START

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UNIVERSITY MICROFILMS INTERNATIONAL, ANN ARBOR, MICHIGAN

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Vol. 1101 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 4, 1989

Route to:

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UNITED STATES PATENT AND TRADEMARK OFFICE
April 4, 1989 Volume 1101 Number 1

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

The withdrawal of the Norwegian declaration under PCT Article 64(1)(a), that Norway shall not be bound by PCT Chapter II, as from Jan. 1, 1989, was announced at 1096 O.G. 34 on Nov. 22, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Oct. 26, 1988.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on April 1, 1986 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,578,821 through 4,580,295
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 30, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,321,708 through 4,322,857
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and 7 years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant . . . $ 445.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 445.00
By other than a small entity . . . . . $ 890.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 15, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,493,117	06/510,558	1/15/85
4,493,120	06/434,767	1/15/85
4,493,121	06/489,479	1/15/85
4,493,126	06/338,587	1/15/85
4,493,137	06/533,399	1/15/85
4,493,146	06/330,212	1/15/85
4,493,154	06/389,944	1/15/85
4,493,155	06/427,241	1/15/85
4,493,161	06/450,968	1/15/85
4,493,169	06/446,190	1/15/85
4,493,174	06/385,681	1/15/85
4,493,175	06/423,430	1/15/85
4,493,182	06/478,519	1/15/85
4,493,198	06/414,895	1/15/85
4,493,201	06/459,780	1/15/85
4,493,204	06/459,828	1/15/85
4,493,216	06/426,617	1/15/85
4,493,227	06/345,842	1/15/85
4,493,230	06/460,181	1/15/85
4,493,245	06/487,573	1/15/85
4,493,246	06/395,071	1/15/85
4,493,247	06/504,264	1/15/85
4,493,251	06/427,913	1/15/85
4,493,260	06/549,841	1/15/85
4,493,262	06/438,683	1/15/85
4,493,267	06/340,115	1/15/85
4,493,268	06/493,241	1/15/85
4,493,285	06/456,857	1/15/85
4,493,288	06/513,817	1/15/85
4,493,290	06/495,775	1/15/85
4,493,296	06/268,019	1/15/85
4,493,299	06/406,189	1/15/85
4,493,303	06/482,379	1/15/85
4,493,310	06/509,207	1/15/85
4,493,313	06/372,882	1/15/85
4,493,324	06/505,306	1/15/85
4,493,328	06/394,835	1/15/85
4,493,330	06/454,578	1/15/85
4,493,332	06/464,141	1/15/85
4,493,345	06/516,092	1/15/85
4,493,349	06/473,779	1/15/85
4,493,366	06/438,463	1/15/85
4,493,381	06/485,624	1/15/85
4,493,393	06/529,518	1/15/85

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Patent Number	Serial Number	Issue Date
4,493,395	06/538,536	1/15/85
4,493,401	06/434,375	1/15/85
4,493,413	06/342,434	1/15/85
4,493,421	06/429,039	1/15/85
4,493,428	06/544,107	1/15/85
4,493,430	06/432,655	1/15/85
4,493,437	06/429,950	1/15/85
4,493,453	06/479,813	1/15/85
4,493,455	06/502,108	1/15/85
4,493,476	06/425,897	1/15/85
4,493,477	06/527,268	1/15/85
4,493,480	06/531,865	1/15/85
4,493,487	06/492,330	1/15/85
4,493,491	06/474,015	1/15/85
4,493,493	06/434,901	1/15/85
4,493,497	06/275,579	1/15/85
4,493,500	06/478,711	1/15/85
4,493,504	06/417,481	1/15/85
4,493,506	06/362,629	1/15/85
4,493,511	06/416,073	1/15/85
4,493,520	06/442,333	1/15/85
4,493,522	06/438,122	1/15/85
4,493,527	06/429,721	1/15/85
4,493,533	06/370,120	1/15/85
4,493,535	06/301,447	1/15/85
4,493,538	06/423,231	1/15/85
4,493,539	06/394,040	1/15/85
4,493,552	06/479,266	1/15/85
4,493,563	06/354,246	1/15/85
4,493,566	06/387,156	1/15/85
4,493,567	06/323,032	1/15/85
4,493,571	06/476,666	1/15/85
4,493,576	06/458,656	1/15/85
4,493,579	06/339,179	1/15/85
4,493,588	06/303,829	1/15/85
4,493,618	06/485,460	1/15/85
4,493,634	06/372,829	1/15/85
4,493,639	06/570,415	1/15/85
4,493,645	06/509,809	1/15/85
4,493,646	06/401,611	1/15/85
4,493,649	06/464,665	1/15/85
4,493,651	06/586,272	1/15/85
4,493,652	06/487,022	1/15/85
4,493,657	06/400,018	1/15/85
4,493,658	06/450,335	1/15/85
4,493,663	06/456,552	1/15/85
4,493,665	06/385,303	1/15/85
4,493,670	06/563,697	1/15/85
4,493,675	06/487,556	1/15/85
4,493,680	06/446,429	1/15/85
4,493,700	06/425,287	1/15/85
4,493,703	06/609,520	1/15/85
4,493,712	06/424,895	1/15/85
4,493,728	06/507,874	1/15/85
4,493,729	06/283,136	1/15/85
4,493,732	06/480,021	1/15/85
4,493,736	06/538,806	1/15/85
4,493,738	06/470,545	1/15/85
4,493,742	06/592,652	1/15/85
4,493,743	06/459,646	1/15/85
4,493,749	06/428,596	1/15/85
4,493,751	06/416,154	1/15/85
4,493,764	06/618,791	1/15/85
4,493,766	06/381,242	1/15/85
4,493,825	06/432,967	1/15/85
4,493,827	06/551,144	1/15/85
4,493,835	06/436,802	1/15/85
4,493,838	06/426,543	1/15/85
4,493,841	06/464,444	1/15/85
4,493,842	06/494,349	1/15/85
4,493,843	06/380,838	1/15/85
4,493,846	06/243,570	1/15/85
4,493,853	06/462,726	1/15/85
4,493,857	06/448,813	1/15/85
4,493,860	06/448,103	1/15/85
4,493,862	06/582,391	1/15/85
4,493,871	06/456,727	1/15/85
4,493,912	06/523,306	1/15/85
4,493,918	06/414,998	1/15/85
4,493,925	06/409,786	1/15/85
4,493,936	06/569,379	1/15/85
4,493,937	06/448,093	1/15/85
4,493,946	06/471,905	1/15/85
4,493,948	06/508,126	1/15/85
4,493,950	06/434,865	1/15/85
4,493,951	06/486,260	1/15/85
4,493,956	06/527,289	1/15/85
4,493,965	06/498,061	1/15/85
4,493,975	06/430,731	1/15/85
4,493,978	06/512,550	1/15/85
4,493,990	06/425,909	1/15/85
4,493,995	06/376,142	1/15/85
4,493,996	06/394,341	1/15/85
4,494,002	06/460,502	1/15/85
4,494,007	06/414,385	1/15/85
4,494,011	06/358,021	1/15/85
4,494,013	06/438,875	1/15/85
4,494,026	06/509,719	1/15/85
4,494,032	06/524,267	1/15/85
4,494,037	06/416,182	1/15/85
4,494,045	06/488,849	1/15/85
4,494,049	06/425,907	1/15/85
4,494,052	06/405,441	1/15/85
4,494,071	06/340,911	1/15/85
4,494,078	06/258,808	1/15/85
4,494,092	06/397,603	1/15/85
4,494,095	06/430,981	1/15/85
4,494,142	06/323,280	1/15/85
4,494,169	06/551,466	1/15/85
4,494,170	06/551,469	1/15/85
4,494,199	06/418,682	1/15/85
4,494,214	06/463,613	1/15/85
4,494,229	06/331,383	1/15/85
4,494,237	06/388,995	1/15/85
4,494,243	06/442,055	1/15/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,165,832, Re. S.N. 313,258, Filed Feb. 23, 1989, Cl. 229/054.00R, THERMOPLASTIC BAG, Milton C. Kuklier, Owner of Record: *Mobil Oil Corp., Fairfax, Va.,* Attorney or Agent: James P. O'Sullivan, Ex. Gp.: 241

4,623,216, Re. S.N. 246,274, Filed Sept. 19, 1988, Cl. 350/6.8, LIGHT BEAM SCANNING APPARATUS, Hideki Sato, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: William M. Wannisky, Ex. Gp.: 257

4,637,199, Re. S.N. 300,051, Filed Jan. 23, 1989, Cl. 53/451, INDUCTION SEALING OF PAPERBOARD, Robert F. Steck, et al., Owner of Record: *International Paper Co., New York, N.Y.,* Attorney or Agent: Robert M. Isackson, Ex. Gp.: 321

4,638,364, Re. S.N. 299,189, Filed Jan. 19, 1989, Cl. 358/227, AUTO FOCUS CIRCUIT FOR VIDEO CAMERA, Tatsuo Hiramatsu, Owner of Record: *Sanyo Electric, Osaka, Japan,* Attorney or Agent: William F. Westerman, Ex. Gp.: 262

4,640,015, Re. S.N. 301,079, Filed Jan. 24, 1989, Cl. 33/203.18, MACPHERSON STRUT ALIGNMENT GAUGE AND STRAIGHTENING APPARATUS, James H. Mason, Owner of Record: *Inventor,* Attorney or Agent: William J. Clemens, Ex. Gp.: 246

4,644,425, Re. S.N. 251,079, Filed Sept. 30, 1988, Cl. 360/69, CONTROL APPARATUS FOR CONTROLLING, Isao Tamaki, Owner of Record: *Sony Corp., Tokyo, Japan,* Attorney or Agent: Lewis H. Eslinger, Ex. Gp.: 235

4,721,452, Re. S.N. 297,499, Filed Jan. 13, 1989, Cl. 425/547, APPARATUS FOR PRODUCING HOLLOW PLASTIC ARTICLES, Frank W. Delfer, III, Owner of Record: *Husky Injection Molding System Ltd., Ontario, Canada,* Attorney or Agent: Robert B. Bachman, Ex. Gp.: 135

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

The Dahle Corp., Arcadia, Calif., Reg. No. 887,546, for the mark "ATTIVO", Canc. No. 17,379.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before May 5, 1989:

Bryan, John F., Jr., Rte. 2, Box 331F, McKinney, Tex. 75069
Diederiks, Everett G., 12804 Valleyhill St., Lake Ridge, Va. 22192
Johnson, John M., 339 Regents Blvd., Tacoma, Wash. 98466
Kelly, Harold A., Canadian Pats. & Dev. Ltd., 275 Slater St., Ottawa, Ont., Canada K1A 0R3
Klein, Richard L., 4986 Marlin Dr., Huntington Beach, Calif. 92649
Knab, Ann Marie, P.O. Box 293, Ft. Lee, N.J. 07024
Krasnow, Ronald A., Kirkland & Ellis, 655 - 15th St., NW. Washington, D.C. 20005
Lachaiane, Kimberley A., P.O. Box 34312, Sta. D, Ottawa, Ont., Canada K1P 6N9
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CAMERON WEIFFENBACH,
Mar. 9, 1989. *Director of Enrollment*
and Discipline.

Notice of Suspension

Arthur O. Klein, of New York, N.Y. and Westport, Conn., Registration No. 19102, has been suspended from practice as an attorney before the Patent and Trademark Office beginning Mar. 27, 1989 for a period of seven (7) years; execution of the last five (5) years is suspended and Arthur O. Klein is placed on probation for those five (5) years. The terms of probation are:

(i) Arthur O. Klein shall comply with all disciplinary rules applicable to patent attorneys and agents practicing before the Patent and Trademark Office.
(ii) No document in any patent or trademark application can be filed in the Patent and Trademark Office by or on behalf of Arthur O. Klein which (a) uses a certificate of mailing under 37 CFR 1.8, and (b) which indicates on the document that the document was prepared by, worked on, or signed by or on behalf of, Arthur O. Klein.

After the first two (2) years of the seven (7)-year suspension and subject to the probationary five (5)-year period, Arthur O. Klein may be reinstated to practice before the Patent and Trademark Office in patent cases upon compliance with the requirements of 37 CFR 10.160.

No application for readmission shall be considered in less than (2) years from Mar. 27, 1989.

DONALD J. QUIGG,
Feb. 28, 1989. *Assistant Secretary and*
Commissioner of Patents
and Trademarks.

Removal from Register

Pursuant to the provisions of 37 C.F.R. §10.11(b), a letter was directed on Sept. 27, 1988 to Mr. Francis D. Thomas, Jr., 2317 Pennsylvania Ave., NW., Suite 11, Washington, D.C. 20037, the last post office address furnished by him to the Office of Enrollment and Discipline. No reply was received within the period of thirty (30) days therein set.

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Accordingly, his name is being removed from the Register of Attorneys.

Mar. 13, 1989. CAMERON WEIFFENBACH, *Director Office of Enrollment and Discipline.*

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 and 2

[Docket No. 90143-9043]

Amendments of Patent and Trademark Rules concerning Judicial Review of Decisions of the Board of Patent Appeals and Interferences and the Trademark Trial and Appeal Board.

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Proposed Rulemaking.
Summary: The Patent and Trademark Office (PTO) proposes amendments to the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, relating to (1) decisions of the Board of Patent Appeals and Interferences (BPAI), (2) requests for reconsideration of decisions of the BPAI and the Trademark Trial and Appeal Board (TTAB), (3) extensions of time in proceedings after a decision by the BPAI under §§1.196 and 1.197, (4) practices concerning judicial review of final decisions of the BPAI and TTAB, (5) extensions of time for seeking judicial review of BPAI and TTAB decisions and (6) miscellaneous changes in the practice before the BPAI and housekeeping amendments.

Two recent decisions of the U.S. Court of Appeals for the Federal Circuit have held that even though the BPAI includes a new ground for rejection in its decision under 37 CFR §1.196(b)(3), appellants may appeal directly to the Federal Circuit without first seeking reconsideration at the BPAI. Where judicial review is sought without requesting reconsideration, the arguments against the new ground of rejection are developed for the first time during court proceedings. The proposed amendments will require that appellants seek reconsideration of the new ground of rejection prior to appeal or commencement of a civil action.

Experience under the current rules relating to judicial review of final board decisions indicates that the rules may be confusing in certain respects relating to the time in which judicial review must be sought and the manner in which extensions of time for seeking judicial review may be obtained. The proposed rules eliminate any confusion as to when judicial review must be sought and standardize the manner of obtaining extensions of time to seek judicial review.

The proposed rules also make clarifying and housekeeping amendments with respect to practice before the BPAI.

Dates: Comments must be submitted on or before May 24, 1989. An oral hearing is not scheduled.
Address: Address written comments to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231 marked to the attention of Associate Solicitor Richard E. Schafer.
For Further Information Contact: Richard E. Schafer by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information:

(1) *Decisions of the BPAI and requests for reconsideration of BPAI and TTAB decisions*

Only final decisions of the BPAI and TTAB are subject to judicial review. 35 U.S.C. §§141, 145; 15 U.S.C. §1071; 28 U.S.C. §1295 (a)(4)(A) and (B).

Section 1.196(b) provides that if the BPAI has knowledge of any grounds, not involved in the appeal, for rejecting any appealed claim, it may include in its decision a statement to that effect. The statement then constitutes a new rejection of the claims. The rules, as presently written, permit appellants to treat the decision as a final decision in the case and thus immediately appealable. 37 CFR §1.196(b)(3). Therefore, when an appellant proceeds under this option, arguments against the new rejection are presented for the first time to the reviewing court.

A recent decision by the U.S. Court of Appeals for the Federal Circuit rejected the Commissioner's argument that an appellant should not be permitted to contest the BPAI's new ground for rejection because it had not requested reconsideration of that ground by the BPAI. *In re Evanega, 829 F.2d 1110, 1113, 4 USPQ 2d 1249, 1252 (Fed. Cir. 1987). See also In re Nielson*, 816 F.2d 1567, 1570, 2 USPQ 2d 1525, 1527 (Fed. Cir. 1987). In *Evanega*, the Commissioner urged that requiring appellants to request reconsideration, where the BPAI adopts a new ground for rejection, would provide the BPAI with an opportunity to consider appellant's arguments and correct any errors while the case was still in the PTO. This conserves judicial resources, and in any event, obtains the benefit of the BPAI's view should judicial review ultimately be sought. The court held, however, that in view of PTO regulations (37 CFR §1.196(b)(3)) which "expressly provide that the board's decision, even if based on a new ground, is a final determination and thus may be appealed without seeking reconsideration," appellant could not be required to request reconsideration by the BPAI. *Id.*

The rule changes proposed herein would eliminate 37 CFR §1.196(b)(3). By removing §1.196(b)(3), appellants will no longer have the option of treating a new ground of rejection as final and immediately appealable. Appellants' options will be limited to requesting remand to the examiner or requesting reconsideration by the BPAI as set forth in §§1.196(b)(1) and 1.196(b)(2). It is also proposed that the preamble of §1.196(b) be amended to specifically recite that a new ground of rejection shall not be considered a final decision for judicial review.

Under the proposed rules, appellants will still be able to elect further prosecution before the examiner under 37 CFR §1.196(b)(1) or request reconsideration under §1.196(b)(2). Where the option of §1.196(b)(2) is chosen, the proposed rule requires a request for reconsideration to address the new ground of rejection and state the reasons why the new ground was in error. The proposed amendments to §1.196(b)(2) also provide that the BPAI will reconsider the new rejection and, if necessary, render a new decision. The decision on reconsideration will be deemed to incorporate the earlier decision except for any portions of the earlier decision specifically withdrawn.

Reconsideration or remand need not be requested if appellant does not contest the new ground. Appellants may seek judicial review as to claims not subject to the new ground.

The PTO also proposes to amend §1.196(a) to expressly provide for remands to the examiner for further consideration. The BPAI has inherent authority, as part of its role in reviewing standards of patentability applied in the PTO, to remand applications to the examiner for further consideration. *Cf.* Manual of Patent Examining Procedure (MPEP) §§1211 and 1212. The proposed change merely makes express that which is inherent.

The proposed amendments will also delete the portion of current §1.196 d) which provides (1) that any decision which includes a remand shall not be a final decision for the purposes of judicial review and (2) that upon conclusion of the proceedings on remand the BPAI may enter an order making its decision final. Those provisions have been included as new §1.196(e). Under this proposed paragraph, decisions pursuant to §1.196(b) would not be final as to the claims subject to a new rejection.

In light of the proposed addition of §§1.196(e), it is proposed to delete the last sentence of §1.196(b)(1) which similarly provides that the BPAI, after conclusion of proceedings on remand, may enter an order making its decision final.

(2) *Requests for reconsideration of BPAI and TTAB decisions*

The PTO proposes to amend §1.197(b) to provide that any request for reconsideration must specifically state the points believed to have been misapprehended or overlooked in the BPAI's decision. Experience has shown that many requests for reconsideration are nothing more than reargument of appellant's position on appeal. The provision, as proposed, intends to limit requests to the points of law or fact which appellant feels were overlooked or misapprehended by the BPAI.

The proposed amendments also clarify the exception found in the first sentence of §1.197(b) by including specific references to the "original decision" and the "decision on reconsideration." Some confusion has been noted with respect to the meaning of the current language.

In order to simplify calculation of times for requesting reconsideration of the decisions of the boards, the proposed rules would amend §§1.658(b), 2.129(c), and 2.144 to specify a period of one month rather than the periods expressed in days. Section 1.197(a) currently specifies a one-month period.

(3) *Extensions of time after a decision by the BPAI to take action under §§1.196 and 1.197*

Currently, appellants in patent cases may use fee extensions under §1.136(a) to extend the time for making an election under §1.196(b) or seeking reconsideration under §1.197. Appellants may submit their request for reconsideration up to five months or a response to a new ground of rejection up to six months after the date of the decision. This inordinately delays final disposition of appeals. The PTO proposes to amend §1.136(a) to provide that fee extensions are not available to file responses to a BPAI decision pursuant to §§1.196, 1.197 or 1.304. One month is deemed to be ample time to submit a request for reconsideration. Note that Fed. R. Civ. P. 59 provides 10 days and Fed. R. App. P. 40 provides 14 days for similar requests. Extensions under §1.136(b) will be available to extend the time to file a response under §§1.196 and 1.197. Extensions of time to file a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action would be governed exclusively by proposed §1.304(a). See further discussion below.

The PTO also proposes to amend §1.136(a) to specifically refer to §1.136(b) for extensions of time to file responses under §§1.196 and 1.197 and to refer to §1.304 for extensions of time to initiate judicial review. The proposed amendments add references to §1.136(b) in §1.197(b) and new §1.196(f).

Where appellant elects further prosecution before the examiner under §1.196(b)(1), fee extensions of time under§1.136(a) to respond to the examiner's actions remain available.

(4) *Time for seeking judicial review of decisions of the BPAI and TTAB*

Currently, judicial review of final decisions of the BPAI or TTAB must be sought within sixty days of the decision or thirty days after a decision on reconsideration: 37 CFR §§1.304(a) and 2.146(d)(1). However, where a decision on reconsideration is, in effect, a new decision, it is not clear whether the time for appeal is thirty or sixty days. The proposed amendments eliminate any confusion by providing a two-month period to appeal measured from either the date of the decision or the decision on a timely filed request for reconsideration.

Some problems have also arisen with respect to the specification of the time for seeking judicial review in days: Miscalculations have resulted in filing untimely requests fo judicial review. In order to simplify calculation of the time for judicial review, it is proposed to amend §§1.304(a) and 2.145(d)(1) to specify two months rather than sixty days. The two-month period meets the sixty-day requirement of 35 U.S.C. §§142, 145 and 146 and 15 U.S.C. §§1071(a)(2) and (b)(1) except for time periods which include Feb. 28. In order to comply with the sixty-day requirement, it is proposed to amend §§1.304(b) and 2.145(d)(2) to provide that an additional day shall be added to any two-month period for initiating judicial review which includes Feb. 28. Appeals will always be timely if the judicial review is initiated within two months of the final decision.

Currently, the rules do not specify a time period for filing a cross-appeal or cross-action in *inter partes* cases. The absence of such a time period makes it difficult for parties and their attorneys to make appropriate plans for judicial review. For example, in an interference where there has been a split judgment, one of the parties may be satisfied with the judgment but may desire to appeal the adverse judgment only if an appeal is noted by the other party. Where the appeal is filed on the last possible day, a cross-appeal is precluded. The U.S. Court of Appeals for the Federal Circuit, in its practice notes to Fed. Cir. R. 15, has noted that parties in agency proceedings do not have the fourteen-day cross-appeal provided by Fed. R. App. P. 4(a)(3). The PTO proposes to amend §§1.304(a) and 2.145(d)(1) by specifying that the time for filing a cross-appeal or commencing a cross-action expires (1) fourteen days after service of the notice of appeal or the summons and complaint or (2) two months after the decision to be reviewed, whichever is later.

Similarly, no provision for filing a cross-action is currently provided where an appellee elects to have further proceedings conducted in the district court pursuant to 35 U.S.C. §146 or 15 U.S.C. §1071(a)(1). The PTO proposes to amend 37 CFR §§1.304(c) and 2.145(d)(3) to provide that the time for filing a cross-action expires 14 days after service of the summons and complaint. Should the rule as proposed be adopted, the district court will determine whether any cross-action was timely filed since neither the complaint nor cross-action is filed in the PTO.

(5) *Extensions of time to seek judicial review*

Standards for granting requests for extensions of time to take an appeal or commence a civil action vary depending upon which board is involved and upon the particular proceeding before the board. Thus, under current practice, extensions relating to patent applications may be obtained by paying the appropriate fee under §1.136(a). However, in a reexamination proceeding or when judicial review is sought from a decision of the TTAB, the requester must demonstrate sufficient cause under §1.550(c) or §2.145(d)(1). The PTO intends to standardize the manner in which an extension of time to initiate judicial review may be obtained. The PTO proposes to adopt a standard which is similar to the standard used in the Federal courts for granting extensions. Under the proposed rules the Commissioner may extend the time (1) for good cause if requested before the expiration of the time provided for initiating judicial review or (2) upon a showing of excusable neglect in failing to initiate judicial review if requested after the expiration of the time period. This standard will be applicable in both trademark and patent proceedings (proposed §§1.304(a) and 2.145(e)) once the last decision, i.e., either the decision (in circumstances where no timely reconsideration is sought) or the decision on reconsideration, of either board has been entered. In patent cases, extensions of time under §1.136(b) and §1.550(c) and fee extensions under 37 CFR §1.136(a) will no longer be available to extend the time for the purpose of judicial review once a decision or a decision on reconsideration has been entered. It is proposed to amend §.304(a) to state that the provisions of §§1.136 and 1.550(c) are not available to extend the time to initiate judicial review. The PTO proposes to amend §§1.136(a), 1.136(b), 1.191(d),

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1.550(c), 1.645(a) and (b) to refer to §1.304 for extensions of time for seeking judicial review after the decision has been entered. It is also proposed to further amend §1.645(a) by (1) adding the introductory phrase "Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action," to the first sentence and (2) deleting the references to filing a notice of appeal or commencing a civil action in the second sentence.

In view of the proposed amendments to §§1.197 and 1.304, relating to extensions of time to seek reconsideration or initiate judicial review, it is also proposed to amend §1.191(d) by eliminating reference to §§1.196 and 1.197.

(6) *Miscellaneous amendments*

Currently, appellants may use fee extensions to delay the time for requesting an oral hearing at the BPAI. This delays final disposition of the appeal and causes administrative problems and duplication of effort due to the transfer of the appeal to the hearing docket. The PTO proposes to amend §1.191(d) by deleting the reference to §1.194. Under the proposed rules, extensions under§1.136(b) will be available to extend the time to request an oral hearing.

Section 1.191(b) requires that appeals in an application or in a reexamination proceeding be signed by the applicant or patent owner or by a duly authorized attorney. It is proposed to eliminate the second sentence of the rule and add reference to reexamination proceedings to the first sentence. This proposed change merely combines the two sentences without any change in substance.

Some confusion has resulted as to who has jurisdiction to take action in a patent application after a notice of appeal to the BPAI has been filed. Problems arise, for example, as to the appropriate PTO official to decide certain petitions and other matters after an appeal has been filed. MPEP §1210 indicates that jurisdiction over the application normally passes at one of five possible times listed therein. The PTO proposes to amend Rule 1.191 by adding a new section (e) which provides that jurisdiction transfers to the BPAI when the application or reexamination file including all briefs and examiner's answers is transmitted to the BPAI. Thus, jurisdiction transfers to the BPAI when all written submissions by the applicant and the examiner have been entered and the application papers have been forwarded to the BPAI.

New paragraph 1.191(e) as proposed also includes a provision that the Commissioner, prior to the time the BPAI renders its decision, may *sua sponte* order that an application be remanded to the examiner for further consideration. This provision merely makes explicit the inherent authority of the Commissioner to direct and supervise the examination of patent applications.

There is some confusion as to when "termination of proceedings" occurs in situations where judicial review has been sought. The proposed amendment to §1.197(c) provides that proceedings are "terminated" when the Federal Circuit's mandate is received by the PTO or after the time for appeal from the judgment of the district court in a civil action under 35 U.S.C. §145 has expired. The PTO also proposes to eliminate the language "In such cases," in the second sentence of §1.197(c) since it is superfluous and may be confusing.

The PTO proposes to delete the phrase "that he or she elects" and substitute "electing" therefor in §§1.304(c) and 2.145(c)(3). The proposed amendment merely changes wording without any change in substance.

It is also proposed to amend the last sentence of the preamble of §1.196 b) by changing the verb "make" to "makes" to conform the verb to the singular subject of the sentence.

The PTO proposes to remove the portions of §§1.301, 1.303, 2.145(a)(2) and 2.145(c)(3) which refer to transmittal of the certified list and certified copies of the notice of election under 35 U.S.C. §141 or 15 U.S.C. §1071(a)(1) to the U.S. Court of Appeals for the Federal Circuit. These procedures are required by applicable statutes or Court Rules and are unnecessary in the PTO's regulations.

The PTO proposes to amend §§1.304(a), 1.304(c), 2.145(c)(3) and 2.145(d)(1) by including a statement that the certificate of mailing provisions of §1.8 are not applicable. No substantive change is involved since the inapplicability of §1.8 is already stated in §§1.8(a)(2)(viii) and (ix).

Sections 1.304(b) and 2.145(d)(2) provide that where the last day of the period for initiating judicial review is a "Saturday, Sunday or legal holiday," the time is extended to the next day which is not one of those days. The PTO proposes to amend §§1.304(b) and 2.145(d)(2) to recite "Federal holiday in the District of Columbia" rather than "legal holiday." These changes will merely conform the language of these sections with the language of 35 U.S.C. §21(b) and 37 CFR §1.7.

Additional proposed changes to §2.145(c)(2) and (3) make changes in wording without any change in substance.

Other Considerations

The proposed rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 350 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the proposed rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The proposed rule change requiring appellant to request reconsideration under the specific circumstances set forth would not be expected to result in an increase of fees charged by attorneys and agents to entities, including small entities, since the rule change is intended to eliminate erroneous grounds for rejection prior to appeal and in some instances is expected to eliminate the need for appeal.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no Federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR, Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and recordkeeping requirements, Small businesses.

List of Subjects in 37 CFR, Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set out in the preamble, the Patent and Trademark Office proposes to amend Parts 1 and 2 of Title 37 of the Code of the Federal Regulations as set forth below. Proposed deletions are indicated in brackets ([]) and proposed additions by arrows (►◄).

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.136 is proposed to be revised to read as follows:

§1.136 Filing of timely responses with petition and fee for extension of time and extension of time for cause.

(a) If an applicant is required to respond within a nonstatutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in §1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action►,◄ [or] (2) the application is involved in an interference declared pursuant to §1.611 ►or (3) the response is to a decision by the Board of Patent Appeals and Interferences pursuant to §§1.196, 1.197 or 1.304◄. The date on which the response, the petition and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See ►§1.136(b) for extensions of time relating to proceedings pursuant to §§1.196 or 1.197, §1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action,◄ §1.645 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See ►§1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action,◄ §1.645 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings.

3. Section 1.191 is proposed to be amended by revising paragraphs (b) and (d) and adding paragraph (e) to read as follows:

§1.191 Appeal to Board of Patent Appeals and Interferences

• • • • •

(b) The appeal in an application ►or reexamination proceeding◄ must identify the rejected claim or claims appealed, and must be signed by the applicant►, patent owner◄ or duly authorized attorney or agent. [An appeal in a reexamination proceeding must identify the rejected claim or claims appealed, and must be signed by the patent owner or duly authorized attorney or agent.]

• • • • •

(d) The time periods set forth in §§1.191 through ►1.193◄ [1.194, 1.196 and 1.197] are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings. ►See §1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.◄

►(e) Jurisdiction over the application or patent under reexamination passes to the Board of Patent Appeals and Interferences upon transmittal of the file, including all briefs and examiner's answers, to the Board. Prior to the entry of a decision on the appeal, the Commissioner may sua sponte order the application remanded to the examiner.◄

4. Section 1.196 is proposed to be amended by revising paragraphs (a), (b) and (d) and adding new paragraphs (e) and (f) to read as follows:

1.196 Decision by the Board of Patent Appeals and Interferences

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner ►or remand the application to the examiner for further consideration◄. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. ►A new rejection shall not be considered final for the purpose of judicial review.◄ When the Board of Patent Appeals and Interferences make►s◄ a new rejection of an appealed claim, the appellant may exercise ►either◄ [any one] of the following ►two◄ [three] options ►with respect to the new ground◄:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner [and the decision of the Board of Patent Appeals and Interferences shall not be considered final for the purpose of judicial review]. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the application the applicant may again appeal to the Board of Patent Appeals and Interferences. [When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.]

(2) The appellant may have the case reconsidered under §1.197(b) by the Board of Patent Appeals and Interferences upon the same record. ►The request for reconsideration shall address the new ground for rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought◄. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall ►reconsider the new ground for rejection and◄, if necessary, render a new decision which shall include all grounds upon which a patent is refused. ►The decision on reconsideration is deemed to incorporate the earlier decision, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review◄.

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[(3) The appellant may treat the decision, including the new grounds for rejection given by the Board of Patent Appeals and Interferences, as a final decision in the case.]

* * * * *

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.[Whenever a decision of the Board of Patent Appeals and Interferences includes a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.]

►(e) Whenever decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.◄

►(f) See §1.136(b) for extensions of time to take action under this section.◄

5. Section 1.197 is proposed to be amended by revising paragraphs (b) and (c) to read as follows:

§1.197 Action following decision

* * * * *

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless [that] ►the original◄ decision is so modified ►by the decision on reconsideration◄ as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. ►The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See 37 CFR §1.136(b) for extensions of time for seeking reconsideration.◄

(c) ►Termination of proceedings.◄ Proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (§1.304) except: (1) where claims stand allowed in an application or (2) where the nature of the decision requires further action by the examiner. [In such cases, the]►The◄ date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the court or review by civil action (§1.304) expires. If an appeal to the court or a civil action has been filed, proceedings are [similarly] considered terminated when the appeal or civil action is terminated. ►An appeal to the U. S. Court of Appeals for the Federal Circuit is terminated when the mandate is received by the Office. A civil action is terminated when the time to appeal the judgment expires.◄

6. Section 1.301 is proposed to be revised to read as follows:

§1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court. [The certified list of documents and any original or certified copies of such documents required by the Court will be transmitted to the Court by the Patent and Trademark Office].

7. Section 1.303 is proposed to be amended by revising paragraph (c) to read as follows:

§1.303 Civil action under 35 U.S.C. 145, 146, 306.

* * * * *

(c) If any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an interference proceeding files notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (§1.302), that he or she elects to have all further proceedings conducted as provided in 35 U.S.C. 146[, certified copies of such notices will be transmitted to the U.S. Court of Appeals for the Federal Circuit for such action as may be necessary]. The notice of election must be served as provided in §1.646.

8. Section 1.304 is proposed to be revised to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is ►two months◄ [sixty days] from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under §1.197(b) or §1.658, the time for filing an appeal or commencing a civil action shall expire ►two months◄ [at the end of the sixty-day period or thirty days] after action on the request[, whichever is later]. ►In interferences, the time for filing a cross-appeal or cross-action expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later. The time periods set forth in this section are not subject to the provisions of §1.136, 1.550(c) or 1.645(a) or (b).◄ [Except for an appeal from or commencing a civil action after a decision of the Board of Patent Appeals and Interferences in a reexamination proceeding or an interference proceeding, the time periods set forth herein are subject to the provisions of §1.136. See §1.550(c) for extensions of time to appeal or commence a civil action in a reexamination proceeding. See §1.645(a) for extensions of time to appeal or commence a civil action in an interference.] ►The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.◄ [An examiner-in-chief, upon a showing of excusable neglect, may extend the time for seeking judicial review of a decision of the Board of Patent Appeals and Interferences in an interference case when a request is untimely filed after expiration of the time prescribed by this section.] ►The certificate of mailing practice of §1.8 is not available for filing a notice of appeal or cross-appeal. See §1.8(a)(2)(ix).◄

(b) The times specified ►in this section◄ [herein] ►in days◄ are calendar days. ►The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes Feb. 28.◄ If the last day of the time specified for appeal or commencing a civil action falls on a Saturday, Sunday or [legal] ►Federal◄ holiday ►in the District of Columbia◄, the time is extended to the next day which is neither a Saturday, Sunday nor a ►Federal◄ holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 [that he or she elects] ►electing◄ to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. ►The time for filing a cross-action expires 14 days after service of the summons and complaint. The certificate of mailing practice of §1.8 is not available for filing a notice of appeal or cross-appeal. See §1.8(a)(2)(viii).◄

9. Section 1.550 is proposed to be amended by revising paragraph (c) to read as follows:

§1.550 Conduct of reexamination proceedings

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension.►See §1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.◄

* * * * *

10. Section 1.645 is proposed to be amended by revising paragraphs (a) and (b) to read as follows:

§1.645 Extension of time, late papers, stay of proceedings

(a) ►Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, a ◄ [A] party may file a motion (§1.635) seeking an extension of time to take action in an interference[, to file a notice of appeal (1.302 or §1.304), or to commence a civil action (§1.303 or §1.304).] ►See §1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.◄ The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action[, filing the notice, or commencing the civil action]. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proven through the witness.

(b) Any paper belatedly filed, will not be considered except upon motion (§1.635 which shows sufficient cause why the paper was not timely filed. ►See §1.304(a) for exclusive procedures relating to belated filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or belated commencement of a civil action.◄

* * * * *

11. Section 1.658 is proposed to be amended by revising paragraph (b) to read as follows:

1.658 Final decision

* * * * *

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within ►one month◄ [14 days] after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or " Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

* * * * *

PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

12. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

13. Section 2.129 is proposed to be amended by revising paragraph (c) to read as follows:

§2.129 Oral argument; reconsideration

* * * * *

(c) Any request for rehearing or reconsideration or modification of a decision issued after final hearing must be filed within ►one month◄ [thirty days] from the date of the decision. A brief in response must be filed within fifteen days from the date of service of the request. The times specified may be extended by order of the Trademark Trial and Appeal Board on motion for good cause.

14. Section 2.144 is proposed to be revised to read as follows:

§2.144 Reconsideration of decision on ex parte appeal

Any request for rehearing or reconsideration, or modification of the decision, must be filed within ►one month◄ [thirty days] from the date of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

15. Section 2.145 is proposed to be amended by revising paragraphs (a), (c)(2), (c)(3), (d)(1),(d)(2) and (d)(3) and adding new paragraph (e) to read as follows:

§2.145 Appeal to court and civil action.

(a) Appeal to U.S. Court of Appeals for the Federal Circuit. An applicant for registration, or any party to an

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interference, opposition, or cancellation proceeding or any party to an application to register as a concurrent user, hereinafter referred to as inter partes proceedings, who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under section 8 of the Act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§2.165, 2.184), may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal:

(1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section);
(2) In the court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court. [The certified list required by the rules of the Court will be transmitted to the Court by the Patent and Trademark Office.]

* * * * *

(c) * * *

(2) ►Any◄ [If an] applicant or registrant in an ex parte case ►who takes◄ [has taken] an appeal to the U.S. Court of Appeals for the Federal Circuit[, he thereby] waives ►any◄ [his] right to proceed under section 21(b) of the Act.

(3) ►Any◄ [If any] adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding ►may file a◄ [files] notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), [that he or she elects] ►electing◄ to have all further proceedings conducted as provided in section 21(b) of the Act[, certified copies of such notices will be transmitted to the U.S. Court of Appeals for the Federal Circuit for such action may be necessary]. The notice of election must be served as provided in §2.119. ► The certificate of mailing practice of §1.8 is not available for filing a notice of election. See §1.8(a)(2)

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is ►two months◄ [sixty days] from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§2.127(b), 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire [at the end of the] ►two months◄ [sixty day period or thirty days] after action on the request[, whichever is later]. ►In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later.◄ [The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.] ►The certificate of mailing practice of §1.8 is not available for filing a notice of appeal or cross- appeal. See §1.8(a)(2)(ix).◄

(2) The times specified ►in this section◄ [herein] ►in days◄ are calendar days. ►The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes Feb. 28.◄ If the last day of time specified for an appeal, or commencing a civil action falls on a Saturday, Sunday or [legal] ►Federal◄ holiday ►in the District of Columbia◄, the time is extended to the next day which is neither a Saturday, Sunday nor a ►Federal◄ holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under section 21(a)(1) of the Act ►electing◄ [that he or she elects] to have all further proceedings conducted under section 21(b) of the Act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the Act. ►The time for filing a cross-action expires 14 days after service of the summons and complaint.◄

►(e) Extensions of time to commence judicial review. The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.◄

Feb. 13, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

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Department of Commerce
Patent and Trademark Office
37 CFR Parts 1 and 10

Docket No. 90135-9035

Duty of Disclosure and Practitioner Misconduct

Agency: Patent and Trademark Office, Commerce
Action; Proposed Rule
Summary:The Patent and Tradmark Office (Office) proposes to amend the rules of practice in patent cases (1) to clarify the duty of disclosure standard for information required to be submitted to the Office; (2) to make information disclosure statements mandatory for complying with the duty of disclosure; (3) to provide specific deadlines for submitting such statements including the requirement of a fee in some cases if the statement is filed after the first deadline; (4) to eliminate consideration of duty of disclosure issues by he Office except in disciplinary proceedings, and under limited circumstances in the examination of reissue applications; and (5) to eliminate the striking of patent applications which are improperly executed. The Office further proposes to amend the rules governing practice before it by registered attorneys and agents to define acts of misconduct which conform to a failure to comply with the proposed rules on duty of disclosure.

These proposed changes are considered desirable in view of the large amount of resources that are being devoted to duty of disclosure issues both within and outside the Office without significantly contributing to the reliability of the patents being issued. The proposed rules are intended: (1) to reduce the burden on patent applicants and those associated with the filing and prosecution of patent applications in complying with the duty of disclosure to the Office; (2) to minimize the risk that valuable patent rights will be lost by providing procedures and mandatory deadlines for submitting information to the Office in pending patent applications; (3) to ensure consideration of relevant information by the Office before a final decision on patentability is made by the patent examiner; and (4) to permit some of the Office resources now devoted to a consideration of duty of disclosure issues to be directed to the reduction in the backlog of pending patent applications.
Dates: Comments must be submitted on or before June 20, 1989. A public hearing will be held on June 22, 1989, beginning at 9:30 a.m. Requests to present oral testimony should be received on or before June 20, 1989.
Addresses: Address written comments and requests to present oral testimony to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Charles E. Van Horn. The hearing will be held at the U.S. Patent and Trademark Office in Room 912 of Bldg. 2, Crystal Park, located at 2121 Crystal Dr., Arlington, Va. Written comments and a transcript of the public hearing will be available for public inspection in Room 5C15 of Bldg. 2, Crystal Plz.
For Further Information; Charles E. Van Horn or John H. Raubitschek by telephone at (703) 557-4035 or by mail addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information:

The goal of any patent examination system is to provide for the grant of reliable patents to protect the patent owner and those who must often expend considerable resources in developing the invention. The grant of reliable patents is dependent, in large part, on the examiner making a decision on patentability after a thorough consideration of the scope and content of the prior art. Any intentional withholding from the Office of information which directly affects the determination of patentability of an invention may undermine the reliability of the resulting patent.

This proposed rule change is designed to ensure that the examiner considers the pertinent prior art before making a final decision on patentability and to allow for the reallocation of Office resources regarding the duty of disclosure in the prosecution of patent applications before the Office. It has long been recognized that by reason of the nature of an application for patent, those representing a patent applicant before the Office are required to act in a manner consistent with the highest degree of candor and good faith. *Kingsland* v. *Dorsey*, 338 U.S. 318, 83 USPQ 330 (1949), *reh,q denied*, 338 U.S. 939 (1950).

There have been several attempts to define the duty to disclose information to the Office in 37 CFR 1.56. In addition, an evolving body of case law on fraud and inequitable conduct in the Office has reflected, at times, a lack of cohesive direction. This has led to some uncertainty about the duty of disclosure and to the unproductive use of considerable resources by the Office, the patent bar, patent applicants, and patent owners in addressing issues relating to this duty. *See* 16 AIPLA Quarterly Journal Nos. 1 and 2 (1988).

The determination of inequitable conduct in the Office as it relates to the nondisclosure of information affecting the patentability of an invention has involved a factual determination of two elements: (1) materiality of the information; and (2) intent to mislead the Office on the part of the individual who did not bring the information to the attention of the Office. After the withheld information and conduct of the individual are determined to meet the threshold levels of materiality and intent, courts balance the findings relating to materiality and intent in order to evaluate whether inequitable conduct has occurred. *J. P. Stevens & Co.* v. *Lex Tex, Ltd.*, 747 F.2d 1553, 223 USPQ 1089 (Fed. Cir. 1984), *cert. denied*, 474 U.S. 822 (1985).

The Office standard for materiality in §1.56 is considered by the courts to be an appropriate starting point for analysis since it appears to be the broadest, thus encompassing other standards, and because §1.56 governs how one ought to conduct business with the Office. *American Hoist & Derrick Co.* v. *Sowa & Sons, Inc.*, 725 F.2d 1350, 220 USPQ 763 (Fed. Cir.), *cert. denied*, 469 U.S. 821 (1984). However, the Office believes that an appropriate standard of materiality should take into consideration whether or not the examiner was influenced by the withholding of the information to avoid the harsh effects of *A. B. Dick Co.* v. *Burroughs Corp.*, 798 F.2d 1392, 230 USPQ 849 (Fed. Cir. 1986), where a patent was held to be unenforceable even though the examiner was aware of and applied the withheld prior art. In addition, there may be a question of the need for applying the concept of materiality to claims which have been canceled or modified in order to find inequitable conduct. *See Driscoll* v. *Cebala*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984).

Some court decisions have held that intent to mislead may be inferred from the materiality of the withheld reference(s). *Argus Chemical Corp.* v. *Fibre Glass-Evercoat Co., Inc.*, 759 F.2d 10, 225 USPQ 1100 (Fed. Cir.), *cert. denied*, 474 U.S. 903 (1985). Other decisions require consideration of the attorney's or agent's good faith or lack thereof. *Allen Archery, Inc.* v. *Browning Mfg. Co.*, 819 F.2d 1087, 2 USPQ 2d 1490 (Fed. Cir. 1987). However, recently the Federal Circuit has required that in order to prove inequitable conduct, there must be evidence of intent to mislead the Office beyond the materiality of the withheld references. *FMC Corp.* v. *Manitowoc, Co. Inc.*, 835 F.2d 1411, 5 USPQ 2d 1112 (Fed. Cir. 1987) and *Burlington Industries, Inc.* v. *Dayco Corp.*, 849 F.2d 1418, 7 USPQ 2d 1158 (Fed. Cir. 1988). *See also Kingsdown Medical Consultants, Ltd.* v. *Hollister Inc.*, 863 F.2d 867, 9 USPQ 2d 1384 (Fed. Cir. 1988) (en banc).

The requirement for evidence on intent to mislead the Office was also applied to the Office in making a rejection under §1.56. *In re Harita*, 847 F.2d 801, 6 USPQ 2d 1930 (Fed. Cir. 1988). The recent emphasis by the courts on the element of intent has led the Office to re-examine its policy with respect to §1.56 because of the difficulty in obtaining probative evidence on intent. The Office makes its decision on the record and does not take live testimony where the demeanor of the witnesses, who are subject to cross-examination, can be observed. For the Office to conduct hearings is not considered to be an effective utilization of resources. Further, the examination procedure is essentially *ex parte* and so the evidence on intent would have to be developed primarily by the Office.

On the other hand, courts hear testimony, have subpoena power, and can easily fashion an equitable remedy to fit the precise facts in those cases where inequitable conduct is established. In addition, a court proceeding generally involves at least two participating adverse parties to develop the evidence. Thus, it seems more appropriate for inequitable conduct issues to be handled by the courts rather than by an administrative body, especially since inequitable conduct is not a statutory criterion for patentability but rather results from a judicial application of the doctrine of unclean hands.

The proposed changes to the rules relating to the duty of disclosure retain the responsibilities of candor and good faith in dealing with the Office and are intended to promote the reliability of issued patents while minimizing the risks that patent rights may be unnecessarily compromised in the examination of patent applications. The Office believes that these purposes can be accomplished by specifying the threshold level of materiality to conform with an objective "but for" standard, and by ensuring that an information disclosure statement will be considered in an application at a point in time before a final determination of patentability is made. The "but for" standard of materiality should result in a more predictable duty of disclosure because it is based on a statutory standard of patentability. Although submission of an information disclosure statement might be acceptable a short time after final action by the examiner with an additional fee to cover the increased costs of examination, the Office considers the establishment of final action as a specific deadline to be a more effective way to ensure that pertinent information will be thoroughly considered by the examiner before the patent issues and to discourage intentional delays in the submission of information disclosure statements.

Under the proposed changes to the rules, the Office will no longer investigate violations of the duty to disclose, except with respect to a charge of misconduct under§10.131, nor will it reject claims for such violations. Similarly, the Office will not comment upon duty of disclosure issues which are brought to the attention of the examiner except to note in the application file, when appropriate, that such issues are no longer considered by the Office during its examination of patent applications.

Examination of lack of deceptive intent in reissue applications will continue, but without any in-

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dependent investigation of inequitable conduct issues. The reissue applicant's statement of lack of deceptive intent will be accepted as dispositive except in special circumstances, such as a judicial determination of fraud or inequitable conduct or an admission of facts which would conclusively establish fraud or inequitable conduct without any investigation. In those cases, the claims will be rejected under 35 U.S.C. 251 for failing to satisfy the statutory requirement of a lack of "deceptive intent." *See In re Clark*, 522 F.2d 623, 187 USPQ 209 (CCPA 1975). Accordingly, reissue will not be available to cure a prior judicial determination of inequitable conduct.

It is anticipated that under the proposed change in practice, information pertinent to a determination of patentability will be brought to the attention of the Office in a timely manner. An applicant's desire to minimize the prospect of facing an inequitable conduct charge or decision in any later litigation as well as to assure the greatest benefit of the presumption of validity under 35 U.S.C. 282, should provide sufficient incentive to furnish the necessary information to the Office. By filing information disclosure statements which include close art or information even though it is not considered to render any claim unpatentable, an applicant may thereby avoid inequitable conduct issues or charges and develop a strong defense in the event of such a charge. The practice of citing close art may be helpful in those cases where the art is combinable with other art subsequently found and cited by the examiner especially since a court may find that the withheld information does, in fact, affect patentability.

It should be noted that patentees may have to show later in litigation that there was no "intent" to withhold information or deceive the Office. Thus, until the proposed change by the Office is adopted by the Office and the courts, an applicant and those others who owe a duty to the Office should comply also with the duty as applied by the courts which may find inequitable conduct or fraud with respect to one or more claims, thereby rendering a patent unenforceable or invalid. *See Kingsdown Medical Consultants, Ltd.* v. *Hollister Inc., supra*, at 20.

The proposed change is very unlikely to have a significant impact on the workload of the Federal courts since the duty of disclosure issue was raised in less than 0.3% of the pending applications over the past two fiscal years and patent suits were filed at a rate of about 0.83% of all patents granted in the same time period. Further, enforcement by the Office of the duty of disclosure has rarely avoided the necessity of consideration of this issue by the courts.

Practitioners found to have participated in inequitable conduct or fraud remain subject to disciplinary proceedings. 37 CFR Part 10.

The proposed rules would substantially conform the rules to the policy announced in the Official Gazette: "Patent and Trademark Office Implementation of 37 CFR 1.56," 1095 *Official Gazette* 16 (Oct. 11, 1988), "Further Clarification on Patent and Trademark Office Implementation of 37 CFR 1.56," 1096 *Official Gazette* 19 (Nov. 8, 1988), and "Patent and Trademark Office Implementation of 37 CFR 1.28(d) and 1.56(c), (f) and (g)," 1098 *Official Gazette* 502 (Jan. 3, 1989).

DISCUSSION OF SPECIFIC RULE CHANGE PROPOSALS:

Section 1.17, if amended as proposed, would add a fee defined in paragraph (p) to be $200.00, which is due upon filing of an information disclosure statement more than three months after the filing date of the application as described in proposed §1.97(f) and (g) or more than two months after the date of the order for examination as set forth in proposed §1.555(b). Two exemptions from this fee requirement are provided in §§1.97(g) and 1.555(b). The information disclosure statement will not be considered to have been filed until the fee is paid in full.

Prior to the changes in the duty of disclosure proposed herein, an applicant assumed the risk of violating the duty if an examiner cited a reference before it was brought to the attention of the Office. Under the proposed rules, which are more flexible in allowing information to be brought to the attention of the Office, the duty would not be violated until a patent issued. Therefore, the proposed fee is being charged to cover a new service as well as to compensate the Office for the extra work caused the examiner who may have to redo part or all of the examination.

Section 1.28(d)(2) is proposed to be amended to remove the references to §1.56(d) (proposed to be deleted) and to §1.555 of this part. This proposal retains the identification of a fraud practiced or attempted on the Office, but removes the reference to those sections of this part which provide for rejections based on such fraud.

Section 1 52(c) is proposed to be amended to remove the reference to §1.56(c), which is proposed to be deleted. As noted below, the Office proposes that it will no longer take steps to strike an application for the reasons defined in §1.56(c).

Section 1.56 is proposed to be deleted in its entirety to provide a clear demarcation with past practice in the Office and to facilitate future citation and application of the proposed new rule and the principles it embodies. Thus, a legal search of §1.57 will reveal only cases decided under the new practice, but a search of §1.56 will be limited to cases decided under the old practice.

Proposed §1.57 defines the new duty to disclose information to the Office and the limited circumstances in which the Office will take action when it is determined that a violation has occurred Proposed §1.57 defines various aspects of Office practice, procedure and policy as follows:

(a) who has the duty to disclose;
(b) what information is required to be disclosed;
(c) circumstances for action by the Office; and
(d) misconduct - lack of candor and good faith.

Section 1.57(a), as proposed, defines the class of individuals who owe a duty of candor and good faith to the Office. The purpose of §1.57(a) is to define the same class of individuals included in §1.56. Thus, the duty is owed by four groups of individuals that are not necessarily mutually exclusive: (1) any named inventor as defined in paragraph (a)(1); (2) any non-inventor as defined in paragraph (a)(2); (3) each registered attorney or agent as defined in paragraph (a)(3); and (4) any other individual who is both substantively involved in the preparation or prosecution of the application and who is associated with at least one of the entities defined in paragraph (a)(4)(II). The latter group of individuals would include foreign patent attorneys representing an applicant for a U.S. patent through a local correspondent firm. *See In re Harita, supra*, and *Gemveto Jewelry Co., Inc.* v. *Lambert Bros., Inc.*, 542 F. Supp. 933, 216 USPQ 976 (S.D.N.Y. 1982). It would also include a person acting as liaison between the inventor and the attorney or agent handling the prosecution of an application before the Office and who is involved in the preparation or prosecution of the application in a manner that would make a reasonable representative aware of the substantive aspects of the patent application. The person does not have to be a member of a law firm or corporate patent department employed by the assignee of the patent application. On the other hand, merely because the individual worked on related cases for the same assignee would not, without further knowledge of the content and claims of the application being considered, create a duty of disclosure for that individual, nor would there be a duty to inquire of that individual as to whether he or she knew of relevant information.

Section 1.57(b), as proposed, represents a significant departure from the standard defined under §1.56. It adopts an objective "but for" standard of materiality, which requires a conclusion that a pending claim would not have been permitted to issue in a patent grant "but for" the misrepresentation, concealment, or otherwise culpable conduct with respect to any fact. That is, the "but for" standard of materiality requires a conclusion that a pending claim is (1) patentable in the absence of a given fact which is the subject of misrepresentation, concealment or otherwise culpable conduct; and (2) unpatentable in the presence of such fact. In deciding the question of materiality under the "but for" standard, a decision maker would first look to the patentability of the claim based on the record and the facts known to the individuals designated in §1.57(a) without the fact which was misrepresented, concealed, or otherwise subject to culpable conduct, i.e., as though the fact did not exist. Having determined that the claim is patentable without the fact which was misrepresented, concealed, or otherwise subject to culpable conduct, the decision maker would then determine if the claim is unpatentable assuming the fact does exist. If the claim is determined to be unpatentable, the fact would meet the "but for" test standard of materiality proposed in these rules.

Whether or not information meets the "but for" standard of materiality is not dependent upon what the examiner would do with the misrepresented or concealed information if the true facts were known to the examiner, but rather whether or not the information would make a difference in the patentability of the claims if the information had been properly disclosed and not misrepresented nor concealed.

Thus, the determination of patentability under this standard is not based on the subjective determination of any particular examiner or other Office personnel, nor on the subjective determination of any of the individuals defined in proposed §1.57(a), but consists of an objective legal conclusion as to the patentability of one or more claims under relevant sections of Title 35 and applicable judicial precedent. A person would not be considered by the Office to have violated the duty of disclosure under §1.57 until a patent issued and it is determined that at least one patent claim is unpatentable based at least in part on information withheld from the Office.

The duty to disclose under proposed §1.57(b) does not apply to information which is of record in an application. In other words, there would be no violation of the duty if the examiner independently finds the withheld prior art and makes it of record in the application file prior to the issuance of a patent. Further, information and documents cited in international search reports from the European Patent Office (EPO) and the Japanese Patent Office (JPO) will be considered to be of record under certain circumstances in the corresponding PCT-based national stage application filed under 35 U.S.C. 371. Those circumstances include the current agreement among the three patent offices (EPO, JPO, USPTO) that international search reports prepared by any of the three offices and designating another office will include a copy of each document cited and an indication of the relevance of such document. This cooperative arrangement has been working informally for about five years and became a formal continuing program recently. Thus, the duty to disclose does not apply to documents cited in an international search report prepared by any of the three offices because they will be considered by the Office to be of record in the national stage application filed in the United States under 35 U.S.C. 371.

The information which is misrepresented or concealed need not anticipate a pending claim to fall within the "but for" standard of materiality, but must, when added to other facts of record in the application and known to the individuals designated in proposed §1.57(a) preclude the allowance of at least one pending claim in a patent. Allowance may be precluded under appropriate sections of Title 35 in addition to any judicially created doctrine such as double patenting of the obviousness type.

A pending claim within the meaning of proposed §1.57(b) is a claim which is presented for examination and has not been canceled. No duty of disclosure would exist as to a claim that is canceled in a preliminary amendment submitted with the application papers. Similarly, no duty of disclosure would exist as to a claim that has been canceled at the time a person defined in proposed §1.57(a) becomes aware of a publication that would render that claim unpatentable, either by itself or in combination with other evidence of record or known to such a person. On the other hand, a duty of disclosure would exist as to a claim that has been withdrawn from consideration by the examiner - for example, as the result of a restriction requirement - but has not been canceled. Nevertheless, a violation of that duty would not occur unless and until a patent issued with such a claim.

The duty of disclosure arises at the point in time when an individual becomes aware of information not of record in the application that would render unpatentable any claim then pending. Actual knowledge of the pertinent information and its materiality is not required by this proposed paragraph if the individual should have known of the information and its materiality. *See FMC Corp.* v. *Manitowoc Co., supra* and *FMC Corp.* v. *Hennessy Industries, Inc.*, 836 F.2d 521, 5 USPQ 2d 1272 (Fed. Cir. 1987). The duty of disclosure continues until that claim is canceled. If a claim is modified during prosecution in the Office, the scope of the amended claim determines the duty of disclosure. But, as mentioned above, there would be no violation of that duty unless a patent issues with a claim which would be unpatentable over information which includes the withheld prior art or information.

Proposed §1.57(b) makes mandatory the procedures set forth in proposed §§1.97 and 1.98 for disclosing to the Office information that meets the "but for" standard of materiality. The general practice of filing information disclosure statements as a method of complying with the duty of disclosure would no longer be optional.

Finally, proposed §1.57(b) indicates that an individual designated in proposed §1.57(a)(4) can satisfy the duty of disclosure by disclosing information to an individual designated in any of proposed §1.57(a)(1)-(3). This provision relates only to the determination of possible misconduct on the part of the individual designated in proposed §1.57(a)(4), and does not otherwise satisfy the duty of disclosure owed to the Office.

Proposed §1.57(c) emphasizes that responsibility for compliance with the duty defined in paragraph (b) rests with the individuals identified in paragraph (a), and that generally no evaluation will be made by the Office in any proceeding as to compliance with paragraph (b). The only circumstances in which the Office will consider compliance with this section under the proposed rules are either with reference to a disciplinary proceeding under 37 CFR Part 10 or in limited situations with a reissue application, as where there is a judicial determination of fraud or inequitable conduct or an admission of facts which would conclusively establish fraud or inequitable conduct without any investigation.

Proposed §1.57(d) would provide a cross reference to the rules relating to the representation of others before the Office in 37 CFR Part 10 and indicate that the failure of a registered representative to comply with the duty of candor and good faith required by proposed §1.57 may be cause for instituting disciplinary action under §10.131 for misconduct.

The provisions of §1.56(c), (f) and (g) are proposed to be eliminated because an application may be filed in the Office without an oath or declaration pursuant to §1.53(d). Further, the defects in executing a patent application listed in §1.56(c) would have to be cured by filing a supplemental oath or declaration pursuant to proposed §1.67(c). Accordingly, the Office will not consider striking an application for these defects under the proposed rules and will not entertain a petition directed to such matters. However, the conduct of any practitioner permitting a material alteration of the application papers after the oath or declaration has been signed, which is prohibited by §1.52(c), is not condoned by the Office and remains subject to a disciplinary proceeding. *See* §10.23(c)(11).

Similarly, since the Office will not comment on duty of disclosure issues which are brought to its attention in

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original or reissue applications except in very limited circumstances related to deceptive intent in a reissue application, the provisions of §1.56(d), (e), (h) and (i) are proposed to be eliminated. The provision in §1.56(j) that a time period would be set by the Office for the applicant to provide copies of documents omitted from an information disclosure statement is to be deleted because time may be given only in very limited circumstances in order to complete an information disclosure statement under proposed §1.97.

Section 1.63(a)(1) is proposed to be revised to require that an oath or declaration be dated when it is signed. Thus, the Office will be able to determine if there has been an unusual length of time between the date of execution of the oath or declaration and the filing date of the application. Also, a cross reference to §1.64 is added because that section contanns several execution requirements.

Section 1.63(b)(3) and (d) are proposed to be revised to reflect that §1.56 is being replaced by new §1.57. The oath or declaration filed with an application would need to acknowledge a duty to disclose information as required by proposed §1.57. Any oath or declaration, which acknowledges a duty to disclose information material to the examination of the application in accordance with the present §1.56(a), would be acceptable under the proposed rules since the proposed standard of materiality is included within the standard previously applied by the Office (i.e., if an individual complied with the former standard, that individual would comply with the proposed standard).

Section 1.67 is proposed to be revised to add new paragraph (c) requiring that a new oath or declaration be filed if a prior one contained any of the defects previously listed in §1.56(c). The new oath or declaration may be sought by the Office or the applicant may voluntarily submit one.

The provisions of present §1.97 are proposed to be revised to require the submission of a statement regarding information which an individual designated in proposed §1.57(a) has a duty to disclose under proposed §1.57(b), to define the time periods for filing an information disclosure statement, and to continue the option to file a statement directed to information which the applicant would like the Office to consider even though the information may not meet the "but for" level of materiality.

Under proposed §1.97(a), an information disclosure statement would be required to be filed in each national application or Patent Cooperation Treaty (PCT)-based national stage application where an individual designated in proposed §1.57(a) knows or should have known of information which meets the objective "but for" test of proposed §1.57(b). An individual is not obligated to conduct a prior art search nor furnish a negative information disclosure statement. The filing of an information disclosure statement in a reexamination proceeding is addressed in the proposed revision of §1.555.

Under proposed §1.97(b), an information disclosure statement may be filed to contain information which an applicant would like the Office to consider in the examination of an application There is no duty or requirement to disclose information to the Office unless it meets the threshold materiality and knowledge requirements set forth in proposed §1.57.

Section 1.97(c), as proposed, would make mandatory the time periods for filing an information disclosure statement. This provision differs from current practice which only encouraged the filing of an information disclosure statement within a short period of time after the application is filed. By requiring a statement to be filed within the times specified, the Office seeks to promote the efficiency of the examination process and to help avoid duty of disclosure issues Specifically, the statement shall be filed in a national patent application within three months of the filing date of the application. For a PCT-based national stage application, the statement shall be filed within three months of entry of the national stage application as set forth in §1.491. In each type of application, an information disclosure statement may be filed after the three-month period, but this would normally require a fee. The purpose of the fee for information submitted after the three-month period is to compensate the Office for the extra work caused the examiner who may have to redo part or all of the examination because of the late submission.

The time periods for filing a statement are not subject to an extension of time under §1.136. However, the examiner may allow an additional time period to permit an applicant to provide any information required by §1.98, which was inadvertently omitted The concept proposed here is the same as that applied under §1.135(c). Otherwise, if the applicant needs to supplement an incomplete statement after the three-month period has expired, the additional information would have to be filed as part of a separate statement under §1.97(f), which may require a fee.

An information disclosure statement timely filed within the three months of the filing date pursuant to proposed §1.97(c) will be considered by the examiner, even if filed after the mailing of an examiner's final action or a notice of allowance, which in rare instances may occur within three months of the filing date. For the purposes of this proposed section, the statement will be considered to be filed on the day it is received in the Office, or the date of mailing on a properly executed certificate of mailing pursuant to §1.8 or Express Mail certificate pursuant to §1.10, whichever is earlier.

Proposed §1.97(d) would continue the present practice of permitting an applicant to file an information disclosure statement either as a paper or submission separate from the specification or by incorporating the information disclosure statement in the specification of the application.

Proposed §1.97(e) would stipulate that the mere filing of an information disclosure statement shall not constitute an admission that any information disclosed in that statement renders unpatentable any claim pending in the application, unless the statement contains an admission within the meaning of §1.106(c). This section would also continue the present policy that the filing of an information disclosure statement will not be construed as a representation that any patentability search has been made.

Proposed §1.97(f) would expand and revise the existing practice of filing supplemental information disclosure statements under §1.99. Under the proposed section, an applicant may satisfy the duty of disclosure requirement by filing a statement after the three-month period in paragraph (c) has expired In addition, a statement would be required to bring to the attention of the Office any information not in the record nor contained in an information disclosure statement filed under proposed paragraph (c), which meets the standard of materiality in proposed §1.57. As in paragraph (c), a statement filed under paragraph (f) may include other information which an applicant would like the Office to consider in examining the application. Thus, such a statement may be used to supplement one filed under paragraph (c).

It should be noted that the standard of materiality applies to claims pending in the application and relates to information of record in the application being examined in addition to the information known or which should have been known by an individual designated in proposed §1.57(a). Thus, a document known to such an individual which was not required to be disclosed in an information disclosure statement under proposed §1.97(c) may need to be disclosed in a statement under proposed §1.97(f) due to intervening events.

For example, the scope of the claims may be changed to make a document fall within the proposed standard of materiality even though the document was not relevant to the patentability of the claims as originally presented. As an additional example, an inventor may know of a first reference which by itself does not render a claim unpatentable However, the examiner may find and cite a second reference which makes the first reference fall within the proposed scope of materiality - thereby creating a duty to disclose the first reference. Likewise, the first reference may become relevant due to the citation of a third reference by a foreign patent office or because of the independent discovery by the inventor during the examination process of a fourth reference All of these possibilities continue to make it important for individuals to bring pertinent information to the attention of the Office as soon as it is discovered.

It is recognized that patentability may be established by the submission to the Office of evidence of unexpected results or commercial success. In addition, a reference may be removed from consideration by filing an antedating affidavit containing evidence of prior invention under §1.131. It is permissible for an applicant to rely on such evidence in determining whether or not to disclose certain information to the Office even if the evidence is not submitted to the Office for evaluation Therefore, there would be no violation of the duty of disclosure if, prior to the issuance of a patent, an applicant is or becomes aware of such evidence that would establish patentability of all the claims over the withheld information and the art of record. Of course, a court later might conclude that the evidence was not sufficient to establish patentability and find that there was inequitable conduct On the other hand, if the applicant becomes aware of such evidence after issuance of a patent, this would not avoid a violation of the duty to the Office because the patent would not have issued *but for* the withholding of information.

A statement under paragraph (f) must be filed no later than the business day prior to the mailing date of the final action or the notice of allowance, whichever occurs first This will enable the examiner to consider carefully the statement without disrupting the normal processing of applications within the Office. In the event that a final Office action is withdrawn or a notice of allowance is rescinded, any information disclosure statement that had not been filed in a timely manner would be acceptable if timely resubmitted and otherwise proper in form and content The application would then be treated as if no final action or notice of allowance had been mailed up to the point that such an action is withdrawn or rescinded. No extensions of time are permitted under §1.136 although the examiner may set an additional time period to permit an applicant to provide any information required by §1.98, which was inadvertently omitted.

As noted above, a statement that was untimely when filed under paragraph (f) could be considered timely by the occurrence of subsequent events If one of those events occurs, the information contained in the statement would be considered by the examiner if the information disclosure statement is timely resubmitted In the absence of any of those events, such that the statement remains untimely, the information contained in the statement would be considered only if the application in which it is filed is abandoned and the information is disclosed in a continuing application in the manner prescribed in proposed §§1.97 and 1.98. This will require that copies of documents cited in the information disclosure statement be resubmitted in the continuing application.

Proposed §1.97(g) would require that a fee in the amount set forth in proposed §1.17(p) accompany an information disclosure statement filed under paragraph (f) unless the statement certifies that all of the information disclosed in such a statement was, within three months prior to the date the statement is filed in the Office, either first cited by a foreign patent office in a counterpart foreign patent application or first came to the attention of any person charged with the duty of disclosure in § 1.57(a). The date on the action by the foreign patent office begins the three-month period in the same manner as the mailing of an Office action starts a three-month shortened statutory period for response. Likewise, the filing date of the statement is the date the statement is received in the Office, or the date of mailing if accompanied by a properly executed certificate of mailing under §1.8, or certificate of Express Mail under §1.10, whichever occurs earlier.

The term "counterpart foreign patent application" means that a claim for priority has been made in either the U.S. application or a foreign application based on the other, or that the disclosures of the U.S. and foreign patent application are substantively identical. Although paragraph (g) does not require a fee if the information disclosure statement is submitted within certain time periods, this is not intended to modify the requirement in paragraph (f) of this section that a statement must be filed before the final action or notice of allowance is mailed.

Certification by a registered practitioner that the statement was filed within the three-month period of either first citation by a foreign patent office or first discovery of the information (not the materiality of the information) will be accepted as dispositive of compliance with this provision in the absence of evidence to the contrary. A statement on information and belief normally will not be sufficient. Although it is recognized that an individual actually becomes aware of the information in the communication from the foreign patent office sometime after it was mailed, the mailing date of such a communication, if it occurs prior to the first awareness of the same information, would determine the date for filing of an information disclosure statement without a fee. The Office is willing to absorb any additional cost in considering such information submitted three months after filing the application only when it is clear that an applicant is diligent in providing the information to the Office.

Under proposed §1.97(h), an information disclosure statement would not be considered to be filed until all component parts of a complete statement under proposed §1.98 are filed with the Office, except for inadvertent omissions. Thus, the filing of a statement identifying relevant documents but intentionally failing to supply available copies of all the cited documents will not be accepted until such copies are supplied Paragraph (h) also sets forth the consequences and procedures for processing an information disclosure statement that is either not complete and/or not filed in a timely manner. Such a statement will not be deemed to satisfy any applicable duty of disclosure owed to the Office by an individual designated in proposed §1.57(a) but will be returned to the applicant and not considered by the Office in that application. If the required fee was submitted, it will be refunded. The Office will note in the record of the application that an information disclosure statement was returned to the applicant. It is expected that an applicant will file a continuing application to have the Office consider pertinent prior art which comes to his or her attention after final action or notice of allowance has been mailed if the prior art affects the patentability of any claim.

Under the proposed revision of §1.98, the administrative details of supplying information to the Office are defined. For the most part, these details remain unchanged from current practice, but the format and wording has been modified to provide greater clarity. Under proposed §1.98(a), the information disclosure statement must include a listing of the information required to be disclosed by §1.97, preferably in or on a form which is suitable for inclusion in the record without requiring the examiner to reproduce the same information on a form acceptable to the printer so that the documents will be listed on the patent. Those submitting an information disclosure statement are encouraged to use form PTO-1449, "Information Disclosure Citation." In addition to the listing, the statement must include an explanation of the reason each item of information is listed Typically, the reason would include a concise explanation of the relevance of each item to the claimed invention, but may further contain an explanation of why the claimed invention should be considered patentable over the item of information.

Proposed §1.98(b) would continue the present practice and policy of requiring an individual to submit a legible copy of the document or other information cited in the information disclosure statement either in its entirety or

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at least that portion of each item of information which caused the individual submitting the information to list that item in the information disclosure statement. If a copy of the document or item of information is not in the possession, custody, control or is not otherwise readily available to any individual designated in proposed §1.57(a), the individual submitting the statement must submit a statement to that effect at the time of presenting the statement to the Office. It is not expected that the latter situation will arise very often, but because of the time deadlines involved in filing an information disclosure statement, it is considered appropriate to provide this flexibility for individuals charged with the duty to bring information to the attention of the Office The Office will not, however, assume the responsibility of obtaining a copy of that item of information before making a final determination of patentability.

Copies of pending U.S. patent applications cited in the information disclosure statement should not be submitted to the Office as set forth in proposed §1.98(b)(1)(III) because this may result in the unnecessary disclosure of the contents of such patent applications when the application in which it was cited matures into a patent.

Proposed §1.98(c) continues the present practice and policy regarding the identifying information to be listed for each document typically cited in an information disclosure statement. Listing of the patentees or authors in a patent or publication may be limited to the last name of the first listed inventor followed by "*et al.*"

Proposed §1.98(d) continues the present practice and policy relative to citing and supplying information which is cumulative and relative to supplying a translation of information that is not in the English language. Under this proposed section, if any of the information required to be disclosed is substantially cumulative in terms of its content relative to the patentability of the claims, the statement need be accompanied by only a single copy of a document containing the essential information provided that the omission of the copies of the cumulative information is explained.

In addition, an English language translation of a foreign language document or the relevant portion thereof need only be submitted when it is in the possession, custody or control of, or readily available to any individual designated in proposed §1.57(a). This does not mean that such an individual must purchase a translation in each case, even though a translating service is readily available. But if the individual has the ability to translate the foreign language into English and has done so for the purposes of reviewing the information relative to the claimed invention, the translation would be considered "readily available" to the individual.

Section 1.175(a)(7) is proposed to be revised to reflect that §1.56 is being replaced by §1.57. Any reissue oath acknowledging a duty to disclose information, which is material to the examination of the application in accordance with the present §1.56(a), would be acceptable under the proposed rules as explained in connection with the proposed change to §1.63(b) and (d).

Section 1.193(c) is proposed to be deleted and reserved, reflecting the intention of the Office not to comment on duty of disclosure issues in an original or reissue application except in very limited circumstances related to deceptive intent in a reissue application.

Section 1.291(a) is proposed to be revised to eliminate consideration in a protest of an allegation about duty of disclosure issues Since the Office will not be investigating these issues, such a protest will merely be placed in the application file without comment Further, protests which do not adequately identify a pending application will be disposed of because the Office cannot act on such protests.

Section 1.291(c) is proposed to be revised to remove the reference to §1.56. As explained above, there would be no need to require information in a protest with respect to an issue of duty of disclosure.

Section 1.313(b) is proposed to be revised to include, as a reason for withdrawing an application from issue after the issue fee has been paid, a request by an applicant to consider information which has not been filed in a timely manner. Accordingly, since the Office will not consider information which is untimely filed in an application, it is necessary to provide a mechanism to permit an applicant to withdraw an application from issue in the event that it is desired to have the Office consider information that has come to the attention of an individual specified in proposed §1.57(a) after the mailing of the final Office action or the notice of allowance. This mechanism is also available to those who belatedly decide to bring the information to the attention of the Office before the patent issues. The Office wishes to provide every reasonable opportunity for an individual to avoid the consequences of misconduct in the Office.

Section 1.555 is proposed to be revised to conform with the duty of disclosure contained in new §1.57 and to require that an information disclosure statement be filed within certain time periods Under proposed §1.555(a), there would be no fee if the statement is filed within two months of the date of the order for reexamination pursuant to §1.525. An information disclosure statement limited to information not of record as of the date of the order for reexamination will not be considered to be a patent owner's statement pursuant to §1.530.

Under proposed §1.555(b), a statement may be filed after the two months if accompanied by a fee in certain circumstances and if filed prior to the mailing of a notice of intent to issue a reexamination certificate. A fee would be due unless it is certified that all of the information disclosed in such a statement was, within two months prior to the date the statement is filed in the Office, either first cited by a foreign patent office in a counterpart foreign patent application or first came to the attention of any person charged with the duty of disclosure in §1.57(a) if the same information was not earlier cited by a foreign patent office in a counterpart foreign application.

As stated with respect to proposed §1.97(g), the date on the action by the foreign patent office begins the two-month period and the filing date of the statement is the date the statement is received in the Office, or the date of mailing if accompanied by a properly executed certificate of mailing under §1.8, or certificate of Express Mail under §1.10, whichever is earlier Extensions of time to file an information disclosure statement under either paragraph will not be permitted because 35 U.S.C. 305 requires that reexamination proceedings be conducted with special dispatch and because such a provision would defeat the purpose of the fee to pay for the added costs of examination.

The duty of disclosure is not violated in a reexamination proceeding unless a claim either confirmed or allowed in a reexamination certificate would be rendered unpatentable by withheld information known at the time of the mailing of the notice of intent to issue a reexamination certificate.

Relevant prior art discovered after the mailing of the notice of intent would not be considered in the pending reexamination proceeding. Therefore, the patent owner may wish to file a new request for reexamination under 35 U S C. 302 to have the new information considered on the merits. An information disclosure statement filed in a reexamination proceeding must be made in accordance with the form and content specified in proposed §1.98.

Subparagraph 10 of §10.23(c) is proposed to be revised to reflect that §1.56 is proposed to be replaced by proposed §1.57 and to add a reference to the duty of disclosure requirement in a reexamination set forth in §1.555. The proposed change in the duty of disclosure will, of course, have an impact on any disciplinary action charging a practitioner with a violation of that duty.

Subparagraph 11 of §10.23(c) is proposed to be revised to reflect the change that §1.56(c) is proposed to be deleted. Although applications having defects in their execution will no longer be stricken, the Office desires to continue to discourage practitioners from permitting

alterations in the application papers after the oath or declaration is signed as prohibited by §1.52(c), especially if such alterations are material.

Mere editing, such as correcting misspellings, would not be considered to involve material changes. Nor would the insertion of filing or patent information of a parent or related application. However, adding to or deleting from the application matters of substance, such as a working example or a claim, would be considered to be a material change.

OTHER CONSIDERATIONS:

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the proposed rules do not require individuals to submit information that they are not already under an obligation to provide to the Office. The proposed rules further promote the efficiency of the examination process by requiring a timely submission of an information disclosure statement and eliminating rejections based on inequitable conduct, thereby reducing the costs to all patent applicants.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this proposed rule has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

This proposed rule contains a collection of information requirement subject to the Paperwork Reduction Act, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011. Each information disclosure statement is estimated to take approximately 30 minutes, including time for reviewing instructions, gathering and maintaining data needed and completing and reviewing the collection of information. Send comments regarding this burden estimate to the Patent and Trademark Office, Office of Management and Organization and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington D.C. 20503. (Attention Paper Reduction Project 0651-0011)

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are proposed to be amended as follows:

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In §1.17, paragraph (p) is proposed to be added to read as follows:

§1.17 Patent Application Processing Fees.

• • • •

(p) For filing an information disclosure statement under §§1.97(f) and (g) and 1.555(b) 200.00

3. Section 1.28(d)(2) is proposed to be revised to read as follows:

§1.28 Effect on fees of failure to establish status, or change status, as a small entity.

• • • • •

(d)(1) • • •

(2) Improperly and through gross negligence (i) establishing status as a small entity or (ii) paying fees as a small entity shall be considered as a fraud practiced or attempted on the Office.

4. Section 1.52(c) is proposed to be revised to read as follows:

§1.52 Language, paper, writing margins.

• • • • •

(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed must be made before the signing of any accompanying oath or declaration pursuant to §1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. No such alterations in the application papers are permissible after the signing of an oath or declaration referring to those application papers. After the signing of the oath or declaration referring to the application papers, amendments may only be made in the manner provided by §§1.121 and 1.123 through 1.125.

• • • • •

5. Section 1.56 is proposed to be removed and reserved §1.56 [Reserved]

6. Section 1.57 is proposed to be added to read as follows:

§1.57 Duty of disclosure.

(a) A duty of candor and good faith toward the Office rests on the following individuals:

(1) any named inventor who signs the oath required by 35 U.S.C. 117 and 35 U.S.C. 118;
(2) any non-inventor who signs the oath required by the last sentence of 35 U.S.C. 115 in an application filed under 35 U.S.C. 117 and 35 U.S.C. 118;
(3) each registered attorney or agent who prepares or prosecutes the application; and
(4) every other individual who is:

(i) substantively involved in the preparation or prosecution of the application; and
(ii) associated with the inventor, an assignee, or any entity to whom there is an obligation to assign the application or any patent issuing thereon.

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(b) Any individual designated in paragraph (a) of this section has a duty to disclose to the Office all information not considered by the Office to be of record in an application, which that individual knows or should have known would render unpatentable any pending claim. This duty continues with respect to the pending claim until it is canceled or the application becomes abandoned at which time the duty ceases. Thus, the duty is violated only if a patent issues with a claim which would be rendered unpatentable by the withheld information when all the facts of record in the patent file and known to the individuals designated in paragraph (a) of this section at the time the patent issues are considered. The manner for submitting the required information to the Office is provided in §§1.97 and 1.98. Disclosure to a person designated in paragraphs (a)(1), (a)(2), or (a)(3) of this section by an individual designated in paragraph (a)(4) of this section shall satisfy the duty as to that individual.

(c) No evaluation as to compliance with this section will be made by the Office except as provided below:

(1) in a reissue application where the Office is presented with clear and convincing evidence of deceptive intent in obtaining a patent, such as a judicial determination of fraud or inequitable conduct or an admission of facts conclusively establishing fraud or inequitable conduct without conducting an investigation; or
(2) in a disciplinary proceeding against a practitioner under Part 10.

(d) Failure of a registered patent attorney or agent to comply with the duty of candor and good faith may be cause for instituting disciplinary action under §10.131 for misconduct. *See also* §10.23(c)(10).

7. Section 1.63 is proposed to be revised to read as follows:

§1.63 Oath or declaration.

(a) • • •

(1) Be signed, dated and executed in accordance with §§1.64 and 1.66 or 1.68;

• • • • •

(b) • • •

(3) Acknowledges the duty to disclose information in accordance with §1.57.

• • • • •

(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose information in accordance with §1.57 which occurred between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

8. Section 1.67 is proposed to be revised to add paragraph (c) to read as follows:

§1.67 Supplemental oath or declaration.

• • • • •

(c) A supplemental oath or declaration meeting the requirements of §1.63 must also be filed if the application was altered after the oath or declaration was signed or if the oath or declaration was signed:

(1) in blank;
(2) without review thereof by the person making the oath or declaration; or
(3) without review of the specification, including the claims, as required by §1.63(b).

9. Section 1.97 is proposed to be revised to read as follows:

§1.97 Filing of information disclosure statement.

(a) An information disclosure statement shall be filed within the time periods set forth in this section in each:

(1) national patent application; and
(2) PCT-based national stage application to disclose all information which any individual charged with the duty of disclosure in §1.57(a) knows or should have known renders unpatentable any claim pending in the application at the time the information disclosure statement is filed. If there is no such information, an information disclosure statement is not required.

(b) An information disclosure statement may also disclose other information which an applicant would like the Office to consider in examining the application.

(c) An information disclosure statement may be filed without a fee in a national patent application within three months of the filing date of the application. In a PCT-based national stage application, the statement may be filed without a fee within three months of entry of the national stage application under §1.491. No extensions of time are permitted under §1.136 except that if a *bona fide* attempt has been made to comply with §1.98 but part of the required information was inadvertently omitted, additional time may be given to enable full compliance.

(d) Any information disclosure statement filed under this section may be:

(1) filed in a paper separate from the specification of the application; or
(2) incorporated in the specification.

(e) Unless an information disclosure statement contains an admission within the meaning of §1.106(c), the filing of an information disclosure statement shall not constitute an admission that any information disclosed renders unpatentable any claim pending in the application. Nor shall the mere filing be construed as a representation that a patentability search has been made.

(f) If, after the time for submitting an information disclosure statement under paragraph (c) of this section has expired, there is information not of record which is required to be disclosed under §1.57(b), a statement shall be timely filed in the form required by §1.98. The statement may also include other information which the applicant would like to have considered. Any statement filed under this paragraph will be deemed timely only if it is filed prior to the mailing of an examiner's final action under §1.113 or of a notice of allowance under §1.311, whichever occurs first. No extensions of time are permitted under §1.136 except that if a bona fide attempt has been made to comply with §1.98 but part of the required information was inadvertently omitted, additional time may be given to enable full compliance.

(g) The information disclosure statement under paragraph (f) of this section shall be accompanied by the fee set fort in §1.17(p) unless the statement certifies that, within three months prior to the date the statement is filed in the Office, the date of either one of the following events occurred:

(1) the mailing of a communication from a foreign patent office in a counterpart foreign patent application first citing all the patents, publications, and other material disclosed in the statement; or
(2) the first knowledge by any person charged with the duty of disclosure in §1.57(a) of all the patents, publications, and other material disclosed in the statement if they were not cited earlier by a foreign patent office in a counterpart foreign patent application.

(h) Any information disclosure statement which does not comply with §1.98 except for inadvertent omissions considered under paragraphs (c) and (f) of this section or any statement which is not timely filed as required by this section, will be:

(1) deemed not to satisfy any applicable duty of disclosure owed under §1.57 if a patent subsequently issues;
(2) returned to the applicant; and
(3) considered only if:

(i) the application is abandoned, and
(ii) the information is disclosed in an information disclosure statement timely filed in a continuing application.

10. Section 1.98 is proposed to be revised to read as follows:

§1.98 Content of information disclosure statement.

(a) The information disclosure statement shall include:

(1) a list of all the patents, publications, or other material required or permitted to be disclosed under §1.97(a), (b) and (f); and
(2) a concise explanation of why each patent, publication, or other material is listed.

(b) The information disclosure statement shall be accompanied by:

(1) a legible copy of:

(i) each U.S. Patent;
(ii) each publication or foreign patent or that portion of which caused it to be listed; and
(iii) all other material, except patent application files, or that portion of which caused it to be listed; or

(2) a statement that a copy is not in the possession, custody, or control or is not readily available to any individual designated in §1.57(a).

(c) Each U.S. patent listed in an information disclosure statement shall be identified by patentee(s), patent number and issue date. Any foreign patent or published foreign patent application shall be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and a publication date indicated on the patent or published application. Each publication shall be identified by author(s), if any, title of publication, relevant pages of the publication, date and place of publication.

(d) When the disclosures of two or more patents or publications required to be reported in an information disclosure statement are substantively cumulative, a single copy of one patent or publication may be submitted and the other patents or publications merely listed in the statement provided that an explanation is included about the omission of the copies of the cumulative information. If an English language translation of a foreign language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in §1.57(a), a copy of the translation shall accompany the statement. [OMB Control No. 0651-0011]

11. Section 1.99 is proposed to be removed and reserved.

§1.99 [Reserved]

12. Section 1.175(a)(7) is proposed to be revised to read as follows:

§1.175 Reissue oath or declaration.

(a) • • •

(7) Acknowledging a duty to disclose information in accordance with §1.57.

• • • • •

13. Section 1.193(c) is proposed to be removed and reserved:

§1.193 Examiner's Answer.

• • • • •

(c) [Reserved]

14. Section 1.291(a) and (c) are proposed to be revised to read as follows:

§1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the application to which the protest is directed will be entered in the application file if (1) the protest is timely submitted; and (2) the protest is either served upon the applicant in accordance with §1.248, or filed with the Office in duplicate in the event service is not possible. Protests raising duty of disclosure issues will be placed in the application file without comment on these issues. Further, protests which do not adequately identify a pending patent application will not be considered by the Office but will be disposed of.

• • • • •

(c) An acknowledgment of the entry of a protest under paragraph (a) of this section in a reissue application file will be sent to the member of the public filing the protest. A member of the public filing a protest under paragraph (a) of this section in an application for an original patent will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard which the member of the public may include with the protest in order to receive an acknowledgment by the Office that the protest has been received. The Office will communicate with the applicant regarding any protest entered in the application file and may require the applicant to supply information, including responses to specific questions raised by the protest, in order for the Office to decide any issues raised by the protest. The active participation of the member of the public filing a protest pursuant to paragraph (a) of this section ends with the filing of the protest and no further submission on behalf of the protestor will be acknowledged or considered unless such submission raises new issues which could not have been earlier presented, and thereby constitutes a new protest.

15. Section 1.313(b) is proposed to be revised to read as follows:

§1.313 Withdrawal from issue.

• • • • •

(b) When the issue fee has been paid, and the patent to be issued has received its issue date and patent number, the application will not be withdrawn from issue for any reason except (1) a mistake on the part of the Office; (2) an illegality in the application; (3) unpatentability of one or more claims; or (4) consideration of identified information under §1.57 in a continuing application.

16. Section 1.555 is proposed to be revised to read as follows:

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§1.555 Duty of disclosure in reexamination proceedings.

(a) The duty of candor and good faith owed to the Office in a reexamination proceeding is the same as that provided in §1.57, but the duty is not violated unless a claim either confirmed or allowed in a reexamination certificate would be rendered unpatentable by the withheld information known at the time a notice of intent to issue a reexamination certificate under §1.570 is mailed. Any information disclosure statement bringing patents or printed publications to the attention of the Office shall be in the form required by §1.98 and may be filed without a fee within two months of the date of the order for reexamination under §1.525. An information disclosure statement limited to information not of record as of the date of the order for reexamination will not be considered to be a patent owner's statement pursuant to §1.530.

(b) Upon payment of the fee set forth in §1.17(p), an information disclosure statement may be filed after two months from the date of the order for reexamination but no later than the mailing of the intent to issue a reexamination certificate. The fee in §1.17(p) will not be required if the statement certifies that, within two months prior to the date the statement is filed in the Office, the date of either one of the following events occurred:

(1) the mailing of a communication from a foreign patent office in a counterpart foreign patent application first citing all the patents, publications, and other material disclosed in the statement; or
(2) the first knowledge by any person charged with the duty of disclosure in §1.57(a) of all the patents, publications, and other material disclosed in the statement if they were not cited earlier by a foreign patent office in a counterpart foreign patent application.

(c) No extensions of time are permitted under either paragraph (a) or (b) of this section except that, if a *bona fide* attempt has been made to comply with §1.98 but part of the required information was inadvertently omitted, additional time may be given to enable full compliance.

Part 10 - Representation of Others Before the Patent and Trademark Office

17. The authority citation for Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

18. Section 10.23(c), paragraphs (10) and (11) are proposed to be revised to read as follows:

§10.23 Misconduct.

* * * * *

(c) * * *

(10) Violating the duty of candor or good faith requirements of §1.57(a) and (b) and §1.555(a) of this subchapter.

(11) Knowingly filing, or causing to be filed, an application containing any material alteration made in the application papers after the signing of the accompanying oath or declaration.

* * * * *

Feb. 2, 1989.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 4, 1989

B1 3,868,274	4,755,600	4,771,113	4,781,982
Re. 32,774	4,755,693	4,771,170	4,782,018
4,062,881	4,756,730	4,771,364	4,782,228
4,365,963	4,759,097	4,771,520	4,782,284
4,424,528	4,761,456	4,771,943	4,782,294
4,446,228	4,761,588	4,772,012	4,782,320
4,545,859	4,627,730	4,772,087	4,782,516
4,596,491	4,762,751	4,772,260	4,782,639
4,627,164	4,762,831	4,772,441	4,782,785
4,645,826	4,763,189	4,773,819	4,783,734
4,651,769	4,763,731	4,774,366	4,784,044
4,652,502	4,764,870	4,774,811	4,784,394
4,661,487	4,764,900	4,774,818	4,784,504
4,662,437	4,765,582	4,774,957	4,785,787
4,667,228	4,765,725	4,775,225	4,785,872
4,669,420	4,765,824	4,775,353	4,786,031
4,685,803	4,766,002	4,775,468	4,786,116
4,686,750	4,766,125	4,775,640	4,786,147
4,691,303	4,766,198	4,775,889	4,786,197
4,695,405	4,766,469	4,776,083	4,786,711
4,703,282	4,766,682	4,776,104	4,786,760
4,705,786	4,766,808	4,776,134	4,786,786
4,706,156	4,766,912	4,776,157	4,786,799
4,707,819	4,767,068	4,776,354	4,787,028
4,708,276	4,767,296	4,776,506	4,787,096
4,726,745	4,767,782	4,777,886	4,787,133
4,727,231	4,768,193	4,778,109	4,787,415
4,728,571	4,768,884	4,778,169	4,787,417
4,732,456	4,769,200	4,778,330	4,787,481
4,737,466	4,769,319	4,778,381	4,787,507
4,739,527	4,769,375	4,779,394	4,787,614
4,740,592	4,769,488	4,779,929	4,787,976
4,742,073	4,769,511	4,780,016	4,788,918
4,745,496	4,769,735	4,780,212	4,790,341
4,747,232	4,770,437	4,780,778	4,791,269
4,749,827	4,770,567	4,781,331	4,793,179
4,751,141	4,770,610	4,781,679	4,794,446
4,753,626	4,770,993	4,781,728	4,796,436
4,753,668	4,771,072	4,781,924	

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SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collec patents from either microfilm or paper collections are generallcontemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 376
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska—Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada—Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 11, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	8-21-86
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	11-24-86
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	12-18-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	7-7-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	8-12-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during February 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,638,239 to 3,646,613, inclusive
Plant Patents ..... None

TRADEMARK DATA BASE PRODUCTS
LISTING OF PRODUCTS AVAILABLE FOR PURCHASE

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Section I

Product Description	Frequency
Magnetic Tape of New Pending Applications	Weekly
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Listing of Applications for Renewal of Registrations	Monthly
Magnetic Tape of Status Changes on All Registrations and Pending Applications	Monthly
Official Gazette Magnetic Tapes (REF-1)	Weekly
Trademark Image File	Weekly

Section II

Product Description	Frequency
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March 20, 1989

Donald J. Quigg
Assistant Secretary and Commissioner
of Patents and Trademarks

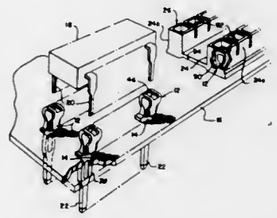
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REEXAMINATIONS

APRIL 4, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 29,513 (1028th)
ELECTRICAL CONNECTION APPARATUS
Lennart B. Johnson, Milford, N.H., assignor to Teradyne, Inc., Boston, Mass.
Reexamination Request No. 90/001,457, Mar. 3, 1988.
Reexamination Certificate for Reissue Patent Re. 29,513, issued Jan. 10, 1978, Ser. No. 709,872, Jul. 29, 1976.
Original No. 3,917,375, dated Nov. 4, 1975, Ser. No. 479,843, Jun. 17, 1974.
Int. Cl.[4] H01R *13/00*
U.S. Cl. 439—485



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1, 2, 6, 9, 12, 17** and **18** is confirmed.

Claims **3–5, 7, 8, 10, 11, 13–16, 19** and **20** are cancelled.

1. Panel-mounted electrical apparatus for a circuit device from which extend leads arranged in two side-by-side rows, said apparatus comprising

A. first and second side-by-side rows of socket contacts,

1. each socket contact extending within a separate aperture in such panel and having a folded contact clip disposed at least partly thereabove,
2. said contact clip having a folded, inverted, U-shaped configuration including a first clip arm extending toward and within the aperture, a bridging fold uppermost on said clip and apertured to receive a lead of said circuit device, and a second clip arm extending alongside said first clip arm and forming a resiliently-expandable contact area therewith for receiving therebetween the electrical lead, and

B. a heat sink of thermally-conductive material having an upper panel disposed between said rows of socket contacts and arranged for contiguous abutment against the bottom of such circuit device.

B1 3,904,039 (1029th)
WASHING MACHINE PACKING BRACE
Norman R. Anyon, Wilkinsonville, Mass., assignor to Republic Packaging Corporation, Chicago, Ill.
Reexamination Request No. 90/001,555, Jul. 18, 1988.
Reexamination Certificate for Patent No. 3,904,039, issued Sep. 9, 1975, Ser. No. 483,148, Jun. 26, 1974.
Int. Cl.[4] B65D *85/06*
U.S. Cl. 206—320

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

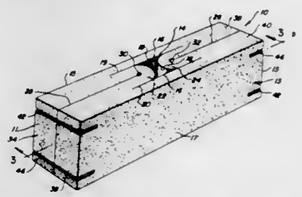
1. A packing brace for a washing machine assembly having a rotatable agitator positioned within the washing drum, comprising

a single unitary block of resilient material, said block having a length dimensionally greater than the width and height thereof and having opposed sides and ends,

said block provided with a center core cut-out,

said center core cut-out bounded by opposed straight side edges and opposed oppositely disposed forward and rear arcuate walls,

each of said straight side edges bounding said center core cut-out being co-extensive with lateral slits,



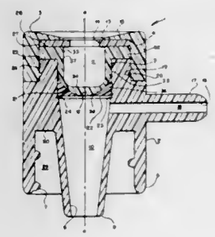
said block further provided with a pair of central slits extending mid-width along the length thereof from each end to a point spaced inwardly from said center core cut-out, thereby to form two pair of bracing members,

each of said mid-width slits terminating at a circular core positioned adjacent to said center core cut-out thereby to provide a self-formed hinge between each respective pair of said bracing members,

and each of said bracing members being movable to a laterally extended packing position as a result of the self-formed hinges associated therewith and the resiliency of the material, whereby said center core accomodates the agitator head of a washing machine and each of said bracing members may be moved laterally to frictionally engage the interior side walls of the washing machine drum thereby to firmly engage and restrain the agitator from movement.

B1 4,436,519 (1030th)
REMOVABLE HEMOSTASIS VALVE
William J. O'Neill, Garland, Tex., assignor to Argon Medical Corp., Athens, Tex.
Reexamination Request No. 90/000,564, May 29, 1984.
Reexamination Certificate for Patent No. 4,436,519, issued Mar. 13, 1984, Ser. No. 267,984, May 28, 1981.
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—175

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



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Claims 1-10 are cancelled.

1. A hemostasis valve comprising:

(a) a body having a central passage therein;

(b) a seal having a central aperture therein, said seal being mounted in said central passage; and

(c) a resilient, dome shaped diaphragm having a wall member with a single, linear slit therein, said diaphragm being mounted in said central passage, said diaphragm wall member having an inner bottom diaphragm surface, and an outer bottom diaphragm surface, said slit extending through said wall member from said inner bottom diaphragm surface to said outer bottom diaphragm surface, said wall member defining with said seal a diaphragm chamber within the space between said inner bottom diaphragm surface and said seal, whereby the side walls of said dome shaped diaphragm will act in cooperation with the walls of said central passage to resiliently urge said slit closed when no catheter is present therethrough.

B1 4,526,828 (1031st)

PROTECTIVE APPAREL MATERIAL AND METHOD FOR PRODUCING SAME

Kenneth E. Fogt; James D. Slosser; John A. Varos, all of Willard, and Gopinath Radhakrishnan, Tiffin, all of Ohio, assignors to Pioneer Industrial Products Company, Willard, Ohio

Reexamination Request No. 90/001,237, May 11, 1987.

Reexamination Certificate for Patent No. 4,526,828, issued Jul. 2, 1985, Ser. No. 508,231, Jun. 27, 1983.

Int. Cl.[4] A41D *13/10;* **D03D** *15/00*

U.S. Cl. 428—229

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERIMED THAT:

Claim 6 is cancelled.

Claims **1** and **11** are determined to be patentable as amended.

Claims **2-5**, **7-10** and **12-15**, dependent on an amended claim, are determined to be patentable.

New claims **16-19** are added and determined to be patentable.

1. A protective material comprising:

a base layer of textile material;

an intermediate layer of relatively cut-resistant, fiber material formed from intermeshing strands, defining pores therebetween,

an outer layer of solid, elastomeric material which retards penetration by liquid;

said pores in said intermediate layer being sufficiently large to permit the passage therethrough of said elastomeric material when the latter is in a liquid state;



said base layer being sufficiently nonporous to prevent the passage entirely therethrough of said elastomeric material when the latter is in a liquid state;

said solid, elastomeric material extending through said intermediate layer to bond the intermediate layer to said base layer, filling the pores in said intermediate layer and substantially totally encapsulating the strands of said intermediate layer;

[said elastomeric material being essentially the only bond between the base layer and the intermediate layer.]

the bond between the base layer and the intermediate layer consisting essentially of said elastomeric material.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED APRIL 4, 1989

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H611

SEMI-SUBMERSIBLE VESSEL

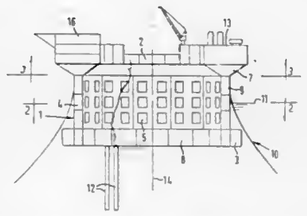
Duncan P. Peace, Twickenham, England, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 15, 1987, Ser. No. 3,443

Claims priority, application United Kingdom, Jan. 17, 1986, 8601096

Int. Cl.[4] B63B *35/08, 35/44, 1/10;* **E02B** *17/00*

U.S. Cl. 114—264 **18 Claims**



1. A semi-submersible vessel comprising an in horizontal direction continuous side wall attached at the lower end thereof to an underwater pontoon hull and supporting at the upper end thereof an operating deck, wherein the side wall and pontoon hull have each a substantially vertical axis of symmetry and surround each a central opening which is concentric to said axis.

H612

MOWING APPARATUS

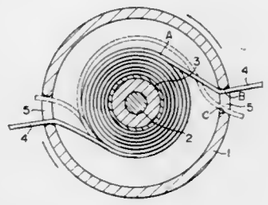
Toru Baba, Yokosuka, Japan, assignor to Kioritz Corporation, Mitaka, Japan

Continuation of Ser. No. 697,784, Feb. 4, 1985, abandoned. This application Jun. 6, 1986, Ser. No. 873,154

Claims priority, application Japan, Feb. 7, 1984, 59-15884[U]

Int. Cl.[4] A01D *50/00*

U.S. Cl. 56—12.7 **1 Claim**



1. A mowing apparatus comprising:

a casing containing a cord wound on a spool and operative to rotate while an end portion of said cord is drawn out from the casing;

wherein the improvement comprises:

a cord outlet opening formed in said casing in the form of a circumferentially elongated slot having a major axis of a dimension in the range between 2d and 10d oriented in the direction in which said casing rotates with a leading end and a trailing end, and a minor axis of a dimension in the range between 1.1d to 3d where d is the diameter of said cord, said trailing end of said cord outlet opening being in the form of a tilting surface portion inclined in a cord drawing direction and rounded in the direction of thickness such that said cord bending about the leading end of said slot bends at a point along its length different from where said cord bends about the trailing end of the slot, said elongated slot being defined by smooth edges uninterrupted by notches.

H613

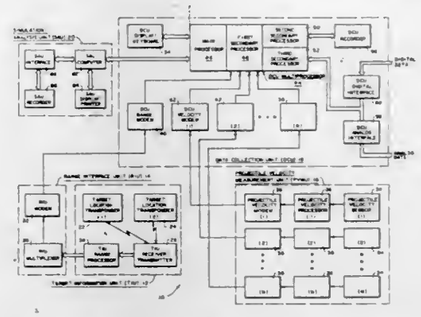
PORTABLE SHIPBOARD GUNNERY TRAINING/DIAGNOSTIC APPARATUS

Samuel L. Stello; James M. Johnson, and J. Harold Jones, all of Fredericksburg, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 9, 1984, Ser. No. 629,290

Int. Cl.[4] F41G *3/26*

U.S. Cl. 434—19 **10 Claims**



1. A detachable portable shipboard gunnery/diagnostic apparatus for simulation, analysis and assessment of simulated and actual live ordnance firings comprising:

a target information unit for measuring the range information from an associated ship on which said portable shipboard gunnery/diagnostic apparatus is placed to a desired shore target;

a range interface unit operatively connected to said target information unit for multiplexing the range information therefrom and conditioning it for subsequent transmission,

a projectile velocity measurement-unit for measuring the initial velocity of projectiles as they exit the barrels of guns on the associated ship;

a data collection unit operatively connected to said range interface unit and said projectile velocity measurement unit for storing and retrieving data therefrom, said collection unit including detachable interfacing means for detachably interfacing information from the "machinery" of the associated ship for deriving gunnery, diagnostic and ballistic parameters, and

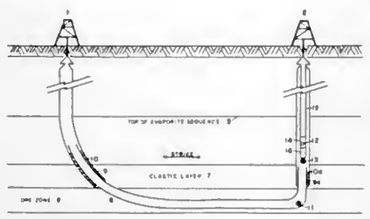
a simulation/analysis unit operatively connected to said data collection unit and being configured to simulate, summarize and interpret training exercise results, said simulation-/analysis unit being operatively connected to said main processor and having a predetermined program for processing the actual gunnery data from said data collection unit and for simulating an actual gunnery exercise.

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H614
METHOD TO CONNECT DRILL HOLES UTILIZING SIGNALLING DEVICES

Robert R. Norman, Sr., P.O. Box 1300, Moab, Utah 84532

Filed Sep. 19, 1988, Ser. No. 203,088
Int. Cl.⁴ E21C *41/08, 41/14*
U.S. Cl. 299—4 **19 Claims**



1. A method of establishing accurate communication between drill holes in deep, thick or shallow, thin soluble ore bodies comprising the following steps:

a. drilling an initial hole to the top of the closest, overlying evaporite sequence to the ore zone, said hole then being deflected horizontally to reach the soluble ore zone;

b. drilling to a point at a distance of 1000 to 5000 feet or more from the point of deflection;

c. pushing a signal-sending device to the base of the said initial hole whereupon the position of the said signal-sending device can be surveyed in to establish the location of a second drill hole;

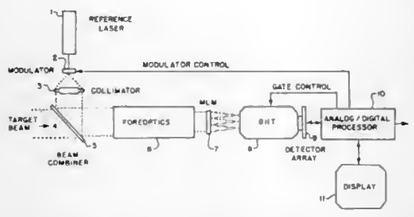
d. drilling a second hole to the position of the aforementioned signal-sending device in the initial hole utilizing a signal-receiving device positioned in the drilling apparatus in the second hole;

e. conjoining the bases of the drill holes.

H615
HIGH SPEED/LOW LIGHT WAVEFRONT SENSOR SYSTEM

Julius M. Feinleib, Cambridge, and Lawrence E. Schmutz, Watertown, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 22, 1988, Ser. No. 146,891
Int. Cl.⁴ G01J *1/00, 1/20*
U.S. Cl. 356—121 **5 Claims**



1. A wavefront sensing apparatus capable of sensing wavefront distortion and an angle of arrival of an incoming wavefront, said wavefront sensing apparatus comprising:

a source which produces a reference beam;

a means for combining said reference beam from said source with said incoming wavefront to produce a combined wavefront;

a means for dividing said combined wavefront from said combining means into multiple subaperture wavefront images;

an image intensifier which receives and intensifies said multiple subaperture wavefront images above a detection threshold level, to produce thereby intensified multiple subaperture wavefront images with a plurality of incoming wavefront spots and reference beam spots indicative of tilt angles of said incoming wavefront and said reference beam in each subaperture;

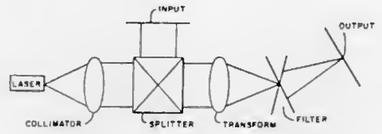
a detector array which produces measurement signals which indicate an incoming beam centroid and a reference beam centroid for each subaperture by an optical detection of said intensified multiple subaperture wavefront images received from said image intensifier, said detector array being characterized by having a detection threshold which must be exceeded for optical signals to be detected by the detector array; and

a means for calculating said angle of arrival and said wavefront distortion of said incoming wavefront from said incoming beam centroid and said reference beam centroid of said multiple subaperture wavefront images, said calculating means receiving and converting into digital said measurement signals from said detector array and calculating therefrom said wavefront distortion and said angle of arrival.

H616
METHOD OF MAKING A PRE-ALIGNED OPTICAL CORRELATOR

Richard L. Hartman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1988, Ser. No. 227,571
Int. Cl.⁴ G02B *5/18*
U.S. Cl. 350—162.13 **4 Claims**



1. A method of making a pre-aligned optical correlator comprising: providing a solid optical correlator body that has flat surfaces thereon, providing a position on the solid optical correlator body to mount a matched filter, mounting a matched filter in a predetermined position relative to the provided position on said solid optical correlator body, positioning a laser diode relative to a predetermined surface of said correlator body for providing a laser beam in a predetermined path to a center position of said matched filter, adjusting said laser diode until the laser beam from said laser diode is centered relative to the center position of the matched filter, and securing said laser diode in said adjusted position relative to said optical correlator body to fix the laser diode relative to the optical correlator body.

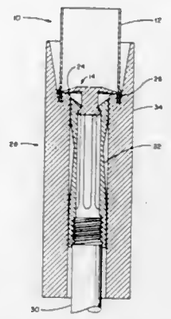
H617
CLOSURE SYSTEM

Nicholas A. Hertelendy, Kennewick, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 22, 1987, Ser. No. 41,267
Int. Cl.⁴ B65B *7/28;* B67B *1/00*
U.S. Cl. 53—486 **6 Claims**

1. A method of sealing a cylindrical metallic container having a open end comprising inserting within said open end a cap having a frusto-conical flange which fits closely within said

container, then deforming the flange of said cap in a direction tending to flatten it, thereby forcing the periphery of the flange

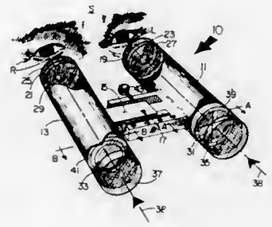


of said cap into and deforming said container so as to form a tight seal therewith.

H618
INTERPUPILLARY DISTANCE MEASURING DEVICE

Harold S. Merkel, Beavercreek, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 5, 1987, Ser. No. 119,877
Int. Cl.⁴ A61B *3/10*
U.S. Cl. 351—204 **3 Claims**



1. An instrument for measuring the interpupillary distance of a subject, comprising:

(a) a first sighting tube and a second sighting tube disposed in adjustable parallel spaced relationship along respective parallel first and second optical axes;

(b) means interconnecting said first tube and said second tube for selectively adjusting said first tube in said adjustable parallel spaced relationship relative to said second tube and for gauging the spacing between said first and second optical axes;

(c) a first eyepiece lens and a second eyepiece lens, having equal preselected focal lengths, disposed along respective said first and second optical axes at corresponding first ends of said first sighting tube and said second sighting tube; and

(d) a single first translucent target bearing a first recognizable indicia disposed within said first tube along said first optical axis a distance equal to said preselected focal length from said first lens, and a single second translucent target bearing a second recognizable indicia different from said first recognizable indicia disposed within said second tube along said second optical axis a distance equal to said preselected focal length from said second lens, said first recognizable indicia and said second recognizable indicia being optically fusible by said subject sighting along respective said first and said second optical axes by spacing said first sighting tube and said second sighting tube a distance corresponding to the interpupillary distance of said subject.

H619
PREPARATION OF ALKYL GLYCOSIDES

Robert S. McDaniel, Jr., Decatur; Leonard F. Vanderburgh, Bethany, and Stephen J. Sommer, Decatur, all of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jan. 25, 1984, Ser. No. 573,905
Int. Cl.⁴ C07G *3/00;* C07H *15/00, 17/00*
U.S. Cl. 536—18.6 **11 Claims**

1. A process for preparing alkyl glycosides having substituent alkyl groups of 4 to 25 carbon atoms, which process comprises reacting a saccharide selected from the group consisting of unsubstituted saccharides and alkyl glycosides having substituent alkyl groups of 1 to 3 carbon atoms with a monohydric alcohol having 4 to 25 carbon atoms at a temperature of about 80° to 140° C. in the presence of about 5 to 100 meq. acid catalyst per mole saccharide unit and in the presence of at least 1 to about 25 moles N-methyl-2-pyrrolidone per mole saccharide unit.

H620
CONIFER GROWTH STIMULATION AND FOREST MANAGEMENT

Donald C. Young, 309 Jacarandа Pl., Fullerton, Calif. 92632

Continuation of Ser. No. 793,699, Oct. 31, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 119,638
Int. Cl.⁴ C05C *9/00;* C05B *15/00*
U.S. Cl. 71—28 **20 Claims**

1. A method for promoting the growth of conifers which comprises applying to said conifers an amount of biuret sufficient to promote the growth of said conifers.

H621
FLAVOR MODIFICATION OF DISTILLED SPIRITS

Gary A. Day, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Mar. 25, 1988, Ser. No. 173,521
Int. Cl.⁴ C12G *3/06;* A23G *3/00*
U.S. Cl. 426—592 **15 Claims**

1. A method of modifying the flavor of a distilled spirit comprising mixing a major amount by weight of a distilled spirit with a minor amount by weight of a saccharide composition consisting essentially of a member selected from the group consisting of crystalline fructose, aqueous solutions thereof, mixtures of crystalline fructose and crystalline dextrose, and aqueous solutions thereof, said minor amount being less than 5% by weight of the resulting mixture.

H622
ANALYTICAL ELEMENT FOR MEASURING ACTIVITY OF CREATINE KINASE

Shigeki Kageyama; Kazuya Kawasaki, and Harumi Katsuyama, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 18, 1988, Ser. No. 195,238
Claims priority, application Japan, May 18, 1987, 62-120547
Int. Cl.⁴ C12Q *1/54, 1/50, 1/48, 1/32*
U.S. Cl. 435—14 **9 Claims**

1. In a dry analytical element for the determination of creatine kinase enzymatic activity, comprising at least one porous medium and at least one water permeable layer having a liquid contact relation with said porous medium, wherein said porous medium or said water permeable layer contains creatine phosphoric acid, ADP, a thiol compound as a creatine kinase activation agent, glucose, hexokinase, G6PDH, NAD^+, and an electron transmission agent, and a formazane dye forming tetrazolium salt, the improvement wherein said at least one

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water permeable layer contains a formazane dye forming tetrazolium salt and not more than 16 g/m^2 of gelatin.

H623
INTEGRAL MULTILAYER ANALYSIS ELEMENT

Takashi Miyazako, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

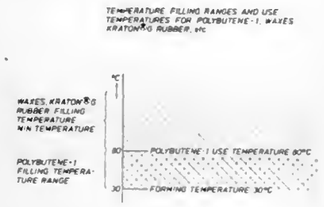
Filed Feb. 12, 1988, Ser. No. 155,421
Claims priority, application Japan, Feb. 12, 1987, 62-30211
Int. Cl.[4] G01N *31/22*
U.S. Cl. 456—170 10 Claims

1. A integral multilayer analysis element comprising, in order, first at least one reagent layer and second a porous spreading layer laminated on a light-permeable water-impermeable support, wherein a fluorine-containing surfactant is incorporated at least in said spreading layer.

H624
POLYBUTYLENE GEL FILLED CABLES

Dale L. Handlin, Jr.; Robert G. Lutz, and William H. Korcz, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 679,169, Dec. 6, 1984. This application Feb. 20, 1987, Ser. No. 17,120
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—462 4 Claims



1. A cable which may be used for low temperature filling without sacrificing the use temperature, and which may be easily repaired, which comprises:

a cable body, which contains a slow forming, thermally reversible translucent encapsulating compound, wherein said encapsulating compound contains from about 2 percent by weight to about 8 percent by weight butene-1 polymer or copolymer, wherein said butene-1 polymer or copolymer contains from about 3 percent by weight to about 10 percent by weight of a C_2–C_5 comonomer, and from about 92 percent by weight to about 95 percent by weight of a naphthenic or paraffinic oil, wherein said oil has an aromatic content of from about 5 percent by weight to about 25 percent by weight.

H625
GROUT FORMULATION FOR DISPOSAL OF LOW-LEVEL AND HAZARDOUS WASTE STREAMS CONTAINING FLUORIDE

Earl W. McDaniel; Terry L. Sams, and Othar K. Tallent, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 2, 1987, Ser. No. 56,833
Int. Cl.[4] G21F *9/16*; C04B *7/02, 2/02, 7/34*
U.S. Cl. 252—628 9 Claims

1. A composition which may be used to formulate a waste disposal grout for immobilization of fluoride ion-containing aqueous waste materials comprising:

from about 30 to about 70 weight percent cement;

from about 10 to about 60 weight percent fly ash;

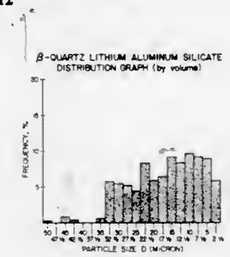
from about 3 to about 13 weight percent clay; and

from about 5 to about 20 weight percent calcium hydroxide.

H626
SOL-GEL CERAMIC OXIDES

Josephine Covino, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 4, 1986, Ser. No. 892,967
Int. Cl.[4] C03C *3/00*
U.S. Cl. 501—12 15 Claims



1. A method for selectively incorporating transition metals within a ceramic oxide matrix and for producing a ceramic oxide product having a particular particle size distribution and crystal structure, said method comprising the steps of:

forming a solution of hydrolyzable transition metal organic compounds in an organic solvent;

lowering the pH of said solution with an acid to a range that allows growth of metal oxide chains and networks through hydrolysis and condensation reactions without the formation of colloidal silica;

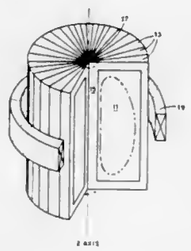
initiating a hydrolytic polycondensation reaction in said solution by adding water to produce a gel containing three-dimensionally cross-linked polymers having a controlled cross-linked matrix; and

heating said gel so as to substantially remove organic and free liquid components and convert said gel to a particulate oxide product.

H627
SPHERICAL TORUS FUSION REACTOR

Yaeng-Kay M. Peng, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 783,604
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—142 12 Claims



1. A toroidal plasma confining device, comprising:

a toroidal field generating means including a plurality of toroidal field coils disposed about said toroidal plasma for generating a toroidal magnetic confinement field about said toroidal plasma;

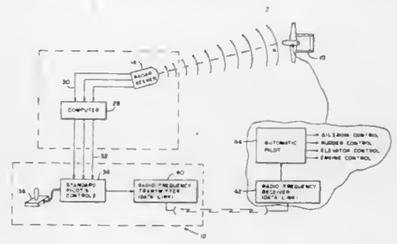
a poloidal field generating means including at least one electrical current conducting coil encircling said toroidal plasma adjacent the outer radius of said toroidal plasma for generating only a vertical magnetic field component within said toroidal plasma which together with said toroidal magnetic confinement field defines a toroidal plasma confinement region for confining said toroidal plasma concentrically about a main vertical axis thereof having an aspect ratio less than 2 and a natural elongation of about 2 such that said toroidal plasma exists in the form of a compact, generally-spherical, toroidal shape; and

a vacuum containment means for encapsulating said toroidal plasma in a vacuum environment.

H628
UNIVERSAL AUTOMATIC LANDING SYSTEM FOR REMOTE PILOTED VEHICLES

Pat H. Mclngvale, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 18, 1988, Ser. No. 182,603
Int. Cl.[4] G01S *13/91*
U.S. Cl. 342—33 6 Claims



1. An automatic landing system for landing remotely piloted flying vehicles in a predetermined flight path and at a predetermined point, comprising;

(a) an auto pilot carried by said flying vehicle for measuring the parameters of attitude, airspeed, and heading and comparing the same to predetermined parameters for the desired attitude, airspeed and heading, and for adjusting the path of said aircraft whenever deviations from the desired parameters are detected;

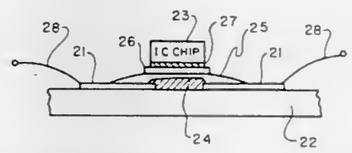
(b) radar transmitter and receiver means disposed on a stabilized gimbal for measuring the angular deviation from a reference and the actual distance from said vehicle to said radar transmitter and receiver means on a continuous basis; and

(c) control means for receiving signals from said radar, transmitter and receiver means indicating the pitch and yaw angle and the range from said radar transmitter and receiver means to the said vehicle, computing both actual and desired altitude and heading angle on a continuous basis and comparing said desired and actual altitudes and heading on a continuous basis from the initiation of landing approach until said vehicle reaches a pre-determined touch-down point, and for transmitting signals indicative of any deviation from said desired parameters to said autopilot for correcting any such deviations from said desired parameters whereby said remotely piloted flying vehicle is landed at a predetermined touchdown point and travels along a predetermined glideslope and heading during landing.

H629
NON-DESTRUCTIVE SEMICONDUCTOR CHIP BONDING AND CHIP REMOVAL

Francis J. Murdoch, Monmouth Beach, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 9, 1987, Ser. No. 2,835
Int. Cl.[4] H01L *23/16, 39/02, 23/56*
U.S. Cl. 357—75 1 Claim

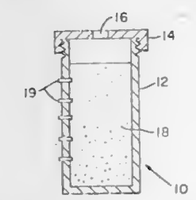


1. An integrated circuit chip mounting arrangement comprising a substrate, electrically conductive electrodes deposited on said substrate immediately adjacent the location where said chip is to be mounted and extending outwardly therefrom, resistor material deposited on said substrate and extending between said electrodes and in intimate contact therewith, said resistor material having a low ohms/square value of 1 to 10 ohms at approximately 400° C., a thin layer of insulating glass covering said resistor material, a thin metallic layer deposited on the upper surface of the glass and being approximately coextensive with the resistor material, the layer of insulating glass and the metallic layer each being 0.5 to 2.0 mils thick, the integrated circuit chip being positioned on the upper surface of the metallic layer and immediately above the resistor material, a layer of eutectic solder on the underside of said chip, said solder having a melting point of approximately 400° C., and means for applying a low voltage of 10–20 volts to the electrically conductive electrodes, said eutectic solder serving to secure said chip in place on the substrate when said low voltage is applied to said electrodes to heat said resistor material to approximately 400° C. and thereby temporarily melt the eutectic solder, the inner ends of the conductive electrodes being perpendicularly extended so as to be substantially coextensive with the length of said chip, the distance between the inner ends of the electrodes being substantially coextensive with the width of said chip, the resistor material filling the entire gap or space between the conductive electrodes.

H630
AGING GAUGE

Robert E. Betts, and John F. Crawford, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 5, 1988, Ser. No. 177,308
Int. Cl.[4] G01K *3/00, 11/00*
U.S. Cl. 374—106 6 Claims



1. An aging gauge for a component of a solid propellant rocket motor wherein said component when aged for predetermined time periods and predetermined temperatures forms

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aging prducts which can be determined by analyses methods, said aging gauge comprising:

(i) a container for containing a thermally sublimational material;

(ii) an opening having a removable seal in said container which said opening is normally sealed after loading said thermally sublimational material into said container and when said aging gauge is placed into service said seal is effectively removed, said opening then serving as a vent for a measurable sublimination reaction;

(iii) a predetermined amount of a thermally sublimational material loaded into said container, said thermally sublimational material characterized by having a low sublimation rate over the temperature range from about 70° F. to about 160° F. and by having a measurable loss amount of said thermally sublimational material after an elapsed aging time period for comparison with the amount of aging products found in a component of a solid propellant rocket motor aged with said aging gauge for a like elapsed time period to establish calibration data for said aging gauge whereby an aging gauge of a like construction serves to determine the total heat that a component of a solid propellant rocket motor has been subjected to and which serves to determine the aging products expected to be presented from a comparison of the sublimation amounts with the analyses determined aging products present when a calibration curve is established for said aging gauge; and,

(iv) means affixed to said aging gauge for determining the maximum temperature to which said aging gauge is subjected to during aging service.

REISSUES

APRIL 4, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,898

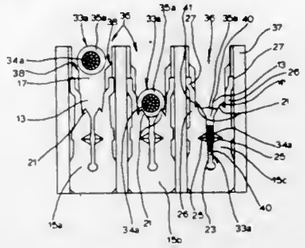
MULTIGAUGE INSULATION DISPLACEMENT CONNECTOR AND CONTACTS THEREFOR

Helen Dechelette, London, England, assignor to Molex Incorporated, Lisle, Ill.

Original No. 4,527,852, dated Jul. 9, 1985, Ser. No. 521,769, Aug. 9, 1983. Application for reissue May 28, 1987, Ser. No. 55,088

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—395 **5 Claims**



1. A U-shaped, stamped metal electrical contact member adapted to be mounted in a terminal receiving cavity of a connector housing for connecting an insulated conductor to an external terminal, said contact member including two opposed leg portions, each with a free end and a bight jointed end and each leg portion having a slot formed therein including a wire receiving mouth converging towards and leading to opposed insulation cutting edge surfaces which provide electrical connection to an insulated conductor, said contact member further including a bight portion extending between the bight joining ends of the leg portions, the improvement comprising:

each slot extending from the free end of each leg portion towards the bight joining end thereof, with each leg portion including two opposed spaced-apart transversely deflectable resilient limb portions each having an upper free end at the mouth having outwardly extending housing engaging means for engaging portions of the connector housing defining the terminal receiving cavity to limit outward deflection of said limbs when urged apart by insertion therebetween of an insulated wire, whereby the portion of each limb portion below the free end is outwardly bowed upon continued insertion of said insulated wire.

Re. 32,899

LOW VOLTAGE LIGHTING SYSTEM REPLACEABLE BULB ASSEMBLY

Jerry H. Laidman, 4658 Lacotta Pl., Sherman Oaks, Calif. 91403

Original No. 4,654,765, dated Mar. 31, 1987, Ser. No. 779,138, Sep. 23, 1985. Application for reissue Jun. 3, 1988, Ser. No. 202,698

Int. Cl.[4] H01R *33/00*; F21V *1/00*

U.S. Cl. 362—226 **9 Claims**

8. An improved law voltage lighting system comprising:

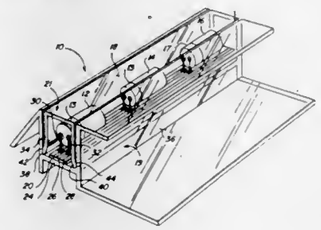
(a) an elongated housing including a generally rectangular elongated cavity having a floor;

(b) an elongated non-conductive strip having a lower surface;

(c) a plurality of conductors secured to said non-conductive strip;

(d) a plurality of replaceable low voltage light bulbs selectively connectable to said conductors;

(e) electrical contact means for connecting said light bulbs to said conductors and secured to said conductors such that said lower surface of said non-conductive strip is everywhere non-conductive; and



(f) a remavable transparent cover over said housing retaining said non-conductive strip within said cavity with said lower surface of said non-conductive strip abutting said floor of said-cavity.

Re. 32,900

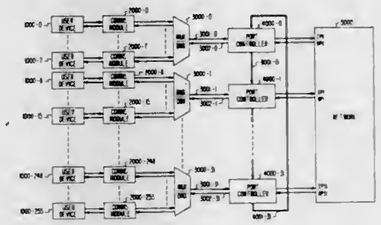
FAST CIRCUIT SWITCHING SYSTEM

Milo Orsic, Lincolnwood, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,524,440, dated Jun. 18, 1985, Ser. No. 558,630, Dec. 6, 1983. Application for reissue Jun. 8, 1987, Ser. No. 59,713

Int. Cl.[4] H04Q *11/00, 11/04*

U.S. Cl. 370—54 **31 Claims**



1. A communications system comprising

a plurality of source channels for conveying information,

a plurality of destination channels for conveying information,

a plurality of communications modules each associated with at least one of said source channels and each comprising transmitter means for transmitting, on the at least one associated source channel, circuit setup request signals and data, each of said circuit setup request signals defining at least one of said destination channels,

a plurality of controllers each comprising storage means for storing one of a plurality of status words each defining the availability of at least one of said destination channels,

means for cycling each of said status words to the storage means of each of said controllers and

a network,

wherein each of said controllers is associated with at least one of said source channels and further comprises

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means for receiving information on the at least one associated source channel and

means responsive to one of said circuit setup request signals and to subsequent data, when one of said status words cycled to the storage means of that controller defines as available one of said destination channels that is defined by that circuit setup request signals, for transmitting that circuit setup request signal and said subsequent data to said network, and

wherein said network comprises means responsive to circuit setup request signals received from said controllers for transmitting data received from said controllers to ones of said destination channels defined by those circuit setup request signals.

Re. 32,901

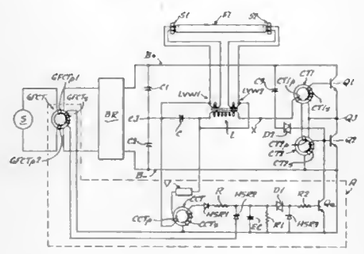
SERIES-RESONANT ELECTRONIC BALLAST CIRCUIT

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Original No. 4,538,095, dated Aug. 27, 1985, Ser. No. 500,841, Jun. 3, 1983. Application for reissue Oct. 28, 1986, Ser. No. 924,852

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—244 **34 Claims**



14. A ballast for a gas discharge lamp, said lamp having a pair of electrodes and requiring thereacross, in order to initiate lamp operation, an initial relatively high-magnitude lamp starting voltage for a relatively brief period of time, said ballast being adapted to be powered from an ordinary electric utility power line and comprising:

rectifier-means connected in circuit with said power line by way of a pair of power-line-wires and operative to provide a DC voltage;

inverter-means connected with said DC voltage and operative to provide a high-frequency-voltage having a fundamental frequency that is substantially higher than that of the voltage normally present on said power line;

tuned-circuit-means connected in circuit with said AC output, said tuned-circuit-means being substantially resonant at the fundamental frequency of said high-frequency-voltage and having a pair of output terminals with a tuned-circuit-voltage thereacross, the presence of said tuned-circuit-voltage being a response to the presence of said high-frequency-voltage;

lamp-socket-means connected in circuit with said pair of output terminals and operable to permit disconnectable connection of said gas discharge lamp therewith;

disable-means connected in circuit with said inverter means and operable, upon the receipt of a disable-signal, to disable the operation of said inverter-means, thereby to remove said tuned-circuit-voltage from said pair of output terminals;

voltage-clamping-means connected in circuit with said pair of output terminals and operative, by drawing current therefrom, to limit the magnitude of said tuned-circuit-voltage present thereacross to a level that is about equal to or somewhat larger than said relatively high-magnitude lamp starting voltage; and

sensing-means connected in circuit with said voltage-clamping-means and operable to provide said disable-signal to said disable-means whenever said voltage-clamping-means has drawn current from the output terminals for longer than a brief period of time;

whereby, if a gas discharge lamp is not connected with said lamp-socket-means and thereby operative to constitute a load for said tuned-circuit-means, the inverter means is disabled within a brief period of time.

PLANT PATENTS

GRANTED APRIL 4, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,709

THORNLESS HONEYLOCUST

Willet N. Wandell, Rte. #1, Box 286, Oquawka, Ill. 61469

Filed Nov. 6, 1987, Ser. No. 117,337

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—52 **1 Claim**

1 A new variety and the parts thereof, of *Gleditsia triacanthos* var. inermis 'Wandell' as described herein that differs from other varieties by the unique combination of: (1) a distinct broadly pyramidal growth form; (2) a uniform branch angle; (3) a dense compact crown composed of many lateral branches; (4) a high leaf population of deep green foliage; and (5) a rapid rate of growth demonstrated by the development of many lateral branches at an early age and the early development of caliper on juvenile trees propagated from the parent tree.

6,710

CARNATION NAMED LONTOYO

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, La Londe, France

Filed Sep. 24, 1987, Ser. No. 100,719

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of spray carnation and parts thereof, substantially as herein shown and described, characterized by the orange coloration of its relatively small blooms produced profusely with an intermittent flowering habit, and by the vigorous and upright growth habit of the plant, reaching an average height of about 106 cm. at eight months.

6,711

CARNATION NAMED LONTEREY

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, La Londe, France

Filed Sep. 24, 1987, Ser. No. 100,720

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinct carnation cultivar and parts thereof, substantially as herein shown and described, characterized by the uniform overall pink coloration of its medium sized, ball-shaped blooms which are carried on long, straight, strong and rigid stems, and by its vigorous growth habit with a moderately abundant production of foliage.

6,712

PLUM TREE, VIKING PRIDE

Joseph W. Satterstrom, 12299 E. Magnolia, Kingsburg, Calif. 93631

Filed Oct. 29, 1987, Ser. No. 114,155

Int. Cl.⁴ A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described which is somewhat similar to the Durado Plum Tree (U.S. Plant Pat. No. 3,925) with which it is most closely related but from which it is distinguished as to novelty by bearing fruit which are large, uniform and a dark red color, the fruit ripening for commercial harvesting approximately ten days after the Durado Plum Tree and approximately one week prior to the Black Beaut Plum Tree (U.S. Plant Pat. No. 3,617) which matures at approximately the same time of the season.

6,713

FLORIBUNDA ROSE CV. MACREXY

Samuel McGredy, IV, Aukland, New Zealand, assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Oct. 28, 1987, Ser. No. 116,731

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—26 **1 Claim**

1. A new and distinct variety of floribunda rose cv. Macrexy, the parts thereof, the variety characterized in that it exhibits a very compact and upright growth habit and remains under 3 feet in height; it is extremely floriferous with large trusses of soft, creamy pink color flowers essentially as described and illustrated herein.

6,714

HYBRID TEA ROSE PLANT CV. AROBIPY

Jack E. Christensen, Ontario, and Thomas F. Carruth, Canoga Park, both of Calif., assignors to Bear Creek Gardens, Inc., Somis, Calif.

Filed Nov. 5, 1987, Ser. No. 117,615

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—14 **1 Claim**

1. A new and distinct variety of hybrid tea rose plant cv. Arobipy, the parts thereof, being particularly characterized by its tall growing habit; its large excellently formed buds and flowers; its uniformly white blossoms with only the outer guard petals having traces of pink and green along the margin and midrib, respectively; and its broad petals numbering between thirty and thirty-five petals per blossom as described and illustrated.

6,715

LILY PLANT NAMED 'DAWN PIXIE'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed May 18, 1987, Ser. No. 51,824

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive variety of Asiatic hybrid lily plant and parts thereof, substantially as herein shown and described, characterized by its conspicuously spotted and gold throated deep pink flowers; and by its short stemmed, abundantly leaved and upright flowering silhouette, ideal for pot plant culture.

6,716

GERANIUM PLANT NAMED PRAELUDIUM

Guenter Duemmen, 4134 Rheinberg 4, Dammweg 18-20, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 110,771

Claims priority, application Italy, Apr. 24, 1987, 099 NV/87

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium known as *Pelagonium zonale*, to be known by the cultivar name Praeludium, as described and illustrated, and particularly characterized by the combination of characteristics of: an intensive-red colored flower; a semi-double flower form; a dark green foliage with a slight zonation; robust foliage; a large umbel; and a good rooting pattern.

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6,717
GERANIUM PLANT NAMED FEELING
Guenter Duemmen, 4134 Rheinberg 4, Dammweg 18-20, Fed. Rep. of Germany
Filed Oct. 21, 1987, Ser. No. 110,890
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinct cultivar of geranium known as *Pelargonium zonale,* to be known by the cultivar name Praeludium, as described and illustrated, and particularly characterized by the combination of characteristics of: a bright lilac colored flower; a semi-doubled flower form; white color in the middle of the flower; dark green foliage with good durability under outdoor summer conditions; and a good branching pattern.

6,718
BOUVARDIA NAMED JOWHITE
John M. F. de Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands
Filed Dec. 1, 1987, Ser. No. 127,099
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration and form of its profusely blooming flowers.

6,719
BOUVARDIA NAMED ROXANNE
John M. F. De Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands
Filed Dec. 1, 1987, Ser. No. 127,100
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration and form of its profusely blooming flowers.

6,720
BOUVARDIA NAMED JOROSA
John M. F. De Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands
Filed Dec. 1, 1987, Ser. No. 127,103
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its profusely blooming flowers.

6,721
BOUVARDIA NAMED PAULINE
John M. F. de Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands
Filed Dec. 1, 1987, Ser. No. 127,104
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration and form of its profusely blooming flowers.

6,722
BOUVARDIA NAMED JOLITA
John M. F. de Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands
Filed Dec. 1, 1987, Ser. No. 127,105
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its profusely blooming flowers.

6,723
BOUVARDIA NAMED ILONKA
John M. F. de Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands
Filed Dec. 1, 1987, Ser. No. 127,106
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim
1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its profusely blooming flowers.

6,724
HACKER'S AUGUST GOLD APPLE TREE
Theodore R. Hacker, 956 Stonewall Rd., Lexington, Ky. 40501
Filed Nov. 23, 1989, Ser. No. 124,271
Int. Cl.[4] A01H 5/03
U.S. Cl. Plt.—34 1 Claim
1. A new and distinct variety of fruiting apple tree named Hacker's August Gold and parts thereof as described and illustrated, characterized by its silvery green fruit which ripens to a golden yellow.

PATENTS

GRANTED APR. 4, 1989

ERRATA

For CLASS	See PATENT NO.
029-527	4,817,213
012-133	4,817,305
043-088	4,817,313
033-832	4,817,362
057-100	4,817,371
057-263	4,817,380
057-265	4,817,381
043-088	4,817,674
198-346	4,817,694
228-110	4,817,814
277-009	4,817,846
206-427	4,817,866
242-018	4,817,896
227-003	4,817,965
294-001	4,817,998
356-028	4,818,071
249-083	4,818,204
425-549	4,818,217
422-133	4,818,566
436-518	4,818,687
503-201	4,818,742
525-390	4,818,803
235-455	4,818,847
341-080	4,818,969
340-568	4,819,015
341-013	4,819,051
342-353	4,819,053
355-014	4,819,066
355-024	4,819,067
324-083	4,819,080
328-134	4,819,081
363-056	4,819,157

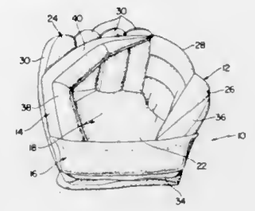
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PATENTS

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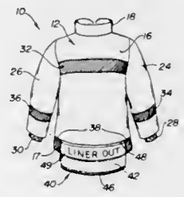
GENERAL AND MECHANICAL

4,817,209
CHILD'S BASEBALL GLOVE
Roger W. Lehmann, 18 Flintlock Ct., Bernardsville, N.J. 07924, and Michael I. Satten, 4 Farmers Rd., Kingspoint, N.Y. 11024
Filed Jul. 22, 1988, Ser. No. 223,291
Int. Cl.[4] A41D *13/10*
U.S. Cl. 2—19 **14 Claims**



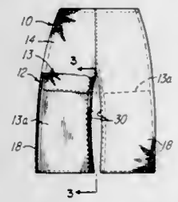
1. A child's baseball glove comprising a hand member including a palm section, a thumb section, a finger section including a plurality of side-by-side finger elements, and a webbing section, said finger elements being connected to one another adjacent the outer ends thereof, said webbing section connecting said thumb section to the next adjacent finger element, and a pocket member, said pocket member being of fabric-covered, padded construction and extending from a point adjacent the outer extremity of said thumb section downwardly along the front side of said thumb section, across the base portion of said palm section, upwardly along the front side of the outermost finger element and across the front sides of said finger elements adjacent the outer extremities thereof to a point adjacent said webbing section, at least those portions of said pocket member which extend downwardly along the front side of said thumb section across the base portion of said palm section and upwardly along the front side of the outermost finger element having an average cross-sectional diameter of at least approximately one inch.

4,817,210
PROTECTIVE COAT FOR FIREFIGHTERS
Don Aldridge, New Carlisle, and Rolf U. Metzger, Fairborn, both of Ohio, assignors to Lion Apparel, Inc., Dayton, Ohio
Filed Mar. 28, 1988, Ser. No. 174,198
Int. Cl.[4] A41D *1/02, 13/00*
U.S. Cl. 2—81 **22 Claims**



1. A protective coat for firefighters, comprising:
an outer shell having a front and back portion defining a neck opening and right and left sleeve openings, and right and left sleeves attached to the right and left sleeve openings, respectively, the back portion of said outer shell having a lower edge;
an inner liner having a front and back portion defining a neck opening and right and left sleeve openings, and right and left sleeves attached to the right and left sleeve openings of said inner liner, respectively, the sleeves of said inner liner being insertable within the sleeves of said outer shell with the neck openings being coincident so that said inner liner is secured within said outer shell, the back portion of said inner liner having a lower edge; and
a flap of material secured to one of said outer shell and said inner liner extendable downwardly in a first position below the lower edge of the back portions of said outer shell and said inner liner, and foldable upwardly in a second position thereabove and separable fastening means for securing said flap in said second position to the other of said outer shell and said inner liner, said flap providing a visual indication that said inner liner is not missing when in said second position.

4,817,211
FIREFIGHTER'S TROUSERS CAPABLE OF RECEIVING A BOOTED FOOT
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417
Filed Apr. 18, 1988, Ser. No. 182,399
Int. Cl.[4] A41D *1/06*
U.S. Cl. 2—227 **6 Claims**



1. A firefighter's trousers which are easily donned by a firefighter who wears boots, in which each of the boots has a foot part and a leg part, the foot part and the leg part of each of the boots having given dimensions, the trousers comprising an outer shell of abrasion resistant material and an inner liner of insulation material, the inner liner being covered by the outer shell, the outer shell having a torso part and a pair of leg parts, the inner liner having a torso part and a pair of leg parts, each of the leg parts of the outer shell and each of a the leg parts of the inner liner of the trousers having a lower portion which is adapted to cover the leg part of a firefighter's boot, the torso part of the inner liner being of material of a given weight per unit area and having a given flexibility and having given insulation qualities, the lower portion of the inner liner of each of the leg parts of the trousers being of a lighter weight material than the material of the torso part of the inner liner and having a flexibility greater than the given flexibility of the torso part of the inner liner and having lesser insulation qualities than the given insulation qualities of the torso part, the lower portion of each of the leg parts of the inner liner being tubular and forming a tubular passage significantly greater in dimensions than the given dimensions of the foot part and leg part of the boots, the lower portion of the leg parts of the outer shell freely encompassing the lower portion of the respective leg part of the inner liner whereby the boots move easily through the lower leg parts of the trousers as a firefighter dons the trousers while wearing the boots, the lower portion of each of the leg parts of the outer shell having a bottom edge, the lower portion of each of the leg parts of the inner liner having a bottom edge, the bottom edge of the lower portion of the leg parts of the outer shell and the bottom edge of the leg parts of the inner liner being adapted to be immediately above the foot parts of the boots as the boots and trousers are worn by the firefighter, wherein the lower portion of the leg parts of the inner liner and

the lower portion of the leg parts of the outer shell cover the leg parts of the boots, and whereby the legs of the firefighter are adequately protected while permitting ease of donning of the trousers while the firefighter wears boots and while permitting the trousers to have minimum weight.

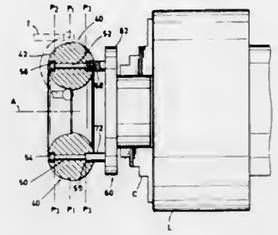
4,817,212
NIGHTTIME WATERSPORTS ILLUMINATOR
Edward J. Benoit, 1030 Grand Ave., San Diego, Calif. 92109
Filed Jul. 15, 1987, Ser. No. 73,566
Int. Cl.[4] A42B *1/24*
U.S. Cl. 2—209.2 **7 Claims**



1. Head gear for water sports comprising:
a hood constructed of stretchable material for enclosing in a water tight manner the head of a wearer, said hood having a chamber with a bottom surface for containing an illumination means, said chamber having an opening through the front upper surface thereof and a slit through the bottom surface for providing access to said opening from the interior of said chamber;
a waterproof illumination means with a front lens for light illumination therethrough and an "on" and "off" switch for controlling the illumination of said light, said light being insertable from the interior of said hood through said slit into said chamber with said lens extending through said opening in a water tight sealed relationship therewith and said switch being operable between said "on" and "off" positions through the stretchable material of said hood from the exterior of said hood;
a rigid rim is attached to the front of said hood at a location between said opening and the eyes of the wearer whereby reflected illumination from said light is not transmitted to the eyes of the wearer of the hood; and
a single releasable length adjustable strap being attached to said hood for selectively securing the hood under the chin of the wearer.

4,817,213
METHOD FOR FORMING A TORUS AND A PISTON MADE THEREFROM FOR USE IN A ROTARY ACTUATOR
William B. Scoble, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.
Filed Feb. 19, 1988, Ser. No. 157,887
Int. Cl.[4] B22D *11/126*
U.S. Cl. 29—527.6 **15 Claims**

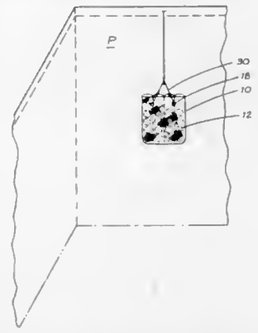
1. A method for forming a finished torus comprising:
forming a torus workpiece of a given dimension from a desired material, said torus workpiece having a generally circular cross-sectional configuration, a first face and a second face;
rigidly mounting said torus workpiece on a support while leaving a first hemi-toroidal surface of said torus workpiece exposed;
mounting said support on means to rotate said torus workpiece and said support about a fixed axis passing through the center of said torus workpiece;
indexing a cutting tool adjacent said torus workpiece at a first point which lies on a first plane passing through said torus work-piece perpendicular to said axis, said first plane equidistant between a second parallel plane passing through said torus workpiece perpendicular to said axis and spaced in a first direction from said first plane and a third parallel plane passing through said torus workpiece perpendicular to said axis and spaced in a second, opposite direction from said first plane;
rotating said support and said torus workpiece around said axis while moving said cutting tool in contact with said torus workpiece in a semi-circular path from said first point across said exposed, first hemi-toroidal surface of said torus workpiece to a second point 180° from said first point to thereby remove a desired amount of material from said exposed first hemi-toroidal surface of said torus workpiece;



removing said torus workpiece from said support;
rigidly mounting said torus workpiece on said support while leaving the second hemi-toroidal surface of said torus workpiece exposed;
indexing said cutting tool adjacent said torus workpiece at said first point;
rotating said support and said torus workpiece around said axis while moving said cutting tool in contact with said torus workpiece in a semi-circular path from said first point across said second, hemi-toroidal surface of said torus workpiece to said second point thereby removing a desired amount of material from said exposed, second hemi-toroidal surface of said torus workpiece to thereby produce a finished torus of a second, smaller dimension.

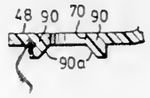
4,817,214
POOL CLEANING CHLORINE ENVELOPE
Rex E. Stuessy, 5355 N. Camino De Cumbre, Tucson, Ariz. 85715
Filed Aug. 20, 1987, Ser. No. 87,293
Int. Cl.[4] E03D *9/02*
U.S. Cl. 4—222 **10 Claims**

1. A chlorine tablet holder comprising:
a backing material;
a frontal material, said backing material and said frontal material being permanently attached forming vertical chlorine tablet receiving pockets; and
a plurality of hanging supports fixedly attached to said backing and frontal material for suspending and localizing said chlorine tablet holder in a swimming pool by a plurality of



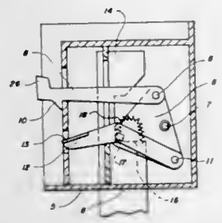
conventional suspending mechanisms that are removably attached to said hanging supports.

4,817,215
TOILETS
John M. Stewart, River Drive Park, Canada, assignor to Sanitation Equipment Limited, Concord, Canada
Filed Dec. 22, 1986, Ser. No. 944,025
Int. Cl.[4] A47K *13/12*
U.S. Cl. 4—236 **5 Claims**



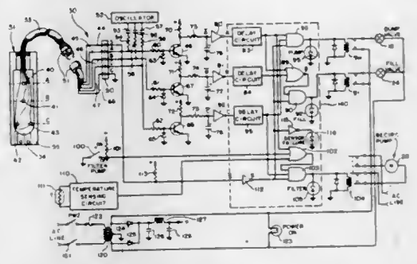
1. A toilet having a bowl unit including a bowl, at least one of seat member and a lid member, hinge means coupling side member to the bowl unit and defining a hinge axis permitting movement of the member between raised and lowered positions with respect to the bowl, and cam means arranged to co-act as the said member is moved between its said raised and lowered positions and generate frictional forces inhibiting free movement of the hinge means about said axis so that said member will tend to remain in a raised position to which it has been moved, wherein said hinge means comprises first and second hinge pins disposed in positions spaced along said axis and each extending between a lug on the bowl unit and a co-operating flange on said lid or seat member, each said pin being fixed against turning with respect to one of the lug and flange, and wherein said cam means comprises, in association with each said hinge pin, first cam surfaces formed on the other of said lug and flange and second cam surfaces on said pin, said flanges on the lid or seat membe being disposed outwardly of the lugs on the bowl unit and the cam surfaces being shaped to cause portions of said flanges adjacent the pins to be forced outwardly as said cam surfaces co-act upon movement of said lid or seat member between its said raised and lowered positions, producing tension stresses in said lid or seat memer that tend to urge said cam surfaces toward one another and generate said frictional forces inhibiting free movement of the hinge means.

4,817,216
WATER-SAVING FLUSHING ATTACHMENT
David Auman, 624 S. Virginia Ave., Belleville, Ill. 62220
Filed May 17, 1988, Ser. No. 194,977
Int. Cl.[4] E04D *1/14, 3/12*
U.S. Cl. 4—325 **7 Claims**



1. A water-saving attachment to a toilet tank, comprising:
(a) a hollow casing having a first side with first and second openings therein and a bottom with a third opening therein, said casing being attached to the inside of a toilet tank by attaching means;
(b) a pivot-plate rotatably secured to the inside of said casing by an axial pin;
(c) a latch arm having one end thereof pivotably secured to said pivot-plate by a first pivot pin and having the other end thereof protruding from said first side opening when the mechanism is in a cocked position;
(d) an oblique lower stop arm having one end thereof pivotably secured to said pivot-plate by a second pivot pin, the other end thereof protruding from said second side opening when the mechanism is in a tripped position;
(e) a float arm having an irregular shape cut out therefrom to accomodate a third pin attached to said pivot plate, said third pin being attached to said float arm by a spring, said float arm extending through said third opening and having a float attached to the lower end thereof;
(f) a flushing arm extension which is attached to the other end of a normal toilet tank flushing arm, said flushing arm extension being adapted to cooperate with the other ends of said latch arm and said lower stop arm to control the amount of water discharged from said flush tank.

4,817,217
SWIMMING POOL CONTROL SYSTEM
Olin A. Lively, 4375 Shady Bend, Dallas, Tex. 75234
Continuation of Ser. No. 703,272, Feb. 20, 1985, Pat. No. 4,685,158. This application May 26, 1987, Ser. No. 53,860
Int. Cl.[4] E04H *3/16, 3/18*
U.S. Cl. 4—508 **7 Claims**



1. A system for maintaining water at a predetermined nominal level within a swimming pool wherein the surface of the water is subject to repeated disturbances, said system being

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adapted to control a fill valve to add water to the pool as required, comprising:

nominal water level sensing means positioned in the pool at the predetermined nominal level and including an electrical contact exposed to the disturbed surface of the water in the pool for producing an output signal indicative of the instantaneous presence or absence of water at the predetermined nominal level;

delay circuit means for producing a first control signal indicative after a first predetermined sensing period of the continuous uninterrupted presence of said output signal during said entire first sensing period, and a second control signal indicative after a second predetermined sensing period of the continuous uninterrupted absence of said output signal during said entire second sensing period;

said delay circuit means including first and second pulse-driven counters, a source of clock pulses for said counters and a bistable latch circuit, the output of said first counter being enabled only in the presence of said output signal and reset in the absence of said output signal and conditioning said latch circuit to one switching state upon reaching a predetermined count, said second counter being enabled only in the absence of said output signal and reset in the presence of said output signal and conditioning said latch circuit to its other switching state upon reaching a predetermined count, said latch circuit developing said control signals in accordance with the switching state thereof, and

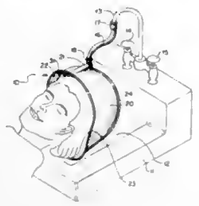
control circuit means for closing the fill valve in response to said first control signal, and for opening the fill valve in response to said second control signal to maintain the water in the swimming pool at the predetermined level.

4,817,218

HAIR RINSING BASIN

Paul Dimitriu, 607 S. Hill St., Suite 910; John Boyajian, 607 S. Hill St., Suite 636, both of Los Angeles, Calif. 90014; Isaac Fils, 37350 51st St. East, Palmdale, Calif. 93550, and George Sanchez, 22201 Ventura Blvd., Suite 201, Woodland Hills, Calif. 91364

Filed Feb. 29, 1988, Ser. No. 162,144
Int. Cl.[4] A45D *19/00*
U.S. Cl. 4—515 **8 Claims**



1. A hair rinsing device removably situated in a conventional sink basin comprising:

a pair of substantially hemispherical shells of conformal configuration nested together in spaced apart relationship to define a fluid passageway between opposing surfaces of said pair of shells;

said pair of shells constituting an inner and outer shell having terminating edges joined to establish said passageway;

said inner shell of said pair having a multiplicity of openings communicating said fluid passageway with a rinsing cavity of said inner shell; and

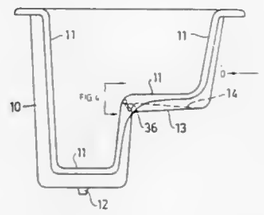
a plurality of fluid dispersing elements movably disposed in said passageway between said shells and having a grooved conical portion disposed in said inner shell opening, respectively, for discharging fluid carried in said passageway therethrough into said rinsing cavity.

4,817,219

SITTING BATHTUB

Sture Schenström, 6, 1:a Kyrkvägsgränd, S-602 10 Norrköping, Sweden

PCT No. PCT/SE86/00136, § 371 Date Nov. 24, 1986, § 102(e) Date Nov. 24, 1986, PCT Pub. No. WO86/05673, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 26, 1986, Ser. No. 946,046
Claims priority, application Sweden, Mar. 28, 1985, 8501552
Int. Cl.[4] A47K *3/02*
U.S. Cl. 4—555 **6 Claims**



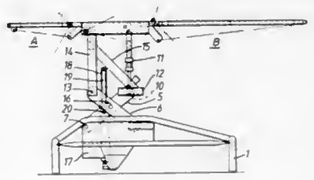
1. A sitting bathtub including a bottom, a generally horizontal seat having a front edge and a side wall surrounding said bottom and said seat and forming therewith an open-topped container having an upper edge, the side wall having a flat portion and said flat portion and the respective upper edge portion having an opening through which a person may enter and leave the bathtub, said opening having a lower portion which is disposed below and immediately in front of said seat and said opening also having an upper portion which is wider than said lower portion and which is disposed both in front of and immediately laterally of said seat, a separate, manually maneuverable hatch which is free of connection to the bathtub so as to be selectively placed inside and outside the bathtub by the user, said hatch having a front lower corner and also having a shape generally complementary to but larger than said opening so that when placed inside the bathtub the edge portion of said hatch overlies the edge portion of said opening whereby said hatch covers said opening and said hatch being arched inwardly so as to counteract a tendency to arch outwardly under the pressure of water when the bathtub is full of water; a sealing strip between the edge portion of said hatch the edge portion of said opening, said inwardly arched hatch and said side wall of the bathtub being so shaped that upon mounting said hatch inside said bathtub in overlying relationship to said opening contact between said edge portions is obtained initially at said front lower corner of said edge portions; an inner handle mounted inside said bathtub on said side wall adjacent said opening for movement between an unlatching position in which the handle is spaced from said hatch and latching positions in which the handle presses outwardly against the inner surface of said hatch at a location above said lower corner so that initially the lower parts of said hatch are in contact with said side wall, establishing an initial seal at the lower parts of said hatch and so that water when entering the bathtub exerts further pressure on said hatch, which pressure successively extends upwards as the water rises in the bathtub thereby completing sealing of the edge portion of said hatch to the edge portion of said opening.

4,817,220

HEIGHT ADJUSTING MECHANISM FOR A PHYSICAL THERAPY BENCH

Rolf Guttormsen, Skien, Norway, assignor to A/S SABA Medical, Oslo, Norway

Continuation of Ser. No. 921,700, Oct. 22, 1986, abandoned. This application Aug. 20, 1987, Ser. No. 88,541
Claims priority, application Norway, Oct. 24, 1985, 854267
Int. Cl.[4] A61G *7/00*; A47C *31/00*
U.S. Cl. 5—63 **3 Claims**



1. An adjustable physical therapy bench, comprising:

(a) a first, bottom frame;

(b) a second, upper frame including adjustable leaves;

(c) a third, intermediate frame located between the first and second frames and being attached to the second, upper frame;

(d) a height adjustment mechanism operatively connected between the first, second and third frames, including:

first and second substantially equal length levers pivotally connected to each other between the ends thereof, the first lever also being pivotally connected at a first end to the first, bottom frame and, at a second end, pivotally and slidably connected to a support connected to the second, upper frame, the second lever also being pivotally connected at a first end to the intermediate frame and, at a second end, pivotally and slidably connected to the first, bottom frame,

wherein, the second upper frame is movable between a first position with the first lever angled downward relative to the pivot point at the first end thereof and the second lever angled upwardly relative to the pivot point at the first end thereof, and a second position with the first lever angled upwardly relative to the pivot point at the first end thereof and the second lever angled downwardly relative to the pivot point at the first end thereof; and

(e) power means pivotally connected to the first lever,

wherein, when the second upper frame is in the first position and the power means is activated, the first lever is caused to rotate counterclockwise relative to the pivot point at the first end thereof, the second lever pivots relative to the first lever and is caused to rotate clockwise relative to the pivot point at the first end thereof, the first and second levers temporarily move into a copalnar relationship and then continue to rotate past each other, thereby moving the second, upper frame to the second higher position.

4,817,221

MULTIPURPOSE SURVIVAL TOOL

William W. Ryan, 717 NE. 8th St., Grants Pass, Oreg. 97526

Filed Jul. 1, 1987, Ser. No. 68,408
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—148 **4 Claims**

1. A hand held and manipulated tool comprising an elongate, generally flat plate having an arcuate cutting edge extending substantially from end to end thereof, said plate including a generally straight edge in opposed relation to the cutting edge, a generally longitudinally straight guide member along the straight edge and including a rounded external surface to engage the palm of a hand of a user, said plate including a plurality of longitudinally spaced, finger-receiving openings in spaced relation to the cutting edge and guide member thereby enabling individual fingers to cooperate with the plate openings and combine with the guide member to form a handgrip for securely holding the tool during use, said cutting edge including one length portion having a smooth bevelled knife edge extending from one end of the cutting edge and a second length portion having a sawtoothed edge extending from the other end of the cutting edge, said knife edge being substantially longer than the sawtoothed edge, said openings having their centers arcuately arranged and substantially equally spaced from the arcuate cutting edge, a second guide member spaced from the guide member along the straight edge of the plate and in parallel relation thereto, each of said guide members projecting laterally from both surfaces of the plate and facilitating gripping engagement of the tool, the endmost openings being disposed longitudinally outwardly of the ends of the second guide member whereby the fingers received in the endmost openings can engage the surface of the plate outwardly of the ends of the second guide member to stabilize the plate with respect to the hand of the user when using the tool in a manner that forces are exerted along the length of the cutting edge.

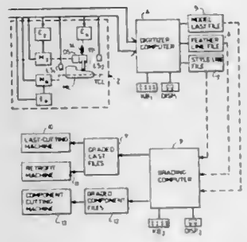


4,817,222

METHOD AND APPARATUS FOR MAKING SHOE LASTS AND/OR SHOE COMPONENTS

Aharon Shafir, Leon Blum St. 9, Tel Aviv, Israel

Filed Oct. 15, 1987, Ser. No. 109,297
Int. Cl.[4] A43D *1/04*, *1/00*
U.S. Cl. 12—146 L **29 Claims**



1. A method of making shoe lasts, comprising the operations:

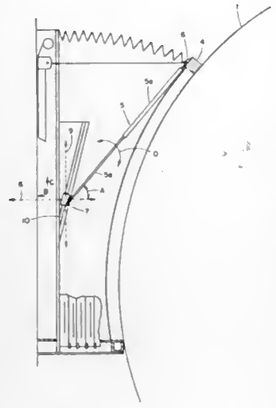
digitizing a large number of sample points on the outer surface of a model last representing a particular shoe style to produce a model last digital file representing the three-dimensional surface contour of the respective model last;

grading said model last digital file to produce one or more graded last digital files each representing a different last size of the respective shoe style;

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and utilizing each of said graded last digital files to produce a graded shoe last of the respective shoe style.

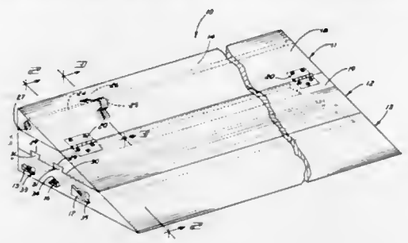
4,817,223
AIRPORT PASSENGER RAMP
Robert Koch, Bad Sooden-Allendorf, Fed. Rep. of Germany, assignor to Hubner Gummi-und Kunststoff GmbH, Fed. Rep. of Germany
Filed Apr. 8, 1987, Ser. No. 36,007
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703347
Int. Cl.⁴ B64F *1/305*
U.S. Cl. 14—71.1 **6 Claims**



1. A covered passenger ramp having a back end adapted to provide a connection with an airport building to enable passengers to leave said building via said ramp and board an airplane, comprising an upper and lower front end, a telescoping element connected at one end to said upper front end and adapted to move said upper front end into the proximity of an airplane fuselage, for which purpose said upper front end is to be moved further out than the lower front ramp end, an opposite end of the telescoping element, connected at a controlled movable pivot point remote from the upper front ramp end, said opposite end of the telescoping element having means for varying the inclination in a horizontal and vertical direction, whereby the upper front ramp end may be caused to come into engagement with different shapes of fuselage.

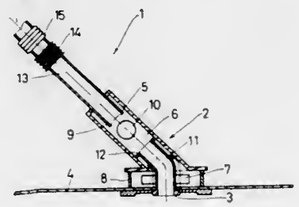
4,817,224
ADJUSTABLE DOORWAY RAMP APPARATUS
Daniel Visnaw, 13611 Malibu, Garden Grove, Calif. 92647, and Dale Lockwood, 1120 Sycamore Ave. #5, Tustin, Calif. 92680
Filed Sep. 8, 1988, Ser. No. 241,455
Int. Cl.⁴ E01D *1/00*
U.S. Cl. 14—69.5 **8 Claims**

1. An adjustable wedge-shaped ramp apparatus positionable on a first level relative to a vertically spaced upper level comprising,
   a first wedge-shaped member including a lower planar face, a rear planar face orthogonally formed to said lower face, and an upper surface joining said rear and lower planar faces, and
   said first member pivotally joined at an edge, formed by the junction of the upper surface and the lower planar face, to an underlying second member wherein the pivotal joining includes a plurality of hinges secured to said upper surface of said first member and to an upper surface of said second member, and
   a third member underlying said second member and mechanically and removably secured to said second member,



and said second and third members formed of trapezoidal cross-sectional configurations.

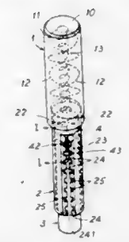
4,817,225
SWIMMING POOL CLEANING DEVICE
Herman Stoltz, Pretoria, South Africa, assignor to Automated Pool Cleaners (Pty) Ltd., Transvaal Province, South Africa
Filed Apr. 14, 1988, Ser. No. 181,666
Claims priority, application South Africa, Apr. 16, 1987, 87/2731
Int. Cl.⁴ F04H *3/20*
U.S. Cl. 15—1.7 **10 Claims**



1. A device for cleaning surfaces submerged in a liquid comprising a surface contacting head, an inclined passage for flow of liquid through the head, an entrance for flow into the head and an outlet for flow from the head providing at its upstream end a closure valve seat for the outlet, a closure member free to move in the head towards and away from the valve seat and a hollow axially contractable resilient member connected to the outlet at one end with its other end suitable for connection to a flexible suction hose.

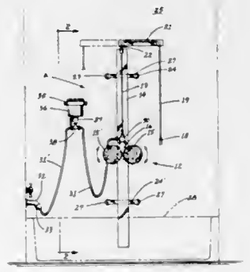
4,817,226
ROTATIVELY RUBBING ERASER
Fu-Ching Kuo, P.O. Box 10160, Taipei, Taiwan
Filed Apr. 20, 1988, Ser. No. 183,936
Int. Cl.⁴ B43L *19/00*
U.S. Cl. 15—3.53 **4 Claims**

1. A rotatively rubbing eraser comprising: a guiding holder generally formed as a cylindrical jacket having a cylindrical hole formed therein, a pair of helical grooves helically formed on a cylindrical wall defining the cylindrical hole of said holder, and a restoring spring having its upper end secured to a top-end plate sealing the cylindrical hole of said holder; an intermediate sleeve means generally formed as a cylindrical tube having a pair of protruding beads formed on two opposite sides of the cylindrical tube engageable with the pair of helical grooves in said holder; and an eraser positioning means secured with an eraser stick adjustably held in said sleeve means, said restoring spring normally tensioning said sleeve means outwardly within said guiding holder, whereby upon a holding and depression of said holder to allow said eraser to resiliently



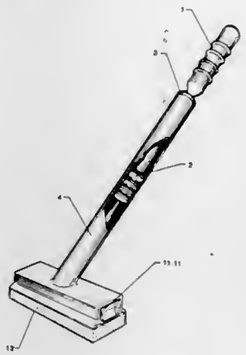
contact a mark on a paper to be erased, said sleeve means will be helically rotated within said holder to allow said eraser to rotatively rub out the mark.

4,817,227
BODY SCRUBBER
John H. Scott, 5054 Maple Dr., St. Louis, Mo. 63113
Filed Jun. 11, 1987, Ser. No. 60,644
Int. Cl.⁴ A47K *7/04*
U.S. Cl. 15—21 R **11 Claims**



1. A user-powered gravity-assisted body scrubber for use in a tub or shower, comprising a vertically elongated guide member of uniform width, and an arm swingably attached to an inner end of the arm to an upper end of the guide member and extending radially outwardly therefrom, means pivotally affixing the inner end of the arm to said upper end of the guide member and permitting the arm to be deployed in any of a variety of positions determined by the user, means for mounting the guide member outwardly from the wall in spaced, parallel relation to the wall, a brush carriage fitted to the guide member in slidably captive relation for movement vertically along the guide member, at least one circular brush carried by the brush carriage for rotation about an axis perpendicular to said movement along the guide member, means for causing the brush to rotate in response to said movement along the guide member, a cable having one end connected to the carriage, a first reach of the cable extending upwardly from the carriage along the guide member, a second reach of the cable coincident with the arm, the arm guiding the second reach cable outwardly from the elongated member, at least one pulley carried by the arm, the cable extending over the pulley to provide at the outer end of the arm at a user-selected position, determined by user positioning of the arm, a downwardly extending third reach of the cable for being pulled downwardly by the user by use of either hand to lift to carriage upwardly along the guide member against gravity and for being released to permit the carriage to move downwardly under its own weight along the guide member assisted by the force of gravity, the guide member extending from at least proximate a floor of said tube or shower, and having an upper end at a height at least as great as the height of a normally sized adult whereby the user may scrub the body by placement of the body against the rotating brush while alternately pulling and releasing the cable outer reach by single-handed operation to produce thereby vertical oscillation of the brush and corresponding rotation of the brush.

4,817,228
PNEUMATIC SPONGE MOP
Robert F. von Meyer, 300 W. 109th St., New York, N.Y. 10025
Filed Feb. 5, 1988, Ser. No. 153,216
Int. Cl.⁴ A47L *13/12*
U.S. Cl. 15—119 A **6 Claims**



1. A self-wringing sponge mop, comprising: an airtight tubular handle;
   means for intermittently creating a partial vacuum within said handle;
   an airtight box at one end of, and in sealed communication with said handle;
   one side of said box being formed by a flexible member having two surfaces;
   one of said surfaces facing the interior of said box, and the other of said surfaces facing outwardly of said box and being provided with means for mounting a sponge mop head;
   and a sponge mop head attached to said mounting means, whereby, when said partial vacuum is created, said flexible member is pulled into the interior of said box, causing said member to at least partially surround said attached sponge, thus compressing said sponge to wring it.

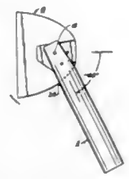
4,817,229
QUICK CHANGE WIPE DOWN KNIFE WITH ROTATABLE BLADE
Michael J. Sedillo, Carmichael, Calif., assignor to Winchar Enterprises, Petaluma, Calif.
Filed May 10, 1988, Ser. No. 192,215
Int. Cl.⁴ B05C *17/10*
U.S. Cl. 15—104 S **9 Claims**

1. In a wipe down knife hand tool having a tubular shaped handle and a flat knife blade attached adjacent one end thereof in a slot of said tube, the improvement comprising:
   said blade being pivotally and frictionally engaged to said handle in a manner allowing rotation therebetween by application of force by hand but not allowing rotation by the weight of the blade itself,
   a first stop attached to said blade in a position to engage a

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side of said handle when rotated in one direction about said pivotable attachment, and

a second stop provided as an end of said handle slot that engages an edge of the blade as the blade is rotated to its second stable position,



whereby two stable rotatable positions of the blade with respect to the handle are provided without any mechanical latch or detent that additionally needs to be manipulated.

4,817,230

DUST COLLECTOR

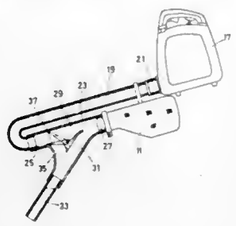
Katsumi Kiyooka, Saitama, Japan, assignor to Komatsu Zenoah Co., Japan

Continuation of Ser. No. 753,923, Jul. 11, 1985, abandoned. This application Nov. 2, 1987, Ser. No. 117,417

Claims priority, application Japan, Jul. 11, 1984, 59-142226

Int. Cl.[4] A47L *5/14, 5/16, 5/24*

U.S. Cl. 15—330 **7 Claims**



1. A dust collecting device comprising:

a fan for generating air currents;

a U-shaped air pipe having first and second ends, the first end of the U-shaped air pipe being connected to the fan;

a dust collecting means for collecting dust;

a cleaning pipe through which the air currents flow;

a confluence pipe with a confluence region located therein, the confluence pipe having three ports, with the first of the ports connected to the second end of the air pipe, and said first port having an under side and an upper side, the second of the ports connected to the dust collecting means, the third of the ports connected to the cleaning pipe, and the confluence pipe being formed such that the ports connected to the air pipe and the dust collecting means are substantially aligned, such that the ports connected to the air pipe and the cleaning pipe are at an acute angle with respect to each other; and

selector valve means including a stationary portion disposed within the confluence region, the stationary portion defining inside the confluence pipe an air pass path for the passage of air from the air pipe to the dust collecting means, a branch path for the passage of air from the air pipe to the cleaning pipe, and a suction path for the passage of air from the cleaning pipe to the dust collecting means, and further including a movable valve member having a substantially plate-like shape with first and second ends, the first end of the movable valve member being pivotally connected to the stationary portion, wherein the movable valve member is pivotally shifted from outside the confluence pipe between first and second positions in which the second end of the movable valve member is abutted on said under or said upper side of the first port, respectively, such that at the first position the movable valve member blocks the branch path so that the air pipe communicates with the dust collecting means through the air pass path, whereby a suction is created that allows the cleaning pipe to suck dust and other debris from the outside into the cleaning pipe and through the suction path into the dust collecting means, and at the second position the movable valve member blocks the air pass path with the movable valve member being kept in position by the air flow from the air pipe so that the air pipe communicates with the cleaning pipe through the branch path, whereby air is caused to flow to the outside through the cleaning pipe to blow dust and other debris.

4,817,231

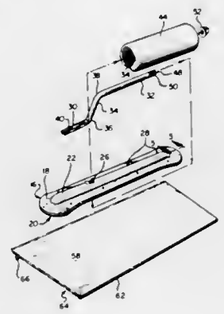
DURABLE TROWEL CONSTRUCTION

Thomas V. Ocwieja, Oak Brook, Ill., assignor to Anco Tool and Stamping Co., Inc., Hillside, Ill.

Filed Apr. 16, 1986, Ser. No. 852,563

Int. Cl.[4] B05C *17/10;* **E04F** *21/16*

U.S. Cl. 15—235.4 **21 Claims**



1. A trowel comprising:

a generally planar blade member having a side adapted for troweling;

a cap member having a top surface and a bottom peripheral surface, the bottom peripheral surface defining a flat lip adapted for and being attached to said planar blade member opposite to said side adapted for troweling, said cap member including a raised hollow rib formed in said top surface and extending substantially the length of said cap member, the hollow portion of said rib facing downwardly, said hollow rib having an aperture extending through a top surface of said rib between the ends of said rib;

a handle;

a handle support member having a cap attachment end disposed within and secured to said hollow rib, a handle attachment end opposite said cap attachment end carrying said handle, and an intermediate leg portion between said cap attachment end and said handle attachment end extending through said aperture; and

means for securing said handle to said handle support member.

4,817,232

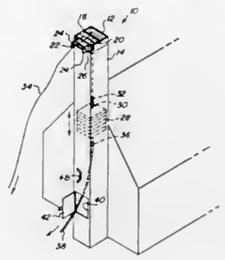
EASY CHIMNEY SWEEP

Michael Bardunias, 10 Meredith Dr., Greenlawn, N.Y. 11740

Filed Jul. 24, 1987, Ser. No. 77,662

Int. Cl.[4] F23J *3/00;* **A46B** *17/00*

U.S. Cl. 15—163 **2 Claims**



1. A chimney sweeping device, comprising, a collar receivable on the top of a chimney;

a. a first roller;

b. a second roller;

c. means on said collar for rotatively mounting said first roller and said second roller thereto;

d. a rope;

e. a fireproof chain;

f. a cleaning brush having two ends, with said rope and chain removably attached to said brush in an assembly and said assembly adapted for engagement with said rollers to elevate and lower said brush inside said chimney;

g. clamp means secured to said collar for fastening said collar to said chimney;

h. an eye secured to one end of said brush;

i. a snap ring secured to one end of said rope;

j. a clip fixedly secured on the other end of said brush; and

k. an external and fixed fastener, wherein said eye removably receives said snap ring, and said clip is removably received at said chain, and when said chain is pulled said brush is lowered on the interior of said chimney, and when said chimney has been cleaned by said brush, said brush is removed from said rope and said chain, and one end of said chain is fastened directly to said snap ring and said rope is pulled out of said chimney to prevent said rope from burning and said chain engages with said first roller and said second roller and depends downward in said chimney after securing said rope to said external and fixed fastener.

4,817,233

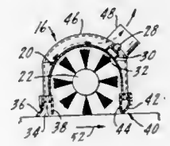
SCRUBBER SQUEEGEES FOR SCRUBBING FORWARD AND BACKWARD

Steven J. A. Waldhauser, Niagara Falls, N.Y., assignor to Tennant Company, Minneapolis, Minn.

Filed Apr. 22, 1988, Ser. No. 185,064

Int. Cl.[4] A47L *11/202*

U.S. Cl. 15—320 **8 Claims**



1. In a scrubber, a mobile frame, at least one scrub brush attached to the frame to engage and work on a surface to be cleaned, an enclosure over the brush having a defined periphery approaching and opposing the surface, means for supplying a cleaning solution to the brush, squeegees engaging the surface on the front and rear portions of the periphery of the enclosure, a vacuum chamber associated with the enclosure in communication with the squeegees and a source of vacuum, and means for communicating only the rear squeegee to the vacuum chamber when the scrubber is moving forward and communicating only the front squeegee to the vacuum chamber when the scrubber is moving to the rear.

4,817,234

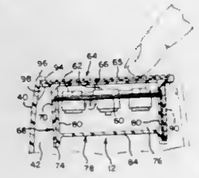
VACUUM CLEANER WITH SHIELDED ELECTRONIC CONTROL MODULE

Gregg A. Grealich, Boyle County, Ky., assignor to Whirlpool Corporation, Bentoo Harbor, Mich.

Filed Jul. 25, 1988, Ser. No. 223,562

Int. Cl.[4] A47L *9/28*

U.S. Cl. 15—339 **16 Claims**



1. A vacuum cleaner comprising

a handle including a control housing and

an electronic control module in said housing including a circuit board having electronic components mounted thereon,

said control module further including a faceplate having a touch sensitive outer surface outwardly of said circuit board and an inner surface and means for establishing an elongate electrical creep path for static electric charges between said outer surface of said faceplate and said circuit board, said creep path having an effective length sufficient to minimize the possibility of an electrical breakdown between said outer surface and said circuit board due to said static electric charges,

said establishing means including a first peripheral wall extending around and below said circuit board integral with said faceplate and including an outside face below said circuit board defining at least a portion of said creep path and a second peripheral wall extending below said circuit board in nested overlapping relation with said first wall and defining a portion of said creep path, said creep path extending over at least fifty percent of the extension of said second wall downwardly from said circuit board.

4,817,235

PNEUMATIC PAVEMENT CLEANING APPARATUS

Tom R. Doxey, 2101 Constellation Dr., Colorado Springs, Colo. 80906, and Burton D. Glaser, 723 Prairie Rd., Colorado Springs, Colo. 80909

Filed Feb. 24, 1988, Ser. No. 159,979

Int. Cl.[4] A47L *5/30*

U.S. Cl. 15—387 **2 Claims**

1. A pneumatic pavement cleaning apparatus consisting of:

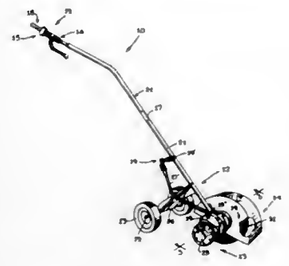
an air supply unit including a source of compressed air; an air supply hose member connected to the source of compressed air; a valve member connected on end to the air hose member and provided on its other end with an air supply tube member; wherein, the valve member controls the flow of air from the source of compressed air to the outlet end of the air supply tube member;

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a wheeled support unit operatively associated with said air supply tube member;

a drive unit having an axial drive shaft wherein the drive unit comprises an air powered motor member having an inlet and an outlet wherein the drive unit is operatively connected to the outlet end of the air supply tube member whereby the controlled admission of compressed air through said valve member and said air supply tube member will cause the motor member to rotate said axial drive shaft; and,

a cleaning unit operatively associated with said drive inlet for use with a selected one among a plurality of diverse cleaning attachment members including a brush element;



and a cutting blade member; and, a securing member for releasably securing said selected one of said plurality of cleaning attachment members to the outboard end of said axial drive shaft; a cowl member operatively connected to said drive unit and radially disposed relative to the axial drive shaft of the drive unit; and, a blower tube unit operatively connected to the outlet of the air powered motor member whereby the exhaust from the said motor member may be discharged to one side and at an angle relative to one side of the selected one of said plurality of cleaning attachment members disposed within the cowl member of the cleaning unit; wherein said blower tube unit will blow debris off to one side of the direction of travel of the apparatus.

4,817,236

STROKE-CONTROLLED WINDSHIELD WIPER UNIT FOR MOTOR VEHICLES

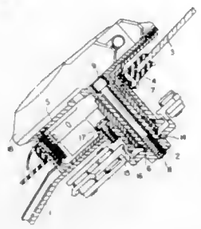
Anton Epple, Rottenburg; Hans Trube, Herrenberg, and Martin Pfeiffer, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,224

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1986, 3626642

Int. Cl.⁴ B60S *1/16*

U.S. Cl. 15—250.34 **2 Claims**



1. Stroke controlled windshield wiper unit for a motor vehicle comprising:

a gear casing including a hollow drive shaft;

a stroke mechanism for a wiper in said gear casing;

a drive unit having splines;

the hollow drive shaft of said gear casing being solidly rotationally connected to said stroke mechanism and having splines;

a threaded fastener means having a head located at one end, passing through said hollow drive shaft and being threadedly received in said drive unit for solidly rotationally connecting said hollow drive shaft to said drive unit via intermeshing their splines; and

means directly adjacent said hollow drive shaft for limiting axial displacement of said drive unit when it is being screwed to said gear casing by said threaded fastener means.

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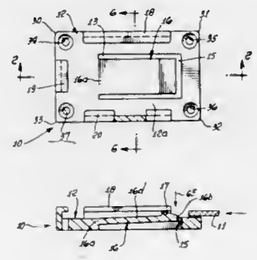
CASTER PLATE RETENTION BRACKET

James F. Murphy, San Dimas, Calif., assignor to Bel-Air Plastics, Inc., South El Monte, Calif.

Filed May 2, 1988, Ser. No. 188,893

Int. Cl.⁴ B60B *33/06*

U.S. Cl. 16—29 **10 Claims**



1. In a bracket for connection to the top plate of a wheeled caster, that top plate being generally rectangular and having lateral width W_1 and longitudinal length L_1 dimension, the combination comprising:

(a) said bracket defining a mounting plate having an upper surface,

(b) the bracket including a longitudinally elongated cantilevered arm of lateral width W_2 and longitudinal length L_2 where $L_2 > W_2$, the arm having one end integral with the mounting plate, and a free opposite end, there being a transverse abutment on and upstanding at the arm free end, and relative to the arm, said abutment defining a shoulder spaced from the arm free end and facing toward said one end of the arm,

(c) said bracket having two longitudinally elongated guides which are laterally spaced apart and have downward facing surfaces, said guides projecting above the level of said mounting plate upper surface to form guide channels for guiding the lengthwise reception of laterally spaced, longitudinally extending opposite edge portions of the caster top plate,

(d) and said bracket having a laterally elongated stop which projects above the level of said mounting plate upper surface, said stop defining a stop surface facing toward said abutment shoulder, there being spacing of length L_3 between said stop surface and said abutment shoulder, where $L_3 \geq L_1$,

(e) The abutment shoulder normally projecting above said upper surface of the amounting plate sufficiently that the arm must be yieldably deflected, by finger pressure on the abutment, to allow said caster plate opposite edge portions of slide lengthwise in said channels, whereby the caster plate may then be brought toward and into engagement with said stop shoulder as the plate rides over the abutment and then drops into confined position between said stop shoulder and said abutment shoulder, with the arm then tensioned to urge the plate into engagement with downward facing surfaces on the guides;

(f) said bracket being of one-piece molded plastic construction, said abutment having a top surface which slopes directionally longitudinally away from the stop shoulder and downwardly, said cantilevered arm projecting upwardly proximate its free end so that substantially the entire abutment upper sloping surface being normally about the level of said mounting plate upper surface, until progressively deflected downwardly by camming pressure exerted by an edge of the caster plate to accept the caster plate into said confined position, said upper sloping surface extending throughout the major width of said arm.

4,817,238

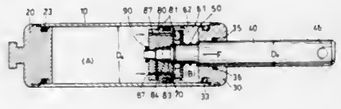
PNEUMATIC DOOR-CLOSER HAVING A CLOSABLE PASSAGE AND A REGULATABLE PASSAGE

James C. Liu, No. 308, Fu-Sheng Tsun, Hsin-Shen Hsiang, Taichang Hsien, Taiwan

Filed Jun. 2, 1988, Ser. No. 201,532

Int. Cl.⁴ E05F *3/02*

U.S. Cl. 16—66 **4 Claims**



1. A door-closer comprising an air cylinder filled with compressed air, a piston rod movable in said cylinder, and an annular piston means sleeved movably on said piston rod and movable sealingly in said cylinder for defining first and second sealed chambers in first and second end portions of said cylinder respectively, said piston means moving from said second end portion of said cylinder to said first end portion of said cylinder when an associated door which is equipped with said door-closer is opened, said piston means including a piston body sleeved movably on said piston rod and having a tapered central bore which is communicated with said second chamber, a closable passage formed through said piston body and communicated with said first and second chambers, a spring-biased seal disposed in said second chamber and biased to close said closable passage, and a regulatable passage formed through said piston body and communicated with said tapered bore and said first chamber, said piston rod having a shoulder which is movable axially within said tapered bore of said piston body by rotating said cylinder relative to said piston rod for regulating air flow between said first and second chambers through said regulatable passage, said spring-biased seal being movable to open said closable passage when said piston means moves from said second end portion of said cylinder to said first end portion of said cylinder in response to opening of said door; whereby, when said piston means moves from said second end portion of said cylinder to said first end portion of said cylinder in response to opening of said door, increased air pressure in said first chamber urges said spring-biased seal to separate from said closable passage so that compressed air can flow from said first chamber to said second chamber through said regulatable passage and said closable passage; when said opened door is released, air pressure accumulated in said first chamber urges said piston means to return from said first end portion of said cylinder to said second end portion of said cylinder in such a manner that compressed air flows from said second chamber to said first chamber through said regulatable passage.

4,817,239

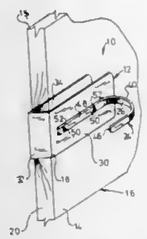
DOOR HOOK

Sheila R. Campbell and Frank J. Campbell, both of 54123 Buccaneers Bay, Utica, Mich. 48087

Filed Oct. 26, 1987, Ser. No. 112,471

Int. Cl.⁴ E05B *1/00*

U.S. Cl. 16—114 R **14 Claims**



1. A sanitary door opener assembly (**10**) for mounting upon and opening a door (**16**) having an outer swinging edge (**20**), said assembly (**10**) comprising;

a bracket (**12**) adapted to be mounted on one side (**14**) of the door (**16**) with a forward extremity (**18**) thereof adjacent the outer swinging edge (**20**) of the door (**16**);

a generally U-shaped hook (**24**) non-movably fastened to said bracket (**12**) and extending from said bracket (**12**) in a plane perpendicular to said forward extremity (**18**) of said bracket (**12**) for presenting a concave pocket (**26**) opening toward the outer swinging edge (**20**) of the door (**16**) for receiving a human forearm to open the door;

said assembly (**10**) characterized by the width of said bracket (**12**) measured in a direction parallel to said forward extremity (**18**) being at least twice the width of said hook (**24**) measured in a direction parallel to said forward extremity (**18**).

4,817,240

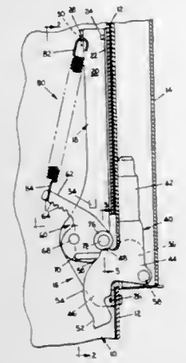
APPLIANCE DOOR HINGE

Milo D. Sovis, Jr., Grand Haven, and James A. Parker, Holland, both of Mich., assignors to Ace Manufacturing Co., Grand Haven, Mich.

Filed Jun. 3, 1983, Ser. No. 501,006

Int. Cl.⁴ E05F *1/08*

U.S. Cl. 16—297 **15 Claims**



1. A self-contained hinge assembly for a range door comprising:

a frame bracket having a body portion adapted to be mounted within a housing of a range or similar appliance

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and a hinge flange having an outer portion adapted to project outwardly from the housing;

a one-piece rigid hinge arm having a door-attaching portion adapted to be rigidly mounted to a door mounted exterior to the housing and a cam arm adapted to project into said housing, the cam arm having a cam surface with a first and second end;

means pivotably mounting the hinge arm to the outer portion of the frame bracket hinge flange for pivotable movement of the door about the pivotable mounting means, the hinge arm being movable between a first position at which the door will be closed and a second position at which the door will be substantially perpendicular to the housing;

a cam follower arm having a cam follower element thereon;

means for pivotably mounting the cam follower arm to the frame bracket body portion so that the cam follower arm bears against the cam surface between the first and second ends thereof and so as to produce a counterbalancing moment on the hinge arm at all positions between the first and second ends; and

means acting between the frame bracket and the cam follower arm for biasing said cam follower arm in a direction to force the cam follower element against the cam follower cam surface so as to counterbalance the weight of the door between the first and second positions.

4,817,241

HINGE, IN PARTICULAR FOR FURNITURE

Gerhard Koch, Nagold, and Roland Hölzle, Halterbach, both of Fed. Rep. of Germany, assignors to Kaefele, KG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 859,082, May 2, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,412

Int. Cl.[4] E05D *7/04, 15/00*

U.S. Cl. 16—238 **29 Claims**



1. A hinge for hinging a door to a wall member, comprising a first base part for connection to the door, a second base part for connection to the wall member, a first long bracket pivotably connected to said first base part, a first short bracket pivotably connected to said first base part at a location spaced laterally from the connection of said first long bracket, a second long bracket pivotably connected to said second hase part and a second short bracket pivotably connected to said second base part at a location spaced laterally from the connection of said second long bracket, said first and second long brackets being pivotably connected to each other near centers thereof, said first long bracket being pivotably connected to said second short bracket and said second long bracket being pivotably connected to said first short bracket, said first base part and said second base part each including an outer housing adapted to be fixed to the door in the case of said first base part and the wall member in the case of the second base part, an inner housing mounted for movement in two approximately perpendicular directions in said outer housing and adjustment means for adjusting the relative position in the two approximately perpendicular directions of said inner housing in said outer housing.

4,817,242

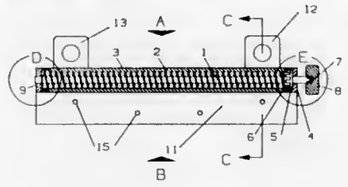
TOILET SEAT SPRING HINGE HAVING AN ADJUSTABLE SPRING FORCE

Sandu Z. Rapp, 1865 79th St. Causeway, #15-1 The Kennedy House, North Bay Village, Fla. 33141

Continuation-in-part of Ser. No. 17,312, Apr. 13, 1987. This application Jul. 18, 1988, Ser. No. 220,676

Int. Cl.[4] E05F *1/08*

U.S. Cl. 16—300 **8 Claims**



1. A spring hinge or attaching a toilet seat to a toilet bowl comprising:

a first hinge member having mounting means for attachment to the top of the toilet bowl and a plurality of substantially tubular, aligned, hinge knuckles above said mounting means;

a second hinge member having attachment means for attachment to the toilet seat and a plurality of substantially tubular, aligned, hinge knuckles fitting end-to-end between and in axial alignment with said hinge knuckles of the first hinge member;

a rigid rod extending along the inside of said hinge knuckles of said first and second hinge members and slidably supported by said first and second hinge members;

a first coupling member affixed to said rod and presenting a series of teeth in succession circumferentially around said rod and facing toward one end of said rod;

a second coupling member affixed to said second hinge member and presenting a series of teeth in succession circumferentially around said rod and facing toward said teeth of the first coupling member;

and a coil spring encircling said rod inside said hinge knuckles and acting between said first coupling member and said first hinge member to normally hold said first coupling member in toothed engagement with said second coupling member;

said rod being slidably displaceable manually along said hinge members to disengage said first coupling member from said second coupling member, after which said rod can be rotated to adjust the force of said spring said first hinge member has a manually attachable and removable first end cap at one end of the hinge knuckles of said first and second hinge members;

said second hinge member has a manually attachable and removable second end cap at the opposite end of the hinge knuckles of said first and second hinge members;

said rod is slidably supported by and slidably movable relative to said end caps;

said spring is attached at one end to said first end cap and at its opposite end to said first coupling member;

and said second coupling member is attached to the inside of said second end cap and its teeth face toward said first end cap.

4,817,243

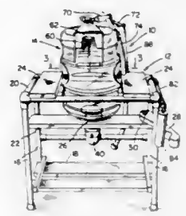
CRUSTACEAN MEAT EXTRACTOR

Ralph J. Esposito, 8040 Chef Menteur Hwy., New Orleans, La. 70126

Filed Feb. 5, 1988, Ser. No. 152,491

Int. Cl.[4] A22C *29/02*

U.S. Cl. 17—48 **10 Claims**



9. The method of extracting meat from a crustacea tail, said method including penetrating the vent of a crustacea tail, from the end of the tail remote from the head end thereof with a small diameter liquid jet discharge means, supporting the crustacea tail stationary relative to the liquid jet discharge means and with a sharpened blade tip positioned at the head end of the vein of the crustacea tail and projecting laterally of the tail inward from the backside thereof and maintained stationary relative to the shell of the crustacea tail, and causing a jet discharge of liquid to be discharged from said liquid jet discharge means into the vent of the crustacea tail sufficient to eject the meat of the crustacea shell from the later in a longitudinal direction such that the sharpened blade tip will open and strip substantially clean the vein of the crayfish tail as it is ejected from the shell.

4,817,244

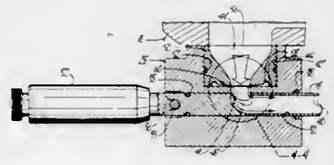
METHOD AND MEANS OF LUBRICATING THE PASSAGE OF MEAT EMULSION THROUGH THE STUFFING HORN OF A MEAT EMULSION ENCASING MACHINE

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Oct. 6, 1987, Ser. No. 106,172

Int. Cl.[4] A22C *11/02*

U.S. Cl. 17—49 **8 Claims**



1. The method of lubricating the passage of meat emulsion through the stuffing horn of a meat emulsion encasing machine comprising a source of meat emulsion under pressure, an elongated hollow stuffing horn having an inlet and an internal surface, a connection block joining said source of meat emulsion, and said inlet, and a passage in said block for the passage of meat emulsion from said source into said inlet, comprising,

forcing meat emulsion under a first magnitude of pressure through said passage and said inlet into said stuffing horn,

providing a concentric ring of fluid under a second magnitude of pressure around said passage and being in communication with said passage through a narrow annular opening surrounding said passage,

subjecting the fluid in said concentric ring to a second magnitude of pressure greater than said first magnitude of pressure imposed on said meat emulsion, with said second magnitude of pressure being sufficient to cause said fluid to exit along the entire periphery of said narrow annular opening to form a fluid film between said meat emulsion and the internal surface of said passage,

said second magnitude of pressure on said fluid being approximately 10 to 15 pounds per square inch greater than said first magnitude of pressure exerted on said meat emulsion,

and the depth of said narrow annular opening being limited to between approximately 0.001 and 0.003 inches.

4,817,245

MEAT SAW AND METHOD OF PROCESSING MEAT

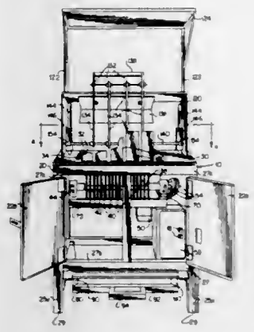
Richard A. Melville, 8c Tagalad Road, Mission Bay, Auckland, New Zealand

Filed Jul. 31, 1986, Ser. No. 892,760

Claims priority, application New Zealand, Aug. 5, 1985, 212990

Int. Cl.[4] A22B *17/02*

U.S. Cl. 17—52 **27 Claims**



1. A meat saw for simutaneously making mutiple cuts in a piece of meat comprising:

a base mamber;

a saw table supported by the base member and adpated to support the piece of meat to be sawn, the saw table containing a plurality of elongated, generally parallel apertures;

means for holding the piece of meat against the saw table, the means for holding the piece of meat comprising a restraining member for engaging and holding the piece of meat while it is being cut by the saw blades and means for pivotally mounting the restraining member on the saw table, the restraining member being pivotally adjustable from an upper position in which the restraining member extends away from the saw table to a lower position in which the restraining member extends generally parallel to the saw table proximate the apertures;

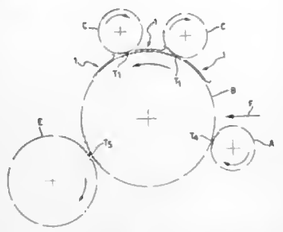
a plurality of spaced rotary saw blades mounted on a common rotatable shaft, the shaft being located beneath the saw table and movably mounted on the base member so that the position of the shaft relative to the saw table is continuously adjustable from a lower position in which the blades do not extend above the saw table to an upper position in which the blades extend through the apertures in the saw table and above the saw table to engage and cut the meat when the shaft is raised toward the upper position;

means for rotatingly driving the shaft; and

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means for adjusting the position of the shaft relative to the saw table.

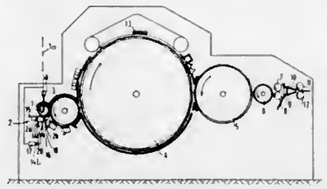
4,817,246
ROLL CARDING UNIT
Giovanni Bacchio, Mongrando, Italy, assignor to Fonderie Officine Riunite F.O.R. Ing. Graziano di L. Graziano & C. S.A.S., Biella, Italy
Filed Aug. 14, 1987, Ser. No. 85,376
Claims priority, application Italy, Sep. 10, 1986, 67701 A/86
Int. Cl.⁴ D01G *15/32*
U.S. Cl. 19—98 **5 Claims**



1. A roll carding unit for processing fibers for the production of non-woven textiles consisting essentially of
a high-speed rotary drum for drawing the fibers,
a licker-in roll rotating tangentially to the input to the drum to load the fibers onto the surface thereof,
a combing roll rotating tangentially to the output of the drum to remove the fibers from the surface thereof by condensation,
at least one worker roll rotating tangentially to the drum and at a speed considerably less than the speed of said drum, said worker roller being disposed between the licker-in roll and combing roll to take up some of the fibers from the surface of the drum by condensation and to card these fibers, and
auxiliary means for facilitating the loading of the fibers onto each worker roll and facilitating their removal therefrom, said auxiliary means comprising first and second tile-shaped members extending parallel to and adjacent the surface of the drum and disposed upstream and downstream respectively of the zone at which each of said worker rolls touches the drum, relative to the sense of rotation thereof, said upstream tile-shaped member including an input and output section, said output section extending close to the zone of touching in order to convey the flow of fibers thereto and the downstream tile-shaped member including an input and output section said input section being disposed at an angle to the surface to the drum and extending toward the surface of the worker roll to direct the fibers to the surface of the worker roll.

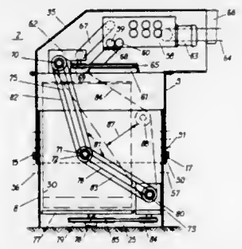
4,817,247
LAP LEVELER FOR A TEXTILE FIBER PROCESSING MACHINE
Ferdinand Leifeld, Kempen, and Franz J. Nohr, Jüchen, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany
Filed Sep. 23, 1987, Ser. No. 100,334
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632581; Jul. 4, 1987, 3722141
The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.
Int. Cl.⁴ D01H *5/38*
U.S. Cl. 19—105 **21 Claims**

1. In a textile fiber processing machine including a feed roller having a generally horizontal longitudinal axis and a feed table cooperating with the feed roller by defining therewith a nip through which the fiber lap passes; said feed table having a width extending parallel to said axis; a motor connected with the feed roller for rotating the feed roller; a fiber processing roller adjoining said feed roller and said feed table and being arranged to receive the fiber lap as it emerges from said nip; and an apparatus for levelling the thickness of the running fiber lap; said apparatus including a lap thickness measuring means including a sensor element cooperating with a surface of said feed roller and undergoing excursions in response to thickness variations of the fiber lap running between the feed roller and



the sensor element; and a control device connected to said measuring means for receiving, from said measuring means, signals representing said excursions; said control device being connected to said motor for applying rpm control signals thereto as a function of said thickness variations; the improvement wherein said sensor element is separate from, and is movable relative to, said feed table; said feed table having an aperture and said sensor element cooperating with said feed roller through said aperture.

4,817,248
VERTICALLY ADJUSTABLE DRAWING FRAME
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany
Filed Aug. 7, 1987, Ser. No. 83,776
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626773
Int. Cl.⁴ B65H *54/80;* **D01H** *5/00;* **F16M** *11/26*
U.S. Cl. 19—159 R **7 Claims**



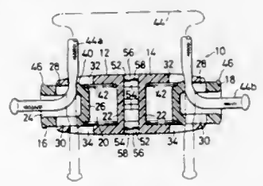
1. A drawing frame for depositing filaments in a can, the frame comprising:
a housing having an upper part and a generally stationary lower part telescoping therewith, one of the parts fitting complementarily within the other part;
attachment means for securing the parts together at any of a plurality of different vertically offset positions, whereby the upper part can be set at different heights above the lower part and therefore cans of different heights can be held between the parts;
means in the lower part including a turntable for supporting a filament can and for rotating it about an upright axis; and
means in the upper part for pulling in and drawing filaments and for depositing the drawn filaments in the can.

4,817,249
CLOTHING ORNAMENTATION DEVICE ADAPTED TO BE FITTED TO A BUTTON PASSED THROUGH A BUTTONHOLE
Pierre Astier, 76, rue de Crimée, 75019 Paris, France
Filed Mar. 8, 1988, Ser. No. 165,495
Claims priority, application France, Mar. 12, 1987, 87 03377
Int. Cl.⁴ A44B *1/12*
U.S. Cl. 24—113 MP **2 Claims**



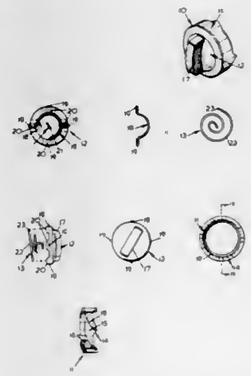
1. A clothing ornamentation device adapted to be fitted to a button inserted in a buttonhole comprising a cylindrical body which is hollow on the inside for housing said button, and which includes contact and abutment areas in the inside periphery of said cylindrical body for maintaining in position said button, the axis of the button serving as a rotation axis for said cylindrical body and the periphery of said button serving as a guide for said rotation, one base of said cylindrical body being adapted as a decorative means or support therefore and an opposite base being provided with a perpendicular lug substantially in the direction of the generatrices of said cylindrical body and constituting the start of an open ring parallel to said opposite base terminating in a short ramp provided with a dull point.

4,817,250
CORD LOCK
Mutsuo Kurosaki, Yokohama, Japan, assignor to Nifco, Inc., Kanagawa, Japan
Filed Jan. 21, 1988, Ser. No. 146,552
Claims priority, application Japan, Jan. 23, 1987, 62-8231
Int. Cl.⁴ F16G *11/14*
U.S. Cl. 24—115 G **14 Claims**



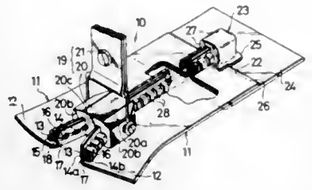
1. A cord lock, comprising:
a pair of cylindrical main bodies, having a longitudinal axis defined therein, for permitting intermediate portions of a cord to extend therethrough; and
a pair of lock members movably mounted upon said main bodies for respectively cooperating with said main bodies so as to develop a predetermined force resisting movement of said intermediate portions of said cord in its longitudinal direction relative to said main bodies and said pair of lock members;
each one of said pair of main bodies being formed with tubular circumferentially extending engaging means, for permitting engagement and disengagement of said pair of main bodies with respect to each other, comprising at least one engaging projecting having a first predetermined circumferential extent about said longitudinal axis of said main body, and at least one engaging recess, for reception of said at least one engaging projection of the other one of said pair of main bodies, having a second predetermined circumferential extent about said longitudinal axis of said main body.

4,817,251
FASTENER FOR ATTACHING BUTTONS AND THE LIKE TO FABRIC
Leo D. Shirley-Smith, Malbury, and Michael Winning, London, both of England, assignors to Modern Milly Limited, England
Continuation of Ser. No. 702,503, Feb. 19, 1985, abandoned.
This application Oct. 13, 1987, Ser. No. 107,895
Claims priority, application United Kingdom, Feb. 18, 1984, 8404338; Jul. 13, 1984, 8417842
Int. Cl.⁴ A44B *9/00*
U.S. Cl. 24—710.4 **15 Claims**



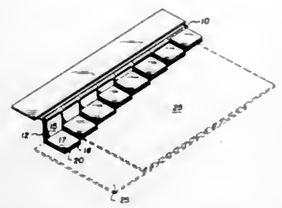
1. A fastener for fabric layer which comprises:
an outer body defining an open face and including a securing surface;
an inner body received within said outer body;
securement means for securing said inner body to said outer body against axial separation and for permitting simultaneous relative rotational and axial movement of said inner body with said outer body;
a securing device supported by said inner body and having a pointed material-engaging end,
said inner and outer bodies being rotatably movable between a first, open position and a second, attached position, in the first, open position said inner body being relatively axially displaced from the open face of said outer body and the material-engaging end of said securing device being displaced from the securing surface, in the second, attached position said inner body being relatively axially withdrawn toward the open face of said outer body and the pointed material-engaging end of said securing device being positioned adjacent and facing the securing surface,
whereby said inner and outer bodies may be positioned in the first position and material engaged by the end of said securing device, and the outer body may then be rotated relative said inner body to axially withdraw said inner body toward said outer body and to position the securing surface adjacent the end of the securing device to prevent release of the engaged material.

4,817,252
FLUID-TIGHT SLIDE FASTENER
Masahiro Kusayama, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Continuation of Ser. No. 46,577, May 6, 1987. This application Oct. 20, 1987, Ser. No. 110,618
Claims priority, application Japan, May 6, 1986, 61-68059[U]
Int. Cl.[4] A44B *19/32*
U.S. Cl. 24—389 2 Claims



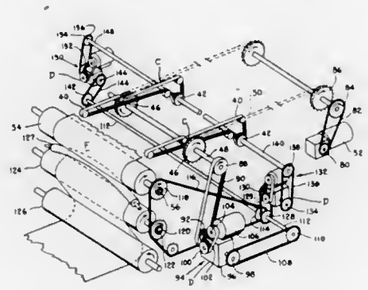
1. A fluid-tight slide fastener comprising:
(a) a pair of stringers each having a water-proof support tape and a row of coupling elements mounted on and along a bent inner longitudinal edge of said support tape, said bent inner longitudinal edge having throughout the length thereof an intermediate portion folded around said row of coupling elements and upper and lower sealing abutments on opposite sides of said folded intermediate portion;
(b) a slider slidably mounted on the two rows of coupling elements for taking the latter into and out of coupling engagement with each other to close and open the slide fastener;
(c) an end stop mounted on one surface of said support tapes at one end of thereof and having embedded therein a length of said bent inner longitudinal tape edges; and
(d) each of said bent inner longitudial tape edges including a longitudinal portion extending from within said end stop over a specified length of said coupling element rows permanently interengaged adjacent to said end stop, said lower sealing abutment of said longitudinal portion of each bent inner longitudinal tape edge defining jointly with the corresponding lower sealing abutment on the mating stringer a substantially inverted "V" cross-sectional configuration.

4,817,253
CARD HOLDING DEVICE
Rodney I. Harmatuik, 105-145 King Edward St., Coquitlam, British Columbia, Canada
Filed Oct. 20, 1987, Ser. No. 110,920
Int. Cl.[4] A44B *21/00*; A45C *13/00*
U.S. Cl. 24—458 9 Claims



1. A card holding device comprising a hinge member having a plurality of grasping members rotatably mounted along the length of the hinge member, each of said grasping members having a hinge mounting portion and a card receiving portion comprising a clip having a pair of spaced, opposed gripping arms separated by a distance less than the thickness of an appropriate card, said gripping arms being sufficiently flexible to allow the edge of a card to be inserted betweeen the arms whereupon the arms exert a clamping force to grasp and hold the card firmly in place.

4,817,254
TENTER ENTRY FEED SYSTEM AND METHOD
Robert J. Poterala, Rte. 15, Rocky Pointe Way, Greenville, S.C. 29615
Filed Apr. 24, 1986, Ser. No. 855,467
Int. Cl.[4] D06C *3/02*; D06H *3/12*
U.S. Cl. 26—51.3 26 Claims

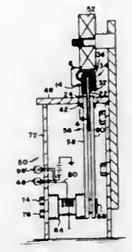


25. Tenter entry feed apparatus for attaching fabric selvages to traveling tenter chains which travel over tenter rails comprising:
a frame;
a main feed roll carried adjacent said frame;
a pair of parallel attachment rail sections about which said tenter chains travel;
means for carrying said parallel attachment rail sections on said frame in a manner that said rail sections move towards and away from each other in a parallel relationship transverse to the direction of fabric travel and in which their ends are fixed in angular and longitudinal movement in relation to fabric travel;
means for moving said rail sections in response to a width of said fabric to follow said fabric width;
an entry end of each of said attachment rail sections being fixed closely adjacent said main feed roll and defining an attachment point for the attachment of said fabric to an associated tenter chain traveling about each said attachment rail section;
said entry end of each of said attachment rail sections being fixed against angular and longitudinal movement in close proximity to said main feed roll in a manner that the distance of the span of fabric between said main feed roll and attachment point is minimized; means for positively controlling the transport of the fabrics without wandering of the selvages from the main feed roll directly to said attachment points whereby straight and parallel attachment of the selvages to said tenter chains may be had and
a constant fabric attachment point being defined by a distance between said main feed roll and said fabric attachment points which remains constant as said fabric is transported to said attachment points.

26. A tenter entry feed system for a tenter of the type which includes a pair of tenter rails, a pair of entry rails connected to said tenter rails, tenter chains carried for traveling movement about said rails having a plurality of tenter pins for pinning a fabric to said chains for delivery of said fabric through said tenter, said tenter entry feed system comprising:
a frame;
a main fabric feed roll;
drive means for driving said main fabric feed roll;

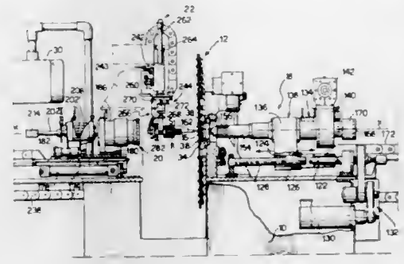
a first entry feed assembly slideably carried adjacent one side of said frame, and a second entry feed assembly slideably carried adjacent an opposing side of said frame, means for slidably carrying said first and second assemblies for movement towards and away from each other in a parallel manner to follow the fabric selvages, and means for moving said first and second assemblies in response to a fabric selvedge position; and
each said entry feed assembly including:
a parallel pinning rail section affixed to said entry feed assembly for parallel movement therewith,
an idler sprocket with an associated tenter pin chain traveling about said sprocket along said parallel pinning rail section,
elongated fabric conveyor means carried adjacent said parallel pinning rail section and tenter pin chain for positively conveying fabric through said entry feed assembly,
conveyor drive means for driving said elongated fabric conveyor means to control overfeed and underfeed of fabric to said tenter,
overfeed wheel means carried in superposed relationship with said elongated fabric conveyor means including means for pinning fabric onto said pins of said tenter pin chain at a pinning point while said fabric is conveyed by said elongated conveyor means; and
said elongated fabric conveyor means extending rearwardly from said overfeed wheel means to close proximity with said main fabric feed roll to generally span the entire distance therebetween and positively feed and control the fabric between said feed roll and a nip of said overfeed wheel means and said fabric conveyor means.

4,817,255
INSERTION-REMOVAL MONITOR/CONTROL FOR SEAL CARRIER MANUFACTURE
Howard C. Shaw, Jr., 700 Wyndwicke Rd., St. Joseph, Mich. 49085
Filed Nov. 19, 1987, Ser. No. 122,770
Int. Cl.[4] B21B *15/00*
U.S. Cl. 29—33 R 7 Claims



1. In combination with an extrusion apparatus for manufacturing a seal having a rubber carrier with a metal insert that extends between first and second legs, said first and second legs having gripping fingers on the inside surface, said carrier being manipulated by a forming member to bring said first and second legs into a U-shape, said U-shape defining a desired predetermined relationship between said first and second legs and the internal gripping fingers to establish acceptable insertion-removal characteristic with respect to a projection, the improvement comprising:
sensor means for engaging said carrier to monitor the relationship between said first and second legs and gripping fingers as a function of the frictional resistance to movement of the carrier with respect to the sensor means.

4,817,256
AUTOMATIC MACHINE FOR FORMING INDUCTION WINDINGS IN THE ROTOR SLOTS OF DYNAMO-ELECTRIC MACHINES
Gianfranco Riti, Vasto, and Mario Scampoli, Polistri, both of Italy, assignors to Industrie Magneti Marelli S.r.l., Milan, Italy
Filed Aug. 4, 1987, Ser. No. 81,392
Claims priority, application Italy, Aug. 4, 1986, 67629 A/86
Int. Cl.[4] H02K *15/09*
U.S. Cl. 29—33 L 10 Claims



1. In a machine for forming induction windings in rotors, having respective shafts and axial slots, of dynamo-electric machines such as electric motors, alternators and the like, of the type including a magazine of conductor wires wound on spools, a winding station, a wire-guiding unit with a horizontal axis including motor driven means for supplying an array of said conductor wires radially inwardly toward said axis from the magazine to the winding station, said winding station comprising take-up means operating to engage ends of the wires adjacent said axis, chuck means for gripping the shaft of the rotor and means for moving said chuck means longitudinally of the axis of the wire-guiding unit and rotating said chuck means about this axis in synchronism with the operation of the wire-guiding unit in an operative forming cycle during which each wire is deposited longitudinally within a respective first slot of the rotor, wound transversely at one end of the rotor between the first slot and a second slot which is not adjacent the first slot, deposited longitudinally within the second slot, wound transversely at the other end of the rotor between the second and first slots, redeposited longitudinally within the first slot, rewound transversely at the end of the rotor between the first and second slots, and redeposited longitudinally within the second slot, and in which there are provided radial pusher means associated with the wire-guiding unit for arranging the longitudinal portions of the wires within the respective slots, and cutting means for cutting the ends of the wires projecting from the second slots of the rotor at the end of the cycle and for forming these end parts into bent hooks adapted to cooperate with the take-up means in the subsequent cycle, the improvement comprising the take-up means for the ends of the wires comprise an annular gripper member having motor-driven means for its activation and deactivation, and motor means for translating the gripper member along the axis relative to the winding station, the gripper member having an associated attachment member for attachment to the shaft of the rotor at the end opposite the chuck means, said motor means being deactivatable when the ends of the shaft of the rotor are secured by said chuck means and said associated attachment member whereby the translation and rotation of the gripper member is carried out by the chuck means during the forming cycle, the machine further including motor-driven loading and unloading means for supplying the rotors to the winding station and removing them therefrom, respectively, in synchronism with the operation of the chuck means and the take-up means, and electronic means for controlling the wire-guiding unit, the take-up means, the chuck means, the cutting

means, and the loading and unloading means in an automatic operating sequence.

4,817,257

METHOD OF MAKING AN ENGINE CRANKSHAFT

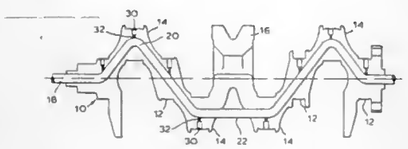
Paul A. Mascarenas, Brentwood, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1987, Ser. No. 128,373

Claims priority, application United Kingdom, Nov. 28, 1986, 8628522

Int. Cl.[4] B23P *15/00*

U.S. Cl. 29—156.4 R **1 Claim**



1. A method manufacturing a crankshaft having crank pins, which comprises (i) casting in place a hollow metal tube within said crankshaft, and (ii) laser piercing bores in at least the bearing surfaces of said crank pins of the crankshaft to connect with the interior of said metal tube, said metal tube being preformed to a desired shape that is insertable into a casting cavity of a mold, the shape having sufficient length to not totally encapsulate the tube in the cast material or mold during casting, and the part of the tube lying outside the mold during casting serving to align the tube within the mold.

4,817,258

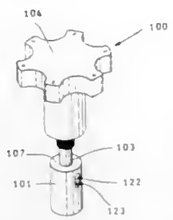
KEY ORIENTATION AND SEATING TOOL

Mark H. Waters, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 31, 1987, Ser. No. 90,292

Int. Cl.[4] B25B *27/14*

U.S. Cl. 29—240 **15 Claims**



1. A tool for orienting and seating a programmable key in an electrical connector, said key having an extended keying portion and being rotatable to position said keying portion at any selected one of a plurality of orientations, and thereafter being insertable into a key-receiving passageway in said connector, said tool comprising:

a sleeve having a bore extending thereinto from a forward end face thereof;

a substantially rigid member positioned within said bore, said member including means at its forward end for defining a space for receiving said extended keying portion of said key;

means for coupling said substantially rigid member to said sleeve for permitting axial movement of said member relative to said sleeve while preventing relative rotation between said member and said sleeve,

means for rotating said substantially rigid member and said sleeve coupled thereto when the extended keying portion of said key is received within said space for rotating said key to a selected orientation; and

means for thereafter moving said substantially rigid member axially forward relative to said sleeve for inserting said oriented key into said key-receiving passageway.

4,817,259

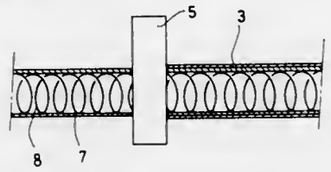
COMPOSITE PIPE, PROCESS FOR PRODUCING THE SAME, AND HEAT PIPE USING THE SAME

Ryosuke Hata, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 811,164, Dec. 19, 1985, Pat. No. 4,733,699. This application Jun. 22, 1987, Ser. No. 64,390

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—424 **2 Claims**



1. A method for manufacturing a composite pipe comprising the steps of forming a lead pipe, said lead pipe being formed by means of a continuous lead extrusion means while supplying a rigid spiral to said continuous lead extrusion means for forming said lead pipe with a spiral, surrounding said rigid spiral with a wick prior to the forming of said lead pipe, and supplying said lead pipe to a continuous aluminum extrusion machine capable of extruding while enveloping a long object, and forming an aluminum pipe on said lead pipe by extruding the aluminum with said lead pipe as a core.

4,817,260

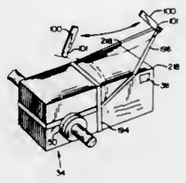
METHOD AND APPARATUS FOR DEBANDING MAIL BUNDLES

Gordon S. Martin, 12265 SW. 72nd Ave., Tigard, Oreg. 97223

Filed Dec. 2, 1987, Ser. No. 127,802

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—426.6 **18 Claims**



17. A method for nondestructively removing rubber bands that encircle bundles of stacked envelopes, each bundle being encircled by lengthwise-girding and girthwise-girding rubber bands, the bundles having front and rear faces and the envelopes having edges which define edge faces, including leading and trailing end faces and top and bottom faces of the bundles, the method comprising:

positioning a rubber band-girdled bundle of stacked envelopes at a work station;

inserting an unsharpened blade between two adjacent envelopes of the bundle;

moving the blade relative to the bundle in such a manner that the lengthwise-girding rubber band is removed from at least one end face of the bundle;

reinserting the blade between two envelopes of the bundle;

moving the bundle and blade relative to one another in such a manner that all girthwise-girding rubber bands and any retained lengthwise-girding rubber bands are removed from the bundle; and

discharging the bundle from the work station.

4,817,261

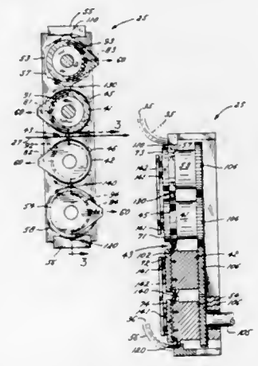
ROTARY SNAP MACHINE

Robert W. Sessions, Hinsdale, and Richard A. Rodzen, Bollingbrook, both of Ill., assignors to Ferris Manufacturing Company, Burr Ridge, Ill.

Filed Jan. 26, 1988, Ser. No. 149,109

Int. Cl.[4] B21D *39/03;* B27F *7/17*

U.S. Cl. 29—429 **21 Claims**



1. A machine for deforming a stud and an eyelet through a web so as to create a unitary structure comprising the stud, the eyelet and the web, which comprises:

a stud die wheel having dies spaced about the circumference of the wheel for receiving the stud,

an eyelet die wheel having dies spaced about the circumference of the wheel for receiving the eyelet,

a supply means for supplying studs and eyelets to the stud die wheel and the eyelet die wheel,

said stud and said eyelet die wheels positioned adjacently, thereby providing a nip therebetween so that said stud and said eyelet on said dies meet and deform at the nip,

a suction means for holding the stud or eyelet on the respective die,

a drive means for synchronously rotating the wheels, and

a means for continuously moving a web through a nip of the two wheels.

4,817,262

PAINT DRAIN CLOSURE ATTACHING METHOD

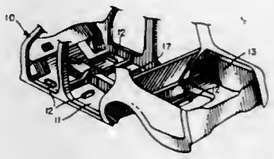
Peter G. Seyler, Franklin Park, Ill., assignor to Perfection Spring & Stamping Corp., Mt. Prospect, Ill.

Division of Ser. No. 915,728, Oct. 6, 1986, Pat. No. 4,700,981, which is a continuation-in-part of Ser. No. 794,653, Nov. 4, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 80,863

Int. Cl.[4] B23P *25/00;* B21D *35/00*

U.S. Cl. 29—458 **1 Claim**

1. A vehicle body treatment process comprising the steps of forming a plurality of drain holes in floor panels of a vehicle body undergoing manufacture, each such drain hole having a downwardly-projecting rim extending thereabout; inserting upstanding pins of a vehicle body supporting and locating apparatus upwardly into said drain holes for supporting and precisely orienting said body during the manufacture thereof; removing said pins from said drain holes and immersing said body in a paint bath; removing said body from said bath and draining paint therefrom through said drain holes; inserting a closure plug downwardly into each of said drain holes following the draining of paint from said body, said plugs each being formed of sheet metal and being of inverted hat-shaped configuration with integral bottom and side walls defining an upwardly-opening cavity and a perimetric flange projecting outwardly from the top of said side wall, each of said plugs also having a thermoplastic sealant ring extending about the underside of said perimetric flange, and being inserted with its side



wall extending downwardly through one of said drain holes, its bottom wall below the floor panel in which said hole is formed, its flange extending over said floor panel, and said sealant ring being interposed between said flange and said floor panel; thereafter mechanically locking said side wall of said plugs to said floor panels; and finally heating said vehicle body and said plugs to soften said rings and form hermetic seals between said flanges of said plugs and said floor panels.

4,817,263

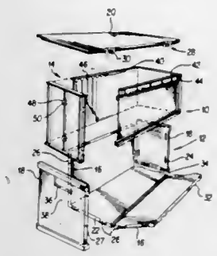
METHOD OF STORING ELECTROSTATIC DISCHARGE SENSITIVE DEVICES

Dennis C. Donalson, and Robert R. Wilkie, both of Roanoke Rapids, N.C., assignors to W.R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 114,932, Oct. 30, 1987, abandoned, which is a division of Ser. No. 875,858, Jun. 19, 1986. This application Jun. 3, 1988, Ser. No. 204,966

Int. Cl.[4] B21D *39/00*

U.S. Cl. 29—455.1 **6 Claims**



1. A method for storing electrostatic discharge sensitive devices comprising:

(a) molding a top member, bottom member, two side members, and two end members;

(b) connecting said members to form an enclosable shell;

(c) molding two side panels, each having a plurality of grooves along an interior surface thereof, and two end panels;

(d) affixing a rigid support bracket to an exterior surface of each side panel;

(e) connecting said panels to form an inner shell;

(f) placing said inner shell within said enclosable shell;

(g) connecting the inner shell to the end members of said enclosable shell; and

(h) inserting the electrostatic discharge sensitive devices in corresponding facing grooves of the inner shell.

4. A method for making a storage container suitable for storing electrostatic discharge sensitive devices comprising:

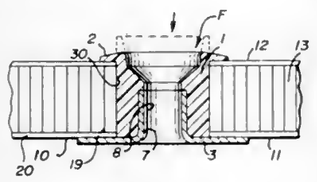
(a) molding a top member, bottom member, two side members, and two end members;
(b) connecting said members to form an enclosable shell;
(c) molding two side panels, each having a plurality of grooves along an interior surface thereof, and two end panels;
(d) affixing a rigid support bracket to an exterior surface of each side panel;
(e) connecting said panels to form an inner shell;
(f) placing said inner shell within said enclosable shell; and
(g) connecting the inner shell to the end members of said enclosable shell.

4,817,264

FASTENER AND ASSEMBLY PROCESS

Albert L. Worthing, Tustin, Calif., assignor to Shur-Lok Corporation, Irvine, Calif.

Filed Aug. 10, 1987, Ser. No. 83,066
Int. Cl.[4] F16B *19/04*
U.S. Cl. 29—512 **11 Claims**



1. In combination with a sandwich panel of the type containing first and second parallel spaced face surfaces, and a core structure intermediate said top and bottom surfaces forming a sandwich construction of a predetermined thickness, and said panel further containing at least one hole there through for receiving a fastener, the fastener comprising:
a generally cylindrical body portion, said body portion having a height greater than the thickness of said panel and containing an axial passage for permitting extension of a bolt shank there into,
said body portion further comprising a thermoplastic material, said thermoplastic material having the characteristic of softening responsive to the application of ultrasonic energy thereto,
said body portion further including, and integrally formed flange portion extending about the upper end peripheral of said axial passage for bonding attachment to a first face of said panel in the region extending about the inert hole in said panel,
flange means, said flange means being of a different material than said body portion and containing a washer shaped base of a predetermined diameter having a central opening and containing an upwardly extending tubular portion, said upwardly extending tubular portion being coaxial of said passage in said body portion and coaxial of and located within said axial passage and attached to said walls defining said body portion axial passage, said tubular portion of said flange means being of a predetermined length, which length is less than the thickness of said panel and less than the length of said body portion,
said flange means consisting of a metal material having a density greater than the density of the metal aluminum, said body portion and said flange means together defining a predetermined volume and predetermined weight and density factor defined as said predetermined weight divided by said predetermined volume, and wherein said density factor is lesser than or equal to the density factor of the metal titanium.

11. The method of affixing a fastener to a panel, said fastener comprising a body portion and a flange portion, said body portion comprising a thermoplastic material and being of a length greater than the thickness of said panel, said panel containing an opening for receiving there within said body portion of said fastener and preventing the movement there through of said flange portion, comprising the steps of:
inserting said fastener into and through said panel opening until fastener movement is blocked by said flange being against the panel, whereby an end of said body portion of said fastener extends beyond the plane of the surface of the opposed side surface of said panel and said adhesive is against said panel,
applying ultrasonic energy to said end of said fastener body portion for reshaping said end into a flange, said ultrasonic energy causing said end to flare over and contact said adjacent panel surface thereby sealing the panel against moisture entering the core space via the fastener identification hole and adhesively fastening said flange to one surface of said panel,,
applying an adhesive material to a surface of said flange portion adjacent to said panel, and
curing said adhesive.

4,817,265

METHOD FOR THE MANUFACTURE OF A CONTROL DISC OR A CONTROL SHIELD FOR A LIQUID-RING MACHINE

Peter Trimborn, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Mynchen, Fed. Rep. of Germany

Filed Apr. 2, 1987, Ser. No. 34,142
Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617344
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—527.6 **2 Claims**



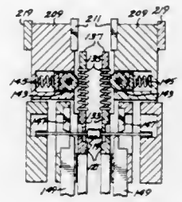
1. A method for the manufacture of a control disc or plate for a liquid-ring machine including a vane wheel adapted to be rotated hy a rotating shaft, the control disc or plate having an end face wall with front side facing a liquid ring and a back side, suction and pressure slots on the front side of the end face wall, a shaft opening and at least one passage for operating liquids extending through the end face wall and partitions forming chambers on the back side of the end face wall comprising the steps of:
forming a bearing disc of ordinary steel having a circular outer edge and partitions within the perimeter thereof including an open cylindrical support for the vane wheel shaft and no end face wall,
grinding off the front side of the circular edge and the front sides of the partitions of the bearing disc so as to lie in one plane,
forming a flat cover disc of corrosion resistant steel alloy with the suction and pressure slots, the shaft opening corresponding to the open cylindrical vane wheel shaft support of the bearing disc and the passage for operating liquids, and
welding the flat cover disc to the ground-off front sides of the circular edge and partitions of the bearing disc.

4,817,266

VARIABLE AXIAL LEAD ELECTRICAL COMPONENT FEEDER

Gregory W. Holcomb, 13 Viento, Irvine, Calif. 92714

Filed Jul. 27, 1987, Ser. No. 78,290
Int. Cl.[4] B23P *23/00*
U.S. Cl. 29—566.3 **15 Claims**



1. A component lead cutting and forming apparatus for axial lead electronic components respectively having first and second leads secured to tape, comprising:
first and second supporting means adjustably separated from each other for supporting the leads of an axial lead component in process;
means for adjusting the separation between said first and second supporting means without disassembly of said first and second supporting means;
means for strain relief clamping the leads of the axial lead component in process;
first and second cutting means adjustably separated from each other for cutting the leads of the component in process, the separation between said first and second cutting means being adjustable independently of the adjustment of the separation between said first and second supporting means;
means for adjusting the separation between said first and second cutting means without disassembly of said first and second cutting means independently of the adjustment of the separation between said first and second supporting means;
means for controlling said first and second means to cut the first and second leads of the axial lead component in process;
bending means for cooperating with said first and second supporting means to bend the leads of the component in process when said first and second supporting means and said bending means move relative to each other; and
driving means for providing linear relative translation between (a) said first and second supporting means and (b) said bending means in a direction generally orthogonal to the leads of the component in process to effect bending of the leads of the component in process.

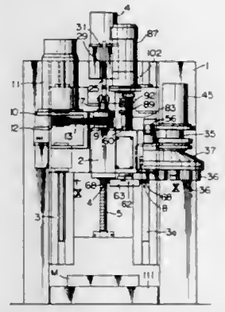
4,817,267

TOOL CHANGE APPARATUS FOR MACHINING CENTER AND THE LIKE

Shinichi Hitomi, Yatomi, Japan, assignor to Howa Machinery, Ltd., Aichi, Japan

Filed Aug. 19, 1987, Ser. No. 86,871
Claims priority, application Japan, Aug. 20, 1986, 61-194894
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **14 Claims**

1. A tool change apparatus for a machining center and the like, comprising in combination:
a column;
a spindle head slidably mounted on said column;
a spindle rotatably mounted in said spindle head and having an axial bore extending therethrough;
a draw bar slidably disposed in and extending through said axial bore;
one end of said axial bore having tool reception bore means for reception of a tool, said draw bar including clamping means for, when said draw bar moves slidingly in one direction, clamping a tool in position in said tool reception bore means, and, when said draw bar moves slidingly in the opposite direction, releasing the tool from the tool reception bore means;
a tool magazine unit mounted on said column and comprising a plurality of tool mounting pots for provisionally holding respective tools and for selectively shifting these tools to a predetermined tool change station;
a tool change shaft mounted on one of said spindle head and said column and extending parallel to said spindle at an intermediate position between said spindle and one of the tool pots situated at said tool change station, said tool change shaft being rotatable around its own axis and also shiftable in the direction of its length;



a pair of tool change arms provided on said tool change shaft for holding a tool to be changed;
operating means including an operating shaft extending shiftably through said tool change shaft axially thereof for converting shifting movement of the operating shaft into closing and opening movements of said tool change arms;
a Geneva wheel mechanism for rotatingly and intermittently driving said tool change shaft;
a first cam mechanism foı shifting said tool change shaft in the axial direction thereof;
a second cam mechanism for shifting said operating shaft in the axial direction thereof;
a single motor driving said Geneva wheel mechanism and said first and second cam mechanisms; and
provisional clamp means adjacent said tool reception bore means for engaging and releasably holding a tool in said tool reception bore means.

4,817,268

METHOD OF AND ARRANGEMENT FOR EXCHANGING TOOL HOLDERS IN WORKING UNITS FOR WORKING OF WORKPIECES

Hans-Ulrich Jaissle, Ludwigsburg; Manfred Hofmann, Moeglingen, and Dietrich Geiger, Grossbottwar, all of Fed. Rep. of Germany, assignors to Hueller Hille GmbH, Ludwigsburg, Fed. Rep. of Germany

Division of Ser. No. 637,533, Aug. 2, 1984, Pat. No. 4,646,421.
This application Feb. 24, 1987, Ser. No. 17,899
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 33295395
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **5 Claims**

1. A method for repositioning one or more tool holders from one or more non-working storage positions, respectively to a working position for working workpieces, in a tool holder arrangement including a carriage member reciprocatable between said working and non-working positions, a drive unit at a first end of said carriage member, and a rotatable exchange

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ring means operably positioned about said carriage member and drive unit, for rotation of said one or more tool holders thereabout, and capable of being moved in joint longitudinal reciprocating movement with said carriage member, said method for repositioning comprising the steps of:

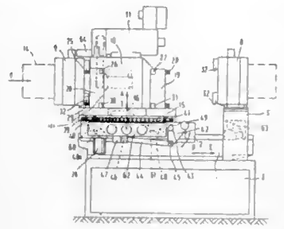
moving said carriage member and said rotatable exchange ring means in a first reciprocating direction until said carriage member is proximate to said tool holder in one of said one or more non-working storage positions, said storage positions being remote to the drive unit at said first end of said carriage member;

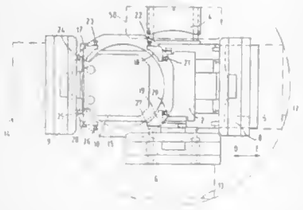
coupling said tool holder at said non-working storage position to said rotatable exchange ring means;

rotating said rotatable exchange ring means relative to said carriage member so as to move said coupled tool holder to a position closely juxtaposed to said drive unit at said first end of said carriage member;

coupling, fixing and tensioning said tool holder to said drive unit for transmission of power to the tools borne by said tool holder;

repositioning said carriage member, drive unit and rotatable





exchange ring means in a second reciprocating direction, substantially opposite to that of said first reciprocating direction, to said working position at which working position said tool holder may accomodate the working of workpieces;

uncoupling, after the working of workpieces, said tool holder from said coupled, fixed and tensioned position along said drive unit at said first end of said carriage member;

retracting said carriage member, said drive unit and said rotatable exchange ring means with said tool holder, from said working position by reciprocating same in said first reciprocating direction;

rotating said rotatable exchange ring means relative to said carriage member so as to move said tool holder coupled to said rotatable exchange ring means to a position closely juxtaposed to any one of said one or more non-working storage positions; and

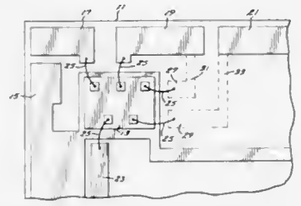
uncoupling and releasing said tool holder from said rotatable exchange ring means for engagement by and remote storage of said disengaged tool holder at one of said one or more non-working storage positions.

4,817,269

INDUCED METALLIZATION PROCESS BY WAY OF DISSOCIATING ALUMINUM NITRIDE CERAMIC

Randolph E. Root, Westminster, and Thanh T. Vu, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 14, 1987, Ser. No. 96,083
Int. Cl.[4] H01C *17/06*
U.S. Cl. 29—620 **13 Claims**



1. A process for forming electrically conductive elements on a ceramic substrate comprising the steps of:

providing a nonconductive ceramic substrate having a metallic component and which can dissociate into its constituent components to provide dissociated metal bonded to the ceramic substrate upon application of laser energy; and

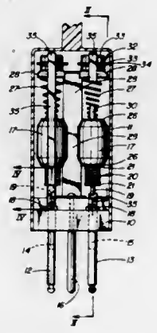
applying laser energy to predetermined areas of the surface of the nonconductive ceramic substrate to provide dissociated metallic conductors in the predetermined areas.

4,817,270

METHOD OF MANUFACTURING A HEAT COIL ASSEMBLY FOR A PROTECTOR UNIT

Eric A. Schelthauer, Chicago, Ill., assignor to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 853,952, Apr. 21, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 94,082
Int. Cl.[4] H01H *39/00*
U.S. Cl. 29—622 **9 Claims**



1. A method of manufacturing a heat coil assembly for a protector unit, comprising:

providing a pin, a plate, a terminal, a spool, a coil, and a fusible alloy layer;

attaching one end of said pin to said plate;

attaching one end of said terminal to said plate;

attaching said spool to the other end of said pin by fusing said fusible alloy layer to both said spool and said pin; and

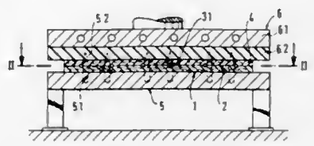
winding said coil on said spool after said spool is fused to said pin.

4,817,271

APPARATUS FOR THE MANUFACTURE OF A FLEXIBLE HEATING APPLIANCE

Dieter Altmann, and Eberhard Haupt, both of Gründau-Rothenbergen, Fed. Rep. of Germany, assignors to I. G. Bauerhin GmbH, electro-technische Fabrik, Gruendau-Rothenbergen, Fed. Rep. of Germany

Continuation of Ser. No. 756,265, Jul. 18, 1985. This application Jan. 21, 1987, Ser. No. 8,091
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512616
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—729 **3 Claims**



1. An apparatus for the manufacture of a flexible heating appliance which comprises a heating circuit having at least one continuous heating wire, said wire placed between textile materials being heat-attachable with one another, said apparatus comprising:

(a) a template comprising a rigid steel plate having an upper surface and a lower surface;

(b) said rigid plate having a plurality of blind holes distributed uniformly over said upper surface;

(c) legs attached to said lower surface supporting said rigid plate;

(d) a plurality of steel nails having a point on a first end and no head on a second end, said second ends inserted into said blind holes in a given pattern defining a configuration for said heating circuit;

(e) a steel ironing plate having an underside positioned above said template and having means for heating to a temperature of up to about 250° C.; and

(f) an elastic pressure plate attached to said underside comprising a material absorbing 10,000 penetrations of said points without requiring exchange of said pressure plate.

4,817,272

LEAD CRIMPING APPARATUS

Carl Campisi, Chicago, Ill.; Andrew Kaliszek, Phoenix, Ariz.; Elmer M. Klein, Mundelein, Ill.; Richard G. Schmid, Glenview, Ill., and Thomas J. Bradfish, West Chester, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 18, 1987, Ser. No. 87,009
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—741 **46 Claims**

1. Apparatus for crimping leads or tabs of a plurality of electronic components positioned on a generally planar PC board, wherein said leads or tabs are positioned in apertures within and extend through said PC board, said apparatus comprising:

a pneumatically actuated lower assembly positioned beneath said PC board and including a slide member displaceable generally parallel to the plane of said PC board;

an upper assembly disposed between said PC board and said lower assembly and including first upper and second lower generally flat plates, wherein said first upper plate includes a plurality of crimping elements each positioned adjacent to at least one electronic component lead or tab and said second lower plate is engaged by a responsive to displacement of said slide member for engaging and displacing said crimping elements, whereupon each of said crimping elements engages at least one electronic component lead or tab in effecting the crimping thereof;

bearing means coupled to the lower portion of each of said crimping elements to facilitate displacement between said crimping elements and said second lower plate; and

biasing means positioned between and engaging said first upper and second lower plate for urging said plates apart.

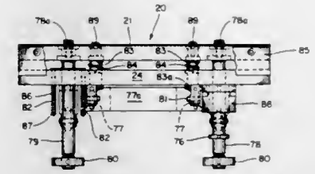
17. A crimping mechanism for engaging and crimping a lead/tab of an electronic component positioned on a first side of a circuit board, wherein said lead/tab is positioned in an aperture in and extends through said circuit board to a second opposed side thereof, said crimping mechanism comprising:

a support structure;

a first pivot arm coupled to said support structure;

first means for urging said first pivot arm in a first direction of rotation;





actuation means movable between first and second positions for engaging and pivotally displacing said first pivot arm in a second opposed direction of rotation when moved from said first position to said second position and for disengaging and allowing said first pivot arm to be displaced by said first means in said first direction of rotation when moved from said second to said first position;

first roller means disposed on said first pivot arm and adapted for engagement by said actuation means to facilitate relative displacement between said pivot arm and said actuation means;

first biasing means disposed between and engaging said support structure and said actuation means for urging said actuation means from said second to said first position; and

lead/tab engaging means coupled to said first pivot arm for engaging and crimping an electronic component lead/tab when said first pivot arm is displaced in said second direction of rotation.

4,817,273

BURN-IN BOARD LOADER AND UNLOADER

Larry J. Lape, Sugarland, and Ramon A. Salazar, Houston, both of Tex., assignors to Reliability Incorporated, Houston, Tex.

Filed Apr. 30, 1987, Ser. No. 44,873
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—741 **21 Claims**

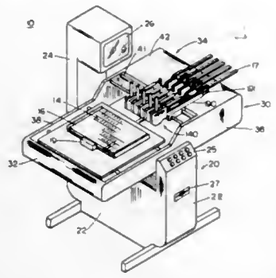
1. An apparatus for loading IC packages into and unloading IC packages from sockets mounted on printed circuit boards, comprising:

means for supporting the printed circuit boards in a substantially horizontal position and for rotating the printed circuit boards in both the clockwise and the counterclockwise direction from the substantially horizontal position to a plurality of inclined positions;

means affixed to said supporting and rotating means for

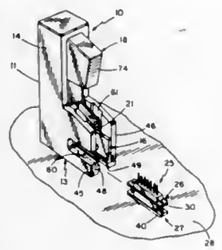
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inserting IC packages into and extracting IC packages from sockets on printed circuit boards; and



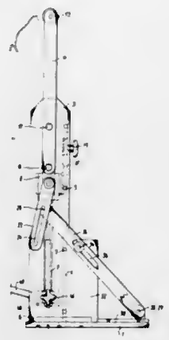
means affixed to said inserting and extracting means for delivering IC packages to and from said inserting and extracting means.

4,817,274
PULLER TOOL FOR MULTIPLE PIN CONNECTORS
Kent R. Higgins, 3104 Thrush La., Rolling Meadows, Ill. 60008
Filed Feb. 10, 1988, Ser. No. 154,285
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—764 **15 Claims**



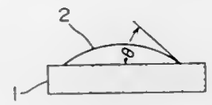
1. A puller for separating multiple pin electrical conductor connectors for the type having a male connector with a generally rectangular elongated frame and a female connector with a similar generally rectangular elongated frame parallel to and spaced from the male connector frame when the connectors are connected, each having an axis in the direction of elongation, comprising: a body having an elongated base portion for engaging the side of one of the connector frames facing the other frame, a puller slide mounted for pure linear reciprocating motion on the body and having an elongated portion for engaging the other frame on the side thereof facing the one frame so that when reciprocated will separate the frames while maintaining the parallel relation therebetween said elongated base portion and the sldie elongated portion being insertable between the male connector and the female connector in the direction of said axis of elongation without any transverse movement of the base portion or the slide elongated portion, and means on the body for actuating the puller slide.

4,817,275
DEVICE FOR POSITIONING A MEANS OF FIXING CONSISTING OF A SCREW AND A PLATE
Cornelis E. Van Berkel, Staringlaan 27, 1422 BG Uithoorn, Netherlands
Filed Jul. 29, 1987, Ser. No. 79,236
Claims priority, application Netherlands, Aug. 6, 1986, 8602013
Int. Cl.[4] B23P *19/06*
U.S. Cl. 29—787 **7 Claims**



1. In a device for positioning in line a screw and the hole of a plate, which screw and plate form the means for fixing a layer on a substrate, with the hole of the plate having a downwardly pressed edge to allow countersinking of the screwhead, with the device including
a base plate;
a housing mounted above said base plate, said housing having a guide standing at right angles to said base plate;
a carrier for a screwdriver mounted slideably in said guide for movement up and down;
a screwdriver having a centerline, said screwdriver being positioned within said carrier;
a guide channel for said screwdriver;
a first opening in said base plate, the center of which first opening coincides with said centerline of said screwdriver, said first opening resiliently adapted to hold a plate;
a magazine for plates incorporated within said housing and adapted to contain a stack of plates;
a slide adapted to move parallel to said base plate at the level of the lowermost plate of the stack of plates, and further adapted to move said lowermost plate from the stack towards said first opening in said base plate;
a screw magazine, and a means for feeding a screw one at a time from said screw magazine into said guide channel;
the improvement comprising the arrangement wherein said carrier and said slide are mechanically connected and cooperatively provide means to move said lowermost plate from a stack of plates into said first opening of said base plate only during relative upward movement of said carrier with respect to said housing, with said carrier being connected with a handle present above the housing, wherein when the handle is moved upwardly, by hand, the carrier will be moved upwardly and the slide will move parallel to the base to move the lowermost plate into said first opening said guide having a step limiting upward movement of said carrier with respect to said housing, said guide channel having a constriction formed by elastic means allowing the passage under pressure of a screw head resting upon said constriction, and said screw magazine comprising a tube with a slit in the bottom through which a plurality of screws can extend with their heads resting inside said tube, said screwdriver being adapted to extend through said constriction and past a second opening connecting said screw magazine with said guide channel, said screwdriver further having a length such that only in the uppermost position of said carrier is said screwdriver clear of said second opening between said guide channel and said screw magazine.

4,817,276
PROCESS FOR PRODUCING CERAMIC SUBSTRATES FOR MICROELECTRONIC CIRCUITS
Gyozo Toda, Hino; Takashi Kuroki, Yokohama; Shousaku Ishihara, Kamakura; Naoya Kanda, and Tsuyoshi Fujita, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 2, 1986, Ser. No. 847,302
Claims priority, application Japan, Apr. 5, 1985, 60-70864
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] H05K *3/12*; C04B *35/10, 35/18*
U.S. Cl. 29—830 **4 Claims**

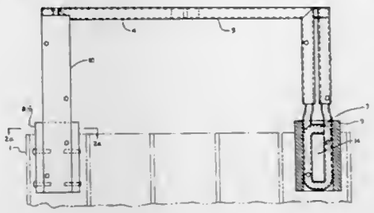


1. A process for producing ceramic substrates which comprises the steps of;
forming green sheets from a composition consisting of 70 to 85% by weight of a mullite ceramic and 30 to 15% by weight of a binder composed of 60 to 95% by weight of SiO_2, 4 to 30% by weight of Al_2O_3, and 1 to 10% by weight of MgO;
printing circuit patterns with a conductor paste comprising a high-melting metal on the green sheets; and
sintering the resulting sheets at a temperature of 1550° to 1700° C. in a reducing atmosphere.

4,817,277
METHOD OF MANUFACTURING AN ELECTRICALLY CONDUCTIVE ADHESIVE BOND
Hartmann Hieber, Hamburg, and Wolfgang Thews, Wewelsfleth, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 17, 1987, Ser. No. 15,772
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3608010
Int. Cl.[4] H05K *3/00*
U.S. Cl. 29—832 **15 Claims**

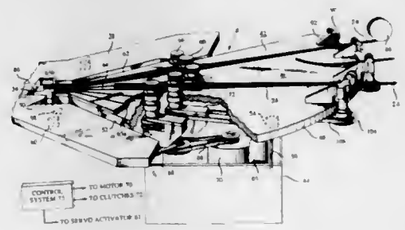
1. A method of manufacturing an electrically conductive adhesive bond between two electrically conductive parts, said method comprising applying a layer of at least one transition element selected from the group consisting of the first and second series of elements of the periodic system of the elements to a surface present on each of said electrically conductive parts in a thickness such that the resultant coated surfaces have a roughness in the μm range, applying an electrically non-conductive adhesive to at least one of said coated surfaces, bringing coated surfaces, including an adhesive coated surface, of said two electrically conductive parts in contact, one against the other, in a manner such that raised portions of one of said coated surfaces is in contact with raised portions of the other coated surface and adhesively bonding together said coated surfaces.

4,817,278
SIDE TERMINAL CONNECTION BY FUSING
William E. Mullane, Warren, Ohio, assignor to The Taylor-Winfield Corporation, Warren, Ohio
Filed Jul. 25, 1988, Ser. No. 224,989
Int. Cl.[4] B23P *19/00*; H01M *2/02*
U.S. Cl. 29—730 **2 Claims**



1. Apparatus for simultaneously fusing both positive and negative side terminal posts of a lead acid storage battery, comprising a pair of tombstones of L-shape, said terminal posts each having an inwardly extending projection extending into a substantially U-shaped opening at the top of the vertical legs of said tombstones, a pair of spaced induction coils connected in series, a mold for surrounding each coil for confining fused metal to fill the said substantially U-shaped opening in the top of said tombstones for providing an integral connection between said terminal posts and said vertical portions of said tombstones when said terminal posts and tombstones are lifted into said molds and the induction coils are energized.

4,817,279
METHOD AND APPARATUS FOR SELECTIVELY FEEDING STRIPS OF MATERIAL
Willard E. Rapp, Princeton, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.
Continuation-in-part of Ser. No. 37,487, Apr. 13, 1987, abandoned. This application Feb. 29, 1988, Ser. No. 158,632
Int. Cl.[4] H01R *9/09*; B23P *23/00*
U.S. Cl. 29—845 **14 Claims**

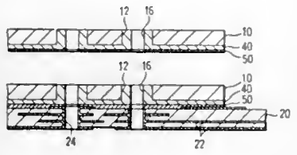


1. A method for fabricating an article comprising the steps of:
selectively feeding a first one of a plurality of strips of material into an input slot on a machine which processes the strips to at least partially fabricate said article; and
completing the fabrication of said article, characterized in that said step of selectively feeding said first one of said strips comprises the steps of:
guiding each of said strips into one end of a separate one of a plurality of channels extending across a plate;
indexing the plate to selectively align the other end of a first one of said channels containing a first strip with the input slot; and
advancing said first strip within said first channel so said first strip passes through said channel and into said input slot for processing by the machine while controlling the

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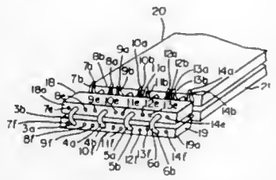
length of the strip advanced through the channel to permit varying lengths to be advanced.

4,817,280
METHOD OF MANUFACTURING PRINTED CIRCUIT BOARDS
Risuke Ozaki, Kokubunji, Japan, assignor to O. Key Printed Wiring Co., Ltd., Tokyo, Japan
Filed Jun. 9, 1986, Ser. No. 871,910
Claims priority, application Japan, Jun. 10, 1985, 60-124378; Dec. 2, 1985, 60-269398
Int. Cl.⁴ H05K *3/10*
U.S. Cl. 29—846 **7 Claims**



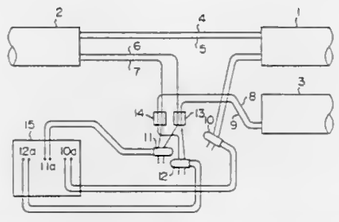
1. A method of manufacturing printed circuit boards comprising the steps of:
(a) providing holes on a metal plate;
(b) attaching a prepreg to said metal plate;
(c) filling said prepreg into said holes by heat-pressing said metal plate to which said prepreg is attached;
(d) providing lead wire holes at the centers of the prepreg filled holes; and
(e) gluing a resin plate having at least one circuit layer, and having either through holes or lead wire holes, to the side of said metal plate where said prepreg is attached.

4,817,281
FLAT CABLE BRANCHING AND CONNECTING PROCESS
Naoto Sugawara, Sagamihara, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Mar. 15, 1988, Ser. No. 168,182
Int. Cl.⁴ H01R *43/00*
U.S. Cl. 29—857 **1 Claim**



1. A method of forming branch connection of a flat cable, having earth leads and signal leads comprising the steps of:
removing an insulation coating of a flat cable in a transverse direction relative to the flat cable at three longitudinal portions thereof, thereby exposing all of the leads of the flat cable at said three portions;
folding the flat cable at the intermediate exposed lead portion of said three portions;
cutting the earth leads of the flat cable at the intermediate exposed lead portions;
causing each of the earth leads of the flat cable at the exposed portions to project toward and beyond an outside surface of the folded cable;
causing the signal leads of the leads of the flat exposed lead portions to project toward the folded ends thereof keeping the folded condition thereof;
electrically connecting the earth leads on both surfaces of overlapped portions to a common earth lead connecting means at said both surfaces; and
electrically connecting each of the folded projecting portions of the signal leads and of the common earth lead connecting means to a corresponding connection terminal of branch signal output means.

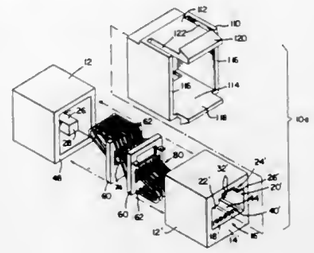
4,817,282
CABLE SPLICING METHOD WHILE MAINTAINING ELECTRICAL CONNECTION
Terrance L. Markwardt, Cedar Park, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 5, 1988, Ser. No. 152,456
Claims priority, application Japan, Feb. 20, 1987, 62-37721
Int. Cl.⁴ H01R *43/00*
U.S. Cl. 29—868 **2 Claims**



1. A method of replacing a portion of an old cable by a new cable by making use of side entry electrical wire connectors, piercing probes and a transfer equipment, which old and new cables, respectively, contain therein a plurality of wire pairs, said method comprising the steps of:
partly removing an outer sheath of the old cable to expose the plurality of wire pairs;
attaching first and second piercing probes to a wire pair of the old cable being transferred and attaching a third piercing probe to a corresponding wire pair of the new cable;
closing bridging relays of the transfer equipment between the two piercing probes attached to the old cable pair to establish a parallel circuit between the two piercing probes;
cutting the old cable wire pair between the two piercing probes to break the parallel circuit;
transferring the electrical circuit between the first and second piercing probes attached to the old cable wire pair to the second piercing probe attached to the old cable and the third piercing probe attached to the new cable wire pair;
using the side entry electrical wire connectors to connect the new cable wire pair to the old cable wire pair to which said one of the two piercing probes is attached;
removing said piercing probes from the old and new cable wires; and
repeating the above steps for subsequent old and new cable wire pairs.

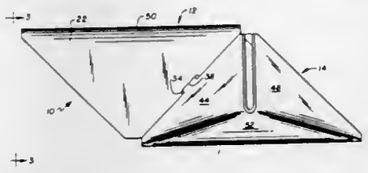
4,817,283
METHOD OF FORMING A MODULAR PLUG COUPLER
James J. Johnston, Saybrook, and Edward B. Propheter, Cromwell, both of Conn., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Aug. 21, 1987, Ser. No. 88,177
Int. Cl.⁴ H01R *43/16*
U.S. Cl. 29—884 **18 Claims**

1. A method of forming a terminal subassembly for receipt in an insulative housing, the method including the sequential steps of:
pulling solid wires from a reel and aligning them to form a plurality of side by side wires;
deforming a portion of each wire;



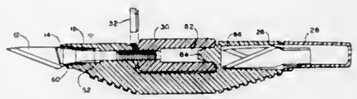
molding an insulative material over at least a portion of the wires, to form an insulative web over the wires proximate to the deformation, thereby defining a terminal subassembly;
shearing the wires to form two free ends; and
forming the wires into the desired configuration.

4,817,285
RAZOR BLADE HOLDER
Andrzej J. Olejniczak, New York, N.Y., assignor to O & J Design, New York, N.Y.
Filed Apr. 3, 1987, Ser. No. 33,689
Int. Cl.⁴ B26B *21/00*
U.S. Cl. 30—47 **14 Claims**



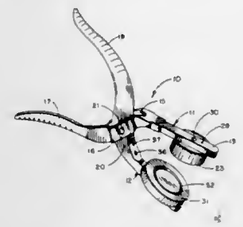
1. A razor blade holder comprising:
slot defining means for receiving a razor blade, said slot defining means having a length parallel to a longitudinal edge of the razor blade when inserted in said slot defining means;
at least one clamping means defined within said slot defining means for clamping a razor blade within said slot; and
first and second finger gripping means mounted to first and second longitudinal aides of the said slot defining means, respectively, and extending laterally outwardly therefrom, so that a said finger gripping means is disposed on either longitudinal side of a razor blade within said slot, said first and second finger gripping means being offset from one another along said length of said slot defining means.

4,817,284
ERGONOMIC UTILITY KNIFE
James E. Sacherman, 1550 California Ave., Palo Alto, Calif. 94306, and John W. Toor, 425 Alma St., #311, Palo Alto, Calif. 94301
Filed Mar. 10, 1987, Ser. No. 24,245
Int. Cl.⁴ B65B *1/00*
U.S. Cl. 30—329 **4 Claims**



2. A utility knife having
a handle comprising a shaft portion and a lower protrusion and including a central axial bore through at least a part of the shaft portion,
a central knob positioned within an opening in the handle, the central knob being fixedly positioned axially but freely rotatable, the central knob having a threaded axial bore extending at least partially therethrough,
a collet adapted to receive a blade in one end thereof and having a threaded portion at the other end thereof capable of extending through the central axial bore in the shaft portion of the hand and of being threaded into the axial bore in the central knob, such that a tightening rotation of the central knob relative to the collet increases the clamping force on a blade held within the collet, while a loosening rotation of the central knob relative to the collet decreases the clamping force and moves the collet axially outward relative to the central knob, and
slot means within the central axial bore through the shaft portion for aligning the blade relative to the handle as the collet is tightened around the blade by the rotation of the knob.

4,817,287
CUTTING TOOL FOR COLOSTOMY WAFER
Janet O. Arnold, 1415 Bryant St., Leesburg, Fla. 32749-1211, and Shirley H. Seanett, R.R. 1, Box 1283, Fruitland Park, Fla. 32731
Filed Mar. 2, 1987, Ser. No. 20,360
Int. Cl.⁴ B26F *1/36*
U.S. Cl. 30—178 **5 Claims**



1. A colostomy wafer cutting tool comprising:
a first jaw member including a lever handle and a lever jaw portion, said first and second jaw members being movable attached together between the handle and jaw portions thereof, whereby the jaws can be actuated with said lever handle portions;
a removably attached annular cutting blade attached to the lever jaw portion of said first jaw member, said removably attached annular cutting blade bottom having an alignment pin attached thereto and said first jaw member lever jaw portion having an opening therein for receiving said alignment pin;
a cutting block attached to the second jaw member lever jaw portion and having an annular cutting groove therein shaped for said annular cutting block to enter to thereby cut a piece of material placed between said annular cutting blade and said cutting block, said cutting block being

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loosely attached to said second jaw member lever jaw portion whereby said cutting block can slightly tilt to the angle of said annular cutting blade; and

said second jaw member having a threaded opening therein for attaching an alignment stop thereto.

4,817,288

CUTTING HEAD FOR CORD TYPE MOWER

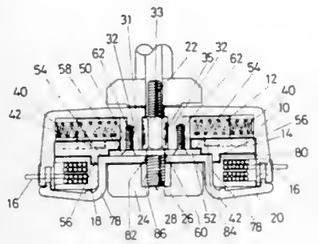
Daijo Hirose, 1669-2, Ayubashiri, Takasu-mura, Gujo-gun, Gifu Prefecture, and Mitsukazu Takishita, 311-6, Nakatsuya, Shirotori-cho, Gujo-gun, Gifu Prefecture, both of Japan

Filed Mar. 20, 1987, Ser. No. 28,686

Claims priority, application Japan, Mar. 25, 1986, 61-66933

Int. Cl.⁴ A01D *50/00*

U.S. Cl. 30—276 **2 Claims**



1. A cutting head for a cord type mower in which cords wound on a cord spool project outside the cutting head and are rotated at a high rotating speed by a driving source to sever grass and weeds, said cutting head comprising:

a bowl-shaped rotary casing having slots in the rim thereof through which the cords project, said casing being adapted to be operatively connected to the driving source for being driven in rotation;

a speed change control mechanism in said casing for controlling the speed of rotation of said rotary casing for varying the speed according to the length of the projecting portions of the cords, said speed change control mechanism having a plurality of engaging members, said casing having an upper wall with an inner surface having therein a plurality of radial grooves at regular angular intervals in the circumferential direction of said casing and in which said engaging members are radially slidably received, springs resiliently biasing said engaging members radially toward the center of said rotary casing, a speed change control plate in said casing below said engaging members, said speed change control plate having a control groove therein constituted by a plurality of outer control groove portions therein extending along a circular path at intervals in the circumferential direction of said casing, a plurality of angularly inwardly extending control groove portions extending from the one ends of said outer control groove portions which are downstream in the direction of rotation of said casing and inwardly at an angle to a radius of said casing, and a plurality of radially extending control groove portions extending between the inner ends of said angularly inwardly extending control groove portions and the other ends of said outer control groove portions, a stud on each of said engaging members engaged in said control groove, and said outer control groove portions having an increasing width in the direction from the radially extending control groove portions to said angularly inwardly extending control groove portions;

a cord spool for carrying cords to project through said slots fixedly mounted on the lower side of said speed change control plate; and

a cover member fixed to the lower side of said casing for enclosing said speed change control plate and said cord spool.

4,817,289

CORD CUTTER HEAD

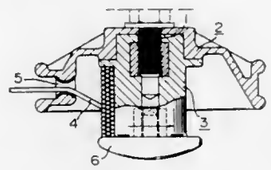
Toru Baba, Yokosuka, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed May 20, 1987, Ser. No. 53,026

Claims priority, application Japan, May 24, 1986, 61-78617[U]

Int. Cl.⁴ A01G *3/06*

U.S. Cl. 30—276 **5 Claims**



5. A cord cutter head comprising:

a housing having a downwardly directed opening;

a spool formed integrally with said housing and comprising a lower end portion which projects downward from said housing through said opening so as to be exposed outside the cutter head, said spool carrying a flexible cutter cord wound thereon;

a flange member having a larger diameter than that of said spool is detachably secured to a free end of the lower end portion of said spool for supporting the cord;

and an aperture formed in the wall of said housing and adapted to allow the portion of the cutter unwound form the spool to pass therethrough;

whereby a user can rewind or otherwise handle the cutter cord on said spool by the exposed lower end portion.

4,817,290

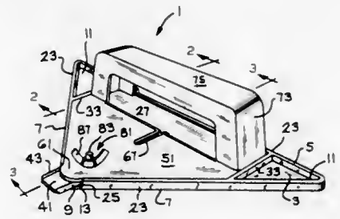
TRIMMING TOOL

Larry L. Baughman, R.R. #5, Bryan, Ohio 43506

Filed Apr. 24, 1986, Ser. No. 855,325

Int. Cl.⁴ B26B *29/00*

U.S. Cl. 30—293 **16 Claims**



12. A trimming tool comprising:

a base having at least one corner, said base defining an elongated channel, said elongated channel extending from said corner into the center of said base;

a trimming blade moveably positioned in said elongaed channel, the sides of said channel engaging the sides of said trimming blade to maintain said trimming blade in the desired position, said trimming blade being extendable from said corner of said blade for cutting material;

a top removeably positioned on said base, said top covering said elongated channel and said trimming blade, said top acting to maintain said blade in said elongated channel;

a flange positioed on said base, said flange extending in a direction towards said top, said flange engaging said sides of said top to properly locate said top on said base, a passageway positioned in said flange in the area of said elongated channel to allow said trimming blade to extend from said base and said top; and,

a handle secured to said top, said handle being disposed for advancing said trimming tool to cut material.

4,817,291

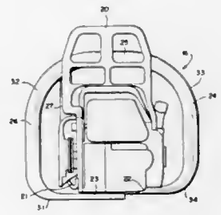
MOTOR-DRIVEN CHAIN SAW HAVING AN IMPROVED HANDLE

Hans-Peter Stehle, Waiblingen, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Sep. 29, 1987, Ser. No. 102,208

Int. Cl.⁴ B27B *17/00*

U.S. Cl. 30—381 **12 Claims**



11. A motor-driven chain saw, comprising:

housing means for substantially enclosing the operating motor portion of said motor-driven chain saw and having a top, two sides, a front, a rear and a bottom portion;

guide bar means extending from said housing means in a predetermined direction for a predetermined distance for supporting and guiding a saw chain thereon during use of said chain saw;

sprocket gear means to interconnect said motor portion of said motor-driven chain saw with said saw chain during use of said chain saw;

first handle means attached to said housing means in a transverse plane at approximately the center of gravity of said motor-driven chain saw for supporting and manipulating said chain saw;

second handle means attached to said housing means at a location spaced from said first handle means in a direction away from said guide bar means for guiding said chain saw during use;

said first handle means being formed of hollow tubular material having predetermined flexural strength with a predetermined length that is sufficient to encircle said housing means in a predetermined spaced apart manner and having ends for attaching to said housing means to form a bail-type handle;

said hollow tubular material forming said first handle means by a plurality of substantially 90° bends with a straight portion between at least two of said bends and said straight portion being located across said top of said housing means; and,

insert means of a predetermined cross-sectional configuration fitted within said straight portion of said first handle means to support said hollow tubular material at points that are spaced apart a predetermined distance.

4,817,292

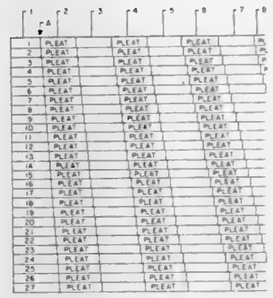
PLEAT PLACEMENT CHART AND METHOD OF USING THE SAME

Earnest J. Callahan, 2207 Sims Way, Port Townsend, Wash. 98368

Filed Mar. 23, 1987, Ser. No. 29,061

Int. Cl.⁴ G01B *3/10*

U.S. Cl. 33—1 B **8 Claims**



4. A chart whereon drapery material is placed for locating the bounds of pleated and unpleated areas by moving the pinned return and overlap portions of said material downwardly on columns of slanting vertical lines until said pins fall on a pair of spaced lines having alternate spaces of pleated and unpleated areas therebetween, comprising an elongated rectangular surface having an arrangement of columns sloping to the right of the chart containing offset vertical lines defining a plurality of horizontal rows of spaces, the columns extending along said chart having alternate areas of pleated and unpleated spaces, the row of spaces in the first column being numbered from the uppermost to the bottom of said spaces, said columns likewise being numbered horizontally from left to right.

4,817,293

METHOD FOR AXIAL ALIGNMENT OF AN ASSEMBLY FOR IMPLANTING A PARIETAL PROBE IN A REDUCING-SMELTING FURNACE, AND ASSOCIATED IMPLANTING ASSEMBLY

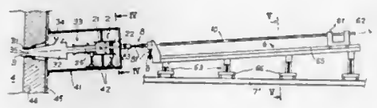
Jean-Claude Daverio, Ban-Saint-Martin, and Frédéric Grein, Illange, both of France, assignors to Institut des Recherches de la Siderurgie Francaise-irsid, Maizieres-Les-Metz, France

Filed Jun. 26, 1987, Ser. No. 66,485

Claims priority, application France, Jun. 27, 1986, 86 09393

Int. Cl.⁴ G01B *7/12*

U.S. Cl. 33—228 **15 Claims**



1. Method for axial alignment of an implanting assembly for the implantation of an elongated rectilinear parietal probe in a reducing-smelting furnace, such as a blast furnace, through an orifice having an axis and being provided in a wall of said furnace, wherein the implanting assembly includes a tightness device having an axis along which the probe is movable in order to penetrate into the furnace, said tightness device being adjustable in position around the axis of the wall orifice, wherein the implanting assembly further includes an adjustable frame for guiding the probe, which is movably mounted on a

carriage carried by said frame, into and out of the furnace, said method comprising the steps of:

placing a sighting telescope coaxially on the tightness device,

sighting the orifice of the furnace with the telescope,

adjusting the position of the tightness device to align the axis of the orifice with that of the tightness device in accordance with the sighting,

replacing the telescope with a light beam-emitting source coaxial with the tightness device and being directed towards the adjustable frame at an aiming target provided on the carriage, the center of the target corresponding to the axis of the probe, and

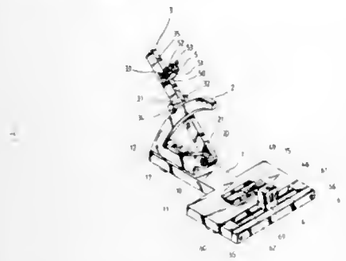
moving the carriage to various positions along the frame and adjusting the position of the frame at each position of the carriage so that the light beam strikes the center of the target at each position of the carriage.

4,817,294

CLUB HEAD ANGLE MEASURING INSTRUMENT

Shui-Chuan Lai, 69, Ting Sheng Street, Chien Chin District, Kaohsiung, Taiwan

Filed Oct. 8, 1987, Ser. No. 105,360
Int. Cl.[4] G01B *5/24*
U.S. Cl. 33—508 **9 Claims**



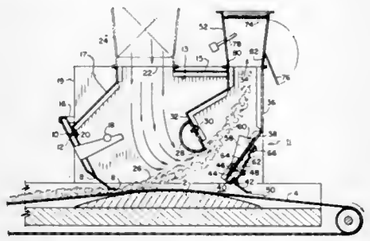
1. A club head angle measuring instrument comprising a balance base, a graduated curve mounted on the base, an adjusting rod-connected with the graduated curve at the rear end, a club holder fixed to the adjusting rod, an indicator fixed to the adjusting rod and engaging the graduated curve, and a slide fitted on a guide bar in the front of the balance base.

4,817,295

HOT AIR INDUCTION BOX

Samuel G. Jackson, P.O. Box 16587, Lubbock, Tex. 79490

Filed Aug. 7, 1987, Ser. No. 83,737
Int. Cl.[4] F26B *17/00*
U.S. Cl. 34—57 R **8 Claims**



1. A hot air induction box of the type used to heat seed cotton which is being transported by conveyance means along a path to a cotton gin, the induction box comprising:

an enclosure surrounding a portion of the path used by the conveyance means, the enclosure having sidewalls which define a closed interior with an entrance opening and a cotton exit;

passage means for connecting said cotton exit to existing external suction means for pneumatically drawing seed cotton from the conveyance path, through the enclosure and out the cotton exit;

a heating duct which connects the enclosure to a source of hot air at atmospheric pressure; and

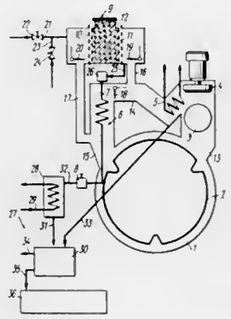
gate means partially restricting the entrance opening so as to be compliant to the entrance of seed cotton but to restrict the entrance of air to thereby create a partial vacuum within the enclosure, the vacuum so created being effective to pull hot air into the enclosure through the heating duct to heat the cotton as it passes to the cotton exit.

4,817,296

DRY-CLEANING MACHINE FOR TEXTILES

Vladimir M. Kabakov, ulitsa Profsojuznaya, 21, korpus 4 4, kv. 174, Moscow, and Ivan E. Razinkov, Zheleznodorozhny pereulok, 2a, kv. 75, Kharkovskaya oblast, Gotvald, both of U.S.S.R.

Filed Nov. 5, 1987, Ser. No. 117,674
Claims priority, application U.S.S.R., Dec. 16, 1986, 4157466
Int. Cl.[4] D06F *43/08*
U.S. Cl. 34—77 **6 Claims**



1. A dry-cleaning machine for textiles, comprising:

a housing;

a cage drum enclosed in said housing;

a blast fan;

an air cleaner to get rid of mechanical impurities;

an air cooler;

an air heater having a means for heating air by condensation of steam, the means for heating air having an inlet and outlet;

an adsorber;

an adsorbent contained in said adsorber for adsorbing a solvent;

an inlet connection for steam admission to said adsorber during desorption of said solvent from said adsorbent;

an outlet connection for discharging a mixture of steam and vapours of said desorbed solvent from said adsorber said outlet connection for discharging a mixture of steam and vapours of said desorbed solvent communicates with the inlet of said means for heating air;

air conduits, communicating together with said cage drum, blast fan, air cleaner, air cooler, air heater and adsorber, for the air to flow in a path through the air conduits;

a system of valves provided in said air conduits for changing the path of air flow during drying the textiles under process and for preventing steam from penetrating into said cage drum in the course of desorption of said solvent;

a means, in communication with the outlet of the means for heating air, for cooling and separating a mixture of condensates of steam and desorbed solvent vapours passing from the means for heating air;

a means for separating the condensate from the steam and desorbent solvent vapours and discharging it from said means for heating air, said means being interposed between said air heater and said means for cooling and separating the mixture of condensates; and wherein

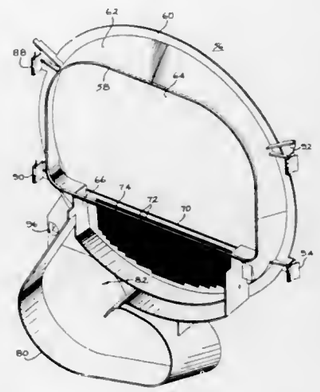
the amount of said adsorbent contained in said adsorber and its adsorption capacity are so selected as to provide for adsorption of the vapours of said solvent at the final stage of drying the textiles under process involving air circulation through said cage drum and said adsorber within one operating cycle of the machine.

4,817,297

FABRIC DRYER SUPPORT STRUCTURE

Daniel N. Toma, Georgetown, Ind., and Thomas P. Mitchell, Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 14, 1987, Ser. No. 132,872
Int. Cl.[4] F26B *11/04*
U.S. Cl. 34—133 **10 Claims**



1. A fabric dryer including:

a housing having a rear panel, a pair of spaced apart side panels jointed to said rear panel and a front panel removably mounted for closing the space between the front edges of said side panels;

said front panel including a front wall and a pair of rearwardly projecting side flanges, each of said side flanges terminating in an inwardly projecting lip; said front wall including a flange defining an access opening therein;

a clothes receiving drum mounted in said housing for rotation about a generally horizontal axis, said drum having a front flange defining a drum opening generally aligned with the access opening in said front wall; and

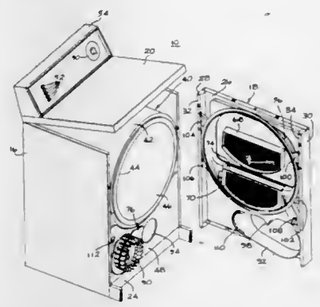
a separate intermediate member bridging between the front of said drum and said front wall around the access opening, said intermediate member defining an outlet opening for exit of air from said drum and forming a mount for an exit air filter, said intermediate member including a flange fitting around said flange in said front wall and a plurality of resilient tabs received between said front wall and said inwardly projecting lips for connecting said intermediate member to said front panel.

4,817,298

FABRIC DRYER WITH IMPROVED BLOWER ASSEMBLY

Daniel N. Toma, Georgetown, Ind., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 14, 1987, Ser. No. 132,871
Int. Cl.[4] F26B *11/04*
U.S. Cl. 34—133 **12 Claims**



1. A fabric dryer including:

a dryer housing having a rear wall, a pair of spaced apart side walls and a front wall;

a fabric receiving drum mounted in said housing for rotation about a generally horizontal axis; the front of said drum defining a drum opening spaced from said housing front wall;

a support panel positioned rearwardly of said front wall and supporting the front of said drum;

a blower mechanism for drawing air through said drum and discharging the air from said dryer housing; said blower mechanism including a drive motor mounted rearward of said support panel and a tangential flow blower wheel mounted forward of said support panel and driven by said motor; and

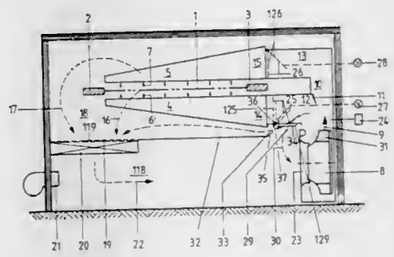
means, including said support panel, providing a blower housing containing said blower wheel.

4,817,299

CONVECTION HEAT TREATING APPARATUS FOR THERMAL TREATMENT OF A TRAVELING SUBSTRATE

Manfred Pabst, Cologne, Fed. Rep. of Germany, assignor to A. Monforts GmbH & Co., Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,524
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3627904
Int. Cl.[4] F26B *13/00*
U.S. Cl. 34—155 **20 Claims**



1. A convection heat treating apparatus for thermal treat-

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ment of a traveling substrate, such as drying or heat setting of a traveling web of textile material with a treatment gas, said apparatus comprising:

an enclosure through which said substrate travels and within which treatment gas circulates,

a pair of application chambers within said enclosure arranged in essentially parallel spaced facing relation on opposite sides of said traveling substrate, said application chambers having inlets for receipt of treatment gas within said chambers and outlets through which treatment gas is applied from said application chambers onto said substrate,

a distribution chamber communicating with said pair of application chambers through said inlets for distribution of said treatment gas to said application chambers,

means for circulating treatment gas through said distribution chamber and said application chambers onto said traveling substrate,

a return flow chamber having an opening in said enclosure for receiving treatment gas after application onto said substrate for flow of said treatment gas through said return flow chamber to said circulating means for recirculation of said treatment gas,

a branch opening in said distribution chamber to allow passage of treatment gas from said distribution chamber to said opening in said return flow chamber without passing through said application chambers, and

a flow control means for regulating flow of treatment gas from said distribution chamber into said application chambers and for controlling flow of treatment gas through said branch opening, said flow control means being adapted to vary the opening of said inlet between closed and open and to maintain said branch opening closed when said inlet opening is varied between open and partially opened to an intermediate extent and to open said branch opening when said inlet is closed from said intermediate extent.

4,817,300

APPARATUS FOR UNIFORMLY SUBJECTING A FLOW-TRAVERSABLE HEATABLE MATERIAL TO A FLUID FLOW

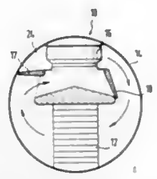
Carl Kramer, and Reinhard Grundmaan, both of Aachen, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,788

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701995

Int. Cl.⁴ F26B *21/06*

U.S. Cl. 34—191 **3 Claims**



1. An apparatus for uniformly subjecting a flow-traversable heatable material to a fluid flow comprising:

(a) a fan serving as flow drive;

(b) flaps closing or opening alternately in dependence upon the desired flow direction;

(c) a radial-flow fan installed above the plane of the flaps comprising a spiral housing blowing out on at least two sides;

(d) the volume flow emerging from the discharge openings of said spiral housing is adapted to be supplied to the heatable material from the one or from the other side simply by alternate actuation of the flaps; and

(e) the installation space of the radial-flow fan above the flaps is a portion of a circular cylinder and has the cross-section of a circular segment.

4,817,301

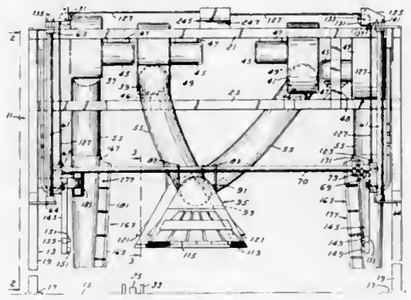
APPARATUS FOR DRYING VEHICLES

James A. Belanger; Robert J. Wentworth, both of Northville; Graham J. Astley, Novi, and Barry S. Turner, Livonia, all of Mich., assignors to Belanger, Inc., Northville, Mich.

Filed May 27, 1987, Ser. No. 55,581

Int. Cl.⁴ F26B *19/00*

U.S. Cl. 34—243 C **55 Claims**



1. In an apparatus for drying vehicles, a framework upon a floor surface having an axis adapted to receive a vehicle moving along said axis;

a transverse rotatable lift rod having ends which are guidably and rotatably mounted upon said framework for providing controlled vertical adjustments and rotational movement of said lift rod;

a transverse top nozzle housing connected to and depending from said lift rod for controlled vertical adjustments and for rotational movement therewith, said top nozzle housing when accidentally struck by a vehicle moving through said framework rotating said lift rod and swinging out of the path of the vehicle as it moves along the axis;

said top nozzle housing having an air inlet at its top communicating with an air chamber and downwardly extending laterally spaced sidewalls terminating in an elongated throated, downwardly opening air outlet communicating with said air chamber:

a pair of opposed elongated upright side air nozzle housings mounted upon opposite sides of said framework, each side air nozzle housing having an air inlet at its upper end, an elongated air chamber communicating with said air inlet and an elongated lateral nozzle including a series of vertically aligned orifices extending approximately the height of a vehicle, and inclined rearwardly at an acute angle toward the vehicle;

a plurality of motor-operated air blowers mounted upon said framework with each blower having an air outlet;

a plurality of flexible hoses interconnecting the air outlet of each blower with one of the housing air inlets respectively;

remote-controlled power means upon said framework connected to said lift rod for successively vertically raising and lowering said top nozzle housing to normally prevent contact with a vehicle moving through said framework;

said connection of said top nozzle housing to said lift rod including a pair of spaced mount blocks upon said housing sidewalls as a part thereof; and

a pair of laterally spaced upright support arms at their upper ends secured to said lift rod and at their lower ends secured to said mount blocks.

4,817,302

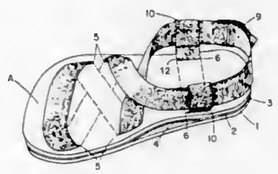
SANDAL CONSTRUCTION WITH IMPROVED STRAP ADJUSTMENT

Stephen B. Saltsman, 2344 County Rd. 225, Durango, Colo. 81301

Filed Apr. 18, 1988, Ser. No. 183,002

Int. Cl.⁴ A43B *3/12*

U.S. Cl. 36—11.5 **20 Claims**



1. A sandal comprising at least two laminations forming the upper and lower portions of the sandal, the upper lamination having a plurality of apertures therein, foot retention strap means having a plurality of first strap portions passing through the apertures, the strap means having a plurality of second portions extending transversely of the sandal between the laminations and with each of said second portions interconnecting two of said first strap portions, the strap means having parts above the upper lamination for attaching the sandal to a foot, said parts forming at least one loop from one of said apertures to another of said apertures and being manually engageable to pull said second portions relative to the upper lamination to adjust the size of each such loop, an adhesive between said laminations over essentially all the opposed surfaces of the laminations for securing the laminations to each other except where portions of the strap means lie therebetween, thin material adjacent opposite surfaces of at least part of said second portions of the strap means to prevent contact of the adhesive therewith wherever said material overlies said strap portions, said material being sufficiently thin to prevent any perception by the wearer of increased thickness of the sandal sole in the areas of said second transversely extending portions of the strap means and to allow said last mentioned portions to slide between the laminations as said strap parts are pulled to adjust the size of a respective loop.

4,817,303

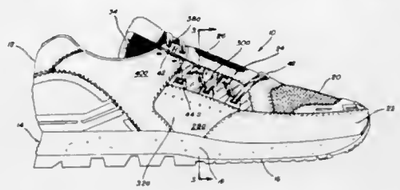
ATHLETIC SHOE HAVING A DUAL SIDE LACING SYSTEM

Lawrence Selbiger, Portland, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.

Filed Jul. 17, 1987, Ser. No. 74,651

Int. Cl.⁴ A43B *11/00*

U.S. Cl. 36—50 **10 Claims**



1. An upper for an athletic shoe, comprising:

a. a toe portion;

b. a lateral quarter panel having a lower edge attached to a shoe sole and having an upper edge, said lateral quarter panel having a first non-stretchable panel and a first elastic panel;

c. a medial quarter panel having a lower edge attached to a shoe sole and having an upper edge, said medial quarter panel having a second non-stretchable panel and a second elastic panel;

d. a vamp for substantially covering and protecting a forefoot and extending from said toe portion, said vamp having a lateral side and a medial side, said lateral side of said vamp being attached to the upper edge of said lateral quarter panel and said medial side of said vamp being attached to the upper edge of said medial quarter panel;

e. means for lacing the lateral side of the shoe comprising at least one eyelet connected to the lateral side of said vamp and at least one eyelet connected to said lateral quarter panel; and

f. means for lacing the medial side of the shoe comprising at least one eyelet connected to the medial side of said vamp and at least one eyelet connected to said medial quarter panel; said means for lacing the lateral side of the shoe and means for lacing the medial side of the shoe being oriented so that both said means can be laced with a single lace.

4,817,304

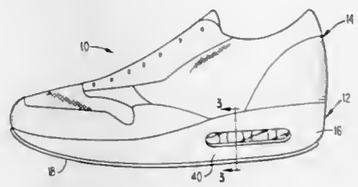
FOOTWEAR WITH ADJUSTABLE VISCOELASTIC UNIT

Mark G. Parker, Beaverton, Oreg.; David M. Forland, Vancouver, Wash.; Lester Q. Lee, Gaston, Oreg.; Thomas McGuirk, Lake Oswego, Oreg.; Daniel R. Potter, and Stephen F. Potter, both of Beaverton, Oreg., assignors to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.

Filed Aug. 31, 1987, Ser. No. 90,926

Int. Cl.⁴ A43B *13/12, 13/18, 13/20*

U.S. Cl. 36—114 **26 Claims**



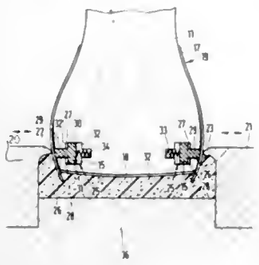
1. Footwear comprising an upper, a sole member attached to said upper, said sole member including a sealed inner member of flexible material, said inner member being inflated with a gaseous medium to form a compliant and resilient insert having spaced upper, lower, front, back and side surfaces, an elastomeric yieldable outer member encapsulating said insert about preselected portions of said insert, said preselected portions including a major portion of at least said upper or lower surface and a portion of said side surfaces, said inner and outer members functioning together to form a viscoelastic unit for attenuating shock and returning energy of foot impact,and means for adjusting the impact response of said viscoelastic unit to have the effect of said insert dominate the impact response function of said unit in a predetermined area adjacent at least one side of said insert, said adjusting means including a gap in said outer member along the side of said insert adjacent said predetermined area, said gap extending from a surface of said insert to form an open space where the flexible material of said sealed inner member can flex during foot impact, said predetermined area having a forward end spaced rearward of the front surface of said insert and a rearward end spaced forward of the back surface of said insert whereby said impact response adjustment to said viscoelastic unit is substantially localized between the forward and rearward ends of said predetermined area.

4,817,305

LAST FOR SHOE SHAFTS WHICH HAS A GENERALLY T-SHAPED GROOVE AND A SPRING-BIASED GENERALLY T-SHAPED PROFILE BAND THEREIN

Walter Wetzel, Achim, Fed. Rep. of Germany, assignor to Klöckner Ferromatik Desma GmbH, Malterdingen, Fed. Rep. of Germany

Filed Nov. 27, 1987, Ser. No. 126,179
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640561
Int. Cl.[4] A43D *3/00, 65/02*
U.S. Cl. 12—133 R 12 Claims



1. In a last for supporting a shoe shaft and which is cooperable with lateral mold parts and a bottom stamp for molding a sole onto a shoe shaft mounted on the last, the last having a groove therearound that extends inwardly from a side surface thereof, and a profile band of flexible material which is movably positioned in the groove and which can contact a shoe shaft mounted on the last opposite where sealing edges of the lateral mold parts will contact the shoe shaft, said last including spring means for biasing said profile band towards said side surface thereof and against a shoe shaft mounted on the last, the improvement wherein (a) said groove is formed by a linear inlet portion which communicates with the side surface of said last and a guide portion which is formed by two oppositely-extending legs that are oriented perpendicularly to said linear inlet portion, thereby providing said groove with a generally T-shaped cross section, said linear inlet portion being horizontally oriented when said last is vertically oriented and said legs of said guide portion providing opposite stopping surfaces which extend perpendicularly to said linear inlet portion, and (b) wherein said profile band includes a linear stem part and a foot part which is formed by two oppositely-extending legs that extend perpendicularly to said linear stem part, thereby providing said profile band with a generally T-shaped cross section, said stem part of said profile band being positioned in said inlet portion of said groove and said foot part of said profile band being positioned in said guide portion of said groove, said profile band being dimensioned to be movable without lateral play within said groove toward and away from said side surface of said last, said legs of said profile band being movable between opposite stopping surfaces of said legs of said guide surface of said groove.

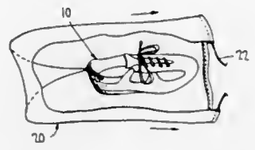
4,817,306

FOOTWEAR ARTICLE WITH ATTACHED CARRYING BAG

Earl F. Bayer, 23 Dahlia Rd., Somerset, N.J. 08873

Continuation-in-part of Ser. No. 38,140, Apr. 14, 1987, abandoned. This application Dec. 7, 1987, Ser. No. 131,234
Int. Cl.[4] A43B *23/00;* A41D *27/20*
U.S. Cl. 36—136 17 Claims

1. A footwear article with attached carrying bag which comprises an upper, means attached to said footwear article to provide a storage pocket, a carrying bag, and connection means attaching said carrying bag to said footwear article such that said carrying bag can be sufficiently large that, when extended away from said pocket chamber and turned inside out, it will contain the footwear article to which it is attached



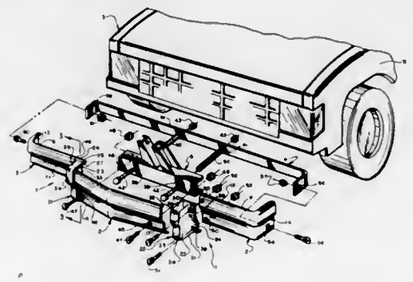
and a companion footwear article yet can be folded into, a compact unit and stored with said storage pocket when not in use.

4,817,307

BUMPER MOUNTING ASSEMBLY FOR A SNOWPLOW

David L. Hardgrove, 8433 Cleveland Ave., North Canton, Ohio 44720

Filed Jun. 23, 1988, Ser. No. 210,365
Int. Cl.[4] E01H *5/00*
U.S. Cl. 37—197 7 Claims



6. The device defined in claim 3 in which the mounting bracket plate includes top, bottom, front, and rear edges; and in which the front and rear edges of said plate have a contour generally similar to the contour of the bumper sections.

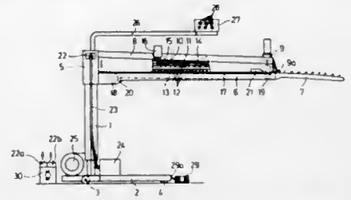
4,817,308

STEAM PRESSING STATION FOR PRESSING FABRIC SEAMS

Fritz M. Fend, Regensburg, and Dieter May, Walleshausen, both of Fed. Rep. of Germany, assignors to Velt GmbH & Co., Landesberg, Fed. Rep. of Germany

Filed Sep. 18, 1987, Ser. No. 98,492
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632839; Jul. 2, 1987, 8709122[U]
Int. Cl.[4] D06F *71/30*
U.S. Cl. 38—1 B 14 Claims

1. A steam pressing station for pressing fabric seams, comprising:
- a support stand;
- a blower;
- a lower pressing member fastened to said stand, said lower pressing member being formed with a suction chamber, said suction chamber being connected to said blower, said lower pressing member including a conveyor belt forming a pressing surface of said lower pressing member;
- motor means operatively connected to said conveyor belt for selectively revolving same in either of two opposite directions;
- an upper pressing member fastened to said stand above said lower pressing member, said upper pressing member including a form pressing body movable in a direction substantially perpendicular with respect to said pressing surface of said lower pressing member, said form pressing body being provided with a heatable seam chamber connectable to a steam generator, said form pressing body being further provided with a pressing plate defining a lower side of said steam chamber and having a plurality of steam openings;
- fabric seam threading means attached to said upper pressing member at a free end thereof for separating fabric edge strips extending from a seam to be pressed;
- a fabric receiving member fastened to said lower pressing member at a free end thereof;



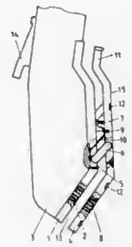
- fabric edge holding means for clamping against said conveyor belt a leading edge of a fabric piece to be pressed upon a drawing of said leading edge past said fabric seam threading means and for continuing to bold said leading edge to said conveyor belt during a drawing of said fabric piece between said lower pressing member and said upper pressing member and past said fabric seam threading means, said fabric edge holding means being movably mounted to said stand to follow motions of said conveyor belt at said pressing surface.

4,817,309

HAND HELD STEAM PRESSER

Karlheinz Frank, Offenbach am Main; Christoph Hanschke, Dreieich, and Franz A. Stützer, Offenbach am Main, all of Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,799
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703763
Int. Cl.[4] D06F *71/28*
U.S. Cl. 38—15 2 Claims



1. A hand-held steam presser including a support plate having steam holes and forming an outer wall of said hand-held steam presser including;
- (a) a pressure plate releasably fixed to said support plate for forming a gap between said support plate and said pressure plate for insertion of a wrinkled garmet therebetween the inside surfaces of the pressure plate and support plate comprising in a lengthwise direction a plurality of non planar mating surfaces,
- (b) said pressure plate containing steam openings,
- (c) said steam openings registering with said steam holes,
- (d) a holder connected to said support plate,
- (e) said holder and said pressure plate hinged together by at least a pair of spacers rotatable about articulation points, and
- (f) said pressure plate movable towards said support plate by a handle connected thereto against pressure applied by a spring.

4,817,310

THERMALLY IMPRINTABLE BAGGAGE TAG OF PAPER

Thomas J. Breen, Northbrook, and Stephen H. King, Schaumburg, both of Ill., assignors to Rand McNally & Company, Skokie, Ill.

Filed Dec. 11, 1987, Ser. No. 131,941
Int. Cl.[4] G09F *3/100*
U.S. Cl. 40—299 6 Claims



1. A thermally imprintable elongated, generally rectangular baggage tag and severable stub assembly comprising:
- a sheet assembly having an outer surface and an opposite lower surface, and comprising a rectangular first highly calendered, dense bond paper sheet defining said outer surface, said outer surface of the first paper sheet being generally smooth and relatively flat, a second rectangular paper sheet of the same dimensions as the first sheet, a plurality of reinforcing fibers running longitudinally only of the lengths of said first and second sheets and lying parallel to each other, said first and second sheets being laminated to each other by an adhesive with said fibers being sandwiched therebetween,
- a first transverse score line in said sheet assembly to define a baggage tag portion and a stub portion along which said stub portion may be severed from said baggage tag portion, said score line substantially severing said reinforced fibers,
- an adhesive layer covering at least part of the lower surface of said sheet assembly,
- and a heat sensitive coating on the outer surface of said first sheet for facilitating thermal imprinting of data on the outer surface of said baggage tag assembly.

4,817,311

DECORATIVE BALL DEVICE

Raymond Ong S. T., Fl. 7-1, No. 149, Kee Lung Road, Section 1, Taipei, Taiwan

Filed Dec. 16, 1987, Ser. No. 133,961
Int. Cl.[4] G09F *19/00*
U.S. Cl. 40—410 5 Claims

1. A decorative ball device comprising:
- a transparent hollow sphere with a predetermined diameter, the interior of said sphere containing a liquid and a plurality of small pieces, said sphere having a downwardly extending annular skirt, said annular skirt having an annular opening formed therein;
- a pump case being disposed below the annular opening of said skirt, the interior of said pump case having a chamber which receives a blade, a guide box being integrally formed with said pump case, said guide box communicating with said chamber through a hole, said pump case having an outlet channel and an inlet channel at its top portion;
- a motor being mounted to one side of said pump case in such

a manner that said blade in said pump case is joined with a shaft of said motor;

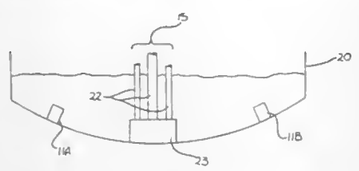
a sealing ring being disposed between said skirt and said pump case, said sealing ring having a downward flap to tightly fit the inner periphery of said skirt and the outer periphery of said pump case, said sealing ring having a supporting plate which extends into said sphere, said sealing ring further having a central aperture respectively



communicating with said outlet channel and inlet channel, said supporting plate having a pair of holes at its bottom and said holes respectively correspond to said outlet channel and said inlet channel, the top surface of said supporting plate having s puppet thereon;

whereby when the liquid is driven to circulate in said sphere by said blade driven by said motor, said pieces may move with the circulating liquid flow to spread throughout said sphere.

4,817,312
USER ACTIVATED FOUNTAIN DISPLAY
Mark Fuller, Studio City, and Alan S. Robinson, El Monte, both of Calif., assignors to Wet Enterprises, Inc., Burbank, Calif.
Filed Feb. 18, 1987, Ser. No. 15,970
Int. Cl.[4] B05B *17/08*
U.S. Cl. 40—439 **21 Claims**



14. A water display comprising:

a fountain pool;

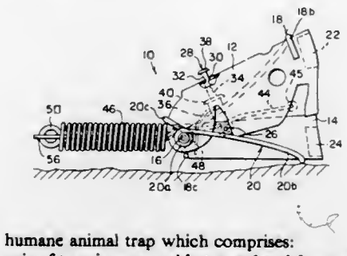
at least one sound transducer disposed in said fountain pool below the surface of the water therein for providing a transducer signal responsive to sound transmitted through the water in said fountain pool;

signal conditioning means coupled to said at least one sound transducer and responsive to the transducer signal therefrom to provide an output signal responsive to a transducer signal caused by a predetermined object entering said fountain pool;

a fountain;

a fountain control means coupled to said signal conditioning means and said fountain and responsive to the output signal of said signal conditioning means to cause said fountain to provide a time limited water display.

4,817,313
HUMANE ANIMAL TRAP
Alfred Falzon, 78-08 153rd Ave., Howard Beach, N.Y. 11414, and Frederich Hoffman, 736 Martha St., Elmont, N.Y. 11003
Filed Aug. 29, 1988, Ser. No. 237,835
Int. Cl.[4] A01M *23/26*
U.S. Cl. 43—88 **3 Claims**



1. A humane animal trap which comprises:

(a) a pair of trap jaws movable toward and from each other and including an upper trap jaw having a top and side walls and a lower trap jaw having a bottom and side walls overlapping said side walls of said upper trap jaw;

(b) a first pivot pin pivotly connecting said trap jaws together;

(c) a pair of springs disposed on said first pivot pin tending to move said trap jaws toward each other;

(d) a pair of cushions, which can be scented for attracting an animal, are each removably attached to inner faces of said walls of each of said trap jaws being sufficiently smooth, soft and unobstructed to prevent injury to jaws of an animal when closed upon the same;

(e) a second pivot pin carried by said lower trap jaw;

(f) a latch arm carried by said second pivot pin and extending through an opening the said upper trap jaw, said latch arm having a notch on one side thereof adapted to engage said top wall of said upper trap jaw and hold said trap jaws open against action of said springs and a series of notches on other side thereof adapted to engage top surface of said top wall of said upper trap jaw to prevent opening of said trap jaws;

(g) a spring tending to move said series of notches into engagement with said top wall of said upper trap jaw;

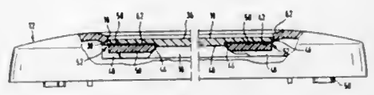
(g) a spoon shaped bait-receiving member connected to said latch arm; and

(i) a generally C-shaped retaining bar having a ball shaped member formed thereon, carried by said second pivot pin and located between said trap jaws in advance of said spoon shaped bait-receiving member and adapted to engage and hold front teeth of the animal, said trap jaws being movable independently of said retaining bar, so that when the animal opens its mouth and closes its jaws upon the bait, said latch arm will rock and disengage causing said trap jaws to move toward each other with cushions bearing against the jaws of the animal for trapping the animal thereto .

4,817,314
CONTAINER FOR ACCOMMODATING A PILE OF PICTURES
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
PCT No. PCT/EP86/00623, § 371 Date Jun. 11, 1987, § 102(e) Date Jun. 11, 1987, PCT Pub. No. WO87/03106, PCT Pub. Date May 21, 1987
PCT Filed Oct. 29, 1986, Ser. No. 59,873
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1985, 3539297
Int. Cl.[4] G09F *11/30*
U.S. Cl. 40—513 **40 Claims**

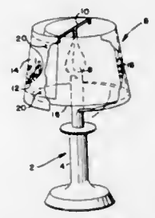
1. A container for a stack of substantially rectangular pic-

tures comprising a housing having a large side, a display opening in said large side permitting display of a picture therebeneath, a slider reciprocable relative to said housing in a direction parallel to said large side, means for aligning said picture relative to said display opening, a recess in said large side, the recess having dimensions exceeding those of said display open-



ing, a transparent pane inserted into said recess from the exterior of said housing, support elements extending from the contour of said recess toward said display opening and beneath said pane so as to support it against the interior of the container, and means for masking the housing interior between said display opening and said recess contour so as to cover said aligning means.

4,817,315
THREE-DIMENSIONAL DISPLAY DEVICE FOR LAMPSHADES
Brian G. Kammerer, and Glenda M. Kammerer, both of 220 Gerdes Rd., New Canaan, Conn. 06840
Filed May 20, 1987, Ser. No. 52,575
Int. Cl.[4] G09F *13/00*
U.S. Cl. 40—554 **21 Claims**



1. A decorative display device comprising:

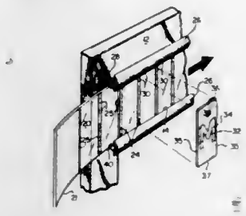
an electric lamp comprising a base portion, a frustoconical configured lampshade mounted to said base portion, and illuminating means positioned within lampshade;

said frustoconical lampshade comprising a viewing opening cut out from a portion of said lampshade;

a first frame of material having a first pictorial representation thereon and mounted to cover said viewing opening for displaying said first ptictorial representation through said viewing opening; and

at least a second frame of material having a second pictorial representation thereon and being configured in a frustoconical shape, said second frame being mounted within said lampshade so that said first and second pictorial representations are in alignment with each other and with said viewing opening, said first and second frames being spaced apart from each other and being mounted concentrically with respect to each other and with respect to the curavature of said lampshade proximate to said viewing opening and said second pictorial representation being predistorted when viewed flat such that it is substantially undistorted when viewed in said frustoconical shape.

4,817,316
SIGN ASSEMBLY
Robert E. Walker, 2824 Brighton Ct., Westchester, Ill. 60153
Filed May 18, 1987, Ser. No. 51,296
Int. Cl.[4] G09F *13/04*
U.S. Cl. 40—576 **6 Claims**



1. A backlighted sign assembly comprising:

at least one face plate, said face plate comprising at least one elongated window-like opening;

retaining means for removeably retaining a custom strip of information to said face plate at said window-like opening when use of such a custom strip is desired;

a removable backing strip;

said retaining means for removeably retaining said backing strip to said face plate at said window-like opening when use of changeable copy is desired;

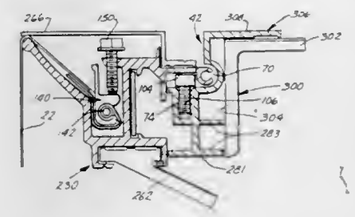
at least two wafers, each wafer comprising a background and at least one indicium;

said background of each of said wafers being relatively opaque compared to said indicium,

said retaining means for adjacently retaining said wafers to said face plate at said window-like opening; and

means on said backing strip for preventing the leakage of light from behind said backing strip forwardly between said adjacent wafers.

4,817,317
COMPONENT SIGN SYSTEM
Judson L. Kovalak, Jr., Rockford, Mich., assignor to SignComp, Inc., Comstock Park, Mich.
Filed Dec. 30, 1986, Ser. No. 947,689
Int. Cl.[4] G09F *17/00*
U.S. Cl. 40—603 **19 Claims**



1. A component display sign comprising:

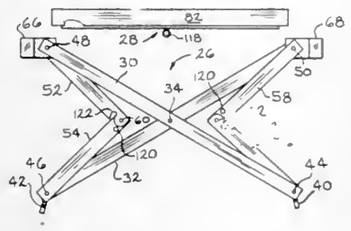
a generally rectangular main frame including a plurality of joined body frame members, each body frame member including an outer wall and a configured peripheral face flange extending generally perpendicular to said outer wall, said peripheral face flange of each body frame member defining an elongated, generally semicircular, outwardly opening hinge groove and an elongated drain channel adjacent said elongated hinge groove, said hinge groove defining a lower edge and said drain channel being integral with and extending along said lower edge;

a generally rectangular face frame including a plurality of

joined face frame members, each face frame member including an elongated hinge flange having an integral hinge bead, said integral hinge bead being disposed within one of said hinge grooves and wherein each of said hinge flanges defines a plurality of spaced apertures overlying one of said elongated drain channels; and

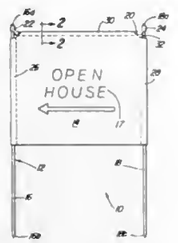
a plurality of hinge fasteners, each fastener positioned through an aperture of one of said face frame members and into a drain channel of one of said body frame members to capture said hinge bead within said hinge groove.

4,817,318
DEMOUNTABLE ROAD SIGN
C. Randolph Strauch, 934 Rogers St., Bucyrus, Ohio 44820
Filed Mar. 26, 1987, Ser. No. 30,119
Int. Cl.[4] G09F *7/02*
U.S. Cl. 40—610 **21 Claims**



1. In a demountable road sign having a ground engaging support including a base structure and an intermediate support structure, the improvement comprising, a frame having a pair of longer arms pivotally interconnected at their mid points, a sign housing engaging member at one end of each of said longer arms, spring means for providing biasing force to said frame, a pair of pivotally interconnected shorter arms, one end of one of said pair of shorter arms pivotally connected to said one end of one of said longer arms and one end of the other of said pair of shorter arms pivotally connected to the end opposite said one end of the other of said longer arms, a sign housing defining sign panel receiving opening and a rotationally biased roller disposed for rotation within said housing having a sign panel affixed thereto whereby said housing may be engaged by said sign housing engaging members and said sign panel extended across said frame.

4,817,319
COLLAPSIBLE SIGN
Ralph S. Vitale, 14943 Masonic, Warren, Mich. 48093
Filed Jun. 17, 1987, Ser. No. 63,235
Int. Cl.[4] G09F *15/00, 17/00*
U.S. Cl. 40—610 **7 Claims**



1. A collapsible sign comprising:
a collapsible frame including two upright frame members and at least one cross frame member, each of said frame members having two ends, said frame further including means for releasably securing each end of said at least one cross member to a first upper end of a respective one of said upright members, wherein each of said frame members has substantially the same width;
a flexible web;
means for releasably attaching said web to said frame members so that the web extends tautly between each of said upright members and is supported by said cross member; and
wherein said means for releasably securing comprises two resilient and flexible connectors, each connector adapted to engage an end of said at least one cross member and the first end of a respective one of said upright members;
wherein said resilient connectors comprise flexible tubular members having a tubular wall defining a central lumen, said central lumen being adapted to fit over and tightly engage the ends of said cross member and said upright member;
wherein each of said tubular members includes a notch centrally disposed through said tubular wall to facilitate bending of said tubular member.

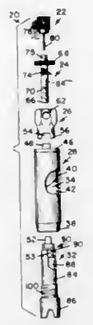
4,817,320
SHOPPER'S REMINDER SYSTEM
Linda S. Frayne, Miami, Fla., assignor to Ad-Aptations Inc., Miami, Fla.
Filed Jun. 25, 1987, Ser. No. 66,385
Int. Cl.[4] G09F *7/04*
U.S. Cl. 40—621 **5 Claims**



1. A reminder system for replacing household food items or like inventory, said system comprising:
a. a first base and a second base used in combination with one another and respectively including a first display surface integrally formed on said first base and a second display surface integrally formed on said second base, both said first and second display surfaces having a substantially planar configuration,
b. a mounting means formed on each of said first and second bases and extending outwardly therefrom for attachment of said first and second base in adjacent, communicating relation to one another on a supporting surface,
c. each of said first and second display surfaces formed of a magnetically attractable material and each comprising a dividing means formed thereon and disposed and structured to define a plurality of compartments on each of said first and second display surfaces,
d. said dividing means comprising a plurality of lines, a first number of which are parallel and spaced from one another and disposed in parallel relation to a longitudinal axis of each display surface, and a second number of said plurality of lines spaced apart in parallel relation to one another and disposed in transverse relation to said first number of lines,

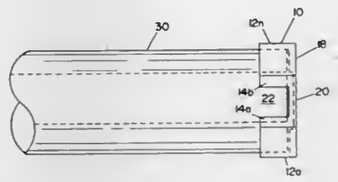
e. indicator means for visually representing a plurality of different categories of inventory and comprising a plurality of indicator elements,
f. indicia means for identifying individual ones of said plurality of categories formed on each of said indicator elements and disposed in an exposed, viewable position when said indicator elements are mounted on either of said first or second display surfaces,
g. at least some of said plurality of indicator elements each comprise said indicia means being defined by a pictorial representation of one of a plurality of categories and each of said pictorial representations comprising a miniature, three-dimensional replica of one category of inventory,
h. connector means secured to each of said plurality of indicator elements for attachment thereof to either of said first or second display surfaces and comprising a magnetic member secured to each of said indicator elements and disposed for removable, magnetic attraction to either of said first and second display faces,
i. said first and second bases each further including a title portion formed thereon in spaced relation to respective ones of said first and second display surfaces and each title portion including informative labeling means thereon for identifying each of said first and second display surfaces as being indicative of needed inventory or not needed inventory,
j. disposition of any of said indicator elements on one of said display surfaces being indicative of inadequate inventory supply of an indicated category of inventory and positioning of any of said display elements on the other of said display surfaces being indicative of an inadequate inventory supply of an indicated category, and
k. transfer of any of said indicator elements to the other of said display surfaces being indicative of a current status of inventory supply of a given category of inventory.

4,817,321
MULTIPURPOSE TOOL FOR A MUZZLE LOADING CAP LOCK FIREARM
John L. Clement, Benton, Ark., assignor to K. W. Thompson Tool Co., Inc., Rochester, N.H.
Filed Jan. 22, 1980, Ser. No. 147,820
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **21 Claims**



1. A multipurpose tool for a muzzle loading cap lock firearm comprising:
(a) a propellant measuring body having a cavity for holding a quantity of propellant and an opening to the cavity at the end of said body,
(b) a nipple wrench having a socket at one end for engaging a complementary shaped portion of a nipple which is threaded into the barrel of a cap lock firearm, said socket having an axis of rotation wherein rotation of said socket about said axis causes rotation of said nipple for unthreading the nipple from the firearm's barrel and threading the nipple into the firearm's barrel, said wrench having a bore which extends entirely through the wrench,
(c) a handle which is removably attached to said wrench for rotating said wrench about said axis, said handle having a shank which has a free end which is extendable through said bore so that a portion of said free end extends beyond said bore, said handle having a stop which limits the extension of said free end beyond said bore and,
(d) connecting means for removably attaching said shank to said propellant measuring body when said shank is located in said bore and extends beyond said bore, whereby said propellant measuring body, said wrench and said handle are combined for convenience purposes.

4,817,322
BARREL PROTECTOR FOR A WEAPON
Raymond Dietz, Elko, and Mark E. Morris, Chaska, both of Minn., assignors to Quality Mold, Inc., Eden Prairie, Minn.
Filed Sep. 9, 1987, Ser. No. 94,414
Int. Cl.[4] F41C *21/14*
U.S. Cl. 42—96 **6 Claims**



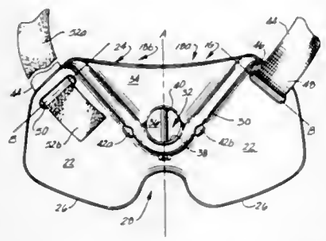
1. A barrel protector having a bore for at least one barrel of a firearm comprising:
a. side rim means for surrounding an end of a barrel of said firearm
b. said side rim means including an inwardly extending thick continuous covering member of a flat surface in a center of said rim means for encompassing and abutting up against an end portion of said barrel; and,
c. a substantially thin central member portion of said continuous covering member of a thickness of a range of 0.006–0.008 inches, said thin central member portion, said thick continuous covering, and said barrel protection all of the same polymer material whereby said thin central member portion breaks away when a projectile of said firearm is fired.

4,817,323
BELT FOR USE WITH A FISHING ROD
Dennis Braid, 8046 Oso Ave., Canoga Park, Calif. 91306
Filed Mar. 23, 1987, Ser. No. 29,085
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 **4 Claims**

1. A device for holding a fishing rod to the body in an angling position comprising:
a rigid fixture substantially symmetrical about an imaginary center line, said fixture including a forward surface having an upper edge, a bore into which the end of a fishing rod may be inserted and a raised V-shaped ridge having a crotch at the bore and legs which extend upwardly and laterally outwardly from the bore to thereby form a guide surface between the legs of the V-shaped ridge that extends between the bore and the upper edge of the forward surface of the fixture for guiding a rod end into the bore, said fixture also having a rear surface adapted to lay against the body to assist in holding the rod when in the angling position and further including at each end a slot angled upwardly at an acute angle with respect to said center line; and

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a belt adapted at one end to be attached through one slot, wrap over the hips and around the lower back of the user



and be adjustably attached at the other end through the other slot, said slots cooperating with the belt to position the fixture adjacent the body of the user.

4,817,324

PALMING GRIP FISHING ROD AND REEL ASSEMBLY

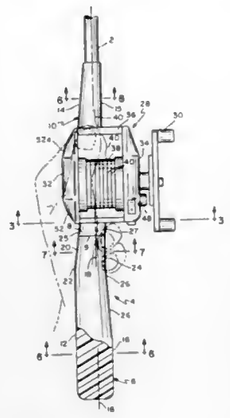
John E. Brackett, Minneapolis, and Larry J. Dahlberg, Brainerd, both of Minn., assignors to Fishing Designs, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 946,823, Dec. 29, 1986, Pat. No. 4,697,376, which is a continuation-in-part of Ser. No. 842,309, Mar. 21, 1986, Pat. No. 4,631,853, which is a continuation-in-part of Ser. No. 610,609, May 15, 1984, Pat. No. 4,577,432. This application Oct. 5, 1987, Ser. No. 104,093

The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.

Int. Cl.[4] A01K *87/00*

U.S. Cl. 43—23 **29 Claims**



1. A fishing rod and handle assembly comprising:
a rod shaft having a longitudinal, central axis;
an elongated handle secured to said rod shaft;
a reel seat segment on said handle having a reel seat thereon;
a foregrip segment on the front end of said handle forward of said reel seat segment and a rear portion of said foregrip segment extending rearwardly over at least one-half the length thereof being continuously laterally offset from the longitudinal, central axis of said rod shaft towards the opposite side of said reel seat segment from that on which the crank of a reel mounted on said reel seat segment will be located, and said laterally offset portion of said foregrip comprising the palming grip said thereof and
an upward force-resistance cross section along at least a portion of said foregrip segment as viewed along a vertical cross sectional plane extending generally perpendicular to said rod shaft axis with said rod shaft oriented horizontally, said upward force resistant cross section comprising an inclined surface formed on the top of said foregrip segment by cutting away a portion of the top of said foregrip on the laterally offset, palming grip side thereof, said inclined surface sloping generally downwardly and outwardly towards said palming grip side of said foregrip, whereby a relatively large part of the user's palm and fingers may be positioned on top of said inclined surface to effectively resist leveraged upward rod forces acting on said foregrip.

4,817,325

FISHING LURE

John Thomas, 1984 Canna St., Thousand Oaks, Calif. 91360

Filed May 18, 1987, Ser. No. 51,502

Int. Cl.[4] A01K *83/00*

U.S. Cl. 43—42.1 **8 Claims**



1. A fishing lure comprising:
(a) a plurality of fishing hooks each having a shank and a hook portion attached to the shank, each hook portion having a hooking end, means for connecting the fishing hooks together along their shanks such that the hook portions are circumferentially spaced from each other;
(b) body means of flexible foam material having a central opening for receiving the shanks in the central opening and the hook portions extending out of the body means, the body means having a relaxed state and a compressed state, the body means having a first body portion the body means having a second body portion attached to the top of the first body portion, the second body portion having an outside surface contacting the outer surface of the first body and tapering inward from the outside surface of the first body portion;
(c) wherein the radius of the body member in its relaxed state at the hook portion is greater than the distance from the shank to the hook portions, the hook portions pushing on the foam material to embed themselves partially in the body means.

4,817,326

WEIGHTED CASTING BUBBLE

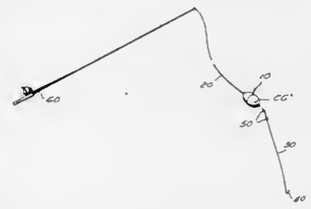
Clarence Benjestorf, 14325 McNab, #80, Bellflower, Calif. 90706

Filed Nov. 9, 1987, Ser. No. 117,982

Int. Cl.[4] A01K *93/00*

U.S. Cl. 43—43.1 **1 Claim**

1. A fishing tackle system of variably-predetermined-weight, variably-predetermined-density, shifting-center-of-gravity fishline-attachable combinatorial casting weights and controlled floatation devices, the fishing tackle system comprising:
a plurality of selectively weighted casting bubbles, each weighted casting bubble comprising:
a hollow tube, universal among the plurality of weighted casting bubbles, capable of passing a fishing line through its bore;
a bubble member, universal among the plurality of weighted casting bubbles, disposed about the tube for creating an airtight chamber;
a predetermined amount, unique to each weighted casting bubble, of positionally shifting high density material;
wherein by the predetermined amount of high density material the aggregate weight and density of the weighted casting bubble is also predetermined;
wherein by the positional shifting of the high density material during casting and during retrieving of the weighted casting bubble its center of gravity is shifting; and
wherein selected ones of the plurality of selectively weighted casting bubbles include surface coloration suitable to attract fish;
wherein the surface coloration is gradient in lightness in proportion to the density of each of the selected ones of the plurality of selected weighted casting bubbles.



4,817,327

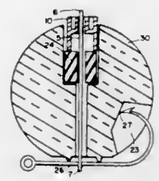
HOOK KEEPER FISHING FLOAT

Thomas J. DeKay, 355 NE. Elm Ter., Pine Crest Lakes, Jensen Beach, Fla. 34957

Filed Jul. 14, 1988, Ser. No. 218,953

Int. Cl.[4] A01K *91/00*

U.S. Cl. 43—43.1 **10 Claims**



1. A fishing float and fish hook keeper for alternative attachment to a fishing line and to a fish hook for protectively covering the point thereof while engaging the shank of said hook, comprising:
a lightweight float body having an axial bore extending therethrough with a portion of said bore providing a spring seat;
a spring biasing means having a first end and a second end, said biasing means mounted at said first end against said spring seat;
a plunger having an axial hole therethrough, said plunger extending into said bore and into engagement with said biasing means at said second end, said biasing means biasing said plunger outwardly of said bore;
a shaft extending axially of said bore and through said hole in said plunger, said shaft having first and second hooked end portions, said first hooked end portion being biased against the outermost end of said plunger by said biasing means for engaging said fishing line therebetween and said second hooked end portion being biased against said float body for engaging said fishing line therebetween in a first mode of operation and for engaging said shank of said fish hook therebetween in a second mode of operation;
a point-receiving recess in said float body for protectively receiving said point of said fish hook while said shank is engaged by said second hook portion.

4,817,328

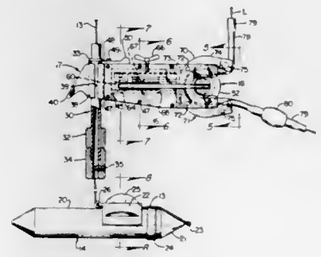
RELEASABLE DOWNRIGGER TROLLING APPARATUS

Susan I. Hartley, and Ralph L. Short, both of Rock Springs, Wyo., assignors to Susan I. Hartley and Hartley Trolline Limited, both of Rock Springs, Wyo., a part interest

Filed Dec. 19, 1986, Ser. No. 943,684

Int. Cl.[4] A01K *91/00*

U.S. Cl. 43—43.12 **16 Claims**



1. A line release mechanism for releasably securing a fishing line to a cable comprising:
a body having one end secured to said cable and a line-receiving groove at an opposite end thereof, a guide member including a guide surface thereon, said groove oriented in a direction substantially parallel to said guide surface, pivot means pivotally mounting said guide member for movement between a closed position in which said guide surface is disposed in confronting relation to said groove to define an arcuate guide path with said fishing line extending along said guide path between said groove and said guide surface and an open position in which said guide member is moved to one side and out of the path of said fishing line in response to a predetermined amount of force applied to said guide member in a direction away from said line-receiving groove, said guide member defined by a wheel mounted on an axis normal to the extension of said fishing line between said wheel and said line-receiving groove, said guide surface formed on an external surface of said wheel, said line-receiving groove recessed into said opposite end of said body, and said pivot means including an arm member having one end pivotally connected to said wheel for pivotal movement of said wheel about an axis normal to and intersecting said wheel axis.

4,817,329

EXTERMINATION OF INSECTS BY HEAT

Charles Forbes, 7343 Via Lorado, Rancho Palos Verdes, Calif. 90274

Filed Aug. 29, 1986, Ser. No. 902,317

Int. Cl.[4] A01M *1/20*

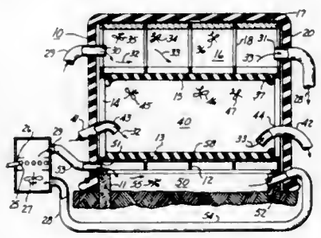
U.S. Cl. 43—124 **14 Claims**

1. A method of exterminating wood-destroying insects in situ whose situs is embodied at a substantial depth inside a wooden structural member of an urban structure having surfaces, said method comprising:

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heating an environmentally acceptable gas which does not undergo phase change at any temperature between ambient and the temperature utilized herein, to an elevated temperature;

applying said heated gas to surfaces of said structure until the temperature of the wooden structural member at said substantial depth reaches a lethal temperature at which said insects cannot survive for a significant length of time,



and maintaining said lethal temperature at said substantial depth for a period of time necessary to assure the death of said insects, said heated gas being supplied at a supply temperature higher than said lethal temperature; said application of heated gas being accomplished in such a manner that the heated gas circulates so as to provide for improved heat transfer to the surfacer of the structure and to avoid thermal stratification in the structure.

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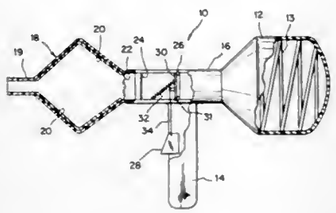
INSECT CAPTURING DEVICE

Stephen A. Fahringer, 4695 Bennett Dr., Las Vegas, Nev. 89121

Filed Oct. 6, 1987, Ser. No. 104,957

Int. Cl.⁴ A01M *5/00*

U.S. Cl. 43—133 **9 Claims**



1. A hand-held, portable, manually operated device for capturing insects, said device comprising:

(a) handle means for holding said device;

(b) bellows adapted to create a vacuum when squeezed;

(c) a trap chamber having a nozzle opening to the atmosphere, said chamber including an interior adhesive surface; wherein said adhesive is normally tacky;

(d) conduit means connecting said bellows and said trap chamber; wherein said trap chamber is detachably mounted to said conduit means; and wherein said trap chamber is disposable;

(e) screen means in said conduit means;

(f) valve means in said conduit means, said valve means being movable between closed and open positions; wherein said valve means comprises a door which is pivotally mounted in said conduit means, and wherein said door is biased toward its said closed position by means of a spring;

(g) trigger means adapted to move said valve means from said closed position to said open position;

wherein when a vacuum exists in said bellows, and said valve is moved to said open position, air rushes through said nozzle in said trap chamber and into said bellows, whereby an insect drawn into said trap chamber through said nozzle is caught on said adhesive surface.

4,817,331

METHOD AND APPARATUS FOR REMOVING EARTHWORMS FROM SOIL USING ELECTRIC PULSES

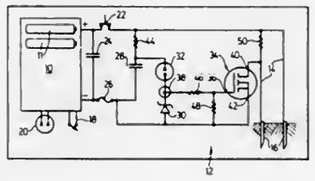
Paul Podsiadly, 50 Wilson Street, Woodstock, Ontario, Canada M4S 3M5, and Ian Soutar, London, Canada, assignors to Paul Podsiadly, Woodstock, Canada

Filed Jul. 7, 1987, Ser. No. 70,765

Claims priority, application Canada, Feb. 17, 1987, 529940

Int. Cl.⁴ A01M *5/02*

U.S. Cl. 47—1.3 **16 Claims**



1. Portable apparatus for causing earthworms to come to the surface of soil comprising;

(a) a power supply;

(b) circuit means connected to said power supply for producing electric pulses having the following characteristics:

average power, P, during each pulse between 10 watts and 500 watts;

duration, t, of each pulse between 0.1 second and 0.001 second; and

frequency, f, of the pulses between 0.5 Hertz and 10.0 Hertz;

each of P, f and t being chosen so that the product of P, f and t is maintained between 0.1 watts and 10 watts;

(c) and a pair of electrodes connected to said circuit means for coupling said pulses into said soil.

4,817,332

METHOD OF ENHANCING PLANT GROWTH AND APPARATUS FOR PERFORMING THE SAME

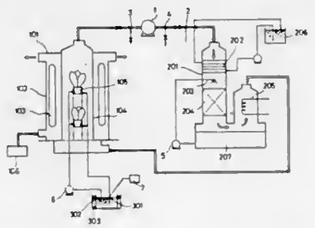
Akira Ikeda; Shigeki Nakayama; Kenji Ezaki; Toshitsugu Ishii, and Isao Itakura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,212

Claims priority, application Japan, Oct. 28, 1983, 58-203308; Oct. 28, 1983, 58-203309

Int. Cl.⁴ A01G *9/14*

U.S. Cl. 47—17 **2 Claims**



1. An apparatus for plant cultivation, comprising; a cultivation chamber for housing a plurality of plant holding means, each holding a plant, an air-conditioning system for supplying air to said cultivation chamber, including means for regulating said air in temperature, humidity and CO_2 concentration, and a nutrient supply system for supplying nutrient salts to said plant holding means in said cultivation chamber, said cultivation chamber including an inner chamber having a wall transparent to light for housing said plant holding means in a stacked manner, and an outer chamber disposed to surround said inner chamber and having a reflective inner wall, said outer chamber being provided therein with a plurality of light sources arranged around said plants so as to direct light radially inwardly of said inner chamber and toward said plants, for peripherally, substantially uniformly and instantaneously omni-directionally illuminating said plants held in said plant holding means.

4,817,333

PROCESS FOR THE ACID-BASE DISINFECTION OF RICE SEEDS

István Szepessy; Ferenc Tundik, both of Debrecen; István Gyürk, Budapest, and Ibolya S. née Kiss, Szarvas, all of Hungary, assignors to Debreceni Mezogazdasagi Gepgyarto Vallalat, Debrecen, Hungary

Filed May 21, 1987, Ser. No. 53,153

Claims priority, application Hungary, May 21, 1986, 2154/86

Int. Cl.⁴ A01N *3/00*; A01C *1/06, 21/00*

U.S. Cl. 47—58 **5 Claims**

1. A method for preventing a nematodal, bacterial or fungal infection in rice-sowing seeds and at the same time for improving the germination of seeds which consists essentially of the steps of:

(a) applying to the surface of the rice-sowing seeds a finely dispersed acidic solution of a mineral acid or an organic acid in a concentration of 0.5 to 50 g/l, employing 0.01 to 50 liters of the acidic solution per kg of the seeds in order to control the nematodal, bacterial or fungal infection;

(b) neutralizing the acidic solution applied to the seeds in step (a) by applying to the surface of the seeds 10 to 2000 g of an alkaline power per kg of seeds, during which time the seeds are kept in motion; and

(c) planting the seeds.

4,817,334

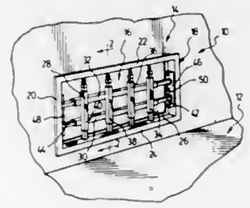
WINDOW BAR SECURITY SYSTEM

Raymond B. Badger, Inglewood; Peter J. Schmitz, and Arthur L. Thistle, both of Mississauga, all of Canada, assignors to Palladium Security Products (1985) Inc., Toronto, Canada

Filed Feb. 11, 1985, Ser. No. 700,197

Int. Cl.⁴ E06B *3/68*

U.S. Cl. 49—55 **3 Claims**



1. A window bar guard system for discouraging breaking and entry through a window, said system comprising a rigid bar grillwork having a plurality of spaced-apart first set of parallel bars and a plurality of interconnecting spaced-apart second set of parallel bars extending essentially perpendicular to said first set, said bar grillwork spanning a window opening to block human entry through the grillwork, means for securing opposite ends of said plurality of said first set of bars to corresponding structural portions defining opposing edges of a selected window opening, said plurality of said first set of bars each having a first tubular bar spanning a majority of the distance between said opposing window edges, a second tubular bar for telescopic insertion in an end portion of said first tubular bar, said first and second tubular bars having mating cross-sections, said second set of parallel bars being permanently secured to said first tubular bars of said first set of bars, said second tubular bars being operative for extended distances from within said first tubular bar of approximately the distance between spaced-apart bars of said second set, said second tubular bars being extended from said first tubular bars to span the remaining distance between said opposing window edges, means for permanently securing said second tubular bars to said first tubular bars after said first and second tubular bars are in their extended positions, said first and second tubular bars being formed of a metal selected from the group consisting of an aluminum alloy and steel, said means for permanently securing said tubular bars being formed by piercing adjacent wall portions of said first and second steel tubular bars to overlap thereby pierced sections of said adjacent wall portions, said overlapped wall portions permanently securing the relative telescopic positions of said first and second tubular bars, said second set of parallel bars comprising a plurality of third tubular bars, each of which is secured to said plurality of parallel first tubular bars, a fourth tubular bar for telescopic insertion in an open end portion of said third tubular bar, said third and fourth tubular bars having mating cross-sections with at least one pair of adjacent planar wall portions extending along said third and fourth tubular bars, said fourth tubular bars being operative for extended distances from within said third tubular bar of approximately the distance between spaced-apart bars of said first set, said fourth tubular bars being permanently secured to said third tubular bars after said third and fourth tubular bars are in their extended positions, said third and fourth tubular bars being formed of steel and being permanently secured by piercing said adjacent planar wall portions of said third and fourth steel tubular bars to overlap thereby pierced sections of said adjacent wall portions, said overlapped wall portions permanently securing the relative telescopic positions of said third and fourth tubular bars.

4,817,335

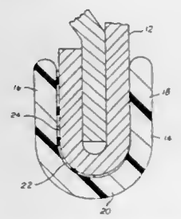
DECORATIVE CLEAR PLASTIC EDGE GUARD

Robert Adell, 200 Adell Blvd., Sunnyvale, Tex. 75182

Filed Jul. 22, 1987, Ser. No. 76,366

Int. Cl.⁴ B60J *5/00*

U.S. Cl. 49—462 **11 Claims**



1. In combination with the colored trailing edge of a swinging closure, such as an automobile door, an edge guard comprising a clear transparent body having a base which fits over the end of the trailing edge and legs which extend from said base and are disposed against opposite sides of the trailing edge, adhesive means disposed to act between the interior of said body and the trailing edge to attach the plastic body to the trailing edge, said adhesive means being selectively disposed on at least a portion of only one leg such that the other leg remains free of any adhesive means and the color of said trailing edge is presented through said other leg free of visual

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obstruction save for any negligible effect which might be imposed by the clear transparent character of said body, and in which said adhesive means is disposed along substantially all of said only one leg and an adjoining portion of said base.

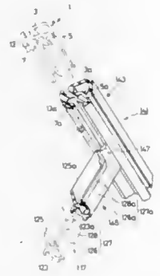
4,817,336

GLASS RUN CONNECTING CORNER PIECE

Hisayuki Kisanuki, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 27, 1988, Ser. No. 199,768
Claims priority, application Japan, May 30, 1987, 62-84973[U]; May 30, 1987, 62-84974[U]
Int. Cl.⁴ E06B *7/16*
U.S. Cl. 49—476 **4 Claims**





1. A glass run connecting corner piece provided in a corner portion of a window frame for connecting a glass run for an upper edge of said window frame with a glass run inner for a lower edge of said door frame for sealing an inner surface of said door glass, said glass run having a base portion fixed to said window frame, a hollow seal portion for sealing a circumferential edge of door glass, and a hollow bent portion for sealing an inner surface of said door glass and for forming a water escape together with said hollow seal portion, said glass run inner having another base portion fixed to said window frame, a first belt-like seal portion provided upright from an upper edge of said other base, and a second belt-like seal portion provided upright from a lower edge of said other base portion with a distance from said first seal so as to form a water escape,

said glass run connecting corner piece comprising:

a longitudinal portion having the same cross-sectional shape as that of said window frame upper edge glass run and being stuck to said window frame upper edge glass run with its axial line made coincident with that of the latter; and

a transverse portion having the same cross-sectional shape as that of said window frame lower edge glass run inner and being stuck to said lower edge glass run inner with its axial line made coincident with that of the latter;

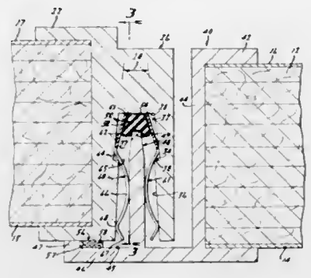
wherein said first seal portion in said transverse portion is connected to a side wall of said hollow bent portion in said longitudinal portion, and wherein said second seal portion in said transverse portion is connected to said hollow seal portion in said longitudinal portion, so that said water escape of said longitudinal portion is communicated with said water escape of said transverse portion.

4,817,337

RADIATION RESISTANT DOOR SEAL

Michael J. Lahita, Tulsa, Okla., assignor to AMCA International Corp., Hanover, N.H.

Filed Sep. 8, 1987, Ser. No. 93,756
Int. Cl.⁴ E06B *7/16*
U.S. Cl. 49—483 **53 Claims**



1. In a radiation resistant enclosure comprising a door member hingedly fixed to a frame member having a doorway adjacent edge portions of the members being electrically conductive, one member including a conductive channel extending lengthwise and having a back wall and a pair of side walls and the other member including a conductive blade extending lengthwise and insertable within said channel, and a pair of elongated metal plates for engaging one respective side wall in said channel and the blade to establish good electrical contact therebetween, characterized in that

said side walls incline outwardly from the and away from one another whereby to describe a truncated edge-shaped cross-section including an interior shoulder and an enlarged interior chamber adjacent the back wall, and

each plate has opposite edges with one said edge conductively connected to the back wall, a planar portion extending from the one edge, a bowed rearward section extending from the planar portion and engaging the side wall of said chamber and the shoulder, a bowed forward section extending from the other edge and engaging the side wall adjacent to the opening to said channel, and a bowed central section connecting said sections and adapted to engage the blade.

4,817,338

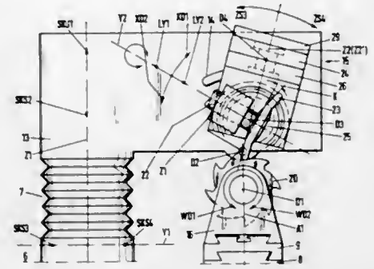
GRINDING HEAD FOR A MACHINE FOR GRINDING HELICALLY GROOVED CUTTING TOOLS

Volker Zang, Westerheimer Strasse 30, D-7903 Feldstetten, Post Laichingen 4, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,403
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538795
Int. Cl.⁴ B24B *3/00*
U.S. Cl. 51—48 HE **5 Claims**

1. Grinding head for a tool grinding machine for use in grinding helically grooved cutting tools, comprising a rotatable spindle (22), grinding means (23) mounted on said spindle, an adjustable first carriage (21) supporting said spindle and

being displaceable relative to a pair of perpendicularly arranged axes, said pair of axes comprises a first axis (Y_2) with said first carriage being reciprocal along said first axis and a second axis (X_2) with said first carriage being pivotable about said second axis, wherein the improvement comprises said first and second axes intersecting at a first point (D_3), a third axis (D_2) spaced from the first point (D_3) and the second axis (X_2) and parallel to the second axis for adjusting the rake angle of a cutting tool (20) to be ground, means for rotatable supporting the cutting tool about a central axis (X_1) parallel with the third



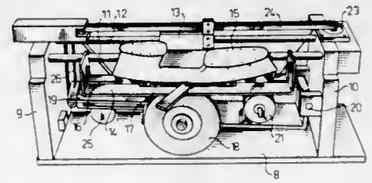
axis, means for adjusting said third axis (D_2) perpendicularly relative to the central axis (X_1) of the cutting tool, and said third axis being securable in the adjusted position, for adjusting the rake angle, said first carriage (21) supporting said spindle (22) is arranged to be pivoted around said third axis (D_2), said grinding head (15) having a vertical axis (Z_1), said third axis (D_2) intersecting said vertical axis (Z_1) of said grinding head at right angles, and a second carriage (25) supporting said first carriage (21) linearly displaceable at a grinding head column (13) arranged axially parallel relative to t he vertical axis (Z_1) of said grinding head.

4,817,339

PROCESS AND DEVICE FOR GRINDING ELONGATED OBJECTS

Thomas Weidmo, Slagavägen 9, S-198 00 Bålsta; Lars G. E. Edlund, Mörbylund 17, S-182 30 Danderyd; Knut S. R. Gullstrand, Kevingeringen 83, S-182 33 Danderyd; Carl H. J. Malmgren, Styrmansgatan 50, S-114 60 Stockholm, and Erik B. Eskilsson, Mörbyleden 20, S 182 12 Danderyd, all of Sweden

Filed Oct. 29, 1986, Ser. No. 924,364
Claims priority, application Sweden, Nov. 7, 1985, 8505266
Int. Cl.⁴ B24B *9/04, 17/00*
U.S. Cl. 51—165.71 **13 Claims**



1. A method for grinding elongated objects, especially for edge grinding of objects, comprising the steps of:

locating an object to be ground and having two ends in a horizontally displaceable carriage,

scanning an existing grind profile by displacing the carriage in steps of predetermined length and conveying a horizontally fixed scanning member vertically over at least one scanning cycle to the object to be ground,

recording and coordinating for every scanning cycle a position of the carriage and the corresponding position of the scanning member,

performing horizontal displacement of the carriage and vertical displacement of the scanning member separately and in subsequent working steps,

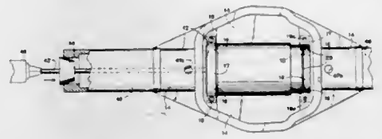
grinding the object in at least one working step in correspondence to the scanning cycles.

4,817,340

TOOL AND METHOD FOR REPAIRING FLAT BEARING SURFACES

Gary Culp, 1200 E. Airport, Hermiston, Oreg. 97838

Filed Mar. 21, 1988, Ser. No. 171,674
Int. Cl.⁴ B24B *15/00*
U.S. Cl. 51—241 S **6 Claims**



1. A tool for truing and reconditioning a flat bearing surface having a peripheral cylindrical bearing seat extending perpendicularly from said surface, said tool comprising:

(a) a journaling member having an axis of rotation, an end, and an external surface adjacent said end for matingly engaging said cylindrical bearing seat and thereby positioning said axis of rotation at the center of said bearing seat;

(b) an arbor rotatably journaled in said journaling member so as to rotate about said axis of rotation; and

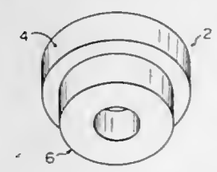
(c) an abrasive circular disk affixed to said arbor so as to be rotatably driven by said arbor about said axis, said disk being positioned externally of said end of said journaling member and having an outer periphery which is radially inward of said external surface so as to prevent contact of said periphery with said cylindrical bearing seat.

4,817,341

CUTTING TOOL HAVING CONCENTRICALLY ARRANGED OUTSIDE AND INSIDE ABRASIVE GRAIN LAYERS AND METHOD FOR PRODUCTION THEREOF

Yoshio Umeda, Tokyo, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Division of Ser. No. 924,522, Oct. 29, 1986, abandoned. This application Apr. 26, 1988, Ser. No. 186,135
Claims priority, application Japan, Nov. 5, 1985, 60-247749
Int. Cl.⁴ B24D *3/00*
U.S. Cl. 51—293 **11 Claims**



1. A method of producing a cutting tool, which comprises

a step of forming a supporting base having an outer circumferential surface and an inner circumferential surface arranged concentrically in a radially spaced relationship,

a step of forming an outside and an inside abrasive grain

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layer by electrodepositing abrasive grains on the outer circumferential surface and the inner circumferential surface of the supporting base, and

a step of dissolving part of the supporting base after the electrodeposition step to make the outside abrasive grain layer and the inside abrasive grain layer project concentrically, .from the supporting base.

4,817,342

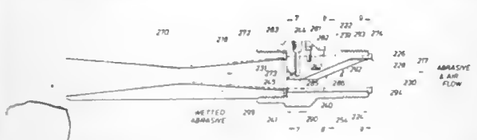
WATER/ABRASIVE PROPULSION CHAMBER

R. Craig Martin, and Jerry P. Woodson, both of Houston, Tex., assignors to Whitemetal Inc., Houston, Tex.

Continuation-in-part of Ser. No. 73,571, Jul. 15, 1987, abandoned. This application Oct. 22, 1987, Ser. No. 111,299

Int. Cl.[4] B24C *5/04*

U.S. Cl. 51—439 **17 Claims**



1. Propulsion apparatus adapted for use in a liquid propelled abrasive cleaning system comprising,

a housing having a bore formed therein defining a longitudinal axis, said bore having an inlet end and an outlet end, said bore being substantially straight to define a path of a flow of air and abrasive to said bore from said inlet end of said bore, and

injection means for injecting high pressure water substantially coaxially in said bore toward said outlet end,

said injection means disposed in said path of said flow of air and abrasive downstream from said inlet end of said bore and including a water injection member having a central section and a leading section,

said central section having lateral sides which are substantially parallel to each other, the distance between said lateral sides of said central section defining a central section width, the longitudinal distance of said lateral sides defining a central section length,

said leading section facing said inlet end of said bore and having leading lateral sides which angle inwardly respectively from said central section lateral sides toward said longitudinal axis of said bore, said leading lateral sides terminating at a leading side facing said inlet end of said bore, said lateral sides of said central section and of said leading section each having top and bottom ends which are secured to radially opposite walls of said bore, the longitudinal distance of said leading lateral sides of said leading section between said leading side and said central section defining a leading section length which is substantially greater than said central section length, said leading side being of a width which is substantially smaller than said central section width, whereby the shape of said leading section operably facilitates said flow of air and abrasive around the lateral sides of said central section of said water injection member,

said water injection member having an outlet orifice disposed substantially coaxially with said bore of said housing,

said water injection member having a radially directed passage communicating with said outlet orifice,

said housing having water inlet means communicating with said radially directed passage and operably adapted to receive high pressure water,

whereby said high pressure water propels said flow of air and abrasive through said outlet end.

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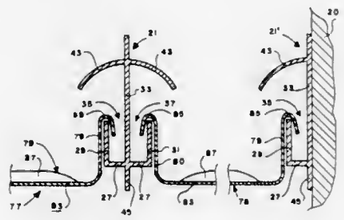
LEAK-PROOF CEILING SYSTEM

B. G. Rutledge, 5667 Rensslaer, Bartlett, Tenn. 38134

Filed Oct. 5, 1987, Ser. No. 104,648

Int. Cl.[4] E04B *5/52*; E04D *13/00*

U.S. Cl. 52—22 **13 Claims**



1. A leak-proof ceiling structure for being associated with a roof to define a protected space beneath said roof and to prevent any liquid which may leak through said roof from passing to said protected space, said leak-proof ceiling structure comprising;

(a) a pair of elongated longerons, each longeron having a first end and a second end;

(b) suspension means for suspending said longerons beneath said roof with each of said longerons spaced apart from the other with said second end of said longerons higher than said first end thereof;

(c) elongated trough means for being suspended between said pair of longerons and for catching liquid that may leak from said roof; and

wherein each of said longerons further comprises a fin having means for attaching a suspended ceiling therefrom.

4,817,344

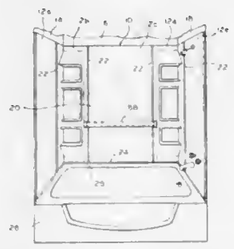
BATHTUB WALL SURROUND KIT

John W. Wissinger, New Castle, Pa., assignor to Universal-Rundle Corporation, New Castle, Pa.

Filed Nov. 30, 1987, Ser. No. 126,835

Int. Cl.[4] A47K *3/16*

U.S. Cl. 52—35 **20 Claims**



20. A bathtub wall surround kit, comprising:

a plurality of panels adapted to be secured to the walls of a bathtub opening and each having a vertical edge adapted to be disposed in overlapping relation to a corresponding vertical edge of the next adjacent of said panels;

a plurality of vertical seals for joining the corresponding vertical edges of said overlapping panels in substantially watertight fashion, each of said vertical seals including a panel-receiving channel formed by a pair of spaced apart walls joined by a channel-defining bottom wall, each of said vertical seals also including seal means adapted to cooperate with said overlapping panels;

said pair of spaced apart walls of each of said vertical seals including a back wall and a front wall, each of said vertical seals having said back wall disposed between said overlapping panels and having said front wall tapering toward said back wall, each of said vertical seals being formed such that said front wall is movable toward and away from said back wall;

each of said vertical seals being formed such that said seal means includes a flexible finger inwardly of said channel, each of said inward flexible fingers extending from one of said walls so as to sealingly engage a surface of the outermost of the corresponding ones of said overlapping panels;

each of said vertical seals also being formed such that said seal means includes a flexible finger outwardly of said channel, each of said outward flexible fingers extending from one of said walls so as to sealingly engage the outwardly facing surface of the innermost of the corresponding ones of said overlapping panels;

means for securing each of said vertical seals to the innermost of the corresponding ones of said overlapping panels after said vertical edge of the outermost of the corresponding ones of said overlapping panels has been placed in said channel; and

a continuous base seal for joining the bottom edges of said panels to a rim of a bathtub in substantially watertight fashion, said base seal including a wall portion adapted to be secured to the walls of a bathtub opening and a base portion adapted to be disposed in sealing engagement with the rim of the bathtub, said base seal including at least one downwardly and outwardly projecting flexible finger associated with each of said wall and base portions.

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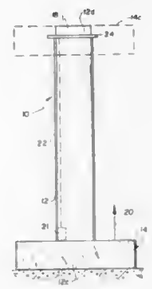
BUILDING HAVING MOVABLE RESTAURANT

John J. McGlew, P.O. Box 823 (E. Lake Rd.), Tuxedo Park, N.Y. 10997

Filed Jul. 15, 1982, Ser. No. 398,596

Int. Cl.[4] E04H *3/04*

U.S. Cl. 52—36 **7 Claims**



1. A building structure comprising means defining a vertically extending guide, a restaurant dining car for accommodating diners at a dining table associated with said guide for movement upwardly and downwardly therealong, said dining car having at least one wall with a window view, means defining a restaurant food preparation area adjacent said dining car, and food delivery means providing an interconnection between said dining car and said food preparation area, said structure including a central building, said vertically extending guide being carried by said building, said vertical guide including a trackway on said building for the movement of the car upwardly along said building on one side thereof, a horizontal trackway on said building permitting movement of said car laterally in respect to said building.

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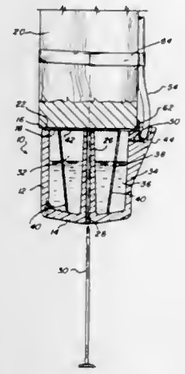
DEVICE FOR FEEDING PRESERVATIVE TO WOODEN POSTS

Carl T. Westgard, 2049 Crestvue Circle, Golden, Colo. 80401

Filed Dec. 29, 1987, Ser. No. 139,009

Int. Cl.[4] A01M *1/20*; E04C *3/30*

U.S. Cl. 52—101 **9 Claims**



1. A device for feeding a preservative to a wooden post having an upper end, a lower end and a side wall extending between the upper and lower ends, and wherein the lower end forms an angle other than a straight angle with the side wall, comprising in combination:

a. A container for holding a charge of liquid preservative, said container having a compartment in which the preservative is confined,

b. Attachment means for securing the container to the wooden post such that the compartment is disposed beneath the lower end of the post when the post is substantially vertically oriented whereby the preservative can be drawn into said lower end, and

c. Feed means on said container for delivering the preservative to the lower end of the post, said feed means being an absorptive wick-like element positioned in said compartment so as to abut the lower end of said post when the device is attached to the post.

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WINDOW PANEL

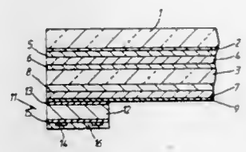
Derek L. A. Hand, Solihull, and Christopher W. G. Hall, Redditch, both of England, assignors to Pilkington Brothers P.L.C., St. Helens, England

Filed Oct. 21, 1986, Ser. No. 921,118

Claims priority, application United Kingdom, Feb. 27, 1986, 8604847

Int. Cl.[4] E06B *7/12*

U.S. Cl. 52—171 **15 Claims**



1. A lightweight impact-resistant window panel comprising an outer toughened glass ply and an inner glass ply each having a thickness in the range from about 1.5 mm to about 3.5 mm

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and being laminated with an intermediate ply of impact-resistant plastics material which is adhered to the glass plies by transparent plastics interlayers, and an inner ply of impact-resistant plastics material bonded to the rearward face of the inner glass ply by an interlayer of transparent plastics material, the said two plies of impact-resistant plastics material having an aggregate thickness in the range from about 1 mm to about 3 mm.

4,817,348
DUCT FORMING SLEEVE ASSEMBLY
Richard A. Wydra, 10025 Lakeview Ct., Palos Park, Ill. 60464
Filed Jun. 19, 1987, Ser. No. 63,674
Int. Cl.[4] E04B *5/48*
U.S. Cl. 52—220 **23 Claims**



1. A duct forming sleeve assembly for use in a method for providing passageways in poured concrete, such as in a foundation, for the routing of pipes, cables and conduits therethrough, said assembly comprising:

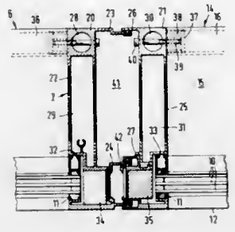
a rectangular base plate member which is positioned within the concrete in a plane parallell to a surface of the concrete for attachment to a wooden or metal floor deck prior to the concrete pouring process, said base plate being provided with mounting means and further being provided with a plurality of cutout areas each of which is capable of accepting a cylindrical sleeve members therein;

a plurality of cylindrical rigid sleeve members, equal to the number of cutout areas within the base plate, each sleeve member being received in a cutout area of said base plate along an axis which is perpendicular to the plane of the base plate; and

a reinforcing rod system, comprising a plurality of elongate metal rods, each rod having a length greater than the distance between at least two cylindrical sleeves in a line plus the diameters of those sleeves, said rods being welded at points along their length to each of the at least two sleeve members at an identical position on each of said at least two sleeve members.

4,817,349
APPARATUS FOR HEATING, VENTILATING, COOLING AND REGULATING THE TEMPERATURE OF ROOMS OF A BUILDING
Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Josef Gartner & Co., Fed. Rep. of Germany
Filed Mar. 1, 1982, Ser. No. 353,148
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108355
Int. Cl.[4] F24F *3/00*
U.S. Cl. 52—220 **8 Claims**

1. Apparatus for use in heating, ventilating, cooling and/or regulating the temperature of rooms in a building including a facade which comprises a building support structure in the form of a framework of hollow posts and hollow girders, to which there are applied facade elements and possibly window areas substantially free of heat bridges, characterized in that sections of said hollow posts and hollow girders are connected to one another in a fixed manner for the conduction through at least a portion thereof of a heat transfer fluid, between delivery and return flow lines, a further fluid in heat exchanging relation to said heat transfer fluid, said hollow posts being load carrying structural support members constructed in two pieces, each of said two pieces constituting a post part which is an integral structure and at least one thereof being formed to provide within the body thereof at least two channels, respectively for conduction of the heat transfer fluid and for the conduction of said further fluid, said post parts being interconnected to define therebetween a utility passage and being respectively adapted for the independent connection thereto of hollow girders to have the girders interconnect therewith in one or more aligned pairs, without welding, for the movement thereto and/or therefrom of said fluids, said two post parts being generally C-shaped in cross section and each including a double-walled base leg portion, incorporating a channel for said heat transfer fluid and a channel for said further fluid, which has relatively freely projecting legs which are perpendicular thereto through the medium of which said two post parts are coupled to define therebetween a third channel which provides said utility passage and one said hollow post.



4,817,350

Patent Not Issued For This Number

4,817,351
GLAZING SYSTEM
John J. Michlovic, Avon Lake, Ohio, assignor to The Standard Products Company, Cleveland, Ohio
Filed Oct. 29, 1987, Ser. No. 114,693
Int. Cl.[4] E04H *3/00*
U.S. Cl. 52—235 **7 Claims**

1. A glazing system comprising:

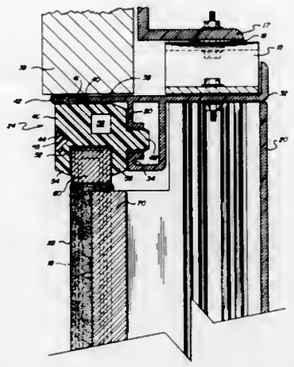
means for supporting glazing components secured to structure of a building,

said supporting means defining a ribbon window opening in the building,

a pair of resilient polymeric gasket strips coupled with said support means and positioned parallel to one another a desired distance apart, a channel in each of said gaskets for receiving glass lites or panels, said channels opposing one another,

a plurality of mullions positioned substantially perpendicular to said gaskets and coupled with said support means in said ribbon window opening,

a plurality of glass panels positioned in said gasket channels and nesting on said mullions,



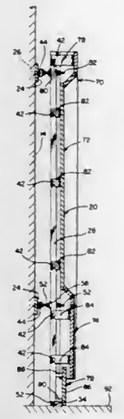
a member projecting from each said mullion and sandwiched between adjacent glass panels forming a gap between adjacent glass panels,

a plurality of separating members positioned in said channels adjacent said projecting members such that said separation members are positioned opposing one another in said opposing channels between adjacent glass panels, said separating members extending a desired distance beyond said gaskets out of said channels, and

a plurality of liquid sealant beads positioned in said gaps and abutting said separation members such that said liquid sealant beads are prohibited from contact with said gasket strips.

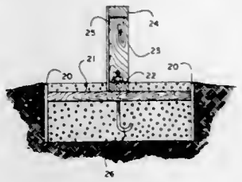
4,817,352
DISPLAY WALL SYSTEM
Daniel H. DeLange, 13220 Southwest 208th St., Miami, Fla. 33177, and Ralph B. Schregardus, Hickory Center, Rt. 2, Waupun, Wis. 53963
Filed Feb. 18, 1988, Ser. No. 157,232
Int. Cl.[4] E04B *2/88*
U.S. Cl. 52—235 **9 Claims**

1. A display wall system including a pair of wall posts for mounting in horizontal spaced apart upstanding position along a wall structure and display wall means removably supported from and spanning between said posts, a pair of upper and lower mounts for each of said posts adapted to be fixedly mounted from generally vertically spaced portions of said wall, each of said mounts including a horizontally outwardly projecting threaded shank supported therefrom for limited adjusted horizontal positioning relative to said mount, each of said posts including upper and lower vertical slots formed therein through each of which the outer end of a corresponding threaded shank is adjustably secured between a pair of axially spaced abutment members threaded on said shank, each of said posts including horizontally outwardly projecting stud



extending outward from the side thereof opposing the other post, said display wall means including horizontally spaced apart vertical marginal portions, each of said marginal portions including vertically spaced mounting brackets supported therefrom removably engaged with and supported from the corresponding headed shank means.

4,817,353
SELFCONTAINED INTEGRAL FOOTING FORM AND FOUNDATION WALL
John T. Woods; John D. Woods; Paul F. Woods, and Frederick T. Woods, all of P.O. Box 1949, Decatur, Ga. 30031
Filed Oct. 28, 1987, Ser. No. 113,607
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—295 **4 Claims**



1. A form for use in constructing the foundation of a building which foundation will have a predetermined height and width, said form comprising:

(a) a pair of laterally spaced skirt members being spaced apart by a distance equal to said predetermined width and having a height at least equal to said predetermined height;

(b) at least two spreaders equal in length to said predetermined width and secured at their ends to said skirt members;

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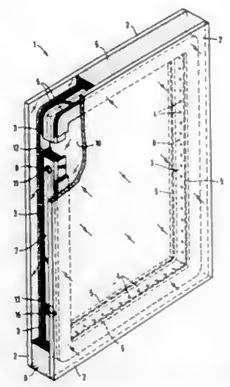
(c) a bottom plate secured to said spreaders;
(d) a plurality of wall risers secured to said bottom plate; and
(e) a top plate secured to said plurality of wall risers, said skirt members, spreaders, bottom plate, and risers all being fabricated from material which will resist decomposition whereby said form is adapted to be placed into an excavation, filled with concrete, and left in place to become part of a composite foundation for a building.

4,817,354

SPACER FRAME FOR INSULATING-GLASS PANES AND METHOD AND APPARATUS FOR TREATING THE SAME

Franz Bayer, Elzach, Fed. Rep. of Germany, assignor to Franz Xaver Bayer Isolierglasfabrik KG, Elzach, Fed. Rep. of Germany

Continuation of Ser. No. 805,987, Dec. 5, 1985, abandoned. This application Apr. 9, 1987, Ser. No. 36,186
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 3445838
Int. Cl.⁴ E04B *1/70*
U.S. Cl. 52—302 **19 Claims**



1. A spacer frame for insulating-glass panes, comprising a tubular body defining an internal space and having at least one opening which establishes communication between said space and the exterior of said body; a mass of tough elastic sealing compound confined in a portion of said space in the region of and sealingly surrounding said opening so that the opening is sealed from the reminder of said internal space, said compound having a prefabricated hole in register with said opening; and a plug removably extending into said hole by way of said opening and establishing a seal with said compound, said compound exhibiting a tendency to contract against the plug in said space.

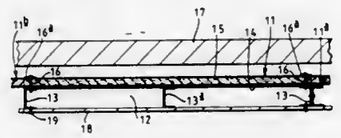
4,817,355

WALL CONSTRUCTION

Stephen R. Tilsley, and Ian P. MacCarthy, both of Birmingham, England, assignors to Metsec plc, West Midlands, England

Filed May 26, 1987, Ser. No. 54,377
Claims priority, application United Kingdom, Jun. 13, 1986, 8614425
Int. Cl.⁴ E04G *21/00*
U.S. Cl. 52—407 **10 Claims**

1. A wall construction comprising a plurality of interconnected metal frame assemblies, said assemblies providing an inner face, each frame assembly including metal studs of channel section secured together to form a rectangular frame having an outer face, a rectangular panel secured to said outer face and having sufficient thermal capacity and conductivity for acting as a heat sink for the frame for reducing rate of temperature rise in the frame when the frame is subjected to heat from a fire or the like, said panel having an outer face, and a thermal insulation layer on the outer face of said panel, said thermal



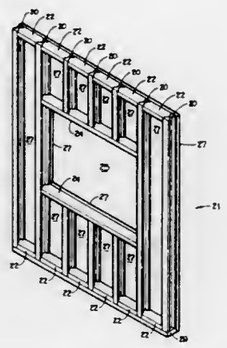
insulation layer having an outer face, the wall construction further comprises an inner wall lining on the inner face of the frame assemblies, and an external skin at the outer face of the thermal insulation layers of the frame assemblies.

4,817,356

CONSTRUCTION SYSTEMS AND ELEMENTS THEREOF

Christopher R. Scott, 6518 Avenida Wilfredo, La Jolla, Calif. 92037

Division of Ser. No. 578,285, Feb. 8, 1984, abandoned. This application Feb. 19, 1987, Ser. No. 16,364
Int. Cl.⁴ E04C *3/30*
U.S. Cl. 52—729 **8 Claims**



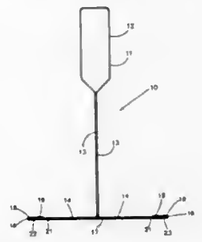
1. A building system for the construction of room-sized structures, comprising:
a plurality of longitudinal members having a cross-section comprising two parallel flange portions interconnected by an integral web portion defining a groove in said longitudinal member, each of said longitudinal members being essentially symmetrical about respective central axes;
a plurality of transverse members of predetermined length having end portions receivably engageable by the cross-sectional shape of said longitudinal members, said end portions shaped to fit into said grooves of said longitudinal members, so that said transverse members are adapted to hold said longitudinal members in spaced parallel relationship;
wherein said longitudinal member and said transverse members are cooperatively engageable to form a structure of parallel spaced apart longitudinal members; and
a plurality of key block members having a cross-section corresponding to the open cross-section formed between two parallel longitudinal members which abut one another through their two flange portions, said key block members cooperatively engageable to link adjacent longitudinal members along the longitudinal edges thereof.

4,817,357

SUSPENSION CEILING GRID TEE

Joseph A. Hocevar, Willoughby Hills, Ohio, assignor to Doan Incorporated, Chicago, Ill.

Filed Dec. 21, 1987, Ser. No. 135,922
Int. Cl.⁴ E04C *3/32*
U.S. Cl. 52—732 **10 Claims**



1. A grid tee for suspension ceilings and the like comprising a first elongated piece of sheet metal and bent to provide a stiffening bulb along one edge, a pair of parallel web portions extending from said bulb in face-to-face adjacency, and flange portions extending laterally in opposite directions from the side of said web remote from said bulb, and a second elongated piece of sheet metal forming a cap positioned in face-to-face adjacency with the side of said flange portions remote from said bulb and connected to said flange portions along their edges by a reverse bend extending around adjacent edges of said flange portions, and bands of cross-linking cured adhesive along the interface between said flange portions and said cap bonding said flange portions to said cap, said adhesive having sufficient shear strength and sufficient elasticity to permit said grid tee to twist through at least two degrees per inch of length without failure of said bond, and being substantially insensitive to temperatures normally encountered by said grid tee during shipment, storage, and use, said reverse bends operating to press said flange portions and said cap together along said interface where said bands of adhesive are located while said adhesive becomes cross-linked, said coating being undamaged by said adhesive.

4,817,358

ASPHALT SHINGLE WITH FOAMED ASPHALT LAYER UNDER TABS

William W. Lincoln, and Stephen J. Jones, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 18, 1983, Ser. No. 514,433
Int. Cl.⁴ E04D *1/28*
U.S. Cl. 52—557 **5 Claims**



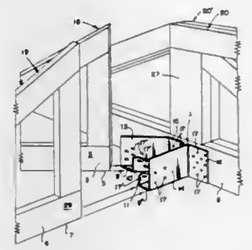
1. An improved asphalt shingle comprising an asphalt shingle having a headlap portion and a normally exposed tab portion, with the improvement of a layer of foamed asphalt substantially covering an underside of the tab portion, the layer of foamed asphalt being of sufficient thickness at least at a free end portion of the tab portion to provide an enhanced relief effect when the shingle is installed on a roof, said free end portion of the tab portion being an end portion thereof remote from said headlap portion as distinct from an end portion thereof attached to said headlap portion.

4,817,359

MULTIPLE WOOD TRUSS CONNECTION

Karen W. Colonias, Lafayette, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Feb. 1, 1988, Ser. No. 150,894
Int. Cl.⁴ E04C *3/02*
U.S. Cl. 52—643 **2 Claims**



1. In a multiple wood truss connection comprising:
a. a wood hip truss including a wood bottom chord having a bottom edge and parallel first and second sides;
b. a wood jack truss including a wood bottom chord having a bottom edge and parallel first and second sides;
c. a wood carrier girder including a wood bottom chord disposed at an angle of about 90° to said jack truss and less than 90° to said hip truss;
d. a sheet metal connector including:
1. a seat member adapted for receiving said bottom edges of said wood bottom chords of said wood hip truss and said wood jack truss;
2. a first tab member connected to said seat member and extending angularly upwardly therefrom for registration with said second side of said wood bottom chord of said wood hip truss;
3. a second tab member connected to said seat member and extending angularly upwardly therefrom for registration with said first side of said wood bottom chord of said wood jack truss;
4. a first sidewall member spaced from said first tab member and connected to said seat member and extending upwardly therefrom parallel to said first tab member for registration with said first side of said wood bottom chord of said wood hip truss;
5. a second sidewall member spaced from said second tab member and extending upwardly therefrom parallel to said second tab member for registration with said second side of said wood bottom chord of said wood jack truss;
6. a first backwall member connected to said first sidewall member and extending at an angle thereto along a first bend line and forming a substantial section of metal providing vertical shear resistance along said first bend line and first back wall is connected to said bottom chord of said wood carrier girder;
7. a second backwall member connected to said second sidewall member and extending at an angle thereto along a second bend line and providing vertical shear resistance along said second bend line and said second back wall member is connected to said bottom chord of said wood girder and in the same plane as said first backwall member;
8. fastener openings formed in said first and second tab members, said first and second sidewall members and said first and second backwall members dimensioned for receipt of fasteners therethrough; and
9. fastener means respectively connecting said first sidewall member and said first tab member to said wood hip truss, said second sidewall member and said second tab

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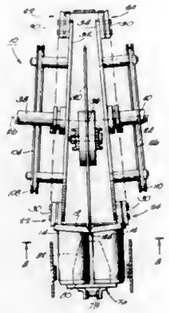
member to said jack truss, and said first and second backwall members to said carrier girder.

4,817,360
PREMOLDED FIBERGLASS DECK COVERING, DECK AND PREMOLDED FIBERGLASS COVERING COMBINATION, AND METHOD OF MAKING A PREMOLDED FIBERGLASS DECK COVERING
James R. Gorman, 2012 43rd Ave. East, Seattle, Wash. 98112
Filed May 4, 1987, Ser. No. 47,024
Int. Cl.[4] E02D *37/00*
U.S. Cl. 52—747 **4 Claims**



1. The method of covering an exterior wood deck with a fiberglass covering, comprising:
laying up the fiberglass covering to a predetermined size and shape corresponding to the overall size and shape of the wood deck to be covered in a mold; and
removing the covering from the mold intact and gluing the molded covering onto the exterior wood deck at the deck location to provide a waterproof covering in one piece over the exterior wood deck.

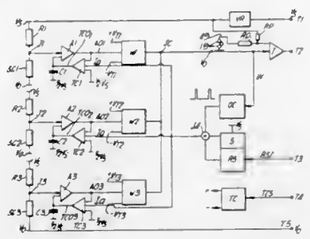
4,817,361
CARRIER ASSEMBLING APPARATUS
Ernest R. Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., Libertyville, Ill.
Filed Feb. 16, 1988, Ser. No. 156,367
Int. Cl.[4] B65B *27/04, 21/00*
U.S. Cl. 53—48 **25 Claims**



1. An apparatus for installing a plastic carrier onto a plurality of containers arranged in side-by-side relationship, said apparatus comprising first and second pluralities of members adapted to engage the carrier and arranged to rotate around non-coincident substantially intersecting axes so as to expand the carrier for installation onto the containers.

4,817,362
PROBE FOR MEASURING WORKPIECES AND ELECTRICAL CONNECTIONS THEREFOR
Clifford W. Archer, Dursley, United Kingdom, assignor to Renishaw plc, United Kingdom
Filed Apr. 9, 1987, Ser. No. 36,464
Claims priority, application United Kingdom, Apr. 24, 1986, 8610088
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—832 **6 Claims**

1. Measuring apparatus, including a measuring probe and electrical apparatus external to the probe, for determining the co-ordinate position of a workpiece through contact of the workpiece by the probe, the measuring apparatus further including first and second electrical circuits for electrically interconnecting the probe with the electrical apparatus, a power supply for the circuits and electrical connections between the circuits, one of the first and second circuits being located internally within the probe and the other of the first

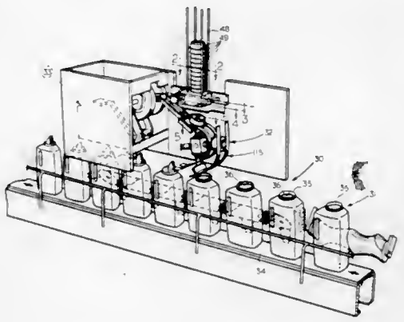


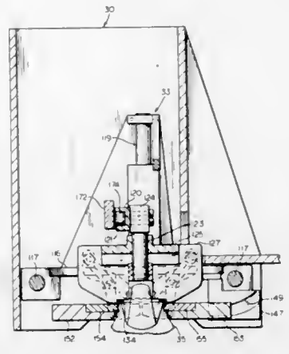
and second circuits being located external to the probe, the first circuit including means responsive to a change in voltage initiated by the second circuit to produce an output for use by the first circuit, the second circuit including means responsive to a change in current initiated by the first circuit to produce an output for use by the second circuit, such that only two electrical connections between the first and second electrical circuits are necessary.

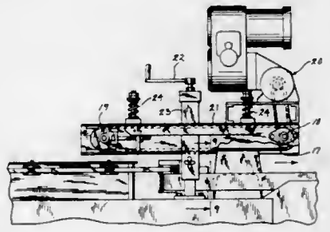
4,817,363
FITMENT INSERTER MACHINE
David L. St. Clair, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio
Filed Sep. 2, 1987, Ser. No. 92,095
Int. Cl.[4] B65B *7/28*
U.S. Cl. 53—307 **20 Claims**

1. A fitment inserter machine for inserting a fitment into a container having an opening for receiving such fitment, the machine comprising, conveyor means for serially moving a plurality of containers,
placer means for placing a fitment at a container opening while such container is moving,
and pressing means for pressing such fitment into such container opening while such container is moving,
said pressing means including mating jaws for grasping and holding such container adjacent such container opening during pressing of such fitment, said fitment inserter machine further including a flying table mounted for movement adjacent said conveyor means, and wherein said presser means includes a presser head mounted on said table, said presser head moving at the speed of the bottles during pressing.

4,817,364
PACKAGING MACHINE AND METHOD
James L. Good, Stoneville, N.C., assignor to Miller Brewing Company, Milwaukee, Wis.
Filed May 20, 1987, Ser. No. 52,461
Int. Cl.[4] B31B *1/26;* **B65B** *7/20*
U.S. Cl. 53—374 **1 Claim**

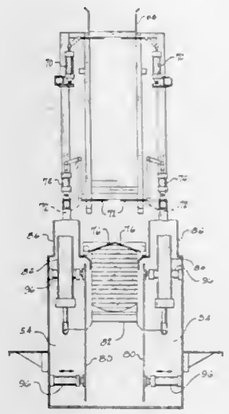






1. In a packaging machine for packaging a plurality of articles in cartons having irregular side walls, a flat top and vertical end flaps to be sealed, the improvement which comprises a vertically adjustable compression belt which is supported by springs and which rises and falls automatically to adjust to mirror variations in carton height; said belt adapted to maintain pressure upon the center of the top of a carton to keep the top flat while the end flaps are being sealed so that the end flaps will be properly aligned.

4,817,365
FIBROUS INSULATION BATT PACKAGING MACHINE
Richard C. Yawberg, Grand Rapids, and James W. Scott, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Nov. 13, 1987, Ser. No. 120,059
Int. Cl.[4] B65B *63/02, 13/20*
U.S. Cl. 53—438 **12 Claims**



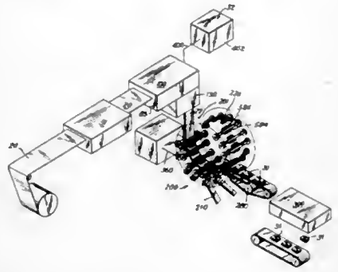
1. A fibrous insulation batt packaging machine comprising a vacuum chamber, an inlet tube for receiving batts, the inlet tube being defined by (a) a pair of sidewalls, (b) a pair of moveable endwalls, and (c) a platen, the platen being mounted for vertical movement and the endwalls and side walls forming a rectangular inlet tube cross-section which is substantially the same size as that of the batts, vacuum means for partially evacuating the vacuum chamber thereby causing compression of the batts, vacuum chamber top doors mounted for movement to close the inlet tube, means for mechanically further compressing the batts, means for moving the moveable endwalls to open the inlet tube, and means for pushing the compressed batts from the vacuum chamber into a bag.

4,817,366
HIGH CAPACITY PACKAGE SEAL, SEVER, AND BRICK APPARATUS AND METHOD
Daryl Kozzal, Colgate, and Gunars Salnajs, Milwaukee, both of Wis., assignors to International Paper Company, Purchase, N.Y.
Filed Dec. 17, 1986, Ser. No. 942,986
Int. Cl.[4] B65B *9/08, 51/22, 51/30, 61/24*
U.S. Cl. 53—451 **36 Claims**

1. Apparatus for use in a machine for forming a plurality of sealed packages from an advancing tube of polyfoil web filled with a product, comprising:
a structure mounted in the machine and adapted to rotate about an axis at a controllable speed;
a plurality of sealing mechanisms mounted in a spaced apart relationship about the periphery of the structure, each sealing mechanism further comprising
a sealing jaw and an anvil jaw pivotably connected together so that one of the sealing or anvil jaws is mounted parallel to the axis of the structure, the sealing mechanism having an open position and a closed position, the closed position having the anvil and sealing

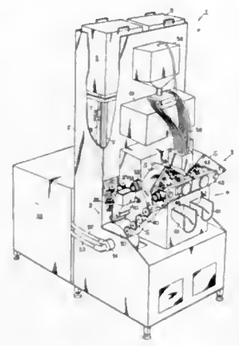
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jaws being transversely clamped together in parallel about the tube to form a clamped package,
means for sealing the tube area clamped between the sealing jaw and anvil jaw to form a sealed package,
means for severing the transverse seal area, and
a plurality of flanges;
means for closing each sealing mechanism as it approaches a



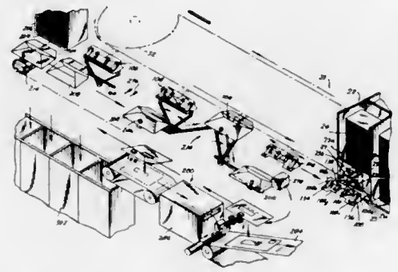
preselected location in its path of travel, the location being proximate to the advancing tube so that closing the sealing mechanism transversely compresses the tube flat between the sealing jaw and anvil jaw; and
means for preforming sealed packages clamped between adjacent sealing mechanisms by compressing the clamped sealed package against the boundary created by the flanges of the adjacent sealing mechanisms.

4,817,367
APPARATUS FOR MANUFACTURING GELATIN CAPSULE AND METHOD THEREFOR
Toshimitsu Ishikawa, and Katsuhide Tamura, both of Shizuoka, Japan, assignors to Sankyo Co., Ltd., Fuji, Japan
Filed Aug. 10, 1987, Ser. No. 85,725
Int. Cl.[4] B65B *9/04*
U.S. Cl. 53—454 **7 Claims**



1. An apparatus for manufacturing gelatin capsules comprising:
a gelatin sheet forming means which allows a predetermined amount of melted gelatin to flow continuously onto a rotary drum, cools the gelatin on the drum while transmitting it, and forms the gelatin into a sheet shape, wherein said rotary drum is a cooling drum and into which cooling media has been supplied;
a gelatin capsule forming means to supply objects to be contained in the capsule between two gelatin sheets formed by said gelatin sheet forming means while supplying the two gelatin sheets between a pair of die rolls having capsules forming dies on the surface thereof and form gelatin capsules containing said object, the pair of die rolls of said gelatin capsule forming means being disposed so that one die roll is urged against the other, and a pressure gauge to numerically indicate the pressure being provided for the said gelatin capsule forming means; and
a gelatin capsule recovery means to recover gelatin capsules formed by the gelatin capsule forming means.

4,817,368
MAIL INSERTING AND COLLATING APPARATUS
John A. DePasquale, New York; Ivar R. Segalowitz, Great Neck, and Ceasar P. Andolfi, Bellerose, all of N.Y., assignors to J.A.D. Enterprises, Inc., New York, N.Y.
Division of Ser. No. 918,578, Oct. 14, 1986, Pat. No. 4,712,359.
This application Oct. 9, 1987, Ser. No. 106,438
Int. Cl.[4] B65B *25/14*
U.S. Cl. 53—460 **11 Claims**

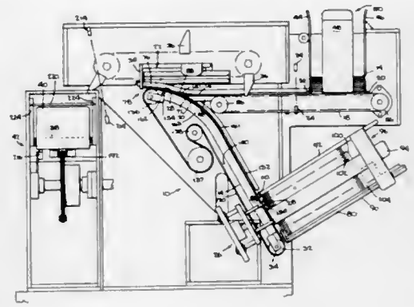


1. A method of inserting and collating mailing inserts into envelopes, comprising the steps of:
supplying said envelopes to at least one envelope carrier means for holding said envelopes;
moving said envelopes in said envelope carrier means along a first path;
supplying said inserts to at least one adjustable length pocket means for holding said inserts;
moving said inserts in said pocket means along a second path in which at least a portion of said second path runs substantially parallel and adjacent to said first path;
moving each envelope carrier means toward a respective pocket means at an insert and envelope merge station to move said pocket means into said envelope; and
reducing the length of each said pocket means as it approaches said insert and envelope merge station while said pockets are moving to allow said envelopes to move over said pocket means.

4,817,369
APPARATUS FOR ENVELOPE INSERTION AND STACKING
Lawrence S. Tribbey, San Mateo, Calif., assignor to Machine Development Company, Inc., Dublin, Calif.
Continuation of Ser. No. 865,383, May 20, 1986, abandoned, Continuation of Ser. No; 777,198, Sep. 18, 1985, abandoned, Continuation of Ser. No. 573,010, Jan. 23, 1984, abandoned. This application Apr. 6, 1987, Ser. No. 35,028
Int. Cl.[4] B65B *43/26, 43/39, 43/18*
U.S. Cl. 53—571 **18 Claims**

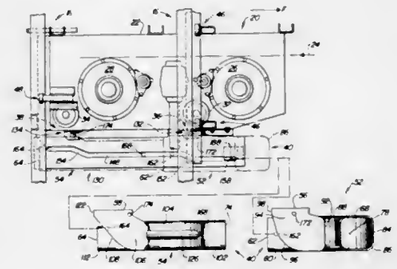
1. A machine for inserting diskettes into envelopes having side panels and a top flap comprising:
means for receiving and holding a plurality of diskettes in a stack,
means for engaging and removing one diskette at a time from the stack,
means for receiving each diskette from the stack and for conveying the diskette toward a loading station,

actuator means responsive to the movement of each diskette,
means for receiving and holding a plurality of envelopes in a stack, said envelope having side panels sealed along three sides and an open top flap,
means responsive to said actuator means for removing one envelope at a time from its stack,
means for receiving each removed envelope and for conveying each envelope to the loading station ahead of the diskette,
means for retaining the envelope at the loading station,



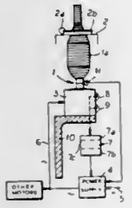
means for back bending the envelope at the loading station to open the envelope,
means for depressing the top flap below the path of travel of the diskette,
means for centering the diskette with respect to the opening in the envelope,
means for moving the diskette into the envelope and
means for discharging the filled envelope from the loading station.

4,817,370
MOLDED COTTON DOOR AND MOUNTING STRUCTURE THEREFOR
Timothy A. Deutsch, Newton, and Virgil D. Haverdink, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Aug. 19, 1987, Ser. No. 87,075
Int. Cl.[4] A01D *46/08*
U.S. Cl. 56—41 **23 Claims**



1. In a cotton harvester adapted for forward movement over a field of cotton plants and having a row unit with a cotton discharge opening, means for harvesting cotton from the cotton plants and directing harvested cotton through the opening, door structure for receiving the cotton directed through the opening comprising:
a compartment including a compartment opening;
means for supporting the compartment adjacent the row unit with the compartment opening located adjacent the row unit opening for receiving harvested cotton from the row unit; and
elongated guide means slidably receiving the compartment for generally linear advancement of the compartment along the guide means between a removed position offset from the row unit opening and an operating position adjacent the row unit opening.

4,817,371
INDIVIDUAL-MOTOR DRIVE METHOD OF AND APPARATUS FOR SPINDLES OF A SPINNING MACHINE
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany
Filed Jun. 11, 1987, Ser. No. 61,877
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619647
Int. Cl.[4] D01H *1/244, 1/20, 1/22*
U.S. Cl. 57—100 **15 Claims**



1. A method of operating a spinning machine having individual spindles and a respective asynchronous motor connected to each spindle and adapted to drive the spindle at an operating spinning speed upon application at a given supply frequency of a current source determining the speed of the motor and being associated with an operating voltage such that at said operating speed, each motor is operated with a given voltage-frequency ratio, said method comprising the steps of:
at least over a substantial portion of time for acceleration of the respective spindle to said operating speed from standstill, applying to the respective motor an increased supply voltage to thereby reduce the duration time until the motor reaches said operating speed; and
thereafter terminating the voltage increase in response to the attainment of said operating speed by the spindle being accelerated.

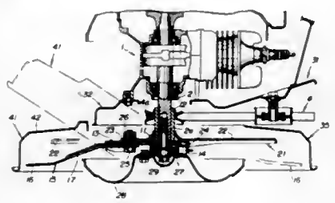
4,817,372
POWER LAWN MOWER
Toshihiro Toda; Masato Mukainakano, both of Saitama; Shigeto Iwadare, Tokyo, and Masatoshi Ihara, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 757,412, Jul. 22, 1985, abandoned. This application Jan. 28, 1988, Ser. No. 149,998
Claims priority, application Japan, Jul. 23, 1984, 59-153663; Jul. 23, 1984, 59-153664; Jul. 23, 1984, 59-153665; Jul. 23, 1984, 59-112165[U]
Int. Cl.[4] A01D *87/10*
U.S. Cl. 56—12.8 **10 Claims**

1. A power lawn mower comprising:
an engine having an output shaft extending vertically downwardly;
a cutter blade having a central portion mounted on said output shaft for rotation therewith , a cutting edge at each end of said cutter blade and downward-sloped intermediate portions of said cutter blade joining each cutting edge to said central portion of said cutter blade;

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a housing mounted to a lower portion of said engine and positioned at a lower portion of said output shaft to cover said cutter blade, said housing having a substantially flat ceiling portion and a substantially cylindrical portion extending downwardly from the periphery of said ceiling portion; and

a throw-out plate mounted on said output shaft between said



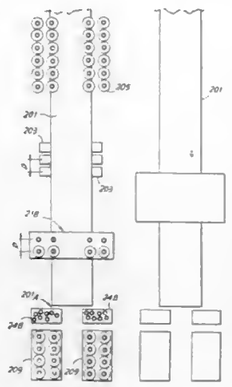
ceiling portion of said housing and said cutter blade, said throw-out plate having a pair of throw-out arms each being substantially flat so as not to generate an air flow and each having a distal end portion positioned between and away from both said cutter blade and said ceiling portion, each throw-out arm having a curved leading edge along a substantially whole front edge thereof for pushing cut grass outwardly along said leading edge.

4,817,373

APPARATUS FOR AUTOMATICALLY SUPPLYING CONTINUOUS SPINNING MACHINES WITH REELED MATERIAL

Sergio Gualchierani, Florence, Italy, assignor to Gualchierani System s.a.s. di Sergio Gualchierani & C., Florence, Italy

Filed Mar. 31, 1987, Ser. No. 33,341
Claims priority, application Italy, Apr. 3, 1986, 9363 A/86; Aug. 13, 1986, 9462 A/86
Int. Cl.[4] D01H *9/18, 9/10*
U.S. Cl. 57—281 **16 Claims**



1. Apparatus for supplying continuous spinning machines with reels or bobbins of reeled material comprising:

a frame or housing (12; 212) extending along and above the spinning machine (1; 201), supporting guide means (16; 216), including a transfer carriage (18; 218) running along said spinning machine;

said transfer carriage having a plurality of mandrels (22, 222) carrying reels or bobbins (24; 224) to be replaced, drive means (20; 220) being provided to lift and lower said mandrels, and jaw means (27) being provided in order to engage and retain the reels or bobbins inserted on said mandrels; and comprising

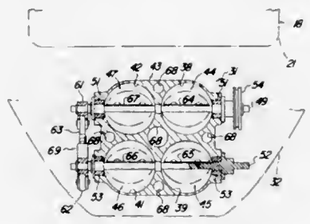
in cooperative relationship with each or with a set of working groups (3; 203) an overturn and transfer unit (30; 230) carrying a plurality of mandrels (22; 222A), a first set of which is directed downwardly in order to maintain a corresponding set of reels in the feeding portion, suspended above the corresponding working groups, and a secnd set of which is directed upwardly in order to receive a set of new reels or bobbins, means (68, 233, 234, 230) being provided in order to move said unit so as to substitute exhausted or partially exhausted reels with new reels, said mandrels carried by said unit being provided with elastic elements (11) adapted to retain the tubes (32) and the reels wound thereon on the corresponding mandrel.

4,817,374

EXHAUST CONTROL DEVICE OF ENGINE

Hideaki Kitta, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 11, 1987, Ser. No. 96,592
Claims priority, application Japan, Sep. 13, 1986, 61-215043
Int. Cl.[4] F02B *27/02*
U.S. Cl. 60—313 **17 Claims**



1. An exhaust system for an internal combustion engine having first and second exhaust ports, a first exhaust pipe extending from said first exhaust port, and a second exhaust pipe extending from said second exhaust port, a single valve body formed with first and second exhaust passages spaced vertically one above the other, means for communicating a horizontally extending portion, of said first exhaust pipe with said first exhaust gas passage of said valve body, means for communicating a horizontally extending section of said second exhaust pipe with said second exhaust gas passage of said valve body, a first valve shaft journaled in said valve body for rotation about a horizontally extending axis, a second valve shaft journaled in said valve body and rotatable about a horizontally extending axis, a first valve element fixed to said first valve shaft within said first exhaust gas passage for controlling the flow therethrough, a second valve element fixed to said second valve shaft within said second exhaust gas passage for controlling the flow therethrough, and means for simultaneously connecting said first and said second shafts for common rotation.

4,817,375

TURBINE ENGINE FUEL CONTROL SYSTEM

Jean-Marie Brocard, Rubelles; Eric Perrodeau, Bourg la Reine, and Maurice G. Vernochet, Melun, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." , Paris, France

Filed Jan. 28, 1988, Ser. No. 149,369
Claims priority, application France, Jan. 28, 1987, 87 00976
Int. Cl.[4] F02C *9/32*
U.S. Cl. 60—39.281 **8 Claims**

1. Fuel control system, particularly for a turbine engine, comprising:

a high pressure proportioning pump for providing a supply of fuel at a pressure Pam,

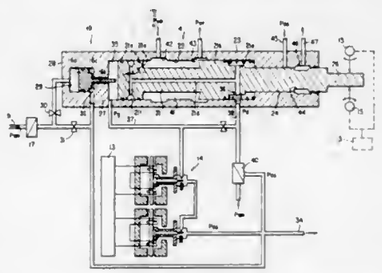
a feed flow regulator connected to receive fuel at said supply pressure Pam from said pump and adapted to provide an output flow at a delivery pressure Pav,

a fuel injection system connected to receive said output flow from said flow regulator,

a pressure drop detector responsive to said supply and delivery pressures Pam and Pav to provide a control pressure signal Pmod dependent on the pressure drop Pam-Pav, substantially constant,

a control valve also connected to said fuel supply from said pump and responsive to said control pressure signal Pmod to control said fuel supply to said flow regulator so as to maintain said pressure drop Pam-Pav substantially constant,

an overspeed limiter adapted to detect the rotational speed of said turbine plant and operative to reduce the flow of fuel to said injection system in response to the speed of said plant exceeding a preset overspeed threshold,



a stop valve connected between said flow regulator and said injection system capable of shutting off the flow of fuel from said flow regulator to said injection system,

and a control computer for controlling said system,

wherein said feed flow regulator comprises

a sleeve including means defining a fuel inlet port and a fuel outlet port,

a double differential piston slidably mounted in said sleeve and adapted to vary the opening of at least one of said inlet and outlet ports to control said output flow,

a first fixed stop limiting the movement of said double differential piston at a position defining a maximum fuel output flow rate,

a second stop movable between an inoperative position and an operative, safety position limiting the movement of said double differential piston at a position defining a minimum fuel output flow threshold,

and control circuit means actuatable to retract said second stop to said inoperative position to allow said minimum output flow threshold to be crossed and said double differential piston to reach a nil output flow position.

4,817,376

MODULAR SUB-ASSEMBLY FOR TURBINE ENGINE FUEL CONTROL SYSTEMS

Jean-Marie Brocard, Rubelles; Eric Perrodeau, Bourg la Reine, and Maurice G. Vernochet, Melun, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." , Paris, France

Filed Jan. 28, 1988, Ser. No. 149,364
Claims priority, application France, Jan. 28, 1987, 87 00975
Int. Cl.[4] F02C *9/28*
U.S. Cl. 60—39.281 **7 Claims**

1. A modular control sub-assembly in a fuel control system for a turbine engine, said fuel control system comprising:

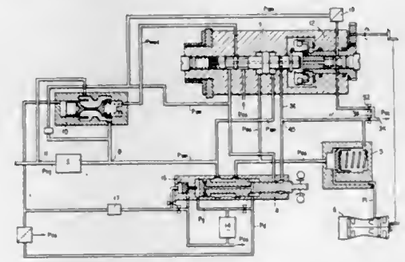
a high pressure proportioning pump- for providing a supply of fuel at a pressure Pam,

a feed flow regulator connected to receive fuel at said supply pressure Pam from said pump and adapted to provide an output flow at a pressure Pav for delivery to a fuel injection system,

a pressure drop detector responsive to said supply and delivery pressures Pam and Pav to provide a control pressure signal Pmod dependent on the pressure drop Pam-Pav,

a control valve operative on said fuel supply from said pump and responsive to said control pressure signal Pmod to control said fuel supply to said flow regulator so as to maintain said pressure drop Pam-Pav substantially constant, and

an overspeed limiter adapted to be rotated by said turbine plant in proportion to the rotational speed of said plant and operative to reduce the flow of fuel to said injection system in response to the speed of said engine exceeding a present overspeed threshold,



wherein said modular control sub-assembly incorporates said pressure drop detector and said overspeed limiter and said sub-assembly comprises:

a casing having a bore,

a slide mounted for axial and rotational movement in said bore, said slide forming said pressure drop detector,

means in said casing housing said overspeed limiter at one end of said bore in coaxial relation to said slide, and

coupling means for transmitting the rotational movement of said overspeed limiter to said slide,

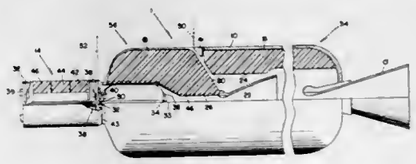
said overspeed limiter including fly-weight means adapted to act on said slide, when said overspeed threshold is exceeded, to move said slide axially in the same direction as said slide moves when detecting an increase in said pressure drop Pam-Pav to reduce said control pressure signal Pmod and cause said control valve to open and reduce said fuel supply to said feed regulator.

4,817,377

HEAD END CONTROL AND STEERING SYSTEM: USING A FORWARD END MANEUVERING GAS GENERATOR

Thomas J. Kirschner, Jr., Northeast, Md., and John J. Walsh, Wilmington, Del., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed May 7, 1987, Ser. No. 47,755
Int. Cl.[4] F02K *9/00, 1/00*
U.S. Cl. 60—225 **10 Claims**



1. A multi-stage rocket system including a rocket motor

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having a plurality of lower stages and a head end final maneuvering stage with each of said lower stages including a propulsive propellant, and with said final maneuvering stage being used to provide pointing, ignition, and control of said rocket system,

said final maneuvering stage including a plurality of thruster nozzles and an inlet through which gas under pressure may flow to said thruster nozzles, and further including check valve means associated with said inlet to control the flow of gas therethrough, said check valve means allowing a flow of gas under pressure into said maneuvering stage through said inlet, but precluding a flow of gas under pressure outwardly thereof,

a gas generator associated with one of said lower stages and having a first outlet orifice in communicating relation with said inlet for supplying generated gas under pressure to said thruster nozzles through said check valve means, said gas generator having a second outlet orifice which initially is sealed but which when opened allows generated gas under pressure to be delivered to said lower stages for igniting said stages, said gas generator having excess gas generating capacity whereby propulsive gases resulting from ignition of said lower stages is precluded from flowing through said check valve means.

4,817,378

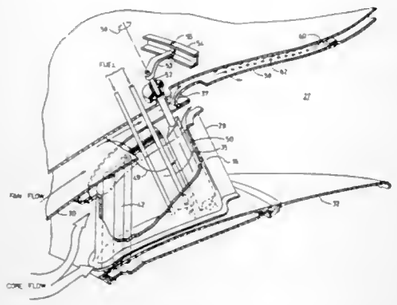
GAS TURBINE ENGINE WITH AUGMENTOR AND VARIABLE AREA BYPASS INJECTOR

Rollin G. Giffin, III, Cincinnati; Ivan E. Woltmann, West Chester, and Donald P. McHugh, Wyoming, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 14,562, Feb. 13, 1987, abandoned. This application May 23, 1988, Ser. No. 198,670

Int. Cl.[4] F02K *3/10*

U.S. Cl. 60—261 **15 Claims**



9. A gas turbine engine including a core engine and a center body associated therewith, an inlet for supplying gas flow to the core engine, a bypass duct surrounding the core engine for bypassing a portion of the gas around the core engine, and an augmentor aft of the core engine, for providing augmented thrust, comprising:

(a) a plurality of circumferentially disposed hollow members positioned in the path of core gases from the the core engine;

(b) each of said members extending generally radially from said bypass duct to said center body;

(c) each of said members being open at the radially outward end for receiving bypass gas from said bypass duct;

(d) each of said members including spaced apart sidewalls and an opening in one of said side walls near the trailing edge and extending substantially the length of each of said members for discharging bypass gas in a direction which provides thorough mixing of said core gases and said bypass gas throughout substantially the entire region between adjacent hollow members.

4,817,379

JET PROPULSION ENGINE AND METHOD

Charles S. Bagley, 1314 Ohio Ave., Alamogordo, N. Mex. 88310

Continuation-in-part of Ser. No. 689,862, Jan. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 426,122, Sep. 28, 1982, abandoned. This application Jan. 27, 1987, Ser. No. 7,363

Int. Cl.[4] F02C *3/10*

U.S. Cl. 60—261 **6 Claims**



1. An air breathing, jet propulsion engine, comprising an open-ended, elongate, tublur casing having a lead section at one open end thereof with means adapted to receive a stream of atmospheric air and compress it substantially adiabatically to at least twice ambient pressure, a second, relatively short, intermediate section in longitudinal alignment and flow communication with said first section, and a third, elongate, discharge section at the opposite open end of the casing and in longitudinal alignment and flow communication with said second section; a smaller, open-ended, elongate and perforate tubular member concentrically positioned within said second and third sections of the casing as a combustion chamber and configurated to define with said casing as the entrance to said second section thereof a thrust nozzle having an annular, convergent entry for air followed by an annular throat for initiating supersonic flow of air and to define, further, a wholly and progressively divergent discharge passage around and along said perforate tubular member which opens at said opposite open end of the casing as a thrust orifice for supersonic flow of a heated, nozzle airstream from around the combustion chamber, said discharge passage being in flow communication with the combustion chamber along the length thereof by way of the perforations of said perforate tubular member; and means for establishing combustion within said combustion chamber for mass transfer by convection of hot gases from said ombustion chamber to said supersonic flow of air so as to supply heat to and increase velocity of the airstream flowing through said wholly divergent discharge passage and out said thrust orifice, wherein the engine is of turbojet configuration having air pressurizing turbine means in the lead section of the casing, said turbine means comprising a turbine wheel, a low pressure fan section, and a relatively high pressure compressor and turbo section having nozzles directed against said turbine wheel, the nozzles of the turbine means each substantially conforming structurally and functionally to the nozzle of the intermediate and discharge sections of the casing.

4,817,380

PROCESS AND DEVICE FOR PIECING UP AN OPEN-END FRICTION SPINNING DEVICE

Kurt Lovas, Bohmfeld, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/DE86/00234, § 371 Date Jan. 5, 1987, § 102(e) Date Jan. 5, 1987, PCT Pub. No. WO87/00214, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 5, 1986, Ser. No. 27,226

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522518

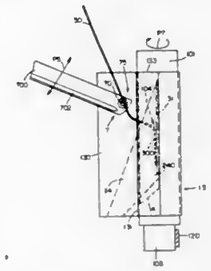
Int. Cl.[4] D01H *7/882, 15/02*

U.S. Cl. 57—263 **41 Claims**

1. A process for piecing up a downed end in an open-end friction spinning device which has two friction spinning elements driven in the same direction which form a nip subjected to suction, one of the ends of this nip forming a draw-off end, comprising steps of:

(a) feeding a thread end into a piecing position outside of said nip;

(b) transferring said thread end to a thread forming zone in said nip; while keeping a thread portion between said thread end and said draw-off end out of said nip; and



(c) feeding opened fibers to said thread forming zone whereby the feeding of the fibers into the nip is controlled so that the thread end comes into contact with the fibers at the same moment it reaches said thread forming zone after which the thread is drawn off effecting piecing of the thread.

4,817,381

PROCESS AND APPARATUS FOR REGISTERING DEAD SPINNING OR TWISTING STATIONS

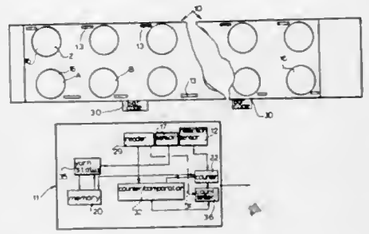
Werner Meissner, Hattenhofen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,877

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643300

Int. Cl.[4] D01H *13/32, 15/00*

U.S. Cl. 57—265 **16 Claims**



1. A process for registering dead workstations of a spinning or twisting machine having a plurality of workstations, particularly a ring spinning machine, in which yarn breaks can be automatically eliminated by a yarn-starting carriage, whereby at such workstations at which after a predetermined number of successive yarn break elimination attempts by said yarn-starting carriage fail, said workstations are automatically registered in a memory as one of said dead workstations and said yarn-starting carriage does not perform any yarn break operations at these dead workstations, said process comprising the steps of:

(a) automatically testing for yarn breaks each workstation regardless of a registration thereof as a dead workstation or not in said memory upon arrival at said workstation by said yarn-starting carriage;

(b) determining from said memory a registration as a dead workstation or not of said workstation being tested;

(c) automatically erasing from said memory as determined in step (b) the registration as a dead workstation of said workstation being tested if no yarn break is present thereat; and

(d) displacing said yarn-starting carriage to a next workstation if said workstation being tested has no yarn break or upon completion of step (c).

12. In an apparatus for registering dead workstations of a spinning or twisting machine having a plurality of workstations, particularly a ring spinning machine, of the type wherein a yarn-starting carriage is displaceable along said machine and said dead workstations are registered in a memory separately defined from said plurality of workstations, the improvement comprising:

yarn break detection means provided on said carriage for testing whether a yarn break is present or not upon arrival of said carriage at a workstation regardless of whether said workstation is registered as dead or not in said memory; and

erasing means for automatically erasing from said memory a registration as dead of said workstation arrived at by said carriage and at which no yarn break is detected by said yarn break detection means.

4,817,382

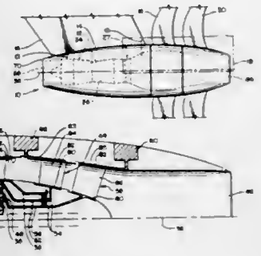
TURBOPROP PROPULSION APPARATUS

Peter K. C. Rudolph, Seattle, and Grazyna B. Ostrom, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1985, Ser. No. 815,447

Int. Cl.[4] F02K *3/072*

U.S. Cl. 60—268 **31 Claims**



1. A turboprop propulsion assembly comprising:

a. a nacelle having a support structure;

b. a gas generating and power section mounted in said support structure and having a longitudinally extending operating axis, said gas generating and power section comprising:

1. a compressor means to receive intake air;

2. a burner means to receive air from the compressor and burn fuel therein to create a gaseous combustion product;

3. a turbine means having a turbine blade means centered on, and rotatable about, said operating axis;

c. said nacelle having a forward inlet and a rear exhaust nozzle, with said propulsion assembly defining a substantially continuous gaseous fluid flow path from said inlet through said gas generating and power section to said exhaust nozzle;

d. first and second propellers mounted for counter-rotation at a mounting location radially outward of said flow path;

e. a planetary drive transmission comprising:

1. an inner sun gear means of a relatively smaller diameter, mounted for rotation about said operating axis and

operatively connected to said turbine means so as to be driven thereby;

2. a ring gear means of a relatively larger diameter, mounted for rotation relative to said support structure about said operating axis and drivingly connected to said first propeller for rotation in a first direction;

3. a planetary means comprising planetary gear means rotatable about axis means generally parallel to said operating axis and drivingly interconnected between the sun gear means and the ring gear means in a manner that rotation of said sun gear means relative to said planetary means in a first direction causes rotation of said ring gear means relative to said planetary gear means in a second direction opposite to the first direction, and further comprising planet carrier means operatively connected to the planetary gear means and rotatable about the operating axis, said planet carrier means being drivingly connected to the second propeller means for rotation in a direction opposite to the direction of rotation of the first propeller;

f. said planetary transmission being positioned at a location spaced radially from said flow path in a manner that gaseous fluid flow through said flow path can be optimized,

g. a gear box enclosing said planetary drive transmission;

h. first torque frame means interconnected between said ring gear means and said first propeller, and second torque frame means interconnected between said planet carrier means and said second propeller, said first and second propellers being axially spaced from said first and second torque frame means, respectively;

i. at least two sets of bearing means positioned at axially spaced locations within said gear box to provide bearing support for said first and second torque frame means;

whereby as said turbine section rotatably drives said sun gear, said sun gear causes relative counter-rotation of said planet carrier and said ring gear to cause counter-rotation of said propellers.

4,817,383

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED EXHAUST EMISSION CHARACTERISTICS

Takatoshi Masui, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 27, 1987, Ser. No. 112,956

Claims priority, application Japan, Nov. 8, 1986, 61-264886

Int. Cl.⁴ F02D *41/14*; F01N *3/20*

U.S. Cl. 60—274 **14 Claims**

1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, comprising the steps of:

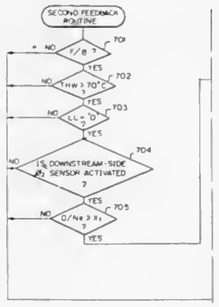
calculating an air-fuel ratio correction amount in accordance with the outputs of said upstream-side and downstream-side air-fuel ratio sensors;

determining whether said downstream-side air-fuel ratio sensor is activated;

measuring a time period of reversions of the output of said downstream-side air-fuel ratio sensor;

determining whether said time period is larger than a predetermined value;

prohibiting a calculation of said air-fuel ratio correction amount by the output of said downstream-side air-fuel ratio sensor when said time period is larger than said predetermined value and said downstream-side air-fuel ratio sensor is activated; and



adjusting an actual air-fuel ratio of said engine in accordance with said air-fuel ratio correction.

4,817,384

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED EXHAUST EMISSION CHARACTERISTICS

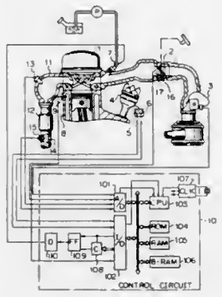
Atsuo Okumura; Masato Ujino, and Takashi Kawase, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 11, 1987, Ser. No. 84,105

Claims priority, application Japan, Aug. 13, 1986, 61-188759; Oct. 13, 1986, 61-241488; Jan. 21, 1987, 62-009930; Feb. 20, 1987, 62-035820

Int. Cl.⁴ F02D *41/14*

U.S. Cl. 60—274 **58 Claims**



1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, comprising the steps of:

calculating an air-fuel ratio correction amount in accordance with the outputs of said upstream-side and downstream-side air-fuel ratio sensors;

guarding said air-fuel ratio correction amount within a predetermined range;

adjusting an actual air-fuel ratio in accordance with said air-fuel ratio correction amount;

determining whether or not said air-fuel ratio correction amount reaches a maximum or minimum value of said predetermined range; and

prohibiting a calculation of said air-fuel ratio correction amount by the output of said downstream-side air-fuel ratio sensor while carrying out a correction of said air-fuel ratio correction amount by the output of said upstream-side air-fuel ratio sensor when said air-fuel ratio correction amount reaches the maximum or minimum value of said predetermined range.

4,817,385

TEMPERATURE CONTROL APPARATUS FOR VEHICULAR CATALYTIC CONVERTERS

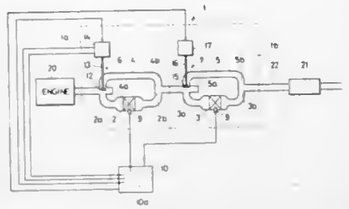
Shiro Kumagai, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1987, Ser. No. 72,220

Claims priority, application Japan, Jul. 16, 1986, 61-10797[U]

Int. Cl.⁴ F01N *3/20*

U.S. Cl. 60—288 **9 Claims**



1. A temperature control apparatus for at least two catalytic converters connected in series in a exhaust passage of an internal combustion engine mounted on a vehicle, a first of said at least two catalytic converters being connected in the vicinity of said engine, and a second of said at least two catalytic converters being connected farther from said engine than said first catalytic converter, the control apparatus comprising:

a by-pass connected in parallel with said first catalytic converter;

a control valve for substantially continuously and variably controlling the ratio between the amounts of exhaust gas introduced from said engine into said first catalytic converter and into said by-pass;

valve drive means for driving said control valve in a substantially continuous manner;

temperature detecting means for detecting a temperature value associated with the catalyst-bed temperature of said first catalytic converter; and

control means for calculating a deviation between a reference value and the temperature value detected by said temperature detecting means, and for delivering a drive signal to said valve drive means in accordance with said deviation, thereby controlling the opening of said control valve to keep said temperature value associated with said catalyst-bed temperature of said first catalytic converter in the vicinity of said reference value.

4,817,386

METHOD FOR THE SUPPLY OF COMBUSTION AIR TO THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

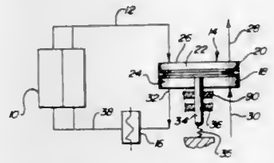
Oskar Schatz, Teilhohe 14, D-8031 Stockdorf, Fed. Rep. of Germany

Continuation of Ser. No. 609,930, May 14, 1984, abandoned. This application Dec. 29, 1986, Ser. No. 948,456

Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318161

Int. Cl.⁴ F02B *37/00*

U.S. Cl. 60—605.1 **2 Claims**



1. A method for supplying combustion air to a combustion chamber of an internal combustion engine, said engine being a piston engine having means for compressing the combustion air, conduits connecting the compressing means to each piston cylinder of the engine, and cooling means associated with the conduits, said method comprising the steps of;

providing means for compressing combustion air, said means for compressing coupled with exhaust gas discharge of said engine,

driving said means for compressing with exhaust gas pulses from the engine,

compressing the combustion air in said means for compressing in response to exhaust gas pulses discharged from the engine, said means for compressing combustion air being of a desired size and having a desired volume such that a stroke of said means for compressing combustion air provides a piston cylinder of the engine with a desired amount of combustion air,

transporting said combustion air along said conduit to said piston cylinder,

passing said conduit through said cooling means,

cooling said combustion air while passing said combustion air through said cooling means,

expanding said combustion air in said piston cylinder before closing the inlet valve of said piston cylinder,

closing said inlet valve during the piston suction stroke,

providing said piston cylinder with a desired size and volume for enabling said expanded combustion air to expand in said cylinder and to have a pressure of substantially atmospheric pressure, and

beginning a compression stroke by the engine with said expanded combustion air in said piston cylinder at a pressure at the beginning of said compression stroke of substantially atmospheric pressure.

4,817,387

TURBOCHARGER/SUPERCHARGER CONTROL DEVICE

Larry D. Lashbrook, Fort Lauderdale, Fla., assignor to Hamilton C. Forman, Trustee, Fort Lauderdale, Fla.

Filed Oct. 27, 1986, Ser. No. 923,578

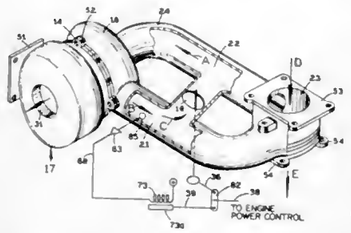
Int. Cl.⁴ F02B *33/44*

U.S. Cl. 60—611 **23 Claims**

1. Turbocharger control device for an internal combustion engine having an exhaust turbine having an inlet and an outlet, a compressor also having an inlet and an outlet, coupled to the turbine, disposed between the engine fuel/air mixture source and the engine intake manifold, and control means coupled to the engine fuel/air mixture source, comprising: a dedicated

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recirculation loop means for recirculation having an inlet and an outlet in fluid communication with the respective compressor outlet and inlet; a recirculation control valve disposed in the recirculation loop for controlling the amount of recirculating fuel/air mixture circulating in the loop, and recirculation valve control means controllingly engaging the recirculation valve for controlling the amount of fuel/air mixture flow in the recirculation loop.



4,817,388

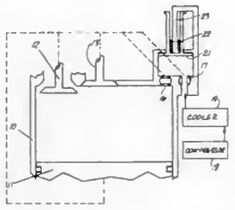
ENGINE WITH PRESSURIZED VALVED CELL

Joseph B. Bland, P.O. Box 1098, Solvang, Calif. 93463

Continuation-in-part of Ser. No. 835,645, Mar. 3, 1986, abandoned. This application Sep. 16, 1987, Ser. No. 97,606

Int. Cl.[4] F02B *19/18*

U.S. Cl. 60—721 **22 Claims**



1. An two-stroke engine comprising:
an expansion chamber capable of undergoing the cycles of expansion and exhaust;
a cell separate from the expansion chamber but in immediate proximity to the expansion chamber;
means for compressing a gas external to the expansion chamber;
a cell inlet valve means connecting the externally compressed gas and the cell;
a transfer valve means connecting the cell and the expansion chamber;
exhaust valve or port means within the expansion chamber;
heat input means for increasing the molecular activity of the externally compressed gases over the molecular activity of the gases following external compression;
linkage means for supplying power from the expansion means to the desired work load, the external compressor means, the valve actuation means and any auxiliary power means required for engine operation for:
(a) opening the cell inlet valve to admit externally compressed gas when substantially all of the gas within the cell has been exhausted into the expander;
(b) closing the cell inlet valve before the opening of the transfer valve;
(c) closing the exhaust valve before the completion of the exhaust cycle to allow the remnant gases to be recompressed to substantially the pressure within the cell;
(d) opening the transfer valve when the pressure within the expansion chamber and the pressure within the cell are substantially the same; and
(e) closing the transfer valve following the transfer of substantially all of the externally compressed gas into the expander.

4,817,389

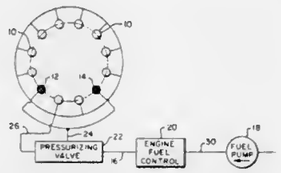
FUEL INJECTION SYSTEM

Thomas E. Holladay, Lake Park, and Thomas L. DuBell, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 24, 1987, Ser. No. 100,796

Int. Cl.[4] F02C *7/22*

U.S. Cl. 60—739 **7 Claims**



1. A fuel supply system for the combustor of a gas turbine engine comprising:
a plurality of circumferentially spaced fuel injectors located for injection of fuel into the combustor;
the majority of said fuel injectors being air atomized type main nozzles;
the minority of said fuel injectors being pressure atomized type pilot nozzles;
an igniter adjacent to each pilot nozzle;
pump means for supplying fuel to said injectors;
variable restriction means located between said pump means and said main nozzles; and
a pilot fuel delivery conduit receiving fuel between said pump means and said variable restriction means for delivering fuel to said pilot nozzles, where by a high delivery pressure to said pressure atomized pilot nozzles may be obtained at all times.

4,817,390

CRYOGENIC COMPRESSOR

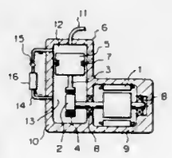
Takuya Suganami, and Yoshio Kazumoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 123,964

Claims priority, application Japan, Dec. 16, 1986, 61-299309

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 **26 Claims**



1. A cryogenic compressor having a compression space and a buffer space which are partitioned off from each other by means of a reciprocating piston, wherein the improvement comprises:

a passage which connects said compression and buffer spaces directly to each other;
a check valve provided in said passage, said valve allowing a gas to flow only from said buffer space to said compression space; and
a purification chamber provided in said passage and in series with said check valve, said chamber being filled with a purifying substance.

4,817,391

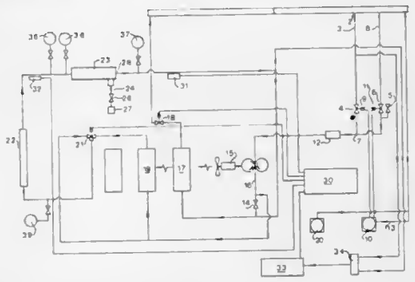
METHOD AND APPARATUS FOR PRODUCING A CONTROLLED ATMOSPHERE

Elman Roe, 12008 A S. 43rd Ave.; William R. Ash, 1409 W. Chestnut, both of Yakima, Wash. 98902; Terry Campbell, 5406 W. Washington, and Steve Forney, 8313 Naches Heights Rd., both of Yakima, Wash. 98908

Filed Nov. 2, 1987, Ser. No. 115,108

Int. Cl.[4] F25J *3/00*

U.S. Cl. 62—17 **19 Claims**



1. An apparatus for producing a controlled atmosphere in a preselected area; comprising,
an inlet for accepting exhaust gases from said area where the controlled atmosphere is desired; and,
a compressor having an entrance and an exit with said entrance connected to said inlet for increasing the pressure of the gases received from said inlet; and,
gas separation means connected to the exit of said compressor for removing gases selected from the group of carbon dioxide, oxygen, ethylene, water vapor from the gases received from said compressor; and,
an outlet connected to said gas separation means for releasing gases into said area where the controlled atmosphere is desired.

4,817,392

PROCESS FOR THE PRODUCTION OF ARGON

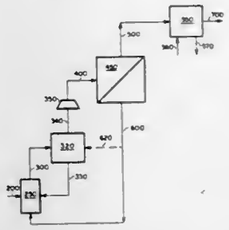
Rakesh Agrawal, Allentown; Steven R. Auvil, Whitehall, and Jung S. Choe, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 874,745, Jun. 16, 1986, Pat. No. 4,717,407, which is a continuation-in-part of Ser. No. 759,027, Jul. 25, 1985, Pat. No. 4,654,063, which is a continuation-in-part of Ser. No. 684,655, Dec. 21, 1984, Pat. No. 4,595,405. This application Jul. 29, 1987, Ser. No. 79,187

Int. Cl.[4] F25J *3/00*

U.S. Cl. 62—18 **22 Claims**

14. A process for producing an O_2-lean argon stream comprising:
(a) treating an argon-containing gas mixture in a cryogenic separation unit to produce a crude argon stream having an argon concentration between 80–98 volume % argon, and an essentially O_2-free nitrogen stream;
(b) treating said crude argon stream in a membrane separation unit which is capable of separating oxygen and argon to produce an O_2-lean argon reject stream and an O_2-rich permeate stream;
(c) employing the essentially O_2-free nitrogen stream from the cryogenic separation unit as a sweep stream on the permeate side of the membrane to reduce the partial pressure of O_2 on the permeate side of the membrane thereby increasing the flux of O_2 through the membrane;



(d) recycling the O_2-rich permeate stream along with the nitrogen sweep stream to the cryogenic separation unit; and
(e) recovering the O_2-lean, argon reject stream from the membrane separation unit.

4,817,393

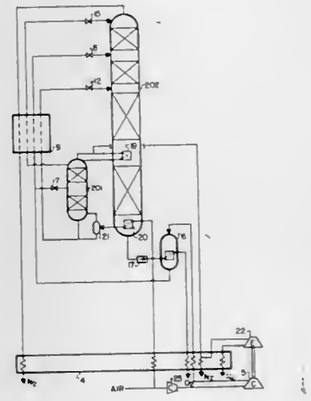
COMPANDED TOTAL CONDENSATION LOXBOIL AIR DISTILLATION

Donald C. Erickson, 1704 S. Harbor Ln., Annapolis, Md. 21401

Filed Apr. 18, 1986, Ser. No. 853,461

Int. Cl.[4] F25D *3/04*

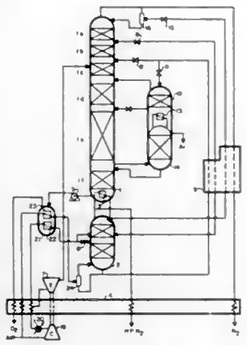
U.S. Cl. 62—22 **10 Claims**



1. A dual pressure cryogenic distillation process for producing gaseous oxygen from a supply of compressed and cleaned air comprising:
a. cooling a major fraction of said compressed and cleaned air:
b. rectifying said major fraction in a high pressure rectifier to liquid nitrogen overhead product and kettle liquid bottom product;
c. distilling the kettle liquid in a low pressure column to liquid oxygen bottom product and gaseous nitrogen overhead product;
d. working expanding a compensating vapor comprised of at least 77% N_2 thereby producing refrigeration;
e. further compressing the remaining minor fraction comprising no more than about 30% of said compressed, cleaned warm air in a compressor powered by said expansion work;

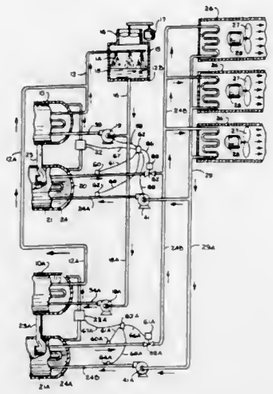
f. pressurizing said liquid oxygen to at least about 0.2 ATA above LP column bottom pressure;
g. cooling the minor air fraction to near its dewpoint;
h. condensing substantially all the minor air fraction by exchanging latent heat with said pressurized liquid oxygen;
i. withdrawing evaporated oxygen as product;
j. dividing the condensed air into two streams, each comprising at least 15% of said minor fraction;
k. injecting one of said streams into an intermediate height of the HP rectifier and injecting the second stream into an intermediate height of the LP column; and
l. separately reboiling said LP column bottoms by exchanging latent heat with at least one of:
(i) HP rectifier overhead vapor and
(ii) partially condensing major fraction of said supply air.

4,817,394
OPTIMIZED INTERMEDIATE HEIGHT REFLUX FOR MULTIPRESSURE AIR DISTILLATION
Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401
Filed Feb. 2, 1988, Ser. No. 151,565
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 **22 Claims**



1. A process for the fractional distillation of a supply of compressed and cleaned air to high purity oxygen and crude argon comprising:
(a) distilling an oxygen-argon mixture to liquid oxygen bottom product and crude argon overhead product in an argon-oxygen distillation column comprised of an argon stripper and an argon rectifier;
(b) pressurizing said liquid oxygen bottom product to at least about 0.2 ATA above argon stripper bottom pressure;
(c) evaporating at least part of said pressurized liquid oxygen by exchanging latent heat in a first oxygen evaporator with a major fraction of said supply air which is partially condensed thereby;
(d) withdrawing at least part of said evaporated oxygen as product;
(e) supplying at least the uncondensed fraction of the air from said first oxygen evaporator to a high pressure (HP) rectifier, and rectifying it therein to N_2 overhead product and oxygen-enriched bottom product;
(f) refluxing the overhead of said HP rectifier and reboiling the bottom of said argon stripper by exchanging latent heat;
(g) refluxing the overhead of a nitrogen (N_2) removal column for distilling said HP rectifier bottom product to oxygen-argon mixture, at least part of which is supplied to said distilling step a), by supplying it with depressurized liquid N_2 from the overhead of said HP rectifier;
(h) evaporating additional liquid oxygen in a second oxygen evaporator by exchanging latent heat with about 10 to 20% of said supply air and thereby producing liquid air; and
(i) splitting said liquid air into respective intermediate height reflux streams for both said HP rectifier and said N_2 removal column.

4,817,395
METHOD AND APPARATUS FOR SAVING ENERGY IN AN AIR CONDITIONING SYSTEM
George Martinez, Jr., P.O. Box 1141, Gonzales, La. 70737
Filed Jun. 11, 1987, Ser. No. 60,535
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—175 **13 Claims**

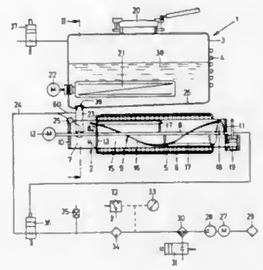


1. A method for reducing the amount of energy consumed in cooling a building with a chilled water air conditioning system having an evaporator containing a supply chilled water line and a return chilled water line comprising:
a. operating the air conditioning system at full capacity until the supply chilled water temperature reaches a pre-set temperature, and
b. varying the total water flow in the return chilled water line and the supply chilled water line to maintain the temperature differential between the temperature of the water in the supply chilled water line and the temperature of the water in the return chilled water line at a pre-set value.

4,817,396
APPARATUS FOR PRODUCING ICE CREAM, MILK SHAKES OR FROZEN DESSERTS FROM A FLOWABLE FORMULATION
Waldemar Menzel, Kulmbach-Burghaig, Fed. Rep. of Germany, assignor to LUMENGmbH Nahrmittel- und Maschinenfabrik, Kulmach, Fed. Rep. of Germany
Filed Mar. 1, 1988, Ser. No. 162,675
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707779
Int. Cl.[4] A23G *9/20*
U.S. Cl. 62—306 **25 Claims**

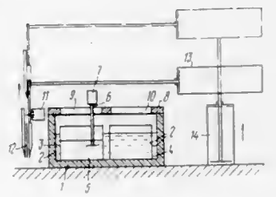
1. An apparatus for producing ice cream, milk shakes or frozen desserts from a flowable formulation, comprising a gastightly closable storage container for the formulation;
a cooling and freezing cylinder connected to the container by a feed pipe in which there is a rotatingly drivable agitating and scraping mechanism, the feed pipe terminating in an inlet chamber disposed at one end of the cylinder, there being at the other end of the cylinder a discharge valve;

means being provided for transporting the formulation from the inlet chamber to the discharge valve;
an air line discharging into the inlet chamber in order to apply compressed air to the cylinder and the storage container; and



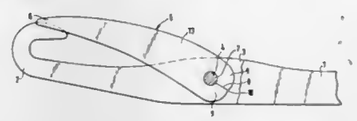
a retaining means is associated with the feed pipe which substantially seals off the feed pipe when there is pressure in the air line and opens it when the pressure in the air line fails, wherein the retaining means comprises a retaining plate at least substantially covering the feed pipe and having apertures.

4,817,397
DEVICE FOR REFRIGERATION AND FREEZING OF BIOLOGICAL OBJECTS
Valentin I. Grischenko, Valery F. Tarasov, Sergei E. Galchenko, Jury V. Kalugin, Jury S. Paraschuk, Nina A. Luchko, and Elena N. Chernysh, all of Kharkov, U.S.S.R., assignors to Institut Problem Kriobiologii Krombditsyny Akademii Nauk Ukrainskoi, U.S.S.R.
Filed Jun. 21, 1988, Ser. No. 209,573
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R **5 Claims**



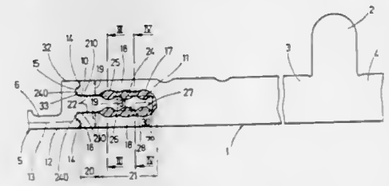
1. A device for refrigeration and freezing of biological objects, comprising a heat-insulated tank for a refrigerant, a vessel made of a high heat-conductivity material and accommodated in said tank; a high thermal-diffusivity powdered material contained in said vessel; a container for biological objects immersed in said high thermal-diffusivity powdered material held in said vessel.

4,817,398
LATCH NEEDLE FOR LOOP FORMING TEXTILE MACHINES
Sigmund Sos, and Ferdinand Schuller, both of Albstadt, Fed. Rep. of Germany, assignors to Theodor Groz & Söhne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft, Albstadt-Ebingen, Fed. Rep. of Germany
Filed May 6, 1988, Ser. No. 191,031
Claims priority, application Fed. Rep. of Germany, May 7, 1987, 8706529[U]
Int. Cl.[4] D04B *35/04*
U.S. Cl. 66—121 **8 Claims**



1. In a latch needle for loop forming textile machines, said needle including:
a steel needle shank having upper and lower edges, a sawslot defined in said needle shank and a needle hook at one end of said needle shank;
an axle extending transversely across said sawslot and supported in said needle shank; and
a nonmetallic latch pivotally mounted on said axle and provided with a noucat at one end, said latch being pivotal between an open and a closed position, wherein when said latch is in said closed position, said noucat rests on said needle hook and when said latch is in said open position, a back surface of said latch contacts part of said needle shank, the improvement wherein:
said latch is of a fiber reinforced thermoplastic synthetic material selected from the group consisting of a homopolymer and a copolymer.

4,817,399
KNITTING TOOL FOR TEXTILE MACHINES, PARTICULARLY KNITTING MACHINES
Sigmund Sos, and Ferdinand Schuller, both of Albstadt, Fed. Rep. of Germany, assignors to Theodor Groz & Söhne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft, Albstadt-Ebingen, Fed. Rep. of Germany
Filed May 9, 1988, Ser. No. 191,982
Claims priority, application Fed. Rep. of Germany, May 7, 1987, 8706530[U]
Int. Cl.[4] D04B *35/04*
U.S. Cl. 66—123 **18 Claims**



1. A stamped knitting tool for textile machines, particularly knitting machines, said tool including:
a shank member having upper and lower edges and first and second end surfaces, said shank member further having at least one butt extending from one of said edges and an axially extending recess defined in said first end surface so that said recess is laterally bounded by a web portion of said shank member on each side, each respective said web portion having a facing edge which faces the recess which is divided into a guide region adjacent to said first end

surface and a following anchorage region, and each of said facing edges has an irregular profile in said anchorage region; and

a working member having a needle head or needle hook disposed at one end and a shank-like connecting member portion disposed at the other end, with said connecting member portion being positioned in the recess of said shank member so that it extends through said guide region and into said anchorage region, being shaped so that it is guided in a form-locking manner by said facing edges of said web portions in said guide region, and having opposing edges containing an irregular profile in the region corresponding to said anchorage region; the improvement wherein:

said web portions and said connecting member portion are shaped so that at least one open space is formed in said anchorage region between an edge of said connecting member portion and the adjacent edge of the shank member defining the recess; and

a vibration damping material fills said open space and firmly connects said connecting member portion to said shank member, to anchor said working member in said shank member.

4,817,400

BIELASTIC, WARP-KNIT FABRIC AND ITS PRODUCTION

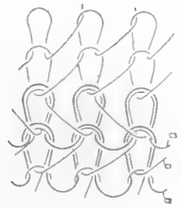
Harald Baesgen; Helmut Schillings, and Ernst Berg, all of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 900,552, Aug. 26, 1986, which is a continuation of Ser. No. 587,083, Mar. 7, 1984, abandoned. This application Aug. 21, 1987, Ser. No. 88,182

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309311

Int. Cl.[4] **D04B** *21/00*

U.S. Cl. 66—195 **5 Claims**



1. A bielastic, warp-knit fabric comprising elasthane yarns and hard fiber yarns wherein the fabric comprises loops of elasthane yarn bound horizontally as weft thread into stitches of ground warp knit fabric of the hard fiber yarns and wherein the hard fiber yarns cover the elasthane yarns on both sides of the fabric.

4,817,401

RETAINING BARRIER ASSEMBLY

Alija Cohodar, P.O. Box 380074, Miami, Fla. 33138

Filed Jun. 8, 1987, Ser. No. 59,098

Int. Cl.[4] **E05B** *73/00*

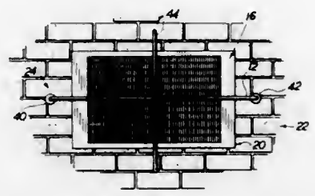
U.S. Cl. 70—58 **8 Claims**

1. A retaining barrier assembly used in combination with a wall having an interior exposed surface and an exterior exposed surface and designed to restrict unauthorized removal of an object from either the interior or exterior surfaces of the wall when the object is mounted in an aperture formed in the wall, said assembly comprising:

(a) an exterior brace element having an elongated configuration and made of rigid, high strength material and having opposite ends secured to the wall adjacent the aperture, said external brace element extending outwardly from the exterior surface of the wall and across and in overlying relation to an exteriorly disposed face of the object,

(b) an interior brace element having an elongated configuration and made of rigid, high strength material and having opposite ends secured to the wall adjacent the aperture, said interior brace element extending outwardly from the interior surface of the wall and extending in overlying relation to the internal face of the object,

(c) anchor means mounted in said wall on opposite sides of the aperture and in spaced, substantially adjacent relation thereto and extending through the wall in an exposed relation to both of the exterior and interior surfaces thereof for interconnection and anchoring of correspondingly positioned ends of said exterior and interior brace elements to one another and the wall,



(d) said interior brace element comprising a first end movably attached to said anchor means and the wall and a second end movably connected to said anchor means and movable between an open and a closed position,

(e) said open position defined by disposition of said interior brace element out of overlying relation to the interior face of the object to provide access thereto and removal of the object from the wall,

(f) said anchoring means comprising at least one sleeve member rotatably mounted relative to and in surrounding relation about at least one pair of correspondingly positioned connected ends of said interior and exterior brace elements, whereby unauthorized disconnection of the anchoring sleeve from said brace element is restricted.

4,817,402

LOCKING APPARATUS

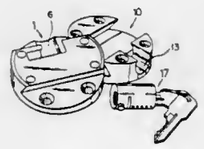
Tommy S. L. Leiding, Germaniavagen 9 182 62, Djursholm, Sweden

Continuation of Ser. No. 703,948, Feb. 21, 1985, abandoned. This application Feb. 17, 1987, Ser. No. 15,031

Claims priority, application Sweden, Feb. 22, 1984, 8400972

Int. Cl.[4] **E05B** *73/00*

U.S. Cl. 70—58 **7 Claims**



1. An apparatus for locking two objects together, comprising:

a first engaging member incluing a first base surface securable to one of said two objects, a dovetail-shaped tenon portion extending in an engaging direction substantially parallel to said first base surface, and a first locking recess extending into at least one side of said tenon portion;

a second engaging member including a second base surface securable to the other of said two objects, a dovetail-shaped mortise portion extending substantially parallel to said second base surface and being slidably engaged with said tenon portion of said first engaging member in said engaging direction only, and a second locking recess extending through at least one side of said mortise portion, said second locking recess being alignable with said first locking recess when said mortise portion and said tenon portion are engaged, said engaged mortise and tenon portions cooperating to prevent said first and second engaging members from being separated in a direction perpendicular to said engaging direction; and

a lock member inserted within said first and second locking recesses when said locking recesses are aligned to prevent said first and second engaging members from sliding relative to one another in said engaging direction.

4,817,403

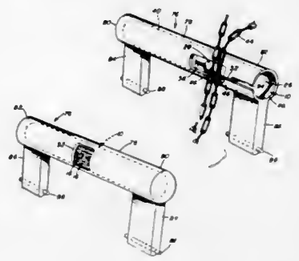
PERSONAL LOCKING DEVICE

Gary S. Dimmick, Oakmont, Pa., assignor to Lockman Products Co. Inc., Pittsburgh, Pa.

Division of Ser. No. 874,220, Jun. 13, 1986, Pat. No. 4,682,481. This application Jul. 6, 1987, Ser. No. 70,303

Int. Cl.[4] **E05B** *65/52*

U.S. Cl. 70—69 **12 Claims**



1. A handle for a carrying case comprising,

an elongated body portion having a closed end and an open end with an internal cavity extending between said closed and open ends,

means extending from said body portion for connecting said body portion to a carrying case,

a first aperture and a second aperture through said body portion,

said first and second apertures being positioned on opposite sides of said body portion substantially intermediate said closed and open ends thereof, and

a slot having an opening extending from said open end of said body portion and a closed end spaced from said first aperture.

4,817,404

REVERSIBLE BOLT LOCK, SPECIFICALLY WITH A LOCKING FUNCTION RELEASED BY COIN DROP

Armin Eisermann, Velbert 1, and Diethard Geiger, Wülfrath, both of Fed. Rep. of Germany, assignors to Schulte-Schlagbaum Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 20, 1986, Ser. No. 831,975

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1985, 3508613

Int. Cl.[4] **E05B** *63/06*

U.S. Cl. 70—134 **7 Claims**

1. A lock having a locking function released by a coin drop, said lock comprising:

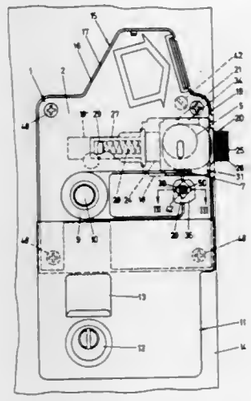
a lock box housing;

a key-operated locking device;

an operating element shiftable in response to operation of said locking device by said key;

a support casing adapted to be mounted on a door intermediate said door and said lock box housing for receiving and supporting said lock box housing;

a reversible latching element slidably mounted on said support casing, said reversible latching element having two heads formed on opposite end thereof, said support casing including a channel opening toward said lock box housing for receiving said latching element and guiding said element along a path of movement, said latching element



being reversible about an axis extending transversely to the said path of movement of said latching element, said key-operated locking device being mounted within said channel of said support casing;

a spring-loaded slide carried by said support casing, said slide being separable from and engaging one head of said latching element and being effective to bias said latching element and another head of said latching element toward movement in a forward locking direction;

said operating element being engageable with said latching element to urge said latching element in a direction opposite to said forward locking direction.

4,817,405

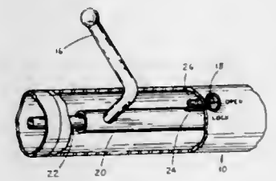
AUTOMOTIVE TRANSMISSION LOCK

Edward Gentry, RR #1 Box 195, Westbend, Iowa 50597

Filed Jun. 23, 1987, Ser. No. 65,599

Int. Cl.[4] **E05B** *65/12*

U.S. Cl. 70—247 **2 Claims**



1. In a vehicle having a gear shift lever mounted for pivotal movement about a steering column and an automatic transmission with a locked-out position, a transmission lock comprising:

(a) a pivotable lock cylinder pivotable between a first, free position and a second, locked position only by a mating key inserted into said lock cylinder;

(b) a radially extended ear mounted on said lock cylinder for

pivotable movement between said first, free position and said second, locked position;

(c) a collar member pivotable about the steering column by movement of the gear shift lever into and out of the locked-out position of the automatic transmission;

(d) an ear-receiving slot oriented parallel to the plane of pivotal movement of said ear member;

(e) a plurality of positions of said collar member corresponding to a plurality of positions of the gear shift lever, wherein one of said positions of said collar member, corresponding to the locked-out position of the automatic transmission, aligns said slot in the plane of pivotal movement of said ear member; and

(f) wherein said ear member is rotated by said mating key between said first, free position therefor to said second, locked position therefor within said ear-receiving slot to prevent the gear shift lever from moving the transmission out of the locked-out position therefor.

4,817,406

LOCK IMPRESSIONING KEY

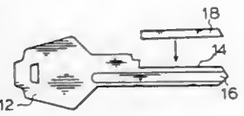
William E. Martin, 499 John Street N., Hamilton, Ontario, Canada L8L 4R7

Filed Aug. 7, 1987, Ser. No. 82,619

Claims priority, application United Kingdom, Aug. 11, 1986, 8619522

Int. Cl.[4] E05B *19/20*

U.S. Cl. 70—394 1 Claim



1. An impressioning key for making an impression of the tumblers of a lock, comprising a key blank having a main portion of relatively hard material, said main portion having a recess in an upper forward edge portion, and a tumbler engaging portion consisting substantially wholly of lead secured to the main portion in the recess, said tumbler engaging portion being a solid pre-shaped body of lead filling the recess, wherein the tumbler engaging portion is separately soldered to the main portion.

4,817,407

ROLLING STAND

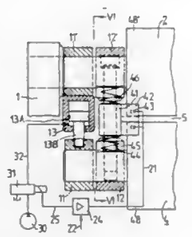
Günter Alich, Bernhofstrasse 51, 8134 Adliswil, Switzerland

Filed Jun. 23, 1987, Ser. No. 65,861

Claims priority, application Switzerland, Jul. 2, 1986, 2654/86

Int. Cl.[4] B21B *13/14, 37/08*

U.S. Cl. 72—8 16 Claims



1. A rolling stand, comprising:

a housing;

a stationary roll supported in said housing and having a journal projecting at each side thereof;

at least one movable roll arranged in spaced apart relationship to said stationary roll so as to define a gap therebetween and having journal projecting at each side thereof;

first bearing means for supporting said journals of said stationary roll and said movable roll;

second bearing means adjacent said first bearing means and acting on said stationary roll and said movable roll; and

control means for adjusting the width of said gap by shifting said movable roll relative to said stationary roll, said control means acting solely between said first and second bearing means to define a closed control system and including a control element arranged between said first bearing means for exerting a force to adjust said gap between said stationary roll and said movable roll and a work element arranged between said second bearing means and acting as counterforce in opposition to the force exerted by said control element for prestressing said movable roll relative to said stationary roll so as to allow precise adjustment of said gap and compensation of any bearing play.

4,817,408

METHOD AND MACHINE FOR FABRICATING ROTATION BODIES BY PLASTIC DEFORMATION

Ludwig Balint, Bregenzer Strasse 37, A-6911 Lochau, Austria

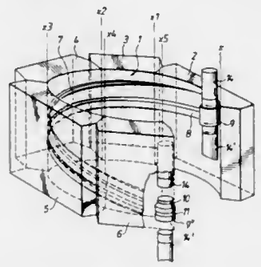
Continuation of Ser. No. 881,041, filed as PCT AT85/00041 on Oct. 15, 1985, published as WO86/02296 on Apr. 24, 1986, abandoned.

This application Mar. 11, 1988, Ser. No. 170,039

Claims priority, application Austria, Oct. 19, 1984, 3345/84; Oct. 19, 1984, 3346/84

Int. Cl.[4] B21H *1/22*

U.S. Cl. 72—92 22 Claims



1. A process of fabricating a rotation body having different diameters along the length thereof, which comprising the steps of:

(a) rotating a blank about the longitudinal axis thereof and working the rotating blank between two pressure zones to apply thereto a local pressure exceeding the flow limit of the blank material whereby circularly extending impressions of the different diameters are worked into the blank, the pressure zones crossing each other,

(b) displacing the pressure zones relative to each other while applying the local pressure, one of the pressure, one of the pressure zones being displaced in a direction at an angle to its longitudinal extension and the longitudinal direction of the pressure zone it crosses and the points of crossing of the crossing pressure zones forming a geometric line at an angle to the longitudinal axis, and

(c) displacing the blank in dependence on said line and on the different diameters to be produced.

4,817,409

APPARATUS FOR FLANGING AND INDENTING BOTH ENDS OF A CYLINDRICAL CONTAINER BODY

Kurt Bauermeister, Braunschweig, Fed. Rep. of Germany, assignor to Lanico-Maschinenbau Otto Niemsch Gesellschaft Mit Beschrankter Haftung, Braunschweig, Fed. Rep. of Germany

Filed Jul. 17, 1987, Ser. No. 74,766

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1986, 3624444

Int. Cl.[4] B21D *19/06*

U.S. Cl. 72—94 9 Claims



1. In an apparatus for flanging and indenting an end of a cylindrical container body, particularly for an aerosol or beverage container, comprising at least two rotatably driven slidable opposite to each other axially into said container body to support said body, at least one of said heads being a flanging and indenting head provided with a radially slidable wobble disk supported centered on a conical member slidable against a spring, said flanging and indenting head being provided with a pivoting arm equipped with a flanging and indenting roller which is pivotable by at least one controlling cam about an axis running parallel to the rotation axis of said flanging and indenting roller so that said flanging and indenting roller is brought into and out of engagement with said wobble disk to form a flanged and indented edge of said container body, the improvement wherein for deforming or working said container body composed of doubly reduced or other metal sheet with a Rockwell hardness of at least 60 HR 30T, said wobble disk is associated with two of said flanging and indenting rollers and said two flanging and indenting rollers are held so as to engage on said container body to be processed and deform said container body by increasing amounts gradually in the direction of rotation of said container body, two flanging and indenting rollers associated with said wobble disk being positioned jointly on the free end of said pivoting arm and at least one of said flanging and indenting rollers is angularly adjustable on said free end of said arm relative to the other of said flanging and indenting rollers for successive engagement of said flanging and indenting rollers with said container body.

4,817,410

ROLL FOR MILL

Takashi Yatsuzuka, Kitakyushu; Tetsuya Ohba; Kouji Tanabe, both of Muroran; Tatsuo Kojima, Gifu; Tatsunobu Kobayashi, Gifu, and Kouki Katou, Gifu, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha and Nippon Steel Corporation, both of Tokyo, Japan

Filed Jun. 4, 1987, Ser. No. 58,174

Claims priority, application Japan, Jun. 19, 1986, 61-143865

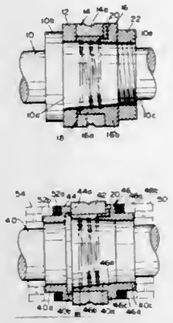
Int. Cl.[4] B21B *27/02, 31/08*

U.S. Cl. 72—199 8 Claims

1. A roll for a mill comprising:

a roll shaft of a circular cross-section having an axis of rotation therethrough, said roll shaft including a tapered portion disposed intermediate opposite ends of said roll shaft, said tapered portion having an outer peripheral surface tapering axially of said roll shaft from one end of said tapered portion to the other end of said tapered portion, said roll shaft including a reduced-diameter portion having a diameter not greater than a diameter of said tapered portion, said reduced-diameter portion extending away from said other end of said tapered portion and terminating in one end of said roll shaft;

a ring of a wear-resistant material disposed around said tapered portion of said roll shaft, said ring having an outer peripheral surface adapted to engage with a metal material to be rolled; and



a tubular sleeve having an inner peripheral surface tapering axially thereof and press-fitted between said tapered portion of said roll shaft and said ring with said inner peripheral surface being held in contact with said outer peripheral surface of said tapered portion to retain said ring in place on said roll shaft for rotation therewith, said sleeve including an inner groove formed in said inner peripheral surface of said sleeve and a passageway formed through said sleeve and communicated with said inner groove so as to supply pressurized oil to said inner groove through said passageway.

4,817,411

MANUFACTURE OF METAL EXTRUSIONS

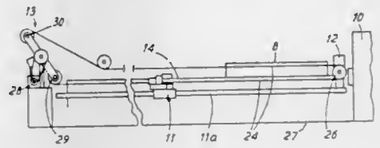
Walter Bennett, Farnborough, and Peter G. Eden, Churchdown, both of United Kingdom, assignors to Alcan International Limited, Montreal, Canada

Filed Jun. 25, 1986, Ser. No. 878,314

Claims priority, application United Kingdom, Jul. 1, 1985, 8516574

Int. Cl.[4] B21C *29/00*

U.S. Cl. 72—255 7 Claims



1. Apparatus for the manufacture of extrusions comprising an extruder having an extrusion die, first gripping means adapted to grip, at a location closely adjacent the extrusion die, the leading end of an extruded section emerging from the die and to pull said leading end of the section away from the die as extrusion of the section proceeds, means for continuously rapidly and uniformly cooling the extruded section as extrusion proceeds, means co-operating with the first gripping means to stretch the extruded section comprising second gripping means adapted and arranged to grip the extruded section

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adjacent the die after extrusion of the section has stopped and while the extruded section remains projecting from the die, means for increasing the distance b[illegible] the first and second gripping means while the extruded [illegible]n is held by said first and second gripping means and is aligned with the die in the direction of extrusion, and cutting means for cutting through the extruded section between the second gripping means and the die, wherein said second gripping means comprises a member which is swivellable away from and towards the extrusion die into first and second positions respectrively and on which gripping jaws for gripping the extrusion are mounted, whereby when the jaws are opened and the member is swivelled towards the die into said second position, an end portion of the extruded section is exposed for gripping by said first gripping means.

4,817,412

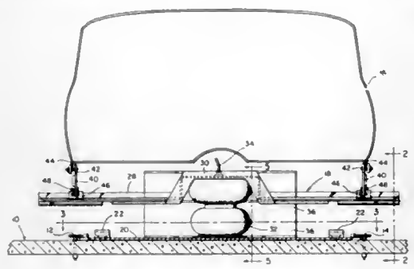
UNIBODY LIFTING AND ANCHORING ASSEMBLY

Virgil H. Hinson, 206 Fairway Oaks Dr., Brunswick, Ga. 31520

Filed Oct. 23, 1987, Ser. No. 111,855

Int. Cl.[4] B21D *1/12*

U.S. Cl. 72—305 **13 Claims**



1. A vehicle body lifting and anchoring assembly for use upon a support surface over which a vehicle to be repaired may be moved along a predetermined path, said assembly being adapted to be used in pairs, including an elongated horizontal support member to be disposed transverse to said path, supported from said surface and adjustably laterally shiftable along said path over said surface, an elongated horizontal lift member disposed above and generally paralleling said support member, fluid operated lift means interposed between the longitudinal mid-portions of said members for elevating said lift member relative to said support member, upstanding supports adjustably guidingly mounted on opposite end portions of said lift member for independent adjustable shifting therealong and including upper end portion clamp structures for clamp engaging and supporting corresponding opposite side body pinch weld ares of a vehicle body positioned along said path and over said members, said lift means and lift member including coacting means supporting said lift member from said lift means for rocking relative to said support member about a horizontal axis disposed at generally right angles relative to said lift member.

4,817,413

METHOD OF USING AN OPTO-ACOUSTIC APPARATUS FOR MEASURING CONCENTRATION OF GAS

Ichiro Asano, and Toshihiko Uno, both of Minami, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Division of Ser. No. 567,802, Jan. 3, 1984, abandoned. This application Mar. 11, 1986, Ser. No. 838,564

Claims priority, application Japan, Jan. 8, 1983, 58-2614

Int. Cl.[4] G01N *21/85*

U.S. Cl. 73—24 **6 Claims**

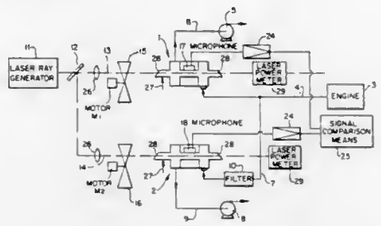
1. A method of using an opto-acoustic apparatus for measuring, an environment containing extraneous noise, the concentration of a gas in a mixture of gases or of particulates in a gas, comprising:

providing a measuring opto-acoustic cell having gas inlet and gas outlet means for receiving and discharging a gas containing particulates or a mixture of gases containing a gas the concentration of which is to be measured;

placing said cell in an environment containing extraneous or unwanted noise signals;

directing laser rays from a laser ray generating device into said opto-acoustic cell;

placing a chopper in the path of the laser rays between said device and said cell and operating said chopper for chopping the laser rays at a frequency corresponding to the resonant frequency of said cell;



providing a narrow band microphone having a resonator with a narrow resonance frequency range including the resonant frequency of said cell and sufficiently narrow to exclude the extraneous or unwanted noise signals from the environment in which said cell is located;

placing said microphone on said cell for detecting the sound signal generated by changes in the internal pressure of said cell; and

determining from said sound signal the concentration of the gas in the mixture of gases or the concentration of the particulates in the gas.

4,817,414

MEASURING ARRANGEMENT FOR DETECTING THE LEVEL OF COMBUSTIBLE GASES MIXED WITH AIR

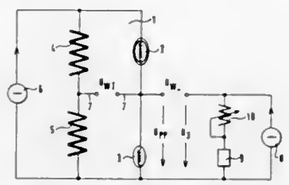
Werner Hagen; Claus-Dieter Brandt, both of Bad Schwartau, and Gerd Mahrt, Barnitz, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 30, 1987, Ser. No. 68,905

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622307

Int. Cl.[4] G01N *27/12*

U.S. Cl. 73—25 **6 Claims**



1. A measuring arrangement for detecting the proportion of a combustible gas mixed with air such as methane in air, the measuring arrangement comprising:

constant-current supply means for supplying a constant current;

a heat-conductivity measuring sensor for responding to the heat conductivity of the proportion of gas to be detected, said heat-conductivity measuring sensor being connected to said supply means for receiving said constant current with a voltage drop occurring across said measuring sensor that changes in dependence upon temperature;

measuring signal terminal means for taking off a measuring voltage signal;

compensating voltage source means for generating a compensating voltage which changes in magnitude and direction in correspondence with the temperature-dependent changes in said voltage drop;

said measuring signal terminal means and said compensating voltage source means conjointly defining a series circuit connected in parallel with said measuring sensor; and,

said compensating voltage source means being connected into said series circuit so as to cause said compensating voltage to act in opposition to said temperature-dependent changes in said voltage drop whereby said measuring voltage signal is independent of changes in temperature and is exclusively indicative of said heat conductivity.

4,817,415

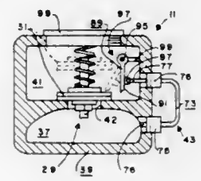
FLUID LINE LEAK DETECTOR

Joseph R. Mooney, New Orleans, La., assignor to Pan Am Environmental Systems, Inc., Cape Canaveral, Fla.

Filed Dec. 14, 1987, Ser. No. 132,179

Int. Cl.[4] G01M *3/04*; F17D *3/04*

U.S. Cl. 73—40.5 R **14 Claims**



1. An improved fluid line leak detector of the type including a casing attached to said fluid line and having a passageway therethrough forming an integral part of said fluid line, including a valve means located within said passageway of said casing for dividing said fluid line into upstream and downstream portions and movable between an open position in which fluid can freely flow from said upstream portion to said downstream portion, and including an auxiliary flow passageway means extending between said upstream and downstream portions of said fluid line for providing a passageway from said upstream portion to said downstream portion when said valve means is in said closed position; wherein the improvement comprises:

(a) a bar member movably attached to said casing within said passageway for movement between a first position in which said valve means is free to move from said closed position to said open position and a second position in which said valve means is prevented from moving to said open position; and

(b) receptacle means associated with said bar member and said auxiliary flow passageway means for causing said bar member to move to said second position any time said valve means is in said closed position and fluid passes through said auxiliary flow passageway means from said upstream portion to said downstream portion of said fluid line.

4,817,416

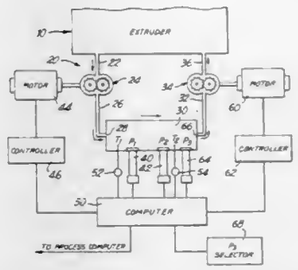
ON-LINE RHEOLOGICAL MEASUREMENTS

John F. Blanch, Mantoloking; Ronald F. Garritano, Flemington, both of N.J.; William D. Richards, Scotia, and Joseph C. Golba, Jr., Ballston Spa, both of N.Y., assignors to Rheometrics, Inc., Piscataway, N.J.

Filed Jun. 13, 1988, Ser. No. 206,035

Int. Cl.[4] G01N *11/08*

U.S. Cl. 73—55 **18 Claims**



1. In the method for conducting an on-line rheological measurement in a process melt so as to provide process control information based upon the viscosity of the process melt, utilizing a rheometer of the type in which a first metering pump delivers diverted melt from a process main stream to the entrance of a capillary passage and a second metering pump returns the diverted melt from the exit of the capillary passage to the process main stream and the diverted melt is subjected to a pressure drop between spaced apart locations along the capillary passage between the entrance and the exit, the improvement comprising: measuring the viscosity of the diverted melt by controlling the rate of flow of the melt through the capillary passage to maintain essentially constant the pressure drop in the diverted melt between the spaced apart locations and measuring the actual temperature of the diverted melt in the capillary passage so as to provide the process control information based upon the measured viscosity of the diverted melt corrected to a known standard by the measured temperature of the diverted melt.

4,817,417

DOUBLE ECCENTRIC MOUNT

Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 6, 1987, Ser. No. 46,334

Int. Cl.[4] G01H *11/00*

U.S. Cl. 73—660 **5 Claims**

1. Method for aligning and securing the geometric center of a sensor about a selectable position in a continuous alignment zone along an inner surface of a turbomachine in order to monitor the vibration in a rotatable row of blades the sensor being eccentrically securable to a first member rotatable about a first axis, the first member being eccentrically coupled to a second member which is rotatable about a second axis, rotation of the first and second members providing movement of the sensor geometric center through the continuous alignment zone, the method comprising the steps of:

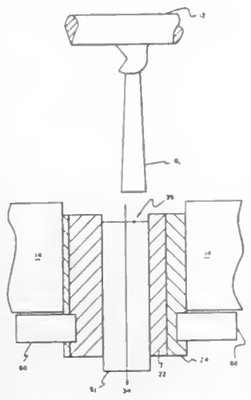
(a) securing the sensor to the first member;

(b) mounting the second member to the inner surface of the turbomachine for rotation about the second axis;

(c) rotating the first member about the first axis and rotating the second member about the second axis to move the geometric center of the sensor through the alignment zone until the geometric center reaches the selectable position;

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(d) securing the first member against rotation with respect to the turbomachine; and



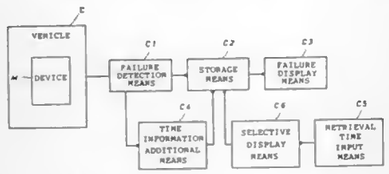
(e) securing the second member against rotation with respect to the turbomachine.

4,817,418

FAILURE DIAGNOSIS SYSTEM FOR VEHICLE

Ken Asami; Kazunori Sakai, both of Nagoya; Shinichi Hori, Anjo; Noriyuki Nakashima, Nagoya; Yutaka Okuda, Kariya, and Kimio Tamura, Anjo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Nippondenso Co., Limited, both of Aichi, Japan

Continuation of Ser. No. 861,867, May 12, 1986, abandoned.
This application Oct. 26, 1987, Ser. No. 113,327
Claims priority, application Japan, May 15, 1985, 60-103066
Int. Cl.[4] G01M *19/00*; **G06F** *11/00*
U.S. Cl. 73—118.1 **5 Claims**



1. A failure diagnosis system for a vehicle comprising:

a failure detection means for detecting failure of vehicle components, said failure detection means outputting failure information;

a storage means for storing the failure information outputted by said failure detection means;

a failure display means for displaying the failure information stored in said storage means;

a time information additional means for combining time information indicative of the time when failure of vehicle components is detected with said failure information outputted by said failure detection means, said time information means outputting time of failure information to said storage means;

retrieval time input means for selecting a retrieval time; and

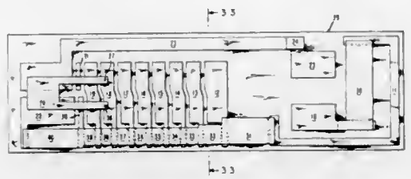
a selective display means for selectively displaying a combination of failure information and time information within said retrieval time.

4,817,419

FLUID PRESSURE SENSOR CIRCUIT

Lee J. Iden, Morristown, N.J., assignor to Iden Industries, Inc., Millington, N.J.

Filed Aug. 5, 1987, Ser. No. 82,050
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—118.1 **41 Claims**



1. An electrical sensor circuit with resistors, contact pad conductors on a front face of a ceramic substrate, a connecting means for applying an external potential source comprising a wiper arm means and a means for maintaining continuous electrical contact between the wiper arm means and the contact pad conductors, which comprises:

(a) a substrate comprised of a ceramic material having a front face and a back face; and

(b) a circuit permanently attached to the front face of said substrate comprising (i) connecting means for applying an external potential source comprising a wiper arm means having contacting point means; (ii) contact pads as conductors for the wiper arm means permanently attached to the front face of said ceramic substrate and in electrical attachment to said connecting means and said resistors; (iii) a high density of resistor segments permanently attached to the front face of said substrate and in electrical attachment with said contact pads; (iv) means for maintaining continuous electrical attachment between at least one contacting point means of the wiper arm means and at least one of said conductors comprising the wiper arm means in the shape of a tuning fork having at least two discrete tines each having a contacting point means defining a straight vertical line set in the horizontal plane of the front face of the substrate, said substrate having at least two adjacent conductors, each having the same irregular shape wherein the side edges thereof are equidistant, each conductor being at a distance from an adjacent conductor sufficient to maintain continuous electrical contact between at least one of the contacting points and at least one of the conductors; and (v) means for measuring resistance.

4,817,420

METHOD AND DEVICE FOR EXAMINATION OF A JOINT OF A ULTRASONIC JOINT INSPECTION DEVICE AND METHOD

Takashi Kawaguchi, Ageo; Yoshiaki Fujita, Omiya, and Satoshi Kawai, Tochigi, all of Japan, assignors to Nippon Piston-Ring Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 873,948, Jun. 13, 1986, abandoned.
This application Oct. 28, 1987, Ser. No. 113,354
Claims priority, application Japan, Jun. 14, 1985, 60-127979
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 R **9 Claims**

1. An ultrasonic joint inspection device for inspecting a joint between a hollow shaft and a piece joined to an outside surface of the hollow shaft of a composite camshaft, said device comprising:

a probe having means for generating ultrasonic waves and means for detecting ultrasonic waves;

a mirror positioned in front of said probe in a pathway of said ultrasonic waves generated from said probe for deflecting said ultrasonic waves;

support means for supporting and aligning said probe and said mirror;

guide means for supporting, positioning and aligning an assembled structure of said support means, said probe and said mirror within and out of engagement with an inner peripheral surface of the hollow shaft whereby a precise, fixed distance is maintained between said mirror and the joint being examined during the rotation of the hollow shaft about the inspection device;

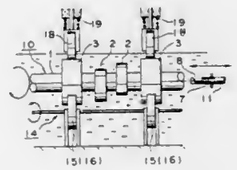
camshaft support means for supporting and rotating the camshaft being inspected, said camshaft support means comprising:

a first roller and a second roller rotatably mounted to a support;

a third roller positioned above said first roller and said second rollers;

biasing means for biasing said third roller against an outer peripheral surface of the hollow shaft during rotation of the hollow shaft about said probe; and

means for moving said probe along a longitudinal axis of the hollow shaft for providing scanning of the entire joint.



9. A method for examination of a joint between a hollow shaft and a piece joined to an outside surface of the hollow shaft of a composite camshaft, said method comprising the steps of:

placing said camshaft into a liquid and rotatably mounting said camshaft about an axis of said hollow shaft;

placing one end of said camshaft into engagement with a reference plate and biasing said end against said reference plate;

placing a mirror inside said hollow shaft in front of said probe and movably mounting said mirror in an axial direction of said probe;

placing a probe of an ultrasonic search unit inside said hollow shaft;

applying ultrasonic examination of said joint from inside of said hollow shaft;

driving said camshaft to rotate and driving said mirror to move in the axial direction of said probe such that a whole portion of said joint is scanned by ultrasonic wave beams during the ultrasonic examination; and

storing data based on the distance of the joint with respect to said reference plate in the memory of a data processing unit and utilizing this stored data during examination for locating the joint.

4,817,421

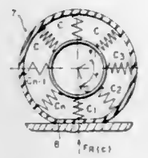
METHOD AND APPARATUS FOR IMPROVEMENT OF WHEEL RUNNING CONDITIONS

Günther Himmler, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Apr. 28, 1987, Ser. No. 43,408
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1986, 3614379
Int. Cl.[4] G01M *17/02*
U.S. Cl. 73—146 **7 Claims**

5. An apparatus for optimization of running characteristics of an automobile wheel, comprised of a rim and a tire fitted upon the rim and presenting spring qualities, the apparatus including:

a transducer for detecting radial force variations, connected to a vector adding circuit to which resultant radial force variation vectors due to non-uniform mass distribution in the tire contact area and differences in tire spring rate are fed from analyzing circuits;



a difference-forming circuit having an input to which the output of the adding circuit is connected to obtain angular difference of the angular output signal delivered by the output of the vector adding circuit and a datum angle signal; and

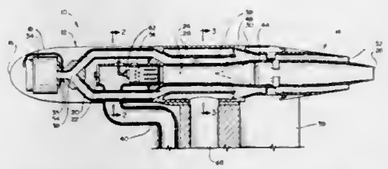
a device to which the output of the difference-forming circuit is connected to a device for controlling adjustment of the tire relative to the rim as a function of said angular difference.

4,817,422

TONE INJECTED NACELLE FOR AEROACOUSTIC WIND TUNNEL TESTING

Richard M. Allen, Enumclaw, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 13, 1987, Ser. No. 107,675
Int. Cl.[4] G01M *9/00, 15/00*
U.S. Cl. 73—147 **20 Claims**



2. An aeroacoustical testing apparatus for jet engine nozzle assembly noise level evaluation, the apparatus having a forward upstream end, a rear downstream end, and a longitudinal center axis, and the apparatus comprising:

(a) a primary exhaust generating means for directing a primary gaseous flow, the means having an upstream end and defining a generally longitudinally extending primary passageway, the primary exhaust generating means being positioned in a nacelle and being arranged to direct a primary gaseous flow through the primary passageway and out the primary nozzle,

(b) a secondary bypass flow generating means defining an annular bypass passageway surrounding the primary passageway, the secondary bypass flow generating means being arranged to direct bypass flow through the bypass passageway and out the secondary nozzle means,

(c) a single acoustical energy generating means substantially centered on the longitudinal center axis at a location forwardly of the forward end of the primary exhaust generating means, the acoustical energy generating means having a primary sound propagating axis along which sound from the acoustical energy generating means is primarily transmitted, the sound propagating axis extending rearwardly from the acoustical energy generating

means and being substantially a continuation of the longitudinal center axis, and

(d) acoustical coupling means leading in a substantially longitudinal direction from the sound generating means to the bypass passageway to direct the acoustical energy from the acoustical energy generating means through the bypass passageway and the secondary nozzle means.

4,817,423

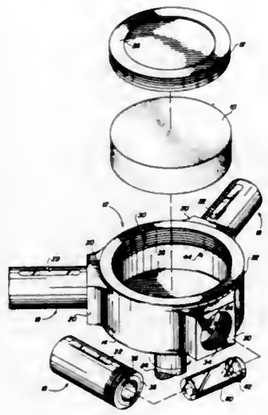
METHOD AND APPARATUS FOR DETERMING DISTRIBUTION OF FLUIDS IN A POROUS SAMPLE

Richard L. Christiansen, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 22, 1987, Ser. No. 137,409

Int. Cl.[4] E21B *49/02*

U.S. Cl. 73—153 **11 Claims**



10. Apparatus for use in expelling fluid from a porous sample, comprising:

a chamber adapted to receive a porous sample having an arcuate outer extremity the curvature of which substantially corresponds to the arc of a circle;

the chamber also having an arcuate outer extremity substantially corresponding to the arc of a circle;

means connecting the chamber to a rotatable shaft mounted substantially on the center of curvature of the arcuate outer extremity of the chamber;

means for rotating the shaft, whereby the spinning of a fluid-saturated porous sample contained in the chamber will expel fluid from the sample; and

means for capturing fluid expelled from the sample.

4,817,424

STRIP INSPECTING APPARATUS AND ASSOCIATED METHOD

Leonard P. Pellatiro, McKeesport, Pa., assignor to Enamel Products & Planting Company, McKeesport, Pa.

Division of Ser. No. 15,695, Feb. 17, 1987. This application Feb. 9, 1988, Ser. No. 153,952

Int. Cl.[4] B31B *1/00, 49/00*

U.S. Cl. 73—159 **6 Claims**

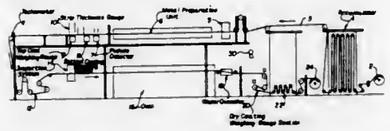
1. Apparatus for inspecting strip including strip supply means for providing said strip, inspection means for monitoring a plurality of properties of said strip,

transport means for passing said strip by said inspection means,

said inspection means having signal generating means for emitting signals related to the properties being monitored when said strip passes thereby,

signal processing means for receiving said signals and emitting a responsive error signal when one of said properties in a portion of said strip departs from predetermined property limits,

strip marking means for providing markings in one or more of a plurality of longitudinal zones on said strip responsive to said error signals with each said zone representing a particular type of defect and said markings being placed within the longitudinal section of said strip wherein said defect exists,



fabricating equipment for converting the marked strip into fabricated products,

feed means for feeding said marked strip into said fabricating equipment, and

mark decoder means for providing an indication of what defects exist in portions of the strip passing adjacent thereto.

4,817,425

YARN DEFECT DETECTING METHOD

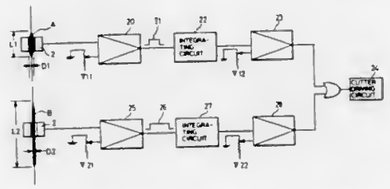
Yutaka Ueda, Nara, and Toshio Yamauchi, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 20, 1987, Ser. No. 40,299

Claims priority, application Japan, Apr. 25, 1986, 61-96144

Int. Cl.[4] D01H *13/22*

U.S. Cl. 73—160 **9 Claims**



1. A method of detecting a defect of a yarn, characterized in that it comprises the steps of producing an electric signal in accordance with a feeding speed of a yarn, providing a reference value corresponding to a predetermined defect length of a yarn, correcting the reference value in accordance with the electric signal, and comparing the thus corrected reference value with a detection signal produced from a yarn detector thereby to detect a defect of the yarn greater than the predetermined defect length included in the yarn during feeding.

4,817,426

METHOD AND AN APPARATUS OF DETERMINING THE ANGLE OF AN INCIDENT FLOW AND/OR OF THE AIRSPEED AT A STATIONARY OR MOVING POINT OF MEASUREMENT

Eduard Igenbergs, and Christian Jahncke, both of Munich, Fed. Rep. of Germany, assignors to Prof. Dr.-Ing. Eduard Igenbergs, Munich, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 941,240

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544144

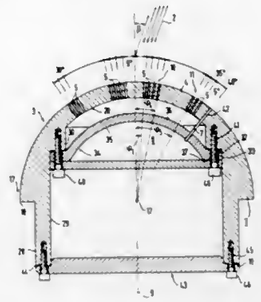
Int. Cl.[4] G01C *21/00*; G01P *5/14*

U.S. Cl. 73—180 **30 Claims**

13. A method of determining the angle of an incident flow in

at least one measurement plane at a measurement point, comprising the steps of:

using a measurement body at the measurement point to generate a pressure distribution of the incident flow as it flows around the measurement body, the measurement body having an at least partly spherical surface with a center of curvature and a datum line extending from said center of curvature to said spherical surface, said incident flow generating a symmetrical pressure distribution on said surface about a line of symmetry specific to the direction of said incident flow,



measuring the pressure of the incident flow around the measurement body at a plurality of locations on each side of said line of symmetry, with each of said plurality of locations on each respective side of said line of symmetry subtending an angle at said center of curvature relative to said line of symmetry of a different magnitude from the other of said plurality of location;

calculating the pressure distribution produced at said spherical surface by said incident flow from said pressure values from said locations; and

determining said angle of incidence as the angle between a maximum of said pressure distribution and a direction of incidence corresponding to said datum line.

4,817,427

DEVICE FOR MEASURING WATER FLOW RATE IN PLANT STEM

Masaharu Kitano, Koga, and Hiromi Eguchi, Fukuoka, both of Japan, assignors to Kyushu University, Fukuoka, Japan

Filed May 20, 1988, Ser. No. 196,508

Claims priority, application Japan, Sep. 19, 1987, 62-233636

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204.16 **4 Claims**



1. A device for measuring water flow rate in plant stem comprising, a heater mounted on a stem of plant so as to apply heat to the stem, a first control means for controlling heat dissipation from outer surface of the heater at a certain level, a second control means for controlling heat dissipation through the stem at a certain value, a detector for detecting quantity of heat Q generated by the heater, a temperature detecting means for measuring temperature difference of the stem between two points which points engage upstream end and downstream end of the heater with respect to water flow in the stem respectively, and a calculating means for determining water flow rate F in the stem based on the detected quantity of heat Q and the detected temperature difference.

4,817,428

DIRECT WEIGHING OF LIQUID HANDLING PLANT

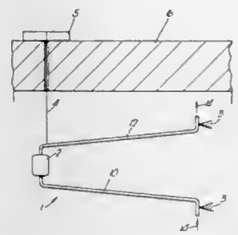
Lionel H. Ford, Blackpool; Samuel N. Oruh, Lytham; Jaswant Singh, Forton, and Geoffrey S. Coldwell, Preston Lancashire, all of United Kingdom, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 10, 1987, Ser. No. 83,283

Claims priority, application United Kingdom, Aug. 21, 1986, 8620360

Int. Cl.[4] G01N *9/06*

U.S. Cl. 73—434 **7 Claims**



1. In a liquid handling plant including pipework defining part of a liquid flow path through the plant, a weight monitor for the determination of the density of liquid in the plant comprising pipe constraining means operative on the pipework at points fixed in space to define legs of the pipework cantilevered from each respective constraining means, a junction intercommunicating the legs at their ends remote from the respective constraining means to constitute as a known volume the liquid which, in use, is situated within the structure comprising the legs and junction, and a null deflection weighing system coupled to and supporting said structure for enabling the weight of the known volume to be measured and hence the density of the liquid to be deduced.

4,817,429

METHOD AND APPARATUS FOR OPTIMIZATION OF RUNNING CONDITIONS OF AN AUTOMOBILE WHEEL

Eickhart Goebel, Pfungstadt, Fed. Rep. of Germany, assignor to Hofmann Werkstatt Technik GmbH, Pfungstadt, Fed. Rep. of Germany

Filed May 26, 1987, Ser. No. 53,775

Claims priority, application Fed. Rep. of Germany, May 26, 1986, 3617625

Int. Cl.[4] G01M *1/14*

U.S. Cl. 73—459 **11 Claims**

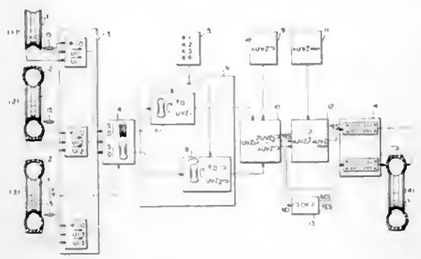
1. In a method for optimizing running conditions of an automobile wheel comprised of a rim and a tire fitting on the rim, the method including the step of determining unbalance caused by the tire and rim in measuring runs including at least one measuring run in which the tire is fitted on the rim in an arbitrary position and in which the tire and rim are readjusted (matched) relative to each other so that forces produced by the tire are opposed to forces caused by the rim, the improvements wherein:

after said at least one measuring run, another measuring run is performed in which tire and rim are readjusted relative to each other by a given angle;

both static and dynamic unbalance vectors of the tire and static and dynamic unbalance vectors due to geometric

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deformations of the rim are determined on the basis of the data measured in said two measuring runs; and
the matching procedure comprises readjustment of the tire and rim relative to each other by an angle which is calcu-



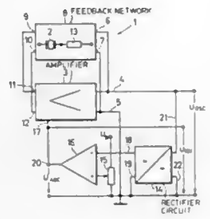
lated on the basis of the static and dynamic unbalance vectors thus determined and said given angle, such that unbalance forces due to non-uniform mass distribution of the tire are opposed to unbalance forces due to geometric deformations of the rim.

4,817,430

SYSTEM FOR DETERMINING THE THICKNESS OF VARYING MATERIAL COATINGS

Ewald Benes, Biedermannsdorf; Paul Berlinger, Vienna, both of Austria, and Gernot Thorn, Hanau, Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 130,083
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1987, 3700366
Int. Cl.⁴ G01B *17/02*
U.S. Cl. 73—579 **13 Claims**



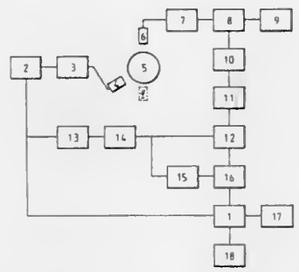
1. A system for determining the current thickness of changing coatings of material on a substrate during the coating process, especially for the production of thin coatings in optical devices and semiconductors, comprising:
an electrically excitable, mechanically vibratable element with at least one pronounced resonant frequency;
an oscillator circuit for exciting said vibratable element at a resonant frequency to a stationary vibration;
said vibratable element being coated with the material in the same manner as the substrate;
first circuit means for producing a varying electrical signal (U_D) which changes monotonically with the damping of the mechanical resonance that is caused by the coating of said vibratable element;
second circuit means for relating the electrical signal (U_D) to a fixedly given electrical limit value signal (U_{DE}) occurring at a limit damping at which the vibratable element can still just be excited to a stationary vibration;
means for indicating the relationship between the varying signal (U_D) and the fixedly given electrical signal (U_{DE}) as a consumption state change of said vibratable element.

4,817,431

DEFECT DETECTION IN CYLINDRICAL OBJECTS

Friedhelm Schlawne, Kerpen-Sindorf, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 1, 1987, Ser. No. 69,417
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622500
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—600 **2 Claims**



1. Method for detecting defects in a cylindrical test object having an axis, there being a stationary transmission and receiving device arranged about a path along which the said test object passes in an axial direction, comprising the steps of:
providing a plurality of test cycles and one particular pulse per test cycle by means of a transmission portion of said device, said pulse splitting into two pulses which porpagate bi-directionally and circularly around said axis in said test object;
receiving both splitted pulses once per circulation of each of the splitted pulses around the test object, so that a plurality of pulses appear in a receiver portion of said device in the test cycle, the amplitude of the splitted pulses gradually declining;
providing a sequence of burst signals, each of limited duration, as reference signals for purposes of timing and gating, the bursts being repeated per said circulation on the basis of the expected propagation time between transmission and receiving portions
providing peak detection of received splitted signals within limited periods of time, per circulation, in synchronism with said reference signals;
digitizing the detected peak signals; and
processing said digitized peak signals by forming the quotient of two sets of sequential peak signals in a test cycle.

4,817,432

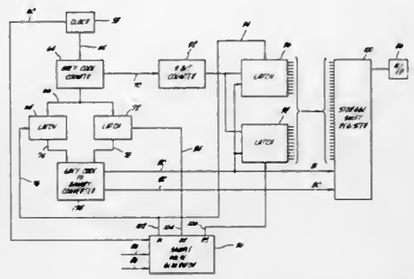
DIGITAL ULTRASONIC INSTRUMENT FOR OPHTHALMIC USE

David A. Wallace, Beverly Hills; Steven E. Feldon, San Marino; Gary Mezack, Norco; Douglas L. Whiting, South Pasadena; William J. Dally, Pasadena, and Scott A. Karns, Pomona, all of Calif., assignors to Design Team Partners, Glendale, Calif.

Filed Sep. 27, 1985, Ser. No. 781,257
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—602 **3 Claims**

1. An asynchronous signal detection system in which asynchronous signals are detected and correlated to synchronous signals comprising
sample pulse means for receiving asynchronous signals and generating a plurality of sample pulses,
counter means for counting in a continuous manner,

grey code counter means for counting in a continuous manner and for clocking said counter means,
latch means comprising a first latch, a second latch, a third latch and a fourth latch wherein said latch means is connected to said sample means and wherein said first and second latches are connected to said grey code counter means and said third and fourth latches are connected to



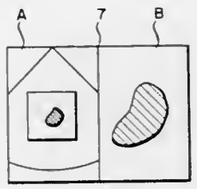
said counter means and wherein said sample pulses are adapted to cause said first and second latches to latch data from said grey code counter means and said third and fourth latches are adapted to latch data from said counter means, and
converter means for receiving and converting data from said first and second latches for controlling said third and fourth latches.

4,817,433

ULTRASONIC IMAGING APPARATUS

Takeshi Sato, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 5, 1986, Ser. No. 893,238
Claims priority, application Japan, Aug. 14, 1985, 60-179889
Int. Cl.⁴ G01N *29/00*
U.S. Cl. 73—620 **8 Claims**



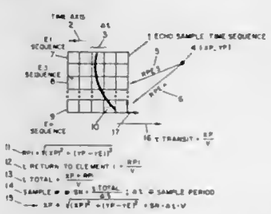
1. An ultrasonic imaging apparatus comprising:
ultrasonic transducer means for emitting ultrasonic beams to a subject and for generating echo signals corresponding to echoes from the subject;
ultrasonic steering signal generating means for alternately generating and supplying first and second steering signals to said ultrasonic transducer means, said first steering signal corresponding to a first rate frequency and a first steering angle which define a region of interest and allowing said transducer means to steer the region of interest of the subject, and said second steering signal corresponding to a second rate frequency and a second steering angle which define a to-be-enlarged part of the region of interest and allowing said transducer means to steer the to-be-enlarged part of the region of interest;
signal-processing means for processing the echo signals generated by said transducer means to output image signals representing the image of the region of interest and image signals representing an enlarged image of the to-be-enlarged part of the region of interest; and
display means connected to said signal-processing means for receiving the image signals from said signal-processing means and having a first display section for displaying the image of the region of interest and a second display section for displaying the enlarged image of the to-be-enlarged part of the region of interest,
wherein said ultrasonic steering signal generating means alternately generates said first and second steering signals so that the region of interest and the to-be-enlarged part of the region of interest are alternately scanned, and the image of the region of interest and the enlarged image of the to-be-enlarged part of the region of interest are alternately displayed on said first and second display sections.

4,817,434

DEVICE FOR IMAGING THREE DIMENSIONS USING SIMULTANEOUS MULTIPLE BEAM FORMATION

Forrest Anderson, P.O. Box 1400, Bernalillo, N. Mex. 87004

Continuation-in-part of Ser. No. 799,424, Nov. 19, 1985, Pat. No. 4,688,430. This application Aug. 17, 1987, Ser. No. 86,588
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—625 **24 Claims**



4. A method for creating the image points, pixels or voxels of an image of the reflecting points within a three dimensional volume containing reflecting points, said method being capable of creating the image after the transmission of a single pulse of energy, comprising the steps of:
(a) Transmitting at least one pulse of energy which will propagate with a known velocity through the three dimensional volume encountering each of the reflecting points;
(b) Receiving echoes, propagating with a known velocity, caused by the reflecting points, with three or more receiver elements of a sparse array of three or more receiver elements;
(c) Sampling the echoes to create a time sequence of the echo samples from each of the receiver array elements;
(d) Combining the samples from the different receiver elements to create an image of the reflecting points.

4,817,435

SHEAR PRESSURE GAGE

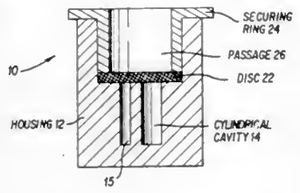
James G. Faller, Newark, Del., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 9, 1988, Ser. No. 166,069
Int. Cl.⁴ G01L *7/00*
U.S. Cl. 73—700 **13 Claims**

1. A pressure indicating apparatus comprising:
a body member having a bored cavity, and a plurality of smaller cylindrical cavities of varying diameters located beneath said bored cavity,
a disc member positioned at the bottom of said bored cavity and covering said smaller cylindrical cavities;
means for securing said disc member adjacent to said hous-

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ing and for admitting pressure through said bored cavity to said disc;



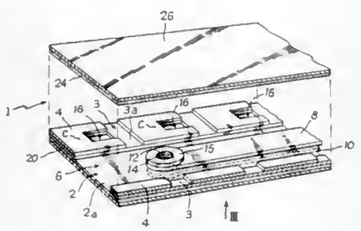
wherein said disc member will rupture in the region immediately about the diameter of any said smaller cylindrical cavity if a predetermined critical pressure for any said cylindrical cavity is exceeded.

4,817,436

MEASURING DEVICE FORMING FLUXMETER AND TEMPERATURE SENSOR COMBINED AND PROCESS FOR PREPARING THE SAME

Hébert Sallée, Saint Martin d'Heres, and Daniel Quenard, Gieres, both of France, assignors to Centre Scientifique et Technique du Batiment, Paris, France

Filed Nov. 3, 1987, Ser. No. 116,378
Claims priority, application France, Nov. 5, 1986, 86 15427
Int. Cl.⁴ G01L *19/04;* **B44C** *1/22;* **C23F** *1/02;* **H01L** *21/306*
U.S. Cl. 73—708 **19 Claims**



1. In a composite material, comprising a substrate of insulating matter on one face of which is deposited an uninterrupted thin layer of a first conductive or semi-conductive matter coated on at least its face opposite said substrate of insulating matter by a succession of zones, separated from one another and disposed in successive rows, constituted by very thin deposits of a second conductive or semi-conductive matter having a different thermoelectric power from that of the first conductive or semi-conductive matter,

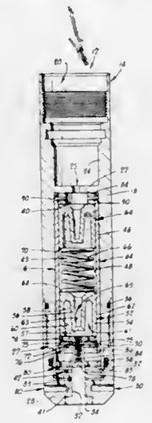
said insulating substrate comprises on its face comprising said uninterrupted thin layer a certain number of free spaces in at least certain of which are made a certain number of first metal patterns of a third conductive or semi-conductive matter, constituting a first arm of a thermocouple, an equal number of second metal patterns of a fourth conductive or semi-conductive matter with a thermoelectric power different from that of said third matter, constituting a second arm of a thermocouple, is disposed on that face of the insulating substrate opposite the uninterrupted thin layer and said first patterns, each first pattern is in contact with a corresponding second pattern by a metallic spot weld made in an orifice passing through at least said first pattern and said substrate of insulating matter.

4,817,437

PRESSURE COMMUNICATING, FLUID ISOLATING INTERFACE

John R. Dennis, and Billy W. White, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 21,835, Mar. 4, 1987, Pat. No. 4,782,694.
This application Jul. 8, 1988, Ser. No. 217,009
Int. Cl.⁴ G01L *7/00*
U.S. Cl. 73—756 **3 Claims**



1. An apparatus for communicating pressure from an external fluid to a pressure sensitive tool, said apparatus comprising:

a housing adapted to connect to the pressure sensitive tool and further adapted to receive the external fluid;

a filter disposed within said housing, said filter having a plurality of passageways through which pressure from the external fluid is communicable to the pressure sensitive tool without communicating the external fluid to the pressure sensitive tool;

a second filter, disposed within said housing so that said second filter is spaced from the first-mentioned filter, said second filter having a plurality of passageways through which pressure communicated through the first-mentioned filter is communicable to the pressure sensitive tool; and

a spring disposed within said housing between the two mentioned filters.

4,817,438

WATER APPLICATOR FOR PAPER TENSILE STRENGTH TESTER

Rodney T. Patrick, 511 Goebel St., Berlin, N.H. 03570

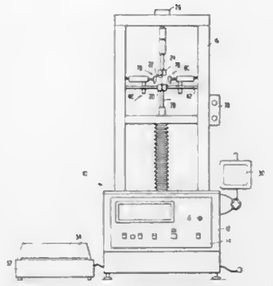
Filed Apr. 28, 1988, Ser. No. 187,202
Int. Cl.⁴ G01N *3/08*
U.S. Cl. 73—835 **4 Claims**

1. A water applicator for a paper tensile strength testing machine of the type having gripping means for holding sheet of paper under tension in a vertical plane comprising support means adapted to be secured to the tensile strength testing machine adjacent the gripping means,

first and second actuator means having movable members mounted on said support means on opposite sides of said vertical plane,

a pair of sponge means detachably mounted on said movable members of said first and second actuator means, respectively, for movement toward and away from each other on opposite sides of said vertical plane for movement into and out of engagement with opposite sides of said sheet, and

spray means mounted on said support means for spraying a predetermined amount of water on at least one of said



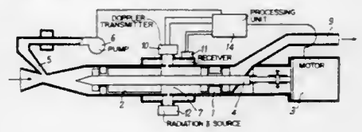
sponge means when said sponge means are moved out of engagement with said sheet.

4,817,439

PROCESS AND APPARATUS FOR MEASURING TWO PHASE FLOW

Marcel Arnaudeau, and Philippe Rousset, both of Paris, France, assignors to 501 Institut Francais du Petrole, France

PCT No. PCT/FR84/00305, § 371 Date Aug. 30, 1985, § 102(e) Date Aug. 30, 1985
PCT Filed Dec. 31, 1984, Ser. No. 774,603
Claims priority, application France, Dec. 30, 1983, 83 21088
Int. Cl.⁴ G01F *1/74*
U.S. Cl. 73—861.04 **7 Claims**



1. Process for measuring the flow of liquid and gaseous phases of an axially flowing two-phase fluid comprising, at a first location, rotating the flowing two-phase fluid around an axis defining its flow to generate a coaxial flow having an inner tubular layer formed by the gaseous phase, surrounded by an outer tubular layer formed by the liquid phase, measuring the thickness of the tubular layers of the liquid phase and gaseous phase at a location downstream from said first location, measuring the axial flow velocity of at least the liquid phase at a location downstream from said first location, and determining the flow volume of each phase and the volumetric ratio of the gaseous phase to the liquid phase of the two phase fluid, by comparison of the measured thicknesses and axial flow velocity with previously obtained data.

4,817,440

COMPLIANT TACTILE SENSOR

Mark Curtin, Cambridge, Mass., assignor to The Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, Providence, R.I.

Continuation of Ser. No. 789,073, Oct. 18, 1985, abandoned.
This application Jun. 9, 1987, Ser. No. 60,941
Int. Cl.⁴ B25J *13/08;* **G01B** *7/18*
U.S. Cl. 73—862.04 **2 Claims**

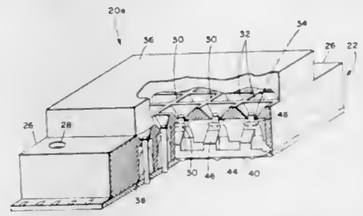
1. A tactile sensor which comprises:

(a) a housing;

(b) a plurality of members in the housing, the members arrayed in a grid-like configuration to define chambers, the members comprising inactive zones and the chambers defined by the members comprising sensitive zones and having fluid disposed therein;

(c) a tube received in each of the chambers, the tube having a resistive wire therein, the fluid in the chamber when displaced adapted to vary the resistance of the wire which resistance is measured as an electrical output;

(d) a pressure sensitive skin secured to the housing and in communication with the sensitive zones, the sensitive zones corresponding to more than fifty percent of the total



surface area of the skin, the skin being compliant such that when contacted by an object and subjected to a compressive stress the underside of the skin deflects which deflection is sensed by the sensitive zone which is in communication with the deflected skin, the fluid in the chamber underlying said sensitive zone being displaced; and

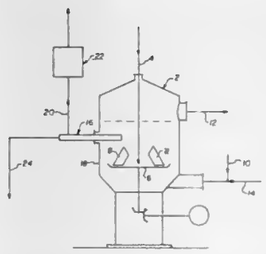
(e) output means disposed in the housing and in communication with each of the resistive wires in each of the chambers adapted to provide an output in response to the deflection in that portion of the skin in communication with the sensitive zone.

4,817,441

PROCESS AND APPARATUS FOR OBTAINING A GAS SAMPLE

Jan S. Porowski; Mans L. Badiani, both of Pittsburgh; Edward J. Hampton, Murrysville, and William J. O'Donnell, Bethel Park, all of Pa., assignors to O'Donnell & Associates, Inc., Pittsburgh, Pa.

Filed May 2, 1988, Ser. No. 188,914
Int. Cl.⁴ G01N *1/00*
U.S. Cl. 73—863.12 **11 Claims**



4. A process for obtaining a gaseous sample from a stream containing solid particulate material, a gas, water and steam which comprises withdrawing a stream containing said particulate material, a gas, water and steam from a system containing the same through an elongated tubular member extending into said system and discharging said stream from said tubular member externally of said system, heating said stream in its passage through said tube and removing from said tubular member externally of said system a gaseous sample consisting essentially of said gas and said steam through a porous section

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of said elongated tubular member having openings in the wall thereof smaller in cross-section than the solid particulate material in said stream, said stream being passed through said elongated tubular member at a velocity such that deposition of said particulate material on the inner walls thereof is substantially inhibited.

4,817,442

SAMPLE SPLITTER

John C. Loosemore, Applecross, Australia, assignor to Brian Christoperh Coupe, Kingsley, Australia

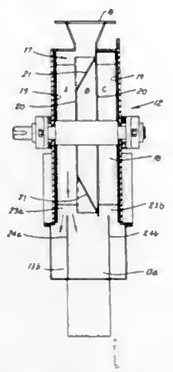
PCT No. PCT/AU85/00268, § 371 Date Jun. 26, 1986, § 102(e) Date Jun. 26, 1986, PCT Pub. No. WO86/03001, PCT Pub. Date May 22, 1986

Continuation of Ser. No. 887,099, Jun. 26, 1986, abandoned.

This PCT application Nov. 1, 1985, Ser. No. 98,764

Int. Cl.[4] G01N *1/12*

U.S. Cl. 73—863.56 **7 Claims**



1. A sample splitter comprising a housing having a substantially cylindrical rotor chamber defined by a cylindrical peripheral wall and a pair of generally planar end walls, at least one inlet to said rotor chamber formed in said peripheral wall, at least two outlets from said rotor chamber formed in said peripheral wall and circumferentially spaced from said inlet, and a cylindrical rotor rotatably received in the rotor chamber, said rotor being substantially complimentary in shape to said motor chamber and being sub-divided into at least two separate axially spaced zones, each of said zones being divided into pockets circumferentially spaced from each other for precluding samples from flowing directly from said inlet to any of said outlets without passing through at least one of said rotor pockets, each pocket communicating sequentially with said inlet on rotation of the rotor, and at least one of said pockets communicates with a different outlet from another of said pockets.

4,817,443

DEVICE FOR CLEANING A LIQUID SAMPLE TAKING NEEDLE

Henri Champseix, Montesson, and Serge Champseix, Les Mureaux, both of France, assignors to A.B.X., Levallois Perret-Hauts-de Seine, France

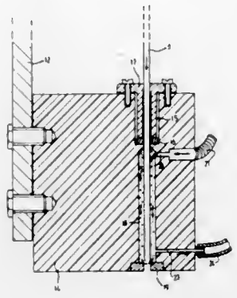
Filed Nov. 10, 1987, Ser. No. 119,085

Claims priority, application France, Nov. 14, 1986, 86 15833

Int. Cl.[4] G01N *1/14*; B08B *9/02*

U.S. Cl. 73—864.22 **10 Claims**

1. A device for cleaning a sample taking needle, particularly a blood sample, comprising a frame, a needle for taking samples mounted on the frame, a mobile means mounted on said frame for contacting with said needle, said mobile means having a cylindrical cleaning chamber opening outwards with the needle received in the cleaning chamber, said mobile means being slidable over the needle between a high position at which the lower part of the needle projects out of the mobile means and is accessible for taking a liquid sample and a low position at which the mobile means covers the whole of the lower part of the needle, with the end of the needle lying withdrawn inside the cylindrical chamber, and fluid cleaning means for



applying a vacuum at the lower part of said chamber for sucking a rinsing fluid injected through the needle for providing inner rinsing in a counterflow with respect to the liquid sample taking direction.

4,817,444

TORQUE SENSOR

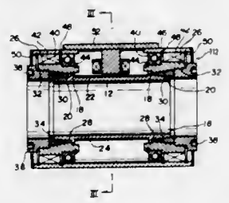
Toru Yagi; Tsuneo Takahashi, and Masayuki Nishigachi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,599

Claims priority, application Japan, Mar. 3, 1986, 61-44255; Mar. 3, 1986, 61-44256; Mar. 3, 1986, 61-44257; Mar. 3, 1986, 61-44258; Mar. 3, 1986, 61-44259

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 **24 Claims**



1. A torque sensor comprising a magnetic member whose magnetostrictive characteristics vary with the amount of torque applied thereto and coils for detecting magnetostrictive variation disposed opposite the magnetic member, characterized in being constituted as an independent unit separate from a shaft whose torque is to be measured, wherein the independent unit comprises a cylindrical member mountable on said shaft and having said magnetic member attached to the cylindrical surface thereof, and an enclosure member which has the coils fixed on an inner cylindrical surface thereof opposed to the outer surface of the cylindrical member, is mounted to be rotatable about the same axis as that of the cylindrical member, and covers the magnetic member attached to the cylindrical member.

4,817,445

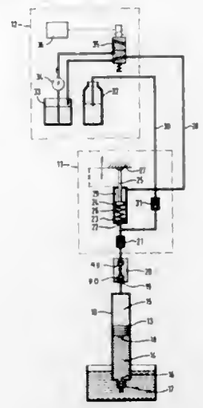
DEVICE FOR THE REMOVAL OF LIQUID SAMPLES

Willi Fink, Tübingen-Weilheim, Fed. Rep. of Germany, assignor to Edmund Bühler GmbH & Co., Tübingen-Weilheim, Fed. Rep. of Germany

Filed Feb. 26, 1987, Ser. No. 19,526

Int. Cl.[4] G01N *1/14*

U.S. Cl. 73—864.62 **8 Claims**



1. In a device for the removal of liquid samples from natural or artificial liquid collecting or flow receptacles, comprising a cylinder sample container which simultaneously forms a sample transporting container, a piston freely movable in said container and subdividing said container into two cylindrical chambers, one of said chambers having a first opening for a liquid sample and provided with a check valve and another of said chambers having a second opening for a piston-driving medium, the improvement comprising: a leakage free coupling unit fluidly connected to said second opening for connection with the piston-driving medium and having means to close the coupling unit at two ends thereof; and a dosing device for the piston-driving medium, said dosing device being fluidly connected to said coupling unit and including a dosing pump cylinder receiving the piston-driving medium, a pump piston and a restoring spring, said pump piston being movable in said pump cylinder to a predetermined position against said spring.

4,817,446

PARTICLE SIZE DISTRIBUTION ANALYSIS

Shigeo Kanamori, Kobe, Japan, assignor to Toa Medical Electronics Co. Ltd., Japan

Filed Feb. 13, 1987, Ser. No. 14,770

Claims priority, application Japan, Jul. 25, 1986, 61-176423; Jul. 25, 1986, 61-176424; Jul. 25, 1986, 61-176425

Int. Cl.[4] G01N *15/02*

U.S. Cl. 73—865.5 **16 Claims**

8. A method for measuring and analyzing particle size distribution, the method comprising:

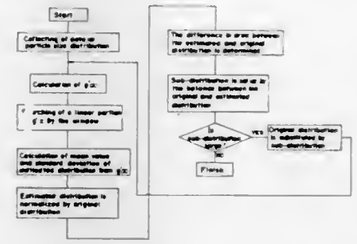
collecting an analyzing particle size distribution of a given sample content from a particle size measuring instrument;

setting up an estimated particle size distribution as a theoretical distribution;

comparing between the analyzing particle size distribution and the estimated particle size distribution so as to determine the difference therebetween;

making the difference a characteristic parameter for classifying the analyzing particle size distribution according to the sample content; and

further including setting up a plurality of estimated particle size distributions as multiple theoretical distributions, comparing between said analyzing distribution and each of said plurality of estimated distributions to determine the difference between each of said plurality of estimated distributions and said analyzing distribution and making



each difference a characteristic parameter for classifying the analyzing particle size distribution according to the sample content.

4,817,447

WEATHER RESISTANCE TESTER

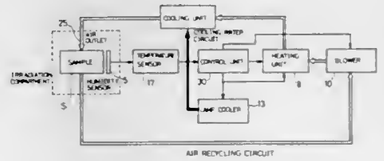
Yoshio Kashima, Kasukabe; Hirofumi Kinugasa, Matsudo; Yasuo Yoshida, and Teruo Iwanaga, both of Gyoda, all of Japan, assignors to Dainippon Plastics Co., Ltd., Osaka and Iwasaki Electric Co., Ltd, Tokyo, both of, Japan

Filed Jun. 17, 1987, Ser. No. 63,641

Claims priority, application Japan, Jun. 17, 1986, 61-142153

Int. Cl.[4] G01N *17/00*

U.S. Cl. 73—865.6 **23 Claims**



1. A weather resistance tester comprising:

(a) a U.V. radiation source comprising a lamp for generating U.V. radiation;

(b) a reflector having the U.V. source accommodated therein and an opening at a lower portion thereof for permitting the lamp to project U.V. radiation downward through the opening;

(c) a shield panel provided in the opening of the reflector and closing the opening for transmitting U.V. radiation therethrough and substantially blocking water vapor therefrom;

(d) a sample support disposed below the opening;

(e) means for adjusting the temperature in operative relation with the sample support;

(f) a compartment having accommodated therein the U.V. source, the reflector, the shield panel, the sample support and the temperature adjusting means;

(g) a recycling duct having an intake portion and an outlet portion connected to the compartment and provided with a heat exchanger and means for blowing air;

(h) a humidifier in operative relation with the sample support for providing a condensation condition therearound; and

(i) control means for giving operational instructions to the U.V. source, the temperature adjusting means, the heat exchanger, the blower means and the humidifier to maintain a sample on the sample support at a predetermined

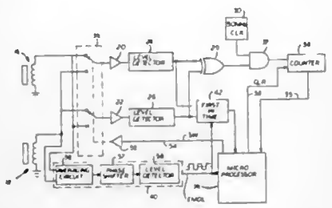
temperature while the lamp is on and to subject the sample to a condensation condition while the lamp is off.

4,817,448

AUTO ZERO CIRCUIT FOR FLOW METER

James W. Hargarten, Lafayette, and Allan L. Samson, Berthoud, both of, assignors to Micro Motion, Inc., Boulder, Colo.

Filed Sep. 3, 1986, Ser. No. 903,337
Int. Cl.⁴ G01F *1/84*
U.S. Cl. 73—861.38 **10 Claims**



1. An electronic signal processor for cancelling errors arising from variations in operational characteristics of electronic components in circuitry used to determine the time difference between two analog signals having periodic amplitudes, said electronic signal processor comprising:

first and second digitizing means having an input and output, each digitizing means providing a digital output representative of the input thereto;

switching means for initially connecting a first analog signal of said two analog signals to the input of said first digitizing means and at the same time the second analog signal of said two analog signals to the input of said second digitizing means, and at a predetermined period prior to the end of one cycle of said two analog signals for further connecting said first analog signal to the input of said second digitizing means and said second analog signal to the input of said first digitizing means, said cycle end determined by reference to a predetermined signal level value;

first-in-time circuit means for determining which of said first analog signal or said second analog signal is first in time for each of the time differences to be measured;

time difference measuring means for determining the time differences between the output signals from the first digitizing means and the second digitizing means; and

computing means for adding and subtracting the time differences determined by said time difference measuring means during the periods of about two cycles of said two analog signals, where the output from said first-in-time circuit means is used for determining if time differences determined by said time difference measuring means are added or subtracted.

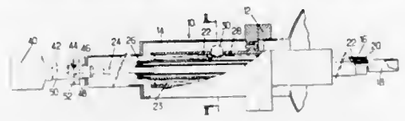
4,817,449

DEVICE FOR MOVING SAMPLES IN A CONTROLLED ATMOSPHERE ENCLOSURE

Claude Le Tyrant, 4, Place Pacquières, 78210 Nezel, France

Filed Aug. 3, 1987, Ser. No. 80,608
Claims priority, application France, Aug. 5, 1986, 86 11327
Int. Cl.⁴ H01J *49/04*
U.S. Cl. 73—866.5 **5 Claims**

1. A device for moving samples in an evacuated enclosure, comprising: a sheath assembly defining an internal volume and arranged for connection with the enclosure; a rack unit mounted in the sheath assembly for axial movement; a pinion mounted for rotation on said sheath assembly, meshing with said rack unit and rotatable from the outside of said sheath assembly through a deformable sealed mechanical drive connection, a sample holder connected to said rack unit having a freely rotatable axial connection with said rack unit; and a drive rod having a slidable non-rotatable connection with said sample holder, fixed against axial movement with respect to



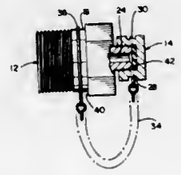
the sheath assembly and rotatable from the outside of said sheath assembly through a deformable sealed mechanical drive connection, each of said connections being positive and devoid of slidable joints.

4,817,450

PRESSURE/TEMPERATURE TEST PLUG ASSEMBLY

Edward J. Jachim, Moorestown, N.J., assignor to Spedco, Inc., Rivertos, N.J.

Filed Nov. 30, 1987, Ser. No. 126,483
Int. Cl.⁴ G01D *11/00, 11/30*; G01K *1/14*; G01L *19/00*
U.S. Cl. 73—866.5 **1 Claim**



1. A pressure/temperature test plug assembly (10) comprising a valve body (12) having

an exteriorly threaded first end portion (16) adapted to be received by a threaded opening in a pressure line,

an exteriorly threaded opposite second end portion (22),

a hex head portion (20) integrally formed with and disposed between said first and second end portions (16 and 22),

an unthreaded portion (18) on said first end portion (16) adjacent the hex head portion (20), and

said second end portion (22) having a passageway (24) extending through said hex head portion (20) whereby a test probe may be inserted through the second end portion (22), the hex head portion (20) and the first end portion (16),

a protective closure cap (14) having internal threads engaging said second end portion (22),

a pair of hex head areas (26) on the exterior of said cap and a peripheral grove (28) therebetween,

said valve body (12) and said closure cap being aligned along a common longitudinal axis whereby the unthreaded portion (18) and the groove (28) are in axial alignment,

a resilient seal member (42) disposed internally of said closure cap (14) and abutting said second end portion (22) and thereby sealing said passageway (24) when the closure cap (14) is in a sealing position,

a split ring (30) snap fitted into said groove (28),

another split ring (36) snap fitted into said unthreaded portion (18),

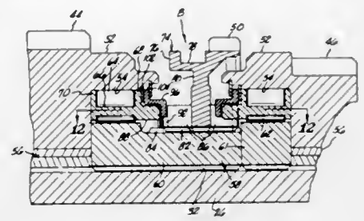
a chain (34) extending between said split rings (30 and 26) to retain the closure cap (14) from separation from the valve body (12) when the closure cap (14) is released from the valve body (12) for a testing operation and when the closure cap (14) is in a sealing position on the second end portion (22).

4,817,451

CONTROL MECHANISM FOR SELECTIVE ENGAGEMENT OF A FREE WHEELING ENGAGEMENT MECHANISM

Peter H. Weismann, 1631 Indus St., Santa Ana, Calif. 92707

Filed Feb. 26, 1987, Ser. No. 19,217
Int. Cl.⁴ F16H *3/10*
U.S. Cl. 74—333 **35 Claims**



1. An engagement mechanism comprising

an engagement inner having an inner race;

an engagement outer having an outer race, one of said inner race and said outer race having cam surfaces inclined relative to the other of said inner race and said outer race;

wedging elements between said inner race and said outer race;

a cage between said inner race and said outer race, said cage retaining said wedging elements and being angularly movable relative to said cam surfaces to selectively couple said engagement inner and said engagement outer through said wedging elements, said cage having a first actuator portion;

an actuator angularly fixed relative to said cam surfaced and having a second actuator portion, said actuator being movable relative to said cage to selectively engage said first and second actuator portions to angularly displace said cage relative to said cam surfaces;

a friction member functionally positioned between said cage and the one of said engagement inner and said engagement outer not having said cam surfaces; and

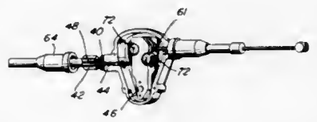
a control member movably mounted on said cage and operatively linked to said actuator to selectively frictionally engage said cage with the one of said engagement inner and said engagement outer not having said cam surfaces.

4,817,452

FORCE AND THROW TRANSFORMER FOR ACTUATION LINKAGES

Ronald L. Burkey, 32550 Bradley, Sun City, Calif. 92381

Continuation-in-part of Ser. No. 24,474, Mar. 11, 1987, abandoned. This application Jul. 13, 1988, Ser. No. 218,467
Int. Cl.⁴ G05G *7/04*
U.S. Cl. 74—522 **4 Claims**



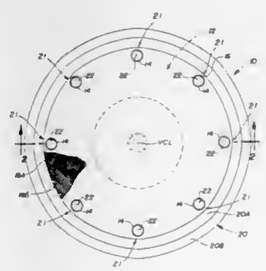
1. The combination of a housing means rigidly anchoring the ends of two hollow cable sleeves, said cable sleeves being parallel and laterally offset from each other and lying in a plane wherein said housing means comprises a rigid structure containing a pivot pin aperture laterally offset from said cable sleeves; and a lever means comprising a first anchoring means for one end of an input cable and a second anchoring means for one end of an output cable, said cables being mounted in, and free to move longitudinally within said cable sleeves, and said lever means comprising a rigid structure containing a pivot pin aperture offset from said anchoring means wherein said input cable provides a longitudinal input force while said output cable is imparted a longitudinal output force, said force being transferred from said input cable to said output cable by said lever means; and a pivot pin means joining said lever means to said housing means such that said lever means lies in said plane and is nominally oriented in such a manner that the longitudinal axis of said lever means lies approximately transverse to said cables; whereby said input force results in said output force where said output force is larger than said input force; and whereby said cable sleeves transfer the natural reactive force in the opposite direction as that applied to said cables, providing stability to said housing means.

4,817,453

FIBER REINFORCED CENTRIFUGE ROTOR

Francis N. Breslich, Jr., and John H. Laakso, both of Seattle, Wash., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 805,708, Dec. 6, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 148,210
Int. Cl.⁴ F16F *15/10*; G05G *1/00, 3/00*
U.S. Cl. 74—572 **6 Claims**



1. A centrifuge rotor comprising:

a central disc having a predetermined stiffness associated therewith, the disc having a periphery thereon and an array of sample receiving cavities therein, the disc being a laminated structure comprising a plurality of isotropic fiber laminates each having an axis with the axes of each fiber in each vertically adjacent laminate being offset by a predetermined angular amount from the axis of each fiber in the next adjacent laminate and

a reinforcing rim disposed circumferentially about the periphery of the disc, the rim having an inner diameter and also having a predetermined stiffness associated therewith,

both the periphery of the disc and the inner diameter of the rim each being polygonal in shape, the rim and the disc being adhesively bonded only adjacent to those regions of the disc wherein the sample receiving cavities are disposed, the disparity in physical properties in the disc and the rim being such that rotation of the rotor generates a radially inwardly directed compressive force imposed by the rim on the disc in the vicinity of the cavities therein.

4,817,454

ROTARY BODY SUBJECTED TO CENTRIFUGAL FORCES

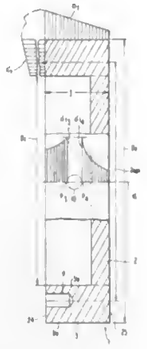
Hans-J Schöpf, Stuttgart; Wolfgang Kizler, Fellbach; Wolfram Dahm, Nürtingen, and Rudolf Thom, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 29, 1981, Ser. No. 258,559

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016441

Int. Cl.⁴ G05G *1/00*

U.S. Cl. 74—572 **18 Claims**



1. A rotary body subjected to centrifugal forces, comprising a disk portion, and a load ring carried by the disk portion, the l load ring including inner and outer peripheral surfaces respectively defined by an inner cylindrical surface having a diameter D_i and an outer cylindrical surface having a diameter D_a, at least one bore extending in an axial direction of the rotary body and disposed at an optimum position in the load ring, said optimum position being spaced from a center of rotation of the rotary body by a distance which is less than ½ (D_i+D_a) and arranged at a position where a peripheral stress at a radially innermost point of said at least one bore is equal to a peripheral stress at a radially outermost point of said at least one bore, whereby reduction in strength of said load ring by the disposition of at least one bore therein is minimized by the optimum disposition of said at least one bore within said load ring.

4,817,455

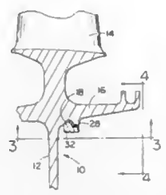
GAS TURBINE ENGINE BALANCING

Paul M. Buxe, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 15, 1987, Ser. No. 108,612

Int. Cl.⁴ F16F *15/22, 15/10*; G05G *1/00*

U.S. Cl. 74—573 R **2 Claims**



1. A bladed rotor balance arrangement comprising:

a bladed rotor having a circumferential axially extending cylindrical extension;

an inwardly facing groove in said cylindrical extension having a rounded ring receiving surface at the root thereof around the inner periphery of said extension;

a locking protrusion located on said extension adjacent to said groove at one location only;

a resilient split balancing ring of initial substantially uniform cross section, formed to mate with said rounded ring receiving surface, and having an interlocking protrusion at one location only, said locking protrusion and said interlocking protrusion formed to interlock with each other; and

said resilient split balancing ring removably located in said groove with said locking protrusion and said interlocking protrusion engaged, whereby said ring may be removed for balance grinding and replaced in the identical position.

4,817,456

DYNAMIC BALANCING DEVICE FOR PRESS

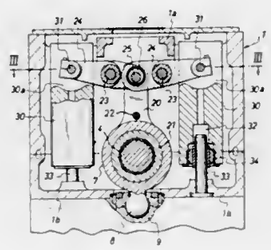
Shozo Imanishi, and Mitsuo Sato, both of Kanagawa, Japan, assignors to Aida Engineering, Ltd., Kanagawa, Japan

Filed Apr. 16, 1986, Ser. No. 852,717

Claims priority, application Japan, Sep. 7, 1985, 60-198195

Int. Cl.⁴ B30B *7/02*

U.S. Cl. 74—604 **5 Claims**



1. A dynamic balancing device in combination with a press having a crankshaft, a connecting rod mounted on an eccentric portion of the crankshaft and connected to a slide at its free end, comprising:

a link means mounted on the eccentric portion of the crankshaft and extending in a direction opposite to the direction in which the connecting rod extends;

a pair of vertically movable balancing weights provided on opposite sides of the crankshaft; and

a pair of levers each having first and second ends, each of said first ends pivotally attached to an upper end of a respective one of said balancing weights, said second ends overlapped with each other and pivotally connected with said link means, and said levers being pivoted on the press at their respective mid-portions.

4,817,457

UNIFORM WALL FLEXSPLINE

John H. Carlson, Danvers, Mass., assignor to Quincy Technologies, Inc., New Haven, Conn.

Filed Aug. 18, 1986, Ser. No. 897,695

Int. Cl.⁴ F16H *33/00, 35/00*

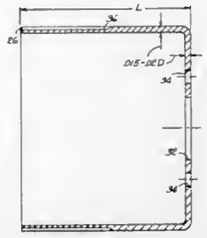
U.S. Cl. 74—640 **9 Claims**

1. A strain wave gearing device comprising a ring gear having internal, axially extending teeth,

a cup shaped strain gear made from a strain gear blank having a uniform thickness throughout from about 0.015D to 0.02D where D is the blank bore diameter,

external axially extending teeth means defined around the open end of the cylindrical portion of said strain gear blank for engaging with the internal teeth of said ring gear, the number of external teeth on said strain gear being different than the number of internal teeth on said ring gear, said cylindrical portion having the same thickness as a diaphragm portion of said strain gear blank,

attachment means defined in the diaphragm portion of said strain gear blank, and



a wave generator located within said strain gear, said wave generator adapted to be rotatively driven relative to said strain gear whereby relative rotational movement will occur between said strain and ring gears.

4,817,458

BELT-PULLEY TYPE STEPLESSLY VARIABLE TRANSMISSION ASSEMBLY

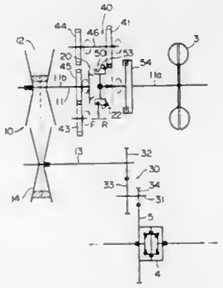
Hitoshi Akutagawa, and Masayoshi Shigemasa, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 28, 1987, Ser. No. 90,514

Claims priority, application Japan, Aug. 29, 1986, 61-202898; Feb. 16, 1987, 62-32951

Int. Cl.⁴ F16H *37/06*

U.S. Cl. 74—665 GE **9 Claims**



1. A steplessly variable transmission system comprising: a belt-pulley type transmission having an input shaft carrying driving pulley means of a variable effective diameter, an output shaft carrying driven pulley means of a variable effective diameter and belt means connecting the driving and driven pulley means so that power can be transmitted between the driving and driven pulley means, said input shaft comprised of a first shaft portion connected with an output member of an engine and a second shaft portion on which is mounted said driving pulley means; a driven gear fixedly mounted on one end of said second shaft portion facing said first shaft portion; a reverse gear mechanism having a reverse counter shaft arranged parallel to said input shaft, a reverse counter gear mounted on one end of said reverse counter shaft at the side of said second shaft portion having a fixed position relative to said second shaft portion, a reverse idle gear rotatable around an axis parallel to said input shaft and said reverse counter shaft, said reverse idle gear being always engaged to both said reverse counter gear and said driven gear, a reverse gear mounted on the other end of said reverse counter shaft at the side of said first shaft portion; a sleeve member splined on said first shaft portion at one end facing said second shaft portion so that it is slidable in an axial direction of said input shaft; an outer gear formed on the periphery of said sleeve member which is engageable only with said reverse gear; and a synchronizer mechanism provided between said sleeve member and said driven gear for synchronizing rotations between said sleeve member and said driven gear for connecting therebetween; said sleeve member being slidable axially of said input shaft to a first position at the side of said second input shaft portion wherein it is connected with said driven gear through said synchronizer mechanism and said outer gear thereof is disconnected from said reverse gear, and to a second position at the side of said first input shaft portion wherein said outer gear is connected with said reverse gear and the sleeve member is disconnected from said driven gear.

4,817,459

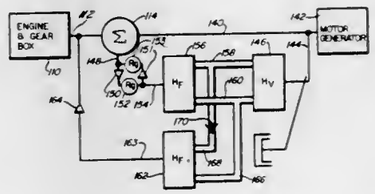
ENGINE STARTING AND POWER GENERATING SYSTEM

Evans W. Erikson; Richard W. Reynolds, both of Rockford, and Daniel M. Ryan, Poplar Grove, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 24, 1987, Ser. No. 137,590

Int. Cl.⁴ F16H *47/04, 47/08, 47/00*

U.S. Cl. 74—687 **10 Claims**



1. An engine starting and power generating system comprising:

an engine requiring a first torque level input to be started;

a dynamoelectric machine alternatively usable as a motor in an engine starting mode or a generator in a power generating mode and requiring a second torque level input, less than said first torque level input, to operate as a generator;

means interconnecting said engine and said machine including a differential having first, second and third rotary elements, first and second hydraulic units, a variable displacement hydraulic unit, first, second and third overrunning clutches, hydraulic lines connecting said first and second hydraulic units to said variable hydraulic unit and in parallel with each other and a check valve in one of said lines for hydraulically isolating said second hydraulic unit from said variable hydraulic unit when said system is in a power generating mode;

said first rotary element being connected via both said first and second clutches to said first hydraulic unit with said first and second clutches arranged to overrun in opposite directions of rotation and torque transmission, said second rotary element being connected to said dynamoelectric machine and to said variable displacement unit, and said third rotary element being connected to said second hydraulic unit via said third clutch, said third clutch being disposed to begin to overrun when said engine is approaching idle speed during an engine starting mode;

said first hydraulic unit and said variable hydraulic unit being sized so as to, together with said differential provide said second torque level to said dynamoelectric machine from said engine during a power generating mode; and

said first and second hydraulic units and said variable hydraulic unit being sized so as to together with differential,

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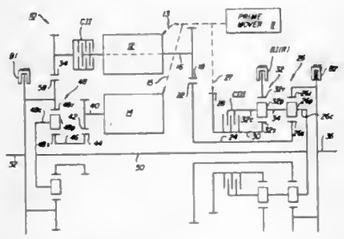
provide said first torque level from said dynamoelectric machine to said engine during an engine starting mode.

4,817,460

INFINITELY VARIABLE STEERING TRANSMISSION

Bradley O. Reed, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 3, 1987, Ser. No. 128,308
Int. Cl.[4] F16H *47/10*
U.S. Cl. 74—687 **19 Claims**



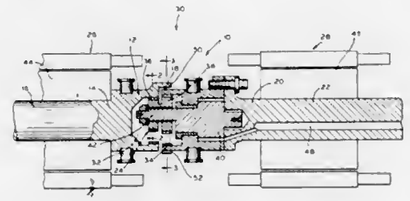
1. A steering transmission comprising, in combination:
A. first and second drive units each driven at a substantially constant speed for producing respective first and second unidirectional, continuous outputs infinitely variable between a minimum speed and a maximum speed;
B. a first output planetary gear set drivingly connected to a first transmission output and including
(1) a first sun gear,
(2) a first ring gear,
(3) a first planetary carrier, and
(4) a first pinion gear set mounted on said first planetary carrier;
C. a second output planetary gear set drivingly connected to a second transmission output and including
(1) a second sun gear,
(2) a second ring gear,
(3) a second planetary carrier, and
(4) a second pinion gear set mounted on said second planetary carrier;
D. an input gear set;
E. first means drivingly interconnecting said first and second output planetary gear sets;
F. second means drivingly connecting said first drive unit to said first output planetary gear set;
G. third means applying said second drive unit output to said second output planetary gear set;
H. fourth means applying a substantially constant speed input to said input gear set, said input gear set being drivingly connected to one of said first and second output planetary gear sets;
J. fifth means for selectively conditioning said input gear set to drive said one output planetary gear set at a speed having a first predetermined fixed ratio to said constant speed input, whereby to operate said transmission in one speed range; and
K. sixth means for selectively applying said first drive unit output to second output planetary gear set, whereby to operate said transmission in another speed range different from said one speed range.

4,817,461

DUAL GENERATOR PHASE SHIFTING DEVICE

Walter J. Iseman, Monroe Center, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 5, 1987, Ser. No. 104,809
Int. Cl.[4] F16H *47/00*
U.S. Cl. 74—720 **16 Claims**



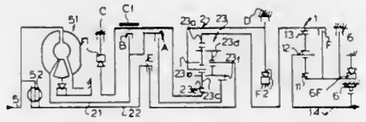
1. A phase shifting device for a dual PM generator having a first rotor-supporting shaft in drivingly interconnected relation to a second rotor-supporting shaft, comprising:
first gear means associated with an end of said first rotor-supporting shaft and second gear means associated with an end of said second rotor-supporting shaft, said end of said first rotor-supporting shaft being disposed in spaced adjacent relation to said end of said second rotor-supporting shaft; and
means for drivingly interconnecting said end of said first rotor-supporting shaft to said end of said second rotor-supporting shaft through said first and second gear means, and interconnecting means cooperating with said first and second gear means between said ends of said first and second rotor-supporting shafts to maintain a selected phase relationship between first and second generators defining said dual generator by directly transmitting rotational movement of one of said first and second rotor-supporting shaft such that said first and second rotor-supporting shafts normally rotate at the same speed, said interconnecting means being adapted to cooperate with said first and second gear means to selectively effect a phase shift between said first and second generators on command.

4,817,462

PLANETARY SHIFT GEAR UNIT

Hans-Jorg Dach, Friedrichshafen, and Anton Ott, Tettnang, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Continuation of Ser. No. 826,481, Jan. 17, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 122,561
Claims priority, application PCT Int'l Appl., May 26, 1984, PCT/EP84/00162
Int. Cl.[4] F16H *37/00, 57/10*
U.S. Cl. 74—740 **6 Claims**



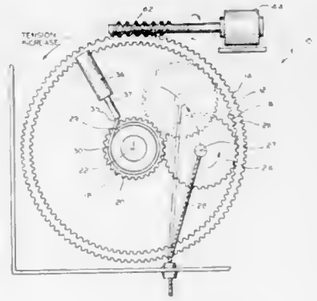
1. A planetary-gearing speed-change transmission having exclusively five forward speeds for a motor vehicle, comprising:
a basic planetary gear transmission assembly with four forward speeds having:
an input shaft connectable to a vehicle engine:
main planetary gearing establishing first, second, third and fourth gear ratios corresponding to first, second, third and fourth forward speeds of the planetary-gearing speed-change transmission so that all forward speeds are developed through planetary gearing, said first forward speed corresponding to the highest speed-reduction ratio of the main planetary gearing;
said second forward speed corresponding to a lower speed-reduction ratio than said first forward speed;
said third forward speed corresponding to a lower speed-reduction ratio than said second forward speed and;
said fourth forward speed corresponding to a lower speed-reduction ratio than said third forward speed;
clutch and brake means operatively connected with said main planetary gearing and selectively operable to select one of said speeds by establishing the corresponding gear ratio of said main planetary gearing, and
an output shaft connected to said main planetary gearing; and
a planetary-gearing group drive connected in series with said four-speed basic planetary gear transmission assembly and generating selectively a fifth speed for said planetary-gearing speed-change transmission which is interposed between two of said first through fourth speeds so that said planetary-gearing speed-change transmission will have five speeds, said planetary-gearing group drive including:
group-drive planetary gearing connected to said output shaft and providing the output of said planetary-gearing speed-change transmission, said group-drive planetary gearing being constructed and arranged to add a single gear ratio increment between said input shaft and the output of the planetary-gearing group drive exclusively for a single one of said first and second forward speeds which is at least equal to the gear ratio increment between said second and third gear ratios for the second and third speeds of said main planetary gearing, and said single gear ratio increment is at most equal to the gear ratio increment between said first and said second gear ratios, and
means for actuating said group-drive planetary gearing to selectively add said gear ratio increment to a previously selected one of said first and second gear ratios.

4,817,463

ELECTRIC CABLE TENSIONING DEVICE

Gregory W. Cameron, Jackson, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Apr. 14, 1987, Ser. No. 38,215
Int. Cl.[4] F16H *3/44, 57/10*
U.S. Cl. 74—781 R **10 Claims**



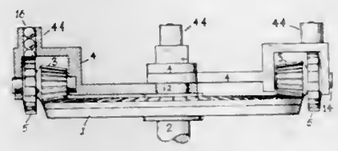
1. A cable tensioning device, comprising:
planetary gear means applying tensile force to a cable affixed to said planetary gear means, said planetary gear means being rotatable between s cable untensioned position and a cable tensioned position, said planetary gear means being rotatable toward said cable tensioned position in response to an input moment to said planetary gear means;
means for imparting said input moment to said planetary gear means, said means for imparting said input moment being responsive to an input torque from a single input torque source, and
means for holding said planetary gear means at said cable tensioned position upon cessation of said input moment, said means for holding being adaptable for releasing said planetary gear means for movement to said untensioned position.

4,817,464

FRICTIONLESS CONTINUOUSLY VARIABLE TRANSMISSION

Joseph F. Korban, and Nouhad F. Korban, both of 220 E. Mermaid Ln., #159, Philadelphia, Pa. 19118

Continuation-in-part of Ser. No. 851,405, Apr. 11, 1986. This application Apr. 9, 1987, Ser. No. 36,913
Int. Cl.[4] F16H *3/44*
U.S. Cl. 74—793 **12 Claims**



1. An infinitely variable speed transmission comprising:
a transmission housing;
an input drive shaft rotatably mounted in said transmission housing;
drive plate means having a plurality of radial drive surfaces therein, said drive plate means fixed to said input drive shaft;
an output drive shaft rotatably mounted in said transmission housing eccentric to said input shaft;
a bevel gear fixed to said output drive shaft;
a plurality of independently rotatable pinion arms, each arm having a proximal and distal end and being rotatably fixed to said output drive shaft at its proximal end;
a plurality of pinion gears rotatably mounted in said distal ends of said rotatable pinion arms, said pinions engaging said bevel gear; head means, fixed to said pinion arms and engaging said radial drive surfaces in said drive plate means; and
pinion engagement means for locking said pinion gears in sequence to effect driving of said bevel gear.

4,817,465

ROTARY TABLE FOR BAKERY PRODUCT SLICER

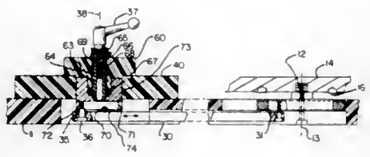
Ronald O. Browne, and Martin A. Grano, both of Santa Barbara, Calif., assignors to Food Tools, Inc., Santa Barbara, Calif.

Filed Dec. 23, 1986, Ser. No. 946,416
Int. Cl.[4] B23B *29/24;* F16H *29/04*
U.S. Cl. 74—817 **5 Claims**

1. An indexer to drive a unidirectionally rotatable turntable around a vertical axis, said turntable being adapted to receive unidirectional rotary forces, said indexer comprising: a base, a post having a vertical post axis, said post supporting said turntable for rotation around said vertical axis; an oscillator mounted to the base and rotatable around said post axis unidirectionally to engage and drive said turntable; a crank arm having a vertical crank axis of rotation; pivot means on said crank arm spaced from said crank axis at a throw distance therefrom; a connecting rod interconnecting said oscillator and

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said pivot means for reciprocably driving said oscillator; mount means mounted to said base which mount means is movable toward and away from said post, said mount means thereby mounting said crank arm to said base for axial movement nearer to and farther from said post selectively to adjust said throw distance; whereby the angular movement of the



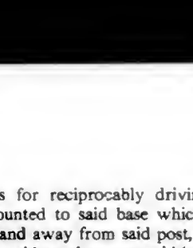
oscillator can be adjusted to be different for the same angular rotation of the crank arm, said oscillator and said drive means returning to the same starting position after each cycle of turning the crank arm to drive the turntable through the oscillator and return, to have advanced the turntable through an angular increment determined by the length of the throw distance.

4,817,466

REMOTE CONTROL SYSTEM FOR MARINE ENGINE

Minoru Kawamura, and Seiji Inoue, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 13, 1986, Ser. No. 930,716
Claims priority, application Japan, Nov. 14, 1985, 60-255557
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—858 **19 Claims**



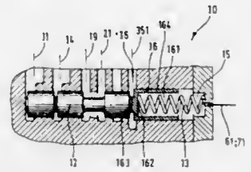
1. In a remote control system for a watercraft having a propulsion unit comprised of an engine having an engine speed control, and a transmission having at least a forward gear and a neutral, first power means for moving said engine speed control between an idle position, a part throttle position and a full throttle position, second power means for moving said transmission between said forward gear and said neutral condition, a remote control device for actuating said first and said second power means including an operator actuable engine speed control element and an operator actuable transmission control element and computer means for transmitting signals from aid remote control device to said first and said second power means including logic for precluding operation of said second power means to effect a shift unless the engine speed is below a predetermined value.

4,817,467

TRANSMISSION WITH DUAL MODULATED SHIFT CONTROLS

Horst Furtner, Kressbronn; Eugen Gerteiser, Eriskirch, and Georg Gierer, Kressbronn, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP86/00237, § 371 Date Jan. 5, 1987, § 102(e) Date Jan. 5, 1987, PCT Pub. No. WO86/06809, PCT Pub. Date Nov. 20, 1986
PCT Filed Apr. 19, 1986, Ser. No. 2,698
Int. Cl.⁴ B60K *41/16*
U.S. Cl. 74—864 **7 Claims**



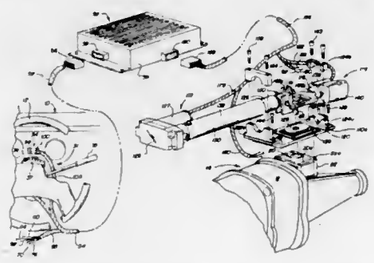
1. In combination with a vehicle having a super charged engine with a fuel feed control, a transmission driven by the engine and a control system for automatic shift of the transmission between drive ratios through at least two drive establishing devices (A, C') engaged under a control pressure modulated as a function of vehicle speed and a function of engine load demand reflected by fuel feed control position, said control system including a shift valve (**10, 100**) to which said control pressure is fed during said shift between said drive ratios, the improvement comprising signal pressure means operatively connected to the engine for providing a loading signal pressure (PL) and means (**61, 71**) directly connecting the signal pressure means to the shift valve (**10, 100**) for supply thereto of the loading signal pressure separately from the control pressure to correctively influence operation of the shift valve as a function of engine load demand.

4,817,468

ELECTRIC SHIFT APPARATUS FOR MANUAL TRANSMISSION

Keith V. Leigh-Monstevens, Troy; Edward L. Tury, Brighton; Leslie P. Branum, Troy, and Gregg A. Thoe, Farmington, all of Mich., assignors to Ap Aero, Inc, Sterling Heights, Mich.

Filed Jun. 18, 1987, Ser. No. 64,099
Int. Cl.⁴ G05G *9/00*
U.S. Cl. 74—335 **39 Claims**



1. An electric shift apparatus for controlling a manual transmission having a plurality of shift components selectively movable to provide a plurality of forward speed positions and a neutral position, said apparatus comprising:

(A) a control assembly, including a gear selector assembly adapted to be positioned in the passenger compartment of the vehicle and including gear selector means having respective select positions corresponding to each position of the transmission, operative in response to operator selection to generate a plurality of electrical control signals respectively corresponding to each position of the transmission; and

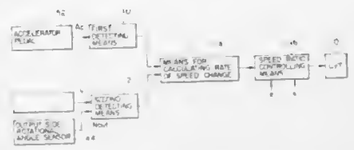
(B) an electrical power module adapted to be secured to the housing of the transmission and operative in response to receipt of each of said control signals to impart a specific combination and sequence of angular and axial movements to said shift components to move the transmission respectively to the transmission position corresponding to the received control signal.

4,817,469

AUTOMATIC TRANSMISSION FOR AUTOMOBILE AND METHOD OF CONTROLLING SAME

Takashi Shigematsu; Tomoyuki Watanabe; Setsuo Tokoro, all of Susono, and Daisaku Sawada, Gotenba, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 568,791, Jan. 6, 1984, abandoned. This application Nov. 23, 1987, Ser. No. 125,814
Claims priority, application Japan, Aug. 22, 1983, 58-151732
Int. Cl.⁴ B60K *41/12*
U.S. Cl. 74—866 **17 Claims**



1. A control apparatus for a continuously variable transmission for vehicles, comprising:

first detecting means for detecting a change amount (ΔAc) in a pedalling amount (Ac) of an accelerator pedal;

second detecting means for detecting vehicle speed;

calculating means for calculating a rate of change of speed ratio of the continuously variable transmission from outputs of the first and second detecting means such that said rate of change of speed ratio increases with an increase in said change amount; and

control means for controlling the speed ratio of the continuously variable transmission in relation to the output of the calculating means.

4,817,470

GEAR-SHIFT MECHANISM FOR MOTOR-VEHICLE MULTI-STEP TRANSMISSIONS WITH INTERRUPTION OF TRACTION

Erich Müller, Cappel; Edmund Volkert, Neckarsulm, and Wolfgang Rienecker, Herzogenaurach, all of Fed. Rep. of Germany, assignors to ZWN Zahnradwerk Neuenstein GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 879,986, Jun. 30, 1986, abandoned. This application May 3, 1988, Ser. No. 189,956
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—866 **4 Claims**

1. An electronically controlled multi-ratio power transmission for a motor vehicle powered by a combustion engine and having driven wheels, comprising:

a drive shaft;

a clutch for connecting said combustion engine to said drive shaft;

an output shaft connected to said driven wheels of said motor vehicle;

a countershaft;

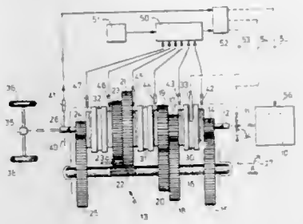
a pair of toothed wheels meshing with each other and arranged on said driven shaft and said countershaft respectively to continuously drive said countershaft in synchronism with said drive shaft;

a first set of toothed wheels arranged freely rotatable on said output shaft, said toothed wheels of said first set having a peripheral toothing and being each provided with a radial projection carrying a circumferential external toothing;

a second set of toothed wheels arranged on said countershaft to rigidly rotate therewith and having a peripheral toothing, one each of said toothed wheels of said first set continuously meshing with one each of said toothed wheels of said second set by way of engagement of said peripheral toothings;

gear shift sleeves arranged on said output shaft to rigidly rotate therewith, said sleeves being axially displaceable on said output shaft and carrying each a circumferential internal toothing, complementary to said external toothing of said projections of said toothed wheels of said first set and being arranged adjacent thereto;

means for selectively axially displacing one of said sleeve to being said internal toothing of said one sleeve into engagement with said external toothing of said projection of said adjacent toothed wheel;



a disk rotating in synchronism with said output shaft and carrying markers;

a first stationary sensor sensing said markers and operable to generate a first periodic signal having a frequency indicative of the rotational speed of said output shaft;

a set of second stationary sensors sensing said external toothing of said toothed wheels of said first set and operable to generate second periodical signals having a frequency indicative of the rotational speed of said toothed wheels of said first set;

phase-detection means having inputs coupled to said first sensor and said second sensors to compare said first periodical signal with one each of said second periodical signals, said phase-detection means having an output;

a threshold-stage coupled to said output of phase-detection means, said threshold-stage generating a third signal when said internal toothing of said one sleeve and said external toothing of said projection of said adjacent toothed wheel are at a predetermined relative angular position;

manual control switch means for preselecting a transmission ratio; and

actuating means selected by said manual control switch means for axially displacing said one sleeve to effect engagement of said internal and said external toothings upon generation of said third signal.

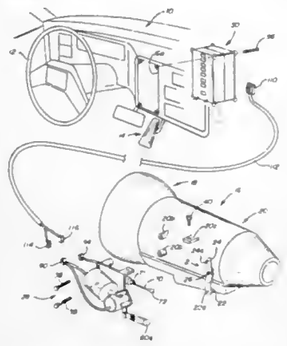
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4,817,471

ELECTRICAL CONTROL SYSTEM FOR CONTROL OF AN AUTOMATIC TRANSMISSION APPARATUS

Edward L. Tury, 9732 Rosemary La., Brighton, Mich. 48116

Continuation-in-part of Ser. No. 62,755, Jun. 16, 1987, Pat. No. 4,790,204. This application Oct. 15, 1987, Ser. No. 108,812
Int. Cl.[4] B60K *41/18, 20/10*
U.S. Cl. 74—866 44 Claims



1. An electrical control apparatus for control of an automatic transmission apparatus in a motor vehicle having a plurality of transmission states including a motor adapted for upshifts and downshifts, the electrical control apparatus comprising:

an operator input means for generating a desired transmission state signal corresponding to manual operator input;

a transmission state sensing means for generating a present transmission state signal indicative of the state of the automatic transmission;

a speed sensing means for generating a signal indicative of the speed of the motor vehicle;

a logic control unit connected to the motor, said operator input means and said transmission state sensing means

for determining if said desired transmission state differs from said present transmission state signal, and

for determining whether the desired transmission state is an upshift or a downshift from the present transmission state, and for controlling the motor to upshift if the desired transmission state is an upshift from the present transmission state and to downshift if the desired transmission state is a downshift from the present transmission state, when said desired transmission state signal differs from said present transmission state signal.

for inhibiting control of the motor for either an upshift or a downshift when said signal indicative of the speed of the motor vehicle indicates a speed greater than a predetermined speed corresponding to the desired transmission state, at least two transmission states having corresponding predetermined speeds which differ.

4,817,472

TRANSMISSION CONTROL SYSTEM WITH PROTECTION AGAINST EXCESSIVELY HIGH SPEED DOWNSHIFTING

Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 215,659, Dec. 12, 1980. This application Jun. 28, 1983, Ser. No. 508,989
Claims priority, application Japan, Apr. 2, 1980, 55-43148
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—869 3 Claims

1. For an automatic transmission for an engine driven vehicle, comprising a gear transmission mechanism comprising a plurality of fluid pressure actuated friction engaging mechanisms, selective supply of fluid pressure to said friction engaging mechanisms selectively providing a plurality of speed stages from said gear transmission mechanism:

a hydraulic fluid pressure control system, comprising:

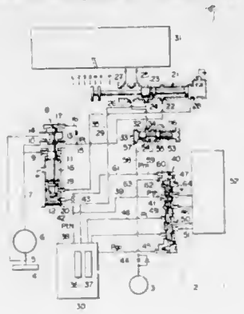
(a) a source of hydraulic fluid pressure;

(b) a line fluid pressure regulation valve, which is supplied with the fluid pressure from said source of hydraulic fluid pressure and a booster pressure to produce a controlled line fluid pressure which increases as said booster pressure increases;

(c) a manually operated selector valve, which is selectable between a plurality of positions denoting speed ranges including a "D" range and at least one other forward speed range in which the highest gear speed stage available is lower than the highest gear speed stage available in said "D" range, which receives a supply of said line fluid pressure, which produces as output a lower range fluid pressure substantially equal in pressure value to said line fluid pressure when said other forward speed range is selected thereon, and which does not produce as output said lower range fluid pressure when said "D" range is selected thereon;

(d) a throttle fluid pressure control valve, which receives a supply of said line fluid pressure, and which produces therefrom a throttle fluid pressure whose value varies according to a quantity representative of engine load;

(e) a governor fluid pressure control valve, which re-



ceives a supply of said line fluid pressure, and which produces therefrom a governor fluid pressure whose value varies according to road speed;

(f) a modulator fluid pressure control valve which receives a supply, when available, of said lower range fluid pressure from said manually operated selector valve, and which produces therefrom a modulator fluid pressure by regulating said line fluid pressure to a fixed pressure level; and

(g) a shift valve, comprising a valve element, which receives supply of said throttle fluid pressure and said modulator fluid pressure, if available, which act on said valve element so as to bias it in a first direction, which further receives supply of said governor fluid pressure which acts on said valve element so as to bias it in a direction opposite to said first direction, and in which said valve element is switched to and fro in said first and opposite directions according to a balance relationship between said throttle fluid pressure and said governor fluid pressure, said shift valve controlling supply of actuating fluid pressure to some of said fluid pressure actuated friction engaging mechanisms so as to provide the highest speed stage available in said other forward speed range when said valve element is in its extreme position in said first direction;

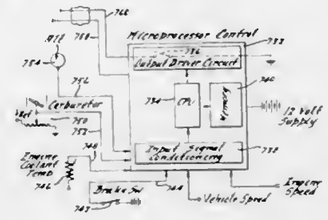
(h) a shuttle valve which supplies either of said throttle fluid pressure and said modulator fluid pressure, if available, whichever is higher than the other, as said booster pressure to said line fluid pressure regulation valve.

4,817,473

HYDRAULIC CONTROL VALVE SYSTEM FOR AN AUTOMATIC MULTIPLE-SPEED TRANSMISSION WITH A LOCKUP TORQUE CONVERTER AND ELECTRONICALLY OPERATED LOCKUP CONTROL

Paul A. Baltusis, Northville, and Stephen R. Wolodkiewicz, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 11, 1987, Ser. No. 24,500
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—869 6 Claims



1. In a control system for an automatic transmission in an engine powered vehicle comprising multiple ratio gearing:

a pressure source;

a clutch and brake means for effecting ratio changes including two top ratios and at least one lower, underdrive ratio;

a hydrokinetic torque converter having a turbine connected to torque input poritions of said gearing and an impeller connected to said engine;

a pressure operated lockup clutch means in said converter for directly connecting said turbine and said impeller;

a control circuit including pressure operated means for sequentially actuating said clutch and brake means and ratio shift valve means for controlling distribution of pressure from said source to said pressure operated means;

a converter clutch shift valve and a converter clutch shuttle valve in portions of said circuit connecting said pressure source to said lockup clutch means;

a source of an engine torque signal and a source of a vehicle speed signal connected to said converter clutch shift valve whereby the latter is shifted between a lockup clutch engaging position and lockup clutch disengaging position depending upon the relative values of vehicle speed and engine torque;

said shuttle valve establishing and disestablishing communication between said lockup clutch and said pressure source as it is shifted between a lockup position and an unlock position in response to movement of said converter clutch shift valve, the latter being hydraulically linked to the former;

a solenoid valve means connected hydraulically to said converter clutch shuttle valve;

a microprocessor control unit for energizing and deenergizing said solenoid valve whereby the latter distributes actuating pressure selectively to said converter clutch shuttle valve, the influence of said converter clutch shift valve on said converter clutch shuttle valve thereby being overruled at speeds greater than a minimum calibrated value;

engine torque demand sensing means, engine speed sensing means and vehicle speed sensing means communicating with input signal conditioning portions of said microprocessor control unit;

a shift solenoid valve means in communication with said pressure source and said ratio shift valve means for alternately blocking and distributing pressure to said ratio shift valve means whereby the latter is actuated from one of said positions to the other; and

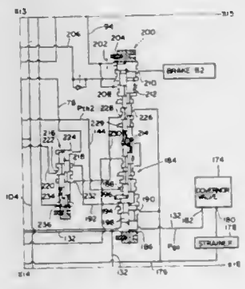
electronic microprocessor control means including a ratio shift data memory for storing a predetermined ratio shift schedule, said control means being connected to said shift solenoid valve means for developing a shift signal in response to vehicle speed and torque demand in accordance with said stored shift schedule.

4,817,474

HYDRAULIC PRESSURE CONTROL APPARATUS FOR USE IN AUTOMATIC TRANSMISSION

Kunio Morisawa, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 715,820, Mar. 25, 1985, Pat. No. 4,719,822. This application Oct. 1, 1987, Ser. No. 103,412
Claims priority, application Japan, Apr. 4, 1984, 59-65819; Jul. 9, 1984, 59-140613; Jul. 9, 1984, 140614; Jul. 18, 1984, 59-147677
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—869 3 Claims



1. An automatic transmission of a vehicle, comprising:

a gear transmission mechanism (**507**);

a hydraulic fluid pressure source (**10**);

a plurality of friction engaging means including

a first friction engaging means (**B2**) adapted to be supplied with a hydraulic fluid pressure originated in said source to engage when said gear transmission mechanism provides a first speed stage; and

a second friction engaging means (**B1**) adapted to be supplied with a hydraulic fluid pressure originated in said source to engage when said gear transmission mechanism provides a second speed stage and not to be supplied with the hydraulic fluid pressure to be disengaged when said gear transmission mechanism provides said first speed stage; and

a hydraulic fluid pressure switching over system for selectively supplying and exhausting hydraulic fluid pressures originated in said source to and from said friction engaging means, including

a manual valve (**46**) having a first port (**52**) for delivering a first detent fluid pressure originated in said source when said gear transmission mechanism is fixed to said first speed stage, and a second port (**54**) for delivering a second detent fluid pressure originated in said source when said gear transmission mechanism is fixed to said second speed stage;

a speed shift valve (**184**) having an output port (**194**) for selectively supplying a hydraulic fluid pressure originated in said source when said gear transmission mechanism provides said second speed stage;

a second speed holding valve (**216**) having a first input port (**218**), a second input port (**232**), an outlet port (**222**), a first control port (**224**) and a second control port (**236**) and

adapted to connect said output port thereof with said first input port thereof under a spring biasing when said first and second control ports thereof are not supplied with said second and first detent fluid pressures, respectively, or when said first and second control ports thereof are supplied with said second and first detent fluid pressures, respectively, so as to transfer said hydraulic fluid pressure delivered from said speed shift valve toward said second friction engaging means, and to connect said output port thereof with said second input port thereof when said first control port thereof is supplied with said second detent fluid pressure while said second control port thereof is not supplied with said first detent fluid pressure; and

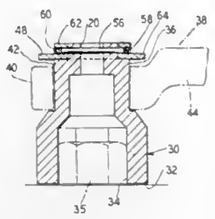
a shift valve (**200**) having an input port (**204**) adapted to be supplied with a hydraulic fluid pressure originated in said source, an output port (**210**) connected with said first friction engaging means, a control port (**204**), an auxiliary input port (**226**) adapted to be supplied with a hydraulic fluid pressure originated in said source, an auxiliary output port (**228**) connected with said second input port of said second speed holding valve and a drain port (**229**), said shift valve being adapted to disconnect said output port thereof from said input port thereof while connecting said auxiliary output port thereof with said auxiliary input port thereof when said control port thereof is not supplied with said first detent fluid pressure and to connect said output port thereof with said input port thereof while disconnecting said auxiliary output port thereof from said auxiliary input port thereof so as to connect said auxiliary output port thereof with said drain port thereof when said control port thereof is supplied with said first detent fluid pressure.

4,817,475

WRENCH SOCKET

Michael W. Kelly, 1021 N. Prarie, and Laura B. Patterson, 911 Dawes, both of Joliet, Ill. 60435

Continuation of Ser. No. 895,314, Aug. 11, 1986, Pat. No. 4,699,029. This application Aug. 17, 1987, Ser. No. 66,113
Int. Cl.[4] B25B *13/06*
U.S. Cl. 81—121.1 **20 Claims**



1. A wrench socket comprising:

a driven end having an internal drive opening therein to receive a driving projection from a first wrench;

a drive end having a drive means to engage a threaded fastener for rotatingly driving said fastener;

an external drive surface area intermediate said driven end and said drive end for receiving a second wrench in surrounding relationship; and

retaining means for preventing axial disengagement of said second wrench from said socket in a direction toward said driven end, including a resilient member biased against a wrench engaging member, located adjacent to said driven end to assure selective retention of said second wrench on said socket;

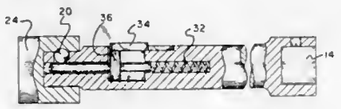
whereby, said socket may be driven by either said first wrench through said internal drive opening or said second wrench through said external drive surface area.

4,817,476

SOCKET WRENCH EXTENSION

Richard Karge, 6512 Browning Rd., Pennsauken, N.J. 08110

Division of Ser. No. 861,682, May 12, 1986, Pat. No. 4,733,584. This application Mar. 21, 1988, Ser. No. 171,112
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—177.85 **1 Claim**



1. A locking socket wrench extension comprising:

an elongated extension member having an axially aligned opening adjacent one end thereof adapted to receive the driving stud of a ratchet wrench or similar tool;

the end of said extension member remote from said one end including a socket drive stud thereon;

a socket retaining means including a socket engaging ball carried by said socket drive stud, said retaining means including a transverse slot formed in the wall of said socket drive stud, said ball being contained within said transverse slot and being movable between a locking position wherein a portion of said ball lies outside of said transverse slot and said socket drive stud and an unlocking position wherein said ball moves inwardly toward the center of said socket drive stud;

an elongated bore within said extension member and coaxial therewith, the forward end of said bore intersecting said transverse slot;

a radially and axially extending slot formed in the wall of said extension member intermediate the ends thereof, said radially and axially extending slot intersecting said bore and communicating with the outside of said extension member at an opening at one side of said extension member only; the portion of the wall of said extension member directly opposite said opening being solid;

a radially extending post located within said radially and axially extending slot and extending into said bore, said post having a hole therein coaxial with said bore and being axially movable within said radially and axially extending slot;

an elongated pin located within said bore and being capable of limited axial movement, said pin passing through the hole in said post and being secured to the post for movement therewith, the forward end of said pin being adapted to move said ball into said locking position when said pin moves forwardly, said ball moving into said unlocking position when said pin moves rearwardly;

spring means within said extension member for biasing said pin forwardly, and

a slideable button on the exterior of said extension member and interconnected with said pin via said post for moving said pin rearwardly.

4,817,477

APPARATUS AND METHOD OF AUTOMATICALLY PUNCHING HOLE PATTERNS IN SHEETS OF MATERIAL

Jack K. Emery, Santa Ana, and Michael B. Dent, Fullerton, both of Calif., assignors to C.A. Picard, Inc., Battle Creek, Mich.

Filed Dec. 19, 1986, Ser. No. 944,467
Int. Cl.[4] B26D *5/32, 5/34*
U.S. Cl. 83—23 **10 Claims**

8. An apparatus for punching holes at precise locations in sheets of material, said apparatus comprising:

means for emitting light on a sheet of material;

means for detecting the light emitted by said light emitting means, the intensity of the detected light being indicative of the relative position of said sheet of material in said apparatus, said sheet of material having a first reference mark which alters the intensity of the light detected by said detecting means when said reference mark is moved relative to said emitting means and having a second reference mark, each of said reference marks being detected in order to align said sheet of material in a respective direction;

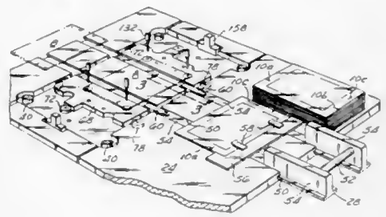
means for automatically positioning said sheet of material in response to the intensity of the light detected by said detecting means, said means for automatically positioning said sheet of material comprising:

first means for incrementally moving said sheet of material in a first direction;

second means for incrementally moving said sheet of material in a second direction opposite said first direction, each of said moving means comprising a positioning cam;

a first stepping motor coupled to drive said first moving means; and

a second stepping motor coupled to drive said second moving means; and



means for punching a predetermined pattern of holes in said sheet of material upon said detecting means detecting a predetermined intensity of light.

9. A method of automatically punching holes at precise locations in sheets of material, said method comprising the steps of:

(a) emitting light on a sheet of material;

(b) detecting the light emitted in said step (a), the amount of detected light being indicative of a feature of said sheet of material, the light detected in said step (b) being reflected from the surface of said sheet of material;

(c) automatically positioning said sheet of material in response to the amount of light detected in said step (b);

(d) punching a pattern of holes in said sheet of material upon the detection in said step (b) of a predetermined light intensity; and

(e) ejecting a punched sheet of material upon the insertion of an unpunched sheet of material;

said feature of said sheet of material being a reference mark having two edges, said reference mark altering the intensity of the light detected in said step (b), both edges of said reference mark being detected in said step (b).

4,817,478

TIMBER MILL

Angus C. Fisher, Millbank Road, Terrara, Australia 254C, and William J. Andrews, Emerys Road, West Camberwarra, Australia 2540

PCT No. PCT/AU86/00341, § 371 Date Sep. 8, 1987, § 102(e) Date Sep. 8, 1987, PCT Pub. No. WO87/02928, PCT Pub. Date May 21, 1987
PCT Filed Nov. 7, 1986, Ser. No. 105,429
Claims priority, application Australia, Nov. 2, 1985, PH03333; Sep. 1, 1986, PH07774
Int. Cl.[4] B26D *1/00*
U.S. Cl. 83—35 **18 Claims**

1. A compact timber milling apparatus for the continuous sorting, processing and reprocessing of timber into various cross sectional dimensions, said apparatus comprising:

a main superstructure having a primary support means;

the superstructure including a platform superstructure and comprising at least one bench;

the superstructure including means for feeding timber onto the said platform;

at least one set of saws associated with each of said at least one bench;

a saw infeed means into each of the said at least one set of saws;

a conveyor means to direct timber to various locations on said platform on each of said at least one bench;

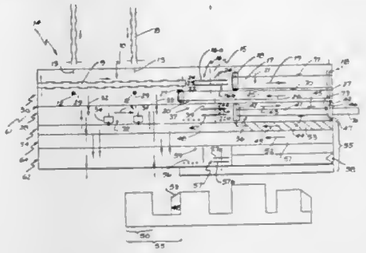
guide and stopper means to control the passage of timber being processed;

means near said conveyor means to enable separation of and re-direction of cut timber across said at least one bench;

a means on the said at least one bench to enable exiting of cut timber from said apparatus;

means for transferring timber from one bench to another bench or from one bench to a location off the apparatus;

wherein, when a length of timber is to be processed, a predetermined processing or reprocessing route is selected, said route being created by integration between a configuration of components on said at least one bench, said components including the conveyor means and the said separation means on said at least one bench under control by an operator, thereby enabling time ordered timber processing and reprocessing sequences to be performed on timber until a desired size of timber is achieved.



11. A milling apparatus comprising a first cutting bench, in combination with a second and third bench, said first bench comprising:

a saw infeed means, a cutting means for cutting timber from said saw infeed means, a first conveyor for receiving cut timber from the cutting means, a means for allowing exiting of cut timber from said first bench, a second conveyor for transferring cut timber from said first conveyor to another location means for separating cut timber and directing said cut timber along a preselected route according to a preselected time sequence;

said second bench being adjacent said first bench and comprising:

a infeed means for receiving timber from said first bench;

a second cutting means for cutting timber from said saw infeed means;

a first conveyor for receiving cut timber from said cutting means;

a means for allowing exiting of cut timber from said second bench;

said third bench adjacent said second bench and comprising:

at least one conveyor to receive cut timber from the conveyor of an adjacent bench;

a means for transferring timber from said conveyor to a saw infeed means on said third bench;

a cutting means to receive timber from said saw infeed means;

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a pair of parallel conveyors which are adapted to receive cut timber which is urged to fall by separation means located on said third bench, from either side of an overhead conveyor also located on said third bench;

a means for enabling exiting of cut timber from said overhead conveyor;

a means for transferring timber from either of said pair of conveyors to said saw infeed means; wherein when a piece of timber is to be processed, the said timber is initially cut on said first bench then guided along a predetermined route for exiting said first bench or reprocessing on said second or third benches.

4,817,479

SLICING APPARATUS AND PROCESS FOR PRODUCING A COOKED, SLICED MEAT PRODUCT

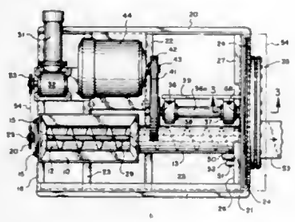
Paul M. Perrine, 14 Paku Drive, Tairua, New Zealand

Continuation of Ser. No. 810,054, Dec. 17, 1985, abandoned. This application Jan. 6, 1988, Ser. No. 142,829

Claims priority, application New Zealand, Dec. 17, 1984, 210591

Int. Cl.[4] B26D *7/34, 7/00*

U.S. Cl. 83—169 21 Claims



1. Slicing apparatus comprising at least one feed tube for material to be sliced, said at least one tube having a discharge end; cutter means adjacent the discharge end of said at least one feed tube and having at least one cutting edge thereon adapted to pass across the discharge end of said tube closely enough to create a scissor action between the cutting edge and at least the portion of the feed tube end passed last by the cutting edge when passing thereby and said cutter means adapted to block the free discharge of material from the discharge end of the said at least one tube; means for pressurizing material to be sliced in said at least one feed tube so that said material substantially fills said at least one tube at its discharge end and is forced from said at least one feed tube against said cutter means; and means for moving said at least one cutting edge repeatedly across the discharge end of said feed tube.

4,817,480

KNIFE SHARPENER

Raymond A. Young, 7570 Springhill Dr., Gladstone, Oreg. 97027

Filed Aug. 10, 1987, Ser. No. 83,212

Int. Cl.[4] B26D *7/12*

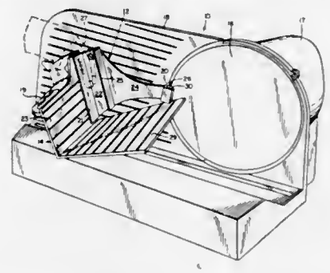
U.S. Cl. 83—174.1 12 Claims

10. A knife sharpener for sharpening an edge of a knife of a food slicing machine having a movable carriage tray and a baseplate, the knife having opposing beveled and planar edge portions, comprising:

a stationary abrasive cylinder for sharpening the beveled portion of the knife edge;

a stationary abrasive rectangular block for sharpening the planar portion of the knife edge;

a housing for removably receiving the block and cylinder, the housing including adjustable means for urging the block and cylinder into contact to form a sharpening notch for receiving the knife edge therebetween; and a handle and a neck connecting the housing to the handle, the handle and housing having aligned planar edges for



resting against the baseplate to align the sharpening notch with the plane of the knife edge.

4,817,481

VEGETABLE CUTTING DEVICE

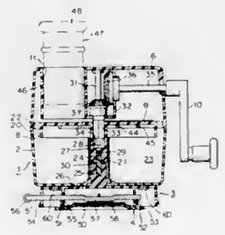
Shinobu Homma, Tokyo, Japan, assignor to Kabushiki Kaisha Honma, Tokyo, Japan

Continuation of Ser. No. 88,006, Aug. 18, 1987, abandoned, which is a continuation of Ser. No. 821,665, Jan. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 599,036, Apr. 11, 1984, Pat. No. 4,602,543. This application Mar. 8, 1988, Ser. No. 169,175

Claims priority, application Japan, May 19, 1983, 58-073718

Int. Cl.[4] B02C *18/24*

U.S. Cl. 83—355 12 Claims



1. A cutting device used on a base plate for cutting a vegetable and the like, said device comprising:

a cup-shaped lower housing having a central axis and an upper peripheral portion,

an inverted cup-shaped upper housing having a lower peripheral portion which is engageable with the upper peripheral portion of said lower housing, said upper housing having an inlet,

a connecting means for detachably inter-connecting the lower peripheral portion of said upper housing and the upper peripheral portion of said lower housing,

a cutting disk detachably arranged in said lower housing and rotatable about the axis of said lower housing, said disk having an upper face which faces said inlet and having a lower face which defines a storage chamber in an interior of said lower housing beneath said disk, said disk having a bore extending along the axis of said lower housing, and said disk having at least one cutter blade,

a drive means having a manually operated drive shaft which is rotatably supported by said upper housing, said shaft having a lower engaging portion which is detachably fitted into the bore of said disk and which is non-rotatable relative to said disk to drive the disk while preventing any upward movement thereof,

a fixing apparatus attached to a bottom face of said lower housing, and fixing said lower housing onto the base and wherein said disk has a downward extending portion having a hole therein, a pin disposed along the axis of the lower housing and rotatably engaged in said hole, wherein said fixing apparatus has a projection which extends toward the hole, and wherein said pin is mounted on said projection whereby the disk is rotatably supported from below by the pin to prevent downward movement of the disk.

4,817,482

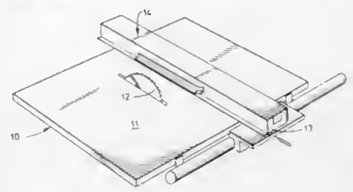
WORKPIECE GUIDE FOR USE WITH TABLE SAWS

James T. Dunaway, Jr., 3690 Mack Rd., Unit 5, Fairfield, Ohio 45014, and John T. Pater, 1171 Kahn Ave., Hamilton, Ohio 45011

Filed Mar. 30, 1987, Ser. No. 31,377

Int. Cl.[4] B27B *27/02*

U.S. Cl. 83—438 17 Claims



1. A workpiece guide for use on a table saw fence as an aid in the cutting of thin workpieces, said guide comprising:

(a) an elongated inverted U-shaped body dimensioned to straddle the fence with a first leg of the body angled inwardly so as to exert a holding force on the fence, a bridge extending from the first leg, a second extending from the bridge to a top surface of the table saw with a lip extending outwardly from a bottom extremity of the second leg;

(b) a guide strip extending along the length of the U-shaped body and immovably secured thereto, said guide strip positioned above the lip and substantially parallel with the lip so that a thin workpiece will slide between said guide strip and lip in a steady fashion, further wherein the guide strip is angled upwardly at a workpiece feed side as an aid to feeding the thin workpiece along the guide and into a saw blade; and

(c) a stop in association with the U-shaped body to engage said fence and prevent lateral movement of the workpiece guide along the fence during a cutting operation.

4,817,483

ELECTRICALLY POWERED DISPENSER FOR ROLLED SHEET MATERIAL HAVING A ROTARY BLADE CUTTER

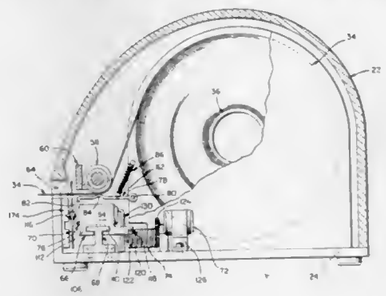
Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064

Filed Jul. 8, 1987, Ser. No. 71,088

Int. Cl.[4] B65H *75/32*

U.S. Cl. 83—488 11 Claims

1. A dispenser for rolled sheet material comprising a hollow housing, means in the housing to rotatably support a roll of sheet material, said housing including a discharge slot through which a web of sheet material can be discharged, means in said housing to move a web of material through the discharge slot, and means in said housing for cutting the web of material adjacent to but spaced from the discharge slot, said cutting means comprising a carriage movable transversely of the web of material, a motor mounted on the carriage and including an output shaft, a rotary circular cutting blade mounted on the output shaft with the periphery of the blade engaging and cutting the web of material when the carriage is moved transversely of the path of movement of the web of material, said means in the housing to move a web of material including a feed roller engaging one surface of the web of material, a feed roller follower engaging the opposite surface of the web of material in opposed relation to the feed roller with the feed roller follower being a plate-like member having an upwardly offset portion engaging the web of material, said follower



being pivotally mounted and spring biased toward the feed roller, a feed roller drive motor connected to the feed roller through a reduction drive train, and a feed roller wiper engaged with the periphery of the feed roller in spaced relation to the follower to prevent the web of material from wrapping around the feed roller.

4,817,484

ELECTRONIC STRINGED INSTRUMENT

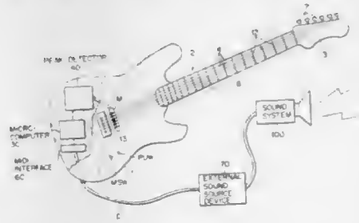
Akio Iba, Tokorozawa, and Shigeru Uchiyama, Sayama, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 184,099

Claims priority, application Japan, Apr. 27, 1987, 62-101843; May 27, 1987, 62-134216; May 27, 1987, 62-134217

Int. Cl.[4] G10H *1/06, 1/40, 3/18*

U.S. Cl. 84—1.16 11 Claims



1. An electronic stringed instrument comprising:

picking-data output means for detecting a status of a picking operation with respect to at least one string at a plurality of fret operation positions and outputting picking data including pitch designation data for specifying a musical tone having a specific pitch and string trigger data for specifying a generating timing for a musical tone;

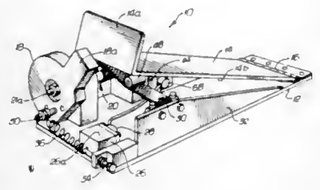
mode selecting means for selectively setting a normal play mode and at least one other selection mode;

tone generating means for, when said pitch designation data is output from said picking-data output means in response to said picking operation, with said normal play mode being set by said mode selecting means, generating a musical tone having a pitch specified by said pitch designation data, at a timing indicated by said string trigger data; and

musical tone parameter setting means for, when said pitch designation data is output from said picking data output

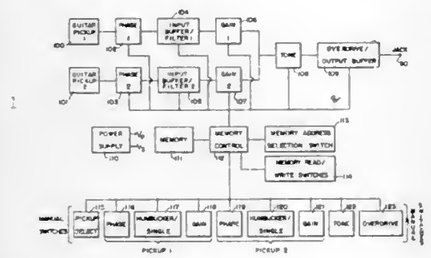
means in response to said picking operation, with said at least one selection mode being set by said mode selecting means, selecting and setting a specific one of a plurality of musical parameters, in accordance with said picking data output from said picking-data output means.

4,817,485
PEDAL OPERATED ELECTRONIC DRUM
Terry Bozzio, 10644 Wilkins Ave., Apt. No. 302, Los Angeles, Calif. 90024, and Wayne Yentis, 13812 Gavina Ave., Sylmar, Calif. 91342
Filed Dec. 10, 1985, Ser. No. 792,042
Int. Cl.[4] G10H *3/12*
U.S. Cl. 84—1.04 **25 Claims**



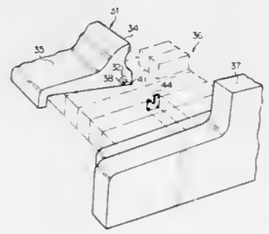
22. An electronic percussion instrument comprising:
a base;
a pedal, pivotally attached to the base;
a movable hammer element, actuatably coupled to the pedal;
an anvil element, made of a material which vibrates when struck, the anvil element having a striking surface disposed in a first position for engagement with the hammer element when the pedal is actuated and a transducer coupling surface disposed at a second position for acoustically ccupling impact induced vibrations in the anvil element to a transducer; and
a piezoelectric transducer which is acoustically coupled to the transducer coupling surface, wherein the piezoelectric transducer is positioned away from any substantially direct, parallel overlap with the striking surface of the anvil.

4,817,486
CONTROL SYSTEM WITH MEMORY FOR ELECTRIC GUITARS
John H. Saunders, 351 Orchard, Upland, Calif. 91786
Filed Dec. 31, 1986, Ser. No. 948,249
Int. Cl.[4] G10H *1/46, 3/18*
U.S. Cl. 84—1.15 **14 Claims**



1. A system for controlling the output of a plurality of pickups of an electric guitar, comprising:
a plurality of switch means responsive to both manual and electronic actuation which control the characteristics of the pickups including separate volume switches for each pickup wherein each volume switch comprises a multiple tap resistor ladder containing at least eight resistors selectably connected either individually or in combination by an analog multiplexer means such that the volume decibel level may be adjusted in non-linear increments, tone control switch means to control the frequency content of the output, overdrive switch means to enable the overloading of the input circuits of an external amplifier and phase switch means to control the phase of the outputs, and
a digital memory control means comprising means to recognize and store in memory a plurality of different combinations of settings for the plurality of switch means, means to select and recall particular single combinations of switch settings, means to cause the generation and transmission of electronic actuation signals to the plurality of switch means to reset the switches as necessary to achieve the recalled combination of switch settings, and means to retain the contents of the memory for an extended period of time.

4,817,487
STRUCTURE OF FALL BOARD ASSEMBLY OF KEYBOARD INSTRUMENT
Noboru Yamashita, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed May 5, 1988, Ser. No. 190,397
Claims priority, application Japan, May 6, 1987, 62-67993[U]
Int. Cl.[4] G10C *3/02*
U.S. Cl. 84—179 **11 Claims**

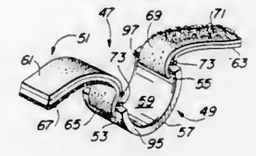


1. A fall board assembly for use in a keyboard instrument having a keyboard located between a pair of side arms, comprising:
(a) a fall board having a boss portion and a covering plate portion extending from the boss portion; and
(b) a pair of rotary dampers provided between the boss portion of said fall board and said side arms, respectively, and operative to allow the fall board to move between first and second angular positions, said keyboard being covered with the covering plate portion of said fall board in said first angular position but exposed to a player in said second angular position, wherein said rotary dampers produce a damping effect against the rotation of the fall board when said fall board rotates from said second angular position to said first angular position.

4,817,488
GUITAR SLIDE BAR APPARATUS
Federico E. de los Santos, 2068 E. Libra Dr., Tempe, Ariz. 85283
Filed Jun. 15, 1988, Ser. No. 207,167
Int. Cl.[4] G10D *3/00*
U.S. Cl. 84—319 **29 Claims**

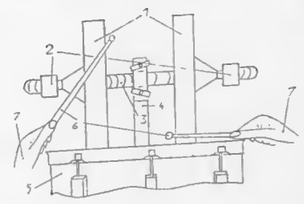
1. A guitar slide apparatus adapted to be worn on and removed from at least one selected finger of a guitar player's fret hand, said at least one selected finger including a first finger joint, a finger tip portion forward of said first finger joint, a second finger joint, a finger mid-portion disposed between said first and second finger joints, and a rear finger portion on the opposite side of said second finger joint, said guitar slide apparatus comprising:

a partially semicircular arcuate band means having a lateral length sized to fit over said finger mid-portion without encumbering the normal bending movement of said first and second finger joints, said arcuate band means having a convexly curved exterior surface means for contacting at least one selected guitar string and altering its normal vibration for producing the steel guitar sound, an opposite



concave surface means for conforming to the curve of at least the bottom of said finger mid-portion, and a pair of opposite end portions; and
means operably coupled to said opposite pair of end portions of said band means for quickly and easily removably securing and unsecuring said arcuate band to the finger mid-portion of said at least one selected finger.

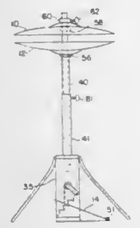
4,817,489
TRAINING DEVICE FOR PERCUSSION MUSICIANS
Maurice L. Chabal, Les Plaines Gagnieres F., 30160 Besseges, France
PCT No. PCT/FR86/00405, § 371 Date Aug. 27, 1987, § 102(e) Date Aug. 27, 1987, PCT Pub. No. WO87/03410, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 26, 1986, Ser. No. 87,503
Claims priority, application France, Nov. 27, 1985, 85/17643
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—411 P **8 Claims**



1. A training device for training a percussion musician in the use of a percussion instrument having sticks and a diaphragm, the device comprising:
a percussion instrument having sticks and a diaphragm; and means of limiting the movement of the sticks,
said means being composed of at least one slide guide disposed in a substantially vertical plane above said diaphragm and along which said sticks freely slide.

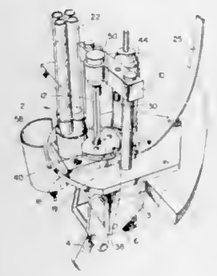
4,817,490
PERCUSSION INSTRUMENT
Brian F. Cahill, 1244 Ruger Ave., Janesville, Wis. 53545
Filed Nov. 20, 1987, Ser. No. 123,400
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422.1 **4 Claims**

1. A foot pedal operated hi-hat cymbals musical instrument for producing a double beat with each complete cycle of pedal movement, comprising:
a frame having a support stand and an upright tube;
a rod slidably extending through said tube;
a pair of cymbals, the upper one mounted on said rod, and the lower one mounted on said tube;
a cam axle pivotably mounted on and extending horizontally across said stand below said tube and rod;
a lobe cam fixed to said cam axle with its cam surface engaging the lower end of said rod, the lobe part of said cam surface when engaging said rod raising said upper cymbal apart from said lower cymbal, and the regular part of said cam surface on each side of said lobe part when engaging said rod dropping said upper cymbal against said lower cymbal;
a foot pedal pivotably mounted on said stand with its free end above its pivoted end and disposed below said cam and cam axle;
a flexible strap having one end connected to and partially



wrapped around said cam axle, and having its other end connected to said free end of said pedal;
a lever arm mounted on and extending out from said cam axle;
a spring attached to said stand and to the extended end of said lever arm, resiliently urging said free end of said pedal to an undepressed upper position wherein said regular part of said cam surface on one side of said lobe part places the cymbals in closed position, whereby when said free end of said pedal is partially depressed said lobe part of said cam surface places the cymbals in open position, and when said free end of said pedal is fully depressed said regular part of said cam surface on the other side of said lobe part places the cymbals in closed position.

4,817,491
APPARATUS FOR A FIREARM AMMUNITION HAND LOADER
Arthur Fenton, Box 47, Meteghan, Nova Scotia, Canada B0W 2J0
Filed Jul. 28, 1988, Ser. No. 225,714
Int. Cl.[4] F42B *31/02, 33/02. 11/03*
U.S. Cl. 86—19 **12 Claims**



1. An apparatus for use by a hand loader of ammunition, for installing gas checks on bullets and for sizing and lubricating bullets, the apparatus comprising:
(a) a frame;
(b) a circular index plate rotatable about an axis passing

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through its center, the plate having associated with it at equally spaced locations about its periphery three bullet receiving slots;

(c) three stations mounted on the frame and each positioned to act simultaneously at a different one of the three slots on the index plate, the stations consisting of:

(i) a bullet feed station where bullets, to have gas checks applied and to be sized and lubricated, are supplied to the index plate,

(ii) a check station where gas checks to be secured to the bullets, are supplied to the index plate and,

(iii) a size and lubrication station where bullets, with gas checks securely seated thereon, are sized and lubricated;

(d) movable index ratchet means mechanically associated with the index plate which, upon movement, rotates the index plate progressively to align each of the slots with a different one of each of the stations;

(e) handle means associated with the index ratchet means to cause movement of the index ratchet means and to cause the index plate to move so that its slots are in aligned positions with the stations;

(f) a bullet feed means associated with the bullet feed station to supply individually to an aligned slot at the bullet check station a bullet from a bullet supply reservoir;

(g) a gas check supply and seating mechanism associated with the gas check station to supply individually and in predetermined orientation a gas check from a gas check reservoir to one of the aligned slots in the index plate, and to seat a gas check on the base of the bullet, a slot being provided at the gas check station to receive the gas check from the check supply means, and hold that gas check and a bullet for seating of the gas check on the bullet;

(h) a size mechanism comprising a sizing die;

(i) a lubricating mechanism for feeding lubricant from a lubricant reservoir to the sizing die, both the sizing mechanism and the lubricating mechanism associated with the size and lubricating station, a slot in the die for receiving a bullet with a gas check mounted thereon;

(j) bullet guide means cooperating with the index plate to direct bullets being worked on on the index plate from one station to the next;

(k) ejection means associated with the check station and the size and lubrication station to cause bullets in the slots associated with each of those stations to be ejected from those slots when that station's work on the bullet has been completed; and

(l) interacting mechanical means, operable by movement of the handle means, to cause movement of the index ratchet means to rotate the index plate so that its slots are properly aligned with each of these stations and to operate the ejection means and perform the necessary work on the bullet at the gas check station and size and lubrication station,

whereby a bullet from the bullet reservoir is progressively, in sequence, fed to the index plate, passed to the gas check station where a gas check is securely seated on it, passed to the size and lubrication station where it is sized and lubricated, and then ejected from the index plate.

4,817,492

DEVICE FOR GENERATING TRANSVERSE FORCE ON BALLISTIC MISSILE MOCK-UPS DURING AIR TESTS

Pierre Dequenes, and Jean C. Franceschi, both of Toulon, France, assignors to Constructions Navales et Industrielle de la Mediterranee, La Seyne Sur Mer, France

Filed Dec. 30, 1986, Ser. No. 947,643
Claims priority, application France, Jan. 13, 1986, 86 00362
Int. Cl.[4] F41F *3/04*
U.S. Cl. 89—1.8 **7 Claims**

1. A device for generating transverse force on a ballistic missile mock-up for air tests by means of of an installation including a mock-up launching tube adapted to slant at an angle and a recovery mock-up gantry comprising:

(a) a support structure for said mock-up pivotally mounted to a recovery mock-up gantry so as to permit said structure to slant at substantially the same angle as said mock-up launching tube;

(b) a carrier provided with a guide along said support structure, said carrier supporting a mobile jack having a stem for adjusting transverse force applied on one end of said stem which is transmitted to said mock-up via another end of said stem;



(c) an adjustable assembly of loads for imparting a desired transverse force to said mock-up, said loads being fixed at an and of a cable wound on an electric winch mounted at an upper end of said support structure, said cable running on return pulleys fixed to said carrier, wherein at least one of said pulleys is mounted on said stem end of said jack transmitting said transverse force; and

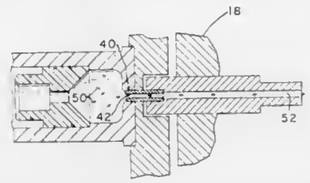
(d) an adjustable cam system mounted on said support structure and cooperating with a roller provided on said jack for displacing said jack by varying said transverse force by an automatic modification of counter-pressure in said jack.

4,817,493

WEAR-INDICATING PIERCER PIN FOR EXPLOSIVELY-OPERATED TOOLS

Kazuhiro Goto, Markham, Canada, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 4, 1988, Ser. No. 164,709
Int. Cl.[4] F41F *13/00;* **F41C** *27/00;* **F41D** *11/04, 11/16*
U.S. Cl. 89—1.14 **1 Claim**



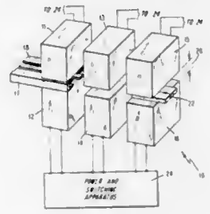
1. A wear indicating piercer pin for explosively operated industrial tools of the type employing a cartridge containing a powder charge remote from a base thereof and wherein the cartridge base is penetrated by the piercer pin to permit escape of gases subsequent to detonating the powder charge and upon slight withdrawal of the pin, said piercer pin comprising an elongated body with a rear face, a leading tip end and n passage extending from said rear face into said body to a predetermined location rearwardly from said leading tip end so that upon said leading tip end wearing down, said passage will be exposed.

4,817,494

MAGNETIC RECONNECTION LAUNCHER

Maynard Cowan, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 6, 1987, Ser. No. 34,354
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **20 Claims**



1. An electromagnetic launcher comprising:

at least two coils for receiving electric current and storing magnetic energy, at least one end of each coil being in opposition to an end of another coil, said opposing ends being separated by a gap;

a projectile, at least of portion of said projectile defining an electrically conductive gap portion arranged for movement through the gap, said gap portion permitting substantially unrestricted distribution of eddy current densities therein, said projectile being moved by the magnetic energy store by said coils in a direction transverse to the axes of said coils; and

electric power means for abruptly supplying electric power to said coils; and

sensor means, responsive to the position of said projectile, for controlling said power means to prevent power from being supplied to said coils until said gap portion of said projectile substantially occupies the gap between said coils, and to supply power only when said gap portion of said projectile substantially occupies the gap between said coils;

wherein the reconnecting magnetic field lines across the gap push said projectile from the gap between said coils.

4,817,495

DEFENSE SYSTEM FOR DISCRIMINATING BETWEEN OBJECTS IN SPACE

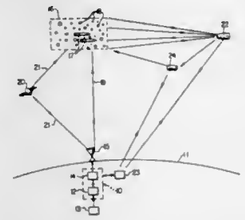
Adam T. Drobot, Annandale, Va., assignor to APTI, Inc., Los Angeles, Calif.

Filed Jul. 7, 1986, Ser. No. 883,223
Int. Cl.[4] G01N *23/00;* **H05C** *3/00*
U.S. Cl. 89—1.11 **14 Claims**

1. A method of discriminating between armed, reentry vehicles and unarmed objects in space, said method comprising:

transmitting electromagnetic radiation from the surface of the earth to the vicinity of the vehicles and objects to accelerate electrons present in space to create a cloud of relativistic electrons around said re-entry vehicles and said objects;

interacting said relativistic electrons with said reentry vehicles and said objects to thereby produce individual signature signals representative of said individual re-entry vehicles and said objects; and



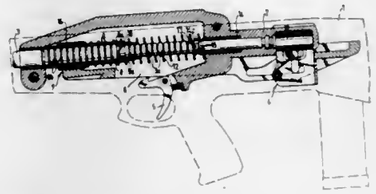
detecting said signature signals for discriminating between said re-entry vehicles and said objects.

4,817,496

FIREARM

Ulrich Zedrosser, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Dec. 17, 1987, Ser. No. 134,173
Claims priority, application Austria, Dec. 19, 1986, 3389/86
Int. Cl.[4] F41D *5/04*
U.S. Cl. 89—191.02 **7 Claims**



1. A firearm comprising

a housing,

a barrel disposed in said housing, said barrel including a barrel bore, a main body portion having a first outer diameter, and a collar having a second outer diameter, said second outer diameter larger than said first outer diameter, said collar being integral with said barrel,

a stop fixed to said barrel,

said collar being axially spaced at a fixed distance from said stop,

an actuating mechanism,

a gas drive comprising stationary pneumatic piston means comprising said collar and said main body portion of said barrel, and a movable pneumatic cylinder for receiving said piston means,

said pneumatic cylinder comprising a sliding sleeve which is displaceable along said barrel and along said collar into engagement with said stop,

said sleeve including a first portion dimensioned to be in sliding engagement with said main body portion of said barrel and a second portion dimensioned to be in sliding engagement with said collar,

said sleeve and said barrel defining a cylinder chamber between said collar and said first portion of said sleeve,

said barrel including a transverse bore connecting said barrel bore with said cylinder chamber to permit powder gases formed in said barrel bore by the discharge of each round to enter said cylinder chamber and to displace said sleeve along said barrel against said stop,

said collar including annular grooves on its outside surface which comes into sliding engagement with said sleeve,

said barrel also including annular grooves on its outside

surface in sliding engagement with said sleeve between said collar and said stop,
means for operatively connecting said sleeve with said actuating mechanism, and
a return spring for urging said sleeve away from said stop.

4,817,497

MULTIPLE-CIRCUIT VALVE APPARATUS

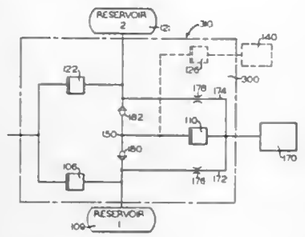
Gunter Seegers, Barsinghausen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 773,898

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434884

Int. Cl.[4] F15B *13/04*

U.S. Cl. 21—29 **12 Claims**



1. A multiple-circuit valve apparatus to control a fluid pressure responsive multiple-circuit system on a motor vehicle having a parking brake valve, said multiple-circuit valve apparatus comprising:
(a) a housing;
(b) a first fluid pressure communication passageway formed in said housing and having one end thereof connectable to a source of operating fluid pressure;
(c) a first overflow valve positioned within said housing and having an inflow port connected to receive such operating fluid from said first passageway, said first overflow valve having a first minimum predetermined pressure required on the inflow side to initially open thereby communicating fluid therethrough and a first predetermined closing pressure on the outflow side thereby preventing reverse fluid communication therethrough after closing of said first overflow valve, said first predetermined closing pressure being less than said first minimum initial opening predetermined pressure;
(d) a second fluid pressure communication passageway formed in said housing and connected at one end thereof to an outflow port of said first overflow valve and connectable at the other end thereof to an operating service circuit and to a parking brake circuit on such motor vehicle to respectively communicate such operating fluid from said first overflow valve to such operating service brake circuit and such parking brake circuit;
(e) a second overflow valve positioned within said housing and having an inflow port connected to receive such operating fluid from said second passageway, said second overflow valve having a second minimum predetermined pressure required on the inflow side to initially open thereby communicating fluid therethrough and a second predetermined closing pressure on the outflow side thereby preventing reverse fluid communication therethrough after closing of said second overflow valve, said second predetermined closing pressure being less than said first and said second minimum initial opening pressure;
(f) a third fluid pressure communication passageway formed in said housing and connected at one end thereof to an outflow port of said second overflow valve and having the other end thereof connectable to such parking brake circuit on such motor vehicle to communicate such operating fluid from said second overflow valve to such parking brake circuit;
(g) a bidirectional flow communication means formed in said housing and connected at one end thereof to said third passageway and connected at the other end thereof to one of said first and said second passageways for communicating fluid between said third passageway and said one of said first and said second passageways, said bidirectional flow communication means being restricted to limit such bidirectional flow to a predetermined level and to gradually reduce pressure in such parking brake circuit sufficient to activate such parking brake valve when a defect occurs in such operating service brake circuit; and
(h) a check valve disposed in said second passageway intermediate said outflow port of said first overflow valve and said inflow port of said second overflow valve.

4,817,498

DYNAMIC CHARACTERISTIC COMPENSATING DEVICE FOR ELECTRICAL HYDRAULIC SERVO ACTUATOR

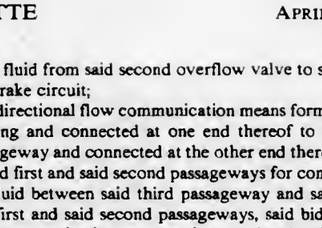
Shigeyuki Takagi, Gifu, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Dec. 7, 1987, Ser. No. 129,206

Claims priority, application Japan, Dec. 6, 1986, 61-289978; Sep. 7, 1987, 62-222146

Int. Cl.[4] F15B *13/16*

U.S. Cl. 91—361 **18 Claims**



1. A dynamic characteristic compensating device for an electrical hydraulic servo actuator of the type having a main piston with first and second chambers on respective sides thereof and an electrical hydraulic servo valve for controlling the pressure in said first and second chambers in accordance with a control signal received at a control input side, said device comprising:
a differential pressure detecting member mechanically independent of said main piston;
means for displacing said member in accordance with a difference in pressure between said first and second chambers;
speed detecting means for generating an electrical signal representing the speed of movement of said member; and
feedback means for feeding said electrical signal back to said control input side of said valve as a feedback signal for cooperating with said control signal to control said servo valve.

4,817,499

TRACTOR HITCH CONTROL SYSTEM

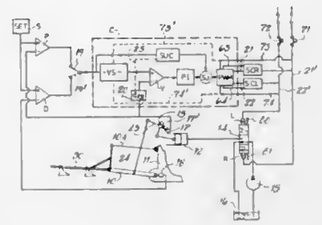
Regis Bellanger, Rimbard, France, and William J. Graaskamp, Guelph, Canada, assignors to Massey-Ferguson Services N.V., Curacao, Australia

Filed Jun. 10, 1987, Ser. No. 60,294

Claims priority, application United Kingdom, Jun. 14, 1986, 8614522; Jun. 14, 1986, 861523

Int. Cl.[4] F15B *13/16*

U.S. Cl. 91—361 **12 Claims**



1. A tractor hitch control system for the control of the position of an implement hitch relative to a tractor using an actuator connected between the hitch and tractor, the system comprising:
main control means operable by a tractor operator from his normal operator's location on the tractor for the setting of a desired value of an operating parameter of the tractor and/or hitch,
sensing means for sensing the actual value of the operating parameter,
comparator means for comparing the desired and actual values of the operating parameter to provide an error signal,
processing means for processing the error signal to provide an actuating signal to control the actuator thereby moving the hitch so as to tend to reduce the error signal to zero,
and secondary control means positioned at a location remote from the normal operator's location to allow the operator to initiate a signal to adjust the position of the hitch when at said remote location,
the system being characterized in that any signal from the secondary control means is opposed by a smaller hitch positioning signal generated within the control system so that the speed of movement of the hitch in response to signals from the secondary control means is moderated.

4,817,500

BRAKING ASSISTANCE VACUUM SERVOMOTOR AND PROCESS FOR ADJUSTING SUCH A SERVOMOTOR

Jean-Pierre Gautier, Aulnay-sous-Bois, France, assignor to Bendix France, Drancy, France

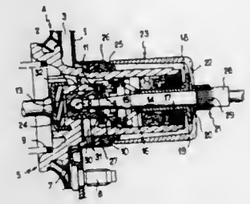
Filed May 18, 1988, Ser. No. 198,711

Claims priority, application France, Oct. 22, 1985, 8515678

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—376 R **8 Claims**

1. A braking assistance vacuum servomotor, comprising a casing divided internally into a vacuum chamber and a working chamber by a piston structure biased by a piston spring toward a rear portion of the casing and which comprises a hub enclosing distribution valve means which comprises a first valve seat, formed by the hub, a second valve seat coaxial with said first valve seat and formed by an end of a valve plunger which slides in the hub and which is connected to an actuating rod of said servomotor, and a valve member mounted in said hub and biased axially by a valve spring toward said first and second valve seats so as to cooperate with the seats, and a rod return spring coaxial with said rod and arranged between said hub and a tubular stop member mounted slideably on said rod and which comprises, remote from said rod return spring, first and second bearing surfaces which cooperate with a first stop on said rod and a second reference stop, respectively, characterized in that said first stop comprises a separate ring member mounted on and fixed firmly and permanently to the rod in a predetermined position, the ring member fixed firmly and permanently by deformation of said ring member after the ring member has been placed in abutment with said first bearing surface by means of axial movement of the ring member along



said actuating rod while a predetermined pulling force is applied to said rod so as to position said second valve seat in full contact with a front face of the valve member without disengaging the valve member from said first valve seat, and the tubular stop member including a plurality of radially extending, angularly spaced-apart ribs which comprise, centrally, the first bearing surface and, peripherally, the second bearing surface which engages the second reference stop, the plurality of ribs permitting air flow therebetween.

4,817,501

MULTIPLE-CIRCUIT VALVE APPARATUS

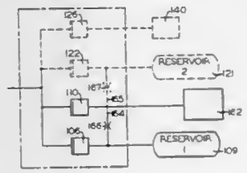
Gunter Seegers, Barsinghausen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 773,898, Sep. 9, 1985. This application Oct. 19, 1987, Ser. No. 109,871

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434884

Int. Cl.[4] F15B *11/08, 13/04*

U.S. Cl. 91—446 **10 Claims**



1. A multiple-circuit valve apparatus to control a fluid pressure responsive multiple-circuit system on a motor vehicle having a parking brake valve, said multiple-circuit valve apparatus comprising:
(a) a housing;
b) a first fluid pressure communication passageway formed in said housing and having one end thereof connectable to a source of operating fluid pressure;
(c) a first overflow valve positioned within said housing and having an inflow port connected to receive such operating fluid from said first passageway, said first overflow valve having a first minimum predetermined pressure required on the inflow side to initially open thereby communicating fluid therethrough and a first predetermined closing pressure on the outflow side thereby preventing reverse fluid communication therethrough after closing of said first overflow valve said first predetermined closing pressure

being less than said first minimum initial opening predetermined pressure;

(d) a second fluid pressure communication passageway formed in said housing and connected at one end thereof to an outflow port of said first overflow valve and having the other end thereof connectable to an operating service brake circuit on such motor vehicle to communicate such operating fluid from said first overflow valve to such operating service brake circuit;

(e) a second overflow valve positioned within said housing and having an inflow port connected to receive such operating fluid from said first passageway, said second overflow valve having a second minimum predetermined pressure required on the inflow side to initially open thereby communicating fluid therethrough and a second predetermined closing pressure on the outflow side thereby preventing reverse fluid communication therethrough after closing of said second overflow valve, said second predetermined closing pressure being less than said first and said second minimum initial opening pressure;

(f) a third fluid pressure communication passageway formed in said housing and connected at one end thereof to an outflow port of said second overflow valve and having the other end thereof connectable to such parking brake circuit on such motor vehicle to communicate such operating fluid from said second overflow valve to such parking brake circuit; and

(g) a first bidirectional flow communication means formed in said housing and connected at one end thereof to said third passageway and connected at the other end thereof to said second passageway for communicating fluid between said third passageway and said second passageway, said first bidirectional flow communication means being restricted to limit such bidirectional flow to a predetermined level and to gradually reduce pressure in such parking brake circuit sufficient to activate such parking brake valve when a defect occurs in such operating service brake circuit.

4,817,502

MULTIPLE-CIRCUIT VALVE APPARATUS

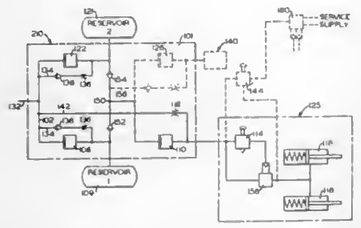
Gunter Seegers, Barsinghausen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 773,898, Sep. 9, 1985. This application Nov. 27, 1987, Ser. No. 109,978

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434884

Int. Cl.[4] F15B *11/08, 13/04*

U.S. Cl. 91—446 **14 Claims**



1. A multiple-circuit valve apparatus to control a fluid pressure responsive multiple-circuit system on a motor vehicle having a parking brake valve, said multiple-circuit valve apparatus comprising:

(a) a housing;

(b) a first fluid pressure communication passageway formed in said housing and having one end thereof connectable to a source of operating fluid pressure;

(c) a first overflow valve positioned within said housing and having an inflow port connected to receive such operating fluid from said first passageway, said first overflow valve having a first minimum predetermined pressure required on the inflow side to initially open thereby communicating fluid therethrough and a first predetermined closing pressure on the outflow side thereby preventing reverse fluid communication therethrough after closing of said first overflow valve, said first predetermined closing pressure being less than said first minimum initial opening predetermined pressure;

(d) a second fluid pressure communication passageway formed in said housing and connected at one end thereof to an outflow port of said first overflow valve and connectable at the other end thereof to an operating service brake circuit on such motor vehicle and connected at such other end thereof to an inflow port of a second overflow valve to respectively communicate such operating fluid from said first overflow valve to such operating service brake circuit and to such second overflow valve;

(e) said second overflow valve being positioned within said housing and having a second minimum predetermined pressure required on the inflow side to initially open thereby communicating fluid therethrough and a second predetermined closing pressure on the outflow side thereby preventing reverse fluid communication therethrough after closing of said second overflow valve, said second predetermined closing pressure being less than said first and said second minimum initial opening pressure;

(f) a third fluid pressure communication passageway formed in said housing and connected at one end thereof to an outflow port of said second overflow valve and having the other end thereof connectable to a parking brake circuit on such motor vehicle to communicate such operating fluid from said second overflow valve to such parking brake circuit;

(g) a bidirectional flow communication means formed in said housing and connected at one end thereof to said third passageway and connected at the other end thereof to said first passageway for communicating fluid between said third passageway and said first passageway, said bidirectional flow communication means being restricted to limit such bidirectional flow to a predetermined level and to gradually reduce pressure in such parking brake circuit sufficient to activate such parking brake valve when a defect occurs in such operating service brake circuit;

(h) a first unidirectional flow communication means formed in said housing and connected at one end thereof to said first passageway and connected at the other end thereof to said second passageway for communicating predetermined amount of fluid from said first passageway to said second passageway in bypass relationship of said first overflow valve thereby reducing said first minimum initial opening predetermined pressure of said first overflow valve; and

(i) a first check valve disposed in said second passageway intermediate said outflow port of said first overflow valve and said inflow port of said second overflow valve.

4,817,503

DIAPHRAGM PUMP WITH PRESSURE CHAMBER HAVING A RIBBED WALL

Kazumasa Yamada, Tokyo, Japan, assignor to Yamada Yuki Seizo Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,445

Claims priority, application Japan, Sep. 22, 1987, 62-237960

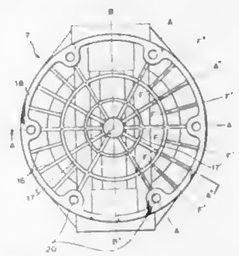
Int. Cl.[4] F04B *43/06*

U.S. Cl. 92—98 R **1 Claim**

1. A pressure chamber of a diaphragm pump which is provided therein with a diaphragm, said pressure chamber comprising:

a wall forming part of said pressure chamber with said wall having ribs thereon including an outer ring rib;

an inner ring rib circumferentially extending at the inner side of said outer ring rib; and



a radial rib extending so as to connect together said outer and inner ring ribs in the radial direction, the circumferential wall thickness of said radial rib being substantially smaller than the radial wall thickness of said outer ring rib.

4,817,504

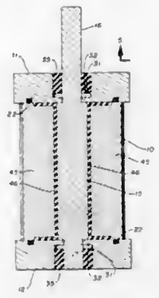
OSCILLATORY ACTUATOR WITH DIRECT CONTACT SHAFT-SHOULDER TO END CAP SEAL

Walter G. Lieberman, Minneapolis, Minn., assignor to Tol-O-Matic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 632,719, Jul. 20, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,161

Int. Cl.[4] F01C *9/00*

U.S. Cl. 92—125 **18 Claims**



1. A rotary actuator comprising:

a housing having a generally cylindrical opening formed therein, said opening being defined on its sides by an inner cylindrical surface and on its ends by a pair of spaced, generally parallel end surfaces, each of said end surfaces extending inwardly from said inner cylindrical surface to a center opening and each of said end surfaces being continuous such that each of said end surfaces lies in a single plane generally perpendicular to said inner cylindrical surface;

a centrally disposed shaft extending through said cylindrical opening, said shaft having a central portion comprising a pair of ends and being disposed within said cylindrical opening and between said end surfaces, said shaft further having a pair of end portions extending outwardly from the ends of said central portion along the longitudinal axis of said shaft and through said center openings, the ends of said central portion having a diameter greater than the diameter of said end portions and greater than the diameter of said center openings and said end portions having a diameter less than the diameter of said center opening, said shaft further including a pair of shoulder portions joining the ends of said central portion and said end portions, each of said shoulder portions comprising a generally annular sealing surface being disposed generally perpendicular to the longitudinal axis of said shaft and having an outer edge defined by intersection with a repsective end of said central portion for direct sealing engagement with a portion of said end surfaces;

at lesast one stator vane member connected with said inner cylindrical surface and having first seal means for sealing engagement with said end surfaces and said central portion of said shaft;

at least one rotor vane member connected with said central portion of said shaft and having a second seal means for sealing engagement with said end surfaces and said inner cylindrical surface, said second seal member extending along the periphery of said rotor vane member and terminating at the outer edge of said annular sealing surface;

an actuation chamber defined between each of said stator and rotor vane members;

means for introducing pressurized fluid into and exhausting pressurized fluid from said actuation chambers; and

a pair of end caps each embodying one of said end surfaces and center openings wherein each of said end surfaces includes an inner end sealing portion adjacent to, and extending radially outwardly from, its respective center opening and adapted for limited deflection as a result of direct sealing engagement by said annular sealing surface, each of said end caps further including a bore portion lying on an axis common with the axis of said center openings, said bore portin being longitudinally adjacent to said inner end sealing portion and having a diameter greater than the diameter of the ends of said central portion of said shaft to thereby permit the limited deflection of said inner end sealing portion.

4,817,505

PISTON WITH STIFFENING STRUCTURE FOR LOWER SKIRT REGIONS

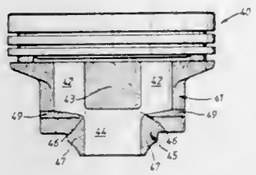
Michael L. P. Rhodes, Rugby, England, assignor to AE PLC, Rugby, England

Filed Jun. 19, 1987, Ser. No. 64,002

Claims priority, application United Kingdom, Jun. 27, 1986, 8615808

Int. Cl.[4] F16J *1/04, 1/08*

U.S. Cl. 92—237 **11 Claims**

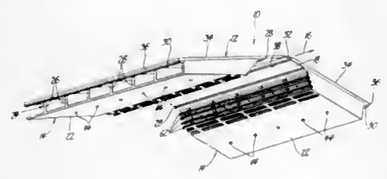


1. A piston comprising a crown portion including piston ring grooves and a skirt portion, said skirt portion being divided into an upper skirt region and a lower skirt region wherein on each side of the plane including the piston axis and the gudgeon pin axis said upper skirt region includes at least one bearing surface and said lower skirt region comprises a bearing surface, each bearing surface of said lower skirt region being supported by two substantially planar skirt wall sections lying in planes forming an acute angle of less than 75° with said plane which includes the piston axis and gudgeon pin axis, the maximum bearing contact arc of said lower skirt bearing surface lying between 10° and 22.5° either side of the plane which is normal to the gudgeon pin axis and which includes the piston axis, and wherein substantial parts of the axially lower extremity of said upper skirt region and the axially upper extremity of

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said lower skirt region are bounded by wall portions extending generally transversely to the piston axis.

4,817,506
ROOF VENT
John J. Cashman, Royal Oak, Mich., assignor to Ridgeline Corporation, Rochester, Mich.
Filed Feb. 18, 1988, Ser. No. 157,376
Int. Cl.[4] F24F *7/02*
U.S. Cl. 98—42.21 **45 Claims**

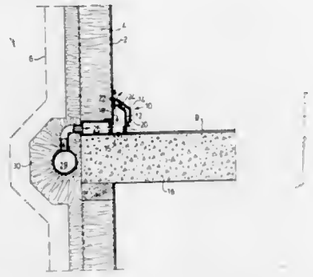


1. A ventilator (10) of the type for disposition along a roof ridge for venting the internal atmosphere in the an enclosure, said ventilator (10) comprising: a sheet-like cover means (12) having a cross section extending continuously along a longitudinal axis (16) thereof, said cover means (12) having a lower surface (18) for presentation toward the roof ridge; baffle means (14) having a predetermined cross sectional shape and extending along said longitudinal axis (16) on said lower surface (18) of said cover means (12) for allowing the passage of fluid laterally therethrough, said baffle means (14) including a sheet-like wall member (22) spaced from said lower surface (18) of said cover means (12) a predetermined distance and extending continuously along said longitudinal axis (16); said ventilator (10) characterized by said baffle means (14) including support means (24) for rigidly and unyieldingly supporting said wall (22) in said predetermined spaced distance from said lower surface (18) to prevent collapse and warpage of said wall (22) during adverse conditions, said support means (24) including a plurality of longitudinally spaced parallel partitions (26) extending in a plane perpendicular to said longitudinal axis (16) and said lower surface (18) and said wall (22), each of said partitions (26) having a periphery completely conforming to said cross sectional shape of said baffle means (14).

4,817,507
AIR SUPPLY DEVICE
Tommy Kedbrant, Guldsmedsvägen 12, S-818 00 Valbo, Sweden, assignor to Tommy Kedbrant, Valbo; Bo Söderström and Bengt-Ake Gerhartz, both of Gavle, all of, Sweden
PCT No. PCT/SE86/00520, § 371 Date Jul. 31, 1987, § 102(e) Date Jul. 31, 1987, PCT Pub. No. WO87/03071, PCT Pub. Date May 21, 1987
PCT Filed Nov. 13, 1986, Ser. No. 93,545
Claims priority, application Sweden, Nov. 13, 1985, 8505368
Int. Cl.[4] F24F *13/06*
U.S. Cl. 98—40.03 **4 Claims**

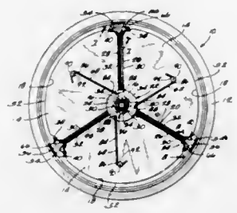
1. An air supply means for a device for conditioning air of rooms, comprising:

a double walled air blower means which extends along at least one outer wall of the room and forms a base inside the room for the lower portion of said room wall, said blower means comprising an inner wall mounted at a distance from an inner side of said wall of the room to delimit, together with said lower portion of the wall of the room and a floor of the room, a longitudinal duct extending along the room wall, an outer wall at a distance from said inner wall of the blower means to define a space between said inner and outer walls separated from said longitudinal duct, and at least one exhaust opening in the upper portion of said inner wall of the blower means and communicating with said space, said space having an inlet at a lower portion thereof and an exhaust opening at an upper portion of said outer wall of the blower means to produce co-ejection of room air through said space when exhausting air from said longitudinal duct through said exhaust openings; and



a pressure box for equalizing the pressure and eliminating turbulence in the air flow to said longitudinal duct, said pressure box being mounted below the room wall to support said wall and connected between an air conditioning device and an inlet of said longitudinal duct.

4,817,508
OPPOSED BLADE BALANCED DAMPER
Kenneth Prochnow, Madison, Wis., assignor to Carnes Company, Inc., Verona, Wis.
Filed Nov. 5, 1987, Ser. No. 117,486
Int. Cl.[4] F24F *13/10*
U.S. Cl. 98—41.1 **14 Claims**



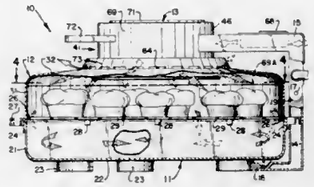
1. An opposed blade balanced damper for controlling gas flow in a duct of substantially circular cross section, said balanced damper comprising:

a plurality of substantially identical, substantially plan sector-shaped damper blades each including an apex end and an outer end opposite said apex end;

means for supporting said damper blades within the duct movement between a fully closed position, wherein said damper blades are substantially coplanar with one another and substantially oppose gas flow through the duct, and a fully open position, wherein each damper blade is positioned so that said outer end is upstream and said apex end is downstream relative to gas flow through the duct so that gas flow through the duct is not substantially opposed; and

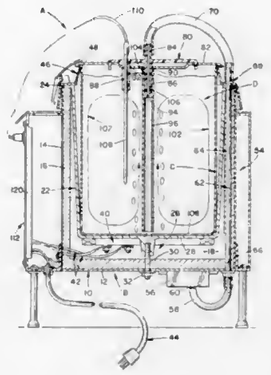
user actuable control means centrally disposed relative to said damper blades and accessible from a downstream position relative to the direction of gas flow through the duct for moving said damper blades to, and retaining said damper blades in, selected positions between and including said fully closed and fully opened positions.

4,817,509
AIR FRYER
Chad S. Erickson, Plymouth, Minn., assignor to Alternative Pioneering Systems Inc., Minneapolis, Minn.
Filed Feb. 17, 1987, Ser. No. 14,997
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—330 **12 Claims**



1. An air fryer comprising an upper member and a lower member, said members defining an enclosure having a circular horizontal cross section and an ovular vertical cross section, said lower member having disposed therein a rack for supporting food pieces to be cooked, said upper member having defined therein a central opening, said fryer further including a blower disposed in said upper member central opening, said blower being adapted to move a heated air current in said enclosure at a rapid velocity, means for heating said air current to a temperature in the range of 150 to 450 degrees F. whereby food pieces disposed on said rack are rapidly cooked, said blower and said heating means comprising a unit mounted in said opening, said unit being easily removed without disassembly of said unit for cleaning said upper and lower members.

4,817,510
COOKING APPARATUS FOR FLUID CONTAINER
Raymond P. Kowalics, Solon; Kenneth C. Sidoti, Maple Heights, and Richard L. Beery, Shreve, all of Ohio, assignors to The Meyer Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 849,780, Apr. 9, 1986, abandoned. This application Jul. 22, 1986, Ser. No. 888,849
Int. Cl.[4] A47J *27/62*
U.S. Cl. 99—331 **14 Claims**



1. A cooking apparatus for cooking soup comprising:

means for defining a selected boiling temperature of the soup;

means for generating a boiling signal representative of the selected boiling temperature;

means for defining a selected simmer temperature of the soup;

means for generating a simmer signal representative of the selected simmer temperature;

means for monitoring a temperature of the soup;

means for generating a temperature signal representative of the monitored soup temperature;

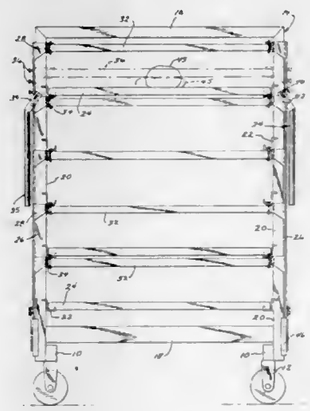
a timer means for generating a timing signal indicative of the tolling of a preselected simmer time period;

means for generating a control signal in accordance with the boiling signal, the simmer signal and the temperature signal;

means for selectively controlling application of heat to the soup in accordance with the control signal; and

means for terminating the simmer period in accordance with the timing signal.

4,817,511
FOOD PRODUCT PRESS
Min N. Huang; Steven R. Lary, and Claude L. McFarlane, all of Madison, Wis., assignors to DEC International Inc., Madison, Wis.
Filed Oct. 1, 1987, Ser. No. 103,509
Int. Cl.[4] B30B *15/10*
U.S. Cl. 99—349 **8 Claims**



1. In a food product press having a rigid supporting framework adapted to be supported from below including oppositely disposed vertical side supports, vertically spaced horizontal product shelves attached to and extending between the side supports, and vertically spaced horizontal press shelves disposed between the product shelves and movable vertically with respect to the side supports and product shelves to compress food products between adjacent product and press shelves, an improved apparatus for effecting and maintaining product compression comprising:

(a) unitary slide plates movably attached to opposite vertical side supports and reciprocable vertically with respect thereto;

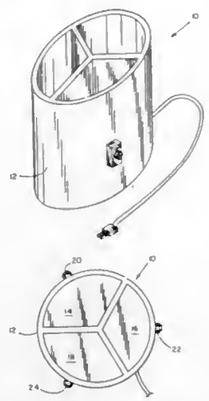
(b) press shelf support means on the slide plates for holding each press shelf by its opposite edges such that the press shelves move vertically in unison with the slide plates;

(c) compression means operatively interconnecting the side supports and slide plates for establishing a selectively variable uniform spacing between adjacent product and press shelves and initial compression of the food products; and

(d) locking means for maintaining the spacing between adjacent product and press shelves established by said compression means.

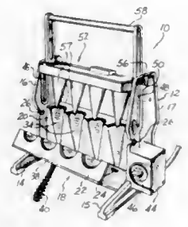
VOL 1101 ISS 1 AP 4 1989 UMI

4,817,512
COOKING UTENSIL
Sandra K. Vaagen, R.R. 1, Box 116, Ellendale, Minn. 56026
Filed Nov. 17, 1986, Ser. No. 931,052
Int. Cl.[4] A47J *27/12, 27/122*
U.S. Cl. 99—367 **1 Claim**



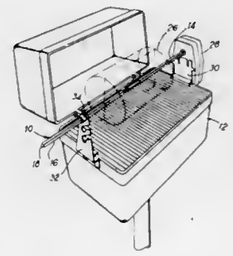
1. A cooking utensil for deep frying foods, comprising:
a. upstanding housing means, said housing means having a substantially cylindrical shape;
b. a plurality of fluid tight compartment means retained within and integrally formed from said housing means, each of said fluid tight compartment means serving to hold a quantity of food to be cooked, each of said plurality of fluid tight compartment means retaining in independent supply of cooking oil;
c. a plurality of switch means, each of said switch means controlling a supply of cooking heat to one of said plurality of fluid tight compartment means.

4,817,513
CONE BAKER
Donald A. Carbon, 105 Days Ave., Buchanan, Mich. 49107, and Frederick S. Carbon, deceased, late of Buchanan, Mich. (by Donald A. Carbon, executor)
Filed Oct. 5, 1987, Ser. No. 104,431
Int. Cl.[4] A47J *37/00*
U.S. Cl. 99—383 **8 Claims**



1. A baker for a food receptacle, said food receptacle being formed from flowable batter, said baker comprising a frame, said frame including a mold which defines a mold cavity having a wall and two spaced upright frame parts, said cavity wall closely approximating the exterior configuration of said food receptacle, and a core which closely approximates the interior configuration of said food receptacle, said core fittable into said mold cavity, and heating means positioned in one of said mold and core for cooking said batter to produce said food item, said core swingably connected to said frame between an up position spaced from said mold wherein said batter may be introduced into said mold cavity and a down position within said mold cavity, said frame including base legs connected to spaced upright frame parts, each frame part having an elongated vertical opening therethrough, said core including a mounting plate, said mounting plate including a pin vertically slidable in each opening, said pins in said openings constituting means for sliding said core between its said up and down positions said pins being positioned on said mounting plate in a direction perpendicular to the movement of said core.

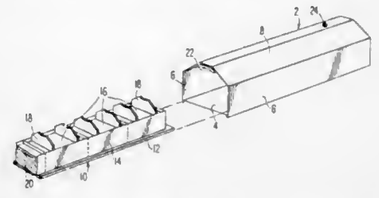
4,817,514
MODULAR ROTISSERIE ROD ASSEMBLY
Robert J. Hitch, and Mason P. Holland, both of Columbus, Ga., assignors to W. C. Bradley Company, Columbus, Ga.
Filed Jan. 5, 1987, Ser. No. 455
Int. Cl.[4] A47J *37/04*
U.S. Cl. 99—419 **8 Claims**



1. A modular rotisserie rod assembly for suspending food over a bed of coals in a barbecue grill or the like comprising right and left rod members each having a threaded end, said threaded end being of a reduced dimension relative to said rod members and including a shoulder portion adjacent said threaded ends, a collar means having a passageway therethrough, said passageway being threaded for threadedly receiving said threaded ends and connecting said rod members, an adjustment means having a threaded passageway therethrough and disposed adjacent said collar means on one of said threaded ends for locking said collar means in a selected position with said collar means abutting one of said shoulder portions for preventing unthreading of said assembly during operation of the rotisserie.

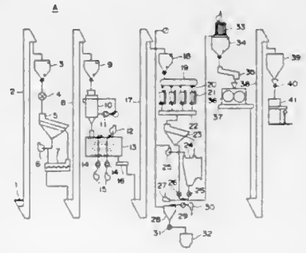
4,817,515
CHEESE PRESS
Poul Bjerre, Ballevej 2, Silkeborg; Per Busk, Skön Valborgsvej 2, Vejle; Knud Gasbjerg, Grundtvigsvej 8, and Curt Meinild, Färgevej, both of Silkeborg, all of Denmark
Continuation of Ser. No. 413,337, Aug. 16, 1982, abandoned. This application Jan. 24, 1986, Ser. No. 822,257
Int. Cl.[4] A01J *25/00, 25/12;* **A23C** *19/00*
U.S. Cl. 99—454 **19 Claims**

1. A cheese press comprising at least one pressing unit for receiving cheese moulds, said at least one pressing unit comprising an elongate and continuous tube-like housing including a bottom portion for supporting cheese moulds, longitudinal side wall portions and a roof portions, the longitudinal side wall portions and roof portion of the housing being formed as an integral structure engaged with said bottom portion along the longitudinal edges thereof, said housing being adapted to permit introduction of cheese moulds through an end thereof, pressure exerting means located within said housing adjacent said roof portion and actuatable from outside said housing to exert pressure towards said bottom portion, wherein the pressure exerting means comprises an inflatable hose mounted lengthwise in said housing, and whereby a cheese mould can be



introduced into said housing and pressed between said pressure exerting means and said bottom portion of said housing.

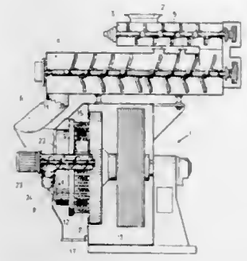
4,817,516
APPARATUS FOR MANUFACTURING A FOODSTUFF SUITABLE FOR SOYBEAN MILK PRODUCTION
Shigeru Chikarashi, Sapporo, Japan, assignor to Nichii Co., Ltd., Osaka, Japan
Filed Oct. 9, 1987, Ser. No. 107,510
Int. Cl.[4] A23J *1/14*
U.S. Cl. 99—483 **3 Claims**



1. An apparatus for manufacturing a foodstuff suitable for soybean mild production comprising a separator for separating dust and the like from soybean material, a brushing machine coupled to an output of the separator for receiving the soybean material from the separator and for brushing the soybean material, a band dryer connected to an output of the brushing machine for adjusting a water content of the soybean material, a skin remover connected to an output of the band dryer for removing skin from the soybean material, a classifier connected to an output of the skin remover for separating granular masses from powdery masses of the soybean material, and flat pressing rollers connected to an output of the classifier for receiving granular masses and for pressing the granular masses into flat flakes.

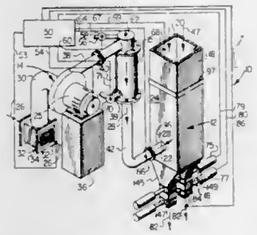
4,817,517
METHOD AND APPARATUS FOR MAKING FOOD PELLETS
Jörg Ammann, Oberuzwil; Hans Peter Schaffner, Niederuzwil, and Ernst Ackermann, Egg, all of Switzerland, assignors to Gebrueder Buehler AG, Uzwil, Switzerland
Continuation of Ser. No. 852,828, Apr. 16, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 186,702
Claims priority, application Switzerland, May 9, 1985, 1962/85
Int. Cl.[4] A23K *1/20*
U.S. Cl. 99—483 **24 Claims**

1. An an arrangement for making food pellets from a raw material, comprising:
die means having holes corresponding toe the outer shape of the pellets to be formed by said die means;
supply means for feeding the raw material into said die means;
pressure exerting means for pressing said raw material through the holes of said die means to form pellet; and



output means for transporting the pellets fromed by the die means from the same, said output means comprising a feedback arrangement for feeding at least part of said pellets back into said die means to be pelleted again, said feeding arrangement having an inlet end and a discharge end.

4,817,518
ANTI-CORING GRAIN TREATMENT SYSTEM
W. Gerald Wyatt, Arlington, Tex., and Jim Bleke, Wolcottville, Ind., assignors to Vapor Energy, Inc., Arlington, Tex.
Filed Aug. 26, 1985, Ser. No. 766,640
Int. Cl.[4] A23K *1/00*
U.S. Cl. 99—516 **10 Claims**



1. An improved grain treatment system for selectively conditioning substantially homogeneous plugs of grain with a heating and conditioning medium comprising steam so as to enhance food value and digestibility of said grain, said system comprising:
a substantially vertically disposed vessel having an inlet in an upper end thereof and an outlet in a lower end thereof such that said grain can be passed therethrough;
means for introducing substantially homogeneous plugs of grain into said vessel via the inlet of said vessel for passage of said plugs of grain therethrough;
anti-coring means disposed within said vessel comprising a grain flow diverting member centrally disposed within said vessel for diverting flow of said homogeneous plugs of grain outwardly therefrom;
means for injecting said steam into said vessel in countercurrent flow to the flow of said homogeneous plugs of grain for enhancing contact of said grain with said steam to provide a plugs of conditioned grain; and
means for discharging plugs of conditioned grain from said vessel, said means communicating with the outlet of said vessel for selectively opening, closing and sealing the outlet to prevent egress of said steam therethrough.

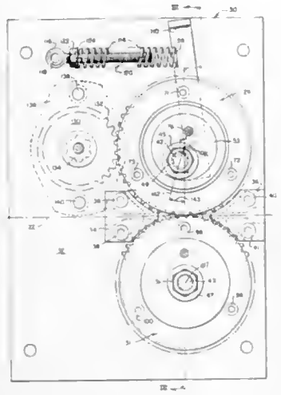
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4,817,519

WIRE FEED AND TENSIONING APPARATUS

S. Bernard Brouse, Orland Park, and John Wiedel, Chicago, both of Ill., assignors to Stanwich Holdings, Inc.

Filed Oct. 10, 1986, Ser. No. 917,584
Int. Cl.[4] B65B *13/04*
U.S. Cl. 100—32 6 Claims



1. In an apparatus for feeding metal wire in a first direction around the periphery of an article and tensioning said wire in a second direction opposite to said first direction, said apparatus including first and second wheels each having a peripheral groove adapted to contact the wire on opposed sides of the wire at substantially the same location along the length thereof, and means for rotatively driving said first and second wheels alternately in the first and second directions for feeding and tensioning of the wire, respectively, around said article,

the improvement in said apparatus which is characterized by:

said wire being guided in a substantially straight line path tangent to the outer periphery of said first and second wheels for contact with the groove in each of said first and second wheels,

said axis of rotation of the first wheel being located at an eccentric position in a 90° quadrant on the exit side of said first wheel with respect to said second, tensioning direction, said eccentric axis being located in a direction extending radially from a cental axis of said first wheel, said radial direction making an angle within the range of 5 to 40° with respect to a line passing through the central axis of said first and second wheels,

whereby, increasing torque on the outer periphery of said first wheel increases the pressure exerted by said first wheel on the wire during tensioning.

4,817,520

COMPACTOR WITH CONTROL APPARATUS FOR OFFSETTING OPERATION BETWEEN A GATE AND A RAM

Ronald L. Brown, Vernon; James K. Robbins, Fayette, both of Ala., and Kent Spiers, Caledonia, Miss., assignors to Marathon Corporation, Birmingham, Ala.

Filed Jul. 16, 1987, Ser. No. 74,213
Int. Cl.[4] B30B *1/08, 15/16*
U.S. Cl. 100—41 27 Claims

1. A uniform density compactor assembly, comprising:

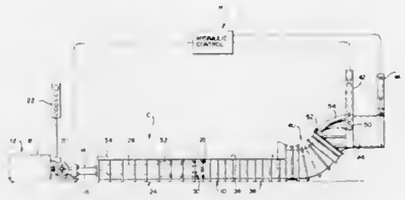
(a) an elongated curvilinear chamber having a waste receiving end portion at a first elevation and a waste discharge end at a second higher elevation;

(b) ram means displaceable within said chamber for causing compaction of waste during transfer between said end portion and said end;

(c) first drive means operably connected to said ram means for causing displacement thereof;

(d) means positioned proximate said ends and being movable into and out of said chamber for selectively restricting said chamber and thereby controlling the passage of waste through said chamber;

(e) second drive means operably connected to said restricting means for causing displacement thereof;



(f) offset means operably interconnecting said first and second drive means for causing offsetting operation thereof so that the waste exits said end with a substantially uniform density;

(g) said first drive means including a first hydraulic cylinder and piston assembly;

(h) said second drive means including a second hydraulic cylinder and piston assembly; and

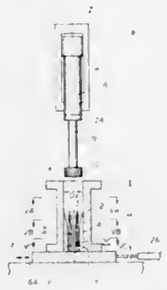
(i) said offset means including a hydraulic control means for continuously regulating the pressure of said second drive means as a function of the pressure of said first drive means.

4,817,521

COMPRESSION APPARATUS FOR SOLID WASTE

Katsuo Katada, Kamakura, and Yoshiyuki Sakata, Yokohama, both of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,335
Claims priority, application Japan, Feb. 27, 1986, 61-42317; Mar. 6, 1986, 61-48796; Jul. 9, 1986, 61-161561; Jul. 21, 1986, 61-171054; Sep. 17, 1986, 61-218501; Dec. 25, 1986, 61-313538
Int. Cl.[4] B30B *5/00*; G21F *9/12, 9/24, 9/00*
U.S. Cl. 100—240 11 Claims



1. A compression apparatus for reducing solid waste in volume, comprising:

a base;

axial compression means for axially compressing a columnar container containing the solid waste, the axial compression means including punching means having first teeth projecting radially outwards from an outer periphery thereof at equal angular intervals about an axis thereof, bottom mold means mounted on the base, and drive means for driving the punching means toward the bottom mold means for axial compression; and

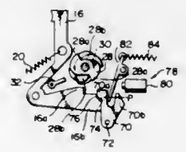
a mold adapted to be placed on the bottom mold means and having a cavity wall for concentrically receiving the container, the cavity wall located coaxially to the punching means and including a plurality of mold projections projecting radially inwards and extending axially at equal angular intervals about the axis, each mold projection including an inclined inner face in contact with a conical plane tapering toward both the axis and the bottom mold means, the inclined inner faces being substantially equispaced around the axis and the cavity wall defining at the inclined inner faces a radial compression cavity, adjacent mold projections defining axial grooves therebetween for receiving expanded portions of tbe container during compression, the teeth of the punching means being adapted to pass through respective axial grooves so that the punching means may pass through the radial compression cavity for compressing the container radially inwards.

4,817,522

PRINTER DEVICE

Shohachi Nihira, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 880,656, Jun. 30, 1986, abandoned, which is a continuation of Ser. No. 614,462, May 25, 1984, abandoned. This application Dec. 2, 1987, Ser. No. 127,576
Claims priority, application Japan, May 25, 1983, 58-91676
Int. Cl.[4] B41J *9/18, 9/38*
U.S. Cl. 101—93.34 5 Claims



1. A printer device comprising:

a type drum provided on an outer periphery thereof with a plurality of types;

a plurality of hammers provided in the axial direction of said type drum and having one end in opposed relations to the of said type drum and an other end provided with at least two engaging notched of a depth which are different from each other;

hammer springs for biasing said hammers in directions of flying to said types, respectively;

a reset cam for moving said plurality of hammers to a first retracted position against biasing forces of hammer springs;

hammer holding members for being engageable with said engaging notches of said hammers, respectively, and for holding each of said hammers at the first retracted position when engaging with one engaging notch and at a second retracted position when engaging with the other engaging notch, each of said hammer holding members being formed in a bifurcated shape including two arms, and an outer side of one arm of which is engageable with and disengagable from said two engaging notches of said hammer to alternately hold said hammer at the retracted position and to release said hammer; and

a plurality of electromagnetic means, each one of which is provided for at least two of said hammer holding members for selectively actuating said hammer holding members and selectively releasing said hammers, said electromagnetic means including an armature disposed to be movable between said two arms of said hammer holding member, said armature being movable between a first position engaging an inner side of said one arm when the electromagnetic means is not excited, and a second position engaging the other of said two arms when said electromagnetic means is excited for selectively releasing said hammers, wherein, in said first position, the inner side of said one arm acts as a stopper for said armature so ad to define a pre-stroke gap between said armature and said hammer holding members;

wherein said pre-stroke gap is a predetermined value between the other of said two arms of said hammer holding members and said armature at the time of non-excitation and said armature moves within the pre-stroke gap during excitation of said electromagnetic means such that said armature is given sufficient speed to strongly push the other arm by inertial force thereof, and disengage said one arm from said one of said two engaging notches;

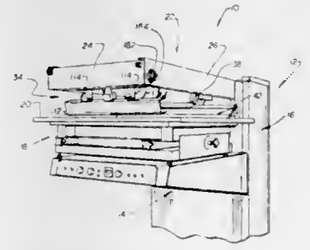
whereby said hammer holding members can be readily disengaged from the one of said two engaging notches of the hammer.

4,817,523

FLAT BED SCREEN PRINTING PRESS

Charles W. Harpold, and James E. Belcher, both of Grand Rapids, Mich., assignors to Harco Graphic Products, Inc., Grand Rapids, Mich.

Filed Oct. 20, 1986, Ser. No. 921,606
Int. Cl.[4] B41F *15/08, 15/42*
U.S. Cl. 101—123 10 Claims



1. A screen printing press comprising:

a main frame;

a printing bed supported on the main frame;

a rectangular printing frame having a rear end pivoted to said main frame for movement between a first printing position generally parallel to said printing table and a second flood position angled with respect to said printing table, said printing frame including elongated side members, a front member and a rear member, each of said side members defining an elongated track;

a squeegee and flood bar carriage engaging said elongated tracks and movable along said side members, said carriage including a pair of spaced side plates, a pair of slides, each slide extending from one of said side plates and into a respective one of said tracks, a pair of pivot plates, each pivot plate pivoted to one of said side plates, a squeegee support member extending between said pivot plates and a flood bar support member extending between said pivot plates in spaced, parallel relationship, said squeegee and flood bar support members being engaged by said pivot plates so that pivoting of said pivot plates alternately raises and lowers said squeegee and flood bar support members;

pivot plate actuating means operatively connected to said main frame and engaging at least one of said pivot plates for automatically lowering said flood bar support member when said printing frame is raised to its flood position and

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for automatically lowering said squeegee support member when said printing frame is in its printing position, said pivot plate actuating means including an elongated, rigid actuating member pivoted to said printing frame and operatively connected to said main frame, said elongated actuating member extending along and parallel to one of said side members of said printing frame;

a pivot bracket supporting said actuating member, said pivot bracket being pivoted to said printing frame;

shifting means fixed to said pivot bracket and operatively engaging said main frame for pivoting said pivot bracket as said printing frame moves between said first and said second positions; and

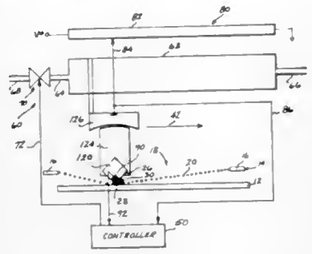
means operatively connecting said actuating member to one of said pivot plates.

4,817,524

SCREEN PRINTING METHOD AND APPARATUS

Dietrich E. Riemer, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1986, Ser. No. 947,903
Int. Cl.[4] B41F *15/08*
U.S. Cl. 101—123 **13 Claims**



1. In a screen printing method for applying an ink to a substrate by placing a screen over the substrate, drawing a squeegee having a contact edge over the screen in a flood stroke such that a layer of ink is deposited on the screen, and then drawing the squeegee over the screen in a print stroke with the contact edge in contact with the screen such that ink is forced through the screen onto the substrate, the improvement comprising controlling the squeegee velocity v and the squeegee angle α during the print stroke such that pressure in the ink adjacent to the contact edge, determined as a function of the squeegee velocity v, the amount of ink on the screen before the squeegee A, and the squeegee angle α, is substantially constant.

4,817,525

METHOD AND APPARATUS FOR SYNCHRONOUSLY CONTROLLING THE PRINTING SPEED OF BELT-TYPE PRINTING MACHINE

Toshimasa Yagi, Kasugai, Japan, assignor to Isowa Industry Co., Ltd., Nagoya, Japan

Filed Jul. 7, 1987, Ser. No. 70,583
Claims priority, application Japan, Jul. 8, 1986, 61-160535
Int. Cl.[4] B41F *5/04*
U.S. Cl. 101—219 **3 Claims**

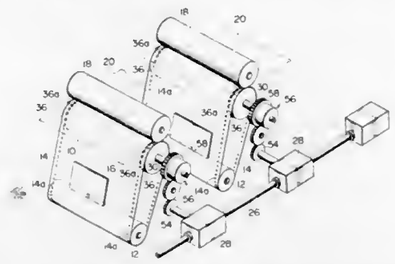
1. A method for synchronously controlling a printing speed of a belt-type printing machine including a plate cylinder, a tension roll for adjusting a distance between said plate cylinder and said tension roll, and an endless printing belt detachably wound around said plate cylinder and said tension roll, said method comprising the steps of:

detecting a line speed of a drive means for said plate cylinder as a reference speed,

engaging perforations formed along longitudinal edges of said endless printing belt with circumferentially spaced sprocket pins arranged around freely rotatable sprocket wheels located at opposite ends of said plate cylinder to prevent lateral movement of said endless printing belt,

detecting a traveling speed of said endless printing belt as said endless printing belt is driven by said plate cylinder,

comparing said detected line speed against said detected traveling speed, and



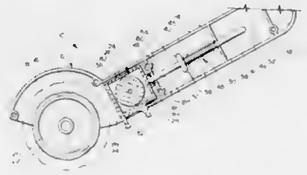
controlling the speed of rotation of said plate cylinder on the basis of a differential between said detected line speed and said detected traveling speed so as to synchronously equalize said detected traveling speed of said endless printing belt with said reference speed.

4,817,526

ROLLING CONTACT PRINTER WITH RETRACTABLE INKING WHEEL

Jeffrey M. Winston, 658 W. Shore Dr., Anacortes, Wash. 98221

Filed Oct. 22, 1987, Ser. No. 111,772
Int. Cl.[4] B41K *1/38*
U.S. Cl. 101—329 **18 Claims**



1. A printing device for printing a continous strip of indicia on a material, the device having a forward end, a rear end, and a longitudinal center axis, the printing device comprising:

a. a housing comprising a handle and an operating end portion attached to the handle, the operating end portion defining a print wheel cavity;

b. a print wheel having an outer circumferential printing surface, adapted to be mounted in the housing in the print wheel cavity for rotation about a wheel axis;

c. an inking assembly comprising an ink housing and an inking roller rotatably mounted in the ink housing, the ink housing having an open front portion, the inking assembly being moveable between a first forward position where the inking roller is in contact with the print wheel and a second retracted position where the inking roller is spaced from the print wheel;

d. spring means mounted in the housing adapted to urge the inking roller toard the first forard position;

e. releasable retaining means adapted to hold the inking assembly in the second retracted position; and

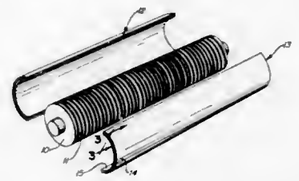
f. said ink housing having a substantially enclosed side wall and having an open front end, the inking assembly further comprising a removeable closure member, the closure member being adapted to be positioned on the open front portion of the ink housing when the ink housing is in the second retracted position.

4,817,527

PRINTING BLANKET WITH CARRIER PLATE AND METHOD OF ASSEMBLY

Gerald L. Wonch, Naperville, and Gary Procknow, Chicago, both of Ill., assignors to R.R. Donnelley & Sons Company, Lisle, Ill.

Filed Mar. 6, 1986, Ser. No. 836,766
Int. Cl.[4] B41F *27/02*
U.S. Cl. 101—389.1 **8 Claims**



1. An offset printing blanket for use in a web offset press, comprising:

a carrier plate of corrosion resistant material, said material being a ferritic stainless steel;

an elastomer blanket sheet which has a layer with a printing surface and a base layer of resilient, closed cell, foamed elastomer adjacent the carrier plate;

and

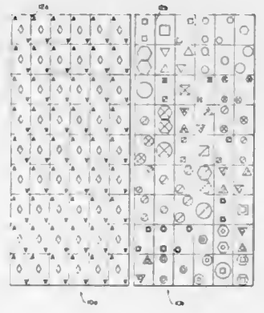
an epoxy adhesive securing the blanket sheet to the plate.

4,817,528

METHOD AND APPARATUS FOR MAKING PERSONALIZED PLAYING CARDS

Jacqueline M. Baker, 7 S. 18th Ave., Yakima, Wash. 98902

Filed Jul. 21, 1986, Ser. No. 888,741
Int. Cl.[4] B41N *1/00*
U.S. Cl. 101—395 **10 Claims**



1. A set of printing plates for printing personalized playing cards on sheets of card stock material, wherein the cards are of the type which are assembled in a plurality of decks having a specific, total number of cards and wherein each card in a deck has a unique, face side and a common decorative back side, comprising:

fifty-three different front plates, each plate having a plurality of card face printing images for producing card faces on the front side of the card stock sheet, wherein different card face printing images are positioned to register with one another on the different front plates; and

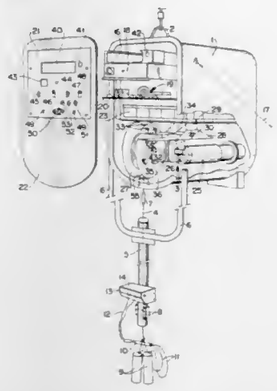
one back plate having a plurality of different, decorative card back printing images for producing card backs on the reverse side of the card stock sheets, wherein the card back printing images are positioned to produce card backs which register with the card face on the front side of the card stock sheets so that the printed sheets can be collated in one stack wherein each card location in the stack has a complete card deck thereat.

4,817,529

PROCESS AND APPARATUS FOR AUTOMATICALLY POSITIONING AN EXPLOSIVE CHARGE ABOVE THE SURFACE OF SNOW

Jacob Schippers, Quartier Le Bresson, 38660 Le Touvet, France

Filed Jun. 17, 1987, Ser. No. 63,010
Claims priority, application France, Jun. 17, 1986, 86 08825
Int. Cl.[4] F42D *3/00*
U.S. Cl. 102—302 **37 Claims**



1. A process for automatically positioning an explosive charge at a predetermined height above the surface of the snow so as to set off an avalanche, comprising the steps of:

(a) positioning said explosive charge above a preselected point on the snow by a cable transport apparatus;

(b) lowering said explosive charge by unwinding a predetermined length of a flexible suspension element connected with said explosive charge;

(c) detecting contact between said explosive charge and the snow or the ground by sensing a reduction in the tension of said flexible suspension element;

(d) lifting said explosive charge by winding said flexible suspension element until it is tensioned; and

(e) raising said explosive charge further to a predetermined height.

4,817,530

DELAY DETONATOR

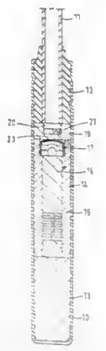
Hans Florin, Troisdorf Sieglar, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 21, 1986, Ser. No. 921,202
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614301; Aug. 29, 1986, 3629371
Int. Cl.[4] F42B *3/16*
U.S. Cl. 102—322 **19 Claims**

1. A delay detonator comprising a casing containing, in sequence, a secondary charge, a delay means for establishing the delay time period of said detonator, a sealing partition, a booster charge, and an ignition transfer hose extending into one end of the casing, the reaction of reactive material within said ignition transfer hose progressing within the ignition transfer hose to cause reaction of the booster charge which acts via said partition to activate said delay means; the delay means, in turn, causing, after a predetermined delay period, detonation of the secondary charge within said casing; the sealing partition being arranged within the casing between the one end of the ignition transfer hose and the delay means and an auxiliary

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charge being arranged on that side of the partition facing the delay means, said auxiliary charge being ignitable by energy generated by reaction of said booster charge, while a sealing



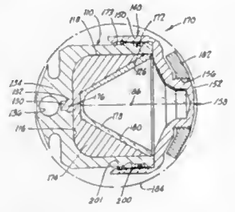
action is maintained by said partition during ignition of the delay means; and said partition having on a side facing the one end of the hose a recess wherein the booster charge is arranged.

4,817,531

CAPSULE CHARGE RETAINING DEVICE

Jerry L. Walker, Fort Worth; Jerry Motley, Arlington, and Glenn Christopher, Fort Worth, all of Tex., assignors to Jet Research Center, Inc., Arlington, Tex.

Continuation-in-part of Ser. No. 106,472, Oct. 5, 1987, Pat. No. 4,784,061. This application Jan. 19, 1988, Ser. No. 145,077
Int. Cl.⁴ E21B *7/00*
U.S. Cl. 102—306 **16 Claims**



1. A shaped charge device, comprising:

a cylindrical case member having a closed end and an open end with a circumferential groove formed adjacent the open end and a frustoconical shoulder formed adjacent the circumferential groove;

a cylindrical cap member having a closed end and an open end that has diameter of a size for mating engagement with the open end of said case member, and having a frustoconical shoulders formed circumferentially about the surface adjacent the open end of the cap member; and

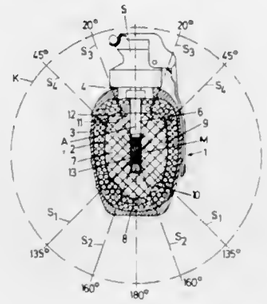
an eleastomeric ring is compressively received within the case groove and a resilient ring is positioned between the frustoconical shoulders of the case member and cap member when said cap member is slidably positioned in mating engagement with said case member whereby said case and cap members are retainably engaged.

4,817,532

FRAGMENTATION SHELL FOR GRENADES, PARTICULARLY HAND GRENADES

Hans Assmann, Schwanenstadt, Austria, assignor to Oregon Etablissement fur Patentverwertung, Liechtenstein, Liechtenstein

Continuation of Ser. No. 58,648, Jun. 2, 1987, abandoned, which is a continuation of Ser. No. 844,120, Mar. 26, 1986, abandoned. This application Apr. 1, 1988, Ser. No. 177,870
Claims priority, application Austria, Apr. 1, 1985, 954/85
Int. Cl.⁴ F42B *27/00, 13/18*
U.S. Cl. 102—482 **9 Claims**



1. A fragmentation shell for grenades, in particular hand-grenades, comprising a hollow body defined by an inner fragmentation jacket, the inner fragmentation jacket being made of metal particles embedded in plastic and being enclosed by an outer housing to form said hollow body, said hollow body having a stretched spherical shape and at least one aperture along a central longitudinal axis, said inner fragmentation jacket having a side portion, a shoulder portion, a bottom portion and a transition zone, said transition zone being located where said side portion joins said bottom portion and extending over a sphere sector zone of an approximately 25° angle width and lying in the zone between sphere sector 130° and 165° related to a spherical surface concentric to a center point of said fragmentation shell, where the zero degree axis coincides with the central longitudinal axis of the inner fragmentation jacket that passes through the aperture in the inner fragmentation jacket, said transition zone having a thickness that is greater than any of the thicknesses along said side portion, said shoulder portion or said bottom portion, said increased thickness of said transition zone being designed to contain a greater accumulation of metal particles than any point along said side portion, said shoulder portion or said bottom portion to achieve a uniform distribution of fragments from an exploded grenade.

4,817,533

TRANSPORTATION SYSTEM OF FLOATED-CARRIER TYPE

Teruo Azukizawa, and Mimpei Morishita, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 6, 1987, Ser. No. 46,464
Claims priority, application Japan, May 14, 1986, 61-109914
Int. Cl.⁴ B60L *13/10;* **B60M** *7/00*
U.S. Cl. 104—289 **12 Claims**

1. A transportation system of floated-carrier type, comprising:

a stationary portion;

guide rails mounted on the stationary portion and extending in a longitudinal direction;

a carrier for carrying cargo;

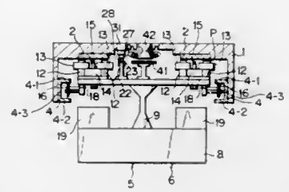
a floating device for causing said carrier to float from said guide rails, in a non-contact manner;

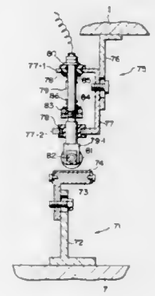
transfer means for causing said carrier to travel along said guide rails;

a battery, mounted on said carrier; and

a charging device having a first terminal arranged on the carrier and connected to said battery, a charging power source arranged on said stationary portion, and a second terminal arranged on said stationary portion, connected to said charging power source, and capable of contacting said first terminal when said carrier is stopped at a predetermined position, whereby when said carrier is moved up to the predetermined position, said first and second terminals are brought into contact with each other, and said charging power source supplies power to said battery via said first and second terminals;

wherein when said carrier is stopped at the predetermined position by said transfer means, and is moved up a predetermined distance by said floating device, said second terminal is brought into contact with said first terminal.





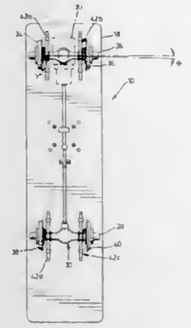
4,817,534

PRESENT INVENTION RELATES TO RAIL VEHICLES

Harry Skobleuick, and Roy E. Smith, both of Kingston, Canada, assignors to Urban Transportation Development Corporation Limited, Toronto, Canada

Filed Apr. 9, 1987, Ser. No. 36,869
Int. Cl.⁴ B21C *15/00*
U.S. Cl. 105—30 **9 Claims**

1. A vehicle having a longitudinal axis and arranged to travel along a track formed from a pair of rails extending in the direction of the longitudinal axis, each of the rails having a wheel contacting surface disposed on opposite sides of and parallel to a central track axis, comprising a pair of wheel sets each having a pair of frusto conical wheels disposed on opposite sides of the longitudinal axis, and wheel mounting means for mounting each of said wheels for independent rotation about a respective axis of rotation, means for maintaining at least one of said wheel mounting means of at least one of said wheel sets in a position wherein said axis of rotation is disposed at an angle other than 90 degrees to said longitudinal axis, in order to cause an incremental offset of said longitudinal axis



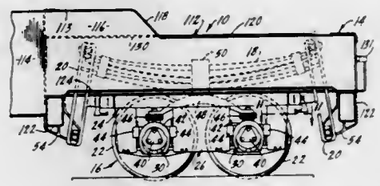
relative to said central axis as the vehicle travels along said track and thereby improve the stability of the vehicle.

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STAND ALONE WELL CAR WITH DOUBLE AXLE SUSPENSION SYSTEM

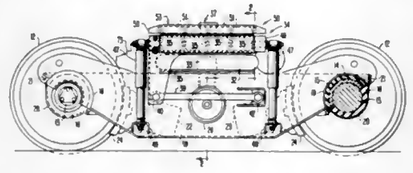
Boris S. Terlecky, Woodridge, Ill., assignor to Trailer Train Company, Chicago, Ill.

Filed Dec. 24, 1986, Ser. No. 946,054
Int. Cl.⁴ B61F *5/24*
U.S. Cl. 105—158.2 **11 Claims**



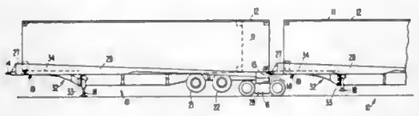
1. A railroad car comprising a carbody having end sections, and a pair of double axle suspension systems each supporting an end section, each including two wheel-supporting axles disposed transversely relative to their associated end section, each axle being journaled in a pair of spaced bearing adapter housings, two spaced beams bridging said axles, each beam being connected to adjacent bearing adapter housings, two spaced leaf springs disposed longitudinally relative to their associated end section, each beam being rotatably connected to an adjacent leaf spring, and two pairs of spaced swing hangers, the swing hangers of each pair being pivotally connected to respective ends of an adjacent leaf spring and also pivotally connected to said end section, and wherein said system further includes a frame rotatably connected to its associated end section, said frame having at least two spaced plates, said plates and said adjacent bearing adapter housings being oriented such that they abut to limit lateral movement of their associated end section relative to the wheels supported by said axles.

4,817,536
RAIL BOGIE FOR CONVERTIBLE RAIL-HIGHWAY VEHICLE
Christopher A. Cripe, 1903 Escourt Dr., Coatesville, Pa. 19320, and Alan R. Cripe, 4511 Menokin Rd., Richmond, Va. 22335
Filed May 4, 1987, Ser. No. 45,582
Int. Cl.[4] B61F *5/10*
U.S. Cl. 105—182.1 25 Claims



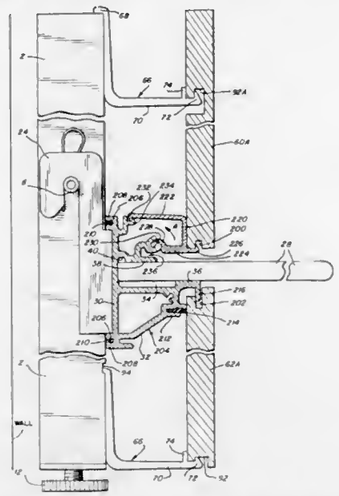
1. A rail bogie for coupling to a convertible rail-highway vehicle for operating the vehicle in rail mode, comprising:
first and second wheelset assemblies, each said assembly including an axle having rail wheels mounted to each end thereof;
first and second sideframe members coupled to and extending between said wheelset assemblies on each side of the rail bogie;
a bolster assembly operatively coupled to and extending between said sideframe members;
a coupling assembly mounted to said bolster assembly for coupling the rail bogie to an associated convertible rail-highway vehicle;
a spring assembly mounted to each said sideframe member so as to be disposed intermediate each said sideframe member and said bolster assembly respectively;
said spring assembly comprising at least first and second airspring assemblies each mounted to a respective side frame member of the rail bogie; and
said bolster assembly including reservoir means for storing air operatively coupled to said airspring assemblies.

4,817,537
CONTAINER CARRYING CONVERTIBLE RAIL-HIGHWAY VEHICLE
Alan R. Cripe, 4511 Menokin Rd., Richmond, Va. 23225, and Christopher A. Cripe, 1903 Escourt Dr., Coatesville, Pa. 19320
Filed Mar. 16, 1987, Ser. No. 26,463
Int. Cl.[4] B61D *17/10*
U.S. Cl. 105—404 2 Claims



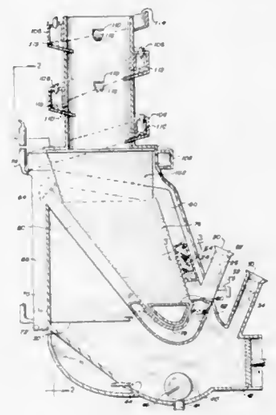
1. A convertible rail-highway vehicle having a gooseneck chassis for carrying containers comprising:
an elongated center sill member extending longitudinally the entire length of the vehicle and having a varying cross section along its length with a rearward portion, a transition portion and a forward portion with a gooseneck of reduced section at said forward portion which has a top snrface and a lower face and said transition portion located between said gooseneck and the remainder of said center sill member;
a front coupler at one end o said chassis;
a rear coupler at the end of said chassis opposite from said front coupler;
a front transverse sill member attached to said forward portion of said center sill member;
a rear transverse sill member attached to said rearward portion of said center sill member;
first and second elongated side beam elements mounted at a forward end thereof to said front sill member and a rearward end thereof to said rear sill member with said forward end of said side beam elements being deep with a greater section modulus as compared to said rearward end and spaced on opposite sides of said center sill member at a distance to straddle and run outside of and to nest said container with the front of said side beam elements being disposed at a higher level than said center sill member at said forward end with said greater section modulus and deep side beam elements providing high bending stability in the gooseneck so as to take the high tension and compression forces through said couplers when said vehicle is used as part of a train;
transverse members extending between said center sill member and each of said side beam elements; and
said center sill member includea a longitudinal plate having a top surface which extends from said front transverse sill member to said rear transverse sill member with said plate being the lower face member of said center sill at the forward end and rearward of said gooseneck section becomes the top surface of said center sill and extends rearwardly to be coplanar with the top surface of said rear transverse sill.

4,817,538
CONSTRUCTION SYSTEM FOR SHELVES
Jorgen Michaelsen, Frejasvey, Denmark, assignor to Bang & Olufsen of America, Inc., Mt. Prospect, Ill.
Continuation-in-part of Ser. No. 615,246, May 30, 1984, abandoned. This application Nov. 7, 1984, Ser. No. 668,961
Int. Cl.[4] A47B *96/06*
U.S. Cl. 108—108 4 Claims



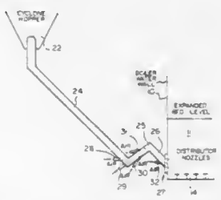
2. A shelving system for supporting shelves having first and rear edges and panelling plates, comprising:
horizontal support rail means, including means for mounting a shelf in a cantilevered manner projecting outwardly therefrom; and
a plurality of support brackets mounted in spaced relationship along said horizontal support rail means for supporting a panelling plate near the rear edge of said shelf, including complimentary interengaging means between the support brackets and the rail means providing a snap-locking, releasable engagement therebetween;
said complimentary interengaging means comprising first cam portions between each bracket and the rail means providing rigid support engagement therebetween and second snap-locking portions between the bracket and the rail means providing releasable latch engagement therebetween.

4,817,539
WASTE RECLAMATION FURNACE
Edwin O. Korkia, 334 County Rd. 566, Bovey, Minn. 55709
Filed Dec. 7, 1987, Ser. No. 129,229
Int. Cl.[4] F23G *5/00, 7/00*
U.S. Cl. 110—243 20 Claims



1. A pollution-free waste reclamation furnace, comprising
(a) a petroleum derivative waste cooking chamber with an opening sealable with a door having an oil bath therein for receiving and cooking petroleum derivative waste fed into the chamber through the opening wherein the waste is heated until it melts and dissolves within the oil; and
(b) solid waste cage operably designed to move through the oil in the cooking chamber to collect undissolved solid waste and to remove such solid waste through the opening.

4,817,540
SYSTEM FOR ASH REINJECTION IN BUBBLING-BED FLUIDIZED BED COMBUSTOR
Vladimir V. Razbin, Kanata; Dilip L. Desai, Nepean, and Frank D. Friedrich, Carp, all of Canada, assignors to Energy, Mines & Resources Canada, Ottawa, Canada
Filed Apr. 1, 1987, Ser. No. 32,604
Claims priority, application Canada, Apr. 4, 1986, 505921
Int. Cl.[4] F23J *1/00*
U.S. Cl. 110—266 1 Claim



1. In a bubbling bed fluidized bed combustor having a combustion zone in which fuel is burned in a fluidized bed of granular material, means for collecting particles from flue gases and means for reinjecting the collected particles into the combustion zone, an improved reinjection system comprising a particulate material conductor pipe connecting said particle collecting means to said combustion zone, said conductor pipe including a first downwardly sloping section flow connected at an upper end thereof to said particle collecting means, a short upwardly sloping section flow connected at a lower end thereof to a lower end of said first downwardly sloping section and a second downwardly sloping section flow connected at an upper end thereof to an upper end of said upwardly sloping section, the first downwardly sloping section, the upwardly sloping section and the second downwardly sloping section forming therebetween a Z-valve, first air injector means for injecting air into the upwardly sloping section to lift the particles therein past the upper end of said short upwardly sloping pipe section, said first injector means including an air nozzle mounted axially with respect to said short upwardly sloping pipe section, at the lower end of said upwardly sloping pipe section to draw particulate material from the first downwardly sloping section into the upwardly sloping section and additional air nozzles mounted in a lower region of said upwardly sloping section to direct air flows to urge the flow of particulate material up the upwardly slopping pipe section and a second air injector means for forcing particles from the second downwardly sloping section into the fluidized bed of the combustion zone against back pressure from the fluidized bed, said second air injector means including a tapered pipe portion forming a throat of reduced cross-sectional area and an air nozzle with an outlet in said throat adapted to create an air flow drawing particulate material from the second downwardly sloping section and force said particulate material into the fluidized bed against said back pressure.

4,817,541
KNIFE HOLDER CLAMP APPARATUS FOR CUT PILE TUFTING MACHINE
Ray O. V. Magourik, Chattanooga, Tenn., assignor to Tufteo Corporation, Chattanooga, Tenn.
Filed Apr. 4, 1988, Ser. No. 177,166
Int. Cl.[4] D05C *15/24*
U.S. Cl. 112—80.6 8 Claims



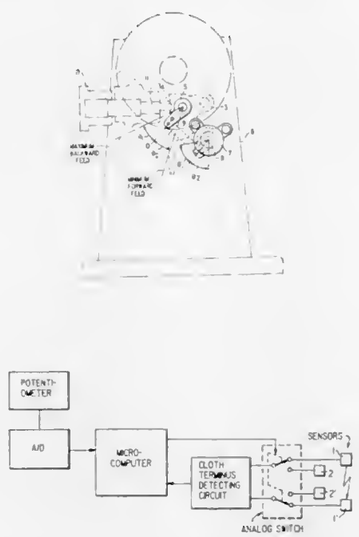
1. In a cut pile tufting machine having means for supporting a base fabric for longitudinal movement in a feeding direction through said machine, a plurality of transversely spaced reciprocal needles for introducing yarns through said base fabric to form loops, a looper hook for each needle on the opposite side of the base fabric from the needles and adapted to cooperate with a corresponding needle to seize and hold a yarn carried by the needle to form a loop, a cutting apparatus comprising:
(a) a knife holder module comprising a knife block member h: ing front and rear portions and top and bottom portions, and an elongated staff having upper and lower portions and opposed sides,
(b) a plurality of elongated knife slots extending upright through said block member,
(c) a plurality of elongated knives, each knife being received in a corresponding knife slot,
(d) securing means in said block member for engaging and

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holding each knife in said corresponding knife slot to project above said knife block member,
(e) said staff being fixed to the rear portion of said knife block member,
(f) an elongated knife bar mounted below said looper hooks for cooperative reciprocable movement with said looper hooks, said knife bar having a front face, a top face, and a bottom face,
(g) a plurality of upright rib members projecting from said front face of said knife bar, each of said rib members being disposed at an angle to the longitudinal axis of said knife bar, said adjacent rib members being transversely spaced to define recesses between said rib members,
(h) a transverse clamping slot formed in each rib member, each clamping slot having upper and lower portions and opening forward,
(i) said upper portion of each clamping slot defining a depending catch element,
(j) said elongated staff comprising an elongated rearward opening channel adapted to slip-fit over and receive a corresponding rib member in an operative position in which said knives project upward between corresponding looper hooks,
(k) a clamp element on said staff adapted to be inserted within said clamping slot and fit behind said catch element in said operative position, and
(l) detent means in the lower portion of said slot for securing said clamp element against said catch element to hold said staff upon said corresponding rib member in said operative position.

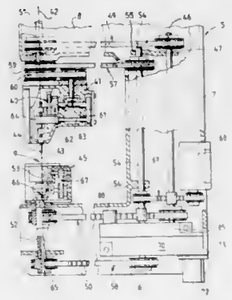
4,817,542
CLOTH TERMINUS DETECTING APPARATUS FOR SEWING MACHINE HAVING MEANS TO AUTOMATICALLY SELECT A SENSOR IN RELATION TO A FEED SETTING
Tsukasa Ando, Nishikasugai, and Seiichiro Hagino, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Apr. 29, 1988, Ser. No. 187,849
Claims priority, application Japan, Apr. 30, 1987, 62-107538
Int. Cl.[4] D05B *19/00*
U.S. Cl. 112—121.11 2 Claims

1. An apparatus for detecting the terminus of cloth being sewn by a sewing machine comprising:
a plurality of sensors each consisting of a light emitting portion and a light receiving portion, said portions being paired and disposed in opposition, said sensors being disposed on a path along which said cloth is fed and at positions upstream of the needle of said machine;
means for electrically detecting a set cloth feed amount; and
a selection circuit for electrically selecting one of said sensors consisting of paired light emitting and light receiving



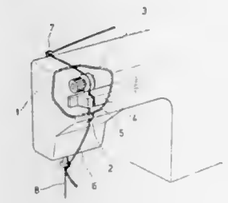
portions which is positioned at the optimum position with respect to said set cloth feed amount.

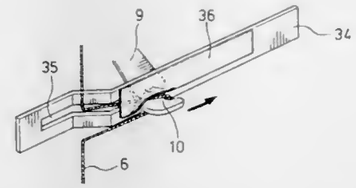
4,817,543
SEWING AUTOMAT WITH A SEWING HEAD INCLUDING A ROTARY HOUSING
Jochen Fischer, Detmold, Fed. Rep. of Germany, assignor to Kochs Adler Aktiengesellschaft, Fed. Rep. of Germany
Filed Jul. 8, 1987, Ser. No. 70,913
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625882
Int. Cl.[4] D05B *19/00, 69/00*
U.S. Cl. 112—121.12 4 Claims



1. A sewing automat with a sewing head (5) and a device for generating a two-axis-relative movement between a workpiece (36) to be sewn and the sewing head (5) including:
a rotary housing (41) supported at said sewing head (5) and swivelling drivable about an axis of rotation by an adjusting shaft (46), said rotary housing (41) having:
a needle bar (44) with a needle (43) supported in said rotary housing (41) and reciprocatingly drivable via a crank drive (62) driven by a common drive, which common drive is drivable by a main drive shaft (54) of said sewing head (5), the needle having a needle axis (42) being identical with said axis of rotation,
a needle jogging gear (63, 64) connected to said crank drive (62) for generating a needle feed movement, and
a thread take-up lever drive (40) coupled to said crank drive (62),
a hook bearing (45) swivelling drivable by said adjusting shaft (46) about said needle axis (42) equiangularly to said rotary housing (41),
a hook (53) arranged in said hook bearing (45) and drivable by said main drive shaft (54),
a drive motor (68) for driving said main drive shaft (54),
an adjusting drive for driving said adjusting shaft (46), and
a central control unit (35) for controlling the drive motor (68) and the adjusting drive,
a rotary position indicator (88) associated to the central control unit (35) and coupled to the main drive shaft (54), which rotary position indicator (88) generates a pre-set number of pulses per revolution of the main drive shaft (54), and the main drive shaft (54) and the adjusting shaft (46) being coupled to the rotary position indicator (88) via a differential gear (70) in such a way that upon swivelling of the adjusting shaft (46) the rotary position indicator (88) generates a number of pulses corresponding to the swivelling of the adjusting shaft (46).

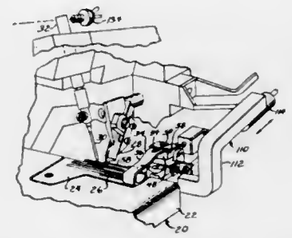
4,817,545
THREAD TAKE-UP LEVER DEVICE FOR SEWING MACHINES
Yoshio Mikuni, Osaka, and Osamu Tanaka, Hirakata, both of Japan, assignors to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan
Filed Jun. 22, 1987, Ser. No. 64,393
Claims priority, application Japan, Jun. 23, 1986, 61-96375[U]; Jul. 30, 1986, 61-180870
Int. Cl.[4] D05B *40/02*
U.S. Cl. 112—241 6 Claims





1. A thread take-up lever device for sewing machines, comprising
thread take-up means (9, 9c) having a portion (10, 10c) adapted to engage a thread (6), said thread take-up means being reciprocated in such a manner that said engaging portion is reciprocated along a predetermined path and draws the thread during its forward travel; wherein said thread take-up lever means is adapted to release the thread from said engaging portion during its return travel and acts to put away the thread from said engaging portion during the return travel of said thread take-up lever means;
means (36, 41, 45, 49) for preventing the thread from clinging to said thread take-up lever means, fixedly installed in at least one position along said path of travel of said engaging portion and adapted to contact a portion of the thread to thereby prevent said portion from being brought by said thread take-up lever means during the return travel of said thread take-up lever means; said cling-preventive means comprising thread braking means (36, 41, 45, 49) extending to intersect the path of travel of said engaging portion, wherein said thread braking means acts in the direction in which while engaging a portion of the thread engaged by said engaging portion it separates a slack, which forms in the thread during the return travel of said engaging portion, from said thread take-up lever means as a result of the return travel of said thread take-up lever means; and
said thread braking means comprises a skirt member (36, 41, 45, 49) of flexible sheet material which extends in the direction to project into the plane in which said thread take-up lever means is reciprocated, at least the front edge of said skirt member contacting said thread take-up lever means.

4,817,544
HEMMING DEVICE WITH HEMMING GUIDE AND GUIDE MEMBER FOR A SEWING MACHINE
Manfred Ackermann, Elmhurst, and Franklin V. Narbert, Chicago, both of Ill., assignors to Union Special Corporation, Chicago, Ill.
Filed Aug. 20, 1987, Ser. No. 87,718
Int. Cl.[4] D05B *35/02*
U.S. Cl. 112—141 19 Claims



1. A sewing machine for sewing a fabric, comprising:
a reciprocating needle;
a hemming device comprising a guide member having an edge guide extending towards the needle, and an elongated hemming guide extending laterally from the guide member and including means for retaining the fabric in a folded configuration passing towards the needle;
means for sensing passage of a cross-seam of the fabric as it passes along the guide member;
means responsive to the sensing means for shifting the guide member and hemming guide along with the fabric laterally away from the needle while the needle penetrates the fabric in the region of the cross-seam, with the guide member and hemming guide having a fixed position relative to each other during shifting of the shifting means; and
means for returning the guide member and hemming guide along with the fabric laterally to its original position.

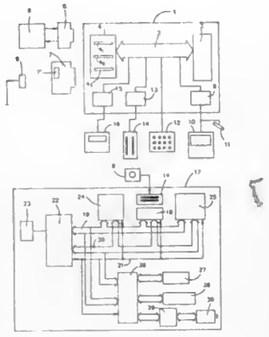
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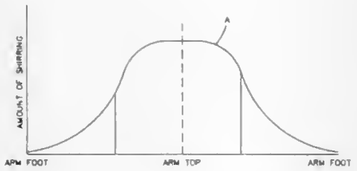
4,817,546

SHIRRING CONTROL APPARATUS AND METHOD

Taishi Yokoyama; Isao Takahashi, and Masahiko Sato, all of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 878,833, Jun. 11, 1986. This application Mar. 23, 1988, Ser. No. 172,144
Int. Cl.[4] D05B 27/08
U.S. Cl. 112—262.1 9 Claims





1. In a shirring sewing machine system for sewing a first cloth having a long sewing length divided into a plurality of notch sections on a second cloth having a short sewing length divided into the same number of notch sections as the first cloth with notch positions of each of the first cloth and the second cloths aligned,

said system comprising:

a memory means for storing a curve (A) defining an ideal distribution of an amount of shirring;

an input means for inputting at least the length of notch sections of each of the first and second cloths;

a first distribution means for changing the relative coordinates of the ideal distribution curve to real coordinate values in accordance with at least said inputted length of notch sections and for distributing said amount of shirring to each of said notch sections in accordance with said real coordinate values;

a second distribution means for distributing said distributed amount of shirring of each of said notch sections to each stitch in accordance with the number of stitches of each of the notch sections calculated from said length of notch sections of said second cloth and a predetermined feeding pitch for said second cloth; and

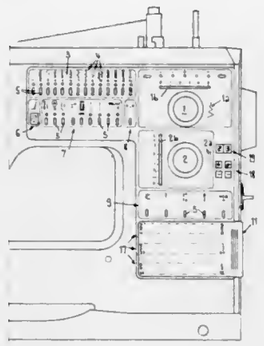
a means for calculating and storing an amount of differential movement for a cloth feeding unit which supplies the amount of shirring corresponding to said distributed amount of shirring per stitch to said first cloth.

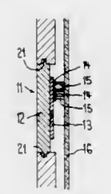
4,817,547

SEWING MACHINE

Alfred Gaeumann, Steckborn; Otto Hangarter, Oehningen/-Wangen, and Otmar Stillhard, Steckborn, all of Switzerland, assignors to Fritz Gegauf AG Bernina-Nahymaschinenfabrik, Steckborn, Switzerland

Filed Jan. 25, 1988, Ser. No. 148,300
Claims priority, application Switzerland, Jan. 28, 1987, 00291/87
Int. Cl.[4] D05B 3/02
U.S. Cl. 112—457 8 Claims





1. A sewing machine having an electronic stitch pattern control comprising memories containing electronic control data for a number of stitch patterns and a processor for control of the sewing machine by selected control data recalled from the memories of the sewing machine, at least one additional module having two surfaces mechanically attachable and electrically connectable to the sewing machine with at least one surface of the module visible when attached to the sewing machine, the module comprising memories with electronic data for a number of additional stitch patterns, each of the additional stitch patterns having an illustration associated therewith on the visible surface of the module and a code visible on the surface being associated with each of the stitch pattern illustrations, means on the sewing machine for selecting any desired stitch pattern by selecting and indicating the code associated thereto for recalling electronic data associated with the selected stitch pattern from the memories of the module by means of the processor of the sewing machine.

4,817,548

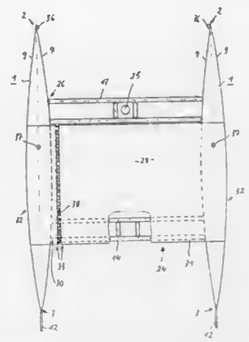
MULTIPLE HULL BOAT

Karl H. Guergen, DE - 2116, Hanstedt, Fed. Rep. of Germany

Filed Aug. 5, 1987, Ser. No. 81,806
Int. Cl.[4] B63H 9/00
U.S. Cl. 114—61 6 Claims

1. Multiple hull boat comprising at least two hulls with holding devices and a deck removably attached to the hulls by said holding devices; wherein each hull has a knife-shaped bow

that merges rearwardly into a keel of substantially uniform thickness extending from the bow to a stern of the hull, said keel having a center fin arranged at a highest and widest section of the hull below a sail center of gravity; wherein the cross-sectional dimensions of each hull in transversely extending vertical planes vary in an asymmetric manner with the cross-sectional area of the hull decreasing continuously to the bow and to the stern from a longitudinally middle portion of the hull containing said highest and widest section, the cross-sectional area at the stern being less than one-third of the cross-sectional area at the highest and widest section; wherein a top side of each hull is transversely convex and is arranged to



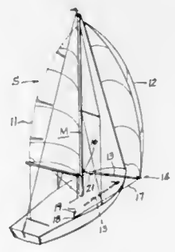
extend longitudinally in a horizontal plane in said middle portion of the hull and to convexly curve downwardly below said horizontal plane from said middle portion rearwardly toward the stern and forwardly toward the bow; wherein a lower boundary line of the hull, at a junction between the bottom of the hull and the keel, extends horizontally between the bow and the stern and is parallel to the topside of the hull in said middle portion; and wherein lateral sides of the hull are convexly curved in longitudinal directions from said middle portion forwardly toward the bow and rearwardly toward the stern, and have a slightly convex curvature between the topside and bottom of the hull.

4,817,549

COMBINED WHISKER POLE AND BOAT HOOK

John E. Beatman, 29 Valley Rd., Clinton, Conn. 06413

Filed Oct. 30, 1987, Ser. No. 114,840
Int. Cl.[4] B63H 9/4
U.S. Cl. 114—102 15 Claims



1. A nautical spar means comprising:

a boat hook, and

a whisker pole combined,

said spar means defining an elongated, lightweight, single pole terminating at one end in a fastener means and terminating at the opposite end in a resilient bumper means for fending off,

said opposite end being formed further with a hook means for grappling and a fixed pin means,

said pin means being operable to engage releasably a clew of a sail means,

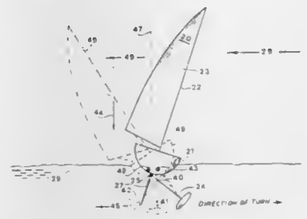
said pin means, said hook means and said bumper means being arranged so as to be operable independently.

4,817,550

STABILIZING SYSTEM FOR VEHICLES AND METHOD FOR USING SAME

Gunter E. Gutsche, 4476 Forget, Terrebonne, Quebec, Canada J6X 1Z4

Filed Jan. 20, 1988, Ser. No. 146,102
Int. Cl.[4] B63B 39/02
U.S. Cl. 414—124 20 Claims



1. In a vehicle adapted to move in touch with a medium, said vehicle having a body with a front end or leading end and a rear end or trailing end, said body defining a center line passing through said front end and said rear end, said vehicle exposable to external forces acting substantially normal to said center line, said vehicle having steering means and at least one antiskid member or antidrift member disposed on said body aligned substantially parallel with said center line and adapted to be in touch with said medium and to resist movement of said vehicle in the direction of said external lateral forces by contact with said medium, the improvement comprising: a separate stabilizing system to resist rolling or heeling forces acting on said vehicle, said stabilizing system comprising weight shifting means and consisting of:

(a) at least one ballasted member having a higher specific weight than water and being distinct from said antiskid member and having more mass than said antiskid member, said ballasted member adapted and disposed on said vehicle to be laterally movable with respect to said center line solely by at least one of said external lateral forces and

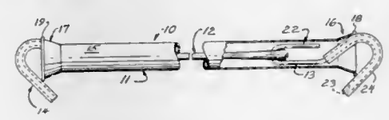
(b) a releasable stopping means or locking means adapted to hold or connect said ballasted member in selected positions with respect to said body.

4,817,551

BOAT MOORING DEVICE

Carl Matson, 10953 Rivercrest Dr., Little Rock, Ark. 72212

Filed Jun. 22, 1987, Ser. No. 64,511
Int. Cl.[4] B63B 21/00
U.S. Cl. 114—230 6 Claims

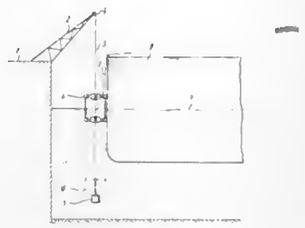


1. Apparatus for mooring one or two adjacent sides of a boat to a dock without the need for mooring connectors on the

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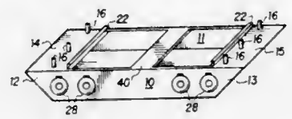
opposite sides of said boat, said boat having a first connector, and said dock having a second connector, said apparatus comprising: a rigid tubular sleeve having first and second open ends; stretchable tension means in said sleeve; first and second releasable attaching means fastened respectively at the respective ends of said tension means; said first and second attaching means extending at least partially out of the associated open ends of said sleeve whereby said first and second attaching means may be pulled from said tube and releasably coupled respectively to said first and second connectors, and said tension means will urge said first and second attaching means respectively against opposing ends of said sleeve thereby to place said rigid sleeve under compression to space said boat from said dock at a fixed distance determined by the length of said sleeve.

4,817,552
MOORING DEVICE
Leendert Poldervaart, La Turbie, France, assignor to Single Buoy Moorings, Inc., Marly, Switzerland
Filed Jun. 7, 1984, Ser. No. 618,386
Claims priority, application Netherlands, Jun. 7, 1983, 8302024
Int. Cl.⁴ B63B *21/04*
U.S. Cl. 114—230 **1 Claim**



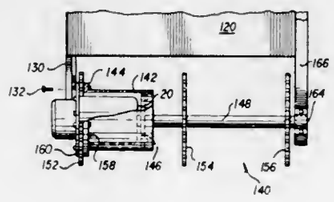
1. A mooring device comprising a structure to which a vessel is to be moored, an arm extending out from said structure over a body of water, an elongated flexible member extending down from the arm at a distance from said structure and terminating below the surface of said body of water, a weight on said elongated flexible member below the surface of the body of water, and a fender disposed on the elongated flexible member spaced a substantial distance above the weight for vertical movement relative to the elongated flexible member, the elongated flexible member being flexible above and below the fender, the fender having means to adjust its elevation relative to the elongated flexible member to about the level of the surface of the body of water, said elongated flexible member and said fender being so disposed that when the elongated flexible member hangs straight down from the arm, the fender is spaced a substantial distance from said structure, the arm and the elongated flexible member and fender being so disposed that a vessel can push the fender against said structure whereupon the elongated flexible member between the arm and the fender occupies a position inclined from the vertical and the weight tends to return the elongated flexible member to a vertical position thereby to push the vessel away from said structure to which the vessel is moored, there being a plurality of said elongated flexible members, the fender comprising an elongated body which is guided on said plurality of elongated flexible members, said weight being a single elongated weight that loads all said elongated flexible members.

4,817,553
CRAWFISH HARVESTING BOAT
Russell J. Knott, Sr., Rt. 2, Box 87, Arnaudville, La. 70512
Filed Apr. 8, 1987, Ser. No. 35,762
Int. Cl.⁴ B63B *35/14*
U.S. Cl. 114—255 **8 Claims**



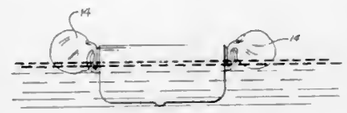
1. A multipurpose boat for harvesting crawfish which comprises,
a. a flat bottom hull generally rectangular in configuration having a front deck and an aft deck across the upper ends of the width of the hull,
b. an open space between said front and aft decks,
c. said open space having a height and width of the hull,
d. propulsion means for moving the boat within a body of water,
e. support means for supporting a net on each side of said hull,
f. means for moving said support means to a position substantially perpendicular to said hull for positioning said net to harvest the crawfish and to a position substantially parallel with said hull for emptying said net,
g. means for receiving said crawfish from said net,
h. means for washing said crawfish in said receiving means, and
i. means for sorting said crawfish according to size and dispensing said assorted crawfish into different containers within said open space depending upon the size of the crawfish.

4,817,554
MARSH CRAFT TRACK ADAPTER
Perry J. Prestenbach, 30 Highway 90 East, Houma, La. 70364
Filed Jul. 10, 1987, Ser. No. 72,093
Int. Cl.⁴ B62D *55/12*
U.S. Cl. 114—270 **5 Claims**



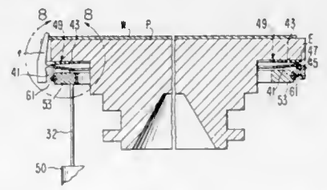
1. An adapter for rendering an earth mover amphibious comprising a frame and a pair of pontoon assemblies, each such assembly including:
a pontoon attached to a respective end of said frame;
an endless track guided around the periphery of the pontoon;
a hydraulic motor having a stationary part attached to said pontoon, and a drive flange for driving the track around the pontoon; and
a drive shaft assembly for transferring power from said hydraulic motor to said track, the drive shaft assembly comprising
a tube disposed around the motor, having open end attached to said drive flange and a second end extending beyond the motor,
a plate affixed to the other end of the tube,
a shaft affixed to the plate and coaxial with the tube, the shaft extending from the plate in a direction away from the tube,
a pillow block for supporting the distal end of the shaft, and a plurality of sprockets for driving the track, at least one of said sprockets being affixed to said tube and at least one of said sprockets being affixed to said shaft.

4,817,555
BOAT FLOTATION COLLAR
Lee O. Melnen, Rte. 5, Box 1094, Edinburg, Tex. 78539
Filed Sep. 25, 1987, Ser. No. 101,269
Int. Cl.⁴ B63B *5/24*
U.S. Cl. 114—360 **6 Claims**



1. A flotation device for use with water craft comprising,
an elongate guard means of a generally "U" shaped cross-sectional configuration including an open top portion for securement about an upper perimeter of said water craft, and
an elongate expandable pneumatic cell means positionable in a first position defining a first volume completely within the interior formed by said "U" shaped configuration of said bumper guard means,
and
compressed air means for inflating said pneumatic cell means to a second volume and a second position substantially exteriorly of said interior of said bumper guard means wherein said second volume is substantially greater than said first volume, and
wherein said bumper guard means are of finite length with terminal end portions wherein said terminal end portions are open to enable drainage of undesirable water from each end portion.

4,817,556
APPARATUS FOR RETAINING WAFERS
Eric L. Mears, Rockport; Richard J. Hertel, Bradford; Robert V. Brick, Gloucester, and Carl J. Holt Jr., Newport, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.
Filed May 4, 1987, Ser. No. 46,230
Int. Cl.⁴ B05C *13/00*
U.S. Cl. 118—503 **26 Claims**

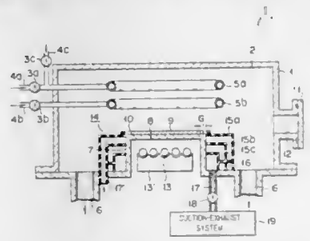


1. A device for releasably holding a workpiece, said device comprising:
a base;
a resilient member having a plurality of finger members extending therefrom, said resilient member extending between and connected to said finger members, said resilient member being pivotally attached to said base; and
means for selectively moving said finger members into and out of engagement with said workpiece, and means for moving including means for elastically deforming said resilient member to pivot said finger members.

4,817,557
PROCESS AND APPARATUS FOR LOW PRESSURE CHEMICAL VAPOR DEPOSITION OF REFRACTORY METAL
Michael Diem, Orange; Michael A. Fisk, Anaheim, and Jon C. Goldman, Orange, all of Calif., assignors to Anicon, Inc., San Jose, Calif.
Continuation of Ser. No. 875,033, Jun. 16, 1986, abandoned, which is a division of Ser. No. 497,321, May 23, 1983, Pat. No. 4,619,840. This application Sep. 4, 1987, Ser. No. 92,967
Int. Cl.⁴ C23C *16/00*
U.S. Cl. 118—719 **2 Claims**

1. An apparatus for depositing a refractory metal film on a semiconductor substrate, comprising: a reactant gas source chamber having a sealed reservoir therein provided with means for permitting introduction of a solid metallic compound therein; a reactant gas passageway connected to said reactant gas source chamber; a valve for controlling flow through a conduit in said reactant gas source chamber interconnecting said sealed reservoir and said reactant gas passageway; source chamber heating means in said reactant gas source chamber for heating said sealed reservoir and said conduit and said valve to a temperature higher than the sublimation temperature of said solid metallic compound; a deposition chamber connected to said passageway and provided with load means for transferring a semiconductor substrate into said deposition chamber; substrate heating means for heating a semiconductor substrate within said deposition chamber to a reaction temperature at which metal will deposit on said semiconductor substrate while maintaining said deposition chamber at a substantially lower temperature; and evacuation means for evacuating said deposition chamber to a vacuum of less than three torr said evacuation means comprising a constant volume vacuum pump connected to said deposition chamber by an exhaust conduit, a source of inert gas connected downstream of said deposition chamber to said exhaust conduit through a mass flow controller for regulating a flow of inert gas, and pressure responsive means for controlling opening of said valve regulating said solid metallic compound in said reactant gas source chamber to provide a selected partial pressure of said reactant gas in said deposition chamber.

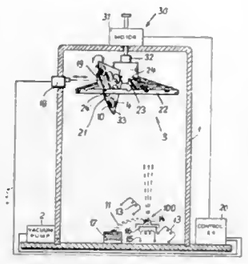
4,817,558
THIN-FILM DEPOSITING APPARATUS
Hitoshi Itoh, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 10, 1987, Ser. No. 72,143
Claims priority, application Japan, Jul. 10, 1986, 60-162283
Int. Cl.⁴ C23C *16/00*
U.S. Cl. 118—725 **13 Claims**



1. A thin-film depositing apparatus comprising:
a reaction container adapted to receive a material gas therein, for a thin-film depositing reaction;
a substrate supporting member located in a predetermined

position in the reaction container in order to set a substrate on which a thin film is to be deposited;
heating means for heating the substrate supporting member to deposit the thin film, while heating the substrate; and
a first cover member covering, in a contacting or non-contacting manner, the whole surface of the substrate supporting member except a substrate bearing surface on which the substrate is to be set wherein a space is provided between said first cover member and said substrate supporting member.

4,817,559
VACUUM VAPOR-DEPOSITION APPARATUS FOR COATING AN OPTICAL SUBSTRATE
Delio Ciparisso, Ascona, Switzerland, assignor to Satis Vacuum AG, Zurich, Switzerland
Filed Jul. 30, 1987, Ser. No. 79,824
Claims priority, application Switzerland, Jul. 31, 1986, 03080/86
Int. Cl.[4] C23C *16/44*
U.S. Cl. 118—731 **6 Claims**



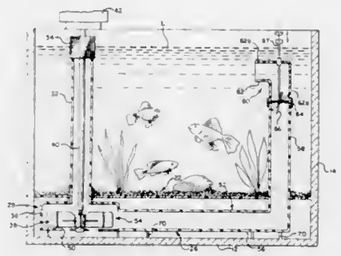
1. In a vacuum vapor deposition apparatus for coating a plurality of optical substrates such as plastic spectacle lenses which are distributed on a support means which rotates in an evacuable container above at least one vapor source, the improvement wherein said support means includes a plurality of at least approximately circular segment-shaped flat support plates which are positionable cup-like relative to each other and are supported on a common rotating axle, each pivotable about 180°, each of said support plates having a plurality of substrate holders provided in openings formed in said support plates with at least one respective retaining or tension providing spring retaining each of said substrates in a respective one of the openings, of which at least one of said substrate holders is tiltable freely on both sides thereof from the plane of said support plate to a predetermined angle.

4,817,560
LITTER BOX SIFTER
Darrell E. Prince; Jean Wimberly, both of P.O. Box 305, Bergman, Ark. 72615, and Jay B. Taylor, P.O. Box 1568, Harrison, Ark. 72602
Filed Dec. 28, 1987, Ser. No. 138,571
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—1 **12 Claims**



1. Pet litter box with cleaning apparatus comprising a liquid impervious tray, and
a litter sifting basket slightly smaller than said tray and of rigid material with a generally flat bottom portion adjoined by at least two sides,
said bottom portion being formed of an array of parallel bars with generally triangular cross-sections,
said bars being supported at least in part from said sides and being spaced apart to form elongated interstices therebetween with a transverse dimensions of about 3/16 inch to ¼ inch,
the sides of said basket being formed of parallel bars which are a continuation of said array of parallel bars forming the bottom portion of said basket.

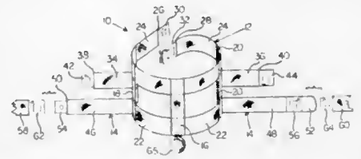
4,817,561
AQUATIC AERATION AND FILTERING SYSTEM
Thomas D. Byrne, Rolling Meadows, and Martin Sliva, Cary, both of Ill., assignors to Ichthyotech, Ltd., Rolling Meadows, Ill.
Filed Dec. 17, 1986, Ser. No. 943,247
Int. Cl.[4] A01K *63/00*
U.S. Cl. 119—5 **21 Claims**



1. An aeration and filtering system for an aquarium having a bottom wall and upstanding side walls with a porous filter bed spaced above said bottom wall and having a liquid therein defining a liquid level, pump means between said bottom wall and said filter bed and having a first inlet adjacent said liquid level to draw liquid from said tank and oxygen from the surrounding atmosphere air to be mixed therewith to produce an oxygenated liquid mixture and having a second inlet for drawing liquid substantially depleted of oxygen from below said filter bed to be mixed with said oxygenated mixture to produce an oxygen-rich liquid mixture, and conduit means extending from said pump means to a level below said liquid level in said tank so that said oxygen-rich liquid mixture is drawn toward and through said filter bed to produce aerobic bacteria on said filter bed for digestion of waste products from aquatic life while oxygen is available in said liquid above said filter bed for sustaining aquatic life.

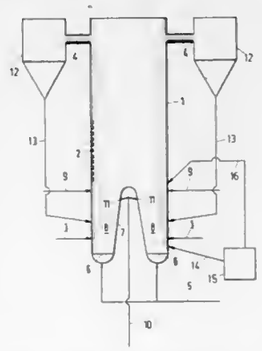
4,817,562
VEHICULAR PET RESTRAINT
Martha K. Giroux, R.R. 2, Rte. 207, Box 9, Lebanon, Conn. 06249
Filed Dec. 29, 1986, Ser. No. 327
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—96 **6 Claims**

1. A vehicular pet restraint comprising a harness portion for engaging a pet's body for restraining the pet, and an attaching portion having a left side attaching strap affixed to said harness portion and provided with a left latching member for releasable interlocking engagement with a left mating latching member on a left strap of a seat belt already installed in a vehicle and a right side attaching strap affixed to said harness portion and provided with a right latching member for releasable interlocking engagement with a right mating latching member on a right strap of the seat belt, wherein one of said left latching member of said restraint and said right latching member of



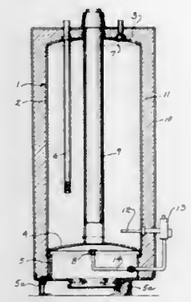
said restraint is a female latching member and the other one of said left latching member of said restraint and said right latching member of said restraint is a male latching member.

4,817,563
FLUIDIZED BED SYSTEM
Hans Beisswenger, Mahwah, N.J.; Ronald Knoche, Frankfurt, and Wolfgang Frank, Eschborn, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Feb. 25, 1988, Ser. No. 160,370
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706538
Int. Cl.[4] B09B *3/00*
U.S. Cl. 122—4 D **7 Claims**



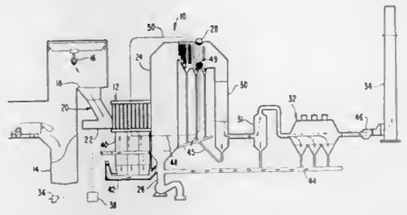
1. A fluidized bed system comprising:
a fluidized bed reactor, said reactor having a bottom and means for exhausting a gas from said reactor;
means for introducing fluidizing gas into the bottom of said reactor;
means for introducing a secondary gas into the reactor at a level of at least one meter above the bottom of the reactor but not in excess of 30% of the reactor height;
means for introducing fuel into said reactor at a level between the means for introducing fluidizing and secondary gas into said reactor;
a solids separator to remove solids from exhaust gas from said reactor;
recycle means for returning the removed solids to said reactor;
at least one displacing body to cover 40 to 75% of the bottom surface of said reactor, said least one displacing body having a height not in excess of one-half the reactor height.

4,817,564
WATER HEATER CONSTRUCTION
Marc W. Akkala, New Berlin, and Dennis R. Hughes, Germantown, both of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.
Filed Mar. 21, 1988, Ser. No. 170,789
Int. Cl.[4] F22B *5/00*
U.S. Cl. 122—17 **22 Claims**



1. A water heater, comprising a tank to contain water to be heated, flue means extending upwardly through the tank for conducting waste gases of combustion, and heating means located adjacent the lower end of said flue means and having at least one outlet, said heating means at the region of said outlet having a cross-sectional area in the range of 0.5% to 50% with respect to the cross-sectional area of the lower end of said flue means, said outlet being constructed and arranged to provide a flame pattern which is in close proximity to the inner surface of said flue means.

4,817,565
THERMALLY TURBULENT COMBUSTION SYSTEM
William G. Collins, Jr., Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 23, 1988, Ser. No. 197,175
Int. Cl.[4] F22B *5/02*
U.S. Cl. 122—197 **17 Claims**



1. A thermally turbulent combustion system comprising:
a generally cylindrical, longitudinally extending combustion chamber formed by a plurality of interconnected circumferential cooling pipes, said chamber having an inlet end, an outlet end, a top and sidewalls;
fuel transport means adjacent the bottom of said chamber for transporting fuel therethrough along a path parallel to the longitudinal axis thereof;
means for supplying combustion air to said chamber; and
wherein the width of said chamber is greater than the width of said fuel path.

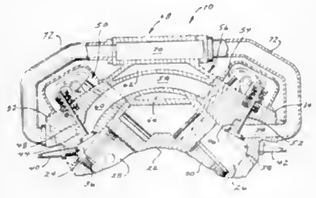
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4,817,566

FOUR-STROKE CYCLE INDUCTION TUNED V-ENGINE WITH CENTRAL EXHAUST MANIFOLD

Neil A. Newman, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 9, 1987, Ser. No. 118,863
Int. Cl.[4] F02B 75/18
U.S. Cl. 123—52 MV 20 Claims



1. A four-stroke cycle V-engine, comprising:

a pair of cylinder banks each having a plurality of cylinders, said cylinder banks being slanted with respect to each other to form a V-engine configuration, said cylinder banks lying along and defining two nonparallel planes forming the V, said cylinders being defined by a head and cylindrical sidewalls, said cylinders each having an intake port for receiving an air-fuel mixture and an exhaust port for allowing exhaust to pass from said cylinders; and

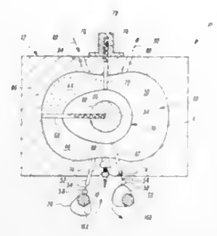
supply means for furnishing said air-fuel mixture to said intake ports from outside the valley of said V-engine, said supply means extending through both said planes.

4,817,567

ROTARY PISTON ENGINE

Ronald C. Wilks, 415 Cora St., Apt. 202, Arlington, Tex. 76011

Filed Dec. 30, 1987, Ser. No. 139,469
Int. Cl.[4] F02B 53/00
U.S. Cl. 123—231 7 Claims



1. An improved rotary piston engine comprising, in combination:

a housing having an internal chamber bounded by curved bore including convex and concave curved surfaces, the internal cross section of the chamber presenting an oval profile which is constricted about a housing section disposed intermediate said convex and curved surfaces;

a piston mounted for rotation within said chamber, said piston having a convex curved external surface and a slot intersecting said convex surface for receiving a movable vane;

a piston vane mounted for extension and retraction through said piston slot;

a resilient member mounted in said piston slot biasing said piston vane into yieldable engagement with said housing bore;

a counter-piston vane mounted on said housing for extension into and retraction out of said housing chamber, said counter-piston vane being mounted for sliding movement within a slot which intersects said housing through said constricted housing section;

a compression vane mounted for extension and retraction into and out of said housing chamber, said compression vane being received within a slot which intersects said constricted housing section;

said housing having a combustion chamber disposed within said constricted housing section intermediate said counter-piston vane and said compression vane, said combustion chamber being in fluid communication with said housing chamber, and said housing having intake and exhaust ports intersecting said housing in fluid communication with said internal chamber;

an engine separation vane mounted for extension and retraction into and out of said housing chamber, said engine separation vane being received for sliding movement within a slot intersecting said housing intermediate said intake and exhaust ports; and,

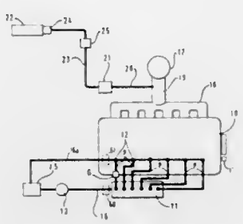
resilient means coupled to said engine separation vane for biasing said engine separation vane into yieldable engagement against the convex curved surface of said piston.

4,817,568

DUAL FUEL COMPRESSION IGNITION ENGINE

Timothy J. Bedford, Castle Donnington, United Kingdom, assignor to Gaspower International Limited, Derby, United Kingdom

PCT No. PCT/GB86/00499, § 371 Date Apr. 15, 1987, § 102(e) Date Apr. 15, 1987, PCT Pub. No. WO87/01163, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 21, 1986, Ser. No. 52,852
Claims priority, application United Kingdom, Aug. 24, 1985, 8521244
Int. Cl.[4] F02D 19/10
U.S. Cl. 123—431 15 Claims



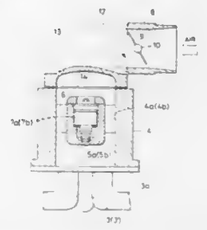
1. A dual fuel compression ignition engine having a gas fuel supply system for the engine to supply gaseous fuel to the engine at a variable rate whereby the speed of the engine is continuously variable, a diesel fuel supply system for the engine including an injection pump and an injector system, a control means to control the amount of pilot diesel fuel injected into the engine, a first means to provide a first input to the control means to cause the control means to supply pilot fuel at a variable predetermined rate, said rate being varied in accordance with at least one operating parameter of the engine and second means to provide a second input to said control means from a feed-back signal indicative of the amount of pilot diesel fuel injected into the engine and the control means being adapted to adjust the supply of the pilot fuel to correspond to that signalled by the first input.

4,817,569

SINGLE OR TWIN VALVE TYPE FUEL INJECTION SYSTEM

Yoshiya Takano, Katsuta, and Yoshikazu Hoshi, Toukai, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1986, Ser. No. 901,372
Claims priority, application Japan, Aug. 28, 1985, 60-189014
Int. Cl.[4] F02M 61/14
U.S. Cl. 123—470 14 Claims



1. A fuel injection system for an internal combustion engine having intake air passage means for supplying intake air, a plurality of cylinder means making a same stroke without overlapping and intake manifold means having a branching position for supplying intake air from said intake air passage means into the respective cylinder means, the fuel injection system, comprising:

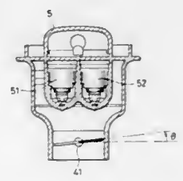
fuel injection valve means disposed within said intake air passage means at an upstream side of said branching position of said intake manifold means for supplying fuel to each of said cylinder means, throttle valve means disposed in a throttle body means forming part of said intake air passage means of the engine at a position upstream of said fuel injection valve means, and means formed in said intake air passage means between said throttle valve means and said fuel injection valve means for regulating a flow of intake air passing therethrough between the throttle valve means and said fuel injection valve means, wherein said means for regulating includes an unobstructed curved passage means which is integrally formed with said throttle body means supporting the throttle valve means which is configured to direct the lines of flow of said intake air in a fixed direction toward said fuel injection valve means.

4,817,570

METHOD OF AND APPARATUS FOR FUEL CONTROL

Kiyomi Morita, Katsuta; Junji Kiyake, Mito; Keiji Hatanaka, Chigasaki, and Kiyotoshi Sakuma, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,874
Claims priority, application Japan, Sep. 1, 1986, 61-203712
Int. Cl.[4] F02D 41/34
U.S. Cl. 123—472 6 Claims



1. A fuel control method for an internal combustion engine provided with a fuel injection system comprising an intake passage communicating with an air cleaner and cylinders of the engine, a throttle valve pivotally mounted around a throttle valve shaft, and two fuel injectors arranged on a plane crossing said throttle valve shaft at right angles and on a upstream side of said throttle valve so that said throttle valve shaft is disposed between said two injectors, the method comprising the steps of:

obtaining, from a map, fuel injection share correction coefficient, based on an opening position of the throttle valve and revolutions per unit time of said engine;

correcting amounts of fuel to be injected by said respective fuel injectors in dependence upon said fuel injection share correction coefficient so that the fuel amount to be injected by one of said fuel injectors increases by an amount determined on a basis of said fuel injection share correction coefficient and the fuel amount to be injected by the other said fuel injectors decreases by the same amount as the same of fuel increases; and

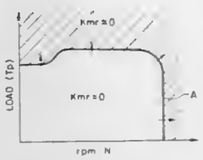
injecting an amount of fuel determined by the above step into said intake passage by said fuel injectors, alternately, so that the cylinders each receive an optimum amount of fuel.

4,817,571

METHOD AND APPARATUS FOR FUEL CONTROL

Kiyomi Morita, Katsuta; Junji Miyake, Mito; Keiji Hatanaka, Chigasaki, and Kiyotoshi Sakuma, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,873
Claims priority, application Japan, Sep. 1, 1986, 61-203713
Int. Cl.[4] F02D 41/10
U.S. Cl. 123—492 9 Claims



1. A method of fuel control which includes a step of fuel increment for acceleration, wherein a fuel feed rate which is determined depending upon the number of revolutions per unit time of the engine and an air suction rate is increased by a predetermined degree when acceleration is detected, the method comprising the steps of detecting whether or not a load of the engine, running at a low speed with the number of revolutions per unit time of the engine not more than a predetermined level, has exceeded a predetermined level after acceleration; and correcting, in addition to increase in the fuel feed rate to be effected in said step of fuel increment for acceleration, the fuel feed rate so as to further increase on the basis of the number of revolutions per unit time of the engine in practical operation and a quantity of variation of the load when it is detected in said detecting step that the engine is accelerated and the load has exceeded a predetermined level.

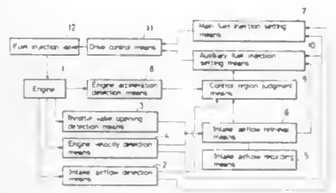
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4,817,572

ELECTRONICALLY CONTROLLED FUEL INJECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Shinpei Nakaniwa, Maebashi; Yukio Hoshino, Gunma; Naoki Tomisawa, Takasaki; Seiichi Otani, Maebashi; Tadashi Ariga, and Shouji Furuhashi, both of Yokohama, all of Japan, assignors to Nissan Motor Co. Ltd. and Nippon Denshi Kiki Co., Ltd., both of Isezaki, Japan

Filed Aug. 27, 1987, Ser. No. 89,788
Claims priority, application Japan, Aug. 27, 1986, 61-199137
Int. Cl.[4] F02D *41/10*
U.S. Cl. 123—492 5 Claims



1. An electronically controlled fuel injection device for an internal combustion engine comprising:

a fuel injection means;

a main fuel injection setting means which sets an amount of fuel to be injected, based on a detected amount of intake airflow for said engine and a detected engine velocity;

an auxiliary fuel injection setting means which sets an amount of fuel to be injected, based on a detected engine velocity and an retrieved amount of intake airflow;

a control region judgement means for selecting in a specific operating region for engine acceleration one of said main and auxiliary fuel injection setting means for operation of said fuel injection means;

an intake airflow retrieval means which determines said retrieved amount of intake airflow corresponding to said operating region from the data of intake airflow previously made based on the area of opening of a throttle valve and said engine velocity;

said control region judgement means adapted to compare said detected amount of intake airflow with said retrieved amount of intake airflow during said operating region for engine acceleration, to select said main fuel injection setting means for operation when said detected amount of intake airflow is less than or equal to said retrieved amount of intake airflow, and to select said auxiliary fuel injection setting means when said detected amount of intake airflow is larger than said retrieved amount of intake airflow.

4,817,573

FUEL CONTROL DEVICE FOR INTERNAL-COMBUSTION ENGINES

Toshihiro Yamada; Hiroyuki Takebayashi, both of Hiroshima; Setsuhiro Shimomura, and Yukinobu Nishimura, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,585
Claims priority, application Japan, Dec. 27, 1986, 61-314569
Int. Cl.[4] F02M *51/00*; F02D *41/18*
U.S. Cl. 123—494 4 Claims

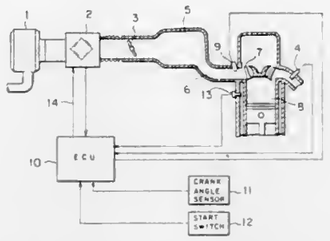
1. A fuel control device for internal-combustion engines, comprising:

(a) a fuel supply means for supplying fuel to an internal-combustion engine in accordance with the operation of a fuel control valve;

(b) a hot-wire intake sensor provided in an intake passageway of said internal-combustion engine; for sensing the amount of air being drawn in;

an air-fuel ratio sensor disposed in an exhaust pipe of said internal-combustion engine; and

(c) a fuel control means which calculates the amount of fuel required by said internal-combustion engine on the basis of the output of said hot-wire intake sensor, and controls said control valve to control said fuel supply means so as to supply the fuel to said internal-combustion engine, and, at the same time, receives the output of said air-fuel ratio sensor to provide negative feedback to compensate for



change in characteristic of said hot-wire intake sensor; said fuel control means including:

(i) memories and a writing means for writing in corresponding memories an amount of feedback correction corresponding to the output of said intake sensor at selected representative points, and

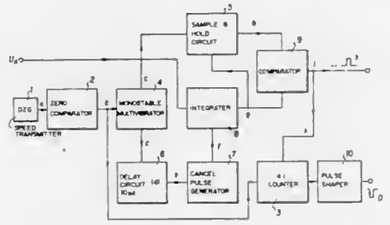
(ii) a correction means for correcting the setting of said control valve by interpolation operation from the output of said intake sensor and the content of memories corresponding to said representative points.

4,817,574

FEED SYSTEM FOR INJECTION NOZZLES

Gerhard Engel; Thomas Kütner; Rolf Stünkel, all of Stuttgart, and Rolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00257, § 371 Date Aug. 4, 1987, § 102(e) Date Aug. 4, 1987, PCT Pub. No. WO87/02418, PCT Pub. Date Apr. 23, 1987
PCT Filed Jun. 20, 1986, Ser. No. 66,358
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3536034
Int. Cl.[4] F02D *41/34, 41/36*
U.S. Cl. 123—494 14 Claims



1. A system for controlling the commencement (SB) of injection and the injection quantity for cylinders of a self-ignition internal combustion engine having a camshaft, a crankshaft, and means for sensing operational variables of the engine, comprising a reference pulse transmitter coupled to said crankshaft to generate a succession of reference pulses (R) to which the commencement of the fuel injection is related; a speed pulse transmitter coupled to said camshaft to generate

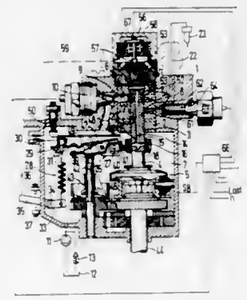
during each engine cycle a succession of speed pulses (D) and a synchronizing pulse (S); means for separating said speed pulses from said synchronizing pulse; and a computerized evaluation means having inputs connected to said sensing means, said reference pulse transmitter and to said separating means to compute in dependence on a distance between two consecutive speed pulses (D) immediately preceding a reference pulse (R) and on the engine variables an injection commencement point (SB), and further determining from said distance and said synchronizing pulse a cylinder pertaining to said commencement point.

4,817,575

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Gerald Höfer, Bad Aibling, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 31, 1987, Ser. No. 140,182
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 3703438
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—506 19 Claims



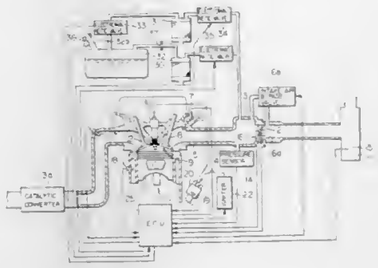
1. A fuel injection pump for internal combustion engines having a housing, a cylinder in said housing, a pump piston (4) driven to reciprocate and simultaneously rotate in said pump cylinder (3) and thereby serving as a fuel distributor, a pump work chamber (6) in the pump cylinder defined by said piston, which during a fuel supply stroke of the pump piston is made to communicate in succession, via one of a plurality of pressure lines (22) to a fuel injection valve (23), longitudinal intake grooves (8) disposed on the pump piston adjacent said work chamber, for communication during each intake stroke of the pump piston with a suction line (9) extending from a fuel-filled suction chamber (7) in said housing to said pump cylinder and said pump work chamber for controlling a fuel supply that is effective for injection during a supply stroke being permanently connected to a relief conduit (14) in said piston which discharges via an outlet opening (16) into the suction chamber (7), an annular slide (18) including a control edge (19) for controlling fuel injection controls discharge of fuel via said outlet opening in combination with the pump piston motion, a mechanical fuel injection quantity regulator (25) which adjusts said annular slide relative to said pump piston, a connecting conduit (53) which contains a first valve (52, 54) disposed between the pump work chamber (6) and a relief chamber, said connecting conduit (53) is opened at an onset of a supply stroke of said pump piston by said first valve (52, 54) and is closed after a predetermined stroke (h_v) of the pump piston and an electrically controlled second valve (56) provided in series with said first valve, said second valve being opened at a supply stroke onset and closable by an electric control unit as a function of operating parameters for a variably long time during the opening time of the first valve.

4,817,576

VAPORIZED FUEL CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Tomoaki Abe, Obu; Masashi Kiyono, Anjo, and Mitsunori Takao, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 20, 1987, Ser. No. 123,523
Claims priority, application Japan, Dec. 5, 1986, 61-290947
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—519 7 Claims



1. A vaporized fuel control apparatus for an internal combustion engine, which is adapted to discharge fuel vapor formed in a fuel tank into an intake system of an engine, said apparatus comprising:

a refuelling canister for adsorbing fuel vapor formed in said fuel tank during a refuelling thereof;

a running canister for adsorbing fuel vapor formed in said fuel tank during a running of said engine;

a first electromagnetic valve provided in a path for discharging the fuel vapor adsorbed by said refuelling canister into said intake system of said engine for selectively controlling said discharging;

a second electromagnetic valve provided in a path for discharging the fuel vapor adsorbed by said running canister into said intake system of said engine for selectively controlling said discharging;

first setting means for setting a valve duty cycle of said second electromagnetic valve;

second setting means for setting a valve duty cycle of said first electromagnetic valve at a value equal to one nth, where n is an integer not smaller than 2, of the valve duty cycle of said second electromagnetic valve set by said first setting means; and

output means for outputting electrical signals to said first and to said second electromagnetic valves in parallel, one of said electrical signals being representative of said valve duty cycle of said first electromagnetic valve set by said second setting means, and an other electrical signal representative of said valve duty cycle of said second electromagnetic valve set by said first setting means respectively.

4,817,577

BREAKERLESS IGNITION SYSTEM WITH ELECTRONIC ADVANCE

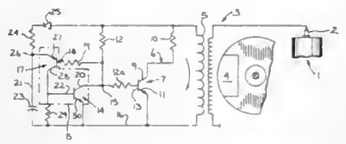
Richard A. Dykstra, Cedar Grove, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Feb. 18, 1988, Ser. No. 157,374
Int. Cl.[4] F02P *5/04, 1/00, 11/00*
U.S. Cl. 123—651 27 Claims

1. A breakerless ignition system for an internal combustion engine, comprising a generator having a rotating magnet means periodically coupled to a primary winding and generating an alternating current output including a leading pulse signal and a following pulse signal of opposite polarity interconnected to form a periodic output signal and operable to generate a firing voltage pulse upon interruption of said output signal, a switching power transistor means having a collector

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and an emitter and an input base, a control switch means connected to said input base to turn said power transistor means off, a voltage dropping means connected in series with said collector to enhance system operation at low engine speeds, and a full wave bridge rectifier with diode elements connected



between said primary winding and said collector-to-emitter of said power transistor means, said voltage dropping means being one of said diode elements connected in series with the said collector and introducing said voltage drop into said circuit.

4,817,578

INTERNAL COMBUSTION ENGINE

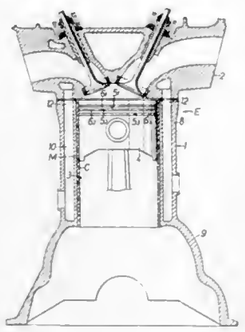
Hideaki Ushio; Tadayoshi Hayashi; Kazuo Shibata; Yoshikazu Fujisawa, and Tsunehisa Hata, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1987, Ser. No. 80,495

Claims priority, application Japan, Jul. 31, 1986, 61-180954; Aug. 1, 1986, 61-118664[U]; Aug. 1, 1986, 61-181593; Aug. 4, 1986, 61-183183; Sep. 11, 1986, 61-214264; Oct. 9, 1986, 61-240979; Nov. 19, 1986, 61-176580; Feb. 16, 1987, 62-31510; Mar. 16, 1987, 62-37253[U]; Apr. 14, 1987, 62-91437; Apr. 14, 1987, 62-91438

Int. Cl.[4] F16J *9/28;* **F02F** *1/18, 5/00*

U.S. Cl. 123—668 **74 Claims**



1. An internal combustion engine comprising a cylinder block made of a light-alloy and having a wall with a cylinder bore for slidably receiving a piston with a piston ring thereon, comprising, the wall having a cylindrical fiber-reinforced portion formed of a mixture of an alumina-based fiber and a carbon fiber with a light-alloy matrix; said alumina-based fiber having a fiber volume fraction set in a range of 8 to 20%; and said carbon fiber having a fiber volume fraction set in a range of 0.3 to 15%, an average aspect ratio set in a range of 10 to 100, and a Young's modulus set in a range of 20 to 30 t/mm^2.

4,817,579

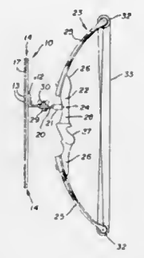
CAMOUFLAGE SHIELD FOR ARCHERS

Ralph R. Mathias, 1200 Chavel Dr., East Liverpool, Ohio 43920

Filed Jan. 28, 1988, Ser. No. 149,481

Int. Cl.[4] F41B *5/00;* **A01M** *31/02*

U.S. Cl. 124—23 R **4 Claims**



1. An improvement in a camouflage device attachable to an archer's bow having a riser and outwardly extending limbs attached thereto, the improvement comprising a foldable upright frame with a centrally positioned upright frame member having upper and lower ends and a section of camouflage fabric material having an opening therein secured to said foldable upright frame, a two part support arm, a first part of which is attached to said centrally positioned upright frame member and a second part of which is attached to said riser, means pivotally and adjustably securing said first and second parts of said two part support arm to one another whereby said camouflage device may be moved from a first position at a right angle to said riser and limbs of said bow to a second position at either side of said riser and limbs of said bow, said foldable upright frame comprising a pair of oppositely disposed generally C-shaped upright frames having spaced ends, said spaced ends pivotally attached to said upper and lower ends of said centrally positioned upright frame member whereby said camouflage device may be arranged in a narrow vertical shape, a V-shape and a flat shape.

4,817,580

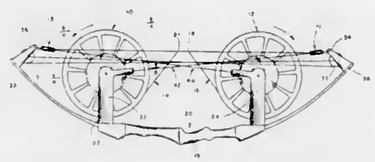
COMPOUND BOW

Waldo K. Butterfield, Butterfield La., Strathan, N.H. 03885

Filed Jun. 6, 1988, Ser. No. 202,327

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—23 R **4 Claims**



1. A leverage-increasing device for use on a compound bow of the type having a pair of bow limbs on both sides of a handgrip area and a bowstring extending betweeen the bow limbs ends, said bowstring having a central point of arrow notch engagement, comprising:

a first and second bracket mounted on said bow, said first bracket disposed above said handgrip and said second bracket disposed below said handgrip:

a first and second wheel, each having a central axis, each rotatably mounted through their central axis on said first and second brackets respectively, said first and second wheels being mounted in an aligned position with said bow;

a first and second attachment member each interconnected with and positioned near said central axis of said first and second wheels respectively;

a first and second cable, each having a first and second end, each cable having its first end attached to a point on the outer periphery of each wheel respectively, each of said cables extending around a portion of the perimeter of each wheel and each cable attached at their second end to said bowstring one above and one below the point of arrow notch engagement adapted when said bowstring is pulled for said first and second cables to move rearward rotating said first and second wheels from a first position to a second position of rotation;

a third and fourth cable, each having a first and second end, each of said cables' first ends attached respectively to said first and second attachment members near the axis of each of said wheels, said third and fourth cables extending and having their second ends attached to each of said bow limb ends on the opposite side of said handgrip from said wheel to which said first cable end is attached respectively, said attachment members being rotated as said first and second cable are pulled when drawing the bowstring thus rotating said wheels to their second positions, such rotation causing said third and fourth cables to be pulled by said attachment member's movement, such third and fourth cable movement pulling the bow ends inward by the tension of such third and forth cable's pulling thereon;

release means to release the tension on said third and fourth cables when the bowstring is fully drawn; and

means to rotate said first and second wheels to their first positions after said tension of said third and fourth cables is released to rewind said first and second cables back around said first and second wheels.

4,817,581

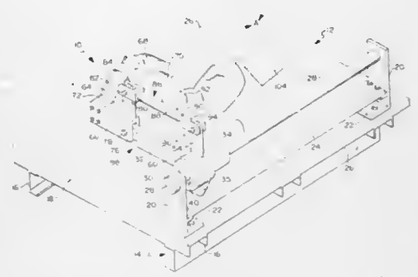
ADJUSTABLE SUPPORT FOR CUTTING APPARATUS

Frederick Trentadue, Olathe, Kans., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Feb. 10, 1988, Ser. No. 154,269

Int. Cl.[4] B28D *1/04*

U.S. Cl. 125—14 **10 Claims**



1. An apparatus for guiding a cutting tool through a linear cutting stroke, comprising:

workpiece support means having a support surface for supporting a workpiece during said cutting stroke;

linear guide means for accurately guiding said cutting tool through said linear cutting stroke, said linear guide means being operatively associated with said workpiece support means;

pivot means operatively associated with said linear guide means; and

linkage means pivotally connected to said pivot means for interconnecting said cutting tool with said linear guide means, said linkage means comprising a first link disposed substantially perpendicular to said support surface of said workpiece support means for maintaining said cutting tool substantially perpendicular to said support surface of said workpiece support means during pivotal movement of said linkage means.

4,817,582

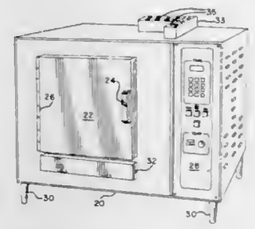
GAS COMBINATION OVEN

G. Robert Oslin, and Stewart C. Jepson, both of Chicago, Ill., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Sep. 17, 1987, Ser. No. 97,842

Int. Cl.[4] A21B *1/00*

U.S. Cl. 126—21 A **17 Claims**



1. A combination cooking oven that is heated by gas comprising:

an enclosure;

an oven inner chamber in said enclosure that is substantially a rectangular parailelpiped defined by a top plate, a bottom plate, a side wall that includes a plurality of apertures, a fan shroud, a rear wall and a front wall that includes a door, the shroud spaced from the enclosure to form a plenum, the top plate, bottom plate and side wall spaced from the enclosure to form with the rear wall and the front wall a heat-exchange region;

a plurality of fire tubes disposed in the heat-exchange region;

a plurality of gas burners disposed to heat the fire tubes by passing hot combustion products through the fire tubes, and a second and third gas burner heating another of said serpentine compartments:

a fan disposed in the shroud to circulate gases and vapors through the oven inner chamber, the heat-exchange region and back to the oven inner chamber through the apertures in the side wall;

means for supplying steam to the oven inner chamber comprising a boiler having a plurality of gas burners disposed to send hot combustion products through a vertical array of serpentine channels in a fire tube within a chamber having a water inlet and a steam outlet, wherein at least one channel is heated by two burners;

mean for sensing temperatures in the oven inner chamber and in the means for supplying steam; and

means responsive to the means for sensing temperatures for controlling the oven in heated air, steam and combination cooking modes.

4,817,583

INSECT GUARD FOR A GAS APPLIANCE

Joseph J. Hanagan, Freeport, and Doyle Raymer, Davis, both of Ill., assignors to King-Seeley Thermos Co., Prospect Heights, Ill.

Division of Ser. No. 943,122, Dec. 17, 1986, Pat. No. 4,747,391. This application Mar. 10, 1988, Ser. No. 166,197

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—41 R **4 Claims**

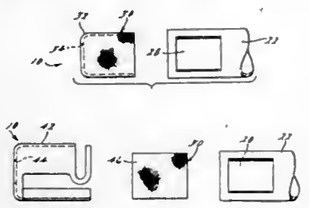
4. In a gas burner apparatus having a venturi tube with a

primary air intake end, an insect guard for preventing the nesting of insects in the venturi tube comprising:

an air intake opening defined in said air intake end of said venturi tube;

a shutter means adjustably positioned on said air intake end for adjustably blocking at least a portion of said air intake opening;

a screen disposed on said shutter means, said screen having a plurality of apertures each being of a fixed size small enough to prevent passage therethrough by an insect sought to be prevented from nesting;



said screen being positioned immediately adjacent said air intake opening to prevent passage of an insect through said air intake opening;

a fuel dispensing nozzle and wherein said shutter means has a means for receiving said nozzle and wherein said insect guard further comprises means for forming a seal between said nozzle and said means for receiving said nozzle to prevent passage of an insect through said means for receiving said nozzle

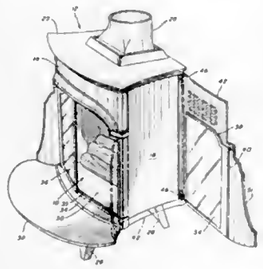
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4,817,584

WOOD BURNING STOVE WITH CONCEALABLE DOORS

Allan S. Wilker, Brookfield, Vt., assignor to Vermont Castings, Inc., Randolph, Mass.

Filed Mar. 13, 1987, Ser. No. 25,490
Int. Cl.⁴ F24B 3/00; F23M 7/00
U.S. Cl. 126—66 **16 Claims**



1. A stove for burning solid fuels or gas logs comprising:

a combustion chamber defined by a frame assembly including front, side, rear, top and bottom walls, one of said walls having an opening for viewing of the combustion chamber and for access to the combustion chamber;

door means including at least one vertically hinged door movable between a closed position in which it covers at least a part of said opening, an open position which permits access to said combustion chamber through said opening and a concealed storage position; and

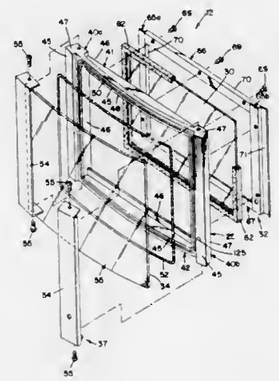
door concealment means coupled to said frame assembly for retaining said door in the storage position so that it is completely concealed from view, said door concealment means including a side panel hinged to said frame assembly, said door means being hinged to said side panel, and a storage compartment for said door means being defined between said side panel and said frame assembly.

4,817,585

FIREBOX DOOR ARRANGEMENT

Richard D. Craver, Marshalville, Ohio, assignor to Orrville Products, Inc., Orrville, Ohio

Filed Jun. 1, 1987, Ser. No. 56,046
Int. Cl.⁴ F23M 7/02
U.S. Cl. 126—200 **14 Claims**



1. A door in combination with an opening for a firebox and the like comprising:

an outer glass pane having a periphery defined by vertically-extending right hand and left hand edge surfaces contiguous with longitudinally extending top and bottom edge surface;

a spacer frame having vertically-extending right hand and left hand channel portions and longitudinally extending top and bottom channel portions, said top and bottom channel portions connected at their ends to the ends of said right and left hand portions to define a contiguous, open spacer frame, each channel portion of said spacer frame having an inner face surface adapted to face said opening, an outer face surface removed from said opening formed by said spacer frame and an outer edge surface defining the exterior surface of said spacer frame;

outer sealing means for thermally sealing said outer glass pane to said outer face surfaces with said top and bottom edge surfaces of said outer glass pane generally flush and aligned with said outer edge surfaces of said top and bottom channel portions of said spacer frame, said outer sealing means including outer retainer means overlying only at least portions of said right hand and said left hand portions of said spacer frame to effect said thermal seal while exposing a substantial portion of said top and bottom edge surfaces of said outer glass pane whereby said top and bottom edge surfaces of said outer glass pane defines the top and bottom of said door;

hinge means for adjustably securing said door to said opening;

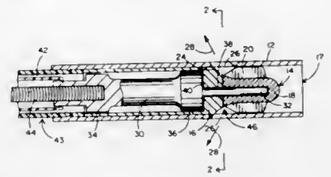
latch means for locking said door in a closed position in said opening.

4,817,586

PERCUTANEOUS BLOOM PUMP WITH MIXED-FLOW OUTPUT

Richard K. Wampler, Gold River, Calif., assignor to Nimbus Medical, Inc., Rancho Cordova, Calif.

Filed Nov. 24, 1987, Ser. No. 124,560
Int. Cl.⁴ A61F 1/24
U.S. Cl. 600—16 **6 Claims**



1. An intravascular axial flow blood pump, comprising;

(a) an elongated substantially tubular housing of substantially constant diameter having a blood intake at one end thereof;

(b) a rotor disposed in said housing adjacent said one end, said rotor including

(i) a hub carrying rotor blades and having a diameter substantially smaller than the inside diameter of said housing;

(ii) a journal positioned adjacent the other end of said housing and having a diameter substantially equal to the inside diameter of said housing; and

(iii) drive means associated with said journal for driving said rotor; and

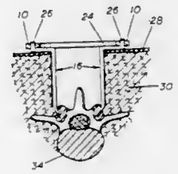
(c) said housing having blood exit apertures therein disposed around the periphery thereof between said blades and said journal.

4,817,587

RING PARA-SPINAL RETRACTOR

Woodrow W. Janese, 2806 N. Navarro, Suite M, Room B, Victoria, Tex. 77901

Filed Aug. 31, 1987, Ser. No. 91,811
Int. Cl.⁴ A61B 17/02
U.S. Cl. 128—20 **7 Claims**



5. In a para-spinal retractor (of the type), for retracting and holding apart tissue adjacent the spinal column during surgery, including a generally flat elliposoidal ring and a plurality of elongate retractor blades attachable to the ring, the improvement comprising:

each blade having a traction part arranged to be inserted into and rotated to a vertical position in an incision adjacent the spine,

a facet portion extending downwardly from and at an angle towards the interior of the ring from the traction part, and arranged for insertion in the tissue of the spinal column prior to rotation of the blade,

a skin surface part of the blade extending perpendicular to the traction part and away from the incision,

a ring coupling part of the blade, extending upwardly perpendicular to the skin surface part, and having a generally rectangular cross-section, and

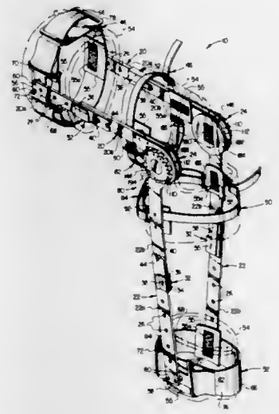
the ring having a plurality of rectangular openings, arranged perpendicular to the ring, and sized to closely, yet slidably, engage the ring coupling part and rest on the skin surface part of the blade, when the traction part of the blade is vertical.

4,817,588

MOTION RESTRAINING KNEE BRACE

Gary R. Bledsoe, Grand Prairie, Tex., assignor to Medical Technology, Inc., Grand Prairie, Tex.

Filed Jul. 1, 1987, Ser. No. 68,931
Int. Cl.⁴ A61F 5/00
U.S. Cl. 128—80 C **38 Claims**



1. Motion restraining knee brace apparatus comprising:

first and second elongated thigh support members respectively positionable to extend along first and second lateral sides of a thigh portion of a human leg;

first and second elongated calf support members respectively positionable to extend along first and second lateral sides of a calf portion of the leg, each of said thigh and calf support members having:

a first longitudinal section having an opening means formed therein,

a second longitudinal section having protruberance means formed thereon for releasable insertion, in a first lateral direction, into a selected portion of said opening means to selectively vary the length of the support member, and to longitudinally and pivotably lock said first and second longitudinal sections thereof, and

retaining means carried by one of said first and second longitudinal sections for movement relative thereto between a first position in which said first and second longitudinal sections may be separated in said first lateral direction, and a second position in which said retaining means prevent their separation in said first lateral direction;

connecting means for operatively securing said thigh and calf support members to the leg, said connecting means including:

first strap means interconnectable between said thigh support members and adapted to generally encircle said thigh portion of the leg, and

second strap means interconnectable between said calf support members and adapted to generally encircle said calf portion of the leg;

first hinge means, positionable adjacent a knee portion of the leg, for pivotably interconnecting facing end portions of

said first thigh support member and said first calf support member;

second hinge means, positionable adjacent said knee portion of the leg, for pivotably interconnecting facing end portions of said second thigh support member and said second calf support member, each of said first and second hinge means being adjustable to selectively limit the relative pivotal movement of its associated support members to a predetermined angular range extending between selectively variable extension and flexion limit angles, each of said first and second hinge means including:

base means,

a duality of stop members each carried by said base means for translational movement relative thereto into a selected one of a series of positions thereon,

adjustment means, carried by said base means for movement relative thereto, and

cooperating means on said base means, said duality of stop members and said adjustment means for sequentially:

causing said adjustments means, during a first movement thereof relative to said base means, to engage a selected one of said duality of stop members and move it away from an initial position thereof on said base means,

permitting the stop member moved by said adjustment means to be manually moved to a second position on said base means, and

locking the manually moved stop member on said base means in said second position on said base means,

first attachment means for anchoring an end portion of one of the support members associated with the hinge means to its base means, and

second attachment means for connecting an end portion of the other of the support members associated with the hinge means to its base means for pivotal motion relative thereto between and into motion-limiting engagement with the first and second stop members carried thereby; and

flexible restraining means, carried by said thigh and calf support members, for inhibiting extension of the leg beyond said extension limit angle, said flexible restraining means being:

positionable entirely posteriorly of the leg,

configured to longitudinally span and exert pressure against a posterior longitudinal portion of the leg extending from longitudinally above the knee to longitudinally below the knee, and having opposite end portions positioned and configured to laterally span and exert pressure against opposite ends of said posterior longitudinal portion, in response to extension of said leg,

operative to be progressively and uniformly loosened along said posterior longitudinal portion by said thigh and calf support members as the leg is flexed toward said flexion limit angle, and

operative to be progressively and uniformly tightened against said posterior longitudinal portion by said thigh and calf support members as the leg is extended toward said extension limit angle.

4,817,589

FOOT SUPPORT DEVICE FOR IMPROVED AMBULATION

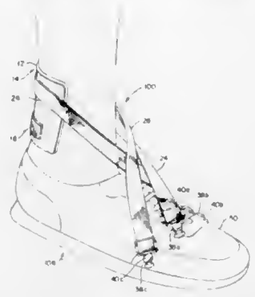
Larry W. Wertz, 3301 Bayshore Blvd., Apt. 2310, Tampa, Fla. 33629

Filed Aug. 27, 1987, Ser. No. 89,816
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—80 E **22 Claims**

1. A foot support device comprising:

a substantially rigid support member adapted to engage only a posterior portion of a leg of a person at a posterior ankle section of said leg;

a plurality of strap means for assisting said foot in dorsiflexion and eversion movements, said strap means being connected to said support member, said strap means being so constructed and arranged that said strap means are disposed to be releasably attached to a shoe worn on a foot of said person, at least a first one of said strap means extending from an upper portion of said support member around an inside portion of said leg to an outer part of said shoe,



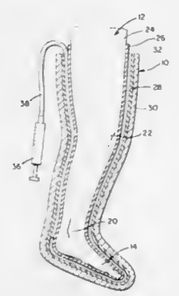
at least a second one of said strap means extending from said upper portion of said support member around an outside of said leg to an inner part of said shoe and at least a third one of said strap means extending from a lower portion of said support member around an inside of said leg to a predetermined attachment point at substantially an outer edge of said shoe.

4,817,590

CAST AND METHOD OF ASSEMBLY ON A LIMB

William C. Stancik, Jr., 1019 Felder Ave., Montgomery, Ala. 36106

Filed Apr. 9, 1987, Ser. No. 37,391
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—90 **4 Claims**



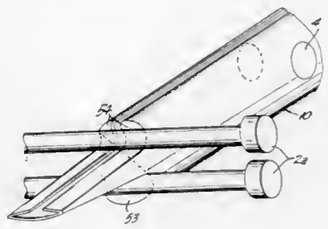
1. A cast for immobilizing and stabilizing a fracture site comprising a rigid outer shell of unitary construction of hardenable material adapted to conform with, support and stabilize a fracture site at the time of an original fracture when the limb is swollen, a buffer adapted to be positioned between the cast and limb, said buffer being resilient and adapted to snugly engage the exterior of the limb and adapted to follow the limb away from the cast as the limb reduces in cross-sectional area, a liner on the inner surface of said rigid cast in engagement with the buffer when the cast is initially applied to a swollen limb with the liner staying against the inner surface of the cast, and a filler of flowable and hardenable material adapted to support the limb and adapted to be injected into and fill the space between the liner on the inner surface of the rigid cast and the buffer which followed the limb as the limb reduced in size due to reduction in swelling or atrophy of the muscles for maintaining optimum support and stability of the fracture site subsequent to the rigid cast being placed on the fracture site.

4,817,591

INTRAMEDULLARY NAIL

Kaj Klaue, Bern, Switzerland, assignor to Synthes, Paoli, Pa.

Division of Ser. No. 733,930, May 14, 1985, Pat. No. 4,705,027.
This application Aug. 6, 1987, Ser. No. 82,217
Claims priority, application Switzerland, May 14, 1984, 2385/84
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YZ **2 Claims**



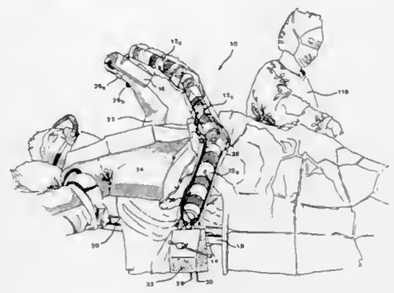
1. An intramedullary buttressing nail for stabilizing the position of bone fragments subsequent to the reduction of a bone fracture, said nail having a main body, a head and a tip for insertion into the medulla of a bone along the axis of the bone, the tip of said nail having a portion which is reduced in cross-sectional area with respect to the main body for insertion between two bolts previously inserted through the bone approximately parallel to one another and transverse to the long axis of the bone on the distal side of the fracture, said nail further having opposing shoulders at the juncture of said reduced portion and said main body of said nail, said shoulders being inwardly arcuately curved to seat said transverse bolts, thus limiting travel of the distal fragment of the bone in the proximal direction to avoid shortening of the bone during healing; and means in said nail for receiving a further bolt for fixing said nail relative to the bone.

4,817,592

TOROIDAL SURGICAL SHIELD

Geoffrey F. Auchinleck, Vancouver; James A. McEwen, Richmond; John C. Osborne, Port Coquitlam, and Carlo R. Bussani, Burnaby, all of Canada, assignors to Andronic Devices, Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 6,131, Jan. 23, 1987. This application Dec. 22, 1987, Ser. No. 137,252
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—855 **7 Claims**



1. Apparatus for forming a sterile barrier around a body part or the like, comprising:

(a) an elongated tube of sterile flexible material, gathered together into a toroidal shape; and

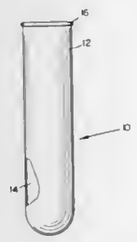
(b) removable impervious material enclosing the toroidal shaped tube such that the body part can be passed through the tube while the tube is enclosed by the removable impervious material.

4,817,593

PROCESS FOR PREPARATION OF POLYURETHANE CONDOMS

Robert A. Taller, and Charles W. McGary, Jr., both of Centerville, Ohio, assignors to Deseret Medical Inc., Franklin Lakes, N.J.

Division of Ser. No. 903,822, Sep. 2, 1986, Pat. No. 4,684,490, Continuation of Ser. No. 555,861, Nov. 28, 1983, abandoned.
This application Apr. 27, 1987, Ser. No. 43,061
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.
Int. Cl.[4] A61F *13/00, 5/44*
U.S. Cl. 128—844 **8 Claims**



1. Condoms consisting of a cross-linked thermoset polyurethane having a uniform wall thickness within the range of between about 2.2 and 2.8 mils obtained from a single dipping bath according to the process characterized by the steps of

(a) setting up a single dipping bath, said bath comprising

(1) a solvent solution of a polyurethane polymer or prepolymer;

(2) said polymer or prepolymer being the reaction product of a polyisocyanate and at least one long chain polyol;

(3) said polyol being amorphous and non-crystalline at room temperature and having an average molecular weight within the range of between about 500 and 6000;

(4) said polyol having an average hydroxy number of within the range of between about 225 and 22.4; and

(5) said polyisocyanate having an NCO/OH ratio of within the range of between about 0.95/1 and 1.1/1;

(b) dipping molds on which condoms are to be formed in said single dipping bath for a period of time within the range of between about 30 and 60 seconds for depositing a polyurethane film in the form of a condom on each of said molds;

(c) withdrawing said molds from said single dipping bath at the rate of within the range of between about 16 and 90 centimeters per minute;

(d) curing said deposited film in the form of a condom on each of said molds by exposure to elevated temperatures for a time sufficient to effect said cure;

(e) cooling the said cured film on said molds;

(f) forming an integral cuff at the base of the said film on each of said molds; and

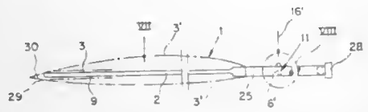
(g) removing said deposited film in the form of a condom with an integral cuff from each of said molds.

4,817,594
WOUND DRESSINGS WITH ELECTRICALLY CONDUCTIVE LAYERS
Laszlo Juhasz, 18 Clovelly Avenue, London, Great Britain (NW9 6DT)
PCT No. PCT/GB86/00218, § 371 Date Dec. 9, 1986, § 102(e) Date Dec. 9, 1986, PCT Pub. No. WO86/05971, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 18, 1986, Ser. No. 2,665
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 8509978
Int. Cl.⁴ A61F *13/00, 15/00*
U.S. Cl. 128—155 **27 Claims**



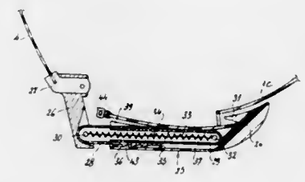
1. An integral anti-bacterial wound dressing which comprises, five layers which are, in order except that layers (3) and (4) may be in either order,
(1) a first layer of a permeable material;
(2) a layer of semi-permeable material;
(3) a layer of an electrically-conductive material, in the form of an open mesh;
(4) a layer of charcoal fabric; and
(5) a non-adherent wound-facing second layer of a permeable material;
in which layers (1), (2) and (5) are substantially co-extensive and surround the charcoal fabric (4), and are bound together in the surrounding area.

4,817,595
VALVE FOR PRESSURE BANDAGE (FOR THE STAUNCHING OF A BLEEDING EXTERNAL WOUND)
Walter B. Maass, Hohenlohestrasse 26, 2800 Bremen, Fed. Rep. of Germany
PCT No. PCT/EP86/00176, § 371 Date Mar. 12, 1987, § 102(e) Date Mar. 12, 1987, PCT Pub. No. WO86/05385, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 24, 1986, Ser. No. 16,719
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 3510667
Int. Cl.⁴ A61F *13/00*
U.S. Cl. 128—155 **31 Claims**



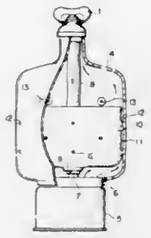
1. A pressure bandage for the staunching of bleeding external wounds, comprising:
a hollow, gas-tight compress for covering the wound to be dressed, said compress having at least one elastically deformable wall section;
a fluid feed line for introducing a fluid into said compress to pressurize said compress;
a valve seat disposed in said fluid feed line; and
a flexible valve disc having an outer edge provided with a first part connected to the valve seat and a second part capable of being moved into contact with and away from the valve seat, the valve disc being pressed in a circumferentially sealing manner against the valve seat when the internal pressure of the compress exceeds external pressure in the fluid feed line, the unconnected part of said valve disc being forced out of contact with the valve seat when external pressure in the fluid feed line exceeds the pressure in the compress, thereby permitting pressurizing of the interior of the compress, the unconnected edge section being provided with a handle whereby the unconnected edge section can be moved out of contact with the valve seat to relieve pressure within the compress.

4,817,596
HELMET FOR USE WITH RESPIRATOR MASK
Adrien Gallet, Chatillon-sur-Chalaronne, France, assignor to Gallet S.A., Chatillon-sur-Chalaronne, France
Filed Sep. 6, 1983, Ser. No. 529,617
Claims priority, application France, Sep. 3, 1982, 82 15389
Int. Cl.⁴ A62B *18/00*
U.S. Cl. 128—201.24 **8 Claims**



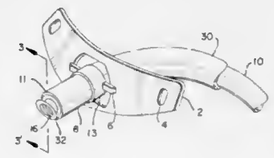
1. In combination, a helmet comprising
a rigid double-walled shell having right and left sides and formed therebetween with a forwardly open face cutout and therebelow with a downwardly open neck opening;
means inside the shell for supporting same on the head of a wearer with the face cutout in front of the wearer's face and the neck opening around the wearer's neck;
respective right and left backwardly directed anchor elements fixed on the right and left sides of the shell outside the shell, the helmet being generally symmetrical about a vertical symmetry plane between the sides and bisecting the cutout and opening; and
an at least semitransparent lens pivotal on the shell between a down position in front of the upper portion of the face cutout and an up position lying above the face cutout between the walls of the shell; and
a respirator comprising
a mask engageable through the face cutout snugly with the face of the wearer of the helmet;
respective right and left hooks engageable with the respective anchor elements and each including
a front part pivoted on the mask,
a rear part telescoping with the front part,
a forwardly hooked part carried on the rear part and engageable behind the respective anchor element when the mask is engaged through the face cutout with the face of the helmet wearer; and respective springs connected between the rear parts and the respective front parts, the springs being tensioned to telescope the rear parts forward into the respective front parts and thereby pull the mask back into the face cutout of the helmet and against the face of the user when the hook parts are engaged over the respective anchor elements and the mask is engaged through the face cutout with the helmet wearer, the respirator being substantially only connected to the helmet by the hooks.

4,817,597
SELF-CONTAINED CLOSED-CIRCUIT OXYGEN-GENERATING BREATHING APPARATUS
Shunji Tanaka, Hiratsuka, Japan, assignor to Japan Pionics, Ltd., Tokyo, Japan
Filed Jul. 20, 1987, Ser. No. 75,763
Claims priority, application Japan, Jul. 25, 1986, 61-113392
Int. Cl.⁴ A62B *18/02*
U.S. Cl. 128—205.17 **18 Claims**



1. An oxygen-generating breathing apparatus having an oxygen-generating agent which generates oxygen by reacting with carbon dioxide and moisture contained in exhalation gas exhalated by a user, comprising:
a face piece adapted to be placed on a face of the user to receive exhalation gas from the user and supply inhalation gas to the user;
an oxygen-generating canister containing the oxygen-generating agent and having an exhalation gas inlet and an oxygen-enriched gas outlet;
an exhalation gas passageway connecting the exhalation gas inlet of said canister to said face piece;
a breathing bag connecting the oxygen-enriched gas outlet of said canister to said face piece and retaining the oxygen-enriched gas therein for supplying a necessary amount of the oxygen-enriched gas to said face piece as the inhalation gas; and
partition means disposed in said breathing bag for defining a longitudinally elongated passage for the oxygen-enriched gas discharged from the oxygen-enriched gas outlet of said canister, said elongated passage extending along the length of said breathing bag along an inner surface of said breathing bag, so that heat of the oxygen-enriched gas is radiated through said breathing bag while the oxygen-enriched gas passes through said passage.

4,817,598
TRACHEOSTOMY TUBE WITH RING PULL REMOVABLE INNER CANNULA
Denis LaBombard, Georgetown, Mass., assignor to Portex, Inc., Wilmington, Mass.
Filed Jun. 8, 1987, Ser. No. 59,078
Int. Cl.⁴ A61M *16/00*
U.S. Cl. 128—207.14 **7 Claims**



1. A removable cannula system comprising:
an outer cannula having a first and second end;
an inner cannula having a first and second end, said inner cannula being interconnectable inside said outer cannula at said second ends;
first locking means disposed inside said outer cannula at said second end and second locking means disposed at said second end of said inner cannula for interconnecting said inner cannula inside said outer cannula; and,
grasping means for facilitating withdrawal of said inner cannula from said outer cannula, said grasping means including an annular ring with a hinge means connecting said annular ring to said inner cannula, said annular ring being alignable with an opening of said outer cannula at said second end and easily accessible to the fingers to be unfolded for pulling said inner cannula from said outer cannula.

4,817,599
TO AND FRO WASHING SYSTEM AND METHOD
Robert C. Drews, 211 N. Meramec Ave., Clayton, Mo. 63105
Filed Dec. 30, 1987, Ser. No. 139,730
Int. Cl.⁴ A61B *17/00*
U.S. Cl. 128—303 R **4 Claims**



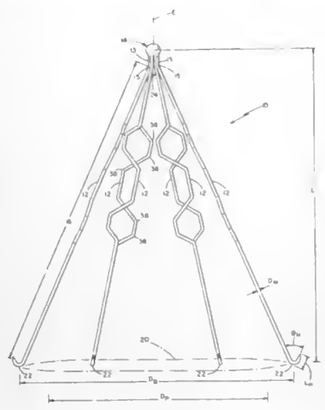
1. System for emulsifying cortex and/or nucleus in the capsular bag comprising:
a. a housing including a body member;
b. cannula means supported within said housing and including a configured hole at a tube end and a fluid port at a body member end;
c. motor means including peristaltic pump therein connected to said fluid port;
d. power means for said motor means; and,
e. motor control means connected between said motor means and said power means for reciprocally powering said motor means in a to and fro rotating action, whereby said to and fro rotating action provides a to and fro washing action that emulsifies the cortex and/or nucleus lens material in and out of said hole in said cannula.

4,817,600
IMPLANTABLE FILTER
James K. Herms, Watertown; Gaillard R. Nolan, Acton; Jonathan McGrath, Canton, and Mark J Tolkoff, Brookline, all of Mass., assignors to Medi-Tech, Inc., Watertown, Mass.
Filed May 22, 1987, Ser. No. 53,354
Int. Cl.⁴ A61B *17/00*
U.S. Cl. 128—303 R **18 Claims**

1. In a blood clot filtration device for filtering solid and semi-solid materials from a liquid moving along a vessel axis of a tubular vessel, said filtration device having a device axis and comprising:
a head; and
a plurality of legs having divergent leg portions, each said leg secured at one of its ends to said head and each having securing means on its end distal with respect to said head; and at least one generally U-shaped bend intermediate its end,
the improvement wherein,
said legs further comprises a first linear leg portion between said head and said divergent leg portion, said first linear

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leg portion having a predetermined length emanating distally from said head and, said first linear leg portion



being arranged parallel to said device axis of said filtration device.

4,817,601

CATHETER SYSTEM FOR CONTROLLED REMOVAL BY RADIANT ENERGY OF BIOLOGICAL OBSTRUCTIONS

Laurence A. Roth, Londonderry, N.H.; Stephen J. Herman, Andover, Mass.; Carl R. Turnquist, Concord, Mass.; Edward L. Sinofsky, Reading, Mass., and Jacob Y. Wong, Santa Barbara, Calif., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 708,826, Mar. 6, 1985, abandoned. This application May 6, 1987, Ser. No. 47,430

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **50 Claims**



1. A method for recanalizing an obstructed lumen by removing successive layers of biological obstructing material so as to form a hole through said material by application of radiant energy comprising:

providing a catheter having waveguide means, the catheter having a distally located emission aperture for emission of said radiant energy in a beam propagating along a beam axis, said emission aperture having cross-sectional dimensions corresponding substantially to cross-sectional dimension of the catheter;

inserting said catheter into said lumen to locate the emission aperture in proximity to the obstruction;

directing said radiant energy through the waveguide means to cause emission of said beam from said emission aperture;

controlling said emitted beam to define an unfocused working region extending distally from said emission aperture and around said axis in which the density of said energy is sufficient to cause said removal and so that portion of the beam which propagates distally beyond the working region will have insufficient energy density to cause said removal;

said working region defining a cross-section substantially large enough to enable the catheter to be passed through a hole formed by the working region, the working region having an axially depth not substantially greater than about cross-sectional dimension of the catheter;

applying the working region of the beam to the obstructing material thereby to form a hole by removal of said material to a depth no greater than about the axial extent of said working region; and

advancing said catheter through said hole.

4,817,602

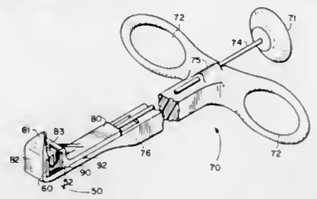
VASECTOMY INSTRUMENT

Dan Beraha, 912 Woodbriar Ct., Fort Walton Beach, Fla. 32548

Division of Ser. No. 643,496, Aug. 23, 1984, Pat. No. 4,682,598. This application Jan. 27, 1986, Ser. No. 822,376

Int. Cl.[4] A61B *17/12, 17/32*

U.S. Cl. 128—305 **10 Claims**



6. A disposable surgical instrument for applying a pair of spaced apart ligating clips onto a tubular vessel and excising a segment of the vessel therebetween comprising:

a disposable cutter and ligating clip module having a pair of spaced apart blocks, a first one of said pair of blocks having a pair of spaced apart cutting blades and a second one of said pair of blocks opposing said first block and having a cutting blade receiving surface, said blocks having grooves for holding a pair of spaced apart open ligating clips;

spacing means for spacing said first and second block apart including a pair of pins having proximal ends thereof anchored to said second block and extending between said second block and said first block, said pins having distal ends frictionally engaging said first block, said friction to be overcome by pressure tending to move said first block toward said second block;

a pair of open ligating clips disposed in said grooves; and

handle means having a pair of open closable jaws for holding said module, said handle means including closing means for closing said jaws when a tubular vessel is disposed within said open clips and between said cutting blades and said receiving block, thereby clamping said pair of clips onto the tubular vessel and excising a segment thereof between said clips.

4,817,603

LANCET DEVICE

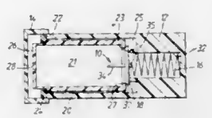
Robert C. Turner, and Rury R. Holman, both of Oxford, England, assignors to Glyme Valley Technology Limited, Woodstock, England

Filed Jul. 30, 1987, Ser. No. 79,381

Claims priority, application United Kingdom, Jul. 30, 1986, 8618578

Int. Cl.[4] A61B *17/34*

U.S. Cl. 128—329 R **10 Claims**



1. A lancet device comprising:

(a) a needle assembly having a lancet needle suitable for piercing human or other animal tissue;

(b) means defining a housing containing said lancet needle, said housing having a substantially closed front end wall with a first aperture therein, and an abutment surface in spaced relation with the end wall;

(c) sealing means for sealing said first aperture prior to operation of the lancet device;

(d) a single firable biassing spring positioned within said housing, said spring being capable of being under compression or tension, said spring having a first end in abutment with the lancet needle and a second end in abutment with the abutment surface in the housing opposite said front end wall and being freely extendable between the first and second ends thereof to move the lancet needle from a first position within said housing to a second position in which said lancet needle at least partially protrudes out of said housing through said first aperture to pierce the human or other animal tissue;

(e) means for initially retaining said single firable biasing spring under compression within the housing to hold said needle; and

(f) means for releasing the firable biasing spring from the retaining means to allow the lancet needle to move to the second position wherein, when said lancet is in said second position, said biasing spring is in over-extension under tension, and said biasing spring relaxes from being under tension so as automatically to retract said lancet needle from said second position to a location within said housing.

4,817,604

DISPOSABLE CHOLANGIOGRAM CLIP

Ray C. Smith, III, 7544 Iron Horse La., Indianapolis, Ind. 46256

Filed Sep. 11, 1987, Ser. No. 95,120

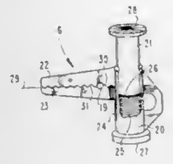
Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—346 **9 Claims**

1. A surgical tool comprising;

a clamp having a pair of mutually opposed distal ends and a pair of proximal ends releasably lockable to controllably space apart said distal ends;

a tissue clip having a first control end and a second control end lockingly but removably engagable with said distal ends of said clamp, said clip further having a pair of spring biased mutually opposed jaws controllably movable apart by movement of said first control end and said second control end with said jaws being movable from a open position to a closed position, at least one of said jaws including an aperture formed thereon through which a body tube may extend when said jaws are clamped onto tissue; and,



a catheter insertable through said aperture when said jaws are clamped onto tissue sealing same to said catheter and allowing fluid flow through said catheter while said clip is positioned thereon.

4,817,605

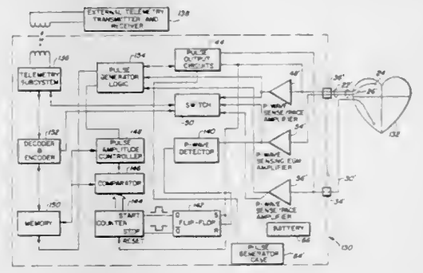
PACEMAKER SYSTEM AND METHOD FOR MEASURING AND MONITORING CARDIAC ACTIVITY AND FOR DETERMINING AND MAINTAINING CAPTURE

Jason A. Sholder, Canoga Park, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Division of Ser. No. 662,723, Oct. 19, 1984, Pat. No. 4,686,988. This application Mar. 19, 1987, Ser. No. 27,715

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PT **12 Claims**



9. A method of determining capture of stimulation pulses comprising the steps of:

(a) generating a stimulation pulse and applying it to a prescribed location to be stimulated;

(b) sensing electrical activity at a location spaced apart from the stimulating location of step (a);

(c) measuring the time delay between the application of the stimulation pulse of step (a) and the sensing of electrical activity of step (b); and

(d) adjusting the magnitude of the stimulation pulses until the time delay measured in step (c) for successive measurements is substantially the same and within a prescribed tolerance of an expected propagation time delay, denoting captured stimulation pulses.

4,817,606

BODY ACTIVITY CONTROLLED HEART PACER

Anders Lekholm, Bromma, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,552

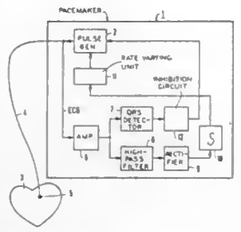
Int. Cl.[4] A61B *1/00;* **H05G** *00/00*

U.S. Cl. 128—419 PG **12 Claims**

1. A body activity-controlled device for pacing the heart of a patient, comprising:

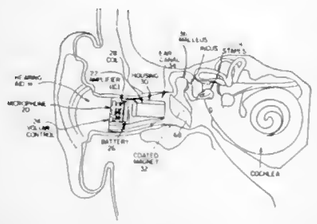
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pulse generating means for generating heart stimulation pulses at a basic rate;
means for sensing body activity which includes means for sensing myoelectrical signals from said patient;



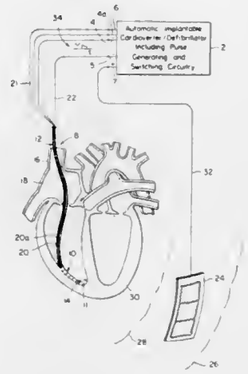
means connected to said means for sensing body activity for identifying said myoelectrical signals and generating a body activity signal based thereon; and
control means for controlling said pulse generating means to vary said basic rate as a function of said body activity signal.

4,817,607
MAGNETIC OSSICULAR REPLACEMENT PROSTHESIS
Gary Tatge, Germantown, Tenn., assignor to Richards Medical Company, Memphis, Tenn.
Continuation-in-part of Ser. No. 837,708, Mar. 7, 1986. This application May 15, 1987, Ser. No. 50,909
Int. Cl.[4] A61N *1/00*; H05G *1/00*
U.S. Cl. 128—419 R **12 Claims**



1. A middle ear ossicular replacement prosthesis for replacing at least a portion of the ossicular chain by making contact with two separated locations in the middle ear and for use with a hearing aid producing a magnetic field corresponding to sound waves received by the wearer, comprising:
a head portion adapted for contacting the tympanic membrane, said head portion including a magnet; and
a shaft portion adapted to extend from said head portion to a location in the middle ear,
wherein said head portion and said shaft portion are adapted to transmit to the inner ear the acoustically induced vibrations of the tympanic membrane received by said head portion and the magnetically induced vibrations developed by the coupling of the magnetic field produced by said magnet and the magnetic field produced by the hearing aid.

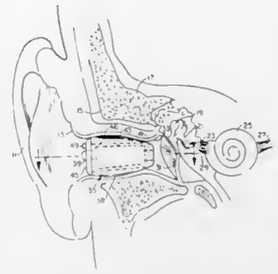
4,817,608
CARDIOVERTING TRANSVENOUS CATHETER/PATCH ELECTRODE SYSTEM AND METHOD FOR ITS USE
J. Edward Shapland, and Stanley M. Bach, Jr., both of Shoreview, Minn., assignors to Mieczyslaw Mirowski, Owings Mills, Md.
Filed May 29, 1987, Ser. No. 56,044
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 P **18 Claims**



1. In an automatic implantable cardioverter/defibrillator system for delivering electrical discharges to the heart of a patient to restore normal cardiac rhythm, the system including a pulse generator having terminals of opposite polarity for generating an electrical shock to implantable electrodes, the improvement comprising:
an intravascular catheter insertable within the heart of a patient having a first, distal electrode on the catheter for positioning in the right ventricle, and a second, proximal electrode on the catheter, spaced from the first electrode, for positioning in the superior vena cava region;
a subcutaneous patch electrode for positioning outside the thoracic cavity in the region of the left ventricle, said subcutaneous patch electrode being connected to a terminal of said pulse generator of one polarity;
electrical conducting means for electrically connecting together said first electrode and said second electrode, and connecting such electrodes to a terminal of said pulse generator of an opposite polarity; and
discharge means in said pulse generator for supplying electrical energy between said terminals of opposite polarity and hence between said subcutaneous patch electrode and the commonly connected first and second electrodes of said catheter to produce a uniform electric field across the heart with the majority of the electrical current of said electric field passing through both ventricles of the heart.

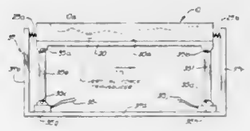
4,817,609
METHOD FOR TREATING HEARING DEFICIENCIES
Rodney C. Perkins, Woodside, and Jason L. Carlson, Portola Valley, both of Calif., assignors to Resound Corporation, Palo Alto, Calif.
Filed Sep. 11, 1987, Ser. No. 96,129
Int. Cl.[4] H04R *25/00*
U.S. Cl. 128—420.6 **3 Claims**
1. A method for treating hearing impairment in a human,

comprising, surgically substantially enlarging the external auditory canal in a region proximate the ear drum, and placing



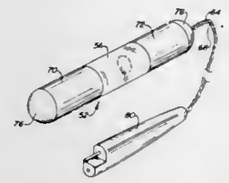
in said region an electronic hearing aid having an external housing molded to conform with the shape of said region.

4,817,610
METHOD OF DETERMINING CENTER OF GRAVITY AND BODY WEIGHT
Arnold St. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025
Division of Ser. No. 786,746, Oct. 11, 1985, Pat. No. 4,681,098. This application Jul. 15, 1987, Ser. No. 73,632
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—630 **3 Claims**



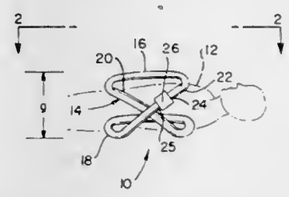
1. A method for determining the horizontal component of a subject's center of gravity and body weight, the method comprising the steps of:
placing the subject's body horizontally in a substantially rigid body mold having an impression exactly matching the dorsal half of the body, the body mold being supported by supporting members;
attaching a vertical force transducer to each of the supporting members; and
analyzing the amplified outputs of the force transducers to compute the subject's body weight and horizontal center of gravity.

4,817,611
ESOPHAGEAL ELECTROCARDIOGRAPHY ELECTRODE
Robert C. Arzbaecher, Chicago; D. J. Davis, Jr., Wheaton, and Mark P. Lowther, Barrington, all of Ill., assignors to Arzco Medical Electronics, Inc., Chicago, Ill.
Filed Nov. 13, 1986, Ser. No. 930,748
Int. Cl.[4] A61B *5/04*; A61N *1/05*
U.S. Cl. 128—642 **18 Claims**
1. An electrode suitable for swallowing by a patient comprising:
an elongated, molded, non-conducting body member, said body member being generally cylindrically-shaped, with a centrally located radially extending shoulder, said shoulder having an essentially cylindrical, exterior, peripheral surface;
first and second electrical conductors, each said conductor formed as a thin-walled, hollow cylinder said conductors carried by said body member spaced apart thereon so as to abut first and second ends of said shoulder;
said body member having first and second conductor locking end regions with each said end region having a generally curved exterior shape and with said locking end regions formed joined together as a single unitary member;



first and second elongated wire conducting members with each said wire conducting member electrically coupled to a respective conductor with a selected one of said wire conducting members extending, at least in part, substantially axially through said body member.

4,817,612
CROSS-COUPLED DOUBLE LOOP RECEIVER COIL FOR NMR IMAGING OF CARDIAC AND THORACO-ABDOMINAL REGIONS OF THE HUMAN BODY
E. William Akins, and Jeffrey R. Fitzsimmons, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.
Continuation of Ser. No. 896,234, Aug. 14, 1983, abandoned. This application May 18, 1988, Ser. No. 196,780
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 **6 Claims**

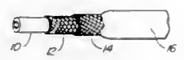


1. An NMR receiver coil structure for NMR imaging of cardiac and thoraco-abdominal regions of a human body, said coil structure comprising:
a coil, adapted to receive NMR signals, having at least two turns separated by a gap extending in a gap direction, said gap being sufficiently large to accommodate a human torso, said turns being cross coupled by crossed diagonal elements;
said coil being formed of a conductor which is tubular and of a material which has good electrical conductivity; and
a component unit located where said diagonal elements cross, said coil having terminal ends in one of said diagonal elements, said component unit being mounted to bridge said terminal ends, and said component unit including a capacitor electrically connected to the coil terminal ends to form a parallel resonant circuit, and wherein said crossed diagonal elements are located on a first side of said coil structure, said gap has a maximum at a second side of said coil structure opposite said first side of said coil structure, said coil structure has a third side and a fourth side, said gap direction being perpendicular to a first sideways direction extending between said first and second sides and being perpendicular to a second sideways direction extending between said third and fourth sides, said first

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sideways direction being perpendicular to said second sideways direction, and wherein said gap is completely open on said second, third, and fourth sides of said coil structure.

4,817,613
GUIDING CATHETER
Richard Jaraczewski, Livermore, and Mark E. Plaia, Santa Cruz, both of Calif., assignors to Devices for Vascular Intervention, Inc., Redwood City, Calif.
Filed Jul. 13, 1987, Ser. No. 72,439
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—658 32 Claims



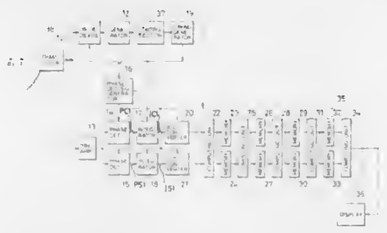
1. In a guiding catheter having distal and proximal ends and adapted for introduction into a vascular vessel,
an elongated tubular member having a slick interior surface,
a first torque transmitting layer tightly overlaying said elongated tubular member and formed of a flat braided material,
a second torque transmitting layer tightly overlaying said first torque transmitting layer and formed of a flat braided material, and
a flexible casing that encases and impregnates said first and second torque transmitting layers, said flexible casing being formed from a plurality of coatings having dissimilar durometers,
whereby said flexible casing is applied to the braided layers as a viscous material and then hardened so that it seals and covers the braided torque transmitting layers.

4,817,614
METHOD AND APPARATUS FOR ADAPTIVE FOCUSING IN A MEDICAL ULTRASOUND IMAGING APPARATUS
Dietrich Hassler, Uttenreuth; Heinz Eschenbacher, and Wolfgang Haerer, both of Erlange, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Aug. 19, 1987, Ser. No. 87,046
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1986, 3628220
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.05 20 Claims



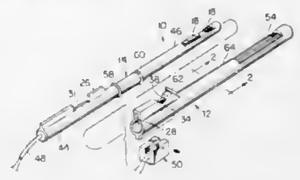
1. A method for generating an ultrasound B-image of an examination subject having acoustic inhomogeneities using an ultrasound array having a plurality of transducer elements, each transducer element having a variable delay associated therewith, including a delay used for a standard focusing of said ultrasound array, said method comprising the steps of:
scanning a sectional plane of said examination subject with focused ultrasound beams from said ultrasound array in an adaptation phase;
measuring, in said adaptation phase, echo signals reflected by said examination subject using a selected active aperture, said echo signals being disturbed by the acoustic inhomogeneities in said examination subject;
calculating correction values for the delay of each of said element in said ultrasound array from the delays used for said standard focusing based on the measured values obtained in said adaptation phase; and
scanning said examination subject with said ultrasound array using the delays calculated based on said correction values and the delays used for said standard focusing to compensate for said disturbances caused by said acoustic inhomogeneities to obtain further echo signals; and
generating a standard B-image from said further echo signals.

4,817,615
ULTRASONIC TEMPERATURE MEASUREMENT APPARATUS
Hiroshi Fukukita; Shinichiro Ueno, both of Tokyo; Masayuki Tone, and Tsutomu Yano, both of Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Dec. 12, 1986, Ser. No. 941,221
Claims priority, application Japan, Dec. 13, 1985, 60-281336; Mar. 28, 1986, 61-71537; Mar. 28, 1986, 61-71538; Mar. 28, 1986, 61-71539; Mar. 28, 1986, 61-71540; Mar. 28, 1986, 61-71542
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.02 8 Claims



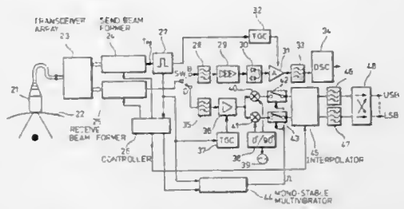
1. An ultrasonic measuring apparatus comprising:
ultrasonic transducer means driven in reponse to a plurality of frequencies for receiving ultrasonic waves reflected from a body to be examined and for converting the reflected ultrasonic waves into electric signals;
phase detecting means for phase-detecting the signal from said ultrasonic transducer means in synchronism with the frequencies;
timing generator means for generating a plurality of gate intervals in synchronism with the driving of said ultrasonic transducer means; and
computing means for obtaining phase differences at the plurality of gate intervals for the plurality of frequencies in accordance with an output of said phase detecting means indicative of the result of the phase-detection and for computing a dispersion data, which is a variation component of the phase difference between the frequencies, and the relative variation between the dispersion data.

4,817,616
AUTO SWITCH BIPLANE PROSTATE PROBE
Albert Goldstein, Ann Arbor, Mich., assignor to Wayne State University, Detroit, Mich.
Filed Oct. 30, 1987, Ser. No. 114,501
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—662.06 15 Claims



15. An ultrasound probe (**10**) comprising: an outer casing (**12**) having a longitudinal axis and a unitary scanning position therein, support means (**14**) mounted within said outer casing (**12**) for supporting more than one scanning means (**16,18**) aligned on said longitudinal axis; a plurality of scanning means (**16,18**) mounted on said support means (**14**) along said longitudinal axis for respectively ultrasound scanning different planes (**23,25**) of an adjacent object (**20**) when positioned at said unitary scanning position; shifting means for shifting said support means (**14**) axially within said outer casing (**12**) independently of said unitary scanning position of said outer casing (**12**) and moving one of said scanning means (**16,18**) into said unitary scanning position; and registry means for setting any of said scanning means at said scanning position.

4,817,617
DIAGNOSTIC IMAGING APPARATUS
Yasuhito Takeuchi; Takao Higashiizumi; Hideya Akasaka; Takao Jibiki, and Shinichi Sano, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan
Continuation of Ser. No. 844,179, Mar. 13, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 171,191
Claims priority, application Japan, Jul. 16, 1984, 147080
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.05 3 Claims



1. A diagnostic imaging apparatus for multibeam reception from a plurality of acoustic scan lines, said apparatus comprising
a common transducer means for scanning a plurality of scan lines;
control means;
first means under the control of said control means for applying ultrasonic wave pulses of multiple beams to said transducer means to radiate an object body under diagnosis through said plurality of scan lines;
second means under the control of said control means for receiving echo signals from said transducer means resulting from echo signals emanating from said body in response to said multiple beams of ultrasonic pulses, said echo signals comprising successive cycles of a plurality of Doppler components and a single 2-dimensional B-mode component in each cycle;
demodulator means;
2-dimensional B-mode imaging means;
switching means under control of said control means for selectively connecting said second means to said imaging means during a time said echo signals comprise said 2-dimensional B-mode component, and for selectively connecting said second means to said demodulator means during a time said echo signals comprise said plurality of Doppler components;
wherein said 2-dimensional B-mode imaging means after connecting by said switching means to said second means processes said 2-dimensional B-mode component outputted from said common transducer means and said second means, into signals for registering;
wherein said demodulator means after connecting by said switching means to said second means generates demodulating signals based on the Doppler components outputted from said common transducer means and said second means;
sampling means under control of said control means and connected to said demodulating means for performing range gate sampling of the demodulated signals generated by said demodulating means and for generating sampling values;
interpolating means under control of said control means and connected to said sampling means for interpolating the sampling values outputted from said sampling means and for restoring lost sample values of Doppler signals lost during receipt of said B-mode components by said common transducer means to provide a restored Doppler component;
Doppler signal processing means under control of said control means and connected to said interpolating means for processing the sampling values after interpolating by said interpolating means; and
scan and Doppler register means for registering for each cycle measurements for said plurality of Doppler components and measurement for said 2-dimensional B-mode component and measurements for said restored Doppler component lost during the time the B-mode component is being received by said common transducer means;
wherein said interpolation means comprises means for interpolating the r'th value of interpolation values satisfying the following equation

$$z_r = \sum_{i=-\lambda}^{\lambda} a_i \cdot x_{r+i}$$

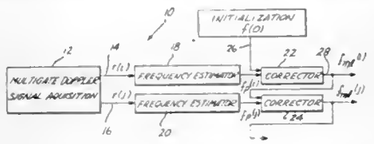
wherein λ is number of sampling pulses respectively preceding and succeeding an interpolation point, a_i is interpolation coefficient, and x_{r+i} is an actual sampling value preceding and succeeding said interpolation point.

4,817,618
RANGE-CONTINUITY ANTI-ALIASING
Philip A. DesJardins, Seattle, and Jeffry E. Powers, Rainbridge Island, both of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.
Continuation of Ser. No. 062,359, Jun. 12, 1987, abandoned, which is a continuation of Ser. No. 739,254, May 30, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 120,214
Int. Cl.[4] A61B *8/06*
U.S. Cl. 128—661.09 8 Claims

1. Anti-abasing circuit for use in a pulsed doppler ultrasound velocimeter comprising:
(a) multigate doppler means including means for transmitting and receiving ultrasonic waves and means for providing doppler signals from a plurality of different range gates corresponding to a plurality of different sample depths;

(b) frequency estimator means for receiving the doppler signals and for providing, for each range gate, a corresponding perceived frequency signal representing the perceived frequency of the doppler signal for the range gate; and

(c) anti-aliasing means for receiving the perceived frequency signals and for providing an unaliased signal corresponding to each range gate, the anti-aliasing means including means for comparing, for each range gate, the perceived frequency signal corresponding to the range gate with the unaliased signal corresponding to a different range gate,



and for modifying the value of the perceived frequency signal corresponding to the range gate to produce the unaliased signal corresponding to the range gate by reducing the difference between the unaliased signal corresponding to said different range gate and the perceived frequency signal corresponding to the range gate, and initialization means for providing an initialization signal such that for one range gate, the anti-aliasing means produces the corresponding unaliased signal by reducing the difference between the initialization signal and the perceived frequency signal corresponding to said one range gate.

4,817,619

ULTRASONIC DIAGNOSIS APPARATUS

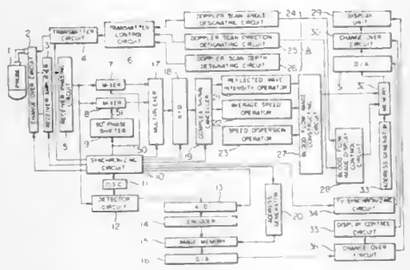
Takashi Sugiyama; Satoshi Tamano, both of Kashiwa, and Yukio Ito, Tokyo, all of Japan, assignors to Hitachi Medical Corp., Tokyo, Japan

Filed Mar. 14, 1986, Ser. No. 839,508

Claims priority, application Japan, Jun. 24, 1985, 60-136012

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—661.09 **13 Claims**



1. An ultrasonic diagnosis apparatus comprising:

a single ultrasonic wave transmitting and receiving means for transmitting an ultrasonic pulse beam into a living body at a predetermined recurrence frequency to scan a scanning region and for receiving reflected waves therefrom;

B-mode scanning means for causing said single ultrasonic wave transmitting and receiving means to perform a B-mode scan, such that an ultrasonic pulse beam is transmitted in a plurality of directions and received as reflected-echo signals from said plurality of directions, for producing an ultrasonic image;

Doppler-mode scanning means for causing said single ultrasonic wave transmitting and receiving means to perform a Doppler-mode scan, such that an ultrasonic pulse beam is transmitted into said living body in a plurality of directions and received as reflected-echo signals from said plurality of directions, for producing an ultrasonic image;

B-mode image producing means for performing first image-processing with respect to said reflected-echo signals received through said B-mode scan which correspond to a predetermined cross-sectional are in said living body and for storing resultant B-mode image data after said first image-processing;

Doppler-mode image producing means for determining a Doppler frequency shift between said reflected-echo signals received through said Doppler-mode scan, for performing second image-processing with respect to said reflected-echo signals with shifted frequencies for producing a Doppler image of a moving part in said living body, and for storing resultant Doppler-mode image data after said second image-processing;

display means for reading the stored B-mode image data from said B-mode image producing means and the stored Doppler-mode image data from said Doppler-mode image producing means and for displaying said B-mode image data and said Doppler-mode image data as a two-dimensional image; and

Doppler scanning area designating means for supplying to said Doppler-mode scanning means a command which causes said Doppler-mode scanning means to variably designate said Doppler scanning area.

4,817,620

NONCONTACT TYPE TONOMETER

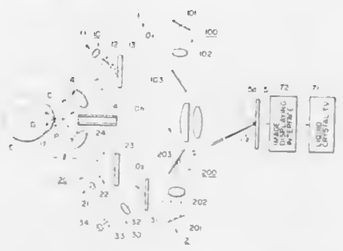
Kenjiro Katsuragi; Katsuhiko Kobayashi, and Yoshitaka Torii, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,536

Claims priority, application Japan, Sep. 6, 1986, 61-209945

Int. Cl.[4] A61B *3/16*

U.S. Cl. 128—648 **9 Claims**



1. A non-contact tonometer, comprising:

fluid discharging means for discharging a pulse of fluid from a nozzle towards the cornea of an eye to be tested to transfigure the eye, said cornea having a vertex and said nozzle being movable into a predetermined alignment position relative to said vertex;

means for measuring an intraocular pressure value of the eye to be tested in accordance with the pressure of said fluid pulse and the transfiguration of the eye;

means for detecting an alignment error between said predetermined alignment position of said nozzle and the position of said nozzle relative said corneal vertex upon discharge of said fluid pulse; and

means for correcting said measured intraocular pressure value in accordance with said detected alignment error to determine an actual intraocular pressure value.

4,817,621

APPARATUS INCLUDING DOPPLER SIGNAL TRANSDUCER FOR DETERMING THE POSITION OF AN OBJECT

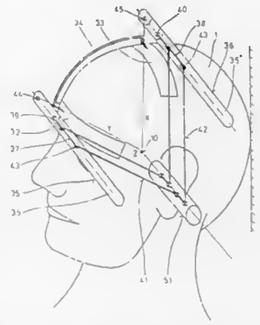
Rune Aaslid, Seattle, Wash., assignor to Eden Medizinische Elektronik GmbH, Überlingen, Fed. Rep. of Germany

Filed Jun. 10, 1987, Ser. No. 60,742

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704339

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—662.03 **14 Claims**



1. An apparatus for determining the position and other characteristics of an object, including for example the position of a blood vessel and rate as well as the direction in which the blood flows in this vessel, via a measuring element that is embodied as a Doppler signal emitter and receiver aligned as well as oriented to locate, to detect and to receive different signals that permit appropriate conclusions to be made, said apparatus further comprising:

two parallelogram-type linkage systems, each having two ends, one end of each system being pivotably connected via pivot means to said measuring element, and the other end of each system being pivotably connected via further pivot means to a respective reference element, said respective reference elements as well as said measuring element in structural relationship to very precisely repeat measurements and to fix the measuring element in certain positions in order to repeat measurements without difficulty at a later point in time to determine whether any changes have occurred.

4,817,622

INFRARED IMAGER FOR VIEWING SUBCUTANEOUS LOCATION OF VASCULAR STRUCTURES AND METHOD OF USE

Carl Pennypacker, 231 San Carlos, El Cerrito, Calif. 94530; Donald E. Morris, 44 Marguerita Rd., Kensington, Calif. 94707, and Pieter P. Tans, 2960 13th St., Boulder, Colo. 80302

Filed Jul. 22, 1986, Ser. No. 888,916

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—664 **11 Claims**

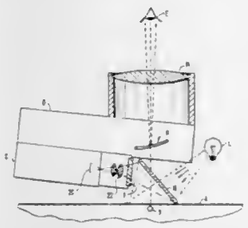
1. Apparatus for producing an enhanced contrast infrared image of the flesh for viewing subcutaneous structures such as veins in flesh illuminated with light which includes infrared light, said apparatus comprising:

light source means including means for providing infrared light and adapted to illuminate a portion of flesh so as to produce an image of said flesh from differential absorption of said infrared light on said flesh;

video camera means adapted to receive an image of said differentially absorbed infrared light on said illuminated flesh and output a video signal;

monitor means for playing back from said outputted video signal the image of said illuminated flesh; and,

circuit means connecting said video camera means and said monitor means for producing an enhanced contrast image of said flesh in real time whereby said image from said



differential absorption of infrared light has the contrast enhanced to view subcutaneous structure such as veins.

4,817,623

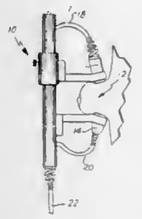
METHOD AND APPARATUS FOR INTERPRETING OPTICAL RESPONSE DATA

Hugh F. Stoddart, Groton, Mass., and Gary D. Lewis, St. Clair Shores, Mich., assignors to Somanetics Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 542,022, Oct. 14, 1983, Pat. No. 4,570,638. This application Feb. 18, 1986, Ser. No. 830,578

Int. Cl.[4] A61B *6/08*

U.S. Cl. 128—665 **25 Claims**



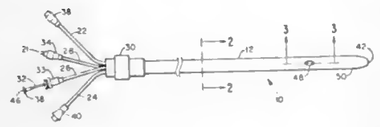
1. A method of assessing the internal physiological compositional state of an individual examination subject comprised of organic matter and the like which is transmissible by at least certain selected light energy wavelength spectra, comprising the steps: applying the selected light energy spectra to said examination subject in a manner which infuses at least certain of such light into the interior of such subject; detecting the presence of said infused light after the same has transmissed a particular distance defining at least a portion of the interior of said examination subject; quantifying the detected light energy for said examination subject as a sequence of values correlated with at least certain of said selected wavelengths to thereby produce a sequence of discrete wavelength-related values for said examination subject; conditioning said discrete values at least partially on the basis of said distance, to produce a series of wavelength-related individual conditioned quantified values particularizing the said individual examination subject; determining at least one composite averaged value from said series of different wavelength values, to characterize the particular subject under examination in terms of at least one individual numerical value; and comparing selected ones of said at least one numerical value to other analogouslyobtained individual numerical values to thereby assess the internal physiological compositional state of the subject under examination in relation to that characterized by said other numerical values.

4,817,624

MINI-BOLUS TECHNIQUE FOR THERMODILUTION CARDIAC OUTPUT MEASUREMENTS

Ronald S. Newbower, Acton, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Filed Dec. 20, 1985, Ser. No. 811,684
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—692 **10 Claims**



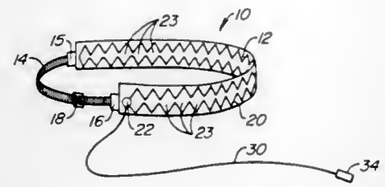
1. A catheter for use in injection applications, comprising:
a flexible outer tube having an outer wall, a first end, a second end, and a plurality of lumens, each lumen being bounded by lumen-defining walls and extending from the first end toward the second end of said outer tube; and
a flexible inner tube having a wall defining an outer surface and an inner passage;
said inner tube being located within one of the plurality of lumens and extending from the first end toward the second end of said outer tube and terminating in a port of said outer tube;
said inner tube having a volume substantially less than the volume of the luemn in which it is located, so that said catheter possesses a low dead volume;
said inner tube further being sufficiently smaller in cross-sectional area than the lumen in which it is located in leave space between the outer surface of the wall of said inner tube and the walls defining the lumen in which said inner tube is located;
the combination of said outer tube, the wall of said inner tube, and the space about said inner tube thermally insulating the inner passage of said inner tube from the environment external to said catheter to a greater degree than said outer tube thermally insulates the catheter lumen which contains said inner tube, whereby said catheter permits multiple successive small-volume injections of fluid to be made in thermodilution applications without degradation of the temperature of each small-volume injection.

4,817,625

SELF-INDUCTANCE SENSOR

Laughton E. M. Miles, Palo Alto, Calif., assignor to Laughton Miles and Zeala Miles, both of Palo Alto, Calif.

Filed Apr. 24, 1987, Ser. No. 42,140
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—721 **11 Claims**



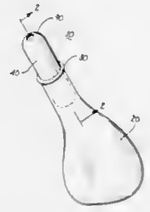
1. A self-inductance sensor for measuring the change in circumference of an object comprising:
an elongate band of distensible material adapted to partially circumscribe the object;
an elongate strap of nondistensible material having its ends attached to the opposite ends of the band so that the band and strap in combination form a closed loop adapted to completely circumscribe the object;
an electrical conductor secured to the band and having a first portion extending from a first position adjacent one end of the band to a second position adjacent the other end of the band and a second portion extending from said second position to said first position, each portion of the conductor having a repetitive geometric configuration with the portions symmetrically and closely juxtaposed to form a series of substantially enclosed areas which change shape as the band is distended; each of said substantially enclosed areas being bounded half by said geometric configuration of said first position and half by said geometric configuration of said second portion;
and means for measuring the self-inductance of the conductor to indicate the relative extension of the band and thus the change in circumference of the object.

4,817,626

NASAL EXHALER AND METHOD

Hal Blaine, P.O. Box 6166, Phoenix, Ariz. 85261

Continuation of Ser. No. 042,681, Apr. 27, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 219,881
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—728 **7 Claims**



1. A method for equalizing atmospheric pressure on opposite sides of an ear drum comprising the steps of:
inhaling air;
providing a nasal exhaler having a resiliently inflatable bag;
providing a hollow member with openings on each end thereof, said hollow member being frictionally, operably, and detachably, coupled with said inflatable bag at a first end thereof, said coupling being air-tight; said hollow member having external surface means having a configuration for providing an air-tight seal adjacent a second end portion thereof with a rim portion of a person's nostril; and said hollow member having means for allowing the flow of air therethrough the openings on each end thereof; and thereafter
inflating said bag by forcibly exhaling through a first nostril of a pair of nostrils into said hollow member while blocking a second nostril of said pair of nostrils to cause the eustachian tubes air pressure to become equalized and to prevent the possibility of rupturing an eardrum.

4,817,627

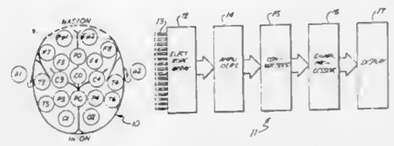
ELECTROENCEPHALOGRAPHIC MONITORING

Daniel E. Cohen, Eden Prairie, and Frederick T. Strobl, Wayzata, both of Minn., assignors to CNS, Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 83,666, Aug. 7, 1987, abandoned. This application Sep. 4, 1987, Ser. No. 93,577
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—731 **43 Claims**

1. A method of treating at least a first electroencephalographic signal to provide a first index parameter based thereon indicative of extent and durations of selected diminutions in power in such signal, said method comprising:

acquiring said first electroencephalographic signal;
determining a first succession of total powers of said first electroencephalographic signal with there being one of said total powers associated with each of an ordered set of selected segments of said first electroencephalographic signal which are in order of occurrence thereof; and



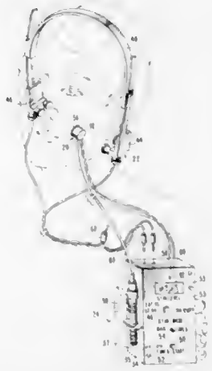
forming said first index parameter as a succession of values depending on said first succession of total powers with said successive first index parameter values changing monotonically, if at all.

4,817,628

SYSTEM AND METHOD FOR EVALUATING NEUROLOGICAL FUNCTION CONTROLLING MUSCULAR MOVEMENTS

David L. Zealear, 1061 W. Hollywood #2A, Chicago, Ill. 60660, and Alan R. Gibson, Phoenix, Ariz., assignors to David L. Zealear, Nashville, Tenn.

Filed Oct. 18, 1985, Ser. No. 789,847
Int. Cl.[4] A61B *15/05*
U.S. Cl. 128—741 **51 Claims**



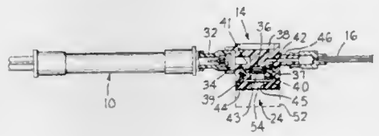
1. A system for evaluating motor nervous system function of the facial nerves of a subject comprising:
an accelerometer sensing means for sensing the magnitude of acceleration of a part of the face of the subject along at least one axis of three-dimensional space,
a monitoring means operatively associated with said sensing means for monitoring said sensed acceleration magnitudes,
said monitoring means including a stimulating means for stimulating the facial nerves of the subject,
said sensing means sensing the magnitude of the facial part acceleration evoked by said stimulating means, and
said stimulating means including an electrode assembly and a positioning means for positioning said electrode assembly on the subject against the skin overlying the facial nerves below at least one of the subject's ears.

4,817,629

PROCESS AND APPARATUS FOR MEASUREMENT AND MONITORING OF MUSCLE COMPARTMENT PRESSURE

Scott J. Davis, Kalamazoo; Wayne N. Warfield, Schoolcraft Township, Kalamazoo County, and William M. Booth, III, Paw Paw Township, Van Buren County, all of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 815,848, Jan. 3, 1986, abandoned. This application Feb. 18, 1987, Ser. No. 15,835
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 **14 Claims**



1. A tissue fluid pressure measuring and monitoring system, comprising a syringe, a pressure chamber member having a bottom, and a tissue penetrating means aligned in series, said syringe and tissue penetrating means having flow passages, said pressure chamber member being a one piece member coaxially aligned between said syringe and tissue penetrating means;
a cap fitted to the bottom of said pressure chamber member, said pressure chamber member and cap cooperating to define an internal chamber having a top wall, said wall and bottom wall, said bottom wall being annular and having a central opening therethrough, L-shaped connecting passages in said top wall respectively connecting said flow passages with said internal chamber, said L-shaped passages having generally aligned but spaced apart legs respectively connected to said flow passages in said syringe and tissue penetrating means, said L-shaped passages further having respective downward extending parallel, spaced apart legs connecting respective aligned legs with said internal chamber at two points spaced from the center of the chamber, the top wall of said chamber being domed in the central portion thereof and having a substantially square cross section annular recess at the perimeter thereof, said pressure chamber member being free of any valve structure in and between said connecting passages and chamber;
a diaphragm of semitoroidal shape and hence of generally W-shaped cross section, said diaphragm separating top and bottom portions of said chamber, said diaphragm having a rim, a raised central head and a deeply depressed annular suspension portion radially interposed between the rim and central head, said rim being of substantially square cross section and substantially thicker than the rest of said diaphragm, said rim being snugly received in said annular recess in said top of said chamber, the radially outer portion of said rim defining a downward facing annular step, said cap having an upstanding annular cylindrical wall snugly telescopingly received in an annular side wall of said member and at its upper edge abutting said annular step of said diaphragm rim, the edge of said domed portion of said top wall of said member lying at an intermediate level in the height of said rim, all four sides of said rim being in sealing engagement with opposed surfaces of said pressure chamber member and cap, said depressed annular suspension portion being of deep U-shaped cross section and extending from said rim down to near the bottom wall of said chamber, said central head having a rest (no pressure differential thereacross) position at about the level of said step of the rim and spaced above the bottom of said annular suspension portion, said downwardly extending legs of said L-shaped connecting passages opening through the top wall of said chamber verti-

VOL 1101 ISS 1 AP 4 1989 UMI

cally opposite said depressed annular suspension portion and substantially flush with said rim and the radially outer wall of said annular suspension portion of said diaphragm to prevent trapping air between the diaphragm and chamber top wall when the syringe is activated to drive liquid through said pressure chamber member and tissue penetrating means, the central opening in the bottom wall of said chamber being spaced opposite said raised central head of said diaphragm by more than the depth of said depressed annular suspension portion and said depressed annular suspension portion being radially outboard of said central opening in said bottom wall so that said central opening is free of blocking by said diaphragm;

a pressure transducer positionable at said central opening, whereby movement of said diaphragm caused by pressure in said tissue is detected by said pressure transducer.

4,817,630

CONTROL CABLE FOR A BIOPSY FORCEPS

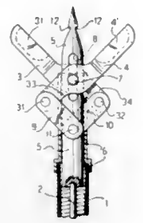
Jean-Marie Schintgen, 45, Avenue Victor Hugo, 75116 Paris, and Bruno Zeitoun, 23, rue Daubenton, 75005 Paris, both of France

Division of Ser. No. 870,238, Jun. 3, 1986, Pat. No. 4,721,116. This application Nov. 2, 1987, Ser. No. 115,415

Claims priority, application France, Jun. 4, 1985, 85 08387

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—751 **11 Claims**



1. Control cable for a surgical cutting forceps comprising a control wire for attachment to a cylindrical plug slidably held in a tube for moving two pivoting jaws pivoted on a first end of said tube and a flexible tubular sheath of circular cross-section surrounding said control wire over the full length of the sheath, made of stainless steel helicoidal wire with adjacent turns uniformly wound tightly over its length and attachable at its distal end to said tube, wherein the external surface of at least a part of the sheath, including a distal end portion thereof, is reduced in outer diameter by grinding into a shape which is longitudinally flattened and circumferentially symmetrical with respect to centers of the cross-sections of the sheath in the part of the sheath having a reduced outer diameter, at least part of said reduced diameter portion having a shape gradually tapering down in girth towards said distal end.

4,817,631

METHOD FOR REMOVING TISSUE FROM A BODY

Wolfram Schnepp-Pesch, Schönblick 6, D-7505 Ettlingen; Josef Lindenberg, Käthe-Kollwitz-Str. 10 a, D-7500 Karlsruhe 41, and Dieter Köhler, Auf'm Kampe 56, 5948 Schmallenberg-Winkhausen, all of Fed. Rep. of Germany

Continuation of Ser. No. 19,797, filed as PCT EP86/00020 on Jan. 21, 1986, published as WO86/06951 on Dec. 4, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 126,474

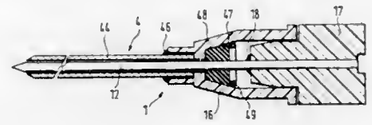
Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518547

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—753 **13 Claims**

1. A method of removing tissue from an interior of a body, comprising:

inserting an elongated obturator, a first end of which comprises a point, into a cavity of an elongated hollow body, wherein said obturator is adapted to fit tightly in a hollow space of said hollow body, and wherein said hollow body includes a sharpened insertion end and a self-sealing seal in an area remote from said insertion end, which completely seals said hollow body, and wherein said obturator is inserted through said seal, thereby perforating said seal such that said first end of said obturator is directed towards said insertion end of said hollow body, wherein before said obturator is inserted through said seal, said seal contains no perforations, and wherein said seal is capable



of maintaining a vacuum within said hollow body upon complete withdrawal of said obturator out of said hollow body;

inserting said hollow body housing said obturator into said interior of said body;

drawing said obturator up such that said first end of said obturator is directed away from said insertion end of said hollow body, wherein said tissue is cut away by said sharpened insertion end and drawn up within said cavity of said hollow body and said obturator from said interior of said body.

4,817,632

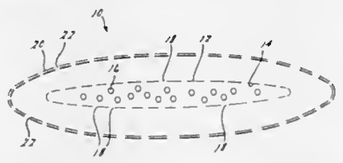
ORAL FLUID COLLECTION ARTICLE

Willfried Schramm, Ann Arbor, Mich., assignor to BioQuant, Inc., Ann Arbor, Mich.

Filed Jun. 23, 1987, Ser. No. 65,559

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—769 **13 Claims**



1. An oral fluid collection article for placement entirely in the buccal cavity of an individual for collection and filtering of a saliva fluid sample comprising: a semi-permeable membrane container defining an enclosed chamber, said semi-permeable membrane container having pores which are of a size to allow desirable oral fluid molecules to pass through, said pores acting as a filter for filtering out of larger undesirable particulate or molecular matter from said saliva; and osmotic substance means being disposed in said enclosed chamber for creating an osmotic pressure system inside of said chamber and for drawing oral fluid from said buccal cavity through said container and into said chamber of said semi-permeable membrane container and retaining at least a portion of said fluid in said chamber.

4,817,633

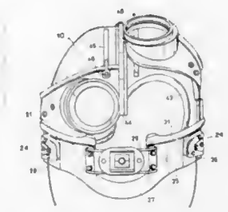
LIGHTWEIGHT DEVICE TO STIMULATE AND MONITOR HUMAN VESTIBULO-OCULAR REFLEX

M. Catherine McStravick, Houston; David R. Proctor, and Scott J. Wood, both of League City, all of Tex., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 5, 1987, Ser. No. 116,821

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—782 **18 Claims**



1. A neurosensory helmet comprising:

(a) a rigid shell to surround the head of a test subject, said shell having large front facial cutouts resulting in a centrally extending nose portion;

(b) means for coupling said shell relative to the skull of said test subject to prevent relative movement between said shell and the skull, without restraining head movement of the test subject;

(c) means for sensing eye and head movement of the test subject; and

(d) means for sealing out the entrance of extraneous light from the test subject.

4,817,634

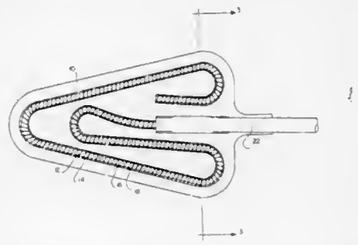
EPICARDIAL PATCH ELECTRODE

Timothy W. Holleman, Ham Lake; Richard Sandstrom, Scandia; Roger Rugland, Ham Lake, and Terrell M. Williams, Coon Rapids, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 18, 1987, Ser. No. 63,371

Int. Cl.[4] A61N *1/05*

U.S. Cl. 128—784 **20 Claims**



1. An epicardial defibrillation electrode for a long term implant, comprising:

a generally planar flexible insulative base pad having a periphery which generally takes the form of a convex, closed curve, said base pad having an upper and a lower face, and having molded into the lower face thereof at least one elongated convoluted groove;

at least one elongated space wound electrode coil, mounted longitudinally within said groove in said lower face of said base pad, said electrode coil having a diameter greater than the depth of said groove in said lower face of said base pad; and

an insulated, elongated conductor, coupled to said electrode coil and extending from said base pad.

4,817,635

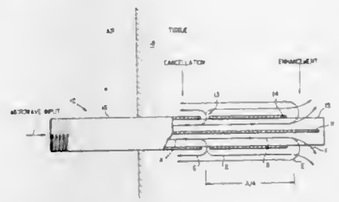
INTERSTITIAL APPLICATOR WITH CANCELLATION/ENHANCEMENT GAP

William T. Joines; Yang Zhang, both of Durham, and James R. Oleson, Chapel Hill, all of N.C., assignors to Duke University, Durham, N.C.

Filed Mar. 23, 1987, Ser. No. 29,119

Int. Cl.[4] A61N *5/02*

U.S. Cl. 128—804 **6 Claims**



1. An interstitial applicator for heating a localized region of living tissue comprising:

a coaxial means for transmitting electrical energy, said coaxial means having an inner conductor, an outer conductor surrounding coaxially said inner conductor and a dielectric separator positioned between said inner and outer conductor, a source of electromagnetic energy connected to one end of said coaxial means including one end of said inner and said outer conductor wherein said coaxial means further includes a gap formed in said outer conductor, said gap having a width substantially equal to $\frac{1}{3}$ of the diameter of said coaxial means and wherein the distance between said gap and the other end of said outer conductor is substantially equal to $\frac{1}{4}$ of the effective wavelength of said electromagnetic energy wherein said effective wavelength is defined as the wavelength of the electromagnetic energy of said source modified by the effective dielectric constant formed by the combination of said dielectric between said inner and outer conductor and by said outer conductor and the environment in which said gap and said outer conductor are positioned.

4,817,636

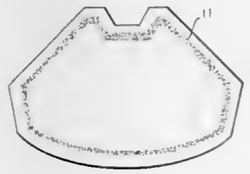
ANTI-SNORING DEVICE

Thomas H. Woods, 2920 Marshall St., Falls Church, Va. 22042

Filed Oct. 1, 1987, Ser. No. 103,295

Int. Cl.[4] A61F *5/56*

U.S. Cl. 128—848 **8 Claims**



1. An anti-snoring device comprising a sheet of flexible, tear-resistant material, a hypoallergenic adhesive applied to the back face of said material, and a backing sheet which covers the adhesive back of said material, wherein the device is sized

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and configured to substantially cover a user's closed mouth and fit within the area between the cheeklines and underneath the nose without extending over the user's nose or cheeks and to extend below the user's mouth sufficiently to hold the mouth closed, said device having angular sides converging towards the top edge to extend along the cheeklines o f the user, and having a central depression at the top edge to fit below the underside of the user'nose.

4,817,637

SUBCUTANEOUS INJECTION AND WITHDRAWAL SITE

Donald V. Hillegass, Franksville, and Eric J. Woodruff, Racine, both of Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed Nov. 25, 1987, Ser. No. 125,431
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—899 **21 Claims**



1. A septum comprising an implantable hollow spherical housing, said housing being needle-penetrable and self-sealing throughout its surface, said housing defining a chamber therein for receiving fluid,

fluid flow means interconnected to said chamber for permitting passage of fluid therethrough, said flow means including a conduit in fluid communication with said chamber, and connector means for permitting rotation of said housing relative to said conduit, and

needle stop means within said housing for preventing a needle accessing said chamber from passing through the opposite side of said housing.

4,817,638

APPARATUS FOR ADJUSTING A CIGARETTE HAVING VARIABLE SMOKING CHARACTERISTICS

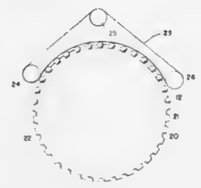
Martin T. Garthaffner, Midlothian; Billy J. Keen, Jr., Richmond; Grier S. Fleischhauer, Midlothian, and Ronald D. Honaker, Powhaton, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

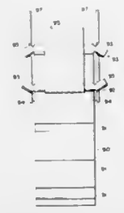
Filed Aug. 1, 1985, Ser. No. 761,631
Int. Cl.[4] A24C *5/60*
U.S. Cl. 131—29 **32 Claims**

1. Apparatus for adjusting a cigarette having a variable smoking characteristic, said cigarette having a tobacco rod, a filter plug, and a rotatable element associated with said filter plug for varying said smoking characteristic, said cigarette having been assembled with a first level of said smoking characteristic on a cigarette making machine, said apparatus comprising:

means for holding said tobacco rod of said cigarette,

means for torsionally engaging said rotatable element, said torsional engagement means moving relative to said holding means for rotating said rotatable element a desired





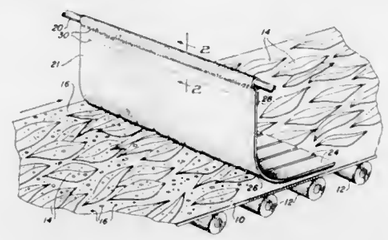
amount, thereby adjusting said level of said smoking characteristic to a second dilution level.

4,817,639

TOBACCO LEAF CLEANING DEVICE

Charles R. Caudill, P.O. Box 729 - Space 1062, Apache Junction, Ariz. 85217

Filed Jul. 14, 1987, Ser. No. 73,271
Int. Cl.[4] A24B *1/04*
U.S. Cl. 131—325 **20 Claims**



1. A tobacco leaf cleaning device for removing foreign particles such as lint and string from tobacco leaves as the tobacco moves from one point to another on said cleaning device including in combination:

means for moving tobacco leaves;

support means located a predetermined distance above said means for moving tobacco leaves;

a flat flexible sheet member having a predetermined length greater than said predetermined distance, said sheet member having upper and lower ends;

means for attaching the upper end of said sheet member to said support means; and

cleaning means on the lower end of said sheet member for contacting tobacco leaves as the leaves pass under said sheet member for removing lint and foreign particles from the leaves.

4,817,640

HERBAL CHEW AND SNUFF COMPOSITIONS

John K. Summers, Anderson, Ind., assignor to Better Life International Life, Inc., Stuart, Fla.

Continuation-in-part of Ser. No. 777,614, Sep. 19, 1985, Pat. No. 4,696,315. This application Sep. 12, 1986, Ser. No. 907,402
Int. Cl.[4] A24B *15/18*
U.S. Cl. 131—359 **39 Claims**

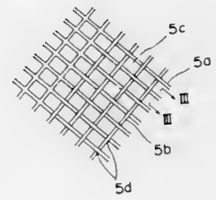
1. A chewing composition comprising a nicotine-free herb containing essential oils capable of being encased and capable of being processed to a texture which is non-injurious to the surface of the oral cavity, said herb is a mixture of dandelion, and dock or sorrel and a casing material absorptive to said herb which includes a preservative, a binder, and a humectant for combining with said essential oil-containing herb which maintains said herb in a moist coherent cud during chewing.

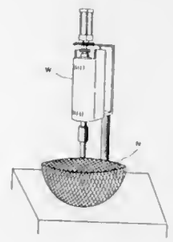
4,817,641

WIG BASE AND METHOD OF PRODUCING SAME

Hisao Kobayashi, Machida, and Kosuke Mochizuki, Katsushika, both of Japan, assignors to Aderans Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 882,939, filed as PCT JP85/00642 on Nov. 18, 1985, published as WO86/02811 on May 22, 1986, abandoned. This application Jun. 1, 1988, Ser. No. 205,481
Claims priority, application Japan, Nov. 17, 1984, 59-241614
Int. Cl.[4] A41G *3/00*
U.S. Cl. 132—201 **11 Claims**





1. A method of producing an individually shaped male wig base, comprising the successive steps of:

(1) preparing a head-contoured male mold shaped directly from a user's own head;

(2) placing a synthetic resin film on said male mold to cover the same;

(3) placing a first network of a woven fabric with meshes and a second network of a woven fabric with crossing filaments forming meshes larger than that of said first network, in the order stated, on said synthetic resin film so as to cover the entire surface of said male mold without wrinkles;

(4) soaking said synthetic resin film and said first and second networks held on said male mold with a resin solution to coat the filaments of said second network and their intersections with the resin solution, said first network serving to absorb the resin solution to prevent films from being formed on the meshes of said second network;

(5) drying and curing the resin solution to bond the filaments of said second network to each other at the intersections to preliminarily shape said second network;

(6) peeling off said second network from said first network to provide a head-shaped net pattern intended for use as the wig base; and

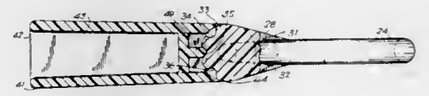
(7) heat-welding the intersections of the filaments of said head-shaped net pattern.

4,817,642

DENTAL FLOSS ADAPTER

Don Lipp, 585 West End Ave., New York, N.Y. 10024

Filed Dec. 7, 1987, Ser. No. 129,243
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—324 **4 Claims**



1. A disposable dental floss holder adapted to be supported upon a free end of a handle of a toothbrush comprising: a floss supporting element and a handle engaging element pivotally interconnected therewith; said floss supporting element having a main body of bowed configuration, including first and second free ends, an insert-molded length of dental floss extending between said free ends, an interconnecting member integrally molded with said main body and including a generally planar body extending laterally therefrom, said planar body having an arcuate peripheral surface having plural detent recesses therein, pivot means extending from said body having a principal axis perpendicular to that of said planar body; said handle-engaging element forming an elongated hollow tube open at a first end thereof to define a socket for engaging a free end of a toothbrush, and a second end having a planar recess corresponding in configuration to that of said planar body, and defining a continuous bore having an axis perpendicular to said planar recess pivotally engaging said pivot means, said planar recess including detent means selectively engageable with one of said detent recesses; whereby said floss supporting element may be selectively positioned at a desired angle relative to the axis of said handle-engaging element.

4,817,643

CHINESE FINGER CUFF DENTAL FLOSS

Mary Lou C. Olson, 1147 Ivyhill Dr., Mendota Heights, Minn. 55118

Filed Jul. 30, 1987, Ser. No. 79,359
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—329 **6 Claims**



1. A dental floss comprising a plurality of fibers of a sufficient number to be self-supporting woven in a Chinese finger-cuff pattern such that a hollow cylinder is defined by said fibers.

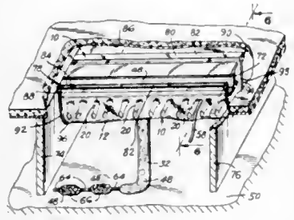
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4,817,644

APPARATUS AND METHOD FOR THE SAFE AND EFFECTIVE, LARGE SCALE REMOVAL AND DISPOSAL OF HAZARDOUS MATERIALS FROM BUILDING COMPONENTS

Richard W. Holmes, Westport, Conn., and Jaime A. Escobar, Queens Village, N.Y., assignors to Envirosafe Corp., New York, N.Y.

Filed Oct. 17, 1986, Ser. No. 920,025
Int. Cl.[4] B08B *7/00*
U.S. Cl. 134—6 **25 Claims**



1. An apparatus for the removal and disposal of hazardous materials from a region of a structure containing said hazardous materials, said apparatus comprising:

(a) a sheet of non-rigid material which is impervious to said hazardous material, said sheet being sized and shaped for forming an enclosure about said region, said enclosure being for containing said hazardous material and being impervious thereto; said sheet having dimensions of sufficient size so that said region enclosed by said enclosure contains quantities of hazardous material having a mass which, when removed from said region of said structure enclosed by said enclosure would interfere with further removal of hazardous material if said hazardous material remained in said enclosure;

(b) removal means for facilitating removal of said hazardous material from said structure, said removal means being operated within said enclosure from outside said enclosure;

(c) chute means having a volume at least sufficient for containing said hazardous material removed from said structure by said removal means, said chute means being formed of a nonrigid material which is impervious to said hazardous material, said chute means being permanently attached to said sheet and extending therefrom so that interior portions of said enclosure formed by said sheet are in communication with interior portions of said chute means, said chute means being sized, shaped and positioned along said sheet so that said hazardous material removed from said region by said removal means is movable directly from said enclosure into said chute means and a disposal means, said disposal means being a part of said chute means most remote from said enclosure, said disposal means of said chute means being separable from a remaining portion of said chute means so that said disposal means and said remaining portion remain sealed, and so that a sealed disposal means is disposable independently of said sheet and said remaining portion of said chute means.

20. A process for the removal of hazardous material from a region of a structure comprising the steps of:

(a) enclosing said region with a non-rigid sheet of a material impervious to said hazardous material to form an enclosure impervious to said hazardous material;

(b) removing the hazardous material from said region by using a removal means within said enclosure operated from outside said enclosure;

(c) moving the hazardous material from said enclosure into an elongate chute having an interior portion in communication with an interior portion of said enclosure; said material being moved to a disposal region of said chute most remote from said enclosure;

(d) sealing said removed hazardous material in said disposal region of said chute so that said disposal region and the reminder of said chute are both sealed;

(e) separating said disposal region of said chute from said remaining portion of said chute so that said disposal region and the remainder of said chute both remain sealed; and

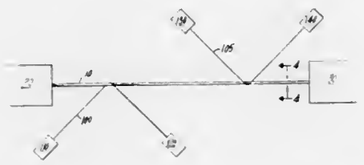
(f) disposing of said disposal region of said chute independently of said enclosure and said remaining portion of said chute.

4,817,645

IN-PROCESS WIRE CLEANING

Ralph A. Vogel, Three Rivers, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Sep. 21, 1987, Ser. No. 99,271
Int. Cl.[4] B03B *1/00*
U.S. Cl. 134—15 **4 Claims**



1. A method for cleaning a moving wire with a moving cleaning surface which comprises:

wrapping at least one string about the wire so that the at least one string contacts the wire at least around the entire wire circumference, with the string approaching and departing from the wire at a low angle, and translating the string between a payoff and pickup means so that a clean moving string surface contacts the moving wire surface.

4. An apparatus for cleaning a moving wire which comprises:

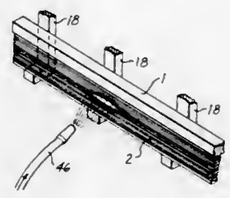
at least one string payoff and at least one string pickup means, for controllably moving at least one string between said at least one payoff and said at least one pickup means, said at least one string approaching the moving wire to be cleaned at a low angle, wrapping about the wire over at least the entire wire circumference and leaving the moving wire at a low angle said moving string presenting a new clean surface to said move wire.

4,817,646

METHOD AND APPARATUS FOR CLEANING MINI BLINDS

Milo Brooks, 2821 Brundage La., Bakersfield, Calif. 90304

Filed Jul. 31, 1987, Ser. No. 80,061
Int. Cl.[4] B08B *30/00*
U.S. Cl. 134—26 **9 Claims**



1. In connection with a window blind having a plurality of parallel, spaced slats, a method of cleaning at least a portion of the blind, comprising the following steps:

drawing the slats of the blind together so that the slats are substantially stacked one on top of the other;

immersing at least the portion of the drawn blind to be cleaned in a container of liquid detergent;

rinsing the drawn blind with a rinsing liquid; and,

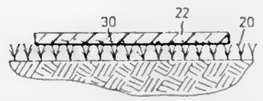
blowing the drawn blind with a gas until it is substantially dry.

4,817,647

METHOD OF REMOVING OIL FROM A GOLF COURSE

James H. Nelson, Corunna, Canada, assignor to Green Kleen International Inc., Port Huron, Mich.

Filed Nov. 2, 1987, Ser. No. 115,394
Int. Cl.[4] B08B *7/00*
U.S. Cl. 134—40 **4 Claims**



1. A method of removing oil from an elongated oil spill site on a grass lawn, wherein oil is trapped in the crowns of the grass plants and is spread on the surrounding soil in which the grass plants are growing, comprising:

applying a first absorbent cover to at least a substantial portion of the length of said elongated oil spill site to remove at least an initial amount of oil from the crowns of the grass plants and the surrounding soil to provide a partially cleaned site;

removing said first absorbent cover from the surface of said partially cleaned site;

applying a surfactant to said partially cleaned site to release a substantial portion of the remaining oil from the crowns of the grass plants and the surrounding soil;

applying a second absorbent cover to said partially cleaned site to absorb an initial amount of the surfactant and the oil which is released from the crowns of the grass plants and the surrounding soil;

removing said second absorbent cover from said partially cleaned site;

applying water to the surface of said partially cleaned site to flush the remaining residual oil and surfactant from the grass lawn.

4,817,648

LENS CLEANER DEVICE FOR AUTOMOBILE HEADLAMP

Masatoshi Sugasawa, and Shigeki Okuma, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,219
Claims priority, application Japan, Dec. 28, 1984, 59-276806; Sep. 30, 1985, 60-216919
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—57 R **22 Claims**

22. A lens cleaner device for automatically cleaning the lens of an automotive lamp, comprising:

a supply of cleaning fluid;

means for initiating a lens cleaning operation, said means for initiating comprising:

a capacitor; and,

means for charging said capacitor;

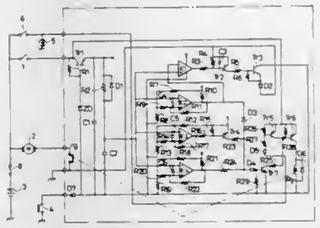
means for jetting said cleaning fluid against said lens, said means for jetting comprising:

a plurality of comparators, each having a first input and a second input;

voltage divider means for supplying a different respective reference voltage to said first input of each of said comparators;

means for coupling said second input of each of said comparators to said capacitor;

whereby the outputs of said comparators change in sequence as a voltage across said capacitor changes; and



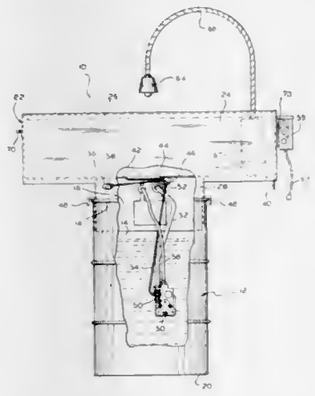
control means for controlling the flow of said cleaning fluid in response to the outputs of said comparators, such that said cleaning fluid is delivered to said lens in first and second spurts spaced a predetermined period of time apart from one another.

4,817,649

PARTS WASHER DEVICE

Robert E. Schmalz, Jr., Roselle; Kenneth R. Laedtke, Chicago, and Timothy E. Owens, Lombard, all of Ill., assignors to Graymills Corporation, Chicago, Ill.

Filed Apr. 7, 1988, Ser. No. 179,024
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—58 R **25 Claims**



1. A parts washer device, comprising:

a liquid container having an open end and a closed end, said open end being defined by a rim, said liquid container being adapted to carry a liquid solvent therein;

a tank adapted to be removably positioned on said liquid container, said tank including a parts washing portion adapted to be supported above said open end of said liquid container and a skirt portion extending below said parts washing portion and adapted to fit within said open end of said liquid container, and including means for supporting said tank on said liquid container such that parts can be washed therein;

a pump mounted on said tank so as to extend through said skirt portion into said liquid solvent when said tank is

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supported on said liquid container, said pump including a pump discharge tube for carrying said liquid solvent from said liquid container to said parts washing portion of tank; and

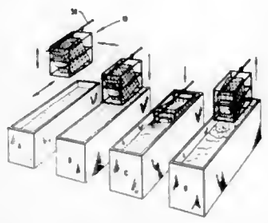
means for retracting said pump and said pump discharge tube into said skirt portion of said tank and retaining said pump and pump discharge tube within said skirt portion of said tank during removal of said tank from said liquid container.

4,817,650

SELF-CONTAINED TILTABLE BASKET FOR PLATING, WASHING OR OTHERWISE TREATING HOLLOW ARTICLES

Herbert Tilton, 1 Claridge Dr., Apt. 1027, Verona, N.J. 07044

Filed Jan. 4, 1988, Ser. No. 140,640
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—76 **11 Claims**



1. A self-contained frame and basket system for holding hollow articles during immersion in a liquid solution within a tank comprising,

a. said frame having a series of openly spaced interconnected vertical and horizontal members to define an interior space, said frame being carried by a conveyor system for immersion in said liquid solution such that when immersed said liquid solution passes between said openly spaced members to fill said interior space;

b. said basket disposed within said frame and having a plurality of spaced interconnected rod members defining at least one article compartment therein;

c. pivot means connecting said basket to said frame at a point offset from the center of said basket to cause said basket to normally tilt in a single direction;

d. at least one buoyant tank connected to the rod members of basket on the side of said basket remote from the pivot means to tilt the basket in a direction opposite the normally tilted direction when the frame and basket are immersed in said liquid solution to effectively dissipate any air pockets which might form in the hollow article.

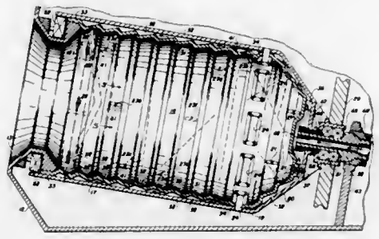
4,817,651

HAND AND FOREARM CLEANSING APPARATUS

William E. Crisp, Phoenix; Richard C. Kudlicki, and Judson L. Smith, both of Tempe, all of Ariz., assignors to Scientific Growth, Inc., Tempe, Ariz.

Filed Oct. 26, 1987, Ser. No. 112,299
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—102 **22 Claims**

1. In hand and forearm cleansing apparatus, a cylinder having an inner surface forming a cleaning chamber, said cylinder being rotatable about its axis and having an open end through which the hand and forearm of the user enters the cleansing chamber, nozzle means in the wall of said cylinder, said nozzle means presenting no significant protruberances on the inner



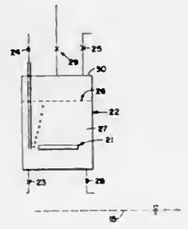
surface of the cylinder, means for conveying cleansing fluid to said nozzle means, and means for rotating said cylinder.

4,817,652

SYSTEM FOR SURFACE AND FLUID CLEANING

Benjamin Y. H. Liu, North Oaks, and Kang H. Ahn, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Mar. 26, 1987, Ser. No. 30,895
Int. Cl.[4] B08B *3/10*
U.S. Cl. 134—102 **7 Claims**



1. A system for cleaning a surface, comprising:

(a) a pressure vessel, the pressure vessel being suitably configured so as to house the surface;

(b) a cleaning fluid within the pressure vessel of sufficient depth such that the surface is submerged in the cleaning fluid;

(c) means for introducing a gas into the cleaning fluid so as to achieve a desired pressure within the pressure vessel, wherein the desired pressure is dependent upon the gas, the surface and the cleaning fluid;

(d) a pressure relief valve movable between a first open position and a second closed position, wherein movement of the valve from the closed position to the open position causes a substantially instantaneous decrease in the desired pressure within the pressure vessel such that bubbles spontaneously form within the cleaning fluid, the bubbles tending to form around contaminants on the surface, the bubbles tending to remove the contaminants from the surface and suspend the contaminants within the cleaning fluid; and

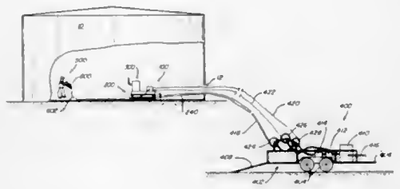
(e) a drain, the drain permitting the cleaning fluid to be removed from the pressure vessel, thereby simultaneously removing the suspended contaminants from the pressure vessel such that a relatively clean surface remains within the pressure vessel.

4,817,653

TANK CLEANING, WATER WASHING ROBOT

Richard W. Krajicek, Houston, Tex., and Robert R. Cradeur, Sulphur, La., assignors to Serv-Tech, Inc., Houston, Tex.

Filed Jan. 22, 1988, Ser. No. 147,237
Int. Cl.[4] B08B *3/02, 9/08*
U.S. Cl. 134—168 R **18 Claims**



1. A water washing robot comprising:

a frame having robot articulation means detachably mounted thereon for moving said frame,

positive displacement water pump means carried by said frame,

nozzled articulatable water washing means detachably mounted on said frame for spraying water on a surface to be cleaned,

hydraulic power means operatively independently connected with said positive displacement water pump means, said robot articulation means and said articulatable water washing means for powering said pump means and articulating said frame and said water washing means,

hydraulic control means independently operatively connected with said hydraulic power means for regulating the operation thereof,

water supply means connected with said articulatable water washing means for delivering wash water thereto, and

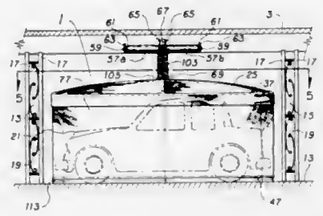
water disposal means connected with said positive displacement water pump means for disposing of waste water.

4,817,654

RETRACTABLE VEHICLE COVER AND APPARATUS THEREFOR

Mary Jane Christensen, 4650 Dulin Rd., #122, Fallbrook, Calif. 92028

Filed Jun. 20, 1988, Ser. No. 208,762
Int. Cl.[4] E04H *15/04*
U.S. Cl. 135—90 **11 Claims**



1. A cover and apparatus for raising and lowering it from an overhead structure to a vehicle parked thereunder, comprising:

(a) a plurality of thin-walled, hollow tubes extending outward in radial pattern from a position centered over where the vehicle is to be parked, each tube having a first end retained on a hub and having a second end terminating slightly beyond the outer perimeter of the vehicle in spaced-apart arrangement thereabout;

(b) an upper frame comprising a plurality of bendable rods attached together in end-to-end fashion for attachment to said second ends of said rods for positioning slightly outboard of the perimeter of the vehicle;

(c) a lower frame comprising a plurality of bendable tubes attached together in end-to-end fashion for positioning slightly outboard of the perimeter of the vehicle near the surface on which the vehicle is parked;

(d) a series of cover control lines attached at various points to said lower frame, each passing upward therefrom to said second ends of said tubes, through said tubes inward toward said hub, outward from said first tube ends and upward toward the overhead structure;

(e) a freely rotating shaft rotatably mounted adjacent the overhead structure having grooves formed about the circumference thereof for receipt of said control lines;

(f) a height control line attached between said hub and the overhead structure of a length sufficient to retain said hub at a preselected distance above the vehicle when lowered by said control lines:

(g) first means for gathering and directing said control lines from said shaft to one side of the overhead structure and then downward therefrom;

(h) a sheet-like cover arranged out over said thin-walled hollow tubes and downward from said second ends thereof from said upper frame to said lower frame and then to the floor on which the vehicle is parked to cover the vehicle parked thereunder when said hub, rods and frames are lowered by said control lines and to fold up under said upper frame in curtain-fashion when said control lines are retracted up over said shaft to raise said hub, rods, frames and cover to the overhead structure, wherein the weight of said cover, frame and control lines sufficient to curve said hollow tubes downward in an umbrella fashion over the vehicle;

(i) second means for winding and unwinding said control lines in regulated fashion to raise and lower said cover over the vehicle; and,

(j) a valance extending downward from said cover, outboard said upper frame, to act as a cover, when said upper and lower frames are brought together by said retracted control lines, to hide the stored cover from external view.

4,817,655

CANOPY ASSEMBLY

Jackson R. Brooks, Estes Park, Colo., assignor to ABC Extrusion Company, Fort Collins, Colo.

Filed Dec. 16, 1986, Ser. No. 942,341
Int. Cl.[4] E04H *15/34, 15/64;* **E04B** *1/00;* **A47H** *13/00*
U.S. Cl. 135—101 **21 Claims**

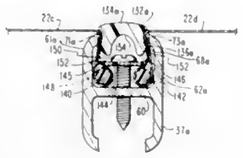
1. In an assembly including a frame composed of a plurality of elongated elements interconnected to form a rigid array to which a stretchable fabric is secured and stretched, the combination comprising:

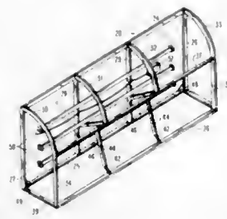
means for securing portions of said fabric into corresponding adjacent different ones of said elements and establishing a selectable degree of tension in said fabric;

means for connecting together the corresponding adjacent ends of respective ones of said elements to form said frame;

and at least some of said elements each having space opposed pairs of mutually-spaced legs projecting individually away from respective opposite ends of a crossbar joining said legs as to define with said legs an H-shaped cross-section to define a pair of space-opposed cavities into either

one of which cavities said fabric is secured, said means for securing comprising means for drawing selected portions





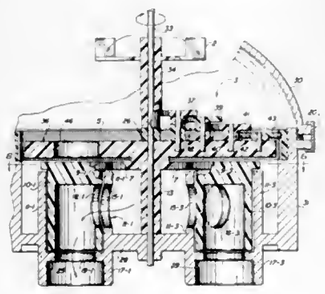
of said fabric into some of said spaced-opposed cavities thereby tensioning said fabric between said elements.

4,817,656

MULTI-PORT DISTRIBUTION VALVE WITH GEAR DRIVEN ROTARY DISTRIBUTION CYLINDERS

Charles M. Gould, Glendale, Ariz., assignor to Shasta Industries, Inc., Phoenix, Ariz.

Filed Mar. 1, 1988, Ser. No. 162,586
Int. Cl.[4] F16K *31/16*
U.S. Cl. 137—2 **8 Claims**



8. A method of distributing fluid under pressure by using a fluid distribution apparatus with an inlet port and a plurality of outlet ports, the method comprising the steps of:

(a) rotating an impeller in response to flow of the fluid through the inlet port;

(b) rotating a rotary member in geared-down relationship to the impeller in response to the rotation of the impeller;

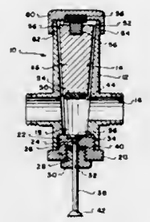
(c) operating a plurality of outlet port valves associated with the plurality of outlet ports, respectively, by rotating a plurality of rotary cylinders in response to rotation of the rotary member, each rotary cylinder being disposed in a corresponding hollow stationary cylinder, each stationary cylinder having in its cylindrical wall a first fluid opening and also having in one end a second fluid opening, each rotary cylinder having in its cylindrical wall a first fluid opening alignable with the first fluid opening of the corresponding stationary cylinder, each rotary cylinder also having in one end a second fluid opening aligned with the second fluid opening in the corresponding rotary cylinder, each rotary cylinder also having a fluid passage between its first and second fluid openings, the rotary cylinders being rotated so that at all times one or two of the outlet port valves are sufficiently open that flow of the fluid through the fluid distribution apparatus is substantially unimpeded as the outlet port valves open and close and fluid pressure drop across the fluid distribution apparatus is small.

4,817,657

INERTIALLY ACTIVATED SHUT-OFF VALVE

Mike Kovacs, 5648 Slicers Cir., Agoura Hills, Calif. 91301

Filed Mar. 21, 1988, Ser. No. 171,266
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—38 **8 Claims**



1. A valve for preventing flow of a fluid within a conduit comprising:

a housing, said housing including a fluid passage, said housing including an internal chamber, said internal chamber having an upper end and a lower end, said lower end connecting with said fluid passage, said upper end being spaced from said fluid passage;

a plug mounted within said internal chamber, said plug being movable between a retracted position and an extended position, said retracted position being when said plug is located totally within said internal chamber and unrestricts flow through said fluid passage, said extended position being when said plug is located within said fluid passage blocking flow of fluid therethrough;

first magnet means connecting said plug and said housing, said first magnet means to support said plug in said retracted position, upon said housing incurring a jarring force of sufficient magnitude said plug is caused to disengage from said first magnet means with said plug to then move by gravity to said extended position, said first magnet means located at said upper end of said internal chamber; and

said plug including an extension, said extension to connect with said first magnet means, said extension being of a lesser cross-sectional area than said first magnet means.

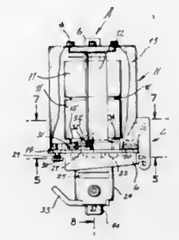
4,817,658

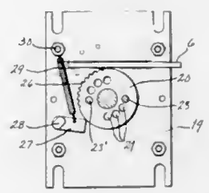
AUTOMATIC VALVE ACTUATOR

Jerry L. Lyons, St. Louis, Mo., assignor to Essex Industries, Inc., St. Louis, Mo.

Filed Aug. 19, 1988, Ser. No. 234,483
Int. Cl.[4] F16K *5/08*
U.S. Cl. 137—75 **9 Claims**

1. In a valve actuator for automatic actuation of a rotary valve mechanism having a shaft and a valve element carried by the shaft in response to a specific exigency, the actuator including a housing, means for affixing the housing in relation to the valve, a spring within the housing, a coupling connected to the spring for being rotatably driven for actuation thereby of the valve mechanism when released, camming means for operatively preventing rotation of the coupling until released, a releasable link for securing the camming means against releasing movement, the coupling being operatively connected to a





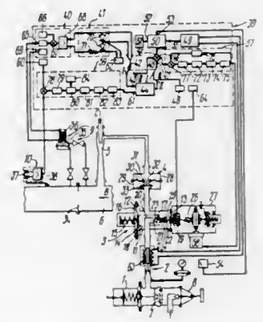
shaft of the valve mechanism, the improvement comprising a mechanism for lockingly interengaging the coupling and housing upon actuation such that the valve mechanism is precluded from rotating in a direction contrary to the actuation direction upon actuation.

4,817,659

APPARATUS FOR AUTOMATICALLY METERING GAS INTO LIQUID

Iokhannes I. Sutt, Tallin, U.S.S.R., assignor to Tallinskoe Proizvodstvennoe Upravlenie Vodosnabsheniya I Kanalizatsii, Tallinn, U.S.S.R.

PCT No. PCT/SU86/00125, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/05133, PCT Pub. Date Aug. 27, 1987
PCT Filed Dec. 8, 1986, Ser. No. 134,784
Int. Cl.[4] G05D *7/00*
U.S. Cl. 137—88 **1 Claim**



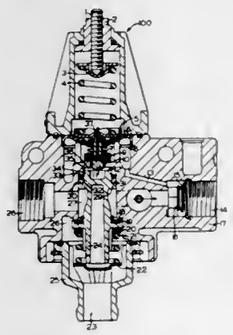
1. An apparatus for automatically metering gas into liquid, comprising successively arranged in a gas supply line, a gas pressure regulator (1), a gas flow meter (2), a gas flow governor (3), a vacuum check valve (4), and an ejector (5) connected to a supply line (6) of the liquid being gasified, a liquid flow meter (9) installed in the supply line (6) of the liquid, and a control system (39) having respective inputs connected to outputs of the gas and liquid flow meters (2,9) and its output connected to an actuating device (27) of the gas flow governor (3), charactertized in that the gas flow governor (3) and vacuum check valve are integrated into a single unit comprising a sealed chamber (11) having its two opposite walls formed by two substantially parallel diaphragms (12,13), a hollow cylinder (14) accommodated between the two diaphragms (12,13) and having its one end fixedly attached to one diaphragm (12) for axially reciprocating therewith and having a central opening (17) made through the other end thereof, a sleeve (19) having one end closed and mounted coaxially with the cylinder (14) in the center of the other diaphragm (13) and fixedly attached by the closed end thereof to an output element (26) of the actuator (27) of the gas flow governor (3), a needle valve having its seat (21) accomodated inside the hollow cylinder (14) coaxially therewith and mounted in the side wall of a closed-end pipe (20) communicating with the internal space of the gas flow meter (2) and extending through a slot (18) in the side wall of the cylinder (14), a valve member of said needle valve being in the form of a stem (22) with a pointed tip (23) provided on its one end, extending axially with the cylinder (14), the end of the stem (22) with the tip (23) being introduced through the central opening (17) into the internal space of the cylinder (14) so that the pointed tip thereof interacts with the seat (21), while the base of the tip (23) interacts with the internal surface of the butt end of the hollow cylinder (14), the other end of the stem (22) being mounted in the sleeve (19) for reciprocation therein and interaction with the closed end of the sleeve (19) under the bias of a resilient member.

4,817,660

PRESSURE REGULATING VALVE

Karl-Heinz Deike, Pattensen; Bernd Kiel, Wunstorf, and Heinz-Werner Konig, Barsinghausen, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,411
Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715148
Int. Cl.[4] G05D *16/10*
U.S. Cl. 137—116 **19 Claims**



1. A pressure regulating valve having reduced noise generation capability when used in a fluid pressure system, said pressure regulating valve comprising:

(a) a valve body portion having a fluid pressure medium inlet port connectable with a source of fluid pressure and a fluid pressure outlet port connectable with at least one consumer of such fluid pressure;

(b) a control piston positioned within a first control chamber which restricts fluid pressure communication and by a

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control pressure can be moved in an axial direction within said first control chamber against a force of a control element positioned adjacent said control piston;

(c) a first valve mechanism positioned within said valve body portion and connected with said first control chamber and with a second control chamber, said first valve mechanism being activated by said control piston;

(d) said second control chamber being limited on one side thereof by a first surface area of an activating piston which forms a part of a second valve mechanism, said activating piston being positioned in a pressure chamber formed in said valve body portion, said pressure chamber being connected for fluid communication with each of said fluid pressure medium inlet port and said fluid pressure outlet port and to a pressure medium exhaust port to atmosphere;

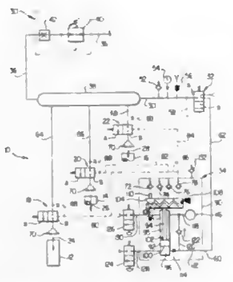
(e) said first surface area on said activating piston being positioned such that said activating piston can be moved, by fluid pressure communication to said second control chamber, in a direction of an opening of said second valve mechanism;

(f) a sealing element positioned around said activating piston to seal said second control chamber and said pressure chamber against each other, said sealing element being movable on a body portion of said activating piston;

(g) a first detent positioned on a portion of an outer circumference of said activating piston which engages a first face of said sealing element, said first detent being located on a side of said sealing element which is on an opposite side of said second control chamber; and

(h) a second detent positioned on said valve body portion which engages a second face of said sealing element, said second detent being located on a side facing said sealing element in said second control chamber, said first detent and said second detent being positioned in relation to each other such that said sealing element can be moved between them and over said outer circumference of said activating piston.

4,817,661
ADJUSTABLE ENERGY OUTPUT/CYCLIC EVENT FILTER CLEANING CONTROL SYSTEM
David F. Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108
Filed Oct. 21, 1987, Ser. No. 112,535
Int. Cl.⁴ B01D *46/04*
U.S. Cl. 137—119 **22 Claims**



19. A pressure operable cyclic control device comprising:

a body having a chamber formed therein;

piston means mounted in said chamber for pressure driven reciprocation therein between an actuating position and a reset position, said piston means dividing said chamber into first and second opposite portions;

inlet passage means, communicating with said first portion of said chamber, for intermittently receiving and then venting a flow of pressurized fluid from a source thereof to respectively drive said piston means to said actuating position and then permit said piston means to be pressure driven to said reset position;

reset passage means for flowing pressurized fluid into said second portion of said chamber to drive said piston means to said reset position during outflow of pressurized fluid through said inlet passage means;

reset storage reservoir means for receiving and storing a portion of the pressurized fluid intermittently flowed inwardly through said inlet passage means and then flowing the stored fluid through said reset passage means into said second portion of said chamber, after said piston means have been driven to said actuating position, in a manner driving said piston means to said reset position using only stored fluid in said reset storage reservoir means, thereby resetting said device;

transfer passage means connected to said inlet passage means for flowing a portion of the pressurized fluid intermittently flowed inwardly therethrough into said reset storage reservoir means to charge the same;

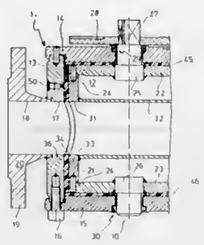
check valve means interposed in said transfer passage means for preventing pressurized fluid flow therethrough from said reset storage reservoir means to said inlet passage means;

orifice means, interposed in said inlet passage means between said transfer passage means and said first portion of said chamber, for restricting inflow and outflow of pressurized fluid through said inlet passage means;

control output means carried by said body, said control output means being operatively engageable to generate a control output signal; and

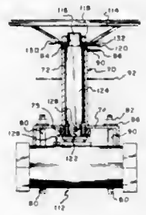
engagement means for operatively engaging and then being disengaged from said control output means in response to movement of said piston means toward and away from said actuating position, respectively.

4,817,662
SHUT-OFF VALVE
Hubert Skibowski, Hamburg, Fed. Rep. of Germany, assignor to Dover Corporation, New York, N.Y.
Filed Jun. 26, 1987, Ser. No. 67,710
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621746
Int. Cl.⁴ F16K *5/04*
U.S. Cl. 137—312 **6 Claims**



1. A shut-off valve comprising a casing having at least two connections, a shut-off element having a cylindrical outer surface and being rotatably supported in the casing, said shut-off element having a thru passage which can be selectively aligned with the at least two connections, a resilient annular cylindrical sealing sleeve being fixed in the casing against rotational movement and having two thru bores adapted to be aligned with the at least two connections, the sealing sleeve co-acting with the cylindrical outer surface of the shut-off element and the casing to provide sealing means, the sealing sleeve being positioned in an axial direction by the casing, a groove (**35**) being formed in the cylindrical outer surface of the sealing sleeve (**33**) around both of the thru bores (**34**) and an elastic sealing ring (**36**), having a diameter larger than the depth of the groove (**35**), being placed in each groove, the improvement wherein an axial groove (**38**) being formed in each outer edge surface of the sealing sleeve (**33**) and an elastic sealing ring (**40**), having a diameter larger than the width of the axial groove (**38**), being placed therein to provide further sealing.

4,817,663
BALL OR PLUG VALVE STEM EXTENSION AND LOCK MECHANISM
William J. McAndrew, 118 Somerset Rd., Glassboro, N.J. 08028
Continuation of Ser. No. 069,876, Jul. 6, 1987, Pat. No. 4,756,507. This application Apr. 20, 1988, Ser. No. 183,764
Int. Cl.⁴ F16K *31/46*
U.S. Cl. 137—385 **28 Claims**



6. A locking device on a valve stem extension for a ball or plug fluid control valve interfitted with a stem extension to place a valve turning means to turn the valve stem at a position movably free of obstruction comprising:

(a) a cylindrical tube having an internal size sufficient to interfit over the valve stem extension allowing the valve stem extension to rotate freely inside the tube, the tube having an upper end and a lower end,

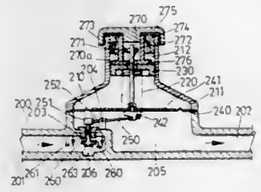
(b) an attachment means structurally attached to the lower end of the tube to attach the tube to a body of the valve,

(c) a horizontal radial plate structurally attached to an outside surface of the upper end of the tube, having at least two vertical holes extending through the radial plate, one hole positioned in relation to a full open position of the valve and one hole positioned in relation to a full closed position of the valve, and

(d) a locking plate having an opening to interfit over the shape on the upper end of the rod, and shaped to couple with and move in conjunction with turning of the valve stem extension and having a hole to align with either of the holes in the radial plate by turning the valve stem extension.

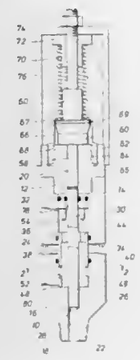
4,817,664
GAS PRESSURE REGULATOR
Zong-Shi Chang, P.O. Box 10160, Taipei, Taiwan
Filed Apr. 29, 1988, Ser. No. 187,914
Claims priority, application United Kingdom, Nov. 30, 1987, 8727975
Int. Cl.⁴ F16K *17/00*
U.S. Cl. 137—458 **1 Claim**

1. A gas pressure regulator, comprising: a body and a cover defining an inlet passage, an outlet passage and a pressure sensing chamber containing a spring biassed diaphragm, a throttle nozzle connecting the inlet passage to the pressure sensing chamber; a switch valve comprising a needle biassed by a switch spring, engaged in the throttle nozzle, projecting into the pressure sensing chamber and having a flange with a sealing washer mounted thereon and located in the inlet passage; a lever arrangement coupling the diaphragm to a member which can abut the end of the needle projecting into the pressure sensing chamber, the arrangement being such that when the flow volume in the outlet passage is greater than the flow volume in the inlet passage the diaphragm will move to cause the lever arrangement to release the needle, the force of the switch spring will cause the flange and sealing washer thereon of the switch valve to close the throttle nozzle and, since the flange is located in the inlet passage, subsequent rise of pressure in the inlet passage will cause the switch valve to close even more tightly thereby eliminating the possibility of the switch valve opening because of weakening elastic force of the spring due to wear, and a restoring mechanism formed in said cover operatively resetting the regulator after being automatically shut off; the improvement which comprises: said restoring mechanism including: a rod coupled to the diaphragm, a ring surrounding the rod and biassed towards the diaphragm by a



spring, and a retaining element secured on a tip of the rod, said ring having a large-diameter disk formed on a lower end of said ring, said disk having a rod hole for reciprocativety moving said rod therethrough, said rod hole being smaller than a lateral length of said retaining element, whereby upon an outward pulling of the ring, the diaphragm will be pulled to a position since the retaining element of the rod is operatively carried by the disk and in which the lever arrangement will act on the needle to open the throttle nozzle and when the pulling force is removed, the ring will return to its original position because of the force of the spring but the rod and diaphragm can remain in the position as the rod hole in the disk freely passing said rod.

4,817,665
SAFETY VALVE
Yves J. M. Nicolas, 16 Square du Pont Colbert, 78000 Versailles, France
Filed Jan. 19, 1988, Ser. No. 145,419
Claims priority, application France, Jan. 21, 1987, 87 00686
Int. Cl.⁴ F16K *17/04*
U.S. Cl. 137—494 **7 Claims**



1. A pressure relief valve comprising:

a hollow body closed by a plug defining a revolution volume having a relatively large central chamber and two rela-

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tively narrow opposing chambers, said central chamber comprising a release hole, fitted with sealing means,

a floating piston having its ends engaged in said opposing chambers, one side of said piston being subjected to a reference thrust and the other to the pressure of the fluid to be controlled,

said opposing chambers are a reference chamber and a chamber under control having identical diameters, and said floating piston comprises in its median section, a cylindrical box, having a bottom and a wall, said box being adapted to slide in said central chamber, at least one longitudinal hole being pierced in said bottom and at least one radial hole pierced in said wall,

so that in a closed position of the valve, the wall of said box closes said release hole in a sealed manner, and the floating piston closes said chamber under control in a non-sealed manner and,

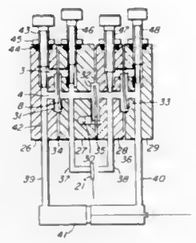
in an open position of the valve said piston is clear ot the chamber under control and said radial hole is placed opposite said release hole.

4,817,666

FLUID FLOW CONTROL VALVES

Frank E. Sanville, 12 Southstoke Road, Bath BA2 5SJ, England

Filed Jun. 4, 1987, Ser. No. 57,770
Int. Cl.⁴ F15B *13/044*; F16K *7/18*
U.S. Cl. 137—596.17 **5 Claims**



1. A fluid flow control valve in a fluid flow control circuit, the valve comprising a cavity, first, second and third ports open to the cavity, and a valve member for selectively closing the first or the second of the ports;

the valve member being a flexible sheet in which there is a tongue that is in the cavity and that is anchored with respect to the cavity along one edge only and that is otherwise fee to move within the cavity for closing the first or the second port;

the sheet being provided with a perforated zone through which the third port is permanently open to the cavity;

the third port of the valve serving as an input for receiving fluid under pressure, the first and the second ports serving as two outputs for this fluid each extending to an associated outlet, and there being means for selectively opening and closing the outlets;

the valve member being responsive to pressure drop at one or other of the outlets, brought about by operation of the outlets, to close the output that has the opened outlet associated with it; and

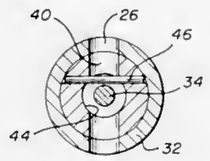
there being a supply extending from between the input and one of the outlets, downstream of the valve member, for supplying, when this outlet is closed, fluid received from the input.

4,817,667

METERING REGULATOR FOR PNEUMATIC TOOLS

Jack L. Hagar, Pinehurst, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 3, 1988, Ser. No. 151,837
Int. Cl.⁴ F16K *31/12*
U.S. Cl. 137—613 **6 Claims**



1. An air metering regulator for installation in pneumatic tools comprising:

a generally tubular body having inlet and outlet ends and connected to the tool, said body having an air supply passageway therein extending from said inlet end;

a volume metering sleeve having an outlet and having a metering port therein, said port located in communication with said air supply passageway and said sleeve moveably located within said body for varying the area of said port in communication with said passageway to correspondingly vary the volume of air flowing through said passageway and port to the outlet end of said body;

a pressure regulator member located within said sleeve having a first end projecting from the outlet thereof, an intermediate portion of reduced diameter, and a second end portion closely fitting into said sleeve, said first end being larger than and engageable with said outlet, said pressure regulating member being moveable from an open position toward a closed position in response to pressure in the outlet of said body; and,

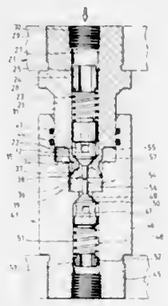
biasing means for urging said pressure regulating member toward said open position in opposition to the pressure in the outlet of said body, whereby pressure in the outlet exerts a force on said pressure regulating member equal to the force exerted by said biasing means moving said pressure regulating member toward said restricted position thereby limiting the air pressure in the outlet of said body.

4,817,668

INTEGRAL METAL SEAL FOR HYDRAULIC COUPLING

Robert E. Smith, III, Stafford, Tex., assignor to National Coupling Company, Inc., Stafford, Tex.

Filed Oct. 2, 1987, Ser. No. 104,448
Int. Cl.⁴ F16L *37/28*
U.S. Cl. 137—614.04 **17 Claims**



1. A hydraulic coupling comprising a male and a female member, each of the members comprising a body having a longitudinal bore extending therethrough, a valve seat at one end of the longitudinal bore, and a poppet valve slideable between an open position and closed position in relation to the valve seat for regulating fluid flow through the longitudinal bore;

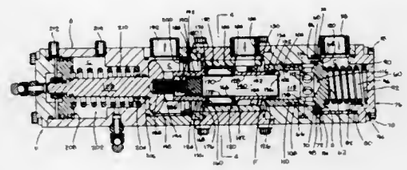
the female member having a cylindrical receiving chamber for slideably receiving the male member therein; and the male member having a leading face with a flexible outer rim to form a metal-to-metal seal with the wall of the receiving chamber at any position within the receiving chamber and maintain the seal during relative movement between the male and female member.

4,817,669

CONTROL VALVE

Miller M. Barrier; Graeme E. Reynolds, and Daniel J. Pesek, all of Houston, Tex., assignors to B.R. Controls, Inc., Houston, Tex.

Filed Jun. 4, 1987, Ser. No. 57,318
Int. Cl.⁴ F15B *13/042*
U.S. Cl. 137—627.5 **16 Claims**



1. A subsea production control valve comprising:

a body defining a cavity therein, said body having a supply, function, and vent port in flow communication with said cavity;

a supply sealing means in said cavity adjacent to said supply port for selective operation in two positions to open and close said supply port, said supply sealing means further comprising:

a seat circumscribing said cavity and disposed between said supply port and said function port;

a plug assembly mounted in said cavity with a portion thereof circumscribed by said seat, said plug assembly further comprising;

a plug having a seating surface thereon said supply port being closed when said seating surface engages said seat; and

a tubular segment extending from adjacent said seating surface and having an outer surface in slidable contact with said cavity wall in said body, said tubular segment means having at least one fluid passageway extending from its outer surface to an inner surface of said tubular segment, whereupon when said seating surface is displaced from said seat, flow communication is established from said supply port to within said tubular segment;

function sealing means in said cavity, adjacent said function port, selectively operable in three positions for:

first, opening said function port, while sealingly isolating flow communication from said supply sealing means, to allow flow communication to said vent port;

second, isolating said function port from said vent port and aligning said function port with said supply sealing means with said supply sealing means in the closed position; and

third, retaining said function port in alignment to allow flow communication to said supply sealing means and shifting said supply sealing means from said closed to said open position;

said function sealing means operable from its first to its second position independent of said supply sealing means;

whereupon initial movement of said function sealing means from said first to said second position interrupts fluid communication between said vent port and said function port and allows fluid communication between said function port and said supply sealing means,

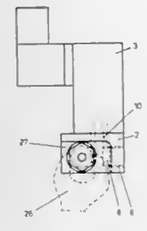
further movement of said function sealing means from said second to said third positions operably engages said supply sealing means to open said supply port and allow fluid communication through said cavity from said supply to said function port.

4,817,670

PRESSURE MEDIUM CONTROL VALVE

Andreas Gogel, Winterthur, Switzerland, assignor to Georg Fischer AG

Filed Mar. 21, 1988, Ser. No. 171,478
Claims priority, application Switzerland, Mar. 27, 1987, 01189/87
Int. Cl.⁴ F16K *11/00*
U.S. Cl. 137—884 **6 Claims**



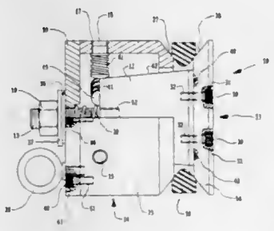
1. In a pressure medium control valve including a valve body and a screw mounted in the valve body, wherein a plurality of pressure medium control valves are combinable in a multiple-valve unit, the multiple-valve unit defining a continuous duct for the pressure medium, the improvement comprising each screw having an external thread, a corresponding internal thread and a throughbore, each screw being screwable with the external thread thereof into the internal thread of the next following screw, each screw defining a shoulder surface and each valve body defining an end face, the shoulder surface being braceable against the end face, the throughbores in the screw defining the continuous ducts.

4,817,671

HIGH PRESSURE MECHANICAL PLUG DEVICE

Allen D. Mathison, Richfield, and Dale K. Nelson, Minneapolis, both of Minn., assignors to Cherne Industries, Inc., Minneapolis, Minn.

Filed Jan. 21, 1988, Ser. No. 146,342
Int. Cl.⁴ F16L *55/10*
U.S. Cl. 138—89 **27 Claims**



1. A mechanical plug device for sealing and locking into the interior of a high pressure pipeline and wherein said mechanical plug device is constructed and arranged to lock the plug

device in the pipeline by utilizing the internal fluid pressure therein, said device comprising:

(a) a top plate body structure having a circular cross-section having a generally hollow interior and having a plurality of laterally disposed apertures at predetermined locations;

(b) a bottom plate structure having a central longitudinal axis and having an end wall of a circular cross-section for receiving the fluid pressure of the pipeline and further having a ram section of a predetermined slope extending axially therefrom for insertion and free movement into the hollow interior of said top plate body structure;

(c) an elastomeric sealing member in communication with one said plate structures for sealing engagement with the interior of a pipeline;

(d) a plurality of rigid locking members being constructed and arranged for generally the lateral movement with respect to said ram member and for extension through said laterally disposed apertures of said top plate body structure; and

(e) means to move said bottom plate toward said top plate body structure without restricting the further free movement of said bottom plate toward said top plate, whereby the movement of said bottom plate structure into said top plate body structure causes said ram member to laterally push said rigid locking members through said top plate apertures for engagement with the pipeline wall to secure said mechanical plug therein and wherein the fluid pressure of the pipeline acts on said bottom plate structure end wall to further move said ram section with respect to said rigid locking members to further secure said device therein.

4,817,672

COMPOSITE TUBE FOR HEATING GASES

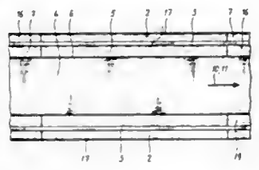
Johannes J. Broodman, Breskens, Netherlands, assignor to Jogema Holding B.V., Middelburg, Netherlands

Filed Feb. 10, 1986, Ser. No. 827,554

Claims priority, application Netherlands, Feb. 12, 1985, 8500393

Int. Cl.⁴ F16L *11/00*

U.S. Cl. 138—113 **20 Claims**



1. Composite tube adapted for heating gases to temperatures in excess of about 1300° C., comprising:

(a) an internal combustion or heating tube which is adapted to carry internally, heating gases at a temperature in excess of about 1300° C., which tube is resistent to the milieus of the gases, and has high heat transfer properties;

(b) an external reinforcement of high strength which completely surrounds said internal tube, and which consists essentially of molybdenum, tungsten, tantalum, niobium or a mixture thereof;

(c) spacer means separating said internal tube from said external reinforcement;

(d) a passageway for gases to be heated located between said external reinforcement and said internal combustion and heating tube such that gases to be heated contact the internal combustion or heating tube externally;

(e) means for supplying gases to be heated to said passageway; and

(f) means for supplying heating gases at a temperature in excess of about 1300° C. internally of said internal combustion or heating tube.

4,817,673

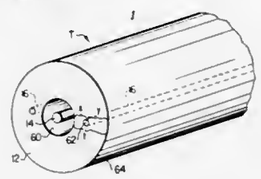
FUSE TUBE WITH REINFORCING ELEMENT

David R. Zoghby, Allentown; Leon F. Hines, Hazleton, both of Pa., and Thomas D. Sampson, Rootstown, Ohio, assignors to Atlas Powder Company, Dallas, Tex.

Continuation of Ser. No. 861,057, May 8, 1986, abandoned. This application Sep. 23, 1987, Ser. No. 99,648

Int. Cl.⁴ F16L *11/08*

U.S. Cl. 138—174 **16 Claims**



1. A reinforced fuse tube which resists longitudinal deformation comprising:

(a) a wall comprised of a low yield strength plastic defining a passageway therethrough in which a reactive element may be placed, said tube having a diameter of about 0.3 inches or less; and

(b) one or more reinforcement yarns of a high tenacity non-conductive material exhibiting less than 15% elongation at failure deposited within said wall, said reinforcement yarns being positioned substantially parallel to the longitudinal axis of said fuse tube, wherein the distance from the interior surface of said wall to the axis of the reinforcement yarn is equal to or less than 0.20 of the nominal thickness of the tube wall, said reinforced yarns fail when said fuse tube is elongated about 4% such failure causing a visible depression on the tube in the area of failure allowing the user to identify a defective tube.

4,817,674

TRAP FOR CAPTURING ANIMALS

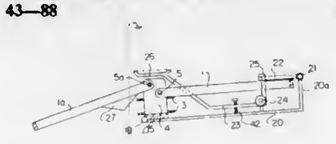
Johannes Luke, Muhlenweg 14, 3477 Marienmunster, Fed. Rep. of Germany

Filed Dec. 28, 1987, Ser. No. 138,638

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1987, 3744309

Int. Cl.⁴ A01M *23/26*

U.S. Cl. 43—88 **16 Claims**



1. Animal trap having two shackles borne opposite each other in plate hinges, whereby the pair of shackles can be tensed by means of one or more tension springs and by means of a release mechanism can be maintained in a locked condition, whereby the pins (5, 5*a*) of each of the opposite shackles (1, 1*a*) are offset vertically in relation to each other, and that the amount by which both shackles (1, 1*a*) are either longer or shorter corresponds to the distance through which the pins (5, 5*a*) for both shackles are offset from each other.

4,817,675

METHOD FOR REPAIRING A BROKEN WARP THREAD ON WEAVING MACHINES, AND THE RETHREADING MECHANISMS USED

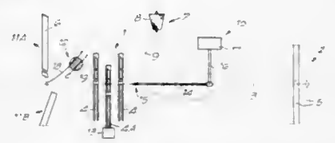
Stefan Dewaele, Kortrijk, and Dirk Gryson, Dikkebus-Ieper, both of Belgium, assignors to Picanol N.V., Belgium

Filed Aug. 28, 1987, Ser. No. 90,510

Claims priority, application Netherlands, Aug. 28, 1986, 8602192

Int. Cl.⁴ D03J *1/14*

U.S. Cl. 139—35 **17 Claims**



1. A method for repairing warp thread breaks in a weaving loom in which a broken warp thread is detected by a fallen drop wire of a warp stop motion device, the method comprising:

upon the falling of a drop wire, taking a new warp thread from a supply of warp thread separate from the loom supply of warp thread, and moving the new warp thread to a position between the warp stop motin device and a harness of the loom by means of a rethreading mechanism;

raising the fallen drop wire and threading a first end of the new warp thread through the raised drop wire by means of the rethreading mechanism;

and threading a second end of the new warp thread through a heddle of the harness corresponding to the broken warp thread.

4,817,676

LOOM SHEDDING MOTION

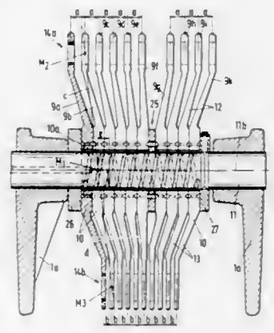
Peter Hans, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 18, 1987, Ser. No. 63,475

Claims priority, application Switzerland, Jul. 4, 1986, 02721/86

Int. Cl.⁴ D03C *13/00*

U.S. Cl. 139—57 **3 Claims**



1. A device providing a loom shedding motion having a predetermined number of cams connected to a drive shaft means for driving a plurality of pivoted cam follower levers, first thrust rods connected to the follower levers and to pivotally mounted bent levers, each of said bent levers comprising two arms supported on a central bearing and being offset with respect to said central bearing, said central bearing having a bearing center, one arm of the bent levers being on a motion input end and another arm on a motion output end, motion-transmitting pivot means located at the motion input and motion output ends of the arms for connecting said input end with said first thrust-rod and said output end with a second thrust rod, the arrangement of the levers being such that, when viewed as a group perpendicular to a bearing axis of the arms, the bent levers have a fan shape in which a spacing (b) between the center of adjacent pivot means at the motion output end is less than a distance e from one bent lever bearing center to an adjacent bent lever bearing center and said distance is less than a spacing (a) between the center of adjacent pivot means at the motion input end, whereby connecting lines from the centers of the pivot means of any one of said bent levers to the bearing center of the same bent lever define angles with respect to a centerline of the central bearing which differ by at most 8°.

4,817,677

METHOD FOR CONTROLLING THE WARP LET-OFF AND CLOTH TAKE-UP ON WEAVING MACHINES

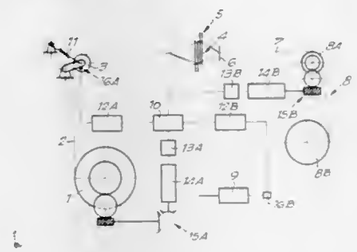
Filip Deconinck, Zwevegem; Johan Cappelaere, Poperinge, and Michel Vandeweghe, Wijtschate-Heuvelland, all of Belgium, assignors to Picanol N.V., Ieper, Belgium

Filed Aug. 21, 1987, Ser. No. 87,824

Claims priority, application Belgium, Aug. 22, 1986, PV2/61037

Int. Cl.⁴ D03D *49/06*

U.S. Cl. 139—99 **17 Claims**



1. A method of controlling the rate of warp let-off and cloth take-up in a weaving machine, said method comprising:

generating a signal that is a function of a variation over time in at least one of a plurality of parameters that are functionally related to warp thread tension and warp thread speed;

processing the generated signal by removing a component of the signal that is a function of the variation over time of the parameter due to changes in a weaving pattern; and

using the processed signal to control the rate of warp thread let-off and cloth take-up in the weaving machine so that effects due to variations of the weave pattern during weaving are removed.

4,817,678

BROKEN WARP THREAD LOCATOR

Stefan Dewaele, Kortrijk, Belgium, assignor to Picanol N.V., Belgium

Filed Jun. 16, 1987, Ser. No. 62,611

Claims priority, application Belgium, Jun. 20, 1986, 2/60999

Int. Cl.⁴ D03D *51/30*

U.S. Cl. 139—353 **11 Claims**

1. A method for determining the location of a fallen drop wire in an automated weaving loom using an electrical drop wire weft break detection system wherein multiple conductive drop wires arranged in rows engage weft threads and, upon a weft breakage, fall to bridge a pair of spaced electrodes having a combined resistance (A + B) along their lengths to establish a point of electrical connection between the electrodes at some

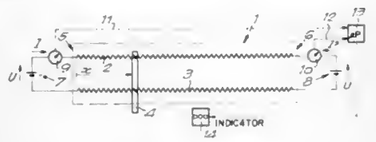
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distance (x) from one end of the electrode pair, said electrical connection having a contact resistance (R), comprising:

(a) applying known voltages (U) in opposition to each other across the opposed ends of the electrode pairs to thereby establish a pair of current circuits respectively including (i) the lengths (x) of the electrodes from one electrode pair end to the fallen drop wire, and the conductive drop wire; and (ii) the remaining lengths of the electrode pair from the fallen drop wire to the opposite end of the electrode pair, and the fallen drop wire; whereby, the relationships thus established can be expressed as:

$$U=(A+B)x\cdot I+(I+I')R \quad (1)$$

and



$$U=(A+B)(1-x)I'+(I+I')R \quad (2)$$

where:

I and I' are values corresponding to current flowing through the pair of current circuits; and

the total length of the electrode pair is equated to unity (1);

(b) determining values corresponding with the currents I and I';

(c) determining the value x from the expression:

$$x=I'/(I+I') \quad (3)$$

to determine the location of the fallen drop wire.

4,817,679

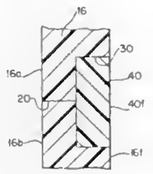
METHOD OF REPAIRING CARBON FIBER RAPIERS AND REPAIRED RAPIER

Lester F. Foster, Jr., Rte. 1, Box 446, Linwood, N.C. 27299

Filed Apr. 17, 1987, Ser. No. 40,160

Int. Cl.[4] D03J *3/00*; D22D *19/10*; D32B *35/00*

U.S. Cl. 139—380 **17 Claims**



1. A rapier for use in a weaving machine comprising:

a longitudinally extending body of carbon fiber,

a groove in said body extending from a first surface thereof partly through said body,

a split extending from a second surface of said body opposite said first surface to said groove, and

a mixture of epoxy resin and glass fiber substantially filling said groove

4,817,680

METHOD AND SYSTEM FOR INTRODUCING A WEFT THREAD OF FINITE LENGTH IN A STORAGE SHUTTLE OF A WEAVING LOOM

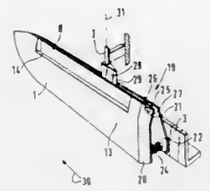
Adolf Links, and Franz Lanthaler, both of Hechingen/Bechtoldsweiler, Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft m.b.H., Lindau/Bodensee, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 146,263

Claims priority, applicatioo Fed. Rep. of Germany, May 12, 1987, 3715742

Int. Cl.[4] D03D *47/26*

U.S. Cl. 139—436 **21 Claims**



1. A method of pneumatically introducing a weft thread or pick (31, 32) into a moving shuttle (1) in which a compressed air jet is emitted from an injector (2) and is utilized to introduce the weft thread or pick into the shuttle, which shuttle moves relative to the injector,

wherein, during said introduction, the air of said jet is constrained to follow a path transverse to the direction of relative movement of the shuttle and the injector,

comprising, in accordance with the invention, the steps of

guiding the air of said jet in a generally U-shaped path, by guiding said air into a first chamber (11) located in the shuttle, then deflecting the air within the shuttle by about 180°, and then, in a reverse direction of air flow, guiding said air into a second chamber (12) located adjacent and parallel to said first chamber, and then exhausting said air,

said chambers, extending along the longitudinal direction of the shuttle and being separated from each other by a separating wall leaving a communication gap to provide for air flow communication of said chambers; and

separating said weft thread or pick from the air of the jet in the chamber first exposed to the air jet and forming a thread storage chamber (11), and locating the thread within the thread storage chamber along the length of the thread storage chamber by relatively moving the shuttle and the air jet.

4,817,681

WEFT THREAD BRAKE MECHANISM FOR SHUTTLELESS LOOMS

Valentin Krumm, Hergensweiler; Siegbert Gsell, Wangen, and Gottfried Cramer, Lindau, all of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 117,694

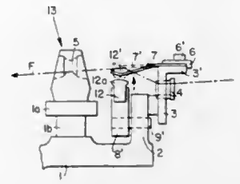
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637919

Int. Cl.[4] D03D *47/34*

U.S. Cl. 139—450 **7 Claims**

1. A weft thread brake mechanism for controlling the tension of weft threads in shuttleless looms, comprising a first plurality of thread guide eyes and a second plurality of thread guide eyes, mounting means for mounting said first plurality of thread guide eyes in a first row and for also mounting said second plurality of thread guide eyes in a second row in such a way that said first and second rows of thread guide eyes extend in parallel to each other, whereby a thread guide eye in one row is located for cooperation with a respective thread guide eye in the other row so that a thread must pass through both thread guide eyes forming a pair, a plurality of individual

thread brake leaf spring means mounted on said mounting means for individually applying a braking force to a respective weft thread intermediate said first and second rows of thread guide eyes, a control rail for controlling the operation of said leaf spring means, journal means for movably securing said control rail to said mounting means intermediate said first and second rows of thread guide eyes and below said leaf spring



means so that said control rail can be moved between a rest position and an operating position below said weft threads, said control rail pressing said weft threads directly from below against the respective leaf spring means, and drive means operatively connected to said control rail for simultaneously pressing said control rail from below directly against said weft threads and thus against all of said leaf spring means.

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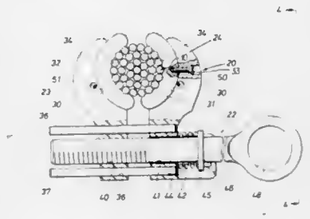
SPLICING TOOL FOR TRANSMISSION LINES

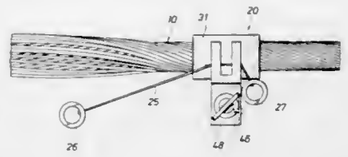
Danny R. Williams, Friendswood, Tex., assignor to Houston Industries, Incorporated, Houston, Tex.

Filed Dec. 17, 1984, Ser. No. 682,745

Int. Cl.[4] B21F *15/02*

U.S. Cl. 140—113 **6 Claims**





1. A splicing accessory tool for use in splicing high voltage electrical transmission lines comprising:

at least two facing jaw means having facing, semicylindrically curved contact surfaces for slidably engaging at least 50% of the circumference of a transmission line along a section of transmission line having spirally wound conductor wires, said contact surfaces having spiral grooves to conform to the curvature of individual wires in a transmission line;

means for interconnecting said jaw means to one another for movement of said jaw means between a closed engagement condition with the outer surface of a transmission line and an open condition where the jaw means can be removed from or placed upon a transmission line,

a single actuator means for controlling movement of said jaw means between said open and closed conditions; and

pulling means connected to said jaw means for applying a pulling force to move the jaw means in a longitudinal direction along a stationary transmission line, said pulling means permitting rotation of the jaw means around a transmission line when the jaw means are moved longitudinally of a transmission line by the pulling means, said pulling means including a flexible cord member coupled to each of said jaw means and having sufficient length to at least one side of said jaw means to permit twisting of said cord member when the tool is rotated about a axis of rotation.

4,817,683

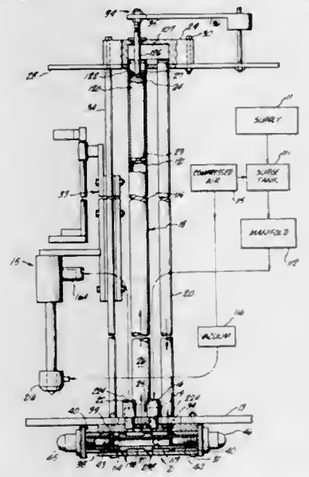
ADJUSTABLE AUTOMATIC ACCURATE CONTAINER FILLING MACHINE

Herman Laub, III, deceased, late of San Gabriel (by Louise M. Laub, executrix), and Edward S. Hunt, Glendale, both of Calif., assignors to Laub Engineering Corporation, Alhambra, Calif.

Filed Jul. 1, 1987, Ser. No. 69,398

Int. Cl.[4] B65B *3/12*

U.S. Cl. 141—1 **56 Claims**



1. Apparatus for filling containers with a flowable substance from a supply comprising means for conveying containers along a path, the path passing through a filling station, a plurality of nozzles for movement along at least part of the path together with the associated containers, a plurality of cylinders mounted for movement along at least part of the path together with the containers, each cylinder having respective opposite ends and each cylinder having a free piston movable in each cylinder towards opposite end of the cylinder, the piston having no extension from each respective cylinder, a plurality of spool valve assemblies associated with each respective cylinder for alternately connecting respectively each valve assembly to the respective opposite end of the each cylinder for charging and discharging the respective opposite ends with the flowable substance, each valve assembly alternately connecting a nozzle to a respective opposite end of a cylinder for discharging the flowable substance from the supply and/or connected cylinder end into a container, and means for mechanically operating the valve assemblies to regulate supply of the flowable substance into the container.

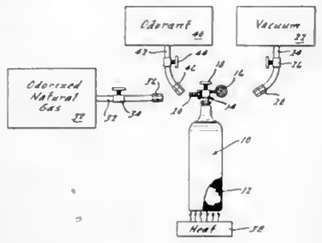
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4,817,684

METHOD AND APPARATUS FOR SORPTIVELY STORING A MULTICONSTITUENT GAS

John W. Turko, River Rouge, and Kenneth S. Czerwinski, Detroit, both of Mich., assignors to Michigan Consolidated Gas Company, Detroit, Mich.

Filed Sep. 16, 1987, Ser. No. 97,847
Int. Cl.[4] B65B 31/00
U.S. Cl. 141—4 63 Claims



1. A method for sorptively storing a multiconstituent gas in, and for selectively releasing the multiconstituent gas from, a vessel having a predetermined sorbent material therein, the multiconstituent gas being composed of at least two constituents, a first of the constituents being preferentially sorbed by the predetermined sorbent material over a second of the constituents, and the first of the constituents being present in the multiconstituent gas in a predetermined minimum quantity substantially less than the quantity of the second constituent present in the multiconstituent gas, said method being adapted for substantially preventing the first constituent from being substantially sorptively removed from the multiconstituent gas upon release of the stored multiconstituent gas from the vessel, said method comprising the steps of:

sorptively saturating the sorbent material in the vessel with a pre-storage quantity of the first constituent at a first predetermined pressure;

introducing the multiconstituent gas under pressure into the vessel after the sorbent material has been sorptively saturated and pressurizing the vessel with the multiconstituent gas to a second predetermined pressure higher than said first predetermined pressure in order to cause both of the first and second constituents of the multiconstituent gas to be sorptively stored therein; and

selectively releasing the stored and pressurized multiconstituent gas from the vessel, the sorbent material thereby desorptively releasing the multiconstituent gas with the first constituent present therein in at least said predetermined minimum quantity, as the pressure in the vessel decreases during said release.

4,817,685

APPARATUS AND METHOD FOR SIMULTANEOUSLY FILLING MULTIPLE MUNITIONS ITEMS WITH EXPLOSIVE

Peter Skerchock, Little Falls; Lawrence Honablew, Morristown; Antonio Caldrelli, Morris County, all of N.J., and LeRoy D. Cooper, Riverton, Kans., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

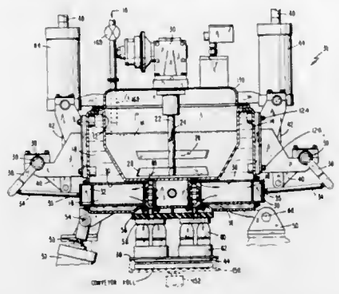
Filed Apr. 6, 1987, Ser. No. 34,529
Int. Cl.[4] B65B 3/12; C06B 21/00
U.S. Cl. 141—11 12 Claims

9. A method for simultaneously and positively injecting an explosive material into a plurality of munition item elements, comprising the steps of:

maintaining a quantity of said explosive material in a molten state;

simultaneously withdrawing a predetermined plurality of separate amount of said explosive material; and

positively and simultaneously injecting each of said plurality of predetermined amounts of said molten explosive material into each of said plurality of munitions item elements and into a small-volume temporary riser to accomodate for shrinkage of said injected molten explosive cooling within each of said munitions items after said injection.

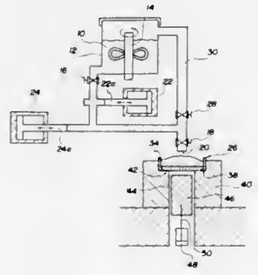


4,817,686

METHOD FOR LOADING COSMETIC MATERIAL INTO A CONTAINER AND SOLIDIFYING SAID COSMETIC MATERIAL

Yoshiharu Hatakeyama, and Mitsuo Ishiguro, both of Tokyo, Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1987, Ser. No. 13,423
Claims priority, application Japan, Feb. 17, 1986, 61-30688; Feb. 17, 1986, 61-30689
Int. Cl.[4] B29J 5/00
U.S. Cl. 141—12 10 Claims



1. A method for loading a cosmetic material into a container and solidifying said cosmetic material, comprising the steps of:

providing a container having an upper open end and comprising a frame forming a side wall and a bottom plate slidably fitted in said frame;

preparing a viscous cosmetic material by mixing a powder cosmetic material with a solvent;

dripping a predetermined amount of said viscous cosmetic material into said container from said upper open end thereof;

disposing said container in compression means including a supporting block and a presser, at least one of said supporting block and said presser having a porous absorbent element adjacent said container, and said presser including a flat and smooth lower surface;

tightly closing said upper open end of said container by said lower surface of said presser so that said lower surface is positioned at a level of the upper edge of said frame of said container;

compressing said cosmetic material by pressing and moving said bottom plate upwardly relative to said frame of said container; and

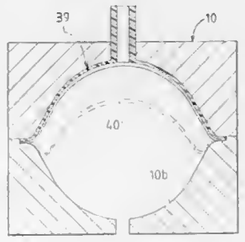
squeezing said solvent from said cosmetic material through said porous absorbent element during said compressing step, whereby said cosmetic material is solidified with the upper end thereof being flat and flush with the upper edge of said frame of said container.

4,817,687

FILLING DEVICE

Peter Löfgren, Hovas, and Nils Arthun, Partille, both of Sweden, assignors to Steridose Systems AB, Sweden

Division of Ser. No. 622,129, Jun. 19, 1984, Pat. No. 4,685,494.
This application Mar. 27, 1987, Ser. No. 30,571
Claims priority, application Sweden, Jun. 27, 1983, 8303656
Int. Cl.[4] B67D 5/00
U.S. Cl. 141—65 13 Claims



1. A device for filling a container, comprising:

(A) a housing defining a dosage chamber therein;

(B) an at least partly flexible temporary storage container disposed in said chamber;

(C) inlet means for supplying filling goods to said temporary storage container, outlet means for emptying the filling goods from said temporary storage container to the container to be filled, and means communicating said inlet and outlet means with the interior of said temporary storage container without leakage; and

(D) means for establishing a pre-determined pressure condition inside said dosage chamber comprising a vacuum source and a pressure source;

(E) wherein said temporary storage container comprises first and second container parts, said second container part is formed as a rigid semi-sphere, and said first container part, with maintained internal environment, is placeable in abutment with the inside of said second container part.

4,817,688

METHOD AND DEVICE FOR DRIVING DOUBLE BELLOWS PUMP

Donald G. Corniea, Inver Grove, Minn., assignor to Liquipak International, Inc., St. Paul, Minn.

Filed Apr. 20, 1987, Ser. No. 39,731
Int. Cl.[4] B67D 5/40
U.S. Cl. 141—140 14 Claims

1. An oscillating drive assembly for a double bellows dispensing unit, comprising:

a frame member;

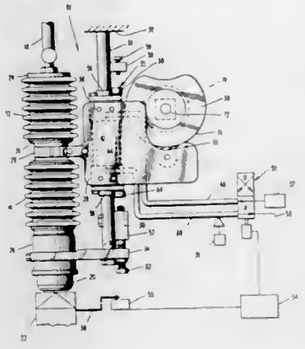
connection means for rigidly connecting said frame member to said double bellows dispensing unit;

a shaft mounted at a fixed position adjacent said dispensing unit;

a fluid cylinder slidably mounted on said shaft, said frame member being secured to said fluid cylinder;

a rotary cam and a cam follower, one of which being mounted on said frame member and the other of which being mounted at a fixed position;

bidirectional fluid motor means cooperating with said fluid cylinder for selectively urging the fluid cylinder in one of two directions, whereby said rotary cam and cam follower are engaged when the fluid motor means urges the fluid cylinder in a first direction, and the rotary cam and cam follower are disengaged when the fluid motor means urges the fluid cylinder in a second direction;



said rotary cam and cam follower are arranged so as to produce oscillation of said frame member along said shaft when said cam is rotating and when said rotary cam and cam follower are engaged; and

controllable means for selectively controlling the fluid motor means whereby when said drive assembly is connected with said double bellows dispensing unit and the fluid motor means is urging said cam and cam following into engagement, rotation of said cam imparts oscillating motion to activate said dispensing unit.

4,817,689

AUTOMATIC CONTROL SYSTEM FOR FILLING BEVERAGE CONTAINERS

William F. Stembridge, College Park; W. Frank Stembridge, East Point, both of Ga., and James C. Sturrock, Espanola, N. Mex., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 684,215, Dec. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 629,397, Jul. 10, 1984, abandoned. This application Feb. 9, 1987, Ser. No. 12,760
Int. Cl.[4] B67C 3/28
U.S. Cl. 141—198 2 Claims

1. An apparatus for automatically filling containers with beverage comprising;

(a) a pair of adjacent beverage dispensing valve assemblies, each of which includes:

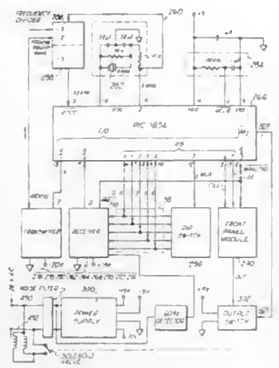
(1) an ultrasonic energy transmitter for transmitting ultrasonic energy down toward a container supporting surface located below a beverage dispensing nozzle;

(2) an ultrasonic energy receiver, separate from and spaced apart from said transmitter and positioned for receiving ultrasonic energy reflected back up from the direction of said surface and for generating corresponding signals;

(3) control circuit means for using said generated signals for detecting the presence of a container placed on said surface and below said nozzle; and

(4) said control circuit means including means for control-

ling the filling of said container with beverage from said nozzle; and



(b) means for operating said adjacent valve assemblies separated in time by synchronizing their operation to different half cycles of an a.c. power supply.

4,817,690

DEVICE FOR FILLING TRANSPORTABLE VESSELS WITH FLOWABLE MATERIALS

Dieter Heeren, Ascheberg, and Friedrich Vock, Münster, both of Fed. Rep. of Germany, assignors to Basf Lacke & Farben AG, Münster, Fed. Rep. of Germany

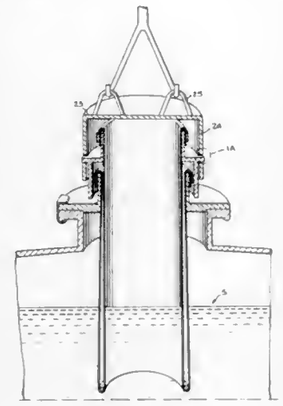
PCT No. PCT/EP86/00490, § 371 Date May 26, 1987, § 102(e) Date May 26, 1987, PCT Pub. No. WO87/01681, PCT Pub. Date Mar. 26, 1987

PCT Filed Aug. 21, 1986, Ser. No. 75,814

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3533837

Int. Cl.⁴ B65B *39/00*

U.S. Cl. 141—338 **9 Claims**



1. A device for filling transportable vessels having filler sockets from containers holding flowable materials, the device comprising:

first clamping ring for coupling the device to the filler socket of the vessel;

a flexible circular filler hose fastened at a first end to the first clamping ring;

weighting ring having a diameter smaller than the inside diameter of the hose, the ring being placed outside the hose within a loop formed in said hose by folding the hose back upon itself, inside the hose and being capable of sliding up and down the hose when said hose is raised and lowered in said vessel; and

second clamping ring for coupling the device to the containers, the second clamping ring being connected to a second end of the hose, after the hose has been folded back over itself to enclose the weighting ring and directed back through the first clamping ring, the second clamping ring being sized to fit over the first clamping ring when the device is in a stowed position in said vessel.

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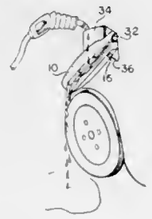
PROTECTIVE FUEL FILL BIB USING FLEXIBLE SHEET WITH TROUGH SHAPER

Kenny M. Lau, 3635 Mission St., San Francisco, Calif. 94110

Filed Jul. 28, 1987, Ser. No. 78,800

Int. Cl.⁴ B65B *3/00*

U.S. Cl. 141—390 **11 Claims**



1. A fuel fill bib for protecting a fender area of an automobile adjacent to its fill pipe in case an accidental trickling to a massive overflow of fuel occurs from said fill pipe or a fuel-hose nozzle during or after filling, and which is compactable so that it can be stored within a fill-pipe compartment when not in use, comprising:

a single sheet of flexible material having a top edge, two side edges, a bottom edge, and parallel top and bottom surfaces defined by said top, side, and bottom edges,

said bottom edge of said sheet being a free edge of said sheet,

said sheet including means for attaching a portion of said sheet, adjacent said top edge, around said fill pipe,

said sheet having shaping means for causing it to form a self-supporting trough which extends substantially from said portion adjacent said top edge to said free bottom edge such that when said portion adjacent said top edge is attached to said fill pipe, said sheet is extended to its full length, and said bottom surface is placed over and tangent to a bottom edge of the opening of said fill-pipe compartment,

(a) said bottom edge of said sheet will extend free of and away from said fender area, and

(b) when said top surface of said sheet is viewed from a direction parallel to and looking into said fill pipe, said side edges of said sheet will be closer to an observer than a middle portion of said sheet between said side edges so as to form said self-supporting trough extending from said fill pipe to said free bottom edge and so that said middle portion of said top side of said sheet will face said observer,

such that any spillage of fuel from said fill pipe will run down said middle portion of said sheet in the trough formed by said sheet and then off said free bottom edge of said sheet and away from said fender area and to the ground,

said sheet also being composed of flaccid material which in itself is not rigid enough to be self-supporting or to assume said trough shape and which has sufficient flexibility so that it can be folded or crumpled and tucked completely into said fill-pipe compartment,

said shaping means comprising a supporter constructed from resilient material of sufficient size to extend the width of said sheet and cause said sheet to assume said trough shape when said sheet is pulled out of said compartment.

4,817,692

RING SAW

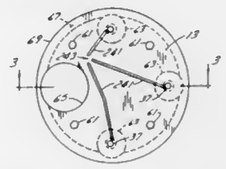
Laurent Denis, Ste. Rosalie, Canada, assignor to Equipements Denis Inc., St. Hyacinthe, Canada

Filed Aug. 30, 1988, Ser. No. 238,147

Claims priority, application Canada, Sep. 2, 1987, 545994

Int. Cl.⁴ A01G *23/08*

U.S. Cl. 144—3 D **11 Claims**



11. A tree felling head having: a fixed frame; a movable frame slidably mounted on the fixed frame; the movable frame having a generally U-shape configuration defined by a pair of parallel arms joined by a base; a ring saw mounted on each arm and extending toward the other arm; each ring saw having a circular disk-shaped saw body; a cutting ring mounted about the circular peripheral edge of the saw body; cutting teeth mounted on the cutting ring; drive means on the saw body for rotating the cutting ring about the saw body; the saw body having an annular slot in its peripheral edge that extends radially inwardly; the cutting ring having an annular, radially inwardly directed, flange on its inner circumferential surface that extends into the slot in the saw body; and driven means on the inner surface of the flange that cooperate with the drive means on the saw body to rotate the ring; the ring saws aligned and overlapping; and means moving the movable frame forwardly on the fixed frame to have the two ring saws cut through a tree between them while their cutting rings are rotating.

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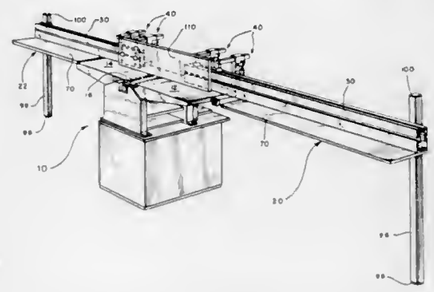
MACHINE TOOL EXTENSION TABLE AND METHOD FOR INSTALLING SAME

Michael J. Schuler, 1410 N. Broadway, Urbana, Ill. 61801

Filed Apr. 27, 1988, Ser. No. 186,800

Int. Cl.⁴ B27C *9/00*; **B27B** *25/10*

U.S. Cl. 144—359 **54 Claims**



1. An extension table for a machine tool of the type that comprises a machine table that is substantially fixed during processing of a workpiece, said machine table having an upper surface that defines a reference plane, said extension table comprising:

a beam having a lower surface which defines a beam plane, said beam comprising an inner portion and an outer portion;

a ledge mounted to the lower surface of the outer portion of the beam to extend outwardly from at least one side of the beam, said ledge defining an upper surface substantially parallel with the beam plane;

means for mounting the inner portion of the beam on the machine table with the lower surface resting on the machine table and the beam plane substantially parallel with the reference plane;

said inner portion of the beam overlapping the machine table, said outer portion of the beam cantilevered from the machine table, and said beam having sufficient rigidity to ensure that when the beam is loaded only with the ledge the upper surface of the ledge is substantially coplanar with the reference plane;

a leg; and

means for adjustably securing the leg to the outer portion of the beam to support the beam against downward deflection when loaded with a workpiece.

4,817,694

CONVEYING APPARATUS AND FIXING APPARATUS

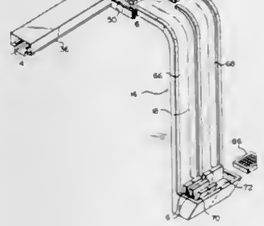
Yukito Matsuo, Yokohama; Tsuyoshi Ishida, Yokohama; Kunihiko Nakamura, Yokohama; Mitsuaki Masuko, Tokyo; Kouitirou Shin, Saitama, and Isao Shirai, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Nippon Airshooter Co., Ltd., Tokyo, both of, Japan

Filed Dec. 5, 1986, Ser. No. 938,644

Claims priority, application Japan, Dec. 7, 1985, 60-275480

Int. Cl.⁴ B65G *43/08*

U.S. Cl. 198—346.2 **13 Claims**



1. A conveying apparatus for conveying at least one object, comprising;

main conveying means including main conveying path defining means for defining a main conveying path, at least one station located along the main conveying path, at least one carrier movably guided along the main conveying path with said object contained therein, and driving/stopping means for moving the carrier along the main conveying path and stopping it at the station located along the main conveying path, so that said at least one object is delivered, said driving/stopping means including a plurality of first conductors arranged along said main conveying path at predetermined intervals, and a second conductor attached to the carrier and driven by the first conductors;

sub-conveying means including sub-conveying path defining means extending from the station and defining a sub-conveying path along which said object is conveyed, a con-

veying mechanism for conveying said object along said sub-conveying path, a first supply/receipt section located at an end of said sub-conveying means adjacent to said main conveying path, a second supply/receipt section located at another end of said sub-conveying path, spaced from said main conveying path, said second supply/-receipt station supplying said object to said conveying mechanism and receiving the object from said conveying mechanism, said conveying mechanism including a first conveying section for conveying the object from the first supply/receipt section to the second supply/receipt section, and a second conveying section for conveying the object from the second supply/receipt section to the first supply/receipt section;

transfer means for transferring objects in the station such that objects on the main conveying means are transferred to the sub-conveying means and objects on the sub-conveying means are transferred to the main conveying means; and

a fixing apparatus which includes:

fixing means attached to said carrier, said fixing means being movable between a first position, where the object is fixed to said carrier, and a second position, where the object is not fixed to said carrier;

urging means for urging the fixing means towards the first position; and

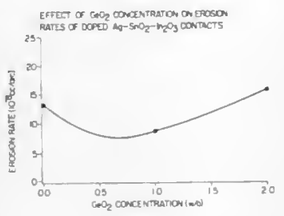
releasing means mounted on said conveying path, along which said carrier is conveyed, said releasing means moving the fixing means towards the second position against the urging force of said urging means, thereby releasing the object from said fixing means.

4,817,695

ELECTRICAL CONTACT MATERIAL OF AG, SNO_2, GEO_2 AND IN_2O_3

Philip C. Wingert, 1711 Three Meadows Rd., Greensboro, N.C. 27408; Charles Brecher, 9 Skyview Rd., Lexington, Mass. 02173; Han J. Kim, 342 Silver Hill Rd., Concord, Mass. 01742, and Shinhoo Kang, 78 Concord Rd., Wayland, Mass. 01778

Filed Dec. 2, 1987, Ser. No. 127,845
Int. Cl.[4] C22C *5/06*
U.S. Cl. 148—431 **3 Claims**



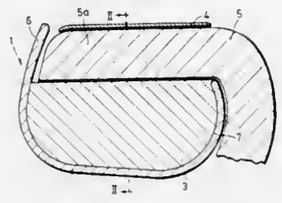
1. An electrical contact having at least 95% theoretical density and having the following composition, by weight: 6 to 18% SnO_2, 0.25 to 1% GeO_2, 0.2 to 2% In_2O_3Ag, said SnO_2, GeO_2 and In_2O_3 being homogeneously distributed within the silver matrix.

4,817,696

PNEUMATIC TIRE BEAD CORE RING FOR ANCHORING A CARCASS

Jonny Janus, Kreuzstrasse 53, D-4000 Duesseldorf 1; Gert Vaubel, Warburg-Welda; Stefan Klatzer, Schloss Neuhaus, and Günter Beckmann, Haltern, all of Fed. Rep. of Germany, assignors to Benteler-Werke AG, Paderborn and Jonny Janus, Dusseldorf, both of, Fed. Rep. of Germany

Filed Apr. 30, 1987, Ser. No. 44,303
Claims priority, application Fed. Rep. of Germany, May 3, 1986, 3615138
Int. Cl.[4] B60C *15/04*
U.S. Cl. 152—540 **8 Claims**



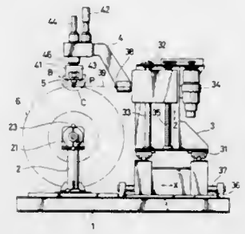
1. A bead core ring for a rubber tire having a carcass, said bead core ring comprising a shaped ring having a limb portion and an opposing end portion defining a trough therebetween, a winding of strands disposed in said trough, said limb portion of said shaped ring extending outwardly beyond the winding in said trough and said opposing end portion, cover means comprising a flat plastic ring, said cover means and said opposing end portion defining a laterally open area therebetween adapted to receive an end portion of said carcass, said cover means and said shaped ring adapted to coact to secure a carcass to said core ring.

4,817,697

APPARATUS FOR GROOVING TIRES

Masao Takami; Toru Nagahata, both of Kobe; Masakazu Arita, Kakogawa; Eigi Shibata, Nakama, and Tadahiko Tamura, Kitakyushu, all of Japan, assignors to Sumitomo Rubber Industries, Inc., Hyogo, Japan

Continuation of Ser. No. 825,922, Feb. 4, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 213,455
Claims priority, application Japan, Feb. 4, 1985, 60-20288
Int. Cl.[4] B29H *21/08*
U.S. Cl. 157—13 **17 Claims**



1. An apparatus for grooving a tire, which comprises:

a base portion,

tire support means for supporting and rotating a tire, said tire support means being mounted on said base portion,

said tire support means including a tire support shaft extending in a first longitudinal direction,

a support frame mounted on said base portion,

an arm support shaft projecting from said support frame,

said arm support shaft having a longitudinal axis extending in a second longitudinal direction,

pivotal arm means having first and second ends with said first end thereof being pivotally mounted on said arm support shaft,

cutting means connected to said second end of said pivotal arm means,

means for providing relative movement between said cutting means and said tire support shaft in said first longitudinal direction and perpendicular to said first longitudinal direction,

said cutting means including a cutter holder shaft having an axis and being attached to said pivotal arm means, said cutter holder shaft axis extending in a direction which is perpendicular to said second longitudinal direction of said longitudinal axis of said arm support shaft, a cutter holder attached to said cutter holder shaft, said cutter holder being rotatable about said axis of said cutter holder shaft, and a cutter attached to said cutter holder, and

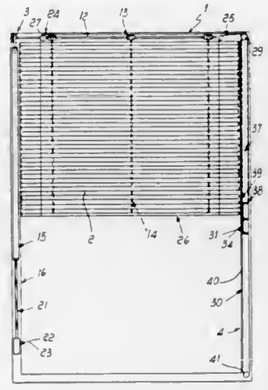
said cutter when cutting said tire being located so that it intersects a line which is an extension of said longitudinal axis of said arm support shaft.

4,817,698

MULTIPLE BLADE CURTAIN, IN PARTICULAR A VENETIAN BLIND

Mauro Rossini, and Mario Encicliati, both of Este, Italy, assignors to B.M. di Mauro Rossini & C. S.a.s., Este PD, Italy

Filed May 14, 1987, Ser. No. 49,885
Claims priority, application Italy, May 16, 1986, 41568 A/86
Int. Cl.[4] E06B *9/38*
U.S. Cl. 160—107 **8 Claims**



1. A multiple blade curtain, in particular Venetian blind, comprising two substantially parallel spaced-apart glass surfaces defining a hermetically sealed interspace of a glass box and comprising internally of said sealed interspace:

a plurality of superimposed slats;

first control means for selectively adjusting the inclination of said slats, said first control means including first cord means for tilting said slats and first drive means for operating said first cord means;

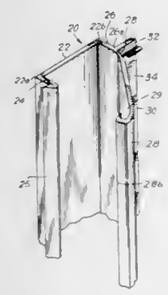
second control means for accumulating said slats upwardly of said sealed interspace, said second control means including a rigid rod disposed underneath of said slats, second cord means connected at a first end thereof with said rigid rod for raising thereof and second drive means for operating said second cord means, said second drive means further comprising an upper and a lower idle rollers journalled to opposite upper and lower corners of said sealed interspace, an endless cable wound on said upper and lower idle rollers, an inner slider secured to a location of said endless cord and connected to a second end of said second cord means for driving thereof; said blind further comprising externally of said sealed interspace first and second operating means respectively coupled with said first and said second drive means; wherein said second drive means further comprise a variable counterweight means including a plurality of juxtaposed elements secured to said endless cable lengthwise thereof to form a substantially flexible track-like member, said track-like member extending upwardly from the top end of said inner slider for a length corresponding to that of said plurality of slats in their fully extended condition so as to wind on said upper idle roller, the overall weight of said track-like member being substantially one half the cumulative weight of all the slats, said inner slider having a weight substantially corresponding to that of said rigid rod increased by one half the cumulative weight of all the slats, whereby when said slats are in their upwardly accumulated position, the weight of said inner slider and that of said track-like member coact to balance the cumulative weight of said slats and of said rod, and whereby when said slats are in their completely downwardly extended position the weight of said slider is partially counterbalanced by the weight of said track-like member to oppose the only weight of said rigid rod, in any intermediate position of said slats the weight of said track-like member which passes over and laterally down of said upper idle roller partially counterbalancing the weight of said inner slider thus balancing the weight of the effective extension of blind to be raised, thereby keeping the effort required for accumulating the slats at a substantially constant minimum value.

4,817,699

WALL TRACK FOR FABRIC WALL COVERINGS

Harvey C. Fein, New York, N.Y., assignor to DFB Sales, Inc., Long Island City, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,443
Int. Cl.[4] E06B *3/80*
U.S. Cl. 160—327 **4 Claims**



1. A plastic wall track for affixing fabric to a wall comprising an elongated base adapted to be secured to the wall, said base including a generally flat surface having first and second opposing edges, a first shoulder extending outwardly from the first edge of said base away from the wall, a second shoulder extending outwardly from the second edge of said base away from said wall, said first shoulder including a first lip, said second shoulder including a panel hingedly secured thereto having a second lip adapted to lock over said first lip to capture said fabric therebetween, said second shoulder including a flange extending outwardly therefrom essentially parallel to said base, said flange being spaced outwardly from said base, said flange being adapted to support a lining material under said fabric, said flange including an adhesive material on the

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outer surface thereof, said lining material being supportable on said flange and affixable thereto by said adhesive material.

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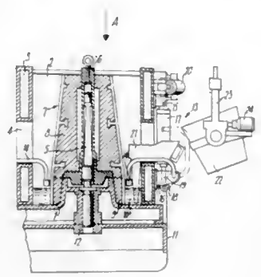
SQUEEZE-OUT CASTING MACHINE

Vladimir N. Milov, ulitsa Krivorozhskaya, 21, korpus 2, kv. 67; Anatoly A. Loginov, 7-yaParkovaya, 27, kv. 52, both of Moscow; Nikolai S. Ostrenko, deceased, late of Moscow; Viktor I. Gorsky, Slavyansky bulvar, 17, kv. 48; Nikolai A. Demyanovich, 1-y Goncharny pereulok, 7, kv. 108, both of Moscow; Rifkhat B. Davletkhanov, Institutsky pereulok, 6, kv. 52, Dolgoprudny Moskovskoi oblasti; Sergei N. Klimets, ulitsa Titova, 3, kv. 18, Kamensk-Uralsky Sverdlovskoi oblasti; Gennady P. Dokshin, ulitsa Dobroljubova, 3, kv. 31, Kamensk-Uralsky Sverdlovskoi oblasti; Jury A. Telyatnikov, ulitsa Tevosyana, 7, kv. 118, Kamensk-Uralsky Sverdlovskoi oblasti; Vladislav I. Yarkin, ulitsa Pushkina, 2, kv. 81, Kamensk-Uralsky Sverdlovskoi oblasti; by Ekaterina A. Ostrenko, administrator, Kosinskaya ulitsa, 26, korpus 1, kv. 64, Moscow; by Inna E. Chevalkova, administrator, Proektiruemy proezd, 3, kv. 77, Moscow, and by Alla E. Stebakova, administrator, ulitsa Lipetskaya, 11, korpus 1, kv. 171, Moscow, all of U.S.S.R.

Continuation-in-part of Ser. No. 372,699, Apr. 28, 1982, abandoned. This application Mar. 16, 1987, Ser. No. 26,057

Int. Cl.⁴ B22D *27/11*

U.S. Cl. 164—259 **3 Claims**



1. A machine for squeeze-out casting, comprising

a baseplate;

a first and second half-molds mounted on said baseplate;

a drive operatively connected with said half-molds for reciprocating the half-molds along said baseplate

two sealing jaws mounted on said baseplate for reciprocation under the action of said drive;

pour-in ports defined in said sealing jaws, adapted to be closed by overlapping as said half-molds are brought together;

a centering pin rigidly secured on said baseplate;

a frame supported by said centering pin;

a core unit mounted on said frame;

a metal-receiving chamber defined by said core unit, said baseplate, said sealing jaws and portions of said half-molds adjoining said baseplate; and

means for reducing convective streams of air introduced into the chamber and for creating a gas cushion of an inert gas above a melt introduced into the metal-receiving chamber by an arrangement for supplying an inert gas communicating with said metal-receiving chamber wherein said arrangement for supplying an inert gas includes:

a plurality of ducts defined in walls of said half-molds adjoining said baseplate;

said walls having an inner surface;

said ducts having longitudinal axes extending at an angle to the inner surface of the walls of said metal-receiving chamber, for swirling the stream of the inert gas being fed above the surface of the molten metal.

4,817,701

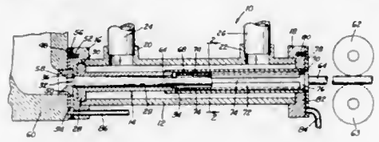
METHOD AND APPARATUS FOR HORIZONTAL CONTINUOUS CASTING

Thomas J. Stevens, Orange, Calif., assignor to Steel Casting Engineering, Ltd., Orange, Calif.

Continuation of Ser. No. 82,283, Aug. 6, 1987, abandoned, which is a continuation of Ser. No. 814,816, Dec. 30, 1985, abandoned, which is a continuation of Ser. No. 740,152, Jun. 6, 1985, abandoned, which is a continuation of Ser. No. 641,285, Aug. 16, 1984, abandoned, which is a continuation of Ser. No. 402,062, Jul. 26, 1982, abandoned. This application Mar. 28, 1988, Ser. No. 173,104

Int. Cl.⁴ B22D *11/00*

U.S. Cl. 164—415 **2 Claims**



1. A horizontal continuous casting machine for producing metal product in the form of wire or rod, comprising:

a housing containing a liquid-cooled mold having an entrance end and an exit end;

an end cap overlying the entrance end of said mold and having a central aperture aligned with the bore of the mold;

a generally cylindrical nozzle of zirconium oxide ceramic disposed with one end thereof projecting into said aperture in said end cap, said nozzle having a central bore opening into said mold bore, and said nozzle also having a radial flange, one side of which bears against said end cap;

a pressure plate attached to said end cap and abutting against the other side of said radial flange;

an annular seal spaced radially outward from said nozzle flange and surrounding the nozzle, said seal enclosing the cavity between said end cap and said pressure plate; and

means for supplying inert gas to said cavity at pressure above atmospheric but below the static pressure head of the molten metal within the nozzle, whereby the nozzle is surrounded and blanketed by inert gas, and the porous ceramic nozzle is permeated by the inert gas, thereby displacing oxygen from the surface pores when the molten metal passes through the nozzle.

4,817,702

APPARATUS FOR CASTING ENDLESS STRIP

Seiji Itoyama; Hakaru Nakato; Tsutomu Nozaki; Yasuhiro Habu; Nagayasu Bessho, and Tetsuya Fujii, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Division of Ser. No. 879,278, Jun. 27, 1986, Pat. No. 4,735,254. This application Sep. 29, 1987, Ser. No. 102,114

Claims priority, application Japan, Jun. 27, 1985, 60-96576; Aug. 30, 1985, 60-189965; Apr. 14, 1986, 61-84234; Apr. 16, 1986, 61-86204

Int. Cl.⁴ B22D *11/06, 11/10*

U.S. Cl. 164—432 **8 Claims**

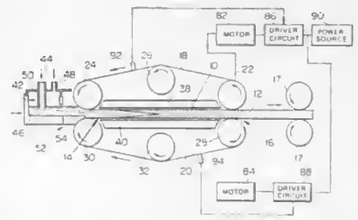
1. A continuous casting apparatus having a supply nozzle providing molten material for casting strip comprising:

an endless belt arranged on a support means below said nozzle and comprising a driven roller for forming a lower surface of a continuous casting chamber;

a pair of stationary members forming side walls of said casting chamber;

sealing means for establishing a seal between the bottom of said nozzle and said belt for preventing flow of said molten material therebetween;

said supply nozzle being arranged for supplying molten material to said casting chamber along a flow path defined by said supply nozzle being slightly narrower than said



casting chamber and the lower surface defining the floor of said supply nozzle being slightly higher than the highest section of said endless belt, and the outlet end of said floor being slightly offset in the upstream direction of said flow of molten material relative to said highest section of said casting chamber.

4,817,703

STRIP CASTING UNIT WITH DOWNSTREAM MULTI-STAND CONTINUOUS ROLLING MILL

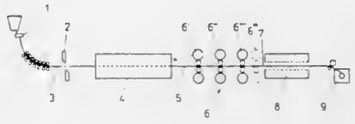
Wolfgang Robde, Dormagen, and Jürgen Seidel, Kreutzal, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 6, 1987, Ser. No. 118,584

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637893

Int. Cl.⁴ B21B *1/26, 1/46, 13/22;* B22D *11/12*

U.S. Cl. 164—476 **11 Claims**



1. In a process for making hot-rolled steel strip from a striplike continuously cast starting material in successive processing steps including bringing said striplike continuously cast starting material after solidification to the hot rolling temperature and subsequently feeding said starting material to a multistand rolling mill for rolling to a finished rolled product, the improvement wherein said rolling to said finished rolled product occurs continuously in from three to four roll stands with the largest possible reduction per pass, the first two of said roll stands are provided with a large working roll diameter and an approximately maximum rolling moment, and all of the working rolls of the continuous rolling mill are directly driven.

7. In a strip casting unit with an associated multi-stand continuous rolling mill having a plurality of working rolls for making hot-rolled steel strip from a striplike continuously cast starting material in successive process steps, said striplike continuously cast starting material being brought after solidification to the hot-rolling temperature and being fed to said continuous rolling mill for rolling to a finished rolled product, the improvement wherein said multi-stand continuous rolling mill comprises three or at most four roll stands, the first two of said roll stands have an approximately maximum rolling moment, and all of the working rolls of the continuous rolling mill are directly driven.

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LATENT HEAT STORAGE APPARATUS

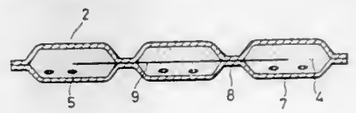
Kazuo Yamashita, Ikoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 16, 1987, Ser. No. 62,650

Claims priority, application Japan, Jun. 17, 1986, 61-140757; Jul. 30, 1986, 61-179074; Oct. 20, 1986, 61-248724

Int. Cl.⁴ F28D *20/00*

U.S. Cl. 165—10 **7 Claims**



1. A heat storage apparatus comprising a plurality of chambers for encasing at least a latent heat storage material and a capillary member provided between said plurality of chambers so that said plurality of chambers are coupled to each other, a supercooling-prevention material being encased in at least one of said chambers.

4,817,705

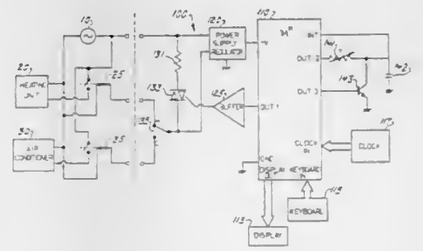
THERMOSTATIC CONTROL WITHOUT TEMPERATURE DROOP USING DUTY CYCLE CONTROL

Michael R. Levine, Ann Arbor, Mich., and Lorne Nelson, Bloomington, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 7, 1987, Ser. No. 70,725

Int. Cl.⁴ F23N *5/20*

U.S. Cl. 165—12 **53 Claims**



1. A method of thermostatic control of a temperature modifying apparatus comprising the steps of:

measuring the ambient temperature;

generating an error signal based upon the difference between a set point temperature and said measured ambient temperature;

operating the temperature modifying apparatus proportional to said error signal; and

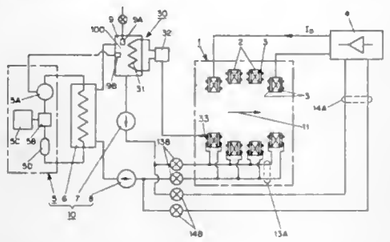
adjusting said set point temperature in a direction away from said measured ambient temperature if the time history of said error signal indicates a generally increasing error signal and in a direction toward said measured ambient temperature if the time history of said error signal indicates a generally decreasing error signal.

4,817,706

LIQUID COOLING TYPE UNIFORM MAGNETIC FIELD COIL

Harumi Miyama, and Haruo Ono, both of Chiba, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 7, 1987, Ser. No. 1,246
Claims priority, application Japan, Jan. 16, 1986, 61-7072
Int. Cl.[4] F25B *29/00*; G01V *3/00*; H01F *5/00, 27/08*
U.S. Cl. 165—30 5 Claims



1. In apparatus including a coil for producing a uniform magnetic field, and which is also heated, when supplied with excitation current from a power supply, and a cooling system for maintaining the temperature of said coil within a prescribed operating temperature range while being supplied with excitation current having a cooling liquid circulation path including cooling plates operatively coupled to said coil and through which cooling liquid is circulated, means for cooling said cooling liquid and pump means including a circulation pump and a back pressure pump for circulating said cooling liquid along said circulation path, apparatus for maintaining the temperature of said coil substantially within said prescribed operating temperature range when not being supplied with excitation current, said apparatus comprising

heater means disposed in said circulation path for controllably heating the cooling liquid circulated along said circulation path, and

means for measuring the temperature of said cooling liquid at a selected point in said circulation path and responsively thereto controlling said heater means to heat the circulating cooling liquid to a temperature which maintains said coil at a temperature within said prescribed range when not supplied with excitation current.

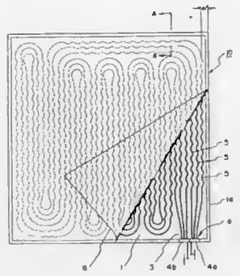
4,817,707

HEATING SOFT FLOOR MAT

Kazuo Aoyama, Chiba; Yukitaka Murata, Tokyo; Kiyoshi Hattori, Tokyo; Akio Okamoto, Tokyo; Kiyoshi Takahashi, Ibaraki; Takashi Sasaki, Ibaraki, and Shigeko Hanari, Ibaraki, all of Japan, assignors to Ryowa Corporation and Tokyo Gas Co., Ltd., both of Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 99,018
Claims priority, application Japan, Sep. 26, 1986, 61-146481[U]; Sep. 26, 1986, 61-146483[U]; Dec. 23, 1986, 61-196765[U]
Int. Cl.[4] F28F *21/06, 1/00*
U.S. Cl. 165—46 2 Claims

1. A heating soft floor mat comprising a base sheet composed of a thermoplastic resin foamed article as a heat insulating layer having meanderingly formed thereon grooves for conduits, conduits for heating medium disposed in the grooves, and cover material having flexibility covering the surface side thereof, wherein the thermoplastic resin foamed article is a crosslinked polyethylene foamed article containing closed cells having a degree of expansion of from 10 to 40 and the conduits



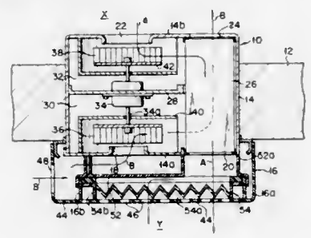
are composed of low density crosslinked polyethylene having a density of less than 0.910 g/cm^3.

4,817,708

VENTILATING UNIT FOR DRAWING AND EXHAUSTING AIR

Nobuyuki Ono, Kakamigahara, and Toshikazu Ogata, Nagoya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 895,852, Aug. 12, 1986, abandoned.
This application Feb. 25, 1988, Ser. No. 166,840
Claims priority, application Japan, Aug. 19, 1985, 60-181332; Aug. 19, 1985, 60-181333; Aug. 19, 1985, 60-126351[U]
Int. Cl.[4] F24H *3/02*
U.S. Cl. 165—54 7 Claims



1. A ventilating unit comprising:

a ventilator body provided with an air-intake passage for introducing outdoor-air indoors and an air-discharge passage for introducing indoor-air outdoors;

a filter provided in said air-intake passage, to filter air flowing through the air-intake passage;

an air-intake fan arranged in said air-intake passage, to force outdoor-air indoors through said air-intake passage;

an air-discharge fan arranged in said air-discharge passage, to force indoor-air outdoors through said air-discharge passage;

drive means for driving said air-intake fan and air-discharge fan;

a heat exchanger provided in both said air-intake passage and said air-discharge passage so as to be detachable from the ventilator body for cleaning, for exchanging heat between air streams flowing through said air-intake passage and said air-discharge passage and for trapping coarse dust particles in the air stream flowing through the air-intake passage, the heat exchanger being located toward an outdoor-facing portion of the ventilator with respect to said filter, and having a number of heat-exchanging elements arranged in a spaced relation, and a frame holding the heat-exchanging elements, said heat-exchanging elements and frame being made of material which can be washed with water; and

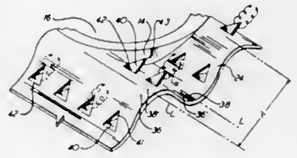
means for causing a larger amount of air to flow through said air-intake passage than through said air-discharge passage so as to prevent a negative air pressure from developing in a room for which said ventilating unit is installed, thereby preventing unfiltered outdoor-air from being introduced indoors through gaps and room crevices.

4,817,709

RAMP WING ENHANCED PLATE FIN

Jack L. Esformes, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 2, 1987, Ser. No. 127,838
The portion of the term of this patent subsequent to Nov. 29, 2007, has been disclaimed.
Int. Cl.[4] F28D *1/04*
U.S. Cl. 165—151 9 Claims



1. A finned tube heat exchanger comprising:

a plurality of heat conductive convoluted plate fins having a plurality of holes therein, said fins disposed parallel to each other at predetermined intervals whereby a first fluid flows over surfaces of the fins between adjacent fins;

a plurality of heat transfer tubes disposed in respective ones of said holes in heat transfer relation with said plate fins, said heat transfer tubes adapted to having a second fluid flowing therethrough whereby heat is transferred between said first and second fluids;

each of said convoluted plate fins having a sine-wave like shape in a plane generally parallel to the flow of said first fluid, said sine-wave like shaped convoluted plate fin having a plurality of curvilinear peak means defining the maximum and minimum amplitude of the fins; and

each of said convoluted plate fins having an enhanced heat transfer portion disposed between adjacent holes, said enhanced heat transfer portion having a number of rows of a plurality of raised ramp means, said rows of raised ramp means arranged in a direction generally perpendicular to the direction of flow of the first fluid, a side length of each of said plurality of raised ramp means connected to the surface of the fins generally perpendicular to the direction of flow of said first fluid and positioned upstream in the flow direction of the first fluid wherein said raised ramp means forms counter rotating vortices downstream of said ramp means.

4,817,710

APPARATUS FOR ABSORBING SHOCK

A. Glen Edwards, Hockley; David S. Wesson, Katy, both of Tex., and Emmet F. Brieger, Nogal, N. Mex., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 740,927, Jun. 3, 1985, Pat. No. 4,693,317.
This application Jul. 17, 1987, Ser. No. 74,586
Int. Cl.[4] E21B *17/07*; G01D *11/10*
U.S. Cl. 166—242 7 Claims

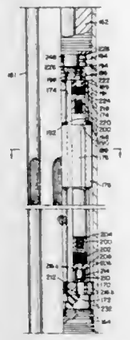
1. Apparatus for protecting a component utilized in a borehole from shock, said apparatus comprising:

a housing for encasing said component; and

a cage assembly received within said housing, said cage assembly for supporting said component encased within said housing, said cage assembly comprising:

a first shock absorbing assembly at a first longitudinal end of said component;

a second shock absorbing assembly at the other longitudinal end of said component;



a shock absorbing element along the length of said component, said shock absorbing element for restricting radial movement of said component;

a base member; and

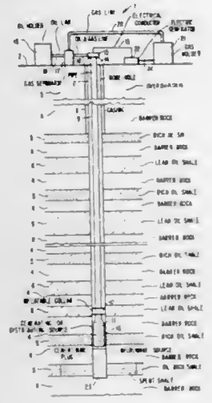
a support member extending from said base member, said support member having a first end coupled to said base member.

4,817,711

SYSTEM FOR RECOVERY OF PETROLEUM FROM PETROLEUM IMPREGNATED MEDIA

Calhoun G. Jeambey, 7485 E. Kenyon Ave., Denver, Colo. 80237

Filed May 27, 1987, Ser. No. 55,412
Int. Cl.[4] E21B *43/24, 43/34, 49/00*
U.S. Cl. 166—248 29 Claims



1. Process for in situ recovery of extractable carbonaceous values from underground petroleum impregnated porous media comprising:

subjecting the underground petroleum impregnated porous media, in situ and in the substantial absence of air, to microwave radiation from a microwave distributing source substantially immediately adjacent the media and distributed at least initially at incrementally increasing radiation power, for heating the impregnated petroleum

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content preferentially relative to the corresponding porous media and progressively in a direction away from the microwave source and to a selective temperature of at least about 425° C. and sufficiently for liquefying substantially the liquefiable petroleum constituents present which liquify at the corresponding heating temperature and in turn for causing the thereby formed mixture of liquified and gasified constituents to migrate under autogenous pressure through the porous media in a direction toward the microwave source; and

recovering the migrating constituents from the vicinity of the microwave source; and

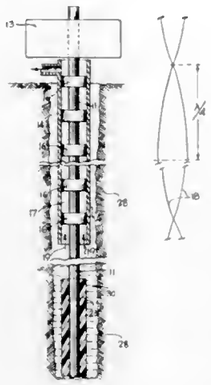
wherein the radiation is distributed initially in intermittent interval cycles of on and off duration in a first phase, and thereafter is distributed substantially continuously in a second phase.

4,817,712

ROD STRING SONIC STIMULATOR AND METHOD FOR FACILITATING THE FLOW FROM PETROLEUM WELLS

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Mar. 24, 1988, Ser. No. 173,248
Int. Cl.[4] E21B *43/25*; F04F *7/00*
U.S. Cl. 166—249 **7 Claims**



1. In a petroleum well pumping system for pumping liquid out of said well having a tubing string running down the well, a rod string of an elastic material within and running along said tubing string, vibration generator means for providing vibrational energy to said rod string at a frequency such as to effect resonant standing wave vibration thereof, and a plurality of sonic impeller elements mounted on said rod string at spaced intervals therealong, the improvement being means for unclogging and removing contaminants from the earthen formation surrounding the well and from perforations in the tubing string comprising:

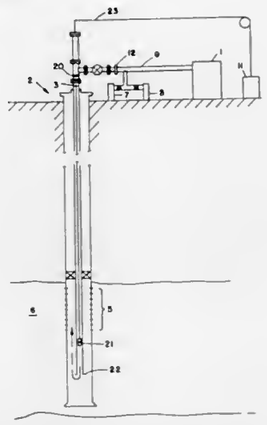
a piston member attached to the bottom end of said rod string, said piston member being immersed in the liquid in said well and being driven by said vibrational energy, said piston member radiating said energy into the liquid and thence to said formation to free contaminants therein, said piston member being dimensioned so as to operate as a monopole in said liquid at the frequency of said vibrational energy.

4,817,713

STEAM INJECTION PROFILING

Tanh V. Nguyen, Fullerton, Calif.; C. Brent Davenport, Houston, Tex.; Christopher E. Stevens, Lemoore, Calif.; John C. Reis, Yorba Linda, Calif., and Ralph S. Millhone, Brea, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 88,465, Aug. 19, 1987, Pat. No. 4,793,414, which is a continuation of Ser. No. 935,662, Nov. 26, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 146,770
Int. Cl.[4] E21B *43/24, 47/00*
U.S. Cl. 166—252 **4 Claims**



1. A method of determining steam profiles in a steam injection well comprising the steps of:

(a) inserting a well logging tool into a steam injection well at a first location, said logging tool further comprising a first gamma ray detector, said first location above said tubing tail;

(b) inserting a second gamma ray detector in communication with said steam upstream of said first gamma ray detector;

(c) injecting a radioactive, thermally stable tracer into the steam injection well, said tracer selected from the group: radioactive Argon, radioactive Krypton, and radioactive Xenon;

(d) determining a transit time between said first and said second gamma ray detector;

(e) moving said logging tool to a second location;

(f) repeating steps (c) and (d); and

(g) calculating, by use of said transit time, an amount of fluid entering a formation between said first location and said second location.

4,817,714

DECREASING TOTAL FLUID FLOW IN A FRACTURED FORMATION

Timothy A. Jones, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 14, 1987, Ser. No. 85,667
Int. Cl.[4] E21B *43/22, 43/26, 43/263, 47/04*
U.S. Cl. 166—252 **17 Claims**

1. A method for decreasing fluid bypass in a reservoir where at least one substantially large fracture exists comprising:

(a) locating at least one substantially large fracture which has caused "fingering" in said reservoir;

(b) fracturing said reservoir by applying a force sufficient to create smaller multiple fractures which have smaller apertures that produce a total lower flow rate than said large fracture;

(c) creating by said fracturing fractures with smaller apertures whereby said large fracture is substantially closed while subsequently created fractures with the smaller apertures remain open; and



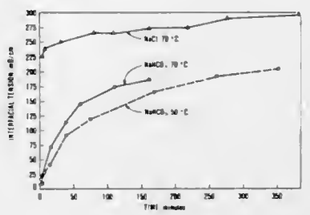
(d) causing thereby a decrease in total fluid flow via said created fractures which fluid flow previously emitted from said substantially large fracture thereby decreasing fluid bypass and obtaining a substantially better sweep of the reservoir.

4,817,715

AQUEOUS FLOODING METHODS FOR TERTIARY OIL RECOVERY

Deborah A. Peru, Bartlesville, Okla., assignor to IIT Research Institute, Chicago, Ill.

Filed Jun. 15, 1987, Ser. No. 62,777
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—266 **6 Claims**



1. A method for flooding of a subterranean petroleum bearing formation for tertiary oil recovery, comprising the steps of

providing at least one production well having at least one inlet within the subterranean petroleum bearing formation, and at least one injection well having at least one outlet within the subterranean petroleum bearing formation,

injecting into the petroleum bearing formation through the injection well, a low alkaline pH aqueous sodium bicarbonate flooding solution having a pH in the range of from about 8.25 to about 9.25 comprising from about 0.25 to about 5 weight percent of sodium bicarbonate, from about 0.05 to about 1.0 weight percent of petroleum recovery surfactant, and from about 1 to about 20 weight percent of sodium chloride, based on the total weight of the aqueous flooding solution,

withdrawing through at least one inlet of said production wells, an oil and water mixture comprising petroleum from the subterranean petroleum bearing formation and at least a portion of the low alkaline pH sodium bicarbonate aqueous flooding solution, and

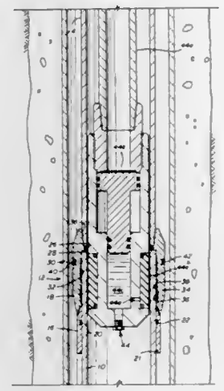
separating the oil from the aqueous oil and water mixture.

4,817,716

PIPE CONNECTOR AND METHOD OF APPLYING SAME

William M. Taylor, Houston, and Thomas G. Cassity, Katy, both of Tex., assignors to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Apr. 30, 1987, Ser. No. 44,583
Int. Cl.[4] E21B *29/10*
U.S. Cl. 166—277 **10 Claims**



4. The method of repairing a damaged casing within a well bore including the steps of:

preparing the upper end of the damaged casing,

lowering a casing repair connector into surrounding relation to the upper end of the prepared casing,

said casing repair connector having internal sealing and griping means immediately surrounding the exterior of the upper end of the casing,

lowering a pressure forming tool into the upper interior of said prepared casing,

delivering fluid under pressure to said pressure forming tool to pressure form the casing into sealing and gripping engagement with said internal sealing and gripping means within said casing repair connector, and

recovering said pressure forming tool.

6. A casing repair connector comprising:

a tubular housing having means at its upper end for connecting to a string extending upwardly from its upper end, internal rib locating means below said connecting means and internal sealing and gripping profiles below said rib locating means, and

a tubular guide connected to the lower end of said tubular housing to guide said housing in locating it in surrounding relationship to the upper end of the casing to be repaired,

said tubular housing being sufficiently strong to withstand deformation of the upper end of the casing into gripping and sealing engagement with the interior of said tubular housing.

4,817,717

HYDRAULIC FRACTURING WITH A REFRACTORY PROPPANT FOR SAND CONTROL

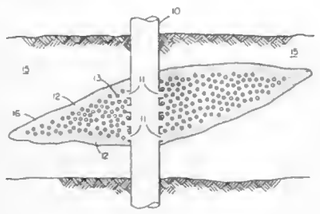
Alfred R. Jennings, Jr., and Lawrence R. Stowe, both of Plano, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,175
Int. Cl.[4] E21B *43/04, 43/24, 43/267, 43/27*
U.S. Cl. 166—278 **14 Claims**

1. A sand control and heat transfer method for use in a borehole having an unconsolidated or loosely consolidated oil or gas reservoir which is otherwise likely to introduce substantial amounts of sand into the borehole, comprising:

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(a) providing a borehole casing through said reservoir;
(b) perforating said casing at preselected intervals therealong to form at least one set of longitudinal, in-line perforations;
(c) hydraulically fracturing said reservoir by injecting a fracturing fluid containing a fine grain fused refractory material which comprises substantially silicon carbide or silicon nitride, and a clay stabilizing agent through said perforations at a volume and rate sufficient to allow said stabilizing agent to penetrate the fracture face along its entire length at a depth sufficient to overcome the effects of fluid velocity increases in oil or gas production flow on the movement of clay particles or fines located near the fracture face into the fracture as production flow linearly approaches said fracture face;



(d) injecting a proppant comprising a gravel packing fused refractory material comprised substantially of silicon carbide or silicon nitride into said fracture so that said gravel packing material pushes said fine grain refractory material up against the face of the fractured reservoir, whereby a first layer of fine grain fused refractory material is held in place along the entire face of said fracture by a second layer of gravel packing fused refractory material also extending along the entire length of said fracture thereby excluding fines; and
(e) producing oil or gas from said reservoir through said fracture into said borehole casing via a thermal oil recovery method which proppant and layers provide for increased heat transfer into said formation.

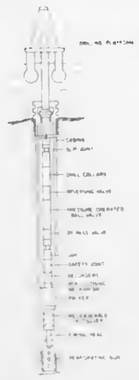
4,817,718

HYDRAULICALLY ACTIVATED FIRING HEAD FOR WELL PERFORATING GUNS

John A. Nelson, Spring, and Gregg W. Stout, Montgomery, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Sep. 8, 1987, Ser. No. 94,275
Int. Cl.[4] E21B *43/112*
U.S. Cl. 166—297 **32 Claims**

1. Apparatus for firing a perforating gun suspended by a tubing string and a set packet at a selected location in a subterranean well, comprising, in combination: a tubular housing assembly attachable at its upper end to the set packer; a perforating gun secured to the lower end of said tubular housing assembly; a percussion detonatable primer for said perforating gun; means mounting said primer above said perforating gun and in the interior of said tubular housing assembly; said tubular housing assembly defining a first annular, axially elongated, fluid pressure chamber in the interior of said tubular housing assembly; said first fluid pressure chamber being fillable with a clean, light density, compressible fluid at the well surface; water leg means communicating between the top portion of said first fluid pressure chamber and the well annulus surrounding said tubular housing assembly, thereby imposing well hydrostatic pressure on the clean fluid in said first fluid pressure chamber; an axially extending cylinder chamber defining a bore; an axially elongated piston-free firing pin slidably and sealably mounted in the bore of said cylinder chamber; said tubular housing assembly defining a second fluid pressure chamber above said firing pin; first conduit means in said tubular housing assembly and the set packet communicating between said second fluid pressure chamber and the well annulus above the set packet, whereby increasing well annulus pressure above said set packet increases the fluid pressure in said second fluid pressure chamber and exerts a downward force on said firing pin; a normally open shiftable piston valve disposed intermediate said first fluid pressure chamber and said water leg means; a portion of said piston valve being disposed in said second fluid pressure chamber and shiftable to a closed position by a first predetermined increase in well annulus pressure above said set packet, thereby trapping a well hydro-



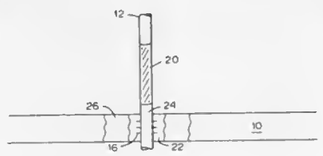
static reference pressure in said first fluid pressure chamber; second conduit means in said tubular housing assembly for applying said reference fluid pressure in said first fluid pressure chamber to the bottom portions of said firing pin to urge said firing pin upwardly and away from said primer; means for latching said firing pin in an elevated position relative to said primer; and means responsive to an increase in well annulus pressure above said packet to a second predetermined level above said reference pressure for releasing said latching means, whereby said firing pin is driven downwardly to detonate said primer.

4,817,719

METHOD FOR SUSPENDING WELLS

Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 30, 1986, Ser. No. 890,679
Int. Cl.[4] E21B *33/13*
U.S. Cl. 166—292 **16 Claims**



1. A method for shutting in a well which minimizes formation damage comprising:
(a) placing into said formation a liquid solution sufficient to establish fluid flow into said formation which solution also minimizes fluid retention;
(b) pumping a pumpable solidifiable gel mixture into the productive interval of a formation via a wellbore;
(c) causing said gel mixture to become a solid thereby forming a gel plug within said wellbore and a formation gel

within said formation sufficient to withstand environmental formation conditions and pressures which cause hydrocarbonaceous fluids to flow into said wellbore from the formation areas near said wellbore;
(d) placing in said wellbore on top of said plug an amount of cement sufficient to isolate said productive interval when said cement hardens while being supported by said plug; and
(e) allowing said cement to set which set cement in combination with said gel plug is competent to exclude production fluids from said wellbore.

4,817,720

METHOD FOR FORMING A BARRIER TO FLUID FLOW IN AN OIL FORMATION ADJACENT TO A PRODUCING OIL WELL

Robert H. Friedman, and Billy W. Surles, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 135,163, Dec. 18, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 242,240
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—295 **12 Claims**

1. A method of treating an oil well completed in an oil containing consolidated formation, said well having communication means with at least a portion of the oil formation, to form a fluid impermeable barrier in the formation displaced from the oil well which comprises the steps of:
(a) forming an aqueous resin emulsion treating fluid comprising a dispersed hydrocarbon, water and surfactant, which emulsion is susceptible to demulsification on contact with a sufficient concentration of polyvalent metal ions, said treating fluid pH being in the range of from 2 to 6;
(b) introducing said resin emulsion treating fluid through the well into the formation at a predetermined injection rate, whereupon the resin emulsion begins extracting polyvalent metal ions from said formation;
(c) thereafter injecting an aqueous displacement fluid into the formation to displace the treating fluid to the location in the formation where it is desired to form the barrier;
(d) controlling the rate of injecting the treating fluid and displacing fluid as a function of the rate which polyvalent metal ions are removed from the formation so the level of polyvalent metal ions in the treating fluid reaches the critical concentration for precipitating hydrocarbon from the treating fluid after the treating fluid has been displaced away from the wellbore to the desire location;
(e) reducing the injection rate of the aqueous displacement fluid into the well to a predetermined value for a period of time sufficient to permit the hydrocarbon to precipitate from the treating fluid, forming the fluid impermeable barrier.

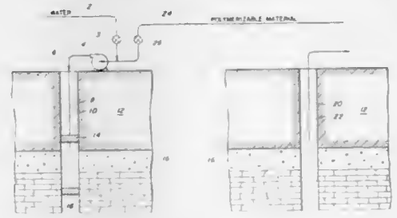
4,817,721

REDUCING THE PERMEABILITY OF A ROCK FORMATION

Kenneth W. Pober, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 14, 1987, Ser. No. 132,849
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—295 **9 Claims**

1. A process for reducing the permeability of a subterranean formation traversed by a well bore which comprises introducing into the formation via the well bore a polymerizable material which remains constant in volume or expands on polymerization, said polymerizable material being selected from the group consisting of bicyclic lactones, bicyclic ortho esters and



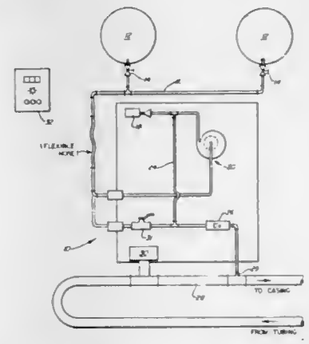
spiro orthocarbonates, and thereafter allowing such polymerization to take place.

4,817,722

AUTOMATIC WELL TREATMENT METHOD

Ralph R. Montfort, Jr., Houston, and James J. Moran, Sugarland, both of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 23, 1987, Ser. No. 41,851
Int. Cl.[4] E21B *43/12*
U.S. Cl. 166—310 **2 Claims**



1. A method for treating with a treatment chemical oil and gas wells having a flow line feeding into the well casing annulus, said method comprising the steps of:
(a) flushing the well casing annulus with production fluid of the well;
(b) forming a uniform mixture of production fluid and treatment chemical in the well flow line; and
(c) introducing the mixture of production fluid and treatment chemical into the casing annulus.

4,817,723

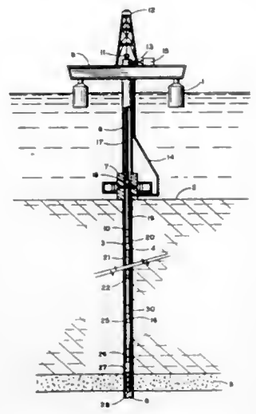
APPARATUS FOR RETAINING AXIAL MANDREL MOVEMENT RELATIVE TO A CYLINDRICAL HOUSING

Paul D. Ringgenberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 27, 1987, Ser. No. 78,484
Int. Cl.[4] E21B *34/08*
U.S. Cl. 166—321 **20 Claims**

1. A downhole tool adapted to be suspended in a well bore on a pipe string comprising:
a cylindrical housing having an open longitudinal passageway therethrough;
a mandrel slidably received in said housing and being axially moveable between a first position and a second position;
means for reversibly moving said mandrel between said first

and second positions responsive to a pressure differential between the interior of said pipe string and the annulus of said well bore; and



mandrel retaining for retaining said mandrel in one of said positions until such a pressure differential exceeds a predetermined value, said retaining means being constructed and arranged to so retain said mandrel each time said mandrel moves to said one position.

4,817,724

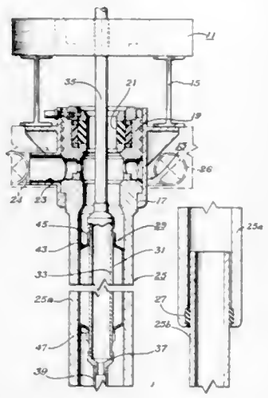
DIVERTER SYSTEM TEST TOOL AND METHOD

Robert R. Funderburg, Jr., Spring; Max E. Kattner, Houston; Lionel J. Milberger, Houston, and Louis D. Slaughter, Houston, all of Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Aug. 19, 1988, Ser. No. 234,223

Int. Cl.[4] E21B *33/035, 33/127, 47/06*

U.S. Cl. 166—337 **3 Claims**



1. A method for testing a diverter system on an offshore drilling rig of a type having a marine riser assembly extending to a subsea well, the diverter system having a packer element and at least one port located below the packer element for the passage of drilling fluid flowing upward from the marine riser assembly during drilling, the method comprising:

connecting a tubular member to the upper end of a packer having an elastomeric expansive seal element;

placing the packer in an upper portion of the marine riser assembly below the diverter system and expanding the seal element against the interior of the upper portion;

closing the packer element of the diverter system around the tubular member; then

applying fluid pressure in the space between the packer element of the diverter system and the seal element of the packer to determine if any leakage in the diverter system exists.

3. An offshore drilling rig linked to a subsea well by a marine riser assembly extending upward from the subsea well, comprising in combination:

a diverter system having a blowout preventer packer element and at least one port located below the packer element for the passage of drilling fluid flowing upward from the marine riser assembly during drilling;

a marine riser assembly having an upper portion connected to the diverter system and a lower portion extending to a subsea well;

a packer having an elastomeric expansive seal element, the packer being removably positioned in the upper portion of the marine riser assembly;

a pair of hydraulic fluid lines extending from the drilling rig to the seal element, one of the fluid lines located at the upper end of the seal element and the other of the fluid lines located at the lower end of the seal element;

a tubular member connected to the upper end of the packer and extending upward through the diverter system;

means for applying hydraulic fluid under pressure to at least one of the fluid lines to expand the seal element against the interior of the upper portion of the marine riser assembly;

means for closing the packer element of the diverter system around the tubular member;

means for applying fluid pressure through the port of the diverter system to the space between the packer element of the diverter system and the seal element of the packer to test for leakage of the diverter system; and

means for applying air pressure to one of the fluid lines and for venting the other of the fluid lines to purge the seal element of hydraulic fluid for collapsing the seal element after the test for leakage has been completed.

4,817,725

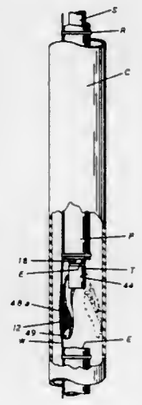
OIL FIELD CABLE ABRADING SYSTEM

Robert L. Jenkins, New Iberia, La., assignor to C. "Jerry" Wattigny, a part interest, New Iberia, La.

Filed Nov. 26, 1986, Ser. No. 935,589

Int. Cl.[4] E21B *20/04*

U.S. Cl. 166—376 **22 Claims**



1. A down-hole, oil field cable abrader, comprising:

a body attachable to a tubing string having an open interior which communicates with an interior of the tubing string;

an elongated abrading head having an end pivotally connected to said body;

an abrading portion extending axially along said head from said end pivotally connected to said body, said abrading portion including

a plurality of abrading elements which spiral axially about said abrading head and taper to an area distal said end pivotally connected to said body;

piston means slidably disposed in said open interior for longitudinal movement within said body from a first position to a second position by the pressure of a fluid in the interior of the tubing string;

translating means included with said abrading head for translating a portion of the longitudinal force generated by the fluid as said piston means moves to said second position into a radial force to bias said abrading head radially outward from a first position in which said abrading head has its longitudinal axis generally parallel to the axis of the tubing string to a second position suitable for abrading a cable located down-hole outside the tubing string and alongside said abrading head; and

rotating means connected to the tubing string for rotating said abrading head when biased to said second position to a further position in which the cable is wrapped at least partially around said abrading head to abrade the cable as said abrading head rotates, severing the cable after a multiple number of passes.

18. A method of abrading a cable located substantially down-hole within a well bore between the well bore and a smaller, at least generally concentric tubular member, comprising the steps of:

(a) lowering a tubing string having an extendable cable abrading portion attached thereto into the well bore which has the cable to be severed located in the well bore substantially down-hole, said abrading portion having a plurality of abrading elements that spiral axially about an abrading head included with said abrading portion, until said abrading portion is located substantially down-hole adjacent the area of the cable to be severed;

(b) moving said abrading portion into contact with the cable and further moving it against the cable, causing the cable to be cyclically wrapped at least partially around said abrading elements by the movement of said abrading elements to provide a curved path for the cable across said abrading elements, and still further moving said abrading portion until it is moved past and out of contact with the cable, after the cable was drawn across said abrading elements; and

(c) cyclically moving said abrading elements against the cable a multiple number of times to abrade the cable as it is drawn over said abrading elements until the cable is ultimately severed by the repetitive abrading action.

4,817,726

ACTUATING ARRANGEMENT FOR A POWER LIFT

Manfred Becker, Frankenthal, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Sep. 17, 1986, Ser. No. 908,130

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534316

Int. Cl.[4] A01B *63/112*

U.S. Cl. 172—9 **7 Claims**

1. A tractor hitch control system comprising:

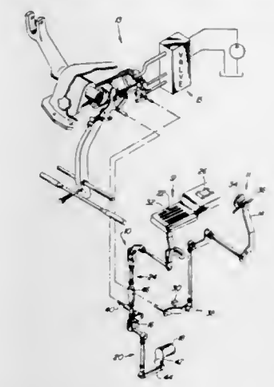
a manually operable control member;

an hydraulic actuator means operable to raise and lower the hitch;

a linkage forming a purely mechanical connection between the control member and the actuator means for transmitting control signals from the control member to the actuating means;

an electric motor selectively operated by one of the control member and linkage; and

a manually operable switch means coupled to the motor, the switch means being operable to activate the motor to



move the one of the control member and linkage to thereby operate the actuator means, the switch means comprising a main switch and at least one secondary switch positioned remote from the main switch.

4,817,727

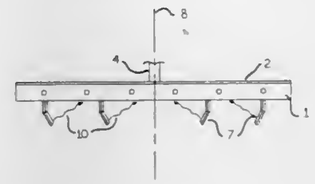
SUBTILLER

Lloyd N. Mielke, and Leonard L. Bashford, both of Lincoln, Nebr., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 24, 1987, Ser. No. 42,086

Int. Cl.[4] A01B *13/08*

U.S. Cl. 172—192 **16 Claims**



1. A soil subtiller apparatus comprising

a. a sweep blade;

b. at least one leg shank extending downward of said sweep blade, wherein said shank comprises an elongated, generally vertical plate having inner and outer faces, wherein said inner face generally is opposite an imaginary vertical plane parallel to the direction of travel of said apparatus, said plane passing through the middle of said sweep blade; wherein said plate's leading edge is angled away from said imaginary plane in said direction of travel so that said plate pushes soil toward said imaginary plane, wherein said angle is about 5°–30°; wherein said plate has a horizontal bend about midway between said plate's upper and lower extremities to divide said plate into upper and lower segments in which said upper segment is vertical and said lower segment is bent toward said imaginary plane; wherein said bend forms an angle between said upper and lower segments which is small enough so that said plate maintains its generally vertical configuration, but is sufficient enough to cause a generally horizontal fracture plane in said soil adjacent said inner face, at a right angle

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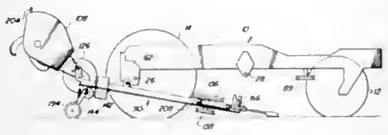
to said lower segment, extending from said lower segment's bottom toward said imaginary plane for a distance at least as long as said plate's height.

4,817,728

IMPLEMENT STRUCTURE FOR FACILITATING EASY MOUNTING TO AND DISCONNECTION FROM A LAWN AND GARDEN TRACTOR

Steven L. Schmid, Agency; Larry D. Hining, and Frank K. O'Toole, both of Ottumwa, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 23, 1987, Ser. No. 76,638
Int. Cl.[4] A01D *35/12*
U.S. Cl. 172—273 12 Claims



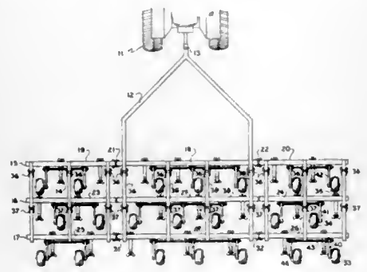
1. A combined lawn and garden tractor and implement structure for facilitating easy connection and disconnection of the implement to and from the tractor, comprising: a tractor frame supported on front and rear pairs of wheels; said frame supporting transverse implement mounting pin means; an elongate implement frame; a working tool mounted to the implement frame; mounting bracket means fixed to the implement frame and including receptacle means for selectively receiving the mounting pin means; transport wheel means mounted to the implement frame at a location at least adjacent a vertical transverse plane extending through a center of gravity of the implement and being so located relative to the mounting bracket means that when the implement is to be connected to the tractor frame the implement may be rolled on the transport wheel means to locate the implement frame between one of the front and rear pairs of tractor tires and beneath the tractor frame and rocked about the wheels to adjust the mounting bracket means vertically so as to bring the receptacle means into engagement with the mounting pin means.

4,817,729

HINGED CULTIVATOR FRAME

Patrick R. McCormick, P.O. Box 96, Lloydminster, Saskatchewan, Canada S9V 0X9

Filed Feb. 16, 1988, Ser. No. 156,214
Int. Cl.[4] A01B *73/04*
U.S. Cl. 172—311 10 Claims



1. A cultivator adapted to be drawn in a forward direction of draft by a tractor over an agricultural field, said cultivator comprising:

a plurality of interconnected tool-carrying frames, said plurality of interconnected tool-carrying frames including a leading tool-carrying frame and at least one following tool-carrying frame, said leading and following tool-carrying frames being arranged in contiguous relationship one after another forwardly to rearwardly;

each said tool-carrying frame comprising a plurality of sections arranged abreast transversely of said direction of draft;

each said following tool-carrying frame being connected with a tool-carrying frame disposed immediately forwardly thereof solely by longitudinal hinge means each said longitudinal hinge means having a single hinge axis substantially perpendicular to and transversely of said direction of draft; and

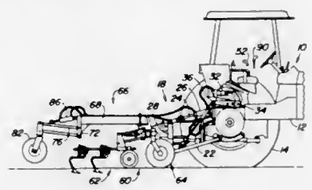
support wheels attached to each of said tool-carrying frames for supporting the frames.

4,817,730

HYDRAULIC WEIGHT TRANSFER SYSTEM FOR AN IMPLEMENT WITH A LIFT ASSIST WHEEL

David C. Winter, Johnston, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 16, 1988, Ser. No. 156,041
Int. Cl.[4] A01B *63/22*
U.S. Cl. 172—328 7 Claims



1. In combination, a tractor having a three-point hitch including a pair of lower draft links and an upper center link;

means for rocking the lower draft links vertically including a single-acting rockshaft cylinder;

an implement carried by the three-point hitch;

a lift assist assembly connected to the implement and including an arm, a ground wheel supported by the arm and a hydraulic arm cylinder connected to the arm for rocking the arm vertically to raise and lower the wheel relative to the implement;

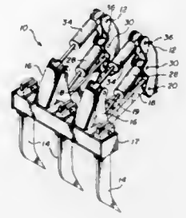
hydraulic control means for operating the arm cylinder and the rockshaft cylinder generally in parallel to raise the lower draft links and to lower the ground wheel to thereby raise the implement on the draft links and the lift assist wheel, said hydraulic control means including means for operating the arm cylinder and the rockshaft cylinder to lower the draft links while raising the lift assist wheel to a position out of contact with the ground, and wherein said hydraulic control means further includes valve means connected to the rockshaft cylinder and a rockshaft control valve connected to the valve means, and wherein said valve means includes means for communicating fluid under pressure from the rockshaft control valve to the rockshaft cylinder for lifting the lower draft links to shift implement weight to the tractor without operating the arm cylinder.

4,817,731

RIPPER MECHANISM

Daniel L. Kariak, Crystal Lake, Ill., assignor to Komatsu Dresser Company, Libertyville, Ill.

Filed Jul. 1, 1987, Ser. No. 69,286
Int. Cl.[4] A01B *13/08*
U.S. Cl. 172—464 4 Claims



1. An improved parallelogram type ripper mechanism for attachment to a prime mover comprising:

a pair of identical left and right hand mounting brackets fixedly secured to the rear of the prime mover;

a toolbeam having a pair of toolbeam towers;

at least one ripper shank fixedly attached to said toolbeam;

a draft frame including a pair of identical parallel left and right hand links, each having a first and second end lying in the same plane relative to each other and each of said links being pivotally attached at said first end to one of said toolbeam towers and pivotally attached to one of said mounting brackets at said second end;

said links each having a lifting brace structure fixedly attached to said second ends;

a pair of identical parallel left and right hand hydraulic lift cylinders lying in the same plane relative to each other, each having first and second end, and each being pivotally attached on said first end to said mounting brackets and pivotally attached to said lifting brace structures on said second end;

a pair of identical parallel left and right hand hydraulic pitch cylinders said pitch cylinders being identical to said lift cylinders lying in the same plane relative to each other, each having a first and second end, and each being pivotally attached on said first end to said toolbeam towers and pivotally attached to said mounting brackets at said second end;

said left and right hand lift cylinders being mounted to said mounting brackets in the same vertical plane as said left and right hand links, respectively, and said first ends thereof being vertically disposed a specified distance from the point of attachment between said link and said mounting bracket;

said left and right hand pitch cylinders being mounted to said mounting brackets in the same vertical plane as said left and right hand links, respectively, and said first ends thereof being vertically disposed a distance of approximately twice said specified distance from the point of attachment between said link and said mounting bracket; and

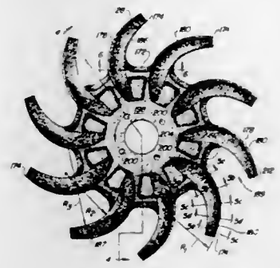
said lift and pitch cylinders being attached to said mounting brackets at vertically spaced locations along a line positioned at a predetermined angle rearwardly toward said toolbeam towers from a vertical axis passing through the center of the attachment point of each said link to said mounting brackets.

4,817,732

SPIDER WHEEL FOR A ROTARY INCORPORATOR

Douglas P. Brown, Bettendorf, Donald R. Peck, Clive, both of Iowa, assignor to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 747,143, Jun. 20, 1985, Pat. No. 4,646,850. This application Oct. 15, 1986, Ser. No. 918,960
Int. Cl.[4] A01B *21/02*
U.S. Cl. 172—548 13 Claims



1. A spider wheel for a rotary incorporator adapted for towing in a given direction, said spider wheel adapted to be supported for forward rotation about an axis offset at a preselected acute angle with respect to the direction transverse to said given direction, said spider wheel comprising a hub, a plurality of tines extending radially outwardly from the hub and curving rearwardly with respect to the forward direction of rotation, said tines each comprising a rearwardly directed back face, a front face opposite the back face defining a soil working surface, said front face and back face converging at an acute angle to a side edge extending along a substantial portion of the length of the tine and adapted to move transversely through the soil, a side face located opposite the side edge and extending between the front and back faces, and wherein the intersection of said back face with a line parallel to the axis of rotation of the wheel defines an angle of substantially less than twenty-five degrees whereby upon rotation of the wheel in the soil said back face is first to engage the soil and engages the soil at a relatively flat angle.

4,817,733

HYDRAULIC PILE DRIVER

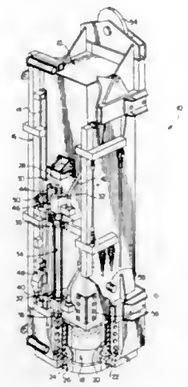
Radolf Hennecke, Bnoch, and Achim Kehrberger, Ostfildern, both of Fed. Rep. of Germany, assignors to Delmag Maschinenfabrik Reinhold Dornfeld GmbH & Co., Fed. Rep. of Germany

Filed Mar. 30, 1987, Ser. No. 31,664
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 8700227[U]
Int. Cl.[4] B21J *7/08*
U.S. Cl. 173—2 12 Claims

1. A hydraulic pile driver, with a driving weight, with a guide device for the driving weight, with a double-acting lifting cylinder acting on the driving weight and with a source of pressure medium which can be connected by way of a reversing valve to one or the other of the work chambers of lifting cylinder, wherein a position indicator cooperates with a driven part of the lifting cylinder and an output signal of this position indicator is used in the change-over of the reversing valve from its first working position, in which the lifting cylinder is acted upon in the direction of an extension of its driven part into its second working position in which the lifting cylinder is supplied with pressure medium in the direction of a retraction of its driven part, characterized in that the position indicator comprises a measuring rule (46) connected to the driven part (32) of the lifting cylinder (34) and a sensor (50) cooperating with marks (60) on the measuring rule (46), and in

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that the output signal of the sensor (50) is sent to a digital counter (66), which can be reset by the output signal of a final



position sensor (52), which is actuated in one of the end positions of an lifting cylinder (34).

4,817,734

SUBMERGIBLE ELECTROHYDRAULIC DRIVE UNIT FOR RAMMING AND WORKING DEVICES TO BE USED UNDER WATER

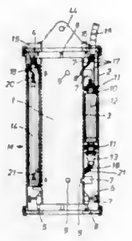
Hans Knehn, Hamburg, Fed. Rep. of Germany, assignor to Bomag-Menck GmbH, Boppard, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,904

Claims priority, application European Pat. Off., Jul. 28, 1987, 87110894.0

Int. Cl.[4] E02D *7/06, 7/18*

U.S. Cl. 173—29 **43 Claims**



1. A submergible electrohydraulic drive unit for working devices for use under water, comprising a housing having upper and lower supporting plates, an outer wall connected with said supporting plates, and an inner wall forming a thoroughgoing receiving space for at least one exchangeable device selected from a pile driver hammer, a vibration ramming device, a rotatable working device or a rinsing device; and a plurality of pump units connectable with the device and including a plurality of hydraulic pumps and associated electric motors, arranged between said inner wall and said outer wall at circumferential distances from each other, so that the drive unit is formed as a multi-purpose unit for driving the respective one of said devices, said pump units being mounted for limited movement against pretensioned spring force relative to said housing, and at least one of said plates being provided with means for exchangeably mounting said device in opposition adjusted relative to said receiving space.

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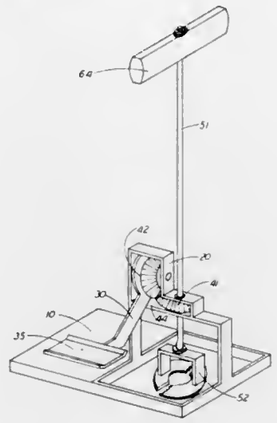
FOOT POWERED ICE AUGER

Robert F. Corrigan, 654 Eastgate Dr., Frankenmuth, Mich. 48734

Filed Jun. 8, 1984, Ser. No. 618,942

Int. Cl.[4] F25C *5/04*

U.S. Cl. 173—30 **4 Claims**



1. A manually foot powered ice auger using a foot driven ratchet drive means secured to a bevel gear assembly means which is interfaced to an auger shaft means in a manner to effect rotational movement of the auger shaft without being affixed thereto, thus facilitating free vertical movement of the shaft during operation; to the auger shaft means is permanently attached an auger head on one end and to the other a handle assembly which permits free rotation of the auger shaft within the handle assembly; this combination of means is housed in and supported by a framework secured to a base means that maintains the relationship and alignment of the subassembles.

4,817,736

PHEUMATIC IMPACT IMPARTING TOOL

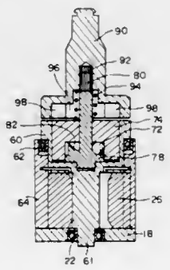
Akira Ono, Hatoyama, Japan, assignor to Ritt Corporation, Japan

Filed Aug. 17, 1987, Ser. No. 85,723

Claims priority, application Japan, Aug. 18, 1986, 61-191697

Int. Cl.[4] B25D *15/00*

U.S. Cl. 173—93 **6 Claims**



1. A pneumatic impacting tool comprising:
a pneumatic motor including a cylindrical rotor, said rotor being adapted to be rotated by compressed gas and having an axially extending rotor recess in one end face;
a shaft aligned with the axis of rotation of said rotor and having one end rotatably mounted within said recess in said rotor;
an anvil having an axially extending anvil recess for receiving the end of said shaft opposite said one end and having, within said anvil recess, (1) shaft receiving means for holding said shaft against rotation relative to said anvil and (2) radially extending impact receiving means;
a follower slidably seated within said rotor recess for rotation therewith and mounted on said shaft for reciprocating sliding movement between an anvil disengaged position where said follower is engaged within said rotor recess for rotation with said rotor while said anvil is not rotated and an anvil engaged position where said follower is engaged within both said rotor recess and said anvil recess whereby said anvil is rotated with said rotor;
biasing means for biasing said follower toward said anvil disengaged position;
camming means, within said rotor recess, for intermittently driving said follower into said anvil recess against the force of said biasing means, said follower striking said impact receiving means by rotation within said anvil recess, thereby generating impacting force.

4,817,737

HYDRAULIC STRIKING DEVICE WITH IMPACT FREQUENCY CONTROL

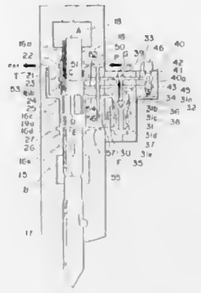
Takatoshi Hamada, Osaka, Japan, and Wen-Ho Huang, Jia Li Tseng, Taiwan, assignors to Nittetsu Jitsugyo Co., Ltd., Osaka, Japan

Filed Feb. 10, 1987, Ser. No. 13,442

Claims priority, application Japan, Mar. 11, 1986, 61-54133; Sep. 17, 1986, 61-220613

Int. Cl.[4] B25D *9/18, 9/26*

U.S. Cl. 173—115 **4 Claims**



1. A hydraulic breaker comprising:
a cylinder means;
a piston slidably mounted in said cylinder means for sliding therein between an uppermost position and a lowermost position,
said piston having a five-staged configuration including a first, a second, a third, a fourth and a fifth stage sequentially disposed along an axial direction of the piston,
said piston also including a high pressure receiving surface extending between said first stage and said second stage, a lower pressure receiving surface extending between said fourth stage and said fifth stage and a gas pressure receiving surface,
said high pressure receiving surface having a diameter larger than that of said gas pressure receiving surface, and said low pressure receiving surface having an area that is larger than that of said high pressure receiving surface;
said cylinder means having a gas chamber therein for containing gas under pressure, said gas chamber open to said gas pressure receiving surface of said piston for urging said piston from said uppermost position to said lowermost position,
a high pressure port open to a source of high pressure oil for allowing high pressure oil to pass into said cylinder means,
a low pressure port for discharging oil from said cylinder means,
a piston high pressure chamber defined between an interior peripheral wall of said cylinder means and said piston, said piston high pressnre chamber open to said high pressure receiving surface of said piston,
said piston high pressure chamber and said high pressure port in constant open communication so that high pressure oil supplied through said high pressure port exerts a force on said high pressure receiving surface that acts in a direction to move the piston toward said lowermost position whenever the piston is being raised from said lowermost position or lowered from said uppermost position,
a piston low pressure chamber defined between the interior peripheral wall of said cylinder means and said third stage of said piston, said low pressure chamber in constant open communication with said low pressure port for allowing oil to be incessantly discharged therefrom through said low pressure port whenever said piston is being raised from said lowermost position or lowered from said uppermost position, and
a piston contradirection chamber open to said lower pressure receiving surface;
a main valve movably disposed within said cylinder means for moving between first and second positions therein, said main valve in operative hydraulic communication with said high pressure port and said low pressure chamber and said contradirection chamber, said main valve having a passageway extending therethrough,
said first position being a position at which a first flow path for oil is established from said contradirection chamber, through said passageway of said main valve and to said low pressure chamber for allowing oil in said contradirection chamber to be discharged therealong to said low pressure port as said piston is being lowered from said uppermost position,
said second position being a position at which said first flow path is closed and a second flow path for oil is established between said high pressure port and said contradirection chamber for allowing high pressure oil to flow therealong to act on said low pressure receiving surface for raising said piston from said lowermost position;
said cylinder means further having a piston pilot chamber defined between the interior peripheral wall of said cylinder means and the piston at a location disposed between said piston high pressure chamber and said piston low pressure chamber,
a speed change chamber defined between the interior peripheral wall thereof and said piston at a location disposed between said piston pilot chamber and said speed change chamber,
said piston pilot chamber open to said high pressure port when said piston is in the lowermost position thereof, and open to said low pressure port when said piston is in the uppermost position thereof,
said speed change chamber open to said low pressure port prior to said piston reaching the uppermost position thereof when the piston is raised from the lowermost position thereof, and
a control pin pilot chamber open between said piston pilot chamber and said main valve, high pressure acting on said main valve in said control pin pilot chamber when said piston pilot chamber is open to said high pressure port for urging said main valve to said second position, said control pin pilot chamber open to said low pressure port through said pilot pressure chamber when said pilot pressure chamber is open to said low pressure port thereby allowing said main valve to move to said first position after said piston has reached said uppermost position;
a speed change valve operatively hydraulically connected

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between said control pin pilot chamber and said speed change chamber, said speed change valve movable between a first position at which said control pin pilot chamber is closed to said speed change chamber and a second position at which said control pin pilot chamber is open to said speed change chamber to open said control pin pilot chamber to said low pressure port before said piston has reached the uppermost position thereof; and

means for selectively moving said speed change valve between the first and the second positions thereof.

4,817,738

PORTABLE HANDHELD MOTOR-DRIVEN TOOL

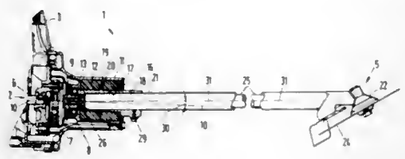
Wolfgang Dorner, Rottenburg; Michael Leuchte, Stuttgart, and Klaus Bröckel, Rottenburg, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,213

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629039

Int. Cl.[4] F21B *3/00*; F16C *1/06*

U.S. Cl. 173—162.1 **8 Claims**



1. A portable handheld, motor-driven tool equipped with a work tool, the motor-driven tool comprising:

a housing;

a drive motor mounted in said housing and having a motor shaft defining a longitudinal motor shaft axis, said drive motor having a predetermined weight which imparts forces to the motor-driven tool transversely to said axis during the operation thereof;

a drive shaft defining a longitudinal drive shaft axis and having a first end facing toward said motor;

coupling means for coupling said motor shaft to said drive shaft at said first end thereof;

said drive shaft having a second end for driving said work tool;

a damping member having a predetermined elasticity and being mounted in said housing for elastically supporting said drive shaft at said one end thereof; and,

said damping member including holding means for holding said drive shaft at said one end thereof so as to cause said longitudinal axis to be offset with respect to said motor shaft axis by a predetermined offset angle when said motor-driven tool is at rest; said offset angle being selected to permit said longitudinal axis to come into substantial alignment with said motor shaft axis during said operation in response to said forces.

4,817,739

DRILLING ENHANCEMENT TOOL

John D. Jeter, 1403 Teche Dr., St. Martinville, La. 70582

Continuation of Ser. No. 877,216, Jun. 23, 1986, abandoned. This application May 19, 1987, Ser. No. 53,357

Int. Cl.[4] E21B *21/10*

U.S. Cl. 175—38 **13 Claims**

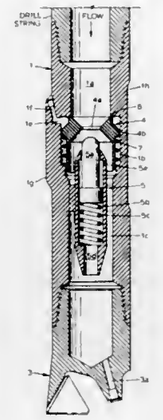
9. A method for increasing the penetration rate of a drill head on a fluid conducting drill string suspended in a well having a drilling face exposed to an effective hydrostatic pressure comprising hydrostatic pressure produced by a drilling fluid column in the well and pressure resulting from impingement of a stream of drilling fluid ejected from the drill head against the drilling face, the method comprising the steps of:

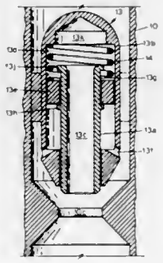
(a) pumping a drilling fluid stream down the bore of the drill string, through a downhole fluid flow resistance means, and ejecting at least part of said drilling fluid stream, from at least one nozzle in said drill head, against the drilling face;

(b) periodically increasing the resistance of said downhole fluid flow resistance means to reduce the velocity of said drilling fluid stream ejected from said nozzle to reduce the effective hydrostatic pressure and to store fluid pressure energy in said drill string; and

(c) periodically reducing said resistance of said downhole fluid flow resistance means to increase said velocity of said drilling fluid stream ejected from said nozzle;

said increasing and said reducing of said resistance being caused to occur alternately and automatically in response to and during constant flow of said drilling fluid stream at a constant flow rate.





10. A method for increasing the penetration rate of a drill head on a fluid conducting drill string suspended in a well having a drilling face exposed to an effective hydrostatic pressure comprising hydrostatic pressure produced by a drilling fluid column in the well and pressure resulting from impingement of a stream of drilling fluid ejected from the drill head against the drilling face, the method comprising the steps of:

(a) pumping a drilling fluid stream down the bore of the drill string and ejecting at least part of said drilling fluid stream, from at least one nozzle in said drill head, against the drilling face; and

(b) periodically diverting at least part of said drilling fluid stream to the well, outside the drill string through at least one upwardly directed nozzle in the drill string, to periodically reduce the effective hydrostatic pressure at said drilling face;

said periodically diverting being caused to occur continually and automatically in response to and during constant flow of said drilling fluid stream at a constant flow rate.

4,817,740

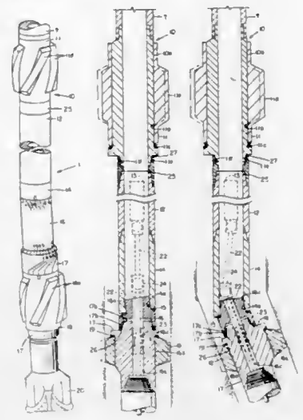
APPARATUS FOR DIRECTIONAL DRILLING OF SUBTERRANEAN WELLS

Herbert W. Beimgraben, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Aug. 7, 1987, Ser. No. 83,520

Int. Cl.[4] E21B *7/08*

U.S. Cl. 175—74 **4 Claims**



1. Apparatus for positioning a motor driven drilling bit relative to a well bore to control the direction of further drilling, comprising, in combination:

a downhole motor housing supportable on a tubing string and mounting a fluid motor driven by pressurized fluid supplied through the tubing string;

a first tubular housing having an upper end concentrically secured to the lower end of said motor housing;

the lower end of said first tubular housing having a first surface formed thereon having an axis angularly disposed relative to the axis of said first tubular housing;

a second tubular housing having second surface engagable with said first surface;

said second surface being angularly disposed relative to the axis of said second tubular housing, whereby the extent of engagement of said first and second surfaces determines the angular position of the axis of said second tubular housing relative to the axis of said first tubular housing;

means for selectively adjusting the extent of engagement of said first and second surfaces;

a third tubular housing concentrically secured to the lower end of said second tubular housing;

said third tubular housing having an external surface that is eccentric relative to the bore axis of said third tubular housing;

first annular stabilizer means rotationally adjustably mounted on said external surface;

said first annular stabilizer having an external cylindrical surface that is eccentric relative to said external surface, whereby the lateral position of said first annular stabilizer may be selectively adjusted;

means for rotatably mounting a drilling bit on said third tubular housing;

drive means, including universal joints, traversing the bores of said first, second and third tubular housings to operatively connect said fluid motor and said drilling bit and

a second adjustable eccentric stabilizer secured to the exterior of the upper end of said motor housing.

4,817,741

ROTARY DRILL

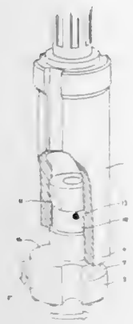
Uno Lof, Sunne, Sweden, assignor to Lovab, Lof Och Ostlund, AB, Sunne, Sweden

Filed Oct. 2, 1987, Ser. No. 103,655

Claims priority, application Sweden, Oct. 3, 1986, 8604207

Int. Cl.[4] E21B *10/66*

U.S. Cl. 175—398 **5 Claims**



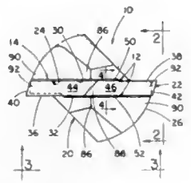
1. A rotary boring drill for operation with a casing wherein said boring drill is expanded below the casing for a boring operation and contracted for subsequent removal through the casing, said boring drill comprising a substantially cylindrical transition piece having means at one end for attachment to a rotary and reciprocating drill rod, the central axis of said cylindrical transition piece coinciding with the rotary axis of said drill rod, a planar surface extending over a major portion of the other end of said cylindrical transition piece, a cylindrical hole in said planar surface having an axis spaced from said central axis and extending into said cylindrical transition piece, a driving shoulder integral with an arcuate portion of said cylindrical transition piece at said other end and extending below said planar surface, said driving shoulder having a planar driving surface, a substantially cylindrical reamer piece having a mounting shaft on one end and a cutting surface on the other end, a recessed driven shoulder in an arcuate portion of said cylindrical reamer piece, said driven shoulder having a planar driven surface similar to said planar driving surface, said reamer piece mounting shaft having a portion of reduced diameter and being receivable in said hole in said cylindrical transition piece for rotary and axially reciprocating motion, a pin insertable through a passageway in said cylindrical transition piece and receivable in said reduced diameter portion of said reamer mounting shaft, said pin defining first and second limiting positions of axial motion of said reamer mounting shaft, said pin in said first limiting position residing near the bottom of the reduced portion of said reamer mounting shaft whereby said driver and driven planar surfaces are overlapped and said reamer piece and transition piece are in abutting relationship, said pin in said second limiting position residing near the top portion of said reduced portion of said reamer mounting shaft whereby said driver and driven planar surfaces are decoupled and said transition piece and reamer piece are capable of independent rotation.

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4,817,742
BUTTERFLY-TYPE SHIM HAVING PERFORATIONS IN MID-SECTION THEREOF AND DOUBLE SANDWICH BRAZE JOINT PRODUCED THEREWITH

Hubert H. Whysong, Imler, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 84,581, Aug. 11, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,937
Int. Cl.[4] E21B *10/58;* **B23C** *1/04*
U.S. Cl. 175—410 **16 Claims**



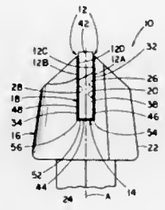
1. A butterfly-type shim for facilitating formation of a double sandwich type braze joint, said shim comprising:
(a) a pair of upstanding side walls having lower edges;
(b) a bottom wall having opposite side portions and a main portion with a generally flat configuration extending between and interconnecting said opposite side portions, each said opposite side portion of said bottom wall merging from said main portion and being unturned through approximately ninety-degrees with respect thereto, said bottom wall being connected at its opposite side portions to said lower edges of said side walls so as to dispose said lower edges of said side walls generally above the plane of said bottom wall in spaced apart relationship to one another; and
(c) means defining perforations through said bottom wall and side walls generally across a midsection region of said shim, said shim having opposite end regions where said bottom wall and side walls are solid and free of perforations.

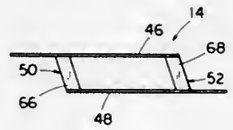
4,817,743
BUTTERFLY-TYPE SHIM HAVING SEMI-OPENED BOTTOM AND DOUBLE SANDWICH BRAZE JOINT PRODUCED THEREWITH

Mark S. Greenfield, Cary, N.C.; Stephen P. Stiffler, New Enterprise, and Raymond D. Evans, Everett, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Mar. 12, 1987, Ser. No. 24,945
Int. Cl.[4] E21B *10/58*
U.S. Cl. 175—411 **2 Claims**

2. In combination with a bit body having interior opposite side surfaces and an interior bottom surface interconnecting said side surfaces to define an elongated groove across said body and a carbide insert tip having exterior opposite side surfaces and an exterior bottom surface and being sized relative to said groove to fit within said groove in spaced relation to said corresponding side and bottom surfaces of said body defining said groove, a butterfly-type shim being disposed within said groove between said respective corresponding interior and exterior surfaces of said bit body and insert tip for facilitating formation of a double sandwich braze joint between said bit body, insert tip and shim, said shim comprising:
(a) a pair of upstanding side walls having lower edges; and
(b) at least a pair of bottom webs each including a main portion having a generally flat configuration and extending between opposite end portions, each opposite end portion of said bottom web merging from said main portion and being upturned through approximately ninety-degrees with respect thereto, said each bottom web being spaced apart from the other, extending in transverse relationship to and between said side walls and connected at its opposite end portions to said lower edges of said side walls so as to dispose said side walls in spaced apart relationship to one another and said lower edges of said side walls generally above said bottom web main portion;
(c) said each bottom web resting on said bottom surface of the bit body groove and, in turn, thereby elevating said shim side walls in spaced relation above said groove bottom surface such that said lower edges of said side walls are spaced thereabove also;
(d) said each bottom web being substantially less in which than the lengths of said shim side wall lower edges and bearing spaced apart to define a through-opening therebetween;





(e) said each bottom web supporting said insert bit at its exterior bottom surface in overlying relation to and spaced above the groove bottom surface so as to define a gap which extends across and above said bottom surface of said groove, below said insert tip bottom surface and said lower edges of said shim side walls, and between said opposite interior side surfaces of said bit body such that said gap will allow relatively unrestricted, free flow of molten braze alloy across said bottom surface of said groove and thereby facilitate effective setting up of capillary flow of braze alloy upwardly along corresponding adjacent surfaces of said bit body and insert tip on opposite sides of said shim side walls to produce the double sandwich braze joint therebetween.

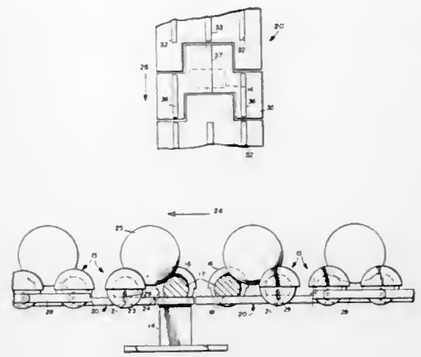
4,817,744
FRUIT SIZING AND WEIGHING

Harry C. Power, Jr., Faber, Va., assignor to Powell Machinery, Inc., Faber, Va.

Filed Mar. 21, 1988, Ser. No. 171,456
Int. Cl.[4] G01G *19/00, 21/22;* **B65G** *15/44;* **B07C** *5/16*
U.S. Cl. 177—145 **11 Claims**

1. A product weighing apparatus comprising:
a weighing mechanism;
a plurality of spaced separate and distinct product engaging elements, any two or more adjacent elements for engaging each product to be weighed;
conveyance means for conveying said product engaging elements, including a moving conveying mechanism and a stationary track;
means for interconnecting said product engaging elements with said moving conveyance mechanism, so that relative vertical movement therebetween is possible, and means associated with said product engaging elements for sliding on said track means; and

said weighing mechanism including a portion of said stationary track means that is vertically movable with respect to the rest of said stationary track means, said portion of said

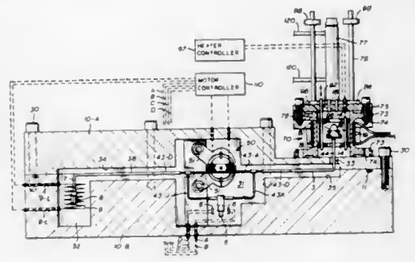


stationary track means shaped and dimensioned so that at least two adjacent product engaging elements, engaging a product to be weighed, are weighed at the same time.

4,817,745
THERMOGRAVIMETRIC BALANCE

Joseph E. Beshoory, 10926 Sagebluff, Houston, Tex. 77089

Filed Dec. 21, 1987, Ser. No. 135,710
Int. Cl.[4] G01G *7/00, 23/00;* **G01N** *25/00*
U.S. Cl. 177—212 **8 Claims**

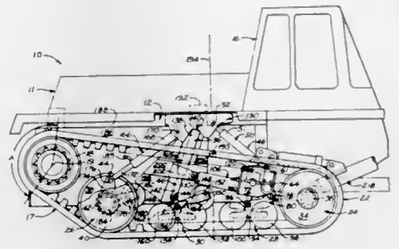


1. Balance apparatus comprising:
opposed 1st and 2nd beams;
said 1st beam including means for supporting a sample to be examined;
said 2nd beam including, in conjunction with a first signal generating external coil, balance dampening means, said 2nd beam's dampening means including a depending first magnet;
said 1st and 2nd beams being joined by a cradlecarrying bridge member, said bridge member including a depending second magnet;
motor means supporting of said bridge member; and
means for causing said motor means to compensate or weight change in said sample, said compensation causing means including means for receiving said first signal, means for receiving a second signal generated by said magnet in conjunction with at least a pair of Hall Detectors external thereto, and means for translating said first and second signals into motor activation.

4,817,746
SUSPENSION MECHANISM FOR A TRACK-TYPE VEHICLE

Robert J. Purcell, Washington; Gerald P. Simmons, Morton, and Robert R. Farris, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 22, 1987, Ser. No. 136,898
Int. Cl.[4] B60G *5/06;* **B62D** *55/14*
U.S. Cl. 180—9.1 **21 Claims**

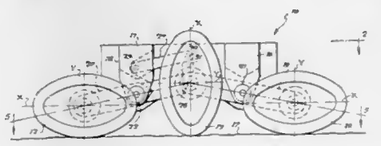


1. A suspension mechanism for supporting a superstructure and a frame of a vehicle, includes a drive wheel rotatably secured to the frame above the ground, a front idler wheel, a rear idler wheel, a forward guide roller assembly, a rearward guide roller assembly, and a track entrained about the wheels and the guide roller assemblies, comprising:
rear suspension strut means for resiliently supporting the superstructure on the rear idler wheel;
intermediate suspension strut means for resiliently supporting the superstructure on the rearward guide roller assembly; and
front suspension strut means for resiliently supporting the superstructure collectively on the front idler wheel and the forward guide roller assembly, the forward and rearward guide roller assemblies being located longitudinally between the front and rear idler wheels, and the track wrapping partially around the front idler wheel.

4,817,747
ALL-TERRAIN VEHICLE

John F. Kopczynski, 1671 Sweeney St., N. Tonawanda, N.Y. 14120

Filed Nov. 3, 1987, Ser. No. 116,397
Int. Cl.[4] B62D *61/10*
U.S. Cl. 180—22 **57 Claims**



1. A six-wheeled vehicle comprising a vehicle body having opposite sides, first and second bogies on each of said opposite sides, first and second longitudinally spaced axles on each of said sides mounting central portions of each of said first and second bogies, respectively, for pivotal movement, each of said bogies having inner and outer ends, means mounting an outer wheel for rotation on each outer end of each of said first and second bogies, means mounting an inner wheel on the inner end of said second bogies, and linkage means coupled relative to said first and second bogies for causing said first and second bogies on each side of said vehicle to always extend at a substantially equal angle to the horizontal in all angular positions of said first and second bogies to thereby cause said outer

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wheel of said first bogie and said inner wheel to move same amounts in equal direction as said bogies pivot and to cause said outer wheel of said second bogie to move the same amount in the opposite direction as said bogies pivot.

4,817,748

INDUSTRIAL VEHICLE EQUIPPED WITH ELECTRICALLY POWERED POWER STEERING SYSTEM

Kazuo Murata; Shigeru Togo, and Masamichi Furuta, all of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 3, 1987, Ser. No. 92,520
Claims priority, application Japan, Sep. 6, 1986, 61-210358
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **11 Claims**



1. A steerable industrial vehicle having a vehicle body, comprising:
- an electrically powered power steering system mounted in said vehicle body and including an electric motor which produces power for amplifying torque applied to a steering wheel;
- a cargo-handling motor mounted in said vehicle body at a position near the power steering electric motor, said cargo-handling motor producing power for handling a cargo;
- a box structure mounted in said vehicle body and housing therein said cargo-handling motor, said box structure including an inboard side wall facing said power steering electric motor, an outboard open side facing the outside of the vehicle and a lower wall securedly mounted on the vehicle body; and
- means for detachably connecting said cargo-handling motor to said lower wall of said box
- wherein the inboard side wall of the box structure is formed with an opening therein, said opening being so sized as to permit manual labor for changing a given part of said power steering electric motor.

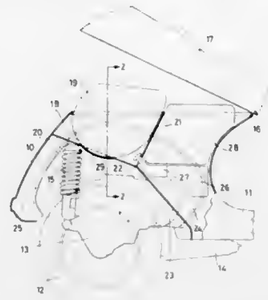
4,817,749

MOTOR SCOOTER HAVING IMPROVED STRUCTURE

Giacomo Montano, Livorno, Italy, assignor to Piaggio & C. S.p.A., Milan, Italy

Filed Jun. 15, 1987, Ser. No. 61,530
Claims priority, application Italy, Jun. 25, 1986, 22380/86 [U]
Int. Cl.[4] B62K *11/10;* **B62J** *9/00*
U.S. Cl. 180—119 **11 Claims**

1. A motor scooter comprising a self-supporting frameless monocoque body, said body including a rear body portion defined by a pair of opposite walls bridged by a rear wall, upper edges of said side and rear walls collectively defining an upper terminal edge of said rear body portion, said upper terminal edge defining an opening of a predetermined peripheral configuration and area, said opening being adapted to provide access to a volume accessible from above, a first transverse wall portion (21) partitioning said volume into a fuel tank volume and an adjacent crash helmet volume, means for securing said first transverse wall portion in transverse rigidity to said rear body portion thereby imparting rigidity to said monocoque body rear body portion, a fuel tank in said fuel tank volume, a second transverse wall portion (20) defining a bottom of said crash helmet volume, means for securing said second transverse wall portion in transverse rigidity to said



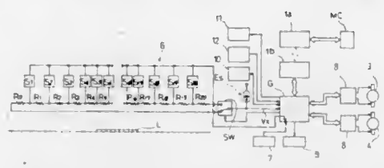
rear body portion thereby imparting further rigidity to said monocoque body rear body portion, a crash helmet in said crash helmet volume and having a portion projecting through said opening beyond said upper terminal edge, a saddle closing said opening and overlying said crash helmet in a first closed position of said saddle, and means for mounting said saddle for movement to a second open position at which said crash helmet can be accessed from above.

4,817,750

RUNNING CONTROL SYSTEM FOR CONVEYOR CART

Hideo Ishida; Susumu Moriya, both of Kasugai; Takuo Taya, Komaki, and Hiroshi Shimokata, Inuyama, all of Japan, assignors to 501 Daifuku Co., Ltd., Osaka, Japan

Filed May 4, 1987, Ser. No. 46,871
Claims priority, application Japan, May 9, 1986, 61-107506; Jun. 9, 1986, 61-133229; Jun. 9, 1986, 61-133227; Jun. 9, 1986, 61-87716[U]; Oct. 3, 1986, 61-236641; Feb. 6, 1987, 62-16771[U]
Int. Cl.[4] G05D *1/03*
U.S. Cl. 180—168 **10 Claims**



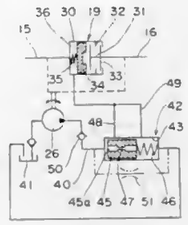
1. A vehicle running control system comprising a guiding line (L) extending along a running track, and a conveyor cart (A), the conveyor cart (A) including detecting means (6) for detecting the guiding line (L) and outputting detection data and steering control means operable in response to the detection data for permitting the conveyor cart (A) to automatically run along the guiding line (L), said detecting means (6) is switchable for selectively detecting right and left edges of said guiding line (L) wherein said detecting means (6) includes a plurality of resistances (R) connected in series and a plurality of magnetism sensitive elements operable to connect connection points of said resistances (R) to a common electric potential and said guiding line (L) comprises a magnetic tape.

4,817,751

A DRIVING FORCE DISTRIBUTION TRANSMISSION FOR VEHICLES WITH FOUR-WHEEL DRIVE

Hiroaki Asano, Okazaki; Keiichi Nakamura, Kariya; Masaji Yamamoto; Shigeo Tanooka, both of Okazaki, and Toshifumi Sakai, Aichi, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 29, 1988, Ser. No. 162,124
Claims priority, application Japan, Mar. 27, 1987, 62-75241
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—233 **5 Claims**



1. A transmission for use with a vehicle with four-wheeled drive, said transmission comprising:
- a first drive shaft connected with the front wheels;
- a second drive shaft connected with the rear wheels;
- a hydraulic clutch connected with the first and second drive shafts and having outer plates and inner plates, the inner plates being capable of frictionally engaging with the outer plates to selectively transmit rotating force between the first and second drive shafts;
- a pump connected with the first and second drive shafts and acting to produce a hydraulic pressure corresponding to the difference between the rotational speeds of the drive shafts;
- a first oil passage for guiding the oil delivered by the pump into a reservoir;
- a restrictor formed in the first oil passage;
- a bias spring for pressing the outer and inner plates of the clutch towards each other at all times;
- a second oil passage for guiding the oil delivered by the pump into an oil chamber formed in the clutch;
- a third oil passage which connects the oil chamber in the clutch directly with the reservoir, by passing the restrictor; and
- a selector valve means which, when the difference between speeds of the two drive shafts is small, closes the second oil passage and opens the third oil passage and which, when the difference is large, opens the second passage and closes the third passage.

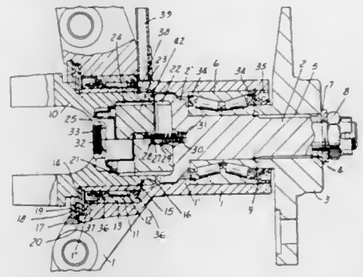
4,817,752

AUTOMATIC FREE WHEELING HUB ASSEMBLY

Roberto J. H. Lobo, and Mauricio Rysevas, both of Sao Paulo, Brazil, assignors to AVM-Auto Equipamentos LtDA, Sao Paulo, Brazil

Filed Feb. 4, 1987, Ser. No. 10,953
Claims priority, application Brazil, Feb. 6, 1986, 8600514
Int. Cl.[4] F16D *25/04, 25/061;* **B60K** *23/06*
U.S. Cl. 180—247 **20 Claims**

1. An automatic free wheeling hub assembly adapted for a four wheel drive vehicle to drivingly connect a wheel to the vehicle drive axle, said vehicle including a wheel hub mounted upon a drive axle shaft;
- said hub assembly comprising a support having an axial bore through which the axle shaft extends;
- a universal joint axially aligned with and spaced from said axle shaft and projected into said support;
- means journalling said axle shaft upon said support;
- means axially securing said axle shaft upon said support;
- means journalling said universal joint upon said support;
- means axially securing said universal joint to said support;
- said axle shaft having at one end thereof internally splined teeth;
- said universal joint having a cavity aligned with the axle shaft;
- said universal joint at said cavity being provided with internally splined teeth matching and axially aligned with the internally splined teeth provided at said one end of said axle shaft;
- an axially movable cylindrical clutch disc positioned within said cavity having an end face, said clutch disc having external teeth matching and movable along said internally splined teeth of said universal joint and being selectively engagable with the internally splined teeth provided at said one end of said axle shaft;
- fluid responsive actuating means including a movable member mounted within said cavity and axially abutting said end face;



- said movable member dividing said cavity into a pair of chambers upon its opposite sides;
- a resilient element between said clutch disc and shaft axially biasing said clutch disc completely within the cavity of said universal joint, out of engagement with the internal teeth of said axle shaft;
- said fluid responsive actuating means being responsive to a pressure differential in said chambers thereby moving said movable member and said clutch disc axially in said cavity overcoming said resilient element effecting engagement of the teeth of said clutch disc and said axle shaft, part of the teeth of said clutch disc remaining engaged with the internal teeth of said universal joint, said clutch disc functioning as a connecting element between said axle shaft and said universal joint;
- said wheel hub and axle shaft, when disengaged from said clutch disc, being adapted to turn freely as a unit, independent from said clutch disc, support and universal joint.

4,817,753

INTERAXLE DIFFERENTIAL RESTRICTION DEVICE FOR VEHICLE FOUR WHEEL DRIVE SYSTEMS

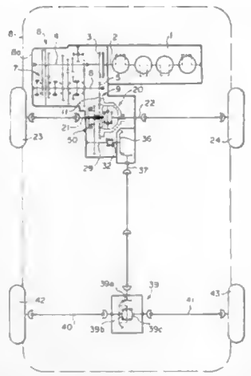
Manabu Hiketa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 31, 1987, Ser. No. 91,029
Claims priority, application Japan, Sep. 2, 1986, 61-206117; Sep. 10, 1986, 61-213071
Int. Cl.[4] B60K *17/35*
U.S. Cl. 180—249 **17 Claims**

1. A vehicle four wheel drive system including engine means having output shaft means extending transversely of a vehicle body, transmission means having an input member and an output member extending transversely of the vehicle body and speed ratio changing means provided between the input and output members, said transmission means being disposed adja-

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cent to said engine means in the transverse direction of the vehicle body, said input member being connected with the output shaft means of the engine means, planetary type inter-axle differential gear means having an input member and two output members, said input member of the inter-axle differential gear means being connected with the output member of the transmission means, first inter-wheel differential gear means provided on first wheel axis means and connected with one of said two output members of the inter-axle differential gear means to drive said first wheel axle means, second inter-wheel differential gear means provided on second wheel axle means, transfer gear means connected with the other of said two output members of the inter-axle differential gear means to drive said second inter-wheel differential gear means, said inter-axle differential gear means and said transfer gear means being located on said first wheel axle means, said first inter-



wheel differential gear means being located at one side of said inter-axle differential gear means adjacent to said engine means in the transverse direction of the vehicle body, said transfer gear means being located at the other side of the inter-axle differential gear means opposite to said one side where the first inter-wheel differential gear means is located, differential restricting means provided coaxially with said inter-axle differential gear means and the first inter-wheel differential gear means and located at a side of the transfer gear means opposite to said first inter-wheel differential gear means in the transverse direction of the vehicle body, said differential restricting means including first clutch disc means connected with said transfer gear means and second clutch disc means opposite to said first clutch disc means and connected with said one output member of said inter-axle differential gear means, and means for urging said first and second clutch disc means into power transmitting engagement with each other.

4,817,754

AUTOMOTIVE SEAT BELT SYSTEM AND RETRACTOR DEVICE FOR SEAT BELT SYSTEM

Hisao Muramoto, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

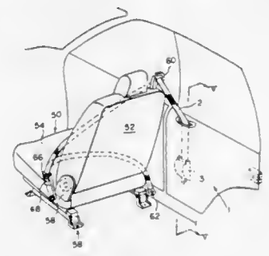
Filed Apr. 26, 1988, Ser. No. 186,220

Claims priority, application Japan, Apr. 27, 1987, 62-103677; Apr. 27, 1987, 62-103678

Int. Cl.⁴ B60R *21/10*

U.S. Cl. 180—268 **19 Claims**

1. A seat belt system for a vehicle having front and rear doors provided on each side of the vehicle body with a center pillar intervening therebetween and a seat provided inside the vehicle body, comprising a seat belt which is adapted to be supported by first and second support means respectively provided on the outer side of the passenger seated on the seat adjacent to the doors and on the inner side of the passenger remote from the doors, and a retractor fixed to the rear door, the retractor having a casing means for retractably accommodating one end portion of the seat belt and a lock means which



prevents the seat belt from being drawn out from the casing means when horizontal acceleration acting on the vehicle body exceeds a predetermined value.

4,817,755

SUSPENDED STRUCTURE FOR COUPLING SEISMIC SOURCES TO THE WALLS OF A BOREHOLE

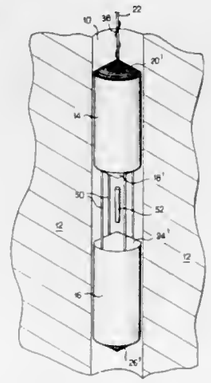
Omnes Gildas, L'Hay-les-Roses, France, assignor to Compagnie Generale De Geophysique, Massy Cedex, France

Filed Mar. 3, 1987, Ser. No. 20,965

Claims priority, application France, Mar. 3, 1986, 8602920

Int. Cl.⁴ G01V *1/40*

U.S. Cl. 181—106 **13 Claims**



1. A suspended structure for use in a borehole in the ground in conjunction with an acoustic phenomenon suitable for generating acoustic waves in said ground for underground prospecting purposes, said structure comprising a first cylindrical element suspended directly over a second cylindrical element, each adapted to absorb at least a substantial part of said acoustic waves and having a diameter less than the diameter of the borehole, and elongated suspension elements having transverse dimensions and connecting the bottom of said first cylindrical element to the top of said second cylindrical element at peripheral zones thereof, said first and second cylindrical elements defining therebetween a space substantially closed at the top of said second cylindrical element and at the bottom of said first cylindrical element thereof and to which the walls of said borehole are exposed and wherein said first and second cylindrical elements are formed within an internal axial passage between said space and said borehole, a valve means being provided in said passage and being normally biased against a seat by a spring and opening for absorbing said acoustic waves

and for establishing a fluid communication with the borehole outside the structure when said acoustic waves are generated by said acoustic phenomenon, whereby said acoustic phenomenon generated in said space is prevented from propagating in a longitudinal direction of said borehole and is applied substantially to said walls of said borehole within said space.

4,817,756

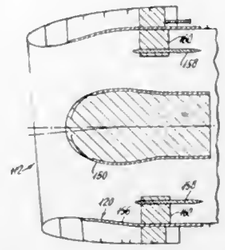
QUIET NACELLE SYSTEM AND HUSH KIT

Thomas W. Carr; Philip M. Rose, both of Chula Vista, and Alan H. Marsh, Huntington Beach, all of Calif., assignors to Aeronautic Development Corp. Ltd., Amsterdam, Netherlands

Continuation-in-part of Ser. No. 769,141, Aug. 26, 1985, Pat. No. 4,723,626. This application Jul. 28, 1987, Ser. No. 78,560

Int. Cl.⁴ B64D *33/02;* **F02K** *1/44*

U.S. Cl. 181—214 **9 Claims**



1. In an aircraft jet engine nacelle adapted to permit operation of the aircraft at low noise levels at take-off and landing, the combination comprising:

(a) a nose cowl defining an inlet, the nose cowl having an airflow surface with an acoustic liner on substantially the entire airflow surface thereof, and anti-icing means disposed at least in part at the forwardmost portion of the nose cowl and having an acoustic liner thereon;

(b) a nose dome portion on a fan section for the engine, the nose dome portion having an airflow surface with an acoustic liner on the airflow surface thereof;

(c) a ring disposed concentrically of the nose cowl and the nose dome portion, the ring having an airflow surface with an acoustic liner on substantially the entire airflow surface thereof:

(d) a long fan duct extending from the fan section to a thrust reverser, the fan duct comprising inner and outer wall portions and splitters disposed between the inner and outer wall portions, with at least the inner and outer wall portions having airflow surfaces with acoustic liners on the airflow surfaces thereof;

(e) forward and aft cowls circumscribing the engine; and

(f) a thrust reverser and nozzle defining an exhaust.

4,817,757

WALL COVERING FOR ABSORBING SOUND WAVES IN A LIQUID MEDIUM

René Perret, Grenoble, and Etienne Rouget de Gourcez, Fontainebleau, both of France, assignors to Alsthom, Paris and Vibrachoc, Evry, both of, France

Filed May 18, 1988, Ser. No. 195,227

Claims priority, application France, May 25, 1987, 87 07317

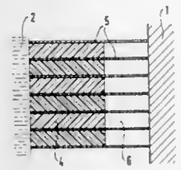
Int. Cl.⁴ E04B *1/82*

U.S. Cl. 181—288 **6 Claims**

1. A wall covering for absorbing sound waves in a liquid medium, said covering having a rear face for applying to a rigid base wall and a front face for being immersed in an ambient medium, in particular a liquid, through which sound waves propagate, said covering comprising:

auxiliary walls fixed perpendicularly to the base wall and leaving elongate energy-dissipating ducts extending along a direction which is also perpendicular to said wall, said ducts being filled with a dissipating substance having a dynamic viscosity which is greater than that of the surrounding liquid so that the substance dissipates the energy by friction when said substance oscillates longitudinally in said ducts by the propagation of said sound waves; and

a clearance space behind said dissipation ducts in order to allow the dissipating substance to perform such oscillations freely;



wherein said dissipating substance is a visco-elastic substance which responds to stress by considerable deformation accompanied by viscous friction, and which responds to such stress ceasing by spontaneously and progressively returning to an initial shape thereof, said substance adhering to said fixed auxiliary walls such that the elasticity of said substance ensures that the substance returns to said initial shape after longitudinal displacement.

4,817,758

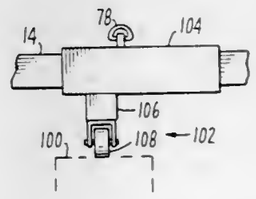
WINDOW CLEANING SUPPORT STRUCTURE

James E. Gilmore, P.O. Box 2074, Livermore, Calif. 94550

Filed Feb. 16, 1988, Ser. No. 157,042

Int. Cl.⁴ E04G *3/10*

U.S. Cl. 182—16 **10 Claims**



1. A support structure for supporting an object suspended from the top of a building having a substantially flat roof, said apparatus comprising:

a counterweight carriage including a frame member and at least three wheels rotatably coupled to the frame member, wherein the wheels are operable for allowing the counterweight carriage to roll along the roof, wherein the counterweight carriage further includes a steering mechanism coupled to at least one of the wheels and operable for steering the support structure, includes a ballast container mounted to the frame and operable for containing ballast material, and includes beam attachment means disposed at the top of the ballast container for securely coupling to a horizontal beam;

a beam securely coupled to the counterweight carriage at an inward end of the beam and disposed substantially horizontally and transversely to the direction of travel of the counterweight carriage, wherein the beam has an outward end operable for extending outwardly over an edge of the roof;

a center support securely coupled to the beam at a position between the inward and outward ends thereof and operable for supporting the center of the beam, wherein the

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center support includes a frame having a horizontal frame member disposed transversely to the beam and having a vertical frame member extending upwardly from the center of the horizontal member, wherein the center support further includes two wheels each rotatably coupled to an end of the horizontal frame member and operable for allowing the center support to roll along with the counterweight carriage and beam along the roof in a direction generally transverse to the beam, and wherein the center support further includes attachment means disposed at the top of the vertical frame member for securely coupling to the beam; and

means coupled to the outward end of the beam for supporting an object suspended below.

4,817,759

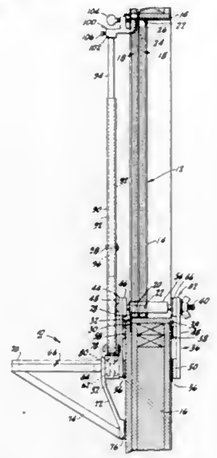
ACCESS PLATFORM FOR SLIDING GLASS WINDOWS

Marv Galyardt, 36711 Port Fogwood Pl., Newark, Calif. 94560

Filed Apr. 20, 1988, Ser. No. 184,003

Int. Cl.[4] E04G *3/06*

U.S. Cl. 182—36 **10 Claims**



1. A portable access platform for access to the outside of a conventional sliding window unit having a casing with a sill and a pair of sliding windows, which create an open portion and a closed portion in the window unit when one of the windows is slid aside the other, the access platform comprising:

a clamping unit having means for clamping the clamping unit securely over a section of the casing sill in the open portion of the window unit;

an elongated slide unit slidably engaged with the clamping unit and constructed and arranged to extend below the outside sill of the window unit with ends reaching approximately the length of the sill when the clamping unit is installed and the access platform is in place;

a platform unit connected to the slide unit and arrangeable at least along the closed portion of the window unit when the access platform is in place;

wherein the clamping unit is slidable along the slide unit for moving the clamping unit from one end of the slide unit to the other for select installation of the access platform for access to either side of the window unit upon sliding a window to one side or the other.

4,817,760

DISPLACEMENT DETECTING MECHANISM FOR HYDRAULIC CIRCUIT OF FORK LIFT

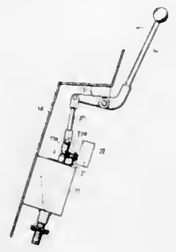
Naoki Yamamura, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jul. 22, 1986, Ser. No. 888,822

Claims priority, application Japan, Jul. 30, 1985, 60-117643[U]

Int. Cl.[4] B66B *9/20*

U.S. Cl. 187—9 R **4 Claims**



1. A displacement detecting mechanism for a hydraulic circuit of a fork lift, comprising: at least one spool type hydraulic control valve having a valve housing and a longitudinal valve spool passing through said housing between first and second sides of said housing, a fork lift loading lever operably coupled to a first end of said valve spool at said first side of said housing for controlling the longitudinal position of said valve spool within said valve housing, means responsively coupled to said loading lever for starting a loading motor to generate hydraulic pressure upon actuation of said loading lever, and a linear stroke type variable resistor for controlling a motor speed control circuit the loading motor, said variable resistor having a body part joined to said housing at said second side of said housing, and having a positionable slider, said slider being coupled responsively to a second end of said valve spool at said second side of said housing for detecting the displacement of said valve spool.

4,817,761

CONTROL APPARATUS FOR ELEVATOR

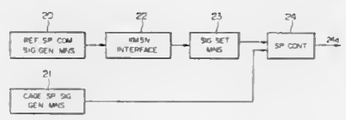
Shigemi Iwata, and Hiroyuki Ikejima, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 28, 1988, Ser. No. 187,517

Claims priority, application Japan, Apr. 28, 1987, 62-105018; Dec. 25, 1987, 62-329208

Int. Cl.[4] B66B *1/30*

U.S. Cl. 187—116 **10 Claims**



1. A control apparatus for an elevator comprising means for generating a reference speed command signal; means for detecting a cage speed signal, a transmission interface which transmits the reference speed command signal from the signal generation means; and a speed controller which controls a speed of a cage on the basis of a deviation between a transmitted reference speed command signal obtained through the transmission interface and the cage speed signal from the signal detection means; and signal setting means for setting a new value not varying suddenly, as a value at the present time when a present value of the transmitted reference speed command signal sent by said transmission interface, the cage speed signal, or a controlled variable based on these signals varies suddenly from a past time-serial value of the corresponding signal.

4,817,762

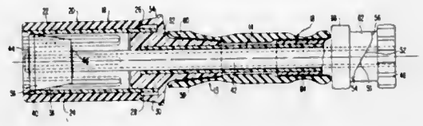
DISPENSER HANDLE FOR ROLLS OF FLEXIBLE SHEET MATERIAL

William R. Powell, 2740 Plateau Dr., Riva, Md. 21140

Filed Nov. 10, 1987, Ser. No. 119,035

Int. Cl.[4] B65H *59/04, 23/06;* **B23B** *31/26, 31/40*

U.S. Cl. 188—67 **2 Claims**



1. A dispenser handle for a roll of flexible sheet material wound on a hollow cylindrical core comprising a spindle having a first part carrying an annular, radially expandable means for locking engagement with the interior wall of a hollow core and a second part adapted to extend co-axially clear of said core when said first part is engaged therewith, said second part carrying a pair of axially spaced flanges, a manually collapsible friction sleeve surrounding with clearance that portion of the spindle between said flanges whereby said sleeve is at all times trapped on said spindle against axial separation therefrom, a concical expander element axially movable within said annular expandable means to effect movement thereof between a collapsed condition enabling its free movement into and out of a core and an expanded locking condition, a first ramp carried by the outer end of the second part of said spindle, a shaft connected at one end to said expander element and passing co-axially and slideably through said spindle with its opposite end extending beyond said first ramp, a second ramp carried on the extending end of said shaft and slideably engaging said first ramp, a knob integrally connected to said second ramp and being rotatable to a first position causing said second ramp to slide up said first ramp and move said shaft and expander element axially to effect radial expansion of said expander element, said knob being rotatable to a second position enabling said shaft and said expander element to be moved in the opposite direction to permit collapse of said expandable element, and flats at the upper ends of the respective ramps arranged to interengage when said knob is rotated to its first position to retain said expander element in a position wherein said expandable means is retained in its expanded condition.

4,817,763

FULL PLATE DISC BRAKE, IN PARTICULAR FOR TRACTORS

Klaus Hillen, Neuwied, and Christoph Beuerle, Koblenz, both of Fed. Rep. of Germany, assignors to Lucas Industries public limited company, Birmingham, England

Filed Feb. 8, 1988, Ser. No. 153,100

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 8702176[U]

Int. Cl.[4] F16D *55/14, 65/16*

U.S. Cl. 188—73.2 **7 Claims**

1. Full plate disc brake, in particular for tractors, comprising

a housing (2) having inner guide surfaces (3, 4, 5),

at least one first and one second stop (40, 41) fixed with respect to the housing,

a first and a second thrust plate (10, 11) guided rotatably and axially displaceably at the guide surfaces (3, 4, 5) of the housing (2),

a first lug (12) on the first thrust plate (10) which limits the rotation thereof in one direction of rotation in that it strikes the first stop (40),

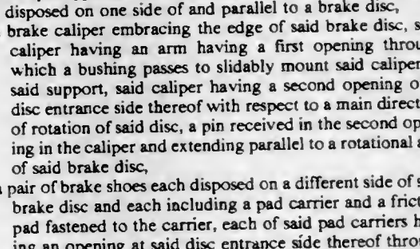
a second lug (13) on the second thrust plate (11) which limits the rotation thereof in the opposite direction of rotation in that it strikes the second stop (41),

a first and a second set of brake discs (20, 24; 21, 25) which are arranged adjacent the first and second thrust plate (10, 11) respectively,

a first and a second intermediate disc (22, 23) which are arranged between the brake discs (20, 24; 21, 25) of the first and second set respectively and are likewise rotatably and axially displaceably guided at the guide surfaces (3, 4, 5) of the housing (2),

at least one actuator (8) for opposite rotation of the two thrust plates (10, 11),

spreading members (46) which are arranged between the



two thrust plates (10; 11) and spread them apart when the thrust plates are turned with respect to each other, thereby initiating a braking servo effect, and

projections (26, 28; 27, 29) on the intermediate discs (22, 23) which cooperate with projections (16, 18; 17, 19) of the thrust plates (10, 11) for increasing the servo effect thereof, characterized in that each of the two intermediate discs (22, 23) comprises at least two projections (26, 28; 27, 29) which are arranged offset with respect to each other at at least approximately equal angular intervals and are each associated with a projection (16, 18; 17, 19) of the associated thrust plate (10; 11) in such a manner that each intermediate disc (22, 23) can transmit to the associate thrust plate (10; 11) moments solely in the direction of rotation in which the lug (12; 13) of the respective thrust plate (10; 11) moves away from the associated stop (40; 41) fixed with respect to the housing.

4,817,764

SPOT-TYPE DISC BRAKE

Roberto Stoka, Nauheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 15, 1983, Ser. No. 514,065

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232759

Int. Cl.[4] F16D *65/14*

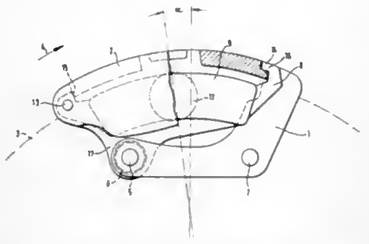
U.S. Cl. 188—73.44 **3 Claims**

1. A spot-type disc brake comprising a brake support member disposed on one side of and parallel to a brake disc,

a brake caliper embracing the edge of said brake disc, said caliper having an arm having a first opening through which a bushing passes to slidably mount said caliper to said support, said caliper having a second opening on a disc entrance side thereof with respect to a main direction of rotation of said disc, a pin received in the second opening in the caliper and extending parallel to a rotational axis of said brake disc,

a pair of brake shoes each disposed on a different side of said brake disc and each including a pad carrier and a friction pad fastened to the carrier, each of said pad carriers having an opening at said disc entrance side thereof through which said pin passes, each of said pad carriers also having

a suspension tab extending from a disc exit side thereof, said caliper having a complementary guide edge against each suspension tab of said pad carriers abut,



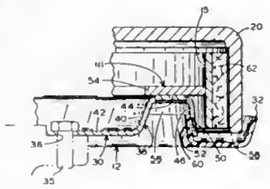
whereby said pad carriers are slidably supported in said caliper for movement parallel to the rotational axis of said brake disc.

4,817,765

BACKING PLATE ASSEMBLY FOR A DRUM BRAKE

John L. Turak, South Bend, and Robert Spaargaren, Granger, both of Ind., assignors to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 875,112, Jun. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 726,932, Apr. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 490,762, May 2, 1983, abandoned. This application Sep. 22, 1987, Ser. No. 99,632
Int. Cl.[4] F16D *65/00*
U.S. Cl. 188—218 A 10 Claims



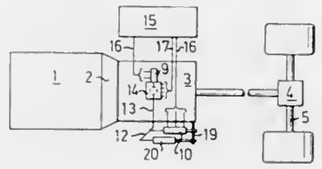
1. A backing plate assembly for a drum brake having a pair of brake shoes, the backing plate assembly comprising a first part adapted for attachment to a vehicle frame and a second part connected with the first part and cooperating with the first part and a drum of the drum brake to substantially close an open area disposed between the drum and first part, characterized in that said first part comprises a substantially flat portion for attachment to the vehicle frame and a reinforced portion having an inner wall contiguous with the flat portion and extending axially outwardly therefrom and substantially circumferentially around the first part, a support wall offset axially from said flat portion and engageable with webs of the pair of brake shoes, and an outer wall having a body extending axially inwardly from the support wall and substantially circumferentially around said first part, said second part coupled to said first part at the outer wall, the second part comprising a single piece, integral self-supporting member that is tightly and frictionally coupled to said first part by means of a snap-on connection between said first and second parts, the second part extending radially outwardly from a radial extremity of said first part and spaced axially apart from the drum, the second part having a free end extending axially over an outer axial portion of said drum, the pair of brake shoes defining an interface with an axially extending surface of said drum, and the first and second parts coupled together at a location on the outer wall, the location being disposed solely, radially inwardly of the interface.

4,817,766

ARRANGEMENTS FOR DAMPING SHIFTING MOVEMENTS IN TRANSMISSIONS

Nils H. Nilsson, Nykvarn, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Continuation of Ser. No. 4,311, Jan. 7, 1987, abandoned, which is a continuation of Ser. No. 746,329, Jun. 19, 1985, abandoned. This application Mar. 2, 1988, Ser. No. 166,737
Claims priority, application Sweden, Jun. 21, 1984, 8403329
Int. Cl.[4] B60K *20/00*; F16F *9/50*; G05G *9/00, 13/00*
U.S. Cl. 188—281 20 Claims



1. Apparatus for damping shifting movements in a mechanical, synchronized multispeed transmission in a driving unit for vehicles, in which transmission a shifting movement is effected by a pressure-medium controlled shifting cylinder which, for engagement of the various gear speeds, effects movements in two directions opposite to each other, said apparatus including a damper comprising a piston in a pressuremedium-filled cylinder portion, said damper being coupled to means transmitting the shifting movements, in order to damp the engagement movements for the respective gear speed, the piston being arranged on a piston rod which extends through both ends of the cylinder portion so that there exists a pressure medium chamber on each side of the piston; fluid communication means including flow passages in the piston and through the wall of the cylinder, said flow passages being arranged such that there is established free communication through the piston between said chambers when the piston is in a neutral, center position in the cylinder portion whereby upon relative movement between the piston and the cylinder portion the damper has a pressure medium filled volume which remains constant, said fluid communication means further including means for throttling the flow of pressure medium through the piston only when the piston is moving away from its neutral position in the cylinder portion whereby the piston and thereby the shifting movement is damped only when the piston is moved away from the neutral position.

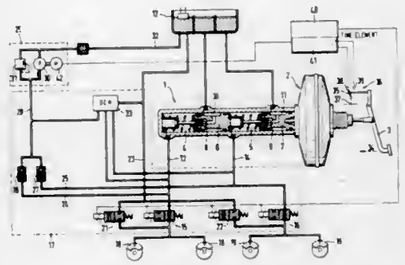
4,817,767

HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Wolfram Seibert, Pfungstadt, and Guenter Trach, Offenbach, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,679
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607366
Int. Cl.[4] B60T *11/00, 8/42*
U.S. Cl. 188—348 6 Claims

1. A hydraulic brake system for automotive vehicles with a master brake cylinder connected to an unpressurized reservoir and with a brake line connected to a working chamber of the master brake cylinder and leading to pressure control valves of a brake slip control device, which pressure control valves are followed by at least one wheel brake, with the working chamber of the master brake cylinder being connectable to a pressure medium source upon the start of the brake slip control device, means for detecting the onset of the application of the brake pedal (3), means responsive to the detecting means for supplying a predetermined pressure medium amount coordinated with the clearance of the brake from the pressure medium source (29) to the brake cylinder of the wheel brake wherein said clearance of said brake is overcome prior to further brake pedal travel following said onset thereby to reduce the overall brake pedal travel, wherein the pressure medium source (29) contains a pump (30) with a drive (42)



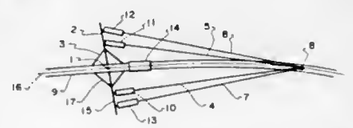
which by way of a switch (36) operable by the brake pedal (3), is switched on for a predetermined time during which the pressure medium amount required to overcome the clearance of the wheel brake flows into the wheel brake cylinder, said brake system further comprising an adjustable-response-duration time element (41) which is actuable by means of the switch (36), the response duration of said time element (41) being adjustable to correspond to the the delivery time of the pump (30) which is required to overcome the clearance of the wheel brake.

4,817,768

BEAM VIBRATION DAMPING SYSTEM

Larry L. Schumacher, 18876 Tenderfoot Trail, Newhall, Calif. 91321

Filed Feb. 29, 1988, Ser. No. 161,712
Int. Cl.[4] F16F *7/10*
U.S. Cl. 188—378 11 Claims



1. A mechanism for damping structural beam vibration comprising:

a mast structure approximately orthogonal to a longitudinal axis of a beam at a reference point fixed in the beam;

a deformation measurement means to measure the beam lateral displacement of a damped point on the beam relative to the reference point fixed in the beam;

a beam forcing means to provide a force to the damped point fixed in the beam approximately 180 degrees out of phase with the beam lateral velocity relative to the reference point fixed in the beam;

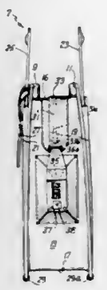
a controller means to evaluate the damped point on the beam lateral velocity from the deformation measurement means measurements and to compute the beam forcing means commands.

4,817,769

HASP LOCK, ZIPPER AND COVER ASSEMBLY FOR PORTFOLIO

Frank Saliba, 115 W. 30th St., New York, N.Y. 10001

Continuation of Ser. No. 859,484, May 5, 1986, abandoned. This application Dec. 8, 1987, Ser. No. 130,218
Int. Cl.[4] A45C *3/02, 13/10, 13/36*
U.S. Cl. 190—18 R 6 Claims



1. In a leather portfolio having generally rectangular side panels, a closed bottom, closed end, a lock embedded in one end and an open top which defines a security compartment for holding papers which are to be guarded against unauthorized entry, that improvement consisting of:

a unitary three piece combination of a sewn-together zipper assembly, a leather zipper cover and a locking hasp which unitary combination is additionally sewn between the inner upper edges of said side panels of said leather portfolio;

said zipper assembly comprising two rows of interlocking slide fastener elements, a pull member with said locking hasp for engaging said lock at said one end, a tongue fastened to the other end and a leather strip adjoining each of the rows of fastener elements and each strip being sewn to a respective side panel;

said leather strip adjoining each of the fastener elements and the cover for the zipper assembly extending along the entire top of the security compartment and extending downwardly at the ends on each side of the portfolio to terminate on said one end at the lock and at a fastener at the other end of said portfolio, said cover at the lock end of said portfolio concealing from view the connection between the lock and the zipper assembly;

said hasp being attached to the pull member of said zipper assembly by means of a loop member connecting an end of said hasp to the pull member of said zipper assembly;

said leather zipper cover being sewn to one of said side panels with an edge thereof remote from the sewn edge overlying the slide fastener elements to project only slightly beyond the far edge of said slide fastener elements to thereby hide the slide fastener elements from view;

the strips of said zipper assembly which are sewn to both side panels and the zipper cover sewn to one of said side panels being of the same material as said side panels to provide the appearance at the top of the portfolio of a unitary cover matching the sdes of the portfolio with no visual indication of opening mens viewed from the top;

the pull member of said zipper assembly constituting the sole means of opening and thereby entering the central compartment of said portfolio after the lock hasp is detached from said lock to pull the zipper fastener elements open starting from the end where the lock is located to the other opposite end at the tongue where the tongue is fastened to said other end and said tongue being fastened to said other end of said leather portfolio with a snap

fastener and wherein said side panels, ends, bottom and zipper cover of said portfolio are constructed of leather.

4,817,770

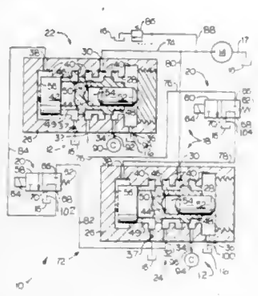
CONTROL SYSTEM FOR INDEPENDENT CONTROL OF FLUID ACTUATED DEVICES

Alan R. Coutant, Chillicothe, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 940,233, Dec. 12, 1986, Pat. No. 4,729,408, which is a continuation of Ser. No. 754,361, Jul. 12, 1985, abandoned. This application Nov. 5, 1987, Ser. No. 117,185

Int. Cl.[4] F16D *25/11*

U.S. Cl. 192—3.58 **3 Claims**



1. A fluid control system including a source of pressurized fluid in combination with a multi-speed transmission, comprising:

a plurality of fluid actuated directional clutches operatively associated with the multi-speed transmission;

a plurality of fluid actuated speed clutches operatively associated with the multi-speed transmission;

a plurality of valve mechanisms each operatively connected to the source of pressurized fluid and to respective ones of the plurality of fluid actuated directional and speed clutches, each valve of the plurality of valve mechanisms has an inlet port, an actuator port, a drain port, and first and second outlet ports, and each valve mechanism is movable between a first position at which the inlet port is on open communication with the first outlet port and the second outlet port is in open communication with the drain port and a second position at which the inlet port is blocked from the first outlet port and is in open communication with the second outlet port, one of the first and second output ports of each valve mechanism is connected to respective ones of the speed and directional clutches;

a plurality of signal control valves each being selectively connected to the actuator port of respective ones of the plurality of valve mechanisms and operable to actuate a respective one of the plurality of valve mechanisms; and

means for hydraulically interlocking selected ones of the plurality of signal control valves and selected ones of the plurality of valve mechanisms so that in operation only one fluid actuated directional clutch of the plurality of fluid actuated directional clutches and only one fluid actuated speed clutch of the plurality of fluid actuated speed clutches may be engaged at one time.

4,817,771

SPRING CLUTCH WITH ENGAGEABLE FIRST AND SECOND HELICAL CLUTCH SPRINGS

Peter Iten, Staefa, Switzerland, assignor to Baumann & Cie AG, Rüti, Switzerland

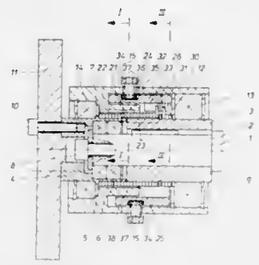
PCT No. PCT/CH86/00095, § 371 Date Mar. 16, 1987, § 102(e) Date Mar. 16, 1987, PCT Pub. No. WO87/00594, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 8, 1986, Ser. No. 44,497

Claims priority, application Switzerland, Jul. 19, 1985, 3157/85

Int. Cl.[4] F16D *13/08, 67/02*

U.S. Cl. 192—16 **6 Claims**



1. A spring clutch which comprises

a housing,

a driving hub rotatably mounted with respect to said housing,

a driven hub rotatably mounted with respect to said housing, said driving hub and said driven hub being axially aligned within said housing,

a first helical clutch spring mounted within said housing, said first helical clutch spring having a first portion which surrounds a portion of said driven hub and is in pre-loaded contact with said driven hub and a second portion which surrounds a first portion of said driving hub, said second portion, when in an unextended condition, providing an annular space between it and said driving hub, said second portion including a radially outwardly-extending end portion,

a second helical clutch spring mounted within said housing so as to surround a second portion of said driving hub, said second helical clutch spring being in pre-loaded contact with said driving hub, said second helical clutch spring including a radially outwardly-extending end portion, and

an axially-movable clutch sleeve rotatably mounted within said housing and connected to said end of said second portion of said first helical clutch spring, axial movement of said clutch sleeve being capable of moving said end of said second portion of said first clutch spring into locking contact with said end of said second clutch spring, such that rotation of said second clutch spring by said driving hub will result in rotation of said first clutch spring and thus said driven hub.

4,817,772

SHIFTABLE FRICTION CLUTCH

Christoph Sacher, Sauerlach/Arget, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 115,889

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637327

Int. Cl.[4] F16D *13/04, 13/54*

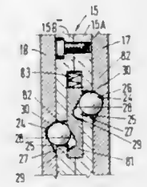
U.S. Cl. 192—48.91 **10 Claims**

1. In a shiftable friction clutch, having a pair of clutch halves, a gearshift sleeve which is axially movably supported on a shaft to be clutched and at least one axially movable

friction ring which belongs to one clutch half and cooperates through clutch friction surfaces with the other clutch half and is supported on the shaft to be clutched through rolling members for producing a contact force proportional to torque by means of sloped surfaces inclined in a first direction with respect to a plane of rotation, said gearshift sleeve having means defining plural lugs and at least one groove, said friction ring having means defining plural teeth thereon, said teeth and lugs being adapted to operatively engage each other for purposes of effecting, in response to an axial movement of said gearshift sleeve, at least one of an engagement of said clutch halves and a disengagement of said clutch halves, the improvement comprising wherein:

(a) said teeth on said gearshift sleeve have means defining a first surface inclined in a second direction opposite to said first direction and relative to said plane of rotation;

(b) said means defining said plural lugs and at least one groove includes means defining a second surface generally parallel to said first surface, said first and second surfaces being brought into pressing engagement only when disengagement of said clutch halves is desired;



(c) said sloped surfaces are provided on a first axially facing side of at least one rotatable element on said shaft and which is rotatable relative to said shaft as well as on a second axially facing side on said friction ring which opposes said first axially facing side, the slope of said sloped surfaces being inclined the same direction at an acute angle relative to said plane of rotation;

(d) said at least one rotatable element is guided for said relative rotatable movement in a recess on said shaft and being spring loaded by means of a pressure spring acting in a direction of rotation of said shaft;

(e) said rolling members are guided between said sloped surfaces on said at least one element and on said friction ring, and in axial bores in a portion of said shaft which is oriented intermediate said opposing sloped surfaces; and

(f) means are provided for causing said at least one rotatable element to be blocked so as to maintain said rolling members unmovable during engagement of said clutch and unblocked to facilitate movement of said rolling members during disengagement of said clutch, and while said friction ring is still in frictional engagement.

4,817,773

SYNCHRONIZING MECHANISM FOR CLUTCHES

Gunter Knödel, Mühlacker, and Wolfgang Lees, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Getrag Getriebe- und Zahnradfabrik GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 803,305, Dec. 2, 1985, abandoned. This application May 27, 1987, Ser. No. 54,946

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1984, 3444670

Int. Cl.[4] F16D *23/08*

U.S. Cl. 192—53 F **8 Claims**

1. A synchronizing mechanism for clutches, comprising:

a rotatable shaft;

at least one pair of meshing gears having one gear mounted on the shaft for relative rotation;

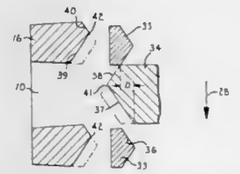
a clutch body on said one gear presenting external teeth;

a guide sleeve mounted on the shaft for rotation therewith;

a gear shift sleeve mounted on said guide sleeve for rotation therewith, said gear shift sleeve having internal teeth and said gear shift sleeve being displaceable axially on said guide sleeve to bring said internal teeth into force transmitting engagement with said external teeth of the clutch body;

a toothed synchronizing ring in form-locking engagement with the guide sleeve and in frictional engagement with the clutch body circumferentially, said synchronizing ring having limiting positions relative to the guide sleeve defined as forward and rearward positions when the synchronizing ring is rotating in a predetermined direction;

a pair of check faces on each tooth of said gear shift sleeve, said check faces in each pair comprising a leading check face and a trailing check face when the gear shift sleeve is rotating in said predetermined direction;



a pair of check faces on each tooth of said synchronizing ring comprising a leading check face and a trailing check face when the synchronizing ring is rotating in said predetermined direction, said pairs of check faces on the teeth of the gear shift sleeve and of said synchronizing ring cooperating to permit the teeth of the gear shift sleeve to come into engagement with the external teeth of the clutch body when the gear shift sleeve and the clutch body rotate at a synchronous speed; and

said leading check faces on the teeth of the gear shift sleeve each having an axial extension greater than that of the trailing check face on the same tooth.

4,817,774

FLUID FRICTION CLUTCH

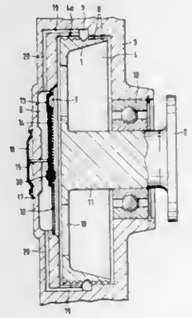
Joerg Digele, Freiberg, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlertabrik Julius Fr. Behr GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 911,669. Sep. 25, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 188,664

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1985, 3536456

Int. Cl.[4] F16D *35/00*

U.S. Cl. 192—58 B **9 Claims**



1. A fluid friction clutch comprising:

a disk,

a housing concentrically surrounding the disk, said housing and disk being rotatable with respect to one another with

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a working gap formed between the housing and disk for accommodating clutch fluid which transfers forces between said housing and disk,

a clutch fluid storage chamber separated from the working gap by a partition wall having clutch fluid opening means to the working gap,

temperature responsive valve means for controlling the clutch fluid opening means,

collecting channel means separate from the clutch fluid opening means for returning clutch fluid from the working gap to the storage chamber in bypassing relation to the clutch fluid opening means along a flow path other than through the clutch fluid opening means during relative rotation of the disk and housing,

and return flow groove means formed in at least one of the disk and housing, said return flow groove means including two sections axially spaced from one another at opposite sides of a return opening to the collecting channel means with said grooves being sloped oppositely in each of the respective groove sections and being configured to induce clutch fluid flow toward the return opening during relative rotation of the disk and housing.

4,817,775

PRE-ASSEMBLED AUTOMOTIVE CLUTCH COVER ASSEMBLY

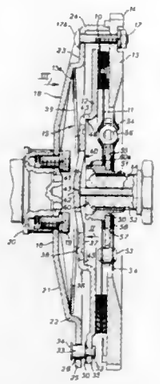
Valter Baccalaro, and Carlo Beccaris, both of Santena, Italy, assignors to Valeo, Paris, France

Filed Jun. 8, 1982, Ser. No. 386,397

Claims priority, application France, Jun. 12, 1981, 81 11596

Int. Cl.⁴ F16D *13/44*

U.S. Cl. 192—89 B **8 Claims**



1. A clutch suitable for automotive vehicles, said clutch comprising a pre-assembled cover assembly incorporating a pressure plate, a diaphragm spring and a clutch cover, said pressure plate being mounted for limited axial displacement relative to said clutch cover against the bias of said diaphragm spring, a plurality of fixing screws for attaching said clutch cover to a driving shaft, a reaction plate adapted to be fixed for rotation with the driving shaft and a friction disc adapted to be mounted on a driven shaft and disposed axially between said reaction plate and said pressure plate, said pressure plate having a dished central region offset axially towards said clutch cover, a fulcrum defined on the side of said pressure plate remote from said reaction plate for engagement with said diaphragm spring, a peripheral part of said diaphragm spring bearing against said clutch cover and urging said pressure plate to grip said friction disc between said pressure plate and said reaction plate, a plurality of openings in said dished central region for receiving said fixing screws thereby enabling said pre-assembled cover assembly to be mounted as a unit, said dished central region having an outer margin including an annular plurality of holes which open into an annular oil recovery groove on that side of said pressure plate facing said friction disc.

4,817,776

STARTING CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION SYSTEM

Toshiaki Tateno, 930-132, Obbacho, Midori-Ku, Yokohama-shi, Kanagawa-Ken, 227; Shigeki Fukushima, 412, Futoocho, Kohoku-Ku, Yokohama-shi, Kanagawa-Ken, 222, and Tomoyuki Iwamoto, 8-1, Miyamaedaira, 3-chome, Miyamae-Ku, Kawasaki-shi, Kanagawa-Ken, 213, all of Japan

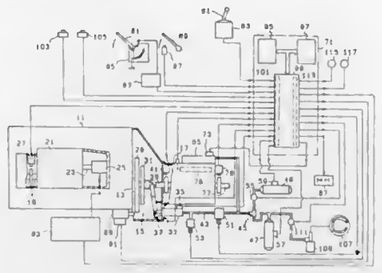
PCT No. PCT/JP86/00151, § 371 Date Nov. 25, 1986, § 102(e) Date Nov. 25, 1986, PCT Pub. No. WO86/05747, PCT Pub. Date Oct. 9, 1986

PCT Filed Mar. 28, 1986, Ser. No. 939,341

Claims priority, application Japan, Mar. 29, 1985, 60-44892[U]; Apr. 10, 1985, 60-74502; Apr. 12, 1985, 60-76638; Jul. 16, 1985, 60-108258[U]; Sep. 30, 1985, 60-150070[U]; Sep. 30, 1985, 60-150071[U]

Int. Cl.⁴ B60K *41/28, 41/02*

U.S. Cl. 192—0.092 **17 Claims**



1. A starting control apparatus for an automatic transmission system in a vehicle comprising engine control means for controlling an increase and a decrease of the rotation speed of an engine; a clutch coupled to an output shaft of said engine; a parallel-shaft type gear transmission coupled at an input shaft thereof to said clutch; a clutch actuator for actuating engagement and disengagement of said clutch; clutch position detecting means for detecting engagement and disengagement of said clutch; shift position change-over means for changing the meshing state of said parallel-shaft type gear transmission; operating condition detecting means for detecting operating conditions of the vehicle; operation control means for controlling the operation of said actuator and said shift position change-over means; target engine rotation-speed generating means for generating a target engine rotation speed corresponding to an amount of accelerator pedal depression detected by said operating condition detecting means; vehicle-starting judging means for judging as to whether or not said shift position change-over means is actuated to establish a vehicle-starting speed ratio on the basis of a signal applied from said operating condition detecting means; engine rotation-speed increasing means operating, when said vehicle-starting judging means judges that said shift position change-over means is actuated to establish the vehicle-starting speed ratio, to apply to said engine control means an accelerator pseudo signal voltage computed on the basis of said target engine rotation speed and a present engine rotation speed detected by said operating condition detecting means, thereby increasing the present engine rotation speed to said target engine rotation speed; clutch urging means for applying, in response to a signal applied from said engine rotation-speed increasing means, a signal to said operation control means to urge said clutch from a disengaged state toward an engaged state; synchronous rotation judging means for judging, when the engine rotation speed has been increased to a peak thereof by said engine rotation-speed increasing means, as to whether or not said engine rotation speed is substantially synchronous with a clutch rotation speed; clutch engagement judging means for deciding that said clutch is to be completely engaged when said synchronous rotation judging means judges that said engine and said clutch are under substantially synchronous rotation but deciding that said clutch is to be operated in a semi-engaged state when said synchronous rotation judging means judges that said engine and said clutch are under asynchronous rotation; and accelerator pseudo signal voltage stepwise releasing means for applying to said engine control means a signal for stepwise releasing said accelerator pseudo signal voltage when said clutch position detecting means detects that said clutch is completely engaged.

4,817,777

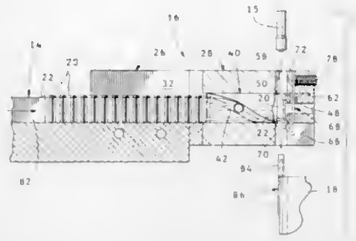
ARTICLE INVERTING DEVICE

Kevin S. Postel, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 26, 1987, Ser. No. 89,380

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 193—46 **6 Claims**



1. An article inverting device for use in inverting articles from one orientation to another during transfer from a reservoir to a work station, said device comprising connecting means at one end for being attached to the reservoir or a track from the reservoir and an elongated tube at another end, said tube having a helical groove extending along a length thereof and encircling said tube by about 180 degrees so that an article entering said groove at one end and moving therethrough will be inverted at another end.

4,817,778

ARRANGEMENT FOR CONVEYOR SYSTEMS

Mats I. Davidson, Djupadal, S-502 78 Gånghester, Sweden

PCT No. PCT/SE86/00351, § 371 Date Mar. 31, 1987, § 102(e) Date Mar. 31, 1987, PCT Pub. No. WO87/00821, PCT Pub. Date Feb. 12, 1987

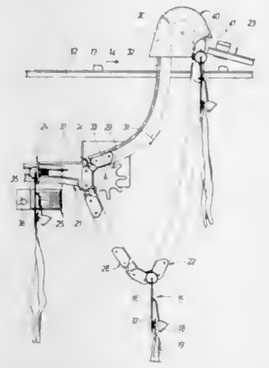
PCT Filed Aug. 4, 1986, Ser. No. 46,046

Claims priority, application Sweden, Aug. 8, 1985, 8503746

Int. Cl.⁴ B65G *17/20*

U.S. Cl. 198—346.1 **5 Claims**

1. A conveyor including first conveyor means to transport objects, such as carriers for workpieces, along a first transport line in an upper transport level, and a plurality of second conveyor means along said transport line to transport objects between said upper level and a lower level in which object receiving stations, such as work stations, are located, said second conveyor means operating independently of said first conveyor means, selectively actuable first transfer means situated at first connection points between said first and second conveyor means to transfer the objects from the first conveyor means to the second conveyor means, and second transfer means at second connection points between said first and second conveyor means to selectively transfer objects from said second conveyor means to said first conveyor means, and wherein each of said second conveyor means comprises a chain conveyor positioned along the transport line of said first conveyor means, said chain conveyor comprising an endless chain, driving means for moving said chain in an endless loop in a transport line having a transport direction from one of said first connection points to one of said second connection points, and in an idle line from said one second connection point to said one first connection point, and there is provided supporting means at the upper end of said loop for carrying said chain with the lower end of the loop hanging free from the supporting means, said chain having a plurality of object carrying links, said links having releasable holding means for receiving an object at a receiving outer end thereof and for holding it at an inner portion thereof, and locking means at the receiving end which, in a first position thereof, permits said end to be free for introduction of the object into said inner portion and which, in a second position thereof, locks the object so that it is arrested at said inner portion, said supporting and driving means including actuation means for holding said locking means in its first position at the second connection point and allowing it to be in its second position during passage of the free hanging loop.



4,817,779

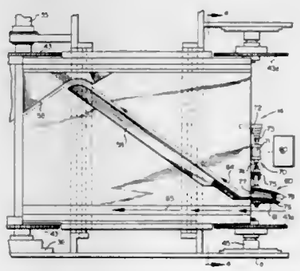
SELECTIVE PRODUCT FEED APPARATUS

Charles C. Beck, Bloomington, and Gregory S. Anderson, Eagan, both of Minn., assignors to Thiele Engineering Company, Minneapolis, Minn.

Filed Apr. 30, 1986, Ser. No. 857,713

Int. Cl.⁴ B65G *47/46*

U.S. Cl. 198—365 **6 Claims**



1. For use in an apparatus in which an article carried on a

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first conveyor is transferred to a second conveyor during continuous motion of the conveyors from an upstream position to a downstream position by means of a transfer mechanism including cam follower means engageable by cam track means underlying the first conveyor to actuate the transfer mechanism for effecting the transfer operation, directing means for selectively directing the cam follower means to either engagement with the cam track means to effect a transfer operation or to bypass the cam track means so that no transfer operation is effected, comprising guide track means having a body with a generally arcuate-shaped periphery of channel-shaped cross section which defines a generally arcuate guide path having an entry end and an exit end at ends of the arcuate-shaped periphery, said body including a pivot connection for pivoting the guide track means so that the entry end is generally rotated about a point while the exit end is swung in opposed lateral directions toward and away from the cam track means so that a succession of cam follower means can enter the guide path while downstream cam follower means are laterally displaced as they travel along the arcuate guide path, for selective alignment of individual cam followers as they exit the end of the path with said cam follower means, and a pivot pin on a frame member of the first conveyor adjacent the upstream end thereof, engageable with the pivot connection of the guide track means so as to mount the guide track means for said pivoting thereof.

4,817,780

MEANS FOR SECURING OBJECTS

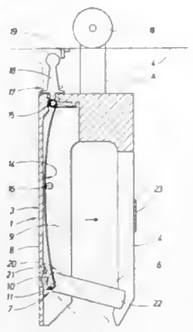
Mats I. Davidsson, Djupadal, S-502 78 Gånghester, Sweden

PCT filed Jul. 18, 1985, PCT No. PCT/EP87/00285, § 371 Date Mar. 20, 1986, § 102(e), Date Mar. 20, 1986, PCT Pub. No. W086/00790, PCT Pub. Date Feb. 13, 1986, Ser. No. 852,455

Claims priority, application Sweden, Jul. 23, 1984, 8403820

Int. Cl.⁴ B65G *17/32*

U.S. Cl. 198—465.4 **10 Claims**



1. A device for securing an object, comprising: a frame having a surface; a locking arm having an end and also having pivot shaft means; and slot means in said frame for supporting said pivot shaft means in predetermined first and second positions, in said first position said end of said locking arm clamping said object against said surface, said surface forming a limit stop restricting pivotal motion of said locking arm in one direction; in said second position the distance of said pivot shaft means from said limit stop being larger than in said first position, whereby said end of said locking arm is movable in said one direction beyond said limit stop to thereby release said object.

4,817,781

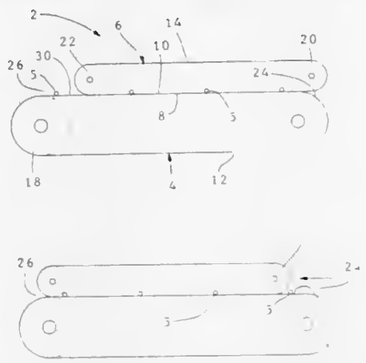
RESILIENT BELT TYPE CONVEYOR HAVING IMPROVED LOADING AND UNLOADING FEATURES

Kenneth F. Folk, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 3, 1987, Ser. No. 128,123

Int. Cl.⁴ B65G *15/14*

U.S. Cl. 198—627 **15 Claims**



1. A conveyer for transporting wires laterally of their axes along a conveying path, the conveyer comprising first and second belt assemblies in side by side coplanar relationship, each belt assembly comprising an endless belt having a feeding stretch, a return stretch, and two curving ends, the feeding stretches of the first and second belts being in opposed confronting relationship, the conveyer having a loading end and a discharge end, the feeding stretches of the first and second belts extending between the ends, and actuating means for intermittently indexing the belts whereby wires held between the feeding stretches of the belts are conveyed along the conveying path, the conveyer being characterized in that:

the first and second belts each have loading end portions and discharge end portions which are at the loading end and at the discharge end respectively of the feeding stretch,

at least one of the end portions of the second belt is shiftable, with respect to the corresponding end portion of the first belt, between a juxtaposed position and a spaced position, the one end portion of the second belt being against the corresponding end portion of the first belt when the one end portion of the second belt is in its juxtaposed position, the one end portion of the second belt being spaced from the corresponding end portion of the first belt when the one end portion of the second belt is in its spaced position, the corresponding end portion of the first belt being thereby exposed when the one end portion of the second belt is in its spaced position whereby,

a wire can be placed on, or removed from, the corresponding end portion of the first belt when it is exposed and the one end portion of the second belt is in its spaced position.

4,817,782

HEAVY DUTY CONVEYOR BUCKET WITH AUXILIARY SUPPORT MEANS

George T. Gough, Charlotte, N.C., assignor to Gough Holdings (Engineering) Limited, England

Filed Jun. 11, 1987, Ser. No. 60,478

Int. Cl.⁴ B65G *17/36*

U.S. Cl. 198—710 **2 Claims**

1. A bucket conveyor, comprising:

(a) a plurality of buckets;

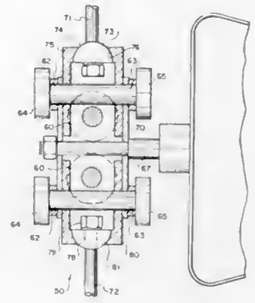
(b) a chain on which the buckets are mounted in cantilevered

relation to one side of the chain by means of an outwardly-extending bucket spindle connecting the chain to one side of the bucket;

(c) a chain track on which the chain is mounted for linear movement thereon;

(d) drive means for moving the chain whereby the buckets are moved along a circuitous conveyor path between at least one bucket filling station and at least one bucket emptying station;

(e) means for moving the buckets around the axis of movement of the chain as required for the buckets to negotiate curves and turns in the conveyor path as the buckets move along the conveyor path on the chain, wherein said means for moving the buckets comprises a plurality of spaced-apart bucket trolleys on each of which trolleys is pivotally mounted a bucket, connection means joining adjacent trolleys for permitting each of said trolleys to rotate independently of each other about the axis of movement of the chain, and said track including means for imparting rotation movement to said trolley at predetermined locations



on the conveyor path, and further wherein each said trolley comprises, a chassis, a pair of horizontal wheel shafts with wheels thereon carried by said chassis perpendicular to the axis of movement of the chain, and a pair of vertical wheel shafts with wheels thereon carried by said chassis perpendicular to the axis of movement of the chain and perpendicular to the horizontal wheel shafts, and wherein said track comprises four spaced-apart, elongate, continuous twisted track tubes for receiving therebetween, respectively, one of the horizontal or vertical wheels in engaging, following relation thereto whereby, as the wheels of the trolley follow the twist of the track tubes, the bucket is moved around the axis of movement of the chain;

(f) an auxiliary support wheel mounted for rotation on the side of the bucket opposite the bucket spindle in coaxial relation therewith; and

(g) an auxiliary track mounted in laterally spaced-apart relation to the chain track in supporting relation to the auxiliary support wheel to support the bucket on both sides thereof.

4,817,783

SINGLE PISTON ROD HYDRAULIC DRIVE

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed May 3, 1988, Ser. No. 189,540

Int. Cl.⁴ B65G *25/00*

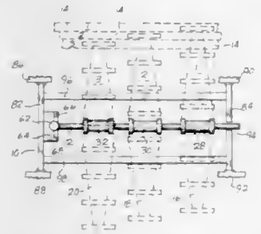
U.S. Cl. 198—750 **10 Claims**

1. For use with a reciprocating floor type conveyor having at least three sets of floor slat members which are mounted adjacent to each other for longitudinal reciprocation, and a plurality of transverse drive beams, one for each set of floor slat members, each transverse drive beam including means for connecting it to its set of floor slat members, a hydraulic drive unit for the transverse drive beams, comprising:

an elongated piston rod extending parallel to the floor slat members and perpendicular to the transverse drive beams, at a location offset below the transverse drive beams,

a plurality of piston heads, one for each transverse drive beam, spaced apart along the piston rod and fixed in position on the piston rod,

a cylinder for each piston head, each said cylinder being mounted to reciprocate back and forth on said piston rod



relative to its piston head, each said cylinder and its piston head together defining first and second variable volume chambers, one axially endwise from each end of the piston head,

said piston heads and cylinders being positioned to place each cylinder at least closely below a related one of the transverse drive beams,

means for connecting each cylinder to its transverse drive beam; and

wherein in use the transverse drive beams are moved by said cylinders back and forth along the piston rod.

4,817,784

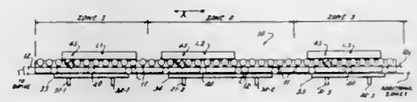
ZERO PRESSURE ACCUMULATING CONVEYOR CONTROL

Gregory R. Judge, Louisville, Ky., assignor to Figgie International Inc., Willoughby, Ohio

Filed May 27, 1982, Ser. No. 382,586

Int. Cl.⁴ B65G *13/06*

U.S. Cl. 198—781 **4 Claims**



4. An improved pneumatic control means for a discharge zone of an accumulating conveyor having upstream accumulating zones wherein said conveyor includes respective pneumatically operated means for selectively driving each of said zones, said improved pneumatic control means comprising:

a master control valve having a first input connected directly to a source of pressurized air, a single output connected directly to the pneumatically operated means of said discharge zone, and a second input, said master control valve selectively connecting one of said first and second inputs to said output exclusively of the other,

a control valve connected to said source of pressurized air and having an output connected directly to said second input of said master control valve,

a shuttle valve means in an upstream zone adjacent said discharge zone for selectively passing pressurized fluid to the pneumatically operated means of said upstream zone, said shuttle valve means having at least one input, and

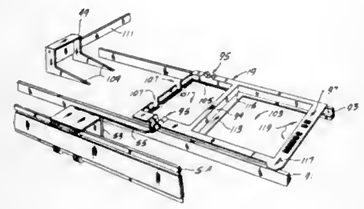
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said control valve output also connected directly to said input of said shuttle valve means.

4,817,785
AUTOMATED MICROBIOLOGICAL TESTING APPARATUS

Glenn L. Farber, Port Jefferson; Maria C. Navarro, North Massapequa; Manfred K. Hegemann, Nyack; Samuel G. Cohen, Pleasantville, and Cameron O. Cox, Monsey, all of N.Y., assignors to Sherwood Medical Company, St. Louis, Mo.

Division of Ser. No. 707,339, Mar. 1, 1985, Pat. No. 4,720,463.
This application Nov. 6, 1987, Ser. No. 118,382
Int. Cl.[4] B65G *29/00*
U.S. Cl. 198—803.01 **12 Claims**



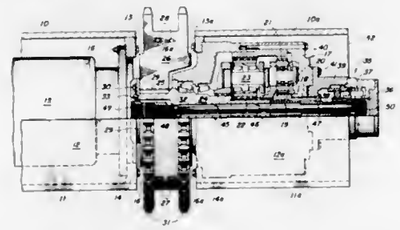
1. A carrier for a micrological tray comprising:
a pair of opposed, relatively rigid, parallel side members, and a pair of opposed, relatively rigid, parallel end members respectively connected to the opposite ends of said side members defining a rectangular frame having top and bottom sides and at least one opening suitable for holding and supporting a microbiological tray;
each of said side members having an integral outwardly extending flange with said flanges forming a pair of opposed, paralle shoulders on a bottom side of said flanges suitable for riding on a pair of parallel rails; one pair said opposed members each having an integral ledge extending inwardly with said ledges forming a pair of opposed ledges for supporting the microbiological tray in said opening;
receiving means integrally formed in the top side of at least one of said flanges including walls defining a recess for receiving drive means for moving said frame along the rails.

4,817,786
DRIVE ARRANGEMENT FOR TRAMMING CONVEYOR

Richard E. Doerr, and Thomas W. McCormick, both of Morgantown, W. Va., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Apr. 18, 1986, Ser. No. 853,318
Int. Cl.[4] B65G *23/04*; F16H *3/44*
U.S. Cl. 198—834 **1 Claim**

1. A compact drive apparatus for a chain conveyor comprising:
(a) a planetary drive means having a casing attached to said conveyor with an input and an output on opposite sides of said planetary drive means;
(b) a chain sprocket drive means axially coupled to the output of said planetary drive means;
(c) motor means having a casing and an output shaft, said casing of said motor means attached to said conveyor and having said output shaft of said motor means facing said output of said planetary drive means;
(d) a variable speed transmission means having an input and a coaxially mounted output, said variable speed transmission having its coaxially mounted output coupled to said input of said planetary drive means, and having a first opening through its output in communication with the input of said variable speed transmission means;
(e) a second opening passing axially through said chain sprocket drive means and said planetary drive means output; and

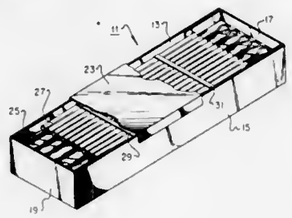


(f) means for mechanically coupling said output shaft of said motor means through said first and second openings to said input of said variable speed transmission means,
whereby said apparatus provides a compact and easily maintained chain drive arrangement.

4,817,787
DETONATONG CORD SAFETY TRANSPORT SYSTEM

Harrold D. Owen, Fort Worth, Tex., assignor to Owen Oil Tools, Inc., Fort Worth, Tex.

Filed May 6, 1988, Ser. No. 190,710
Int. Cl.[4] B65D *81/02*
U.S. Cl. 206—3 **10 Claims**

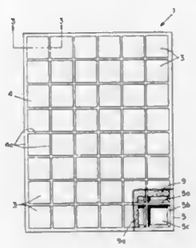


1. A detonating cord safety transport system comprising:
a container;
a mounting board of insulating material inside the container, with a walled path of selected configuration;
detonating cord threaded through the walled path, with a series of loop regions and adjoining, parallel regions;
a cord separator means between the det cord in the parallel regions to sever adjoining cord, if detonated, and terminate further det cord detonation;
means to secure each cord separator means within an associated parallel region.

4,817,788
LAMINATED LAUNDRY PRODUCT

William T. Bedenk, and Kendall L. Harden, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 675,804, Nov. 28, 1984, Pat. No. 4,638,907.
This application Oct. 29, 1986, Ser. No. 924,226
The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.
Int. Cl.[4] C11D *17/04*
U.S. Cl. 206—0.5 **4 Claims**



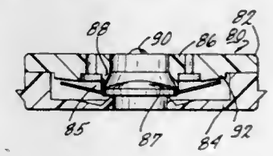
1. A compact, through the wash laundry product comprising:
a laminate of two plies of which at least one ply comprises a strong, high stretch tissue made of synthetic fibers which is deeply embossed to form a multiplicity of nonconnecting cups surrounded by rims;
the tissue in each cup having been prestretched about 15% to about 100% by said deep embossing;
said cups containing a laundry active, said active being selected from powdered detergents, builders, brighteners, softeners, enzymes, bleach solids, fillers, and mixtures thereof;
the other of said two plies covering the deeply embossed ply forming patterned cells which contain the powder, said plies being sealed on said rims to provide said compact, through the wash laundry product;
said high stretch embossed ply originally having a dry CD stretch of about 9% to about 25% and a dry MD stretch of about 30% to about 60%, a wet cross-sectional tensile strength of about 78.7 to about 315 g/cm (200;14 800 g/in), said embossed ply selected to withstand the stretching and said two plies being selected to survive automatic washing and drying cycles without significant tearing; said tissue having sufficient porosity to permit the laundry actives to dissolve and flow through the tissue.

2. A compact, through the wash laundry product comprising:
a laminate consisting of at least two plies;
one of said plies being a higb stretch tissue made of synthetic fibers which is deeply embossed to form a multiplicity of nonconnecting cups surrounded by rims, said deeply embossed ply being prestretched about 15% to about 100% from said deep embossing, said deeply embossed ply having a dry CD stretch of at least 12%,
said cups containing laundry active powders selected from powdered detergents, builders, enzymes, softeners, brighteners, bleach solids, fillers, and mixtures thereof;
the other of said two plies covering the deeply embossed ply forming patterned cells which contain the powder, said plies being sealed on said rims;
said deeply embossed ply being selected to withstand the stretching and both of said plies being selected to survive automatic washing and drying cycles without significant tearing; said deeply embossed ply having sufficient porosity to permit the laundry actives to dissolve and flow through the said deeply embossed ply.

4,817,789
LENS CONTAINER ASSEMBLY

Lyle E. Paul, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Sep. 23, 1987, Ser. No. 100,297
Int. Cl.[4] B65D *85/38*
U.S. Cl. 206—5.1 **43 Claims**



1. A lens container assembly comprising:
lens container means acting to hold a lens, and including a base means, and a lens cover means moveable relative to said base means and acting together with said base means to form a compartment of sufficient size to contain said lens;
carrier means acting to carry said lens container means and being movable so that by moving said carrier means said lens container means is placed in a closed position with said lens cover means in relative proximity to said base means or in an opened position with said lens cover means relatively separated from said base means; and
housing means acting to hold said carrier means and being adapted so that said carrier means is movable relative thereto, said housing means including cam means acting to at least assist in moving said lens container means to said opened position.

34. A lens container for holding a lens comprising:
base means;
lens cover means constructed of resilient material, secured to said base means at at least one point and together with said base means acting to form a compartment of sufficient size to contain a lens;
clamp means attached to said lens cover means, being movable relative to said base means and said lens cover means and adapted to be activated to hold said lens in place in said compartment and;
projection means secured to said lens cover means and adapted to be contacted to activate said clamp means.

39. A lens container for holding a lens comprising:
base means;
lens cover means associated with said base means and together with said base means acting to form a compartment of sufficient size to contain a lens; and
clamp means being movable relative to said base means and said lens cover means and adapted to be activated by the action of a cam to hold said lens in place in said compartment.

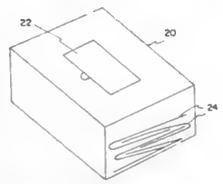
4,817,790
TOWELETTE

Amir Porat, and Michael Porat, both of 2 Kaufman St., Tel Aviv, Israel

Filed Mar. 12, 1987, Ser. No. 25,074
Claims priority, application Israel, Apr. 22, 1986, 78566
Int. Cl.[4] B65D *81/22*
U.S. Cl. 206—205 **6 Claims**

1. A package of towelettes comprising an openable and

resealable container and at least two moisturized towelettes disposed within said container, wherein said at least two towe-



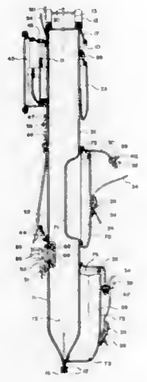
lettes comprise a sheet of material impregnated with a powder to be deposited on the skin, together with a liquid carrier.

4,817,791

COMBINATION SUITCASE-GARMENT BAG

David R. Adams, 3735 Millcrest Rd., Salt Lake City, Utah 84109

Filed Dec. 1, 1987, Ser. No. 127,254
Int. Cl.[4] B65D *85/18*
U.S. Cl. 206—287.1 **19 Claims**



1. A foldable, suitcase-garment bag comprising:

flexible, elongate, substantially rectangular front and rear panels;

interconnecting means interconnecting the bottoms, sides, and at least a portion of the tops of said front and rear panels to form an interior space between said panels;

a closeable opening for gaining access to the interior space between the panels;

bottom means secured to said rear panel intermediate its length whereby the bag may be folded into substantially three overlapping sections with the bottom means providing a bottom for the bag upon which it can stand when in folded confirguration;

a substantially rigid stiffening member secured to the rear panel and extending transversely thereof and located intermediate the length of said panel so as to be substantially at the top of the bag when the bag is in its folded configuration;

means for securing the bag in its folded configuration; and

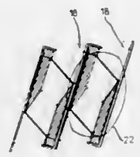
handle means for carrying the bag in its folded configuration.

4,817,792

INDIVIDUAL CONTAINER THAT CAN BE ASSEMBLED TO A MULTIPLE STORAGE CONTAINER

Josef Seifert, Grosselfingen, Fed. Rep. of Germany, assignor to Kurz Kunststoffe GmbH, Owingen, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,580
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724961
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—309 **15 Claims**



1. Individual container that can be assembled to a multiple storage container, in particular a multiple filing box, for receiving plate-like objects, for example storage means in the form of sound or data carriers (CD disks, floppy disks, CD ROM boxes) or the like, which may be additionally accommodated in a protective housing (cassette), characterized in that the front wall (12) and the rear wall (11) of each individual container (10) are laterally connected by hinged links (13*a*, 13*b*) provided on both sides and acting in the manner of a parallelogram guide, so that the respective individual container (10) can be opened by a pulling action, and that coacting fixing means (27, 28) are provided on the outwardly directed faces of the front and the rear wall for connecting one outer rear wall face to the adjacent front wall face of the following individual container (10), or vice versa.

4,817,793

PROTECTIVE PACKAGE FOR A DISPLAY TUBE WINDOW

Roelof E. Schuil, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,749
Claims priority, application Netherlands, Aug. 27, 1986, 8602173
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—328 **3 Claims**



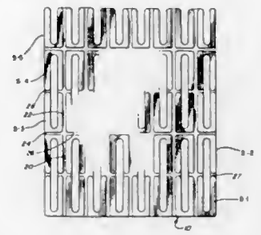
1. A temporary protective assembly for a pair of display windows of a display tube, the display windows each comprising an upright edge, the right edges of the display windows being situated substantially opposite each other, a ring of synthetic material present between the edges, the assembly thereby enclosing a space between the display windows, the space being evacuated, whereby the assembly provides protection for the display windows during transport and/or storage, prior to the permanent assembly of the display windows into a display tube.

4,817,794

VERSATILE MULTIPLE USE SHIM PRODUCT

Gary L. Workman, Lombard, Ill., assignor to Deslauriers, Inc., Bellwood, Ill.

Filed Nov. 13, 1987, Ser. No. 119,979
Int. Cl.[4] B65D *85/28*
U.S. Cl. 206—372 **7 Claims**



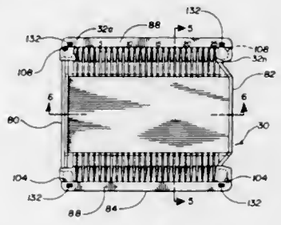
1. A versatile multiple use shim product comprising, a molded sheet of plastic material having a plurality of rows of shims with each shim having a pair of legs with an opening therebetween and integrally connected to adjacent shims in the same row as well as adjacent rows by relatively thin and narrow fracturable hinge sections of said plastic material; and the shims in at least two adjacent rows of shims being arranged in a mirror-image relation to have the openings of opposed shims in the adjacent rows define an elongate enclosed opening.

4,817,795

ROBOTIC ACCESSIBLE WAFER SHIPPER ASSEMBLY

Robert D. Kos, Victoria, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed Mar. 4, 1988, Ser. No. 163,981
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—328 **11 Claims**



1. A wafer shipper assembly comprising:

(a) a shipper base including a generally rectangular floor member having walls angled upwardly and slightly outwardly from the floor to a generally rectangular shaped rim, interior vertical corner indentations, an interior vertical bar indentation in an end wall, exterior recesses generally conforming to the corner indentations and the bar indentation extending from the floor to about the mid-height of the base, the walls generally conforming to the shape of the rim from the rim to about the mid-height of the base, thereby forming exteriorly accessible ledges at each corner of the base at about the mid-height of the base and one part of a two part latching arrangement on each of two opposite walls;

(b) a generally rectangular carrier including an exteriorly projecting bay shaped rear face and an open letter-H configured front face securing outer edges of mirror-image side faces, interiorly extending wafer supporting spacers in the side faces for supporting a plurality of wafers in upright parallel spaced apart axial alignment, vertical wings angled outwardly from outer edges of the front and rear faces extending up from about the mid-height of the carrier, registration bars on outer edges of the front face extending down from about the mid-height of the carrier; and

(c) a shipper cover including a generally rectangular top member having a plurality of wafer engaging and supporting members in cooperating alignment with the wafer supporting spacers in the carrier, four walls angled downwardly and slightly outwardly from the top member and a second part of a two part latching arrangement on each of two on opposite walls in cooperating alignment with said one part of a two part latching arrangement on the shipper base;

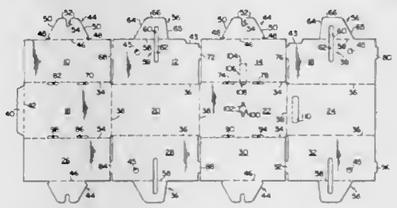
so that the wafer carrier is received within the shipper base with registration bars cooperating with the bar end indentation to insure one-way alignment of the wafer carrier within the shipper base, and the shipper cover is received by the shipper base containing the wafer carrier with the wafer supporting members in the cover cooperating with the wafer supporting spacers in the carrier to provide upright parallel spaced apart axial alignment of wafers, and with one part of a two part latching arrangement on the cover cooperating with a second part of a two part latching arrangement on the shipper base to provide latching engagement of the shipper cover with the shipper base containing the wafer carrier, thus providing a secure package for transportation and storage of wafers.

4,817,796

PACKING BOX

David B. Camillo, Great Bend, and Melvin Gentry, Lawrence, both of Kans., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 4, 1988, Ser. No. 164,318
Int. Cl.[4] B65D *85/04*
U.S. Cl. 206—396 **5 Claims**



1. A box for dispensing and storing wire or the like, said box having a hole and a plurality of flutes for dispensing the wire, a plurality of side portions, two pairs of folding bottom portions, one of each of said pairs being appended to a bottom of one of said side portions, each of one pair being appended to a respective bottom portion by a first fold line and each of the other pair being appended to a respective bottom portion by a second fold line, and two pairs of folding top portions, one of each of said pairs being appended to a top of one of said side portions, each of one pair being appended to a respective top portion by a first fold line and each of the other pair being appended to a respective top portion by a second fold line, one pair of said top portions and one pair of said bottom portions having cones appending thereto, and the other pair of said top portions and the other pair of said bottom portions having locking tabs appending thereto, said cones being inserted through a slot formed within said box and being anchored therein by said locking tabs, wherein the improvement is characterized by;

each of said pairs of top portions and each of said pairs of bottom portions having said locking tabs appended thereto having a flap tab appended on both sides thereof, and

each of said side portions appended to said top and bottom

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portions having cones appended thereto having a plurality of slots passing therethrough for engaging said flap tabs such that said cones and locking tabs of said pairs of top portions do not touch said cones and locking tabs of said pairs of bottom portions.

4,817,797

CLOSED PACKAGE WITH A COMPOSITE BINDING MEMBER/HANDLE AND A GRASPING CAVITY

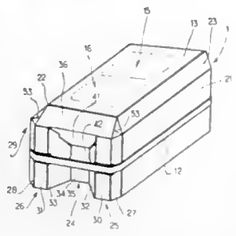
Benoît Hamelin, Breuschwickersheim, France, assignor to Brasseries Kronenbourg, Strasbourg, France

Filed Jun. 20, 1986, Ser. No. 876,475

Claims priority, application France, Jun. 21, 1985, 8509603; Dec. 16, 1985, 8518743; Dec. 16, 1985, 8518744

Int. Cl.[4] B65D *65/00*

U.S. Cl. 206—428 **17 Claims**



1. A package for accomodating a plurality of containers, comprising

a body having an upper panel, lateral panels spaced from one another and connected with said upper panel, and end panels spaced form one another and connected with said upper panel, each of said lateral panels being connected with a respective one of said end panels through a corner which is provided with a notch;

a bottom connectable with said body so as to completely close the package; and

a binding member extending over a periphery of said body and engaging in said notches of said corners of said body, said binding member being also formed as a handle,

at least one of said end panels of said body being formed with an inner cavity as seen from the exterior, so that containers can be accommodated in the package in multiple rows of containers extending between said end panels, and wherein at least one row adjoining said inner cavity near a center thereof has fewer containers than at least another row also extending between said end panels, but being free from adjoining said inner cavity near the center thereof, and so that a passage is formed between at least a part of said one end panel and said binding member for grasping said binding member, and

said bottom being formed in the region of said cavity with a shape which corresponds to a shape of said cavity.

4,817,798

CASSETTE TAPE HOLDING BOX AND DISPENSER

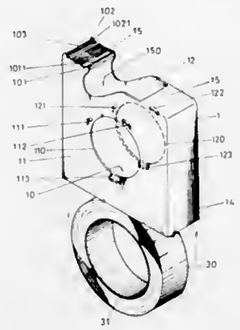
Harrison Huang, Shenkang, Taiwan, assignor to Glory Formosa Co., Ltd., China

Filed Jan. 19, 1988, Ser. No. 145,570

Int. Cl.[4] B65D *85/67*

U.S. Cl. 206—411 **5 Claims**

1. A portable holding box and dispenser for adhesive or pressure-sensitive tape comprising a receptacle to contain the roll of tape which is formed by a pair of aligned parallel front and rear walls, another pair of aligned parallel side walls and a top panel running transversely between corresponding segments of the upper edge of the side walls, said sidewalls being flexible; on each of the side walls, there is a hole at a central part respectively; on each inner surface of the side walls, a plurality of bosses having small height being disposed around the central hole respectively, the top panel and the side walls also defining an opening for dispensing tape from the roll, said



receptacle being open at the bottom for insertion of a new roll of tape or removal of a used roll of tape, said roll being inserted or removed by outwardly flexing the sidewalls.

4,817,799

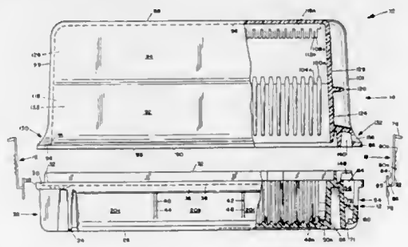
DISK PACKAGE

Barry Gregerson; Larry Dressen, and Roger L. Mortensen, all of Chanhassen, Minn., assignors to Empak, Inc., Chanhassen, Minn.

Filed Oct. 6, 1986, Ser. No. 915,497

Int. Cl.[4] B65D *85/30, 45/16*

U.S. Cl. 206—445 **8 Claims**



1. Disk package comprising:

a. a base including a rounded curved bottom between vertical end members, a flat base between said end members, a configured groove extending about an edge of said base and with a like configured lip extending about said edge of said base inwardly of said groove, a plurality of opposing alternating divider teeth and disk grooves extending upwardly and inwardly from an inner surface of said rounded curved bottom of said base, and locking clip containment means at opposing ends on said vertical end members;

b. a cover including a lower flat surrounding edge with a lower flat surface, partially lower sides adjacent said flat surface, inwardly angled upper sides adjacent said lower sides, opposing ends defined between each adjacent paired lower side and upper side, a top surface joining said opposing ends and said upper sides, an opposing plurality of aligned alternating divider teeth and disk grooves on said lower sides extending inwardly from inner surfaces of said lower sides, an aligned opposing plurality of spring biased teeth with inclined ramps and "U" grooves extending downwardly from the inner surface of said top surface, a handle extending outwardly from an indented part of each said opposing end, and latch hole means in each of said opposing ends; and,

c. removable spring biased locking means engaged into said locking clip containment means and latched into said latch hole means for joining said base and said cover into a locked relationship.

4,817,800

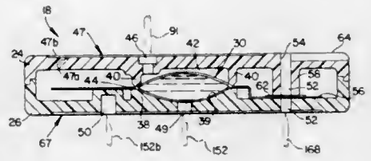
FLUID INJECTION SYSTEM CASSETTE AND FLUID PACKAGING METHODS

Harold R. Williams, Capistrano Beach, and Robert M. Spencer, San Juan Capistrano, both of Calif., assignors to Surgikos, Inc., Arlington, Tex.

Filed May 20, 1987, Ser. No. 52,460

Int. Cl.[4] B65B *35/28*

U.S. Cl. 206—484 **19 Claims**



1. A fluid delivery cassette, comprising:

relatively rigid walls defining a plurality of compartments each having a delivery wall and a pressure wall; and

a plurality of fluid containing cells, one of said cells positioned in each of said compartments and sealed to said walls, said cells each including a movable wall, said compartments having a hole in the delivery wall through which the fluid may be ducted out of said cell, and having an aperture in the pressure wall through which pressure may be applied against said movable wall to force the fluid out of said cell.

4,817,801

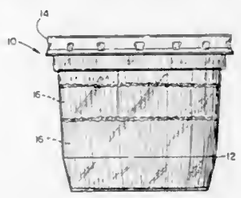
TWO PIECE PACKAGE FOR PAPER BAKING CUPS

William E. Schwaikert, Salisbury, Conn., assignor to Reynolds Metals Company, Richmond, Va.

Filed Mar. 6, 1987, Ser. No. 22,909

Int. Cl.[4] B65D *21/02, 85/62*

U.S. Cl. 206—519 **18 Claims**



1. A combination comprising:

a multiplicity of concentrically stacked, fluted conical baking cups, each cup having a nominal height; end

a one-piece plastic container having a generally circular base with an outer circumference and a sidewall extending from the outer circumference in a generally axial direction to the base and forming a mouth for receiving said cups, said sidewall including a lower frustoconical portion extending generally in the axial direction from said outer circumference and an intermediate frustoconical portion extending from said lower frustoconical portion, said lower frustoconical portion subtending a first cone angle greater than about 10° and having an axial height not greater than about ⅓ of said nominal height and said intermediate frustoconical portion subtending a second cone angle less than about 10° and contacting any of said baking cups also contacting said base to prevent expansion of said contacting baking cups into contact with said lower frustoconical portion and minimize creep of said baking cups up said side wall.

4,817,802

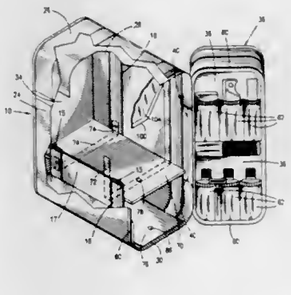
UTILITY BAG

Michael J. Pratt, Park City, Utah, assignor to Ogio International, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 85,179, Aug. 14, 1987, Pat. No. 4,752,008. This application Jun. 17, 1988, Ser. No. 208,241

Int. Cl.[4] B65G *69/00;* **A45C** *3/00*

U.S. Cl. 206—579 **20 Claims**



1. A utility bag which is generally rectangular in shape and sized to fit into an athletic locker or under the seat of an airplane, said utility bag comprising

(a) a tubular, generally rectangular, rigid frame member comprising opposite, generally rectangular, end elements which are interconnected by a tubular, relatively thin sheet of material having a generally rectangular shape corresponding to the shape of the opposite end elements;

(b) a fabric side panel having a width such that the forward and rearward edges of said side panel extend beyond the opposite end elements of said frame member, said side panel tautly enveloping said frame member on the outside surfaces thereof, with said side panel being joined to itself at opposing ends and along the width thereof to form contiguous top wall, bottom wall and sidewalls, wherein the top wall is substantially parallel with the bottom wall and the sidewalls are substantially parallel with each other;

(c) a generally rectangular fabric end panel attached at its edges to the rearward edges of said side panel to form a closed rear end wall;

(d) an outwardly swinging, generally rectangular fabric door attached in hinge-like fashion along one edge thereof to a mutually respective forward edge of said side panel; and

(e) an interengaging zipper closure means attached to the remaining forward edges of said side panel and the other three mutually respective side edges of said rectangular fabric door for releasably securing the fabric door in a closed position to the front edge of said side panel.

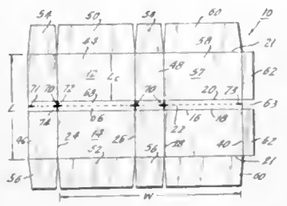
VOL 1101 ISS 1 AP 4 1989 UMI

4,817,803

LEAK RESISTANT MULTIPLE-COMPARTMENT FROZEN FOOD PACKAGE

Edward J. Risucci, 35-20 Leverich St., Jackson Heights, N.Y. 11372

Filed Feb. 5, 1988, Ser. No. 152,439
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—602 19 Claims



1. A blank for forming a food container having separable food compartments, the blank comprising:
a blank sheet having length and width dimensions;
first fold lines comprising at least one pair of relatively closely spaced fold lines scored into the blank, the first fold lines extending transversely to the length of the blank;
a respective second fold line extending in the direction of and located between each pair of the first fold lines;
a plurality of third fold lines extending along the length of the blank and intersecting the first and second fold lines; and
a plurality of pairs of slits extending through the blank, each pair of slits being located at an intersection point of the second and third fold lines and the slits of each pair intersecting.

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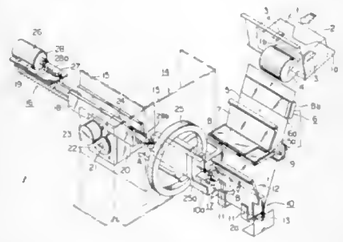
COUNTING AND HALF-WRAPPING APPARATUS FOR BANKNOTES WITH THE FUNCTION OF DISCRIMINATING THE BANKNOTES OF DIFFERENT NOMINAL VALUES

Hikaru Kawano, Odawara, and Koji Sato, Hiratsuka, both of Japan, assignors to Musashi Engineering Kabushiki Kaisha, Tokyo and Hitachi Denshi Engineering Kabushiki Kaisha, Kanagawa, both of, Japan

Continuation of Ser. No. 601,802, Apr. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 561,562, Dec. 14, 1983, Pat. No. 4,511,301, and Ser. No. 601,795, Apr. 19, 1984, Pat. No. 4,566,244. This application May 23, 1986, Ser. No. 868,877

Claims priority, application Japan, Dec. 22, 1982, 57-223924; Apr. 30, 1983, 58-76487

Int. Cl.[4] B07C *5/34;* B65B *35/50*
U.S. Cl. 209—534 4 Claims



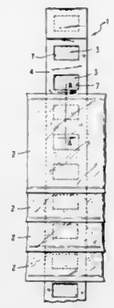
1. An apparatus for counting the number of and half-wrapping banknotes, said apparatus being adapted to be capable of discriminating the banknotes of different nominal values, and said apparatus comprising, in combination, a hopper for accommodating a stack of banknotes, a drum mounted at said hopper and adapted for separately extracting said banknotes from said hopper, a substantially vertical transport plate disposed below said drum for receiving and guiding said extracted banknotes in downward direction, a sensing and discriminating unit adjacent to said transport plate below said drum and adapted for sensing or discriminating the nominal value, authenticity or transport state of the banknotes extracted and forwarded by said drum, a changeover shutter plate adjacent to and below said sensing and discriminating unit and adapted for selectively forwarding the banknotes from said sensing and discriminating unit in a selected one of two preset directions, said shutter plate being controlled by output signals supplied from said sensing and discriminating unit, a reject note stacker disposed laterally adjacent to said shutter plate and adapted for receiving rejected banknotes forwarded in one of said selected forwarding directions of said shutter plate, a stack unit adjacent to and below said reject note stacker and adapted for receiving a predetermined number of the desired banknotes forwarded in the other of said selected forwarding directions of said shutter plate, whereby undesired notes contained in the banknotes extracted by said drum are forwarded to said reject note stacker and only the desired notes are forwarded into said stack unit by the operation of said changeover shutter plate, lateral transfer chuck means mounted for movement in a direction transverse to said other of said forwarding directions and toward and away from said stack unit and having means for gripping desired notes in said stack unit and removing the desired notes from said stack unit, and means for moving said chuck means in a direction transverse to said other of said forwarding directions and toward and away from said stack unit.

4,817,805

APPARATUS FOR SECURING, DISPLAYING AND DISPENSING OF ENVELOPE PACKAGE GOODS

Isidoro L. Rodriquez, Hialeah, Fla., assignor to Very Best Foods, Inc., Miami, Fla.

Filed Jun. 11, 1987, Ser. No. 60,633
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—71 14 Claims



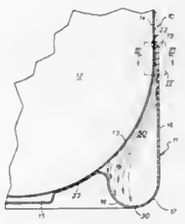
1. An apparatus for securing, displaying and dispensing a plurality of envelope packaged goods, comprising:
(1) an elongated masking strip having a front side and a back side and having a plurality of spaced apart apertures therein;
(2) an elongated securing strip having a front side and a back side and width dimensions which are no greater than the dimensions of the masking strip and being attached by its front side to the back side of the masking strip, said securing strip having a pressure sensitive adhesive disposed only on the front side thereof and at least at the portions thereof next to said apertures, whereby the combination of the masking strip and the securing strip form a unitary structure which is free of adhesive on the back side of the securing strip and on the front side of the masking strip except at the apertures of the masking strip, whereby the said apertures only present adhesive to the front side of the masking strip and are thereby adapted to receive and releasably secure envelope packages;
(3) an end portion at least at one end of the said unitary structure whereby an adhesive free portion is provided and adapted to receive a supporting hanger for the unitary structure;
(4) said apertures being of a size and configuration to present sufficient adhesive to the front side of the masking strip through a single aperture that a portion of an envelope package may be releasably secured thereto; and
(5) said adhesive being an adhesive which will tackify to and releasably secure an envelope made of a polyolefin, cellophane, polystyrene, and waxed paper, but will not permanently adhere thereto, sot hat an envelope package may be removed from its securing disposition at any aperture without the removed package having any tactilely detectable adhesive thereon.

4,817,806

BOTTLE WITH ROUNDED BOTTOM FITTED WITH A BASE AND PROVIDED WITH A PASSAGE FOR A HEAT-EXCHANGE FLUID AND BASE FOR SAME

Alain Billaud, Meaux; Victor Lorin, Trilport, and Alain Vanney, Chambry par Varreddes, all of France, assignors to Carnaud Kerplas, Meaux, France

Filed Dec. 18, 1986, Ser. No. 943,025
Claims priority, application France, Dec. 19, 1985, 85 18839
Int. Cl.[4] B65D *23/00, 25/24*
U.S. Cl. 215—12.1 23 Claims



1. A bottle suitable for processing by means of a heat exchange fluid, as by pasteurization or the like, comprising a bottle body and a separate base attached to the body, and, between said base and a lower part of the bottle body, means defining a passage for heat exchange fluid running over a substantial part of the bottom of the bottle body from an inlet area for entering heat exchange fluid to an outlet area for exiting heat exchange fluid, said inlet and outlet areas being substantially spaced from each other, and said inlet and outlet areas being in substantially longitudinally spaced relation relative to the axis of the bottle body.

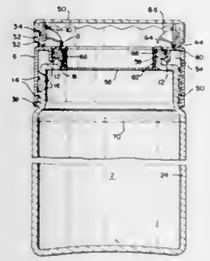
15. A base for a bottle body having a rounded bottom and a lateral wall and adapted to undergo treatment by means of a heat exchange fluid, said base comprising a lateral wall adapted to surround and to be fixed to a lower portion of said lateral wall of said bottle body, an annular support boss, a bottom part comprising a rounded support area adapted to support the rounded bottom of said bottle body, and means, delimited in part by said support area, defining a passage for heat exchange fluid to run over a substantial part of the bottom of the bottle body from an inlet area, for entering heat exchange fluid, to an outlet area, for exiting heat exchange fluid, said inlet and outlet areas being substantially spaced from each other, and wherein said base has an axis and said inlet and outlet areas are in substantial longitudinally spaced relation to the axis.

4,817,807

TAMPER-EVIDENT CONTAINER

L. Leroy Hummer, P.O. Box 19692, Alexandria, Va. 22320

Continuation-in-part of Ser. No. 881,208, Jul. 1, 1986, abandoned. This application Jun. 23, 1987, Ser. No. 74,075
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—253 25 Claims



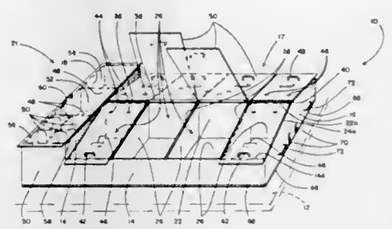
13. Apparatus comprising an adaptor and a container, said adaptor comprising a skirt for attachment to a sidewall of said container, a bottom wall extending inwardly from said skirt, latch means extending downwardly from said bottom wall for engaging a lip attached to said container securing said adaptor to said container, said adaptor comprising a collar extending downwardly from said bottom wall and covering a portion of an inner surface of said sidewall, and a removable seal attached to said collar.

4,817,808

TABLE-TOP RECEPTACLE FOR STORING PREPARED FOOD ITEMS

Bonnie Bracy, P.O. Box 163, Hwy. 1207, Enfield, N.C. 27823

Filed Feb. 1, 1988, Ser. No. 150,900
Int. Cl.[4] B65D *1/22*
U.S. Cl. 220—20 8 Claims



1. A compartmented, table-top receptacle for storing a plurality of prepared food items, said receptacle comprising:
(a) a wall structure including two side walls and two end walls defining an enclosed area with an open top;
(b) a centrally disposed hinge wall extending between said end walls parallel to said side walls for dividing said enclosed area into two adjacent compartments;
(c) a plurality of dividing walls, each of which extends between said hinge wall and said side walls for dividing said adjacent compartments into a plurality of laterally adjacent food bins capable of receiving and storing food items;
(d) a plurality of closure means, each operatively associated with a respective food bin for closing said food bins to

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protect the stored food items from ambient conditions; and

(e) each said closure means comprising a top panel pivotally secured to said hinge wall and movable between a first position in which the associated food bin is closed and a second position in which the associated food bin is open.

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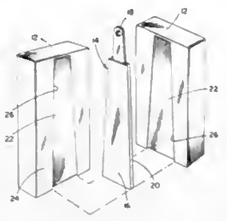
SLIDABLY INTERLOCKING ATTACHMENT PLATES AND ITEMS

Raymond L. Rozmestor, Westville, N.J., assignor to Advanced Concept Tools, Inc., Edgewater Park, N.J.

Continuation-in-part of Ser. No. 858,166, May 1, 1986, Pat. No. 4,711,353. This application Dec. 4, 1987, Ser. No. 128,917

Int. Cl.[4] B65D *21/02*

U.S. Cl. 220—23.4 **6 Claims**



1. A slidably interlocking attachment plate and item connected thereto comprising a strip-like panel having converging side edges extending from one end toward the other end to form a wedge shaped plate with the side edges being inclined from one surface toward the other to form a wedge shaped male dovetailed connecting member, said item including a recess in a surface thereof with the side edges of the recess converging from one end toward the other end to form a wedge shaped recess and the side edges of the recess being inclined from an outer surface to an inner surface and oriented in diverging relation to form a female, wedge shaped dovetailed connecting member for receiving the plate therein for connecting the plate and item by longitudinal relative sliding movement of the plate and item with the male dovetailed member telescoped into the female dovetailed member, means including a transverse surface on the plate and in the recess which engage to provide a positive limit to movement of the plate into the recess and end means on the narrow end of said plate extending axially outwardly of the item and panel to provide access to the plate to enable manipulation of the plate and item.

4,817,810

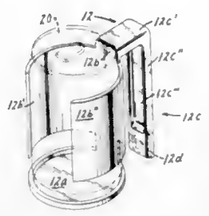
COMBINED CONTAINER HOLDER AND OPENER

Michael S. Shall, 2570 N. Kentucky Ave., Evansville, Ind. 47711

Filed Jan. 19, 1988, Ser. No. 145,293

Int. Cl.[4] A47I *45/00*

U.S. Cl. 220—85 H **4 Claims**



1. A combined holder and opener for a container comprising a framework having a base for supporting the container, a side wall having arm portions at least partially surrounding the outside of said container, and a handle having portions extending outwardly and downwardly from said side wall, said downwardly extending portion having an open cavity at the free end thereof adapted to selectively receive an opening tab for said container.

4,817,811

OUTLET DEVICE FOR A FLUID CONTAINER

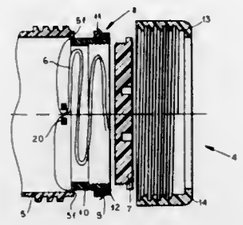
Pierre Pfeiffer, Drulingen; Benoit Cheval, Saverne, and Paul Sigwalt, Drulingen, all of France, assignors to Sotralentz S.A., Drulingen, France

Filed Oct. 13, 1987, Ser. No. 108,173

Claims priority, application France, Apr. 9, 1987, 87 05177

Int. Cl.[4] B65D *5/00*

U.S. Cl. 220—85 SP **8 Claims**



1. In an outlet device for a fluid container with an outlet pipe and with an outlet hose connected to said outlet pipe, said outlet hose being replaceable, the improvement wherein said outlet hose is made of rubber or plastic and is attached to the inside of said outlet pipe, said outlet pipe is closable exteriorly by a cover and said outlet hose folded together in front of said cover is closed inside in said outlet pipe by a clamping device, said outlet hose with a connecting edge being inserted in a gap between the inner wall of said outlet pipe and a mounting ring and is held by a sealing ring placed on the front surface of said outlet pipe which for its part is held by an exteriorly directed clamping collar on said mounting ring, and a screw collar ring which retains said mounting ring with an interior collar is exteriorly screwed on said outlet pipe.

4,817,812

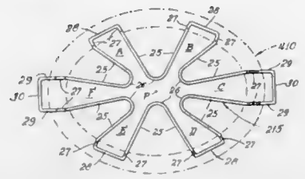
HOLDING FRAME FOR AN OVEN PAN

Norton Sarnoff, and Carl R. Fletcher, both of Wheeling, Ill., assignors to Ensar Corporation, Wheeling, Ill.

Filed Apr. 25, 1984, Ser. No. 603,781

Int. Cl.[4] B65D *90/00, 90/12*

U.S. Cl. 220—85 H **3 Claims**



1. In combination with a metal foil oven pan of the type having a continuous side wall extending around the periphery of a substantially planar bottom wall thereof, the improvement comprising a one-piece wire holding frame having segments forming support members capable of extending below and supportingly engaging the bottom wall of the pan, the support

members generally radiating from the center of the pan bottom wall, said support members terminating at the periphery of the bottom wall in upwardly extending lateral restraining portions adapted to horizontally restrain the pan side wall, said upwardly extending portions extending to a height less than the height of the oven pan side wall, at least two lateral restraining portions arranged at opposite sides of the pan and being formed with at least one outwardly disposed section of wire forming a handle for the holding frame, whereby the oven pan is capable of being vertically supported by the support members and horizontally restrained by the lateral restraining portions and said frame and pan are adapted to be jointly lifted into and out of an oven as a unit.

4,817,813

CLOSURE DEVICE IN MOTOR VEHICLES

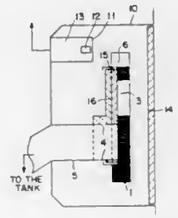
Guenter Krause, Gröbenzell, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Filed Nov. 3, 1987, Ser. No. 116,157

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637289

Int. Cl.[4] B67C *3/00*

U.S. Cl. 220—86 R **8 Claims**



1. A closure device for an inlet line of a liquid tank in motor vehicles which prior to the feed of liquid into the inlet line is operable to be moved from a closing position into an open position and subsequently thereafter again into the closing position, the closure device being undetachably seated on the inlet line and being provided with a through-opening corresponding to the inlet line opening, and the through-opening being arranged aligned with the inlet line in the open position and being arranged beyond the inlet line in the closing position.

4,817,814

ULTRASONICALLY WELDING A CONDUCTOR WIRE TO AN ELECTRICAL TERMINAL

Guillermo Coto, Monroe; Curtis L. Welter, West Haven, and Michael Patrikios, Stratford, all of Conn., assignors to American Technology, Inc., Milford, Conn.

Filed Aug. 28, 1987, Ser. No. 90,328

Int. Cl.[4] B23K *20/10*

U.S. Cl. 228—110 **12 Claims**

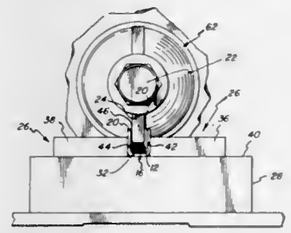
11. Apparatus for ultrasonically welding a conductor wire to an electrical terminal with a U-shaped channel portion having a relatively unbroken internal surface for receiving one or more conductor wires, and upstanding tabs forming part of said channel portion, comprising:

an ultrasonic horn having a welding tip sized to enter said channel portion;

means for confining said electrical terminal and said one or more conductor wires within said U-shaped channel portion adjacent said welding tip, wherein said confining means comprises a work support device having a U-shaped chamber for receiving said electrical terminal, the upstanding tabs of said U-shaped channel portion being in contact with the walls of said U-shaped chamber to prevent contact of said welding tip with the walls of said chamber portion, and wherein the upstanding tabs extend upward from the base surface beyond the walls of the U-shaped chamber;

means for moving said welding tip between said upstanding tabs into said channel portion directly against the conductor wires whereby the upstanding tabs prevent contact of said welding tip with the confining means; and

means for ultrasonically welding said wires with said welding tip to the relatively unbroken surface of the electrical terminal.



4,817,815

CONTAINER COMPRISING CYLINDRICAL JACKET AND LID WITH CLOSABLE VENT AND PROCESS FOR ITS PRODUCTION

Peter Stahlecker, Matthews, N.C., assignor to American Suessen Corporation, Charlotte, N.C.

Filed Apr. 5, 1988, Ser. No. 177,992

Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3714949

Int. Cl.[4] B65D *39/04, 51/18*

U.S. Cl. 220—209 **13 Claims**



1. A process for the production of a sealed container comprising the steps of:

providing a cylindrical jacket of plastic material or of paper coated with plastic at least on an inside cylindrical surface thereof,

closing-off opposite ends of said jacket by installing first and second plastic closure pieces at said ends, respectively,

one of said first and second closure pieces defining a lid having an outlet opening closed by a tear-off tab prior to installation thereof to said jacket,

said closing-off step including installing a cylindrical projection of one of said first and second closure pieces into said jacket in a manner forming a seal therebetween,

one of said first and second closure pieces including a gas vent opening located in a radially outer portion thereof,

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which vent opening is sealed only after the installation of both of said first and second closure pieces.

8. A sealed container comprising:

a cylindrical jacket of plastic material or of paper material coated with plastic at least on an inner cylindrical surface thereof, and

first and second plastic closure pieces closing-off opposite ends of said jacket,

one of said first and second closure pieces defining a lid having an outlet opening pre

closed by a tear-off tab,

one of said first and second closure pieces including an outer cylindrical skirt extending into said jacket and sealed relative thereto,

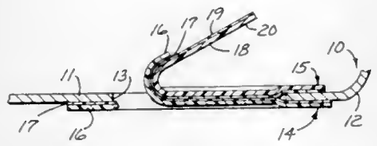
one of said first and second closure pieces including a gas vent opening closed-off at its outer end, said gas vent opening located in a radially outer portion of said last-named closure piece, said gas vent opening being closed only after both said closure pieces are installed on said jacket.

4,817,816

EMBOSSED TAPE FOR CLOSURE SYSTEM

Steven R. Leseman, Cottage Grove; Agatona D. Monteagudo, St. Paul, and Maan-Shii S. Wu, Mendota Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 20, 1988, Ser. No. 197,037
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 10 Claims



1. Closure system comprising a container end portion having an opening therein,

(a) an exterior tape comprising a backing and an adhesive layer, said exterior tape being situated circumjacent said opening and being firmly adhered to the top surface of said container end portion circumjacent said opening by means of said adhesive layer; and

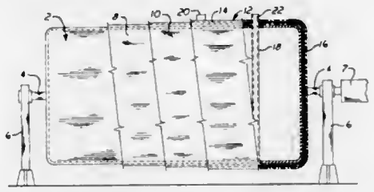
(b) a protective tape comprising a barrier layer and an adhesive layer firmly bonded to said barrier layer, said protective tape being firmly bonded to the bottom surface of said container end portion circumjacent said opening by means of said adhesive layer of said protective tape, and further being firmly bonded to said exterior tape in the area of said opening by means of said adhesive layer of said protective tape and said adhesive layer of said exterior tape, said protective tape being embossed.

4,817,817

DOUBLE WALL STORAGE TANK AND METHOD OF MAKING SAME

David T. Palazzo, P.O. Box 290676, Tampa, Fla. 33687

Continuation-in-part of Ser. No. 105,881, Oct. 7, 1987, Pat. No. 4,780,946, and Ser. No. 105,890, Oct. 7, 1987, Pat. No. 4,780,947, each is a continuation-in-part of Ser. No. 43,634, Apr. 28, 1987, Pat. No. 4,744,137, which is a division of Ser. No. 884,481, Jul. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 775,140, Sep. 12, 1985, Pat. No. 4,640,439, and Ser. No. 818,258, Jan. 18, 1986, Pat. No. 4,644,627. This application May 16, 1988, Ser. No. 194,387
Int. Cl.[4] B65D *25/18, 87/24*
U.S. Cl. 220—445 12 Claims



10. A tank for storage of liquids comprising;

a substantially rigid inner tank having a generally cylindrical sidewall and a pair of end walls;

a substantially rigid and substantially fluid tight outer sheath enclosing said inner tank and formed of a resin impregnated fibrous material that is substantially fluid tight;

a release agent interposed between at least said inner tank cylindrical sidewall and said outer sheath to prevent bonding between said outer sheath and said release agent coated sidewall of said inner tank; and

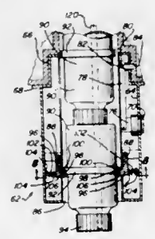
means for applying between the exterior surface of said inner tank and said outer sheath a fluid under a pressure that is sufficient to break engagement between said outer sheath and the exterior surface of said inner tank, whereby is formed a double wall tank in which said inner tank exterior surface defines an inner wall and said outer sheath defines an outer wall.

4,817,818

TAMPER-PROOF METHOD OF DISTRIBUTING AND RETAILING FOOD AND DRUG PRODUCTS

Walter R. Lockhart, 6331 Mesedge Dr., Colorado Springs, Colo. 80919

Filed Jul. 31, 1987, Ser. No. 80,339
Int. Cl.[4] A47F *1/08*
U.S. Cl. 221—1 11 Claims



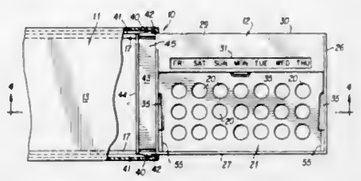
1. A tamper-proof method for distributing products manufactured at a manufacturing plant and shipped to a retail location comprising the steps of sealing the products at the manufacturing plant in a container having a dispensing opening through which the products can be removed, said dispensing opening having removable tamper-proof sealing means whereby access to the interior of the container is prevented, shipping the container to a retail location, removing the tamper-proof sealing means at the retail location, and locking dispensing means to the container at the dispensing opening with the dispensing means being adapted to permit the removal of products from the container while preventing the insertion of products into the container.

4,817,819

CONTAINER FOR TABLETS

Thomas K. Kelly, Larchmont, N.Y., assignor to Berlex Laboratories, Inc., Cedar Knolls, N.J.

Continuation of Ser. No. 810,620, Dec. 19, 1985, abandoned. This application Feb. 17, 1987, Ser. No. 16,474
Int. Cl.[4] B65D *83/04*
U.S. Cl. 221—2 4 Claims



1. A container specifically for containing tablets, such as birth control tablets, retained in an array in a blister pack, the container comprising:

a tray made of plastic for supporting the blister pack on a deck surrounded by parallel front and back walls and by parallel side walls, the deck having an array of holes therethrough corresponding to the array of tablets retained in the blister pack; the deck having first and second surfaces, the first surface being in abutment with the blister pack and the second surface being exposed, whereby tablets may be dispensed from the blister pack by pressing against the tablets to push the tablets from the first surface, through the holes and out past the second surface; a land disposed on the tray adjacent to the deck, the land having fixed indicia for displaying the days of the week aligned with the holes through the deck; the tray member having a prescribed length between inner and outer ends, the inner end having a box frame just inboard thereof and the outer end being a completely flat end plate having a pair of oppositely opening notches;

a cover made of plastic and slidably receiving the tray member for covering the contents of the container, the cover member being bottomless; the cover member having a top panel for covering the first surface of the deck when the tray member is slidably received within the cover member and the cover member being open adjacent the second surface of the deck member; the cover member having a pair of opposed side walls with lips extending toward one another and spaced from the top panel for retaining the tray member therebetween and a back wall for stopping sliding movement of the tray member; the side walls of the cover member each having an outer surface defined by a pair of convex flutes spaced by a projection planar portion; the cover member having a length slightly greater than the tray member, wherein when the tray member is pushed completely into the cover member the end plate of the tray member is within the cover member and flush with respect to end of cover member, with the pair of opposed lips being received within the oppositely opening notches;

stop means for preventing the tray member from disengaging completely from the cover member; the stop means including a pair of opposed, longitudinally extending grooves in the pair of opposed side walls of the cover member and a pair of resilient lateral detents integral with the tray member and positioned outboard of the box frame, the detents being received in the opposed grooves, the opposed grooves having stops adjacent the open end of the cover member, which stops are engaged by the detents when the tray member is in the fully open position to limit projection of the tray member from the cover member, wherein a portion of the tray member remains within the cover member when the tray is fully projected;

a plurality of lug members positioned in spaced relation with respect to the first surface of the deck for retaining the blister pack in abutment with the first surface; and

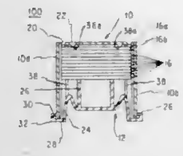
a pair of opposed guide walls positioned adjacent the first surface of the deck and extending at an oblique angle with respect to the back walls of the tray member for orienting the blister pack correctly with respect to the array holes through the deck.

4,817,820

SLIDE DISPENSER FOR A REAGENT CANNISTER

Robert Heiland, Gosben, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Aug. 27, 1987, Ser. No. 90,234
Int. Cl.[4] B65G *59/02*
U.S. Cl. 221—279 17 Claims



14. A one-piece biasing and sealing spring member for a reagent slide dispenser, comprising:

a hollow, unitary resilient body, said body including a chamber portion of a hemispherically shaped configuration allowing said body to fold into said chamber portion, a slide engagement portion extending from said chamber portion, and lip portion means for mechanically sealing said dispenser from light and humidity.

4,817,821

VALVE FOR PRESSURIZING A COMPRESSED GAS ACCUMULATOR AND FOR THE SUDDEN DISCHARGE OF GAS FROM THE ACCUMULATOR

Hervé H. J. Simoens, 40 Avenue Foch, 59700 Marco en Baroeul, France

Continuation of Ser. No. 919,383, Oct. 16, 1986, abandoned. This application Jan. 6, 1988, Ser. No. 204,943
Claims priority, application France, Oct. 31, 1985, 85 16619
Int. Cl.[4] B65D *88/70*
U.S. Cl. 222—3 21 Claims

1. A quick release air device including a valve, a compressed gas accumulator (4) and an outlet conduit (6), said valve comprising: a piston having a length considerably smaller that its diameter;

a guide block having an axial length parallel to an axis of symmetry of said piston and having a small cross section relative to said diameter, said guide block being fixed to said piston;

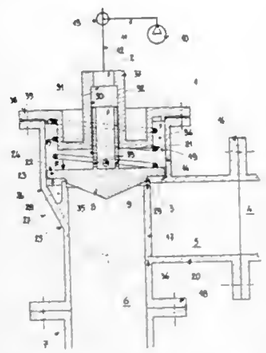
a feed chamber in which said piston is disposed, said feed chamber having flow path between the accumulator and the outlet conduit when said piston is in an open position, said flow path being blocked when said piston is in a closed position;

a cylinder defining said feed chamber and having an end, said end serving as a seat on which the piston rests when disposed in said closed position, a portion of said piston

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extending beyond said seat and over a passage which communicates with said accumulator whereby said portion is subject to pressure from the accumulator when the piston is in its closed position;

an elastic means biasing said piston towards its closed position, saiid elastic means directly contacting a face of said piston, and said elastic means is disposed around said guide block; and



a slide which cooperates with said guide block and in which said guide block slides to maintain said piston in proper alignment with the cylinder defining said feed chamber, said slide being at least partially surrounded by said elastic means, and

wherein said feed chamber has a filler neck for supplying pressurized gas to said feed chamber.

4,817,822

INDICATING DEVICE

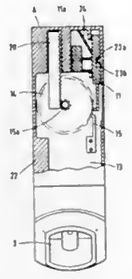
Paul K. Rand, Hitchin; Carole A. Osterweil, Swiss Cottage, and Robert E. Newell, Pinner, Middlesex, all of England, assignors to Glaxo Group Limited, London, England

Filed Apr. 24, 1987, Ser. No. 42,431

Claims priority, application United Kingdom, Apr. 25, 1986, 8610121; Aug. 11, 1986, 8619516

Int. Cl.⁴ B67D *5/22*

U.S. Cl. 222—38 **11 Claims**



1. An aerosol dispenser comprising:

(a) a housing in which an aerosol container can be located, an outlet leading from the housing and a support in the housing arranged to receive an outlet member of the aerosol container and having a passage through which the contents of the aerosol container may pass to the outlet, the outlet member being held stationary in the housing support and the body of the container moveable relative to the outlet and housing to dispense its contents in measured doses; and

(b) a dose indicating device for indicating and number of doses dispensed from, or remaining in, the container, the said device comprising

(i) a linearly movable indicator means mounted externally of the said housing and moveable relative to said housing and said container;

(ii) a movement detecting member movable by movement of the body of the contaienr relative to the outlet member and housing and

(iii) means mechanically interconnecting the movement detecting member and the indicator means and responsive to movement of the movement detecting member relative to the housing to initiate movement of the indicating means incrementally.

4,817,823

SPLIT CLIP FOR FOLDED COLLAPSIBLE TUBE

Anders V. Sparr, Sr., P.O. Box 48, Waupun, Wis. 53963

Filed Oct. 22, 1987, Ser. No. 111,278

Int. Cl.⁴ B65D *37/00*

U.S. Cl. 222—103 **5 Claims**



1. In combination with a collapsible tube for fluent material and of the type including a first end portion equipped with a flattened and sealed terminal end and a second end portion equipped with a fluent material outlet opening, an apparatus for retaining said first end in a flattened condition along transverse zones of said tube progressively spaced therealong from said terminal end toward said outlet end, said apparatus including an elongated tubular clip constructed of stiff, but somewhat resilient material, said clip being of a length greater than the transverse width of said tube along a flattened transverse zone thereof, said clip including a generally radial, full length narrow slot formed therein, said clip being longitudinally split to define closely opposing parallel edges defining the opposite sides of said slot, said tube first end portion being flattened along a flattened zone thereof extending from said terminal end toward said second end portion and being tightly folded back upon itself along a transverse fold line within said zone and closely adjacent the non-flattened second end portion of said tube, said fold line and closely adjacent transverse portions of said zone of said tube on either side of said fold line being received within said clip with said transverse portions being tightly clamped between said parallel edges, the stiffness of said resilient material, and thus said clip, being sufficient to maintain a tight clamping action on said closely adjacent transverse portions of said tube on either side of said fold line sufficient to prevent flow of said fluent material past said fold line from said second end portion of said tube into said first end portion of said tube when said second end portion of said tube is manually squeezed to express said fluent material from said outlet opening.

4,817,824

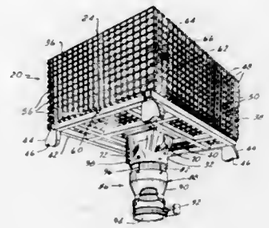
COLLAPSIBLE BULK CONTAINER

Arthur E. LaFleur; Arnie LaFleur, and Lee LaFleur, all of Manistee, Mich., assignors to Custom Packaging Systems, Inc., Manistee, Mich.

Filed Dec. 8, 1986, Ser. No. 939,421

Int. Cl.⁴ B65D *88/26*

U.S. Cl. 222—105 **39 Claims**



1. A collapsible bulk container comprising; a cage having a generally flat and generally rectangular and rigid bottom, rigid side walls and rigid end walls carried by said bottom, said walls being collapsible from a generally upstanding position wherein a bag can be received in said cage between said walls to a knocked down position whereby said walls overlie and extend generally parallel to said bottom, and said bottom being constructed and arranged to underlie, support and carrying the weight of the contents of a bag when full and received in said cage between said upstanding side walls, and a collapsible bag of a flexible material received in said cage and which has a generally rectangular top and a generally rectangular bottom interconnected by generally rectangular side walls, when said bag is full said bottom and side walls of said bag being generally complimentary to and supported by the associated bottom and side and end walls of said cage, said bag comprises a tubular blank of flexible material having a pair of flat overlying panels adapted to form a pair of opposite side walls of the bag and a pair of folded gusset panels extending inwardly between the flat panels from the opposite edges of the flat panels and adapted to form another pair of opposite side walls of said bag, said blank having adjacent its lower end each flat panel and adjacent gusset panel connected together along lines extending diagonally inwardly from the opposite side edges of the panels toward the lower end of the tubular blank, said diagonal lines of connection terminating at their laterally inward ends in spaced apart relation laterally outwardly of the inner folded edges of the gusset panels at points spaced from the lower end of the blank, each flat panel and the adjacent gusset panel also being connected together along a line extending lengthwise of the blank from said points to termination of the diagonal line to the lower end of the blank, each flat panel and the adjacent gusset panel being severed along lines spaced laterally outwardly of and generally co-extensive in length with said lengthwise extending lines of connection to form a discharge spout at the lower end of the bag which when open has a generally rectangular cross section, the portion of the flat panels and gusset panels lying between said diagonal connection lines forming when the blank is open said bottom wall of said bag, and an access opening through said cage and constructed and arranged so that the discharge spout can be extended through said opening to discharge the contents of said bag through said discharge spout.

4,817,825

WATER JET INJECTION DEVICE FOR USE WITH DISPENSERS FOR PRODUCING AND DISPENSING BEVERAGES MIXED OF FRUIT SYRUP OR CONCENTRATE AND WATER

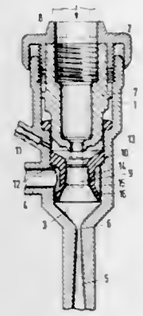
Uwe Freese, Lübeck, Fed. Rep. of Germany, assignor to Dagma Deutsche Automaten- Und Getraenkemaschinen GmbH & Co. KG, Rheinfeld, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 20,374

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607606

Int. Cl.⁴ B67D *5/56*

U.S. Cl. 222—129.2 **13 Claims**



1. An injection device for proportioning a liquid of relatively high viscosity in the form of fruit syrup or concentrate with a liquid of relatively low viscosity in the form of water and dispensing as a liquid mixture of predetermined proportions of said liquids, comprising:

an elongated injector housing having a major axis and an outlet passage extending along said axis;

means forming a first inlet passage for the liquid of low viscosity, so that said first inlet passage terminates in said housing at a distance from said outlet passage;

means forming a mixing chamber in said housing upstream of said outlet passage and having an annular wall extending along said axis;

means forming a second inlet passage for the liquid of high viscosity opening laterally into said chamber and spaced upstream of said outlet passage; and

an annular elastic body defining with said wall an annular compartment for said liquid of high viscosity, said body having an outwardly flared annular lip portion tapering and engaging said annular wall between said second inlet passage and said outlet passage, so that said mixing chamber communicates with said compartment upon a deflection of said lip portion, said lip portion forming a nonreturn valve with respect to flow into said compartment from said chamber.

4,817,826

TOOTHBRUSH HOLDER FOR STAND-UP TOOTHPASTE DISPENSERS

Joseph Judge, 1660 E. 12th St., Brooklyn, N.Y. 11229

Continuation-in-part of Ser. No. 941,068, Dec. 12, 1986, Pat. No. 4,705,194. This application Sep. 8, 1987, Ser. No. 93,617

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.⁴ A47G *29/08;* **B67D** *5/06*

U.S. Cl. 222—192 **6 Claims**

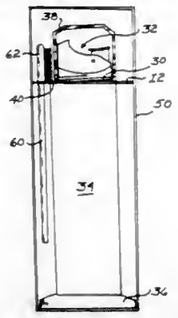
1. A toothpaste dispenser package comprising in cooperative association,

a stand-up toothpaste dispenser having a tubular body, a supporting base therefor extending laterally beyond the

tubular body, and an upstanding neck of lesser diameter than said body,

a merchandising carton for said dispenser having a cross-sectional internal dimension at least as great as said dispenser base, whereby surrounding space exists between the walls of said carton and said dispenser body and neck,

a toothbrush holder attachment of relatively stiff thin sheet material having a central aperture for reception therethrough of said dispenser neck, said attachment having means at said aperture for cooperatively engaging said neck to retain said attachment thereon, said attachment



further having laterally extending portions of substantially the lateral extent of said dispenser base and of said carton internal dimension, and having at least one smaller aperture in said portions for reception of a toothbrush,

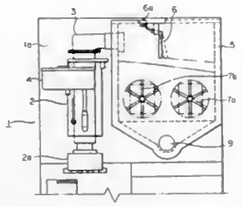
said attachment thereby having a dimensional configuration to fit within said carton substantially normal to the longitudinal axis thereof so as to be enabled to be inserted into said carton assembled onto said dispenser neck and fit within said surrounding space, whereby said dispenser base and said attachment at the dispenser neck cooperate to stabilize the dispenser within the carton notwithstanding the smaller dimension of the said dispenser body.

4,817,827

ICE DISPENSER

Yoshikazu Kito; Toshihiko Ishikawa, and Susumu Tatematsu, all of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Apr. 6, 1988, Ser. No. 178,348
Claims priority, application Japan, Apr. 13, 1987, 62-88881
Int. Cl.⁴ B01F *15/02*; F25C *15/08*
U.S. Cl. 222—238 **8 Claims**



1. An ice dispenser apparatus including an ice storage chamber, an ice dispensing mechanism mounted for rotation within said ice storage chamber to dispense outwardly ice pellets stored within said ice storage chamber, means operatively connected to said ice dispensing mechanism for generating an ice dispensing signal to trigger operation of said ice dispensing mechanism, agitator means mounted for rotation within said ice storage chamber for agitating the ice pellets within said ice storage chamber, and drive means coupled to said agitator means for driving said agitator means, said drive means being operatively coupled to said ice dispensation signal generating means and adapted to be energized in response to said ice dispensing signal, the improvement comprising:

first means (X_5) operatively coupled to said ice dispensation signal generating means and said ice dispensing mechanism for causing said ice dispensing mechanism to be operated over a period during which said ice dispensing signal is issued; and

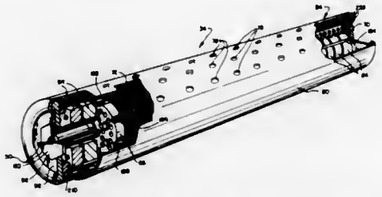
second means (X_4, X_8, X_9, TM_1, TM_2, TM_3) operatively coupled to said ice dispensation signal generating means and said drive means for energizing said drive means for a first period (t_1) in response to generation of said ice dispensing signal and for deenergizing said drive means for a second period (t_2) until the integrated value of the periods during which said ice dispensing signal is issued has attained the length of a second period (t_2).

4,817,828

INFLATABLE RESTRAINT SYSTEM

George W. Goetz, Detroit, Mich., assignor to TRW Automotive Products Inc., Lyndhurst, Ohio

Filed Oct. 3, 1986, Ser. No. 915,266
Int. Cl.⁴ B67B *7/24*
U.S. Cl. 222—3 **14 Claims**



1. Apparatus for generating gas, said apparatus comprising:

a cylindrically shaped grain having a central longitudinal axis and opposite, radially extending end faces spaced apart along the longitudinal axis;

said grain being made of a material which generates gas upon combustion;

said grain having a plurality of parallel passages extending therethrough and intersecting said opposite end faces;

said passages having central longitudinal axes located on concentric circles which have their centers on the longitudinal axis of said grain;

the axes of the passages on a first one of said concentric circles being circumferentially spaced around said grain from the axes of the passages on a second one of said concentric circles; and

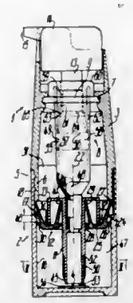
said passages having axes located on adjacent concentric circles forming a plurality of rectangular arrays of openings in said end faces, one of the end faces of said grain including a plurality of projections, each of said projections being disposed in the center of a rectangular array of openings and having end surface means spaced axially from the one end face for engaging an adjacent surface to provide space for gas to flow across the one end face of said grain during combustion of said grain.

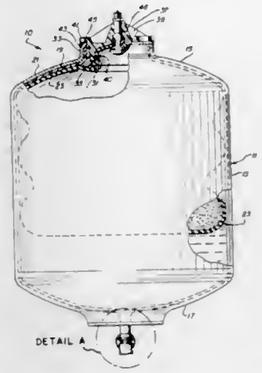
4,817,829

DISPENSER FOR FLOWABLE MEDIA

Karl-Heinz Fuchs, Radolfzell; Lothar Graf, Rielasingen, and Heinz-Peter Forsbach, Lohmar 1/Grimberg, all of Fed. Rep. of Germany, assignors to Ing. Erich Pfeiffer GmbH and Bayer AG, both of, Fed. Rep. of Germany

Filed Feb. 20, 1986, Ser. No. 831,645
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505911; Jun. 15, 1985, 3521580
Int. Cl.⁴ G01F *11/00*
U.S. Cl. 222—259 **40 Claims**





1. A dispenser for a fluid medium, operable for dispensing paste-like pharmaceutical and cosmetic substances by a pumping operation, comprising:

a reservoir member defining a reservoir for storing the fluid medium, having a filling opening for engaging

means for conveying the fluid medium into the reservoir through the filling opening during a filling operation of the dispenser, to establish an at least partly filled operational condition of the dispenser, and having at least one closable ventilation opening;

a reservoir piston having at least part of the filling opening formed therethrough and having means for closing the at least one ventilation opening;

means for engaging and releasably securing the reservoir piston at a filling position in the reservoir member, for engagement with the conveying means during the filling operation, and thereafter, for enabling the reservoir piston to be moved from the filling position to a range of operational positions in the reservoir for dispensing the fluid medium, one of the operational positions being a storage position; and,

the at least one closable ventilation opening being disposed in the vicinity of the filling position, the at least one ventilation opening being open for communication with the reservoir when the reservoir piston is in the filling position for venting the reservoir during a filling operation and being closed off from communication with the reservoir when the reservoir piston is in the operational positions.

4,817,830

PRESSURE VESSEL WITH A BLADDER

William M. Yavorsky, Woodbury, Minn., assignor to Ecodyne Corporation, St. Paul, Minn.

Filed Oct. 31, 1986, Ser. No. 925,609
Int. Cl.⁴ B67D *5/42*
U.S. Cl. 222—386.5 **4 Claims**

1. A pressure vessel for containing fluids, said pressure vessel comprising: a thin thermoplastic inner liner providing an impervious barrier to said fluids, said inner liner having an opening therethrough; an outer layer covering said inner liner and providing strength, rigidity and structural integrity to said vessel, said outer layer having an opening substantially coincident with said opening of said inner liner; said opening in said inner liner and said opening in said outer layer forming a port through said vessel; an elastic, inflatable bladder disposed in said inner liner and suspended within said fluids for displacing said fluids out of the vessel; and cap means normally closing said port, said cap means comprising a rigid main body member having an opening therethrough and valve means positioned in said opening of said main body member for closing said opening in said main body member,

securing means for securing said cap means in leak-proof engagement over said port,

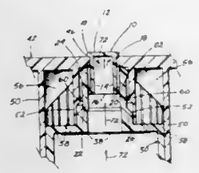
said bladder having an opening and said valve means including a recess for receiving a portion of said bladder disposed around said opening in said bladder, said valve means clamping said portion of said bladder against the walls of said opening through said main body member of said cap means, suspending said bladder from said main body member, and providing communication with said bladder.

4,817,831

DISPENSING CAP WITH EXPANDABLE PLUG

G. Jerry Theisen, 4950 Mountain Lakes Blvd., Redding, Calif. 96003

Filed Mar. 28, 1988, Ser. No. 173,868
Int. Cl.⁴ B67D *5/32*
U.S. Cl. 222—499 **3 Claims**



1. An expandable plug with supporting structure for a captive dispensing cap, comprising:

a. a substantially cylindrical hollow plug having a concave closed end with an encircling overhanging rim and a circumferal outer wall terminating oppositely said closed end at an opened end; the orientation of said hollow plug being said outer wall vertically inclined, said closed end the top thereof and said opened end the bottom thereof; said hollow plug being thin-walled and sufficiently pliable to expand outwardly from pressure applied internally and by resilience in the material to return to an original shape and to an original position in a containing cap;

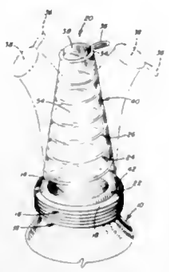
b. an elongated cylindrical support wall for said plug; said support wall lengthwise vertically inclined having an

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opened top end flanged outwardly with said flange having a beveled top and a beveled bottom and collaring said support wall top end therearound, said support wall enlarged downwardly into a widened sleeve end with said widened sleeve having a beveled top, there being a narrowed expanse between said collaring flange and said widened sleeve sized for slide-fitting the structure of a top-apertured snap-to-open, snap-to-close external cap; internally said support wall having spaced plug-support brackets attached to the sides of said plug with said plug protruding somewhat above the opened top end of said plug support wall, there being a multiple of passageways opening between said spaced brackets alongside of said plug;

c. a container compatible inner cap with vertically striated outer side wall surfaces in accord with similar inner surfaces on said apertured external outer cap, said container compatible inner cap threaded internally to the size of threads on a container neck and affixed to said downwardly widened sleeve end of said support wall as a larger continuation thereof, said inner cap having a flattened top with an aperture therein to provide an opened passageway from said container through said openings between said spaced brackets alongside of said plug.

4,817,832
TELESCOPING NOZZLE ASSEMBLY
Joan M. Nagy, 1102 Elweli St., Pittsburgh, Pa. 15207
Filed Sep. 10, 1987, Ser. No. 95,412
Int. Cl.[4] B67D *5/37*
U.S. Cl. 222—530 **8 Claims**



1. A telescoping nozzle assembly for dispensing fluid from a container comprising,

base means having an opening therethrough and adapted to be secured over a pouring opening in a container,

resilient means having an end portion connected with said base means and an opposite end portion, said resilient means having a normally collapsed helical position adjacent said pouring opening of said container, said resilient means extendable to an extended elongated helical position; said resilient means being biased toward a collapsed helical position;

said resilient means having a hollow interior portion when in said elongated helical position fluidly connected with said opening in said base means,

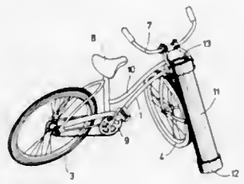
a resilient covering surrounding said resilient means and extendable with said resilient means from said normally collapsed helical position to said elongated helical position,

said resilient covering having a bottom surface portion sealingly connected with said base means and a top surface portion defining a generally circular opening in said resilient covering, and

tab means on said resilient means opposite end portion,

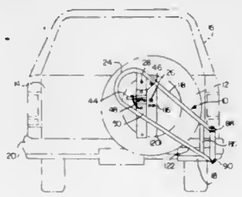
said tab means having a free end portion adapted to be grasped and pulled in a direction away from said pouring opening in said container to extend said resilient means and said resilient covering away from said normally collapsed helical position to said elongated helical position.

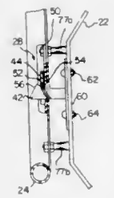
4,817,833
VEHICLE CARRIER
Anthony J. Rebera, 3003 Avon Blvd., Ashtabula, Ohio 44004
Filed Dec. 31, 1987, Ser. No. 140,217
Int. Cl.[4] B62J *7/00*
U.S. Cl. 224—36 **5 Claims**



1. A wheeled vehicle having a front and rear wheel and adapted to be ridden, forwardly with the wheels in alignment, the vehicle being inherently unstable when stationary, such that it will fall to one side or the other of the usual direction of travel, the front wheel of said vehicle being steerable, by steering means for turning the same on an axis to the right and left, and a carrier of elongated rigid construction mounted at the front of the vehicle to extend in alignment with and having an end extremity extending for a substantial distance ahead of the front wheel aforesaid, turning of the front wheel through a substantial arc to one side of the line of travel of the vehicle, causing the lower extremity of the carrier to engage the surface on which the wheels are supported and maintain the vehicle in substantially upright position.

4,817,834
BUMPER MOUNTED SPARE WHEEL CARRIER
Raywood C. Weller, 34-400 Cathedral Canyon Dr., #178, Palm Springs, Calif. 92234
Continuation of Ser. No. 778,533, Sep. 20, 1985, abandoned. This application Feb. 13, 1987, Ser. No. 15,535
Int. Cl.[4] B62D *43/02*
U.S. Cl. 224—42.06 **16 Claims**





1. A spare wheel carrier for a vehicle comprising:

a first mounting bracket adapted to be secured to a rear bumper of said vehicle;

a second mounting bracket adapted to be secured to a rear door of said vehicle;

an arm mounted on said first mounting bracket and adapted for pivotal movement between a first position in non-contacting adjacent relation to said second mounting bracket and a second position extending substantially laterally from said vehicle to a point remote from said second mounting bracket;

means for mounting a wheel on said arm;

means for selectively latching said arm to said second mounting bracket when said arm is in said first position at a point in spaced relation to said rear door of said vehicle, said arm being maintained in non-contacting adjacent relation to said second mounting bracket by said latching means at said point in spaced relation to said rear door of said vehicle;

discrete resilient means disposed between said arm and said second mounting bracket for maintaining said arm in non-contacting adjacent relation to said second mounting bracket when said arm is latched to said second mounting bracket; and

means for adjusting the distance between said arm and said second mounting bracket when said arm is latched to said second mounting bracket to ensure that said discrete resilient means acts to bias said arm in a direction away from said second mounting bracket thereby causing said arm to be latched to said second mounting bracket in a vibration isolating manner.

4,817,835
GUN SLING
Edmund S. Tarr, Jr., Cody, Wyo., assignor to Cody Trading Post, Inc., Scottsville, Va.
Filed Aug. 28, 1987, Ser. No. 90,373
Int. Cl.[4] F41C *33/00*
U.S. Cl. 224—150 **9 Claims**



1. A gun sling, for carrying a gun, said sling comprising:

a strap, having a longitudinal axis and two opposite end regions, said strap including means for dividing said strap into two halves, said means comprising a slit parallel to said longitudinal axis;

means for attaching each of said end regions to said gun at two spaced apart points on said gun; and

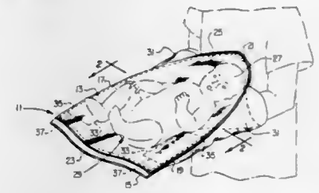
means for changing the length of said strap, said length changing means comprises:

means defining at least two holes in each strap half, said holes on said strap half aligned longitudinally;

keeper means, having at least two hooks, said keeper means on at least one of said end regions, mounted for connection to a respective hole on each strap half, said keeper means forming a first loop on said strap; and

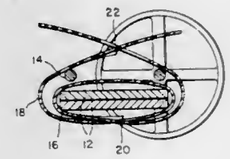
a keeper slide, for sliding over and securing said keeper means when said at least two hooks are inserted in respective holes on each of said strap halves.

4,817,836
RECEIVING BLANKET WITH SIDE SLEEVES
Joe B. Bates, Rte. 3, Box 295, Flint, Tex. 76115
Continuation of Ser. No. 97,177, Sep. 11, 1987, abandoned. This application Jun. 23, 1988, Ser. No. 210,320
Int. Cl.[4] A61G *1/00*
U.S. Cl. 224—158 **8 Claims**



1. A receiving blanket for a newly born baby comprising of a substantially rectangular outer sheet of a substantially liquid impervious material having two opposed longitudinal extending peripheral sides; and inner absorbent sheet forming a means to receive the torso of a baby on its outer surface; two open longitudinally extending sleeves secured respectively along each of said opposed peripheral sides, said sleeves forming means of such length to substantially receive and envelope the hands, wrists and a portion of the forearms of a user of said blanket, the portion of the blanket between said sleeves defining a baby receiving portion.

4,817,837
STRAP FOR HOLDING SKIS AND SKI POLES
Betty L. Grover, P.O. Box 58, Ashton, Id. 83420
Filed Sep. 3, 1987, Ser. No. 92,668
Int. Cl.[4] A45F *3/14;* **B65D** *63/10*
U.S. Cl. 224—250 **2 Claims**



1. A strap device for holding skis and ski poles comprising:

a strap having first and second ends and a portion of substantially uniform width between said first and second ends,

a first pair of notches on opposite ends of said strap adjacent said first end to form an insert portion between said first end and said first pair of notches;

a first elongated slot of preselected length in the strap adjacent said second end wherein the preselected length of the first slot is slightly longer than the distance between the inner edges of the first pair of notches;

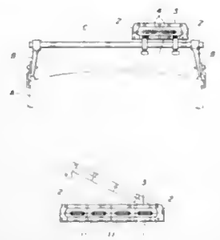
a second pair of notches in said strap between said first elongated slot and said first pair of notches; and

a second elongated slot of preselected length in said strap between said first and second pairs of notches wherein the preselected length of the second slot is slightly longer than the distance between the inner edges of the second pair of

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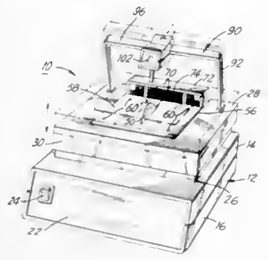
notches, each of said slots being defined by spaced parallel edges, the distance between the first slot and first pair of notches being slightly longer than the circumferential distance around a pair of back-to-back skis, the distance between said second pair of notches and second elongated slot being slightly longer than the circumferential distance around a pair of ski poles and that portion of the strap encircling the skis.

4,817,838
CARGO-FASTENING UNIT FOR USE WITH ROOF-CARRIERS OF VEHICLES
Masashi Kamaya, Tokyo, Japan, assignor to PIAA Corporation, Tokyo, Japan
Filed Oct. 20, 1987, Ser. No. 110,275
Int. Cl.[4] B60R *9/04*
U.S. Cl. 224—319 **2 Claims**



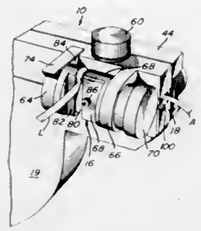
1. A cargo-fastening unit, for use with a roof-carrier for a vehicle comprising:
a horizontal bar and a clamping-bar pivotably connected in parallel with the horizontal bar at least one end portion of said horizontal bar so as to clamp and carry a load between said bars, wherein the horizontal bar and the clamping bar are respectively divided into first and second sections and at least one detachable coupling bar for separately joining said first and second sections.

4,817,839
ROTARY SAW AND METHOD FOR SECTIONING DENTAL MODELS
Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.
Filed Feb. 13, 1987, Ser. No. 14,662
Int. Cl.[4] B26D *7/00*
U.S. Cl. 225—2 **12 Claims**



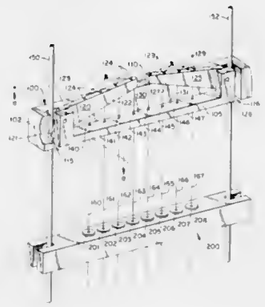
8. A method of segmenting dental models containing impressions of teeth projecting upward from a base while protecting the margin area between natural and artificial parts of the model, comprising the steps of marking a desired cutting line on the model; cutting along the marked cutting line occlusally to a slight depth to score the cutting line in the model; placing the dental model on a horizontal table, and sawing upwardly from the underside of the dental model until the cut approaches the occlusal cut.

4,817,840
APPARATUS FOR FEEDING LEADER TAPE
Bruce Atkins, Montreal, and Pierre Tardif, Longueuil, both of Canada, assignors to Leader Brac Industries Inc., Canada
Filed Nov. 25, 1987, Ser. No. 125,329
Claims priority, application Canada, Mar. 2, 1987, 530932
Int. Cl.[4] B26D *9/00*
U.S. Cl. 225—7 **5 Claims**



1. An apparatus for feeding a leader tape comprising a housing including means for rotatably mounting a reel of leader tape, guide means in the housing for determining the feed path of the tape in order to change the direction and plane of the path of the tape, means mounted in the housing for selectively engaging the tape and advancing it a predetermined distance in the feed path, and cutting means mounted on the housing for cutting the tape in the feed path downstream of the means for advancing the tape, said guide means including a first guide bar at a position such that the tape can be removed tangent to the reel and second guide means downstream of the guide bar for changing the plane of the tape by approximately 90°, and a third guide means downstream of the second guide means for changing the direction of the tape by approximately 90°.

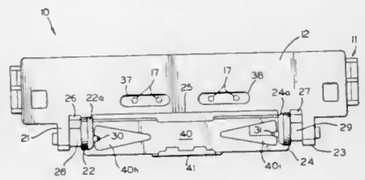
4,817,841
THREADING BAR FOR USE WITH A WIRE COATING APPARATUS HAVING PARALLEL TRANSPORT CABLES
Paul E. Justus, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.
Filed Dec. 3, 1987, Ser. No. 128,374
Int. Cl.[4] G03B *1/56*
U.S. Cl. 226—92 **4 Claims**



3. A threading bar for use in a multistrand wire coating apparatus having spaced transport cables comprising:

a body portion extending between said transport cables;
a plurality of spaced passages through said body portion, each for admitting and passing a strand of wire;
a first channel suitably sized to admit a portion of a transport cable therein;
a second channel suitably sized to admit a portion of the other transport cable therein;
a movably lever arm having a long portion and a short portion, pivotally mounted to said body portion whereby movement of the long portion of the lever arm causes contact between the short portion of the lever arm and the portion of transport cable within one of said channels; and
a plurality of securing points on said long portion of said lever arm for securing the strands of wire passing through the spaced passages in said body to said lever arm.

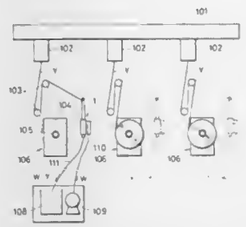
4,817,842
DOOR AND SPRING ASSEMBLY FOR A PAPER FEED MECHANISM
Joseph T. Wilson, III, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 29, 1988, Ser. No. 150,348
Int. Cl.[4] G03B *1/30;* **B41J** *11/32*
U.S. Cl. 226—74 **21 Claims**



1. A feed mechanism for a printer comprising in combination a tractor body,
a door having hinge elements,
pivot means connecting said hinge elements to said tractor body and permitting rotation of said door back and forth between first and second positions,
a platform on said tractor body between said hinge elements,
cam means on each of said hinge elements and rotatable with said door, said cam means having a common axis with said pivot means,
said cam means having first and second cam surfaces radially displaced from said common axis, and
an elongate flexure beam assembled to said tractor body and which serves to apply a spring force to said cam means for moving said door to said first and second positions, wherein:
said flexure beam is a straight piece in its relaxed state prior to assembly to said tractor body,
said flexure beam is held in flexed condition with a continuous bend by said platform and said cam means, and
said flexure beam is simply supported between its ends by said platform and frictionally engaged at its ends by said first and second surfaces of said cam means.

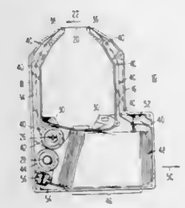
4,817,843
SUCTION DEVICE FOR YARN-THREADING
Takao Sano, Moriyama, Japan, assignor to Toray Industries, Inc., Tokyo, Japan
Filed Dec. 1, 1987, Ser. No. 127,928
Int. Cl.[4] B65H *51/16*
U.S. Cl. 226—97 **14 Claims**

1. A suction device for picking-up and pulling a yarn by using an injection force, provided by a controlled flow of pressurized liquid to thread said yarn to a desired position, said suction device comprising:
a first injection nozzle providing a first jet for injecting a first flow of pressurized liquid;
a pressurized liquid exhaust pipe having an inlet port facing said first jet with a predetermined yarn introducing space and a pressurized liquid exhaust passage formed by an internal space of said pressurized liquid exhaust pipe, said pressurized liquid exhaust passage including a through hole; and



a second injection nozzle providing a plurality of second jets around said through hole for obliquely injecting a second flow of pressurized liquid into said pressurized liquid passage, the respective axes of said second jets intersecting with each other at an intersection point displaced by a predetermined distance from an axis of said first jet, said axis of said first jet being identical to an axis of said through hole.

4,817,844
ENDLESS INK RIBBON CASSETTE
Gerard Chenest, Saint Paer, France, assignor to Unisys Corporation, Blue Bell, Pa.
Filed May 4, 1987, Ser. No. 45,483
Claims priority, application United Kingdom, May 14, 1986, 8611731
Int. Cl.[4] B41J *32/02, 33/16;* **B65H** *20/02, 20/28*
U.S. Cl. 226—118 **8 Claims**



1. An endless ink ribbon cassette wherein a ribbon is drawn from a storage void and reintroduced into said void, said cassette comprising:
a first induction wheel including first and second rim portions spaced apart on an axle; a second induction wheel urged against said rim portions, said first and second induction wheels being cooperative to draw said ribbon onto said first induction wheel and between said first and second induction wheels to be introduced into said void; and unitary fixed insert means, said cassette including an inner wall for maintaining said insert means between said first and second rim portions, said insert means comprising a first portion and a second portion;
said first portion having as its outline, part of the circumference of a circle concentric with said axle of said first induction wheel, the periphery of said first portion of said insert extending at least from the angular position where said ribbon first contacts said first induction wheel to the

point at which said second induction wheel is urged against said rim portion of said first induction wheel, thereby preventing entry of said ribbon between said first and second rim portions,

said second portion of said insert means being continuous with said first portion of said insert means, the periphery of said second portion of said insert means including spaced-apart sides extending from opposite sides of said outline of said first portion of said insert means, the one of said sides furthest from the position where said ribbon first contacts said first induction wheel extending tangentially from said outline of said first portion of said insert means, said spaced-apart sides terminating in a common transverse side engaging said inner wall of said cassette, said second portion of said insert means filling the space between said first induction wheel and said inner wall, thereby stripping said ribbon from said last mentioned wheel, while negating the entrapment of said ribbon within said space.

4,817,845

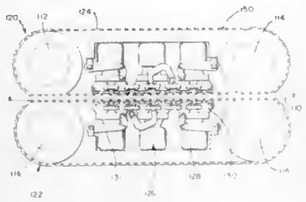
APPARATUS FOR PULLING SMALL-DIAMETER FRAGILE CABLE

John M. Franchuk, Lynnwood, Wash., assignor to WesTech Gear Corporation, Lynwood, Calif.

Continuation of Ser. No. 838,653, Mar. 11, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 161,208

Int. Cl.⁴ B65H *51/14*

U.S. Cl. 226—172 **16 Claims**



1. Apparatus for pulling small-diameter fragile cable, such as a fiberoptics or electric cable or the like, comprising:

at least two resilient wheels having tread surfaces and having their axes of rotation parallel to each other and having their tread surfaces opposed to one another; and

at least two independent, endless, flexible bar assemblies, wherein the first bar assembly is entrained around the tread surface of the first wheel and the second bar assembly is entrained around the tread surface of the second wheel, and wherein each bar assembly further comprises:

a plurality of bars, wherein each bar is defined by a top and bottom surface with the bottom surface being substantially flat, said top surface being situated to face toward the tread surface of the wheel, said bars being sufficiently rigid in their length, width and depth dimensions to transmit the resilient pressure of the wheel without bending the bar, said width dimension of the bar being defined as the dimension parallel to the transverse direction of the tread surface of the wheel and being approximately equal to the transverse measurement of the tread surface of the wheel, said length direction of the bar being defined as the dimension parallel to the longitudinal direction of the tread surface of the wheel, wherein the gap between successive bars is less than the length of each bar, each said bar being defined by a leading edge, extending along the width of the bottom surface of the bar, and

flexible coupling means entrained around the tread surface of each wheel, means for attaching each bar to the flexible coupling means whereby the flexibility of the flexible coupling means allows the bar to pivot about its leading edge to allow the bottom surface of the bar to press flat against the cable when the leading edge is pressed against the cable by the wheel; and

wherein each bar assembly is frictionally engaged with the tread surface of each respective wheel and whereby the wheels and bar assemblies are adapted to engage and apply a frictional pulling force on the opposite side of a cable to transport the cable along a path of movement of the bars.

4,817,846

TRANSMISSION SHAFT SEALING ARRANGEMENT

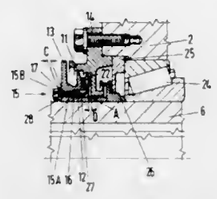
Johann Eichinger, Vaterstetten, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 103,171

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 8626535

Int. Cl.⁴ F16J *15/32;* **F16H** *57/00;* **B61C** *9/08*

U.S. Cl. 277—9 **15 Claims**



1. In a transmission means having a rotating machine part protruding from a stationary part of said transmission means and a transmission shaft sealing arrangement oriented between said stationary part and said rotating machine part for purposes of protecting an inner chamber of said transmission housing from water and dirt entering said transmission housing, said transmission shaft sealing means including a first seal ring means and a second seal ring means arranged concentrically to one another on said rotatable machine part, said first and second seal ring means both cooperating with seal surface means on said stationary part, said first seal ring means having a first V-ring seal ring with a first lip and being fixed in an active position wherein said first lip engages said seal surface means on said stationary part, the improvement wherein said second seal ring means includes a second V-ring seal ring with a second lip and support means for supporting said second seal ring for axial movement on said rotatable machine part between a not active position wherein said second lip is spabed from said stationary part and an active position wherein said second lip engages said stationary part., wherein said support means includes a manually adjustable means operable from a location externally of said transmission housing, and wherein said manually adjustable means includes plural externally threaded screws with screwheads accessible from said location and extending into said rotatable machine part on which is mounted said first and second V-ring seal rings so that the externally threaded ends engage said second V-ring seal ring and cause the screw-in depth of said screws to determine the position of said second V-ring seal ring relative to said stationary part.

4,817,847

INSTRUMENT AND A PROCEDURE FOR PERFORMING AN ANASTOMOSIS

Michael Redtenbacher, Vienna, and Karl H. Munchow, Portschach, both of Austria, assignors to Finanzaktiengesellschaft Globe Control, Vaduz, Liechtenstein

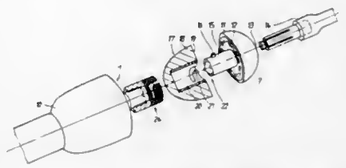
PCT No. PCT/AT87/00029, § 371 Date Jan. 28, 1988, § 102(e) Date Jan. 28, 1988, PCT Pub. No. WO87/06448, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 21, 1987, Ser. No. 143,163

Claims priority, application Austria, Apr. 21, 1986, 1052/86; Mar. 19, 1987, 663/87

Int. Cl.⁴ B31B *1/00*

U.S. Cl. 227—19 **33 Claims**



1. A staple suturing instrument for performing an anastomosis, said instrument comprising: a staple magazine including a central journal and a circular scalpel, a pilot head releasably secured at an end of the central journal, said pilot head having an hemispherical outer surface and an anvil surface for clinching staples, said anvil surface facing the staple magazine, wherein the pilot head is releasably attached through a connector with the end of the central journal and with a cap that covers the anvil surface and the connector wherein said cap has a curved outer surface.

4,817,848

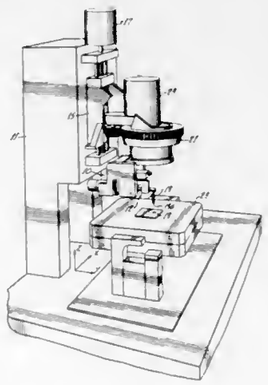
COMPLIANT MOTION SERVO

John B. Gabaldon, San Diego, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 12, 1988, Ser. No. 193,450

Int. Cl.⁴ B23K *20/10*

U.S. Cl. 228—102 **14 Claims**



1. A method of contacting an object by a tool with a predetermined force comprising:

compliantly mounting a tool to a carriage for motion of the tool relative to the carriage in a first direction,

resisting relative motion of the tool and carriage in said direction,

generating a force command signal,

generating a feedback signal indicative of position of said tool with respect to said carriage, and

moving the carriage relative to the object in response to the feedback signal so as to decrease the difference between said force command signal and said feedback signal.

4,817,849

METHOD FOR BONDING SEMICONDUCTOR LASER ELEMENT AND APPARATUS THEREFOR

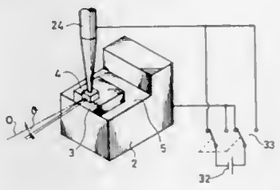
Akihiro Yamamoto, Hirakata; Yutaka Makino, Toyonaka, and Shinji Kaino, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 8, 1987, Ser. No. 93,678

Claims priority, application Japan, Sep. 9, 1986, 61-212283

Int. Cl.⁴ H01S *3/18;* **B23K** *11/00, 11/32*

U.S. Cl. 228—103 **2 Claims**



1. A method for bonding a semiconductor laser element comprising:

a step for movably locating a laser chip on a stem of a semiconductor laser device,

a step for supplying an electric current to said movably located laser chip to cause said laser chip to emit a laser light,

a step for examining an intensity of said emitted laser light,

a step for detecting a central axis of a light beam of said emitted laser light;

a step for measuring a difference between a direction of said central axis and a predetermined direction,

a step for adjusting a portion of said laser chip until said difference becomes within a predetermined range, and

a step for bonding said laser chip on the stem by passing a current therethrough, when said difference becomes within said predetermined range.

4,817,850

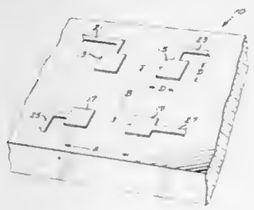
REPAIRABLE FLIP-CHIP BUMPING

Eliezer Wiener-Avnear, Carlsbad, and Ronald L. Williams, San Marcos, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 28, 1988, Ser. No. 174,289

Int. Cl.⁴ B23K *31/02*

U.S. Cl. 228—119 **11 Claims**



1. A contact structure for use with an integrated circuit chip having conductive bonding bumps for conductively bonding the chip to the contact structure, the contact structure comprising:

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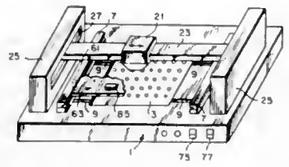
a substrate;
a plurality of contact pads disposed on said substrate and located to receive a predetermined integrated circuit chip having conductive bonding bumps respectively associated with said plurality of contact pads; and
a plurality of bonding sites defined at each of said plurality of contact pads, said plurality of bonding sites being substantially identical for each of said contact pads, each bonding site having corresponding bonding sites on the other of said plurality of contact pads which cooperatively form sets of bonding sites, each of which forms a mirror image of the conductive bonding bumps on the predetermined integrated circuit chip.

4,817,851

SURFACE MOUNT TECHNOLOGY REPAIR STATION AND METHOD FOR REPAIR OF SURFACE MOUNT TECHNOLOGY CIRCUIT BOARDS

Michael J. Kolesar, Derry, and Philip J. Bois, Manchester, both of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 829,445, Feb. 13, 1986, abandoned. This application Mar. 9, 1988, Ser. No. 169,109
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—119 **29 Claims**



1. A repair station for replacing components on circuit boards comprising:
a frame;
means for removably mounting a circuit board on said frame;
a first heating means carried by said frame;
said first means for heating an entire circuit board to and maintaining the circuit board at a substantially uniform elevated temperature, but below the melting point of solder used to secure the leads of components to said circuit board;
a second heating means movably carried by said frame;
said second means for heating the leads of a selected component, such that solder or the leads of the second component melts;
a transverse rod movably mounted in a track on said frame; and
a housing carrying said second heating means is mounted for slidable movement along said rod, whereby positioning of said second heating means relative to a selected component is accomplished by movement of said rod and said housing.

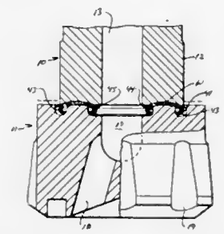
4,817,852

METHOD OF REPLACING DRILL BIT HEADS

C. L. Hill, Ft. Loudon, Pa., assignor to T. H. Industries, Fort Lauden, Pa.

Filed Oct. 8, 1987, Ser. No. 105,587
Int. Cl.[4] B23K *20/12*
U.S. Cl. 228—114 **14 Claims**

1. A method for uniting the working end of a down-the-hole drill bit to a shank wherein the shank is formed of impact resistant material and includes outer wall defined by a first diameter and an interfacing portion which is in opposing relationship to an interfacing portion of the working end of the drill bit and wherein an elongated opening of a second diameter is provided through the shank which is axially aligned with at least one opening in the working end of the drill bit and wherein the working end is formed of a wear resistant material comprising the steps of:
(a) Forming the interfacing portion of the shank and the interfacing portion of the working end to include substantially planar surface portions;
(b) modifying the configuration of the interfacing portion of the working end of the drill bit to provide a first access therein in which flash material may be received so as to not interfere with said openings, said first recess having a



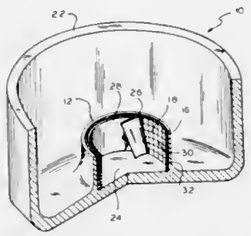
diameter which is greater than the second diameter of the elongated opening through the shank and being generally coaxial with the working end of the drill bit and which is in open communication and extends outwardly with respect to said opening in said working end;
(c) Axially aligning said interfacing portions of the shank and the working end so that said planar surface portions are in abutting contact; and
(d) Inertia welding the shank and working end wherein flash developed by the inertia welding is received within said first recess outwardly with respect to the elongated opening in the shank.

4,817,853

COMPOSITE, METHOD OF FORMING A COMPOSITE, AND ARTICLE OF MANUFACTURE

John F. Scanlon, Roscoe; Thomas A. Bolgert; David W. Okey, both of Rockford, and William D. Sherman, Genoa, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 26, 1986, Ser. No. 936,640
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—121 **39 Claims**



1. A composite having a machineable surface, comprising:
a first layer formed of a non-metallic base material and a second layer formed of a metal-coated matrix bonded to said non-metallic base material of said first layer; and
a third layer formed of a machineable metallic material integral with said matrix and sufficiently thick to accommodate subsequent machining to a precision dimension.

24. A method of forming a composite having a machineable surface, comprising the steps of:

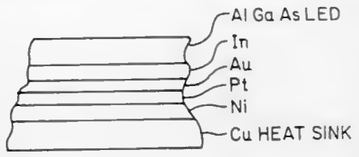
providing a base layer formed of a non-metallic base material;
providing a matrix layer formed of metal-coated graphite fibers and bonding said matrix layer to said non-metallic base layer; and
providing a machineable layer formed of metallic material and applying said machineable layer to said matrix layer.

4,817,854

LED SOLDERING METHOD UTILIZING A PT MIGRATION BARRIER

Peter L. Tihanyi, Yorktown Heights; Hubert J. Vollmer, Mahopac; Jeffrey S. Mott, and Maryanne Sovak, both of Shenorock, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 932,139, Nov. 17, 1986, which is a continuation-in-part of Ser. No. 710,505, Mar. 11, 1985, Pat. No. 4,623,086. This application Dec. 22, 1987, Ser. No. 136,255
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—124 **20 Claims**



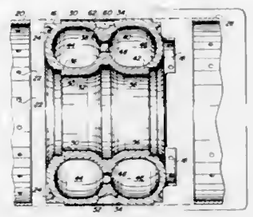
1. A method of soldering an electronic chip to a heat sink made of material selected from the group consisting of Cu and BeO comprising the steps of:
(a) adhering a layer of pure Pt of at least 1500 angstroms in thickness over said sink;
(b) thereafter annealing said sink in a partial vacuum containing a reducing gas;
(c) thereafter depositing a wetting layer and a layer of In solder upon said layer of Pt; and
(d) soldering said chip to said heat sink by use of a flux free soldering process.

4,817,855

PRESSURE VESSEL

Bela Bunkoczy, Chandler, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 13,219, Feb. 6, 1987, which is a continuation-in-part of Ser. No. 767,228, Nov. 19, 1986, abandoned, which is a division of Ser. No. 659,606, Dec. 31, 1985, Pat. No. 4,561,476. This application Apr. 20, 1988, Ser. No. 183,797
Int. Cl.[4] B23K *3/02, 33/00*
U.S. Cl. 228—171 **20 Claims**



1. A toroidal pressure vessel comprising a first annular part and a complementary second annular part, said first part and said second part cooperating to bound a toroidal chamber therewithin, said first part and said second part further cooperating to define a pair of circumferentially extending joints which are spaced apart both axially and radially, means sealingly uniting said first part and said second part at said pair of joints, axially extending structural interface means integral with said toroidal pressure vessel for allowing the latter to define a longitudinal portion of an elongate airframe structure, and said vessel defining radially outwardly disposed surface means in heat transfer relation therewith for both defining a longitudinal outer surface portion of said airframe structure and conducting aerodynamic heating from external of said airframe structure into said pressure vessel.

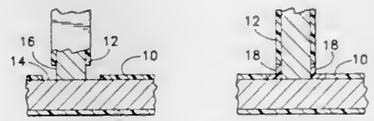
9. The method of providing a supply of pressurized gas within an airborne vehicle comprising the steps of:
providing a toroidal pressure vessel defining a longitudinally extending structural portion of said vehicle;
utilizing a radially outer wall of said pressure vessel to define a radially outwardly disposed longitudinal portion of an outer surface of said vehicle;
storing pressurized gas within said pressure vessel;
controllably releasing said stored gas from said pressure vessel during flight of said vehicle to result in gas-expansion cooling of said pressure vessel and contents; and
utilizing said longitudinal portion of said vehicle outer surface to conduct aerodynamic heating into said pressure vessel and contents in offset to said cooling thereof.

4,817,856

METHOD FOR COATING A PUMP IMPELLER

Paull A. T. Koistinen, Joensuu, and Seppo T. Tolonen, Outokumpu, both of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Continuation-in-part of Ser. No. 788,756, Oct. 18, 1985, abandoned. This application Jul. 31, 1987, Ser. No. 80,065
Claims priority, application Finland, Oct. 23, 1984, 844155
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—176 **9 Claims**



1. A method for forming a coated pump impeller from at least two parts which can be fitted together, comprising
(a) coating said parts with a desired coating material except in the areas where they meet when they are fitted together,
(b) fitting the coated parts together in order to form an impeller, and
(c) applying coating material in an uncured state to exposed areas of the parts in order to form an essentially continuous coating where the parts meet.

4,817,857

PROCESS FOR RESTRICTED LEAD CONTENT SOLDERING OF COPPER WITH CONTROLLED COPPER CONTAMINATION OF THE MOLTEN SOLDER RESERVOIR

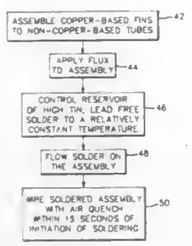
Homer G. Hargrove, Maitland, Fla., and Jay L. Kratz, Cherry Hill, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1987, Ser. No. 61,766
The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—183 **8 Claims**

1. An improved method for continuous metal fusion bonding of copper-based fin to non-copper-based heat exchanger tubing, said improved method comprising

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a. assembling said fin to said tubing;
b. applying flux to said fin-tubing assembly;
c. controlling the temperature of an essentially lead-free, high tin solder reservoir;
d. flowing solder from said reservoir on said fin tubing assembly;
e. returning excess solder to the reservoir; and



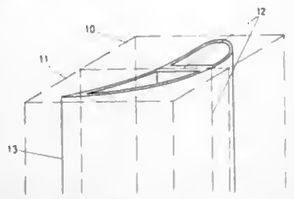
f. wiping each portion of said soldered finned tubing with an air quench in less than 15 seconds from the time that solder was flowed on that portion and return the excess solder wiped from said finned tubing to said reservoir, whereby the solder is rapidly solidified and essentially all of the high temperature melting copper-tin alloy which is formed is retained adjacent to the fin surfaces thus avoiding copper-tin alloy sludge formation in the reservoir.

4,817,858

METHOD OF MANUFACTURING A WORKPIECE OF ANY GIVEN CROSS-SECTIONAL DIMENSIONS FROM AN OXIDE-DISPERSION-HARDENED NICKEL-BASED SUPERALLOY WITH DIRECTIONAL COARSE COLUMNAR CRYSTALS

Clemens Verpoort, Fislisbach, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed May 11, 1988, Ser. No. 192,630
Claims priority, application Switzerland, May 13, 1987, 1839/87
Int. Cl.⁴ B23K *20/02;* **B21K** *3/04*
U.S. Cl. 228—193 **8 Claims**



1. A method of manufacturing a workpiece of any given cross-sectional dimensions from an oxide-dispersion-hardened nickel-based superalloy with directional coarse columnar crystals set with their longitudinal axis at right angles to the cross-sectional area, wherein, at least two workpiece parts consisting of the material quoted and available in the zone heat treated coarse crystalline condition are mechanically fine machined by milling and grinding to produce bonding surfaces on at least one side of each containing the longitudinal axis of the columnar crystals and are subsequently heat-treated in the temperature range from 50° to 100° C. below the recrystallization temperature for 0.5 to 6 hours to remove the stresses and structural perturbations introduced by cold working during the machining, wherein further the workpiece parts are joined together at the mutually corresponding bonding surfaces and are subjected to a diffusion bonding process by means of hot isostatic presssing in such a way that the workpiece parts are initially brought to 600° C. under a pressure p_K of not more than 5 MPa and are then heat-treated at a heating rate of not more than 2° C./min to at least a critical temperature T_K, above which no further cold working occurs and, subsequently, the pressure being slowly increased at a rate of not more than 1 MPa/min to a p_{max} of 100 to 300 MPa with simultaneous heating at 2° C./min up to a diffusion bonding temperature T_D of 0° to 50° C. below the recrystallization temperature and wherein this condition retained for 1 to 24 hours and the workpiece bonded in this way is cooled to room temperature.

4,817,859

METHOD OF JOINING NODULAR CAST IRON TO STEEL BY MEANS OF FUSION WELDING

Georg Breitenmoser, Aadorf, and Guy Faber, Oberrohrdorf, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Sep. 22, 1987, Ser. No. 99,603
Claims priority, application Switzerland, Sep. 24, 1986, 3819/86
Int. Cl.⁴ B23K *35/30;* **C21D** *9/50*
U.S. Cl. 228—226 **7 Claims**



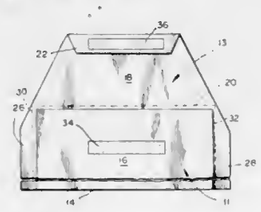
1. A method for joining nodular cast iron to steel by means of fusion welding, with an iron alloy filler having the composition:
C=0.01–0.12% by weight,
Mn=0.2–1.5% by weight,
Si=1–4% by weight,
Al=0.005–0.1% by weight,
Mo=0.2–0.7% by weight,
Ce=0.0001–0.02% by weight,
Mg=0.0001–0.01% by weight,
Zr=0.01–0.7% by weight,
S=0.006% by weight max.,
P=0.01% by weight max.,
Fe=remainder, to which additional seeding substances are added to precipitate the carbon in globular form in the welding zone.

4,817,860

FRAGRANCE RELEASING ENVELOPE

Ruth Shapiro, 8113 Ave. L, Brooklyn, N.Y. 11236

Filed Feb. 20, 1987, Ser. No. 16,933
Int. Cl.⁴ B65D *27/16*
U.S. Cl. 229—80 **6 Claims**



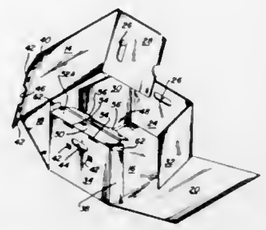
1. An envelope adapted for releasing a fragrance upon opening thereof comprising:
an envelope blank;
said envelope blank defining a front panel;
a rear panel connected to the front panel along a first transverse fold line;
said rear panel being foldably displaceable about the first transverse fold line in overlying relationship with respect to the front panel;
a top panel connected to the front panel along a second transverse fold line;
said top panel being foldably displaceable about the second transverse fold line in overlying relationship with respect to the rear panel;
a closure flap for providing exit access to the envelope, said closure flap being defined by either of said top panel or said rear panel, said closure flap further being adapted for foldable displacement about a third transverse fold line;
said front panel having two side flaps, each of said side flaps being foldable about a respective longitudinal fold line; said side flaps further including sealing means for securing the flaps with one of said side flaps being secured to the rear panel and the other of said side flaps being selectively securable for providing entry access into the envelope;
at least two fragrance strips applied to a surface of the envelope blank;
said fragrance strips including an adhesive matrix containing fragrance within rupturable microencapsules;
said adhesive matrix providing a temporary bond between contiguous fragrance strips and having an adhesive strength which exceeds the tensile rupture limits of the microcapsules;
a first fragrance strip applied to said closure flap, said closure flap being displaceable about the third transverse fold line for positioning the first fragrance strip in confronting registration with a second fragrance strip for sealing engagement;
said closure flap being openable for removing the envelope contents upon separation of the fragrance strips with concomitant rupturing of the microcapsules and release of the fragrance.

4,817,861

FILE STORAGE CARTON

Gregory A. Henrikson, 550 South Laredo Cir., Aurora, Colo. 80017

Filed Feb. 24, 1987, Ser. No. 137,689
Int. Cl.⁴ B65D *5/02*
U.S. Cl. 229—122 **3 Claims**



1. A storage carton blank comprising:
(A) a polygonal bottom panel having a righthand marginal edge, a lefthand marginal edge, a rear marginal edge and a front marginal edge;
(B) a polygonal left outside panel having a righthand marginal edge hingeably connected to said bottom panel lefthand marginal edge, a lefthand marginal edge, a rear marginal edge and a front marginal edge;
(C) a polygonal right outside panel having a lefthand marginal edge hingeably connected to said bottom panel righthand marginal edge, and a rear marginal edge;
(D) a polygonal top pane having a righthand marginal edge hingeably connected to said left outside panel lefthand marginal edge, a rear marginal edge, and a front marginal edge;
(E) a polygonal inside rear wall panel having a front marginal edge hingeably connected to said top panel rear marginal edge, a rear marginal edge, and an elongated cutout defined therein;
(F) a polygonal outside rear wall panel having a front marginal edge hingeably connected to said bottom panel rear marginal edge, a righthand marginal edge, a lefthand marginal edge and an elongated cutout defined therein to be positioned to be coincident witb said inside rear wall panel cutout to form a storage carton double-thickness handhold in the storage carton set-up configuration;
(G) a polygonal left inside wall pane having a righthand marginal edge hingeably connected to said outside rear wall panel lefthand marginal edge, a lefthand marginal edge and a rear marginal edge;
(H) a polygonal right inside wall panel having a lefthand marginal edge hingeably connected to said outside rear panel righthand marginal edge, and a front marginal edge;
(I) a polygonal access opening cover having a rear marginal edge hingeably connected to said bottom panel front marginal edge, a righthand marginal edge, a lefthand marginal edge, a front marginal edge, an elongated cutout defined therein, and two elongated slots defined therein adjacent to said access opening cover front marginal edge;
(J) a polygonal front flap having a rear marginal edge hingeably connected to said top panel front marginal edge, a righthand marginal edge hingeably connected to said left outside panel lefthand marginal edge, a rear marginal edge hingeably connected to said inide rear wall panel front marginal edge, and an elongated notch defined in said front flap front marginal edge and located to co-operate with said access opening cover elongated cutout to form a storage carton double-thickness handhold in a set-up storage carton;
(K) a polygonal double wide flange having a rear marginal edge hingeably connected to said access opening cover front marginal edge, two foldlines dividing said double wide flange into first and second sections which are adapted to lie on top of each other when said double wide flange is folded about said foldlines, a front marginal edge having two tongues located thereon to fit into said access opening cover slots when said double wide flange is folded about said foldlines;
(L) a polygonal right marginal flange having a lefthand marginal edge hingeably connected to said access opening cover righthand marginal edge and a front marginal edge;
(M) a polygonal left marginal flange having a righthand marginal edge hingeably connected to said access opening cover lefthand marginal edge and a front marginal edge;
(N) a two part fastener mounted on said front flap and on said access opening cover for releasably attaching said front flap to said access opening cover;
(O) a polygonal left tab having a rear marginal edge hingeably connected to said left marginal flange front marginal edge and being located to fit between the sections of said double wide flange; and
(P) a polygonal right tab having a rear marginal edge hingeably connected to said right marginal flange front marginal edge and being located to fit between the sections of said double wide flange.

4,817,862

CONTROL APPARATUS

Amor Bhattacharya, Plano, Tex., assignor to Trans-Tech Industries, Inc., Plano, Tex.

Filed Oct. 2, 1987, Ser. No. 103,964
Int. Cl.⁴ F23N *5/20*
U.S. Cl. 236—10 **20 Claims**

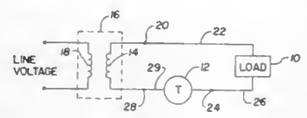
1. Apparatus for controlling the operation of a gas valve in a gas heating system which includes thermostatic switch means and a source of AC voltage which are operatively connected to form a series circuit with said gas valve such that said gas valve is activated by said AC voltage to allow gas to flow to a gas burner in said gas heating system when said thermostatic

switch means is activated to the closed position, said apparatus comprising:

switch means operatively connected to provide continuity in said series circuit upon receipt of a first control signal and to remove said continuity in said series circuit upon removal of said first control signal;

isolation means operatively connected to receive a second control signal having a high state and an alternate low state, said isolation means being structured to generate said first control signal when receiving the high state of said second control signal and being operatively connected to apply said first control signal to said switch means;

a power supply operatively connected to receive said AC voltage and to provide a DC output voltage of predetermined value;



timer means structured to generate said second control signal upon receiving, as an input, said DC output voltage from said power supply; and

relay means including an activating coil which is operatively connected to be activated by said DC output of said power supply and further including contact means operatively connected to place the output of said switch means in said series circuit with said gas valve when said thermostatic switch means is closed and said activating coil is activated and to remove the output of said switch means in said series circuit with said gas valve when said thermostatic switch means is open and said activating coil is not activated, said contact means providing continuity in said series circuit with said gas valve when said output of said switch means is removed from said series circuit with said gas valve.

4,817,863

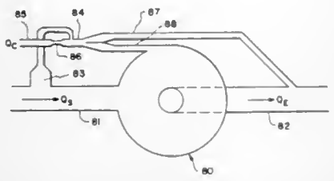
VORTEX VALVE FLOW CONTROLLER IN VAV SYSTEMS

Gordon M. Bragg, Waterloo; Richard G. Carothers, Puslinch; Kenneth A. MacLeod, Newmarket, all of Canada, and Marvin D. Nelson, Hennepin, Minn., assignors to Honeywell Limited-Honeywell Limitée, North York, Canada

Filed Sep. 10, 1987, Ser. No. 94,980

Int. Cl.[4] F24F *13/08*

U.S. Cl. 236—49.4 **15 Claims**



11. In a fan or ejector system having a fan or ejector for moving air from one location of an enclosure to another location through at least one duct, a temperature control system for controlling the temperature of air in a space comprising:

vortex valve means for controlling air moving through said duct, said vortex valve means having an inlet for receiving supply air moving through said duct upstream of said vortex valve means, an outlet for discharging discharge air to said duct downstream of said vortex valve means, said discharge air being supplied to a space, and a control port for receiving a vortex control signal, said vortex valve means controlling the flow of said discharge air by controlling the flow of air from said inlet to said outlet in response to said vortex control signal; and,

control means including means responsive to said temperature for supplying said vortex control signal to said control port of said vortex valve means for causing said vortex valve means to control the flow of said discharge air in response to said temperature and said control means further including compensation means for causing said vortex valve means to maintain said flow of said discharge air substantially unaffected by changes in flow of supply air.

4,817,864

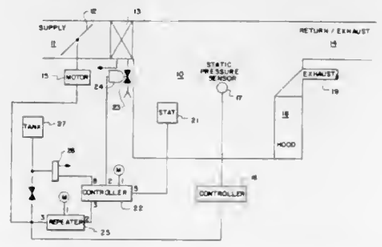
TEMPERATURE COMPENSATION FOR VAV SYSTEM

Peter P. Payne, Wheeling, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 901,966, Aug. 28, 1986, abandoned, which is a continuation of Ser. No. 720,113, Apr. 14, 1985, abandoned. This application Jun. 20, 1988, Ser. No. 220,949

Int. Cl.[4] F24F *13/10*

U.S. Cl. 236—49.4 **26 Claims**



1. A temperature compensation control system for stabilizing the temperature within a space as the amount of air being supplied to said space undergoes sudden changes, said space being supplied with supply air through a supply duct, said supply duct having a temperature controlling means located therein, said space also having a return and/or exhaust duct associated therewith for removing air from said space, said system comprising:

temperature sensing means for sensing the temperature of said space;

first means for providing an output signal indicative of a change in air pressure within said space; and,

controller means responsive to said temperature sensing means and to said output signal for controlling said temperature controlling means according to said temperature of said space and for controlling said temperature controlling means for stabilizing said temperature within said space responsive to said output signal, said controller means having a temperature input connected to said temperature sensing means and an input connected to said first means.

4,817,865

VENTILATION SYSTEM FOR MODULAR ELECTRONIC HOUSING

Donald L. Wray, Lauderdale, Fla., assignor to Racal Data Communications Inc., Sunrise, Fla.

Filed Mar. 17, 1988, Ser. No. 169,551

Int. Cl.[4] F24F *7/00*

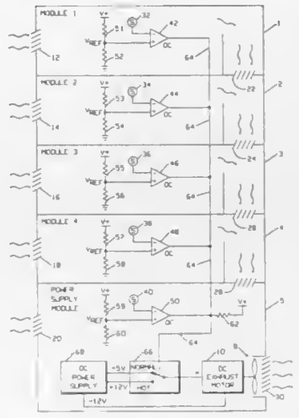
U.S. Cl. 236—49.5 **10 Claims**

1. A ventilation arrangement for a modular enclosure for electronic circuits, comprising in combination:

a ventilation fan includng a motor for providing movement of cooing air in said modular enclosure, said motor being operable at at least two speeds including a lower speed and a higher speed wherein said higher speed induces greater air movement than said lower speed;

a plurality of modular electronic circuit compartments for housing a corresponding plurality of electronic circuits, each of said modular compartments including an air path for said cooling air moved by said ventilation fan;

a plurality of temperature sensing means, one situated in each of said modular compartments, for individually sensing the temperature in each of said compartments as an indication of the temperature of each of said electronic circuits; and



speed control means, responsive to each of said temperature sensing means, for causing said motor to operate at said lower speed if the temperature in each of said modular compartments is below a predetermined threshold and for causing said motor to operate at said higher speed if the temperature in any one or more of said modular compartments exceeds said predetermined threshold;

whereby, if any one or more of said electronic circuits within said modular compartments require additional ventilation, the speed of operation of said motor is increased to provide the required additional ventilation in all of said compartments.

4,817,866

PACKAGING

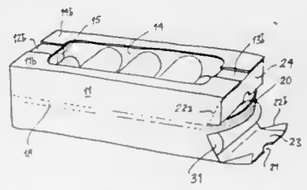
Roger J. Wonnacott, Launceston, United Kingdom, assignor to St. Regis Packaging Limited, Launceston, United Kingdom

Filed Sep. 17, 1987, Ser. No. 98,594

Claims priority, application United Kingdom, Sep. 17, 1986, 8622320; Jul. 20, 1987, 8717073

Int. Cl.[4] B65D *5/46*

U.S. Cl. 206—427 **10 Claims**



7. A black for packaging a plurality of rows of cylindrical cans having selected outside dimensions, said blank including wall panels defining four walls of a carton and further panels defining two sides of the carton, one of said wall panels including spaced-apart cuts defining a carrying handle therebetween, the blank also including lines of spaced-apart perforations providing respective lines of weakness defining a precursor of an access opening, a length of reinforcing tape being located between the handle-defining cuts, and the two spaced-apart lines of weakness each terminating at the first one of the handle-defining cuts, to define an access flap adapted to be displaced along a hinge line generally parallel to said cuts between said lines of weakness.

4,817,867

TRACK INSTALLATION FOR MODEL RAILWAYS

Wolfgang Schuller, 26, Am Parkfriedhof, 4300 Essen 1, Fed. Rep. of Germany

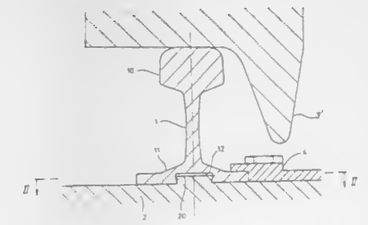
PCT No. PCT/EP86/00761, § 371 Date Aug. 21, 1987, § 102(e) Date Aug. 21, 1987, PCT Pub. No. WO87/03817, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 18, 1986, Ser. No. 111,024

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545710

Int. Cl.[4] A63H *19/30*

U.S. Cl. 238—10 A **9 Claims**



1. A track for a model railway, comprising two essentially parallel rails, each rail having a base and a longitudinal axis; a groove of substantially dovetail cross section in each base parallel to the longitudinal axis of the respective rail, and a plurality of sockets providing access to said groove from underneath; a plurality of crossties located below and transverse to said two rails at spaced intervals; each crosstie having an upper side and a projection on said upper side, with a cross sectional profile fitting interlockingly or frictionally into the respective groove, and being releasably insertable in pushbutton-like manner through a respective socket into the groove; said projections being located completely within the groove and forming the sole means connecting the crossties to the rails.

4,817,868

CARRIER FOR SCENTED MATERIAL

John M. Cook, Lafayette, Calif., and Lon L. Weiss, Kinnelon, N.J., assignors to Dow Corning Corp., Midland, Mich.

Filed Jun. 5, 1987, Ser. No. 58,907

Int. Cl.[4] A61L *9/04*

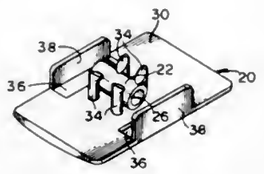
U.S. Cl. 239—55 **12 Claims**

1. A device for controlled release of pheromone scent, comprising:

a pheromone material emitting a volatile insect-attractive pheromone scent, the material being disposed in a tube, the tube having at least end openings at which the material is exposed to air circulation;

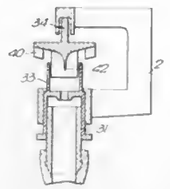
a carrier for the material, the carrier being a plate shaped as a substantially planar sheet and having a side to which the tube is affixed, the carrier having a substantial margin adjacent the tube, the carrier having a through hole disposed perpendicularly through said plate at least at one of

the end openings of the tube, and means holding the tube on said side, whereby the carrier can be manipulated with



reduced exposure to the material and the pheromone scent is broadcast by air circulation at said through hole.

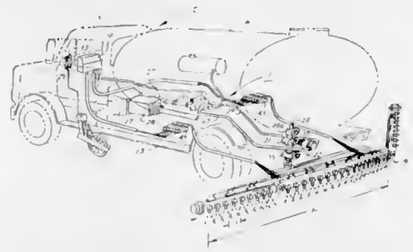
4,817,869
ROTATING MINIATURE SPRINKLER FOR IRRIGATION SYSTEMS
Zvi Rubinstein, 14 Ilan Street, Givat Shaul, Israel
Division of Ser. No. 789,453, Oct. 21, 1985, Pat. No. 4,754,925. This application Sep. 29, 1987, Ser. No. 102,510
Claims priority, application Israel, Oct. 24, 1984, 73294; Sep. 24, 1985, 76483
Int. Cl.[4] B05B *3/08*
U.S. Cl. 239—222.17 **9 Claims**



1. A miniature sprinkler having a fixed vertically extending nozzle in communication with a supply pipe and comprising:
a flow diverter being rotatably mounted by means of an axially extending shaft, loosely retained in a bushing at the top of the nozzle; said flow diverter including an axially extending inlet in register with the nozzle's outlet, at least one side outlet and at least one open arcuate channel between said inlet and said side outlet, said channel defining a flow path for diverting the water flow, such as to be emitted through said outlet in the form of a jet;
drive means comprising at least one blade affixed adjacent the periphery of the flow diverter and at least partially aligned with the diverter outlet so that at least part of the water flow from the diverter side outlet impinges on said at least one blade to cause the rotation of said diverter, said at least one blade being shaped so as to change the direction of the flow of water impinging thereupon; and
wherein the diverter is axially movable relative to the nozzle and is adapted to close said at least one side outlet and the nozzle in the absence of the water flow through the nozzle.

4,817,870
VEHICLE-MOUNTED SPRAY APPARATUS
William J. Dalton, Ashton, Ill., assignor to E. D. Etnyre & Company, Oregon, Ill.
Filed Jul. 29, 1985, Ser. No. 760,276
Int. Cl.[4] B05B *9/06, 1/20, 1/16*
U.S. Cl. 239—157 **9 Claims**

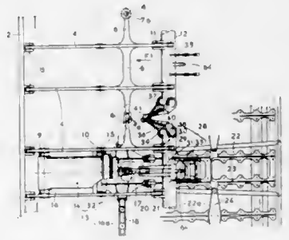
1. In a vehicle with a primary drive source for moving said vehicle and for spreading liquid material on a ground surface, a material distributing apparatus comprising:
a tank carried on said vehicle for holding said liquid material;
a discharge element for discharging the liquid material, said discharge element being capable of changing the pattern of distributing said liquid material;
a pump for initiating and maintaining a controlled rate of flow of said liquid material from said tank to said discharge element;
first means responsive to said primary drive source for providing to said pump an adjustable drive source that maintains a static drive ratio with respect to said primary drive source such that said rate of flow of said liquid material is automatically adjusted in response to changes in the speed of said vehicle in order to maintain a constant rate of application for the material onto the ground surface despite changes in the speed of the vehicle;
second means for adjusting the pattern provided by said discharge element;



third means responsive to change of the distribution pattern provided by said second means for automatically adjusting said drive ratio to said first means so as to adjust the rate of flow of the liquid material from said pump to said discharge element such that the rate of application remains unchanged despite changes in said distribution pattern;
a network of piping interposed between said pump and said discharge element, said network including valves for network wherein each of said valves includes an actuating means responsive to a signal from a manually operable means; and
said manually operable means having discrete alternative positions for selecting routes of said liquid material through said network for loading or distributing said material and, in connection with the selections, said third means being responsive to the selection of particular routes to provide a predetermined drive ratio for said first means.

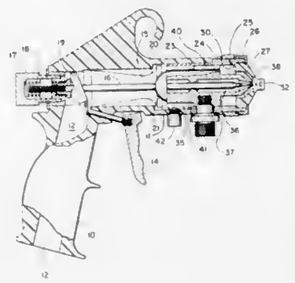
4,817,871
CONTROL SYSTEM FOR TURBOJET ENGINE NOZZLE FLAPS
Yves R. J. Bernenil, Paris, and Gérard E. A. Jourdain, Saintry S/Seine, both of France, assignors to Societe Nationale d'Etude et de Consturction de Moteurs d'Aviation (SNECMA), Paris, France
Filed Jul. 5, 1988, Ser. No. 215,257
Claims priority, application France, Jul. 8, 1987, 87 09672
Int. Cl.[4] B64C *9/38*
U.S. Cl. 239—265.39 **6 Claims**

1. In a turbojet engine having a generally annular exhaust gas duct extending about a longitudinal axis, the exhaust gas duct having a downstream edge, and a nozzle structure with a plurality of converging flaps having upstream and downstream edges, a plurality of diverging flaps having upstream edges pivotally connected to downstream edges of the converging flaps, a plurality of pairs of support beams having upstream and downstream ends extending generally parallel to the longitudinal axis, means to connect the upstream ends of the pairs of support beams to the downstream edge of the exhaust gas duct, and means to pivotally connect upstream edges of the converging flaps to the support beams, the improved flap control system comprising:
(a) a plurality of control shafts extending around the nozzle structure in a plane extending generally perpendicularly to the longitudinal axis of the exhaust gas duct, each control shaft having a substantially straight central axis;
(b) first attaching means to attach each control shaft to a pair of support beams;
(c) flap actuating means attached to a pair of support beams, the flap actuating means having an extendable and retractable actuating rod;



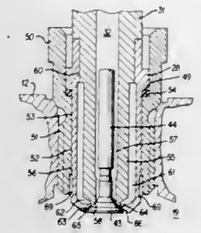
(d) second attaching means to attach an actuating rod to a control shaft;
(e) third attaching means attaching a control shaft to a diverging flap such that extension and contraction of the actuating rod causes the converging and diverging flaps to change their angular positions thereby changing the cross-sectional shape of the nozzle structure; and,
(f) means for interconnecting adjacent control shafts comprising:
(i) a generally triangularly shaped link member having a base portion attached to each end of each control shaft so as to pivot about a pivot axis; and
(ii) universal ball-joint means interconnecting the apexes of adjacent link members.

4,817,872
ADJUSTABLE FLUID SPRAY GUN
Roy D. Mattson, 2194 Deer Pass Trail, White Bear Lake, Minn. 55110
Continuation of Ser. No. 52,901, May 22, 1987, abandoned. This application Mar. 11, 1988, Ser. No. 180,706
Int. Cl.[4] B05B *1/28*
U.S. Cl. 239—300 **6 Claims**



1. For a fluid spray gun having a hollow barrel, a hollow handle attached to one end of the barrel for bringing pressurized air to the barrel, a fluid nozzle in the barrel having an exit port at the other end of the barrel for spraying out fluid, an air cap at said other end of the barrel with air openings for forming the spray pattern, a trigger-operated elongated plunger movable along the barrel for opening and closing the fluid spray opening and a passageway extending radially from the fluid nozzle for bringing fluid to be sprayed into the fluid nozzle, the invention comprising:
an air restrictor nozzle located in the gun barrel toward the handle for restricting the amount of air flow to the barrel; and
means for moving the fluid nozzle along the barrel for selectively changing the spray pattern and simultaneously controlling the air flow to the barrel through said air restrictor nozzle and controlling the amount of fluid ejected from the exit port.

4,817,873
NOZZLES FOR IN-CYLINDER FUEL INJECTION SYSTEMS
Michael L. McKay, Willetton, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia
Filed Nov. 10, 1986, Ser. No. 928,549
Claims priority, application Australia, Nov. 13, 1985, PH 03407
Int. Cl.[4] B05B *15/00, 1/24;* **F02M** *61/00*
U.S. Cl. 239—397.5 **21 Claims**



1. An internal combustion engine in-cylinder fuel injection nozzle comprising a body having a fuel passage therein, port means at one end of the body for in use communicating the fuel passage with an engine combustion chamber, a valve seat in said port means, valve element means selectively openable outward with respect to the body for co-operating with the valve seat to control fuel flow from the fuel passage to the engine combustion chamber, fuel directing surface means in the port means extending down stream from and adjacent to the valve seat for directing the fuel passing through the port means in a defined path into the combustion chamber, and member means for maintaining the fuel directing surface means in use at an elevated temperature to combust particles of combustion products deposited thereon, said fuel directing surface means being formed on said member means, said member means also for contacting the body about the periphery of and proximate to the valve seat by an area of reduced thickness to provide a minimal heat transfer path between the body and member means.

4,817,874
NOZZLE ATTACHMENT FOR ABRASIVE FLUID-JET CUTTING SYSTEMS
Richard Z. Jarzebowicz, Kirkland, Wash., assignor to Flow Systems, Inc., Kent, Wash.
Filed Oct. 31, 1985, Ser. No. 794,234
Int. Cl.[4] B05B *7/04*
U.S. Cl. 239—434 **22 Claims**

1. For use in a fluid jet cutting apparatus of the type including a source of high-pressure fluid, a high-velocity nozzle having a nozzle opening through which said fluid is directed as a high-velocity fluid cutting jet, and a conduit for delivering

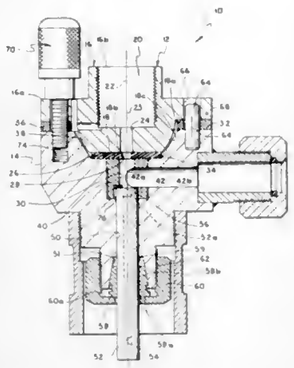
VOL 1101 ISS 1 AP 4 1989 UMI

fluid from said source to the nozzle opening, a nozzle attachment for producing as abrasive fluid jet comprising:

a body having an internal mixing region and including,

(a) a first body member detachably mountable on the high-velocity nozzle and including a first conduit in fluid communication with the mixing region and the nozzle opening;

(b) an abrasive conduit in fluid communication at one end with the mixing region and adapted to communicate with a source of abrasive at its other end;



(c) a second body member including a second conduit in region to discharge a high-pressure jet of fluid-abrasive mixture at its distal end, the second body member being mounted for pivoting movement with respect to the first body member to permit alignment between the first and second conduits; and

(d) fastening means for releasably securing the first and second body members against relative movement.

4,817,875

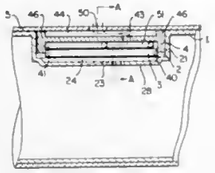
FLEXIBLE PIPE FOR TRICKLE IRRIGATION

David Karmeli, 2 Yaldei Teheran Street, and Gideon Peri, 15 Mivtza Yonatan Street, both of Haifa, Israel

Filed Sep. 21, 1987, Ser. No. 99,102

Int. Cl.[4] B05B *15/00*

U.S. Cl. 239—542 **10 Claims**



1. A trickle irrigation pipe provided with longitudinally spaced trickle irrigation emitters in the shape of oblong chambers comprising:

an inner plastics tube provided with a plurality of spaced-apart oblong wells impressed into said tube and extending inwardly, and a sheet material capable of fusing with the material of said inner tube covering each said well so as to form a top cover of each said chamber, wherein the bottom f each said chamber is perforated by at least one water inlet opening and wherein said top cover is perforated by a water outlet opening;

a substantially rigid dripper unit of oblong shape of a size coextensive with said chamber, said dripper unit having a recessed top surface surrounded by a raised rim tightly connected to said top cover by fusing and a substantially flat bottom surface recessed in parts by a flow restricting duct, said duct having a first end coextensive with one end of said dripper unit and a second end short of the second end of said dripper unit, a flow passage perforating said dripper unit from said second end of said duct to said recess in said upper surface;

a flat, flexible wafer positioned in the bottom of said chamber and contacting said bottom surface of said dripper unit, said wafer being of shorter length than said bottom surface to permit water to flow from said water inlet opening into said first end of said flow-restricting duct;

said wafer and said flow restricting duct being so designed that water pressure acting on the underside of said wafer and urging it into said flow-restricting duct reduces the cross section of said duct in such a proportion as to effect a uniform output of said trickle emitter within a predetermined pressure range, water flowing at reduced pressure from the second end of said duct through said flow passage to the top of said dripper unit to the outside through said water outlet in said chamber top cover.

4,817,876

ELECTROMAGNETICALLY ACTUATABLE VALVE, IN PARTICULAR FUEL INJECTION VALVE

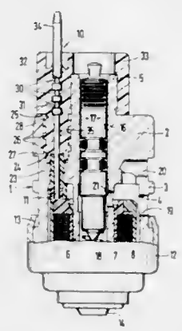
Udo Hafner, Lorch, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 128,763

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705587

Int. Cl.[4] B05B *1/30*

U.S. Cl. 239—585 **5 Claims**



1. An electromagnetically actuatable fuel injection valve for fuel injection systems in internal combustion engines, having a metallic valve housing, a core in said housing, a magnet coil which surrounds said core, electrically conductive contact pins that extend into said housing and protrude from said housing, said contact pins guided into the valve housing through ducting bores in said housing which form bore walls in said valve housing, each of said contact pins having inner ends electrically conductively connected to the ends of the winding of the magnet coil, an extruded plastic covering extending radially inside each ducting bore thereby surrounding said contact pins, said plastic covering beginning at a circumference of the contact pins within said bores and extending to said walls of said bores and extending to outside the valve housing surrounding said contact pins, each ducting bore (**24**) being provided with at least two bore grooves (**26**) in said bore wall (**25**), each contact pin (**10**) including at least two contact pin grooves (**30**) in the circumference, and the bore grooves (**26**) and the contact pin grooves (**30**) are filled with said extruded plastic covering (**33**).

4,817,877

SHREDDING MACHINE

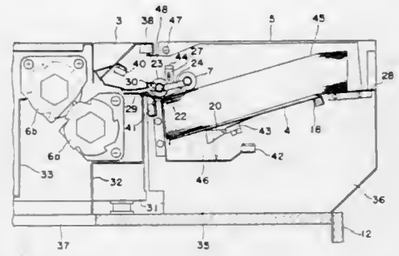
Tetsuya Itoh, Nara; Shougo Iwai, Yamatokoriyama, and Shizuo Yoshikawa, Kitakatsuragi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 4, 1988, Ser. No. 164,338

Claims priority, application Japan, Mar. 4, 1987, 62-50871; Mar. 9, 1987, 62-53733

Int. Cl.[4] B02C *18/22*

U.S. Cl. 241—34 **3 Claims**



1. A shredding machine which comprises:

a cutting means for shredding paper material;

a paper feed tray movable between lowered and elevated positions and adapted to support thereon the paper material to be shredded;

a feed means for feeding the paper material from said paper feed tray towards said cutting means;

a paper material detecting means for detecting a topmost portion of the paper material placed on said paper feed tray;

a paper feed tray driving means for moving said paper feed tray in response to a signal outputted from said paper material detecting means; and

a control means for interrupting the operation of said feed means in the case where the signal outputted from said paper material detecting means remains unchanged over a predetermined length of time.

4,817,878

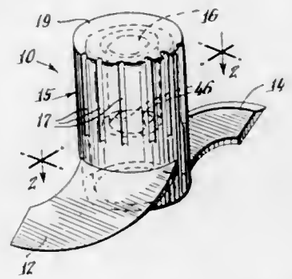
ROTATABLE TOOL POWER LOCK RETENTION APPARATUS FOR FOOD PROCESSOR

Koichiro Shibata, Seto, Japan, assignor to Cuisinarts, Inc., Greenwich, Conn.

Filed Sep. 7, 1983, Ser. No. 530,022

Int. Cl.[4] B02C *18/18*

U.S. Cl. 241—282.2 **19 Claims**



1. In a food processor having a working bowl with a vertical motor-driven shaft having an upwardly extending drive end extending up into the bowl and in which a rotatable tool has a hub removably placed down upon said drive end of the drive shaft in driving relationship with the shaft prior to operation of the food processor and such tool has at least one food processing blade secured to and extending outwardly from said hub said blade normally being positioned on the hub with respect to said working bowl such that the blade in normal operation contacts the food in said bowl being processed thereby tending to lift the hub upwardly along said drive shaft, wherein said motor driven shaft rotates during operation of the food processor and said drive shaft stops rotating upon stopping of the operation of the food processor, rotatable tool power lock retention apparatus for preventing said hub from being lifted upwardly relative to said drive shaft during operation comprising:

at least one flattened section having a flat extending axially upward along said drive end of said drive shaft;

said drive shaft having a notch therein in said flat,

said notch extending horizontally and having an overhang of the shaft above said notch,

said tool hub having an axial socket with an open bottom and a closed top,

said socket having an axially extending drive surface which is spaced from said flat on said drive end of said drive shaft when said tool hub is placed down upon and completely encloses said drive end of said drive shaft for permitting a small amount of relative angular displacement between said drive shaft and said hub,

said flat on said drive shaft coming into contact with said drive surface in said socket in driving relation therewith after the shaft has rotated forwardly through said small amount of annular displacement for thereafter causing the tool to rotate with the drive shaft, being driven thereby,

horizontally extending lip means projecting inwardly in said socket being aligned with said notch when said hub is initially placed vertically down on said upwardly extending drive end of said drive shaft,

said lip means entering said notch below said overhang when said small amount of angular displacement has occurred,

said rotatable tool when placed down onto said drive end of said drive shaft becoming locked thereon due to said small relative angular displacement occurring when the food processor drive shaft starts to rotate moving said lip means of said socket into engagement in said notch in said drive end for preventing the upward lifting of the tool along said drive shaft, and

the tool becoming unlocked upon stopping the food processor drive shaft for permitting rotation of the tool through said small relative angularly displacement removing said lip means in said socket covering said drive end of said drive shaft from said engagement in said notch for permitting manual lifting of the tool upwardly and off from said upwardly extending drive end of said drive shaft.

4,817,879

SPOOLING MACHINE

Ernst Vehling, Bordesholm, Fed. Rep. of Germany, assignor to Neumuenstersche Maschinen-und Apparatebau GmbH (Neumag), Neumuenster, Fed. Rep. of Germany

PCT No. PCT/EP86/00697, § 371 Date Sep. 4, 1987, § 102(e) Date Sep. 4, 1987, PCT Pub. No. WO87/03569, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 2, 1986, Ser. No. 95,154

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1985, 3543565

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[4] B65H *54/20, 54/32*

U.S. Cl. 242—35.5 R **8 Claims**

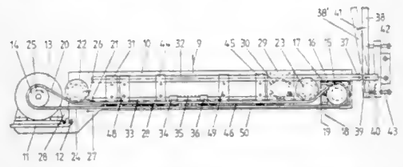
1. A spooling machine having at least two winding places that are arranged adjacent to each other in a row and having a traversing device, comprising:

a plurality of intermediate belt portions arranged adjacent to each other, each of said intermediate belt portions having a plurality of carriers uniformly spaced apart from each other by a predetermined uniform distance (y) and including a first carrier and a second carrier, means for moving said intermediate belt portions linearly in opposite direc-

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tions so as to move said carriers in association therewith and thereby move said first carrier and said second carrier in opposite directions with respect to each other; and

means for feeding a thread from said first carrier to said second carrier and including a plurality of pairs of deflectors having a traversing area at which a respective one of said deflectors actually detaches said thread from an arriving one of said carriers, said adjacent deflectors being arranged so as to mark a place of reversal of said transversing area individually and thereby correspond to a



predetermined number of winding places, adjacent two of said deflectors being spaced apart from each other by a predetermined spacing (x) that is half as large as said predetermined uniform distance between said carriers, said adjacent deflectors being formed to have an effective spacing (z) that is smaller than said predetermined distance (x), said effective spacing (z) which constitutes a distance between said transversing area of each of said adjacent deflectors and which is smaller than said predetermined distance (x).

4,817,880

YARN WITHDRAWAL APPRATUS AND METHOD

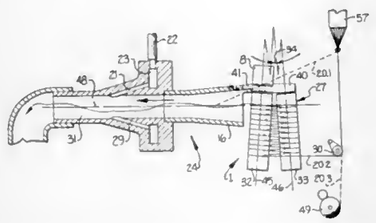
Erich Lenk, Remscheid, and Albert Stitz, Kürten, both of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 8,490, Jan. 29, 1987. This application Apr. 14, 1987, Ser. No. 38,334

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3613040; May 2, 1986, 3614864; Jun. 24, 1986, 3621139; Dec. 8, 1986, 3641849

Int. Cl.[4] B65H *51/22, 54/88*

U.S. Cl. 242—47.01 **26 Claims**



1. An apparatus for continuously withdrawing an advancing yarn and comprising

a support structure including a housing,

yarn advancing means rotatably mounted to said housing of said support structure and comprising a single rotatable roll which is adapted to be looped by the advancing yarn, with said roll having a first end portion and an opposite second end portion,

drive means mounted to said support structure for rotating said roll at a predetermined rotational speed,

suction means mounted to said support structure and having an inlet opening closely adjacent said yarn advancing means for withdrawing a yarn which is looped about said roll; and

said housing having an interior wall which generally conforms to the surface of said roll with a small gap therebetween, with the width of said gap being greater than the diameter of the yarn, and wherein said housing includes an inlet passage adjacent said first end portion and an outlet passage adjacent said second end portion, and with said outlet passage communicating with said inlet opening of said suction means.

4,817,881

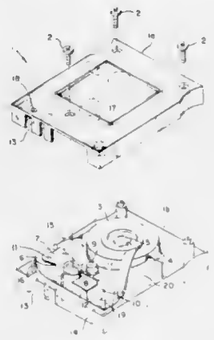
ENDLESS MICROCASSETTE TAPE

Hiromi Nakai, and Masao Tsurumaki, both of Saitama, Japan, assignors to Asahi Corporation, Saitama, Japan

Filed Jun. 29, 1987, Ser. No. 67,145

Int. Cl.[4] G11B *23/07*

U.S. Cl. 242—55.19 A **15 Claims**



1. An endless microcassette tape wherein a recording tape is capable of stable travel therein comprising:

a microcassette tape housing including a top case and a bottom case,

a tape reel rotatably disposed within said housing, and recording tape wound on said reel, said tape housing further including,

a reel rotating shaft rotatably supported on at least one of said top and bottom cases for supporting said reel in the rear of said housing,

a pinch roller and a capstan rotatably provided on at least one of said top and bottom cases and positioned at the front of said microcassette tape housing for passage of said tape therebetween,

first tape guide means secured to at least one of said top and bottom cases and positioned between said pinch roller and said reel rotating shaft so that said tape passes between said first tape guide means and an outer wall of said housing, wherein said first tape guide means has a surface portion for preventing said tape from being caught and collected under said pinch roller, said surface portion being on a line tangential to said pinch roller, and

second tape guide means in the form of a curved preventive guide wall for directing said tape which passes said pinch roller to said first tape guide means and for preventing slackening of said tape within said microcassette tape housing following passage of said tape between said pinch roller and said capstan.

4,817,882

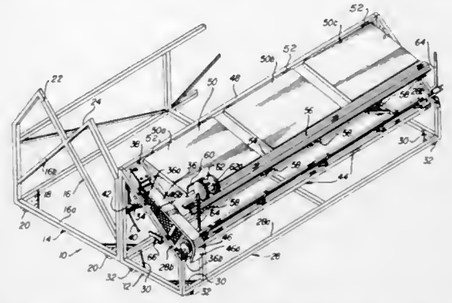
MEASURING, CUTTING AND ROLLING APPARATUS

Clarence R. Brewer, Sr., P.O. Box 247, and Mark D. Young, 421 Reservoir Ave., both of Central City, Ky. 42330

Filed Oct. 6, 1987, Ser. No. 105,124

Int. Cl.[4] B65H *19/26*

U.S. Cl. 242—56 R **17 Claims**



1. A measuring, cutting and rolling apparatus for rolls of material, said apparatus comprising:

a movable support frame;

support means mounted on said support frame for receiving and supporting a base roll of material so that material can be unwound therefrom;

an expandable material take-up shaft device mounted on said support frame onto which material from base roll is wound;

drive means for rotating said take-up shaft device so as to provide winding of material from the base roll onto said take-up shaft device;

releasable mounting means for releasably mounting said take-up shaft device on said frame so as to permit the take-up shaft device with a roll of material wound thereon to be removed from the apparatus;

measuring means, mounted on said frame, for measuring the length of the material wound onto said take-up shaft device; and

cutting means, mounted on said frame, for assisting in cutting off the material from the base roll when material wound onto the take-up shaft device is of the desired length;

said take-up shaft device including a main shaft and said releasable mounting means including a stub shaft disposed at one end of said main shaft for supporting said main shaft by means of a tongue and groove connection, said apparatus further comprising control means for moving said main shaft laterally of the axis thereof relative to said stub shaft to provide disengagement of said main shaft from said stub shaft at said tongue and groove connection.

4,817,883

MEASURING DEVICE FOR THE PRESSING ZONE WIDTH OF A ROLLER ON A ROLL OF MATERIAL AND PROCESS AND CONTROLLER FOR MAKING THE ROLL WITH A PREDETERMINED ROLL HARDNESS

Peter Hoffmann, Korschenbroich; Gerhard Buschmann, Düsseldorf; Hans Leichter, Neuss, and Ewald G. Welp, Erkrath, all of Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

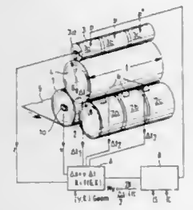
Filed Apr. 21, 1987, Ser. No. 40,943

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1986, 3614436

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[4] B65H *17/08;* **G01N** *3/40*

U.S. Cl. 242—66 **8 Claims**



1. A winder apparatus for rolling a web of material, comprising:

support rollers carrying a roll wound from a web of material;

a pressing roller bearing upon said roll so that said roll has a pressing zone width in contact with one of said rollers forming one web-rolling parameter and with a pressing surface area forming another web-rolling parameter; and

a measuring device for measuring at least one of said parameters, said measuring device comprising:

at least one sensor received in a surface of said one of said rollers for generating a signal Δt for a time interval during which a distance of said sensor from said roll is above or below a limiting value,

speed-measuring means for detecting a speed of said web and generating a signal v representing said speed,

means for measuring a radius of said roll as it is wound, thereby generating a signal r representing said radius, and

a computer connected to said sensor, said speed-measuring means, and to said means for measuring said radius and receiving said signals Δt, v and r for producing an output representing said one of said parameters.

4,817,884

METHOD AND DEVICE FOR WINDING MAGNETIC TAPE USING MAGNETIC ALIGNMENT

Masaaki Sakaguchi; Mitsunobu Usui, and Akira Takagi, all of Kangawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 29, 1987, Ser. No. 8,494

Claims priority, application Japan, Jan. 30, 1986, 61-16887; Apr. 18, 1986, 61-57581[U]

Int. Cl.[4] B65H *18/26;* **G11B** *15/30*

U.S. Cl. 242—67.1 R **9 Claims**

2. A magnetic tape winding device, comprising:

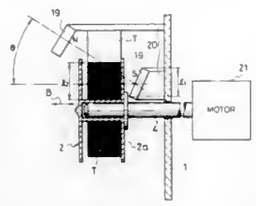
a tape winding body having a flange;

means for rotating said tape winding body to wind a magnetic tape on said magnetic winding body; and

magnetic means for applying a substantially linear magnetic field to said tape wound adjacent said flange in a direction

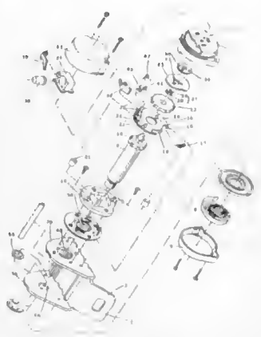
VOL 1101 ISS 1 AP 4 1989 UMI

oblique to an axis of rotation of said rotating means, said magnetic field being substantially constant on said tape



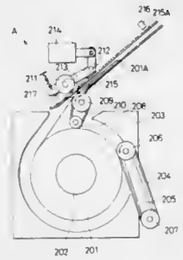
independently of a winding depth of said tape on said tape winding body.

4,817,885
AUTOMATIC-EMERGENCY LOCKING RETRACTOR FOR SEAT BELTS
Kenjiro Matsumoto, Osaka, Japan, assignor to Ashimori Kogyo Kabushiki Kaisha, Osaka, Japan
PCT No. PCT/JP87/00263, § 371 Date Dec. 21, 1987, § 102(e) Date Dec. 21, 1987, PCT Pub. No. WO87/06544, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 24, 1987, Ser. No. 143,852
Claims priority, application Japan, Apr. 24, 1986, 61-60945
Int. Cl.⁴ B60R *22/40*
U.S. Cl. 242—107.4 A **2 Claims**



1. An automatic-emergency locking retractor for seat belts, comprising a spindle for winding a webbing, said spindle being rotatably supported on a retractor body and adapted to be given a turning force in the direction of winding of the webbing; a synchrogear and a locking plate having external gear teeth formed on the outer periphery thereof, said synchrogear and said locking plate, respectively, being mounted on this spindle so as to rotate synchronously therewith; a locking ring fixedly secured to said retractor body and having circumferentially inclined cam faces formed therein; locking rollers movable along the cam faces of this locking ring and engageable with the external gear teeth on said locking plate; a clutch plate rotatably mounted relative to said spindle and biased in the direction of winding of the webbing so as to move said locking rollers; and a hook supported on this clutch plate so as to turn freely and engageable with said synchrogear by the action of the acceleration exerted on the vehicle body, characterized in that said retractor has a lever supported on the clutch plate so as to turn freely and engageable with said synchrogear; a spring member for biasing this lever in the direction of its engagement with said synchrogear; a stopper provided on a fixing member so as to project therefrom and adapted to prevent the engagement of said lever with the synchrogear when said clutch plate is under no load condition; and a control cam, said control cam being arranged such that it may be reversely rotated at a reduced speed relative to the rotation of said spindle, the arrangement being made such that when the whole webbing is unwound said control cam is engaged with said hook and operable to engage this hook with the synchrogear, whilst when the webbing is wound by a predetermined amount said control cam is engaged with said lever and operable to disengage this lever from the synchrogear.

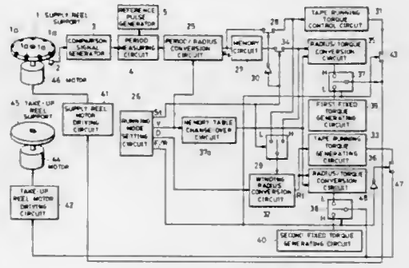
4,817,886
FILM CONVEYING APPARATUS
Kiyoharu Yoshioka, Tokyo, and Masahiko Ito, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 13, 1987, Ser. No. 49,167
Claims priority, application Japan, May 15, 1986, 61-109553; Jun. 4, 1986, 61-128038; Jun. 12, 1986, 61-136865; Jun. 12, 1986, 61-136866
Int. Cl.⁴ B65H *16/00;* **G11B** *15/18*
U.S. Cl. 242—192 **17 Claims**



1. A film conveying apparatus comprising;
means for conveying a film in a lengthwise direction, said film conveying means being in pressure contact with a surface of the film led from a film roll to convey the film by frictional force;
means for guiding side periphery of the film to position it within a predetermined area;
means for releasing the pressure contact between said conveying means and the film so that a portion of the film led from the film roll and conveyed by said conveying means may be guided only by said guiding means in a widthwise direction of the film.

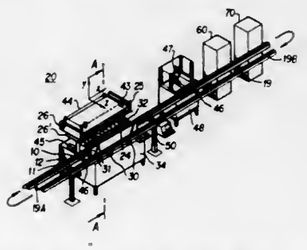
4,817,887
DEVICE FOR CONTROLLING REEL DRIVING MOTOR
Isao Harigaya, Yokohama, and Susumu Kozuki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 2, 1986, Ser. No. 936,741
Claims priority, application Japan, Dec. 13, 1985, 60-279125; Dec. 13, 1985, 60-279126; Dec. 25, 1985, 60-295313; Dec. 27, 1985, 60-297225; Dec. 27, 1985, 60-297226
Int. Cl.⁴ G11B *15/43, 15/44, 15/46*
U.S. Cl. 242—186 **25 Claims**

1. A device for running a tape-like medium between a pair of reels in accordance with one of a plurality of tape-running modes having different tape running speeds, comprising:
(A) reel driving means for rotating said reels;
(B) detecting means for detecting the state of rotation of said reels and for generating reel rotation data;
(C) instruction means for designating tape-running modes one by one among the plurality of tape-running modes so as to change the tape-running mode;
(D) first control signal generating means for generating first control signal for controlling said reel driving means on the basis of the tape-running mode designated by said instruction means and the reel rotation data generated by said detecting means;
(E) second control signal generating means for outputting a second control signal for a predetermined period after the changing of the tape-running mode is effected by said instruction means, so as to control said reel driving means on the basis of the tape-running mode designated by said instruction means and the reel rotation data generated by said detecting means when the changing of the tape-running mode is effected by said instruction means; and



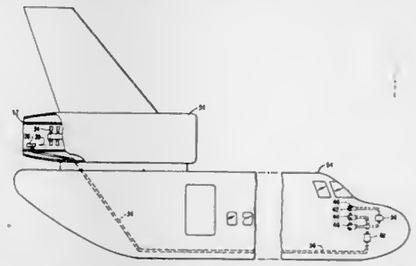
(F) supplying means for supplying said second control signal generated by said second control signal generating means to said reel driving means for the predetermined period after the changing of the tape-running mode is effected by said instruction means, and for supplying said first control signal generated by said first control signal generating means to said reel driving means for a period other than the predetermined period.

4,817,888
MULTIPLE SPINDLE WINDING MACHINE FOR ELECTRIC COILS
Ernst Arnold, Buchs, Switzerland, assignor to Meteor AG, Ruschlikon, Switzerland
Continuation-in-part of Ser. No. 854,485, Apr. 22, 1986, abandoned. This application Jun. 10, 1987, Ser. No. 60,319
Int. Cl.⁴ H01F *11/04*
U.S. Cl. 242—7.09 **5 Claims**



1. A multiple spindle winding machine for electric coils comprising:
a winding station;
a processing station;
a conveyor belt having a plurality of workpiece carriers, said conveyor belt being arranged to sequentially transport said workpiece carriers to said winding station and said processing station along a substantially linear path, a plurality of stops being movable into and out of said path to selectively arrest at least one of said plurality of workpiece carriers, each of said plurality of workpiece carriers including a base plate for frictionally engaging said conveyor belt, at least two spaced apart coil holding fixtures rigidly secured to said base plate and cooperable with said winding station, and a holding pin positioned between said at least two coil holding fixtures; and
a lifting device having guide rails laterally displaced from said conveyor belt, said base plate being receivable by said guide rails for elevating at least one of said plurality of workpiece carriers from said conveyor belt to said winding station, said winding station having a pivotable arm, said pivotable arm having a wire guide and a cutting device mounted thereto for providing wire to be wound around a coil, residue wire being collected by said holding pin.

4,817,889
FOOLPROOF SIMPLIFIED VACUUM SYSTEMS
Richard D. Henry, R.D. #1, Box 331-A, Clinton, Pa. 15026
Continuation-in-part of Ser. No. 85,790, Aug. 17, 1987, abandoned. This application Mar. 10, 1988, Ser. No. 169,142
Int. Cl.⁴ B60T *13/00*
U.S. Cl. 244—1 R **3 Claims**



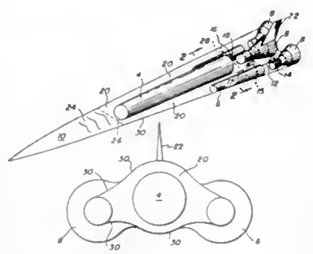
1. A vacuum system of an aircraft providing vacuum pressure immediately following engine start up comprising;
(a) a longitudinally extending exhaust tail pipe;
(b) an exhaust by-pass tube coaxially contained within the tail pipe:
(c) a venturi shaped insert having a throat and being held in a snug fit inside the by-pass tube such that all high velocity exhaust gas passing through the by-pass tube passes through the venturi; and
(d) a suction pressure tube extending from the venturi throat and passing at right angles through the tail pipe and by-pass tube to a suction relief valve and to a turn and bank indicator, a gyro horizon, and a directional gyro, with the turn and bank indicator also having a restrictor needle valve.

4,817,890
MULTIPLE-PROPELLANT AIR VEHICLE AND PROPULSION SYSTEM
George A. Coffinberry, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Oct. 14, 1986, Ser. No. 918,213
Int. Cl.⁴ B64D *37/04*
U.S. Cl. 244—135 R **21 Claims**

1. An aircraft having a skin of aerodynamic shape and a propulsion system which utilizes a dual fuel system with a fuel storage system having an inner tank and an outer tank located within the skin of the aircraft and having storage means for oxidizer separate from the fuel storage system, wherein one of the fuels is a cryogenic fuel, comprising:
(a) a non-vacuum, inner tank for containing the cryogenic fuel; and
(b) a non-vacuum outer tank defined by the skin of the aircraft and surrounding the inner tank for containing a second fuel, the second fuel being a fuel having a low

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freezing point and a high boiling point which acts as an insulator for the cryogenic fuel in the inner tank, the wall



of the inner tank separating the cryogenic fuel in the inner tank and the second fuel in the outer tank.

4,817,891

DEPLOYMENT ARRANGEMENT FOR SPINNING BODY

John E. Gaywood, Stevenage, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Apr. 15, 1987, Ser. No. 38,716

Claims priority, application United Kingdom, Apr. 15, 1986, 8609166

Int. Cl.[4] F42B *13/32*

U.S. Cl. 244—3.23 **3 Claims**



1. A deployment system for deploying a member from a spinning body, said system comprising;

a deployable member having a root portion rotatably mounted on said spinning body to allow rotation of said deployable member from a stowed position to a deployed position under centrifugal force;

said system further comprising retarding means, movable under centrifugal force to apply a spin-rate dependent friction force retarding deployment of said deployable member throughout at least a major portion of the movement of said deployable member to its deployed position, wherein said root portion includes a friction surface extending around at least part of the periphery thereof, and said retarding means is freely movable under centrifugal force and includes a friction surface for frictionally engaging the friction surface of said root portion, wherein said retarding means comprises an arm member having one end pivotally mounted on the spinning body and the other end carrying a bob weight, said arm member being provided with said friction surface intermediate said one end and said weight.

4,817,892

AEROSPACE PLANE AND ENGINE THEREFOR

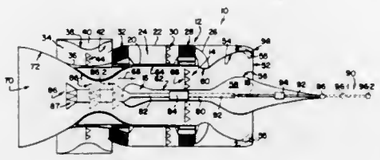
Charl E. Janeke, 261 Loveday Street, Muckleneuk, Pretoria, Transvaal Province, South Africa

Filed Apr. 28, 1987, Ser. No. 43,442

Claims priority, application South Africa, Apr. 28, 1986, 86/3166

Int. Cl.[4] B64D *27/20*; B64C *1/16*

U.S. Cl. 244—15 **10 Claims**





1. An engine suitable for use in an aerospace plane adapted for repeated operation, the engine being a composite engine comprising, in combination and in co-axial arrangement:

a rocket engine arranged on an axis;

a ram jet engine arranged annularly around the rocket engine; and

a turbo jet engine arranged annularly around the ram jet engine, the composite engine comprising:

a diffuser which is adjustable to render it suitable for subsonic, supersonic and hypersonic operation, which diffuser leads into a combustion chamber for the ram jet engine;

an inlet leading from the diffuser at a predetermined position thereof into the turbo jet engine, which predetermined position is at a throat of the diffuser when it is adjusted to operate as a supersonic diffuser;

a secondary expansion nozzle for the ram jet engine which is a converging/diverging expansion nozzle suitable for supersonic operation;

a primary expansion nozzle for the rocket engine which is longitudinally adjustable to desired longitundinal positions within the secondary expansion nozzle, including the following positions:

a passive, retracted position upstream of a throat of the secondary expansion nozzle for use when the rocket engine is inoperative and no cooperation between the primary and secondary expansion nozzle occurs,

an extended position downstream of the throat for use when the rocket engine is operative and the aerospace plane flies at low speed, in which extended position the primary expansion nozzle is adapted to induce ambient air to flow via the diffuser and the ram jet engine into the secondary expansion nozzle, and

an intermediate position for use when the rocket engine is operative and the ram jet engine is inoperative, in which intermediate position the primary nozzle is aligned with the secondary nozzle such that the secondary nozzle acts as an extension of the primary nozzle, to form a composite expansion nozzle for the rocket engine.

4,817,893

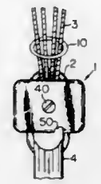
GROMMET AND CONNECTOR LINK PROTECTOR SHIELD

Thomas M. Fetsko, 4422 Homestead-Duquesne Rd., Munhall, Pa. 15120

Filed May 6, 1987, Ser. No. 46,428

Int. Cl.[4] B64D *17/24*

U.S. Cl. 244—142 **16 Claims**



9. A protector shield adapted to surround a portion of a connector link for connecting parachute shroud lines to a riser, said protector shield having a first member with channel means for surrounding a portion of said connector link, a second member complementary with said first member and having channel means for surrounding said portion of said connector link and means for attaching said first member of said protector shield to said second member of said protector shield with said channel means in said first member and said channel means in said second member forming a first passageway in surrounding relationship to said portion of said connector link, whereby said protector shield minimizes the contact between said connector links and a slider grommet on shroud lines when a slider grommet moves downwardly along shroud lines to minimize nicking of the surface of the slider grommet by contact between the surface of the slider grommet and a connector link and subsequent fraying of shroud lines by the slider grommet.

4,817,894

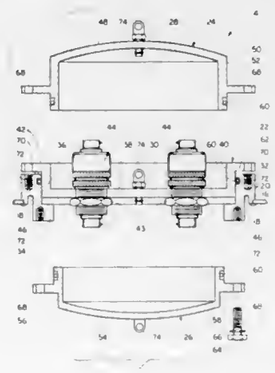
HERMETIC FEEDTHROUGH CHANGE-OUT MODULE DEVICE AND METHOD FOR USE IN A PRESSURIZED SPACECRAFT HULL

Herbert E. Ferree, Hempfield Twp., Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 2, 1988, Ser. No. 162,842

Int. Cl.[4] B64G *1/22*; B65D *51/18*; F16J *13/00*

U.S. Cl. 244—158 R **23 Claims**



1. A hermetic feedthrough change-out module device for mounting in an access opening in a wall of a pressurized vessel, comprising:

(a) a mounting member attachable to the pressurized vessel wall about the opening therein;

(b) a module member removably matable in sealing relation to said mounting member, said module member being adapted to mount at least one sealable feedthrough connector which is operable for attaching utility components thereto for routing utility services from the exterior to the interior of the pressurized vessel;

(c) an inner cover removably mountable in sealing relation to said module member for sealing off the interior of the pressurized vessel from said module member and the feedthrough connector when the latter is mounted on said module member; and

(d) an outer cover removably mountable in sealing relation to said mounting member for sealing off said module member from the exterior of the pressurized vessel.

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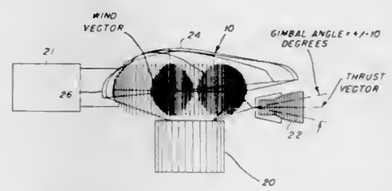
AEROBRAKING ORBITAL TRANSFER VEHICLE

Carl D. Scott, Friendswood; Kornel Nagy; Barney B. Roberts, both of Houston; Robert C. Ried, Friendswood; Kenneth R. Kroll, Houston, and Jce Gamble, Friendswood, all of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 746,162, Jun. 18, 1985, abandoned. This application Oct. 14, 1987, Ser. No. 110,060

Int. Cl.[4] B64G *1/24*

U.S. Cl. 244—138 R **15 Claims**



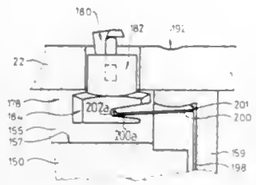
1. A reusable, spaced-based, aerobraking orbital transfer vehicle, said vehicle including a structure formed of bulkheads and stringers, the external configuration of said structure being in the shape of a raked-off, wide angle cone with a blunted nose and a toroid-like skirt about the base of the cone to form an aerobrake providing drag and lift for said vehicle, the blunted nose reduces the stagnation point heat flux and the windward surface heat flux, the skirt provides a smooth transition from the conical surface to a surface that is more nearly parallel to the wind velocity reducing the heat flux near the trailing edge of the cone, the external surface of the aerobrake being covered with a material that will provide reuseable thermal protection during excursions of the vehicle into the atmosphere, the structure integrally supporting an ascent/descent propulsion system, the tankage therefor and other systems of said vehicle, the thrust vector of the propulsion system being approximately normal to an axis extending through the base of the cone.

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4,817,896
THREAD-CATCHING DEVICE FOR WINDING MACHINES

Peter Busenhart; Heinz Oswald, both of Winterthur, and Ruedi Schneeberger, Turbeuthal, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Jan. 28, 1987, Ser. No. 7,580
Claims priority, application United Kingdom, Jan. 29, 1986, 86 02179
Int. Cl.[4] B65H *54/02, 65/00*
U.S. Cl. 242—18 PW **18 Claims**



1. A chuck structure adapted to be cantilever-mounted for rotation about a longitudinal axis thereof in a winding machine for threads, such as synthetic plastics filament and glass fiber strands, comprising:

a chuck member having a bobbin tube receiving surface;

at least one thread-catching device cooperating with said chuck member;

mounting means associated with said chuck member for dispalceably mounting said at least one thread-catching device inside the chuck structure;

said mounting means being associated with at least one opening extending substantially radially through the chuck structure;

said at least one thread-catching device being displaceably mounted inside the chuck structure by said mounting means and being displaceable generally in radial direction of the chuck structure and at least partially through said at least one opening from a retracted position into an extended position under the action of centrifugal force when the chuck structure is rotated about its longitudinal axis at least at a predetermined operating speed in use;

said mounting means returning said at least one thread-catching device from said extended position towards said retracted position when the chuck structure operates at a rotational speed lower than said predeterminate operating speed of the chuck structure;

said at least one thread-catching device having a head portion which projects radially outwardly from the bobbin tube receiving surface of the chuck member when the at least one thread-catching device is in said extended position;

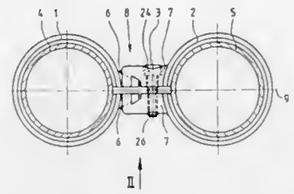
said head portion of said at least one thread-catching device being located inwardly of said bobbin tube receiving surface when said at least one thread-catching device is in said retracted position; and

said head portion including at least a portion of a thread-catching means adapted to receive and clamp a thread to secure the thread for winding into a package when a bobbin tube is received by said bobbin tube receiving surface.

4,817,897
CROSS-CONNECTOR TO TWO CROSSING TUBULAR ELEMENTS

Ulrich Kreusel, Birkenstrasse 28, 6537 Gensingen, Fed. Rep. of Germany

Filed Feb. 6, 1987, Ser. No. 11,584
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1986, 3604325
Int. Cl.[4] F16L *3/16*
U.S. Cl. 248—68.1 **8 Claims**



1. A cross connector for connecting two continuons pipes that cross each other at any desired angle, said cross connector including a first and a second pipe clamp each having a split ring pipe encircling portion for encircling a pipe to be clamped, an inner pair of outwardly extending clamp arms formed one adjacent each end of the split ring of said first pipe clamp and an outer pair of outwardly extending clamp arms formed one adjacent each end of the split ring of said second pipe clamp, the clamp arms of each pair having a space therebetween, detent means formed on the outer surface of said inner pair of clamp arms and groove means formed in the spaced inner surfaces of the outer pair of clamp arms, said inner pair clamp arms being insertable between said outer clamp arm to engage said detent means with said groove means by a snap connection permitting free rotation between the first and second pipe clamps, and screw fastener means extending between and engaging said outer clamp arms, said screw fastener means being operable to securely clamp said outer clamp arms to said inner clamp arms to thereby tighten each clamp and securely connect the pair of pipes.

4,817,898
ADJUSTING DEVICE, PARTICULARLY FOR ADJUSTABLE CHAIRS

Hermann Locher, Dornach, Switzerland, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland

Filed May 11, 1987, Ser. No. 48,028
Claims priority, application Switzerland, May 15, 1986, 01971/86
Int. Cl.[4] F16F *9/32*
U.S. Cl. 248—161 **6 Claims**

1. An adjusting device, comprising:

a hydraulic cylinder;

a main piston reciprocatingly mounted in said hydraulic cylinder;

a piston rod provided for said main piston;

said hydraulic cylinder containing a cylinder chamber located at a side of the main piston provided with said piston rod;

a force-exerting spring for loading said main piston;

a flowable medium for loading said main piston;

a control device displaceably guided in said piston rod;

said hydraulic cylinder comprising a cylinder tube;

said cylinder tube possessing a substantially constant inner diameter and outer diameter;

said force-exerting spring comprising a compression spring;

said compression spring having opposed ends;

said cylinder tube having a lower end flange disposed remote from said piston rod;

a freely movable auxiliary piston member arranged in said hydraulic cylinder and located in neighboring relationship to said main piston;

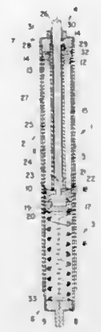
one end of said opposed ends of said compression spring bearing upon said lower end flange of said cylinder tube which is disposed remote from said piston rod;

the other end of said opposed ends of said compression spring bearing upon said freely movable auxiliary piston member;

said freely movable auxiliary piston member having a side facing away from said compression spring and forming together with said main piston a chamber;

said control device operatively connecting said chamber with said cylinder chamber located at the side of the main piston provided with said piston rod;

said piston rod possesses a longitudinal bore;



said control device comprising an actuating rod guided for lengthwise movement in said longitudinal bore;

said actuating rod having a diameter;

said control device comprising a control piston arranged at the actuating rod at an end of the longitudinal bore located at the side of the main piston;

said control piston having a smaller diameter than the diameter of the actuating rod;

said main piston having an axial bore;

said control piston serving for opening and closing said axial bore of said main piston;

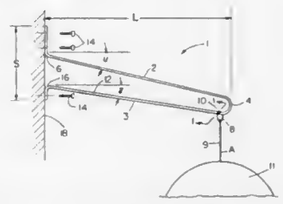
said piston rod being provided with radial bores disposed transversely to said longitudinal bore; and

said axial bore forming by means of said radial bores of the piston rod a connection between said cylinder chamber and said chamber.

4,817,899
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Stephen G. Clarke, 330 Riply Hill Rd., Coventry, Conn. 06238

Filed Aug. 6, 1987, Ser. No. 82,799
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—205.1 **6 Claims**

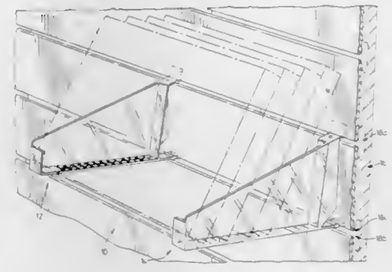


1. A cantilevered bracket suitable for hanging a birdfeeder or the like at a position spaced from a mounting surface from which said bracket is mounted and from the ground, said bracket comprising an upper arm, and a lower arm integrally joined at respective outer ends by a generally arcuate member and, at respective inner ends of said arms, means for attachment of said arms separately to a generally vertical mounting surface, and means associated with said lower arm for engagement by a hanger of a birdfeeder or the like, wherein said means for engagement comprises a detent means defined in upper and side surfaces or said lower arm, and wherein a hanger for a birdfeeder or the like has an arcuate portion, and said detent means has the form of a pair of depressions for securing said arcuate portion or said hanger.

4,817,900
SUPPORT DEVICE FOR USE ON A DISPLAY WALL

Paul S. Whittington, Thornhill, and James Morison, Oshawa, both of Canada, assignors to Gorrie Advertising Management Limited, Ontario, Canada

Filed May 9, 1988, Ser. No. 191,537
Int. Cl.[4] F16B *5/06*
U.S. Cl. 248—225.1 **11 Claims**



1. A support device for supporting a product on a display wall having a number of regularly spaced passages, comprising a body to support said product, attachment means for releasable attachment of said body to said display wall, said attachment means including a first element for disposition in a first of said passages, said first element being arranged to inhibit removal thereof from said first passage when said body is in an operative position and a second element for disposition in a second of said passages whereby, in said operative position, said second element is spring biased toward engagement with an edge portion of said display wall defining said second passage so as to inhibit displacement of said second element from said operative position.

4,817,901
ADJUSTABLE SECUREMENT RING

Jen M. Kuo, No. 26-5, Hsin Ten Village, Jen Te Hsiang, Tainan Hsien, Taiwan

Filed Jun. 7, 1988, Ser. No. 203,500
Int. Cl.[4] F16B *2/08*
U.S. Cl. 248—231 **3 Claims**

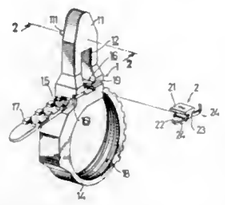
1. An adjustable securement ring for securing a bicycle pump on a bicycle comprising a securing element (1) and a retarding means (2), wherein:

said securing element (1) has a retaining body (11) comprising a cone-shaped protrusion (111) for sustaining a distal end of said bicycle pump; a passage (12) is formed beneath said protrusion (111) to facilitate an assembly of said retarding means (2) thereon; an elongate strip (14) protrudes from a bottom end of said retaining body (11) and make a loop to go back through a channel (15) provided on a lower portion, proximate to said passage (12), of said retaining body (11); a wall (19) between said passage (12) and said channel (15) is receded to form a recess (16) to receive said retarding means (2); and a plurality of spaced

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protuberances (17) are provided on an outer surface of a strap portion of said elongate strip (14) along its length; and

said retaining means (2) has upper and lower plates (21, 22) which are connected to each other by a connector (23); a pair of wing-like elements (24) are laterally provided on said connector (23) to keep said retarding means (2) to horizontally reciprocate along said passage (12) when said retarding means lodges in said recess (16) with



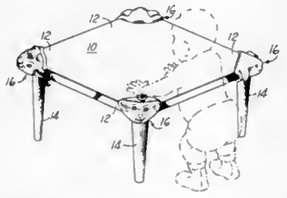
said wing-like elements (24) housed in slots (161) proximate to said recess (16); a tenon (210) is provided on a lower side of said upper plate (21) to prevent an escape of said retarding means (2) from said securing element (1); and lugs (220, 221) are provided on a lower side of said lower plate (22) to retain said strap portion of said elongate strip (14).

4,817,902

CORNER PROTECTOR AND COVER

Donald R. Mason, 104 Magnolia Ave., Magnolia, Mass. 01930

Filed Apr. 24, 1987, Ser. No. 42,000
Int. Cl.[4] A47B *95/00*
U.S. Cl. 248—345.1 13 Claims



I. A two part corner protector assembly for the padded covering of a corner of structure, comprising:

a resilient inner core;

a separate flexible outer cover disposable about said inner core;

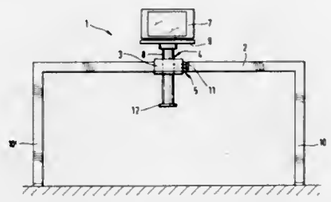
said outer cover including an arrangement of securement means including a stretchable hem removably securing said outer cover to said inner core, said tie members securing said assembly together and to the corner of a structure.

4,817,903

ARRANGEMENT FOR CARRYING HORIZONTALLY AND VERTICALLY ADJUSTABLE DATA PROCESSING DEVICES

Manfred Braehler, Grossenlueder; Heinz Rousek, and Erwin Noll, both of Huenfeld, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00031, § 371 Date Sep. 29, 1987, § 102(e) Date Sep. 29, 1987, PCT Pub. No. WO87/04769, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 23, 1987, Ser. No. 117,068
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1986, 3602549
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—419 8 Claims



1. An arrangement for carrying adjustable data processing devices, comprising two vertical legs having upper ends; a horizontally arranged carrier connecting said upper ends of said vertical legs; a member movable relative to said carrier; a column arranged to support a data processing device; said legs having a fixed height; said member being provided with a receptacle for receiving said column; said carrier being formed as a double carrier including two carrier members; and said receptacle being arranged centrically relative to said double carrier.

4,817,904

SEAT POSITION ADJUSTING MECHANISM FOR A VEHICLE

Kiyohiko Munakata, Yokohama, and Shinichi Nishimura, Zama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Ohi Seisakusho Co., Ltd., Kanagawa, both of, Japan

PCT No. PCT/JP82/00184, § 371 Date Jan. 20, 1983, § 102(e) Date Jan. 20, 1983, PCT Pub. No. WO82/04018, PCT Pub. Date Nov. 25, 1982
PCT Filed May 20, 1982, Ser. No. 460,232
Claims priority, application Japan, May 22, 1981, 56-78397
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—429 13 Claims

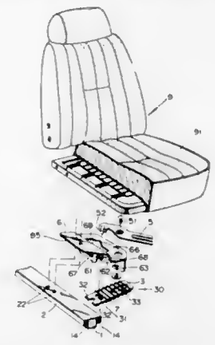
1. A seat position adjusting mechanism for a vehicle comprising:

a lower rail secured to a vehicle body, one side wall of said lower rail being formed with a series of engaging holes along the longitudinal direction of the rail;

an upper rail secured to a seat, said upper rail slidably engaging said lower rail;

a latch mechanism including a flat latch member having a substantially level surface and reciprocally movable about said upper rail toward and away from said lower rail, said flat latch member having a bifurcated end portion opposite said lower rail, said bifurcated end portion constituting latching legs engageable with adjacent engaging holes, and a flattened-cross-section coil spring wound around said latch member so as to urge the latch member in the direction of engagement with said engaging holes; and

an operation handle pivotably secured to said upper rail, one end of the handle being connected to said latch mecha-



nism, and the other end of said handle being provided with a grip.

4,817,905

FOLDABLE STAND-UP SUPPORT DEVICE

Sam J. Rondone, La Mirada, Calif., assignor to House of Packaging, Inc., City of Industry, Calif.

Filed Apr. 13, 1987, Ser. No. 37,317
Int. Cl.[4] A47B *97/04*
U.S. Cl. 248—459 4 Claims



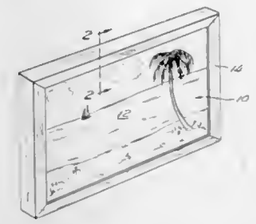
1. A support device for supporting an object constructed from a single sheet of material defining a substantially flat first section, means for holding the object to a front side of the first section, a substantially flat second section contiguous with the first section, being generally parallel thereto, positioned on a backside of the first section, and terminating at a hinge disposed intermediate to the ends of the first section and defined by a score line in the sheet, securing means proximate to and spaced from the hinge, extending generally parallel to the hinge and securing the second section to the backside of the first section, a support leg extending from the hinge in a direction away from the second section, the leg being defined by back-to-back doubled-over third and fourth sections, the third section being contiguous with the hinge, the fourth section being secured to the third section and including an extension which extends past the hinge and which is formed so that in a first position where the leg is substantially parallel to the first section the extension is disposed between the first and second sections and between the hinge and the securing means, and so that in a second position where the leg is angularly inclined relative to the first section, a free edge of the extension abuts the backside of the first section and the leg stably positions the first section in a generally upright position with the hinge axis spaced apart from the first section.

4,817,906

DECORATIVE WALL HANGING HEATER

Mearl E. Ellison, Bellflower, Calif., assignor to Thermal Art, Inc., Bellflower, Calif.

Continuation of Ser. No. 749,601, Jun. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,113, Feb. 10, 1984. This application Apr. 2, 1987, Ser. No. 34,279
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—542 4 Claims



1. A hanger device for the rigid but adjustable mounting of an item to a vertical surface, said device comprising:

an elongate mounting plate having slot means formed therein for mounting said plate by fasteners at selected locations on a vertical surface;

a supporting plate integrally formed with, and extending perpendicular from said mounting plate;

a level means located on said mounting pltae for indicating the relationship of said supporting plate to the horizontal;

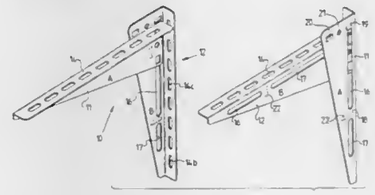
a pair of vernier adjusting means located on said supporting plate for adjusting the horizontalism of said item to be mounted on the vertical surface after said mounting plate is fixedly attached to the vertical surface.

4,817,907

BRACKET ASSEMBLY

Kenneth S. Cougan, P.O. Box 125, Margate, Queensland, Australia 4019

Filed Nov. 27, 1987, Ser. No. 125,839
Claims priority, application Australia, Nov. 26, 1987, PH9176
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—558 5 Claims



1. A bracket assembly including a first member and a second member wherein each of said first member and second member have an engagement arm and an attachment arm whereby said attachment arm includes a plurality of attachment apertures or a single attachment slot and said engagement arm includes one or more retaining projections and a retaining aperture as well as one or more elongate slots whereby in use each of said first member and said second member may be oriented so that one of said members is oriented substantially vertically and the other of said members is oriented substantially horizontally having regard to the periphery of a doorway whereby a pair of said bracket assemblies may be located on opposite sides of said doorway and said one or more retaining projections and said

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retaining aperture of the engagement arm of one member may be oriented with an adjacent elongate slot of the engagement arm of the other member and each of the attachment arms of both members may be attached to the doorway periphery or a door adapted to close said doorway.

4,817,908

SEAT SUSPENSION FOR UNDERGROUND MINING MACHINES

Ronald D. Hanlon, Titusville, and Ronald K. Dickey, Meadville, both of Pa., assignors to Joy Technologies Inc., Franklin, Pa.

Filed Jul. 29, 1987, Ser. No. 79,174
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—564 **10 Claims**



1. A seat suspension for an underground mining machine comprising:

(a) fixed bracket means adapted to be attached to a side wall of an operator compartment of an underground mining machine, said fixed bracket means including plural rod members each having upper and lower ends attached respectively to upper and lower portions of said fixed bracket means;

(b) sliding bracket means including plural upper horizontal apertured flange segments and plural lower horizontal apertured flange segments, said flange segments sized and positioned to receive and slide on said plural rod members to provide relative vertical movement with respect to said fixed bracket means, said sliding bracket means attached to a back portion of a seat provided within the operator compartment; and

(c) vertical suspension means operably connected between said fixed bracket means and said sliding bracket means for supporting the seat and for reducing and dampening vibration and shock transmitted from the mining machine to the seat, said fixed bracket means, said sliding bracket means and said suspension means each positioned entirely behind said seat.

4,817,909

ELASTOMERIC HANGER STRUCTURE

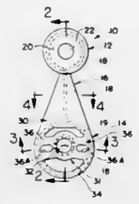
Donald L. Deane, Logansport, Ind., assignor to GenCorp Inc., Akron, Ohio

Filed Dec. 7, 1987, Ser. No. 129,791
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—610 **5 Claims**

1. An elastomeric hanger for suspending a part of an exhaust system from a motorized vehicle chassis, said hanger comprising a unitary molded elastomer having a Shore A durometer hardness of from about 40 to about 75 whereby the strength of the elastomer is sufficient to support said exhaust system for further comprising:

a first elastomeric coupling portion having an opening for receiving an attachment means which connects the first coupling portion with the part, the opening having a central axis;

a second elastomeric coupling portion having (i) a first section having an opening formed about a central axis which is substantially parallel to the central axis formed in the first elastomeric coupling portion, (ii) a second section radially outward and circumscribing said first section and being spaced therefrom, and (iii) web means connecting selected portions of said first and second sections; said web means being designed to deflect under the application of predetermined lateral forces to said hanger, said lateral forces being substantially parallel to the central axis of the openings formed in the first and second elastomeric coupling portions so that said first section can move along said central axis relative to said second section in response to forces which cause said web means to deflect so as to inhibit the transmission of forces between the part and the support and to isolate vibration of the part;



an intermediate elastomeric portion connecting said first and second elastomeric coupling portions; and

metal reinforcing means comprising a length of metal wire embedded in said first coupling portion, in said intermediate portion and in the second section of the second coupling portion, said wire at least partially enclosing each of the openings in the first and the second elastomeric coupling portions.

4,817,910

RETAINING SYSTEM, IN PARTICULAR FOR RETAINING BUNDLES OF WIRES IN A TELEPHONE EXCHANGE

Geza Molnar, Aiglemont, and Claude Yapoudjian, Morangis, both of France, assignors to Mars Actel, Vrigne aux Bois, France

Filed Jul. 27, 1987, Ser. No. 77,720
Claims priority, application France, Jul. 25, 1986, 86 10808
Int. Cl.[4] F16L *3/22*
U.S. Cl. 248—68.1 **6 Claims**

1. A retaining system, in particular for retaining bundles of wires in a telephone exchange, said system being intended more generally for maintaining a plurality of objects in position relative to a supporting structure, and comprising:

a stack of retaining stages following one another in a stacking direction and each extending along a longitudinal direction and along a lateral direction;

each of said stages including retaining means for receiving one of said objects to be retained;

a first stage being provided with fixing means for fixing it to said supporting structure; and

each subsequent stage being provided with link means for linking it to the preceding stage;

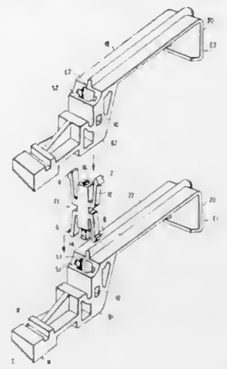
said system including the improvements whereby each of said stages comprises a link block extending from a base face to a top face along said stacking direction in such a manner that the base face of each succeeding stage bears against the top face of the preceding stage;

at least eacb non-end stage is provided with a link rod extending along said stacking direction and projecting from said base face and/or from said top face;

at least each non-end stage includes a link housing extending within its link block from said top face and/or from said base face in order to receive and contain the link rod projecting from the base face and/or from the top face of the succeeding stage and/or from the preceding stage, in such a manner as to prevent each stage from sloping relative to the other stages at least by rotation about the axes of said longitudinal and lateral directions;

snap-fastening projections are provided along one of said lateral or longitudinal directions on said link rod or in said housing, said projections being resiliently retractable in order to enable said link rod to be inserted in said link housing;

snap-fastening housings are provided in the walls of said link housing or of said link rod in order to receive said snap-fastening projections when said rod is pushed home into said link housing with the base and top faces of consecutive stages coming into contact so as to oppose separation of said two stages;



said link rods are separable from said stages and include said snap-fastening projections, with each of said rods including a pair of oppositely-directed snap-fastening projections at each of its ends, each of said link housings being in the form of a link channel passing through said block along said stacking direction, a portion of the length of said channel running from said base face constituting one of said link housings for a link rod coming from a preceding state, and a portion of the length of said channel running from said top face constituting one of said link housings for a link rod coming from a succeeding stage.

4,817,911

APPARATUS FOR FORMING ICE SCULPTURES

Vittorio Infanti, Staten Island, N.Y., assignor to Infanti Chair Manufacturing, Corp., Staten Island, N.Y.

Continuation-in-part of Ser. No. 799,092, Nov. 18, 1985, abandoned. This application May 16, 1988, Ser. No. 194,442
Int. Cl.[4] F25C *1/22*; **B29C** *39/40*
U.S. Cl. 249—82 **27 Claims**

1. A mold assembly for producing ice sculptures comprising first and second mold halves each having a planar surface;

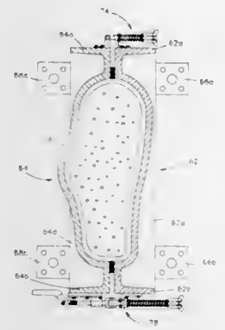
each of said mold halves having a cavity recessed in said planar surface;

said cavities cooperating to define a hollow mold having a surface shape for producing the desired ice sculpture when said mold halves are joined together with their respective planar surfaces facing one another;

said cavities cooperatively forming an opening along one side of the joined mold halves for receiving water;

means arranged between the planar surfaces of said mold halves for providing a water-tight seal around said hollow mold to prevent leakage of water from the hollow mold when the mold halves are joined;

joining assemblies arranged along opposite sides of the mold assembly for normally urging the mold halves together to initially maintain said water-tight seal and being resiliently yieldable to enable the mold halves to move apart in a controlled manner due to expansion of the freezing water in the mold.

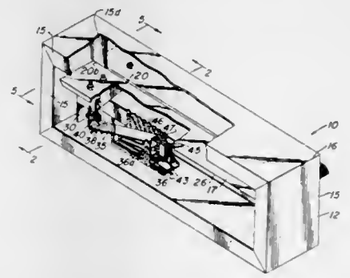


4,817,912

BI-METAL OPERATOR FOR SMOKE, FIRE AND AIR CONTROL DAMPER

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Filed Sep. 24, 1987, Ser. No. 100,601
Int. Cl.[4] F16K *31/70*; **F24F** *7/00*
U.S. Cl. 251—11 **17 Claims**



1. An improved damper operator for a damper having a frame and a reciprocal blade operatively associated with the frame, comprising:

(a) a bi-metallic element, a first end of which is fixedly connected to the frame;

(b) a pivotal linkage including a pivot point, said pivotal linkage being pivotally connected to a second end of said bi-metallic element and operatively connected to the blade;

(c) a single over center action biasing means operatively coupled from said bi-metallic element to said blade; and

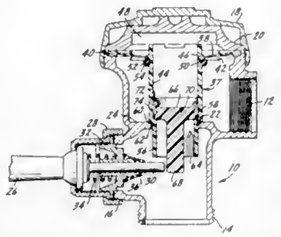
(d) a center position being defined at a location where said pivot point is directly in line with a biasing force of said biasing means as said bimetallic element is heated, said biasing means moves in one direction to one side of said center position to snap said blade to a fully close position and as said bimetallic element is cooled said biasing means moves in an opposite direction to the other side of said center position to snap said blade to a fully open position.

4,817,913

FLUSHOMETER RELIEF VALVE

John F. Whiteside, Franklin Park, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Sep. 12, 1988, Ser. No. 242,549
Int. Cl.[4] F16K *31/145*
U.S. Cl. 251—40 18 Claims



1. In a flush valve of the type having a hollow body, an inlet, an outlet, a valve seat formed in the body between the inlet and outlet, a diaphragm peripherally fixed to said flush valve body, a barrel, integral with said diaphragm, a seal member on the exterior of said barrel and positioned to close upon said valve seat,

an annular valve seat on the inside of said barrel, a relief valve positioned for movement within said barrel and having an exterior portion thereof formed and adapted to close upon said barrel valve seat, said relief valve having an annular outwardly-extending flexible deformable lip spaced from said exterior portion and in sealing contact with the interior of said barrel, an annular space being defined between and by said flexible lip and said exterior portion, said flush valve having an operating handle assembly, a portion of which is formed and adapted to contact and tilt said relief valve, causing a portion of said relief valve exterior portion to move away from said barrel valve seat and causing a portion of said relief valve lip to move away from the interior of said barrel thereby opening a flow communication between the moved portions of said flexible lip and said exterior portion and through said annular space to provide for operation of said flush valve.

4,817,914

ELECTROMAGNETIC VALVE ASSEMBLY

James M. Pick, Elk Grove, and Wesley S. Swanson, Elkgrove Village, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 23, 1987, Ser. No. 137,785
Int. Cl.[4] F16K *31/06, 1/44*
U.S. Cl. 251—129.15 17 Claims

1. A subassembly for an electromagnetically actuated valve comprising:

(a) guide means formed of non-magnetic material and defining an open hollow, said guide means adapted to be received and sealed in a valve housing;

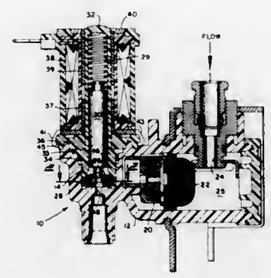
(b) armature means formed of ferromagnetic material and received in said hollow and guided for sliding movement therein, said armature means having a poppet disposed on one end thereof;

(c) retaining means formed integrally with said guide means and extending from the opening of said hollow, said retaining means defining thereon a plurality of registration surfaces;

(d) valve seat means having;

(i) a member formed of elastomeric material with a valving passage therethrough and a poppet seating surface formed on one end thereof, and

(ii) a rigid insert member having first portions thereof embedded in said elastomeric material and second portions thereof extending radially outwardly beyond said first portions, said second portions being received in engagement with said registration surfaces of said guide means for retaining said valve seat means thereon; and,



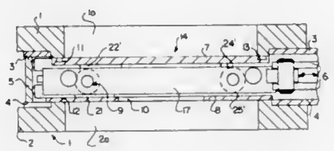
(e) means operative to bias said armature means in a direction urging said poppet into contact with said valve seat means.

4,817,915

SLIDE VALVE

Friedrich Tinner, Sax, Switzerland, assignor to Cetec AG, Sax, Switzerland

Filed Dec. 16, 1987, Ser. No. 133,784
Claims priority, application Switzerland, Dec. 18, 1986, 5100/86
Int. Cl.[4] F16K *25/00*
U.S. Cl. 251—199 5 Claims



1. A slide valve assembly which comprises

a valve housing which includes a pair of flange members and a plurality of casing members positioned between said flange members so as to fixedly position said flange members in parallel with one another, each of said flange members having openings therein to form a fluid flow passage through the valve housing, and each of said flange members having a seating surface surrounding the opening therein on a side thereof which faces the other flange member, and

a valve closure control device which is movable between said flange members of said valve housing into and out of a closure position within said valve housing at which said valve closure control device functions to block said fluid flow passage in said valve housing, said valve closure control device including

a frame means,

a first and second closure plates supported by said frame means so as to extend in parallel with said flange members, said first closure plate including three triangularly-arranged cam projections on a side thereof which faces said second closure plate and said second closure plate including three triangularly-arranged cam projections on a side thereof which faces said first closure plate, each of said cam projections including a first surface portion which is inclined relative to the associated closure plate,

resilient means positioned between said first and second closure plates to urge them towards one another, and

two spaced apart shafts mounted on said frame means and extending between said first and second closure plates, each said shaft including three roll bodies thereon, two of said three roll bodies on each said shaft being capable of contacting and rolling along the first surface portions of two cam projections on one of said closure plates and the third of said three roll bodies on each said shaft being capable of contacting and rolling along the first surface portion of a cam projection on the other of said closure plates,

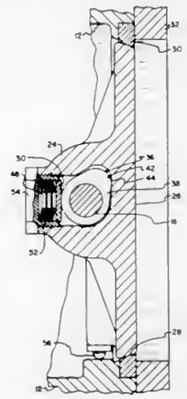
movement of said valve closure control device into said closure position causing said roll bodies on each of said shafts to contact said cam projections of each of said first and second closure plates to move said closure plates apart and into respective contact with said valve seating surfaces of said flange members.

4,817,916

BUTTERFLY VALVE

William W. Rawstron, Northboro, Mass., assignor to Jamesbury Corporation, Worcester, Mass.

Continuation-in-part of Ser. No. 23,430, Mar. 9, 1987, abandoned. This application Nov. 20, 1987, Ser. No. 123,417
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—163 13 Claims



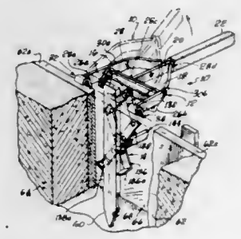
1. A valve comprising, a valve body, a passageway through said valve body, an annular valve seat position in and surrounding said passageway, a valve shaft rotatably mounted within said passageway on an axis located at right angles to the axis of said passageway, a valve closure member, and mounting means for mounting said valve closure member on said valve shaft adapted to move said valve closure member upon 90 ° of rotation of said valve shaft between an open position, a closed position in alignment with and spaced from said annular valve seat, and a seated position in which an annular surface of said valve seat, and a seated position in which an annular surface of said valve closure member engages said annular valve seat, said mounting means comprising a valve shaft passageway therein through which said valve shaft passes, and at least one cam chamber therein surrounding said valve shaft, and wherein said valve further comprises (a) a cam mounted on said valve shaft and rotatable therewith, said cam located in said cam chamber and said cam and said cam chamber being sized such that said cam engages said cam chamber upon rotation of said cam of 15° or less to move said mounting means and said valve closure member linearly along the axis of said passageway between said closed and said seated positions, (b) spring biasing means mounted on said mounting means and engaging said cam adapted to bias said mounting means and valve closure member from said seated position away from said annular valve seat linearly along said axis of said passageway to said closed position and (c) rotational stop means adapted to provide engagement between said valve body and said valve closure member to prevent further rotation of said valve closure member when said valve closure member has been rotated to said closed position in alignment with said annular valve seat.

4,817,917

METHOD AND APPARATUS FOR REMOVAL OF STAKES, AND THE LIKE

Robert L. Stultz, P.O. Box 251, Magalia, Calif. 95954; James M. Angel, 1647 Young Ave., and Rodney Kopsa, 1765 Sparks Drive, both of Paradise, Calif. 95969

Filed Jul. 9, 1982, Ser. No. 396,679
Int. Cl.[4] E21B *19/00*
U.S. Cl. 254—30 7 Claims



1. Apparatus for removing stakes, or the like, which are partially imbedded in the ground comprising: a leverage member having an elongated handle means on one end and means for contacting a leverage position on the other end; a pair of interconnected arms pivotally mounted upon said leverage member; a pair of gripping arms connected to said pivotally mounted arms in such manner that they can contact opposed sides of a stake, or the like, partially imbedded in the ground.

7. The method of removing stakes which have been driven into the ground from the ground comprising: gripping the stake on diametrically opposed sides with a pair of arms which are cooperatively hinged to one another in such manner that they may move inwardly towards one another against the sides of the stake, or the like while they are in contact; connecting said cooperative arms to a leverage member structure; exerting pressure against said arms in contact with said stakes by pivoting said leverage member structure upon at least one point against a member cooperative with a structural purpose of said stake comprising the edge of a concrete form held in position by said stake.

4,817,918

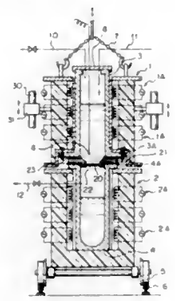
APPARATUS FOR FILTERING MOLTEN SCRAPS OF METAL FOR REGENERATION

Shogo Mochizuki, Shimizu; Hisao Isogai, Fuji; Sadanori Ishikawa, Shimizu, and Mitsuyoshi Mochizuki, Shizuoka, all of Japan, assignors to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1987, Ser. No. 108,650
Claims priority, application Japan, Oct. 17, 1986, 61-159254[U]
Int. Cl.[4] C21D *11/00*
U.S. Cl. 266—87 3 Claims

1. An apparatus for filtering scraps of light metal for regeneration thereof, comprising (1) an upper vessel having heating means for maintaining the scraps of the light metal charged therein for the filtration thereof, at a predetermined tempera-

ture in order to melt the same or for maintaining molten metal supplied therein after having been preliminarily molten, at said predetermined temperature, (2) a lower vessel having heating means, filtering means comprising a filtering material interchangeably mounted on a filter holder and interposed between said upper vessel and said lower vessel, the upper surface of said filtering material being rendered to be in a planar form, (3) temperature controlling means for both said heating means, (4)



pressurizing means connected to said upper vessel or depressurizing means connected to said lower vessel, said upper and lower vessels being made of cast steel or steel plates, (5) a lifting/lowering device for said upper vessel and (6) a transporting device for said lower vessel, wherein an inner vessel for receiving the molten metal which has been passed through said filtering means is freely and removably arranged within said lower vessel.

4,817,919

DEVICE FOR CASTING, PARTICULARLY CONVERTER FOR CASTING AND/OR POST-TREATING MOLTEN METAL

Hermann Mutschlechner, Hall i.T.; Herbert Platzer, Innsbruck, both of Austria, and Rudolf Pavlovsky, Schaffhausen, Switzerland, assignors to George Fischer Limited, Schaffhausen, Switzerland

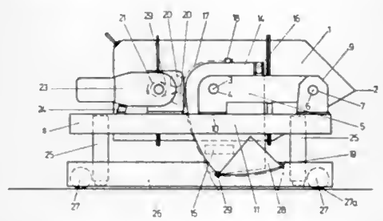
PCT No. PCT/CH83/00070, § 371 Date Feb. 7, 1984, § 102(e) Date Feb. 7, 1984, PCT Pub. No. WO83/04419, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 1, 1983, Ser. No. 589,110

Claims priority, application Switzerland, Jun. 7, 1982, 3497/82-3

Int. Cl.⁴ C21C *5/46*

U.S. Cl. 266—245 **6 Claims**



1. A casting device comprising a converter vessel, at least one chain guide segment fixed to said converter vessel, means for driving said guide segment, said guide segment having a first segment arc and a second segment arc serially arranged thereon, each of said first and second segment arcs having a different radius, wherein the improvement comprises only one tilting arm connected to each said guide segment, said tilting arm being elongated, a first bearing block and a second bearing block positioned on and disposed in spaced relation in the elongated direction of said tilting arm, said first segment arc having a smaller radius than said second segment arc, a stationary axle mounted in said second bearing block, said stationary axle forming the pivot point of the radius of said second segment arc, a tilting axle mounted in said first bearing block and said tilting axle forming the pivot point of said first segment arc, and said means for driving said guide segment includes only one driving member connected to each said guide segment, said converter vessel and said at least one guide segment being pivotally displaceable relative to said tilting arm about said tilting axle, and said converter vessel guide segment and tilting arm being pivotally displaceable about said stationary axle.

4,817,920

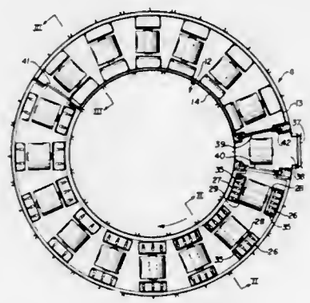
APPARATUS FOR CONTINUOUS HEAT TREATMENT OF METAL STRIP IN COIL FORM

Thomas J. Erfort, Jr., Pittsburgh, Pa., assignor to Salem Furnace Co., Pittsburgh, Pa.

Continuation of Ser. No. 835,549, Mar. 3, 1986, abandoned, which is a continuation of Ser. No. 673,890, Nov. 21, 1984, abandoned. This application Jul. 30, 1987, Ser. No. 79,699

Int. Cl.⁴ C21D *9/06*

U.S. Cl. 266—252 **4 Claims**



1. In an enclosed annular furnace chamber for heating coils of metal strip having a rotatable annular hearth and stationary sidewalls and roof

the improvement comprising means affixed to said hearth for supporting said coils on their outermost wraps with their axes in radial directions, a plurality of separate distribution means within said chamber including perforated face portions having a circular shape substantially corresponding to a coil end for simultaneously projecting a temperature-modifying gaseous medium against both ends of said coils and through the coil eyes and around their outer surfaces, said distributing means being spaced from said coil ends and positioned against said inner and outer sidewalls and adjacent said roof respectively to form spaced-apart stations around the furnace chamber, means for cyclically indexing the rotary hearth a distance equal to the spacing between adjacent stations and for holding at said position a predetermined period of time prior to repeating a next indexing cycle, whereby, each of the stations treat a coil as said coil is indexed around said furnace chamber, means positioned in the upper portion in each said station for withdrawing said gaseous medium from around the coil in that station and recirculating the same medium through said distributing means at that station, whereby the temperatures of said coils are modified by heat conduction between both ends of said coils and their centers.

4,817,921

COMPOSITE SPRING

Andrew Stevenson, Hertford, England, assignor to The Paton Corporation, Seattle, Wash.

Continuation of Ser. No. 886,753, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 680,841, Dec. 12, 1984, abandoned. This application Jan. 28, 1988, Ser. No. 149,944

Int. Cl.⁴ F16F *3/10*

U.S. Cl. 267—33 **11 Claims**



1. A spring having a force vs. deflection curve with a constant rate region which persists for about the initial 20% of its columnar deflection, a rising rate region which persists for about the last 40% of its columnar deflection, and an intermediate plateau region, said spring comprising: an elongated tubular elastomeric body having a generally straight sided longitudinal profile and a matching inner surface under zero columnar deflection, and a coil spring embedded in said body for controlling deformation of said body such that said plateau region persists for a substantial portion of such columnar deflection so long as the occurrence of a series of symmetric bulging instabilities at a plurality of locations spaced apart along the length of said body under a predetermined axial load condition, said body and said coil spring being constructed and arranged according to the following:

$$S = \frac{(R - r)n}{2H} \quad (a)$$

$$E = \frac{(R - r)}{t} \quad (b)$$

where

S=stability factor

E=reinforcing efficiency factor

H=total axial length of said body,

n=the total number of coils of said coil spring,

r=the internal radius of said body,

R=the external radius of said body,

(R−r)=the wall thickness of said body, and

t=the wire diameter of the coils of said coil spring,

wherein the value of S is between about 0.05 and 0.2 and the value of E is between about 0.05 and 0.2.

4,817,922

AIRSPRING HEIGHT SENSOR

Hubert T. Hovance, Ravenna, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 23, 1987, Ser. No. 111,896

Int. Cl.⁴ F16F *9/04;* **B60G** *17/04*

U.S. Cl. 267—64.21 **27 Claims**

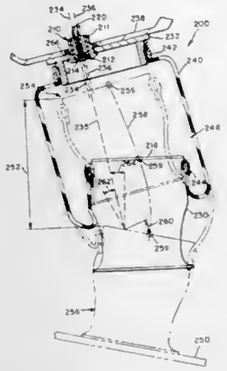
1. An airspring with an internal height sensor and a pair of rigid members comprising:

a rigid piston;

a rigid upper retainer;

a flexible membrane sealingly attached to said piston and said upper retainer to form a working cavity therebetween;

a means for sensing the relative vertical distance between said piston and said upper retainer, said means for sensing including an infrared light emitting diode transmitter attached to one of said rigid members and capable of emitting radiation of a given wavelength, a photo diode receiver positioned within receiving range of said infrared light emitting diode transmitter capable of sensing the radiation of said given wavelength and providing a variable output signal, a reflector positioned on said second rigid member within a line of sight of said transmitter, a means for comparing said variable output signal with a predetermined height range, a means for controlling the relative distance between said piston and said upper retainer.



4,817,923

VIBRATION DAMPER

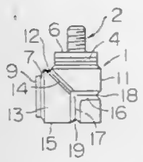
Yoshikiyo Kamata, Hachioji, and Takashi Fukuoka, Fuchu, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 894,806, Aug. 8, 1986, abandoned, which is a continuation of Ser. No. 710,680, Mar. 12, 1985. This application Jul. 20, 1987, Ser. No. 78,015

Claims priority, application Japan, Mar. 21, 1984, 59-40328

Int. Cl.⁴ F16F *1/52*

U.S. Cl. 267—63 A **1 Claim**



1. A vibration damper comprising:

a main body which is formed from an elastic material into a substantially cubic overall form having a plurality of grooves, which grooves are connected with each other on one surface of the main body;

fixtures which are attached to each of a first two surfaces of said main body which first two surfaces are adjacent each other;

a first groove formed on the body along the side where the first two surfaces bearing fixtures come together;

second two surfaces extending orthogonally with respect to said first two surfaces, said second two surfaces bearing a second groove and a third groove respectively, which second groove and said third groove are formed so as to extend diagonally from a respective end of said first groove to the center of their respective said second two surfaces and terminating at said center to form inner ends;

fourth and fifth grooves extending from the inner end of said second and third grooves in each said second two surfaces in orthogonal relationship to said first two surfaces, respectively and terminating in outer ends;

sixth and seventh grooves formed on a respective one of third two surfaces, said third two surfaces, located opposite said second two surfaces, and said sixth groove extending to the outer end of said fourth groove on each of said second two surfaces, and said seventh groove extending to the outer end of said fifth groove.

4,817,924

SPRING CORE FOR A MATTRESS

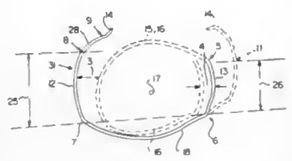
Alan Thoenen, Reherstr. 12a, St. Gallen, Sweden (CH-9016)

Continuation of Ser. No. 908,903, Sep. 18, 1986, abandoned, which is a continuation of Ser. No. 650,780, Sep. 14, 1984, abandoned. This application Apr. 28, 1988, Ser. No. 188,109

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333846

Int. Cl.[4] A47C *23/043*

U.S. Cl. 267—91 2 Claims



1. A spring core for a mattress, comprising a plurality of identically configured helical circular springs each made of a single piece of wire having a central spiral position (**15,16**) defining a spring axis (**17**) and terminating at opposing ends with upper and lower end spirals (**11,31**) disposed in planes substantially perpendicular to said spring axis, said springs being arranged in side by side rows and connected with each other at said upper and lower end spirals (**11,31**) by connecting elements (**30**) arranged in said planes, said upper and lower end spirals (**11,31**) each being substantially U-shaped and having a longer leg (**12**) and a shorter leg (**13**) connected to each other by a base web (**18**), said legs (**12,13**) of each end spiral being laterally outwardly spaced from said central spiral portion in relation to said spring axis, the radial spacing between said longer leg (**12**) and said central spiral portion (**15,16**) being greater than the corresponding spacing between said central spiral position and said associated shorter leg (**13**) of the same end spiral (**11,31**), the opposing end spirals of each spring being rotated approximately 180 degrees in relation to each other to dispose the longer and shorter legs of the upper end spiral of each spring in mirror symmetry to the longer and shorter legs, respectively, of the associated lower end spiral.

4,817,925

ENGINE MOUNT WITH HYDRAULIC DAMPING

Rüdiger Sprang, St. Augustin, and Ralf Waldecker, Neuwied, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1987, Ser. No. 92,039

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629860

Int. Cl.[4] **F16F** *15/04;* **B60K** *5/12*

U.S. Cl. 267—140.1 7 Claims

1. Engine mount with hydraulic damping, comprising a working chamber and a compensating chamber filled with liquid, a rigid intermediate plate disposed between said chambers, said intermediate plate having an overflow channel formed therein interconnecting said chambers, walls of elastomeric material at least partly surrounding said chambers, a rigid bearing plate for supporting an engine at an end of said working chamber defining an inner surface of said bearing plate facing said working chamber, said inner surface having a cylindrical recess formed therein in the form of an air storage chamber, and a throttle element maintaining a volume of the liquid in said air storage chamber separate from the liquid in said working chamber, said throttle element having a throttle

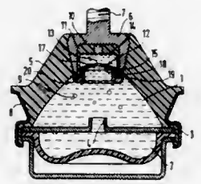


plate tapered toward said air storage chamber with a central throttle opening formed therein for aspirating air bubbles trapped in the liquid to be stored as a volume of air in said storage chamber, said throttle plate having an outer periphery, a hollow cylindrical attachment at said outer periphery, and a flat radial rim.

4,817,926

HYDRAULICALLY DAMPED TUBULAR RUBBER SPRING

Hans-Werner Schwerdt, Laudenbach, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,758

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711424

Int. Cl.[4] **F16F** *13/00*

U.S. Cl. 267—140.1 10 Claims



1. In a hydraulically damped tubular rubber spring comprising, in combination:

(a) an inner tube made of a hard, rigid material;

(b) an outer tube made of a hard, rigid material, said outer tube surrounding said inner tube in a spaced relationship;

(c) an elastomeric element disposed in the spacing between said inner and said outer tubes and adhesively attached thereto, said elastomeric element defining at least two chambers separated by a partition and arranged in succession in the direction in which forces are to be applied to said rubber spring;

(d) at least one throttle opening interconnecting said two chambers for passage of a liquid contained in said chambers;

the improvement wherein the inner tube is provided at least at one point with a radial enlargement of its wall that extends at right angles to the direction in which the forces are introduced, wherein the throttle opening is completely enclosed over at least a portion of its axial length by the radial enlargement, wherein the enlargement is formed by a rib which extends parallel to the axis of said inner tube, said rib being embedded in said partition, and wherein the ration between the radial length of the enlargement and

the radial length of the partition is in the range of 0.3 to 0.65.

4,817,927

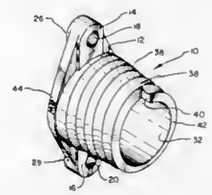
COIL TORSION SPRING MOUNTING CONES WITH GROOVE BREAK AND METHOD OF MOUNTING

David O. Martin, Salt Lake City, Utah, assignor to Martin Door Manufacturing, Salt Lake City, Utah

Filed Aug. 21, 1986, Ser. No. 898,533

Int. Cl.[4] **F16F** *1/08, 1/12;* **E05F** *1/08;* **F16B** *7/02*

U.S. Cl. 267—155 2 Claims



1. A coil torsion spring mounting apparatus for reducing chafing of a coil torsion spring comprising:

an anchor cone for a first end of the coil torsion spring comprising a frustoconical outer surface having a basal end and a terminal end, the external diameter of the terminal end being incrementally smaller than the internal diameter of the coil torsion spring and the external diameter of the basal end being incrementally larger than the external diameter of the terminal end so as to cause a plurality of the end coils at the first end of the coil torsion spring to tightly grip the anchor cone, the anchor cone including a spiral groove on the frustoconical outer surface extending from the terminal end to the basal end and having a contour in the groove corresponding to the external diameter of a spring wire that forms the coils of the coil torsion spring, the groove corresponding to the coils of the first end of the coil torsion spring and terminating at a groove break formed as an edge transverse to the axis of the groove, the anchor cone including anchor means for anchoring the anchor cone to a bracket, first indicia means on the anchor cone for indicating the direction of mounting the anchor cone to the first end of the coil spring; and

a winding cone for a second end of the coil torsion spring comprising a frustoconical outer surface having a basal end and a terminal end, the external diameter of the terminal end being incrementally smaller than the internal diameter of the coil torsion spring and the external diameter of the basal end being incrementally larger than the external diameter of the terminal end so as to cause a plurality of the end coils at the second end of the coil torsion spring to tightly grip the winding cone, the winding cone including a spiral groove on the frustoconical outer surface extending from the terminal end to the basal end and having a contour in the groove corresponding to the external diameter of the spring wire that forms the coils of the coil torsion spring, the groove corresponding to the coils of the second end of the coil torsion spring and terminating at a groove break formed as an edge transverse to the axis of the groove, the winding cone including winding means for rotating the winding cone in a preselected direction so as to selectively increase the coil tension of the coil spring, second indicia means on the winding cone to indicate the proper mounting orientation of the winding cone to the second end of the coil torsion spring, third indicia means on the winding cone to indicate the proper placement of the coil torsion spring relative to the overhead door, fourth indicia means on the winding cone to indicate the direction of rotation of the winding cone to create said increase in tension of the coil spring, and fifth indicia means on the winding cone to indicate the color the winding cone is to be colored.

4,817,928

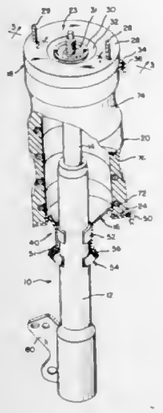
SUSPENSION SYSTEM

H. Neil Paton, 1460 Elliott Ave. West, Seattle, Wash. 98119

Filed Oct. 9, 1987, Ser. No. 106,459

Int. Cl.[4] **B60G** *13/00, 15/00;* **F16F** *7/00, 9/00*

U.S. Cl. 267—219 7 Claims



1. A suspension, comprising: a damping assembly; first spring seat means operatively associated with said damping assembly forming a first seating surface which is continuous and extends around said damping assembly; second spring seat means operatively associated with said damping assembly forming a second seating surface which is continuous and extends around said damping assembly in an opposed parallel relationship with said first seating surface; a tubular, sealed elastomeric spring having two ends which are operatively associated with said first seating surface and said second seating surface to form two continuous seals therebetween, respectively; first anti-tampering means acting between said first spring seat means and one end of said spring; second anti-tampering means acting between said second spring seat means and the other end of said spring; bearing means acting between said second spring seat means and said cylinder, and including a load bearing member and a thrust bearing member; said load bearing member being movable with respect to said damping assembly and projecting away from said other end in an outward direction; said thrust bearing member being secured to and projecting outwardly from said damping assembly in parallel underlying relation with said load bearing member; and third anti-tampering means acting between said load bearing member and said thrust bearing member; said first anti-tampering means being breakable in response to tampering with the seal formed between said first seating surface and said one end; said second anti-tampering means being breakable in response to tampering with the seal formed between said second seating surface and said other end; and said third anti-tampering means being breakable in response to tampering with said spring and said first and second spring seat means.

4,817,929

CABLE CLAMP ALIGNMENT FIXTURE

Frank J. Kozak, St. Clair, Mich., assignor to Detroit Edison Company, Detroit, Mich.

Filed Dec. 28, 1987, Ser. No. 138,580

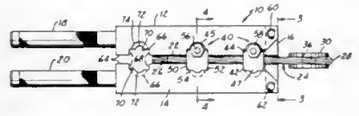
Int. Cl.[4] **B25B** *1/20*

U.S. Cl. 269—43 4 Claims

1. A fixture for assisting in clamping the folded-back end

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portion of a cable to the load supporting main position of the cable by means of clamps spaced apart lengthwise thereof, said fixture comprising a first elongated member, a second elongated member, means pivotally connecting said members together at one end thereof for pivotal movement in a common plane from an open position to a closed position, said members having confronting surfaces which in the closed position of said members are disposed in parallel spaced apart relation to receive and retain said folded-back end portion and main portion of said cable in side by side relation when said cable is

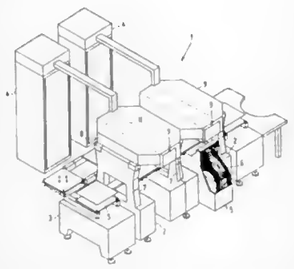


disposed lengthwise between said members, said first member having longitudinally spaced recesses in its confronting surface, said second member having longitudinally spaced recesses in its confronting surface which are respectively opposed to the recesses in the confronting surface of said first member when said members are moved to closed position, said opposed recesses in the closed position of said members receiving and firmly gripping said clamps against rotation and at the same time exposing said clamps so that they may be tightened by means of a wrench or similar tightening device.

4,817,930
GUIDING DEVICE

Fransiscus H. Van Deuren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 9, 1987, Ser. No. 119,462
Claims priority, application Netherlands, May 13, 1987, 8701139
Int. Cl.[4] B23Q *1/02*
U.S. Cl. 269—73 **11 Claims**

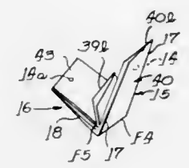


1. A guiding device comprising at least one base portion, at least one aerostatically journalled carriage portion displaceable with respect to the at least one base portion and a drive for the at least one carriage portion,
said at least one base portion being provided with guide tracks,
said at least one carriage portion being provided with a plurality of bearing feet, which cooperate with the guide tracks and in which ducts are provided for the supply of pressurized air for generating and maintaining air cushions, which act as air bearings,
said guiding device further comprising means for pre-stressing the air bearings, wherein
the guide tracks define first and second guide planes enclosing an angle with each other,
and the means for pre-stressing the air bearings includes a magnet system comprising a permanent magnetic part and a ferromagnetic part, which are arranged with opposite surfaces facing each other on the base portion and the carriage portion, respectively
the plane of symmetry through the centre line of the magnet system enclosing first and second acute angles with the first and second guide planes, respectively
said opposite surfaces of said permanent magnet part and said ferromagnetic part enclosing third and fourth acute angles with said first and second guide planes, said third and fourth acute angles being the complementary angles of said first and second acute angles, respectively.

4,817,931
FOLDED LEAFLET AND METHOD AND APPARATUS FOR MAKING SAME

Robert Vijuk, Downers Grove, Ill., assignor to Vijuk Equipment, Inc., Elmhurst, Ill.

Filed Jan. 20, 1987, Ser. No. 5,422
Int. Cl.[4] B41L *43/12*
U.S. Cl. 270—37 **4 Claims**



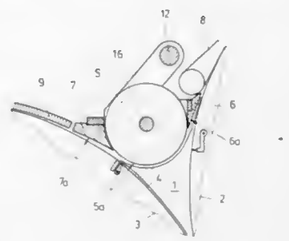
1. A folded closed instructional leaflet having exterior edges and being formed from an integral sheet comprising:
a pair of first fold lines formed in the sheet and extending parallel and dividing the sheet into superimposed panels,
a first cross fold normal to said fold lines which divides the superimposed panels into a first short leg and a second long leg, each of said legs having superimposed panels therein,
a lip portion on said long leg,
a second cross fold in the short leg forming a short interior section in the short leg disposed within the interior of the leaflet and a leg section,
a third cross fold in the long leg forming a leg section having superimposed panels with the lip portion on said leg section, said second and third cross folds forming substantially equal halves for the leaflet with the short interior section between the halves, and
adhesive means interior of the leaflet joining the halves together at the lip portion to form a closed leaflet with fold lines and cross folds along its exterior edges.

4,817,932
GUIDE DEVICE

Rudolf Stäb, Frankenthal, and Hans-Peter Sonnenberg, Altrip, both of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Feb. 1, 1988, Ser. No. 151,024
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705195
Int. Cl.[4] B41C *1/04*
U.S. Cl. 270—47 **18 Claims**

1. A guide device for a narrowing gap between the two cylinders of a machine for processing sheet-like products, adapted to cooperate with each other during the transfer of the sheet-like products comprising a rotary member which is rotatably supported by means of lateral journals with an axis parallel to the cylinders and has a cylindrical outer surface, and at least one stationary connection member which is laterally adjacent to the aid rotary member and has a surface configuration tangentially intersecting with the cylindrical outer surface of the rotary member, and in the case of which the rotary member and each connection member associated therewith are arranged so as to be adjustable in relation to the adjacent cylinders, wherein on at least one of the lateral journals of the rotary member, which is able to be moved by means of a

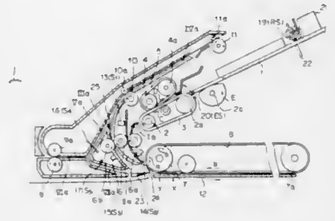


setting device along an associated guide running sideways in relation to the axis of the rotary member, there is for each connection member at least one pivoting arm pivoted on the same and on such pivoting arm a carrier for the associated connection member is pivotally carried, which carrier is in pivotally firm connection with an associated sliding guide device.

4,817,933
DOCUMENT HANDLING APPARATUS

Takeshi Honjo, Kawasaki, and Naomi Takahata, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,576
Claims priority, application Japan, Oct. 2, 1984, 59-206619; Oct. 2, 1984, 59-206620; Oct. 2, 1984, 59-206621; Oct. 2, 1984, 59-206622; Oct. 2, 1984, 59-206623; Oct. 2, 1984, 59-206624; Oct. 2, 1984, 59-206625
Int. Cl.[4] B65H *5/22*
U.S. Cl. 271—3.1 **8 Claims**

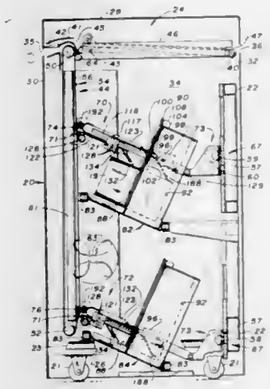


8. A document handling apparatus comprising:
stacker means for stacking documents;
document feeding means for feeding a document from said stacker means to a position for exposure and returning the document after the exposure thereof to said stacker means;
first detecting means for detecting one circulation of a bundle of documents stacked on said stacker means, said first detecting means having a partition member set on the document bundle, and a sensor for sensing said partition member;
second detecting means for detecting the presence of the document in an inlet section of said document feeding means; and
control means for monitoring an output from said second detecting means for a predetermined period prior to initiation of re-feeding of the documents from the stacker means so as to control said document feeding means to continue an operation thereof, upon setting of said partition member on the document bundle, when the document is detected within the predetermined period, and to inhibit the operation thereof, without setting said partition member on the document bundle, when the document is not detected within the predetermined period.

4,817,934
DUAL TOTE SORTER AND STACKER

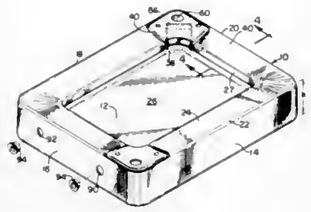
Walter A. McCormick, Bellevue; Douglas W. Langton, Seattle; James Kellum, Renton; Steve McKelvy, Bellevue, and Greg Phillips, Seattle, all of Wash., assignors to EMF Corporation, Redmond, Wash.

Filed Jul. 27, 1987, Ser. No. 78,254
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—295 **16 Claims**



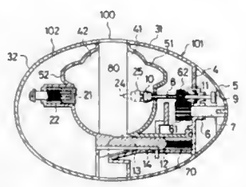
1. An apparatus for receiving, transporting, and stacking sheets into stacks comprising the combination of:
(a) a support frame defining an enclosure, said enclosure having sheet receiving means for entry of said sheet into said enclosure;
(b) vertical conveyor means extending along one wall of said enclosure; said vertical conveyor having a plurality of foraminous belts through which air is drawn into a vacuum plenum, a wall of said vacuum plenum supporting said belts for movement thereon, said belts being trained about upper and lower rollers;
(c) means for conducting said sheets from said receiving means to said vertical conveyor;
(d) means for removing said sheets from said vertical conveyor and placing said sheets in a stack on a support surface, said means for removing comprising a carriage assembly abutting said vertical conveyor and having means to raise and lower said carriage assembly engaging said frame, said means for removing having a transfer deflector attached in said carriage, said transfer deflector being located between said vacuum plenum and said foraminous belts, and extendable into the path of sheets travelling along said vertical conveyor to deflect said sheets onto said carriage assembly, further comprising means to deliver sheets to an inclined tray and an extendable and retractable sheet transfer support surface over which said sheets move from said vertical conveyor to said tray;
(e) an inclined tray assembly, said tray assembly having an inclined tray removably attached to said support frame and being located near the end of said extendable and retractable sheet transfer surface, said tray receiving sheets from said carriage, the vertical location of said carriage indexing with the height of the stack of said sheets within said tray.

4,817,935
PLAY ENCLOSURE FOR ARTWORK, PAPERWORK, SAND AND WATER PLAY USE
Nevada Varga, R.D. #2, Box 401 A, Milford, N.J. 08848
Filed Apr. 12, 1988, Ser. No. 180,524
Int. Cl.[4] A63G *31/00*
U.S. Cl. 272—1 A 16 Claims



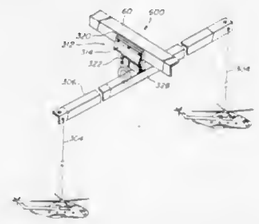
1. An enclosure for interchangeable use for artwork, paperwork, sand play and water play adapted for play by children, comprising:
an open top, rectilinear, box-like structure having short side walls as compared with a length and a width of said rectilinear structure;
a peripheral shelf inwardly extending from peripheral top edges of all sides of said open top of said rectilinear structure, a top surface thereof having an inward extension wide enough for a child's seat and a child's table surface, said peripheral shelf having at least one corner cut-out adjacent an intersection of two side walls of said rectilinear structure, said cut-out having a mouth open to a center region of said rectilinear and said peripheral shelf defining, about a periphery of said cut-out, a peripheral groove open to said top surface of said shelf; and,
at least two discrete, interchangeable corner elements each having an elemental top surface of substantially the same size and shape as said cut-outs, each said corner element having depending side wall sections with a thickness and a height complementary to said peripheral groove of said cut-out such that when said removable corner elements are disposed in said cut-out, said side wall sections mate with said peripheral groove and said elemental top surface is coplanar with said top surface of said peripheral shelf, one of said two corner elements having means for holding instruments, and the other one of said two corner elements having a shallow, depressed elemental center region with holes permitting passage of a fluid medium into an inboard region of said rectilinear structure.

4,817,936
SPRING-POWERED TOY
Takashi Matsuda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 920,305, Oct. 16, 1988, Pat. No. 4,736,943. This applicatioo Apr. 11, 1988, Ser. No. 180,287
Int. Cl.[4] A63J *23/00*; A63H *13/16*
U.S. Cl. 272—27 R 5 Claims



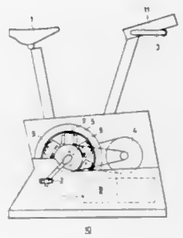
1. A combination toy comprising;
i. a hollow housing container having two half shell members separably connected together to form a single shell form, and internally having a housing space when two shell members are connected together; and a spring powered mobile toy capable of being housed in said housing space in said hollow housing container, and having spring drive means that makes by its output said toy member to be movable;
ii. an input/output axle for said spring drive means disposed on the external face of said spring powered mobile toy, and on the tip thereof is provided with coupling means;
iii. wherein said hollow housing container comprises
a. spring windup means having an axle that is capable of being coupled with said coupling means of said input/output axle of said spring powered mobile toy housed in said housing space;
b. connecting means for connecting half shell members;
c. connection retaining means for maintaining the connecting state of said connecting means
d. and connection releasing means for canceling the connecting state of said connecting means by the output rotation of said input/output rotation of said self powered mobile toy.

4,817,937
PROPULSION APPARATUS FOR A MODEL OF A FLYING OBJECT
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 743,156, Jun. 10, 1985, abandoned. This application Jul. 10, 1987, Ser. No. 72,054
Int. Cl.[4] A63H *13/20*
U.S. Cl. 272—31 R 6 Claims



1. A propulsion apparatus for a flying object, said propulsion apparatus comprising:
a base;
a telescopic shaft extending from said base;
drive means for rotating said shaft about its longitudinal axis;
an arm connected to said shaft at a center of said arm;
a transparent hanging line connected at one end to said arm;
connecting means for connecting the other end of said hanging line to an upper surface of a body of the flying object; and
said hanging line being connected to said arm through a clip-on assembly, said clip-on assembly including a clamping clip body, two parallel slats secured to clamping sections of said clip body and engaging with said arm, a mounting plate secured to a handle section of said clip body, a bar-shaped member having holes for said hanging line at opposite ends thereof and rotatably secured to said mounting plate so as to change an angle between said arm and said bar-shaped member.

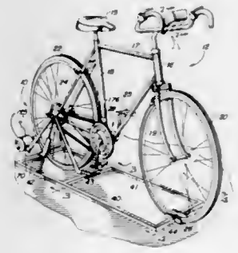
4,817,938
BICYCLE ERGOMETER AND EDDY CURRENT BRAKE THEREFOR
Shinroku Nakao, Kanagawa; Masao Itoh, Tokyo; Akira Itoh, Tokyo, and Hiroshi Takano, Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Division of Ser. No. 588,933, Mar. 13, 1984, Pat. No. 4,678,182.
This application Jun. 22, 1987, Ser. No. 64,556
Claims priority, application Japan, Jul. 8, 1983, 58-123172; Jul. 8, 1983, 58-123173
Int. Cl.[4] A63B *69/16*
U.S. Cl. 272—73 5 Claims



1. A bicycle ergometer comprising:
an exercise device for use by a user;
means for selectively inputting physical attributes of said user into said exercise device, said inputting means including a keyboard display for generating a digital value corresponding to said inputted physical attributes;
conversion means for converting said digital value corresponding to said inputted physical attributes to an analog value;
a pulse sensor for measuring the number of pulses per minute of said user;
arithmetic control circuit means coupled with said pulse sensor for calculating a training range defined by an upper limit of pulses per minute and a lower limit of pulses per minute corresponding to said inputted physical attributes, and for producing a load changing signal in response to said pulse sensor for maintaining the number of pulses of said user within said training range; and
loading means coupled to said exercise device for varying a load applied to said exercise device in accordance with said load changing signal, said loading means including:
a rotor assembly, said rotor assembly being formed of ferrous material having not more than about 0.12% carbon and not more than about 0.34% silicon;
a stator having a plurality of series-connected coils proximate a periphery of said stator; and
means connected between a power source and said coils for generating a substantially constant current in response to said load changing signal, said current generating means including a characteristic signal generating circuit for generating a square root signal in response to said load changing signal and a current control circuit connected to said signal generating circuit for controlling the current supplied to said coils through said power source, said rotor assembly providing a substantially constant torque characteristic in response to said current generating means.

4,817,939
CYCLE TRAINING DEVICE
Quent Augspurger, and Charles H. Bartlett, both of 2519 E. Thomas Rd. #A, Phoenix, Ariz. 85016
Filed Dec. 28, 1987, Ser. No. 138,152
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—73 9 Claims

1. A stationary exercise apparatus for use with a conventional bicycle having a frame-mounted wheel on an axle driven through a rider-operated pedal mechanism, said apparatus comprising:
(a) a base member for supporting said bicycle;
(b) power generating means including:
(i) an AC induction motor having a shaft, said motor connectable in a power circuit and being an asynchronous generator upon reaching a predetermined speed;
(ii) motion sensing means engageable with said bicycle wheel and adapted to be driven thereby; and
(iii) uni-directional clutch means operatively interposed between said motor shaft and said motion sensing means whereby said motor shaft is driven only in one rotational direction by operation of said bicycle through the full range of operational speeds;
(c) indicator means connected to said motor providing an indication of the power generated by said motor upon said motor reaching synchronous speed;



(d) a support member pivotally mounted on said frame, said support member extending at opposite sides of the bicycle wheel and having hubs detachably securable at opposite ends of the said axle supporting the wheel, said support member being mounted to provide limited pivotal movement of the wheel and bicycle about a longitudinal axis extending adjacent the lower-most point on the wheel; and
(e) switch means in said power circuit operative to energize said motor only when a predetermined pedal speed is achieved by the rider which speed approximately corresponds to the synchronous speed of the motor, such that when the pedal speed falls below the synchronization speed, the motor disconnects from the power circuit but the one-way clutch remains engaged as long as the pedals are operated.

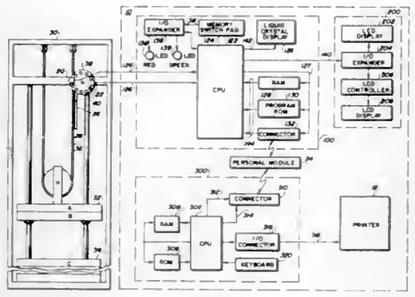
4,817,940
COMPUTERIZED EXERCISE MONITORING SYSTEM AND METHOD FOR COMPARING PRESENT AND PAST EXERCISE ACTIVITIES
Bon F. Shaw, Winter Park, and Gary M. Bond, Orlando, both of Fla., assignors to Fike Corporation, Blue Springs, Mo.
Filed Apr. 4, 1986, Ser. No. 848,215
Int. Cl.[4] A63B *21/24*
U.S. Cl. 272—93 34 Claims

1. A system for monitoring and comparing electrical signals representative of the movement of an exercise machine, said movement corresponding to a user's exercise performance with criteria representative of the user's previous exercise performance on the exercise machine, said system comprising:
(a) a monitoring means for measuring in real time a present movement of the exercise machine corresponding to a user's exercise activity and for providing signals representative thereof;
(b) memory means for providing signals representative of the user's past movement of the exercise machine; and
(c) evaluating means coupled to said monitoring means for receiving said signals representative of the user's present

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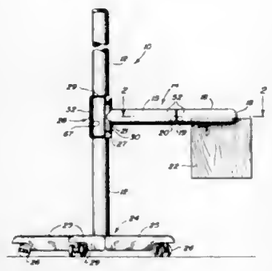
movement of the exercise machine and coupled to said memory means for receiving said past signals, for comparing said present signals to said past signals, and for computing a repetition count based on a percentage change between said past and present movements and providing an output signal representative of said repetition count.

24. In an exercise monitoring system having an evaluation means, a memory means, and a sensing means, a method of monitoring and comparing a user's exercise performance on an exercise machine to the user's past exercise performance, said method comprising the steps of:



(a) measuring a movement in the exercise machine caused by a physical exertion of a user and producing a signal representative thereof;
(b) retrieving data from the memory means, the data identifying the user's past movement of the exercise machine and producing a signal proportional thereto;
(c) comparing, with the evaluation means, the signal from the present movement of the exercise machine with the signal from the past movement of the exercise machine and computing a repetition count based on a percentage change between said present and past movements; and
(d) displaying an indication of the movements and the repetition count to the user.

4,817,941
ADJUSTABLE TARGET HOLDER FOR MARTIAL ARTS TRAINING
Tim McCorry, 326 Gwynedd Ct., Exton, Pa. 19341
Filed Oct. 2, 1987, Ser. No. 103,953
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—76 **9 Claims**

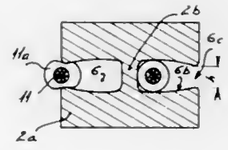


1. An adjustable target holder for martial arts training, comprising:
a vertical support post and means to support said post to extend perpendicularly from a supporting surface;
an elongated bi-sectional arm including:
(i) a first arm having a proximal end for attachment to said post and a distal end;
(ii) a second arm, including an extending section rotatably attachable to said distal end of the first arm, one of the first arm and the extending section of the second arm having a diameter less than the diameter of the other of said first arm and the extending section of the second arm, whereby said first arm and said second arm fit within one another;
means to slidably retain said elongated bi-sectional arm at the proximal end of the first arm on said post;
means to rotatably and lockably retain said extending section, including a plurality of identical angularly spaced depressions around a circumference of one of the first arm and the second arm, proximate the distal end of the first arm, and a spring loaded push button mounted on and extending from the other of said first and said second arm, the spring loaded push button being operably connected to a spring loaded follower, the spring loaded follower being mounted to be depressed by depression of said push button, permitting relative rotation of the first arm and the second arm, and upon release of the spring loaded push button, the spring loaded follower engaging in one of the angularly spaced depressions, fixing the second arm relative to the first arm;
means located in said second arm to removably retain and position a target; and,
means to prevent lateral movement of the second arm in the first arm, including a collar and collar mounting means mounted in the first arm and the extending section of the second arm, the collar and collar mounting means frictionally engaging one another to prevent said lateral movement.

4,817,942
SAFETY FENCING SWORD
Jean A. Begon, Saint-Etienne, France, assignor to Begon S.A. Societe Anonyme, Le Chambon Feugerolles, France
PCT No. PCT/FR86/00160, § 371 Date Jan. 9, 1987, § 102(e) Date Jan. 9, 1987, PCT Pub. No. WO86/06824, PCT Pub. Date Nov. 20, 1986
PCT Filed May 7, 1986, Ser. No. 10,978
Claims priority, application France, May 10, 1985, 85 07459
Int. Cl.[4] A63B *69/02*
U.S. Cl. 272—98 **10 Claims**

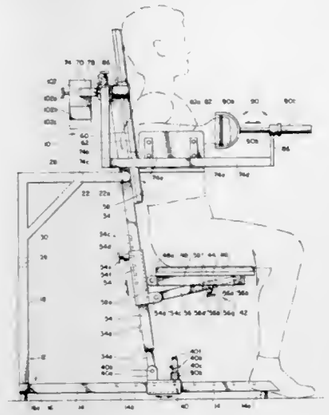
1. A safety fencing sword capable of providing an audible indication of metal fatigue, comprising:
an elongated blade having a tip at one end and means for mounting a handle at an opposite end of the blade; and
at least one groove formed in said blade and subdividing same over at least a portion of the length of said blade from said tip into at least two elongated blade parts held together by a strain concentration zone fixedly and unitarily interconnecting said parts for effective fencing, said strain concentration zone being dimensioned and configured to rupture longitudinally upon the development of a fencing-use-generated fatigue of the material approaching a transverse-breakage condition to cause exclusive longitudinal separation of said parts at said portion of said blade, thereby altering a sound generated by the blade upon impact.



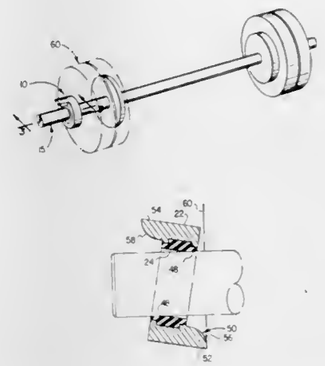


4,817,943
TOTAL SHOULDER EXERCISE AND MUSCLE DEVELOPMENT MACHINE
George Pipasik, 954 14th St., Apt. A, Santa Monica, Calif. 90403
Filed Aug. 20, 1987, Ser. No. 87,591
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **14 Claims**

1. An exercise machine for the strengthening and development of shoulder muscles comprising:
(a) a frame including a longitudinally-extending base beam and an upper pair of horizontally-projecting support arms each terminating in a journal box;
(b) a centrally-disposed, extensible-length body support beam journaled in its upper portion to the journal boxes of said support arms for pivotal connection thereto and including means at its lower end for adjustable coupling to said base beam whereby the lower end of said body support beam may be positioned forwardly or rearwardly on said base beam to provide a desired vertical or off-vertical orientation to said body support beam;
(c) an adjustable height seat on said body support beam adapted to support an exercising person in a sitting position;
(d) right side and left side arm abutment members positioned for engagement by the forearms, in horizontal orientation, of the exercising person, said abutment members each being affixed to a supporting frame journaled to a journal box affixed to the upper end of said body support beam located at a point above a shoulder of the exercising person whereby said arm abutment members may each be rotated outwardly and upwardly by movement of the upper arm of said exercising person;
(e) handgrip means carried by the supporting frame of each abutment member at the forward end thereof and positioned for grasping engagement by the hands of the exercising person; and
(f) weight means carried by the supporting frame of each abutment member at the rearward end thereof and adjustably positioned on said frame with respect to the pivot point of said frame whereby a variable resistive force for strengthening and developing shoulder muscles is applied through said frame and said abutment member to the forearm of said exercising person in opposition to rotative movement of the upper arm of said person in an outward and upward direction.



4,817,944
APPARATUS FOR RETAINING WEIGHTS ON A BARBELL
Gregory H. Anderson, Plano, and Alan B. Tarrant, Leonard, both of Tex., assignors to Charles Aaron, a part interest
Filed Dec. 30, 1987, Ser. No. 139,466
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **14 Claims**



1. Apparatus for captively retaining a weight member on a weight lifting bar extending along a first axis and having an

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outer end portion slidably received in a central opening formed through the weight member, said apparatus comprising:

a collar member having an annular cross-section and including a relative rigid radially outer portion, and a radially inner portion formed from a resilient frictional gripping material, said collar member extending along a second axis passing through a central opening formed in said radially inner portion and adapted to slidably receive said outer end portion of the weight bar to permit said collar member to be moved along said outer end portion of the weight bar against a frictional resistance force of said radially inner portion, toward and away from the weight member thereon, when said first and second axes are generally aligned; and

weight engagement means, associated with said collar member and responsive to forceable interengagement with the weight member, for tilting said collar member on said outer end portion of the weigh bar, about a third axis generally transverse to said first axis, to thereby radially compress only axially spaced portions of said frictional gripping material against said outer end portion of the weight bar in a manner frictionally locking said collar member on the weight bar to prevent axially outward dislodgement of the weight member therefrom,

said weight engagement means comprising an axially outer end portion of said radially outer portion of said collar member.

4,817,945

METHOD OF SCORING POCKET BILLIARD BOWLING

Larry G. Ferguson, 1606 Pipeline Rd., Summer Shade, Ky. 42166

Filed Apr. 12, 1985, Ser. No. 722,703
Int. Cl.[4] A63D *15/00*

U.S. Cl. 273—2 **1 Claim**

1. In the method of playing pocket billiard bowling using a six pocket billiard table, a billiard cue, a cue ball, ten object balls, and means for displaying each player's score comprising a horizontal line for each player, ten blocks to each line, two small rectangles located in an upper corner of the first nine blocks of each line and three small rectangle located in the upper portion of the tenth block of each line, the steps comprising:

(a) beginning a first inning by racking the ten object balls on the table, a first player striking the cue ball with the cue to direct such ball at the rack of object balls and break the same, said first player striking the cue against the cue ball to hit one of the object balls and attempt to direct it into a pocket, repeating said attempt until said first player has pocketed the ten object balls or has committed two errors, each error comprising a miss, a scratch or a foul, scoring as in blowing by operating said means to indicate in the leftmost small rectangle the number of object balls pocketed before committing a first error, operating said means to indicate in the rightmost small rectangle the number of object balls pocketed after the first error and before committing a second error;

(b) after the first player has committed two errors or pocketed ten object balls prior to two errors, again racking the ten object balls on the table, a second player similarly striking the cue ball to break the racked balls and to attempt to direct the object balls into pockets, said second player repeating said attempt similar to said first player until said second player has committed two errors or has pocketed ten object balls before committing two errors, operating said means to indicate the number of object balls pocketed by said second player similar to the indication for the first player;

(c) commencing a second inning by said first player attempting to direct object balls into the pockets in the same manner as in said first inning, scoring as in bowling by operating said first player's display means to indicate in the two small rectangles of said second block the number of pocketed object balls in the same manner as in the first inning;

(d) scoring as in bowling by indicating in said first block of said first player the cumulative score for the first inning by adding the indications of the two small rectangles of the first block if less than ten balls had been pocketed by the time of the second error, displaying in said first block of said first player the cumulative score for the first inning by also adding the first small rectangle indication of said second block if ten object balls had been pocketed after the first error and before a second error in the first inning or adding both small rectangle indications of said second block if ten object balls had been pocketed before a first error in the first inning;

(e) completing the second inning by the second player attempting to pocket object balls and indicating that player's score in the first block and small rectangles of the second block in the same manner as the first player;

(f) repeating the above sequence of pocketing object balls and operating the display means through a total of ten innings;

(g) for the tenth inning, each player making a first additional attempt to pocket ten object balls if that player had succeeded, for that inning, in pocketing ten object balls before two errors had been made;

(h) for the tenth inning, each player making a second additional attempt to pocket ten object balls if that player had succeeded, for that inning, in pocketing ten object balls before one error had been made; and

(i) scoring by indicating in the leftmost small rectangle of each player's tenth block the number of object balls pocketed before committing a first error in the tenth inning, indicating in the middle small rectangle of each player's tenth block the number of object balls pocketed after the first error and before committing a second error or the number of object balls pocketed in that player's first additional attempt of the tenth inning if ten object balls had been pocketed before committing a first error, indicating in the rightmost small rectangle the number of object balls pocketed in that player's first additional attempt of the tenth inning if ten object balls had been pocketed before committing a second error or the number of object balls pocketed in that player's second additional attempt of the tenth inning if ten object balls had been pocketed before committing a first error, and indicating in each player's tenth block that player's cumulative score for the game by adding all of that player's tenth block small rectangle indications to the cumulative score indication in that player's ninth block.

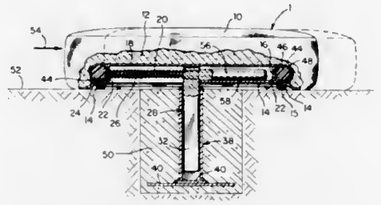
4,817,946

YIELDABLE BASEBALL BASE

Florencio Velasquez, 258 Frederick St., Nogales, Ariz. 85621

Continuation-in-part of Ser. No. 798,935, Nov. 18, 1985, abandoned. This application Apr. 28, 1987, Ser. No. 43,352
Int. Cl.[4] A63B *71/00*

U.S. Cl. 273—25 **7 Claims**



1. A base comprising a frame in the form of a plate with bent

up side walls with side edge flanges projecting outwardly from the side walls,

guide means extending across the frame fixed to opposed side walls,

anchor means including a non-circular tube open at one end for embedding in the ground to resist any movement with the open end located near ground level and exposed,

carriage means slidingly mounted on the guide means and including a depending stem having a peripheral shape to match the inner shape of the non-circular tube so that the stem can be slidingly received in the non-circular tube,

spring means biasing said carriage means relative to the frame,

padded means for covering the frame including a roll that surrounds the frame and lies at the juncture of the side walls and the side edge flanges, and

attaching means for attaching the padded means to the frame.

4,817,947

METHOD OF PLAYING A BOWLING GAME

Michael G. Gautrand, Muskegon, Mich., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 9, 1987, Ser. No. 118,247
Int. Cl.[4] A63D *5/00*

U.S. Cl. 273—37 **24 Claims**



1. A method of playing a bowling game in which players are allowed at least one ball to knock down pins in each of a plurality of frames, said method comprising:

(a) determining a handicap for each player of the game;

(b) selecting a handicapped pin setup for each player for each frame commensurate with the respective player's handicap;

(c) requiring each player to deliver at least one ball in each said frames;

(d) counting the number of pins knocked down by each player in each frame, for determining a score for each player for each frame;

(e) recording each player's frame score as a function of said counting;

(f) adding each player's frame score to determine said player's total score for the game; and

(g) comparing the player's game scores to determine the winner of the game.

4,817,948

REDUCED-SCALE RACING SYSTEM

Louise Simonelli, 1560 E. 31st St., Brooklyn, N.Y. 11234

Filed Sep. 6, 1983, Ser. No. 529,724
Int. Cl.[4] A63H *30/04*

U.S. Cl. 273—86 B **10 Claims**

1. A reduced-scale racing apparatus comprising:

at least one self-powered remotely controlled vehicle; and

at least one operator's booth containing a control console for operating said vehicle,

said vehicle comprising:

a race car body,

first control means on said body for controlling travel of said vehicle,

a forwardly trained video camera mounted on said body,

a rearwardly trained video camera mounted on said body,

transmitter means on said body for the wireless transmission of respective signals from said forwardly and rearwardly trained video cameras, and

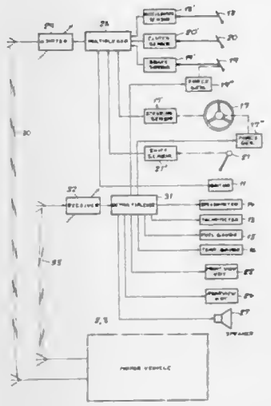
receiver means on said body responsive to wireless signals for operating said first control means;

said operator's booth comprising:

a housing for containing an operator and receiving said control console,

second control means in said housing for generating wireless signals receivable by said receiver means for operating said first control means,

a first video display screen in said housing responsive to the transmitted signals from said forwardly trained video camera for displaying the path in front of said vehicle, said first video display screen being positioned



in front of the operator and configured as a windshield of a race car, and

a second video display screen in said housing responsive to the transmitted signals from said rearwardly trained video camera for displaying the path in back of said vehicle, said second video display screen being positioned at the upper right of said first screen and configured as a rearview mirror of a car; and

said body being further provided with a pair of sideview mirrors mounted within the field of view of said forwardly trained video camera for displaying the reflection thereof at the sides of said first video display screen.

4,817,949

AUTOMATED TELLER MACHINE TRANSACTION RECEIPTS WITH INTEGRAL PROMOTIONAL GAME

Gilbert Bachman, Atlanta, and Byrne E. Heninger, Marietta, both of Ga., assignors to Dittler Brothers, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 741,594, Jun. 5, 1985, Pat. No. 4,671,512. This application Jun. 8, 1987, Ser. No. 59,061
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—139 **5 Claims**

1. An apparatus comprising, in combination:

a transaction receipt having obverse and reverse surfaces;

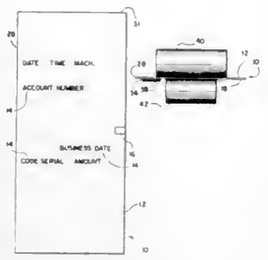
an automated teller machine which prints transaction information on said obverse surface of said transaction receipt, said automated teller machine having a friction drive element which engages portions of one of said obverse or reverse surfaces of said receipt for conveying said receipt through said automated teller machine, and said automated teller machine further having a biasing element which engages portions of the other of said obverse and reverse surfaces of said receipt for biasing said receipt against said obverse and reverse surfaces of said receipt for biasing said receipt against said friction drive element;

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said transaction receipt further comprising:

paper stock having non-smooth obverse and reverse surfaces such that said receipt will not slip when engaged by said friction drive element of said automated teller machine;

game indicia imprinted on a portion of said reverse surface of said paper stock which is not contacted by said other of said friction drive element and said biasing element which engages portions of said reverse surface of said receipt;



a release coating applied over said game indicia, whereby said game indicia may be viewed through said release coating; and

a selectively removable opaque masking applied over said release coating such that said masking does not penetrate said reverse surface of said paper stock, whereby said game indicia are concealed from view until said masking is removed.

4,817,950

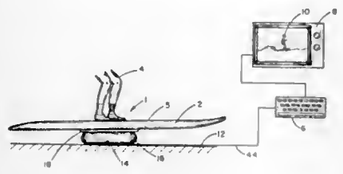
VIDEO GAME CONTROL UNIT AND ATTITUDE SENSOR

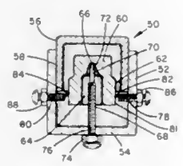
Paul E. Goo, 1188 Bishop, #1905, Honolulu, Hi. 96813

Filed May 8, 1987, Ser. No. 47,129

Int. Cl.[4] A63B *71/00*; A63F *9/00*; H01H *19/00*

U.S. Cl. 273—148 B **11 Claims**





1. A video game comprising a video display terminal, computer means electrically connected to the video display terminal, player-actuated signal generating means for sending signals to the computer means comprising

a generally horizontal rigid platform capable of supporting the weight of the user and adapted to receive the user's feet,

a fulcrum mounted on the platform and adapted to contact a horizontal supporting surface, the fulcrum having a curved exterior surface,

biasing means for resisting movement of the platform to highly tilted positions,

gravity-actuated switch means for opening and closing a plurality of attitude-related electrical switches responsive to the direction of tilt of the platform, said switch means comprising a housing having an internal peripheral wall, a plurality of discrete first electrical contacts uniformly spaced around the internal peripheral wall, a solid conductive gravity-actuated switch closure member centrally mounted in the housing and freely movable in all lateral directions such that tilting of the housing causes the switch closure member to more by gravity into contact with at least one of the first electrical contracts, and a second electrical contact member adapted to maintain permanent electrical contact with the switch closure member, and

transmission means for conveying signals from the electrical switches to the computer means.

4,817,951

PLAYER OPERABLE LOTTERY MACHINE HAVING DISPLAY MEANS DISPLAYING COMBINATIONS OF GAME RESULT INDICIA

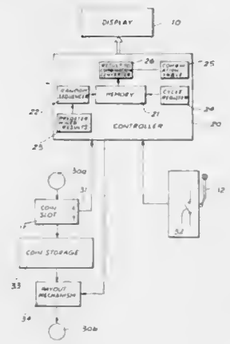
Philip C. Crouch, Vaucluse, and Patrick J. Finnigan, Monterey, both of Australia, assignors to Ainsworth Nominees Pty. Limited, New South Wales, Australia

Filed Jun. 25, 1987, Ser. No. 66,373

Claims priority, application Australia, Jun. 26, 1986, PH6587

Int. Cl.[4] A63B *71/04*

U.S. Cl. 273—143 R **8 Claims**



1. A player operable instant lottery machine, comprising display means, control means to control the operation of the display means, and initiation means operable by a player to cause the control means to select and display a new result on the display means,

said display means comprising means to simultaneously display several indicia in combination, said indicia being selected from a predetermined set of indicia and said combination being selected from a predetermined set of combinations of said indicia,

the control means including storage means for storing an ordered set of numbered game results representing a set of pseudo tickets of a lottery game series which is currently in progress, random number selection means for generating game results for said ordered set of game results and means for storing the ordered set in the storage means at the commencement of each said game series, means for sequentially selecting a next game result from the ordered set in the order in which they are stored in response to operation of the initiating means and means for displaying a combination of indicia corresponding to the currently selected game result.

4,817,952

ELECTRONIC SPATIAL LOGICAL TOY CONTAINING MOVABLE AND/OR ROTATABLE ELEMENTS

Gábor Biró, Pécel; Róbert Breitner, Diósd; Gábor Fazekas, Budapest; István Hejjas, Budapest; Péter Niklai, Budapest; Ernö Rubik, Budapest; Károly Szabó, Budapest, and István Tóthmátyás, Budapest, all of Hungary, assignors to Rubik Studio, Hungary

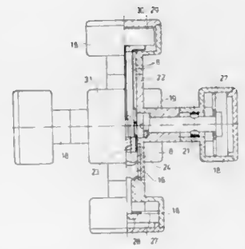
PCT No. PCT/HU86/00012, § 371 Date Dec. 9, 1986, § 102(e) Date Dec. 9, 1986, PCT Pub. No. WO86/05111, PCT Pub. Date Sep. 12, 1986

PCT Filed Mar. 4, 1986, Ser. No. 939,045

Claims priority, application Hungary, Mar. 4, 1985, 784/85

Int. Cl.[4] A63F *9/06*

U.S. Cl. 273—153 S **9 Claims**



1. A logical toy comprising:

(a) movable elements adapted for movement along paths of motion;

(b) first means for connecting the elements, directly or through mechanical transmissions;

(c) sensors coupled to said first connecting means and configured to be allowed to remain in an actuated forced configuration;

(d) a respective circuit switch associated with each sensor for opening or closing a respective signal path;

(e) said circuit switches forming a logical unit serving as a signal transmitter having an output;

(f) electric counter means

(g) second means connecting said output to said electric counter means; and

(h) wherein said logical toy is dimensioned to be hand held and wherein said elements are manually moveable.

4,817,953

PORTABLE TRAINING DEVICE FOR GOLFERS

Anthony Ponchak, 1161 Packer Cir., Tustin, Calif. 92680

Filed Jun. 8, 1987, Ser. No. 59,309

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—188 R **6 Claims**



1. A foldable golfer's training device adapted to be positioned on the ground adjacent the golfer's leg in the ball-addressing position and extending upward to permit engagement with the upper portion of the golfer's leg to limit leg motion by contact with the golfer's leg during a golf swing; the device comprising:

at least two elongated generally planar members interconnected along their respective edges by a plurality of hinge members to form a foldable planar structure, one of said planar members being shorter than the remaining member to preclude interference with the golf swing;

at least two pointed stakes secured to said planar members in spaced apart relation and moveable relative to said planar structure for penetration into the ground for securing said structure on the ground.

4,817,954

GOLF SWING TRAINING DEVICE

Gerald G. Kubo, 34 Eastbrook Dr., River Edge, N.J. 07661

Filed Oct. 1, 1987, Ser. No. 103,349

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—191 R **7 Claims**



1. A golf swing training device enabling a golfer to guide a golf club shaft into a preselected position at the top of the golfer's backswing from which the golfer may commence a down-swing, said device comprising:

a head-piece comprising an open ended generally V-shaped slot having a bottom dimensioned to receive the shaft of the golf club; and

adjustable support means mounted to the head-piece for secure but removable mounting to the shoulders and upper back of the golfer and for adjustably positioning the head-piece along a first axis extending generally between the golfer's shoulders and a second axis extending generally orthogonal to the first axis, such that the bottom of the V-shaped slot of the head-piece is adjustably positioned into the preselected preferred position at the top of the golfer's backswing, said V-shaped slot guiding the golf club shaft into the preselected position at the top of the golfer's backswing, and permitting the golfer to commence a down-swing therefrom.

4,817,955

GOLF BALL DISPENSER AND TEE APPARATUS

Donald N. Hickson, 3313 - 6th Avenue S., Lethbridge, Alberta, Canada T1J 1G4; Gerald W. Todd, S.S. L-3-44, Lethbridge, Alberta, Canada T1J 4B3, and Edward A. Seskus, 2616 South Parkside Drive, Lethbridge, Alberta, Canada

Filed Dec. 21, 1987, Ser. No. 135,643

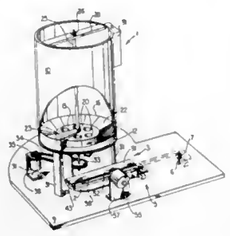
Int. Cl.[4] A63B *57/00*

U.S. Cl. 273—201 **12 Claims**

1. A golf ball dispenser and tee apparatus comprising hopper means for carrying a plurality of golf balls; feed means in said hopper means for dispensing golf balls one at a time; first drive means for operating said feed means; tube means for receiving golf balls one at a time from said feed means; stop means at an open free end of said tube means remote from said hopper means movable between ball retaining and release positions for

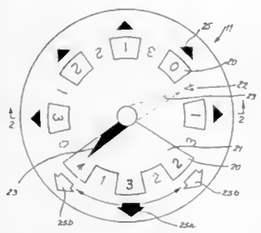
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releasably retaining said golf balls in said tube means; gripper means for gripping a golf ball at said open free end of said tube means; slide means carrying said gripper means for moving a golf ball out of said tube means, whereby said stop means is moved to the release position, and upon release of a golf ball from said tube means immediately returns to the ball retaining position; tee means remote from said open free end of said tube means for receiving a ball from said gripper means; second drive means for operating said slide means to cause said gripper



means to move between a retracted ball pick-up position and an extended ball depositing position above said tee means; first, coin actuated control means for controlling operation of said first drive means to deposit a predetermined number of golf balls in said tube means; and second, user operated control means for controlling operation of said second drive means to cause said slide means and gripper means to move to the ball depositing position, and to cause said gripper means to release a ball onto said tee means.

4,817,956
GAME PLAYING MOVE SELECTOR AND GAME APPARATUS
Umberto C. Fogliani, 873 Canning Highway, Mt. Pleasant, Western Australia, Australia
Filed Mar. 10, 1987, Ser. No. 24,148
Int. Cl.[4] A63B *71/00*; A63F *3/00*
U.S. Cl. 273—246 5 Claims

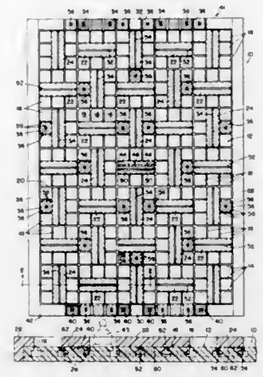


1. A move selector for playing a game simulating a yacht race, the move selector comprising:

4,817,957
VARIABLE MAZE BOARD GAME
Gregory L. Reeves, 1445 S. Gibbs, #B, Pomona, Calif. 91766
Filed Sep. 28, 1987, Ser. No. 101,414
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—248 14 Claims

1. A game apparatus including:
a body having:
a surface having a center,
a first end,
a second opposite end,
first and second sides,
a first plurality of generally parallel lines oriented in a first direction from said first end to said second end, and
a second plurality of generally parallel lines oriented in a second direction generally at a right angle to said first direction and extending from said first side to said second side, said first and second pluralities of generally parallel lines forming a grid and defining areas on said grid,
a first plurality of obstructions positioned on said surface and operatively connected to said body for movement along said first plurality of generally parallel lines, said first plurality of obstructions including first indicia thereon,
a second plurality of obstructions positioned on said surface and operatively connected to said body for movement along said second plurality of generally parallel lines, said

second plurality of obstructions including second indicia thereon, and
a third obstruction positioned on said surface and operatively connected to said body for movement along two of

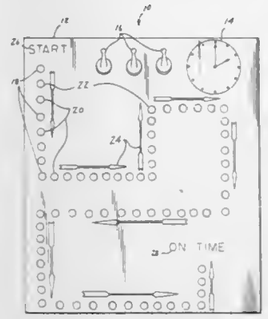


said second plurality of generally parallel lines over said center of said surface, said third obstruction having: third indicia thereon.

4,817,958
Patent Not Issued For This Number

4,817,959
TIME TELLING EDUCATIONAL GAME
Judy O. Tinsley, 214 Cedarwood Dr., Salisbury, N.C. 28144
Filed Aug. 19, 1987, Ser. No. 86,773
Int. Cl.[4] A63F *3/00*; G09B *19/12*
U.S. Cl. 273—249 8 Claims

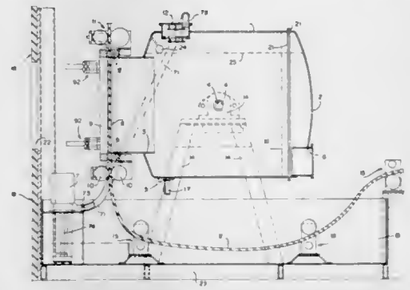
1. A new and improved educational game for teaching people to tell time, comprising:
game board means;
race track means on said game board means;
clock face means associated with said game board means;
clock hand means adjustably mounted on said clock face means;
a plurality of card means for use in the play of said game;
said plurality of card means consisting of three different types of cards;
one of said different types of cards being "time and activity" cards;
said race track means composed of a plurality of spaced circles of various colors printed on said game board means;
a colored circle having a color corresponding to one of the colors of the circles on said game board means printed on





each of said "time and activity" cards; and
various times printed on eacch of said circles on said cards.

4,817,960
PROJECTILE BACKSTOP ASSEMBLY
Allan S. Wojcinski, Bonifatiusstr. 86, D-4000 Dusseldorf 11, Fed. Rep. of Germany
Filed Mar. 13, 1987, Ser. No. 25,747
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608651
Int. Cl.[4] F41J *1/12*
U.S. Cl. 273—410 33 Claims



1. A projectile backstop assembly for decelerating incident of projectiles comprising a boiler-like container,

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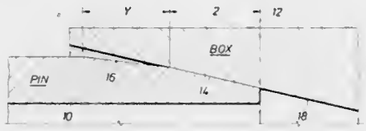
a liquid filing said container and serving as a decelerating medium for projectiles,
said container having inner walls with rounded surfaces and having an inlet opening,
an elongated sheet of material having a region adapted to be pierced by a projectile and sealingly closing said inlet opening,
a pressure frame adapted to be pressed onto said region of material,
pressure applying means to press said pressure frame against the pierced region of said material,
means for advancing said elongated sheet along its longitudinal direction after disengaging said pressure frame whereby the pierced region can be replaced by an adjacent region of said elongated sheet.

4,817,961
FLYING TOY WITH RETURN-FLIGHT FLYING PATTERN
Myron Stone, 614B Gregory Ave., Weehawken, N.J. 07087
Filed Feb. 16, 1988, Ser. No. 156,464
Int. Cl.[4] A63B *65/08*
U.S. Cl. 273—426 **16 Claims**



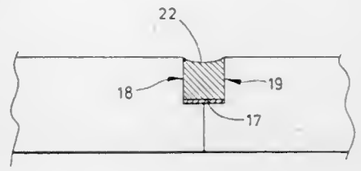
1. A flying toy capable of being packaged unassembled in a flat, compact configuration and erected readily into an assembled, bowed configuration suitable for flight in a return-flight pattern, the flying toy comprising:
first and second essentially flat blade-like members, each member having a length extending longitudinally between opposite ends, a width extending laterally between opposite lateral edges, the length being substantially greater than the width, and an altitudinal thickness sufficient to maintain the length and width during flight, at least the second member being constructed of a bowable material, and the altitudinal thickness of the second member being thin enough to enable deliberate bowing;
a pair of slots in at least the first member, the slots being located centrally between the opposite ends of the first member and intermediate the lateral edges of the first member, the slots extending longitudinally over a length at least as great as the width of the second member and being straight and parallel to one another and spaced apart laterally; and
plurality of bridging sections in the first member, the bridging sections being located centrally between the opposite ends of the first member, and a corresponding intermediate section in the second member, at least one said bridging section being located between each lateral edge and an adjacent one of said slots, and at least another of said bridging sections being located between the pair of slots, the second member being threaded through the slots in the first member such that the first and second members are assembled in erected configuration with bridging sections of the first member juxtaposed with the corresponding intermediate section of the second member and adjacent bridging sections displaced in altitudinally opposite directions by the interposition of the intermediate section of the second member between the adjacent bridging sections of the first member, such that the second member is bowed to establish the bowed configuration for flight in the return-flight pattern.

4,817,962
UNIVERSAL TUBULAR CONNECTION HAVING A VARIABLE METAL-TO-METAL SEAL WIDTH CORRESPONDING TO MATERIAL YIELD STRENGTH
Keith C. Mott, Houston; Gary E. Kirsch, Tomball; H. Paul Barringer, Humble, and Lawrence Y. Tung, Houston, all of Tex., assignors to The Hydril Company, Houston, Tex.
Filed Dec. 28, 1987, Ser. No. 138,667
Int. Cl.[4] F16J *15/08;* **F16L** *15/00*
U.S. Cl. 277—1 **7 Claims**



1. The method of preparing metal-to-metal sealing surfaces for sealing tubular members in universal connection makeup regardless of material yield strength of the tubular members, which comprises
preparing all connecting box members regardless of the material yield strength with a seal surface at a universal conical taper angle, and
preparing respective pin members with an initial conical seal contact surface having a taper angle approximately equal to the universal seal surface conical taper angle of said box members and having a final sealing conical contacting surface at a lesser angle than said angle of said contact seal surface and located toward the distal end of the respective pin members from said conical seal surface, the longitudinal length of said seal surface and said contacting surface being approximately equal for medium yield strength material pin members, the longitudinal length of said seal surface being greater than the longitudinal length of said contacting surface for higher yield strength pin members, and the longitudinal length of said seal surface being less than the longitudinal length of said contacting surface for lower yield strength material pin members,
whereby bearing pressure on both members and resulting compression hoop stresses in the pin member of a connection are greatest for the highest yield strength material pin member and are the least and located the furtherest from the distal end for the lowest yield strength material pin member.

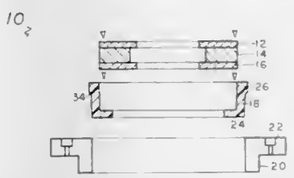
4,817,963
HOT MELT STRIP SEAM SEALING METHOD
Alan J. Munder, Penryn, and John R. Leith, Falmouth, both of England, assignors to Hot Melt Systems Limited, Cornwall, England
Filed Mar. 31, 1987, Ser. No. 33,037
Int. Cl.[4] F16J *15/10;* **E01C** *11/02;* **E04B** *1/68*
U.S. Cl. 277—1 **13 Claims**



1. A process of sealing a joint between two adjacent members such as deck planks, cladding panels and the like carried on a subjacent member for support thereby,
said process comprising the steps of
forming a channel at the junction between at least said two adjacent members, said channel having two adjacent edge faces of said two adjacent members facing one another across the width of said channel and a channel bottom face formed as one of a shoulder of a said adjacent member, an underlying support on which said adjacent members are carried and an underlying substrate supporting said adjacent members,
introducing a bead of resilient solid material into said channel, and
treating said resilient solid material bead to render it temporarily one of plastic and fluid whereby to cause it to adhere to said facing edge faces of said two adjacent members, said treatment of said material of said bead being such as to maintain the resilient elasticity of the material of said solid bead subject to such treatment whereby to maintain the seal thus formed even in the event of substantial relative movement of said two adjacent members sealed by said bead.

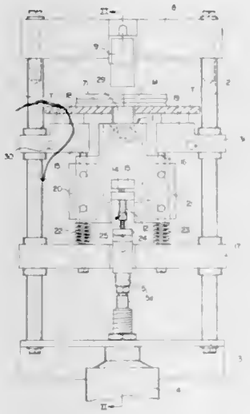
4,817,964
FERROFLUID EXCLUSION SEAL AND METHOD OF ASSEMBLY
Thomas J. Black, Jr., Lowell, Mass., assignor to Ferrofluidics Corporation, Nashua, N.H.
Filed Sep. 25, 1985, Ser. No. 779,983
Int. Cl.[4] B23P *11/00;* **F16J** *15/40, 15/54*
U.S. Cl. 277—1 **15 Claims**

1. In a sealing system having a seal element with a first side, a second side and a periphery, and a housing having a surface which mates with said seal element periphery to form an annular space between said seal element periphery and said housing surface, said annular space having a maximum width less than or equal to a first width, a deformed sealing band for mounting said seal element in said housing, said sealing band comprising a band of deformable material which, prior to assembly of said seal element in said housing, has a substantially L-shaped cross-section with a first leg forming a radially-extending shoulder that bears against said first side of said seal element and with a second leg encircling said seal element periphery, said sealing band second leg having a substantially uniform thickness greater than said first width so that when said sealing band is placed around said seal element and said seal element and said sealing band are inserted into said housing, said sealing band



second leg is forced into said annular space and is deformed to mechanically secure the seal element on said housing surface and to extrude a portion of the material comprising said sealing band second leg from said annular space to form a lip which bears against said second side of said seal element and holds said seal element within said sealing band.

4,817,965
DEVICE FOR ASSEMBLING, BY CLIPPING, MOLDINGS INCORPORATING SEVERAL RABBETS
Antoine Cassese, Les Essarts No. 7,, Saint Germain-Laxis, Maincy, F77950, France
Continuation of Ser. No. 636,980, Aug. 2, 1984, abandoned. This application Sep. 15, 1987, Ser. No. 97,413
Claims priority, application France, Aug. 4, 1983, 83 132853
Int. Cl.[4] B27F *7/00, 7/09*
U.S. Cl. 227—3 **8 Claims**



1. A device for assembling, by clipping, mouldings incorporating several rabbets, which comprise two columns which are connected in their lower part by a base under which is mounted a jack whose rod is connected to a hammer which penetrates in a clip magazine and in their upper part by a piece fast with the two columns and provided with a presser member located substantially opposite the hammer as well as with blocking means, wherein said device further comprises a clipping assembly which comprises the hammer and a sliding guide fast with the hammer as well as a sensor; two small columns on which may slide vertically the clipping assembly, disposed between a lower support disposed between the two columns and above the base and two upper half-supports each

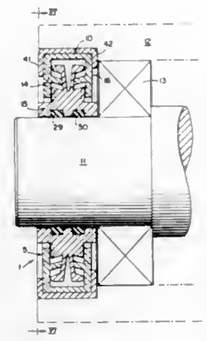
sliding vertically on one of said columns and horizontally on shafts supporting said table, balancing means mounted on each small column below the clipping assembly; and a plate which is disposed at the top of the jack rod, and on which the hammer and the sliding guide rest and which comprises a matching member opposite the sensor with which it cooperates.

4,817,966

ROTARY SHAFT BEARING ISOLATOR SEAL

Richard Borowski, Palmyra, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,945
Int. Cl.[4] F16J 15/16
U.S. Cl. 277—3 26 Claims



1. A rotary shaft bearing isolator seal comprising:
a stator housing having an inner radially extending face;
an annular flange of substantially frusto-conical shape extending radially and axially inwardly from a larger diameter end fixed to said radially extending face to a smaller diameter free end;
a rotor disposed within said stator housing and having a flexible, peripheral radial flange, said radial flange extending radially and axially outwardly from a smaller diameter end fixed to a peripheral wall of said rotor to a larger diameter free end that is biased into contact with said radially extending face of the stator housing under static sealing conditions, and having a contact sealing surface between its fixed and free ends for sealing against said free end of said annular flange under static sealing conditions; and
wherein said annular flange is constructed in a manner causing centrifugal forces generated by rotation of said rotor to overcome said biasing and displace said free end of the radial flange of the rotor out of contact with the radially extending face of the stator housing and said contact sealing face away from the free end of the annular flange of the stator housing.

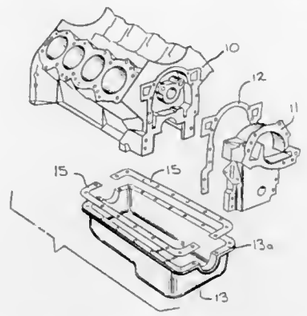
4,817,967

ANGLED JUNCTION SEALING STRUCTURE FOR GASKETS

Jerome G. Belter, Mt. Prospect, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 11, 1987, Ser. No. 131,951
Int. Cl.[4] F16J 15/10
U.S. Cl. 277—199 15 Claims

1. An angled junction sealing structure comprising:
a first gasket including an edge having at least one projection formed therein, said projection extending in a first plane; and
a second gasket including a face engaged by said edge of said first gasket, said face extending in a second plane disposed



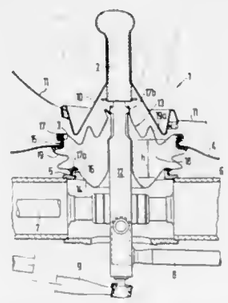
at an angle relative to said first plane and including at least one recess formed therein which receives said projection.

4,817,968

AIRBORNE SOUND SEALING MEANS FOR AN OPENING FOR A GEAR SHIFTING ASSEMBLY

Rüdiger Fischle, Wiernsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 14, 1987, Ser. No. 49,466
Claims priority, application Fed. Rep. of Germany, May 14, 1986, 3616247
Int. Cl.[4] F16J 15/14
U.S. Cl. 277—226 9 Claims



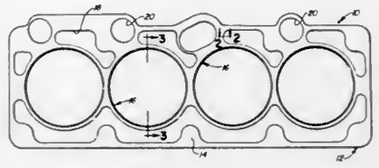
1. A sound sealing and anti-vibrational insulating gear shift lever mounting means for an opening in a body of an automobile having a shift lever which extends through said opening, comprising:
sound sealing and anti-vibrational insulating means arranged in said opening and between said shift lever and said body, for tightly enclosing a shaft of said shift lever; said sound sealing and anti-vibrational insulating means including an interior unstressed space being filled with a flowable medium without inclusion of air, such that in any movement of the gear shift lever a sufficiently thick layer of flowable medium will exist at the opening to provide sound sealing and anti-vibrational insulation between the gear shaft lever and the body around the opening without tensile forces being created in the interior space and without impairment of shifting forces of the gear shift lever.

4,817,969

GASKET AND METHOD OF MAKING SAME

Donald J. McDowell, Riverside, Ill.; Michael J. Maloney, Madison, Wis.; Jerri L. Cooper, Lombard, and Lawrence Pyle, Deerfield, both of Ill., assignors to Fel-Pro Incorporated, Skokie, Ill.

Filed Nov. 20, 1987, Ser. No. 123,219
Int. Cl.[4] F16J 15/12
U.S. Cl. 277—235 B 38 Claims



1. A cylinder head gasket for an internal combustion engine having a head, a block, at least one combustion chamber and at least one passage for fluid communication between the head and the block, the cylinder head gasket comprising:
an integrally molded thin main gasket body having expansive main surfaces and defining a plurality of openings including at least one combustion opening and at least one aperture for fluid communication between the head and the block of an internal combustion engine,
said main gasket body being molded of a reinforced thermoplastic resin composite,
said thermoplastic resin, in an unfilled state, having a high heat distortion temperature of at least 347° F. at 264 psi (according to ASTM Test D648), and being essentially inert to water, and to automotive fuels, coolants and oils,
said resin being substantially amorphous and having an aromatic backbone, having a flexural modulus of at least about 250,000 psi and a relatively high elongation to promote sealing,
said resin being filled and reinforced with fibers in an amount of at least 3% by weight of the unfilled resin, said fibers having a higher stiffness and strength than said unfilled resin and being deformable in tension, compression and bending under transverse loading without fracturing, said fibers having a tensile modulus of not less than 10×10^6 psi at 500° F.,
said fibers serving to distribute loads to which the gasket is subjected in use between the fibers and the resin,
said fibers having good bonding to the resin and having a higher modulus and strength than said unfilled resin to sustain a larger proportion of load, and thereby to provide high sealing stress retention and to prevent torque loss in use by reducing the stress relaxation of the unreinforced resin,
said fibers being random in orientation and short in length and having an aspect ratio of at least 20,
and said main gasket body as molded having an integrally formed non-elastomeric sealing bead extending above the main gasket body and surrounding at least one of said plurality of openings.

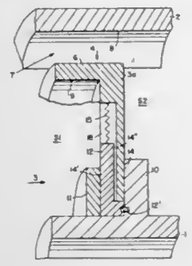
4,817,970

FLUID SEAL HAVING A DIVIDED RING DISK

Olaf Krauss, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed May 5, 1987, Ser. No. 46,996
Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617279
Int. Cl.[4] F16J 15/42, 15/54
U.S. Cl. 277—25 12 Claims

1. A fluid seal for sealing two spaces from each other, said spaces being enclosed by an inner rotating shaft and an outer member, comprising ring means forming a radial ring guide slot around said inner shaft, and a plurality of sealing disk elements having radial surfaces guided for radial movement in said radial ring guide slot, said radial surfaces of said sealing disk elements forming with said ring means an axial seal between said two spaces, said sealing disk elements further having radially outer axial surfaces facing an inner surface of said outer member for forming a radial seal having a small enough gap with said outer member during rotation of the shaft as to define a gas bearing type of seal within the formed gap, said ring means restraining substantially any axial movement of said



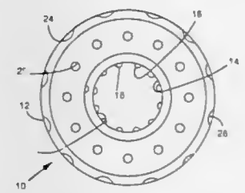
sealing disk elements and wherein each of said sealing disk elements has a substantially radially extending guide groove, said fluid seal further comprising a radially extending guide tongue for each of said radially extending guide grooves, said guide tongues being rigidly secured for cooperating with said radial ring guide slot in radially guiding movement of said sealing disk elements, said guide tongues rotating with said inner shaft for entraining said sealing disk elements with the rotation of said inner shaft to cause said sealing ring disk elements to move radially outwardly in the respective radially extending guide groove.

4,817,971

CHUCK ACTUATOR DEVICE AND METHOD

Jerome R. Flynn, Suite 117, 3857 Birch St., Newport Beach, Calif. 92660

Filed Jul. 16, 1987, Ser. No. 74,007
Int. Cl.[4] B23B 31/06
U.S. Cl. 279—1 K 21 Claims

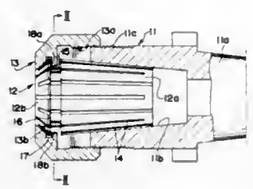


1. A device for operating a chuck of a rotary tool, the chuck including a plurality of jaws that may be tightened around a tool shank or disengaged from the shank by rotation of a chuck drum relative to the tool shank, comprising a generally cylindrical body having a central passage therein configured for mounting on the chuck drum, the body including a plurality of gripping beads formed inside the central passage for gripping the chuck drum and being formed of an elastomer such that a user may manually compress the body around the chuck drum to exert a force thereon such that application of power to the rotary tool while the user compresses the body on the chuck drum causes the chuck drum to rotate, thereby tightening or loosening the chuck jaws, depending upon the direction of rotation of the chuck drum, wherein the gripping beads are

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arranged such that a first group of gripping beads extends longitudinally from a first flat outer edge of the cylindrical body to a region near the longitudinal centerline of the central passage, the first group of gripping beads being spaced apart by generally equal angles and such that a second group of gripping beads extends longitudinally from a second flat outer edge of the cylindrical body to the region near the longitudinal centerline of the central passage, the second group of gripping beads being spaced apart by equal angels generally equal to the angles for the first group of gripping beads, the second group of gripping beads being angularly offset from the first group of gripping beads to approximately bisect the angles between each of the first group of gripping beads.

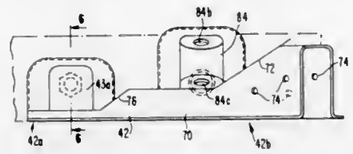
4,817,972
COLLET CHUCK
Haruaki Kubo, Osaka, Japan, assignor to Daishowa Seiki Co., Ltd., Osaka, Japan
Filed Sep. 3, 1987, Ser. No. 92,644
Claims priority, application Japan, Sep. 12, 1986, 61-141079[U]; Oct. 7, 1986, 61-154148[U]
Int. Cl.⁴ B23B *31/04*
U.S. Cl. 299—42 **1 Claim**



1. A collet chuck comprising a chuck body having an inwardly tapered hole in its top end side, a collet adapted to be reduced in its diameter having its external surface tapered so as to be detachably fitted into said tapered hole and a fastening nut which is detachably connected to said collet and, at the same time, is detachably screwed onto the chuck body for reducing the diameter of said collet while fitting the same into said tapered hole in a pressable manner, characterized in that said collet has its top end part equipped around its external periphery with an outward flange coaxial with a virtual central axis thereof, said fastening nut has its internal periphery equipped with a pair of opposed inward flanges coaxial with the virtual center axis thereof, a pair of notched portions are formed at positions opposite to each other in a radial direction of said inward flanges, the internal diameter between the inward flanges is smaller than a minimum external diameter of said outward flange when the diameter of the collet is reduced, both of said inward flanges are provided such that distances from the virtual central axis of the chuck body to inward end margins respectively of both of said inward flanges are different from each other, and a distance between said opposed pair of notched portions is larger than the maximum external diameter of said outward flange when the diameter of said collet is not reduced.

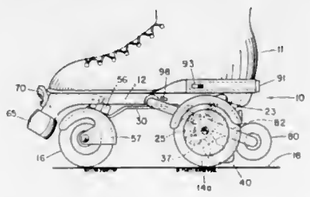
4,817,973
VEHICLE SUSPENSION ASSEMBLY
Youichi Takeda, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Aug. 21, 1987, Ser. No. 88,115
Claims priority, application Japan, Aug. 23, 1986, 61-128334[U]
Int. Cl.⁴ B60G *3/00*; B62D *21/00*
U.S. Cl. 280—781 **10 Claims**

1. A suspension assembly for a vehicle comprising:
(a) a suspension support member including a transverse member extending in the transverse direction of the vehicle integrally connected with a longitudinal member extending in the longitudinal direction of the vehicle;
(b) a vehicle frame;
(c) mounting means for mounting said suspension support member on said vehicle frame;
(d) a suspension arm rotatably connected with said suspension support member for holding a steerable wheel of a vehicle;
(e) a housing member for holding a steering gear mechanism;



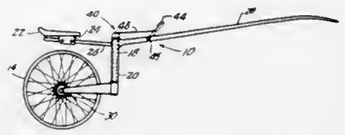
(f) an elongated reinforcing means including a bracket fixed to the longitudinal member and a reinforcing member easily removably connected at one end with said transverse member, said bracket and the other end of said reinforcing member being overlapped and easily removably connected together such that release of said reinforcing member from said bracket enables said reinforcing member to be moved vertically downwardly for ease of removal and repair of the steering gear mechanism; and
(g) clamping means for clamping said housing member to said reinforcing means.

4,817,974
SKATES AND SKATE BOARDS
Robert L. Bergeron, 1312 Pineywoods, Friendswood, Tex. 77546
Filed Nov. 30, 1987, Ser. No. 126,711
Int. Cl.⁴ A63C *17/14*
U.S. Cl. 280—11.2 **16 Claims**



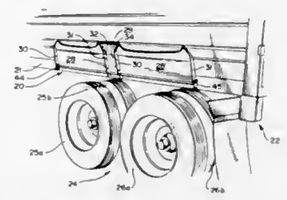
1. A skate construction of the type where a skating base member is supported by rotating wheels members on a skating ground surface for permitting tilting of the skating base member relative to the skating ground surface comprising:
an elongated skating base member;
forward and rearward wheel means rotatively supported on said base member, said wheel means being located at the front and the back of said base member for contacting a skating ground surface, said rearward wheel means including at least two spaced apart rear wheel members on a rear wheel axle, said rear wheel members being respectively located on opposite sides of a vertical lengthwise extending plane extending through said skating base member;
auxiliary wheel means disposed rearwardly of said rear wheel members and consisting of one wheel member located along said lengthwise extending plane and where said one wheel member is smaller in diameter than the diameter of the rear wheel members;
support means attached to said base member for supporting said auxiliary wheel means at a location normally out of contact with a skating ground surface and disposed relative to the rear wheel members whereby said skating base member may be tilted about the rear wheel axle and engage said auxiliary wheel means with a skating ground surface while disengaging the forward wheel means from the skating ground surface; and
said support means including an arm member pivotally attached at one end to said skating base member at a location forwardly of said rearward wheel members, and resilient means disposed between said base member and said arm member for limiting motion of said arm member toward said base member.

4,817,975
SELF-ALIGNING SULKY
Michael Saraydar, 241 Irving Ave., Closter, N.J. 07624
Filed May 9, 1984, Ser. No. 608,409
Int. Cl.⁴ B62C *1/08*
U.S. Cl. 280—63 **4 Claims**



1. A self-aligning sulky having pivotable wheels which comprises:
a transverse frame;
first and second downwardly extending arms disposed at each end of said transverse frame;
first and second trailing arms independently pivotally mounted to said downwardly extending arms, said arms being free to pivot through 360 degrees;
first and second wheels, mounted for rotation to said trailing arms, said wheels being free to pivot through 360 degrees along with said trailing arms to thereby provide self-aligning action;
seat means, for support of a driver, rearwardly mounted to said frame; and
first and second shafts mounted to said frame, constructed and arranged to receive a horse, said shafts being forwardly projecting and substantially parallel.

4,817,976
VEHICULAR RAIN SKIRTS
Richard J. Kingsley, Skamania, Wash., assignor to Saturn Corporation, Tacoma, Wash.
Filed Oct. 5, 1987, Ser. No. 104,255
Int. Cl.⁴ B62D *25/16*
U.S. Cl. 280—154 **30 Claims**



1. A modular rain skirt assembly for use in reducing the laterally projected component of finely atomized, dense, mist emanating from the running gear of heavy vehicles traveling on rain coated road surfaces, said rain skirt assembly comprising, in combination:
(a) generally flat, elongated, panel defining means having inturned leading and trailing edges and defining a projected mist capture area adapted to extend downwardly about the outer upper surfaces of the vehicle's running gear and in parallel laterally spaced relation thereto wherein mounted on a vehicle; and,
(b) first fore and aft mounting bracket means adapted to be affixed to the side of the vehicle immediately above and both fore and aft of the vehicle's running gear, each of said first fore and aft mounting bracket means including: (i) means for fixedly securing said first mounting bracket means on a vehicle body; (ii) a first pivot pin extending in a fore and aft direction and projecting from said first mounting bracket means along a longitudinal line parallel to the plane of said elongate panel defining means and positioned to pass through respective ones of said inturned leading and trailing edges on said rain skirt assembly for pivotally mounting said panel defining means on said first mounting bracket means in a position overlying the outer, upper surfaces of the vehicle's running gear; and (iii), latch means adapted to latchingly couple said elongated panel defining means to said first mounting bracket means in a selected one of a first operative position wherein said panel defining means projects downwardly parallel to the vehicle body in operative mist collecting relation about the outer, upper surfaces of the vehicle's running gear, and a second inoperative position wherein said panel defining means is pivoted upwardly into a position generally parallel to the vehicle body so as to permit unobstructed access to the vehicle's running gear.

4,817,977
STAND FOR MOTORCYCLE
David Bookbinder, 448 East Annette, Phoenix, Ariz. 85022
Filed Aug. 24, 1987, Ser. No. 88,794
Int. Cl.⁴ B62H *1/06*
U.S. Cl. 280—304 **6 Claims**

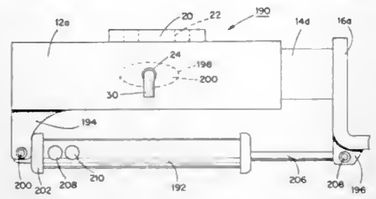


1. A stand system especially adapted for use in combination with a motorcycle for automatically compensating for irregularities of the support surface to hold the motorcycle in a substantially upright position, said stand system comprising:
(A) a housing securable to the motorcycle;
(B) a leg extensively carried by said housing and having a free end for contacting said support surface;
(C) selectively reversible drive means carried by said housing, said drive means transmitting a maximum drive force of a value which is less than the force required to lift the motorcycle from the support surface;
(D) cam means responsive to the drive force of said drive means for alternately moving said leg in an extending direction and in a retracting direction;

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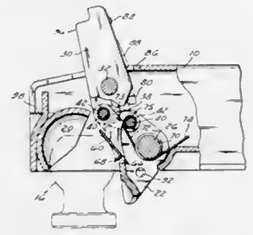
(E) said drive means including:
1. a reversible d-c motor carried by said housing;
a. a first contact assembly section having a common terminal connected to a first electrical side of said reversible d-c motor;
b. a second contact assembly section having a common terminal connected to a second electrical side of said d-c motor;
c. first terminals of each of said first and second contact assembly sections being connected to a voltage source; and
d. second terminals of each of said first and second contact assembly sections being selectively connected to motorcycle ground potential; and
2. first and second complementary elements of a frictionally engaged coupling pair;
a. one of said complementary elements including an engagement surface;
b. another of said complementary elements including:
i. a friction element; and
ii. biasing means for urging said friction element into contact with said engagement surface;
c. means drivingly coupling one of said complementary elements with said motor; and
d. means drivingly coupling another of said complementary elements to said cam means;
(F) said cam means including:
1. a helical cam journaled in said housing for rotation in alternate directions in response to the drive force of said drive means; and
2. a cam follower carried by said leg and drivingly engaged with said helical cam;
(G) retraction stop means for limiting the movement of said leg in the retracting direction; and
(H) extension stop means for limiting the movement of said leg in the extending direction;
whereby, when said contact assembly sections are actuated in a first direction, voltage is applied across said d-c motor in a first polarity to energize said motor to extend said leg and, when said contact assembly sections are actuated in a second direction, voltage is applied across said d-c motor in a second direction to energize said motor to retract said leg.

4,817,978
TRAILER HITCH ASSEMBLIES
Loyal W. James, 6038 Anita Rd., Chico, Calif. 95926
Continuation-in-part of Ser. No. 88,406, Aug. 24, 1987, Pat. No. 4,746,138. This application May 23, 1988, Ser. No. 197,649
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—487 **10 Claims**



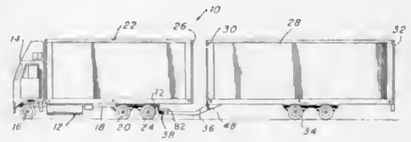
1. An improved trailer hitch for attachment to a towing vehicle, comprising:
a receiver tube having first and second side walls and means attached thereto for securing to the towing vehicle, said receiver tube having transversely aligned holes formed through respective first and second side walls;
a draw bar tube having first and second side walls and opposite first and second end walls to define an elongate void and having transversely aligned elongated slots formed through first and second side walls, said draw bar tube being closely received within said receiver tube;
resilient spring block means for filling said draw bar tube elongate void and having a transverse pin hole therethrough which is centrally aligned with said elongated slots;
trailer hitching means secured to a first end wall of said draw bar tube;
a hitch pin for securing through each of said receiver tube holes, the elongated holes and said pin hole; and
shock absorbing means connected between said receiver tube and said draw bar tube and trailer hitching means.

4,817,979
TRAILER COUPLER
Bernhardt P. Goettker, Escondido, Calif., assignor to Unique Functional Products, San Marcos, Calif.
Filed Feb. 8, 1988, Ser. No. 153,341
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—512 **9 Claims**



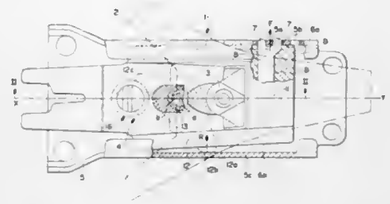
1. A trailer coupler to connect to a ball on a hitch of a towing vehicle, comprising:
(a) a stationary ball-gripping member and a movable ball-gripping member movable between an unlocked position and a locked position, said ball-gripping members being oppositely positioned and defining a ball-receiving cavity of a shape to generally fit a ball in locked position of said movable ball-gripping member, said ball-gripping members being disposed to secure a ball therebetween in said cavity against release in said locked position of said movable ball-gripping member, said ball-gripping members being disposed to release a ball from said cavity in said unlocked position of said movable ball-gripping member,
(b) a movable abutment having an operative position in which said abutment is disposed at the edge of said cavity and said abutment is said operative position abutting part of said movable ball-gripping member in said unlocked position of said movable ball-gripping member and preventing movement of said movable ball-gripping member to said locked position, said abutment in said operative position being positioned partly within said cavity so that when a ball moves between said ball-gripping members and seats in said cavity the ball presses against said abutment and moves said abutment to an inoperative position which no longer abuts said part of said movable ball-gripping member and which permits said movable ball-gripping member to be moved to said locked position, a spring normally biasing said abutment to said operative position and normally forcing said movable ball-gripping member to its unlocked position, and
(c) a pivoted operating handle which can be manually moved between a locked and an unlocked position and a link pivotally connected to said handle and to said movable ball-gripping member, said operating handle being operative when manually pivoted to move said movable ball-gripping member from said unlocked position to said locked position of said movable ball-gripping member only when said abutment has been moved from said operative position to said inoperative position by a ball seating in said cavity.

4,817,980
ARTICULATED TRUCK/TRAILER COMBINATION: FIRST CARGO UNIT COUPLING MECHANISM
Albert Torcomian, Havertown, Pa., assignor to LHT Industries, Inc., Radnor, Pa.
Filed Jan. 7, 1987, Ser. No. 1,053
Int. Cl.[4] B62D *53/08*
U.S. Cl. 280—418.1 **5 Claims**



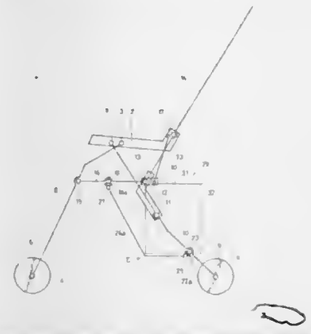
1. In a cargo-carrying vehicle having a power unit, a first cargo-carrying unit releasably affixed to the power unit, the first cargo-carrying unit not being pivotal on the power unit, and a second cargo-carrying unit releasably pivotally connected to the first cargo-carrying unit, wherein the improvement comprises:
said power unit including a frame;
said first cargo-carrying unit including a chassis;
a fifth wheel rigidly affixed within and no higher than said frame;
a kingpin affixed to the underside of said first cargo-carrying unit for engagement with said fifth wheel;
a coupling unit rigidly affixed to the frame at the rearmost end of the power unit;
a coupling unit rigidly affixed to said chassis of said first cargo-carrying unit;
whereby joining said coupling units and engagement of said kingpin with said fifth wheel affixes the first cargo-carrying unit on the power unit.

4,817,981
APPARATUS FOR ADJUSTING THE LONGITUDINAL POSITION OF A SAFETY BINDING ON A SKI
Jack Desbiolles, Annecy, and Pierre Feche, Cran-Gevrier, both of France, assignors to Salomon S.A., Annecy, France
Filed Mar. 7, 1986, Ser. No. 837,276
Claims priority, application France, Mar. 11, 1985, 85 03538
Int. Cl.[4] A63C *9/00*
U.S. Cl. 280—633 **49 Claims**



1. An apparatus for adjusting the longitudinal position of a safety binding on a ski, wherein said apparatus comprises:
(a) a guide element;
(b) a base plate element adapted to receive a binding, wherein said two elements slidingly engage each other so that at least one of said elements slides with respect to the other element in the longitudinal direction of said apparatus, wherein one of said elements comprises a plurality of notches spaced apart in the longitudinal direction of said apparatus, wherein the other of said elements comprises at least one tooth extending transversely to the longitudinal direction of said apparatus and engages said notches;
(c) means for locking said at least one tooth in said plurality of notches, wherein said locking means comprises a journal attached to one of said elements; and
(d) means for preventing substantial transverse displacement of said journal by exerting an elastic transverse force on said base plate to substantially eliminate transverse play between said base plate element and said guide element and thus hold said at least one tooth in said plurality of notches.

4,817,982
FOLDABLE BABY CARRIAGE WITH BASKET
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan
Filed Nov. 24, 1987, Ser. No. 124,830
Claims priority, application Japan, Nov. 26, 1986, 61-282780
Int. Cl.[4] B62B *7/06, 9/26*
U.S. Cl. 280—644 **10 Claims**



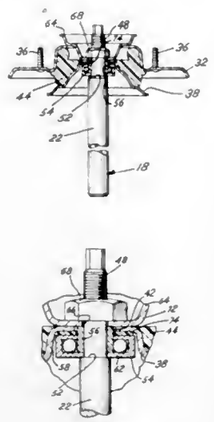
1. A foldable baby carriage, comprising foldable carriage frame means for supporting said carriage, foldable storage means for holding articles, means for suspending said foldable storage means comprising a rotary member turnably attached at an axis of rotation to said foldable carriage frame means, upper frame means (31) attached to said rotary member and extending rearwardly for suspending said storage means, and operating rod means (33) pivotally connected to a portion of said rotary member at a connecting position remote from said axis of rotation and to said frame means for manipulating said means for suspending said foldable storage means into an open state for a normal use of said foldable baby carriage and into a folded state by carrying out a folding movement in response to folding of the carriage frame means for reducing at least one dimension of said foldable baby carriage for storage, and wherein a length and said connecting position of said operating rod means are selected so that as a result of said folding movement of said carriage frame means, said rotary member rotates to such an extent that said upper frame means attached to said rotary member is positioned to extend substantially vertically in said folded state.

4,817,983
APPARATUS AND METHOD FOR REPAIRING A MACPHERSON STRUT ASSEMBLY
Noorali Virani, Carol Stream, Ill., assignor to Maremont Corporation, Carol Stream, Ill.
Filed Nov. 12, 1987, Ser. No. 119,860
Int. Cl.[4] B60G *11/52*
U.S. Cl. 280—668 **9 Claims**

1. In a MacPherson strut assembly for use in a vehicle suspension system supporting a vehicle body upon a vehicle chassis wherein the strut assembly comprises: a strut cylinder that has one end attached to the vehicle chassis; a piston rod that extends from the other end of the strut cylinder, the piston rod having a shoulder formed adjacent to its other end, and also

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having a coaxial annular spacer member and an annular bearing mounted on its other end rod and abutting the shoulder, with the outer diameter of the spacer being less than the inner diameter of the bearing, with the axial length of the spacer being greater than the axial length of the bearing, and with the outer diameter of the bearing being greater than the diameter of the piston rod; an upper support housing assembly comprising: a first member having a central opening therein through which the other end of the piston rod extends and that includes means for attaching the support housing assembly to the vehicle body; a second member that is spaced from the first member a preselected distance in an axial direction parallel to the longitudinal axis of the piston rod and that also has a central opening therein which is aligned with the central opening in the first member and through which the other end of the piston rod extends; and an annular rubber member that is disposed between the first and second members and is secured to each of the first and second members, with the rubber member having a central opening therein which is aligned with the central openings in the first and second members and through which the other end of the piston rod extends; an annular inverted bell shaped retained member having a central opening in its otherwise closed end through which the other end of the piston rod extends and also having its otherwise closed end extending



through the central opening of the first member; a nut threaded onto the other end of the piston rod so as to secure the support housing assembly on the other end of the piston rod by clamping the side of the retainer member against the first member, adjacent to the central opening of the first member; and a coil spring disposed about and radially spaced from the piston rod and at least part of the strut cylinder and biasing the support housing and the strut cylinder axially apart, the rubber member being intended to minimize the transmission of noise and vibrations between the first and second members of the support housing assembly, but cold flowing and taking a permanent set after normal usage of the MacPherson strut assembly so that objectionable noise and vibration are transmitted from the piston rod and the coil spring through the first and second members and hence to the vehicle body, the improvement comprising:

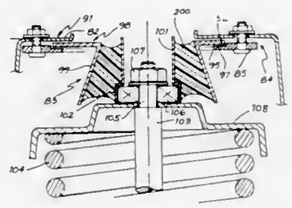
an annular resilient member that has a central opening and that is disposed about the other end of the piston rod and between the bearing and the second member, with the resilient member having a thickness, in an axial direction parallel to the longitudinal axis of the piston rod, and a resilience such that the resilient member will minimize the transmission of noise and vibration between the piston rod and the vehicle body during normal usage of the MacPherson strut assembly.

4,817,984

VEHICLE SUSPENSION SYSTEM

Michael Ferman, Sydney, and Craig Dale, Greenacre, both of Australia, assignors to Arindol Pty. Limited, Bondi Junction, Australia

Filed Sep. 2, 1987, Ser. No. 92,169
Int. Cl.[4] B62D *17/00*
U.S. Cl. 280—668 **9 Claims**



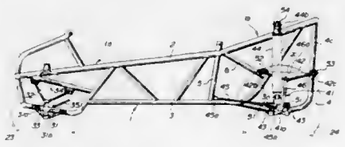
1. A thrust-support assembly for mounting the upper end of a MacPherson strut in a vehicle wheel-suspension system, comprising a thrust bearing for fitting to the upper end of the strut; an inner rigid annular member supporting the thrust-bearing; an outer rigid annular member spaced radially outwardly of the inner member and having means for mounting the assembly against the underside of a suspension tower of the vehicle; a resiliently-deformable annular bush having shock-absorbing properties and located between the inner and outer rigid members; a first pair of inter-engaging circular surfaces arranged eccentrically with respect the thrust-bearing axis and lying between the inner and outer members; and, first clamping means tightenable to prevent relative movement between the circular surfaces of the first pair, and loosenable to allow the two surfaces to be rotated with respect to one another so as to bring the thrust-bearing to a new position with respect to the rigid outer member.

4,817,985

REAR SUSPENSION FOR OFF-ROAD VEHICLE

Akito Enokimoto; Tatsuo Masuda; Akio Handa; Eiji Hosoya; Takerou Shibukawa, and Seiji Watanabe, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,412
Claims priority, application Japan, Sep. 18, 1986, 61-219938; Oct. 27, 1986, 61-255057
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—690 **6 Claims**



1. An off-road vehicle comprising:

a vehicle frame of piping;

a power unit including an engine, a transmission, an intake and exhaust device, a fuel tank, and a battery;

at least one rear wheel; and

a suspension supporting said rear wheel on said vehicle frame, said suspension comprising:

a knuckle by which said rear wheel is rotatable supported, said knuckle having a proximal end and an upward extension;

said vehicle frame having a side frame member positioned laterally of said power unit and a rear frame member positioned rearwardly of said power unit;

a lower arm assembly coupled between said proximal end of said knuckle and said side frame member of said vehicle frame; and

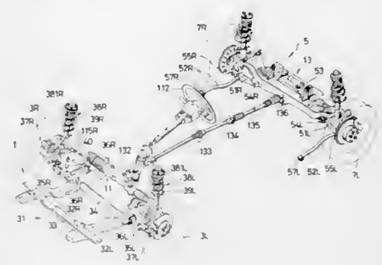
an upper arm having a vertex end and two front and rear legs extending forwardly and rearwardly from said vertex end, said vertex end being pivotally coupled to said upward extension of said knuckle, said front leg being pivotally coupled to said side frame member, and said rear leg being pivotally coupled to said rear frame member.

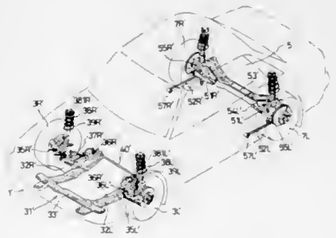
4,817,986

VEHICLE BODY ASSEMBLY USED IN COMMON FOR TWO-WHEEL-AND FOUR-WHEEL-STEERING VEHICLES

Hirotaka Kanazawa, Hiroshima; Akira Marumoto, Kure, and Kouji Tsuji, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 5, 1988, Ser. No. 177,933
Claims priority, application Japan, Apr. 6, 1987, 62-83031
Int. Cl.[4] B62D *21/00*
U.S. Cl. 280—781 **15 Claims**





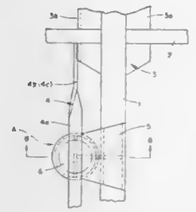
1. A method of adjusting a characteristic of a suspension system contained in a vehicle body assembly which is adapted to be used in common for a two-wheel-steering vehicle and a four-wheel-steering vehicle, characterized by when a front suspension system of said suspension system is installed in a four-wheel-steering vehicle, said front suspension system is set to have a lateral rigidity which is higher than that of said front suspension system installed in a two-wheel-steering vehicle.

4,817,987

STRUCTURAL ELEMENT FOR SUPPORTING THE CHASSIS OR SUPERSTRUCTURE OF A MOTOR VEHICLE ON A WHEEL

Faust Hagin, Munich, and Gerd Rühmann, Gilching, both of Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed May 18, 1987, Ser. No. 51,506
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621821; Mar. 28, 1987, 3710421
Int. Cl.[4] B62D *21/00*
U.S. Cl. 280—788 **9 Claims**



1. A structural element for supporting part of a vehicle on a wheel thereof comprising:

a longitudinal beam extending in the lengthwise direction of the vehicle,

a spring with an upright line of action vertically resiliently supporting said longitudinal beam in relation to said wheel of said vehicle,

a bracket-like spring bearer attached to said longitudinal beam and connected with a top part of said spring,

a spring bearer bar extending in the longitudinal direction of the vehicle, said bearer bar having a saddle-like center part joined to said spring bearer and having arms extending out from said saddle, said arms being downwardly directed to positions at which they are joined with said longitudinal beam, such positions being at a lower level than said center saddle-like part, said arms of said bearer bar between said joining positions and said saddle-like center part being flexible in the transverse direction of the vehicle and resistive to tensile forces.

4,817,988

DEVICE FOR JOINING TWO SKIS TOGETHER WHICH IS READILY REMOVABLE WITH THE SKIS ON THE FEET

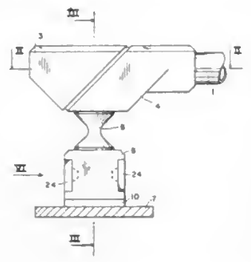
Alain Chauvet, Le Bouscat, and Didier Bondoux, Paris, both of France, assignors to Alain Chauvet and S. A. Prisme, both of, France

Filed Dec. 11, 1987, Ser. No. 131,723
Claims priority, application France, Dec. 12, 1986, 86 17531
Int. Cl.[4] A63C *11/00*
U.S. Cl. 280—817 **6 Claims**

1. A device for joining two skis together, readily removable with the skis on the feet, including a connection system comprising a variable length bar, exhibiting means for articulating through several degrees of freedom arranged at both ends of said bar, said means for articulating are connected to the ski tips of the skis, by a fastening-unfastening device formed by a male part and a female part, one part of said fastening and unfastening device is secured to said means for articulating and a mating part is connected to said ski tips, said parts are lockable-unlockable by fitting together then rotation, of a determined amplitude, about an axis perpendicular to the plane of the ski tips, of the part secured to said means for articulating, wherein said means for articulating exhibit a diabolo or similar configuration and are made from a resilient material, one at least of the ends of said means for articulating is mounted for

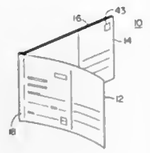
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swivelling, and said connecting bar is a rod with enlarged diameter ends sliding freely and are retained in cylindrical



sleeves connected to one of the ends of said diabolo shaped piece.

4,817,989
POSTCARD
William J. Pendergast, One Washington St., Suites 106–107, Wellesley, Mass. 02181
Filed Dec. 7, 1987, Ser. No. 129,242
Int. Cl.[4] B41L *1/20*
U.S. Cl. 282—9 R **14 Claims**



1. A postcard assembly comprising, a first, second, and third sheet, said sheets being arranged one on top of another, with adjacent sheets removably attached together,

wherein said first and second sheets have first and second upper and first and second lower surfaces, said first and second lower surfaces comprising pressure sensitive material, wherein pressure on said material causes a visible mark to be formed on a sheet positioned below said first or second lower surface, and wherein said third sheet is adapted to be mailed as a postcard with said second sheet removably attached to said third sheet and with said second sheet obscuring said visible mark on said third sheet,

said second and third sheets forming a mailable assembly mailable at postcard rate having an address portion for displaying upon mailing, the address of the recipient and a confidential message portion opaquely covered by at least a portion of said second sheet,

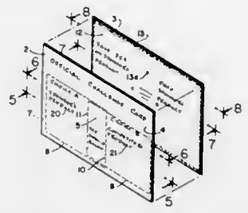
said confidential message portion visible upon removing said second sheet from said third sheet.

4,817,990
MULTIPLE VALUE COUPON SYSTEM
Lee Krost, Stamford, Conn., assignor to Lee Krost Associates Inc., Stamford, Conn.
Filed Sep. 14, 1987, Ser. No. 96,723
Int. Cl.[4] B42D *15/00;* **G09F** *1/08, 9/00;* **B42F** *3/00*
U.S. Cl. 283—101 **15 Claims**

1. A multiple retail coupon document comprising an upper sheet and a lower sheet separably joined together around their edges by an adhesive,

the upper sheet having an outer face with a rectangular center section,

a plurality of end sections defined by lines of division, each end section being adjacent a side of the center section and bearing indicia defining a product,

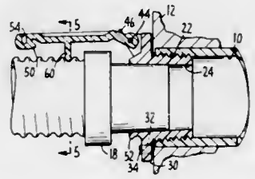


the lines of division being arranged to provide a rectangle encompassing a single end section and the center section,

and, the lower sheet having an inner face with cooperating printed matter disposed in such a manner as to indicate a value of a product upon cutting a rectangle comprising an end section and the center section,

the value not being ascertainable until said rectangle is cut.

4,817,991
SAFETY FITTING FOR A VACUUM ORIFICE IN A SWIMMING POOL
Herman E. Frentzel, Kentfield, and Delter Rief, Rohnert Park, both of Calif., assignors to Arneson Products, Inc., Corte Madera, Calif.
Filed Jun. 19, 1987, Ser. No. 64,241
Int. Cl.[4] F16L *5/00*
U.S. Cl. 285—7 **5 Claims**



1. A fitting for a vacuum orifice formed in the wall of a swimming pool, said fitting for receiving the end of a vacuum hose, said fitting comprising:

a hollow body member connectable to said vacuum orifice and having an opening for receiving a vacuum hose;

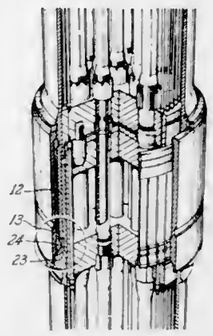
a cap connected to said body member and configured to cover and seal the opening in said body member when said cap is in a closed position;

spring means for biasing said cap into said closed position; and

lock means for securing said cap in the closed position, said lock means being defined by a downwardly projecting lip formed on the exterior of said body member and a resilient finger formed on said cap, said lock means being configured such that in the closed position a gap is defined for receiving a tool to facilitate the disengagement between said lip and said finger and wherein the force generated by said spring means is sufficient to cause the automatic engagement of said lock means even when there is no suction present at the orifice.

2. A fitting as recited in claim 1 further including a lug formed on said cap and located such that when said cap is in the open position, the lug will engage the vacuum hose to enhance the connection between the hose and the fitting.

4,817,992
CONNECTOR WITH REDUCED STRESSES
David Yip, Vancouver, and Peter R. Gibb, Port Coquitlam, both of Canada, assignors to Novacorp International Consulting Ltd., Canada
Filed Oct. 8, 1986, Ser. No. 916,792
Claims priority, application Canada, Oct. 11, 1985, 492802
Int. Cl.[4] F16L *37/12*
U.S. Cl. 285—18 **2 Claims**



1. A connector for axially joining two pipes or like structures together, said connector comprising:

latching means having a plurality of circumferentially arranged latching segments for sliding over the outer surface of said pipes to retain said pipes together;

a locking sleeve for sliding over said latching means and the joining ends of said pipes;

each of said latching segments having an inwardly directed hook portion and a pair of axially spaced support faces on its outer surface, one of said support faces located above said hook portion and the other support face located below said hook portion; and a recessed undercut area on the outer surface of said segments between said support faces;

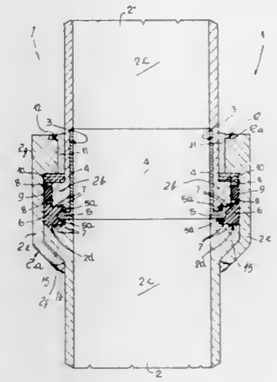
the thickness of said segments in said recessed, undercut area being less than that in the areas of said support faces but greater than the thickness of said segments in the area above said support faces;

a hook-engaging lip on one of said pipes to be joined and having a surface configuration complimentary to that on said inwardly directed hook portion of said latching segments;

said locking sleeve having two annular support faces on its inner surface which slidably engage the support faces on said lathing segments;

the dimensions of the elements being such that, when the locking sleeve is slid over the latching segments, an interference fit is obtained between said locking sleeve, said latching segments and the part to which said connector is being attached.

4,817,993
DIELECTRIC JOINT, PARTICULARLY FOR METALLIC CONDUITS FOR LIQUIDS AND/OR GASES
Walter Zoboli, Via Prampolini 30, 40143 Formigine (Providence of Modena), Italy
Filed Apr. 16, 1987, Ser. No. 39,134
Claims priority, application Italy, Apr. 18, 1986, 28969/86[U]
Int. Cl.[4] F16L *21/00;* **F16J** *15/02;* **H02G** *15/08*
U.S. Cl. 285—54 **11 Claims**



11. A dielectric joint, in particular for metal conduits for liquids and gases, comprising:

a first conduit length having a first outwardly protruding enlarged head, said first conduit length having a first inner surface and defining an inner annular recess extending at least at said first enlarged head, and said first enlarged head defining a first outer diameter,

a second conduit length having a second outwardly protruding enlarged head facing towards said first enlarged head, said second enlarged head defining a second outer diameter larger than said first outer diameter, said second conduit length having a second inner surface aligned with said first inner surface,

a ring element surrounding said first and second enlarged heads, said ring element having an enlarged end portion surrounding said first conduit length at a portion of said first conduit length arranged near said enlarged head, said enlarged end portion of said ring element defining an annular interspace with said first conduit length and having an inner diameter which is smaller than said first outer diameter of said first enlarged head of said first conduit portion, said enlarged end portion of said ring element defining an annular end recess having a transverse side facing said first conduit length and having a variable distance therefrom, with said variable distance increasing towards said first enlarged head, said ring element further having a second end portion countershaped to and in contact with said second enlarged head, said second end portion being welded to said second conduit length,

a cylindrical element of highly electrical insulating material, said cylindrical element extending in said inner annular recess of said first conduit length and having a cylindrical inner surface extending flush with said inner surfaces of said first and second conduit lengths, said cylindrical element having a radial projection outwardly protruding and partially extending between said first and said second enlarged heads,

an annular gasket extending among said first and second enlarged heads, said radial projection and said ring element, said annular gasket having an inner circumferential hole partially accommodating said radial projection, said annular gasket further having first enegagement means copperating with said first and second enlarged heads and

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second engagement means cooperating with said radial projection for position blocking,

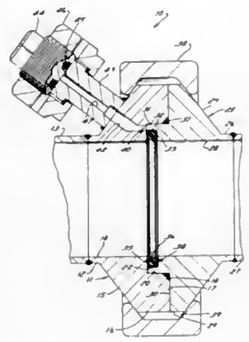
electric insulation elements and stiffening elements interposed between said ring element and said first conduit length, said electric elements including a closure casting of polimerized type resin filling said annular interspace and said end annular recess and defining with said end annular recess a dovetail joint.

4,817,994

ASEPTIC PIPE JOINT

Hervé X. Bronnert, 21495 Partridge Ct., Brookfield, Wis. 53005

Filed Oct. 14, 1987, Ser. No. 108,472
Int. Cl.⁴ F16L *35/00*
U.S. Cl. 285—93 **6 Claims**



1. An aseptic pipe joint comprising a first ferrule having a counter-bore with a sealing surface therein, a second ferrule having a protuberant end adapted to be matingly received in said counter-bore, a counter-bore in said protuberant end of said second ferrule with a sealing surface therein, means in said counter-bore in said second ferrule for engaging said sealing surfaces and sealing the joint between said ferrules,

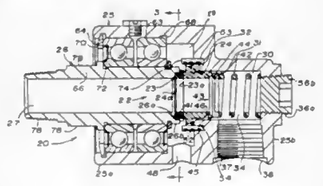
said sealing means including a "C"-shaped metallic ring and a resilient seal ring filling the inside of said "C"-shaped ring to prevent the accumulation of product in the metallic ring and means for holding the joint together.

4,817,995

ROTATING UNION WITH REPLACEABLE SEALING ASSEMBLY

Louis H. Deubler, Northbrook; Delbert C. Reisener, Glenview, and Dennis G. Pearson, Lake Zurich, all of Ill., assignors to Deublin Company, Northbrook, Ill.

Filed Feb. 6, 1987, Ser. No. 11,839
Int. Cl.⁴ F16L *27/00*
U.S. Cl. 285—98 **11 Claims**



1. In a rotating union including a relatively stationary housing, a rotor assembly rotatably mounted in the housing and having an inlet end and an outlet end projecting from one end of the housing for coupling to a rotating drive device adapted to receive fluid conducted through the rotating union, a discharge passageway extending axially through the rotor between its inlet and outlet ends, a fluid inlet chamber defined by a generally cylindrical inner wall portion of the stationary housing at the other end of the stationary housing, inlet means communicating with said inlet chamber and adapted for connection to a source of fluid, and seal means providing a rotating seal between said inlet chamber of the housing and the discharge passageway of the rotor, said seal means comprising:

a rotating annular seal member removably mounted in a counterbore at the inlet end of the rotor to rotate with the rotor, said annular seal member having a pair of concave notches on the periphery thereof and including an annular seal surface,

a one piece non-rotating seal means located in the inlet chamber and slidably and removably supported therewithin, said one-piece non-rotating seal means including a seal member portion having an annular seal surface, bias means positioned in the inlet chamber acting against said non-rotating seal means to maintain said annular seal surface of said non-rotating seal member resiliently engaged with said annular seal surface of said rotating seal member,

means keying the counterbored inlet end of the rotor with said rotating seal member, said means keying comprised of a pair of convex bend portions which are complementary to said pair of concave notches on the periphery of said annular seal member,

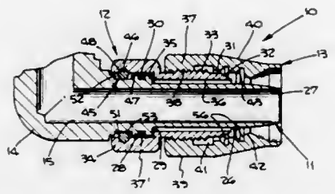
said one-piece non-rotating seal means having a generally cylindrical portion extending axially of the inlet chamber of the housing and a peripheral mounting flange portion provided with first and second apertures aligned with first and second apertures formed in an interior surface of the housing, and key means inserted through the aligned apertures in said flange portion and in the housing to set the non-rotating seal means relative to the housing thereby preventing rotational movement of said non-rotating one-piece seal means within the housing.

4,817,996

ADJUSTABLE REUSABLE FITTING ASSEMBLY FOR REINFORCED HOSE

Robert E. Fouts, Rancho Palos Verdes, Calif., assignor to Earl's Supply Co., Carson, Calif.

Filed Sep. 2, 1987, Ser. No. 92,067
Int. Cl.⁴ F16L *39/02*
U.S. Cl. 285—149 **7 Claims**



1. In a hose and fitting assembly, the hose having an inner fluid sealing tube and an outer tubular reinforcement, the fitting assembly being of the lip-seal detachable and reusable type, the assembly including a nipple having an elongated substantially cylindrical portion received in the fluid sealing tube, an integral enlarged diameter substantially cylindrical portion, and a shoulder portion joining said cylindrical portions, said enlarged portion outer surface having an annular O-ring recess therein axially adjacent said shoulder, an integral swivel adapter including a substantially cylindrical sleeve portion with an inner diameter greater than the outer diameter of said nipple elongated cylindrical portion so as to define an annular space therebetween receiving at least a portion of the lip-seal portion of said hose inner tube, said sleeve portion having external threads and a forwardly extending portion having a sharp edge, said adapter including a nut portion with an inner generally uniform diameter greater than the inner diameter of said sleeve portion so as to define an internal annular shoulder between said nut portion and said sleeve portion, the inner diameter of said nut portion being only slightly larger than the external diameter of the enlarged portion of said nipple for receiving said enlarged portion in snug relation, an O-ring disposed in said O-ring recess, a socket receiving said adapter sleeve portion and said nipple elongated cylindrical portion, said socket having an internally threaded section adjacent one end for threaded engagement with said adapter, an intermediate section having a diameter greater than the external diameter of said forwardly extending portion so as to define an annular space receiving said hose outer tubular reinforcement, and a remaining section having an axially rearwardly decreasing diameter and means for gripping said reinforcement when said socket is axially advanced by threaded engagement with said sleeve portion thereby forcing a portion of said hose inner tube into said annular space between said sleeve portion and nipple and forcing said other portion of said hose and said reinforcement into said annular space between said sleeve portion and said socket, the improvement which comprises:

limited longitudinal axially adjustable and connecting means associated with both said swivel adapter and said nipple for allowing limited longitudinal adjustment of said swivel adapter with respect to said nipple in the axial direction thereof while coupling said swivel adapter to said nipple in a fluid-tight manner,

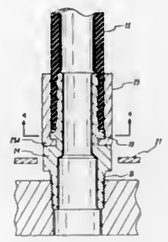
said limited longitudinal axially adjustable and connecting means including an annular connector wire recess in the inner wall of said nut portion, the outer wall enlarged portion of said nipple having an annular groove therein extending longitudinally in the axial direction of said nipple having generally vertical and essentially flat stop shoulders at each end thereof, said annular groove being essentially flat and linear and the plane thereof extending generally normal to the plane of said stop shoulders, and a wire connector member disposed in both said annular wire recess and said annular groove when in registry to prevent disengagement of said swivel adapter from said nipple while permitting relative rotation therebetween and limited axial movement of said swivel adapter with respect to said nipple in the axial direction thereof.

4,817,997

HOSE COUPLING

Thomas L. Ingram, 2313 Meadowlark Ln., Bedford, Tex. 76021

Filed Jun. 25, 1987, Ser. No. 66,866
Int. Cl.⁴ F16L *33/20*
U.S. Cl. 285—256 **13 Claims**



1. A device for coupling a fluid delivery hose to a fluid source, comprising:

a first coupling member for being inserted into the hose at an inlet end thereof;

a second coupling member connected to said first coupling member for being connected to the fluid source;

a collar member disposed between said first and second coupling members, said collar member having a greater diameter than that of the inlet opening of the hose to limit the depth of insertion of the first coupling member into the hose;

a polygonal member disposed between said second coupling member and said collar member so that a recessed region is defined between said collar member and said polygonal member, said recessed region having a plurality of flat surfaces disposed thereon; and

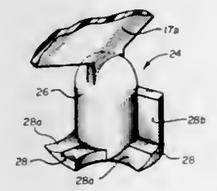
a sleeve member for being concentrically disposed around a portion of said hose adjacent to said inlet end so as to overlap said inlet end, said sleeve member for being crimped against said hose and said collar member so that a portion of said sleeve member is received within said recessed region and engages said flat surfaces to substantially fix said sleeve member against rotation with respect to said hose and said first and second coupling members.

4,817,998

INSTRUMENT FOR HANDLING CONTACT LENS DISINFECTING CATALYST

Francis E. Ryder, Arab, and Rowland W. Kanner, Guntersville, both of Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Aug. 3, 1987, Ser. No. 80,780
Int. Cl.⁴ B65D *85/38*; A61L *2/18*
U.S. Cl. 294—1.1 **17 Claims**



1. An extractor instrument for removing an article having a through passageway and located adjacent the bottom of a container cavity from the open upper end of the container cavity which has an axis generally aligned with said passageway, said instrument comprising an elongate gripping member and a cam structure secured to the gripping member adjacent one end thereof, said cam structure comprising at least one foot extending generally perpendicular to the elongate dimension of said gripping member to enable axial insertion of said foot into said open cavity end, through said article passageway, and engagement of said foot below and against a surface of said article directed away from said open cavity end for subsequent withdrawal of said gripping member and foot to remove the engaged article.

4,817,999

CONVERTIBLE HEADER LATCH MECHANISM

Dale M. Drew, Grosse Point Woods, Mich., assignor to ASC, Incorporated, Southgate, Mich.

Filed Sep. 24, 1987, Ser. No. 100,544
Int. Cl.⁴ E05C *5/02*
U.S. Cl. 292—113 **8 Claims**

1. A latch mechanism for a convertible vehicle having a foldable top and a header, the mechanism having a latch engaging position when fully engaged, and an extreme disengaging position when disengaged, which comprises:

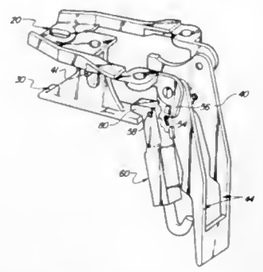
a stationary member being mounted within a convertible top, the member having a pedestal depending therefrom, and a foot extending from the pedestal;

an engaging member having a keeper which attaches to a header, the engaging member having a lip adjacent the

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end thereof opposite the keeper and disposed in an opposite direction from the keeper; and

a release member having two side-struts integrally formed at the sides thereof, the release member being swingably mounted to the stationary member and being pivotally



mounted to the engaging member adjacent the lip enabling the release member to swing downward relative to the stationary member resulting in a camming action between the foot and the lip when a downward force is applied to the release arm which thereby detaches the keeper from the header.

4,818,000

DECORATIVE SURFACE BOLT

Louis G. Bobrowski, Berlin, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Dec. 9, 1987, Ser. No. 130,549
Int. Cl.[4] E05C 1/10
U.S. Cl. 292—147 **14 Claims**

1. In a decorative surface-mounted latch bolt assembly, the combination comprising:

(a) a base member having a top wall and depending sidewalls defining a channel therebetween, said top wall having an aperture therein extending parallel to said channel;

(b) a guide member of synthetic resin seated in said channel of said base member, said guide member having a top wall and side walls extending parallel to said channel of said base member providing a channel extending parallel to said channel of said base member, said top wall of said guide member having an aperture therein aligned with said aperture of said base member;

(c) a latch bolt slidably seated in said channel of said guide member;

(d) a decorative housing having a top wall and a sidewall extending downwardly therefrom about said base member, said top wall having an aperture therein aligned with said apertures in said top walls of said base member and guide member, said sidewall providing an aperture aligned with one end of said channels and dimensioned and configured to permit said latch bolt to pass freely therethrough; and

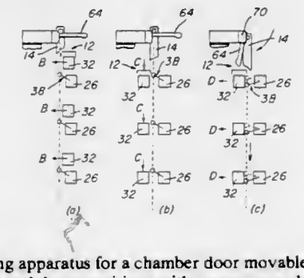
(e) an actuator member disposed above said top wall of said decorative housing and overlying said aperture therein, said actuator member being engaged with said latch bolt through said apertures in said base and guide members to effect reciprocation thereof within said channel of said guide member.

4,818,001

CHAMBER DOOR LOCK

Louis F. Pisacane, Churchville, and William F. Mitchell, Huntington Valley, both of Pa., assignors to Environmental Tectonics Corporation, Southampton, Pa.

Filed Apr. 22, 1987, Ser. No. 41,174
Int. Cl.[4] E05C 9/02
U.S. Cl. 292—304 **14 Claims**



1. Locking apparatus for a chamber door movable vertically between up and down positions with respect to a chamber and swingable about a vertical axis to and from a face of the chamber, comprising:

a locking bar movable vertically between up and down positions and spaced roller assemblies pivotably mounted on said locking bar so as to contact a portion of said chamber door and urge said door against said chamber face when said door and locking bar are in down positions and so as to clear said portion of said chamber door so that said door can be swung from said chamber face when said door and locking bar are in said up positions, and

means coupled to said locking bar for obstructing upward movement of said door when said door and locking bar are in said down positions and for permitting unobstructed upward movement of said when said locking bar is in said up position.

4,818,002

SEALING SYSTEM AND A SEALED SYSTEM

Eduardo De Lima Castro Netto, Rua Othon Bezerra de Melo 40, Rio de Janeiro, Brazil

Filed Dec. 1, 1986, Ser. No. 936,307
Claims priority, application Brazil, Dec. 20, 1985, PI8506415
Int. Cl.[4] B65D 33/34
U.S. Cl. 292—307 R **2 Claims**

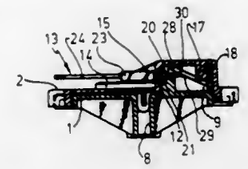
1. A system for sealing two elements to each other, comprising:

a first element and a second element which are relatively movable to and from a sealing position wherein the elements form a closed cavity therebetween,

said first element having a first opening and said second element having a second opening which are aligned in an alignment direction when the elements are in said sealing position, said closed cavity and said first opening being located on opposite sides of said second opening,

one of said elements having a deflecting member which has a deflecting surface means in said closed cavity for deflecting a seal member which is inserted into the closed cavity through said openings; said deflecting surface means being spaced from the openings and being inclined relatively to said alignment direction in order to deflect a seal member in a deflection direction,

said cavity in the region of the second opening being larger than the second opening both in a direction which is opposite to said deflection direction and in a direction which is lateral with respect to the deflection direction,



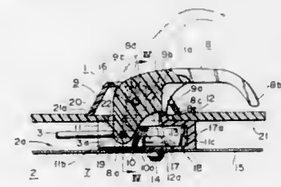
a seal which extends through said aligned openings and includes a lock portion located in said closed cavity, said lock portion having a trailing end with an abutment surface which is displaced from said second opening both in a direction which is opposite to said deflection direction and in a direction which is lateral with respect to the deflection direction.

4,818,003

DOOR HANDLE DEVICE FOR A DOOR OF AN AUTOMOTIVE VEHICLE

Osamu Seko, 401-1, Takakura, Fujisawa-shi, (Kanagawa-ken), 252, and Masaichi Moriya, 14-2-202, Tsurugadai, Chigasaki-shi, (Kangawa-ken), 253, both of Japan

Continuation of Ser. No. 742,136, Jun. 7, 1985, abandoned, which is a continuation of Ser. No. 448,852, filed as PCT JP82/00131 on Apr. 20, 1982, published as WO82/03650 on Oct. 28, 1982, abandoned. This application Dec. 23, 1986, Ser. No. 946,601
Claims priority, application Japan, Apr. 21, 1981, 56-60038
Int. Cl.[4] E05B 3/00
U.S. Cl. 292—336.3 **8 Claims**



1. A door handle device for a door of an automotive vehicle comprising:

a door lock mechanism operative between a door locking state and a door unlocking state;

a door handle having a pivot portion which as a substantially narrower width in comparison with a grip portion, said door handle being associated with said door lock mechanism at the end portion of said pivot portion and being movable between first and second positions to operate said door lock mechanism respectively at said door locking and door unlocking states;

a supporting means having a base portion secured onto a door inner panel of the automotive vehicle and vertical walls extending from said base portion in parallel to each other, said vertical walls defining a first space having a width substantially equal to the width of said end portion of said pivot portion of said handle for pivotably receiving the latter therein, said base portion defining therein a second space which is in alignment with said first space, and through which second space, said end portion of said pivot portion moves; and

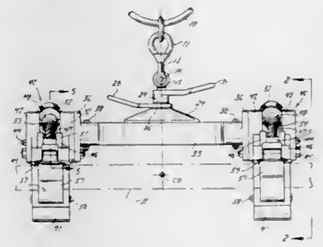
a resilient member disposed within said second space and having one end normally contacting said end portion of said pivot portion for constantly biasing said handle towards said first position.

4,818,004

ROTOR BLADE SLING

Malcom C. Oswalt, and Ralph Hulihee, both of Mesa, Ariz., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 16, 1987, Ser. No. 121,412
Int. Cl.[4] B66C 1/10
U.S. Cl. 294—81.3 **6 Claims**



1. A helicopter blade sling for attachment to a hoist for accurately positioning rotor blades, having a longitudinal axis and a center of gravity, comprising:

a lower clamp shaped as a segment of a sphere and having an outside surface;

a tube centrally attached to and protruding from said lower clamp and having an end termination adapted to engage said hoist;

a race having generally parallel arcuately shaped outside and inside surfaces generated about a common center, said inside surface conforming to and bearing against said outside surface of said lower clamp and said race having an aperture therein so as to permit rotation of said race relative to said lower clamp and said tube attached to and protruding from said lower clamp;

means attached to said race for supporting said rotor blade so that said rotor blade's center of gravity approximately coincides with said common center of said arcuately shaped surfaces of said race; and

means to lock said race with respect to said lower clamp.

4,818,005

GRAPPLE WITH POWERED TOP AND BOTTOM JAW

Brian Purser, Stoke-on-Trent, United Kingdom, assignor to Dudley Shearing Machine Manf. Co. Limited, Stoke-on-Trent, England

Filed Jul. 2, 1987, Ser. No. 69,693
Int. Cl.[4] B66C 3/16
U.S. Cl. 294—88 **4 Claims**

1. A grapple, comprising:

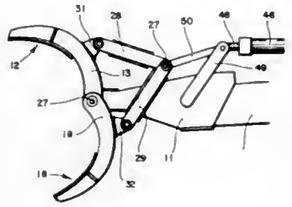
(a) a mounting bracket for attachment to an outer boom of an excavator having a hydraulic cylinder mounted thereon;

(b) a top jaw having an inner end and an outer, free end, said top jaw mounted by its inner end for pivotal movement on said mounting bracket;

(c) a bottom jaw having an inner end and an outer, free end, said bottom jaw mounted by its inner end for pivotal movement on said mounting bracket for opening and closing cooperation with said top jaw; and

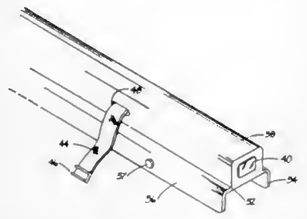
(d) linkage means connected, respectively, to said top and bottom jaws intermediate said inner and outer ends

thereof and to said hydraulic cylinder for unison powered movement of said top and bottom jaws into an open position, and for unison powered movement of said top and bottom jaws into a closed position by operation of only the single hydraulic cylinder through said linkage means, said linkage means comprising a bucket lever pivoted by pivots at opposite ends thereof to a piston rod means of



said cylinder and said outer boom, and a bottom linkage arm pivoted by pivots at opposite ends to said bottom jaw and a top linkage bar means interconnecting said piston rod means and said top jaw, wherein the two pivots of the bucket lever are at all times positioned between the two pivots of the bottom linkage arm and said piston rod means.

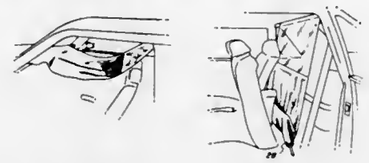
4,818,006
PICKUP BED PROTECTOR
Gustav E. Arndt, RR 1, Adrian, Mo. 64720
Filed Dec. 11, 1987, Ser. No. 131,452
Int. Cl.[4] B61D *45/00*; B62D *33/00*
U.S. Cl. 296—32 **5 Claims**



1. A new and improved pickup bed protector, comprising:
an elongated channel shaped strip having a horizontal top wall with inner and outer vertically downwardly extending side walls;
a series of spaced apertures for reception of threaded fasteners provided along the length of said inner side wall;
an elongated housing having a generally rectangular transverse cross section provided on an outer surface of said top wall;
a series of spaced slots extending through an inner side wall of said housing; and
a spring retraction roller in said housing, adjacent each of said slots.

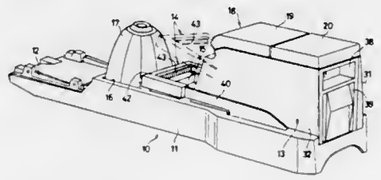
4,818,007
VEHICLE SCREEN/SHADE
Robert Mahoney, 3288 Bermuda Rd., Lake Park, Fla. 33410
Filed Jun. 5, 1987, Ser. No. 58,824
Int. Cl.[4] B60P *3/05*
U.S. Cl. 296—24.1 **6 Claims**

1. A vehicle screen, comprising:
screen means for providing an air flow barrier within the interior of said vehicle, said screen means including a transparent portion and an opaque portion, said screen means being mounted within said vehicle such that said transparent portion provides no substantial impediment to a driver's visibility; said screen means having a first end which is attached to rear of the roof of said vehicle and a second end which may be alternatively placed near the floor of said vehicle providing a compartmentalizing function or near the window of said vehicle providing a sun blocking function;
means for mounting said screen means within said



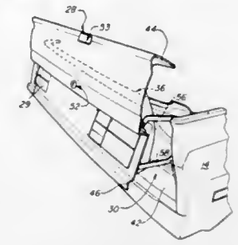
means for retracting said screen means about said mounting means, said screen means being movable from a first retracted position to a second elongated position;
said screen means providing a dual function of first compartmentalizing said vehicle such that only the driver's compartment would require air conditioning or heating, and second providing an opaque sun screen which is placed about the vehicle's windows to prevent sunlight from entering the vehicle, thereby cooling the vehicle and protecting the interior from the harmful effects of radiation.

4,818,008
CONSOLE WITH CONTROLS AND SERVICES FOR A MOTOR CAR
Ermanno Cressoni, Arese, Italy, assignor to Alfa Romeo Auto S.p.A., Naples, Italy
Filed Jul. 12, 1985, Ser. No. 754,447
Claims priority, application Italy, Jul. 16, 1984, 22586/84[U]
Int. Cl.[4] B60R *7/04*; B60T *7/10*
U.S. Cl. 296—37.8 **11 Claims**



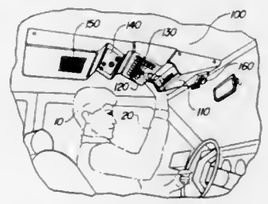
1. A console for use with a motor car having a floor, transversely spaced apart front seats and a dashboard, said console comprising a longitudinally elongated base forming means for attaching said console to a motor car floor between the front seats and in a fixed position, a glove box seated on a rear portion of said base, a U-shaped parking brake lever including a pair of longitudinally extending arms having forward ends joined by a transverse handle, said arms having rear ends carried by pivot means, said pivot means having mounting means for securement to a motor car floor within the confines of said base directly under said glove box, said rear ends of said arms being positioned generally within said base and generally outside the confines of said glove box with the position of said brake lever relative to said glove box being one wherein said transverse handle of said brake lever clears the glove box in all pivotal operative positions of said brake lever.

4,818,009
CONVERTIBLE TOP AUTOMOBILE WITH VERTICALLY MOVABLE TAIL GATE
Peter P. Muscat, 14980 Waterfall Rd., Northville, Mich. 48167
Filed Sep. 24, 1987, Ser. No. 100,542
Int. Cl.[4] B60J *5/10, 7/12*
U.S. Cl. 296—106 **4 Claims**



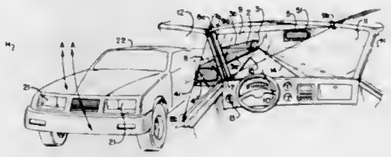
1. In a convertible top automobile of the type including a top comprised of a body attached frame and a fabric covering, said top rearwardly foldable into a receiving storage space formed in part by automobile body portions, said storage space extending to the rear of said automobile, the improvement comprising:
a vertically disposed end opening formed in said body portions at the rear of said automobile, said end opening having a fixed top and bottom member and side members, said end opening entering into said top receiving storage space;
said fabric covering having a rear edge attached to said fixed top member of said end opening;
a movable tail gate extending across the rear of said automobile body and configured to overlie said end opening against said top, sides, and bottom members thereof;
means for mounting said tail gate to be movable between a closed position overlying said end opening and an open position, uncovering said end opening to enable selective access to said top receiving storage space through said end opening.

4,818,010
MOUNTING SYSTEM FOR EQUIPMENT IN POLICE VEHICLES
John A. Dillon, Ypsilanti, Mich., assignor to Automotive Prototypes & Equipment, Ann Arbor, Mich.
Filed Oct. 17, 1986, Ser. No. 920,833
Int. Cl.[4] B60R *11/02*
U.S. Cl. 296—37.7 **15 Claims**



1. A vehicle ceiling mounted console for use in a vehicle having a ceiling upholstery secured by an upholstery molding and an interior dome light mounted to a light mount in the central portion of the vehicle ceiling, said vehicle ceiling mounted console comprising:
an elongated generally rectangular housing having a length for extending between a forward edge of the ceiling rearward along a longitudinal center line of the ceiling to a central portion of the ceiling and having an upper surface generally conformal to the surface of the ceiling;
a forwardly extending tongue disposed on the forward edge of said elongated housing adapted to wedge between a front portion of the upholstery molding and the ceiling for securing the forward edge of said elongated housing;
a plurality of mounting means disposed in said elongated housing, each adapted for mounting a unit of electrical equipment;
an adaptor bracket having a first set of holes therein disposed to correspond to a screw holes in the light mount and having a second set of holes therein adapted to receive mounting bolts;
a rear mounting bubble formed in the upper surface of the rear portion of said elongated housing, said rear mounting bubble extending longitudinally an adjustment distance, said rear mounting bubble having a set of holes therein corresponding to said second set of holes of said adaptor bracket;
a set of screws for securing said adaptor bracket to the light mount via said first set of holes; and
a set of bolts for coupling said rear mounting bubble via said set of holes to said adaptor bracket via said second set of holes,
whereby the location of said set of holes in said rear mounting bubble is selected during installation within said adjustment distance to account for differences in length in the vehicle from the upholstery molding to the light mount.

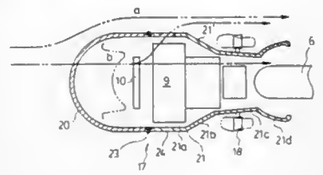
4,818,011
ANTI-GLARE VISOR SYSTEM
Gabe Cherian, 52 Amorok Way, Fremont, Calif. 94539
Filed May 13, 1987, Ser. No. 49,706
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.2 **17 Claims**



1. Anti-glare visor system for vehicles comprising:
(a) a first shaded area being positioned adjacent to the left of a central vision area which extends substantially to the upper portion and lower portion of the vehicle windshield and which has sufficient width for the driver to have an unobstructed view, with the driver's head in normal position, of the driver's side of the roadway from at least the right side of the roadway to at least the center of the roadway and said shaded area being extended outwardly and latterally therefrom wherein (i) the bottom boundary of the shaded area is angled to substantially correspond to the apparent angle at which the headlights of on-coming traffic move past the driver, (ii) the distance between the top and bottom boundaries of the shaded area is sufficient to provide effective shielding of the glare of the headlights of the on-coming traffic as the headlights move past the driver, (iii) the boundary between the shaded area and the central vision area is substantially straight and vertical and (iv) the shaded area extends outwardly sufficiently to provide effective shielding of the on-coming traffice headlight glare substantially to the limit of the driver's peripheral vision; and
(b) a second shaded area which is positioned to the left of the first shaded area and which extends a sufficient amount to effectively shield the headlight glare of a following vehi-

cle reflected in the exterior rear view mirror to the left of the driver.

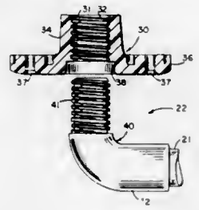
4,818,012
BODY COVERS FOR MOTORCYCLE
Mitsuyoshi Kohama, Kiyose, and Tetsuo Ogishima, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
PCT No. PCT/JP87/00035, § 371 Date Nov. 18, 1987, § 102(e) Date Nov. 18, 1987, PCT Pub. No. WO87/04398, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 21, 1987, Ser. No. 107,718
Claims priority, application Japan, Jan. 27, 1986, 61-013742
Int. Cl.[4] B62J *17/02*; B60K *11/06*
U.S. Cl. 296—78.1 **3 Claims**



1. A body cover for a motorcycle having a body frame including a head pipe, a main frame member extending rearward from the head pipe, a back stay extending rearward from a rear part of the main frame member, a seat rail mounting a seat and adapted to connect a rear end of the back stay to an intermediate part of the main frame member and an engine and carburetor mounted on the body frame comprising:
a forwardly open front cover extending around and covering a front part of said body frame from the front to a left and a right side thereof, said front cover having an opening at each side thereof with each opening bounded by the front cover at a front edge of said opening and providing access to said engine,
a pair of side covers with each side cover having a front edge adapted to be removably attached to one side of said front cover to cover said opening at said one side of said front cover,
each of said side covers having a front part adjacent its front edge formed to provide an outer surface which is a smooth continuation of an adjacent outer surface of said front cover, said front part being formed with an air outlet port for exhausting air from inside of said side cover to the outside of said side cover,
a second part of said side cover rearward of said front part which forms, at an inner surface thereof, an obtuse angle with an inner surface of said front part, an intermediate part of said side cover, rearward of said second part, angled inwardly relative to said second part to provide foot clearance, and a rear part of said side cover, said intermediate and said rear parts of said side cover extend rearward along one side of the body frame under the seat,
whereby each of said side covers extends from a front to a rear of said main frame member and covers one side of the main frame member, back stay and seat rail.

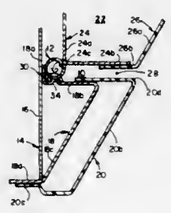
4,818,013
VISOR MOUNTING ASSEMBLY
Kim L. Van Order, Hamilton, Mich., assignor to Prince Corporation, Holland, Mich.
Filed Jul. 27, 1987, Ser. No. 78,381
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.13 **24 Claims**

1. A torque fitting assembly for use with a sun visor pivot rod for a vehicle a comprising;
a threaded fitting having an opening at one end for lockably receiving an end of visor pivot rod and having threads formed at an opposite end; and
a threaded bracket having a bore for threadably receiving said threads on said threaded fitting and including means



for securing said bracket to a vehicle roof, and wherein said fitting and said bracket have threads shaped to provide a predetermined torque for relative movement between them.

4,818,014
MOUNTING ARRANGEMENT FOR SEALING STRIPS
Randy L. Kaye, Utica, Mich., assignor to Schlegel Corporation, Rochester, N.Y.
Filed Sep. 10, 1987, Ser. No. 95,351
Int. Cl.[4] B60J *5/00*; E60B *7/16*
U.S. Cl. 296—146 **20 Claims**

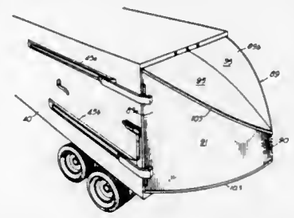


1. A mounting arrangement for sealing strips on motor vehicles and the like, the arrangement comprising:
at least one structural member of the vehicle having projecting rivet means formed integrally from the member along a gap to be sealed; and,
a sealing strip affixed to the projecting rivet means along the gap, obviating the need to provide separate attachment means for the sealing strip.

4,818,015
VEHICULAR AIRFOILS
Barry F. Scanlon, 939 Cumberland Rd., Atlanta, Ga. 30306
Continuation-in-part of Ser. No. 614,117, May 25, 1984, abandoned, which is a division of Ser. No. 319,628, Nov. 9, 1981, Pat. No. 4,451,074. This application Dec. 12, 1986, Ser. No. 941,026
The portion of the term of this patent subsequent to Apr. 4, 2004, has been disclaimed.
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—180.1 **7 Claims**

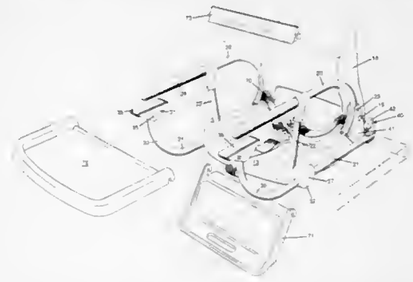
6. An airfoil for lessening wind resistance of trucks and semi-trailers adapted to be bifurcated into two airfoil sections stored flatly beside the truck sides and erected into a tapered unitized configuration to the front or rear of the truck, and with each airfoil section comprising a resilient side panel, a resilient top panel hinged to the top of said side panel, and a resilient bottom panel hinged to the bottom of said side panel,

a frame for each of said airfoil sections, with each frame comprised of a plurality of frame sections coupled together and including a section attached to said side panel and other sections attached to said top and bottom panels, and with each



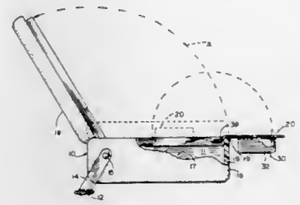
frame adapted to be configured flatly for storage beside said side panel and erected into an erect position with said frames of each airfoil section interlocked and urging said side, top and bottom panels outwardly into a tapered, unitized configuration.

4,818,016
HOOK-ON TYPE BABY CHAIR
John V. Mariol, and David W. Rice, both of Cincinnati, Ohio, assignors to James F. Mariol, Cincinnati, Ohio
Filed Oct. 1, 1987, Ser. No. 101,679
Int. Cl.[4] A47B *83/02*
U.S. Cl. 297—174 **23 Claims**



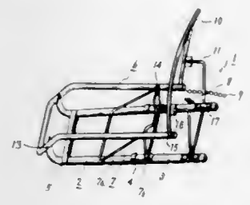
1. A hook-on type baby chair for use with a tabletop, comprising:
(a) a chair having a seat portion and a back portion;
(b) a pair of anchor members each secured to the baby chair and dimensioned so that the anchor member extremities overlie the tabletop to position the baby chair for use;
(c) a pair of vertical arm members extending from the anchor members to the seat portion, wherein said vertical arm members are each fixedly attached to said anchor members and fixedly attached to said seat portion;
(d) a pair of grip members each having a gripper foot on one extremity to frictionally contact an undersurface of the tabletop and each of said members pivotably attached to the vertical arm members for movement of the gripper feet towards and away from the anchor member extremities which overlie the tabletop; and
(e) latch means associated with the anchor members and the grip members so that when disengaged the grip members are free to pivotably move about their points of attachment and when engaged the gripper foot of each grip member is in fixed contact with the undersurface of the tabletop to securely hold the baby chair to the tabletop, further wherein the latch means are capable of providing a plurality of latch positions to accommodate different thickness tabletops and facilitate removable of the baby chair therefrom.

4,818,017
CONTAINER HOLDER FOR A VEHICLE
Ronald A. Dykstra, Holland, and James H. Hoeve, Zeeland, both of Mich., assignors to Prince Corporation, Holland, Mich.
Continuation of Ser. No. 944,989, Dec. 2, 1986, Pat. No. 4,792,184. This application Nov. 2, 1987, Ser. No. 115,521
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—194 **13 Claims**



1. In a vehicle armrest and container holder assembly in which said armrest is adapted for mounting to a vehicle and said holder assembly is adapted to support a container, the improvement comprising:
said armrest having a recess for receiving said container holder assembly in a storage position and means for mounting said holder assembly in a use position extending in a generally horizontal plane; said holder assembly further including a housing and a cup-shaped floor means movably coupled to said housing for movement between a raised position substantially positioned within said housing for producing a reduced depth of said holder assembly for compact storage of the container holder assembly in the armrest, and a lowered position extended downwardly from the lower end of said housing to increase the depth of said holder assembly for use in supporting the bottom of a container whereby said floor means can be raised and said assembly compactly stored in said recess when said holder assembly is not used and can be moved downwardly to said use position for supporting a container.

4,818,018
STRETCHABLE LEGLESS CHAIR
Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki, Osaka, Japan
Filed Aug. 1, 1986, Ser. No. 892,675
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **10 Claims**



1. A stretchable legless chair comprising:
(a) a fixed seat frame having a projecting stopper and a holding member provided respectively on an upper surface and a rear portion thereof;

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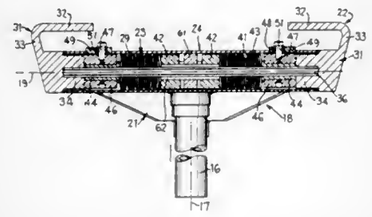
(b) a movable seat frame provided over said fixed seat frame and pivotally coupled with a front portion of said fixed seat frame at the front end thereof, and having a chain at the rear end thereof to be engaged with said holding member;
(c) a legged lever interposed between said fixed seat frame and said movable seat frame and selectably rotatably positionable on said projecting stopper, said legged lever having a short leg lever and a long leg lever of greater length than said short leg lever;
(d) a back reclining frame pivotally coupled at a lower end thereof with the rear end of said movable seat frame; and
(e) a swinging support lever interposed between said back reclining frame and said fixed seat frame.

4,818,019

TILT CONTROL MECHANISM, PARTICULARLY FOR KNEE-TILT CHAIR

Walter C. Mrotz, III, North Muskegon, Mich., assignor to Haworth, Inc., Holland, Mich.

Filed Feb. 9, 1987, Ser. No. 12,571
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—303 **12 Claims**



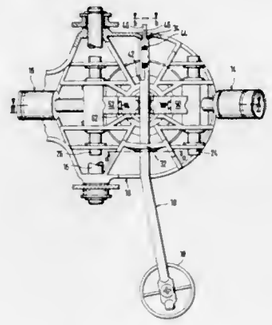
1. In a pedestal-type chair having a base assembly provided with a vertically upwardly projecting pedestal thereon, a seat structure disposed adjacent the upper end of the pedestal, and a knee-type tilt mechanism operatively connecting the seat structure to the pedestal for permitting tilting of the seat structure relative to the pedestal about a substantially horizontally extending tilt axis which extends sidewardly of the seat structure and is disposed in close proximity to the front edge thereof, said tilt axis being positioned forwardly from and in nonintersecting relationship to a vertical axis defined by the pedestal, the knee-tilt mechanism including a housing structure which is mounted on the pedestal and pivotally supports thereon a support structure for relative tilt therebetween about the tilt axis, the support structure being fixedly secured to the seat structure, and spring means coacting between said housing and support structures for imposing a restoring torque on the seat structure which normally maintains the seat structure when unoccupied in a substantially zero-tilt position, said seat structure being tiltable rearwardly about the tilt axis relative to the pedestal through a predetermined maximum tilt angle, comprising the improvement wherein said knee-tilt mechanism includes means responsive to the tilt of said seat structure for causing the restoring torque to increase according to a first predetermined pattern as the seat structure moves from the zero-tilt position to an intermediate position and for thereafter causing the restoring torque to change according to a second predetermined pattern as the seat structure tilts from said intermediate position to said maximum tilt angle so that the restoring torque generated according to said second predetermined pattern is less than the restoring torque which would be generated if the first predetermined pattern was extended from said intermediate position to said maximum tilt angle, said responsive means including cam-and-follower means coacting between said housing and seat structure, said cam-and-follower means including a cam nonrotatably mounted on one of said structures and a follower nonrotatably mounted on the other of said structures, said follower being supported on said other structure for movement relative thereto along a direction which is generally parallel with said tilt axis, said spring means normally urging said follower into engagement with a cam surface which is defined on said cam, said spring means and said cam-and-follower means cooperating to cause said restoring torque to increase at a first rate per degree of tilt as the seat tilts from said zero-tilt position to said intermediate position, and said spring means and said cam-and-follower means cooperating to cause said restoring torque to increase at a second rate per degree of tilt as the seat structure moves from said intermediate position to said maximum tilt position, said second rate being substantially smaller than said first rate.

4,818,020

SEAT ADJUSTMENT APPARATUS

Hermann Meiller, and Wolfram Jahn, both of Amberg, Fed. Rep. of Germany, assignors to Grammer Sitzsysteme GmbH, Fed. Rep. of Germany

Filed May 6, 1987, Ser. No. 47,201
Claims priority, application Fed. Rep. of Germany, May 14, 1986, 3616153
Int. Cl.[4] A47C *1/022*
U.S. Cl. 297—313 **14 Claims**



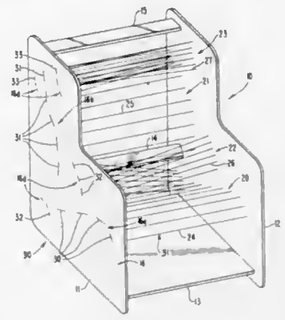
1. Seat adjustment apparatus disposed beneath a seat for adjusting the position of said seat comprising a first gas spring unit for adjusting said seat in a first manner on actuation thereof, a second gas spring unit for adjusting said seat in a second manner upon actuation thereof,
common operating lever means including a first end and a second end, said second end of said common operating lever means including gripping means,
first mounting means mounting said common operating lever means at a first location thereon and second mounting means mounting said common operating lever means at a second location thereon,
said common operating lever means having a first portion and a second portion, said first portion of said common operating lever means being slidably displaceable in said first mounting means while said second portion of said common operating lever means pivots about said second mounting means, and said second portion of said common operating lever means being slidably displaceable in said second mounting means while said first portion of said common operating lever means pivots about said first mounting means whereby said first gas spring unit may be actuated in response to said slidable displacement of said common operating lever means in said first mounting means and said second gas spring unit may be actuated in response to said slidable displacement of said common operating lever means in said second mounting means.

4,818,021

USER VARIABLE CHAIR

Martin Roysher, Box 255, Delmae, N.Y. 12054

Continuation of Ser. No. 5,286, Jan. 16, 1987, abandoned, which is a continuation of Ser. No. 688,899, Jan. 4, 1985, abandoned. This application Jun. 22, 1988, Ser. No. 211,148
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—440 **9 Claims**



1. A user-variable chair comprising:
at least one cord;
a frame having at least two sides each including an array of apertures through which said at least one cord is selectively strung to form a plurality of cord segments each defined by a different portion of said at least one cord strung between two apertures in different ones of said sides; and
a plurality of support portions, each composed of a different group of said cord segments and each having the general shape of a surface passing through the cord segments in the corresponding group, the shape of each of said support portions being variably adjusted by alteration of the apertures through which said at least one cord is strung, said support portions including
a seat support portion,
a back support portion, and
a supplemental support portion arranged on said frame such that the shape of said supplemental support portion is not parallel to the shapes of the seat and back portions, said support portion including two subportions, each composed of a different group of said cord segments and each having the general shape of a surface passing through the cord segments composing that subportion, wherein said subportions are arranged in said frame such that the surfaces passing through the cord segments composing said subportions intersect.

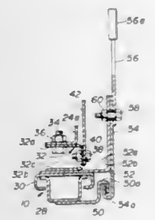
4,818,022

SEAT BELT ANCHOR-EQUIPPED SEAT SLIDE DEVICE

Shinichi Nishimura, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 3, 1986, Ser. No. 937,422
Claims priority, application Japan, Dec. 9, 1985, 60-189925[U]
Int. Cl.[4] B60R *21/00*
U.S. Cl. 297—473 **4 Claims**

1. A seat slide device for sliding a seat to a desired position relative to a stationary floor portion, comprising:
a pair of stationary rails secured to said floor portion;
a pair of movable rails slidably disposed on said stationary rails and secured to a frame member of said seat;
a pair of toughly constructed channel members each being tightly interposed between each of the movable rails and the frame member of the seat;
a first member secured to one of the stationary rails and having a first lock member at its outwardly extending portion;
a second member secured to one of the channel members and extending outwardly therefrom;
an anchor holding bracket secured to an outwardly extending portion of said second member and having a second lock member at its downwardly extending portion; and



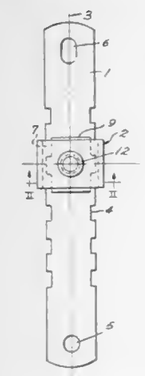
a belt anchor device pivotally connected to both said outwardly extending portion of said second member and said anchor holding bracket,
said first and second lock members interlocking with each other such that said first lock member is slidable with respect to said second lock member.

4,818,023

DEVICE FOR INCREMENTAL ADJUSTMENT OF THE HEIGHT OF A SECURING POINT OR RETURN-TRAVEL POINT FOR A SAFETY BELT OR THE LIKE

Albert Griesemer, Dorfwiese 3-D-5438, Westerburg-Gershasen, Fed. Rep. of Germany

PCT No. PCT/EP87/00032, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/04674, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 24, 1987, Ser. No. 124,850
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1986, 3603140
Int. Cl.[4] B60R *21/10*
U.S. Cl. 297—483 **7 Claims**

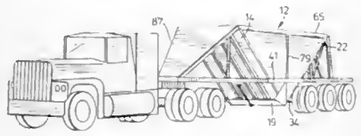


1. A device for incremental adjustment of the position of a securing point for a safety belt, comprising a guide rail and a guide sleeve displaceable on the guide rail, wherein engagement lugs on the one hand and corresponding recesses on the other are provided in such a way that the guide sleeve, for locking purposes, is movable into fixed engagement with the guide rail transverse to the actual displacement direction, said

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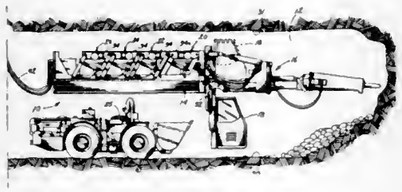
guide sleeve having a spring element that is disposed between the guide rail and the guide sleeve for retaining the guide sleeve in the locking position, said guide sleeve and said guide rail having one of said engagement lugs and recesses whereby said guide sleeve and guide rail are held in said fixed engagement by interengagement between said engagement lugs and recesses.

4,818,024
TANDEM HOPPER TRAILER
John A. Michel, R.R. #2, Blackstock, Ontario, Canada L0B 1N0
Filed Apr. 6, 1988, Ser. No. 178,376
Int. Cl.[4] B60P *1/56*
U.S. Cl. 298—27 **20 Claims**



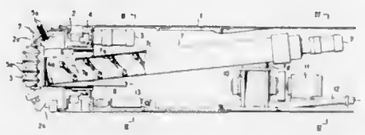
1. An on-road hopper trailer, comprising:
a hopper bin having generally flat front and rear walls each being pitched relative to the vertical so that the walls downwardly converge and meet at the bottom of the bin defining an exit aperture for the bin, and said bin having triangular side panels;
retractable cover means for the exit aperture of the bin;
a rear ladder frame mounted on at least one axle, the ladder frame extending forward and being attached to the rear wall of the hopper;
a base frame provided about the bin and being mounted on the ladder frame, the base frame comprising two first side members each extending forwardly and outwardly to two parallel second side members each extending along a side panel of the hopper bin to two third side members each extending forwardly and inwardly;
a rectangular top frame attached about the top of the hopper bin; and
a plurality of struts attached to and extending from the top frame to the base and ladder frames, thereby forming a support structure for the bin, said struts comprising two rear inner slanted struts each extending from the top frame to a leg of the ladder frame at a point thereon not directly beneath the top frame.

4,818,025
NARROW OPENING MECHANICAL MINER
Mandius C. Lundal, Spokane, Wash., and Fred W. Brackebusch, Kellogg, Id., assignors to Hecla Mining Company, Coeur D'Alene, Id., a part interest
Filed Nov. 14, 1986, Ser. No. 931,199
Int. Cl.[4] E21C *29/00, 31/10*
U.S. Cl. 299—31 **12 Claims**



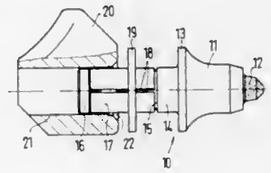
11. A mining vehicle comprising:
an elongated carrier;
means for mounting a mining apparatus to an end of the carrier;
first transverse bracing means adjacent the mining apparatus mounting means, the first transverse bracing means adapted to engage side walls of a mine tunnel for supporting the elongated carrier above the floor of a mine tunnel, the first transverse bracing means including at least one pair of transverse extendible legs protruding in opposite directions, the extendible legs adapted to engage opposite side walls of a mine tunnel for supporting the elongated carrier above the mine tunnel floor;
second transverse bracing means positioned behind the first transverse bracing means, the second transverse bracing means comprising at least three separate transverse bracing units, each transverse bracing unit including at least one pair of transverse extendible legs protruding in opposite directions, the extendible legs adapted to engage opposite side walls of a mine tunnel for supporting the elongated carrier above the mine tunnel floor; and
linkage means extending downwardly from each of the first transverse bracing means and at least three transverse bracing units whereby the first transverse bracing means and at least three transverse bracing units are each independently linked to the elongated carrier, each linkage means being pivotally connected to the elongated carrier and respective first bracing means or bracing unit.

4,818,026
SHIELD TYPE TUNNELING APPARATUS
Toshihiro Yamazaki, and Yoshihito Minami, Both of Osaka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 138,940
Int. Cl.[4] E21D *9/08, 9/12*
U.S. Cl. 299—56 **2 Claims**



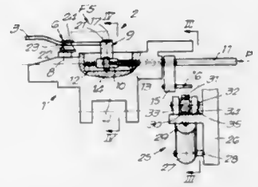
1. Shield type tunneling apparatus comprising a shield body having in its front portion a cutter-head compartment for digging a tunnel through bedrock, said cutter-head compartment being rotatably driven by a driving unit and being filled with water which buoys up rock debris in said cutter-head compartment to enable said rock debris to enter easily a transporting means under the influence of rotational movement of said cutter-head compartment; and transporting means for discharging rock debris produced by said cutter-head compartment from a front area thereof to a rear area of said shield body, said transporting means comprising:
(a) a debris-receiving chamber disposed in a central area of said cutter-head compartment;
(b) a screw conveyor, a front-end portion of which is provided with a debris-receiving opening disposed in said debris-receiving chamber of said cutter-head compartment, said screw conveyor extending rearwardly in a longitudinal direction of said shield body and being provided with a debris-discharging opening at its rear end portion;
(c) at least one water-supply pipe opening into said debris-receiving chamber of said cutter-head compartment at its end, the other end of said water-supply pipe being connected to a water-supply source disposed in a rear area of said tunneling apparatus;
(d) a rock crusher connected to said debris-discharging opening of said screw conveyor, said rock crusher being disposed in said shield body; and
(e) at least one debris-discharging pipe connected to said rock crusher at its end, the other end of said debris-discharging pipe being connected to suction means disposed in said rear area of said tunneling apparatus.

4,818,027
ROUND SHAFT BIT
Peter Simon, Rickenbach, Fed. Rep. of Germany, assignor to Betek Bergbau-und Hartmetalltechnik Karl-Heinz Simon GmbH & Co. KG, Aichhalden, Fed. Rep. of Germany
Filed Jan. 19, 1988, Ser. No. 145,218
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701905
Int. Cl.[4] E21C *35/18*
U.S. Cl. 299—92 **15 Claims**



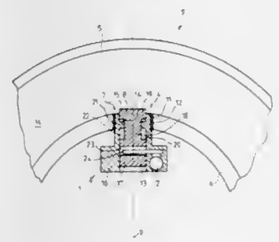
1. A round shaft bit for insertion into the bore of bit holder, said round shaft bit comprising: a bit head (**11**) and bit shaft (**14**), said bit shaft (**14**) having a circumferential groove (**15**), a clamping sleeve (**17**) supported in said groove (**15**), said clamping sleeve (**17**) having a longitudinal slot (**18**) and a variable external diameter, a holding element (**19**) fitting over said clamping sleeve (**17**) holding said clamping sleeve in a clamping position in which position the variable external diameter of said clamping sleeve (**17**) is not greater than the diameter of a bore (**21**) of a bit holder (**20**) into which said bit shaft (**14**) is inserted, said holding element (**19**) being moveable onto an area of bit shaft (**14**) beyond said clamping sleeve (**17**) when said bit shaft (**14**) is fully inserted into said bore (**21**) placing said clamping sleeve (**17**) in force relation against said bore (**21**) axially fixing said bit (**10**) in said bore (**21**) of said bit holder (**20**), said bit shaft (**14**) remaining freely rotatable within said clamping sleeve (**17**).

4,818,028
UNIVERSAL BRUSH CLAMP
Leonel Boucherie, Roeselare-Rumbeke, Belgium, assignor to Firma G.B. Boucherie, naamloze vennootschap, Izegem, Belgium
Filed Jul. 28, 1987, Ser. No. 78,645
Claims priority, application Belgium, Aug. 5, 1986, 2/61027
Int. Cl.[4] B25B *1/20*
U.S. Cl. 300—10 **16 Claims**



1. A universal brush clamp, comprising:
a first and second clamping cam means having angled brush receiving surfaces; and
an adjustable stop having a chamfered brush engaging surface;
said angled brush receiving surfaces comprising a conical lower portion, a cylindrical central portion coterminous therewith and an upper brush retaining portion;
said adjustable stop having an upper brush retaining plate fixed above said chamfered brush engaging surface;
said chamfered brush engaging surface and said conical lower portions of said angled brush receiving surfaces being angled to displace a brush body along said surfaces to a clamped position.

4,818,029
VEHICLE ANTI-THEFT DEVICE MAKING AT LEAST ONE WHEEL UNSERVICEABLE, AND A WHEEL COMPRISING THE DEVICE
Franck Mourot, Marseille, and Jean-Dominique Dana, Tanneron, both of France, assignors to Compagnie Financiere Saint Nicolas, France
Filed Nov. 14, 1986, Ser. No. 930,469
Claims priority, application France, Nov. 15, 1985, 85 16940; Jul. 10, 1986, 86 10106
Int. Cl.[4] B60C *29/00*
U.S. Cl. 301—5 VH **25 Claims**



1. An anti-theft device for a vehicle having wheels provided with pneumatic tires, each tire having at least one orifice through which air under pressure can escape and a tire-inflating valve, said device being adjustable between an operative state and an inoperative state, said device comprising:
control means movable between first and second positions for setting said device either in said operative state or in said inoperative state, respectively; and
deflating and closing means movable between: (1) a normal closed position for sealing the orifice when said device is set in said inoperative state or when the wheel corresponding to the tire is stationary, and (2) an open position for automatically deflating the tire when (a) said device is set in said operative state and (b) the vehicle is in motion, in direct response to the centrifugal force of inertia;
said deflating and closing means being directly subjected to and moved by the centrifugal force of inertia when said device is set in said operative state and when the corresponding wheel rotates at such a speed that the centrifugal force of inertia reaches a sufficient value to move said movable a deflating and closing means, thus opening the orifice and allowing air to escape from the tire through the orifice.

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4,818,030

AUTOMOTIVE WHEEL

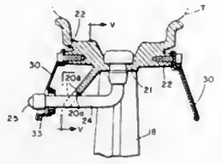
Takao Yoshida, Kawaguchi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1986, Ser. No. 890,067

Claims priority, application Japan, Jul. 26, 1986, 61-114964[U]

Int. Cl.[4] B60B *1/00*

U.S. Cl. 301—5 VH **1 Claim**



1. A vehicle wheel comprising:

wheel rim means having

bottom wall means;

a filling valve; and

a protective projection means formed integrally with bottom wall means of said rim means;

said protective projection means being located adjacent to opposite sides, in the circumferential direction, of said filling valve; and

said filling valve being fitted to said rim bottom wall means and extending generally radially inwardly and then generally laterally of said bottom wall means and outwardly of said wheel rim means with

said filling valve providing a filling extremity spaced radially inwardly from said bottom wall means and disposed spatially displaced from said wheel rim means; and

said protective projection means projecting from said bottom wall means radially inwardly and axially outwardly of said bottom wall means to provide protection on opposite sides of said filling valve at a location spartially displaced from said wheel rim means;

wheel cover means mounted at least in part on said rim means and including

a plurality of circumferentially spaced, wheel exhaust ports; and

said protective projection means comprising

generally U-shaped projection means projecting from said rim means and formed integrally therewith and providing

bifurcated extremity means defining a concave support seat transversely receiving a portion of said filling valve;

said seat being disposed circumferentially between a pair of circumferentially spaced, wheel exhaust ports, and

said seat defining a filling location for said wheel relative to said wheel and cover means thereof.

4,818,031

RAPID MOUNT TRACTION TIRE FOR FORKLIFTS AND THE LIKE

Robert J. Brown, 3297 Bedford Rd., Hastings, Mich. 49058

Filed Oct. 15, 1987, Ser. No. 108,683

Int. Cl.[4] B60B *11/00*

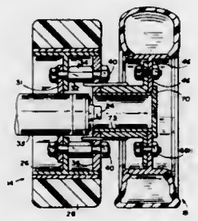
U.S. Cl. 301—36 R **12 Claims**

1. A traction wheel adaptor assembly for removably attaching a traction wheel to a driven wheel of a vehicle outwardly therefor, said driven wheel having a hub, a web extending radially outwardly from said hub and a first set of lugs extending from said web space around said hub, said traction wheel having a standard automotive tire mounting rim including means defining a central aperture in said rim and means defining a set of stud openings in said rim spaced around said central aperture, said adaptor assembly comprising:

an anchor plate having edge means defining a central hole in said plate and means defining a first opening in said plate adjacent said hole;

first attaching means for attaching said plate to said traction wheel with said hole juxtaposed said hub;

an elongated tubular spacer sleeve outwardly of said plate and having wall means defining inner and outer parallel end faces normal to a central axis thereof, said inner end face adapted to seat against said plate, said sleeve further including a first drive pin extending from said wall means beyond said inner end face and aligned with said plate opening to transmit torque from said plate to said spacer;



second attaching means for attaching said spacer sleeve to said second wheel rim including a radially extending flange on said outer end face having an outwardly facing surface and fastening means extending from said outwardly facing surface of said flange and engageable with said stud openings; and

anchor means for attaching said spacer sleeve to said anchor plate, said anchor means extending concentrically through said spacer sleeve and having wall means defining a head portion seating against said outwardly facing surface of said flange and an inner end opposite said head portion having engaging means for engaging said hole.

4,818,032

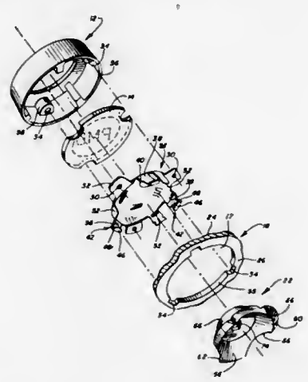
ANTI-THEFT LOCKING DEVICE

John V. Thomas, 665 Park Dr., Barrington, Ill. 60010

Filed Sep. 14, 1987, Ser. No. 96,050

Int. Cl.[4] B60B *7/06, 3/02*

U.S. Cl. 301—37 AT **16 Claims**



6. An anti-theft locking device for securing a medallion to the wheel of a vehicle wherein the medallion is of the type having a plurality of protruding spring retainers supplied with clips that are configured to pass through an opening at the hub of the wheel and abut a surface of the wheel opposite to the medallion body such that the medallion is held in place on the wheel, said device comprising:

first and second engagement portions formed with said clips, said first engagement portion being outwardly bent with respect to said central axis of said hub opening and forming an outer engagement surface and said second engagement portion being inwardly bent with respect to said central axis of said hub opening and forming an inner engagement portion;

a medallion locking disk dimensioned larger than the opening and having a plurality of blades, each of said blades having a rim, said disk configured to fit on the surface of the wheel opposite to the medallion and within the confines of the protruding spring retainers such that in the unlocked condition each of said blades extends between adjacent clips to allow said disk to be inserted into or removed from the retainers and when said disk is in the locked condition said blades are positioned with a rim of said blades located within the inner engagement portion of said second engagement portion of said clips to hold the outer engagement surface of said first engagement portion of said clips in an outward position abutting the surface of the wheel and to prevent the clips from passing through the opening so that the medallion is locked to the wheel.

4,818,033

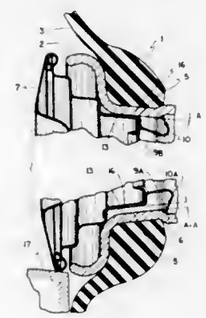
DEVICE FOR PREVENTING A WHEEL CAP FROM LOOSENING FROM A RIM

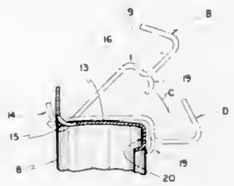
Krister E. G. Arvidsson, Slagstavagen 7A, S-633 47 Eskilstuna, Sweden

Filed Jul. 28, 1987, Ser. No. 78,777

Int. Cl.[4] B60B *7/06*

U.S. Cl. 301—37 CD **4 Claims**





4. A device for mounting a wheel cap on a rim of a vehicle wheel, said device comprising:

a ring member for attaching the wheel cap to the vehicle rim, said ring member comprising:

a ring portion for receiving the wheel cap thereon;

a contact portion for engaging an axially outer portion of the rim,

an inwardly directed portion extending from said contact portion and along an axially inwardly directed portion of the rim extending between the axially outer portion of the rim annular recess formed in the rim,

opening means located between said contact portion and said inwardly directed portion of said ring member, and

a ring hook portion connected to said inwardly directed portion of said ring member; and

at least a pair of opposed anchoring members made of a resilient material for attaching said ring member to the wheel rim, each of said opposite anchoring members comprising:

an outer mounting portion extendable through said opening means in said ring member,

an axially inwardly directed portion extending from said outer mounting portion for location between said inwardly directed portion of said ring member and the axially inwardly directed portion of the rim when said ring member is attached to the rim,

a hook portion connected to said axially inwardly directed portion of the anchoring member for location in the annular recess of the rim when the wheel cap is attached to the rim, and

at least one inner fixing portion for hooking onto said ring hook portion to secure the anchoring member with said ring member;

means for preventing disengagement of the hook portions of said opposed anchoring members from the annular recess in the rim, said preventing means comprising respective surfaces of said axially inwardly directed portions of said anchoring members which respectively engage the axially inwardly directed portion of the rim before the respective hook portion of a respective anchoring member is disengaged from the rim annular recess; and

said inwardly directed portion of said ring member having a convexly shaped radial cross-section and said axially inwardly directed portion of said anchoring member being substantially linear whereby said axially inwardly directed portion of said anchoring member bends over said convexly shaped axially inwardly directed portion of said ring member when said one inner fixing portion of the anchoring member hooks onto said ring hook portion to secure said anchoring member to said ring member.

4,818,034

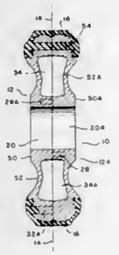
SHOCK ABSORBING WHEEL

Tobin Djerf, Port Isabel, Tex., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Dec. 28, 1987, Ser. No. 137,978

Int. Cl.[4] B60B *5/00*

U.S. Cl. 301—63 PW **17 Claims**



1. A shock absorbing wheel comprising:

a pair of identical disk-like hub sections, each having an inner face and an outer face and an outer edge, mated at their inner faces along a plane of separation;

each of said hub sections being penetrated by a central bearing aperture having a longitudinal axis perpendicular to

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said plane of separation, to receive a conventional wheel bearing therein;

each said inner face of said hub sections including an inner annular ledge immediately surrounding and concentric with said central bearing aperture, first alignment means disposed in said inner annular ledge for aligning said hub sections during assembly of the wheel, an outer annular ledge disposed at the periphery of said hub section concentric with said inner annular ledge, a plurality of apertures symmetrically disposed around said outer annular ledge and fully penetrating said outer annular ledge from said inner face of said hub section to the outer face of said hub section with the longitudinal axes of said apertures parallel to the longitudinal axis of said central bearing aperture, second alignment means disposed in said outer annular ledge for aligning said hub sections during assembly of the wheel, an annular cavity lying between said inner annular ledge and said outer annular ledge, open at said inner face and extending into the interior of said hub section from said inner face;

each said outer edge of said hub sections including a plurality of grooves extending circumferentially around said outer edge and extending from said outer edge into the interior of said hub section;

each said outer face of said hub sections including an annular bearing support ledge immediately surrounding said central bearing aperture and disposed concentric therewith opposite said inner annular ledge of said inner face of said hub section, an outer annular ledge at the periphery of said hub section concentric with said annular bearing support ledge opposite said outer annular ledge of said inner face, an annular groove disposed in and concentric with said outer annular ledge of said outer face and extending into the interior of said hub section, and an annular depression lying between said annular bearing support ledge and said outer annular ledge of said outer face, open at said outer face and extending into the interior of said hub section from said outer face; and

a tire molded around the periphery of said mated hub sections, having tire material extending into said grooves disposed in said outer edge of each said hub section, extending into said groove disposed in said outer annular ledge of said outer face of each said hub section, and extending through each of said apertnres penetrating said hub section through said outer annular ledge to form a system of shock absorbing interlocks flexibly interconnecting said hub sections to each other and said tire to said hub sections.

4,818,035

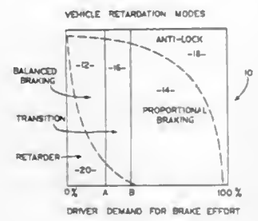
TRACTOR-TRAILER BRAKE CONTROL SYSTEM

Joseph H. McNinch, Jr., Livonia, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 27, 1987, Ser. No. 43,009

Int. Cl.[4] B60T *8/00, 8/58, 7/12*

U.S. Cl. 303—7 **7 Claims**



1. A method for controlling the brake system on a tractor-trailer vehicle having a fifth wheel/king pin connecting structure and individually controllable tractor and trailer sub-vehicle brake systems, said method characterized by:

(a) sensing from a location on said trailer sub-vehicle the value of a parameter indicative of the vertical force exerted on the fifth wheel king pin/connection;

(b) sensing from a location on said trailer sub-vehicle the value of a parameter indicative of the horizontal force exerted by the king pin on the fifth wheel;

(c) sensing from a location on said trailer sub-vehicle the value of a parameter indicative of the acceleration of the vehicle;

(d) modulating the braking forces exerted by the trailer sub-vehicle brake system only to minimize the value of the expression:

$$E = \text{a function of } (H_F/V_F) + a$$

where:

E=error;

H_F=horizontal force at the fifth wheel/king pin connection;

V_F=vertical force imposed at the fifth wheel/king pin connection; and

a=forward acceleration of the vehicle (expressed in units of gravity).

4,818,036

BRAKING POWER TRANSMITTER

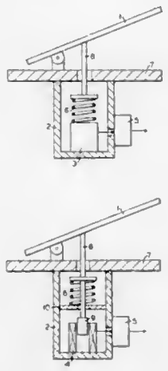
Erich Reinecke, Burgdorf, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 1, 1987, Ser. No. 33,442

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1986, 3611941

Int. Cl.[4] B60T *13/66;* **G01D** *5/20*

U.S. Cl. 303—50 **10 Claims**



1. A braking power transmitter which provides an output signal value to control a braking pressure in a motor vehicle, said braking power transmitter comprising:

(a) a housing, said housing including a generally hollow interior portion;

(b) a brake pedal pivotally connected to said housing to exert a pressure when depressed by an operator of such motor vehicle during a brake application, said brake pedal including a rod-like member which is secured to a bottom surface thereof and extends into said generally hollow interior portion of said housing;

(c) a steel coil spring positioned in said housing with a first end abuttingly engaging said rod-like member, said rod-like member includes a plate member secured to one end thereof which has a face abuttingly engaging said first end of said steel coil spring, said steel coil spring being compressed when a force is applied to said brake pedal by such operator during such brake application;

(d) an electronic force sensing means positioned in axial alignment with said steel coil spring within said generally hollow interior portion of said housing and in abutting engagement with a second end of said steel coil spring for measuring a force being exerted on said steel coil spring by said rod-like member secured to said brake pedal and for transmitting an output signal value having an approximately linear characteristic that is representative of said force measured by said electronic sensing means; and

(e) an electronic system, connected to receive said approximately linear output signal value from said electronic force sensing means, said electronic system transforms said output signal value having said approximately linear characteristic into a progressivity or non-linear characteristic and transmits an output signal value in which said progressivity characteristic for a force applied to said brake pedal over a distance traveled by said brake pedal is less than that of a braking pressure over said distance traveled by said brake pedal.

6. A braking power transmitter which provides an output signal value to control a braking pressure in a motor vehicle, said braking power transmitter comprising:

(a) a housing, said housing including a generally hollow interior portion;

(b) a brake pedal pivotally connected to said housing to exert a pressure when depressed by an operator of such motor vehicle during a brake application, said brake pedal including a rod-like member which is secured to a bottom surface thereof and extends into said generally hollow interior portion of said housing;

(c) a steel coil spring positioned in said housing with a first end of the spring abuttingly engaging a plate member secured to said rod-like member, said steel coil spring being compressed when a force is applied to said brake pedal by such operator during such brake application; said spring having a second end abuttingly braced against a housing partition intermediate said housing,

(d) an electronic distance sensing means positioned in axial alignment with said steel coil spring within said generally hollow interior portion of said housing, said distance sensing means including a movable core fast with the end of said rod-like member and including a fixed coil in which the core is movable for transmitting an output signal value having an approximately linear characteristic that is representative of the distance traveled by the brake pedal; and

(e) an electronic system, connected to receive said approximately linear output signal value from said electronic sensing means, said electronic system transforms said output signal value having said approximately linear characteristics into a progressivity or non-linear characteristic and transmits an output signal value in which said progressivity characteristic for a force applied to said brake pedal over a distance traveled by said brake pedal is less than that of a braking pressure over said distance traveled by said brake pedal.

4,818,037

METHOD FOR ESTIMATING REFERENCE SPEED AND ACCELERATION FOR TRACTION AND ANTI-SKID BRAKING CONTROL

James McEnnan, Agoura Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 16, 1988, Ser. No. 194,362

Int. Cl.[4] B60T *8/32, 8/70, 8/80*

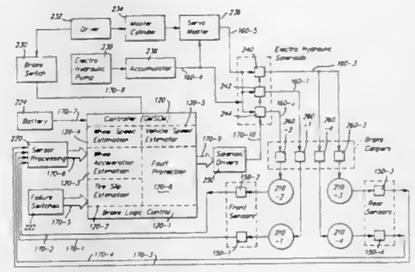
U.S. Cl. 303—97 **18 Claims**

1. A method for estimating a vehicle reference speed and reference acceleration suitable for determining relative wheel slip of an individual wheel of the vehicle, the method comprising:

periodically determining extrapolated values of reference speed and reference acceleration from previously updated values thereof;

estimating a current wheel slip of the individual wheel from the extrapolated value of the reference speed;

computing first and second adaptive filter gains which are functions of a current estimate of slip and a current estimate of wheel acceleration, respectively;



generating an error signal as a function of a difference between current wheel speed and the extrapolated value of the reference speed; and

generating updated values of reference speed and reference acceleration by adding a product of the first gain and the error signal to the extrapolated value of reference speed and by adding a product of the second gain and the error signal to the extrapolated value of reference acceleration.

4,818,038

VEHICULAR BRAKE SYSTEM WITH ELECTRONIC ANTI-LOCK CONTROL AND TRACTION SLIP CONTROL

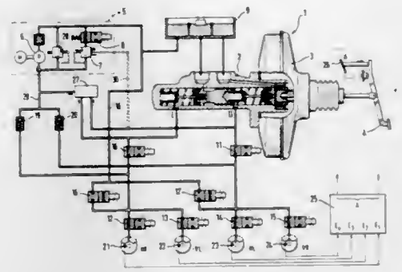
Norbert Ocvirk, Offenbach; Lutz Weise, Mainz; Horst-Peter Becker, Frankfurt am Main, and Otto Determann, Darmstadt, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,490

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624829; Aug. 14, 1986, 3627566

Int. Cl.[4] B60T *13/68, 8/40*

U.S. Cl. 303—119 **8 Claims**



1. A brake system with electronic anti-lock control and traction slip control for automotive vehicles, said system comprising a power-assisted dual-circuit braking pressure generator, two circuits, each of which includes one front wheel and one rear wheel, connected to said braking pressure generator, at least one auxiliary-pressure supply system which is switched on during the control phases and which generates a controlled auxiliary pressure proportional to the pedal force during anti-lock control and an uncontrolled auxiliary pressure during

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traction control, said uncontrolled auxiliary pressure being limited by the pump output, valve means controlling the braking pressure in the wheel brakes and connecting the braking pressure generator and the auxiliary-pressure supply system to the wheel brakes, wheel sensors and electronic circuitries for determining the wheel rotational behavior and for generating electronic braking-pressure control signals, said valve means including one electromagnetically actuated two-way/two-position joint valve in each circuit and one electromagnetically actuated two-way/two-position individual wheel multi-directional control valve located in each of two parallel supply lines connecting the respective driven and non-driven wheels of each circuit to the joint valve of the circuit, said joint valves and said individual wheel valves, in their inoperative position, being open to permit passage of fluid therethrough, each joint valve being in series with the individual wheel valves in each circuit, a pressure-fluid return line and an auxiliary pressure supply line connected between the series connected joint valve of each circuit and the supply lines containing the individual wheel valves, a multi-directional control valve closed in its inoperative position located in each return line and leading to a pressure supply reservoir, and a non-return valve located in each auxiliary pressure supply line.

4,818,039

AUTOMATIC DRIVE SLIP REGULATING UNIT

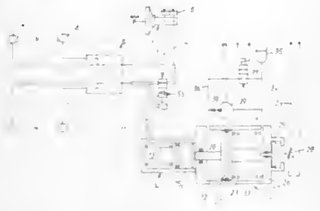
Hannes Bertling, Vaihingen, and Heinz Siegel, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 104,192

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633687

Int. Cl.[4] B60T *8/32*

U.S. Cl. 303—113 **18 Claims**



1. An automatic drive slip regulating system for motor vehicles or the like, which comprises a first master brake cylinder for applying pressure via brake lines to brake cylinders of the wheels of a vehicle, an anti-skid system which controls brake fluid to said wheel cylinders to prevent a skid, a magnetic control valve in at least one brake line for controlling brake fluid flow from said first master cylinder to said brake cylinders, an automatic drive slip regulating unit, a connecting line (**11**) connected with said at least one brake line between said magnetic control valve and said anti-skid system, and with a second master brake cylinder, said connecting line (**11**) discharges into a cylinder chamber (**13**) of said second master cylinder (**14**) which includes a plunger (**15**) therein, said cylinder chamber (**13**) is adapted to be varied in volume by means of said plunger (**15**), which is subject to a pressure of a spring-supported reservoir plunger (**21**) in a cylindrical housing (**22**).

15. A method for actuating the brakes of a motor vehicle or the like by means which comprises incorporating an anti-skid system into at least one brake line disposed between a set of wheel brakes and a master brake cylinder, connecting a line which branches off from said brake line between said master brake cylinder and an automatic drive slip regulating means, actuating a brake pedal to apply pressure in said anti-skid system and said brakes in communication therewith, and detecting a terminal position of a spring loaded plunger in a second master brake cylinder.

4,818,040

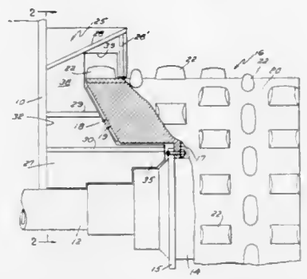
DEBRIS STRIPPER

Edward J. Mezzancella, 74 Wedgewood Dr., Seekonk, Mass. 02771, and Robert E. Kachanis, 35 Clinton St., Pawtucket, R.I. 02861

Filed Jan. 25, 1988, Ser. No. 147,405

Int. Cl.[4] B60S *1/62;* **B62D** *25/16*

U.S. Cl. 305—12 **4 Claims**



1. In a wheeled tractor including a frame and axle means for rotatably supporting a wheel having a ground engaging tread surface with teeth protruding radially outward and a hub supporting the tread the improvement comprising a stationary plate secured to said frame and extending outwardly therefrom in a direction substantially parallel to that of the axle and in close proximity to the inner surface of the hub of the wheel and the axle housing to define a narrow clearance therebetween for breaking-up materials that lodge between the inner surface of the hub of the wheel and about the axle.

4,818,041

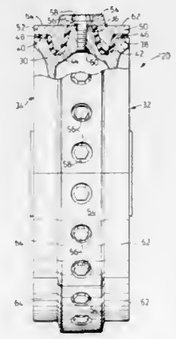
IDLER WHEEL ASSEMBLY FOR TRACK-TYPE VEHICLE

Thomas E. Oertley, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Apr. 4, 1988, Ser. No. 177,275

Int. Cl.[4] H02J *1/12*

U.S. Cl. 305—56 **11 Claims**



1. An idler wheel assembly for a track-type vehicle comprising:

a circular hub having first and second side portions and a circumferential surface portion, said surface portion having a central support surface, first and second contact surfaces, and first and second U-shaped circumferential cavities, one of said cavities positioned between one of the contact surfaces and said central support surface;

a plurality of first wear segments positioned within said first cavity, and a plurality of second wear segments positioned within said second cavity;

resilient means located within said cavities and positioned between said hub and said wear segments;

a plurality of clamping members, said clamping members encircling said hub and adapted to contact said wear segments and compress said resilient means; and

means for securing said clamping members to said central support surface of said hub.

4,818,042

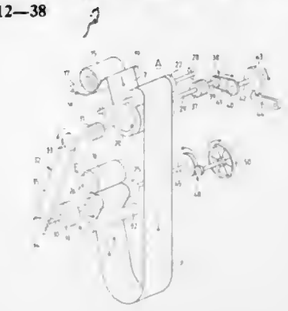
CLOTH TOWEL DISPENSER AND METHOD FOR THE OPERATION THEREOF

Sandro Arabian, Liechtenstein, and Manfred Baumann, Diepoldsau, both of Switzerland, assignors to CWS International AG, Baar, Switzerland

Filed Sep. 23, 1987, Ser. No. 99,825

Int. Cl.[4] B65H *19/00*

U.S. Cl. 312—38 **13 Claims**



1. A cloth towel dispenser incorporating at least one towel unit, said unit comprising:

a first delivery station supporting a clean towel roll having a horizontal axis, the towel roll having a leading feed edge and being adapted to be freely rolled in successive portions, the first station including a pressure roller and a delivery roller receiving a towel cloth from said roll and being rotatable about a horizontal axis and disposed adjacent said pressure roller to guide therebetween a towel cloth upon unrolling said roll;

a second draw-in station spaced below the first station and including a take-up roller freely rotatable about a horizontal axis, and a draw-in roller rotatable about a horizontal axis to retract the successive portions of the roll onto the take-up roller, the leading edge of the roll passing in a manually extractable loop from the first station to the second station along a path which extends downwardly from the first station to a position of use disposed below the second station and then extends upwardly to the second station;

driving means including a gearing operatively connected to said delivery roll, and a spring tension accumulator connected to said gearing and also to said draw-in roller for rotatably interconnecting the delivery roller and the draw-in roller whereby the delivery and draw-in rollers rotate in the same forward direction; said accumulator being tensioned by rotation of said delivery roller during and after the formation of the loop for drawing in a used loop by a spring energy stored in said accumulator; and

a slip clutch connected to said draw-in roller for permitting the draw-in roller to rotate in a reverse direction to allow the towel cloth to be unrolled from said take-up roller during formation of the loop,

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4,818,043

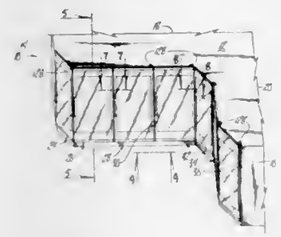
PRODUCT DISPLAY AND MARKETING DEVICE

Arden L. Borgen, Des Moines, Iowa, assignor to Margaret P. Borgen, Des Moines, Iowa

Filed May 13, 1987, Ser. No. 49,733

Int. Cl.[4] A47F *3/00*

U.S. Cl. 312—138 R **30 Claims**



30. A door comprising:

a rectangular transparent panel assembly having a front face, a rear face, an upper edge, a lower edge, a hinge edge, and a latching edge;

said transparent panel assembly comprising at least one rectangular transparent panel forming said front face and having an upper panel edge, a lower panel edge, and opposite side panel edges, said one transparent panel being free from rectangular framing and being sufficiently strong and thick to provide the primary structural support for said panel assembly;

hinge means connected to said panel assembly adjacent said hinge edge thereof for permitting said panel assembly to be mounted for hinged movement about a vertical hinge axis adjacent said hinge edge;

an elongated stop member connected to said rear face of said panel assembly adjacent only said hinge edge of said panel assembly and having a adjacent only said hinge edge of said panel assembly, said stop member being forwardly presented latch surface protruding laterally beyond said hinge edge of said panel assembly;

elongated sealing and latching means on said rear face of said panel assembly and extending along a line adjacent said latching edge thereof.

4,818,044

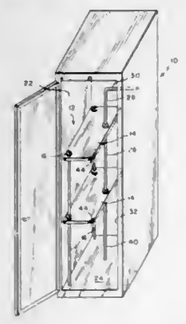
LOCKER AND LOCKER-SHELF INSERT

Bradley M. Dobry, 20 Sheafe St., Apt. #6, Boston, Mass. 02113

Filed Dec. 7, 1987, Ser. No. 129,664

Int. Cl.[4] A47B *41/04*

U.S. Cl. 312—257 SM **9 Claims**



1. A locker construction comprising a locker housing having

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a pair of spaced-apart lateral walls, a floor, and a readily-removable insert therein, said insert consisting of

(a) a shelf-bearing support structure;

(b) shelves affixed to said structure and extending laterally across a first portion of the width of said locker;

(c) said support structure comprising (1) a vertical support means bearing against a horizontal support surface of said locker and positioned immediately proximate to a first lateral wall of said locker and (2) a lateral support member for said insert comprising a first length connected to said shelves or said support structure and extending upwardly from the uppermost of said shelves and a second length extending horizontally and laterally across a second portion of the width of said locker, said second length being immobilized against a second lateral locker wall and forming means to maintain said insert in an upright position.

4,818,045

HOLOGRAPHIC OPTICAL ELEMENT HAVING PERIPHERY WITH GRADUALLY DECREASING DIFFRACTION EFFICIENCY AND METHOD OF CONSTRUCTION

B. Jin Chang, Ann Arbor, Mich., assignor to Kaiser Optical Systems, Ann Arbor, Mich.

Filed Dec. 29, 1987, Ser. No. 138,872
Int. Cl.[4] G02B *5/32, 27/10*
U.S. Cl. 350—3.7 **24 Claims**



1. A holographic optical element structure comprising:

a transparent supporting substrate having a first surface;

a diffraction element layer disposed on said first surface of said transparent supporting substrate having interference fringes of a maximum contrast in a central portion thereof and having interference fringes of gradually decreasing contrast for more peripheral regions thereof; and

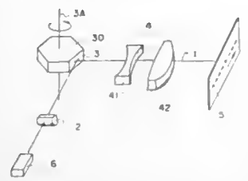
a transparent cover plate disposed on a surface of said diffraction element layer opposite said transparent supporting substrate, whereby said diffraction element layer is enclosed between and protected by said transparent supporting substrate and said transparent cover plate wherein said transparent cover plate comprise glass layers ground to a thickness between 0.020 inches and 0.040 inches as claimed in claim 1.

4,818,046

LIGHT BEAM SCANNING DEVICE

Hirohito Kondo, Setagaya, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Nov. 24, 1987, Ser. No. 124,921
Claims priority, application Japan, Dec. 3, 1986, 61-286717
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **4 Claims**



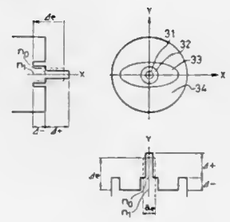
1. A light beam scanning device in which an f-θ lens system is arranged such that a deflective reflecting surface and a surface to be scanned are set in an optical conjugate relationship, and a linear convergent light beam deflected at a constant angular speed by said deflective reflecting surface is transmitted through said f-θ lens system to be converted at a constant speed and focused on said surface to be scanned to scan said surface, wherein said f-θ lens system comprises a first cylindrical lens located adjacent said deflective reflecting surface and having a refractive power in only a deflection plane, and a second toric lens adjacent an output surface of said first lens, a first surface of said second lens adjacent said first lens having a negative refractive power and a second, opposite surface of said second lens having a positive refractive power in a sectional plane perpendicular to said deflection plane.

4,818,047

POLARIZED WAVE PRESERVING FIBER

Yuuetsu Takuma; Hiroshi Kajioka; Tatsuya Kumagai, all of Hitachi; Toshihide Tokunaga, Kita-Ibaragi, and Kohdo Yamada, Hitachi, all of Japan, assignors to Hitachi Cable Limited, Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,632
Claims priority, application Japan, Sep. 1, 1986, 61-203751
Int. Cl.[4] G02B *6/22*
U.S. Cl. 350—96.33 **7 Claims**



1. A polarized wave preserving fiber comprising:

a core;

cladding formed around said core;

an oval jacket provided around said core, the retractive index distribution varying along the periphery of said jacket in a manner such that its refractive index is lower than that of said cladding in the minor axis and major axis directions, the difference between the refractive index of said jacket and said cladding in the major axis direction being larger than the difference in the refractive index of said jacket and said cladding in the minor axis direction; and

a support member provided around said oval jacket and having the same refractive index as said cladding.

4,818,048

HOLOGRAPHIC HEAD-UP CONTROL PANEL

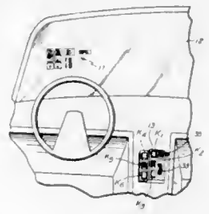
Gaylord E. Moss, Marina del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 6, 1987, Ser. No. 788
Int. Cl.[4] G03H *1/00*
U.S. Cl. 350—3.7 **13 Claims**

1. A display comprising:

a windshield in front of a viewer's face;

a control panel means responsive to the viewer's manual movements; and



means including a hologram means applied to said windshield for displaying an indication of said manual movements in a line of sight through said windshield.

4,818,049

METHOD AND APPARATUS FOR EFFICIENTLY CONVEYING LIGHT OVER A DISTANCE AND EFFECTING CONTROLLED ILLUMINATION BY PROJECTION THEREOF

Harry M. Assenheim, Georgetown, and Edwin W. Morley, Mississauga, both of Canada, assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 10, 1987, Ser. No. 61,051
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.15 **23 Claims**



1. The method of illuminating a selected area of a target surface with laser light comprising the steps of:

obtaining laser light in the form of a truly collimated beam;

introducing substantially all of said laser light into a first end of an elongate flexible fiber optic cable;

transmitting said laser light from said first cable end internally thereof to a second end of said fiber optic cable with attendant formation of multiple modes therein;

causing formation of a sufficient number of modes in said transmitted laser light to insure mode mixing and substantially uniform illumination of said selected area upon projection of said laser light;

extracting from said second end of said fiber optic cable in multimodal form substantially all of said laser light introduced therein;

projecting said extracted multimodal laser light in the form of an apparently collimated or not truly collimated beam having an initial diameter across a known certain distance of at least 100 initial diameters; and

impinging said apparently collimated beam upon said target surface selected area to illuminate the latter.

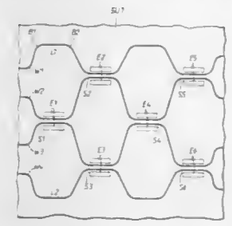
4,818,050

OPTICAL SWITCH ARRAYS

Peter J. Duthie, Northampton, Great Britain, assignor to Plessey Overseas Limited, Ilford, England

Filed Oct. 29, 1987, Ser. No. 114,906
Claims priority, application United Kingdom, Nov. 1, 1986, 8626152
Int. Cl.[4] G02B *6/10, 6/26*
U.S. Cl. 350—96.14 **5 Claims**

1. An optical switch array comprising a plurality of optical waveguide paths which extend in parallel and in close proximity with one another across a common substrate, a plurality of optical switches comprising opposed sections of adjacent waveguide paths having electrodes actively associated therewith between which electrical switching voltages are applied to effect switching of light from one waveguide path to another, in which some of the optical waveguide paths have the same characteristics throughout their lengths whereas the other optical waveguide paths have alternate sections thereof of dissimilar characteristics whereby the said opposed sections



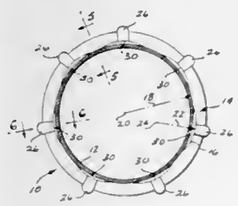
of adjacent waveguide paths forming parts of the optical switches are of the same characteristics to facilitate effective coupling between these waveguide paths when electric switching signals are applied to the electrodes and whereby further opposed sections of adjacent waveguide paths extending between the optical switches have dissimilar characteristics to prevent coupling therebetween in the presence of the electric field produced in nearby optical switches.

4,818,051

OPTICAL BUS

Charles D. Fraser, Lakewood, Colo., assignor to US West Advanced Technologies, Inc., Englewood, Colo.

Filed Aug. 10, 1987, Ser. No. 83,664
Int. Cl.[4] G02B *5/14*
U.S. Cl. 350—96.16 **20 Claims**



1. An optical bus comprising:

(a) an optical fiber through which a light wave signal produced by a primary source input at one end propagates, the optical fiber being formed in a loop, which at least at one point, has a radius of curvature sufficiently small that the light wave signal is incident on an internal surface of the optical fiber at an angle in excess of which the light wave signal may fully reflect internally, causing part of the light wave signal to be transmitted through the optical fiber surface at said point;

(b) a photodetector disposed at said point, which is responsive to the part of the light wave signal transmitted through the optical fiber surface to produce a corresponding electrical switch;

(c) a light source electrically connected to the photodetector, and responsive to the electrical signal produced thereby to produce a corresponding light wave signal that is a replica of the light wave signal produced by the primary source; and

(d) a distribution optical fiber, one end of the distribution optical fiber being optically coupled to the light source

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and the other end of the distribution optical fiber being terminated at a receiver, so that the replica of the light wave signal produced by the primary source is distributed thereby to the receiver.

4,818,052

DEVICE FOR OPTICAL SWITCHING BY FLUID DISPLACEMENT AND A DEVICE FOR THE COMPOSITION OF A LINE OF POINTS

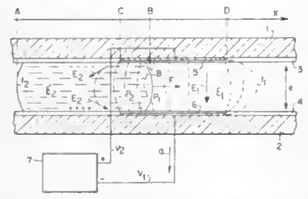
Jean-Pierre Le Pesant, Gif Sur Yvette; Michel Hareng, La Norville; Jean-Pierre Huignard, Paris; Jean-Pierre Herriau, Orsay; Bruno Mourey, Boulogne Billancourt, and Jean-Noël Perbet, Gif Sur Yvette, all of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 625,866, Jun. 28, 1984, abandoned. This application Apr. 21, 1987, Ser. No. 43,263

Claims priority, application France, Jul. 4, 1983, 83 11074

Int. Cl.[4] G02B *6/26, 6/42*

U.S. Cl. 350—96.15 **18 Claims**



1. A device for optically switching at least one incident optical beam between at least first and second exit paths comprising:

first and second fluids contained within a confinement space defined by a pair of transparent elements,

electrically controlled switching means for placing into a path of said incident optical beam either the first fluid for producing reflection of the optical beam into said first exit path or the second fluid which does not produce a reflection so that the optical beam travels over the second exit path, the first and second fluids being immiscible and having different dielectric permittivities, one of the fluids having a globular structure embedded in interstitial structure of the other fluid,

said electrically controlled switching means including means for generating an electric field gradient in order to cause the fluid having the higher permittivity to converge toward a region of the confinement space which is subjected to the electric field gradient,

wherein said first fluid is air and the second fluid is a hydrocarbon.

4,818,053

OPTICAL BENCH FOR A SEMICONDUCTOR LASER AND METHOD

Eugene I. Gordon, Convent Station, N.J.; Robert J. Nielsen, Upper Black Eddy, Pa., and John W. Stafford, Summit, N.J., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 2, 1986, Ser. No. 902,998

Int. Cl.[4] G02B *06/32*

U.S. Cl. 350—96.18 **18 Claims**

1. An integrated alignment fixture for aligning the elements of a semiconductor laser and optical fiber combination, comprising,

an optical bench including a one-piece, elongated platform having a top surface along which is defined an optical axis,

a semiconductor laser mounted on said top surface having front and rear facets of optical emission along the optical axis,

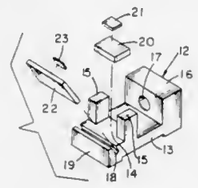
a monitor of optical emission mounted on said top surface for receiving optical emission from the rear facet of emission,

a lens mounted on said top surface focused on the front facet for transmitting optical emission from the front facet along the optical axis,

first positioning means for securing the lens to the optical bench with the lens focused on the front facet,

an optical fiber having an optical face,

second positioning means for securing the optical fiber to the optical bench with the optical face aligned with the optical axis, and



a datum surface on the optical bench for aligning the lens and for aligning the optical axis,

wherein optical emission from said front facet is propagated along said optical axis defined by said optical bench through said lens into said optical fiber, and optical emissiion from said rear facet is propagated along said optical axis defined by said optical bench to said monitor.

4,818,054

DISTRIBUTION FRAME FOR OPTICAL FIBERS

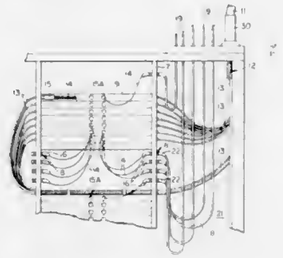
Edward K. George, Soath Hornchurch; Roger E. Jung, London, and Brian P. Mills, Hornchurch, all of England, assignors to Telephone Cables Limited, England

Filed Nov. 30, 1987, Ser. No. 126,754

Claims priority, application United Kingdom, Dec. 12, 1986, 8629707

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **11 Claims**



1. A distribution frame for an optical fibre transmission system, comprising:

(a) a cabinet having side panels bounding an interior in which surplus lengths of optical fibre cables in loop form are accommodated,

(b) a pair of relatively spaced inner panels spaced from the side panels and substantially parallel thereto, and

(c) a plurality of organiser trays supported by and occupying the space between the inner panels and each tray being arranged to accommodate surplus lengths of several fibres from the cables,

(d) the inner and side panels being spaced apart to accommodate the end parts of a multiplicity of connection fibres for connection to respective fibres from the organiser trays, and

(e) the inner panels being provided with a multiplicity of openings to support couplers for enabling connections to be made through those openings between fibres from the organiser trays and the respective connection fibres.

4,818,055

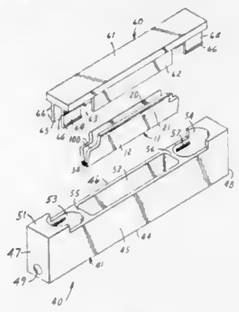
OPTICAL FIBER SPLICE CONNECTOR

Richard A. Patterson, Georgetown, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 18, 1988, Ser. No. 182,794

Int. Cl.[4] G02B *6/36, 6/38*

U.S. Cl. 350—96.20 **15 Claims**



1. A splice connector for making butt splices between two optical fibers comprising

a base of having a bottom, top, opposed side walls and end walls, means for defining a cavity in said top wall and for defining aligned openings communicating with said cavity in said end walls,

a splice element inserted in said cavity and comprising central rib means having a first elongate fiber supporting surface and a pair of lever means pivoted about opposite edges of said rib means and diverging therefrom, said lever means each having an elongate fiber supporting surface positioned adjacent said first fiber supporting surface to form a passageway for optical fibers and for engaging said fibers at spaced positions around said fiber, said lever means being initially disposed to diverge from said rib means and being formed for movement toward each other to grasp said optical fibers therebetween and splice ends of two fibers in aligned position, and

a cap having a top, and depending bar means on one surface of said top for receiving the diverging lever means of said element therebetween and for camming said lever means toward each other, said cap being disposed on said base with said bar means in said cavity and with said diverging levers of said element dispose therebetween whereby movement of said cap into said base to close said cavity will urge said lever means toward one another bringing said supporting surfaces against said optical fibers and align the ends thereof in the passageway and to retain said ends in aligned relationship.

4,818,056

OPTICAL CONNECTOR WITH DIRECT MOUNTED PHOTO DIODE

R. Scott Enochs, Hillsboro; Scott R. Jansen, Beaverton; Daniel R. Murphy, Beaverton; Randy S. Randall, Beaverton, and Joanne Roth, Hillsboro, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 2, 1987, Ser. No. 20,269

Int. Cl.[4] G02B *6/42*

U.S. Cl. 350—96.20 **18 Claims**

1. A through-wall optical connector for mounting to a wall of a housing at an opening through the wall and for receiving and making an optical connection to an input/output optical transmission fiber supported by an input/output coupler, the connector comprising:

a body;

body mounting means for mounting the body to the wall;

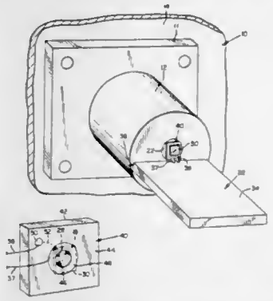
a ferrule mounted to the body, the ferrule having first and second end surfaces and an axial optical fiber receiving bore extending between the ferrule end surfaces, the body supporting the ferrule such that the ferrule end surfaces are accessible from opposite sides of the wall through the wall opening;

an optical fiber positioned within the bore;

a photo diode;

photo diode mounting means for rigidly mounting the photo diode directly to the body such that the photo active portion of the photo diode is optically coupled to the optical fiber adjacent the first end surface of the ferrule; and

means mounted to the wall for receiving the input/output coupler and for positioning the input/output transmission fiber in optical communication with the optical fiber in the bore adjacent the second end surface of the ferrule.



4,818,057

AN APPARATUS FOR FIXING LIGHT WAVEGUIDE CABLES IN A PLUG HOUSING

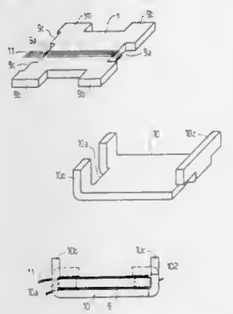
Helmut Bruch, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,720

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1986, 8630246

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **10 Claims**



1. In an apparatus for fixing light waveguide cables in a plug housing which comprises a through-opening for conducting at least one light waveguide cable through the housing, the improvements comprising first means for releasably holding and supporting a light waveguide cable jacket, second means for releasably holding and supporting reinforcing elements of the cable, third means for releasably holding and supporting at least one fiber-like light waveguide of the cable in a fixed direction in the housing, said second means including a plate for wrapping the reinforcement elements thereon and a pinch element coacting with said plate to clamp the wrapped elements on the plate, said housing being composed of at least two

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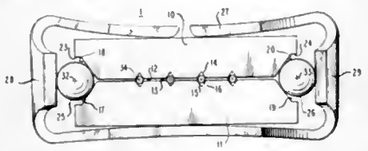
parts being separable on a parting plane extending parallel to the fixed direction of the light waveguide in the housing, said parts being provided with separate recesses for receiving and mounting each of the first, second and third means separately in the housing with the first, second and third means extending across the parting plane so that each of the first, second and third means can be separately manipulated within said housing.

4,818,058

OPTICAL CONNECTOR

Rocco Bonanni, Wayne, N.J., assignor to American Telephooe and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 3, 1988, Ser. No. 163,690
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **10 Claims**



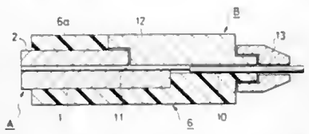
1. An optical fiber connector comprising:
a block of material with edge and major surfaces, said block including at least one groove formed with sloping sidewalls in a major surface and adapted to receive therein an optical fiber, said block also including a beveled portion extending from the major surface on each edge surface such that the slope of each beveled portion is the same as one of the sidewalls of the groove;
a spline disposed in contact with the beveled portion of at least one edge surface, extending beyond said block, and adapted for engagement with the beveled portion of a similar block for alignment therewith; and
means for maintaining the spline in contact with the beveled portion.

4,818,059

OPTICAL CONNECTOR AND SPLICER

Toshiaki Kakii; Yasuo Asano, and Shuzo Suzuki, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 13, 1987, Ser. No. 25,840
Claims priority, application Japan, Mar. 14, 1986, 61-57984; May 16, 1986, 61-113331; Aug. 26, 1986, 61-200409; Aug. 29, 1986, 61-204289; Sep. 26, 1986, 61-229238; Oct. 31, 1986, 61-261403
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **16 Claims**



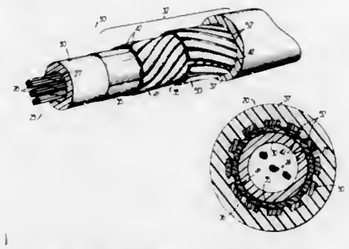
1. An optical fiber connector for use in the coupling of optical fibers, said connector being disposed to be connected to an identical optical connector by two guide pins only, said connector comprising:
a substrate plate having at least one optical fiber groove and at least one guide pin groove each formed at one surface thereof for positioning said at least one optical fiber and said guide pins, respectively; and
a flat plate mounted on said substrate plate, and having a flat surface confronting said one surface on said substrate plate so as to expose at least a part of said optical fiber, said flat plate being joined to a partial area of said substrate plate for defining at least one optical fiber holding portion and at least one guide pin holding portion, a remaining area of said substrate plate, where said flat plate is not joined, defining an exposed area for facilitating insertion of said optical fiber into said optical fiber holding portion said exposed area having a step at a side thereof for fixing a coated optical fiber.

4,818,060

OPTICAL FIBER BUILDING CABLES

Candido J. Arroyo, Lilburn, Ga., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1987, Ser. No. 32,889
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **17 Claims**



5. An optical fiber cable, which comprises:
a core comprising at least one optical fiber;
a tubular member which is made of a plastic material and which encloses said core;
a core wrap which comprises a fiber glass tape impregnated with a material which includes a micaceous constituent, said core wrap being disposed about said tubular member;
a jacket which is made of plastic material; and
a strength member system which is disposed between said core wrap and said jacket and which is effective to provide said cable with a predetermined tensile stiffness, said strength member system comprising:
an inner layer of longitudinally extending strength members which are made of a dielectric material; and
an outer layer of longitudinally extending strength members which are made of a dielectric material and which engage said first layer of strength members and said jacket, with a plurality of the strength members of said outer layer having sufficient compressive stiffness and being coupled sufficiently to said jacket to provide a composite arrangement which is effective to inhibit contraction of said cable and with the remaining strength members being relatively flexible.

4,818,061

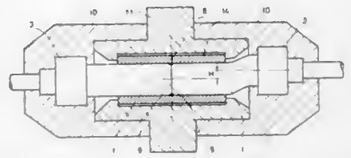
FERRULE FOR CONNECTING OPTICAL FIBERS AND OPTICAL CONNECTOR USING IT

Shinichi Iwano, Tokorozawa, and Yasuhiro Ando, Houya, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

PCT No. PCT/JP85/00493, § 371 Date May 1, 1986, § 102(e) Date May 1, 1986
PCT Filed Sep. 4, 1985, Ser. No. 858,186
Claims priority, application Japan, Sep. 5, 1984, 59-184440; Feb. 8, 1985, 60-23330; May 2, 1985, 60-93827
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **20 Claims**

9. A connector for connecting optical fibers comprising ferrules to cover ends of each optical fiber which are to be connected with each other, the ferrules each including a flange and a cylindrical part integrally extending from the flange, and alignment guide which aligns the two ferrules in a manner to cause the ends of the two optical fibers to oppose each other axially and which is characterized in that each of said ferrules includes a flange and a cylindrical portion having one end formed integrally with said flange and extending coaxially

with respect thereto with the flange having a selected diameter and said cylindrical portion having a diameter substantially less than selected diameter and with said cylindrical portion having a length that is substantially greater than the diameter of said



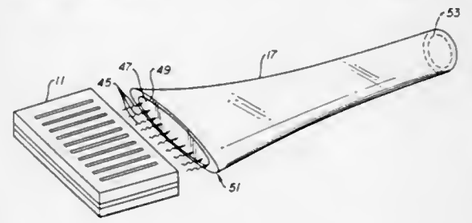
cylindrical portion so as to allow a large elastic displacement at an end thereof opposite said one end and wherein deforming means are provided to deflect said ferrules and, at the same time, to press the ends thereof against said alignment guide.

4,818,062

OPTICAL SYSTEM WITH BRIGHT LIGHT OUTPUT

Donald R. Scifres, and D. Philip Worland, both of San Jose, Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Division of Ser. No. 43,612, Apr. 28, 1987, Pat. No. 4,763,975. This application Mar. 29, 1988, Ser. No. 174,826
Int. Cl.[4] G02B *6/26, 6/02, 6/16*
U.S. Cl. 350—96.29 **10 Claims**



1. An optical pumping system for a solid state laser comprising,
light source means for optically pumping a solid state active medium in a resonant optical cavity, said light source means emitting light from an elongated emissive area with given lateral and transverse divergences,
a fiberoptic waveguide having an input end and an output end, said input end positioned relative to said light source means for accepting light emitted therefrom, said input end having oblong core dimensions and lateral and transverse numerical apertures corresponding respectively to said emissive area and said lateral and transverse divergences so as to guide most of said light emitted by said light source means, and
optical means in proximity to said output end of said waveguide for coupling said light into an end of said solid state active medium, said output end and said optical means cooperating to match said light to a desired mode of said resonant optical cavity.

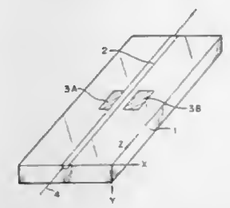
4,818,063

OPTICAL MODULATING/SWITCHING DEVICE

Kuniharu Takizawa, Tokyo, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Filed Mar. 3, 1986, Ser. No. 835,284
Claims priority, application Japan, Mar. 15, 1985, 60-51837
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 **39 Claims**

1. An optical modulating/switching device comprising:
a substrate having a refractive index which varies in accordance with an electric field applied to said substrate;
an optical waveguide arranged on said substrate; and
flat electrodes disposed asymmetrically about said optical waveguide, an electric field being applied through said flat electrodes to said substrate and said optical waveguide



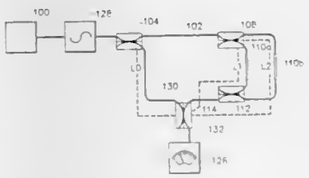
so that a refractive index of a portion of said substrate in the vicinity of said optical waveguide is varied to interrupt a light beam propagating through said optical waveguide, said flat electrodes being so arranged with respect to said optical waveguide that an electric field between said flat electrodes distributes asymmetrically about said optical waveguide.

4,818,064

SENSOR ARRAY AND METHOD OF SELECTIVE INTERFEROMETRIC SENSING BY USE OF COHERENCE SYNTHESIS

Robert C. Youngquist, Deland, Fla.; Robert H. Wentworth, Palo Alto, and Kenneth A. Fesler, Sunnyvale, both of Calif., assignors to Board of Trustees Stanford Junior University, Stanford, Calif.

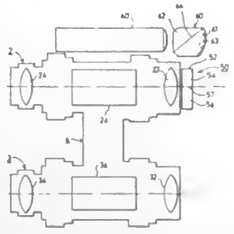
Filed Sep. 24, 1987, Ser. No. 100,483
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.15 **43 Claims**



1. A sensor array for monitoring environmental effects on a selected sensor, comprising:
a plurality of interferometers, with at least one interferometer incorporating a sensor segment which influences light traveling therein in response to selected environmental effects, and with each interferometer defining a particular optical path length difference;
means for providing to said interferometers an optical signal comprising a plurality of component signals at frequencies which are spaced from one another and at magnitudes such that said optical signal defines a waveform which reaches a maximum magnitude at a periodic rate which substantially corresponds to a difference in optical signal travel time through the optical paths of the interferometer which incorporates the selected sensor; and
means for monitoring optical signals which have passed through at least one of said interferometers, to identify the environmental influence which affected the optical signal which passed through the selected optical sensor.

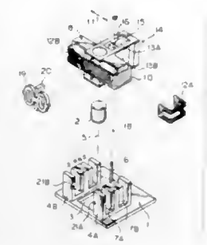
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4,818,065
OPTICAL DEVICE PARTICULARLY USEFUL AS AS NIGHT VISION GOGGLES
Leah Ziph, Haifa, and Shay Ghilai, Zahala, both of Israel, assignors to Elbit Computers Ltd., Haifa, Israel
Filed Mar. 2, 1988, Ser. No. 163,048
Claims priority, application Israel, Mar. 4, 1987, 81775
Int. Cl.[4] G02B *27/14*
U.S. Cl. 350—174 **20 Claims**



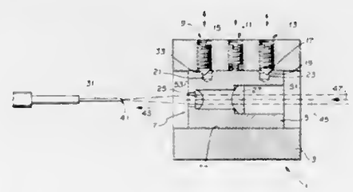
1. An optical device comprising a monocular assembly including an objective lens to be located remote from a viewer's eye for viewing a scene, and an eyepiece to be located adjacent to the viewer's eye; and means for injecting additional information into the viewed scene, including a prism assembly adjacent to and aligned with the objective lens of said monocular assembly on the side thereof opposite to its eyepiece; said prism assembly comprising a pair of transparent prisms having confronting inclined surfaces joined together at said inclined surfaces, and a reflector sandwiched between said joined inclined surfaces and having a surface area which is at least one order of magnitude smaller than the surface area of the objective lens.

4,818,066
OBJECTIVE LENS DRIVING DEVICE
Hiroyasu Nose, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Contiauation of Ser. No. 692,630, Jan. 18, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 933,333
Claims priority, application Japan, Jan. 30, 1984, 59-13469; Jan. 30, 1984, 59-13470; Jan. 30, 1984, 59-13471; Sep. 18, 1984, 59-195365
Int. Cl.[4] G02B *7/11*
U.S. Cl. 350—247 **7 Claims**



1. An objective lens driving device, comprising:
a holding member for holding an objective lens;
an intermediate support member constructed for rotation about a rotary support axis spaced apart from the optic axis of said object lens and parallel to said optic axis;
parallel plate spring having one end thereof secured to said holding member and the other end thereof secured to said intermediate support member, said parallel plate springs supporting said holding member for movement only in the direction of the optic axis of said objective lens relative to said intermediate support member and said rotary support axis being positioned between said one end and said other end; and
driving means for driving said holding member in the direction of the optic axis of said object lens and a direction perpendicular to said optic axis.

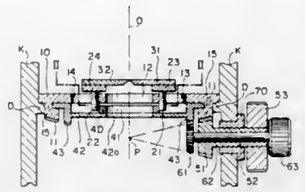
4,818,067
FIBER OPTIC FOCUSING DEVICE
Bernd Maisenbacher, Friendenstr, and Rudolf Vozdecky, Schwarzwaldstr, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 21, 1987, Ser. No. 40,894
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613643
Int. Cl.[4] G02B *7/04*
U.S. Cl. 350—255 **7 Claims**



1. An optical device for focussing a light beam along an optical axis, comprising:
a lens element;
holder means for holding the lens element aligned with the optical axis, the holder means having opposing upper and lower surfaces parallel to the optical axis;
first and second conical bores positioned in the upper surface of the holder means;
frame means for holding the holder means aligned with the optical axis, the frame means having opposing internal upper and lower surfaces parallel to the optical axis and engageable with the upper and lower surfaces of the holder means;
first and second threaded bores positioned through the upper surface of the frame means for receiving first and second setscrews; and
wherein the setscrews include conical points for engagement with the first and second conical bores, such that engagement of the first setscrew with the first conical bore causes motion of the lens element in one direction along the optical axis and engagement of the second setscrew with the second conical bore causes motion of the lens element in an opposite direction along the optical axis.

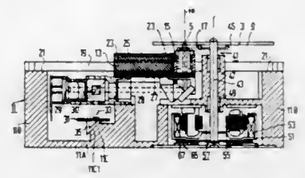
4,818,068
SLIT APPARATUS
Kazutoshi Takagi, Setagaya, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 29, 1988, Ser. No. 212,932
Claims priority, application Japan, Jun. 30, 1987, 62-100406[U]
Int. Cl.[4] G02B *26/02*
U.S. Cl. 350—272 **1 Claim**

1. A slit apparatus which comprises a base plate (10) provided for rotation about an axis of rotation (O) and having a first gear (11) arranged along the direction of rotation: at least two guiding slots (13, 14) formed on said base plate (10) so that the slots are located in opposite positions with regard to said axis of rotation (O) and along a line (L) perpendicular to said axis of rotation (O); at least two rods (21, 22) movable along said guiding slots (13, 14), respectively; at least two slit blades (31, 32), each connected to one of the rods (21, 22) so that each of said slit blades is movable in a direction opposite to the other and in a direction parallel to said line (L); cam means (40, 42) having a second gear (43) arranged along the direction of rotation to cause each of said rods (21, 22) to move in a direction opposite to the other when said cam means is rotated



about said axis of rotation; slit direction adjusting means comprising a first drive shaft (52) perpendicular to said axis of rotation (O), a first driving gear (51) meshing with said first gear (11), and a slit direction adjusting knob (53); and slit width adjusting means comprising a second drive shaft (62) coaxial with said first drive shaft (52), a second driving gear (61) meshing with said second gear (43), and a slit width adjusting knob (63).

4,818,069
ASSEMBLY OF A FIRST ELEMENT TO A SECOND ELEMENT BY ADHESIVE AND A WEDGE-SHAPED BODY
Nicolaus Maan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 21, 1987, Ser. No. 98,645
Claims priority, application Netherlands, May 21, 1987, 8701211
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—321 **11 Claims**



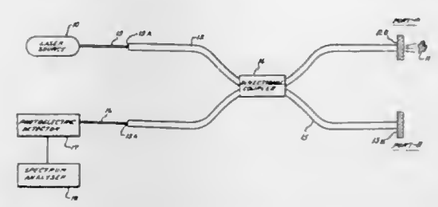
10. A device for recording and/or reading information in an information surface of a disc by means of radiation spot, comprising a frame, a rotary drive means with a spindle having an axis of rotation, an optical system with a lens system which has an optical axis and which is movable parallel to and transversely of said information surface, and a lens-system drive means, said device further comprising a first element to which a second element is secured by means of an adhesive and a third element comprising a wedge-shaped body, said body having profiled surfaces facing said first and second elements and being interposed therebetween, said surfaces comprising first surface portions against which said first and second elements abut, and second surface portions which together with said first and second elements form adhesive gaps in which the adhesive is applied to join said first and second elements and the second surface portions.

4,818,070
LIQUID CRYSTAL OPTICAL DEVICE USING U.V.-CURED POLYMER DISPERSIONS AND PROCESS FOR ITS PRODUCTION
Tomoki Gunjima; Hiroshi Kumai; Minoru Akatsuka, all of Yokohama, and Shoichi Tsuchiya, Sagamihara, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan
Filed Jan. 15, 1988, Ser. No. 144,171
Claims priority, application Japan, Jan. 22, 1987, 62-11237
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—334 **29 Claims**

1. A liquid crystal optical device comprising a pair of substrates provided with electrodes and a layer containing a liquid crystal material sandwiched between the pair of substrates, wherein said layer is formed by irradiating light to a mixture of a liquid crystal material and a photo-curable compound selected so that the refractive index of the resulting cured product agrees to either the ordinary refractive index (n_0) or the extraordinary refractive index (n_e) of the liquid crystal material used, or the refractive index (n_x) of the liquid crystal material when it is randomly oriented, held between the pair of substrates provided with electrodes, to cure the photo-curable compound and fix the resulting phase separation of the liquid crystal material and the cured product, wherein said layer has at least a portion optically oriented by applying a voltage to the portion across the substrates during the irradiation of light to cure the photo-curable compound.

15. A process for producing a liquid crystal optical device, which comprises supplying a mixture of a liquid crystal material and a photo-curable compound selected so that the refractive index of the resulting cured product agrees to either the ordinary refractive index (n_0) or the extraordinary refractive index (n_e) of the liquid crystal material used, or the refractive index (n_x) of the liquid crystal material when it is randomly oriented, between a pair of substrates provided with electrodes and irradiating the mixture with light to cure the photo-curable compound and form a cured layer of the mixture, wherein a voltage is applied to at least a portion of the mixture across the substrates during the irradiation so that only said portion is optically oriented upon curing.

4,818,071
FIBER OPTIC DOPPLER ANEMOMETER
Richard B. Dyott, Orland Park, Ill., assignor to Andrew Corporation, Orland Park, Ill.
Filed Mar. 26, 1985, Ser. No. 716,340
Int. Cl.[4] G01P *3/36*
U.S. Cl. 356—28.5 **10 Claims**



1. A fiber optic Doppler anemometer comprising a source of coherent light,
a directional coupler formed by the combination of first and second single-mode optical fibers, each of said fibers having a core and cladding of different refractive indices and forming a single-mode guiding region, with a first end of said first fiber receiving an incident beam of coherent light from said source and guiding said light through said directional coupler to a second end of said first fiber which is located adjacent to a body having a moving surface to be measured, whereby both the second end of said first fiber and said moving surface reflect a portion of said light back

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into said first fiber, said incident beam and the light reflected from said second end of said first fiber having the same frequency, the portion of said light reflected from said moving surface having a frequency different from that of the incident beam entering said fiber, said reflected light being directed back through said directional coupler, said directional coupler coupling a portion of said reflected light toward a first end of said second fiber, and

a photoelectric transducer for receiving the portion of said reflected light coupled by said directional coupler into the first end of said second fiber, and converting said light to analogous electrical signals.

4,818,072

METHOD FOR REMOTELY DETECTING AN ELECTRIC FIELD USING A LIQUID CRYSTAL DEVICE

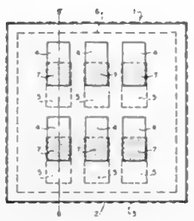
Manoochehr Mohebban, Foster City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

PCT No. PCT/US87/01758, § 371 Date Mar. 18, 1988, § 102(e) Date Mar. 18, 1988, PCT Pub. No. WO88/00718, PCT Pub. Date Jan. 28, 1988

Continuation-in-part of Ser. No. 888,892, Jul. 22, 1986. This PCT application Jul. 22, 1987, Ser. No. 193,005

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—336 **35 Claims**



1. A method of detecting an electric field generated by an electrical component, comprising the steps of:

(I) providing a device having at least one liquid crystal display element, said display element comprising:

(a) a first conductor, at least part of which is transparent;

(b) a second conductor aligned relative to said first conductor such that a portion of one of said conductors extends significantly beyond the other; and

(c) a liquid crystal material optically responsive to an electric field and positioned between said first and second conductors;

(II) bringing said device into the proximity of said electrical component, but without making electrical contact with either said component or with ground, such that said first and second conductors are positioned at different areas of intensity of said electric field; and

(III) observing the optical state of said liquid crystal display element.

18. A device for detecting an electric field surrounding an electrical component, said device comprising:

(I) an array comprising a plurality of liquid crystal display elements each of which comprises

(a) a first conductor, at least part of which is transparent;

(b) a second conductor aligned relative to said first conductor such that a portion of one of said conductors extends significantly beyond the other; and

(c) a liquid crystal material optically responsive to an electric field and positioned between said first and second conductors; and

(II) a protective packaging surrounding and electrically insulating said array from the exterior environment, said protective packaging being at least partially transparent to permit viewing of the optical state of at least one of said liquid crystal display elements

4,818,073

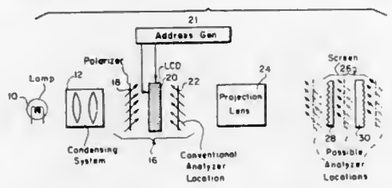
LIQUID CRYSTAL DISPLAY PROJECTION SYSTEM HAVING IMPROVED CONTRAST

Stephen Magocs, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Company, Knoxville, Tenn.

Filed Nov. 25, 1986, Ser. No. 934,871

Int. Cl.[4] G02F *1/13*; G03B *21/56*, *21/14*

U.S. Cl. 350—337 **4 Claims**



1. A polarized projection system comprising

an illumination source furnishing light rays;

liquid crystal means positioned in the path of said light rays, said liquid crystal means comprising polarizer means for polarizing said light rays in a predetermined plane thereby creating first polarized light, at least one liquid crystal positioned in the path of said first polarized light at a first predetermined distance from said polarizer means for rotating the plane of polarization of said first polarized light into a second plane of polarization in response to a control signal applied thereto, light rays polarized in said second plane of polarization constituting second polarized light, whereby said liquid crystal means furnishes a crystal output light polarized in accordance with said control signal;

means for applying said control signal to said liquid crystal in accordance with information to be displayed;

a projection screen planed at a second predetermined distance from said liquid crystal means, said projection screen having a front surface and a rear surface; and

analyzer means for transmitting only a selected one of said first polarized light and said second polarized light, said analyzer means being positioned in the path of said crystal output light at a third predetermined distance exceeding said first predetermined distance from said liquid crystal means;

further comprising projection lens means positioned in the path of said crystal output light between said at least one liquid crystal and said analyzer means; and

wherein said analyzer means is positioned between said rear surface of said projection screen and said projection lens.

4,818,074

PROJECTION DEVICE FOR IRRADIATING A LIGHT TO A DISPLAY DEVICE AND OPTICALLY MAGNIFYING AND PROJECTING A REFLECTION LIGHT THEREFROM

Kenya Yokoi, Yokohama; Takamichi Enomoto, Shiroyamamachi; Fuyuhiko Matsumoto, Kawasaki; Wasaburo Ohta, Yokohama; Toru Miyabori, Kawasaki; Akihiko Kanemoto, Yokohama; Haruo Iimura, Yokohama, and Takaaki Miyashita, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,668

Claims priority, application Japan, Sep. 3, 1986, 61-135178[U]; Oct. 20, 1986, 61-249139; Dec. 18, 1986, 61-302335; Mar. 10, 1987, 62-34900[U]; Mar. 23, 1987, 62-42312[U]; Mar. 23, 1987, 62-42313[U]; May 8, 1987, 62-112039; May 28, 1987, 62-133204; May 29, 1987, 62-135519; Jul. 8, 1987, 62-170501; Aug. 20, 1987, 62-207317; Aug. 25, 1987, 62-210617

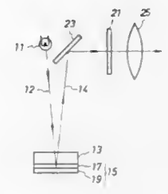
Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—338 **8 Claims**

1. A projection device for irradiating a light to a display device and optically magnifying and projecting a reflection light therefrom, comprising:

a liquid crystal cell,

a first polarization means and a reflection means disposed respectively on an opposite side from an irradiated side of said liquid crystal cell, and



a second polarization means and optical magnifying means disposed respectively on an optical path of the reflection light reflected by said reflection means and outgoing from said liquid crystal cell, the first polarization means and the reflection means being integrally formed as a polarization-reflection plate made of a metal thin film, and the second polarization means being an optical analyzer.

4,818,075

COLOR LIQUID CRYSTAL DEVICE

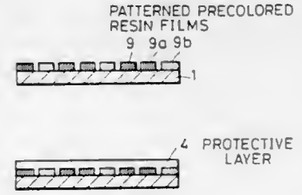
Hideaki Takao, Sagamihara; Miki Tamura, Yokohama; Masaru Kamio, Atsugi; Tatsuo Murata, Ohme, and Nobuyuki Sekimura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,093

Claims priority, application Japan, Jan. 23, 1987, 62-14924

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 F **34 Claims**



1. A color liquid crystal device comprising a pair of substrates having electrodes, a color filter disposed between at least one of said pair of substrates and its electrode, and a liquid crystal disposed between said pair of substrates, wherein said color filter is composed of a resin and a coloring material, and V and P have a relationship of $\frac{1}{3} \leqq P/V \leqq 3/2$, where V (gr) and P (gr) represent the respective contents of said resin and said coloring material that form said color filter.

4,818,076

COLOR-SELECTIVE CIRCULAR POLARIZER AND ITS USE

Gerd Heppke, and Feodor Oestreicher, both of Berlin, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

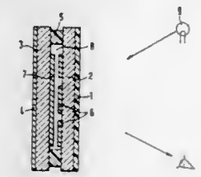
Continuation of Ser. No. 638,454, Aug. 1, 1984, abandoned. This application Jun. 12, 1987, Ser. No. 60,810

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244885

Int. Cl.[4] G02F *1/137*

U.S. Cl. 350—346 **17 Claims**

1. A wavelength selection device comprising: a liquid crystal cell comprising two carrier plates, each of said carrier plates having electrically conductive coatings on their mutually facing sides, means for applying a variable voltage across said coatings, and a chiral liquid crystal layer in an optically isotropic blue phase enclosed between said plates, whereby said liquid crystal layer reflects electromagnetic radiation with a λ_{max} dependent on the magnitude of said voltage.



4,818,077

FERROELECTRIC LIQUID CRYSTAL DEVICE AND METHOD OF DRIVING THE SAME

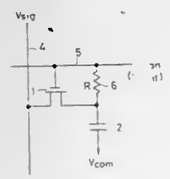
Junichi Ohwada, and Katsumi Kondo, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1985, Ser. No. 770,204

Claims priority, application Japan, Sep. 5, 1984, 59-184646

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **14 Claims**



1. In a method of driving a liquid crystal device having a bistable ferroelectric liquid crystal sandwiched between display electrodes, switching elements disposed at respective intersection points between a plurality of scanning electrodes and a plurality of signal electrodes, a control element disposed at a juncture between said each switching element and one of said display electrodes; said method comprising the steps of:

when said switching element is off, applying to said ferroelectric liquid crystal a voltage having an absolute value of a crest value held to be less than a threshold value ($|V_{th}|$) of said ferroelectric liquid crystal;

when said switching element is on, applying to said ferroelectric liquid crystal a first voltage signal whose crest value has an absolute value less than said threshold value ($|V_{th}|$) to said ferroelectric liquid crystal so as to bold a light transmissive state; and

when said switching element is on, applying to said ferroelectric liquid crystal a second voltage signal whose crest value has an absolute value not less than said threshold value ($|V_{th}|$) so as to change the light transmissive state.

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4,818,078

FERROELECTRIC LIQUID CRYSTAL OPTICAL MODULATION DEVICE AND DRIVING METHOD THEREFOR FOR GRAY SCALE DISPLAY

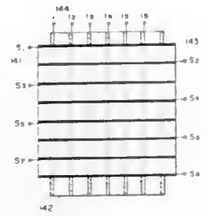
Akihiro Mouri, Kokubunji; Hiroyuki Kitayama, Sagamihara; Shuzo Kaneko; Tohru Takahashi, both of Tokyo; Masahiko Enari, Yokohama; Mitsutoshi Kuno, Tokyo, and Tsutomu Toyono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1986, Ser. No. 934,920

Claims priority, application Japan, Nov. 26, 1985, 60-266980; Mar. 20, 1986, 61-063456; Mar. 20, 1986, 61-063458

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **58 Claims**



1. A method for driving an optical modulation device, comprising:

providing an optical modulation device comprising a first substrate having a first conductor film thereon, a second substrate having thereon a second conductor film disposed opposite to said first conductor film, and an optical modulation material disposed between said first and second substrates; and

forming a potential gradient along an extension of said first conductor film or both said first and second conductor films, and applying an information signal to said first or second conductor film.

23. A liquid crystal apparatus, comprising:

a liquid crystal device comprising a first substrate having thereon a first conductor film, a second substrate having thereon a second conductor film opposite to said first conductor film, and a ferroelectric liquid crystal disposed between said first and second substrates;

means for forming a potential gradient along an extension of said first conductor film or both said first and second conductor films; and

means for applying an information signal to said first or second conductor film.

4,818,079

MULTIPLE QUANTUM WELL OPTICAL MODULATOR

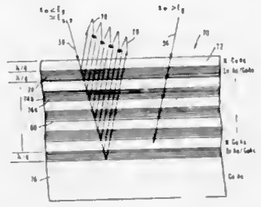
Joseph Maserjian, La Crescenta, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 003,633, Jan. 15, 1987, abandoned. This application Jan. 28, 1987, Ser. No. 149,653

Int. Cl.[4] G02F *1/19, 1/21*

U.S. Cl. 350—354 **7 Claims**

1. A resonant structure evidencing an enhanced electro-optic effect comprising a multiplicity of alternating quarter-wave layers of a first material and a superlattice structure comprising alternating layers of said first material and a second material having a bandgap less than that of said first material, said superlattice structure having an index of refraction which is changed by changes in the fields at the boundaries responsive to the photocurrent generated by an incident write signal, said changes being read by use of a read signal of a wavelength that



is slightly below the bandgap of said superlattice and is resonantly reflected from said quarter-wave layers.

4,818,080

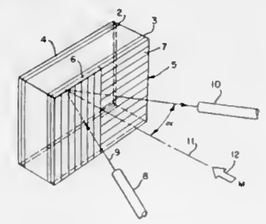
MONOLITHIC FARADAY OPTICAL SWITCH

William M. Glasheen, Derry, N.H., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 5, 1987, Ser. No. 117,174

Int. Cl.[4] G02F *1/09*

U.S. Cl. 350—355 **6 Claims**



1. A monolithic Faraday effect optical switch comprising:

(a) an optical switching element including a radiation transmitting substrate having at least the following elements:

(1) at least one (1) Faraday effect polarization rotator means on said substrate;

(2) polarizing means including polarizer and analyzer elements deposited on one side of said substrate to control passage of radiation;

(3) radiation reflecting means deposited on the other side of said substrate to reflect radiation passing through said substrate

(b) radiation transmitting and receiving means positioned adjacent to said switching element on said one side of said substrate, said transmitting means positioned to irradiate said polarizing means whereby incident radiation from said transmitting means passes through said polarizer element and thence through said Faraday rotator means and said substrate to said reflecting element and back to said analyzer element;

(c) a magnetic field Positioned in flux relationship with said switch, said magnetic field passing through said Faraday effect rotator means to vary the polarization of the incident polarized radiation whereby passage of incident radiation through said switch and said analyzer element to said receiving means is controlled by the presence or absence of a magnetic field.

4,818,081

ZOOM LENS SYSTEM FOR USE IN COMPACT CAMERA

Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

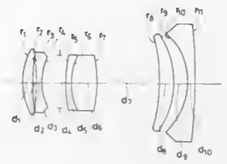
Filed Dec. 11, 1987, Ser. No. 132,084

Claims priority, application Japan, Aug. 28, 1987, 62-214709

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

Int. Cl.[4] G02B *15/14, 9/60*

U.S. Cl. 350—423 **10 Claims**



1. In a zoom lens system for use in a compact camera that comprises, in order from the object side, a first lens group having a positive focal length and a second lens group having a negative focal length, said zoom lens system performing zooming by changing the distance between said first and second lens groups, the improvement wherein said first lens group comprises a first lens unit having a negative focal length that comprises a positive lens element and a negative lens element, and a second lens unit having a positive focal length disposed on the image side of said first lens unit and which comprises a negative lens element and a positive lens element, said zoom lens system satisfying the following conditions:

$$1.2 < f_S/f_1 < 1.5; \quad (1)$$

$$1.69 < N_{1an}; \quad (2)$$

$$34 < \nu_{1an}; \quad (3)$$

$$-2.0 < f_S/f_{1bn} < -0.7; \quad (4)$$

$$9 - \nu_{1bp} - \nu_{1bn}; \text{ and} \quad (5)$$

$$0.23 < f_{BS}/f_S < 0.5 \quad (6)$$

wherein

f_S: the focal length of the overall system at the wide-angle end;

f_1: the focal length of the first lens group;

N_{1an}: the refractive index, at the d-line, of the negative lens element in the first lens unit;

ν_{1an}: the abbe number of the negative lens element in the first lens unit;

f_{1bn}: the focal length of the negative lens element in the second lens unit;

ν_{1bp}: the Abbe number of the positive lens element in the second lens unit;

ν_{1bn}: the Abbe number of the negative lens element in the second lens unit; and

f_{BS}: the back focus of the overall system at the wide-angle end.

4,818,082

COMPACT WIDE-ANGLE CLOSE-FOCUS SLR ZOOM LENS

Melvyn H. Kreitzer, Cincinnati, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1988, Ser. No. 199,509

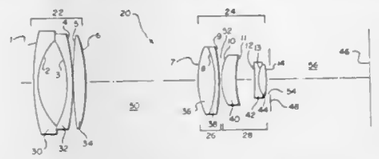
Int. Cl.[4] G02B *15/14, 27/00, 9/62*

U.S. Cl. 350—427 **4 Claims**

1. A wide-angle close-focus zoom lens having a back focus distance sufficient to accommodate a viewfinder mirror of a single lens reflex camera, said lens comprising:

a negative power focus and compensating lens element unit located at the front of said lens, said focus and compensating lens element unit being movable for focusing and for compensating during zooming and having two mutually adjacent negative lens elements followed by a positive lens element, and

a positive power variator lens element unit comprising:



a movable positive power lens element sub-unit in the form of a positive power doublet that provides the majority of magnification change during zooming, and

a movable negative power lens element sub-unit rearwardly of said positive power lens element sub-unit, said negative power sub-unit being in the form of a positive lens element spaced forwardly from a negative power lens element doublet.

4,818,083

VARI-FOCAL LENS SYSTEM

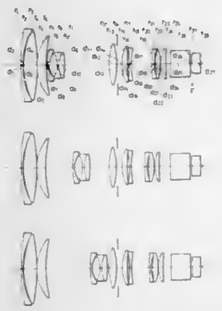
Shin-ichi Mihara, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,899

Claims priority, application Japan, Nov. 13, 1986, 61-268538

Int. Cl.[4] G02B *15/14*

U.S. Cl. 350—427 **15 Claims**



1. A vari-focal lens system comprising, in the order from the object side, a first lens group having a positive focal length and arranged to be always kept fixed, a second lens group having a negative focal length and arranged to be movable along the optical axis when varying the focal length of the lens system as a whole and to be kept fixed at the time of focusing, a third lens group having a positive focal length and arranged to be always kept fixed, and a fourth lens group with a positive focal length located by leaving a comparatively large airspace in respect to said third lens group and arranged to be movable for the purpose of compensation so as to eliminate the displacement of the focal point caused when varying the focal length of the lens system as a whole and, moreover, to integrally move said fourth lens group as a whole for the purpose of focusing, said vari-focal lens system being arranged that rays coming out from said third lens group become approximately afocal.

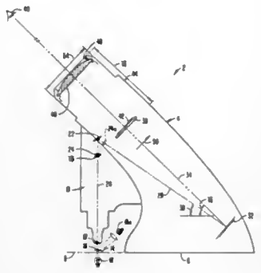
VOL 1101 ISS 1 AP 4 1989 UMI

4,818,084

SINGLE EYEPIECE BINOCULAR MICROSCOPE

John B. Wentz, III, 8619 Skyline Blvd., Oakland, Calif. 94611

Continuation of Ser. No. 058,422, Jun. 5, 1987, abandoned. This application Jul. 14, 1988, Ser. No. 220,350
Int. Cl.[4] G02B *21/36, 21/00*
U.S. Cl. 350—508 10 Claims



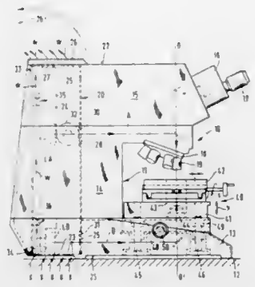
1. A single eyepiece binocular microscope for viewing a specimen by an observer comprising:
a microscope housing including a base defining a horizontal base plane;
an optical train including, in order, a first, objective lens mounted to the housing above a specimen receiving area, a first mirror mounted to the housing at a first position vertically above the first lens, a second mirror mounted to the housing at a second position, and a rear projection screen mounted to the housing at a third position;
a light source for illuminating the specimen receiving area;
the first lens and the first mirror defining a first vertical light path;
the first mirror and the second mirror defining a second light path therebetween;
the second mirror and the rear projection screen defining a third light path from the second mirror and through the rear projection screen;
the first, second and third light paths constituting an optical path;
the verticall position of the second mirror being at or below the elevation of the half-way point between the first lens and the first mirror;
the second light path extending downwardly and away from the observer at an acute reflection angle to the base plane of substantially less than 90°;
the housing including an open-ended viewing chamber having light blocking circumferential walls extending generally coaxially with the third axis outwardly from the third position to a viewing opening at one end in the viewing chamber;
the third light path extending upwardly and towards the observer at an acute, viewing angle to the base plane, the third light path passing back over the specimen with at least a portion of the viewing opening being positioned horizontally between a user and the first and second light paths to give the user unobstructed visual and physical access to the specimen; and
the first position being adjacent the viewing chamber and the second position being adjacent the base plane to maximize the length of the optical path.

4,818,085

MICROSCOPE HAVING AN EASILY REMOVABLE LAMP STRUCTURE

Klaus Schindl, and Karl Moser, both of Vienna, Austria, assignors to Reichert-Jung Optische Werke A.G., Vienna, Austria

PCT No. PCT/EP86/00755, § 371 Date Aug. 4, 1987, § 102(e) Date Aug. 4, 1987
PCT Filed Dec. 15, 1986, Ser. No. 88,781
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544354
Int. Cl.[4] G02B *21/06*
U.S. Cl. 350—528 27 Claims



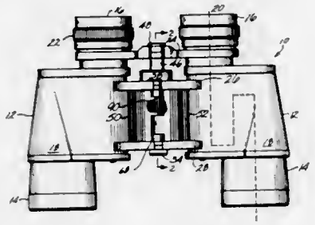
1. A microscope comprising a base portion, a cross member and a vertical portion connecting the base portion and cross member, at least one lamp for microscope illumination being arranged within the vertical portion, wherein a slide adapted to be shifted in and out of the vertical from above in a substantially vertical direction holds at least one lamp.

4,818,086

FOCUS LOCK FOR BINOCULARS

Sidney D. Moore, Claremont, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Mar. 9, 1988, Ser. No. 165,810
Int. Cl.[4] G02B *7/06*
U.S. Cl. 350—552 24 Claims



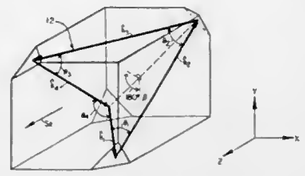
1. In a binocular having a pair of telescopes mounted in axial alignment with a hinge tube, said binocular having a focus knob for the focus adjustment of said binocular, said knob being mounted on said hinge tube, said knob comprising:
a hub mounted between said pair of telescopes for rotation about the longitudinal axis of said hinge tube, said hub including means for supporting an axle pin for pivoting first and second paddle platforms thereon, said pin axially aligned with said hinge tube;
said first and said second paddle platforms extending radially outward relative to said axle pin in substantially opposite directions, said first and second paddle platforms being independently pivoted on said axle pin and each of said first and second paddle platforms having means for preventing rotating motion of said hub, said means being engaged by pivoting said paddle platforms in one direction and disengaged by pivoting said paddle platforms in the opposite direction, whereby movement of said hub is accomplished by pushing said first and said second paddle platforms in their respective disengaging directions and pushing one of said paddle platforms slightly more than the other paddle platform for rotational motion of said hub.

4,818,087

ORTHOHEDRAL RING LASER GYRO

Terry A. Dorschner, Newton Centre, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 27, 1982, Ser. No. 412,459
Int. Cl.[4] G02B *5/08*
U.S. Cl. 350—622 6 Claims



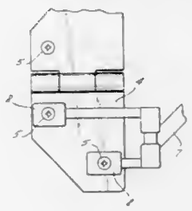
1. An optical system for the propagation of a beam of electromagnetic energy comprising:
means for directing said beam of electromagnetic energy along an optical ring path, said optical ring path divided into equal length segments all lying in only two orthogonal planes, and
wherein said optical ring path is arranged to provide circular birefringence to said beam.

4,818,088

SIDE VIEW MIRROR MOUNTING ON A FOLDING DOWN FRONT WINDSHIELD

Eric Sacknoff, 1528 E. 91st St., Brooklyn, N.Y. 11236

Filed Feb. 1, 1988, Ser. No. 150,829
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—632 7 Claims



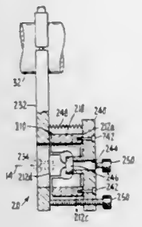
1. In a combination side-view mirror unit and folding down type front windshield unit of a motor vehicle, of the type wherein
said front windshield unit is composed of a window, a window frame housing said window and hinge means removably joining said windshield unit onto said motor vehicle,
said hinge means including a plurality of holes for placement of means removably joining said windshield unit onto said motor vehicle, and
said side-view mirror unit is composed of a mirror frame and mounting means disposed at one end of said mirror frame and removably joining said mirror unit onto said hinge means,
the improvement wherein said mounting means include a plurality of openings and substantially align with said hinge means, thereby said means removably joining said windshield unit into said motor vehicle comprise means removably joining said mirror unit onto said motor vehicle, whereby additional mounting means are omitted.

4,818,089

KINEMATIC RESONATOR SUPPORT

Wayne S. Mefferd, Los Altos Hills, Calif., assignor to Coherent, Inc., Palo Alto, Calif.

Filed Apr. 24, 1987, Ser. No. 42,272
Int. Cl.[4] G02B *7/18, 5/08*
U.S. Cl. 350—634 5 Claims



1. An assembly for adjustably mounting a mirror to a fixed member comprising:
a pivot member having a central opening and two opposed end faces, said pivot member further including four mounting arms formed therein and spaced apart by about 90 degrees, with one pair of opposed mounting arms projecting towards one of the two end faces and with the other pair of opposed mounting arms projecting towards the other end face and with each arm having a region of reduced width capable of flexure, and with all of said flexure regions lying substantially in one radial plane intermediate the opposed end faces of said pivot member, and with one pair of said mounting arms being connected to said fixed member;
a mirror plate connected to the remaining pair of mounting arms of said pivot member, said mirror plate including mirror holder for mounting a mirror thereon; and
means for adjusting the mirror plate with respect to the fixed member about said flexure regions of said mounting arms.

4,818,090

REAR-VISION MIRROR FOR AUTOVEHICLES

Nardino Righi, Milan, Italy, assignor to Com. Mer Italia S.p.A., Milan, Italy

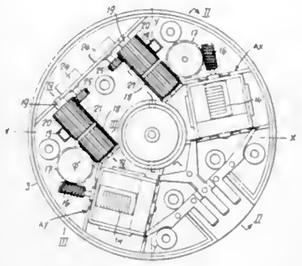
Filed Jan. 28, 1988, Ser. No. 149,661
Claims priority, application Italy, Feb. 11, 1987, 12418 A/87
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—634 4 Claims

1. A mirror device for an automobile comprising:
a housing including a planar mirror holder and a mounting means for mounting said mirror holder in said housing for angular movement about a horizontal pivot axis and a vertical pivot axis;
a vertical driving unit means and a horizontal driving unit means mounted in said housing for respectively moving said mirror holder about the respective vertical and horizontal axes, each said driving unit means including an electric motor, a rack articulatingly attached at one end to said mirror holder, a guide through which said rack slidably extends at a right angle to said mirror holder, and a mechanical transmission means for transmitting a driving force between said electric motor and said rack, said mechanical transmission means including (a) a member

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located between said electric motor and said rack with said rack permanently connected to said member such that any movement of said rack also causes a movement of said member and (b) a friction coupling means between said member and said electric motor for drivingly coupling said member to said electric motor frictionally while allowing said member to move free of said electric motor when the friction coupling is overcome;

a respective angular detecting means associated with each said driving unit for detecting the angular position of said



mirror holder about the respective axis, each said angular detecting means including a potentiometer which is directly driven by movement of said member; and

a control means for controlling the position of said mirror holder, said control means including a motor actuation means for controlling the actuation of said electric motors, a storage means connected to said potentiometers for storing at least one position of said mirror holder, and a positioning means associated with said storage means and said potentiometer for automatically returning said mirror holder to said at least one stored position.

4,818,091

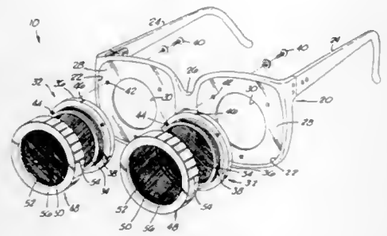
SYSTEM AND METHOD OF DETECTING VISUAL FIELD DEFECTS

Alfredo A. Sadun, San Marino, and Michael Wall, New Orleans, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Dec. 31, 1985, Ser. No. 815,368

Int. Cl.⁴ G02C *7/12*; A61B *3/07*

U.S. Cl. 351—49 **18 Claims**



1. A method of detecting visual field defects in a patient, comprising the steps of:

(a) providing an illuminated object having a substantially consistent or regular pattern on a substantially homogeneous background for viewing by the patient;

(b) then separately for each eye, one at a time,

fixing the luminance of the object as perceived by the patient so that the object is barely visible by the patient, and having the patient record the presence of any visual field defects observed through the one eye viewing the object.

4,818,092

DEVICE ON A PAIR OF GLASSES

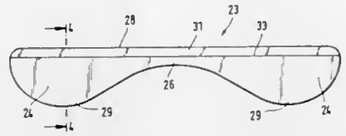
Walter H. Boaoni, Zeppelinstrasse 9, 7012 Fellbach-Schmiden, Fed. Rep. of Germany

Filed Jun. 1, 1984, Ser. No. 616,314

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 8316015[U]

Int. Cl.⁴ G02C *5/12*

U.S. Cl. 351—136 **5 Claims**



1. In combination, a frame of a pair of glasses having a pair of eye rims with front surfaces and nasal regions which are connected together by a bridge with a front surface and a nasal region; and a saddle strap pad made of plastic, having a forward end region, comprising the improvement wherein:

(a) A shallow rabbet extends from the nasal region of one eye rim, through the nasal region of the bridge, into the nasal region of the other eye rim, and has a predetermined depth, a forward rabbet wall spaced from the front surface of the eye rim and the bridge, and a sagittal rabbet wall, which is substantially longer than the forward rabbet wall;

(b) The saddle strap pad at the forward end region is glued into the shallow rabbet, and in the area of the forward end region is thicker than the dept of the rabbet;

(c) The saddle strap pad has a Shore D hardness for silicone elastomer in the range 10–30; and

(d) Both the forward rabbet wall and the sagittal rabbet wall are level.

4,818,093

HINGE FOR THE ELASTIC ARTICULATION OF A TEMPLE PIECE TO THE FRONT FRAME OF AN EYEGLASS FRAME

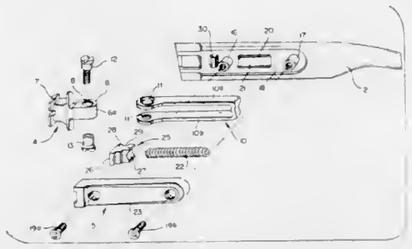
Vittorio Tabacchi, VII Strada 20, 35129 Padova, Italy

Filed Sep. 17, 1987, Ser. No. 97,745

Claims priority, application Italy, Sep. 23, 1986, 23175-B/86.

Int. Cl.⁴ G02C *5/16, 5/22*

U.S. Cl. 351—113 **6 Claims**



1. A hinge for the elastic articulating of a temple piece to the front frame of an eyeglass frame, comprising a first hinge element fastened on the front frame and shaped externally in accordance with a cam profile, a second hinge element telescopically guided on the temple piece and urged by a spring into a retracted position within the temple piece and a lug fastened on the temple piece and acting on said cam profile,

characterized by the improvement (fact) that it includes a resilient abutment for said spring formed in said temple piece, which is structurally independent of said lug, said lug being interposed between said abutment and said first hinge element.

4,818,094

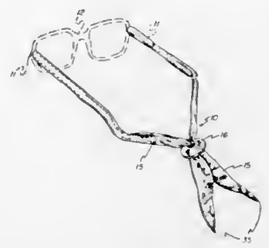
EYEGLASS RETAINER

Todd G. Lyons, Dayton, Ohio, assignor to Powder Blue U.S.A., Inc., West Carrollton, Ohio

Filed Jun. 25, 1987, Ser. No. 66,896

Int. Cl.⁴ G02C *3/02*

U.S. Cl. 351—157 **2 Claims**



1. An assembly for retaining a pair of spectacles having a pair of temples on the head of a wearer, comprising

(a) a pair of strips of fabric,

(b) each of said fabric strips having at one end thereof a tubular portion constructed and configured to receive and retain the rearward end of one of the spectacle temples,

(c) said tubular portion constituting a minor portion of the length of said strip,

(d) the major portion of each said strip being essentially flat,

(e) said flat portion of each said strip being of minimum width adjacent said tubular portion thereof and including a portion of substantially greater maximum width spaced a substantial part of the length thereof from said tubular portion thereof, and

(f) a ring having a central opening therethrough sized to receive said minimum width portions of both of said strips simultaneously therethrough as well as said minimum width portion of one of said strips and said maximum width portion of the other said strips simultaneously therethrough but not of sufficient size to receive said maximum width portions of both of said strips simultaneously therethrough,

(g) whereby when said tubular portions thereof are received around spectacle temples, said ring is retained between said temples and said maximum width portions of said strips, and upon separation of the free ends of said strips, said strips will be tightened behind the wearer's head by forced travel of said ring over said strips toward the wearer's head.

4,818,095

SPECIAL LENS AND GLASSES EQUIPPED WITH THE SAME

Kunio Takeuchi, 1-61, Nishi 1-chome, Minami 11-Jho Chuo-ku, Sapporo-Hokkaido, Japan

PCT No. PCT/JP85/00002, § 371 Date Jun. 19, 1986, § 102(e) Date Jun. 19, 1986, PCT Pub. No. WO85/03140, PCT Pub. Date Jul. 18, 1985

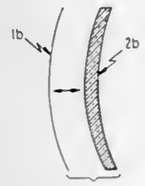
PCT Filed Jan. 4, 1985, Ser. No. 876,891

Claims priority, application Japan, Jan. 4, 1984, 59-000148; Feb. 6, 1984, 59-020530; PCT Int'l Appl., Feb. 25, 1984, PCT/JP84/00067

Int. Cl.⁴ G02C *7/12*; G02B *5/30*

U.S. Cl. 351—159 **9 Claims**

1. A special lens for glasses for a wearer, which lens has been formed by cementing a polarizer having an angle to a lens for glasses on the side of the lens opposite the eyeball of the wearer by a bonding agent, said polarizer angle being obtained by adding 90° to an astigmatic angle of the eyeball when the astigmatic angle is in the range from 0° to 90°, which astigmatic



angle is obtained by measuring and calculating the astigmatic angle of the eyeball of the wearer, and said polarizer angle being obtained by subtracting 90° from the astigmatic angle when the astigmatic angle is in the range of more than 90° to 180°.

4,818,096

PHOTOREACTIVE LENSES WITH ADAMANTANE SPIRO COMPOUNDS

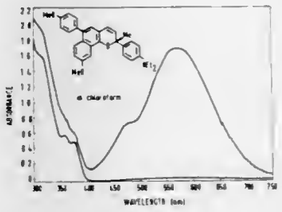
Harry G. Heller, Cardiff, Wales; Stephen N. Oliver, Felixstowe, England; John Whittall, Caerphilly, Wales; Jack Brettle, Towcester, England; Clive Trundle, Towcester, England, and Martin W. Baskerville, Towcester, England, assignors to The Plessey Company plc, Ilford, England

Filed Jun. 17, 1987, Ser. No. 63,054

Claims priority, application United Kingdom, Jun. 17, 1986, 8614680

Int. Cl.⁴ G02B *27/00*; C07D *265/00*; G03C *1/733*

U.S. Cl. 351—163 **12 Claims**



1. An opthalmic or plano-lens which darkens in sunlight and reverts to a pale or colourless condition in white light at normal ambient temperatures, wherein the lens has incorporated therein or coated thereon at least two heliochromic compounds, one of said compounds comprising an adamantane spiro-benzopyran or spironaphthopyran in which an adamantane group is present in the 2-spiro-position of the benzopyran or naphthopyran ring and a second compound comprising a benzo or naphthopyran having a nitrogen-containing substituent in the 2-position of the pyran ring.

4,818,097

OCULAR-PURSUIT MEASURING

Lucille M. J. Linde, 1954 18th Ave., Greeley, Colo. 80631

Continuation-in-part of Ser. No. 618,933, Jun. 8, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 884,486

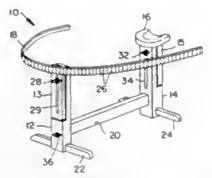
Int. Cl.⁴ A61B *3/00*

U.S. Cl. 351—203 **19 Claims**

1. A technical process for measuring the ocular tracking ability of a person comprising the use of the following

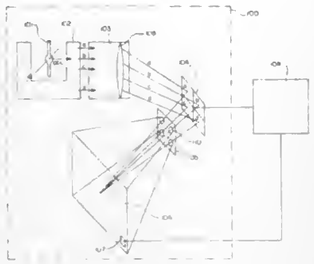
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(a) providing an ocular-pursuit measuring instrument comprising:
(i) a first upstanding leg member;
(ii) a second upstanding leg member spaced from the first leg member;
(iii) connecting means connecting said first and second leg members;
(iv) vertically adjustable chin support means at the upper end of said first leg member, said support means being adapted to stably support said person's head; and
(v) an arcuate member pivotably mounted at its midpoint to the upper end of said second leg member in a manner such that said arcuate member may be pivoted about an



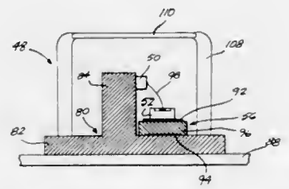
axis passing through said midpoint perpendicular to the axis of said second leg member; wherein said arcuate member includes a graduated scale therealong;
(b) positioning such person in a manner such that the person's chin is stably supported by said chin support means;
(c) placing said arcuate member in a horizontal position;
(d) testing the person's ocular tracking ability by moving a target along said arcuate member from said midpoint to measure smooth eye movement by such person following said target; and
(e) recording the number of units on said graduated scale between said midpoint and the maximum point where smooth eye movement was completed accurately.

4,818,098
APPARATUS AND METHOD OF FORMING AND PROJECTING HIGH PRECISION OPTICAL IMAGES
Frederic J. Kahn, Palo Alto; Paul N. Kendrick, Sunnyvale; Jerry Leff, Saratoga; Linden J. Livoni, Los Gatos; Bryan E. Loucks, Los Altos Hills; David E. Stepner, Cupertino, and Kenneth G. Witte, San Jose, all of Calif., assignors to Sharp Corporation, Osaka, Japan
Filed May 9, 1986, Ser. No. 861,492
Int. Cl.[4] G03B *21/00*
U.S. Cl. 353—122 **27 Claims**



1. A projection apparatus including
a light source,
an image object plane containing at least two spaced reflecting images,
optical means including a single condenser lens disposed to receive light from said source and form at least two beams and directing one of said beams on each of said reflecting images,
at least two spaced multielement projection lenses in which the power is concentrated primarily in the inner elements and achromatization is concentrated primarily in the outer elements to provide lenses with front to rear surface lengths less than half the focal length to provide a compact design with relatively small off-axis angle, high resolution and low distortion, said projection lenses positioned to receive light reflected by said images on to a receiving plane so that the images are in coregistration.

4,818,099
OPTICAL RADAR SYSTEM
Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash. 98008, and Ekhard Preikschat, 9048 NE. 41st St., Bellevue, Wash. 98004
Filed Oct. 25, 1985, Ser. No. 791,580
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—5 **10 Claims**

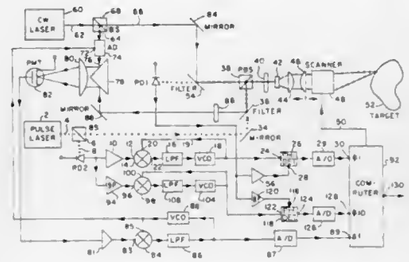


1. A transmitter for an optical radar system, comprising:
a metallic heat sink;
a laser diode mounted to the heat sink in direct heat transfer thermal relationship thereto, the laser diode having first and second terminals and having its first terminal electrically connected to the heat sink;
a capacitor positioned adjacent the heat sink, the capacitor comprising a first plate having direct mechanical and electrical connection to the heat sink and a second plate spaced from the first plate;
an avalanche transistor having its collector connected to the second plate and its emitter connected to the second terminal of the laser diode;
means for providing a trigger signal to the base of the avalanche transistor; and
means for charging the second plate, the direct mechanical and electrical connection of the capacitor to the heat sink minimizing self-inductive impedance and stray capacitance when the capacitor discharges through the laser diode.

4,818,100
LASER DOPPLER AND TIME OF FLIGHT RANGE MEASUREMENT
Michael T. Breen, Garden City, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Sep. 30, 1987, Ser. No. 103,087
Int. Cl.[4] G01C *3/08*; G01P *3/36*; G01B *11/26*
U.S. Cl. 356—5 **10 Claims**

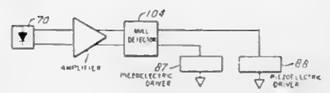
1. A hybrid distance gauge for measuring the distance from a fixed point to a target, comprising:
laser means for providing a continuous laser light wave and a laser light pulse train whose envelope waveform comprises a fundamental first harmonic component whose frequency is the laser light pulse train's pulse repitition frequency and a plurality of higher harmonic components, the frequency of each of which is an integral multiple of said pulse repetition frequency;
means for obtaining both a reference beam based upon the

continuous laser light wave and a target beam of the laser continuous light wave and for obtaining both a reference beam based upon the laser light pulse train and a target beam of the pulse train;
unitary optical means for directing said target beam of the continuous laser light wave and the target beam of the pulse train across the distance to said target for reflection and return propagation therefrom;
means responsive to said pulse train reference beam for providing a locally generated pulse train whose pulse repetition frequency is equal to that of one predetermined harmonic component of said harmonics including said first harmonic of the reference pulse train envelope and whose phase has a predetermined relationship to the phase of said



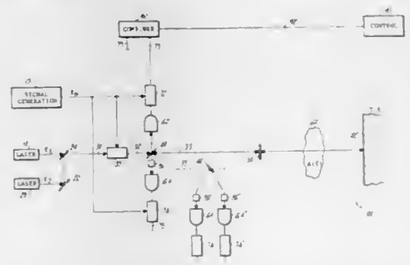
one predetermined harmonic component of the reference pulse train envelope;
phase comparison means for comparing the phase of said locally generated pulse train with the phase of that harmonic number component of the return target pulse train and outputting a first signal indicative thereof;
comparison means for comparing the frequency of said continuous laser light wave reference beam with the frequency of said return continuous laser light wave and outputting a second signal indicative thereof;
data processing means receiving said first and second output signals for combining said first and second output signals into composite data indicative of the distance to places of reflection on said target.

4,818,101
LASER-DOPPLER VELOCIMETRY
David C. Soreide, Seattle, and Gary D. Douglas, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Dec. 2, 1986, Ser. No. 936,844
Int. Cl.[4] G01P *3/36*; G01B *11/23*; G01J *1/20*
U.S. Cl. 356—28.5 **29 Claims**



1. Measurement apparatus for carrying out a measurement of a property at a test location, comprising:
means for providing a measurement beam of electro-magnetic radiation and a guide beam of electromagnetic radiation,
a first beam deflector located to receive said beams and deflect the same,
a second beam deflector for receiving the measurement beam and the guide beam and directing them towards the test location and a detection location respectively, the second beam deflector converging the measurement beam and the guide beam at the test location and the detection location respectively,
collector means for collecting electromagnetic radiation from the test location,
detector means at the detection location for receiving the guide beam and providing an output signal representative of the spatial relationship between the test location and the collector means, and
feedback means effective between the detector means and the first beam deflector for adjusting beam orientation in such a manner as to maintain constant the spatial relationship between the test location and the collector means.

4,818,102
ACTIVE OPTICAL PYROMETER
William H. Glenn, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 22, 1986, Ser. No. 945,158
Int. Cl.[4] G01J *5/48*
U.S. Cl. 356—43 **6 Claims**



1. An optical pyrometer for measuring the temperature of an object in an absorbing ambient medium comprising:
modulated light source means for generating modulated probe radiation having a predetermined source power level, modulation frequency and source optical wavelength;
means for directing said probe radiation at a predetermined location on said object;
means for receiving input optical radiation emanating from said object;
means for measuring the power of said input optical radiation in a predetermined measurement optical wavelength range and at said predetermined modulation frequency, and for forming a first signal representative of an input power magnitude in said measurement optical wavelength range;
means for forming a second signal representative of said predetermined source power level; and
means for combining said first and second signals to form an output signal representative of said temperature, characterized in that:
said modulated light source means includes means for generating first and second probe radiation beams at first and second optical wavelengths having first and second probe power levels respectively sufficient to raise said temperature and said modulated light source means directs said first and second probe radiation beams at said predetermined location;
said means for forming a signal representative of said predetermined source power level includes means for forming first and second probe power signals representative of said first and second probe power levels of said first and second probe radiation beams;
said means for measuring said input power magnitude includes frequencey-dependent detection means responsive to radiation of one of said first and second optical wavelengths and further includes means for forming first and

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second input power magnitude signals representative of said input radiation at said first and second optical wavelengths when said second and first probe radiation beams respectively are directed at said predetermined location, whereby said first input power magnitude represents radiation of said first optical wavelength emitted from said object when irradiated at said second optical wavelength, and said second input power magnitude represents radiation of said second optical wavelength emitted from said object whe irradiated at said first optical wavelength; and said means for combining signals combines said first and second input power magnitude signals to produce a ratio signal representative of the ratio of said second to said first input power magnitude and further combines said ratio signal with said first and second probe power signals to produce an output signal representative of said temperature.

4,818,103

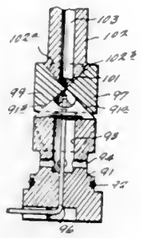
FLOW CYTOMETRY

Richard A. Thomas, Miami, Fla.; Jerry T. Thornthwaite, Johnson City, Tenn., and Ross W. Eggelston, Miami, Fla., assignors to Ratcom, Miami, Fla.

Continuation of Ser. No. 648,356, Sep. 7, 1984, Pat. No. 4,673,288, which is a continuation of Ser. No. 263,882, May 15, 1981. This application Jan. 20, 1987, Ser. No. 5,280

Int. Cl.[4] G01N *21/05, 27/08*

U.S. Cl. 356—72 **6 Claims**



1. A flow transducer comprising means defining an aperture having an axis, said aperture having at least one flat side, means defining an inlet chamber and an outlet chamber immediately adjacent the aperture along its axis, at least one of said inlet and outlet chamber having walls disposed at an angle of at least 5° relative to the plane of the aperture, said at least one of said inlet and outlet chambers at a distance from the aperture of twice the width of the aperture in a plane through its axis having a cross-section area at least 10 times the cross-sectional area of said aperture.

4,818,104

REMOTE ANGLE MEASUREMENT—ESPECIALLY MISSILE YAW MEASUREMENT

Richard L. Hartman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 5, 1987, Ser. No. 104,464

Int. Cl.[4] G01B *11/26*

U.S. Cl. 356—138 **12 Claims**



1. Apparatus for measuring the orientation of an elongated body within a first plane which extends through the longitudinal axis of said elongated body and the angle of deviation of the longitudinal axis of said body from a second plane which is transverse to said first plane, and which intersects said longitudinal axis comprising:

(a) a coded pattern disposed on said longitudinal body for indicating the angle at which the longitudinal axis of said body intersects said second plane; and

(b) cylindrical lens means disposed on said elongated body, one focal length away from said coded pattern for focusing on different portions of said coded pattern when observed to indicate the angle at which said longitudinal axis intersects said second plane.

4,818,105

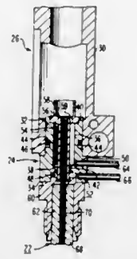
BURNER FOR FLAME PHOTOMETRIC DETECTOR

Andrew M. E. Warchol, Media, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 21, 1987, Ser. No. 99,435

Int. Cl.[4] G01N *21/72*

U.S. Cl. 356—315 **13 Claims**



1. A burner for a flame photometric detector comprising:

a housing having a passage therethrough, said housing having a wall adjacent one end across the passage and an opening through the wall to the passage which opening is smaller in diameter than the passage, and a recess at the other end of the housing which is larger in diameter than the passage

a burner within said passage in the housing, said burner including a cylindrical tube extending through the passage and fitting tightly in the opening in the wall, a radially outwardly extending flange fitting tightly in the recess at the other end of the housing, and a cylindrical flame holder projecting from the flange, and

at least one gas inlet tube extending through the wall of the housing into the passage;

said housing, burner, and inlet tube all being of stainless steel and the burner and inlet tube being brazed to the housing to form a tightly sealed integral unit.

4,818,106

SPECTRAL ANALYSIS DEVICE ON A CONVERTER

Karl-Heinz Koch; Fritz Meininghaus; Hermaan J. Kopineck, and Wilhelm Tappe, all of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Stahl Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

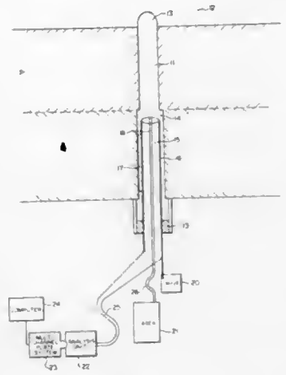
Filed May 5, 1987, Ser. No. 47,021

Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617869

Int. Cl.[4] G01J *3/443;* **G01N** *21/63*

U.S. Cl. 356—318 **12 Claims**

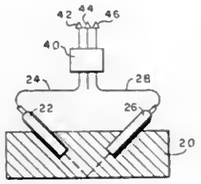
1. A spectral analysis device for use on a container filled with molten liquid metal, in particular iron or steel, having an opening extending from outside the container through a wall of the container up to the molten metal content and filled with inert gas, a unit for spectral analysis disposed on an outer wall surface of the container and optically connected to receive radiation emanating from said molten metal, a laser beam generating means for generating a laser beam said laser beam being radiantly directed through said opening into the container and onto the melt, whereon parts of the melt are vaporized and stimulated to emit an element-specific natural radiation, said generating means for the laser beam and said spectral analysis unit being each connected to the opening by an optical



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means for detecting incident light;
means for tilting one of coaxial beams with respect to the other to create an interference pattern between the coaxial beams; and
means for directing the light reflected from the aspheric surface onto the detector, whereby the interference pattern sensed by the detector gives an indication of the shape of the aspheric surface.

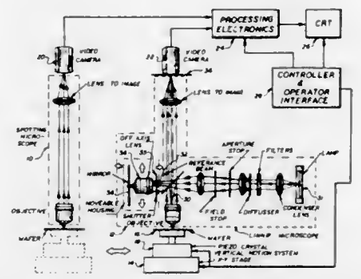
4,818,109
FIBER OPTICAL COMBINER PARTICULARLY FOR A RING LASER GYRO
Thomas J. Hutchings, Canoga Park, and George A. Pavlath, Thousand Oaks, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Continuation-in-part of Ser. No. 750,416, Jun. 28, 1985, abandoned. This application Oct. 7, 1986, Ser. No. 916,152
Int. Cl.⁴ G01C *19/64*
U.S. Cl. 356—350 **33 Claims**



1. In a ring laser, including means for transmitting rays of the counterpropagating laser beams out of said laser, the improvement comprising;
A body of light-transmissive rigid material attached to said laser to intercept said rays;
first and second light-focusing means each having an optically transmissive single mode fiber attached to one end thereof, each said light focusing means being configured to focus received rays onto the axis of its attached single mode fiber;
said body having passages therein, aligned relative to said rays, to receive said light focusing means and said rays, and positioned and directed to cause said rays to be delivered into the axes, respectively, of said single mode fibers;
a 3×3 single mode fiber optical coupler connected to receive said single mode fibers from said lenses and having a third single mode fiber therein, said single mode fibers being geometrically positioned within said coupler to deliver light to each other and to said third single mode fiber;
three light detectors connected to said three single mode fibers from said coupler, respectively, to produce electrical signals at a frequency which is equal to the difference in optical frequency between said counterpropagating laser signals.

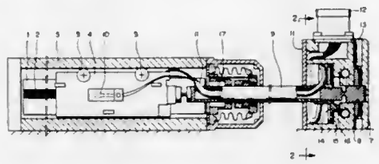
4,818,110
METHOD AND APPARATUS OF USING A TWO BEAM INTERFERENCE MICROSCOPE FOR INSPECTION OF INTEGRATED CIRCUITS AND THE LIKE
Mark Davidson, Palo Alto, Calif., assignor to KLA Instruments Corporation, Santa Clara, Calif.
Filed May 6, 1986, Ser. No. 860,308
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—358 **16 Claims**

16. A method of inspecting an object and generating synthetic image data comprising the steps of:
(a) using an interference optical system including an object channel and a reference channel for simultaneously inspecting an object and a reflective reference surface and developing a plurality of images formed by the interference between object wave energy passing from said object and through said object channel to an image plane and reference wave energy passing from said reference surface and through said reference channel to said image plane, each said image being formed in response to a change in position of either said object or said reference surface
(b) determining for each image the absolute value of the degree of coherence between said object wave energy and said reference wave energy by calculating the variance in



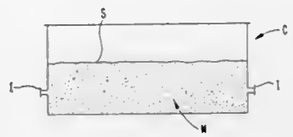
the intensity of each pixel over the said plurality of images and generating corresponding absolute value coherence data; and
(c) using said absolute value coherence data to generate synthetic image data representative of a particular characteristic of said object, wherein the brightness of each pixel element of a synthetic image developed using said synthetic image data is proportional to said absolute value coherence data.

4,818,111
POSITION MEASURING INSTRUMENT
Alfred Affa, Stein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany
Filed Jul. 16, 1987, Ser. No. 74,524
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1986, 3627079
Int. Cl.⁴ G01B *11/00*
U.S. Cl. 356—374 **10 Claims**



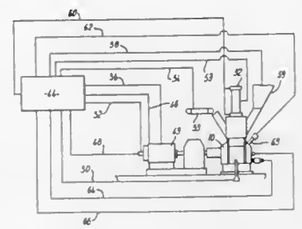
1. In a measuring instrument for measuring the relative position of two relatively movable objects, the instrument of the type comprising a housing attached to one of the objects; a measuring scale; and a scanning unit for scanning the measuring scale to produce at least one measuring signal, the improvement comprising:
a fastening member adapted to be fixedly attached to the other of the objects, the fastening member defining a chamber;
a connecting member defining a first end, a second end, and a passageway extending substantially the length of the connecting member, the first end connected to the scanning unit, the second end passing through the housing and connected to the fastening member such that the passageway is connected with the chamber; and
signal conduction means for conducting the measuring signal to a region external to the measuring instrument, the signal conduction means extending from the scanning unit through the passageway of the connecting member and into the chamber of the fastening member;
the signal conduction means and the fastening member cooperating to allow the signal conduction means to lie in a configuration such that the fastening member may be substantially rotated about the connecting member.

4,818,112
PROCESS FOR MIXING FOUNDRY MOLDING MATERIALS
Norbert Damm, Karlsdorf-Neuthard, and Thomas Parr, Karlsruhe, both of Fed. Rep. of Germany, assignors to BMD Badische Maschinenfabrik Durlach GmbH, Karlsruhe, Fed. Rep. of Germany
Filed Aug. 22, 1986, Ser. No. 899,398
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3537980
Int. Cl.⁴ B28C *5/00*
U.S. Cl. 366—2 **5 Claims**



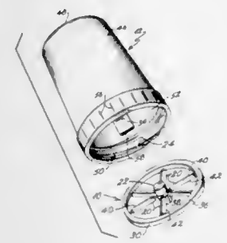
1. A process for mixing wet molding materials, used for foundry purposes, the process comprising premixing dry components of said molding materials in a container, adding moist components of said molding materials after said premixing, and then homogenizing said moist and dry components by further mixing, wherein said moist components are added under an overpressure to said premixed dry components below a surface level of said premixed dry components.

4,818,113
CONTROL FOR BATCH MIXERS
Sureshchandra R. Patel, Branford, Conn., assignor to Farrel Bridge Limited, Rochdale, United Kingdom
Filed Apr. 24, 1987, Ser. No. 42,152
Claims priority, application United Kingdom, Apr. 26, 1986, 8610287
Int. Cl.⁴ B28C *7/04;* **B01F** *15/00*
U.S. Cl. 366—76 **6 Claims**



1. A process for mixing a composition comprising polymeric material and additive materials in an internal mixer having two mixing rotors mounted for rotation in a mixing chamber, a ram mounted for sliding movement in a passage opening into the mixing chamber by which pressure can be applied to material in the mixing chamber, and means for controlling the temperature of the mixer, the process comprising:
(a) rotating the rotors at a preselected rate;
(b) introducing each of the polymeric and additive materials to be mixed into the mixing chamber at appropriate intervals after start of the mixing operation;
(c) applying a preselected pressure to the ram; and
(d) after all of the materials to be mixed have been added, initiating a control stage when the ram has reached a predetermined position of the ram in the passage, the control stage comprising:
(1) selecting defined ultimate targets from at least some monitorable mixing variables at which mixing is deemed satisfactory, said mixing variables being selected from composition temperature, total energy input to the composition by the rotors during mixing, mixing cycle time, torque of the rotors at a preselected mixing cycle time and position of the ram;
(2) monitoring said mixing variables from which the quality of mixing can be determined; and
(3) dependent on the value of the mixing variables monitored, adjusting at least one control variable of the mixing process selected from rotor speed and ram pressure so that the mixing process continues towards the previously defined ultimate targets of the monitored mixing variables at which mixing is deemed satisfactory.

4,818,114
SHAKER TOP FOR BABY BOTTLES
Melinda M. Ghavi, 10726 Randy La., Cupertino, Calif. 95014
Filed Jun. 12, 1987, Ser. No. 61,431
Int. Cl.⁴ A47J *43/27;* **A61J** *9/081*
U.S. Cl. 366—130 **15 Claims**

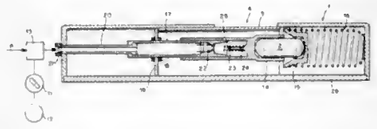


1. A drink shaker for attachment to a baby bottle comprising:
a mixing chamber, comprising an open end with internal screwthreads proportioned and dimensioned to permit the attachment of said mixing chamber to said baby bottle,
in combination with said mixing chamber, a mixing means for fragmenting and dispersing food particles into liquid, proportioned and dimensioned to fit within said mixing chamber with a plurality of uniformly spaced arms radiating from a center post; said arms are diamond-shaped creating shear points and straight sides between said shear points whereby the break-up of food is enhanced and the clumping of food in crevices avoided.

4,818,115
DEVICE TO MECHANICALLY BREAK APART A BARRIER

Peter J. T. Törnqvist, Barkassvägen 11, S-181 35 Lidingö , Sweden

PCT No. PCT/SE85/00381, § 371 Date May 29, 1986, § 102(e) Date May 29, 1986, PCT Pub. No. WO86/01995, PCT Pub. Date Apr. 10, 1986
PCT Filed Oct. 2, 1985, Ser. No. 876,872
Claims priority, application Sweden, Oct. 2, 1984, 8404931
Int. Cl.[4] B01F *11/00;* A61C *5/06*
U.S. Cl. 366—212 13 Claims



1. Apparatus for vibrating a device containing a barrier separating at least two mutually miscible ingredients for breaking the barrier and subsequently mixing said ingredients, comprising:

an enclosure having walls defining a space sized such as to accommodate said device, at least one of the walls defining said space being an outer wall of said enclosure;

an opening defined in said outer wall and being sized to admit said device therethrough, said space being in communication with the exterior of said enclosure through said opening;

a lid coupled to said enclosure for movement between a first position closing said opening and a second position uncovering said opening;

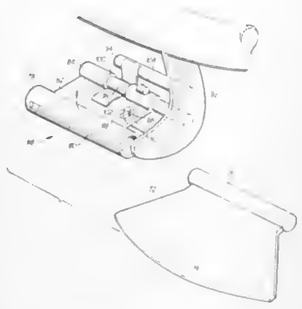
means for moving said lid between its first and second positions;

means for imparting to said device a sufficiently rapid vibratory motion within said space to break said barrier and mix said substances, and for actuating said vibratory motion upon said lid closing said opening.

4,818,116
FOOD PROCESS AGITATOR

Warren A. Pardo, Bel Air; Richard J. Pardo, and Valentino Gabriele, both of Baltimore, all of Md., assignors to J. C. Pardo and Sons, Inc., Baltimore, Md.

Division of Ser. No. 907,001, Sep. 15, 1986. This application Nov. 25, 1987, Ser. No. 125,576
Int. Cl.[4] B01F *7/02*
U.S. Cl. 366—311 8 Claims



1. In combination with an agitator mounted for rotation within a container within which materials are being mixed, apparatus mounted on the agitator for scraping walls of the container, comprising:

scraper means positioned in scraping relation with at least portions of the walls of the container for preventing adhesion of the materials to said walls;

mounting means carried by the agitator and carrying the scraper means for mounting the scraper means for pivotal motion relative to the agitator, the mounting means comprising a pivot rod and a base plate, the base plate being planar in conformation and being joined to the agitator and extending outwardly therefrom, the pivot rod being attached to the base plate and extending perpendicularly therefrom, the scraper means pivoting about the pivot rod; and,

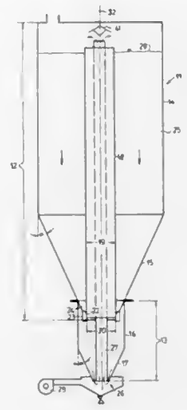
adjusting means carried by the agitator for constantly adjusting the position of the scraper means to accommodate surface contours of the walls and to accommodate surface wear of at least portions of the scraper means in order to maintain the scraper means in scraping relation with said walls on rotation of the agitator, the adjusting means comprising retainer means spaced from the mounting means and carried by the agitator for providing a surface against which a force can be directed, the retainer means comprising a spring retainer rod mounted to the base plate of the mounting means and extending perpendicularly therefrom and parallel to and spaced from the pivot rod, and a spring having first and second end portions and a medial portion, the medial portion of the spring being supported by the mounting means and the first and second end portions respectively biasing against the scraper means and the retainer means, the spring being a double curve flat spring with the medial portion thereof being arcuate and fitting about the pivot rod, the first end portion of the spring biasing against the scraper means and the second end portion of the spring being arcuate and fitting about and biasing against the spring retainer rod, the spring thereby exerting a bias on the scraper means to force the scraper means into scraping relation with the walls of the container and to hold the scraper means under tension.

4,818,117
APPARATUS FOR MIXING BULK MATERIALS IN DUST, POWDER OR COARSE GRAINED FORM

Wolfgang Krambrock, Vogt, Fed. Rep. of Germany, assignor to AVT Anlagen-und Verfahrenstechnik GmbH, Vogt, Fed. Rep. of Germany

Filed Mar. 5, 1987, Ser. No. 22,172
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607485
Int. Cl.[4] B01F *13/02*
U.S. Cl. 366—341 15 Claims

1. Device for blending dust, powder or coarse particle bulk materials, comprising a first upper blending device with a cylindrical blending container and a connecting upper discharge funnel tapering conically towards a second lower blending device with a cylindrical container and a connecting discharge hopper which tapers conically towards the bottom to form an upper and lower mass flow silo, a blending pipe concentrically installed in the upper blending device for mass flow, which extends approximately to the lower end of the upper connecting discharge funnel, whereby the blending pipe contains inlet openings throughout its whole length for bulk material; and wherein: the concentrically installed blending pipe is vertically subdivided into numerous gravity pipes arranged side by side, each of which contains several inlet openings arranged above one another, said blending pipe is constructed cylindrically in the lower end region; and means are provided for transporting the bulk material situated at the

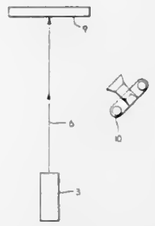


lower end of the lower blender device back to the upper material surface of the device via a conveying pipe.

4,818,118
COATING THICKNESS MEASUREMENT

Thomas E. Bantel, Cincinnati, Ohio; David F. Lahrman, Champaign, Ill., and John F. Halase, III, Fairfield, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 674,998, Nov. 26, 1984, Pat. No. 4,634,291. This application Nov. 20, 1986, Ser. No. 932,830
The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.
Int. Cl.[4] G01N *25/00, 21/71*
U.S. Cl. 374—7 6 Claims



1. A method of ascertaining the equivalent thermal barrier thickness of a coating comprising the steps of:

using a laser beam, heating a first area on the coating having an unknown thermal barrier equivalent thickness;

measuring the relative temperature distribution over a second area on the coating;

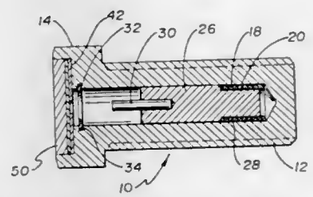
comparing the measured temperature distribution with a collection of reference temperature distributions each representing a reference equivalent thermal barrier thickness; and

selecting from the reference collection a reference temperature distribution representing the equivalent thermal barrier thickness of the coating.

4,818,119
HOT BEARING WARNING BOLT

Theodore Busch, Minneapolis, Minn., and Clark E. Johnson, Jr., Denver, Colo., assignors to Rastech, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 865,209, May 19, 1986, abandoned. This application Aug. 3, 1987, Ser. No. 80,979
Int. Cl.[4] G01K *1/14, 11/06*
U.S. Cl. 374—208 25 Claims



1. A high temperature warning device adapted to replace a standard structural bolt used to hold a bearing cover plate of a bearing journal box of a roller bearing mounted on an axle by threading into a threaded bore of the journal box to perform the dual purpose of holding said cover to said journal box and providing a high temperature warning, said device comprising:

(a) a body having a threaded shaft whose threads matingly engage with said threaded bore normally holding said standard structural bolt of said bearing journal, and a bolt head having wrench gripping faces and having wrench gripping faces and constructed and arranged such that said device may be threaded into a threaded bore of a bearing journal box;

(b) said body including an axially extending bore having an opening through said head, said bore leaving the majority of the body intact;

(c) heat detecting means positioned with said bore of said body, said heat detecting means constructed and arranged such that upon being heated to a preselected temperature a force is exerted outwardly from said bore toward said opening in said head;

(d) closure plug means for normally sealing the bore of said device without covering the wrench gripping faces of the bolt head so as to enclose and protect said heat detecting means therewithin, said closure plug means being constructed and arranged such that force from said heat detecting means will cause said closure plug means to be expelled from the device thereby exposing a signal means; and

(e) said signal means producing a signal when said closure plug means is expelled.

4,818,120
OPENABLE AND RECLOSABLE TAMPER EVIDENT BAG TAG

Joseph Addiego, Pinebrook, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jul. 20, 1987, Ser. No. 75,516
Int. Cl.[4] B65D *33/14*
U.S. Cl. 383—5 18 Claims

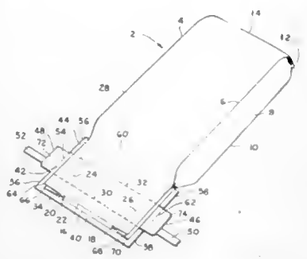
1. An openable and recloseable tamper evident transparent plastic bag container, comprising:

(a) a disposable flexible transparent plastic bag having a front and back wall, a sealed bottom edge, two side gussets and an unsealed opened end;

(b) a thin, flat support member attached to said back wall, said support member having at least one score line disposed thereon, said score line oriented substantially perpendicular to said opened end of said bag, said score line dividing said support member into a plurality of sections, whereby when said sections of said score line a dead fold is effected and said opened of said bag is substantially hermetically sealed

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(c) end tabs having adhesive surfaces extending outwardly from the edges of one of said sections of said support member on opposite lateral sides of said support member and being frangibly connected thereto, wherein said end tabs are adapted to be folded along the frangible connections with the adhesive surfaces fixedly securing said end tabs to the folded over section of said support member



whereby, when said folded over sections of said support member are unfolded, the frangible connections of said end tabs will be broken;

(d) a tin-tie oriented perpendicular to said open end of said bag and affixed to said support member, said tin-tie having opposite ends for releasibly securing together said sections of said support member after said sections have been folded over and onto each other.

4,818,121

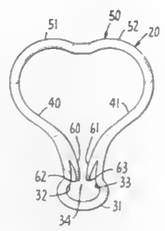
CARRYING HANDLE

Henry J. Volk, 3512 Hawkeye, Turlock, Calif. 95380

Continuation-in-part of Ser. No. 76,799, Jul. 23, 1987, Pat. No. 4,772,133. This application Apr. 11, 1988, Ser. No. 180,283

Int. Cl.⁴ B65D *33/06*

U.S. Cl. 383—6 **3 Claims**



1. A carrying handle for use in conjunction with food items which have been wrapped and wherein said wrapping is secured at one end with a retaining clip, comprising:

clamping means adapted to be placed into position around said wrapping at a point between said retaining clip and said food item,

finger-hold means connected to said clamping means whereby the user inserts one or more fingers into said finger-hold means to carry said food item,

a pair of flexible arm means located between said clamping means and said finger-hold means whereby said carrying handle will either lie against said food item or may be pulled away from said food item as said food item is carried, and

at least one finger means carried by said flexible arm means, said finger means being adapted to move to a first position to facilitate insertion of said handle onto said wrapping, and to move to a second position to prevent said handle from inadvertently falling off the wrapping of said food item.

4,818,122

ACCESSORY DEVICE FOR SAFETY BREATHING EQUIPMENT

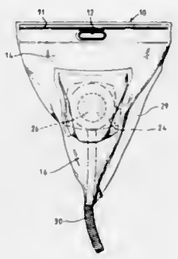
Robin D. Arbuthnot, Cockles Farm, Morley St. Botolph, Wymondham, Norfolk NR 18 9TW, England

Filed Aug. 17, 1987, Ser. No. 86,693

Claims priority, application United Kingdom, Aug. 16, 1986, 8620003

Int. Cl.⁴ B65D *33/02, 33/08*

U.S. Cl. 383—10 **6 Claims**



1. An accessory device for safety breathing equipment, comprising a bag of flexible impervious material, narrowing from a wide closed top to a relatively narrow bottom end, said bag having means at the top by which it can be carried, a voluminous region below the top for accommodating the air filter unit of a respirator, a region of reducing width below said voluminous region for accommodating the hose or hoses leading towards the face mask of the respirator, and a means of closure extending from the bottom end to a point at or adjacent the closed top and which, when the bag is in use, closes the bag tightly around the hose or hoses extending out of its bottom end and loosely encloses the filter unit in the voluminous region, the arrangement also providing for air access to the interior of the bag for enabling continued operation of the filter unit when required.

4,818,123

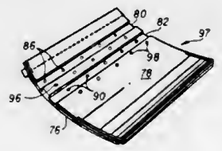
FOIL JOURNAL BEARING COOLING

Alston L. Gu, Rancho Palos Verdes, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 889,652, Jul. 26, 1986, Pat. No. 4,701,060. This application Aug. 10, 1987, Ser. No. 84,272

Int. Cl.⁴ F16C *32/06*

U.S. Cl. 384—106 **51 Claims**



1. A fluid film journal bearing comprising:

a pair of members arranged for relative rotation with respect to one another; and

a compliant foil bearing operably disposed between said pair of relatively rotatable members, said compliant foiled bearing including a plurality of overlapping individual foils mounted on one of said pair of members and having a coating of high lubricity material disposed toward the other of said pair of members, said coating having at least one axially extending slot, the coating thickness being at least one fiftieth of the foil thickness.

4,818,124

PIVOT MOUNTED ROLLER

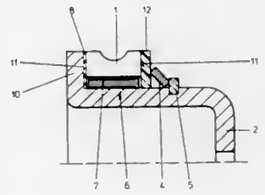
Manfred Brandenstein, Eussenheim; Horst M. Ernst, Eltingshausen; Roland Haas, Hofheim; Günter Neder, Schweinfurt, and Josef Stork, Gerolzhofen, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,632

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709343

Int. Cl.⁴ F16C *23/04*

U.S. Cl. 384—208 **5 Claims**



1. In a pivot mounted roller assembly comprising a support, a bearing having a non-rotating bearing ring, and a radially acting spring between the non-rotating bearing ring and the support, the improvement comprising first and second machine parts on said support, and means for axially prestressing the bearing ring between radially extending surfaces of said first and second machine parts, at least one surface at the abutment of said ends of the bearing ring and the radially extending surfaces comprising a friction contact surface.

4,818,125

ELECTRONIC TYPEWRITER WITH WORD CORRECTION FUNCTION INCLUDING PITCH CHANGING MEANS

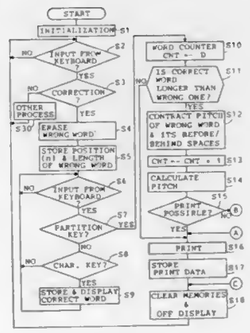
Toshiyuki Sakai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 10, 1987, Ser. No. 119,335

Claims priority, application Japan, Nov. 13, 1986, 61-270579

Int. Cl.⁴ B41J *5/00, 31/09*

U.S. Cl. 400—63 **3 Claims**



1. An electronic typewriter with an ability of correcting a printed word, comprising:

input means for inputting characters and commands;

print means for printing a character;

erasion means responsive to a correction command for erasing a word printed by the print means;

print data memory for storing printed characters;

correction data memory for storing a character string inputted in place of the word erased by the erasion means;

determination means for determining whether the character string plus one space from each side of the character string is admissible in a space of the erased word plus one space from each side of the erased word when a printing pitch of the character string is reduced under the condition that characters in the character string do not overlap one another;

selection means for selecting a least number of neighboring words to be erased when the determination means determines that the character string plus one space from each side of the character string is not admissible in the space of the erased word plus one space from each side of the erased word, the least number being a necessary number of neighboring words to be erased for admitting the character string and the erased neighboring words with a reduced printing pitch in the space of the erased word and the erased neighboring words, under a condition that characters in the character string and the erased neighboring words do not overlap one another; and

correction control means for driving the erasion means to erase the word or words selected by the selection means and for driving the print means to print the character string and the selected word or words with the reduced printing pitch in the space of the erased word and the erased neighboring word or erased neighboring words.

4,818,126

METHOD AND APPARATUS FOR THERMALLY PRINTING DATA IN SPECIAL FONTS ON DOCUMENTS LIKE CHECKS

Ralf M. Brooks, Waterloo; Alan R. Queich, Cambridge, and Philip J. Wilkinson, Nepean, all of Canada, assignors to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Dec. 14, 1983, Ser. No. 561,449

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 400—120 **8 Claims**

1. A thermal printing apparatus comprising:

a print station;

means for positioning a record medium at said print station;

means for printing on a said record medium positioned at said print station;

said means for printing comprising:

an arcuately-shaped platen;

a line of printing elements;

means for selectively energizing said printing elements in said line of printing elements;

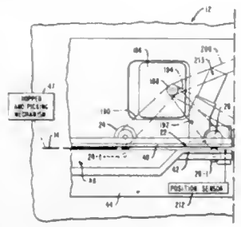
first means for mounting said platen for reciprocal movement between printing and non-printing positions with regard to said print station;

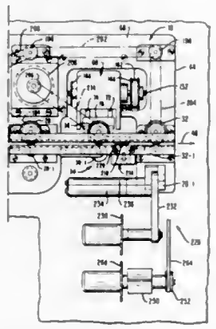
second means for mounting said line of printing elements for pivotal movement about an axis between first and second positions with regard to said print station; and

actuating means conpled to said first and second mounting means to move said platen linearly from said non-printing position to said printing position, and thereafter to pivotally move said line of printing elements through an arc from said first position to said second position so as to maintain said line of printing elements in substantial tangential relationship with said platen during movement of

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said line of printing elements from said first position to said second position;





said arcuately-shaped platen having a radius of curvature whose center lies at said axis when said platen is moved to said printing position by said actuating means.

4,818,127

INCLINED WRITING BY MEANS OF MATRIX PRINTER

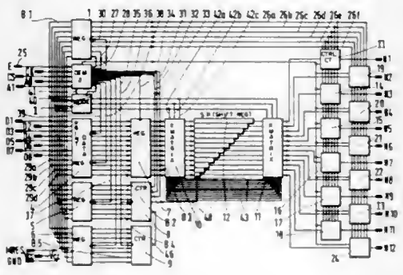
Alfred Babech, Ulm-Soerflingen; Manfred Gruener, Ulm, and Jutta Stein, Illertissen, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 889,415

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526369

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—121 **2 Claims**



1. Digital micro-processor for generating obliquely oriented character printing (cursive writing) under utilization of matrix print principles, the printer including a plurality of print elements arranged in one or more columns, as well as a character generator and circuit means for controlling the print elements depending upon information stored in the character generator, the micro-processor including and comprising the following combination of elements;

a plurality of shift registers for operating in parallel, including a register for a longest delay and a register for a shortest delay, and registers for delays inbetween, in an ordered sequence;

data register means for receiving print characters and representations thereof;

first circuit means for selecting column organized print information from the data register means to be shifted through said shift registers in a first orientation such that a high point in a column receives the longest, and a low point, the shortest delay, and for inverting said order in response to a reversal in direction of printing;

a plurality of print element control circuits;

data bit distributing circuit for selectively feeding the data bit having been shifted through the shift registers in the initial or the inverted order to the control circuits;

circuit means bypassing the shift registers for directly feeding the data from the data register to the print element control circuits; a general delay register connected for receiving and holding a delay representing number;

and a countdown device connected to said general delay register for down counting the number of said delay register to thereby introduce a particular overall delay of printing, the number differs for different directions such that vertical alignment of printed characters obtains.

4,818,128

IMPACT PRINTER CAPABLE OF BEING EQUIPPED WITH AN AUTO SHEET FEEDER

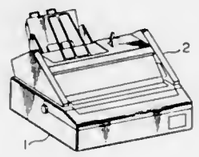
Kyoichi Yokoo, and Takehiko Nanbu, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshiba Computer, Engineering Corporation, Oume, both of, Japan

Filed May 23, 1986, Ser. No. 866,316

Claims priority, application Japan, May 31, 1985, 60-117826; Jul. 31, 1985, 60-169122

Int. Cl.[4] B41J *9/38*

U.S. Cl. 400—166 **3 Claims**



1. An impact printer which can be equipped with an auto sheet feeder, comprising:

printing means;

means for driving said printing means;

means for detecting whether or not said auto sheet feeder is equipped; and

controlling means for controlling said driving means so that printing strength of said printing means is reduced in accordance with an output signal of said detecting means below the printing strength for plural sheets of paper on the basis of an output signal of said detecting means, when said impact printer is equipped with said auto sheet feeder,

said controlling means comprising a first pulse generating means for generating a first pulse in response to a print signal which drives said printing means;

a second pulse generating means for generating a second pulse in response to said print signal, the pulse width of said second pulse being shorter than said first pulse; and

selecting means for selecting either of said first pulse and said second pulse on the basis of the result of said detecting means, whereby said driving means drives said printing means according to the pulse selected by said selecting means,

said first and second pulse generating means having monostable multivibrators, and said driving means having a driving transistor, the pulse selected by said selecting means being applied to the base of said driving transistor.

4,818,129

METHOD FOR CORRECTING BIDIRECTIONAL PRINTING ALIGNMENT OF A SERIAL DOT PRINTER

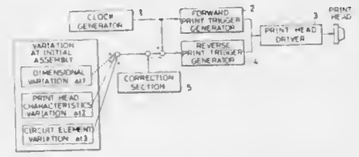
Jiro Tanuma; Kuniharu Hayashi; Shinichi Katakura, and Hiroshi Sakaino, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1987, Ser. No. 103,824

Claims priority, application Japan, Oct. 9, 1986, 61-239218

Int. Cl.[4] B41J *19/30*

U.S. Cl. 400—323 **4 Claims**



1. A method for operating a serial dot matrix printer having a print head that is reciprocated along a first direction and stopped for performing bi-directional printing on a medium that is moved in a second direction orthogonal to said first direction, said method comprising the steps of:

storing in a memory device a set of correction amounts for correcting bi-directional printing alignment;

reading and successively printing said correction amounts;

manipulating a key, when a desired correction amount is printed, to input a command signal for registering said desired correction amount in a battery-backed-up memory; and

performing said bi-directional printing using said desired correction amount registered in said battery-backed-up memory.

4,818,130

CHARACTER ERASABLE PRINTING APPARATUS INCLUDING SELECTIVE ERASING OF VARIABLE LENGTH UNDERLINE

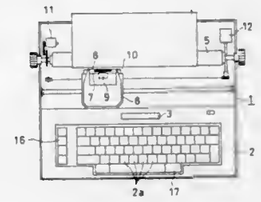
Yuichi Harada, Nagoya, and Hajime Kumazawa, Ichinomiya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 17, 1987, Ser. No. 121,880

Claims priority, application Japan, Nov. 19, 1986, 61-276252; Jan. 20, 1987, 62-11091; Apr. 17, 1987, 62-95696

Int. Cl.[4] B41J *29/36*

U.S. Cl. 400—697 **15 Claims**



1. A character erasable printing apparatus comprising:

input means for inputting data regarding characters and symbols and commands;

printing means having a printing head movable in a predetermined printing direction for printing a character or symbol corresponding to an input data on a printing medium;

automatic underline mode setting means for setting an automatic underline mode in said printing means;

print data memory means for storing code data and underline data of the characters, symbols and underline printed by said printing means corresponding to their printing positions;

reading means for reading out the code data of the characters and symbols and underline data stored in said print data memory means;

erasing means for erasing a character or symbol from said printing medium, by operation of said printing means according to the code data being read out by said reading means, when an erasure command is inputted from said input means; and

erasure control means for controlling said reading means to read out only the code data of the printed character or symbol corresponding to the present printing position of said printing head from said print data memory means, when said erasure command is received in the automatic underline mode, and for controlling said erasing means to erase the printed character or symbol corresponding to the read-out code data in such a manner that the printed underline remains unerased.

4,818,131

TYPEWRITER HAVING MEANS FOR AUTOMATIC INDICATION OF CANDIDATE CORRECT WORD FOR MISSPELLED WORD, AND/OR AUTOMATIC CORRECTION OF MISSPELLED WORD

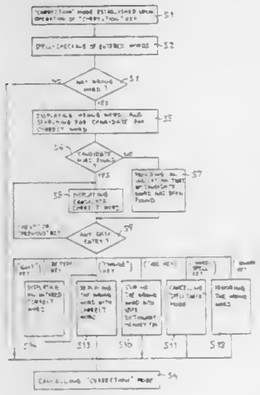
Toshiyuki Sakai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 29, 1986, Ser. No. 947,828

Claims priority, application Japan, Dec. 29, 1985, 60-298528; Dec. 29, 1985, 60-298529

Int. Cl.[4] B41J *3/46, 3/50*

U.S. Cl. 400—63 **19 Claims**



1. A typewriter having a function of automatically indicating a candidate correct word for a mispelled word, comprising:

a keyboard having a multiplicity of keys;

an input data memory for storing input data constituting words entered through said keyboard;

a printing mechanism operable for printing characters corresponding to said input data entered through said keyboard;

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a display device operable for displaying said characters in only one line; and

a control device connected to said keyboard, said input data memory, said printing mechanism and said display device, for controlling said input data memory, said printing mechanism and said display device, to store, print and display said input data entered through said keyboard;

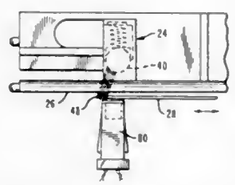
said control device including a dictionary memory for storing data of a multiplicity of words, and spell-checking and correct-word indicating means for sequentially comparing each of the words of said input data with said multiplicity of words stored in said dictionary memory, to check said input data for any misspelled wrong words, and if a wrong word is found in said input data, searching for at least one candidate correct word to be substituted for said found wrong word, from among said words stored in said dictionary memory, displaying said wrong word, and upon locating said candidate correct word displaying said candidate correct word in relation to said found wrong word on said display device, without operator intervention upon location of a candidate correct word.

4,818,132

OPTICAL SENSOR PROTECTIVE MEMBER

Robert A. Brull, Dryden; Robert F. Bullivant, Interlaken; James R. Del Signore, II, Trumansburg, and Alan H. Walker, Barton, all of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 12, 1988, Ser. No. 155,329
Int. Cl.⁴ G01N *21/86*
U.S. Cl. 400—708 **18 Claims**



1. A protective member for use with a record member guide operably associated with optical sensing means for sensing presence of a record member, said protective member comprising a

housing secured to the record member guide in position opposed to a surface of said optical sensing means, and

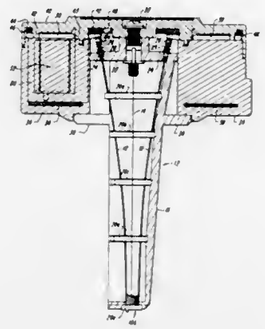
sweep means supported in said housing and normally disposed in contact with said surface of said sensing means, said sensing means providing for optically sensing a record member upon insertion thereof along said record member guide, said sweep means substantially covering the surface of said optical sensing means to inhibit ambient light from said surface in the absence of a record member, and said sweep means moving across said surface when a record member is moved along said guide to engage said sweep means and thereby move said sweep means from contact with the surface of said optical sensing means to permit optically sensing of the presence of said record member.

4,818,133

HIGH SPEED WIRE MATRIX PRINT HEAD

Richard A. Williams, 5 Marilyn Park, Hampstead, N.H. 03841, and James T. Busse, 19 Cleveland Hill Rd., Brookline, N.H. 03033

Filed May 16, 1986, Ser. No. 863,715
Int. Cl.⁴ B41J *3/12*
U.S. Cl. 400—124 **2 Claims**



1. A high speed wire matrix print head comprising:

a plurality of print wires each having a printing end and an actuating end and being axially movable between a print position and a standby position;

guide means for supporting said print wires with a desired arrangement of the printing ends and for axial movement between the print position and the standby position;

means for biasing said print wires to the standby position;

electromagnetic actuating means for individually actuating selected print wires from the standby position to the print position. said actuating means including an armature and an electromagnet associated with each of said print wires, each electromagnet comprising a generally E-shaped magnetic pole piece having a base and three aligned parallel arms of substantially the same length extending from the base, and an energizing coil on the center of the three arms; and

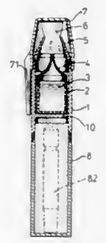
means for mounting said actuating means about an axis of said print head such that each armature extends radially outward from the actuating end of its associated print wire and each electromagnet is positioned to cause pivoting axial movement of its associated armature, each pole piece being positioned with said arms parallel to the axis of the print head and radially aligned with its associated armature, so that the two inner arms of said E-shaped pole piece urge said armature toward the print position and the innermost arm exerts a force on said armature near the actuating end of the print wire in order to provide high speed actuation of said print wire, each of said pole pieces comprising a plurality of magnetic laminations to reduce eddy current losses and enhance the speed of operation of said print head, said laminations having different sizes in order to shape said pole piece such that said energizing coil is generally sector-shaped when disposed on the center arm of said pole piece and efficiently fits the sector-shaped space available in said print head.

4,818,134

CLEANING PEN FOR CLEANING SPECTACLE LENSES

Allan Tsai, 2nd Fl., No. 1, Lane 222, Tun Hua N. Rd., Taipei, Taiwan

Continuation-in-part of Ser. No. 17,847, Feb. 24, 1987, abandoned. This application Jun. 16, 1987, Ser. No. 62,839
Int. Cl.⁴ G02C *13/00*
U.S. Cl. 401—195 **1 Claim**



1. A pen-like eyeglass cleaner comprising:

a tubular pen body having first and second end portions and an interior partition between said first and second end portions for forming first and second chambers within said pen body;

a detergent container placed within said first chamber, said container including a cover having an outer end surface which has an eyelet opening and an openended slot communicated from the interior of the container with said eyelet opening;

a detergent contained in said detergent container;

a wiping tip of absorbent material having opposite ends;

a tubular cover telescopically received on said first end portion of said tubular pen body, said cover having a rectangular end opening, said cover holding said wiping tip in such a manner that one end of said wiping tip contacts said outer end surface of said detergent container and communicates with said eyelet opening and the other end of said wiping tip extends through said rectangular opening in said cover;

a cap, sized to fit sealingly on said first end portion over said cover and having a clip secured thereto;

a roll of cleaning cloth:

a cloth container having an open end portion inserted tightly into said second end portion of said pen body for defining therebetween a sealed chamber in which said roll of cleaning cloth is contained;

a screwdriver; and

a screwdriver container, rolled within said roll of cleaning cloth, receiving said screwdriver therein, including a screwdriver socket formed at an end thereof so that said screwdriver may be secured in said screwdriver socket for use.

4,818,135

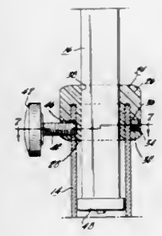
LOCKING COLLAR FOR TELESCOPING CYLINDRICAL TUBES

Wallace H. Desjardins, 352 Lake Blvd., Lindenwold, N.J. 08021

Continuation of Ser. No. 445,673, Nov. 30, 1982, abandoned. This application Feb. 6, 1985, Ser. No. 699,219
Int. Cl.⁴ E04G *25/02*
U.S. Cl. 403—104 **11 Claims**

1. A locking device for selectively locking an adjustable inner cylindrical member in a desired position within a cylindrical tubular outer member, said device comprising a one-piece molded resilient plastic collar disposed at one end of said outer member, said collar including a resilient uninterrupted cylindrical flange disposed in close-fitting relation between said outer tube and said inner member, and screw means extending through said outer tube and selectively actuatable to bear directly against and effect a substantial circumferential resilient displacement of said resilient flange and a consequent





frictional engagement of said flange with said inner member to lock said inner member in a selected position.

4,818,136

HYDRAULIC VEHICLE BARRICADE AND METHOD

Ralph G. Nasatka, 8405 Dangerfield Pl., Clinton, Md. 20735, and Michael Lippy, 12032 Forbes Glen Dr., Herndon, Va. 22070

Filed Apr. 29, 1987, Ser. No. 43,977
Int. Cl.⁴ E01F *13/00*
U.S. Cl. 404—6 **22 Claims**

1. Hydraulic barricade, comprising:

(a) support means;

(b) barricade means pivotally associated with said support means;

(c) at least a first hydraulic cylinder and piston assembly operably connected with said barricade means for pivoting said barricade means between an up and a down position;

(d) pump means as a primary source for supplying pressurized hydraulic fluid and for supplying pressurized hydraulic fluid to a secondary source;

(e) directional control valve means interposed between and in fluid communication with said cylinder and piston assembly and said sources for causing operation of said cylinder and piston assembly and thereby pivoting of said barricade means;

(f) first check valve means interposed between and in fluid communication with said sources for permitting pressurized fluid to flow from said pump means and said cylinder and piston assembly to said secondary source and for

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preventing fluid from flowing from said secondary source to said primary source;

(g) said secondary source including an hydraulic accumulator for storing hydraulic fluid under pressure; and

(h) emergency valve means interposed between and in fluid communication with said secondary source and said directional control valve means for supplying fluid from said accumulator to said directional control valve means and said emergency valve means including a manual/remote operator for permitting selective operation thereof.

17. The method of operating a pivotal barricade disposed across a roadway by means of an hydraulic system having a pump providing a primary source of motive power and an accumulator providing a secondary passive source of motive power and a directional control valve having a remote operator and a manual operator override thereof interposed between



each of said sources and a cylinder and piston assembly which pivots the barricade and an emergency valve having a remote operator and a manual operator override thereof is interposed between the accumulator and the directional control valve and wherein fluid may flow from the primary source to the secondary source but not from the secondary source to the primary source, the method comprising the step of:

(a) causing pivoting of the barricade by any one of operating the directional control valve remote operator while the pump is operating and thereby causing selected pivoting of the barricade, operating the directional control valve and emergency valve remote operators in an emergency condition and thereby causing immediate pivoting of the barricade, and operating the directional control valve and emergency valve manual override operators while the pump is not operating and thereby deriving motive power from the accumulator.

4,818,137

TERRORIST VEHICLE ARRESTING SYSTEM

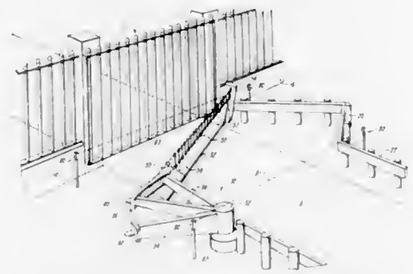
Alexander M. Gorlov, Chestnut Hill, Mass., assignor to Flexible Barricades, Inc., Watertown, Mass.

Filed Dec. 4, 1987, Ser. No. 128,725
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **17 Claims**

1. A terrorist vehicle arresting system for precluding the onward travel of an encroaching vehicle through a gateway down a driveway comprising:

a turnstile having a sector and positioned to one side of said driveway, said sector being of a size which when said turnstile is rotated occludes at least a portion of said driveway adjacent said gateway;

an immovable crash barrier positioned at the other side of said driveway adjacent said gateway; and



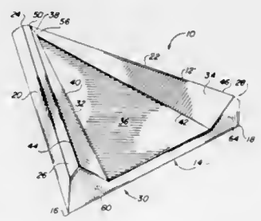
means for rotating said turnstile sector into said driveway upon approach of an encroaching vehicle, thereby to deflect said vehicle into said crash barrier.

4,818,138

HIGHWAY MARKER

Donald M. Brown, Professional Tower, Suite 800, Odessa, Tex. 79761

Filed Dec. 22, 1987, Ser. No. 136,357
Int. Cl.[4] E01F *9/00*
U.S. Cl. 404—14 **15 Claims**



1. A highway marker for attachment to a roadbed to signal the location of a lane extending longitudinally of the roadbed and to signal the proper direction of movement in a traffic lane while defining the boundaries of the traffic lane;

said marker has a bottom surface for attachment to a roadbed, and surfaces forming a base and adjacent sides that are perpendicularly arranged respective to the bottom surface and describe the boundaries of a triangle;

a triangular floor in the form of a triangle which is smaller than the first recited triangle and has an edge forming a base that is coincident with the perpendicular base, and edges spaced inwardly from the perpendicular sides; with there being a peaked boundary formed between the perpendicular adjacent sides and the edges of the floor; said triangular floor and the triangular bottom surface each having an apex;

means forming a reflective surface on said perpendicular adjacent sides which jointly form an arrow indicating a direction of travel;

means forming a reflective surface on said floor indicating a direction of travel separate from the arrow.

4,818,139

METHODS AND APPARATUS FOR MAKING AN ASPHALT-AGGREGATE PAVEMENT

James D. Brock, Chattanooga, Tenn.; Donald W. Smith, Aurora, Ill., and John P. Renneck, Chattanooga, Tenn., assignors to Barber-Greene Company, KeKalb, Ill.

Filed Aug. 25, 1987, Ser. No. 89,318
Int. Cl.[4] E01C *19/00*
U.S. Cl. 404—81 **20 Claims**



1. The method of laying an asphalt-aggregate pavement mat comprising the steps of:

(a) operating a finishing machine of the type having a screed for forming an asphalt-aggregate pavement mat;

(b) operating a plurality of delivery trucks to transport the asphalt-aggregate material in a sequential manner from an asphalt plant to the job site;

(c) providing a self-propelled mobile apparatus which includes:

(i) hopper means,

(ii) first conveyor means for receiving the asphalt-aggregate material from a delivery truck and for advancing the material to the hopper means, and

(iii) second conveyor means for transporting the asphalt-aggregate material laterally from the hopper means to the finishing machine;

(d) operating the self-propelled mobile apparatus for transferring the asphalt-aggregate material from the delivery trucks one at a time to the hopper means; and

(e) operating the self-propelled mobile apparatus for transferring material from such apparatus to the finishing machine while the former is positioned to one side of the latter.

7. A self-propelled mobile apparatus for supplying asphalt-aggregate material from a delivery truck to a finishing machine comprising:

(a) chassis means including ground engaging mobile support means and steering means for at least a part of the support means;

(b) motive power means carried by chassis means and connected to at least a part of said support means;

(c) hopper means mounted on said chassis means;

(d) first conveyor means mounted on said chassis means and having a receiving portion adapted to receive the asphalt-aggregate material as it is discharged from the delivery truck, said first conveyor means having a receiving end with a width at least as great as the width of the bed of the delivery truck for rapidly receiving the contents of the latter, said first conveyor means also having a delivery portion for discharging the asphalt-aggregate material into said hopper means;

(e) second conveyor means mounted on said chassis means for transporting the asphalt-aggregate material to the finishing machine; and

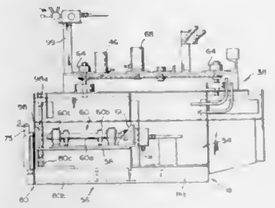
(f) transversely disposed third conveyor means mounted in the lower portion of said hopper means for delivering the asphalt-aggregate material to said second conveyor means.

4,818,140

SCREED EXTENDER WITH BERM-FORMING SCREED

James O. Carlson, 1022 Arleo La., Tacoma, Wash. 98466

Filed Jan. 22, 1988, Ser. No. 146,849
Int. Cl.[4] E01C *19/22*
U.S. Cl. 404—118 **11 Claims**



1. A screed extension unit comprising:

a slide rail unit adapted to be mounted on a paving machine with a primary screed and having an inner end and an outer end;

a slide body unit slidably mounted on the slide rail unit for selectively extending outwardly beyond the outer end of the slide rail unit and beyond one end of said primary screed;

an extension screed having an inner screed section mounted at the bottom of said slide body unit and having an outer screed section pivotally mounted at the outer end of the inner screed section for vertical swinging movement in an arc between a lower position aligned with said inner screed section and a raised position sloping upwardly away from said inner screed section, said screed sections each having a respective bottom screed face therealong, with the inner end of the bottom screed face of the outer screed section being substantially in contact with the outer end of the bottom screed face of the inner screed section in all positions of said outer screed section in said arc; and

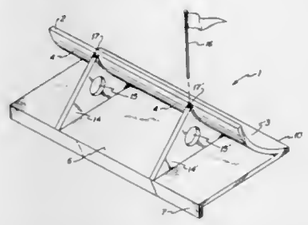
slope adjusting means extending between said outer screed section and said slide body unit for selectively swinging said outer screed section in said arc.

4,818,141

PREFABRICATED EROSION PREVENTION WALL

Hans G. Ranch, 426 Wayman Cir., West Palm Beach, Fla. 33406

Continuation-in-part of Ser. No. 685,747, Dec. 24, 1984, abandoned, which is a continuation of Ser. No. 672,701, Nov. 19, 1984, abandoned. This application Jun. 12, 1986, Ser. No. 873,867
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—30 **9 Claims**



1. A prefabricated erosion prevention barrier, said barrier placed on the seabed beneath surf waters and used to prevent beach erosion, comprising:

a generally horizontal platform, said platform securing said barrier upon said seabed,

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a generally crescent shaped, concave front surface, said front surface having a seabed bottom edge secured to said platform and an upwardly rising top edge, said front surface facing incoming waves when said barrier is placed upon said seabed, said crescent shape having an increasing slope with respect to said horizontal platform when traversing said front surface from said bottom edge to said top edge, and

a plurality of support struts, said struts interposed said concave front surface and said horizontal platform, said struts being generally perpendicular to said surface and platform,

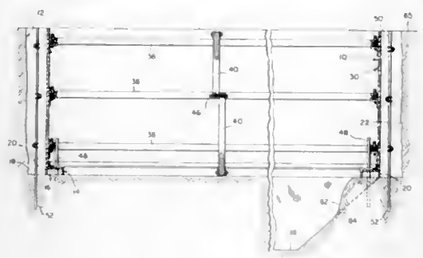
wherein an artificial barrier reef is provided which minimizes turbulence both before and after said reef, allows an optimum percentage of wave energy transmission and deflection, and prevents beach erosion without detrimental effects upon natural marine conditions and habitat.

4,818,142

METHOD AND APPARATUS FOR CONSTRUCTING A WALLED POOL EXCAVATION

James C. Cochran, Rte. 1, Box 30, Newton, Ala. 36352

Filed Nov. 13, 1987, Ser. No. 120,379
Int. Cl.[4] E04H *3/18*; B65G *5/00*; E04B *1/16*
U.S. Cl. 405—55 **13 Claims**



1. The method of constructing a walled excavation for receiving a vinyl pool liner therein, said method comprising determining the inner and outer boundaries of a pool wall to be formed, leveling and compacting the ground about said boundaries and outwardly from said outer boundary a predetermined minimum distance, excavating the ground within and to said outer boundary, installing and leveling a temporary excavation bottom periphery footer about the periphery of the bottom of said excavation and with said footer including an outer margin at least generally coinciding with the inner boundary of said pool walls, erecting a reinforcing rod skeletal frame about said excavation between said inner and outer boundaries, erecting inner form walls upon and about the outer margin of said footer with cross-bracing extending and removably secured between at least one pair of opposite form walls, pouring hardenable fluent material into said excavation between said inner form walls and the walls of said excavation, allowing said poured material to at least partially harden and thereafter removing said form walls and footer.

11. In combination with a ground excavation including vertical walls extending thereabout and projecting above substantially equal depth bottom portions of the excavation spaced slightly inward of the walls thereof, a combined footing and inner form wall assembly including elongated footing sections disposed in substantially end abutted relation and secured together to form an effectively continuous footing extending about the bottom of said excavation spaced slightly inward of the walls thereof and with the footing including an outer periphery, a plurality of form wall panels removably erected upon and about said outer periphery to form a peripherally continuous inner form wall upon said outer periphery, a plurality of cross-bracing members removably secured between and relatively bracing at least one pair of opposite form wall panels, a plurality of vertically spaced and effectively peripherally continuous bracing members secured about said form wall assembly inwardly of the latter, and an upstanding effectively peripherally continuous reinforcing rod frame erected between said form wall assembly and the opposing walls of said excavation.

4,818,143

ASBESTOS DECOMPOSITION

Song-Tien Chou, Manhattan, Kans., assignor to ASD, Inc., Houston, Tex.

Filed Jan. 7, 1988, Ser. No. 141,541
Int. Cl.[4] B09B *3/00*
U.S. Cl. 405—128 **9 Claims**

1. A method for decomposing asbestos containing relatively small amounts of foreign matter, comprising the steps of:

reacting a quantity of material containing asbestos with a quantity of sulfuric acid to produce a first mixture, said first mixture containing reaction products comprising completely decomposed particles of said asbestos, said first mixture having a pH value of less than 2;

reacting said first mixture with a neutralizing agent to produce a second mixture, said second mixture having a pH value of approximately 7; and

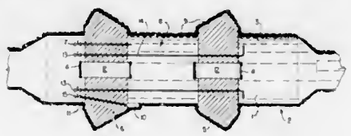
reacting said second mixture with a lubricating agent, an accelerating agent, and a cementitious or pozzolanic substance to produce a third mixture, said third mixture comprising a solidified compound containing said decomposed particles of said asbestos, said solidified mixture providing effective containment of said asbestos particles.

4,818,144

FLOOD ISOLATION DAM

Dennis Mraz, 410 Jessop Ave., Saskatoon, Saskatchewan, Canada (S7N 2S5)

Filed Nov. 14, 1986, Ser. No. 930,424
Int. Cl.[4] E21D *9/00*
U.S. Cl. 405—132 **10 Claims**



1. A method for high pressure flood dam isolation of unsaturated brines in salt rock comprising the steps of:

(a) removing all fracture or otherwise potentially discontinuous material in the wall of a mine opening;

(b) constructing first and second dams across said mine opening, said first dam defining a pressure side, and said wall having a microfracture system peripherally of said dams;

(c) sealing the host rock on the pressure side of said first dam;

(d) injecting hydrophobic medium under pressure between said first and second dams;

(e) sealing the microfracture system in the host rock around said first and second dams through rock repressurization;

(f) impregnating the microfracture system within the host rock with hydrophobic medium;

(g) monitoring the pressure on the pressure side of said first barrier; and

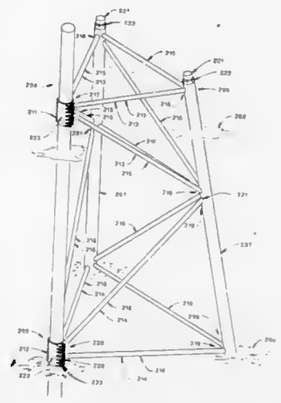
(h) withdrawing any seepage from a sump located between said first and second dams.

4,818,145

OFFSHORE SUPPORT STRUCTURE METHODS AND APPARATUS

Samuel C. Carruba, Fulshear, Tex., assignor to CBS Engineering, Inc., Houston, Tex.

Filed Sep. 16, 1986, Ser. No. 908,408
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—203 **35 Claims**



1. A support structure for use with a well located in a body of water, the well having an upstanding conductor pipe, having upper and lower ends, extending from the ground below the body of water to above the surface of the water, comprising:

two tubular legs, each leg having upper and lower ends, the upper end of each leg adapted to extend beyond the surface of the water and the lower end of each leg adapted to be disposed upon the ground;

a first set of bracing members disposed between and interconnecting the legs in a spaced relationship from one another;

first and second conductor pipe clamps, the first conductor pipe clamp adapted to be disposed about the upper end of the conductor pipe, and the second conductor pipe clamp adapted to be disposed about the lower end of the conductor pipe;

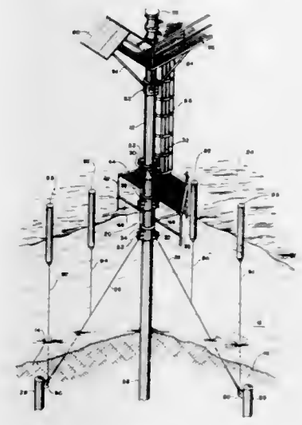
a second set of bracing members, each bracing member of the set having first and second ends, the first ends of each bracing member being connected to one of the legs, the second ends of each bracing member being secured to the first conductor pipe clamp, the second set of bracing members extending outwardly and away from each of the legs; and a third set of bracing members, each bracing member of the set having first and second ends, the first ends of each bracing member being connected to one of the legs, the second ends of each bracing member being secured to the second conductor pipe clamp disposed adjacent the ground, the third set of bracing members extending outwardly and away from each of the legs, whereby upon the first and second conductor pipe clamps being secured to the upper and lower ends of the conductor pipe, the conductor pipe will be supported by the legs and the second and third sets of bracing members.

4,818,146

WELLHEAD AND CONDUCTOR STABILIZED BY A CABLE AND ANCHOR SYSTEM

Ozeman J. Fontenot, Youngsville, La., assignor to Texhoma Contractors, Inc., Youngsville, La., a part interest

Filed Jan. 23, 1985, Ser. No. 694,014
Int. Cl.[4] E02B *3/22*; E02D *7/00*
U.S. Cl. 405—212 **1 Claim**



1. A method for stabilizing an offshore wellhead and conductor having a portion thereof driven into a formation beneath a mud line of a body of water, the method comprising the steps of:

providing a brace for placement in fixed engagement around the conductor, the brace being provided with a plurality of outwardly extending stationary attachment means, each attachment means having a corresponding pulley mounted on the brace, the pulleys being symmetrically disposed around the brace in a single plane;

providing a boat landing bumper on the brace;

attaching a first end of an anchor cable to an anchor pile;

releaseably securing the anchor pile to a drive pile with a connection means comprised of a pair of connecting cables fixed to the drive pile at a first end of each of the connecting cables and fixed at a second end of each of the connecting cables to the anchor pile with a padeye clamp provided with a clamp release cable that extends to the surface of the water, the clamp release cables opening the padeye clamps when pulled;

exerting a downward force on the drive pile to drive the anchor pile into anchoring engagement with the land formation beneath the mud line;

pulling the clamp release cables to open the padeye clamps and releasing the anchor pile from the drive pile;

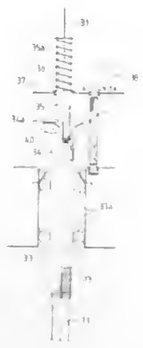
threading each anchor cable between one of the pulleys and the conductor;

sliding the brace downwardly on the conductor to dispose the pulleys beneath the surface of the water; and

tightening each anchor cable and fixing it to the attachment means.

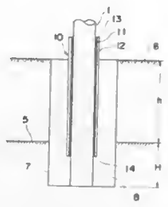
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4,818,147
TENDON FOR ANCHORING A SEMISUBMERSIBLE PLATFORM
Jens Rasmussen, Partille, Sweden, assignor to Gotaverken Arendal AB, Goteborg, Sweden
Filed Oct. 30, 1987, Ser. No. 114,763
Claims priority, application Sweden, Nov. 12, 1986, 8604835
Int. Cl.[4] E02B *17/00;* **B63B** *21/50*
U.S. Cl. 405—224 **3 Claims**



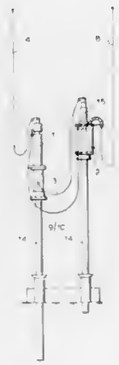
1. A tendon installation apparatus for anchoring a semisubmersible platform to a sea bed foundation, comprising substantially vertical legs and horizontal pontoons of said platform; a generally rectangular frame which is connected to said horizontal pontoons via said legs; tendons which run substantially vertically between said foundation and the corners of said frame; anchoring points for the tendons connected internally in the legs at a level of the platform, and at the level of the pontoons; and a single elastic load bearing connection means which is remotely adjustable between said platform and each of said tendon.

4,818,148
FROST DAMAGE PROOFED PILE
Takashi Takeda, Kanagawa; Katsumi Omori, Yokohama; Toshiyuki Ohkuma; Kenji Kidera, both of Kawasaki; Shigeru Nakagawa, Yokohama, and Tetsuzo Hirose, Kanagawa, all of Japan, assignors to Nippoo Kokan Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 862,274, May 12, 1986. This application Mar. 7, 1988, Ser. No. 164,967
Claims priority, application Japan, May 14, 1985, 60-100429; May 14, 1985, 60-100430; May 14, 1985, 60-100431; May 14, 1985, 60-100432
Int. Cl.[4] E02D *5/60*
U.S. Cl. 405—234 **11 Claims**



1. A frost damage proofed pile comprising:
a pile member,
a smooth-surfaced plastic covering member having a low coefficient of friction and being formed on an outer surface of said pile member, integral with said pile member, to surround a predetermined length of said pile member for reducing a frost heaving force or negative friction acting on said pile member when said covering member is in contact with frozen soil in a frigid area, and
adhesion means for closely adhering said covering member to said pile outer surface within said predetermined length to a degree greater than a shear stress generated on said outer surface by said frozen soil.

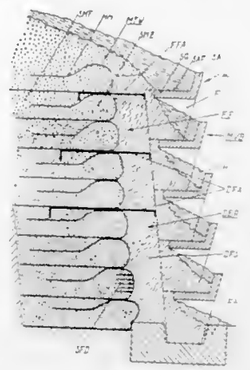
4,818,149
METHOD OF AND A DRIVE UNIT FOR DRIVING RAMMING PARTS UNDER WATER
Hans Koehn, Hamburg, Fed. Rep. of Germany, assignor to Bomag-Menck GmbH, Boppard, Fed. Rep. of Germany
Filed Dec. 15, 1987, Ser. No. 133,901
Claims priority, application European Pat. Off., Jul. 28, 1987, 87110889.0
Int. Cl.[4] E02D *7/06*
U.S. Cl. 405—228 **23 Claims**



1. A method of driving ramming parts under water, comprising the steps of lowering a first ramming device suspended on a first supporting element and also a submergible electrohydraulic drive unit under water; lowering in addition to said first ramming device also a second ramming device suspended on a second supporting element so that at least one of said ramming devices assumes a seating position on a ramming part; arranging the drive unit close to one of the ramming devices and connecting it with both ramming devices; partially driving one ramming part by said one ramming device and then transferring said one ramming device to another ramming part; further driving the one ramming part or a further ramming part in by the other ramming device; and driving both ramming devices by the same drive unit.

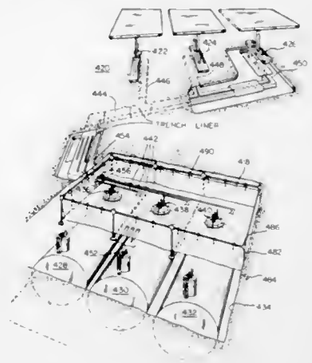
4,818,150
WALL WITH GRAVITY SUPPORT STRUCTURE, BUILDING ELEMENT AND METHOD FOR CONSTRUCTION THEREOF
Felix P. Jaecklin, Ennetbaden, Switzerland, assignor to Geotech-Lizenz AG, Switzerland
Filed Sep. 8, 1986, Ser. No. 904,643
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 3532641
Int. Cl.[4] E02D *29/02, 17/20*
U.S. Cl. 405—262 **9 Claims**

1. A wall comprising a support structure and a fore-part, said support structure including a plurality of vertically arranged compartments, said compartments being defined by flexible envelope material filled with bulk material, said fore-part including at least one projection directed upwards and at least one excavation neighboring said projection and being arranged offset in relation thereto in a direction toward a front side of said fore-part, at least one of said compartments having a first portion extending over said projection and into said excavation



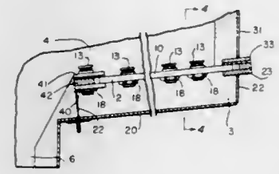
in said fore-part to form a positive connection with said fore-part, and said at least one compartment having a second portion extending back from said excavation over said projection into said support structure, whereby said at least one compartment is connected to said fore-part to resist horizontal forces acting between said fore-part and said support structure.

4,818,151
SECONDARY CONTAINMENT SYSTEMS ESPECIALLY WELL SUITED FOR HYDROCARBON STORAGE AND DELIVERY SYSTEMS
Jack Moreland, Dolton, Ill., assignor to MPC Containment Systems, Chicago, Ill.
Continuation-in-part of Ser. No. 709,597, Mar. 8, 1985, Pat. No. 4,682,911, which is a continuation-in-part of Ser. No. 586,782, Mar. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 930,788, Nov. 14, 1986, Pat. No. 4,778,310. This application Apr. 9, 1987, Ser. No. 36,290
The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.
Int. Cl.[4] B65G *5/00*
U.S. Cl. 405—303 **13 Claims**



1. A secondary containment for a fuel delivery system, comprising means for bulk storing fuel, dispensing means in at least one area which is remote from said bulk storing means for delivering said fuel, a system of conduits for delivering fuel from said bulk storing means to said dispensing means, secondary containment means underlying said system of conduits and continuously communicating throughout said conduit delivery system where fuel might spill or leak for containing said spilled or leaked fuel, and means for draining said secondary containment means to a collecting point so that said contained fuel accumulates in at least one area of said containment means from which said contained fuel may be removed.

4,818,152
APPARATUS FOR CONVEYING HOT FINELY DIVIDED MATERIAL
Thomas R. Lawall, Emmaus, Pa., assignor to Fuller Company, Bethlehem, Pa.
Filed Oct. 14, 1986, Ser. No. 918,209
Int. Cl.[4] B65G *53/20*
U.S. Cl. 406—88 **10 Claims**



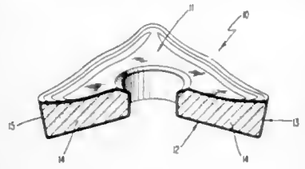
1. Apparatus for conveying finely divided dry material having a temperature in excess of 500° F. comprising a conduit having an inlet at one end for material to be conveyed and an outlet at its other end; a substantially flat plate mounted in said conduit dividing the conduit into an upper material chamber and a lower plenum chamber for supporting material to be conveyed in the material chamber, said lower plenum chamber adapted to be conected to a source of gaseous fluid under pressure; said plate having a plurality of openings therethrough spaced along its length and width providing communication between the lower plenum chamber and the upper material chamber; a plurality of nozzle means, each mounted in one of said openings for dispersing gaseous fluid under pressure supplied to said lower plenum chamber through material supported by said plate to aerate material in the upper material chamber whereby the thus aerated material will flow downwardly on said plate from said inlet to said outlet by gravity; each of said nozzle means having openings therein sufficiently large to permit gaseous fluid under pressure to pass therethrough at a desired pressure drop and sufficiently small to limit the backflow of material from the material chamber to the plenum chamber.

4,818,153
CUTTING INSERT HAVING MEANS FOR DETECTING WEAR
Ingemar H. Strandell, N. Rönsgatan, and Ingemar S. L. Svensson, Sagostigen, both of Sweden, assignors to Santrade Limited, Lucerne, Switzerland
Filed Nov. 6, 1986, Ser. No. 927,372
Claims priority, application Sweden, Nov. 7, 1985, 8505260
Int. Cl.[4] B23B *27/14, 25/06;* **B23C** *5/16*
U.S. Cl. 407—113 **11 Claims**

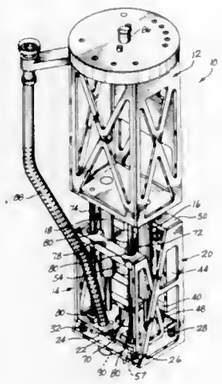
1. A cutting insert with at least one cutting edge for chip-removing machining comprising a substrate (14;14') and at

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least one first layer (15;15') at least partly covering the substrate, characterized in that said cutting insert includes a fluorescent material which is provided to be exposed during wear of the first layer (15;15').

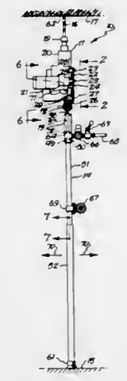


4,818,154
END-EFFECTOR ASSEMBLY FOR COUNTERSINKING A PREDRILLED BORE
Jeffrey C. Bye, Everett, and Mark F. Gabriel, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Jul. 14, 1987, Ser. No. 72,866
Int. Cl.[4] B23B *39/00*
U.S. Cl. 408—111 **6 Claims**



1. An end-effector assembly for use in positioning a drive motor and cutting tool relative to a workpiece, so that said cutting tool may be used to countersink a predrilled bore in said workpiece, comprising:
a first cage subassembly mounted to a supporting structure;
a second cage subassembly normally positioned below said first cage subassembly;
first cylinder means operable for linearly extending and retracting said second cage subassembly in an axial direction relative to said first cage subassembly;
a third cage subassembly at least partially surrounding said second cage subassembly and having a generally horizontally mounting plate to which said drive motor and cutting tool are mounted, said plate being positioned below said second cage subassembly; and
a plurality of compliant members interconnecting said third cage subassembly and said second cage subassembly, wherein each of said compliant members includes a plurality of washers juxtapositionally stacked in substantially the same direction as said axial direction, said washers being connected together in a manner so that said plurality of washers interconnects said second and third cage subassemblies, to cause said third cage subassembly to extend and retract correspondingly with said second cage subassembly in response to operation of said first cylinder means, and further, said plurality of washers being connected together in a manner so that said washers may shift laterally with respect to each other, to permit said third cage subassembly to shift laterally relative to said second cage subassembly.

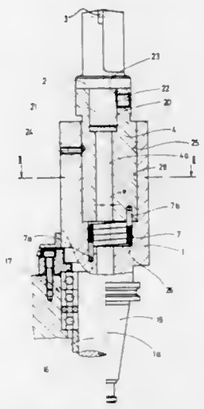
4,818,155
POWER TOOL SYSTEM INCLUDING ADAPTER AND COUPLING MEMBER THEREFOR
John C. Belknap, Buffalo, N.Y., assignor to MacMuscle Co., Inc., Buffalo, N.Y.
Filed Feb. 4, 1988, Ser. No. 152,247
Int. Cl.[4] B23B *45/14*; E21C *11/00*
U.S. Cl. 408—130 **33 Claims**



27. In combination: a power tool and a coupling member for coupling said power tool to an external force-applying member, first attachment means on said power tool, said coupling member comprising first and second body members, second attachment means on said first body member for attachment to said first attachment means, third attachment means on said second body member for attachment to said external force-applying member, and resilient coupling means for coupling said first and second body members in a first position for providing sufficient axial rigidity therebetween to permit axial forces to be transmitted between said external force-applying member and said power tool through said first and second body members in a predetermined direction but permitting radial flexing between said first and second body members to a second position when they are subjected to radial forces above a predetermined value and thereafter returning said body members to said first position after said radial forces are removed.

4,818,156
TOOL FOR MAKING ROUGHING AND FINISHING CUTS IN A WORKPIECE
Walter Bauer, Weidenstrasse 15, 7403 Ammerbuch 1, Fed. Rep. of Germany
Filed Jun. 17, 1988, Ser. No. 208,047
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1987, 3720630
Int. Cl.[4] B23B *51/00*
U.S. Cl. 408—150 **12 Claims**

1. A tool for cutting workpieces comprising:
a drill chuck rotatable about a first axis,
a blade carrier mounted on said chuck for rotation therewith, and being rotatable relative to said chuck about an eccentric second axis such that said carrier is rotatable relative to said chuck between
a first position wherein a blade mounted on said carrier is disposed at a first distance from said first axis for effecting a roughing cut as said tool is advance relative to the workpiece whereby said carrier is acted upon by a first reaction torque, and
a second position wherein the blade is disposed at a second distance from said first axis for effecting a finishing cut as said tool is retracted relative to the workpiece wherein said carrier is acted upon by a second reaction torque weaker than said first reaction torque, and



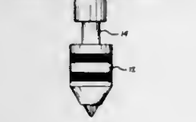
spring means on said chuck for biasing said carrier away from said first position toward said second position with a biasing torque greater than said second reaction torque but less than said first reaction torque, wherein said carrier is automatically spring biased to said second position in response to withdrawal of said tool relative to the workpiece.

4,818,157
QUICK-CHANGE ADAPTER AND TOOLS FOR USE WITH THE ADAPTER
Thomas Kouvelis, Berwyn, Ill., assignor to James E. Scapillato, LaGrange Park, Ill., a part interest
Filed Dec. 31, 1986, Ser. No. 948,106
Int. Cl.[4] B23B *31/22*
U.S. Cl. 408—240 **9 Claims**



1. A combination unitary quick-change adapter for use with a chuck of an electric drill and a unitary bit designed for adjustment-free, axial insertion into and removal from the adapter, the combination comprising:
said adapter including:
a shaft portion of solid cross-section and having a longitudinal axis and first and second opposing ends, said first end adapted for insertion into the chuck of the electric drill;
a generally tubular collar portion having an open end and a closed end integral with and immovably fixed to said second end of said shaft, said collar portion being coaxial with said axis of the shaft portion and being provided with an inner peripheral wall portion having a polygonal cross-section centered about the shaft axis and defining an open interior of said collar;
a throughbore opening in said peripheral wall portion being perpendicular to said shaft axis and having a narrowed inner end and an outer end;
a ball and a compression spring provided in said opening in direct contact with each other so that said ball is biased by said spring against said narrowed inner end to permit a portion of said ball to project vertically into said interior of said collar and perpendicular to said axis; and
a plug dimensioned to enclose said outer end of said opening and adapted to retain said spring and said ball therein;
said bit including a shaft end and a work end, said shaft end having a polygonal cross-section adapted to matingly engage said polygonal inner peripheral wall portion in said collar portion, said shaft end further having a circumferential area of reduced diameter adapted to be engaged by said spring-biased ball when said shaft end is inserted into said collar portion so as to be in direct contact with said closed end, said closed end adapted to exert axial driving force upon said shaft end of said tool;
said tool being secured within said collar by said spring-biased ball and by said mating engagement between said shaft end and said inner peripheral wall so that the tool may be axially inserted into and removed from the adapter without any manipulation or adjustment of the adapter.

4,818,158
FLOATING TAP HOLDER
Arthur J. Munroe, 2 Sharren La., Enfield, Conn. 06082
Filed Nov. 12, 1987, Ser. No. 119,477
Int. Cl.[4] B23G *1/26*
U.S. Cl. 408—241 R **4 Claims**



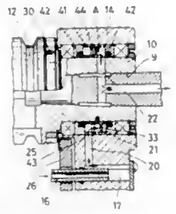
1. A floating tap holder, comprising:
chuck means for holding a tap;
spring means for exerting an axial feed force on said chuck means;
hollow sleeve means;
said hollow sleeve means provided with opposed longitudinal slots;
a drive shaft connected to said chuck means and slidably received in said hollow sleeve means;
and
a transversely extending drive rod connected to said drive shaft and received for longitudinal movement in said slots.

4,818,159
CUTTING TOOL HOLDER WITH OIL HOLES
Sutemaru Mizoguchi, Ikoma, Japan, assignor to Mizoguchi Iron Works & Co., Ltd., Ikoma, Japan
Division of Ser. No. 578,717, Feb. 9, 1984, Pat. No. 4,652,189.
This application Sep. 5, 1986, Ser. No. 903,927
Claims priority, application Japan, Apr. 28, 1983, 58-66115
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.[4] B23C *5/28*; B23Q *11/10*
U.S. Cl. 409—136 **2 Claims**

2. A tool holder assembly which comprises, in combination, a tool holder connected to a spindle of a machine for rotation together therewith, a stationary support member rotatably

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coupled to said tool holder for rotatably supporting the tool holder connected to a fixed portion of the machine, a fluid supply circuit defined in the tool holder for supplying a cutting fluid from an external source thereof toward a fluid discharge passage defined in a cutting tool, said cutting tool being replaceably connected to and carried by the tool holder, and a vane-type displacement pump assembly coupled to said fluid supply circuit comprising a rotor, constituted by a portion of the tool holder, and a pump casing constituted by a portion of the stationary support member and forming an annular chamber axially aligned with said tool holder, said rotor having a first portion off-set relative to the axis of rotation for sweeping the circumferential wall as said tool holder and said rotor are rotated and a second portion spaced from said circumferential wall as said tool holder and said rotor are rotated and spring urged vane means between said rotor and said circumferential wall of said chamber, said vane-type displacement assembly being operable to forcibly pump the cutting fluid, which has been supplied from the external source thereof to the vane-type displacement pump, toward the fluid discharge passage in the cutting tool.



4,818,160

MACHINING DEVICE WITH A TOOLHOLDER DISPLACEABLE IN THREE COORDINATES PERPENDICULAR TO ONE ANOTHER

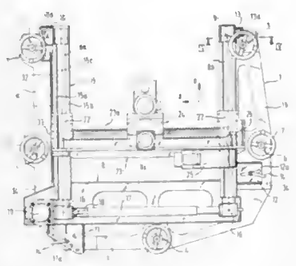
Gerd Rabe, Meinerzhagen, and Gerd Pollak, Gummersbach, both of Fed. Rep. of Germany, assignors to L. & C. Steinmuller GmbH, Gummersbach, Fed. Rep. of Germany

Filed May 28, 1987, Ser. No. 54,956

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1986, 3619000

Int. Cl.⁴ B23C *1/06*

U.S. Cl. 409—202 **11 Claims**



1. A portable machining device including a toolholder (**24**) displaceable in three coordinates (X, Y, Z) perpendicular with respect to one another by means of three linear guides (**23**, **15**, **28**) and associated drives (**25**, **19**, **30**) on a frame of the device, characterized in that the frame (**1**, **8**) of the device is of an essentially U-shaped configuration having two parallel legs and a section connecting said legs, whereby the device may be selectively positioned adjacent the article to be machined in such a way that the surface to be machined is located in the working space defined between said legs and section; that the toolholder (**24**), retained in a shape-mating fashion, is displaceably mounted on a carriage (**23**) which extends transversely to the legs (**1***a*, **8***a*; **1***b*, **8***b*), the toolholder being movable on the carriage in the first coordinate direction (X) and the third coordinate direction (Z), the carriage being retained in a shape-mating fashion with its ends (**22**) mounted on the legs (**1***a*, **8***a*; **1***b*, **8***b*) of the frame and being displaceable along the longitudinal extents of the legs in the second coordinate direction (Y).

4,818,161

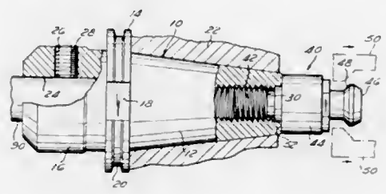
TOOL HOLDER SYSTEM AND METHOD OF USE

Harold D. Cook, 33642 Via Martos, Dana Point, Calif. 92629

Continuation of Ser. No. 787,034, Oct. 15, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 930,687

Int. Cl.⁴ B23C *1/00*

U.S. Cl. 409—233 **4 Claims**



1. A method of mounting a tool holder formed in a first standard configuration into a machine tool spindle formed in a second standard configuration comprising the steps of:

providing a tool holder having a first standard configuration and a machine tool spindle having a second and different standard configuration, said tool holder and tool spindle of the same configuration each having connecting means of substantially equal lengths for connecting them to each other and wherein said connecting means of said first and second configurations have different lengths so that the different configurations are not compatible for connection together;

connecting said first standard tool holder and said second standard tool spindle by threadingly inserting one end of an elongate extension member into said tool holder to extend the axial length of said tool holder to a distance commensurate for use in said spindle formed in the second standard configuration; and

positioning the opposite end of said elongate extension member into said machine tool spindle to cooperate with tool holder retention means positioned within said machine tool spindle to permit retrofitted use of said tool holder within said spindle.

4,818,162

TIE-DOWN DEVICE FOR TRUCKS

Raymond C. Zukowski, and Terrance M. Zukowski, both of Grand Rapids, Mich., assignors to Zukowski Enterprises, Grand Rapids, Mich.

Filed Aug. 10, 1987, Ser. No. 83,444

Int. Cl.⁴ B61D *45/00*

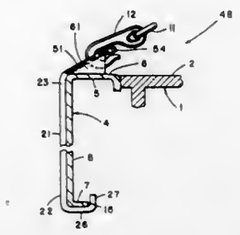
U.S. Cl. 410—116 **23 Claims**

1. In a system for mounting an object to a cargo bed provided with a top mounting surface, oppostie side surfaces and bottom surfaces adjacent said sides, wherein the system includes a securing means which extends over the object in a tight-fitting manner and is coupled to opposite sides of the bed, the improvement comprising a substantially channel-shaped tie-down device for coupling said securing means to the bed, said tie-down device being removably mountable to a side of the bed and infinitely adjustable therealong, said tie-down device including:

a body adapted to extend along said side of the bed and having a first end and an opposite second end;

a hook means for grippingly engaging the bed to resist tensile forces generated in the securing means, said hook means being fixedly attached to said first end of said body and extending outwardly from said body in a first direction such that said hook means will wrap around said bottom surface of the bed adjacent the side of the bed;

coupling means provided with an opening fro receiving and retaining the securing means to facilitate coupling of the securing means to the bed, said coupling menas being



pivotally mounted to said second end of said body for movement about an axis substantially parallel to the top surface of said cargo bed, so that said coupling menas aligns itself with the direction of said tensile forces created in the securing means, whereby stress generated in said device by said tensile forces is reduced; and

engagement means adjacent said coupling means and extending outwardly from said second end of said body for matingly engaging the top surface of the bed, said engagement means enabling said device to be mounted and retained on the bed solely by its own configuration.

4,818,163

ANCHOR BOLT ASSEMBLY INCLUDING A BOLT AND AN EXPANDING SLEEVE

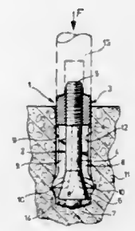
Rolf Bereiter, Grabs, Switzerland, and Peter von Flue, Ruggell, Liechtenstein, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Continuation of Ser. No. 935,068, Nov. 21, 1986, abandoned, which is a continuation of Ser. No. 705,412, Feb. 26, 1985, abandoned, which is a continuation of Ser. No. 436,175, Oct. 22, 1982, abandoned. This application Mar. 17, 1988, Ser. No. 169,087

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 3146027

Int. Cl.⁴ F16B *13/06*

U.S. Cl. 411—44 **2 Claims**



1. An anchor bolt assembly arranged to be inserted into and secured within a borehole comprising an axially extending bolt having a leading end inserted first into the borehole and a trailing end, said bolt having an axially extending frusto-conical section adjacent the leading end thereof with the axially extending surface of said frusto-conical section converging inwardly in the direction from the leading end toward the trailing end, said bolt including an axially extending cylindrically shaped shank rigidly secured to and extending from the smaller diameter end of said frusto-conical section toward the trailing end of said bolt so that said frusto-conical section and shank form a monolithic unitary member, means for securing a load to the trailing end of said bolt, an axially extending expanding sleeve laterally enclosing at least a major portion of an axially extending part of said bolt and said sleeve being axially displaceable relative to said bolt including said frusto-conical section on said bolt, said expanding sleeve having a leading end inserted first into the borehole and a trailing end so that said expanding sleeve can be driven into a borehole for displacement relative to said bolt and said frusto-conical section thereof for widening at least an axially extending section of said expanding sleeve extending from the leading end thereof, said expanding sleeve has axially extending slots therein extending from the leading end of said expanding sleeve toward the trailing end thereof with the trailing end of said slots spaced axially from the trailing end of said sleeve, said expanding sleeve has an inside diameter extending from the leading end thereof corresponding to the outside diameter of said cylindrically shaped shank and a maximum outside diameter axially and circumferentially extending first section greater than the largest diameter of said frusto-conical section and located at and extending axially from the leading end thereof, and the axially extending outside surface of said expanding sleeve extending from said first section has an axially and circumferentially extending second section located within the axially extending region of said slots and having a smaller diameter than the maximum outside diameter of said first section so that the outside surface of said expanding sleeve does not become jammed in the borehole when said expanding sleeve is driven into the borehole relative to said bolt and said frusto-conical section thereon, said smaller diameter axially extending second section having a leading end and a trailing end with the trailing end located approximately at the trailing end of said slots, the leading end of said smaller diameter second section of said sleeve is spaced axially from the leading end of said sleeve by a distance approximately equal to the wall thickness of said expanding sleeve at the leading end thereof, said leading end of said expanding sleeve having a continuous circumferentially extending radially outer edge and a continuous circumferentially extending radially inner edge and said outer and inner edges being interrupted circumferentially only by the leading ends of said slots and a leading end surface extending transversely of the axial direction of said expanding sleeve and extending radially inwardly from said radially outer edge of said radially inner edge located at said inside diameter to said expansion sleeve, said radially outer edge and radially inner edge each located in a separate plane extending perpendicularly of said sleeve axis, said leading end surface being recessed conically inwardly from said radially outer edge to said radially inner edge of said expanding sleeve so that the radially outer edge forms a sharp cutting edge and the leading end surface forms a conically shaped recess in the leading end of said sleeve located radially outwardly from said frusto-conical section on said bolt and extending axially inwardly from said cutting edge for receiving material cut from the borehole surface by said cutting edge as said expanding sleeve is driven into the borehole relative to said anchor bolt whereby with the leading end of said sleeve driven to the plane of the leading end of said frusto-conical section said recess remains radially outwardly from said frusto-conical section.

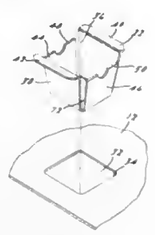
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4,818,164

BODY PANEL MOUNTING RECEPTACLES

Lawrence P. Kazyak, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 8, 1987, Ser. No. 59,094
Int. Cl.[4] F16B *39/02*; E04B *1/38*
U.S. Cl. 411—82 8 Claims



1. In an apparatus for mounting plastic body panels on metallic subframes of automobiles of the type wherein a plurality of square apertures is formed in the metallic subframe into which cups are inserted for receiving a plastic/adhesive substance to be heat cured in situ for defining a mounting surface for the body panel, the improvement wherein the cup is formed as a unitary four-sided truncated pyramidical structure having:
a rectangular imperforate base portion;
a pair of mounting sides extending from opposite sides of the rectangular base portion, each having a turned-over flange portion abuttingly engageable with the metallic subframe adjacent the aperture;
a pair of locking sides arranged in opposed relationship extending from the remaining opposed ends of the rectangular base portion and being fabricated to normally extend in an outwardly canted direction with respect to the base portion to position the free ends thereof beyond the inner periphery of the subframe aperture, whereby insertion of the cup into the aperture operates to deflect the locking sides inwardly to permit insertion through the aperture whereupon the locking sides spring outwardly to resist removal of the receptacle from the aperture.

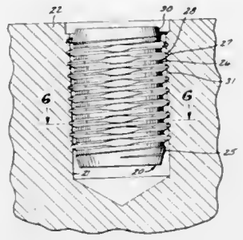
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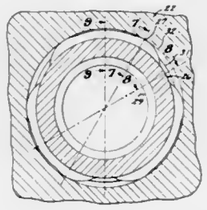
THREADED ELEMENT FOR USE AS AN INSERT

Yoji Shirai, Fujisawa, Japan, assignor to Rexnord Inc., Torrance, Calif.

Filed Apr. 2, 1987, Ser. No. 40,892
Claims priority, applicatioo Japan, Apr. 23, 1986, 61-92377
Int. Cl.[4] F16B *37/12*
U.S. Cl. 411—178 11 Claims

1. A threaded element for forming a threaded profile in the wall of a bore formed in a material and for insertion into said bore so as to reinforce said bore, comprising:
a cylindrical stem having an external thread, said stem having an unthreaded radius smaller than the unthreaded radius of said bore and a threaded radius greater than said unthreaded radius of said bore, said thread having a plurality of separate tapping lobes for cutting said threaded profile, each adjacent pair of said lobes having a recess defined between them, each of said tapping lobes being defined by
two cutting arcs formed on opposite ends of each of said lobes, the apex of each of said cutting arcs defining the maximum thread radius of said threaded profile as measured from the center of said stem, each of said cutting arcs having a convex configuration relative to said center of said stem, and
an escape-gap arc intermediate said two convex cutting arcs, said escape-gap arc having an escape radius, as measured from the center of said stem, smaller than said maximum thread radius and greater than the minimum thread radius of said threaded profile as measured from said center of said stem, said escape gap arc having a





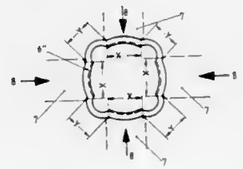
convex configuration relative to said center of said stem.

4,818,166

FASTENING A COMPONENT ON A SHAFT OR IN A BORE AGAINST AXIAL DISPLACEMENT

Hans-Joachim Szukay, Bergisch-Gladbach, and Wilhelm Maul, Cologne, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 6, 1987, Ser. No. 34,361
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625148
Int. Cl.[4] F16B *19/00*; B23P *19/00*
U.S. Cl. 411—361 4 Claims



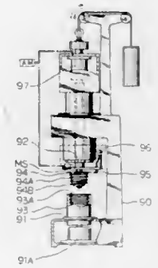
1. An attachment for fastening a component to a surface comprising:
an annular groove formed on the surface adapted to receive therein a retaining ring;
a retaining ring having angularly spaced first portions deformed into the groove so that the retaining ring fits within the groove without axial clearance, and second portions located adjacent the first portions deformed radially away from the annular groove by deformation of the first portions; and
a shoulder formed on the surface for contact with the component to prevent displacement of the component in one axial direction, the retaining ring forcing the component into contact with the shoulder after deforming the first portions into the groove.

4,818,167

TAPERED SCREW MEMBER HAVING GUIDE MEANS

Seiji Hatsutori, Nagoya, Japan, assignor to Daidotokushuko Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 599,436, filed as PCT JP83/00248 on Aug. 1, 1983, abandoned. This application Dec. 22, 1986, Ser. No. 943,853
Claims priority, application Japan, Feb. 18, 1982, 58-26753; Aug. 2, 1982, 57-135459; Apr. 8, 1983, 58-52945[U]
Int. Cl.[4] F16B *25/00, 35/04*
U.S. Cl. 411—386 11 Claims



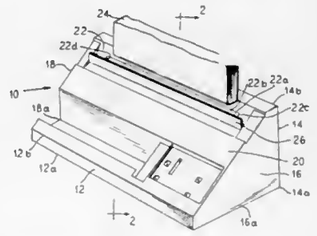
1. In a tapered screw member provided with a tapered thread, the improvement characterized in that a guide means for inducing thread engagement is positioned on an extension from said tapered thread and in a groove formed on a portion of said extension, said guide means in said groove having a projection height higher than the height of the nearest crest of said tapered thread for engaging the thread of a receiving member and guiding said nearest crest of said tapered thread into thread engagement with the thread of a member into which said tapered screw member is being threaded.

4,818,168

DOCUMENT SUPPORT APPARATUS FOR THERMAL BINDING

Thomas T. Battisti, Buffalo Grove, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Nov. 4, 1987, Ser. No. 116,548
Int. Cl.[4] B42C *9/00, 7/00*; B42D *3/00*
U.S. Cl. 412—37 7 Claims



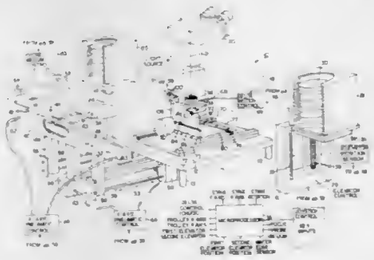
1. An apparatus for use in thermally binding documents, said apparatus including:
means defining a housing;
means associated with the housing which define a receiving aperture for receiving documents to be bound;
support means associated with said housing and
aligned with the receiving aperture means for compressing documents together along the edge to be bound and for supporting documents in a predetermined position;
heating means associated with said housing and adjacent said predetermined positioning and support means for heating the edge of said documents to be bound;
said support means including a pair of spaced, downwardly extending support plate-like means which are biased toward each other for grasping documents therebetween;
said plate-like means including a pair of flexible plate members, each secured at one end to said housing adjacent said document receiving aperture and spaced from each other and each of the other ends being free and resiliently biased toward each other to cooperate in defining said predetermined position;
said plate-like means being constructed to converge from said document receiving end toward said binding end and form a V-like shape; and
said housing means, said receiving aperture defining means and support means being unitary and formed of a plastic.

4,818,169

AUTOMATED WAFER INSPECTION SYSTEM

Richard R. Schram, deceased, late of Northridge, Calif., and by Gary R. Schram, executor, 3140 Clybourn Ave., Burbank, Calif. 91505

Filed May 17, 1985, Ser. No. 735,822
Int. Cl.[4] G01N *21/01*
U.S. Cl. 414—331 24 Claims



1. A system for transporting and precisely positioning semiconductor wafer relative to an optical inspection axis without introducing contamination or mechanical instabilities comprising: a frame having a front boundary and a pair of spaced apart side support means bounding an interior wafer inspection position within a two-dimensional reference area, the frame further including a horizontal reference surface transverse to and intercepted by the inspection axis and within the side support means, and bridge means spanning the side support means above the reference surface and mounted to each of the side support means each side support means having an exterior side surface extending along a first direction substantially perpendicular to the front boundary of the frame
optical inspection means mounted on the bridge means the bridge means spanning the reference area and the optical inspection means being positioned on the bridge means along the vertical inspection axis;
XY stage means mounted on and movable within the limits of the reference surface in two orthogonal directions, and including wafer support means substantially at a first horizontal plane a predetermined distance above the reference surface;
first wafer storage cassette means disposed adjacent the exterior side surface of the first of the side support means and including means for positioning any of a plurality of stacked wafer storage cells substantially at the first horizontal plane;
second wafer storage cassette means disposed adjacent the exterior side surface of the second of the side support means and including means for positioning any of a plural-

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ity of stacked wafer storage cells substantially at the first horizontal plane; and

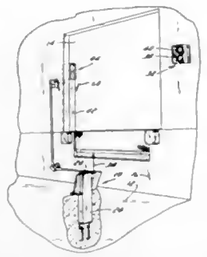
wafer transport means confronting the front boundary of the frame and including wafer holding means disposed substantially at the first horizontal plane and movable in said first direction laterally along the front boundary of the frame to transfer wafers between the first and second cassette means and the inspection position.

4,818,170

DRIVEWAY TRUCK RESTRAINING APPARATUS

Patrick W. Fisher, Milwaukee, and James P. Hagen, Jr., Hartland, both of Wis., assignors to Nova Technologies, Inc, Hartford, Wis.

Filed Feb. 24, 1987, Ser. No. 17,987
Int. Cl.[4] B65G *67/02*
U.S. Cl. 414—401 **7 Claims**



1. A driveway truck restraining apparatus positioned in front of a loading dock in a position to block the travel of an ICC bar located on the back of a truck, said apparatus comprising,

a sealed casing embedded in a driveway in a spaced relation to a loading dock,

a ram mounted in said casing for movement to a position to block the path of travel of the ICC bar located on the back of the truck,

means for sensing the presence of the ICC bar on a truck, and

means for moving said ram to the blocking position when the ICC bar is sensed by said sensing means to lock the truck at the loading dock, said moving means including:

a cable secured to the lower end of said ram, and

a pneumatic piston and cylinder assembly mounted on said dock and operatively connected to said cable for raising said ram to the blocking position.

4,818,171

PALLET TRANSFERRING ARRANGEMENT AND METHOD

Gary F. Burkholder, North Royalton, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Oct. 22, 1987, Ser. No. 112,640
Int. Cl.[4] B65G *67/00*; B60P *1/00*
U.S. Cl. 414—497 **29 Claims**

1. A material handling vehicle having a frame, and first and second spaced apart sides, a load carrying member movable relative to the vehicle frame between first and second elevationally spaced apart positions, and first and second guide assemblies maintaining said load carrying member in a plane transverse the vehicle sides, comprising;

a ground engaging foot connected to the second guide assembly;

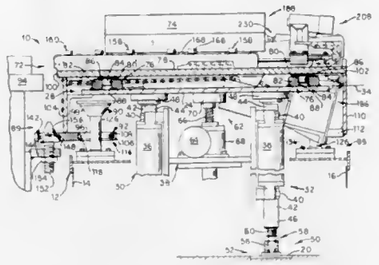
a jack assembly connected to and simultaneously moving the load carrying member and said ground engaging foot between respective first and second elevationally spaced apart positions;

a pallet transfer deck;

means for movably supporting the pallet transfer deck on the load carrying member;

a plurality of deck positioning cone members connected to one of the vehicle frame and pallet transfer deck; and

a plurality of deck positioning socket members connected to the other of the vehicle frame and pallet transfer deck,



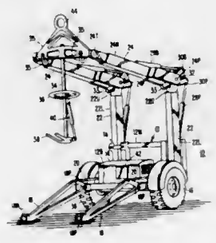
said plurality of deck positioning cone members each being matingly restrainingly engaged with a respective deck positioning socket member at the second position of the load carrying member and spaced from mating restraining engagement with the deck positioning socket members at the first position of the load carrying member.

4,818,172

PARASITIC CRANE

Bruce S. Johnson, Burbank, Calif., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Aug. 25, 1987, Ser. No. 89,084
Int. Cl.[4] B66C *23/00*
U.S. Cl. 414—686 **26 Claims**



1. A crane comprising:

(a) a frame assembly;

(b) first and second posts mounted to said frame assembly adjacent opposite sides thereof and extending up;

(c) a coupler mounted to an inner side of said frame assembly and operable to removably couple said crane to a vehicle;

(d) first and second booms, said first boom having an inner end mounted at a first pivot axis to said first post and an outer end, said second boom having an inner end mounted at a second pivot axis to said second post and an outer end;

(e) a crosshead attached to said outer end of said first boom and said outer end of said second boom; and

(f) a load support attached to said crosshead and operable to support loads attached thereto for movement by said crane; and wherein said first and second booms are respectively pivotable in unison about first and second pivot axes over a range of at least 30° above horizontal in an outer direction towards an outer side opposite said inner side through 30° above horizontal in an inner direction towards said inner side, and wherein said crane is operable to move loads between said outer side and said inner side with the load support passing through a plane defined by said first and second booms, and further comprising a horizontal axis and pivot means and wherein said crosshead is pivotably mounted to each of said outer ends by said pivot means to allow it to pivot about said horizontal axis relative to said first and second booms.

8. A crane comprising:

(a) a frame assembly;

(b) first and second posts mounted to said frame assembly adjacent opposite sides thereof and extending up;

(c) a coupler mounted to an inner side of said frame assembly and operable to removably couple said crane to a vehicle;

(d) first and second booms, said first boom having an inner end mounted at a first pivot axis to said first post and an outer end, said second boom having an inner end mounted at a second pivot axis to said second post and an outer end;

(e) a crosshead attached to said outer end of said first boom and said outer end of said second boom; and

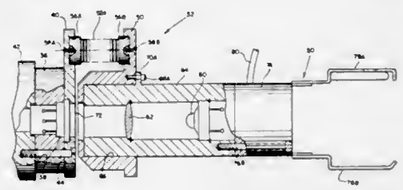
(f) a load support attached to said crosshead and operable to support loads attached thereto for movement by said crane; and wherein said first and second booms are respectively pivotable in unison about first and second pivot axes over a range of at least 30° above horizontal in an outer direction towards an outer side opposite said inner side through 30° above horizontal in an inner direction towards said inner side, and wherein said crane is operable to move loads between said outer side and said inner side with the load support passing through a plane defined by said first and second booms, and further comprising a frame lifter operable to lift at least a portion of said frame assembly relative to the ground when said coupler is coupled to a vehicle such that the crane can be positioned by the vehicle while the crane is completely removed from the ground.

4,818,173

ROBOT ARM MEMBER RELATIVE MOVEMENT SENSING APPARATUS

Mohammed M. Khusro, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 12, 1983, Ser. No. 484,228
Int. Cl.[4] B25J *9/00, 17/02*
U.S. Cl. 414—735 **19 Claims**



1. Apparatus for sensing load forces exerted along at least selected axes of a work performing mechanism having a driven input portion and a load engaging output portion, said apparatus comprising:

means connecting said input and output portions for resilient relative displacement along at least one given axis; and

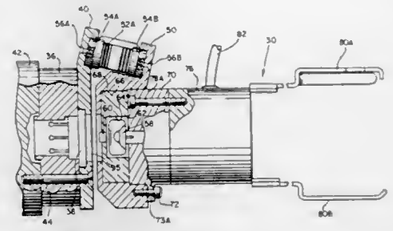
means for detecting the relative displacement of said portions along a direction at least parallel to said given axis so as to determine the load forces acting in said direction on said output portion as a function of said displacement and the resiliency of said connecting means, said detecting means including a position sensing lateral effect photodiode fixedly mounted with respect to one of said portions having a given photosensitive surface extending in said direction, and means for directing a spot of light to said photosensitive surface from a fixed location with respect to the other of said portions such that the position of said spot of light on the photosensitive surface of said photodiode is a continuous function of the relative displacement of said portions in said direction.

4,818,174

COMPACT ROBOT ARM MEMBER RELATIVE MOVEMENT SENSOR

Archie H. Arpiarian, Cambridge, and Mohammed M. Khusro, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 12, 1983, Ser. No. 484,229
Int. Cl.[4] B25J *9/00, 17/02*
U.S. Cl. 414—735 **16 Claims**



1. Sensing apparatus for detecting relative movement between a pair of members along a given path, said apparatus comprising:

a position sensing lateral effect photodiode mounted in fixed relation to one of said members, said photodiode having a given photosensitive surface extending generally in the direction of said path;

an energizeable source of light;

an optical fiber arrangement for directing light from said source to said photodiode and for forming a confined spot of light thereon, said optical fiber arrangement having one end thereof mounted in operative relation to said source and extending from a fixed location relative to the other of said members to a point where the other end of said optical fiber arrangement is in closely adjoining relation to said photosensitive surface to thereby produce said confined spot of light on said surface; and

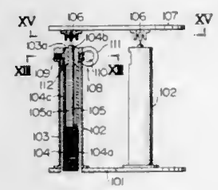
means coupled to said photodiode for producing a signal that is a continuous function of the position of said spot of light on said photosensitive surface.

4,818,175

EXPANDABLE AND CONTRACTIBLE ARMS

Motohiko Kimura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 643,793, Aug. 24, 1984, Pat. No. 4,712,969.
This application Dec. 12, 1986, Ser. No. 940,941
Claims priority, application Japan, Aug. 29, 1983, 58-157475; Mar. 31, 1984, 59-64880
Int. Cl.[4] B25J *17/00*
U.S. Cl. 414—730 **6 Claims**



1. An expandable and contractible arm comprising:

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a plurality of serially connected, independently expandable and contractible units, each unit comprising:

(a) a lower base plate connected to a first end of each of at least three independently expandable and contractible double thread levers,

(b) an upper base plate,

(c) means for connecting a second end of each of said at least three expandable and contractible double thread levers to said upper base plate, said connecting means comprising:

(i) a ball joint secured to each double thread lever second end,

(ii) a pin slidably extending through each ball joint, and

(iii) each pin being received by a respective pair of L-shaped flanges each depending from a lower surface of said upper base plate, one pair of said flanges each having a slot disposed therein, each said slot supporting an end of said respective pin, whereby said pin is slidable within said slot in a direction perpendicular to the length of said pin, and

(d) means for independently expanding and contracting each of said at least three expandable and contractible double thread levers to so as to expand and contract each said unit independently from another said unit when said expanding and contracting means within said unit are operated equally, and so as to bend each said unit independently from another said unit when said expanding and contracting means within said unit are operated unequally.

4,818,176

BURST GUARD RING FOR TURBO-ENGINE HOUSINGS

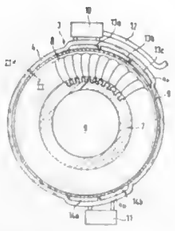
Werner Huether, and Axel Rossmann, both of Karlsfeld, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 7, 1988, Ser. No. 178,481

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712830; Apr. 15, 1987, 3712829

Int. Cl.[4] F01D *21/00*

U.S. Cl. 415—9 **11 Claims**



1. A burst guard ring for a turbine engine housing, comprising radially outer elastic fiber belt means for surrounding said engine housing, said fiber belt means being made of fibers in a matrix material, and a partially radially inner circumferential ceramic layer comprising separate ceramic tile means arranged exclusively at least at one critical location extending over a limited portion of the circumference of said guard ring, said elastic fiber belt means holding said ceramic tile means in place only in said critical location, said elastic fiber belt means being free of ceramic tile means outside said critical location yet providing sufficient protection in noncritical areas outside said critical location.

4,818,177

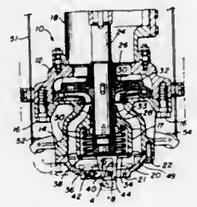
CENTRIFUGAL PUMP WITH INTEGRAL SUCTION VALVE

Martin Grohmann, Brunn Am Gebirge, Austria, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 10, 1986, Ser. No. 940,451

Int. Cl.[4] F04D *15/00, 1/12*

U.S. Cl. 415—49 **9 Claims**



1. In a centrifugal pump, wherein an impeller is mounted for rotation within a housing having an inlet opening, the improvement comprising:

the housing having an outer housing portion defining a circular inlet opening, said housing further having an inner housing portion within the outer housing portion, the inner and outer housing portions defining an annular passage from the circular inlet opening to the inlet of the impeller, said inner housing portion defining a cavity facing the circular inlet opening;

a closure element mounted within the outer housing portion for movement between an open position and a closed position, said closure element being a discharged member constrained for linear motion by the housing between the open and closed positions;

means for sealing the inlet opening in cooperation with the closure element when said closure element is in the closed position;

a spring received in the cavity for biasing said closure element against said means for sealing; and

said means for biasing providing sufficient biasing force to cause said closure element to move to said closed position when no liquid is available to be drawn in the housing to minimize backflow, yet allow said closure element to move to the open position when rotation of the impeller causes liquid to be drawn into the housing through the inlet opening and the closure element being mounted in the housing whereby the separation between the inlet opening and impeller is minimized to reduce the static head between the inlet opening and impeller.

4,818,178

PROCESS FOR COOLING THE BLADES OF THERMAL TURBOMACHINES

Walter Sibbertsen, Hamburg, Fed. Rep. of Germany, assignor to Marresearch Gesellschaft fuer Forschung und Entwicklung GmbH, Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP87/00029, § 371 Date Nov. 18, 1987, § 102(e) Date Nov. 18, 1987, PCT Pub. No. WO87/04776, PCT Pub. Date Aug. 13, 1987

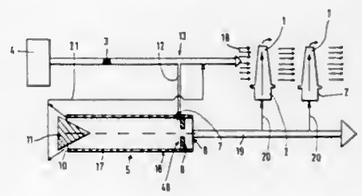
PCT Filed Jan. 23, 1987, Ser. No. 117,202

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1986, 3603350

Int. Cl.[4] F01D *5/18*

U.S. Cl. 415—115 **30 Claims**

1. A method for cooling heat-stressed structural elements of turbomachines, in which cooling air flows past wall-surfaces of the structural elements to be cooled, subjected to heat, of said structural elements, wherein the cooling air flows tangentially into a vortex-tube consisting of a cylindrical vortex-chamber, having two choke-elements at the end-sections, at a location between the said choke-elements that is in the vicinity a one of said choke-elements that is provided with an orifice-plate-like inflow-section, and wherein the flow after entering the vortex-tube is divided into two partial flows of cooling air, one of which, after flowing through the choke-element with an ori-



fice-plate-like inflow-section, is cooled in relation to the temperature of the cooling air flowing into said vortex-tube and is fed to the wall surfaces to be cooled, while the other partial flow of cooling air is led away from the vicinity of the structural elements.

4,818,179

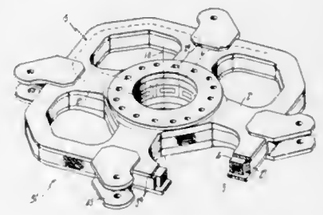
COMPOSITE HELICOPTER ROTOR HUB

Thomas J. Toner, Milford, and Leonard J. Doolin, Southbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 30, 1987, Ser. No. 80,368

Int. Cl.[4] B64C *11/06*

U.S. Cl. 416—134 A **4 Claims**



1. A helicopter rotor hub including a main retention plate comprising:

(a) a plurality of fiber reinforced resin triaxial braided tubular rings said rings being substantially evenly spaced about in a plane normal to a central axis; said rings forming a circumferential ring structure having an outer periphery and arm means for attaching said circumferential ring structure to a driveshaft; said arm means extending inwardly from said circumferential ring structure;

(b) a circumferential fiber reinforced resin triaxial braided strap disposed about the periphery of and substantially coplanar with said circumferential ring structure forming a strapped circumferential ring structure;

(c) said strapped circumferential ring structure having upper and lower fiber reinforced plates disposed above and below and substantially parallel to said ring structure;

(d) said triaxial braided tubular rings having substantially circumferential fibers interwoven with angled fibers oriented at a predetermined angle to said circumferential fibers; said circumferential and angled fibers disposed about a central core; and

(e) said circumferential triaxial braided strap comprising a flattened braided tubular ring having substantially circumferential strap fibers and angle strap fibers oriented at a predetermined angle to said circumferential strap fibers; wherein said fiber orientation withstands forces both in the plane of said retention plate and normal to said retention plate.

4,818,180

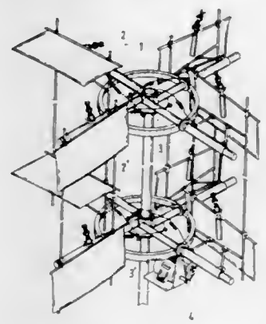
VERTICAL-AXLE WIND TURBINE

Hsun-Fa Liu, c/o Victoria Li, 1749 Shadowview Dr., Austin, Tex. 78758

Filed Feb. 29, 1988, Ser. No. 167,477

Int. Cl.[4] F03D *7/06*

U.S. Cl. 416—117 **1 Claim**



1. An apparatus relating to a vertical-axle wind turbine comprises upper and lower horizontally disposed wheels, fore eccentric tube spokes, compressible and tensible slide-cantilevers, rear eccentric tension ropes, pairs of dual-rocker trapezoid linkages, inclined flap-blades, and equipoises, in which: The slide-cantilevers each is inserted into respective fore eccentric tube spokes on the upper and lower wheels with a compression spring placed between the fore eccentric block and the inner end of the slide-cantilever, the rear eccentric tension ropes each is connected between the rear eccentric stake and the slide-cantilever, the pairs of dual-rockers trapezoid linkages each are hinged between the upper and lower slide-cantilevers and the upper and lower beams of an upstanding frame to define deflection of the upstanding frame toward both sides of the dual-rockers up to 40 degrees, the declined flap-blades each with its axis on its upper edge hinged slightly inclined across the upstanding frame, and the equipoises each containing a rolling ball in a reverse-arch tube on a crank counter-lever or containing a counter-lever and a counter-arm extends reversely from the upper edge of the flap-blade and the contained angle between counter-lever and counter-arm is adjustable.

4,818,181

WIND TURBINE

Andrej A. Kodric, 22 Evangeline Court, Rexdale, Ontario, Canada M9V 4V2

Filed Jan. 11, 1988, Ser. No. 143,381

Int. Cl.[4] F01D *5/12*

U.S. Cl. 416—196 A **18 Claims**

1. A wind turbine comprising:

a housing pivotally positioned atop a support structure;

hub rotatably positioned at one end of the housing;

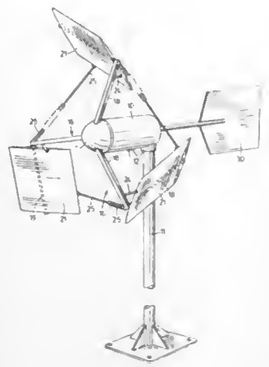
at least two arm members being attached to and radiating outwardly from the hub and being spaced equally from one another, the arm members each having an identical structure comprising an inner arm portion and an outer arm portion at an angle of from 75° to 105° to the inner portion, the arm members being oriented in the same substantially vertical plane;

a vane being pivotally attached to each outer arm portion;

means for biasing the pitch angle of each vane about its outer

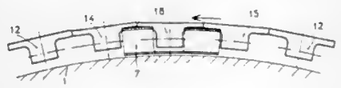
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arm portion to catch the wind and thereby impart rotation to the hub; and



means for orienting the housing so that the vanes may catch the wind.

4,818,182
SYSTEM FOR LOCKING TURBINE BLADES ON A TURBINE WHEEL
Michel A. Bouru, Moissy Cramayel, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d-Aviation (SNECMA), Paris, France
Filed Jun. 6, 1988, Ser. No. 202,827
Claims priority, application France, Jun. 10, 1987, 87 08044
Int. Cl.[4] F01D *5/32*
U.S. Cl. 416—215 **8 Claims**

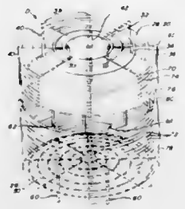


1. A system for locking turbine blades having enlarged foot portions and platforms onto a turbine wheel defining a circumferential groove adapted to receive the enlarged foot portions so as to radially retain the blades on the wheel, the wheel further defining a window radially communicating with the circumferential groove to allow radial insertion and withdrawal of the foot portion of a turbine blade, comprising:

(a) first and second circumferentially extending ribs on the turbine wheels, the ribs extending on either side of the circumferential groove and each rib defining locking notches circumferentially spaced from the window; and,

(b) a locking device having a resiliently deformable center section adapted to be radially insertable into the circumferential groove and locking flanges extending generally axially from the center section and adapted to contact radially inner portions of platforms of adjacent blades and to engage the locking notches defined by the first and second ribs to circumferentially lock the turbine blads on the wheel such that the foot portions are out of alignment with the window.

4,818,183
LOW IMPEDANCE FAN SAFETY GUARD
Ronald E. Schaefer, 5818 Michael Ct., St. Cloud, Minn. 56301
Filed Dec. 3, 1987, Ser. No. 128,163
Int. Cl.[4] F04D *29/70*
U.S. Cl. 416—247 R **8 Claims**



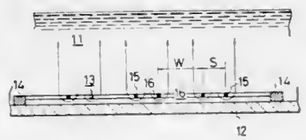
1. A low impedance safety guard for an air circulating fan with rotating fan blades which prevents a human hand, finger or foot from getting into the path of the rotating fan blades while yet achieving the unrestrictive air stream benefits of a relatively open guard which is generally considered unsafe, comprising:

(a) rear and front parallel and opposing substantially open, air stream unobstructive fan blade guard faces in front and behind the fan blades, respectively, which will permit the hand, finger or foot to pass partially therethrough;

(b) a substantially closed circumferential wall located about the rotatable fan blades; and

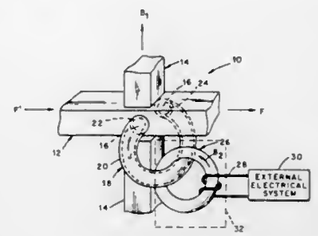
(c) means for connecting the faces and circumferential wall together to enclose the fan blades approximately equal distant from the respective faces to prohibit the hand, finger or foot from reaching the blade path after passing partially through either face.

4,818,184
DEVICE FOR GENERATING JET WITH ELECTRIC FIELD
Akira Yabe, and Takao Taketani, both of Ibaraki, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan
Filed Mar. 30, 1987, Ser. No. 31,371
Claims priority, application Japan, Mar. 31, 1986, 61-73149
Int. Cl.[4] F04B *37/02*
U.S. Cl. 417—48 **13 Claims**



1. A device for generating jets in a liquid by applying a high voltage between a pair of electrodes disposed in the liquid at a predetermined distance from each other, said pair of electrodes being a plane electrode and a perforate type electrode having a plurality of large and small space areas arranged alternately, the pressure of the liquid in the large space areas being made lower than the pressure of the liquid in the small space areas, thereby causing jets to flow out from said large space areas.

4,818,185
ELECTROMAGNETIC APPARATUS OPERATING ON ELECTRICALLY CONDUCTIVE FLUIDS
Igor Alexeff, Oak Ridge, Tenn., assignor to The University of Tennessee Research Corporation, Knoxville, Tenn.
Filed Oct. 13, 1987, Ser. No. 107,943
Int. Cl.[4] H02K *44/00*
U.S. Cl. 417—50 **19 Claims**



1. An apparatus for operating on an electrically conductive fluid, comprising:

a first condnit for containing the conductive fluid for movement therein;

at least two apertures disposed across from each other in the sides of said first conduit;

magnetic field means for producing a magnetic field across said first conduit between said apertures, and substantially perpendicular to a line passing across said first conduit between said apertures; and

a second conduit for containing the conductive fluid therein, said second conduit being closed along its length and disposed outside of said first conduit and having first and second open ends which are connected to said apertures so that the conductive fluid in said second conduit is in fluid communication only with the conductive fluid in said first conduit and through said apertures so that a continuous fluid loop containing the conductive fluid is established extending through said second conduit and across said first conduit between said apertures thereby creating a path for the conduction of an electric current through said loop across said first conduit between said apertures, and said second conduit being further situated outside of said magnetic field to minimize the effect of the magnetic field on the conductive fluid carrying the electric current in said second conduit.

4,818,186
DRIVE MECHANISM FOR DISPOSABLE FLUID INFUSION PUMPING CASSETTE
John Pastrone, Los Gatos; Leland D. Chamness, Mountain View; George H. Fellingham, San Jose, and Walter L. Jimison, Palo Alto, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed May 1, 1987, Ser. No. 45,959
Int. Cl.[4] F04B *49/10, 7/00;* **A61M** *1/00*
U.S. Cl. 417—63 **22 Claims**

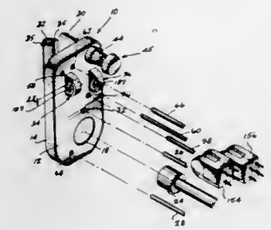
1. A driver for driving a fluid pumping cassette having valve means for controlling the flow of fluid through the fluid pumping cassette, driven by actuators associated with said driver, comprising:

a. an elongated valve actuator to operate valve means on the cassette;

b. a bracket pivotally mounted on said driver, said bracket having two arms, a first arm being pivotally secured to one end of said valve actuator;

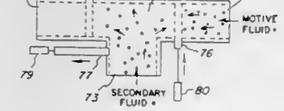
c. cam means driveably engaging the second arm of said bracket;

d. motor means to drive said cam means; and



e. positioning means to monitor the rotational position of said cam means.

4,818,187
FLUID EXCHANGE PUMP
Daniel Scampini, 64B Woodhollow, Twin Lakes Apts., Clifton Park, N.Y. 12065
Filed May 21, 1986, Ser. No. 865,369
Int. Cl.[4] F04F *1/06*
U.S. Cl. 417—137 **1 Claim**



1. A fluid exchange pump comprising:

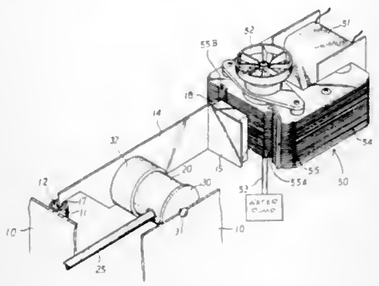
a first cylindrical conduit having inlet and outlet means and a least one arcuate port therein and radial base means;

a longitudinally chambered cylindrical body enveloping a portion of said conduit and adapted for rotation thereabout, said body containing therein at least one arcuate radial chamber, said radial chamber having an inner port and an outer port in respective slidable registry with said conduit and an outer housing, said body having an open end and a coaxially ported base disposed opposite said radial base means,

said outer housing fixedly coupled to said conduit by said radial base means and enveloping said cylindrical body so that said cylindrical body will rotate about said conduit and within said outer housing, said outer housing having arcuate ports, said arcuate ports comprising at least one outlet port and at least one inlet port; and

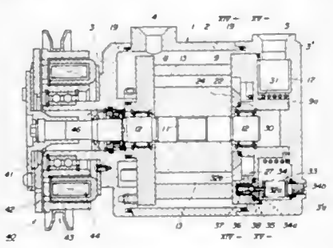
means for rotating said cylindrical body relative to said conduit, whereby when said cylindrical body is caused to rotate between said fixed conduit and said outer housing, said chamber inner and outer ports are intermittently aligned and disaligned with the arcuate ports of said conduit and said outer housing thereby allowing a sequence of admitting a secondary fluid to said chamber, isolating said secondary fluid by rotation of said chamber to then expose it to a motive fluid, pumping said secondary fluid and exhausting said motive fluid together from the filled chamber, and accomplishing the aforesaid sequence continuously by action of the rotary motion aforesaid.

4,818,188
WATER AND AIR PUMPING APPARATUS FOR A FISH-RAISING POOL
Kuan-Der Chan, No. 13, Lien Shih, Lien Shih Li, Hu Wei Chen, Yun Lin Hsien, Taiwan
Filed Dec. 21, 1987, Ser. No. 135,736
Int. Cl.[4] F04B *23/10, 43/02*
U.S. Cl. 417—201 2 Claims



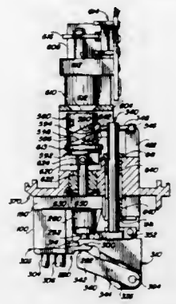
1. A water and air pumping apparatus for a fish-raising pool comprising a shaded-pole motor having an exciting coil, a shading coil and a laminated core, a centrifugal water-pumping mechanism driven by said motor, and an air pumping drum device having a compression cap, wherein the side surface of said laminated core adjacent to said shading coil but remote from said exciting coil has two longitudinal grooves symmetrical thereto and parallel to the rotating shaft of said motor, and a magnet connected to said compressing cap and disposed so as to face the area between said grooves on said side surface and to be capable of transversely reciprocating with respect to said rotating shaft so that when said motor drives said water-pumping mechanism, a strong variant magnetic field resulting from the provision of said grooves will reciprocate said magnet so that said air-pumping drum device is activated.

4,818,189
VARIABLE CAPACITY VANE COMPRESSOR
Nobuyuki Nakajima, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Nov. 14, 1986, Ser. No. 931,217
Claims priority, application Japan, Nov. 28, 1985, 60-268137
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[4] F04B *49/02;* F04C *29/08*
U.S. Cl. 417—295 10 Claims



1. In a variable capacity vane compressor including:
a clutch;
a cylinder formed of a cam ring and a pair of a front side block arranged close to said clutch and a rear side block arranged remote from said clutch, said front and rear side blocks closing opposite ends of said cam ring, said cylinder having at least one first inlet port formed therein, a rotor rotatably received within said cylinder, and a plurality of vanes radially slidably fitted in respective slits formed in said rotor; and
a housing defining a suction chamber therein, said housing having a rear head at a side of said rear side block remote from said rotor, a driving shaft on which said clutch and said rotor are secured, said driving shaft extending through said front side block, and power transmitting means mounted on said driving shaft at a side of said front side block remote from said rotor; and
wherein compression chambers are defined between said cylinder, said rotor and adjacent ones of said vanes and said compression chambers varying in volume with rotation of said rotor for effecting suction of a compression medium from said suction chamber into said compression chambers through said at least one first inlet port, and compression and discharge of said compression medium;
the improvement comprising:
at least one second inlet port formed in said rear side block and adjacent a corresponding first inlet port, said at least one second inlet port extending circumferentially and communicating said suction chamber with at least one of said compression chambers which is on a suction stroke;
an annular opening angle control element arranged in said rear side block at an end face of said rear side block facing said rotor and coaxially with said driving shaft for rotation about an axis of said driving shaft, said annular opening angle control element being so disposed that a circumferential position thereof determines the opening angle of said at least one second inlet port, said annular opening angle control element having a radially extending pressure receiving portion integrally formed on an end face thereof remote from said rotor and defining a first pressure chamber communicating with a high pressure side to be supplied with discharge pressure therefrom and a second pressure chamber communicating with said suction chamber to be supplied with a suction pressure from said suction chamber, said first and second pressure chambers being arranged in said rear side block circumferentially of said control element, said pressure receiving portion being angularly displaceable in response to a difference between pressure in said first pressure chamber and pressure in said second pressure chamber for causing said opening angle control means to vary the opening angle of said at least one second inlet port;
biasing means for urging said annular opening angle control element in a direction in which the opening angle of said at least one second inlet port is increased; and
pressure control means arranged in said rear side block and said rear head and being responsive to at least one parameter representative of a thermal load on said compressor for varying at least one of the pressure in said first pressure chamber and the pressure in said second pressure chamber, whereby a change in the opening angle f said at least one second inlet port causes a change in the timing of commencement of the compression of the compression medium;
said pressure control means comprising a valve mechanism including means for detecting said suction pressure of said compression medium in said suction chamber as said at least one parameter representative of the thermal load on said compressor, means for closing said valve mechanism to disconnect said first pressure chamber and said suction chamber from each other when the detected suction pressure is higher than a predetermined value, and means for opening said valve mechanism to allow escape of the pressure in said first pressure chamber to said suction chamber to thereby decrease said difference between the pressure in said first pressure chamber and the pressure in said second pressure chamber when the detected suction pressure is lower than said predetermined value.

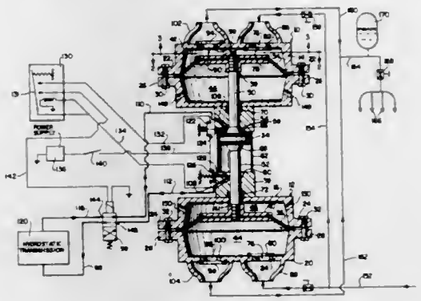
4,818,190
CASSETTE LOADING AND LATCHING APPARATUS FOR A MEDICATION INFUSION SYSTEM
John P. Pelmulder, Chatsworth, and Lanny A. Gorton, Sunland, both of Calif., assignors to Pacesetter Infusion, Ltd., Sylmar, Calif.
Filed Dec. 1, 1987, Ser. No. 127,359
Int. Cl.[4] F04B *39/14*
U.S. Cl. 417—360 20 Claims



1. A system for facilitating the installation of a disposable cassette comprising a pump with a reciprocating piston onto a main unit in a medication infusion system or the like, comprising:
latch means on said disposable cassette for locking said disposable cassette in the proper position on said main unit, said latch means being movable between a first unlatched position and a second latched position;
means on said main unit for engaging said latch means on said disposable cassette when said cassette is placed in the proper position on said main unit, said engaging means on said main unit being engaged by moving said latch means from said first unlatched position to said second latched position;
means located on said main unit for receiving and driving said piston of said pump, said receiving and driving means having a first open position for receiving said piston when said disposable cassette is installed onto said main unit and a second closed position for engaging said piston with said receiving and driving means; and
interlocking means for moving said receiving and driving means from said first open position to said second closed position when said latch means is moved from said first unlocked position to said second locked position with said disposable cassette installed onto said main unit.

4,818,191
DOUBLE-ACTING DIAPHRAGM PUMP SYSTEM
Bernard H. Schlake, Cincinnati, Ohio, assignor to Neyra Industries, Inc., Cincinnati, Ohio
Continuation of Ser. No. 364,473, Mar. 31, 1982, abandoned.
This application Aug. 15, 1984, Ser. No. 640,556
Int. Cl.[4] F04B *43/06*
U.S. Cl. 417—390 9 Claims

1. A system for pumping fluid materials comprising
(a) a dual-acting diaphragm pump comprising spaced housings having flexible diaphragms for dividing the housings into pumping and back chambers
(b) inlet and outlet valved openings in communication with each of said pumping chambers
(c) inlet lines and outlet lines connected to said inlet and outlet valved openings
(d) a hydraulic cylinder and piston interposed between said housings
(e) a piston shaft extending between said diaphragms and engaged with opposed faces of said piston
(f) hydraulic means engaged with opposite ends of said hydraulic cylinder for activating said piston and piston shaft
(g) a directional control valve connected to said hydraulic means for alternately supplying hydraulic fluid to opposite ends of said hydraulic cylinder to effect reciprocating movement of said piston shaft and resultant movement of said flexible diaphragms to draw the fluid material into, and then expel the fluid material from, said pumping chambers



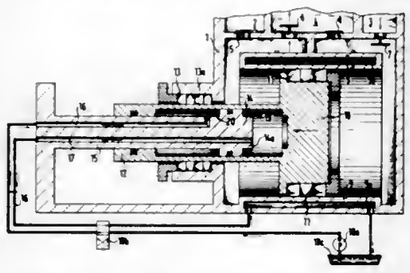
(h) a pressure compensated variable volume pump connected with said hydraulic means and said directional control valve for maintaining constant output pressure of the pumped fluid material
(i) power means for activating said variable volume pump
(j) an expansion tank connected to, and mounted above, said outlet line for minimizing the drop in the pressure of the pumped fluid material, and
(k) electrical means for operating said directional control valve to reverse the direction of flow of hydraulic fluid through said directional control valve and effect reversal in the direction of movement of said piston shaft to alternate the discharge of fluid materials from said pumping chambers.

4,818,192
RECIPROCATING PUMP
Ernst Korthaus, Sonnenstrasse 112, 4600 Dortmund 1, Fed. Rep. of Germany
PCT No. PCT/EP84/00093, § 371 Date Nov. 30, 1984, § 102(e) Date Nov. 30, 1984, PCT Pub. No. WO84/03914, PCT Pub. Date Oct. 11, 1984
PCT Filed Apr. 3, 1984, Ser. No. 679,040
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1983, 3312357; Mar. 24, 1984, 3410911
Int. Cl.[4] F04B *21/00*
U.S. Cl. 417—372 7 Claims

1. A double-acting reciprocating pump for liquids which pump can operate dry without overheating, which comprises:
a hydraulically-driven plunger disposed within a pump cylinder for reciprocating movement therein, said plunger having plunger packings disposed between said plunger and said pump cylinder, said pump cylinder having flow-through openings in communication with a coolant circuit to cool said plunger packings;
a plunger rod connected to said plunger which rod passes

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through a stuffing box and is sealed from said pump cylinder by stuffing box packings, said plunger rod having at



least one hollow space which is in connection with said coolant circuit to cool said stuffing box packings.

4,818,193

CENTRIFUGAL PUMP SELECTIVELY MOUNTABLE IN CENTERLINE OR INLINE POSITION

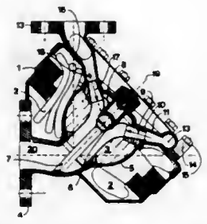
Karsten A. Laing, and Birger J. Laing, both of Remseck-2, Fed. Rep. of Germany, assignors to Laing Holding and Associates, San Diego, Calif.

Filed Sep. 17, 1987, Ser. No. 98,363

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1986, 3631710

Int. Cl.⁴ F04B *39/12*

U.S. Cl. 417—423.15 **5 Claims**



1. A centrifugal pump with a first port and perpendicular to this port a first axis which appertains to the first port and a second port and a second axis appertaining in the same way to said second port, the pump forming a unit with an electric motor driving an impeller with an appertaining axis of rotation, all three axes lying in the same geometrical plane, the first axis and the second axis forming an angle of 45 degrees with the axis of rotation, the pump exhibiting a housing consisting of two portions connected to each other along a periphery lying in a plane of rotation appertaining to the axis of rotation, one of said ports forming a unit with the remaining portion of the pump housing, said two portions being selectively mountable in a first position in which the first and the second axis form an angle of 90 degrees and in a second position in which the first and the second axis form a single line.

4,818,194

CHECK VALVE ASSEMBLY FOR FLUID PRESSURE INTENSIFYING APPARATUS

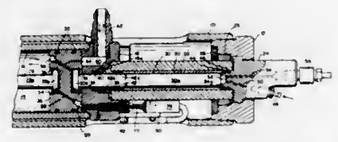
Albert C. Saurwein, 5 F St., SE., Auburn, Wash. 98002

Filed Jun. 11, 1987, Ser. No. 60,521

Int. Cl.⁴ F04B *21/02*

U.S. Cl. 417—567 **12 Claims**

1. Fluid inlet-outlet means for mounting in fluid communication with a high pressure chamber of a reciprocating piston cylinder, said fluid inlet-outlet means comprising a check valve body fitable to said high pressure chamber, said valve body being provided with a longitudinal axial fluid passage opening at one end for fluid communication with an adjacent high pressure piston chamber and opening at the other end into a cavity provided in an adjacent high pressure outlet line coupling; a low pressure fluid inlet distributor mounted by said valve body, with said valve body being provided with an elongated inlet fluid passage opening at one end for fluid communication with an adjacent high pressure piston chamber and opening at the other end into the adjacent low pressure fluid inlet distributor, said inlet fluid passage extending acutely outward through said valve body from its inner end to its outer end to an annular land provided in the exterior of said valve body, and said inlet distributor having an annular configuration and being axially fitted around said valve body and sealed against said annular land in fluid communication with said inlet fluid passage; distributor sealing means that fluid-tightly secures said inlet distributor to said valve body annular land; a valve mechanism for said valve body comprising an elongated valve stem extended through said axial fluid passage and extending out from the inner end of said valve stem and extend-



ing into the coupling cavity at the outer end of said valve stem and being so configured as to enable high pressure fluid to pass from said inner end through said axial fluid passage into said coupling cavity, and further comprising an inlet poppet slidably mounted on the inner end of said valve stem and being so configured as to overlay and seal off the inlet fluid passage opening when the force exerted by fluid from a high pressure fluid chamber exceeds the force exerted by inlet fluid within said inlet fluid passage; and outlet seat element exposed to said coupling cavity and through which said valve stem extends, an outlet poppet mounted by said valve stem outer end within said coupling cavity and so configured as to be able to seat against said outlet seat element to seal said axial fluid passage from high pressure fluid backflow out of said coupling cavity; a high pressure fluid outlet line coupling externally mounted to said valve body, said outlet line coupling being provided with an internal coupling passage within which said valve stem extends as aforesaid; a low pressure fluid inlet line coupling externally mounted to said fluid inlet distributor; and valve body mounting means compressively fitting said valve body to the adjacent high pressure chamber and being configured whereby fluid inlet and discharge through said valve body is independent of the valve body mounting.

4,818,195

SCROLL COMPRESSOR WITH VALVED PORT FOR EACH COMPRESSION CHAMBER

Akira Murayama; Naoshi Uchikawa; Ryoichi Kuroshima; Hiroaki Kuno; Tetsuya Arata, and Masao Shibayashi, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

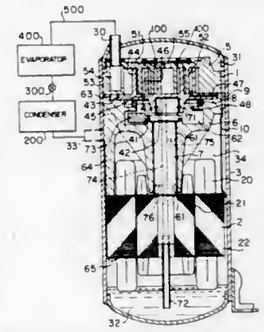
Continuation of Ser. No. 14,476, Feb. 13, 1987, abandoned. This application Jun. 17, 1988, Ser. No. 208,110

Claims priority, application Japan, Feb. 26, 1986, 61-39223

Int. Cl.⁴ F04C *18/04, 29/08*

U.S. Cl. 418—15 **5 Claims**

1. A scroll compressor including an orbiting scroll member and a stationary scroll member, each scroll member having an end plate and a substantially spiral wrap protruding substantially perpendicularly from one side of the end plate, said scroll members being assembled with the spiral wraps thereof engaged with each other so that a plurality of closed spaces are defined between said spiral wraps and said end plates to form compression chambers, said orbiting scroll member being adapted to make an orbiting motion with respect to said stationary scroll member so that the compression chambers are progressively moved towards a center of the spiral wrap of said stationary scroll member while the volumes of the compression chambers are progressively decreased to compress a gas sucked into said closed spaces, communication port means for communicating said compression chambers with a discharge chamber in which a discharge pressure is built up, and valve members associated with said communication port means, said valve members being adapted to open an associated communication port means due to a difference in pressure between the compression chamber and said discharge chamber, wherein said communication port means comprises groups



of communication ports formed in the end plate of said stationary scroll member, each valve member comprises a lead valve associated with communication ports of one of said groups, a valve seat for the lead valve defined by a planar bottom face of a recess formed in an end face of the stationary scroll member adjacent said discharge chamber, and each lead valve extends along a chord with an outer end fixed to the bottom face and a free inner end in the vicinity of the center of the spiral wrap so as to cooperate with one of the groups of communication ports, and wherein an angular distance, expressed in terms of a wrap angle $\Delta\lambda$, between said communication ports of one group which are successively opened to the same compression chamber in accordance with the orbiting motion of said orbiting scroll member is determined to meet the following condition:

$$0<\Delta\lambda<2\pi$$

4,818,196

VARIABLE CAPACITY VANE-TYPE MOTOR HAVING A CONTROL CHANNEL SELECTIVELY COMMUNICATING WITH THE WORK CHAMBER

Manfred Kahrs, Wiesbaden, and Hermann Schoellhorn, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 8, 1987, Ser. No. 1,398

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1986, 3601050

Int. Cl.⁴ F01C *21/16;* **F03C** *2/22*

U.S. Cl. 418—22 **4 Claims**

1. A vane-type motor comprising,

a housing,

a rotor disposed in said housing,

at least two cam rings surrounding said rotor in axially disposed side-by-side relationship, at least one of said cam rings being rotatable in a circumferential direction relative to another of said cam rings,

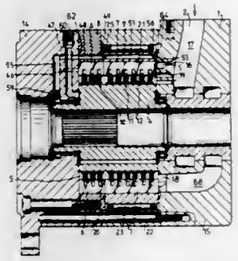
sets of vanes respectively associated with each of said cam rings, said vanes being displaceable in radially extending slots in said rotor and subdividing a work chamber between said rotor and said cam rings into work cells,

two side plates laterally confining said work chamber,

an inlet channel to supply a pressure fluid to the work chamber,

a discharge channel through which said pressure fluid can be discharged from the work chamber and

a control channel selectively communicating between said inlet channel and said work chamber, said rotor defining a



control element means to cyclically cause communication via said control channel between said work chamber and said inlet channel to preclude and control sudden pressure build-up in said work chamber.

4,818,197

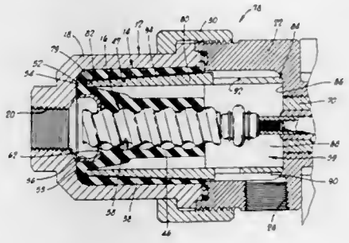
PROGESSIVE CAVITY PUMP

James W. Mueller, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 20, 1987, Ser. No. 4,503

Int. Cl.⁴ F04C *2/107, 5/00*

U.S. Cl. 418—48 **7 Claims**



1. A progressive cavity pump comprising:

a first housing portion defining an inlet therethrough;

a second housing portion attachable to said first housing portion and defining an outlet therethrough;

a substantially elastomeric stator comprising:

an outer portion removably attached to said first and second housing portions having a first end and a second end spaced from said first end;

an inner portion defining a pumping chamber therethrough and having a first end and a second end spaced from said first end of said inner portion; and

an annular end portion interconnecting said first ends of said outer and inner portions;

a rotor disposed in said inner portion of said stator and extending through said pumping chamber for pumping fluid from said inlet to said outlet in response to rotation of said rotor; and

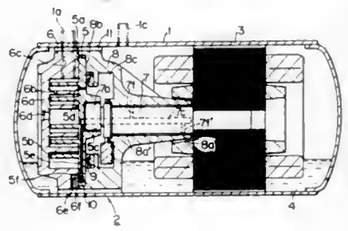
an elongated member disposed in said housing portions and generally annularly between said inner and outer portions of said stator and longitudinally between said annular end portion of said stator and a portion of said second housing portion, said member being removable from said housing portions and separable from said stator.

4,818,198

SCROLL FLUID MACHINE WITH OIL FEED PASSAGES

Takahiro Tamura, Shimizu, and Kazuo Sakurai, Shizuoka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 13, 1987, Ser. No. 120,098
Claims priority, application Japan, Nov. 26, 1986, 61-281092
Int. Cl.[4] F04C *18/04, 29/02*
U.S. Cl. 418—55 4 Claims



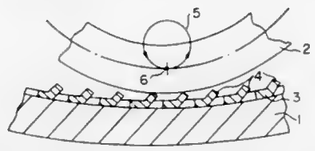
1. A scroll fluid machine of horizontal type, comprising a closed housing including a suction port and a discharge port, an oil reservoir at its bottom, an electric motor arranged within said closed housing, a horizontally extending drive shaft driven by said motor, a frame secured to inside of said closed housing for rotatably supporting said drive shaft, and a scroll component arranged within said closed housing and driven by said drive shaft, said scroll component including a fixed scroll and an orbiting scroll each having an end plate and a spiral wrap integrally upstanding from the end plate, the wraps of the respective fixed and orbiting scrolls meshing with each other, said drive shaft being in engagement with said orbiting scroll, said end plate of said orbiting scroll being slidably held between said frame and said end plate of said fixed scroll, said orbiting scroll being arranged to move in orbital motion relative to said fixed scroll without rotation orbiting scroll about its own axis, and said end plate of said fixed scroll being formed with a radial hole for communicating said suction port with a peripheral portion of said scroll wraps, and with an axial hole at the center of the end plate for communicating the central portion of the scroll wraps with said discharge port through a void space of said closed housing for maintaining the pressure inside of said closed housing at a discharge pressure level, wherein said frame is formed with a recess opposite to said end plate of said orbiting scroll for defining a back pressure chamber on the rear side of the orbiting scroll, said end plate of the orbiting scroll is formed with a penetrating hole at a radially intermediate position of the scroll for maintaining the pressure in said back pressure chamber at an intermediate pressure level between the suction pressure level and the discharge pressure level of the scroll machine and pressing said orbiting scroll on said fixed scroll, said end plate of the fixed scroll is further formed with a first feed oil passage having one end communicating with said oil reservoir and the other end opening on a sliding surface contacting with said orbiting scroll, said end plate of the orbiting scroll is formed with a second feed oil passage having one end always communicating with said other end of said first feed oil passage and the other end opening at the vicinity of the orbiting axis of the orbiting scroll opposite to said drive shaft, and said drive shaft is formed with a third feed oil passage having one end communicating with said other end of said second feed oil passage and the other end of said second feed oil passage and the other ends opening to the bearing portions of said frame supporting said drive shaft, said bearing portions communicating with said back pressure chamber, such that the oil is forced to flow from said oil reservoir to said contact surfaces of said scrolls and to the bearing portions of the frame through said first, second and third feed oil passages by virtue of the pressure difference existing between said discharge pressure in said oil reservoir and the intermediate pressure in said back pressure chamber.

4,818,199

SPIRAL DISPLACEMENT MACHINE FOR COMPRESSIBLE MEDIA WITH EMBOSSED SHEET METAL SEAL STRIP

Klaus-Dieter Emmenthal; Claus Müller, and Otto Schäfer, all of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,548
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636628
Int. Cl.[4] F01C *1/04, 19/02;* F16J *15/16, 15/447*
U.S. Cl. 418—55 8 Claims



1. A displacement machine for compressible media, comprising a stationary housing having at least one displacement chamber rendered in the manner of a groove extending with a spiral shape, a band-shaped displacement body associated with each displacement chamber and likewise rendered in spiral shape, a discoid rotor supporting the displacement body for eccentric motion in relation to the housing so that, during operation, each of the displacement body's outside wall points performs a circular movement bounded by peripheral walls of the displacement chamber, the curvature of the displacement body relative to the curvature of the displacement chamber being arranged so that the displacement body nearly comes in contact with and forms a radial gas with radially inner and outer peripheral walls of the displacement chamber at least ooe line of sealing which advances continuously during operation, and a sheet metal strip between the displacement body and a wall of the displacement chamber having outwardly projecting scale-like embossings so as to seal the radial gap therebetween.

4,818,200

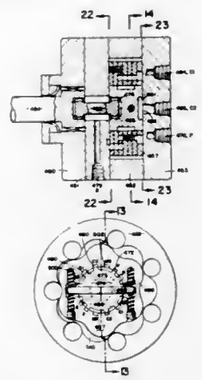
HYDROSTATIC STEERING DEVICE HAVING THE CONTROL VALVE WITHIN THE ROTOR

Hollis N. White, Jr., 243 Pyle La., Hopkinsville, Ky. 42240

Continuation of Ser. No. 883,980, Jul. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 812,443, Dec. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 763,001, Aug. 6, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 142,301
Int. Cl.[4] B62D *5/083, 5/097;* F04C *2/10;* F15B *13/04*
U.S. Cl. 418—61.3 13 Claims

1. An improvement for a hydrostatic steering device including a control valve and an operational gerotor set having an orbiting rotor, the improvement comprising the rotor surrounding the control valve and the control valve orbiting with the rotor.

9. An improved hydrostatic steering device, said device comprising a drive shaft, a valve seat, means to rotatably connect said valve seat to said drive shaft, a valve member-rotor, means surrounding and cooperating with the valve member rotor to form pressure cells for rotating the valve member-rotor, means to get fluid to and from said cells, said valve member-rotor surrounding part of said valve seat, said valve seat and valve member-rotor forming a valve at their joint, means to get fluid to said valve, means to get fluid from said valve, means within the location where said valve member-rotor surrounds said valve seat to resiliently connect said valve member-rotor to said valve seat for a certain degree of rotation, and means to lost-motion drivingly rotatably connect said valve member-rotor to said drive shaft after said certain degree of rotation.

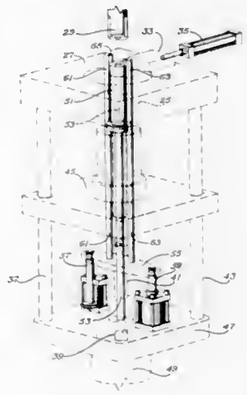


4,818,201

METHOD OF MANUFACTURING BUSHINGS WITH POWDERED METALS

Billy G. Howard, Arlington, Tex., assignor to Martin Sprocket & Gear, Inc., Arlington, Tex.

Filed Nov. 19, 1987, Ser. No. 122,839
Int. Cl.[4] B22F *3/00*
U.S. Cl. 425—78 10 Claims



1. A die assembly for forming with powdered metal selected machine components such as bushings for shafts, the assembly comprising:

a die including a cavity for receiving powdered metal and forming a hollow metal bushing of a selected inner wall dimension and a tapered and grooved outer wall configuration;

a lower punch to form the lower end of the cavity;

an upper punch to extend and retract into the opposite end of the die to form the upper end of the cavity;

a core extending through the lower punch, into the cavity and into a lower region of the upper punch during powdered metal compression to form the inner wall of the bushing;

feeder means to deposit powdered metal in the cavity when the upper punch is retracted;

core extension rods extending through the die, generally parallel with the core, with lateral protrusions extending into the cavity to form grooves on the exterior of the bushing;

means moving the core extension rods in concert with the core between a powder compression position and a position to expel the finished bushing.

4,818,202

HYDRATION MEANS

Christopher G. Bevan, Corby, and Douglas Hacking, Mowbray, both of England, assignors to C. G. Bevan Associates Limited, Northamptonshire, England

Filed Jan. 25, 1988, Ser. No. 147,991
Claims priority, application United Kingdom, Jan. 29, 1987, 8701971
Int. Cl.[4] B29C *33/80;* B28B *1/08, 21/14*
U.S. Cl. 425—90 11 Claims



1. In apparatus for use in the manufacture of cored construction products formed from dry particulate materials and comprising a mould, a mould cavity defined by the mould, an elongate core former removably disposable within the mould cavity along a vertical axis thereof, and vibration means operable on the mould to compact or pre-compact dry particulate materials, and any fibres provided therein, present in the mould, and an hydration means adapted to apply setting liquid to a surface formed in the dry particulate material on withdrawal of the core former, the improvement wherein the hydration means comprising a freely suspended hydration head reciprocable along a path coincident with the vertical axis aforesaid and adapted to receive setting liquid from a supply thereof and deliver the same as a spray to the said surface.

4,818,203

SYSTEM FOR INJECTION MOLDING ELONGATED BODIES

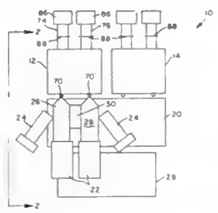
Norbert Majerus; Harold E. Mills, and John S. Rambacher, all of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 2, 1988, Ser. No. 201,769
Int. Cl.[4] B29C *45/14*
U.S. Cl. 425—115 20 Claims

1. Apparatus for injection molding a continuous elongated body made of curable fluid molding material by increments, said apparatus comprising a mold, a mold cavity in said mold, a temperature moderated closed end of said mold cavity, an open end of said mold cavity spaced from said closed end a distance less than the length of said elongated body, means for injecting a curable fluid molding material into said mold cavity to form a first section of said elongated body in a first position with a trailing portion abutting said closed end, means for heating said injected fluid molding material to cure said first

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section, temperature moderating means for limiting the heating of said trailing portion of said first section at said closed end to prevent full curing of said trailing portion of said first section, means for opening said mold to permit shifting of said first section longitudinally from said first position in said mold cavity to a second position with said trailing portion of said first section at said open end of said mold cavity and the remainder of said first section outside of said mold, means for closing said mold to enclose said mold cavity and clamp said trailing portion of said first section, said means for injecting said curable fluid molding material being operative to form a



second section of said elongated body with a leading portion of said second section abutting said trailing portion of said first section and a trailing portion of said second section abutting said closed end of said mold cavity, said means for heating being operative to heat said injected fluid molding material of said second section and said trailing portion of said first section to cure said second section and adhere said trailing portion of said first section to said leading portion of said second section, and said opening means being operative to open said mold for removing said trailing portion of said first section and said second section of said elongated body from said mold cavity.

4,818,204

MOLD FOR MOLDING SEMICONDUCTOR DEVICES

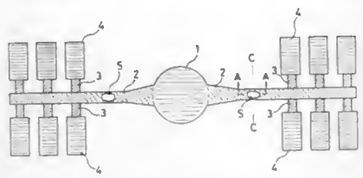
Osamu Nakagawa; Koji Yanagitani; Ikuo Sasaki, and Toshinobu Banjo, all of c/o Mitsubishi Denki Kabushiki Kaisha, Kitaitami Seisakusho, No. 1, Mizuhara 4-chome, Itami-shi, Hyogo-ken, Japan

Filed May 30, 1986, Ser. No. 868,590

Claims priority, application Japan, May 31, 1985, 60-119084

Int. Cl.⁴ B29C *39/10*

U.S. Cl. 249—83 **6 Claims**



1. A metal mold for plastic molding a semiconductor device by a transfer-molding method with the use of thermo-hardening plastic, which comprises:

a pot section for receiving plastic;

a runner section operatively connected to said pot section for receiving a flow of said plastic from said pot section;

a flow restrictor section mold in the form of an obstruction elongated in the direction of flow in said runner section, wherein said flow restrictor section is positioned medially in said runner section and projects into said runner section so as to permit flow on either side of said flow restrictor section, said flow restrictor section being tapered toward said pot section and away from said pot section, and said flow restrictor section reducing the cross-sectional area of said runner section to provide opportunity for complete melting of said plastic a first time so as to reduce the viscosity of said plastic;

a gate section operatively connected to said runner section for receiving said plastic from said runner section, and having a cross-sectional area reduced from that of said runner section to provide a further opportunity for melting said plastic to insure complete melting of said plastic so as to further reduce the viscosity of said plastic; and

a cavity section operatively connected to said gate section for receiving said plastic and for forming said plastic into a product, whereby said flow restrictor section provides for a reduction in the number of internal voids in said product.

4,818,205

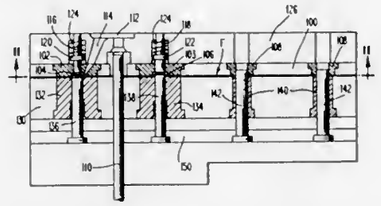
APPARATUS FOR MOLDING A SNAP FASTENER ONTO FABRIC

James E. Burke, Huntington, and Robert J. Zavatkay, Torrington, both of Conn., assignors to Scovill Fasteners Inc., New York, N.Y.

Division of Ser. No. 127,958, Dec. 2, 1987. This application Sep. 30, 1988, Ser. No. 251,302

Int. Cl.⁴ B29C *39/18, 41/20*

U.S. Cl. 425—117 **3 Claims**



1. An apparatus for molding a plastic snap fastener head including a base flange and a head element onto fabric comprising:

a. A core pin mounted on a retainer plate,

b. A first mold plate including a mold insert and having a bore therethrough slideably receiving the core pin,

c. A second mold plate reciprocally mounted to move toward and away from the first mold plate and an insert having a bore aligned with the bore on the first mold plate, the two plates adapted to press between them during molding a layer of fabric,

d. At least one ejection pin in the core on the second mold plate and designed to engage during the molding the distal end of the aligned core pin, and spring means urging the ejection pin toward the core pin and stop means limiting its travel toward the first plate,

the ejection pin and the core pin and the surrounding areas of the first and second mold plates being shaped to form a fastener head with the head on one side of the fabric and the flange on the other side, the spring-pressed ejection pin upon the opening of the mold and retraction of the core pin being adapted to follow the core pin till the travel of the ejection pin is limited by the stop means to eject the fastener head from the mold, the part having a central opening in the top of its head where during molding the spring-pressed ejection pin engaged the core pin.

4,818,206

MULTI-SCREW EXTRUDER

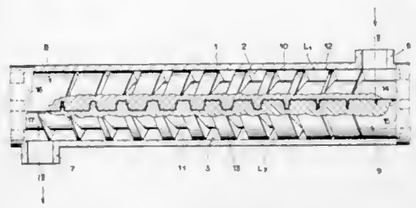
Charles E. Maillefer, Au Village, 1164 Buchillon, Switzerland

Filed Oct. 7, 1987, Ser. No. 105,259

Claims priority, application Switzerland, Oct. 23, 1986, 42224/86

Int. Cl.⁴ A01J *17/00*

U.S. Cl. 425—204 **6 Claims**



1. A machine section is a multi-screw machine for processing plastics material, said machine section comprising:

a cylinder extending longitudinally from an inlet end to an outlet end and including, a first bore having a first inner surface, a second bore having a second inner surface, and a feed passage at said inlet end having an inlet opening in said first inner surface, and an extraction passage at said outlet end having an outlet opening in said second inner surface;

a first screw accommodated in said first bore and a second screw accommodated in said second bore, said first and second bores being connected to one another laterally, said first and second inner surfaces having two common ridges extending from said inlet end to said outlet end, said screws having both a core and mutually meshing thread means, and being supported by bearings outwardly of said bores;

said inner surfaces, said cores and said thread means defining a plurality of crescent-shaped free spaces in each of said first and second bores and a plurality of gaps of predetermined clearances between said free spaces, said free spaces decreasing in volume in said first bore from said inlet end to said outlet end, said free spaces increasing in volume in said second bore from said inlet end to said outlet end; and

said inlet and outlet openings continuously and directly communicating with at least one of said free spaces in said first and second bores, respectively, to introduce said plastics material into said first bore and discharge said plastics material from said second bore, said machine section operating as a melting section of an extrusion machine, the pressure in said first bore being higher than the pressure in said second bore.

4,818,207

CURSIVE LETTER DOUGH CUTTER

Helen L. Heron, 1085 Murrieta Ave., #212, Livermore, Calif. 94550

Filed Mar. 28, 1988, Ser. No. 174,159

Int. Cl.⁴ A21C *11/10*

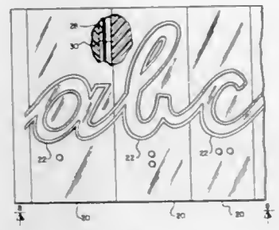
U.S. Cl. 425—289 **15 Claims**

1. A dough cutter having a plurality of individual cursive alphabetic letters attached together to form a continuous combination of letters comprising:

(a) a plurality of rectangular cutter bodies each having a top surface, a bottom surface, an upper edge, a lower edge, a first side and a second side;

(b) a raised individual cursive alphabet letter disposed integrally with said top surface completely filling the surface from the first side to the second side with the letter starting and ending at the same position on the sides relative to the lower edge;

(c) a pair of extended cutting blades outwardly deployed from the bottom surface of said body in the form of a border of a cursive alphabet letter duplicating the raised individual letter on the top, except reversed in mirror image thereunto, said blade terminating with a sharp edge allowing dough to be cleanly cut when pressed thereunto; and,



(d) attaching means to connect a plurality of bodies together to form a continuous combination of alphabetic letters allowing dough to be cut into a single piece with the blade mating on the sides outlining the letters.

4,818,208

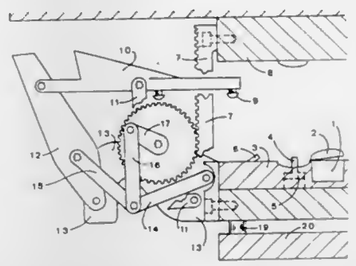
MOLD CLOSING DEVICE

John R. Byrne, 1519 Prospect St., Watertown, Wis. 53094

Filed Mar. 14, 1988, Ser. No. 167,494

Int. Cl.⁴ A01J *21/00*

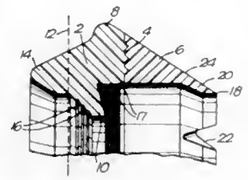
U.S. Cl. 425—394 **1 Claim**



1. A mold comprising a moveable mold member provided with adjacent cavities for a cap and a lid, ejection means on said moveable mold member beneath the cavity for the lid to eject said lid from said lid cavity, a rack attached to the fixed mold member and a gear including a crank arm attached to said moveable mold member, a pivoted linkage attached to said moveable mold member and to said crank arm, said pivoted linkage also being attached to a plate having means thereon extending towards the moveable mold member for forcing a lid closed, said rack, gear and pivoted linkage moving said plate into the space between the mold members when the mold is open and moving said plate out of the space between the mold members when the mold is closed.

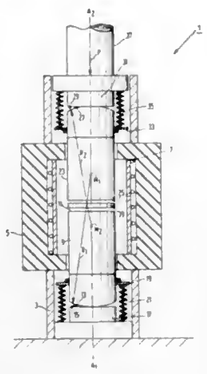
VOL 1101 ISS 1 AP 4 1989 UMI

4,818,209
MOULD AND SEALING RING
Stefan Petersson, Forsheda; Bror Gustafsson, Gislaved, both of Sweden, and Gunnar Parmann, Alv y, Norway, assignors to Forsheda AB, Forsheda, Sweden
Filed Apr. 15, 1987, Ser. No. 38,737
Claims priority, application Sweden, Apr. 17, 1986, 8601750
Int. Cl.[4] B29C 57/06
U.S. Cl. 425—392 13 Claims



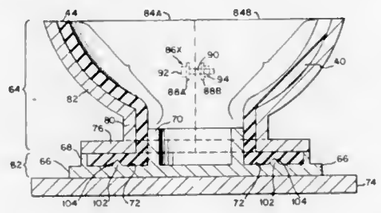
1. In combination:
a cylindrical mandrel having an annular projection and a pair of annular grooves therein, wherein said annular projection separates said grooves and abuts an annular shoulder of said reinforcing portion; and
a mold and sealing ring mounted on said mandrel, said ring including a first annular sealing portion of elastically yieldable sealing material having an inner peripheral projecting portion received in one of said grooves in radially compressed relation and a second annular reinforcing portion of a rigid material positioned axially adjacent and in abutting relation with said sealing portion, said reinforcing portion having a wedge shape for guiding a heated plastic pipe end thereover and having a resiliently expandable edge portion with a sharp edge received in the other of said grooves in radially expanded relation.

4,818,210
APPARATUS FOR COMPRESSING A STACK OF JUXTAPOSED FOILS
Cornelis D. Van Dijk, Veldhoven; Johannes Brandsma, and Willem R. De Wild, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 14,514, Feb. 3, 1987, abandoned. This application Jun. 15, 1988, Ser. No. 210,069
Claims priority, application Netherlands, Feb. 25, 1986, 8600462
Int. Cl.[4] A01J 21/00
U.S. Cl. 425—411 6 Claims



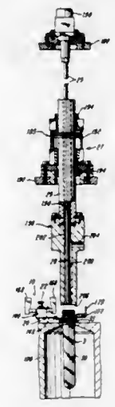
1. In an apparatus for compressing a stack of juxtaposed foils containing an oxidic ceramic powder that may be mixed with an organic binder and layers, provided with patterns of electrical conducting material, interposed between said foils, said apparatus comprising a furnace and two dies, supported in opposed relationship to each other, each die having a pressure face and an end face remote from said pressure face, said pressure faces opposing each other, supporting means for supporting said dies, at said end faces, in a direction opposed to each other along an axis extending along the centers of each said dies and intersecting said faces, at least one of said supporting means being capable of pressing the pressure face of the die supported thereby toward the opposing pressure face of the opposing die in a direction along an axis joining said end faces and means connected to said dies for maintaining said dies in a direction opposed to each other along said axis, and said dies extending through boundary walls of said furnace in a manner such that the opposing pressure faces are positioned within the furnace and that said stack can be arranged between said pressure faces, the improvement wherein a spherical bearing surface contacting a planar bearing surface is provided between one of said supporting means and the end face of said die supported by said supporting means, said spherical bearing surface extends in a direction transverse to said axis and at least one of said end faces has a spherical bearing surface.

4,818,211
DIE SYSTEM FOR MAKING MANHOLE FRAME FOR SPHERICAL TANKS
William J. Weidman, Old Tappan, N.J., and Edmund Netz, Rego Park, N.Y., assignors to Cardinal Tank Co., Brooklyn, N.Y.
Filed Mar. 24, 1987, Ser. No. 29,625
Int. Cl.[4] B29C 41/04
U.S. Cl. 425—425 12 Claims



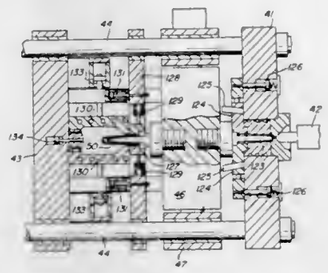
1. A die system for making an access-hole frame for a spherical tank made of a nonmetal moldable material, the access-hole frame including a cylindrical neck having circular top and bottom edges as oriented with the spherical tank and forming a cylindrical access hole, an outwardly extending, partly spherical collar connected to the bottom edge of the neck, and a radially outwardly extending access-hole flange having top and bottom sides and connected to the top edge of the neck, the die system, comprising, in combination,
a rotatable table, supporting a three-piece die,
said three-piece die including:
bottom die means having an access-hole-frame flange cavity and for forming a portion of the neck of the frame upon application of the nonmetal moldable material to said bottom die means,
first top die means for forming the remaining portion of the neck of the frame and for forming the collar of the frame,
second top die means is removably fitted together with said first die means to form an operational top die means, for forming the remaining portion of the neck of the frame and for forming the collar of the frame,
securing means for removably holding said first and second die means together as said operational top die means ready for a molding process,
said operational top die means is removably fitted on top of said bottom die means subsequent to said application of the nonmetal moldable material to said bottom die means, and in conjunction with said bottom die means being for forming the remaining portion of the neck of the frame and for forming the collar of the frame upon application of said nonmetal moldable material to said operational top die means after being fitted on top of said bottom die means.

4,818,212
BLOW MOLDING APPARATUS
Joseph F. Gibbemeyer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Division of Ser. No. 869,499, Jun. 2, 1986. This application Jun. 12, 1987, Ser. No. 60,809
Int. Cl.[4] B29C 48/12
U.S. Cl. 425—529 5 Claims



1. An improved stuffer apparatus for use in blow molding a plastic bottle within a blow mold from a plastic preform and comprising:
a stuffer cylinder having a hollow plunger with a first bore extending completely therethrough;
a stuffer nose secured on an end of said hollow plunger, having a nose sealing structure for establishing an air tight seal with the preform, and haviong a nose bore extending coaxially from said first bore to and thru said sealing structure;
a long stroke center rod cylinder mounted vertically above and coaxial with said stuffer cylinder, having a centering plunger that extends when fully retracted through all of the above bores to about a remotest part of said nose sealing structure; and having a stroke large enough to move an outboard end of said centering plunger from said fully retracted position to engagement with a bottom of the preform being blown when at the blow mold bottom; and
blow air passage means in said nose for conveying blow air through the nose to an exit into the preform at said nose sealing structure.

4,818,213
INJECTION BLOW MOLDING
Siegfried S. Roy, 34 Nathan Lord Rd., Amherst, N.H. 03031
Continuation of Ser. No. 740,893, Jun. 3, 1985, Pat. No. 4,615,667, which is a continuation-in-part of Ser. No. 560,592, Dec. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 367,467, Apr. 12, 1982, abandoned. This application Oct. 6, 1986, Ser. No. 916,002
Int. Cl.[4] B29C 49/06
U.S. Cl. 425—533 4 Claims



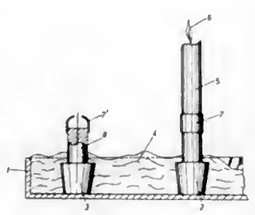
1. Injection blow molding apparatus for use in making blow molded hollow articles of thermoplastic material having a neck with a neck opening, comprising at least one preform core having a free end and having a portion of constant cross section adjacent its base end and an adjoining tapered portion, a preform injection molding station and a blow molding station, means for mounting the core for step-wise movement to bring said core at different times into positions presented toward the preform injection molding station and the blow molding station, and neck ring split means for the core including neck engaging elements relatively movable in a direction radially toward and away from the outside of the neck of the article being formed, and shifting means operative when the core is presented toward the blow molding station for shifting the preform on the core toward the free end of the core and thereby provide spacing between the preform and said tapered portion of the core while means operative when the preform has been shifted toward the free end of the core are urging the neck engaging elements into engagement with each other so that the neck of the preform remains in sealing contact with the constant cross-section base end portion of said core, in the position where the core is presented toward the blow molding station prior to a blow molding operation.

4,818,214
DEVICE FOR EXTINGUISHING THE FLAME OF A CANDLE
Sture Ronnback, Box 172, S-430 93 Halso, Sweden
PCT No. PCT/SE87/00370, § 371 Date Jun. 6, 1988, § 102(e) Date Jun. 6, 1988, PCT Pub. No. WO88/01714, PCT Pub. Date Mar. 10, 1988
PCT Filed Aug. 24, 1987, Ser. No. 187,527
Claims priority, application Sweden, Aug. 25, 1986, 8603568
Int. Cl.[4] F23N 5/00
U.S. Cl. 431—35 1 Claim

1. A device for extinction of the flame of a burning candle, characterized by a sleeve of heat-shrinkable plastic which is

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applied about the candle so as to encircle the latter, which sleeve, when affected by the heat generated by the candle



flame, is arranged to shrink and at least partly close about the end of the candle, thus extinguishing the flame.

4,818,215

THERMALLY COLOR-CHANGING CANDLFHOLDER

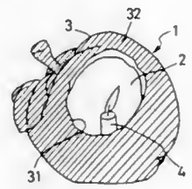
Hideji Taga, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Nagoya, Japan

Filed Mar. 16, 1988, Ser. No. 169,243

Claims priority, application Japan, Mar. 23, 1987, 62-42342[U]

Int. Cl.⁴ F23Q *2/32*

U.S. Cl. 431—126 **7 Claims**



1. A candleholder comprising: a shell shaped to simulate an external appearance of a predetermined object, said shell having a hollow interior chamber for accommodating a candle and an opening communicating with said chamber; and a layer of a thermally color-changing material formed on at least a portion of an outer surface of said shell.

4,818,216

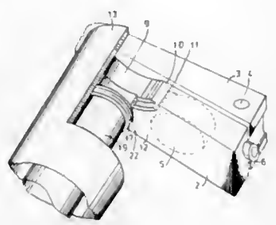
METHOD AND APPARATUS FOR REMOVING FUEL GUN FROM BOILER

Phillip J. Yates, 621 SW. Addie St., Port St. Lucie, Fla. 34983

Filed Jun. 20, 1988, Ser. No. 209,181

Int. Cl.⁴ F23D *11/36*

U.S. Cl. 431—154 **11 Claims**



1. Apparatus for withdrawing from a tubular fuel gun port a tightly-fitting fuel gun having an enlarged external portion, said apparatus comprising:

(a) a first jaw means for engaging said enlarged portion of said fuel gun;

(b) a second jaw means for engaging the outer edge of said gun port;

(c) connecting means for pivotally connecting said first jaw means to said second jaw means at a first end of each said jaw means;

(d) spreading means interposed between said first jaw means and said second jaw means for forcefully spreading apart said jaw means, whereby a second end of each said jaw means is spread apart one from the other while said first ends pivot about said connecting means;

(e) said second jaw means including an edge between said first end and said second end, said edge having a curvilinear portion substantially corresponding to the inner curvature of said gun port to provide clearance for unobstructed passage of said fuel gun during withdrawal;

(f) said second jaw means further including positioning means for positioning said curvilinear portion against the outer edge of said gun port and in registry therewith to provide said clearance for unobstructed passage of said fuel gun;

(g) wherein said spreading means forces said first jaw means against said expanded portion of said gun and said second jaw means against the outer edge of said gun port, thereby forcing said gun out of said gun port.

4,818,217

INJECTION MOLDING SYSTEM WITH NOZZLES IN TANDEM

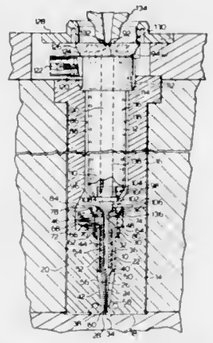
Harald H. Schmidt, Acton, and Michael C. McEaroe, Georgetown, both of Canada, assignors to Mold-Masters Limited, Georgetown, Canada

Filed May 9, 1988, Ser. No. 191,882

Claims priority, application Canada, Apr. 13, 1988, 563982

Int. Cl.⁴ B29C *45/22*

U.S. Cl. 425—549 **8 Claims**



1. An injection molding system comprising:

(a) a forward first elongated heated nozzle having a rear end and a forward end seated in a well in a forward mold core, said first nozzle adjacent a gate extending, from the well to a cavity, the first nozzle having a first bore extending from an inlet at the rear end to a space surrounding the forward end leading to the gate,

(b) a backplate with a rear face having a seat therein, said seat concentrically aligned with a second melt bore extending through the backplate, the backplate being mounted on the rear end of the first nozzle with the second melt bore extending in axial alignment with the inlet to the first nozzle, the backplate having a portion which extends rearwardly into bearing contact with an upper

mold core, said upper mold core holding the backplate and the first nozzle securely in place,

(c) a rearward second elongated heated nozzle having a rear end, a forward end and a central third melt bore, said second nozzle being substantially longer than the first nozzle and being seated in a well in a rearward mold core said central third melt bore extending through said second nozzle from an inlet at the rear end of said second nozzle to the forward end of said second nozzle, the third melt bore being in axial alignment with the second melt bore through the backplate and the inlet to the first melt bore through the first nozzle, the forward end of the rearward nozzle having a forwardly projecting portion which is received in the seat in the rear face of the backplate to allow sliding axial movement between said forwardly projecting portion and said seat to provide for thermal expansion and contraction of the rearward nozzle.

4,818,218

INTERNAL COMBUSTION BURNERS

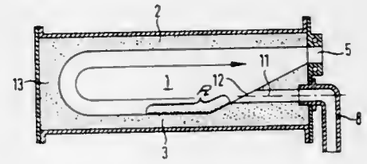
René Gest, Rantigny, France, assignor to Isover Saint-Gobain, Paris La Défense, France

Continuation of Ser. No. 752,500, Jul. 8, 1985, which is a continuation of Ser. No. 478,913, Mar. 25, 1983. This application Dec. 23, 1986, Ser. No. 945,184

Claims priority, application France, Apr. 6, 1982, 82 05919

Int. Cl.⁴ F23R *3/54*

U.S. Cl. 431—158 **14 Claims**



1. Apparatus for attenuating glass fibers by subjecting molten streams of glass to the high velocity, high temperature blast of an internal combustion burner, said apparatus comprising:

means establishing a plurality of streams of molten glass in attenuable condition;

an internal combustion burner, said burner comprising a combustion chamber having opposed, substantially parallel first and second side walls of refractory material, opposed first and second end walls of refractory material extending between said side walls, passage means in said first end wall for directing a flow of combustion gas onto the first of said combustion chamber side walls toward the second of said end walls, said second end wall being configured so as to reverse the flow of said combustion gas and redirect it along said second side wall, said side walls being sufficiently closely spaced stop as to permit the radiant heating of said first side wall by said second side wall and a resultant heating of the combustion gas flowing along said first side wall, and an orifice in said first end wall for passage of combustion products, said orifice restricting expansion of the burning gas to produce a burner combustion chamber pressure substantially in excess of 100 nm water column, thereby providing a directional, high velocity, high temperature blast of combustion products emanating from said combustion chamber through said orifice;

said orifice being located so as to direct said blast into engagement with said streams of molten glass to thereby effect attenuation thereof.

4,818,219

VAPORIZATION BURNER

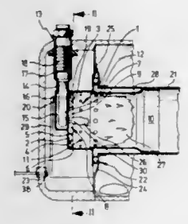
Friedrich Widemann, Munich, and Siegfried Piegsa, Gauting, both of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 177,448

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1987, 3713460

Int. Cl.⁴ F23Q *3/00*

U.S. Cl. 431—261 **20 Claims**



1. Vaporization burner for a liquid fuel heating device having a combustion chamber; a combustion pipe disposed in said combustion chamber; a fuel absorbent body, said absorbent body being arranged on a front side of a carrier that faces the combustion chamber in a manner which leaves at least a portion of said front side exposed; and an ignition device; wherein the ignition device is disposed on a rear side of said carrier which faces away from said combustion chamber; wherein said carrier has at least one opening extending through it in an area of the carrier which is covered by the absorbent body; and wherein at least one through-opening is provided in the exposed portion of the carrier part.

4,818,220

GAS CUTTING TORCH

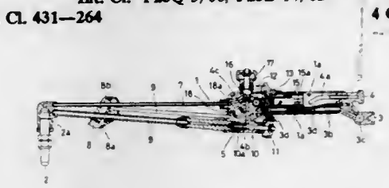
Souji Kobayashi, Kawaguchi, Japan, assignor to Taseto Co., Ltd., Japan

Filed Jun. 3, 1987, Ser. No. 57,777

Claims priority, application Japan, Jun. 4, 1986, 61-130891

Int. Cl.⁴ F23Q *3/00*; F23D *14/82*

U.S. Cl. 431—264 **4 Claims**



1. A gas cutting torch comprising a housing providing an elongate hollow handle portion having front and rear ends;

gas and oxygen entry fittings mounted on the rear end;

a manifold block mounted on the front end;

separate passages for gas and oxygen extending through the handle portion connecting the fittings to the manifold block;

gas, oxygen and pilot gas pipes extending forwardly from the manifold block with the gas and oxygen pipes joining at a cutting tip and the pilot gas pipe terminating at an outlet port adjacent but spaced from the cutting tip;

ignition electrodes installed in the outlet port;

the manifold being formed with bores interconnecting the respective gas and oxygen passages and pipes;

first and second chambers in the bores interconnecting the gas passage with the gas pipe, the first chamber being located upstream of the second chamber;

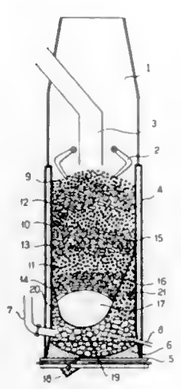
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a back-fire preventive device releasably mounted in the first chamber;
the second chamber being a gas mixing chamber and having a gas mixing valve mounted therein;
a further bore connecting the oxygen passage with the gas mixing chamber wherein a gas and oxygen mixture is supplied by the gas mixing chamber to the gas pipe;
a third chamber in the bore interconnecting the oxygen passage and the oxygen pipe, the third chamber having an oxygen jet control valve mounted therein whereby the oxygen jet gas supplied to the oxygen pipe can be adjusted;
a fourth chamber in the bore interconnecting the gas passage with the pilot gas pipe;
a pilot gas control valve being mounted in the fourth chamber; and,
a piezoelectric gas ignition device mounted in the handle having an operating button located for longitudinal sliding movement adjacent the manifold block, the pilot gas valve being operable to admit pilot gas to the pilot pipe by movement of the ignition button to an ignition position to supply an ignition spark to the electrodes.

4,818,221
PROCESSES AND DEVICES FOR MELTING MATERIALS CAPABLE OF FORMING FIBERS

Michel Besne, Saint-Etienne du Rouvray, and Fernand Guillot, Le Mesnil Esnard, both of France, assignors to Isover Saint-Gobain, Courbevoie, France

Filed May 13, 1987, Ser. No. 49,219
Claims priority, application France, May 13, 1986, 86 06821
Int. Cl.⁴ F27D *1/08*
U.S. Cl. 432—99 **8 Claims**

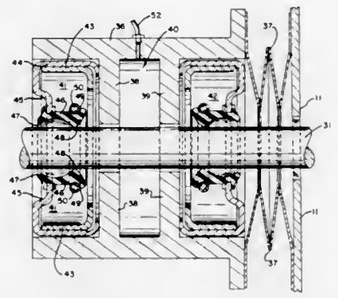


1. An improved process for charging a melting enclosure of the cupola type for melting a high-melting point rock wool-forming material, said cupola having a multiplicity of tuyeres and said cupola having a tap hole for removing the melted material from said cupola, said tap hole being in fluid communication with a pouring still external to said cupola, comprising the steps of:
charging said cupola with coke and said high-melting point rock wool-forming material; and
supplying combustive gas in a non-uniform manner to create a gas circulation velocity gradient in the section of said cupola corresponding to the level of said tap hole, wherein the lowest circulation velocities are substantially close to said tap bole and wherein the total pressure measured in said pouring sill near said tap hole is less than 60% of the pressure in the tuyere closes to said tap hole, and the melt flow of the melted material through the tap hole is substantially uniform and homogeneous.

4,818,222
SEALED ROTARY HEARTH FURNACE

James P. Docherty, Carnegie, and Beverly E. Johnson, Pittsburgh, both of Pa., assignors to Salem Furnace Co., Pittsburgh, Pa.

Filed Jan. 14, 1988, Ser. No. 206,575
Int. Cl.⁴ F27B *9/16*
U.S. Cl. 432—138 **8 Claims**



1. In a rotating hearth furnace for heating particulate material comprising a stationary wall and roof, means in said roof for charging particulate material onto said hearth, means in said wall for supplying hot gases to said particulate material, a soaking pit opening from the center of said hearth for discharge of said particulate material and rabbles mounted in said roof, the improvement comprising:
a floor below said hearth affixed to said wall to form a closed chamber, supporting rollers for said hearth positioned intermediate said hearth and said floor, a horizontal shaft affixed to each said supporting roller extending through said wall and cantilevered in bearing mounted outside said wall, shaft sealing means between each said shaft and said wall, means outside said wall for rotating said hearth, means for supplying hot gases to said chamber below said hearth and perforations in said hearth admitting said hot gases therethrough.

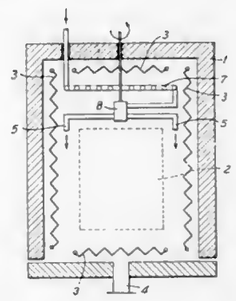
4,818,223
APPARATUS FOR TREATING WORKPIECES WITH HOT GASES INCLUDING GAS DISTRIBUTING MEANS

Gerhard Hild, Asslar, Fed. Rep. of Germany, assignor to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany

Filed Jun. 18, 1987, Ser. No. 64,221
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622339
Int. Cl.⁴ F27B *5/04*
U.S. Cl. 432—205 **10 Claims**

1. Apparatus for processing objects under the action of hot gas, wherein, in a chamber, a heating device containing the objects to be processed and a connection for evacuating or subjecting the chamber to overpressure are arranged, comprising the improvement that there is present in the chamber within said heating device at least one hot gas valve designed as a three-way valve for supplying the hot gas, wherein said three-way valve comprises a housing having a gas inlet stub and two gas outlet stubs, one valve core which is arranged to be rotatable within said housing and is equipped on a gas inlet side with two apertures and on a gas outlet side with one aperture and with a rotational pin by means of which the position of said valve core with respect to said housing can be changed in such a manner that said gas inlet stub is alternately connected with either of said two gas outlet stubs, said housing

and said valve core consisting essentially of metal which is suitable for operation at temperature in excess of 1,000° C. with



the outer surface of said valve core being equipped with a layer of ceramic material.

4,818,224
PROCESS

Peter V. Geenen, The Hague, and Jan Benais, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 11, 1987, Ser. No. 131,599
Int. Cl.⁴ F27B *14/08*
U.S. Cl. 432—248 **3 Claims**

1. A process for minimizing the cracking tendency and uncontrolled dimensional change, and improving the strength of, a rammed plastic refractory reactor liner comprising phosphate-bonded silicon carbide or phosphate-bonded alumina, comprising heating said reactor liner placed or mounted in a reactor, prior to its first use, from ambient temperature up to a temperature of from about 490° C. to about 510° C., the heating being carried out by heating said liner at a rate to produce a temperature increase of the liner not greater than about 6° C. per hour.

4,818,225
ORTHODONTIC ELASTIC BAND AND TREATMENT METHOD

Jeffery L. Fasnacht, 4956 Douglas Ave., Racine, Wis. 53402

Filed Mar. 9, 1987, Ser. No. 23,716
Int. Cl.⁴ A61C *7/00*
U.S. Cl. 433—18 **19 Claims**

1. An intraoral orthodontic elastic band for replaceable use in tension comprising:
an orally-acceptable elastomeric material selected from the group consisting of natural rubber, natural-synthetic rubber, synthetic rubber, thermoplastic polymeric materials, and blends thereof, having suitable physical properties; and
a food-grade flavoring substance substantially uniform throughout the elastomeric material as an in situ constituent of elastic-band formation from a homogeneous mixture of said elastomeric material and said flavoring substance,
whereby without compromising elastomeric force properties the elastic band provides flavor release in an intraoral environment during an extended period which is substantially commensurate with the period of substantial initial reduction in elastic band strength.

4,818,226
ORTHODONTIC ARCHWIRE

Carl J. Berendt, Carlsbad; Gerald Nelson, and Michael Meyer, both of Berkeley, all of Calif., assignors to Lancer Pacific, Carlsbad, Calif.

Filed Sep. 18, 1987, Ser. No. 98,615
Int. Cl.⁴ A61C *7/00*
U.S. Cl. 433—20 **17 Claims**

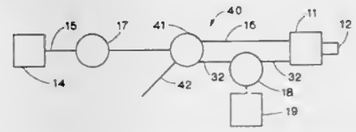


1. An orthodontic archwire of unitary memory retaining wire for repositioning teeth en masse, the archwire comprising a first, second and third curved section, the first curved section extending distally from a midline and having at least two different radii of curvature along its length when the archwire is in an unstressed condition, the second curved section extending distally from the midline of the archwire in a direction opposite of the first curved section and having at least two different radii of curvature along its length when the archwire is in an unstressed condition, and the third curved section extending distally in opposite directions from the midline of the archwire and having at least two radii of curvature when the archwire is in an unstressed condition, whereby the archwire, when mounted on orthodontic brackets, applies continual force throughout treatment to move and position teeth by utilizing counterforce mechanics.

4,818,227
SOUND PRODUCING INDICATORS USED IN COMBINATION WITH PNEUMATICALLY OPERATED MACHINES

Kenneth K. Krueger, Laguna Niguel, Calif., assignor to Denar Corporation, Anaheim, Calif.

Filed Jan. 21, 1988, Ser. No. 147,242
Int. Cl.⁴ A61C *1/00, 3/00*
U.S. Cl. 433—27 **10 Claims**



1. In the combination of a machine which is capable of being operated in a first manner by a fluid at other than ambient pressure, conduit means connected to said machine for conveying a fluid relative to said machine so as to operate said machine in said first manner and indicator means for providing an audible signal when said machine is employed in another manner than said first manner the improvement which comprises:
said indicator including a sound producing means capable of being operated by said fluid to produce a sound, said indicator means also including diverting means for diverting at least some of said fluid to said sound producing means so as to operate said sound producing means when said machine is being employed in said other manner in order to indicate that said machine is being employed in said other manner.

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4,818,228

OCCLUSION SIMULATOR

Pierre Berceaux, 39, bd Henri Henrot, F-51100 Reims, France

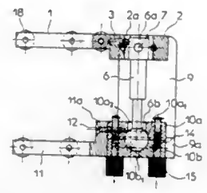
PCT No. PCT/FR86/00357, § 371 Date Jun. 16, 1987, § 102(e) Date Jun. 16, 1987, PCT Pub. No. WO87/02234, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 17, 1986, Ser. No. 72,258

Claims priority, application France, Oct. 18, 1985, 85 15524

Int. Cl.[4] A61C *11/00*

U.S. Cl. 433—54 **13 Claims**



1. Occlusion simulator for dental prostheses for reproducing mandible motions, comprising upper and lower articulated forks, representing the maxillary and mandible respectively, connected by a small rod, said upper articulated fork representing the maxillary being connected to one end of the small rod by a first fork-holder and an articulation pin, said lower fork representing the mandible being connected to the other end of the small rod by means of a second fork-holder and a ball joint wherein the excursion of the second lower fork-holder with respect to the ball-joint of the small rod is limited longitudinally and transversely by two side plates mounted on either side of said first upper fork-holder.

4,818,229

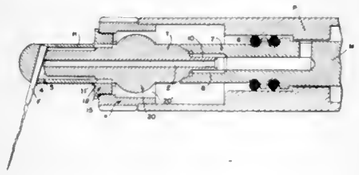
DENTAL ULTRASONIC ENDODONTIC UNIT

Ion Vasile, Miami, Fla., assignor to Eagler Engineering Corporation, Hialeah, Fla.

Filed Apr. 29, 1987, Ser. No. 43,760

Int. Cl.[4] A61C *1/14*

U.S. Cl. 433—127 **13 Claims**



1. In an assembly for operating an endodontic file in a dental handpiece at ultrasonic frequencies,

(a) a rectilinear tip provided with a central passage for fluids or medicaments adapted to have one end thereof connected to the output end of an ultrasonic vibratory unit within the handpiece, and the other end of the tip extending beyond the free end of said handpiece and having an external thread along an intermediate portion of said tip,

(b) housing means for entirely covering said tip, said housing means including a housing having a closed outer end and internal threads adjacent to the open end thereof for threaded engagement with said external thread along said intermediate portion of said tip,

(c) said housing having a single opening in the lateral wall thereof adjacent to its closed end extending transversely to the longitudinal axis of said tip,

(d) said opening adapted to accommodate loosely the shank of an endodontic file for clamping against the inner wall of the closed end of said housing by the outer end of said tip while leaving room for the discharge of fluid from said passage and through said opening to the remaining portion of said file beyond said housing, and

(e) said housing means further including rotary means at the end of said handpiece for effecting movement of said housing relative to the outer end of said tip in an axial direction, thereby to selectively clamp and release the shank of the file between the tip and the inner wall of said housing.

4,818,230

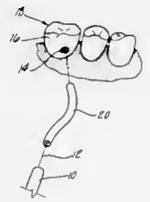
METHOD FOR REMOVING DECAY FROM TEETH

William D. Myers, 5855 Wingcroft Ct., Birmingham, Mich. 48010, and Terry Myers, 1935 N. Pontiac Trail, Walled Lake, Mich. 48088

Continuation-in-part of Ser. No. 808,542, Dec. 13, 1985, abandoned. This application Aug. 12, 1987, Ser. No. 85,235

Int. Cl.[4] A61C *5/00*

U.S. Cl. 433—215 **8 Claims**



1. A method for removing tooth decay that has invaded the dentin from a tooth comprising the steps of:

aiming a pulsed laser so that the output from the laser impinges upon the tooth decay,

repeatedly activating the laser until the tooth decay is removed from the tooth,

wherein said laser has an energy output in the range of 0.1 to 100 millijoules per pulse and a pulse duration of between several picoseconds and several milliseconds.

5. A method for removing disease from soft gum tissue comprising the steps of:

aiming a pulsed laser so that the output from the laser impinges upon the diseased soft gum tissue,

repeatedly activating the laser until the diseased soft gum tissue is eradicated,

wherein said laser has an energy output in the range of 0.1 to 100 millijoules per pulse and a pulse duration of between several picoseconds and several milliseconds.

4,818,231

PROCESSING DEVICE FOR LOCAL IRRADIATION WITH VISIBLE OR INVISIBLE LIGHT

Hans Steiner, Germering, and Alois Mitterndorfer, Schönberg, both of Fed. Rep. of Germany, assignors to Wilhelm Sedlbauer GmbH, Fed. Rep. of Germany

PCT No. PCT/DE86/00191, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/06614, PCT Pub. Date Nov. 20, 1986

PCT Filed May 9, 1986, Ser. No. 25,142

Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516774

Int. Cl.[4] A61C *5/00*

U.S. Cl. 433—215 **16 Claims**

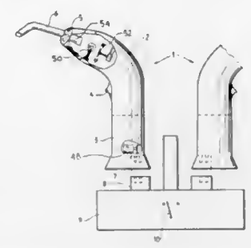
1. A hand held processing device for local irradiation, with

visible or invisible light, of defined processing points of tooth fillings for hardening the tooth fillings during a dental treatment, said hand-held device comprising:

a housing, within which is disposed:

a light source means for emitting said visible or invisible light;

a light conductor optically coupled to said light source means via an optical coupling element, said light conductor transmitting said light to said processing points;



a fan means for cooling said light source;

at least one rechargeable battery means for supplying power to said light source means and said fan means and;

means for counting the number of times said light source is activated and for preventing further activation thereof when the count exceeds a predetermined number until said batteries have been recharged.

4,818,232

TANK GUNNER PROFICIENCY TEST SYSTEM

Chris M. Pruitt, 400A Savage Dr., Newport News, Va. 23602

Filed Nov. 23, 1987, Ser. No. 125,645

Int. Cl.[4] F41F *27/00*

U.S. Cl. 434—23 **15 Claims**



1. In association with a military tank having a main gun movable in elevation and azimuth by hand action of a human gunner, and an optical gun sight usable by the gunner for gun target acquisition: the improvement comprising a gunner/commander proficiency evaluation means; said evaluation means comprising a target board having indicia thereon representing a moving target: a recording board; and a marking instrument; said recording board being positionable in front of the tank in close adjacenty to the muzzle end of the main gun; said marking instrument being attachable to the main gun for imprinting a visible record of gun motion on the recording board; said target board being locatable a pre-specified distance from the muzzle end of the gun in position to be viewed by the gunner through the optical gun sight.

4,818,233

RELIGIOUS INSTRUCTION KIT

Hugh F. J. Behan, 3314 Country Club Dr., Box 1107, Jefferson City, Mo. 65102, assignor to Hugh F. J. Behan, Jefferson City, Mo.

Filed Apr. 14, 1987, Ser. No. 15,400

Int. Cl.[4] G09B *19/00*

U.S. Cl. 434—245 **5 Claims**

1. A religious instruction kit to teach children about worship services, rituals and sacraments, comprising:

a first set of model pieces representing an altar, a pulpit, a tabernacle and a baptismal font;

a second set of model figures representing a priest and people;

and a third set of model objects representing altar objects used in a worship service;

the second and third sets being freely movable in both lateral and transverse directions with respect to the altar piece;





whereby the model figures and objects may be located and moved with respect to the model pieces to depict various positions of priest, people and objects during the course of the worship service.

4,818,234

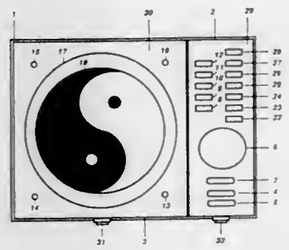
PSYCHOPHYSIOLOGICAL REFLEX ARC TRAINING SIMULATOR

Dana J. Redington, 630 Park Rd., Redwood City, Calif. 94062, and Larry G. Mah, 320 Masonic Dr., East Vallejo, Calif. 94591

Filed Jun. 25, 1986, Ser. No. 878,232

Int. Cl.[4] A63B *69/00*

U.S. Cl. 434—247 **19 Claims**



1. A training simulator comprising

means for providing a reaction stimulus having at least two forms,

means for selectively establishing a degree of difficulty,

means for randomly energizing said reaction time stimulus to provide said different forms of stimulus in accordance with said established degree of difficulty,

means for sensing a reaction to said energized stimulus,

means connected to said reaction time sensing means for measuring the reaction time to said energized stimulus, and

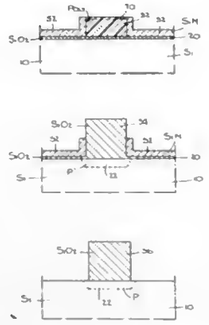
means for generating an indication of the measured reaction time.

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4,818,235
ISOLATION STRUCTURES FOR INTEGRATED CIRCUITS

Fung-Ching Chao, Tainan Hsien, Taiwan, assignor to Industry Technology Research Institute, Hsinchu, Taiwan

Continuation of Ser. No. 13,012, Feb. 10, 1987, abandoned. This application Jun. 7, 1988, Ser. No. 205,558
Int. Cl.[4] H01L *21/76*
U.S. Cl. 437—61 **10 Claims**



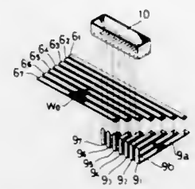
1. A process for forming an isolation region for an integrated circuit which comprises:
(a) forming a polysilicon layer over the isolation region atop a silicon substrate coated with a stress-release layer;
(b) masking the isolation region of the polysilicon layer;
(c) removing the unmasked portion of the polysilicon layer by dry etching so as to leave an upwardly projecting polysilicon layer over the isolation region;
(d) removing the mask from the top of said polysilicon layer;
(e) sequentially depositing on the sructure from step (d), including on the top and the vertical surfaces of said upwardly projecting polysilicon layer, a silicon nitride layer;
(f) depositing a photo-resist layer on said silicon nitride layer of a thickness sufficient to form a planar surface above the top of said polysilicon layer;
(g) etching back the photo-resist layer and the silicon nitride layer anisotropically so as to expose the top surface of the polysilicon layer;
(h) removing the residual photo-resist; and
(i) oxidizing the polysilicon layer to form a field oxide layer, while the vertical surfaces of the layer remain masked with said silicon nitride layer.

4,818,236
WIRE HARNESS FOR AUTOMOTIVE VEHICLE

Yoshiaki Nakayama, and Yasuhiro Miyazawa, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Nov. 25, 1987, Ser. No. 125,531
Int. Cl.[4] H01R *33/00*
U.S. Cl. 439—34 **10 Claims**

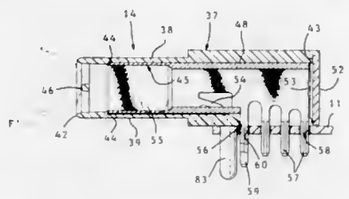
1. A wire harness for an automotive vehicle, which comprises:
(a) a plurality of trunk harness conductors arranged in parallel to each other at regular intervals, both ends of each of said trunk harness conductors being cut off so as to be arranged at an angle of 45 degrees or more with respect to a longitudinal direction thereof;
(b) at least one set of first branch conductors arranged in parallel to each other at regular intervals and perpendicular to said trunk harness conductors, a first end of each of said first branch harness conductors being cut off so as to be arranged at an angle of 45 degrees with respect to a longitudinal direction thereof and connected to an end of each of said trunk harness conductors independently in regular order, and a second end of each of said first branch harness conductors being cut off so as to be arranged perpendicular to the longitudinal direction thereof and formed with a connector terminal directly connectable with an electric element; and
(c) at least one set of second branch conductors arranged in parallel to each other at regular intervals and perpendicular to said trunk harness conductors, an intermediate portion of each of said second branch conductors being connected independently in regular order to an intermediate portion of each of said trunk harness conductors so that each connected point is arranged on a line extending at an angle of 45 degrees with respect to the longitudinal direction thereof, and a second end of each of said second branch harness conductors being cut off so as to be arranged perpendicular to the longitudinal direction thereof and formed with a connector terminal directly connectable with an electric element.



4,818,237
MODULAR PLUG-IN CONNECTION MEANS FOR FLEXIBLE POWER SUPPLY OF ELECTRONIC APPARATUS

Ronald M. Weber, Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 4, 1987, Ser. No. 91,973
Int. Cl.[4] H01R *13/04*
U.S. Cl. 439—693 **19 Claims**



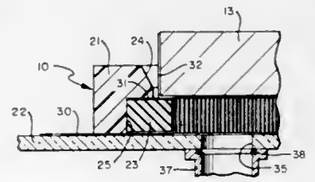
1. A matable connector assembly comprising:
a receptacle formed from an insulative material, the receptacle having a forward open end;
a male contact member formed from a conductive material and secured within the receptacle, the male contact member having a plurality of spring finger contact elements, each comprising a cantilevered beam extending forwardly within the receptacle and terminating prior to the forward open end of the receptacle;
first guard means carried by the receptacle, extending substantially adjacent to the forward open end thereof, and disposed within the plurality of contact elements of the male contact member for preventing insertion of a finger through the forward open end of the receptacle to engage the male contact member therein, the first guard means comprising a cylindrical sleeve disposed within the receptacle, the cylindrical sleeve having a rearward end portion integrally joined to the receptacle by a plurality of struts;

a plug formed from an insulative material and adapted to be slidably received and partially nested within the receptacle, the plug having a forward open end;
a female contact member formed from a conductive material and secured within the plug, the female contact member having a forward portion terminating prior to the forward open end of the plug;
second guard means carried by the plug substantially between the forward portion of the female contact member and the forward open end of the plug for preventing insertion of a finger through the forward open end of the plug to engage the female contact member therein, whereby as the plug is slidably received within the receptacle, the first guard means on the receptacle is received within and passes through the second guard means on the plug, and the plurality of contact elements on the male contact member in the receptacle are received within the open forward end of the plug, are deflected inwardly thereof, and pass through the second guard means on the plug to be received within and engage the forward portion of the female contact member in the plug.

4,818,238
TEST SOCKET FOR LEADLESS CHIP CARRIER

Wade P. Borg, El Segundo, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1985, Ser. No. 799,886
Int. Cl.[4] H05K *13/08*
U.S. Cl. 439—42 **1 Claim**

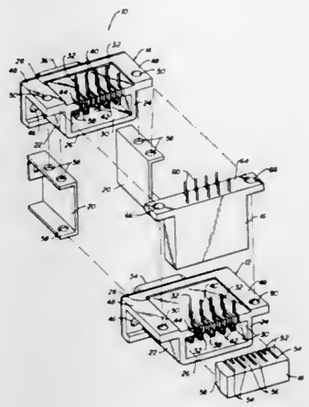


1. A socket for an electrical component comprising:
a substantially rigid frame having an aperture therein with sloped entry sides in said aperture at the entrance of said aperture for receiving and guiding an electrical component into said aperture, a connector recess at the bottom of said aperture, said aperture having sides above said connector recess so that an electrical component can be smoothly inserted and removed into said aperture by guidance by said sloped entry sides toward said connector recess and out of said aperture without catching on the sides of said aperture;
connector means having a top and having a bottom disposed in said recess in said frame for making connection to the electrical component received in said opening, said connector means being made of an insulating elastomeric material, a pattern of conductor strips disposed on said insulating elastomeric material extending from the top thereof to the bottom thereof, said frame being positioned with respect to said connector means so that an electrical component guided by said aperture in said frame is guided into contact with said conductor strips on said top of said connector means so as to make contact and form a vacuum seal between the electrical component and said connector means;
means for testing the conductors on said bottom of said resilient dielectric connector to test the electrical component in contact with said top of said connector; and
vacuum holding means for urging the electrical component toward said connector means.

4,818,239
STACKED MULTIPIN CONNECTORS

Kaya Erk, San Jose, Calif., assignor to Maxcoax, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 42,385, Apr. 24, 1987. This application Jul. 7, 1987, Ser. No. 71,159
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—55 **17 Claims**



1. A stacked electrical connector of the type for engaging external devices, comprising,
an upper connector body having a first connector face and a plurality of angulate first contact elements, said first connector face having first engaging means for selectively coupling said upper connector to a first external device, the first contact elements each having a first segment extending rearwardly from said first connector face and second segment extending downwardly from said first segment,
a pair of bracket members, each having a first end mounted to said upper connector body and each having a second end, said bracket members maintained in horizontally spaced apart relation by said mounting to the upper connector body, and
a lower connector body joined to said second ends of the pair of brackets in adjacent yet vertically spaced relation to said upper connector body, said lower connector body having a second connector face and a plurality of angulate second contact elements, said second connector face having second engaging means for selectively coupling said lower connector to a second external device, the second elements each having a first segment extending rearwardly from said second connector face and a second segment extending downwardly from said first segment,
said first and second contact elements of said upper and lower connectors being electrically conductive and having a downward extend sufficient for attachment to a printed circuit board.

4,818,240
POWER RAILS FOR EDGE MOUNTING MODULES

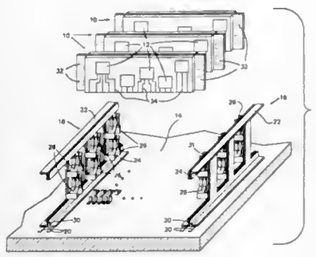
Friedrich A. Karner, Milton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 114,961
Int. Cl.[4] H05K *1/14*
U.S. Cl. 439—64 **5 Claims**

1. An edge support and power distribution structure for supporting and delivering power at multiple voltage levels to at least one substrate mounting at least one integrated circuit chip comprising:
a support member,

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a pair of spaced side rails mounted on said support member and extending generally parallel to each other,
each side rail comprised of first and second electrically conducting strips of material separated by an insulating material,
said first and second strips of conducting material having projections formed thereon extending generally normal

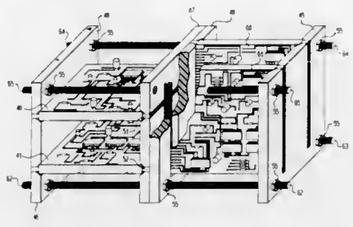


thereto and lying on spaced planes to define therebetween a slot to receive one edge portion of a substrate, said slots on opposite side rails being generally aligned, and means to provide power levels independently to each strip of each side rail,
whereby said side rails act as substrate supports and also provide power to at least four separately determined voltage levels.

4,818,241
ELECTRICAL INTERCONNECTION DEVICE USING ELASTOMERIC STRIPS

Lanny S. Smoot, Morristown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 9, 1987, Ser. No. 118,460
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—65 **3 Claims**

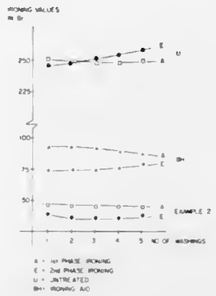


1. A structure for electrically interconnecting a first and a second set of circuit boards, said structure comprising:
first and second rectangular, flat holding members each having a plurality of parallel slots therein, and
elastomeric strips of alternating electrically conductive and non-conductive segments segments placed respectively in each said slot,
wherein a first edge of each said board of said first set is placed in surface contact along the length of an associated said strip on a first side of said first holding member, a first edge on each said board of said second set is placed in surface contact along the length of an associated strip on a first side of said second holding member, and
wherein a second side of said second holding member is placed flush and fixedly maintained in surface contact with a second side of said first holding member, an edge of each said board in said first set having an electrically conductive path to an edge of each said board in said second set via the associated two said strips.

4,818,242
LAUNDRY CARE PRODUCT FOR FINAL RINSE: AQUEOUS MIXTURE OF CATIONIC SILICONE OIL, CATIONIC FATTY ACID CONDENSATE AND CATIONIC FILM-FORMER

Dieter Burmeister, Bad Salzuflen, and Joachim Marziakowski, Düsseldorf, both of Fed. Rep. of Germany, assignors to Hoffmann's Starkefabriken AG, Fed. Rep. of Germany

Filed Nov. 28, 1986, Ser. No. 935,836
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1985, 3542725
Int. Cl.[4] C11D *3/37*; D06M *13/40, 15/64*
U.S. Cl. 8—115.6 **34 Claims**



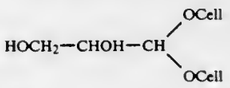
1. A textile post-wash-aid composition comprising an aqueous vehicle, and dispersed in said aqueous vehicle:
(A) a silicone oil characterized by a viscosity of 1,000 to 10,000 mm^2s^{-1};
(B) a cationic fatty acid condensation product comprising a C_{10-22} aliphatic monocarboxylic acid condensate with a polyamine or with an addition product of a polyamine with ethylene oxide or with propylene oxide, and
(C) a cationic film former selected from the group consisting of cation-active alkoxylated starch and cation-active alkoxylated cellulose.

4,818,243
WRINKLE RESISTANT FABRIC PRODUCED BY CROSSLINKING CELLULOSIC MATERIALS WITH ACETALS OF GLYCERALDEHYDE

Leon H. Chance, and Gary F. Danna, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 18, 1987, Ser. No. 50,436
Int. Cl.[4] D06M *13/12*
U.S. Cl. 8—116.4 **12 Claims**

1. An improved wrinkle resistant cellulosic fabric characterized by a glyceraldehyde crosslink of the following structure

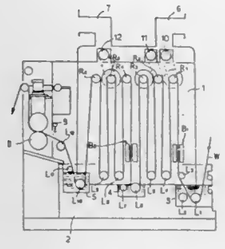


with a cellulose matrix.

4,818,244
CLOTH WASHING MACHINE

Hideo Iwami, Kyoto, Japan, assignor to Naigai Special Dyeing Co., Ltd., Japan

Filed Jun. 3, 1987, Ser. No. 57,963
Claims priority, application Japan, Dec. 30, 1986, 61-312761
Int. Cl.[4] D06B *3/12*
U.S. Cl. 8—149.1 **6 Claims**

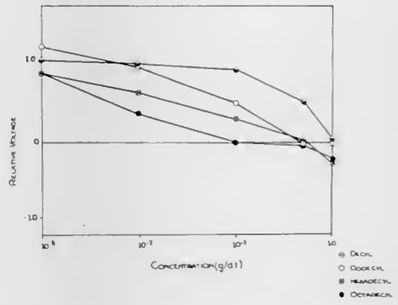


6. A method for removing water from a cloth using a cloth washing machine, said cloth washing machine comprising a steaming chamber, a water tank located within said steaming chamber, and cloth transporting means for transporting said cloth through said steaming chamber and said water tank, said method comprising the steps of:
transporting said cloth along a path through said steaming chamber and said water tank;
stretching said cloth along a portion of said path; and
vibrating said cloth along said portion of said path which is located outside said water tank to cause water to be removed from said cloth.

4,818,245
PROCESS FOR TREATING PROTEIN FIBERS TO IMPART ANTISTATIC SURFACE MODIFICATIONS

Janusz Jachowicz, Stamford, and Michael Wong, Easton, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Jan. 9, 1987, Ser. No. 1,722
Int. Cl.[4] A61K *7/06*; D06M *00/00*
U.S. Cl. 8—188 **15 Claims**



1. A process for imparting an antistatic surface modification to protein fibers comprising the step of contacting the surface of the protein fibers with an anionic polymer-free composition containing an amount of a high molecular weight polymeric quaternary ammonium salt that is effective, when the composition is in contact with the protein fibers for a predetermined time period, to impart to said fibers said antistatic surface modification that is durable through at least four subsequent shampooings, said polymeric quaternary salt having as a sub-

stituent of the ammonium radical an alkyl group of at least 12 carbons.

4,818,246

PROCESS FOR IMPROVING THE LIGHT-FASTNESS OF LEATHER DYEINGS

Alois Püntener, Rheinfelden, Switzerland; Gerhard Back, Lörrach, Fed. Rep. of Germany, and Josef Koller, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

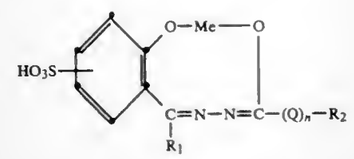
Continuation of Ser. No. 796,446, Nov. 8, 1985, abandoned. This application Sep. 17, 1987, Ser. No. 97,269

Claims priority, application Switzerland, Nov. 9, 1984, 5389/84

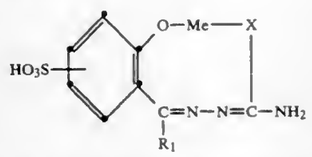
Int. Cl.⁴ D06P *3/32*

U.S. Cl. 8—437 **16 Claims**

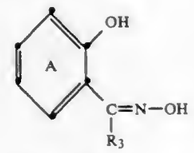
1. Process for improving the light-fastness of leather dyed with an anionic cobalt or chrome complex dye, which process comprises treating the leather before, during or after dyeing with a composition consisting essentially of a light-fastness improving amount of a compound of copper selected from the group consisting of (1) a copper salt of an inorganic or organic acid, (2) a copper salt of an inorganic or organic acid in admixture with a further organic carboxylic acid, (3) an acylhydrazone copper complex of the formula



wherein R_1 and R_2 are each, independent of the other, hydrogen or an unsubstituted or substituted alkyl or aryl radical, Me is copper, Q is oxygen or NH and n is zero or 1, (4) a copper complex of the formula



wherein R_1 and Me are as defined above, and X is oxygen or sulfur, and (5) a copper complex of a compound of the formula



wherein R_3 is hydrogen, OH, alkyl or cycloalkyl, and wherein the ring A is unsubstituted or is further substituted by sulfo or sulfonamido.

4,818,247

REACTIVE AZO DYES CARRYING TWO AMINE-FLUORO-TRIAZINYL GROUPS FOR DYEING AND PRINTING COTTON

Athanassios Tzikas, Prattein, and Adolf Käser, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 835,586, Mar. 3, 1986, abandoned, which is a continuation of Ser. No. 767,247, Aug. 20, 1985, abandoned, which is a continuation of Ser. No. 618,691, Jun. 8, 1984, abandoned. This application May 21, 1987, Ser. No. 53,526

Claims priority, application Switzerland, Jun. 10, 1983, 3187/83

Int. Cl.⁴ C09B *62/08*; D06P *3/66*

U.S. Cl. 8—549 **17 Claims**

1. Reactive dyes of the formula

[(R1)(X1)—N]—[D—N=N—K]—[N—(R2)(X2)]

in which:

D is a benzene or naphthalene radical of a diazo component;

K is a phenyl, naphthyl or pyridyl radical of a coupling component,

R_1 and R_2, independently of each other, are each hydrogen, or an unsubstituted or substituted C_1–C_4-alkyl radical, and

X_1 and X_2, independently of each other, are each an unsubstituted or substituted aminofluoro-s-triazinyl radical.

4,818,248

PROCESS FOR DYEING NATURAL OR SYNTHETIC POLYAMIDE FIBRE MATERIALS WITH 1:1 METAL COMPLEX DYES IN PRESENCE OF ALKALI METAL FLUORDSILICATE OR AMINDNLUM SILICATE

Gerhard Back, Lörrach, Fed. Rep. of Germany, and Walter Mosimann, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 30, 1987, Ser. No. 102,942

Claims priority, application Switzerland, Oct. 10, 1986, 4061/86

Int. Cl.⁴ C09B *67/24*; D06P *1/67, 3/24*

U.S. Cl. 8—620 **26 Claims**

1. A process for dyeing natural or polyamide fibre material from an aqueous liquor with dyes, in the presence of an alkali metal salt or an ammonium salt and in the presence of an assistant, which process comprises dyeing said fibre material with at least one sulfonated 1:1 metal complex dye or with a mixture containing at least one sulfonated 1:1 metal complex dye and at least one sulfonated metal-free dye, in the presence of 20 to 35 percent by weight of an alkali metal fluorosilicate or ammonium fluorosilicate or a mixture thereof, based on the weight of the 1:1 metal complex dye employed, at a pH value in the range from 3 to 5.

4,818,249

TREATED WOOD PRODUCTS

Raybon Barrett, Jr., 11821 Bitten Hollow #18, Austin, Tex. 78758

Filed Dec. 24, 1987, Ser. No. 137,587

Int. Cl.⁴ C10L *5/36*

U.S. Cl. 44—14 **5 Claims**

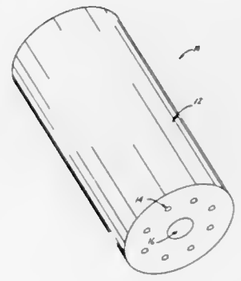
1. A new and improved treated wood product for combustion in fireplaces and wood stoves, comprising:

a man made fireplace log formed from compressed wood materials;

a longitudinally extending central bore formed in said log;

a cylindrical scented core received in said bore;

a plurality of longitudinally extending holes arranged in a circle about said central bore;



and

a plurality of scented rods received in each of said holes.

4,818,250

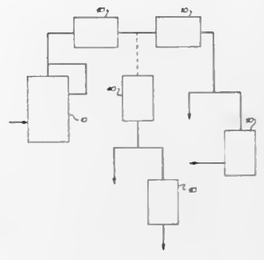
PROCESS FOR PRODUCING FUEL FROM PLANT SOURCES AND FUEL BLENDS CONTAINING SAME

Robert D. Whitworth, Houston, Tex., assignor to Lenco Energy, Inc., Greenville, S.C.

Filed Oct. 21, 1987, Ser. No. 111,914

Int. Cl.⁴ C10L *1/22*

U.S. Cl. 44—62 **28 Claims**



1. A process for producing a fuel from plant sources comprising the steps of:

(a) providing a supply of limonene;

(b) distilling the limonene and removing the distillate fraction in a temperature range of from about 346° F. to about 382° F.;

(c) removing water from the distilled limonene; and

(d) treating the distilled limonene to preclude the formation of gums therefrom.

4,818,251

REMOVAL OF WATER HAZE FROM DISTILLATE FUEL

Thomas Easton, and Bryan Thomas, both of Barry, Wales, assignors to Dow Corning Ltd., Barry, Wales

Filed Apr. 28, 1988, Ser. No. 187,112

Claims priority, application United Kingdom, May 8, 1987, 8710889

Int. Cl.⁴ C10L *1/28*

U.S. Cl. 44—72 **19 Claims**

1. A method of de-hazing distillate fuel which comprises adding to the fuel an organosiloxane having at least one quaternary ammonium substituted siloxane unit having the general formula

$$R_aZSiO_{(3-a)/2} \quad \text{(i)}$$

in which a has the value 1 or 2, each R is selected from the group consisting of substituted and unsubstituted hydrocarbon groups having up to 10 carbon atoms, provided that one R may be a hydroxyl group when a has the value 2, Z represents a quaternary ammonum group having the formula

$$R'N^+(R^2)_3X^- \quad \text{(ii)}$$

linked to the siilcon atom of the siloxane unit, in which R' represents a divalent hydrocarbon group linking the silicon and nitrogen atoms, each R^2 represents an alkyl group having up to 20 carbon atoms and X^- represents a halogen ion, said distillate fuel containing up to about 0.1 percent by weight of water dispersed therein.

11. A mixture consisting essentially of:

(I) a distillate fuel;

(II) up to about 0.1 percent by weight of water based on the weight of said distillate fuel; and

(III) a de-hazing amount of an organosiloxane having at least one quaternary ammonium substituted siloxane unit having the general formula

$$R_aZSiO_{(3-a)/2} \quad \text{(i)}$$

in which a has the value 1 or 2, each R is selected from the group consisting of substituted and unsubstituted hydrcarbon groups having up to 10 carbon atoms, provided that one R may be a hydroxyl group when a has the value 2, Z represents ammonium group having the formula

$$R'N^+(R^2)_3X^- \quad \text{(ii)}$$

linked to the silicon atom of the siloxane unit, in which R' represents a divalent hydrocarbon group linking the silicon and nitrogen atoms, each R^2 represents an alkyl group having up to 20 carbon atoms and X^- represents a halogen ion.

4,818,252

ARRANGEMENT FOR GASIFYING FINELY DIVIDED PARTICULARLY SOLID FUEL UNDER HIGH PRESSURE

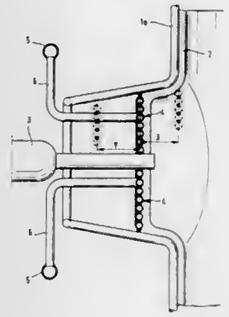
Klaus Köhnen, Ruhr; Hans Niermann, Essen, and Hans C. Pohl, Witten, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 29,535

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3613508

Int. Cl.⁴ C10J *3/48*

U.S. Cl. 48—67 **19 Claims**



1. An arrangement for gasifying finely divided, particularly solid fuel under increased pressure, comprising a multi-pipe wall having a plurality of pipes arranged to be supplied with a cooling medium, said multi-pipe wall limiting a gas-collecting

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chamber and also limiting a plurality of recesses which form combustion chambers, each of said recesses having a plurality of parameters including a depth, a width and an angle of inclination of a peripheral wall and being such that at least one of said parameters is changeable in accordance with operational conditions, said multi-pipe wall including a plurality of first multi-pipe wall portions which limit said recesses and a second multi-pipe wall portion which limits said gas-collecting chamber and are disconnectable and releasable from one another so that at least one of said first multi-pipe wall portions which limits one of said recesses can be removed and replaced by another different first multi-pipe wall portion which limits another different recess; and means for disconnectably and releasably attaching said at least one first multi-pipe wall portion to said second multi-pipe wall portion.

4,818,253

DEVICE FOR GASIFYING FINELY DIVIDED FUELS UNDER INCREASED PRESSURE

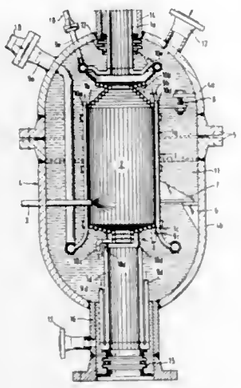
Klaus Köhnen, Mülheim/Ruhr; Hans Niermann, and Norbert Ullrich, both of Essen, all of Fed. Rep. of Germany, assignors to Krupps Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jun. 9, 1987, Ser. No. 60,357

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623604

Int. Cl.[4] C01J *3/48, 3/76*

U.S. Cl. 48—67 **5 Claims**



1. A device for gasification of finely divided fuels by oxygen containing gases under increased pressure, comprising a pipe wall structure assembled of a plurality of pipe circuits for cooling water which enclose 5 a gasification reactor space; a pressure jacket surrounding at a distance the pipe wall structure to delimit therewith an inter7 space; each of said pipe circuits having an inlet conduit passing through said pressure jacket and an outlet end opening into said interspace to fill the same with a body of water; a common water discharge conduit provided in said pressure jacket and communicating with said interspace; and means for hermatically separating said gasification reactor space from said interspace.

4,818,254

SEMI-PERMEABLE MEMBRANES CONSISTING PREDOMINANTLY OF POLYCARBONATES DERIVED FROM TETRAHALOBISPHENOLS

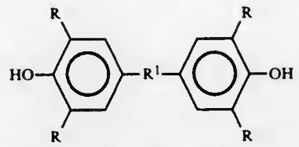
Joginder N. Anand, Clayton; Darrell C. Feay, Orinda, both of Calif.; Stephen E. Bales, Midland, Mich., and Thomas O. Jeanes, Antioch, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 851,758, Apr. 14, 1986, abandoned. This application Jan. 6, 1988, Ser. No. 141,878

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—316 **59 Claims**

1. A semi-permeable gas separation membrane comprising a thin discriminating layer consisting predominantly of a carbonate polymer derived from a bisphenol corresponding to formula I



where R at each occurrence is independently H, Cl, Br, or C_1–C_4 alkyl and R^1 is



—S—, —SO_2—, —O—, or a C_1–C_6 divalent hydrocarbon a C_1-C_6 divalent fluorocarbon radical or inertly substituted hydrocarbon radical, with the proviso that at least 25 weight percent of the moieties derived from the bisphenol of Formula I present in the discriminating layer bear R groups which are exclusively Br or Cl, said gas separation membrane exhibiting a separation factor for oxygen and nitrogen at 24° C. of at least 6.1 and a reduced flux of 3.35×10^{-9} cc/cm^2-sec-cm Hg or greater for oxygen.

17. A process for separating oxygen from nitrogen which comprises contacting a gaseous stream containing oxygen and nitrogen with the membrane of claim 1 under conditions such that oxygen selectively permeates through the membrane, in comparison to nitrogen.

4,818,255

MATERIAL FOR GAS SEPARATION

Junichi Matsuura, Kamakura; Tatsuki Oguchi, Kawagoe, and Munehisa Okada, Tokyo, all of Japan, assignors to Kozo Director-general of Agency of Industrial Science and Technology Iizuka, Tokyo, Japan

Filed Feb. 9, 1988, Ser. No. 154,043

Claims priority, application Japan, Feb. 10, 1987, 62-27216; Feb. 10, 1987, 62-27217; Feb. 28, 1988, 63-15936

Int. Cl.[4] B01D *53/04, 53/22*

U.S. Cl. 55—16 **21 Claims**

1. A material for gas separation obtained by mixing a copper compound and a benzoin and/or an ascorbic acid in a solvent.

4. A selective gas permeation membrane comprising a supporting membrane and a material for gas separation as defined in claim 1, supported thereon.

4,818,256

STEAM SCRUBBING METHOD AND SYSTEM FOR EXHAUST GASES

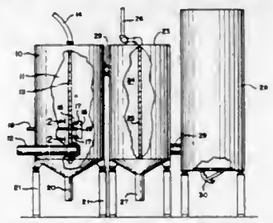
Jody D. Ross, 809 Liberty, Suite B, Boise, Id. 83704

Filed Apr. 20, 1988, Ser. No. 183,899

Int. Cl.[4] B01D *47/00*

U.S. Cl. 55—93 **6 Claims**

1. A method of cleaning an exhaust gas, comprising the steps of flowing an exhaust gas into a steam scrubber having a steam scrubber chamber within which is impingement plate means; directing a flow of steam toward said impingement plate



means; and directing a jet of a liquid carrying a gas treatment chemical toward and against said impingement plate means, so as to atomize said liquid and mix it with the steam.

4,818,257

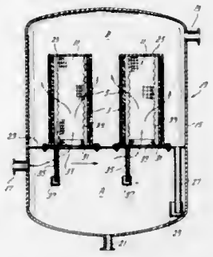
FIBER BED SEPARATOR AND PROCESS FOR REMOVAL OF AEROSOLS FROM HIGH VELOCITY GAS WITHOUT RE-ENTRAINMENT

Eugene D. Kennedy, Maryland Heights; Donald R. McAlister, Ballwin, and Albert E. Tung, Manchester, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 1, 1987, Ser. No. 44,938

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—97 **48 Claims**



33. A process for removing aerosols of less than 3 microns from a moving gas stream in a fiber bed separator wherein said aerosol containing gas is caused to flow substantially horizontally through a bed of fibers having a mean diameter of at least about 10 microns to 50 microns and packed to a substantially uniform bed voidage from about 85% to about 99%, resulting in separation of a substantial proportion of the aerosol from the gas as a collected liquid phase, an improvement whereby reentrainment of said liquid phase from the downstream surface of said fiber bed is substantially prevented, said improvement comprising:

providing a second fiber bed adjacent said first fiber bed, adjacent surfaces of said fiber beds being substantially vertical and wherein each of said first fiber bed and said second fiber bed are configured as a tube that is substantially concentric with the cylindrical axis;

causing said aerosol containing gas to flow through said first fiber bed at a velocity that effects collection of the liquid aerosol, consequently imparting a horizontal component of movement of collected liquid through said first fiber bed toward the downstream surface of said first fiber bed due to gas phase drag; and

continuing the substantially horizontal flow of said gas, now substantially free of aerosol particles, through said second fiber bed, said second fiber bed having a substantially uniform bed voidage of 95% to 99% and comprising a network of fibers having a mean fiber diameter between about 100 and about 450 microns, said network comprising a plurality of layers of generally planar knitted wire mesh material containing ridges therein extending from the plane of the weave, thereby creating a space between successive layers so that the voidage of the second fiber bed exceeds the voidage of the knitted mesh material, and wherein the ridges of each of said layers are generally parallel to one another and extend in a direction biased with respect to the direction in which the ridges of an adjacent layer extend; the fiber diameter and voidage of said second bed being such that liquid collected from the aerosol in said first fiber bed substantially drains from said second fiber bed without substantial re-entrainment.

4,818,258

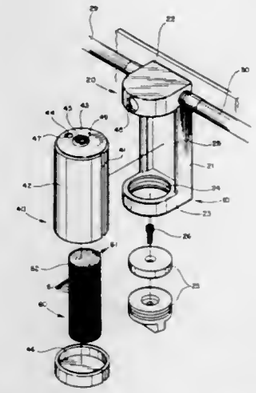
FILTER MODULE

Clifton B. Vann, III, Charlotte, N.C., assignor to L&H Technologies, Inc., Charlotte, N.C.

Continuation of Ser. No. 117,667, Nov. 5, 1987. This application Dec. 31, 1987, Ser. No. 139,984

Int. Cl.[4] B01D *55/22*

U.S. Cl. 55—158 **19 Claims**



1. A filter module for enclosing a filter medium for removing particulate matter from a moving gas stream, comprising:

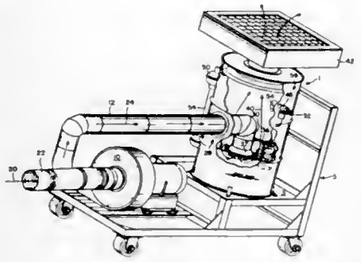
(a) a base having a base gas inlet for being connected to a source of gas to be filtered and a base gas outlet for discharging filtered gas;

(b) an enclosed replaceable and disposable filter module housing for being releasably received in and supported by said base, said filter module housing having a module gas inlet adapted for sealing gas flow connection to said base gas inlet, and a module gas outlet adapted for sealing gas flow connection to said base gas outlet for discharging filtered gas from the filter module housing and base; and

(c) a filter element sealingly positioned in said filter module housing in gas flow interposed relation downstream of said module gas inlet and upstream of said module gas ontlet in such manner that the gas must pass through said filter element in order to reach said module gas outlet, said filter element comprising a multiplicity of hollow fibers each defined by a membrane wall formed of a microporous material surrounding a centrally-disposed lumen wherein filtration occurs by passing the gas from an upstream side of the hollow fiber through the membrane wall of the fibers to a downstream side thereof.

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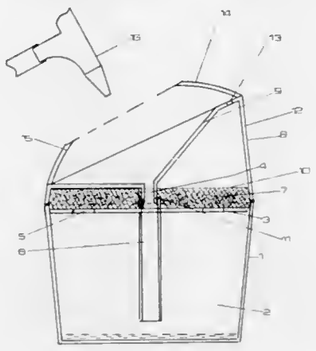
4,818,259
AIR FILTRATION DEVICE
Gary L. Marano, Redwood City, Calif., assignor to Jet-Flow Filtration Co., Redwood City, Calif.
Filed Jan. 19, 1988, Ser. No. 144,968
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—227 **4 Claims**



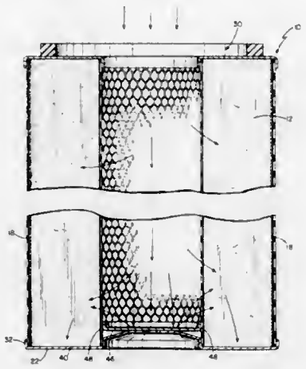
1. A wet dust collective device for efficiently removing dirt or other particles from air comprising an upright cylindrical tank forming a settling chamber for the dirt to be collected, the chamber being filled with water to a defined level, the tank having a dirty air inlet substantially above the water level an L-shaped pipe extending down from said dirty air inlet to below the level of the water in the chamber, said L-shaped pipe terminating in a flared cap portion for carrying dirty air below the surface of the water and causing the air to flow in a turbulent fashion through the water, the dust settling to the bottom of the chamber, a dry element filter located on the top of said tank and said chamber for providing secondary cleaning of the air, and means for conveying the dirty air to the tank at high pressure comprising a high pressure direct drive blower and an air transfer hose having an end coupled to said dirty air inlet to said chamber and an inlet end coupled to a high pressure outlet of said high pressure direct drive blower, said blower receiving said dirty air at its inlet and propelling it through said air transfer pipe and said L-shaped pipe at sufficient power to cause significant turbulence in the water where the air exits from the pipe, whereby the dirt is precipitated from the air and settles to the bottom of the tank.

4,818,260
AIR BRUSH CLEANING DEVICE
Joseph Minnella, 38 Bodenos Dr., Sayville, N.Y. 11782
Filed Mar. 10, 1988, Ser. No. 166,504
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—385.4 **11 Claims**

1. An air brush cleaning device, comprising
a container limiting an inner chamber and having a substantially horizontal wall,
means for introducing a paint from an air brush into said inner chamber of said container and including a through going passage provided in said wall,
means for absorbing vapors produced from the paint and including a plurality of openings provided in said wall and filtering means associated with said openings, so that the paint is introduced into said inner chamber through said passage while the vapors escape from said inner chamber through said openings and are absorbed by said filtering means,
means for guiding the paint toward said passage in said wall and including a guiding lid which is located upstream of said container and removably connected with said container, said guiding lid being funnel-shaped and including at least one inner wall which is inclined toward said passage and an inlet for the paint so that when the paint is introduced into said guiding lid through said inlet it is guided by said inclined wall towards said passage of said container,
said guiding lid having an outlet in a connected position with said container, which outlet is substantially aligned with said passage of said container, and a closing wall which in the connected position prevents propagation of the vapors, which escape from said inner chamber of said container through said openings, from entering said guiding lid,
said passage of said container being provided with a guiding tube which extends from said passage into an interior of said inner chamber of said container, said outlet of said guiding lid having a short outlet tube which is engageable with said guiding tube of said passage of said container.

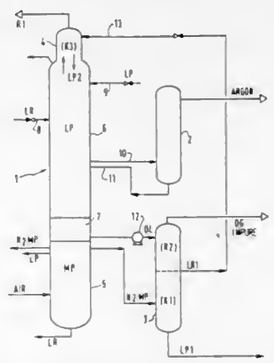


4,818,261
REVERSED PULSE CLEANING FILTER
Weir E. Beckon, 10166 Boone Circle, Bloomington, Minn. 55438
Filed Oct. 15, 1987, Ser. No. 108,450
Int. Cl.[4] B01D *46/10*
U.S. Cl. 55—498 **15 Claims**



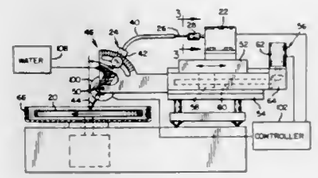
10. A filter which is cleaned by pressurized reverse air pulses emitted from a reverse air pulse source, comprising:
(a) a filter medium for filtering foreign particles from the substance passing therethrough;
(b) a perforated housing having end plates and containing said filter medium, said filter medium being connected to said end plates and forming seals thereby, one of said end plates having an inlet therein, and one of said seals being disposed in confronting relation to said inlet, said housing defining an air inlet passageway with an axis of air travel for receiving reverse air pulses for cleaning said filter medium, and for providing an outlet for the filtered substance; and
(c) a rigid imperforate protector plate separate from said end plates and transversely disposed within said air inlet passageway, said protector plate being devoid of substantial axially extending flow directing structure and being constructed and arranged so that the direct forces of the reverse air pulses used for cleaning said filter medium do not directly contact said end plate forming said confronting seal.

4,818,262
AIR DISTILLATION PROCESS AND PLANT
Jean-Renaud Brugerolle, Paris, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation des Procedes Georges Claude, Paris, France
PCT No. PCT/FR86/00247, § 371 Date Feb. 6, 1987, § 102(e) Date Feb. 6, 1987, PCT Pub. No. WO87/00609, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 9, 1986, Ser. No. 26,792
Claims priority, application France, Jul. 15, 1985, 85 10796
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 **17 Claims**



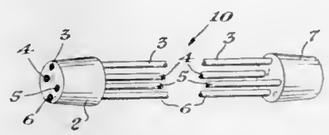
1. A process for high-yield argon production by means of an air distillation plant comprising a main distillation apparatus (1; 1,18; 1,6A; 1A) associated with an argon producing column (2) through an argon tapping conduit (10), comprising:
sending to the base of a first mixing column section (K1) gaseous nitrogen which may be impure but is substantially without argon, and to the top of a second mixing column section (K2) liquid oxygen which may be impure but is substantially without argon;
sending to the base of the second section (K2) at least a part of the top vapor of the first section and to the top of the first section (K1) at least a part of the liquid produced at the base of the second section;
withdrawing between the two mixing column sections a fluid flow, and forming from said fluid flow a residual gas which is a mixture of nitrogen and oxygen comprising about 10 to 30% oxygen;
discharging from the second section (K2), at the top of the later, impure oxygen containing at the most a few % nitrogen; and
discharging from the first section (K1), at the base of the latter, poor liquid (LP1) constituted by nitrogen containing at the most a few % oxygen, and sending this poor liquid as reflux to the main distillation apparatus (1; 1,18; 1,6A; 1A).

4,818,263
METHOD AND APPARATUS FOR PRECISELY POSITIONING MICROLENSES ON OPTICAL FIBERS
John H. Mitch, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Jan. 11, 1967, Ser. No. 62,308
Int. Cl.[4] C03B *37/027, 11/08*
U.S. Cl. 65—2 **20 Claims**



1. A method for providing a microlens on the end of an optical fiber comprising the steps:
providing an abrasive surface;
positioning the optical fiber so that the axis of the end portion thereof defines a desired angle with the abrasive surface;
effecting relative movement between the end portion of the fiber and the abrasive surface; and
providing a spring means for urging the end portion of the fiber against the abrasive surface.

4,818,264
MULTICAPILLARY GAS CHROMATOGRAPHY COLUMN
Marsha L. Langhorst, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Apr. 30, 1987, Ser. No. 44,396
Int. Cl.[4] C03B *23/20;* **B01D** *15/08*
U.S. Cl. 65—4.3 **2 Claims**



1. A method of making a balanced multicapillary gas chromatography column, consisting essentially of the steps of:
(a) cutting a single capillary gas chromatography column into a plurality of essentially equal length sections; and
(b) assembling the sections into a bundle of the sections to make a finished column.

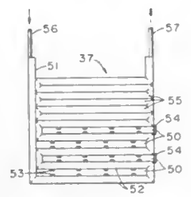
4,818,265
BARRIER APPARATUS AND METHOD OF USE FOR MELTING AND REFINING GLASS OR THE LIKE
John F. Krumwiede, Cumberland, Md., and Heary C. Goode, Decatur, Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 14, 1987, Ser. No. 133,587
Int. Cl.[4] C03B *5/20*
U.S. Cl. 65—135 **12 Claims**

1. A method of making glass or the like wherein partially melted, liquefied glass batch materials are received in an intermediate vessel with relatively low density material at the surface regions of the pool of material held in the vessel, and the liquefied material is passed from an outlet end of the intermediate vessel to a refining stage, characterized by blocking flow at the outlet end of the vessel so as to restrict the outlet

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flow of the liquefied material to the lower half of the vessel, with the blocking at the surface regions being by means of a metallic structure extending across substantially the entire width of the vessel and provided with circulation of coolant, the blocking below the surface region being substantially by means of a graphite structure through which coolant is not circulated, whereby the blocking of unwanted surface flow is effected without undue cooling of the liquefied material adjacent to the barrier that would induce drawing low density material down into the outlet flow stream.

7. Apparatus for making glass or the like comprising means for liquefying glass batch materials, an elongated channel for receiving partially melted material from the liquefying means,



a refining vessel communicating with an outlet end of the channel, barrier means at the outlet end of the channel for restricting outlet flow to the lower half of the channel, the upper portion of the barrier means including a metallic structure extending across substantially the entire width of the channel so as to block flow at the surface of the material held in the channel, the metallic member being provided with means to pass coolant therethrough, a substantial area of the submerged portion of the barrier means consisting of a graphite structure not provided with coolant passage means, whereby significant reduction of the outlet opening can be achieved without unduly affecting the thermal conditions in the channel.

4,818,266

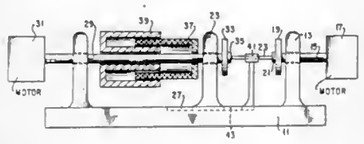
APPARATUS FOR PRODUCING GLASS TUBING OF A NARROWED DIAMETER

Frederick Sachs, Buffalo, and Victor Demjanenko, North Tonawanda, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 693,725, Jan. 23, 1985, abandoned. This application May 14, 1986, Ser. No. 863,119

Int. Cl.⁴ C03B *23/11*

U.S. Cl. 65—271 **5 Claims**



1. An apparatus for producing narrowed diameter hollow glass tubing which comprises:

a. a pair of co-axially aligned chucks, one of said chucks being stationary, and one of said chucks being laterally movable while remaining in co-axial alignment with said stationary chuck,

b. a pair of independent drive means, each said drive means operatively arranged to independently rotate one of said co-axially aligned chucks at a variable speed,

c. a movable heating means positoned inter-mediate said chucks,

d. means for moving said movable chuck in lateral direction away from said stationary chuck while maintaining said co-axial alignment between the chucks, and

e. means for moving said heating means in a lateral direction simultaneously with the movement of said movable chuck, said heating means moving about one-half the distance moved by said movable chuck, whereby said heating means remains substantially centered between said chucks.

4,818,267

APPARATUS FOR WITHDRAWING A SAMPLE FROM A GLASS MELTING FURNACE

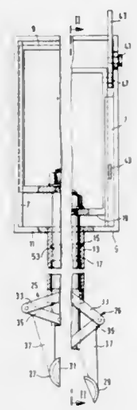
Helmut Straschewski, Kehl-Querbach, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 169,624

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708818

Int. Cl.⁴ C05B *5/16*

U.S. Cl. 65—375 **10 Claims**



1. An apparatus which can be raised and lowered for withdrawing a sample from a glass-melting furnace having an opening formed therein to facilitate taking a sample of the melt, the apparatus comprising:

an elongated guide frame having a lower base and defining a vertical longitudinal axis;

a slider having a lower end and being mounted within said guide frame;

guide means in said guide frame for displaceably guiding said slider along said axis between upper and lower positions within said guide frame;

an annular guide member fixedly mounted in said base so as to define a clear passage into said frame, said guide member extending downwardly from said base in the direction of said axis so as to be lowerable into the melt through the opening in the furnace;

said slider having a pull rod mounted to said lower end of said slider so as to extend coaxially into said passage of said annular guide member and be displaceable relative to the latter as said slider moves between said upper and lower positions;

articulated linkage means interconnecting the lower end of said guide member and the lower end of said pull rod for moving between first and second positions in correspondence with the movement of said slider between said upper and lower positions; and,

a pair of grippers mounted on said articulated linkage means for moving between an open position to receive a sample of the melt when said linkage means is in said second position and a closed position when said linkage means is in said first position wherein said grippers conjointly define a closed cavity for holding the sample.

4,818,268

OSMOPROTECTANT

R. B. Holtz, Morgan Hill, Calif., assignor to Spawn Mate, Inc., Capitola, Calif.

Continuation-in-part of Ser. No. 16,508, Feb. 17, 1987, abandoned, Continuation of Ser. No. 776,770, Sep. 16, 1985, abandoned. This application Oct. 14, 1987, Ser. No. 106,960

Int. Cl.⁴ C05F *11/00*

U.S. Cl. 71—5 **16 Claims**



1. An osmoprotectant particle for enhancing fungus growth comprising:

a protein carrier particle, generally spherical in structure, including a plurality of recessed attachment sites; and

a plurality of osmoprotectant droplets, smaller in size that said carrier particle and having a core formed by the hydrocarbon tails of a water soluble phosphoglyceride material surrounded by an osmoprotectant layer, said osmoprotectant layer comprising the polar head of the phosphoglyceride material, said droplets being attached to said plurality of recessed attachment sites to be substantially surrounded by the carrier particle such that release of said osmoprotectant layer occurs only during the latter flushes of the mushroom crop when the carrier particle has been partially broken down by mycelia of earlier flushes.

4,818,269

CELLULOSIC COMPOSITIONS AND METHODS FOR TREATING CELLULOSIC MATERIALS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 442,296, Nov. 17, 1982, and a continuation-in-part of Ser. No. 444,667, Nov. 26, 1982, and a continuation-in-part of Ser. No. 453,496, Dec. 27, 1982. This application Jan. 3, 1983, Ser. No. 455,268

Int. Cl.⁴ A01N *47/28, 59/02*

U.S. Cl. 71—83 **25 Claims**

1. A method for weakening the physical structure of plant matter which comprises contacting said plant matter with an amount of an aqueous solution comprising urea and sulfuric acid sufficient to weaken the physical structure of said plant matter, in which solution the molar ratio of said urea to said sulfuric acid is within the range of about ¼ to about 7/4.

4,818,270

2-(HETEROAMINO)-4,5-SUBSTITUTED-OXAZOLE/-THIAZOLE COMPOUNDS AS HERBICIDE ANTIDOTES, COMPOSITIONS AND USE

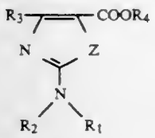
Raymond C. Grabiak, Maryland Heights; Robert K. Howe, Bridgeton, and Cheryl Yearell-Vinson, University City, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 28, 1986, Ser. No. 901,220

Int. Cl.⁴ A01N *43/76, 43/78;* C07D *413/12, 417/12*

U.S. Cl. 71—88 **56 Claims**

1. A compound of the formula



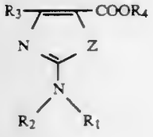
wherein Z is oxygen or sulfur;

R_1 and R_2 are independently hydrido, pyrazolyl, pyridinly or pyrimidinyl radicals, provided that at least one of R_1 and R_2 is not hydrido and R_1 and R_2 are combined to form a pyrazolyl, benzimidazolyl or octahydroindolyl radical, substituted or unsubstituted with an amino or alkozycarbonyl radical;

R_3 is a baloalkyl radical, and

R_4 is a lower alkyl radical.

11. A composition of a herbicidally-effective amount of a herbicide compound selected from the group consisting of thiocarbamates, acetamides, and triazines and an antidotally-effective amount of a compound of the formula



wherein

Z is oxygen or sulfur;

R_1 and R_2 are independently hydrido, pyrazolyl, pyridinyl or pyrimidinyl radicals, provided that at least one of R_1 and R_2 is not hydrido and R_1 and R_2 are combined to form a pyrazolyl, benzimidazolyl or octahydroindolyl radical, substituted or unsubstituted with an amino or alkoxycarbonyl radical;

R_3 is a haloalkyl radical, and

R_4 is a lower alkyl radical.

4,818,271

PYRIDINYLUREA COMPOUNDS AND AGRICULTURAL USES

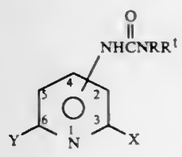
Robert N. Henrie, II, East Windsor, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 31, 1985, Ser. No. 793,371

Int. Cl.⁴ A01N *43/40;* C07D *213/44*

U.S. Cl. 71—88 **22 Claims**

1. Pyridinylurea compounds of the formula:



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and acid addition salts thereof; wherein R is isopropyl, n-butyl, i-butyl, tert. butyl, sec. pentyl, tert. pentyl, cyclopropyl, or an alkyl(C_1–C_5) group substituted with hydroxy, cycloalkyl(C_3–C_8) or dialkylamino; R^1 is hydrogen or methyl; R and R^1 together with the nitrogen atom of the NRR^1 group optionally define a heterocycle selected from pyrrolidinyl, 3-pyrrolinyl, piperidinyl and azepinyl; X is hydrogen, halogen, haloalkyl, alkoxy, alkylthio or alkylsulfonyl; Y is hydrogen, halogen, haloalkyl, alkoxy, alkylthio or alkylsulfonyl; R, X and Y may each contain alkyl (C_1–C_2) atoms; and wherein the $NHCONRR^1$ group is bonded to the pyridinyl ring in the 4-position; provided that at least one of X and Y is other than hydrogen and provided further that when R^1 methyl then R is tert. butyl or cyclopentyl and when X and Y are halogen then R is cycloalkyl(C_5–C_7) or isopropyl, and R, X and Y each contain 1–20 carbon atoms unless otherwise specified.

11. A plant growth regulator composition comprising a plant regulating amount of a compound of claim 1 in admixture with an agriculturally acceptable carrier or extender.

4,818,272

OXAZOLIDINEDIONE DERIVATIVES, METHOD OF PRODUCING THE DERIVATIVES, AND HERBICIDES CONTAINING THE DERIVATIVES

Kenji Hirai; Takamasa Futikami; Atsuko Murata, all of Kanagawa; Hiroaki Hirose; Masahiro Yokota, both of Chiba, and Shoin Nagato, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo; Chisso Corporation, Osaka and Kaken Pharmaceutical Co. Ltd., Tokyo, all of, Japan, a part interest

PCT No. PCT/JP86/00514, § 371 Date Jun. 11, 1987, § 102(e) Date Jun. 11, 1987, PCT Pub. No. WO87/02357, PCT Pub. Date Apr. 23, 1987

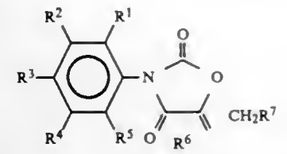
PCT Filed Oct. 9, 1986, Ser. No. 72,268

Claims priority, application Japan, Oct. 11, 1985, 60-226270; Oct. 11, 1985, 60-226294

Int. Cl.[4] A01N *43/76;* **C07D** *263/06*

U.S. Cl. 71—88 **4 Claims**

4. A herbicide comprising an effective amount of a compound of the formula:



wherein

R^1 is selected from the group consisting of hydrogen, halogen and nitro;

R^2 and R^5 are independently selected from the group consisting of hydrogen and halogen;

R^3 is selected from the group consisting of hydrogen, halogen and alkyl of 1–4 carbon atoms;

R^4 is selected from the group consisting of hydrogen, halogen, nitro, haloalkyl of 1–3 carbon atoms, alkoxy of 1–8 carbon atoms, alkenyloxy of 2–8 carbon atoms, alkynyloxy of 2–8 carbon atoms and cycloalkyloxy of 3–8 carbon atoms;

R^6 and R^7 are independently selected from the group consisting of hydrogen, straight or branched chain alkyl of 1–8 carbon atoms and aryl of 6–10 carbon atoms or R^6 and R^7 may be taken together to form a polymethylene chain of 3–10 carbon atoms;

said alkyl, alkoxy, alkenyloxy, alkynyloxy, cycloalkyloxy and aryl groups being unsubstituted or substituted with one or more halogen, alkyl groups of 1 to 5 carbon atoms or alkoxycarbonyl groups of 2 to 8 carbon atoms and

at most three of R^1–R^5 being substituents other than hydrogen, in association with an acceptable carrier.

4,818,273

SUBSTITUTED 1,2,4-TRIAZOLO[1,5-A]PYRIMIDINE-2-SULFONAMIDES, COMPOSITIONS CONTAINING THEM, AND THEIR UTILITY AS HERBICIDES

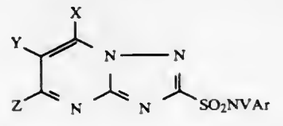
William A. Kleschick, Martinez, Calif.; Robert J. Ehr, Eden Prairie, Minn.; Mark J. Costales, Concord; Ben C. Gerwick, III, Clayton, both of Calif.; Richard W. Meikle, deceased, late of Walnut Creek, Calif. (by Diane L. Meikle, heir); William T. Monte, Concord, Calif., and Pearson, Norman R., Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 768,393, Aug. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 551,758, Nov. 14, 1983, abandoned. This application Dec. 10, 1986, Ser. No. 940,480

Int. Cl.[4] A01N *43/90;* **C07D** *487/04*

U.S. Cl. 71—90 **132 Claims**

1. A method of controlling undesired vegetation which comprises applying to the locus of the vegetation an herbicidally effective amount of a compound having the formula:



wherein

Ar represents an aromatic or heteroaromatic ring chosen among phenyl; 1- or 2-naphthyl; 2-, 3-, or 4-pyridyl; 2- or 3- thienyl; 2- or 3-furyl; 2-, 4-, or 5-thiazoyl; 2, 4, or 5-imidazoyl; 2-, 4- or 5-oxazoyl; 3-, 4-, or 5-isothiazoyl; 3-, 4-, or 5-isoxazoyl; 3-, 4-, or 5-pyrazoyl; 2-benzthiazoyl; 2-benzoxazoyl; 2-benzimidazoyl; or 1-benztriazoyl; and Ar is unsubstituted except in the case of where Ar is phenyl or Ar is substituted with one to four substituents chosen from among C_1–C_6 alkyl; benzyl; halo; C_1–C_6 mono- or polyhaloalkyl; phenyl; phenyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; hydroxy; C_1–C_6 alkoxy; C_1–C_6 mono- or polyhaloalkoxy; phenoxy; phenoxy substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; 2-pyridyloxy; 2-pyridyloxy substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; amino; C_1–C_6 alkylamino; C_1–C_6 dialkylamino; nitro; C_1–C_6 alkylthio; C_1–C_6 polyhaloalkylthio; C_1–C_6 alkylsulfinyl; C_1–C_6 polyhaloalkylsulfinyl; C_1–C_6 alkylsulfonyl; C_1–C_6 polyhaloalkylsulfonyl; phenylthio; phenylthio substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; phenylsulfinyl; phenylsulfinyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; phenylsulfonyl; phenylsulfonyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; cyano; carboxyl; C_1–C_{10} alkoxycarbonyl; phenoxycarbonyl; phenoxycarbonyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; alkoxyalkoxycarbonyl wherein the number of carbons in the alkoxyalkoxy fragment ranges from 2–10 and the number of oxygens in the alkoxyalkoxy fragment ranges from 2–4; 2-pyridylmethoxycarbonyl; dialkylaminoalkoxycarbonyl wherein the number of carbons in the dialkylaminoalkoxy fragment ranges from 3–10 and the number of oxygens in the dialkylaminoalkoxy fragment is one; C_3–C_6 alkenyloxycarbonyl; $COON{=}C(R^{14})(R^{14})$ wherein R^{14} independently represents hydrogen, C_1–C_6 alkyl or phenyl; amino-, C_1–C_6 alkylamino- or di C_1–C_6 alkylaminocarbonyl; C_1–C_{10} alkoxysulfonyl; C_1–C_4 polyhaloalkoxysulfonyl; di C_1–C_6 alkylaminosulfonyl; formyl; C_1–C_6 alkylcarbonyl; C_1–C_6 mono- or polyhaloalkylcarbonyl; phenylcarbonyl; phenylcarbonyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; or $C(R^{15})(R^{15})OR^{16}$ wherein each R^{15} independently represents hydrogen or C_1–C_6 alkyl and R^{16} represents hydrogen, C_1–C_6 alkyl, benzyl, phenylcarbonyl, or C_1–C_6 alkylcarbonyl; (except in the cases of thio, sulfinyl, and sulfonyl substituents where if one of these substituents is present the other one to three Ar substituents may not be chosen from among the other two; oxycarbonyl substituents where the other one to three Ar substituents may not be chosen from among different oxycarbonyl substituents or aminocarbonyl substituents where the other one to three Ar substituents may not be chosen from among different aminocarbonyl substituents); X, Y, and Z idependently represent carboxyl; hydrogen; C_1–C_6 alkyl; C_1–C_6 mono- or polyhaloalkyl; mono- or polyhaloalkoxy; amino; C_1–C_4 alkylamino; or di C_1–C_4 alkylamino; phenyl; phenyl substituted with one or more groups chosen from halo, nitro, C_1–C_6 alkyl, or C_1–C_6 mono- or polyhaloalkyl; C_1–C_6 alkylthio; or halo; or two adjacent substituents (i.e. X and Y or Y and Z) are joined together to form a five, six, or seven-membered saturated cyclic structure of carbon atoms or one said carbon atom of X, Y or Y, Z is replaced by a heteroatom chosen from among nitrogen, oxygen, and sulfur (i.e. X, Y or Y, Z is $—(CH_2)_n—$ wherein n is 3, 4, or 5; or X, Y or Y, Z is $—(CH_2)_n—A—(CH_2)—_m$ wherein n is 0–4, the value of m is equal to the ring size minus (n + 3) and A is NH, O, or S); and V is H or R and R represents C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, phenylalkyl, C_2–C_4 alkanoyl, C_1–C_{10} alkoxycarbonyl, phenoxycarbonyl, di C_1–C_6 alkylaminocarbonyl, C_1–C_6 akylsulfonyl, phenylsulfonyl, C_1–C_{10} alkoxythiocarbonyl or phenoxythiocarbonyl wherein alkyl, alkenyl, alkynyl and alkoxy in each instance is optionally substituted by halo and each phenyl moiety is optionally substituted by one or two groups selected from halo, nitro, C_1–C_4 alkyl, and C_1–C_4 haloalkyl; and, when V represents hydrogen, agriculturally acceptable salts thereof.

4,818,275

HERBICIDAL ARYL TRIAZOLINONES

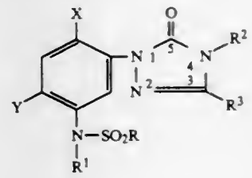
George Theodoridis, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 811,615, Dec. 20, 1985. This application Dec. 31, 1986, Ser. No. 946,667

Int. Cl.[4] A01N *43/64;* **C07D** *249/14*

U.S. Cl. 71—92 **23 Claims**

1. An herbicidal compound of the general formula



in which

X is Br, Cl, F or haloalkyl;

Y is Br, Cl, F, methyl, haloalkyl, nitro, or a radical of the formula $R^8OCH_2—$, $R^8SCH_2—$, $R^8SOCH_2—$ or $R^8SO_2CH_2—$ where R^8 is C_1–C_3alkyl, C_2–C_5alkenyl, C_3–C_5alkynyl, phenyl, or substituted phenyl;

R^3 is halogen, alkyl, haloalkyl, cyanoalkyl, arylalkyl, alkoxyalkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylthioalkyl, alkylsulfinylalkyl or alkylsulfonylalkyl;

R^2 is alkyl, alkoxy, haloalkyl, alkenyl, alkynyl, cyanoalkyl, thiocyanoalkyl, or a group of the formula —alkylene—Y'-R^5 in which said alkylene group has 1 to 5 carbon atoms, Y' is oxygen or S(O)r in which r is 0 to 2, and R^5 is alkyl, alkenyl or alkynyl;

R is alkyl;

R^1 is hydrogen, a salt-forming group, alkyl, benzyl, haloalkyl, alkoxy, SO_2R, alkynyl, alkenyl, a group of the formula —alkylene—SO_2R or alkoxymethyl or R and R_1 together is alkylene, said salt-forming group being selected from Na, K, Ca, and ammonium.

4,818,274

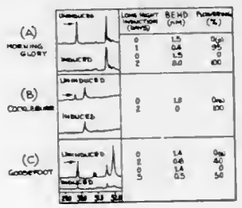
METHOD AND COMPOSITION FOR REGULATING THE FLOWERING OF PLANTS

Kenneth A. Bridle, and Mordecai J. Jaffe, both of Winston-Salem, N.C., assignors to Wake Forest University, Winston-Salem, N.C.

Filed Dec. 23, 1985, Ser. No. 812,248

Int. Cl.[4] A01N *37/04*

U.S. Cl. 71—106 **7 Claims**



1. A method of treating plants in a non-toxic manner to control flowering without killing or damaging the plant, which method comprises applying to the plants a solution of a diester of a dicarboxylic acid, which acid contains from 2 to 16 carbon atoms, said diester having as one alcohol residue an alkyl radical containing from 3 to 16 carbon atoms, and having as the other alcohol residue an alkyl radical containing from 3 to 16 carbon atoms, in an amount insufficient to kill but effective to delay the flowering of said plants.

4,818,276

HERBICIDAL 1-ARYL-Δ^2-1,2,4-TRIAZOLIN-5-ONES

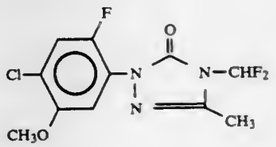
Lester L. Maravetz, Westfield, and George Theodoridis, Princeton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 673,291, Nov. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 594,602, Mar. 29, 1984, abandoned. This application Aug. 8, 1985, Ser. No. 763,855

Int. Cl.[4] A01N *43/64;* **C07D** *249/12*

U.S. Cl. 71—92 **4 Claims**

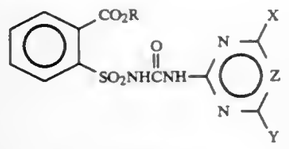
1. The compound of the formula



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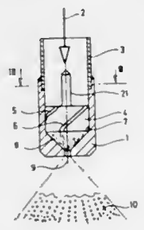
4,818,277
ALKYL SULFONES
Levitt George, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 227,886, Jan. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 134,287, Mar. 26, 1980, abandoned. This application Jul. 12, 1982, Ser. No. 395,782
Int. Cl.[4] A01N *43/54*; C07D *239/02*
U.S. Cl. 71—92 3 Claims
1. The compound N-[(4-methoxy-6-methylpyrimidin-2-yl)-aminocarbonyl]-2-(propylsulfinyl)benzenesulfonamide.

4,818,278
AGRICULTURAL SULFONAMIDES
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 382,369, May 26, 1982, abandoned, Continuation-in-part of Ser. No. 29,281, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 15,341, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,070, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,965, May 30, 1978, abandoned. This application Sep. 14, 1984, Ser. No. 650,870
Int. Cl.[4] A01N *43/66*
U.S. Cl. 71—93 12 Claims
1. A herbicidal mixture consisting essentially of an effective amount of a compound
A. Is selected from:



R is C_1–C_4 alkyl or C_2–C_4 alkenyl;
X is CH_3, OCH_3 or OC_2H_5;
Y is C_1–C_4 alkyl, C_1–C_4 alkoxy or Cl; and
Z is CH or N;
and their agriculturally suitable salts, and
B. Is selected from :
3-amino-2,5-dichlorobenzoic acid;
N-(2,chloroethyl)-2,6-dinitro-N-propyl-4-(trifluoromethyl)aniline;
3,5-dinitro-N,N-dipropylsulfanilamide;
N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzeneamine;
N-(cyclopropylmethyl)-1,1,1-trifluoro-2,6-dinitro-N-propyl-p-toluidine;
3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea;
2-chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide;
2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2,methoxy-1-methylethyl)acetamide;
a,a,a-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine
N-phosphonomethylglycine;
1,1'-dimethyl-4,4'-bipyridinium ion;
N-[2,3-dimethyl-5-[[(trifluoromethyl)sulfonyl]amino]-phenyl]acetamide;
5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoic acid;
2-[4-(2,4-dichlorophenoxy)phenoxy]propanoic acid;
2-s-butyl-4,6-dinitrophenol;
4-(2,4-dichlorophenoxy)butyric acid;
4-amino-6-t-butyl-3-(methylthio)-as-triazin-5(4H)-one;
2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)-benzene;
isopropyl carbanilate;
2-[[4-chloro-6-(ethylamino)-s-triazin-2-yl]amino]-2-methyl-propionitrile;
3,5-dibromo-4-hydroxybenzonitrile;
1,2-dimethyl-3,5-diphenyl-1H-pyrazolium;
S-(2,3,3-trichlorallyl)diisopropylthiocarbamate;
[[4-chloro-o-tolyl]oxy]acetic acid;
3',4'-dichloropropionalide;
2-(t-butylamino)-4-(ethylamino)-6-(methylthio)-s-triazine;
3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione;
5-bromo-3-s-butyl-6-methyluracil;
3-(3,4-dichlorophenyl)-1,1-dimethylurea;
monosodium methanearsonate;
3,6-dichloro-o-anisic acid;
2-chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine;
2-chloro-4,6-bis(ethylamino-s-triazine;
N-[5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl]-N,N'-dimethyl-1-urea;
4-amino-3,5,6-trichloropicolinic acid;
ethyl hydrogen(aminocarbonyl)phosphonate;
2,2-dichloropropionic acid;
(2,4-dichlorophenoxy)acetic acid;
1,3-dimethyl-3-(2-benzothiazolyl)urea;
4-chloro-2-butynyl-m-chlorocarbanilate;
trichloroacetic acid;
methyl-5-(2,4-dichlorophenoxy)-2-nitrobenzoate; and
N-(4-isopropylphenyl)-N',N'-dimethylurea.

4,818,279
METHOD AND DEVICE FOR THE GRANULATION OF A MOLTEN MATERIAL
Bernard Chaleat, Norcier, and Philippe Vaxelaire, Ville La Grand, both of France, assignors to Extramet Industrie S.A., Boane, France
PCT No. PCT/FR87/00182, § 371 Date Feb. 11, 1988, § 102(e) Date Feb. 11, 1988, PCT Pub. No. WO87/07546, PCT Pub. Date Dec. 17, 1987
PCT Filed May 27, 1987, Ser. No. 163,119
Claims priority, application France, Jun. 13, 1986, 86 08543
Int. Cl.[4] B22F *9/08*
U.S. Cl. 75—0.5 C 10 Claims

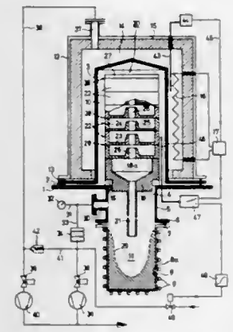


10. Method of making solidified granules of reactive metals having predetermined dimensions by using a granulating device comprising means for heating and melting the metal to be granulated and means for feeding molten metal into a container terminating in a orifice for spray discharge of the metal in the form of droplets at the inlet of a cooling enclosure in which the droplets solidify in the form of granules and means for applying an adjustable pressure to the metal fed to the container, characterized in that said container is provided on at least part of its internal wall with raised helical elements which cause the molten metal to flow in helical streams.

4,818,280
PROCESS FOR PRODUCING NONFERROUS METAL POWDER
Bernd Langner, Winsen/Luhe; Artur May, Meckelfeld, and René-Holger Wilde, Badendorf, all of Fed. Rep. of Germany, assignors to Norddeutsche Affinerie Aktiengesellschaft, Hamburg, Fed. Rep. of Germany
Filed Apr. 7, 1988, Ser. No. 178,717
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711650
Int. Cl.[4] B22F *9/24*
U.S. Cl. 75—0.5 A 10 Claims
1. A process for producing a powder containing particles of a nonferrous metal, comprising the steps of;
(a)reacting under stirring a substance selected from the group which consists of an oxide, an hydroxide and mixtures thereof of a nonferrous metal in an aqueous medium at a concentration of said substance between 20 and 400 g/l calculated as the metal, with an aqueous sugar or starch solution at a pH above 3.2 and at a temperature between 20° C. to 160° C. to precipitate a powder of the nonferrous metal which is substantially oxide-free; and
(b) recovering the precipitated substantially oxide-free nonferrous metal powder from said medium.

4,818,281
METHOD OF MELTING IN AN OXYGEN CONVERTER
Gennady S. Kolganov; Stanislav S. Volkov; Jury A. Rudnev; Vladimir G. Mizin, and Evgeny N. Ivashina, all of Tula, U.S.S.R., assignors to Nauchno-Proizvodstvennoe Obiedinenie "Tulachermet", Tula, U.S.S.R.
Filed Dec. 1, 1987, Ser. No. 127,211
Int. Cl.[4] C21C *7/00*
U.S. Cl. 75—51.5 2 Claims
1. A method of production of steel in an oxygen converter from solid metal iron-bearing materials, comprising:
charging iron-bearing materials into the oxygen converter;
heating said iron-bearing materials through their simultaneous burning hydrocarbon and solid carbon-containing fuels in an oxygen-containing gas until a melt is formed;
removal of the oxidizing slag from the surface of said melt when the temperature of said slag is 1525°–1580° C.; and
loading a solid iron in an amount of 2–5% of the initial quantity of the solid metal iron-bearing materials into said melt after removal the oxidizing slag from its surface.

4,818,282
METHOD FOR RECOVERING METAL-CARBIDE SCRAP BY ALLOYING
Erwin Wanetzky, Gross-Krotzenburg; Franz Hugo, Aschaffenburg, and Fernand Kuhlmann, Seligenstadt, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany
Continuation of Ser. No. 435,768, Mar. 14, 1988, abandoned. This application Sep. 10, 1987, Ser. No. 96,813
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144284
Int. Cl.[4] C22B *7/00*
U.S. Cl. 75—63 4 Claims
1. A method of recovering metal-carbide scrap by treating the scrap with a low melting point metal, comprising the steps of: alloying metal-carbide scrap with a low melting point metal in an inner chamber arranged in a container in the presence of inert gas for bringing a metal-carbide matrix into solution at temperatures above the melting point of the alloy formed; directing metal vapor and inert gas from said inner chamber through a single opening onto condensation surfaces; circulating inert gas released from metal vapors through said inner chamber; carrying out the alloying step at pressures above substantially twice the partial pressure of the low melting point metal, and then vaporizing the low melting point metal at pressures below 1 mbar before condensing on said condensation surfaces; recirculating inert gas released from metal vapors from said condensation surfaces through a closed gas path formed by an annular gap between said container and said inner chamber, at least one capillary gap in said inner chamber, a vapor duct between said inner chamber and said condensation surfaces, and a return flow opening between said condensation surfaces and said container, whereby penetration of metal vapor in direction of inner surfaces and components of said container is prevented, said capillary gap comprising a gap left between crucibles stacked within said inner chamber to preclude a screen connection between contents of said inner chamber and inner faces of said container.

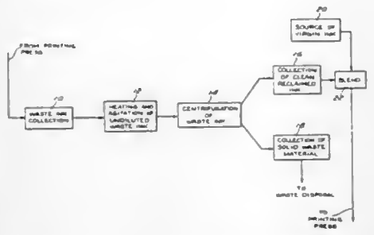


4,818,283
DISPERSION HARDENED COPPER ALLOYS AND PRODUCTION PROCESS THEREFORE
Karl-Heinz Grünthaler, Usingen; Dieter Langbein, Bad Homburg; Fehmi Nilmen, Kriftel/Ts., and Heinrich Winter, Eschborn, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 16, 1987, Ser. No. 109,273
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 3635370
Int. Cl.[4] G22F *3/00*
U.S. Cl. 75—247 22 Claims
1. A process for producing a dispersion hardened copper alloy, comprising:
admixing to a copper melt from 3.0 to 15 weight % of molybdenum to provide a mixture which is a melt;
superheating the mixture to a temperature ranging from about 200° C. to about 1000° C. above the melting point of copper to provide a superheated melt; and
subjecting the superheated melt to very rapid solidification at a cooling rate ranging from 10^4 to 10^6 °C./sec.

4,818,284
INK RECLAMATION SYSTEM
John L. McKelvey, Lakeland, Fla., assignor to The Ink Company, Sacramento, Calif.
Filed Dec. 22, 1987, Ser. No. 137,235
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—20 12 Claims
1. An improved method for reclaiming undiluted printing ink containing solid contaminants, said method comprising:
(a) heating and agitating said undiluted waste ink until said waste ink is substantially homogeneous in consistency and sufficiently low in viscosity to permit subsequent centrifugation and processing thereof;
(b) thereafter, centrifuging said heated and agitated undiluted waste ink to separate said solid contaminants from

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said waste ink and to thereby produce a clarified reclaimed ink; and



(c) thereafter blending said clarified reclaimed ink with a quantity of virgin ink to produce a clarified ink/virgin ink mixture having desired properties.

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INK JET PRINTER INK COMPOSITION AND PROCESS FOR PRODUCING SAME

Gary C. Causley, Aloha, and Mary J. Peterson, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 27, 1987, Ser. No. 113,795

Int. Cl.[4] C09D *11/02*

U.S. Cl. 106—22 **20 Claims**

1. A set of ink compositions for use in an ink jet color printer associated with a color display device, which comprises:

a first component ink composition including a water-soluble cyan dye, and a liquid diluent system comprising from about 30 to 100 weight % of an aqueous solvent, and from about 0 to about 70 weight % of a water-soluble organic solvent, based on the total weight of said diluent system;

a second component ink composition comprising a water-soluble magenta dye, and a liquid diluent system comprising from about 30 to 100 weight % of an aqueous solvent, and from about 0 to 70 weight % of a water-soluble organic solvent, based on the total weight of said diluent system;

a third component ink composition comprising a water-soluble yellow dye, and a liquid diluent system comprising from about 30 to 100 weight % of an aqueous solvent, and from about 0 to 70 weight % of a water-soluble organic solvent, based on the total weight of said diluent system;

said first component ink composition having an angle in a CIELAB standard chromaticity diagram of from about 235° up to about 265°, said second component ink composition having an angle in the CIELAB standard chromaticity diagram of from about 330° up to about 360°, said third component ink composition having an angle in the CIELAB standard chromaticity diagram of from about 85° up to about 115°, a first secondary color formed from said first and second component ink compositions having an angle in the CIELAB standard chromaticity diagram of from about 290° up to about 320°, a second secondary color formed from said first and third component ink compositions having an angle in the CIELAB standard chromaticity diagram of from about 150° up to about 180°, and a third secondary color formed from said second and third component ink compositions having an angle in the CIELAB standard chromaticity diagram of from about 15° up to about 45°, all of said CIELAB standard chromaticity diagrams being measured with reference to an illuminant C, 2° standard observer.

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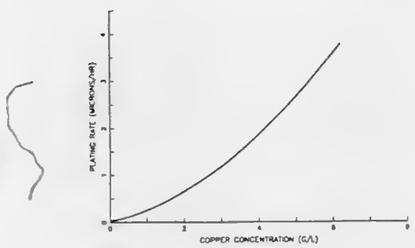
ELECTROLESS COPPER PLATING BATH

Rangarajan Jagannathan; Mahadevaiyer Krishnan, both of Hopewell Junction, and Gregory P. Wandy, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1988, Ser. No. 165,663

Int. Cl.[4] C23C *18/38*; B05D *3/10*

U.S. Cl. 106—1.23 **26 Claims**



1. An electroless copper plating bath for providing a predominately copper deposit which is firmly adherent to various substrates, said bath being devoid of formaldehyde comprising:

2 to 8 grams per liter of copper sulfate 20 to 40 grams per liter of EDTA 3 to 5 grams per liter of amine borane, and 50 to 100 milliliters per liter of alkanolamine,

wherein said EDTA is selected from the group consisting of an alkali metal EDTA, said amine borane is selected from the group consisting of DMAB, morpholineamineborane, t-butylamineborane and isopropylamineborane and alkanolimine is selected from the group consisting of triethanolamine, alkyl groups in the alkanolamine, including mixtures.

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FIBER REINFORCED PLASTER MOLDS FOR METAL CASTING

Thomas L. Ravins, Portland, and Dale R. Greve, Beaverton, both of Oreg., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Continuation of Ser. No. 379,933, May 19, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,354

Int. Cl.[4] B22C *1/00*

U.S. Cl. 106—38.3 **15 Claims**



1. A mold member useful for the casting of nonferrous metals comprising a cured mixture of calcium sulfate molding plaster and at least about 3% by weight insoluble calcium sulfate anhydrite whisker fibers based on the dry weight of the mixture.

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DISPERSANT FOR CONCRETE MIXTURES OF HIGH SALT CONTENT

Alois Aigaesberger, Trostberg, and Johann Plank, Saal/Donau, both of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation of Ser. No. 591,197, Mar. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 439,253, Nov. 4, 1982, abandoned. This application May 11, 1988, Ser. No. 195,425

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344291

Int. Cl.[4] B01J *13/00*; C04B *7/02, 24/22*

U.S. Cl. 106—90 **6 Claims**

1. In a cement or concrete system comprising cement and water containing from 2% up to a saturated solution of a dissolved mineral salt the improvement comprising an effective amount to disperse the cement of a dispersant comprising a condensation product of an acyclic ketone selected from the group consisting of acetone, diacetone alcohol, methyl ethyl ketone, methoxyacetone and mesityl oxide, an acyclic aldehyde selected from the group consisting of formaldehyde, acetaldehyde, methoxyacetaldehyde, aldol, acrolein, crotonaldehyde, glyoxal and glutaraldehyde and an alkali or alkaline earth salt acid-group-introducing compound consisting of an acid selected from the group consisting of sulphurous acid, 2-aminoethanesulphonic acid and aminoacetic acid or wherein said acid-group-introducing compound is a sulfite addition product of the ketone or aldehyde, wherein the molar ratio of ketone:aldehyde: acid introducing compound components is 1:1 to 18:0.25 to 3.0 and said condensation product is formed by a condensation reaction of these compounds at a temperature in the range of about 60° C. to about 85° C.

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METHOD FOR UTILIZING SLAG FROM METAL PRODUCTION

Tarmo K. Miintymäki, Harjavalta, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 804,376, Dec. 3, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 63,751

Claims priority, application Finland, Dec. 21, 1984, 845114

Int. Cl.[4] C03C *13/06*; C04B *5/06, 14/46*

U.S. Cl. 106—117 **5 Claims**

1. A method for utilizing slag with an iron oxide content of 40 to 65% by weight from metal production, to produce a product which is useful as raw material in the production of heat-resistant, fire-resistant and/or alkali resistant fibre materials, comprising changing the temperature dependence of the slag viscosity by means of alloying for increasing the relative proportion of acidic components contained in the slag, the iron oxide content of the treated slag being at least 22% by weight FeO, and the calcium oxide content of the slag being between 0–10% by weight.

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METHOD FOR UTILIZING SLAG FROM FERROALLOY PRODUCTION

Frans H. Tuovinen, Ulvila, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 804,375, Dec. 3, 1985, abandoned. This application Aug. 19, 1987, Ser. No. 88,506

Claims priority, application Finland, Dec. 21, 1985, 845115

Int. Cl.[4] C03C *13/06*; C04B *5/06, 14/46*

U.S. Cl. 106—117 **6 Claims**

1. A method of using a molten slag from ferroalloy production containing 20–30 percent by weight silicon oxide, 20–36 percent by weight aluminum oxide and 15–36 percent by weight magnesium oxide for the manufacture of heat-resistant, fire-resistant and/or alkali-resistant fibre material which comprises adding 10–45 percent by weight aluminum oxide or silicon oxide and aluminum oxide into the molten slag in order to change the slag viscosity and to adjust the defibration temperature of the slag and then defibrating the product.

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SILK-FIBROIN AND HUMAN-FIBRINOGEN ADHESIVE COMPOSITION

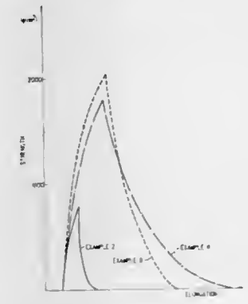
Makoto Iwatsuki, Tokyo, and Toshio Hayashi, Kyoto, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 10, 1987, Ser. No. 131,427

Claims priority, application Japan, Dec. 10, 1986, 61-294148

Int. Cl.[4] C08L *89/00*

U.S. Cl. 106—124 **4 Claims**



1. An adhesive comprising a mixture of human-fibrinogen and silk-fibroin.

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ANTIFOAM INGREDIENT FOR DETERGENT COMPOSITIONS

William J. Iley, and John W. Yorke, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 901,223, Aug. 28, 1986, abandoned. This application Aug. 28, 1987, Ser. No. 93,074

Claims priority, application United Kingdom, Sep. 4, 1985, 8521956

Int. Cl.[4] C08L *3/00*; C09B *3/22*; B01J *20/00*

U.S. Cl. 106—210 **13 Claims**

1. A process for the production of a detergent powder composition, which process comprises:

(I) producing a particulate anti-foam ingredient by the steps of:

(a) adding an anti-foam active material comprising at least one hydrophobic anti-foam active substance which is at least partially liquid at a temperature within the range from 5° to 90° C., to pregelatinized partially hydrated water-swellable hydrophilic starch as a carrier material for said anti-foam active material, and mixing said anti-foam active material with said starch to form a homogeneous mixture;

(b) adding water to said mixture of anti-foam active material and starch whereby hydration of said starch is effected,

the amounts of said starch, anti-foam active material and added water being such that the anti-foam ingredient comprises

(i) from 30 to 90% by weight of said starch,

(ii) from 5 to 50% by weight of said anti-foam active material, and

(iii) from 5 to 30% by weight of said added water;

(II) thereafter incorporating the resulting anti-foam ingredient into a detergent powder composition containing detergent active and detergency builder.

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STABLE SLURRIES COMPRISING POWDERED ACTIVATED CARBON

Bruce K. Fillipo, Dublin, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 890,687, Jul. 25, 1986, Pat. No. 4,729,795, which is a continuation-in-part of Ser. No. 761,641, Aug. 1, 1985, abandoned. This application Nov. 20, 1987, Ser. No. 123,094
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] C04B *14/36*
U.S. Cl. 106—476 **6 Claims**

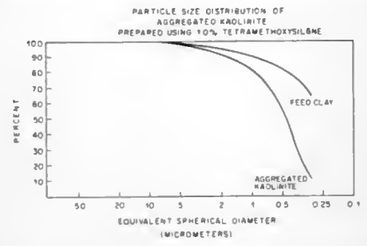
1. A composition comprising a thixotropic slurry of powdered activated carbon and an effective polysaccharide or modified polysaccharide suspending agent, said powdered activated carbon being prepared by the destructive distillation of a wood precursor, said slurry having a viscosity of about 200–4,000 cps Brookfield RVT.

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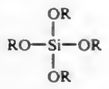
KAOLINITE AGGREGATION USING ORGANO-SILICON COMPOUNDS

Rasik H. Raythatha, Tennille, Ga., and Joshua O. Brannen, III, Tyler, Tex., assignors to E.C.C. America Inc., Atlanta, Ga.

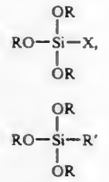
Filed Jun. 26, 1987, Ser. No. 67,213
Int. Cl.[4] C04B *14/04*
U.S. Cl. 106—487 **24 Claims**



1. A method for producing a kaolin pigment providing enhanced optical and printability properties when used in paper manufacture, which comprises mixing kaolin particles having a moisture content in the range of 1 to 2% by weight with an aggregating agent comprising an organic silicon compound selected from the group consisting of symmetric compounds having the formula

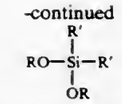


where R=CH_3, C_2H_5, C_3H_7, n—C_4H_9, sec-C_4H_9 and C_6H_5 and asymmetric compounds having the formula



and

-continued



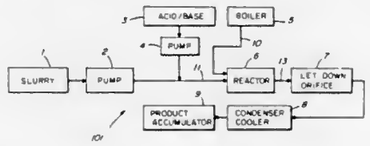
where R=C_2H_5, X=Cl or Br, and R'=H, ,and recovering an aggregated particular kaolin pigment product.

4,818,295

CYCLONE REACTOR

Alvin O. Converse, Norwich, Vt.; Hans E. Grethlein, and Joseph E. Holland, both of Hanover, N.H., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 4, 1986, Ser. No. 848,245
Int. Cl.[4] B01J *3/00;* **B01D** *47/00*
U.S. Cl. 127—1 **3 Claims**



1. A cocurrent-flow reactor system for the hydrolysis of cellulosic or lignocellulosic material to sugar comprising:

a hollow cylindrical reactor vessel having an internal reaction chamber defined by a peripheral annular wall and end walls having inwardly extending central cores to define a central portion of said chamber of less height than that at said peripheral wall;

first and second tangential entries coupled into said reaction chamber at the peripheral, annular wall thereof;

a source of slurry connected to said first tangential entry for introducing slurry as a cyclonic flow into said reaction chamber, said slurry including cellulosic or lignocellulosic solids and aqueous solution for hydrolysis of said solids to sugar, said solids being of greater density than said solution;

a steam boiler connected to said second tangential entry for introducing steam in support of said cyclonic flow and to provide heat for hydrolysis within said reaction chamber, said cylonic flow biasing slurry solids towards the outer periphery and slurry solution towards the central portion of said reaction chamber;

slurry discharge means disposed at the central portion of said reaction chamber for withdrawing slurry with solution of enriched sugar content, said slurry solids being retained longer than said solution within said reaction chamber due to the biasing of solids towards said peripheral wall by said cyclonic flow; and

a let-down orifice coupled to said discharge means for reducing the slurry temperature and stopping the hydrolysis process.

4,818,296

SCRAPER FOR SUGAR CENTRIFUGE

Conny Hejman; Làszlò Korán, and Bo Moosheden, all of Hässleholm, Sweden, assignors to Nils Weibull AB, Hasselhölm, Sweden

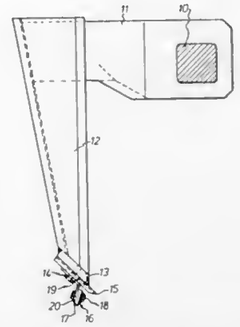
Filed Nov. 27, 1987, Ser. No. 126,126
Claims priority, application Sweden, Sep. 21, 1987, 8703657
Int. Cl.[4] C13F *1/06, 1/10;* **B01D** *33/00;* **F22B** *37/48*
U.S. Cl. 127—2 **4 Claims**

1. A sugar centrifuge having a centrifugal bowl with an inner bowl wall and a scraper system, the system comprising:

and arm (**11**) insertable in the centrifugal bowl and pivotal therein;

a scraper blade (**12**) mounted on said arm and having a rear side and a tip (**13**) with a scraper edge (**15**), said scraping edge being close to but out of contact with the inner bowl wall and being movable along said inner bowl wall for scraping off sugar during rotation of the bowl; and

an afterscraper (**16**), mounted on the scraper blade rear side and adapted to be directly or indirectly, via a sugar formation retained by said afterscraper, in engagement with said inner bowl wall the afterscraper further including at least one rail (**31**) and defining, with the scraper blade (**12**) adjacent the edge (**15**), a space (**35**) along the scraping edge (**15**) said space being adapted to take up sugar which, after solidification and filling of said space (**35**), constitutes the sugar formation in contact with the bowl wall.

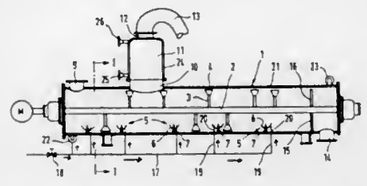


4,818,297

PROCESS FOR REMOVING SOLVENTS FROM BULK MATERIAL

Reinhold Holzmüller, Paderborn-Elsen, and Roland Lücke, Paderborn, both of Fed. Rep. of Germany, assignors to Gebruder Lodige Maschinenban-Gesellschaft, Paderborn, Fed. Rep. of Germany

Continuation of Ser. No. 436,050, Oct. 22, 1982, abandoned.
This application Nov. 13, 1987, Ser. No. 120,132
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142985
Int. Cl.[4] B08B *7/04;* **B01D** *3/38*
U.S. Cl. 134—12 **3 Claims**



1. A process for treating added solvent laden bulk material in order to remove added solvents from said bulk material, including the steps of (1) adding to the solvent laden bulk material steam at substantially atmospheric pressure and at a temperature of between 90 and 100 degrees C., the steam condensing at normal temperatures and having a higher boiling point than the added solvent, (2) concurrently mechanically loosening the bulk material and thereby exposing the bulk material to said steam, the temperature of the bulk material being raised by the steam to thereby volatilize the solvent, a portion of the steam remaining in its uncondensed, vapor phase and another portion of the steam being condensed from its vapor phase, (3) expelling by evaucation the volatilized solvent from the bulk material together with said uncondensed part of the steam, the added solvent which initially adhered to the particles of the bulk material being thereby replaced by the condensate of the steam, whereby the added solvent is removed from the bulk material which has been mechanically loosened to form a fluidized bed, including the additional steps of (4) continuously moving the bulk material in a single horizontal direction during the process, (5) passing the steam through the loosened and fluidized bulk material to at least partly retard the bulk material transport speed, (6) passing at least a portion of the steam vertically through the bulk material in a perpendicular direction to the horizontal direction of motion of said bulk material.

4,818,298

METHOD OF REMOVING DEPOSITS FROM THE INSIDE WALLS OF A PIPELINE AND APPLYING PROTECTIVE COATINGS THERETO

Viktor V. Shishkin; Dmitry N. Cherebedov; Nikolai F. Kryazhevskikh; Valery P. Panchenko, all of Krasnodar; Yaroslav P. Sushkov, Elsk; Evgeny G. Lukin, Alma-Ata; Petr G. Sokol, Krasnodar; Alexandr I. Chernyai, Alma-Ata; Viktoria I. Kapralova, Alma-Ata, and Lidia S. Sulekova, Alma-Ata, all of U.S.S.R., assignors to Trest "Juzhvodoprovod" , Krasnodar, U.S.S.R.

PCT No. PCT/SU85/00070, § 371 Date Apr. 9, 1987, § 102(e) Date Apr. 9, 1987, PCT Pub. No. WO87/01058, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 16, 1985, Ser. No. 56,486
Int. Cl.[4] B08B *3/02, 9/02*
U.S. Cl. 134—22.11 **15 Claims**

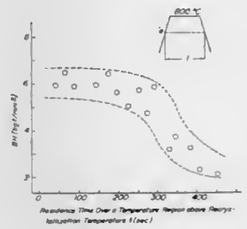
1. A method for removing the deposits including corrosion products from the inner surface of a pipeline and applying a protective coating thereto, comprising the steps of treating the corrosion products with an agent capable of reducing their mechanical strength; cleaning the surface of the pipeline with high-speed jets of liquid which produce a differential pressure in the range of 0.2 to 1.25 Mpa.; and treating the inner surface of the pipeline with a corrosion inhibitor which reacts with the remaining deposits to form substantially insoluble compound which creates a protective coating on said pipeline inner surface.

4,818,299

METHOD OF MANUFACTURING COLD-ROLLED STEEL SHEETS

Susumu Sato; Mitsumasa Kurosawa; Hideo Suzuki; Takashi Obara, and Kozo Tsunoyama, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 755,500, Jul. 15, 1985, Pat. No. 4,750,952.
This application Nov. 27, 1987, Ser. No. 125,921
Claims priority, application Japan, Jul. 17, 1984, 59-146990; Jun. 7, 1985, 60-122807; Jul. 3, 1985, 60-144437
Int. Cl.[4] C22C *8/04*
U.S. Cl. 148—2 **2 Claims**



1. A method of manufacturing a cold-rolled steel sheet for deep drawing having an improved bake hardenability, which comprises the steps of:

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melting a steel material containing 0.0005 to 0.015% by weight of C, not more than 0.003% by weight of S and not more than 0.004% by weight of N, provided that the value of S+N is not more than 0.005% by weight, and Ti corresponding to Ti(wt %) represented by the following equation (1) when an effective Ti amount expressed by Ti* in the equation (1) satisfies the following inequality (2);

$$Ti^*(wt\ \%)=Ti(wt\ \%)-(48/14)N(wt\ \%)-(48/32)S(wt\ \%) \quad (1)$$

$$1\times C(wt\ \%)\leqq Ti^*(wt\ \%)\leqq 20\times C(wt\ \%) \quad (2)$$

, and the balance being substantially Fe with inevitable impurities;

continuously casting the resulting molten steel to produce a cast slab;

heating the resulting cast slab at a heating temperature of 1210° to 1330° C.;

hot rolling the resulting cast slab;

cold rolling the resulting hot-rolled sheet; and

subjecting the resulting cold-rolled sheet to a continuous annealing inclusive of heating and cooling, provided that the residence time over a temperature region above the recrystallization temperature is within 300 seconds.

4,818,300

METHOD FOR MAKING LITHOPLATE

Elwin L. Rooy; Gerald R. Petrey, both of Pittsburgh, Pa.; James R. Weaver, Bettendorf, Iowa; Douglas A. Granger, Murrysville, Pa.; Raymond T. Richter, Davenport, Iowa, and H. Gray Reavis, Jr., Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1986, Ser. No. 939,318
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—2 **21 Claims**



1. A method for producing lithoplate comprising:

providing molten aluminum alloy consisting essentially of 0.20% max. Cu, 0.055–0.085% Si, 0.55–0.75% Fe, 0.20% max. Mn, 0.40–0.70% max. Mg, 0.25% max. Zn, 0.10% max. Cr, 0.05% max. Ti when cast, 0.025% max. V, 0.05% max. each of other elements not to exceed 0.15% total, and the remainder Al;

adding to the molten alloy means for refining the grain of an ingot to be cast and molded from the molten alloy;

removing nonmetallic inclusions from the molten alloy;

making an ingot by casting the molten alloy into a mold;

homogenizing the ingot at a temperature of 1130°±20° F. for a period of time suitable to insure homogenization of the ingot;

cooling the homogenized ingot to approximately 905° F. at a rate ≦68° F./hour;

hot rolling the ingot at an initial temperature of 860°±30° F. to produce a reroll stock;

cold rolling the reroll stock to a finished gauge workpiece; and

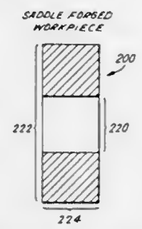
graining at least one surface of the workpiece.

4,818,301

PROCESS FOR PRODUCING LARGE SECTION, LARGE MASS FORGED SLEEVES FROM LARGE DIAMETER INGOTS OF ALLOY 625 AND FROM HOT ISOSTATICALLY PRESSED PREFORMS OF ALLOY 625 POWDER

Ashok K. Khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Continuation-in-part of Ser. No. 879,479, Jun. 27, 1986, Pat. No. 4,714,498. This application Nov. 23, 1987, Ser. No. 123,805
Int. Cl.[4] C22F *1/10*
U.S. Cl. 148—11.5 N **21 Claims**



1. A process for producing large section, large mass forged sleeves of alloy 625 consisting essentially of a limiting composition by weight percentage of 58.0 min. nickel, 20.0–23.0 chromium, 5.0 max. iron, 8.0–10.0 molybdenum, 3.15–4.15 columbium (plus tantalium), 0.10 max. carbon, 0.50 max. manganese, 0.50 max. silicon, 0.015 max. phosphorus, 0.015 max. sulphur, 0.40 max. aluminum, 0.40 titanium, and 1.0 max. cobalt (if determined), comprising the steps of:

(a) forming a workpiece by hot isostatically pressing alloy 625 powder to a shape having a predetermined outside diameter, length, and central bore size;

(b) saddle forging the workpiece which further comprises the substeps of,

(1) heating the workpiece to a temperature of 2125° F.,

(2) placing the workpiece on a preheated saddle forging mandrel,

(3) working the workpiece by rotating the workpiece in steps with a first manipulator means and at each step applying a saddle forging die having a width substantially the same as the total length of the workpiece, with the saddle forging die applying a pressure of 3000 tons to the workpiece until the workpiece stops moving when the saddle forging die is applied, and rotating the workpiece for each successive step an amount to allow an overlap of a new step's press location with the previous step's press location;

(4) reheating the workpiece to a temperature of 2125° F. and repeating step (b)(3) until the bore in the workpiece is opened to a predetermined diameter;

(c) mandrel forging the saddle forged workpiece which further comprises the substeps of,

(1) heating the workpiece to a temperature of 2125° F.,

(2) placing the workpiece on a preheated mandrel forging mandrel,

(3) working the workpiece with a preheated top mandrel forging die and a preheated bottom mandrel forging die by moving the workpiece in its axial direction in steps, with each step being a portion of a mandrel forging die width, and at each step axially rotating the workpiece with a second manipulator means in increments until the workpiece is rotated at least 360° at each step, with the mandrel forging dies applying a maximum pressure of 3000 tons to the workpiece at each increment of axial rotation of the workpiece at each step, with each increment of axial rotation being an amount to allow an overlap of a new rotation increment's press location with the previous rotation increment's press location, and working the workpiece until it stops moving when the mandrel forging dies are applied,

(4) reheating the workpiece to 2125° F. and repeating step (c)(3) until a predetermined length of the workpiece is achieved,

(5) air cooling the workpiece to room temperature;

(d) thermal treating the workpiece followed by annealing the workpiece; and

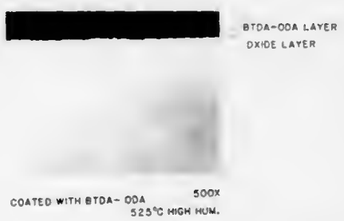
(e) finish machining the workpiece to form the finished large section large mass forged sleeve.

4,818,302

METHOD OF HEAT TREATMENT

Karl Wefers, Upper Burrell Township, Armstrong County, and Frank A. Mozelewski, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 827,991
Int. Cl.[4] C21D *1/44*
U.S. Cl. 148—13.1 **19 Claims**



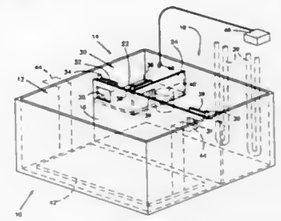
1. In a method of treating an aluminum or magnesium alloy under conditions such that material alteration of the chemical nature of the alloy would occur by surface attack, the improvement comprising heat treating the alloy with a polymer coating on it for mitigating said alteration, the polymer coating being thermally stable to temperatures above 400° C., the polymer coating being effective for said mitigating even at solution heat treatment temperatures.

4,818,303

METHOD AND APPARATUS FOR SETTLING SLUDGE

John M. Cole, Farmington Hills, Mich., assignor to Kolene Corporation, Detroit, Mich.

Filed Oct. 15, 1987, Ser. No. 108,460
Int. Cl.[4] C21D *1/46*
U.S. Cl. 148—20 **9 Claims**



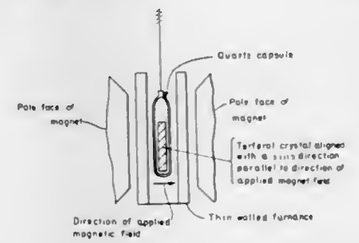
1. A salt bath tank for containing a fused salt bath to treat work pieces, wherein said treatment results in sludge that will settle out of the bath, said tank comprising a work zone and a salt processing zone separated by partition means, said salt processing zone having a salt heating section and a salt recovery section, means to circulate said salt between the recovery section and the heating section with a turbulent flow at least in said heating section, heating means in said heating section, adjustable bypass gate means to control the flow of salt from the heating section to the recovery section; and adjustable primary gate means associated with the partition means to provide laminar flow in said work zone from said heating section through said work zone to said recovery section, thereby causing sludge to settle in said work zone while allowing treatment of work pieces by salt essentially free of sludge and maintain turbulent flow of the salt in the heating section to prevent sludge from settling in the heating section, and means to remove sludge from said work zone.

4,818,304

METHOD OF INCREASING MAGNETOSTRICTIVE RESPONSE OF RARE EARTH-IRON ALLOY RODS

John D. Verboeven; O. Dale McMasters; Edwin D. Gibson; Jerome E. Ostenson, and Douglas K. Finnemore, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 20, 1987, Ser. No. 110,974
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—103 **9 Claims**



1. A method of processing an RFe_x alloy magnetostrictive rod to increase its magnetostrictive response, where R is one or more rare earth metals, Fe is iron, and x is a number from 1.5 to 2.0, said rod being essentially in the form of a longitudinally aligned single crystal having twin plane boundaries running generally perpendicular to the <111> direction of the crystal, comprising the steps of:

(a) heating said rod to a temperature above its Curie temperature and in the range from 400° to 600° C. while protecting the rod from chemical reaction;

(b) while said rod is at said temperature, directionally applying a magnetic field of from 5,000 to 15,000 gauss, the direction of said field being at least approximately perpendicular to said twin plane boundaries; and

(c) cooling said rod to a temperature below its Curie temperature while continuing to apply said field.

4,818,305

PROCESS FOR THE PRODUCTION OF ELONGATED ARTICLES, ESPECIALLY MAGNETS, FROM HARD POWDERED MATERIALS

Erich Steingroever, Bonn, Fed. Rep. of Germany, assignor to Magnetfabrik Bonn GmbH, Bonn, Fed. Rep. of Germany

Continuation of Ser. No. 332,330, Dec. 18, 1981, abandoned. This application May 9, 1984, Ser. No. 607,732
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047701
Int. Cl.[4] H01F *41/02, 1/08*
U.S. Cl. 148—103 **16 Claims**

1. A process for the production of an elongated anisotropic permanent magnet body, having at least one pair of oppositely polarized surface regions, each region continuously extending along the length thereof, from anisotropic permanent magnet powder, comprising the steps of:

forming a plurality of sections from anisotropic permanent magnet powder under pressure and the influence of an orienting multipolar magnetic field;

each of said plurality of sections being formed having two generally planar, parallel sides and a circular periphery;

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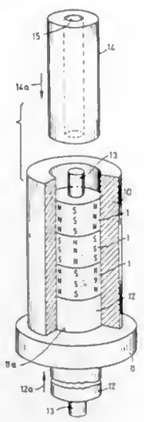
each of said plurality of sections having a diameter and a thickness;

said orienting multipolar magnetic field being applied to each individual one of said plurality of sections during the forming thereof under pressure to magnetize said each individual one to have a plurality of magnetic poles spaced uniformly about said circular periphery so as to form oriented magnetic domains in each said section oriented according to said orienting multipolar magnetic field whereby a preferred direction of magnetization exists in each said section; whereby each individual one of said plurality of sections has an initial magnetization;

stacking at least two, but less than the total number of said sections required to form a final magnet body, one upon another such that at least one of said generally planar, parallel sides of each stacked section abuts a generally planar side of an adjacent stacked section, the section being stacked in an elongated nonmagnetic mold;

the magnetic poles of adjacent sections causing alignment of adjacent sections by attraction of opposite magnetic poles, such that opposite magnetic poles of adjacent sections abut one another;

applying pressure on said stacked sections in a lengthwise direction in the absence of an orienting magnetic field so as to form a single coherent body from said stacked sections; said single coherent body having a predetermined length;



releasing said pressure, stacking at least one additional one of said sections in said mold upon said previously stacked sections and again applying pressure on all of said stacked sections in a lengthwise direction to continue the formation of a coherent body from all of the sections stacked in said mold; said coherent body having a length and a width, said width being generally equal to said diameter of each of said plurality of sections;

removing said coherent body from said mold and subjecting it to heat to sinter said single coherent body at sufficiently high temperature that said single coherent body loses its magnetization;

and applying a second multipolar magnetic field having each respective north and south magnetic region extending along the length of said single coherent body such that said single coherent body is magnetized in the preferred direction of magnetization of said oriented magnetic domains, linearly alternating ones of said sections of said coherent body being oppositely magnetized by said second multipolar magnetic field relative to said initial magnetization so as to form a final permanent magnet body having at least one pair of oppositely magnetically polarized surface regions, each polarized surface region extending lengthwise along substantially entirely said predetermined length of said final premanent magnet body, each polarized surface region including a single magnetic polarity.

4,818,306

MONOCRYSTALLINE ALLOY WITH A NICKEL BASE MATRIX

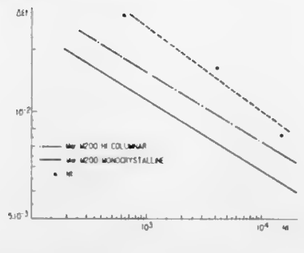
Francoise J. Bois, Cesson; Luc G. Remy, Paris, and Jean-Marc C. Theret, Evry, all of France, assignors to Societé Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A." and Association pour la Recherche et le developpment des Methodes et Processus Industriels "ARMINES", both of Paris, France

Filed Feb. 24, 1986, Ser. No. 832,351

Claims priority, application France, Mar. 6, 1985, 85 03267

Int. Cl.⁴ C22C *19/05*

U.S. Cl. 148—404 **6 Claims**



1. Monocrystalline alloys with a nickel base matrix, without intentional addition of carbon, of boron or of zirconium, consisting essentially of a composition by weight as follows:

Co	0 to 10%
Cr	5 to 7%
Mo	1.5 to 2.5%
W	8.5 to 12.5%
Ta	0 to 6.5%
Al	5 to 7%
Nb	0 to 2%
Ni	balance to 100%

with, in addition, a summation of atomic percentages: 0.005Co+0.036Cr+0.052Mo+0.066W+0.026Al+0.116Nb+0.049Ta less than or equal to one, and a summation of atomic percentages: Ta+W+Mo+Nb between 5.9 and 6.3, the alloys being free of titanium.

4,818,307

DISPERSION STRENGTHENED COPPER-BASE ALLOY

Kazuhiko Mori, Toyota; Katsuhiko Ueda, Aichi; Soya Takagi, and Minoru Kawasaki, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

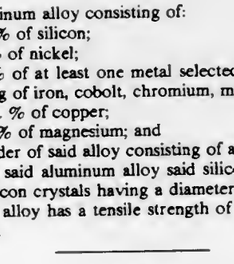
Filed Dec. 16, 1987, Ser. No. 133,620

Claims priority, application Japan, Dec. 19, 1986, 61-303176

Int. Cl.⁴ C22C *9/02, 9/06*

U.S. Cl. 148—414 **4 Claims**

1. A dispersion strengthened copper-base alloy having excellent wear resistance, said alloy consisting essentially of, in weight percent, 5 to 30% of nickel, 1 to 5% of silicon, 0.5 to 3% of boron and 4 to 30% of iron, the remainder being copper and unavoidable impurities; and having a structure in which



hard particles composed chiefly of a silicide of an iron-nickel system are dispersed in a copper-base matrix.

4,818,308

ALUMINUM ALLOY AND METHOD FOR PRODUCING THE SAME

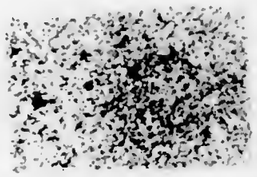
Yusuke Odani; Kiyoaki Akechi, and Nobuhito Kuroishi, all of Itami, Japan, assignors to Sumitomo Electric Industries, Inc., Osaka, Japan

Continuation of Ser. No. 677,472, Dec. 3, 1984, abandoned. This application Dec. 10, 1986, Ser. No. 940,168

Claims priority, application Japan, Dec. 2, 1983, 58-228968; Dec. 9, 1983, 58-233245; Jan. 7, 1984, 59-1090; Mar. 23, 1984, 59-56492

Int. Cl.⁴ C22C *21/00*

U.S. Cl. 148—437 **6 Claims**



2. An aluminum alloy consisting of:

10–36 wt. % of silicon;

2–10 wt. % of nickel;

2–10 wt. % of at least one metal selected from the group consisting of iron, cobolt, chromium, manganese;

0 to 6.5 wt. % of copper;

0 to 2 wt. % of magnesium; and

the remainder of said alloy consisting of aluminum;

wherein in said aluminum alloy said silicon comprises primary silicon crystals having a diameter of 10 μm or less and said alloy has a tensile strength of at least above 40 kg/mm².

4,818,309

PRIMER COMPOSITION

Michael Yabsley, Cheltenham, and Jill Hergt, Moonee Ponds, both of Australia, assignors to ICI Australia Limited, Victoria, Australia

Filed Mar. 2, 1987, Ser. No. 20,987

Claims priority, application Australia, Feb. 28, 1986, PH4836

Int. Cl.⁴ C06B *45/00*

U.S. Cl. 149—2 **13 Claims**

1. A primer explosive composition comprising (a) a water-in-oil emulsion comprising (i) a discontinuous aqueous phase comprising at least one oxygen-releasing salt, (ii) a continuous water-immiscible organic phase and (iii) an emulsifier, and (b) 20 to 75% w/w of the total composition of brisant explosive and wherein the emulsifier includes a polar group and is a reaction product of a poly(alk(en)yl) succinic acid and a compound selected from the group consisting of glycerol, pentaerythritol, sorbitol, or an internal anhydride thereof, ethylene diamine, tetraethylene triamine, dimethylaminopropylamine; 2-hydroxypropanolamide, ethanolamine, diethanolamine, oxazoline, and imidazoline, and short-chain poly(oxyethylene) groups containing up to 10 ethylene oxide units, said composition having a putty-like consistency and remaining mouldable and sensitive to detonation even after storage.

4,818,310

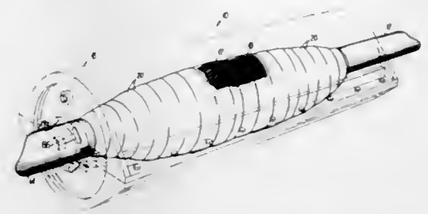
PRESSURIZED CABLE SPLICE CLOSURE APPARATUS AND METHOD

Thomas E. McNeal, Hanceville, Ala., assignor to Bell South Corporation, Atlanta, Ga.

Filed May 5, 1987, Ser. No. 47,025

Int. Cl.⁴ H01B *13/06*

U.S. Cl. 156—48 **19 Claims**



1. A method for preventing water from infiltrating a splice joining first and second multiconductor cable segments, comprising:

forming a reservoir about the splice;

sealing said reservoir to the first and second multiconductor cable segments;

forming an opening in said reservoir;

pouring a curable encapsulant into said reservoir through said opening;

working said encapsulant into interstices between conductors in the first and second multiconductor cable segments;

sealing said reservoir;

enclosing said reservoir in a splice closure; and

injecting a compressed gas into said splice closure and pressurizing said splice closure.

4,818,311

METHODS OF AND APPARATUS FOR HEATING A MOVING METALLIC STRAND MATERIAL

Bruce B. Boehlke, Duluth, Ga., and Stephen T. Zerbs, Gretna, Nebr., assignors to Americas Telephone and Telegraph Company, AT&T Technologies Inc., Berkeley Heights, N.J.

Filed Jan. 21, 1987, Ser. No. 5,711

Int. Cl.⁴ H01B *13/00*

U.S. Cl. 156—51 **22 Claims**

1. A method of making an insulated conductor, said method comprising the steps of:

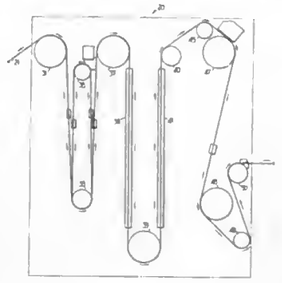
advancing successive increments of a length of a metallic wire from one sheave to another at a predetermined speed, the one sheave being a predetermined distance from the other sheave with each successive increment being substantially less than the distance between the sheaves;

heating successive increments of the length of the moving wire between the sheaves by applying an alternating current between the sheaves;

causing the speed at which the wire is advanced and the distance between the sheaves to be such that an integral

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number of half cycles of the alternating current are caused to be applied to each successive increment of length of the wire as each successive increment of length of the wire is moved from the one sheave to the other sheave to cause



the energy applied to each successive increment of length of the wire to be substantially constant;

applying an insulative covering to successive increments of length of the moving wire; and

taking up the insulated wire.

4,818,312

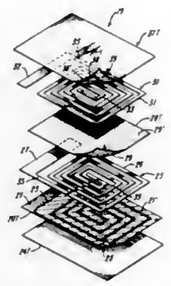
METHOD OF MAKING ELECTRONIC TAGS

S. Eugene Benge, Middletown, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 81,096, Aug. 3, 1987, which is a continuation-in-part of Ser. No. 41,556, Apr. 22, 1987, which is a continuation-in-part of Ser. No. 912,466, Sep. 29, 1986, Pat. No. 4,717,438. This application Oct. 28, 1987, Ser. No. 114,792

Int. Cl.⁴ B32B *31/16*

U.S. Cl. 156—52 **4 Claims**



4. Method of making tags for use in an electronic article surveillance system, comprising the steps of: providing a web having a series of first conductors, providing another web having a series of second conductors, wherein at least one of the conductors is a spiral conductor, depositing welding material on each conductor of one of said series, positioning a deactivator adjacent one conductor of one of said series, wherein the deactivator includes heat activatable material rendered conductive by the application of heat, positioning the webs so that the first and second conductors are in adjacent pairs spaced apart by dielectric material to provide a tag web, and applying heat to the tag web at a temperature high enough to cause the welding material to weld the conductors to each other to provide a detectable resonant circuit but low enough to prevent the activatable material from being rendered conductive.

4,818,313

METHOD FOR REGULATING THE ENERGY SUPPLY TO A SEALING DEVICE FOR THE SEALING OF THERMOPLASTIC MATERIAL

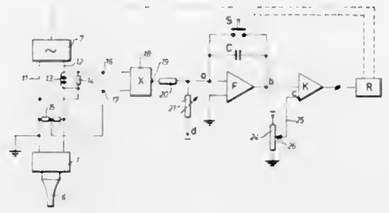
Anders Sundberg, Baskogatan 20, Sweden, assignor to Tetra Pak International, Lund, Sweden

Filed Jun. 4, 1986, Ser. No. 870,360

Claims priority, application Sweden, Jun. 28, 1985, 8503214

Int. Cl.⁴ B29C *65/08;* **G01N** *29/00*

U.S. Cl. 156—64 **9 Claims**



1. A method for regulating a supply of energy to a sealing device for sealing expanded plastic material comprising the steps of:

pressing the sealing device against combined expanded plastic material to be sealed;

supplying an energy pulse to the sealing device;

measuring a value representative of the amount of energy drawn off by the sealing device;

adjusting the measured value to compensate for heat losses which occur over time during the supply of the energy pulse to the sealing device;

comparing the adjusted measured value with a predetermined value representative of an amount of energy adapted for the sealing operation; and

cutting off the supply of the energy pulse to the sealing device when the adjusted measured value reaches the value representative of an amount of energy adapted for the sealing operation.

4,818,314

PROCESS FOR LINING A HIGH PRESSURE PIPELINE

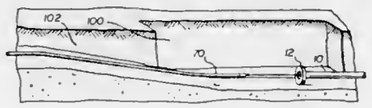
Perry N. Brittain, and John D. Kirkpatrick, both of Calgary, Canada, assignors to Sentry Piping Systems, Inc., Canada

Continuation of Ser. No. 664,837, Oct. 25, 1984, abandoned, which is a division of Ser. No. 359,498, Mar. 18, 1982, Pat. No. 4,496,499, which is a continuation-in-part of Ser. No. 115,488, Jan. 25, 1980, abandoned. This application Sep. 12, 1986, Ser. No. 906,655

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.⁴ B29C *17/07;* **B32B** *31/04*

U.S. Cl. 156—87 **6 Claims**



1. A method of lining a section of a high pressure pipeline which utilizes the structural strength of the pipeline to enable the lined pipeline section to be operated at high pressure, comprising:

(a) drawing through the pipeline in non-collapsed, fully tubular formed condition a plastic liner that is sufficiently rigid so as to be self-sustaining in tubular form in the presence of a collapse pressure condition of at least about one atmosphere and having an outside diameter sufficiently less than the inside diameter of the pipeline section to enable drawing the liner through the pipeline section in non-collapsed, fully tubualar formed condition until the line is substantially longitudinally co-extensive with the pipeline section;

(b) then longitudinally elastically stretching the liner beyond its relaxed length within the pipeline section by pulling the liner beyond the end of the pipeline from which it is drawn while the opposite end of the liner is fixed relative to the pipeline;

(c) then fixing the liner against longitudinal movement within the pipeline section;

(d) then permanently deforming the liner by radially forcing and expanding same against the inner wall of the pipeline section by applying a radial force within the liner to cause its radial expansion to an extent to permanently change the liner outside diameter from its original size to a size conforming to the inside diameter of the pipeline;

(e) during step (d), bleeding trapped fluid from the space between the liner and the pipeline through a bleeding opening.

4,818,315

METHOD FOR THE PRODUCTION OF A BROUS ABSORPTION BODY

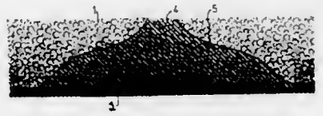
Maud Hellgren, Mölnlycke, and Henry Zöller, Västra Frölunda, both of Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

Division of Ser. No. 753,545, Jul. 10, 1985. This application Dec. 29, 1986, Ser. No. 946,534

Claims priority, application Sweden, Jul. 16, 1984, 8403732

Int. Cl.⁴ B27N *3/04, 3/12*

U.S. Cl. 156—62.2 **5 Claims**



1. A method of manufacturing a fibrous absorption body for use in disposable products such as diapers, sanitary napkins or wound dressings, comprising at least one type of absorbing fibers and a thermoplastic binding agent that has a binding temperature, comprising forming of the absorption fibers and the binding agent a homogeneous intermixture in the form of a substantially non-compressed web, heating said web above said binding temperature throughout the thickness of the web to activate the binding agent thereby to interconnect the absorption fibers by the binding agent throughout the thickness of the web, cooling the web below the binding temperature of the binding agent, and subsequently compressing the web between rollers of which a roller on one side of the web is at a temperature below the binding temperature of the binding agent and a roller on the opposite side of the web is at a temperature above said binding temperature, thereby to obtain a binding effect decreasing in a direction away from said opposite side of the web so as to produce a continuous density gradient in the web after its passage between said rollers.

4,818,316

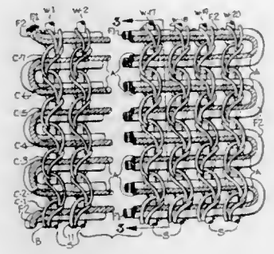
METHOD OF FORMING A RAVEL RESISTANT WARP KNIT ELASTIC TAPE

Paul L. Weinle, Charlotte, and Ivan E. Hinshaw, Badin, both of N.C., assignors to Collins & Aikman Corporation, New York, N.Y.

Division of Ser. No. 58,143, Jun. 4, 1987, Pat. No. 4,733,545. This application Nov. 23, 1987, Ser. No. 124,027

Int. Cl.⁴ D04B *1/08, 1/16*

U.S. Cl. 156—88 **4 Claims**



1. A method of forming a ravel resistant warp knit elastic tape including the steps of

(a) knitting yarns in a plurality of parallel and walewise extending stitch loop chains forming successive courses perpendicular to the wales of the elastic tape,

(b) while simultaneously inlaying an elastomeric yarn in selected ones of the parallel stitch loop chains to provide longitudinal stretchability to the elastic tape,

(c) while simultaneously inlaying a filling yarn back and forth across the elastic tape and in each course of the stitch loop chains,

(d) while simultaneously plating a thermoplastic heat fusible binder yarn with the filling yarn and extending back and forth across the elastic tape between opposite selvage edges thereof, and

(e) then heating the elastic tape to a sufficient temperature to soften and fuse the thermoplastic heat fusible binder yarn to the yarns forming the stitch loop chains to prevent unraveling of the stitch loop chains across an entire width of the elastic tape.

4,818,317

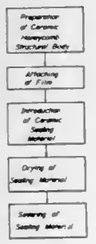
METHOD FOR PRODUCING CERAMIC HONEYCOMB STRUCTURAL BODY

Masashi Otaka, Mie, and Showji Asai, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jun. 11, 1987, Ser. No. 60,462

Int. Cl.⁴ C03B *29/00*

U.S. Cl. 156—89 **21 Claims**



1. A method for producing a ceramic honeycomb structural

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body having selectively sealed open end surfaces, comprising the steps of:

attaching a film or mask on an open end surface of a ceramic honeycomb structural body;

introducing a ceramic sealing material into through holes of the ceramic honeycomb structural body through apertures provided at selected positions of the film or mask, said sealing material having a viscosity of 50–1,500 poises;

commencing drying of said sealing material within 2 minutes after the introduction of said sealing material into through holes, said drying being performed by exposing said sealing material to an environment having a temperature of 100°–300° C. for 0.5–3.0 minutes; and

sintering said ceramic honeycomb structural body to solidify said sealing material.

4,818,318

METHOD OF FORMING COMPOSITE FIBER BLENDS

Paul E. McMahon, Mountainside; Tai-Shung Chung, Summit, N.J., and Lincoln Ying, Bridgewater, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Continuation of Ser. No. 589,929, Mar. 15, 1984. This application Apr. 28, 1986, Ser. No. 858,900

Int. Cl.⁴ B65H *81/00*; B32B *31/20*

U.S. Cl. 156—166 **16 Claims**



1. A process for preparing a continuous, substantially uniform tow useful in forming composite molded articles which comprises:

(a) forming a continuous tow of continuous non-thermoplastic reinforcing fibers;

(b) forming a continuous tow of continuous thermoplastic polymer fibers having a melting point of at least about 50° C.;

(c) uniformly and continuously spreading the thermoplastic polymer fiber tow to a selected width;

(d) uniformly and continuously spreading the non-thermoplastic reinforcing fiber tow to a width that is essentially the same as the selected width for the thermoplastic polymer fiber tow;

(e) intimately, uniformly and continuously intermixing the spread non-thermoplastic reinforcing fiber tow and the spread thermoplastic polymer fiber tow in a relatively tension-free state by employing a gas intermixing means which directs a generally perpendicular gas flow onto the fibers and by bringing the tows into simultaneous contact with each other in substantially the same area such that there is provided a substantially uniform distribution of the thermoplastic fibers and the non-thermoplastic reinforcing fibers within an intimately intermixed tow; and

(f) continuously withdrawing the intimately intermixed tow.

4,818,319

PROCESS FOR REDUCING THE WATER VAPOUR DIFFUSION IN A PLASTICS COMPOSITE INSULATOR CONSISTING OF SEVERAL LAYERS

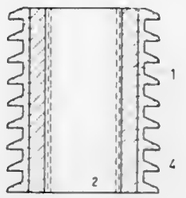
Hans-Rudolf Beer, Binz; Helmut Britsch, Schinznach-Dorf; Elias Jülke, Wettingen, and Tony Kaiser, Buchs, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 10, 1986, Ser. No. 837,833

Claims priority, application Switzerland, Apr. 4, 1985, 1473/85

Int. Cl.⁴ B32B *31/12*; H01B *3/04*

U.S. Cl. 156—192 **10 Claims**



1. A process for reducing water vapor diffusion in a plastics composite insulator, comprising:

applying a diffusion barrier layer consisting of at least one filled resin layer as either a surface layer or an intermediate layer onto an area of said insulator, said diffusion barrier layer being produced by centrifuging a synthetic resin filled with mica, mica containing iron as a constituent and/or glass flakes onto at least one of the layers of the plastics composite insulator.

4,818,320

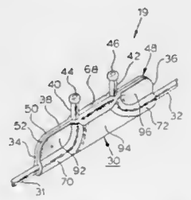
NASAL CANNULA HARNESS AND METHOD OF MAKING THE SAME

Edwin G. Weichselbaum, Eureka, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Division of Ser. No. 596,754, Apr. 4, 1984. This application Jul. 3, 1986, Ser. No. 882,046

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—227 **10 Claims**



1. The method of making a nasal cannula harness for delivering gas to the nasal passages of a patient comprising the steps of providing a pair of flexible narine tubes each having a distal end portion for insertion into a nare of the patient when in use, providing a plastic sheet having left, right, upper, and lower side edges and first and second pairs of channels in one side of said sheet, the first pair of channels extending inwardly from the left and right edges of the sheet, respectively, and curving to the lower side edge of the sheet, the second pair of channels extending inwardly from the left and right edges of the sheet respectively and curving to the upper side edge of the sheet, the depth of the channels being less than the diameter of the narine tubes, and securing the narine tubes to the sheet to form a nasal cannula including the steps of positioning the narine tubes respectively in the channels of one or the pairs of channels with the narine tubes extending out both ends of the said channels and curving generally in accordance with the curves of these channels, folding the sheet into upper and lower sheet sections with the sheet sections in facing relation and such that the channels of the other pair of channels respectively receive the narine tubes and form a pair of tunnels with the channels of said one pair of channels, and fixedly connecting facing portions of the sheet sections on each side of each the narine tubes together to secure the narine tubes relative to the sheet sections.

4,818,321

PREPARATION OF LAMINATED MATERIAL

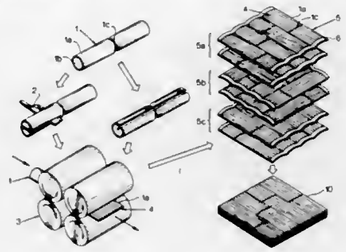
Shin Shimizu, Setagaya; Tsugane Tanaka, Mitaka; Osamu Ohara, Setagaya, and Taisei Inoue, Funabashi, all of Japan, assignors to Koyo Sangyo Co., Ltd.

Filed May 29, 1987, Ser. No. 57,288

Claims priority, application Japan, Jun. 11, 1986, 61-135516

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—254 **7 Claims**



1. A method for the preparation of a laminated material comprising the steps of cutting open an annual lignocellulosic stalk in the fiber direction; flattening said lignocellulosic stalk by means of a roller press at pressures of from 0.5 to 10 kg/cm^2 to form a compressed stalk, one face of which consists of its epidermis; arranging a plurality of said compressed stalks in parallel with each other to form a sheet; coating said sheet with a resin adhesive; stacking a plurality of said sheets coated with said adhesive; and then bonding with temperatures of from room temperature to 180° C. and pressures of from 5 to 30 kg/cm^2.

4,818,322

METHOD FOR SCRIBING CONDUCTORS VIA LASER

Ronald Morino, Sea Cliff; Brian E. Swiggett; Raymond J. Keogh, both of Huntington, all of N.Y., and Jonathan C. Crowell, Lakeville, Mass., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation of Ser. No. 756,691, Jul. 19, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 96,873

Int. Cl.⁴ B23K *26/02, 26/08*; B32B *31/28*

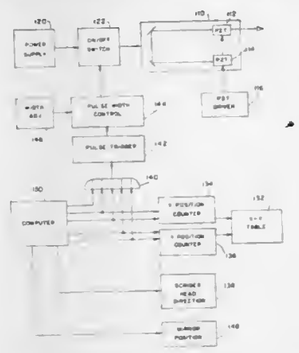
U.S. Cl. 156—272.8 **18 Claims**

1. In a process for scribing a conductor in a predetermined pattern on a surface of a substrate, the process including the steps of: (a) providing a conductor; (b) scribing said conductor to the surface of the substrate; (c) bonding said conductor to the surface by means of an adhesive which is activated by directing laser energy at the adhesive, and scribing the conductor to the surface of the substrate, the improvement which comprises:

(1) providing discrete laser beam pulses, each having substantially the same energy content,

(2) directing said pulses substantially at the adhesive between the conductor and the substrate to activate the adhesive as the conductor is being scribed, and

(3) continuously varying the number of said discrete pulses as the conductor feed rate continuously varies to provide



a constant number of said discrete pulses for each incremental length of conductor being scribed.

4,818,323

METHOD OF MAKING A VOID FREE WAFER VIA VACUUM LAMINATION

Frank Secco d'Aragona, and Hang M. Liaw, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 26, 1987, Ser. No. 66,673

Int. Cl.⁴ B23K *20/02, 20/24, 35/30*

U.S. Cl. 156—286 **12 Claims**

1. A method of bonding wafers and removing voids created therebetween comprising the steps of:

providing a first wafer with a bonding surface;

providing a second wafer with a bonding surface;

assembling said bonding surfaces in a dissolvable gas environment under atmospheric pressure;

reducing the pressure about said first and second wafers;

heating said first and second wafers creating a bond therebetween defining a void therein, said void containing said dissolvable gas;

increasing the pressure about said first and second wafers to approximately atmospheric pressure;

heating said first and second wafers to a reaction temperature below a melting point of said first and second wafers;

dissolving said dissolvable gas contained in said void into said first and second wafers; and

eliminating said void.

4,818,324

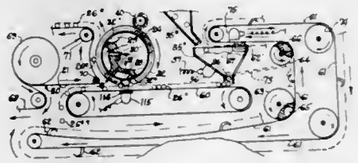
METHOD OF FABRICATION OF THIN COMPRESSIBLE MATTRESSES

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Sep. 11, 1987, Ser. No. 95,238

Int. Cl.⁴ B32B *31/06, 31/08, 31/10*; A47C *27/08*

U.S. Cl. 156—292 **7 Claims**



1. A method of fabricating a continuous structure having a substantially constant thickness, said structure comprising two

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parallel sheets between which spherically shaped balls are enclosed and bonded thereto, said balls being programmably positioned and arranged relatively to one another so as to form a one-ball thick layer and be separated from each other by an adjusted set distance, said method comprising the steps of:

dropping the balls of an endless belt in a continuous one-ball thick layer;

causing said layer to pass below a cylindrical surface of a drum located above the belt;

feeding a constant and continuous supply of the balls close to the surface of the drum equipped with means to attract and retain some of said balls at programmed locations on said surface;

attracting balls passing by at programmed locations on said drum surface for positioning and retention thereon;

leaving unattracted balls on the endless belt for evacuation and subsequent re-droppings onto the endless belt;

rotating the drum synchronously with the advancement of a first one of the two sheets, said first sheet having one side coated with an adhesive;

causing said adhesive coated side of the first sheet to come into contact with a point on the ball surface most distant from the drum axis of rotation;

causing a small pressure to be exerted by the first sheet on each ball at said contact point so as to create the start of a bond between each ball and the first sheet coated side;

causing a coated side of the second sheet to come into contact with each ball at a point diametrically opposed to the contact point already created with the first sheet; and

curing the bonds created at the sheet-ball contact points so as to strengthen said bonds and eliminate adhesive tackiness.

4,818,325

METHOD OF BONDING NON-POLAR OR HIGHLY CRYSTALLINE RESIN SUBSTRATES EMPLOYING A PRIMER AND A CYANOACRYLATE ADHESIVE

Akihiko Hiraiwa; Kenji Ito, and Kaoru Kimura, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Toyko, Japan

Division of Ser. No. 818,716, Jan. 14, 1986, abandoned. This application Jul. 27, 1987, Ser. No. 78,403

Claims priority, application Japan, Jan. 18, 1985, 60-5936; Jan. 31, 1985, 60-15486

Int. Cl.⁴ C09J *5/04*

U.S. Cl. 156—315 **32 Claims**

1. A process for bonding non-polar or highly crystalline resin substrates together or bonding the resin substrate to another material by using a primer comprising an organometallic compound and an organic polymer as the effective components, and a cyanoacrylate-based adhesive comprising 2-cyanoacrylate.

4,818,326

PROCESSING APPARATUS

Jiann Liu, Irving; Cecil J. Davis, Greenville, and Lee M. Loewenstein, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 73,935, Jul. 16, 1987, abandoned. This application Apr. 26, 1988, Ser. No. 188,139

Int. Cl.⁴ B44C *1/22;* B05D *3/05;* C23F *1/02;* C03C *15/00*

U.S. Cl. 156—345 **9 Claims**

1. An apparatus for processing of wafers, comprising:

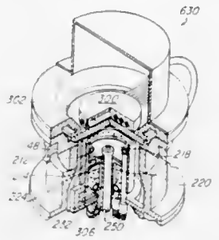
(a) a vacuum process chamber;

(b) a wafer support engaging a wafer in a face down position inside said vacuum chamber against a water cooled substrate;

(c) at least one electrode capable of accelerating the excited molecules toward the face of the wafer;

(d) said cooled substrate capable of being one of said at least one electrodes;

(e) a remote plasma chamber capable of exciting gases to produce a remote plasma; and



(f) a magnet at the periphery of said chamber capable of confining the ion beam.

4,818,327

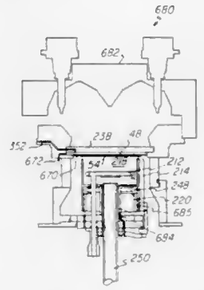
WAFER PROCESSING APPARATUS

Cecil J. Davis, Greenville, and Robert T. Matthews, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 16, 1987, Ser. No. 74,419

Int. Cl.⁴ B44C *1/22;* C23F *1/02;* H01L *21/306;* C23C *14/00*

U.S. Cl. 156—345 **21 Claims**



1. An apparatus for processing wafers comprising:

(a) a vacuum processing chamber;

(b) a source of radiant energy; and

(c) a reflector which radiatively couples said source of radiant energy to the wafer in a wafer support.

4,818,328

PROCESS FOR MANUFACTURING SACKS, BAGS, AND THE LIKE

Toshiya Hara, Tokyo, Japan, assignor to Oji Seitai Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 607,136, May 4, 1984. This application Dec. 31, 1987, Ser. No. 140,234

Claims priority, application Japan, May 9, 1983, 58-79339

Int. Cl.⁴ B65B *13/02*

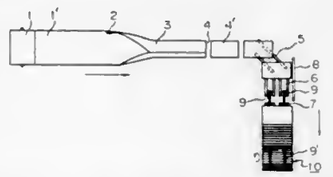
U.S. Cl. 156—350 **10 Claims**

1. A system for manufacturing sacks, bags, or the like, comprising:

a plurality of tube-making machines, each comprising a means for making tubes of sheet material, a means for discharging said tubes in an axial direction of the tubes, each of said tubes having open axial ends, a means for turning said tubes by substantially 90° so as to feed said tubes in flat form one by one in a direction substantially perpendicular to the axial direction of the tubes, the tubes being overlapped or shingled as offset by a predetermined distance;

a plurality of reeling stations, each comprising a means provided for each said tube-making machine, for winding said tubes one by one on a reel core with the axial direction being parallel to a reel core axis and with the help of at least one tape member which is connected at one end thereof to said reel core and is continuously supplied with the rotation of the reel core, so that the tubes are secured on the reel core by the tape member being applied to the tubes one by one from the outside thereof, to form a tube wound reel having a desired diameter;

a reel storing station for storing said tube wound reels;



a plurality of bottom-closing machines, each comprising a means for unwinding the tubes one by one from said reel core by pulling said tape member to rotate the tube wound reel, a means for taking up the overlapped tubes one by one and separating said individual tubes from each other, and a means for closing a bottom of each of said individual tubes, while said tubes are fed one by one in the direction substantially perpendicular to the axial direction of the tubes;

computer controlled crane means for removing said tube wound reels, in turn, from said reeling stations to put them in said reel storing station and picking a desired tube wound reel to deliver it to a designated one of said bottom-closing machines.

4,818,329

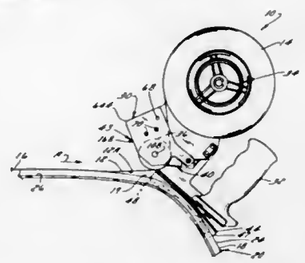
APPARATUS FOR DISPENSING AND APPLYING TAPE

Edward P. Tutas, Kenosha, and Donald J. Passehl, Waterford, both of Wis., assignors to Kranz Incorporated, Racine, Wis.

Filed Mar. 9, 1988, Ser. No. 165,818

Int. Cl.⁴ B32B *35/00*

U.S. Cl. 156—391 **13 Claims**



1. A device for dispensing and applying a strip of adhesive masking tape to a portion of a surface of an object which is to be painted, the surface portion to be masked including a convex curved section, said surface further including a groove lying adjacent and parallel to said surface portion to be masked and corresponding in curvature to said portion to be masked, said device being movable relative to said object along a path parallel to said groove and parallel to said portion to be masked, said device having a leading end which moves along said path toward said portion to be masked and having a trailing end which moves along said path away from a portion already masked, said device comprising:

a support frame;

means on said support frame for rotatably supporting a roll of adhesive masking tape;

pressure applying means on said support frame near said trailing end of said device around which tape from said roll of tape is reeved and having an undersurface which is adapted to press said tape against said surface portion to be masked;

cutting means on said support frame selectively operable to cut said tape;

and guide means on said support frame near said leading end of said device comprising two projections which are engageable with said groove and are spaced apart from each other in the same direction as said path, said projections having ends which lie in a plane which is spaced a fixed distance from another plane in which said undersurface of said pressure applying means lies.

4,818,330

ONE-SIDED CORRUGATED BOARD MACHINE HAVING REPLACABLE CORRUGATING ROLLERS

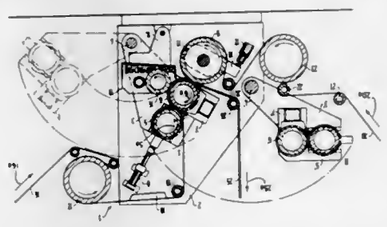
Hans Mosburger, Welberhammer, Fed. Rep. of Germany, assignor to BHS-Bayerische Berg-, Hütten- und Salzwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 16, 1987, Ser. No. 97,204

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1986, 3631803

Int. Cl.⁴ B31F *1/28*

U.S. Cl. 156—473 **4 Claims**



1. A one-sided corrugated board machine with at least two pairs of corrugated rollers which are supported in a drivable manner as assemblies affixed to a support, said machine comprising:

at least two pair of corrugated rollers each pair forming an assembly including a lower corrugated roller and an upper corrugated roller wherein each assembly is supported on a separate pivotally movable bearing bracket pivotably affixed to said support such that said bearing bracket supporting one said assembly originally occupying a work position can be pivotably moved to a first rest position away from said work position and said bearing bracket supporting another said assembly occupying a second rest position separated from said first rest position and said work position can be pivotably moved to said work position;

a glue-applying device affixed on said support such that said device cooperates with said assembly in said work position; and

a clamping roller affixed on said support such that said clamping roller cooperates with said assembly in said work position, further providing that said glue-applying device and said clamping roller can be moved away from a path of motion of said assembly when said assembly is moved from one position to another position.

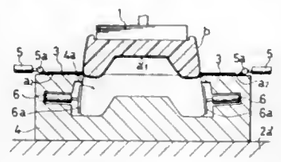
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4,818,331

APPARATUS FOR MANUFACTURING A SEAT

Makoto Shimada, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Filed Apr. 23, 1987, Ser. No. 41,771
Int. Cl.[4] B65C *1/00;* **B32B** *3/04;* **B29C.***1/00;* **C09J** *7/02*
U.S. Cl. 156—485 **11 Claims**



1. An apparatus for manufacturing a seat in which the seat is assembled by bonding a top cover member to surfaces of a foam cushion member, said apparatus comprising:

a lower die having a hollow portion for accommodating said foam cushion therein;

stretching means for retaining ends of said top cover member and stretching said top cover member, said stretching means being arranged on said lower die such that they are disposed so as to surround said hollow portion of said low die; and

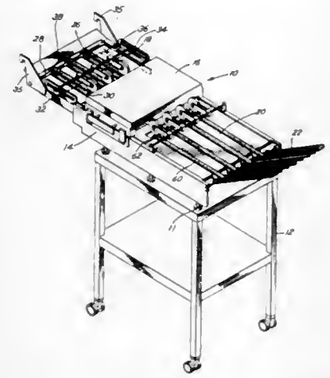
pressing means for pressing side lateral portions of said top cover member against side walls of said cushion member, said pressing means being arranged to surround said side walls of said cushion member and disposed within inner side walls of said hollow portion of said lower die.

4,818,332

BUSINESS FORM SEALER/CONVEYOR

Elmer J. Schnitz, Sanborn, and David G. Wagner, Amherst, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation of Ser. No. 537,268, Sep. 29, 1983, abandoned. This application May 7, 1986, Ser. No. 861,629
Int. Cl.[4] B31B *31/00*
U.S. Cl. 156—499 **5 Claims**



1. Apparatus for conveying and sealing groups of form sheets into form sets, at least one of the form sheets for each form set having heat sealable adhesive, the apparatus comprising;

a base;

heating means on the base for heating the heat sealable adhesive to seal the form sheets of the groups together; and

conveyor means on the base conveyor the groups of form sheets through the heating means, the conveying means including means for receiving groups of form sheets moving at a first speed and overlapping of the groups of form sheets into overlapped groups for conveying the overlapped groups at a second speed through the heating means, the second speed being less than the first speed.

4,818,333

METAL SURFACE REFINEMENT USING DENSE ALUMINA-BASED MEDIA

Mark D. Michaud, Bristol, Conn., assignor to Rem Chemicals, Inc., Southington, Conn.

Filed Aug. 3, 1987, Ser. No. 80,911
Int. Cl.[4] B24B *1/04;* **C23F** *1/00*
U.S. Cl. 156—628 **25 Claims**

1. A process for the refinement of metal surfaces of objects, in which a mass of elements, including a quantity of objects having relatively rough metal surfaces, and a solution capable of converting said surfaces to a softer form, are introduced into the container of a mass finishing unit and are rapidly agitated therein for a period of time to produce relative movement among said elements and to maintain said surfaces in a wetted condition with said solution, for conversion of any metal exposed thereon, on a continuous basis, so as to thereby effect a significant reduction in roughness by chemical and mechanical action; wherein the improvement comprises the inclusion in said mass of elements of a quantity of relatively heavy and nonabrasive solid media elements, the amount and size of which are selected to promote relative sliding movement thereamong and with respect to said objects, under the conditions of agitation, said media elements being composed of a mixture of oxide grains fused to a coherent mass having a density of at least about 2.75 grams per cubic centimeter, and being substantially free of discrete abrasive particles, the composition of said media elements being such that the average weight reduction thereof is less than about 0.1 percent per hour, as determined in a vibratory bowl having a capacity of about 280 liters, substantially filled with said media elements and operated at about 1,300 revolutions per minute and an amplitude of 4 millimeters, with a soap solution flowing through the bowl at the rate of about 11 liters per hour, said quantity of media elements having a bulk density of at least about 1.70 grams per cubic centimeter.

4,818,334

METHOD OF ETCHING A LAYER INCLUDING POLYSILICON

Stanley Shwartzman, Somerville Borough, and Michael F. Leahy, East Brunswick Township, Middlesex County, both of N.J., assignors to General Electric Company, Somerville, N.J.

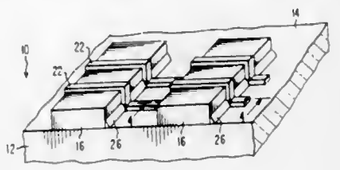
Filed Mar. 15, 1988, Ser. No. 168,465
Int. Cl.[4] H01L *21/306;* **B44C** *1/22*
U.S. Cl. 156—643 **15 Claims**

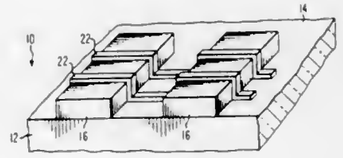
1. A method of plasma etching a layer which includes polycrystalline silicon and which extends over an island of silicon on a substrate, said method comprising the steps of:

(a) covering a portion of said layer with a masking layer;

(b) subjecting the exposed portion of the layer to a gaseous mixture of nitrogen, chlorine and chloroform while passing a current through the gas to create a plasma so as to etch away the exposed portion of the layer and coat the exposed walls of the remaining portion of the layer with a thin polymer layer; and then

(c) subjecting the polycrystalline layer to a gaseous mixture of an inert gas, chlorine and a gas containing oxygen and carbon while passing a current through the gas to create a plasma so as to etch away any stringers of the layer which may remain on the side walls of the island.



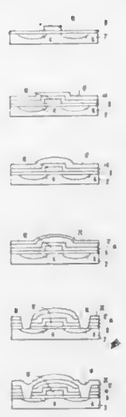


4,818,335

TAPERED WET ETCHING OF CONTACTS USING A TRILAYER SILOX STRUCTURE

Martin P. Karnett, Catonsville, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Fort George G. Meade, Md.

Filed May 13, 1988, Ser. No. 197,007
Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/01;* **H01L** *21/306*
U.S. Cl. 156—644 **9 Claims**



1. A method for producing tapered contact sidewalls in a semiconductor device including a thermally oxidized base having gate, source and drain regions, a first layer of undoped oxide material deposited on the thermal oxide layer of the base and a layer of doped oxide material deposited on the layer undoped oxide material, comprising the steps of:

(a) depositing a second layer of undoped oxide material on the layer of doped oxide material; and

(b) wet etching windows in the oxide layers adjacent to the source and drain regions to define contact areas of the device, said second layer of undoped oxide material having a slower etch rate than said layers of doped and thermal oxide material, whereby the sidewalls of the contact areas are uniformly tapered to improve metal step coverage of the device while minimizing structural defects and increasing long term device reliablity.

4,818,336

METHOD OF MAKING METAL MOLDS AND DIES

James J. Rossetti, Palmyra, Wis., assignor to Advanced Tool Technologies, Incorporated, Lake Geneva, Wis.

Continuation of Ser. No. 850,769, Apr. 11, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 107,893
Int. Cl.[4] C23F *1/02;* **B29C** *47/08*
U.S. Cl. 156—651 **6 Claims**



1. A method of forming a contoured surface in a workpiece in the form of a metal mold or die by etching the surface thereof comprising the steps of;

a. providing a template having a contoured surface which is a negative pattern of the contoured surface to be formed in the workpiece,

b. applying a meltable coating to the workpiece, the coating being resistant to an etchant and having a melting temperature such that the coating is generally solid after application to the workpiece,

c. immersing the coated workpiece in an etchant,

d. heating the template to at least the melting temperature of the coating,

e. pressing the heated template against the coated workpiece and melting any portions of said coating contacted by the template,

f. only displacing the melted portions of said coating as the contoured surface of the template moves into contact with the workpiece,

g. withdrawing the template from the coated workpiece to permit resolidification of any melted coating, while leaving any locations of the workpiece contacted by the contoured surface of the template essentially free of said coatings and exposing portions of the workpiece without withdrawing any coating with the template;

h. permitting the etchant to etch said portions of the workpiece exposed by displacement of the coating and

i. repeating steps (e) through (h) until the surface of the workpiece conforms to the contoured surface of the template.

4,818,337

THIN ACTIVE-LAYER SOLAR CELL WITH MULTIPLE INTERNAL REFLECTIONS

Allen M. Barnett, Newark, and Michael G. Mauk, Wilmington, both of Del., assignors to University of Delaware, Newark, Del.

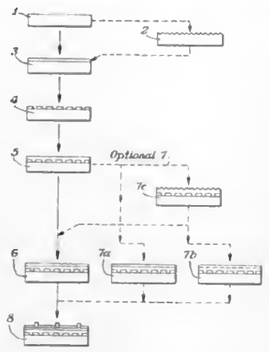
Filed Apr. 11, 1986, Ser. No. 851,036
Int. Cl.[4] H01L *21/306, 31/00;* **B44C** *1/22*
U.S. Cl. 156—659.1 **21 Claims**

1. In a process for forming a silicon photovoltaic solar cell having a silicon substrate, at least one surface of the substrate having thereon a coating of a barrier layer and a multiplicity of electrical pathways through the coating to electrically couple photovoltaically active elements of the solar cell with the silicon substrate, the process comprising:

providing an electrically conductive silicon body having at least one substantially uniform surface; formation of a thin

coating on the substantially uniform surface to form the barrier layer;

formation by lithography and etching of a multiplicity of holes extending through the coating to expose micro-



scopic areas of silicon of the substrate with the exposed areas comprising a minor proportion of the substrate; and

epitaxially growing of silicon in the holes to provide electrical pathways through the coating.

4,818,338

METHOD FOR EMPTYING SUSPENSION FOR A PULPER

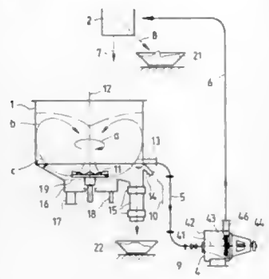
Theodor Bähr; Helmut Thumm, and Walter Musselmann, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Division of Ser. No. 591,870, Mar. 21, 1984, Pat. No. 4,634,059. This application Aug. 27, 1986, Ser. No. 900,759

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311082

Int. Cl.⁴ D21B *1/32*

U.S. Cl. 162—4 **9 Claims**



1. A method of emptying pulp suspension containing foreign matter from a pulper for removing said foreign matter from the pulper, said method comprising:

pulping pulpable material in a pulper to form a pulp suspension of the material containing foreign matter in the pulper;

passing the suspension through a screen and thence to a pulp removal space in the bottom region of the pulper for collecting screened suspension;

periodically and cyclically feeding batches of suspension containing foreign matter from the pulper into a withdrawal apparatus housing via a withdrawal outlet near the bottom of the pulper but above the screen;

activating the suspension containing foreign matter in the withdrawal apparatus housing by rotating the suspension in that housing at a location near a first longitudinal end thereof, the suspension being supplied to the withdrawal apparatus near an opposite longitudinal end thereof, and being withdrawn tangentially from the withdrawal apparatus near said first longitudinal end, the suspension being withdrawn sufficiently near the location of rotation to provide a pumping-off action for pumping-off said withdrawn suspension containing foreign matter from the withdrawal apparatus without substantially sorting the suspension in the withdrawal apparatus;

while feeding one batch of suspension into the withdrawal apparatus housing, also conveying a batch of previously activated and rotated suspension out of the withdrawal apparatus housing; and

sorting the conveyed suspension for removing dirt therefrom.

4,818,339

METHOD AND DEVICE FOR PREPARATION AND PRIMARY SEPARATION OF PAPER PULP

Pierre Lamort, Vitry Le Francois, France, assignor to E et M Lamort, France

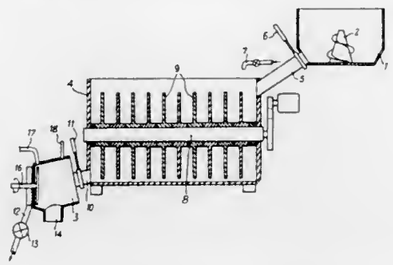
Filed Jul. 25, 1986, Ser. No. 890,616

Claims priority, application France, Jul. 26, 1985, 85 11453

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.⁴ D21B *1/08*; D21C *9/08*

U.S. Cl. 162—4 **9 Claims**



1. A method of preparation and primary separation of a paper pulp from a recycled paper and similar fibrous substances, comprising of the following steps:

(a) agitating without shredding and cutting of a mixture of said fibrous substances in a primary pulper with a first agitator means situated within said primary pulper;

(b) simultaneous discharging of the entire content of the primary pulper including the mixture of the fibrous substances and contaminants into a vat having a working volume substantially larger than a working volume of the primary pulper;

(c) stirring the mixture within said vat with a second agitator means having a longitudinal shaft provided with spiral-shaped blades extending from said shaft;

(d) discharging the mixture from the vat into a separator, and washing out the contaminants in the sseparator; and

(e) removing the contaminants from the separator.

4,818,340

ENVELOPE TYPE SEPARATOR FOR STORAGE BATTERY AND MANUFACTURING PROCESS THEREFOR

Takao Hasegawa, and Hideo Endo, both of Gifu, Japan, assignors to Nihon Muki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 514,098, Jul. 15, 1983, abandoned. This application Oct. 3, 1985, Ser. No. 783,873

Claims priority, application Japan, Jul. 15, 1982, 52-122175

Int. Cl.⁴ D21H *1/02*

U.S. Cl. 162—125 **1 Claim**

1. A process for preparing an envelope type separator for a storage battery which comprises:

(a) forming a wet microporous paper layer from an aqueous slurry of a mixture of an inorganic powder material, a synthetic organic fiber material, and a synthetic organic pulp material;

(b) forming a wet course paper layer from an aqueous slurry of a mixture of a synthetic organic fiber material, and a synthetic organic pulp material that contains no inorganic powder material;

(c) combining said wet microporous paper layer and said wet coarse paper layer together by a paper making process;

(d) heating the resultant combination-paper type wet sheet to effect drying and binding the two paper layers thereof together through fusion of the synthetic pulp materials thereby producing a combination-paper type separator sheet, said combination-paper type separator sheet being an integral combination of the microporous paper layer containing the inorganic powder material and the coarse paper layer containing no inorganic powder material, said course paper layer being comparatively large in pore diameter and thus in porosity;

(e) arranging said separator sheet so that the mutually inward facing surfaces of the coarse paper layer are placed one upon another; and

(f) adhering the mutually inward facing surfaces of the coarse paper layer together by melting the synthetic pulp materials by thermal fusion at predetermined locations thereof so that the separator sheet is formed into the shape of an envelope.

4,818,341

PRODUCTION OF PAPER AND PAPERBOARD OF HIGH DRY STRENGTH

Hans-Juergen Degen, Lorsch; Sigberg Pfohl, Speyer; Volkmar Weberndoerfer, Mannheim; Gerd Rehmer, Bobenheim-Roxheim; Michael Kroener, and Andreas Stange, both of Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 12, 1988, Ser. No. 155,503

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 3706525

Int. Cl.⁴ D21D *3/00*

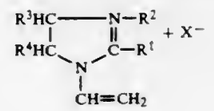
U.S. Cl. 162—168.2 **6 Claims**

1. A process for producing paper and paperboard of high dry strength by adding a mixture of from 1 to 20 parts by weight of a cationic polymer which contains as characteristic monomers copolymerized units of

(a) diallyldimethylammonium chloride,

(b) N-vinylamine or

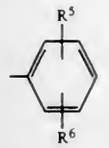
(c) an N-vinylimidazoline of the formula



(I)

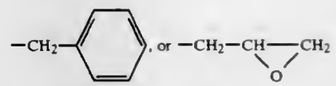
where

R^1 is H, C_1–C_{18}-alkyl or



R^5 and R^6 are each H, C_1–C_4-alkyl or Cl,

R^2 is H, C_1–C_{18}-alkyl,



R^3 and R^4 are each H or C_1–C_4-alkyl and

X^- is an acid radical,

and which has a K value of not less than 30, and 100 parts by weight of natural potato starch which is converted into a water-soluble form by heating in an aqueous medium at above the gelatinization temperature of natural potato starch in the absence of any oxidizing agent, polymerization initiator or alkali, as a dry strength enhancer to the paper stock and dewatering the paper stock with sheet formation.

4,818,342

HEAT TREATMENT OF PAPER PRODUCTS

Dinkar G. Wagle, Monroe; Vacheslav M. Yasnovsky, Orangeburg, both of N.Y., and Jerome M. Floyd, Mobile, Ala., assignors to International Paper Company, Purchase, N.Y.

Continuation-in-part of Ser. No. 768,643, Aug. 23, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 103,004

Int. Cl.⁴ D21F *11/00*

U.S. Cl. 162—207 **3 Claims**

1. A method of improving the stiffness and strength of a kraft paper product while maintaining acceptable flexibility thereof comprising steps of

heat treating incompletely dried or moisturized paper product, at high temperature within the range of 284° F. to 482° F. for 0.5 seconds to 120 seconds, and then

rewetting the surface of said product immediately following said heat treating step, said product being maintained above 212° F. during the interval between the heat treating and rewetting steps.

4,818,343

DEVICE FOR CUTTING OFF AN EDGE STRIP AND FOR GUIDING THE EDGE STRIP IN CONNECTION WITH THE THREADING OF A PAPER OR BOARD WEB

Paavo Laine, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Apr. 16, 1987, Ser. No. 38,950

Claims priority, application Finland, Apr. 18, 1986, 861649

Int. Cl.⁴ B26D *1/00*

U.S. Cl. 162—286 **10 Claims**

1. A device for cutting off and guiding an edge strip from one part of a paper or board machine to another in connection with the threading of a paper or board web, the device comprising:

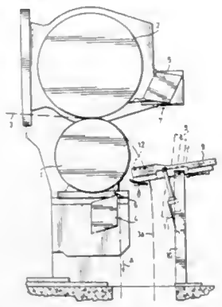
an edge strip receiving portion, air jet nozzles mounted adjacent the edge strip receiving portion for guiding the edge strip, a web path, and a threading plate having a front end facing the web path and being provided with cutting means for cutting off the edge strip and guiding the edge strip onto the threading plate,

said cutting means comprising at least one blade member having a cutting edge and being pivotally mounted on the front end of the threading plate adjacent the edge strip

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receiving portion, said at least one blade member, relative to the threading plate, being only pivotally displaceable, and

displacement means for pivotally displacing the blade member and cutting edge in a plane substantially parallel to the plane of the threading plate so that the blade member cuts off the edge strip on the side facing away from the front end of the threading plate and guides the edge strip onto the threading plate.



4,818,344

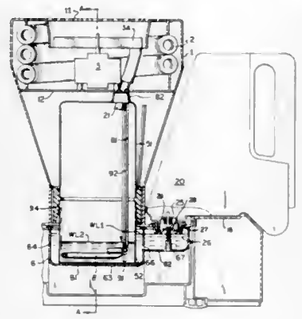
WATER DISTILLING APPARATUS

Dov Z. Glucksman, 462 Boston St., Topsfield, Mass. 01983

Filed Dec. 17, 1987, Ser. No. 133,930

Int. Cl.[4] B01D *3/02;* **C02F** *1/04*

U.S. Cl. 202—176 **9 Claims**



1. A water distilling apparatus comprising

a vaporizing portion containing an electric heating element and thermostatic control means serving to protect said heating element from overheating;

a condensing portion including a condenser coil communicating with said vaporizing portion by a steam conduit and provided with a distilled water outlet;

an electric fan adapted to blow outside air over the surface of said condenser coil;

means for supplying raw water to said vaporizing portion, and means for receiving distilled water from said condensing portion;

said water vaporizing portion comprises a raw water receptacle including a main compartment having a bottom and upstanding side walls, and a filling compartment provided with means for being supplied with raw water up to a pre-determined height, said filling compartment communicating with said main compartment through a small-size opening effecting a substantially uniform water level in said filling compartment and in said main compartment; and a vertical vaporizing chamber having a closed top and open bottom of smaller horizontal dimensions than those of said main receptacle compartment and positioned in said main compartment close to and distanced from the bottom of said compartment, said electric heating element being positioned close to the open bottom end of said vaporizing chamber.

4,818,345

DISTILLATION APPARATUS

Ann-Sofi Jönsson, Sandvägen 35, S-240 13 Genarp, Sweden

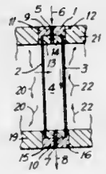
PCT No. PCT/SE86/00289, § 371 Date Feb. 10, 1987, § 102(e) Date Feb. 10, 1987, PCT Pub. No. WO86/07585, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 16, 1986, Ser. No. 30,862

Claims priority, application Sweden, Jun. 17, 1985, 8502999

Int. Cl.[4] B01D *13/00, 53/22;* **C02F** *1/04*

U.S. Cl. 202—163 **10 Claims**



1. Apparatus for distilling a liquid, comprising:

a porous membrane, said membrane being pervious to vapor but impervious to liquid, and having a thickness of less than about 0.5 mm;

a condensation surface spaced a predetermined distance apart from the membrane;

an open gap between the membrane and the condensation surface, said open gap having a width of between about 0.2 mm and about 1.0 mm, said vapor diffusing only across said membrane and said open gap;

means for supplying the liquid to be distilled to the surface of said membrane remote from the open gap; and

means for maintaining the temperature of the condensation surface remote from the open gap at a lower temperature than the temperature of the liquid to be distilled.

4,818,346

VERTICAL DISTILLATION COLUMN WITH A DE-ENTRAINMENT DEVICE

Jeremy B. Bentham, and Johan J. B. Pek, both of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 7, 1987, Ser. No. 47,377

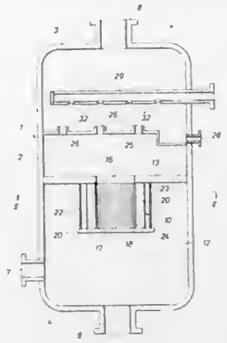
Claims priority, application United Kingdom, May 7, 1986, 8611122

Int. Cl.[4] B01D *3/10*

U.S. Cl. 202—197 **13 Claims**

1. Vertical distillation column having a feed inlet arranged in the lower part of the column, a gas outlet arranged in the upper part of the column, and a de-entrainment device arranged in the column between the feed inlet and the gas outlet, wherein the de-entrainment device comprises a first chamber, a second chamber extending above the first chamber within the column and separated from the first chamber by at least one permeable

wall which is inclined with respect to the horizontal plane and comprises coalescence means, and flow controlling means restricting fluid flow through the upper part of the coalescence means.



4,818,347

PROCESS FOR THE ISOLATION OF VINYL ACETATE

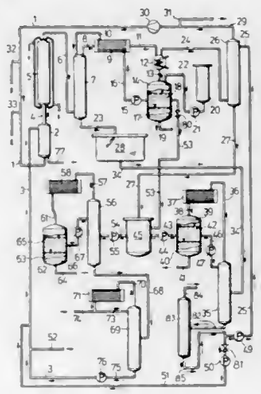
Günter Roscher, Kelkheim; Karl H. Schmidt, Idstein/Taunus; Hansjörg Hey, Hofheim am Taunus; Horst Langner, Hattersheim am Main, and Erwin Andereya, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 53,525, May 19, 1987, abandoned, which is a continuation of Ser. No. 745,410, Jun. 14, 1985, abandoned. This application Dec. 10, 1987, Ser. No. 133,248

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1984, 3422575

Int. Cl.[4] B01D *3/00;* **C07C** *67/48*

U.S. Cl. 203—42 **6 Claims**



3. A process for isolating vinyl acetate from a gas mixture containing vinyl acetate, ethyl acetate, acetic acid, water and carbon dioxide formed in the reaction of ethylene with acetic acid and oxygen in a reaction zone in the gas over catalysts containing palladium or palladium compounds, which comprises

(a) passing the gas mixture leaving the reaction zone into a first distillation column,

(b) cooling the gas mixture leaving the top of the first distillation column to −20° to +50° C., the condensate obtained forming an aqueous phase and an organic phase,

(c) removing the aqueous phase formed in step (b),

(d) recycling all or a portion of the organic phase formed in step (b) as a reflux to the top of the first distillation column used in step (a),

(e) washing the gas not condensed in step (b) containing gaseous vinyl acetate in a washing column with acetic acid containing not more than 10% of water to obtain an acetic acid solution containing vinyl acetate,

(f) passing a bottom product from step (a) containing vinyl acetate, ethyl acetate, acetic acid and water to a second distillation column and removing a side stream containing ethyl acetate from an enrichment zone above the bottom thereof,

(g) using all or a portion of the bottom product from step (f) containing acetic acid for the wash in step (e),

(h) cooling a top vapor of step (f), an aqueous phase and organic phase being formed,

(i) removing the aqueous phase formed in step (h),

(k) recycling a portion of the organic phase formed in step (h) as a reflux to the top of the second distillation column used in step (f),

(l) passing the remaining portion of the organic phase formed in step (h) together with acetic acid solution obtained in step (e) and with the remaining portion of the organic phase, formed in step (b), which is not used as a reflux in step (d) into a third distillation column which contains an intermediate tray,

(m) cooling a top vapor from step (l) and recycling substantially all of the condensate formed as a reflux to the top of the third distillation column used in step

(l), the remaining portion being discharged for removal of low-boiling constituents, and then removing, from the intermediate tray of the column, the entire reflux and allowing it to separate into an aqueous phase and an organic phase,

(n) removing the aqueous phase formed in step (m),

(l) recycling the organic phase formed in step (m) to the third distillation column used in step (1), below the intermediate tray,

(p) passing a bottom product from step (l) containing vinyl acetate and acetic acid into a fourth distillation column and

(q) removing the vinyl acetate at the top of the fourth distillation column used in step (p).

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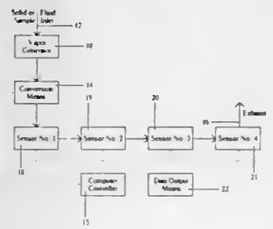
METHOD AND APPARATUS FOR IDENTIFYING AND QUANTIFYING SIMPLE AND COMPLEX CHEMICALS

Joseph R. Stetter, Naperville, Ill., assignor to Transducer Research, Inc., Naperville, Ill.

Filed May 26, 1987, Ser. No. 53,723

Int. Cl.[4] G01N *31/00*

U.S. Cl. 204—1 T **13 Claims**



1. A method for identifying and quantifying at least one component of liquids and solids comprising the steps of:

changing a non-fluid sample to a fluid material, introducing said fluid material to an array of sensors for exposure of said fluid material to said sensors, said array including

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plural sensors having differing electrical responses to said fluid material which are dependent on the interaction of said fluid material with each of said sensors and upon either an operational condition of at least one of said sensors or at least one property of the fluid material,

changing an operational condition of at least one of said sensors or at least one property of the fluid material to provide a plurality of different responses from at least one of said sensors,

forming a response pattern from the responses of said sensors, and

comparing the formed response pattern with a set of previously established response patterns to identify at least one component of the liquids and solids.

7. An instrument for identifying at least one component of gases, liquids and solids comprising,

means for changing solids to liquids or gases, or liquids to gases, said means including at least one heating element means for vaporizing liquids and solids, a block of heat resistant material having a chamber therein, a sample container to fit within said chamber along with said heating element, means such that said container is contacted with said heating element means, and means for sealing said chamber from the atmosphere;

sensing means including an array of sensors;

means for introducing the liquids or gases to said sensing means, said array including at least two sensors having different electrical responses to the liquids or gases dependent on the interaction of the liquids or gases with each of said sensors and upon an operational condition of at least one of said sensors,

means for changing an opertional condition of at least one of said sensors to provide a plurality of different responses from said at least one sensor,

means for forming a response pattern from said sensing means upon exposure to a liquid or gaseous sample,

means for providing a plurality of previously established response patterns, and

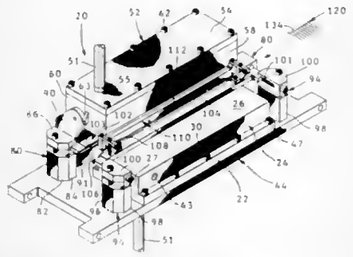
means for comparing the formed response pattern with at least one previously established response pattern to identify the component of the gases, liquids and solids.

4,818,349

SELECTIVE PLATING APPARATUS FOR ZONE PLATING

Mark L. Smith, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 1, 1988, Ser. No. 150,879
Int. Cl.[4] C25D *5/02, 17/00*
U.S. Cl. 204—15 **16 Claims**



10. A method for continuously plating a selected zone on a workpiece, said zone being intermediate the longitudinal edges of said workpiece, comprising the steps of:

providing a contained supply of plating solution having an elongated avenue of escape, said avenue of escape being proximate the plating zone of said workpiece, said contained supply including anode means mounted along the length of said avenue of escape and at a spaced location therefrom such that all the plating solution leaving the supply has been charged by said anode means;

guiding a continuous strip of said workpiece with said zone to be selectively plated through said apparatus, said workpiece being oriented in a generally horizontal plane as said workpiece is moved through said apparatus, said guiding means being adapted to guide said workpiece such that said selected zone is proximate said avenue of escape, said strip comprising cathode means; and

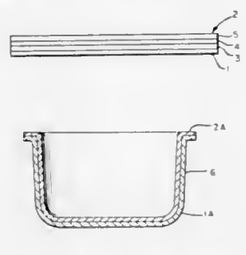
maintaining a desired flow rate of plating solution through said avenue of escape, whereby said solution wets the selected zone of said workpiece and deposits a layer of plating in the selected zone on the surface of said workpiece as it passes through said apparatus.

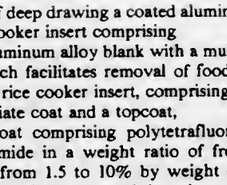
4,818,350

METHOD OF MAKING A RICE COOKER

Kenneth Batzar, 1712 Lark La., Cherry Hill, N.J. 08003

Division of Ser. No. 751,571, Jul. 3, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 902,024
Int. Cl.[4] C23C *28/00*
U.S. Cl. 204—29 **3 Claims**





1. A process of deep drawing a coated aluminum alloy blank to make a rice cooker insert comprising

coating the aluminum alloy blank with a multi-layer release coating which facilitates removal of food residues from the finished rice cooker insert, comprising a primer coat, an intermediate coat and a topcoat,

said primer coat comprising polytetrafluoroethylene and polyamide-imide in a weight ratio of from 4:1 to 10:1 along with from 1.5 to 10% by weight colloidal silica, based on the solids content of the primer,

said intermediate coat comprising polytetrafluoroethylene, pigment and coalescing agent which can be decomposed by heat at temperatures used to cure the coating system, and

said topcoat comprising polytetrafluoroethylene, coalescing agent which can be decomposed by heat at temperatures used to cure the coating system, catalyst to enhance such decomposition, and mica flake or pigment-coated mica flake,

and drawing the coated blank at a draw ratio between 1.4:1 and 2.5:1 to produce an insert with the coating on the inside of the insert.

4,818,351

METHOD FOR THE SURFACE TREATMENT OF AN IRON OR IRON ALLOY ARTICLE

Tohru Arai; Hironori Fujita; Yoshihiko Sugimoto; Yukio Ohta; Shigeo Moriyama, and Akira Sato, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Jul. 24, 1987, Ser. No. 80,828
Claims priority, application Japan, Jul. 30, 1986, 61-179239; Nov. 12, 1986, 61-269220
Int. Cl.[4] C23C *8/32*
U.S. Cl. 204—39 **20 Claims**

1. A method for forming a surface layer composed of a carbonitride of vanadium, a carbonitride of chromium, or a carbonitride of vanadium and chromium on the surface of an iron or iron alloy article, comprising

preparing (a) a material containing vanadium, chromium or a combination of vanadium and chromium and (b) a treating agent comprising an alkali-metal cyanide, an alkali-metal cyanate, an alkaline-earth-metal cyanide, an alka-



(× 1000)

line-earth-metal cyanate, or a combination of any of the foregoing, and

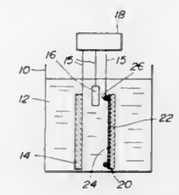
heating said article in the presence of said material and said treating agent at a temperature of not more than 650° C., thereby diffusing nitrogen, carbon, and vanadium or chromium or vanadium and chromium into the surface of said article.

4,818,352

ELECTRODEPOSITION OF FUNCTIONAL FILM ON ELECTRODE PLATE RELATIVELY HIGH IN SURFACE RESISTIVITY

Hiroshi Inaba, Matsusaka; Kiyoshi Nakase, Mie, and Yukitoshi Yanagida, Matsusaka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 4, 1987, Ser. No. 45,479
Int. Cl.[4] C25B *3/00*
U.S. Cl. 204—59 R **14 Claims**



1. A method of electrolytically depositing a film of an electrochemically synthesizable substance on an electrode plate, which comprises a substrate and a conductive coating film not lower than $3\Omega/cm^2$ in surface resistivity, by immersing said electrode plate and another electrode in an electrolytic liquid and causing a DC current of a predetermined density to flow between said electrode plate and said another electrode,

characterized in that said electrode plate is provided with an elongate auxiliary electrode element which is attached to the outer surface of said conductive coating film and extends at least along the whole periphery of said conductive coating film and that said auxiliary electrode element is used as the electric terminal of said electrode plate in producing said current.

4,818,353

METHOD FOR MODIFYING ELECTROCATALYST MATERIAL, ELECTROCHEMICAL CELLS AND ELECTRODES CONTAINING THIS MODIFIED MATERIAL, AND SYNTHESIS METHODS UTILIZING THE CELLS

Stanley H. Langer; Michael J. Foral, and John C. Card, all of University of Wisconsin, 1415 Johnson Dr., Madison, Wis. 53706

Filed Jul. 7, 1987, Ser. No. 70,426
Int. Cl.[4] C25B *3/00*
U.S. Cl. 204—74 **33 Claims**

1. A method for modifying the electrochemical characteristics of a transition metal-containing electrocatalyst, generally at its surface, which method comprises the steps of:

(a) contacting an exposed surface of an electrocatalyst material containing a transition metal of Group VIII or Group I-B of the Periodic Table with an oxidized sulfur-containing species which is chemisorbable on or by said transition metal and which has the structural formula:

$$S_xO_y^{-z}$$

where x and y are numbers from 1 to 6 and z is a number from 0 to 2, provided that y is $<4x$ when $z=2$ and $<3x$ when z is 0, so that the average oxidation state of the sulfur atoms in said oxidized sulfur-containing is greater than +1 but less than +6, until said oxidized sulfur-containing species has become bound to said transition metal, at least at the exposed surface of said electrocatalyst material;

(b) decreasing, under non-electrochemical oxidizing conditions, the amount of oxidized sulfur-containing species bound to said transition metal at said exposed surface to about 10 to 95 atomic % of the said transition metal at said exposed surface;

(c) electrochemically or chemically reducing said oxidized sulfur-containing species bound to said transition metal at said exposed surface.

4,818,354

PROCESS FOR THE PREPARATION ELECTROLYTIC MANGANESE DIOXIDE

Eberhard Preisler, Erftstadt; Johannes Holzem; Gerhard Mietens, both of Hürth, and Gerhard Nolte, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,882
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703616
Int. Cl.[4] C25B *1/00*
U.S. Cl. 204—96 **8 Claims**

1. In the process for the preparation of electrolytic manganese dioxide (EMD) by electrolyzing an electrolyte consisting of a sulfuric acid solution of manganese sulfate by means of titanium anodes

the steps comprising the manganese sulfate and sulfuric acid concentrations in the said solution are kept constant by continuously removing a part by volume of the used electrolyte

replacing the removed electrolyte by supplying an equivalent volume of fresh manganese sulfate solution,

producing flocculent nuclei of a manganese oxide hydrate in said manganese sulfate solution and

supplying these nuclei together with the manganese sulfate solution to the electrolyte in the cell.

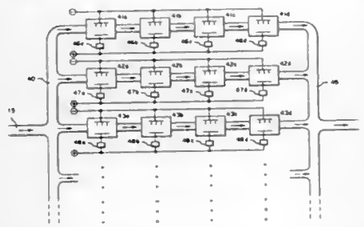
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METHOD AND APPARATUS FOR REMOVING POLYCYCLIC AROMATIC HYDROCARBONS FROM THE EXHAUST OF A MUNICIPAL WASTE INCINERATOR

Ira E. Kanter, Monroeville, and Pang K. Lee, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1987, Ser. No. 43,576
Int. Cl.[4] C07C *3/24*
U.S. Cl. 204—170 **2 Claims**



1. A method of decomposing an aromatic hydrocarbon by breaking a benzene ring therein, comprising the steps of:
(a) distributing input gases, containing an aromatic hydrocarbon and other substances, into plural parallel flow paths;
(b) directing the input gases in each of the flow paths between a first pair of electrodes in a corresponding first stage of each of the flow paths;
(c) establishing a first electrical potential across the first pair of electrodes in each of the first stages to produce a glow discharge increasing the energy level in a portion of the input gases sufficiently to cause scission of the benzene ring into components of the aromatic hydrocarbon and reaction of the components of the aromatic hydrocarbon with at least one of the other substances to produce nonaromatic hydrocarbons;
(d) supplying first output gases from the first stage in each flow path to a second stage containing a second pair of electrodes between which the first output gases pass; and
(e) establishing a second electrical potential across the second pair of electrodes in the second stage to produce a glow discharge increasing the energy level in a portion of the first output gases sufficiently to cause scission of the benzene ring in a portion of the input gases unaffected by the first stages into the components of the aromatic hydrocarbon and reaction of the components of the aromatic hydrocarbon with at least one of the other substances to produce more of the nonaromatic hydrocarbons.

4,818,356

PROCESS FOR MULTICOAT CATHODIC WET-ON-WET PAINTING OF METALLIC CONDUCTIVE SUBSTRATES

Michael Geist; Günther Ott, both of Münster; Georg Schön, Everswinkel; Arnold Dobbelstein, and Wolfgang Batzill, both of Münster, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben Aktiengesellschaft, Münster, Fed. Rep. of Germany

PCT No. PCT/EP85/00694, § 371 Date Sep. 25, 1986, § 102(e) Date Sep. 25, 1986, PCT Pub. No. WO86/03791, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 11, 1985, Ser. No. 905,333
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447257
Int. Cl.[4] C25D *13/06*
U.S. Cl. 204—181.1 **14 Claims**

1. A process for coating an electrical conductive substrate, which comprises:
immersing the substrate in a first acidic aqueous bath comprising a first cationic synthetic resin binder having amino groups or a mixture of amino groups and hydroxyl groups, a first cross-liner mixture of a pair of crosslinking agents, and additive agents selected from the group consisting of a pigment, a filler, a corrosion inhibitor, a surface coating additive, a catalyst and an organic solvent in an amount of up to 15% by weight, based upon the total weight of said first bath ingredients excluding water and acid,
making the substrate the cathode for electrodeposition,
depositing a first coat on the substrate by means of direct current to produce a sigle coated substrate,
removing the single coated substrate form the bath and rinsing it,
immersing the single coated substrate in a second acidic aqueous bath comprising a second cationic synthetic resin binder having amino groups or a mixture of amino groups and hydroxyl groups, a second cross-linker mixture of a pair of crosslinking agents, and additive agents selected from the group consisting of a pigment, a filler, a corrosion inhibitor, a surface coating additive, a catalyst and an organic solvent in an amount of up to 15% by weight based upon the total weight of said second bath ingredients excluding water and acid,
making the single coated substrate the cathode for electrodeposition,
depositing a second coat on the single coated substrate by means of direct current to produce a double coated substrate,
removing the double coated substrate from the bath and rinsing it, and
curing the double coated substrate;
said pairs of crosslinking agents of the first and second crosslinker mixtures each being (a) a pair of carboxylic esters having the differing activated alcohol residual moieties wherein the alkyl group thereof has a substituent selected from the group consisting of beta ester, beta-alkyl ether, beta, gammadihydroxy, and beta hydroxy, (b) a pair of polyisocyanates blocked with different blocking agents, or (c) a combination of said carboxylic ester and said blocked polyisocyanate, each pair of cross-linking agents having different reactivities such that their crosslinking reactions are initiated at temperature which are at least 10° C. apart and the crosslinking agent which reacts first is present in an amount of from 15 to 60 mol %, based upon the mixture of the crosslinking agents.

4,818,357

METHOD AND APPARATUS FOR SPUTTER DEPOSITION OF A SEMICONDUCTOR HOMOJUNCTION AND SEMICONDUCTOR HOMOJUNCTION PRODUCTS CREATED BY SAME

Christopher Case; Joseph J. Loferski, both of Providence, R.I., and Francisco Sanchez-Quesada, Madrid, Spain, assignors to Brown University Research Foundation, Providence, R.I.

Filed May 6, 1987, Ser. No. 47,414
Int. Cl.[4] C23C *14/54, 14/56*
U.S. Cl. 204—192.25 **48 Claims**

1. A method of vacuum chamber sputter deposition of a semiconductor homojunction comprising:
providing a target made of a semiconductor compound containing at least one non-metallic element;
providing a substrate for receiving the sputtered species from said target to form sequential layers of deposited semiconductor material;
providing an electric field between said target and said substrate; and
introducing an inert gas sequentially at a plurality of discrete partial pressures to adjust the incident energy of said sputtered species by thermalization, for altering the mean free path of said sputtered and incident species to control the ratio of non-metallic to metallic elements in said deposited semiconductor material and create a plurality of different semiconductor material layers.

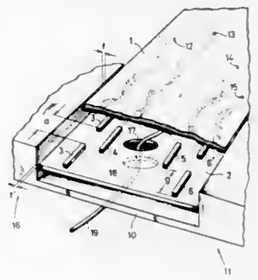


4,818,358

MAGNETRON CATHODE SPUTTER COATING APPARATUS

Peter Hubert, Alzenau; Barbara Kussel, Rodgau, and Peter Wirz, Walderabach, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,629
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1987, 3721373
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—298 **16 Claims**



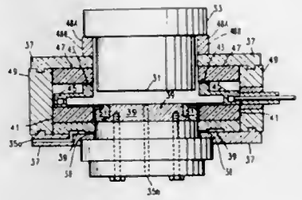
1. Coating apparatus with a high sputtering rate, with a magnet system in which magnetic lines of force emerging from the cathode surface and returning thereto form a discharge area in conjunction with an electrical field, characterized in that on the side of a first plate facing away from a substrate, and parallel thereto, a second plate is disposed, on which two or more parallel rows of a plurality of magnets of the same polarity are affixed, the magnets of a first row being disposed offset from the magnets of an adjacent row, and the magnets of each row being about a same distance apart.

4,818,359

LOW CONTAMINATION RF SPUTTER DEPOSITION APPARATUS

Fletcher Jones, Ossining, and Joseph S. Logan, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 900,959, Aug. 27, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 127,540
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—298 **9 Claims**



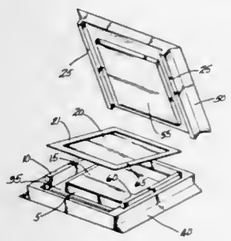
1. In a non-reactive RF sputter etching and/or deposition apparatus wherein a vacuum chamber encloses cathode and anode electrodes having respective areas, said cathode electrode being adapted for having a source target located thereon and said anode electrode being adapted for having workpiece substrates mounted thereon such that said cathode electrode and anode electrode are located in a face to face relationship and having a means for supplying and varying RF voltage applied to said cathode and anode electrodes and wherein said chamber includes means for introducing an ionizable gas into said chamber such that the high frequency and relatively high voltages applied to said electrodes form a plasma there between, the improvement comprising:
an additional electrode encircling said cathode and anode electrodes and the space therebetween wherein said additional electrode is within and separate from said chamber and has an area approximately equal to or slightly larger than the sum of said cathode electrode and anode electrode areas.

4,818,360

METHOD AND APPARATUS FOR BLOTTING FROM ELECTROPHORESIS GELS

Stanley M. Hurd, Hamden, and Richard E. Kouri, New Haven, both of Conn., assignors to Bios Corporation, New Haven, Conn.

Filed Aug. 28, 1987, Ser. No. 90,740
Int. Cl.[4] G01N *27/26, 27/28*
U.S. Cl. 204—299 R **4 Claims**



1. A blotting apparatus for transferring electrophoresed materials from a gel slab to a membrane comprising:
a raised platform defining a bottom plate providing a flat surface for molding a gel slab,

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a base plane surrounding at least a portion of said platform;
a gel slab disposed on said bottom plate containing a pattern of electrophoresed material,
a top unit having a top plate;
a membrane sandwiched between and in areal contact with the gel and with the top plate whereby the electrophoresed material migrates passively to said membrane free of any external inducement.

4,818,361

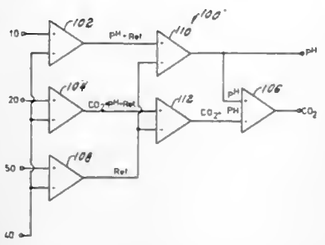
COMBINED PH AND DISSOLVED CARBON DIOXIDE GAS SENSOR

Bruce Burgess, Ann Arbor, Mich., and Glenn Martin, Newark, Del., assignors to Diamond Sensor Systems, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 940,527, Dec. 10, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 126,438

Int. Cl.⁴ G01N *27/30*

U.S. Cl. 204—406 **16 Claims**



1. An apparatus for measuring pH and the concentration of dissolved CO_2 in a fluid comprising:
a measurement chamber for containing a sample of fluid to be measured;
a pH sensor including
a first wire having first and second ends, said first end exposed for electrical contact thereto,
a first electrochemically active layer disposed covering said second end of said first wire for forming an electrochemical coupling to said first wire,
a first dried electrolyte layer disposed covering said first electrochemically active layer, said first dried electrolyte layer when hydrated forming an aqueous solution buffered against changes in pH due to changes in dissolved CO_2 concentration, and
a first membrane having an outer surface exposed to the fluid in the said measurement chamber and an inner surface covering said first electrolyte layer, said first membrane being sensitive to the difference in pH between the inner and outer surfaces thereof to form an electrical potential thereacross and being water permeable;
a CO_2 sensor including
a second wire having first and second ends, said first end exposed for electrical contact thereto,
a second electrochemically active layer disposed covering said second end of said second wire for forming an electrochemical coupling to said second wire,
a second dried electrolyte layer disposed covering said second electrochemically active layer, said second dried electrolyte layer when hydrated forming an aqueous solution including bicarbonate ions, and
a second membrane having an outer surface exposed to the fluid in said measurement chamber and an inner surface covering said second electrolyte layer, said second membrane being sensitive to the difference in pH between the inner and outer surfaces thereof to form an electrical potential thereacross and being water and dissolved CO_2 permeable;
a ground electrode disposed in electrical contact with the fluid in said measurement chamber;
a reference electrode disposed in electrical contact with the fluid in said measurement chamber for providing a stable reference potential independent of ionic activity of the fluid in said reference chamber; and
an electrical circuit connected to said first ends of said first and second wires including
a first differential signal means connected to said first wire and said ground electrode for generating a first difference signal proportional to the electrical potential difference between said first wire and said ground electrode,
a second differential signal means connected to said second wire and said ground electrode for generating a second difference signal proportional to the electrical potential difference between said second wire and said ground electrode,
a third differential signal means connected to said reference electrode and said ground electrode for generating a third difference signal proportional to the electrical potential difference between said reference electrode and said ground electrode,
a fourth differential signal means connected to said first differential signal means and said third differential signal means for generating a fourth difference signal proportional to the electrical potential difference between said first difference signal and said third difference signal, said fourth difference signal being said pH signal,
a fifth differential signal means connected to said second and third differential signal means for generating a fifth difference signal proportional to the electrical potential difference between said second difference signal and said third difference signal, and
a sixth differential signal means connected to said fourth differential signal means and said fifth differential signal means for generating a sixth difference signal proportional to the electrical potential difference between said fourth difference signal and said fifth difference signal, said sixth difference signal being said CO_2 signal.

4,818,362

OXYGEN CONCENTRATION SENSING APPARATUS

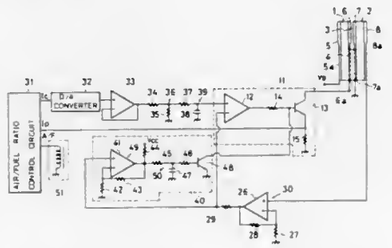
Masahiko Asakura; Tomohiko Kawanabe; Minoru Muroya; Shin'ichi Kubota; Katsuhiko Kimura; Yasunari Seki, and Kouji Matsuura, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1987, Ser. No. 27,893

Claims priority, application Japan, Mar. 19, 1986, 61-63201; Mar. 19, 1986, 61-63199

Int. Cl.⁴ G01N *27/58*

U.S. Cl. 204—406 **7 Claims**



1. An oxygen concentration sensing apparatus comprising:
oxygen sensing means including,
first and second oxygen ion-conductive solid electrolytic members disposed in a gas under measurement, each of said first and second solid electrolytic members having a pair of electrodes formed thereon, said first and second solid electrolytic members being disposed apart so as to form a restricted region therebetween, said first solid electrolytic member functioning as an oxygen pump element and said second solid electrolyte member functioning as a sensor cell element for measuring an oxygen concentration ratio;
current supply means for supplying a current between said electrodes of said oxygen pump element at a level such that a constant voltage is maintained between said electrodes of said sensor cell element; and
limiter means for limiting said level of said current supplied by said current supply means,
said current supply means developing an oxygen concentration sensing voltage output proportional to said level of said current supplied to said oxygen pump element;
said limiter means including delay means for controlling said limiter means to reduce said level of current supplied to flow between said electrodes of said oxygen pump element after a predetermined time interval has elapsed after the voltage developed between said electrodes of said sensor cell element increases above a predetermined voltage.

4,818,363

COMBUSTION EXHAUST GAS SENSOR STRUCTURE, PARTICULARLY FOR AUTOMOTIVE ENGINE EXHAUST GASES

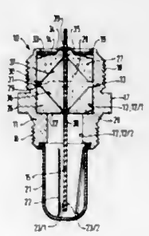
Kurt Bayha, Oberriexingen, and Helmut Weyl, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,116

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206903

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—426 **17 Claims**



1. Gas sensor structure to sense the composition of combustion exhaust gases, particularly exhaust gases from an internal combustion engine, having
a metallic housing (11) having a sensing end portion and a terminal end portion, said housing being formed with an elongated opening therethrough;
an elongated plate-like sensing element having a sensing end region and a terminal end region, and including a carrier element in the form of an elongated plate (15);
electrode connection means (24) located on the surface of the sensing element and extending towards the sensing end region;
retaining means (26, 27) securing the sensing element in the metallic housing at an intermediate region of the sensing element, including two electrically insulating retaining elements (26,27) shaped to define a chamber therebetween, in which the intermediate region of the sensing element is received in a manner subdividing said chamber into a pair of opposite subchambers communicating with each other around the lateral edges of said elongated plate;
abutment means (20) for supporting one of said retaining elements in the housing;
wherein the electrically insulating retaining elements (26,27) are positioned in the metallic housing in longitudinally aligned, stacked position, and separated from each other by a gap (31), both retaining elements, inwardly of the metallic housing, being formed with a through-bore in form of a terminal slit (38,39) through which said plate-like sensing element passes, and with a chamber-forming recess (36,37), the recesses in said retaining elements jointly defining said chamber, said recess of each said retaining element expanding from said terminal slit to an enlarged recess region adjacent the gap (31) by way of diverging retaining element surfaces (29,30) which are oblique with respect to the plane of the plate (15);
and wherein sealing material (28) is located in said chamber as well as in said gap (31), extending, in said gap, radially outwardly to engage the inner walls of the metallic housing, the surfaces (29,30) of said retaining elements bounding said recesses (36,37) thereof defining said chamber, and surface portions of said plate (15) located within said chamber, thereby completely filling the chamber and the gap, and comprises
an electrically insulating powder or pulverized material which is resiliently compressible at all temperatures to which the sensor is exposed, during quiescent as well as operating conditions;
and wherein resilient compression means (14, 14') are provided, located in the housing and exerting a compression force against said retaining elements (26,27) tending to resiliently compress the electrically insulating powder or pulverized material in the chamber and in said gap between the retaining elements and exerting compressive force against the surface portions of said plate located within said chamber,
said sensing element (15) passing through and being retained in position by said powder or pulverized material exerting compressive force against said surface portions of said plate thereof.

4,818,364

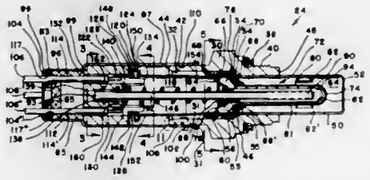
TERMINAL MEMBER FOR 02 SENSOR

David C. Weber, Toledo, and Debojit Barua, Findlay, both of Ohio, assignors to Allied-Signal Inc., Morristown, Pa.

Filed Apr. 13, 1987, Ser. No. 37,361

Int. Cl.⁴ G01N *27/26*

U.S. Cl. 204—427 **6 Claims**



1. In an oxygen sensor having an electrochemical tubular member retained in a housing and a heater member for maintaining the temperature of the sensor above a preset minimum temperature, said sensor having an external conductive coating separated from an internal conductive coating, said external and internal conductive coatings being connected to a control member, said control member responding to changes in the electrical potential between said external and internal conductive surfaces to provide an indication of the oxygen concentration in a fluid, the improvement in the terminal member through which the electrochemical tubular sensor and heater member are connected to the control member comprising:
a cylindrical member having a first diameter section sepa-

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rated from a second diameter section by a first shoulder, a stepped axial bore that extends from said second diameter section into said first diameter section, said cylindrical member having a second shoulder located in said stepped axial bore, said cylindrical member having first and second radial slots that extend through said first diameter section from first and second axial grooves, said cylindrical member having first and second passages which define a first flow path for presentation of a reference gas to the electrocylindrical tubular member;

a first contact ring located on said first shoulder and connected to said external conductive coating by a first resilient member and to said control member by a first lead that is located in said first passage;

a second contact ring located on said second shoulder and connected to said internal conductive coating by a second resilient member and to said control member by a second lead located in said second passage;

a first terminal member located in said first slot and connected to said heater and to said control member; and

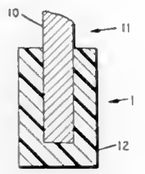
a second terminal member located in said second slot and connected to said heater and to said control member, said first and second terminal members completing an electrical circuit through which voltage is supplied to said heater member.

4,818,365

SOLID STATE INDICATOR ELECTRODE AND METHOD OF MAKING SAME

Patrick J. Kinlen, High Ridge, and John E. Helder, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 14, 1986, Ser. No. 918,201
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—433 **18 Claims**



1. A junction-type metal/metal oxide solid state indicator electrode having improved rejection of interferences caused by anion migration comprising a sensing portion, wherein the sensing portion has a cured perfluorocarbon copolymer coating.

5. A method for making a junction-type metal/metal oxide solid state indicator electrode comprising the steps:

(a) contacting the electrode with a perfluorocarbon copolymer to form a copolymer-coated electrode,

(b) drying the coated electrode,

(c) repeating (a) and (b) from 2 to 5 times, to form a sufficiently coated electrode,

(d) curing the copolymer coating,

(e) cooling the electrode, and

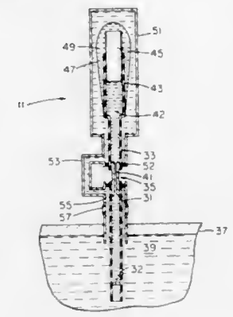
(f) hydrating the copolymer coating.

4,818,366

LONG LIFE REFERENCE ELECTRODE

Robert M. Yonco, LaGrange, and Zoltan Nagy, Woodridge, both of Ill., assignors tn The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 30, 1987, Ser. No. 79,615
Int. Cl.[4] G01N *27/28, 27/30, 27/40*
U.S. Cl. 204—408 **6 Claims**



1. An electrode assembly for providing a reference potential in respect to a high pressure, high temperature system comprising:

an elongated, generally vertical tube for containing liquid electrolyte, said tube having an upper portion and a mid-portion disposed outside of said system and a lower portion sealingly penetrating into electrolytic communication with said high pressure, high temperature system;

flow restriction means in the lower portion of said tube for restricting the release of electrolyte into said high pressure, high temperature system;

pressure imparting means for applying a constant incremental pressure above the system pressure to urge a constant flow of liquid electrolyte through the flow restriction means into said system, said pressure imparting means being a piston of sufficient weight slidably fitted into the upper portion of said vertical tube to provide by gravity said constant incremental pressure as said electrolyte flows into said system regardless of the system pressure;

pressure equalization means between said piston and said high pressure, high temperature system for balancing said piston to said system pressure, said pressure equalization means being coupled to said piston through a flexible pouch containing a water immiscible, electrically insulating liquid encompassing the upper portion of said vertical tube; and

an electrode disposed in contact with said electrolyte in the mid-portion of said tube outside said high pressure, high temperature system for providing a reference electrical potential in respect to said system.

4,818,367

ASPHALT, COPOLYMER AND ELASTOMER COMPOSITION

David S. Winkler, Wooster, Ohio, assignor to J. H. Diamond Company, Lake Worth, Fla.

Filed Apr. 14, 1986, Ser. No. 851,835
Int. Cl.[4] C08L *95/00;* **C10C** *1/00*
U.S. Cl. 208—23 **50 Claims**

1. An asphalt composition comprising a reaction product from reaction of a copolymer and an unsaturated elastomer in the presence of an asphalt;

said coplomyer having substantial anhydride functionality and comprising a reaction product from reaction of an anhydride and an olefin; and

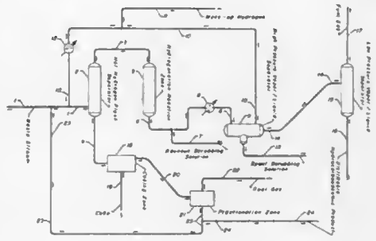
said unsaturated elastomer having at least two terminal allylic groups.

4,818,368

PROCESS FOR TREATING A TEMPERATURE-SENSITIVE HYDROCARBANACEOUS STREAM CONTAINING A NON-DISTILLABLE COMPONENT TO PRODUCE A HYDROGENATED DISTILLABLE HYDROCARBONACEOUS PRODUCT

Tom N. Kalnes, La Grange; Robert B. James, Jr., Northbrook, and Darrell W. Staggs, Crystal Lake, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 28, 1987, Ser. No. 113,587
Int. Cl.[4] C10G *69/06*
U.S. Cl. 208—50 **15 Claims**



1. A process for treating a hydrocarbonaceous stream containing a non-distillable component to produce a hydrogenated distillable hydrocarbonaceous product while minimizing thermal degradation of said hydrocarbonaceous stream which process comprises the steps of:

(a) contacting said hydrocarbonaceous stream with a first hydrogen-rich gaseous stream having a temperature greater than said hydrocarbonaceous stream in a flash zone at flash conditions thereby increasing the temperature of said hydrocarbonaceous stream and vaporizing at least a portion thereof to provide a hydrocarbonaceous vapor stream comprising hydrogen and a heavy stream comprising said non-distillable component;

(b) contacting said hydrocarbonaceous vapor stream comprising hydrogen with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation conditions to simultaneously increase the hydrogen content of the hydrocarbonaceous compounds contained in said hydrocarbonaceous vapor stream and to generate at least one water-soluble inorganic compound produced from the reaction of said hydrocarbonaceous compounds and said hydrogen;

(c) contacting the resulting effluent from said hydrogenation zone containing hydrogenated hydrocarbonaceous compounds and at least one water-soluble inorganic compound with an aqueous scrubbing solution;

(d) introducing a resulting admixture of said effluent from said hydrogenation zone and said aqueous scrubbing solution into a separation zone to provide a second hydrogen-rich gaseous stream, a liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds and a spent aqueous scrubbing solution containing at least a portion of said water-soluble inorganic compound;

(e) separating said liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds to provide a hydrocarbonaceous vapor stream comprising normally gaseous hydrocarbons and a normally liquid hydrogenated distillable hydrocarbonaceous product; and

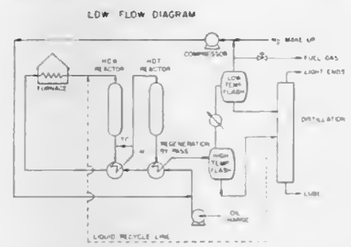
(f) reacting at least a portion of said heavy stream comprising said non-distillable component recovered from step (a) in a thermal coking zone at thermal coking conditions to provide a thermal coking zone effluent.

4,818,369

LIQUID EFFLUENT RECYCLE TO REACTOR IN DEWAXING PROCESSES

Robert W. Bortz, Woodbury Heights, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 5,358, Jan. 12, 1987, abandoned, which is a continuation of Ser. No. 767,572, Aug. 20, 1985, abandoned. This application Jan. 6, 1988, Ser. No. 140,873
Int. Cl.[4] C10G *45/58*
U.S. Cl. 208—100 **8 Claims**



1. In a process for catalytically treating a hydrocarbonaceous petroleum feedstock, said feedstock is contacted under lube dewaxing conditions in a two-phase trickle-bed reactor with a dewaxing catalyst comprising an aluminosilicate zeolite having a constraint index having the approximate range of from about 1 to about 12 and a silica to alumina ratio of at least 12 to 1 to produce a dewaxed liquid effluent product, the improvement wherein about 405 to about 90 wt. % of said liquid effluent product containing dewaxed oil without being separated into fractions and without further treatment is continuously recycled independent of fresh feed rate directly back to the dewaxing reactor thereby improving catalyst bed liquid distribution improving catalyst performance and aging rate and reducing feedstock maldistribution.

4,818,370

PROCESS FOR CONVERTING HEAVY CRUDES, TARS, AND BITUMENS TO LIGHTER PRODUCTS IN THE PRESENCE OF BRINE AT SUPERCRITICAL CONDITIONS

A. A. Gregoli; Uriel M. Oko, and Frederic Leder, all of Tulsa, Okla., assignors to Cities Service Oil and Gas Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 888,412, Jul. 23, 1986, abandoned. This application Sep. 14, 1987, Ser. No. 96,000
Int. Cl.[4] C10G *9/34*
U.S. Cl. 208—106 **9 Claims**

1. A continuous process for converting a hydrocarbon fuel crude oil with an API gravity into a hydrocarbon crude oil product having a higher API gravity compared to that of the feed crude oil comprising

(a) introducing into a reactor a mixture containing a first hydrocarbon crude with a first API gravity and from about 2 wt. % brine to less than about 50 wt. % brine; and

(b) reacting the first hydrocarbon crude with the brine in the reactor at at least the supercritical temperature and pressure for the brine in order to convert the first hydrocarbon crude into a second hydrocarbon crude having a second API gravity that is higher than the first API gravity of the first hydrocarbon crude.

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4,818,371

VISCOSITY REDUCTION BY DIRECT OXIDATIVE HEATING

Richard L. Bain, Golden, and John R. Larson, Boulder, both of Colo., assignors to Resource Technology Associates, Boulder, Colo.

Filed Jun. 5, 1987, Ser. No. 58,878
Int. Cl.[4] C10G *9/00*; C07C *37/00*
U.S. Cl. 208—106 **31 Claims**

1. A process for reducing the viscosity of hydrocarbons, said process comprising:

(a) introducing a hydrocarbon feed stream into a vessel, said stream comprising a core portion and a boundary layer;

(b) increasing the bulk temperature of said stream from a first bulk temperature to a second bulk temperature;

(c) introducing an amount of an oxidizing agent into said core portion of said stream to oxidize components in said stream and provide heat to said core portion of said stream to produce a bulk reaction temperature greater than said second bulk temperature;

(d) controlling the amount of said oxidizing agent to maintain said reaction bulk temperature below the coking temperature of said feed; and

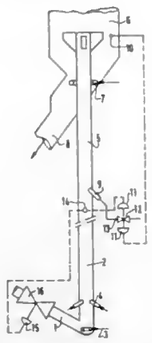
(e) maintaining said reaction bulk temperature to produce a reaction product having a lower viscosity than said feed.

4,818,372

PROCESS AND APPARATUS FOR THE CATALYTIC CRACKING OF HYDROCARBON FEEDSTOCKS WITH REACTION-TEMPERATURE CONTROL

Jean-Louis Mauleon, Marly-le-Roi; Francois Ville, Paris, and Jean-Bernard Sigand, Vaucresson, all of France, assignors to Compagnie de Raffinage et de Distribution Total France, Paris Cedex, France

Continuation of Ser. No. 884,015, Jul. 10, 1986, abandoned. This application Oct. 20, 1987, Ser. No. 111,115
Claims priority, application France, Jul. 10, 1985, 85 10569
Int. Cl.[4] C10G *37/02*
U.S. Cl. 208—113 **16 Claims**



1. A process for the catalytic cracking of heavy hydrocarbon feedstock of which more than 10 weight percent has a boiling point above 500° C., comprising the steps of:

contacting in an inlet zone the feedstock and hot active particles of a cracking catalyst in a dilute fluidized bed under thermal conditions sufficiently high to vaporize virtually instantaneously substantially all the feedstock and to enhance initial thermal cracking of the heaviest compounds contained in the feedstock;

maintaining a temperature moderated reaction zone by injecting an auxiliary fluid into the dilute fluidized bed downstream of the inlet zone wherein the feedstock and catalyst are mixed, but upstream of an outlet zone wherein the cracked feedstock and spent catalyst are separated, under conditions such that the injection of the auxiliary fluid produces a rapid reduction in the temperature of the mixed vaporized feedstock and active catalyst particles by from 10 C. to 70° C. in a time of less than one second after injection of the feedstock, thereby causing the subsequent downstream catalytic cracking reactions to proceed in the temperature moderated reaction zone under conditions more favorable for catalytic cracking which conditions are relatively milder and independent of the temperature resulting from the mixing of vaporized feedstock and active catalyst; said auxiliary fluid being a gas or being completely vaporizable under the conditions in said temperature moderated reaction zone while at least a substantial portion of said heavy hydrocarbon feedstock is substantially unvaporizable under the conditions in said temperature moderated reaction zone;

separating spent catalyst from the cracked feedstock in said outlet zone downstream of the temperature moderated zone;

stripping the spent catalyst;

regenerating the spent catalyst by combusting coke deposited thereon during the cracking step to produce a hot, active regenerated catalyst; and

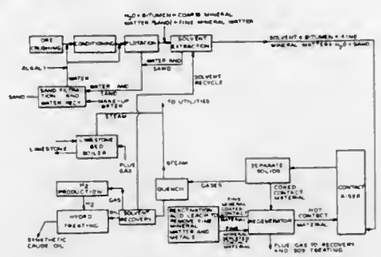
recycling the hot regenerated catalyst to said inlet zone for said contacting with the feedstock under conditions such that the temperature resulting from the mixing of the feedstock and catalyst is at least above 500° C. and is also at least from 40° to 100° C. higher than the final reaction temperature at said outlet zone.

4,818,373

PROCESS FOR UPGRADING TAR SAND BITUMEN

David B. Bartholic, Watchung, and William J. Reagan, Englishtown, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Continuation-in-part of Ser. No. 662,666, Oct. 19, 1984, abandoned, Ser. No. 682,962, Dec. 18, 1984, abandoned, and Ser. No. 719,939, Apr. 4, 1985, abandoned. This application Nov. 6, 1985, Ser. No. 795,581
Int. Cl.[4] C10G *17/00*
U.S. Cl. 208—252 **25 Claims**



1. A process for upgrading a charge of a tar sand bitumen concentrate containing mineral matter including fine particles which comprises contacting said charge in a riser in the presence of a low boiling organic solvent diluent with finely divided attrition-resistant particles of a hot fluidizable substantially catalytically inert solid which is substantially chemically inert to a solution of mineral acid, the contact of said charge with said particles being at high temperature and short contact time to vaporize the high hydrogen containing components of said bitumen, said period of time being less than that which induces substantial thermal cracking of said charge, at the end of said time separating said vaporizing product from said fluidizable particles, said fluidizable particles now bearing a deposit of both combustible solid, adherent particles of fine particles of mineral matter and metals, and passing said particles of inert solid with deposit of combustibles and fine particles of mineral matter to a regenerator to oxidize the combustible portion of said deposits, removing at least a portion of deposit of mineral matter and metals by removing said inert solid from said regenerator and contacting removed inert solid with a hot mineral acid, and recirculating fluidizable solid depleted at least in part of deposited mineral matter to contact with incoming charge of tar sand bitumen concentrate and diluent.

4,818,374

PROCESS FOR CONVERTING COAL TO AN OIL FRACTION

Nobuyoshi Hirokoh, Tokyo; Yoichi Kageyama, Isehara; Yukio Nakako, Takarazuka, and Tetsuo Matsumura, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo; Kabushiki Kaisha Kobe Seiko Sho, Kobe; Idemitsu Kosan Company Limited, Tokyo; Asia Oil Company Limited, Tokyo and Nippon Brown Coal Liquefaction Co., Ltd., Tokyo, all of, Japan

Continuation of Ser. No. 610,651, May 16, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 795,729
Claims priority, application Japan, May 16, 1983, 58-85566
Int. Cl.[4] C10G *1/06*
U.S. Cl. 208—413 **12 Claims**

1. A process for converting coal to an oil fraction, which comprises:

(a) catalytically hydrogenating a mixture of coal, a solvent and a hydrogenated heavy oil having a boiling point of at least 420° C. in a first hydrogenation zone, said hydrogenated heavy oil comprising the heavy oil component present in and subsequently separated from the hydrogenation reaction product obtained from the first hydrogenation zone and the heavy oil component separated from the hydrogenated reaction product of the second hydrogenation zone below;

(b) separating an oil fraction whose hydrocarbon molecules have a carbon atom content of at least five and which boils over a range up to a temperature not greater than 420° C. and a fraction mainly composed of heavy oil components which boil at a temperature of at least 420° C. from the reaction product of step (a);

(c) deashing said fraction mainly composed of heavy oil components and simultaneously or independently removing preasphaltenes from said fraction;

(d) separating at least a portion of the deashed oil fraction from the reaction product of step (c), said oil fraction containing from 5 to 20% by weight of preasphaltene components;

(e) catalytically hydrogenating the portion of oil separated in step (d) in the presence of a nickel-molybdenum catalyst for from 0.1 to 5 hours in a second hydrogenation zone maintained at a temperature of from 330° to 450° C. under a hydrogen partial pressure of from 50 to 300 kg/cm^2;

(f) separating an oil fraction having a boiling point not greater than 420° C. and a heavy oil component having a boiling point of at least 420° C. from the reaction product of step (e); and

(g) recycling said separated heavy oil component to the first hydrogenation zone in an amount of at least 30% by weight relative to the heavy oil components in said deashed liquified oil of step (d).

4,818,375

HYDRAULICALLY OPERATED DIFFERENT DENSITY PARTICLE SORTING APPARATUS

Thor Dorph, 119 S. Boulevard, San Mateo, Calif. 94402

Division of Ser. No. 547,237, Oct. 31, 1983, Pat. No. 4,614,579. This application Aug. 14, 1986, Ser. No. 896,594
Int. Cl.[4] B03B *5/40, 5/66*
U.S. Cl. 209—18 **6 Claims**

1. An apparatus for hydraulically sorting different density particles which comprises:

an elongate, inclined conduit, having upper and lower open-end termini, inclined upward in a direction along its longitudinal axis;

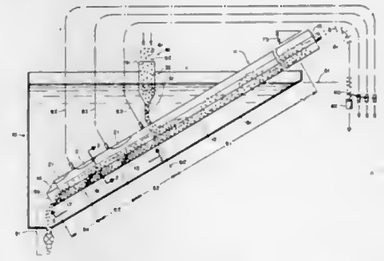
a main lower fluid inlet which comprises said lower open-end terminus of said elongate, inclined conduit;

a main upper fluid outlet connected to said upper open-end terminus of the elongate, inclined conduit;

a mixed particle feed inlet, connected to said elongate, inclined conduit at an intermediate longitudinal location between said main lower fluid inlet and main upper fluid outlet; and

a side-gutter low point line, extending longitudinally along the bottom of said elongate, inclined conduit, and that is formed by a first flat sloped upstanding conduit side-wall that forms vertexes, along with a second flat conduit bottom side wall which is tilted downwards at an angle in a second direction that is transversely disposed relative to the inclined, longitudinal direction of said elongate, inclined conduit;

means for producing an upward fluid flow through said elongate, inclined conduit which flow is characterized by inherently establishing higher fluid flow velocity forces in the midstream of the conduit and lower fluid flow velocity forces at, and adjacent to, the elongate, inclined conduit boundary wall surfaces,



whereby in operation the elongate, inclined conduit and upward fluid flow producing means cooperate to create two superincumbent strata of precipitated mineral particles which tend to move in opposite longitudinal directions, relative to each other, upon and along the entire bottom surface length of the elongate, inclined conduit and wherein the mineral particles are sorted and displaced from each other according to different particle density by the spontaneous interaction of particles colliding while tending to move in opposite longitudinal directions by which the heavy mineral particles sink into lowermost locations in the downward moving, underlying lower particle stratum where, subjected to lower fluid flow processing forces against which the heavy mineral particles discharge from the lower terminus of the inclined conduit as concentrates, while the light mineral particles are displaced into uppermost and more outspread and overlying upper particle stratum locations to be moved by the higher midstream fluid flow processing forces in upward longitudinal direction to discharge the light mineral particles from the upper terminus of the inclined conduit as tailings.

4,818,376

LEAKAGE PREVENTION APPARATUS FOR A CLASSIFIER

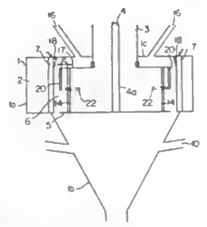
Hiroaki Tanaka, Narashino; Mitsuhiro Ito, Funabashi; Takeshi Furukawa, and Satoru Fujii, both of Onoda, all of Japan, assignors to Onoda Cement Company, Ltd., Onoda, Japan

Filed Apr. 24, 1987, Ser. No. 42,438
Claims priority, application Japan, Apr. 28, 1986, 61-63269[U]; Apr. 28, 1986, 61-63270[U]
Int. Cl.[4] B07B *4/02, 7/00, 11/06*
U.S. Cl. 209—135 **7 Claims**

1. In a classifier comprising a hopper-typed casing having a substantially cylindrical upper portion and a substantially

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cone-shaped lower portion, a vertical rotary shaft depending from the center of the casing, a rotary disc disposed in the vicinity of the lower end of the cylindrical portion of the casing and mounted on the end of the vertical rotary shaft, a horizontal dispersing disc provided directly below the top of the casing, a plurality of vertical guide vanes provided spaced from the outside of the horizontal dispersing disc and inwardly spaced from one or a plurality of air inlets extended tangentially to the cylindrical portion of the casing to form a classifying chamber with the rotary disc and the horizontal dispersing disc, a circular collision plate spaced from the outside of the horizontal dispersing disc in the upper portion of the classifying chamber, a plurality of vortex adjusting members provided on the same circumference in the classifying chamber and secured at their one ends to the rotary disc and at their other ends to the horizontal dispersing disc, and a fine powder discharge pipe provided on the upper portion of the casing to communicate into the inner side of the vortex adjusting members in the classifying chamber; the classifier having a leakage prevention apparatus characterized by a plurality of dispersing and classifying vanes spaced from the outside of the vortex adjusting members and inwardly spaced from the collision plate and having their upper ends secured on the under surface of the horizontal dispersing disc.



4,818,377

DEFROTHING METHOD AND APPARATUS

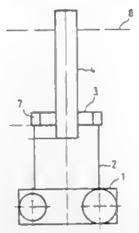
Peter Schweiss, Langenau, and Hans-Dieter Dorflinger, Heidenheim, both of Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 110,931

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1986, 3635713

Int. Cl.[4] B03D *1/10*; B10D *19/02*

U.S. Cl. 209—164 **15 Claims**



14. Method for defrothing and degassing the liquid foam flowing from the foam duct of a primary flotation cell to a subsequent secondary flotation cell, comprising the steps of

(1) using recycled liquid from the secondary cell to create a potential vortex rotary flow in an apparatus which is rotationally symmetric in its effective area, by tangential introduction of said recycled liquid into the base of said apparatus and exit of said recycled liquid from said apparatus; and

(2) introducing the liquid foam to be defrothed and degassed into contact with the rotary flow in the upper area of said apparatus;

whereby the liquid portion of the foam is incorporated into the recycled liquid and the gas portion of the foam is removed at the air-to-liquid interface of the potential vortex rotary flow.

4,818,378

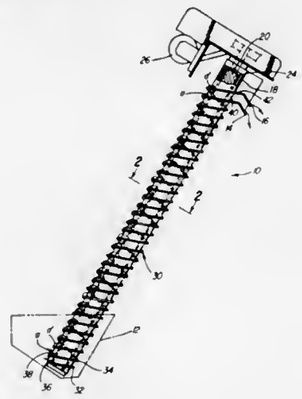
MAGNETIC CONVEYOR WITH MULTIPLE SPIRAL RAMPS

Eldon G. Elliott, 7397 Kingsbridge, Canton, Mich. 48187

Filed Mar. 17, 1987, Ser. No. 26,636

Int. Cl.[4] B03C *1/02*; B65G *17/46*

U.S. Cl. 209—225 **11 Claims**



1. An apparatus (10) for handling parts (a,a') by magnetic attraction comprising: a cylindrical casing (18) of nonmagnetic material having an uninterrupted surface throughout its length; magnetizing means (20) for magnetically attracting parts (a,a') to said casing (18); nonmagnetic ramp means spirally wound around said casing (18); and drive means (26) for rotating said magnetic means (20) relative to said ramp means to cause the parts (a,a') to rotate about the axis of said casing (18) while said ramp means (30) causes said parts (a,a') to advance along the length of said casing (18), characterized by said ramp means (30) including multiple part segregating means for separately receiving parts from a source and segregating the parts (a,a') received and discharged along the length of said casing (20), said multiple part segregating means including a plurality of ramps (32,34) of nonmagnetic material wound spirally around the length of said casing (18), each of said ramps (32,34) having an in-feed end (36,38) and a discharge end (40,42), said in-feed ends (36,38) being contained within a single in-feed part source (12) and said discharge ends (40,42) being operatively connected to discharge receiving means for receiving the segregated discharged parts.

4,818,379

SCREENING APPARATUS WITH INTEGRATED DISTRIBUTING AND SEGREGATING DEVICE

Karl H. Eggerstedt, Wedel, Fed. Rep. of Germany, assignor to Fredrik Mogensen AB, Hjo, Sweden

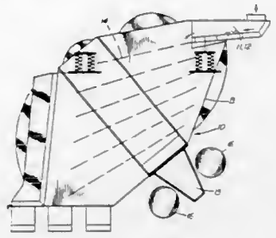
PCT No. PCT/SE86/00251, § 371 Date Feb. 5, 1987, § 102(e) Date Feb. 5, 1987, PCT Pub. No. WO86/07290, PCT Pub. Date Dec. 18, 1986

PCT Filed May 30, 1986, Ser. No. 26,547

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1985, 3520614

Int. Cl.[4] B07B *1/40*

U.S. Cl. 209—254 **11 Claims**



1. A distributing and segregating device for a multideck screening machine which includes a frame housing a plurality of successive, superimposed screening decks, an inlet end through which material to be screened can be fed onto a upstream end of an upper deck, an outlet end having a plurality of outlets associated with overflows or underflows of one or more successive ones of said screening decks, and at least one vibrator for vibrating the frame, including said inlet end, for advancing material received through said inlet end, across and through the screening decks and to said outlets

said device comprising a module adapted to be removably exchangeably supported on the frame of said multideck screening machine for vibration therewith at said inlet end as a means for feeding material to be screened into the multideck screening machine through said inlet end, and including:

wall means defining an enclosed box having an upwardly opening inlet and, transversally displaced from vertical registry with said inlet, a forwardly and downwardly opening outlet;

said wall means including a floor for said box, said floor having a sloping, gabled, medially ridged upstream portion disposed in vertical registry under said inlet and sloping down towards a juncture with a sloping downstream portion which is flatter by being less gabled and less medially ridged than said upstream portion; said downstream portion leading to said outlet at a downstream edge of said floor.

4,818,380

METHOD AND APPARATUS FOR SORTING ARTICLES

Osamu Azegami, Fuchu, and Toshifumi Miyake, Ohtsu, both of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 11,042, Feb. 5, 1987, abandoned, which is a continuation of Ser. No. 779,619, Sep. 25, 1985, Pat. No. 4,693,378, which is a continuation of Ser. No. 474,334, Mar. 11, 1983, abandoned. This application Apr. 19, 1988, Ser. No. 185,359

Claims priority, application Japan, Mar. 13, 1982, 57-39981; Mar. 13, 1982, 57-39982; Mar. 13, 1982, 57-40069; Mar. 13, 1982, 57-40071

Int. Cl.[4] B07C *5/34*

U.S. Cl. 209—565 **1 Claim**

1. Apparatus for automatically sorting articles by their sizes using a conveyor mechanism having a plurality of buckets for supporting and transporting the articles, the buckets being openable to discharge the articles at a plurality of discharge positions selected according to the sizes of the articles, said apparatus comprising:

an image pickup unit, positioned adjacent the conveyor mechanism, for producing images of the articles as conveyed by said conveyor mechanism;

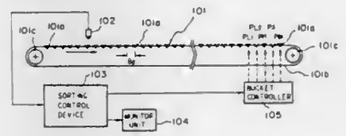
a sorting control device, coupled to said image pickup unit, for producing selection signals based on the images produced by said image pickup unit; and

a bucket controller coupled to said sorting control device, said bucket controller responsive to the selection signals for indicating discharge positions where the articles are to be discharged from the buckets, said sorting control device including:

an image memory;

an image processor, coupled to said image memory and said image pickup unit, for processing the images for the respective buckets and for storing the processed images in said image memory;

a synchronous signal generator, coupled to the conveyor mechanism for generating a measurement synchronous



pulse and a sorting synchronous pulse each time the buckets are moved one pitch;

an area computing unit, coupled to said image memory and said synchronous signal generator, for reading the images, one at a time, from said image memory in response to the measurement synchronous pulse and for computing the areas of the articles in the read images;

a grade setting unit for setting a range having a size selection reference for the articles;

a grade discriminating unit, coupled to said grade setting unit and said area computing unit, for generating the selection signals which correspond to the discharge positions at which the articles are to be discharged from the buckets, according to the size selection reference set by said grade setting unit; and

a shift register, coupled to said grade discriminating unit, said synchronous signal generator, and said bucket controller, for storing the selection signals and for applying the selection signals to said bucket controller according to the sorting synchronous pulse produced by said synchronous signal generator.

4,818,381

APPARATUS FOR SUPPLYING ELECTRONIC PARTS HAVING POLARITY

Satoru Tanaka; Seizou Takada, and Tamiaki Matsuura, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 24, 1987, Ser. No. 66,067

Claims priority, application Japan, Jun. 25, 1986, 61-149193

Int. Cl.[4] B07C *5/344*; B65G *47/24*; G01R *31/26*

U.S. Cl. 209—573 **2 Claims**

1. An apparatus for supplying electronic parts having two ends and a terminal at each of said ends and having a polarity, comprising:

a first passage through which electronic parts are supplied;

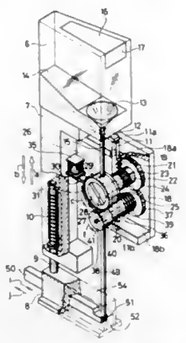
a first rotating member having a radially extending parts receiving hole for receiving said electronic parts one by one supplied from said first passage;

a plurality of electrodes which are arranged in the vicinity of the ends of said parts-receiving hole that moves as said

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first rotating member is rotated, and which respectively come in contact with both end terminals of said electronic part in said parts receiving hole so as to detect the polarity of the electronic part;

a second rotating member having a through hole in which said electronic part fed from said parts receiving hole is inserted when said first rotating member is rotated to a predetermined position, and which rotates in timed relation to rotation of said first rotating member;



means for selectively preventing said electronic part from passing through said through hole responsive to signals generated in a detector including said electrodes; and

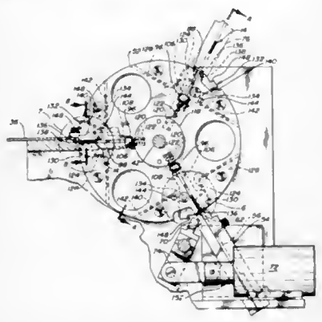
a second passage for receiving said electronic part directly, when said electronic part passes through said through hole, and for receiving said electronic part after said second rotating member is rotated to a predetermined position when said electronic part is selectively prevented from passing through said through hole.

4,818,382

DISC SINGULATOR

Richard A. Anderson, Maple Grove, and Gerald R. Bowe, Blaine, both of Minn., assignors to Micro Component Technology, Inc., Shoreview, Minn.

Filed Jul. 1, 1985, Ser. No. 750,260
Int. Cl.[4] B07C *5/344*; G01R *31/26*
U.S. Cl. 209—573 **4 Claims**



1. Apparatus for singulating integrated circuit devices, each having a generally rectangular platen-like main body portion and a plurality of contacts carried by the main body portion along opposite edges thereof, for introduction at a test site including a plurality of resilient probes for engaging the contacts as the devices pass through the test site, comprising:

(a) a disc having a pair of closely spaced parallel walls defining a gap therebetween, and a slot, extending radially inwardly from a periphery of said disc, formed therein, said disc having a thickness and said slot being sized to receive an integrated circuit device in said slot with the contacts carried by the main body portion along opposite edges thereof extending beyond said spaced parallel walls of said disc;

(b) means for mounting said disc for rotation so that, as it rotates, an integrated circuit device received in said slot is passed through the test site and each contact of the device engages and wipes past a corresponding one of the resilient probes;

(c) a first wire spring held within said gap for urging the integrated circuit device received in said slot into frictional engagement with an edge of said slot;

(d) a plunger disposed for reciprocation along an axis generally parallel to an axis of elongation of said slot to urge an integrated circuit device received within said slot radially outwardly to overcome pressure exerted thereon by said first wire spring;

(e) means biasing said plunger radially outwardly with respect to said disc;

(f) a finger carried by said plunger for reciprocation therewith and received within said slot for movement therealong to a radially outermost position flush with said periphery of said disc;

(g) a latch, to oppose the radially outward urging by said plunger, carrying a shoulder, and being mounted for pivoting between a first position wherein said shoulder obstructs entry to, and egress from, said slot, and a second position wherein said shoulder is retracted to afford free entry to, and egress from, said slot; and

(h) means urging said latch toward said first position thereof;

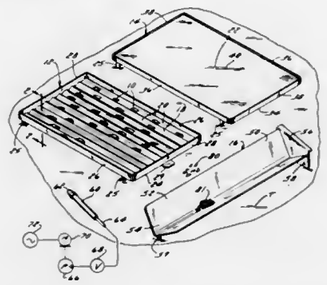
(i) wherein said finger, when in its radially outermost position, precludes movement of said latch from its second position to its first position.

4,818,383

APPARATUS AND METHOD FOR INSPECTING AND GRADING SAMPLES OF GRAIN

Robert O. Wang, 2744 S. 61st St., Milwaukee, Wis. 53219

Filed Nov. 2, 1987, Ser. No. 115,826
Int. Cl.[4] B07C *7/04*
U.S. Cl. 209—702 **7 Claims**



1. Apparatus for inspecting and grading samples of grain, each sample comprising a plurality of kernels of grain and each kernel having a plurality of sides which are visually inspected during grading, said apparatus comprising:

first and second trays having first and second tray surfaces, respectively,

each tray having side edges and being rotatably movable when in use between one position and another position wherein the tray surface of one of said first and second trays faces upwardly and the tray surface of the other of said first and second trays faces downwardly;

each tray surface when facing upwardly providing the sole support for kernels disposed thereon;

at least one of said tray surfaces being formed of resiliently compressible material;

and means on said first tray surface and rigidly secured to said first tray having side walls defining a plurality of depressions in which kernels are received when said first tray surface faces upwardly and which effect a predetermined arrangement of kernels on said first tray surface;

said side walls being of lesser height than that of the kernels in said depression so that all but one side of the kernels are exposed for visual inspection;

said second tray being detachably mountable on said first tray with both tray surfaces confronting and spaced sufficiently close to each other to effect compression of said material so that kernels in said depressions are entrapped and immobilized between said tray surfaces, thereby enabling both trays to be rotated simultaneously from one position wherein said first tray surface faces upwardly and said second tray surface faces downwardly to another position wherein said first tray surface faces downwardly and said second tray surface faces upwardly,

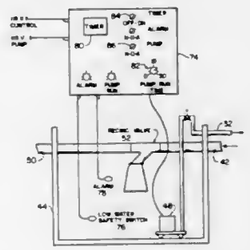
said first tray being detachable from said second tray when the latter is in its said other position to afford access for visual inspection of sides of said kernels, including said one side, which kernels are arranged on and supported by said second tray surface.

4,818,384

RECIRCULATING SAND FILTER

Robert B. Mayer, 9029 Longstreet Dr., Manassas, Va. 22110

Filed Aug. 14, 1987, Ser. No. 85,171
Int. Cl.[4] B01D *35/00*
U.S. Cl. 210—86 **3 Claims**



1. A recirculating sand filter system for the treatment of waste water comprising:

a septic tank, for receiving waste water;

a recirculating pump tank connected to said septic tank for receiving effluent from the septic tank, said recirculating pump tank having a pump connected to a pump outlet line;

at least one sand filter having a distribution pipe connected to said pump outlet line and positioned to spray water over a surface of said sand filter, said pump periodically pumping water from said recirculating pump tank to dose the sand filter, said sand filter further having at least one collection pipe at the bottom of the filter for collecting filtrate and returning the filtrate to the recirculating pump tank via a return line by gravity feed; and

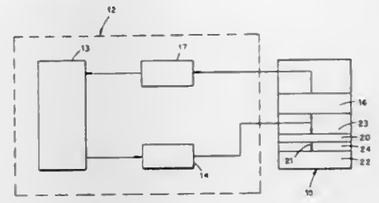
a recirculating valve in said recirculating pump tank connected between said return line and a discharge line exiting said recirculating pump tank, said recirculating valve comprising a T-pipe consisting of a horizontal straight section and a downwardly directed branching arm having a large radius curvature allowing for smooth, nonturbulent flow, and a float valve connected to said branching arm for blocking the flow of water into said recirculating pump tank when a level of water in the tank exceeds a predetermined maximum level.

4,818,385

FILTER WITH HIGH PRESSURE INDICATOR

Frank W. Medley, III, 45 E. 18th St., Cookeville, Tenn. 38501

Filed Aug. 31, 1987, Ser. No. 91,595
Int. Cl.[4] B01D *35/14*
U.S. Cl. 210—90 **15 Claims**



1. An externally mounted filter for use in filtering contaminated fluids from a fluid-containing system and being adapted to indicate the occurrence of a sustained fluid pressure in the filter in excess of a predetermined pressure level, said filter comprising:

a housing for containing fluid in the filter;

means for sealably connecting said housing to the fluid-containing system in flow communication therewith;

a filter element disposed within said housing for removing contaminants from the fluid;

indicator means disposed in said filter, said indicator means being exposed to fluid pressure in the filter and configured to assume a signaling configuration upon exposure to a fluid pressure in the filter in excess of the predetermined level, said indicator means being visible in said signaling configuration to a person viewing the filter from the outside of the housing; and

surge discrimination means configured to limit exposure of said indicator means to fluid pressure in the filter during the occurrence of fluid pressure surges in excess of the predetermined level so that said indicator means is exposed to the fluid pressure in the filter substantially only during periods of sustained fluid pressure and is substantially unaffected by the influence of high pressure during said pressure surges.

4,818,386

DEVICE FOR SEPARATING THE COMPONENTS OF A LIQUID SAMPLE HAVING HIGHER AND LOWER SPECIFIC GRAVITIES

James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Oct. 8, 1987, Ser. No. 106,092
Int. Cl.[4] B01D *21/26, 17/038*
U.S. Cl. 210—97 **11 Claims**

8. A dual barrier assembly for introduction into an evacuatable liquid collection tube, said assembly providing selectively, when inserted into an evacuatable liquid collection tube, a dual annular seal, and an open passage therearound in response to pressure differentials in a tube in which it is inserted, said assembly comprising

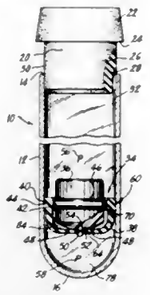
(a) a cup-shaped flexible portion;

(b) said cup-shaped flexible portion having a first annular ring adjacent the upper edge thereof;

(c) the outer circumferential edge of said first annular ring selectively movable into and out of sealing engagement with the internal wall of a tube chamber into which said assembly is inserted in response to alternating equal and different pressures above and below said dual assembly;

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(d) means defining at least one opening in the bottom wall of said cup-shaped flexible portion providing flow communication therethrough;
(e) a round solid core portion nested in said cup-shaped portion;
(f) a second annular ring extending from the outer surface of said solid core portion;

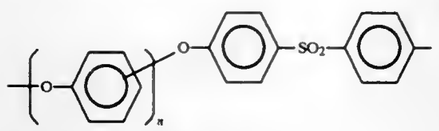


(g) said solid core portion movable vertically in said cup-shaped portion for causing said first and second ring to move into and out of sealing engagement with each other in response to alternating equal and different pressures above and below said dual assembly; and
(h) means connecting said solid core portion and said bottom wall of said flexible cup-shaped portion.

4,818,387
SULFONATED POLYSULFONE COMPOSITE SEMIPERMEABLE MEMBRANES AND PROCESS FOR PRODUCING THE SAME
Kenichi Ikeda; Shouichi Yamamoto, and Hiroki Ito, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 10, 1988, Ser. No. 157,123
Claims priority, application Japan, Jun. 15, 1984, 59-124048; Jun. 15, 1984, 59-124049; Feb. 28, 1985, 60-40829
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—490 **26 Claims**

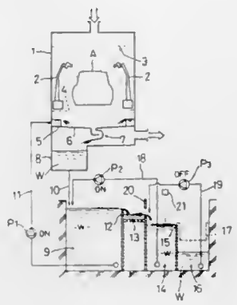
1. A sulfonated polysulfone composite semipermeable membrane from reverse osmosis or ultrafiltration having a pure water flux of higher than 3 m^3/m^2.day under a pressure of 3.5 kg/cm^2 and comprising polysulfone series ultrafiltration support membrane having laminated thereon in unity a 0.01 to 5 μm semipermeable membrane composed of a sulfonated polysulfone formed by sulfonating a polysulfone composed of a recurring unit shown by formula (A)

(A)



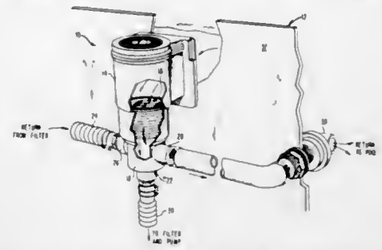
wherein n is an integer of 1 or more.

4,818,388
PAINT WASTE SEPARATING AND COLLECTING APPARATUS
Koji Morioka, and Makoto Watanabe, both of Tokyo, Japan, assignors to Taikisha Ltd., Tokyo, Japan
Filed Dec. 8, 1987, Ser. No. 130,111
Claims priority, application Japan, Dec. 9, 1986, 61-293675; Dec. 11, 1986, 61-191309[U]
Int. Cl.[4] C02F *1/40*
U.S. Cl. 210—167 **6 Claims**



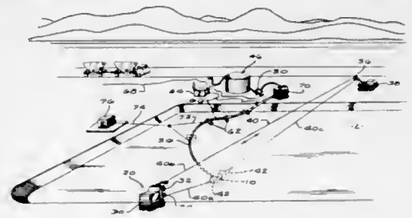
1. A paint waste separating and collecting apparatus comprising: a separator tank (9) for receiving cleaning water laden with paint waste discharged from a cleaning device and for causing the paint waste to separate and float from cleaning water held in said tank,
a circulating passage (11) for supplying cleaning water stripped of the paint waste from the separator tank (9) to the cleaning device,
a first weir (12) for allowing floating paint waste to flow together with overflow water from said separator tank (9),
an auxiliary separator tank (14) for receiving the overflow water from said first weir (12),
a second weir (15) for allowing the floating paint waste to flow together with overflow water from said auxiliary separator tank (14),
a collector vessel (17) for receiving the overflow water from said second weir (15) and having a plurality of dewatering pores for separating the paint waste from the overflow water,
a recovery tank (16) for accommodating said collector vessel (17),
a first return passage (18) for returning cleaning water stripped of the paint waste from said auxiliary separator tank (14) to one of said separator tank (9) and said cleaning device, and
a second return passage (19) for returning cleaning water stripped of the paint waste from said recovery tank (16) to one of said auxiliary separator tank (14) and said separator tank (9),
wherein said separator tank (9) has a storage capacity at least ten times larger than said auxiliary separator tank (14), the paint waste being caused to float and separate from the cleaning water reserved in said tank (9) before being flowed over said first weir (12) and said floated and separated paint waste being caused to flow over said first weir (12) by a surface flow (f) toward said first weir (12) generated over a wide region by natural downflow movement of the discharged cleaning water into said separator tank (9).

4,818,389
SKIMMER WITH FLOW ENHANCER
Samuel Tobias, Edison; Thomas Pinelli, Saddle Brook; Robert M. Messinger, Cranford, and Fred T. Hazlehurst, Roselle Park, all of N.J., assignors to Hayward Industries, Inc., Elizabeth, N.J.
Filed Dec. 31, 1987, Ser. No. 140,049
Int. Cl.[4] E04H *3/20*; **F04F** *5/48*
U.S. Cl. 210—169 **24 Claims**



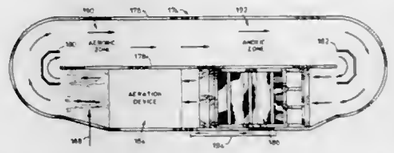
1. A skimmer for skimming water from a swimming pool or spa, comprising entraining means for entraining additional water from the pool or spa to thereby increase the flow of water into and out of the skimmer, said entraining means including a first nozzle member and a second nozzle member, said first and second nozzle members cooperating with each other to jet an entraining stream of water through the skimmer, and isolating means for isolating the entraining stream of water from the rest of the water flowing through the skimmer, said isolating means including actuating means for selectively actuating and deactuating said isolating means, whereby the skimmer can be operated at a first flow rate when said isolating means is actuated and at a second flow rate, which is greater than the first flow rate, when said isolating means is deactuated.

4,818,390
APPARATUS FOR DETOXIFICATION OF LAGOONS
Frank Manchak, Jr., 11300 Norwalk Blvd., Santa Fe Springs, Calif. 90670
Filed Jan. 11, 1988, Ser. No. 141,827
Int. Cl.[4] B01D *43/00, 19/04*; **G21F** *9/04*
U.S. Cl. 210—170 **32 Claims**



22. Apparatus for mixing a treatment agent with waste materials in a liquid waste containing lagoon, comprising:
(a) a bi-directionally operable process tool having means thereon form mixing a treatment agent with contents of said lagoon;
(b) means for moving said tool along a path of movement through said lagoon from one side to the other side thereof;
(c) support cable means extending above and across said lagoon along the path of movement of said process tool and laterally displaced therefrom;
(d) moveable hopper means for continuously conveying said treatment agent to said process tool during movement of said process tool from one side of said lagoon to the other side thereof, said hopper being supported from said support cable near said process tool;
(e) means for moving said hopper across said lagoon in timed relationship with said process tool as said process tool moves thereacross; and
(f) means on said tool for continuously mixing said treatment agent with lagoon contents during movement of said tool through said lagoon.

4,818,391
INTEGRAL CLARIFIER
Leonard S. Love, 578 Minette Circle, Mississauga, Ontario, Canada L5A 3B9
Filed Sep. 28, 1983, Ser. No. 536,816
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.[4] C02F *3/20*
U.S. Cl. 210—195.3 **15 Claims**



11. An aerobic biological reactor in the form of an oxidation ditch comprising:
a clarifier and a reaction basin in liquid communication with one another and together adapted to contain a body of liquid to be treated, the clarifier and reaction basin together defining a closed loop around which liquid can be continuously circulated with the liquid flowing through the clarifier during circulation;
inlet means for conducting influent liquid to said body;
outlet means through which treated liquid can be removed from the clarifier as the effluent from the reactor;
first and second means providing liquid communication between the clarifier and reaction basin, said first means being arranged to permit liquid and sludge to flow from the clarifier into the reaction basin and said second means being arranged to conduct liquid from the reaction basin to the clarifier and having an inlet adjacent the surface of the liquid and the reaction basin and an outlet defined by at least one pipe disposed so that liquid leaving the outlet directs settled solids into the clarifier in substantially non-turbulent flow relationship with respect to the liquid being circulated in said loop, whereby a substantially quiescent settling zone is defined in said clarifier for settling of biological solid particles; and,
aeration means in said reaction basin adapted to aerate said liquid and cause said continuous circulation of liquid around the loop defined by the clarifier and reaction basin;
wherein the clarifier is defined by a wall extending across said loop at the downstream end of the clarifier considered in the direction of circulation of liquid around the loop, and by a liquid collecting chamber extending across the loop at the upstream end of the clarifier and from which extends said at least one pipe, said first means providing liquid communication being defined by an opening below said wall at the downstream end of the clarifier, and said second means providing liquid communication being defined by said liquid collecting chamber and at least one pipe, said liquid collecting chamber being arranged so that a portion of the liquid being circulated enters the chamber while the remainder flows through the clarifier in a main fluid flow, and said at least one pipe being oriented so that liquid leaving said pipe issues in laminar and substantially turbulence-free relationship with respect to said main liquid flow.

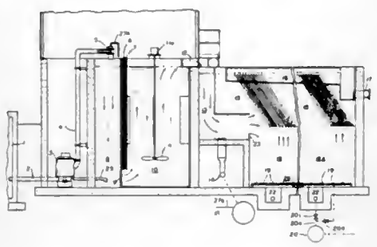
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4,818,392

LIQUID WASTE TREATMENT SYSTEM

Roy H. Werner, Pittsburgh, Pa.; Randy A. Galgon, Lockport, N.Y., and Clifford J. Decker, Bethel Park, Pa., assignors to Hazleton Environmental Products Inc., Hazelton, Pa.

Filed Nov. 30, 1987, Ser. No. 131,947
Int. Cl.[4] B01D *21/01, 21/08;* **C02F** *1/52*
U.S. Cl. 210—195.3 **2 Claims**



1. Apparatus for treating water in a structure having a plurality of adjoining compartments, said structure comprising: a first compartment, inlet means for introducing and mixing means for continuously mixing raw water, air, and chemical treating agents at the top of said first compartment so as to move the mixture downwardly through a reaction area in said first compartment, a second compartment, a partition between the first and second compartments having means defining a bottom opening through which mixture is led from the bottom of said first compartment to the bottom of the adjoining second compartment by means of gravity, a third compartment, an impeller fan in said second compartment for hydraulically aiding the lifting through gravity flow of material from the bottom to the top of said second compartment, thence to the top of said third compartment, a floc tunnel in said third compartment for classifying sludge particles, a sludge removing apparatus in said third compartment for progressively densifying the sludge, and discharge means for clarified water together with a vertical baffle in said third compartment at the end of a horizontal settling passageway prior to said sludge removing apparatus, whereby some large solids are accumulated to trap small size solids, and a recycle pump for removing said small size solids and seeding the incoming mixture at the top of the first compartment.

4,818,393

APPARATUS FOR THE ANAEROBIC TREATMENT OF WASTE WATER

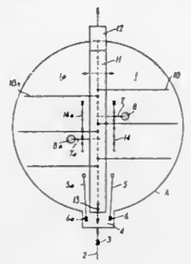
Jean Durot, Villepreux, and Roger Nicol, Issy les Moulineaux, both of France, assignors to Degremont, S.A., Rueil-Malmaison Cedex, France

Filed Nov. 5, 1986, Ser. No. 927,183
Claims priority, application France, Nov. 15, 1985, 85 16929
Int. Cl.[4] B01D *21/24*
U.S. Cl. 210—197 **8 Claims**

1. The apparatus for the anaerobic treatment of waste water comprising:

(a) a reactor vessel adapted to be closed to the atmosphere and pressurized, and reactor vessel being divided into at least two substantially identical chambers;

(b) a conduit system comprising a gas-lift transfer in each chamber having two branches communicating between each of said chambers within the reactor vessels thereby adapting each of said chambers to function alternatively and reciprocably as a fermentation chamber and a decantation chamber; and



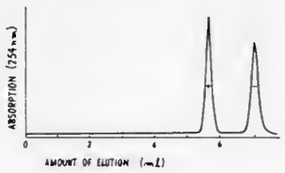
(c) a perforated manifold disposed within each of said chambers and opening into a central gutter for collecting treated water connected to a draining system.

4,818,394

SEPARATING AGENT

Yoshio Okamoto, Amagasaki; Koichi Hatada, Ikeda; Tohru Shibata, Himeji; Ichiro Okamoto, Himeji, and Hiroyuki Nakamura, Himeji, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Continuation of Ser. No. 684,565, Dec. 21, 1984, abandoned.
This application Jan. 11, 1988, Ser. No. 144,628
Claims priority, application Japan, Dec. 28, 1983, 58-245667
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 **20 Claims**



1. A separating agent which comprises a cellulose derivative selected from the group consisting of cellulose tribenzoate and cellulose tribenzoate ring-substituted with alkyl, alkenyl, alkynyl, nitro, halogen, amino, alkyl-substituted amino, cyano, hydroxyl, alkoxy, acyl, thiol, sulfonyl, carboxyl or alkoxy carbonyl, said cellulose derivative being supported on a porous carrier having a particle size of from 1 micron to 10 millimeters and a pore size of from 10 Angstrom units to 100 microns.

4,818,395

DEVICE FOR ELIMINATING SCALE AND FOR PREVENTING THE FORMATION OF SCALE

Elfriede Schulze, Schildstrasse 22, 8673 Rehau, and Eberhard Rudolph, Quadenberg 60, 8438 Berg/Opf., both of Fed. Rep. of Germany

Filed Aug. 3, 1987, Ser. No. 81,160
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 8620798[U]; Aug. 28, 1986, 3629288
Int. Cl.[4] C02F *1/48*
U.S. Cl. 210—222 **18 Claims**

1. A device for eliminating scale and for preventing the formation of scale in pipe systems through which a liquid flows in which device the liquid is exposed to a magnetic field generated by a magnet coil, comprising:

(a) a housing having an internal space which is formed in said housing, said internal space being circularly symmetrical to a housing axis,

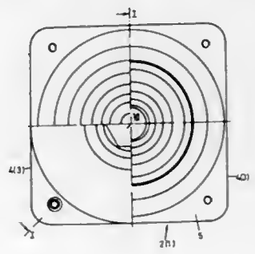
(b) a partition positioned in said internal spaced in said housing, said partition subdividing the internal space into two chambers and arranged perpendicularly to the housing axis, said partition being arranged a distance from a housing inside surface that defines said internal space,

(c) an inlet to one chamber, formed in the housing,

(d) an outlet from the other chamber, formed in the housing, with the inlet and the outlet being in each case opposite to a central area of the partition,

(e) said magnet coil concentrically enclosing the partition and being arranged in an annular recess of the housing,

(f) an annular wall section concentrically enclosing the partition and being provided between the magnet coil and the internal space of the housing and limiting the internal space at its radially outwards located circumferential area, with the partition and the housing at least in its area surrounding the internal space being made of cast iron which is annealed after coasting and before machining the inside



surface of the housing (1, 2; 101, 102) and the sides of the partition (14, 108),

(g) with the housing (1, 2; 101, 102) being provided on its inside surface with a coating of a corrosion-resistant material having a high magnetic conductivity, with the partition (14, 108) being also provided on its sides with a coating of said corrosion-resistant material,

(h) said annular wall section (26, 118) consisting of a non-magnetic material and having in the direction of the housing axis (S) a width which is larger than the smallest distance between the inside surface of the housing (1, 2; 101, 102) and an opposite surface of the partition (14, 108), and

(i) a circuit (123, 124) for driving the magnet coil (25, 116) by a DC-current periodically changing its polarity and flowing through the magnet coil (25, 116) in a first direction during a first time interval (T1) and in a second direction opposite to the first during a second time interval (t).

4,818,396

DEVICE FOR A FILTER

Joachim Wolf, Malmsheimer Str. 67, 7252 Weil der Stadt, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,726
Int. Cl.[4] B01D *46/00*
U.S. Cl. 210—232 **12 Claims**

1. Device for a filter, having:

a filter pot with an upper edge,

an adapter with an outer marginal zone, arranged to have filter cartridges hanging therefrom,

a media-tight foil bag surrounding said filter cartridges and abutting at least indirectly in said filter pot,

a head arranged above said adapter,

a sealing device arranged between said upper edge of said filter pot and said outer marginal zone of said adapter,

outflow volume means between said adapter and said head,

a lid arranged to fit upon said pot and said sealing device,

an elastic feed connector extending upwards from said head and communicating with the interior of said foil bag,

an elastic outflow connector extending upwards from said head and communicating with said outflow volume means, and

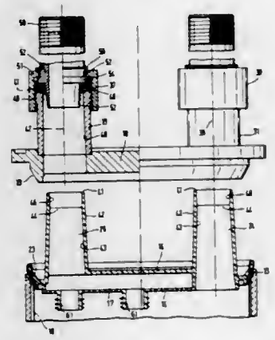
said lid having openings through which said feed and outflow connectors pass,

comprising the improvement wherein:

(a) first and second vertical cylindrical enclosing connector pipes, each with an inner surface which can be subjected to circumferential stresses, extend from said lid,

(b) said feed connector is arranged to fit in said first enclosing connector pipe and said outflow connector is arranged to fit in said second enclosing connector pipe,

(c) a hollow cone is arranged at the end of each of a plurality of conduits, which is subjectable to pressure stresses and has an external circumferential surface that is a steep



cylinder-cone frustum that fits in its narrower zone into said feed and outflow connectors, respectively,

(d) an axially acting clamping device is arranged between each of said hollow cones and respective ones of said enclosing connector pipes,

(e) said feed connector and said outflow connector each have an inner surface and an upper marginal zone that is adapted to be widened so far by said hollow cone that said upper marginal zone abuts in respective ones of said enclosing connector pipes, and

(f) clamping devices are arranged to apply a force that is at least great enough to tighten the area between said hollow cones and said inner surfaces at said upper marginal zones of said feed connector and said outflow connector to a working pressure of said filter.

4,818,397

SHUT-OFF VALVE SEAL

Theodore J. Joy, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 22, 1986, Ser. No. 944,959
Int. Cl.[4] B01D *27/10*
U.S. Cl. 210—232 **17 Claims**

1. A shut-off valve sealing system in a removable cartridge-type filter assembly comprising:

a body having an inlet to conduct fluid to be filtered therethrough to an inlet of a filter cartridge, an outlet to conduct filtered fluid therethrough from an outlet of the filter cartridge when supported on the body, and a central opening in communication with the inlet and the outlet;

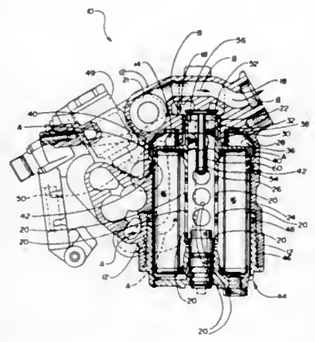
a seal member on the body about said central opening;

a valve member on the body and movable in an axial path against a radial inner side of the seal member to shut off the inlet when the filter cartridge is removed from the body; and

retainer means for retaining the seal member on the body, the retainer means projecting beyond the inner side of the seal member and into the path of movement of the valve

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member to provide a stop means for direct engagement with the valve member to stop movement of the valve



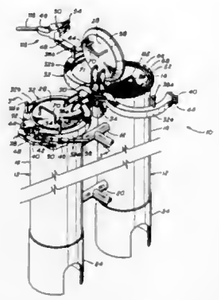
member whereby, in shut condition, the seal member engages a side of the valve member and the retainer means directly engages an axial end of the valve member.

4,818,398

FILTER SYSTEM WITH READILY REPLACEABLE FILTER ELEMENT

W. Gerald Lott, 707 Lehman, Houston, Tex. 77018, and Glen E. Grant, 2911 Beverly St., Pasadena, Tex. 77503

Filed Dec. 21, 1987, Ser. No. 135,389
Int. Cl.[4] B01D *35/14, 35/30*
U.S. Cl. 210—238 **15 Claims**



1. A filter system having a readily replaceable filter element, comprising:

(a) an inlet conduit and outlet conduit respectively adapted for connection to flow control valves;

(b) an elongated cylinder vessel body having a flow inlet connected to the inlet conduit, a flow outlet connected to the outlet conduit, a closed end, an open end, a fixed closure flange defined about the periphery of said open end, and a support flange defined about the inner wall of said body between said flow inlet and said flow outlet;

(c) said support flange having a flat surface facing said slow inlet;

(d) a moveable cover member having a movable closure flange adapted to fit said fixed closure flange;

(e) hinge means connecting the cover member to said vessel body for pivoting said cover member from a closed position are to an open position;

(f) said movable closure flange and said fixed closure flange respectively defining flat surfaces on one side and chamfered bevels on the other side to cooperatively form a V-shaped section in external profile when said flat surfaces are disposed in abutment;

(g) one of said flat surfaces forming a peripheral groove containing a first seal ring to effect a fluid tight seal when said flat surfaces are constrained together;

(h) a hinged constraining ring defining a V-shaped sectional internal profile about its inner periphery, said constraining ring being adapted to be cammed about said V-shaped external profile of said flanges and also adapted to be pivoted about its hinge from a closed to an open position;

(i) a toggle latching means connecting to latch said constraining ring into a forceful camming relationship about said flanges when toggled to a closed position and into a position releasing said flanges when toggles to an open position;

(j) an elongated liquid-solids filter element member disposed within said body, said filter element having an elongated hollow permeable member attached about the periphery of a support ring, said support ring having a flat surface abutting said flat surface of said support flange in sealing relationship;

(k) a peripheral groove formed in the flat surface of one of said support ring and said support flange and containing a second seal ring to effect further a fluid tight seal therebetween; and

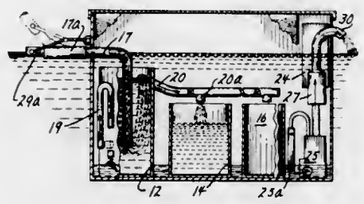
(l) a supporting arcuate resilient spring connected to opposite sides of said support ring and extending to be forcefully deformed against the inner side of said cover member when said cover member is in closed position to forcefully abutt said support ring against said support flange.

4,818,399

OIL SPILLAGE RECOVERY ARRANGEMENT

Harry E. Midkiff, R. 1, Owensville, Ind. 47565

Filed Aug. 31, 1987, Ser. No. 91,095
Int. Cl.[4] E02B *15/04*
U.S. Cl. 210—242.3 **2 Claims**



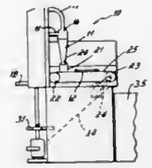
1. An oil spillage recovery arrangement comprising a floatable housing including an inlet conduit receiving a mixture of oil and water, cooperating floatable boom and gathering head means directing said mixture towards said inlet conduit, a first receptacle within said floatable housing into which said mixture is introduced, a siphon communicating with said mixture within said first receptacle selectively separating said mixture and passing water into said floatable housing, where entry into said siphon is below the outlet of said inlet conduit within said first receptacle and the outlet from said siphon is outside of said first receptacle, a second receptacle within said floatable housing, conduit means selectively passing separated oil from said first receptacle into said second receptacle, pump means including a conduit for discharging said water from said floatable housing, and steadying means controlling placement of said floatable housing at a use location.

4,818,400

CYCLONE AND FILTER BELT APPARATUS FOR DEWATERING

Robert G. Russell, Denton, and Roy D. Lister, Keller, both of Tex., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Dec. 14, 1987, Ser. No. 132,173
Int. Cl.[4] B01D *33/04, 36/00*
U.S. Cl. 210—262 **3 Claims**



1. Dewatering apparatus comprising:

an elongated, endless filter belt passing around two spaced horizontal pulleys,

said belt having an upper run,

means for driving one of said pulleys to advance said upper run,

a hydrocyclone having a tangential or volute inlet for introducing a slurry, an upper end for the discharge of water and a lower end for the discharge of a mixture of solids and water, and

a shroud surrounding the lower end of said hydrocyclone, said shroud converting any horizontal components of the discharge from the lower end to vertical components to forcibly drive water through said filter belt,

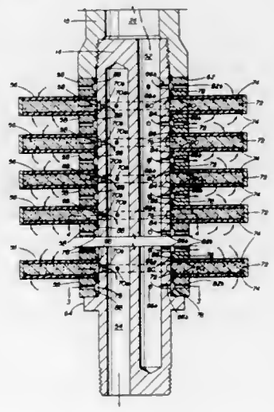
said hydrocyclone being disposed over the upstream end of said filter belt with only said shroud surrounding the lower end directing discharge onto said belt.

4,818,401

ROTARY FILTRATION DEVICE

William J. Lawrence, 5 Harbor La., Kemah, Tex. 77565

Filed Jul. 18, 1988, Ser. No. 220,154
Int. Cl.[4] B01D *33/22*
U.S. Cl. 210—330 **3 Claims**



1. In a filtration device including a rotating assembly for filtering fluid medium from matter in a fluid suspension which is external to the rotating assembly, the improvement in the rotating assembly which comprises:

a. a rotary shaft having a longitudinal axis and containing:

(1) an inflow bore having an axis substantially parallel to the longitudinal axis of said shaft, and

(2) an outflow bore spaced apart from and substantially parallel to said inflow bore,

b. at least one annular porous filtration member coaxially fixedly engaging said shaft and comprising a porous inner support layer and a porous outer filtration layer enveloping the inner support layer, the pores in the outer layer being smaller than the pores in the inner layer, the pores of said layers being in fluidic communication so that upon immersion in a said fluid suspension the fluid medium can pass from the outer layer to the inner layer,

c. fluid suspension distribution means circumferentially coaxially in fluid communication with such inflow bore for distributing fluid suspension from said inflow bore exteriorly of said shaft into a processing zone adjacent said annular porous filtration member,

d. filtrate distribution means circumferentially coaxially in fluid communication with said outflow bore and radially inwardly concentric to said filtration member for distributing filtrate from said filtration member into said outflow bore, and

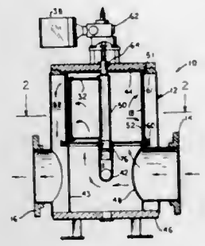
e. sealing means juxtaposed above and below said filtration member coaxially fixedly sealingly engaging said shaft and engaging said filtration member for sealing off fluid communication between said fluid suspension distribution means and said filtrate distribution means.

4,818,402

SELF CLEANING STRAINER

Carl A. Steiner, Erie, and Henry R. Jensen, Waterford, both of Pa., assignors to TM Industrial Supply, Inc., Erie, Pa.

Filed Aug. 17, 1987, Ser. No. 86,022
Int. Cl.[4] B01D *29/10*
U.S. Cl. 210—411 **11 Claims**



1. A backwash strainer comprising a cylindrical body,

a cylindrical strainer element in said body,

an annular space between said cylindrical body and said cylindrical strainer element,

an inlet in said body to said strainer element,

an outlet from said annular space,

said element comprising a plurality of substantially parallel, equally spaced bars,

said parallel bars defining a cylindrical surface with spaced slots between said parallel bars,

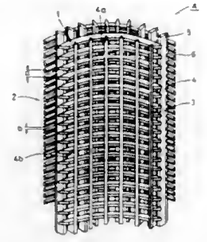
support means attached to said bars holding said bars in spaced relation to one another,

a hollow backwash arm having an axially extending slot defined by two spaced members having ends,

said backwash arm being movable about a central axis moving said ends of said backwash arm in close spaced proximity relation to said cylindrical surface providing a space for backwash water to flow between said ends of said backwash arm and said cylindrical surface for washing foreign material from said inside surface into said backwash arm to said discharge outlet.

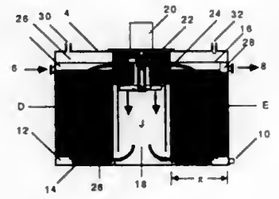
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4,818,403
DOUBLE CYLINDER SCREEN
Tadayoshi Nagaoka, Kawachi, Japan, assignor to Nagaoka Kanaami Kabushiki Kaisha, Osaka, Japan
Filed Dec. 24, 1986, Ser. No. 946,424
Int. Cl.[4] B01D 25/04
U.S. Cl. 210—488 9 Claims



1. A double cylinder screen assembly having no internal extraction pipe comprising an inner cylindrical major pressure resistant member and a cylindrical outer screen member, said inner pressure resistant member comprising:
radially spaced-apart inner rods extending in the axial direction of the double cylinder screen; and
spiral reinforcing means wound at a predetermined pitch on the outside surface of said inner rods, said spiral reinforcing means including axially spaced-apart turns defining a plurality of first openings, wherein portions of said spiral reinforcing means are affixed to portions of said inner rods,
radially spaced-apart screen rods extending in the axial direction of the double cylinder screen and in pressure contact with the outer surface of the spiral reinforcing means of said inner pressure resistant member; and
wire means spirally wound at a predetermined pitch on the outside surface of said screen rods and including axially spaced-apart turns defining a plurality of second openings, wherein portions of said wire means are affixed to portions of said screen rods,
wherein the width of said first openings are larger than the width of said second openings.

4,818,404
SUBMERGED BIOLOGICAL WASTEWATER TREATMENT SYSTEM
Curtis S. McDowell, Allentown, Pa., assignor to Tri-Bio, Inc., Allentown, Pa.
Filed Jul. 8, 1987, Ser. No. 70,899
Int. Cl.[4] C02F 3/06, 3/30
U.S. Cl. 210—603 9 Claims

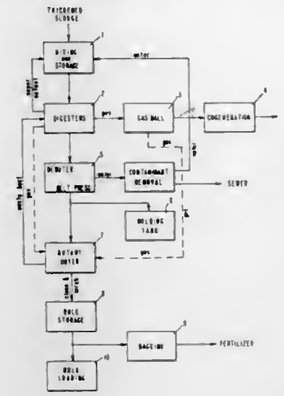


1. In an aerobic process for treating an aqueous liquor containing biodegradable waste wherein the aqueous liquor is introduced into the containment vessel having an inlet and outlet and in which said waste is biologically digested as the liquor passes through the vessel, said biological digestion being accomplished by contacting the liquor with aerobic bacteria and other microorganisms growing in slimes on sumberged surfaces of a packing material through which water and gases move freely; the improvement for enhancing biological degradation which comprises;
establishing one or more first annular vertically-extending chambers within the periphery of the containment vessel, these first chambers forming an annulus around a centrally-located vertically-extending chamber, said first chamber(s) being in fluid communication with each other at the top and bottom ends and said centrally located chamber being in fluid communication with all of the said first chamber(s) at the top and bottom ends;
establishing said packing material suitable for attachment of microorganisms within said first annular vertically-extending chamber(s);
establishing a toroidal-mixing pattern in said containment vessel by maintaining a downward fluid flow from the top to the bottom in said second centrally-located chamber, then horizontally across the bottom of said first annular vertically-extending chambers and then upwardly through said first annular vertically-extending chambers and the packing material therein;
introducing air to said centrally located chamber wherein a first means of oxygen dissolution is created by high liquid velocities and turbulence which entrains gas bubbles in the fluid and transfers oxygen into the fluid; and
establishing a fluid velocity in said centrally-located chamber of 1.5 to 4.0 feet per second downward and of sufficient horizontal liquid velocity at the floor of said vessel and at the periphery of said second central chamber for dispersing the gas bubbles and fluid under said packing material in said first annular vertically extending chamber.

9. In a process for continuously treating an aqueous liquor containing a variety of waste chemicals and requiring several biological degradation steps, wherein the liquid is introduced to a closed-sealed containment vessel having an inlet and outlet which establishes a constant liquid level in said vessel and which vessel constitutes the first stage of a series of reactor stages, and in which chemicals are partially biologically digested as the liquor passes through the said first stage, said biological digestion being accomplished by contacting the liquor with anaerobic bacteria and other microorganisms, growing in slimes on the submerged surfaces of porous structures through which water and gases move freely; the improvement for completing biological degradation more effectively is comprised of:
establishing said first stage with one or more vertically-extending chambers within the periphery of a reactor vessel, these first chambers forming an annulus around a second centrally-located vertically-extending chamber, said first chamber(s) all being in fluid communication with each other at the top and bottom ends and said second chamber being in fluid communication with all of the said first chamber(s) at the top and bottom ends;
establishing a uniform-porous matrix having a large surface area suitable for attachment of microorganisms within the confines of said first annular vertically-extending chamber(s) in said first stage;
establishing a toroidal-mixing pattern in said first stage by maintaining a downward fluid flow from the top to the bottom of said second centrally-located chamber by means of a pumping device placed in said second chamber, and returning said fluid flow to the top of said second chamber by forcing it to pass from the floor of the vessel upwardly through said first annular vertically-extending chambers and the porous matrix therein;
establishing a uniquely efficient means of transferring dissolved gases produced by anaerobic bacteria growing on said porous matrix, to the closed-sealed gas space above the fluid in said closed-sealed vessel by introducing gas from said closed-sealed gas space to the downflow in said second chamber wherein a first means of degassing the fluid is created by high liquid velocities and turbulence which entrains gas bubbles in the fluid and transfers dissolved gases in and out of the fluid while the rapid downward flow of fluid transports the gases and fluid to the bottom of the vessel and hence to the bottom of all of said first chamber(s) wherein the gas bubbles and fluid are forced to rise through all of the porous matrix to the top of said chamber(s) thus providing a second means of degassing the fluid, thus transferring dissolved gases to the gas bubbles which upon arriving at the surface of the liquid in said closed-sealed vessel combine with the gases present in said closed gas space;
establishing a means of extracting the excess gases produced by anaerobic processes in said first stage from said closed-sealed vessel while excluding oxygen from said closed-sealed gas space;
establishing critical fluid velocities in said centrally-located chamber, of 1.5 to 4.0 feet per second downward, horizontal liquid velocities of V (ft/sec.)$=x$(ft)$\div$(0.66 sec.$\pm$0.3) at the floor of said vessel and at the outer periphery of said second chamber for dispersing the gas bubbles and fluid uniformly under said uniform porous matrix, wherein x is the breadth of the said first annular vertically-extending chambers in feet, and maintenance of minimum velocities of said fluid moving upward through said uniform porous matrix within said first annular vertically-extending chamber(s) of from 0.22 to 0.32 per second;
establishing a second reactor vessel similar to said first stage above which receives the partially treated liquor from said first stage and constitutes a second-stage reactor vessel with the embodiments of the submerged fixed film system of the first stage, but which may operate in either an anaerobic mode as does said first stage or which may operate in an aerobic mode wherein oxygen rich gases are introduced to the gases recirculated in the toroidal mixing pattern; and
establishing a plurality of subsequent reactor stages all operating with the embodiments of the said first or second stages wherein each stage receives the partially treated liquor of the previous stage and has a defined biological treatment purpose to include organic chemical removal, removal of certain inorganic chemicals such as sulfates, nitrates and metals which form sulfide precipitates, satisfaction of biological oxygen demand and satisfaction of nitrogen oxygen demand.

4,818,405
SLUDGE TREATMENT
Kenneth B. Vroom, 26 Middleridge La. S., Rollings Hills, Calif. 90274, and Michael B. Rose, 764 W. 30th St., San Pedro, Calif. 90732
Filed Jan. 15, 1988, Ser. No. 144,818
Int. Cl.[4] C02F 11/04
U.S. Cl. 210—603 11 Claims

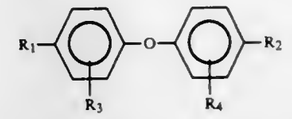
1. A process for converting sludge into soil amendment, comprising digesting sludge anaerobically to produce methane, a concentrated sludge, and supernatant, mixing additional sludge with supernatant and introducing the resultant mixture to the digestion system, transferring methane that is produced to a storage area, using methane to heat a rotary dryer into which concentrated sludge has been transferred from the digestion system, drying concentrated sludge to a solid product useful as a soil amendment, and using waste heat from the



dryer to maintain the digestion system at a temperature of approximately 105° to 130° F.

4,818,406
BIOLOGICAL DEGRADATION OF CHEMICALS BEARING AN OXYDIBENZENE NUCLEUS
David L. M. Sawchuk, Sarnia, Canada, and Ronald H. Olsen, Ann Arbour, Mich., assignors to Polysar Limited, Sarnia, Canada
Filed Nov. 24, 1986, Ser. No. 933,894
Int. Cl.[4] C02F 3/00; C12R 1/38
U.S. Cl. 210—611 4 Claims

1. A process for degrading a non-halogenated surfactant compound of the formula



wherein R_1 and R_2 are independently selected from hydrogen and a C_8–C_{20} alkyl radical and R_3 and R_4 are independently selected hydrogen and a hydrophilic radical selected from a sulfonate radical and a sultate radical, where one of R_1 and R_2 and one of R_3 and R_4 is other than hydrogen, said process comprising:
(i) providing wastewater containing said surfactant compound,
(ii) preparing a pure culture of the bacterium *Pseudomonas cepacia* OLSA 100 (ATCC 53554)
(iii) introducing said wastewater and said bacterium into an aerobic wastewater treatment facility, and
(iv) growing the bacterium *Pseudomonas cepacia* OLSA 100 (ATCC 53554) in said wastewater treatment facility under aerobic conditions so as to degrade said surfactant.

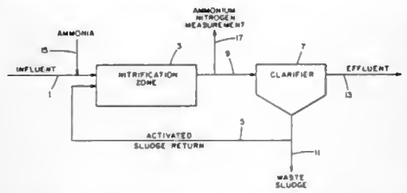
4,818,407
NITRIFICATION WITH AMMONIA ENRICHMENT
Eugene D. Bogusch, 1421 Bolson Dr., Downers Grove, Ill. 60516
Filed Mar. 24, 1988, Ser. No. 842,982
Int. Cl.[4] C02F 3/12
U.S. Cl. 210—614 8 Claims

1. In an activated sludge process for the nitrification of wastewater including a nitrification zone through which the

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wastewater is continuously passed while being aerated in the presence of activated sludge at a pH of about 6 to 9, and a clarifier in which the nitrified wastewater from the nitrification zone is clarified, the improvement for controlled enrichment of the nitrification zone with ammonium nitrogen comprising:

(a) a step of measuring the ammonium nitrogen concentration in the wastewater and activated sludge mixed liquor at an outlet of the nitrification zone, and



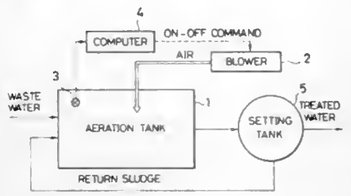
(b) a step of adding an ammonium nitrogen enriching agent consisting essentially of anhydrous ammonia to an inlet of the nitrification zone at a controlled rate restricted by the ammonium nitrogen measurement whereby the ammonium nitrogen concentration found at an outlet of the nitrification zone feeding into the clarifier is maintained below a predetermined level of about 2 mg/l so as not to adversely affect the nitrification efficiency of the nitrification zone.

4,818,408

INTERMITTENT AERATION TYPE BIOLOGICAL TREATMENT PROCESS AND SYSTEM THEREFOR

Youichi Hamamoto, Tokyo, Japan, assignor to Nishihara Om-Tech Co., Ltd. and Nishihara Environmental Sanitation Research Corp. Ltd., both of Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,489
Claims priority, application Japan, Sep. 9, 1986, 61-210652
Int. Cl.[4] C02F *3/12*
U.S. Cl. 210—614 11 Claims



1. An intermittent aeration process for the biological treatment of waste water, comprising:

(a) contacting influent waste water and activated sludge in an aeration tank wherein the mixture of waste water and activated sludge forms a mixed liquor that undergoes intermittent aeration, wherein the aeration step and the cessation of aeration are alternately repeated; and wherein the duration of the aeration step is determined by

(b) continuously measuring the concentration of the dissolved oxygen value of the liquor during the aeration step and calculating the values of deficient dissolved oxygen and the dissolved oxygen variation at predetermined time intervals;

(c) integrating and processing the values of deficient dissolved oxygen and the dissolved oxygen variation by an oxygen requirement value calculating-integrating operational unit to calculate an oxygen requirement value for the activated sludge in the current aeration step, and the necessary aeration time duration for the next succeeding step to thereby control the aeration for the next succeeding step.

4,818,409

OBTAINING AQUEOUS SOLUTIONS OF ORGANIC ACIDS OR BASES FROM AQUEOUS SOLUTIONS OF THEIR SALTS

Hermann Puetter, Neustadt, and Hartwig Voss, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,466
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514348
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—638 16 Claims

1. A process for obtaining an aqueous solution of a water-soluble organic acid which consists essentially of:

passing through alternate compartments of an exchange cell which is not exposed to an electric current, said cell having two or more compartments separated from one another by a cation exchange membrane,

(a) an aqueous solution of a salt of said organic acid, said acid having a pK_a value >2, and

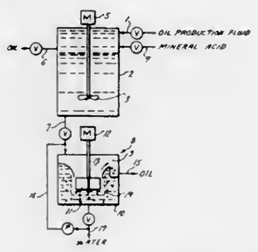
(b) an aqueous solution of a mineral acid, the respective solutions (a) and (b) being transported past opposite sides of the separating membrane.

4,818,410

METHOD OF REMOVING WATER SOLUBLE ORGANICS FROM OIL PROCESS WATER

Thomas J. Bellos; Roy W. Greenlee, and Frederick T. Welge, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jan. 14, 1988, Ser. No. 143,438
Int. Cl.[4] C02F *1/26*; B01D *17/05*
U.S. Cl. 210—639 20 Claims



1. A method of removing water soluble organics from oil process water comprising the steps of:

(a) incorporating in the said water a strong acid to adjust the pH of the water to within the range of about 2–6;

(b) thereafter or simultaneously making intimate contact between the acidified water and oil with the result that the content of water soluble organics in the water is substantially reduced by being transferred from the water to the oil; and

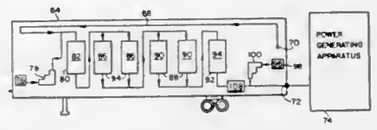
(c) separating the oil and the water.

4,818,411

DEOXYGENATION PROCESS

Richard C. Dickerson, and William S. Miller, both of Virginia Beach, Va., assignors to Ecolochem, Inc., Norfolk, Va.

Continuation of Ser. No. 562,001, Dec. 16, 1983, Pat. No. 4,556,492. This application Jul. 26, 1985, Ser. No. 759,236
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—668 21 Claims



1. A deoxygnation process comprising a first step of contacting a liquid contacting dissolved oxygen and hydrazine with a bed of activated carbon to catalyze a reaction between said dissolved oxygen and a portion of said hydrazine, whereby an amount of dissolved carbon contaminants is added to said liquid, and a second step of removing said contaminants and said unreacted hydrazine that comprises passing said liquid through a strong acid cation exchange resin and a strong base anion exchange resin.

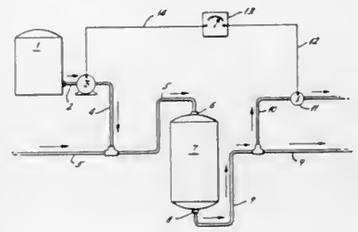
21. A deoxygenation process comprising a first step of contacting a liquid containing dissolved oxygen and hydrazine with a bed of activated carbon to catalyze a reaction between said dissolved oxygen and a portion of said hydrazine, and a second step of removing at least unreacted hydrazine by passing said liquid through a strong acid cation exchange resin.

4,818,412

APPARATUS AND PROCESS FOR FEEDING HYPOCHLORITE SOLUTION

John T. Conlan, Ventura, Calif., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 1, 1986, Ser. No. 847,081
Int. Cl.[4] C02F *1/72*
U.S. Cl. 210—704 16 Claims



1. An improved apparatus having a pump means for feeding a hypochlorite solution from a souce of the solution to a device for removing impurities from water in a water treatment system, wherein the improvement comprises:

(a) first means for continuously measuring the oxidation/reduction potential of the effluent water of the device, and

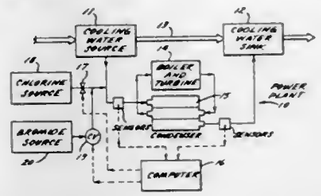
(b) second means operatively connected to the first means and the pump means for continuously controlling the feed-rate of the pump means in response to the measured oxidation/reduction potential of the effluent water, thereby maintaining a predetermined oxidation/reduction potential in the effluent water of the device.

4,818,413

BIOCIDE WATER TREATMENT HAVING REDUCED COPPER CORROSION

Richard L. Hoover, St. Charles, Ill., and Mark A. Bush, Louisville, Ky., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 5, 1987, Ser. No. 81,857
Int. Cl.[4] C02F *1/76*
U.S. Cl. 210—739 6 Claims



1. A method for treating industrial process waters flowing through a system made of copper or copper alloy to control the growth and deposit of microorganisms in said system by adding to said waters a combined amount of a bromide salt and a chlorine source which is effective to control said growth and deposit of said microorganisms, said bromide salt being added to said industrial process waters at an adjusted bromide feed rate, wherein the improvement comprises the steps of:

sensing the rate of copper corrosion in said system;

comparing the sensed rate of copper corrosion in said system to a predetermined corrosion limit which is less than said sensed rate of copper corrosion; and

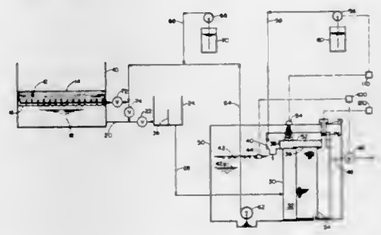
based on said comparing, increasing said bromide feed rate to decrease said copper corrosion rate to said predetermined corrosion limit, whereby the amount of copper discharge from said system into said industrial process waters is reduced.

4,818,414

SLIME CONTROL FOR PRIMARY FILTRATION SYSTEMS

David S. Roos, Lorain, Ohio, assignor to Zimpro/Passavant Inc., Rothschild, Wis.

Filed Mar. 25, 1988, Ser. No. 173,704
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—744 52 Claims



1. A process for control of the quality of a media bed filter regenerating or backwashing liquid, to protect the filter bed media and the media support structure from the deleterious effects of biological solids generated or retained within said liquid comprising the steps of;

(a) introducing a filtrate from said media bed filter into a first collection chamber containing a removable screen assembly covering a first upper outlet, said chamber also containing a second lower outlet;

(b) transferring filtrate which has traversed said screen as-

sembly in said first collection chamber to a predetermined level within a second collection chamber;

(c) adding a predetermined amount of bactericide to said filtrate which has traversed said screen assembly to retard bacterial growth therein, to form a bactericide-treated filtrate; and

(d) regenerating or backwashing said media bed filter with said bactericide-treated filtrate to improve operation of said filter.

18. An apparatus for control of the quality of a media bed filter regenerating or backwashing liquid, to protect the filter bed media and the media support structure from the deleterious effects of biological solids generated or retained within said liquid comprising;

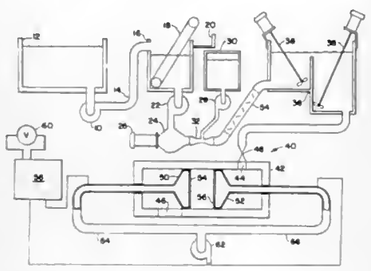
a first collection chamber with a liquid inlet; a first liquid outlet containing a removable screen assembly; a second liquid outlet located below the level of said first liquid outlet; a second collection chamber; means for transferring liquid which has traversed said screen assembly to said second collection chamber; means for measuring the amount of liquid transferred from said first collection chamber to said second collection chamber; means for adding a predetermined amount of bactericide to said liquid entering said second collection chamber; control means for terminating transfer of liquid from said first chamber to said second chamber upon the liquid in said second chamber reaching a predetermined level; and means to deliver a bactericide-treated liquid to said media bed filter to regenerate or backwash said filter.

4,818,415

METHOD AND APPARATUS FOR REMOVING LIQUID FROM PERMEABLE MATERIAL

Timothy A. Kramer, 606 Bay Ave., Pt. Pleasant Beach, N.J. 08742, and Kent M. Kramer, 7 Williams St., Rumson, N.J. 07760

Filed Mar. 3, 1988, Ser. No. 173,811
Int. Cl.[4] B01D *33/22, 35/18*
U.S. Cl. 210—748 41 Claims



1. A method of removing liquid from a permeable material, comprising the steps of:

(a) constraining the material such that the material interfaces with at least one surface which is permeable to the liquid contained in the material and which is at a temperature below the vaporization temperature of the liquid;

(b) heating the material at at least one location remote from said at least one surface to a temperature sufficiently high to cause the in situ vaporization of the liquid in the vicinity of said at least one location such that as the vaporized liquid expands it forces at least some of the remaining unvaporized liquid through said at least one surface; and

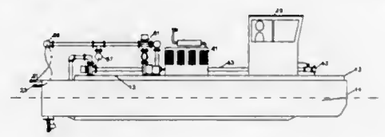
(c) maintaining said at least one surface at a temperature below the vaporization temperature of the liquid during the performance of at least a substantial portion of step (b) such that the liquid in the vicinity of said at least one surface is inhibited from vaporizing.

4,818,416

METHOD AND APPARATUS FOR TREATING BODIES OF WATER

Thomas E. Eberhardt, 220 Blenheim Dr., Easton, Pa. 18042

Continuation-in-part of Ser. No. 75,114, Jul. 20, 1987, Pat. No. 4,747,958. This application May 26, 1988, Ser. No. 199,314
Int. Cl.[4] C02F *1/68*
U.S. Cl. 210—749 3 Claims



1. A method comprising: treating an aquatic environment bonded by at least in part a sloping bottom to redress a predetermined constituent imbalance in said environment by dispensing to said environment for providing a uniform coating on said bottom of a fluent treatment agent by:

(a) directing a floating means across the surface of said body of water, said floating means having associated therewith transversely extended fluent material dispensing means and feed means for said dispensing means,

(b) determining the velocity of movement of snch floating means,

(c) substantially continuously determining the depth of water under the floating means by at least two on-board depth detection means arranged in an extended transverse pattern,

(d) substantially continuously processing the velocity and depth data to determine the slope of the bottom from the depth detected under each depth detector at any given time and determining from such slope substantially the actual bottom surface area over which the floating means and associated fluent material dispensing means passes,

(e) adjusting the feed means to said fluent material dispensing means to dispense a predetermined amount of at least one fluent treatment agent into said body of water proportionally related to the actual bottom surface area over which the floating means passes to correct such imbalance at least in part by providing material to the bottom.

4,818,417

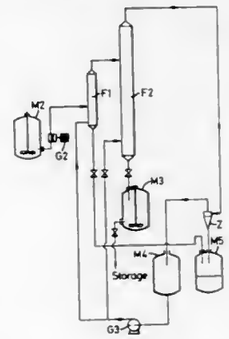
TREATMENT OF CATALYST PARTICLES

Pierre Crouzet, Martigues, France, assignor to BP Chemicals Limited, London, England

Division of Ser. No. 2,162, Jan. 12, 1987, Pat. No. 4,714,553. This application Jul. 9, 1987, Ser. No. 71,638
Claims priority, application France, Jan. 20, 1986, 86 00724
Int. Cl.[4] E01D *17/00, 45/02*
U.S. Cl. 210—768 6 Claims

1. A process comprising: elutriating by a liquid, solid particles of a Ziegler-Natta catalyst to obtain separation into at least two portions which differ in average particle size, by providing in a preliminary stage (stage 1) a suspension of the solid catalyst particles prepared in the elutriation liquid which is a non-polar liquid chemically inert in relation to the catalyst, at a concentration in the range 20 to 150 grammes per liter, and further providing in said process, one or more of the following defined stages M and N,

wherein stage M is a process for separating large particles comprising, providing a vertical elutriation column F1 having a height H', introducing the catalyst suspension at a flow rate Q1 and at a level between H'/2 and the bottom of the column, introducing the elutriation liquid at a flow rate R1 into the column F1 at a level lower than that of the introduction of the catalyst suspension, causing the liquid to flow in the column in an ascending stream substantially under laminar flow conditions, withdrawing from the top of the column F1 a catalyst suspension substantially free from large particles and, withdrawing from the bottom of the column F1 a catalyst suspension mainly comprising large particles and wherein stage N is a process for separating fine particles comprising, providing a vertical elutriation column F2 of height H, introducing the catalyst



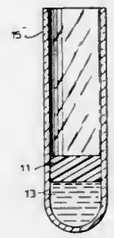
suspension at a flow rate Q2 and at a level above H/2 and below 7H/8, introducing the elutriation liquid at a flow rate R2 into the column F2 at a level below H/2, causing the liquid to flow in the column in an ascending stream and substantially under conditions of laminar flow, withdrawing from the top of the column F2 elutriation liquid charged with fine catalyst particles and withdrawing from the bottom of the column F2 catalyst particles substantially freed from fine particles.

4,818,418

BLOOD PARTITIONING METHOD

Alex M. Saunders, San Carlos, Calif., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 653,178, Sep. 24, 1984, Pat. No. 4,751,001. This application Feb. 3, 1988, Ser. No. 151,655
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—782 14 Claims



1. A method of separating and partitioning mononuclear cells from a blood sample, which comprises the steps of:

placing a water soluble density gradient material in a centrifuge tube having a bottom closed end and positioning the water soluble density gradient material adjacent to the bottom closed end of the tube;

placing a thixotropic gel-like substance in the centrifuge tube and positioning the thixotropic gel-like substance adjacent to and on top of the water soluble density gradient material, the thixotropic gel-like substance being substantially hydrophobic, and the water soluble density gradient material having a specific gravity which is higher than that of the thixotropic gel-like substance;

placing a sample of blood in the centrifuge tube, the thixotropic gel-like substance acting as a partition between the water soluble density gradient material and the blood sample placed in the tube on top of the gel-like substance and acting to keep the water soluble density gradient material in place in the bottom of the tube and separated from the blood sample; and

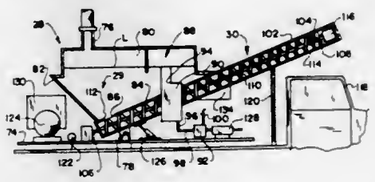
centrifuging the tube to separate the mononuclear cells from other cells of the blood sample, wherein the water soluble density gradient material and the thixotropic gel-like substance form separate barrier layers between the mononuclear cells and the other cells of the blood sample.

4,818,419

METHOD OF REMOVING CLOGGING MATERIAL FROM A CLOGGED GRANULAR FILTER MEDIUM

Ken Mims, Lake Monroe, Fla., assignor to Uddo-Mims International, Inc., Edgewater, Fla.

Continuation-in-part of Ser. No. 714,034, Mar. 20, 1985, Pat. No. 4,707,277. This application Oct. 19, 1987, Ser. No. 110,111
Int. Cl.[4] B01D *37/04;* C02C *1/20*
U.S. Cl. 210—796 11 Claims



1. A method of cleaning and removing clogging material from a clogged granular filter medium of a granular filter device comprising the steps of:

providing an apparatus to remove and clean the clogged granular filter medium including a collector means, a first pump means having an input and an output port, the input port being in fluid tight communication with the collector means, a conduit means in fluid tight communication with the output port of the first pump means, a reservoir means having an inlet and an outlet, the inlet of the reservoir means being connected to the conduit means, a second pump means, an Archimedean screw conveyor further including an elongate housing defining a first and second opening, the housing extending angularly relative to the reservoir means an elongate axle rotatably supported by and extending through and along the length of the housing, the axle having a first and a second end, the first end of the axle being disposed adjacent to the outlet of the reservoir means, spiral conveyor means rigidly secured to the axle, the spiral conveyor means being disposed within the housing and extending between the first and second opening of the housing; and

conducting a cleaning operation of loosening and removing the clogging material from the clogged granular filtering medium of the filter device comprising:

positionion the collector means proximate the clogged granular filter medium for collecting the clogged granular filter medium and a portion of water contained within a tank housing the clogged granular filter medium;

pumping the clogged granular filter medium and the portion of water from the granular filter device by the first pump means such that a slurry of clogged granular filter medium is formed and flows from the granular filter device through the collector means, first pump means and conduit means towards the reservoir means such that during the transit through the collector means, first pump means

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and conduit means the clogged granular filter medium is agitated causing an intergranular frictional action among the clogged granular filter medium thereby loosening the clogging material from the granular filter medium to form a suspension of loosened clogging material and entrained granular filter medium;

settling the granular filter medium within the reservoir means such that the granular filter medium settles towards the outlet of the reservoir means;

separating the granular filter medium from the suspension of loosened clogging material such that the separated granular filter medium is conveyed angularly relative to the reservoir by the Archimedean screw conveyor thereby permitting the suspension of loosened clogging material and granular filter medium to be conveyed away from the first opening of the separator towards a second opening of the separator, such that the suspension of loosened clogging material drains back towards the first opening and the granular filter medium is separated from the loosened clogging material and conveyed towards the second opening for discharge therefrom;

pumping the suspension of loosened clogging material from the reservoir by the second pump means;

collecting the cleaned granular filter medium from the second opening of the separator; and

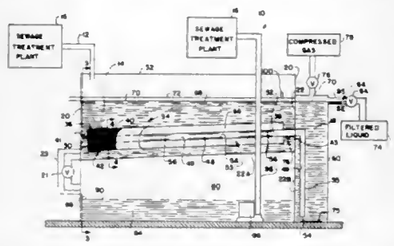
transporting the cleaned granular filter medium back to the tank of the filter device.

4,818,420

BACKWASH FILTER

Ken Mims, Lake Monroe, Fla., assignor to Uddo Mims International, Inc., Edgewater, Fla.

Filed May 15, 1987, Ser. No. 49,840
Int. Cl.[4] B01D *23/24, 29/38, 35/30*
U.S. Cl. 210—798 **20 Claims**



17. A liquid filtering and backwashing apparatus comprising:

a filter tank for receiving in use a liquid to be filtered;

a filter cell having a first and second end disposed within said filter tank;

a conduit having a first portion and a second portion;

said filter cell including said first portion of said conduit and an outer member with said outer member being positioned around and spaced from said first portion of said conduit for receiving in use a filtering medium therebetween;

said first portion of said conduit and said outer member each being provided with a plurality of openings to enable fluid communication therethrough;

said second portion of said conduit being in fluid communication with a backwash holding tank;

a first outlet valve in fluid communication with said filter tank to enable an outward flow from said filter tank;

a second outlet valve in fluid communication with said backwash holding tank to enable in use outward flow thereform;

said second outlet valve in fluid communication with said backwash holding tank being positioned to establish in use a first level wherein said first level enables said filter cell disposed in said filter tank to be covered by the liquid to be filtered; and

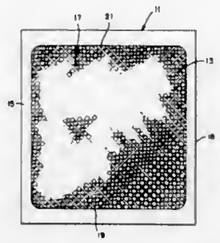
an inlet valve in fluid communication with said backwash holding tank to admit in use compressed gas into said holding tank to enable backwashing of said filter cell and filter tank.

4,818,421

FABRIC SOFTENING DETERGENT COMPOSITION AND ARTICLE COMPRISING SUCH COMPOSITION

Felicia J. Boris, Flanders, and Charles A. Beagle, South Plainfield, both of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Filed Sep. 17, 1987, Ser. No. 98,347
Int. Cl.[4] C11D *1/86*
U.S. Cl. 252—8.8 **33 Claims**



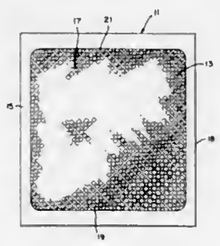
1. A fabric softening detergent composition which comprises a detersive proportion of nonionic detergent, a building proportion of builder for the nonionic detergent, and a fabric softening proportion of a combinatin of fabric softening cationic compound and silicone glycol copolymer, for which copolymer a hydrophilic-lipophilic balance number is in the range of 4 to 19, and in which the copolymer is of ethylene glycol and propylene glycol, wherein the proportion of silicone glycol copolymer significantly improves the fabric softening action of the fabric softening cationic compound.

4,818,422

FABRIC SOFTENING DETERSIVE ARTICLE

Richard P. Adams, Kendall Park; Richard J. Holland, Trenton, and Patricia A. Bodak-Cumming, Edison, all of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Filed Sep. 17, 1987, Ser. No. 98,345
Int. Cl.[4] D06M *13/12*
U.S. Cl. 252—8.8 **23 Claims**



1. A fabric softening and detersive article for use in an automatic washing machine to wash and soften laundry, which article comprises a water insoluble container having a fabric softening particulate built laundry detergent composition which is transported through a permeable wall of said container as an aqueous solution, emulsion or dispersion, into the

to wash water of the automatic washing machine, so that the laundry in the wash water may be washed and softened thereby, wherein the fabric softening detergent composition comprises a detersive proportion of nonionic detergent, a building proportion of builder for the nonionic detergent, a fabric softening proportion of fabric softening cationic compound and a transport promoting proportion of anionic surface active agent (surfactants), which proportion of anionic surfactant is less than the proportions of the nonionic detergent and of the fabric softening cationic compound, and which anionic surfactant solubilizes, emulsifies and/or disperses component(s) of the fabric softening detergent composition, including the fabric softening cationic compound, in the permeable container so that substantially all of such composition and such compound is transported out of the container and into the wash water during washing of laundry in the washing machine.

4,818,423

LOW TEMPERATURE LUBRICATING OIL

Hans-Horst Steinbach; Jürgen Ackermann, both of Bergisch Gladbach, and Ottfried Schlak, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 170,265
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710423
Int. Cl.[4] C10M *107/50*
U.S. Cl. 252—49.6 **7 Claims**

1. Fluorosiloxane lubricant comprising compounds corresponding to the formula

$$T_aM_bD^F_cD_d$$

wherein

T denotes alkyltrisiloxy having 1 to 12 alkyl carbon atoms,

M denotes trialkylmonosiloxy having 1 to 12 carbon atoms in each alkyl,

D denotes dialkyldisiloxy having 1 to 12 carbon atoms in each alkyl,

D^F denotes a substituted alkyldisiloxy having 1 to 12 carbon atoms in the alkyl and substituted by a fluorinated moiety of the formula $C_nF_{2n+1}—CH_2—CH_2$,

wherein n is a number from 2 to 10,

a is a number from 1 to 5,

b is a number from 3 to 7,

c is a number from 3 to 7, and

d is a number from 30 to 70.

4,818,424

SPRAY DRYING OF A DETERGENT CONTAINING A POROUS CRYSTAL-GROWTH-MODIFIED CARBONATE

Elfed H. Evans, Clwyd, and Peter C. Knight, South Wirral, both of United Kingdom, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,759
Claims priority, application United Kingdom, Apr. 30, 1987, 8710290
Int. Cl.[4] B01D *1/18;* **C11D** *7/12, 11/02, 17/06*
U.S. Cl. 252—91 **8 Claims**

1. A process for the preparation of a granular detergent composition, which comprises the steps of:

(i) preparing a first aqueous slurry comprising sodium carbonate, optionally together with sodium sulphate and/or sodium bicarbonate, and a crystal growth modifier which is an organic material having at least three carboxyl groups in the molecule, the crystal growth modifier being incorporated in the slurry not later than the sodium carbonate and in an amount of from 0.1 to 20% by weight based on the total amount of crystal-growth-modified carbonate-based carrier salt;

(ii) simultaneously spray drying in the same spray drying tower the first aqueous slurry and a second aqueous slurry comprising one or more anionic and/or nonionic surfactants, one or more detergency builders and optionally one or more further heat-sensitive detergent components, to form a powder including a crystal-growth-modified carbonate-based carrier salt, said first and second aqueous slurry being present in an amount such that the spray-



dried powder produced therefrom contains from 5 to 30% by weight of crystal-growth-modified carbonate-based carrier salt;

(iii) treating the powder obtained from step (ii) with a liquid detergent component in an amount within the range of from 5 to 67% by weight based on the carbonate-based carrier salt.

4,818,425

PROCESS FOR THE PREPARATION OF DIPEROXYDODECANEDIOIC ACID-CONTAINING AGGLOMERATES AND COMPOSITIONS IN WHICH THESE AGGLOMERATES ARE USED AS BLEACHING COMPONENT

John Meijer, Deventer; Reinder Torenbeek, Terwolde, and Rolf H. van den Berg, Kring Van Dorth, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed May 20, 1987, Ser. No. 51,752
Claims priority, applicatioa Netherlands, May 28, 1986, 8601361; Jan. 19, 1987, 8700107
Int. Cl.[4] C11D *3/395;* **C01B** *15/00;* **C07C** *179/10*
U.S. Cl. 252—94 **6 Claims**

1. A process for preparing agglomerates containing an aliphatic diperoxydicarboxylic acid and a water-impermeable material solid at room temperature, which process comprises the successive steps of agitating an aqueous suspension of the acid in the presence of the water-impermeable material in an amount of at least 25% by weight, calculated on the acid, for a time sufficient to agglomerate the suspended acid particles and at a temperature above the melting point of the water-impermeable material and below the decomposition temperature of the acid, cooling with continued agitation of the suspension of the agglomerated particles thus obtained to a temperature at which the water-impermeable material turns solid, and isolating the resulting agglomerates, characterized in that the diperoxydicarboxylic acid is 1,12-diperoxydodecanedioic acid.

4,818,426

QUATERNARY AMMONIUM OR PHOSPHONIUM SUBSTITUTED PEROXY CARBONIC ACID PRECURSORS AND THEIR USE IN DETERGENT BLEACH COMPOSITIONS

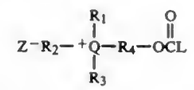
Robert W. R. Humphreys, Oradell, N.J., and Stephen A. Madison, Valley Cottage, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 27,278, Mar. 17, 1987, Pat. No. 4,751,015. This application Mar. 30, 1988, Ser. No. 174,735
Int. Cl.[4] C11D *3/395*
U.S. Cl. 252—99 **41 Claims**

9. A bleaching-detergent composition comprising:

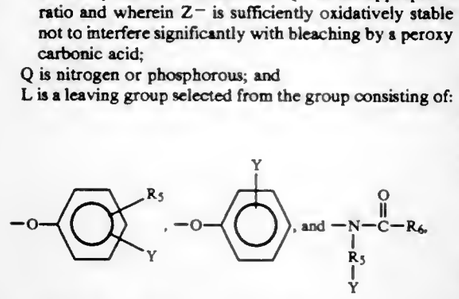
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(i) from 1 to 60% of a peroxygen compound capable of yielding hydrogen peroxide in an aqueous solution;
(ii) from 0.1 to 40% of a bleach precursor having the formula:



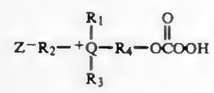
(I)

wherein:
R_1, R_2 and R_3 are each a radical selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, phenyl, hydroxyalkyl, polyoxyalkylene, and R_4OCOL;
or two or more of, R_1, R_2, and R_3 together form an alkyl substituted or unsubstituted nitrogen-containing heterocyclic ring system;
or at least one of R_1, R_2, and R_3 is attached to R_4 to form an alkyl substituted or unsubstituted nitrogen-containing heterocyclic ring system;
R_4 is selected from a bridging group consisting of alkylene, cycloalkylene, alkylenephenylene, phenylene, arylene, and polyalkoxylene; and wherein the bridging group can be unsubstituted or substituted with C_1–C_{20} atoms selected from alkyl, alkenyl, benzyl, phenyl and aryl radicals;
Z^- is a monovalent or multivalent anion leading to charge neutrality when combined with Q^+ in the appropriate ratio and wherein Z^- is sufficiently oxidatively stable not to interfere significantly with bleaching by a peroxy carbonic acid;
Q is nitrogen or phosphorous; and
L is a leaving group selected from the group consisting of:



wherein R_5 and R_6 are a C_1–C_2 alkyl group, and Y is H;
(iii) from 0 to 50% of a surfactant selected from the group consisting of nonionic, anionic, amphoteric and surface active mixtures thereof; and
(iv) from 0 to 80% of a detergent builder.

18. A peroxy acid compound according to the formula:



(II)

wherein:
R_1, R_2 and R_3 are each a radical selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, phenyl, hydroxyalkyl, polyoxyalkylene, and mixtures thereof;
or two or more of R_1, R_2, and R_3 together form an alkyl substituted or unsubstituted nitrogen-containing heterocyclic ring system;
or one of R_1, $R_2$and R_3 is attached to R_4 to form an alkyl substituted or unsubstituted nitrogen-containing heterocyclic ring system;
R_4 is selected from a bridging group consisting of alkylene, cycloalkylene, alkylenephenylene, phenylene, arylene, and polyalkoxylene; and wherein the bridging group can be unsubstituted or substituted with C_1–C_{20} atom selected from alkyl, alkenyl, benzyl, phenyl and aryl radicals;
Z^- is a monovalent or multivalent anion leading to charge neutrality when combined with Q^+ in the appropriate ratio and wherein Z^- is sufficiently oxidatively stable not to interfere significantly with bleaching by a peroxy carbonic acid; and
Q is nitrogen or phosphorous.

4,818,427

PRETREATMENT OR STEEPING PREPARATIONS FOR STUBBORNLY SOILED DISHES AND A PROCESS FOR WASHING SUCH DISHES

Theodor Altenschoepfer, Duesseldorf; Peter Jeschke, Neuss, and Klaus-Dieter Wisotzki, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 19, 1987, Ser. No. 110,141
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1986, 3635535
Int. Cl.⁴ C11D *3/43, 3/60*
U.S. Cl. 252—174.21 **6 Claims**

1. A process for cleaning stubbornly soiled dishes comprising applying to said dishes a pretreatment or steeping preparation comprising from about 0.5 to about 20% by weight of a low-foaming nonionic surfactant, from about 0.5 to about 25% by weight of a polyhydric alcohol or glycol ether, from about 0.5 to about 10% by weight of a hydrotropic compound, and from about 0.01 to about 6% by weight of a viscosity regulator, all weights based on the weight of said preparation, in the form of an aqueous suspension or solution adjusted to a viscosity of at least 5 mPa.s. and to a pH of from about 3 to about 6; placing the dishes in the crockery basket of an automatic dishwashing machine at room temperature with the coated soiled surface of the dishes facing the outlet of a stream of circulating water in the dishwashing machine, waiting at least about 30 minutes prior to starting said dishwashing machine, and starting the dishwashing machine for its normal washing cycle.

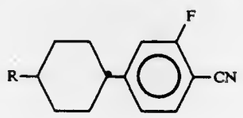
4,818,428

LIQUID CRYSTAL PHASE

Bernhard Scheuble, Alsbach; Georg Weber, Erzhausen, and Joachim Krause, Dieburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

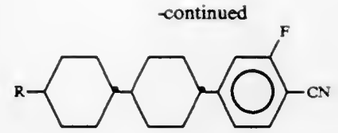
PCT No. PCT/EP85/00733, § 371 Date Sep. 12, 1986, § 102(e) Date Sep. 12, 1986, PCT Pub. No. WO86/04081, PCT Pub. Date Jul. 17, 1986
PCT Filed Dec. 20, 1985, Ser. No. 913,886
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1985, 3500897
Int. Cl.⁴ C09K *19/34, 19/54, 19/00;* **G02F** *1/13*
U.S. Cl. 252—299.1 **18 Claims**

1. A liquid crystal phase having at least five liquid crystal components and a threshold voltage <1.6 volt, and containing at least 18% of a highly polar component of reduced degree of association and, effective to reduce the phase's quotient of K_3/K_1 of the elastic constant for bending (K_3) and spreading (K_1) to a value $\leqq 1.1$, at least 27% of an apolar liquid crystal component having a dielectric anisotropy in the range from -2 to $+2$, wherein
the highly polar component of reduced degree of association is at least one of the compounds:

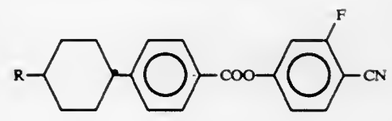


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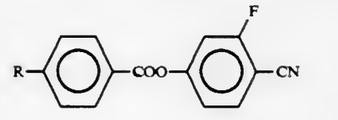
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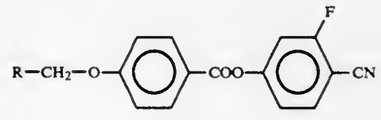
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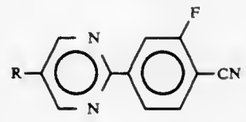
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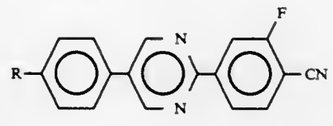
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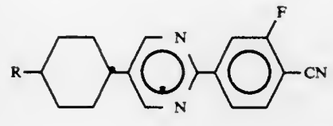
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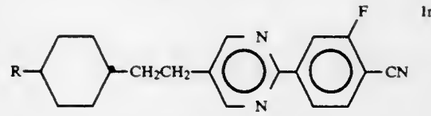
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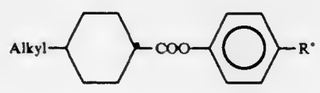


Iq

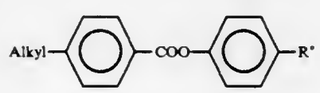


Ir

in which R is a straight-chain alkyl group of 1 to 7 C atoms and in which a CH_2 group can be replaced by —O— or —CH=CH—,
the apolar liquid crystal component is at least one of the compounds:

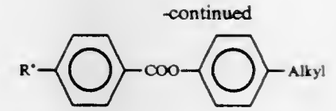


A

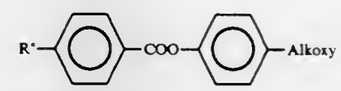


B

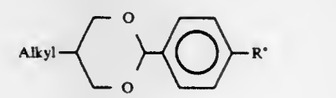
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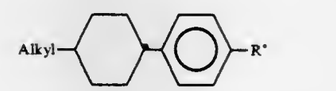
C



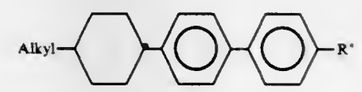
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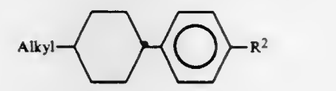
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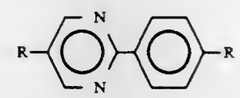


F



G





IIa

in which alkyl and alkoxy are each a straight-chain alkyl or alkoxy group of 1 to 7 C atoms, R* is a straight-chain alkyl or alkoxy group or an oxaalkyl or alkenyl group of 1 to 7 C atoms, R is a straight-chain alkyl group of 2 to 10 C atoms, in which a CH_2 group can be replaced by —O— or —CH=CH—, and R^2 is butyryloxy, and
the pyrimidine compounds of formulae Io to Ir and/or IIa are present in a total amount of 27 to 61%.

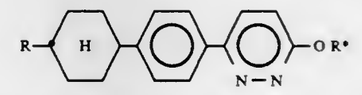
4,818,429

CYCLOHEXYLPHENYLPYRIDAZINES

Shinichi Saito; Takashi Inukai; Hiromichi Inoue; Kazutoshi Miyazawa, and Kouji Ohno, all of Kanagawa, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 11, 1987, Ser. No. 95,111
Claims priority, application Japan, Sep. 11, 1986, 61-214471
Int. Cl.⁴ C09K *19/34, 19/52;* **C07D** *237/00, 237/02*
U.S. Cl. 252—299.61 **4 Claims**

1. A compound expressed by the formula



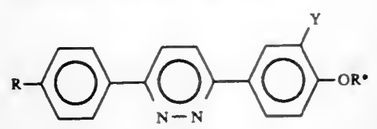
(I)

wherein R represents a normal alkyl group of 5–7 carbon atoms and R* represents an optically active alkyl or alkoxyalkyl group each of which has 5–8 carbon atoms with one methyl branching.

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4,818,430
3,6-DIPHENYLPYRIDAZINES
Shinichi Saito; Takashi Inukai; Hiromichi Inoue; Kazutoshi Miyazawa, and Kouji Ohno, all of Yokohamashi, Japan, assignors to Chisso Corporation, Tokyo, Japan
Filed Sep. 15, 1987, Ser. No. 98,932
Claims priority, application Japan, Sep. 16, 1986, 61-217388
Int. Cl.[4] C09K *19/52, 19/34;* C07D *237/00, 237/02*
U.S. Cl. 252—299.61 3 Claims

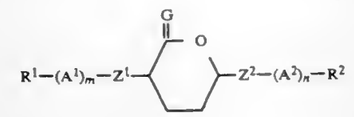
1. A compound expressed by the formula



wherein R represents a linear alkyl group of 3 to 9 carbon atoms, R* represents an optically active alkyl group of 5 to 11 carbon atoms having a methyl branch and Y represnets a hydrogen atom or a fluorine atom.

4,818,431
LIQUID CRYSTAL DIELECTRIC
Rudolf Eidenschink, Münster; Joachim Krause, Dieburg, and Peter Fuss, Mühltal-Traisa, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany
Continuation of Ser. No. 583,507, Feb. 24, 1984, abandoned.
This application Nov. 24, 1986, Ser. No. 933,953
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1983, 3306960
Int. Cl.[4] G02F *1/13;* C09K *19/34;* C07D *309/30, 309/04, 309/08, 407/02, 405/06, 405/112*
U.S. Cl. 252—299.61 17 Claims

1. A liquid-crystal dielectric useful for electrooptical display elements comprising at least two liquid crystal components, wherein at least one component is a compound of the formula



wherein
G is H_2 or =O;
R^1 and R^2 each independently is alkyl of 1–10 C-atoms; alkyl of 1–10 C atoms wherein one or two non-adjacent CH_2 groups are replaced by O atoms; F; Cl; Br; or CN; and R^2 can also be H;
A^1 and A^2 each independently is 1,4-phenylene, 1,4-cyclohexylene, 1,3-dioxane-2,5-diyl, piperidine-1,4-diyl, 1,4-bicyclo[2.2.2]octylene or pyrimidine-2,5-diyl or one of these groups substituted by 1–4 F atoms;
Z^1 and Z^2 each independently is —CO—O—, —O—CO—, CH_2CH_2—, —OCH_2—, —CH_2O—, or a single bond; and
m and n each is 0, 1, 2, or 3, but (m+n) is at least 1 and at most 3, it being possible, when m is 2 or 3, for the groups A^1 and, when n is 2 or 3, for the groups A^2 each to be identical or different from one another, with the proviso that when —$(A^2)_n$—R^2 is OR, wherein R is H or alkyl, Z^1 and Z^2 are single bonds, and G is H_2, then R^1-$(A^1)_m$— is not 4-cyanophenyl, 4-alkylphenyl and 4-alkylcyclohexyl.

4,818,432
3-SUBSTITUTED BIPHENYL COMPOUND
Kazutoshi Miyazawa; Takashi Inukai; Hiromichi Inoue; Shinichi Saito, and Kouji Ohno, all of Kanagawa, Japan, assignors to Chisso Corporation, Ohsaka, Japan
Filed Apr. 27, 1987, Ser. No. 42,805
Claims priority, application Japan, Apr. 25, 1986, 61-90618
Int. Cl.[4] C09K *19/12;* C07C *49/807, 43/225, 49/84*
U.S. Cl. 252—299.66 2 Claims

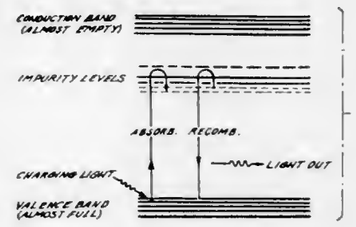
1. A chiral smectic c liquid crystal compound selected from the group consisting of
4'-(6-methyl-octyloxy)-3'-fluoro-4-pentylbiphenyl,
4'-(6-methyl-octyloxy)-3'-fluoro-4-octylbiphenyl,
4'-(7-methyl-nonyloxy)-3'-fluoro-4-octylbiphenyl,
4'-(7-methyl-nonyloxy)-3'-fluoro-4-decylbiphenyl,
4'-(8-methyl-decyloxy)-3'-fluoro-4-pentylbiphenyl,
4'-(8-methyl-decyloxy)-3'-fluoro-4-dodecylbiphenyl,
4'-decyloxy-3'-fluoro-4-(6-methyl-octyl)-biphenyl,
4'-dodecyloxy-3'-fluoro-4-(6-methyl-octyl)-biphenyl,
4'-(6-methyl-octyloxy)-3'-fluoro-4-nonanoyl-biphenyl,
4'-(6-methyl-octyloxy)-3'-bromo-4-decanoyl-biphenyl,
4'-(6-methyl-octyloxy)-3'-cyano-4-decanoyl-biphenyl,
4'-(6-methyl-octyloxy)-3'-fluoro-4-dodecanoyl-biphenyl,
4'-(6-methyl-octyloxy)-3'-chloro-4-dodecanoyl-biphenyl,
4'-(8-methyl-decyloxy)-3'-fluoro-4-dodecanoyl-biphenyl,
4'-octyloxyl-3'-fluoro-4-(6-methyl-octanoyl)-biphenyl,
4'-decycloxy-3'-fluoro-4-(6-methyl-octanoyl)-biphenyl, and
4'-dodecyloxy-3'-fluoro-4-(6-methyl-octanoyl)-biphenyl.

4,818,433
PROCESS FOR PRODUCING LANTHANUM CERIUM ALUMINATE PHOSPHORS
A. Gary Sigai; Michael N. Alexander, both of Lexington, and Charles W. Struck, Medfield, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Division of Ser. No. 133,100, Dec. 14, 1987, which is a division of Ser. No. 560,296, Dec. 12, 1983. This application Jun. 3, 1988, Ser. No. 201,794
Int. Cl.[4] C09K *11/80*
U.S. Cl. 252—301.4 R 6 Claims

1. A process for producing a luminescent phosphor composition consisting essentially of lanthanum cerium aluminate phosphor represented by the formula $La_{1-x}Al_yO_{(3/2)(y+1)}$ wherein $0.10<x<1.0$ and $11.0\leqq y\leqq 12.5$ and further characterized by predominantly blue peak emission, comprising the following steps in the sequence set forth:
a. dissolving lanthanum (III) oxide and cerium (III) nitrate hexahydrate in predetermined proportions as desired in said phosphor composition in hot acid to form a solution;
b. diluting the solution of step (a) with distilled water;
c. heating the diluted solution of step (b) to a temperature of about 90° C.;
d. adding γ-aluminum oxide in a predetermined proportion as desired in said phosphor composition to the heated solution of step (c) to form a suspension;
e. adding oxalic acid to the suspension of step (d)in an amount at least sufficient to fully precipitate lanthanum (III) and cerium (III) as oxalates;
f. allowing the suspension of step (e) containing said oxalic acid to stand for a period of time sufficient for a precipitate containing lanthanum, cerium and aluminum in a ratio desired in said phosphor composition to form;
g. drying the precipitate of step (f) at a temperature of about 140° C.;
h. pulverizing the dried precipitate of step (g);
i. firing the pulverized dried precipitate of step (h) in a reducing atmosphere at a temperature of about 1600° to about 1800° C. for about 3 to about 4 hours; and
j. pulverizing the fired product of step (i).

4. A process for preparing a luminescent material represented by the formula $La_{1-x}Ce_xAl_yO_{(3/2)(y+1)}$ wherein $0.10<x<1.0$ and $11.0\leqq y\leqq 12.5$ and further characterized by predominantly blue peak emission, comprising the following steps in the sequence set forth:
a. dissolving lanthanum (III) oxide and cerium (III) nitrate hexahydrate in predetermined proportions as desired in said luminescent material in hot acid to form a solution;
b. diluting the solution of step (a) with distilled water;
c. adding γ-aluminum oxide in a predetermined proportion as desired in said luminescent material to the diluted solution of step (b) to form a suspension
d. adding ammonium carbonate until the suspension of step (c) is slightly basic so that lanthanum and cerium precipitate as carbonates;
e. allowing the suspension of step (d) to stand for a period of time sufficient for a precipitate containing lanthanum, cerium and aluminum in a ratio desired in said luminescent material—has to form;
f. drying the precipitate at a temperature of about 140° C.;
g. pulverizing the dried precipitate of step (f);
h. firing the pulverized dried precipitate of step (g) in a reducing atmosphere at a temperature of about 1600° C. to about 1800° C. for a period of time of about three hours; and
i. pulverizing the fired product of step (h).

4,818,434
THERMOLUMINESCENT MATERIAL INCLUDING FUSIBLE SALT
Joseph Lindmayer, Rockville, Md., assignor to Quantex Corporation, Rockville, Md.
Division of Ser. No. 798,297, Nov. 15, 1985, Pat. No. 4,755,324.
This application Apr. 6, 1988, Ser. No. 178,201
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] C09K *11/56, 11/88*
U.S. Cl. 252—301.4 S 11 Claims



1. A crystalline thermoluminescent material consisting essentially of:
(a) a base material selected from the group of: alkaline earth metal sulfides, and selenides;
(b) a fusible salt, there being at most 2 parts fusible salt for every 10 parts of base material by weight;
(c) a first dopant consisting of lanthanum oxide in an amount of between 1,000 and 7,000 parts per million; and
(d) a second dopant consisting of europium trioxide in an amount of between 500 and 1,000 parts per million; and
wherein said thermoluminescent material provides electron trapping with trap depths less than 0.150 eV and more than 0.020 eV.

4,818,435
AQUEOUS SUSPENSION OF DELAMINATED VERMICULITE
Alexander Lukacs, III, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Mar. 12, 1987, Ser. No. 25,121
Int. Cl.[4] C04B *20/06*
U.S. Cl. 252—378 R 6 Claims

1. In a composition comprising an aqueous suspension of vermiculite platelets, wherein the improvement comprises the platelets being ionically bonded to organo-substituted onium ions polymerizable by radical or ionic means.

4,818,436
PROCESS AND COMPOSITION FOR PROVIDING REDUCED DISCOLORATION OF PYRITHIONES
Cheryl B. French, Glastonbury, and Gene A. Hyde, Hamden, both of Conn., assignors to Olin Corporation, Cheshire, Conn.
Filed Aug. 31, 1987, Ser. No. 91,684
Int. Cl.[4] C07C *143/90;* C11D *1/28*
U.S. Cl. 252—400.23 13 Claims

1. A process for reducing or inhibiting the formation of a blue coloration in a metalworking fluid, said blue coloration being due to the presence of ferric ion and sodium pyrithione in said metalworking fluid, which comprises adding to said metalworking fluid an effective amount of an alkali metal or alkaline earth metal salt of 1-hydroxyethane-1,1-diphosphonic acid.

4,818,437
CONDUCTIVE COATINGS AND FOAMS FOR ANTI-STATIC PROTECTION, ENERGY ABSORPTION, AND ELECTROMAGNETIC COMPATABILITY
Robert E. Wiley, Port Huron, Mich., assignor to Acheson Industries, Inc., Port Huron, Mich.
Filed Jul. 19, 1985, Ser. No. 757,029
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 35 Claims

1. A conductive coating composition useful in protecting electronic components and the like from damage caused by stray electrostatic discharge when applied to a surface which may come into close proximity with said components comprising:
(a) about 5 percent to about 50 percent total elemental carbon by weight of the composition;
(b) about 2 percent to about 50 percent of a polymeric binder by weight of the composition;
(c) about 5 percent to about 93 percent of a solvent by weight of the composition; and
(d) about 0 percent to about 5 percent of a surfactant by weight of the composition;
wherein about 5 percent to about 95 percent of said total elemental carbon, by weight of the elemental carbon, is a ground coal-based, calcined coke, said coke demonstrating an E_c value of about 27 to about 80.

4,818,438
CONDUCTIVE COATING FOR ELONGATED CONDUCTORS
Robert E. Wiley, Port Huron, Mich., assignor to Acheson Industries, Inc., Port Huron, Mich.
Filed Jul. 19, 1985, Ser. No. 757,085
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 24 Claims

1. A conductive coating composition useful in the manufacture of an elongated conductive means comprising:
(a) about 0.75 percent to about 35 percent total elemental carbon, by weight of the composition;
(b) about 25 percent to about 90 percent of a polymeric binder, by weight of the composition;
(c) about 9.25 percent to about 74.25 percent of a carrier, by weight of the composition; and
(d) about 0 percent to about 5 percent of a surfactant, by weight of the composition;
wherein about 5 percent to about 90 percent of said total elemental carbon, by weight of the elemental carbon, is a ground coal-based, calcined coke, said coke demonstrating an E_c value of about 27 to about 80.

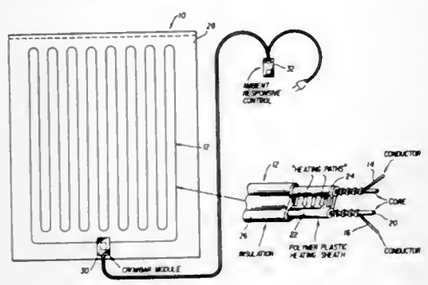
VOL 1101 ISS 1 APR 4 1989 UMI

4,818,439

PTC COMPOSITIONS CONTAINING LOW MOLECULAR WEIGHT POLYMER MOLECULES FOR REDUCED ANNEALING

Brian D. Blackledge, Taylorsville, and William M. Rowe, Jr., De Kalb, both of Miss., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Jan. 30, 1986, Ser. No. 824,193
Int. Cl.⁴ H01B *1/06*
U.S. Cl. 252—511 **15 Claims**



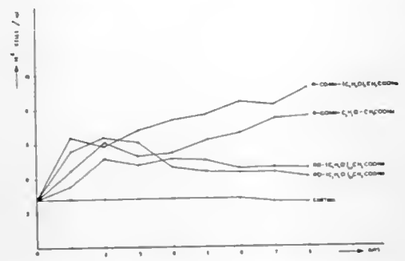
1. An electrically conductive composite polymer material comprising a suitable finely divided electrically conductive carbon black in an amount of 4 to 25% by weight dispersed within an olefinic polymer wherein the polymer has a number average molecular weight in the range of about 15,000 to 40,000 to reduce the annealing time necessary to achieve an electrically conductive material exhibiting PTC behavior to less than one minute.

4,818,440

NOVEL POLYETHER CARBOXYLIC ACID DERIVATIVES, AS WELL AS THEIR USES

Werner Schäfer, Oberwil; Rolf Schäfer; Doris Schäfer, both of Ariadorf, all of Switzerland; Johan G. Aalbers, As Bodegraven, and Jacob K. Smid, Sx Bodegraven, both of Netherlands, assignors to Stamicarbon B.V., Bodegraven, Netherlands

Filed Aug. 16, 1983, Ser. No. 523,781
Claims priority, application Netherlands, Aug. 19, 1982, 8203257
Int. Cl.⁴ A61K *7/50*; C07C *103/50*; C11D *1/10, 17/08*
U.S. Cl. 252—546 **13 Claims**



1. In a composition for prolonged or multiple contact with the human skin and containing a detergent agent, the improvement wherein said detergent agent consists essentially of at least one detergent selected from the group consisting of compounds of the formula:

$$R—CO—NH—(C_2H_4O)_n—CH_2COOH,$$

wherein R—CO— is the residue of at least one aliphatic carboxylic acid of 6–22 carbon atoms and n represents a number having an average value of 2–10, as well as their salts with alkali metals, ammonium and amines, and at least a carrier therefor.

12. In a method involving substantial contact of human skin with a detergent composition, comprising the step of bringing the detergent composition into contact with the skin repeatedly or for a prolonged period of contact, the improvement comprising reducing secondary toxicity by using as a said detergent a compound of the formula:

$$R—CO—NH—(C_2H_4O)_n—CH_2COOH,$$

wherein R—CO— is the residue of at least one aliphatic carboxylic acid of 6–22 carbon atoms and n represents a number having an average value of 2–10, as well as their salts with alkali metals, ammonium and amines.

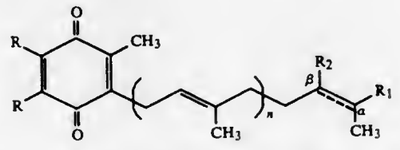
4,818,441

QUININE DERIVATINES

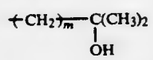
Isuke Imada, Izumi; Shinji Terao, Toyonaka; Mitsuru Kawada, Amagasaki, and Mitsuru Shiraishi, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 1, 1980, Ser. No. 165,009
Claims priority, application Japan, Jul. 2, 1979, 54-84291
Int. Cl.⁴ C07C *50/02, 50/26*
U.S. Cl. 260—396 R **14 Claims**

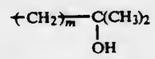
1. A compound of the formula:



wherein α=β is a saturated bond or a double bond; each R independently of one another is methyl or methoxy, or the two R groups taken together represent —CH=CH—CH=CH—; when α=β is a saturated bond, R_2 is hydrogen or hydroxyl; when α=β is a double bond, R_2 is hydrogen; when α=β is a double bond or when R_2 is hydroxyl, R_1 is carboxyl, $-(CH_2)_m OH$ wherein m is an integer of 1 through 3, or



wherein m is an integer of 1 through 3; when α=β is a saturated bond and R_2 is hydrogen, R_1 is hydroxymethyl or



wherein m is an integer of 1 through 3; and n is zero or an integer of 1 through 9, provided that when α=β is a double bond and at the same time R_1 is $-(CH_2)_m OH$, n is an integer of 1 through 9, and provided that when α=β is a saturated bond and at the same time R_2 is hydrogen and at the same time R_1 is CH_2OH, each R independently of one another is methyl or methoxy, and provided that when α=β is a double bond and at the same time R_1 is COOH, n is an integer of 1 through 5 or 7 through 9,

or a pharmaceutically acceptable salt thereof.

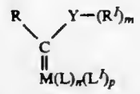
4,818,442

DISPROPORTIONATION PROCESS

John W. Vanderveen, and Dennis S. Banasiak, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 9, 1984, Ser. No. 658,926
Int. Cl.⁴ C07C *67/475, 41/30, 6/04, 17/26*
U.S. Cl. 260—405.5 **8 Claims**

1. A process for the disproportionation of olefins comprising (1) contacting said olefins under suitable reaction conditions with a catalyst comprising a neutral carbene-metal complex having the general formula



wherein R is selected from the group consisting of alkyl or cycloalkyl radicals containing 1 to 10 carbon atoms per radical, aryl or substituted aryl radicals containing 6 to 30 carbon atoms per radical wherein the substituted aryl radicals can have one or more substitutents each of which can be the same or different and selected from the group consisting of halides, alkoxides, and alkyl radicals containing 1 to 20 carbon atoms per radical; wherein R^I is selected from the group consisting of alkyl, cycloalkyl, aryl, substituted aryl, triarylsilyl, and trialkylsilyl radicals containing 1 to 30 carbon atoms per radical and wherein the aryl substituents are as described for R; M can be Cr, when said metal compound component contains Ti, or M can be W or Re; Y is O, Se, S, N, or P, each L is a neutral ligand individually selected from CO, NO, PR_3^I, PCl_3, RF_3, and pyridine, where R^I is as defined above, and L^I is cyclopentadienyl; p is 0 or 1; n is 5 when p is 0 or 2 when p is 1; and m is 2 when Y is N or P and 1 when Y is 0, Se, or S, and (2) removing the catalyst from the reaction product by contacting said reaction product with anhydrous ammonia to obtain a solid which is separated from the liquid.

4,818,443

CARBOCYCLIC DERIVATIVES

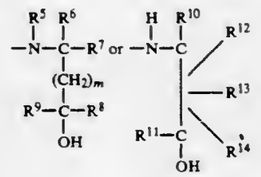
Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 801,060, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 673,531, Nov. 20, 1984, abandoned. This application Jan. 19, 1988, Ser. No. 145,601
Int. Cl.⁴ C07C *93/00, 87/28*
U.S. Cl. 260—501.18 **7 Claims**

1. A compound of the formula

$$ArCH_2R^1$$

or a pharmaceutically acceptable acid addition salt thereof wherein R^1 contains not more than eight carbon atoms and is a group



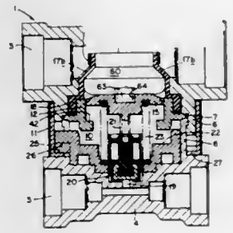
wherein
m is 0 or 1;
R^5 is hydrogen;
R^6 and R^7 are the same or different and each is hydrogen or C_{1-5} alkyl optionally substituted by hydroxy;
R^8 and R^9 are the same or different and each is hydrogen or C_{1-3} alkyl;
—CC— is a five- or six-membered saturated carbocyclic ring;
R^{10} is hydrogen, methyl or hydroxymethyl;
R^{11}, R^{12} and R^{13} are the same or different and each is hydrogen or methyl;
R^{14} is hydrogen, methyl, hydroxy, or hydroxymethyl and Ar is 4H-cyclopenta[def]phenanthrene.

4,818,444

FLUID PRESSURE CONTROL VALVE AND A SYSTEM WHICH INCLUDES SUCH A VALVE

John B. Hedderick, Middlesex; Brian R. Rutty, Addlestone, and John J. Walshe, Minety, all of Great Britain, assignors to Arthur Guinness Son and Company (Great Britain) Limited, Great Britain

Filed Apr. 28, 1988, Ser. No. 187,273
Claims priority, application United Kingdom, May 1, 1987, 8710367
Int. Cl.⁴ G05D *11/03*
U.S. Cl. 261—30 **26 Claims**



1. A fluid pressure control valve comprising discrete first and second passages, the second fluid passage having an exhaust port controlled by closure means having associated therewith biasing means which acts to normally close the exhaust port, the force exerted by the biasing means varying in response to displacement of sensing means which sensing means is displaceable in response to fluid pressure variations in the first passage whereby as fluid pressure in the first passage increases towards or above a predetermined value the sensing means is displaced to increase the biasing force on the closure means and as fluid pressure in the first passage decreases towards or below the predetermined value the sensing means is displaced to decrease the biasing force on the closure means and wherein means is provided for adjusting the sensing means to determine the predetermined pressure required in the first passage variations from which predetermined pressure causes the displacement of the sensing means.

4,818,445

APPARATUS FOR TREATING A SOLUTION OR A SLURRY SOLUTION

Masakazu Onizuka; Atsushi Tatani; Katsuhiko Yamada; Masao Hino; Nobutaka Maeda, all of Kanoashia, and Tokuma Arai, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

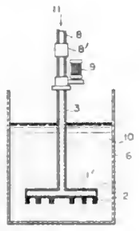
Filed May 12, 1987, Ser. No. 48,682
Claims priority, application Japan, May 12, 1986, 61-70007[U]; Jun. 3, 1986, 61-83616[U]; Jun. 3, 1986, 61-83618[U]; Apr. 13, 1987, 62-88947
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—87 **8 Claims**

1. An apparatus for treating a solution or a slurry which comprises
a container,
a hollow shaft rotably disposed within said container,

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a plurality of hollow stirring branch pipes extending from and communicating with the lower end of said shaft,

a plurality of hollow gas jet pipes extending from said respective branch pipes toward the bottom of the container an being opened at the lower ends thereof, wherein with regard to said gas jet pipes, the front surfaces and back surface thereof are convexly curved and flat, respectively, in a cross-sectional view,



a means for sealing said shaft and

a means for rotating said shaft, whereby as said shaft is rotated, a gas, which is introduced into said shaft is jetted from openings of said jet pipes through said sealing means, said shaft and said branch pipes, so as to feed said gas to a gaseous phase section formed behind each of said jet pipes.

4,818,446

APPARATUS FOR INTRODUCING A GAS INTO A FLUID

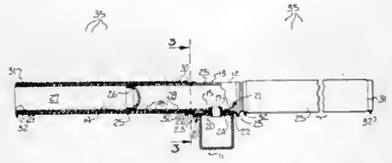
Berthold Schreiber, and Erhard Schreiber, both of Hanover, Fed. Rep. of Germany, assignors to Schreiber Corporation, Inc., Trussville, Ala.

Filed Oct. 29, 1987, Ser. No. 113,972

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1986, 3636882

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—122 **20 Claims**



1. An apparatus for introducing gas in the form of fine bubbles into a liquid and which is useful for the aeration of waste water or the like, and comprising

a gas supply pipe,

an elongate integral one-piece gas diffuser pipe having a medial portion, and opposite end portions integral with said medial portion, and having plug means disposed in each of said end portions so as to define a closed gas chamber between said plug means and an open ended flooding chamber in each of said opposite end portions, and at least one gas distribution opening extending through each of said opposite end portions and within said closed gas chamber.

means mounting said medial portion of said gas diffuser pipe to said gas supply pipe so as to provide gas communication between said gas supply pipe and said closed gas chamber of said gas diffuser pipe, and

an elastomeric diffuser sleeve disposed coaxially over each of said end portions of said diffuser pipe and so as to overlie the associated gas distribution opening, with each of said sleeves having a multiplicity of perforations therein,

whereby gas from said gas supply pipe is adapted to enter into said closed gas chamber and then pass through said distribution openings and said perforations of said diffuser sleeves to form fine bubbles in the liquid being treated, and so that the liquid being treated enters said open ended flooding chambers to reduce the buoyancy of the apparatus.

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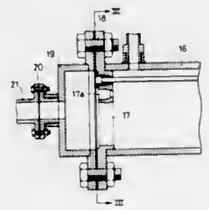
APPARATUS FOR MASS TRANSFERRING BETWEEN PHASES DIFFERENT FROM EACH OTHER

Yoshihiko Iwasaki, Miyazaki, Japan, assignor to Kiyomoto Tekko Kabushiki Kaisha, Japan

Filed Apr. 27, 1987, Ser. No. 43,221

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—122 **1 Claim**



1. An apparatus for contact between phases different from each other, comprising:

an outer tubular column **16** formed at side wall portions thereof with a nozzle for feeding fluid and a nozzle for discharging fluid;

at least one tube fixing member **17** each having a peripheral edge portion formed into a collar shape, and a central portion formed large in wall thickness, said thick wall portion being formed therein with a plurality of through-holes **17a** which are formed at the innermost portion thereof with an inwardly raised annular stepped portion and at the inlet portion thereof with threads, said peripheral edge portion being coupled and fixed to an opening of said outer tubular column **16**;

porous tubes **5** made of a glass material, inserted through openings at the innermost positions of the plurality of through-holes **17***a* of said tube fixing member **17** and having a multiplicity of pores each having a size of 0.1 to 10 micrometers;

O-rings **23** disposed at the annular stepped portions in the plurality of through-holes **17***a* of said tube fixing member **17**;

a plurality of collars **22**, one end of each of which is in contact with said O-ring in the plurality of through-holes **17***a*;

a plurality of fixing metals **24** each formed on the outer periphery thereof with threads which are threadably coupled to the threads of the plurality of through-holes **17***a*; and

a cover **19** having a collar portion fixed to said collar shaped peripheral edge portion of said tube fixing member **17** through a packing **20**;

wherein, in a state where said fixing metal is threadably coupled to said through-hole **17***a*, said O-ring **23** is deformed, whereby, only by the deformation of said O-ring, said porous tube **5** can be contacted and held.

4,818,448

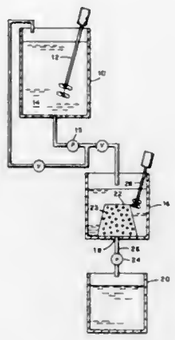
METHOD FOR FABRICATING LIGHT WEIGHT CARBON-BONDED CARBON FIBER COMPOSITES

George E. Wrenn, Jr., Clinton; Leonard A. Abbatiello, and John Lewis, Jr., both of Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 17, 1987, Ser. No. 63,059

Int. Cl.⁴ B29C *41/16, 71/02*

U.S. Cl. 264—29.2 **5 Claims**



1. Method of fabricating a carbon-bonded carbon fiber composite of a density in a range of about 0.04 to 0.10 grams per cubic centimeter, comprising the steps of forming an aqueous slurry containing about 100 to 500 ppm of solid material consisting essentially of carbonaceous fibers and a carbonizable binder provided by a corable thermosetting resin precursor, contacting a surface of a perforated and configured mandrel with the aqueous slurry, depositing solid material from the aqueous slurry onto the surface of the mandrel by draining water from the aqueous slurry through perforations in the mandrel with gravity flow at a flow rate in the range of 0.03 to 0.30 liters of water per minute per square inch of surface area on said mandrel contacted by said aqueous slurry, continuing the deposition of the solid material onto said mandrel until a billet of the solid material of a desired thickness is formed, heating the billet for curing the resin precursor, removing the molded billet from the mandrel, and thereafter heating the billet in an inert atmosphere to a temperature sufficient to carbonize carbonizable material in said billet for providing said carbon-bonded, carbon fiber composite.

4,818,449

PROCESS TO PREVENT CRACK FORMATION IN THE PRODUCTION OF CARBON FIBERS

Yasuhiro Yamada; Takeshi Imamura, both of Tosu; Hidemasa Honda, Tokyo; Masatoshi Tsuchitani, and Ryoichi Nakajima, both of Ichihara, all of Japan, assignors to Itaru Todorok, Director-General of Agency of Industrial Science and Technology and Maruzen Petrochemical Co., Ltd., both of Tokyo, Japan

Filed Jan. 13, 1986, Ser. No. 818,499

Claims priority, application Japan, Jan. 19, 1985, 60-7699

Int. Cl.⁴ D01F *9/12*

U.S. Cl. 264—29.2 **10 Claims**

1. A process for producing carbon fibers from a mesophase pitch by melt spinning which comprises extruding in a molten mesophase pitch through a spinning nozzle hole, rendering the extruded pitch fibers thus obtained into an infusible state by heating under an oxidizing atmosphere and then carbonizing or graphitizing said pitch fibers by heating under an inert atmosphere, wherein the spinning is accomplished by constraining said pitch to flow through a plug means forming a spiral passage substantially around the axis of said spinning nozzle hole to give a rotary motion to said molten mesophase pitch just



before extruding said pitch through said nozzle hole, to thereby effectively prevent crack formation in said fibers.

4,818,450

APPARATUS AND METHOD FOR FORMING PELLETS

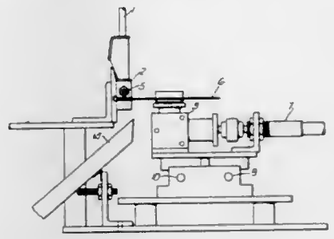
Alan J. Hall, Stockton on Tees; Frank A. Kirk, Easingwold; Alan M. Patterson, Guisborough, and Peter M. Paxton, Northallerton, all of England, assignors to Imperial Chemical Industries, PLC, Great Britain

Filed Oct. 27, 1986, Ser. No. 923,218

Claims priority, application United Kingdom, Nov. 8, 1985, 8527661; Apr. 30, 1986, 8610612; Aug. 7, 1986, 8619329

Int. Cl.⁴ B29C *47/00*

U.S. Cl. 264—39 **8 Claims**



1. A process of forming pellets with little squashing which comprises extruding a strand of deformable pellet forming material, passing the strand downwards for a substantial distance under the influence of gravity and then cutting it horizontally by holding the strand at a cutting position against a cutting blade at least partially by blowing gas against the strand in a direction opposing the cutting blade and severing pellets from the strand by passing the blade substantially horizontally through the strand whilst the strand is in a deformable condition and held by the gas.

6. Apparatus for forming pellets of deformable material with little squashing which comprises:

an extruder for extruding a strand of said deformable material, said extruder being adapted to pass the strand downwardly under the influence of gravity;

a blade at a cutting position a substantial distance below said extruder;

means at said cutting position for passing said blade substantially horizontally through said strand to cut said strand while it is in a deformable condition; and

means for at least partly blowing gas against said strand in a direction opposing said blade when said strand is at said cutting position for holding said strand against said blade as said strand is cut.

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4,818,451

METHOD OF PREPARING A FOAMED MOLDED ARTICLE AND BLOW-FILLING GUN APPARATUS FOR USE THEREIN

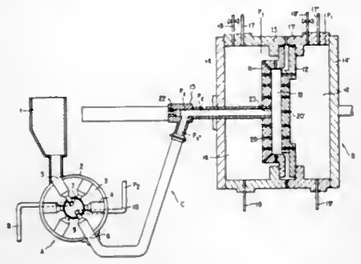
Masakazu Arai, and Masahiro Tanaka, both of Mie, Japan, assignors to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

Filed Apr. 2, 1987, Ser. No. 33,351

Claims priority, application Japan, Apr. 2, 1986, 61-74319; May 8, 1986, 61-103878

Int. Cl.[4] C08J *9/22;* **B29B** *13/00;* **B29C** *13/06*

U.S. Cl. 264—40.3 **13 Claims**



1. A method of molding pre-foamed synthetic resin particles into a foamed molded article, which comprises the steps of:

increasing the pressure in a mold cavity having a charging port with a pressurized gas;

charging said mold cavity with pre-foamed synthetic resin particles as they are compressed with a gas pressurized to a pressure higher than the pressure in the mold cavity through a conduit into the mold cavity;

controlling said charging such that the supply of pre-foamed resin particles is stopped when the pressure within said conduit or said charging port, as detected by a pressure sensitive switch, exceeds the pressure in the mold cavity by a predetermined amount; and

heating the charged pre-foamed synthetic resin particles with steam so that they are fused together or expanded and fused together to form a foamed molded article.

4,818,452

METHOD OF MANUFACTURING AN INTEGRAL ASYMMETRICAL MEMBRANE

Klemens Kneifel, Geesthacht; Klaus-Viktor Peinemann, Reinbek, and Rudolf Waldemann, Lauenburg, all of Fed. Rep. of Germany, assignors to GKSS Forschungszentrum Geesthacht GmbH, Geesthacht, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,226

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 37169165

Int. Cl.[4] B01D *13/01*

U.S. Cl. 264—41 **14 Claims**



1. A method comprising manufacturing an integral asymmetrical hollow-filament membrane for the separation of liquid or gaseous mixtures, by,

providing a membrane-forming agent in the form of a polyetherimide;

mixing said polyetberimide with a solvent that is miscible with water; then

accommodating the resulting polyetherimide/solvent mixture in a geometrical form; and then

bringing said form into contact with a precipitating agent and providing posttreatment.

4,818,453

PROCESS FOR MAKING POROUS RESIN AND MOLDED PRODUCT CONTAINING CONTINUOUS HOLES

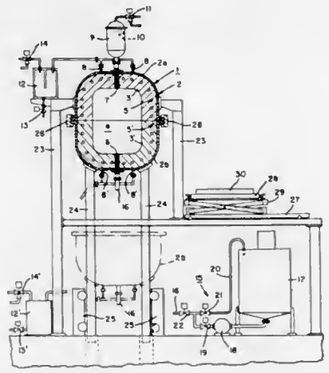
Saihachi Inoue; Shigeru Kiriyama, and Kazuhiro Imada, all of Osaka, Japan, assignors to Inax Corp., Aichi and I-N Technical Lab, Ltd., Osaka, both of, Japan

Division of Ser. No. 826,547, Feb. 6, 1986, Pat. No. 4,763,489. This application Sep. 1, 1987, Ser. No. 91,707

Claims priority, application Japan, Feb. 13, 1985, 60-27239

Int. Cl.[4] C08J *9/28*

U.S. Cl. 264—41 **16 Claims**



7. A method for making a porous resin mold containing continuous pores wherein the molding material is an epoxy resin mixture, the steps comprising:

mixing together an epoxy compound having one or more epoxy groups in each molecule and an emulsifier comprising at least two non-ionic emulsifiers selected from the group consisting of a sorbitan aliphatic acid ester having a hydrophile-lipophile balance value of about **4–8**, a polyoxyethylene oleylether having a hydrophile-lipophile balance value of about **8–17**, and a polyoxyethylene sorbitan aliphatic acid ester having a hydrophile-lipophile balance value of about **11–15.6**;

adding to said mixture a hardener which reacts with and hardens the epoxy compound;

stirring the resulting epoxy compound emulsifiers and hardener into an even emulsion while adding water; and

adding a filler to said even emulsion while stirring.

4,818,454

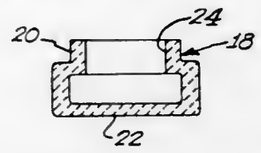
METHOD OF MAKING CERAMIC COMPOSITE ARTICLES BY INVERSE SHAPE REPLICATION OF AN EXPENDABLE PATTERN

Andrew W. Urquhart, Newark, and E. Allen LaRoche, Jr., Middletown, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 907,919, Sep. 16, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 206,999

Int. Cl.[4] C04B *33/32*

U.S. Cl. 264—59 **27 Claims**



1. A method for producing a self-supporting ceramic composite body having therein at least one cavity which inversely replicates the geometry of a pattern, said composite body comprising a ceramic matrix obtained by oxidation of a parent metal to form a polycrystalline material comprising an oxidation reaction product of said parent metal with an oxidant, and a filler infiltrated by said ceramic matrix, the method comprising the steps of:

(a) providing an expendable pattern material;

(b) packing said pattern material within a bed of conformable filler to inversely replicate therein the geometry of said pattern material, said bed of filler being characterized by (1) being permeable to said oxidant under the process conditions in step (c) and being permeable to infiltration by the growth of the oxidation reaction product through said filler, and (2) at least in a support zone thereof enveloping said pattern material having sufficient cohesive strength under the process conditions in step (c) to retain the inversely replicated geometry within said bed;

(c) replacing said pattern material with a quantity of parent metal and maintaining a temperature above the melting point of said parent metal but below the melting point of said oxidation reaction product to maintain a body of molten parent metal and, at said temperature,

(1) reacting the molten parent metal with said oxidant to form said oxidation reaction product,

(2) maintaining at least a portion of said oxidation reaction product in contact with and between said body of molten metal and said oxidant, to progressively transport molten metal from said body of molten metal through the oxidation reaction product and into said bed of filler to concurrently form said cavity in said bed of filler as oxidation reaction product continues to form at the interface between said oxidant and previously formed oxidation reaction product, and

(3) continuing said reacting for a time sufficient to at least partially infiltrate said filler with said oxidation reaction product by growth of the latter to form said composite body having said cavity therein; and

(d) recovering the resulting self-supporting composite body.

4,818,455

HIGH THERMAL CONDUCTIVITY CERAMIC BODY

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 30, 1986, Ser. No. 868,490

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[4] C04B *35/58;* **F27D** *7/06*

U.S. Cl. 264—65 **22 Claims**

1. A process for producing a sintered polycrystalline aluminum nitride ceramic body having a composition defined and encompassed by polygon ABCFGH of FIG. 2, a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 0.70 W/cm·K at 25° C. which consists essentially of the steps:

(a) forming a mixture consisting essentially of an oxygen-containing aluminum nitride powder, gadolinium oxide and free carbon, shaping said mixture into a compact, said mixture and said compact having a composition wherein the equivalent % of said gadolinium and aluminum ranges from point A to point F of FIG. 2, said gadolinium ranging from about 8.0 equivalent % to about 0.3 equivalent %, said aluminum ranging from about 92.0 equivalent % to about 99.7 equivalent %, said mixture and said compact having an equivalent % composition of Gd, Al, O and N outside the composition defined and encompassed by polygon ABCFGH of FIG. 2,

(b) heating said compact in a nitrogen-containing nonoxidizing atmosphere at a temperature ranging from about 1350° C. to a temperature sufficient to deoxidize the compact but below its pore closing temperature reacting said free carbon with oxygen contained in said aluminum nitride producing a deoxidized compact, said deoxidized compact having a composition wherein the equivalent % of Al, Gd, O and N is defined and encompassed by polygon ABCFGH of FIG. 2, said free carbon being in an amount which produces said deoxidized compact, and

(c) sintering said deoxidized compact in a nitrogen-containing nonoxidizing atmosphere at a minimum temperature of about 1840° C. producing said polycrystalline body.

4,818,456

SIMPLIFIED PROCESS FOR OBTAINING POLYESTER YARNS AT HIGH SPEED

Gerard Perez, and Rene Vielily, both of Lyon, France, assignors to Rhone-Poulenc Fibres, Lyon, France

Continuation of Ser. No. 786,356, Oct. 11, 1985, abandoned, which is a continuation of Ser. No. 580,265, Feb. 15, 1984, abandoned. This application Aug. 20, 1987, Ser. No. 88,536

Claims priority, application France, Feb. 16, 1983, 83 02628

Int. Cl.[4] D01F *6/62;* **D01D** *5/088, 5/12*

U.S. Cl. 264—103 **5 Claims**



1. A process for high-speed spinning of polyester based filaments which comprises:

cooling filaments with a gaseous fluid after they have left a spinning die;

simultaneously bringing the filaments together and oiling them at a convergence point situated at a distance L_1 from the die such that $L_o \leqq L_1 \leqq (L_o+30)$ cm, the value of L_o corresponding to the first point at which the derivative of a curve expressing the birefringence Δn of the filaments as a function of the distance (in cm) relative to the die passes

through a maximum, under the desired spinning conditions; and

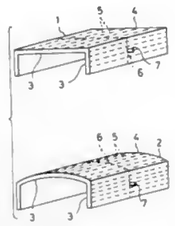
directly winding the filaments on a bobbin at a speed greater than 4,500 m/min and at a tension no greater than about 2 cN/tex, wherein the maximum distance between the die and the point of deposition of the yarn on the bobbin being 100 to 200 cm.

4,818,457

METHOD OF MAKING MOLD USED IN SLIP CASTING PROCESS

Haruyuki Ito, and Akio Matsumoto, both of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan

Filed Jul. 24, 1987, Ser. No. 77,294
Claims priority, application Japan, Jul. 26, 1986, 61-176372
Int. Cl.⁴ B29C *33/38, 39/10, 39/12, 67/12*
U.S. Cl. 264—130 **7 Claims**



1. A method of making a mold used in a pressure slip casting process, said method comprising the steps of:

preparing at least two porous bodies, each defining a filter layer having a plurality of channels formed therein for allowing water and air to flow therethrough;

placing a first reinforcing iron frame and one of said at least two porous bodies on a bottom board with a parting agent applied to a surface of said bottom board;

applying a sealing resin to an outermost surface of said one porous body opposite to a molding surface thereof and to a portion of said surface of said bottom board between said first reinforcing iron frame and said one porous body to provide a parting face;

applying an adhesive to said sealing resin on said outermost surface and on said parting face and to an inner surface of said first reinforcing iron frame after said sealing resin has cured;

filling a space between said one porous body and said first reinforcing iron frame with a filler to form a first part of said mold; and

preparing a second part of said mold, said second part preparing step including the sub-steps of:

turning said first part upside down together with said one porous body and said first reinforcing iron frame to direct said parting face upward and applying a parting agent to said parting face;

overlaying the other of said at least two porous bodies on said one porous body;

overlaying a second reinforcing iron frame on said first reinforcing iron frame;

applying a sealing resin to an outermost surface of said other porous body opposite to a molding surface thereof and to said parting face of said first part;

applying an adhesive to said sealing resin and an inner side of said second reinforcing iron frame after said sealing resin has cured;

filling a space between said second reinforcing iron frame and said other porous body with a filler; and

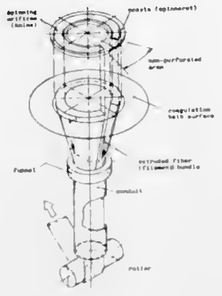
parting said second part from said first part after said filler has cured.

4,818,458

METHOD OF PRODUCING ACRYLIC FIBERS

Akira Sugiura; Shigeru Sawanishi, and Noboru Ogawa, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Nov. 4, 1986, Ser. No. 926,625
Claims priority, application Japan, Nov. 26, 1985, 60-266741
Int. Cl.⁴ D01F *6/18*
U.S. Cl. 264—182 **1 Claim**



1. A method of producing acrylic fibers which comprises:

dry-wet spinning an acrylonitrile polymer spinning solution through an annular type spinneret having a perforated part with more than 3,000 spinning orifices and further having one non-perforated part with no spinning orifices extending from the outer periphery to the inner periphery of the spinneret, wherein the non-perforated part has an area in the range of from 1/9 to 1/5 of the perforatable area of the spinneret, and wherein the spinneret has an annulus and an interval between the spinning orifices which satisfy the following formula (IV):

$$W/p \leqq 100 \quad \text{(IV)}$$

wherein W represents the width of the annulus and p represents the interval between the spinning orifices;

passing the spun fibers through a coagulation bath of a coagulation liquid and having therein a funnel-shaped conduit which satisfies the following formula (I):

$$1{,}200 \leqq Re = Dup/\mu \leqq 6{,}000 \quad \text{(I)}$$

wherein Re represents the Reynold's number of the coagulation liquid, D represents the inner diameter of the conduit, U represents the speed of the coagulation liquid in the conduit, σ represents the density of the coagulation liquid and μ represents the viscosity of the coagulation liquid; and

stretching the fibers under conditions which satisfy the following formulas (II) and (III):

$$2 \leqq JS \leqq 20 \quad \text{(II)}$$

$$0.2 \leqq \log JS/\log TS \leqq 0.7 \quad \text{(III)}$$

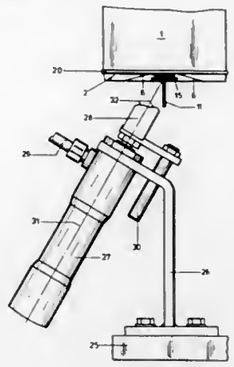
wherein JS represents a jet stretch ratio and TS represents a total stretch ratio.

4,818,459

LID OF A LIQUID PACK WITH PROCESS AND APPARATUS FOR PRODUCING THE SAME

Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Developpement S.A., Pully, Switzerland

Continuation of Ser. No. 910,784, Sep. 23, 1986, abandoned, Continuation of Ser. No. 701,887, Feb. 15, 1985, abandoned. This application Nov. 3, 1987, Ser. No. 120,246
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405253
Int. Cl.⁴ B29C *53/02*
U.S. Cl. 264—295 **4 Claims**



1. A method of forming a lid for a liquid pack, comprising the steps of:

molding in a mold from a thermoplastic material in a plastic state an end wall for the pack, said end wall having a peripheral edge, said end wall defining a pouring opening therein, an opening flap portion having a planar cover wall and a collar depending from said cover wall about the periphery thereof, said collar fitting securely within said pouring opening, a hinge connected to said opening flap and said end wall, and a planar handle connected to said end wall along a handle base to extend normally outward from said end wall;

opening said mold at least sufficiently to expose said handle and an outer surface of said end wall;

folding said handle, while still in a plastic state, through 90° substantially along said handle base to a position against said cover wall; and

retaining said handle in said position until said thermoplastic material hardens, whereby said handle is disposed in said position to facilitate stacking prior to initial opening of the pack, and may be returned to an upright position by a user to facilitate opening of the pack.

4,818,460

ROLLER FORMING OF THERMOPLASTIC SHEET MATERIAL

Herman F. Nied, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 843,343, Mar. 24, 1986, abandoned. This application Aug. 18, 1987, Ser. No. 87,053
Int. Cl.⁴ B29C *51/00*
U.S. Cl. 264—310 **13 Claims**

10. A method of forming thermoplastic parts comprising the steps of:

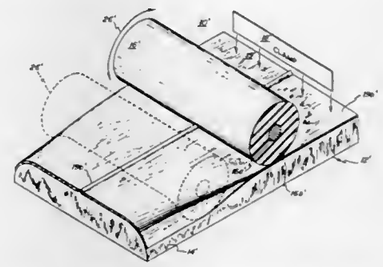
providing a metal form including a surface of predetermined curvature which varies in height along both the length and width of the form;

providing a substantially flat sheet of thermoplastic material having predetermined size and shape approximately equal to that of the form surface;

overlying said surface of said metal form with said thermoplastic sheet;

clamping a first end of said thermoplastic sheet to said metal form for preventing slippage therefrom;

heating the entire thermoplastic sheet; and



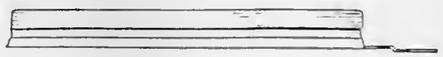
providing pressure on said thermoplastic sheet using a pliable roller moved in a direction substantially perpendicular to said sheet first end so that said sheet conforms to the form surface.

4,818,461

METHOD FOR SCORING RIGID PLASTIC SHEET MATERIAL

Edward E. Batson, Mesa, and John H. Kurz, Scottsdale, both of Ariz., assignors to WMF Container Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 774,225, Sep. 5, 1985, abandoned. This application Aug. 11, 1986, Ser. No. 895,206
Int. Cl.⁴ B29C *43/04, 59/02*
U.S. Cl. 264—325 **9 Claims**



1. A method for forming finger rupturable frangible score lines in a plastic container lid of rigid plastic sheet material to provide a finger removable portion in said plastic container lid comprising:

(a) selecting said lid of rigid plastic sheet material adapted for use in food and beverage containers;

(b) placing said lid of sheet material over a female die member having a serrated edge associated therewith, said sheet material of said lid overlapping the edges of said female die member; and,

(c) applying force to said lid of sheet material on the opposite side of said material from said female die by means of a punch member which slightly overlaps the edges of said female die whereby said fracturable score line is formed having corrugations corresponding to the points and notches of said serrated edge of said female die to form said finger rupturable frangible score line in said rigid plastic sheet material of said plastic container lid.

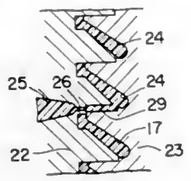
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4,818,462

METHOD AND APPARATUS OF INJECTION MOLDING FRONT GRILL PANELS OF ROOM AIR CONDITIONER UNITS AND THE LIKE

Mitsuo Murano, Fujinomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 19, 1987, Ser. No. 63,838
Claims priority, application Japan, Jun. 26, 1986, 61-150515
Int. Cl.[4] B29C 45/27
U.S. Cl. 264—328.8 5 Claims



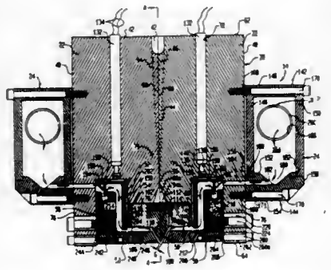
1. In a method of injection molding a louvered article having numerous transverse parallel slats of outward-upward inclinations, including injecting molten resin into cavities formed between a stationary half mold and a movable half mold, along a parting line thereof, the molten resin being injected into said cavities through pin-point gates formed on the stationary half mold side and tab gates also formed on the stationary half mold side, each pin-point gate communicating with a mold cavity through an associated tab gate, said tab gates positioned on the mold at positions corresponding to the upper edge faces of the transverse slats, said pin-point gates being connected to the side faces of the tab gates.

4,818,463

PROCESS FOR PREPARING NON-WOVEN WEBS

Peter G. Buehning, 10 Nottingham Rd., Short Hills, N.J. 07078

Continuation of Ser. No. 856,727, Apr. 26, 1986, abandoned.
This application Nov. 20, 1987, Ser. No. 124,344
Int. Cl.[4] D01D 5/14
U.S. Cl. 264—40.1 8 Claims



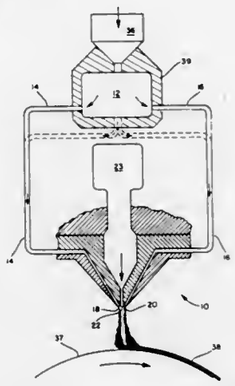
1. A process for producing a non-woven web of thermoplastic polymer fibers comprising:
(a) extruding thermoplastic polymer through a row of die openings in a triangular cross-sectional die head of a die body;
(b) discharging gas along the entire length of the die onto each side of the molten resin as it is extruded to attenuate the molten resin as fibers in a plane away from said die openings, said gas having a substantially uniform velocity along the length of the die wherein said gas for each side is passed sequentially through a pipe discharging through a slit or plurality of holes into an air chamber designed to provide uniform velocity gas along the length of the air chamber, from the air chamber through a plurality of flow distribution holes in the die body, the gas discharging from the flow distribution holes into a longitunal groove in the die body as a plurality of streams said groove having gas deflector assembly to intermix the streams of gas discharging from the flow distribution holes and form said gas of substantially uniform velocity along the length of the die; and
(c) collecting the attenuated fibers on a receiver in the path of said plain to form said nonwoven web.

4,818,464

EXTRUSION PROCESS USING A CENTRAL AIR JET

Jark C. Lau, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 645,668, Aug. 30, 1984, abandoned.
This application Jun. 11, 1986, Ser. No. 872,992
Int. Cl.[4] B65H 54/00
U.S. Cl. 264—510 10 Claims



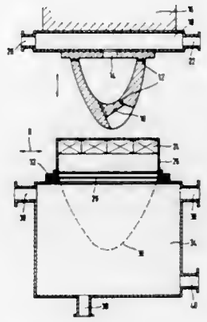
1. A method of producing fibers of a thermoplastic material comprising the steps of:
(a) forming a centrally positioned high velocity gas jet having initial jet shear layers of small scale turbulence located in the peripheral regions of the jet adjacent an outlet of thermoplastic material delivery means;
(b) extruding at least two streams of a molten thermoplastic material from said outlet of thermoplastic material delivery means, said thermoplastic material delivery means arranged at least partly surrounding an outlet of said high velocity gas jet;
(c) merging said at least two molten thermoplastic material streams with the shear layers of said high velocity gas jet to attenuate said thermoplastic material into fibers within said shear layers forming thereby a plurality of reduced diameter fiber streams of said thermoplastic material with said high velocity gas jet located between said fiber streams; and
(d) directing said plurality of fiber streams with said high velocity gas jet between them onto a collecting surface, forming thereby a melt blown non-woven mat.

4,818,465

PROCESS FOR THE PRODUCTION OF SHAPED PLASTIC ELEMENTS

Kurt Mente, Hanover, Fed. Rep. of Germany, assignor to J. H. Benecke GmbH, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 831,301, Feb. 20, 1986, abandoned.
This application Apr. 12, 1988, Ser. No. 183,360
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1985, 3505828
Int. Cl.[4] B29C 51/10
U.S. Cl. 264—522 9 Claims



1. A vacuum deep-drawing process for the production of a shaped thermoplastic article from a deep-drawable thermoplastic sheet comprising the steps of:
clamping said sheet in a clamping frame in a combined heating and cooling unit;
heating a first side and at least 30% of the thermoplastic sheet to within the plastic flow temperature range thereof;
simultaneously cooling a second side of the thermoplastic sheet to a temperature less than the plastic flow temperature range thereof;
deep-drawing said thermoplastic sheet by applying a molding tool against the first side of the sheet; and
applying a vacuum to said first side of said sheet so as to draw said first side against said molding tool.

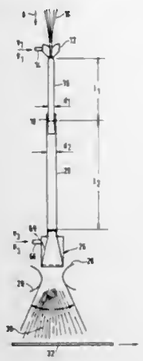
4,818,466

PROCESS FOR THE PRODUCTION OF NON-WOVEN MATERIAL FROM ENDLESS FILAMENTS

Kurt Mente, Hanover, and Gerhard Knitsch, Wedemark, both of Fed. Rep. of Germany, assignors to J. H. Benecke, AG, Hanover and Corovin GmbH, Peine, both of, Fed. Rep. of Germany

Filed Nov. 20, 1986, Ser. No. 932,555
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541127
Int. Cl.[4] D01D 11/02
U.S. Cl. 264—555 5 Claims

1. A process for the production of a non-woven material from endless filaments and a substrate comprising the steps of:
supplying to an input side of a filament draw-off nozzle a first gaseous propellant having a first predetermined input pressure and input volume to establish a filament draw-off force which draws endless filaments from spinnerets in the form of a warp into one end of a filament guide tube and moves said warp downwardly through said filament guide tube;
spreading said warp at the other end of said filament guide tube with a spreading extruder having Coanda shells that is attached to said filament guide tube so that said individual filaments are distributed in a substantially uniform manner on a substrate located below said Coanda shells; and
directing in a substantially downward direction at a location immediately above said Coanda shells a second gaseous propellant having a second predetermined input pressure and input volume that is lower than said first predetermined input pressure and input volume with at least one slot nozzle having a narrowing cross-section with its narrowest cross-section at an output opening to obtain further uniformity of said individual filaments distributed on said substrate to obtain said non-woven material.

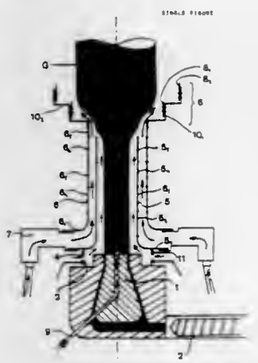


4,818,467

PROCESS FOR COOLING A TUBULAR SLEEVE OF THERMOPLASTIC MATERIAL AND A DEVICE FOR MAKING USE THEREOF

Joel Audurean, Noeux les Mines; Brigitte Morese-Seguela, Bethune, and Vincent Hervais, Bully les Mines, all of France, assignors to Societe Chimique des Charbonnages, societe anonyme, Paris la Defense, France

Filed Mar. 27, 1987, Ser. No. 30,615
Claims priority, application France, Mar. 28, 1986, 86 04498
Int. Cl.[4] B29C 47/88
U.S. Cl. 264—564 12 Claims



1. A process for cooling a tubular sleeve produced by hot extrusion-blowing of a thermoplastic material through an annular die, said tubular sleeve being in the shape of a cylinder having a diameter substantially equal to that of said die at a first stage, in the shape of a conical frustum at a second stage, and in the shape of a cylinder having the same axis as the cylinder of the first stage and a diameter greater than the cylinder of the first stage at a third stage, said process comprising the steps of:
flowing a stream of primary air under pressure substantially parallel to and spaced from said tubular sleeve at said first

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stage, said stream of primary air reaching said tubular sleeve at said second stage; and

flowing a stream of secondary air proximate to and along said tubular sleeve at said first stage, said stream of secondary air being in flow communication with the atmosphere and being induced by said stream of primary air and flowing substantially parallel and proximate to said tubular sleeve at said first stage, said stream of secondary air being substantially laminar over most of its path.

5. A device for cooling a tubular sleeve produced by hot extrusion-blowing of a thermoplastic material through an annular die provided at the end of an extruding means, said device comprising:

a first cylindrical sleeve member coaxially aligned with said die, said first sleeve member and said tubular sleeve defining a secondary air flow space;

a second cylindrical sleeve member coaxially aligned with said first sleeve member and having a diameter greater than said first sleeve member, said first and second sleeve members defining a primary air flow space therebetween and having upper ends disposed to direct air at said tubular sleeve at a location at which the diameter of said tubular sleeve increases to prevent said tubular sleeve from falling under the action of gravity;

a cyclindrical ring comprising at least one orifice having an adjustable opening, said ring being disposed proximate to and coaxially aligned with said die to direct air into said secondary air flow space proximate to said die;

a source of pressurized air; and

means for flow communicating said source of pressurized air and said primary air flow space, the flow of pressurized air through said primary air flow space inducing a flow of air through said secondary air flow space, said induced flow of air being substantially parallel to and along said tubular sleeve.

4,818,468

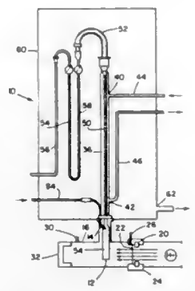
CONTINUOUS FLOW RADIOACTIVE PRODUCTION

John A. Jungerman; Neal F. Peck; Horace H. Hines, and Manuel Lagunas-Solar, all of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 821,270, Aug. 3, 1977. This application May 9, 1983, Ser. No. 491,343

Int. Cl.⁴ G21G *1/10*

U.S. Cl. 376—195 **12 Claims**



1. A process for preparing ^{123}I which comprises:

irradiating with a proton beam in an irradiation zone a liquid sample of XI as a target material, wherein X is alkali metal or I, the protons in said beam having an energy in the range of 60–70 MeV at a power level of at least about 5 μa, wherein the thickness of the XI sample is sufficient to reduce the energy of said particles by from about 15–25 MeV and said beam irradiating a substantial portion of said liquid sample in said zone;

continuously passing a stream of helium onto the surface of said liquid sample in said irradiation zone whereby ^{123}Xe produced by said irradiation is entrained with said helium and carried from the irradiation zone to a condensing zone;

cooling said helium stream in said condensing zone returning XI to said irradiation zone and transferring said helium stream to a collection zone;

condensing ^{123}Xe by cooling said helium stream in said collection zone to a temperature below the condensation temperature of ^{123}Xe, and collecting ^{123}Xe in said collection zone; and

allowing ^{123}Xe to decay to ^{123}I.

4,818,469

SEAL FOR TURNING VALVE BODIES, IN PARTICULAR FOR VALVES IN NUCLEAR-ENGINEERING PLANTS

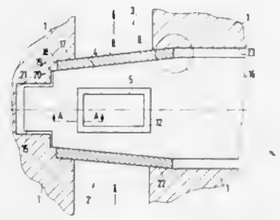
Helmuth Supik, Sarstedt, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 923,629

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1985, 3538306

Int. Cl.⁴ G21C *13/02*; F16K *5/02*

U.S. Cl. 376—203 **7 Claims**



1. In combination with a value in a nuclear plant, comprising a housing and a valve body, a seal composed of a molded flexible graphite element positioned on said body to seal said valve body against said housing, said element being coated with a thin flexible layer of tantalum.

4,818,470

APPARATUS FOR THE ULTRASONIC EXAMINATION OF SHROUD HOLD DOWN BOLTS

David L. Richardson, Los Gatos; Jack P. Clark, San Jose; Thurman D. Smith, San Jose, and Richard W. Perry, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 31, 1987, Ser. No. 91,174

Int. Cl.⁴ G21C *17/00*

U.S. Cl. 376—245 **5 Claims**

5. A process of testing hold down bolts depending from the sides of a steam separator within a nuclear reactor, said process comprising the steps of:

maintaining said steam separator under water;

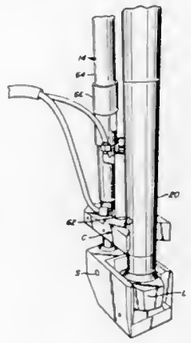
moving said bolts to unlatch said bolts from brackets on said shroud adjacent said steam separator;

providing a shoe having a piezoelectric device mounted to the bottom of said shoe and exposed upwardly;

providing a remotely actuated clamp attached to said shoe overlying said piezoelectric device;

providing a mount to said shoe for manipulating said shoe underwater in a depending relationship at the bottom end of a pole;

providing a pole and attaching said pole to said shoe;



manipulating said shoe to the bottom of said bolt;

clamping said shoe to said bolt; and testing said bolt with said piezoelectric device.

4,818,471

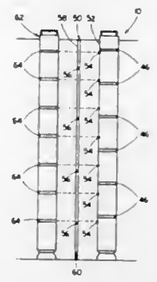
BWR FUEL ASSEMBLY CHANNEL WITH LOCALIZED NEUTRON ABSORBER STRIPS FOR LPRM CALIBRATION

Ronald M. Thomson, Monroeville, and Rusi P. Taleyarkhan, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1987, Ser. No. 83,402

Int. Cl.⁴ G21C *17/10*

U.S. Cl. 376—254 **7 Claims**



1. In the combination of at least one Local Power Range Monitor (LPRM) string and a plurality of fuel assemblies arranged in side-by-side spaced positions about said string, said LPRM string having a hollow tube and a plurality of neutron detectors located therein at spaced axial locations for providing local power monitoring information, said hollow tube of said string for receiving a neutron flux sensitive probe to calibrate said detectors, each of said fuel assemblies having a plurality of spaced fuel rods, an outer hollow tubular channel surrounding said fuel rods and a plurality of fuel rod spacers disposed within and axially along said channel and about said fuel rods so as to maintain them in side-by-side spaced relationship, all of said spacers of at least one of said fuel assemblies being composed solely of a material incapable of producing a localized change in neutron flux, the improvement which comprises:

a plurality of elements attached to the exterior of said channel of said at least one fuel assembly so as to be spaced from and in non-contacting relation with said channels of adjacent fuel assemblies and with said fuel rods of said one fuel assembly, located axially at different preselected positions therealong at each of which position it is desired to produce a localized change in netruon flux and located adjacent to and spaced from said hollow tube of said string, each of said elements being composed of a material capable of producing a localized change in neutron flux such that the sole function of said each element is to produce such localized change in neutron flux upon passage of the probe through said hollow tube of said string and past said elements, whereby the probe will sense the neutron flux change being produced by each of said elements and thereby the position of the probe can be tracked as it is moved through said string tube.

4,818,472

METHOD AND APPARATUS FOR THE WET DISMANTLING OF RADIOACTIVELY CONTAMINATED OR ACTIVATED COMPONENTS OF NUCLEAR REACTOR PLANTS

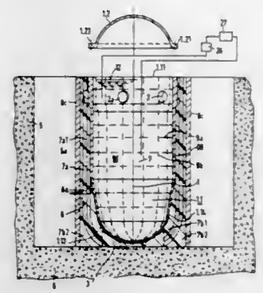
Hermann Operschall, Lauf, and Robert Weber, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 57,178

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1986, 8614813[U]; Oct. 13, 1986, 3634876

Int. Cl.⁴ G21C *19/00*; G21F *9/34*

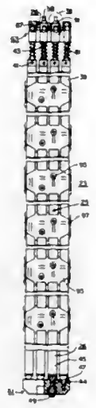
U.S. Cl. 376—260 **14 Claims**



9. Method for the wet dismantling of a radioactively contaminated or activated reactor pressure vessel disposed inside a reactor pit and spaced from a concrete biological shield defining a gap between the pressure vessel and the shield, which comprises severing coolant lines and closing connector stumps of the reactor pressure vessel at the end of the service lift of the pressure vessel, subsequently filling the gap between the presure vessel and the shield by casting or injection molding forming a sheathing, flooding the pressure vessel with water for radiation shielding, at least partly dismantling the pressure vessel into individual pieces through a material removing method, temporarily storing the individual pieces in the sheathing, and removing the individual pieces from the sheathing to a permanent storage location, the sheathing having a thickness sufficient to support at least part of the pressure vessel after dismantling the pressure vessel into individual pieces.

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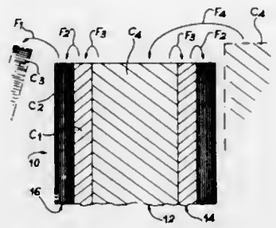
4,818,473
FUEL BUNDLE
Chun K. Lui, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 732,032, May 8, 1985, abandoned. This application Feb. 26, 1987, Ser. No. 20,190
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—261 **11 Claims**



10. The method of forming a fuel bundle of a nuclear reactor, said fuel bundle being formed of a top plate, a bottom plate, a plurality of fuel rods, and at last one tie rod, said tie rod having a key near its lower end and at its upper end being of non-circular transverse cross-section, said top plate having a non-circular opening to engage said upper end, said opening in said top plate having an inner peripheral surface which matches the outer surface of said upper end, said upper end being a slip fit in said opening in said top plate, and said upper end having a length so that it is capable of penetrating said opening and extending at least in part above said top plate, and said bottom plate having a receptacle for said key; the said method including: positioning said fuel rods in said bottom plate, positioning said tie rod in said bottom plate with said key passed through said receptacle to the underside of said bottom plate, after said tie rod is so positioned turning said tie rod so that the key is in engagement with the underside of said bottom plate, thereafter mounting said top plate in engagement with said fuel rods with the upper end of said tie rod extending through said opening in said top plate and extending above said top plate, and next securing said tie rod to the upper side of sid top plate thus simultaneously secnring said key to the underside of said bottom plate.

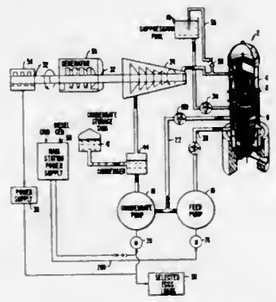
4,818,474
PROCESS FOR THE CONTROL OF THE CORE OF A PRESSURIZED NUCLEAR WATER REACTOR
Guy Malhoultre, Paris; Mathieu Israel, Bourg-la-Reine, and Gérard Gambier, Rambouillet, all of France, assignors to Electricite De France Service National, Paris, France
Filed Nov. 2, 1987, Ser. No. 116,375
Claims priority, application France, Nov. 3, 1986, 86 15283
Int. Cl.[4] G21C *19/02, 19/33*
U.S. Cl. 376—267 **5 Claims**

1. Process for the control of the core of a pressurized water reactor, formed from dismantlable assemblies, each having a group of rods containing fissile material pellets, characterized in that it comprises initially placing in the core at least one first type of assembly, whereof the rods contain uranium oxide pellets and a second type of assembly (10) whose rods (C_1, C_2, C_3) contain mixed uranium and plutonium oxide pellets, the rods of the assemblies of said second type being distributed in accordance with at least two concentric zones (12,14,16) containing mixed oxide pellets having different plutonium concentrations, said concentrations decreasing towards the outside of the assemblies from a central zone (12) towards a peripheral zone (16), making these assemblies (10) undergo successive irradiation cycles and periodically transferring, following each of these irradiation cycles, the rods (C_1, C_2) of each zone (12,



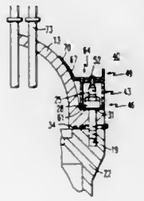
14) of the assemblies of the second type into the adjacent zone (14, 16) towards the outside of said assemblies, the rods (C_3) located in the periheral zone (16) being discharged and new rods (C_4) containing the mixed oxide pellets with a plutonium concentration equal to the plutonium concentration of the pellets contained in the rods (C_1) initially placed in the central zone (12) being loaded into said central zone.

4,818,475
TURBINE-GENERATOR SHAFT-COUPLED AUXILIARY GENERATORS SUPPLYING SHORT-DURATION ELECTRICAL LOADS FOR AN EMERGENCY COOLANT INJECTION SYSTEM
Douglas M. Gluntz, San Jose, and James C. Black, Morgan Hill, both of Calif., assignors to General Electric Company, San Jose, Calif.
Filed Feb. 12, 1988, Ser. No. 155,433
Int. Cl.[4] G21C *15/18*
U.S. Cl. 376—282 **9 Claims**



7. In a nuclear reactor having water coolant heated to steam to drive a turbine, said turbine having a coupled main generator for supplying power output to a grid, said reactor further including a reactor core cooled by a water coolant injection system, an improved process for operating said water coolant injection system during a loss-of-coolant inventory accident including the steps of:
providing a second generator;
mechanically coupling said second generator to said turbine and said coupled main generator:
converting rotational energy of said turbine and said coupled main generator into electric power using said mechanical coupled second generator comprising converting the spindown momentum of said turbine and said coupled main generator to electric power through said mechanically coupled second generator;
providing a reactor coolant injection pump having an inlet and an outlet;
coupling said inlet to a source of coolant;
coupling said outlet to the interior of said reactor;
providing an electric motor to drive said reactor coolant injection pump; and
supplying power from said second generator to said motor during operation of said plant, whereby power to said reactor coolant injection pump includes said power generated from the spindown momentum of said turbine and said coupled main generator.

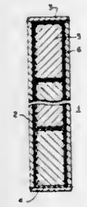
4,818,476
REACTOR VESSEL STUD THREAD PROTECTOR
Michael R. Gasparro, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 25, 1988, Ser. No. 160,452
Int. Cl.[4] G21C *13/02*
U.S. Cl. 376—294 **15 Claims**



1. In combination with a nuclear reactor pressure vessel having a removable closure head, the closure head being sealingly engaged with the pressure vessel by a plurality of stud bolts, an upper end thereof having a threaded section for threadingly engaging a nut and a vertical bore being disposed within the stud bolt, the combination further including a reactor vessel stud thread protector which encloses the exposed upper portion of the bolt and associated nut projecting above the closure head, wherein the reactor vessel stud thread protector is comprised of: a tubular wall portion being opened at its lower end and substantially closed at its upper end; a drip pan associated with the outer surface of the protector, said drip pan being disposed radially inwardly with respect to the outer periphery of the vessel head, whereby the drip pan collects any fluid being emitted from the reactor vessel; and means for fastening the stud thread protector to an associated stud.

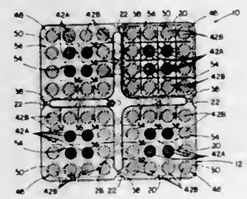
4,818,477
PCI RESISTANT FUEL AND METHOD AND APPARATUS FOR CONTROLLING REACTIVITY IN A REACTOR CORE
Walston Chubb, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 10, 1984, Ser. No. 629,533
Int. Cl.[4] G21C *3/04, 3/06, 7/04*
U.S. Cl. 376—419 **22 Claims**

1. A nuclear reactor core comprising a plurality of generally cylindrical fuel rods, each of said fuel rods comprising a cladding containing a plurality of nuclear fuel pellets stacked end-to-end within said cladding, wherein substantially each fuel pellet of substantially all of the fuel rods is coated with a layer of a refractory material interposed between the fuel pellet and the cladding of sufficient thickness to effectively prevent direct contact between the pellet and the cladding, said layer comprising a burnable poison having a non-naturally occurring



tailored isotopic composition adjusted to reduce, in a controlled fashion, initial excess reactivity in said reactor core.

4,818,478
BWR FUEL ASSEMBLY MINI-BUNDLE HAVING INTERIOR FUEL RODS OF REDUCED DIAMETER
Rusi P. Taleyarkhan, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 7, 1987, Ser. No. 130,034
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—435 **21 Claims**



1. A mini-bundle of fuel rods for use in each of a plurality of separate compartments of a BWR fuel assembly, said compartments being formed by an outer hollow tubular flow channel for directing the flow of coolant/moderator fluid through the fuel assembly and a hollow water cross extending through said channel and attached along the interior of said channel so as to provide a central hollow channel for flow of coolant/moderator fluid through the fuel assembly and to divide said outer channel into said separate compartments, said mini-bundle of fuel rods comprising:
(a) an interior array of fuel rods in said mini-bundle thereof, each of said fuel rods in said interior array being of a first predetermined diameter size; and
(b) a peripheral array of fuel rods in said mini-bundle thereof, each of said fuel rods in said peripheral array being of a second predetermined diameter size greater than said first diameter size.

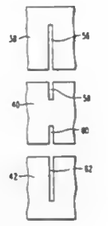
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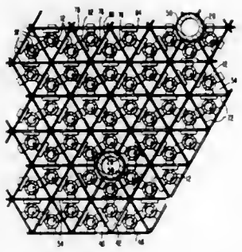
4,818,479

NUCLEAR REACTOR SPACER GRID AND DUCTLESS CORE COMPONENT

David W. Christiansen, Kennewick, and Richard A. Karnesky, Richland, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 4, 1985, Ser. No. 784,277
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—442 **6 Claims**





1. A ductless core component for use in a liquid cooled, fast flux nuclear reactor core for axially and laterally constraining a plurality of elongated rods containing nuclear material comprising:

an upper support plate member,

an upper spacer grid member,

a plurality of intermediate spacer grid members,

a lower spacer grid member,

a lower support plate member,

a nozzle means,

a flow dispersion tube means for fluidly and mechanically connecting said nozzle means to said lower support plate member,

a handling socket means attached to said upper support plate member for enabling gripping of the core component,

a plurality of orifice plates disposed between said lower support plate member and said nozzle means,

a plurality of support rods passing through said lower spacer grid member, said intermediate spacer grid members, and said upper spacer grid member fixedly attached to said lower support plate member and to said upper support plate member, said support rods being provided with passage means axially therethrough for passing a flow of coolant, and

a plurality of spacer sleeve means disposed about each of said support rods between said upper spacer grid member and the uppermost of said intermediate spacer grid members, between each of said intermediate spacer grid members and said intermediate spacer grid member immediately beneath it, and between the lowermost of said intermediate spacer grid members and said lower space grid member for maintaining a predetermined spacing between said grid members between which said spacer sleeve means are disposed, each of said spacer sleeves being bowed with respect to their axis to grip said support rods to prevent flow induced vibration damage to said support rods,

each of said upper spacer grid member, said plurality of intermediate spacer grid members, and said lower spacer grid member comprising a plurality a cell members, the cell members being substantially triangular and being formed through the interconnection of a plurality of top grid strip members, a plurality of middle grid strip members, a plurality of bottom grid strip members, and outer grid strip members, each elongated rod passing through and being laterally constrained within one of the cell members, each cell member comprising three wall members, each wall member comprising a portion of a top grid strip member, a middle grid strip member, a bottom grid strip member, or an outer grid strip member.

4,818,480

METHOD OF MAKING A CATHODE FROM TUNGSTEN AND IRIDIUM POWDERS USING A BARIUM PEROXIDE CONTAINING MATERIAL AS THE IMPREGNANT

Louis E. Branovich, Howell Township, Monmouth County; Gerard L. Freeman, Freehold Township, Monmouth County; Bernard Smith, Ocean, and Donald W. Eckart, Wall Township, Monmouth County, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 9, 1988, Ser. No. 204,327
Int. Cl.[4] B22F *3/26*
U.S. Cl. 419—27 **10 Claims**

1. Method of making a cathode for operation in microwave devices from tungsten and iridium powders using a barium peroxide containing material as the impregnant, said method including the steps of:

(A) mixing the tungsten and iridium powders,

(B) adding about 2 percent by weight of an activator to the mixture,

(C) ball milling the mixture for about 8 hours,

(D) pressing the ball milled mixture into a billet at about 48,000 p.s.i. in a die,

(E) sintering the billet at about 1800° C. for about thirty minutes in dry hydrogen of less than −100 dewpoint,

(F) backfilling the billet with copper in dry hydrogen at about 1500° C.,

(G) machining the billet to the desired geometry,

(H) removing the copper by etching in nitric acid,

(I) thoroughly rinsing in deionized water, methanol and then drying,

(J) firing the billet in dry hydrogen at about 1400° C. for about 15 minutes,

(K) impregnating the billet with a barium peroxide containing material by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts for about two minutes,

(L) removing the billet from the furnace after the furnace is cooled, and

(M) removing any loose pieces of impregnant from the billet.

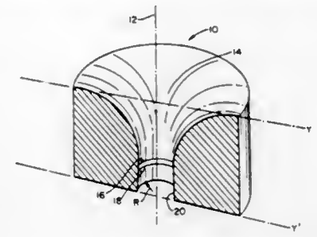
4,818,481

METHOD OF EXTRUDING ALUMINUM-BASE OXIDE DISPERSION STRENGTHENED

Michael J. Luton, Summit, N.J.; Raghavan Ayer, Stanford, Conn.; Ruzica Petkovic-Luton, Summit, N.J.; Joseph Vallone, Roselle, N.J., and Stephen Matras, Hillsborough Township, Somerset County, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 9, 1987, Ser. No. 23,851
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—67 **12 Claims**

1. A method for extruding fine grain aluminum mechanically alloyed powder material into rods such that the resulting extruded product is substantially free of texture, which method comprises extruding a billet of the powder material having a



mean grain size less than about 5 microns through a die having an internal contour which conforms substantially to the formula:

$$\frac{1}{R^2} = \frac{1}{R_o^2} + Kx$$

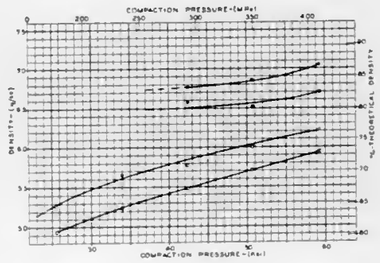
where R is the radius of the die contour at any given point x along the major axis of the die orifice from its entry plane, R_o is the radius of the billet, and K is an arbitrary constant.

4,818,482

METHOD FOR SURFACE ACTIVATION OF WATER ATOMIZED POWDERS

Joe M. Poole, and Lindy J. Curtis, both of Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Jul. 9, 1987, Ser. No. 71,654
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—33 **6 Claims**



1. A P/M method for producing workpieces, the method comprising:

(a) water atomizing powder selected from the group consisting of nickel-base, cobalt-base and iron-base alloys;

(b) introducing the powder into a nitric acid-hydrofluoric acid bath;

(c) rinsing the powder;

(d) introducing the powder into an alkaline bath;

(e) rinsing the powder;

(f) consolidating the powder into the workpiece; and

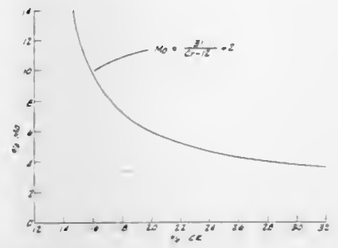
(g) drying the powder.

4,818,483

ALLOY RESISTANT TO SEAWATER AND CORROSIVE PROCESS FLUIDS

John H. Culling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Dec. 29, 1986, Ser. No. 947,427
Int. Cl.[4] C22C *38/42, 30/02*
U.S. Cl. 420—45 **5 Claims**



1. An air meltable, workable, castable, weldable, machinable, nonmagnetic alloy having a single phase austenitic structure and being resistant to seawater and corrosive process fluids, the alloy consisting essentially of between about 3% and 8% by weight manganese, between about 12% and 28% by weight nickel, between about 17.3% and about 19% by weight chromium, between about 0.68% and about 3.51% by weight copper, between about 0.07% and about 0.25% by weight nitrogen, between about 5.9% and about 8% by weight molybdenum, up to about 0.08% by eight carbon, up to about 1.5% by weight silicon, up to about 0.66% by weight niobium, up to about 1.32% by weight tantalum, up to about 1% by weight vanadium, up to about 1% by weight titanium, up to about 0.6% by weight of a rare earth component selected from the group consisting of cerium, lanthanum, and misch metal, up to about 5% by weight cobalt, and between about 30% and about 56% by weight iron, the titanium content being at least about five times any excess of carbon content above 0.03% by weight, the sum of the cobalt content and the nickel content being between about 17% and about 28% by weight, and the sum of the niobium content and one-half the tantalum content not exceeding about 0.66% by eight.

4,818,484

AUSTENITIC, NON-MAGNETIC, STAINLESS STEEL ALLOY

Terry A. DeBold, Wyomissing; John H. Magee, Jr., and Norman B. Schmidt, both of Reading, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Continuation of Ser. No. 772,727, Sep. 4, 1985, abandoned, which is a division of Ser. No. 560,932, Dec. 13, 1983, Pat. No. 4,554,028. This application Nov. 26, 1986, Ser. No. 935,116
Int. Cl.[4] C22C *38/44*
U.S. Cl. 420—46 **13 Claims**

1. An austenitic, non-magnetic, stainless steel alloy consisting essentially in weight percent (w/o) of about:

Elements	w/o
C	.02 Max.
Mn	3.0–9.0
Si	0.5 Max.
Cr	18–23
Ni	15–22
Mo	4.8–6.5
Cu	2 Max.
B	.01 Max.

N ranging from a minimum of about 0.20 w/o to no more than

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the amount that can be retained in solid solution; 3Mo+Cr being equal to at least 29.5; C+N being equal to at least about:

$$\frac{Cr + Mo + 1.5\,Si + 0.87\,Mn - Ni - 6.1}{30}$$

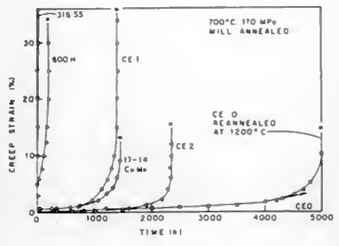
and the balance being essentially iron so that a large section size of the alloy, that has been significantly warm worked between about 1500 F. and 1650 F. but not subsequently annealed, has a 0.2% yield strength of at least about 90 ksi and, when formed into a U-bend, does not undergo stress corrosion cracking within about 700 hours in boiling saturated aqueous sodium chloride containing 2 w/o ammonium bisulfite.

4,818,485

RADIATION RESISTANT AUSTENITIC STAINLESS STEEL ALLOYS

Philip J. Maziasz; David N. Braski, and Arthur F. Rowcliffe, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 11, 1987, Ser. No. 13,471
Int. Cl.[4] C22C *38/44*
U.S. Cl. 420—57 **9 Claims**



1. An austenitic stainless steel alloy, with improved reistance to radiation-induced swelling and embrittlement, and improved resistance to thermal creep at high temperatures, consisting essentially of, by weight percent: from 16 to 18% nickel; from 13 to 17% chromium; from 2 to 3% molybdenum; from 1.5 to 2.5% manganese; from 0.01 to 0.5% silicon; from 0.2 to 0.4% titanium; from 0.1 to 0.2% niobium; from 0.1 to 0.6% vanadium; from 0.06 to 0.12% carbon; from 0.01% to 0 03% nitrogen; from 0.03 to 0.08% phosphorus; from 0.005 to 0.01% boron; and the balance iron.

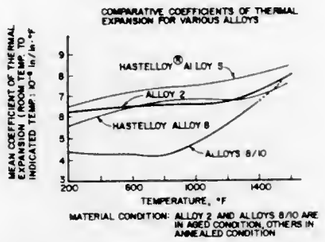
4,818,486

LOW THERMAL EXPANSION SUPERALLOY

Michael F. Rothman, Kokomo, Ind., and Hani M. Tawancy, Dhahran, Saudi Arabia, assignors to Haynes International, Inc., Kokomo, Ind.

Filed Jan. 11, 1988, Ser. No. 141,742
Int. Cl.[4] C22C *19/05*
U.S. Cl. 420—442 **3 Claims**

1. A nickel-base alloy having a low coefficient of thermal expansion consisting essentially of, in weight percent, up to 0.3 carbon, 5 to 12 chromium, 10 to 30 molybdenum, 22 to 40 molybdenum plus tungsten, 1 maximum aluminum, trace to 0.015 boron, 5 maximum iron, 2 maximum manganese, 1.2 maximum silicon, 0.1 maximum rare earth metals, balance nickel plus normal impurities wherein the ratio of Mo+W:Cr is between 2:1 and 7:1 to provide a favorable combination of



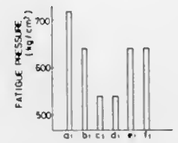
properties and wherein the chromium plus molybdenum content exceeds 31 to obtain optimum ordering characteristics.

4,818,487

ALUMINUM BEARING ALLOY

Soji Kamiya; Yuji Yokota; Tatsuhiko Fukuoka, and Yoshio Kumada, all of Aichi, Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Continuation of Ser. No. 908,433, Sep. 17, 1986, abandoned. This application Oct. 8, 1987, Ser. No. 106,019
Claims priority, application Japan, Sep. 17, 1985, 60-204679
Int. Cl.[4] C22C *21/00*
U.S. Cl. 420—530 **2 Claims**



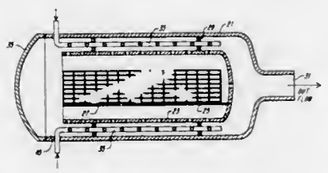
1. An aluminum bearing alloy consisting essentially, by percentage by weight, of 3 to 20% of Sn, 0.2 to 1.2% of Mn, 0.2 to 2% of Cu, 1.5 to 8% of Si, and the balance Al.

4,818,488

PROCESS AND APPARATUS FOR DRY STERILIZATION OF MEDICAL DEVICES AND MATERIALS

Adir Jacob, 23 Juniper La., Framingham, Mass. 01701

Continuation-in-part of Ser. No. 19,134, Feb. 25, 1987. This application Jul. 14, 1987, Ser. No. 72,899
Int. Cl.[4] A61L *2/20*
U.S. Cl. 422—23 **9 Claims**



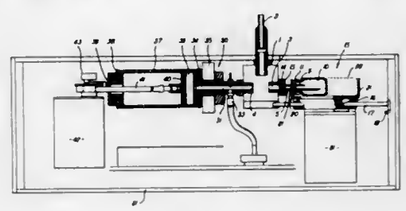
1. A method for sterilization of medical devices and material comprising the steps of,
placing said devices and materials within a metallic perforated electrode, generally cylindrical in shape, said electrode being positioned within, and generally concentric with, a gas-tight confining chamber, said chamber being generally cylindrical, formed from metal and connected to a point of potential reference,
evacuating said chamber to a substantially low pressure and introducing a gas consisting of argon, or helium, or a mixture thereof, into said chamber,
initiating an electrical discharge in said gas within said chamber by application of RF voltage between said internal perforated electrode and the metal chamber wall, creating a gas plasma, having a substantially field free and glowless volume within the perforated electrode containing said devices and materials, whereby said devices and materials are contacted by substantially electrically neutral active species at a temperature below that which would be detrimental to said devices and materials,
maintaining said gas plasma for a controlled period of time,
maintaining a flow of said gas through said chamber during said electrical discharge; and
evacuating the gas plasma residual gases from said chamber prior to withdrawing said devices and material from it.

4,818,489

DEVICE FOR SAMPLING BREATH AIR AT THE WORKPLACE

Winfried Gönner, Uberlingen; Bruno Kolb, Owingen, both of Fed. Rep. of Germany, and Gottfried Machata, Vienna, Austria, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Continuation of Ser. No. 619,889, Jun. 12, 1984, abandoned. This application Dec. 2, 1986, Ser. No. 935,611
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323720
Int. Cl.[4] G01N *33/14, 33/48*
U.S. Cl. 422—84 **11 Claims**



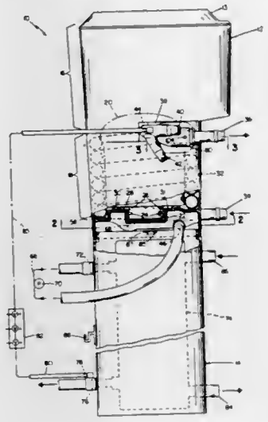
1. An automatic breath air sampling device comprising
a directional control valve having an inlet, a first outlet and a second outlet,
a mouthpiece communicating with said inlet for exhaling breath air into said control valve,
needle means communicating with said first outlet for conducting breath air into a sealed sample vessel,
a sealed sample vessel for holding a breath air sample for testing, said vessel being adapted to be pushed onto said needle means to receive breath air therefrom,
a sample vessel carrier means for movably mounting said vessel and for driving said vessel into fluid communication with said needle means thereby enabling said vessel to receive a breath air sample,
said control valve being switchable between at least first and second operating positions with said control valve being configured in said first position for diverting breath air from said inlet to discharge from said second outlet so as to rinse said control valve of dilutants and pollutants with breath air prior to sampling for purpose of preventing introduction of dilutants and pollutants into the sample vessel in said second position and said control valve being configured in said second position for discharging sample breath air through said needle means into said sample vessel,
pressure sensor means for sensing a predetermined minimum flow of breath air from said second outlet when said control valve is switched to said first position,
timing means for establishing a fixed predetermined time interval after said pressure sensor means senses said predetermined minimum flow, said time interval being predetermined for adequate rinsing of said control valve of sample dilutants and pollutants with breath air, and
control means for controlling said vessel carrier means to drive said vessel into communication with said needle means and for switching said control valve to said second position after said timing means determines said time interval has elasped where said control valve is rinsed of dilutants and pollutants.

4,818,490

INTEGRAL BLOOD OXYGENATOR

Gary A. Carson, Evergreen; Roger J. Elgas, Littleton, and Timothy M. Gordon, Morrison, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Continuation of Ser. No. 740,216, Jun. 3, 1985, abandoned, which is a continuation of Ser. No. 588,719, Mar. 12, 1984, abandoned, which is a continuation of Ser. No. 372,065, Apr. 26, 1982, abandoned. This application Aug. 13, 1987, Ser. No. 84,928
Int. Cl.[4] A61M *1/14*
U.S. Cl. 422—46 **6 Claims**



1. Blood oxygenating apparatus for oxygenating venous blood removed from a patient,
said apparatus comprising
a membrane oxygen-to-blood transfer portion and
a venous blood reservoir portion, said reservoir portion
being of such rigidity that change of contents volume causes no corresponding change of reservoir portion volume,
being so oriented that with change in contents volume a generally horizontal surface of contents rises or falls in said blood reservoir portion, and
being disposed above said transfer portion, and
means for delivering to and maintaining in said reservoir portion a substantial but varying volume of venous blood.

4,818,491

SUNTANNING GAUGE

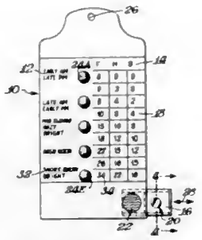
James D. Fariss, Media, Pa., assignor to Sun du Jour, Inc., Newark, Del.

Filed Mar. 14, 1988, Ser. No. 167,522
Int. Cl.[4] G01K *11/12*; G01N *21/78*
U.S. Cl. 422—56 **10 Claims**

1. A suntanning gauge comprising a plurality of UV-light

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absorbing lenses of varying thicknesses affixed to a base, under each lens is provided a fluorescent material which emits visible light when UV-light impinges upon it, said base having indicia thereon near said lenses, said indicia corresponding to the sun



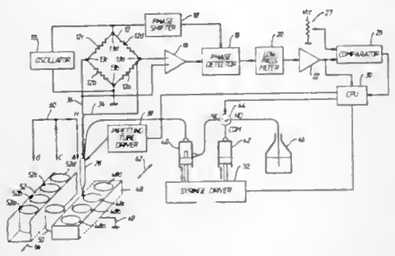
protective factor number for various skin complexions as provided by sunscreening compositions, the thinnest lens having the lowest sun protective factor number placed near it and the thickest lens having the highest sun protective factor number placed near it.

4,818,492

CAPACITIVE LIQUID LEVEL SENSOR FOR AUTOMATIC CHEMICAL ANALYZER

Yoshiaki Shimizu, Nishinasuno, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 20, 1987, Ser. No. 28,705
Claims priority, application Japan, Mar. 20, 1986, 61-63075
Int. Cl.[4] B01L *3/02*
U.S. Cl. 422—100 **5 Claims**



1. A capacitive liquid level sensor for an automatic chemical analyzer, comprising:

pipetting tube means for approaching a liquid level of a sample to suck the sample;

an electrical bridge network including four impednace elements and four terminals, a first of the four terminals being electrically connected to said pipetting tube means by a sensing cable;

a compensating cable extending from another terminal of said bridge network to said pipetting tube means along the sensing cable, one end of said compensating cable being eletrically connected to said another terminal and the other end being electrically open-circuited for cancelling capacitance between said pipetting tube means and said network bridge means, detected by said pipetting tube means;

an A.C. source for supplying an A.C. current to said electrical bridge network to enable detecting a change of capacitance corresponding to a distance between the pipetting tube means and the liquid level;

phase detector means for producing a D.C. output signal representative of a difference in phase between the A.C. current and an A.C. output signal provided from said electrical bridge network; and

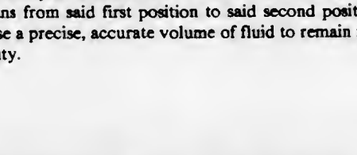
comparing means for comparing the D.C. output signal provided from said phase detector means with a preselected reference level to determine whether or not said pipetting tube means has reached the liquid level.

4,818,493

APPARATUS FOR RECEIVING A TEST SPECIMEN AND REAGENT

William E. Coville, Levittown, Pa.; Hyman Grossman, Lambertville, N.J., and Michael Sokol, Melrose Park, Pa., assignors to Bio/Data Corporation, Hatboro, Pa.

Division of Ser. No. 793,376, Oct. 31, 1985, Pat. No. 4,695,430.
This application Apr. 27, 1987, Ser. No. 43,113
Int. Cl.[4] B01L *3/00;* **G01N** *35/00*
U.S. Cl. 422—102 **12 Claims**



1. Apparatus for receiving a sample of a fluid to be tested and a test reagent, comprising:

(a) slide means having at least one cavity in a top surface thereof for receiving and holding a quantity of fluid to be tested, and

(b) body means slideably engaged with said slide means, said slide meand being slidable between a first position relative to said body means and a second position relative to said body means, a bottom surface of said body means facing the top surface of said slide means,

(c) said body means having at least one opening therethrough from its top surface to its bottom surface, said opening being in alignment with said at least one cavity in said slide means when said slide means is in said first position whereby fluid to be tested is introduced into said cavity through said opening,

(d) said body means also having at least one downwardly opening chamber therein, a lower end of said chamber being in the same plane as the bottom surface of said body means and being substantially open and an upper end of said chamber being substantially closed except for an opening therethrough, said chamber having a downwardly projecting member extending from said upper end of said chamber into said chamber, said chamber being in alignment with said at least one cavity in said slide means when said slide means is in said second position to form a test cell comprising said chamber and said cavity, said member being of a length such that the lowermost end thereof is below the surface of the fluid to be tested and reagent is said test cell, said member being adapted to conduct light from a light source through the fluid and the reagent in said test cell for enabling automated inspection of the fluid and the reagent in said test cell,

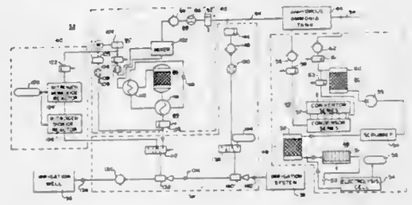
(e) the top surface of said slide means being in sliding contact with the bottom surface of said body means to form means for removing excess fluid to be tested from said at least one cavity as said slide means moves relative to said body means from said first position to said second position to cause a precise, accurate volume of fluid to remain in said cavity.

4,818,494

APPARATUS FOR MANUFACTURING NITROGEN FERTILIZER SOLUTIONS

John A. Eastin, P.O. Box 389, Grant, Nebr. 69140

Continuation of Ser. No. 9,564, Jan. 28, 1987, abandoned, which is a continuation of Ser. No. 691,742, Jan. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 507,166, Jun. 23, 1983, Pat. No. 4,511,389, which is a division of Ser. No. 379,466, May 18, 1982, Pat. No. 4,435,201, which is a continuation-in-part of Ser. No. 100,825, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 824,289, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 728,788, Oct. 1, 1976, abandoned, which is a division of Ser. No. 581,050, May 7, 1975, abandoned. This application Nov. 10, 1987, Ser. No. 122,481
Int. Cl.[4] B01J *8/04, 14/00*
U.S. Cl. 422—191 **17 Claims**



1. Apparatus for nitrogeneous fertilizing comprising:

an anhydrous ammonia tank containing ammonia;

mixer means for mixing air and ammonia;

burner means for oxidizing between 12.5 pounds and 146 pounds of nitrogen each hour in a continuous process by burning ammonia;

ammonia conduit means connecting said anhydrous ammonia tank containing ammonia and said mixer means;

ammonia valve means within said ammonia conduit means for restricting the flow of anhydrous ammonia between said anhydrous ammonia tank and said mixer means to a range of between 12.5 pounds and 146 pounds of nitrogen each hour;

mixer gas conduit means connecting said mixer means and said burner means for supplying a mixture of anhydrous ammonia and air to said burner means;

said burner means including a catalyst capable of sustaining burning of ammonia and air after ignition;

first-stage absorber means containing a first packing;

said first packing including a solid surface catalyst for aiding reactions between ammonia oxides and air;

means for supplying water to said first-stage absorber means;

first oxide conduit means communicating with said burner means and said first-stage absorber means for permitting the flow of the products of combustion from said burner means to said first-stage absorber means;

means for bringing the nitrogen oxides formed by burning the ammonia into contact with the solid surface catalyst and flowing water int eh first-stage absorber means in a continuous process as the nitrogen oxides are formed to form a dilute solution of nitric acid in a continuous stream;

filter inlet means for permitting air to enter said first-stage absorber means at a rate to provide a molar ratio of oxygen to nitric oxides of at least 2 to 1;

second-stage absorber means adapted to hold a second packing material;

means communicating with said first-stage absorber means and said second-stage absorber means for moving nitrogen oxides from said first-stage absorber means to said second-stage absorber means;

conduit means for applying ammonium hydroxide to the second-stage absorber means whereby ammonium nitrite and ammonium nitrate solutions are formed;

said conduit means including regulating means for restricting the flow of said ammonium hydroxide to a level that maintains the pH in an absorber tank above 6.7;

stripper-oxidizer means communicating with said first-stage absorber means and second-stage absorber means for receiving said dilnte solution of nitric acid and from said first-stage absorber means and ammonium nitrite from said second-stage absorber means; whereby said ammonium nitrite is oxidized to ammonium nitrate; and

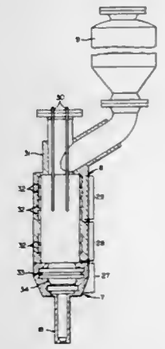
outlet means from said stripper-oxidizer means whereby nitrate fertilizer solution may be removed therefrom.

4,818,495

REACTOR FOR FLUIDIZED BED SILANE DECOMPOSITION

Sridhar K. Iya, Vancouver, Wash., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 439,171, Nov. 5, 1982, abandoned. This application Jul. 30, 1985, Ser. No. 760,572
Int. Cl.[4] B01J *8/18*
U.S. Cl. 422—145 **5 Claims**



1. An improved fluidized bed silane pyrolysis reactor comprising:

(a) A vessel having a vertically oriented generally cylindrical wall surrounding a reaction chamber which is adapted to be heated to effect pyrolysis of silane, said vessel being closed to the atmosphere and having an inlet located at the lower end of the vessel for introducing into said reaction chamber a silane and/or halosilane-containing feed gas stream and an outlet located at the upper end of the vessel for discharging said gas stream and the gaseous by-products of the silane and/or halosilane decomposition from the vessel;

(b) primary heating means located within said reaction chamber for forming a heating zone at the upper end of said vessel and for heating said heating zone to a temperature substantially above the temperature of said vessel wall surrounding the heating zone with said heating zone being heated to a temperature range between about 650° C. and 800° C. and with said primary heating means providing from about at least 70 to 90% of the total heat input thereto;

(c) gas distributor means for producing from said feed gas stream a single fluidized bed in the reaction chamber of said vessel;

(d) means for introducing silicon seed particles into said vessel such that the silicon seed particles enter the fluidized bed and are maintained in fluid suspension in said heating zone;

(e) said vessel having a reaction zone in the reaction chamber below said heating zone wherein substantially all of the reduction of the silane feed gas occurs with said reac-

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tion zone being effectively heated by the silicon seed particles descending from said heating zone;

(f) secondary heating means for heating said reaction zone to compensate for heat losses therein and for sustaining the temperature in said reaction zone from falling below a range from about 450° C. to about 650° C. such that a vertical temperature gradient is formed within the fluidized bed from the heating zone to the reaction zone and wherein said silane and/or halosilane in the gas stream is caused to preferentially decompose to silicon on said seed particles in the heterogeneous mode, said secondary heating means providing a maximum of about 10 to 30% of the total heat input to said vessel; and

(g) means defining a collection zone at the bottom end of said vessel wherein silicon-coated silicon seed particles may be removed.

4,818,496

APPARATUS FOR TREATING A SULFUR DIOXIDE-CONTAINING GAS

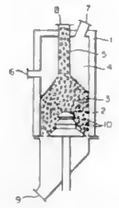
Hiroshi Tsutsumi, Kitakyushu; Morihito Okamura, and Osamu Matsunaga, both of Tochigi, all of Japan, assignors to Mitsui Mining Company, Limited, Tokyo, Japan

Filed Aug. 22, 1986, Ser. No. 899,141

Claims priority, application Japan, Sep. 13, 1985, 60-201704

Int. Cl.⁴ F01N *3/10*; B01D *53/34*

U.S. Cl. 422—172 **4 Claims**



1. An apparatus for treating a sulfur dioxide-containing gas, comprising, in combination, a reducing reaction means and a composition controlling oxidation reaction menas, in which a sulfur dioxide-containing gas is reduced and a part of the resulting sulfur and hydrogen sulfide is then oxidized to convert the composition of the gas into that suitable for the Claus reaction, wherein:

the reducing reaction means comprise a reaction chamber of a carbonaceous material moving bed type provided in a reactor, having at a lower part of the reaction chamber a grate having a raw material gas inlet for feeding the raw material gas containing sulfur dioxide into the reaction chamber and a raw material gas feed pipe provided to the bottom of the grate, a discharge chute fitted to the lower part of the reactor for receiving resultant ash and non-fired carbonaceous material through a gap between the grate and the side wall of the reactor and discharging through an exhaust port, and a carbonaceous material charging chute for charging a carbonaceous material into the reaction chamber through a carbonaceous material inlet provided at the upper part of the reactor, and

the composition controlling oxidation reaction means comprising a combustion chamber, provided above and in flow communication with said reaction chamber in the same reactor, having an air inlet for feeding air to said combustion chamber to oxidize the reduced gas from said reaction chamber and a gas outlet for discharging a composition-controlled gas suitable for the Claus reaction.

4,818,497

DEVICE FOR PURIFICATION OF EXHAUST GASES

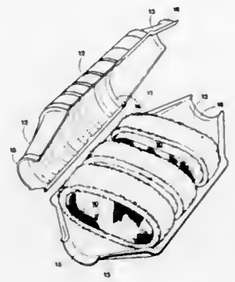
Lars Andersson; Berndt Stenlund, both of Sandviken, and Rolf Wiberg, Gävle, all of Sweden, assignors to Sandvik AB, Sandviken and PIO AB, Ockelbo, both of, Sweden

Filed Jun. 15, 1987, Ser. No. 61,779

Claims priority, application Sweden, Jun. 16, 1986, 8602670

Int. Cl.⁴ F01N *3/15*

U.S. Cl. 422—179 **9 Claims**



1. Apparatus for the catalytic purification of exhaust gases from combustion engines, comprising an elongated casing forming a chamber with an exhaust gas inlet port at one end thereof and an exhaust gas outlet port at another end thereof, a catalytic body disposed in said chamber, dampening means disposed in said chamber and comprising at least one block formed of a wire and fitted around an outer surface of said catalytic body, said wire being of a preformed screw shape, said preformed screw-shaped wire being wound into the shape of said at least one block such that said at least one block defines inner and outer peripheries, said screw-shaped wire providing said at least one block with elasticity enabling said at least one block to be elastically expanded and compressed, said inner periphery of said at least one block being of smaller cross-section than said catalytic body when said at least one block is in a relaxed state, said at least one block being elastically expanded so that said inner periphery is stretched around said outer surface of said catalytic body and exerts inward gripping forces thereagainst, said at least one block being disposed in an annular space defined between said catalytic body and said elongated casing and elastically compressed therebetween whereby the inward gripping forces are enhanced and said outer periphery is outwardly biased against an inner surface of said casing to enable said at least one block to expand outwardly within said annular space as said space enlarges in response to thermal expansion of said casing.

4,818,498

OZONE GENERATOR EMPLOYING PLATE-SHAPED HIGH-VOLTAGE ELECTRODES

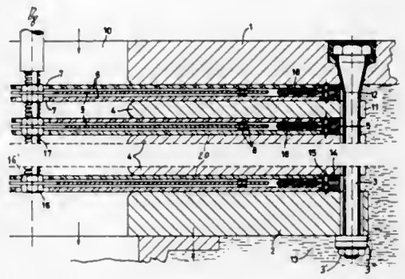
Bruno Bachhofer, Säntisstrasse 85, D-7981 Bavendorf, and Anton Locher, Bergstrasse 6, D-7981 Torkenweiler, both of Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,706

Int. Cl.⁴ C01B *13/12*

U.S. Cl. 422—186.2 **2 Claims**

1. In an ozone generator composed of a plurality of plate-shaped high-voltage electrodes and a plate of insulating dielectric material assembled in a stack, the electrodes including at least one externally coolable electrode and at least one counter-electrode, with the plate of insulating material being disposed between the externally coolable electrode and the counter-electrode, the plate of insulating material being pressed against the externally coolable electrode while being spaced from the counter-electrode to form a discharge space, the



improvement comprising silicone oil interposed between, and contacting, said externally coolable electrode and said plate.

4,818,499

APPARATUS FOR THE DECOMPOSITION OF SODIUM ALUMINATE LIQUOR FOR THE PRODUCTION OF ALUMINA

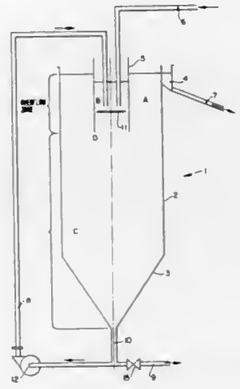
Eric Chantriaux, and Henri Grobelny, both of Aix-en-Provence, France, assignors to Aluminium Pechiney, Paris, France

Filed May 12, 1987, Ser. No. 48,883

Claims priority, application France, May 15, 1986, 86 07149

Int. Cl.⁴ B01J *8/08, 8/10*

U.S. Cl. 422—227 **5 Claims**



1. A grading decomposer apparatus for continuously decomposing a liquor of sodium aluminate supersaturated in alumina, comprising:

(a) a cylindrical-conical tank for containing the liquor, said tank having a cylindrical upper portion and a conical lower portion;

(b) overflow means generally peripherally disposed in the upper portion of said tank;

(c) tubular element passing from above into the cylindrical upper portion of said tank and terminating in said cylindrical portion, below said overflow means;

(d) means located in the lower portion of said tank for removing liquor from said tank to an outlet means;

(e) means for removing liquor for recycling from the lower portion of said tank and means for introducing recycled liquor to the upper portion of said tank within said tubular element and below said overflow means;

(f) means for introducing a feed flow of liquor into the upper portion of said tank within said tubular element, and below said overflow means; and

(g) static disperser means disposed within said tubular element below said means for introducing the feed flow of liquor and said means for introducing recycled liquor;

whereby a feed and tranquilization zone is created within said tubular element, an overflow zone is defined by the volume occupied in the upper portion of said tank outside of said tubular element, and an underflow zone is defined by the volume occupied in said tank below said tubular element, the volume ratio of the overflow zone to the underflow zone being between 0.1 and 0.5.

4,818,500

METHOD OF AND APPARATUS FOR GROWING CRYSTALS

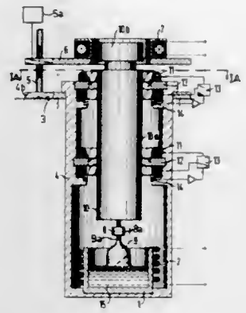
Karl Boden, Julich; Harald Ibach, Aachen-Verlautenheide, and Udo Linke, Duren, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft Mit Beschrankter Haftung, Julich, Fed. Rep. of Germany

Division of Ser. No. 772,558, Sep. 4, 1985, Pat. No. 4,708,764. This application Sep. 8, 1986, Ser. No. 905,272

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432467; Aug. 9, 1985, 3530417

Int. Cl.⁴ C30B *15/30*

U.S. Cl. 422—249 **3 Claims**



1. An apparatus for producing a crystalline body which comprises:

means for supporting a bar member upon which crystallizable material can form a crystal from a melt of said material derived from a source member positioned to form a crystallization interface with said bar member and for moving said members relatively in a generally axial direction to effect growth of said crystal;

means for magnetically suspending at least one of said members so that a generally axial displacement thereof can be effected in a substantially frictionless manner, and including a magnetizable core connected with said one of said members;

a radial stabilizer for magnetically stabilizing said core and including an array of electromagnets providing an annular gap between said core and said array, a position sensor for detecting the position of said core with respect to said array, and an electrical controller responsive to said position sensor for controlling electrical energization of said electromagnets in response to a detected position of said core; and

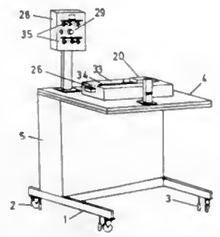
means for applying a signal to said controller to impart transverse displacement to said core by controlled energization of said electromagnets to effect relative displacement of said members and intimate mixing of said melt at said interface.

4,818,501

MACHINE FOR STERILIZING LIPSTICKS

Jacinto Pruneda-Caridad, Pza Nicaragua, 11-7o B Mostoles, Madrid, Spain

Filed Jun. 25, 1987, Ser. No. 66,830
Claims priority, application Spain, Jul. 24, 1986, 8600532
Int. Cl.[4] A61L *2/00*
U.S. Cl. 422—300 **11 Claims**



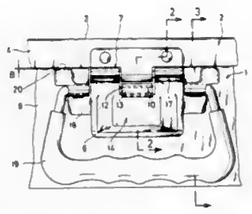
1. A machine for sterilizing a lipstick bar comprising:
(a) a mobile carrying bench means, said bench means equipped with casters for movement and with means for leveling and stationary anchoring said bench means;
(b) said bench means having a bench top;
(c) a carriage means movably attached to said bench top;
(d) a sterilizing means fixed to said bench top, said carriage means movable in front of said sterilizing means;
(e) detecting means for detecting a position of said carriage means during movement of said carriage means, said detecting means affixed to said bench top;
(f) a rotary means positioned in the carriage means, said rotary means housing and rotating a lipsitck bar to be sterilized during movement of said carriage means;
(g) blocking means for blocking rotation of said lipstick bar by said rotary means, said detecting means controlling the blocking means such that said lipsitck bar is allowed to rotate when said carriage means moves in front of said sterilizing means.

4,818,502

STERILIZING CONTAINER FOR SURGICAL INSTRUMENTS

Wolfgang Taschner, Tuttlingen, Fed. Rep. of Germany, assignor to Aesculap-Werke AG, Tuttlingen, Fed. Rep. of Germany

Filed Nov. 14, 1986, Ser. No. 931,190
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542404
Int. Cl.[4] E05C *3/04;* **B65D** *45/16*
U.S. Cl. 422—310 **9 Claims**



1. A sterilizing container comprising:
a tub shaped bottom part having an upper edge at its open top,
a rigid lid adapted to fit on said upper edge and to close said bottom part,
an elastically compressible seal disposed between said bottom part upper edge and said lid,
a pair of closure bars mounted on the lid, each of said closure bars extending from a pivotally mounted end to a free end,
means mounted on said lid for pivoting of each of said closure bars between a closed position and an open position,
means mounted on said bottom part for coacting with each of said closure bars when in the closed position to fix the lid to the bottom part, each coacting means including (i) an elastic detent member having an inclined guide along which each corresponding closure bar slides when pivoted into the closed position to clamp the lid against the bottom part and (ii) a lid stop which delimits the approach of the lid to the bottom part, and
a closure bar stop disposed between each pivoting means and each corresponding closure bar to define an end position for each closure bar when the closure bar is in the open position,
each closure bar, when in the end position, resting against each corresponding stop and extending perpendicularly from the lid, being positioned and arranged for use as a carrying handle for the lid.

4,818,503

EXTRACTION PROCESS FOR REMOVING AND RECOVERING METALS FROM AQUEOUS SOLUTIONS

Bror G. Nyman, Ulvila, and Leif Erik I. Hummelstedt, Turku, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 746,732, Jun. 20, 1985, abandoned. This application Sep. 8, 1987, Ser. No. 96,245
Claims priority, application Finland, Jul. 3, 1984, 842668
Int. Cl.[4] C01G *113/00*
U.S. Cl. 423—10 **14 Claims**

1. A process for removing and recovering metal from the aqueous sulfate solution thereof comprising
contacting said aqueous sulfate solution with an extractant solution comprising a metal extractant diluted in a liquid hydrocarbon comprising a kerosine-type hydrocarbon or a chlorinated hydrocarbon,
wherein said metal extractant is a substituted phosphonic acid monoester, in which the substituted moiety is a phenyl-vinyl group, and in which a 1-octyl group is employed as the ester group of the phosphonic acid monoester;
whereby the concentration of the metal in the aqueous sulfate solution decreases, and whereby the concentration of the metal in the extractant solution increases,
separating the extractant solution having increased metal concentration from the aqueous sulfate solution having decreased metal concentration, and
recovering said metal from the extractant solution, so that the metals can be removed from the aqueous solutions to be treated without neutralizing the quantity of acid which is generated during the extraction.

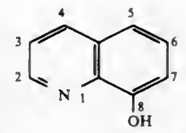
4,818,504

PURIFIED, STRONTIUM-FREE BARIUM VALUES

Thierry Delloye, Villeparisis, and Jean-Louis Sabot, Maisons Laffitte, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Apr. 28, 1988, Ser. No. 187,344
Claims priority, application France, Apr. 29, 1987, 87 06088
Int. Cl.[4] B01D *11/04*
U.S. Cl. 423—157 **27 Claims**

1. A process for the purification of barium values contained in an aqueous solution thereof containing contaminating amounts of strontium, comprising intimately contacting and liquid/liquid extracting such initial aqueous solution with an organic solvent phase which comprises at least one essentially water insoluble 8-hydroxyquinoline extractant having the formula (I):



(I)

said extractant bearing at least one substituent of the formula (II):

$$—CH_2—R' \quad \text{(II)}$$

wherein R' is an alkyl, alkenyl, alkynyl, alicyclic or aromatic radical, whereby a phase separation thus results, and recovering a final aqueous phase comprising the purified barium values.

4,818,505

PROCESS FOR REMOVING OR SEPARATING POLLUTANTS FROM WASTE GASES

Dietrich Müller, Handelmannweg 1, D-2000 Hamburg 52, Fed. Rep. of Germany

Continuation of Ser. No. 602,428, Apr. 20, 1984, abandoned. This application Mar. 28, 1986, Ser. No. 832,150
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3314969
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—210 **19 Claims**

1. A process for removing or separating pollutants including heavy metal pollutants and SO_2 from flue gas comprising the following step:
contacting the flue gas having said heavy metal pollutants and less than or equal to 1.0% by weight of SO_2, with a binder suspension consisting essentially of sludge in an aqueous suspension having 2 to 10% sludge solids consisting of digested sewage sludge.

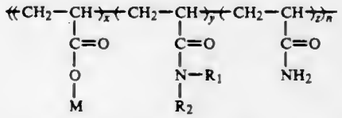
4,818,506

GYPSUM SCALE INHIBITORS FOR FLUE GAS DESULFURIZATION SYSTEMS

Mei-jan L. Lin, Naperville; Richard J. Mouché, Batavia; Baker N. Nimry, Downers Grove, and Dodd W. Fong, Naperville, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jan. 15, 1988, Ser. No. 144,804
Int. Cl.[4] C01B *17/00;* **B01D** *21/00*
U.S. Cl. 423—242 **46 Claims**

1. A method for inhibiting the formation of gypsum scale in a flue gas desulfurization process which comprises contacting a sulfur-containing flue gas with an aqueous medium, comprising Gypsum in an amount between about 0.3 and about 30 weight percent said method comprising maintaining in the aqueous medium about 0.04 to about 120 ppm of an acrylate/acrylamide copolymer having the formula:



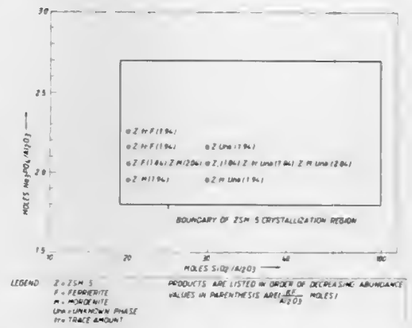
where $x+y+z=1$, x is between about 0.05 and about 0.95, y is between about 0.05 and about 0.95, and z is between about 0 and about 0.95; R_1 comprises H, an alkyl group containing from 1 to 4 carbon atoms, or $C_p(OH)_q$ where p is an integer from 1 to 4 and q is an integer from 1 to 3; R_2 comprises H or an alkyl group containing from 1 to 4 carbon atoms; n is an integer, sufficiently large in number so as to achieve a weight average molecular weight between about 1,000 to about 50,000; and M is H, an alkali metal, an alkaline earth metal, a transition metal, NH_4, a C_1–C_4 alkyl, or a mixture thereof.

4,818,507

NOVEL PROCESS FOR THE PREPARATION OF ZSM-5 ALUMINOSILICATE ZEOLITE

Bruce H. C. Winquist, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 14, 1986, Ser. No. 885,506
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **10 Claims**



1. A method of manufacture of a ZSM-5 aluminosilicate zeolite which comprises crystallizing, at a temperature of from about 185° C. to about 250° C., an aqueous crystallizing gel consisting essentially of a colloidal silica, a colloidal alumina, water, trisodium phosphate and potassium fluoride, wherein said water is present in a range of from about 200 to about 500 moles of water per mole of colloidal alumina, wherein said colloidal silica and said colloidal alumina are present in a molar ratio of greater than about 20 moles of said colloidal silica per mole of said colloidal alumina and less than 50 moles of said colloidal silica per mole of said colloidal alumina, wherein said trisodium phosphate is present in a mole ratio of 1.8 to 2.7 moles of said trisodium phosphate per mole of said colloidal alumina and wherein said potassium fluoride is present in a molar relationship of greater than 0.5 to less than 2.1 moles of potassium fluoride per mole of colloidal alumina.

4,818,508

PROCESS FOR PREPARING MOLECULAR SIEVE BODIES

William H. Flank, Chappaqua; Walter P. Fethke, Jr., Monroe, and Julio Marte, Peekskill, all of N.Y., assignors to UOP, DesPlains, Ill.

Filed Aug. 20, 1985, Ser. No. 767,363
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **67 Claims**

1. A method of preparing molecular sieves of the zeolite type in massive bodies which comprises digesting in the presence of alkali metal oxide massive preformed or shaped bodies, which contain reactive clay and which are prepared from particles of non-reactive clay, in which at least fifty weight percent (50%) of the particles range in size from about 1.5 to about 15 microns, until said reactive clay is substantially converted to crystalline zeolite.

4,818,509
CONTINUOUS PROCESS FOR MANUFACTURING CRYSTALLINE ZEOLITES IN CONTINUOUSLY STIRRED BACKMIXED CRYSTALLIZERS

Francis G. Dwyer, West Chester, and Albert B. Schwartz, Philadelphia, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 864,748, May 13, 1986, abandoned, which is a continuation of Ser. No. 799,294, Nov. 20, 1985, abandoned, which is a continuation of Ser. No. 592,684, Mar. 23, 1984, abandoned. This application Oct. 21, 1986, Ser. No. 921,704

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—329 **15 Claims**

1. A method for preparing a variety of crystalline zeolites having selected crystal sizes, compositions, and pore sizes within a continuous manufacturing plant, comprising:

A. forming a precursor slurry within a precursor tank which is held, as an induction stage, at a temperature below 200° F. for from 4 to 16 hours while crystallization nutrients and modifiers are continuously fed thereto to form a reaction mixture which is thoroughly and continuously homogenized with high shear agitation to produce said precursor slurry having a total solids content that is above 10% by weight of the slurry and a synthetic crystalline siliceous solid content not exceeding 15% by weight of said total solids content; and

B. crystallizing said zeolites therein at temperatures greater than 180° F. and at pressures from autogenous to 400 psig for at least two hours in a first crystallization stage and at least one additional crystallization stage, wherein said first crystallization stage is operated in a separate reaction vessel from said at least one additional crystallization stage and wherein said at least one additional crystallization stage is conducted at a higher temperature than said first crystallization stage, and wherein the contents of said at least one additional crystallization stage are partially and selectively backmixed to said first crystallization stage.

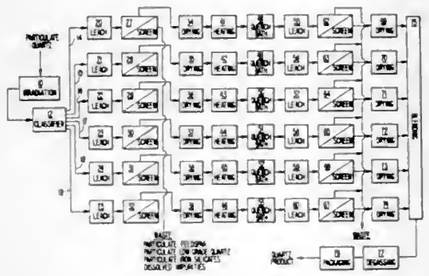
4,818,510
MODIFIED CLOSE FRACTION BATCH PROCESS FOR PURIFICATION OF SiO_2

Lothar Jung, Bridgewater, N.J., assignor to Quartz Technology, Inc., Bridgewater, N.J.

Filed Oct. 21, 1985, Ser. No. 789,646

Int. Cl.⁴ C07B *33/12*

U.S. Cl. 423—335 **27 Claims**



1. A process for recovering a particulate silica product from a particulate raw material silicon dioxide of a purity lower than that of said product, said process comprising:

(a) classifying said particulate silicon dioxide to obtain a plurality of sized fractions;

(b) treating one of said sized fractions with a reagent which is a solvent for the silicon doxide to create a size differential between an undesirable portion of said one fraction and a desirable portion of said one fraction, said desirable, portion having a higher silica purity than said undesirable portion; and

(c) classifying the treated fraction by size to isolate the desirable portion as said silicon dioxide product.

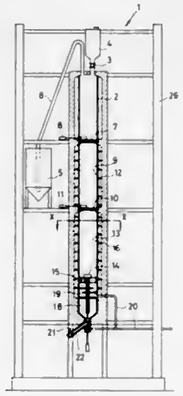
4,818,511
PROCESS AND APPARATUS FOR PRODUCING NON-OXIDE COMPOUNDS

Yoshitsuga Nishi; Kenji Kawasaki; Mutuo Hayashi, and Chitake Yamagishi, all of Tokyo, Japan, assignors to Nihon Cement Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 76,222

Int. Cl.⁴ C01B *21/068, 21/064;* B01J *8/28*

U.S. Cl. 423—344 **8 Claims**



1. A process for producing non-oxide compounds which comprises, providing a multi-stage reaction apparatus made up of a reactor section, a raw material drier section arranged above the reactor section, and a non-oxidizing gas feeder section arranged under the reactor section, said reactor section including a plurality of cylindrical reaction vessels vertically placed on top of the other, each of said reaction vessels being provided with a plate having a plurality of gas inlets and a raw material discharger to open and close said gas inlets at its bottom and also with a heater on its inside or outside, said raw material drier section including a raw material drier provided with a plate having a plurality of gas inlets and a raw material discharger to open and close said gas inlets at its bottom and also with a raw material feeder at its top, said non-oxidizing gas feeder section being provided with a cooling chamber, product discharge chute, gas preheating chamber, and gas feeding pipe and having a heater on its outside, feeding raw materials to the raw material drier section from the raw material feeder, drying the raw materials, introducing the dried raw materials into the reaction vessel of the reactor section, subsequently introducing the raw materials into the lower reaction vessel by operating the raw material discharger, introducing a non-oxidizing gas through the non-oxidizing gas feeder simultaneously with said procedure, thereby fluidizing or bubbling the raw materials in said raw material drier section and each of said reaction vessels, contacting the raw materials with the non-oxidizing gas at a high temperature, drying the raw materials and completing the reaction, and introducing the reaction product into the cooling chamber for cooling.

4,818,512
ACTIVATED ALUMINUM CHLORHYDROXIDE

Herand M. Markarian, Congers, N.Y.; Allan H. Rosenberg, Randolph, and George L. Cohen, Warren, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Sep. 23, 1987, Ser. No. 100,153

Int. Cl.⁴ C01B *7/00*

U.S. Cl. 423—462 **11 Claims**

1. A process for preparing an aluminum chlorhydroxide product containing from about 77% to about 85% of an aluminum chlorhydroxide molecular species having a K_d value equal to about 0.4 comprising heating an about 5% aqueous solution of aluminum chlorhydroxide at a temperature of from about 60° C. to about 132° C. and for a period of from about 30 minutes to about three months to produce a reaction product, spray drying the reaction product so produced, and recovering the powdered aluminum chlorhydroxide product.

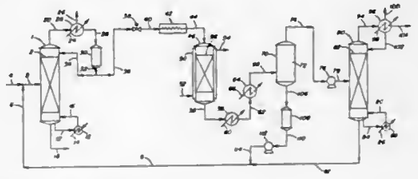
4,818,513
SEPARATION OF HYDROGEN FLUORIDE FROM 1,1-DIFLUOROETHENE

Fred C. Trager, Barberton; J. Douglas Mansell, Akron, and W. Eugene Wimer, Uniontown, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 21, 1987, Ser. No. 136,217

Int. Cl.⁴ C01B *7/19;* C07C *17/34, 19/08, 21/18*

U.S. Cl. 423—488 **14 Claims**



1. A process comprising:

(a) introducing a gaseous feed stream comprising hydrogen fluoride and 1,1-difluoroethene to a condensing zone,

(b) contacting said feed stream in said condensing zone with liquid organic barrier material to partially condense said feed stream and produce a gaseous phase comprising most of the 1,1-difluoroethene originally present in said feed stream and a liquid condensate comprising most of the hydrogen fluoride originally present in said feed stream, and

(c) removing said gaseous phase and said liquid condensate from said condensing zone as separate streams,

wherein less than about 50 percent of the 1,1-difluoroethene originally present in said feed stream reacts with hydrogen fluoride to form 1,1,1-trifluorethane during the partial condensation and the removal of said separate streams from said condensing zone.

4,818,514
METHOD FOR RECYCLING NO IN A SYSTEM PRODUCING FERRIC SULFATE

Ralph Miller, Pleasantville, N.Y., assignor to T-Thermal, Inc., Conshohocken, Pa.

Continuation-in-part of Ser. No. 755,840, Sep. 15, 1987, Pat. No. 4,693,881. This application Sep. 15, 1987, Ser. No. 97,541

Int. Cl.⁴ C01G *41/14;* C01B *17/02, 21/00*

U.S. Cl. 423—558 **10 Claims**

1. A method of producing ferric sulfate containing solution substantially free of NO which comprises

(a) oxidizing ferrous sulfate and sulfuric acid with an initial oxygen containing gas mixture to which NO has been added to form a ferric sulfate containing solution in which NO is dissolved and a gas mixture of reduced oxygen content containing NO;

(b) separating the gas mixture of reduced oxygen content containing NO from the solution formed in step (a);

(c) contacting the ferric sulfate containing solution in which NO is dissolved with a gas mixture similar in composition to said initial oxygen containing gas mixture to strip the dissolved NO from said ferric sulfate containing solution and to transfer the NO to said initial oxygen containing gas mixture;

(d) employing means to separate NO from the gas mixture of reduced oxygen content of step (b) and transferring said NO to the gas mixture produced in step (c); and

(e) employing in step (a) the gas mixture produced in step (d).

4,818,515
ALPHA-ALUMINA IN THE FORM OF SPHERICAL NON-AGGREGATED PARTICLES HAVING A NARROW SIZE DISTRIBUTION AND SIZES BELOW 2 MICRONS AND PROCESS FOR PREPARING SAME

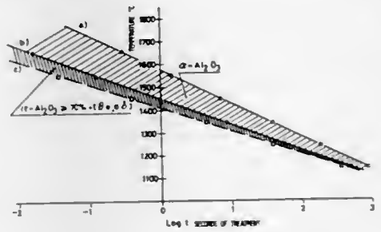
Emiliano M. Ceresa, Vigliano Biellese; Antonio Gennaro, Cameri, and Paolo Cortesi, Chivasso, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 818,674, Jan. 14, 1986, abandoned. This application Sep. 25, 1987, Ser. No. 102,295

Claims priority, application Italy, Jan. 18, 1985, 19142 A/85

Int. Cl.⁴ C01F *7/02*

U.S. Cl. 423—625 **9 Claims**



1. Alpha-alumina consisting essentially of solid, spherical non-aggregated particles, having an average number diameter ranging from 0.06 to 2 μm, a polydispersion index dw/dn lower than or equal to 2.0, wherein dw is the weight average diameter and dn is the average number diameter, the total porosity of micro-meso type being lower than 0.3 cc/g, the specific surface area ranging from 0.7 to 80 m^2/g, and the apparent density of the particles being in the range of from 3.20 to 3.94 g/cm^3; and wherein "porosity of the micro type" means pores having a diameter below 20 A and "porosity of the meso type" means pores having a diameter ranging from 20 to 500 A according to IUPAC 1972 classification.

4,818,516
METHOD OF NUTRITIONAL ASSESSMENT AND THERAPY

Jack Metcoff, Oklahoma City, Okla., assignor to The Board of Regents for the University of Oklahoma, Norman, Okla.

Filed Apr. 22, 1985, Ser. No. 725,419

Int. Cl.⁴ A61K *49/00, 31/40, 31/195*

U.S. Cl. 424—9 **34 Claims**

1. A method for assessing nutritional status in a subject, comprising:

measuring the rate of at least one selected intracellular metabolic process;

measuring the intracellular levels of selected amino acids;

for each selected intracellular metabolic process, identifying the primary intracellular amino acids; and

identifying each of the primary intracellular amino acids which is present at an abnormal level.

4,818,517

PHARMACEUTICAL PREPARATION FOR OBTAINING A HIGHLY VISCOSE HYDROGEL OR SUSPENSION

Bobby L. S. Kwee, JV OSS, and Johannes G. J. Egberink, EB OSS, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Jan. 20, 1987, Ser. No. 4,714

Claims priority, application Netherlands, Jan. 24, 1986, 8600155

Int. Cl.[4] A61K *47/00*

U.S. Cl. 424—488 6 Claims



1. Pharmaceutical controlled drug release preparation that, when mixed with water, becomes a highly viscose, homogeneously syringeable hydrogel or suspension, said pharmaceutical preparation comprising at least one drug and at least one polymer, said polymer being insoluble or sparingly soluble in water but having the capability of swelling in water, and further comprising a water-soluble thickening agent, said agent being present in an amount sufficient to prevent separation of water from said hydrogel when being subjected to pressure but less than the amount required to significantly increase the viscosity of the total quantity of water required for swelling the polymer to form the hydrogel or suspension.

4,818,518

EFFERVESCENT DENTIFRICE

Anthony J. Gioffre, Ridgefield, Conn., and Ronald J. Ross, Upper Nyack, N.Y., assignors to UOP, Des Plains, Ill.

Division of Ser. No. 672,351, Nov. 16, 1984, Pat. No. 4,627,972.

This application Nov. 7, 1986, Ser. No. 928,014

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] A61K *7/16*

U.S. Cl. 424—44 10 Claims

1. An effervescent dentifrice composition which upon contact with water provides an effervescent action which comprises an anhydrous dentifrice base medium and from about 1 to about 60 weight percent of a dehydrated crystalline microporous inorganic oxide adsorbent containing an effective amount of between about 5 and about 25 percent by weight of carbon dioxide based on the combined weight of the said dehydrated inorganic oxide adsorbent and carbon dioxide.

4,818,519

METHOD AND COMPOSITION FOR PREVENTION OF PLAQUE FORMATION AND PLAQUE DEPENDENT DISEASES

Perry A. Ratcliff, 7125 E. Lincoln Dr., Scottsdale, Ariz. 85253

Continuation-in-part of Ser. No. 24,329, Mar. 10, 1987, which is a continuation-in-part of Ser. No. 947,079, Dec. 29, 1986, Pat. No. 4,689,215, which is a continuation-in-part of Ser. No. 17,241, Dec. 29, 1986, Pat. No. 4,696,811. This application Aug. 24, 1987, Ser. No. 88,609

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.[4] A61K *7/16, 7/20, 33/20*

U.S. Cl. 424—53 3 Claims

1. A method for preventing periodontitis in the oral cavity, said method comprising the steps of applying within the oral cavity, for a period of ten seconds, a stabilized aqueous solution of chlorine dioxide, having an effective concentration in the range of 0.005% to 0.2%, and thereby creating a higher oxygen tension in the saliva present in the oral cavity by decreasing the anaerobic bacterial population and increasing the aerobic bacterial population within the oral cavity, converting living tissues adjacent oxygenated saliva from anaerobic into aerobic glycolysis, increasing the number of adenosinetrephosphate molecules said stabilized chlorine dioxide in aqueous solution being an agent effective to at least assist in accomplishing said steps of creating, converting and increasing.

4,818,520

KERATIN HYDROLYSATE FORMULATIONS AND METHODS OF PREPARATION THEREOF

Albert M. Fleischner, Westwood, N.J., assignor to Edmund M. Jaskiewicz, Washington, D.C.

Filed Oct. 15, 1986, Ser. No. 918,885

Int. Cl.[4] A61K *7/48, 7/075, 37/12, 37/18*

U.S. Cl. 424—61 6 Claims

1. The method of preparing a neutralized viscous liquid proteinaceous extract which is useful as a skin conditioner, shampoo and the like, comprising the steps of heating an aqueous mixture of avian feathermeal and alkaline material; refluxing said mixture for several hours at 100 degrees C. under one atmosphere of pressure; thereafter cooling the refluxed solution and filtering said solution to recover a proteinaceous extract; adding sufficient sulfuric acid to extract to reduce the pH to 3.0; removing the precipitate formed during acidification of the extract by vacuum filtration; then heating and evaporating approximately one half by volume of the resultant concentrated viscous filtrate; adding sufficient alkali hydroxide to said viscous filtrate to neutralize the same to a pH of 7.0; and finally storing said proteinaceous extract at room temperature, and thereafter re-heating the said extract to re-dissolve precipitate material to produce a clear viscous liquid lotion.

4,818,521

EMULSION COSMETIC STABLY CONTAINING VITAMIN C

Hiroshi Tamabuchi, Takatsuki, Japan, assignor to Sunstar Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 724,570, Apr. 18, 1985, abandoned.

This application Nov. 24, 1986, Ser. No. 933,867

Int. Cl.[4] A61K *7/48, 7/135*

U.S. Cl. 424—62 5 Claims

1. An emulsion cosmetic containing stabilized Vitamin C which comprises:

(A) an oil in water emulsion emulsified with a non-ionic surface active agent selected from the group consisting of sorbitan fatty acid esters, glycerol fatty acid esters and polyoxyethylene alcohol ethers; and

(B) a mixture of L-ascorbic acid or a fatty acid ester thereof and an oil selected from the group consisting of silicone oils, liquid paraffin, squalane, castor oil, olive oil and isopropyl myristate; said cosmetic being prepared by:

(1) first admixing said oil with said L-ascorbic acid or a fatty acid ester thereof within a weight ratio of said oil to said L-ascorbic acid or a fatty acid ester thereof, being about 1:0.5 to 4; and

(2) mixing said mixture with said oil in water emulsion in an amount of 1 to 10% by weight, based on the total weight of the resultant emulsion cosmetic.

4,818,522

ENCAPSULATION OF ADJUVANTS WITHIN ANTIPERSPIRANT ACTIVES

Radolph Ferentchak, New Providence, and James F. Kozischek, Belvidere, both of N.J., assignors to Reheis, Inc., Berkeley Heights, N.J.

Filed Sep. 14, 1987, Ser. No. 96,588

Int. Cl.[4] A61K *7/34*

U.S. Cl. 424—66 20 Claims

1. An antiperspirant composition comprising thick-walled, hollow, essentially spherical particles, the walls of said particles consisting essentially of a water soluble compound or complex of a polyvalent metal having antiperspirant efficacy and the hollow interior of said particles being at least partially filled with a water-immiscible component of said antiperspirant composition.

4,818,523

HAIR RINSE CONDITIONER

Jane Clarke, Matawan; Amrit Patel, Dayton, and Clarence R. Robbins, Martinsville, all of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Jun. 17, 1987, Ser. No. 63,194

Int. Cl.[4] A61K *7/08*

U.S. Cl. 424—70 19 Claims

1. A stable easily removable hair rinse conditioner composition comprising about 1.0 to 2.5% by weight of a dodecyl trimethyl quaternary ammonium compound, about 0.5 to 10% by weight of a C_{14}–C_{22} alkanol or mixture of alkanols, and about 0.5 to 1.5% by weight of a cyclic or linear silicone, in about 79 to 94.5% by weight of an aqueous carrier, said composition being in the form of an emulsion and having a pH of about 2.5 to 4.5.

4,818,524

DEODORIZING COMPOSITIONS

Anthony Gibbs, Norwich, United Kingdom, assignor to Walex Products Company, Jamestown, N.C.

Filed Jul. 8, 1987, Ser. No. 70,911

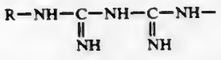
Claims priority, application United Kingdom, Jul. 9, 1986, 8616740; Dec. 5, 1986, 8629179

Int. Cl.[4] A61K *31/55, 7/32*

U.S. Cl. 424—76.1 12 Claims

1. An odor neutralizing composition comprising

(a) a complexing agent selected from a polymer of the formula (1)



in which R is a substituted or unsubstituted alkylene group having up to 12 carbon atoms in the unsubstituted chain;

(b) a carrier capable of assisting wetting of odor forming compositions;

(c) a cationic moiety; said moiety being part of a chemically independent compound, or chemically associated with a complexing agent or the carrier, and

(d) an auxiliary complexing agent selected from a transition metal ion which is capable of oxidation.

4,818,525

INSECTICIDAL RESIN COATING FILM

Keiichi Kamada; Seiji Kawamoto, both of Chiba; Makoto Yaegashi, and Shiro Shiraishi, both of Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

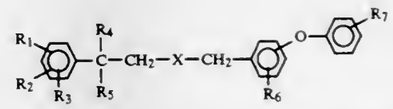
Filed Aug. 4, 1987, Ser. No. 81,471

Claims priority, application Japan, Aug. 8, 1986, 61-185222; Sep. 1, 1986, 61-203737; Sep. 2, 1986, 61-205104; Sep. 2, 1986, 61-205105; Sep. 3, 1986, 61-205897; Sep. 12, 1986, 61-214006

Int. Cl.[4] A61K *31/78*

U.S. Cl. 424—81 1 Claim

1. An insecticidal resin coating composition characterized by comprising 100 parts by weight of a copolymer resin of acrylonitrile and/or methacrylonitrile and another monomer and 0.1 to 10 parts by weight of an insecticide of any of the following general formula



wherein R_1, R_2 and R_3 each represent a hydrogen or halogen atom or a lower alkyl, lower haloalkyl, lower alkoxy, lower haloalkoxy or methylenedioxy group, R_4 represents a lower alkyl group, R_5 represents a hydrogen atom or a methyl or ethyl group, or R_4 and R_5 taken together may form a cycloalkyl group having 3 to 6 carbon atoms, the cycloalkyl group being unsubstituted or substituted with a halogen atom or a methyl group, R_6 represents a hydrogen or halogen atom, R_7 represents a hydrogen or halogen atom or a lower alkyl or lower alkoxy group and X represents an oxygen or sulfur atom or a methylene group.

4,818,526

USE OF DIBUTYL SUCCINATE, DIMETHYL DISULFIDE AND MIXTURES OF SAME AS MOSQUITO ATTRACTANTS

Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Lincroft, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ira Katz, West Long Branch, N.J., and Kenneth R. Schrankel, Tinton Falls, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Filed Aug. 29, 1986, Ser. No. 901,647

The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.[4] A01N *25/00*

U.S. Cl. 424—84 1 Claim

1. A method of attracting Culicidae to an insect trap comprising the step of exposing the environment surrounding said trap to an insect attractant-containing polymer which consists of a mixture of a polymer and from about 1% up to about 45% by weight of said polymer of dimethyl disulfide, said polymer being compatible with said dimethyl disulfide.

4,818,527

T CELL EPITOPES OF THE HEPATITIS B VIRUS NUCLEOCAPSID PROTEIN

George B. Thornton; Ann M. Moriarty; David R. Milich, and Alan McLachlan, all of San Diego, Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Dec. 9, 1986, Ser. No. 939,617

Int. Cl.[4] A61K *39/00, 39/29;* C07K *7/00, 15/00*

U.S. Cl. 424—88 23 Claims

1. An immunogenic polypeptide conjugate comprising HBcAg operatively linked through an amino acid residue side chain to a polypeptide immunogen.

4,818,528

VACCINE AGAINST INFECTIOUS BOVINE KERATOCONJUNCTIVITIS

Wallace H. Green, Scottsville, N.Y., and Leon N. D. Potgieter, Knoxville, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Feb. 6, 1987, Ser. No. 11,991

Int. Cl.[4] A61K *39/02*

U.S. Cl. 424—92 6 Claims

1. A vaccine against infectious bovine keratoconjunctivitis comprising a pharmaceutically acceptable carrier and protein fragments derived from individual pili of a pathogenic strain of Moraxella bovis by cleaving such pili with cyanogen bromide, each such protein fragment including at least one antigenic site exposed in the course of said cleaving of said Moraxella bovis and which is common to the pili proteins of multiple pathogenic strains of Moraxella bovis, said protein fragments being

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capable of inducing the production of antibodies reactive to said antigenic site, said antibodies being nonspecific to the Moraxella bovis strain from which said protein fragments originated.

4,818,529

Patent Not Issued For This Number

4,818,530

PREPARATION OF PELLETS CONTAINING FUNGI FOR CONTROL OF SOILBORNE DISEASES

James J. Marois, Davis, Calif.; Deborah R. Fravel, Silver Spring, Md.; William J. Connick, Jr., New Orleans; H. Lynn Walker, Ruston, both of La., and Paul C. Quimby, Jr., Leland, Miss., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 713,733, Mar. 20, 1986, Pat. No. 4,724,147, which is a continuation-in-part of Ser. No. 506,952, Jun. 22, 1983, abandoned. This application Sep. 18, 1987, Ser. No. 98,173

Int. Cl.[4] A61K *63/00;* **A01N** *63/04, 37/18*

U.S. Cl. 424—93 **16 Claims**

1. A method for producing pellets containing living fungi inoculum for control of soilborne plant diseases comprising:

(a) selecting and growing living fungi from the group consisting of: *Gliocladium virens* isolate Gl3, *Penicillium oxalicum* isolate Windels, *Talaroymces flavus* isolate Tf-1, *Talaromyces flavus* biotype Tfl-1, *Trichoderma viride* biotype T-1-R9, for sufficient time to be used as inoculum;

(b) harvesting and homogenizing the living fungal propagules of (a) for sufficient time to uniformly mix tbe propagules;

(c) diluting the living fungal propagule homogenate with a sodium alginate solution of a sufficient concentration to effect subsequent gelation;

(d) adding dropwise the product of (c) into an aqueous solution of of a calcium salt, said calcium salt selected from the group consisting of calcium chloride and calcium gluconate, thereby forming alginate gel pellets containing living fungi dispersed throughout.

11. A method for controlling soilborne plant diseases in an agricultural field comprising:

applying living fungus-containing alginate gel pellets to an agricultural field infested with soilborne plant diseases, wherein said living fungus reproduces and controls said soilborne plant diseases, said fungus selected from the group consisting of: *Gliocladium virens* isolate Gl-3, *Penicillium oxalicum* isolate Windles, *Talaromyces Flavus* isolate Tl-1, Talaromyces biotype Tfl-1 and *Trichoderma viride* biotype T-1-R9.

4,818,531

GROWTH HORMONE AND THYROID HORMONE

David B. Anderson, and Jack F. Wagner, both of Greenfield, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 6, 1985, Ser. No. 698,669

Int. Cl.[4] A61K *37/02*

U.S. Cl. 424—111 **11 Claims**

1. A method of offsetting feed intake depression in pigs attributable to exogenous administration of a growth hormone related substance, which comprises administering an effective amount of a thyroid-active substance to the pigs.

4,818,532

BROMOPHOR COMPOSITION

Paritosh M. Chakrabarti, Pittsburgh, Pa.; Roger A. Crawford, Wadsworth, and Robert H. Juda, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 23, 1986, Ser. No. 922,375

Int. Cl.[4] A61K *33/18*

U.S. Cl. 424—150 **16 Claims**

1. A free-flowing particulate bromophor composition comprising particulate, inert amorphous siliceous carrier and from about 1 to about 80 weight percent of a bromophor that is a complex of (a) bromine, (b) halide represented by the formula MY, wherein M is hydrogen, alkali metal or alkaline earth metal, and Y is bromine, chlorine or iodine, the mole ratio of halide to bromine being from about 1:1 to 1:12, and (c) organic carrier capable of developing intermolecular attractive forces with bromine, the organic carrier being selected from nonionic, anionic and cationic surfactant-type materials, the amount of bromine in the bromophor being between about 10 and about 50 weight percent.

4,818,533

PRODUCTION OF HIGH PURITY ALKALOIDS

Richard T. Boulware, High Point, N.C., and George Schlowsky, Ridgewood, N.J., assignors to Vipont Pharmaceutical, Inc., Fort Collins, Colo.

Continuation of Ser. No. 753,264, Jul. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 596,589, Apr. 4, 1984, abandoned. This application Sep. 4, 1987, Ser. No. 96,262

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[4] A61K *35/78, 31/44*

U.S. Cl. 424—195.1 **10 Claims**

1. A method for extracting an alkaloid from a plant containing the alkaloid, which alkaloid forms a free base soluble in non-polar solvents and a water soluble acid salt comprising grinding the plant material, slurrying the plant material in a mixture of water and a cosolvent, adjusting the pH of the mixture to a pH of about 8.5, extracting the alkaloid in a nonpolar solvent which is insoluble in water, dissolving the alkaloid into water by lowering the pH of the solution with acid, adding the salt of a mineral acid or a mineral acid to precipitate tbe alkaloid, and collecting the precipitated alkaloid.

4,818,534

INSECTICIDAL DELIVERY COMPOSITIONS AND METHODS FOR CONTROLLING A POPULATION OF INSECTS IN AN AQUATIC ENVIRONMENT

Richard Levy, Fort Myers, Fla., assignor to Lee County Mosquito Control District, Ft. Myers, Fla.

Filed Apr. 1, 1987, Ser. No. 32,532

Int. Cl.[4] A01N *25/34;* **A61K** *9/14*

U.S. Cl. 424—404 **25 Claims**

1. An insecticidal delivery composition for controlling a population of aquatic environment insects in preflood or flood conditions comprising (1) at least one superabsorbent solid organic polymer comprising hydrophilic acrylamide or acrylate polymers, copolymers or terpolymers, which absorb over 100 times their weight in water, (2) at least one different insecticidal agent, said polymer and agent being present in a total

amount effective to control the population of aquatic environment insects; and wherein said composition is an admixture formed by mixing the superabsorbent polymer and the insecticidal agent to control release rate in the aquatic environment, and wherein said composition is capable of being applied by delivering the admixture to a target habitat of an aquatic environment insect and after delivery being effective in the environment to control the population of insects.

4,818,535

REPELLENT COMPOSITIONS

David A. Baines, Ely; Christopher G. Faulkes, London; Andrew J. Tomlinson, and Peter C. Y. K. Ning, both of Cambridge, all of England, assignors to Dalgety U.K. Limited, London, England

Filed Feb. 17, 1988, Ser. No. 157,368

Claims priority, application United Kingdom, Feb. 18, 1987, 8703716

Int. Cl.[4] A01H *25/24*

U.S. Cl. 424—407 **20 Claims**

1. A repellent composition comprising (a) a synthetic blend of saturated alkanoic acids having 3–20 carbon atoms and which is characteristic of the acid fraction obtained by a Soxhlet extraction of lion feces followed by separation into basic, neutral and acid fractions; and (b) felinine.

4,818,536

EMULSFIABLE POLYMER CONCENTRATE CONTROLLED DELIVERY AND RELEASE SYSTEM

Paul A. Meyers, Dublin, Calif., and Linneaus C. Dorman, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 5, 1986, Ser. No. 871,001

Int. Cl.[4] A01N *25/08*

U.S. Cl. 424—409 **19 Claims**

1. A storage stable, water emulsifiable, substantially nonaqueous liquid or low melting solid concentrate having a water content not greater than about 0.1% which is adapted for use in the on-site preparation of an aqueous emulsion of an agricultural chemical, consisting of a solution of

(a) at least one liquid hydrophobic agricultural chemical having bicidal activity from the group consisting of (α-(2,2,2-trichloroethyl)styrene); 1,1-trichloro-3,4-epoxy-3-phenylbutane; 1,1,1,-trichloro-4,5-epoxy-4-(3,5-dichlorophenyl)pentane; 1,1,1-trichloro-4,5-epoxy-4-phenylpentane; 1,1,1-trichloro-3,4-epoxy-3-(3,5-dichlorophenyl) butane and 0,0-diethyl 0-3,5,6-trichloro-2-pyridylphosphorothioate,

(b) a solid hydrophobic polymer, in an amount effective to achieve sustained release from the concentrate of the compound of (a),

(c) a water immiscible organic solvent, and

(d) an emulsiying agent, in an amount effective to form a stable oil-in-water emulsion when the concentrate is mixed with water.

4,818,537

LIPOSOME COMPOSITION FOR TREATING DRY EYE

Lake S. S. Guo, Lafayette, Calif., assignor to Liposome Technology, Inc., Menlo Park, Calif.

Filed Oct. 21, 1986, Ser. No. 910,008

Int. Cl.[4] A61F *2/00;* **A61K** *9/66;* **B01J** *13/02*

U.S. Cl. 424—427 **13 Claims**

1. A liposome composition for treating dry eye, comprising:

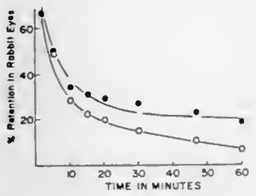
(a) an aqueous medium buffered to a pH of between about 6.2 and 6.7;

(b) dispersed in said aqueous medium, liposomes whose vesicle-forming lipids include about 60–90 mole percent saturated phosphatidylcholine; and

(c) included in the lipid bilayers of said liposomes, 10–40 mole percent of a quaternary benzyl amine having an aliphatic hydrocarbon chain of between 15–20 carbon atoms.

11. A method of treating dry eye, comprising

providing an aqueous suspension of liposomes formulated to contain 60–90 mole percent saturated phosphatidylcholine



and 10–40 mole percent of a quaternary benzyl amine having an aliphatic hydrocarbon chain of between 15–20 carbon atoms; and

applying the suspension to an ocular surface in an amount sufficient to form an aqueous liposome matrix coating the surface.

4,818,538

TREATMENT OF HUMAN VIRAL INFECTIONS

Janet L. Rideout, Raleigh; David W. Barry, Chapel Hill; Sandra N. Lehrman; Martha H. St. Clair, both of Durham, and Phillip A. Furman, Durham, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 776,899, Sep. 17, 1985, Pat. No. 4,724,232. This application Oct. 21, 1987, Ser. No. 111,205

Claims priority, application United Kingdom, Mar. 16, 1985, 8506869; May 9, 1985, 8511774

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[4] A61K *9/48, 9/44*

U.S. Cl. 424—436 **9 Claims**

1. A sealed container including a pharmaceutical composition in unit dosage form comprising 5 to 500 mg of 3'-azido-3'-deoxythymidine together with a pharmaceutically acceptable solid carrier.

4,818,539

INGESTIBLE AGGREGATE AND DELIVERY SYSTEM PREPARED THEREFROM

James J. Shaw, Morristown, and Shri C. Sharma, Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 698,511, Feb. 5, 1985, Pat. No. 4,747,881. This application Feb. 29, 1988, Ser. No. 161,698

Int. Cl.[4] A23K *1/175;* **A23L** *1/30;* **A23C** *9/00*

U.S. Cl. 424—441 **10 Claims**

1. A delivery system comprising

(i) an edible matrix; and

(ii) an ingestible substantially anhydrous aggregate having a particle size of about 4 to about 80 mesh, U.S. Std. Sieve and having a density of about 0.25 g/cc, consisting essentially of a pre-swelled hydrocolloid and a substrate, wherein the hydrocolloid in its hydrated form is applied to the substrate under pressure of about 1 to about 5 bar, wherein the hydrocolloid at least partially entraps and binds the substrate, wherein the substrate is selected from the group consisting of dietary fibers, drugs and mixtures thereof, and wherein the substrate and the hydrocolloid are not the identical material.

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4,818,540
TRANSDERMAL FERTILITY CONTROL SYSTEM AND PROCESS
Yie W. Chien, North Brunswick; Te-Yen Chien, and Yih-Chain Huang, both of Piscataway, all of N.J., assignors to Rutgers, The State University of New Jersey, New Brunswick, N.J.
Continuation-in-part of Ser. No. 705,194, Feb. 25, 1985, and a continuation-in-part of Ser. No. 770,968, Aug. 30, 1985. This application Aug. 29, 1986, Ser. No. 902,440
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—448 **30 Claims**

1. A transdermal fertility-controlling polymer matrix dosage unit comprising:
(a) a backing layer which is substantially impervious to the fertility-controlling estrogen and progestin hormones to be delivered transdermally;
(b) a polymer matrix disc layer which is adhered to said backing layer and which has microdispersed therein effective dosage amounts of fertility-controlling estrogen and progestin hormones said estrogen being selected from the group consisting of 17-beta estradiol, ethinyl estradiol and biocompatible derivatives thereof convertible to said estradiols, progestin being selected from the group consisting of levonorgestrel and norethindrone, said polymer being bioacceptable and permitting said hormones to be transmitted for transdermal absorption, said hormones being stable in said polymer matrix and being transdermally absorbed simultaneously to provide at least minimum effective daily doses of said hormones to effect fertility control; and
(c) an adhesive means for securing the dosage unit for transdermal absorption to the subject treated.

4,818,541
TRANSDERMAL DELIVERY OF ENANTIOMERS OF PHENYLPROPANOLAMINE
John E. Sanderson, North Miami, Fla., assignor to Schering Corporation, Kenilworth, N.J.
Filed Aug. 19, 1987, Ser. No. 87,848
Int. Cl.[4] A61F *13/02*
U.S. Cl. 424—448 **16 Claims**

1. A method of inducing anorexia comprising transdermally administering to a human in need of such treatment about 40–50 mg. daily of an anorectic compound selected from the group consisting of (+)-norephedrine, (−)-norephedrine, (+)-norpseudoephedrine and (−)-norpseudoephedrine.

4,818,542
POROUS MICROSPHERES FOR DRUG DELIVERY AND METHODS FOR MAKING SAME
Patrick P. DeLuca, Lexington, Ky.; Motoko Kanke, Fukuyama; Toyomi Sato, Tokyo, both of Japan, and Hans G. Schroeder, Encinitas, Calif., assignors to The University of Kentucky Research Foundation, Lexington, Ky.
Continuation of Ser. No. 551,414, Nov. 14, 1983, abandoned. This application Mar. 31, 1986, Ser. No. 846,513
Int. Cl.[4] A61K *9/16, 9/50, 9/52;* **B01J** *13/02*
U.S. Cl. 424—491 **25 Claims**

1. A method for preparing a relatively homogenous essentially spherical microporous polymeric network of interconnecting channels containing a pore incorporated agent confined essentially completely inside the channels comprising preparing an agentpolymer-solvent dispersed first phase, dispersing said first phase in a continuous solvent second phase to obtain a suspension, removing solvent from said suspension by freeze drying, or dilution-extraction-precipitation and recovering said microporous polymeric network.

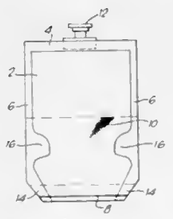
15. A drug delivery system comprising a spherical microporous polymeric network of interconnecting channels containing a drug wherein said drug is distributed essentially within the channels of said microporous polymeric network.



4,818,543
CONTROL OF FOOD INTAKE IN POULTRY BY DIETARY ADDITION
Leo S. Jensen, Athens, Ga., and Bryan I. Fancher, Spofford, N.H., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.
Filed Oct. 15, 1987, Ser. No. 109,259
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 **10 Claims**

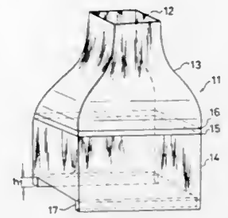
1. A method for controlling food intake in poultry which comprises feeding to the poultry a feed composition containing a feed material and glycolic acid in an amount effective to reduce the intake of the feed material by the poultry.

4,818,544
BEVERAGE PACKAGES
Barry Seward, Lymington Bottom, England, assignor to Mars G. B. Limited, London, England
Filed May 26, 1987, Ser. No. 54,301
Claims priority, application United Kingdom, May 27, 1986, 8612868
Int. Cl.[4] B65D *30/24, 30/10, 33/36*
U.S. Cl. 426—77 **4 Claims**



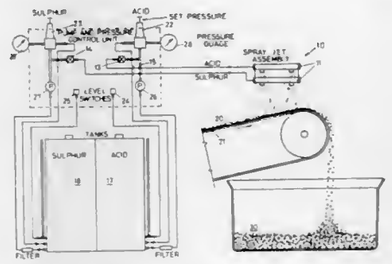
1. A generally planar sealed beverage sachet formed of a substantially air- and water-impermeable flexible sheet material, said sheet material enclosing and being attached to a web of water permeable material which supports a product which provides a beverage when mixed with an aqueous medium, the sachet being provided with a locating means at one end thereof for an aqueous medium introducing means, a frangible base seam comprising a pressure- or heat-sensitive seal at the opposite end, and a pair of side seams each of which includes, adjacent the base seam, a sealed land, said lands extending inwardly towards one another across the generally planar surface of the sachet, said lands being configured and oriented within said sachet sufficient to reduce upward curling of the base seam when aqueous medium is introduced and said base seam opens when said sachet is used.

4,818,545
FOOD MATERIAL-CONTAINER COMBINATION
Yuji Kunimoto, Koube, Japan, assignor to House Food Industrial Company Limited, Higashiosaka, Japan
Filed Jan. 2, 1986, Ser. No. 815,464
Claims priority, application Japan, Jan. 11, 1985, 60-2945
Int. Cl.[4] B65D *81/34*
U.S. Cl. 426—107 **2 Claims**



1. A food material-container combination for use in a microwave oven, said combination comprising:
(a) a microwave transparent, self-standing container formed of water resisting and heat resisting material, said self-standing container:
(i) comprising a flexible, walled, bag-like upper portion, a rigid bottom portion separably connected to said flexible upper portion, and means for separating said flexible upper portion from said rigid bottom portion after cooking, said rigid bottom portion having side walls and an at least generally planar bottom and said flexible upper portion comprising a microwave shielding layer;
(ii) having an opening in said flexible upper portion, said opening being closable by folding said flexible upper portion along a line above said means for separating said flexible upper portion from said rigid bottom portion after cooking; and
(iii) comprising means for vertically elevating said at least generally planar bottom 5–10 mm above a microwave oven table; and
(b) a raw food material that solidifies after cooking in said self-standing container disposed in said rigid bottom portion of said self-standing container,
(c) said flexible upper portion being dimensioned such that, after said flexible upper portion has been folded closed and before cooking, an unfilled volume remains in said flexible upper portion above the raw food material,
whereby:
(d) during cooking, the solidifying food material takes the shape of said rigid bottom portion; and
(e) after cooking, said flexible upper portion can be removed from said rigid bottom portion and the solidified food material served in said rigid bottom portion.

4,818,546
METHOD OF SPRAYING GRAPES WITH PRESERVATIVE LIQUID
Darryl R. Whitford, Rosedale, Australia, assignor to S Smith & Son Pty Ltd., Australia
Filed Jul. 6, 1987, Ser. No. 69,871
Int. Cl.[4] A23B *7/16*
U.S. Cl. 426—231 **4 Claims**



1. A method of spraying grapes with preservative liquid upon harvesting, comprising the steps of:
transporting harvested grapes from a harvester into a bin;
spraying a series of pulses of preservative liquid over the harvested grapes as they are transported into the bin with an "OFF" time period between successive pulses during which no liquid is sprayed and n "ON" time period comprising the duration of each pulse during which liquid is sprayed; and
controlling the rate of application of sprayed preservative liquid to the grapes in accordance with a grape picking rate by controlling at least one of the OFF and ON time periods.

4,818,547
METHOD FOR COOKING FOOD MATERIAL OF VARYING VOLUME
Yoshiyuki Miwa, 9, Sumihata, Satokomaki, Kisogawa-cho, Haguri-gun, Aichi-ken, and Kazuya Miyake, 416, Usagishinden, Shirone-shi, Nigata-ken, both of Japan
Filed May 12, 1987, Ser. No. 48,937
Claims priority, application Japan, May 12, 1986, 61-108338
Int. Cl.[4] A23L *1/01*
U.S. Cl. 426—233 **12 Claims**

1. A method for cooking food materals of varying volume in a cooking apparatus comprising the steps of:
heating a quantity of food material to a prescribed set temperature in the cooking apparatus;
stopping the heating for a first predetermined period for radiating heat from the food material;
applying heat to the food material for a second prescribed period;
detecting a final temperature of the food material;
measuring a period elapsed from the step of heating a quantity of food material until the detecting step;
computing a value, corresponding to the thermal capacity of the food material in the cooking apparatus, from the detected temperature and the elapsed period; and
raising the temperature of the food material in the cooking apparatus to a prescribed cooking temperature for a period corresponding to the computed value.

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4,818,548

METHOD OF TREATING FRESH MEAT CUTS

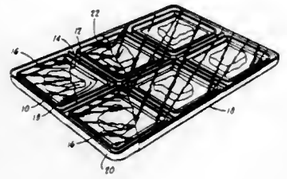
Chin S. Cheng, Oklahoma City, Okla., assignor to Wilson Foods Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 806,609, Dec. 9, 1985, Pat. No. 4,683,139, which is a continuation-in-part of Ser. No. 753,938, Jul. 11, 1985, abandoned. This application Jul. 27, 1987, Ser. No. 78,276

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[4] A23B *4/00, 4/02, 4/12*

U.S. Cl. 426—265 **9 Claims**



1. A process for packing fresh meat cuts comprising:

treating the fresh meat cuts by contacting the fresh meat cuts with an aqueous solution containing (a) a phosphate compound selected from the ground consisting of the alkali metal orthophosphates, alkali metal pyrophosphates, alkali metal tripolyphosphates and alkali metal hexametaphosphates; (b) a reducing compound selected from the group consisting of ascorbic acid, isoascorbic acid, the alkali metal salts of said acids, and reductic acid, and (c) a sequestering agent selected from the group consisting of citric acid, tartaric acid, ethylenediaminetetracetic acid, and the sodium and potassium salts of such acids, so as to place in the so treated meat, from about 0.1 weight percent to about 2.0 weight percent of the phosphate compound, from about 0.01 weight percent to about 0.3 weight percent of said reducing compound, and from about 0.01 weight percent to about 0.3 weight percent of said sequestering agent, all based on the total weight of the fresh meat cut so treated by contacting; then

packaging the treated fresh meat cuts in a gaseous mixture which comprises from about 2 percent to about 25 oxygen, and from about 20 percent to about 80 percent carbon dioxide, with the balance being nitrogen, whereby the properties of the thus treated and packaged meat are improved and will remain good for an extended period of time of up to at least 21 days in said controlled gaseous atmosphere, and whereby the microbial shelf life of the meat is caused to be at least as long as the color shelf life of the meat.

4,818,549

PRESERVATIVE METHOD AND PRESERVED FRUIT OR VEGETABLE PRODUCT, USING CITRIC ACID, SODIUM AND CALCIUM CHLORIDE-CONTAINING PRESERVATIVE COMPOSITION

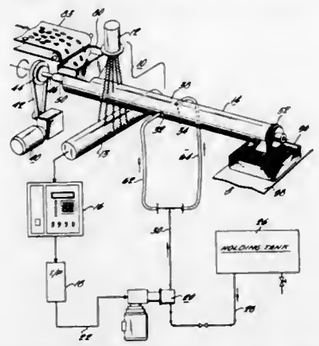
Ferdinand Steiner, Newtown, and Thomas E. Rieth, Shelton, both of Conn., assignors to Pepperidge Farm, Incorporated, Norwalk, Conn.

Filed Dec. 5, 1986, Ser. No. 938,461

Int. Cl.[4] A23B *7/10, 7/16*

U.S. Cl. 426—267 **10 Claims**

1. In a process in which the light-colored pulp of a plant product is contacted with a composition which is effective in deterring the deterioration of the pulp, the improvement wherein the composition comprises an aqueous solution of citric acid, sodium chloride and calcium chloride in an amount effective to deter for at least 7 days the browning of said pulp



stored at a non-freezing temperature within the range of about 32° F. to about 42° F.

4,818,550

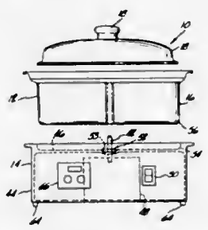
APPARATUS AND PROCESS FOR MARINATING FOODSTUFFS

Peter G. Davidson, Malibu, Calif., assignor to Robert H. Clark, III, Pacific Palisades, Calif.

Filed Jan. 11, 1988, Ser. No. 142,183

Int. Cl.[4] A22C *9/00;* **A23L** *1/318*

U.S. Cl. 426—281 **6 Claims**



6. A process for marinating foodstuffs in a short period of time consisting only of the steps of: placing the foodstuffs in a marinade in an airtight vessel; reducing the pressure within the vessel to a level of about 15–24 in. Hg. below atmospheric pressure; allowing the foodstuffs to remain at rest in the marinade for about 3–5 minutes; introducing air into the vessel to raise the pressure therein to atmospheric; and removing the foodstuffs from the marinade.

4,818,551

METHOD OF MAKING A LIQUID SMOKE IMPREGNATED SHIRRED CASING STICK

Alan D. Stall, Naperville, and Keith A. Watts, Elmhurst, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 893,514, Aug. 5, 1986. This application Apr. 19, 1988, Ser. No. 183,214

Int. Cl.[4] A22C *13/02*

U.S. Cl. 426—420 **6 Claims**

1. A method of making a substantially straight and coherent liquid smoke impregnated shirred stick comprising the steps of:

(a) shirring a length of liquid smoke impregnated, unreinforced cellulosic casing about a mandrel to gather said casing length into pleats to form a shirred stick having a cylindrical bore, said shirring disposing said casing pleats in a regular pattern which follows a continuous helix along the stick wherein the pleats in the regular pattern have a period of radial displacement one from another which is less than 15° per foot of casing deshirred from the stick and, thereafter, longitudinally compacting the shirred casing;

(b) during the course of said shirring, applying a water containing shirring solution to the casing in an amount sufficient to provide the casing with a moisture content of at least 16% by weight of dry cellulose;

(c) positioning a dowel in axial alignment with the shirring mandrel, the dowel having a substantially smooth outer surface and an outside diameter of about 85–95% of the outside diameter of the mandrel;

(d) doffing the shirred and compacted casing onto the dowel immediately following step (a) and allowing the pleats of the shirred casing to expand inward and grip against the outer surface of the dowel;

(e) maintaining the shirred and compacted casing in place on the dowel for between 4 hours and 72 hours to permit absorption of water in the shirring solution by the casing, and a substantially uniform distribution of the absorbed water throughout the casing such that the shirred casing becomes substantially dimensionally stable; and thereafter

(f) separating the shirred and compacted casing from the dowel.

4,818,552

PROCESS FOR RECOVERING CAFFEINE ADSORBED TO ACTIVATED CARBON

Louris Kaper, Barneveld, Netherlands, assignor to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Aug. 6, 1987, Ser. No. 82,341

Claims priority, application Netherlands, Aug. 6, 1986, 8602012

Int. Cl.[4] A23F *5/22;* **C07D** *473/12*

U.S. Cl. 426—422 **8 Claims**

1. A process for recovering caffeine from laden activated carbon by treating the laden activated carbon with an organic acid wherein said activated carbon is treated with a mixture comprising at least 65% by weight of acetic acid and at least 2% by weight of citric acid.

8. A process for decaffeinating coffee by means of activated carbon, followed by recovering the caffeine from the carbon, wherein the caffeine is recovered by using the process as claimed in claim 1.

4,818,553

BAKERY PRODUCT WITH A REDUCED FAT EDIBLE WATER IN-OIL EMULSION

Ebo J. Holscher, Fijnaart, and Jacobus Dijkshoorn, Vlaardingen, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 904,726

Claims priority, application United Kingdom, Sep. 12, 1985, 8522622

Int. Cl.[4] A21D *13/08*

U.S. Cl. 426—549 **14 Claims**

1. A bakery product comprising the following ingredients:

(i) an edible water-in-oil emulsion to serve as a shortening comprising 15–70% of a fat phase containing a fat displaying the following fat solids profile expressed in percentages at the indicated temperatures:

$N_{5\text{-}15°\ C.} = 30\text{–}70$; $N_{20°\ C.} = 15\text{–}35$; $N_{30°\ C.} = 2\text{–}16$; $N_{35°\ C.} = 0\text{–}10$,

the balance up to 100% consisting of an aqueous phase containing 5–60% by weight, based on the total emulsion, of a water-dissolved humectant comprising at least one polyol; and

(ii) an effective amount to form said bakery product of a component selected from the group consisting of flour, eggs, leavening agent, sugar and mixtures thereof.

4,818,554

AERATED FOOD PRODUCT BASED ON RAW MILK AND METHOD FOR ITS PREPARATION

Claude Giddey, Geneva, and Georges Dove, Carouge, both of Switzerland, assignors to Jacobs-Suchard-A.G., Zurich, Switzerland

Filed May 7, 1987, Ser. No. 46,695

Claims priority, application Switzerland, May 16, 1986, 1995/86

Int. Cl.[4] A23G *3/00;* **A23C** *9/154*

U.S. Cl. 426—564 **20 Claims**

1. An aerated food product in the form of a foam made from new milk, comprising, as a homogeneous mixture:

raw milk freshly evaporated under reduced pressure;

about 50 to 75 percent by weight of at least one sweetening and/or preserving additive which is a carbohydrate or polyol;

at least one hydrophilic, antisyneretic, gellifying polymer;

at least one flavoring ingredient or composition; and

a foaming agent; the amount of milk being such that the whole product is a consistent, non-viscous foam mass containing, dispersed therein, microbubbles of air or of an inert gas, and having a density, water activity a_w and water content (by weight) which do not exceed 0.75, 0.80 and 30%, respectively.

4,818,555

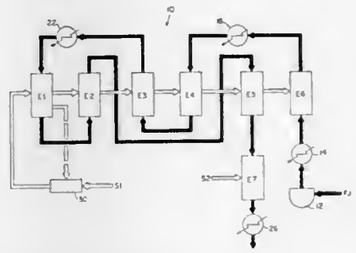
METHOD OF MAKING LOW VISCOSITY EVAPORATIVE ORANGE JUICE CONCENTRATES HAVING LESS COOKED OFF-FLAVOR

Robert D. Piotrowski; George R. Ross; Rudolf G. K. Strobel, all of Cincinnati; Raju V. Thundathil, West Chester, and Chee-Hway Tsai, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 18, 1987, Ser. No. 52,089

Int. Cl.[4] A23L *2/06*

U.S. Cl. 426—599 **15 Claims**



1. A process for preparing an orange juice concentrate of enhanced flavor, which comprises the steps of:

(a) providing a feed juice obtained from oranges having:

(1) a juice solids content of from about 9° to about 140° Brix;

(2) a viscosity of about 10 centipoise or less at a temperature of 8° C.;

(3) abont 10% or less sinking pulp; and

(4) pectinesterase activity of from about 1×10^{-4} to about 5×10^{-4} P.E. units per °Brix;

(5) about 0.015% or less titratable peel oil;

(6) from about 100 to about 200 mg/100 ml of flavanoid glycosides;

(7) aroma and flavor volatiles wherein the ratio of the combined amount of acetaldehyde, methanol, ethyl butyrate, ethyl 3-hydroxy hexanoate and valencene to the combined amount of hexanal, alpha-pinene, myrcene, decanal, linalool, and octanol is from about 8.5 to about 23.2;

(b) heating the feed juice in one or more evaporators at

temperatures in the range of from about 95° to about 160° F. for an average of from about 5 to about 25 seconds per evaporator to provide an preconcentrated feed juice having a juice solids content of from about 15° to about 25° Brix and a pectinesterase activity of from about 1×10^{-4} to about 5×10^{-4} P.E. units per °Brix;

(c) heating the preconcentrated feed juice in one or more evaporators under vacuum to temperatures in the range of from about 160° to about 180° F. under conditions of high shear across the heated surface of each evaporator to provide an intermediately concentrated feed juice having a juice solids content of from about 25° to about 40° Brix and pectinesterase activity of about 0.5×10^{-4} P.E. units or less per °Brix;

(d) heating the intermediately concentrated juice in one or more evaporators at temperatures in the range of from about 170° F. to about 100° F. for an average of from about 5 to about 25 seconds per evaporator to provide a highly concentrated juice having a juice solids content of from about 55° to about 75° Brix;

(e) rapidly cooling the highly concentrated juice to a temperature of about 65° F. or less to provide an orange juice concentrate having:

(1) a juice solids content of from about 55° to about 75° Brix;

(2) a viscosity of from about 500 to about 6000 centipoise at a temperature of 8° C.;

(3) pectinesterase activity of about 0.5×10^{-4} P.E. units or less per °Brix; and

(4) at least about 28% retained valencene.

4,818,556

KONNYAKU PRODUCTS

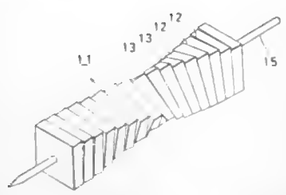
Chikako Hosshi, Tokyo, Japan, assignor to Yagenkaisha Matsubei, Tokyo, Japan

Continuation of Ser. No. 864,247, May 19, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 183,402

Claims priority, application Japan, May 28, 1985, 60-79937; Dec. 16, 1985, 60-193303; Jan. 17, 1986, 61-4793

Int. Cl.⁴ A23L *1/214*

U.S. Cl. 426—615 **4 Claims**



1. A konnyaku food product having improved texture, an elongate shape and a cross-section with its sides forming angles when said product is viewed in the direction of the longitudinal axis of said product, said sides of said cross-section, when viewed in said direction of said longitudinal axis, having lengths not exceeding 4 centimeters, said product having a plurality of notches cut in at least two opposite sides thereof to form thin portions for improving the texture of said product, said notches being parallel with a plane forming an angle with said longitudinal axis of said product, said notches on each side being spaced apart at intervals not exceeding 4 millimeters, said notches having depths of at least 3 millimeters, said product having an unnotched central portion, extending along said longitudinal axis thereof, for connecting said plurality of thin portions, said unnotched portion and said notches permitting twisting of said product about its longitudinal axis to generally shift said thin portions with respect to each other to provide longitudinally-extending, spiralling, design-forming ridgelines for said product.

4,818,557

BRAN-GLUTEN MEAT REPLACEMENT PRODUCT AND MEAT PRODUCTS COMPRISING SAME

Ernst Conrad, Postlåda 2150 B, Höganäs, Sweden (S-263 00)

Continuation of Ser. No. 912,154, Sep. 24, 1986, abandoned, which is a continuation of Ser. No. 802,947, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 289,810, Aug. 3, 1981, abandoned. This application Nov. 5, 1987, Ser. No. 120,202

Claims priority, application Sweden, Aug. 12, 1980, 8005667

Int. Cl.⁴ A23L *1/10, 1/317*

U.S. Cl. 426—618 **8 Claims**

1. A meat replacement product for use in minced meat products which comprises a grain meat, said grain meat consisting essentially of gluten protein and bran concurrently derived from a whole cereal grain by removal of substantially all of the water soluble components from the grain wherein the ratio of gluten to bran ranges from 0.5:1 to 1.5:1.

4,818,558

FIBER/TOFU FOOD PRODUCT AND METHOD FOR MAKING THE SAME

Warren E. Hartman; Richard S. Leiss, both of Worthington, and Robert S. Updegraff, Powell, all of Ohio, assignors to Worthington Foods, Inc., Worthington, Ohio

Filed Aug. 4, 1987, Ser. No. 81,184

Int. Cl.⁴ A23L *1/20;* **A23J** *1/14*

U.S. Cl. 426—634 **33 Claims**

1. A method of making a tofu food product comprising:

dispersing monofilament edible fibers selected from the group consisting of proteinaceous fibers, polysaccharide fibers and mixtures thereof, in an aqueous vegetable protein extract to form a mixture, and

coprecipitating a fibrous curd from said mixture.

4,818,559

METHOD FOR PRODUCING ENDOSSEOUS IMPLANTS

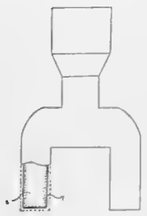
Masaaki Hama, Seattle, Wash.; Keiichirou Watanabe, Toyonaka, and Hiroshi Ishimaru, Niihama, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 29, 1986, Ser. No. 890,286

Claims priority, application Japan, Aug. 8, 1985, 60-175568; Aug. 8, 1985, 60-175570

Int. Cl.⁴ A01N *1/02;* **B05D** *1/08, 3/00;* **A61C** *8/00*

U.S. Cl. 427—2 **8 Claims**



7. A method for producing an endosseous implant which comprises: blasting a surface of a metallic core material selected from the group consisting of titanium and a titanium alloy; thermally spraying titanium hydride having a particle size of 10 to 100 μm onto the surface of the blasted metallic core material to make the surface of the core material rough to a maximum surface roughness of 15 to 100 μm; and thermally spraying a ceramic material selected from the group consisting of alumina, hydroxyapatite and a mixture of alumina and hydroxyapatite onto the surface of the resulting core material, thereby forming a layer of the ceramic material of 10 to 200 μm in thickness on the surface.

4,818,560

METHOD FOR PREPARATION OF MULTI-LAYER STRUCTURE FILM

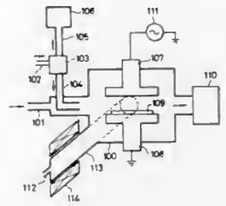
Shunichi Ishihara, Ebina; Jun-Ichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 945,894

Claims priority, application Japan, Dec. 28, 1985, 60-298042

Int. Cl.⁴ B05D *3/06;* **C23C** *16/22*

U.S. Cl. 427—38 **6 Claims**



1. A method for preparing a multi-layer structure film on a substrate in a reaction space according to a plasma-assisted chemical vapor deposition method by applying discharge energy to starting gases in said reaction space to effect film formation, comprising:

separately introducing into the reaction space a starting material gas (A) at a first flow rate (a) which is a major flow rate component, a starting material gas (B) at a second flow rate (b) which is a minor flow rate component and activated hydrogen wherein the second flow rate (b) is at most ½ of the first flow rate (a);

applying external discharge energy to said reaction space to generate a plasma with said starting material gas (A), said starting material gas (B) and said activated hydrogen;

forming a first deposited film layer on the substrate by permitting said starting material (A), said starting material (B), and said activated hydrogen to form a mixture and chemically react while maintaining the discharge energy applied at a substantially constant intensity and thereby produce the first deposited film layer on the substrate having a first composition; and

forming at least a second deposited film layer on top of said first deposited film layer by varying said second flow rate (b) relative to said first flow rate (a) while maintaining the discharge energy applied to said reaction space at the substantially constant intensity applied when forming said first deposited film layer and thereby produce said at least second deposited film layer having a second composition different from said first composition so as to form a multilayer laminated film of at least two layers of different compositions;

wherein each deposited film layer has a thickness in the range of from 10 Å to 200 Å.

4,818,561

THIN FILM DEPOSITION APPARATUS AND METHOD

Thomas L. Strahl, Fremont, Calif., assignor to Machine Technology, Inc., Parsippany, N.J.

Continuation of Ser. No. 779,537, Sep. 24, 1985, Pat. No. 4,664,935. This application May 6, 1987, Ser. No. 47,200

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.⁴ B05D *3/06;* **C23C** *16/00, 14/00*

U.S. Cl. 427—38 **33 Claims**

1. Apparatus for applying a thin film by sputtering to a film-receiving surface of a workpiece comprising:

means defining a process chamber;

means for maintaining said process chamber at a pressure below atmospheric pressure;

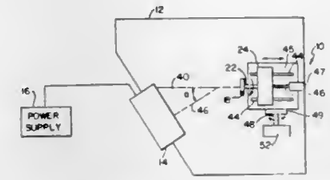
a deposition source in the process chamber at a first location therein, said deposition source having an emission surface arranged in a vertical orientation;

sputtering means for sputtering film forming material from said emission surface; and

means at a second location in the process chamber for mounting a workpiece having a film-receiving surface arranged in a vertical orientation for rotation relative to the deposition source, the emission surface and said film-receiving surface being at an angle in the range of about 10 to 45 degrees, said angle defined between an imaginary line perpendicular to the emission surface of the deposition source and an imaginary line perpendicular to the film-receiving surface of the workpiece when the workpiece is mounted by said mounting means.

13. A method for applying a thin film by sputtering to a film-receiving surface of a workpiece comprising:

providing a deposition source in a process chamber with the source having an emission surface arranged in a vertical orientation;



mounting a workpiece in the process chamber in space relationship to the deposition source, said workpiece having a film-receiving surface arranged in a vertical orientation;

maintaining the process chamber at a pressure below atmospheric pressure during sputtering;

energizing said deposition source for sputtering film forming material from said emission surface;

rotating said workpiece relative to the deposition source as the deposition source is energized; and

maintaining the emission surface and the film-receiving surface at an angle in the range of about 10 to 45 degrees, said angle defined between an imaginary line perpendicular to the emission surface of the deposition source and an imaginary line perpendicular to the film-receiving surface of the workpiece when the workpiece is mounted within the process chamber.

4,818,562

CASTING SHAPES

Frank G. Arcella, Bethel Park, and Gerald G. Lessmann, Pleasant Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 21,845, Mar. 4, 1987, abandoned. This application Mar. 24, 1988, Ser. No. 172,991

Int. Cl.⁴ B05D *1/03*

U.S. Cl. 427—53.1 **126 Claims**

1. A method of casting a shape comprising directing a laser or electron gun at fusible powder in a fluidized bed, where said beam melts said powder and said melted powder fuses and solidifies on a surface, forming said shape.

102. Apparatus for casting a shape comprising:

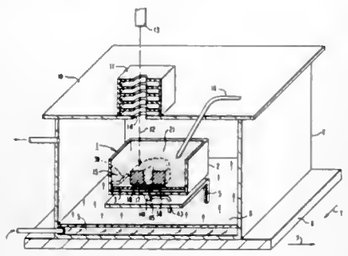
(A) a fluidized bed;

(B) a surface within said bed;

(C) an electron gun or a laser having an energy sufficient to fuse powder within said fluidized bed, where the output beam of said electron gun or said laser is directed at said surface;

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(D) means for controlling the level of powder in said fluidized bed relative to said surface;



(E) means for controlling the horizontal position of said surface relative to said beam.

4,818,563

PROCESS FOR FORMING DEPOSITED FILM

Shunichi Ishihara, Ebina; Shigeru Ohno, Yokohama; Masahiro Kanai; Shunri Oda, both of Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

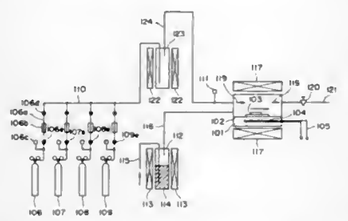
Filed Feb. 20, 1986, Ser. No. 831,413

Claims priority, application Japan, Feb. 21, 1985, 60-33272; Feb. 22, 1985, 60-32918; Feb. 25, 1985, 60-35606; Feb. 26, 1985, 60-36765; Feb. 27, 1985, 60-38574; Feb. 28, 1985, 60-39049

The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—55 23 Claims



1. A process for forming a deposited film comprising

separately introducing an active species (A) and an active species (B) into a film forming space housing a substrate therein, said active species (A) being formed by decomposing a compound containing germanium and a halogen; and said active species (B) being formed from a chemical substance for film formation which is reactive with said active species (A); and

applying heat energy to said active species (A) and active species (B) and allowing both active species (A) and active species (B) to react with each other thereby to form a deposited film on the substrate.

4,818,564

METHOD FOR FORMING DEPOSITED FILM

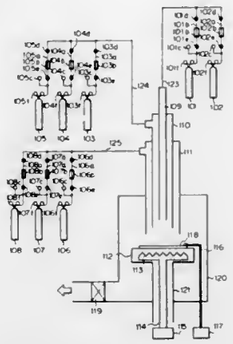
Shunichi Ishihara, Ebina; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,462

Claims priority, application Japan, Oct. 23, 1985, 60-237006; Oct. 24, 1985, 60-238497; Dec. 28, 1985, 60-298046

Int. Cl.[4] B05D *5/06, 5/12;* C23C *16/00*

U.S. Cl. 427—69 42 Claims



1. Method for forming a deposited film on a substrate in a film-forming space which comprises:

(a) conducting a gaseous starting material for forming a deposited film and a gaseous halogenic oxidizing agent selected from the group consisting of F_2, Cl_2, Br_2 and I_2 into the film-forming space;

(b) effecting chemical contact between said gaseous starting material and said gaseous halogenic oxidizing agent in said film-forming space to form a plural number of precursors containing precursors in an excited state, wherein at least one of said precursors is the feeding source of the constituent element of said deposited film; and

(c) depositing said film on said substrate without the use of external discharge energy in said film-forming space, wherein the step of effecting chemical contact is implemented (i) by employing a gas introducing conduit system having multiple concentric tubular conduits extending into said film-forming space, in which exit orifices of inner ones of said conduits adapted to carry at least said gaseous starting material are set back from an exit orifice of the outer of said conduits adapted to carry said gaseous halogenic oxidizing agent in order to enable the gaseous halogenic oxidizing agent to surround said gaseous starting material during introduction thereof into said film-forming space; and (ii) by spacing said substrate from 5 millimeters to 15 centimeters from said gas introducing conduit system.

4,818,565

METHOD TO STABILIZE METAL CONTACTS ON MERCURY-CADMIUM-TELLURIDE ALLOYS

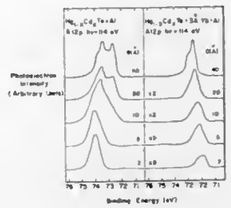
Alfonso Franciosi, Eden Prairie, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 115,174, Oct. 30, 1987, abandoned. This application Feb. 29, 1988, Ser. No. 165,411

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—74 8 Claims

1. A method of stabilizing metal contacts on a body of a mercury-cadmium-telluride alloy comprising depositing a layer of a rare earth element on the surface of the alloy prior to



depositing an overlayer of a contact metal on said layer of said rare earth element.

4,818,566

APPARATUS FOR MIXING MULTICOMPONENT PLASTICS, IN PARTICULAR POLYURETHANE

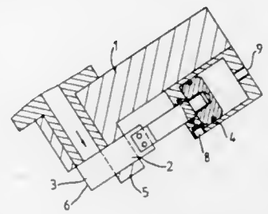
Peter Taubenmann, Munich, Fed. Rep. of Germany, assignor to Elastogran Maschinenbau GmbH, Lemfoerde, Fed. Rep. of Germany

Filed May 5, 1987, Ser. No. 46,147

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616600

Int. Cl.[4] B01D *3/10, 5/06*

U.S. Cl. 422—133 2 Claims



1. Apparatus for mixing multi-component plastics which comprises:

a mixing chamber, said chamber including inlet orifices for passing individual components of the plastic into the chamber, and an outlet orifice for moving the mixture out of the chamber, and

a steadying attachment for the mixture emerging from the mixing chamber, said attachment including a plurality of spaced lamellae which can be moved into and out of a position for receiving the mixture emerging from the chamber, said lamellae being so arranged that the mixture passes between and in contact with the lamellae when the lamellae are positioned for receiving the mixture, and a guide housing arranged adjacent to the outlet orifice in which housing the lamellae are movable, said housing including webs which occupy the spaces between lamellae.

4,818,567

COATED METALLIC PARTICLES AND PROCESS FOR PRODUCING SAME

Preston B. Kemp, Jr., Athens, and Robert J. Holland, Sr., Sayre, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 14, 1986, Ser. No. 918,181

Int. Cl.[4] B05D *7/00;* B22F *1/00*

U.S. Cl. 427—216 9 Claims

1. A process for producing coated powder particles, said process comprising:

(a) increasing the aspect ratio of relatively ductile and/or malleable metallic powder particles selected from the group consisting of metal powder particles and metal alloy powder particles to greater than about 50 to 1 by relatively high speed milling; and

(b) mechanically applying the resulting ductile and/or malleable metallic particles having the increased aspect ratio to a powder material selected from the group consisting of metal powder, metal alloy powder, ceramic powder, and ceramic glass powder, by relatively low speed milling, said powder material being sufficiently less deformable than said ductile and/or malleable metallic powder, to produce coated particles consisting essentially of a core which consists essentially of said powder material and a coating relatively uniformly distributed on said core, said coating consisting essentially of said ductile and/or malleable metal, said coated particles having a particle size of less than about 50 micrometers in diameter.

4,818,568

HOT DIP COATED STEEL SHEET AND PROCESS FOR PRODUCING THE SAME

Takenori Deguchi, Shisui; Masaru Suzaki, Izumisano; Sanae Watanabe, Matsudo, and Kazuko Uchida, Funabashi, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Division of Ser. No. 49,693, Apr. 17, 1987. This application Sep. 24, 1987, Ser. No. 100,414

Claims priority, application Japan, Aug. 29, 1985, 60-190560; Aug. 30, 1985, 60-191773

Int. Cl.[4] C23C *2/26*

U.S. Cl. 427—226 14 Claims

1. A process for producing a hot dip coated steel sheet, comprising the steps of:

subjecting a steel sheet to hot dipping of zinc-based or zinc-/aluminum-based alloy,

thereafter regulating the coverage,

then spraying an aqueous solution containing a salt of cobalt or a salt of iron, or both of these, on the surface of a coating while the coating is kept at a temperature of 170° C. or higher or after the coating is heated to 170° C. or higher, to effect thermal decomposition of the salt, and

forming a film consisting essentially of of oxides of cobalt or iron, or both of these, on the surface of the coating.

4,818,569

ARTICLES AND METHODS FOR TREATING FABRICS IN CLOTHES DRYER

Toan Trinh, Mainville; Eugene P. Gosselink, and Gail B. Rattinger, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 5, 1987, Ser. No. 105,415

Int. Cl.[4] B05D *3/12*

U.S. Cl. 427—242 23 Claims

1. An article of manufacture adapted for use to provide fabric soil release benefits and to soften fabrics in an automatic laundry dryer comprising:

I. fabric treatment composition comprising:

(a) at least an effective amount of fabric conditioning agent selected from the group consisting of cationic fabric softening agents, nonionic fabric softening agents, and mixtures thereof; and

(b) at least an effective amount of at least one anionic polymeric soil release agent having at least one hydrophobic moiety and at least one hydrophilic anionic moiety; and

II. dispensing means which provides for release of an effective amount of said fabric conditioning agent (a) and anionic polymeric soil release agent (b) to fabrics in an automatic laundry dryer at operating temperatures, said agents (a) and (b) being, as they appear in the article of manufacture, substantially solid under storage conditions and being mobilized under dryer conditions.

4,818,570

PROCESS FOR THE PRODUCTION OF SMOOTH-SURFACED PARTS FROM A HARD GEMLIKE MATERIAL, AND THE USE OF THIS PROCESS

Victor A. Milles, St. Gallerstrasse 55, Wil, Switzerland

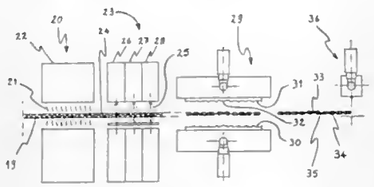
PCT No. PCT/CH86/00153, § 371 Date Jul. 14, 1987, § 102(e) Date Jul. 14, 1987, PCT Pub. No. WO87/03109, PCT Pub. Date May 21, 1987

PCT Filed Nov. 4, 1986, Ser. No. 83,854

Claims priority, application Switzerland, Nov. 18, 1985, 4 910/85

Int. Cl.⁴ B05D *5/06;* **B29C** *43/20, 59/00*

U.S. Cl. 427—273 **22 Claims**



1. Process for the production of smooth-surfaced shaped parts from a hard gemlike material, in which process pieces of a granulate or a divided paste material are coated with an added pigment, pressed together and then hardened to form a hard material, wherein the paste material, comprising pieces which are coated with added pigment and then pressed together, is pressed out to form a pressed-out strand, the pressed-out strand being subjected to a first, incomplete hardening, after which the incompletely hardened paste material of the strand is just no longer capable of flowing under its own weight, a strand surface to be used which has no coating of added pigment, being formed after said first, incomplete hardening, said surface to be used being smoothed, and the hardening of the paste material of the strand to form a hard material finally being completed.

4,818,571

METHOD AND APPARATUS FOR APPLYING A BAND OF COATING MATERIAL AROUND A RECIPIENT SURFACE OF AN ARTICLE

Terence J. Pilley, deceased, late of Nazeing (by Mervyn H. Pilley, Executor); Fred R. Pilling, and Colin A. Tester, both of Bolton, all of United Kingdom, assignors to Metal Box Public Limited Company, Reading, United Kingdom

PCT No. PCT/GB86/00598, § 371 Date Jul. 15, 1987, § 102(e) Date Jul. 15, 1987, PCT Pub. No. WO87/01971, PCT Pub. Date Apr. 9, 1987

PCT Filed Oct. 6, 1986, Ser. No. 93,565

Claims priority, application United Kingdom, Oct. 4, 1985, 8524517; Jun. 14, 1986, 8614527

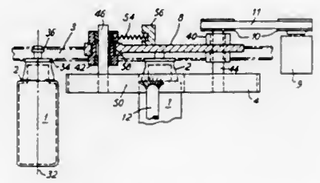
Int. Cl.⁴ B05D *5/00;* **B05C** *1/00, 1/14*

U.S. Cl. 427—286 **19 Claims**

1. A method of applying a band of coating material around a recipient surface of an article of curved cross-section, at a predetermined longitudinal position on the article, the band being of predetermined width, the method comprising the steps of:

directing a stream of liquid coating material onto a moving donor surface of an elongate donor member while moving the latter along a first path, so as to charge the donor surface with a predetermined quantity of the material;

holding the article by a carrier so that the article depends downwardly from the carrier;



using the carrier to bring the recipient surface along a second path into contact with the donor surface and without causing the recipient surface to contact any surface except for the donor surface; while the recipient surface is in contact with the donor surface rotating the article so as to present the whole area to be coated to the donor surface; and

causing or allowing the band of coating material thus applied to dry.

4,818,572

PROCESS FOR PRODUCTION OF CALCIUM PHOSPHATE COMPOUND-COATED COMPOSITE MATERIAL

Takayuki Shimamune, Tokyo, and Masashi Hosounma, Kanagawa, both of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,378

Claims priority, application Japan, Oct. 17, 1986, 61-247161; Oct. 17, 1986, 61-247162

Int. Cl.⁴ B05D *3/00, 3/2;* **C23C** *22/08;* **C25D** *5/00*

U.S. Cl. 427—327 **11 Claims**

1. A process for producing a calcium phosphate compound-coated composite material which comprises oxidizing a metallic substrate to form a layer of an oxide of the metal component of the substrate on the surface of the substrate, and forming a coating layer of a calcium phosphate compound on the surface of the oxide layer.

4,818,573

PROCESS FOR THE WATERPROOF WORKING WITH THE USE OF DEPOSITION LAYER INCLUDING MESH REINFORCING BAR

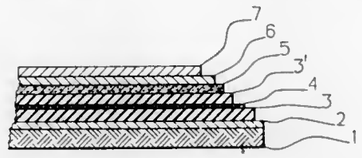
Kokichi Nishiwaki, Tokyo, Japan, assignor to Kabushikikaisha Toshonishiwaki, Japan

Continuation of Ser. No. 863,143, May 14, 1986, abandoned. This application Sep. 25, 1987, Ser. No. 102,293

Claims priority, application Japan, May 17, 1985, 60-103814

Int. Cl.⁴ B05D *1/36, 7/00;* **E04C** *1/00;* **E04B** *2/00*

U.S. Cl. 427—403 **2 Claims**



1. A process for waterproof working of a structure in cold

weather to compensate for decreasing elastic modulus down to about −10° C. by increasing the extension percent of a waterproof material using deposition layers and a mesh-reinforcing bar layer having a tensile strength of from 70 km/cm² and strength of more than 5 kg per one bar, wherein said bar layer has a mesh width of from about 0.5 to 5 mm, and a thickness of from about 0.1 to 2 mm comprising, depositing on a primer on said structure at least one waterproof material selected from the group consisting of: (1) a rubber elastic cement comprising a mix of a synthetic resin emulsion selected from copolymers of methyl methacrylate-ethyl acrylate, methyl-methacrylate-butylacrylate, methylmethacrylate-2-ethylhexyl acrylate, methylmethacrylate-butadiene, styrene-ethylacrylate and styrene-butylacrylate and cement in a ratio of 1:0.5 to 1:0.7 and (2) an elastic mortar obtained by mixing 100 parts of said rubber elastic cement, 30 parts by weight of silica sand and 60 parts by weight of water; and inserting said mesh reinforcing bar layer in between one of said waterproof deposited layers.

4,818,574

PROCESS OF FORMING A REFRACTORY MASS AND MIXTURE OF PARTICLES FOR FORMING SUCH A MASS

Léon-Philippe Mottet, Tarcienne; Pierre Robyn, Nivelles, and Pierre Laroche, Nalinnes, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed May 13, 1987, Ser. No. 49,388

Claims priority, application Luxembourg, May 16, 1986, 86431

Int. Cl.⁴ B05D *1/10*

U.S. Cl. 427—422 **17 Claims**

1. A process of forming a coherent refractory mass on a surface by ceramic welding comprising:

projecting against that surface, together with oxygen, a mixture of refractory particles and fuel which reacts in an exothermic manner with the projected oxygen to release sufficient heat to melt at least the surfaces of the refractory particles and thus form said refractory mass, characterised in that said fuel consists essentially of finely divided particles of at least one element which is oxidisable to form a refractory oxide and in that the projected mixture also contains carbonaceous particles which are of such a size or composition that carbon particles become occluded in the formed refractory mass.

4,818,575

BIAXIALLY DRAWN POLYESTER VESSEL HAVING RESISTANCE TO HEAT DISTORTION AND GAS BARRIER PROPERTIES AND PROCESS FOR PREPARATION THEREOF

Shunsaku Hirata; Shigezo Nohara, both of Yokohama, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

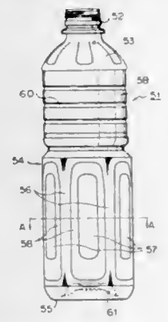
Filed Mar. 2, 1987, Ser. No. 20,998

Claims priority, application Japan, Feb. 28, 1986, 61-41952; Feb. 5, 1987, 62-23491

Int. Cl.⁴ B65D *90/02*

U.S. Cl. 428—36.7 **4 Claims**

1. A biaxially drawn polyester vessel having good resistance to heat distortion and gas-barrier properties, which is prepared by biaxially draw-blow forming of a preform comprising inner and outer layers of a polyester composed mainly of ethylene terephthalate units and at least one intermediate layer composed of a gas-barrier resin with the temperature conductivity of the gas-barrier resin being ½ to ⅓ the temperature conductivity of the polyester, wherein the barrel of the vessel has pillar convexities having a relatively large diameter and a short circumference and panel-like concavities having a relatively small diameter and a long circumference, which are alternately arranged in the circumferential direction of the barrel where the circumferential size of the panel-like concavities is 10 to 50 mm, the axial size of the panel-like concavities is 40 to 160 mm and the step between the panel-like concavities and the pillar convexities is 1 to 8 mm, the panel-like concavities having a function of expanding and contracting in the diameter direction of the barrel according to the change of the pressure in the vessel, the inner and outer layers in the panel portion are biaxially and molecularly oriented so that the in-plane orientation degree (1+m) is at least 0.350, and the inner and outer layers in the panel portion are heat-set so that the crystallization degree, determined by the density method, of the outer layer in the panel portion is at least 30% and is higher by at least 2% than the crystallization degree of the inner layer in the panel portion.



4,818,576

SILICONE RELEASES, LAMINATES AND METHODS

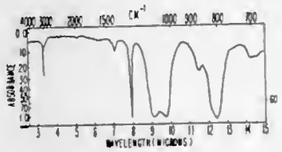
John R. Pennace, Paxton, and Sharon A. Quinn, Hudson, both of Mass., assignors to Flexcon Co., Inc., Spencer, Mass.

Continuation of Ser. No. 596,767, Apr. 4, 1984, Pat. No. 4,614,677, which is a continuation-in-part of Ser. No. 405,637, Aug. 5, 1982, abandoned, which is a continuation of Ser. No. 296,701, Aug. 27, 1981, which is a continuation of Ser. No. 99,265, Feb. 20, 1980, abandoned, and a continuation of Ser. No. 58,983, Jul. 10, 1979, abandoned, and a continuation of Ser. No. 969,254, Dec. 13, 1978, abandoned, and a continuation of Ser. No. 759,154, Dec. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 558,324, Mar. 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 538,588, Jan. 16, 1975, abandoned. This application Sep. 29, 1986, Ser. No. 913,122

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

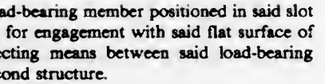
Int. Cl.⁴ A61F *13/02*

U.S. Cl. 428—40 **15 Claims**



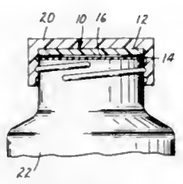
1. A silicone release article comprising a backing and a releasable polysiloxane on said backing;

said polysiloxane having a viscosity before curing in the range from about 60 to below 900 centipoises at 25 degrees C. and the following structure:



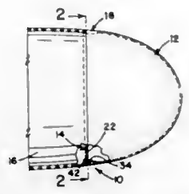
where
R' is an organic radical;
R is partially or entirely hydrogen, partially or entirely hydroxyl, and/or partially or entirely organic;
X is below 350.

4,818,577
SYNTHETIC LINER CAPABLE OF RESISTING CHEMICAL ATTACK AND HIGH TEMPERATURE
David T. Ou-Yang, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 20, 1987, Ser. No. 87,666
Int. Cl.[4] B65D *53/00*; B32B *3/26, 27/00*
U.S. Cl. 428—36.5 **14 Claims**



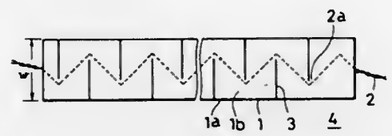
1. Liner suitable for a cap for a container consisting of:
(a) a layer of compressible polymeric foam, said layer of foam comprising a polymer or copolymer of olefin,
(b) a layer of adhesive in contact with and coextensive with said layer of foam, and
(c) a layer of polymeric film in contact with and coextensive with said layer of adhesive, said layer of film being made of a material selected from the group consisting of crystalline and semicrystalline polyesters, silicones, polytetrafluoroethylenes, and polyimides.

4,818,578
COMPOSITE STRUCTURE ATTACHMENT SYSTEM
Sharad R. Moghe, Northfield Center, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Jan. 11, 1988, Ser. No. 142,381
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—57 **10 Claims**



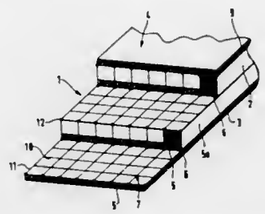
1. A composite structure attachment assembly comprising in combination a composite structure of laminated reinforced plastic having overlapping layers of fabric plies embedded in a thermoplastic material forming a unitary body, an edge portion of said composite structure having an edge surface for abutting engagement with a surface of a second structure, a slot spaced from said edge surface and extending through at least some of said overlapping layers of fabric plies, said slot having a flat surface generally parallel with said edge surface of said composite structure, a load-bearing member positioned in said slot having a flat surface for engagement with said flat surface of said slot and connecting means between said load-bearing member and said second structure.

4,818,579
SHEET FOR FORMING TWISTED FLAPS IN CONTINUOUS ARRANGEMENT AND METHOD OF PRODUCING SAME
Hiroshi Uchida, Ashikaga, Japan, assignor to Earthnics Corporation, Tokyo, Japan
PCT No. PCT/JP87/00169, § 371 Date Nov. 17, 1987, § 102(e) Date Nov. 17, 1987, PCT Pub. No. WO87/05642, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 18, 1987, Ser. No. 130,383
Claims priority, application Japan, Mar. 18, 1986, 61-61578; Apr. 23, 1986, 61-94219
Int. Cl.[4] B32B *1/06*
U.S. Cl. 428—102 **27 Claims**



1. A sheet for forming twisted flaps in a continuous arrangement comprising a strip having incisions extending widthwise thereof alternately from its opposite side edges beyond the longitudinal center line of the strip, and a stitching thread attached to the strip by stitching and extending longitudinally of the strip in a wave pattern through a position in the vicinity of the terminal end of each of the incisions, so that when the stitching thread is pulled apart at its opposite ends, the strip forms raised and curved flaps inclined with respect to the longitudinal direction of the stretched thread.

4,818,580
HOUSING COMPONENT PART MADE OF A LAMINATED MULTI-LAYERED WOVEN LAMINATE
Wolfgang Böttger, Ködnitz, and Kurt Biedermann, Kulmbach, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interbolding GmbH, Wuppertal, Fed. Rep. of Germany
Filed Jul. 2, 1987, Ser. No. 69,167
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 8617619[U]
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—113 **6 Claims**



1. A housing component part having a contour made into predetermined shape, comprising:
an upper woven layer having warps and fill fibers defining a very fine structure of first openings;
a lower woven layer disposed beneath said upper layer and having warp and fill fibers defining a coarse structure of second openings larger than said first openings;
tying fiber means for interconnecting said layers to form a single multi-layered woven laminate; and,
laminating means impregnating said layers via capillary action through said second openings into said first openings so as to form a multi-layered woven laminate.

4,818,581
BIAXIALLY ORIENTED POLYESTER FILM
Hideo Katoh, Kanagawa; Hisashi Hamano, Sagamihara; Kinji Hasegawa, Yokohama, and Yoshihiro Noumi, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Aug. 26, 1987, Ser. No. 89,571
Claims priority, application Japan, Aug. 27, 1986, 61-199150; Sep. 1, 1986, 61-203836; Mar. 10, 1987, 62-53095; Mar. 23, 1987, 62-65797; Mar. 25, 1987, 62-69142
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—143 **13 Claims**

1. A biaxially oriented polyester film formed from an intimate mixture comprising
(1) an aromatic polyester, and
(2) 0.01 to 4% by weight, based on the aromatic polyester, of spherical fine particles of silica having
(a) an average particle diameter of 0.05 to 4 μm,
(b) a particle diameter ratio, defined by the ratio of maximum diameter to minimum diameter, of from 1.0 to 1.2, and
(c) a relative standard deviation (σ) of particle size, defined by the following equation

$$\sigma = \frac{\sqrt{\sum_{i=1}^{n} (D_i - D)^2/n}}{D}$$

wherein D_i is the diameter (μm) of the equivalent circular area of each of the particles, D is an average value (μm) of the diameter of the equivalent circular area defined by the following equation

$$D = \sum_{i=1}^{n} D_i/n$$

and n is the number of the particles, with the proviso that the diameter of the equivalent circular area denotes the diameter of each particle calculated when it is assumed that each particle is of a true spherical shape,
of up to 0.5.

4,818,582
TENSION BANDS AND METHODS FOR THEIR MANUFACTURE
Graham Gilgrass, Oxford, United Kingdom, assignor to Oxford Magnet Technology Limited, Oxford, England
Filed Aug. 20, 1987, Ser. No. 87,223
Claims priority, application United Kingdom, Sep. 8, 1986, 8621563
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—189 **17 Claims**

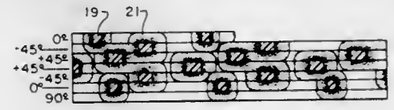


1. A tension band comprising a plurality of layers of resin bonded fibre rovings, the rovings of the plurality of layers extending in the same direction and being substantially parallel to each other, and the rovings in each said layer being laterally offset from the rovings in adjacent layers in a direction transverse the direction in which the rovings extend.

4,818,583
USE OF A FIBROUS WEB INCORPORATING MICROSPHERES FOR PREPARING REINFORCED OBJECTS
Adam P. Geel, Doorwerth, Netherlands, assignor to Lantor B.V., Veenendaal, Netherlands
Filed Jan. 29, 1986, Ser. No. 823,534
Claims priority, application Netherlands, Jan. 29, 1985, 8500242
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—195 **14 Claims**

1. A fibrous web provided with microspheres disposed mainly within said web and arranged in a predetermined, non-random pattern in which areas of the web which contain microspheres are separated from each other by areas which contain virtually no microspheres.

4,818,584
ARRESTING DELAMINATION IN COMPOSITE LAMINATE
James R. Eisenmann, Fort Worth, Tex., assignor to General Dynamics Corp., Fort Worth, Tex.
Filed Dec. 3, 1987, Ser. No. 128,027
Int. Cl.[4] B32B *27/14*
U.S. Cl. 428—148 **6 Claims**

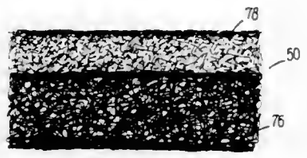


1. A composite laminate having a plurality of laminate layers containing a resin having embedded therewithin high tensile strength filaments of a light weight component; a plurality of respective narrow strips of tough adhesive at a plurality of respective discrete locations within each layer of laminate, said adhesive having a fracture toughness greater than the fracture toughness of the resin in the respective layers of laminate; and a region of diffused adhesive surrounding each strip of tough adhesive, said region of diffused adhesive having a toughness greater than the fracture toughness of the resin in the respective layers of laminate such that said composite laminate has increased resistance to delamination and any delamination, either inter-layer or intra-layer, will be arrested and contained within a predetermined zone having an aerial extent determined by the respective angles which the respective filaments in the resin in each respective layer are oriented.

4,818,585
AGRICULTURAL PROTECTIVE FABRIC
Peter W. Shipp, Jr., Woodstock, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Aug. 24, 1987, Ser. No. 88,757
Int. Cl.[4] B32B *27/14*
U.S. Cl. 428—198 **9 Claims**

1. A protective fabric covering growing plants comprising:
a. a first nonwoven web layer comprising a first material that

is resistant to environmental degradation during the course of a growing season; and



b. a second nonwoven web layer laminated to the first layer and comprising a second material that is degradable during the course of the growing season.

4,818,586

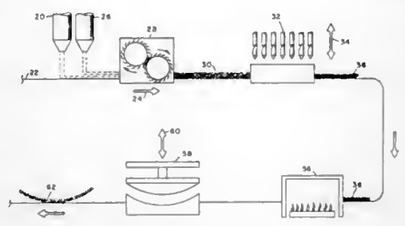
PREFERENTIALLY NEEDLED TEXTILE PANEL AND METHOD

Gerald J. Smith, and Elwood G. Trask, both of Auburn, Me., assignors to Gates Formed-Fibre Products, Inc., Auburn, Me.

Continuation of Ser. No. 820,854, Jan. 21, 1986, abandoned. This application Nov. 4, 1987, Ser. No. 120,195

Int. Cl.[4] B32B *27/14*

U.S. Cl. 428—198 **36 Claims**



1. A non woven fiber panel which has been needle-punched, comprising:

a face side formed predominantly of first fibers which, during needle-punching, have been preferentially snagged from a batt of said first fibers in admixture with other fibers by needle barbs of a needle loom and thence selectively driven to the face side of the panel, said first fibers having an average length which is less than the average length of said other fibers; and

a base side joined to the face side and formed predominantly of said other fibers.

4,818,587

NONWOVEN FABRICS AND METHOD FOR PRODUCING THEM

Shozo Ejima, Moriyama; Taizo Sugihara, Omihachiman, and Morio Abe, Shiga, all of Japan, assignors to Chisso Corporation, Osaka, Japan

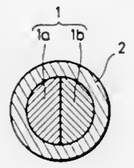
Filed Oct. 15, 1987, Ser. No. 108,459

Claims priority, application Japan, Oct. 17, 1986, 61-245425; Aug. 21, 1987, 62-207823

Int. Cl.[4] D02G *2/00*

U.S. Cl. 428—198 **11 Claims**

1. A nonwoven fabric comprising at least 30% by weight of heat-adhesive composite fibers comprising a core portion and a sheath portion, said core portion being of the side-by-side type composite structure comprising two core components of different polypropylene base polymers in a composite ratio of 1:2 to 2:1, one of said core components having a Q value, expressed in terms of the weight-average molecular weight/the number-average molecular weight, equal to or higher than 6 and the other having a Q value equal to or lower than 5, said sheath portion meeting at least the requirement that it should comprise a sheath component of a polyethylene base polymer having a melting point lower by at least 20 ° C. than the lower one of the melting points of said two core components, and said sheath portion covering completely said core portion in a



proportion of 25 to 55% by weight based on the total weight of it and said core portion, and which is stabilized by the inter-fiber bonds of the sheath portion of said heat-adhesive composite fibers.

4,818,588

PACKAGING MATERIALS

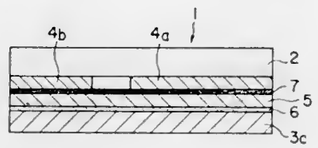
Mitsuo Okabe, Yokohama; Hirohito Tomita, and Shoichi Kubo, both of Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1986, Ser. No. 931,863

Claims priority, application Japan, Nov. 20, 1985, 60-260863; Mar. 24, 1986, 61-65482; Mar. 27, 1986, 61-45357[U]; May 23, 1986, 61-11857

Int. Cl.[4] B32B *3/10, 5/16, 15/08*

U.S. Cl. 428—201 **9 Claims**



1. A packaging material comprising:

(a) an outer layer of a heat shrinkable plastic film and;

(b) a metallic glossy laminate disposed on an inner side of said outer layer and which maintains metallic gloss even after heat shrinkage, and said laminate comprises an anti-blushing primer layer disposed on the inner side of said outer layer and a metal-deposited layer disposed on said primer layer.

2. The packaging material according to claim 1 which has an ink layer interposed between said film and said anti-blushing primer layer.

4,818,589

PAINT TRANSFER ARTICLE AND METHODS OF PREPARATION AND USE THEREOF

Bruce E. Johnson, White Bear Lake, and Max Naglosky, III, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 818,795, Jan. 14, 1986, abandoned. This application May 8, 1987, Ser. No. 47,886

Int. Cl.[4] B32B *7/02, 15/08*

U.S. Cl. 428—201 **26 Claims**

1. A paint transfer article comprising:

(A) a continuous reinforcing layer, said layer having two major surfaces and having a glass transition temperature below about 20° C. and a tensile modulus of at least about 50 pounds/inch^2 at 200° F.; and

(B) a colored layer on a first major surface of said reinforcing layer;

wherein said paint transfer article is substantially nonelastomeric and sufficiently extensible to intimately conform to the contours of the surface of a substrate.



2. The paint transfer article of claim 1 wherein said colored layer comprises a substantially clear coating over a colored base stratum.

4,818,590

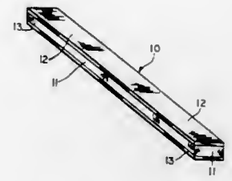
WOOD VENEER COVERED STRUCTURAL RIGID PLASTIC FOAM ELEMENTS

Kendall W. Prince, West Valley City, and Jack R. Prince, Farmington, both of Utah, assignors to Princewood, West Valley City, Utah

Filed Jun. 22, 1987, Ser. No. 65,355

Int. Cl.[4] B32B *5/18, 21/08*

U.S. Cl. 428—213 **11 Claims**



1. A structural element which comprises structurally stable, resilient, rigid plastic foam substrate having opposing surfaces and having a wood veneer adhering to at least one of said surface wherein thickness of the substrate is not in excess of 10 mm, and wherein the veneer is sufficiently thin, relative to the substrate, that the structural properties of the substrate are maintained.

4,818,591

THERMAL TRANSFER RECORDING MEDIUM

Shegehiro Kitamura; Masao Asano; Yoshiaki Shimizu, and Takao Abe, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1986, Ser. No. 913,323

Claims priority, application Japan, Oct. 7, 1985, 60-224046; Jan. 30, 1986, 61-20984; Feb. 7, 1986, 61-25069

Int. Cl.[4] B32B *7/02*

U.S. Cl. 428—216 **4 Claims**



1. A thermal transfer recording medium, comprising a support, a heat-fusible layer formed from an aqueous emulsion of a heat-fusible substance coated on said support and dried; and at least one colorant layer formed from an aqueous emulsion of a thermoplastic resin and a colorant coated on said layer and thereafter dried said colorant layer having a film thickness of not more than 2 μm.

4,818,592

MULTIPLE LAYER FILMS CONTAINING ORIENTED LAYERS OF NYLON AND ETHYLENE VINYL ALCOHOL COPOLYMER

William F. Oastan, Appleton, Wis., assignor to American National Can Company, Chicago, Ill.

Division of Ser. No. 675,519, Nov. 28, 1984, Pat. No. 4,640,852. This application Jul. 22, 1986, Ser. No. 888,187

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.[4] B32B *27/08*

U.S. Cl. 428—216 **5 Claims**



1. A multiple layer sheet structure wherein the layers are firmly adhered to each other, said sheet structure comprising a first molecularly oriented layer of nylon, and in face to face contact with said first layer, a second molecularly oriented layer of ethylene vinyl alcohol copolymer, said first and second layers having been molecularly oriented by a process operating on a previously fabricated film, at a temperature below the melting temperatures of both said first and second layers, said sheet structure, when incorporating therein a third oriented layer of nylon on said second oriented layer of ethylene vinyl alcohol copolymer, a fourth oriented layer of an olefinic adhesive on the third layer, a fifth oriented layer of propylene ethylene copolymer on the fourth layer, and a sixth layer of propylene ethylene copolymer adhering a seventh layer of propylene ethylene copolymer to the fifth layer, and wherein, when the overall thickness of the seven layers is about 5 mils, with said first layer and the third layer each being about 0.2 mil thick, said second layer being about 0.3 mil thick, the fourth layer being about 0.45 mil thick, and said fifth, sixth, and seventh layers combined being about 3.75 mils thick, the seven layer film will have an impact strength of about 3.0 to about 9.0 centimeter-kilo-grams, and a split-type break.

4,818,593

ULTRATHIN HETEROAROMATIC POLYMER FILMS AND PROCESS FOR MAKING THE SAME

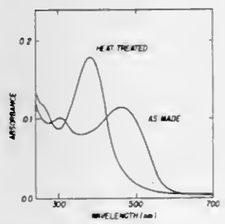
Alan K. Engel, Bryn Mawr, Pa., assignor to Research Development Corp. of Japan, Tokyo, Japan, a part interest

Filed Feb. 3, 1987, Ser. No. 10,479

Claims priority, application Japan, Feb. 7, 1986, 61-24219

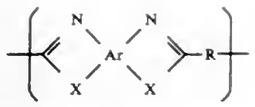
Int. Cl.[4] B32B *7/02;* **C08G** *12/04*

U.S. Cl. 428—220 **14 Claims**

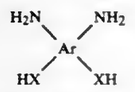


1. A film comprising a heteroaromatic polymer, said heteroaromatic polymer containing the heteroaromatic moiety

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wherein R is aromatic, heteroaromatic, olefinic, acetylenic, or a mixture of these; Ar is an aromatic nucleus and X is an heteroatom selected from the group consisting of NR', S, O, Se, and Te; R' being H, aromatic, or aliphatic; said heteroatoms being in ortho (X, N) pairs; said film comprising a single unit layer of said polymer being of a thickness less than 50 nanometers; and said unit layer being produced by the process comprising the steps of spreading an aldehyde monomer or an aldehyde monomer precursor on the surface of an aqueous solution containing one or more amine monomers, and allowing the reaction to proceed, wherein said aldehyde monomer or aldehyde monomer precursor comprises aromatic, heteroaromatic, olefinic, acetylenic, aliphatic moieties, or a mixture of these, and wherein said aromatic amine monomer is of the formula



where Ar is an aromatic nucleus, X is a beteroatom seclected from the group consisting of NR', S, O, Se, and Te; R' being H, aromatic, or aliphatic; the functional groups of said aromatic amine monomer being in ortho (XH, NH_2) pairs.

4,818,594

CONSOLIDATED NONWOVEN FABRICS AND PROCESS FOR PRODUCING THEM

Klaus Albien, Denzlingen, and Günter Maurer, Neuenburg, both of Fed. Rep. of Germany, assignors to Rhodia AG, Freiburg, Fed. Rep. of Germany

Filed Sep. 1, 1987, Ser. No. 91,840

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630392

Int. Cl.[4] D03D *3/00*

U.S. Cl. 428—224 **9 Claims**

1. A consolidated nonwoven water and oil wipe fabric prepared by a continuous process comprising the steps of:

(a) forming a melt or a solution of a spinnable polymeric material;

(b) blow-spinning said spinnable polymrric material through a spinneret means having at least one nozzle orifice to form textile fibrous elements having a diameter in the range of 0.1 to 6 μm;

(c) depositing said textile fibrous elements on a receiving means;

(d) consolidating said textile fibrous elements no said receiving means by a water-jet means to form a consolidated nonwoven fabric;

(e) concurrently or subsequently applying a zwitterionic or cationic surfactant agent to the consolidated nonwoven fabric in a wet-in-wet procedure; and

(f) drying the thus treated consolidated nonwoven fabric.

4,818,595

FIRE BARRIER COATING AND FIRE BARRIER PLYWOOD

Harold Ellis, Miami, Fla., assignor to Delphic Research Laboratories, Inc., Miami, Fla.

Continuation of Ser. No. 638,796, Aug. 8, 1984, Pat. No. 4,661,398, which is a continuation-in-part of Ser. No. 603,799, Apr. 25, 1984, Pat. No. 4,572,862. This application Apr. 24, 1987, Ser. No. 42,430

The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.

Int. Cl.[4] C04B *7/32, 9/00*

U.S. Cl. 428—245 **21 Claims**

1. A fire resistant composition comprising a hardened, substantially uniform dispersion of:

(A) a binder component comprising a substantially uniform mixture of

(1) heat activated MgO, and

(2) high-alumina calcium aluminate cement comprising 70% to 80% Al_2O_3 cured with;

(B) a gauging component in about a stoichiometric amount sufficient to react with said binder component, wherein the gauging component is derived from an aqueous solution of M_gCl_2 or M_gSO_4 having a specific gravity of about 26° to about 32° Baume.

14. A method of making a fire resistant composition comprising:

(A) preparing a substantially dry, powdered binder component comprising

(1) heat activated M_gO, and

(2) high-alumina calcium aluminate cement comprising 70% to 80% Al_2O_3;

(B) preparing a gauging component comprising an aqueous solution of M_gCl_2 or M_gSO_4, wherein the aqueous solution has a specific gravity of about 26° to about 32° Baume;

(C) gradually adding said binder component to said gauging component with mixing to substantially uniformly disperse said binder component in said gauging component to form a slurry; and

(D) reacting the gauging component with the binder component to permit the slurry to set into a hard monolithic refractory;

wherein said gauging component is employed in about a stoichiometric amount relative to said binder component.

4,818,596

WATERPROOF ARTICLE AND METHOD FOR MAKING A WATERPROOF ARTICLE

John A. Cook, Faringdon, and Raymond W. Singleton, Cirencester, both of Great Britain, assignors to Scimat Limited, Swindon, United Kingdom

Continuation of Ser. No. 88,621, Aug. 21, 1987, abandoned. This application Jul. 13, 1988, Ser. No. 220,994

Claims priority, application United Kingdom, Aug. 22, 1986, 8620484

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—265 **23 Claims**

1. An article which is rendered waterproof by a microporous memberane of a hydrophobic material, the pores of the membrane in a layer-like region on or towards a surface thereof being plugged with a hydrophilic material, leaving hydrophobic material exposed on the said surface between the pores.

4,818,597

HEALTH CARE LAMINATE

Diego H. DaPonte, Woodstock; Norman K. Fox, LaGrange, and Robert A. Funk, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 27, 1988, Ser. No. 148,817

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—284 **4 Claims**



1. A nonwoven laminate comprising

(a) a central layer of melt-blown thermoplastic fibers of a polar polymer;

(b) insulative layers on each side of the central layer and formed of melt-blown fibers of a non-polar polymer; and

(c) outer layers outside each insulative layer and formed of spun-bonded filaments of a non-polar polymer.

4,818,598

ABSORBENT STRUCTURES

Arthur Wong, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 28, 1985, Ser. No. 750,104

Int. Cl.[4] C08D *5/20*

U.S. Cl. 428—284 **21 Claims**

1. An absorbent structure comprising, by weight:

(a) from about 1% to about 99% hydrogel selected from the group consisting of hydrolyzed acrylonitrile grafted starch, starch polyacrylates, cross-linked polyacrylates, and isobutylene maleic anhydride copolymers, or mixtures thereof;

(b) from about 1% to about 99% of a fibrous cationic material which functions as an anion exchange material;

(c) from 0% to about 99% of a fibrous anionic material which functions as a cation exchange material; and

(d) from 0% to about 99% of a conventional absorbent material; said absorbent structure having an equilibrium pH of from about 5 to about 11 at the surface of said structure when said structure is saturated with synthetic urine.

4,818,599

POLYESTER FIBERFILL

Ilan Marcus, Versoix, Switzerland, assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 921,646, Oct. 21, 1986, abandoned. This application Apr. 13, 1988, Ser. No. 180,150

Int. Cl.[4] D04H *1/04*

U.S. Cl. 428—288 **15 Claims**

1. An improved polyester fiberfill blend consisting essentially of, by weight, (a) from about 60 to about 95% of crimped polyester staple fiber, and (b) complementally, to total 100%, from about 5 to about 40% of crimped staple binder fiber, comprising a polymer having a binding temperature lower than the softening temperature of the said polyester staple fiber, characterized in that the said polyester stable fiber has a coating cured thereto of a slickener consisting essentially of chains of poly(alkylene oxide).

4,818,600

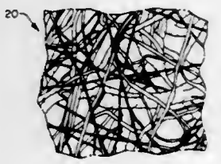
LATEX COATED BREATHABLE BARRIER

Ralph V. Braun, Roswell; Christine H. Brown, Dunwoody; Steven W. Fitting, Acworth; Lance J. Garrett, Jr., Marietta; David C. Law, Roswell, and Robert E. Weber, Marietta, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 9, 1987, Ser. No. 130,778

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—290 **14 Claims**



1. A breathable barrier which comprises:

A. a first layer which is a porous sheet having a first side and a second side; and

B. a second layer joined to said first side of said first layer, which second layer comprises a continuous film of a polymeric latex material, in which:

said film is not microporous in that it is substantially free of voids which connect the two surfaces of said film; and

said film has an average thickness of from about 10 to about 250 microns;

wherein the first layer side of said second layer is intimately comingled with at least some of the fibers at the surface of said first side of said first layer, none of the pores at the surface of said first side of said first layer are so large as to significantly adversely affect the barrier properties of said breathable barrier as a consequence of said comingling, and said breathable barrier has a water vapor transmission rate at 37° C. and about 50 percent relative humidity of from about 100 to about 2,200 $g/m^2/24$ hours and is impermeable to 0.9 percent by weight saline solution at about 21° C. for a period of at least about one hour at a hydrostatic head of at least about 11.4 cm.

4,818,601

RUBBER-CORD COMPOSITE BODIES

Michio Itoh, Kodaira; Tadashi Saito, Tokyo; Nobuyuki Okamura, Kodaira; Hisao Yamamoto, Higashimurayama; Yutaka Iseda, Tachikawa, and Hirohiko Takagi, Higashiyamato, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 9, 1988, Ser. No. 153,897

Claims priority, application Japan, Feb. 20, 1987, 62-35924

Int. Cl.[4] B32B *5/06*

U.S. Cl. 428—297 **7 Claims**

1. A rubber-cord composite body, characterized in that fiber cords for rubber reinforcement treated with an epoxy compound and further with an adhesive composed of resorcin, formaldehyde and rubber latex having a mol ratio of resorcin to formaldehyde of less than 1.0 are embedded in a rubber composition containing 0.5～10 parts by weight of a bismaleimide compound and 0.5～10 parts by weight of a bismaleimide compound and 0.5～10 parts by weight of sulfur based on 100 parts by weight of starting rubber.

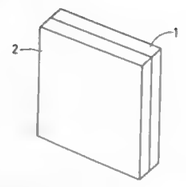
VOL 1101 ISS 1 AP 4 1989 UMI

4,818,602

HYGROSCOPIC COMPOSITE MATERIAL

Satoshi Yoshimi; Akira Matsuoka, and Kazuhiko Asano, all of Osaka, Japan, assignors to Daiken Trade & Industry Co., Ltd., Toyama, Japan

Filed Sep. 11, 1987, Ser. No. 95,576
Claims priority, application Japan, Sep. 12, 1986, 61-216772; Sep. 12, 1986, 61-216773; Sep. 12, 1986, 61-216774
Int. Cl.[4] C04B 32/02; D32B 1/16
U.S. Cl. 428—304.4 8 Claims



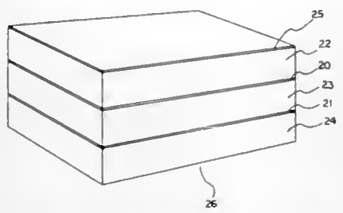
1. A hygroscopic composite material comprising:
a porous body selected from the group consisting of a cement hardened body, a plaster hardened body, a calcium silicate hardened body and an inorganic sintered body, having many micropores with an average diameter of less than 10μ; and
a humidity adsorbing body which comprises a hydraulic substance having incorporated therein a water-soluble moisture absorbing chemical, said humidity absorbing body being laminated to one side of said porous body;
wherein said porous body and said humidity absorbing body are so composed that a steam pressure differential is generated about the interface therebetween to enable said humidity absorbing body to absorb moisture and transfer the absorbed moisture into said micropores of said porous body, and to enable the moisture thus transferred into said micropores to be converted into water.

4,818,603

THERMAL-ACOUSTIC INSULATION COMPOSITE PANEL

Warren B. Mueller, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 12, 1987, Ser. No. 119,565
Int. Cl.[4] B32B 3/26, 7/12, 27/18
U.S. Cl. 428—316.6 24 Claims



1. A composite panel having utility as a fire-resistant thermal and acoustic insulating material said panel comprising at least one septum bonded to a surface of at least one foamed polyimide insert, said septum comprising a polyorganophosphazene composition containing about 50–500 parts by weight of a heavy metal compound per 100 parts by weight of polyorganophosphazene.

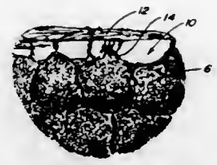
12. A composite panel of claim 1 comprising said septum bonded to and sandwiched between two of said foamed polyimide inserts.

4,818,604

COMPOSITE BOARD AND METHOD

Richard W. Tock, Lubbock, Tex., assignor to Sub-Tank Renewal Systems, Inc., San Angelo, Tex.

Filed Mar. 27, 1987, Ser. No. 32,049
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—319.9 28 Claims



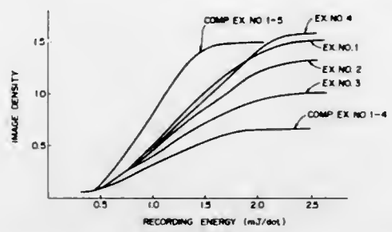
1. A molded foam composite board, comprising:
(a) from about 40 parts by weight to about 90 parts by weight of a thermoplastic polymer comprising vinyl monomers having a blown density of from about 1 to about 3 lb m/ft^3;
(b) from about 1 part by weight to about 60 parts by weight lignocellulosic filler providing extractable plasticizer compounds, said filler comprising from about 10 to about 25% cellulose content, from about 30 to about 45% lignin content and from about 7 to about 13% ash content so that upon being blown the surface of said polymer is plasticized by said compounds for thereby increasing interfacial bonding between the expanded polymer and said filler; and,
(c) tacifier agent of from about 1 part by weight to about 2 parts by weight of said polymer.

4,818,605

THERMOSENSITIVE IMAGE TRANSFER RECORDING MEDIUM

Akira Suzuki, Mishima; Nobuo Mochizuki, Kannami; Motoo Tasaka, Susono, and Kunichika Morohoshi, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 15, 1987, Ser. No. 38,645
Claims priority, application Japan, Apr. 18, 1986, 61-88204; Aug. 29, 1986, 61-201856; Sep. 4, 1986, 61-206844
Int. Cl.[4] B41M 5/26
U.S. Cl. 428—321.3 16 Claims



1. A thermosensitive image transfer recording medium, consisting essentially of:
a support material;
an image transfer layer of a finely porous network structure consisting of cellulose acetate butyrate formed on said support, said pores containing a material consisting essentially of:
(a-1) a non-volatile oil which does not dissolve the resin network structure, and
(a-2) a thermofusible ink composition consisting essentially of (I) a thermofusible wax, which is solid at room temperature, selected from the group consisting of (i) an animal wax, (ii) montan wax, (iii) a wax selected from the group consisting of carnauba wax, paraffin wax, microcrystalline wax, castor wax, higher fatty acids, metal salts and esters of higher fatty acids and homopolymer or copolymer waxes, and (iv) mixtures thereof, and (ii) a colorant.

4,818,606

HIGHLY RUNNING-ENDURANT MAGNETIC RECORDING MEDIUM

Noboru Koyama; Shu Ishiguro, and Ryosuke Isobe, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,919
Int. Cl.[4] G11B 5/70, 5/706, 5/708
U.S. Cl. 428—323 24 Claims



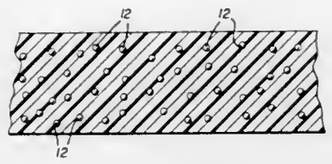
1. A magnetic recording medium comprising a nonmagnetic support having thereon a magnetic recording layer comprising a magnetic layer containing ferromagnetic metal powder wherein said ferromagnetic metal powder contains aluminum and has a BET specific surface area of not less than 40 m^2/g and said magnetic recording layer contains a fatty acid having a neutralization value of not more than 250, an ester of fatty acid and a carbon black having a DBP oil absorption of not less than 110 ml/100 g and an average particle size of not more than 60 mμ.

4,818,607

SMALL HOLLOW PARTICLES WITH CONDUCTIVE COATING

Steven F. Rickborn, San Jose, and Donald Z. Rogers, Menlo Park, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Continuation of Ser. No. 761,747, Aug. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 672,407, Nov. 16, 1984, abandoned, and Ser. No. 672,396, Nov. 16, 1984, abandoned. This application May 8, 1987, Ser. No. 48,531
Int. Cl.[4] B32B 5/16; C04B 35/52
U.S. Cl. 428—323 14 Claims



1. An electrically conducting material, comprising:
a small hollow refractory generally spherical particle having an exterior surface; and
an electrically conducting coating substantially equally covering said exterior surface, said coating having at least about 70 atomic percent carbon and being from about 10 Angstroms to about 500 Angstroms thick.

2. A material as set forth in claim 1, wherein there are a plurality of such coated particles.

3. A material as set forth in claim 2, wherein said coated particles are embedded in a matrix.

4,818,608

MAGNETIC RECORDING MEDIUM

Shizuo Furuyama, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 10, 1987, Ser. No. 13,445
Claims priority, application Japan, Feb. 10, 1986, 61-27119; Feb. 10, 1986, 61-27120; Feb. 10, 1986, 61-27121; Feb. 10, 1986, 61-27122; Feb. 10, 1986, 61-27123; Feb. 10, 1986, 61-27124; Feb. 10, 1986, 61-27126
Int. Cl.[4] G11B 5/70, 5/708
U.S. Cl. 428—327 8 Claims

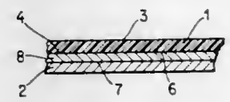
1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer which is formed on the substrate and comprises a magnetic powder, an abrasive material consisting of α-alumina particles having an average particle size of not larger than 1 μm as a first particulate component and at least one second particulate component as an abrasion reistance additive selected from the group consisting of SiC, TiO_2, TiC, α-Fe_2O_3, Cr_2O_3, fluorocarbon and benzoguanamine, the second particulate component having an average particle size which is smaller than the first particulate component and contained in an amount of 2 to 30% by weight based on the weight of the first component α-alumina, and the total amount of said first and second particulate components being from 2 to 10% by weight based on the weight of the magnetic powder.

4,818,609

PACKAGING COMPRISING SUBSTRATE, METALLIC LAYER AND ANTIFRICTION FILM

Helmuth Schmoock, Büchener Weg 121, D-2058 Lauenburg/Elbe, Fed. Rep. of Germany

PCT No. PCT/EP85/00651, § 371 Date Jul. 25, 1986, § 102(e) Date Jul. 25, 1986, PCT Pub. No. WO86/03144, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 29, 1985, Ser. No. 897,638
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1984, 3443319
Int. Cl.[4] B32B 15/08, 9/04; G11B 5/72; C09B 5/23
U.S. Cl. 428—336 22 Claims



1. A foil, particularly for use in packaging goods, comprising a substrate having two essentially parallel major surfaces; a metallic layer overlying a portion at least of one of said surfaces; and an antifriction film on said layer, said film overlying the entire layer, have a substantially constant thickness of at most 0.5 micron and comprising a lubricant, said metallic layer being located between said substrate and said film.

4,818,610

UNIFIED PRESSURE-SENSITIVE ADHESIVE TAPE

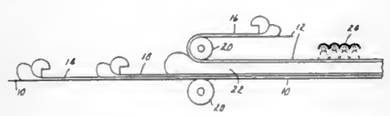
Patrick G. Zimmerman, St. Paul; Gordon G. Johnson, Lake Elmo; Susan L. Korpela, St. Paul, and Caroline L. Vernon, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 900,372, Aug. 29, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 84,781
Int. Cl.[4] C09J 7/02
U.S. Cl. 428—345 14 Claims

1. A pressure-sensitive adhesive tape comprising a plurality of superimposed layers, contiguous layers comprising differing acrylic compositions, said layers having been simultaneously photopolymerized, at least one outer layer being an acrylic pressure-sensitive adhesive layer, said layer comprising at least one alkyl acrylate ester of a nontertiary alkyl alcohol, and a photoinitiator, contiguous layers defining an interface therebe-

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tween, each of said layers comprising a photopolymerized matrix of polymeric chains; said polymeric chains extending through said interface into the matrix of a contiguous layer;



said polymeric chains comprising polymerized monomers having migrated from the matrix of each contiguous layer prior to polymerization, whereby said contiguous layers cannot be delaminated.

4,818,611

HIGH-PURITY SILICON NITRIDE FIBERS

Mikiro Arai; Osamu Funayama; Hayato Nishii, all of Oki, and Takeshi Isoda, Niiza, all of Japan, assignors to Tso Nesryo Kogyo K.K., Tokyo, Japan

Filed Nov. 13, 1986, Ser. No. 930,803
Claims priority, application Japan, Nov. 19, 1985, 60-257824
Int. Cl.⁴ D02G *3/00*
U.S. Cl. 428—364 **2 Claims**



1. A continuous silicon nitride fiber consisting essentially of carbon of 5 weight percent or less, the remainder being amorphous silicon nitride, said fiber having a fiber size of 10 to 30 μm diameter, a tensile strength of 30 to 220 Kg/mm², a modulus of elasticity of 7 to 30 tons/mm², and a resistivity of 2 to $7\times10^{10}\Omega$-cm.

4,818,612

PROCESS FOR THE PRODUCTION OF PITCH-TYPE CARBON FIBERS

Ryuichi Hara, Machida; Masami Kagizaki; Tsuyoshi Takakura, both of Kitakyushu, and Shigeki Tomono, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 748,441, Jun. 21, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 39,679
Claims priority, application Japan, Jun. 26, 1984, 59-131641; Feb. 7, 1985, 60-22570; May 7, 1985, 60-96194; May 8, 1985, 60-96973; May 8, 1985, 60-96974; May 8, 1985, 60-96975
Int. Cl.⁴ D02G *3/00*
U.S. Cl. 428—367 **7 Claims**



1. A carbon fiber having a cross-sectional crystal structure of substantially uniform mesh form orientation as observed by a polarizing microscope.

4,818,613

SINGLE TOW PREPREG

Shigeki Ohtani, and Kazuhiro Suzuoki, both of Moriyama, Japan, assignors to Ciba-Geigy Corp., Ardsley, N.Y. and Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 922,624, Oct. 24, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 185,285
Claims priority, application Japan, Oct. 25, 1985, 60-239230
Int. Cl.⁴ D02G *3/00*
U.S. Cl. 428—396 **3 Claims**

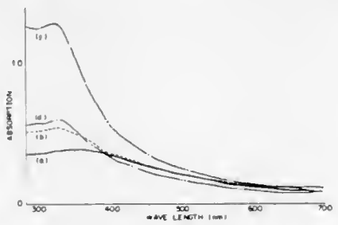
1. A single tow prepreg which is impregnated with a composition comprising 100 parts by weight of a thermosetting resin having a softening point below 20° C. and 3 to 30 parts by weight of a high molecular weight compound having a glass transition temperature below −10° C. selected from the group consisting of polybutadiene, polyisoprene, chloroprene, styrene-butadiene copolymer, an acrylonitrile copolymer, an ethylene/vinyl acetate copolymer, polypropylene glycol, an ethylene glycol/propylene glycol copolymer, epichlorohydrin rubber, acrylic rubber and, polyurethane rubber.

4,818,614

MODIFIED POWDER

Hiroshi Fukui; Ryujiro Nambu; Tsutomu Saito; Yutaka Ohtsu; Asa Kimura; Motokiyo Nakano; Okitsugu Nakata; Kenichi Tomita; Kazuo Tokubo; Kazuhisa Ohno; Toshio Yoneyama; Takashi Ogawa; Hideo Morohoshi; Junichi Koyama; Taketoshi Kanda; Kunihiro Kawaguchi, and Yuzo Shimizu, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed Jul. 25, 1986, Ser. No. 891,001
Claims priority, application Japan, Jul. 29, 1985, 60-165974; Sep. 3, 1985, 60-194654; Nov. 15, 1985, 60-256166; Nov. 26, 1985, 60-265715; Feb. 5, 1986, 61-023518; Feb. 18, 1986, 61-033595; Mar. 25, 1986, 61-066635; Apr. 3, 1986, 61-077301; Apr. 3, 1986, 61-077302; Apr. 5, 1986, 61-078740; Apr. 5, 1986, 61-078741; May 9, 1986, 61-106175; May 23, 1986, 61-118901; May 28, 1986, 61-122821; May 31, 1986, 61-127047; Jun. 10, 1986, 61-134540; Jun. 13, 1986, 61-137838; Jun. 13, 1986, 61-137839; Jun. 13, 1986, 61-137840
Int. Cl.⁴ B32B *9/00*; B05D *7/00*; C09C *3/12*; A61K *7/02*
U.S. Cl. 428—403 **32 Claims**



1. A modified powder coated on substantially the entire surface thereof with a film of a silicone polymer carrying a pendant group on one side thereof opposite the other side which is in contact with the surface of said powder, said powder being produced by a process comprising the steps of
(a) coating the powder with a film of a silicone polymer having at least one Si—H moiety, and
(b) carrying out an addition reaction of a compound capable of reacting with an Si—H moiety, to the Si—H moiety in the outer surface of the film of the silicone polymer of step (a), whereby the pendant group derived from said compound is bonded to the outer surface of the film of the silicone polymer.

4,818,615

ELONGATED MOLDING GRANULES AND INJECTION-MOLDING PROCESS EMPLOYING THEM

Bruce A. Luxon, Stamford; Malalur V. Murthy, Wethersfield, and Craig W. Panasy, Black Rock, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 2, 1986, Ser. No. 869,518
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.⁴ B32B *9/00, 15/00*; D04H *1/58*
U.S. Cl. 428—407 **13 Claims**

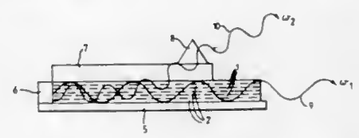
1. An injection molding compound comprising elongated granules, each of said granules containing a bundle of elongated reinforcing filaments extending generally parallel to each other longitudinally of the granule and substantially uniformly dispersed throughout said granule in a thermally stable, film forming thermoplastic adhesive comprising
(a) a poly(C_2–C_6 alkyl oxazoline) in combination with
(b) a poly(vinylpyrrolidone), said adhesive substantially surrounding each said filament said reinforcing filaments being present in an amount of from 67.5–97.5% by volume and said adhesive being present in an amount of from 2.5 to 32.5% by volume.

4,818,616

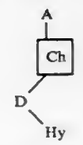
OPTICALLY NON-LINEAR MATERIALS AND THIN FILMS INCORPORATING THESE MATERIALS

David R. J. Milverton, London, and Ian R. Girling, Twickenham, both of England, assignors to The General Electric Company, p.l.c., England

Filed May 19, 1986, Ser. No. 864,264
Claims priority, application United Kingdom, May 31, 1985, 8513770
Int. Cl.⁴ B32B *9/04*; G02B *5/18*; C08F *8/30*; C08C *19/22*
U.S. Cl. 428—411.1 **24 Claims**



1. A body of optically non-linear material, comprising a multilayer Langmuir-Blodgett film having molecules extending perpendicular to the plane of the film in a Y configuration, alternate monolayers of said film being composed of first elongate chromophore molecules each having an electron donor-acceptor (D/A) pair and being of the general formula:



and second elongate chromophore molecules each having an electron donor/acceptor pair and being of the general formula:



wherein
D and D' are the same or different electron-donor atoms or groups,
Ch and Ch' are the same or different elongate chromophore groups,
A and A' are the same or different electron-acceptor atoms or groups, and
Hy and Hy' are the same or different hydrophobic groups, whereby the electron donor/acceptor pairs of alternate layers are reversed relative to the respective hydrophobic group so that all of said electron donor-aceptor pairs of said molecules have the same orientation throughout the thickness direction of said Y-configuration film.

4,818,617

METHOD AND MATERIAL FOR CHECKING DRILLED PRINTED CIRCUIT BOARDS

Larry A. Stock, Box 2810, Olympic Valley, Calif. 95730

Filed Aug. 14, 1986, Ser. No. 896,472
Int. Cl.⁴ B32B *27/36*
U.S. Cl. 428—412 **5 Claims**

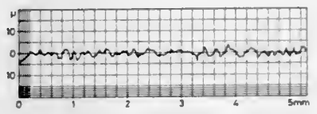
1. A method for hole location in a drilled printed circuit board, said method employing a master overlay sheet having a pattern of holes corresponding to the desired pattern of holes in the printed circuit board and being composed of a plastic material characterized by:
a thickness in the range from about 0.005 to 0.025 inches;
a matte finish on at least one surface;
a blue-green or yellow-green color; and
a light transmissivity in the range from 25 to 40 percent;
said method comprising:
placing the master overlay sheet over the drilled printed circuit board; and
visually comparing the alignment of holes in the overlay with holes in the printed circuit board, whereby the color and light transmissivity of the overlay provide a high contrast which enhances the detectability of misaligned holes.

4,818,618

ALUMINUM MATERIAL COATED WITH FLUORINE RESIN

Hiroshi Okazaki; Fumio Matsuyama, and Seiji Watabe, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 19, 1987, Ser. No. 27,925
Claims priority, application Japan, Mar. 19, 1986, 61-62782
Int. Cl.⁴ B32B *27/06, 15/08*
U.S. Cl. 428—421 **10 Claims**



1. A fluorine resin coated aluminum material which is prepared by a process consisting essentially of the steps of coating a fluorine resin on an aluminum material having a magnesium content of from 0.01 to 10.0 wt %, and sintering the coated resin at a temperature not lower than the decomposition point of said fluorine resin.

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4,818,619

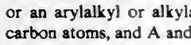
FORMED ARTICLES OF FLUORINATED POLYMERS CONTAINING FILLERS AND HAVING IMPROVED PROPERTIES

Ezio Strepparola, Bergamo; Tiziano Tereaghi; Enrico Monza, both of Milan, and Fabio Felippone, Monza, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Dec. 18, 1986, Ser. No. 943,079
Claims priority, application Italy, Dec. 23, 1985, 23374 A/85
Int. Cl.⁴ B32B *27/00;* **C08K** *7/12, 7/14*
U.S. Cl. 428—421 **5 Claims**

1. Formed articles consisting essentially of fluorinated polymers having improved mechanical properties and an improved surface appearance, comprising a reinforcing material dispersed in the fluorinated polymer and based on glass, asbestos and silicates in general or carbon in the form of fibers or granules or aromatic polyamidic fibers, said reinforcing material, before being dispersed in the fluorinated polymer, having been superficially pre-treated with a bonding agent consisting essentially of fluoropolyethers having an average molecular weight from 1,000 to 10,000 and containing functional end groups adapted to form bonds with the reinforcing material, said functional groups being selected from the following classes:

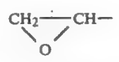
(a) siloxane groups having the formula:



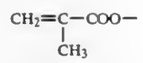
where R is an alkyl radical containing from 1 to 5 carbon atoms, or an aryl radical containing from 6 to 10 carbon atoms, or an arylalkyl or alkylaryl radical containing from 7 to 10 carbon atoms, and A and A', like or different from each other, are —R or —OR;

(b) alkoxy-titanic groups;

(c) the epoxy group:

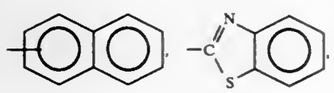


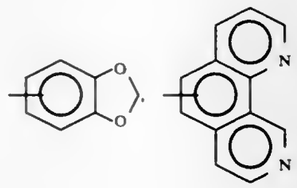
(d) the acrylic group: $CH_2=CH-COO-$; or the methacrylic group:



(e) isocyanic groups; and

(f) an aromatic radical, either containing or not containing hetero-atoms, as follows:



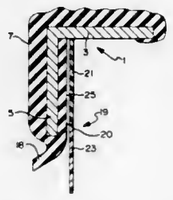


4,818,620

ELASTOMER COATED LIP SEAL

Andy C. Pilkington, Tecumseh, Mich., assignor to Mather Seal Company, Milan, Mich.

Continuation of Ser. No. 917,569, Oct. 10, 1986, abandoned.
This applicatioa Jun. 22, 1988, Ser. No. 211,173
Int. Cl.⁴ B32B *15/04, 15/06, 27/08, 27/40*
U.S. Cl. 428—422 **6 Claims**



5. A lip seal comprising:

a case member formed of a rigid material selected from the group consisting of plastic and metal;

a coating of a non-rigid resilient elastomeric material selected from the group consisting of rubber and polyurethane, said coating provided over at least a portion of said case member; and

a composite lip seal element having a polytetrafluoroethylene portion bonded radially concentric to a non-rigid resilient elastomeric portion along an axially-extending interface and wherein said elastomeric portion of said composite lip seal is bonded with an adhesive to said elastomeric material of said coating to form a non-rigid shock-absorbing elastomer to adhesive to elastomer connection between said coating and said composite lip seal element.

4,818,621

PRESSURE SENSITIVE ADHESIVES WITH REDUCIBLE ADHESIVE FORCE USING RADIATION, AND FILMS THEREWITH

Hideo Kuroda, Hannancho, and Masao Taniguchi, Sennan, both of Japan, assignors to Bando Chemical Industries, Ltd., Hyogo, Japan

Filed Feb. 14, 1986, Ser. No. 829,818
Claims priority, application Japan, Feb. 14, 1985, 60-28030; Feb. 14, 1985, 60-28031; Sep. 4, 1985, 60-196540; Sep. 4, 1985, 60-196541; Sep. 4, 1985, 60-196542; Sep. 4, 1985, 60-196543; Sep. 4, 1985, 60-196544; Sep. 4, 1985, 60-196545
Int. Cl.⁴ B32B *27/30, 27/16;* **C08L** *33/08, 75/04*
U.S. Cl. 428—424.6 **5 Claims**

1. A pressure sensitive adhesive reducible in adhesive force by the application thereto of ultraviolet light which comprises:

(i) at least one elastic polymer selected from the group consisting of a polymer comprising an acrylic acid ester copolymer, and a saturated copolyester comprising a dibasic carboxylic acid and a dihydroxy alcohol;

(ii) an ultraviolet light polymerizable acrylic acid ester having not less than two acryloyl or methacryloyl groups in the molecule and having a molecular weight of not more than about 1000, in amounts of about 15–200 parts by weight in relation to 100 parts by weight of the elastic polymer;

(iii) a tackifier in amounts of about 10–200 parts by weight in relation to 100 parts by weight of the elastic polymer;

(iv) anhydrous silica powder in amounts of about 1–30 parts by weight in relation to 100 parts by weight of the elastic polymer;

(v) a polyisocyanate in amounts of about 1–100 parts by weight in relation to 100 parts by weight of the elastic polymer; and

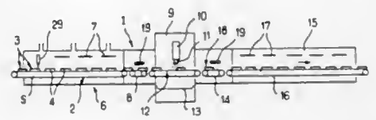
(vi) a photopolymerization initiator in a sufficient amount to induce the photopolymerization of the ultraviolet light polymerizable acrylic acid ester.

4,818,622

PROCESS AND DEVICE FOR THE PRODUCTION OF A SAFETY PANE

Jean-Louis Bravet, and Francois de Toytot, both of Thourotte, France, assignors to Saint-Gobain Vitrage, Aubervilliers Cedex, France

Filed Jan. 15, 1986, Ser. No. 819,019
Claims priority, application France, Jan. 15, 1985, 85 00496
Int. Cl.⁴ B05D *5/06;* **B32B** *27/40*
U.S. Cl. 428—425.6 **36 Claims**



1. A process for the production of a compound pane comprising a glass sheet having thereon a transparent polyurethane-based layer having energy-absorbant properties, wherein said polyurethane-based coating layer having energy absorbing properties is formed directly on said glass sheet by the reactive spraying of a reactive mixture of an isocyanate component having a viscosity under 5,000 centipoises at 40° C. and a polyalcohol component, wherein said isocyanate component contains at least one aliphatic or cycloaliphatic diisocyanate or a prepolymer of the isocyanates, and wherein said polyalcohol component contains at least one long difunctional poloyalcohol having a molecular weight of from between 500 and 4000 and at least one short diol having a molecule weight under about 300 as a chain extending agent, (1) wherein said isocyanate component and said polyalcohol component are used in a quantity such that the ratio of isocyanate group equivalents to hydroxyl group equivalents is at least about 0.9, or (2) wherein said isocyanate component and said polyalcohol component are used in a quantity such that the ratio of isocyanates group equivalents to hydroxyl group equivalent is at least about 0.8 when at least one of said components is trifunctional.

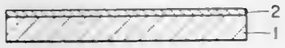
18. A compound pane comprising a glass sheet having thereon a transparent polyurethane-based layer having energy-absorbent properties, wherein said compound pane is obtained by forming directly said polyurethane-based coating layer having energy absorbent properties onto said glass sheet by the reactive spraying of a reactive mixture of an isocyanate component having a viscosity under 5,000 centipoises at 40° C. and a polyalcohol component, wherein said isocyanate component contains at least one aliphatic or cycloaliphatic diisocyanate or a prepolymer of these isocyanates, and wherein said polyalcohol component contains at least one long difunctional polyalcohol having a molecular weight of between 500 and 4000 and at least one short diol having a molecule weight under about 3 as a chain extending agent, (1) wherein said isocyanate component and said polyalcohol component are used in an amount such that the ratio of isocyanate group equivalents to hydroxyl group equivalents is at least about 0.9, or (2) wherein said isocyanate component and said polyalcohol component are used in a quantity such that the ratio of isocyanate group equivalents to hydroxyl group equivalents is at least about 0.8 when one of said components is trifunctional.

4,818,623

SLIDE GLASS

Toyoharu Hozumi, and Yoshihiro Ohshita, both of Hiroshima, Japan, assignors to Wakunaga Seiyaku Kabushiki Kaisha, Osaka, Japan

Filed Nov. 28, 1986, Ser. No. 935,724
Claims priority, application Japan, Nov. 28, 1985, 60-268176
Int. Cl.⁴ B32B *17/06;* **G01N** *33/48;* **G02B** *21/34*
U.S. Cl. 428—447 **7 Claims**



1. A slide glass, comprising:

a slide glass structure having a glass surface with silicic acid groups and a lipophilic functional group introduced into at least a part of said silicic acid groups by the reaction of a hydrocarbyl halosilane compound with said silicic acid group so that said surface has improved adhesiveness to a tissue specimen for microscopic examination.

4,818,624

STABILIZED LIGHT-POLARIZING MATERIAL

John F. Downey, Jr., Lexington, Mass., assignor to Polaroid Corporation, Patent Department, Cambridge, Mass.

Filed Dec. 19, 1986, Ser. No. 945,301
Int. Cl.⁴ B32B *9/04;* **B05B** *5/06*
U.S. Cl. 428—447 **13 Claims**

1. A polyvinyl alcohol light-polarizing article comprising a molecularly oriented polyvinyl alcohol layer having dichroic light-polarizing molecules therein, at least one surface of said polyvinyl alcohol layer being organosilylated.

4,818,625

BORON-SILICON-HYDROGEN ALLOY FILMS

Henry W. Lavendel, Palo Alto, and John C. Robinson, Cupertino, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 747,635, Jun. 24, 1985, Pat. No. 4,689,104.
This application Mar. 23, 1987, Ser. No. 28,994
Int. Cl.⁴ B32B *15/04, 17/06*
U.S. Cl. 428—457 **2 Claims**

1. An intermetallic compound formed from elements selected from groups IIIa and Va of the periodic table having a solid boron-silicon-hydrogen alloy film deposited on at least one surface thereof, said film sealing and stabilizing said surface against structural degradation.

4,818,626

METHOD FOR PRODUCING SINTERED METALIZED ALUMINUM NITRIDE CERAMIC BODIES

Waltraud Werdecker, Hanau; Dieter Brunner, GroBostheim, and Martin Kutzner, Neuberg, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau Lauten, Fed. Rep. of Germany

Filed Aug. 3, 1987, Ser. No. 81,322
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630066
Int. Cl.⁴ B05D *5/12;* **B22B** *15/04*
U.S. Cl. 428—469 **22 Claims**

1. A method for producing a sintered metalized aluminum nitride ceramic body, comprising the steps of:

applying, onto a green aluminum nitride ceramic body, a metalizing paste comprised of about 50 to 90% of an inorganic component which comprises 90 to 99% by weight of powdered metalizing agent selected from the group consisting of tungsten, molybdenum, hafnium nitride, zirconium nitride and titanium nitride and 1 to 10% by weight of a powdered mixture comprising 5 to 95% by

weight of aluminum nitride and 5 to 50% by weight of a rare earth metal oxide which is dispersed in an amount of about 10 to about 50% of anorganic vehicle to form the metalizing paste; thereafter

drying the metalizing paste; and thereafter

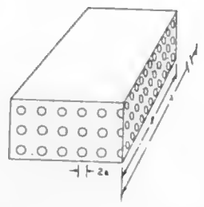
sintering the metalizing paste and the green ceramic body by heating to a temperature of from about 1750° C. to about 2000° C. in a nitrogen or nitrogen-hydrogen mixture atmosphere to convert the metalizing paste and the green ceramic body into said sintered metalized aluminum nitride body.

4,818,627

ARTICLE OF MANUFACTURE

James R. Melcher, Lexington, and Stuart Iukpen, Arlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 3, 1986, Ser. No. 824,918
Int. Cl.[4] B22F 3/00
U.S. Cl. 428—551 6 Claims



1. An article of manufacture comprising an electrically conductive substrate having a coating comprising a paint composition containing flat metallic particles wherein at least a portion of the flat metallic particles wherein at least a portion of the flat metallic particles are oriented in substantially the vertical direction relative to the substrate surface wherein the metallic particles are copper particles.

4,818,628

PROCESS FOR MAKING COMPOSITE BEARING MATERIAL PRODUCED THEREBY

Robert G. Alexander, and George C. Pratt, both of Ann Arbor, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Continuation of Ser. No. 15,591, Feb. 17, 1987, abandoned, which is a continuation of Ser. No. 868,236, May 28, 1986, abandoned. This application Aug. 31, 1987, Ser. No. 91,339
Int. Cl.[4] B22F 7/04
U.S. Cl. 428—561 6 Claims

1. A copper lead tin alloy with the lead content ranging between 8 and 35 percent by weight and the tin content ranging between 0.5 and 10.0 percent by weight, and the balance essentially all copper, the microstructure of which consists of interconnected lead islands in a copper-rich matrix, the average size of the lead islands being less than 8 microns and there being not more than 1 percent of the lead islands larger than 40 microns.

4,818,629

JOINT CONSTRUCTION FOR LINED EQUIPMENT

Einar R. Jenstrom, Waukegan, Ill., and Mortimer Schussler, Titusville, Fla., assignors to Fansteel Inc., North Chicago, Ill.

Filed Aug. 26, 1985, Ser. No. 769,263
Int. Cl.[4] B32B 15/04
U.S. Cl. 428—594 21 Claims

1. A wall assembly comprising:

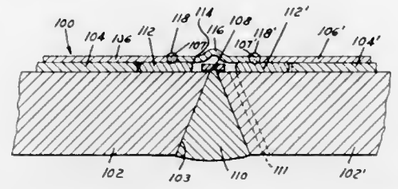
(a) abutting edges of a composite wall of a first metallic material, an intermediate layer of a second metallic material, and a third layer of a third metallic material, with one face of the first and third metallic materials in a face-to-face relation with a face of the second metallic material, and with the third metallic material not being directly weldable to the first metallic material,

(b) a channel formed in an area adjacent the edges of the third layer and the intermediate layer, and further extending into the intermediate layer underlying the third layer,

(c) a groove formed in the first metallic material at the abutting edges,

(d) a weld in said groove joining the first material material, said first metallic material being of uniform thickness on opposing sides of said weld under said channel and beneath edges of said intermediate and third layers separated by said channel,

(e) separate backup strip means of the third metallic material



spaced laterally from each other and located at the respective sides of said channel overlying said first metallic material, and partially underlying the third layer in the channel formed in the intermediate layer, said backup strip means having a thickness substantially equal to thickness of said intermediate layer and having opposed edges laterally spaced from each other by a distance which is less than that separating said edges of said third layer,

(f) an inlay strip of the third metallic material with edges positioned on said backup strip means, bridging said channel and abutting the edges of the layer of third metallic material in said channel, said inlay strips having a longitudinally extending convolution for accommodating lateral thermal expansion, and

(g) welds joining the abutting edges of the inlay strip and said layer of third metallic material to the backup strip means of third metallic material.

4,818,630

SEAMLESS ORIENTED METAL FIBER STRUCTURE

Michael S. Beaton, DeLand, Fla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 22, 1985, Ser. No. 714,946
Int. Cl.[4] B23P 17/06
U.S. Cl. 428—605 6 Claims



CROSS SECTION OF GRADED DENSITY MOLDED SEAMLESS SEAL ANALOG OF FM5158 BACKING RING IS SHOWN FOR ORIENTATION REFERENCE 100X

1. A process for making a tube-like abradable metal fiber seal exhibiting superior abradability and gas flow blockage, comprising:

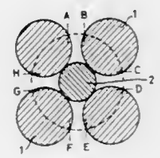
felting discrete metal fibers into a tube-like recess in a fixture, the feltig done in planes perpendicular to the longitudinal axis of the recess, the fixture having only one open end with the recess formed of that open end, said fibers having a diameter of 3 to 145 microns, a length of 30 to 7,620 microns, and a length to diameter range of 10 to 180, compressing the fibers in the recess by applying pressure in a direction coincident with the recess's longitudinal axis to compress the fibers into a lattice network having a density 12 to 70%, heating the fibers to produce interdiffusion bonding between a majority of adjacent fibers.

4,818,631

STRAND FOR APPLICATION AS REINFORCEMENT IN OBJECTS OF POLYMER MATERIAL AS WELL AS ONE OR MORE SUCH STRAND COMPRISING OBJECTS OF POLYMER MATERIAL

Luc Bourgois, Desselgem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed May 11, 1987, Ser. No. 48,619
Claims priority, application Netherlands, Jun. 19, 1986, 8601599
Int. Cl.[4] B32B 15/00; B23P 17/06
U.S. Cl. 428—605 5 Claims



1. A strand for reinforcing objects made of polymer material comprising a core comprising at least one wire and at least three but less than six outside wires arranged round it, the core wire having an outside diameter larger than the diameter of the circle tangent to each of the outside wires in the hollow space that remains free when their cross-section have the highest packing density and smaller than the diameter of the outside wires, wherein the outside wires are made of carbon steel wire with a tensile strength of at least 2250–1130 log d N/mm^2, d being the wire diameter in mm, said core wire being made of carbon steel with a tensile strength less than 2250–1130 d N/mm^2.

4,818,632

PLATED STRUCTURE EXHIBITING LOW HYDROGEN EMBRITTLEMENT

Grace F. Hsu, Seattle, and Richard C. Colonel, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 671,053, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 444,243, Sep. 30, 1982, abandoned. This application Sep. 4, 1985, Ser. No. 773,504
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.[4] B23B 3/26
U.S. Cl. 428—613 10 Claims

1. A coated article exhibiting low hydrogen embrittlement and high corrosion resistance comprising:

a substrate, the amount of hydrogen present in the substrate being less than about one part per million (by weight),

a metal coating comprising an alloy of zinc and nickel on said substrate having a microstructure characterized by a



plurality of microscopic interconnected escape channels for hydrogen.

4,818,633

FIBRE-REINFORCED METAL MATRIX COMPOSITES

John Diswoodie, Eastham Wirral; Martyn H. Stacey, Northwich; Michael D. Taylor, Gt Barrow, and Andrew M. Walker, Guilden Sutton, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 10, 1986, Ser. No. 928,455
Claims priority, application United Kingdom, Nov. 14, 1985, 8528156
Int. Cl.[4] C22C 1/09
U.S. Cl. 428—614 10 Claims

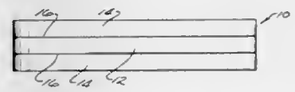
1. A metal matrix composite comprising randomly oriented alumina fibres wherein the density of the individual fibres is from 1.8 to 2.5 g/ml embedded in a metal matrix material of density from 1.8 to 2.8 g/ml.

4,818,634

COMPOSITE METAL SPRING MATERIAL, METHOD OF MAKING, AND SPRING MEMBERS FORMED THEREFROM

Thomas Bliss, Mattapoisett, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 24, 1986, Ser. No. 946,414
Int. Cl.[4] B32B 15/18, 15/20; C22F 1/08; C21D 9/02
U.S. Cl. 428—677 3 Claims



1. A composite metal spring material comprising a layer of a copper metal selected from the group consisting of high conductivity copper and age and precipitation hardenable copper alloys metallurgically bonded to each side of a layer of austenitic stainless steel to form a symmetrical composite metal laminate, the laminate being selectively work-hardened for providing the laminate with selected resilience to form an electrically conductive spring material, characterized in that the material of the layer of copper metal comprises a material selected from the group consisting of high conductivity copper and age and precipitation hardenable copper alloys having nominal compositions by weight percent of 0.05 to 0.15 zirconium, 0.005 max. iron, 0.005 max. aluminum, 0.005 max. magnesium and the balance copper plus silver, the total of iron, aluminum and magnesium not exceeding 0.01 max., an alloy of 0.040 to 0.080 phosphorous, 0.080 to 0.130 magnesium, and the balance (at least 99.75 min.) copper plus silver with silver in the range from 0.27 to 0.100, an alloy of 0.025 to 0.040 phosphorous, 0.015 to 0.15 iron and the balance copper (plus silver), an alloy of 0.025 to 0.060 zirconium and the balance copper (plus silver), an alloy of 0.03 phosphorous, 0.007 iron, 0.005 zinc, and

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the balance copper (plus silver), and substantially pure copper having not more than 0.05 of other constituents therein, and in that the stainless steel layer of the spring material comprises a stainless steel alloy having a limited stabilizing dispersion therein selected from the group having nominal compositions by weight percent of 0.15 carbon max., 2.00 manganese max., 1.00 silicon max., 0.060 phosphorous max., 0.030 sulfur max., 17.5 to 17.8 chromium, 7.5 to 7.8 nickel and the balance iron, an alloy of 0.04 carbon man., 2.50 manganese max., 0.50 silicon max., 17.25 chromium, 4.5 nickel, 2.4 copper, and the balance iron, and an alloy of 0.09 carbon max., 1.00 manganese max., 1.00 silicon max., 0.040 phosphorous max., 0.030 sulfur max., 16.0 to 18.0 chromium, 6.50 to 7.75 nickel, 0.75 to 1.50 aluminum, and the balance iron, the stainless steel material being selectively strain hardened equal to about twenty-five to fifty percent of full work-hardening thereof and dispersion strengthened and in substantially fully solutionized condition except for said strain hardening and dispersion strengthening and being in selected thermally stress-relieved condition for providing the spring material with improved tensile strength of improved stability.

4,818,635

NITRIDE-BASED CERAMIC MATERIAL

Thommy C. Ekström, Stockholm, and Nils A. Ingelström, Bromma, both of Sweden, assignors to Santrade Ltd., Lucerne, Switzerland

Continuation of Ser. No. 21,627, Mar. 3, 1987, abandoned, which is a continuation of Ser. No. 719,141, Apr. 2, 1985, abandoned. This application May 27, 1988, Ser. No. 201,355
Claims priority, application Sweden, Apr. 6, 1984, 8401921
Int. Cl.⁴ C04B *35/58*
U.S. Cl. 428—698 **19 Claims**

1. A sintered ceramic material based on silicon nitride, aluminum nitride and alumina consisting essentially of a combination of polytype of Si-Al-O-N and an alpha' phase of Si-Al-O-N and/or a beta' phase of Si-Al-O-N and an intergranular phase, the sintered material having in percent by volume: 1-70% polytype, 5-80% alpha' and/or beta' phase and 0.1-20% of the intergranular phase.

4,818,636

FILMS OF CATENATED PHOSPHORUS MATERIALS, THEIR PREPARATION AND USE, AND SEMICONDUCTOR AND OTHER DEVICES EMPLOYING THEM

Christian G. Michel, Ossining; Rozalie Schachter, New York, both of N.Y.; Mark A. Kuck, Upper Montclair, N.J.; John A. Baumann, Dobbs Ferry, N.Y., and Paul M. Raccah, Chicago, Ill., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 442,208, Nov. 16, 1982, Pat. No. 4,508,931, which is a continuation-in-part of Ser. No. 335,206, Dec. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 419,537, Sep. 17, 1982, Pat. No. 4,620,968, which is a continuation-in-part of Ser. No. 335,206, Dec. 30, 1981, abandoned. This application Dec. 11, 1984, Ser. No. 680,367
The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.
Int. Cl.⁴ B32B *9/00, 13/00*
U.S. Cl. 428—704 **7 Claims**

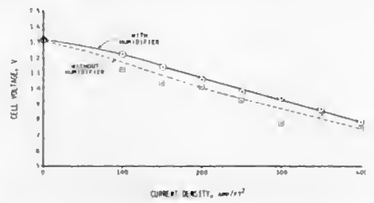
1. A solid film of MP_x deposited on a substrate where M is one or more metals and P is one or more pnictides.

4,818,637

HYDROGEN/HALOGEN FUEL CELL WITH IMPROVED WATER MANAGEMENT SYSTEM

Trent M. Molter, Enfield, Conn., and Anthony B. LaConti, Lynnfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 20, 1988, Ser. No. 196,527
Int. Cl.⁴ H01M *8/04, 8/10*
U.S. Cl. 429—15 **4 Claims**



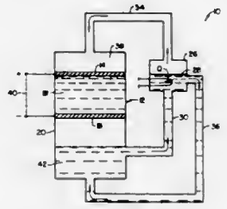
1. An improved method of operating a hydrogen/halogen fuel cell comprising
a. introducing hydrogen fuel into the anode chamber of a fuel cell;
b. introducing a halogen oxidant into the cathode chamber of a fuel cell;
c. contacting said hydrogen fuel with the catalytic anode thereby catalytically disassociating the hydrogen into hydrogen ions and electrons;
d. transporting the hydrogen ions through a solid polymer electrolyte membrane to the cathode electrode;
e. passing the electrons through an external circuit to the cathode;
f. reacting the oxidant with the hydrogen ions in the presence of the catalytic cathode to produce an acid;
wherein the improvement comprises humidifying the hydrogen gas prior to its introduction into the anode chamber thereby providing excess water which maybe protonically pumped through the solid polymer electrolyte membrane with the hydrogen ions to the cathode and thereby diluting the acid produced at the cathode.

4,818,638

SYSTEM FOR HYDROGEN THERMAL-ELECTROCHEMICAL CONVERSION

Prodyot Roy, Saratoga, Calif., assignor to General Electric Company, San Jose, Calif.

Division of Ser. No. 897,243, Aug. 18, 1986, Pat. No. 4,692,390. This application Jun. 9, 1987, Ser. No. 60,141
Int. Cl.⁴ H01M *8/06*
U.S. Cl. 429—20 **11 Claims**



1. A thermoelectric conversion cell comprising:
a pair of spaced-apart solid electrodes having an electrolyte therebetween chosen to selectively pass ionized hydrogen atoms;

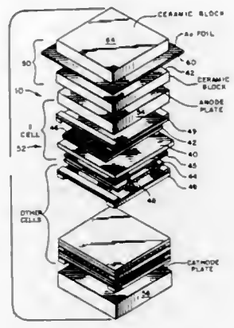
means for supplying hydrogen gas to a first of said electrodes;
means for supplying a reactant which reacts with hydrogen gas to a second of said electrodes so that a chemical potential created across the electrodes, whereby the flow of hydrogen across the electrodes induces a current flow between the electrodes.

4,818,639

MOLTEN CARBONATE ELECTROLYTE CREEPAGE BARRIER

H. Russell Kunz, Vernun, Conn., assignor to Gas Research Institute, Chicago, Ill.

Division of Ser. No. 721,226, Apr. 8, 1985, Pat. No. 4,704,340. This application Jan. 11, 1987, Ser. No. 61,326
Int. Cl.⁴ H01M *2/32*
U.S. Cl. 429—34 **4 Claims**



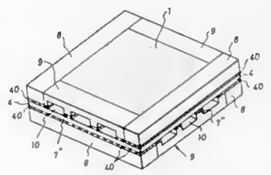
1. An electrolyte creepage barrier for a molten carbonate fuel cell comprising: a relatively thin layer of a predetermined material which is poorly wet by said electrolyte disposed in such a way as to substantially prevent electrolyte creepage at a negative end of the fuel cell; and further including a pair of ceramic members, said thin layer of material being placed between the ceramic members.

4,818,640

CARBONACEOUS COMPOSITE PRODUCT PRODUCED BY JOINING CARBONACEOUS MATERIALS TOGETHER BY TETRAFLUOROETHYLENE RESIN, AND PROCESS FOR PRODUCING THE SAME

Hiroyuki Fukuda; Masatomo Shigeta; Kiyomi Ohochi; Hisatsugu Kaji, all of Iwaki; Kuniyuki Saitoh, Abiko, and Masayuki Funabashi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1986, Ser. No. 907,977
Claims priority, application Japan, Sep. 25, 1985, 60-211797; Sep. 26, 1985, 60-213408; Oct. 4, 1985, 60-221439; Oct. 25, 1985, 60-238684; Jul. 18, 1986, 61-169525; Aug. 6, 1986, 61-184721
Int. Cl.⁴ H01M *2/18*
U.S. Cl. 429—38 **11 Claims**



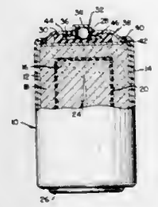
1. A composite electrode substrate for a fuel cell, comprising a separator, a porous and carbonaceous electrode provided with flow channels for a reactant gas and joined to both surfaces of the separator via a flexible carbon sheet, said separator being a calcined compact carbon material having a thickness of not more than 2 mm, a bulk density of not less than 1.40 g/cc, a gas-permeability of not more than 10^{-6} ml/cm²·hour·mmAq and an electric resistance of not more than 10 mΩ-cm, said composite electrode substrate further comprising:
a peripheral sealer formed of a calcined gas-impermeable and compact carbon material and disposed on a side of said electrode parallel to said flow channels therein or a peripheral sealer and gas-distributor assembly, wherein said peripheral sealer is disposed on the side of said electrode parallel to said flow channels therein and said gas-distributor is formed of a calcined gas-impermeable and compact carbon material and distributes the reactant gas on a side of said electrode perpendicular to said flow channels therein, or a manifold which is a calcined gas-impermeable and compact carbon plate and provided with a flow passage for supplying the reactant gas, said peripheral sealer, said peripheral sealer and gas-distributor assembly, or said manifold being joined to an extended part of said separator beyond said electrode via a tetrafluoroethylene resin layer, said peripheral sealer, said gas-distributor and said manifold being respectively a compact carbon material having a bulk density of not less than 1.40 g/cc and a gas-permeability of not more than 10^{-4} ml/cm²·hour·mmAq and difference of the thermal expansion coefficient of each material of said peripheral sealer, said gas-distributor and said manifold from that of the material of said separator being not more than 2×10^{-6}/°C.

4,818,641

CELL CIRCUIT INTERRUPTER

Alan J. Ledenican, Willowick, Ohio, assignor to Eveready Battery Company, St. Louis, Mo.

Filed Apr. 4, 1988, Ser. No. 177,241
Int. Cl.⁴ H01M *2/34*
U.S. Cl. 429—61 **11 Claims**



1. A galvanic cell comprising a conductive container open at one end and closed at the opposite end and including in said container a positive electrode, a negative electrode and an electrolyte, and said container being in electrical contact with one of said electrodes; a cover mounted over said conductive container, said cover being secured to and electrically insulated from said conductive container and in electrical contact with the other electrode; an insulating member comprising a flat disc having an upwardly extending peripheral flange with the circumference of said insulating member being smaller than the circumference of the closed end of said conductive container, said insulating member disposed at the central exposed area of the closed end of the container with the peripheral flange extending outward and with the peripheral area of the closed end of the container being exposed; a terminal conductive member disposed within the flange and seated on the outer surface of said insulating member; an annular conductive member disposed and secured to the exposed peripheral area of the closed end of the container and extending over the upstanding flange of the insulating member and electrically contacting the

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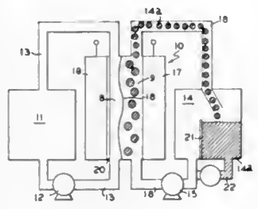
terminal conductive member thereby adapting the terminal conductive member as the terminal for the electrode in electrical contact with said conducting container; and wherein the central area of the closed end of the conductive container upon bulging a predetermined amount will force the insulating member away from the closed and of the container whereupon the outward extending flange will push against the annular conductive member and thereby electrically isolate the terminal conductive member from the electrode in electrical contact with the conductive container.

4,818,642

ELECTROLYTE ADDITIVE FOR IMPROVED BATTERY PERFORMANCE

Richard J. Bellows, Hampton, and Edward Kantner, E. Brunswick, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 3, 1986, Ser. No. 835,339
Int. Cl.[4] H01M *10/26*
U.S. Cl. 429—105 **10 Claims**



1. An electrochemical cell having a metal bromine couple, said cell comprising:
- an electrode structure on which the metal of the couple is deposited during charging of the cell;
- a counterelectrode structure at which to generate cathodic bromine during charging of the cell;
- a microporous separator between said electrode and counterelectrode structure;
- an aqueous electrolyte of a metal bromide, the metal of the bromide being the same as the metal of the couple and including a water soluble complexing agent capable of forming a water immiscible complex with bromine; and
- an additive capable of decreasing the wettability of the microporous separator by the immiscible bromine complex formed during charging of the cell, said additive being present in amount sufficient to produce a measurable increase in the coulombic efficiency of said cell.

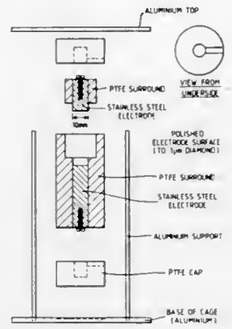
4,818,643

MATERIALS FOR ELECTRICAL DEVICES

John A. Cook, Faringdon; George B. Park, and Robert H. McLoughlin, both of Swindon, all of England, assignors to Raychem Limited, Swindon, United Kingdom

Continuation of Ser. No. 780,546, Sep. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 618,104, Jun. 7, 1984, abandoned, and Ser. No. 675,909, Nov. 28, 1984, abandoned. This application Dec. 17, 1986, Ser. No. 942,911
Claims priority, application United Kingdom, Dec. 15, 1983, 8333388; European Pat. Off., Dec. 13, 1984, 84308708.1
Int. Cl.[4] H01M *6/16*
U.S. Cl. 429—188 **10 Claims**

1. A polymeric electrolyte material for use as an electrolyte in an electrochemical cell, comprising a blend of
- (a) an ionizable salt,
- (b) an extrudable organic polymer cpable of permitting sufficient transfer of dissociated ions of the salt so that the blend can function as an electrolyte in an electrochemical cell in the substantial absence of any liquid, and



- (c) a plasticizing agent which inhibits change in the morphology of the polymer from an amorphous phase to a crystalline phase.

4,818,644

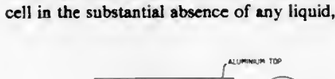
IONICALLY CONDUCTIVE MATERIAL

Michel Armand, St. Martin d'Uriage, France, assignor to Centre National de la Recherche Scientifique; Societe Nationale Elf Aquitaine, both of Paris, France and Hydro-Quebec, Montreal, Canada

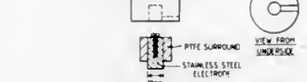
Filed Oct. 30, 1987, Ser. No. 115,050
Claims priority, application France, Oct. 30, 1986, 86 15115
Int. Cl.[4] H01M *6/18*
U.S. Cl. 429—192 **6 Claims**

1. Ionically conductive material composed of a salt in solution in a solvent, characterized by the fact that the salt is represented by one of the following formulas:

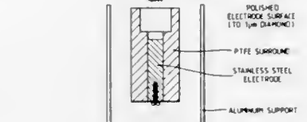
I



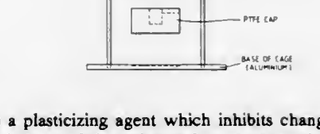
II



III



IV



V

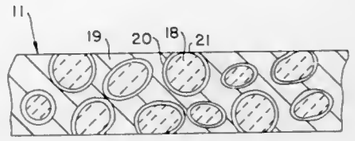
in which:
- M is an alkali metal, alkaline earth metal, transition metal, or rare earth metal,
- RF and R'F, which are identical or different, each represents a perhalogenated, preferably perfluorinated group having from 1 to 12 carbon atoms,
- R is hydrogen or an alkyl group having from 1 to 30 carbon atoms,
- QF is a divalent perfluorinated group having from 2 to 6 carbon atoms.

4,818,645

ELECTROCHEMICAL CELL HAVING NON-SOLUTION LITHIUM ALLOYS

Peter B. Harris, Stow; James Bennett, Andover; Kathy M. Lechiaro, Ipswich; Peter F. Morello, Bedford, and Robert C. McDonald, Stow, all of Mass., assignors to Whittaker Technical Products, Inc., Los Angeles, Calif.

Filed Nov. 30, 1987, Ser. No. 126,326
Int. Cl.[4] H01M *4/40, 6/14*
U.S. Cl. 429—209 **6 Claims**



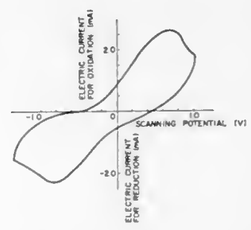
1. An electrochemical cell comprising:
- an anode made of lithium alloyed with a companion metal selected from the group consisting of molybdenum and tungsten;
- a cathode current collector separated from said anode; and
- a cathodic electrolyte solution for wetting said anode and cathode current collector.

4,818,646

POLYPYRROLE FILM AND METHOD OF PRODUCING THE SAME

Masaaki Takakubo, and Toshiyuki Ohsawa, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 3, 1986, Ser. No. 915,000
Claims priority, application Japan, Oct. 3, 1985, 60-219113; Dec. 4, 1985, 60-271550; Feb. 28, 1986, 61-41686; Aug. 4, 1986, 61-183158
Int. Cl.[4] H01M *4/60;* C25B *3/00*
U.S. Cl. 429—213 **20 Claims**



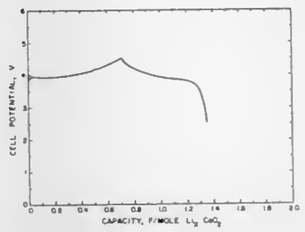
1. A film of polypyrrole doped with a transition metal complex anion having a higher oxidation number of a redox couple consisting of transition metal complex anions.

4,818,647

METHOD OF MAKING A CATHODE FOR USE IN A RECHARGEABLE LITHIUM BATTERY, CATHODE SO MADE, AND RECHARGEABLE LITHIUM BATTERY INCLUDING THE CATHODE

Edward J. Plichta, Freehold, and Mark Salomon, Fairhaven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 20, 1987, Ser. No. 28,169
Int. Cl.[4] H01M *4/58*
U.S. Cl. 429—218 **2 Claims**



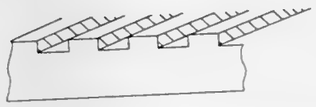
1. A rechargeable lithium battery comprising lithium as the anode, a cathode having a porosity of at least 50 percent and prepared from a cathode mixture of about 80 weight percent lithium cobalt dioxide (Li_xCoO_2 where $0 \leqq x \leqq 1$), about 10 weight percent Shawinigan carbon black, and about 10 weight percent polytetrafluoroethylene as a dough with additions of an aqueous wetting agent and roll pressing the cathode dough between two Mylar sheets onto both sides of an expanded aluminum screen and sintering at about 280° C. under vacuum for about 1 hour, and 1.5 to 2.0M $LiAsF_6$ in methyl acetate as the electrolyte.

4,818,648

OPTICAL MEMORY ELEMENT

Kenji Ohta, Nara; Akira Takahashi; Tetsuya Inui, both of Nara; Hiroyuki Katayama, Ikoma; Junji Hirokane, Tenri, and Yoshiteru Murakami, Nishinomiya, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1986, Ser. No. 934,718
Claims priority, application Japan, Nov. 27, 1985, 60-270361
Int. Cl.[4] G03C *5/16;* G01D *9/00;* G11B *3/70*
U.S. Cl. 430—17 **6 Claims**



1. In an optical memory element comprising a substrate with grooves from which signals are read out, and recording medium disposed on said substrate, said substrate is composed of a glass containing SiO_2 in the range of 51 to 71% by weight, Na_2O in the range of 10 to 18% by weight, K_2O in the range of 0 to 8% by weight, Al_2O_3 in the range of 12 to 22% by weight, and B_2O_3 in the range of 0 to 9% by weight.

2. An optical memory element according to claim 1, wherein said grooves are formed by disposing a photoresist film on said glass substrate; disposing a masking board, on which groove information is patterned, on said photo-resist film; applying light to said masking board to form a guide groove pattern latent image on said photo-resist film; developing said guide groove pattern latent image formed on said photoresist film to form the grooves in the photo-resist film; subjecting said glass substrate covered with said photo-resist film containing the

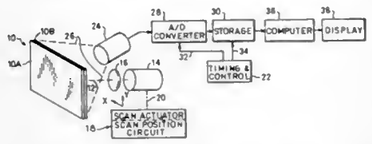
grooves to an etching treatment to form the grooves in said glass substrate; and removing said photo-resist film from said glass substrate.

4,818,649

METHOD FOR INTENSIFICATION AND REFLECTIVE READ-OUT OF UNDEREXPOSED FILM, RADIOGRAPHS, AND THE LIKE

Ivor Brodie, Palo Alto, Calif., and Malcolm Thackray, Cronulla, Australia, assignors to SRI International, Menlo Park, Calif.

Filed Apr. 1, 1987, Ser. No. 34,019
Int. Cl.[4] G03C *5/24, 7/00, 1/40, 11/00*
U.S. Cl. 430—21 **11 Claims**



1. In a method for the intensification and reflective read-out of underexposed or low optical density regions of properly exposed metallic silver particle photographic images contained in the protective medium of a film the steps including,

converting the metallic silver particle image to a more reflective image,

scanning the converted image from one side thereof with a beam of electromagnetic radiation having a small spot size at the converted image,

viewing radiation reflected from the converted image at said one side with a detector having a signal output proportional to incident radiation, and

converting the detector output for visual display of an intensified image of the metallic silver particle, photographic image, resolution of the intensified image being dependent upon the spot size of the scanning beam at the converted image.

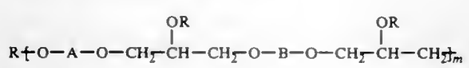
4,818,650

ARYLAMINE CONTAINING POLYHYDROXY ETHER RESINS AND SYSTEM UTILIZING ARYLAMINE CONTAINING POLYHYDROXYL ETHER RESINS

William W. Limburg, Penfield; Dale S. Reofer, Webster; John F. Yanus, Webster, and Leon A. Teuscher, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 10, 1987, Ser. No. 61,064
Int. Cl.[4] G03G *5/087, 5/14*
U.S. Cl. 430—56 **13 Claims**

1. An electrostatographic imaging member comprising a support layer a charge generating layer and a charge transport layer, said charge transport layer comprising an arylamine compound represented by the formula:

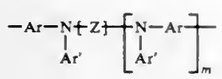


wherein:

R is selected from the group consisting of —H, —CH_3, and —C_2H_5;

m is between about 4 and about 1,000; and

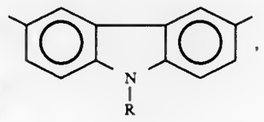
A is selected from the group consisting of an arylamine group represented by the formula:

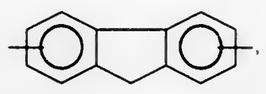


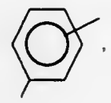
wherein:

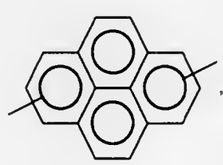
m is 0 or 1,

Z is selected from the group consisting of:

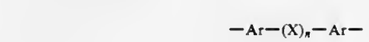








, and

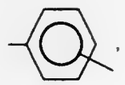


wherein:

n is 0 or 1,

Ar is selected from the group consisting of:

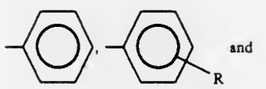
, and



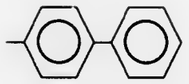
wherein:

R is selected from the group consisting of —CH_3, —C_2H_5, —C_3H_7, and —C_4H_9,

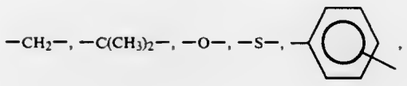
Ar' is selected from the group consisting of:



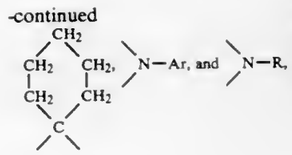
and



X is selected from the group consisting of:



-continued



and

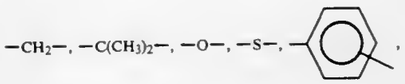
B is selected from the group consisting of:

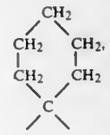
the arylamine group as defined for A and

—Ar—V)$_n$Ar—

wherein:

Ar is as defined above, and V is selected from the group consisting of:





and at least A or B contains the arylamine group, said arylamine compound being substantially non-photoconductive when exposed to radiation having a wavelength between about 4,000 angstroms and about 9,000 angstroms, capable of supporting the injection of photo-generated holes and capable of supporting the transport of said holes.

4,818,651

LIGHT RECEIVING MEMBER WITH FIRST LAYER OF A-SIGE(O,N)(H,X) AND SECOND LAYER OF A-SIC WHEREIN THE FIRST LAYER HAS UNEVENLY DISTRIBUTED GERMANIUM ATOMS AND BOTH LAYERS CONTAIN A CONDUCTIVITY CONTROLLER

Shigeru Shirai, Nagahama, and Shigeru Ohno, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1987, Ser. No. 11,505

Claims priority, application Japan, Feb. 7, 1986, 61-23691; Feb. 13, 1986, 61-27900; Feb. 13, 1986, 61-27901; Feb. 13, 1986, 61-27902; Feb. 20, 1986, 61-33923; Feb. 20, 1986, 61-33924; Feb. 24, 1986, 61-37357

Int. Cl.[4] G03G *5/082*
U.S. Cl. 430—57 **33 Claims**

1. A light receiving member comprising a substrate and a light receiving layer disposed on said substrate; said light receiving layer comprising (a) a 1 to 100 μm thick first layer having photoconductivity and (b) a 0.003 to 30 μm thick second layer in sequence from the side of the substrate; said first layer (a) comprising (i) an amorphous material containing silicon atoms as the main constituent, (ii) 1 to 6×10^5 atomic ppm of germanium atoms, (iii) at least one atom selected from hydrogen atoms and halogen atoms in a total amount of 0.01 to 40 atomic %, (iv) a conductivity controlling element selected from the group consisting of Group III and V elements of the Periodic Table, and (v) at least one atom selected from the group consisting of oxygen atoms and nitrogen atoms, wherein said germanium atoms being so distributed in the thickness direction that the concentration thereof is enhanced at the position adjacent to the substrate and the concentration thereof is reduced or made substantially zero at the position adjacent to the interface with said second layer (b); wherein said second layer (b) comprises (b-i) an amorphous material containing silicon atoms, (b-ii) 0.001 to 90 atomic % of carbon atoms, and (b-iii) 1.0 to 1×10^4 atomic ppm of one atom selected from Group III and V atoms of the Periodic Table and does not contain germanium atoms.

4,818,652

LIGHT RECEIVING MEMBER WITH FIRST LAYER OF A-SI(H,X) AND SECOND LAYER OF A-SI(C(HX) WHEREIN FIRST AND SECOND LAYERS RESPECTIVELY HAVE UNEVENLY AND EVENLY DISTRIBUTED CONDUCTIVITY CONTROLLER

Shigeru Shirai, Shiga, and Shigeru Ohno, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1987, Ser. No. 11,334

Claims priority, application Japan, Feb. 7, 1986, 61-23689; Feb. 7, 1986, 61-23690; Feb. 13, 1986, 61-27899

Int. Cl.[4] G03G *5/085*
U.S. Cl. 430—57 **11 Claims**

1. A light receiving member comprising a substrate for a light receiving member and a light receiving layer disposed on said substrate, said light receiving layer comprising (from the side of said substrate), a 1 to 100 μm thick first layer (I) having photoconductivity comprised of an amorphous material containing silicon atoms as the main constituent and at least one of hydrogen atoms and halogen atoms in a total amount of 10^{-2} to 40 atomic % and a 3×10^{-3} to 30 μm thick second layer (II) comprised of an amorphous material containing silicon atoms, 10^{-3} to 90 atomic % of carbon atoms, and at least one of hydrogen atoms and halogen atoms in a total amount of 10^{-2} to 40 atomic %; said first layer (I) containing a conductivity controlling element in an unevenly distributed state in the layer thickness direction; and said second layer (II) containing a conductivity controlling element in a uniformly distributed state in the layer thickness direction.

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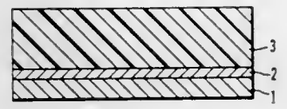
ELECTROPHOTOGRAPHIC RECORDING MATERIAL WITH MOPOMERIL ALLEPTOR ADDITIVE

Wolfgang Wiedemann, Geisenheim-Johannisberg; Michael Drexler, Bischofsheim, and Juergen Fuerderer, Mainz, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

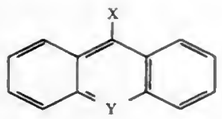
Filed Oct. 23, 1986, Ser. No. 922,332

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3537979

Int. Cl.[4] G03G *5/14, 5/09*
U.S. Cl. 430—59 **9 Claims**



1. An elecrophotographic recording material comprising an electrically conducting base layer and a photoconductive system deposited thereon which comprises a layer containing a charge-carrier generating compound and a film containing a hole-transporting compound mixed with a binder, wherein said photoconductive system contains at least one monomeric acceptor additive that has electron-attracting substituents and is a compound represented by formula (I)



where
X is hydrogen, a halogen or a cyano group, and
Y is nitrogen or the grouping



where
Z is a halogen or a cyano group, said additive being present in an amount ranging from between about 0.2 to 10% by weight, based on total coating.

4. A recording material as claimed in claim 1, wherein said additive is 9-chloroacridine.

4,818,654

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER WITH COMBINATION OF POLYMETHYL METHACRYLATE RESINS

Masaaki Hiro, Kanagawa, and Toshiyuki Yoshihara, Mitaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 698,831, Feb. 6, 1985, abandoned. This application Jan. 13, 1987, Ser. No. 4,276
Claims priority, application Japan, Feb. 10, 1984, 59-23999
Int. Cl.[4] G03G *5/14, 5/04*
U.S. Cl. 430—59 **15 Claims**

1. An electrophotographic photosensitive member having a photosensitive layer on an electroconductive substrate, said photosensitive layer containing at least one (I) low molecular weight polymethyl methacrylate having a molecular weight of 28×10^4 or lower, and at least one (II) high molecular weight polymethyl methacrylate having a molecular weight of 50×10^4 to 250×10^4, said polymethyl methacrylate (II) being contained in a proportion of from 5 to 15 parts by weight in the composition consisting of 100 parts by weight of the polymethyl methacrylates (I) and (II), wherein said photosensitive layer has a laminated structure comprising a charge generating layer and a charge transporting layer, said charge transporting layer containing said composition of polymethyl methacrylates (I) and (II).

7. An electrophotographic photosensitive member according to claim 1, wherein said charge transporting layer contains at least one charge transporting compound selected from the group of consisting of polycyclic aromatics, carbazoles, hydrazone, pyrazolines, oxazole compounds, thiazole compounds, triarylmethance compounds and polyarylalkanes.

4,818,655

ELECTROPHOTOGRAPHIC LIGHT RECEIVING MEMBER WITH SURFACE LAYER OF $A\text{-}(Si_xC_{1-x})_yH_{1-y}$ WHEREIN X IS 0.1–0.99999 AND Y IS 0.3–0.59

Shigeru Shirai; Keishi Saito; Takayoshi Arai; Minoru Kato, and Yasushi Fujioka, all of Shiga, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,127
Claims priority, application Japan, Mar. 3, 1986, 61-45914; Mar. 4, 1986, 61-46701
Int. Cl.[4] G03G *5/085*
U.S. Cl. 430—60 **26 Claims**

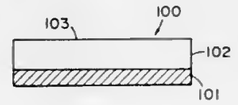
1. A light receiving member for use in electrophotography comprising a substrate for electrophotography and a light receiving layer comprising a long wavelength light absorption layer comprising a polycrystal material containing silicon atoms and germanium atoms, a photoconductive layer comprising an amorphous material containing silicon atoms as the main constituent and a surface layer comprising an amorphous material of the formula $A-Si_xC_{1-x})_y:H_{1-y}$ wherein x is 0.1 to 0.99999 and y is 0.3 to 0.59 and which contains 41 to 70 atomic % of hydrogen atoms.

4,818,656

IMAGE FORMING MEMBER FOR ELECTROPHOTOGRAPHY

Tadaji Fukuda, Kawasaki; Yutaka Hirai; Katsumi Nakagawa, both of Tokyo, and Toshiyuki Komatsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 102,791, Sep. 24, 1987, abandoned, which is a continuation of Ser. No. 939,283, Dec. 3, 1986, abandoned, which is a continuation of Ser. No. 840,975, Mar. 13, 1986, abandoned, which is a continuation of Ser. No. 749,117, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 647,869, Sep. 5, 1984, abandoned, which is a continuation of Ser. No. 571,147, Jan. 17, 1984, abandoned, which is a continuation of Ser. No. 367,024, Apr. 9, 1982, abandoned, which is a continuation of Ser. No. 199,266, Oct. 21, 1980, abandoned. This application May 24, 1988, Ser. No. 198,729
Claims priority, application Japan, Oct. 24, 1979, 54-137238
Int. Cl.[4] G03G *5/082, 5/09*
U.S. Cl. 430—65 **7 Claims**



2. An electrophotographic image forming member which comprises a substrate, a barrier layer overlying the substrate and a photoconductive layer overlying the barrier layer, said photoconductive layer comprising (a) hydrogenated amorphous silicon and (b) from 0.001–100 atomic ppm of carbon as an impurity based on silicon.

4,818,657

LIQUID DEVELOPER FOR ELECTROSTATIC LATENT IMAGE

Tsuneyuki Kondo, Kyoto, and Yasuhiro Sato, Otsu, both of Japan, assignors to Toray Industries, Incorporated, Tokyo, Japan

Continuation of Ser. No. 874,125, Jun. 13, 1986, abandoned. This application Sep. 21, 1987, Ser. No. 99,668
Claims priority, application Japan, Jun. 13, 1985, 60-127156
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—114 **14 Claims**

1. A liquid developer for electrostatic latent image, comprising the following components (a), (b) and (c) dispersed in an electrical resistive aliphatic hydrocarbon solvent having an electrical resistivity not smaller than 10^9 Ωcm, a dielectric constant not larger than 3 and a boiling point in the range of 68° to 250° C.:

(a) a copolymer which as a whole is insoluble in said solvent and which consists essentially of a copolymer segment soluble in said solvent and a copolymer segment insoluble in said solvent,

wherein said solvent-soluble copolymer segment and said solvent-insoluble copolymer segment are in the proportions of 25–60% by weight and 75–40% by weight, respectively, said solvent-soluble copolymer segment consisting of components:

(i) at least one monomer selected from the group consisting of alkyl acrylates and alkyl methacrylates and (ii) at least one monomer selected from the group consisting of cycloalkyl acrylates, cycloalkyl methacrylates, aralkyl acrylates and aralkyl methacrylates, wherein said components (i) and (ii) being in proportions of 40–80% by weight and 20–60% by weight, respectively, and said solvent-insoluble copolymer segment containing vinyl acetate as a main monomer component,

wherein the vinyl acetate content of said solvent-insoluble copolymer segment is in the range of 50 to 100% by weight;

(b) a coloring agent; and

(c) a dispersant, wherein the developer is capable of providing a concentration of printed image area of no lower than 0.8, after a continuous 1000 m printing for electrostatic paper of A-1 size at a percent image area of 5% and capable of providing constant concentration of the printed image area by supplying additional concentrate toner to a toner depleted developer.

4,818,658

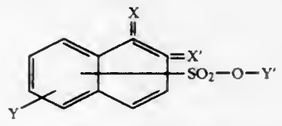
PHOTOACTIVE ESTERIFICATION PRODUCT OF A DIAZOOXIDE COMPOUND AND A CURCUMIN DYE AND PHOTORESIST MATERIALS WITH PRODUCT

Robert L. Martin, Framingham; M. Martha Rajaratnam, Winthrop, and Pamela Turci, Boxboro, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed Apr. 17, 1987, Ser. No. 39,170
Int. Cl.[4] G03C *1/54;* **C07C** *113/00*
U.S. Cl. 430—156 **19 Claims**

1. A photoresist composition responsive to activating radiation at a wavelength within the range of from 200 to 460 nm comprising an admixture of a polymer binder and a photoactive compound, said photoactive compound having a concentration varying from between 1.0 and 35.0 weight percent of the total solids of the photoresist composition and containing at least ten percent of an esterification product of a diazooxide and curcumin dye having two pendant hydroxyl groups.

17. A photoactive compound that is the esterification product of curcumin dye having two pendant hydroxyl groups and a diazooxide where the diazooxide corresponds to the following general formula:



where X and X' are N_2 or O and are different from each other, Y is hydrogen or halogen and Y' is halogen.

4,818,659

SILVER HALIDE PHOTOGRAPHIC MATERIALS FOR PHOTOCHEMICAL PROCESS WHICH CAN BE USED IN A BRIGHT ROOM

Toshiro Takahashi; Ken-ichi Kawabara; Kimitaka Kameoka, and Masahiro Okada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 7, 1987, Ser. No. 35,549
Claims priority, application Japan, Apr. 7, 1986, 61-79532
Int. Cl.[4] G03C *1/36, 1/10*
U.S. Cl. 430—264 **10 Claims**

1. A silver halide photographic material for use in a bright room comprising a support having thereon at least two silver halide emulsion layers, each of said emulsion layers having a different sensitivity and comprising silver chloride grains or silver chlorobromide grains having at least about 80 mol % silver chloride, each of said silver halide emulsion layers containing from about 1×10^{-7} mol to about 1×10^{-4} mol of a rhodium salt per mol of silver, wherein the sensitivity of the lower emulsion layer (the emulsion layer coated nearer to the support) is higher than the sensitivity of the upper emulsion layer (the emulsion layer coated farther from the support), the difference in sensitivity being from about 0.1 log E to 0.6 log E, and at least one of said silver halide emulsion layers or different hydrophilic colloid layers contains a hydrazine derivative represented by the formula $R_1—NHNH—G—R_2$, wherein R_1 represents an aliphatic group or an aromatic group; R_2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and G representes a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted iminomethylene group, and at least one of said silver halide emulsion layers or different hydrophilic colloid layers contains a dye compound having a λmax of from about 400 nm to about 550 nm.

4,818,660

PHOTOHARDENABLE ELECTROSTATIC MASTER HAVING IMPROVED BACKTRANSFER AND CHARGE DECAY

Graciela B. Blanchet-Fincher; Curtis R. Fincher, Jr., both of Wilmington; Lawrence K.-F. Cheung, Hockessin; Rolf Dessauer, Greenville, and Catharine E. Looney, Centreville, all of Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Nov. 4, 1987, Ser. No. 117,189
Int. Cl.[4] G03G *5/026*
U.S. Cl. 430—281 **47 Claims**

1. A high resolution, photohardenable electrostatic master comprising:

a. an electrically conductive substrate bearing

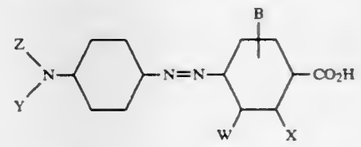
b. a photohardenable layer consisting essentially of

(1) an organic polymeric binder,

(2) a compound having at least one ethylenically unsaturated group,

(3) a photoinitiator and

(4) an aromatic amino compound selected from the group consisting of (i) a basic dye, (ii) a leuco dye salt of the basic dye and (iii) the combination of a strong acid (5) present in the amount of 0.33 mole to 1.0 mole per mole of amino nitrogen of said compound (4) and an azo dye salt of the formula



wherein

Y and Z, which can be the same or different, are H, alkyl, halogen, hydroxy and alkoxy; W and X are individually H but when taken together can from a 6-membered aromatic ring; and

B is H, alkyl, halogen and alkoxy.

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4,818,661

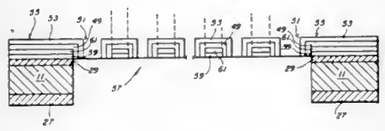
METHOD FOR FABRICATING THIN FILM METALLIC MESHES FOR USE AS FABRY-PEROT INTERFEROMETER ELEMENTS, FILTERS AND OTHER DEVICES

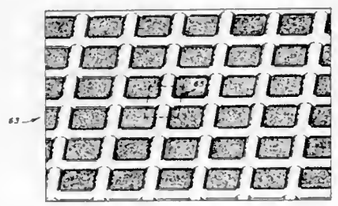
Charles J. Taylor, Catonsville; Julius Grossman, Randallstown; Jacqueline Fischer, Silver Spring; Howard A. Smith, Chevy Chase; Martin C. Peckerar, Silver Spring, and Milton L. Rebbert, Elkridge, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 21, 1987, Ser. No. 79,962

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—320 **5 Claims**





1. A method for fabricating a free-standing, thin membrance that has a smooth surface containing a desired pattern of holes extending through the thickness of the membrane, said method comprising the steps of:

applying a photoresist material to the front side of a substrate;

lithographically developing a preselected pattern in the photoresist material;

depositing a first material into the preselected pattern to form an inner pattern within the preselected pattern;

removing from the front side the photoresist material and any first material on that photoresist material to expose the inner pattern;

depositing a second material onto the exposed portion of the first material to develop the desired pattern; and

removing the substrate to produce the free-standing thin membrance having a smooth surface containing the desired pattern of holes extending through the thickness of the membrane.

4,818,662

PROCESS FOR FORMING COLOR IMAGES

Toshiaki Aono, and Koichi Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 811,321, Dec. 19, 1985, abandoned, which is a continuation of Ser. No. 594,050, Mar. 28, 1984, abandoned. This application Feb. 25, 1987, Ser. No. 18,859

Claims priority, application Japan, Mar. 30, 1983, 58-54169

Int. Cl.[4] G03C *5/54, 1/06*

U.S. Cl. 430—348 **11 Claims**

1. In a process for forming a color image comprising exposing and heating in the presence of a hydrophilic thermal solvent a light-sensitive material comprising a support having thereon a light-sensitive silver halide, a hydrophilic binder and a compound capable of forming or releasing a hydrophilic mobile dye chemically in connection with reduction of the silver halide into silver upon heating, transferring and fixing through the use of only said heating and hydrophilic thermal solvent the thus formed or released hydrophilic dye to a dye fixing layer having a hydrophilic binder, and then separating the portion having the silver halide and the compound capable of forming or releasing a hydrophilic mobile dye and the portion having the dye fixing layer from each other, and wherein to improve separability when the portion having the silver halide is separated from the portion having the dye fixing layer polyvinyl alcohol having a degree of saponification of not less than about 70% is present in at least one surface layer of the light-sensitive material and the dye fixing layer being separated.

4,818,663

PHOTOGRAPHIC MATERIALS AND COLOR PROOFING SYSTEM

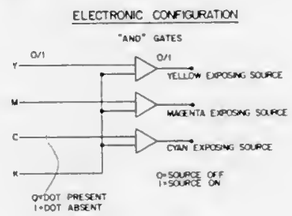
Stephen R. Powers, and Thomas D. G. Hellings, both of Harlow, United Kingdom, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 2, 1987, Ser. No. 34,001

Claims priority, application United Kingdom, Apr. 15, 1986, 8609132

Int. Cl.[4] G03C *1/46, 1/485*

U.S. Cl. 430—358 **17 Claims**



1. A radiation-sensitive element suitable for the preparation of half-tone colour proofs comprising a substrate bearing at least four positive acting silver halide imaging media coated thereon, said imaging media including:

(1) a positive acting silver halide imaging medium capable of forming a yellow image upon imagewise exposure and processing,

(2) a positive acting silver halide imaging medium capable of forming a magenta image upon imagewise exposure and processing,

(3) a positive acting silver halide imaging medium capable of forming a cyan image upon imagewise exposure and processing, and

(4) a positive acting silver halide imaging medium capable of forming a black image or a balancing black image upon imagewise exposure and processing,

each imaging medium (1), (2) and (3) having a maximum spectral sensitivity at a wavelength different from that of the maximum sensitivity of the other imaging media of (1) to (3), the imaging medium (4) having spectral sensitivity at each of the wavelengths of the maximum sensitivity of the three other imaging media.

4,818,664

PROCESSING OF SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS CONTAINING A COMPOUND RELEASING A SPECIFIED DEVELOPMENT INHIBITOR

Shinji Ueda; Keiji Mihayashi, and Seiji Ichijima, all of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1987, Ser. No. 52,085

Claims priority, application Japan, May 20, 1986, 61-115793

Int. Cl.[4] G03C *5/44, 7/00, 1/08, 7/26*

U.S. Cl. 430—430 **19 Claims**

1. A process for processing a silver halide color photographic material which comprises processing, after color development, a silver halide color photographic material with a processing solution having a bleaching faculty and containing an aminopolycarboxylic acid ferric complex salt as an oxidizing agent, said color photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer and at least one compound releasing by the reaction with an oxidation product of a developing agent a group releasing or forming a development inhibitor by the reaction with another molecule of an oxidation product of a developing agent.

4,818,665

MEDIUM AND PROCESS FOR IMAGE FORMATION

Masahiro Haruta, Funabashi; Hiroshi Matsuda; Hirohide Munakata, both of Yokohama, and Yukuo Nishimura, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 710,686, Mar. 12, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 27,050

Claims priority, application Japan, Mar. 14, 1984, 59-47183; Mar. 14, 1984, 59-47184; Mar. 14, 1984, 59-47185; Mar. 14, 1984, 59-47186; Mar. 14, 1984, 59-47187; Mar. 14, 1984, 59-47188

Int. Cl.[4] G03C *1/72*

U.S. Cl. 430—494 **2 Claims**

1. A medium for image formation which comprises a monomolecular film or monomolecular built-up film of a metal chelate compound on a substrate in which the metal chelate is selected from the group consisting of:

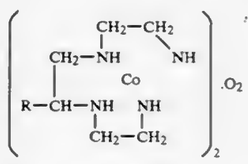
$$IrX(CO)(PPh_3)(PPh_2Ph—R)Y; \quad (1\text{-a})$$

$$IrX(CO(PR_3)(PR'_3)Y, \quad (1\text{-b})$$

wherein X is a halogen atom, Ph—R is phenyl substituted by an alkyl of 10 to 30 carbon atoms; Y is O_2, H_2, SO_2, CO, HCl, HBr, olefin, or halogenated alkyl; and R and R' are each the same or different alkyl group having 10 to 30 carbon atoms;

$$Y'Co(PPh_3)(PPh_2Ph—R) \quad (1\text{-c})$$

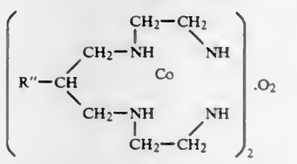
wherein Y' represents H_2, N_2, Cl_1, I_2, or CO; and Ph—R is phenyl substituted by an alkyl of 10 to 30 carbon atoms;



(1-d)

and

-continued



(1-e)

wherein R'' is alkyl having 8 to 30 carbon atoms wherein said metal chelate compound is capable of adsorbing and desorbing reversibly gaseous molecules under the action of activation energy.

4,818,666

ERASABLE OPTICAL RECORDING ELEMENT AND METHOD OF OPTICALLY RECORDING AND ERASING INFORMATION

Dirk J. Gravesteijn, and Carlus J. Van Der Poel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

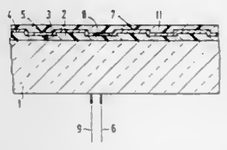
Filed Jun. 2, 1986, Ser. No. 869,484

Claims priority, application Netherlands, Mar. 28, 1986, 8600811

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.[4] G03C *1/72*

U.S. Cl. 430—495 **6 Claims**



1. A method for the optical recording and erasing of information in which a disc-shaped recording element which comprises a substrate and a recording layer provided thereon of the crystalline recording material of the formula $(QSB)_{100-x}M_x$, wherein Q is In or Ga, M is a metal or a chalcogenide element and $x = 2$–15 is rotated and exposed to a recording spot which is moved diametrically over the element and originates from a laser light beam which is focused on the recording layer and is pulsated in accordance with the information to be recorded, the crystalline recording material in the exposed places being converted into amorphous information areas which are read in reflection by means of continuous energetically weak laser light, the recorded information being erased in real time during the revolution of the recording element by exposure to an erasing spot which is also moved diametrically over the element and originates from a continuous laser light beam focused on the recording layer, amorphous information areas being reverted to the original crystalline state as a result of the exposure to said erasing spot.

4,818,667

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Fumio Hamada, and Hiroshi Shimazaki, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1987, Ser. No. 2,200

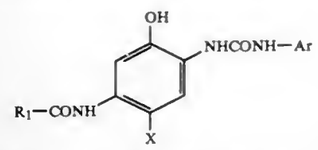
Claims priority, application Japan, Jan. 20, 1986, 61-11757

Int. Cl.[4] G03C *1/46, 7/34*

U.S. Cl. 430—502 **11 Claims**

1. A silver halide color photographic material which has

red-, green- and blue-sensitive silver halide emulsion layers with interlayers being interposed between said emulsion layers to form hydrophilic colloid layers on a support, wherein the total thickness of the hydrophilic colloid layers is not more than 18 μm on a dry basis and at least one silver halide emulsion layer contains a cyan dye-forming coupler represented by the following general formula (I):



(I)

where R_1 is an optionally substituted alkyl, aryl or heterocyclic grpoup; Ar is an optionally substituted aryl group; and X is a group that may be eliminated upon coupling reaction with the oxidized product of a color developing agent.

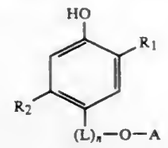
4,818,668

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Seiji Ichijima; Hideo Usui, and Kohzaburoh Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

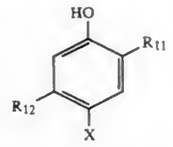
Continuation of Ser. No. 769,049, Aug. 26, 1985, abandoned. This application May 26, 1987, Ser. No. 56,280
Claims priority, application Japan, Aug. 24, 1984, 59-176353
Int. Cl.[4] G03C *1/40*
U.S. Cl. 430—505 **31 Claims**

1. A silver halide color photographic material containing at least one coupler represented by formula (I)



(I)

wherein R_1 represents a substituted or unsubstituted ureido group or a substituted or unsubstituted acylamino group; R_2 represents a substituted or unsubstituted acylamino group; L represents a group which is capable of being released from the phenolic group of formula (I) in a reaction with the oxidation product of a developing agent, and releases —O—A thereafter; n represents 0 or 1; and A represents an aromatic group substituted with a hydroxy group or a substituted amino group selected from the group consisting of an aliphatic amino group, an aromatic amino group, an acylamino group, a sulfonamido group, a carbmoylamino group, a sulfamoylamino group, an alkoxyamino group, a hydroxyamino group and an acyloxyamino group or an unsubstituted amino group at at least one of the 2-position and the 4-position thereof, wherein said silver halide color photographic material contains at least one other color image-forming coupler together with the coupler represented by formula (I), which at least one other color-image forming coupler is represented by formula (III)



(III)

wherein R_{11} represents a substituted or unsubstituted ureido group or a substituted or unsubstituted acylamino group; and R_{12} represents a substituted or unsubstituted acylamino group; and X represents a hydrogen atom or a coupler releasable group.

4,818,669

SILVER HALIDE EMULSION

Hideo Ikeda, and Shuzo Suga, both of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Apr. 29, 1986, Ser. No. 857,063
Claims priority, application Japan, Apr. 30, 1985, 60-93328
Int. Cl.[4] G03C *1/02, 1/08*
U.S. Cl. 430—509 **9 Claims**



1. Photographic light-sensitive material comprising a support and, located on the support, (A) at least one layer containing halogen conversion-type grains selected from the group consisting of halogen conversion-type silver chlorobromide grains, halogen conversion-type silver iodobromide grains and halogen conversion-type chloroiodobromide grains, the grains having substantially no surface sensitivity, the average grain size thereof being not more than 0.30 micron, and the grains containing from 0 to 2 mol% of silver iodide; and (B) at least one layer containing light-sensitive silver halides grains which contain 3 to 15 mol% of silver iodide, wherein the layers (A) and (B) are provided separately or combined into a single layer, and wherein the halogen conversion-type grains of (A) have a sensitivity of not more than 1/10 relative to the sensitivity of the light-sensitive silver halide grains of (B) and (A) has a coated silver amount of 0.2–20 weight % relative to the total coated silver amount of the light-sensitive silver halide grains of (B).

4,818,670

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS CONTAINING COMPOUND CAPABLE OF SPLITTING OF DIFFUSIBLE DEVELOPMENT INHIBITOR OR PRECURSOR AND SILVER HALIDE GRAIN HAVING INTERNAL FOG NUCLEUS

Toshihiko Yagi, and Hiroshi Shimazaki, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,285
Claims priority, application Japan, Feb. 20, 1986, 61-35499
Int. Cl.[4] G03C *1/08, 1/46, 7/26, 7/32*
U.S. Cl. 430—544 **8 Claims**

1. A silver halide photographic light-sensitive material comprising a support and at least one silver halide light-sensitive emulsion layer thereon, said emulsion layer containing a compound capable of splitting off a diffusible development-inhibitor or a precursor thereof upon a coupling reaction with an oxidized product of a color developing agent,

said compound represented by

COUP—Y)m Formula I

wherein, COUP is a coupler residue, m is 1 or 2, and Y is a group bonded with COUP at a coupling position thereof

and is capable of being split off to make a diffusible development-inhibitor or a precursor thereof,

at least one of said emulsion layers and a layer adjacent thereto containing a silver halide emulsion comprising a silver halide grain having an internal fog nucleus.

4,818,671

RAPIDLY PROCESSABLE SILVER HALIDE COLOR PHOTOSENSITIVE MATERIAL

Keiji Ohbayashi; Mitsuhiro Okumura; Takaaki Kojima, and Shigeo Tanaka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,224
Claims priority, application Japan, Jul. 31, 1986, 61-180643; Aug. 13, 1986, 61-189925; Dec. 18, 1986, 61-300107
Int. Cl.[4] G03C *17/26, 1/16, 1/08, 7/36*
U.S. Cl. 430—550 **21 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon photographic component layers including at least one silver halide emulsion layer comprising

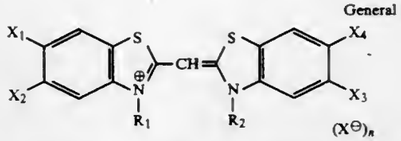
(a) silver halide grains comprising not less than 80 mol% of silver chloride,

(b) a gold compound in an amount of from 5×10^{-7} to 5×10^{-3} mol per mol of silver halide contained in said silver halide emulsion layer,

(c) a sulfur sensitizer and

(d) a spectral sensitizing dye represinted by the following general formul [I] in an amount of from $5=10^{-6}$ to 3×10^{-3} mol per mol of silver halide containing said silver halide emulsion layer:

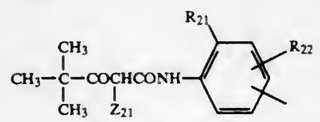
General formula [I]



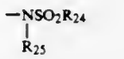
wherein X_1, X_2, X_3 and X_4 hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryl group or a hydroxy group, respectively; R_1 and R_2 are an alkyl group, respectively; $X\ominus$ is a counter anion and n is 0 or 1.

3. The silver halide color photographic light-sensitive material of claim 2, wherein said silver halide emulsion layer contains an yellow coupler represented by the following general formula:

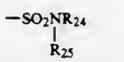
General formula [Y]



wherein R_{21} is a halogen atom or an alkoxy group; R_{22} is a $—NHCOR_{23}SO_2R_{24}$ group, a $—COOR_{24}$ group, a $—COOR_{23}COOR_{24}$ group, an



group or an



group in which R_{23} is an alkylene group, R_{24} is a ballast group and R_{25} is an alkyl group, an aralkyl group or a hydrogen atom; and Z_{21} is a group capable of being splitted off upon reaction with the oxidized product of a color developing agent.

4,818,672

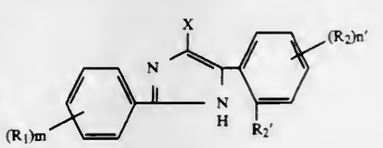
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL IMPROVED IN CYAN IMAGE CHARACTERISTICS

Toyoaki Masukawa; Yasuo Tsuda; Hidetaka Ninomiya; Noritaka Nakayama, and Toshihiko Kimura, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1987, Ser. No. 60,058
Claims priority, application Japan, Jun. 13, 1986, 61-138869; Oct. 31, 1986, 61-261488
Int. Cl.[4] G03C *7/38*
U.S. Cl. 430—558 **3 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer containing a cyan dye-forming coupler represented by the following Formula II:

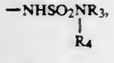
Formula [II]



wherein R_1 and R_2 each represent a group capable of being a substituent of a phenyl group, R_2' is selected from the group consisting of $—NHCOR_3$,



$—NHCOOR_3$, $—NHSO_2R_3$,



$—NHR_3$, and hydroxy; R_3 and R_4 each represent a hydrogen atom, an alkyl group or an aryl group; m is an integer from 0 to 5, and n' is an integer from 0 to 4, provided that R_1 and R_2 may be the same or different when the total of m and n' is not less than 2; and X represents a group or an atom capable of being split off from the coupler upon reaction of an oxidized product of a color developing agent with the coupler residue; and the total number of carbon atoms contained in the groups represented by R_1, R_2, R_2' and X is from 8 to 50.

4,818,673

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shinji Ueda; Kazunori Hasebe, and Junya Nakajima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 5, 1987, Ser. No. 82,003
Claims priority, application Japan, Aug. 5, 1986, 61-183944
Int. Cl.[4] G03C *7/02, 5/44, 5/24, 7/32*
U.S. Cl. 430—566 **17 Claims**

1. A method for processing a silver halide color photographic material comprising processing an imagewise exposed silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer comprising silver chloride or silver chlorobromide containing at least about 80 mol% of silver chloride with a color developing

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solution and thereafter processing said material with a bleach-fixing solution, wherein the bleach-fixing solution contains a ferric complex salt of an organic acid and from about 1×10^{-2} to about 2 mol of bromide ions and/or from 5×10^{-4} to about 5×10^{-2} mol of iodide ions per liter.

4,818,674

SILVER HALIDE EMULSIONS COMPRISING GRAINS WITH (100) SURFACES HAVING CONJUGATED (110) SURFACE CRYSTALS THEREON AND METHOD FOR THE PREPARATION THEREOF

Tadashi Ogawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 19, 1987, Ser. No. 51,435
Claims priority, application Japan, May 19, 1986, 61-114275
Int. Cl.[4] G03C *1/02*
U.S. Cl. 430—567 23 Claims



1. A silver chlorobromide emulsion which is substantially free from silver iodide and which contains silver halide crystal particles comprising cubic, rectangular parallelepiped or tetradecahedral first silver halide crystals having six (100) surfaces, at least one of said six (100) surfaces projection conjugated with second silver halide crystals having a halogen composition different from that of said (100) surfaces of said first silver halide crystals and mainly comprising (110) crystal surfaces.

4,818,675

SILVER HALIDE PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL WITH IMPROVED SILVER BLACKNESS OF PICTURE IMAGE

Nobuaki Miyasaka; Hideo Ikeda; Mioru Sakai; Shigeru Ohno, and Yasuo Mukunoki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 11, 1986, Ser. No. 872,895
Claims priority, application Japan, Jun. 12, 1985, 60-127663
Int. Cl.[4] G03C *1/02, 1/08, 7/26*
U.S. Cl. 430—567 15 Claims

1. A silver halide photographic material having at least one layer of a silver halide photographic emulsion on at least one side of a support, wherein said layer of silver halide photographic emulsion contains fine silver halide grains, or tabular silver halide grains having a grain thickness of 0.4μ or less, and wherein a dye having a maximum absorption wave length of 520 to 580 nm is contained in said layer of silver halide photographic emulsion and/or another layer in an amount such that the transmission density of green light is 0.01 to 0.03 after the developing treatment of the photographic material.

4,818,676

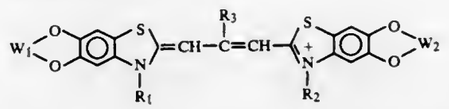
SILVER HALIDE PHOTOGRAPHIC EMULSION

Susumu Baba; Eigi Matsubara; Katsuaki Iwaosa, and Akira Tanaka, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 10, 1986, Ser. No. 905,449
Claims priority, application Japan, Sep. 12, 1985, 60-202622; Sep. 12, 1985, 60-202623; Sep. 12, 1985, 60-202624
Int. Cl.[4] G03C *1/19*
U.S. Cl. 430—574 7 Claims

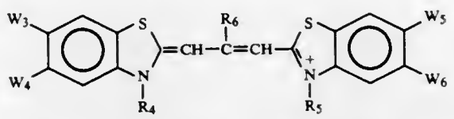
3. A silver halide photographic emulsion containing a combination of the sensitizing dyes represented by the general formula (I), (II) and (III):

general formula (I):



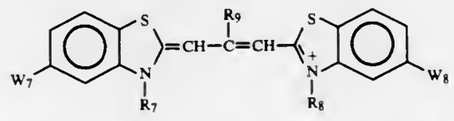
wherein R_1 represents an alkyl group, R_2 represents a sulfoalkyl group or a sulfoaralkyl group, and R_3 represents an alkyl group, and W_1 and W_2 represent each an alkylene group;

general formula (II):



wherein W_3 to W_6 represent each an alkyl group, an alkoxy group, or hydroxyl group, R_4 represents an alkyl group, R_5 represents a sulfoalkyl group or a sulfoaralkyl group, and R_6 represents an alkyl group;

general formula (III):



wherein R_7 represents an alkyl group, R_8 represents an sulfoalkyl group or a sulfoaralkyl group, R_9 represents an alkyl group, and W_7 and W_8 represents each an alkyl group, an alkoxy group, or hydroxyl group;

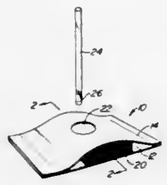
wherein at least one of W_3-W_8 of the dyes of the general formulas (II) and III) is an alkoxy group or a hydroxyl group.

4,818,677

MEMBRANE ASSAY USING FOCUSED SAMPLE APPLICATION

Martha L. Hay-Kaufman, Los Altos; Rosette Becker, Palo Alto, and Robert Danisch, Fremont, all of Calif., assignors to Monoclonal Antibodies, Inc., Mountain View, Calif.

Filed Dec. 3, 1987, Ser. No. 128,257
Int. Cl.[4] G01N *33/53, 33/569*
U.S. Cl. 435—4 47 Claims



1. An assay method for determining the presence of an analyte in a liquid sample, said method employing:

a reaction cell including a microporous membrane and an absorbent in liquid receiving relationship with the membrane;

an applicator separate from the reaction cell and having a port with an open area in the range from about 0.5 mm^2 to 20 mm^2, said area being substantially less than the area of the membrane; and

a reagent system including components capable of interacting with analyte immobilized within the microporous membrane to produce a visual signal; said method comprising:

applying to the membrane of the reaction cell in a predetermined order (1) a preselected volume of sample, and (2) the components of the reagent system, wherein at least one of the sample and the components is applied using the applicator, the port of the applicator being contacted with the membrane to limit outward diffusion of the analyte within the membrane, whereby a visual signal is produced having the dimensions of the port; and

observing the entire surface of the membrane to determine if the visual signal has been produced.

4,818,678

DIAGNOSTIC SYSTEM FOR THE DETECTION OF CYTOMEGALOVIRUS

Michael B. A. Oldstone, and George Rice, both of La Jolla, Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed May 4, 1984, Ser. No. 607,387
The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.
Int. Cl.[4] G01N *33/569, 33/577*
U.S. Cl. 435—5 18 Claims

1. A diagnostic system for assaying for the presence of a cytomegalovirus immediate-early antigen in human peripheral blood lymphocytes, said system including in at least one container as an active ingredient an effective amount of monoclonal receptor molecules produced by hybridoma L-14, said hybridoma having the ATCC accession number HB 8554.

4,818,679

METHOD FOR RECOVERING MUTANT CELLS

Lawrence A. Chasin, and Gail U. Chasin, both of Leonia, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Feb. 19, 1985, Ser. No. 702,958
Int. Cl.[4] C12Q *1/68, 1/26, 1/06, 1/04*
U.S. Cl. 435—6 19 Claims

1. A method of recovering mutant eukaryotic cells which produce a substance encoded by an allelic gene in a quantifiably reduced amount which is about 50% of the amount produced by wild type cells, the mutant cells so recovered being characterized by a mutation in one allele, comprising:

a. treating wild type cells under mutagenizing conditions so as to produce mutant cells, including mutant cells which produce a substance in a quantifiably, reduced amount relative to wild type cells;

b. contacting under suitable conditions such mutant cells with a suitable amount of an appropriate detectable compound capable of binding to the substance when it is present in the cells so as to permit the detectable compound to bind to the substance;

c. detecting the amount of the detectable compound bound to the substance in the cells and thereby the cells which produce the substance in the quantifiably reduced amount; and

d. recovering such cells which produce the quantifiably reduced amount of the substance.

4,818,680

METHOD AND KIT INVOLVING DISPLACEMENT AND REHYBRIDIZATION OF LABELED POLYNUCLEOTIDE

Mary Collins, 27 Euclid Ave., Natick, Mass. 01760; Joseph P. Dougherty, 123 Highland Ave., Somerville, Mass. 02143; Marian S. Ellwood, R.D. 4, Box 109, Lebanon, N.J. 08833; Edward F. Fritsch, 115 North Branch Rd., Concord, Mass. 01742, and Kenneth A. Jacobs, 151 Beaumont Ave., Newton, Mass. 02160

Filed Dec. 18, 1985, Ser. No. 811,034
Int. Cl.[4] C12Q *1/68;* C12N *33/53;* G01N *33/566*
U.S. Cl. 435—6 43 Claims

1. A method for determining the presence or amount of a predetermined target nucleotide sequence in the nucleic acid of a biological sample which comprises the steps:

(a) providing a reagent complex of (i) a probe polynucleotide which is capable of binding by complementary base pair binding to the target nucleotide sequence, and (ii) a labeled polynucleotide which is bound by complementary base pair binding to the probe polynucleotide in a first region of the probe nucleotide at least partially coextensive with the region in which the probe polynucleotide is capable of binding to the target nucleotide sequence;

(b) contacting the reagent complex with a sample and with a capturing polynucleotide under conditions in which the target nucleotide sequence, if present, binds to the probe polynucleotide and displaces labeled polynucleotide from the reagent complex, and in which the capturing polynucleotide binds by complementary base pair binding selectively to the displaced labeled polynucleotide, in a region of the labeled polynucleotide that had been bound to the probe polynucleotide by complementary base pair binding.

(c) separating displaced labeled polynucleotide which has bound to capturing polynucleotide from labeled polynucleotide which has not bound to capturing polynucleotide; and

(d) detecting displaced labeled polynucleotide which was bound to capturing polynucleotide and has been separated; and

(e) relating detecting step (d) to determining the presence of said target nucleotide sequence in the nucleic acid of a biological sample.

4,818,681

FAST AND SPECIFIC IMMOBILIZATION OF NUCLEIC ACIDS TO SOLID SUPPORTS

Nanibhushan Dattagupta, New Haven, Conn., assignor to Molecular Diagnostics, Inc., West Haven, Conn.

Filed Feb. 22, 1985, Ser. No. 704,129
Int. Cl.[4] C12Q *1/68;* C07H *21/00;* C12P *19/34*
U.S. Cl. 435—6 3 Claims

1. A process for immobilization of a nucleic acid comprising

(a) linking a nucleoside phosphate to a solid support through the nitrogen heterocyclic moiety of the nucleoside phosphate and

(b) enzymatically covalently coupling a nucleic acid to the resultant immobilized nucleoside phosphate from step (a) via a phosphate or linkage.

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4,818,682

IN VITRO DETECTION OF GASTROINTESTINAL CANCER

Anthony W. Linnane, Camberwell, Australia, assignor to Mucan Diagnostics Pty., Ltd., Victoria, Australia

PCT No. PCT/AU85/00136, § 371 Date Apr. 24, 1986, § 102(e) Date Apr. 24, 1986, PCT Pub. No. WO86/00414, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 21, 1985, Ser. No. 860,223

Claims priority, application Australia, Jun. 25, 1984, PG5672

Int. Cl.[4] C12Q *1/00*

U.S. Cl. 435—7 **7 Claims**

1. An in vitro diagnostic method for detecting the presence in a patient of cancer cells or other cells producing mucin antigens, which method comprises the step of testing a sample of a physiological fluid selected from the group consisting of blood, blood serum and blood plasma taken from the patient to detect the presence of SIMA and/or LIMA in said sample.

4,818,683

IMMUNOASSAY FOR MONOAMINES

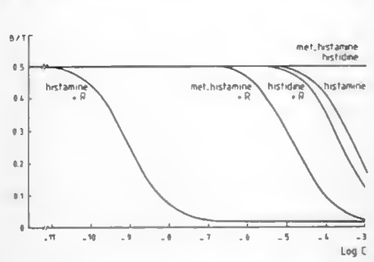
Anne Morel, and Michel Delaage, both of Marseille, France, assignors to Immunotech, Paris, France

Continuation of Ser. No. 719,873, Apr. 4, 1985, abandoned. This application Aug. 6, 1987, Ser. No. 83,899

Claims priority, application France, Apr. 10, 1984, 84 05783

Int. Cl.[4] G01N *33/53, 33/536;* C07K *17/02*

U.S. Cl. 435—7 **10 Claims**



1. A method for the immunoassay of a primary or secondary monoamine present in a biological sample, comprising the steps of:

acylating said monoamine while present in said biological sample by an acylation reagent (I) of the formula:

R—CO—R'

in which

R is NH_2—CO—CH_2—NH—CO—CH_2—CH_2— and R' represents a leaving group selected from the group consisting of an N-hydroxysuccinimide group, halogen, —O—CO—R'' and —S—R'', wherein R'' is a hydrocarbon radical or OH—C_6H_5— to form an acylated monoamine

coupling said acylated monoamine to a macromolecular carrier to form an immunogenic complex;

producing an antibody against said immunogenic complex;

selecting a tracer having the formula: X—NH—CO—R_1, wherein R_1 is a radical selected so that said tracer binds to said antibody competively with respect to said acylated monoamine, that is coupled to (1) a radioactive iodonated tyrosine residue or (2) an enzyme residue and X is the residue of said monoamine;

performing a competitive binding assay of said biological sample comprising said acylated monoamine against said tracer for said antibody.

4,818,684

AUTO-ANTI-IDIOTYPIC MONOCLONAL ANTIBODIES TO STEROID RECEPTORS AND USES THEREOF

Isidore S. Edelman, New York; Bernard F. Erlanger, Whitestone; Efthia Tzilianos, Astoria, and William L. Cleveland, New York, all of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Sep. 10, 1985, Ser. No. 774,289

Int. Cl.[4] G01N *33/531, 33/577;* C01N *15/00*

U.S. Cl. 435—7 **17 Claims**

1. Hybridoma 8G11C6 (ATCC No. HB 8708).

2. Anti-idiotypic monoclonal antibody produced by the hydridoma of claim 1.

3. A qualitative competitive immunoassy for detecting a glucocorticoid receptor which comprises:

(a) contacting material suspected of containing the glucocorticoid-receptor with the anti-idiotypic monclonal antibody of claim 2 so as to form a complex which includes the anti-idiotypic monoclonal antibody and the glucocorticoid-receptor; and

(b) detecting the presence of the complex and thereby the presence of the glucocorticoid-receptor.

4,818,685

METHOD AND KIT FOR DIAGNOSING BLOOM'S SYNDROME

Michael A. Sirover, Richboro, Pa., assignor to Temple University of the Commonwealth Systems of Higher Education, Philadelphia, Pa.

Filed Feb. 12, 1987, Ser. No. 13,745

Int. Cl.[4] G01N *33/53, 33/535, 33/577*

U.S. Cl. 435—7 **16 Claims**

1. A method for diagnosing Bloom's syndrome comprising:

contacting a human UDG-containing sample with a first anti-human UDG monoclonal antibody which does not recognize Bloom's syndrome UDG; and

assaying said sample for binding of UDG by said monoclonal antibody.

4,818,686

CHEMICAL BLOCKING AGENT AGAINST NON-SPECIFIC BINDING OR STAINING OF AN ANTIBODY SPECIFIC FOR TERMINAL DEOXYNUCLEOTIDYL TRANSFERASE IN BIOLOGICAL SPECIMENS DURING IMMUNOASSAY

Kenneth H. Kortright, Cooper City; Scott M. Malinconico, Pembroke Pines, both of Fla., and R. Graham Smith, Dallas, Tex., assignors to Coulter Corporation, Hialeah, Fla.

Filed Sep. 15, 1986, Ser. No. 907,003

Int. Cl.[4] G01N *53/00, 53/554*

U.S. Cl. 435—7 **16 Claims**

1. In an immunoassay for Terminal Deoxynucleotidyl Transferase enzyme (TdT) in a prepared sample of mammalian cells by detecting and analyzing the specific binding of a labelled monoclonal antibody to TdT in the cytoplasm of the cells, wherein the improvement comprises introducing a casein protein substantially concurrently with introduction of the antibody to the sample to prevent non-specific binding of the labelled monoclonal antibody in the cytoplasm of the cells whereby the bound cells can be analyzed and enumerated by detection of labelled monoclonal antibody bound thereto.

4,818,687

AFFINITY COLUMN AND PROCESS FOR DETECTION OF LOW MOLECULAR WEIGHT TOXIC SUBSTANCES

John D. Groopman, Essex County; Gerald N. Wogan, Middlesex County and Ana Mashak-Rothstein, Newton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge and Boston University, Boston, both of, Mass.

Filed Feb. 28, 1985, Ser. No. 706,983

Int. Cl.[4] G01N *33/543, 33/548, 33/577*

U.S. Cl. 436—518 **12 Claims**



1. An affinity matrix useful for the isolation of aflatoxins comprising:

a solid phase sorbant material; and

a monoclonal antibody specific for aflatoxins or an aflatoxin-DNA adduct immobilized on said sorbant material, said antibody having an affinity constant not less than about 1×10^9 liters per mole and having substantially equal affinity to aflatoxin M_1 and aflatoxin B_1.

4,818,688

ASSAYS FOR ANTIBODY TO HEPATITIS B CORE ANTIGEN

Marina Adamich, Townsend, Del., and Susan M. Wos, Marlboro, Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 21, 1986, Ser. No. 933,617

Int. Cl.[4] G01N *53/00, 33/543;* C12P *21/00;* C12N *15/00*

U.S. Cl. 435—7 **18 Claims**

1. In a single-antibody inhibition assay for detecting antibody to hepatitis B core antigen (HBcAg) in a patient sample comprising:

(1) incubating the sample and labeled antibody to HBcAg with HBcAg bound to a solid support;

(2) washing the support to remove unbound labeled antibody; and

(3) detecting antibody to HBcAg in the patient sample by measuring the signal generated by labeled antibody bound to the HBcAg or not bound to the HBcAg; the improvement which comprises using as the labeled antibody a monoclonal antibody which is specific for an immunodominant site on HBcAg.

4,818,689

LATE DIFFERENTIATION ANTIGEN ASSOCIATED WITH HELPER T LYMPHOCYTE FUNCTION

Nicole Sachs-Foca, Cliffside Park, N.J., and Donald W. King, Chicago, Ill., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Jul. 5, 1985, Ser. No. 752,397

Int. Cl.[4] G01N *33/53*

U.S. Cl. 435—7 **2 Claims**

1. A method of diagnosing the immune system of a patient by assessing the level of helper T cell activity which comprises:

(a) obtaining from the patient a sample of peripheral blood mononuclear cells containing T lymphocytes;

(b) contacting the sample under appropriate conditions with a monoclonal antibody that specifically binds to LDA_1 (a late appearing T lymphoctyes), so as to form a detectable complex between the monoclonal antibody and the expressed LDA_1;

(c) quantitatively detecting the complex, thereby quantitatively determining the amount of LDA_1 present and the activity of the helper T lymphocytes present in the sample; and

(d) comparing the activity of the helper T lymphocytes present in the sample with a reference thereby diagnosing the immune system of the patient.

4,818,690

METHOD FOR THE DETERMINATION OF PLASMINOGEN ACTIVATORS (PA)

Eric P. Pâques, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 9, 1986, Ser. No. 849,717

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3512909

Int. Cl.[4] C12Q *1/56;* G01N *33/86*

U.S. Cl. 435—13 **11 Claims**

1. A method for the quantitative determination of a plasminogen activator (PA) from the group consisting of urokinase (UK) and tissue plasminogen activator (tPA) in body fluids, which comprises the steps of

incubating PA with plasminogen and with a polysulfuric ester of a saccharide or with a sulfated sugar under conditions effective to allow conversion of the plasminogen into plasmin; and

determining quantitatively the conversion of plasminogen into plasmin.

9. An agent for the quantitative determination of a plasminogen activator comprising at least from about 0.01 to about 1 CTA/ml plasminogen and from about 10^{-4} to 1 g/ml heparin.

4,818,691

COLORMETRIC METHOD FOR QUANTIFICATION OF MAGNESIUM USING α-GLYCEROPHOSPHATE OXIDASE

Joseph D. Artiss, Windsor, Canada; Bennie Zak, West Bloomfield, and Michael C. Wimmer, Lansing, both of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Jul. 3, 1986, Ser. No. 882,072

Int. Cl.[4] C12Q *1/48, 1/26*

U.S. Cl. 435—15 **17 Claims**

1. A composition for determining magnesium levels in an aqueous fluid having adenosine-5'-triphosphate, water and a buffer capable of maintaining a solution pH between about 5.5 and 9.2, the improvement which comprises in addition:

glycerol kinase;

α-glycerophosphate oxidase;

a substance having peroxidase activity;

glycerol

a peroxidase oxidizable co-substrate;

an indicator co-substrate coupler;

an acid base buffer capable of maintaining a solution pH between about 5.5 and about 9.2; and

water.

4,818,692

METHOD AND REAGENT COMPOSITIONS FOR DETERMINING ALPHA AMYLASE USING A BLOCKED AND LABELED SUBSTRATE

Elli Rauscher, Munich; Eugen Schaich, Weilheim; Ulrich Neumann, Peissenberg; August Wahlefeld, Hohenpeissenberg; Wolfgang Gruber, Tutzing-Unterzeismering, and Bernhard Empl, Weilheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

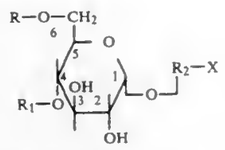
Division of Ser. No. 637,517, Aug. 3, 1984, Pat. No. 4,709,020. This application Jul. 1, 1987, Ser. No. 68,612

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3328616

Int. Cl.[4] C12Q *1/34, 1/40*

U.S. Cl. 435—18 31 Claims

1. Method for determining alpha amylase in a sample comprising adding to said sample a compound of the formula:



(I)

in which R and R_1, independently of one another, each represent a straight-chained or branched alkyl or alkoyl radical containing from 1 to 6 carbon atoms or a phenyl radical or R and R_1 together form a methylene bridge, the hydrogen atoms of which, independently of one another, can each be substituted by an alkyl radical containing from 1 to 5 carbon atoms or a phenyl radical, R_2 represents an oligoglucoside residue containing 2 to 7 glucose units and X is a hydrogen or an optically-determinable residue, in the presence of alpha glucosidase; and

determining X as a measure of the presence or absence or amount of alpha amylase in said sample.

4,818,693

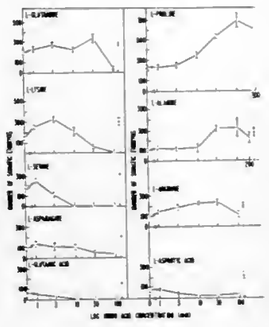
METHODS AND MATERIALS FOR ENHANCED SOMATIC EMBRYO REGENERATION IN THE PRESENCE OF AUXIN

David A. Stuart, and Steven G. Strickland, both of Davis, Calif., assignors to Plant Genetics, Inc., Davis, Calif.

Continuation of Ser. No. 504,891, Jun. 16, 1983, which is a continuation-in-part of Ser. No. 496,186, May 19, 1983. This application Jul. 21, 1986, Ser. No. 888,239

Int. Cl.[4] C12N *5/00, 5/02*

U.S. Cl. 435—240.49 10 Claims



1. A method of producing embryonic tissue from Leguminosae somatic tissue wherein somatic tissue is regenerated from induced cells in a nutritive plant cell culture medium to form embryonic tissue, said method comprising:

providing a nutritive plant cell culture medium upon which somatic embryos differentiate from induced cells, said medium including auxins at a final medium concentration between 1 and 100 μM, together with a sufficient amount of at least one reduced nitrogen source selected from the group consisting of ammonium salts at a final medium concentration between 1 and 25 mM and amino acids at a final medium concentration between 0.5 and 300 mM, said nutritive culture medium upon which somatic embryos differentiate resultantly providing an increased number of somatic embryos, as compared to the number of somatic embryos produced in a plant cell culture without said combination of auxins and at least one reduced nitrogen source in a single medium;

exposing undifferentiated Leguminosae somatic tissue to said provided nutritive plant cell culture medium including sufficient amounts of auxin between 1 and 100 μM and said at least one reduced nitrogen source, to cause embryogenesis in said Leguminosae somatic tissue to form somatic embryos; and,

sustaining said somatic embryos on said provided nutritive plant cell culture medium including sufficient amounts of auxin between 1 and 100 μM and said at least one reduced nitrogen source, to thereby permit embryo development into plantlets.

4,818,694

PRODUCTION OF HERPES SIMPLEX VIRAL PROTEIN

Roger J. Watson; John W. Weis, both of Minneapolis, and Lynn W. Enquist, Excelsior, all of Minn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 20, 1982, Ser. No. 400,028

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[4] C12P *21/00, 21/02, 21/04;* C12N *15/00, 5/00, 1/00, 1/20, 1/16, 1/18;* C07H *21/04*

U.S. Cl. 435—68 61 Claims

1. A process for producing a polypeptide comprising the amino acid sequence of a Herpes Simplex Virus qD glycoprotein or a fragment of said amino acid sequence, wherein said fragment comprises at lest seven contiguous amino acids, said polypeptide containing at least one immunological and antigenic determinant of a Herpes Simplex Virus gD glycoprotein comprising:

(a) culturing a unicellular organism containing a recombinant vector comprising a DNA sequence coding for a polypeptide comprising the amino acid sequence of a Herpes Simplex Virus gD glycoprotein or a fragment of said amino acid seqeunce, wherein said fragment comprises at least seven contiguous amino acids, said polypeptide containing at least one immunological and antigenic determinant of a Herpes Simplex Virus gD glycoprotein, and said recombinant vector capable of being replicated in said unicellular organism and said unicellular organism capable of producing said polypeptide; and

(b) isolating said polypeptide from the culture.

4,818,695

IMMOBILIZED *MUCOR MIEHE* LIPASE FOR TRANSESTERIFICATION

Peter Eigtved, Holte, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 646,752, Sep. 4, 1984, abandoned. This application Jul. 31, 1987, Ser. No. 80,217

Claims priority, application Denmark, Sep. 5, 1983, 4025/83

Int. Cl.[4] C12P *7/64;* C12N *11/08, 9/20;* C12R *1/785*

U.S. Cl. 435—134 9 Claims

1. A method for production of an immobilized lipase preparation adapted for interesterification of fats, which comprises contacting an aqueous solution of *Mucor miehei* lipase with a particulate, macroporous, weak anion exchange resin having a particle size such that more than 90% of the resin particles have a size between 100 and 1000 μm, at a pH in range of 5–7 to bind said lipase to said resin to form said immobilized lipase whereby at least 75% of the lipase activity is removed from the aqueous lipase solution to form a spent aqueous solution, then separating the immobilized lipase from the spent aqueous solution and thereafter drying the separated immobilized lipase to a water content of between about 2 and 40%.

4,818,696

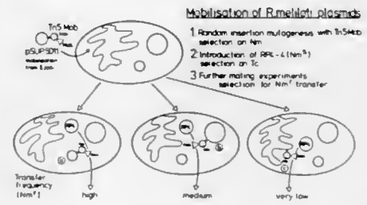
RHIZOBIUM JAPONICUM SYMBIOSIS GENE TRANSFER

Edward R. Appelbaum, Madison; Thomas J. McLoughlin, Monona, both of Wis., and Michael P. O'Connell, Bielefeld, Fed. Rep. of Germany, assignors to Lubrizol Genetics, Inc., Wickliffe, Ohio

Filed Jun. 1, 1984, Ser. No. 616,950

Int. Cl.[4] C12N *15/00, 1/20;* C12R *1/41;* C07H *21/00*

U.S. Cl. 435—172.3 34 Claims



10. A Rhizobium bacterium capable of effective Glycine-specific symbiotic nitrogen fixation containing a recombinant DNA molecule, the DNA comprising a Glycine-specific sym gene having the ability to provide effective nitrogen fixation and nodulation to a Glycine-nodulating rhizobial strain in a Glycine max L. host with which said strain does not naturally form a symbiotic relationship, with a t-vector DNA.

4,818,697

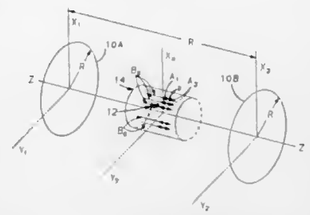
TECHNIQUES FOR ENHANCING THE PERMEABILITY OF IONS THROUGH MEMBRANES

Abraham R. Liboff, Birmingham, Mich.; Bruce R. McLeod, Bozeman, Mont., and Stephen D. Smith, Lexington, Ky., assignors to Life Resonances, Inc., Bozeman, Mont.

Filed Oct. 27, 1986, Ser. No. 923,760

Int. Cl.[4] C12N *13/00*

U.S. Cl. 435—173 16 Claims



1. A method of regulating the transfer of a predetermined ion having a predetermined charge-to-mass ratio through a biochemical membrane located in a space subjected to a local magnetic field, the space defining at least one reference path passing through the biochemical membrane, the reference path extending in a first direction and also extending in a second direction opposite the first direction, said method comprising the steps of:

creating a magnetic field which, when combined with the local magnetic field, results in a resultant magnetic field having a flux density with at least one component representable by a component vector having a direction extending in the first direction along the path through the biochemical membrane and having a magnitude that fluctuates at a predetermined rate to create a nonzero average value; and

creating a predetermined relationship between the ratio of the predetermined rate to the nonzero average value and to the charge-to-mass ratio of the predetermined ion, said predetermined relationship involving the cyclotron resonance frequency of said predetermined ion;

whereby the transfer of said predetermined ion across said biochemical membrane is regulated.

4,818,698

POLYPEPTIDES AND PREPARATION PROCESS THEREOF

Hitoshi Sagai, Mishima; Masayasu Takahara, Shizuoka; Shigeo Katsuragi, Shizuoka; Junboku Kajiwara, Shizuoka, and Haruzni Masujima, Shizuoka, all of Japan, assignors to Toyo Jozo Co., Ltd., Shizuoka, Japan

Filed Aug. 6, 1986, Ser. No. 893,619

Claims priority, application Japan, Aug. 23, 1985, 60-185246

Int. Cl.[4] C12N *9/02;* C07K *13/00*

U.S. Cl. 435—189 6 Claims

1. A polypeptide represented by the following general formula (I):

X_1 Ala Thr Lys Ala Val X_2 Val Leu Lys Gly Asp Gly Pro Val Gln Gly Ile Ile Asn Phe Glu Gln Lys Glu Ser Asn Gly Pro Val Lys Val Trp Gly Ser Ile Lys Gly Leu Thr Glu Gly Leu His Gly Phe His Val His Glu Phe Gly Asp Asn Thr Ala Gly Cys Thr Ser Ala Gly Pro His Phe Asn Pro Leu Ser Arg Lys His Gly Gly Pro Lys Asp Glu Glu Arg His Val Gly Asp Leu Gly Asn Val Thr Ala Asp Lys Asp Gly Val Ala Asp Val Ser Ile Glu Asp Ser Val Ile Ser Leu Ser Gly Asp His X_3 Ile Ile Gly Arg Thr Leu Val Val His Glu Lys Ala Asp Asp Leu Gly Lys Gly Gly Asn Glu Glu Ser Thr Lys Thr Gly Asn Ala Gly Ser Arg Leu Ala Cys Gly Val Ile Gly Ile Ala Gln (I)

wherein X_1 is a hydrogen atom, acetyl group or Met, X_2 is Cys, Ser, Ala, or Thr, and X_3 is Ser, Ala, or Thr.

4,818,699

GENERATION OF SOMACLONAL NON-MENDELIAN VARIANTS

David A. Evans; Christopher E. Flick, both of Burlington, and William R. Sharp, Camden, all of N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Filed Aug. 22, 1983, Ser. No. 525,092

Int. Cl.[4] C12N *5/00, 15/00*

U.S. Cl. 435—240.49 4 Claims

1. A method for isolating non-Mendelian genetic variants in regenerated tomato plants obtained from tissue culture, comprising the steps of:

(i) culturing a callus from an explant of tomato plant tissue of basal medium comprising a variant inducing amount of cytokinin and auxin and regenerating shoots from said callus;

(ii) rooting said regenerated shoots on a rooting medium to form regenerated plantlets;

(iii) growing said plantlets into mature tomato plants;

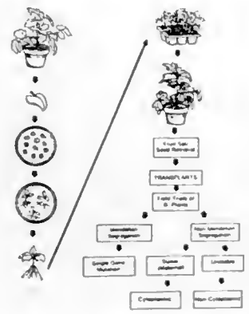
(iv) collecting seed from said regenerated plants;

(v) germinating and growing plants therefrom;

(vi) transplanting said plants to replicate field plots;

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(vii) isolating those plants which yield progeny displaying a variant phenotype throughout a full row and,



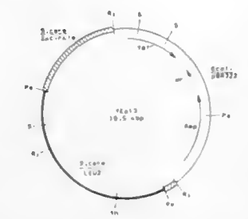
(viii) verifying the cytoplasmic nature of the variation by subjecting chloroplast DNA to restriction enzyme analysis.

4,818,700

PICHIA PASTORIS ARGININOSUCCINATE LYASE GENE AND USES THEREOF

James M. Cregg, San Diego, Calif., and George T. Sperl, Gurnee, Ill., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 25, 1985, Ser. No. 791,485
Int. Cl.[4] C12N *1/20, 9/88, 1/16;* C07H *15/12*
U.S. Cl. 435—252.33 **5 Claims**



1. A gene isolated from *Pischi pastoris* coding for the production of *Pischi pastoris* argininosuccinate lyase or a subunit thereof which upon expression thereof results in biologically active argininosuccinate lyase.

4,818,701

APPARATUS FOR TRANSFERRING BIOLOGICAL SPECIMENS FROM A GEL TO A TRANSFER MEMBRANE AND METHOD

William J. Littlehales, Point Richmond, Calif., assignor to American Bionetics, Inc., Hayward, Calif.

Filed May 13, 1987, Ser. No. 49,774
Int. Cl.[4] C12M *1/12*
U.S. Cl. 435—311 **18 Claims**

1. An apparatus for transferring biological specimens from a gel to a transfer membrane by means of liquid transfer comprising:

(a) means to support a gel containing biological specimens on top of a transfer membrane;

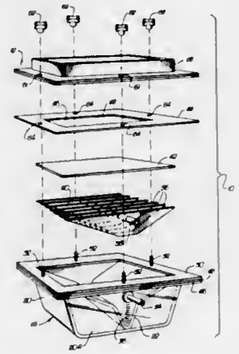
(b) means disposed above the support means to define a reservoir for transfer liquid above the gel;

(c) means adapted to be connected to a vacuum source to cause the passage of transfer liquid from the reservoir through the gel and membrane to thereby transfer the biological specimens from the gel to the transfer membrane, including sealing means disposed between the reservoir means and the support means having an area of liquid passage therethrough smaller than the area of gel placed thereabove to thereby ensure passage of the transfer liquid through the gel; and

(d) a trough located beneath the gel and transfer membrane to collect the transfer liquid which passes through the gel and transfer membrane to facilitate determination of the amount of transfer liquid which passes therethrough.

15. A method of transferring biological specimens from a gel to a transfer membrane, said method comprisng the steps of:

(a) supporting a gel having biological specimens on top of a transfer membrane;



(b) maintaining a reservoir of transfer liquid above the gel;

(c) sealing the underside of the outer perimeter of the gel to prevent bypass of transfer liquid therearound;

(d) passing transfer liquid from the reservoir first through the gel and then the membrane to effect a transfer of biological specimens carried by the gel onto the membrane; and

(e) collecting transfer liquid which has passed through the gel and membrane in a trough beneath the gel and the membrane to determine the amount of transfer liquid which has passed therethrough.

4,818,702

FECAL OCCULT BLOOD TEST REAGENT

Paul J. Lawrence, Campbell, Calif., assignor to Litmus Concepts, Inc., Santa Clara, Calif.

Continuation of Ser. No. 869,573, Jun. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 680,357, Dec. 11, 1984, Pat. No. 4,615,982, and a continuation-in-part of Ser. No. 899,300, Aug. 11, 1986, abandoned. This application Mar. 31, 1988, Ser. No. 175,573
Int. Cl.[4] G01N *21/78, 33/72*
U.S. Cl. 436—66 **8 Claims**

1. A chromogenic reagent for use in a fecal occult blood test comprising a solution of a hydroperoxide, a chromogenic mixture of guaiac and 2,2'-azino-di-(3-ethylbenzyl)thiazoline sulfonic acid (ABTS), and a solvent comprising at least about 50% by volume of a solvent for iron protoporphyrins, wherein the weight ratio of guaiac to ABTS in the chromogenic mixture is in the range of 1:5 to 5:1, and wherein the chromogen mixture is present in the solution at a concentration in the range of about 0.5 to 10% by weight.

4,818,703

STABILIZED ALKALINE PICRATE REAGENT FOR JAFFE CREATININE DETERMINATION

John M. Pizzolante, 4 Todd Rd., Woburn, Mass. 01801

Continuation of Ser. No. 790,456, Oct. 23, 1985, abandoned. This application Jul. 27, 1987, Ser. No. 78,029
Int. Cl.[4] G01N *33/70*
U.S. Cl. 436—98 **10 Claims**

1. An improved method for determining creatinine, comprising the following steps:

preparing a stabilized alkaline picrate reagent solution by mixing water, picric acid, a molar excess relative to said picric acid of an alkali metal hydroxide, and an alcohol having 1 to 4 carbon atoms, said alcohol being employed in an amount effective to stabilize said alkaline picrate reagent solution during storage;

storing said stabilized alkaline picrate reagent solution in a sealed container for a time in excess of the time an unstabilized alkaline picrate reagent solution otherwise corresponding to said stabilized alkaline picrate reagent solution but lacking said alcohol would be stable, until said stabilized alkaline picrate reagent solution is needed for a creatinine determination;

combining an aliquot of said stored stabilized alkaline picrate reagent solution and an aliquot of a sample solution to be analyzed for creatinine, to produce a colored solution; and

measuring the absorbance of said colored solution.

4,818,704

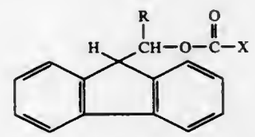
METHOD FOR THE SEPARATION AND DETERMINATION OF ENANTIOMERIC AMINE COMPOUNDS USING AN OPTICALLY ACTIVE AGENT

Björn Josefsson; Stefan Einarsson, both of Gothenburg; Domingo Sanchez, Floda, and Per Möller, Gothenburg, all of Sweden, assignors to Eka Nobel AB, Surte, Sweden

Continuation of Ser. No. 863,712, May 16, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 148,139
Int. Cl.[4] G01N *21/77, 33/68*
U.S. Cl. 436—111 **6 Claims**



1. A method for the resolution and determination of compounds having an amino function in aqueous and non-aqueous samples, comprising adding an optically active agent of the formula:



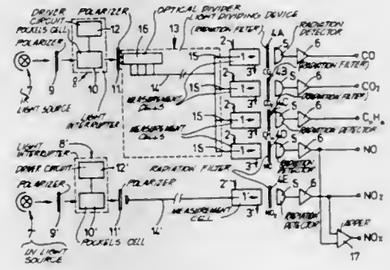
wherein X is halogen, and azide group or a sucinimidyl group and wherein R is an alkyl group or a trifluoromethyl group to a sample containing compounds having an amino function so as to derivatize the amino function of the compounds and form diastereomeric carbamate derivatives, and then separating and determining said derivatives by liquid chromatography.

4,818,705

METHOD AND APPARATUS FOR ANALYZING THE COMPOSITION OF THE EXHAUST GAS OF ANY INTERNAL COMBUSTION ENGINE

Gerd Schneider, Wegberg; Franz-Wilhelm Boost, Monchen-Gladbach, and Frank Leimbach, Wuppertal, all of Fed. Rep. of Germany, assignors to Pierburg GmbH, Neuss, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 25,000
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608122
Int. Cl.[4] G01N *21/85*
U.S. Cl. 436—164 **13 Claims**



1. A method of analyzing the composition of the exhaust gas of an internal combustion engine comprising:

providing a light beam from a light source which can be absorbed by the components in the exhaust gas to be measured,

periodically interrupting the light beam, dividing the thus interrupted light beam into a plurality of parallel subdivided beams, directing the subdivided beams through respective measurement cells which are simultaneously traversed by the exhaust gas to be analyzed,

filtering the output of the respective cells according to the components of the gas to be analyzed thereby,

detecting the thus filtered light output and producing an electrical signal which is a function of the magnitude of said light output to provide indication of the magnitude of the components in the exhaust gas and thereby of the composition thereof.

4. A measuring apparatus for analyzing the composition of the exhaust gas of an internal combustion engine, said apparatus comprising:

a light source for producing a light beam which can be absorbed by components in an exhaust gas which are to be measured,

a plurality of measurement cells each for a respective gas component of the exhaust gas which is to be measured, conduit means for passage therethrough of the exhaust gas and of light from the light source, means supporting said cells in said conduit means for simultaneous passage of the exhaust gas and light therethrough,

a plurality of radiation filters one for each cell tuned to the gas component to be measured,

a plurality of radiation detectors each arranged opposite each respective measurement cell, said filters being disposed between the measurement cells and the respective detectors such that the detectors each receive, via the respective filter, absorption attenuated light radiation to procude an electrical measurement signal as a function thereof,

light interrupter means for the periodic interruption of the light beam from the light source,

said light interrupter means being arranged in the path of the light beam between said light source and said measure-

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ment cells for periodically interrupting said light beam, and,

light dividing means between the light interrupter means and measurement cells for dividing the interrupted light beam produced by said light interrupter means and simultaneously applying the thus divided interrupted light beam to all of the measurement cells.

4,818,706

REAGENT-DISPENSING SYSTEM AND METHOD

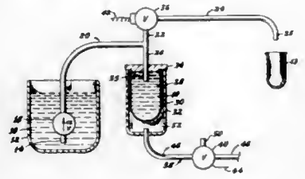
Maurice Starr, Indianapolis, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

[*] The portion of the term of this patent subsequent to Mar. 5, 2002 has been disclaimed.

Continuation-in-part of Ser. No. 486,330, Apr. 19, 1983, Pat. No. 4,503,012. This application Jul. 27, 1984, Ser. No. 635,298

Int. Cl.[4] G01N *1/14*

U.S. Cl. 436—180 **13 Claims**



1. A method for dispensing metered amounts of liquid comprising:

providing a deformable pumping chamber containing a liquid to be dispensed;

applying a positive pressure to the exterior surface of said deformable pumping chamber while blocking the flow of liquid from said pumping chamber to a dispenser means;

coupling the interior of said pumping chamber to said dispenser means for a predetermined period of time while maintaining the positive pressure to the exterior surface of said deformable pumping chamber, the positive pressure applied to the exterior surface of said pumping chamber causing said pumping chamber to contract resulting in a metered amount of liquid being dispensed from said pumping chamber to said dispenser means during said predetermined period of time;

blocking the flow of said liquid from said pumping chamber to said dispenser means after said predetermined period of time; and

reducing the pressure applied to the exterior surface of said deformable pumping chamber to allow said pumping chamber to expand, the resulting reduced pressure within said expanded pumping chamber causing liquid within a supply means coupled to said pumping chamber to be withdrawn from said supply means into said pumping chamber for refilling said pumping chamber with said liquid.

4,818,707

DEVICE AND MIXTURE FOR TESTING FOR IMMUNE RESPONSES TO FOOD

James C. Breneman, 10571 Miller Dr., Galesburg, Mich. 49053

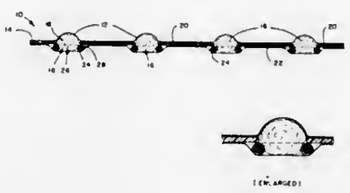
Division of Ser. No. 487,065, Apr. 21, 1983, Pat. No. 4,543,964. This application Apr. 9, 1985, Ser. No. 721,405

Int. Cl.[4] G01N *33/053*

U.S. Cl. 436—513 **15 Claims**

1. A device for the detection of an individual's Gell-Coombs Types I, II, III and IV immune response reactions to test substances, said device comprising:

a mixture of a test substance and a solution of non-toxic aprotic solvent and water, said solvent having the ability to penetrate skin, and said mixture having a sufficient concentration of said test substance such that an immune response will be produced on the skin if the mixture is applied to the skin of an individual sensitive to said test



substance, said solution including at least 20% dimethyl sulfoxide as said solvent; and

means for holding an amount of said mixture against the skin.

4,818,708

CROSSED IMMUNOELECTROPHORETIC TECHNIQUE FOR PREDICTING DOWN'S SYNDROME OCCURRENCE

Julius Kerkay, 8040 Barbara Dr., Strongsville, Ohio 44136

Filed May 21, 1985, Ser. No. 736,352

Int. Cl.[4] G01N *33/561*

U.S. Cl. 436—516 **2 Claims**

1. A method of determining the existence of a greater than normal potential of a woman's bearing a Down's syndrome child, said method comprising

obtaining a sample of said woman's blood serum;

electrophoresing said sample through a first gel in a first direction at a first voltage and for a first time period sufficient to produce a track of separated proteins in said first gel;

electrophoresing a portion of said first gel containing all of said track at a second voltage lying in the range of 6 to 9 volts per centimeter, in a second direction perpendicular to said track through a second gel prepared from a buffer solution and agarose and containing a concentration of antiserum directed against Down's syndrome protein (DSP), which said antiserum reacts with said Down's syndrome protein to generate a DSP precipitin arc in the gamma-A region, for a sufficient time to generate a series of precipitin peaks in said gamma-A region representing the said separated proteins, said concentration of said antiserum lying in the range of 2.25 to 3.25 microliters per square centimeter of said second gel, said second gel being 0.12 cm thick; and

determining whether a DSP precipitin arc has been generated in the same gamma-A region, the presence of said arc indicating the presence of said greater than normal potential.

4,818,709

CEA-FAMILY ANTIGENS, ANTI-CEA ANTIBODIES AND CEA IMMUNOASSAY

Frederick J. Primus, 2012 Summerhayes Ct., Lexington, Ky. 40503, and Milton D. Goldenberg, 636 Lakeshore Dr., Lexington, Ky. 40502

Continuation of Ser. No. 609,607, May 14, 1984, abandoned, which is a continuation of Ser. No. 459,919, Jan. 21, 1983, abandoned. This application Jan. 12, 1987, Ser. No. 5,355

Int. Cl.[4] G01N *33/543, 33/577*; C07K *15/04*

U.S. Cl. 436—518 **9 Claims**

1. An immunoassay method for determining carcinoembryonic antigen (CEA) in an unextracted serum or plasma sample, said method comprising the steps of:

(1) contacting an unextracted serum or plasma sample with a capture antibody bound to a solid support, for a time sufficient to permit antibody binding to CEA in said sample, said capture antibody being a hybridoma-derived Class I anti-CEA monoclonal antibody which specifically binds to an epitope shared by CEA, meconium antigen and non-specific crossreacting antigen; and

(2) contacting the resultant solid support, having the CEA bound to said capture antibody therreon, with a detectably labeled anti-CEA probe antibody whose binding to CEA is not appreciably ionic strength-dependent, for a time sufficient for the probe antibody to bind to CEA bound to said capture antibody, and determining the extent of binding of said probe antibody to said bound CEA, wherein said probe antibody is either:

(a) a hybridoma-derived Class II anti-CEA monoclonal antibody which specifically binds to an epitope shared by CEA and meconium antigen, but which does not specifically bind to non-specific crossreacting antigen, wherein binding to said epitope cannot be cross-blocked by a hybridoma-derived Class I anti-CEA monoclonal antibody which specifically binds to an epitope shared by CEA, meconium antigen and non-specific crossreacting antigen; or

(b) a hydridoma-derived Class III anti-CEA monoclonal antibody which specifically binds to an epitope on CEA and does not specifically bind to meconium antigen or non-specific crossreacting antigen.

4,818,710

METHOD FOR OPTICALLY ASCERTAINING PARAMETERS OF SPECIES IN A LIQUID ANALYTE

Ranald M. Sutherland, Geneva; Claus Dähne, and Georges Revillet, both of Onex, all of Switzerland, assignors to Prutec Limited, United Kingdom

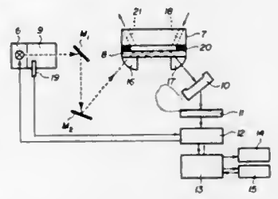
Filed Dec. 6, 1985, Ser. No. 805,903

Claims priority, application European Pat. Off., Dec. 10, 1984, 84810600.1

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[4] G01N *21/00, 33/552, 33/72*

U.S. Cl. 436—527 **22 Claims**



1. A method of determining the presence of more than one component in a single liquid sample by use of multiple internal reflections of excitation radiation in a waveguide comprising the steps of:

coating a surface of a waveguide with a reactant specific to a first component contained in the sample;

exposing said coated surface to the sample, thereby allowing formation of a layer of a complex formed by the reaction of said reactant and said first component;

illuminating an input end of said waveguide with an optical excitation signal in a manner such that an evanescent component of said signal penetrates a sufficient distance into said sample to interact with said complex layer with a second component in the bulk of said sample;

collecting the optical signal after said interaction; and

subsequently analyzing said signal to determine the presence or quantity of each of said first and second components in the sample.

4,818,711

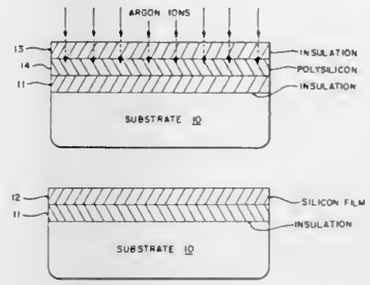
HIGH QUALITY OXIDE ON AN ION IMPLANTED POLYSILICON SURFACE

Himanshu Choksi, Sunnyvale, and Daniel Tang, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 28, 1987, Ser. No. 90,334

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—21 **21 Claims**



1. A method for growing an insulative layer on the surface of the polysilicon film, comprising the steps of:

depositing a silicon film with a dopant;

activating said dopant, said silicon film becoming polysilicon as a result of said activation;

growing a first insulative layer on said polysilicon film;

implanting said polysilicon film with inert ions through said first insulative layer;

removing said first insulative layer;

growing a second insulative layer on said polysilicon film.

21. A method for growing an oxide layer on the surface of a polysilicon film, comprising:

growing a first oxide layer on a substrate;

depositing a silicon film on said first oxide layer;

doping said silicon film with phosphorous ions, said silicon film becoming polysilicon as a result of said doping;

doping said polysilicon film with argon ions;

doping said polysilicon film with oxygen;

growing a second oxide layer on said polysilicon film; whereby, said polysilicon layer has oxygen atoms incorporated into the silicon lattice and said second oxide layer has uniform physical and electrical properties.

4,818,712

ALUMINUM LIFTOFF MASKING PROCESS AND PRODUCT

John W. Tully, Rolling Hills Estates, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Oct. 13, 1987, Ser. No. 107,626

Int. Cl.[4] H01L *21/88, 21/306*

U.S. Cl. 437—26 **26 Claims**

1. A process for masking a semiconductor wafer comprising the steps of:

forming a silicon dioxide layer over a selected portion of the surface of the wafer;

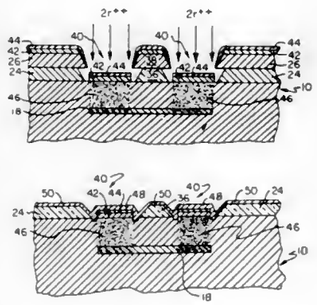
forming an aluminum layer over the silicon dioxide layer;

defining contact areas for connection;

etching said aluminum layer to said silicon dioxide layer in

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the defined contact areas to form windows in said aluminum;
etching said silicon dioxide layer to extend said windows to the wafer surface;
effecting one of an ion implant or an ohmic metallization followed by the other of said ion implant or ohmic metallization;



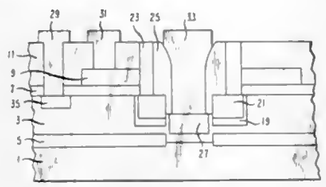
said ohmic metallization comprising placing ohmic contact metal in said windows in contact with the implanted wafer, said ohmic metal chosen such that it is capable of withstanding subsequent temperature cycling;
said ion implant comprising ion implanting base majority carriers through said windows to implant said carriers in the semiconductor wafer;
lifting off said aluminum layer.

4,818,713

TECHNIQUES USEFUL IN FABRICATING SEMICONDUCTOR DEVICES HAVING SUBMICRON FEATURES

Anatoly Feygenson, Exeter Township, Berks County, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 20, 1987, Ser. No. 111,002
Int. Cl.[4] H01L *21/205, 21/76, 21/265*
U.S. Cl. 437—31 **7 Claims**



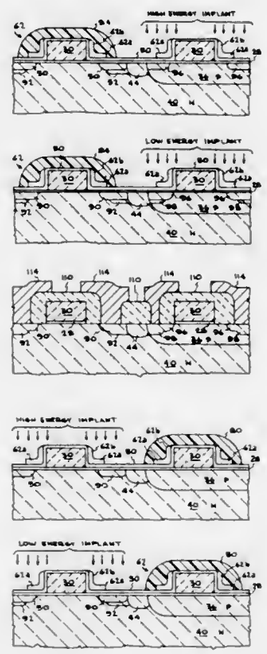
1. A method of fabricating a semiconductor device comprising the steps of:
patterning a first dielectric layer on a semiconductor substrate to form openings which expose portions of a surface of the semiconductor substrate;
depositing a silicon nitride layer so as to cover the patterned dielectric layer;
etching the silicon nitride layer to form sidewall spacers in said openings which leave portions of said semiconductor surface exposed;
growing a layer of silicon on said portions of said surface not covered by said sidewall spacers utilizing a selective epitaxial growth process;
oxidizing said epitaxially grown silicon layer;
removing said sidewall spacers to expose portions of said semiconductor substrate previously underneath said sidewall spacers; and
doping said exposed portions of said semiconductor substrate to form active device regions.

4,818,714

METHOD OF MAKING A HIGH PERFORMANCE MOS DEVICE HAVING LDD REGIONS WITH GRADED JUNCTIONS

Jacob D. Haskell, Palo Alto, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 2, 1987, Ser. No. 127,995
Int. Cl.[4] H01L *21/265, 21/70, 27/00*
U.S. Cl. 437—044 **20 Claims**



1. A method for making an MOS structure having a lightly doped drain region to avoid short channel and punchthrough problems which comprises:
(a) forming a gate electrode on a substrate;
(b) forming a shielding layer of an insulating material over the gate electrode and substrate;
(c) forming another layer of a dissimilar material over said shielding layer;
(d) anisotropically etching said layer of dissimilar material over said shielding layer to remove said layer except for spacer portions over said shielding layer adjacent the sidewalls of said gate electrode;
(e) removing the portions of said shielding layer not masked by said spacer portions, leaving one or more el-shaped shielding members each having a vertical portion against said gate electrode and a horizontal leg beneath said spacer portion extending over said substrate from said vertical portion;
(f) removing said spacer portion over said el-shaped shielding member;
(g) then implanting said substrate with a dopant material at a sufficiently low energy to prevent penetration of said dopant through said el-shaped shielding member and a concentration high enough to form a highly doped source/drain region in the portion of the substrate not shielded by said el-shaped shielding member or said gate electrode; and
(h) then implanting said substrate with a dopant material of the same type at a sufficiently high energy to penetrate through said el-shaped shielding member at a concentration low enough to form a lightly doped source/drain region in the portion of the substrate shielded by said el-shaped shielding member adjacent the region of said substrate beneath said gate electrode;
whereby said low concentration implantation will form a lightly doped source/drain region separating the channel region of the substrate beneath said gate electrode from said highly doped source/drain region.

20. A method for making an MOS structure having a lightly doped drain region to avoid short channel and punchthrough problems which comprises:
(a) forming a gate electrode on a substrate;
(b) forming a shielding layer of an insulating material over the gate electrode and substrate;
(c) forming another layer of a dissimilar material over said shielding layer.
(d) anisotropically etching said layer of dissimilar material over said shielding layer to remove said layer except for spacer portions over said shielding layer adjacent the sidewalls of said gate electrode;
(e) removing the portions of said shielding layer not masked by said spacer portions, leaving one or more el-shaped shielding members each having a vertical portion against said gate electrode and a horizontal leg beneath said spacer portion extending over said substrate from said vertical portion;
(f) removing said spacer portion over said el-shaped shielding member;
(g) then implanting said substrate with a dopant material at a sufficiently low energy to prevent penetration of said dopant through said el-shaped shielding member and a concentration high enough to form a highly doped source/drain region in the portion of the substrate not shielded by said el-shaped shielding member or said gate electrode; and
(h) then implanting said substrate with a dopant material of the same type at a sufficiently high energy to penetrate through said el-shaped shielding member at a concentration low enough to form a lightly doped source/drain region in the portion of the substrate shielded by said el-shaped shielding member adjacent the region of said substrate beneath said gate electrode;
whereby said low concentration implantation will form a lightly doped source/drain region separating the channel region of the substrate beneath said gate electrode from said highly doped source/drain region.

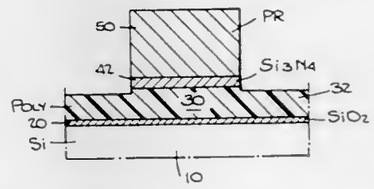
4,818,715

METHOD OF FABRICATING A LDDFET WITH SELF-ALIGNED SILICIDE

Fung-Ching Chao, Tainan Shih, Taiwan, assignor to Industrial Technology Research Institute, China

Filed Jul. 9, 1987, Ser. No. 72,186
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—44 **38 Claims**

32. A process for preparing a structure useful in making a two-region lightly-doped drain field effect transistor which comprises:
a. defining a gate pattern by means of a photoresist mask on a silicon dioxide layer of a laminate comprising a semiconductor substrate having deposited thereon successively a gate oxide layer and a polysilicon layer, and said silicon dioxide layer;
b. completely removing unmasked portions of the silicon dioxide layer and partially removing unmasked portions of the polysilicon layer by anisotropically etching said layers and then stripping the photoresist mask;
c. depositing a SiO_2 layer followed by an anisotropic etch to form oxide sidewall spacers;
d. anisotropically etching the unmasked polysilicon layer partially to form a polysilicon layer having a relatively thick central portion and a relatively thin peripheral step;
e. again depositing a SiO_2 layer followed by an anisotropic etch to form oxide sidewall spacers;



f. again anisotropically etching the unmasked polysilicon completely to form a polysilicon layer having a relatively thick central portion and two concentric peripheral steps, said first step being relatively thin with respect to said central portion and said second step being relatively thin with respect to the first step; and
g. removing the sidewall spacers.

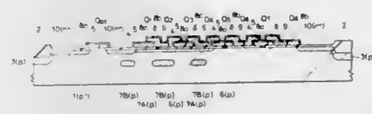
33. A process as claimed in claim 31 or 32 which comprises the additional step of
h. ion-implanting the resultant structure to form simultaneously heavily doped source/drain regions under said exposed portion of said gate oxide layer and two-region lightly-doped source/drain regions under said two peripheral steps of said polysilicon layer, thereby fabricating a two-region lightly-doped drain field effect transistor.

4,818,716

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

Kousuke Okuyama, Kowagoe; Ken Uchida, Higashiyamato; Kouichi Kusuyama, Mitaka; Satoshi Meguro, Tokyo; Hisao Katto, Tokyo, and Kazuhiro Komori, Kodaira, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan and Hitachi Microcomputer Engineering Ltd., Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,690
Claims priority, application Japan, Oct. 22, 1986, 61-249725
Int. Cl.[4] H01L *21/265;* **B01J** *17/00*
U.S. Cl. 437—49 **26 Claims**



1. A manufacturing method of a semiconductor memory device having a vertical-type mask ROM with first-layer and second-layer gate electrodes, in which the second-layer gate electrodes are formed from a second conductive layer, between adjacent ones of the first-layer gate electrodes, which first-layer gate electrodes are formed from a first conductive layer and are disposed at a predetermined interval in a direction of gate length of the first-layer gate electrodes, comprising the steps of:

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forming the first-layer gate electrodes on a principal surface of a semiconductor substrate;

implanting an impurity to write information into the principal surface of the semiconductor substrate between the first-layer gate electrodes by using the first-layer gate electrodes as a mask so as to write first information;

after the step for forming the first-layer gate electrodes, further implanting an impurity to write information into the principal surface of the substrate beneath the first-layer gate electrodes through the first-layer gate electrodes, thereby writing second information; and

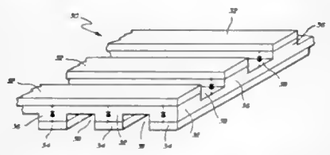
forming the second-layer gate electrodes on the principal surface of the substrate in which said first information has been written.

4,818,717

METHOD FOR MAKING ELECTRONIC MATRIX ARRAYS

Robert R. Johnson, Franklin, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 879,505, Jun. 27, 1986, abandoned.
This application Apr. 10, 1987, Ser. No. 58,225
The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.
Int. Cl.[4] H01L *21/70*
U.S. Cl. 437—52 **16 Claims**



1. A method of making an electronic matrix array, said method comprising the steps of:

providing at least one layer of discrete portions of a phase changeable material, said phase changeable material having a substantially non-conductive state and a comparatively highly conductive state; said discrete portions being set in one of said states;

providing a first set of electrically conductive address lines on one side of said layer of discrete portions of phase changeable material;

disposing said discrete portions of phase changeable material between said first and a second set of electrically conductive address lines, said second set of address lines disposed on the opposite side of said layer of discrete portions of a phase changeable material; said first and second sets of address lines crossing at an angle so as to form a plurality of cross-over points with said discrete portions of a phase changeable material operatively disposed in the areas defined by said cross-over points; and

programming said layer of discrete portions of phase changeable material by converting at least selected ones of said discrete portions of said layer to the other one of said states to form selected substantially non-conductive, discrete portions of phase changeable material of said layer and selected comparatively highly conductive, portions of phase changeable material of said layer.

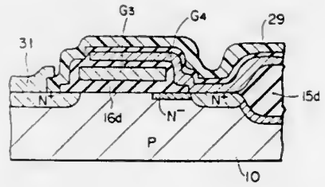
4,818,718

METHOD OF MANUFACTURING SEMICONDUCTOR MEMORY DEVICE

Yasunobu Kosa, and Kazuhiro Komori, both of Kodaira, Japan, assignors to Hitachi, Limited, Tokyo, Japan

Continuation of Ser. No. 668,675, Nov. 5, 1984, abandoned, which is a division of Ser. No. 428,954, Sep. 30, 1982, abandoned.
This application Oct. 3, 1986, Ser. No. 914,587
Claims priority, application Japan, Feb. 20, 1980, 55-18983
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[4] H01L *29/94*
U.S. Cl. 437—52 **18 Claims**





1. A method of fabricating a semiconductor memory device, including: a memory array portion formed on a semiconductor substrate at a first location of one main surface thereof and including a plurality of MIS memory transistors, said MIS memory transistors being respectively formed at first areas of said first location and each having a floating gate electrode and a control gate electrode overlying said floating gate electrode; and a peripheral circuit portion formed at a second location of said semiconductor substrate different from said first location in association with said memory array portion and including a plurality of MIS transistors and wiring lines, said wiring lines being respectively formed at second areas of said second location, comprising the steps of:

forming a first insulating film on said semiconductor substrate at said first location and said second location;

forming a first layer of conductive material on said first insulating film at said first location;

forming a second insulating film on said first layer of conductive material;

forming a second layer of conductive material on said second insulating film at said first location and on said first insulating film at said second location;

patterning said second layer of conductive material, said second insulating film, said first layer of conductive material and said first insulating film at said first location using a photoresist film as a mask so as to form said control gate electrode and said floating gate electrode of said memory array portion; and

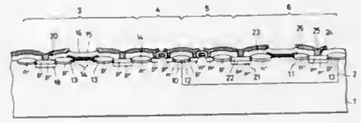
separately, at a different time, patterning said second layer of conductive material at said second location so as to form at least some of said gates and some of said wiring lines.

4,818,719

METHOD OF MANUFACTURING AN INTEGRATED CMOS OF ORDINARY LOGIC CIRCUIT AND OF HIGH VOLTAGE MOS CIRCUIT

Ching-Fa Yeh; Yasunao Misawa, and Yuji Yatsuda, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Filed Jul. 16, 1987, Ser. No. 74,059
Claims priority, application Japan, Jul. 24, 1986, 61-174030
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—057 **7 Claims**



1. A method of manufacturing a semiconductor device having a CMOS unit for an ordinary logic operation and a high voltage MOS unit which are provided in a single semiconductor substrate of a first conduction type, said method comprising the steps of:

forming a well of a second conduction type in said substrate;

forming field-effect transistors having channels of mutually different conduction types in said substrate and said well;

forming electrode wiring layers; and

forming a first impurity region having a particular conduction type and serving as a channel stopper of said CMOS unit and a second impurity region having said particular conduction type of the first impurity region and serving as an offset low-resistance layer of said MOS unit;

wherein in said step of forming first and second impurity regions, forming each of said first and second impurity regions substantially simultaneously in an identical process.

4,818,720

METHOD FOR MANUFACTURING A BICMOS DEVICE

Hiroshi Iwasaki, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 846,512, Mar. 31, 1986, abandoned, which is a division of Ser. No. 658,029, Oct. 5, 1984, abandoned.
This application Sep. 8, 1987, Ser. No. 96,241
Claims priority, application Japan, Oct. 7, 1983, 58-187930
Int. Cl.[4] H01L *29/78, 21/225*
U.S. Cl. 437—58 **4 Claims**

1. A method of manufacturing a semiconductor integrated circuit device which comprises a bipolar transistor and a field effect transistor, the method comprising the steps of:

forming, in a semiconductor substrate of a first conductivity type, first semiconductor regions of a second conductivity type;

forming a semiconductor layer of said first conductivity type on said semiconductor substrate;

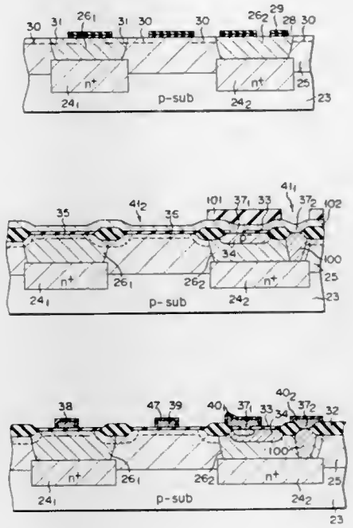
forming, in said semiconductor layer, second semiconductor regions of said second conductivity type contacting said first semiconductor regions;

forming, on said semiconductor layer, an insulation film having a contact hole formed therein, leading to a portion of a predetermined one of said second semiconductor regions;

forming an impurity diffusion source layer of said second conductivity type on said insulation film;

doping said last-mentioned second semiconductor region with an impurity from said impurity diffusion source layer via said contact hole formed in said insulation film, to form, in said last-mentioned second semiconductor region, a third semiconductor region of said second conductivity type, constituting a collector leading region, having a high impurity concentration formed by further implantation of the impurity diffusion source layer while masking other regions of the transistor, and contacting the first semiconductor region contacting said last-mentioned second semiconductor region; and

patterning said impurity diffusion source layer to form gate electrode of a field effect transistor and a collector electrode of a bipolar transistor with said bipolar transistor



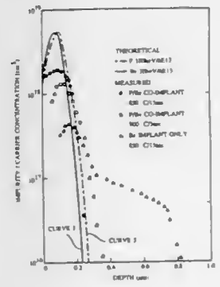
being formed in said last-mentioned second semiconductor region and said field effect transistor being formed in said semiconductor layer where said second semiconductor region is not formed or in another predetermined one of said second semiconductor regions.

4,818,721

ION IMPLANTATION INTO IN-BASED GROUP III-V COMPOUND SEMICONDUCTORS

Kou-Wei Wang, Piscataway, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 29, 1987, Ser. No. 79,371
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—22 **16 Claims**

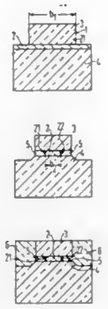


1. A method of manufacturing a semiconductor device comprising:

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providing an In-based Group III–V compound semiconductor body,
implanting ions in a region of said body, and
annealing said body to render said species electrically active, characterized in that said implanting step includes
first implanting into said region Group V ions, followed by second implanting into said region Be ions.

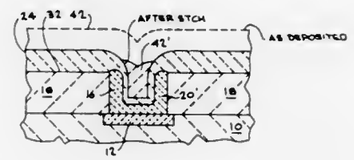
4,818,722
METHOD FOR GENERATING A STRIP WAVEGUIDE
Jochen Heinen, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed May 26, 1987, Ser. No. 54,237
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1986, 3633079
Int. Cl.[4] H01L *21/208*
U.S. Cl. 437—129 **8 Claims**

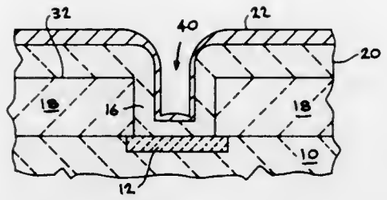


1. A method for generating a strip waveguide which comprises:
providing an epitaxial hetero-layer structure composed of a laser-active layer located between two semiconductor layers, the width of said laser-active layer being greater than the width of the final laser-active layer,
forming a raised strip (1) from the epitaxial hetero-layer structure, said strip being laterally etched with an erosion melt and the lateral surface (21, 22) of the laser-active layer (2) of the htero structure functioning as a waveguide region of the strip (1) is etched away laterally more than the two semiconductor layers and is left covered by one of the erosion melt or a part (5) of said layer dissolved by said melt, and
growing an epitaxial layer laterally outwardly from said erosion melt deposits.

4,818,723
SILICIDE CONTACT PLUG FORMATION TECHNIQUE
Yung-Chau Yen, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 802,570, Nov. 27, 1985, abandoned. This application Nov. 4, 1987, Ser. No. 119,260
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—200 **8 Claims**

7. A method for improving step coverage of electrical contact metallization in a semiconductor integrated circuit structure having a relatively wide and deep contact via, comprising the steps of:
forming a first, conformal silicon material layer on said structure;
forming a first, conformal, refractory metal layer on said first silicon material layer;
heating said structure such that said silicon material and said refractory metal form a first, conformal silicide layer;
removing said first silicide layer such that a silicon material lining remains in said contact via;
forming a second silicon material layer on said structure;
forming a second, refractory metal layer on said second silicon material layer;
heating said structure such that said second silicon material



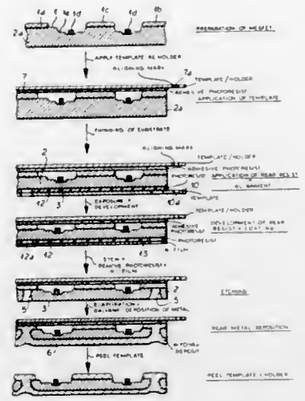


layer and said second, refractory metal layer form a second silicide layer except in said contact via;
removing said second silicide layer;
forming a third, refractory metal layer on said structure;
heating said structure such that said third metal layer and silicon material in said contact via form a silicide plug substantially filling said contact via.

4,818,724
PHOTOLITHOGRAPHIC METHOD OF ALIGNING A STRUCTURE ON THE BACK OF A SUBSTRATE
Antonio Cetronio; Sergio Moretti, both of Rome, and Maurizio Di Bona, Alvito, all of Italy, assignors to Selenia Industrie Elettroniche Associate S.P.A., Rome, Italy
Filed Jun. 30, 1987, Ser. No. 68,645
Claims priority, application Italy, Jun. 30, 1986, 48205 A/86
Int. Cl.[4] H01L *21/30*
U.S. Cl. 437—203 **8 Claims**

2. A method of making an electronic device which comprises the steps of:
(a) forming at least in part by photolithography on one face of an etchable electronic-device substrate electronic circuit elements adapted to be part of said electronic device;
(b) aligning with said one face a first template having indicia associated with said elements and at least one marking on a portion of said first template projecting laterally of said substrate;
(c) bonoing said first template to said one face upon alignment of said indicia with said elements;
(d) while supporting said substrate by said first template, effecting a photolithographic treatment of an opposite face of said substrate consisting essentially of:
(d_1) applying a photoresist to said opposite face,
(d_2) aligning a second template carrying a pattern of throughholes to be applied from said opposite face through said substrate with said substrate and the circuit elements on said one face by photoalignment of a marking on a portion of said second template projecting laterally of said substrate with said marking on said first template,
(d_3) photolithographically exposing said photoresist through said second template, removing said second

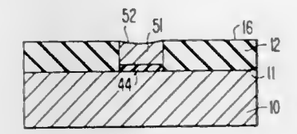
template, and developing said photoresist to form apertures in said photoresist in a pattern of said throughholes,
(d_4) etching said substrate through the thickness thereof in accordance with said pattern to form said throughholes,
(d_5) depositing metal on said opposite face and in said throughholes into conductive contact with said circuit elements on said one face of said substrate; and
(e) thereafter removing said first template from said one face following said photolithographic treatment. bonding of said first template in step (c) being effected by:
(c_1) spreading a high-viscosity resist on a chromium-plated surface of said first template;

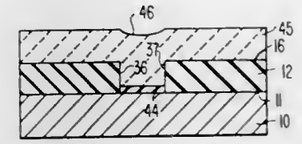


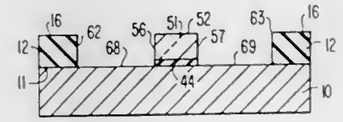
(c_2) spreading a further resist of lesser iscosity than the high-viscosity resist on said one face of said substrate bearing the circuit elements formed in step (a);
(c_3) pressing said first template against said substrate so that said high-viscosity resist and said further resist are in maintained in contact for a period of time enabling said substrate to bond to said first template by bonding characteristics of said of said high-viscosity and said further resist; and
(c_4) baking the bonded first template and substrate at about 90° C. for about 1 hour to stabilize the bond formed by the first template and said substrate.

4,818,725
TECHNIQUE FOR FORMING PLANARIZED GATE STRUCTURE
Richard L. Lichtel, Jr.; Lawrence G. Pearce, both of Palm Bay, and Dryer A. Matlock, Melbourne, all of Fla., assignors to Harris Corp., Melbourne, Fla.
Continuation of Ser. No. 907,007, Sep. 15, 1986, abandoned. This application Jul. 26, 1988, Ser. No. 224,320
Int. Cl.[4] H01L *21/22, 21/265*
U.S. Cl. 437—203 **17 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of:
(a) selectively forming an insulator layer on a surface of a semiconductor substrate so as to expose a first portion of said surface through a first aperture in said insulator layer, said first aperture having a sidewalls that are effectively perpendicular to the surface of said substrate;
(b) forming a layer of conductive material in said first aperture; and
(c) forming a second aperture in said insulator layer, said second aperture intersecting said layer of conductive material in said first aperture and exposing a surface portion of said substrate adjacent to said layer of conductive material.
9. For use in a direct moat process for manufacturing a semiconductor device having a gate electrode structure formed n an aperture of a field insulator layer through which respective regions of a field effect device are formed by the introduction of dopants into the planar surface of a substrate over which said field insulator layer is formed, a method of forming said gate electrode structure comprising the steps of:
(a) selectively forming a field insulator layer on the planar surface of a substrate so as to expose a first surface portion of said planar surface through a first aperture therethrough, said first aperture having sidewalls that are effectively perpendicular to the surface of said substrate;
(b) forming a thin dielectric layer on said exposed first surface portion of said substrate;





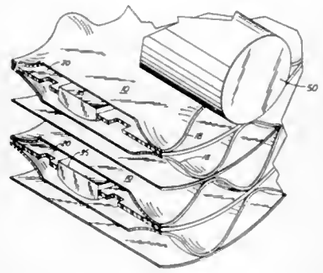


(c) non-selectively forming a conductive layer on the structure resulting from step (b);
(d) removing material of the conductive layer formed in step (c) such that said field insulator layer is exposed and the exposed surface thereof is effectively coplanar with the top surface of said conductive layer in said first aperture; and
(e) forming a second aperture in said field insulator layer, said second aperture intersecting said layer of conductive material in said first aperture and exposing a surface portion of said substrate adjacent to said layer of conductive material.

4,818,726
PROCESS FOR CURING EPOXY ENCAPSULANT ON INTEGRATED CIRCUIT DICE
Nordahl T. Flaten, Burnsville, Minn., assignor to VTC Incorporated, Bloomington, Minn.
Filed Mar. 30, 1988, Ser. No. 175,164
Int. Cl.[4] H01L *23/02*
U.S. Cl. 437—207 **6 Claims**

1. A method of protecting integrated circuit packages supported on a carrier tape of a type used in tape automated bonding processes, the method comprising the steps of:
providing a reel fabricated from a metal or metal alloy;
providing an interleaver tape fabricated from a metal or metal alloy;

corrugating longitudinal edge portions of the interleaver tape; and



winding the carrier tape and the corrugated interleaver tape on a reel in alternating layers, with the integrated circuit packages being suspended between adjacent layers of the carrier tape and the interleaver tape.

4,818,727

METHOD OF IMPROVING THE CORROSION RESISTANCE OF ALUMINUM CONTACTS ON SEMICONDUCTORS

Timothy E. Turner, Roanoke, Tex., assignor to SGS-Thomson Microelectronics Inc., Carrollton, Tex.

Filed Jun. 23, 1987, Ser. No. 65,344
Int. Cl.[4] H01L *29/44*
U.S. Cl. 437—209 13 Claims

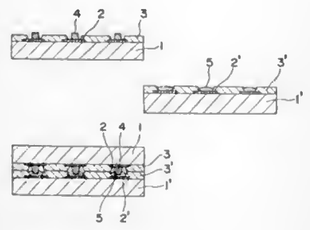
1. A method for producing a semiconductor article which comprises providing a semiconductor device having aluminum containing contact pads; electrically attaching a leadframe to said contact pads; and applying sufficient zinc chromate in solution to said contact pads for a sufficient time and at a sufficient temperature to render said aluminum substantially resistant to corrosion from an atmosphere containing moisture and an ionic species.

4,818,728

METHOD OF MAKING A HYBRID SEMICONDUCTOR DEVICE

Akiteru Rai, Osaka; Keiji Yamamura, and Takashi Nukii, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1987, Ser. No. 128,437
Claims priority, application Japan, Dec. 3, 1986, 61-288264
Int. Cl.[4] H01L *21/60, 21/58*
U.S. Cl. 437—209 5 Claims



1. A method for making a semiconductor device of a type comprising at least first and second semiconductor circuit units, which method comprises the step of;

forming a plurality of connecting electrodes on an upper surface of each of at least first and second semiconductor substrates;

forming an lectrically insulating layer entirely over the upper surface of each of the first and second substrates so as to cover the respective connecting electrodes;

partially removing the insulating layer on each of the first and second substrates to permit the respective electrodes to be exposed to the outside;

forming metal studs on the first substrate in contact with the electrodes so as to protrude outwardly of the respective insulating layer to complete the first semiconductor unit and forming solder deposits on the second substrate in contact with the respective electrodes on such second substrate to complete the second semiconductor unit;

juxtaposing the first and second semiconductor with the metal studs in the first semiconductor unit aligned respectively with the solder deposits in the second semiconductor unit; and

heating the resultant assembly to allow the solder deposits to be melted with the associated metal studs consequently immersed into the melted solder deposits thereby to accomplish a firm interlock between the electrodes on the first and second substrates.

4,818,729

PROCESS FOR PREPARING STABILIZED HIGH CRISTOBALITE

Anthony J. Perrotta, Monroeville; Donald K. Grubbs, Rector, and Edward S. Martin, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 13, 1987, Ser. No. 106,815
Int. Cl.[4] C03C *10/14*
U.S. Cl. 501—4 12 Claims

1. A process for preparing a stabilized high cristobalite comprising the steps of:

(a) forming a gel comprising ultramicroscopic particles of:

(1) SiO_2;

(2) Al_2O_3 wherein the molar ratio of SiO_2 to Al_2O_3 is about 10 to 40; and

(3) a group 1A metal oxide selected from the group consisting of Na_2O, K_2O, Rb_2O, and Cs_2O, or a group 2A metal oxide selected from the group consisting of CaO, SrO, and BaO, wherein the molar ratio of said group 1A or 2A metal oxide to Al_2O_3 is about 0.95 to 1.1; and

(b) heating the gel at 800°–1400° C. for a time sufficient to form stabilized cristobalite.

4,818,730

SEALING GLASS COMPOSITE

Edward F. Smith, III, Madison, Conn., and Lewis C. Hoffman, Singer Island, Fla., assignors to Olin Corporation, New Haven, Conn.

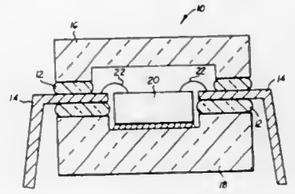
Continuation of Ser. No. 888,309, Jul. 22, 1986, abandoned, Continuation of Ser. No. 651,987, Sep. 19, 1984, abandoned. This application Mar. 17, 1987, Ser. No. 26,701
Int. Cl.[4] C03C *8/24, 8/14, 14/00*
U.S. Cl. 501—15 12 Claims

1. A glass composite, comprising:

a first component consisting essentially of a glass matrix selected from the group consisting of lead borate, lead-zinc borate, lead borosilicate and lead-zinc borosilicate glasses, said glass matrix having a coefficient of thermal expansion in excess of about 80×10^{-7} in./in./° C. (from ambient to glass transition temperature);

an effective amount of up to about 2 wt. % of copper oxide being dissolved into said glass matrix for forming a strong glass to metal bond having improved capability for withstanding thermal shock; and

a second component mixed into said first component to increase the effective coefficient of thermal expansion of the resulting glass composite, said second component consisting of an effective amount up to about 30 wt. % of



a particulate additive having limited solubility in said glass matrix, said particulate additive being selected from the group consisting of calcium fluoride and barium fluoride.

4,818,731

COLORED FRIT AND METHOD FOR MANUFACTURING OF ARTIFICIAL STONE

Toyonobu Mizutani, Seto; Masao Yoshizawa, Chigasaki, and Toichiro Izawa, Matsudo, all of Japan, assignors to Masao Yoshizawa, Kanagawa, Japan

Filed Dec. 29, 1986, Ser. No. 947,237
Claims priority, application Japan, Dec. 28, 1985, 60-299543
Int. Cl.[4] C03C *8/14*
U.S. Cl. 501—17 9 Claims

1. A colored frit prepared by the heat fusion of a material composition comprising a devitrifying substance which is fluoride, in an amount of 0.5 to 20% by weight, a coloring agent comprising a chemical compound containing coloring metallic ions, in an amount which is sufficient in order to produce a desired color, and borosilicate glass in an amount of 30 to 95% by weight wherein said heat fused composition is further supercooled so that the devitrifying substance does not attain a crystallized form.

4,818,732

HIGH SURFACE AREA CERAMICS PREPARED FROM ORGANOSILANE GELS

Joseph R. Fox, Solon, and Douglas A. White, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 19, 1987, Ser. No. 27,765
Int. Cl.[4] C04B *38/02*
U.S. Cl. 501—81 8 Claims

1. A method for forming a high surface area, open microporous partially crystalline, partially amorphous solid ceramic material consisting essentially of silicon carbide comprising:

(a) synthesis of a gel having the idealized formula $(RSiO_{1.5})_n$ wherein R equals vinyl, allyl, or phenyl, the gel being three dimensionally cross linked;

(b) heating the gel at a rate of less than 10° C. per minute to a temperature of between 1200° C. and 1500° C. in an inert atmosphere and maintaining the temperature in the prescribed range until carbothermic reduction reaction to produce SiC proceeds to result in a high surface area, open microporous partially crystalline, partially amorphous solid ceramic material and thereafter reducing the temperature to ambient while maintaining the material in an inert atmosphere.

4,818,733

SILICON NITRIDE SINTERED BODIES AND A METHOD OF PRODUCING THE SAME

Masahiro Shirai, Nagoya, and Tomonori Takahashi, Chita, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 23, 1987, Ser. No. 28,724
Claims priority, application Japan, Mar. 28, 1986, 61-68287; Mar. 28, 1986, 61-68288
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—97 12 Claims

1. A silicon nitride sintered body produced by using a sintering aid containing Y as an essential component, added to at least about 80 wt. % silicon nitride powder, said sintered body having a molar ratio of metal ions (M), other than Si ions, contained in the sintered body to oxygen ions (O) contained in the sintered body within a range of M:O=1:2~1:3, and containing substantially no crystalline phase of a $YSiO_2N$ form, said phase being identified by an X-ray diffraction pattern according to JCPDS Card 31-1462.

4,818,734

METHOD FOR IN SITU TAILORING THE METALLIC COMPONENT OF CERAMIC ARTICLES

Robert C. Kanter; Michael A. Rocazella; Jerry G. Weinstein, all of Newark, Del., and Danny R. White, Elkton, Md., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 908,454, Sep. 17, 1986. This application Feb. 5, 1988, Ser. No. 152,518
Int. Cl.[4] C04B *35/44*
U.S. Cl. 501—128 15 Claims

1. A method for producing a ceramic body comprising infiltrating a porous bed with an oxidation reaction product obtained by oxidation of a precursor metal to form a polycrystalline material comprising (i) the oxidation reaction product of said precursor metal with a vapor-phase oxidant, and (ii) a metallic constituent, said method comprising the steps of:

(a) forming a bed comprising at least one metal aluminate, each metal component of each of said at least one metal aluminate consisting of a metal different from said precursor metal;

(b) orienting said bed and a source of said precursor metal relative to each other so that formation of said oxidation reaction product of said precursor metal will occur into said bed and towards said vapor-phase oxidant;

(c) heating said source of precursor metal and said bed in the presence of said vapor-phase oxidant to a temperature above the melting point of said precursor metal but below the melting point of said oxidation reaction product to form a body of molten precursor metal;

(d) reacting said body of molten precursor metal with said vapor-phase oxidant at said temperature to permit said oxidation reaction product to form;

(e) maintaining at least a portion of said oxidation reaction product in contact with and between said molten precursor metal and said vapor-phase oxidant at said temperature to progressively draw molten precursor metal through said oxidation reaction product towards said vapor-phase oxidant to permit fresh oxidation reaction product to continue to form at an interface between said vapor-phase oxidant and previously formed oxidation reaction product that has infiltrated said bed, and reacting said molten precursor metal with said at least one metal aluminate in said bedding material, thereby liberating said each metal component of each of said at least one metal aluminate; and

(f) continuing step (e) at said temperature for a time sufficient to infiltrate at least a portion of said bedding material with said polycrystalline material, thereby forming said ceramic body comprising (a) said oxidation reaction product; and (b) a metallic constituent comprising at least one metallic phase, said at least one metallic phase comprising unreacted precursor metal and said each metal component from said at least one metal aluminate.

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4,818,735

TETRAGONAL SYSTEM TUNNEL-STRUCTURED COMPOUND AX(GA8MYGA(8+X)-YTI16-X0 56), AND CATION CONDUCTOR AND HEAT INSULATING MATERIAL COMPOSED THEREOF

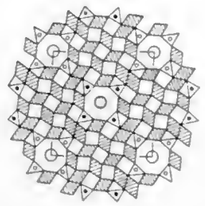
Yoshinori Fujiki; Mamoru Watanabe; Takayoshi Sasaki; Yoshito Onoda, all of Sakura; Tadashi Ohachi, Tsuzuki, and Takefumi Mitsuhashi, Sakura, all of Japan, assignors to National Institute for Research in Inorganic Materials, Ibaraki, Japan

Filed Feb. 11, 1987, Ser. No. 13,433

Claims priority, application Japan, Feb. 14, 1986, 61-030524; Apr. 9, 1986, 61-081622; May 28, 1986, 61-122877; May 29, 1986, 61-124095

Int. Cl.[4] C04B *35/46*

U.S. Cl. 501—134 14 Claims



1. A tetragonal system tunnel-structured compound having the formula:

$$A_x[Ga_8M_yGa_{(8+x)-y}Ti_{16-x}O_{56}] \quad (I)$$

wherein A is at least one alkali metal selected from the group consisting of K, Rb and Cs, or a solid solution of such alkali metal with lithium, sodium or barium, M is at least one trivalent metal selected from the group consisting of Al, Fe and Cr, x is a number of from 0.1 to 2.0, and y is a number of from 0 to 10.

4,818,736

HIGH DIELECTRIC CONSTANT TYPE CERAMIC COMPOSITION

Yohachi Yamashita, Yokohama; Osamu Furukawa, Sagamihara; Mitsuo Harata, Kawasaki, and Takashi Takahashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 791,060, Oct. 24, 1985, abandoned. This application Feb. 11, 1988, Ser. No. 157,149

Claims priority, application Japan, Oct. 25, 1984, 59-222924; Dec. 28, 1984, 59-274754

Int. Cl.[4] C04B *35/46*

U.S. Cl. 501—136 17 Claims

1. A high dielectric constant ceramic composition for a ceramic capacitor, represented by the general formula:

$$xPb(Zn_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3—yPb(Mg_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3—zPbTiO_3,$$

wherein x, y and z have the values defined within lines connecting the following points a, b, c, and d of a ternary composition diagram of said compound having apexes of respective components, and wherein from 1 to 35 mole % of said Pb is substituted by an alkali earth element selected from the group consisting of barium, strontium and combinations thereof:

a: (x=0.50, y=0.00, z=0.50)

b: (x=1.00, y=0.00, z=0.00)

c: (x=0.45, y=0.55, z=0.00)

d: (x=0.15, y=0.70, z=0.15)

and

z is about 0.05 or more, and

y is about 0.01 or more.

4,818,737

STABLE INTERCALATED CLAYS AND PREPARATION METHOD

John R. McCauley, Louisville, Md., assignor to UOP, Des Plains, Ill.

Filed Mar. 5, 1987, Ser. No. 21,972

Int. Cl.[4] B01J *21/16, 29/04*

U.S. Cl. 502—68 56 Claims

1. Hydrothermally-stable clay composition comprising pillars composed of an oligomer or polymer of (a) at least one pillaring metal, (b) at least one rare earth element and (c) oxygen, intercalated between the layers of at least one colloidal expandable, swelling layered, lattice clay mineral or synthetic analogue thereof.

15. Combination of a zeolite and the clay composition of claim 1.

26. Hydrothermally-stable clay composition comprising aluminum-rare earth elements-oxygen oligomers intercalated between the interlayers of a colloidal, expandable clay.

4,818,738

HIGH EQUILIBRIUM ACTIVITY ADDITIVE CATALYST FOR CATALYTIC CRACKING

Pochen Chu, West Deptford, and Sadi Mizrahi, Cherry Hill, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Dec. 9, 1987, Ser. No. 130,491

Int. Cl.[4] B01J *29/04, 29/06*

U.S. Cl. 502—67 18 Claims

9. A catalyst composition for the catalytic cracking of a hydrocarbon feedstock comprising:

(i) a cracking catalyst;

(ii) an additive catalyst comprising a crystalline zeolite having a Constraint Index of from about 1 to about 12 and having at least 10% of the exchangeable cation sites occupied by cations, said cations comprising one or more selected from the group consisting of alkali metal cations, alkali earth cations and transition metal cations, said zeolite bound in a matrix comprising one or more selected from the group consisting of silica gels, cogels of silica and metal oxides, natural clays and synthetic clays.

14. The catalyst composition of claim 9 wherein said cracking catalyst comprises a zeolite catalyst having the structure of one or more selected from the group consisting of zeolite X, zeolite Y, mordenite and faujasite.

4,818,739

HYDROCRACKING CATALYSTS AND PROCESSES EMPLOYING NON-ZEOLITIC MOLECULAR SIEVES

Frank P. Gortsema, Pleasantville; Regis J. Pellet, Croton-on-Hudson; Albert R. Springer, Yonkers; Jule A. Rabo, Armonk, and Gary N. Long, Putnam Valley, all of N.Y., assignors to UOP, DesPlains, Ill.

Filed Dec. 18, 1984, Ser. No. 683,241

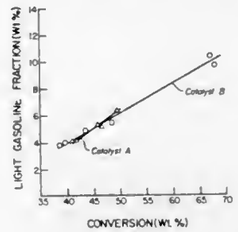
Int. Cl.[4] B01J *29/16, 29/02, 29/08, 29/14*

U.S. Cl. 502—67 24 Claims

1. The process for the preparation of a hydrocracking catalyst comprising:

(a) forming a mixture of at least one zeolitic aluminosilicate and at least one NZ-MS selected from the group consisting of SAPO, ELAPSO, MeAPO, FeAPO, TiAPO and ELAPO and characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a pressure of 500 torr and a temperature of 20° C. at a weight ratio of zeolitic aluminosilicate to NZ-MS between about 1:10 and about 500:1, respectively;

(b) forming a mixture of the product of step (a) and at least one inorganic oxide matrix component and an amount of



at least one hydrogenation catalyst effective to provide a hydrogenation function, to form a hydrocracking catalyst.

4,818,740

CATALYST FOR THE SELECTIVE OXIDATION OF SULFUR CONTAINING COMPOUNDS TO ELEMENTAL SULFUR

Pieter H. Berben, Zeist, and John W. Geus, Bilthoven, both of Netherlands, assignors to VEG-Gasinstituut N.V., Apeldorn and Comprimo B.V., Amsterdam, both of, Netherlands

Filed Apr. 13, 1987, Ser. No. 37,590

Claims priority, application Netherlands, Apr. 16, 1986, 8600959

Int. Cl.[4] B01J *21/04, 21/08, 23/74, 23/86*

U.S. Cl. 502—313 9 Claims



1. A catalyst for the selective oxidation of sulfur-containing compounds, comprising a carrier of which the surface exposed to the gaseous phase does not exhibit alkaline properties under the reaction conditions, and a catalytically active material applied thereto or formed thereon, the specific surface area of the catalyst being less than 20 m^2/g catalyst, with less than 10% of the total pore volume being constituted by pores having a pore radius between 5 and 500 Å.

4,818,741

POROUS AND POROUS-NONPOROUS COMPOSITES FOR BATTERY ELECTRODES

Calman Herscovici, Chappaqua, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 20, 1986, Ser. No. 934,168

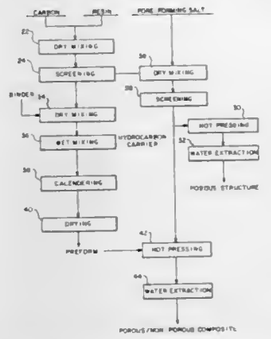
Int. Cl.[4] H01M *4/88, 4/86;* B01J *21/18*

U.S. Cl. 502—101 15 Claims

1. A method of making a porous cathode element for a zinc bromide electrochemical cell comprising the steps of:

(a) dry mixing electrically conductive carbon particles with thermoplastic resin particles, said carbon particles and resin particles having an average particle size distribution of 0 to 45 μm, with a dry water-soluble salt, said salt having a particle size distribution of 0 to 45 μm;

(b) pressure molding a mixture from step (a), said mixture comprising a carbon to resin weight ratio in the range of about 1:5 to 1:1, and a carbon plus resin weight to salt weight ratio of about 1:7 to 1:8, at a pressure of at least 400 kg/cm^2 at 190° C., to form a molded composite;



(c) extracting said molded composite from step (b) with water to form pores by dissolution of said salt, thereby forming a porous cathode element, characterized by 80–95% porosity by volume and a pore size diameter distribution from about 5 microns to about 200 microns.

4,818,742

HEAT SENSITIVE RECORDING ELEMENT

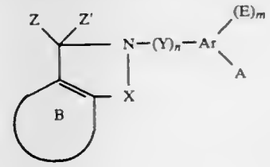
Ernest W. Ellis, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 28, 1987, Ser. No. 192,125

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—201 4 Claims

1. A heat sensitive recording medium comprising a support carrying a recording layer, said recording layer containing a compound which when heat activated undergoes irreversible intramolecular arylation of the nitrogen atom and visible color change, said compound having the formula:



wherein:

n is 0 or 1;

m is 1, 2, 3, 4 or 5;

Ar is an aromatic carbocyclic or heterocyclic ring(s) or fused ring system;

A is a displaceable group;

E is an electron withdrawing group or groups activating A;

Y is carbonyl, sulfonyl, sulfinyl, substituted or unsubstituted methylene or ethylene, and —CH_2CO—, —CH_2SO_2— and —CH_2SO—, the methylene group of which can be attached to N or Ar;

X is carbonyl, sulfonyl, methylene or a substituted or unsubstituted ethylene radical, provided that when X is methylene, Y, is present, is not an alkylene group;

Z and Z' taken individually are moieties completing the auxochromophoric system of a di- or triarylmethane dye when the nitrogen is not attached to the meso carbon and when taken together represent bridged moieties to com-

plete the auxochromophoric system of a bridge triarylmethane dye when the nitrogen is not attached to the meso carbon, provided that if Z or Z' have a nitrogen atom in the auxochromic portion, then Y must be methylene —CH_2CO—, —CH_2SO_2— or —CH_2SO— with said methylene attached to N or be absent with N and Ar being directly bonded; and

B is substituted or unsubstituted carbocyclic ring or rings, a heterocyclic ring, or a fused ring system.

4,818,743

DESULFURIZATION CATALYST AND THE CATALYST PREPARED BY A METHOD

Howard D. Simpson, Irvine; Ryden L. Richardson, Whittier, and Kenneth Baron, Diamond Bar, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 688,726, Jan. 4, 1985, abandoned, which is a division of Ser. No. 482,920, Apr. 7, 1983, Pat. No. 4,500,424. This application Dec. 1, 1987, Ser. No. 127,628

Int. Cl.[4] B01J *27/185, 27/188, 27/19*

U.S. Cl. 502—211 **47 Claims**

1. A catalyst prepared by the method comprising the steps of (1) impregnating support particles with an aqueous impregnant solution comprising a dissolved Group VIB metal component, a dissolved Group VIII metal component and a dissolved phosphorus component, said aqueous impregnant solution containing about 1 to about 6 weight percent of said phosphurs component, calculated as P, said supported comprising a narrow pore size distribution including at least about 60 percent of the total pore volume in pores of diameter from about 60 to about 100 angstroms, having a mode pore diameter in the range from about 60 to about 90 angstroms and at least about 40 percent of the total pore volume in pores of diameter between the mode pore diameter and less than about 40 angstroms above the mode pore diameter and (2) calcining the impregnated support particles to produce a catalyst having a narrow pore size distribution including at least about 75 percent of the total pore volume in pores of diameter from about 70 to about 130 angstoms and less than 10 percent of the total pore volume in pores of diameter greater than 130 diameter angstroms, having a mode pore diameter in the range from about 75 to about 110 angstroms and at least about 40 percent of the total pore volume in pores of diameter between the mode pore diameter and less than about 90 angstroms above the mode pore diameter.

4,818,744

PROCESS FOR THE PRODUCTION OF CATALYZERS AND CATALYZERS FOR THE REMOVAL OF POLLUTING COMPONENTS FROM THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Ulf-Michael Berger, Drenker Strasse 29a, and Volker Berger, Abgunstweg 14, both of 3472 Beverungen, Fed. Rep. of Germany

PCT No. PCT/EP87/00115, § 371 Date Oct. 15, 1987, § 102(e) Date Oct. 15, 1987, PCT Pub. No. WO87/05231, PCT Pub. Date Sep. 11, 1987

PCT Filed Feb. 26, 1987, Ser. No. 126,970

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606335

Int. Cl.[4] B01J *21/08, 23/64, 23/72, 23/84*

U.S. Cl. 502—244 **42 Claims**

1. A process for production of a catalyzer for removal of polluting components from exhaust gases of an internal combustion engine by using carrier materials provided with catalytically effective metallic compounds, said carrier materials comprising the components of:

approx. 22–26% by weight cobalt oxide,

approx. 8–15% by weight manganous oxide,

approx. 4–6% by weight copper oxide,

approx. 25–35% by weight clay,

approx. 27–35% by weight talc, and wherein said catalyzer is prepared by the steps comprising:

(a) drily premixing together all of said components in powder form;

(b) homogenizing said powder mixture to achieve a desired final size;

(c) agitating said homogenized powder in a mixer to achieve plastification and thereafter passing the resultant particles through a sieve for granulation into granules;

(d) pressing said granules into molds to achieve a desired shape;

(e) drying said molds of pressed granules at a temperature of approximately 50° to 150° C.; and

(f) burning said dried molded pressed granules at a temperature ranging from approximately 850° to 900° C.

4,818,745

CATALYST FOR OXIDATION OF CARBON MONOXIDE AND PROCESS FOR PREPARING THE CATALYST

John H. Koits, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 8, 1987, Ser. No. 94,468

Int. Cl.[4] B01J *21/04, 21/10, 23/89*

U.S. Cl. 502—327 **43 Claims**

1. A process for preparing a composition of matter, which is useful and effective as catalyst composition for CO oxidation and consists essentially of (i) at least one metal oxide selected from the group consisting of alumina and magnesia, (ii) at least one noble metal selected from the group consisting of platinum and palladium and (iii) iron oxide, said process comprising the steps of

(a) contacting a support material consisting essentially of at least one metal oxide selected from the group consisting of alumina and magnesia with a solution comprising at least one dissolved compound of at least one noble metal selected from the group consisting of platinum and palladium and at least one dissolved iron compound,

(b) heating the material obtained in step (a) under such conditions as to substantially dry said material obtained in step (a), to substantially convert said at least one compound of at least one noble metal to at least one of oxides of Pt, oxides of Pd, Pt metal and Pd metal and to substantially convert said at least one iron compound to iron oxide; and

(c) heating the material obtained in step (b) in a reducing gas atmosphere at a temperature in the range of from about 550° to about 700° C., under such conditions as to activate said material obtained in step (b) and to form said composition of matter.

4,818,746

METAL CATALYST CARRIER OR SUPPORT BODY ROLLED OR LAMINATED FROM METAL SHEETS AND HAVING A DOUBLE OR MULTIPLE CORRUGATED OR WAVE STRUCTURE

Theodor Cyron, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 913,503

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534904

Int. Cl.[4] B01J *21/04*

U.S. Cl. 502—527 **16 Claims**

1. Metal catalyst carrier body, comprising two alternating layers of sheet metal having different structures at least partially formed of multiple corrugations, said layers having a wave structure with two waves of different wavelength and amplitude including a wave of greatest amplitude, one of said layers having wave crests some of which contact the other of said layers of defining contact points therebetween and some of which are spaced from the other of said layers providing a desired elasticity of the resultant structure, said wavelengths

all being at least substantially as large as said wavelength of said wave of greatest amplitude, the wave structure of one of said layers having an amplitude being smaller than the amplitude of the wave structure of the other of said layers, and the wave structure of said layer having the smaller amplitude having a wavelength being greater than the wavelength of the wave structure of said layer having the greater amplitude.

4,818,747

BICYCLIC ALIPHATIC ALCOHOLS AND THEIR UTILIZATION AS PERFUMING INGREDIENTS

Wolfgang K. Giersch, and Günther Ohloff, both of Bernex, Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Mar. 17, 1988, Ser. No. 169,536

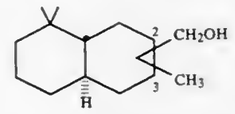
Claims priority, application Switzerland, Mar. 17, 1987, 1006/87-5

Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—14 **12 Claims**

1. Bicyclic aliphatic alcohols or formula

(I)



wherein substituents CH_2OH and CH_3 are geminally bound to the carbon atom in position 2 or 3 of the hexanic ring and wherein the wavy line stands for a C-H bond of cis or trans configuration.

4,818,748

RENIN INHIBITORS AND AMINOACID AND AMINOALDEHYDE DERIVATIVES

Wolfgang Bender; Rolf Henning, both of Wuppertal; Andreas Knorr, Erkrath, and Johannes-Peter Stasch, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

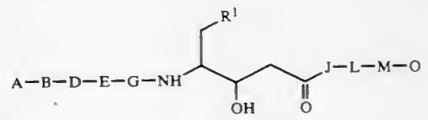
Filed Mar. 6, 1987, Ser. No. 22,710

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608209; Aug. 23, 1986, 3628650

Int. Cl.[4] A61K *37/02;* **C07K** *7/06, 5/08, 5/10*

U.S. Cl. 514—16 **14 Claims**

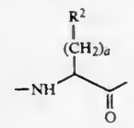
1. A peptide containing up to either amino acid groupings of the formula



in which

A is hydrogen, C_1–C_8-alkyl, C_7–C_{14}-aralkyl, phenylsulphonyl, tolylsulphonyl or C_1–C_8-alkylsulphonyl, or is an amino-protective group,

B, E, G, J, L and M each independently is a direct bond, sarcosyl, or a group of the formula



wherein

a is the number 0, 1, 2, 3 or 4 and

R^2 is hydrogen, C_1–C_6-alkyl, hydroxy-C_1–C_2-alkyl, a group of the formula —CH_2—CO—NHR^3 or —CH_2—NH—R^3,

wherein

R^3 is hydrogen, C_1–C_6-alkyl, C_7–C_{14}-aralkyl, tolylsulphonyl, phenylsulphonyl, C_1–C_6-alkylsulphonyl, or an amino-protective group, or

R^2 is guanidinomethyl, mercaptomethyl, methylthiomethyl, carboxymethyl, C_1–C_6-alkoxycarbonylmethyl, C_7–C_{14}-aralkoxycarbonylmethyl, halogen, indolylmethyl, 4-imidazolylmethyl, pyridyl, triazolylmethyl, pyrazolylmethyl, aryl, or aryl

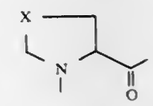
which is substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, halogen, hydroxyl, nitro or a group of the formula



wherein

R^4 and R^5 each independently is hydrogen, C_1–C_6-alkyl, aryl, aralkyl, phenylsulphonyl, tolylsulphonyl, C_1–C_6-alkylsulphonyl, acetyl, benzoyl or an amino-protective group,

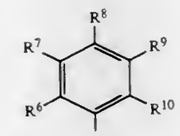
D is a direct bond or a group of the formula



wherein

X is methylene, ethylene or sulphur,

R^1 is a group of the formula



wherein

R^6, R^7, R^8, R^9 and R^{10} each independently is hydrogen, C_1–C_6-alkyl, C_1–C_6-alkoxy, aryl, halogen, hydroxyl, cyano, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, nitro, or a group of the formula



wherein

R^{11} and R^{12} each independently has the same meaning as R^4 and R^5, with the proviso that at least one of the substituents R^6, R^7, R^8, R^9 or R^{10} is nitro or the group —$NR^{11}R^{12}$, and

Q is a radical of the formula —OR^{13}, —NHR^{14}, —$NR^{14}R^{15}$ or —NH—NHR^3,

wherein

R^{13} is hydrogen, C_1–C_{20}-alkyl or C_1–C_{20}-alkyl which is interrupted in the chain by an oxygen atom C_1–C_{20}-alkyl which is substituted by halogen, hydroxyl, phenyl or pyridyl, R^{14} represents hydrogen, C_1–C_{10}-alkyl, C_1–C_{10}-alkyl is substituted by aryl, aryl which which is substituted by nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen or cyano, or C_1–C_{10}-alkyl which is substituted by halogen, adamantyl, quinuclidine, piperidine, N-methyl-piperazine,

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N-phenylpiperazine, N-benzylpiperazine, pyridyl or morphonline, or is aryl or aryl which is substituted by nitro, halogen, C_1–C_4-alkoxy, C_1–C_4-alkyl, or C_1–C_4-alkyl which is substituted by hydroxyl, amino, carboxyl or C_1–C_4-alkoxycarbonyl, or is adamantyl or quinuclidine, and

R^{15} is C_1–C_6-alkyl, or

R^{14} and R^{15} together form a 5- to 7-membered ring which can contain, as a further hetero atom, an oxygen atom, a sulphur atom or the group —NH, —N—C_1–C_6-alkyl, —N-dimethylamino-C_1–C_4-alkyl, —N-aryl or —N-aralkyl, and wherein said ring is unsubstituted or substituted by C_1–C_4-alkyl or aralkyl,

or a physiologically acceptable salt thereof.

4,818,749

CARBOXYALKYL DIPEPTIDES AND MEDICAL USE THEREOF IN TREATING HYPERTENSION AND CONGESTIVE HEART FAILURE

Elijah H. Gold; Bernard R. Neustadt, both of West Orange, and Elizabeth M. Smith, Verona, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

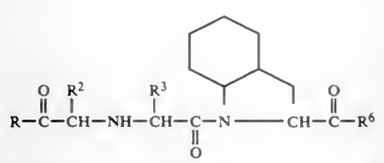
Continuation-in-part of Ser. No. 029,293, Mar. 23, 1987, and a continuation-in-part of Ser. No. 334,053, Dec. 23, 1981, abandoned, Ser. No. 029,293, and Ser. No. 334,053, each is a continuation-in-part of Ser. No. 258,484, Apr. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 201,649, Oct. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 199,886, Oct. 23, 1980, abandoned. This application Nov. 4, 1987, Ser. No. 117,008

Claims priority, application European Pat. Off., Oct. 15, 1981, 81108348.4

Int. Cl.[4] A61K *31/40;* **C07D** *209/26*

U.S. Cl. 514—19 **21 Claims**

1. A compound represented by the formula



and the pharmaceutically acceptable salts thereof, wherein

R and R^6 are the same or different and are hydroxy or lower alkoxy;

R^2 is benzylthiomethyl, 2-phenylethylthiomethyl, naphthylmethylthiomethyl, methylbenzylthiomethyl, carboxyphenylethyl or alkoxycarbonylphenylethyl; and

R^3 is hydrogen, lower alkyl or aminolower alkyl.

21. A method of treating congestive heart failure in a mammal in need of such treatment comprising administering to such a mammal an amount of a compound of claim 1 effective in treating congestive heart failure.

4,818,750

TREATMENT OF HUMAN VIRAL INFECTIONS

Janet L. Rideout, Raleigh; David W. Barry, Chapel Hill; Sandra N. Lehrman, Durham; Martha H. St. Clair, Durham, and Phillip A. Furman, Durham, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 776,899, Sep. 17, 1985, Pat. No. 4,724,232. This application Oct. 20, 1987, Ser. No. 110,968 The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—50 **4 Claims**

1. A method of increasing the number of T-lymphocytes in a human infected with the HTLV III virus comprising administering to said human an effective amount of 3'-azido-3'-deoxythymidine or a pharmaceutically acceptable alkali metal, alkaline earth or ammonium salt thereof.

4,818,751

COSMETICS

Sachiaki Ibe, Tokyo, Japan, assignor to ZEria Shinyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 751,148, Jul. 2, 1985, abandoned. This application Dec. 11, 1986, Ser. No. 941,555

Int. Cl.[4] A61K *31/715*

U.S. Cl. 514—54 **2 Claims**

1. A cosmetic preparation for topical skin application comprising:

(1) 55.3–82.75 (W/W)% of water as a primary vehicle;

(2) at least one skin treating component selected from the group consisting of:

(a). 4–8 (W/W)% of polyhydric alcohol moisture-retaining agents, and

(b). 0.1–35 (W/W)% of oily component;

(3) and about 0.01–about 0.2 (W/W)% of at least one of a neutral polysaccharide selected from the group consisting of arabinogalactan having an average molecular weight of about 30,000, arabinomannan having an average molecular weight of about 12,000, and mannan having an average molecular weight of about 5,000 wherein said polysaccharide is obtained from cells of a bacterium from the genus Mycobacterium, and causes no change in viscosity of the cosmetic preparation.

4,818,752

SOLUBLE PHOSPHORYLATED GLUCAN: METHODS AND COMPOSITIONS FOR TREATMENT OF NEOPLASTIC DISEASES

David L. Williams, River Ridge; I. William Browder, New Orleans, both of La., and Nicholas R. DiLuzio, deceased, late of New Orleans, La. (by Nicholas M. DiLuzio, legal representative), assignors to Bioglucans, L.P., New Orleans, La.

Continuation-in-part of Ser. No. 767,388, Aug. 19, 1985, Pat. No. 4,739,046. This application Feb. 10, 1987, Ser. No. 13,298 The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.[4] A61K *31/66;* **C08B** *37/00*

U.S. Cl. 514—54 **18 Claims**



1. A pharmaceutical composition for the treatment of a malignant neoplastic disease in animals or humans, comprising a therapeutically effective amount of a soluble glucan which comprises a phosphorylated poly-[beta-(1-3)glucopyranose] chain which is characterized by:

(a) the capability of dissolving in water or an aqueous solution;

(b) being non-toxic, non-immunogenic and substantially non-pyrogenic; and

(c) the capability of exerting a profound immunobiological response when administered in vivo to an animal or to a human,

and a physiologically acceptable carrier.

4,818,753

SYNTHESIS AND METHOD OF USE FOR 2, 4 DIAMINOQUINAZOLINE

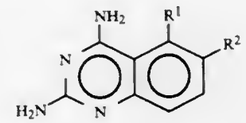
William T. Colwell, Menlo Park, and Joseph I. DeGraw, Sunnyvale, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 18, 1987, Ser. No. 98,499

Int. Cl.[4] A61K *31/505;* **C07D** *239/95*

U.S. Cl. 514—155 **14 Claims**

1. A method to treat fungal infections in animal subjects which comprises administering to a subject in need of such treatment a compound of the formula:



wherein R^1 is H, methyl, ethyl, or chloro, and R^2 is H or hydrocarbyl (1–12C), or the pharmaceutically acceptable acid-addition salts thereof, in an amount effective as an antifungal agent.

11. A method of claim 1 wherein the compound of formula (1) is administered in an effective amount in combination with or in addition to an effective amount of a sulfa drug.

4,818,754

CERTAIN ANTI-INFLAMMATORY PYRAZOLO [4,3-B] PYRIDINE 7-AMINES

Robert W. Ward; Roger E. Markwell, and Ian Hughes, all of Harlow, England, assignors to Beecham Group p.l.c. of Beecham House, Brentford, England

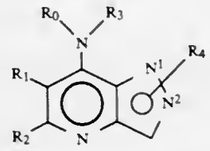
Filed Apr. 16, 1987, Ser. No. 39,540

Claims priority, application United Kingdom, Apr. 17, 1986, 8609421

Int. Cl.[4] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—210 **9 Claims**

1. A compound of the formula (1) or a pharmaceutically acceptable salt or solvate thereof:



(I)

in which:

R_0 is hydrogen or C_{1-6} alkyl;

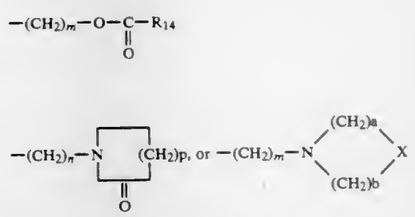
R_1 and R_2 are both hydrogen; or

R_1 is hydrogen, C_{1-6} alkyl; and R_2 is CN; CR_5R_6Y where R_5 and R_6 are independently selected from hydrogen and C_{1-4} alkyl and Y is selected from hydrogen, OR_7 or SR_7 where R_7 is hydrogen, C_{1-6} alkyl or C_{2-4} alkanoyl, and NR_8R_9 and R_9 are independently hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl or C_{2-4} alkanoyl or together are C_{4-6} polymethylene; or COR_{10} where R_{10} is OH or C_{1-4} alkyl, C_{1-6} alkoxy, C_{2-6} alkenyloxy, phenoxy or benzyloxy where the phenyl/benzyl ring is optionally substituted by one or two of halogen, CF_3, C_{1-4} alkoxy and C_{1-4} alkyl; or R_{10} is $NR_{20}R_{21}$ where R_{20} and R_{21} are independently hydrogen, C_{1-6} alkyl, C_{2-6} alkenyl, benzyl or phenyl optionally substituted as described above; or

R_2 is hydrogen, C_{1-6} alkyl, or phenyl optionally substituted by halogen, CF_3, C_{1-4} alkoxy or C_{1-4} alkyl; and R_1 is CN, CR_5R_6Y or COR_{10} as defined for R_2 above; or

R_1 and R_2 together form C_3–C_6 polymethylene optionally substituted by C_1–C_4 alkyl;

R_3 is $—(CH_2)_nCO_2R_{11}$, $—(CH_2)_nCONR_{12}R_{13}$, $—(CH_2)_nCN$,



where a, b, n, m and p are integers and n is 1 to 10, m is 2 to 10, p is 3 to 5, a is 1 to 3, and b is 1 to 3,

and R_{11} is hydrogen, C_{1-8} alkyl, benzyl or phenyl, R_{12} and R_{13} are independently hydrogen, C_{1-6} alkyl, benzyl or phenyl, or together form C_{3-8} alkylene, R_{14} is C_{1-4} alkyl, benzyl or phenyl and X is oxygen, sulphur, NH or N—C_{1-4} alkyl, and

R_4 is hydrogen; or C_{1-4} alkyl or benzyl optionally substituted in the phenyl ring by one or two of halogen, CF_3, C_{1-4} alkoxy or C_{1-4} alkyl, and is attached at nitrogen atom 1 or 2.

4,818,755

BICYCLIC HETEROARYL THIAZOLE COMPOUNDS, CARDIOTONIC COMPOSITIONS INCLUDING THE SAME, AND THEIR USES

Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale; William L. Studt, Harleysville, and Bruce F. Molino, Lansdale, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

PCT No. PCT/US85/02522, § 371 Date Jul. 28, 1986, § 102(e) Date Jul. 28, 1986, PCT Pub. No. WO86/03749, PCT Pub. Date Jul. 3, 1986

Continuation-in-part of Ser. No. 683,204, Dec. 18, 1984, Pat. No. 4,721,721. This PCT application Dec. 18, 1985, Ser. No. 897,064

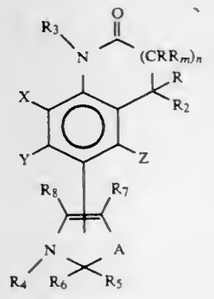
Claims priority, application Canada, Dec. 17, 1985, 497858

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.[4] C07D *215/22*

U.S. Cl. 514—228.2 **9 Claims**

1. A compound according to the formula



wherein:

m is 1;

n is 1;

R_m is R_1;

A is N or S, provided that A is N only when A and R_6 together form a double bond in an imidazo[2.1-b]thiazole ring system;

X, Y and Z are each independently hydrogen, alkyl, alkoxy, hydroxy, alkylmercapto, alkylsulfinyl or alkylsulfonyl;

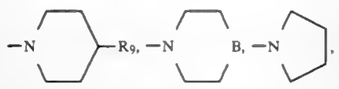
R and R_3 are each independently hydrogen or lower alkyl;

R_1 is hydrogen, lower alkyl, hydroxy, amino, alkylamino, dialkylamino or acetamido;

R_2 is hydrogen, lower alkyl, or R_1 and R_2 together form a carbon-carbon double bond;

R_4 and R_5 together form a carbon-nitrogen double bond or together with the atoms to which they are attached form an imidazo[2.1-b]thiazole ring system including two additional carbon atoms and either one sulfur atom or one additional nitrogen atom;

R_6 is hydrogen, alkyl, aryl, amino, arylamino, mono- or dialkylamino, aralkylamino, guanidino, amidino, hydroxyl, hydroxyalkyl, hydroxyalkylamino, aminoalkylamino, di-alkylaminoalkylamino, aminoalkyl, mono- or di-alkylaminoalkyl,



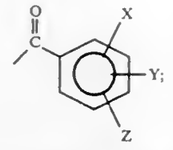
or together with either R_5 or A form a carbon-heteroatom double bond in said imidazo[2.1-b]thiazole ring system;

one of R_7 or R_8 is hydrogen or lower alkyl, and one of R_7 or R_8 represents the carbon-carbon single bond to the position on the fused bicyclic ring ortho to the Y and Z groups;

R_9 is H, alkyl or aryl;

B is NR_{10}, oxygen or sulfur; and

R_{10} is H, alkyl, aryl or



or a pharmaceutically acceptable salt thereof.

4,818,756

2-PYRIMIDINYL-1-PIPERAZINE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND MEDICAMENTS CONTAINING THEM

Peter-Rudolf Seidel, Cologne; Harald Horstmann, Wuppertal; Jorg Traber, Lohmar; Wolfgang Dompert, Roesrath-Forsbach; Thomas Glaser, Cologne, and Teunis Schuurman, Overath, all of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., KG, Cologne, Fed. Rep. of Germany

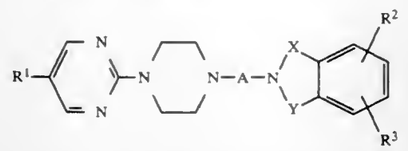
Division of Ser. No. 617,858, Jun. 6, 1984, abandoned. This application Mar. 10, 1986, Ser. No. 838,238

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1983, 3321969

Int. Cl.[4] A61K *31/54;* C07D *417/14*

U.S. Cl. 514—224.2 **17 Claims**

1. A 2-pyrimidinyl-1-piperazine derivative of the formula



A denotes an unsubstituted alkylene group which has 1 to 6 carbon atoms in the chain or an alkylene group which has 1 to 6 carbon atoms in the chain and is substituted by an alkyl group having 1 to 3 carbon atoms or by a hydroxyl group;

R^1 represents hydrogen; unsubstituted straight-chain, branched or cyclic alkyl having 1 to 8 carbon atoms or straight-chain, branched or cyclic alkyl having 1 to 8 carbon atoms which is substituted by alkoxy or halogen alkoxy having 1 to 4 carbon atoms; phenoxy; hydroxyl; halogen; cyano; trifluoromethyl; nitro; unsubstituted amino or amino which is substituted by 1 to 2 alkyl groups having 1 to 8 carbon atoms; alkylmercapto having 1 to 4 carbon atoms; phenylmercapto; acylamino having up to 8 carbon atoms; unsubstituted phenyl or phenyl which is substituted by halogen, nitro, amino, hydroxyl, cyano, trifluoromethyl, alkyl having 1 to 4 carbon atoms, alkoxy having up to 4 carbon atoms or acylamino having up to 8 carbon atoms; or 8-indolyl;

R^2 and R^3,l which can be identical or different, represent hydrogen; unsubstituted straight-chain, branched or cyclic alkyl having 1 to 8 carbon atoms or straight-chain, branched or cycloalkyl having 1 to 8 carbon atoms which is substituted by halogen; unsubstituted alkoxy having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms which is substituted by halogen; unsubstituted aryl or aryl which is monosubstituted or polysubstituted by straight-chain or branched alkyl having 1 to 4 carbon atoms, alkoxy or nitro; unsubstituted carbamoyl or carbamoyl the amide group being substituted by alkyl having 1 to 10 carbon atoms or aryl; unsubstituted sulphamoyl or sulphamoyl the amide gorup being substituted optionally by alkyl having 1 to 10 carbon atoms or aryl; halogen; hydroxyl; nitro; cyano; alkylmercapto having 1 to 4 carbon atoms; unsubstituted amino or amino which is substituted by alkyl having 1 to 8 carbon atoms; morpholino; piperidino; piperazino; alkylsulphonamido, the alkyl radical containing 1 to 8 carbon atoms; unsubstituted arylsulphonamido or arylsulphonamido in which the phenyl radical is substituted by alkyl having 1 to 4 carbon atoms, halogen, alkoxy, alkylmercapto, hydroxyl, amino, nitro or trifluoromethyl; carboxyl; alkoxycarbonyl in which the alkoxy group contains a straight-chain, branched or cyclic alkyl having 1 to 10 carbon atoms; alkoxycarbonylamino in which the alkoxy group contains a straight-chain, branched or cyclic alkyl having 1 to 10 carbon atoms; aryloxycarbonylamino;or acylamino having 1 to 10 carbon atoms,

X denotes carbonyl or sulphonyl, and

Y represents carbonyl, sulphonyl, —CO—CH_2— or —CO—$N(R^4)$—,

R^4 representing hydrogen; unsubstituted lower alkyl having up to 4 carbon atoms or phenyl or alkyl having up to 4 carbon atoms and phenyl which are substituted by halogen, trifluoromethyl, nitro, alkyl or alkoxy, each having 1 to 4 carbon atoms; with the proviso that X and Y cannot both be carbonyl and their salts.

14. A method of treating CNS disorders in warm-blooded animals which comprises administering to said animals an effective amount of an active compound of claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,818,757

UREIDOALKANOYLAMINOCARBONYL AMINO AND IMINO ACIDS AND ESTERS

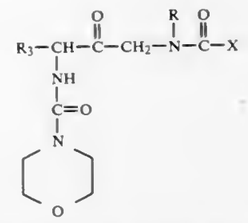
Harold N. Weller, III, and Eric M. Gordon, both of Pennington, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 726,264, Apr. 22, 1985, Pat. No. 4,740,508. This application Dec. 28, 1987, Ser. No. 140,448

Int. Cl.[4] A61K *31/535*

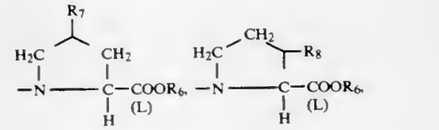
U.S. Cl. 514—231.5 **6 Claims**

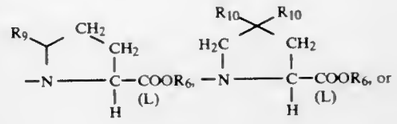
1. A compound of the formula

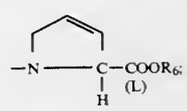


including a pharmaceutically acceptable salt thereof wherein:

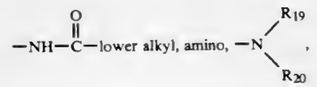
X is

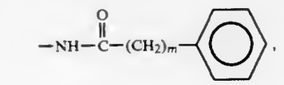


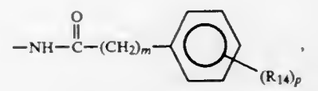


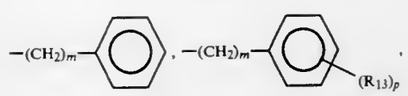


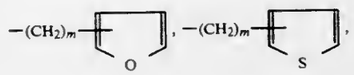
R_7 is hydrogen, lower alkyl, halogen, hydroxy,



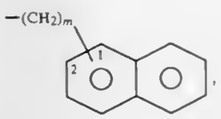




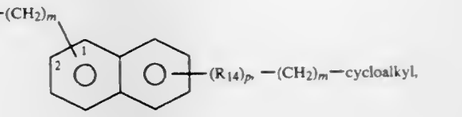


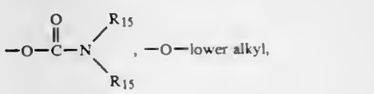


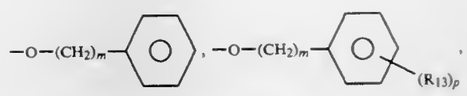
a 1- or 2-naphthyl of the formula



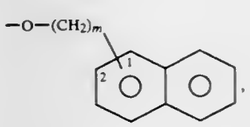
a substituted 1- or 2-naphthyl of the formula



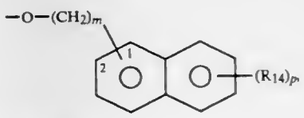




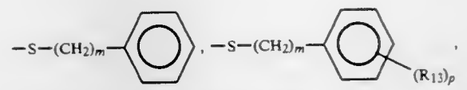
a 1- or 2-naphthyloxy of the formula



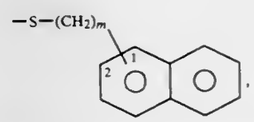
a substituted 1- or 2-naphthyloxy of the formula



—S—lower alkyl,

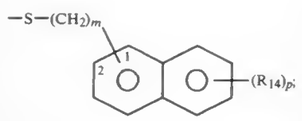


a 1- or 2-naphthylthio of the formula

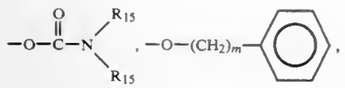


or a substituted 1- or 2-naphthylthio of the formula

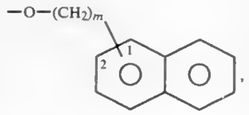
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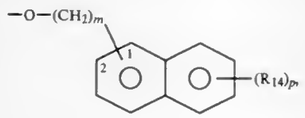
R_8 is halogen,



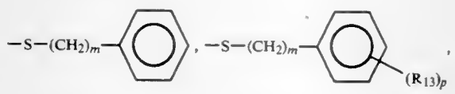
—O—lower alkyl, a 1- or 2-naphthyloxy of the formula



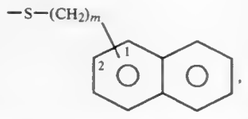
a substituted 1- or 2-naphthyloxy of the formula



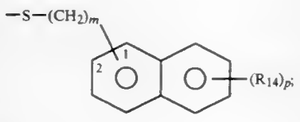
—S—lower alkyl,



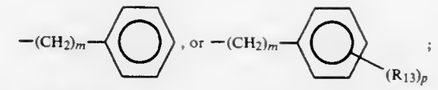
a 1- or 2-naphthylthio of the formula



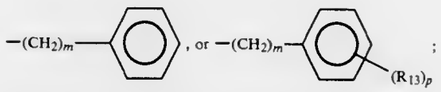
or a substituted 1- or 2-naphthylthio of the formula



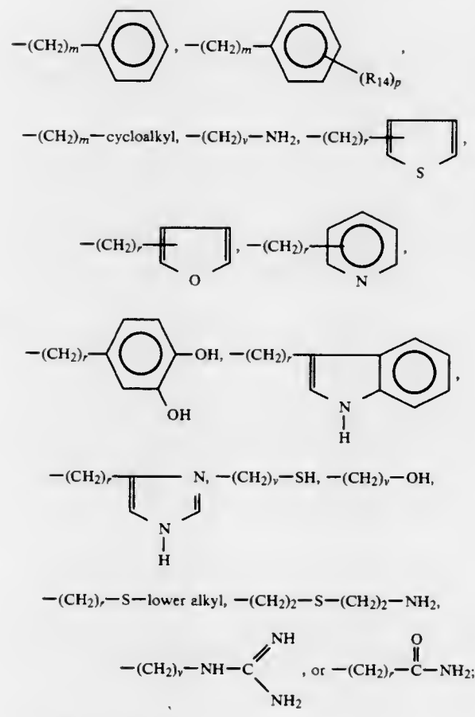
R_9 is keto,



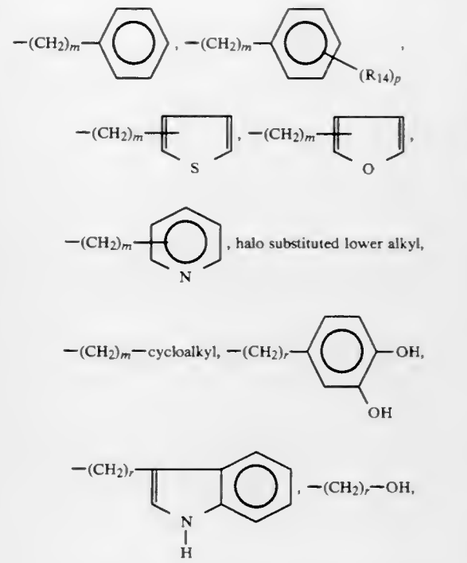
R_{10} is haogen or —Y—R_{16};
R_{13} is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxyl, phenyl, phenoxy, phenylthio, or phenylmethyl;
R_{14} is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxyl;
m is zero, one, two, three, or four;
p is one, two or three provided that p is more than one only if R_{13} or R_{14} is methyl, methoxy, chloro, or fluoro;
R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;
Y is oxygen or sulfur;
R_{16} is lower alkyl of 1 to 4 carbons,

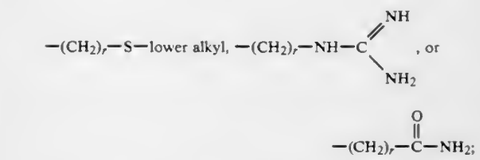


r is an integer from 1 to 4;
R_{19} is lower alkyl, benzyl or phenethyl;
R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;
R is hydrogen, lower alkyl, halo substituted lower alkyl,

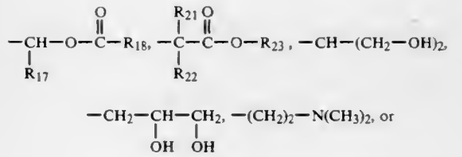


v is an integer from 2 to 6;
R_3 is hydrogen, lower alkyl,





R_6 is hydrogen, lower alkyl, benzyl, benzhydryl,



R_{17} is hydrogen, loswer alkyl, cycloalkyl, or phenyl;
R_{18} is hydrogen, lower alkyl, lower alkoxy or phenyl;
R_{21} and R_{22} are independently selected from the group consisting of hydrogen and lower alkyl; and
R_{23} is lower alkyl.

4,818,758

2-AZOLYLMETHYL-2-PHENYL-4-[BENZAZOL-2-YLOXY-OR-THIO-METHYL]-1,3 DIOXOLANES AND SALTS THEREOF, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR USE

Klaus-Dieter Kampe, Bad Soden am Taunus; Wolfgang Raether, Dreieich, and Walter Dittmar, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

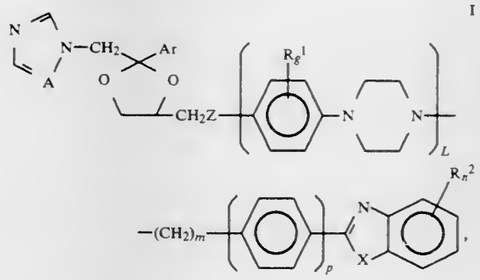
Filed Mar. 19, 1987, Ser. No. 28,173

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609597

Int. Cl.[4] **A61K** *31/335, 31/415;* **C07D** *405/14*

U.S. Cl. 514—252 **7 Claims**

1. A compound of the formula I



in which:
A is CH or N,
Ar is a phenyl group which is unsubstituted or carries up to 2 substituents which are identical or different and are F, Cl, Br or C_6H_5,
Z is O or, if L, m and p simultaneously are zero, is O or S,
R^1 is C_1–C_3-alkyl, F or Cl,
g is 0, 1 or 2,
L is 0 or 1,
m is 0, 1, 2, 3 or 4,
p is 0 or, if m does not equal 0 or if L and m are simultaneously 0, is 0 or 1,
X is O or, if m does not equal 0 or if L, m and p are simultaneously 0, is O or S,
R^2, independently of one another, are C_1–C_4-alkyl, C_1–C_4-alkoxy, F, Cl, Br, I, SCH_3, CO-C_6H_5, CF_3, $COOCH_3$, $COOC_2H_5$ or NO_2, and
n is 0, 1 or 2,
and the physiologically acceptable acid-addition salt thereof.

7. A process for the treatment of mycoses, wherein an active amount of a compound I as claimed in claim **1**, is administered together with pharmaceutically suitable excipients.

4,818,759

TREATMENT OF DISEASE

Carol S. S. Charping, 521 Brookwood Dr., Durham, N.C. 27707

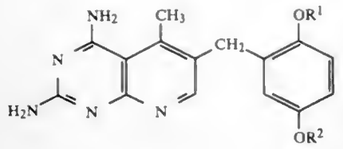
Filed Feb. 5, 1988, Ser. No. 152,837

Claims priority, application United Kingdom, Feb. 6, 1987, 8702758

Int. Cl.[4] **A61V** *31/505*

U.S. Cl. 514—260 **7 Claims**

1. A method of treating rheumatoid arthritis in a human suffering from rheumatoid arthritis comprising the admnistration of an effective anti-rheumatoid arthritis treatment amount of a compound of formula (I):



(I)

wherein R^1 and R^2 are each alkyl of 1 to 4 carbons or a pharmaceutically acceptable acid addition salt thereof to said human.

4,818,760

DERIVATIVES OF PYRIDYLSULFINYL(BENZ-OR THIENO-)IMIDAZOLES AND THEIR USE AS GASTRIC SECRETION INHIBITING SUBSTANCES

Dieter Binder, Vienna; Franz Rovenszky, Bruck an der Leitha, and Hubert P. Ferber, Ansfelden, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

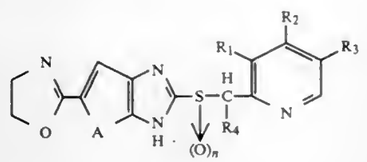
Filed Sep. 9, 1987, Ser. No. 94,594

Claims priority, application Austria, Sep. 10, 1986, 2437/86

Int. Cl.[4] A61K *31/44;* **C07D** *401/00*

U.S. Cl. 514—338 **6 Claims**

1. A 4,5-Dihydrooxazole of the formula



I

in which

A is —CH=CH— or —S—,

R_1, R_3 and R_4, independently of one another, is hydrogen or lower alkyl,

R_2 is hydrogen or lower alkoxy, and

n is 0 or 1.

6. A method for the treatment of prophylaxis of diseases, caused by increased gastric secretions, which comprises administering an effective amount of a compound of formula I as claimed in claim 1 to a patient, suffering from increased gastric secretions.

4,818,761

2-(4-PYRIDYLAMINOMETHYL)-BENZIMIDAZOLE DERIVATIVES HAVING ANTIVIRAL ACTIVITY

Nobukatsu Sato, Nara; Haruo Kuriyama, Mukob, and Masanobu Agoh, Ikeda, all of Japan, assignors to Maruishi Seiyaku Kabushiki Kaisha, Osaka, Japan

Filed Jul. 8, 1987, Ser. No. 71,251

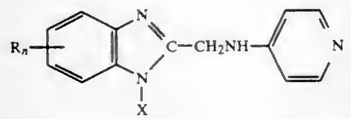
Claims priority, application Japan, Jul. 11, 1986, 61-164324; Jan. 21, 1987, 62-13258

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[4] C07D *401/02*

U.S. Cl. 514—341 **15 Claims**

1. A compound of the formula:



wherein X is selected from the group consisting of hydrogen, alkyl of 1–8 carbon atoms, propylenyl, cyclopentyl, hydroxyalkyl of 2–4 carbon atoms, phenyl, mono- and di-halogenophenyl, tolyl, xylyl, trimethylphenyl, ethylphenyl, methoxyphenyl, phenylalkyl of 1–3 carbon atoms in the alkyl group, 3,3-dimethyl-2-oxobutyl, ethoxyethyl, 2-acetoxyethoxymethyl, trifluoromethylphenyl, 3-fluoro-4-tolyl and thiazolyl,

R is selected from the group consisting of hydrogen, halogen, methoxy, ethoxy, alkyl of 1–4 carbon atoms, phenyl and phenoxy, and

n is an integer of 0, 1 or 2,

or a pharmaceutically acceptable acid addition salt thereof, excluding the compounds where, when X is hydrogen, R_n is hydrogen, 5(6)-chloro, 5(6)-methoxy, 5(6)-methyl, 5,6-dichloro, 5(6)-ethyl, 4(7)-methyl or 5,6-dimethyl.

15. A pharmaceutical composition having antiviral activity, which comprises an antiviral amount of a compound according to claim 1 as an active ingredient, and a pharmaceutically acceptable carrier therefor.

4,818,762

FUNGICIDAL NOVEL HYDROXYALKYNYL-AZOLYL DERIVATIVES

Reinhard Lantzsch, Leverkusen; Klaus Ditgens, Wuppertal; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

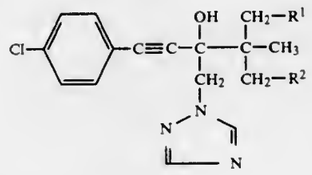
Division of Ser. No. 547,806, Nov. 1, 1983, Pat. No. 4,622,333. This application Jan. 2, 1986, Ser. No. 815,692

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242222

Int. Cl.[4] C07D *249/08;* **A01N** *43/653*

U.S. Cl. 514—383 **8 Claims**

1. A hydroxyalkynyl-azolyl derivative of the formula



in which

R^1 is hydrogen or halogen, and

R^2 is halogen,

or an addition product thereof with an acid or metal salt.

4,818,763

BIOLOGICALLY ACTIVE SUBSTANCE WITH HORMONAL PROPERTIES, PRODUCTION PROCESS THEREOF AND UTILIZATION OF HISTONES FOR MEDICAL PURPOSES

Volker Rusch, Schwalbenweg 6, 6348 Herborn; Robert Reichhart, Homburg/Saale; Michael Zeppezauer, Saarbrücken-Scheidt, all of Fed. Rep. of Germany, and Hans Jörnvall, Sundbyberg, Sweden, assignors to Volker Rusch, Herborn, Fed. Rep. of Germany

PCT No. PCT/DE85/00004, § 371 Date Sep. 12, 1985, § 102(e) Date Sep. 12, 1985, PCT Pub. No. WO85/03003, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 10, 1985, Ser. No. 777,783

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400928; Feb. 16, 1984, 3405620

Int. Cl.[4] A61K *37/00, 37/48*

U.S. Cl. 514—2 **23 Claims**

1. A therapeutic method for the stimulation of the immune system of a patient in need thereof which comprises administering to said patient a biological composition which comprises a therapeutically acceptable carrier and, in quantity having an immuno-stimulating effect, a biologically active pure histone

selected from the group consisting of H2A, H2B, and an evolutionary variable amino acid sequence thereof.

4,818,764

IMIDAZOLINE DERIVATIVE AND METHOD OF TREATING DEPRESSION THEREWITH

Christopher Chapleo, Swanland, and Peter L. Myers, Cottingham, both of England, assignors to Reckitt & Colman Products Limited, England

Filed Feb. 2, 1981, Ser. No. 230,195

Claims priority, application United Kingdom, Feb. 4, 1980, 8003636

Int. Cl.[4] A61K *31/415;* **C07D** *403/00*

U.S. Cl. 514—397 **4 Claims**

3. A method of treating depression which comprises administering to a human an antidepressant effective amount of 2-[2-(1,4-benzodioxanyl)]-2-imidazoline or a non-toxic salt thereof.

4,818,765

1,3-DITHIOLAN-2-YLIDENES THEIR 1-OXIDES, PHARMACEUTICAL COMPOSITIONS, AND METHODS OF USE THEREOF

Andr J. Weith, Signy, and Philippe M. Narbel, Prangins, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

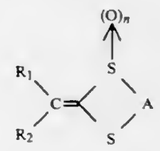
Continuation of Ser. No. 771,481, Mar. 28, 1985, abandoned, which is a continuation of Ser. No. 504,714, Jun. 15, 1983, abandoned. This application Feb. 11, 1987, Ser. No. 13,164

Claims priority, application United Kingdom, Jun. 25, 1982, 8218472

Int. Cl.[4] C07D *339/06, 339/08;* **A61K** *31/385*

U.S. Cl. 514—440 **11 Claims**

1. A compound of the formula



(Ic)

wherein

(I) R_1 is phenyl which is unsubstituted or substituted by a substituent selected from hydroxy, lower alkoxy, carboxy-lower alkoxy, HO_3S-lower alkoxy, di-lower alkylamino-lower alkoxy, halogen, lower alkanoyl, lower alkyl, halo-lower alkyl, carboxy, amino, di-lower alkylamino, lower alkanoylamino, and carboxy-lower alkanoylamino;

R_2 is

(a) phenyl substituted by a substituent selected from hydroxy, lower alkoxy, carboxy-lower alkoxy, halogen, halo-lower alkyl, carboxy, and di-lower alkylamino; or is

(b) selected from the group consisting of phenyl-lower alkyl, halo-lower alkyl, carboxy-lower alkyl, lower alkoxycarbonyl-lower alkyl, di-lower alkylamino-lower alkyl, hydroxybenzoyl, lower alkoxybenzoyl, carboxy, alkoxycarbonyl having up to 9 carbon atoms, and di-lower alkylamino-SO_2—;

A is 1,2-ethylene which is unsubstituted or mono-substituted by oxo or hydroxy; and

n is zero or 1; or

(II) R_1 is phenyl substituted by hydroxy, lower alkoxy, carboxy-lower alkoxy, HO_3S-lower alkoxy, di-lower alkylamino-lower alkoxy, lower alkanoyl, halo-lower alkyl, carboxy, amino, di-lower alkylamino, lower alkanoylamino, or carboxy-lower alkanoylamino;

R_2 is lower alkyl; and

A and n are as defined above;

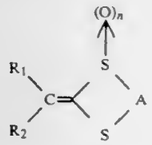
(III) R_1 is di-lower alkoxyphenyl;

R_2 is hydrogen; and

A and n are as defined above;

or a pharmaceutically acceptable salt of such a compound having a salt-forming group.

9. A method of treating hepatic fibrosis in a mammal comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of formula Ia or of a pharmaceutically acceptable salt thereof wherein said formula Ia is



(Ia)

wherein

R_1 is phenyl which is unsubstituted or substituted by hydroxy, lower alkoxy, carboxy-lower alkoxy, HO_3S-lower alkoxy, di-lower alkylamino-lower alkoxy, halogen, lower alkanoyl, lower alkyl, halo-lower alkyl, carboxy, amino, di-lower alkylamino, lower alkanoylamino, or carboxy-lower-alkanoylamino;

R_2 is

(a) hydrogen;

(b) phenyl which is unsubstituted or substituted by hydroxy, lower alkoxy, halogen, halo-lower alkyl, or di-lower alkylamino; or

(c) lower alkyl, halo-lower alkyl, carboxy-lower alkyl, lower alkoxycarbonyl-lower alkyl, di-lower alkylamino-lower alkyl, phenyl lower alkyl, lower alkanoyl, hydroxy benzoyl, lower alkoxy benzoyl, carboxy, alkoxycarbonyl having up to 9 carbon atoms, cyano, or di-lower alkylamino-SO_2—;

A is 1,2-ethylene which is unsubstituted or mono-substituted by oxo or hydroxy; and

n is zero or 1.

4,818,766

NOVEL PHENOXYALIPHATYLPHENYLENEOXYALKYL ESTERS AND AMIDES

Franz Ostermayer, and Markus Zimmermann, both of Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,156

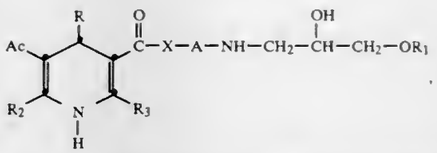
Claims priority, application Switzerland, Jul. 22, 1986, 2918/86

Int. Cl.[4] A61K *31/455;* **C07D** *211/90*

U.S. Cl. 514—356 **23 Claims**

1. A compound of the formula

(I)



in which Ac represents lower alkoxycarbonyl, lower alkanoyl or lower alkanesulphonyl;

X represents oxy, imino or lower alkylimino; of the formula $—X_1—Ph—X_2—$; in which one of the radicals X_1 and X_2 is oxy and the other of X_1 and X_2 is oxy or a direct bond;

Ph represents a phenylene radical that is unsubstituted or is substituted by at least one of lower alkyl, lower alkoxy, halogen, trifluoromethyl and nitro; and

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R represents a phenyl radical unsubstituted or substituted at least one of lower alkyl, lower alkoxy, halo-lower alkoxy, lower alkenyloxy, halogen, trifluoromethyl, cyano, benzylthio benzyloxy, and nitro, said benzylthio and benzyloxy each independently being unsubstituted or substituted by at least one of lower alkyl, lower alkoxy, halo, trifluoromethyl, and nitro; or R represents pyridyl or 1-oxidized pyridyl, each of which is independently unsubstituted or substituted by at least one of lower alkyl, lower alkoxy, lower alkylthio, S-oxidized lower alkylthio, and halogen; or R represents a (1,3-dioxa)indanyl or benzofuraznyl radical;

R_1 represents a phenyl radical unsubstituted or substituted by at least one of lower alkyl, lower alkoxy-lower alkyl, lower alkoxy-lower alkoxy-lower alkyl, cycloalkyl-lower alkoxy-lower alkyl, carbamoyl-lower alkyl, lower alkanoylamino-lower alkyl, lower alkoxy, lower alkenyloxy, lower alkynyloxy, lower alkoxy-lower alkoxy, carbamoyl-lower alkoxy, lower alkanoylamino-lower alkoxy and cyano; or R_1 represents an indolyl radical unsubstituted or substituted by lower alkyl;

R_2 represents lower alkyl; and

R_3 represents lower alkyl, hydroxy-lower alkyl, cyano or amino; or an acid addition salt thereof.

4,818,767

QUINATE SALTS OF ANTIMALARIAL PHENANTHRENEMETHANOL COMPOUNDS

Jean F. Rossignol, Philadelphia, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Nov. 2, 1983, Ser. No. 548,181
Int. Cl.[4] A61K *31/205*
U.S. Cl. 514—555 **7 Claims**

1. A compound represented by the following structural formula (I):



wherein R_1 is hydrogen or an alkyl radical containing one to six carbon atoms and R_2 is an alkyl radical containing one to six carbon atoms.

7. A method for the treatment of malaria in a subject in need of said treatment comprising administering orally or by injection a nontoxic antimalarial quantity of a compound of claim 1.

4,818,768

PROCESS FOR THE TREATMENT OF HYPERPIGMENTARY DERMATOSES INCLUDING MALIGNANT MELANOMAS

Marcella Nazzaro-Porro, Rome, Italy, assignor to Schering AG, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 216,278, Dec. 15, 1980, abandoned, which is a continuation of Ser. No. 965,584, Dec. 1, 1978, Pat. No. 4,292,326, which is a continuation of Ser. No. 895,565, Apr. 12, 1978, abandoned. This application Jan. 29, 1982, Ser. No. 343,745
Claims priority, application Italy, Apr. 19, 1977, 2261 A/77; Dec. 30, 1977, 31471 A/77
Int. Cl.[4] A61K *31/20*
U.S. Cl. 514—558 **7 Claims**

1. A method for the treatment of individuals exhibiting a malignant melanoma or a circumscribed precancerous melanosis of Dubreuihl condition which comprises administering to said individual a therapeutically effective amount of at least one dicarboxylic acid selected from the group consisting of azelaic acid and dodecandioic acid, in a phramaceutically acceptable carrier until said condition is reduced or its further development is arrested.

4,818,769

METHOD OF CONTROLLING STRESS-RELATED DISEASE IN LIVESTOCK BY ADMINISTRATION OF HUMAN IL-2

Jack H. Nunberg; Michael Doyle, both of Oakland; Arthur Newell, Orinda, and Thomas White, Oakland, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 778,371, Sep. 20, 1985, abandoned. This application Apr. 25, 1986, Ser. No. 856,680
Int. Cl.[4] A61K *37/02*
U.S. Cl. 514—2 **6 Claims**

1. A method of diminishing the incidence of shipping fever in livestock which comprises administering to subject livestock an amount of a water soluble form of hIL-2 in the range of above about 10^3 and below about 10^6 u/kg/day over a period of from about 14 to 30 days, wherein the water soluble form of hIL-2 is hIL-2 covalently bonded through one or two amino acids via a coupling agent to polyethylene glycol having a molecular weight in the range of from about 500 to 200,000, and wherein no more than about 50 moles of polyethylene glycol are employed per mole hIL-2.

4,818,770

PREVENTION OF A PLANT DISEASE BY SPECIFIC INHIBITION OF FUNGAL POLYAMINE BIOSYNTHESIS

Leonard H. Weinstein, and Arthur W. Galston, both of Ithaca, N.Y., assignors to Boyce Thompson Institute For Plant Research, Ithaca, N.Y. and Yale University, New Haven, Conn.

Filed Oct. 22, 1986, Ser. No. 921,543
Int. Cl.[4] A01N *37/12, 37/44*
U.S. Cl. 514—564 **18 Claims**

1. The method of protecting plants against infection by fungi by applying a fungicidally effective amount of DL-alpha-Difluoromethylornithine to the plants.

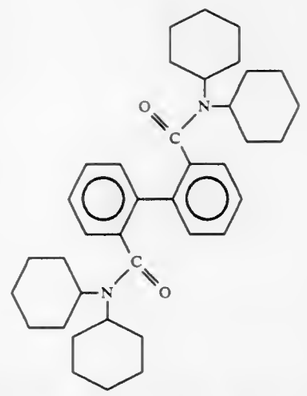
4,818,771

DIPHENIC ACID BIS(DICYCLOHEXYLAMIDE) FOR CLOTHRATE COMPOUND, PROCESS FOR PRODUCING THE SAME

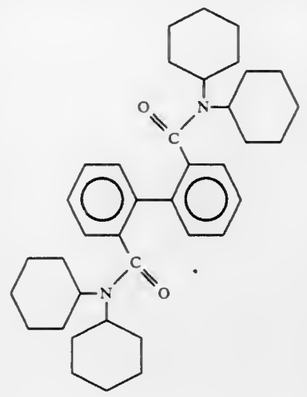
Fumio Toda, Onsen; Ayako Sekikawa, Hatano; Hideo Sugi, Yokohama, and Kenji Tahara, Atsugi, all of Japan, assignors to Kurita Water Industries, Ltd., Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,004
Claims priority, application Japan, Dec. 17, 1985, 60-283860
Int. Cl.[4] A61L *3/00;* **C02B** *1/18;* **C07C** *103/24*
U.S. Cl. 514—616 **7 Claims**

1. Diphenic acid bis(dicyclohexylamide) represented by the following formula:



2. A sustained release antimicrobial composition comprising a clathrate compound consisting of an antimicrobially effective amount of an antimicrobial agent with diphenic acid bis(dicyclohexylamide) represented by the following formula:



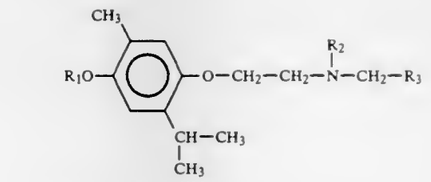
4,818,772

DERIVATIVES OF 4-AMINOETHOXY-5-ISOPROPYL-2-METHYLBENZENES: METHODS OF SYNTHESIS AND UTILIZATION AS MEDICINES

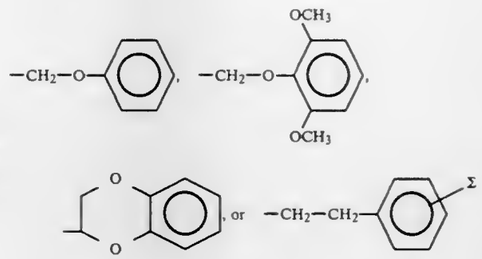
Henri Pontagnier; Christian Courtiol, both of Pessac; Marie-Hélène Creuzet, Bourdeaux; Claude Feniou, Pessac, and Gisèle Prat, Talence, all of France, assignors to Societe Cortial S.A., Paris, France

Filed Apr. 9, 1982, Ser. No. 366,133
Claims priority, application France, Jun. 4, 1981, 81 06832; Apr. 3, 1982, 82 03795; Apr. 3, 1982, 82 03796
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—651 **4 Claims**

1. A compound with alpha 1-blocking activity having the formula

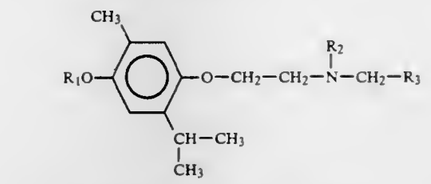


wherein R_1 is —H, —CH_3 or —$COCH_3$;
R_2 is —H or CH_3; and
R_3 is

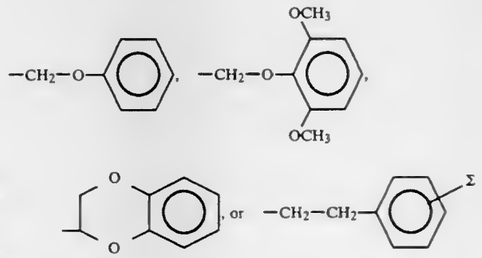


wherein Σ is —H or one or more substituents selected from the group consisting of halogen, —OH and —OCH_3; or a pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition comprising with alpha 1-blocking activity a compound having the formula



wherein R_1 is —H, —CH_3 or —$COCH_3$,
R_2 is —H or CH_3, and
R_3 is



wherein Σ is —H or one or more substituents selected from the group consisting of halogens, —OH and —OCH_3, or
a pharmaceutically acceptable salt thereof;
and a pharmaceutically acceptable adjuvant or diluent in the form of capsules, tablets, liquid drops, injectable solutions, suppositories, collyria or aerosols.

4. A method for blocking alpha 1 receptors in mammals

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which comprises administering an effective amount of a composition according to claim 3.

4,818,773

ALKYLAMINOPHOSPHONIC CHELATING RESINS, THEIR PREPARATION AND USE IN PURIFYING BRINES

Michel A. G. Cornette; Jack Carbonel; Jacques E. A. Franc, and Paul D. A. Grammont, all of Chauny, France, assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 469,437, Feb. 24, 1983, abandoned. This application Nov. 15, 1984, Ser. No. 671,720

Int. Cl.[4] C08D *5/20*

U.S. Cl. 521—32 **24 Claims**

1. A process for the production of an alkylaminophosphonic chelating resin which process comprises:

(a) selecting beads of a macroporous reticulated vinylaromatic copolymer which beads have a porosity from 700 mm^3/g to 1000 mm^3/g, a volume of swelling in toluene factor of from 1.65 to 1.9, and a size in the range of 0.3 to 0.5 mm.

(b) (i) chloromethylating the copolymer beads to introduce a desired level of chlorine,

(ii) aminating the chlorinated beads to form chloraminated beads,

(iii) hydrolyzing the chloraminated beads under moderate conditions with dilute acid, and

(iv) alkylphosphonating the hydrolyzed beads in such a manner as does not produce secondary cross-linking the copolymer,

(c) the said chloromethylation, amination, hydrolysis and alkylphosphonation being carried out under such conditions and for a duration such that the alkylaminophosphonic chelating resin thereby produced has an apparent density of 0.35 to 0.425 g/ml, a granulometry smaller than 0.8 mm, a water retention of 50 to 60 percent in the acid form, a porosity of 800 to 1100 mm^3/g, a total theoretical capacity for the fixation of calcium ions of not greater than 31 g/l of resin in the sodium form and an osmotic resistance such that more than 90 percent of the beads are intact after 30 shocks.

4,818,774

ORGANOPHOSPHORUS COMPOUNDS

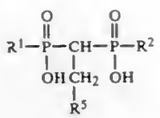
Kenneth M. Kem, Emmaus, Pa., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Mar. 10, 1986, Ser. No. 819,665

Int. Cl.[4] C08F *8/40;* **C07F** *9/38, 9/40*

U.S. Cl. 521—31 **1 Claim**

1. As compositions of matter, chemical compounds having the general formula



wherein R^1 and R^2 can be the same or different and are selected from alkyl, alkoxyl, alkylaryl and alkylaryloxyl groups having 1 to about 18 carbon atoms or hydroxy; and R^5 is a polymer radical selected from the group consisting of polystyrene, polyphenylene ether and polyarylether sulfone, provided that the sum of the carbon atoms of the R^1, R^2 and R^5 groups is at least 16.

4,818,775

RAPID CURE OF POLYURETHANE FOAM WITH AMMONIUM CONTAINING MATERIALS

Fred N. Teumac, Spartanburg, S.C.; Michael A. Ricciardi, Statesville, N.C.; Ronald L. Murph, and Gregory W. Howard, both of Charlotte, N.C., assignors to Reeves Brothers, Inc., Spartanburg, S.C.

Filed May 21, 1987, Ser. No. 52,815

Int. Cl.[4] C08G *18/30*

U.S. Cl. 521—107 **24 Claims**

1. A method for the rapid cure of flexible polyether-derived polyurethane foam without adversely affecting the resultant physical properties of said foam, which method comprises:

adding to a foam forming composition comprising components of a polyether polyol, an organic isocyanate compound, and water in an amount sufficient to act as a blowing agent, an ammonia containing material having a decomposition temperature below the temperature of the highest reaction exotherm of the foam-forming composition;

forming the foam by reaction of the foam-forming components, thereby generating heat and forming a flexible foam structure which includes therein a small number of unreacted thermal isocyanate groups; and

at least partially decomposing said ammonia containing material by exposure to said heat to release ammonia to react with said unreacted isocyanate groups, thus curing the foam.

4,818,776

PHOTOCOPOLYMERIZABLE COMPOSITIONS BASED ON EPOXY AND HYDROXYL-CONTAINING ORGANIC MATERIALS HAVING PRIMARY HYDROXYL CONTENT

Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 464,580, Feb. 7, 1983, abandoned. This application Nov. 6, 1985, Ser. No. 794,605

Int. Cl.[4] C08G *59/24, 59/62, 59/68*

U.S. Cl. 522—31 **15 Claims**

1. A photocopolymerizable composition having an improved cure rate and when cured resistivity to water comprising a cycloaliphatic epoxide having at least two epoxy groups, a propylene oxide polyol capped with ethylene oxide, which reacts with said epoxide, and a photoinitiator, said capped propylene oxide polyol having an average equivalent weight of about 1439 to about 2078 and an average hydroxyl number of about 27 to about 35.

4,818,777

PHENOLIC CORROSION INHIBITORS FOR COATING MATERIALS

Adalbert Braig, Weil-Friedlingen, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 17, 1987, Ser. No. 86,338

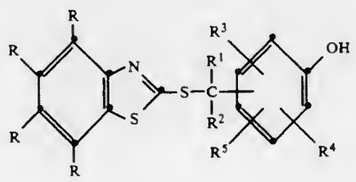
Claims priority, application Switzerland, Aug. 27, 1986, 3438/86

Int. Cl.[4] C08K *5/13, 5/15;* **C04B** *9/02;* **C09D** *5/8*

U.S. Cl. 524—83 **14 Claims**

1. A coating material containing, as a corrosion inhibitor, at least one compound of the formula I

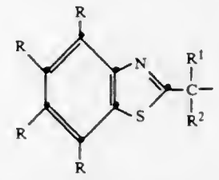
I



in which each R independently is hydrogen, C_1–C_{12}-alkyl, C_1–C_4-halogeno-alkyl, C_1–C_{12}-alkoxy, C_1–C_{12}-alkylthio, phenylthio, benzylthio, C_1–C_{12}-alkylsulfonyl, phenyl, C_7–C_{15}-alkylphenyl, C_7–C_{10}-phenylalkyl, C_5–C_8-cycloalkyl, halogen, $-NO_2$, —CN, —COOH, $-COO(C_1$–C_4-alkyl), —OH, $-NH_2$, $-NHR^6$, $-N(R^6)_2$, $-CONH_2$, $-CONHR^6$ or $-CON(R^6)_2$, R^1 is hydrogen, C_1–C_{12}-alkyl, phenyl or said phenyl substituted by halogen, by C_1–C_4-alkyl, by C_1–C_4-alkoxy or by $-NO_2$;

pyridyl, thienyl or furyl, R^2 is hydrogen or C_1–C_4-alkyl, R^3 and R^4 independently of one another are hydrogen, halogen, C_1–C_4-alkoxy, cyano, nitro, C_1–C_{20}-alkyl, $-(CH_2)_m$-$COOR^7$, $-(CH_2)_m-CONHR^6$, $-(CH_2)_m-CON(R^6)_2$, C_3–C_{20}-alkenyl, C_7–C_{10}-phenylalkyl, phenyl, cyclohexyl, cyclopentyl or a group of the formula II

II



R^5 is hydrogen, C_1–C_{20}-alkyl, C_3–C_{20}-alkenyl or hydroxyl, or R^3 and R^5 together or R^4 and R^5 together form a ring which is fused to the phenol radical and can be a carbocyclic or heterocyclic ring and can contain oxygen, nitrogen or sulfur as hetero atoms, R^6 is C_1–C_{12}-alkyl, C_3–C_{12}-alkyl interrupted by one or more O atoms, C_5–C_8-cycloalkyl, benzyl, phenyl or said phenyl substituted by halogen, by C_1–C_4-alkyl, by C_1–C_4-alkoxy or by nitro; or $-N(R^6)_2$ is a pyrrolidino, piperidino or morpholino group, R^7 is C_1–C_{20}-alkyl which can be substituted by halogen or hydroxyl, or is C_3–C_{20}-alkyl which is interrupted by one or more oxygen atoms and can also be substituted by hydroxyl, and m is 0, 1 or 2.

4,818,778

RUBBER COMPOSITIONS CONTAINING PHENOL DERIVATIVES OF 1,3,4-THIADIAZOLE

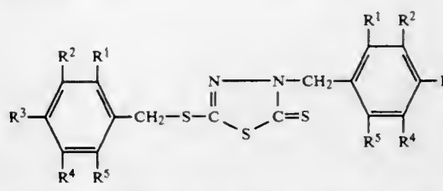
Lester A. Doe, Jr., Newtown, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Division of Ser. No. 46,613, May 7, 1987, Pat. No. 4,734,457. This application Dec. 7, 1987, Ser. No. 132,830

Int. Cl.[4] C08K *5/46*

U.S. Cl. 524—83 **3 Claims**

1. A stabilized composition comprising natural rubber and about 0.2 to 5 parts per hundred parts rubber of a 1,3,4-thiadiazole compound of the structural formula



wherein R^2 represents t-butyl group, R^4 represents C_{1-4}-alkyl group, and R^1, R^3 and R^5 represents hydrogen and hydroxy groups provided that R^1 and R^5 are hydrogens when R^3 is hydroxy and R^3 is hydrogen when R^1 and R^5 are hydroxy groups.

4,818,779

POLY(VINYL ACETATE) EMULSION ADHESIVES CONTAINING AN ALKOXYSILANE

Gerald L. Witucki, and Edwin P. Plueddemann, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 25, 1987, Ser. No. 125,438

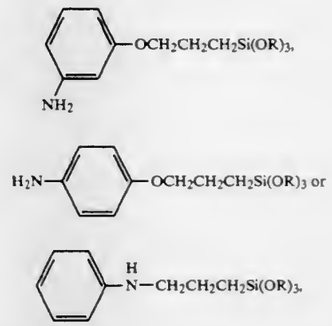
Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—188 **13 Claims**

1. A composition comprising:

(i) a water-borne emulsion adhesive based on a poly(vinyl acetate) resin; and

(ii) an adhesion promoter consisting essentially of at least one alkoxysilane selected from



in which R is independently selected from alkyl or alkoxyalkyl radicals having 1–4 carbon atoms, and from about 1 to 80% by weight of a plasticizer for said poly(vinyl acetate) resin, wherein said alkoxysilane constitutes from about 0.5 to 5.0 percent by weight of said composition.

4,818,780

RADIATION-CURABLE PHENOXY RESINS, PRODUCTION THEREOF, AND ELECTRON BEAM-CURABLE COMPOSITIONS CONTAINING THE SAME

Kevin P. Murray, Hoffman Estates; William E. Hoffman, Roselle, and Robert E. Ansel, Hoffman Estates, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 25, 1988, Ser. No. 185,538

Int. Cl.[4] C08G *18/04*

U.S. Cl. 524—430 **26 Claims**

1. The reaction product of an adduct of an ethylenically unsaturated monohydric alcohol with an organic diisocyanate in which one of the two isocyanate groups is more strongly reactive than the other, the alcohol being used in a molar excess of at least about 3% up to 30% to insure the absence of any significant proportion of unreacted diisocyanate, with a high molecular weight hydroxy functional polyether having a number average molecular weight above 10,000 and an hydroxy functionality in the range of from about 20 to about 300, said adduct being used in an amount to introduce about 1.5 to about 20 ethylenically unsaturated groups per molecule of said polyether, and the reaction being continued to substantially eliminate unreacted isocyanate functionality.

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4,818,781
RESIN FOR MAGNETIC COATING
Masahiro Yamakawa, Takaoka; Toyoichi Arai, Himi, and Kiyosi Nitta, Takaoka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 707,131, Mar. 1, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,912
Claims priority, application Japan, Mar. 3, 1984, 59-41014; Mar. 30, 1984, 59-62568
Int. Cl.[4] C08K *3/10*
U.S. Cl. 524—407 10 Claims

1. In a magnetic coating composition for magnetic recording media in which a magnetic powder is dispersed in a vinyl chloride copolymer resin as a binder, the improvement which comprises as said binder a copolymer consisting of
(1) at least 60% by weight of vinyl chloride units,
(2) 0.3 to 5.0% by weight, as the carboxyl group, of monomer units containing a carboxyl group derived from a monomer selected from the group consisting of unsaturated monocarboxylic acids, unsaturated dicarboxylic acids and monoalkyl esters of unsaturated dicarboxylic acids,
(3) 0.1 to 2.0% by weight, as the hydroxyl group, of monomer units containing the group -X-OH wherein X is selected from the group consisting of C_nH_{2n}, OC_nH_{2n}, $COOC_nH_{2n}$ and $CONHC_nH_{2n}$ wherein n is an integer of from 1 to 10, and
(4) 1 to 20% by weight of units of another monomer derived for a monomer selected from the group consisting of vinyl ester of carboxylic acids, vinyl ethers, vinylidene halides, unsaturated carboxylic acid esters, olefins, unsaturated nitriles, styrene, alpha-methyl styrene and p-methyl styrene,
the equivalent ratio of the hydroxyl groups to the carboxylic groups being from 0.1 to 3.0.

4,818,782
ETHYLENE VINYL ALCOHOL COPOLYMERS CONTAINING PLATELET-TYPE MICA FILLERS, PROCESSES FOR PREPARING SAME AND MULTI-LAYER CONTAINERS WITH LAYERS THEREOF
Thomas C. Bissot, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 30, 1987, Ser. No. 79,471
Int. Cl.[4] C08K *3/34, 3/08, 3/10*
U.S. Cl. 524—413 6 Claims

1. A composition comprising 50 to 95 percent by weight of an ethylene/vinyl alcohol copolymer having an ethylene content of 20 to 60 mole percent, a melt flow rate from 0.1 to 100 g/10 minutes as measured at 210° C., and 50 to 5 percent by weight of muscovite mica wherein at least 95% by weight of the mica particles have a particle size of less than 20 microns, a platelet like shape and an aspect ratio of 20 to 150.

4,818,783
METHOD FOR PRODUCTION OF AQUEOUS DISPERSION OF INORGANIC PIGMENT
Shobu Shioji, Himeji; Masazumi Sasabe, Kakogawa; Yorimichi Dairoku, Himeji, and Teruaki Fujiwara, Nagaokakyo, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan
Filed Nov. 6, 1987, Ser. No. 118,311
Claims priority, application Japan, Nov. 7, 1986, 61-263843; Nov. 14, 1986, 61-269775; Nov. 17, 1986, 61-271964; Nov. 21, 1986, 61-276451; Nov. 21, 1986, 61-276452; Apr. 13, 1987, 62-88704
Int. Cl.[4] C08L *29/04*
U.S. Cl. 524—425 15 Claims

1. A method for the production of an aqueous dispersion by the dispersion of an inorganic pigment in an aqueous medium, which method comprises incorporating in said inorganic pigment as a dispersant (I) 0.1 to 2 parts by weight of a carboxyl group-containing water-soluble polymer possessing a number average molecular weight in the range of 2,000 to 80,000 and (II) 0,03 to 1 part by weight of a water-soluble anionic modified polyvinyl alcohol possessing a polymerization degree in the range of 30 to 700, a saponification degree in the range of 30 to 100 mol %, and an anionic modification degree in the range of 0.5 to 20 mol %, respectively based on 100 parts by weight of said inorganic pigment.

4,818,784
INSULATING COATING LAYER FOR ELECTRONIC CIRCUIT BOARD, INSULATING COATING MATERIAL FOR ELECTRONIC CIRCUIT BOARD, AND METHOD FOR FORMING INSULATING COATING LAYER FOR ELECTRONIC CIRCUIT BOARD
Teruhiko Iwase, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan
Filed Apr. 22, 1987, Ser. No. 40,998
Claims priority, application Japan, Apr. 28, 1986, 61-99239; Aug. 9, 1986, 61-187159; Oct. 31, 1986, 61-261023
Int. Cl.[4] C08K *5/02*
U.S. Cl. 524—463 15 Claims

1. An insulating coating material for an electronic circuit board consisting essentially of a fluorinated thermoplastic resin and a mixed solvent for dissolving said fluorinated thermoplastic resin, said mixed solvent comprising a main solvent and a secondary solvent, said main solvent comprising 1,1,2-trichloro-1,2,2-trifluoroethane (bp. 47° C.), and said secondary solvent being compatible with and having a higher boiling point than said main solvent.

4,818,785
FINE PARTICULATE CROSSLINKED AMORPHOUS COPOLYMER AND PREPARATION AND USE THEREOF
Yasuhiko Otawa; Tetsuo Tojo; Akira Matsuda, all of Ichihara, and Katsuo Okamoto, Funabashi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
PCT No. PCT/JP86/00192, § 371 Date Dec. 9, 1986, § 102(e) Date Dec. 9, 1986, PCT Pub. No. WO86/06086, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 16, 1986, Ser. No. 948,362
Claims priority, application Japan, Apr. 16, 1985, 60-79231; Jul. 18, 1985, 60-157047; Aug. 26, 1985, 60-185919; Feb. 28, 1986, 61-41954
Int. Cl.[4] C08F *8/00, 6/14, 255/04, 255/06*
U.S. Cl. 524—576 5 Claims

1. A composition consisting of fine particulate crosslinked amorphous copolymer selected from the group consisting of ethylene/α-olefin copolymer and ethylene/α-olefin/polyene copolymer having an average particle diameter of 0.2 to 50 μm and containing hot toluene insolubles of 15% by weight or more.

4,818,786
POLYMER BLEND OF CARBON MONOXIDE/OLEFIN COPOLYMER AND A POLYVINYLIDINE FLUORIDE POLYMER
William P. Gergen, Houston, Tex., and Robert G. Lutz, Santa Rosa, Calif., assignors to Shell Oil Company, Houston, Tex.
Filed Jun. 8, 1988, Ser. No. 203,973
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—55 8 Claims

1. A composition comprising a non-miscible blend of, as a major component, a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and, as a minor component, a polyvinylidine fluoride polymer.

4,818,787
PROCESS FOR PRODUCING POLYVINYL ESTER HAVING A HIGH DEGREE OF POLYMERIZATION AND PROCESS FOR PRODUCING POLYVINYL ALCOHOL HAVING A HIGH DEGREE OF POLYMERIZATION
Toshiaki Sato; Junnosuke Yamauchi, both of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Filed Jun. 16, 1986, Ser. No. 874,663
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—62 14 Claims

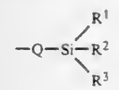
1. A process for producing a polyvinyl ester having a high degree of polymerization indicated by an intrinsic viscosity not less than 1.5 dl/g, said process comprising subjecting a vinyl ester monomer to suspension polymerization at a polymerization temperature not more than 20° C. and not less than −20° C. and at an initial rate of polymerization not more than 10 %/HR and not less than 0.01 %/HR, (the intrinsic viscosity of the polyvinyl ester being defined by the value measured on polyvinyl acetate in acetone solution at 30° C., said polyvinyl acetate being prepared prior to measurements by saponifying the polyvinyl ester and then acetylating the saponified product).

4,818,788
PROCESS FOR PRODUCING POLYVINYL ESTER HAVING A HIGH DEGREE OF POLYMERIZATION AND PROCESS FOR PRODUCING POLYVINYL ALCOHOL HAVING A HIGH DEGREE OF POLYMERIZATION
Toshiaki Sato, Nishinomiya; Ken Yuki; Junnosuke Yamauchi, both of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Filed Jul. 29, 1987, Ser. No. 79,000
Claims priority, application Japan, Aug. 1, 1986, 61-182097
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—62 44 Claims

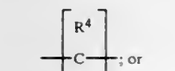
1. A process for producing a polyvinyl ester having a high degree of polymerization and an intrinsic viscosity which is greater than 3.2 dl g^{-1}, said process comprising:
(1) subjecting a vinyl ester monomer to emulsion polymerization under conditions (a), (b), (c) and (d);
wherein:
(a) the medium of the emulsion polymerization is water or a mixture of water and at least one member selected from the group consisting of water-soluble alcohols, water-soluble glycols, water-soluble glycerins, and water-soluble inorganic salts;
(b) said emulsion polymerization is carried out in the presence of an emulsifier which is at least one member selected from the group consisting of nonionic emulsifiers, nonionic-anionic emulsifiers, and anionic emulsifiers;
(c) said emulsion polymerization is carried out in the presence of an initiator, wherein said initiator is (c1) a combination of at least one member selected from the group consisting of hydroperoxides, peroxides, and peracid esters, and at least one member selected from the group consisting of metal ions capable of transferring one electron, or said initiator is (c2) a combination of at least one member selected from the group consisting of hydroperoxides, peroxides, and peracid esters, at least one member selected from the group consisting of metal ions capable of transferring one electron, and at least one member selected from the group consisting of reducing substances; and
(d) said emulsion polymerization is carried out at a temperature of not less than −60° C. and not more than +15° C.; and
(2) obtaining a polyvinyl ester having a high degree of polymerization and an intrinsic viscosity which is greater than 3.2 dl g^{-1} as measured in acetone at 30° C. for a polyvinyl acetate sample obtained by saponification, followed by reacetylation, of said polyvinyl ester.

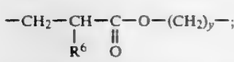
4,818,789
MOISTURE-CURABLE LOW MOLECULAR WEIGHT POLYMERS AND COMPOSITIONS AND COMPOSITES THEREOF
Richard F. Tomko, Homewood, Ill.; William D. Sigworth, Naugatuck, Conn., and Thomas S. Coolbaugh, Arlington, Mass., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.
Division of Ser. No. 905,819, Sep. 10, 1986, Pat. No. 4,759,992. This application May 2, 1988, Ser. No. 189,432
Int. Cl.[4] C08L *51/00*
U.S. Cl. 525—64 15 Claims

1. An amorphous polymer comprising a saturated carbon backbone selected from the group consisting of ethylene/alphaolefin copolymer and ethylene/alphaolefin/nonconjugated polyene terpolymer and which possessed a viscosity index of at least 75 and vinylidene terminal unsaturation, having substituted thereon one or more silane moieties of the formula:



wherein
R^1 is: C_1–C_{12} alkoxy, C_1–C_{12} alkyleneoxy, C_4–C_{12} alkoxyalkoxy, C_5–C_6 cycloalkoxy, C_6–C_9 aryloxy, C_2–C_{13} alkylcarbonyloxy or C_1–C_{12} alkylamino;
R^2 and R^3 are the same or different and are: hydrogen, C_1–C_{12} alkoxy, C_1–C_{12} alkyleneoxy, C_4–C_{12} alkoxyalkoxy, C_5–C_6 cycloalkoxy, C_2–C_{13} alkylcarbonyloxy, C_1–C_{12} alkylamino, C_1–C_{12} alkyl, C_4–C_{12} alkoxyalkyl, C_5–C_6 cycloalkyl or C_7–C_9 aralkyl; and
Q is C_2–C_6 alkenylene, C_5–C_8 cycloalkylene, C_5–C_8 cycloalkenylene or of the formula:


(I)


(II)

wherein j is a whole number between 0 and 6 inclusive; R^4 and R^5 are each independently hydrogen or C_1–C_3 alkyl; R^6 is hydrogen or methyl; and y is an integer between 2 and 5 inclusive; and with the proviso that j can be 0 or 1 only if the saturated carbon backbone had pendent unsaturation prior to being substituted with such silane moiety;
said polymer having a viscosity average molecular weight of between about 500 and about 20,000.

4,818,790
ROOM-TEMPERATURE-CURABLE RESIN COMPOSITION
Masataka Ooka, Nara; Shinichi Kuwamura, Izumi-ohtsu; Hiroshi Ozawa, Izumi-ohtsu, and Hiroshi Ozawa, Izumi-ohtsu, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan
Filed Aug. 28, 1985, Ser. No. 770,059
Claims priority, application Japan, Aug. 31, 1984, 59-180799; Mar. 30, 1985, 60-67725
Int. Cl.[4] C08L *39/00, 33/02*
U.S. Cl. 525—103 12 Claims

1. A room temperature-curable resin composition consisting essentially of (A) an organic solvent solution of a vinyl polymer containing a basic nitrogen atom and having at least one reactive group selected from the group consisting of amine

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groups, carboxyl groups, phosphate ester bonds and mixtures thereof and (B) a compound containing both an epoxy group and a hydrolyzable silyl group in each molecule, said vinyl polymer (A) being a polymer obtained by polymerizing (a-1) at least one vinyl monomer containing at least one tertiary amino group with or without (a-2) another copolymerizable monomer, or a polymer obtained by reacting (a-3 a vinyl polymer containing a carboxylic anhydride group with (a-4) a compound containing both at least one group capable of reacting with the carboxylic anhydride group and at least one tertiary amino group in each molecule, said components (A) and (B) being mixed in such proportions that the proportion of the epoxy group in the component (B) is about 0.2 to 5 equivalents per equivalent of said reactive groups in the component (A).

4,818,791

RESIN COMPOSITION FOR USE IN POWDER PAINT

Haruhiko Murakami, Jakarta; Hirofumi Takeda, Yao, and Hiroshi Sakamoto, Nara, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Apr. 8, 1987, Ser. No. 35,925

Claims priority, application Japan, Apr. 12, 1986, 61-83236; Jan. 3, 1986, 61-127315

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—124 **5 Claims**

1. A resin composition for use in a powder paint, said composition comprising as essential components either

(A) 60 to 96 parts by weight of a polyester resin having an acid number of 5 to 100 mg KOH/g, a hydroxyl number of 5 to 100 mg KOH/g, a softening point of 80° to 150° C. and a number average molecular weight of 1,000 to 10,000,

(B-1) 3 to 40 parts by weight of a vinyl polymer containing both (beta-methyl)glycidyl and hydroxyl groups and having a number average molecular weight of 300 to 8,000, said polymer being obtained from 10 to 95% by weight of at least one (beta-methyl)glycidyl group-containing vinyl monomer selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, beta-methylglycidyl acrylate and beta-methylglycidyl methacrylate, 5 to 60% by weight of a hydroxyl group-containing vinyl monomer and 0 to 85% by weight of another vinyl monomer, and

(C) 1 to 20 parts by weight of a blocked isocyanate; or

(A) 60 to 96 parts by weight of a polyester resin having an acid number of 5 to 100 mg KOH/g, a hydroxyl number of 5 to 100 mg KOH/g, a softening point of 80 to 150° C. and a number average molecular weight of 1,000 to 10,000,

(B-2) 3 to 40 parts by weight of a (beta-methyl)glycidyl group-containing vinyl polymer having a number average molecular weight of 300 to 8,000 and obtained from 10 to 95% by weight of at least one (beta-methyl)glycidyl group-containing vinyl monomer selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, beta-methylglycidyl acrylate and beta-methylglycidyl methacrylate and 5 to 90% by weight of another vinyl monomer copolymerizable with the (beta-methyl)glycidyl group-containing vinyl monomer,

(B-3) 3 to 40 parts by weight of a hydroxyl group-containing vinyl polymer having a number average molecular weight of 300 to 8,000 and obtained from 10 to 95% by weight of a hydroxyl group-containing vinyl monomer and 5 to 90% by weight of another vinyl monomer copolymerizable with the hydroxyl group-containing vinyl monomer, and

(C) 1 to 20 parts by weight of a blocked isocyanate. cyanate.

4,818,792

STABILIZED HIGH SOLIDS LOW TG COPOLYMER NONAQUEOUS DISPERSION FOR CLEAR COAT FINISHES

Glenn E. Martin, Farmington Hills; Timothy D. Salatin, Bloomfield Hills, and Vincent C. Cook, Madison Heights, all of Mich., assignors to BASF Corporation, Clifton, N.J.

Continuation of Ser. No. 728,644, Apr. 29, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 51,254

Int. Cl.[4] C08F *267/02, 267/06;* **C08L** *51/06*

U.S. Cl. 525—286 **18 Claims**

1. A high solids, stable, nonaqueous dispersion in an organic medium, particularly adapted for use as a clear coat automotive finish comprising a copolymerization product of:

(a) monomers whose Tg is abouve about 50° C. selected from the group consisting of acrylic and methacrylic acid and esters thereof, styrene and substituted styrene

and at least two polar monomers whose Tg is up to about 15° C.; and

(b) α, β ethylenically unsaturated

stabilizer copolymers obtained by reacting an α, β ethylenically unsatured oxirane with an acid containing copolymer formed from α, β ethyleneically unsaturated monomers or by reacting an acid containing α, β ethylenically unsaturated monomer with an oxirane containing copolymer, formed from

α, β ethylenically unsaturated monomers, said stabilizer copolymer

(1) having a molecular weight of about 2,000 to about 25,000

(2) soluble in aliphatic solvents; and

(3) having a Tg of about -60° C. to about 0° C.;

such that the copolymerization product is a low Tg copolymer having a Tg between about −10° C. and about 30° C., the resulting dispersion having improved sag resistance when applied to a substrate and improved gloss and distinctness of image when cured to a film.

4,818,793

IMPACT-RESISTANT NYLON MOLDING MATERIALS WHICH ARE LESS SUSCEPTIBLE TO STRESS CRACKING

Hans G. Matthies, Ludwigshafen, and Horst Reimann, Worms, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 782,927, Oct. 2, 1985, abandoned. This application Apr. 17, 1987, Ser. No. 39,763

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436362

Int. Cl.[4] C08L *77/06*

U.S. Cl. 525—183 **2 Claims**

1. An impact-resistant nylon molding material consisting essentially of

A: a linear, thermoplastic, amorphous nylon composed essentially of radicals derived from terephthalic acid, isophthalic acid and alkanediamines of 4 to 20 carbon atoms, said amorphous nylon having a relative viscosity of from 1.4 to 2.5 measured in 1% strength sulfuric acid solution at 23° C., and

B: from 5 to 60% by weight, based on A, of a copolymer of from 70 to 98% by weight of a primary or secondary C_2–C_8-alkyl ester of (meth)acrylic acid, from 1 to 30% by weight of a monomer possessing an acidic functional group or a latent acidic functional group selected from the group consisting of acrylic acid, methacrylic acid, maleic anhydride, tertiary butyl acrylate, tertiary butyl methacrylate and mixtures thereof, and from 1 to 5% by weight of a monomer containing 2 or more olefinic double bonds in the molecule selected from the group consisting of butanediol diacrylate and dicyclopentadienyl acrylate.

4,818,794

SLIGHTLY CROSSLINKED, WATER-SOLUBLE POLYMALEIC ACID, ITS PREPARATION AND ITS USE

Walter Denzinger, Speyer; Heinrich Hartmann, Limburgerhof; Ulrich Goeckel, Boehl-Iggelheim; Felix Richter, Bruehl; Hans-Juergen Raubenheimer, Ketsch, and Ekhard Winkler, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 10, 1987, Ser. No. 94,766

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631814

Int. Cl.[4] C08F *8/12*

U.S. Cl. 525—327.8 **8 Claims**

1. A process for preparing crosslinked water-soluble polymaleic acid containing less than 1% by weight of unpolymerized maleic anhydride consisting of polymerizing maleic anhydride with from 0.1 to 10% by weight, based on maleic anhydride, of a crosslinking agent selected from a diacrylate of dimethacrylate of a dihydric of polyhydric saturated C_2–C_6 alcohol or a diacrylate or dimethacrylate of a polyethylene or polypropylene glycol having a molecular weight of from 250 to 9,000, in an aromatic hydrocarbon at 60° to 200° C., in the presence of from 1 to 20% by weight, based on maleic anhydride, of a peroxyester polymerization initiator derived from a saturated C_4–C_{10} carboxylic acid and then hydrolyzing the polymer.

4,818,795

POLYMALEIC ACID, ITS PREPARATION AND ITS USE

Walter Denzinger, Speyer; Heinrich Hartmann, Limburgerhof; Ulrich Göeckel, Boehl-Iggelheim; Felix Richter, Bruehl; Ekhard Winkler, Mutterstadt, and Hans-Jüergen Raubenheimer, Ketsch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 3, 1987, Ser. No. 92,852

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631815

Int. Cl.[4] C08F *8/12*

U.S. Cl. 525—327.8 **6 Claims**

1. A process for the preparation of polymaleic acid by polymerizing maleic anhydride in an aromatic hydrocarbon at from 60 to 200° C. in the presence of polymerization initiators, and hydrolyzing the polymers, wherein from 1 to 20% by weight, based on maleic anhydride, of peroxyesters derived from saturated or ethylenically unsaturated carboxylic acids are employed as polymerization initiators.

4,818,796

POLYMERS PREPARED BY POLYMERIZING ALPHA, BETA-ETHYLENICALLY UNSATURATED ACIDS AND EPOXY COMPOUNDS

Suryya K. Das, Pittsburgh; Samuel Porter, Jr., Natrona Heights, and Wayne H. Tyger, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 13, 1987, Ser. No. 49,236

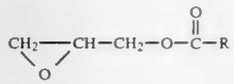
Int. Cl.[4] C08G *59/42*

U.S. Cl. 525—329.5 **7 Claims**

1. A hydroxyl-containing polymer having a hydroxyl number of at least 130 and a weight average molecular weight of less than 15,000 which is curable with a curing agent reactive with active hydrogens in the polymer and which is prepared by heating in the presence of a free radical initiator the following reactive ingredients:

(A) a polymerizable alpha, beta-ethylenically unsaturated carboxylic acid and

(B) an epoxy compound containing at least 5 carbon atoms which is not polymerizable with (A) having the following structure:



where R is a tertiary aliphatic hydrocarbon group of 4 to 26 carbon atoms;

(A) and (B) amounting to at least 80 percent by weight of the reactive ingredients and the equivalent ratio of acid in (A) to epoxy in (B) is at least 1 to 1.

4,818,797

POLYACRYLATE DERIVATIVE

Kenzi Tsuda, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

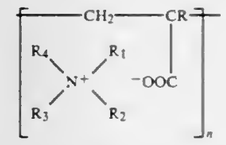
Filed Dec. 30, 1987, Ser. No. 139,474

Claims priority, application Japan, Jan. 10, 1987, 62-3725

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—329.9 **1 Claim**

1. A polyacrylate derivative represented by the formula below:



(where R is a hydrogen atom or methyl group; R_1 to R_4 are groups of which two are methyl groups, one is a benzyl group, and the remaining one is a tetradecyl group or p-1,1,3,3-tetramethylbutylphenoxyethoxyethyl group; and n is a numeral from 200 to 500.)

4,818,798

POLYMER BLEND OF CARBON MONOXIDE/OLEFIN COPOLYMER AND COPOLYESTER ELASTOMER

William P. Gergen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 20, 1988, Ser. No. 208,516

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—539 **11 Claims**

1. A composition comprising a non-miscible blend of, as a major component, a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and, as a minor component, a thermoplastic copolyester elastomer polymer having ether linkages within one recurring segment of the polymer chain.

4,818,799

PROCESS FOR THE IN-REACTOR STABILIZATION OF POLYOLEFINS

Ananda M. Chatterjee, and Robert C. Job, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 13, 1987, Ser. No. 120,254

Int. Cl.[4] C08F *4/52*

U.S. Cl. 526—123 **35 Claims**

1. A process for the in-reactor stabilization of an alpha olefin comprising the steps of sequentially:

adding alpha-olefin monomer into a polymerization reactor;

adding a selectivity control agent and cocatalyst separately, in combination, or reacted together to the polymerization reactor;

adding a procatalyst to the polymerization reactor;

injecting an alkyl-aluminum-antioxidant derived from an OH hindered phenolic antioxidant into the polymerization reactor;

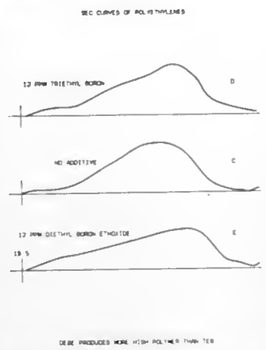
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injecting an acid acceptor into the polymerization reactor; and
polymerizing the monomer.

4,818,800
POLYMERIZATION PROCESS UTILIZING A SILICA-SUPPORTED CHROMIUM OXIDE CATALYST AND BORON-CONTAINING ADJUVANT

Max P. McDaniel, and James N. Short, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 759,984, Jul. 29, 1985, abandoned, which is a division of Ser. No. 613,938, May 25, 1984, abandoned. This application Apr. 15, 1987, Ser. No. 38,386
Int. Cl.[4] C08F *2/14, 4/18, 10/02*
U.S. Cl. 526—106 **15 Claims**



1. A process for the polymerization of at least one aliphatic α-olefin monomer containing 2 to 8 carbon atoms per molecule, wherein said monomer is at least 90 weight percent ethylene which comprises contacting said α-olefin under polymerization conditions with a catalyst system consisting essentially of:

(a) a supported chromium oxide catalyst wherein said support ia a silica-containing support selected from at least one of the group consisting of silica, silica-alumina, coprecipitated silica-titania, coprecipitated silica-alumina-titania, and mixtures thereof, wherein at least a portion of said chromium is hexavalent, and said catalyst (a) contains about 0.1 to 10 percent by weight chromium; and

a boron-component selected from the group consisting of (b) and (b)+(c), employing said boron-component in an amount sufficient to give an atom ratio of boron to chromium within the range of about 0.3:1 to 10:1;

wherein said (b) is a dihydrocarbylboron monohydrocarbyloxide adjuvant R_2BOR and (c) is a trihydrocarbylborane coadjuvant represented BR_3, wherein each R is independently selected from C_1 to C_{15} hydrocarbyl radicals; and said (b)+(c) employs a ratio of $R_2BOR:BR_3$ of about 1:4 to 4:1.

4,818,801
OPHTHALMIC DEVICE COMPRISING A POLYMER OF A TELECHELIC PERFLUOROPOLYETHER

David E. Rice, Oakdale, and Jay V. Ihlenfeld, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 340,473, Jan. 18, 1982, Pat. No. 4,440,918. This application Dec. 13, 1982, Ser. No. 447,605
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.[4] C09F *4/18*
U.S. Cl. 526—247 **29 Claims**

1. A contact lens comprising a polymer of a telechelic perfluoropolyether monomer having a number average molecular weight between about 500 and 15,000 which has the formula

$$Q—W—C_kF_{2k}O—_p—C_qF_{2q}—Z$$

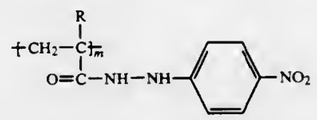
wherein Q is a functional group which will undergo electrophilic, nucleophilic, or free radical reaction; W is a divalent connecting moiety; Z is —WQ or fluorine; p represents the nunber of $—C_kF_{2k}O—$ subunits in said monomer and is an integer of from 3 to 200; q is an integer of from 1 to 4; and k is the same within a given $—C_kF_{2k}O—$ subunit but may vary from $—C_kF_{2k}O—$ subunit to $—C_kF_{2k}O—$ subunit and is an integer of from 1 to 4.

4,818,802
HYDRAZIDE-CONTAINING THERMOPLASTIC POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Sep. 8, 1987, Ser. No. 93,680
Int. Cl.[4] C08F *20/54, 20/02*
U.S. Cl. 526—305 **11 Claims**

1. A thermoplastic polymer which is characterized by a recurring monomeric unit corresponding to the formula:



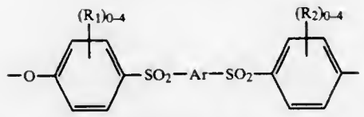
where R is a substituent selected from hydrogen and C_1-C_4 alkyl groups; and m is an integer of at least 3.

4,818,803
POLY(ARYL ETHER SULFONE) COMPOSITIONS HAVING IMPROVED FLOW PROPERTIES

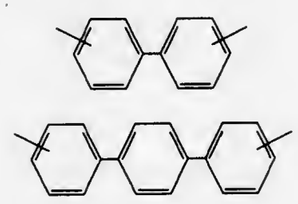
James E. Harris, Piscataway, N.J., assignor to Amoco Corporation, Chicago, Ill.

Filed Jul. 27, 1987, Ser. No. 78,460
Int. Cl.[4] C08G *65/48*; C08L *71/04*
U.S. Cl. 525—390 **10 Claims**

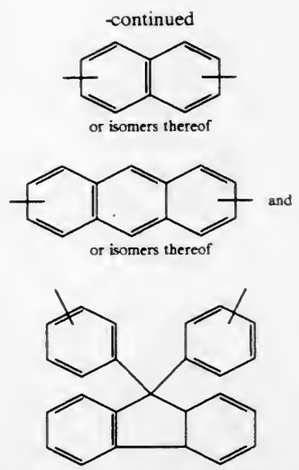
1. A poly(aryl ether sulfone) compositon having improved flow properties comprising a blend of (a) from about 80 to about 99 percent by weight of a poly(aryl ether sulfone) having a second order glass transition temperature (Tg) higher than about 230° C., which consists essentially of units of the formula:



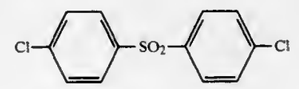
wherein Ar is selected from the group of:



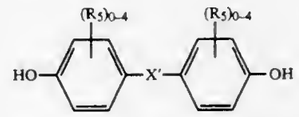
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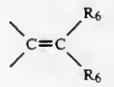
and R_1 and R_2 are C_1 to C_4 alkyl or alkoxy groups and can be the same or different, and (b) from about 1 to about 20 percent by weight of a second poly(aryl ether sulfone) having a Tg below about 230° C., which poly(aryl ether sulphone) is prepared by the nucleophilic polycondensation reaction of:



with bisphenols of the formula:



wherein X' is selected from the group consisting of alkylene and alkylidene radicals having up to and inclusive eight carbon atoms, cyclo-alkylene and cycloalkylidene radicals having up to and inclusive nine carbon atoms, S, CO, and the radicals:



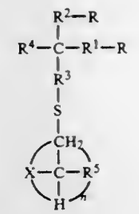
the R_5's are hydrogen or C_1 to C_4 alkyl or alkoxy radicals or halogen atoms and can be the same or different; the R_6's are hydrogen or C_1 to C_4 alkyl radicals or halogen atoms and can be the same or different.

4,818,804
POLYCONDENSABLE MACROMONOMER FROM VINYL MONOMER AND MERCAPTO COMPOUND

Akira Kuriyama, Higashi-Osaka, and Mikiko Yamaguchi, Kyoto, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

Filed Aug. 28, 1987, Ser. No. 90,442
Claims priority, application Japan, Sep. 4, 1986, 61-208949; Sep. 5, 1986, 61-209305
Int. Cl.[4] C08F *222/02, 228/02*
U.S. Cl. 526—211 **5 Claims**

1. A polycondensable macromonomer of the formula:



[I]

wherein R is OH or COOH, R^1, R^2 and R^3 are each a single bond, or R^1, R^2 and R^3 are the same or different and are each an alkylene having 1 to 4 carbon atoms, R^4 is hydrogen atom or an alkyl having 1 to 4 carbon atoms, R^5 is hydrogen atom or methyl, X is an alkyloxycarbonyl having 2 to 15 carbon atoms, a cycloalkyloxycarbonyl having 3 to 7 carbon atoms in the cycloalkyl moiety, or phenyl, and n is an integer of from 1 to 1×10^4.

4,818,805
VULCANIZABLE FLUORINATED SILICONE COMPOSITIONS

Masayuki Ikeno; Masanobu Miyakoshi, and Hiroshi Inomata, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,939
Claims priority, application Japan, Feb. 20, 1987, 62-037653
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 **8 Claims**

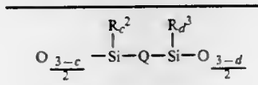
1. A vulcanizable fluorinated silicone composition which comprises a uniform mixture of:

(1) 100 parts by weight of an organopolysiloxane of the following average unit formula

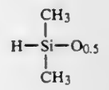
$$(CF_3CH_2CH_2)_aR_b^1SiO_{\frac{4-a-b}{2}}$$

in which R^1 represents a monovalent hydrocarbon group having from 1 to 8 carbon atoms provided that at least 0.05 mole% of a vinyl group and/or an allyl group is contained in the organopolysiloxane, a=0.1 to 1.0, b=2.5 to 1.0, and a+b=1.8 to 3.0;

(2) from 0.1 to 30 parts by weight of an organohydrogenpolysiloxane having at least three SiH groups in one molecule and consisting of the following siloxane units



0.01-33 mole %



0.02-85 mole %

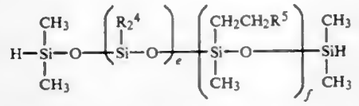
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$(R^5-CH_2CH_2\overset{CH_3}{\underset{|}{}}SiO)$	0–96 mole %
R_2^4SiO	0–90 mole %

in which Q represents a divalent organic group having a molecular weight not larger than 200, R^2, R^3 and R^4 independently represent a monohydrocarbon group having from 1 to 8 carbon atoms, R^5 represents a perfluoroalkyl group having from 1 to 8 carbon atoms, c=0 to 3, d=3 to 0 and c+d=0 to 3;

(3) from 0 to 30 parts by weight of an organopolysiloxane of the following average formula



in which R^4 and R^5 have, respectively, the same meanings as defined above, e=0 to 100, f=100 to 0, and e+f=0 to 100; and

(4) a catalytic amount of a platinum compound.

4,818,806

PROCESS FOR PRODUCING HIGHLY ADHERENT SILICON-CONTAINING POLYAMIC ACID AND CORSSLINKED SILICON-CONTAINING POLYIMIDE

Kouichi Kunimune, Ichiharashi; Yoshiya Kutsuzawa; Hiromi Egawa, both of Yokohamashi, and Shiro Konotsune, Yokosukashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 856,215, Apr. 28, 1986, abandoned. This application Sep. 2, 1987, Ser. No. 93,143

Claims priority, application Japan, May 31, 1985, 60-117959

The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

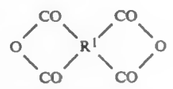
Int. Cl.[4] C08G *77/04*

U.S. Cl. 528—26 **7 Claims**

1. A process for producing a silicon-containing polyamic acid having an inherent viscosity of 0.05 to 5 dl/g as measured in a concentration of 0.5% by weight in a solvent at a temperature of 30±0.01° C., which process comprises either

(a) reacting at least a part of A moles of a tetracarboxylic acid dianhydride expressed by the following formula (1) with B mols of a diamine expressed by the following formula (2), then adding to the resulting reaction product or mixture, C mols of an aminosilicon compound expressed by the following formula (3), and any remainder of the A moles of the same tetracarboxylic acid dianhydride, and reacting the resulting mixture, or

(b) reacting A mols of a tetracarboxylic acid dianhydride expressed by the following formula (1) with a mixture of B mols of a diamine expressed by the following formula (2) and C mols of an aminosilicon compound expressed by the formula (3), wherein the moles A, B and C satisfy the following expressions (4) and (5):

 (1)

$$NH_2-R^2-NH_2 \quad (2)$$

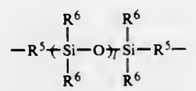
$$NH_2-R^3-SiR^4_{3-k}X_k \quad (3)$$

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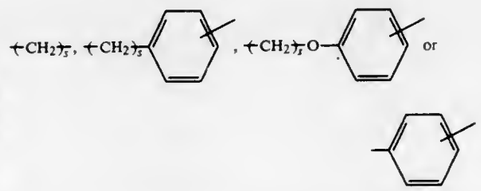
$$1 \leqq \frac{C}{A-B} \leqq 1.8 \quad (4)$$

$$0.1 \leqq \frac{C}{B+C} \quad (5)$$

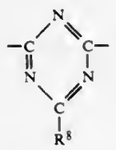
wherein R^1 represents a tetravalent carbocyclic aromatic group; R^2 represents a divalent group selected from the group consisting of (a) an aliphatic group of 2 to 12 carbon atoms, (b) an alicyclic group of 4 to 30 carbon atoms, (c) an aromatic aliphatic group of 6 to 30 carbon atoms, (d) a carbocyclic aromatic group of 6 to 30 carbon atoms, (e) a polysiloxane group expressed by the formula (6)

 (6)

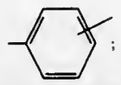
wherein each R^5 independently represents



wherein s represents an integer of 1 to 4, each R^6 independently represents an alkyl group of 1 to 6 carbon atoms, a phenyl group or an alkyl-substituted phenyl group of 7 to 12 carbon atoms, and l represents a value of $1 \leqq l \leqq 100$, and (f) a group expressed by the formula



wherein R^8 represents an aliphatic group or an aromatic aliphatic group each of 8 carbon atoms or less, or a hydrogen atom; R^3 represents

 ;

each R^4 independently represents an alkyl group of 1 to 6 carbon atoms, a phenyl group or an alkyl-substituted phenyl group of 7 to 12 carbon atoms; each X independently represents an alkoxy group, an acetoxy group or a halogen atom; and k is a value of $1 \leqq k \leqq 3$.

4,818,807

LIQUID-CRYSTALLINE POLYMER

Kazuharu Morita; Shunji Uchida, and Satoshi Hachiya, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

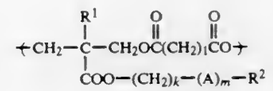
Filed Sep. 3, 1987, Ser. No. 92,612

Claims priority, application Japan, Sep. 4, 1986, 61-206851; Jul. 13, 1987, 62-173025; Jul. 20, 1987, 62-179139

Int. Cl.[4] C08G *63/06*

U.S. Cl. 528—191 **14 Claims**

1. A liquid-crystalline polymer comprising repeating units of the following general formula



wherein:

R^1 is —H, —CH_3 or —C_2H_5,

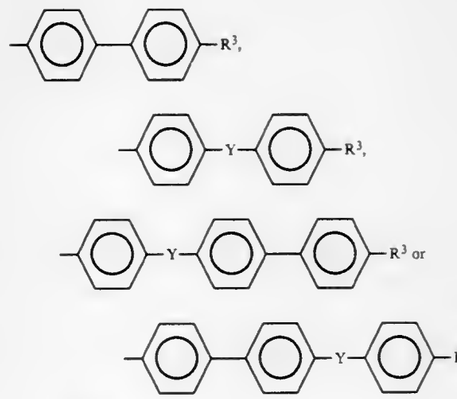
l is an integer having a value of 1 to 20,

k is an integer having a value of 1 to 30,

A is —O— (oxygen) or —COO—,

m is 0 or 1, and

R^2 is



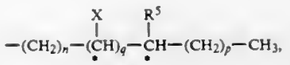
wherein

Y is —COO— or —OCO—,

and R^3 is —$COOR^4$, —$OCOR^4$, —OR^4, —COR^4 or —R^4

where

R^4 is



R^5 being —CH_3, —CN or a halogen radical, n and p being independently an integer having a value of 0 to 10 with the proviso that if R^5 is —CH_3, p is not 0, X being a halogen radical, q being 0 or 1, and C* being an asymmetric carbon atom.

4,818,808

PROCESS FOR PRODUCING POLYESTERS USING A NIOBIUM COMPOUND AS A CATALYST

Toshihiro Kushimoto, Osaka; Yoshimichi Ozawa, and Nobuo Izawa, both of Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo and Research Association for Synthetic Fiber Technology, Osaka, both of, Japan

Filed Mar. 24, 1988, Ser. No. 173,188

Claims priority, application Japan, Apr. 22, 1987, 62-99257; Aug. 24, 1987, 62209573; Dec. 24, 1987, 62-327947

Int. Cl.[4] C08G *63/04*

U.S. Cl. 528—275 **15 Claims**

1. A process for producing a linear polyester comprising a main structural unit of an aromatic dicarboxylic acid ester of an alkylene glycol through polycondensation by a deglycol reaction of a bis alkylene glycol ester of the aromatic dicarboxylic acid, wherein a niobic acid obtained by heat-treating a hydrated niobium compound at the temperature range between 80° C. and 400° C. is used as a catalyst for the polycondensation.

4,818,809

AROMATIC SULFIDE AMIDE POLYMER AND A PROCESS FOR THE PRODUCTION THEREOF

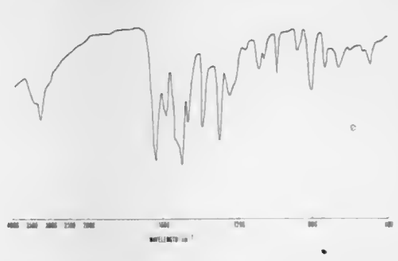
Tomohiro Ishikawa, and Yozo Kondo, both of Yokkaichi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Sep. 14, 1987, Ser. No. 95,670

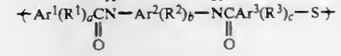
Claims priority, application Japan, Sep. 26, 1986, 61-226060

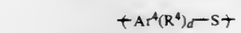
Int. Cl.[4] C08G *63/68, 75/00*

U.S. Cl. 528—364 **13 Claims**



1. Aromatic sulfide amide polymer, of which 1–100% by mole of the composing units consists of a repeating unit having the formula (I) below and 99–0% by mole of the composing units consists of a repeating unit having the formula (II) below, having an inherent viscosity ranging from 0.02 to 10 dl/g when measured in a N-methyl-2-pyrrolidone/lithium chloride, in a ratio of 95/5 by weight, solvent in a concentration of 0.1 g/dl at 30° C. or when measured in a chloronaphthalene solvent in a concentration of 0.1 g/dl at 210° C.,

 (I)

 (II)

wherein, Ar^1, Ar^2, Ar^3 and Ar^4 are the same or different aromatic rings and R^1, R^2, R^3 and R^4 are groups selected from the group consisting of alkyl groups having 1–20 carbon atoms, cycloalkyl groups having 3–20 carbon atoms, aryl groups having 6–20 carbon atoms, alkoxy groups having 1–20 carbon atoms, acyl groups having 2–20 carbon atoms, and aralkyl groups having 7–20 carbon atoms, and the four R's are the same or different from each other, and a, b, c and d represent

integers from 0–4 and are the same or different from each other.

4,818,810

CATALYTIC PROCESS FOR THE PREPARATION OF POLYKETONES FROM CARBON MONOXIDE AND ETHYLENICALLY UNSATURATED HYDROCARBON

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

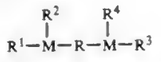
Filed Oct. 2, 1985, Ser. No. 782,787

Claims priority, application Netherlands, Oct. 5, 1984, 8403035

Int. Cl.⁴ C08G *67/02*

U.S. Cl. 528—392 **10 Claims**

1. In a process for the preparation of a polyketone by contacting CO and an alkenically unsaturated hydrocarbon in the presence of a Group VIII metal catalyst, the improvement which comprises contacting the CO and the alkenically unsaturated hydrocarbon in the presence of a catalyst comprising a Group VIII metal complex containing bidentate ligands, the Group VIII metal selected from the group consisting of palladium, cobalt, and nickel, the ligands comprising hydrocarbon groups bonded to a Group Va element selected from the group consisting of phosphorus, arsenic, and antimony, wherein the catalyst is a complex compound that is obtained by reacting (1) a palladium, cobalt or nickel compound, (2) a bidentate ligand of the general formula



in which M is a group Va element selected from the group consisting of phosphorus, arsenic, and antimony, R^1, R^2, R^3, and R^4 are identical or different hydrocarbon groups, R represents a divalent organic bridging group having at least two carbon atoms in the bridge, wherein the carbon atoms of the bridging group R do not contain substituents that would sterically hinder formation of the complex compound, and (3) an anion of a carboxylic acid having a pKa of less than 2.

4,818,811

TERPOLYMER OF CARBON MONOXIDE AND ETHYLENICALLY UNSATURATED MONOMERS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

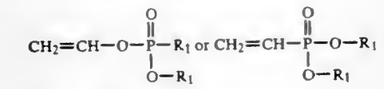
Filed Aug. 26, 1987, Ser. No. 89,374

Claims priority, application Netherlands, Oct. 30, 1986, 8602733

Int. Cl.⁴ C08G *67/02*

U.S. Cl. 528—392 **16 Claims**

1. In the process of producing linear alternating terpolymers of carbon monoxide and two ethylenically unsaturated compounds under polymerization conditions in the presence of a catalyst formed from a palladium compound, the anion of a non-hydrohalogenic acid having a pKa less than about 4 and a bidentate ligand of phosphorus or nitrogen, the improvement wherein the two ethylenically unsaturated compounds are a hydrocarbyl α-olefin of from 2 to 20 carbon atoms inclusive and a hydrocarbyl vinyl compound of from 3 to 30 carbon atoms inclusive selected from vinyl ether, vinyl amide or vinyl phosphonate of the formula



wherein R_1 is alkyl or aryl.

4,818,812

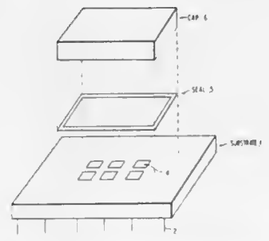
SEALANT FOR INTEGRATED CIRCUIT MODULES, POLYESTER SUITABLE THEREFOR AND PREPARATION OF POLYESTER

James Economy, San Jose, Calif.; John R. Susko, Owego, N.Y.; Willi Volksen, San Jose, Calif., and Robin A. Wheater, Owego, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,387

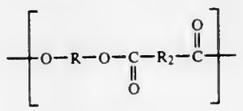
Int. Cl.⁴ C08G *63/02*

U.S. Cl. 528—176 **27 Claims**

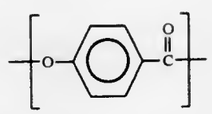


1. An integrated circuit module including a substrate having electrically-conductive pins protruding therefrom having at least one integrated circuit chip attached to the top side of the substrate, a cap covering said at least one integrated circuit chip, wherein said cap is sealed to said substrate by a thermotropic liquid crystalline polyester having low permeability towards moisture and having about 25 to about 100 mole percent of recurring Units I, and 0 to about 75 mole percent of recurring Units II wherein

I



II



wherein each R and R_2, individually, is arylene; cycloalkylene; alkylene; alkylidene; or arylene substituted with a group selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, alkoxy, or halo; or mixtures thereof.

4,818,813

COMPLEXES OF TECHNETIUM 99M WITH PROPYLENE AMINE OXIMES

David P. Nowotnik, and Lewis R. Canning, both of Bucks, England, assignors to Amersham International plc., Bucks, England

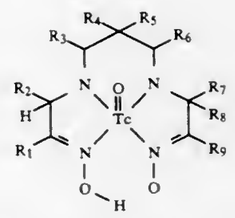
Continuation of Ser. No. 791,995, Oct. 23, 1985, abandoned. This application Nov. 18, 1987, Ser. No. 122,507

Claims priority, application United Kingdom, Oct. 24, 1984, 8426845

Int. Cl.⁴ A61K *49/02*; C07C *131/00*; C07D *295/12*; C07F *13/00*

U.S. Cl. 534—14 **2 Claims**

2. A complex of Technetium-99m with a propylene amine oxime, which complex has the formula



wherein each of R_1, R_2, R_7, R_8 and R_9 is C_1 to C_4 alkyl, R_3 and R_6 are H, and R_4 and R_5 are H or methyl.

4,818,814

WATER-SOLUBLE DISAZO COMPOUNDS CONTAINING THE 1-AMINO-8-HYDROXY-3,6-DISULFO-NAPHTHALENE MOIETY AS A BIVALENT COUPLING COMPONENT AND AN ANILINE OR NAPHTHYLAMINE COMPOUND HAVING A FIBER-REACTIVE GROUP, AND A 2-SULFO-5-ACYLAMINO-ANILINE

Ludwig Schläfer, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

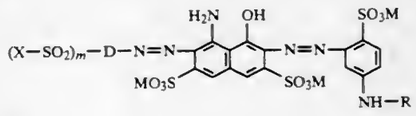
Filed Oct. 14, 1986, Ser. No. 918,530

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536688

Int. Cl.⁴ C09B *62/513, 62/533, 62/67*; D06P *1/384*

U.S. Cl. 534—642 **10 Claims**

1. A water-soluble disazo compound conforming to the formula



in which:

D is a benzene ring, unsubstituted or substituted by chlorine, bromine, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxy, or D is a naphthalene ring unsubstituted or substituted by sulfo;

X is vinyl or β-sulfatoethyl;

R is 3-(β-chloroethylsulfonylbenzoyl), 4-(β-chloroethylsulfonyl)-benzoyl, 3-(β-chloroethylsulfonylmethyl)-benzoyl, 4-(β-chloroethylsulfonylmethyl)-benzoyl, 3-(N-methyl-N-β-chloroethylsulfonyl)-aminobenzoyl or 4-(N-methyl-N-β-chloroethylsulfonyl)-aminobenzoyl, or 4-(β-chloroethylsulfonyl)-cinnamoyl;

M is hydrogen or an alkali metal;

m is the number 1 or 2.

4,818,815

CATIONIC 1,2,3-THIADIAZOLE-AZO-ANILINE OR TETRAHYDROQUINOLINE COMPOUNDS

Peter Moser, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

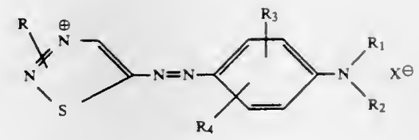
Filed Jul. 17, 1986, Ser. No. 886,500

Claims priority, application Switzerland, Jul. 26, 1985, 3241/85

Int. Cl.⁴ C09B *29/048, 44/20, 69/06*; D06P *1/41*

U.S. Cl. 534—607 **3 Claims**

1. A 1,2,3-thiadiazole-azo compound of the formula



wherein

$X^{\ominus}$ is an anion

R is C_1–C_4 alkyl,

each of R_1 and R_2 independently of the other is C_1–C_4 alkyl, or R_1 together with R_3 in ortho-position to the amino group and with the benzene ring form a tetrahydroquinoline ring which is unsubstituted or substituted by 1 to 4 methyl groups,

R_3 is hydrogen or together with R_1 is the tetrahydroquinoline radical as defined above, and

R_4 is hydrogen.

4,818,816

PROCESS FOR THE ORGANIC SYNTHESIS OF OLIGOSACCHARIDES AND DERIVATIVES THEREOF

Maurice Petitou, Paris; Jean-Claude Jacquinet; Pierre Sinay, both of Orleans la Source; Jean Choay, Paris; Jean-Claude Lormeau, Maromme, all of France, and Mahmoud Nassr, Alexandria, Egypt, assignors to Choay, S.A., Paris, France

Continuation of Ser. No. 457,931, Jan. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 451,615, Dec. 20, 1982, Pat. No. 4,607,025. This application Oct. 26, 1987, Ser. No. 115,593

Claims priority, application France, Apr. 28, 1981, 81 08472; Jan. 15, 1982, 82 00621; Feb. 1, 1982, 82 01675; Feb. 16, 1982, 82 02526; May 28, 1982, 82 09392; Jun. 22, 1982, 82 10892; Jun. 22, 1982, 82 10891; Jul. 2, 1982, 82 11679; Aug. 6, 1982, 82 13804; Sep. 20, 1982, 82 15803; Sep. 20, 1982, 82 15804; Oct. 27, 1982, 82 18003

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.⁴ C07H *5/04, 11/04, 11/00, 1/00*

U.S. Cl. 536—55.2 **61 Claims**

1. A process for synthesizing a mucopolysaccharide condensation product having from 2–12 saccharides which process comprises condensing a first protected saccharide with a second protected saccharide to form a condensation product having a 1–4 alpha linkage between the first protected saccharide and the second protected saccharide,

wherein the first protected saccharide is selected from the group consisting of a D-glucosamine unit and an oligosaccharide comprised of alternating D-glucosamine and uronic acid units linked in the manner found in heparin and having a terminal D-glucosamine at the reducing end, and

wherein the second protected saccharide is selected from the group consisting of a uronic acid unit and an oligosaccharide comprised of alternating D-glucosamine and uronic acid units linked in the manner found in heparin and having a terminal uronic acid at the non-reducing end, further

wherein any uronic acid unit is selected from the group consisting of D-glucuronic acid and L-iduronic acid and further

wherein any D-glucosamine units have nitrogen containing groups at carbon 2, which nitrogen containing groups can be treated to form an amine.

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4,818,817
ENZYMATIC DEGRADATION OF LIPOPOLYSACCHARIDE BIOEMULSIFIERS
Yuval Shoham, Kibbutz Einat; Eugene Rosenberg, Raanana, and David L. Gutnick, Sharon Tichon, all of Israel, assignors to Petroleum Fermentations N.V., Willemstad, Netherlands Antilles
Division of Ser. No. 557,010, Nov. 30, 1983, Pat. No. 4,704,360. This application May 15, 1987, Ser. No. 62,664
Int. Cl.[4] C12N 9/24; B01F 17/30
U.S. Cl. 536—1.1 **16 Claims**

1. Lipo-oligosaccharide fragments of an emulsan, said fragments having a molecular weight ranging from about 1,000 to about 10,000 daltons as measured by gel chromatography, and a molar ratio of ester groups to reducing sugar groups ranging from about 1.4 to about 2.0.

2. Lipo-oligosaccharide fragments of an emulsan, said fragments having a molecular weight ranging from about 1,000 to about 10,000 daltons as measured by gel chromatography and a molar ratio of ester groups to reducing sugar groups ranging from about 1.4 to about 2.0, produced by the action of a microbial enzyme on an emulsan selected from the group consisting of α-emulsan, β-emulsan, ψ-emulsan, apo-α-emulsan, apo-β-emulsan and apo-ψ-emulsan, said enzyme being capable of selectively recognizing a poly-[D-galactosamine/aminouronic acid]-saccharide backbone of an emulsan bioemulsifier and cleaving glycosidic bonds in the emulsan bioemulsifier in at least one nonterminal position to yield lipohetero-oligosaccharide fragments having discrete molecular weight, generally ranging from about 1,000 to about 60,000 daltons, said enzyme having activity in a pH range from about pH 5.5 to about pH 9.5 at a temperature range from about 5° C. to about 60° C., and having a molecular weight of around 89,000 daltons as measured by gel filtration chromatography, and being obtained from bacterial strain YUV-1 having accession number NRRL B-15617.

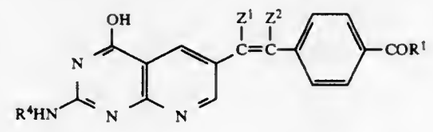
6. A method for preventing bacterial adhesion to a hydrophobic surface comprising applying to said hydrophobic surface a prophylactically-effective amount of the lipo-oligosaccharide fragments of claim 1 or 2.

4,818,818
METHOD FOR THE PREPARATION OF 4'-0-TETRAHYDROPYRANYLADRIAMYCIN B
Hamao Umezawa, deceased, late of Tokyo, Japan (by Mieko Umezawa, Kazao Umezawa, Yoji Umezawa, heirs); Tomio Takeuchi, Tokyo, Japan; Kuniaki Tatsuta, Tokyo, Japan, and Yoshikazu Takahashi, Tokyo, Japan, assignors to Zaidanhojin Biseibutsu Kagaku Kenkyukai, Tokyo, Japan
Filed Oct. 30, 1986, Ser. No. 925,774
Claims priority, application Japan, Nov. 16, 1985, 60-257251
Int. Cl.[4] C07H 15/24
U.S. Cl. 536—6.4 **8 Claims**

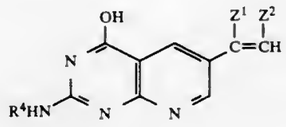
1. A process for the preparation of 4'-O-tetrahydropyranyladriamycin b, comprising reacting adriamycin and phenylboronic acid to form a 9,14-hydroxyl-protected adriamycin, reacting the thus obtained compound with 3,4-dihydro-2H-pyran for 4'-tetrahydropyranylation of the said 9,14-protected adriamycin, and then, deprotecting the 9,14-protected position of the resulting product and isolating 4'-O-tetrahydropyranyladriamycin b by chromatography with silica-gel.

4,818,819
PROCESS FOR THE PREPARATION OF FUSED PYRIDINE COMPOUNDS
Edward C. Taylor, Princeton, and George S. K. Wong, Fort Lee, both of N.J., assignors to The Trustees of Princeton University, Princeton, N.J.
Filed Oct. 20, 1986, Ser. No. 922,511
Int. Cl.[4] C07D 471/04
U.S. Cl. 544—279 **18 Claims**

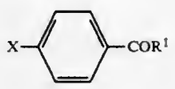
1. In the process of preparing a compound of the formula:



wherein
R^1 is —NHCH($COOR^2$)$CH_2CH_2COOR^2$ or OR^2;
R^2 is hydrogen or a carboxylic acid protecting group;
R^4 is hydrogen or an amino protecting group;
Z^1 when taken independently of Z^2 is hydrogen; and
Z^2 when taken independently of Z^1 is hydrogen, methyl or ethyl; or
Z^1 and Z^2 when taken together are a carbon-carbon bond;
the steps of allowing an unsaturated compound of the formula:

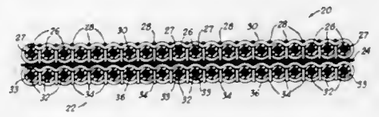


wherein
R^4, Z^1 and Z^2 are as defined above,
to react with a haloaromatic compound of the formula:



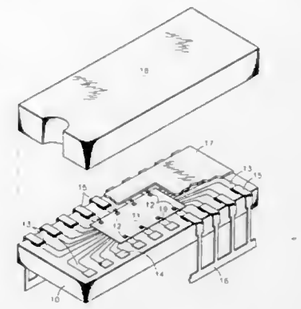
wherein
R^1 and R^2 are as defined aboved and
X is bromo or iodo,
in the presence of a palladium catalyst and in the presence or absence of an inert polar solvent.

4,818,820
TRANSMISSION SYSTEM
Gary J. LaRock, Middlebury, Vt., assignor to Joslyn Corporation, Chicago, Ill.
Filed Apr. 13, 1987, Ser. No. 37,543
Int. Cl.[4] H01B 7/08, 7/34
U.S. Cl. 174—36 **4 Claims**



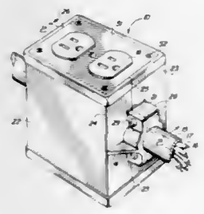
1. A cable transmission system comprising:
a first plurality of individual conductors;
a second plurality of individual conductors;
an insulating layer surrounding each of said individual conductors;
means for determining the characteristic impedance of said conductors, said characteristic impedance determining means including in combination an electrically conductive shield member, a first woven web structure and a second woven web structure, the individual conductors of said first plurality of individual conductors being supported by said first web structure in a fixed, predetermined spaced relationship with respect to each other and the individual conductors of said second plurality of individual conductors being supported by said second web structure in a fixed, predetermined spaced relationship with respect to each other, said shield member being disposed between said first and second web structures, said shield member having a width substantially equal to a width of said first and second plurality of individual conductors to thereby determine the characteristic impedance between said first and second plurality of individual conductors and between said first and second plurality of individual conductors and said shield member.

4,818,821
BRAZED LEADED PACKAGE
Robert M. Wentworth, Phoenix, and Brian Webb, Mesa, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Mar. 30, 1988, Ser. No. 175,450
Int. Cl.[4] H01L 23/10
U.S. Cl. 174—52.4 **4 Claims**



1. A brazed leaded semiconductor package having buried brazed junctions comprising:
a heat conductive support having an area for receiving a semiconductor integrated circuit, and also having a top side and lateral sides; a plurality of interconnecting leads located on the top side of the heat conductive support and having termination pads on the top side; a semiconductor integrated circuit mounted in the area of the heat conductive support for receiving the semiconductor integrated circuit and being electrically connected to the plurality of interconnecting leads; a plurality of formed leads brazed to the termination pads and extending beyond the heat conductive support; and a cover placed on the top side and sealed to the heat conductive support to provide a hermetic seal of the termination pads.

4,818,822
JUNCTION BOX
Norman J. Yahraus, 2240 Lindell Rd., Las Vegas, Nev. 89102
Filed Nov. 4, 1987, Ser. No. 116,904
Int. Cl.[4] H02G 3/08
U.S. Cl. 174—53 **9 Claims**



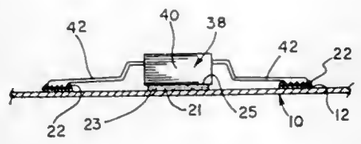
1. An electrical junction box of generally rectangular shape having opposed side and end walls, an open top and bottom side, with at least one end wall thereof provided with a projection extending outwardly from said end wall and having an opening to the interior of said box to accommodate a power cable comprising in combination:
a pair of interlocking sections each of which includes a side wall, a pair of opposed end walls perpendicular to said side wall with one of said end walls being shorter in length than the other opposed end wall;
a clamping member formed in the shorter end wall of one section and in the longer end wall of the other section, each of said clamping members being integral with and extending a distance from the exterior sides of said section end walls and each having curved interior walls;
said sections being assembled together to form said box by joining the shorter end wall of one section with the longer end wall of the other section with said clamping members joined to form said projection;
said assembled box being such that if a plane is passed through the longitudinal axis thereof and perpendicular to a bottom side, said plane will not coincide with the joints formed by assembly of said sections;
said open top and bottom sides being adapted to receive an electrical device to be connected to a power cable.

4,818,823
ADHESIVE COMPONENT MEANS FOR ATTACHING ELECTRICAL COMPONENTS TO CONDUCTORS
Robert F. Bradley, New Buffalo, Mich., assignor to Micro-Circuits, Inc., New Buffalo, Mich.
Filed Jul. 6, 1987, Ser. No. 70,343
Int. Cl.[4] H05K 1/18
U.S. Cl. 174—68.5 **3 Claims**

1. In combination, an adhesive member and a contact enhancing material for cold forming an electrical and mechanical connection between an electrical component having a body and conductive lead and a printed circuit board having a conductive pad, said conductive lead of said electrical component contacting conductive pad of said printed circuit board, said contact enhancing material located between said pad and said lead, said adhesive member located between said printed circuit board and said electrical component body to mechanically

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connect said electrical component to said printed circuit board, said adhesive member being a resilient strip having an adhesive



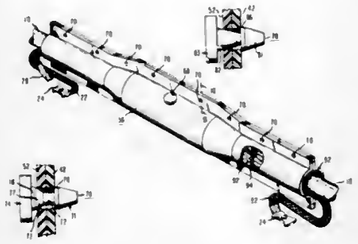
coating on at least one side, said contact enhancing material being a flowable metal-pigmented corrosion resistant material carried by said lead.

4,818,824

CLOSURE FOR AERIAL TELEPHONE CABLE SPLICES

Mayankkumar M. Dixit, Basking Ridge, and Charles Tanzola, Chester, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 19, 1987, Ser. No. 87,122
Int. Cl.[4] H02G *15/113, 7/06, 15/18;* **F16B** *19/00*
U.S. Cl. 174—92 **8 Claims**



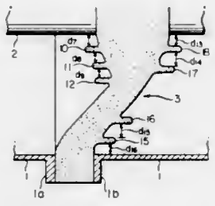
1. Apparatus enclosing splices in a cable comprising:
a body shaped to form a longitudinal cavity enclosing the splices including a first half and a second half,
each body half having a first longitudinal edge and a second longitudinal edge,
the first longitudinal edges of said first and second halves being joined along their lengths;
a tab member of nonuniform thickness formed along the second longitudinal edge of each of said first and second halves, the tab members of nonuniform thickness including a plurality of substantially aligned apertures, and
means for securing the nonuniform thickness tab member along the second longitudinal edge of the first half to the nonuniform thickness tab member along the second longitudinal edge of the second half through said apertures in clamped relationship,
said securing means including a device for penetrating through each aperture comprising
a cylindrical section of a first diameter exceeding the aperture diameter with an end for contacting the tab member of the second longitudinal edge of the first half and a tapered section axially aligned with said cylindrical section having one end of a diameter smaller than the aperture diameter facing the first diameter cylindrical section and another end having a diameter exceeding the aperture diameter defining a predetermined taper angle, said tapered section being axially located to contact the tab member of the second longitudinal edge of the second half all along the periphery of the aperture at the predetermined angle of taper to urge the tab members of the second longitudinal edges of the first and second halves into tight contact.

4,818,825

INSULATING SPACERS FOR USE IN GAS-INSULATED ELECTRIC APPARATUS

Toshio Ishikawa, and Tokio Yamagiwa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,252
Claims priority, application Japan, Nov. 11, 1986, 61-266670
Int. Cl.[4] H01B *17/42, 17/18;* **H02G** *5/06*
U.S. Cl. 174—212 **10 Claims**



1. An insulating spacer having a plurality of fins for use in a gas-insulated electric apparatus in which a high-tension electric conductor inserted through a metallic pipe enclosing an insulating gas is to be supported by said insulating spacer, the improvement in that fin intervals between the end of the insulating spacer which is to be positioned adjacent to said metallic pipe and the fin adjacent thereto, between adjacent ones of said fins, and between the part of the insulating spacer which is to contact said high-tension electric conductor and the fin adjacent thereto are formed in a manner so that one of said fin intervals formed at a position where a creeping component electric field is high is made narrower than another one of said fin intervals formed at a position where a creeping component electric field is lower than that in the first-mentioned position, and in which said fins are formed only at positions on said insulating spacer where the creeping electric field is high, and one of said fin intervals formed at a portion where a creeping component electric field is high is made narrower than another one of said fin intervals formed at a portion where the creeping component electric field is lower than that in the first-mentioned portion.

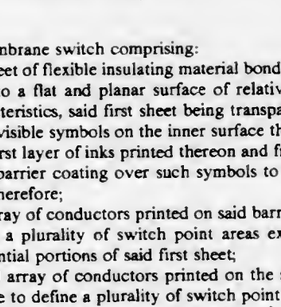
4,818,826

COORDINATE INPUT APPARATUS INCLUDING A DETECTION CIRCUIT TO DETERMINE PROPER STYLUS POSITION

Kiyoshi Kimura, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 25, 1987, Ser. No. 89,670
Claims priority, application Japan, Sep. 19, 1986, 61-219755
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 **4 Claims**

1. A coordinate input apparatus wherein scanning signals are sequentially supplied to a plurality of conductors embeded in an input plane with a parallel arrangement and a coordinate position on the input plane is detected on the basis of a signal detected by a coordinate pointing tool for arbitrarily pointing out a position on the input plane, characterized by comprising:
means for detecting proximity of the coordinate pointing tool when the coordinate pointing tool is positioned in close vicinity to the input plane and for performing a coordinate detecting operation when absolute values of an output signal detected from said conductors twice exceed



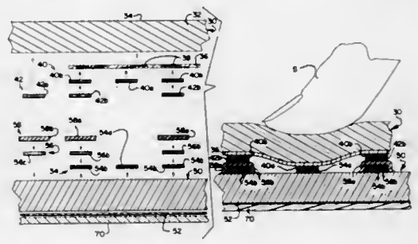
a predetermined output level during a single scanning operation.

4,818,827

LOW FORCE MEMBRANE SWITCH

Ralph G. Ipciaski, Hollis, N.H., and Douglas M. Odom, Phoenix, Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 7, 1988, Ser. No. 178,666
Int. Cl.[4] H01H *13/70, 11/00;* **B05D** *5/12*
U.S. Cl. 200—5 A **12 Claims**



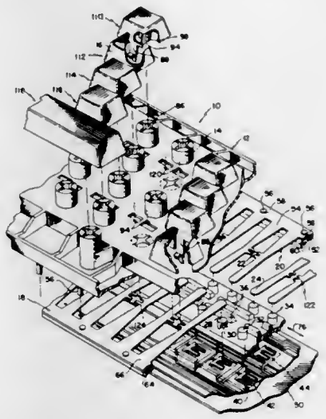
1. A membrane switch comprising:
a first sheet of flexible insulating material bonded in selected areas to a flat and planar surface of relatively inflexible characteristics, said first sheet being transparent and carrying visible symbols on the inner surface thereof formed by a first layer of inks printed thereon and further including a barrier coating over such symbols to provide contrast therefore;
a first array of conductors printed on said barrier coating to define a plurality of switch point areas extending over substantial portions of said first sheet;
a second array of conductors printed on the said inflexible surface to define a plurality of switch point areas extending over substantial portions thereof;
means connecting said first and second arrays of conductors to respective voltage sources; and
spacer means formed by printing an array of spaced apart dots of a dielectric and insulating coating on top of at least one of the arrays of conductors in said defined switch point areas to hold said switch point areas normally apart until pressure is placed thereupon to deform said first sheet and effect a switch closure between corresponding switch point areas of said arrays, the switch required a relatively low pressure to effect closure.

4,818,828

ELECTRONIC KEYBOARD

Charles M. Curley, Ithaca, and Scott J. Longrod, Lansing, both of N.Y., assignors to Smith Corona Corporation, Cortland, N.Y.

Filed Jun. 17, 1988, Ser. No. 209,164
Int. Cl.[4] H01H *13/70;* **G06C** *7/02;* **G06F** *3/02*
U.S. Cl. 200—5 A **6 Claims**



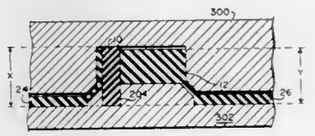
1. A keyboard assembly, comprising:
a main frame;
a plurality of keybuttons supported on the main frame for full travel movement between a rest position and a depressed position, the keybuttons being arranged in at least two rows;
switch contact means for each keybutton mounted on the main frame and being arranged in at least one row;
a spring finger for each keybutton having one end rigidly mounted on the main frame; and
the two rows of keybuttons contact the spring fingers at a location forming one row substantially parallel to the row of the switch contact means for moving the spring fingers to actuate the switch contact means responsive to depression of the keybuttons to provide keyboard outputs.

4,818,829

INTEGRALLY MOLDED COMPOSITES OF SILICONE RUBBER

Leroy N. Nopper, Irvine, and Meryl E. Miller, Rancho Palos Verdes, both of Calif., assignors to Duralith Corporation, Millville, N.J.

Filed Jul. 9, 1987, Ser. No. 71,410
Int. Cl.[4] H01H *13/70;* **B20C** *17/22*
U.S. Cl. 200—512 **24 Claims**



1. A method of manufacturing an integrally molded composite comprising the steps of:
(a) placing a preformed elastomer in a mold cavity;
(b) compressing the preformed elastomer between opposing wall portions of the mold cavity;
(c)flowing an elastomer into the mold cavity and about the

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preformed elastomer under pressure such that the preformed elastomer is not displaced from its position in the mold.

4,818,830

PUSHPIECE MECHANISM FOR A TIMEPIECE

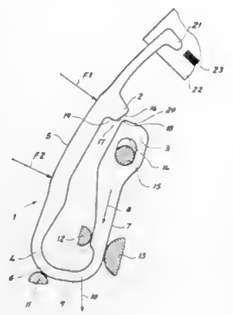
Alphonse Bron, Bassecourt, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Grange, Switzerland

Filed Apr. 1, 1987, Ser. No. 32,802

Claims priority, application Switzerland, Apr. 9, 1986, 1389/86

Int. Cl.⁴ H01H *3/12;* **G04C** *9/00*

U.S. Cl. 200—341 **8 Claims**



1. A control mechanism for a chronograph including a pushpiece movable in response to an applied force from a first rest position to a second pushed-in position, and a pushpiece return means for returning the pushpiece from the pushed-in position to the rest position, wherein said pushpiece return means comprises two bearing elements arranged to cooperate with one another when a force is applied to said pushpiece, one of said bearing elements being arranged to bear against the other so that a force applied to the pushpiece to move said pushpiece from said rest position to said pushed-in position passes through a maximum at an intermediate position between said rest position and said pushed-in position, the maximum force occurring after said bearing elements bear against each other, and an elastic member, said bearing elements and said elastic member being formed as a single piece.

4,818,831

AMPHOTERIC CERAMIC MICROWAVE HEATING SUSCEPTOR

Jonathan Seaborne, Corcoran, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Jun. 25, 1987, Ser. No. 66,376

Int. Cl.⁴ H05B *6/80*

U.S. Cl. 219—10.55 E **20 Claims**

1. A package article for food to be heated by microwave energy in a microwave oven comprising:

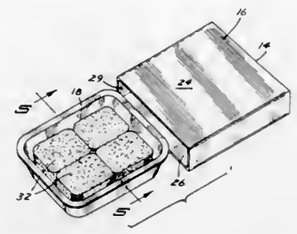
a tray for holding a food item having a top and bottom surface,

a substantially planar microwave heating susceptor disposed within said tray, said microwave heating susceptor fabricated from a ceramic composition, comprising:

a ceramic binder; and

a ceramic susceptor material which absorbs energy and having a residual lattice charge,

wherein the compound is unvitrified,



and wherein the susceptor is in intimate physical contact with the food item and ranges in thickness from about 0.5 to 8 mm.

4,818,832

MICROWAVE OVEN WITH A RACK AND A TURNTABLE

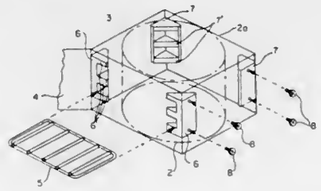
Shigeaki Fukumoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 76,994, Jul. 20, 1987, abandoned, Continuation of Ser. No. 818,009, Jan. 13, 1986, abandoned. This application Mar. 8, 1988, Ser. No. 168,615

Claims priority, application Japan, Feb. 14, 1985, 60-20302

Int. Cl.⁴ H05B *6/78*

U.S. Cl. 219—10.55 E **6 Claims**



1. A microwave oven heating chamber comprising

back and side walls defining a substantially square area with corner sections inside said chamber,

a circular turntable surrounded by said walls with circumference extending substantially to said walls,

a rack for placing thereon articles to be heated, and

a set of pieces supporting said rack over said turntable and being attached to said walls at said corner sections so as not to be directly above said turntable.

4,818,833

APPARATUS FOR RADIANTLY HEATING BLADE TIPS

James D. Formanack, Jupiter; Charles M. Biondo, West Palm Beach, and Chris C. Rhemer, Jupiter, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1987, Ser. No. 135,955

Int. Cl.⁴ H05B *6/14*

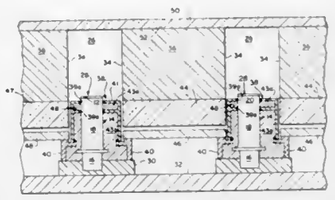
U.S. Cl. 219—10.57 **4 Claims**

1. Apparatus for heating the tip portion of a turbine blade having a longitudinal axis, a root portion, and an airfoil portion, comprising:

an inductively heated graphite susceptor having means for defining a heating chamber for receiving the tip portion of the blade;

means for supporting the blade such that the longitudinal axis of the blade is aligned in the substantially vertical direction;

means for moving said support means in the vertical direction between a first support position to a second support position, such that in the first support position the blade tip is located within said heating chambers, and the airfoil and root portions are located outside of said heating chamber and in the second support position the blade tip, airfoil and root portions are all located outside of said heating chamber;



refractory metal shield means for surrounding and shielding the airfoil and root portion of the blade, said shield means constructed and arranged such that the top portion of the blade if unshielded and extends into said heating chamber when said support means is in said first support position; and

means for providing a non-oxidizing heating atmosphere within each heating chamber.

4,818,834

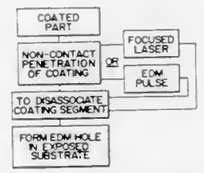
PROCESS FOR DRILLING CHAMFERED HOLES

Gary F. Rupert, Ann Arbor, Mich., assignor to Raycon Corporation, Ann Arbor, Mich.

Filed Mar. 21, 1988, Ser. No. 171,040

Int. Cl.⁴ B23H *1/00, 5/02, 9/14;* **B23K** *26/00*

U.S. Cl. 219—69.17 **4 Claims**



1. A process for drilling an electrically conductive metal substrate having an overlying protective ceramic coating of a composition which resists spark erosion machining by preventing the formation of a spark at a gap between an EDM powered electrode and a metal workpiece the steps comprising:

directing noncontact energy against the protective ceramic coating to disassociate a portion of the protective ceramic coating from the substrate so as to form an exposed surface on the metal substrate;

aligning an EDM powered electrode tip in spaced relationship to the exposed surface to form a spark gap between the exposed surface and the electrode tip;

applying current from the tip to the surface to form a spark across the gap for spark eroding the metal substrate from the exposed surface to form an opening through the metal substrate having the inlet thereto bounded in part by the overlying protective ceramic coating.

4,818,835

LASER MARKER AND METHOD OF LASER MARKING

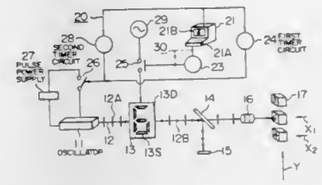
Kouji Kuwabara; Makoto Yano, both of Hitachi, and Takao Umeda, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,829

Claims priority, application Japan, Mar. 2, 1987, 62-45251

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121.6 **8 Claims**



1. A laser marker comprising:

a laser oscillator;

a liquid crystal device irradiated with a laser beam emitted from said laser oscillator and applied with pattern information representative of a character to be printed on an object to be worked;

a polarizer plate for irradiating a laser beam reflecting the pattern information of said liquid crystal device on said object;

a liquid crystal operation circuit and a laser operation circuit respectively connected to said liquid crystal device and said laser oscillator;

a liquid crystal device power switch and a laser switch respectively provided in said liquid crystal operation circuit and laser operation circuit, for operating said liquid crystal device and laser oscillator; and

delay means for retarding operation time of said laser switch with respect to that of said liquid crystal device power switch.

4,818,836

POWER SUPPLY FOR A THREE-PHASE PLASMA HEATING UNIT

Hans J. Behber, Mülheim; Heinrich-Otto Rossner, Essen, and Bernhard Espendiller, Dülmen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 100,768

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632425

Int. Cl.⁴ B23K *9/00*

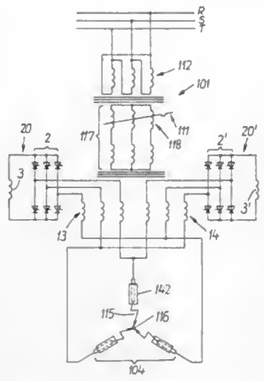
U.S. Cl. 219—121.54 **14 Claims**

1. A power supply for a three-phase plasma heating unit, comprising:

a three-phase transformer having a primary winding group and at least two secondary winding groups which are offset by a 60° phase angle and which are connected to a three--phase plasma heating unit, the transformer additionally having taps which are switched under load; and

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a plurality of converter units each connected to a respective secondary winding group, each converter unit including a



three-phase current-bridge and a choke in the direct current circuit.

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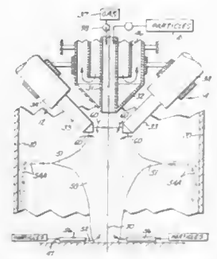
MULTIPLE ARC PLASMA DEVICE WITH CONTINUOUS GAS JET

Emil Pfender, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 817,759, Jan. 6, 1986, Pat. No. 4,725,447, which is a continuation of Ser. No. 655,340, Sep. 27, 1984, abandoned. This application Aug. 24, 1987, Ser. No. 88,610

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.51 10 Claims



1. An apparatus for plasma processing comprising means forming a plasma column directed toward a surface comprising a plurality of substantially equally spaced sources of plasma arranged annularly around a central axis, which sources coalesce to form the plasma column, a source of a gas under pressure, a nozzle for directing gas flow from the source, the nozzle having a flow axis substantially coinciding with said central axis and the flow being directed in the same direction as the flow of plasma from the sources of plasma, said nozzle being in a region adjacent the sources of plasma and where the plasma has not coalesced, and means for regulating flow of gas from the source through said nozzle to provide a gas flow sufficient to stabilize and control the configuration of the plasma column formed.

4,818,838

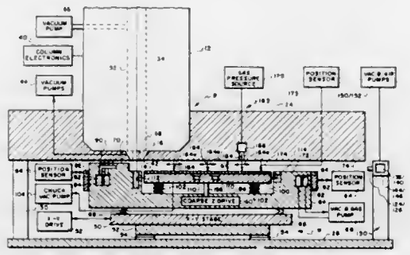
APPARATUS FOR PRESELECTING AND MAINTAINING A FIXED GAP BETWEEN A WORKPIECE AND A VACUUM SEAL APPARATUS IN PARTICLE BEAM LITHOGRAPHY SYSTEMS

Lydia J. Young, Palo Alto, and Lee H. Veneklasen, Castro Valley, both of Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 11, 1988, Ser. No. 141,812

Int. Cl.[4] B23K *15/00*

U.S. Cl. 219—121.12 14 Claims



1. In a particle beam lithography system for treating a semiconductor wafer or mask including a particle beam source and means for generating and directing a particle beam through an aperture as a treating beam for said workpiece surface, said aperture forming part of a means for maintaining only a portion of the surface of said workpiece in a vacuum, the improvement comprising;

means for determining the orientation and position of said workpiece surface relative to and spaced from said aperture including,

plate means on an X-Y stage maintained at a predetermined distance from said aperture,

chuck means in said plate means for holding said workpiece and capable of being positioned relative to said aperture independently of said plate means,

gap setting means, said gap setting means being operative to orient and position said workpiece and said chuck relative to said aperture, and

means locking said chuck means in said plate means after being orienting and positioned by said gap setting means, whereby when said workpiece is oriented and positioned in said plate means, said plate means and X-Y stage are continuously maintained relative to said aperture so that the space between said workpiece surface and said aperture is constant regardless of the position of said X-Y stage.

4,818,839

PROCESS FOR TREATING THE METAL EDGE OF A SKI

William P. Chastain, Tacoma, Wash., assignor to K-2 Corporation, Vashon Island, Wash.

Continuation of Ser. No. 744,046, Jun. 12, 1985, abandoned. This application Sep. 1, 1987, Ser. No. 93,082

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.14 41 Claims

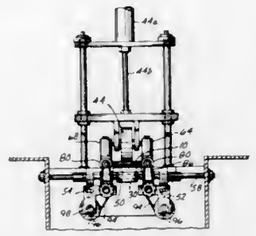
1. A method of treating a ski having a top, bottom and side portions, said side portions having metal edges on their lower portions, said metal edges having side portions and bottom portions, said method comprising the steps of:

orienting and conveying the ski longitudinally along a path;

placing an electrode formed at least in part of carbide and with a circular external shape on at least one side of said path adjacent said metal edge;

rotating said electrode about an axis extending substantially longitudinally of the metal edge;

creating an electrical arc from said electrode to said metal ski edge to carry and deposit carbide from said electrode onto said metal edge; and,



mounting said rotating electrode in position relative to said metal edge to deposit carbide from said electrode onto the side portion of said metal edge but not on the bottom portion of said metal edge.

4,818,840

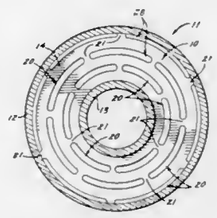
METHOD OF MAKING AN ELECTROMAGNETIC COUPLING DISC

Dwight E. Booth, Janesville, and Gerry N. Lippincott, Milton, both of Wis., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 14, 1987, Ser. No. 133,145

Int. Cl.[4] B23K *26/00;* H01F *41/02*

U.S. Cl. 219—121.72 5 Claims



1. A method of forming a multiple pole coupling disc for an electromagnetic coupling, said method comprising the steps of, providing a disc made of magnetic material, directing a single laser beam toward one face of said disc at a location between the center of the disc and the outer periphery thereof, and effecting relative movement between said disc and said laser beam to cause said laser beam to heat said disc and form a plurality of angularly spaced and curved slots extending completely through said disc, said relative movement being effected such that said single laser beam traces a multidirectional and continuous path extending completely around the margins of each slot and forms said slot by cutting slug means from said disc, said slots being positioned inwardly of the outer periphery of said disc.

4,818,841

METHOD FOR IDENTIFYING THE POWER OUTPUT BY A LASER ONTO A WORKPIECE

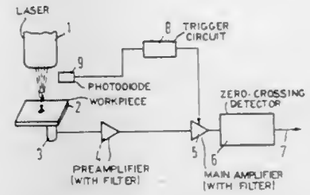
Eduard Sliva, and Wolfgang Stark, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,366

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709904

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.83 2 Claims



1. A method for identifying power output by a laser onto a workpiece, comprising the steps of:

directing a laser beam onto a workpiece causing the generation of a sound emission signal of at least one frequency in the workpiece;

detecting the sound emission signal; evaluating the mean frequency of the sound emission signal as a measurement of the laser power;

setting the laser to a plurality of different power outputs; repeating for each power output the steps of detecting the sound emission signal and evaluating the mean frequency of the sound emission signal;

plotting the means frequency evaluated for each power output for all of said plurality of power outputs to obtain a curve; and linearizing said curve.

4,818,842

DIESEL FUEL HEATER

Robert J. Walty, 1015 Guadalajara Dr., Encinitas, Calif. 92024

Filed Aug. 22, 1986, Ser. No. 899,010

Int. Cl.[4] F02M *31/12;* F24H *3/04*

U.S. Cl. 219—205 23 Claims

21. A diesel fuel heater comprising;

an elongated hollow housing of a heat-conductive material, said housing having a fluid entrance at one end of the elongated hollow housing, and a fluid exit at the opposite end of the elongated hollow housing, the entrance and exit defining a passage within which the fluid is heated;

fin means located inside the housing extending longitudinally within the passage in the direction of the housing elongation, the fin means being formed in the interior of the housing, and fabricated of the same material as the housing;

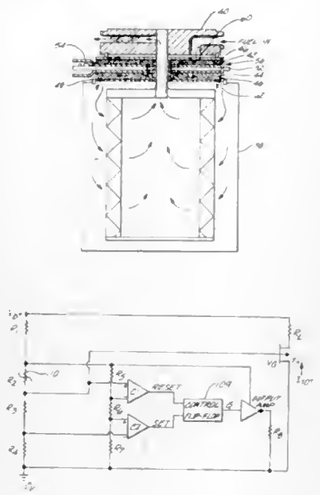
at least one planar heating means in heat-conducting surface contact relationship with the exterior of the housing;

first circuit means for controlling electric current in said planar heating means, said first circuit means being comprised of at least one metal oxide semiconductor power transistor;

second circuit means including a positive temperature coefficient thermistor in surface contact with the exterior of said housing, connected in electrical circuit relationship with the first circuit means for controlling the operation of said first circuit means; and

third circuit means in an electrical circuit relationship with said second circuit means for protecting the first circuit means from thermal overload, said third circuit means being comprised of a pair of comparators which regulate

a control flip-flop in response to the power transistor, the control flip-flop being coupled to an output amplifier for



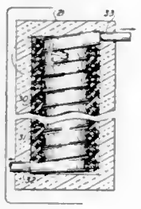
controlling at least one power transistor which provides electrical power to at least one planar heating means.

4,818,843

SMOKE GENERATOR

Edmund Swiatosz, 335 Lake Seminary Cir., Maitland, Fla. 32751

Filed Feb. 12, 1988, Ser. No. 155,376
Int. Cl.[4] H05B *3/48*
U.S. Cl. 219—275 **22 Claims**



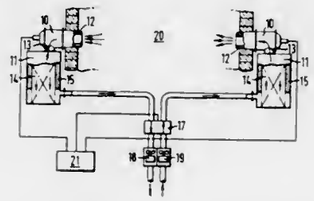
1. A smoke generator comprising:
A housing;
an electrical power source;
an electric pump mounted in said housing and connected to said electrical power source;
a fluid reservoir mounted in said housing and operatively connected to said pump;
a coiled electrical resistance heating tube mounted in said housing and forming an electrical resistance in an electrical circuit, said coiled electrical resistance heating tube having a thin coating of an electrical insulating, thermal conducting material thereon, said coating containing a boron nitride therein, said coating electrically isolating said coils of said coiled electrical resistance heating tube and conducting heat between cold and hot ends of said coiled electrical resistance heating tube and said coiled electrical resistance heating tube having one end operatively connected to said pump;
smoke outlet means located at another end of said coiled electrical resistance heating tube for directing heated fluid generated in said coiled electrical resistance heating tube therefrom;
sensing means for sensing temperature in at least one position in said coiled electrical resistance heating tube and being positioned adjacent to one end of said coiled electrical resistance heating tube; and
switching means for switching said pump on and off responsive to said sensing means sensing predetermined temperatures, whereby smoke is generated in said coiled electrical resistance heating tube upon said tube reaching a predetermined temperature and said pump being switched on to pump fluid from said reservoir through said coiled electrical resistance heating tube.

4,818,844

FURNACE HEATING

Trevor Ward, Rudland, Great Britain, assignor to Hotwork Development Limited, Dewsbury, United Kingdom

PCT No. PCT/GB86/00170, § 371 Date Jan. 8, 1987, § 102(e) Date Jan. 8, 1987, PCT Pub. No. WO86/05865, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 24, 1986, Ser. No. 939,041
Claims priority, application United Kingdom, Mar. 27, 1985, 8507993
Int. Cl.[4] F27D *11/00*
U.S. Cl. 219—279 **17 Claims**



1. A furnace heating arrangement comprising: a heat retentive matrix; means operable to direct a hot exhaust stream from the furnace through the matrix whereby the matrix is heated, and alternately to cause a fluid induction stream to be passed through the matrix to the furnace such that said fluid induction stream is heated by heat retained in the matrix; and an electrical heating means associated with the matrix, said electrical heating means being operable to heat said exhaust stream and alternately said fluid induction stream which is passed through the matrix.

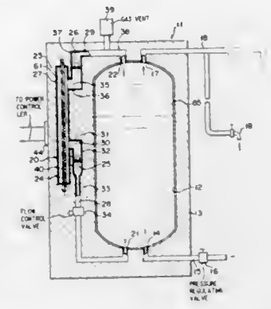
4,818,845

STORAGE TYPE ELECTRIC WATER HEATER HAVING A CLOSED CIRCULATION LOOP PROVIDED WITH A BUBBLE PUMP

Hisao Koizumi, Zushi, and Yoshihisa Oishi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 2, 1987, Ser. No. 69,229
Claims priority, application Japan, Jul. 3, 1986, 61-154978
Int. Cl.[4] H05B *1/02*; F24J *2/00*; F24H *1/18, 1/10*
U.S. Cl. 219—314 **14 Claims**

1. An electric water heater comprising:
a water tank;
a heat insulator covering the water tank;
a cold water supply pipe for introducing cold water into the water tank from a lower part of the same;
a hot water supply pipe connecting an upper part of the water tank to a faucet;
a bubble pump arranged within the heat insulator, bubble pump including:
a connection pipe including an intermediate pipe section closed at a lower end and vertically extending along its axis, a lower pipe section connecting an axially intermediate portion of the intermediate pipe section to the lower part of the water tank, and an upper pipe section connecting an upper portion of the intermediate pipe section to the upper part of the water tank,
an electric heater for heating water located in the intermediate pipe section, and



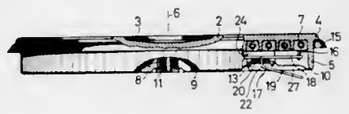
a pair of check valves arranged respectively in the lower pipe section and in the upper pipe section, for allowing water to flow only in a direction from the lower part of the water tank to the upper part of the same; and
a power controller for controlling the supply of electric current to the electric heater.

4,818,846

ELECTRIC HOTPLATE AND APPARATUS FOR THE CONNECTION THEREOF

Robert Kicherer; Felix Schreder; Stefan Reif, and Uwe Schneider, all of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Geräte Blanc U. Fischer, Fed. Rep. of Germany

Filed Nov. 12, 1986, Ser. No. 930,491
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540816
Int. Cl.[4] H05B *3/68*
U.S. Cl. 219—458 **67 Claims**



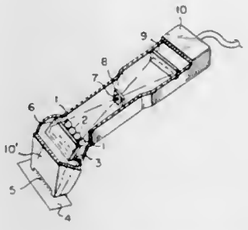
1. An electric hotplate comprising:
a hotplate body (20) having an outer circumference, a bottom side, and at least one heating resistor (7);
a bottom cover (9) for said hotplate body (2);
an insulating member (2) providing a passage for connecting leads (17) of the heating resistor (7), said connecting leads forming connecting portions accessible on the bottom side of the hotplate (1), said connecting portions providing connection ends constructed for connection of appliance leads (34), wherein the connecting leads (17), at least from passage thereof through the insulating member (20) are constructed as one-part, inherently rigid, but resiliently movable pin members forming substantially straight connecting pins (19), freely projecting ends of said connecting pins being directed substantially parallel outwards towards the circumference of the hotplate body (1), said connecting pins the extending at most to an outer circumference of the hotplate body (2).

4,818,847

APPARATUS FOR OPTICALLY READING PRINTED INFORMATION

Masahiro Hara, Kariya; Atutoshi Okamoto, Chita; Toshiyasu Sakai, Kariya; Tadao Oshima, Obu; Hiroshi Yamamoto, Anjo, and Hiromitsu Takai, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 27, 1983, Ser. No. 517,745
Claims priority, application Japan, Jul. 29, 1982, 57-132818; Aug. 19, 1982, 57-144273
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—455 **6 Claims**



1. Apparatus for optically reading thermally printed information in the form of a combination of black and white bars formed on a thermally sensitive white base by thermal printing comprising:
a hand-carried case having an opening at one end thereof;
a light source provided in said case and including first and second pairs of red light emitting diodes in a row for radiating only red light at a wavelength of around 660 nanometers to said thermally printed information through said opening to be reflected thereby;
said second pair of diodes being disposed in between said first pair of diodes;
image forming means provided in said case for forming, at a predetermined position, a reflection image of said printed information in the reflected light received through said opening;
sensor means of silcon type provided in said case and having a spectral sensitivity peak of about 700 nanometers and being disposed at said predetermined position for converting said reflection image of said printed information into a corresponding electric signal, and
means for causing said second pair of diodes to radiate red light with a lower brightness than the brightness radiated by the first pair of diodes to radiate side portions of said printed information at a higher intensity than a central portion thereof for compensating for different length reflection paths from said side and central portions to said image sensing means to effect more uniformity of reflected light across said image sensor means.

4,818,848

AUTOMATIC WIRE CONNECTING APPARATUS FOR WIRE CUT ELECTRIC DISCHARGE MACHINE

Haruki Obara, Sagamihara; Toshiyuki Aso, Hino; Hiroshi Kinoshita, and Tamotsu Ishibashi, both of Hachioji, all of Japan, assignors to Fanuc Limited, Yamanashi, Japan

PCT No. PCT/JP86/00433, § 371 Date Apr. 21, 1987, § 102(e) Date Apr. 21, 1987, PCT Pub. No. WO87/01063, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 21, 1986, Ser. No. 52,734
Claims priority, application Japan, Aug. 21, 1985, 60-181618
Int. Cl.[4] B23H *7/02, 7/10*
U.S. Cl. 219—69.12 **11 Claims**

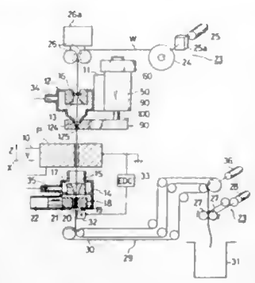
1. An automatic wire connecting apparatus of a wire cut electric discharge machine in which a wire electrode is fed through an upper wire guide arranged above a workpiece and

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a working fluid supplied to said upper wire guide is sprayed from the upper wire guide to said workpiece, the connecting apparatus comprising:

rotary driving means actuated by a compressed fluid for rotating a shaft;

a wire processing unit coupled to the rotating shaft for rotation therewith, said wire processing unit being movable independently from said upper wire guide; and



positioning means for selectively positioning said wire processing unit at a wire insertion position or a retracted position; said wire processing unit having a nozzle hole forming portion, said nozzle hole forming portion having two opposite halves, said two halves defining a slit allowing said wire electrode to pass therethrough when the tow halves are open and defining a nozzle hole capable of fitting with said upper wire guide and of spraying the working fluid when the two halves are closed.

4,818,849

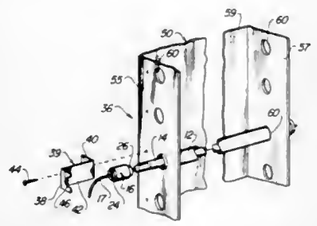
SHIELDED LAMP UNIT

Abraham J. Matlen, 15378 Livernois, Detroit, Mich. 48238

Filed Jul. 13, 1987, Ser. No. 72,549

Int. Cl.[4] F24H *3/00*

U.S. Cl. 219—354 **3 Claims**



1. An improved high intensity cooking unit for automatically broiling and self-basting foods including a rotatable food retainer and a drive system for continuously rotating the food retainer between heating elements, said food retainer being constructed to expose said food to said heating elements as said food retainer rotates, said improvement comprising:

a plurality of quartz lamps;

a plurality of elongated, substantially tubular members shaped complementary to the lamps having an inner diameter greater than the outer diameter of each respective lamp, with each of said lamps being positioned substantially concentrically within a respective one of said tubular members;

support means having first and second laterally spaced faces, a longitudinal bore extending through said faces and first and second opposed substantially annular flanges concentric with said bore extending from each face, one of said flanges having an outer diameter slightly smaller than the inner diameter of said tubular member such that the one flange is readily received by the tubular member;

said longitudinal bore having two concentric portions, the first portion extending inwardly from said first face for receipt of said lamp and the second portion having a smaller diameter than said first portion extending inwardly from said second face, the two portions meeting to form an abutment against which said lamp ends abut;

substantially parallel opposed vertical walls each having a plurality of openings therethrough for receipt of said tubular members, such that said tubular members protrude through each of said walls with said support means being mounted at each end of the tubular members from the opposite faces of said walls, whereby said walls protect the opposite ends of said tubular member, said lamp and said support means from high temperatures; and

resilient retainers mounted upon said walls biasing said support means inwardly toward said tubular member to seal the interior of said tubular member from contaminants;

whereby said foods are positioned closely adjacent the heating elements to utilize the intense heat generated from said quartz lamps without damage to said quartz lamps.

4,818,850

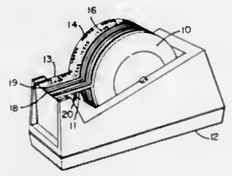
METHOD AND APPARATUS FOR ATTACHING BAR CODE INDICIA ON ITEMS

Peter P. Gombrich, and Donna L. Seeland, both of Boulder, Colo., assignors to CliniCom Incorporated, Boulder, Colo.

Filed Jul. 10, 1987, Ser. No. 72,102

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—494 **33 Claims**



1. A bar code bearing medium, comprising:

a continuous flexible strip of material having a length and means for facilitating tearing of the material in a straight line transversely of the length of the material, the material having first and second oppositely facing surfaces at least one of which is capable of bearing bar code indicia thereon;

an adhesive layer affixed to one of the first and second surfaces; and

bar code indicia printed on one of the first and second surfaces of the material, whereby a continuous strip bar code label is formed which can be readily separated into individual bar code labels of various lengths by tearing the continuous strip bar code label transversely of its length.

4,818,851

HIGH PRECISION COORDINATE INPUT DEVICE USING SEQUENTIALLY DRIVEN CONDUCTORS IN AN INPUT PLANE AND STORED CORRECTION VALUES

Kiyoshi Kimura, Aza-Fujigasaki, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Nov. 25, 1986, Ser. No. 934,665

Claims priority, application Japan, Dec. 18, 1985, 60-282772

Int. Cl.[4] G08C *21/00*

U.S. Cl. 235—472 **12 Claims**

1. A coordinate input device for determining a coordinate position on an input surface by the detection of a signal by a coordinate designator, wherein the coordinate designator can be freely pointed to a location on the input surface, said coordinate input device comprising:

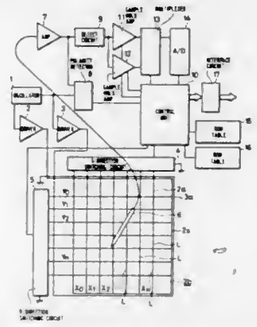
an input surface in which is embedded a plurality of first parallel conductors and having also embedded a plurality of second parallel conductors, orthogonal to said first parallel conductors, said first and second parallel conductors constituting in combination a main loop;

a source line coupled to a first end of each of said first and second parallel conductors and coupled to a first drive source for providing a first drive voltage to said first and second parallel conductors;

switching means coupled to a second end of each of said first and second parallel conductors for selectively allowing current to flow through said first and second parallel conductors, said current providing scanning signals to said first and second parallel conductors;

a compensating loop embedded in said input surface consisting of a condnctor which substantially surrounds said source line and said main loop, said compensating loop being coupled to a second drive source for applying a second drive voltage to said compensating loop;

a coordinate designator for detecting magnetic fields produced by said scanning signals generated by current through said first and second parallel conductors by action of said switching means and for outputting first signals corresponding to said magnetic fields;



a polarity detection means coupled to receive said first signals from said coordinate designator for detecting when an inversion of polarity of said first signals outputted by said coordinate designator occurs as said scanning signals are provided to said first and second parallel conductors by action of said switching means;

a control unit coupled to receive an output signal from said polarity detection means, said control unit also being coupled to said switching means for controlling said switching means, said control unit being also for identifying an approximate coordinate position designated by said coordinate designator based on which of said first and second parallel conductors is selected by said switch means when said polarity inversion is detected;

a first storage means coupled to said control unit for storing compensating values for retrieval by said control unit based on said approximate coordinate position designated by said coordinate designator, said control unit containing an arithmetic unit for calculating an interpolating value based on said compensating value, magnitudes of selected first signals outputted by said coordinate designator, and the magnitude of a second signal detected by said coordinate designator and generated by a current through said compensating loop; and

a second storage means coupled to said control unit for storing correction values for retrieval by said control unit based on said interpolating value, said correction value for being combined with said approximate coordinate position by operation of said control unit to determine a precise coordinate position designated by said coordinate designator.

4,818,852

METHOD FOR FORMING DATA CARDS WITH REGISTERED IMAGES

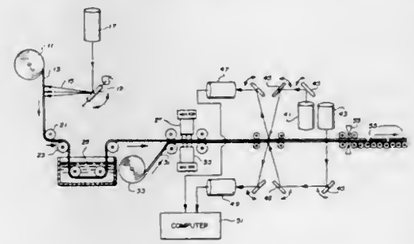
Richard Haddock, Redwood City; Joseph B. Arnold, and Jerome Drexler, both of Los Altos Hills, all of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 822,067, Jan. 24, 1986, Pat. No. 4,745,268, Ser. No. 935,999, Nov. 28, 1986, Pat. No. 4,788,129, and Ser. No. 920,809, Oct. 17, 1986. This application Mar. 27, 1987, Ser. No. 31,714

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[4] G06K *19/02*

U.S. Cl. 235—488 **17 Claims**



1. A method of forming a wallet size data card comprising:

reproducing a plurality of visible images on a first web from a roll, said first web having a front side, a back side and a width dimension not exceeding the width dimension of a wallet size card, the length of the visible image not exceeding the length dimension of a wallet size card,

forming a second web from a roll of high resolution laser optical recording tape containing servo tracks or data location grids, said second web having a front side, a back side and a width dimension,

joining the first web to the second web wherein one side of the first web is proximate to a corresponding side of the second web, and

cutting the joined web at intervals along the lengthwise dimension thereof into a plurality of wallet size cards, each card having a visible image and optical recording tape.

4,818,853

DATA CARD WITH INDUCTIVE SIGNAL TRANSFER DEVICE

Toshihiko Ohta; Kazuyoshi Fuse; Kunio Ohmi; Toshiaki Sato, and Masayuki Shinozaki, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed May 26, 1987, Ser. No. 53,758

Claims priority, application Japan, May 26, 1986, 61-119311; Aug. 29, 1986, 61-201715; Aug. 29, 1986, 61-201729

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—492 **25 Claims**

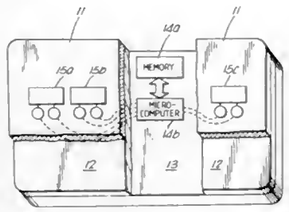
1. A data card having a planar surface which can be resiliently flexed to a degree comprising:

a laminated structure member having at least a synthetic resin protective layer and a ferromagnetic material layer;

an electric circuit device embedded in the laminated structure member;

an electro-magentic transducer having a pair of coils including a first coil and a second coil which are formed on the

laminated structure member, the pair of coils being coupled to the electric circuit device for generating magnetic fluxes of opposite directions with each other according to an information signal supplied from the electric circuit device; and



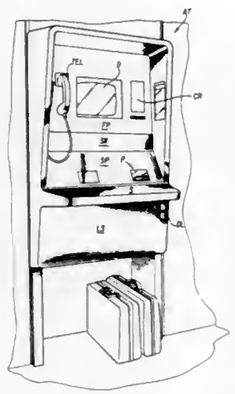
the magnetic flux generated by the first coil flowing in one direction vertical to the surface of the card at the center of first coil and the magnetic flux generated by the second coil flowing in an opposite direction vertical to the surface of the card at the center of the second coil forming a loop of magnetic flux.

4,818,854

TICKET VENDING MACHINE

Michael L. Davies, American Fork, and Lawrence Weber, Centerville, both of Utah, assignors to Unisys Corp., Detroit, Mich.

Filed Dec. 8, 1986, Ser. No. 939,595
Int. Cl.[4] G07F *7/02*
U.S. Cl. 235—381 **16 Claims**



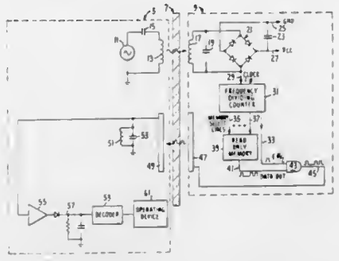
1. An automatic ticket vending machine comprising:
display means adapted to present human-readable messages to a customer;
one or more ticket printing means arranged and adapted to automatically inscribe ticket-validating indicia on prescribed unit tickets and present these to a printer-output station in response to "ticket order signals" t-o;
customer input means arranged and adapted to supply "select signals" SS indicating events to be ticketed, said input means including customer select means and valid billing indicating means;
automatic data processing means DP adapted to receive and store said select signals SS and to process them and responsively issue said ticket-order signals t-o along with associated display messages to said display means, whereby the customer may see, and verify, the associated print commands and ticketed events, price, etc.;
selectably-accessible port means including closure means adapted to be manually translated by a customer upon machine command to allow access to a prescribed ticket-removal station within the machine;
"discarded-ticket" storage means;
ticket receiving pocket means linked to said closure means and disposed operatively adjacent said printer output station(s) and adapted to receive printed tickets there from said respective printer means and to transport these to said ticket-removal station; said ticket receiving means also being selectively operable to "dump" its contents into said "discard-ticket" storage means; said translating of the port closure means being arranged and adapted to so transport said pocket means and present the tickets said pocket means and present the tickets at the ticket-removal station.

4,818,855

IDENTIFICATION SYSTEM

Ronald W. Mongeon; David P. Sidlauskas, both of San Jose, and Theodore D. Geiszler, Los Gatos, all of Calif., assignors to Indala Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 690,849, Jan. 11, 1985, abandoned. This application Jan. 7, 1986, Ser. No. 816,873
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—440 **24 Claims**



1. In a remotely powered portable member having circuitry for storing and transmitting coded information, the improvement comprising:
first coupling means for receiving a signal of a predetermined frequency transmitted via one of a magnetic field and an electric field;
power means connected to said first coupling means for deriving operating power from the received signal for use by said circuitry;
circuit means connecting said circuitry to said first coupling means, for utilizing said predetermined frequency as a clock signal for timing of said circuitry; and
second coupling means connected to said circuitry for transmitting coded information stored by said circuitry via the other one of the magnetic field and the electric field.

4,818,856

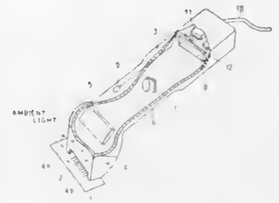
OPTICAL INFORMATION READING APPARATUS

Takeshi Matsushima, Nagoya; Atsutoshi Okamoto, Chita; Hiromitsu Takai, Ohbu; Tadao Ohshima, Nagoya; Mutsushi Yamashita, Chiryu, and Hiroshi Yamamoto, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 4, 1986, Ser. No. 926,519
Claims priority, application Japan, Nov. 6, 1985, 60-248650; Dec. 19, 1985, 60-286133
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **20 Claims**

1. Apparatus for reading optical information which reflects ambient light, comprising:

a casing having hand-holding portion made of non-transparent material, and a head portion having an opening at one end thereof for facing said optical information;
said head portion being constructed to allow illumination of said optical information by ambient light when said opening faces the optical information for a reading thereof;
optical means, disposed in said casing, for forming an image at a predetermined reading position in said casing, said image being formed of said optical information by ambient



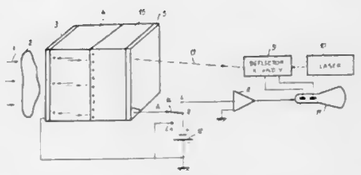
light reflected from said optical information when said opening faces said optical information;
an image sensor, disposed at said predetermined reading position for converting said ambient light image of said optical information into an electric signal; and
means for regulating an exposure time of said image sensor in accordance with an intensity of said ambient light to allow said image sensor to operate over a large range of said ambient light.

4,818,857

ELECTROSTATIC IMAGE SENSOR HAVING AN ELECTRET WHICH POLARIZES A PHOTOCONDUCTIVE LAYER

Francois Micheron, Gif sur Yvette, and Dominique Broussoux, Marcoussis, both of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 9, 1987, Ser. No. 106,262
Claims priority, application France, Oct. 10, 1986, 86 14150
Int. Cl.[4] H01J *31/50, 40/14*
U.S. Cl. 250—213 R **9 Claims**



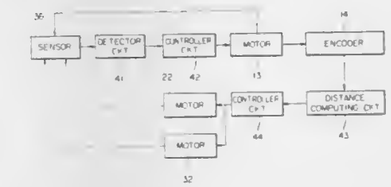
1. An electrostatic image sensor, comprising:
a layer of photoconductive material, said layer of photoconductive material becoming photoconductive when illuminated and behaving as a dielectric when in darkness;
a layer of dielectric material, comprising an electret, for polarizing said layer of photoconductive material, said layer of dielectric material connecting to said layer of photoconductive material;
a first electrode connecting to said layer of dielectric material and a second electrode connecting to said layer of photoconductive material;
light scanning means for successively illuminating each portion of said layer of photoconductive material, along a predetermined path, with a beam of visible light;
electrical signal generating means for generating an electrical signal corresponding to an intensity level of discharge current from said layer of photoconductive material when said layer of photoconductive material is illuminated by said light scanning means, said electrical signal generating means connecting to said first electrode and said second electrode;
initializing means for erasing a latent image recorded in said layer of photoconductive material, said initializing means connecting to said first electrode.

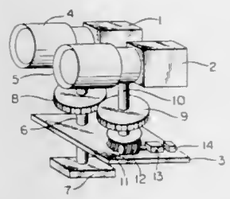
4,818,858

VISUAL SENSOR SYSTEM FOR PRODUCING STEREOSCOPIC VISUAL INFORMATION

Kanehiro Sorimachi, Yokohama, and Tsuneaki Kadosawa, Ninomiya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 922,814, Oct. 17, 1986, which is a continuation of Ser. No. 789,838, Oct. 2, 1985, abandoned. This application Jun. 14, 1988, Ser. No. 208,857
Claims priority, application Japan, Oct. 25, 1984, 59-222896
Int. Cl.[4] G01J *1/20;* H04N *13/00;* B25J *5/00, 19/00*
U.S. Cl. 250—201 **21 Claims**

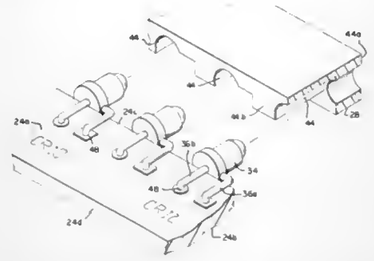




1. A visual sensor system for producing stereoscopic visual information, comprising:
two visual sensor means spaced by a predetermined distance from each other;
light emitting means arranged on one of said two visual sensor means for emitting light to an object through an imaging lens of said one visual sensor means;
photosensor means arranged on the other of said two visual sensor means for sensing the light reflected by the object and incident along the optical axis of an imaging lens of said other visual sensor means determining a convergence position of the object based on an incident position of the sensed light;
convergence angle changing means for changing a convergence angle between said two sensor means on a focusing plane by relatively changing a direction of said other sensor means; and
control means for controlling said convergence angle changing means so that the direction of said other sensor means is changed toward the convergence position of the object determined by said photosensor means.

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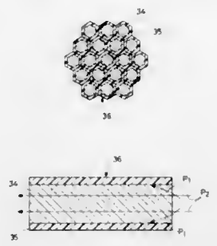
4,818,859
LOW PROFILE OPTO-DEVICE ASSEMBLY WITH SPECIFIC OPTOELECTRONIC LEAD MOUNT
Stewart E. Hough, Georgetown, Tex., assignor to Carroll Touch Inc., Round Rock, Tex.
Filed Jun. 1, 1987, Ser. No. 57,065
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—221 **13 Claims**



12. An opto-device panel assembly for use in an input detection apparatus of the type used to detect the intrusion of an opaque element into an irradiated field, the panel assembly being configured to extend around but not into the irradiated field and comprising:
- an array of opto-devices having leads extending from a body, the opto-devices comprising a plurality of light emitting devices aligned with an array of light detecting devices;
- a peripheral frame comprising an interconnection substrate, the opto-devices being mounted on the frame with light emitting devices being spaced from aligned light detecting devices, the frame being open between corresponding arrays of light emitting devices and light detecting devices, the substrate having an internal peripheral edge, the opto-device panel being characterized in that the opto-devices are disposed with at least a portion of the leads extending along an upper surface of the substrate to the internal peripheral edge of the substrate and secured to circuits thereon and with the opto-device body being disposed within the internal peripheral edge of the substrate, at least a portion of the body of each opto-device extending below the upper surface of the substrate to reduce the height of the opto-device panel assembly.

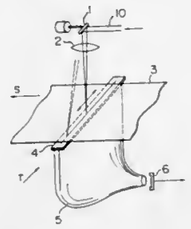
4,818,860
LIGHT COLLIMATING MEMBER FOR PHOTOELECTRIC TRANSFER APPARATUS
Kazuo Hasegawa, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Aug. 5, 1987, Ser. No. 81,832
Claims priority, application Japan, Sep. 22, 1986, 61-222158; Oct. 21, 1986, 61-160085[U]; Nov. 10, 1986, 61-171286[U]; Jan. 30, 1987, 62-11489[U]
Int. Cl.[4] G02B *6/04*
U.S. Cl. 250—227 **4 Claims**

4. A light conducting member in combination with a light emitting device, said light conducting member comprising a large number of optical fibers bundled into an integral body wherein each optical fiber is constituted of a transparent core and a light absorbing clad covering over the periphery of said core, and wherein said core and said clad have indexes of



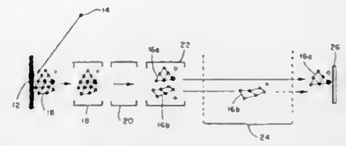
refraction virtually equal to each other, said light conducting member being disposed in front of said light emitting device.

4,818,861
FILM IMAGE READING OUT DEVICE
Hideyuki Horiuchi, Abiko; Chiaki Shimbo, Mitaka; Yoichi Onodera, Hachioji, and Ryuichi Suzuki, Kokubunji, all of Japan, assignors to Hitachi Medical Corp., Tokyo, Japan
Filed Jun. 22, 1987, Ser. No. 64,573
Claims priority, application Japan, Jun. 25, 1986, 61-146944; Jul. 18, 1986, 61-169517
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—235 **17 Claims**



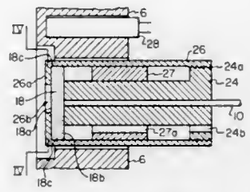
1. A film image reading out device comprising:
- light beam sweeping means for scanning repeatedly a film with a laser light beam along a scanning line of a first direction, the film having opposed surfaces, the laser light beam being projected on one of the opposed surfaces;
- a light diffusing member disposed closely to the surface of said film opposite to that on which said laser light beam is projected, and corresponding to the position of said scanning line, so that light, which has passed through said film, is projected thereon;
- a light transmitting member, which transmits light leaving said light diffusing member, the light diffusing member being positioned so as to have light pass therethrough prior to passing into the light transmitting member;
- a photodetector, which detects light transmitted by said light transmitting member; and
- a film forwarding mechanism, for moving the film in a direction which is perpendicular to said first direction.

4,818,862
CHARACTERIZATION OF COMPOUNDS BY TIME-OF-FLIGHT MEASUREMENT UTILIZING RANDOM FAST IONS
Robert J. Conzemius, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Oct. 21, 1987, Ser. No. 110,856
Int. Cl.[4] H01J *49/40*
U.S. Cl. 250—287 **29 Claims**



1. An apparatus for characterizing the mass of sample and daughter particles, comprising:
- a source for providing sample ions;
- a fragmentation region wherein a fraction of the sample ions may fragment to produce daughter particles;
- an electrostatic field region held at a voltage level G1 to effect ion-neutral separation of fragments from the same sample ion and to separate ions of different kinetic energy;
- a detector system for measuring the relative arrival time of particles;
- processing means operatively connected to said detector system to receive and store said relative arrival times and operable to compare said arrival times with times detected at the detector when said electrostatic field region is held at a voltage level G2 and to thereafter characterize said particles.

4,818,863
ION SOURCE FOR USE IN A MASS SPECTROMETER
Tsutomu Kobayashi; Kiichiro Otsuka; Eiji Kubota, and Tatsuji Kobayashi, all of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan
Filed Dec. 21, 1987, Ser. No. 136,141
Claims priority, application Japan, Dec. 27, 1986, 61-311811; Jan. 30, 1987, 62-20184; Sep. 2, 1987, 62-219323
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—288 **9 Claims**

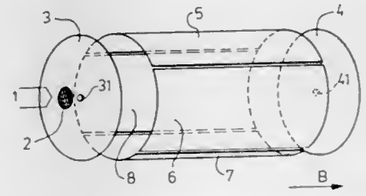


1. In an ion source for use in a mass spectrometer, the ion source having an ionization chamber formed inside of a housing of the ion source, an inlet tube for introducing effluent into the ionization chamber from outside of the housing, said inlet tube comprising an open end inserted into said ionization chamber, a porous member arranged in the ionization chamber and bearing against the inlet tube so as to obstruct the open end of the inlet tube, and a particle beam generating means for directing a particle beam to effluent which exudes from the surface of the porous member after passing through the porous member, for ionizing the exuding effluent, the porous member taking the form of a sheet or plate wherein said particle beam is directed to a bombarded surface area of said porous member, the improvement comprising

(a) there is further provided a cover member for shielding a portion of the surface of the porous member from the particle beam, and

(b) wherein the porous member is configured and supported such that the effluent supplied into the porous member by the inlet tube is allowed to exude from surfaces of the porous member other than the surface bombarded with the particle beam.

4,818,864
METHOD FOR ELIMINATING UNDESIRABLE CHARGED PARTICLES FROM THE MEASURING CELL OF AN ICR SPECTROMETER
Martin Allemann, Hinwil, Switzerland, assignor to Spectrospin AG, Switzerland
Filed Aug. 5, 1987, Ser. No. 81,862
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627605
Int. Cl.[4] H01J *49/36*
U.S. Cl. 250—291 **4 Claims**



1. A method for eliminating undesirable charged low-mass particles from the measuring cell of an ion cyclotron resonance spectrometer, the measuring cell being within a homogeneous magnetic field and defined by trapping electrodes which are provided in perpendicular arrangement relative to the direction of the magnetic field and maintained at a trapping potential for generating a trapping field for the undesirable charged low-mass particles, and by transmitting electrodes provided in parallel arrangement relative to the direction of the magnetic field and supplied with a first rf voltage serving to excite the cyclotron movement of desired particles within the measuring cell, said method including the step of exciting the undesirable charged low-mass particles, to be eliminated, by modulation of the trapping field, into trapping oscillations in the direction of the homogeneous magnetic field so that they overcome the trapping potentials and reach the trapping electrodes and are eliminated therein, said modulation of the trapping field being effected by supplying a second rf voltage to said transmitting electrodes, said second rf voltage having a frequency substantially less than the cyclotron resonance frequency of the undesirable charged low-mass particles.

4,818,865
FOCUS DETECTING SYSTEM FOR CAMERA UTILIZING CORRECTION DATA ON THE ABERRATION OF THE PHOTOGRAPHIC LENS
Toru Matsui, and Toshihiko Karasaki, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Mar. 10, 1987, Ser. No. 24,346
Claims priority, application Japan, Mar. 12, 1986, 61-52727
Int. Cl.[4] G03B *3/10*
U.S. Cl. 250—201 **8 Claims**

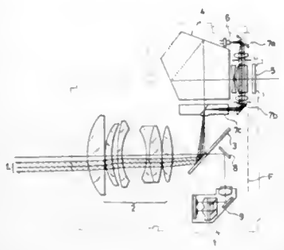
1. A focus detecting system for detecting a focusing condition of a photographic lens mounted on a camera body, comprising:
- means for forming a plurality of secondary images of an image formed by the photographic lens on a predetermined focal plane;
- means, including a plurality of aperture masks, each corresponding to each secondary images respectively, for limit-

ing light bundles passed through the secondary image forming means at each secondary image, said secondary image forming means and said light bundle limiting means including a first pair of elements composed of one aperture mask and one light receiving element, and a second pair of elements composed of the other aperture mask and the other light receiving element, the aperture mask in the first pair being located closer to an optical axis of the photographic lens than that in the second pair;

means, including a plurality of light receiving elements each being disposed for receiving each secondary image respectively, for detecting the light intensity distributions of the plurality of secondary images;

first means for projecting infrared light through the photographic lens onto an object to be focused for illuminating the object;

means for selectively energizing the first projecting means;



means for storing a plurality of correction data, each data corresponding to the respective aperture masks, the plurality of correction data being determined in accordance with both spherical aberration generated by the photographic lens and the deviation of a detected best focus position caused by the difference between the visible light and the infrared light projected by the first projecting means;

means for selecting the light receiving element in the first pair when the first projecting means is deenergized and one of the correction data which is determined in accordance with an aperture mask in the first pair, and for selecting the light receiving element in the second pair when the first projecting means is energized and the other of the correction data which is determined in accordance with an aperture mask in the second pair, and

means for detecting a focusing condition of the photographic lens in accordance with the output of the selected light receiving element and the selected correction data.

4,818,866

INTRUSION DETECTION SYSTEM FOR OPERATING INDUSTRIAL MACHINES WITH VARIABLE SENSITIVITY

Daniel R. Weber, Groton, Mass., assignor to Data Instruments, Inc., Acton, Mass.

Continuation of Ser. No. 818,275, Jan. 13, 1986, abandoned. This application Nov. 10, 1987, Ser. No. 120,732

Int. Cl.[4] G01V *9/04*

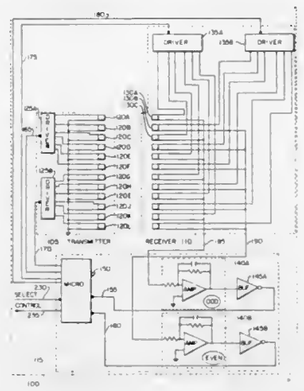
U.S. Cl. 250—221 **15 Claims**

1. An optical intrusion detection system for enabling and/or disabling the operation of an associated industrial machine when an appropriate intrusion is detected, said system comprising:

light transmitter means for generating a plurality of light beams so as to form a light curtain;

light receiver means for sensing said light beams generated by said light transmitter means; and

control means for operating said light transmitter means and light receiver means and controlling operation of the industrial machine, said control means comprising logic circuits for selectively (a) generating a first control signal for selectively enabling or disabling said machine when X or more light beams are blocked during a first phase of the operation of said machine, and (b) generating a second



control signal for selectively enabling or disabling said machine when Y or more light beams are blocked during a second phase of the operation of said machine, wherein X and Y are both integers, X and Y are both >0, and $X \neq Y$.

4,818,867

OPTICAL INFORMATION PROCESSING DEVICE USING OPTICAL SHUTTER ELEMENTS

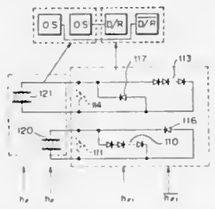
Yutaka Hayashi, Ibaragi; Selichi Ishihara, and Hisato Hiraishi, both of Tokorozawa, all of Japan, assignors to Agency of Industrial Science and Technology; Ministry of International Trade and Industry and Citizen Watch Co., Ltd., all of Tokyo, Japan

Filed Jul. 27, 1987, Ser. No. 78,421

Claims priority, application Japan, Jul. 29, 1986, 61-178522

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—229 **18 Claims**



1. An optical shutter information processing device comprising:

a plurality of photovoltaic elements arranged two-dimensionally and each of said photovoltaic elements generating a voltage upon receipt of a first incident light, light beam of said first incident light irradiating at least one of said photovoltaic elements which are interconnected with each other so as to produce at least one combined output signal: and

one or more optical shutters arranged two-dimensionally and directly driven by said at least one combined output signal, each of said optical shutters receiving a light beam

of a second incident light which is in parallel with said light beam of said first incident light, whereby said second incident light issues from said each of said optical shutters in the form of a light signal modulated at said each of said optical shutters.

4,818,868

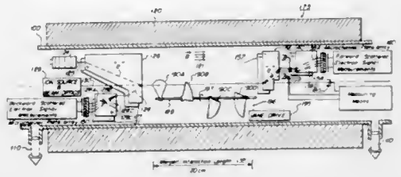
TROCHOIDAL ANALYSIS OF SCATTERED ELECTRONS IN A MERGED ELECTRON-ION BEAM GEOMETRY

Ara Chutjian, La Crescenta, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 11, 1988, Ser. No. 154,713

Int. Cl.[4] H01S *1/00;* **G01K** *1/08;* **H01J** *3/14*

U.S. Cl. 250—252 **21 Claims**



1. A method of determining the absolute excitation cross section of an ion beam, said method comprising the individual steps of:

longitudinally merging an ion beam of a known nominal energy with an electron beam also having a known nominal energy;

directing the merged beams along a longitudinal axis of a known length;

demerging the electron and ion beams, and dispersing the electrons spatially according to their final energy;

using a pair of microchannel plate arrays having a known sensitivity to electron detection for simultaneously measuring dispersed electrons that are scattered at the backward and forward ends respectively of said merged length;

measuring the overlap of the merged ion and electron beams at several known points along the longitudinally merged beam;

measuring the primary electron and primary ion currents; and

relating all measurements to an absolute cross section of the ion beam by a known mathematical formula.

4,818,869

METHOD OF ISOLATING A SINGLE MASS OR NARROW RANGE OF MASSES AND/OR ENHANCING THE SENSITIVITY OF AN ION TRAP MASS SPECTROMETER

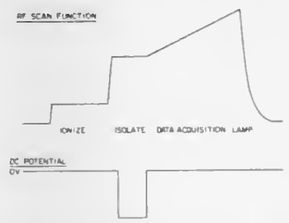
Michael Weber-Grabau, San Jose, Calif., assignor to Fionigan Corporation, San Jose, Calif.

Filed May 22, 1987, Ser. No. 53,448

Int. Cl.[4] H01J *49/42*

U.S. Cl. 250—282 **4 Claims**

1. The method of increasing the sensitivity of an ion trap mass spectrometer to ions of selected mass or masses comprising the steps of generating an RF field, introducing a sample into the RF field, ionizing the sample to form ions which are trapped in the RF field, increasing the RF field to eject ions having masses less than the selected mass or masses and thereafter applying a pulsed DC field to eject ions of unwanted mass



above and below said selected mass or masses while trapping ions of said selected mass or masses.

4,818,870

AIR WITHDRAWING SAMPLING PROBES FOR A CONTRABAND DETECTION SYSTEM

Frank K. Griffiths, Bracknell, Great Britain, assignor to British Aerospace PLC, London, England

Filed May 5, 1987, Ser. No. 46,927

Claims priority, application United Kingdom, May 6, 1986, 8611031

Int. Cl.[4] H01J *49/04*

U.S. Cl. 250—288 **14 Claims**



1. A sampling probe, for use in a contraband detection system for withdrawing air from a cargo container and leading the withdrawn air towards a mass analyzer, comprising a plurality of hollow inter-connected sections having internal surfaces which are of inert plastics material and are substantially continuous through at least one coupling between at least one adjacent pair of the inter-connected sections, one of the sections being an end section having at least one opening for allowing the air to be withdrawn into the sampling probe, and another of the sections being a termination section having a connecting means for allowing the sampling probe to be connected at least indirectly to the mass analyzer, wherein the end section comprises means for insertion between a non-rigid cargo covering and cargo to permit sampling of air from above the cargo and below the non-rigid cargo covering and wherein the end section includes a protrusion means configured so that, after the sampling probe is slid between the non-rigid cargo covering and the cargo, the sampling probe is rotatable so that the protrusion means acts to retain the sampling probe in position.

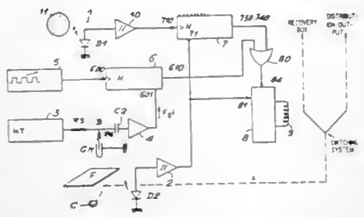
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PROCESS FOR THE DETECTION OF SUPERIMPOSED SHEETS, APPARATUS FOR PERFORMING THE PROCESS AND APPLICATION TO BANK NOTES

Marc Dupoy, Paris; Patrice Dumesnil, GIF sur Yvette; Jacques Mougault, Paris, and Camille Carisey, Creteil, all of France, assignors to Commissariat a L'Energie Atomique and Bull S.A., both of Paris, France

Filed May 19, 1987, Ser. No. 51,330
Claims priority, application France, May 30, 1986, 86 07807
Int. Cl.[4] G01N *23/16*
U.S. Cl. 250—308 10 Claims



1. A process for the detection of superimposed sheets by evaluating their surface mass, comprising the steps of:

passing sheets oriented in a given direction on a transporting system between a particle source and a particle detector,

counting the number of particles received by the detector by measuring the frequency F_g of the pulses of the detector in order to determine the surface mass, and

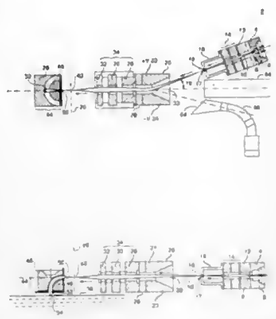
eliminating the sheets with a high superimposition level by comparing the count frequency with a limit value.

4,818,872

INTEGRATED CHARGE NEUTRALIZATION AND IMAGING SYSTEM

Norman W. Parker, Westlake Village; William G. Turnbull, and William P. Robinson, both of Newbury Park, all of Calif., assignors to Microbeam Inc., Newbury Park, Calif.

Filed May 11, 1987, Ser. No. 49,736
Int. Cl.[4] H01J *37/26*
U.S. Cl. 250—309 22 Claims



1. A focused ion beam system having alternating modes wherein, in a first, imaging mode, a primary ion beam is scanned in a predetermined pattern across the surface of a target thereby stimulating emission of secondary particles used for imaging said target and, in a second, charge neutralization mode, electrons are directed to said surface for neutralizing charge accumulated during said first mode, and comprising:

means for providing said primary ion beam and focusing said ion beam at and orthogonally to said target surface in said first mode;

means for controlling the voltage on said target surface;

means for providing an electron beam in said second mode;

an energy analyzer positioned directly above said target surface and including a ninety degree spherical electrostatic capacitor for directing secondary particles horizontally onto a horizontal axis in said first mode and for directing said electron beam vertically onto said target surface in the second mode, said capacitor having a vertical aperture through the outer electrode thereof for allowing transmission of said primary ion beam in said first mode;

imaging detector means for collecting said secondary particles in said first mode;

an electrostatic lens on said horizontal axis for focusing said secondary particles into said imaging detector means in said first mode, and said electron beam into the image plane of said energy analyzer in said second mode; and

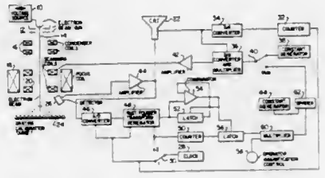
an electrostatic deflector on said horizontal axis for directing said secondary particles into said imaging detector means in said first mode and for directing said electron beam onto the axis of said electrostatic lens in said second mode.

4,818,873

APPARATUS FOR AUTOMATICALLY CONTROLLING THE MAGNIFICATION FACTOR OF A SCANNING ELECTRON MICROSCOPE

Glen A. Herriot, Nepean, Canada, assignor to Vickers Instruments (Canada) Inc., Nepean, Canada

Filed Oct. 30, 1987, Ser. No. 114,741
Int. Cl.[4] H01J *37/256*
U.S. Cl. 250—310 9 Claims



1. Apparatus for calibrating the magnification of a scanning electron microscope including means for generating an electron beam, scanning signal generating means for producing a scanning signal, and means for scanning said beam, said apparatus comprising:

a calibration object which has a plurality of aligned elements thereon which, when scanned by said electron beam produce a signal having a frequency which has a fundamental periodicity dependent on the spacing of said aligned elements;

detector means for detecting said signal and producing an analog output signal having a data content and said fundamental periodicity;

means connected to said detector means for determining the fundamental periodicity of said analog output signal from the entire data content of the analog output signal; control means for producing a desired magnification signal;

correction signal generating means connected to said means for determining the fundamental periodicity of said analog output signal and said control means for producing a final correction signal which is derived from said desired magnification signal and the fundamental periodicity of said analog output signal; and

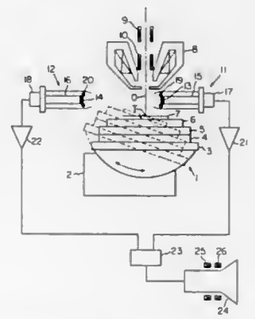
combiner means connected to said correction signal generating means and said means for scanning said beam for combining said final correction signal and said scanning signal to produce a modified scanning signal which scans said electron beam to produce the desired magnification of said scanning electron microscope.

4,818,874

SCANNING ELECTRON MICROSCOPE

Toyoji Ishikawa, Tokyo, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,201
Claims priority, application Japan, Apr. 17, 1987, 62-58351[U]
Int. Cl.[4] H01J *37/256, 37/244*
U.S. Cl. 250—310 3 Claims



1. A scanning electron microscope in which secondary electrons from the specimen surface are detected and in which the topography of the specimen does not produce undesired contrasts comprising:

a means for focusing an electron beam onto a specimen including an objective lens;

a means for scanning a desired region on the specimen with the electron beam;

a stage assembly for tilting, translating, or rotating the specimen;

a first and a second detector for detecting secondary electrons emanating from the specimen in response to the incidence of the electron beam, the detector being disposed both on the same side of the objective lens nearest the stage assembly and each on opposite sides of the optical axis of the electron beam, the first detector being disposed relatively close to the optical axis of the beam, the second detector being disposed relatively remotely from the optical axis such that the stage assembly does not collide with the secondary detector when the stage assembly is tilted through its normal range of motion;

a first and a second amplifier for amplifying the output signals from the first and second detectors, respectively, the amplifiers each having means for adjusting the gain for compensating for the imbalance between the intensities of the output signals from the detectors such that the undesired contrasts caused by specimen topography are reduced;

an arithmetic circuit that arithmetically processes the output signals from the amplifiers; and

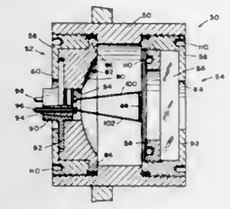
a cathode-ray tube to which the output signal from the arithmetic circuit is supplied as an intensity-modulating signal.

4,818,875

PORTABLE BATTERY-OPERATED AMBIENT AIR ANALYZER

Seymour Weiner, Stamford, Conn., assignor to The Foxboro Company, Foxboro, Mass.

Filed Mar. 30, 1987, Ser. No. 32,038
Int. Cl.[4] G01N *21/35*
U.S. Cl. 250—343 7 Claims



1. In a portable ambient air analyzer instrument of the type having an outer housing with means permitting the instrument to be carried by a person onto a site where gases exist and require measurement of the concentration thereof, said analyzer including an electrically-energized incandescent source producing a beam of infra-red radiation passing through a gas cell containing a gas sample and being directed thereafter to a sensor for analysis so as to produce measurements to be displayed, said analyzer further including manually-operable controls to permit the person carrying the instrument to select any of a variety of functional modes thereof; and a battery in said hosing to supply all of the electrical power required for the operation of said instrument including said incandescent source;

the improvement in said analyzer wherein said incandescent source comprises a pair of electrically-conductive elongate elements positioned side-by-side; and

a filamentary coil of wire secured at its ends to said elongate elements to receive electrical current therefrom;

said coil being self-supporting on said elongate elements, and its interior being free of any material, wherein the amount of radiation produced for a given amount of energy supplied to said source is approximately doubled relative to a mandrel-supported coil.

2. For analyzing the ambient air at sites where flammable or explosive gas mixtures may be present, a portable ambient air analyzer instrument of the type having an outer housing with means permitting the instrument to be carried by a person onto a site where gases exist and require measurement of the concentration thereof, said analyzer including an electrically-energized incandescent source producing a beam of infra-red radiation passing through a gas cell containing a gas sample and being directed thereafter to a sensor for analysis so as to produce measurements to be displayed, said analyzer further including manually-operable controls to permit the person carrying the instrument to select any of a variety of functional modes thereof; and a battery in said housing to supply all of the electrical power required for the operation of said instrument including said incandescent source;

the improvement in said analyzer which comprises:

an enclosure fully surrounding said incandescent source of infra-red radiation and including means providing for explosion-proof operation of said source;

said enclosure including:

a central casing of generally tubular shape;

first and second end plates secured to said central casing at opposite ends thereof and each formed with an opening;

an infra-red window immediately adjacent said first end plate to allow infra-red radiant energy to pass from said incandescent source through said opening in the first end plate;

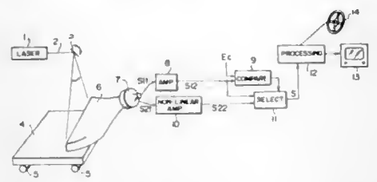
the adjoining surfaces of said window and said first end plate being pressed together and formed flat and smooth;
a lead support member fitted into said opening of said second end plate and having flange means extending beneath said second end plate interiorly thereof;
the adjoining surfaces of said flange means and said second end plate being pressed together and formed flat and smooth;
said end plates comprising means for restraining both said window and said lead support member from being expelled from said enclosure in the event of an internal explosion.

4,818,876

IMAGE READ-OUT APPARATUS EMPLOYING A PHOTOMULTIPLIER

Toshitaka Agano, and Yoshimi Takasaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 5, 1985, Ser. No. 741,407
Claims priority, application Japan, Jun. 6, 1984, 59-116105
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] G01T *1/115*
U.S. Cl. 250—484.1 **9 Claims**



1. An image read-out apparatus for exposing a recording medium carrying an image stored therein to a light beam, and photoelectrically detecting light carrying the image information obtained from the recording medium by use of a photomultiplier,
the image read-out apparatus comprising:
(i) a comparison means for comparing the output current signal of said photomultiplier with a predetermined reference value,
(ii) a voltage detection means for detecting the voltage generated at a bleeder resistor of said photomultiplier, and
(iii) a selection circuit for receiving the output current signal of said photomultiplier, a voltage signal detected by said voltage detection means, and the output of said comparison means, selecting the output current signal of said photomultiplier when the output current signal of said photomultiplier is equal to or lower than said reference value, and selecting said voltage signal when the output current signal of said photomultiplier is higher than said reference value.

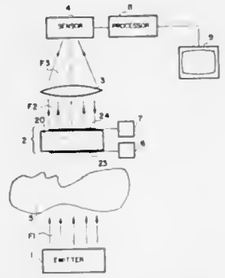
4,818,877

MEMORY DISPLAY SYSTEM

Jean L. Ayrai, Paris; Christian Maillot, St. Mande, and Francois Micheron, Gif Sur Yvette, all of France, assignors to Thomson-CSF, Paris, France

Filed Feb. 25, 1987, Ser. No. 18,532
Claims priority, application France, Feb. 28, 1986, 86 02876
Int. Cl.[4] G01T *1/105*
U.S. Cl. 250—484.1 **18 Claims**

1. A memory display system including a source of illuminating radiation, producing a beam of given wavelength, a body to be explored, a support medium sensitive to said wavelength and receiving the beam retransmitted by the body, wherein
the support medium includes, a layer of a luminescent material for accumulating and storing energy, coming from said beam, in metastable states and releasing it under the effect of electric excitation, in the form of a light flux and, means for applying said electric excitation to the luminescent material;
said layer of luminescent material being enclosed between a first flat plate transparent to said beam and a second flat plate transparent to said light flux, said means for applying said electric excitation including a first electrode situated on the first plate, a second electrode situated on the second plate, and an electric supply means connected to these



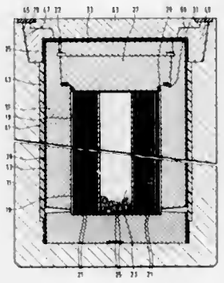
electrodes for selectively applying different potentials to said electrodes so as to cause said support medium to release light from selected points, one of said electrodes being blocking;
the display system further including an optical transmission device receiving the light flux and retransmitting it;
a sensor receiving the light flux retransmitted by the optical transmission device and converting the intensity of the light flux into an electric signal;
a processing circuit receiving said electric signal, processing it and controlling display thereof on a display device.

4,818,878

DOUBLE-CONTAINER UNIT FOR TRANSPORTING AND STORING RADIOACTIVE WASTE

Franz-Wolfgang Popp, Wedemark, and Dietmar Flehr, Celle, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hannover, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,148
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3639653
Int. Cl.[4] G21F *5/00*
U.S. Cl. 250—507.1 **18 Claims**



1. A double-container unit for transporting and storing radioactive waste such as irradiated nuclear reactor materials, the double-container unit comprising:

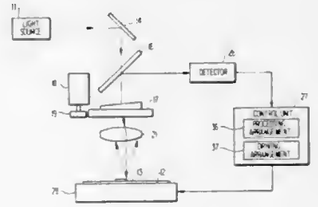
an inner storage container sealed gas-tight for storing the radioactive waste;
an outer shielding container for holding the inner storage container therein and for providing mechanical security and shielding for said inner storage container during the handling and transport of said unit, said outer shielding container including a vessel having a base and a wall extending upwardly from said base so as to define with the latter a cavity for receiving said inner storage container therein;
said wall terminating in an upper end portion defining the opening of said vessel;
a shielding cover for covering said opening;
an intermediate annular member seated in said upper end portion and interposed between said cover and said vessel;
joining means for joining said intermediate annular member to said upper end portion of said vessel;
attachment means for attaching said shielding cover to said intermediate annular member;
said vessel defining a longitudinal axis and said intermediate annular member having an annular projection extending inwardly toward said longitudinal axis so as to be disposed above the outer peripheral edge of said inner storage container to receive an impact load from said inner storage container caused by a movement of the latter within said outer shielding container;
said inner storage container having an upper end face region within said outer peripheral edge thereof;
said shielding cover having a bottom end face adjacent said upper end face region when said shielding cover is seated in said vessel; and,
gap means formed between said bottom end face and said upper end face region for preventing direct contact therebetween in the event of said impact load.

4,818,879

POSITIONING AND MACHINING APPARATUS HAVING A SCANNER FOR CIRCULARLY SCANNING AN OBJECT BY A LIGHT BEAM

Toshikazu Kajikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 21, 1987, Ser. No. 40,677
Claims priority, application Japan, Apr. 21, 1986, 61-90062
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—548 **10 Claims**



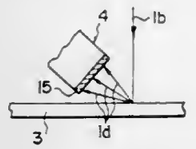
1. A positioning apparatus for use in positioning an object which has a mark extending thereon in a first predetermined direction, said positioning apparatus comprising:
moving means for moving said object in a second predetermined direction which intersects said first predetermined direction;
projecting means for projecting a light beam towards said object;
circularly scanning means optically coupled to said projecting means for circularly scanning said object by movement of said light beam to make said mark produce a particular beam whenever said light beam intersects said mark;
detecting means for detecting said particular beam to produce a mark detection signal representative of detection of said particular beam; and
control means coupled to said detecting means and said moving means and responsive to said mark detection signal for controlling said moving means.

4,818,880

RADIATION IMAGE READ-OUT APPARATUS

Terumi Matsuda; Toshitaka Aagano; Junji Miyahara; Nobuyoshi Nakajima, and Shigeru Saotome, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1985, Ser. No. 710,209
Claims priority, application Japan, Mar. 9, 1984, 59-45077; Nov. 28, 1984, 59-250704; Jan. 10, 1985, 60-2479
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] G01N *23/04;* **G03C** *5/16*
U.S. Cl. 250—327.2 **10 Claims**



1. A radiation image read-out apparatus including a scanning optical system for scanning a stimulable phosphor sheet carrying a radiation image stored therein by stimulating rays, a light guide member having a light input face positioned in the vicinity of a portion of said stimulable phosphor sheet scanned by said stimulating rays, said light guide member guiding light, which is emitted by said stimulable phosphor sheet in proportion to the radiation energy stored when said stimulable phosphor sheet is scanned by said stimulating rays, from said light input face, and a photoelectric converter for receiving the light guided by said light guide member and photoelectrically converting it into an electric signal, wherein the improvement comprises the provision of:
(i) a stimulating ray reflection preventing means positioned between said portion of said stimulable phosphor sheet scanned by said stimulating rays and said light guide member, and
(ii) a means for preventing transmission of said stimulating rays and transmitting the light emitted by said stimulable phosphor sheet in proportion to the radiation energy stored, said means being positioned between said portion of said stimulable phosphor sheet scanned by said stimulating rays and said photoelectric converter.

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HIGH-SENSITIVITY INFRARED POLARIMETER

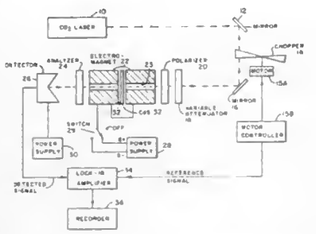
George A. Taston, and John A. Grisham, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 4, 1987, Ser. No. 51,872
Int. Cl.[4] G01J *4/04*
U.S. Cl. 250—338.1 **2 Claims**

1. A high sensitivity infrared polarimeter comprising: a source of CO_2 laser radiation for generating a beam of radiant energy of wavelength of 10.6 microns along a beam path; an attenuator, a polarizer, a magnetic field generating means, an analyzer, said magnetic field generating means comprising an electromagnetic having two coaxial coils for developing a magnetic field, said coils having coaxially aligned apertures therethrough, said apertures being positioned in said beam path such that any impinging radiation passes through the apertures in going from said polarizer to said analyzer, said two coaxial coils further having a space therebetween for individual place-

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ment within said space of a plurality of cadmium sulfide wafers; and a mercury-cadmium-telluride detector disposed in series alignment along the beam path so that impinging radiant energy is coupled sequentially from said source of radiation through said attenuator, polarizer, magnetic field generating means, and analyzer to terminate on said detector; beam directing means disposed in said beam path between said source of laser radiation and said attenuator for guiding the direction of said beam along said path; and interrupting means disposed on



said beam path adjacent said directing means for selectively opening and closing said beam path to laser radiation traversing said path; driving means coupled to said magnetic field generating means for changing the electrical potential driving said magnetic field generating means, said driving means providing, selectively, a positive voltage, a negative voltage, or no voltage to said magnetic field generating means for controlling the degree and direction of an electromagnetic field within said apertures and the space between said coils.

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PHOTOACOUSTIC GAS ANALYZER

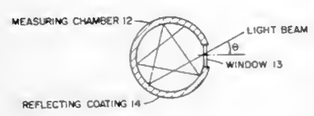
Sten A. Nexo; Jörgen Christensen, both of Birkerod, and Ib E. Jorgensen, Copenhagen, all of Denmark, assignors to Aktieselskabet Bruel & Kjaer, Denmark

Filed May 20, 1987, Ser. No. 52,596

Claims priority, application Denmark, May 27, 1986, 2477/86

Int. Cl.⁴ G01N *21/00*

U.S. Cl. 250—343 **9 Claims**



1. A photoacoustic gas analyzer comprising a measuring chamber, a modulated light source directing light into the measuring chamber, and at least one microphone connected with the measuring chamber for measuring changes in pressure caused by the absorption of light by a gas within the measuring chamber, wherein substantially the entire measuring chamber comprises a curved wall and substantially the entire curved wall is reflecting, and is constructed from a heating absorbing material.

4,818,883

LUMINOMETER APPARATUS

Joseph C. Anderson, and Martin Applebaum, both of London, England, assignors to Biolite Ltd., London, England

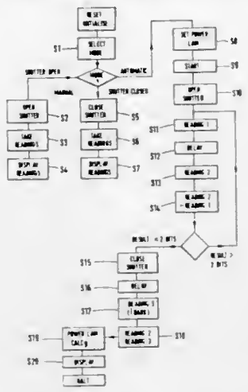
Filed Dec. 16, 1987, Ser. No. 133,569

Claims priority, application United Kingdom, Dec. 17, 1986, 8630136

Int. Cl.⁴ G01N *21/76*

U.S. Cl. 250—361 C **11 Claims**

1. A luminometer apparatus including circuit means comprising a photodetector arranged to detect light emission from a phosphorescent reaction exhibiting a peak light value, means for predeterminedly shielding said photodetector from light, means arranged to sample the light emission from the phosphorescent reaction detected by the photodetector at predetermined time intervals when the shielding means is not shielding the photodetector, subtracting means connected to said sample



means for subtracting the sampled light emission of consecutive samples and for determining the peak light value, means for moving the shielding means to shield said photodetector so as to detect the dark current of the photodetector after the peak light value has been determined and said subtracting means operable for subtracting the dark current from said peak light value to determine a true intensity of the peak light value.

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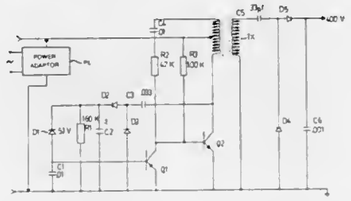
LOW COST APPLIANCE FOR CONTINUOUSLY MONITORING LEVELS OF IONIZING RADIATION IN PREMISES FOR HUMAN OCCUPATION

Malcolm C. Saubolle, 2699 Battleford Rd, Th13, Mississauga L5N 3R9, Canada

Filed Dec. 1, 1986, Ser. No. 937,908

Int. Cl.⁴ G01T *1/18*

U.S. Cl. 250—388 **8 Claims**



6. Apparatus for the continuous monitoring for human occupation, comprising an enclosure, means for mounting the enclosure to structure premises of levels of ionizing radiation in premises to be monitored, an ionizing radiation transducer within the enclosure and producing counts in response to radiation incidents, a power supply means continuously providing an operating potential to said radiation transducer, a time base defining monitoring intervals fixed between about 5 to about 60 seconds, a counter means for accumulating counts during successive monitoring intervals, alarm means responsive to the accumulated count during a monitoring interval exceeding a predetermined threshold representing a level of ionizing radiation which if continued over an extended period would expose a human being to a cumulative dosage exceeding a predetermined level deemed acceptable and indicator means for indicating the level of incident radiation during the most recent monitoring interval, the ionizing radiation transducer being a Geiger-Mueller tube, wherein the power supply means for the Geiger-Mueller tube comprises a squegging oscillator incorporating an inductive element which is the primary of a step up transformer, and the secondary of the transformer feeds a peak detector whose output provides an operating potential for the Geiger-Mueller tube, and a potential divider in series with the tube generates the counts.

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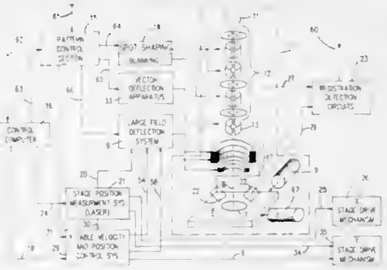
ELECTRON BEAM WRITING METHOD AND SYSTEM USING LARGE RANGE DEFLECTION IN COMBINATION WITH A CONTINUOUSLY MOVING TABLE

Donald E. Davis, Poughkeepsie; Samuel K. Doran, Wappinger Falls, both of N.Y.; Merlyn H. Perkins, New Fairfield, and Hans C. Pfeiffer, Ridgefield, both of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1987, Ser. No. 68,602

Int. Cl.⁴ H01J *37/304*

U.S. Cl. 250—492.2 **7 Claims**



1. Apparatus for writing, upon a workpiece supported on a work table, a pattern having a size larger than a pattern writing field, comprising:

(a) an electron beam means for generating a writing electron beam to be positioned anywhere within predetermined dimensions on said work table,

(b) said work table transporting the position of said workpiece relative to said electron beam,

(c) said workpiece having predetermined registration marks thereon,

(d) control means for receiving position data and for generating control signals in response thereto having at least one input and at least one output,

(e) said control means operating in accordance with a program for providing a predetermined pattern of exposure of said electron beam to said workpiece,

(f) deflection means connected to a said output of said control means for providing deflection of an electron beam in response to said control means,

(g) said electron beam means being juxtaposed with said deflection means,

(h) drive means for continuously transporting said workpiece along a path relative to said electron beam, said drive means having an input connected to a said output of said control means,

(i) registration detection means for providing a measurement of the position of said registration marks on said workpiece with respect to said electron beam without interruption of motion of said work table and said registration detection means including means for providing registration position data based upon said measurement to said control means simultaneously with the motion of said table,

(j) said registration detection means having an output connected to a said input of said control means, and

(k) said control means including means for generating workpiece position correction data relative to said work table as a function of the output of said registration detection means,

(l) wherein said control means provides said position correction data for correcting said predetermined pattern of exposure as a function of said correction data.

4,818,886

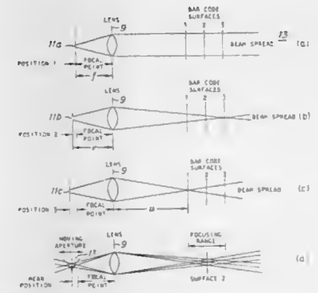
METHOD AND APPARATUS FOR SELF-REFERENCING AND SELF-FOCUSING A BAR-CODE READER

Steven H. Drucker, Oakland, Calif., assignor to Quential, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 930,328, Nov. 12, 1986. This application May 20, 1987, Ser. No. 52,762

Int. Cl.⁴ G06K *7/10*

U.S. Cl. 250—566 **36 Claims**



15. A method of sensing a bar code on a surface at varying distances therefrom, the method comprising the steps of:

supplying radiation to the surface at various focal distances;

selecting the focal distance at which radiation supplied to the surface is focussed; and

sensing the radiation reflected from the surface as the focal distance at which radiation is supplied is altered to produce an output indicative of the relative levels of reflected radiation sensed in response to altered focal distances of the radiation supplied to the surface.

4,818,887

ARRANGEMENT FOR THE RECOGNITION OF OBSTACLES FOR MOTOR VEHICLES

Walter Weishaupt, Munich, and Walter Mehnert, Ottobrunn, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 19, 1987, Ser. No. 109,316

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 3635396

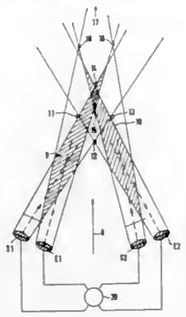
Int. Cl.⁴ G01N *21/86*

U.S. Cl. 250—561 **5 Claims**

1. An arrangement for the recognition of obstacles for motor vehicles by viewing reflections from obstacles between a transmitter and a receiver, comprising: a first transmitter means and a first receiver means for electromagnetic radiation which are directed onto a first close range examination area that begins at a close distance range in front of the first transmitter means; a second receiver means directed together with the first transmitter means to a second examination area which begins at a considerably greater second distance range from the first transmitter means than the first close distance range; selection

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means normally causing the close distance range transmitter-receiver combination to be activated and the considerable greater distance range transmitter combination to be inactivated, the selection means inactivating the first close distance range transmitter-receiver combination and activating the



second greater distance transmitter-receiver combination upon the occurrence of poor visibility at the first close range, and wherein the greater range distance is set with respect to the first close range distance such that reflections that would be caused by poor visibility at the first close range distance would not occur at the second greater range distance.

4,818,888

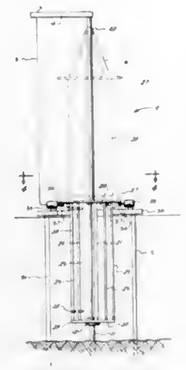
WATER-POWERED ELECTRICITY GENERATING APPARATUS

James L. Lenoir, III, 29 Farnham Pl., Metairie, La. 70005

Filed Oct. 20, 1987, Ser. No. 110,441

Int. Cl.[4] F03B *13/12*

U.S. Cl. 290—43 **15 Claims**



1. A water-powered electricity generating apparatus comprising:

a. a central plate form having a plurality of electricity-generating devices thereon;

b. a water wheel coaxially aligned with and adjacent to the central platform, and having a plurality of blades;

c. a plurality of stops which are movable between a position where contact with the blades is possible to a position where contact with the blades is not possible;

d. a drive gear fixedly attached to the water wheel; and

e. downwardly-facing gear teeth mounted on the drive gear for facilitating the removal of th Ⓡwater wheel from the water in the upward direction.

4,818,889

PINION STOPPER FOR ENGINE STARTER MOTOR

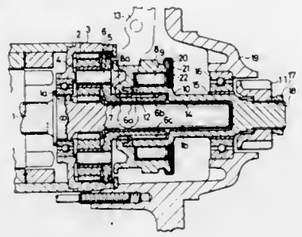
Takashi Kinoshita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,444

Claims priority, application Japan, May 13, 1987, 62-117415; May 13, 1987, 62-117416

Int. Cl.[4] F02N *15/04*

U.S. Cl. 290—48 **4 Claims**



1. In an engine starter motor including an output shaft adapted to be driven upon rotation of an armature, an over running clutch engaged with said output shaft through a helical spline formed on an inner peripheral surface of said over running clutch for moving a pinion axially to drive an engine and a pinion stopper provided on a portion of said output shaft for restricting a movement of said pinion, an improvement comprising said pinion stopper composed of a pinion engaging portion formed on a portion of said helical spline and a stopper member fixed to said over running clutch, said pinion engaging portion having opposite ends defining a definite axial length thereof on said portion of said helical spline, said stopper member being engaged with said pinion engaging portion slidably within said definite axial length of said pinion engaging grooves.

4,818,890

TURBINE HELPER DRIVE APPARATUS

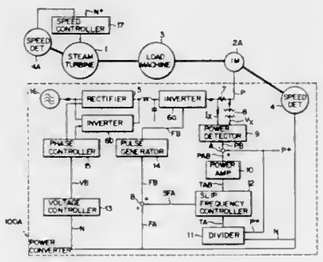
Tadao Mose; Akio Hirata; Suzuo Saito, all of Tokyo, and Hidehiko Kikuchi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 12, 1987, Ser. No. 119,710

Claims priority, application Japan, Nov. 14, 1986, 61-269536; Dec. 12, 1986, 61-294632

Int. Cl.[4] H02P *9/00;* **F01D** *15/10*

U.S. Cl. 290—52 **16 Claims**



1. A turbine helper drive apparatus adapted to an induction motor coupled to a turbine and its load, and having power converting means for changing an input power supplied to said induction motor in accordance with a predetermined preset power, so that load distribution of said load for said turbine and said induction motor is changed, said power converting means comprising:

power detection means for detecting the input power to said induction motor;

speed detecting means for detecting a rotational speed of said induction motor;

magnetic flux detecting means for detecting a magnetic flux of said induction motor;

a first divider for generating a torque reference signal by dividing the preset power by the rotational speed;

a second divider for generating a slip frequency reference signal by dividing the torque reference signal by the magnetic flux; and

power control means for controlling the input power to said induction motor in accordance with the slip frequency reference signal and the predetermined preset power.

4,818,891

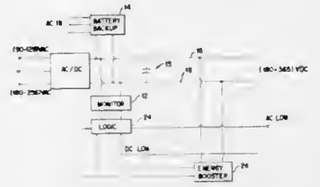
RIDE-THROUGH ENERGY BOOST CIRCUIT

Don L. Drinkwater, Shirley, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 6, 1988, Ser. No. 191,119

Int. Cl.[4] H02J *7/00*

U.S. Cl. 307—64 **16 Claims**



1. A device for riding through variations in a power supply and delaying initiation of a shut down procedure in a computer, the device comprising

an energy booster for raising the power supplied to the computer;

an interrupter for receiving and interrupting an asserted shut down signal and outputting an interrupt signal when said shut down signal has been asserted;

a gate trigger coupled to said interrupter and said energy booster for triggering said energy booster to raise the power supplied to the computer when said gate trigger receives said interrupt signal from said interrupter;

means for monitoring an amount of energy remaining in said energy booster coupled to said energy booster, said means for monitoring outputting a depletion signal when the amount of energy in said energy booster is below a reference value; and

an output stage having inputs coupled to said interrupter and said means for monitoring, said output stage receiving at said inputs said interrupt signal and said depletion signal and outputting a re-asserted shut down signal to said computer when both said interrupt signal and said depletion signal are present at the inputs of said output stage.

4,818,892

LASER DEVICE WITH HIGH-VOLTAGE PULSE GENERATOR, HIGH-VOLTAGE PULSE GENERATOR AND PULSE GENERATING METHOD

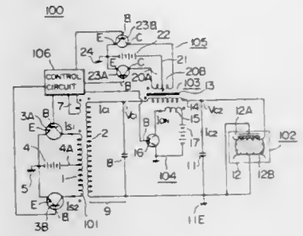
Tuneyoshi Oohashi, Hitachiota; Satoshi Takemori, Hitachi; Toshimichi Kichikawa, Hitachi; Kouji Kuwabara, Hitachi, and Hiroyuki Sugawara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,171

Claims priority, application Japan, Sep. 26, 1986, 62-226029; Mar. 27, 1987, 61-71534

Int. Cl.[4] H03K *3/02;* **G11C** *13/02*

U.S. Cl. 307—106 **15 Claims**



1. A laser device comprising:

laser generating means including discharge electrodes;

a dc power source;

switching means for switching on and off a voltage from said power source;

a transformer including a primary winding and a secondary winding, said primary winding being connected to said switching means;

a tank circuit in the form of a parallel connected inductance-capacitance circuit including the secondary winding of said transformer and a capacitor connected to both ends of said secondary winding, whereby when said switching means is operating it switches on and off the voltage from said dc power source at an oscillation period of said tank circuit such that in response to repeated switching by said switching means electric energy from said dc power source is stored in said tank circuit as a resonance condition build-up of a predetermined value;

a saturable reactor having a main winding is connected to said tank circuit; and

an output capacitor connected between said saturable reactor and the discharge electrodes of said laser generating means, whereby when said main winding of said saturable reactor is energized in accordance with said tank circuit attaining a predetermined stored resonance condition, the electric energy stored in said tank circuit is stored in the from of a charge energy and said charge energy is discharged as a pulse to said discharge electrodes.

4,818,893

HIGH SPEED SWITCHING CIRCUIT

Robert H. Domnitz, Lexington, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Continuation of Ser. No. 918,539, Oct. 10, 1986, abandoned. This application Apr. 6, 1988, Ser. No. 183,319

Int. Cl.[4] H03K *3/26*

U.S. Cl. 307—254 **17 Claims**

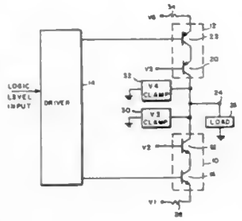
1. An electronic circuit comprising:

a first cascode circuit wherein a collector of a first common-emitter stage is directly coupled to an emitter of a first common-base stage;

a second cascode circuit wherein an emitter of a second common-base stage is directly coupled to a collector of a second common-emitter stage;

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said first common-base stage having a collector coupled to a collector of said second common-base stage; and



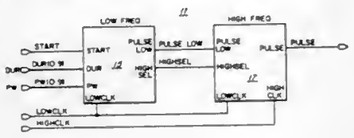
means, connected to said first and second common-emitter stage, for driving said first and second cascode circuits so that said cascode circuits operate in push-pull fashion.

4,818,894

METHOD AND APPARATUS FOR OBTAINING HIGH FREQUENCY RESOLUTION OF A LOW FREQUENCY SIGNAL

George D. Underwood, Inglewood, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 9, 1987, Ser. No. 23,502
Int. Cl.[4] H03L *7/00;* **H03B** *19/00;* **H03K** *7/00*
U.S. Cl. 307—269 **12 Claims**



1. A method of increasing the resolution of a low frequency data signal comprising:
generating a data wave signal having low frequency resolution;
determining the desired high frequency resolution of the data wave form;
generating a low frequency correction signal with a low frequency clock, said correction signal being indicative of the modification of the data signal necessary to obtain the determined high frequency resolution;
communicating the data signal and the correction signal to high frequency logic; and
correcting the data signal to the determined higher frequency resolution at the high frequency logic.

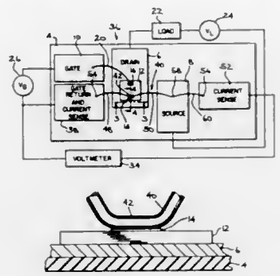
4,818,895

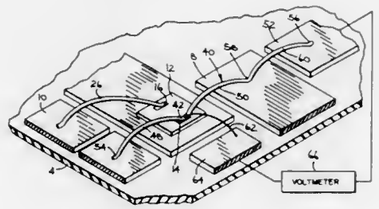
DIRECT CURRENT SENSE LEAD

Lance R. Kaufman, 131 N. White Oak Way, Mequon, Wis. 53092

Filed Nov. 13, 1987, Ser. No. 120,632
Int. Cl.[4] H01L *29/68, 27/22;* **G01R** *29/12;* **H04R** *19/00*
U.S. Cl. 307—303.1 **27 Claims**

1. In an electrical circuit assembly comprising a semiconductor chip having first, second and third terminal connection pads of given lateral size, first and second main terminals connected respectively to said first and second connection pads and providing a main current flow path through said chip, a control terminal connected to said third connection pad for controlling said main current flow, a control return reference terminal connected through a portion of said second main terminal to said second connection pad, the improvement comprising means for minimizing inductance in said control return reference terminal comprising means connecting said control return reference terminal to said second main terminal directly at said second connection pad without plural laterally adjacent bonds at said second connection pad otherwise restricting the size of terminals which can fit within said given lateral size of said second connection pad.





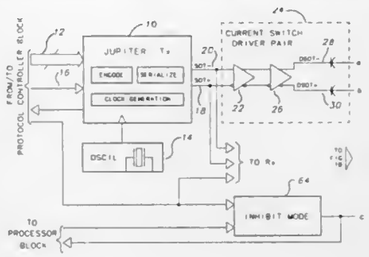
4,818,896

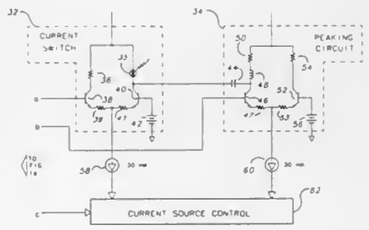
OPTICAL TRANSMITTER DRIVER WITH CURRENT PEAKING

Vicente V. Cavanna, Loomis, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 28, 1987, Ser. No. 90,865
Int. Cl.[4] H03K *19/14, 17/12, 17/64, 19/086*
U.S. Cl. 307—362 **6 Claims**

1. A circuit for driving an electro-optical transducer, operable at a first level and a second level, from digitally-encoded signals including at least a first and a second differential signal, comprising:
first current switching means responsive to said first differential signal for generating therefrom a signal driving said electro-optical transducer;
second current switching means operably coupled to said first current switching means and responsive to said second differential signal for generating a signal cooperating with said signal driving said electro-optical transducer causing additional current to flow through said electro-optical transducer when said first current switching means drives said transducer to said first level, and causing negative current to flow through and producing a charge buildup on, said transducer when said first current switching means drives said transducer to said second level; and
means connected to said first and second current switching means for maintaining current flow through said first and second current switching means at a first and a second predetermined level, respectively, said cooperating first and second current switching means ensuring said predetermined current levels remain constant.



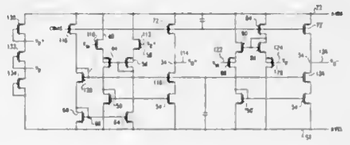


4,818,897

FAST ONE WAY AMPLIFIER STAGE

William R. Krenik, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 25, 1987, Ser. No. 101,108
Int. Cl.[4] H03K *5/24, 5/153*
U.S. Cl. 307—362 **25 Claims**



1. A one way amplifier/comparator, comprising:
a positive rail disposed at a positive voltage;
a negative rail disposed at a negative voltage;
an output node having a capacitive load associated therewith;
an input terminal for receiving an input voltage;
a reference terminal for receiving a reference voltage;
amplifier/comparator circuitry for interfacing with said input and reference terminals to determine the voltage difference therebetween and sourcing a current from said positive rail to said negative rail that varies in a square law relationship with said voltage difference for one polarity thereof and inhibits current flow for the opposite polarity thereof;
switch circuitry having an active state with a low source impedance and an inactive and non-conducting state for selectively switching said output node to one of said positive or negative rails when in the active state;
switch control circuitry coupled in series with said amplifier/comparator circuitry for sensing said current having said square law relationship with said voltage difference of said one polarity and for controlling said switch circuitry to switch from the inactive state to the active state when said current sourced by said amplifier/comparator circuitry exceeds a predetermined level; and
load circuitry for pulling said output node to the opposite of the one of said positive and negative rails to which said switch circuitry switches to when said switch circuitry is in the active state.

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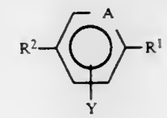
OPTICAL NONLINEARITY IN ORGANIC AND ORGANOMETALLIC MOLECULES VIA LATTICE INCLUSION COMPLEXATION

Albert G. Anderson; David F. Eaton; Wilson Tam, and Ying Wang, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 10, 1986, Ser. No. 905,907
Int. Cl.[4] G02B *1/00*
U.S. Cl. 307—427 **18 Claims**



1. A nonlinear optical element capable of second harmonic generation, comprising a crystalline inclusion complex of a lattice-forming host compound crystallized with continuous channel cavities in the presence of a nonlinearly polarizable guest compound in a noncentrosymmetric space group, said guest compound
(i) being nonlinearly polarizable in the presence of an electromagnetic field, and
(ii) having a molecular width, W, such that $D/2<W<D$, where D is the diameter of the channel cavity;
wherein
(A) the lattice-forming host compound is selected from the group consisting of
(a) Hofmann clathrate lattice compounds having the formula $M^1(NH_3)_2Ni(CN)_4$ wherein M^1 is Mn, Ni, Cu or Cd;
(b) Werner coordination complexes having the formula $M^2X_2A_4$ wherein M^2 is divalent and is Fe, Co, Ni, Cu, Zn, Cd, Mn, Hg or Cr; X is NCS^-, NCO^-, CN^-, NO_3^-, NO_2^-, Cl^{31}, Br^-, or I^-; and A is substituted pyridine, α-arylalkylamine or isoquinoline;
(c) cyclophosphazenes;
(d) tris-ortho-thymotide;
(e) urea, thiourea and selenourea;
(f) phenols. hydroquinones and Dianin's compound;
(g) perhydrotriphenylene;
(h) cyclotriveratrylene;
(i) trianthranilides; and
(j) deoxycholic acid; and
(B) the guest compound is selected from the group consisting of
(a) substituted aromatic compounds of the formula



wherein
A is C or N;
R^1 is $-NH_2$, $-NHCH_3$, $-N(CH_3)_2$, or $-C(O)M$-

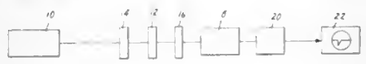
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$(CO)_x$ where M is Mn or Re and x is 5 or M is Co and x is 4;
R^2 is $—NO_2$, —CN, $(CH{=}CH)_nC(O)H$ where n is 1 to 3, or 4-(dicyanomethylene)-2-methyl-6-vinyl-4H-pyran; and
Y is —H, $—CH_3$, $—OCH_3$, —OH, —F or Cl; and
(b) octahedrally coordinated transition metal complexes having a -bonded ligand and having the formula

$[L^1M^3L^2_m]^p$

wherein
M^3 is Cr, Mo, W, Mn, Tc, Re, Fe, Ru, Os, Rh or Ir;
L^1 is an olefinic or aromatic ligand capable of -bonding to M^3 to form a part of an octahedral complex;
each L^2 is independently an unidentate ligand;
m is 1-3; and
p is −1, 0 or +1; with the provisos that said inclusion complex is other than a complex of thiourea and benzene molybdenum tricarbonyl or a complex of tris-ortho-thymotide and stilbene chromium tricarbonyl, and
when said nonlinear optical element is a single crystal, it is other than an inclusion complex of thiourea and cyclopentadienylmanganese tricarbonyl.

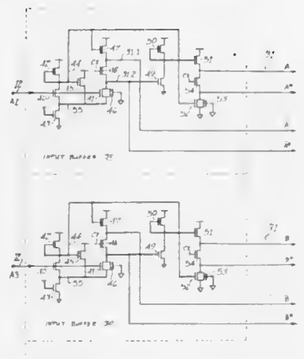
4,818,899
SECOND HARMONIC GENERATION BY CARBAMIC ACID DERIVATIVES
George V. D. Tiers, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 3, 1986, Ser. No. 937,234
Int. Cl.[4] G02F *1/03*; H03F *7/00*
U.S. Cl. 307—425 **14 Claims**



1. A second harmonic generator comprising a laser source of coherent light radiation at a fixed fundamental frequency, an organic molecular crystalline compound, means for directing the output radiation of the laser onto the compound, and output means for utilizing the second harmonic frequency, said compound being a chiral N-aryl carbamyl compound in which the nitrogen of the carbamyl group is directly bonded to the aryl group and which crystallizes in a non-centrosymmetric configuration, said compound being transparent to radiation at said fixed fundamental frequency and said second harmonic frequency.

4,818,900
PREDECODE AND MULTIPLEX IN ADDRESSING ELECTRICALLY PROGRAMMABLE MEMORY
Jeffrey M. Klass, Rosenberg; Paul A. Reed, and Isam Rimawi, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 118,348, Feb. 4, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,637
Int. Cl.[4] H03K *17/687*
U.S. Cl. 307—450 **16 Claims**

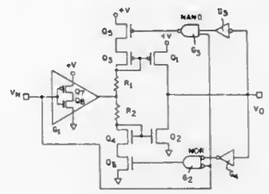
9. A transistor circuit having a first input terminal, a second input terminal, and a circuit enable terminal, said circuit comprising:
(a) a depletion-mode MOS transistor having a source, a drain, and a gate, the latter gate being connected to said first input terminal;
(b) an enhancement-mode MOS transistor having a drain, a source, and a gate, the latter gate being connected to said second input terminal; and
(c) an MOS transistor connected between said depletion-mode transistor and said enhancement-mode transistor for providing a power-down function, said power-down function transistor having a threshold voltage of approximately zero volts and also having a drain connected to

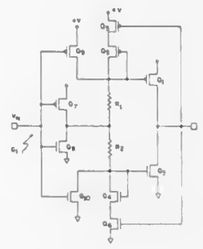


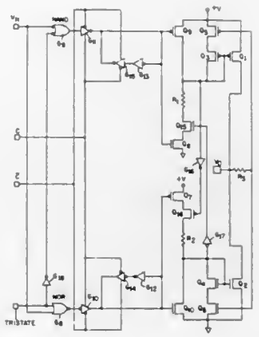
said source of said depletion-mode MOS transistor, a source connected to said drain of said enhancement-mode transistor, and a gate connected to said circuit enable terminal.

4,818,901
CONTROLLED SWITCHING CMOS OUTPUT BUFFER
William R. Young, Palm Bay, and Harold D. Davidson, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.
Filed Jul. 20, 1987, Ser. No. 75,641
Int. Cl.[4] H03K *19/003, 19/017, 19/094, 17/13*
U.S. Cl. 307—451 **28 Claims**

1. A buffer comprising:
buffer input and output;
an output transistor having a conduction path connected between said buffer output and a first power terminal and having a control electrode, and
control means connected to said buffer input and output and said control electrode for operating said output transistor in a constant current mode in response to a first level input signal on said buffer input and a first level output signal on said buffer output and operating said output transistor in a



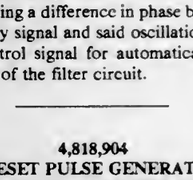




constant voltage mode in response to said first level input signal and a second level output signal.

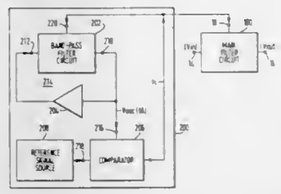
4,818,902
INTEGRATED CIRCUIT COMPONENT
Werner Brockmann, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Fed. Rep. of Germany
Filed Dec. 3, 1986, Ser. No. 937,560
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1985, 3543471
Int. Cl.[4] G01F *7/38*; H03K *19/094*
U.S. Cl. 307—465 **9 Claims**

1. In an integrated circuit component having a plurality of input lines, at least one logic AND-array and a logic OR-array connected thereto, the OR-array having a plurality of outputs, and at least one of the arrays being programmable, wherein the improvement comprises:
selector means having a plurality of data inputs, at least one control input and at least one output, said selector means operating to connect selected inputs to the output as a function of control signals on the control input;
means for connecting at least some of the outputs of the OR-array to inputs of the selector means; and
wherein at least one of the input lines of the integrated circuit component is directly connected to a control input of the selector means whereby the outputs of the logic OR-array which are coupled to the output of the selector



means is a function of control signals applied to the control input of the selector via the said at least one input line of the integrated circuit component.

4,818,903
TIME CONSTANT AUTOMATIC ADJUSTMENT CIRCUIT FOR A FILTER CIRCUIT
Mitsumo Kawano, Honjo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jul. 17, 1987, Ser. No. 74,723
Claims priority, application Japan, Jul. 18, 1986, 61-169234
Int. Cl.[4] H03K *3/20*
U.S. Cl. 307—521 **9 Claims**



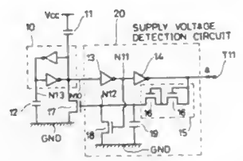
1. An automatic adjustment circuit for adjusting a filter circuit, the filter circuit having a time constant, the adjustment circuit adjusting the time constant and receiving a reference frequency signal, said adjustment circuit comprising:
oscillation means for generating an oscillation signal, said oscillation means including a time constant variable filter and a feedback amplifier connected to said variable filter for positive feedback; and
means for detecting a difference in phase between said reference frequency signal and said oscillation signal and generating a control signal for automatically adjusting the time constant of the filter circuit.

4,818,904
POWER ON RESET PULSE GENERATING CIRCUIT SENSITIVE TO RISE TIME OF THE POWER SUPPLY
Toshifumi Kobayashi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 13, 1988, Ser. No. 143,398
Claims priority, application Japan, Apr. 1, 1987, 62-81606
Int. Cl.[4] H03K *17/22, 17/60*
U.S. Cl. 307—594 **13 Claims**

1. A power on reset pulse generating circuit for providing a reset signal at an output terminal thereof, comprising:
latch means settable into a first state and resettable into a second state,
means for setting said latch means in response to an applied supply voltage,
first resetting means including time constant circuit means

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for resetting said latch means in response to an applied supply voltage having a fast rise time, and



second resetting means including level detecting means for resetting said latch means in response to an applied supply voltage having a slow rise time.

4,818,905

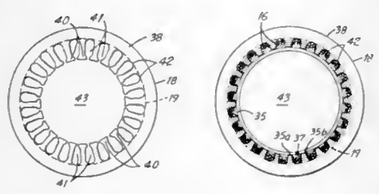
SLOTLESS AND TOOTHLESS WOUND STATORS

Robert J. Lender, Weston, Conn., assignor to EDO Corporation, College Point, N.Y.

Division of Ser. No. 632,667, Dec. 13, 1985, Pat. No. 4,563,808. This application Dec. 13, 1985, Ser. No. 808,629

Int. Cl.[4] H02K *1/18, 15/08*

U.S. Cl. 310—42 **7 Claims**



1. A slotless and toothless wound stator for an electrical machine, comprising an iron stator cylinder having a smooth circumferential inner wall without slots or teeth between opposite ends of the cylinder, electrical windings without supporting form positioned on and pressed against the smooth inner wall about its circumference, and non-magnetic cylindrical retaining means positioned solely on the side of the electrical windings opposite that of the smooth inner wall and pressing against the windings in a direction toward the smooth inner wall.

4,818,906

VEHICLE MOUNTED A.C. GENERATOR

Yutaka Kitamura, and Hiroaki Aso, both of Chiyoda, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

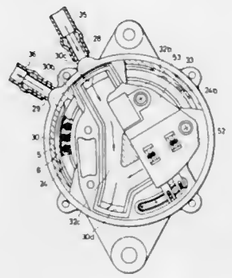
Filed Apr. 7, 1987, Ser. No. 35,427

Claims priority, applicatioo Japan, Apr. 7, 1986, 61-81471

Int. Cl.[4] H02K *9/00*

U.S. Cl. 310—58 **3 Claims**

1. A vehicle mounted a.c. generator, comprising: a rotor shaft (**1**) adapted to be driven by a vehicle engine; a rotor core (**22**) fixedly secured to said shaft and adapted to be excited by an exciting coil (**50**); a stator core (**5**) disposed opposite an outer periphery of said rotor core and mounting a stator coil (**6**); an enclosure half (**24**) enclosing at least a rear portion of the stator coil; a front bracket (**26**) and a rear bracket (**30**) sealingly joined together to define a housing supporting said stator core directly and said rotor shaft indirectly through bearings (**51, 54**); a rectifier (**52**) for rectifying an output voltage generated by said stator coil; a voltage regulator (**53**) for regulating an output voltage of said rectifier to a predetermined value; at least one annular coolant passage (**32***b*) formed between said enclosure half of the stator coil and said rear bracket; a branch coolant passage (**32***c*) formed along an end surface of said rear bracket, a coolant inlet port (**28**) formed in said rear bracket and connected to said annular coolant



passage and said branch coolant passage; and a coolant outlet port (**29**) formed in said rear bracket and connected to said annular coolant passage and said branch coolant passage, said coolant inlet and outlet ports being disposed in a common plane orthogonal to said shaft with an angle between said inlet port and said outlet port being less than 90°, said stator coil, said rectifier and said voltage regulator being cooled by circulating a liquid coolant through said coolant passages.

4,818,907

BRUSHLESS MOTOR FOR DRIVING MAGNETIC DISKS

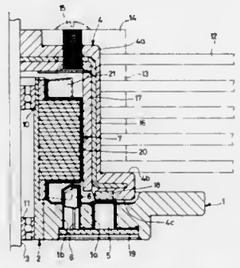
Yozo Shirotori, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Dec. 3, 1987, Ser. No. 128,240

Claims priority, application Japan, Dec. 3, 1986, 61-185521

Int. Cl.[4] H02K *5/10;* **G11B** *33/14*

U.S. Cl. 310—67 R **16 Claims**



1. A brushless motor for driving magnetic disks, comprising:
a housing having at least one through hole therein;
a stator attached to said housing;
a rotor having a driving magnet thereon disposed in opposing relationship with said stator;
a detecting element for detecting a magnetic pole of said driving magnet removably fitted into said at least one through hole; and
sealing means for sealing one open end on a side of said rotor when said detecting element is fitted into said through hole and when said detecting element is removed from said through hole.

4,818,908

BRUSHLESS MOTOR HAVING PHASE ADVANCE

Hiroaki Tamae, Hirakata, and Yoshihiro Ashizaki, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

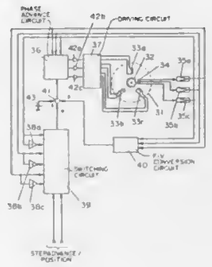
PCT No. PCT/JP85/00679, § 371 Date Jun. 7, 1987, § 102(e) Date Jun. 7, 1987, PCT Pub. No. WO87/01251, PCT Pub. Date Feb. 26, 1987

PCT Filed Dec. 10, 1985, Ser. No. 49,319

Claims priority, application Japan, Aug. 12, 1985, 60-177121

Int. Cl.[4] H02K *29/06*

U.S. Cl. 310—171 **5 Claims**



1. A brushless motor comprising:
a rotor having magnetic pole teeth;
a stator having a plurality of coils, each facing said rotor across a gap;
bearing means for rotatably supporting said rotor;
position sensor means, mounted on said stator, for detecting variations of a position of said rotor and converting said variations into an electric signal, indicative thereof to issue a substantially sine waveshaped polyphase positional signal;
velocity detecting means for converting said positional signal to a velocity signal indicative of a rate of change of said positional signal;
electronic switching means coupled to receive a step advance instruction signal from external to said motor, for selecting one phase of said polyphase positional signal, corresponding to said step advance instruction signal;
phase advancing means for advancing a phase of said positional signal, using a sum of said velocity signal and said selected positional signal as a phase advance amount; and
driving circuit means for exciting said plurality of coils, using the phase-advanced positional signal.

4,818,909

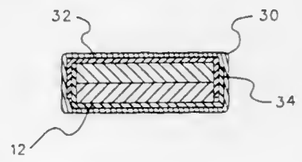
INSULATED COIL ASSEMBLY

Roy L. Balke, Erie, Pa., assignor to General Electric Company, Salem, Va.

Filed Jan. 15, 1988, Ser. No. 144,137

Int. Cl.[4] H02K *3/30*

U.S. Cl. 310—208 **19 Claims**



1. An insulated coil assembly for use in electrical apparatus comprising:
(a) a coil of conductive wire disposed in a predetermined configuration; and,
(b) an insulating layer having good heat conductivity and high dielectric strength disposed over defined portions of said coil, said layer comprising a layer of close woven, heat-cleaned, glass fiber tape impregnated with a cured resin said tape having a warp in the approximate range of from 42 to 52.

4,818,910

COMMUTATOR MOTOR WITH AN INSULATING COVER FOR THE ROTOR SHAFT

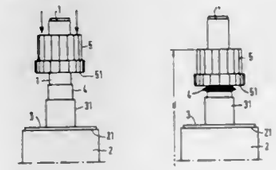
Walter Reisenweber, Mellrichstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 14, 1987, Ser. No. 96,691

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631943

Int. Cl.[4] H02K *1/22, 5/16;* **H01R** *39/16*

U.S. Cl. 310—233 **7 Claims**



1. In a commutator motor including an insulating cover for the rotor shaft in the region between an insulating end disc covering an end face of the rotor stack and the opposite commutator end face, an improvement characterized by an automatically axially collapsible sleeve being closed in the circumferential direction to provide said insulating cover around the rotor shaft, said sleeve comprising a separate part arranged between the insulating end disc and the opposite commutator end face and the automatically axially collapsible sleeve being automatically collapsed in the axial direction by axial displacement of at least one of the rotor stack and commutator during the assembly of the rotor stack and commutator on the rotor shaft to adapt the overall length of the rotor stack, commutator and sleeve on the rotor shaft to a preselected length.

4,818,911

STATOR OF ELECTRIC MOTOR

Norikazu Taguchi, Kakegawa; Hirozumi Nishizaki, Toyohashi; Hisashi Masui, Kosai, and toshiyasu Ishizuka, Hamamatsu, all of Japan, assignors to ASMO Co., Ltd., Kosai, Japan

Continuation of Ser. No. 836,486, Mar. 5, 1986, abandoned. This application Oct. 7, 1987, Ser. No. 105,986

Claims priority, application Japan, Mar. 9, 1985, 60-46799; Mar. 9, 1985, 60-46800; Mar. 11, 1985, 60-34873[U]; Mar. 11, 1985, 60-34874[U]; Mar. 11, 1985, 60-34875[U]

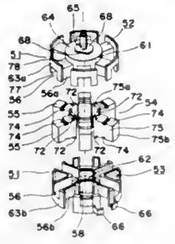
Int. Cl.[4] H02K *1/12*

U.S. Cl. 310—259 **22 Claims**

1. An electric motor, comprising:
a rotor; and
a stator including an insulator member having an upper half shell and a lower half shell, each of said upper and lower half shells including a ring based portion and a pole retaining portion, said pole retaining portion having a plurality of troughs, said troughs extending radially outward from the outer periphery of the ring-based portion in a multipetalous shape, the troughs of said upper shell adapted to align with the troughs of said lower shell; a like plurality of substantially parallelepiped stator poles retained in respective pole retaining portions of the insulator member, each of said stator poles being sandwiched within respec-

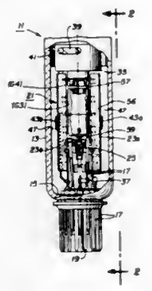
VOL 1101 ISS 1 AP 4 1989 UMI

tive troughs of said upper and lower shells; a plurality of windings, each of said windings applied around a respective stator pole retained in the respective pole retaining



portion; and a yoke member which covers the outer periphery of the insulator member to integrally combine each pole with the yoke member.

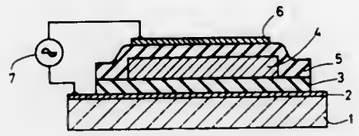
4,818,912
CRT WITH ARC SUPPRESSING MEANS ON INSULATING SUPPORT RODS
Samuel P. Benigni, Lititz, Pa., assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Mar. 15, 1988, Ser. No. 168,200
Int. Cl.[4] H01J *29/82, 29/50*
U.S. Cl. 313—457 **9 Claims**



1. In a cathode-ray tube having a glass neck and an electron gun mount assembly in said neck, said mount assembly comprising means for generating at least one electron beam and a plurality of successively spaced-apart electrodes including a screen grid electrode, a focusing electrode and an anode electrode secured to one major surface of at least two longitudinally extending insulating support beads, an opposite major surface of each of said beads being outwardly facing and having thereon an electrically-conductive coating located opposite said focusing electrode, and means for applying suitable voltages to said electrodes to generate electrical activity within said electron gun mount assembly and along said beads thereof, wherein the improvement comprises

said coating on each of said beads being located in an area of minimum electrical activity along said beads, said coating being spaced a predetermined distance from an end of said focusing electrode adjacent to said screen grid electrode.

4,818,913
AGING METHOD FOR THIN-FILM ELECTROLUMINESCENT DISPLAY PANEL
Kinishi Isaka, Yamatokoriyama; Masashi Kawaguchi, Nara, and Hisashi Uede, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 23, 1982, Ser. No. 401,385
Claims priority, application Japan, Jul. 31, 1981, 56-121001; Jul. 31, 1981, 56-121002
Int. Cl.[4] H01J *9/44;* **H05B** *33/10*
U.S. Cl. 315—169.3 **3 Claims**



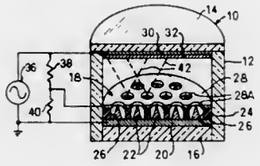
1. A circuit for aging a thin-film electroluminescent display element comprising:

a constant current circuit for providing a constant current to electrode means of an element;

rectangular wave generator means for providing rectangular waveform signals; and

converting means for converting changes in impedance of the element during an aging procedure into changes in applied voltages so that an aging voltage applied to the element is changed in accordance with changes in said impedance.

4,818,914
HIGH EFFICIENCY LAMP
Ivor Brodie, Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.
Filed Jul. 17, 1987, Ser. No. 74,979
Int. Cl.[4] G09G *3/10*
U.S. Cl. 315—169.3 **12 Claims**



1. A cathodoluminescent lamp comprising:

an evacuated envelope at least a portion of which is light-transmitting,

a field emission structure inside said envelope comprising spaced plate-like cathode and accelerator electrodes and an insulator separating and insulating the cathode and accelerator electrodes,

said accelerator electrode comprising a unitary conduct or f ormed with an array of apertures therethrough,

said cathode electrode being formed with an array of needle-like members projecting from one surface thereof and into said apertures in said unitary accelerator electrode,

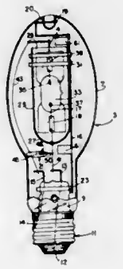
means for supplying a first voltage across the cathode and accelerator electrodes for field emission of electrons from tips of the needle-like members into said evacuated envelope, electrons from each needle-like member being emitted over a solid beam angle whereby electron beams overlap within the envelope,

a layer of phosphor at the light-transmitting portion of the envelope,

an anode electrode at the phosphor layer, and

means for supplying a second voltage greater than said first voltage across the cathode and anode electrodes for collecting the overlapping electron beams emitted from the field emission structure, electrons collected by said anode electrode impinging on said phosphor layer ior exciting the phosphor layer to luminescence.

4,818,915
ARC DISCHARGE LAMP WITH ULTRAVIOLET RADIATION STARTING SOURCE
Gregory Zaslavsky, Brookline; Nikolaos Barakitis, Salem, and William M. Keeffe, Rockport, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Oct. 22, 1987, Ser. No. 111,395
Int. Cl.[4] H01J *7/44*
U.S. Cl. 315—60 **14 Claims**



1. A metal halide arc discharge lamp comprising:

an arc tube containing a chemical fill including mercury and metal halides and having first and second electrodes respectively sealed at opposite ends thereof;

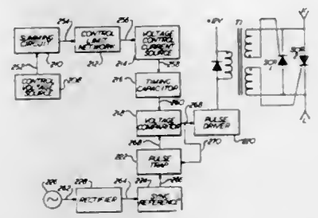
an outer envelope surrounding said arc tube and having first and second terminals for electrical connection thereto;

means for electrically coupling said first electrode of said arc tube to said first terminal;

means for electrically coupling said second electrode of said arc tube to said second terminal; and

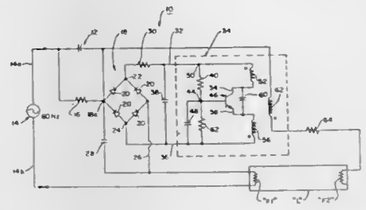
a source of ultraviolet radiation within said outer envelope proximate said arc tube for producing radiation which illuminates the path between said electrodes of said arc tube to decrease the amount of time for generating a gaseous discharge therebetween, said source of ultraviolet radiation comprising an envelope of ultraviolet light transmitting material, a fill material contained within said envelope of said source of ultraviolet radiation, a single electrode sealed in said envelope of said source of ultraviolet radiation, and means for electrically coupling said single electrode of said source of ultraviolet radiation to said means for electrically coupling said first electrode of said arc tube to said first terminal, a portion of said envelope of said source of ultraviolet radiation being capacitively coupled to said means for electrically coupling said second electrode of said arc tube to said second terminal such that said source of ultraviolet radiation produces said ultraviolet radiation during lamp starting when said first and second terminals of said lamp are energized.

4,818,916
POWER SYSTEM FOR INDUCTIVELY COUPLED PLASMA TORCH
Peter J. Morrisroe, New Milford, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Mar. 6, 1987, Ser. No. 22,838
Int. Cl.[4] H01J *7/24*
U.S. Cl. 315—111.21 **14 Claims**



11. A plasma generating method for use with an induction plasma system including a plasma torch, and LC power oscillator network and a separate output LC network, the oscillator network being tuned to a first resonant radio frequency, and the output LC network being cooperative with the plasma torch to inductively energize a continuous plasma discharge therein, the method comprising passing plasma-forming gas through the plasma torch, tuning the output LC network simultaneously to a second resonant radio frequency higher than the first frequency, and coupling the oscillator network and the output LC network so as to transfer a portion of the radio frequency power from the oscillator network to the output LC network, and thereby to the plasma discharge.

4,818,917
FLUORESCENT LIGHTING BALLAST WITH ELECTRONIC ASSIST
Gary W. Vest, 6305 Barberton Ave., Cleveland, Ohio 44102
Filed Jul. 7, 1986, Ser. No. 882,474
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—171 **14 Claims**



1. A circuit for starting and operating a gaseous discharge lamp having spaced apart first and second lamp electrodes, said circuit comprising:

(a) a current limiting ballast means for providing steady-state operating power from an alternating current power source to the lamp, said ballast means having a high voltage side connectable to an input from the alternating current power source, and

(b) oscillator means for providing relatively high voltage and high frequency excitation power with respect to the alternating current power source to start the lamp, and for providing reduced amplitude high frequency power during lamp operation said oscillator means having

(i) rectifier means connected to a low voltage side of said

ballast means and coupleable to a return line of said power source, and

(ii) an oscillator for producing a signal at the high frequency and having a high frequency output means connected in series with said ballast means and said first and second lamp electrodes,

(c) said excitation power being applied to the oscillator means through said rectifier means to start the lamp and as a lamp conduction begins there is a reduction in voltage across the rectifier means and a corresponding reduction in said excitation power coupled through the output means in series with the lamp electrodes.

4,818,918

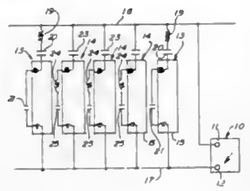
HIGH FREQUENCY LIGHTING SYSTEM FOR GAS DISCHARGE LAMPS

Pierce M. Murphy, 201 W. View Pl., LaCross, Wis. 54603

Filed Apr. 22, 1987, Ser. No. 41,154

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—244 **9 Claims**



1. In a high frequency lighting system, the combination, comprising;

a variable source of high frequency current;

a plurality of lamp units, each including first and second terminals for connection to said variable source of high frequency current and an intermediate terminal and having capacitive means connected intermediate said first terminal and said intermediate terminal and inductive and direct current blocking capacitive means connected in series intermediate said second terminal and said intermediate terminal and a gaseous discharge lamp connected in parallel with half of said capacitive means and half of said inductive and capacitive means, said capacitive and inductive means being proportioned so that half of said lamp units exhibit a resonant frequency of thirteen to twenty percent less than the frequency of said variable source of high frequency current and the other half of said lamp units exhibit a resonant frequency of thirteen to twenty percent greater than said variable source of high frequency current;

means connecting the first and second terminals of said plurality of lamp units in parallel with said variable source of high frequency current; and

means connected to said variable source of high frequency current for controlling the output thereof.

4,818,919

COLOR PICTURE TUBE APPARATUS

Kenichi Kobayashi; Hiroyuki Koba, and Naoto Nakamura, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Oct. 27, 1987, Ser. No. 113,203

Claims priority, application Japan, Oct. 31, 1986, 61-258349; Jun. 19, 1987, 62-151394

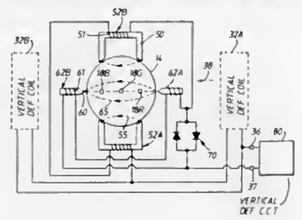
Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—371 **16 Claims**

1. A color picture tube apparatus, comprising:

a color picture tube including an envelope with a panel therein, a phosphor screen disposed inside the panel, and an in-line type electron gun generating a center beam and a pair of side beams for exciting the phosphor screen to emit light; and

defelection means generating horizontal and vertical deflection magnetic fields for deflecting the electron beams from the electron gun to form respective rasters, the deflecting means including means for generating a barrel type vertical deflection magnetic field and non-linear magnetic field correction means for generating an additional pin-cushion type magnetic field added to the vertical deflection magnetic field for vertically adjusting the position of the rasters produced by the side beams to the position of the raster produced by the center beam.



4,818,920

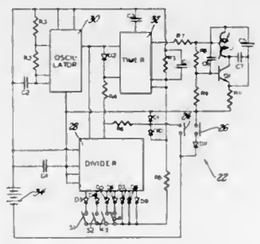
DIGITAL OEM CEILING FAN

Keith D. Jacob, 2321 S. Circle Dr., Ann Arbor, Mich. 48013

Filed Oct. 26, 1987, Ser. No. 112,614

Int. Cl.[4] H04Q *7/02*

U.S. Cl. 318—16 **19 Claims**



1. A remote control fan assembly for connection to an electrical power outlet (12), said assembly comprising; air circulating means (14), electrical motor means (16) for driving said air circulating means (14), radio signal receiver means (20) electrically connected to said motor means (16) and adapted for electrical connection to the electrical power outlet (12) for controlling the power supplied to said motor means (16) in response to a first radio signal, said receiver means (20) including motor control means for controlling the rotational speed of said motor means (16), said motor control means including divider means (82) for receiving and counting each received first radio signal to turn ON and OFF and change the speed of rotation of said motor means (16), said divider means (82) including a divider chip means (90) for receiving said first radio signal and including a delay circuit (92) for delaying the change of speeds between counts and producing an input signal for said divider chip (90) so that said motor means (16) is controlled at a first rotational speed by count one upon a reception of a first motor control signal, said motor means (16) is controlled at a second rotational speed by count two upon a second motor control signal received by said delay circuit (92) for incrementing said divider cbip means (90) to count three after said delay (92), said motor means (16) is controlled at a third rotational speed by count four upon a third motor control signal received by said delay circuit (92) incrementing said divider chip means (90) to count five after said delay, and said motor means (16) is turned off upon a fourth motor control signal received by said divider chip means (90) to be reset by a count six.

2. A remote controlled fan assembly (10) for connection to an electrical power outlet (12), said assembly comprising; air circulating means (14), electrical motor means (16) for driving said air circulating means (14), electrical light means for selectively providing an illumination, radio signal receiver means (20) electrically connected to said motor means (16) and said light means and adapted for electrical connection to the electrical power outlet (12) for controlling the power supplied to said motor means (16) and said light means independently of one another in response to a first and a second radio coded signal, said receiver means including a pulse decoding means (44) for receiving said radio coded signals comprising a series of coded pulses and comparing said pulses to a predetermined light code and a predetermined motor code to produce a light control signal and a motor control signal, respectively, said pulse decoding means (44) including pulse orientation means (46) for detecting said radio coded signals having a predetermined pulse width and pulse separation, said pulse orientation means including width detector means for allowing said radio coded signals to pass when said pulses have a width within a predetermined width range and separation detector means for allowing said radio coded signal to pass when said pulses have a separation within a predetermined separation range, and digital decoding means (56) for receiving the detected radio coded signals from said pulse orientation means (46) and for comparing said coded pulses to a consumers selectable code comprise said predetermine light code and said predetermined motor code to produce said light control signal and said motor control signal when detached.

4,818,921

APPARATUS FOR CONTROLLING A MOTOR IN A CAMERA

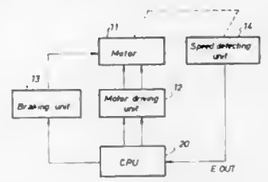
Daisuke Hata, Funabashi; Susumu Iguchi; Yoshimi Ohno, both of Kawasaki; Kazumasa Aoki, Tokyo, and Takayuki Hatase, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 90,348

Claims priority, application Japan, Sep. 1, 1986, 61-205333

Int. Cl.[4] H02P *3/08*

U.S. Cl. 318—269 **4 Claims**



1. An apparatus for controlling a motor in a camera comprising, a motor drive unit for driving said motor in a prescribed sequence, a braking device for applying the brakes on said motor in accordance with said prescribed sequence, and a speed detecting unit for monitoring the speed of said motor and permitting initiation of the next action only after the speed of said motor in consequence of application of the brakes by said braking device, is brought to a level incapable of obstructing the next action.

3. An apparatus for controlling a motor in a camera comprising, a motor driving unit for driving said motor in a prescribed sequence, a braking device for applying the brakes on said motor in accordance with said sequence, a speed detecting unit for monitoring the speed of said motor and transmitting a signal when the speed of said motor, in consequence of application of the brakes by said braking device, is lowered below a prescribed level, and a timer for initiating a next action after an elapse of a prescribed length of time after reception of said signal from said speed detecting unit.

4,818,922

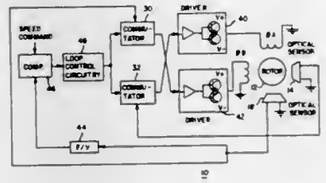
OPTICAL COMMUTATION FOR PERMANENT MAGNET MOTORS

Jerome Sears, Wyckoff; Walter Parfomak, Wallington, and Walter Kluss, Clifton, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 22, 1986, Ser. No. 921,491

Int. Cl.[4] H02K *29/00;* **G01C** *19/28*

U.S. Cl. 318—313 **7 Claims**



1. Permanent magnet motor apparatus comprising:

a two pole permanent magnet rotor;

two phase stator windings, disposed for driving said permanent magnet rotor when energized;

an optical pattern consisting of a reflective segment and a non-reflective segment formed on said rotor;

two optical detectors spatially separated by 90° and disposed with respect to said permanent magnet rotor to sense said optical pattern;

drive circuit means responsive to said optical detector means for continuous two phase driving of said two phase stator windings to start and drive said permanent magnet rotor; and,

feedback means including a feedback circuit for closed loop operation and providing to said drive circuit means a velocity and position feedback signal derived from only one of said optical detectors.

4,818,923

METHOD OF, AND APPARATUS FOR, REGULATING THE ROTATIONAL SPEED OF AN ELECTRIC MOTOR IN A FOUR QUADRANT MODE OF OPERATION

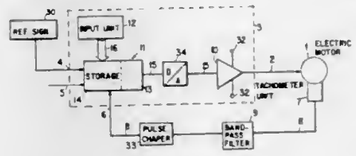
Kurt Heinz, Buchs, and Johannes Felber, Dietikon, both of Switzerland, assignors to Willi Studer AG, Regensdorf, Switzerland

Filed Jan. 30, 1987, Ser. No. 8,767

Claims priority, application Switzerland, Feb. 11, 1986, 544/86

Int. Cl.[4] H02D *5/00*

U.S. Cl. 318—318 **15 Claims**



1. A method of regulating the rotational speed of an electric motor operating in the four quadrant mode of operation, said method comprising the steps of:

supplying a variable power to the electric motor and thereby driving said electric motor at variable rotational speed;

generating a signal having a value which is related in accor-

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dance with a predetermined relationship to the momentary rotational speed of said electric motor;

preselecting a predetermined range of acceptable values for said rotational speed of said electric motor and for the values of said signal related to said momentary rotational speed of said electric motor;

supplying, from a reference signal source, a reference signal related to a desired rotational speed of said electric motor;

continuously comparing with one another said reference signal related to said desired rotational speed of said electric motor and said signal related to said momentary rotational speed of said electric motor;

regulating said variable power supplied to said electric motor according to the results of said comparison of said reference signal related to said desired rotational speed of said electric motor and said signal related to said momentary rotational speed of said electric motor, provided said rotational speed of said electric motor falls within said predetermined range of acceptable values of said rotational speed;

interrupting the supply of regulated power to said electric motor when said signal related to said momentary rotational speed of said electric motor is associated with a rotational speed outside said predetermined range of acceptable values of said rotational speed;

controlling a supply of predetermined power to said electric motor after at least one predetermined duration of time following said step of interrupting the supply of regulated power to said electric motor; and

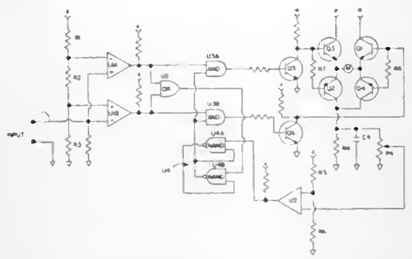
resuming said step of supplying said regulated power after said electric motor, under the controlled supply of said predetermined power, has again assumed said rotational speed within said predetermined range of acceptable values of said rotational speed.

4,818,924

ELECTRIC ACTUATOR FOR AUTOMOTIVE AIR CONDITIONING SYSTEMS

Charles F. Burney, Orland, Calif., assignor to A.R.A. Manufacturing Co., Grand Prairie, Tex.

Filed Jul. 31, 1987, Ser. No. 80,393
Int. Cl.[4] G05B *13/02*
U.S. Cl. 318—561 14 Claims



1. An electric actuator apparatus for controlling the movement of a mechanical output element in accordance with an electrical input signal comprising:

an electrical motor having a rotating driveshaft operable by the application of direct current wherein the polarity of said direct current determines the direction of rotation of said driveshaft;

a mechanical output element mechanically coupled to said driveshaft so as to undergo motion in accordance with the rotation of said driveshaft;

means for causing direct current to be applied to said motor in one direction when said input signal exceeds a first voltage value and causing direct current to be applied to said motor in an opposite direction when said input signal is less than a second voltage value;

means for blocking the application of direct current to said motor when said input signal is at a level between said first and second voltage values;

means for detecting when said motor is drawing an excessive amount of current;

means for disabling application of direct current to said motor when an excessive amount of current is detected; and,

means for continuing said disabling of current to said motor until said input signal returns to a value between said first and second voltage values and said excessive current condition no longer exists.

9. An electric actuator apparatus for controlling the movement of a mechanical output element in accordance with an electrical input signal comprising:

an electrical motor having a rotating driveshaft operable by the application of direct current wherein the polarity of said direct current determines the direction of rotation of said driveshaft;

a mechanical output element mechanically coupled to said driveshaft so as to undergo motion in accordance with the rotation of said driveshaft;

means for causing direct current to be applied to said motor in one direction when said input signal exceeds a first voltage value and causing direct current to be applied to said motor in an opposite direction when said input signal is less than a second voltage value;

means for blocking the application of direct current to said motor when said input signal is at a level between said first and second voltage values; and

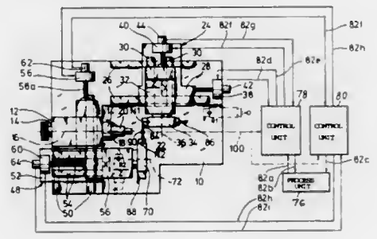
means for modifying said first and second voltage values in proportion to the position of said mechanical output element such that said apparatus acts to regulate said mechanical output element's position.

4,818,925

DEVICE FOR SETTING THE WORKING POINT OF A TOOL IN AN NC MACHINE TOOL

Heinrich Lahm, Mühlhausen-Ehingen; Walter Grossmann, Baltmannsweiler, and Günther Schleich, Hochdorf, all of Fed. Rep. of Germany, assignors to Index-Werke KG Hahn & Tessky, Esslingen, Fed. Rep. of Germany

PCT No. PCT/DE87/00024, § 371 Date Sep. 25, 1987, § 102(e) Date Sep. 25, 1987, PCT Pub. No. WO87/04814, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 21, 1987, Ser. No. 116,714
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1986, 3603316
Int. Cl.[4] G05B *19/10*
U.S. Cl. 318—567 9 Claims



1. A method for setting the working point of a tool with respect to a reference point in an NC machine tool including:

(a) a work spindle rotatable about a spindle axis for holding a workpiece which is to be machined;

(b) a first slide system having a lower and an upper slide mounting a first tool carrier for moving the latter parallel and lateral to said spindle axis, said first tool carrier being indexable to a number of positions with respect to the upper slide of said first slide system and having a number of stations corresponding to the number of positions and at least one tool having a working point in at least one of its stations for machining said workpiece when, by indexing the first tool carrier, said tool is brought into a working position;

(c) a second slide system having a lower and an upper slide mounting a second tool carrier for moving the latter parallel and lateral to said spindle axis, said second tool carrier being indexable to a number of positions with respect to the upper slide of said second slide system and having a number of stations corresponding to the number of positions and at least one tool having a working point in at least one of its stations for machining said workpiece when, by indexing the second tool carrier, said tool is brought into a working position;

(d) a first path measuring system for producing first position signals in response to movements of the slides of the first slide system relative to a first starting point of the first slide system;

(e) a second path measuring system for producing second position signals in response to movements of the slides of the second slide system relative to a second starting point of the second slide system;

(f) a first control sensor mounted in a station of the first tool carrier and a second control sensor mounted in a station of the second tool carrier for bringing said sensors into a sensing position by indexing the respective tool carrier, each of said control sensors having a sensing point and being designed to produce a correction signal when being actuated;

(g) first and second drive means for driving said first and said second slide system to move the working point of a tool being in its working position and the sensing point of a control sensor being in its sensing position into said reference point;

(h) a machine control and calculating system; and

(i) communication means for communicating said position signals and said correction signal to said machine control and calculating system;

said method comprising the following steps:

(1) bringing a selected tool of one of said tool carriers into its working position and the control sensor of the other tool carrier into its sensing position;

(2) moving the working point of said selected tool and the sensing point of said control sensor of said other tool carrier into the reference point, thereby actuating said control sensor by the working point of the selected tool;

(3) picking up the correction signal produced by the control sensor actuated by said selected tool and the position signals produced by the first and second path measuring systems by the machine control and calculating system; and

(4) calculating the position of the working point of said selected tool with respect to the starting point of the slide system mounting said selected tool.

4,818,926

TACHOMETRIC DEVICE DRIVEN BY AN ELECTRIC MOTOR

Rodolfo Bitetti, Milan, Italy, assignor to Veglia Borletti S.r.l., Milan, Italy

Filed Sep. 25, 1987, Ser. No. 101,071
Claims priority, application Italy, Oct. 3, 1986, 53908/86[U]
Int. Cl.[4] G01P *3/487*
U.S. Cl. 318—618 5 Claims

1. A tachometric device, comprising:

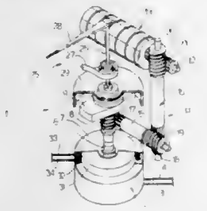
a first electrical signal generator for generating a first electrical signal dependent on the speed of rotation of a first shaft;

an electric motor including a shaft;

a magnetically controllable speed indicator unit;

a first permanent magnet coupled for rotation with said motor shaft and magnetically cooperating with said speed indicator unit;

a second electrical signal generator, integrally contained within said motor, for generating a second electrical signal dependent on the speed of rotation of said motor shaft, said second electrical signal generator comprising a second permanent magnet coupled for rotation with said motor shaft, an electric winding rigidly fixed to the body of said motor in a position substantially facing said second permanent magnet and providing said second electrical signal induced by the rotation of said second permanent magnet; and



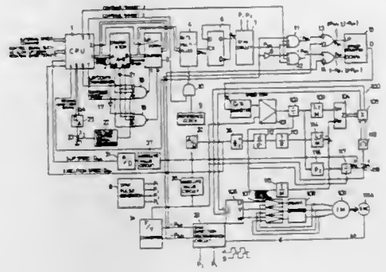
a processing circuit having a first and a second input connected to the outputs of said first and second electrical signal generators, respectively.

4,818,927

ACCELERATION/DECELERATION CONTROL APPARATUS USING SLIP SPEED

Kiyoshi Hino; Kousuke Kaitou, and Kiyokazu Okamoto, all of Tokyo, Japan, assignors to Nippon Electric Industry Co., Ltd. and NEC Corporation, both of Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,056
Claims priority, application Japan, Apr. 11, 1986, 61-83847
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—798 3 Claims



1. An acceleration/deceleration control apparatus for controlling the speed of an induction motor using a slip speed thereof, comprising:

detector means for detecting an actual speed of the induction motor to provide an actual speed signal ωr corresponding thereto;

a vector controller for generating a slip speed signal ωs^* as a function of a secondary flux registered previously corresponding to said actual speed signal ωr, of said actual speed signal ωr, and of a command speed signal ωr^* derived as a result of the control of said apparatus;

slip feedback means connected to said vector controller for

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feeding back the slip speed signal ωs* in the form of the absolute value signal ωs of said slip speed signal ωs*;

comparing means connected to said slip feedback means for comparing a predetermined allowable slip speed signal ωs' corresponding to said actual speed signal ωr with said slip speed signal ωs;

first means for generating a first pulse train Pωc for specifying the speed of the induction motor;

responsive means connected to said comparing means and said first means for forcing said first means to continue the generation of said first pulse train Pωc when the slip speed signal ωs is equal to or less than said allowable slip speed signal ωs' as a result of the comparison in said comparing means or forcing the same to moderate the generation of said first pulse train Pωc when the slip speed signal ωs is greater than said allowable slip speed signal ωs' until the slip speed signal ωs becomes less than the allowable slip speed signal ωs', whereby the angular frequency of the rotating magnetic field of the induction motor is inhibited from changing excessively, to prevent stalling of the induction motor;

second means connected to said detector means, and to said vector controller and said comparing means for receiving said actual speed signal ωr detected by said detector means, and for generating both of a second pulse train Pωr corresponding to said actual speed signal ωr and of the absolute value of the actual speed signal ωr, and applying the latter to said comparing means and said vector controller;

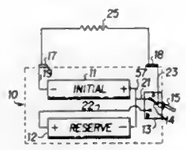
a droop counter connected to said first means, second means, and vector controller for generating said command speed signal ωr* correspondingly to a difference between the accumulation of said first pulse train Pωc and the accumulation of said second pulse train Pωr, said command speed signal ωr* so generated being supplied to said vector controller together with said absolute value of the actual speed signal ωr from said second means for controlling the torque of the induction motor connected to said vector controller.

4,818,928

BATTERY PACK

John F. Schosser, New Fairfield, Conn., assignor to Duracell Inc., Bethel, Conn.

Filed Oct. 1, 1987, Ser. No. 103,622
Int. Cl.⁴ H02J *7/00*; H01M *2/10*
U.S. Cl. 320—2 **7 Claims**



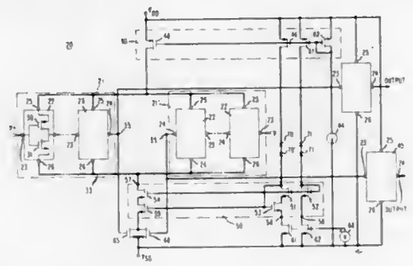
1. A battery-pack power supply which operates between upper and lower voltage limits, said battery-pack comprising a plurality of electrochemical cells connected to provide a main power supply having a voltage which does not exceed a predetermined upper voltage limit and a reserve power supply having a voltage which does not exceed the difference between the upper and lower voltage limits; switch means in said battery pack for interconnecting in a first position only the main power supply into an electronic circuit to be powered by said battery-pack and, alternately for connecting in a second position both the reserve power supply the circuit and the main power supply into the electronic circuit to be powered by the battery-pack; and means for ensuring that the switch means is in the first position when cells are installed in the battery-pack whereby only the main power supply becomes interconnected upon installation.

4,818,929

FULLY DIFFERENTIAL ANALOG COMPARATOR

Jeffrey L. Sonntag, Muhlenberg Township, Berks County; Thayamkulangara R. Viswanathan, Borough of Wyomissing Hills, Berks County, and William B. Wilson, Cumru Township, Berks County, all of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 1, 1988, Ser. No. 214,561
Int. Cl.⁴ G05F *3/24*
U.S. Cl. 323—316 **27 Claims**



1. An analog comparator formed on an integrated circuit for comparing a first voltage input to a second voltage input, characterized by:

a first string of at least one cascaded gain stage, each stage having an input, an output and first and second power terminals, the corresponding power terminals coupling to first and second buses, the input of the first of the cascaded gain stages coupling to the first voltage input of the comparator;

a second string of at least one cascaded gain stage, each stage having an input, an output and first and second power terminals, the corresponding power terminals coupling to the first and second buses, the input of the first of the cascaded gain stages coupling to the second voltage input of the comparator;

a first current source coupling to the first bus; and,

a second current source coupling to the second bus and providing substantially the same current as the first current source.

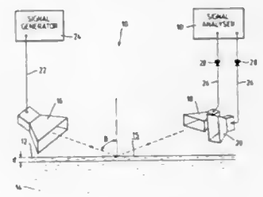
4,818,930

METHOD AND APPARATUS FOR THIN LAYER MONITORING

Michael A. Flemming, Radley Green, and Graham N. Plested, Didcot, both of United Kingdom, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 5, 1987, Ser. No. 104,357
Claims priority, application United Kingdom, Nov. 12, 1986, 8627073; Apr. 1, 1987, 8707797
Int. Cl.⁴ G01R *27/04*
U.S. Cl. 324—58.5 B **11 Claims**

11. An instrument for monitoring the thickness of a continuous layer of a non-metallic material of thickness greater than about 20 micrometers and less than about 10 mm on a surface of another medium, the apparatus comprising means for causing a beam of microwaves to be incident on the exposed surface of the layer and so to be reflected from it at an angle of incidence greater than about 30°, the incident beam having a non-zero vertically plane-polarized component, and means for monitoring at least one component of the reflected microwave beam polarized in a preset appropriate plane, and for determining therefrom the thickness of the layer, the monitored components and the parameter determined from them being predeter-



mined in accordance with the nature of the other medium and the incident beam as set out in the following table:

Other Medium	Angle of Incidence	Non-zero horizontally plane-polarized incident component	Monitored plane-polarized component(s)	Determine
non-metallic	Brewster		Only vertical	Only amplitude
non-metallic	Brewster	Yes	Both vertical and horizontal	Only ratio
non-metallic	differ from Brewster by at least 5°	Yes	Only cross-polarized	Only amplitude
Metallic	any angle	Yes	Only cross-polarized	Only amplitude
Any	Any	Yes	Both vertical and horizontal	Only the phase difference

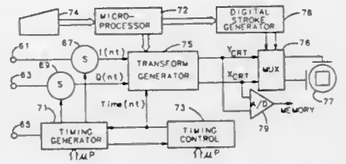
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4,818,931

VECTOR ANALYZER WITH DISPLAY MARKERS AND LINEAR TRANSFORM CAPABILITY

Andrew H. Naegeli, Menlo Park; Juan Grau, San Mateo, and Richard A. Nyquist, Menlo Park, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 19, 1987, Ser. No. 16,308
Int. Cl.⁴ G01R *23/16*
U.S. Cl. 324—77 B **15 Claims**



1. Apparatus for use in the display and analysis of vector modulated signals, comprising:

input means for receiving an input signal including inphase and quadrature components;

sampling means for sampling the input signal to provide a sampled signal;

signal processing means coupled to the sampling means for generating an electronic representation of the input signal in response to the sampled signal;

display control means coupled to the signal processing means and responsive to operator control signals for providing display control signals;

display means coupled to the signal processing means and to the display control means, for providing a waveform display in response to the electronic representation of the sampled signals and to the display control signals;

operator controls coupled to the display control means and including means for providing operator control signals in response to operator manifestations for selecting and positioning a marker on the waveform display;

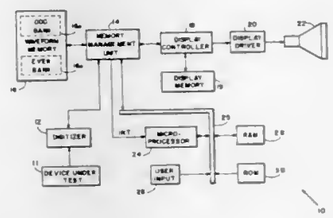
said operator control signals including marker control signals for causing the display means to display visual representations of vector magnitude markers, vector phase markers, and time markers at selected values of cartesian or polar coordinates on the waveform display.

4,818,932

CONCURRENT MEMORY ACCESS SYSTEM

Ronald P. Odenheimer, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 912,024, Sep. 25, 1986, abandoned. This application Jul. 5, 1988, Ser. No. 214,790
Int. Cl.⁴ G01R *13/20, 13/28*
U.S. Cl. 324—121 R **9 Claims**



8. An improved digital oscilloscope of the type having a digitizer for converting an input analog signal to digital data words, a waveform memory to store the digital data words, and a display controller for displaying the digital data from the waveform memory on a display, all under control of a microprocessor, wherein the improvement comprises:

means for addressing the waveform memory as a plurality of memory banks;

means for accessing each memory bank simultaneously by at least two processing units taken from the set including the digitizer, the microprocessor and the display controller; and

means for alternating data accesses to the memory banks between each of the processing units so that the data for each processing unit occurs in sequential data addresses of the waveform memory.

4,818,933

BOARD FIXTURING SYSTEM

Ronald K. Kerschner; James M. Hayes, and Michael L. Bullock, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 8, 1986, Ser. No. 916,667
Int. Cl.⁴ G01R *31/22, 31/00*
U.S. Cl. 324—158 F **26 Claims**

1. A board fixturing system for interfacing a printed circuit board having electronic devices at predetermined locations thereon to a probe plate having electrical contacts at predetermined locations, said board fixturing system comprising:

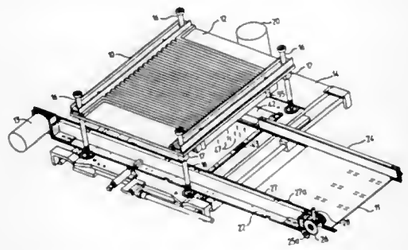
(a) a frame member;

(b) at least one probe plate supported within said frame member;

(c) probing means carried by said probe plate for sending and receiving electronic signals to and from predetermined locations on said board when said board is in electrical contact with said probing means;

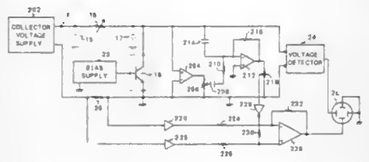
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(d) bias means for biasing said board into contact with said probing means;
(e) alignment means for aligning said board with said probing means;
(f) conveyor means for engaging and transporting said board from outside said frame member to a position adjacent said probe plate; said conveyor means being further adapted to transport said board from said position adjacent said probe plate to another position outside said frame member; and
(g) disengagement means for disengaging said board from



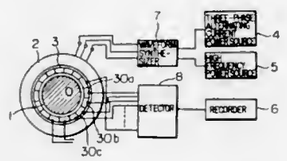
said conveyor means when said board is adjacent said probe plate;
wherein said disengagement means comprises vertically displaceable supports beneath said conveyor means within said frame member, wherein said displaceable supports are biases to a normally upward position adjacent said conveyor means, and wherein said upper section of said frame member is adapted to urge said board downwardly in a manner such that said displaceable supports are deflected downwardly away from said conveyor means; wherein said board is disengaged from said conveyor means.

4,818,934
APPARATUS FOR MEASURING CHARACTERISTICS OF ELECTRONIC DEVICES
Hisashi Tamamura, Tokyo, Japan, assignor to Sony/Tektronix Corporation, Tokyo, Japan
Filed Jan. 5, 1988, Ser. No. 141,006
Claims priority, application Japan, Aug. 18, 1987, 62-204924
Int. Cl.[4] G01R *31/22*
U.S. Cl. 324—158 T **5 Claims**



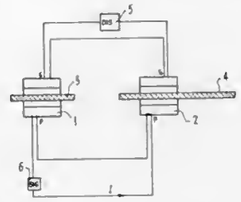
1. An apparatus for measuring characteristics of electronic devices, comprising:
voltage generation means having first and second output terminals, for generating a sine-squared voltage at said first output terminal, the voltage being applied to a first terminal of an electronic device under test with a second terminal thereof being grounded,
a current detection resistor connected between said second terminal of said electronic device under test and said second output terminal of said voltage generation means,
first voltage detection means for detecting a voltage between said first and second terminals of said electronic device under test,
second voltage detection means for detecting a voltage across said current detection resistor,
first detection means for detecting one of a sine-wave component and a cosine-wave component at a point connected to said first terminal of said electronic device under test, and
second detection means for detecting the other of the sine-wave component and the cosine-wave component at a point connected to said first terminal of said electronic devices under test,
wherein said second voltage detection means produces the difference between the voltage across said current detection resistor and the sum of the output voltages from said first and second detection means.

4,818,935
METHOD AND APPARATUS FOR NON-DESTRUCTIVELY DETECTING DEFECTS IN METAL MATERIALS BY USING ROTATING MAGNETIC FIELDS GENERATED BY MULTIPHASE AC CURRENT
Michiaki Takahashi; Mitsuo Yoshida; Kazuyoshi Miyazawa; Sigeyuki Nitta; Junichi Fujisawa, all of Muroran; Nobuji Obara, Sapporo; Shoji Hayashibe, Iruma, and Yoshikazu Sawada, Kawaguchi, all of Japan, assignors to Nippon Steel Corporation and Eddio Corporation, both of Tokyo, Japan
PCT No. PCT/JP86/00340, § 371 Date Feb. 5, 1987, § 102(e) Date Feb. 5, 1987, PCT Pub. No. WO87/00287, PCT Pub. Date Jan. 15, 1987
PCT Filed Jul. 2, 1986, Ser. No. 26,793
Claims priority, application Japan, Jul. 3, 1985, 60-146166; Nov. 22, 1985, 60-263452; Jan. 24, 1986, 61-13442
Int. Cl.[4] G02N *27/72, 27/82;* **G01R** *33/12*
U.S. Cl. 213—232 **8 Claims**



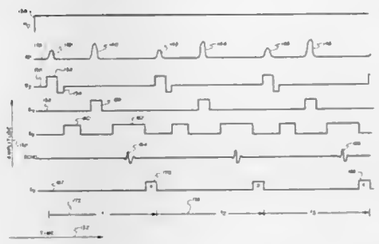
1. An apparatus for non-destructive inspection of flaws in metal materials in which an electromagnetic effect is induced in the surface of an elongated metal material and a change in the electromagnetic effect depenent on the presence or absence of a surface flaw of the metal material is utilized, said apparatus comprising:
means for generating a rotating magnetic field formed as a hollow cylinder into which a material to be examined is insertable longitudinally thereof and having a multiphase winding arranged for generation of the rotating magnetic field;
a transmitting circuit for generating a low frequency multiphase alternating current at a frequency selected as to obtain the rotating magnetic field of a desired revolution number and having respective phases which are independently balancemodulated with a high frequency alternating current of an inspection frequency suitable for inducing said electromagnetic effect in the surface of the examinee material, said transmitting circuit being connected to apply said low frequency multiphase alternating current to said multiphase winding of said rotating magnetic field generating means;
a plurality of detecting elements arranged in the circumferential direction along the inner circumferential surface of said hollow cylindrical rotating magnetic field generating means and suitable for detecting a change in said electromagntic effect generated in the surface of the examinee material, said electromagnetic effect being an eddy current generated in the surface of the examinee material; and
processing means, connected to output ends of said detecting elements, for processing an output from each detecting element to derive a signal indicative of the presence of a flaw at the surface of the examinee material; wherein said processing means includes:
(a) a plurality of phase detectors for phase-detecting the outputs of said detecting elements by using said high frequency alternating current of said inspection frequency as a reference wave;
(b) a plurality of low-pass filters for deriving, from respective outputs of said phase detectors, components having the same frequency as that of said low frequency multiphase alternating current; and
(c) a sampling circuit having a plurality of switches for sequentially sampling outputs of said plurality of low-pass filters in synchronism with the rotation of said rotating magnetic field.

4,818,936
METHOD AND APPARATUS FOR IDENTIFYING AND CLASSIFYING STEELS
Kenneth G. Kemlo, Lambton, Australia, assignor to The Broken Hill Proprietary Company Limited, Victoria, Australia
PCT No. PCT/AU86/00039, § 371 Date Oct. 14, 1986, § 102(e) Date Oct. 14, 1986, PCT Pub. No. WO86/04991, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 17, 1986, Ser. No. 932,509
Claims priority, application Australia, Feb. 15, 1985, PG9314
Int. Cl.[4] G01N *27/72;* **G01R** *33/12*
U.S. Cl. 324—232 **10 Claims**



1. Method of classifying a steel specimen, comprising:
presenting a steel specimen to a coil means, said coil means receiving an excitation current and producing an electrical output dependent on an induction value of said specimen;
applying an excitation current to said coil means at each of a plurality of excitation frequencies in series and determining a respective induction value of said specimen at each of these frequencies;
deriving for each of a plurality of possible steel grades a separate determinant function, said separate determinant function being a sum of a series of products of attributes of said specimen comprising said induction values and predetermined weighted coefficients reflecting the degree to which the respective attributes are effective to discriminate that possible steel grade from the others;
producing a series of differing discriminant functions correlative with the differing possible steel grades and comprised of differing sets of weighted coefficients applied to the same values of said attributes of said specimens; and
determining which of the differing discriminate functions has a maximum numerical value as a measure of which of the known grades most closely matches that of the specimen.

4,818,937
RAPID LINE SCAN NMR IMAGING
David C. Ailion, Salt Lake City, Utah; Thomas A. Case, Oakland, Calif., and Krishnamurthy Ganesan, Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah
Filed Mar. 1, 1988, Ser. No. 162,750
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **9 Claims**



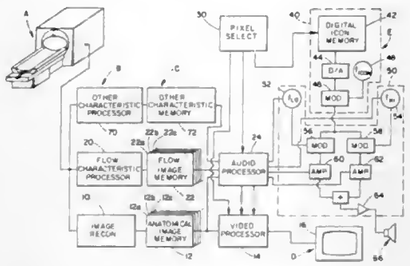
1. A method of NMR line scan imaging, said method comprising:
positioning a specimen within a main magnetic field;
sequentially applying gradient magnetic fields to generate a plurality of pairs of intersecting planes to sequentially produce a plurality of main intersections, each of said pairs of planes being comprised of a first plane and a second plane intersecting the first plane, each of said first and second planes being a plane containing atomic particles of a specimen excited by magnetic fields varied at a selected resonant frequency to cause generation of detectable NMR signals of selected atomic particles of said specimen along said main intersection which is the intersection of the said first plane and the said second plane to produce a one-dimensional image signal of the population of said selected atomic particles at said main intersection, said plurality of main intersections occurring not in the first and second planes of each pair of planes projected prior thereto;
applying spoiler magnetic gradients in said specimen to dephase and in turn prevent the occurrence of minor NMR echo signals wherein each of said second planes in each of the said pairs of intersecting planes projected after the first pair of intersecting planes intersecting prior projected first planes at minor intersections would otherwise cause generation of minor NMR echo signals of selected atomic particles of the specimen; and
processing and displaying the one-dimensional image signals of each main intersection to form a composite two-dimensional image of the said specimen.

4,818,938
AUDIO CODED IMAGING
William Sattin, Cleveland Hts., and Eric E. Gatchalian, Willoughby, both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio
Filed Feb. 26, 1988, Ser. No. 160,913
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **19 Claims**

1. A magnetic resonance imaging apparatus for concurrently producing visual and audio indications of characteristics of an internal region of a subject, the apparatus comprising:
a magnetic resonance scanner for causing and receiving magnetic resonance signals from the interior region;
a reconstruction means for reconstructing a first image representation from the magnetic resonance signals;
a first image memory means for storing a plurality of pixel values of the first image representation;
a video processor means for converting the first image repre-

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sentation pixel values into video signals for producing a man-viewable display on a video monitor;
a computer means for generating pixel values of a second image representation from one of the magnetic resonance signals and the first image representation pixel values;
a second memory means for storing the second image representation pixel values;



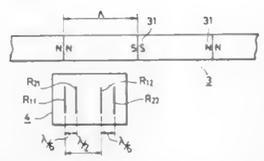
an audio processor for retrieving and processing selected pixel values from the second memory means;
an audio icon means for generating an audio icon signal;
an audio signal modulating means for modulating the audio icon signal in accordance with pixel values retrieved from the second memory means by the audio processor; and
an electro-acoustic transducer for converting the modulated audio icon signals into an audio signal.

4,818,939

APPARATUS FOR MAGNETICALLY DETECTING POSITION OR SPEED OF MOVING BODY UTILIZING BRIDGE CIRCUIT WITH SERIES CONNECTED MR ELEMENTS

Tadashi Takahashi, Hitachi; Seizi Yamashita, Katsuta; Kunio Miyashita, and Syooichi Kawamata, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,545
Claims priority, application Japan, Mar. 5, 1986, 61-46185
Int. Cl.[4] G01B 7/14; G01P 3/42
U.S. Cl. 324—208 **13 Claims**



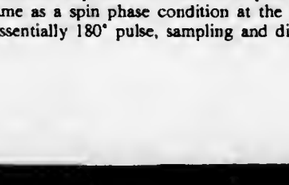
1. An apparatus for magnetically detecting the relative position or speed between moving and stationary bodies, comprising:
a magnetic medium provided on either one of the moving and stationary bodies, and having a plurality of magnetic poles arranged continuously thereon at a constant pitch λ;
sensing means including plural MR elements, provided on the other of the moving and stationary bodies in opposition to said magnetic medium, for sensing a magnetic field generated by said magnetic poles to thereby cause variation in the electric resistance thereof, in which said MR elements constitute k sets of element pairs, each set consisting of two MR elements arranged at positions spaced at $(m+\frac{1}{2})\lambda$ from one another, where m is an integer, and said element pairs being spaced by $(n+1/3\lambda$ from each other, wherein n is an integer; and
output circuit means, including said MR elements connected in a bridge circuit so that said two MR elements of each element pair are connected in series and said k sets of series connections of said MR elements are connected in parallel with each other with respect to a power source of the bridge circuit, for synthesizing k sets of voltages appearing at nodes of said two MR elements connected in series and which include third harmonic components having a phase difference of $2\pi/k$ from each other so as to produce an output signal.

4,818,940

METHOD FOR MEASURING NUCLEAR MAGNETIC RESONANCE

Jürgen Hennig, Freiburg, and Arno Nauerth, Erlenbach, both of Fed. Rep. of Germany, assignors to Bruker Medizintechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Continuation of Ser. No. 774,569, Sep. 10, 1985, abandoned. This application Sep. 18, 1987, Ser. No. 98,637
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434161
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—309 **5 Claims**



1. A nuclear-magnetic-resonance Fourier-transform tomographic method for imaging cross sections of a body, the method comprising exposing the body to a homogeneous magnetic field, superimposing upon the body a time-limited selection magnetic gradient field, during the selection magnetic gradient field irradiating the body with an essentially 90° pulse, subsequently irradiating the body with a timed sequence of essentially 180° pulses to produce a sequence of spin-echo nuclear induction signals, the relative phases and spacing of the 90° pulse and the 180° pulses being selected to define a Carr-Purcell-Gill-Meiboom pulse sequence so that a spin-echo nuclear induction signal occurs in an interval between each pair of adjacent essentially 180° pulses in the pulse sequence, during the sequence of essentially 180° pulses superimposing upon the body a sequence of time-limited phase-encoding magnetic gradient fields and time-limited recording magnetic gradient fields, each phase-encoding magnetic gradient field being imposed during a time interval between a pair of adjacent essentially 180° pulses of the Carr-Purcell-Gill-Meiboom pulse sequence, a portion of the phase-encoding magnetic gradient field being imposed between the first essentially 180° pulse of the pair of pulses and a midpoint of the spin-echo nuclear induction signal occurring between the pair of pulses, each recording magnetic gradient field being imposed during the time interval between a pair of adjacent essentially 180° pulses of the Carr-Purcell-Gill-Meiboom pulse sequence coincident with the occurrence of the spin-echo nuclear induction signal between the pair of pulses, the phase-encoding magnetic gradient fields being changed after each essentially 180° pulse in accordance with a Fourier-transform tomographic imaging method, the form and timing of each time-limited magnetic gradient field relative to the substantially 180° pulses and the spin-echo nuclear induction signals being selected so that spin dephasing which arises during the magnetic gradient field is substantially cancelled at the end of the time-limited gradient field so that a spin phase condition at the time of each essentially 180° pulse subsequent to the first such pulse is substantially the same as a spin phase condition at the time of the preceding essentially 180° pulse, sampling and digitizing the

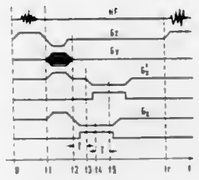
spin-echo nuclear induction signals to form digitized nuclear signal data, and combining such digitized nuclear signal data in accordance with the Fourier-transform tomographic method to form a tomographic image of the cross section of the body.

4,818,941

MR TOMOGRAPHY METHOD AND APPARATUS FOR PERFORMING THE METHOD

Graeme C. McKinnon, Ellerau, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1986, Ser. No. 936,068
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542215
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—309 **7 Claims**



1. An Mr tomography method wherein echo signals are extracted during a plurality of sequences for the reconstruction of the spatial density distribution in an examination region, each execution of a sequence including a selection phase during which a single high-frequency pulse is applied to the examination region in the presence of a magnetic gradient field, a subsequent encoding phase during which the examination region is exposed to a magnetic gradient field with a gradient which varies as regards magnitude or direction from one sequence to another, and a subsequent read phase during which the spin echo signal generated in the examination region is sampled in the presence of a magnetic gradient field, after which an image which is dependent on the proton distribution is calculated from the echo signal, the image values for the individual pixels of the image being determined by formation of the absolute value during a final step, characterized in that each sequence is executed twice, the gradient field (Gx) during the read phase in the second execution of each sequence, or the gradient field previously extending in the opposite direction, being proportioned so that the distance in time between the high-frequency pulse and the echo signal in the second execution is shifted with respect to the first sequence over a period of time (T) which corresponds to half the reciprocal value of the difference between the Larmor frequencies (df) of water-bound and fat-bound hydrogen protons, respectively, an image of the density distribution in the examination region being calculated from the sums of or the differences between the echo signals formed during the two executions of the sequences.

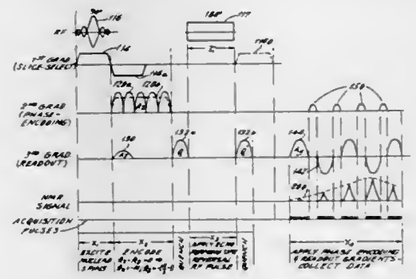
4,818,942

METHOD OF HIGH-SPEED MAGNETIC RESONANCE IMAGING EMPLOYING CONTINUOUS WAVE READOUT GRADIENT

Richard R. Rzedzian, Lexington, Mass., assignor to Advanced NMR Systems, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 937,529, Dec. 3, 1986, Pat. No. 4,740,748. This application Oct. 16, 1987, Ser. No. 109,091
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—312 **33 Claims**

1. A method of deriving image information at high speed from an object using nuclear magnetic resonance signals, comprising the steps of:
(a) subjecting an object to continuous static magnetic field along an axis, said magnetic field having a strength between about 0.5 and 5 Tesla;
(b) exciting nuclear spins in a selected plane of the object by applying to the object a first radio frequency pulse together with a first magnetic field gradient perpendicular to said plane comprising a slice selection gradient, such that free induction decay signals are produced by said excited nuclear spins in said plane;
(c) applying to the object an encoding sequence comprising a second magnetic field gradient having a direction parallel to said plane together with a third magnetic field gradient having direction also parallel to said plane and perpendicular to said second gradient;
(d) applying a second radio frequency pulse to the object;
(e) applying to said object a further slice-selection gradient such that the total dephasing effect of the slice selection gradient applied in step (b) is as close to zero as possible;
(f) applying a sequence comprising a series of alternate and



partially overlapping applications to the object, respectively in time, of said second magnetic field gradient defining phase encoding gradients and said third magnetic field gradients defining readout gradients, said readout gradients being applied as a continuous wave, said sequence of second and third magnetic field gradients being completed within a period of time less than about 100 milliseconds; and
(g) acquiring data to form a magnetic resonance image by sampling nuclear magnetic resonance signals output from said object during the application of said readout gradients to form a series of data values in the time domain, formatting said time domain data into modified data estimating the spatial frequencies of the object and transforming said modified data into spatial domain data for presentation as an image of the object, the data which is acquired during the period when said readout gradients and phase encoding gradients overlap being deleted prior to said transformation.

4,818,943

PHANTOM FOR IMAGING SYSTEMS

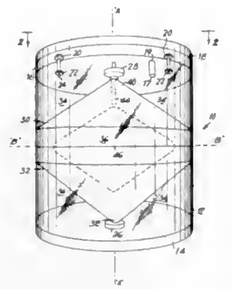
Ramesh Chandra, Ardsley, N.Y., assignor to New York University, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,318
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—318 **26 Claims**

1. A phantom comprising:
a. housing having a central axis and defining a hollow region therein; and
b. wall member disposed within said housing and separating said hollow region into a first region outside of said wall member and a second region within said wall member, said wall member having an outer surface being non-

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aligned with said central axis, said first and said second regions being separately filled with a predetermined fluid



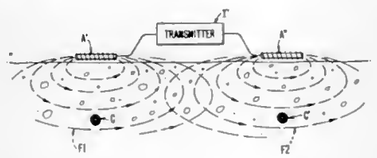
so as to permit evaluation of a tomographic imaging system.

4,818,944

MAGNETIC LOCATING AND TRACING SYSTEM AND METHOD USING DUAL-ANTENNA TRANSMITTER TO DISTINGUISH BETWEEN CONCEALED ADJACENT OBJECTS

John B. Rippingale, Leesburg, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed May 6, 1987, Ser. No. 46,463
Int. Cl.[4] G01R *19/00;* **G01V** *3/08, 3/10*
U.S. Cl. 324—326 **24 Claims**



1. A system for locating at least one of a pair of concealed, elongated, conductive, adjacent objects, comprising, in combination, a transmitter and a receiver, said transmitter having means including a pair of spaced antennae for generating electromagnetic fields coupled to said objects for inducing a pair of distinguishable alternating currents in said objects, respectively said receiver being movable relative to said transmitter and to said objects, having means for sensing magnetic fields associated with said currents, respectively, and having means for producing an output signal dependent upon the sensing of both of said fields associated with said currents.

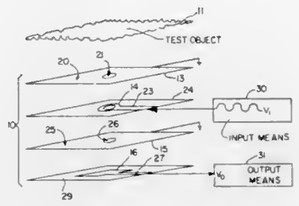
4,818,945

NON CONTACTING VOLT METER

Peter R. Bossard, Langhorne, Pa., assignor to Voyager Technologies, Inc., Langhorne, Pa.

Filed Apr. 22, 1986, Ser. No. 855,073
Int. Cl.[4] G01N *27/22*
U.S. Cl. 324—457 **7 Claims**

4. A multilayered structure for providing an output signal representative of an electric field generated by a charge or a voltage on a test object, said structure comprising an input capacitor plate for receiving an input signal, said structure also comprising an output capacitor plate for applying an output signal to an output means, said input and output plates defining a first capacitor, said input and output capacitor plates respectively defining second and third capacitors with a test object in



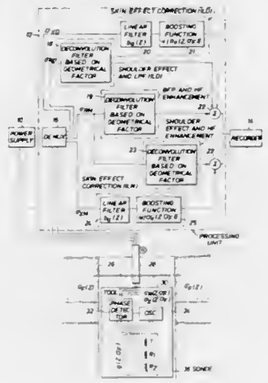
close proximity therewith, said input capacitor plate comprising a metallic annulus.

4,818,946

METHOD AND APPARATUS FOR ENHANCING THE RESOLUTION OF AN INDUCTION LOGGING TOOL IN MEASURING A CHARACTERISTIC OF A BOREHOLE FORMATION

Thomas D. Barber, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Sep. 24, 1987, Ser. No. 100,381
Int. Cl.[4] G01V *3/28*
U.S. Cl. 324—339 **23 Claims**



9. An induction logging apparatus for determining a characteristic of a formation traversed by a borehole comprising:
- a first transmitter-receiver array characterized by a first spatial frequency response having no zeros;
- a second transmitter-receiver array characterized by a second freqeuncy response having a first zero frequency;
- means for determining a first enhanced spatial frequency response from said first spatial frequency response;
- means for determining from said second spatial frequency response a second enhanced spatial frequency response which terminates at a frequency below said first zero frequency of said second spatial frequency response;
- processing means for creating a differential spatial frequency response by substracting said second enhanced spatial frequency response from said first enhanced spatial frequency response;
- processing means for inverting said differential spatial frequency response to produce differential resolution filter weights;
- processing means for inverting said second enhanced spatial frequency response to produce a set of second filter weights;

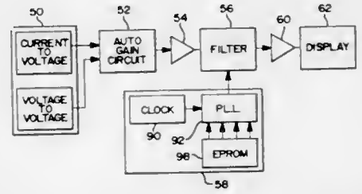
- recording means for recording first induction logging measurements as a function of depth in the borehole from said first transitter-receiver array;
- recording means for recording second induction logging measurements as a function of depth in the borehole from said second transmitter-receiver array;
- said filter means for filtering said first induction logging measurements with said differential vertical resolution filter weights to produce a differential induction signal;
- second filter means for filtering said second induction logging measurements with said second filter weights to produce a second induction signal; and
- summing means for adding said differential induction signal and said second induction signal to produce a signal characteristic of said formation traversed by said borehole.

4,818,947

APPARATUS FOR MEASURING HARMONIC DISTORTION IN A CONDUCTOR, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Myron Zucker, Bloomfield Hills; Ronald G. Jawernycky, Farmington Hills, both of Mich.; Michael Z. Lowenstein, Lakewood, Colo., and Gerald L. Park, East Lansing, Mich., assignors to Myron Zucker, Inc., Royal Oak, Mich.

Filed Mar. 17, 1988, Ser. No. 169,407
Int. Cl.[4] G01R *29/26*
U.S. Cl. 324—57 DE **13 Claims**



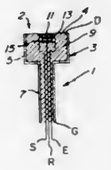
1. Apparatus for locating and measuring harmonic distortion in a conductor, comprising: first means detachably connectable to a conductor for providing an input signal indicative of electrical energy in said conductor; second means connected to said first means and receiving said input signal therefrom, said second means providing a modified signal indicative of the strength of a single, predetermined harmonic of said input signal; and
- third means connected to said second means for selectively varying the single, predetermined harmonic which is indicated by said modified signal.

4,818,948

CAPACITIVE BRIDGE-TYPE PROBE FOR MEASURING BLADE TIP CLEARANCE

Kevin A. Dooley, Georgetown, Canada, assignor to Pratt & Whitney Canada Inc., Quebec, Canada

Filed Aug. 5, 1986, Ser. No. 893,276
Int. Cl.[4] G01R *27/26;* **H01G** *7/00*
U.S. Cl. 324—61 P **7 Claims**



1. A capacitive bridge-type probe for measuring clearance between a fixed surface and a member movable relative to said fixed surface, wherein said bridge comprises four capacitance arms, at least one of said arms comprising a sensitive, variable capacitance arm, at least two other ones of said arms comprising fixed capacitance arms, said four arms being connected in bridge arrangement such that one end of one fixed capacitance arm is connected to one end of the other fixed capacitance arm, the other end of said one fixed capacitance arm being connected to one end of said sensitive arm, said fourth arm being connected between the other end of the other fixed capacitance arm and the other end of aid sensitive arm;

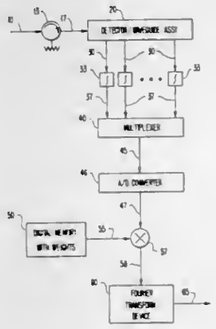
said probe comprising:
- an elongated conductive casing having an opening in said one end thereof, all of said capacitance arms being formed in said conductive casing;
- a dielectric material filling said casing, all of said capacitance arms being embedded in said dielectric material, whereby said probe, including all of said capacitance arms and said casing and dielectric material, comprises an integral unit, said dielectric material forming a surface across said opening of said casing at said one end thereof;
- a first plate member disposed on said surface and in parallel therewith;
- a first conductive lead extending from said first plate member longitudinally of said casing and out the other end of said casing;
- said at least one sensitive arm being formed by the capacitance between said plate member and said casing;
- said probe being mounted in said fixed surface such that the plate member of said sensitive arm faces said movable member;
- whereby, a change in clearance between the fixed surface and the movable member causes a change in capacitance of said sensitive arm.

4,818,949

MICROWAVE AND MILLIMETER-WAVE SPECTRUM ANALYZER

Jonathan D. Cohen, Hanover, Md., assignor to U.S. Government as represented by Director, National Security Agency, Fort George G. Meade, Md.

Filed Jan. 6, 1988, Ser. No. 142,114
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B **10 Claims**



1. Spectrum analysis apparatus, comprising:
- a radio frequency signal source;
- means for guiding radio frequency propagation;
- means for superimposing two replicas of the signal from said signal source in said guiding means such that the replicas propagate in different directions;
- means for simultaneously measuring the radio frequency power in said guiding means at multiple spatial locations;

means for temporally integrating said power measurements; and

means for effecting a Fourier transform of said integrated power measurements.

4,818,950

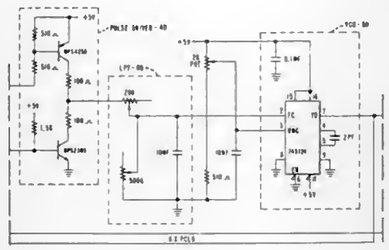
LOW JITTER PHASE-LOCKED LOOP

Michael H. Ranger, San Jose, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 24, 1987, Ser. No. 41,907

Int. Cl.[4] H03K *5/13*

U.S. Cl. 328—155 **10 Claims**



1. A low jitter phase-locked loop comprising:

an error detector for receiving an incoming digital signal and a reference signal and for providing SLOW DOWN or SPEED UP signals as a function of the deviation of the reference signal from said incoming digital signal;

a power source;

pulse driver means for receiving said SLOW DOWN and said SPEED UP signals at its input and for connecting said power source to its output as a function of the received signals;

a low pass filter means coupled to the output of said drive means, including an integrator circuit having a capacitor and a variable resistor connected across said capacitor for controlling the discharge of the said capacitor so as to operate said filter in a lagging phase mode;

a voltage controlled oscillator having an input connected to said low pass filter means for providing an output signal as a function of the signal on its input; and

a divider means coupled to the output of said voltage controlled oscillator for dividing the signal from said voltage controlled oscillator thereby generating said reference signal.

4,818,951

GAIN CONTROL OR MULTIPLIER CIRCUITS

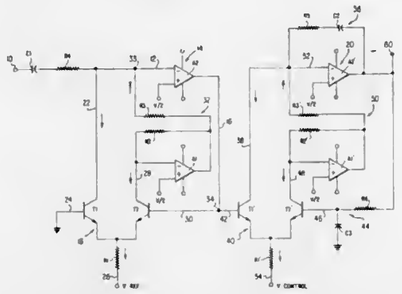
John H. Roberts, Hickory, Miss., assignor to Peavey Electronics Corporation, Meridian, Miss.

Filed Apr. 11, 1988, Ser. No. 180,003

Int. Cl.[4] H03F *3/45;* **G06G** *7/24*

U.S. Cl. 330—254 **14 Claims**

1. In a current-controlled amplifier circuit, the combination of output amplifier means having an input conductor and having an output conductor for converting a signal at the input conductor of the output amplifier means to a current amplified signal, feedback means connected between the output and input conductors of the output amplifier means and including a differential pair of semiconductors having a control current output, for presenting a signal at the input conductor of the output amplifier means which is the product of an input signal to the amplifier circuit and the ratio of a reference current to the control current and for substantially eliminating dc input at the input conductor of the output amplifier means and setting



quiescent base-emitter currents of the semiconductors of the differential pair substantially equal.

4,818,952

OSCILLATION CIRCUIT

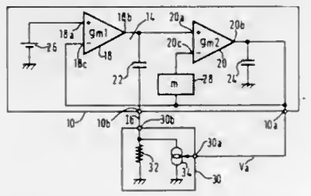
Mitsumo Kawano, Honjo, and Tadashi Terada, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Feb. 2, 1988, Ser. No. 151,585

Claims priority, application Japan, Feb. 4, 1987, 62-23984

Int. Cl.[4] H03B *5/24*

U.S. Cl. 331—108 R **2 Claims**



1. An isolation circuit for an integrated circuit device, comprising:

band-pass filter means for producing an output signal having a voltage and a defined resonant frequency; and

voltage to current converter type limiter amplifier means connected to the band-pass filter means for supplying a current to the band-pass filter means corresponding to the voltage of the output signal of the band-pass filter means; wherein

said voltage to current converter type limiter amplifier means includes a variable current source for converting the voltage of the output signal to a current; and

the band-pass filter means includes a pair of voltage to current conversion circuits connected in series, each circuit of the pair including a capacitor, and wherein the variable current source is connected to the capacitor of the first voltage to current conversion circuit for supplying the current to the capacitor.

4,818,953

OSCILLATOR IMPROVEMENT

Robert S. Feldstein, Pelham Manor, N.Y., assignor to Genlyte Group, Inc., Secaucus, N.J.

Filed Apr. 7, 1988, Ser. No. 178,565

Int. Cl.[4] H03K *3/30*

U.S. Cl. 331—114 **27 Claims**

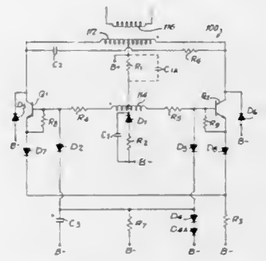
1. An oscillator circuit adapted for connection to a power

source for producing an oscillating signal for driving a load, comprising:

a transformer having a core and primary, secondary and feedback windings on said core, the secondary winding being adapted for connection across the load whereby the signal produced in the secondary drives the load;

a first semiconductor junction device of the type having a base, a collector, and an emitter, the base being connected to one end of the feedback winding and the collector being connected to one end of the primary winding, the first semiconductor junction device being alternately driven between saturation and cut-off for producing an oscillating current across said primary winding when the circuit is connected to the power source;

a second semiconductor junction device of the type accommodating current flow in only one direction upon the



application of at least a predetermined threshold voltage, said second semiconductor device being connected in parallel with the base-emitter junction of said first semiconductor device whereby current is shunted from said base through said second semiconductor device for initiating cut-off of said first semiconductor device when the voltage at said base raises the voltage across the second semiconductor device to said threshold voltage; and

first resistor means connected in series with the emitter of said first semiconductor device such that the voltage at the base of said first semiconductor device is a function of emitter current, the value of said resistor means being preselected to raise the base voltage for initiating current flow through said second semiconductor device before the current flow through said first semiconductor device drives the transformer to saturation.

4,818,954

HIGH-FREQUENCY GENERATOR WITH AUTOMATIC POWER-CONTROL FOR HIGH-FREQUENCY SURGERY

Gerhard Flachenecker, Ottobrunn; Karl Fastenmeier, Munich, and Heinz Lindenmeier, Planegg, all of Fed. Rep. of Germany, assignors to Karl Storz Endoscopy-America, Inc., Culver City, Calif.

Filed Feb. 6, 1987, Ser. No. 11,781

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604823

Int. Cl.[4] A61B *17/36;* **H03L** *5/02*

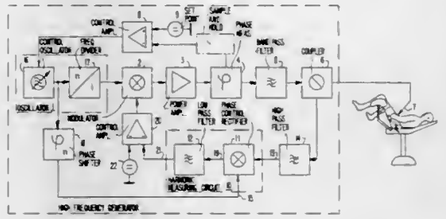
U.S. Cl. 331—183 **14 Claims**

1. High-frequency generator with automatic power-control for high-frequency surgery, consisting of an oscillator for generating the generator frequency, a modulator for controlling the output amplitude, a power amplifier for generating the necessary high-frequency power, an output filter for suppressing frequencies other than the generator frequency of the high-frequency generator, and a harmonic-measuring device for measuring the amplitude of a selected harmonic frequency of the generator frequency in the output circuit of the high-frequency generator, said selected harmonic frequency being generated by the arc existing between the surgical probe and the tissue to be cut during the cutting process, characterized in that

(a) the frequency of the oscillator (**1**) is adjustable by electronic means,

(b) at the output of the power amplifier (**3**) there is a phase-measuring device (**4**) which measures the phase shift between the output voltage and output current of the power-amplifier (**3**),

(c) the output signal of the phase-measuring device (**4**) is fed back by means of a first control amplifier (**8**) to a frequency-control input of the oscillator (I) in such a way that the phase shift between the output voltage and output current



of the power amplifier (**3**) at the thus adjusted frequency corresponds to the ideal value for the power amplifier (**3**), of generally approximately zero degrees, and

(d) the harmonic-measuring device (**10**) contains a phase-controlled rectifier (**11**) whose control signal is derived from the instantaneous frequency of the oscillator (I) and which rectifies only said selected harmonic frequency of the harmonic frequencies contained in the frequency mixture at the output of the high-frequency generator, and the output signal of the harmonic-measuring device (**10**) is fed to the modulator (**2**) via a second control amplifier (**20**) as control signal for controlling the output power of the high-frequency generator.

4,818,955

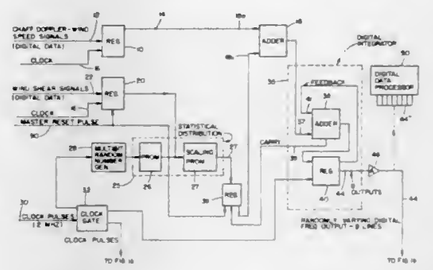
SYSTEM FOR GENERATING SIGNALS SUBJECT TO STATISTICALLY RANDOM FREQUENCY PERTURBATIONS

Yu-Tsang G. Hwang, Dix Hills, N.Y., assignor to Republic Electronics Company, Hauppauge, N.Y.

Filed Aug. 31, 1987, Ser. No. 91,459

Int. Cl.[4] H03K *3/84*

U.S. Cl. 331—78 **10 Claims**



1. A system for generating signals which vary randomly in frequency in accordance with a predetermined frequency density statistical distribution pattern, comprising:

a digital pulse generator means for generating a succession of pulse groups representing a multiplicity of digital numbers varying randomly in accordance with a predeter-

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mined statistical frequency density distribution pattern encoded in said digital pulse generator means;

a first source means of digital number pulse groups representing first signals of substantially constant average frequency, the output of said first source means connected to said digital pusle generator means whereby the output from said digital pulse generator means produces perturbations in frequency of said first signals, said perturbations in frequency varying randomly but distributed in density in accordance with said predetermined statistical distribution pattern;

digital adder means connected to the output of said digital pulse generator means to receive said perturbated first signals;

a second source means of other digital number pulse groups representing second signals of substantially constant average frequency, said second source means connected to said digital adder means for addition to said perturbated first signals to produce further digital number pulse groups representing third signals having an average frequency perturbated randomly in accordance with said predetermined statistical frequency density pattern; and

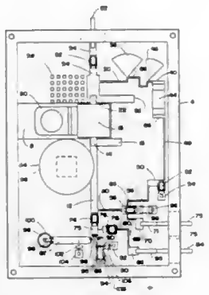
digital integration means connected to said digital pulse generator means to trigger release of said perturbated first signals to said adder means, and connected to said adder means to convert said third digital number pulse groups to multibit outputs.

4,818,956

DIELECTRICALLY STABILIZED GAAS FET OSCILLATOR WITH TWO POWER OUTPUT TERMINALS

Antun Stajcer, Kitchener, Canada, assignor to Com Dev Ltd., Cambridge, Canada

Filed Aug. 3, 1987, Ser. No. 83,567
Claims priority, application Canada, May 5, 1987, 536392
Int. Cl.⁴ H03B *5/38*
U.S. Cl. 331—96 **11 Claims**



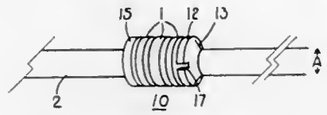
1. A dielectrically stabilized planar GaAs FET oscillator comprising a housing containing a metal pattern on a dielectric substrate with backside metalization soldered to a carrier, said housing having a single gate transistor mounted therein, said transistor having a gate terminal and a drain terminal, with dielectric material located on a gate line of said transistor, said metal pattern being formed and said transistor being biased so that only the dielectric material is required to stabilize power at the frequency of interest and both terminals of said transistor can be made to supply microwave power simultaneously, while said dielectric material resonates in a TE_{01} mode, a power supply to the oscillator being a single negative supply voltage, the output power at the drain terminal being greater than that output power at the gate terminal.

4,818,957

FERRITE TOROID ISOLATOR

Robert W. Cort, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 1988, Ser. No. 175,876
Int. Cl.⁴ H03H *7/01, 7/24*
U.S. Cl. 333—12 **9 Claims**



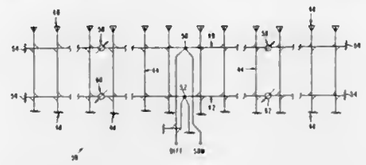
9. A ferrite toroid retainer for positioning a ferrite toroid on a cable comprising a toroidal sleeve slideably mounted on said cable, said toroidal sleeve having an inside dimension substantially equal to the outside dimension of said cable and having an outside diameter substantially equal to the inside diameter of said ferrite toroid, said toroidal sleeve being fabricated of an elastomer.

4,818,958

COMPACT DUAL SERIES WAVEGUIDE FEED

Kuan M. Lee, Brea; William L. Lange, Placentia, and Stan W. Livingston, Anaheim, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 16, 1987, Ser. No. 133,703
Int. Cl.⁴ H01P *5/18*
U.S. Cl. 333—114 **20 Claims**



16. A waveguide feed network which processes sum and difference signals, comprising:

a primary feed line;

a secondary feed line substantially parallel to the primary feed line;

a plurality of crossguide feed lines which are substantially parallel to each other and are substantially perpendicular to said primary and said secondary feed lines;

crossguide couplers which couple the crossguide feed lines to the primary and secondary feed lines except at first and second phase reversal points in the secondary feed line;

a first feed for feeding the sum and difference excitation signals to the primary feed line at its center such that a first primary line phase reversal point lies between said first feed and a first end of the primary feed line and a second primary line phase reversal point lies between said first feed and a second end of the primary feed line;

a second feed for feeding the difference excitation signal to the secondary feed line at its center such that a first secondary line phase reversal point lies between said second feed and a first end of the secondary feed line and a second secondary line phase reversal point lies between said second feed and a second end of the secondary feed line;

a first phase shifter disposed at said first secondary line phase reversal point for imparting a relative phase shift of substantially 180° between said first secondary line phase reversal point and said first primary line phase reversal point; and

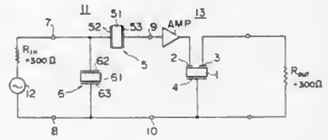
a second phase shifter disposed at said second secondary line phase reversal point for imparting a relative phase shift of substantially 180° between said second secondary line phase reversal point and said second primary line phase reversal point.

4,818,959

PHASE EQUALIZER

Ikuo Katoh, Chiba, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Mar. 19, 1987, Ser. No. 28,086
Claims priority, application Japan, Mar. 28, 1986, 61-70227; Mar. 28, 1986, 61-70228; May 7, 1986, 61-105613
Int. Cl.⁴ H03H *7/00, 9/46, 9/66*
U.S. Cl. 333—28 R **16 Claims**



1. A phase equalizer having a convex-shaped group delay characteristic, for insertion in a four-terminal network of a circuit having a predetermined bandwidth and a concave shaped group delay characteristic, comprising:

a first ceramic resonator inserted in a series arm between an input terminal and an output terminal of said four-terminal network;

a second ceramic resonator inserted in a parallel arm either at an input terminal or at an output terminal of said four-terminal network;

said first ceramic resonator and said second ceramic resonator being mounted on a common single ceramic piezoelectric substrate;

said first ceramic resonator having anti-resonant frequency at one end of said bandwidth; and

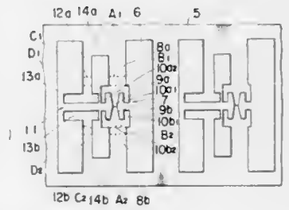
said second ceramic resonator having resonant frequency at the other end of said bandwidth.

4,818,960

COMPOSITE PART AND METHOD OF MANUFACTURING SAME

Hiroshi Satoh, and Tadao Yahagi, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 34,962, Apr. 6, 1987, abandoned. This application Jun. 1, 1988, Ser. No. 201,348
Int. Cl.⁴ H03H *7/00*
U.S. Cl. 333—185 **29 Claims**



1. A composite part, comprising:

an electrically conductive punched-out web-like plate member including at least a pair of first projection segments and a pair of second projection segments, said first and second projection segments in each pair being parallel to each other in a longitudinal direction of the plate number, said pair of first projection segments being symmetrical in a direction transverse to said longitudinal direction, said pair of second projection segments being symmetrical in a direction transverse to said longitudinal direction, a base portion coupling said first and second projection segments in each pair to each other, said first and second projection segments in each pair having adjacent portions positioned near distal ends, respectively, thereof, and base portions coupled to sides of said first and second projection segments in each pair and positioned at remote ends of said first and second projection segments, remote from said distal ends of the first and second projection segments, wherein said distal ends of said projection segments are bent up and away from a bottom plane containing the remote ends of said projection segments;

a plurality of circuit components mounted respectively on the distal ends of said first and second projection segments;

an armor molded of resin and encasing each of said distal ends of the first and second projection segments and circuit components corresponding thereto; and

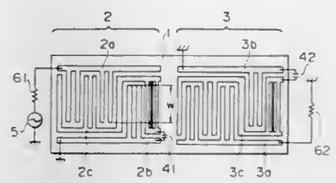
wherein at least a portion of said remote ends of said first and second projection segments are substantially flush with a bottom of said armor and are not covered by said armor, and other portions of said remote ends of said first and second projection segments extend from said armor and are bent along wall surfaces of said armor and wherein said web-like member is severable along a selected one of different lines such that said first and second segments remain joined together or become separated from one another.

4,818,961

SURFACE ACOUSTIC WAVE FILTER WITH CAPACITIVE PHASE SHIFTER

Toshimitsu Takahashi, Yokohama; Takashi Shiba, Yokosuka; Yuji Fujita, and Jun Yamada, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,700
Claims priority, application Japan, Apr. 15, 1987, 62-90813
Int. Cl.⁴ H03H *9/64, 9/145*
U.S. Cl. 333—194 **12 Claims**



1. A surface acoustic wave filter, comprising:

a piezoelectric substrate made of a piezoelectric material;

a pair of input and output electrode arrays, at least one of which includes a sending electrode and a reflecting electrode each of an interdigital form and disposed in the surface acoustic wave traveling direction with a predetermined distance therebetween and a meander electrode disposed between said sensing electrode and said reflecting electrode in a meandering pattern;

said sending electrode, said reflecting electrode and said meander electrode being supplied with electric signals having an electric phase difference corresponding to the inter-electrode gap between said sending electrode and said reflecting electrode;

said sending electrode, said reflecting electrode and said meandering electrode constituting a group-type unidirectional electrode array; and

a phase shifter for generating the electrical phase difference between said electric signals;

wherein said phase shifter consists of a capacitive element;

each of said sending electrode and said reflecting electrode having fingers each of a width and an inter-finger gap equal to $\lambda_0/8$ where λ_0 represents the wavelengths of the surface acoustic wave at a band center frequency;

distance from the fingers of said sending electrode and said reflecting electrode to the opposite meander electrode being $\lambda_0/8$;

each of said sending electrode and said reflecting electrode being constituted by a split type electrode;

said sending electrode and said reflecting electrode being disposed with such a distance therebetween that geometrical phase difference ϕ_M give by $5\pi/4<\phi_M<7\pi/4$ can be established;

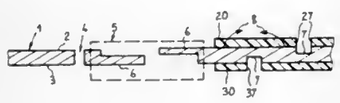
the meander electrode located between the sending electrode and the reflecting electrode within a same group has one electrode finger having a width α_1 while the meander electrode located between the reflecting electrode of one electrode group and the sending electrode of a succeeding electrode group has three electrode fingers in which each of the two outer electrode fingers has a width of $\lambda_0/8$ with the center electrode finger with a width β_1;

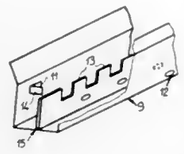
said widths α_1 and β_1 being, respectively, given by

$$\alpha_1 = \left(\frac{\phi_M}{2\pi} - \frac{5}{8}\right)\lambda_0, \text{ and}$$

$$\beta_1 = \frac{\lambda_0}{4} - \alpha_1$$

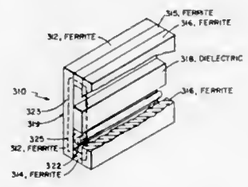
4,818,962
WAVEGUIDE OBTAINED BY SELECTIVE ETCHING METHOD
André Molaine, Monthery, and Jean Poitevin, Villejuif, both of France, assignors to Thomson-CSF, Paris, France
Filed Aug. 26, 1986, Ser. No. 900,483
Claims priority, application France, Sep. 3, 1985, 85 13088
Int. Cl.[4] H01P *3/12, 3/123*
U.S. Cl. 333—239 **3 Claims**





1. A waveguide formed from a metal sheet, said waveguide including stress-free cutouts and ablations formed by chemical etching and having at least one bent portion, bent along a region of reduced thickness, said region of reduced thickness formed by chemical ablation.

4,818,963
DIELECTRIC WAVEGUIDE PHASE SHIFTER
Jerome J. Green, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 741,710, Jun. 5, 1985, abandoned, which is a continuation of Ser. No. 559,141, Dec. 7, 1983, abandoned. This application Nov. 12, 1985, Ser. No. 796,505
Int. Cl.[4] H01P *1/195*
U.S. Cl. 333—24.1 **27 Claims**

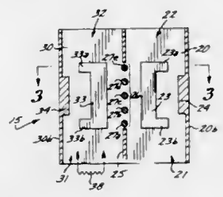


1. In combination:

means for providing a closed magnetization path; disposed within said closed path means, for confining a plurality of propagating electromagnetic waves to said dielectric members; and

means for passing a current through said closed path providing means to produce a magnetic field to vary magnetization in said closed path providing means and to provide in response to such current a predetermined phase shift to each one of such plurality of propagating electromagnetic waves.

4,818,964
SWITCHABLE MULTI-POWER-LEVEL SHORT SLOT WAVEGUIDE HYBRID COUPLER
Mon N. Wong, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Apr. 28, 1986, Ser. No. 856,089
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—111 **10 Claims**



1. A switchable hybrid coupler adapted for selective control of the hybrid coupling ratio, comprising:

a first waveguide and a second waveguide disposed in a contiguous side-by-side relationship each including a pair of broadwalls and a pair of sidewalls and sharing one of said sidewalls as a common dividing sidewall;

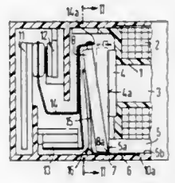
a coupling slot formed in said common sidewall to couple electromagnetic energy between said first and second waveguides;

a plurality of conductive pins arranged to be inserted between said broadwalls of said waveguides along said slot; and

means for independently actuating each of said pins between an inserted position and a retracted position wherein each respective pin is retracted through an opening in one of said broadwalls;

whereby the coupling ratio of the hybrid coupler is selected by the particular selected combination of said pins which are in the inserted position.

4,818,965
ELECTROMAGNETIC RELAY
Fritz Hinrichs, Wolfratshausen, and Herbert Mitschik, Geretsried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed May 28, 1987, Ser. No. 55,497
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3620975
Int. Cl.[4] H01F *7/08, 7/13*
U.S. Cl. 335—274 **32 Claims**



1. An electromagnetic relay comprising:

a coil and a core arranged in the coil;

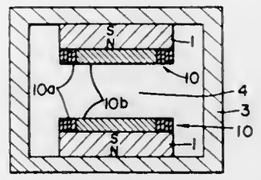
a yoke coupled with the core and extending at least partially adjacent to the coil and having a free end forming an end face essentially aligned with a core pole face cut at right angle to the coil axis; and

a flat armature mounted on the end face of the yoke and forming with the core pole face a working air gap, the electromagnetic relay further comprising:

an armature base plate being of significantly lesser thickness than the yoke is fastened on a surface of the yoke facing away from the coil and projecting beyond the free end of the yoke, the armature base plate forming together with the end face of the yoke a bearing groove for the armature the bearing groove having an angle of aperture being greater than an edge angle of a bearing edge of the armature sitting in it; and

a bearing spring pushing the armature into the bearing groove, the bearing spring being in the form of a leaf spring, which is fastened with one end in front of the free end of the base plate and with its other end extending into a groove of the armature.

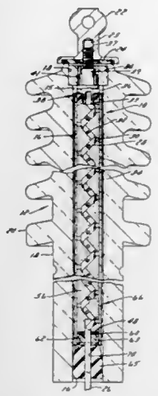
4,818,966
MAGNETIC FIELD GENERATING DEVICE
Toshiaobu Miyamoto; Hideya Sakurai, and Hirofumi Takabayashi, all of Mishima, Japan, assignors to Sumitomo Special Metal Co., Ltd., Osaka, Japan
Filed Mar. 28, 1988, Ser. No. 174,172
Claims priority, application Japan, Mar. 27, 1987, 62-75689
Int. Cl.[4] H01F *3/04*
U.S. Cl. 335—296 **10 Claims**



1. In a magnetic field-generating device which includes a pair of permanent magnet components disposed in such a manner as to face each other with a gap formed therebetween, a yoke for magnetically coupling said pair of permanent magnet components, and pole pieces which are each fixed at one end surface to a surface of an associated permanent magnet component, an opposite end surface thereof facing said gap, said magnetic field-generating device being adapted to generate a magnetic field in said gap, the improvement wherein each pole piece is composed of a solid core portion which has outer sides, and

an outer portion formed of a laminate of magnetic sheets and non-magnetic sheets positioned around said solid core portion, said laminate being laminated in a direction substantially perpendicular to the outer sides of said solid core portion.

4,818,967
FUSED HIGH VOLTAGE BUSHING
Harvey W. Mikulecky, Oconomowoc, Wis., assignor to Cooper Power Systems, Inc., Houston, Tex.
Filed Oct. 30, 1987, Ser. No. 115,504
Int. Cl.[4] H01H *85/02*
U.S. Cl. 337—202 **16 Claims**



1. A fused high voltage electric bushing for connecting a high voltage cable to an electrical apparatus within a casing, said bushing comprising

a housing formed of a dielectic material and having an axially extending passage,

an electric terminal at one end of said passage,

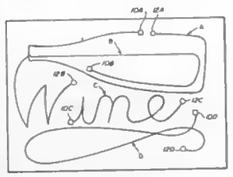
a fuse assembly positioned in said passage and being electrically connected to said electric terminal, said fuse assembly including a dielectric tubing, terminal means mounted on one end of said tubing, an electrically conductive ribbon positioned in said tubing, means formed integral with said ribbon for spacing said ribbon inwardly from said tubing, said ribbon being electrically connected to said terminal means, conductive means connected to the other end of said ribbon and extending outwardly from the other end of said tubing, a granular dielectic material completely filling the interior of said tubing, and means for enclosing the other end of said passage with said rod extending outwardly therefrom.

4,818,968
RARE GAS CONTROL SYSTEM
Harry Friedman, III, 9 Sewell Ave., Brookline, Mass. 02146
Continuation-in-part of Ser. No. 818,261, Jan. 13, 1986, Pat. No. 4,682,146. This application Jun. 29, 1987, Ser. No. 67,129
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 315—169.1 **43 Claims**

1. A rare gas control system comprising; a first envelope means for containing an excitable rare gas and having a pair of electrodes disposed at opposite positions in said first envelope means, second envelope means for containing an excitable rare

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gas and having a pair of electrodes disposed at opposite positions in said second envelope means, and control means including first means for controlling excitation of one of said electrodes of said first envelope means at a variable increasing power level to cause light intensity to sweep from said one electrode toward the other electrode and commencing at a first predetermined control point, second means for controlling



excitation of one of said electrodes of said second envelope means at a variable increasing power level to cause light intensity to sweep from said one electrode toward the other electrode and commencing at a second predetermined control point, and means for providing a control signal commonly coupled to said first and second means for controlling initiation of excitation of said envelope means at said respective predetermined control points.

4,818,969

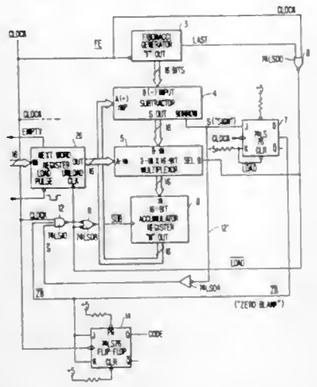
METHOD OF FIXED-LENGTH BINARY ENCODING AND DECODING AND APPARATUS FOR SAME

Lawrence J. Krakauer, Wayland, and Larry Baxter, Carlisle, both of Mass., assignors to Kronos, Inc., Waltham, Mass.

Continuation of Ser. No. 829,288, Feb. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 638,996, Aug. 9, 1984, abandoned. This application Apr. 26, 1988, Ser. No. 188,176

Int. Cl.[4] H03M *7/20*

U.S. Cl. 341—80 **14 Claims**



7. Apparatus wherein numbers are digitally encoded in a space of n fixed-length cells, n being an arbitrary integer, comprising:

means for comparing a number to be encoded with a predetermined Fibonacci Number in a sequence of Fibonacci Number and generating a first code element consisting of a predetermined first integer number of cells if the number to be encoded is greater than or equal to said prededetermined Fibonacci Number, but generating a first code element consisting of a predetermined second integer number of cells if the number to be encoded is less than said predetermined Fibonacci number;

means for subtracting said predetermined Fibonacci Number from the number to be encoded if a first code element of said first number of cells has been generated and for repeating said comparing and generating using the difference obtained by the subtracting as the number to be encoded and using the Fibonacci Number preceding said predetermined Fibonacci Number in said sequence, but if a first code element of said second number of cells has been generated, performing no subtraction, and repeating said comparing and generating using the original number to be encoded and the Fibonacci Number before said preceding Fibonacci Number, thereby to generate a second code element; and

means for causing all of the aforesaid means to operate iteratively until n cells have been utilized in the encoding.

4,818,970

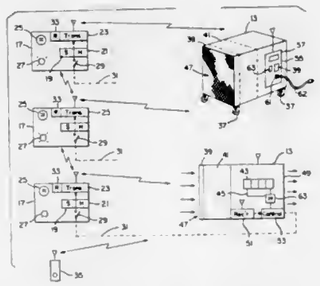
FIRE CONDITION DETECTION AND CONTROL SYSTEM FOR AIR MOVING AND FILTERING UNITS

Anthony Natale, Mt. Holly; Eugene E. Newman, Maple Shade, and Thomas Natale, Morrestown, all of N.J., assignors to GPAC, Inc., Cinnaminson, N.J.

Filed Aug. 13, 1987, Ser. No. 84,763

Int. Cl.[4] G08B *1/08;* **A62C** *37/18*

U.S. Cl. 340—539 **23 Claims**



19. A system for establishing controlled conditions for removal of asbestos materials from an existing building, said system comprising:

a substantially sealed containment area within a building from which asbestos material is to be removed;

at least one air moving and filtering unit for moving and filtering high volumes of air within said containment area; and

a fire condition detection and control system for sensing characteristics of a fire, such as smoke or heat, at a location remote from said at least one air moving and filtering unit, and for disabling said air moving and filtering unit upon detection of a fire condition to terminate the movement of said high volumes of air in the containment area.

4,818,971

FALSE ALARM RESISTANT BURGLAR ALARM SYSTEM

Robert H. Patrick, 1578 St. Mary's Road, Winnipeg, Manitoba, Canada (R2M 3W4)

Filed Feb. 25, 1988, Ser. No. 160,253

Int. Cl.[4] G08B *13/00*

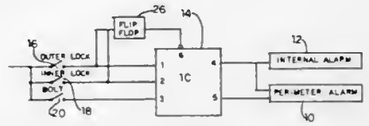
U.S. Cl. 340—543 **19 Claims**

1. A door lock with means for signaling the condition and operation of the lock, said lock comprising:

a bolt with projected and retracted positions;

first and second bolt locking means, each operable to lock the bolt in the projected position;

a bolt position signal means, operable in response to the bolt being in one of the projected and retracted positions to provide a bolt position signal; and



first and second lock signal means responsive to operation of the first and second locking means respectively to provide respective first and second lock condition signals.

4,818,972

REINFORCED BARBED TAPE INCLUDING ELECTRICAL SENSOR

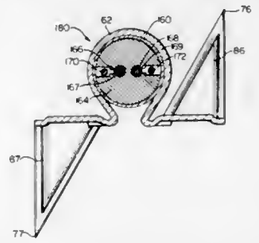
Michael R. Mainiero, Sandy Hook, Conn., and Anthony R. Zagami, Carmel, N.Y., assignors to MRM Security Systems, Inc., Waterbury, Conn.

Continuation-in-part of Ser. No. 927,833, Nov. 6, 1986, Pat. No. 4,718,641. This application Nov. 25, 1987, Ser. No. 125,471

The portion of the term of this patent subsequent to Jan. 2, 2005, has been disclaimed.

Int. Cl.[4] G08B *13/12*

U.S. Cl. 340—566 **13 Claims**



1. A reinforced barbed tape including electrical sensor comprising:

a helical barbed tape formed from a unitary strip of metallic material and having a continuous elongated central supporting portion of arcuate cross-section, said continuous elongated central supporting portion being of generally helical configuration with the plane of the central supporting portion being aligned generally perpendicular to the axis of the helix, said helical barbed tape further including a plurality of barb clusters disposed at spaced apart locations along said arcuate central supporting portion, each said barb cluster comprising first and second generally planar pairs of barbs disposed on opposite sides of said central supporting portion and connected thereto, each said barb having an embossed reinforcement defining a portion of said barb extending out of the plane of said pair, the embossed reinforcement in each said barb including a pointed end aligned with the point of said barb, with the embossed reinforcement of the barbs in each said pair of barbs extending continuously between said barbs to define a single embossed reinforcement for each said pair of barbs, and wherein each said barb cluster comprises first and second roots extending respectively from opposite sides of said central supporting portion and connecting said first and second pairs of barbs to said central supporting portion, and wherein the single embossed reinforcement for each said pair of barbs extends into the associated root connecting said pair of barbs to said central supporting portion; and

an electrical sensor wire disposed in supporting engagement with the arcuate central supporting portion of said helical barbed tape along substantially the entire length of the barbed tape.

4,818,973

SYSTEM FOR DETECTING A TRANSFER OF AN ARTICLE

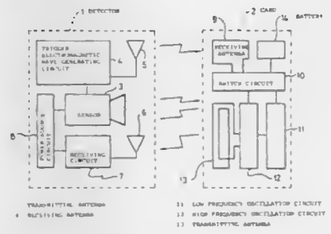
Masami Yamakawa, and Osamu Tomita, both of Yokohama, Japan, assignors to Kabushiki Kaisha Wako Sangyo, Japan

Filed Jul. 14, 1987, Ser. No. 72,888

Claims priority, application Japan, Aug. 1, 1986, 61-180062

Int. Cl.[4] G08B *13/24*

U.S. Cl. 340—572 **6 Claims**



1. A system for detecting a transfer of an article through a monitoring area, said system comprising:

a detector including sensor means for sensing, based on the Doppler effect, an object moving through said monitoring area, said sensor being active before said object reaches said monitoring area and while said object is in said monitoring area to scan for said object; and first transmitter means, coupled to the sensor means, for transmitting a first electromagnetic signal toward said monitoring area when said sensor means senses said object moving through said monitoring area; and

a circuit card for attachment to an article carried by said object, said circuit card comprising a battery; second transmitter means powered by said battery for generating and transmitting a second electromagnetic signal when activated; and first receiver means for receiving said first electromagnetic signal and activating said second transmitter means when said first receiver means receives said first electromagnetic signal;

wherein said detector further comprises second receiver means for receiving said second electromagnetic signal and activating an alarm in response to reception of said second electromagnetic signal;

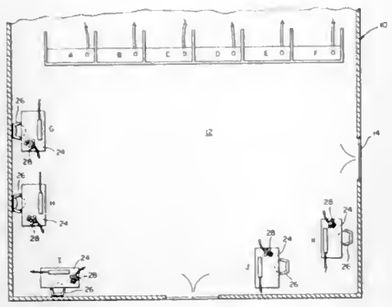
wherein said first receiver means comprises an antenna; and transistor means having a base coupled to said antenna for activating said second transmitter means upon receipt of said first electromagnetic signal by said antenna;

wherein said second transmitter comprises oscillator means, coupled to an output of said transistor, for generating said second electromagnetic signal upon activation of said transistor; and

wherein said battery has a first terminal coupled to said base of said transistor means to deliver battery current toward said base, said antenna is releasably attached to said card with one end coupled to said base of said transistor means and another end coupled to a second terminal of said battery such that when said antenna is attached, said antenna shunts said battery current away from said base of said transistor means, and when said antenna is removed from said card, said battery current flows from said power supply into said base thereby activating said transistor means and in turn said second transmitter means.

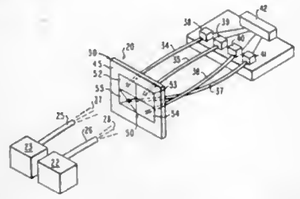
VOL 1101 ISS 1 AP 4 1989 UMI

4,818,974
ROBBERY IN PROCESS WARNING SYSTEM
James I. Fernandez, P.O. Box 741, Hilo, Hi. 96721
Filed Feb. 10, 1987, Ser. No. 13,244
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—574 11 Claims



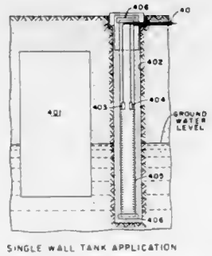
1. In combination with an enclosed building area including a plurality of manned security zones and a plurality of signal receiving locations remote from said security zones, a warning system including signal actuating means in each of said security zones and a plurality of signal generating means in each of said locations with each signal generating means corresponding to a related signal actuating means and including a silent visual warning indicator for viewing by a person manning that location and non-viewable by a person at any of the security zones, electrical circuit means including a source of electrical potential electrically connecting each signal actuating means with the corresponding indicator in each of said locations for actuation thereof, each of said locations including a work surface for the person manning that location and each work surface including information display means thereon projecting upwardly from the corresponding work surface, said display means each including a front side for visually disseminating information generally toward said security zones and an opposite rear side from which the indicators for that location are viewable and which faces away from the security zones.

4,818,975
GENERATOR STATOR CORE TEMPERATURE MONITOR
Maurice A. Jenkins, Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 21, 1988, Ser. No. 171,352
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—584 19 Claims



1. A temperature monitor for a generator stator core having cooling vent holes through which hydrogen gas passes comprising:
light source means which generate a light beam,
heat sensitive target means mounted adjacent to said vent holes and exposed to said hydrogen gas which receive said light beam and which either block said light beam or allow said light beam to pass through, depending on the temperature in said stator core,
receiver means associated with said target means which detects whether said light beam has passed through said target means or whether said light beam has been blocked by said target means and which converts said passed-through light beams into responsive electrical signals, and
monitoring means which receives said responsive electrical signals from said receiver means, converts said responsive electrical signals into processed electrical signals, and outputs data to a user, whereby temperature conditions in said generator stator core can be monitored.

4,818,976
DEVICE FOR MONITORING HYDROCARBONS IN GROUNDWATER
Paul W. Schmitt, Pittsburgh, and Charles W. Gardner, Jr., Gibsonia, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Feb. 26, 1987, Ser. No. 19,196
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—605 2 Claims

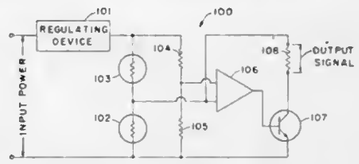


SINGLE WALL TANK APPLICATION

1. An apparatus for monitoring leakage of hydrocarbons from an underground storage tank comprising:
a hydrocarbon vapor sensor of the tin-oxide variety that is located in an underground test area and capable of sensing the presence of a hydrocarbon in said underground test area and having means to connect said vapor sensor by a first electrical cable to send signals to a signal receiving circuitry,
a liquid level sensor that generates an electrical signal in response to contact with a liquid having means to connect said liquid sensor by a second electrical cable to send signals to a remote signal receiving circuitry, said liquid level sensor used to position said hydrocarbon vapor sensor a predetermined height above a sensed liquid level,
remote signal receiving circuit means connected by a third cable to power said sensors and where said circuit receives said signals and generates an alarm signal when the hydrocarbon vapor exceeds a predetermined amount or the liquid sensor contacts a liquid,
timer circuit means to delay the alarm until said alarm signal is received continuously for a pre-determined period of time.

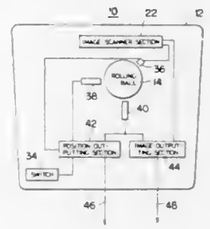
4,818,977
COMBUSTIBLE GAS DETECTOR HAVING TEMPERATURE STABILIZATION CAPABILITY
William J. Alexander, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Nov. 3, 1987, Ser. No. 116,163
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—633 3 Claims

1. A catalytic gas detector circuit comprising:
a bridge circuit having four branches and having input and output terminals wherein said input terminals are connected to a power source means capable of providing either constant current or constant voltage, and said output terminals are connected to a difference amplifier where;
said first branch is a resistance gas sensing element having a catalytic coating that is reactive to combustible hydrocarbon gases;
said second branch is a compensating element;



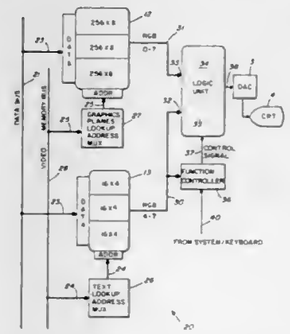
said third and fourth branches are resistors;
said difference amplifier output is connected to a current bypass means, that is parallel connected across said sensing element and responsive to said amplifier output, to pass current and; further having,
a means to measure the current passed by said current bypass device.

4,818,978
POSITION AND IMAGE INPUTTING UNIT
Motoshi Kurihara, Tokyo, and Tsukasa Matoba, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 25, 1985, Ser. No. 748,470
Claims priority, application Japan, Jun. 26, 1984, 59-130102
Int. Cl.[4] H04N *1/02*
U.S. Cl. 340—706 11 Claims



1. A position and image inputting unit which has a position inputting function and a function to input image information to be detected from the surface of an object, comprising:
a packing case,
position outputting means including X and Y position encoders installed in said packing case for obtaining two-dimensional position data of said packing case as said packing case moves along the surface of the object;
image reading means installed in said packing case for reading the image information;
switching means, mounted in said packing case, for switching the operation of the position and image inputting units between said position outputting means and said image reading respectively for selectively outputting data only from said position outputting means to a device external to said packing case or outputting image information to said external device;
wherein said position outputting means includes a rolling ball which makes contact with the surface of the object, and outputs position data for said packing case based on the rolling distance of the rolling ball;
wherein said position and image inputting unit further comprises guide means for regulating the direction of rolling of the rolling ball to make it possible to move said packing case in a fixed direction when said image reading means is in operation; and
wherein said switching means comprises an elastic part which is disposed between said rolling ball and said packing case, and a first switch which outputs a signal, when the elastic part is compressed by a predetermined amount of displacement, that actuates said image reading means as well as interrupts the operation of said position outputting means that has been in operation.

4,818,979
LUT OUTPUT FOR GRAPHICS DISPLAY
Donald C. Manson, Northbridge, Mass., assignor to Prime Computer, Inc., Natick, Mass.
Filed Feb. 28, 1986, Ser. No. 834,756
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—723 18 Claims



1. A display signal generating system comprising:
a. display memory having a plurality of data storage locations, and a plurality of address output signal lines, said display memory outputting on said address output signal lines an address or addresses corresponding to memory locations containing display data,
b. first and second addressable look-up memories having a plurality of input address signal lines coupled to said address output signal lines from said display memory, each of said addressable memories having a plurality of data storage locations, and a plurality of data output signal lines, said memories each including means for generating a data signal on its data output signal lines representative of the data stored at the one of its locations corresponding to the location defining address signal applied to its input address signal lines from said address output signal lines of said display memory, and
c. a logic unit having inputs coupled to said data output signal lines and a plurality of logic unit output signal lines, said logic unit combining the data output signals from said first and second address memories by a selected one of a set of predetermined combination operations to supply a graphics display signal on said logic unit output signal lines; and
d. means, coupled to said logic unit, for applying a selection signal to said logic unit which determines the selected combination operation.

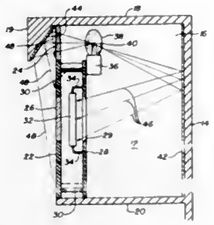
VOL 1101 ISS 1 AP 4 1989 UMI

4,818,980

OPERATOR CONTROL PANEL

Richard P. Strosser, Akron; Stuart O. Swiler, New Holland, and Marvin G. Weaver, Jr., Lititz, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Jun. 18, 1987, Ser. No. 63,389
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 **11 Claims**



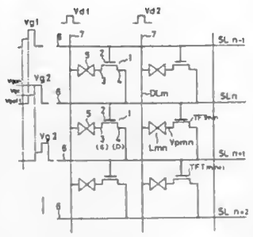
1. An operator control panel comprising:
an enclosure defined by a back wall, sidewalls, a top wall, a bottom wall, and a front panel;
display means disposed inside said enclosure, said display means being viewable through a window in said front panel;
lamp means disposed inside said enclosure;
first reflective means located inside said enclosure rearwardly of said lamp means;
second reflective means located outside said enclosure forwardly of said lamp means;
said lamp means being positioned for projecting first light rays onto said first reflective means and then onto said display means and for projecting second light rays through another window in said front panel onto said second reflective means and then onto said front panel; and
a circuit board disposed in said enclosure for supporting said display means, said lamp means being supported on said circuit board.

4,818,981

ACTIVE MATRIX DISPLAY DEVICE AND METHOD FOR DRIVING THE SAME

Ken-ichi Oki; Satoru Kawai, both of Zama; Ken-ichi Yanai, Atsugi, and Kazuhiro Takahara, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 11, 1987, Ser. No. 95,268
Claims priority, application Japan, Sep. 11, 1986, 61-212696; Sep. 11, 1986, 61-212697; Dec. 25, 1986, 61-307750; Jan. 12, 1987, 62-003348; Mar. 17, 1987, 62-060168
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 **20 Claims**



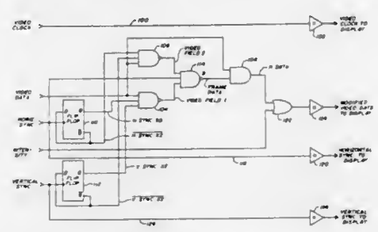
1. An active matrix display device, comprising:
first and second substrates having a peripheral region, forming an enclosure with no ground bus lines and a plurality of display elements arranged in a matrix and having first and second inside surfaces, respectively;
data bus lines formed on the first inside surface, arranged in a first strip pattern and forming a first matrix of first display electrodes of the display elements having row and column positions, said data bus lines having ends at the peripheral region operatively connectable to receive pulses;
scan bus lines formed on the second inside surface, arranged in a second strip pattern perpendicular to said data bus lines, forming a second matrix of second display electrodes of the display elements, said scan bus lines having ends at the peripheral region operatively connectable to receive pulses, said second matrix having row and column positions corresponding to said first matrix; and
switch elements formed on the second inside surface, each of said switch elements corresponding to one of said second display electrodes having a control electrode and first and second controlled electrodes, the control electrode being connected to one of said scan bus lines, the first controlled electrode being connected to a corresponding one of said second display electrodes and the second controlled electrode being connected to a next one of said scan bus lines.

4,818,982

BRIGHTNESS CONTROL FOR AN ELECTRO-LUMINESCENT DISPLAY

Gary Kuehn, Waldorf, Md.; David M. Gerrek, Chesapeake, and Wendy Ferguson, Virginia Beach, both of Va., assignors to Systems Management American Corporation, Norfolk, Va.

Filed Aug. 12, 1987, Ser. No. 84,202
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—793 **7 Claims**



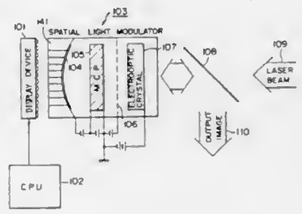
1. A brightness control circuit for use with Plasma and Electroluminescent displays, comprising:
means for receiving from a data source an input video data signal including video data to be displayed on a display, an input horizontal sync pulse signal for horizontally synchronizing said display, an input vertical sync signal for vertically synchronizing said display, an input video clock for establishing a reference for the video data, and an input intensity signal for indicating whether particular video data is to be displayed at a low or a high intensity by said display;
means, coupled to said receiving means, for generating first and second video data fields each of which includes less data than its respective field component in said video data signal;
means for combining said first and second video data fields to form frame data;
means, coupled to said combining means, for receiving said video data and said frame data and for providing half intensity data; and
means for modulating said half intensity video data with said intensity signal to provide modified video data for selectively driving said display at full intensity when said intensity signal indicates that particular video data is to be displayed at a high intensity and at half intensity when said intensity signal indicates that particular video data is to be displayed at a low intensity.

4,818,983

OPTICAL IMAGE GENERATOR HAVING A SPATIAL LIGHT MODULATOR AND A DISPLAY DEVICE

Tsutomu Hara; Yoshiji Suzuki, and Naohisa Mukouzaka, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 7, 1986, Ser. No. 894,014
Claims priority, application Japan, Aug. 20, 1985, 60-182796; Aug. 20, 1985, 60-182797
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—794 **6 Claims**



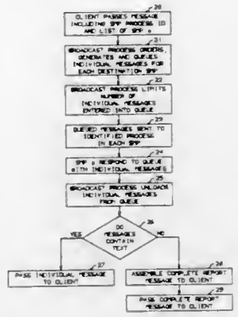
1. An optical image generator, comprising:
a spatial light modulator, said spatial light modulator including a photocathode and a crystal material whose optical property changes with the charge thereon, which can be changed corresponding to the change in a two-dimensional image pattern impinging on the photocathode, the spatial light modulator additionally including a microchannel plate between the photocathode and the crystal material; and
a display device, said display device including a light emitting element matrix array controlled by a computer and arranged adjacent said photocathode.

4,818,984

BROADCASTING MESSAGES IN A DISTRIBUTED PROCESSING SYSTEM

Shih-Jeh Chang, Naperville; Richard T. Emery, Montgomery; Shafik J. Hakim, Naperville; Jen-Lie Ho, Naperville; Paul E. Janssen, Naperville, and Carol M. McCullagh, Lisle, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 26, 1986, Ser. No. 935,402
Int. Cl.[4] H04Q *11/04, 5/02*; H04J *3/16*
U.S. Cl. 340—825.54 **16 Claims**



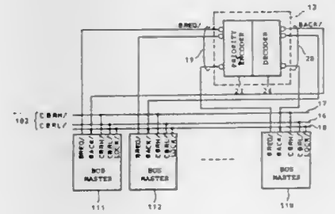
1. In a distributed processing system comprising a plurality of processors using acknowledgment signal processing of broadcast messages, a method of transmitting broadcast messages from one of said processors to a plurality of other ones of said processors and receiving acknowledgment response from each of said other ones of said processors, comprising the steps of:
transmitting a broadcast message from said one of said processors to each of said other ones of said processors individually and in sequence without waiting for receipt of acknowledgment responses from any of said other ones of said processors; and
collecting acknowledgment responses for the transmitted broadcast messages received from each of said other ones of said processors.

4,818,985

BUS ARBITRATION NETWORK CAPABLE OF QUICKLY CARRYING OUT ARBITRATION AMONG BUS MASTERS

Sadanobu Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

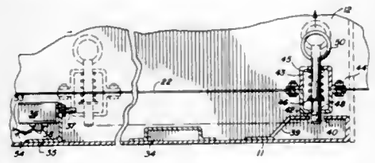
Filed Nov. 23, 1987, Ser. No. 123,879
Claims priority, application Japan, Nov. 22, 1986, 61-277841
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.5 **6 Claims**



1. A bus arbitration network comprising a common bus network, a plurality of bus masters, and an arbiter coupled to said bus masters through said common bus network for arbitrating use of said common bus network, each of said bus masters carrying out communication with each of others of said bus masters through said common bus network and comprising:
internal request producing means for producing an internal normal request signal and an internal particular request signal which indicate an internal normal request and an internal particular request which are related to use of said common bus network;
first supply means coupled to said internal request producing means for supplying said others of the bus masters through said common bus network with a normal bus request signal and a particular bus request signal in response to said internal normal request signal and said internal particular request signal, respectively; and
second supply means coupled to said first supply means for supplying said bus arbiter with a bus request signal in response to each of said internal normal request signal and said internal particular request signal;
said bus arbiter comprising:
means responsive to said bus request signals sent from said bus masters for selecting one of said bus masters as a selected bus master; and
means for delivering to said selected bus master an acknowledgement signal representative of an acknowledgement of the use of said common bus network;
said each bus master further comprising:
means for indicating start of the communication in response to said acknowledgement signal.

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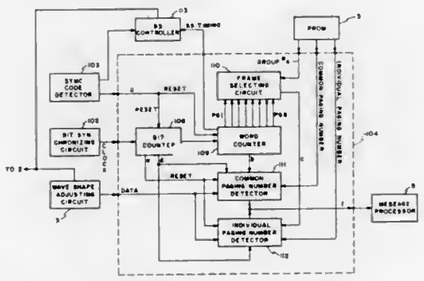
4,818,986
APPARATUS FOR CONTROLLING ACCESS TO DATA STORAGE DEVICES
Robert M. Bauman, 8697 E. Cheryl Dr., Scottsdale, Ariz. 85258
Filed Jan. 27, 1987, Ser. No. 6,810
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.31 **10 Claims**



1. Apparatus for providing a secure environment for an electronic device, said apparatus comprising:
(a) an enclosure having a backwall, opposing side walls and a front portion containing at least one access port therein;
(b) a drawer having opposing sidewalls and movably mounted in said access port for movement between a closed position and a full open position, said drawer receiving an electronic device therein;
(c) locking means for securing said drawer in the closed position;
(d) first switch means mounted on a wall of said enclosure for deactivating an electrical circuit coupled between the electronic device in the drawer and an external power supply upon the movement of said drawer to said closed position;
(e) first coupling means for electrically connecting said first switch means to said external power supply through said enclosure;
(f) second coupling means for electrically connecting said first switch means to the electronic device located within said drawer whereby the opening of said drawer electrically connects said device to the external power supply;
(g) releasable engaging means contained in said drawer and extending through an aperture in a sidewall of said drawer, said engaging means contacting said first switch means to deactivate the circuit when said drawer is in the closed position;
(h) a receiving member mounted on a side wall of said enclosure for receiving said engaging means and maintaining said drawer in a partial open position, the release of said engaging means from within said drawer permitting movement of said drawer to open or closed positions; and
(i) data transmission means for connection to said device and extending outwardly through said enclosure for connection with external circuitry.

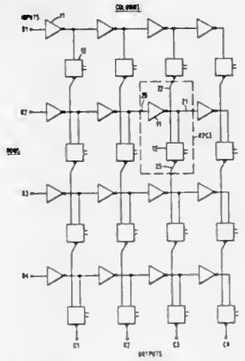
4,818,987
SELECTIVE PAGING RECEIVER WITH MESSAGE DISPLAY
Motoki Ide, and Takashi Oyagi, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Dec. 17, 1986, Ser. No. 942,603
Claims priority, application Japan, Dec. 18, 1985, 60-282726
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.47 **12 Claims**

12. A paging receiver comprising:
receiver means for receiving a paging signal including an individual paging number which is assigned to said receiver and a common paging number which is assigned at least to said receiver, said paging signal being transmitted in cyclically recurring time frames;
decoder means for simultaneously searching the received paging signal both for said individual paging number in a particular group time frame corresponding to the designated group of said paging receiver and said common paging number in a time interval not limited to said particular group time frame, and for outputting an individual detection signal in response to a detection of said individual paging number and for outputting a common detection signal in response to a detection of said common paging number; and



indicating means responsive to one of said individual and common detection signals for indicating the reception of either said individual or common paging numbers.

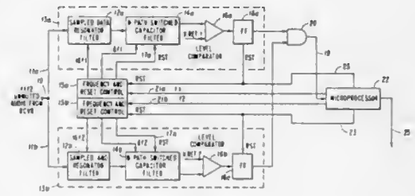
4,818,988
CROSSPOINT SWITCHING ARRAY
Michael Cooperman, Framingham, and Richard W. Sieber, Attleboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Jan. 4, 1988, Ser. No. 140,511
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.85 **5 Claims**



1. A crosspoint switching array for connecting any one of a plurality of M input ports to any one of a plurality of N output ports including M x N crosspoint switching means arranged in M rows by N columns, each crosspoint switching means comprising
a row input connection and a row output connection, the row input connection being connected to the row output connection of the preceding crosspoint switching means in the row, and the row output connection being connected to the row input connection of the following crosspoint switching means in the row;
a column input connection and a column output connection, the column input connection being connected to the column output connection of the preceding crosspoint switching means in the column, and the column output connection being connected to the column input connection of the following crosspoint switching means in the column;

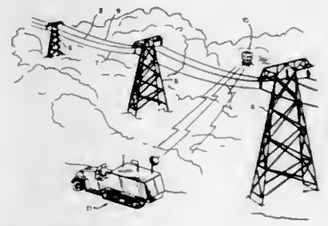
row buffer means having an input connected to the row input connection and an output connected to the row output connection;
selector means having a first input connected to the column input connection, a second input connected to the row output connection, an output connected to the column output connection, and control input means;
said selector means being operable in response to a first control condition at the control input means to provide a closed circuit condition between the first input and the output thereof and an open circuit condition between the second input and the output thereof; and
said selector means being operable in response to a second control condition at the control input means to provide an open circuit condition between the first input and the output thereof and a closed circuit condition between the second input and the output thereof.

4,818,989
SELECTIVE CALLING DECODER
Willard F. Werth, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Mar. 27, 1984, Ser. No. 593,792
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 340—825.730 **1 Claim**



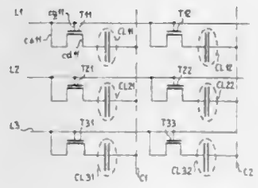
1. A decoding system comprising:
means for receiving an electrical input which may include at least one frequency representing a tone signal;
a sampled data resonator filter coupled to receive said electrical input and controlled to have a center frequency equal to said at least one frequency when that frequency is present in said electrical input;
an N-path switched capacitor filter having an input coupled to receive the output of sampled data resonator filter and controlled to provide an output at said at least one frequency when said frequency is present in said electrical input;
means responsive to said output of a selected filter frequency for detecting the presence of that frequency;
a microprocessor for alterably generating a control frequency; and
a frequency and reset control coupled to receive the control frequency to provide a clocking frequency to said sampled data resonator and said N-path switched capacitor for alterably setting said selected frequency at said at least one frequency, said frequency and reset control comprising:
a phase detector having a first input coupled to receive said control frequency, a second input, and an output;
a low pass filter having an input coupled to receive the output of said phase detector and provide an output;
a voltage controlled oscillator having an input coupled to receive the output of said low pass filter and providing a variable frequency output in response to the input of said voltage controlled oscillator;
a divide-by-2 divider having an input coupled to receive the output of said voltage controlled oscillator and providing a divided output;
a divide-by-8 divider having an input coupled to receive the output of said divide-by-2 divider and having an output coupled to the second input of said phase detector to form a phase locked loop;
a divide-by-60 divider having an input coupled to receive said control frequency and providing an output; and
a set/reset flip-flop having a set input and a reset input and providing an output, said set input of said flip-flop being coupled to receive the output of said divide-by-60 divider and said reset input of said flip-flop being coupled to receive said control frequency.

4,818,990
MONITORING SYSTEM FOR POWER LINES AND RIGHT-OF-WAY USING REMOTELY PILOTED DRONE
Roosevelt A. Fernandes, 104 Ruby Rd., Liverpool, N.Y. 13088
Filed Sep. 11, 1987, Ser. No. 95,152
Int. Cl.[4] G08C *9/06, 19/22*
U.S. Cl. 340—870.07 **27 Claims**



1. A system for monitoring physical and/or environmental features and abnormal conditions associated with or in proximity to an energized electric power conductor extending along a power corridor, said system comprising:
(a) a remotely piloted drone adapted for flight in close proximity to said power conductor and for hovering to detect abnormal conditions along said power conductor;
(b) said drone including means responsive to control signals from a source outside said drone for guidance thereof along said power corridor;
(c) at least one piece of equipment mounted upon said drone and adapted to observe and/or record data commensurate with at least one of said features and conditions in a first location along said power corridor; and
(d) a ground-based control station including means for retrieving said data at a second location, remote from said drone.

4,818,991
ELECTRO-OPTICAL DISPLAY SCREEN WITH CONTROL TRANSISTORS
Michel Gay, Le Fontanil, France, assignor to Thomson-CSF, Paris, France
Filed Nov. 6, 1986, Ser. No. 927,851
Claims priority, application France, Nov. 15, 1985, 85 16935
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 **8 Claims**



2. Electro-optical display screen using control transistors comprising: a first plate (1) and a second plate (2), parallel to

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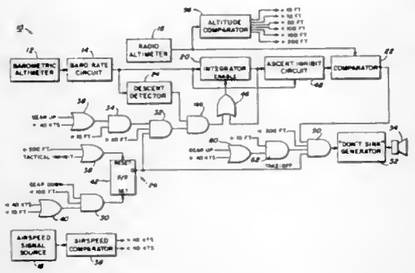
each other and enclosing an electro-optical material (3); the first plate being provided, on its side (10) which is in contact with the electro-optical material, with a matrix of display cell electrodes (E11, E12 . . .) arranged in rows and columns, and with row-controlling conductors (L1, L2 . . .), each conductor being associated with each row of display cell electrodes of the matrix and being set parallel to each row of said electrodes, and with control transistors (T11, T12 . . .) coupling said electrodes to said row control conductors; the second plate (2) being provided, on its surface (20) which is in contact with the electro-optical material, with column conductors each corresponding to a column of the matrix of display cell electrodes (F_{11}, F_{12}. . .) arranged in rows and columns on the surface of the first plate; each control transistor having a drain connected to a display cell electrode of the matrix, and having its gate electrode and its source connected to the row conductor associated with said row display cell electrodes to which its drain is connected.

4,818,992

EXCESSIVE ALTITUDE LOSS AFTER TAKE-OFF WARNING SYSTEM FOR ROTARY WING AIRCRAFT

Noel S. Paterson, Bothell, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 10, 1983, Ser. No. 503,217
Int. Cl.⁴ G08B *23/00*
U.S. Cl. 340—970 **9 Claims**



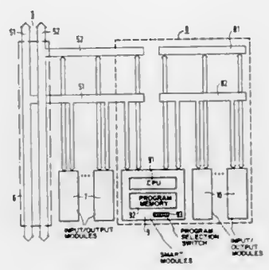
1. A warning system for providing a warning of a hazardous flight condition of a rotary wing aircraft during a take-off or a go-around after a missed approach phase of flight, comprising:
- means for providing a signal representative of the altitude of the aircraft above ground and the descent rate of the aircraft;
- means responsive to the signal provided by said descent rate signal providing means for generating a signal representative of altitude loss of the aircraft; and
- means responsive to the altitude above ground signal providing means and said altitude loss signal providing means for detecting an excessive altitude loss and providing a warning indicative of excessive altitude loss when the aircraft is flying between approximately 20 and 200 feet of altitude above the ground and when the altitude loss exceeds approximately 15 feet at approximately 20 feet of altitude above the ground and approximately 50 feet at approximately 200 feet of altitude above the ground, wherein said altitude and descent rate signal providing means includes a radio altimeter, a barometric altimeter and a barometric rate circuit, wherein said altitude loss signal providing means includes an integrator that is responsive to the barometric rate circuit to provide the altitude loss representative signal, said warning system further including means for enabling the generation of a warning only when the aircraft is in a take-off or a go-around after a missed approach phase of flight, wherein the aircraft has landing gear movable between a down position and a retracted position, wherein said system includes means for providing a signal representative of the position of the landing gear, means for providing a signal representative of the airspeed of the aircraft, and wherein said enabling means includes means responsive to the landing gear position signal providing means, to the airspeed signal providing means and to the altitude signal providing means for generating a take-off mode enabling signal for enabling said warning system only when the landing gear is down, and the aircraft is below approximately 100 feet and either the airspeed of the aircraft is less than approximately 40 knots or the aircraft is below approximately 10 feet above the ground.

4,818,993

ELECTRONIC CONTROL SYSTEM FOR CONTROLLING SEVERAL REMOTE DEVICES

Günter Stöckel, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 29, 1987, Ser. No. 8,786
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606400
Int. Cl.⁴ G05B *23/02*
U.S. Cl. 340—825.060 **3 Claims**



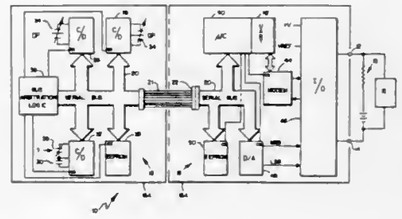
1. An electronic system for controlling several different devices comprising:
- a. a central processing unit;
- b. peripheral control elements, each being connected to at least one of said devices; and
- c. a peripheral bus interconnecting said central unit and said peripheral control elements, each said peripheral control element comprising:
  - (i) a connection module connected to said peripheral bus for exchanging messages with said central processing unit;
  - (ii) a control module connected to said connection module and having a control processing unit, a memory containing an operating system and several control programs, each program being provided to control one of said devices, and a selector switch, said control program being selectively activated by said selector switch;
  - (iii) first input/output modules coupled to said devices;
  - (iv) an internal bus for connecting said control module to said first input/output modules; and
  - (v) second input/output devices connected directly to said connection module.

4,818,994

TRANSMITTER WITH INTERNAL SERIAL BUS

Kelly M. Orth, Apple Valley; Steven M. Quist, Minnetonka; Roger L. Frick, Chanhassen, and Randy K. Paschke, Chaska, all of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Oct. 22, 1987, Ser. No. 112,226
Int. Cl.⁴ G08C *19/16*
U.S. Cl. 340—870.21 **15 Claims**



1. A transmitter comprising:
a serial bus;
a detector module connected to the serial bus and including:
- a plurality of sensing means for coupling serial sensor signals representative of sensed parameters to the serial bus, one of the sensing means being capable of providing an interrupt signal over the serial bus to indicate when a sensing means has a digital signal to be sent; and
- means for selectively enabling the plurality of sensing means, in a selected order, to send their digital signals over the serial bus; and

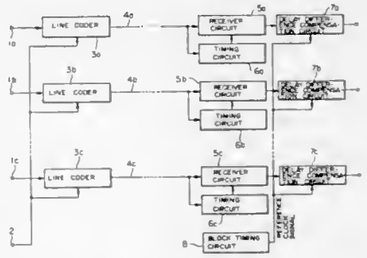
an output module connected to the serial bus and including:
- digital computer means for processing the digital sensor signals to produce a control signal; and
- means for producing a transmitter output signal as a function of the control signal.

4,818,995

PARALLEL TRANSMISSION SYSTEM

Yoshitaka Takahashi, Tokorozawa; Yasushi Takahashi; Yukio Nakano, both of Hachioji; Akihiro Hori, Yokohama; Minoru Maeda, Tokyo; Yoshihiko Miyano, Fujisawa; Ikuo Tokizawa, and Masatoyo Sumida, both of Yokosuka, all of Japan, assignors to Hitachi Ltd. and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed May 19, 1987, Ser. No. 51,519
Claims priority, application Japan, May 19, 1987, 61-112631
Int. Cl.⁴ H03M *7/00*
U.S. Cl. 341—94 **9 Claims**



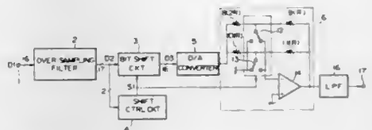
1. A parallel transmission system comprising:
a plurality of line coders for converting parallel original signals into parallel mBnB line codes, each code including a series of n-bit blocks, and each block including an m-bit word, where m and n are natural numbers;
a block timing clock signal for aligning phases of the blocks of said mBnB line codes;
a plurality of parallel transmission lines for transmitting said parallel mBnB line codes from said line codes wherein each transmission line transmits an mBnB line code;
a plurality of receiver circuits for receiving said parallel mBnB line codes from said line coders; and
delay difference compensation means for aligning the phases of the blocks of the parallel mBnB line codes received by said receiver circuits based on a reference signal.

4,818,996

DIGITAL-TO-ANALOG CONVERTING CIRCUIT

Shigenobu Kimura, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 16, 1987, Ser. No. 97,846
Claims priority, application Japan, Sep. 24, 1986, 61-225659
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 341—144 **7 Claims**



1. A digital-to-analog converting circuit for converting digital data into an analog signal, comprising:
- (a) detecting means for detecting whether upper K (where K denotes a positive integral number) bits of inputted digital data are identified as unnecessary bits, said detecting means outputting a shift signal when said upper K bits are identified as said unnecessary bits in all of a plurality of said digital data received during a predetermined time period;
- (b) bit shift means for shifting said digital data by M (where M denotes a positive integral number, and M is set as M≦K) bits in an upper bit direction so as to generate and output shifted data when said shift signal is supplied thereto, said bit shift means passing through said digital data when said shift signal is not supplied thereto;
- (c) converting means for converting the output data of said bit shift means into an analog signal; and
- (d) attenuating means for attenuating said analog signal outputted from said converting means in accordance with the number M of the shifting bits when said shift signal is outputted from said detecting means.

4,818,997

REMOTE OUTPUT INDICATOR FOR PROVIDING OUTPUT INDICATIONS FROM A REMOTELY LOCATED RADAR DETECTOR

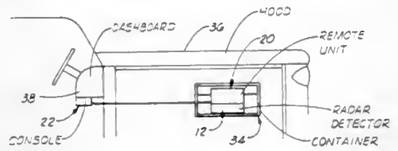
Steven C. Holmes, 2925 Charing Cross Rd., Oklahoma City, Okla. 73120

Filed Jan. 12, 1987, Ser. No. 2,424
Int. Cl.⁴ G01S *7/04*
U.S. Cl. 342—20 **8 Claims**

1. A remote indicator for use with a radar detector providing a perceivable output indication for detecting signals from an operating radar, the remote indicator comprising:
- a remote unit locatable near the radar detector having one portion for sensing the radar detector perceivable output indication and providing an output signal in response to and indicative of the radar detector perceivable output indication; and
- a console remotely located from the radar detector and remote unit receiving the output signal from the remote

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unit indicative of the radar detector perceivable output indication and providing a perceivable output indication



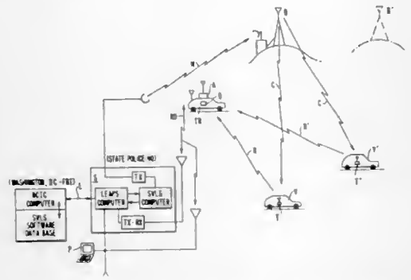
in response to receiving the output signal indicative of the radar detector perceivable output indication from the remote unit.

4,818,998

METHOD OF AND SYSTEM AND APPARATUS FOR LOCATING AND/OR TRACKING STOLEN OR MISSING VEHICLES AND THE LIKE

Sheldon P. Apsell, Newton, and Norval D. Stapelfeld, Brookline, both of Mass., assignors to Lo-Jack Corporation, Boston, Mass.

Filed Mar. 31, 1986, Ser. No. 847,152
Int. Cl.[4] G01S *13/80*
U.S. Cl. 342—44 52 Claims



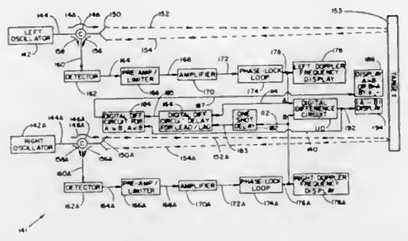
1. A method of tracking a computer-registered transponder-equipped vehicle, upon the same being missing, that comprises, checking the registration of such vehicle to determine that it is computer listed as transponder-equipped; upon affirmative determination of such transponder equipment listing, initiating the broadcasting in an appropriate sector of a radio activation command signal carrying coded identification unique to said vehicle and its transponder; receiving said command signal at the vehicle transponder, decoding the identification and verifying that the same is the unique code of said vehicle and its transponder, and, if so, causing the transponder to become activated to transmit periodic vehicle reply signals including unique identification; receiving said periodic vehicle reply signals in a tracking vehicle and locking onto the same; thereafter, at the request of the tracking vehicle, modifying the said sector radio activation command signals to provide increased-rate command signals to the vehicle transponder; and responding to the increased-rate command signals at the vehicle transponder to increase the periodicity of the transmitted transponder vehicle signals to facilitate tracking by the tracking vehicle.

4,818,999

METHOD AND APPARATUS FOR MEASURING FREQUENCY AND PHASE DIFFERENCE

Herbert S. Kobayashi, Webster; Christopher L. Lichtenberg, Houston; Paul W. Shores, Houston, and Allen R. Cunningham, Houston, all of Tex., assignors to The United States of America as represented by the Administrator of The National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1986, Ser. No. 924,472
Int. Cl.[4] G01S *13/93*
U.S. Cl. 342—59 10 Claims



1. Apparatus for measuring the difference in frequency and phase between first and second pulse trains, comprising:

(a) first difference circuit means comprising (b), (c), (d), and (e) as follows:

(b) leading edge detection means for detecting the leading edges of pulses comprising said second pulse train;

(c) coincidence detection means for detecting coincidence and non-coincidence of each of said leading edges with pulses comprising said first pulse train;

(d) memory element means;

(e) set/reset means for setting said memory element means to a first state in response to each said coincidence of said leading edge and one of said pulses comprising said first pulse train, and for re-setting said memory element to a second state in response to each said non-coincidence of said leading edge and one of said pulses comprising said first pulse train, output of said memory means forming a first difference pulse train;

(f) pulse delay means for detecting leading edges of said second pulse train and for generating a corresponding delayed pulse for each said leading edge;

(g) second difference circuit means for detecting coincidence and non-coincidence of each of said delayed pulses with pulses comprising said first pulse train, said coincidences and non-coincidences forming a second difference pulse train;

(h) third difference circuit means for detecting coincidence and non-coincidence of leading edges of said second difference pulse train and said first states of said first difference pulse train, said third difference circuit means producing a third difference pulse train providing a measure of the difference between said first and said second pulse trains.

4,819,000

SCANNING ANTENNA HAVING AMPLITUDE AND PHASE DISTRIBUTION DIVERSITY

Maurice A. Meyer, Natick, Mass., assignor to Micronav Ltd., Canada

Filed Aug. 10, 1987, Ser. No. 83,246
Int. Cl.[4] G01S *1/16;* H01Q *3/02*
U.S. Cl. 342—408 13 Claims

1. A scanning beam transmit antenna system comprising,

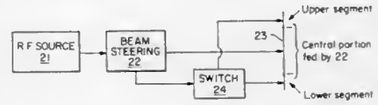
a source of electromagnetic energy,

radiating elements and phase shifters forming a linear array,

connection means comprising a feed network for connecting said source to said radiating elements to establish a prescribed phase and amplitude characteristic thereof and including power dividers for routing said electromagnetic energy to each of said radiating elements,

said power dividers providing a constant amplitude and phase distribution and two selectable incremental amplitude and phase distributions,

said feed network comprising a single-pole multiple-throw



microwave switch coupled to said power dividers for selectively translating said prescribed phase and amplitude characteristic along said array a distance equal to that embraced by a preselected number of said radiating elements by energizing one of said selectable incremental distributions, and

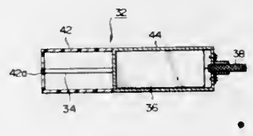
beam steering means for controlling the phase of said electromagnetic energy at each of said radiating elements.

4,819,001

AUTOMOBILE ANTENNA SYSTEM

Junzo Ohe, and Hiroshi Kondo, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 25, 1985, Ser. No. 801,310
Claims priority, application Japan, Nov. 26, 1984, 59-250344; Nov. 26, 1984, 59-250345; Dec. 6, 1984, 59-258806
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 345—712 7 Claims



1. An automobile antenna system comprising:

a first casing mode of synthetic resin and having an elongated opening at one end;

loop antenna means fixed and secured within said first casing and having a portion arranged facing the opening of said first casing, said loop antenna means being provided for detecting surface currents induced on a vehicle body by broadcast waves;

a second casing made of metal and integrally connected to said first casing;

circuit means boused and electrostatically shielded within said second casing and connected to said loop antenna means for processing a signal detected by said loop antenna means;

said first casing, said second casing, said loop antenna means and said circuit means comprising a high-frequency pickup; and

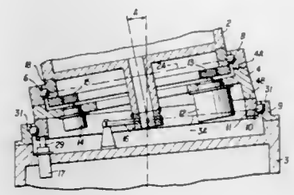
mounting means for mounting said high-frequency pick up at a given position in proximity to a marginal edge portion of the vehicle body where the induced surface currents are concentrated.

4,819,002

DEVICE FOR ORIENTING AND ANGULARLY POSITIONING THE AXIS OF ROTATION OF A ROTATABLE LOAD

Marc J. Reboullet, Meudon, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Sep. 30, 1986, Ser. No. 913,375
Claims priority, application France, Oct. 2, 1985, 85 14580
Int. Cl.[4] H01Q *3/10, 1/12, 1/18, 3/02*
U.S. Cl. 343—765 9 Claims



1. A device for orienting and angularly positioning the axis of rotation of a rotatable load, comprising:

a fixed member defining a first vertical reference axis, the fixed member having an upper mounting plane which is inclined at a non-zero predetermined angle to a plane substantially perpendicular to said first vertical reference axis,

a rotatable support member adapted to support the load and defining said axis of rotation, the support member having a lower mounting plane substantially perpendicular to said axis of rotation,

an intermediate member having upper and lower mounting planes, the upper mounting plane of said intermediate member being inclined at said predetermined angle with respect to said lower mounting plane of said intermediate member,

first mounting means located between said upper mounting plane of said fixed member and said lower mounting plane of said intermediate member, which first mounting means includes means for permitting relative rotation between said fixed member and said intermediate member,

second mounting means located between said upper mounting plane of said intermediate member and said lower mounting plane of said support member, which second mounting means includes means for permitting relative rotation between said intermediate member and said support member,

drive means mounted on said intermediate member for rotatably driving said intermediate member relative to said fixed member,

means interconnecting said support member and said fixed member for stopping rotation of said support member with respect to said fixed member, and

means for holding said intermediate member with said fixed member.

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4,819,003

FLAT CIRCULAR UNIDIRECTIONAL MICROWAVE ANTENNA

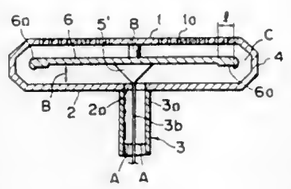
Naohisa Goto, No. 6-15-1-A514, Tsuchihashi, Takatsu-Ku, Kawasaki-Shi, Kanagawa-Ken; Yoshiharu Ito, No. 2-1, 2-Chome, Jin-nan, Shibuya-Ku, Tokyo; Kunitaka Arimura, No. 2-16, 2-Chome, Matsunami, Chigasaki-Shi, Kanagawa-Ken; Makoto Ando, No. 1-22, Deikicho, Kanazawa-Ku, Yokohama-Shi, Kanagawa-Ken; Tatsuya Shirai, No. 16-19, Denenchofuhoncho, Ota-Ku, Tokyo, and Ryuji Teramoto, No. 2613, Iiyama, Atsugi-Shi, Kanagawa-Ken, all of Japan

Filed Mar. 5, 1985, Ser. No. 708,353

Claims priority, application Japan, Mar. 24, 1984, 59-56941; Mar. 24, 1984, 59-56942; Mar. 24, 1984, 59-56943; Mar. 24, 1984, 59-56944

Int. Cl.⁴ H01Q *13/12*

U.S. Cl. 343—771 **17 Claims**



1. A flat circular undirectional microwave antenna comprising a wave-guide space formed inside a flat cylinder having a peripheral wall and inner and outer end plates of which the internal surface is made of metal, said outer end plate defining a plurality of openings for radiation of power therethrough while said inner end plate defines a central power-feeding opening connected to power-feeding means,

an intermediate plate of metal at least on the surface thereof and attached to said cylinder by way of a spacer in such manner as to partition off upper and lower wave-guiding compartments and form a by-pass gap between the periphery of said intermediate plate and the peripheral wall of said cylinder, said gap constituting a junction between said upper and lower wave-guiding compartments, said intermediate plate together with said peripheral wall and end plates defining a power-feeding passage from said power-feeding opening to said power-radiating openings, and matching means for inhibiting the reflection of fed power from said power-feeding opening through said by-pass gap to said power-radiating openings in said outer end plate, said matching means comprising first matching means disposed on said intermediate plate near said power-feeding opening and second matching means disposed near said by-pass gap,

said first matching means being constituted by a conical matching body at the power-feeding means attached to said intermediate plate and having the apex thereof directed toward said power-feeding opening.

4,819,004

PRINTED CIRCUIT ARRAY ANTENNA

Lazare Argintaru, Le Pre Saint Gervais, and Eric Leroux, Levallois Perret, both of France, assignors to Alcatel Thomason Faisceaux Hertziens, Levallois Perret, France

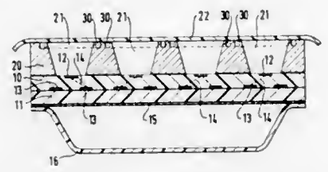
Filed Mar. 26, 1987, Ser. No. 29,919

Claims priority, application France, Mar. 26, 1986, 86 04392

Int. Cl.⁴ H01Q *13/02*

U.S. Cl. 343—778 **7 Claims**

1. A printed circuit array antenna of elongated shape including at least a first printed circuit, said first printed circuit being constituted by a substrate having opposite first and second faces, radiating elements disposed on said first face, an energy distribution tree of interconnected conductors diposed on said second face, and a front structure of elongated planar shape superposed on the first face of said first printed circuit, said front structure being constituted by a rigid plate substrate having front and rear surfaces, pierced with spaced, axially elongated, radiating apertures orthogonal to the plane of the rear surface and located coaxially about the radiating elements



of said first printed circuit, wherein the front structure substrate is at least metallized over the external surfaces thereof and wherein choke ring traps formed by grooves of annular shape are provided within the front surface of the front structure remote from the first printed circuit and disposed around the ends of the apertures of said front structure.

4,819,005

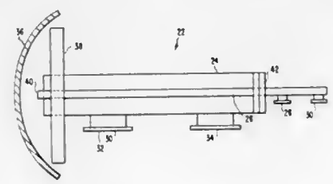
CONCENTRIC WAVEGUIDES FOR A DUAL-BAND FEED SYSTEM

Brian J. Wilkes, 1015 Thomas Rd., Leesburg, Fla. 32748

Filed Aug. 21, 1986, Ser. No. 898,486

Int. Cl.⁴ H01Q *13/00*

U.S. Cl. 343—786 **5 Claims**



1. A dual-feed waveguide used in conjunction with an antenna comprising:

a first circular waveguide or transmitting and receiving microwave energy therethrough at a first frequency band in the range of 3.7 to 4.2 GHz, the diameter of said first circular waveguide large enough to allow the microwave energy of said first frequency band to produce only lower modes TE_{01}, TM_{01}, said lower modes TE_{01}, TM_{01}, provided with a null area in the center of said first circular waveguide, and the diameter of said first circular waveguide small enough to contain the complete first frequency and without reaching the cut-off limit; and

a second circular waveguide provided within said first circular waveguide and concentric therethrough at a second frequency receiving microwave energy therethrough at a second frequency band in the range between 9.0 and 15.0 GHz wherein the diameter of said second circular waveguide is less than the diameter of said first circular waveguide, and said diameter of said second circular waveguide is large enough to contain the complete second frequency band without reaching th cut-off limit, but small enough to be completely contained in the null area of the lower modes TE_{01}, TM_{01}, of the first frequency band.

4,819,006

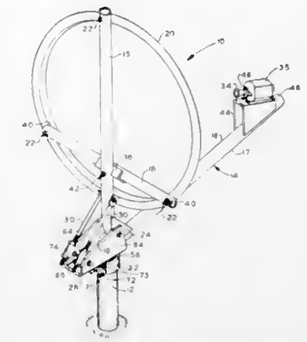
MOUNT FOR SUPPORTING A PARABOLIC ANTENNA

Robert B. Whitesides; Lyle W. Hovland, Murrysville, both of Pa., and Robert F. Crean, Woodstock, Vt., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 8, 1986, Ser. No. 860,989

Int. Cl.⁴ H01Q *1/12*

U.S. Cl. 343—880 **13 Claims**



1. A mount for connecting a parabolic dish television antenna to a hollow pipe mast to receive or send signals to a satellite, comprising:

a support having a linear upright member and a linear cross member attached at its midpoint to the upright member with their axes perpendicular;

means for attaching a peripheral portion of a parabolic dish antenna to the support; and

a fitting assembly attached to the lower end of the upright member having a torque lock adapted to fit within a pipe mast to connect the support to the mast and having means to selectively increase or decrease the diameter of the lock within the mast to enable or prevent rotation of the support about the mast axis, and means for enabling or preventing variation of the angle of inclination of the upright member with respect to vertical.

4,819,007

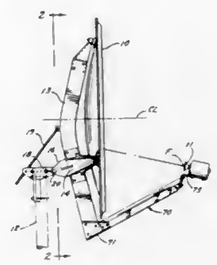
SUPPORTING STRUCTURE FOR REFLECTOR-TYPE MICROWAVE ANTENNAS

Hulusi E. Tezcan, Tinley Park, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Jun. 22, 1987, Ser. No. 65,289

Int. Cl.⁴ H01Q *19/12*

U.S. Cl. 343—840 **11 Claims**



1. A reflector type microwave antenna comprising the combination of

a paraboloidal reflector and a feed horn located at the focal point of the reflector for launching microwave signals onto the reflector and receiving microwave signals from the reflector;

a supporting frame for the reflector and feed horn, said frame including three arms extending along the rear side of the reflector to three spaced mounting locations on the rear side of the reflector; and

means for fastening the arms to said spaced mounting locations on the rear side of the reflector, each of said fastening means having a loose condition in which the respective arm is attached to the reflector but free to move relative to the reflector, and a tightened condition in which the respective arm is rigidly attached to the reflector,

said fastening means also including swivel means for permitting tilting movement of the respective arm relative to the reflector surface when the fastening means is in said loose condition, and permitting said arm to assume different positions relative to the reflector when the fastening means is in said tightened condition.

4,819,008

THERMAL HEAD DRIVER CIRCUIT

Hitoshi Nagato; Shuzo Hirahara, both of Yokohama, and Tadayoshi Ohno, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

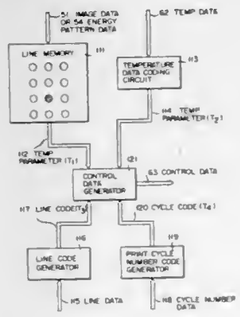
Continuation of Ser. No. 841,958, Mar. 20, 1986, abandoned.

This application Jul. 17, 1987, Ser. No. 75,296

Claims priority, application Japan, Mar. 26, 1985, 60-61365; Mar. 30, 1985, 60-67485

Int. Cl.⁴ G01D *15/10*; H04N *1/22*

U.S. Cl. 346—76 PH **12 Claims**



1. A driver circuit for a thermal head having a plurality of heat generation elements in an array, each heat generation element being subjected to produce heat in accordance with an externally supplied image data, comprising:

means for cyclically receiving a plurality of image data corresponding to said heat generating elements, each image data comprising n (arbitrary positive integer) bits and representing one of 2^n density graduations for one dot of an image;

pulse generating means for generating a plurality of driving pulses in response to the plurality of image data received by said receiving means, each of said plurality of driving pulses being generated for each of said heat generation elements, a cycle of generating the driving pulse being the same as that of receiving the image data and a duration time of each single driving pulse corresponding to one of the 2^n density graduations of corresponding image data; and

drive means for energizing the plurality of heat generation elements during periods of the duration times determined by corresponding driving pulses generated by said pulse generating means, whereby each heat generation element

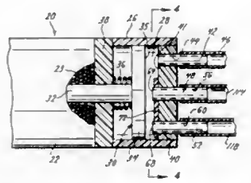
produces heat whose amount corresponds to the multiple density graduation of the image data.

4,819,009

VALVE AND NOZZLE SYSTEM FOR INK JET PRINTING APPARATUS

Larry E. Kniepkamp, Freeberg, Ill., assignor to Marsh Company, Belleville, Ill.

Filed Jul. 1, 1987, Ser. No. 68,420
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—75 **11 Claims**



1. A drop on demand ink jet printing system comprising a nozzle support, a plurality of nozzles supported by the nozzle support, each nozzle having an orifice, a plurality of control valves, each control valve having a chamber, an inlet port communicating with the chamber and with a source of ink, a plurality of outlet ports communicating with the chamber and with a plurality of nozzle orifices, and closure means operable between open and closed positions to open and close communication simultaneously between all the outlet ports and the inlet port and between one and another of the outlet ports whereby surface tension of ink at the orifices is maintained when the closure means is in the closed position.

4,819,010

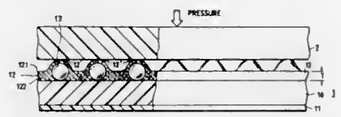
THERMAL PRINTER USING A THERMALLY TRANSFERABLE INK SHEET

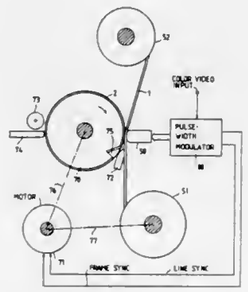
Tadao Kohashi; Hiroshi Onishi, and Hiroshi Esaki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 738,756, May 29, 1985, abandoned. This application Jun. 19, 1987, Ser. No. 64,249
Claims priority, application Japan, May 30, 1984, 59-110023; Oct. 29, 1984, 59-227155; Nov. 22, 1984, 59-247303; Nov. 22, 1984, 59-247332; Dec. 10, 1984, 59-260281
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **11 Claims**

1. A thermal printer comprising:
heating means for generating heat in response to an input signal applied thereto;
first support means movably supporting a recording sheet and providing a pressure on said recording sheet in a direction toward said heating means;
second support means movably supporting a thermal transfer sheet in contact with said heating means, said thermal transfer sheet comprising a heat resistive base, a thermally transferable ink layer on one side of said base, said layer comprising a mixture of a coloring agent and a hot melt binder, the mixture being transferable to said recording sheet in response to application of heat to the other side of said base, and auxiliary particles distributed in said layer so that they partially emerge from the surface of said layer;
means for moving said first and second supporting means; and
means located downstream with respect to said heating means for separating said transfer and recording sheets from each other before the heated mixture solidifies.

2. A thermal printer comprising:
heating means for generating heat in response to an input signal applied thereto;
first support means movably supporting a recording sheet, said recording sheet having a surface roughness represented by an average value of deviations from a center line, said average value being 0.8 micrometers or less and providing a pressure on said recording sheet in a direction toward said heating means;
second support means movable supporting a thermal transfer sheet, said thermal transfer sheet comprising a heat





resistive base, a thermally transferable ink layer on one side of said base, said ink layer comprising a mixture of a coloring agent and a hot melt binder, the mixture being transferable to said recording sheet in response to application of heat to the other side of said base, and auxiliary particles dispersed in said layer so that they partially emerge from the surface of said layer; and
means located down stream of said heating means for separating said transfer sheet and said recording sheet from each other before the heated mixture solidifies.

4,819,011

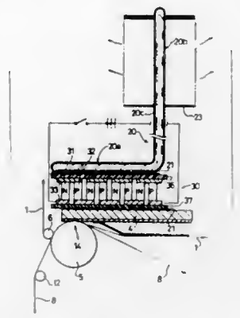
THERMAL PRINTER TEMPERATURE REGULATION SYSTEM

Yuji Yokota, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Oct. 6, 1986, Ser. No. 915,700
Claims priority, application Japan, Oct. 8, 1985, 60-222768
Int. Cl.[4] G01D *15/10*; **G05D** *23/00*; **F25B** *21/02*; **B41J** *3/20*
U.S. Cl. 346—76 PH **25 Claims**

1. A thermal printer in combination with a temperature regulating device, comprising:
a thermal printing zone having a thermal print head in the thermal printer;
heat transfer means disposed relative to the thermal printing zone in a manner which is effective for controlling the temperature in the thermal printing zone, the heat transfer means including a heat pipe and a thermoelectric transducer; and
control means for controlling the heat transfer means in a manner such that initially, when the thermal printer is turned on, heat is applied to the printing zone and when

the temperature at the printing zone has risen to a predetermined level, the heat transfer means is controlled to



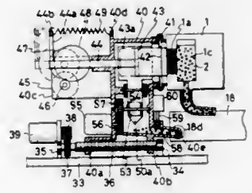
cool and regulate the temperature at the printing zone to the predetermined level.

4,819,012

INK-JET PRINTER WITH CAP MEANS

Takehiko Kiyohara, Zama, and Koji Terasawa, Mitaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1984, Ser. No. 617,928
Claims priority, application Japan, Jun. 10, 1983, 58-102780; Jun. 10, 1983, 58-102781; Jun. 10, 1983, 58-102782; Jun. 10, 1983, 58-102783
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **24 Claims**



1. An ink-jet printer comprising:
printing means having a discharge port for discharging ink for printing on a recording medium;
cap means for covering said discharge port, said cap means being movable into and out of sealing engagement with said printing means;
cap moving means for moving said cap means into and out of sealing engagement with said printing means;
absorbing means, arranged wholly inside said cap means and movable into and out of direct contact with said discharge port while said cap means covers said discharge port in sealing engagement with said printing means, for absorbing the ink in the immediate vicinity of said discharge port;
means for moving said absorbing means between a position at which said absorbing means is in direct contact with said discharge port and a position at which said absorbing is separated from said discharge port while said cap means is in sealing engagement with said printing means; and
removing means for removing the ink absorbed by said absorbing means.

4,819,013

ION GENERATION COMPENSATION

Leo A. Beaudet, Milford, Mass., assignor to Deanison Manufacturing Company, Framingham, Mass.

Filed Oct. 23, 1986, Ser. No. 922,496
Int. Cl.[4] G01D *15/06*
U.S. Cl. 346—159 **18 Claims**

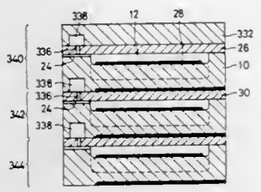
1. A method of generating compensated electrostatic images, which comprises the steps of:
applying a first time-varying potential between a first electrode adjacent a dielectric member and a second apertured electrode adjacent an opposite portion of said dielectric member to generate ions in the aperture,
extracting generated ions by applying a second variable potential V_c between the second electrode and a further electrode member and depositing said ions on a dielectric receptive surface,
controlling the size of electrostatic images generated on the dielectric receptive surface.

4,819,014

INK JET RECORDING HEAD

Takeshi Yasuhara, and Makoto Nishimura, both of Kanagawa, Japan, assignors to Fuji Electric Company, Ltd., Kanagawa, Japan

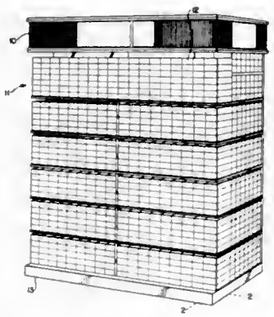
Division of Ser. No. 903,789, Sep. 4, 1986, Pat. No. 4,752,788. This application Apr. 21, 1988, Ser. No. 164,774
Claims priority, application Japan, Sep. 6, 1985, 60-197413; Feb. 25, 1986, 61-39778; Feb. 25, 1986, 61-39779; Feb. 25, 1986, 61-39780; Apr. 9, 1986, 61-81670; Aug. 13, 1986, 61-189853; Aug. 13, 1986, 61-189854
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **2 Claims**



1. An ink jet recording head in which the ink in an ink cavity is jetted in the form of a droplet from an ink nozzle by utilizing a piezo-electric effect, comprising:
a piezo-electric plate of piezo-electric material which has a plurality of elongated ink cavities formed in a surface of said piezo-electric plate and a plurality of ink nozzles formed in said surface in such a manner that said ink nozzles are located on one side, in the longitudinal direction, of said ink cavities and are communicated with said ink cavities, respectively; and
a cover plate fixedly provided on said surface of said piezo-electric plate, said cover plate having a plurality of ink supplying inlets on the side where said ink nozzles are provided.

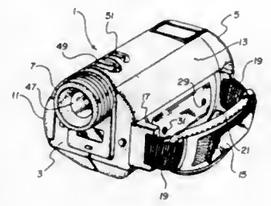
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4,819,015
ANTI-THEFT PRODUCT RACK AND METHOD
Kenneth W. Bullivant, Chadds Ford, Pa., and Sam C. Falco, Winston Salem, N.C., assignors to K-Tron International, Inc., Pitman, N.J.
Continuation of Ser. No. 157,985, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 874,159, Jan. 13, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 245,947
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—568 104 Claims



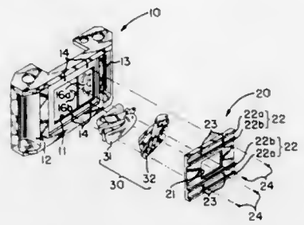
1. A method of indicating removal of product units from a product unit rack including the steps of:
monitoring a weight of said rack;
detecting a change in said weight;
calculating a number of product units removed from said rack corresponding to said change in weight;
providing an indication of unauthorized removal if said number of product units is greater than a limit; and
generating an acknowledgement of authorized removal if said number of product units removed from said rack is greater than zero and less than or equal to said limit.

4,819,016
PHOTOGRAPHIC CAMERA
Bruce A. Leonard, Honeoye Falls, N.Y.; James S. Couch, Powell, and Robert W. Mervar, Columbus, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 16, 1988, Ser. No. 168,814
Int. Cl.[4] G03B *17/02, 29/00*
U.S. Cl. 354—82 7 Claims



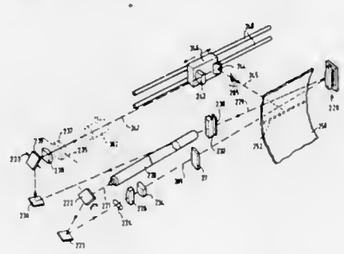
1. An improved photographic camera of the type wherein (a) a manually operated shutter release member is located on the camera body and (b) a handgrip is secured to one of two opposite sides of said camera body to hold the camera body steady during manual operation of said shutter release member, and wherein the improvement comprises:
said handgrip includes grip means for enabling one-hand holding of said camera body and the same hand operation of said shutter release member;
securing means is adapted to be connected alternatively to either one or the other of said two opposite sides of the camera body for securing said grip means in fixed relation to only one of the two sides at a time; and
said shutter release member is arranged substantially midway between said two opposite sides of the camera body to permit alternative right-hand or left-hand operation of the shutter release member in accordance with whichever one side of the camera body said grip means is secured to.

4,819,017
CAMERA HAVING A FOCAL PLANE SHUTTER
Ichiro Nemoto; Ko Aosaki; Atsushi Misawa, and Takahito Otora, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed Jan. 21, 1988, Ser. No. 146,331
Claims priority, application Japan, Jan. 21, 1987, 62-11826
Int. Cl.[4] G03B *17/02*
U.S. Cl. 354—288 4 Claims



1. In a camera having a focal plane shutter comprising two sets of blades which are movable to form a slit which opens a shutter aperture, the improvement which comprises:
a camera body formed from a plastic material;
a rail plate attached to said body and having a plurality of film guide rails; and
a plurality of drive shafts provided for supporting at least said blades;
said body and said rail plate defining therebetween a space in which said blades are housed.

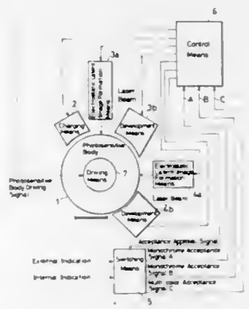
4,819,018
HIGH-SPEED BROAD-BRUSH LASER PHOTOCOMPOSITION
Louis M. Moyroud, 202 Grove Way, Delray Beach, Fla. 33444, and Michel Moulin, CH 1143 Apples, Switzerland
Filed Feb. 20, 1986, Ser. No. 832,000
Claims priority, application United Kingdom, Feb. 22, 1985, 8504565; Dec. 12, 1985, 8530597
Int. Cl.[4] B41B *19/00*; G01D *9/42*
U.S. Cl. 354—5 27 Claims



1. A photcomposing device comprising, in combination. means for forming a laser brush capable of being moved relative to a photosensitive surface to form images thereon, motion

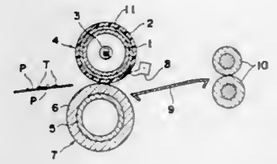
creating means for creating continuous relative motion between said laser brush-forming means and said photosensitive surface in order to space arrays of images created by one pass of said brush over said surface relative to arrays of images created by another pass of said brush over said surface, correcting means for correcting the skewing of images on said surface caused by the continuous simultaneous motion of said brush and said surface relative to one another, said laser brush comprising an elongated array of individually controllable separate laser beams, each being capable of forming a spot on said surface, said correcting means including selecting means utilizing electrical signals for selecting the ones of said separate beams which are utilized to form each given image segment so as to provide the correction.

4,819,019
RECORDING APPARATUS
Jiro Egawa; Naruhito Yoshida; Toshihiro Kasai; Moriya Nagasawa, all of Kanagawa; Naoaki Ide, and Hironobu Machida, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 30, 1987, Ser. No. 9,349
Claims priority, application Japan, Jan. 31, 1986, 61-18235
Int. Cl.[4] G03G *15/00, 15/01*
U.S. Cl. 355—3 R 8 Claims



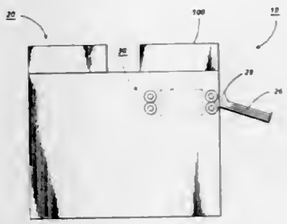
1. A recording apparatus in which data is recorded by charging a moving recording medium, irradiating laser beams on the moving recording medium to form electrostatic latent images thereon, and developing and transferring the electrostatic latent image, comprising:
means for charging the moving recording medium;
at least two image forming means, each for forming electrostatic latent images, on the recording medium in accordance with the data to be recorded, and for developing the formed electrostatic latent images, including a first image forming means operating during a first image forming mode, and a second image forming means operating during a second image forming mode;
means for detecting when one of said image forming means stops operating; and
means for commanding operations of said first and second image forming means, such that said first image forming mode is automatically switched to said second image forming mode when said first image forming means stops operating, and said second image forming mode is automatically switched to the first image forming mode when said second image forming means stops operating.

4,819,020
FIXING ROLLER AND ITS MANUFACTURING PROCESS
Moriyoshi Matsushiro, Toyohashi, and Etsuaki Urano, Toyokawa, both of Japan, assignors to Minolta Camera Kabushika Kaisha, Osaka, Japan
Filed May 22, 1987, Ser. No. 52,868
Claims priority, application Japan, May 30, 1986, 61-126907
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—3 FU 7 Claims



1. A fixing roller for use in a copying apparatus comprising:
an electrically conductive core member;
a primer layer formed on said electrically conductive core member and comprising a primer having incorporated therein an electrically conductive material;
a dispersion layer formed on said primer layer by dispersing a polytetrafluoroethylene perfluoro alkoxy ethylene copolymer (PFA resin) with a conductive material in a dispersing agent; and
a powdery resin layer having release properties and formed on said dispersion layer with said conductive material exposed at the outer surface of said powdery resin layer.

4,819,021
COPIER ON-LINE VARIABLE TAB CUTTER
Michael S. Doery, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 10, 1987, Ser. No. 130,868
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—13 12 Claims



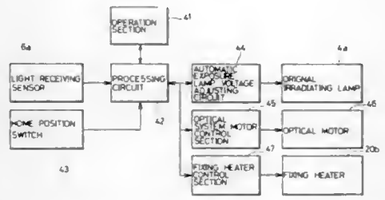
1. In a copier providing a stream of copy sheets in a copy sheet path, the improvement comprising:
sheet selecting and stopping means, for selecting a selected said output copy sheet to be tabbed, and for temporarily stopping said selected copy sheet within said copier at a tabbing registration position within said copier for tab cutting; and
tab cutting means in said copier for cutting an edge of said selected copy sheet transversely of said output copy sheet path to form a selected tab on said selected copy sheet while said copy sheet is temporarily stopped by said sheet selecting and stopping means, and then releasing said tabbed copy sheet into said copy sheet path.

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4,819,022
AUTOMATIC EXPOSURE DEVICE FOR COPYING MACHINE

Shigeo Kurando, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 5, 1987, Ser. No. 22,162
Claims priority, application Japan, Mar. 11, 1986, 61-53074
Int. Cl.⁴ G03G *15/00, 15/20*
U.S. Cl. 355—14 FU **8 Claims**



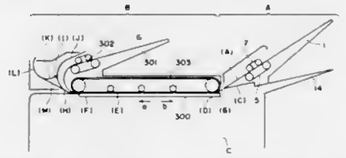
1. In an automatic exposure device for a copying machine comprising an optical system which executes a prescanning operation while irradiating light from a lamp onto an original, an optical sensor for detecting the density of the original by receiving reflecting light from said original, an automatic voltage adjusting circuit for adjusting the exposure amount of said lamp in accordance with a signal corresponding to the density detected by said optical sensor, a photoreceptor on which a static latent image is formed by exposure scanning of the original by said optical system, a developing unit for developing the static latent image on said photoreceptor to a toner sensible image, a transfer unit for transferring said toner sensible image to paper, a fixing unit including a fixing heat roller and a fixing heater for fixing the toner sensible image transferred on said paper, a heater control means including a temperature sensor for detecting the temperature of said fixing heat roller for controlling energization of said fixing heater between two switching states. including an on-state and an off-state in response to the temperature detected by said temperature sensor, and a processing circuit control means for controlling said automatic voltage adjusting circuit and said heater control means and operable to maintain said heater control means in a predetermined on of said two switching states during said prescanning operation, said processing circuit control means being operable, when said optical system is about to initiate execution of said prescanning operation and said heater control means is not in said predetermined switching state, to forcibly switch said heater control means to said predetermined switching state and maintain said predetermined switching state during said prescanning operation irrespective of the temperature of said fixing heat roller

4,819,023
AUTOMATIC DOCUMENT FEEDER FOR AUTOMATICALLY FEEDING A PLURALITY OF STACKS OF ORIGINALS

Makoto Kitahara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1987, Ser. No. 28,732
Claims priority, application Japan, Mar. 24, 1986, 61-065051
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 SH **10 Claims**

1. An automatic document feeder, comprising:
a reserved original feeding station including:
first stacking means for stacking originals including a plurality of sets of originals;
means for detecting the boundary between the plurality of sets of originals;
first feeding means for feeding, one by one, the originals stacked on said first stacking means;
first conveying means for conveying the originals without inversion, fed by said first feeding means, to a processing station; and
means for receiving the originals discharged from the processing station;
a circulation type original feeding station including:
second stacking means for stacking the originals;
second feeding means for feeding, one by one, the originals stacked on said second stacking means;
second conveying means for conveying to the processing station the originals fed by said second feeding means;

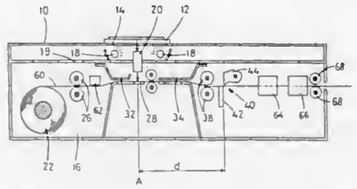


inverting means for receiving the originals from the processing station, inverting the originals so that the direction in which the originals face is inverted and conveying the originals to the processing station; and
returning means for returning the originals to said second stacking means, and
control means for controlling said reserved original feeding station and said circulation type original feeding station to feed an unprocessed original from said reserved original feeding station to the processing station after inverting said unprocessed original with said inverting means.

4,819,024
IMAGE-FORMING APPARATUS HAVING SHEARING DEVICE FOR CUTTING IMAGE-WISE EXPOSED PHOTOSENSITIVE WEB

Shigeru Kagayama, and Morikazu Iwase, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 10, 1987, Ser. No. 119,583
Claims priority, application Japan, Nov. 14, 1986, 61-175746[U]; Jun. 9, 1987, 62-143481
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 R **9 Claims**

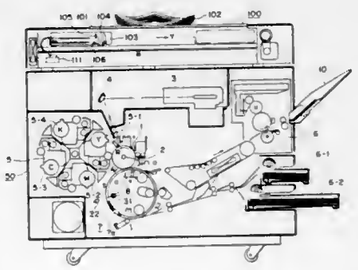


6. An image-forming apparatus for forming images on a pressure-sensitive photosensitive medium, comprising:
a supply roll consisting of said photosensitive medium in the form of a web;
a feeding device operable in a forward direction to feed said web along a feed path;
an exposing device disposed in said feed path, for image-wise exposing a portion of said photosensitive web fed from said supply roll, to form latent images on the image-wise exposed portion;
a developing device disposed in said feed path, at a position downstream of said exposing device, for applying a pressure to said exposed portion of said photosensitive web and thereby developing said latent images into visible images;
a shearing device disposed between said exposing and developing devices, for cutting said photosensitive medium into cut sheets each having a predetermined length which includes said image-wise exposed portion of the web; and
a control device for operating said feeding device in a reverse direction after said each cut sheet is parted from said photosensitive web by said shearing device, and thereby feeding said web in a direction from said shearing device toward said supply roll, until a leading cut end of said web reaches said exposing device.

4,819,025
IMAGE FORMING APPARATUS

Yuji Takahashi, Tokyo; Yoshimi Yamanaka, Kawasaki, and Yutaka Ishikawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 781,510, Sep. 30, 1985, abandoned. This application May 31, 1988, Ser. No. 206,932
Claims priority, application Japan, Oct. 3, 1984, 59-206152; Oct. 3, 1984, 59-206153
Int. Cl.⁴ G03G *15/00, 15/01*
U.S. Cl. 355—14 R **16 Claims**



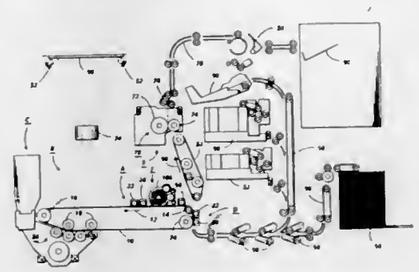
1. An image forming apparatus comprising:
document scan means for scanning a document a plurality of times to reproduce one image;
image forming means for forming the image of the document scanned by said document scan means onto a recording medium; and
control means for controlling said document scan means to reinitiate the scan by said document scan means to complete the image when a scan error of said document scan means is detected,
wherein said control means includes holding means for holding data associated with the scan in which the scan error occurs, and wherein said control means controls said document scan means on the bass of the held data so that the scans completed before occurrence of the scan error will not be executed again and the scan in which the scan error occurs will be executed again.

4,819,026
CLEANING APPARATUS FOR A CHARGE RETENTIVE SURFACE

Clark V. Lange, Ontario; Bruce E. Thayer, Webster, and John M. Wysocky, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1987, Ser. No. 135,962
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—15 **14 Claims**

1. Reproduction apparatus including a charge retentive surface; image forming means for forming a latent image on the charge retentive surface; developing means for developing the latent image with toner; transfer means for transferring the developed toner image from the charge retentive surface to a support surface; and cleaning means for removing residual toner and debris from the charge retentive surface, said cleaning means comprising:
a cleaning brush supported for rotation and contact with the charge retentive surface for removing residual toner and debris therefrom, said brush electrically biased to aid in the removal of residual toner and debris from the charge retentive surface;

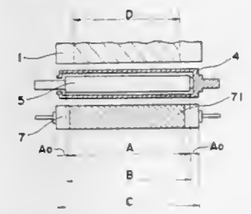


detoning means supported for contact with said brush, and electrically biased for removal from said brush of residual toner and debris; and
said detoning means located adjacent to an oscillation node of said brush caused by release of brush portions from cleaning contact with said charge retentive surface.

4,819,027
DEVELOPING APPARATUS

Hiroshi Murasaki, Ibaragi; Hiroshi Mizuno, Ikoma; Akihito Ikegawa, Sakai, and Kouichi Etou, Takatsuki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 13, 1987, Ser. No. 49,143
Claims priority, application Japan, May 15, 1986, 61-111971
Int. Cl.⁴ G03G *15/09, 15/00*
U.S. Cl. 355—3 DD **8 Claims**



1. A developing device for developing a latent image formed on a latent image-bearing member over an image width thereof, said device comprising:
developing means comprising a developing sleeve confronting the latent image-bearing member, and a plurality of magnet members extending longitudinally within said developing sleeve over a predetermined distance for attracting a magnetic brush comprising toner onto the outer peripheral surface of said developing sleeve over an effective developing width thereof corresponding to said predetermined distance,
said developing sleeve and said magnetic members mounted for relative rotational movement in said device for effecting transfer of the toner attracted over the effective developing width on the outer peripheral surface of said developing sleeve to the latent image-bearing member as said developing sleeve and said magnet members are moved relative one another; and
a toner supply roller for supplying said developing means with toner,
said toner supply roller comprising opposite end portions,

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and a central portion, at which toner is supplied to said developing means, disposed between said opposite end portions,

the outer peripheral surface of only the central portion of said toner supply roller having a pattern of very small recesses defined therein by receiving toner,

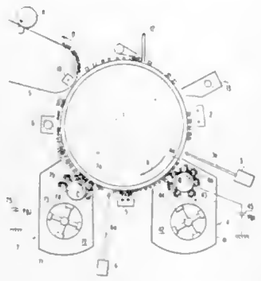
the width of the central portion of said toner supply roller being smaller than said effective developing width, and the entire width of said toner supply roller comprising said opposite end portions and said central portion being at least equal to said effective developing width.

4,819,028

ELECTROPHOTOGRAPHIC RECORDING APPARATUS FOR FORMING A MULTICOLOR IMAGE

Hideaki Abe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,754
Claims priority, application Japan, Oct. 8, 1986, 61-239990
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 **9 Claims**



1. An electrophotographic recording apparatus comprising:

a rotary photoconductive drum;

a first charger unit for uniformly charging a surface of said photoconductive drum to increase a surface potential of said photoconductive drum;

a first exposure unit for selectively exposing said surface of said photoconductive drum so as to decrease the surface potential in a first exposed area to form a first electrostatic latent image;

a first developing unit for developing said first electrostatic latent image with a first color toner to form a first visible image;

a second charger unit for recharging said surface of said photoconductive drum on which said first visible image is formed to increase the surface potential in said first exposed area to a first potential value;

a second exposure unit for selectively exposing said surface of said photoconductive drum so as to decrease the surface potential in a second exposed area to form a second electrostatic latent image, the surface potential in said second exposed area being a second potential value less than said first potential value; and

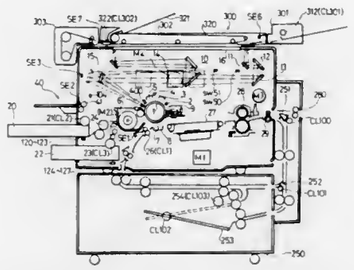
a second developing unit for developing said second electrostatic latent image with a second color toner to form a second visible image, wherein said second developing unit is applied with a bias voltage V_{B2} for adhering said second color toner to said second exposed area, said first potential in said first exposed area being in a range from 0.4 V_{B2} to 0.8 V_{B2} when said second electrostatic latent image is developed by said second developing unit.

4,819,029

COPYING MACHINE CAPABLE OF PRODUCING A COPY WITH A FILING MARGIN

Hideo Ito, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 007,960, Jan. 28, 1987. This application Dec. 23, 1987, Ser. No. 138,724
Claims priority, application Japan, Jan. 29, 1986, 61-17400; Jan. 29, 1986, 61-17401; Jan. 29, 1986, 61-17402
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—7 **13 Claims**



1. A copying machine capable of producing a copy with a filing margin comprising:

a glass platen for supporting a document to be copied;

an image forming means for forming on a copying paper an image of the document placed on said glass platen, including

a magnification varying means for varying magnification for projecting the image on the document to the copying paper, and

an image shift means for shifting a transfer position of the image of the document on a copying paper with respect to the direction of conveyance of the copying paper;

a mode selecting means for selecting one of a filing margin adjusting mode in which a filing margin is formed by said image shift means,

a variable magnification shift mode in which a filing margin is formed by said image shift means and by said magnification varying means with reduced magnification, and

a nonshift mode in which no filing margin is formed; and

a control means for controlling said image forming means in accordance with a type of a document, a type of a copying paper, and the mode selected by said mode selecting means.

4,819,030

CLEANING DEVICE FOR CLEANING TONER IMAGE CARRIER

Tomobumi Shibano, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,995
Claims priority, application Japan, Dec. 17, 1986, 61-298974
Int. Cl.[4] G03G *15/08, 15/00*
U.S. Cl. 355—15 **6 Claims**

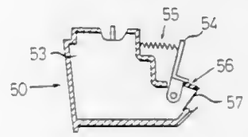
1. A cleaning device for an electrostatic printing apparatus having a toner image carrier, said device comprising:

toner recovery tank having an opening opened to the toner image carrier throughout a full width thereof, and having an upper edge and a lower edge, and being detachable with respect to the toner image carrier;

a seal member mounted on a lower edge of the toner recovery tank and having a front end disposed for pressure contact with the toner image carrier;

a cleaning member rotatably mounted on an upper edge of the toner recovery tank and having a front end disposed for pressure contact with said toner image carrier; and

driving means for moving said cleaning member to rotate toward said seal member to bring said cleaning member



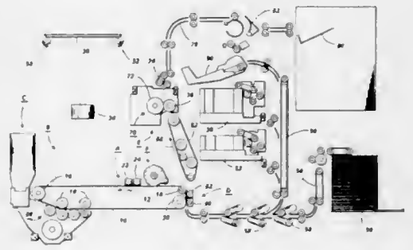
into contact with said seal member for closing said opening of said toner recovery tank such that said opening of said toner recovery tank is closed by means of said cleaning member and said seal member when said toner recovery tank is detached from said toner image carrier.

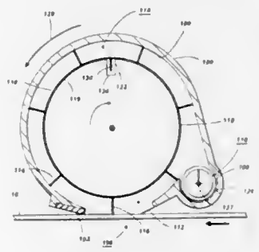
4,819,031

ROTATING VANE TONER TRANSPORT FOR BLADE CLEANING ON HORIZONTAL SURFACES

Bruce E. Thayer, and David R. Wyble, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1987, Ser. No. 135,819
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 **14 Claims**





1. Reproduction apparatus including a charge retentive surface; image forming means for forming a latent image on the charge retentive surface; means for developing the latent image with toner; transfer means for transferring the developed toner image from the charge retentive surface to a support surface; and cleaning means for removing residual toner from the charge retentive surface, said cleaning means comprising:

a cleaning blade supported within a cleaning housing for chiseling removal of toner from the charge retentive surface and accumulating removed toner adjacent thereto;

toner removal means for removal of toner from the area adjacent to the cleaning blade, including an endless surface supporting a plurality of somewhat flexible vanes arranged parallel to said cleaning blade and moving past said cleaning blade in sweeping abutment with the charge retentive surface, the cleaning blade, and an interior surface of the cleaning housing for movement of toner from said charge retentive surfave through said cleaning housing;

said endless surface formed by a generally cylindrical exterior surface of a sleeve member on a shaft journaled for rotating movement through said housing;

said sleeve member and shaft provided with complementary tab and receiving slot, for fixed support of the sleeve member on the rotating shaft; and

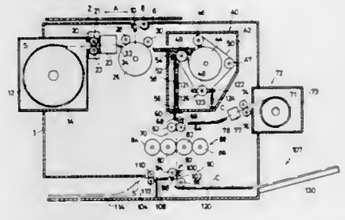
toner transport means for receiving toner from the toner removal means and directing said toner to an output.

4,819,032

BELT TENSIONING MECHANISM IN A THERMALLY DEVELOPING APPARATUS

Akihiko Nagumo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 20, 1988, Ser. No. 145,957
Claims priority, application Japan, Jan. 20, 1987, 62-9157
Int. Cl.[4] G03B *27/32, 27/52, 27/30*
U.S. Cl. 355—27 **5 Claims**



1. An apparatus for thermally developing a photosensitive material having an image produced by image-like exposure, comprising:

a heating roller;

a plurality of support rollers, and a rotating endless belt stretched around these rollers, a photosensitive material being pressed between said belt and heating roller being thereby developed, wherein at least one of said support rollers is movable radially thereof; and

further comprising a tension adjusting mechanism for pushing said one roller outwardly from said belt.

4,819,033

ILLUMINATION APPARATUS FOR EXPOSURE

Yasuhiro Yoshitake, Yokohama; Yoshitada Oshida, Fujisawa; Masataka Shiba, and Naoto Nakashima, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 113,514
Claims priority, application Japan, Oct. 29, 1986, 61-255624
Int. Cl.[4] G03B *27/42, 27/72*
U.S. Cl. 355—53 **8 Claims**

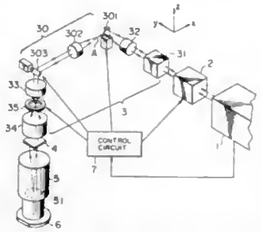
1. An illumination apparatus suitable for use in a projection-/exposure system for projecting an image of a circuit pattern of a reticle on a semiconductor wafer through a projection lens, said illumination apparatus comprising:

an excimer laser for emitting a pulsed laser beam;

an optical system for illuminating the reticle with a plurality of laser pulses emitted from the excimer laser so that laser pulses having passed through the reticle impinge on the semiconductor wafer in different directions, through the projection lens; and

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light intensity control means for controlling the light intensity of each of the laser pulses so that the amount of light



reaction of a light sensitive material provided on the semiconductor wafer with each of the laser pulses is constant.

4,819,034

METHOD AND MICROFILM CAMERA FOR DETECTING CODES APPLIED TO ORIGINAL COPIES IN THE CAMERA

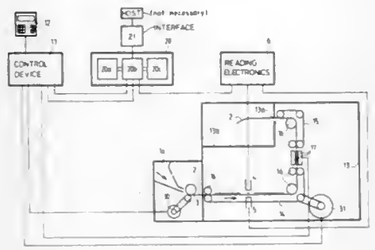
Manfred Weinzieri, Pfaffenhofen, and Eberhard Zieran, Gruenwald, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 24, 1988, Ser. No. 159,836

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3706992

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—41 **3 Claims**



3. A microfilm camera for detecting codes applied to original copies being screened in the camera, comprising means to feed copies into the camera; means to transport copies in the camera; an illumination device at which different blips corresponding to individual images of the copies are applied to a film; a code reader for reading present, non-present and incorrect codes on said copies;

a first intermediate memory for storing and counting codes detected by said code reader; a second intermediate memory for storing and counting ASCII-marks for blip types; computer means with an interface block; and counter and comparison means connected to said first and second intermediate memory, respectively and to said interface block, said counter and comparison means being adjustable to a predetermined number of copies, said counter and comparison means counting copies processed in the camera and stopping said feeding means and said transport means when said predetermined number has been reached and comparing outputs from said first intermediate memory and said second intermediate memory with each other and with said predetermined number, said interface block receiving said outputs and said predetermined number, when they coincide, and said computer processing further all three values in lines to issue a signal for starting said means to feed copies into the camera when said outputs and said predetermined number coincide.

4,819,035

COLOR SEPARATION OPTICAL READING APPARATUS

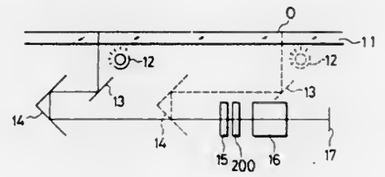
Yasunori Arai; Kazushi Yoshida, and Takashi Iizuka, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,590

Claims priority, application Japan, Sep. 11, 1986, 61-214758; Sep. 11, 1986, 61-214759; Oct. 24, 1986, 61-253404

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—55 **17 Claims**



1. A color separation optical reading apparatus comprising a lighting source for illuminating an object, an imaging optical system for projecting an image of said object illuminated by said lighting source, a light reception member for receiving said light image of said object through said imaging optical system, a wavelength selection means disposed between said lighting source and said light receiving member, and an optical path length correction means having optical power, said optical path length correction means being provided in said optical path of said imaging optical system so as to cooperate with said wavelength selection means to correct defocus due to wavelength selection.

4,819,036

SEMICONDUCTOR DEVICE

Takao Kuroda; Akiyoshi Watanabe, Koganei; Shinji Tsuji, Hachioji; Akio Ohishi, Kokubunji, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP86/00443, § 371 Date May 4, 1987, § 102(e) Date May 4, 1987, PCT Pub. No. WO87/01522, PCT Pub. Date Mar. 12, 1987

PCT Filed Aug. 29, 1986, Ser. No. 60,869

Claims priority, application Japan, Sep. 4, 1985, 60-193739

Int. Cl.[4] H01G *27/12*

U.S. Cl. 357—4 **16 Claims**



1. A semiconductor device comprising a semiconductor layer having a superlattice structure including a first layer of III^1-V^1 binary crystal and a second layer of III^1-III^2-V^2 ternary crystal, which are formed on a III^1-V^1 binary crystal substrate composed of a III-group element and a V-group element, each of said first and second layers respectively of binary and ternary crystals lattice-matching with said substrate, and wherein the layer, of the first and second layers, having a larger energy band gap has a thickness of at most 25 Å.

4,819,037

SEMICONDUCTOR DEVICE

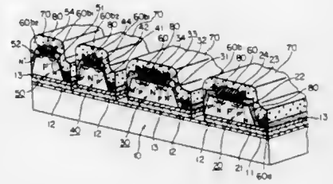
Nobuyoshi Sakakibara; Mitutaka Katada, both of Nishio; Minoru Ohta, Okazaki; Tadashi Hattori, Okazaki, and Takayuki Tominaga, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 3, 1987, Ser. No. 57,027

Claims priority, application Japan, Jun. 5, 1986, 61-130518

Int. Cl.[4] H01L *27/12*

U.S. Cl. 357—4 **13 Claims**



1. A semiconductor device comprising:

a substrate having a main surface;

a plurality of semiconductor single-crystal layers in spatially isolated relationship from each other which are formed on the main surface of the substrate;

an insulation layer between said substrate and each of said semiconductor single-crystal layers;

a plurality of single-crystal semiconductor intermetallic compound layers formed respectively on the semiconductor single-crystal layers and used as electrodes for semiconductor elements;

a plurality of semiconductor epitaxial layers respectively formed on part of the semiconductor intermetallic compound layers, each said semiconductor epitaxial layer being used as an active layer of a semiconductor element;

first wiring means respectively connected electrically to each of the semiconductor epitaxial layers; and

second wiring means respectively connected electrically to each of the single-crystal semiconductor intermetallic compound layers by being in contact with a part of the surface of said single crystal semiconductor intermetallic compound layer on which the semiconductor epitaxial layer is not formed.

4,819,038

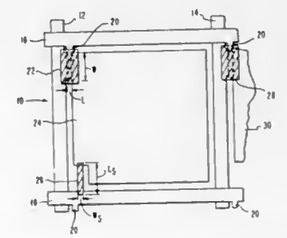
TFT ARRAY FOR LIQUID CRYSTAL DISPLAYS ALLOWING IN-PROCESS TESTING

Paul M. Alt, Yorktown Heights, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 22, 1986, Ser. No. 945,935

Int. Cl.[4] H01L *27/12, 27/14, 29/04, 29/78*

U.S. Cl. 357—4 **8 Claims**



1. An array of thin film transistor devices comprising:

an insulating substrate;

a first plurality of spaced apart conductors disposed substantially parallel one to another upon said substrate;

a second plurality of spaced apart conductors disposed upon said substrate substantially parallel one to another and perpendicularly to said first plurality of conductors to form a grid pattern upon said substrate, each of said second plurality of conductors having a plurality of stub-like extensions depending substantially perpendicularly therefrom, individual ones of said extensions being adjacent and substantially parallel to an individual one of said first plurality of conductors;

a plurality of electrode each of which is disposed upon said substrate, individual ones of said electrodes being disposed between intersecting pairs of said first and second conductors;

a plurality of semiconductor layer regions disposed such that individual ones of said layer regions overlie one of said extensions and at least a portion of a corresponding adjacent one of said first plurality of conductors and a portion of a corresponding one of said electrodes, each of said layer regions being conductively coupled to an underlying one of the extensions, said corresponding one of said first conductors, and said corresponding one of said electrodes to form thereby a thin film transistor device having three terminals; and

a plurality of conductive strips disposed such that individual ones of the strips couple one of said electrodes to one of the adjacent first or second plurality of conductors which is not coupled to the corresponding layer region.

4,819,039

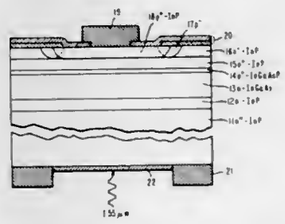
DEVICES AND DEVICE FABRICATION WITH BOROSILICATE GLASS

Gou-Chung Chi, New Providence; Shobha Sing, Summit; LeGrand G. Van Uitert, Morris Township, Morris County, and George J. Zydzik, Columbia, all of N.J., assignors to American Telephone and Telegraph Co. AT&T Laboratories, Murray Hill, N.J.

Filed Dec. 22, 1986, Ser. No. 945,016

Int. Cl.[4] H01L *33/00*; H04N *9/27*; B05D *5/12*

U.S. Cl. 357—17 **33 Claims**



22. A device having low dark current characteristics made by the process comprising the steps of

depositing a glass target material on at least a part of a surface of a III–V semiconductor body by a particle beam procedure to form a glass material region contacting the said at least a part of the surface, in which the glass material is a reconstituted borosilicate glass comprising at least one weight percent B_2O_3 and at least 90 weight percent SiO_2,

ion-implanting at least one suitable dopant into at least one preselected region of the said III–V semiconductor surface, said ionimplanting being conducted before or after said glass material deposition step,

subjecting the said semiconductor body including the implanted region to a thermal anneal, and

completing the fabrication of the device,

wherein the glass target material is prepared at a tempera-

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ture less than 1500° C. by a procedure comprising the steps of:

a. making a sodium borosilicate glass comprising sodium borosilicate;

b effecting phase separation of the sodium borosilicate glass into a sodium-rich phase and a silica-rich phase;

c. separating the sodium-rich phase from the silica-rich phase; and

d. consolidating the silica-rich phase.

4,819,040

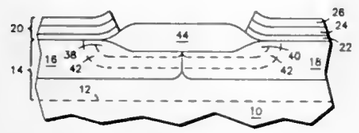
EPITAXIAL CMOS BY OXYGEN IMPLANTATION

Philip J. Tobin, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 858,782, May 2, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 243,208

Int. Cl.[4] H01L *27/02, 27/04, 29/167*

U.S. Cl. 357—42 **6 Claims**



1. An integrated circuit structure comprising:

a monocrystalline silicon substrate;

an epitaxial layer overlying said substrate;

a first N-type region and a second P-type region located at the surface of said epitaxial layer and forming a PN junction therebetween;

a localized thick field oxide region overlying said PN junction and recessed into the surface of said substrate;

a localized region of ion implanted oxygen aligned with and underlying said thick field oxide region.

4,819,041

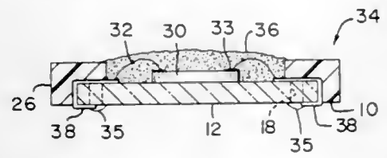
SURFACE MOUNTED INTEGRATED CIRCUIT CHIP PACKAGE AND METHOD FOR MAKING SAME

John P. Redmond, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 30, 1983, Ser. No. 567,210

Int. Cl.[4] H01L *39/02*

U.S. Cl. 357—80 **12 Claims**



1. A surface mountable integrated circuit chip package, comprising:

a mounting base;

a separate flexible laminate having conductive strips thereon, said laminate being conformally disposed on said base so as to at least partially wrap around said base;

a molded frame, having a window therein which is disposed around the outer portions of said laminate, so as to fixedly hold said laminate to said base;

an integrated circuit chip disposed in said window, said chip having pads thereon which are electrically interconnected with said conductive strips; and

an encapsulation portion disposed over said window for sealing said chip in said window.

4,819,042

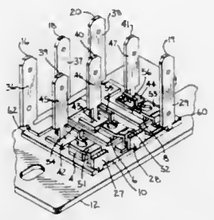
ISOLATED PACKAGE FOR MULTIPLE SEMICONDUCTOR POWER COMPONENTS

Lance R. Kaufman, 131 N. White Oak Way, Mequon, Wis. 53092

Filed Oct. 31, 1983, Ser. No. 546,996

Int. Cl.[4] H01L *27/12*

U.S. Cl. 357—80 **2 Claims**



1. A circuit package for a plurality of isolated power switching semiconductor components each having a pair of main electrodes and a gate electrode for controlling conduction between the main electrodes, said package comprising:

an electrically insulating thermally conductive substrate;

a plurality of pairs of main terminals overlaid and bonded on said substrate;

a plurality of gate terminals bonded on said substrate;

each power switching semiconductor component being bonded to a respective ones of said main terminals for connection to the respective main electrode, the other main electrode being connected to the other main terminal by a jumper, and the gate electrode being connected to said gate terminal by an electrically conductive jumper strap extending therebetween,

wherein:

each of said main terminals and gate terminals includes a substrate portion extending along said substrate, and a lead frame portion integral with said substrate portion and bent to extend away from said substrate;

each pair of main terminals and its respective gate terminal forms a set;

said lead frame portions of said first main terminals of said pair extend generally from a first peripheral edge of said substrate;

said lead frame portions of said second main terminals of said pair extend generally from a second peripheral edge of said substrate opposite said first edge;

said lead frame portions of third terminals of said sets extend from said substrate between said first and second opposing edges;

each said substrate portion of said second terminals of said sets has a first section at said second peripheral edge and a second section extending normal thereto and towards said first peripheral edge around and isolated from said substrate portion of said third terminal between said peripheral edges, said substrate portion of said second terminal having an extended configuration with an open central section in which said third terminal is bonded to said substrate and isolated from said second terminal;

the end of the extended substrate portion of said second terminal is disposed between the substrate portions of said first and third terminals wherein said power switching semiconductor component is bonded to said end of said extended substrate portion of said second terminal, said electrically conductive jumper straps connecting said semiconductor component to said first and third terminals,

wherein each of said main terminals is bent along a bending line parallel to said first and second peripheral edges.

4,819,043

MOSFET WITH REDUCED SHORT CHANNEL EFFECT

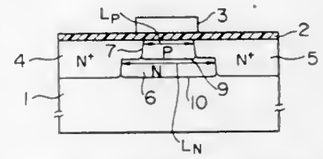
Yoshiaki Yazawa, Hitachi; Yutaka Kobayashi, Tokyo; Akira Fukami, and Takahiro Nagano, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1986, Ser. No. 936,604

Claims priority, application Japan, Nov. 29, 1985, 60-267152

Int. Cl.[4] H01L *29/78, 27/02*

U.S. Cl. 357—23.3 **7 Claims**



1. A semiconductor switching device comprising:

source and drain regions each having a first conductivity type formed on a semiconductor substrate opposite in conductivity type to said source and drain regions;

a gate insulating film formed on a semiconductor surface between said source region and said drain region;

a gate electrode formed on said gate insulating film; and

a semiconductor layer lying beneath said gate insulating film and sandwiched between said source region and said drain region, said semiconductor layer being made up of a first layer and a second layer, said first layer being contiguous to said gate insulating film and opposite in conductivity type to said source and drain regions, said second layer lying beneath said first layer and having the same conductivity type as said source and drain regions, the length of said second layer between said source region and said drain region being greater than the length of said first layer between said source region and said drain region, wherein said first layer has an electric potential substantially equal to an electric potential of said substrate.

4,819,044

VERTICAL TYPE MOS TRANSISTOR AND ITS CHIP

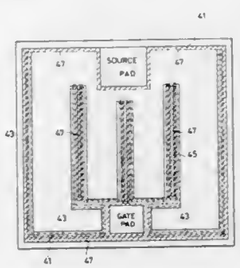
Koichi Murakami, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Feb. 6, 1986, Ser. No. 826,772

Claims priority, application Japan, Feb. 8, 1985, 60-21813

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.4 **3 Claims**



1. A vertical type MOSFET comprising:

a first conductivity type drain region formed on a substrate;

a first well region of a second conductivity type formed within the drain region;

a source region of the first conductivity type formed within the first well region so as to define a gate-controlled channel between the drain region and the source region, the source region, the first well region and the drain region forming a transistor cell;

a second well region of the second conductivity type having a higher impurity concentration than that of the first well region formed within the drain region along a peripheral portion of the transistor cell, the second well region being electrically connected to the source region, the second well region and the drain region forming a zener diode section which is provided electrically in parallel to the transistor cell;

wherein the transistor cell forms a power MOS section of comb shape and the zener diode section is formed at a gap in the comb shape which is not occupied by the power MOS section; and

wherein an electrical current flows through the zener diode section rather than through the transistor cell when a surge voltage is applied to the MOSFET.

4,819,045

MOS TRANSISTOR FOR WITHSTANDING A HIGH VOLTAGE

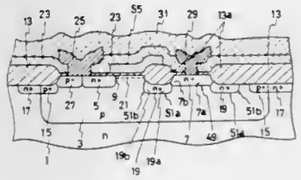
Koichi Murakami, Yokosuka, Japan, assignor to Nissan Motor Co. Ltd., Kanagawa, Japan

Continuation of Ser. No. 824,571, Jan. 23, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,273

Claims priority, application Japan, Jan. 25, 1985, 60-11024

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.4 **2 Claims**



1. A MOS transistor comprising:

a well region of a first conductivity type formed in a semiconductor substrate;

a drain region formed in the well region to form a substantially flat junction with said well region, said drain region having a periphery with a curved portion and having a conductivity type opposite to the first conductivity type;

an oxide film coverng the drain region and the well region, said oxide film having a thinner portion located on a main portion of the drain region and expanding into a thicker portion partially covering the curved portion of the periphery of the drain region; and

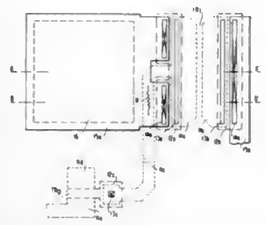
a drift region formed in the well region under the thicker portion of the oxide film to form a junction with the well region and having the same conductivity type as the drain region and having an impurity concentration lower than the drain region, said drift region partially surrounding the drain region at the curved portion of the periphery of the drain region and forming a junction with the curved portion of the periphery of the drain region to cover said curved portion, such that the junction between the well region and the drain region is substantially flat.

4,819,046

INTEGRATED CIRCUIT WITH IMPROVED PROTECTIVE DEVICE

Kazuhiro Mitsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 22, 1987, Ser. No. 52,923
Claims priority, application Japan, May 22, 1986, 61-118760
Int. Cl.[4] H01L *29/78, 27/02, 29/46*
U.S. Cl. 357—23.13 **8 Claims**



1. A protective device for a functional circuit fabricated on a major surface of a semiconductor substrate of a first conductivity type, comprising first and second regions of a second conductivity type spaced apart from each other and formed at said major surface of said semiconductor substrate, each of said first and second regions having at least a first side and a second side opposite to said first side, the first side of said first region and the first side of said second region facing to each other substantially in parallel and being spaced apart via an isolating area, an insulating layer overlying said major surface of said semiconductor substrate to cover at least said first and second regions, a conductive layer formed on said insulating layer near the second side of said first region, said conductive layer being supplied with an external signal and electrically connected to said first region, a third region of said second conductivity type formed at said major surface of said semiconductor substrate and having at least first and second opposite ends, said third region being connected at its first end to a central part of said second side of said first region and extending therefrom through a region underlying said conductive layer, a wiring layer electrically connected to said second region and supplied with a reference potential, and means for connecting the second end to said third region of said functional circuit.

4,819,047

PROTECTION SYSTEM FOR CMOS INTEGRATED CIRCUITS

Glen Gilfeather, and Joe W. Peterson, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 15, 1987, Ser. No. 50,979
Int. Cl.[4] H01L *29/78, 27/02, 27/10*
U.S. Cl. 357—23.13 **6 Claims**

1. A protection system for CMOS integrated circuits to prevent inadvertent damage caused by electrostatic discharge comprising:

a semiconductor body of a generally rectangular shape and having a central portion;

a first annular conductive layer disposed on said semiconductor body surrounding the central portion thereof;

a second annular conductive layer disposed concentrically with said first conductive layer in a spaced apart relationship and adjacent to the edges of said semiconductor body to form an area therebetween;

said first and second layers defining low impedance pathways;

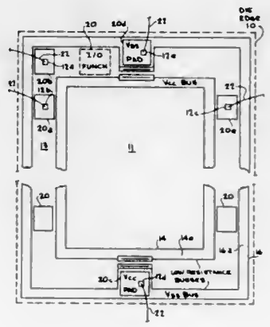
a plurality of bonding pads consisting of input pads, output pads, first power supply pads, and second power supply pads disposed within the area between said first and second conductive layers;

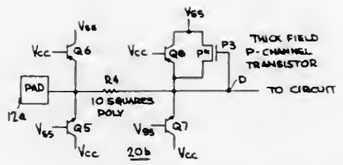
first power supply clamping means for coupling each of the first power supply pads to said first and second layers;

second power supply clamping means for coupling each of the second power supply pads to said first and second layers;

input clamping means for coupling each of the input bonding pads to internal circuit elements formed within the central portion of the semiconductor body and for coupling each of the input bonding pads to said first and second layers;

said input clamping means including primary clamp networks each formed of a first NPN-type bipolar transistor and a first PNP-type bipolar transistor, said first NPN-type transistor having its base connected to the second conductive layer, its emitter connected to the corresponding input bonding pad, and its collector connected to the first conductive layer, said first PNP-type transistor having its base connected to the first conductive layer, its emitter connected to the corresponding input bonding pad, and its collector connected to the second conductive layer;





said input clamping means further including secondary clamp networks each formed of a second NPN-type bipolar transistor, a second PNP-type bipolar transistor, a P-channel transistor, and a resistor, said second NPN-type transistor having its base connected to the second conductive layer, its emitter connected to one end of the resistor, and its collector connected to the first conductive layer, said second PNP-type bipolar transistor having its base connected to the first conductive layer, its emitter connected to the one end of the resistor, and its collector connected to the second conductive layer, said P-channel transistor having its source connected to the second conductive layer and its gate and drain connected to the one end of the resistor, the other end of the resistor being connected to the corresponding input bonding pad;

output clamping means for coupling each of the output bonding pads to the internal circuit elements and for coupling each of the output bonding pads to said first and second layers; and

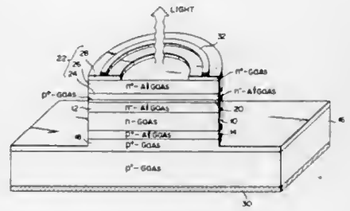
said input clamping means being activated when a voltage higher than a predetermined value is received on its input bonding pad and said output clamping means being activated when its output bonding pad receives a ground potential so as to route current from said input bonding pad via the low impedance pathways to the output bonding pad for discharging of said high voltage.

4,819,048

OPTOELECTRONIC BISTABLE APPARATUS

Ranjit S. Mand, Nepean, Canada, and Masaru Nakamura, Kawaguchi, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 17, 1987, Ser. No. 74,636
Claims priority, application Japan, Jul. 18, 1986, 61-169239
Int. Cl.[4] H01L *29/70, 29/74, 31/06*
U.S. Cl. 357—17 **10 Claims**



1. An optoelectronic bistable apparatus comprising:

a light-emitting first semiconductor layer of a first conductivity type;

a second semiconductor layer of the first conductivity type which has a broader energy gap than that of the first semiconductor layer and is formed on one side of the first semiconductor layer;

a third semiconductor layer of a second conductivity type which has a broader energy gap than that of the first semiconductor layer and is formed on the other side of the first semiconductor layer, the first semiconductor layer being interposed between the second and third semiconductor layers to provide a double heterojunction structure;

an extremely thin fourth semiconductor layer of the second conductivity type, which is formed on the second semiconductor layer, with a high impurity concentration;

a fifth semiconductor layer of the first conductivity type which is formed on the fourth semiconductor layer, at least a portion of the fifth semiconductor layer, which contacts the fourth semiconductor layer, having a broader energy gap than that of the second semiconductor layer;

a first main electrode formed on the third semiconductor layer, and

a second main electrode formed on the fifth semiconductor layer.

4,819,049

METHOD OF FABRICATING HIGH VOLTAGE AND LOW VOLTAGE TRANSISTORS USING AN EPITAXIAL LAYER OF UNIFORM THICKNESS

Roger E. Johnston, Hillsboro, and Alex Y. Tang, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 776,317, Sep. 16, 1985, abandoned. This application Jun. 2, 1988, Ser. No. 203,593
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—40 **7 Claims**

1. An integrated circuit structure comprising a body of semiconductor material and at least first and second transistors formed in a spaced-apart relationship therein and defining a space therebetween at a surface thereof, said body of semiconductor material comprising a substrate and an epitaxial layer over predetermined surface regions of said substrate, said epitaxial layer being of substantially uniform thickness over said predetermined surface regions, said first transistor having a base, an emitter, an active collector and a collector contact region formed in the epitaxial layer and a subcollector formed in a region of the substrate beneath the base and active collector of the first transistor, and said second transistor having a base, an emitter and an active collector formed in said epitaxial



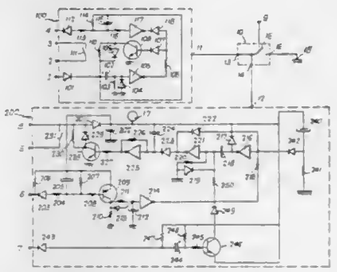
layer, a collector contact region formed in said epitaxial layer and laterally spaced from the base and emitter of the second transistor, and a subcollector formed in a region of the substrate which extends beneath the base, the active collector and the collector contact region of the second transistor, the subcollector of the second transistor having a lower concentration of impurity than the subcollector of the first transistor and being separated by a predetermined distance therefrom.

4,819,050

ALARM, SECURITY, AND PROTECTION SYSTEM FOR A MOTOR VEHICLE

Bernard Manzoni, Saint Claude, France, assignor to Societe Manzoni-Bouchot, France

Filed Jan. 20, 1988, Ser. No. 146,321
Claims priority, application France, Feb. 5, 1987, 87 01425; Oct. 9, 1987, 87 14003
Int. Cl.[4] B60R *25/04*
U.S. Cl. 340—425.5 **16 Claims**



1. An alarm, security, and protection system for a motor vehicle, the system comprising electronic disabling circuits suitable for being selectively switched on by the user in order to disable operation of a member of the vehicle in the event of an intruder attempting to use the vehicle, said system comprising:

a first input terminal connected to receive a D.C. voltage signal when an attempt is made to start the vehicle by acting on the vehicle ignition key;

second and third input terminals interposed on a power supply line to the member to be disabled;

a fourth terminal connected to a detector for detecting a parameter associated with the running of the engine of the vehicle to be protected;

switch means for switching the disabling circuits on and off by connecting and disconnecting determined components of the disabling circuits with ground;

a first relay including a contact connected between said second and third input terminals, said contact being normally closed when the relay is at rest, and an excitation coil connected in such a manner as to be selectively pow-

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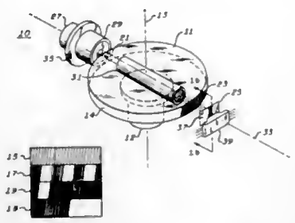
ered only when the disabling circuits are ON and a D.C. voltage signal is delivered on the first input terminal; and inhibitor means connected to the fourth input terminal and comprising first timing means for inhibiting the operation of the disabling circuits should they be switched on while voltage signals representative of a parameter associated with the engine running are being delivered to the fourth input terminal, and providing voltage signals have already been applied to the first input terminal for a period of time which is not less than the time constant of said first timing means.

4,819,051

COMPENSATED ROTARY POSITION ENCODER

Peter E. Jacobson, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1987, Ser. No. 68,009
Int. Cl.⁴ H03M 1/22
U.S. Cl. 341—13 **7 Claims**



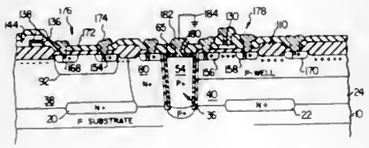
1. An angular position encoder comprising:
a code wheel having coded images circumferentially arranged thereon;
optical means for illuminating diametrically positioned regions of said coded images to establish optical images thereof; and
means positioned to receive said optical images for providing signals representative of relative displacements of Moiré fringes formed from said optical images and thereby representative of said code wheel position and movement.

4,819,052

MERGED BIPOLAR/CMOS TECHNOLOGY USING ELECTRICALLY ACTIVE TRENCH

Louis N. Hutter, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 22, 1986, Ser. No. 945,796
Int. Cl.⁴ H01L 29/78
U.S. Cl. 357—49 **22 Claims**



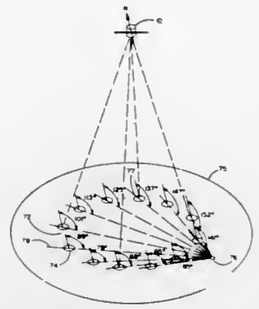
1. A semiconductor circuit comprising:
a conductive substrate of a first conductivity type material;
first and second semiconductor areas of a second conductivity type material formed on said substrate;
a trench separating said first and second semiconductor areas, said trench including electrically isolating sidewalls and a bottom formed in said substrate;
a conductive material filling said trench and in electrical contact with said substrate; and
first and second semiconductor devices formed in respective said first and second semiconductor areas.

4,819,053

SINGLE-POINT LOCATING SYSTEM

Richard A. Halavais, 3815 N. 28 St., Phoenix, Ariz. 85016

Continuation-in-part of Ser. No. 880,705, Jul. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 861,369, May 9, 1986, abandoned. This application Apr. 17, 1987, Ser. No. 39,973
Int. Cl.⁴ H04B 7/185
U.S. Cl. 342—353 **29 Claims**



1. A locating system comprising:
a source of radiation the position of which in a scanned region is to be determined;
a relay device having means for scanning said region in a prescribed pattern, said pattern being the composite of a first circular path over said region and a plurality of second circular paths, said second circular paths being smaller than and spaced symmetrically along said first circular path, and means for determining the directions of respective straight lines between said source of radiation and one point on at least two of said second circular paths whereby the position of said source of radiation in said scanned region is determined by the intersection of said straight lines.

4,819,054

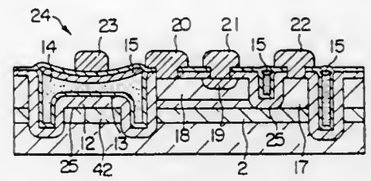
SEMICONDUCTOR IC WITH DUAL GROOVE ISOLATION

Mikinori Kawaji, Hino; Toshihiko Takakura; Akihisa Uchida, both of Koganei; Shigeo Kuroda, Ome; Yoichi Tamaki, Kokubunji; Takeo Shiba, Kodaira; Kazuhiko Sagara, Tokyo, and Masao Kawamura, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 824,929, Jan. 31, 1986, abandoned, which is a continuation of Ser. No. 536,519, Sep. 28, 1983, abandoned, and a continuation-in-part of Ser. No. 670,976, Nov. 13, 1984, abandoned. This application Feb. 6, 1987, Ser. No. 11,932
Claims priority, application Japan, Sep. 29, 1982, 57-168355; Nov. 11, 1983, 58-210834
Int. Cl.⁴ H01L 27/12
U.S. Cl. 357—49 **30 Claims**

1. A semiconductor integrated circuit device having a plurality of active regions in a semiconductor substrate, in which active regions a number of semiconductor elements are formed, and an inactive region in the semiconductor substrate, the inactive region having located thereon wirings, the wirings being connected to at least one of said number of semiconductor elements, with the inactive regions being positioned adjacent one of said plurality of active regions, comprising:

(a) the semiconductor substrate, having a main surface;
(b) a pair of grooves formed in the semiconductor substrate, each groove of the pair of grooves being formed so as to extend from said main surface into the semiconductor substrate, the pair of grooves defining said inactive region therebetween, the pair of grooves having groove surfaces in the substrate extending from said main surface into the substrate;
(c) a single first insulating member formed on the groove surfaces of the pair of grooves, and a second insulating member extending on said semiconductor substrate, on said inactive region, between said pair of grooves, the first insulating member, on the grooves surfaces of the pair of



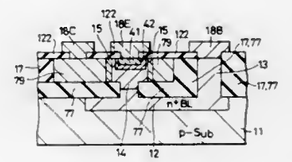
grooves, including a silicon oxide film formed on the groove surfaces and a silicon nitride film formed on the silicon oxide film, and the second insulating member, on the inactive region, including an insulating film of a sufficient thickness for suppressing a parasitic capacitance of said wiring below a predetermined level;
(d) a polycrystalline silicon body filling each groove of said pair of grooves such that each of said pair of grooves includes the silicon oxide and silicon nitride films and said body of polycrystalline silicon; and
(e) said wirings, located on said inactive regions such that said second insulating member is interposed between the inactive region and the wirings.

4,819,055

SEMICONDUCTOR DEVICE HAVING A PN JUNCTION FORMED ON AN INSULATOR FILM

Kazuo Nakazato, Hachioji; Tohru Nakamura, Honya; Takao Miyazaki, Hachioji; Nobuyoshi Natsuaki, Higashiyamato; Masahiko Ogirima, Tokyo, and Minoru Nagata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 920,905, Oct. 17, 1986, abandoned, which is a continuation of Ser. No. 587,079, Mar. 7, 1984, abandoned. This application May 2, 1988, Ser. No. 189,382
Claims priority, application Japan, Mar. 7, 1983, 58-35815
Int. Cl.⁴ H01L 29/72, 27/12, 29/06, 29/04
U.S. Cl. 357—59 **2 Claims**



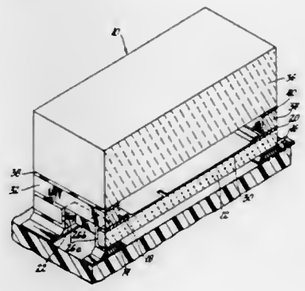
1. A semiconductor device including a vertical bipolar transistor which comprises:
a semiconductor substrate of a first type of conductivity;
a highly doped region having a second type of conductivity, said highly doped region being formed in said substrate;
an insulation film which is formed on said substrate and which has an opening through which at least one portion of said highly doped region extends;
a first single crystal semiconductor region having the second conductivity type which is formed on said insulation film and which is electrically connected to said highly doped region through said opening, wherein said first single crystal semiconductor region has an impurity region of the second type of conductivity adjacent to an upper surface of said first single crystal semiconductor region, thereby to form an emitter or a collector for said bipolar transistor, and has an impurity region of the first type of conductivity which surrounds said impurity region of the second type of conductivity thereby to form a base region for said bipolar transistor, and wherein a portion of the first single crystal semiconductor region of the second type of conductivity in contact with said highly doped region forms a collector or an emitter, said portion of the first single crystal semiconductor region having an impurity concentration which is less than that of the highly doped region;
a polycrystalline silicon layer having the first conductivity type which is formed to electrically contact an outer periphery of said first single crystal semiconductor region; and
a graft region which is formed in a portion of said first single crystal semiconductor region between polycrystalline silicon layer and the base and collector regions formed in the first single crystal semiconductor region, wherein said graft region is formed by diffusion from said polycrystalline silicon layer into the first single crystal semiconductor region,
wherein a first contacting surface between said graft region and said polycrystalline silicon layer exists on said insulation film at a location spaced away from said opening so that said first contacting surface does not come within said opening, and further
wherein a second contacting surface between said graft region and said collector region formed in said first single crystal semiconductor region adjoining said graft region exists on said insulation film at a location spaced away from said opening so that said second contacting surface does not come within said opening to thereby prevent direct physical contact between said graft region and said highly doped region and to prevent downward diffusion from the graft region towards said highly doped region.

4,819,056

HYBRID THICK FILM CIRCUIT DEVICE

Ponnusamy Palanisamy, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Continuation of Ser. No. 881,669, Jul. 3, 1986. This application Sep. 8, 1987, Ser. No. 94,044
Int. Cl.⁴ H01L 27/02, 23/16
U.S. Cl. 357—80 **6 Claims**



1. A hybrid thick film chip device comprising:

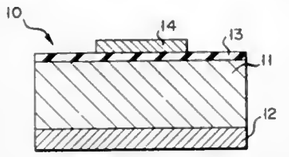
an insulative substrate having first and second opposite plane surfaces;
a first set of end terminals on opposite ends of one plane surface;
a second set of end terminals on opposite ends of the other plane surface;
means for electrically interconnecting the terminals a each end into pairs;
a thick film electrical resistor deposited on one of said plane surfaces of said substrate and electrically connected to said first and second sets of terminals; and
a second thick film component extending between one of said set of terminals and electrically connected to said first and second sets of terminals.

4,819,057

SEMICONDUCTOR LIGHT-EMITTING ELEMENT

Katsuyuki Naito, Tokyo; Masayoshi Okamoto, Kawasaki; Koichi Mizushima, Kamakura; Toshio Nakayama, Fujisawa; Masami Sugiuchi, Yokohama, and Akira Miura, Toride, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 25, 1986, Ser. No. 911,371
Claims priority, application Japan, Sep. 30, 1985, 60-214550; Sep. 30, 1985, 60-214551; Sep. 30, 1985, 60-214552; Sep. 30, 1985, 60-214559; Apr. 25, 1986, 61-96388
Int. Cl.[4] H01L *29/78, 33/00*
U.S. Cl. 357—17 **29 Claims**



1. A semiconductor light-emitting element of a metal/organic film/semiconductor junction structure, comprising:
(a) a semiconductor layer;
(b) an organic Langmuir-Blodgett thin film formed on the semiconductor layer and comprising an electron donative organic monomolecular compound whose longest absorption peak wavelength in an electron transition spectrum falls within a range of 300 nm to 600 nm; and
(c) a layer of metallic material formed on the thin film.

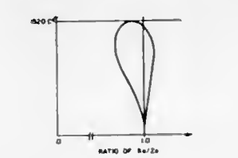
4,819,058

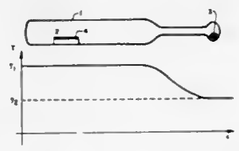
SEMICONDUCTOR DEVICE HAVING A PN JUNCTION

Jan-ichi Nishizawa, No. 6-16, Komegafukuro 1-chome, Sendai-shi, Miygai-ken, Japan

Continuation of Ser. No. 901,742, Aug. 29, 1986, abandoned, which is a division of Ser. No. 628,974, Jul. 10, 1984, Pat. No. 4,619,718, which is a continuation of Ser. No. 266,042, May 21, 1981, abandoned. This application Mar. 21, 1988, Ser. No. 171,247
Claims priority, application Japan, Jun. 12, 1980, 55-79805
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **2 Claims**

1. A blue and green light-emitting device, comprising:
a single crystal pn junction formed in an n-type ZnSe compound semiconductor crystal;
said n-type ZnSe compound semiconductor crystal having been formed by a temperature difference method under controlled vapor pressure, in which:
a solution containing component semiconductor elements is formed;
a temperature difference is established vertically in said solution so as to provide a higher temperature region and a lower temperature region;
a seed crystal is disposed in said low temperature region;
the temperature difference between said high temperature region and said low temperaure region is maintained constant, and a vapor pressure of at least one of said component semiconductor elements is applied to an enclosed headspace in contact with said solution, to thus form said n-type ZnSe compound semiconductor





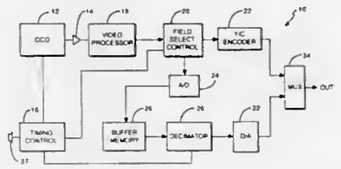
crystal with a relatively low density of component vacancies and to minimize deviation from stoichiometric composition; and
a p-type ZnSe compound semiconductor of said single crystal pn junction having been formed by diffusing Au or Ag onto a surface of said n-type ZnSe compound semiconductor crystal with a higher concentration and a larger diffusion coefficient than said component vacancies.

4,819,059

SYSTEM AND METHOD FOR FORMATTING A COMPOSITE STILL AND MOVING IMAGE DEFINING ELECTRONIC INFORMATION SIGNAL

David D. Pape, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 13, 1987, Ser. No. 120,592
Int. Cl.[4] H04N *7/08, 11/06*
U.S. Cl. 358—12 **15 Claims**



1. Apparatus for formatting high resolution still image electronic information signals and moving image electronic information signals of a type which can be provided from an image sensor at standard video frame and field rates for integration with respect to each other, said apparatus comprising:
means for receiving the moving image electronic information signals from the sensor at the standard video frame and field rate;
means for storing electronic information signals; and
control means for transmitting each succeeding frame of the received moving image electronic information for temporary storage within said storage means, said control means also operating to encode the received moving image electronic information signals into a standard video format and output the encoded moving image electronic informa-

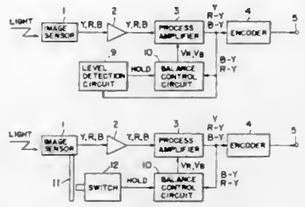
tion signals at the standard video frame and field rate, said control means responding to the selective actuation thereof by outputting only alternate fields of the encoded moving image electronic information signals, while simultaneously outputting from said storage means select portions of the frame of electronic information signals stored by said storing means following said selective actuation, at intervals corresponding to the intervals between said alternate fields of the encoded moving image electronic information signals, said select portions collectively comprising still image electronic information signals which define a still image.

4,819,060

AUTOMATIC WHITE BALANCE CIRCUIT FOR COLOR TV CAMERAS HAVING MEANS FOR INTERRUPTING WHITENING OPERATION UPON VIEWING MONO-COLORED NON-WHITE OBJECT FIELDS

Ikumi Minema, Funabashi, and Yoshiro Hieda, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 8, 1987, Ser. No. 93,947
Claims priority, application Japan, Sep. 8, 1986, 61-137754[U]
Int. Cl.[4] H04N *9/73*
U.S. Cl. 358—29 **4 Claims**



3. An automatic white balance circuit arrangement for a color TV camera having an image sensor which outputs two primary color signals of red and blue respectively and a luminance signal in response to light incident on a field of vision of said image sensor, comprising:
process amplification means for inputting said two primary color signals and said luminance signal from the image sensor and for outputting color difference signals corresponding to a difference between each of said two primary color signals and said luminance signal, amplitudes of said color difference signals being determined by gain control signals input to said process amplification means;
detection means for detecting a condition where a field of vision of said image sensor is substantially occupied with generally magenta or green, for producing a hold signal while the detection of said condition is made, and for outputting said hold signal during the detection; and
balance control means for generating said gain control signals responsive to said color difference signals to control said process amplification means so as to maintain a white balance operation active in case said field of vision is occupied with colors other than generally magenta or green, and for holding said respective gain control signals at respective values thereof at a moment right before said hold signal is supplied, on the basis of said hold signal, in case said field of vision is occupied with generally magenta or green, and for holding said gain control signals at said respective values thereof until said hold signal stops.
wherein said detection means further comprises;
a pair of integrators each of which inputs the a respective color difference signal;
a pair of comparators each of which compares an integrated signal output from a respective one of said integrators with a zero level and each of which generates a positive or negative output, respectively; and
an exclusive OR gate receiving outputs from said pair of comparators and outputting the hold signal when the outputs of said comparators are both positive or negative.

4. An automatic white balance circuit arrangement for a color TV camera for modifying inputted primary color signals from an image sensor of said camera, comprising:
process amplification means for inputting two primary color signals and a luminance signal from the image sensor and for outputting color difference signals each corresponding to a difference between each of said primary color signals and said luminance signal, amplitudes of said color difference signals being determined by gain control signals input to said process amplification means;
detection means for detecting a condition where a field of vision of said image sensor is likely to be substantially occupied with one color, for producing a hold signal while the detection of said condition is made, and for outputting said hold signal during the detection; and
balance control means for generating said gain control signals responsive to said color difference signals to control said process amplification means so as to maintain a white balance in case said field of vision is occupied with various colors, and for holding said respective gain control signals at respective values thereof at a moment right before said hold signal is supplied, on the basis of said hold signal, and for holding said gain control signals at said respective values thereof until said hold signal stops;
wherein said detection means comprises:
a close-up lever operable for moving lenses in the image sensor to form a close-up image of an object in the field of vision of the image sensor; and
a switch to cause generation of the hold signal while said close-up lever is in an operated position forming a close-up image of the field of vision of the image sensor.

4,819,061

RECOVERY OF LUMINANCE AND CHROMINANCE INFORMATION FROM AN ENCODED COLOR TELEVISION SIGNAL

Stuart E. Lang, Montville, N.J., assignor to Dubner Computer Systems, Inc., Paramus, N.J.

Filed Jun. 10, 1987, Ser. No. 60,271
Int. Cl.[4] H04N *9/78*
U.S. Cl. 358—31 **6 Claims**

	A	C	E	G	I	
1	+1	−2	+2	−2	+1	
2	−4	+8	−8	+8	−4	
3	+8	−12	+12	−12	+8	=0(Y)+128(C)
4	−4	+8	−8	+8	−4	
5	+1	−2	+2	−2	+1	

4. An apparatus for decoding the luminance and chrominance components for each pixel of an encoded video image comprising:
means for obtaining a weighted average for the chrominance component of each pixel by combing vertically and horizontally over an array of pixels centered on the pixel being decoded, the array of pixels being selected from a single field of the encoded video image; and
means for correcting the luminance component, obtained by subtracting the weighted average for the chrominance component from the encoded value for the pixel being decoded, as a function of a magnitude of chrominance change across an edge in the encoded video image and of the orientation of the edge.

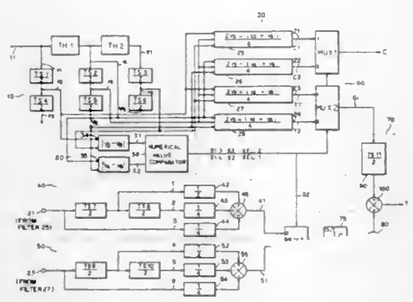
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4,819,062

ADAPTIVE-TYPE LUMINANCE/COLOR SIGNAL SEPARATION CIRCUIT USING THE HORIZONTAL AND VERTICAL CORRELATION IN TELEVISION RECEIVER

Song Dongil; Kim Chul-Jin, and Kim Byung-Jin, all of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 30, 1987, Ser. No. 139,737
Claims priority, application Rep. of Korea, Dec. 5, 1987, 13892
Int. Cl.[4] H04N *9/78*
U.S. Cl. 358—31 **20 Claims**



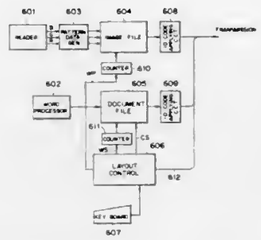
1. A circuit for separating luminance and color signals for use in a color television receiver, said circuit comprising:
composite video signal delay means having a plurality of delay elements consisting of line memories for generating a plurality of delayed signals from a received composite video signal;
first filter means for filtering the delayed signals generated by said composite video signal delay means to provide a plurality of filtered signals;
first selecting means for performing a comparative operation upon delayed signals received from said delay means to detect vertical and horizontal correlation, and for generating output signals representative of said correlation;
band-pass peaking filter means for separating and providing only a horizontal peaking signal when vertical correlation is higher than horizontal correlation after receiving a luminance signal from said first filter means;
low-pass peaking filter means for separating and outputting only a vertical peaking signal when the horizontal correlation is higher than the vertical correlation after receiving a chrominance signal from said first filter means;
data selecting means for selecting one set of said filtered signals in order to output a chrominance signal and a luminance signal on the basis of said output signal of said first selecting means, and for selecting one of said horizontal peaking and vertical peaking signals on the basis of said output signals; and
luminance signal outputting means for compensating for delay in said data selecting means, for preventing noise and excessive peaking to compensate for picture contour and for controlling gains of the vertical and horizontal peaking signals.

4,819,063

DATA PROCESSING SYSTEM WITH COMMON CHANNEL FOR IMAGE AND CHARACTER DATA

Susumu Sugiura, Yamato, and Osamu Hoshino, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 30,271, Mar. 20, 1987, abandoned, which is a continuation of Ser. No. 589,342, Mar. 14, 1984, abandoned. This application May 11, 1988, Ser. No. 193,235
Claims priority, application Japan, Mar. 17, 1983, 58-44994
Int. Cl.[4] H04N *1/46, 1/40*
U.S. Cl. 358—75 **70 Claims**



1. A data processing system comprising:
image data output means for outputting image data;
code data output means for outputting groups of code data, the groups collectively representing a font pattern such as a character or a symbol; and
send out means for sending out to a common signal circuit the image data from said image data output means and the code data from said code data output means,
said image data output means outputting the image data to said send out means in units of a first predetermined number of lines, and said code data output means outputting to said send out means a group of code data representative of a second predetermined number of lines of the font pattern,
wherein the second predetermined number of lines is equal to the first predetermined number of lines.

37. A data processing method comprising the steps of:
producing image data;
producing groups of code data, the groups collectively representing a font pattern such as a character or a symbol;
outputting the image data in units of a first predetermined number of lines; and
outputting one of the groups of code data such that the outputted group of code data represents a second predetermined number of lines of the font pattern, the second predetermined number of lines being equal to the first predetermined number of lines.

45. A data processing method comprising the steps of:
producing image data;
producing code data representing a font pattern such as a character or a symbol;
outputting the image data in units of a first predetermined number of lines;
adding to the code data position code information presenting a part of the font pattern having a second predetermined number of lines equal to the first predetermined number of lines; and
outputting the code data with the added position code information.

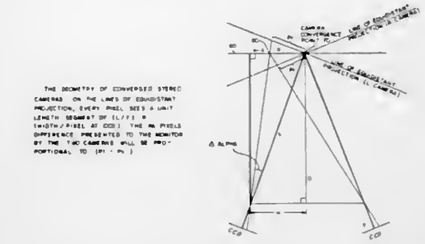
52. A data processing system comprising:
image data output means for outputting image data;
code data output means for outputting code data representing a font pattern such as a character or a symbol, the font pattern having the same resolution as the image data; and
send out means for sending out to a common signal circuit the image data from said image data output means and the code data from said code data output means,
said image data output means outputting the image data to said send out means in units of a first predetermined number of lines, and said code data output means outputting to said send out means code data representative of a second predetermined number of lines of the font pattern,
wherein the second predetermined number of lines is equal to the first predetermined number of lines.

4,819,064

TELEVISION MONITOR FIELD SHIFTER AND AN OPTO-ELECTRONIC METHOD FOR OBTAINING A STEREO IMAGE OF OPTIMAL DEPTH RESOLUTION AND REDUCED DEPTH DISTORTION ON A SINGLE SCREEN

Daniel B. Diner, Altadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 25, 1987, Ser. No. 125,666
Int. Cl.[4] H04N *13/00*
U.S. Cl. 358—88 **32 Claims**



1. A method of reducing depth distortion of a user's stereo view, of an object present in an image on a standard television monitor while maintaining, essentially constant, the image size and depth resolution, said object being located in a region of interest and viewed by a pair of image-collecting devices, with each device having an image-collecting surface, a focal length, and a central axis from the device's image-collecting surface to the region of interest, said method comprising the improvement of:
converging the central axes of said image-collecting surfaces behind said object when it is located in said region of interest; and
simultaneously increasing by equal amounts, the collection-surface-to-object distance, the separation distance between said devices, and the focal lengths for each of the image-collecting devices while holding the convergence of said central axes for both of said devices fixed on the same region of interest as it was prior to said simultaneous increase of said distances and said focal lengths.

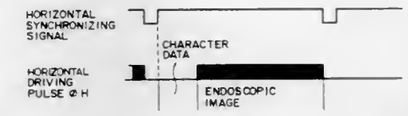
4,819,065

ELECTRONIC ENDOSCOPE APPARATUS

Teruo Eino, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1987, Ser. No. 41,861
Claims priority, application Japan, May 8, 1986, 61-105297
Int. Cl.[4] A61B *1/04*
U.S. Cl. 358—98 **11 Claims**

1. An electronic endoscope apparatus comprising:
an endoscope having a distal end portion in which a solid state image sensor including horizontal and vertical pixels is arranged for generating an image signal;
signal circuit means for driving the solid state image sensor, to cause the same to generate the image signal, processing the image signal output from the solid state image sensor, and for generating a video signal; and
display means including a screen for displaying an endoscopic image corresponding to the video signal output from the signal circuit means, by means of a plurality of horizontal scanning lines,



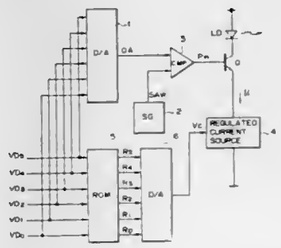
wherein the number of vertical pixels of said solid state image sensor is less than the number of scanning lines displayed on the screen of the display means, and
said signal circuit means drives the solid state image sensor and processes the image signal in such a manner that all of the image signals obtained from the solid state image sensor are displayed on the screen of the display means.

4,819,066

IMAGE PROCESSING APPARATUS

Ken Miyagi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1986, Ser. No. 898,096
Claims priority, application Japan, Aug. 29, 1985, 60-188396
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 E **14 Claims**



1. An image processing apparatus comprising:
digital image data generation means for generating digital image data;
pulse width modulated signal generation means for generating a pulse width modulated signal for modulating a recording beam in accordance with the digital image data generated by said digital image data generation means; and
control signal generation means for generating a control signal to control the intensity of the recording beam in accordance with the digital image data generated by said digital image data generation means;
wherein said pulse width modulated signal generating means processes said digital image data by using a pattern signal to produce the pulse width modulated signal and wherein said pattern signal is an analog pattern signal.

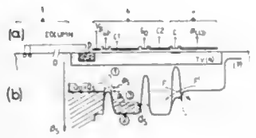
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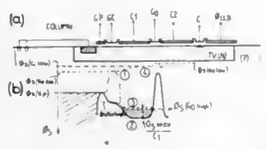
4,819,067

LINE-TRANSFER PHOTOSENSITIVE DEVICE

Jean L. Berger, Grenoble; Louis Brissot, St. Egreve, and Yvon Cazaux, Grenoble, all of France, assignors to Thomson-LSF, Paris, France

Continuation of Ser. No. 647,718, Sep. 5, 1984, abandoned. This application May 6, 1987, Ser. No. 48,476
Claims priority, application France, Sep. 13, 1983, 86 14543
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—24 **4 Claims**





1. A line-transfer photosensitive device comprising on a semi-conductor substrate a photosensitive region (1) comprising M lines of N photosensitive points, the photosensitive points (PH) of the different lines being connected in parallel by means of conductive columns to an interface single line memory which carries out at least the transfer of the signal charges integrated on one and the same line of the photosensitive region to a read register consisting of a volume transfer charge-coupled shift register formed on a semiconductor substrate region having an impurity zone of opposite type with respect to the substrate in order to obtain a charge transfer of the volume-transfer type, wherein the line memory is formed on a semiconductor substrate region having an impurity zone of opposite conductivity type with respect to the substrate in order to produce a volume charge transfer, the dopant concentration of the region wherein the line memory is formed being no greater than that of the region wherein the shift register is formed, and wherein the line memory comprises a plurality of storage capacitors, each capacitor being connected to a respective one of said columns through a diode and transfer gate means, said transfer gate means comprising adjacent to the diode a first gate maintained at a d-c voltage relative to the substrate for establishing a steady potential on the column and for establishing beneath said first gate a threshold for a quantity of charges to be transferred, and a second gate between the first gate and the capacitor maintained at a potential relative to the substrate which varies periodically between a prescribed high level and a prescribed low level for initiating and stopping, respectively, the transfer of charges from the column to the capacitor, the potential at the high level being sufficient to inhibit charge storage beneath the second gate, characterized in that the device further includes a second plurality of storage capacitors, each of which is coupled respectively to a storage capacitor of the plurality forming the line memory by way of an intermediate gate wherein the prescribed high level of the potential which varies periodically corresponds to the relation

$$\phi_s(G'_p)<\phi_s(G_{Ehigh})<\phi_s(G_{Ohigh})+(Q_{Smax}/C_t)$$

with $\phi_s(G'_p)$: the surface potential beneath the first gate,
$\phi_s(G_{Ohigh})$: the high level of the surface potential of the intermediate gate
C_t: the value of the storage capacitors of the line memory
Q_{Smax}: the maximum quantity of signal charge, wherein the prescribed low level of the potential which varies periodically satisfies the further relation

$$\phi_s(G_{Elow})>\phi_s(C_{tlow})>\phi_s(G_{Olow})$$

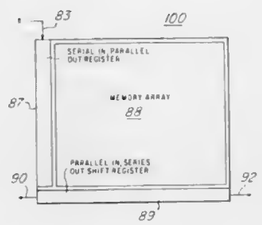
with $\phi_s(C_{tlow})$: the low level of the surface potential beneath the storage capacitors of the line memory
$\phi_s(G_{Olow})$: the low level of the surface potential beneath the intermediate gate.

4,819,068

TIME DISCRETE DIGITAL REFORMATTOR

Alan N. Cooper, Coppell; James K. Taylor, Plano, and Erwin E. Cooper, Carrollton, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1987, Ser. No. 80,713
Int. Cl.[4] H04N *5/33*
U.S. Cl. 358—113 **24 Claims**



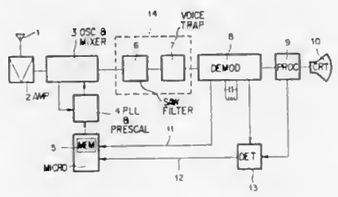
1. A time discrete digital reformattor for reformatting analog data from a detector array of a plurality of detectors wherein the time discrete digital reformattor comprises:
a summing circuit:
an input circuit having a plurality of inputs with each single input being operatively connected to a single detector of the plurality of detectors;
a first time discrete digital memory electrically connected to receive outputs from the input circuit; and
a second time discrete digital memory electrically connected to operate in cooperation with the first time discrete digital memory to provide outputs to the summing circuit.

4,819,069

TELEVISION SIGNAL SELECTION DEVICE

Yasushi Tanaka, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,324
Claims priority, application Japan, Aug. 20, 1986, 61-195997
Int. Cl.[4] H04N *5/50*
U.S. Cl. 358—191.1 **1 Claim**



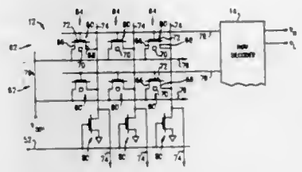
1. In a television signal receiving set which receives television signals of a first system of frequency assignment in which respective channels are assigned the video carrier frequencies thereof with a predetermined frequency space and a plurality of systems of frequency assignment in which the respective channels are assigned the video carrier frequencies thereof with a predetermined frequency offset on the lower sides and on the upper sides of the respective channels of said first system, said television signal receiving set including,
means connected with an intermediate frequency circuit and serves to operate as a frequency discriminator for outputting a voltage for automatic adjustment of a receiving-frequency;
video signal detecting means connected with said intermediate frequency circuit for detecting a video signal in the television signal received to output a video signal detection signal;
a high frequency tuning circuit having a local oscillator which is formed of a phase locked loop circuit for finely adjusting an oscillation frequency thereof on the basis of said voltage and said detection signal, said high frequency tuning circuit finely adjusting the video intermediate frequency of said television signal received;
memory means connected with said intermediate frequency circuit for storing presence and absence of the video carrier of a selected channel:
wherein a television signal selection method comprises a series of steps for carrying out automatic channel present operation and a series of steps for performing normal channel selection after completion of the automatic channel preset operation; said series of steps for carrying out automatic channel preset comprising:
(1) calculating a unit search frequency band which is used to determine where in the occupied band width of each channel the video signal exists, said unit search frequency band being defined by a lower limit frequency equal to an audio-trap frequency of an adjacent lower channel and an upper limit frequency such that frequency discriminator characteristic of said means for outputting the voltage for automatic adjustment of a receiving-frequency is included between said lower limit frequency and said upper limit frequency;
(2) dividing said occupied band width of each channel into a plurality of unit search frequency bands by said unit search frequency band and searching said occupied band width from the highest unit search frequency band to the lowest unit search frequency band for a correct video signal on the basis of said video detection signal;
(3) consecutively searching the respective channels for a video signal using step (2) in ascending order from the lowest channel to the highest channel of said first system;
(4) storing a position data indicative of a position of the unit search frequency band within said occupied frequency band width at which said correct video signal is detected;
(5) searching the adjacent upper channel for the video signal on the basis of said position data of the adjacent lower channel, and returning to step (2) if the correct video signal is not received;
(6) determining that a signal received in the adjacent upper channel is a false video signal if a correct video signal has been found in the adjacent lower channel with a position data representative of any one of a frequency equal to and a frequency higher than that assigned in said first system and while a signal also having been found with a position data representative of a frequency lower than that beyond an established limitation of tolerance on the negative side of said upper channel in said first system;
(7) reading out, upon a command for channel selection, the position data corresponding to the channel selected, and searching the channel for a video signal on the basis of the position data, and for carrying out step (2) if the correct video signal is not found; and
(8) waiting for the arrival of the television signal based upon the position data used in step (7) if the correct video signal is not found in step (7), and carrying out step (7) when the television signal arrives.

4,819,070

IMAGE SENSOR ARRAY

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

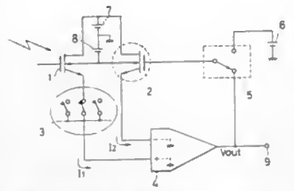
Filed Apr. 10, 1987, Ser. No. 37,302
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.11 **20 Claims**



1. A transistor image sensor array, comprising:
a plurality of transistor image sensors arranged in at least one row and a plurality of columns, each transistor sensor having a gate region for accumulating charge responsive to light incident thereon, and a drain connected to a voltage supply, a voltage threshold of each gate region operable to change according to the amount of accumulated charge;
each sensor further having a source region, a column line for each column coupled to said source regions in said column;
a decoder operable to address said at least one row responsive to a received row line address by applying a predetermined pulse to said at least one row, said pulse operable to remove said accumulated charge from each gate region in the row, a normal source voltage of each transistor in the row provided by a bias source coupled to each said source region, the source voltage of each sensor in the row returning to said normal source voltage responsive to the removal of said accumulated charge in a respective gate region;
a decoder driver for generating a binary address having a plurality of address bits each address bit output from said decoder driver on a respective bit line;
a first matrix formed in said decoder from said bit lines and row lines connected to respective ones of said rows, said matrix operable to connect a pulse source to a selected one of said row lines, transistors formed at selected ones of intersections of said bit lines with said row lines, a gate of each said transistor coupled to a respective bit line, a current path of each said transistor formed in a respective row line, one terminal of each said row lines connected to said pulse source;
a plurality of samplers each coupled to a respective column line for sampling and storing a voltage difference signal proportional to the charge in source voltage of a selected sensor in said column due to a changed threshold voltage of said sensor;
a storage means coupled to said columns for simultaneously receiving and storing said voltage difference signal from each said sampler;
an output for serially outputting each said voltage difference signal from said storage means,
a reference voltage selectively coupled to a respective sampler and used to acquire said voltage difference signal, a first register of said storage means for storing a charge proportional to said voltage difference signal, a second register of said storage means for storing a charge proportional to said reference voltage for each sampler; and
a second output for serially outputting said stored reference voltages.

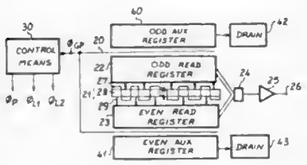
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4,819,071
SOLID STATE IMAGING APPARATUS
Tsutomu Nakamura, Ina, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Mar. 25, 1988, Ser. No. 172,813
Claims priority, application Japan, Apr. 17, 1987, 62-93128
Int. Cl.[4] H04N 3/14; H01L 27/14
U.S. Cl. 358—213.16 21 Claims



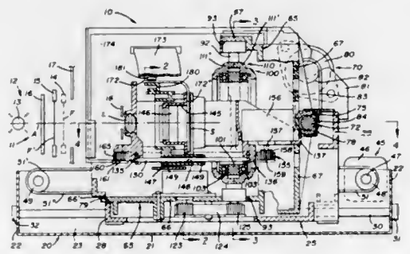
1. A solid state imaging apparatus comprising:
an internal amplification type of light-receiving element which constitutes a picture element;
a signal processing circuit incorporating a pre-amplifier for processing a video signal current of said light-receiving element constituting the picture element;
an internal amplification type reference light-receiving element which is shielded from light;
a feedback loop provided in said pre-amplifier for controlling the gate voltage of said reference light-receiving element such that a current having the same value as that of the video signal current of said light-receiving element which constitutes the picture element is caused to flow to said reference light-receiving element; and
means for discharging the dark current charge accumulated in said reference light-receiving element in the period during which the video signal current from said light-receiving element constituting the picture element is suspended.

4,819,072
ANTI DAZZLE DEVICE FOR A CHARGE TRANSFER IMAGE SENSOR AND AN IMAGE SENSOR INCLUDING SUCH A DEVICE
Gilles Boucharlat; Yvon Cazaux, both of Grenoble, and Jean-Joseph Chabbal, Saint Egreve, all of France, assignors to Thomson-CSF, Paris, France
Filed Dec. 14, 1987, Ser. No. 132,332
Claims priority, application France, Dec. 16, 1986, 86 17572
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.29 4 Claims



1. An antidazzle device for a charge transfer image sensor, this sensor including:
at least one assembly of photosensitive elements in which charges are released by light;
antidazzle drains coupled respectively to each photosensitive element for draining away excess charges released during a phase for accumulating charges in the photosensitive elements,
at least one charge transfer reading register coupled to each photosensitive element assembly, the charges released in each photosenstive element assembly being transferred to this register then shifted by this register to a series output thereof;
and an auxiliary register coupled to each reading register and similar thereto, for collecting excess charges released by the light during the time during which charges are transferred from the photosensitive elements to a reading register, and then for shifting them towards a drain.

4,819,073
FILM VIDEO PLAYER APPARATUS WITH SELECTIVE IMAGE COMPOSING CONTROLS
Mark E. Bridges, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 13, 1988, Ser. No. 143,661
Int. Cl.[4] H04N 3/36
U.S. Cl. 358—214 21 Claims

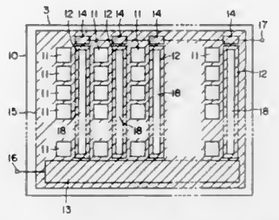


1. A film video player having means mounting photographic film in relation to imaging means having a lens for projecting at least a portion of a film frame image on a sensor which converts a sensor image to a video signal for video display comprising, means for changing the magnification of the sensor image with respect to the film frame image, means for translating the sensor with respect to the film frame image in a first direction, and means for translating the sensor with respect to the film frame image in a second direction perpendicular to the first direction and for rotating the sensor with respect to the film frame image,
wherein the lens has a fixed focal length and said means for changing the magnification of the sensor image with respect to the film frame image includes means for selectively varying the distance between the lens and the photographic film for effecting a selected magnification,
including means for varying the distance between the sensor and the lens for maintaining the sensor image in focus at any selected magnification.

4,819,074
ELECTRONIC STILL CAMERA
Nobuo Suzuki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 30, 1987, Ser. No. 31,460
Claims priority, application Japan, Mar. 31, 1986, 61-73468
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—209 6 Claims

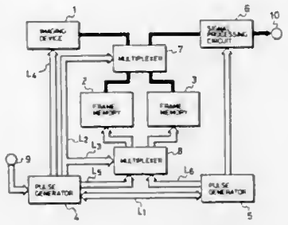
1. An electronic still camera comprising:
a two-dimensional solid state image sensor composed of a first charge signal generating means operating as light receiving means with photosensitive picture cells two-dimensionally arranged for generating a first charge signal, and a charge readout means for reading out the first charge signal generated at the first charge signal generating means;
an optical system for focusing an object image on the solid state image sensor;

a shutter for opening an optical path of the optical system only at the time of photographing;
record means for recording an image signal of the object image obtained from the charge readout means;
a second charge signal generating means for generating a



second charge signal corresponding to an object brightness which is provided within the charge readout means; and
shutter control means for closing the shutter on the basis of an amount of the second charge signal while the shutter is open.

4,819,075
SOLID STATE IMAGING APPARATUS WITH MEANS FOR CONTROLLING SIGNAL ACCUMULATION PERIOD
Takuya Imaide; Ryuji Nishimura, both of Yokohama, and Masaru Noda, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 23, 1987, Ser. No. 100,233
Claims priority, application Japan, Sep. 24, 1986, 61-225329
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.18 7 Claims



1. In a solid state imaging apparatus having photoelectric conversion means consisting of an array of plural photoelectric conversion devices disposed in two dimensions for converting optical information into analog electrical picture element data and means for digitizing the picture element data obtained by said array of photoelectric conversion devices and sequentially reading out the digitized picture element data; and an output circuit to which the picture element data is input and from which a picture signal is output; said solid state imaging apparatus comprising:
a first field memory having a capacity for storing digitized picture element data for one field;
a second field memory having a capacity for storing digitized picture element data for one field;
a first line memory having a capacity for storing digitized picture element data for one line;
a second line memory having a capacity for storing digitized picture element data for one line;
first switching means, during a period m times the horizontal scanning period, supplying digitized picture element data obtained from said photoelectric conversion means to said first line memory and, during another period of one horizontal scanning period, supplying the picture element data stored in said first line memory to said first field memory;
second switching means, during a period m times the horizontal scanning period, supplying digitized picture element data obtained from said photoelectric conversion means to said second line memory and, during another period of one horizontal scanning period, supplying the picture element data stored in said second line memory to said second field memory;
third switching means for connecting said first and second field memories alternately to said output circuit;
first signal generator means for generating a control signal for setting the accumulation period on said array of photoelectric conversion devices to m (m>1) times the field period and supplying this signal to said photoelectric conversion means and also generating write addresses for said first and second field memories;
second signal generator means for generating read addresses for reading out digitized picture element data from said first and second field memories at intervals of one horizontal scanning period; and
fourth switching means for supplying the read addresses generated by said second signal generator means to said first and second field memories alternately at intervals of one horizontal scanning period and also supplying the write address generated by said first signal generator means to said first or second field memory during a certain horizontal scanning period, wherein
said photoelectric conversion means outputs digitized picture element data for one line during a period m times the horizontal scanning period according to the control signal supplied from said first signal generator means, and during a certain period m times the horizontal scanning period, the digitized picture element data output from said photoelectric conversion means is written in said first line memory during the period m times the horizontal scanning period, picture element data stored in said second line memory is read out and written in said second field memory, and picture element data stored in said first and second field memories are supplied to said output circuit alternately at intervals of one horizontal scanning period, whereas, during another period m times the horizontal scanning period, the digitized picture element data output from said photoelectric conversion means is written in said second line memory during the period m times the horizontal scanning period, picture element data stored in said first line memory is read out and written in said first field memory, and picture element data stored in said first and second field memories are supplied to said output circuit alternately at intervals of one horizontal scanning period.

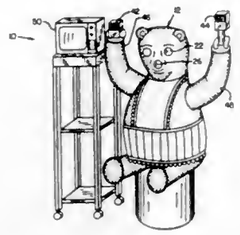
4,819,076
DUAL-CAMERA PHOTOGRAPHIC SYSTEM
John A. Briggs, 325 Water St., Springfield, Oreg. 97477
Filed Aug. 14, 1987, Ser. No. 85,939
Int. Cl.[4] H04N 5/30
U.S. Cl. 358—229 22 Claims

19. A photographic system for simultaneously taking still portraits and video recordings of a subject, wherein both images are suitable as final products for viewing by the subject and others, said system comprising:
a video camera for producing a final-product-quality video image of the subject, said video camera including lens with a zoom feature for changing a field-of-view;
at least one video monitor for real time display of the image of the subject being taken by the video camera;
means for interconnecting said video camera and said video monitor to convey the image from said camera to said monitor;
a still camera for producing a final-product-quality photo-

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graph of the subject, said still camera including a lens with a zoom feature for changing a field-of-view; and

means for mechanically interconnecting said zoom features so that a change in the field of view of one of said zoom feature will result in a corresponding change in the other, wherein said means for mechanically interconnecting



includes a tag operably mounted on the zoom feature of the video camera and a control arm operably mounted on the zoom feature of the still camera, said tag and said control arm being joined by a link arm for simultaneously changing the field-of-view of the zoom features of both lenses.

4,819,077

COLOR IMAGE PROCESSING SYSTEM

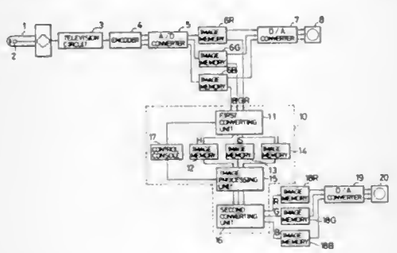
Katsuya Kikuchi, Nasu, and Haruo Kato, Kuroiso, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 15, 1987, Ser. No. 38,830

Claims priority, application Japan, May 14, 1986, 61-111627; May 14, 1986, 61-111629; May 14, 1986, 61-111630; May 14, 1986, 61-111631

Int. Cl.[4] H04N *11/00*; A61B *1/04*

U.S. Cl. 358—98 **5 Claims**



1. An endoscopic system comprising:

imaging means disposed in a scope portion of an endoscope, for taking an image of an object;

first formation means for forming first color images of red, green, and blue, the image obtained by said imaging means;

second formation means for forming at least one second color image of hue, intensity, and saturation based on the first color images formed by said first formation means; and

display means for displaying at least one of the first color images.

4,819,078

ELECTRONIC PRINT BOARD SYSTEM

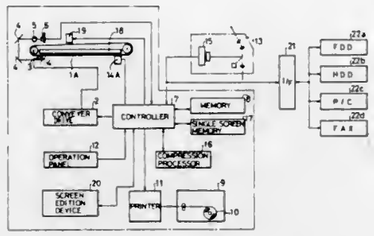
Joji Tadokoro, and Matsusaburo Noguchi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 136,423

Claims priority, application Japan, Dec. 17, 1986, 61-298659; Mar. 30, 1987, 62-74479

Int. Cl.[4] H04N *1/00, 1/10*

U.S. Cl. 358—256 **9 Claims**



1. An electronic print board system, comprising:

a drawing medium on which images can be erasably written manually;

input means for supplying image data; writer means for erasably writing images on said drawing medium corresponding to the image data received from said input means;

means for reading images on said drawing medium and producing output image data corresponding thereto;

means for printing images on a recording medium corresponding to the output image data from said means for reading; and

control means for selectively causing said writer means to write images on said drawing medium corresponding to the image data received from said input means and for selectively causing said means for printing to print images on said recording medium corresponding to the output image data received from said means for reading.

4,819,079

DATA PROCESSING APPARATUS

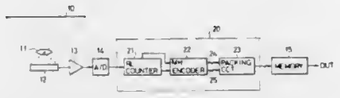
Mitsuji Takao, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 577,992

Claims priority, application Japan, Feb. 14, 1983, 58-23472

Int. Cl.[4] H04N *1/00*

U.S. Cl. 358—260 **25 Claims**



1. A data processing apparatus, comprising:

means for sequentially generating variable length code data;

first memory means adapted to store a maximum length of code data for storing the code data generated from said generating means, and for outputting in parallel the code data therefrom;

second memory means for taking in in parallel the code data output in parallel from said first memory means and storing those code data, and for releasing a predetermined length of code data; and

control means for controlling storage locations of the code

data output in parallel from first memory means in said second memory means.

4,819,080

INSTRUMENT FOR MEASURING THE PHASE JITTER OF ANALOG SIGNALS

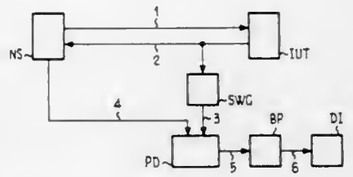
Flavio Cucchietti, and Carlo M. Bruno, both of Turin, Italy, assignors to Sip - Societa Italiana per L'esercizio Delle Telecomunicazioni P.A., Turin, Italy

Filed Apr. 27, 1988, Ser. No. 186,904

Claims priority, application Italy, Jun. 26, 1987, 67552 A/87

Int. Cl.[4] G01R *25/00*

U.S. Cl. 324—83 R **3 Claims**



1. An instrument for measuring the phase jitter of analog signals, wherein a square-wave clock-signal (3) having the same frequency and phase characteristics as the above analog signals (2) is generated by a suitable circuit (SWG) and is compared by a phase comparator (PD) with a reference signal (4), the signal obtained is then filtered by a pass-band circuit (BP), measured and displayed (DI), said circuit (SWG) being characterized in that it comprises:

a transformer (TI), to the primary winding of which said analog signals (2) are sent;

a first threshold comparator (CSP), to compare the signal received from the secondary winding of said transformer (TI) with a positive threshold voltage (+s) inferior to the absolute peak value of the input signal;

a second threshold comparator (CSN), to compare the signal received from the secondary winding of said transformer (TI) with a negative threshold voltage (−s) inferior to the absolute peak value of the input signal;

an EX-OR gate (EO), receiving at the inputs (7, 8) the signals supplied by said first and second threshold comparators (CSP, CSN);

a first D-type flip-flop (FF1) with reset input (11), whose data input is permanently set at logic level 1 and clock input (3) is connected to the output of said EX-OR gate (EO);

a first divide-by-N counter (C1), enabled by said first flip-flop (FF1) to counting a clock signal with a frequency N times higher than the rate of said analog signals, the signal at the output being used to reset said first flip-flop (FF1);

a first AND gate (AN1), receiving at an input the signal outgoing from said first counter (C1) and at the other input the signal outgoing from said EX-OR gate (EO);

a third threshold comparator (CSO), to detect the zero crossings of the signal received from the secondary winding of said transformer (TI);

a pulse generator (GI), generating short-duration pulses in correspondance with signal transitions at the output of said third threshold comparator (CSO);

a second AND gate (AN2), receiving at an input the signal outgoing from said pulse generator (GI) and at the other input the signal outgoing from said first flip-flop (FF1);

a second D-type flip-flop (FF2) with reset input (16), whose data input is permanently set at logic level 1 and the clock input (15) is connected to the output of said second AND gate (AN2);

as second divide-by-N counter (C2), enabled by said second flip-flop (FF2) to counting the clock signal with a frequency N times higher than the rate of said analog signals;

an OR gate (PO), receiving at an input the signal outgoing from said second counter (C2) and at the other input the signal outgoing from said first AND gate (AN1), the outgoing signal being used to reset said second flip-flop (FF2);

a third divide-by-N counter (C3), which counts the clock signal with a frequency N times higher than the rate of said analog signals and is reset by said second counter (C2), the outgoing signal (3) being said square-wave clock signal with the same frequency and phase characteristics as the above analog signals (2).

4,819,081

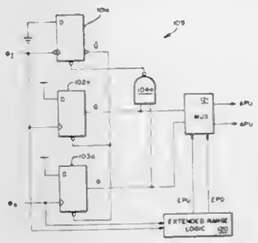
PHASE COMPARATOR FOR EXTENDING CAPTURE RANGE

Andrew M. Volk, Loomis; Terry L. Baucom, Citrus Heights, and Roger Van Brunt, San Francisco, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 3, 1987, Ser. No. 92,477

Int. Cl.[4] H03D *3/02*

U.S. Cl. 328—134 **4 Claims**



1. In a phase comparator having a first input signal, a second input signal, a first correction output signal that indicates error correction in a first direction, and a second correction output signal that indicates error correction in a second direction that is opposite to the first direction, an extended range logic circuit comprising:

means for generating a slip signal that indicates that a phase difference between the first input signal of the comparator and the second input signal of the comparator has reached a predetermined value;

means for generating a direction signal that indicates the direction of the phase difference between the first input signal of the comparator and the second input signal of the comparator;

means responsive to the direction signal, the slip signal, and an enable signal for generating an acceleration signal that indicates error correction in a first direction and for generating a brake signal that indicates error correction in a second direction that is opposite from the first direction, wherein the acceleration and brake signals are updated only during non-slip periods;

means responsive to the slip signal, the acceleration signal, and the brake signal for generating a third correction output signal that indicates error correction in a first direction and for generating a fourth correction output signal that indicates error correction in a second direction that is opposite from the first direction; and

means responsive to the first, second, third, and fourth correction output signals for selecting one among the first, second, third, and fourth correction outputs signals, wherein the first and second correction output signals provide error correction at a first rate and the third and fourth correction output signals provide error correction at a second rate that is faster than the first rate,

whereby a more rapid error correction is achieved when the

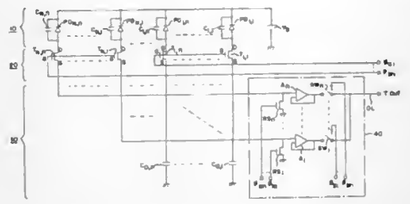
phase difference between the first input signal of the comparator and the second input signal of the comparator reaches the predetermined value.

4,819,082

MANUSCRIPT READING DEVICE

Hisao Ito; Mamoru Nobue; Yoshio Nishihara, and Teiichi Suzuki, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Filed Jun. 26, 1987, Ser. No. 67,455
Claims priority, application Japan, Jun. 30, 1986, 61-153051
Int. Cl.[4] H04N *1/028*
U.S. Cl. 358—294 **4 Claims**



1. A manuscript reading device for reading a manuscript comprising:

a plurality of photodiodes for storing electric charges in parasitic capacitances thereof corresponding to lightness and darkness information on each minute area of a picture image on the manuscript by way of biasing said photodiodes by a predetermined positive voltage, each of said photodiodes having a sandwich structure in which a photoconductive layer and a plurality of divided transparent electrodes are sequentially deposited on a common metal electrode, each of said transparent electrodes corresponding to minute areas of said manuscript picture image, said common metal electrode being biased by a positive voltage; and

a plurality of thin film transistors connected in series to associated ones of said divided transparent electrodes for transferring said electric charges stored in said parasitic capacitances to a corresponding wiring capacitance of a rear wiring group in response to the application of a predetermined positive voltage to gate electrodes thereof, each of said thin film transistors comprising an n-type thin film transistor, wherein said electric charges transferred and stored in said wiring capacitances are sequentially outputted as picture information corresponding to said picture image on the manuscript.

4,819,083

MOVING TYPE IMAGE RECORDING APPARATUS

Masanori Kawai; Kiyotaka Murakami; Tatsuji Kurogama, and Mitsuru Watanabe, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1987, Ser. No. 7,796
Claims priority, application Japan, Jan. 31, 1986, 61-19655; Jan. 31, 1986, 61-19657; Feb. 18, 1986, 61-34834; Apr. 3, 1986, 61-77289; Jun. 26, 1986, 61-149991
Int. Cl.[4] H04N *1/024*
U.S. Cl. 358—294 **16 Claims**

1. A moving type image recording apparatus comprising:

a moving amount detecting means for detecting a moving amount of the apparatus body;

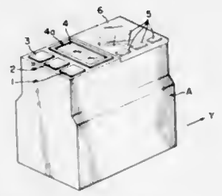
a recording means for recording an image onto a substance to be recorded;

a memory means for storing and holding an image information to be recorded;

an edit means for editing the information stored by said memory means; and

a display means for displaying the image information,

wherein the image information of said memory means or the image information is edited and recorded through said



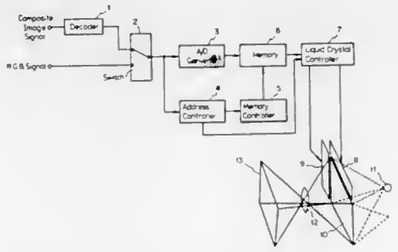
recording means onto the substance to by recorded based on the detecting information from said moving amount detecting means.

4,819,084

METHOD FOR PRINTING THE FRAME OF A COLOR TELEVISION BY USING THE LIQUID CRYSTAL FILTER

Kwan Bark, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 11, 1988, Ser. No. 142,505
Int. Cl.[4] H04N *1/21*
U.S. Cl. 358—296 **1 Claim**



1. A method of printing a frame of a color television image, comprising the steps of: applying via a decoder a composite video signal to one input terminal of a switch, and an R. G. B. signal to another input terminal of the switch, to form an output signal; converting the output signal by an A/D converter into a digital signal; storing the digital signal in a memory as a frame signal, depending on an address designated by a memory controller which is controlled by an address controller supplied with the output signal of said switch; retrieving the frame signal from said memory by a liquid crystal controller depending on the output of said address controller and applying the frame signal to a liquid crystal color filter to form on said filter a frame of complementary colors; transforming the frame of complementary colors into an image with the original colors of said television frame by projecting light beams of a light source on said filter; and focussing the image via a lens onto instant printout paper.

4,819,085

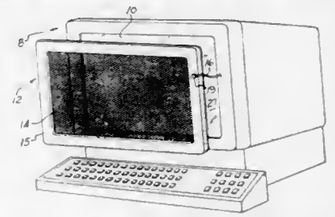
SCREEN FOR CATHODE RAY TUBES

Paul M. Liang, 12-1 Th Fl., No. 148 Sung Chiang Road, Taipei, Taiwan

Continuation-in-part of Ser. No. 871,906, Jun. 9, 1986. This application Jul. 1, 1987, Ser. No. 68,362
Int. Cl.[4] H04N *5/65*
U.S. Cl. 358—245 **4 Claims**

1. A protective device adapted for use with a cathode ray tube, said device comprising a frame which includes a flexible non-metallic outer frame member and a rigidifying metallic

inner frame member, and a screen formed of non-metallic woven fibers which have been chemically treated wherein the



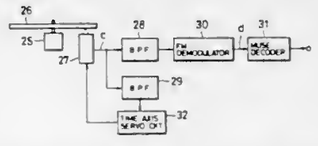
fibers are rendered electrically conductive, said screen fitted in said frame.

4,819,086

MULTIRECORDING METHOD ELIMINATING STRIPED-PATTERN INTERFERENCE

Hideki Hayashi, and Tsutomu Honda, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,376
Claims priority, application Japan, Oct. 18, 1986, 61-247999
Int. Cl.[4] H04N *5/95*
U.S. Cl. 358—343 **6 Claims**



1. In a multirecording method in which a multiplex sub-Nyquist-sampling video signal corresponding to sampling values obtained by performing sampling a plurality of times as to be mutually interpolated with a predetermined relation in sampling position between continued plural fields of video signals is multirecorded on a recording medium together with a predetermined signal, the improvement in which a frequency of said predetermined signal is set to be $m/(2n+1)$ times as high as a horizontal scanning frequency of said video signal, n being a natural number, and m being a natural number other than integral multiples of $(2n+1)$.

4,819,087

SYSTEM FOR PRECISELY EDITING AUDIO SIGNALS ON A VIDEOTAPE

Hajime Takeuchi, Yokohama, and Katsuichi Tachi, Ebina, both of Japan, assignors to Sony Corporation, Tokyo, Japan

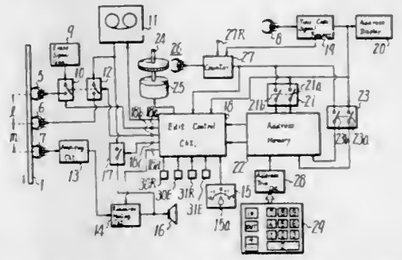
Filed Jan. 21, 1982, Ser. No. 341,282
Claims priority, application Japan, Jan. 22, 1981, 56-8207
Int. Cl.[4] G11B *27/02*
U.S. Cl. 360—14.3 **12 Claims**

1. An editing system for audio signals recorded on magnetic tape comprising:

a helical scan videotape recorder including means for recording and reproducing said audio signals longitudinally on said magnetic tape, address signal reproducing means for reproducing address signals recorded on said tape at predetermined intervals, tape transporting means for moving said tape, mode selecting means for selecting an operating mode of said videotape recorder, and means receiving said address signals reproduced by said address signal reproducing means for generating pulse signals corresponding to a moving speed of said tape and occuring in synchronism with the reproduced address signals at a frequency higher than the frequency of said address signals as reproduced by said reproducing means, whereby said pulse signals represent finer divisions of said tape than said predetermined intervals;

monitor means for monitoring said audio signals reproduced by said videotape recorder; and

editing control means including speed control means for controlling said tape transport means to change said speed of said tape, address signal reading means for reading said



address signals reproduced by said videotape recorder, counting means for counting said pulse signals, memory means for storing output signals from said reading means and said counting means, and controller means responsive to said output signals stored in said memory means for controlling said mode selecting means and said tape transport means to locate precisely an editing point on said tape as defined by one of said finer divisions of said tape.

4,819,088

MAGNETIC RECORDING AND REPRODUCING SYSTEM

Seiji Higurashi, Chiba, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 18, 1987, Ser. No. 27,633
Claims priority, applicatioo Japan, Mar. 19, 1986, 51-61773
Int. Cl.[4] G11B *20/10*
U.S. Cl. 360—19.1 **14 Claims**



1. A magnetic recording and reproducing system comprising:

a first video signal processing means for subjecting an input video signal in conformance with a standard television system to a predetermined signal processing and for producing a video information signal having a predetermined signal format suited for magnetic tape recording and reproduction;

first recording and reproducing means for recording and reproducing the video information signal on and from tracks formed obliquely to a longitudinal direction of a magnetic tape;

second video signal processing means for subjecting the video information signal reproduced by said first recording and reproducing means to a predetermined signal processing and for producing a reproduced video signal in conformance with said standard television system;

analog-to-digital converting means for sampling an input analog audio signal at a predetermined sampling frequency and for producing a digitized audio signal;

encoding means for encoding said digitized audio signal from said analog-to-digital converting means into an encoded digital audio signal comprising first and second

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blocks which occur in a predetermined sequence dependent on a field frequency of the input video signal and an identification signal for identifying said first and second blocks, said first block being made up of a first number of samples constituting said digitized audio signal from said analog-to-digital converting means, said second block being made up of a second number of the samples constituting said digitized audio signal from said analog-to-digital converting means, said first number of samples being greater than a number of samples in 1/N frame of said input video signal and said second number of samples being less than said number of samples in 1/N frame of said input video signal, where N is an integral multiple of five when the field frequency of said input video signal is approximately 60 Hz and is an integral multiple of six when the field frequency of said input video signal is approximately 50 Hz, said encoding means successively encoding all of the samples constituting said digitized audio signal from said analog-to-digital converting means in each frame so that codes are completed in each of said first and second blocks;

second recording and reproducing means for recording and reproducing the encoded digital audio signal on and from the tracks of the magnetic tape, each of said tracks being recorded with the video information signal and the encoded digital audio signal respectively amounting to one field of said input video signal;

decoding means for decoding the encoded digital audio signal reproduced by said second recording and reproducing means in blocks with reference to the identification signal so as to produce all of the samples of each frame; and

audio signal processing means comprising means for producing a reproduced digitized audio signal from the samples obtained from said decoding means and means for producing a reproduced analog audio signal by subjecting the reproduced digitized audio signal to a digital-to-analog conversion.

13. A magnetic recording system comprising:

video signal processing means for subjecting an input video signal in conformance with a standard television system to a predetermined signal processing and for producing a video information signal having a predetermined signal format suited for magnetic tape recording;

first recording means for recording the video information signal on tracks to be formed obliquely to a longitudinal direction of a magnetic tape;

analog-to-digital converting means for sampling an input analog audio signal at a predetermined sampling frequency and for producing a digitized audio signal;

encoding means for encoding said digitized audio signal from said analog-to-digital converting means into an encoded digital audio signal comprising first and second blocks which occur in a predetermined sequence dependent on a field frequency of the input video signal and an identification signal for identifying said first and second blocks, said first block being made up of a first number of samples constituting said digitized audio signal from said analog-to-digital converting means, said second block being made up of a second number of the samples constituting said digitized audio signal from said analog-to-digital converting means, said first number of samples being greater than a number of samples in 1/N frame of said input video signal and said second number of samples being less than said number of samples in 1/N frame of said input video signal, where N is an integral multiple of five when the field frequency of said input video signal is approximately 60 Hz and is an integral multiple of six when the field frequency of said input video signal is approximately 50 Hz, said encoding means successively encoding all of the samples constituting said digitized audio signal from said analog-to-digital converting means in each frame so that codes are completed in each of said first and second blocks; and

second recording means for recording the encoded digital audio signal on the tracks of the magnetic tape, each of said tracks being recorded with the video information signal and the encoded digital audio signal respectively amounting to one field of said input video signal.

4,819,089

DIGITAL VIDEO RECORDER HAVING DATA DISTRIBUTION AMONG FOUR HEADS

James H. Wilkinson, and John G. S. Ive, both of Basingstoke, United Kingdom, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 742,536, Jun. 7, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 125,829

Claims priority, application United Kingdom, Jun. 8, 1984, 8414657

Int. Cl.[4] G11B *5/02*

U.S. Cl. 360—22 **15 Claims**



6. (Amended) A digital video tape recorder for recording digital data that corresponds to a video signal *and to additional data* comprising:

a head drum;

four transducer heads mounted in *first and second* pairs on said head drum for recording *respective first and second pairs of* oblique tracks on a magnetic tape, said *first and second* pairs of heads being at an angular spacing of 180°; and

a demultiplexer receiving digital data to be recorded corresponding to a video signal and to additional data for distributing the digital data evenly among said four transducer heads such that each filed of the video signal is divided into segments, each said segment comprising the digital data corresponding to a group of lines of the *same* field;

said demultiplexer distributing said digital data among said four transducer heads for recording said data on said tape *in a first pair of tracks recorded by said first pair of heads and in a second pair of tracks recorded by said second pair of heads* such that each [said track] *pair of first and second pairs of tracks* comprises a block of digital data relating to a portion of one *of* said [segment] *segments* of a video field and a block of digital data relating to a portion of another *of said segments* [segment] of a video field, said two blocks of digital data *in at least said first pair of tracks* being separated by a *respective* gap and said additional data being recorded in said gap.

4,819,090

DIGITAL SIGNAL REPRODUCING APPARATUS

Kazuo Hikawa, Mitaka, Japan, assignor to Victor Company of Japan, Kanagawa, Japan

Filed Oct. 1, 1987, Ser. No. 103,921

Claims priority, application Japan, Oct. 2, 1986, 61-234958; Oct. 13, 1986, 61-242522

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—32 **5 Claims**

1. A digital signal reproducing apparatus for reproducing digital signals pre-recorded on tracks formed obliquely to a

longitudinal direction of a magnetic tape in blocks, each of said tracks at least comprising a first region recorded with data and amounting to a first number of blocks, a second region recorded with a tracking control signal and amounting to a second number of blocks, and a third region recorded with data and amounting to a third number of blocks, each of said blocks at least comprising a synchronizing signal, an identification code, a block address, a parity code and the data, said digital signal reproducing apparatus comprising:

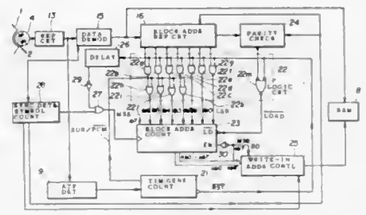
reproducing means for reproducing the digital signals from the tracks of the magnetic tape;

demodulating means for demodulating output reproduced digital signals from said reproducing means into demodulated reproduced data;

block address reproducing means supplied with the demodulated reproduced data from said demodulating means for outputting a block address in the demodulated reproduced data;

first means for detecting the tracking control signal from the reproduced data from said reproducing means and for producing a timing signal indicative of starting positions of each of the first and third regions by predicting the starting positions from a timing of the detected tracking control signal;

memory means for storing the demodulated reproduced data from said demodulating means;



block address counter means reset by said timing signal immediately before the start of each of the first and third regions for carrying out a counting operation and for outputting a counted value as a write-in address of said memory means, said counted value being corrected by the block address from said block address reproducing means when said reproducing means starts to reproduce the digital signals from each of the first and third regions, said block address counter means stopping the counting operation when the counted value reaches a predetermined value; and

second means for detecting the synchronizing signal from the reproduced data from said demodulating means and for at least producing a control signal for controlling a write-in timing of the demodulated reproduced data into said memory means.

4,819,091

HIGH SPEED MAGNETIC DISK CONTACT RECORDING SYSTEM

Blasius Brezoczky, San Jose, and Emil Hopner, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1987, Ser. No. 45,967

Int. Cl.[4] G11B *5/012, 5/22*

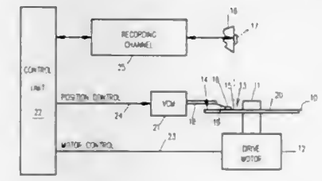
U.S. Cl. 360—97.01 **25 Claims**

1. A high speed magnetic disk contact recording system comprising:

a magnetic recording medium comprising a rigid substrate having a magnetic coating thereon,

a magnetic recording transducer and means to support said transducer in physical contact with said magnetic recording medium, said magnetic recording transducer comprising a substrate of a nonconducting single crystal material having a high thermal conductivity, a low friction coefficient and a high surface energy, and

means to produce relative motion between said magnetic recording medium and said magnetic recording transducer up to a selected operating speed to produce a force of a magnitude by which said transducer is capable of



running in contact with said recording medium without the application of external force whereby said magnetic recording is maintained in continuous and direct contact with said magnetic recording medium during said relative motion at said selected operating speed so that high density recorded data can be reliably written and sensed without excessive wear to either said transducer or said recording medium.

4,819,092

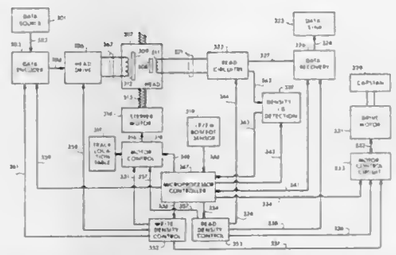
APPARATUS FOR WRITING SIGNAL DENSITY INFORMATION ON A MAGNETIC MEDIUM

Alan J. Richards, Loveland, Colo., assignor to Colorado Memory Systems, Inc., Loveland, Colo.

Filed May 8, 1987, Ser. No. 48,017

Int. Cl.[4] G11B *5/02, 5/03*

U.S. Cl. 360—27 **31 Claims**



1. Apparatus adapted to record density information magnetically in a plurality of discrete areas in a first location on a record member with said information representing the areal density of data recorded magnetically on a plurality of tracks in a second location on said member, said apparatus comprising:

means effective prior to the recording of said density information for erasing all portions of said member immediately adjacent each of said plurality of tracks, and

means for subsequently recording said density information in said plurality of discrete areas in binary coded form with said information recorded in each discrete area representing the value of one bit of said code and with the information in all of said discrete areas combined representing the coded value of said density information, said density information in each area being recorded at a flux reversal density that is unique to the coded bit value represented by said each area.

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4,819,093

ROTARY MAGNETIC RECORDING-REPRODUCING APPARATUS WITH DISC TRACK CHECKING

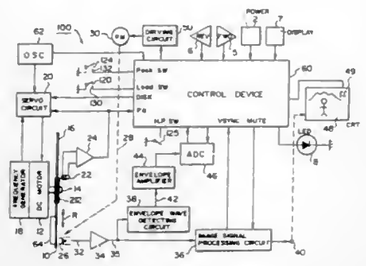
Kazuo Okada, and Yoshiaki Nakayama, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 781,540, Sep. 30, 1985, abandoned. This application Jan. 15, 1988, Ser. No. 145,702

Claims priority, application Japan, Oct. 2, 1984, 59-206701; Oct. 2, 1984, 59-206702; Oct. 2, 1984, 59-206705

Int. Cl.[4] G11B *5/55, 21/08, 33/10*

U.S. Cl. 360—78.06 **6 Claims**



1. A rotary magnetic reproducing apparatus wherein a magnetic head is moved in the radial direction of a magnetic disc rotating in a magnetic disc pack to thereby perform reproducing, comprising:

means for moving and positioning said magnetic head in the radial direction of said magnetic disc;

means for detecting the level of a reproduction signal obtained from said magnetic head;

means for detecting whether said magnetic head is positioned at a home position on said magnetic disc or at some other position;

means for warning that the magnetic disc pack loaded in a predetermined position in a main body of the apparatus is unrecorded; and

control means for judging that said magnetic disc pack loaded into the predetermined position is unrecorded when output signals from said level detecting means and said position detecting means are inputted, and said magnetic head positioned at the home position is caused to pursue each track of said magnetic disc by a predetermined feed width successively in a forward direction to search all tracks with said home position as a starting position in response to said control means controlling said moving means and the level detecting means outputting a signal indicating that no reproduction signal is obtained after all tracks have been searched, said control means driving said warning means when it is judged that said magnetic disc pack is unrecorded.

4,819,094

DAMPED MAGNETIC HEAD SUSPENSION ASSEMBLY

Gary R. Oberg, Route 1, Box 25C, Darwin, Minn. 55324

Continuation-in-part of Ser. No. 895,835, Aug. 12, 1986. This application Dec. 8, 1987, Ser. No. 129,848

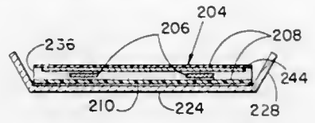
Int. Cl.[4] G11B *5/48*

U.S. Cl. 360—104 **13 Claims**

1. A damped magnetic head suspension assembly defining a longitudinal axis, said assembly comprising:

(a) a load beam having upper and lower ends;

(b) flexible circuit means for providing electrical connection between said upper end and said lower end of the load beam along the longitudinal axis, said flexible circuit means including a flexible circuit film having a plurality of conductors embedded in a thin, flexible, layer of insulating material and laminated between a first layer comprising a thin, flexible first film layer and a second layer comprising one of a thin, flexible second film layer and a thin, conductive coating layer, said flexible circuit film being adhesively bonded to said load beam in at least one spot along the longitudinal axis by adhesive disposed between said first layer and said load beam;



wherein said first film layer is of a thickness no greater than 3 mils; and

wherein said adhesive is of a thickness no greater than 6 mils in order to provide damping.

4,819,095

METHOD OF CONTROLLING A DISK HEAD POSITION BY INDIVIDUALLY TIMING ZONES SERVO INFORMATION

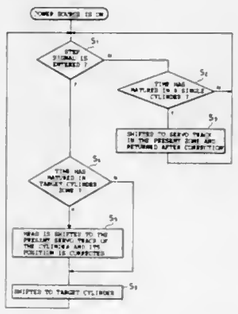
Isao Asano; Shoichiro Saito, both of Furukawa; Tooru Kaneko, Miyagi; Toru Kowaguchi, Furukawa; Tetsuya Mitsuishi, Furukawa, and Hiroshi Yoshida, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed May 29, 1987, Ser. No. 57,256

Claims priority, application Japan, Jun. 4, 1986, 61-128223; Jun. 18, 1986, 61-140351; Jun. 24, 1986, 61-146244; Jun. 30, 1986, 61-151387; Jun. 30, 1986, 61-151388; Aug. 12, 1986, 61-187840; Dec. 10, 1986, 61-292607; Dec. 16, 1986, 61-297713

Int. Cl.[4] G11B *5/596*

U.S. Cl. 360—77.04 **3 Claims**



1. In a head position control method for positioning a head assembly at a fine track position of a recording track in an information recording disk driving device including: an information recording disk having information recording layers on surfaces thereof; a housing accepting said information recording disk therein; a rotary means supported by said housing to rotate said information recording disk; head assemblies opposed to said information recording layers and supported movably along said surfaces of the information recording disk to write or read signals on or from said information recording layers; a head transport means supporting said head assemblies to move them along the surfaces of the information recording disk; and a driving means activating said head transport means, said information recording disk having servo tracks formed at some predetermined regions thereof by writing servo information thereon, the method comprising the steps of:

a first control step of confirming whether any step signal is entered or not from a host computer;

a second control step following said first control step in absence of said step signal of confirming whether a

counter counts or not a predetermined time while the head assembly stays on a single recording track, and returning back to said first control step when the counter does not count the predetermined time;

a third control step following said second step when the counter has counted the predetermined number, of moving the head assembly from a present recording track to a servo track in an associated region and placing the head assembly at a proper position in the servo track, said head assembly being thereafter moved back to the original recording track and placed at the fine track position therein according to information about the positional fixture in the servo track, said third control step subsequently returning to said first control step;

a fourth control step following said first control step in presence of said step signal of confirming whether a predetermined time is counted or not by a counter associated with a servo track in a predetermined region associated with a recording track corresponding to the step number of the step signal;

a fifth control step following said fourth control step when the predetermined time is counted, of moving the head to a servo track associated with a recording track corresponding to the step signal and placing the head at a proper position of the servo track before moving the head to the recording track, said driving means of the head assembly being subsequently activated to move the head assembly to the recording track corresponding to the step signal and place it at the fine track position of the recording track according to information about the positional fixture in the servo track; and

a sixth control step following said fourth control step when the counter does not count the predetermined time, of moving the head assembly directly to the recording track corresponding to the step signal and subsequently returning to said first control step.

4,819,096

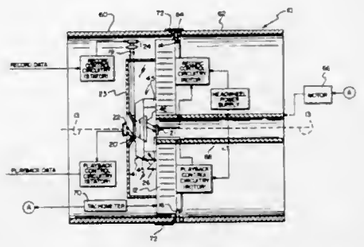
ROTARY HEAD SCANNER INCLUDING ANAMORPHIC BEAM-SHAPING APPARATUS IN AN OPTICAL SIGNAL-TRANSMISSION CHANNEL

Frederic F. Grant, Bellflower, and John P. Grant, Downey, both of Calif., assignors to Datatape Incorporated, Pasedena, Calif.

Continuation-in-part of Ser. No. 922,240, Oct. 23, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 211,933

Int. Cl.[4] G11B *5/52*

U.S. Cl. 360—108 **4 Claims**



1. In rotary scanner apparatus including magnetic transducer means on the periphery of a rotatable headwheel having a central axis of rotation, and means for coupling a record or playback signal to or from, respectively, said transducer means by obliquely projecting a beam of information-bearing light from an off-axis light source onto the light-sensitive surface of a photodetector on the axis of said headwheel, the improvement wherein:

said rotary scanner apparatus further includes optical apparatus, interposed between said light source and said photodetector and arranged to rotate in synchronism with said headwheel, having an optical characteristic for anamorphic beam shaping, to cause the size and shape of the cross section of the light beam, at a plane of incidence coinciding with said photodetector, to correspond substantially to the size and shape of the light-sensitive surface of said photodetector, said optical apparatus further having a conical light-reflective portion defining a surface of revolution centered about the central axis of rotation, in intersecting relationship with an optical path along which the information-bearing beam of light is projected, at an angle to deflect incident light onto the light-sensitive surface of said photodetector.

4,819,097

AUDIO SIGNAL RECORDING/REPRODUCING SYSTEM FOR USE IN TIME-LAPSE VIDEO TAPE RECORDER

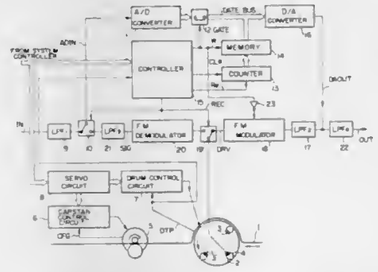
Nobuo Azuma; Masaru Takahashi, both of Yokohama; Akira Shibata, and Katsumi Mikamo, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 10, 1988, Ser. No. 192,170

Claims priority, application Japan, May 13, 1987, 62-114559; May 13, 1987, 62-114560; May 15, 1987, 62-116812; May 15, 1987, 62-116813

Int. Cl.[4] H04N *5/782, 5/91*

U.S. Cl. 360—35.1 **26 Claims**



1. An audio signal recording/reproducing system used in a time-lapse video tape recording device having driving means for shifting and stopping a magnetic tape at a predetermined period; a rotary drum on which the magnetic tape is mounted; first rotary magnetic head means arranged on the rotary drum, when the magnetic tape mounted on the rotary drum is being stopped, for recording a video signal on the magnetic tape to form video signal recording tracks thereon and for detecting the video signal from the video signal recording tracks; and a video signal recording/reproducing circuit, connected with the first rotary magnetic head, for sending the video signal to the first rotary magnetic head means and receiving the video signal detected by the first rotary magnetic head means therefrom, said audio signal recording/reproducing system comprising:

(a) analog-to-digital (A/D) converter circuit for receiving an audio signal and converting it into a digital audio signal;

(b) memory means, connected with said A/D converter circuit, for storing the digital audio signal supplied from the A/D converter circuit by a first clock signal having a first predetermined frequency and reading out the stored digital audio signal by a second clock signal having a higher frequency than the first frequency so as to produce a time-compressed audio signal;

(c) a digital-to-analog (D/A) converter circuit, connected with said memory means, for converting the time-compressed audio signal supplied from the memory means into a time-compressed analog audio signal;

(d) a second rotary magnetic head arranged on said rotary drum for recording, when the magnetic tape is being

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stopped, the time-compressed analog audio signal on the magnetic tape to form audio signal recording tracks in parallel to said video signal recording tracks, said second rotary magnetic head having a gap with a different azimuth angle from that of a gap of said first rotary magnetic head means; and

(e) a controller circuit connected with said memory means for supplying said first and second clock signal to the memory means.

4,819,098

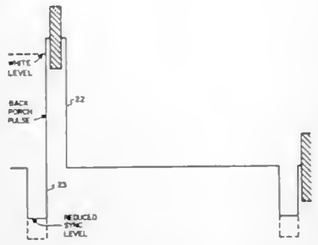
METHOD AND APPARATUS FOR CLUSTERING MODIFICATIONS MADE TO A VIDEO SIGNAL TO INHIBIT THE MAKING OF ACCEPTABLE VIDEOTAPE RECORDINGS

John O. Ryan, Cupertino, Calif., assignor to Macrovision Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 935,055, Nov. 21, 1986, which is a continuation of Ser. No. 554,697, Nov. 23, 1983, abandoned. This application Apr. 14, 1987, Ser. No. 38,163

Int. Cl.[4] H04N *5/782, 9/79*

U.S. Cl. 360—37.1 **13 Claims**



1. A method for processing a video signal so as to inhibit the making of acceptable videotape recordings therefrom while the same is capable of producing a substantially normal picture on a television monitor/receiver, wherein the video signal has sync pulses followed by back porch intervals, comprising the step of significantly raising the voltage amplitudes of a portion of the back porch intervals following the trailing edges of a substantial number of sync pulses in a cluster thereof.

4,819,099

APPARATUS FOR LONGITUDINAL BIDIRECTIONAL RECORDING WITH EQUAL LENGTH TRACKS

Etsuro Saito, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,413

Claims priority, application Japan, Jan. 16, 1986, 61-6691

Int. Cl.[4] G11B *5/52, 15/14, 21/04*

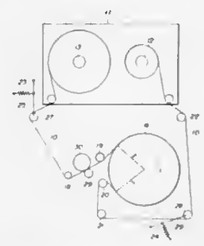
U.S. Cl. 360—84 **32 Claims**

1. A parallel scanning video tape recording and/or reproducing apparatus for a magnetic tape, comprising:

a rotary head drum carrying an azimuth-pair-head constituted of first and second magnetic heads, said first magnetic head being formed with a first gap and said second magnetic head being formed with a second gap with an azimuth angle different from that of said first gap, said first and second magnetic heads being cooperative in forming a single longitudinally extending track on a magnetic tape in one cycle of reording operation, said track having a first section formed by means of said first magnetic head and having a first azimuth pattern and a second section formed by means of said second magnetic head and having a second azimuth pattern which is different from said first azimuth pattern of said first section;

means for guiding said magnetic tape onto said rotary head drum for recording and reproduction, said guiding means wrapping said magnetic tape on the periphery of said rotary head drum so that the longitudinal axis of said magnetic tape lies perpendicular to the rotation axis of said rotary head drum and that said magnetic tape mates with the periphery of said rotary head drum in a predetermined angular range;

means, cooperating with said azimuth-pair-head, for shifting said azimuth-pair-head in a direction parallel to said rotation axis of said rotary head drum for switching scanning tracks of said azimuth-pair-head; and



adjusting means which, when said apparatus performs recording and reproducing both in forward and reverse driving of said magnetic tape, adjusts a scanning angular range over which said azimuth-pair-head scans the magnetic tape in response to the driving direction of said tape to form longitudinal tracks of equal longitudinal length both in forward recording and reverse recording.

4,819,100

FLOATING HEAD SLIDER DEVICE FOR MAGNETIC DISK APPARATUS

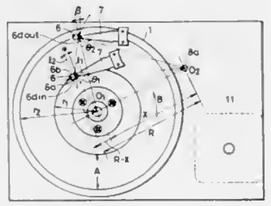
Isao Asano, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 7, 1987, Ser. No. 83,798

Claims priority, application Japan, Sep. 24, 1986, 60-223873; Apr. 14, 1987, 61-89836

Int. Cl.[4] G11B *5/55, 17/32*

U.S. Cl. 360—97.01 **7 Claims**



1. In a magnetic disk apparatus having a magnetic disk with a recording region provided thereon within a predetermined width in a radial direction, a magnetic head with a gap provided at an air outflow edge side and provided with a slider formed integral therewith, a swing arm for supporting the magnetic head for swinging virtually in parallel with the surface of the magnetic disk, said slider having a main axis which is perpendicular to an air inflow edge of said slider, a pivot for pivotally supporting the swing arm, swing drive means for swingingly driving the swing arm, rotational drive means for rotationally driving the magnetic disk about its center, a housing for housing the magnetic disk, magnetic head, and swing drive means for the swing arm in a hermetically sealed condition, an air filter to remove dust within the housing, and drive

power supply means for supplying drive currents to the swing drive means and rotational drive means, the slider being floated as a result of high speed rotation of the magnetic disk by the rotational drive means, so that data is read and written on the recording region, wherein the length of said swing arm and the position of said pivot are such that the distance between the pivot and the center of the magnetic disk and the distance between the pivot and the intersection of the main axis of the slider and the air inflow edge are such that the magnitudes of an angle between a line connecting the pivot and the intersection of the main axis of the slider and the air inflow edge and a line connecting the center of rotation of the magnetic disk and the intersection of the main axis of the slider and the air inflow edge at the time when the magnetic head is located at the innermost circumferential portion of the recording region and at the time when the magnetic head is located at the outermost circumferential portion are substantially the same.

4,819,101

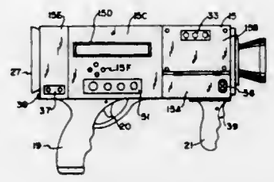
PORTABLE TELEVISION CAMERA AND RECORDING UNIT

Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation of Ser. No. 516,532, Jul. 25, 1983, Pat. No. 4,604,668, and a continuation of Ser. No. 209,057, Nov. 21, 1980, abandoned. This application Jun. 23, 1986, Ser. No. 877,319

Int. Cl.[4] H04N *5/783*

U.S. Cl. 360—10.1 **22 Claims**



1. A portable television camera, recorder and playback unit comprising in combination:

(a) a housing,

(b) a television camera supported within said housing and having an input for light derived from image fields to be scanned by said camera, which input is located at the front end of said camera,

(c) means secured to said housing permitting hand holding and directing said housing such that said input to said camera may be directed by a person whose hand is supporting said housing by engagement with said hand gripping means to aim said housing to permit said television camera to scan a select portion of the image field in front of said housing,

(d) said television camera having a video signal output and means for operating said camera to cause it to full-frame scan the image field presented to said input to said camera and to generate full-frame video picture signals of the image information received, on said output,

(e) first control means including a first manually operated switch for causing said television camera to full-frame scan the image field presented to said camera when said first switch is closed, said first switch being accessible to the hand of a person holding said camera with said hand gripping means,

(f) a video monitor supported by said housing and including a viewing screen which is viewable by a person holding said hand gripping means and operatively directing said housing while operating said camera to scan the image field presented to said camera when so operatively directed,

(g) second manually operable control means including switching means for selectively connecting said monitor with said video signal output of said camera,

(h) a video recorder and reproduction unit supported within said housing immediately adjacent said television camera and a magazine containing a magnetic record member operatively and removably retainable in said recorder and reproduction unit,

(i) said video recorder and reproduction unit having a recording transducing means for recording video signals output by said television camera on said magnetic record member and reproduction transducing means for reproducing video signal recordings from said magnetic record member,

(j) third manually operable control means supported by said housing for controlling said video recorder to record and selectively play back information recorded on said magnetic record member,

(k) fourth manually operable control means supported by said housing for selectively connecting said monitor to either the output of said television camera or the output of said video recorder to permit said monitor to display picture information derived directly from said camera or from said reproduction transducing means of said video recorder.

4,819,102

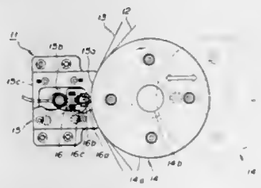
MAGNETIC TAPE TRANSFER PRINTING APPARATUS

Toshio Shirai, Kanagawa; Makoto Ando, Tokyo; Keisuke Uano, Tokyo, and Toshiharu Kobayashi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,304

Int. Cl.[4] G11B *5/86*

U.S. Cl. 360—17 **16 Claims**



1. A magnetic tape transfer printing apparatus comprising:

a drum mounted for rotation in said transfer printing apparatus, said drum having a circumferential surface;

means for holding a master magnetic tape having information recorded therein in direct contact with a slave magnetic tape on a portion of said drum circumferential surface;

means for generating a magnetic transfer bias field to transfer the information from said master magnetic tape onto said slave magnetic tape at said portion of said drum circumferential surface;

means for rotating said drum to transport said master and slave magnetic tape in unison; and

said drum being made of a high-permeability magnetic material at least for said circumferential surface;

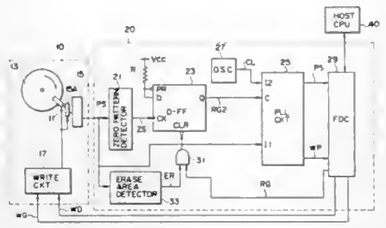
where the magnetic transfer bias field acting on said master magnetic tape to transfer the information from said master magnetic tape onto said slave magnetic tape has an increased vertical component and a decreased lateral component.

4,819,103

APPARATUS FOR REPRODUCING DATA FROM MAGNETIC RECORDING MEDIUM

Hiroshi Okamura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1987, Ser. No. 126,633
Claims priority, application Japan, Nov. 29, 1986, 61-284541
Int. Cl.[4] G11B *5/09, 5/03*
U.S. Cl. 360—51 **11 Claims**



1. A data reproduction apparatus for reading out information recorded on a recording medium, said apparatus comprising:

a magnetic disk drive means, having a pre-erase type magnetic head for reading out information from a magnetic recording medium, for outputting read data, which is a pulse signal, in accordance with information read by said magnetic head;

a phase locked loop (PLL) circuit means, coupled to said magnetic disk drive means, for receiving said read data and oscillating in synchronism with said read data so as to output window pulses;

read means, coupled to said PLL circuit means, for reading out data recorded in said magnetic recording medium upon reception of said window pulses from said PLL circuit means;

sync detecting means, coupled to said magnetic disk drive means and said PLL circuit means, for detecting sync data constituted by predetermined pattern data, based on said read data and then permits said PLL circuit means to oscillate in synchronism with said read data; and

inhibition means, coupled to said magnetic disk drive means and said PLL circuit means, for detecting an erased area upon reception of said read data and inhibiting oscillation of said PLL circuit means in synchronism with said read data while detecting said erased area, said erased area being an area which has been erased by an erase head of said pre-erase type magnetic head and in which no information is written by a read/write head of said pre-erase type magnetic head.

4,819,104

DISK PACK DRIVE WITH ELECTRIC MOTOR HAVING SINTERED PERMANENT MAGNETS

Albert Dierkes, Planegg; Joachim Gilly; Ernst Grecksch, both of Estenfeld, and Friedrich Schellenberger, Hammelburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

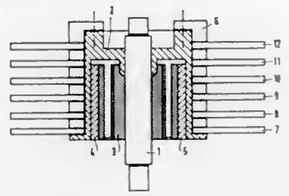
Filed Sep. 18, 1986, Ser. No. 909,218
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534852
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—98.01 **5 Claims**

1. A disk pack drive comprising:

a hub defining a disk pack drive space;

a plurality of memory disks disposed on said hub; and

an electric motor disposed in said disk pack drive space and including an external rotor comprising a plurality of sintered ferrite magnets mounted on said hub, and a shaft, said sintered ferrite magnets being sealed by surface metallization for protecting said memory disks from contamination by particles from said magnets.

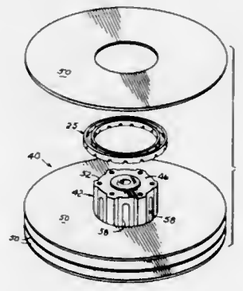


4,819,105

SPACER FOR DISKS IN A DISK DRIVE

William J. Edwards, 1404 N. McMillan, Oklahoma City, Okla. 73127

Filed Oct. 26, 1987, Ser. No. 112,198
Int. Cl.[4] G11B *5/016*
U.S. Cl. 360—98.08 **9 Claims**



1. In a disk drive having a plurality of spaced disks surrounding a driven hub for angularly rotating the disks as a unit, the improvement comprising:

spacer means including a ring, U-shaped in cross section in the radial direction, surrounding the hub and interposed between adjacent disks,

the U-shape of said ring being defined by a substantially planar bight portion and parallel legs extending equidistant from respective lateral limits of the bight portion and further including a row of circumferentially spaced-apart apertures at the intersection of the respective leg of the U-shape with the bight portion for forming a series of transverse fluid passageways through the ring.

4,819,106

HEAD POSITIONING ASSEMBLY FOR MAGNETIC DISC APPARATUS

Takaharu Ueda; Takashi Yamura; Kiyosi Funai, and Tetsu Yamamoto, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

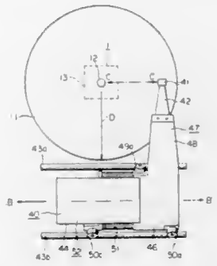
Filed Jan. 15, 1987, Ser. No. 3,418
Claims priority, application Japan, Jan. 16, 1986, 61-8280
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—106 **3 Claims**

1. A magnetic read-and-write head positioning assembly of a magnetic disc apparatus including a magnetic disc rotatable about its center, the positioning assembly comprising:

a guide rail extending parallel to a tangent to an edge of the disc and located adjacent the edge of the disc at a radius extending in a first radial direction from the center of the disc;

a carriage mounted on said guide rail for movement therealong, one side of said carriage being movable along a path tangent to the edge of the disc;

supporting means extending from said one side of said carriage perpendicularly to said guide rail and directly over a face of the disc for supporting the magnetic read-and-write head over the face of the disc, the magnetic read-and-write head being movable by said carriage in a path parallel to the path of carriage movement and perpendicular to said supporting means and intersecting the center of the disc; and



driving means including a voice coil mounted on said guide rail adjacent the edge of the disc and positioning means provided on said carriage and cooperating with said voice coil for producing a driving force to position said carriage along said guide rail;

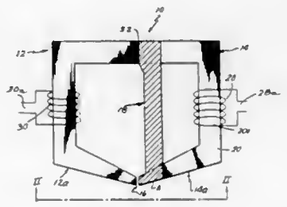
said guide rail, said carriage, and said driving means being disposed at the edge of the disc substantially totally enclosed within a region (a) aligned with the disc in the first radial direction thereof, (b) bounded on two ends by parallel lines which are tangent to opposite edges of the disc and extend perpendicularly to said guide rail, and (c) bounded on two sides by parallel lines one of which is tangent to the edge of the disc and extends parallel to said guide rail and the other of which is spaced outwardly from the edge of the disc.

4,819,107

MAGNETIC TRANSDUCER HEAD STRUCTURE

Michael L. Bolt, Ann Arbor, Mich., assignor to Irwin Magnetic Systems, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 645,436, Aug. 29, 1984, abandoned. This application Oct. 6, 1986, Ser. No. 915,734
Int. Cl.[4] G11B *5/265*
U.S. Cl. 360—121 **5 Claims**



1. A magnetic core structure for a transducer head particularly adapted for use in digital data storage devices, comprising:

a magnetic circuit formed by magnetic core elements, said circuit having at least one gap defined by two (2) opposing sides where magnetic flux in such circuit may access magnetically-recordable data storage media;

means forming a first magnetic pole structure for said circuit and defining one side of said gap, and means forming a second magnetic pole structure for said circuit and defining the other side of said gap, generally opposite said first pole structure;

at least one of said magnetic pole structures having a laminar structure comprising at least one medial strata and at least one flanking strata, each comprising magnetic material and having a predetermined magnetic reluctance;

said flanking strata being disposed adjacent to and overlying at least portions of said medial strata to thereby define an included area of overlap whose size is determined by the length and width of that portion of the flanking strata overlying said medial strata, said medial strata having a thickness at said gap measured in a direction along said gap which is less than the thickness of the other pole structure disposed across said gap;

isolation means comprising at least one layer of non-magnetic material disposed between said medial strata and said flanking strata at said one pole structure, for magnetically isolating at least said portions of said medial strata from the adjacent portions of the flanking strata;

said flanking strata serving to magnetically shunt portions of said magnetic circuit formed by said medial strata by extending alongside and into magnetic communication with said medial strata at a point along said magnetic circuit which is spaced from said one pole structure in the direction of said other pole structure, to thereby provide a parallel magnetic return;

said isolation means layer being thin in relation to said flanking strata wherein the ratio of the thicknesses of said medial strata, said flanking strata, and said isolation layer at said area of overlap is on the order of about 10:4:1; and

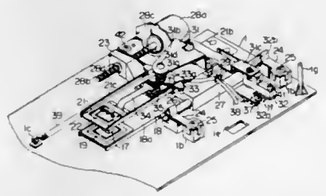
said included area of overlap between said medial strata and said flanking strata at said pole structure being limited in size to a total area which makes the effective magnetic reluctance of said isolation layer to be sufficiently large with respect to that of said flanking strata to limit the transfer of magnetic flux from the flanking strata to the medial strata across the non-magnetic isolation means at said area to less than about ten percent of the total magnetic flux in said magnetic circuit.

4,819,108

APPARATUS FOR POSITIONING MAGNETIC HEAD

Gen Seki, and Seiichi Hayashi, both of Mito, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 724,768, Apr. 18, 1985, abandoned. This application Apr. 5, 1988, Ser. No. 178,884
Claims priority, application Japan, Apr. 20, 1984, 59-78539; Jan. 18, 1985, 60-8063
Int. Cl.[4] G11B *3/10, 3/34, 3/36*
U.S. Cl. 360—104 **17 Claims**



1. A magnetic head position apparatus for a magnetic disk comprising:

a magnetic head;

a head support at which said magnetic head is mounted, said

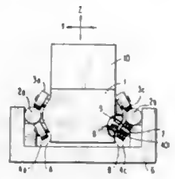
head support extending in a radial direction of the magnetic disk;
means for carrying said head support;
a guide member at which said carrying means is movably mounted;
a chassis at which said guide member is mounted; and
driving means mounted on said chassis, wherein said head support is made of metal, said carrying means is made separately from said head support, and said driving means is coupled to said head support so as to move said magnetic head through driving of said head support by said driving means while making said carrying means follow therewith along said guide member, whereby said magnetic head is accurately positioned without direct influence of said carrying means in a direction of movement of said magnetic head.

4,819,109

SLIDABLE CARRIAGE MOUNT FOR DISC MEMORY APPARATUS

Sadao Okada; Tetsu Yamamoto, and Takashi Yumura, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,373
Claims priority, application Japan, Jul. 27, 1985, 60-166521
Int. Cl.⁴ G11B *5/55, 21/08*
U.S. Cl. 360—106 **7 Claims**



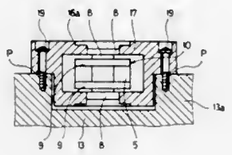
1. A slidable transducer carriage mounting arrangement for a disk memory apparatus, comprising:
(a) a pair of spaced parallel guide rails (*2a, 2b*),
(b) an elongate transducer carriage (**1**) disposed between the rails and having two opposite sides extending in the direction of said rails and two opposite ends connecting said sides,
(c) two pairs of mutually and differently inclined bearing rollers (*3a, 4a; 3b, 4b*) having shafts fixedly mounted to one side of the carriage proximate said opposite ends thereof, the rollers of each pair riding on one of the rails (*2a*) along angularly displaced lines of contact, and
(d) a further pair of mutually and differently inclined bearing rollers (*3c, 4c*), a first roller (*3c*) of said further pair having a shaft fixedly mounted to another, opposite side of the carriage intermediate said ends thereof and riding on another of the rails (*2b*) along a first line of contact, and a second roller (*4c*) of said further pair having a shaft (**7**) resiliently mounted to said opposite side of the carriage intermediate said ends thereof, and below and opposite said first roller, by an elastic member (**9**) concentrically surrounding an inner end of said second roller shaft and disposed in an aperture (**8**) in said another, opposite side of the carriage, said second roller riding on said another rail along a second line of contact angularly displaced from said first line, said second roller being disposed such that it does not bear any of the carriage weight and being urged against said another rail by the elastic member to thereby maintain all of the rollers in stable and continuous positional engagement with their associated rails when the carriage is subjected to rapid accelerations and decelerations.

4,819,110

DISK DRIVE HEAD ACTUATOR AND MOUNTING ARRANGEMENT THEREFOR

Kiyoshi Funai; Tetsu Yamamoto; Nobuaki Maeda; Hiroshi Imai, and Kouichi Yoshioka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1986, Ser. No. 924,628
Claims priority, application Japan, Nov. 18, 1985, 60-259086; Mar. 11, 1986, 61-55457
Int. Cl.⁴ G11B *3/06, 5/48*
U.S. Cl. 360—106 **7 Claims**



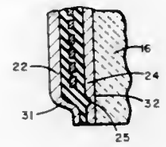
1. A head actuator for a disk drive, comprising:
(a) a base portion having an upward facing support surface;
(b) shaft means projecting upwardly from the support surface of the base portion for rotatably supporting (1) at least one arm carrying a head means adapted to be positioned on a magnetic disk for writing and reading data and (2) a coil mounted to said shaft means;
(c) housing means mounted to the base portion for rotatably supporting said shaft means to enable movement of the arm and said head means and said coil in relation to the base portion and housing means, said housing means including a yoke of integral unitary construction therewith and magnet means connected with the yoke for inducing magnetic flux within the yoke and coil;
said shaft means and said at least one arm and said head means and coil having a center of gravity spaced above the support surface and constituting a movable component tending to induce vibration within said head actuator;
said base portion including projection means extending upwardly from the support surface to define a mounting surface contacting the housing means to provide support for the housing means in substantially a plane of support extending substantially through said center of gravity in a direction substantially parallel to said at least one arm;
(d) means for fastening the base portion to the housing means;
whereby mounting and fastening of said housing means to the base portion along said plane of support increases a resonance frequency of a first resonance point of said head actuator to minimize vibration during operation of the movable component in relation to mounting and fastening of said housing means to the base portion in a plane other than said plane of support, wherein said projection means is of integral unitary construction with the base portion and includes a plurality of projections extending upwardly from the base portion to define a plurality of said mounting surfaces lying substantially in said plane of support, and wherein said housing means has a peripheral portion having a downward facing step adapted to overlie and contact said mounting surfaces; and said fastening means includes screw means extending through said peripheral portion into the projections through said mounting surfaces.

4,819,111

THIN FILM HEAD WITH REDUCED CROSS SECTION IN THE CORE FOR CAUSING MAGNETIC SATURATION IN THE LEADING LEG'S THROAT AREA

Beat G. Keel, Prior Lake, Minn.; Tuan P. Tran, Goleta, Calif.; Gene P. Bonnie, Bloomington, and Edward L. Schwarz, Minneapolis, both of Minn., assignors to Magnetic Peripheral Inc., Bloomington, Minn.

Filed Aug. 29, 1986, Ser. No. 902,359
Int. Cl.⁴ G11B *5/127*
U.S. Cl. 360—125 **7 Claims**



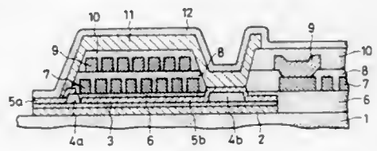
1. A thin film magnetic recording head having a high permeability magnetic flux path and a flux gap in the flux path, for recording and reading data in the vicinity of the flux gap in the magnetic flux path of the head, said data encoded in magnetic patterns in a magnetic recording medium to be moved relative to the gap, said head of the type to be carried on the trailing end surface of a flyer with respect to the medium movement and suspended adjacent the medium with the flux gap in magnetic coupling relationship with the medium surface, said flux gap defined by leading and trailing poles at the ends of leading and trailing flux legs respectively which are mounted on the trailing end surface of the flyer and which form at least a part of the flux path, each flux leg having a throat section adjacent said flux gap, and each said pole having a tip at the end thereof and said head further having a winding encircling said flux path remotely from the flux gap by which winding, recording and reading of data is accomplished, wherein the invention comprises in the leading leg throat section adjacent the flux gap a minimum cross-sectional area smaller than any other cross-sectional area in the head's flux path, whereby magnetic saturation of the flux path is limited to this minimum cross-sectional area in the throat section of the leading leg to thereby prevent during recording magnetic saturation in the trailing leg throat section.

4,819,112

THIN FILM MAGNETIC HEAD

Tetsuya Iwata, and Tatsuya Saito, both of Nagaoka, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Oct. 20, 1987, Ser. No. 111,552
Claims priority, application Japan, Jan. 6, 1987, 62-476
Int. Cl.⁴ G11B *5/147*
U.S. Cl. 360—126 **3 Claims**



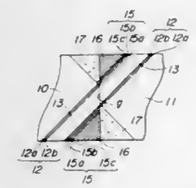
1. A thin film magnetic head fabricated in accordance with a thin film manufacturing method comprising:
a front end of an upper core layer formed on a magnetic gap layer, and
a rear end of the upper core layer formed on an interlayer insulating layer for insulating a conductor coil layer to be coupled with the front end of the upper core layer.

4,819,113

MAGNETIC TRANSDUCER HEAD WITH INCLINED MAGNETIC GAP

Makoto Kubota; Tatauo Kumura; Junichi Saito; Tomio Kobayashi, and Heikichi Sato, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 19, 1985, Ser. No. 713,637
Claims priority, application Japan, Mar. 29, 1984, 59-61852; Jun. 18, 1984, 59-124805; Jan. 26, 1985, 60-13132
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.⁴ G11B *5/187, 5/147*
U.S. Cl. 360—126 **58 Claims**



1. A magnetic transducer head for cooperating with a recording or reproducing track on a magnetic medium comprising:
a first magnetic core element, and a second magnetic core element,
each of said first and second core elements comprising a magnetic ferrite block, a magnetic metal thin film integrated with said magnetic ferrite block, and a non-magnetic thin film having a hardness greater than the hardness of said magnetic film, interposed between said magnetic ferrite block and said magnetic metal thin film,
each of said first and second core elements having a first planar surface and a second planar surface portion adjacent to said first planar surface,
said magnetic metal thin film on said first core element being provided on said second planar surface portion of said first core element and facing an edge thereof to said first planar surface of said first core element, said second planar surface portion of said first core element being slanted with respect to said first planar surface of said first core element,
said magnetic metal thin film on said second core element being provided on said second planar surface portion of said second core element and facing an edge thereof to said first planar surface of said second core element, said second planar surface portion of said second core element being slanted with respect to said first planar surface of said second core element,
said first and second core elements being bonded together along a bonding plane parallel to their said first surfaces, in such manner that an operating magnetic gap is formed between said edge of said magnetic metal thin film on said first core element and said edge of said magnetic metal thin film on said second core element, said track extending across said magnetic gap in a direction transverse to said bonding plane, said magnetic metal thin film on said first core element and said magnetic thin film on said second core element are in one common plane and forming a track width of said operating magnetic gap larger than the thickness of said magnetic metal thin film, and a common contact surface facing a travelling magnetic recording medium is formed by said first and second core elements, said metal thin film on said first core element defining a first notch with said first planar surface of said second

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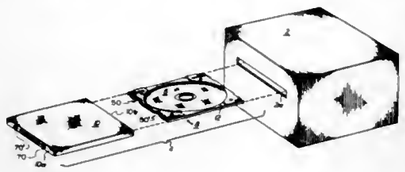
core element, and said metal thin film on said second core element defining a second notch with said first planar surface of said first core element, said first and second notches being filled with non-magnetic material and defining the width of said operating magnetic gap.

4,819,114

WRITE-PROTECTED DATA STORAGE DISK ASSEMBLY

Charles J. Bernitt, King of Prussia, Pa., and Paul J. Mon, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 16, 1987, Ser. No. 133,689
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **4 Claims**



1. A data storage disk assembly comprising a data storage disk having a surface on which data is selectively recordable, said assembly comprising:

(a) a disk carrier comprising a frame for releasably supporting a data storage disk, and a write-protect member movably mounted on said frame for movement between first and second positions, said write-protect member cooperating with a sensor to enable data writing on said disk when said member is in said first position, and to inhibit data writing on said disk when said member is in said second position; and

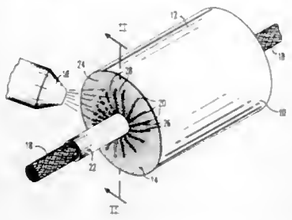
(b) a box-like caddy for protectively containing a disk carrier and a disk supported by said carrier frame, said caddy having a write-protect status indicator movably mounted thereon, said indicator being movable between first and second positions by the write-protect member of a carrier entering said container to reflect the write-protect status of a disk supported by such carrier, said indicator being manually movable to control the position of such write-protect member after the carrier is contained by said caddy.

4,819,115

END CONNECTIONS FOR WOUND CAPACITORS AND METHODS OF MAKING THE SAME

James T. Mitchell, American Township; Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1988, Ser. No. 149,262
Int. Cl.[4] H01G *1/14, 7/00*; H01R *4/00*
U.S. Cl. 361—308 **4 Claims**



3. An end connection on a wound capacitor, comprising:

a first layer of metal on one end of a capacitor winding;

a stranded conductor, having a plurality of strands, positioned adjacent to said first layer of metal, such that portions of said strands lie along a surface of said first layer and are spaced from each other; and

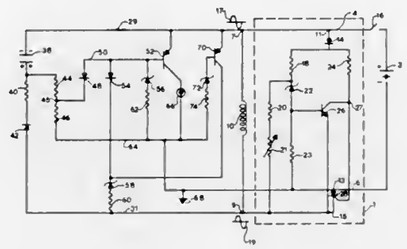
a second layer of metal on said first layer of metal, said second layer covering said portions of said strands and making mechanical and electrical contact with said first layer along edges of said strands and between said strands, thereby mechanically and electrically connecting said strands to said first layer.

4,819,116

FAULT INDICATOR LIGHT CONTROL CIRCUIT

Michael J. Piteo, Enfield, Conn., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Aug. 31, 1988, Ser. No. 238,766
Int. Cl.[4] H02H *9/00*
U.S. Cl. 361—18 **5 Claims**



1. Fault indicator light control circuit for use in combination with a voltage regulator having a silicon-controlled rectifier (SCR) for an alternator/battery charging system, comprising means for connecting the circuit to sense the operation of the alternator, the regulator and the battery voltage, the battery being charged by alternator pulses of one polarity, a capacitor connected to be charged by alternator pulses of opposite polarity to that which charges the battery to establish a reference voltage, a first transistor having its emitter-collector conductive path connected across the terminals of said battery and its base emitter electrodes connected across the capacitor to bias said transistor to its non-conductive state, a light bulb in series with the collector of said transistor to be turned "ON" when the transistor is in its conductive mode, a plurality of conductive paths connected to the base of said transistor and including voltage responsive means to render said transistor conductive and thereby turn "ON" said light bulb, said voltage responsive means being connected to sense any of a plurality of circuit operating defects including a short in said SCR, an open SCR and regulator failure whereby any such operating failure will be indicated by illumination of said light bulb.

4,819,117

METHOD AND APPARATUS FOR DETECTING EXCESSIVE CURRENT DRAW IN AN ELECTRICAL LOAD

Daniel G. Brennan, Farmington Hills; Mark J. Gutwald, Rochester, and Leonard J. Miller, Hartland, all of Mich., assignors to TRW Inc., Lyndhurst, Ohio

Filed Aug. 25, 1987, Ser. No. 89,218
Int. Cl.[4] H02H *3/05*
U.S. Cl. 361—18 **19 Claims**

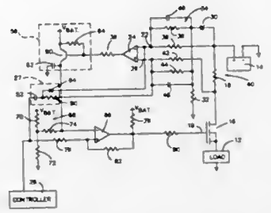
1. An apparatus for sensing excessive current in an electrical load comprising:

means for providing an actuating signal;

means for connecting or disconnecting the electrical load to a source of electrical energy in response to said actuating signal;

means providing a load sense signal at a terminal, said load sense signal having a value indicative of the value of electrical current through the load;

means for modifying said load sense signal in response to said actuating signal to offset an initial change in the value of said load sense signal when the electrical load is first connected to the source of electrical energy said means for modifying includes means for temporarily coupling said actuating signal to said load sense signal at said terminal;



means for providing a reference signal having a predetermined value; and

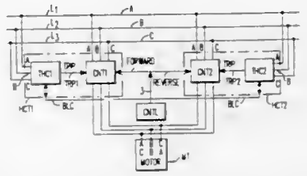
means for comparing the modified load sense signal against said reference signal and for generating a first signal when the reference signal is greater than the modified load sense signal and a second signal when the reference signal is less than the modified load sense signal, one of the signals generated by the comparing means being indicative of excessive current draw by the electrical load.

4,819,118

ELECTROMAGNETIC CONTACTOR TANDEM CONTROL SYSTEM FOR THERMAL PROTECTION OF A BIDIRECTIONAL MOTOR DRIVE

Denis A. Mueller, Asheville, N.C., and Gary F. Saletta, Penn Township, Westmoreland County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 2, 1988, Ser. No. 201,237
Int. Cl.[4] H02H *5/04*
U.S. Cl. 361—25 **7 Claims**



1. In a thermal protection electromagnetic control system for a bidirectional AC motor drive, including first and second contactors respectively associated with opposite directions of rotation of an AC motor supplied with AC power through said contactors, one contactor being inactive to pass AC power to the motor when the other is active to pass power to the motor; the combination of:

a thermal image generator and a protection control unit being associated with one contactor;

another thermal image generator and another protection control unit being associated with the other contactor;

each thermal image generator being responsive to a signal representative of the AC line current supplied to the motor by the associated contactor for generating a motor thermal status representative signal and the corresponding protection control unit being responsive to said status representative signal and to a limit signal for tripping the associated contactor when said limit signal is exceeded by said status representative signal; and

bidirectional communication line means interconnecting opposite protection control units for transferring the status representative signal derived from the thermal image generator of one contactor at one end to the thermal image generator of the other contactor at the other end;

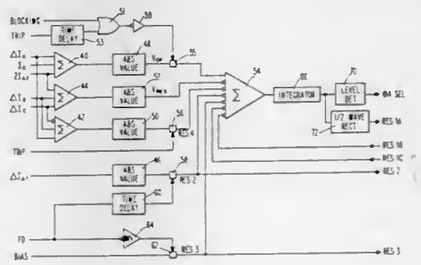
the protection control unit of an active contactor being responsive to the motor thermal status representative signal of the last active contactor and to the thermal status representative signal of the last inactive contactor upon a reversal of direction of the motor.

4,819,119

FAULTED PHASE SELECTOR FOR SINGLE POLE TRIPPING AND RECLOSING SCHEMES

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Nov. 12, 1987, Ser. No. 120,090
Int. Cl.[4] H02H *3/353*
U.S. Cl. 361—76 **9 Claims**



1. A phase selector including means for identifying a faulted phase within a protected zone of a three phase alternating current electrical power distribution system, said faulted phase identifying means comprising, for each of said three phases:

(a) means for generating an operate signal comprising the phasor sum of:

(i) a signal related to a fault component of current flowing in an associated phase;

(ii) a signal related to a negative sequence component of current flowing in said associated phase; and

(iii) a signal related to a zero sequence component of current flowing in said associated phase;

(b) means for generating at least one restraint signal comprising the phasor sum of:

(i) a signal related to a fault component of current flowing in one of the two other phases of said three phase power distribution system;

(ii) a signal related to a fault component of current flowing in the other of the two other phases of said three phase power distribution system; and

(iii) said signal related to the negative sequence component of current flowing in said associated phase; and

(c) means for generating a net operate signal when the magnitude of said operate signal exceeds the magnitude of the sum of said at least one restraint signal.

4,819,120

IMPEDANCE ARRANGEMENT FOR LIMITING TRANSIENTS

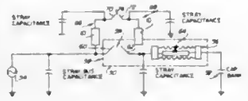
Raymond P. O'Leary, Evanston, Ill., assignor to S&C Electric Company, Chicago, Ill.

Continuation-in-part of Ser. No. 890,425, Jun. 24, 1986, Pat. No. 4,695,918. This application May 18, 1987, Ser. No. 53,428

Int. Cl.[4] H02H *9/00*

U.S. Cl. 361—58 **20 Claims**





1. An impedance arrangement for use in a high-voltage circuit, the impedance arrangement comprising a first winding having a first predetermined inductance and a second winding connected in parallel with said first winding, said second winding having a second predetermined inductance and a second predetermined resistance, said second winding being wound with respect to said first winding in an opposite sense to said first winding and so as to define a predetermined mutual inductance between said first and second inductances, said second predetermined resistance being determined to have an impedance that is at least 10 times the reactance of said first inductance at a first predetermined frequency.

4,819,121

SECURITY APPARATUS FOR POWER CONVERTER

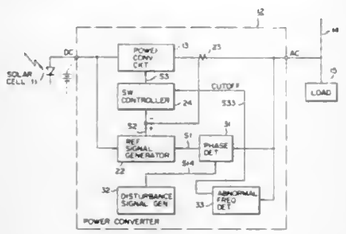
Suzuo Saito, and Shigetoshi Higaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 906,494, Sep. 12, 1986, abandoned. This application Nov. 19, 1987, Ser. No. 124,387

Claims priority, application Japan, Sep. 20, 1985, 60-207925

Int. Cl.[4] H02H *3/26*

U.S. Cl. 361—85 **7 Claims**



1. A security apparatus for a power converter, comprising:
power converting means including a DC power source and at least one power converter for converting DC power from said DC power source into an AC power output applied to an AC system; and
security means for stopping operation of said power converter in the event of an abnormal state of said AC system, comprising,
disturbance generator means for periodically generating a disturbance signal;
phase detector means for detecting the phase of a voltage or current of said AC system, and providing a phase detection signal based on the detected phase of the voltage or current of said AC system and on said disturbance signal;
control means for controlling an output of said power converting means in accordance with said phase detection signal, and
state detector means for detecting whether or not the phase or frequency of the output of said power converting means deviates from a predetermined value, for detecting an abnormal state of said AC system if the phase or frequency of the output of said power converting means deviates from said predetermined value, and for stopping the operation of said control means when said abnormal state is detected;
wherein said disturbance signal produces deviations in the phase or frequency of the power converting means, said deviations being detected by said state detector means in the event that the phase or frequency of said AC system is in said abnormal state;
wherein said phase detector of said security means includes:
a phase locked loop including,
a comparator for comparing an output of a voltage controlled oscillator with a phase reference which corresponds to the voltage or current phase of said AC system,
means for generating timing pulses having a frequency corresponding to an output of said comparator and said disturbance signal, and
signal converter means including said voltage controlled oscillator for converting said timing pulses into said phase detection signal; and
means for feeding said disturbance signal into said phase locked loop;
wherein said disturbance signal has the effect of breaking synchronization of said detected phase of the voltage or current of said AC system and the output of said comparator, said phase reference restoring synchronization when the phase or frequency of said phase reference is within predetermined values and said phase reference otherwise not restoring said synchronization such that said phase locked loop is desynchronized when said phase or frequency of said phase reference is outside said predetermined values.

4,819,122

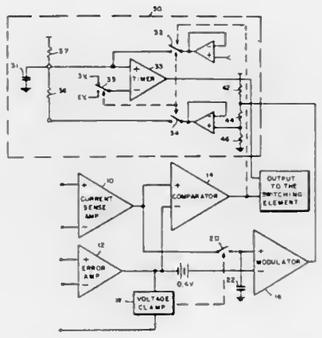
OVER-CURRENT TIMER MODULATOR

Walter S. Gontowski, Jr., Thompson, Conn., assignor to Cherry Semiconductor Corporation, East Greenwich, R.I.

Filed Apr. 2, 1987, Ser. No. 34,098

Int. Cl.[4] H02H *7/10*

U.S. Cl. 361—93 **19 Claims**



1. An overcurrent timer modulator circuit comprising:
means for receiving an output voltage from a current sense amplifier;
means for holding the peak output voltage from said current sense amplifier;
a timing circuit which sets an off time at a constant length of time;
means for comparing the peak output voltage with a first threshold; and
means for extending said off time if said peak output voltage exceeds said first threshold.

4,819,123

COMPRESSED AIR SUPPLY SYSTEM

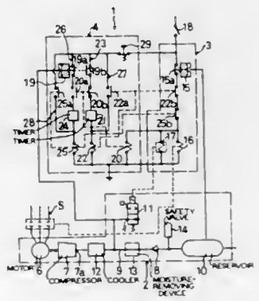
Takeshi Hatimaki, Akashi, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Nov. 19, 1987, Ser. No. 122,981

Claims priority, application Japan, Nov. 25, 1986, 61-281267

Int. Cl.[4] H02H *5/00*

U.S. Cl. 361—23 **10 Claims**



1. A compressed air supply system comprising, a protective circuit means for preventing the pressure in a discharge pipe from dropping below a first preset value after the expiration of a first predetermined length of time and after detection of an upper limit pressure value, the protective circuit also detects and prevents the pressure in the discharge pipe from rising above a second preset value after the expiration of a second predetermined length of time when the lower limit pressure value is detected, said protective circuit opens a control circuit in response to the detected conditions; the compressed air supply system includes an electric motor, an air compressor driven by the electric motor, an air reservoir connected to a discharge pipe of the air compressor via the check valve, an unloading valve connected to the discharge pipe between the check valve and the air compressor, the unloading valve has an open position in which the discharge pipe is connected to the atmosphere and has a closed position in which the discharge pipe is cut off from the atmosphere, a pressure sensor which detects the upper limit pressure value and the lower limit pressure value appearing in the air reservoir, and a control circuit stops the motor and shifts the unloading valve to the open position when the upper limit pressure value is sensed by the pressure sensor and operates the motor and shifts the unloading valve to the closed position when the lower limit pressure value is sensed by the pressure sensor.

4,819,124

OVERCURRENT DETECTOR AND CIRCUIT BREAKER

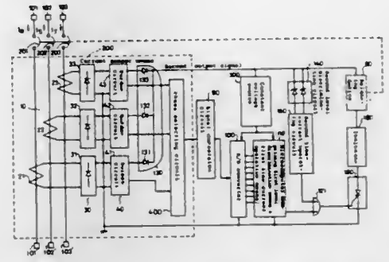
Ichirou Arinobu, Fukuyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1987, Ser. No. 77,372

Int. Cl.[4] H02H *3/08*

U.S. Cl. 361—97 **8 Claims**

1. An overcurrent detector comprising:
current sensor means provided for respective phases of AC power lines for detecting a current value;
phase selecting means for selectively outputting one phase signal having a largest waveform from among three phase signals inputted thereto from said current sensor means by outputting at least one half cycle of said one phase signal.
peak value detection means for detecting a largest instantaneous value from instantaneous values of said sensing outputs;



signal converison means for obtaining a mean square (Im^2) of output of said phase selecting means; and
processing means for processing an output signal of said signal conversion means and an output signal of said peak value detection means to issue a releasing signal.

4,819,125

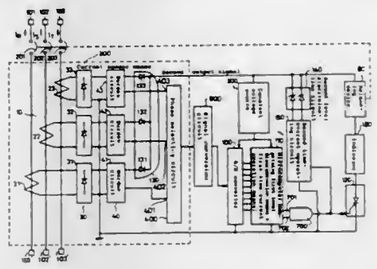
OVERCURRENT DETECTOR

Ichirou Arinobu, and Yoshikiro Hatakeyama, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1987, Ser. No. 77,936

Int. Cl.[4] H02H *3/08, 3/093*

U.S. Cl. 361—97 **22 Claims**



1. A circuit breaker for a multiple phase A.C. power line comprising:
at least one disconnectable contact means provided in said A.C. power line,
current sensor means for respective phases of said A.C. power line for detecting a value of current flowing therein,
secondary output signal generating means for generating secondary output signals corresponding to the current value of said respective phases sensed by said current sensor means,
phase selecting means for selecting and outputting the largest among said secondary output signals corresponding to the respective current value of the selected phase of said current sensor means and making said selection by using a predetermined operating characteristic corresponding to a selected threshold value,
signal conversion means for obtaining a mean or effective

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value of the selected and outputted secondary output signal of said phase selecting means, and

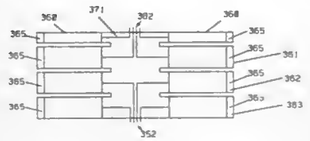
processing means for processing an output signal of said signal conversion means to generate a release signal for disconnecting said contact means in said power line.

4,819,126

PIEZOELECTIC RELAY MODULE TO BE UTILIZED IN AN APPLIANCE OR THE LIKE

William P. Kornrumpf, Albany, and John D. Harnden, Jr., Schenectady, both of N.Y., assignors to Pacific Bell, San Francisco, Calif.

Filed May 19, 1988, Ser. No. 195,949
Int. Cl.[4] H01H *47/26, 50/12, 59/00*
U.S. Cl. 361—207 **10 Claims**



1. A piezoelectric relay module comprising:

a bimorph element comprising substantially overlying first and second planar sheets of piezoelectric material divided into a plurality of generally coplanar fingers extending from a common spine, at least two of said plurality of fingers having different widths, each of said fingers having a fixed end connected to said common spine and a free end, each of said fingers including an electrical contact on said free end of said finger; and

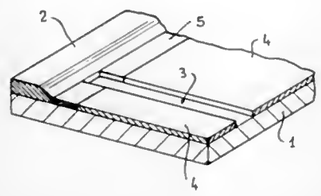
support means for supporting said bimorph element, said support means including a plurality of electrical contacts thereon, each of said electrical contacts of said support means engaging a corresponding electrical contact on said bimorph element when an electric field is applied to said finger.

4,819,127

METALLIZED DIELECTRIC SHEET FOR MAKING CAPACITORS OF THE WOUND TYPE, AND CAPACITORS OBTAINED

Alain Gizolme, Sainte-Consorce, and Jean-Bernard Aldeguer, Saint-Genis Laval, both of France, assignors to Belier Industries, Saint-Genis Laval, France

Filed Jun. 29, 1988, Ser. No. 212,787
Claims priority, application France, Jun. 29, 1988, 87 10252
Int. Cl.[4] H01G *1/015*
U.S. Cl. 361—273 **2 Claims**



1. In a metallized dielectric sheet for making wound capacitors, of the type comprising a support film coated, on one of its faces, with a layer of metal which defines a thickened edge and a series of compartments separated from one another by transverse gaps which, along the thick edge, are joined to one another by a conductive longitudinal zone adapted to melt under the effect of the discharge created by a possible puncture of the dielectric, before the rest of the metallized layer is itself damaged,

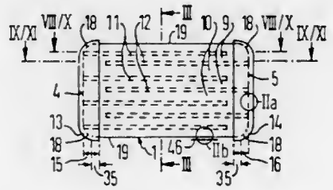
the longitudinal zone is made of a metal or alloy different from that of the rest of the layer and presents a fusibility higher than that of the metal constituting the metallization.

4,819,128

ELECTRICAL MULTILAYER COMPONENT COMPRISING A SINTERED, MONOLITHIC CERAMIC BODY AND METHOD FOR ITS MANUFACTURE

Heinz Florian, Deutschlandsberg; Josef Unterlass, Graz; Franz Zettl; Johann Ramler, both of Deutschlandsberg; Gerhard Kelz, and Anna Moshammer, both of Graz, all of Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,766
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725454
Int. Cl.[4] H01G *3/06;* **H01C** *7/00*
U.S. Cl. 361—321 **14 Claims**



1. In an electrical multilayer component including a sintered, monolithic ceramic body having cavities extending in alternating fashion from opposed end faces and extending partially into opposed lateral surfaces at right angles to said opposed end faces, said body also having an upper surface and a lower surface parallel thereto, both mutually perpendicular to said opposed end faces and said opposed lateral surfaces, ceramic particles disposed in said cavities to serve as support elements between adjoining layers of said ceramic body, metal layers completely filling said cavities and composed of a metal whose melting temperature is substantially lower than the sintering temperature of said ceramic body, and contact elements covering said end faces and extending partially about said lateral surfaces, said contact elements electrically connecting together said metal layers, the improvement which comprises:

the edges between said end faces and their adjoining lateral surfaces as well as the edges between the end faces and said upper surface and said lower surface, as well as the edges between said upper and lower surfaces and the adjoining lateral surfaces being rounded off such that said metal layers extend out to said contact elements, and said contact elements being non-porous and covering those portions of said lateral surfaces which are open to the surfaces and are filled with metal layers.

4,819,129

REMOVABLE WATT-HOUR METER SOCKET COMPARTMENT PANEL COVER WITH SAFETY PARTITION

Reuben A. Erickson, Park Ridge, Ill., assignor to Erickson Electrical Equipment Company, Elk Grove Village, Ill.

Filed May 6, 1988, Ser. No. 191,133
Int. Cl.[4] H02B *9/00*
U.S. Cl. 361—365 **2 Claims**

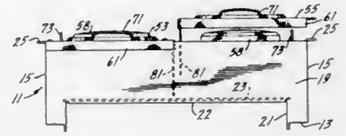
1. A housing assembly for a pair of side-by-side watt-hour meter sockets, the housing assembly including:

a rectangular housing having back, side and end walls, a recessed opening in said back wall for mounting on a conventional panel board chassis for electrical connection to the bus bars of that chassis, and an electrically insulating rear housing panel closing the rear recessed opening,

a horizontally-extending partition dividing the rectangular housing into meter socket and switch compartments,

a pair of individually removable rectangular cover panels positioned side-by-side to close the front of the meter compartment,

each cover panel having an opening for exposing a watt-hour meter to view,



an inwardly-extending partition of electrically insulating material attached to the side of each cover panel which is adjacent to the other cover panel,

each said inwardly-extending partition terminating short of the rear housing panel closing the rear recessed opening of the housing so that each said inwardly-extending partition protects its meter socket against accidental contact when the other cover panel is removed from the housing, and

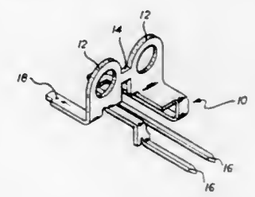
means to individually secure each cover panel to the housing against unauthorized displacement or removal.

4,819,130

FAIL-SAFE RADIO FREQUENCY SUPPRESSOR

Harold Moy, 3622 Worthington Ct., Rochester Hills, Mich. 48309

Filed Dec. 7, 1987, Ser. No. 129,543
Int. Cl.[4] H01G *4/42*
U.S. Cl. 361—302 **17 Claims**



1. A fail-safe R.F. suppression device adapted to be interposed in series in a power supply circuit for energizing a motor, so as to prevent high frequency signals produced by the motor from being transmitted onto the power supply circuit, said suppression device including:

first and second conductors adapted to provide electrical energy to respective first and second motor terminals, each of said conductors comprised of a single unbroken metallic member not having any solder joints in series therewith

a choke associated with at least said first conductor and adapted to block the flow of high frequency current therethrough, said choke comprising a body of ferromagnetic material surrounding a portion of the first conductor and operative to provide a continuous current path along the entirety of the first conductor, said choke having no solder joints therein or in series therewith; and,

a capacitor adapted to block the flow of direct and low frequency current while passing high frequency current therethrough disposed so as to interconnect said first and second conductors;

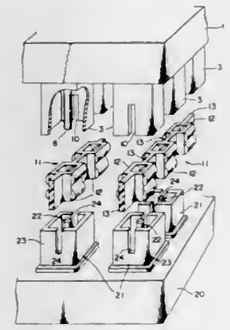
whereby said device is adapted to continue to provide power to the motor in the event of failure of the capacitor or a solder joint.

4,819,131

INTEGRATED CIRCUIT PACKAGE HAVING COAXIAL PINS

Toshihiko Watari, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 26, 1987, Ser. No. 89,530
Claims priority, application Japan, Aug. 27, 1986, 61-200788
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—414 **5 Claims**



1. An integrated circuit package comprising:

a multilayer substrate for mounting a plurality of integrated circuit chips on a first surface thereof, said multilayer substrate having a power supply layer, a ground connection layer and circuit patterns, and said chips being electrically connected to said layers; and

an array of coaxial pins juxtaposed on a second surface of said multilayer substrate opposite to said first surface, each of said coaxial pins comprising an inner conductor and an outer conductor surrounding the inner conductor, the inner conductor of one or more of said coaxial pins being connected to said power supply layer, the inner conductors of the remaining coaxial pins being connected to said circuit patterns, and the outer conductors of all of said coxial pins being connected to said ground connection layer.

4,819,132

ADJUSTABLE SPOILER WITH THIRD BRAKE LIGHT

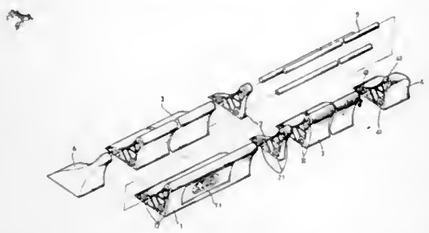
Jau H. Hwan, 2F, No. 27, Lane 697, Duen-Hwa South Rd., and Chun S. Wu, 2F, No. 27, Alley 2, Lane 24, Duen-Hwan Rd., both of Taipei, Taiwan

Filed Jul. 1, 1987, Ser. No. 68,279
Int. Cl.[4] B60Q *1/00;* **B60J** *9/00*
U.S. Cl. 362—61 **6 Claims**

1. A spoiler structure for an automobile comprising a central spoiler member, respective rod elements extending from opposite ends of the central member, spoiler end members attached at the ends of the respective rod elements, and at least one

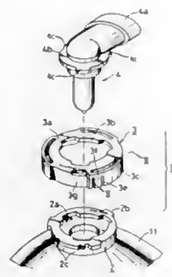
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intermediate spoiler member secured on the respective rod elements between each end member and the central member,



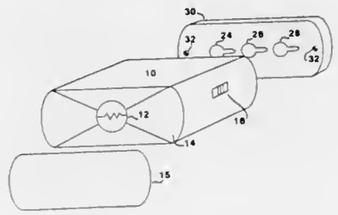
whereby the length of the spoiler structure is determined by the number of intermediate spoiler members.

4,819,133
REPLACEABLE HEADLAMP ASSEMBLY
Tadashi Kochi, Fuchu, and Naotaka Sakamoto, Tokyo, both of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 169,941, Mar. 18, 1988, abandoned. This application Sep. 9, 1988, Ser. No. 243,159
Claims priority, application Japan, Jul. 15, 1987, 62-176630
Int. Cl.[4] H01R *33/00*
U.S. Cl. 362—61 **16 Claims**



1. A replaceable headlamp assembly for holding a mounting portion of a replaceable bulb in position at a bulb socket by rotating a locking member relative to the bulb socket, comprising:
a bulb socket formed at a rear portion of a reflector, said bulb socket having a bulb mount at an inner wall thereof for receiving a mounting portion of replaceable bulb, said bulb socket having at least one key extending outwardly from an outer wall thereof; and
a substantially cylindrical locking member including a member having an opening therein for permitting said mounting portion of said bulb to pass therethrough, means for lockingly engaging said mounting portion of said bulb, and at least one key retainer means facing inwardly from an inner wall of said locking member for engagement with a respective one of said at least one key of said bulb socket;
each of said key retainer means comprising:
a substantially cylindrical wall section, and
a resilient section formed in said substantially cylindrical wall section, said resilient section being engageable with a respective one of said at least one key of said bulb socket and being resiliently deformable responsive to engagement with said respective at least one key for snapping over said at least one key for lockingly engaging said locking member with said bulb socket such that said locking member is rotatable relative to said bulb socket over a given range, said bulb socket and said locking member being thereby integrally assembled together with said locking member being rotatable relative to said bulb socket between a bulb setting and removing position at which a bulb can be set or replaced, and a bulb fixing position at which a bulb is fixed to said bulb socket by said locking member.

4,819,134
INTERIOR AUTOMOBILE LIGHT
Marc A. Rossi, 106 Tamarack Ct., Sterling, Va. 22170
Filed Sep. 25, 1987, Ser. No. 100,839
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—61 **8 Claims**



1. A light for an automobile comprising:
a. a housing;
b. a rechargeable energy source and a light source mounted to said housing;
c. a switch that provides electrical connection between said rechargeable energy source and said light source;
d. a mounting plate having first and second electrodes that provide connection to an electrically positive line and an electrical ground, respectively, of said automobile's electrical system;
e. third and fourth electrodes mounted to said housing and configured to contact first and second electrodes, respectively, when said housing is mounted on said mounting plate, said third electrode providing electrical connection to a first terminal of said rechargeable energy source and said fourth electrode providing electrical connection to a second terminal of said rechargeable energy source; and
wherein said third electrode is electrically connected to a first terminal of said light source and further comprising a fifth electrode attached to said mounting plate, said fifth electrode providing electrical connection to a compartment open indicator switch mounted on said automobile, and a sixth electrode mounted on said housing electrically connected to a second terminal of said light source, said sixth electrode being configured to contact said fifth electrode when said housing is mounted on said mounting plate.

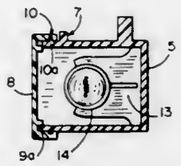
4,819,135
BICYCLE LIGHTING DEVICE
Edward Padilla, 6931 Iselta Blvd., SW., Albuquerque, N. Mex. 87105, and Herman Martinez, P.O. Box 12754, Albuquerque, N. Mex. 87195
Filed Mar. 16, 1988, Ser. No. 168,922
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—72 **2 Claims**

1. A bicycle lighting device for attachment to a bicycle having a frame formed from a plurality of interconnected frame tubes, said lighting device comprising:
at least one elongated tube formed from a flexible transparent material;
said elongated tube provided with a longitudinal slit extending along the entire length thereof forming a resilient frictional clamp dimensioned to be received around one of said bicycle frame tubes;
said elongated tube provided with two rows of embedded longitudinally spaced light emitting diodes, said rows at diametrically opposed locations on said elongated tube;
flashing sequencing means for intermittently flashing said light emitting diodes in sequence;



power supply means for supplying electrical current; and
electrical wiring means imbedded in said elongated tube interconnecting said light emitting diodes, said power supply means and said flashing sequencing means for providing motorists with a flashing signal.

4,819,136
RUNNING BOARD LIGHT ASSEMBLY
Edward Ramsey, 22615 S.R. 120, Elkhart, Ind. 46516
Filed May 16, 1986, Ser. No. 864,608
Int. Cl.[4] B60Q *1/24*
U.S. Cl. 362—81 **8 Claims**



1. A watertight lighting system for an automotive running board comprising:
a closed body having a peripheral wall defining an interior of said body, edge means defining an opening through said wall to said interior, an anchoring ridge substantially surrounding said opening and a plurality of anchoring posts positioned within said opening;
a lamp socket in said body interior, said socket including a body molded of a flexible compound and electrical contacts with integral insulated lead wires;
said contacts and their lead wires being integrally molded into the socket compound in order to form a watertight seal between the socket body and the lead wire insulation;
said socket body including a collar having means defining a lamp-receiving opening therein, said collar configured to extend past the contact end of a lamp installed in said socket and said opening having a diameter configured to form a tight fit with the lamp around the circumference of the lamp so as to render the lamp/socket juncture watertight;
a lens removably covering said opening and having edge means defining anchoring means extending substantially the perimeter of said lens engaging said anchoring ridge for snap-fit retention of said lens to said body;
sealing means between said lens and said body for sealing the interface therebetween; and
fastening means passing through openings in said lens and received in said anchoring posts for fastening said lens to said body, whereby, said lighting system, when assembled, provides a weathertight assembly which allows removal of the lens for easy replacement of a lamp mounted in said lamp socket.

4,819,137
MULTI-PURPOSE SELF DEFENSE APPARATUS
Robert J. Hamilton, 412 Ocean Heights Ave., Linwood, N.J. 08221
Continuation of Ser. No. 11,129, Feb. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 810,608, Dec. 19, 1985, abandoned. This application Jun. 15, 1988, Ser. No. 208,831
Int. Cl.[4] A45B *3/04;* **A63B** *15/02*
U.S. Cl. 362—102 **8 Claims**



1. A multi-purpose self defense baton comprising:
(a) a handle portion including:
(i) a central portion; and
(ii) a housing member connected to one end of said central portion;
(b) a flashlight portion connected to the other end of said central portion;
(c) at least one telescoping member slidably disposed within said housing member;
(d) a tip member replaceably attached to a distal end of said at least one telescoping member, said tip member having a periphery which extends beyond the periphery of said at least one telescoping member;
(e) means for expanding said at least one telescoping member, said expanding means including:
(i) a spring guide rod disposed substantially coaxially within said housing member, one end of said spring guide rod being connected to said central portion; and
(ii) a release spring, at least a portion of which is disposed around said spring guide rod, said spring being compressed when said at least one telescoping member is in a collapsed configuration;
(f) releasable latching means for maintaining said at least one telescoping member in the collapsed configuration, said releaseable latching means comprising a bayonet-type latch which includes:
(i) a pin extending from said housing member; and
(ii) a groove in the periphery of said tip member, said groove adapted to receive and releasably retain said pin; and
(g) securing means for receiving a user's finger to secure said baton to said user's hand, said securing means comprising a ring rotatably attached to a swivel member, said swivel member being rotatably attached to a side of said handle portion.

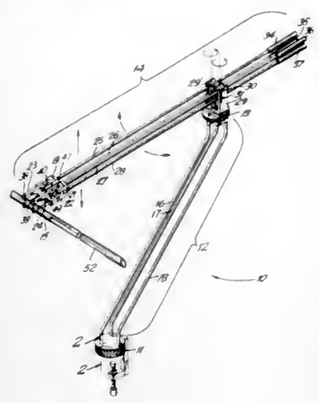
4,819,138
LAMP DESIGN
Peter Polick, 20 Cedar St., Yonkers, N.Y. 10701
Filed Mar. 28, 1988, Ser. No. 173,821
Int. Cl.[4] F21S *3/02*
U.S. Cl. 362—419 **6 Claims**

1. A lamp capable of placement upon a planar surface wherein the illumination element of said lamp is selectively positionable above said planar surface while retaining its orientation with regard to said planar surface independent of the location of said illumination element above said planar surface, said lamp comprising:
(a) a first base member;
(b) a first supporting arm member, said first supporting arm member having an upper portion and a lower portion, said

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lower portion being structurally affixed to said first base member so as to allow for arced movement of said first supporting arm member about said first base member;

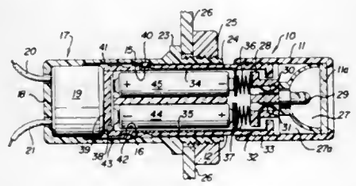
(c) a second base member, said second base member being structurally affixed to the upper portion of said first supporting arm member so as to allow for the selective positioning of said second base member relative to said first base member while maintaining as a constant the axial orientation of said second base member relative to said first base member;



(d) a second supporting arm member structurally affixed to said second base member comprising four parallel supporting members each having affixed at one of their respective end portions balancing members while having "U" shaped members structurally affixed to each of said parallel supporting members at their respective other end portions; and

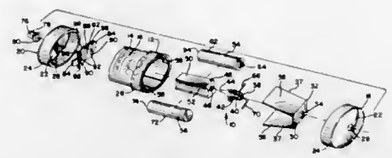
(e) an element housing member structurally affixed to said second supporting arm member.

4,819,139
RECHARGEABLE FLASHLIGHT ASSEMBLY FOR AUTOMOTIVE VEHICLES
Jack L. Thomas, 632 E. St., Room 301, Chula Vista, Calif. 92010-2119
Filed Jan. 4, 1988, Ser. No. 140,585
Int. Cl.[4] F21L *9/00*
U.S. Cl. 362—183 **3 Claims**



1. In combination: A flashlight including a hollow tubular body and at least one rechargeable battery housed in the body; a receptacle having an open end for receiving the body of the flashlight in coaxial relationship when the flashlight is inserted into the receptacle through the open end thereof; a battery charger mounted in the receptacle; and means for establishing electrical contact between the charger and the battery when the flashlight is inserted into the receptacle, said means comprising a pair of axially spaced connector rings mounted on said body in coaxial relationship therewith; and a pair of connector leads mounted in said receptacle and extending axially along the inner surface thereof, said leads having contacts at the respective ends thereof for engagement with said connector rings when the flashlight body is inserted into the open end of the receptacle, said contacts and said connector rings having mating concave/convex surfaces so that said connector leads also serve to retain the flashlight in the receptacle.

4,819,140
COMPRESSIBLE FLASHLIGHT
James P. Griffin, 1216 Ash St., St. Charles, Ill. 60174
Filed Sep. 2, 1988, Ser. No. 240,008
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—189 **7 Claims**



1. A disposable-type flashlight comprising:

a flexible, hollow case,

a front and a rear cap affixed to ends of said case,

a set of batteries carried in said case, said set including a first battery having an insulated outer casing and a second battery having an uninsulated outer casing with said batteries spaced apart by a center post,

a U-shaped spring switch defined by a central web section self-locating in said case adjacent to said front cap and a pair of inward extending arms connecting with said web section, said arms spaced apart and positioned respectively on each side of said batteries and said arms flexing outward away from said batteries to fit firmly against an inner side of said case and form a space between said arms and said batteries respectively,

a bulb having a lens end extending through an opening in said switch web section and in said front cap, an enlarged portion butting against said web section, an inner end held by said center post, a first lead wire affixed to a terminal end of said first battery, and a second lead wire fitted in said switch web section opening next to said bulb, and

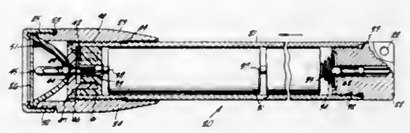
a pressure plate carried in said rear cap with said plate conductively engaging oppositely charged terminal ends of said batteries,

wherein compression of said case presses said switch arm against said second battery casing to complete an electrical circuit between said bulb and said batteries and energizes said bulb.

4,819,141
FLASHLIGHT
Anthony Maglica, Ontario; Robert J. DeLong, Temple City, and Armis L. Lewis, Cucamonga, all of Calif., assignors to Mag Instrument, Inc., Ontario, Calif.
Continuation-in-part of Ser. No. 34,918, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 828,729, Feb. 11, 1986, Pat. No. 4,658,336, which is a continuation of Ser. No. 648,032, Sep. 6, 1984, Pat. No. 4,577,263. This application Apr. 27, 1987, Ser. No. 43,086
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—207 **9 Claims**

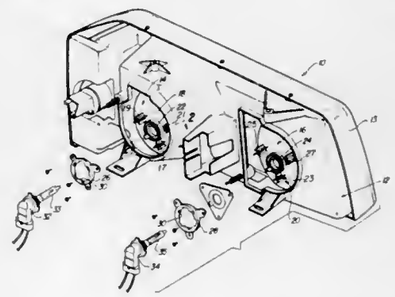
3. An insert for use in a flashlight of the type having a barrel, a battery source of power, a tailcap and a spring which forms an electrical contact with one end of the battery source of power, said insert comprising:

a conductive generally cylindrically shaped member sized for insertion into and along at least one-half the length of the tailcap of the flashlight and disposed to provide electrical coupling between the barrel and the spring; and



a plurality of indents in the member and positioned to retain a spare bulb for the flashlight, wherein the inert provides for a conductive path between the barrel in a tailcap region of the flashlight and the spring.

4,819,142
VEHICLE LAMP ASSEMBLY AND RETAINER
Robert J. Lothamer, Sterling Heights, and James L. Purpura, Canton, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed Feb. 8, 1988, Ser. No. 153,749
Int. Cl.[4] H01R *33/00*
U.S. Cl. 362—226 **2 Claims**



1. A vehicle lamp assembly having:

a first reflector having a first receptacle and a first support mounting;

a second reflector having a second receptacle and a second support mounting;

a first light socket adapted to be received in said first receptacle;

a second light socket adapted to be received in said second receptacle;

first and second retainer rings having a central opening for receiving the light sockets to be inserted within the receptacles;

said first retainer and first support mounting having cooperating first indexing means for seating said retainer in a predetermined alignment on said first support mounting and exclusively of said second support mounting;

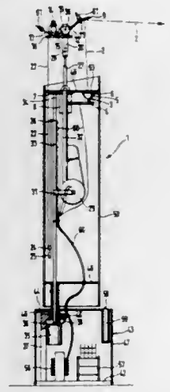
said second retainer and second support mounting having a cooperating second indexing means for seating said retainer in a predetermined alignment on said second support mounting and exclusively of said first mounting;

the first and second indexing means being defined by each said support mounting comprising a plurality of stanchions, each stanchion having raised locating lugs peripherally disposed about a seating surface, wherein at least one locating lug on said first support mounting is recessed from a symmetrical position with respect to the remaining lugs on said first support mounting, wherein at least one locating lug on said second support mounting is recessed from a symmetrical position with respect to the remaining lugs on said second support mounting, and wherein said first and second retainers having support tabs correspondingly positioned to seat against said seating surface of said stanchions, each said retainer including a truncated tab portion adjacent said at least one recessed lug on the respective support mounting;

third indexing means associated with said first retainer for receiving said first socket in a predetermined alignment through said first retainer exclusively of said second socket; and

fourth indexing means associated with said second retainer for receiving said second socket in a predetermined alignment exclusively of said one of said first socket.

4,819,143
PROJECTOR LAMP
Clemens Teichmann, Frankfurt am Main, Fed. Rep. of Germany, assignor to Atelier für Kunst und Technik GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Aug. 7, 1987, Ser. No. 83,650
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 8621953[U]
Int. Cl.[4] F21S *1/12*
U.S. Cl. 362—282 **14 Claims**



1. A projection lamp having at least one adjustable light beam, comprising a projection light, a mirror mounted in alignment with and adjustable relative to the projection light, a swivel bearing for swiveling the mirror, a telescopically extendable and retractable rod, the rod having a free end, the swivel bearing being connected to the free end, the telescopically extendable and retractable rod including a base, the projection light including a support member, the base and the support member being connected to a common support rod, the support rod having an upper end, the telescopically extendable and retractable rod being guided in a guide tube, wherein an upper cover plate, a support member for the guide tube and a support member for the projection light are attached to the upper end of the support rod.

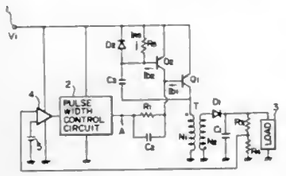
4,819,144
SWITCHING POWER SUPPLY CIRCUIT WITH STORED CHARGE REMOVAL SWITCH
Tetsushi Otake, Saitama, Japan, assignor to Toko, Inc., Japan
Filed Jul. 26, 1988, Ser. No. 224,583
Claims priority, application Japan, Jul. 31, 1987, 62-192106
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **15 Claims**

1. A switching power supply circuit wherein an input DC voltage is applied to an input terminal through an inductance element and on-off controlled by means of switching elements so that a pulse voltage is provided, and said pulse voltage is

rectified and smoothed out to provide a predetermined DC output voltage, said switching power supply circuit comprising:

(1) a transformer including at least a primary and a secondary winding, said primary winding being arranged to be provided with said input DC voltage;

(2) a main switch element for on-off controlling said input DC voltage applied to said primary winding of said transformer and causing a pulse voltage to be generated at said secondary winding of said transformer; and



(3) a second switch element arranged to be on-off driven by the output of said main switch element so that when said main switch element is turned on, said second switch element is turned off while when said main switch element is turned off, said second switch element is turned on, whereby unwanted charges accumulated at said main switch element are discharged through said second switch element when said main switch element is turned off.

4,819,145

DIRECT CURRENT POWER UNIT

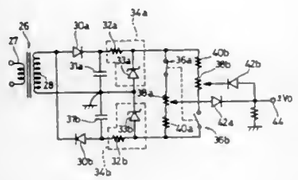
Yukio Maeba, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 21, 1988, Ser. No. 222,204

Claims priority, application Japan, Jul. 22, 1987, 62-112382[U]

Int. Cl.⁴ H02M *7/02*

U.S. Cl. 363—63 **7 Claims**



1. A direct current power unit capable of switching the polarity of an output voltage into negative or positive polarity, comprising:

transformers each comprising a primary winding and a secondary winding for transforming an alternating current voltage inputted to said primary winding to output the same to said secondary winding,

rectifier means each connected to the secondary winding of said transformer for outputting a positive direct current voltage and a negative direct current voltage,

first voltage regulator means for regulating the positive direct current voltage level outputted from said rectifier means,

second voltage regulator means for regulating the negative direct current voltage level outputted from said rectifier means,

first voltage output switching means located on the output side of said first voltage regulator means and first resistance type potential divider means located on the output side of said second voltage regulator means, in which said first switching means and said first resistance type potential divider means are connected in series between the outputs of said first voltage regulator means and said second voltage regulator means, switching means located on the output side of said second voltage regulator means and second resistance type potential divider means located on the output side of said first voltage regulator means, in which said second switching means and said second resistance type potential divider means are connected in series between the outputs of said second voltage regulator means and said first voltage regulator means, and

an output terminal to which the positive direct current voltage outputted from said first resistance type potential divider means and the negative direct current voltage outputted from said second resistance type potential divider means are applied.

4,819,146

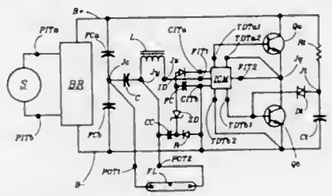
RESONANT INVERTER HAVING FREQUENCY CONTROL

Ole K. Nilssen, Caesar Dr. Rte. 5, Barrington, Ill. 60010

Continuation-in-part of Ser. No. 917,788, Oct. 10, 1986, Pat. No. 4,727,470. This application Aug. 3, 1987, Ser. No. 80,865

Int. Cl.⁴ H02M *7/44*

U.S. Cl. 363—98 **20 Claims**



1. An arrangement comprising:

an inverter powered from a DC supply voltage, the inverter providing a squarewave output voltage at a pair of output terminals, the squarewave output voltage having a frequency, the inverter having control means operative in response to a control signal to control the frequency;

a series-combination of an inductor and a capacitor connected across the output terminals, an AC voltage developing across the capacitor in response to the squarewave output voltage, the magnitude of the AC voltage being an inverse function of the frequency;

connect means operative to permit connection of a load in parallel circuit with the capacitor; and

first sensor means connected in circuit between the series-combination and the control means, the first sensor means being operative in response to the magnitude of the AC voltage to provide at least part of the control signal to the control means, thereby to cause the frequency to increase as a function of the magnitude of the AC voltage; thereby, in turn, to cause the AC voltage to assume a lower magnitude than would have been the case without providing said at least part of the control signal.

4,819,147

INTEGRATED AC TO DC POWER SUPPLY

David Bingham, San Jose, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.

Continuation of Ser. No. 697,271, Jan. 30, 1985, abandoned. This application Oct. 17, 1986, Ser. No. 920,904

Int. Cl.⁴ H02M *7/217*

U.S. Cl. 363—127 **10 Claims**

1. A monolithically integrated power supply circuit, including:

first and a second AC input terminals,

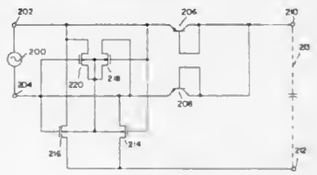
half-wave rectifier means connected to said first and second AC input terminals for converting alternating current to direct current, said half-wave rectifier means having a diode-equivalent device connected between said first AC input terminal and a position filter capacitor terminal for passing current to said positive filter capacitor terminal when the voltage at said first input terminal is more positive than the voltage at said second input terminal, and further having active switching means connected between said first AC input terminal and said AC second input terminal for passing current from said second AC input terminal to said first AC input terminal when the voltage at said second AC input terminal is more positive than the voltage at said first AC input terminal,

a negative filter capacitor terminal connected to said second AC input terminal, said positive and negative filter capacitor terminals for connecting an external filter capacitor therebetween,

voltage regulator means having a positive input connected to said positive filter capacitor terminal, a positive output connected to a positive output terminal, and a negative terminal connected to said second input terminal.

9. A monolithically integrated power supply circuit, including:

first and second AC input terminals,



full-wave rectifier means connected to said first and second AC input terminals including first and second diode equivalent devices, said first diode equivalent device having its anode equivalent end connected to said first AC input terminal, said second diode equivalent device having its anode equivalent end connected to said second AC input terminal, said diode equivalent devices having their cathode equivalent ends connected together to a positive DC filter capacitor terminal,

a first switching device connected between said second AC input terminal and a negative DC output terminal,

a second switching device connected between said second AC input terminal and said negative DC output terminal,

comparing means for sensing whether said first or said second AC input terminal is negative with respect to the other,

switch control means, responsive to said comparing means, for closing the one of said first or second switching devices which is connected to the one of said first and second AC input terminals which has a negative voltage on it with respect to the other of said AC input terminals,

voltage regulator means, having a positive input connected to said positive filter capacitor terminal, a positive output connected to a positive output terminal, and a negative terminal connected to said second input terminal.

4,819,148

DIGITAL GATE PULSE GENERATOR FOR CYCLOCONVERTER CONTROL

Frederick F. Klein, Monroeville, and Gioacchino A. Mutone, Pleasant Hills, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1987, Ser. No. 116,187

Int. Cl.⁴ H02M *5/257*

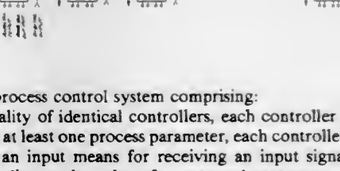
U.S. Cl. 363—161 **13 Claims**

7. A pulse generator for controlling the firing of a plurality of switching devices of a cycloconverter in response to a reference signal representing a desired output which can vary during a line voltage cycle, each being requried to fire in sequence at a specified time which may vary during the line voltage cycle as the reference signal varies, comprising:

a phase circuit means for generating a timing pulse from one phase of an input voltage;

a series of predetermined values for generating a plurality of timing signals;

a plurality of gate pulse controllers, one for each bridge circuit of the cycloconverter, wherein each controller comprises: a calculating means for using the timing pulse from the phase circuit means to generate a plurality of



sequential timing signals by selecting appropriate values for each timing signal from the series of predetermined values; a converting means for converting each timing signal to one which can be compared with the reference signal; a comparator for comparing each converted timing signal with the reference signal at a time when a decision to fire each switching device is made; and a firing means to fire each switching device of the cycloconverter in sequence when the timing signal and the reference signal correspond; and

an interface circuit means for controlling plurality of gate pulse controllers.

4,819,149

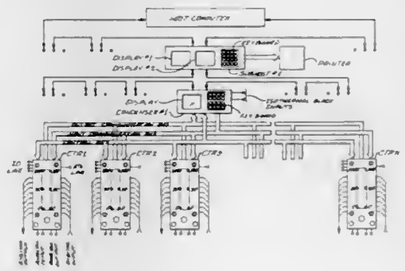
DISTRIBUTED CONTROL SYSTEM

Paul S. Sanik; Dennis H. Shreve, both of Westerville, and Eugene C. Varrasso, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 2, 1986, Ser. No. 859,151

Int. Cl.⁴ G06F *15/46, 15/16*

U.S. Cl. 364—132 **28 Claims**



1. A process control system comprising:

a plurality of identical controllers, each controller controlling at least one process parameter, each controller including an input means for receiving an input signal corresponding to the value of a measured parameter;

means within said controller for calculating an output control signal based upon said input signal;

output means within said controller for sending said output control signal to a device being controlled;

a plurality of identical condenser means selectively connectable to a group of said plurality of controllers each of said

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condensers able to initiate communication with each of said controllers connected thereto for receiving process data and for varying the operation of said calculating means within said controller wherein each of said controllers connected to said condenser means is operable in said process without aids condenser means;

a plurality of identical subhost means selectively connectable to a group of said plurality of condenser means each of said subhost able to initiate communication with each of said condenser connected thereto for receiving process data and for varying the operation of said calculating means of said controllers connected to said condenser means wherein each of said condenser means connected to said subhost is operable in said process control without said subhost means; and

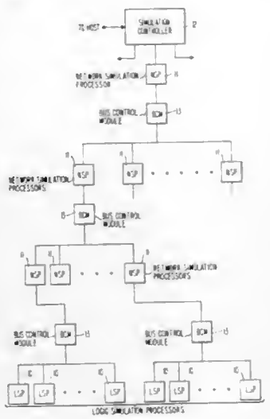
a host computer selectively connected to all subhost means for receiving process data wherein each of said subhost means is operable in said process control without said host computer.

4,819,150

ARRAY FOR SIMULATING COMPUTER FUNCTIONS FOR LARGE COMPUTER SYSTEMS

Andrew T. Jennings, West Chester; Joseph S. Schibinger, Phoenixville, and Ronald J. Kalemba, Berwyn, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 5, 1985, Ser. No. 720,573
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **11 Claims**



1. An array of logic simulation processors for simulating complex logic functions formed of primitive logic functions, said array comprising:

a plurality of logic simulation processors; and

node processing means coupled to each of said logic simulation processors for transmitting value change notices therebetween;

each of said logic simulation processors including a function unit including circuit means having different logic gates for execution of different ones of said primitive logic functions;

each of said logic processors further including value table means for storing present value signals, said value table means being coupled to said function unit to supply individual ones of said present value signals to said function unit;

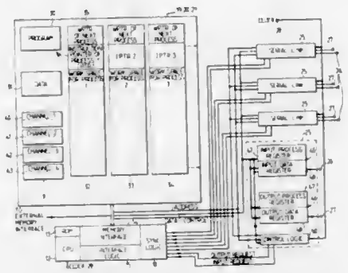
each of said logic simulation processors further including instruction table means for storing a sequence of instructions each of which specifies a particular primitive function to be executed and an address to said value table means to fetch a given one of said present value signals, said instruction table means being coupled to said value table means and said function unit to control the execution of a specified primitive function upon a given present value signal received from said value table means in response to the address contained in a given instruction.

4,819,151

MICROCOMPUTER

Michael D. May, Bristol, United Kingdom, assignor to Inmos Limited, Bristol, United Kingdom

Continuation of Ser. No. 552,602, Nov. 16, 1983, abandoned. This application Nov. 20, 1986, Ser. No. 931,946
Claims priority, application United Kingdom, Nov. 26, 1982, 8233733
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **41 Claims**



1. A method of operating concurrent processes in a computer system having at least one processor and memory wherein each of said concurrent processes executes a plurality of instructions included in respective programs, the method comprising the steps of:

(a) establishing within the memory a respective workspace for each process, each workspace comprising a plurality of addressable first memory locations for recording variables associated with the corresponding process,

(b) defining a respective first pointer for each process to identify the process, said first pointer comprising a workspace pointer pointing to the workspace corresponding to the process;

(c) defining a respective second pointer for each process to indicate a program stage for the process, each said workspace including a second memory location for storing said second pointer from time to time, said second memory location being directly addressable as a first offset from the address pointed to by said workspace pointer and;

(b) scheduling a plurality of processes for execution by a processor, including

(i) indicating a current process which is being executed by a processor by temporarily storing the workspace pointer for that process in a first storage element,

(ii) forming a linked list of processes awaiting execution by providing in a third memory location of the workspace of each process on said linked list an indicator of the respective next process scheduled for execution by the processor, each said third memory location being directly addressable as a second offset from the address pointed to, and

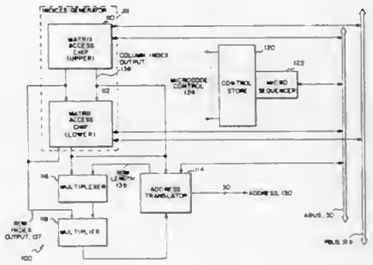
(iii) in response to an instruction, stopping execution of the current process, storing said second pointer for the current process at said second memory location in the workspace for the current process, directly addressing said third memory location of the workspace of one of said plurality of processes to determine the indicator of a subsequent process on said list, storing in said first storage element the indicator of the next process scheduled for execution, and then executing said next process at a program stage indicated by the second pointer of said next process.

4,819,152

METHOD AND APPARATUS FOR ADDRESSING A MEMORY BY ARRAY TRANSFORMATIONS

Alan J. Deerfield, Newport, R.I., and Sun-Chi Siu, Marlboro, Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 720,330, Apr. 5, 1985, abandoned. This application Dec. 21, 1987, Ser. No. 135,579
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **33 Claims**



17. An address generator for accessing a multidimensional data array in response to an array transformation of a high-level programming language comprising:

index generating means for generating a plurality of multidimensional indices specified by said array transformation, said array transformation comprises an initial point parameter and a plurality of displacement and length parameter pairs, each of said pairs expressed relative to said initial point parameter;

address translator means coupled to said index generating means for converting said multidimensional indices into a plurality of nested addressing sequences for serially addressing all elements of said data array located in a memory means specified by said array transformation;

a unified control means coupled to said index generating means and said translator means for providing signals to control the generating of said multidimensional indices and translation of said indices to said nested addressing sequences in accordance with each pair of said plurality of displacement and length parameter pairs; and

bus means coupled to said index generating means, said translator means, and said control means for providing said array transformation parameters to said address generator.

4,819,153

MICROPROCESSOR CONTROLLED RIGID DISK FILE SUBSYSTEM

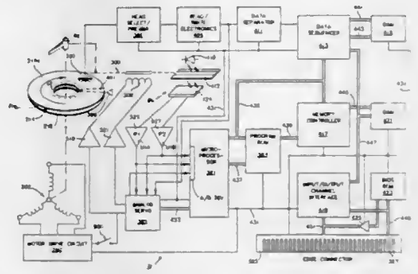
Randolph H. Graham, Fremont; Bruce R. Peterson, San Jose, and Richard J. Blackborow, Cupertino, all of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Filed Jun. 5, 1985, Ser. No. 741,588
Int. Cl.[4] G06F *1/00*; G11B *5/012*
U.S. Cl. 362—200 **38 Claims**

1. An improved control system for a disk file subsystem including a head and disk assembly for storing and retrieving user data, the subsystem having direct plug in connections to address, data, and control buses of a host computer, the control system comprising:

control means for mechanically controlling the position of a head of said assembly relative to a rotating data storage disk of said assembly to cause said head to move to a commanded track of a multiplicity of available concentric data tracks formed on a storage surface of said disk during track seeking operations and to cause said head to remain in substantial centerline alignment with said commanded track during track following operations;

controller/interface means for connecting said subsystem to a host computer including means for receiving commands and data to be stored from said host computer directly via the direct plug in connections to at least one of its said address, data and control buses, including means for controlling the storing and retrieving of data from said surface via said head, including means for reporting subsystem



status and conditions to said host computer and including means for controlling the sending of retrieved data to said host computer via said interface and at least one of the said address, data and control buses of the host computer; and

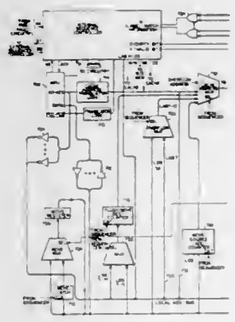
a single programmed control microprocessor for operatively controlling user data disk storage and retrieval operations of said subsystem via said control means and host to disk data transfer operations of said controller/interface means in response to said commands received from said host computer via said controller/interface.

4,819,154

MEMORY BACK UP SYSTEM WITH ONE CACHE MEMORY AND TWO PHYSICALLY SEPARATED MAIN MEMORIES

Jack J. Stiffler, Concord; Michael J. Budwey, and James M. Nolan, Jr., both of Holliston, all of Mass., assignors to Sequoia Systems, Inc., Marlborough, Mass.

Continuation of Ser. No. 750,652, Jun. 28, 1985, Pat. No. 4,654,819, which is a continuation of Ser. No. 448,419, Dec. 9, 1982, abandoned. This application Dec. 4, 1986, Ser. No. 937,978
Int. Cl.[4] G06Z *11/16*
U.S. Cl. 364—200 **24 Claims**



1. Memory backup apparatus for a computer system having a plurality of main memories, a processing element for performing data processing tasks and computations on data, said processing element generating write control signals to cause

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information to be written into said memories and task control signals for controlling said system during a context switch, and means for monitoring fault conditions and for generating fault signals, said backup apparatus comprising,

a first main memory area for storing a first copy of retry data;

a second, physically separate main memory area for storing a second copy of retry data, which second retry copy is a duplicate of said first retry copy;

a non-write-through cache memory for temporarily storing the results of computations by said processing element, said cache memory generating a full signal when a predetermined number of storage locations have been written to by said processing element;

first means responsive to said task control signals and to said full signal for temporarily stopping data processing and for transferring a copy of a set of computational results stored in said cache memory to said first main memory area when a data processing task has been completed, when a context switch has been initiated or when said cache memory becomes full to update said first retry data copy, said first means generating a first completion signal when said transfer has been completed;

second means responsive to said first completion signal and to said fault signal for transferring a copy of said set of computational results stored in said cache memory to said second main memory area to update said second retry copy only when the transfer of said set of computational results between said cache memory and said first main memory area has been completed without a fault condition being detected, said second means generating a second completion signal when said second transfer has been completed;

means responsive to said second completion signal and to said fault signals for resuming data processing only if the writing of data from said cache memory into said second memory area has been completed without a fault condition being detected; and

means for writing the contents of said second memory area into said first memory area and for restarting the data processing task using data stored in said second memory area if a system failure has occurred after the beginning of a storage operation from said cache memory to said first memory area but before said storage operation has been completed.

4,819,155

APPARATUS FOR READING TO AND WRITING FROM MEMORY STREAMS OF DATA WHILE CONCURRENTLY EXECUTING A PLURALITY OF DATA PROCESSING OPERATIONS

William A. Wulf, 6052 Grafton St., Pittsburgh, Pa. 15206, and Charles Y. Hitchcock, III, 7400 Penfield Ct., Pittsburgh, Pa. 15208

Filed Jun. 1, 1987, Ser. No. 56,789
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 **20 Claims**

1. Apparatus for processing data comprising,

a register file for storage of data,

an input bus and an output bus,

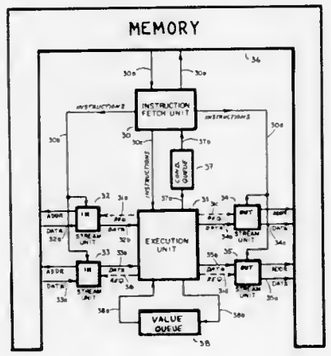
data paths connecting said register file to said input and output buses for transferring data to and from said register file,

a first arithmetic logic unit having a pair of input ports connected to said input bus for receiving instruction to perform a data transformation and an output port,

a second arithmetic logic unit having a pair of input ports for receiving instruction to perform a data transformation and an output port connected to said output bus,

said second arithmetic logic unit input port being connected to said first arithmetic logic unit output port and said input bus respectively, and

said second arithmetic logic unit performing a data transformation in response to input from said first arithmetic logic unit while said first arithmetic logic unit is performing simultaneously a subsequent data transformation in response to said input from said register file with a result



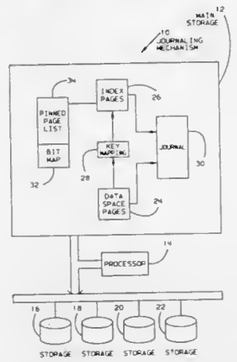
being temporarily stored prior to transfer as input to said second arithmetic logic unit for data transformation in a subsequent cycle.

4,819,156

DATABASE INDEX JOURNALING FOR ENHANCED RECOVERY

Dennis S. DeLorme; Mark L. Holm; Wilson D. Lee; Peter B. Passe; Gary R. Ricard; George D. Timms, Jr., and Larry W. Youngren, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1986, Ser. No. 874,316
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **14 Claims**



1. A method of journaling indexes relating to data spaces comprising the steps of:

a. journaling to a journal unchanged pages of indexes which have changes as a result of the changes to be made to a data space so that the indexes are synchronized with the data space at a desired point in the journal; and

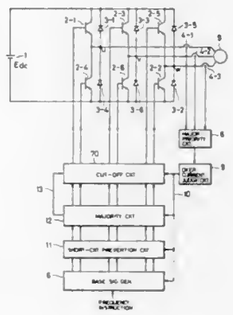
b. journaling changes to the data space prior to changing the data space.

4,819,157

OVERCURRENT PROTECTION CIRCUIT FOR INVERTER DEVICE INCLUDING MAJORITY CIRCUIT FOR TURN-OFF OF MAJORITY OF CONDUCTING TRANSISTORS

Kenji Hirose; Eiichi Sugishima, and Masakatsu Daijyo, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1987, Ser. No. 103,639
Claims priority, application Japan, Oct. 2, 1986, 61-235012; Jun. 30, 1987, 62-163295
Int. Cl.[4] H02P *7/122;* **H02M** *7/5387*
U.S. Cl. 363—56 **8 Claims**



1. An overcurrent protection circuit for an inverter device including three arms each composed of a pair of series connected electric gates, a junction between each of said pair of gates being connected to a load and opposite ends being connected across a d.c. power source for supplying a three-phase a.c. power to the load by on-off controlling the electric gates sequentially according to on-off signals supplied from a control circuit to the electric gates, said overcurrent protection circuit comprising:

current detecting means for monitoring current flowing through the electric gates;

an overcurrent detection circuit, responsive to an output of said current detecting means, for providing an overcurrent signal when the current flowing through any of the electric gates exceeds a predetermined level; and

a majority circuit, responsive to an output of said overcurrent detection circuit, for detecting whether a majority of the electric gates on one side or another side of each of the arms are turned on,

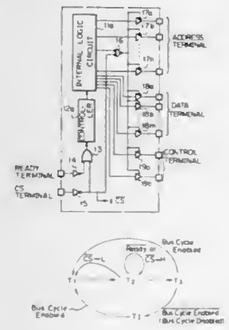
wherein, when the overcurrent signal is produced, one of the on signals of the electric gates on either side of the arms, which are judged as majority, is turned off at a first time point and, at a predetermined time thereafter, the on signals of the remaining electric gates are turned off.

4,819,158

MICROPROCESSOR WITH AN INTERRUPTABLE BUS CYCLE

Takumi Miyashita, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed May 30, 1985, Ser. No. 739,338
Claims priority, application Japan, May 31, 1984, 59-109477
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **7 Claims**



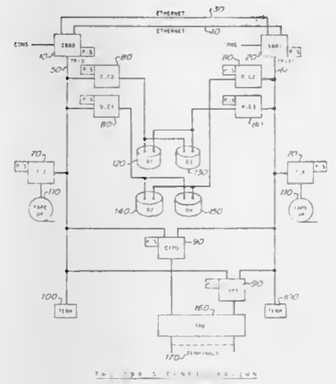
2. A microprocessor according to claim 1, wherein said information is composed of an address and data.

4,819,159

DISTRIBUTED MULTIPROCESS TRANSACTION PROCESSING SYSTEM AND METHOD

Dale L. Shipley, Los Gatos; Joan D. Arnett; William A. Arnett, both of San Jose; Steven D. Baumel, Sunnyvale; Anil Bhavnani, Campbell; Chuenpa J. Chou, Sunnyvale; David L. Nelson, Santa Clara; Maty Soha, Cupertino, and David H. Yamada, San Jose, all of Calif., assignors to Tolerant Systems, Inc., San Jose, Calif.

Filed Aug. 29, 1986, Ser. No. 902,191
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—200 **6 Claims**



1. A distributed processing system comprising: a plurality of processing units,

a plurality of interprocessor communications links each extending from each processing unit to each other processing unit,

each processing unit including a plurality of interprocessor

communications links, a real time processor, an applications program processor, a local memory and at least one I/O processor each connected by a bus internal to the unit and separate from an I/O channel, wherein the real time processor controls access to the internal bus by the remaining portions of the processing unit,

a plurality of I/O channels, one connected to each I/O processor included within each processing unit, and

a plurality of communications processors having at least two ports, each port being connected to an I/O channel associated with a different processing unit, and adapted to connect to a plurality of I/O devices,

a plurality of disk controllers connected to each I/O channel, a plurality of disks each having at least two ports and configured to have a first port connected to a disk controller associated with an I/O channel connected to a first processing unit and a second port connected to a disk controller associated with an I/O channel connected to a second processing unit, and further configured to be addressable by only one of said disk controllers at a time,

each processor being associated with at least a key one of said disks which said processor is capable of addressing and each such key disk being configured to store a log containing transaction information associated with the associated processing unit, and

at least one of said processing units being capable of recognizing the failure of another processing unit, examining the transaction information contained in the log stored on the associated disk, and establishing control of that associated disk.

4,819,160

METHOD OF PROCESSING DATA ACCESS IN A DATABASE MANAGEMENT SYSTEM WITH DATA DICTIONARY DIRECTORY

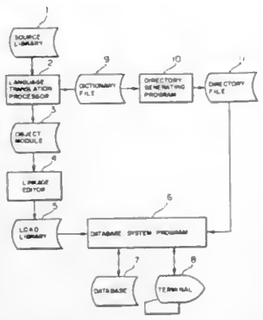
Kazuaki Tanka, Sagamihara; Ichiro Yokoyama; Shigeru Yoneda, both of Ebina; Satoshi Wakayama, Kawasaki; Makoto Urakawa, Yokohama, and Takashi Iihama, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 16, 1987, Ser. No. 4,072

Claims priority, application Japan, Jan. 16, 1986, 61-4927

Int. Cl.[4] G06F *13/00, 15/40*

U.S. Cl. 364—300 **5 Claims**



1. A method of controlling a database access in a database system having a database, a dictionary for storing definition information defining the structure of the data base, and a directory or table generated on the basis of definition information stored in the dictionary, wherein a user program including a database access instruction is compiled and executed, comprising the steps of:

for a compiling stage of said user program:

a first step of confirming if said database access instruction is available to the database system with said definition information by comparing to determine if all of the components to be stated in said database access instruction are really stated and correspond to those defined in the dictionary;

a second step of retrieving information necessary for executing a database access, in response to said database access instruction, from said dictionary and generating an execution table containing said necessary information when the availability of the database access instruction is confirmed;

for an execution stage of said user program;

a third step of confirming that said directory stores at least part of said information stored in said execution table; and

a fourth step of executing a database access, in response to said database access instruction, by using said information stored in said execution table, when it is confirmed in said third step that said directory stores at least a part of said information stored in said execution table.

4,819,161

METHOD OF AUTOMATIC GENERATION OF A COMPUTER FOR NUMERICAL SIMULATION OF PHYSICAL PHENOMENON

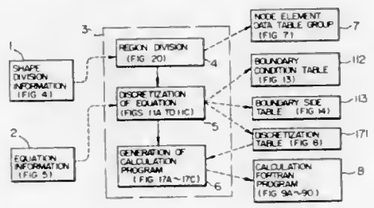
Chisato Konno, Inagi; Yukio Umetani, Hachioji; Hiroyuki Hirayama, Fuchu, and Tadashi Ohta, Higashimurayama, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Eng. Corp., both of Tokyo, Japan

Filed Aug. 26, 1986, Ser. No. 900,424

Claims priority, application Japan, Mar. 10, 1986, 61-50380

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—300 **7 Claims**



1. A method for automatically generating, by use of a computer, a program which calculates an unknown quality (A) within a calculation object region (S1, S2), based upon a finite element method, said automatic generation being performed in response to input information specifying a boundary of the calculation objective region, a division condition of the boundary, a partial differentiation equation related to the unknown quantity, and a boundary condition to be satisfied by the unknown quantity on the boundary, said method comprising the steps of:

(a) dividing the calculation objective region (S1, S2) into element regions (E1, E2, . . .) according to the division condition;

(b) generating , based upon the partial differential equation, a first mathematical expression representing a portion within an arbitrary coefficient (k_{ij}) to be calculated for a matrix equation (k_{ij}) (a_i)=(d_i), said portion being dependent on an element region which includes nodes (N_i, N_j) related to the coefficient, and a second mathematical expression representing a portion within an arbitrary instant (d_i) to be calculated for the matrix equation, said portion being dependent on an element region which includes a node (N_i) related to the constant, wherein a solution of the matrix equation enables the unknown quantity (A) to be represented as a linear combination ($\Sigma_i a_i \phi_i$) of basis functions ϕ_i each defined with respect to a respective node (N_i) of the element regions; and

(c) generating a program which calculates the coefficients ((k_{ij})) and constants ((d_i)); said program generation including the steps of

(c1) generating first and second program portions based upon said first mathematical expression and generating a third program portion based upon said second mathematical expression, wherein said first program portion calculates respective first portions and respective second portions dependent upon positions of nodes (N_i, N_j, and N_k) of one of the element region, so as to renew, by the respective first portions, respective values already calculated for respective diagonal coefficients (K_{ii}, K_{jj}, K_{kk}) related to respective nodes of the one element region, and so as to renew, by the respective second portions, respective values already calculated of respective non-diagonal coefficients (K_{ij}, K_{ji}, K_{jk}, K_{kj}, K_{ki}, K_{ik}) related to respective pairs of nodes of the one element region, and wherein the second program portion calculates respective third portions dependent upon the positions of the plurality of nodes of the one element region, so as to renew, by the respective third portions respective value already calculated for a respective constants of the matrix equation (d_i, d_j, d_k) related to the one element region and

(c3) generating a second program portion for enabling said first to third program portions to be executed for different ones of the element regions of the calculation objective region.

7. A method executed by a computer for automatically dividing a calculation objective region having four sides into element regions, comprising the steps of:

(a1) dividing each side of the calculation objective region according to a division condition specified by input information to determine positions of a plurality of real nodes on each code;

(a2) detecting whether or not a number of real nodes determined by the division condition on a first side of said calculation objective region is different from a number of real nodes determined by the division condition on a second side opposing to said first side and determining positions of virtual positions of virtual nodes when the difference is detected, a number of said virtual nodes being equal to a difference between the real nodes on the first side and the real nodes on the second side, said virtual node being added to one of the first and second sides having a smaller number of real nodes;

(a3) determining a rectangular lattice region having lattice points on sides thereof, a number of said lattice points on each side thereof being equal to a number of real or virtual nodes on a respective one of the four sides of the calculation objective region;

(a4) determining a function for mapping said rectangular region onto said calculation objective region so that said lattice points on the sides of said rectangular lattice region are mapped onto real or virtual nodes on corresponding sides of side calculation objective region;

(a5) determining a plurality of sets of lattice points each set comprising plural adjacent lattice points selected from the lattice points in the rectangular lattice region, said plural lattice points being different from lattice points corresponding to the virtual nodes of said calculation objective region; and

(a6) determining sets of nodes in the calculation objective region each set corresponding to one set of lattice points among said sets of lattice points, each sets of nodes defining an element region of the calculation object region.

4,819,162

TIME CLOCK SYSTEM INCLUDING SCHEDULING PAYROLL AND PRODUCTIVITY ANALYSIS CAPABILITY

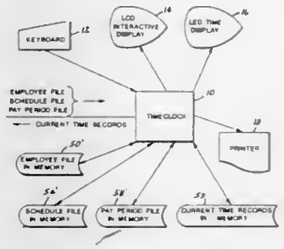
Frederick W. Webb, Jr., Edina; Allen D. Almendinger, Bloomington; Kevin L. Bright, Minneapolis; Kenneth J. Hendren, Eagan; Donald D. Petersen, Long Lake; Michael B. Dandrea, Minneapolis, and Wesley R. Carlson, Roseville, all of Minn., assignors to Time Management Corporation, Golden Valley, Minn.

Continuation of Ser. No. 735,388, May 17, 1985, abandoned.

This application Feb. 9, 1988, Ser. No. 161,322

Int. Cl.[4] G06F *15/21;* **G06k** *7/10*

U.S. Cl. 364—401 **29 Claims**



7. A system of time keeping for hourly employees wherein a plurality of said hourly employees time-in and time-out at a central time clock location when beginning and ending a workshift respectively, a time clock computer located at said location and including input means for entering commands and data, output printer means for printing time certification receipts for an employee, output display means for displaying information to an employee, clock means for maintaining the current time and date and storage means for holding the scheduled times for scheduled employees, daily time records of time-in and time-out transactions made by employees at the beginning and end of a work shift and period-to-date time records of period-to-date time-in and time-out transactions recorded by the time clock during a predetermined pay period, said time clock computer further including:

(a) means for monitoring said input means to detect and interpret the entry of an employee code and a transaction code by an employee;

(b) means for dating time-in and time-out transactions recorded in daily time records with the current date obtained from said clock means;

(c) time-in means responsive to a time-in transaction code for performing the steps of:

(i) reading the current time from said clock means to provide a time-in time;

(ii) verifying that an employee attempting to perform a time-in transaction is scheduled to begin work at said time-in time;

(iii) preventing said time-in transaction if the employee is not scheduled to begin work at said time-in time;

(iv) creating a daily time record for the employee timing in and recording in a daily time record for the employee said time-in time;

(v) storing said daily time record in said storage means; and

(d) time-out means responsive to a time-out transaction code for performing the steps of:

(i) reading the current time from said clock means to provide a time-out time;

(ii) recording said time-out time in the daily time record of the employee;

(e) said time clock computer further including means for causing said printer means to print a certification receipt for the employee timing out, said receipt including a re-

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cord of the time-in and time-out times recorded in the daily time record and/or the time-in and time-out times recorded in the period-to-date record for the employee timing out, the date of said time-in and time-out transactions in said records also being indicated on said receipt so that said printed certification receipt provides a receipt of time transactions for the employee; and

(f) said system further including communication means for transferring at least said daily time records from said storage means to a payroll computer.

4,819,163

DRIVING POWER CONTROL SYSTEM

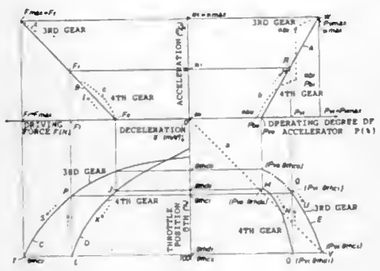
Hidetoshi Shimizu, Mishima; Shigeru Terada, and Yasuhiko Mishio, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 1, 1986, Ser. No. 936,349

Claims priority, application Japan, Dec. 21, 1985, 60-288165; Jan. 7, 1986, 61-948; Feb. 3, 1986, 61-21692

Int. Cl.⁴ B60K *41/08*

U.S. Cl. 364—424.1 **17 Claims**



1. A driving power control system for a vehicle having an automatic transmission which connects to an engine, receives an engine power output from said engine and transmits a driving power to a driving wheel via a gear of the transmission, comprising:

means for detecting a present gear position and for determining a subsequent gear position when a shift in gear positions is required in the automatic transmission;

means for detecting variables indicative of an operating degree of an acceleration mechanism and a running condition of the vehicle, respectively, and for computing a desired driving power in accordance with the detected variables;

engine output control means for controlling an engine output;

means for computing a first desired operating amount for the engine output control means so as to generate the desired driving power at the present gear position, and for controlling the engine output control means to operate at the computed first desired amount at the start of a shift in gear positions; and

means for computing a second desired operating amount for the engine output control means so as to generate said desired driving power at the shifted gear position, and for controlling the engine output control means to operate at the computed second desired amount upon the completion of the shift in gear positions, thereby substantially equalizing said driving ower before and after the shift in gear positions.

4,819,164

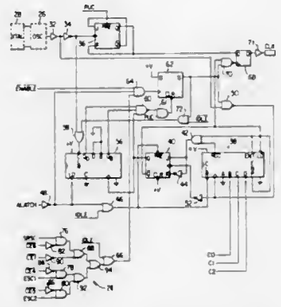
VARIABLE FREQUENCY MICROPROCESSOR CLOCK GENERATOR

Charles N. Branson, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 12, 1983, Ser. No. 560,476

Int. Cl.⁴ G06F *1/04*

U.S. Cl. 364—200 **12 Claims**



1. A microprocessor-based system comprising:

a digital central micrprocessor provided with a clock input and having a rate of operation determined by the frequency of a clock signal input thereto;

memory means operably coupled to said central microprocessor for storing programs respectively including a plurality of instructions and addressable by said central microprocessor;

a first peripheral device operably connected to said central microprocessor, said first peripheral device being addressable by said central microprocessor for control thereby and capable of operating at a first maximum rate of operation when addressed by said central microprocessor which at least equals the maximum rate of operation of said central microprocessor;

a second peripheral device operably connected to said central microprocessor, said second peripheral device being addressable by said central microprocessor for control thereby and capable of operating at a second maximum rate of operation when addressed by said central microprocessor which is less than the maximum rate of operation of said central microprocessor;

a system clock generator for generating a digital reference clock signal having a reference frequency rate; and

frequency rate reduction circuit means connected between said clock generator and the clock input of said central microprocessor for selectively dividing said reference clock signal to generate a microprocessor clock signal as an input to said central microprocessor for clocking said central microprocessor at a normal clock signal having a first frequency rate reduced as compared to the frequency rate of the reference clock signal or a second frequency rate of reduced frequency relative to the first frequency rate of said normal clock signal, said central microprocessor when clocked at said first frequency rate controlling said first peripheral device at or below said first maximum rate of operation therefor and when clocked at said second frequency rate controlling said second peripheral device at or below said second maximum rate of operation therefor; and

said frequency rate reduction circuit means being controlled by said central microprocessor in response to instructions stored in said memory means in selecting the frequency rate of the clock signal input to said central microprocessor.

4,819,165

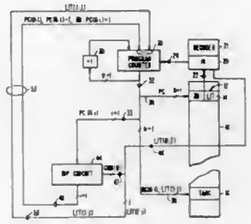
SYSTEM FOR PERFORMING GROUP RELATIVE ADDRESSING

Daniel E. Lenoski, Mountain View, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Mar. 27, 1987, Ser. No. 31,486

Int. Cl.⁴ G06F *12/10*; G11C *8/00*

U.S. Cl. 364—200 **5 Claims**



2. An address generation system of the type that receives a digital (LIT) field and uses the LIT field to generate a second address relative to a first address, the system comprising:

an IDP circuit, including an input port, output port and control port, for generating an IDP output signal comprising a given number of bits at its output port, with the value encoded by the IDP output signal equal to the incremented, decremented or passed (unchanged) signal received at the input port as determined by a control code encoded by a control signal received at the control port;

means for transferring a selected subset of the most significant bits of said first address to the input port of said IDP circuit, with the number bits in said subset equal to said given number,

means for transferring a first selected subset of the binary digits in said LIT field to the control port of said IDP circuit, with the control code encoded by said selected subset determining the value of said IDP output signal; and

means, coupled to said IDP circuit, for combining the IDP output signal with a second subset of the bits in the LIT field to form the second address, with the bits of the IDP output signal forming the most significant bits of the second address and with the second subset of bits forming the least significant bits of the second address.

4,819,166

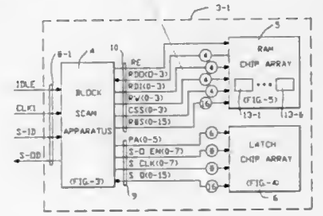
MULTIMODE SCAN APPARATUS

Stephen S. C. Si, Milpitas, Calif., and Dale F. Merrick, Yamhill, Oreg., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 528,160, Aug. 31, 1983, abandoned. This application Apr. 15, 1987, Ser. No. 40,738

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 364—200 **17 Claims**



1. In a data processing system including a host computer comprising a plurality of scannable circuits having data locations in which data is stored during normal operation of the host computer, the scannable circuits each being adapted to one of a plurality of scan sequencing formats for scan out data and scan control information and for providing scan out data from the data locations independent of normal operation of the host computer, and a secondary computer generating the scan control information including a scan mode indicator and a scan address identifying one of the scannable circuits a multimode scan apparatus in communication with a block of the plurality of scannable circuits, comprising:

interface means, connected to the secondary computer, for communicating scan out data and a scanned control information between the multimode scan apparatus and the secondary computer;

mode selecting means, connected to the interface means, for selecting in response to the scan mode indicator one of a plurality of sequencing modes;

means, connected to the mode selecting means and the interface means, for converting the scan out data and scan address to one of the plurality of scan sequencing formats in response to the selected sequencing mode; and

connection means, connected to the means for converting and the scannable circuits in the group, for connecting the scan out data from the scannable circuit identified by the converted scan address to the means for converting.

4,819,167

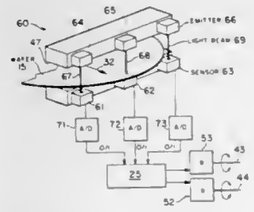
SYSTEM AND METHOD FOR DETECTING THE CENTER OF AN INTEGRATED CIRCUIT WAFER

David Cheng, San Jose, and Wesley W. Zhang, Burlingame, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Apr. 20, 1987, Ser. No. 40,974

Int. Cl.⁴ G06F *15/46*; G21K *5/10*; B65H *1/00*

U.S. Cl. 364—167.01 **10 Claims**



1. A system for detecting the locus relative to a selected point of an object having leading and trailing edges, such as a semiconductor wafer, positioned on a support movable along a selected path, and for moving the support and object to the selected point, comprising:

a sensor array comprising a plurality of sensors adapted for providing an output signal, said sensors being mounted along an axis generally traverse to the path of movement of said object, said sensors being triggered by the leading and trailing edges of the moving object for supplying output signals representing the wafer position associated with the sensor trigger point;

means responsive to the output signals for calculating the location of the wafer relative to the selected point; and

means responsive to the computed relative location of the object for moving the support and the object positioned thereon to the selected point.

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4,819,168

TRAIN CONTROL HAVING IMPROVED WHEEL WEAR ADJUSTMENT FOR MORE ACCURATE TRAIN OPERATION

Paul S. Laskey, Baldwin Boro, Pa., assignor to AEG Westinghouse Transportation Systems, Inc., Pittsburgh, Pa.

Filed Jan. 19, 1988, Ser. No. 145,175
Int. Cl.[4] G06F *15/14*
U.S. Cl. 364—424.01 **16 Claims**



1. A control system for a steel wheel vehicle having at least two propulsion/braking units with each operating at least one axle, said system comprising:

a propulsion/braking control generating current signals to operate the axle motor drives and generating braking signals to operate the associated braking system in accordance with command signals;

a spin/slide control for adjusting said propulsion/braking control in accordance with differential axle speeds to avoid vehicular spins/slides;

means for generating a signal representative of the speed of each axle;

means for generating a signal representative of an entered actual wheel size for a preselected one of said axles;

means for computing speed adjust factors, for the respective axles from the entered actual wheel size, the base wheel sizes and the axle speeds;

means for adjusting the respective axle speeds in accordance with the speed adjust factors and for applying the adjusted axle speeds to said spin/slide control for computation of differential axle speeds with wheel wear compensation;

means for computing tractive effort adjust factors for the respective propulsion/braking units from the actual wheel size, the base wheel sizes and the axle speeds; and

means for applying the tractive effort adjustment factors to said propulsion/braking control for computation and execution of tractive effort with wheel wear compensation.

4,819,169

SYSTEM AND METHOD FOR CALCULATING MOVEMENT DIRECTION AND POSITION OF AN UNMANNED VEHICLE

Hiroshi Saitoh; Kazunori Noso; Kunihiko Kurami, and Norimasa Kishi, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 24, 1987, Ser. No. 100,581
Claims priority, application Japan, Sep. 24, 1986, 61-223696; Oct. 21, 1986, 61-248334
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—424.02 **29 Claims**

1. A system for calculating movement direction and position of a movable object, comprising:

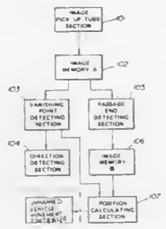
(a) first means for photographing a background of the movable object in a direction of which the movable object moves;

(b) second means for detecting a vanishing point from a photographed background two-dimensional image derived by the first means;

(c) third means for detecting a position of an end of a passage on which the movable object is to move from the photographed background image derived by the first means;

(d) fourth means for calculating a direction of the movable object from a position of the vanishing point detected by the second means; and

(e) fifth means for calculating a distance of the movable object from the position of the passage end detected by



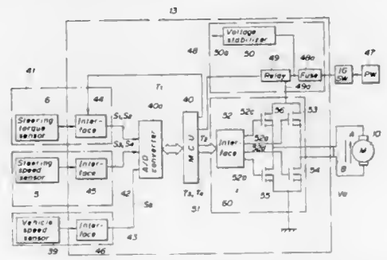
the third means on the basis of the detected position of the passage end and vanishing point.

4,819,170

MOTOR-DRIVEN POWER STEERING SYSTEM FOR AUTOMOTIVE VEHICLES

Yasuo Shimizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1987, Ser. No. 27,378
Claims priority, application Japan, Mar. 24, 1986, 61-65373
Int. Cl.[4] B62D *5/06*
U.S. Cl. 364—424.05 **6 Claims**



1. A motor-driven steering system for an automotive vehicle, comprising:

an input shaft coupled to a steering wheel;

an output shaft coupled to a steerable wheel;

an electric motor applying assistive torque to said output shaft;

steering torque detecting means for detecting steering torque acting on said input shaft;

steering speed detecting means for detecting a steering speed of the steering wheel;

vehicle speed detecting means for detecting a vehicle speed;

control means for controlling said motor, said control means having a control signal generating means for receiving output signals from said steering torque detecting means, from said steering speed detecting means and from said vehicle speed detecting means, and said control signal generating means for generating control signals including a steering torque component, based on the detected steering torque, and a basic steering speed component, based on the detected steering speed; and

driving means responsive to said control signals for supplying a driving signal to said motor;

said control signal generating means having a correcting means for receiving said output signal from said steering speed detecting means and said output signal from said vehicle speed detecting means, and said correcting means for correcting said basic steering speed component such that the basic steering speed component is reduced as the vehicle speed increases; and

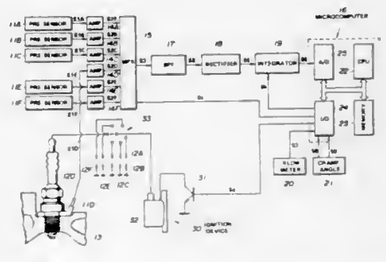
said control signal generating means receiving said output signal from said steering torque detecting means, and adding the corrected steering speed component to said steering torque component for generating said control signals.

4,819,171

ENGINE SPARK TIMING CONTROL SYSTEM

Tatsuo Morita, Yokosuka, Japan, assignor to Nissan Motor Co., Limited, Kanagawa, Japan

Filed Jul. 31, 1986, Ser. No. 891,926
Claims priority, application Japan, Aug. 5, 1985, 60-172933; Aug. 6, 1985, 60-173770
Int. Cl.[4] F02P *5/14*
U.S. Cl. 364—431.08 **8 Claims**



1. A spark timing control system for an engine comprising:

(a) means for detecting an operating condition of the engine;

(b) means for detecting whether a knock is present or absent in the engine;

(c) means for determining a basic target spark timing in accordance with the engine operating condition;

(d) means for determining a spark timing knock corrective value in accordance with the detection of the presence or absence of the knock;

(e) means for determining a spark timing learning corrective value in accordance with the spark timing knock corrective value and with the engine operating condition;

(f) means for detecting a transitional condition of the engine;

(g) means for, when the transitional engine condition is detected, fixing the spark timing knock corrective value at a preset value independent of the detection of the presence or absence of the knock and also independent of the engine operating condition;

(h) means for determining a final target spark timing in accordance with the basic target spark timing, the spark timing knock corrective value, and the spark timing learning corrective value; and

(i) means for generating a spark in the engine at a timing in agreement with the final target spark timing.

4,819,172

VEHICLE SPEED CONTROL SYSTEM

Hitoshi Takeuchi, Kariya; Masao Taujii, Nagoya, and Masahiro Ohba, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 9, 1986, Ser. No. 917,593
Claims priority, application Japan, Oct. 9, 1985, 60-226546
Int. Cl.[4] B60K *31/00*
U.S. Cl. 364—431.07 **7 Claims**

1. A system for controlling the speed of a motor vehicle, comprising:

actuator means for actuating a member provided for regulating the amount of intake air introduced into an engine of said vehicle;

speed sensor means for detecting a speed of said vehicle and for generating a signal indicative of the detected vehicle speed;

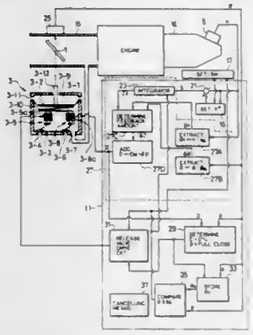
position sensor means for detecting a regulating position of said intake air regulating member;

target speed setting means for setting a target vehicle speed;

subtraction means for successively obtaining a deviation of the vehicle speed detected by said speed sensor means from the set target vehicle speed;

integrator means for integrating the successively obtained deviation;

control means for generating a drive signal to said actuator



means on the basis of said obtained deviation integration value so that the detected vehicle speed becomes equal to said target vehicle speed;

accelerating termination detecting means for detecting a termination of acceleration of said vehicle which is independent of the actuating of said actuator means by a driver of said vehicle and for generating an integration value reset command signal; and

reset means for changing the deviation integration value obtained by said integrator means so as to become smaller in absolute value in response to the generated reset command signal.

4,819,173

SYSTEM FOR PREVENTING EXCESSIVE REPETITION OF INTERRUPT PROGRAMS IN A MICROCOMPUTER

Jürgen Brauninger, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GMBH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1986, Ser. No. 939,703
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544079
Int. Cl.[4] G06F *9/22, 15/00*
U.S. Cl. 364—431.07 **8 Claims**

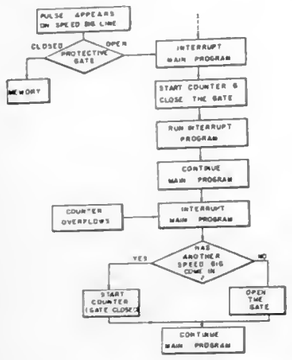
1. Microcomputer for control of machinery having a main program and at least one interrupt program responsive to a source of cyclic signals derived from said machinery, for interrupting said main program and performing an interrupt program consisting of a measurement or other relatively brief processing, said microcomputer comprising:

access control means responsive to a signal from said source of cyclic signals for effectively blocking or giving access of a signal from said source to an interrupt input of said microcomputer for interrupting said main program and obtaining performance of an interrupt program pertaining to said cyclic signal from said source, being responsive also to an access control signal for selective blocking or access giving, and

timing means responsive to any signal from said source which is not blocked by said access control means for producing an access control signal for thereafter blocking said signals from said source by said access control means

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for an interval of a predetermined fixed duration pertaining to said cyclic signals from said source and measured by said timing means, which exceeds the magnitude of an interval necessary for performance of said interrupt program by at least the magnitude of an interval necessary for



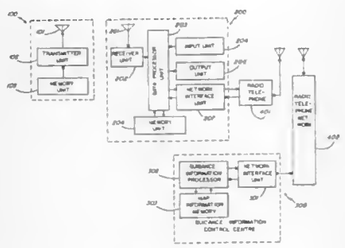
performing emergency programs in the event of detection of an emergency condition by said microcomputer, said access control signal, except during an interval of said predetermined duration timed by said timing means, being of a nature for causing said control means to give access to said interrupt input.

4,819,174

ROAD NAVIGATION SYSTEM

Kenichi Furuno; Yoshio Tooko, and Takayuki Nonami, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1987, Ser. No. 8,573
Claims priority, application Japan, Jun. 9, 1986, 61-133414
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—444 **8 Claims**



1. A road navigation system comprising:

a plurality of guidance information transmitter means disposed along a route, each transmitter means generating current location information in the form of extremely low powered signals so as to effect a transmission of said current location information within a relatively small area; and

guidance signal generator means mounted on a vehicle for information for a driver, said guidance providing guidance signal generator means comprising:

receiver means for receiving said current location information from said guidance information transmitter means;

input means allowing said driver to input destination information;

memory means for storing available map information and the inputted destination information;

data processor means for comparing said map information and said destination information which have been stored in said memory means with said current location information when received, and for producing guidance information representative of route information to be traced from the current point to the destination; and

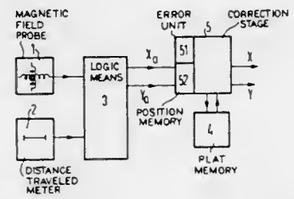
output means for communicating said route information to said driver.

4,819,175

NAVIGATION EQUIPMENT FOR A MOVING VEHICLE

Gero Wuttke, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1987, Ser. No. 98,087
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632619
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 **5 Claims**



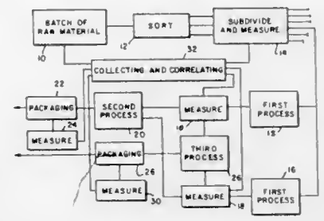
1. Navigation equipment for a vehicle comprising, a magnetic field probe (1) for obtaining measured values for the direction of travel, a travel distance meter (2) for obtaining measured values for the distance travelled, a plat memory (4) in which it stores a digitized street may (41) of a region in a coordinate system, a logic means (3) which receives the outputs of said magnetic field probe and of said travel distance meter and calculates position indications of the vehicle referred to the coordinate system, and storing said indications in a position memory (52), a correction stage (5) connected to said plat memory (4) and said position memory (52) and checks every n^{th} position indication and when said n^{th} position indication does not lie on a street of the street map (41), said correction stage corrects said n^{th} position indication to form a position value (X, Y) which corresponds to a point on a neighboring street, said street map (41) of the region is divided into a network (42) composed of network elements (421) of identical size; every network element (421) has an address in the plat memory (4) allocated to it, one of two binary characters being stored under said address, whereby one binary character identifies a positive network element (421) which lies mainly on a street and the other binary character identifies a negative network element which does not lie mainly on a street; said correction stage (5) includes an error memory (51) which contains the respectively m most recent position indications of the checked position indications which fall on a negative network element (421) which has said one binary character that indicates that the vehicle is not on a street; the position indications from the error memory (51) are successively shifted with a shift value until a correction value is found, so that the position indications shifted therewith fall on a network element (421) which lies mainly on a street and the position indications stored in the error memory (51) are subsequently erased; and every position indication is corrected by the correction value and the result is output as said position value.

4,819,176

PROCESS CONTROL AND DATA COLLECTION SYSTEM

Belal Ahmed, Bridgeport; Andrew Eisner, Stamford; Harold Foodman, Norwalk, all of Conn.; G. Cecil Hartley, Seffner, Fla.; Michael Hartley, Seffner, Fla., and Robert Marsh, Brandon, Fla., assignors to Treasure Isle, Inc., Tampa, Fla.

Filed Feb. 6, 1987, Ser. No. 11,619
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—468 **43 Claims**



1. A processing line data acquisition system for a process line having a sorting and first and second raw material processing steps comprising:

sorting means for sorting an identified batch of raw material by a preselected criteria into a plurality of grades;

first measuring means for measuring total quantity of each grade of raw material sorted by said sorting means for a batch;

second measuring means for measuring a quantity of raw material after a first raw material processing step for portions of identified batches;

third measuring means for measuring a quantity of processed material after a second processing step for portions of said identified batches; and

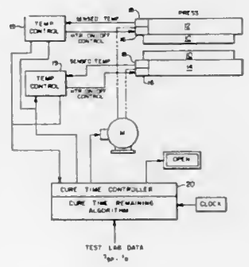
central computer means connected to said sorting means and each measuring means for collecting and correlating the quantities measured on an identified batch basis.

4,819,177

METHOD FOR CURING RUBBER ARTICLES

John R. Jurgensen, Urbana, Ohio, assignor to Systran Corporation, Dayton, Ohio

Filed Jun. 19, 1987, Ser. No. 64,965
Int. Cl.[4] B29C *35/02*; G06F *15/46*
U.S. Cl. 364—476 **6 Claims**



1. A method of curing a rubber article in a mold of the type wherein a temperature of a cavity thereof may vary above or below an optimum temperature, comprising the steps of:

(a) selecting an optimum cure time and temperature for said article;

(b) raising the temperature of said mold to said optimum temperature;

(c) placing said article in said mold cavity and closing said mold;

(d) at a time subsequent to step (c), measuring the temperature of said mold and calculating a decrement to cure time remaining of said optimum cure time with the formulas

$$D=2^{AC}(t_n-t_{n-1})$$

and

$$t_R=t_R-D$$

where D is a decrement to cure time remaining, AC is a time factor exponent equalling $(T_E-T_{SP})/18°$ F. $(10°$ C.), where T_E is measured temperature and T_{SP} is said optimum cure temperature; (t_n-t_{n-1}) is the number of real-time seconds since the last temperature measurement, and t_R is time remaining to effect cure; and

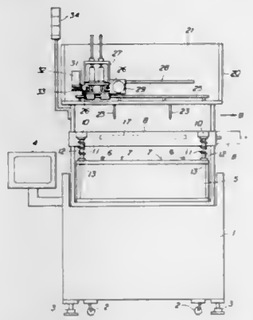
(e) repeating step (d) until t_R is $\leqq 0$, and then opening said mold and removing said article therefrom.

4,819,178

AUTOMATIC CIRCUIT ADJUSTING SYSTEM AND CIRCUIT ADJUSTING TOOL THEREFOR

Shigeo Isayama, and Kazutoshi Ogawa, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 933,909
Claims priority, application Japan, Dec. 6, 1985, 60-274628
Int. Cl.[4] G05B *23/02*; G06F *15/20*
U.S. Cl. 364—481 **29 Claims**



1. An automatic circuit adjusting system comprising:

an adjusting tool assembly with adjusting tools for performing adjustment on a circuit element on a printed circuit board;

a driving means associated with said adjusting tool assembly for driving said adjusting tool;

a movable frame carrying said adjusting tool assembly for shifting the latter within a predetermined two-dimensional coordinate system;

first means for supporting said printed circuit board in a predetermined orientation with respect to said two-dimensional coordinate system;

second means for applying a preset test signal to the circuit element of the printed circuit board, said second means for receiving an output in response to said test signal from said printed circuit board, and comparing said output of said printed circuit board with a predetermined reference signal for deriving an error signal;

third means for shifting said movable frame according to a predetermined schedule for positioning said adjusting tool assembly in alignment with each of said circuit elements to be adjusted in order; and

fourth means for deriving an adjusting magnitude for the circuit element to be adjusted based on said error signal

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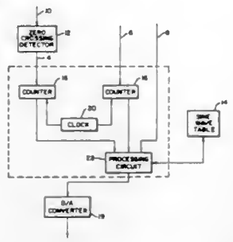
and producing a driver signal for driving said driving means at a magnitude corresponding to the value of said error signal.

4,819,179

DIGITAL SLIP FREQUENCY GENERATOR AND METHOD FOR DETERMINING THE DESIRED SLIP FREQUENCY

Frederick F. Klein, Monroeville, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1987, Ser. No. 116,292
Int. Cl.[4] H02P *9/42*
U.S. Cl. 364—484 **11 Claims**



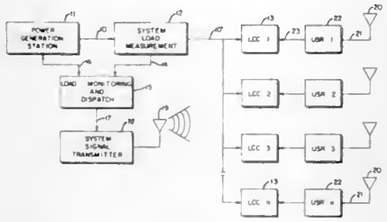
1. A digital slip frequency generator comprising:
a plurality of predetermined reference values which define a waveform;
a calculating means utilizing a line frequency signal, a rotor speed signal and a rotor position signal to select slip frequency waveform values from a plurality of predetermined reference values; and
an output means for converting the selected predetermined reference values into the appropriate slip frequency waveform.

4,819,180

VARIABLE-LIMIT DEMAND CONTROLLER FOR METERING ELECTRICAL ENERGY

Theodore A. Hedman, Littleton, and Maynard L. Moe, Denver, both of Colo., assignors to Dencor Energy Cost Controls, Inc., Denver, Colo.

Filed Feb. 13, 1987, Ser. No. 15,659
Int. Cl.[4] H02J *1/00*; **G01R** *19/00*; **G06F** *15/56*
U.S. Cl. 364—492 **16 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 84 Pages)



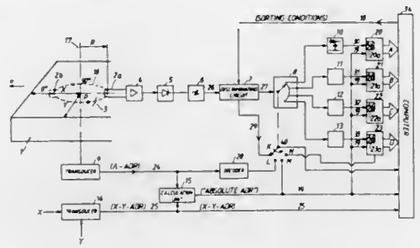
1. In a method for regulating power delivered by a utility to each of a plurality of users wherein each user has variable demands for power consumption, there being a power source, means for delivering power to each said user and a utility control signal transmitted from said power source to each user when it is desired to modify the power consumed by each user, the steps comprising:
measuring the power consumption of each user; and
modifying the power consumption by each user by an amount correlated with the power consumption measurement of each user when a utility control signal is transmitted to each user.

4,819,181

PERFORMANCE INCREASING SIGNAL PROCESSING DEVICE

Bengt H. Törnblom, Västerås, Sweden, assignor to Tornbloms Kvalitetskontroll AB, Sweden

Filed Apr. 15, 1987, Ser. No. 38,764
Claims priority, application Sweden, Apr. 18, 1986, 8601785
Int. Cl.[4] G01N *27/82, 27/90*
U.S. Cl. 364—507 **7 Claims**



1. A device for processing fault signals obtained from at least one transducer movable in a closed path in relation to the surface of a test object, said signals being at least partially derived from at least one defect in said surface, comprising:
means for determining at least two different conditions of said at least one surface defect from said fault signals;
means for determining the angular position of said at least one transducer with respect to said surface in a plane substantially parallel thereto;
means for determining the position of said at least one transducer with respect to a given coordinate system associated with said surface;
means for calculating an absolute address of said at least one transducer with respect to said surface;
means for storing said at least two conditions;
means for distributing said at least two conditions to said means for storing;
means for processing at least one of said at least two conditions in accordance with at least one of said absolute address, said angular position and said position; and
means for switching selected ones of said at least one of said two different conditions, said absolute address, said angular position and said position to said means for processing.

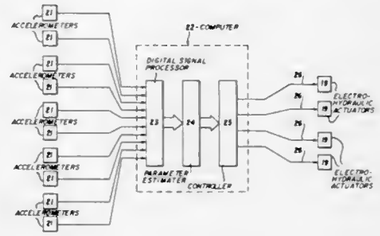
4,819,182

METHOD AND APPARATUS FOR REDUCING VIBRATION OF A HELICOPTER FUSELAGE

Stephen P. King, Stoke-Sub-Hamdon, and Christopher I. Hughes, Yeovil, both of England, assignors to Westland plc, Somerset, England

Filed Feb. 4, 1987, Ser. No. 10,699
Int. Cl.[4] F16F *15/10*; **B04D** *47/00*
U.S. Cl. 364—508 **17 Claims**

1. A method of reducing vibration of a structure comprises the steps of connecting a plurality of actuators between parts of the structure capable of relative motion at an exciting frequency, continuously oscillating the plurality of actuators at a frequency substantially corresponding to the exciting frequency, generating signals representative of dynamic accelerations at a plurality of locations on the structure and feeding said signals to on board processing means providing output signals for controlling the phase and magnitude of applied forces



generated by the actuators and for varying the phase and magnitude characteristics of said forces so as to compensate for changes in structure dynamics whereby the overall level of structural vibration is reduced.

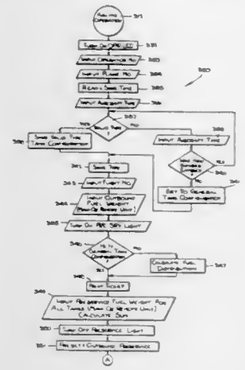
4,819,183

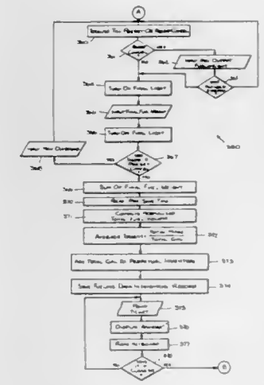
AIRCRAFT FUEL LOADING MANAGEMENT SYSTEM

Edward M. O'Brien, Holland, Pa., and Donald R. Otto, Trenton, N.J., assignors to Ametek, Inc., New York, N.Y.

Filed Jan. 14, 1986, Ser. No. 818,786
Int. Cl.[4] B67D *5/00*
U.S. Cl. 364—509 **14 Claims**

14. A method of normalizing a volume of fuel transferred from one location to another to a temperature normalized volume comprising the steps of:
determining the rate of flow of fuel;
integrating the rate of fuel flow during incremental time periods to obtain incremental volumes of fuel flow;
computing the density of the fuel which flowed for each incremental volume of fuel flow;
computing the weight of each incremental volume of fuel transferred from the incremental volumes and the densities corresponding to the incremental volumes;
summing the weights of the incremental weights of fuel loaded to obtain the total weight of fuel transferred;
normalizing the density of the fuel transferred to a preselected temperature; and





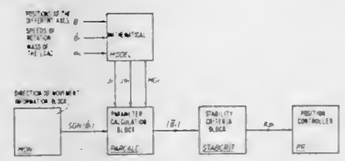
obtaining the normalized volume from the total weight and the normalized density.

4,819,184

METHOD AND A DEVICE FOR OPTIMUM CONTROL OF CONTROL PARAMETERS IN AN INDUSTRIAL ROBOT

Sven Jönsson; Erik Persson, and Lars Östlund, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 29, 1987, Ser. No. 102,516
Claims priority, application Sweden, Sep. 29, 1986, 8604102; Sep. 29, 1986, 8604103
Int. Cl.[4] G05B *13/00*
U.S. Cl. 364—513 **20 Claims**



1. A method of providing optimal parameter control of axis controllers in an industrial robot having a plurality of move-

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ment axes, a drive motor and an axis controller being provided for each axis of the movement axes to control the axis movement in accordance with desired values supplied to the controller, computer equipment being provided to control the robot, the method comprising the steps of:

(a) describing on the basis of a mathematical model static and dynamic properties of the robot;

(b) calculating continuously during the operation of the robot maximum acceleration and deceleration values for at least one axis of the movement axes, the calculating being based on the static and dynamic properties of the robot and an assumed value of the maximum available torque of the drive motors; and

(c) selecting at least one control parameter and/or one path planning parameter in the axis controller of the at least one axis in dependence on the calculated values obtained from the calculating step.

4,819,185

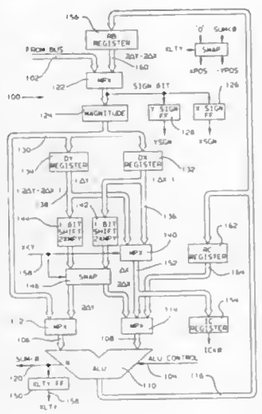
METHOD AND APPARATUS FOR DRAWING WIDE LINES IN A RASTER GRAPHICS DISPLAY SYSTEM

James Corona, Kingston, and Yoshio Iida, Lake Katrine, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1986, Ser. No. 820,762

Int. Cl.⁴ G06F *15/40*

U.S. Cl. 364—518 **8 Claims**



1. Apparatus for efficiently drawing wide lines in a graphics display system comprising:

means for identifying a wide line to be drawn;

means for drawing a line of pixels of said wide line;

means for determining if a next line in said wide line has a different first coordinate value from the first coordinate value of a previous line;

means for generating at least one additional pixel at predetermined coordinate locations for said next line if said first coordinate value of said next line is different from said first coordinate value of an immediately previously drawn line to fill holes in said wide line at said predetermined coordinate locations; and

means for repeating said steps until said wide line has been completely drawn.

4,819,186

WAVEFORM GENERATING APPARATUS FOR DRIVING LIQUID CRYSTAL DEVICE

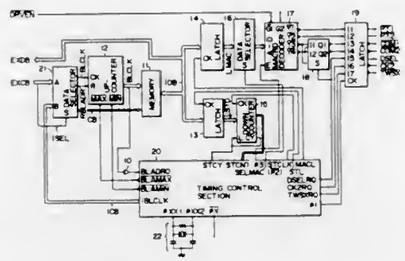
Morio Ohta, and Hideaki Inoue, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1988, Ser. No. 148,424

Claims priority, application Japan, Jan. 30, 1987, 62-21587; Feb. 17, 1987, 62-35294; May 7, 1987, 62-111468; May 19, 1987, 62-123146; Oct. 6, 1987, 62-253212

Int. Cl.⁴ G06F *15/66*

U.S. Cl. 364—519 **19 Claims**



1. A drive waveform generating apparatus for driving a liquid crystal device, comprising:

memory means for storing waveform data for designating a drive waveform of said liquid crystal device and duration data for designating a duration for which the drive waveform designated by the waveform data is to be supplied, and for outputting the waveform data and the duration data in accordance with an input address designation signal;

drive waveform output means for receiving the waveform data and a clock signal having a predetermined period and a predetermined phase and outputting a plurality of drive waveforms designated by the waveform data from corresponding output terminals;

measuring means for receiving the duration data and measuring the duration designated by the duration data; and

count means which is incremented by a predetermined value when said measuring means completes measurement of the duration designated by the duration data, and outputs a count value serving as an address designation signal to be input to said memory means.

4,819,187

SYSTEM FOR INTEGRALLY CONTROLLING AUTOMATIC TRANSMISSION AND ENGINE

Hideki Yasue; Kagenori Fukumura; Kunihiro Iwatsuki, and Yoshio Shindo, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 23, 1986, Ser. No. 945,501

Claims priority, application Japan, Dec. 23, 1985, 60-290016; Dec. 23, 1985, 60-290017; Dec. 24, 1985, 60-291460; Dec. 26, 1985, 60-293985; Dec. 27, 1985, 60-295198; Jan. 28, 1986, 61-16041; Feb. 12, 1986, 61-28652; Feb. 12, 1986, 61-28653

Int. Cl.⁴ G05D *17/02;* **G06F** *15/50*

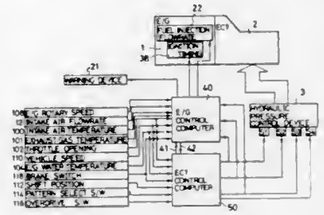
U.S. Cl. 364—431.01 **21 Claims**

1. A system for integrally controlling an automatic transmission and an engine, wherein gear stages are automatically switched in accordance with shift points in a preset shift map, and an engine torque is changed by a predetermined change value during shifting to thereby maintain satisfactory shift characteristics, comprising:

processor means for controlling the engine torque change by the predetermined change value during shifting, the processor means including

means for determining whether conditions exist such that said engine torque cannot be changed in accordance with said predetermined change value; and

means for regulating said engine torque change when said conditions are determined to exist, said regulating means including means for changing the shift points of said preset shift map to lower the shift points when the engine torque change is regulated.



4,819,188

IMAGE PROCESSING APPARATUS

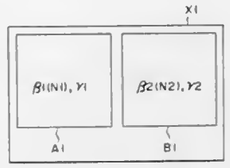
Mitsuyoshi Matsubara, Tochigi, and Yukinobu Ito, Ootawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 22, 1985, Ser. No. 800,793

Claims priority, application Japan, Nov. 22, 1984, 59-248463; Jul. 23, 1985, 60-161181

Int. Cl.⁴ G06F *15/42*

U.S. Cl. 364—413.23 **11 Claims**



1. An image processing apparatus in a radiation image recording system in which radiation image data SO obtained by detecting radiation transmitted through an object to be examined is supplied to an image processing apparatus, said image processing apparatus calculates unsharp mask data Sus corresponding to each pixel data of the radiation image data SO and conducts an operation represented by $S=\gamma[S0+\beta(S0-Sus)]$ (where β: an emphasis an emphasis coefficient, γ: a gradation coefficient) so as to obtain processed image data through frequency emphasis processing and gradation processing of the radiation image data so, and the processed image data obtained by said image processing apparatus is supplied to image recording means so as to form an image corresponding to the original image on a single recording medium, wherein s aid processing apparatus comprises:

parameter setting means for setting two different mask sizes; and

image processing means for calculating two unsharp mask data Sus1 and Sus2 for the two different mask sizes set by said parameter setting means so as to form, at substantially the same time, two sets of processed image data by frequency emphasis processing and gradation processing of the radiation image data using the unsharp mask data Sus1 and Sus2 whereby two images which correspond to the same original image and have different contrasts are formed on said single recording medium on the basis of said two sets of processed image data.

4,819,189

COMPUTER SYSTEM WITH MULTIWINDOW PRESENTATION MANAGER

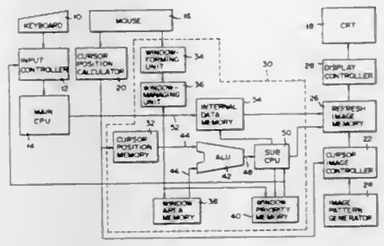
Kiyoshi Kikuchi, Kanagawa, and Akio Mori, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 21, 1987, Ser. No. 52,374

Claims priority, application Japan, May 26, 1986, 61-120898

Int. Cl.⁴ G06F *15/72*

U.S. Cl. 364—521 **9 Claims**



1. A multi-window display apparatus, comprising:

display means having a display screen for displaying window serving as independent image display regions on said display screen in such a manner as to allow said windows to overlap one upon another;

cursor display means, connected to said display means, for moving a cursor displayed on said display screen of said display means in accordance with a manual operation by an operator;

first memory means, connected to said display means, for storing plural pieces of window coordinate data specifying positions and sizes of said windows displayed on said display screen;

second memory means, connected to said cursor display means, for storing data of most current coordinates of said cursor on said display screen, as present-cursor position data; and

window control means, connected to said first and second memory means and said display means, for comparing said present-cursor position data with said plural pieces of said window coordinate data, detecting when said cursor moves into one of said windows, and controlling said display means so as to automatically move one of said windows in which said cursor moves in front of the other windows on said display screen, said one of said windows being entirely visible while said other windows are hidden at least partially behind said one of said windows;

said window control means comprising:

first processing means for initially determining display priorities of said window according to the order said windows are formed, and for generating window priority data;

third memory means, connected to said first processing means, for receiving said window priority data and for storing data of said display priorities of said windows; and

second processing means, connected to said third memory means, for comparing said present-cursor position data with said plural pieces of said window coordinate data, and for, when said cursor is detected to have mvoed into one window, rewriting contents of said third memory means in such a manner that said display priorities of said windows are updated to give said one window the highest display priority, said one window having the highest display priority being displayed as an active window.

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4,819,190

VIDEO LINE PROCESSOR

Daryl E. Hinman; Vernon A. Anderson, and Jon H. Bumgardner, all of Ridgecrest, Calif., assignors to The United States of America as Represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 18, 1986, Ser. No. 875,892

The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.

Int. Cl.[4] G09G *1/00*; G06K *9/36*

U.S. Cl. 364—521 **10 Claims**



1. A video line processor for use with video lines, each represented by a predetermined number of sequential pixel values corresponding to a predetermined time interval therebetween, to transform an input such line into an output such line, the processor comprising:

an input for pixel values of such an input line;

an output for pixel values of such an output line;

means for generating a count incremented at successive such intervals to correspond to positions of such pixel values along such an input or output line;

coefficient memory means having a plurality of storage locations, which correspond individually to such pixel values along such video line and which are addressed successively during such a video line by said count, for outputting a coefficient from each addressed location of the coefficient memory means, each coefficient including a transformation factor and a line memory address;

pixel transformation means for receiving, at each successive such interval, a pixel value of such an input line and such a transformation factor and for generating from said value and said factor a transformed pixel value of such an output line by a predetermined transform;

line memory means, which has a plurality of individually addressable storage locations corresponding individually to such pixel values along such a video line, has an input address connection, and has an output address connection, for, at each such interval, outputting such a pixel value from the one of said storage locations addressed at the output address connection and storing such a pixel value at the one of said storage locations addressed at the input address connection;

line memory address control means for selectively directing said count to one of said addressing connections and for directing such a line memory address being output by the coefficient memory means to the other of said address connections; and

pixel value flow control means for selectively directing pixel values from said input of the line processor to the transformation means or to the line memory means, for selectively directing such transformed pixel values from the transformation means to the line memory means or to said output of the line processor, and for selectively directing pixel values output from the line memory means to the transformation means or to said output of the line processor.

4,819,191

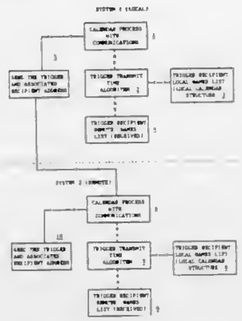
ELECTRONIC CALENDARING METHOD TO ESTABLISH CALENDAR FLOATING TRIGGERS FOR CALENDARED EVENTS AND PROCESSES

Keith J. Scully, Austin, Tex., and Harinder S. Singh, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1987, Ser. No. 8,039

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—518 **12 Claims**



1. An electronic calendaring method for use in a data processing system having a plurality of interactive workstations, each of which is assigned to at least one individual who maintains a calendar on said system, each of said calendars including a plurality of data structures for storing data in designated fields that is related to said calendared event, said data structures including a Trigger data structure for reminding the calendar owner(s) of a subsequent calendared event, said method comprising the steps of;

(a) establishing an event ID field in said Trigger data structure for storing the system ID of the event to be triggered and a trigger time field for storing a trigger time,

(b) establishing a mode field in said Trigger data structure for storing a float mode indicator that causes the initial relationship between said Trigger data structure and said event to be maintained automatically whenever the related event data structure corresponding to said event identified in said event ID field is subsequently processed,

(c) displaying an event calendaring screen to said calendar owner to assist in entering said event data and said Trigger data in said system, and

(d) processing said Trigger data structure in response to processing said related event data structure to determine if said mode field contains said float mode indicator.

4,819,192

METHOD OF DISPLAYING IMAGE

Tetsuzo Kuragano, and Atsushi Kikuchi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,990

Claims priority, application Japan, Feb. 26, 1985, 60-37077; Feb. 26, 1985, 60-37079; Feb. 26, 1985, 60-37078

Int. Cl.[4] G09B *9/08*

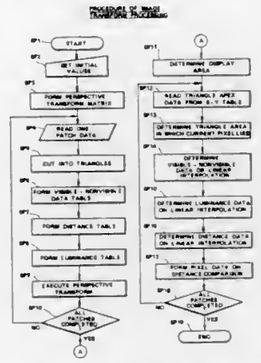
U.S. Cl. 364—522 **9 Claims**

1. A method of processing, by means of a programmed computer, electronic, image data signals representative of surfaces of an object lying within a three-dimensional space for display at corresponding pixels of a two-dimensional, electronic display screen in accordance with a perspective transformation method when seen from a predetermined observing point, which comprises the following steps of:

(a) dividing a surface of the object into a plurality of triangular unit areas and obtaining first plural data representative of surface image information for the object at the three apexes of each triangular unit area;

(b) perspectively transforming only positional data representative of positions of the three apexes of each triangular unit area, which positional data are among the first plural data, onto a two-dimensional plane corresponding to the display screen in relation to the predetermined observing point to obtain second positional data representative of positions of second sets of three apexes, corresponding, respectively, to the three apexes of each triangular unit area on the two-dimensional plane;

(c) vertically setting other object surface image information data included in the first data separately at the three apexes of each triangular unit area on the two-dimensional plane to separately form plural triangular image data planes at the tops of each three vertically set object surface image information data;



(d) obtaining by interpolation calculation each point of intersection between each formed triangular image data plane and each straight line vertically set at a different point included within each triangular area surrounded by the three apexes on the two-dimensional plane, which points, referred to hereinafter as processed points, correspond to different and corresponding individual pixels of the display screen, to separately obtain surface image information data for the object; and

(e) separately displaying said surface image information data at each such corresponding pixel on the display screen.

4,819,193

GRADATION PROCESSING METHOD FOR COLOR IMAGES

Kaoru Imao, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 799,722

Claims priority, application Japan, Nov. 19, 1984, 59-243979; Dec. 11, 1984, 59-261391

Int. Cl.[4] H04N *1/387*; G09G *1/00*

U.S. Cl. 364—526 **7 Claims**

1. A method of processing a color image from scan to print comprising the steps of:

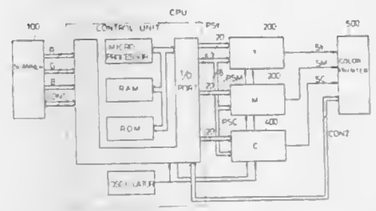
scanning an original image as a series of image pixels;

sensing the color of each pixel as a plurality of differing color components defined in a two-dimensional input coordinate system;

assigning a color gradient to the sensed color for each pixel;

transforming said plurality of color components to a new location within said two-dimensional coordinate system by altering the location coordinates of said color components in accordance with said assigned color gradient; and

interrogating a look-up table with the transformed location coordinates to determine a printing gradation value and printing location coordinates allocated on a two-dimensional coordinate system assigned to each of a plurality of differing color components used to print the second image.



4,819,194

COORDINATE INPUTTING SYSTEM WITH PROVISION FOR ERRONEOUS INPUT DETECTION

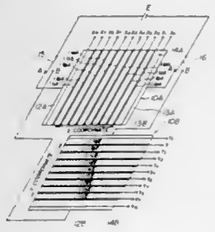
Haruyuki Koizumi, Kyoto; Hideki Sato, Takatsuki; Shinichi Hashizume, Kusatsu, and Koichi Omae, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 3, 1987, Ser. No. 56,892

Claims priority, application Japan, Jun. 18, 1986, 61-143811

Int. Cl.[4] G08C *21/00*

U.S. Cl. 364—556 **7 Claims**



1. A coordinate inputting system, comprising:

at least one coordinate inputting sheet, comprising a sheet body having a resistive layer, a pair of substantially parallel edge electrodes extending along opposite edges of said resistive layer and a plurality of intermediate parallel electrodes, which are substantially parallel to said pair of edge electrodes, and extend along said resistive layer between said pair of edge electrodes in a mutually spaced relationship;

means for applying a voltage across said pair of edge electrodes to develop voltages at each of said electrodes;

a pen for contacting said resistive layer of said sheet to select an input point;

means for storing reference information relating to voltages on said electrodes when said voltage is applied across said edge electrodes and in the absence of any contact between said pen and said sheet;

means for determining as axial coordinate information a divided voltage at an input point where said pen contacts with said sheet;

means for determining which of said electrodes straddle said input point by comparing said axial coordinate information with said reference information; and

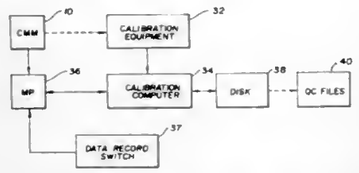
means for determining the validity of an input operation by comparing the voltages upon said straddling electrodes with said reference information.

4,819,195

METHOD FOR CALIBRATING A COORDINATE MEASURING MACHINE AND THE LIKE AND SYSTEM THEREFOR

Frederick K. Bell, Centerville; Gary E. Brazier, Brookville, and Stephen N. Brown, Dayton, all of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Jan. 20, 1987, Ser. No. 4,434
Int. Cl.⁴ G01C *25/00*; G06F *15/46*; G05D *23/275*
U.S. Cl. 364—571.05 **16 Claims**



14. A system (FIG. 3) for calibrating a CMM (**10**) having a measuring volume (**102**), the CMM including a probe shaft (**22**) having at least one axis of motion (X, Y or Z), a device for providing a position signal in determining the position of the probe for the axis of motion in the coordinate frame of the CMM and control means (**36**) for receiving the position signal and for providing a coordinate measurement signal, the system comprising at least one calibration device (**32**) for measuring the position of the CMM in a standard coordinate frame having a standard axis system at a plurality of predetermined positions along the axis of motion of the CMM to obtain measured calibration data, the device generating the position signal in the coordinate frame of the CMM; and data processing means (**34**) for processing the position signal and the calibration data, the improvement comprising:

the data processing means including means (FIGS. **4**A through **4**C) for correlating the position signal and the calibration data to obtain axis correction data for each of said predetermined positions; and

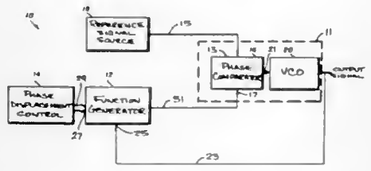
storage means (**110**) for storing the axis correction data in a form which can be utilized by the control means during operation of the CMM for the entire measuring volume.

4,819,196

DIGITAL-BASED PHASE CONTROL SYSTEM

Martin A. Lilley, Fremont, and Jan S. Wesolowski, Redwood City, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

PCT No. PCT/US86/02169, § 371 Date Feb. 27, 1987, § 102(e) Date Feb. 27, 1987, PCT Pub. No. WO87/02490, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 17, 1986, Ser. No. 49,862
Int. Cl.⁴ G06J *1/00*; H03L *7/06*
U.S. Cl. 364—602 **15 Claims**



1. Apparatus for controlling the phase of an output signal relative to the phase of a reference signal, said apparatus comprising:

phase-controlled oscillator means having a first signal input and a second signal input, for comparing the phases of first and second signals and producing said output signal at a phase corresponding to the phase relationship between said first and second signals;

function generator means having a phase control input, for generating a periodic signal of predetermined waveform and of selected phase displacement relative to the phase of a signal coupled to the phase control input;

means for coupling a selected one of said reference signal and said output signal to the phase control input of said generator means; and

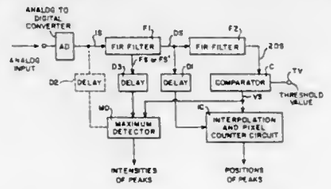
means for coupling the first signal input of the comparator means to receive said signal of predetermined waveform and coupling said second signal input of said comparator means to receive the other of said reference signal and said output signal.

4,819,197

PEAK DETECTOR AND IMAGING SYSTEM

Francois Blais, Vanier, Canada, assignor to Canadian Patents and Development Limited-Societe Canadienne Des Brevets Et D'Exploitation Limitee, Ottawa, Canada

Filed Oct. 1, 1987, Ser. No. 103,382
Int. Cl.⁴ G06F *7/38*; H01J *40/14*
U.S. Cl. 364—715.06 **18 Claims**



1. A circuit for detecting the positions of peaks in a digital input signal, comprising

(a) means for generating a first derivative signal of said input signal, wherein the position of each said peak is represented by a zero crossing point of said first derivative signal,

(b) means for generating a second derivative signal of said input signal, wherein the position of each said peak is represented by a further peak,

(c) means for generating a validation signal when the absolute value of a said further peak exceeds a threshold value, and

(d) an interpolation circuit enabled by a said validation signal for receiving said first derivative signal for generating an output identifying the location of each said zero crossing point, each such location representing the position of a peak of the input signal.

4,819,198

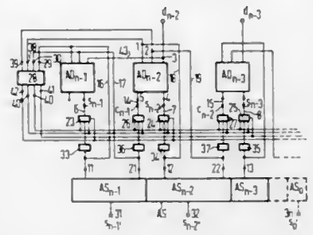
SATURABLE CARRY-SAVE ADDER

Tobias Noll, Neckartailfingen, and Walter Ulbrich, Puchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 9, 1986, Ser. No. 883,657
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524981
Int. Cl.⁴ G06F *7/50, 7/38*
U.S. Cl. 364—787 **17 Claims**

1. In a carry-save adder for a bit-parallel addition of binary numbers in two's complement having a first group of adders (AD_i) with first and second inputs for binary number bits of the same significance, and outputs for producing intermediate sum and carry words, adder means (AS) for receiving said intermediate sum and carry words and combining them to form sum words, and recursive connections by which said intermediate sum words are supplied to said first and second inputs of said

first adders (AD_i), and said first adders having third inputs for receiving externally supplied binary number bits, the combination comprising: a decoder, means for connecting said decoder with the two most significant bits of said intermediate sum and carry words and operative to generate overflow signals in response to prescribed input bit patterns for indicating the imminent transgression of a permissible adder content, and a



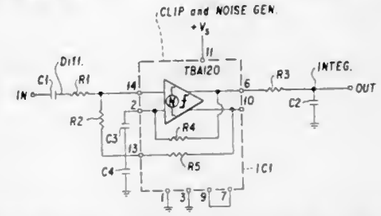
plurality of logic circuits connected in said recursive connections and connected to receive said overflow signals and responsive thereto for disconnecting said intermediate sum and carry words from said recursive circuit branches and for substituting therefor predetermined saturation intermediate sum words and predetermined saturation carry words which yield sum words which do not exceed the permissible adder content.

4,819,199

EXTREMA CODER EMPLOYING NOISY LIMITING AMPLIFIER STAGES

Roger H. Denker, Falls Church, and Arie Visser, Reston, both of Va., assignors to Extrema Systems International Corporation, Reston, Va.

Filed Apr. 24, 1987, Ser. No. 42,156
Int. Cl.⁴ G06G *7/00, 7/18*; G06J *1/00*; H03K *5/153*
U.S. Cl. 364—807 **12 Claims**



1. An apparatus for processing an analog signal comprising:

means for detecting the times of occurrence of minimum and maximum values of said analog signal, thereby producing a detected signal; and

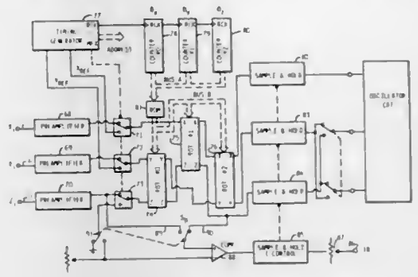
limiting-amplifier means coupled to said means for detecting for encoding said times of occurrence of minimum and maximum values of said analog signal, and further for generating internally in said limiting amplifier means a substantially random noise signal, said noise signal having a broadband spectrum having frequencies in a frequency range substantially higher than the highest frequency in the analog signal, whereby said limiting amplifier means encodes the times of occurrence of the minimum and maximum values of said analog signal in the presence of said noise as an encoded signal, said limiting-amplifier means having a bandwidth greater than the bandwidth of the analog signal, said encoded signal containing information sufficient to enable substantial reproduction of said analog signal therefrom.

4,819,200

REAL-TIME N-DIMENSIONAL ANALOG SIGNAL ROTATOR

Leon O. Chua, El Cerrito, Calif., and Isutomu Sugawara, Yokosuka, Japan, assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 28, 1986, Ser. No. 845,855
Int. Cl.⁴ G06G *7/16, 7/00*
U.S. Cl. 364—841 **20 Claims**



1. A device for use with a cathode ray oscilloscope for displaying from any desired perspective a multi-dimensional surface evolving in time, including in combination:

multi electrical signal introduction means for attachment to related electrical signal-carrying means,

multiplicity of two-dimensional rotator means, so that for the number N of signals and also of N dimensions there are

$$N!/2(N-2)!$$

two dimensional rotator means, each rotator means connected to a different pair of said signal introduction means, for enabling two-dimensional rotation of the paired signals, said rotator means being connected together to produce signal outputs corresponding to the number of said signal introduction means, each signal passing through two of said signal rotator means as each signal makes its way to its respective signal output, and

connection means for connecting said signal outputs to a cathode ray oscilloscope, at least two at a time.

4,819,201

ASYNCHRONOUS FIFO DEVICE COMPRISING A STACK OF REGISTERS HAVING A TRANSPARENT CONDITION

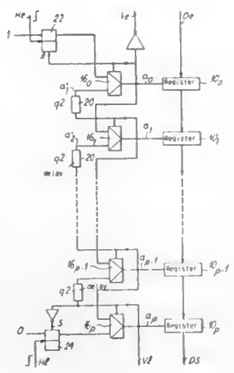
Alain Thomas, Ar Santé, and Michel Servel, Le Rhu en Servel, both of 22300 Lannion, France

Continuation of Ser. No. 655,732, Sep. 28, 1984, abandoned. This application Jul. 27, 1987, Ser. No. 77,999
Claims priority, application France, Sep. 29, 1983, 83 15510
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 364—900 **8 Claims**

1. An asynchronous FIFO device having a stack comprising a plurality of identical data storage registers, a control arrangement of a plurality of identical subassemblies each associated with a respective one of said data storage registers to form a section, and a single device data input connected to a first one of said data storage registers, wherein said data storage registers are latch registers of the type having a transparent condition and having a latch condition: wherein a first said section is connected to receive a shift in signal on a shift in terminal and data on said data input, a last said section is connected to receive a shift out signal on a shift out terminal and to deliver data on a data output, and at least one intermediate said section is connected in series relation between said first section and last section; and wherein each of said subassemblies but in the first section and in the last section comprises switch means having a first data input connected to receive a logic signal indicative

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of the condition of the preceding subassembly, a second data input connected to receive a logic signal indicative of the condition of the following subassembly and a data output connected to a condition control input of the associated one of



said said storage registers, said switch means being constructed to deliver on said data output a signal controlling and representative of the condition of said subassembly, the condition of said switch means being determined reponsive to the logic level of the data output signal of said switch means.

4,819,202

RELEASE PROCESS FOR AN ACCESS-CONTROLLED USER MEMORY AND APPARATUS FOR CARRYING OUT THE PROCESS

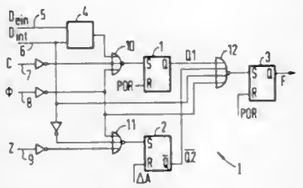
Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,221

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3525017

Int. Cl.⁴ G06F *11/34;* **G11C** *11/40;* **G06K** *5/00*

U.S. Cl. 364—900 **2 Claims**



1. Apparatus for carrying-out a validation operation for a chip card with a user memory, comprising a code memory for storing reference data; a comparator having an input connected to said code memory for receiving said reference data, and an input for receiving externally entered data and an output; a first logical gate having an input connected to said output of said comparator, an input for receiving a respective control signal from an address of said code memory and an output; a control memory having an output; a second logical gate having an input connected to said output of said control memory, an input receiving a control signal from a corresponding address of said control memory and an output; a first bistable circuit having in input connected to said output of said first logical gate and an output; a second bistable circuit having an input connected to said output of said second logical gate and an output; and a third logical gate having inputs respectively connected to said outputs of said first and second bistable circuits and said output of said control memory.

4,819,203

CONTROL SYSTEM FOR INTERRUPTION LONG DATA TRANSFERS BETWEEN A DISK UNIT OR DISK COCHE AND MAIN MEMORY TO EXECUTE INPUT/OUTPUT INSTRUCTIONS

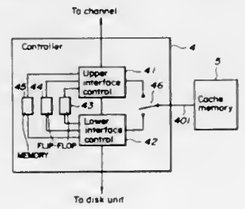
Yoshiro Shiroyanagi, and Akira Kurano, both of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1987, Ser. No. 38,704

Claims priority, application Japan, Apr. 16, 1986, 61-85909

Int. Cl.⁴ G06F *9/00, 13/00, 13/26*

U.S. Cl. 364—900 **7 Claims**



1. A control system for a disk cache memory disposed between a main memory unit and a disk unit, including a disk cache controller comprising:

an upper interface control for receiving an input/output instruction from a central processing unit (CPU), for judging, in response to said input/output instruction, whether object data is found in said disk cache memory, and for controlling data transfer, based on a result of the judgement, of said object data from said disk cache memory if said object data is found in said disk cache memory, or from said disk unit if said object data is not found in said disk cache memory to said main memory unit; and

a lower interface control for controlling data transfer from said disk unit to said disk cache memory;

wherein said upper interface control includes first means for accessing said lower interface control and recognizing whether said lower interface control has performed a data transfer from said disk unit to said disk cache memory, and second means for accessing said first means and providing, when the recognition performed by said first means is positive, a command to said lower interface control interrupting the data transfer being performed thereby;

wherein the data transfer performed by said upper interface control upon reception of said input/output instruction from said CPU is executed after said lower interface control receives a command from said second means interrupting the data transfer from said disk unit to said disk cache memory being performed by the lower interface control.

4,819,204

METHOD FOR CONTROLLING MEMORY ACCESS ON A CHIP CARD AND APPARATUS FOR CARRYING OUT THE METHOD

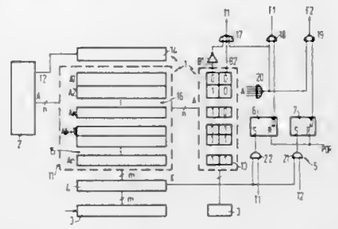
Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,222

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1985, 3524371

Int. Cl.⁴ G06F *11/34;* **G11C** *11/40;* **G06K** *5/00*

U.S. Cl. 364—900 **8 Claims**



1. Method for controlling memory access from a user terminal to a user area and a first code area of a main memory of a chip card, the method which comprises the steps of:

executing a comparison first code stored in said first code area and a data word from the user terminal by the use of a comparator;

fixedly associating addresses of said first code area in main memory with respective addresses of a control memory;

marking several storage locations of the main memory as the first code area with respective first control bits from said control memory;

marking with respective second control bits, having complementary logic states, from said control memory, a first code stored in the associated storage location of the first code area as being one of (a) activated and (b) deactivated first code according to the logic state of said second control bits;

generating an initial release signal in an internal release procedure if a storage location is addressed by an activated first code and if the comparison with the data word entered by the user terminal is affirmative; and preventing generation of the initial release signal if at least one of (a) a deactivated code word is addressed and (b) the comparison of the respective first code with the data word is not affirmative.

4,819,205

MEMORY SYSTEM HAVING MEMORY ELEMENTS INDEPENDENTLY DEFINED AS BEING ON-LINE OR OFF-LINE

Louis A. McRoberts, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1985, Ser. No. 715,718

Int. Cl.⁴ G11G *19/08*

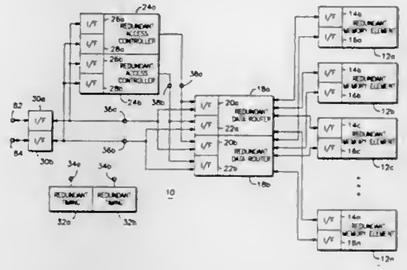
U.S. Cl. 365—1 **15 Claims**

1. A memory system having predetermined reliability, capacity, and data transfer rate requirements, said memory system comprising:

a predetermined number n of memory elements said n memory elements containing a predetermined number m of on-line memory elements wherein the number m reflects the memory capacity and data transfer rate requirements, and containing a predetermined number k of off-line memory elements wherein the number k in conjunction with the number n reflects the memory system reliability requirement;

a data router being coupled via a plurality of memory interfaces to all of said memory elements, said memory interfaces corresponding to said memory elements, said data router including n internal ports, each internal port coupled to a corresponding memory element via said corresponding memory interface so that each said memory element is coupled to only one of said internal ports through said corresponding memory interface;

said data router further including: an input for receiving an input write data stream; an output for supplying an output write data stream; and an encoder coupled between said



data router input and output for the generation of intermediate error detection data so that the intermediate error detection data are inserted into the input write data stream at predetermined positions therein to produce the output write data stream; and

an access controller coupled to said data router via a plurality of router interfaces, said access controller indicating each one of said memory elements as being on-line or off-line independently from all other ones of said memory elements.

4,819,206

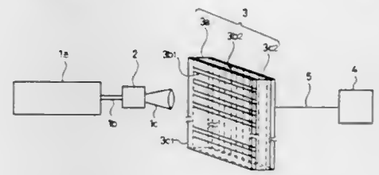
OPTICAL RECORDING SYSTEM

Motomu Yoshimura, Amagasaki, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Aug. 25, 1987, Ser. No. 89,083

Int. Cl.⁴ G11C *13/00;* **G02F** *1/26*

U.S. Cl. 365—106 **8 Claims**



1. An optical recording system which comprises:

a recording medium of which the light absorption spectrum is changed when exposed to light;

a plurality of first parallel transparent elongated electrodes provided on a front face of said recording medium;

a plurality of second parallel elongated electrodes provided on a back face of said recording medium in the direction perpendicular to said first elongated electrodes so as to form a plurality of recording spots at their intersections;

a light source for emitting a light beam sufficiently thick to cover at least one of said recording spots on said recording medium; and

electric field applying means for controlling the field strength of an electric field applied to said at least one

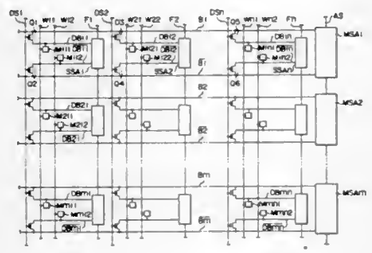
recording spot to control the degree of change in said light absorption spectrum due to the Stark effect so that multiplex information recording is made in a dimension of electric field.

4,819,207

HIGH-SPEED REFRESHING RECHNIQUE FOR HIGHLY-INTEGRATED RANDOM-ACCESS MEMORY

Koji Sakui, Tokyo, and Shigeyoshi Watanabe, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1987, Ser. No. 99,601
Claims priority, application Japan, Sep. 30, 1986, 61-231772; Mar. 2, 1987, 62-46975
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—222 **12 Claims**



1. A dynamic semiconductor memory device having a substrate, said device comprising:
(a) parallel main bit line pairs formed on the substrate, said main bit line pairs including a certain main bit line pair;
(b) sub-bit line pairs connected to said certain main bit line pair;
(c) parallel word lines provided on the substrate to insulatively cross respective of said sub-bit line pairs;
(d) memory cells for capacitively storing information, said memory cells being connected to crossing points of said sub-bit line pairs and said work lines;
(e) first sense amplifier circuits respectively connected to said sub-bit line pairs;
(f) second sense amplifier circuits respectively connected to said main bit line pairs; and
(g) control means, connected to said sub-bit line pairs and said first sense amplifier circuits, for, when a refreshing operation is executed in a refreshing mode of said memory device, selecting simultaneously a plurality of word lines which are associated with different sub-bit lines, for activating said first sense amplifier circuits, and for refreshing together memory cells which are connected to the word lines thus selected.

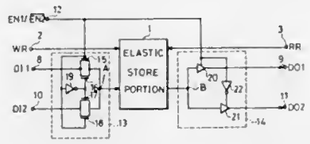
4,819,208

BIODIRECTIONAL ELASTIC STORE CIRCUIT

Takeo Nakabayashi, and Masao Nakaya, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1987, Ser. No. 42,531
Claims priority, application Japan, May 6, 1986, 61-105323
Int. Cl.[4] H03K *17/56, 17/687;* G11C *7/02*
U.S. Cl. 365—189 **6 Claims**

1. A bidirectional elastic store circuit comprising:
an elastic store portion having a data write terminal and a data read terminal,
a first input terminal receiving a data input in a first direction,
a second input terminal receiving a data input in a second direction opposite to said first direction,
a first output terminal applying a data output in said first direction,
a second output terminal applying a data output in said second direction,
first switching means for selecting either said first input terminal or said second input terminal and connecting said selected input terminal to said data write terminal of said elastic store portion,



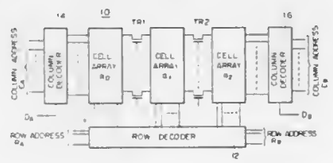
second switching means for selecting either said first output terminal or said second output terminal and connecting said selected output terminal to said data read terminal of said elastic store portion, and
control means for simultaneously driving said first switching means and said second switching means to that said first input terminal and said first output terminal may be simultaneously selected or said second input terminal and said second output terminal may be simultaneously selected.

4,819,209

SIMULTANEOUS DUAL ACCESS SEMICONDUCTOR MEMORY DEVICE

Yoshihiro Takemae, Tokyo, and Takashi Horii, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 19, 1987, Ser. No. 63,989
Claims priority, application Japan, Jun. 19, 1986, 61-143532
Int. Cl.[4] G11C *8/00, 7/00, 5/02*
U.S. Cl. 365—230 **8 Claims**



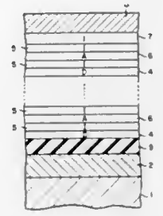
1. A semiconductor memory device comprising:
a memory cell array constituted by a plurality of memory cell array units;
transfer gates inserted in bit lines between the adjacent memory cell array units;
a first and a second column decoders connected to both ends of bit lines in which said transfer gates are inserted; and
a row decoder connected to word lines of said memory cell array;
said row decoder being adapted to be divided operatively in two;
two sets of row/column addresses being supplied to said column decoders and said row decoder;
whereby simultaneous separate accesses to said memory cell array are carried out by said two sets of row/column addresses.

4,819,210

OPTICAL INFORMATION WRITING METHOD

Akira Miura, Toride; Nobuhiro Gemma, Yokohama; Koichi Mizushima, Kamakura; Makoto Azuma, Yokohama, and Takano Iwakiri, Ichikawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 943,716, Dec. 19, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 205,542
Claims priority, application Japan, Mar. 25, 1986, 61-66276; Jun. 4, 1986, 61-129689; Jun. 4, 1986, 61-129692
Int. Cl.[4] G11C *7/00, 11/42*
U.S. Cl. 365—106 **31 Claims**



1. An information writing method of an optical recording device, comprising the steps of:
selectively irradiating light on an optical recording medium which comprises a thin organic film layer and a pair of electrodes for applying a voltage to said thin organic film layer, said thin organic film layer comprising a first thin organic film containing donor molecules and a second thin organic film containing acceptor molecules, said selectively irradiating step causing charge transfer between said donor molecules and said acceptor molecules;
applying a voltage to said electrodes during said step of selectively irradiating; and
recording as information a change in optical or electrical characteristics of said thin organic film caused upon charge transfer;
repeatedly stacking layers, each comprising said first thin organic film containing donor molecules and said second thin organic film containing acceptor molecules, with an insulating molecule film sandwiched therebetween, prior to said irradiating step.

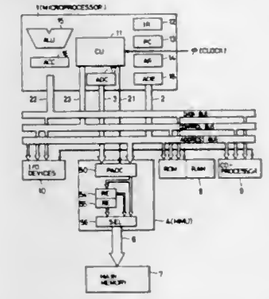
4,819,211

MICROCOMPUTER SYSTEM FOR HIGH SPEED ADDRESS TRANSLATION

Katsuaki Takagi, Higashimurayama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 25, 1987, Ser. No. 66,207
Claims priority, application Japan, Jun. 25, 1986, 61-150243
Int. Cl.[4] G11C *8/00;* G06F *9/00*
U.S. Cl. 365—230 **3 Claims**

1. A microcomputer system comprising:
(a) a microprocessor unit including first means for generating logical address signals on an address bus second means for storing at least some of current logical address signals and previous logical address signals generated by said first means and third means for generating address information on an address information line, said address information indicating that at least some of said current logical address signals generated by said first means are equal to at least some of said previous logical address signals generated by said first means and stored in said second means;
(b) memory means for storing data for said microprocessor unit; and
(c) a memory management unit connected between said microprocessor unit and said memory means, for generating physical address signals to access a predetermined address of said memory means in response to logical address signals generated by said microprocessor unit;
wherein said memory management unit further includes storage means for storing physical address signals corresponding to the logical address signals generated by said microprocessor unit and read out means for reading out the physical address signals stored in said storage means in response to said address information on said address information line from said third means of said microprocessor unit when it has been detected by said third means of said microprocessor unit that at least some of said current logical address signals generated by said microprocessor unit are equal to at least some of said previous logical address signals generated by said microprocessor unit, and wherein said address information line is connected between said third means of said microprocessor unit and said read out means of said memory management unit.

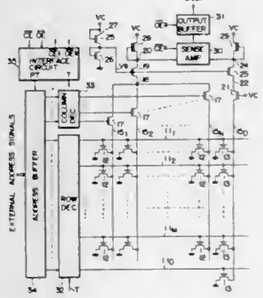


4,819,212

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH READOUT TEST CIRCUITRY

Hiroto Nakai, Kawasaki; Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo; Isao Sato, Yokohama; Shigeru Kumagai, Tokyo, and Kazuto Suzuki, Niigata, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 18, 1987, Ser. No. 50,717
Claims priority, application Japan, May 31, 1986, 61-126359; Jul. 4, 1986, 61-157299
Int. Cl.[4] G11C *7/00, 7/02, 8/00*
U.S. Cl. 365—230 **17 Claims**



1. A nonvolatile semiconductor memory device receiving an external column and row address signal that designate a row and a column, comprising:
a memory cell array for storing data, including a plurality of

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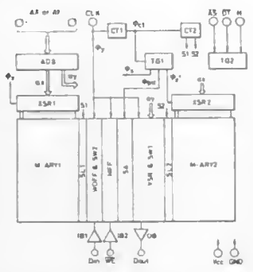
memory cells arranged in rows and columns, each memory cell including a nonvolatile transistor;
a plurality of row lines, each connected to those of said memory cells arranged on a corresponding row;
a plurality of column lines, each connected to those of said memory cells arranged on a corresponding column;
column line select transistors for selecting a one of said plurality of column lines;
column address buffer means for outputting internal column address signals of a selected memory cell in response to received external column address signals;
column decoding means for selectively biasing said column line select transistors to select said column line of said selected memory cell in response to said internal column address signals;
row address buffer means for outputting internal row address signals in response to received external row address signals;
row decoding means for selectively biasing a row line in response to said internal row address signals;
control means, operative in a first and second mode, for controlling said row address buffer means by setting said internal row address signals in a predetermined state to hold said row lines in a nonselected state,
wherein, when said control means is in said first mode, said selected column line is set to a first potential and said internal row address signals are set to said predetermined state in response to said received external row address signals, and
wherein, when said control means is in said second mode, said selected column line is set to one of said first potential and a second potential corresponding to data stored in said selected memory cell; and
sensing means for detecting the potential of said selected column line and for supplying an output signal to an external terminal in response thereto when said control means is in said first and second modes.

4,819,213

SEMICONDUCTOR MEMORY

Yasunori Yamaguchi, Tachikawa, and Masamichi Ishihara, Hinode, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 11, 1986, Ser. No. 940,292
Claims priority, application Japan, Dec. 18, 1985, 60-282879
Int. Cl.⁴ G11C *8/00*
U.S. Cl. 365—233 **28 Claims**



1. A semiconductor memory comprising:
a memory array which includes word lines, a set of data lines crossing thereto, and memory cells, arranged corresponding to intersecting points of said word lines and said data lines,
a first selection circuit for selecting said word lines,
a selection means including designating means for designating one of said data lines in accordance with an address signal, and a second selection circuit coupled to said designating means and to a timing signal means, for connecting a predetermined data line for said data lines to a common data line in synchronization with a first clock signal provided from said timing signal means after connecting said one data line to said common data line;
an output circuit for serially outputting a signal of said common data line to a first external terminal,
a means for holding signals serially supplied to a second external terminal in synchronization with a second clock signal, and
a means for selectively writing in parallel the signals of said holding means to said memory cells through said data lines.

4,819,214

SONIC LOGGING SYSTEM

Paul R. Gutowski, Tulsa; Martin L. Smith, Jr., and Carl H. Sondergeld, both of Broken Arrow, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 29, 1987, Ser. No. 115,085
Int. Cl.⁴ G01V *1/34;* **G01N** *1/32*
U.S. Cl. 367—27 **4 Claims**



1. A method of sonic logging to obtain seismic wave velocities of formations surrounding a wellbore, comprising the steps of:
(a) imparting seismic waves into formations surrounding the wellbore from a seismic source positioned therein;
(b) recording seismic signals representative of the formations' response to the seismic waves with a plurality of receivers positioned in the wellbore; and
(c) Nth root stacking the seismic signals along lines of constant velocity within selected time increments to obtain measures of seismic wave velocity in the formation according to:

$$S_i = \text{sign}(Qi)(Qi)^N$$

$$Qi = \frac{1}{M}\sum_{j=1}^{M} \text{sign}(y_{ij})(y_{ij})^{1/N}$$

$$\text{where sign}(x) = \begin{cases} +1 & x \geqq 0 \\ -1 & x < 0 \end{cases}$$

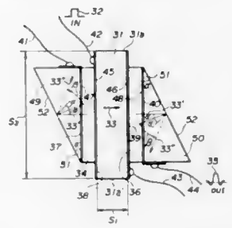
where y_{ij} is the amplitude of the seismic signal j at time i; N equals a constant; and M represents the number of receivers.

4,819,215

ELECTRIC SIGNAL TRANSFER ELEMENT

Takeo Yoknyama, Ebina, and Hidetoshi Yamazoe, Tokyo, both of Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Japan

Filed Jan. 29, 1987, Ser. No. 8,363
Claims priority, application Japan, Jan. 31, 1986, 61-19722; Feb. 7, 1986, 61-25260; Apr. 17, 1986, 61-89020
Int. Cl.⁴ H04B *1/06*
U.S. Cl. 367—135 **7 Claims**



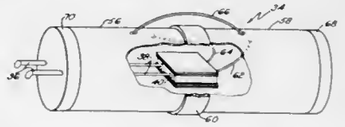
1. An electric signal transfer element comprising:
an ultrasonic wave solid propagation medium having ultrasonic wave signal input and output surfaces with an ultrasonic wave propagation distance therebetween which is shorter than a distance between opposed main surfaces of said medium or a distance between opposed side surfaces of said medium;
input and output transducers, attached to said ultrasonic wave signal input and output surfaces of said ultrasonic wave solid propagation medium, for converting an input electric signal into an ultrasonic wave and for converting the ultrasonic wave into an output electric signal; and
a pair of backing members joined to surfaces of said input and output transducers opposite to said ultrasonic wave signal input and output surfaces of said ultrasonic wave solid propagation medium;
each of said backing members including a reflective surface having a mode conversion angle at which an ultrasonic wave which falls from said input and output transducers on said reflective surfaces of said backing members is mode-converted from a longitudinal wave to a transversal wave or from a transversal wave to a longitudinal wave so that each of said backing members is adapted to eliminate said mode-converted wave from being reflected on said input and output transducers.

4,819,216

INTEGRATED HYDROPHONE PREAMPLIFIER TELEMETRY ASSEMBLY

Dominic Fraioli, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1983, Ser. No. 481,173
Int. Cl.⁴ G01V *1/38*
U.S. Cl. 367—154 **3 Claims**



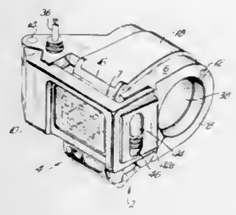
1. A hydrophone system adapted for use in a towed array comprising:
a plurality of cylindrical air backed ceramic acoustic sensors having a common longitudinal axis, said sensors are spaced along said common longitudinal axis and are electrically connected in series;
a metallic mounting ring having said common longitudinal axis connecting to said cylindrical air backed ceramic acoustic sensors and forming the spacing between said cylindrical air backed ceramic acoustic sensors;
an integrated circuit chip including a preamplifier, and a conditioning and telemetry circuit, said integrated circuit chip being located inside the inner cylindrical walls of said sensors and said metallic ring, said integrated circuit chip being electrically connected to said sensors; and
first and second end caps with said first end cap connecting to one end of said plurality of cylindrical air backed ceramic acoustic sensors and said second end cap connecting to the other end of said plurality of cylindrical air backed acoustic sensors, one of said first and second end caps having terminal pins electrically connected to said integrated circuit chip.

4,819,217

BICYCLE HANDLEBAR HOLDER FOR A WRIST INSTRUMENT

John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Sep. 2, 1988, Ser. No. 239,866
Int. Cl.⁴ G04B *47/00;* **B62J** *7/00*
U.S. Cl. 368—10 **7 Claims**



1. An improved bicycle handlebar holder adapted to receive a wrist instrument having, a strap, a case with push buttons and electrical contact means to receive external electrical signals, said holder comprising:
a holder body,
a cover adapted to cooperate with said body and defining therewith a receptacle for receiving said case when the cover is closed,
means for clamping said body to a bicycle handlebar,
a plurality of electrical contact means disposed in said body and opening into said receptacle, and
at least one manual actuator disposed in said cover and adapted to be operable from the exterior of the cover and having a portion movable inside said receptacle, which is adapted to depress one of said pushbuttons when the actuator is operated while said case is disposed in said receptacle when said cover is closed.

4,819,218

QUASI-CONSTANT LINEAR-VELOCITY DISK HAVING CORRESPONDING RADII OF ADJACENT ANNULAR ZONES RELATED BY A RATIONAL NUMBER FOR DISTRIBUTING PRERECORDED INDICIA TO FORM A COHERENT WRITE CLOCK SIGNAL

James A. Barnard, Conesus, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1986, Ser. No. 943,396
Int. Cl.⁴ H04N *5/76*
U.S. Cl. 369—50 **5 Claims**

1. In a disk adapted for recording and playing back information-bearing binary bits at a fixed rate from information-storing

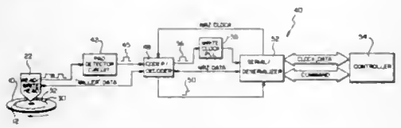
VOL 1101 ISS 1 AP 4 1989 UMI

tracks grouped radially into a plurality of N, greater than two, progressively wider annular zones encircling the center of said disk, the improvement wherein:

(a) the ratio of the radius of any given outlying zone to the corresponding radius of the adjacent inner zone being a fixed rational number n/d, greater than one, for each adjacent pair of zones wherein n and d are fixed integers; and

(b) each track revolution within a given zone, i, has a fixed integer number, P_i, of equally spaced radially aligned uniquely identifiable indicia calculated from:

$$P_i = jx(n/d)^{j-1} \times (d)^{N-1}$$



where j is any positive integer and i is 1 for the innermost zone and is N for the outermost zone whereby

$$P_{i+1}/P_i = n/d.$$

so that when said disk is rotated at a constant angular velocity to cause the indicia to sweep past a fixed radially extending reference, a constant phase relationship is maintained at the reference between adjacent indicia in the same track and between the last indicium on any given track in a particular zone and the next indicium on any other track in the same zone.

4,819,219

TRACK JUMP CONTROL SYSTEM FOR OPTICAL DISK APPARATUS

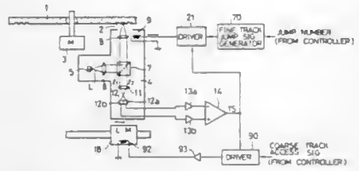
Katsumi Nagano, Setagaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 25, 1987, Ser. No. 29,993

Claims priority, application Japan, Mar. 25, 1986, 61-66303; Apr. 30, 1986, 61-99545; Apr. 30, 1986, 61-99546; Apr. 30, 1986, 61-99547; Apr. 30, 1986, 61-99548

Int. Cl.⁴ G11B *17/22*

U.S. Cl. 369—32 **13 Claims**



1. A track jump control system for an optical disk apparatus for recording and reproducing information in or from an optical disk by an optical beam, said track jump control system comprising:

optical beam moving means for moving the optical beam along a radial dimension of the optical disk; and

track jump signal generating means operatively coupled to said optical beam moving means for providing an analog track jump signal to said optical beam moving means to command said optical beam moving means to jump the optical beam over a designated plurality of tracks in a single substantially continuous movement in response to a track jump command signal, the analog track jump signal including a kick pulse with a voltage V_p for accelerating the optical beam, a constant amplitude pulse with a voltage V_1 for moving the optical beam at a constant speed, and a stop pulse with a voltage $-V_2$ for decelerating the moving optical beam, said kick pulse voltage V_p being greater than said constant amplitude pulse voltage V_1, and said constant amplitude pulse voltage being greater than said stop pulse voltage $-V_2$.

4,819,220

OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS

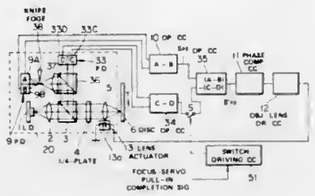
Tasuhiro Miyazaki, Koganei; Hiroo Okada, Hachioji; Toshio Tsurukawa, Machida, and Shohei Kobayashi, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,200

Claims priority, application Japan, Sep. 12, 1986, 61-216819; Jun. 11, 1987, 62-145527

Int. Cl.⁴ G11B *7/00, 15/52*

U.S. Cl. 369—45 **14 Claims**



1. An optical information recording and reproducing apparatus, comprising:

a light source means for generating a light beam for recording or reproducing;

an optical means for condensing and radiating the light of said light source means onto an optical recording medium arranged in a far field position;

a controlling signal producing means for receiving the light returning from said recording medium and producing a focusing controlling signal or tracking controlling signal;

an actuator means for setting said optical means in a focusing state or tracking state by the application of said controlling signal;

a beam distribution detecting means for receiving the light returning from said recording medium and detecting the beam distribution in the tangential direction of the track of said recording medium, and wherein said beam distribution detecting means is for detecting an offset based on a physical change of a surface of said recording medium; and

an offset eliminating means for eliminating the offset in said focusing controlling signal or tracking controlling signal with the beam distribution signal detected by said beam distribution detecting means.

4,819,221

APPARATUS FOR READING RECORD CARRIERS HAVING SUBSTANTIALLY CONCENTRIC OR SPIRAL TRACKS

Hilde M. A. Overath; Cornelius A. Hezemans, and Johannes L. Bakx, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

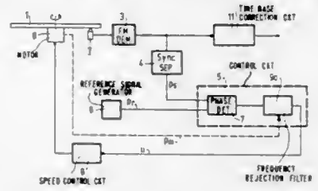
Filed Sep. 9, 1987, Ser. No. 94,575

Int. Cl.⁴ G11B *19/24;* **H04N** *5/76*

U.S. Cl. 369—50 **6 Claims**

1. An apparatus for reading a rotating record carrier having substantially spiral or concentric tracks in which information is stored, which information comprises at least one periodic synchronising signal, the apparatus comprising a scanning device for reading the information, a separator circuit for extracting the synchronising signal from the information read, and a servo system for controlling the rotational speed of the record carrier to a value for which the synchronising signal is

in synchronism with a reference signal, for which purpose the servo system comprises a motor for driving the record carrier and a controller for deriving a control signal for the motor from the synchronising signal and the reference signal, characterized in that the servo system comprises means for selectively rejecting those signal components in the control signal which have a frequency corresponding to the rotational speed of the record carrier.



4,819,222

BINARY ENCODING METHOD FOR DATA READ FROM OPTICAL RECORD AND DEVICE THEREFOR

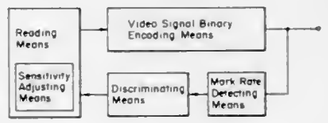
Fumio Kimura, Tokyo, Japan, assignor to Computer Services Corporation, Tokyo, Japan

Filed Apr. 21, 1986, Ser. No. 853,913

Claims priority, application Japan, Apr. 22, 1985, 60-85698; Apr. 22, 1985, 60-85699

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—124 **8 Claims**



1. A binary encoding device for the data read from an optical record for photo-electrically reading the data which are encoded by an FM encoding method and recorded on an optical recording medium by a reading means and encoding the obtained video signals into binary signals by comparing the same with a threshold, said device comprising;

a mark rate detecting means which detects the mark rate (rate of either the high or low level in a unit time) of said binary encoded signals;

discriminating means which compares detected values with a preset mark rate to obtain the deviation therebetween and outputs deviation signals to said reading means,

sensitivity adjusting means which is provided at the preceding stage of said reading means to adjust the reading sensitivity of said reading means in correspondence to said deviation so as to give the binary encoded signals said preset mark rate, and

a CCD linear sensor which is used as said reading means,

said reading means further comprising a synchronizing signal generator which outputs vertical synchronizing signals for setting storage time of the CCD linear sensor and horizontal synchronizing signals which transfer electric charges stored at each photodetector, and a synchronizing signals controller as said sensitivity adjuster which adjusts the output interval of the vertical synchronizing signals corresponding to said deviation signals.

4,819,223

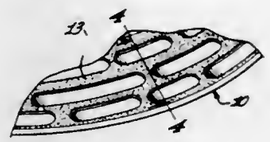
VIDEO RECORD DISC

David P. Gregg, Los Angeles, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation of Ser. No. 571,259, Apr. 29, 1975, abandoned, which is a continuation of Ser. No. 735,007, Jun. 6, 1968, abandoned. This application Jul. 1, 1977, Ser. No. 812,158

Int. Cl.⁴ G01D *15/10;* **G11B** *7/00*

U.S. Cl. 369—275 **17 Claims**



1. A master die member for transferring surface impressions carried by the die member to a finished video disc member, said die member comprising:

a die member having a body and including an impression carrying surface;

said impression carrying surface including a first, continuous surface member which is planar in form;

said impression carrying surface further including a plurality of spaced, raised, second members extending away from the plane of the first surface member and terminating in a second common plane;

said second members being integrally formed with said body;

said impression carrying surface having a center point, and said impression carrying surface terminates at an outer periphery;

said second members being sequentially arranged in a spirally shaped video information track;

each of said second members having a uniform width for defining the width of said information track;

each of said second members having a variable length which lies in the direction of the information track; and

the length of an individual second member cooperates with the length of an adjacent portion of said first surface which lies in the information track to represent video information signals.

4,819,224

WAVELENGTH MULTIPLEXER-DEMULTIPLEXER CORRECTED OF GEOMETRIC AND CHROMATIC ABERRATIONS

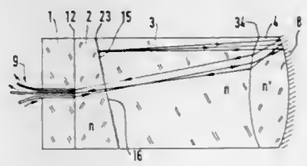
Jean-Pierre Laude, St. Cyr La Riviere par Saclas, France, assignor to Instruments S.A., France

Filed Mar. 20, 1986, Ser. No. 841,561

Claims priority, application France, Mar. 20, 1985, 85 04134

Int. Cl.⁴ H04B *9/00*

U.S. Cl. 370—3 **16 Claims**



1. A multiplexer-demultiplexer of the type in which light of different wavelengths to be combined or to be separated and conducted by optical transmission fibers, and in which the ends of said fibers are disposed in the immediate vicinity of the

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apparent focus of a concave mirror, which concave mirror is assoicated with a wavelength separation system, comprising:

(a) a fiber-carrying element in which entrance and exit fibers are embedded, with their ends in flush alignment with a planar surface on said fiber carrying element;

(b) a transparent element having an index of refraction n and secured to the wavelength separation system with a planar surface in contact with and cemented to the planar surface of the fiber-carrying element and an opposite planar face;

(c) a transparent intermediate element having the same index of refraction n as said transparent element, said transparent element secured to the wavelength separation system and said transparent intermediate element having a planar face in contact with and cemented to the opposite planar face of said transparent element and having an opposite spherical face;

(d) a transparent mirror element having a mating spherical face in contact with said intermediate element and an opposite spherical face treated to form a concave spherical mirror reflecting light towards the intermediate element and having and index of refraction n'different from the index of refraction of the intermediate element, the materials of said transparent intermediate and said transparent mirror elements being selected in such a manner as to exhibit chromatic dispersions which are as close as possible, the radius of the spherical face between the mirror element and the intermediate element being determined as a function of the indices of refraction n and n'to compensate for longitudinal spherical aberrations of the mirror.

4,819,225

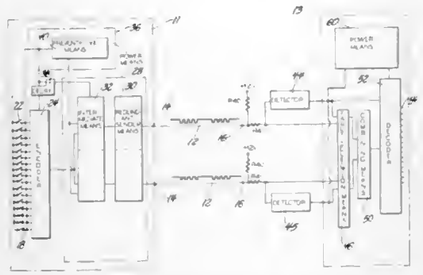
REDUNDANT AND FAULT TOLERANT COMMUNICATION LINK

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098

Filed Mar. 9, 1987, Ser. No. 23,811

Int. Cl.[4] H04L *1/22*

U.S. Cl. 370—16 **28 Claims**



1. An assembly for communicating electrical signals along multiple links while being tolerant of shorting to a positive or negative supply or to discontinuance of any one of the links, said assembly comprising; at least two communication links (**12**) for transmitting signals therealong between inputs (**14**) and outputs (**16**) thereof, transmitter means (**11**) connected to said inputs (**14**) of said communication links (**12**) for identical and continuous transmission of a pulsed signal containing at least one pulse along said communication links (**12**), receiver means (**13**) connected directly to said outputs (**16**) of said communication links (**12**) for producing at least one control signal in response to receiving said pulsed signal, said assembly characterized by including detector means (**44, 45**) independently interconnecting each of said communication links (**12**) and said receiver means (**13**) for producing enabling signals to electrically disconnect said receiver means (**13**) from any one of said communication links in response to an absence of a successive pulsed signal within a predetermined period of time on said output (**16**) of said one of said communication links (**12**).

4,819,226

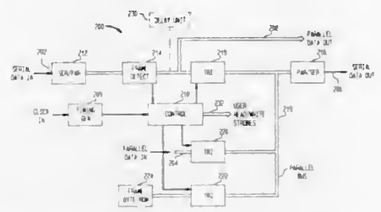
FRAMER CIRCUIT FOR USE IN A DTDM NETWORK

Mark W. Beckner, St. Charles, Ill.; Hung-Hsiang J. Chao, Borough of Madison, N.J.; Thomas J. Robe, Bridgewater, N.J., and Lanny S. Smoot, Morristown, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 10, 1987, Ser. No. 118,898

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—55 **14 Claims**



1. A circuit comprising:

a serial data input for receiving a data stream comprising frames,

a serial-to-parallel converter for converting said frames to parallel form,

a frame detector for detecting said frames in parallel form and for generating frame information,

a control unit for receiving said information and for generating a control signal,

a parallel data input for providing a parallel data stream,

a tristate device operative under the control of said control signal for selectively enabling said parallel data stream, to be written into said frames in parallel form,

a parallel-to-serial converter for reconverting said written parallel frames to serial form, and

a serial data output by which said frames in serial form leave said circuit.

4,819,227

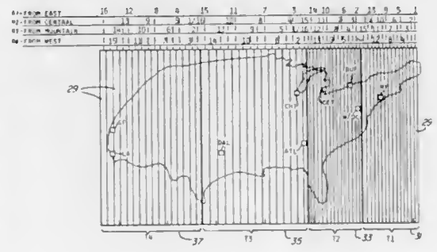
SATELLITE COMMUNICATIONS SYSTEM EMPLOYING FREQUENCY REUSE

Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 14, 1986, Ser. No. 896,983

Int. Cl.[4] H04B *7/185;* **H01Q** *25/00*

U.S. Cl. 370—75 **6 Claims**



1. A method of interconnecting any of a plurality of terminals within a geographic area on the earth for two-way communication using a single earth orbiting communications satellite, comprising the steps of:

(A) allocating a set of uplink communication channels spanning a first preselected band of communications frequencies for use in each of a plurality of uplink zones within said area wherein said uplink zones are arranged seriatim and in contiguous relationship along an axis extending across said area in a manner to cover the entire said area, such that the same uplink communications channels are used by all of said uplink zones;

(B) transmitting from each of said uplink zones to said satellite a radio frequency uplink beam of electromagnetic radiation, the uplink beam from each of said uplink zones carrying a plurality of communication signals over said uplink communications channels;

(C) receiving said uplink beams at said satellite;

(D) allocating a set of downlink communication channels spanning a second preselected band of frequencies for use in each of a plurality of downlink zones within said area wherein said downlink zones are respectively essentially coextensive with said uplink zones, such that the same downlink channels are used by all of said downlink zones;

(E) associated the downlink channels in each of said downlink zones respectively with a plurality of geographic sections within the associated downlink zone, said geographic sections being arranged seriatim along said axis across the associated downlink zone such that each of sections is serviced by a respectively associated one of said downlink channels;

(F) transmitting from said satellite to each of said downlink zones a plurality of radio frequency downlink beams of electromagnetic radiation, said downlink beams carrying a plurality of communications signals originating from terminals in said uplink zones, said downlink beams being transmitted in a manner such that each of said geographic sections receives only those downlink beams having frequencies within the downlink channel associated with a geographic section in step (E).

4,819,228

SYNCHRONOUS PACKET VOICE/DATA COMMUNICATION SYSTEM

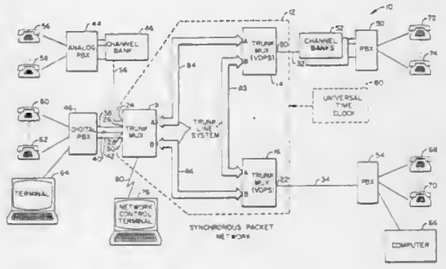
Paul Baran, Menlo Park; Charles M. Corbalis, San Jose; Brian D. Holden, Half Moon Bay; Jon K. Masatsugu; Lewis J. Marggraff, both of Mountain View; David P. Owen, Palo Alto, and Peter W. J. Stonebridge, San Jose, all of Calif., assignors to Stratacom Inc., Campbell, Calif.

Division of Ser. No. 665,819, Oct. 29, 1984, Pat. No. 4,771,425.

This application Oct. 15, 1987, Ser. No. 109,337

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—85 **9 Claims**



1. For use in a communications network for communicating data and voice in independent information packets, including voice packets and data packets, through a digital communications medium, an apparatus for coupling digital signals to said communications medium comprising:

a multiplexing bus, said multiplexing bus including a clock line for synchronizing said information packets;

a multiplexing bus controller coupled to said multiplexing bus and operative to generate at least a clock signal on said clock line to control switching of said information packets, said information packets comprising independently addressable digital data conforming to a standardized time frame of a standardized synchronous communications format; and

means coupled to said multiplexing bus for packetizing signals into digitized information packets, each said digitized information packet having a packet format which is self-contained as to destination and content and which conforms to boundaries of said standardized synchronous time frame; and

first digital communications means coupled to said multiplexing bus for transmitting said information packets to a digital communication medium and for receiving said information packets from said digital communications medium, said first digital communication means being operative to communicate said information packets according to said standardized communication format.

4,819,229

LOCAL AREA NETWORK PRIORITY CONTROL SYSTEM

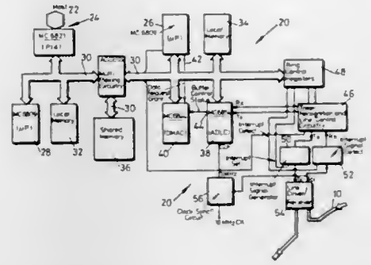
David W. Pritty, Helensburgh, and Derek Masson, Bearsden, both of Scotland, assignors to University of Strathclyde, Glasgow, Scotland

Filed Mar. 10, 1987, Ser. No. 24,412

Claims priority, application United Kingdom, Mar. 13, 1986, 8606217

Int. Cl.[4] H04J *3/02*

U.S. Cl. 370—89 **27 Claims**



1. A local area network interrupt node priority control system for use with a local area network having a plurality of nodes coupled to a shared transmission medium, each node being capable of receiving messages from external sources having different levels of priority, said local area network interrupt node priority control system comprising data carrying means for allocating access of each node to the shared transmission medium, said shared transmission medium incorporating a logically separate priority interrupt control channel coupled to each node of said plurality of nodes and in use, said data carrying means carrying a first message from a first node having a first level priority interrupt means for detecting when a second node has a higher priority message for transmission on said shared transmission medium, and for generating within packet interrupt signal to suspend transmission of said first message from said first node to release said data carrying means to said second node for transmitting said higher priority message, and means for eventually returning said data carrying means to said first node on completion of transmission of said higher priority message to complete transmission of said first message.

4,819,230

OPTIMIZED BANDWITH ALLOCATION MECHANISM BETWEEN CIRCUIT SLOTS AND PACKET BIT STREAM IN A COMMUNICATION NETWORK

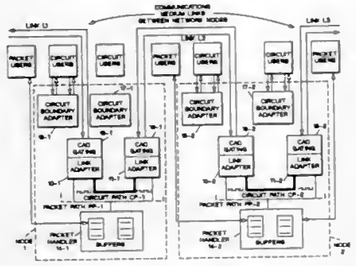
Jean Calvignac, LaGaude, and Pierre Secondo, St. Jeannet, both of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 24, 1987, Ser. No. 77,485

Claims priority, application European Pat. Off., Aug. 27, 1986, 86430030.6

Int. Cl.⁴ H04J *3/26*

U.S. Cl. 370—94 **4 Claims**



1. A mechanism to be used in a communication network comprising boundary circuits and a plurality of nodes, including network boundary nodes connected to the boundary circuit users, for exchanging non-alphanumeric character coded information (NCI) and alphanumeric character coded information in frames comprising circuit slots which are assigned to circuit users on a per call basis for the duration of the call and the remaining part of which circuit slots are assigned to packet switched types of traffic, said nodes comprising means for transporting the circuit user data in the assigned slots from orginating users to destination users, said mechanism being characterized in that said network boundary nodes connected to boundary circuit users comprise interfacing means (**30,32**) comprising:

first means (**30-T,32-T**) for dynamically and instantaneously qualifying each of the circuit slots, said first means setting a qualifying bit to a first value indicating that a slot is assigned to a boundary circuit user or to a second value indicating that said slot is momentarily free and may be assigned to the packet switched traffic, said qualifying bits being transported through the network in correspondence with said slots that they qualify,

second means (**30-R,32-R**) responsive to received qualifying bits and to received bits for reconstructing therefrom boundary circuit user bit streams comprising the user data bits when the qualifying bits are found equal to a first value, and to idle bit configurations when the qualifying bit is found equal to a second value;

said nodes being connected through links (**L1,L2,L3**) and in which said nodes comprise link-adapting means (**16,17**) which control the generation and reception of the frames, said mechanism further comprising:

circuit boundary adapting means attached to said link-adapting means which are connected to boundary circuit users, each circuit boundary adapting means comprising a slot table means (**80,92**) having a plurality of positions equal to the maximum number of circuit slots in said frames, each position storing the correspondence between a circuit slot number and the frames to be sent and received from the link and a boundary circuit user, if any, and

means (**156,228**) for scanning said slot table means and reading a position thereof during each slot.; and

decoding means (**81,94**) responsive to the information read from said slot table means for generating circuit user selection signals for the slots which are assigned to boundary circuit users; and

first gating means (**96,100**) responsive to said circuit users selection signals for sending to said link adapting means the user data and the qualifying bits from said first means, for sending on the link during the assigned slots therefore, and

second gating means (**83,84**) for sending to said second means the user data and the corresponding qualifying bits received from said link adapting means during the said slots assigned to said boundary circuit users connected to the boundary node.

4,819,231

FRAMING TIMING DETECTION CIRCUIT FOR A CHARACTER CODE BROADCASTING SYSTEM

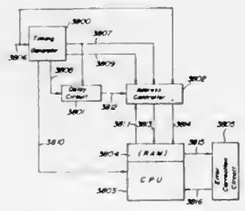
Osama Yamada, Tokyo, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Division of Ser. No. 571,573, Jan. 17, 1984, Pat. No. 4,630,271. This application Aug. 8, 1986, Ser. No. 895,033

Claims priority, application Japan, Jan. 20, 1983, 58-6579; Mar. 31, 1983, 58-54002; Sep. 2, 1983, 58-160523; Oct. 25, 1983, 58-198363

Int. Cl.⁴ H04J *3/26*

U.S. Cl. 370—94 **13 Claims**



1. A framing timing detection circuit for use in a character code broadcasting system, comprising:

first means for receiving a transmitted signal in which a pseudo random signal has been added to a packet signal for the character code broadcasting system;

second means for fetching a signal which includes the received packet signal and signals adjacent to the leading and trailing ends of the received packet signal, the fetched signal being loaded into the second means;

third means for executing a predetermined logical operation on said signal loaded into said second means; and

fourth means for shifting a specific time point of said signal loaded into said second means by one bit sequentially and for detecting a framing timing.

4,819,232

FAULT-TOLERANT MULTIPROCESSOR ARRANGEMENT

Lothar Krings, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 15, 1986, Ser. No. 941,991

Claims priority, application Switzerland, Dec. 17, 1985, 5376/85

Int. Cl.⁴ G06F *11/20*

U.S. Cl. 371—9 **6 Claims**

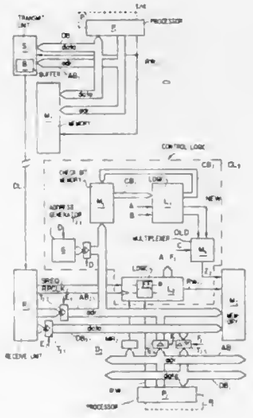
1. In a fault-tolerant multiprocessor arrangement comprising at least a first and a second processor, a first data memory for storing memory words, each of which being stored under an address different from the address of another of said memory words, a second data memory for storing a pair of memory words under each of said addresses, and a control logic with at least a check bit memory having for each pair of memory words stored under the same address in said second data memory at least two check bits for completing the address of each pair of memory words and a one-bit storage cell containing a control bit, an operating method comprising the steps of:

said first processing during execution of a program containing recovery points writes a first of said memory words under a first of said addresses into said first data memory, transfers said memory word including said first address from said first to said second data memory, and writes said transferred first memory word and its respective address into said second data memory under control of said control logic,

said first processor during execution of said program further transfers a recovery point signal indicating in each case the arrival of said program at a recovery point, thereby causing the control logic to invert said control bit of said one-bit storage cell at each recovery point in response to said transferred recovery signal,

said control logic during the process of writing of said first memory word into said second data memory reads out of said check bit memory a first and a second check bit discriminated by said first address, forms a first pointer bit from said first, said second and said control bit in accordance with the rule:

$$OLD(1) := BIT1(1).\bar{A} + BIT2(1).A$$



and a second pointer bit having a binary state which is the inverse of said first pointer bit, feeds said second pointer bit to an address input of said second data memory to complete the pair address for said first address of said first memory word of said second data memory, first

newly determines the binary states of said and second control bits in accordance with the rules:

$$BIT1(1) := NEW1(1).\bar{A} + OLD(1).A, \text{ and}$$
$$BIT2(1) := NEW1(1).\bar{A} + OLD(1).A.$$

writes said newly determined first and second bits into said check bit memory,

said control logic in said interval between said two current recovery points further reads out of said check bit memory a third and a fourth check bit discriminated by a second address of a pair of secondary memory words into which not data have yet been entered within said interval, forms a third and a fourth pointer bit from said third and said fourth check and said control bit in accordance with the rules:

$$OLD(2) := BIT(2).\bar{A} + BIT2(2).A, \text{ and}$$
$$NEW(2) := BIT1(2).\bar{A} + BIT2(2).A$$

newly determines the binary states of said third and said fourth check bit from said third and said fourth pointer and said control bit in accordance with the rules:

$$BIT1(2) := NEW(2).\bar{A} + OLD(2).A, \text{ and}$$
$$BIT2(2) := NEW(2).\bar{A} + OLD(2).A.$$

and writes said newly determined third and fourth check bit into said check bit memory,

said second processor in response to a fault signal of said first processor takes over and continues the execution of said program at a recovery point last reached by said first processor during execution of said program by use of the data states at this recovery point transferred into said second data memory,

said control logic during the process of each reading of said second processor from said second data memory forms in the case of said first or said second address said first or said third pointer bit, and

feeds said formed first or third pointer bit to said address input of said second data memory for completing the pair addresses for said first or second address of said first or second memory word of said second data memory, wherein

A means said control bit,

BIT(1), BIT2(1), BIT1(2) and BIT2(2) mean said first, second, third and fourth check bit,

OLD(1), NEW(1), OLD(2) and NEW(2) mean said first, second, third and fourth pointer bit,

the dot means a logical AND operation,

the plus sign means a logical OR operation, and

the bar above the symbols means negation.

4,819,233

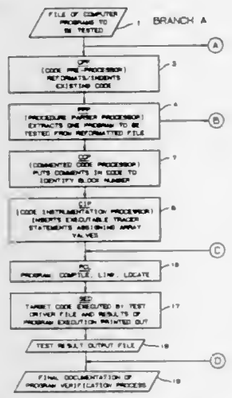
VERIFICATION OF COMPUTER SOFTWARE

R. Ralph Delucia, Valencia; Daniel J. Wolf, Bethel Park, and Eric P. Casteel, N. Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1987, Ser. No. 35,802

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 371—19 **24 Claims**

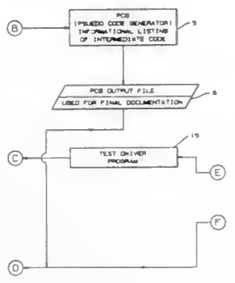


1. A method of verifying a computer source code having a series of program statements, including control statements which provide for branching to alternative statements of the code, said method comprising:

instrumenting the source code to generate when the code is executed an indication for each block of code that the statements of that block have been executed, a block of code being the program statements between control statements;

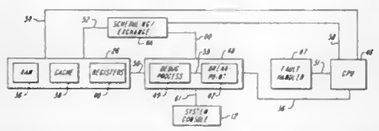
selecting test cases, with each test case comprising input values for variables in the source code, said test cases being selected such that each block of code is executed;

generating a test driver routine to implement the test cases;
compiling and linking the test driver routine with the instrumented source code;



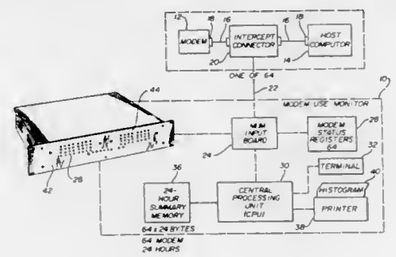
executing the compiled/linked code to implement the test cases, and
generating an output with said indication of each block of code which has been executed by the test cases.

4,819,234
OPERATING SYSTEM DEBUGGER
William S. Huber, Needham, Mass., assignor to Prime Computer, Inc., Natick, Mass.
Filed May 1, 1987, Ser. No. 46,082
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—19 **28 Claims**



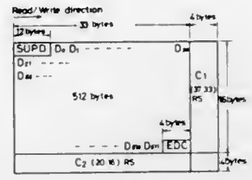
1. A multiprogrammable digital data processor comprising:
A. memory means having addressable locations for storing process code signals associated with each of one or more processes, wherein the process code signals associated with each process include signals representative of at least one of instructions, data, and state values of that process,
B. breakpoint means coupled with the memory means for replacing therein a signal representative of a selected instruction with a selected interrupt signal,
C. scheduler means for scheduling one of said processes for execution during a designated time interval,
D. first central processing unit means coupled to the memory means and to the scheduler means for normally executing the scheduled one of said processes during the designated time interval,
E. debugger means coupled to the first central processing unit means for selectively
i. suspending processing of the scheduled process by the first central processing unit means,
ii. permitting selective access to locations of said memory means for at least one of modifying and outputting values of signals stored in those accessed locations,
F. said debugger means further including simulation means for generating simulation code signals, representative instructions for simulating the selected replaced instruction, and
G. said debugger means further includes restart means for reactivating the suspended process for execution of at least said simulation code.

4,819,235
MODEM USE MONITOR
Robert J. Kelly, 107 Phyllis Dr., Old Tappan, N.J. 07675, and Tadhg Kelly, 1093 Sussex Turnpike, Randolph, N.J. 07869
Continuation-in-part of Ser. No. 797,166, Nov. 12, 1985, Pat. No. 4,710,929. This application Nov. 27, 1987, Ser. No. 126,184
Int. Cl.[4] H04M *3/08*; G06F *11/00*
U.S. Cl. 371—22 **31 Claims**



1. A device for analyzing modem defects among a plurality of modems formed into one or more groups thereof, each said group of modems sequentially serving a rotary hunt arrangement of telephone lines for data communications, said device receiving one or more signals from and for each said modem comprising:
a plurality of intercept means, one for each modem, each for providing at least one combined signal for examination, said combined signal formed by selectively preprocessing two or more intercepted said signals;
central processing means for processing the one or more signals from each said itnercept means and, in turn, being responsive to the condition of said signals, and providing responses for each modem on a periodic basis;
register means for storing said responses for each modem in numbered sequence;
said central processing means further for examining said register means upon acquisition of each said response and,
defect-reporting means for recording all responses from said register means for a given period;
whereby modem defects are apparent upon examination of the defect-reporting means.

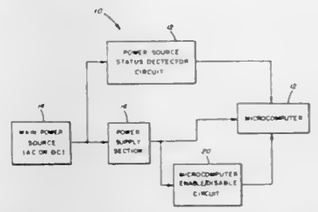
4,819,236
DATA TRANSMISSION METHOD SUITABLE FOR A DISC
Yoichiro Sako; Shinichi Yamamura, both of Tokyo, and Tamotsu Yamagami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jan. 22, 1987, Ser. No. 5,935
Claims priority, application Japan, Jan. 24, 1986, 61-13554; Apr. 23, 1986, 61-93892
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **22 Claims**



1. A data transmission method for data formed as a rectangular array of rows and columns comprising a block of data formed of a predetermined number (n) of words, where n is a real integer, supplementary data associated with said block of data and an error detecting code to detect possible errors which may occur in said block of data and said supplementary data, said method comprising the steps of:
producing and adding a first error correcting code for and to each row of data of said rectangular array along which said data of n words are sequentially arranged;
producing and adding a second error correcting code for and to each of column of data of said rectangular array to thereby form a product-coded data from said block of data, said supplementary data, said first error correcting code and said second error correcting code;
fetching and transmitting said product-coded data along said row;
changing said block of data in word number from the number n to a number m, where m is a selected real integer, by varying the number of data in said column of said rectangular array in response to the above change while the number of data in said row is fixed so as to form a new rectangular array to adjust for the variation in the quantity of data; and
sequentially fetching and transmitting said new product-coded data formed of said new rectangular array along said row.

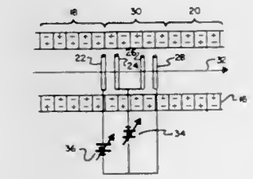
4,819,237
METHOD AND APPARATUS FOR MONITORING THE VALIDITY OF MICROPROCESS OR VOLATILE MEMORY
James E. Hamilton, Hoffman Estates, and Gregory A. Peterson, South Barrington, both of Ill., assignors to Digital Appliance Controls, Inc., Hoffman Estates, Ill.
Filed Aug. 5, 1987, Ser. No. 82,075
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—66 **20 Claims**

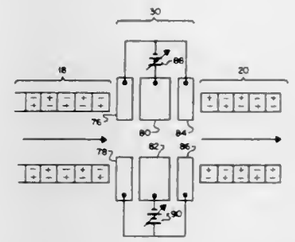
1. A method for extending valid data time on power failure by verification of volatile memory in a microprocessor comprising the steps of,
entering user data into the volatile portion of the memory of a microprocessor actuated for data processing,
transferring an initial fixed bit pattern representative of all the bits of user data from a nonvolatile portion of the memory to the volatile portion of the memory in the event a current fixed bit pattern of user entered data differs from the initial bit pattern,
conducting a sequence of current data processing operations by the microprocessor,
evaluating status of power supplied to a microprocessor,
generating upon an interruption in the supply of power to the microprocessor an initial compressed bit pattern representative of all bits of user data entered in the volatile portion of the memory of the microprocessor,
storing the initial compressed bit pattern in a nonverified portion of volatile memory of the microprocessor for future reference,



generating a current compressed bit pattern representative of the current data processing operations entered in the volatile portion of the memory when the power source is restored,
comparing the current compressed bit pattern in the volatile memory with the initial compressed bit pattern in the nonvolatile memory, and
continuing the data processing operations as long as the current bit patterns are identical to the initial bit patterns.

4,819,238
WIDE BAND FREE ELECTRON LASER WITH VARIABLE PHASE AND FREQUENCY
Robin J. Harvey, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Oct. 26, 1987, Ser. No. 112,332
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—2 **8 Claims**





1. A variable free electron laser, comprising:
first and second free electron laser cavity sections coupled in series by a flow transition region for electrons to flow from the first to the second cavity section, the first cavity section receiving an applied electron beam and the second

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cavity section receiving bunched electrons from the first cavity section and emitting output radiation in response thereto, each cavity section including a wiggler means for coherently bunching electrons flowing through the cavity section;

successive pairs of electrodes in the flow transition region spaced in the direction of electron flow; and

means for applying variable voltage differentials across said electrodes which accelerate the electrons between one electrode pair and decelerate the electrons by a substantially equal amount between another electrode pair, whereby the phase of the generated radiation field is varied.

4. A variable free electron laser, comprising:

first and second free electron laser cavity sections for respectively receiving and emitting an electron beam, the cavity sections being arranged in series for electrons to flow through the first and second cavity sections in order and coupled by a flow transition region, each cavity section including means imposing a periodic oscillatory trajectory normal to the general direction of electron flow upon electrons flowing through the section to generate an electromagnetic radiation field;

three pairs of electromagnet is in the flow transition region spaced in the direction of electron flow; and

means for applying variable energizing signals to the first second electromagnets in the electron path which successively deflect the electrons from and then restore the electrons to their original beam path, and to the third electormagnet which restores the electrons to their original direction along the original beam path, thereby varying the phase of the electron beam and the generated radiation field in accordance with the amount of electron deflection.

4,819,239

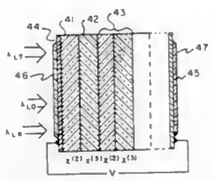
LASER Q-SWITCH

Edward J. Sharp, Stafford Co.; Richard R. Shurtz, II, Fairfax Co.; Wolfgang Elser, Fairfax Co., and Gary L. Wood, Fairfax Co., all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 6, 1987, Ser. No. 46,329

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—12 **15 Claims**



1. A light-transmission control device including:

at least a first and a second set of interleaved films with contiguous broad surfaces, the films within each set being formed from the same material and having a given linear first-order susceptibility to electric polarization which is different for each of said sets, so that said sets define a thin interference filter with opposed broad input and output surfaces and at least one narrow frequency-discrimination band;

at least said first set having a substantially different non-linear higher-order susceptibility than said second set so that said higher-order susceptibility can be activated by an applied electric field to alter said narrow band.

4,819,240

LIGHT MODULATOR

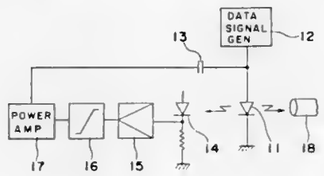
Haruhisa Takiguchi; Shinji Kaneiwa, both of Nara; Toshihiko Yoshida, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 879,635, Jun. 27, 1986, abandoned. This application Apr. 7, 1988, Ser. No. 180,637

Claims priority, application Japan, Jun. 28, 1985, 60-143687

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—26 **5 Claims**



1. A light modulator for modulating data signal to high frequency light signal, said light modulator comprising:

a means for producing a data signal,

a semiconductor laser diode having an input for receiving said data signal and an output for producing a laser beam;

a light detector means for receiving said laser beam and producing an electric signal representing said laser beam;

an electric passage means between said light detector means and said input of said semiconductor laser diode, said electric circuit means including a high pass filter,

said semiconductor laser element, said light detector and said high pass filter constituting a high frequency feedback oscillator,

said high frequency feedback oscillator effects an oscillation at a resonance frequency in said semiconductor laser diode to generate a light modulated high frequency laser signal from said semiconductor laser diode.

4,819,241

LASER DIODE DRIVING CIRCUIT

Katsumi Nagano, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 15, 1986, Ser. No. 897,051

Claims priority, application Japan, Aug. 16, 1985, 60-179255; Aug. 23, 1985, 60-184041; Aug. 23, 1985, 60-184042; Sep. 18, 1985, 60-204417; Oct. 29, 1985, 60-240411

Int. Cl.[4] H01S *3/00*

U.S. Cl. 372—38 **62 Claims**

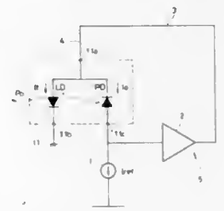
1. A light emitting apparatus comprising:

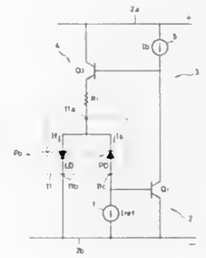
a semiconductor device for emitting a light in response to a driving current;

means for outputting a photovoltia current having a value corresponding to the intensity of the light emitted from the semiconductor device;

a current source electrically coupled to the outputting means, for supplying a reference current having a predetermined value to the outputting means; and

means electrically coupled to the semiconductor device, for controlling the driving current and supplying the controlled driving current to the semiconductor device such that the photovoltaic current output from the outputting





means changes in proportion to the reference current form the current source.

4,819,242

SEMICONDUCTOR LASER DRIVER CIRCUIT

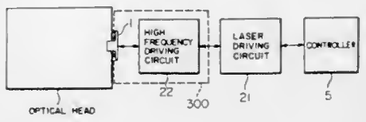
Toshimitsu Kaku, Sagamihara, and Kazuo Shigematsu, Saitama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1986, Ser. No. 932,495

Claims priority, application Japan, Nov. 20, 1985, 60-258534; Oct. 3, 1986, 61-234606

Int. Cl.[4] H01S *3/00, 3/10*

U.S. Cl. 372—38 **11 Claims**



1. A semiconductor laser driver circuit comprising:

a semiconductor laser;

a high frequency oscillation circuit coupled to said semiconductor laser for superposing as high frequency current on a driving current for driving said semiconductor laser; and

a control circuit coupled to said high frequency oscillation circuit for controlling said high frequency current so as to stop the superposition of the high frequency current on said driving current at predetermined high-output oscillation levels of the semiconductor laser and to perform said superposition at predetermined low-output oscillation levels of the semiconductor laser.

4,819,243

SEMICONDUCTOR LASER WITH ACTIVE LAYER HAVING A RADIATION EMITTING ACTIVE REGION THEREIN WHICH EXTENDS THROUGH AND IS BOUNDED BY A CURRENT LIMITING BLOCKING LAYER

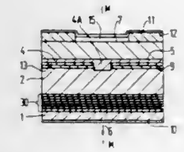
Jan Opschoor, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1987, Ser. No. 104,896

Claims priority, application Netherlands, Oct. 23, 1986, 8602653

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—45 **7 Claims**



1. A semiconductor laser comprising a semiconductor substrate having a layer structure disposed thereon, such layer structure comprising:

a first passive layer of a first conductivity type;

a second passive layer of a second opposite conductivity type;

an active layer of said first conductivity type interposed between said passive layers and forming a pn junction with said second passive layer, an area of said active layer defining an active region therein;

a pair of reflectors forming a resonant cavity for electromagnetic radiation, said cavity being positioned so that said active region is included therein; and

a current-limiting blocking layer of said secon conductivity type laterally bounding said active region of said active layer;

said pn junction producing, at a sufficiently high forward current, coherent electromagnetic radiation emitted from said active region in a direction at right angles to said active layer and which is reflected by said reflectors;

said first and second passive layers and said blocking layer each having a larger band gap and a smaller refractive index than said active layer for the radiation emitted by said active region; characterized in that:

said blocking layer is disposed between said active layer and said first passive layer; and

said active region of said active layer has a thickness greater than the remainder of said active layer and extends through said blocking layer at least as far as said first passive layer.

4,819,244

SEMICONDUCTOR LASER DEVICE

Saburo Yamamoto, Nara; Hiroshi Hayashi, Kyoto, and Taiji Morimoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 4, 1986, Ser. No. 870,450

Claims priority, application Japan, Jun. 11, 1985, 60-128664

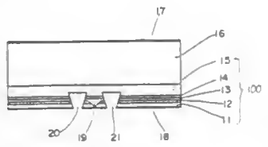
Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **1 Claim**

1. In a semiconductor laser device having a multi-layered growth crystal having an active layer therein for laser oscillation, but having no substrate; a buffer layer formed on said multi-layered growth crystal, the thickness of said buffer layer being thicker than that of all layers constituting said multi-layered growth crystal; a p-sided electrode and an n-sided electrode sandwiching therebetween the composite of said multi-layered growth crystal and said buffer layer, and having the

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structure of a V-channeled substrate inner stripe laser, the device wherein:



a pair of mesa-striped channels are formed outside of the V-channel to remove the outside of the optical waveguide formed in said active layer corresponding to said V-channel.

4,819,245

SEMICONDUCTOR LASER DEVICE HAVING SUBSTRIPED CHANNELS FOR FORMING AN ACTIVE LAYER WHICH IS THIN IN AN INSIDE PORTION

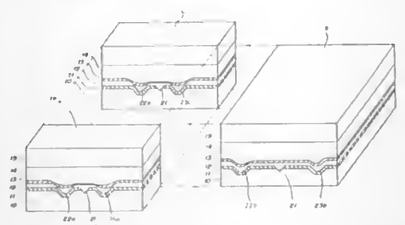
Taiji Morimoto; Mototaka Taneya, both of Nara; Hiroshi Hayashi, Kyoto, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Apr. 22, 1986, Ser. No. 854,627

Claims priority, application Japan, Apr. 23, 1985, 60-87881; Apr. 24, 1985, 60-90400; Jul. 22, 1985, 60-163221; Jul. 23, 1985, 60-163394; Jul. 23, 1985, 60-163399

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—48 **7 Claims**



1. In a semiconductor laser device comprising a substrate having a main striped channel for confining current therein and sub-striped channels formed in a parallel manner outside of said main striped channel, a width of said sub-striped channels being greater than that of said main striped channel, and an active layer for laser oscillation, whereby portions of said active layer corresponding to said sub-striped channels are formed into a concave, and a portion of said active layer positioned between said concaved portions of said active layer results in a plane with a limited thickness, wherein the improvement comprises said thickness of said portion of said active layer positioned between said concaved portions of said active layer being thinner than that of the other portions of said active layer.

4,819,246

SINGLE FREQUENCY ADAPTER

Marc F. Aiello, Oakmont, and John J. Grazulis, Pittsburgh, both of Pa., assignors to Aerotech, Inc., Pittsburgh, Pa.

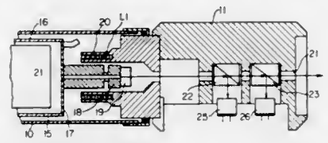
Filed Mar. 23, 1988, Ser. No. 172,262

Int. Cl.[4] H01S *3/03*

U.S. Cl. 372—107 **5 Claims**

1. For a gas laser comprising a tube for containing a lasing medium, means to excite the lasing medium, and mirrors secured at each longitudinal end of said tube supported by hollow mirror mounts extending between the tube and the mirrors, a system for rapidly changing the length between the mirrors comprising

(a) at least one of said mirror mounts being hollow and made of a nominally electrically conducting material and positioned so that the lasing axis passes therethrough



(b) an induction coil surrounding the mirror mount made of a nominally electrically conductive material and outwardly spaced from said mirror mount,

(c) means for applying an alternating current to the induction coil, and

(d) means for modulating the current in the induction coil.

4,819,247

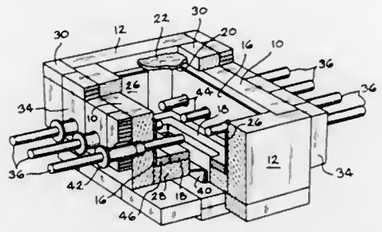
GLASS MELT FURNACE

Stephen Seng, Frazeysburg, and Frank J. Macdonald, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 3, 1987, Ser. No. 116,171

Int. Cl.[4] C03B *5/027*

U.S. Cl. 373—30 **27 Claims**



1. An improved method for melting glass comprising:

providing a pool of molten glass in a melting furnace having bottom and side walls constructed of a refractory having a resistivity that decreases with increasing temperature and a metal liner positioned flush with such refractory at specified locations on such bottom and side walls;

electrically heating such molten glass by means of heating electrodes of opposed polarity immersed in such molten glass providing an electrical charge therebetween, such heating electrodes also providing an electrical charge to such metal liner about 20% less than such charge between such electrodes to encourage a uniform temperature distribution through said pool of glass;

flowing such heated glass past such electrodes into a forming apparatus for producing glass product.

4,819,248

ELECTRODE MONITORING SYSTEM

Eugene C. Varrasso, Heath, and Glen F. Day, Gambier, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 13, 1988, Ser. No. 193,618

Int. Cl.[4] C03B *5/027*

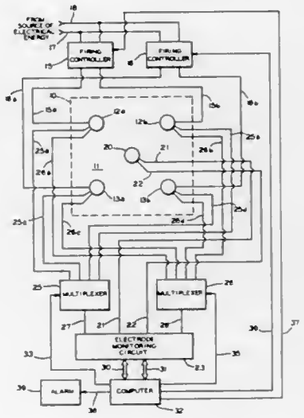
U.S. Cl. 373—39 **18 Claims**

1. In a glass heating furnace including a pool of molten glass and a pair of powered electrodes connected to a source of electrical energy, the powered electrodes being immersed in the pool of molten glass for passing an electrical current therebetween to heat the molten glass, a system for monitoring the electrical resistance of a selected one of the powered electrodes comprising:

a reference electrode immersed in the pool of molten glass;

means for passing a measurement signal between the selected powered electrode and said reference electrode, said measurement signal being distinguishable from the electrical current passing between the powered electrodes; and

means for generating a signal representative of the voltage differential across the selected powered electrode and said reference electrode created as a result of said measurement signal, said voltage differential signal being representative of the electrical resistance of the selected powered electrode.



4,819,249

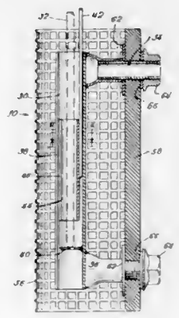
DEVICE FOR DETERMINING THE ACCURACY OF A THERMALLY-ACTIVATED INSTRUMENT

Regner A. Ekstrom, 15555 Millard Ave., Markham, Ill. 60426; Ronald E. Ekstrom, 4326 Applewood La., Matteson, Ill. 60443; Walter E. Ekstrom, R.R. No. 3, Kings Rd. Box 1195, Crete, Ill. 60417, and Allan D. Ekstrom, 207 Corinth Dr., Olympia Fields, Ill. 60461

Filed Dec. 29, 1986, Ser. No. 946,942

Int. Cl.[4] G01K *15/00*

U.S. Cl. 374—1 **15 Claims**



1. A test device for a thermally-activated instrument for determining the accuracy of the instrument, comprising

(a) a first enclosure for retaining the instrument, said first enclosure being hollow and generally cylindrical in configuration and having a length sufficient to accommodate at least a portion of the instrument within the enclosure,

(b) terminal means connected to said first enclosure and adapted to be connected to a power supply for supply of heating current to said first enclosure,

(c) a second enclosure for retaining the instrument, said second enclosure being cylindrical in configuration and being shaped to fit within said first enclosure, said second enclosure having a length less than the length of said first enclosure so that said second enclosure may be positioned at random locations within said first enclosure with the instrument extending through said second enclosure, and

(d) temperature sensing means for sensing the temperature of the instrument, said temperature sensing means being secured to said second enclosure and removable from said first enclosure with said second enclosure.

4,819,250

APPARATUS FOR MEASURING TEMPERATURE AT A HOT POINT ALONG AN ELECTRICAL ENERGY TRANSMISSION CABLE

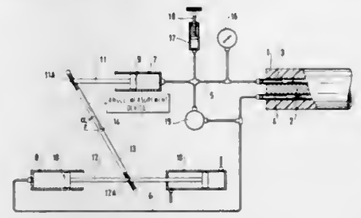
Henri Thevenon, Lyons, France, assignor to Les Cables de Lyon, Clichy Cedex, France

Filed Oct. 21, 1987, Ser. No. 110,822

Claims priority, application France, Oct. 24, 1986, 86 14796

Int. Cl.[4] G01K *5/20*; **H02G** *1/00*

U.S. Cl. 374—104 **3 Claims**



1. An apparatus for measuring temperature at a hot point along an electrical energy transmission cable when the temperature exceeds a fixed limit temperature, said apparatus comprising

a first tube containing a liquid which is vaporizable in the vicinity of said limit temperature to thereby increase a vapor pressure within said first tube, said first tube having a first tube end and said first tube being disposed in contact with the electrical energy transmission cable over the length of said cable;

pressure detecting means for detecting an increase in the vapor pressure of said liquid upon vaporizing thereof at at least one point along said tube, said pressure detecting means comprising means connected to said first tube end for detecting an increase in the pressure exerted by said liquid at said first tube end;

a second tube identical to the first tube and filled with the same liquid, said second tube being disposed in proximity to the first tube and parallel thereto;

said first tube having said end and said second tube having a second tube end connected respectively to cylinders fitted with moving pistons and a rocker lever, pivotally mounted at its center, and being connected at opposite ends to respective pistons whereby movement of the pistons are rendered equal and opposite by said pivotable rocker lever;

the end of the first tube being connected to a pressure gauge constituting said means for detecting an increase in pressure exerted by said liquid at said first tube end and to a chamber of adjustable small volume;

an actuator for exerting pressure on liquid contained in said

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second tube via the piston connected to the end of the second tube whereby excess pressure is set up therein such that said second tube contains liquid only; and

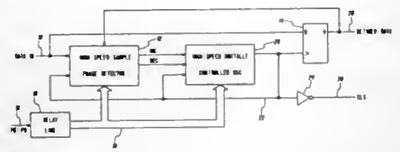
a servo-mechanism for maintaining a pressure difference between the first and second tubes constant.

4,819,251

HIGH SPEED NON-RETURN-TO-ZERO DIGITAL CLOCK RECOVERY APPARATUS

Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 6, 1988, Ser. No. 190,913
Int. Cl.[4] H03L *7/00*
U.S. Cl. 375—119 **5 Claims**



3. The method of recovering a clock signal from a non-return-to-zero (NRZ) data signal having a data bit repetition rate of frequency F using digital circuitry and a reference signal source that has a frequency of less than 2F comprising the steps of:

generating a plurality (N) of signals from said reference signal source wherein each of said N signals has a phase difference of 360°/N with respect to another of said N signals;

generating a frequency and phase controlled clock signal whose phase is altered in response to a phase altering control input signal;

detecting the number of said N signals commencing between the commencement of a data signal and the commencement of a given characteristic of said clock signal; and

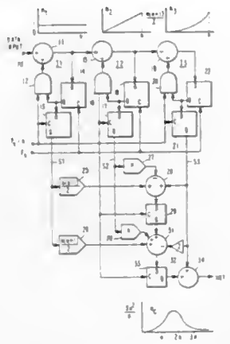
generating a phase altering control signal, for use in generating the clock signal, whenever the detected number of said N signals is outside an allowable range.

4,819,252

SAMPLED DATA SUBSAMPLING APPARATUS

Todd J. Christopher, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Feb. 16, 1988, Ser. No. 155,944
Int. Cl.[4] H04B *1/66*
U.S. Cl. 375—122 **12 Claims**



1. Apparatus for filtering and subsampling a sample data signal occurring at a first rate f_s to produce samples at a second rate f_s/n, n an integer, said apparatus comprising:

an input terminal for receiving said sampled data input signal;

a compound accumulator, coupled to said input terminal, for providing first output values corresponding to the accumulated values of successive input samples of exclusive groups of n input samples of said input signal, second output values corresponding to a double accumulation of values of successive input samples of said exclusive groups of n input samples, and third output values corresponding to a triple accumulation of values of successive input samples of said exclusive groups of n input samples;

first means coupled to said compound accumulator for combining said first, second and third output values in the ratio $n(n-1)/2:-n:1$ to produce a first combined signal FCS1;

second means coupled to said compound accumulator for combining said first, second and third output values in the ratio $n(n+1)/2:n_1-2$ to produce a second combined signal FCS2;

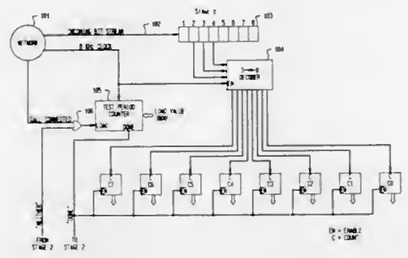
third means coupled to said compound accumulator and to said first and second means, for providing said signal FSC2 delayed by one subsample period and said signal FCS1 delayed by two subsample periods, and for combining said third output values with said signal FCS2 delayed by one subsample period and said signal FCS1 delayed by two subsample period.

4,819,253

METHOD FOR DETERMINING PCM CODING LAW

Orni Petruschka, Middletown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed May 16, 1988, Ser. No. 194,343
Int. Cl.[4] H04B *14/06*
U.S. Cl. 375—30 **5 Claims**



1. A process for classifying a bit stream as being encoded in A-law, or μ-law PCM, comprising the steps of:

(a) examining predetermined bit-positions of the bit stream for the appearance of predetermined code patterns during a monitoring interval,

(b) accruing a count during said interval respective to the appearance of each of said patterns; and

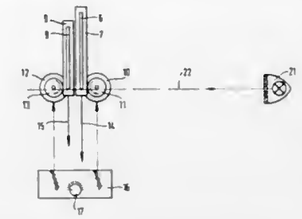
(c) determinating the presence of A-law PCM coding when the count accrues only for that pattern representing the lowest amplitude signal capable of being encoded in A-law PCM and reporting the presence of μ-law PCM when the count accrues only for that pattern representing the lowest amplitude signal capable of being encoded in μ-law PCM.

4,819,254

METHOD OF AND APPARATUS FOR RECORDING AND REPRODUCING IMAGE INFORMATION IN PANORAMIC X-RAY PHOTOGRAPHY

Timo Nieminen, and Tero Nieminen, both of Helsinki, Finland, assignors to Radiante Oy, Helsinki, Finland

Filed Jan. 20, 1987, Ser. No. 5,222
Claims priority, application Finland, Jan. 23, 1986, 8603/21
Int. Cl.[4] A61B *6/00;* **H05G** *1/60*
U.S. Cl. 378—21 **8 Claims**



7. An apparatus for recording total information and reproducing layerwise images thereof in panoramic x-ray photography comprising:

(a) support means supporting a source of x-rays at one end of said support means and an image recording means at the other end of said support means;

(b) drive means for moving said source of x-rays relative to an object to be imaged by a beam of x-rays emanating from said source;

(c) said image recording means including a photographic disc stationarily mounted relative to said object, said photographic disc recording the total information of said beam of x-rays penetrated through said object;

(d) means for producing an image corresponding to desired layer selectively from said total information recorded on said photographic disc; and

(e) an image reproduction device separate from said apparatus and including said means for producing said image from said total information recorded on said photographic disc, said image reproduction device further comprising means for recording said desired layer directly from said photographic disc onto an output film or means for recording said desired layer from said photographic disc onto a display screen via a camera and further comprising film control means or display control means for effecting a speed difference between the recording scan of said photographic disc and an image output on said film or a display scan on said display screen.

4,819,255

STEREO X-RAY FLUOROGRAPHY APPARATUS

Hideki Sato, Nasu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

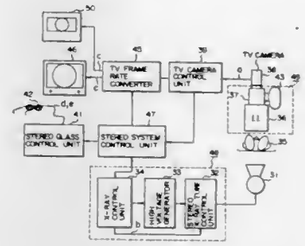
Filed Nov. 3, 1987, Ser. No. 116,158
Claims priority, application Japan, Nov. 19, 1986, 61-273892
Int. Cl.[4] A61B *6/02*
U.S. Cl. 378—42 **9 Claims**

1. A stereo X-ray fluorography apparatus for stereo-fluorographically examining a subject by alternately displaying right and left images of X-rays, emitted from right and left focal points, on a screen of display means, and viewing the right and left images through only the right and the left eyes, respectively, said apparatus comprising:

means for picking-up an X-ray image of the X-rays passed through the subject for a predetermined cycle;

means for alternately irradiating the subject with X-rays from said right and left focal points each time an m (m being a positive integer not less than 2) number of images are picked up by said picking-up means; and

means for storing said m number of images, at each time of X-ray irradiation, from among those images picked up by said picking-up means, and for supplying the right and left



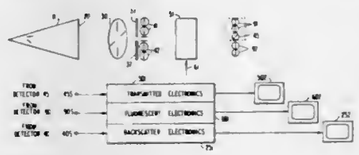
images, which are alternately read out, to said display means.

4,819,256

RADIOGRAPHIC SENSITIVITY FOR DETECTION OF FLAWS AND CRACKS

Martin Annis, Cambridge, and Paul Bjorkholm, Sharon, both of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Apr. 20, 1987, Ser. No. 40,019
Int. Cl.[4] G01N *23/201*
U.S. Cl. 378—87 **8 Claims**



1. A method of imaging for enhancing detection of cracks or flaws in an object using penetrating radiant energy comprising the steps of:

(a) providing a beam of penetrating radiant energy and repeatedly sweeping said beam over a line in space,

supporting an object for illumination by said beam and providing relative motion between said object and said line in space,

(c) providing a radiation detector responsive only to scattered energy from said object as a consequence of its illumination by said beam of penetrating radiant energy,

(d) applying a contrast medium to said object prior to said illumination, said contrast medium selected as one with atomic number significantly different from an atomic number characterizing said object so as to provide contrast in a scatter image, and

(e) using signals produced by said radiation detector to develop an image representing cracks or flaws within which said contrast medium has accumulated.

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4,819,257

LITHOTRIPSY WORK STATION

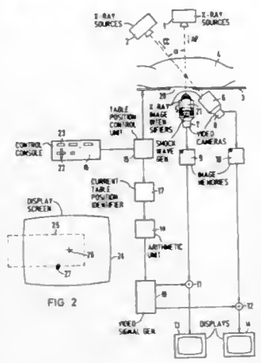
Franz Grasser, Eggolsheim, and Sylvester Oppelt, Bamberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1987, Ser. No. 98,568

Claims priority, applicatioo Fed. Rep. of Germany, Sep. 19, 1986, 3631956

Int. Cl.[4] A61B *17/00*

U.S. Cl. 378—99 4 Claims



1. A lithotripsy work station for use in disintegrating a calculus disposed in the body of a patient, said work station comprising:

a support table on which said patient is disposed, said support table having an opening therein;

means for three-dimensionally positioning said support table;

x-ray means for generating at least one visually displayable image for identifying the position of said calculus in said patient;

a shock wave generator having a focus, said shock wave generator adapted for coupling to said patient through said opening in said support table for disintegrating said calculus;

means for identifying a current position of said support table;

means for generating a signal based on the position of said opening within said patient support table corresponding to range limits for effective coupling of said shock wave generator to said patient;

means for mixing said signal corresponding to the range limits with the viewable image of said patient; and

means for simultaneously displaying the mixed signals.

4,819,258

AUTO-SETTING OF KV IN AN X-RAY MACHINE AFTER SELECTION OF TECHNIC FACTORS

Bennett Kleinman, Amityville; Calvin Kleinman, and Robert P. Coe, both of Dix Hills, all of N.Y., assignors to Bennett X-Ray Corp., Copiague, N.Y.

Continuatioo-in-part of Ser. No. 935,764, Nov. 28, 1986. This applicatioo Aug. 13, 1987, Ser. No. 85,457

Int. Cl.[4] H05G *1/32*

U.S. Cl. 378—111 10 Claims

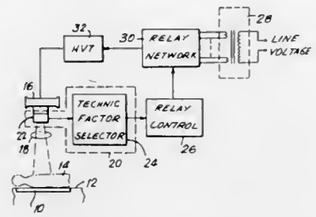
1. An x-ray machine comprising:

an image receptor, a support for a body, and an x-ray source energizable to irradiate the body with x-rays during an exposure interval to thereby form on the receptor an x-ray image of the body;

technic factor selection means for selecting technic factors, including operator-controlled means for selecting KV, and for providing control signals indicative of the selection, including a KV control signal indicative of the selected KV;

a first transformer having a primary winding connected across line voltage and a plurality of secondary windings and relays which selectively connect respective secondary windings into a series circuit having a secondary voltage thereacross;

a second transformer having a primary winding connected to be energized by said secondary voltage and a secondary winding connected to energize the x-ray source at a KV determined by sad secondary voltage;



relay control means responsive to the control signal indicative of the selected KV to cause said relays to connect into said series circuit those secondary windings which collectively give a secondary voltage corresponding to the selected KV, and to thereby cause said second transformer to power the x-ray source at the selected KV.

4,819,259

ROTARY ANODE TYPE X-RAY APPARATUS

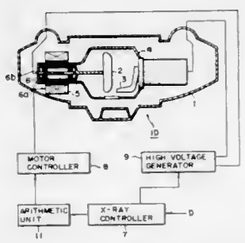
Shigeru Tanaka, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1986, Ser. No. 909,130

Claims priority, application Japan, Sep. 20, 1985, 60-206373

Int. Cl.[4] H01J *35/10, 35/26*

U.S. Cl. 378—125 5 Claims



1. A rotary type x-ray apparatus comprising:

an x-ray tube having predetermined temperature characteristics and including a rotary anode rotatable at a predetermined frequency of revolution and wherein said rotary anode has a target area;

x-ray tube drive means for supplying voltage and current to said x-ray tube and causing x-rays to radiate from said x-ray tube, said x-ray tube drive means including means for supplying voltage pulses to said target area;

an arithmetic unit which operates to prestore the predetermined temperature characteristics of said x-ray tube, calculate an optimum frequency of revolution (f) of the rotary anode according to the following formula:

$$Tmax \geq Tb + (\beta \sqrt{Np \cdot W} - \gamma Np \cdot W) \times$$

-continued

$$V \cdot I \times 10^6 + \delta(V \cdot L/\sqrt{f}),$$

wherein Tmax = the solubility limit temperature of the target area;

W = the pulse width (msec.) of said voltage pulses;

Np = the pulse rate of said voltage pulses;

V = the x-ray tube voltage;

I = the x-ray tube current;

Tb = the temperature characteristics of the X-ray tube; and

β, γ and δ = constants determined by the temperature characteristics of the X-ray tube, and produce data corresponding to the calculated optimum frequency of revolution; and

rotary anode drive means responsive to the data of optimum frequency of revolution output from the arithmetic unit for rotatably driving said rotary anode at said optimum frequency of revolution.

4,819,260

X-RADIATOR WITH NON-MIGRATING FOCAL SPOT

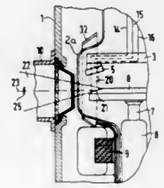
Klaus Haberrecker, Bubenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 915,707, Oct. 6, 1986, abandoned. This application Aug. 12, 1988, Ser. No. 231,370

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3542127

Int. Cl.[4] G01T *1/20;* H01J *35/06*

U.S. Cl. 378—137 5 Claims



1. An x-ray assembly comprising:

an x-ray tube having an envelope with a projection forming a beam exit port;

a cathode disposed in said projection consisting of non-magnetic material and an anode dish spaced from said cathode, said anode dish and cathode disposed in said envelope, said cathode being disposed eccentrically with respect to a center of said anode dish and emitting an electron stream at a focal spot on said anode dish from which an x-ray beam is emitted through said projection;

means for rotating said anode dish;

coil means surrounding said projection and said x-ray beam for generating a magnetic field at least in the space between said anode dish and cathode substantially perpendicular to the direction of propagation of said electron stream;

a sensor means disposed in the path of said x-ray beam for detecting the position of said x-ray beam, and generating a signal corresponding to said position; and

means for adjusting the magnetic field generated by said coil means in response to said signal from said sensor means such that migration of said focal spot on said anode dish is corrected.

4,819,261

PUBLIC TELEPHONE SET

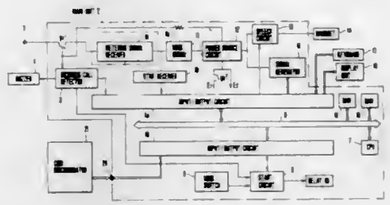
Yoshiaki Takeda; Kazuo Asada, and Shigehiro Eda, all of Tokyo, Japan, assignors to Tamura Electric Works, Tokyo, Japan

Filed Jan. 21, 1988, Ser. No. 209,612

Claims priority, application Japan, Sep. 10, 1987, 62-225348

Int. Cl.[4] H04M *1/24*

U.S. Cl. 379—27 8 Claims



1. A public telephone set having an alarm information transmission function for performing a self-diagnosis for predetermined test positions upon detection of a ringing signal from an office line and automatically forming a DC loop, for transmitting a self-diagnostic result in a predetermined form of a signal, and for releasing the DC loop, comprising:

communication enabling means for enabling incoming communication upon formation of the DC loop based on the incoming call;

signal detecting means for detecting a protocol signal from a maintenance center or a service center via the office line;

timer means started upon formation of the DC loop; and

control means for sending out alarm information to said maintenance center or said service center via the office line when said signal detecting means generates a detection output during an operation of said timer means.

4,819,262

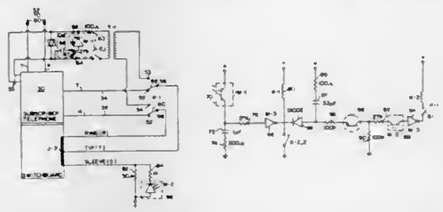
ELECTRONIC GATING CONTROL FOR MANUAL TELEPHONE SWITCHBOARD

Donald Brittain, Fairfax, Va., and Germain Boutin, Edina, Minn., assignors to Guardian Telecommunications Systems, Inc./VASA Engineering, Fairfax, Va.

Filed Oct. 28, 1987, Ser. No. 113,750

Int. Cl.[4] H04M *5/00*

U.S. Cl. 379—157 10 Claims

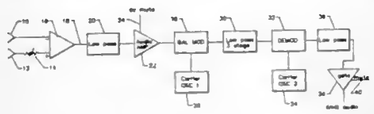


1. A gating circuit for operation in conjunction with a manual cord telephone switchboard to service first and second operational modes of a subscriber telephone connected for telephone communication to a central office, said first mode being an internal intercom connection between the subscriber telephone and the switchboard, said second mode being a secretarial service connection allowing direct communication between the switchboard and the central office, said gating circuit comprising ring detection circuit means for detecting when said subscriber telephone has been rung from the central office,

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switch means adapted to be switched between a first position for connecting the subscriber telephone in the intercom mode and a second position for connecting the subscriber telephone in the secretarial service mode in response to the detection of a ring from the central office by said ring detection circuit, and means for establishing a closed loop for direct communication between the central office and the switchboard when the switch means is in the second position.

4,819,263
APPARATUS AND METHOD FOR HANDS FREE TELEPHONIC COMMUNICATION
Philip G. Franklin, San Clemente, Calif., assignor to Cellular Communications Corporation, Houston, Tex.
Filed Jun. 30, 1986, Ser. No. 880,298
Int. Cl.[4] H04M *9/08*
U.S. Cl. 379—390 **9 Claims**

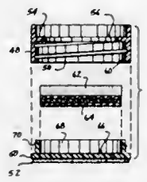


4. An improvement in an apparatus feedback suppression in hands-free operation in full-duplex two-way communication comprising:
- a switched capacitor modulator having an input for receiving a hands-free originated audio signal;
- a first carrier oscillator coupled to said modulator, said first carrier oscillator generating a first carrier frequency, said hands-free originated audio signal being mixed with said first carrier frequency to produce a modulated upper sideband output and modulated lower sideband output of said modulator;
- a first filter for removing frequencies above a predetermined maximum corresponding to said modulated lower sideband output;
- a switched capacitor demodulator for receiving said modulated lower sideband output;
- a second carrier oscillator for generating a second carrier frequency, said second carrier frequency coupled to said demodulator, said demodulator generating a demodulated upper sideband output and demodulated lower sideband output, said second carrier frequency greater than said first carrier frequency predetermined amount; and
- a second filter for removing said demodulated upper sideband output,

whereby interfering feedback within said hands-free two-way communication is reduced.

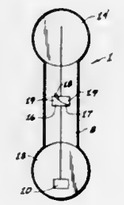
4,819,264
TELEPHONE SANITATION DEVICE
James D. Lemley, Rte. One, Woodville, Ala. 35776
Filed Feb. 19, 1988, Ser. No. 157,713
Int. Cl.[4] H04R *1/17*
U.S. Cl. 379—452 **2 Claims**

1. A telephone sanitation device, comprising:
- a cylindrical holder having a circular mounting plate;
- an adhesive backing on said mounting plate for securing said holder to a telephone;
- an upstanding cylindrical portion provided with external threads integrally formed with said mounting plate;
- a removable upper cylindrical retainer provided with internal threads for cooperative engagement with said external threads;
- an internal annular rim in said cylindrical retainer;
- a central cylindrical aperture encircled by said annular rim; and
- a disinfectant treated foam pad supported on said mounting plate and retained by said annular rim, said foam pad



adapted to contact a telephone mouthpiece when not in use.

4,819,265
DISPOSABLE COVER FOR TELEPHONE
James A. Colella, 94 Claremont Ave., Buffalo, N.Y. 14223
Filed Jul. 7, 1988, Ser. No. 216,192
Int. Cl.[4] H04M *1/17*
U.S. Cl. 379—452 **12 Claims**

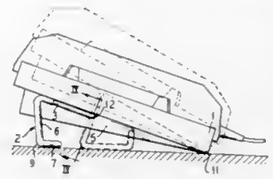


7. A disposable telephone handset cover comprising a cover body impregnated throughout with a composition selected from the group consisting of germicides, disinfectants, fungicides bactericides and mixtures thereof, said cover body having a handle portion, a mouthpiece portion and an earpiece portion, each capable of enclosing the entire respective parts of a handset, said handle portion having a top center slit in its back section from which the handset is inserted into said cover body, said top center slit having a first and second side on either side of said top center slit, said first side having a tab extending outwardly therefrom and overlapping over the second side, the tab having an underside surface with an adhesive, adjacent the underside of said tab is an adhesive cover section also containing said adhesive, said adhesive on said tab having means to connect onto said second side thereby connecting said first and second sides together, said adhesive cover section having means to fix said cover to a telephone handset handle.

4,819,266
TELEPHONE DEVICE WITH MEANS FOR CHANGING THE ANGLE OF INCLINATION
Erwin Awakowicz, Munich, and Peter Kleine, Fischen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jan. 28, 1987, Ser. No. 7,500
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 8606851[U]
Int. Cl.[4] H04M *1/11;* **A47G** *29/00*
U.S. Cl. 379—454 **6 Claims**

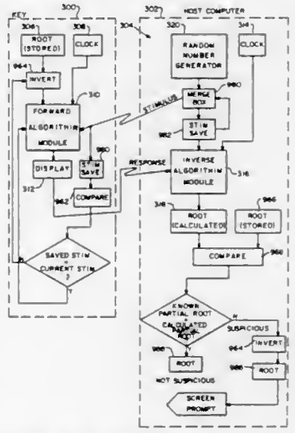
1. A telephone means to be supported on a supporting surface comprising a telephone set and a device for changing the angle of inclination thereof relative to the supporting surface, said telephone set having one end supported by said supporting surface and a second end supported by said device, said device

being formed by a wire shackle having two ends directed toward one another and at a distance from one another pivotably seated in recesses of the telephone set, said wire shackle formed with at least two different portions selectively engageable with said supporting surface, the wire shackle has a U-



shaped region comprising a pair of legs and a base respectively comprising three different lengths, said base and one of said legs comprising said portions engageable with said supporting surface such that the telephone set can be set into at least two different angles of inclination with respect to the supporting surface.

4,819,267
SOLID STATE KEY FOR CONTROLLING ACCESS TO COMPUTER SYSTEMS AND TO COMPUTER SOFTWARE AND/OR FOR SECURE COMMUNICATIONS
William P. Cargile, Half Moon Bay; Richard D. Freeman, Sunnyvale, and James M. Lyon, San Jose, all of Calif., assignors to Thumbscan, Inc., Oakbrook Terr., Ill.
Continuation of Ser. No. 813,647, Dec. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 582,302, Feb. 22, 1984, Pat. No. 4,599,489. This application Jun. 9, 1987, Ser. No. 62,322
Int. Cl.[4] H04L *9/04*
U.S. Cl. 380—23 **17 Claims**



1. Apparatus for affording access by a user to a computer and/or information residing in a computer, and/or for affording secure communications and comprising an access key capable of generating a password and of being transported independently of the computer, and an access key for verification means adapted to be resident in the computer, for allowing access and use of the software program wherein:

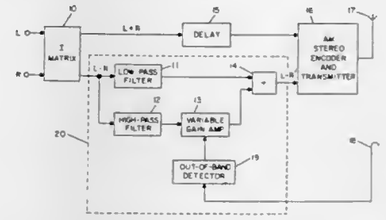
said access key includes:
- (a) first clock means for generating a signal;
- (b) means for storing a root;
- (c) forward algorithm means coupled to said clock means and root storing means for encrypting the root, responsive to the signal from said clock means, into a password;

said access key verification means includes:
- (a) second clock means for generating a signal;
- (b) means for receiving the password;
- (c) inverse algorithm means coupled to said second clock means for decrypting the password and for calculating the root;
- (d) means for generating a stimulus and for communication said stimulus to said inverse algorithm means and said access key;
- (e) said inverse algorithm means including means for using the stimulus to calculate the root from the password;

said access key includes:
- (a) means for receiving the stimulus and communicating the stimulus to said forward algorithm means;
- (b) wherein said forward algorithm means includes means for combining the stimulus with the root to produce the password;
- (c) means for saving at least a portion of stimulus member;
- (d) means for comparing the saved portion of the stimulus number with the next available stimulus number;
- (e) means for inverting at least part of the root before the root is communicated to the forward algorithm module responsive to the comparing means if the saved portion does not have a predescribed relationship with the next available stimulus number; and

said access key verification means includes:
- (a) second means for saving at least a portion of the stimulus number;
- (b) means for merging the saved portion of the stimulus number with the next stimulus number;
- (c) second means for storing at least a portion of the root;
- (d) means for comparing the portion of the root number saved in the second storing means with the calculated root;
- (e) means for generating a suspicion signal depending on whether there is a predetermined relationship between the calculated root and the saved portion of the root.

4,819,268
TRANSMITTER HAVING MEANS FOR CONTROLLING UNDESIRED OUT-OF-BAND RADIATION
Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016
Filed Aug. 17, 1987, Ser. No. 85,684
Int. Cl.[4] H04N *5/00*
U.S. Cl. 381—14 **7 Claims**



1. An improved transmitter having protection from undesired out-of-band radiation caused by high frequency signal components in the signal to be transmitted, comprising:

first means for supplying a signal to be transmitted;

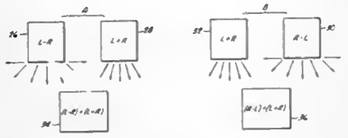
second means, responsive to said supplied signal and to a supplied control signal for developing a modified supplied signal having a selected high frequency portion reduced in amplitude compared to the remainder of said supplied signal by an amount determined by said control signal;

means for transmitting said modified supplied signal;

third means for developing a control signal representative of the undesired out-of-band radiation caused by transmis-

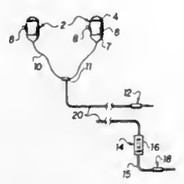
sion of said modified supplied signal and for supplying said control signal to said second means.

4,819,269
EXTENDED IMAGING SPLIT MODE LOUDSPEAKER SYSTEM
Arnold I. Klayman, Huntington Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jul. 21, 1987, Ser. No. 76,412
Int. Cl.[4] H04R 5/02
U.S. Cl. 381—24 40 Claims



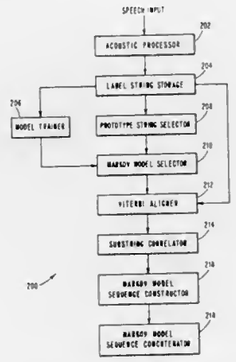
1. A method of reproducing sound from left and right stereo signals comprising:
combining left and right stereo signals to form a sum signal representing the sum of said stereo signals and difference signals representing the difference between said stereo signals,
radiating sound based on said difference signals in wide dispersion patterns over a frequency range, and
radiating sound based on said sum signal in a limited dispersion pattern over said frequency range.

4,819,270
STEREO DIMENSIONAL RECORDING METHOD AND MICROPHONE APPARATUS
Leonard Lombardo, 18695 Hwy. 9, Boulder Creek, Calif. 95006
Filed Jul. 3, 1986, Ser. No. 881,632
Int. Cl.[4] H04R 5/027
U.S. Cl. 381—26 11 Claims



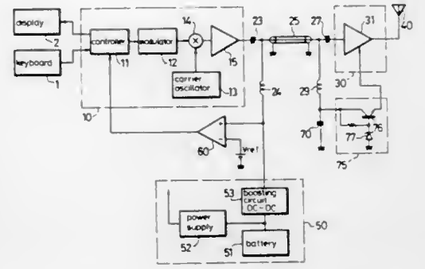
1. A method of stereophonic dimensional recording of sound waves, the method comprising the steps of:
(a) mounting each one of a pair of stereophonic microphones externally on a corresponding side of a human head or a simulated human head adjacent a region defined substantially by an imaginary line drawn along the lower extremity of the jaw bone, then extending upward through the cheek area, behind the eye, then backward to include the temporal region and above the ear, then downward forward of the ear to the jaw bone, away from the ear pinnas and protruding ear features of the human head or artificial ear pinnas and without covering or blocking the ear pinna or ear canal with a portion of the head interposed between each of said microphones;
(b) detecting said sound waves with said pair of microphones mounted as in step a.; and
(c) directing the detected sound waves of step b. to a stereophonic recording device.

4,819,271
CONSTRUCTING MARKOV MODEL WORD BASEFORMS FROM MULTIPLE UTTERANCES BY CONCATENATING MODEL SEQUENCES FOR WORD SEGMENTS
Lalit R. Bahl, Amawalk; Peter V. DeSouza; Robert L. Mercer, both of Yorktown Heights, and Michael A. Picheny, White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 738,933, May 29, 1985, Pat. No. 4,759,068. This application Dec. 16, 1987, Ser. No. 133,719
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—43 18 Claims



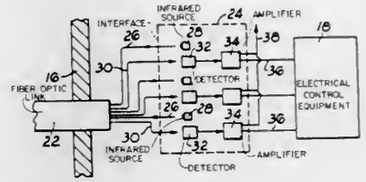
1. In a Markov model speech recognition system having an acoustic processor which generates a string of labels in response to an uttered input where each label is one of an alphabet of labels, a computerized method of constructing Markov model word baseforms comprising the steps of:
(a) for each of a set of Markov models in which each Markov model corresponds to a respective label and in which each Markov model has (i) a plurality of states and (ii) a plurality of arcs wherein each arc extends from a state to a state, computing and storing in computer memory arc probabilities and label output probabilities wherein each label output probability represents the likelihood of a given label being produced at a given arc;
(b) generating, with the acoustic processor, n respective strings of labels in response to each of n utterances of a subject word selected from a vocabulary of words;
(c) selecting the string of labels having a length which is closest to the average length of all strings generated in step (b);
(d) concatenating in sequence the Markov models which correspond to the successive labels in the selected string and storing the concatenated sequence;
(e) for a string other than the selected string, aligning successive substrings of zero or more labels against successive Markov models in the concatenated sequence, based on the stored probabilities;
(f) repeating step (e) for each generated string of step (b) other than the selected string, each string generated in step (b) having a respective substring corresponding to each Markov model in the concatenated sequence of step (d);
(g) partitioning the generated strings of step (b) into successive common segments, the ith common segment of each string corresponding to the i th substring thereof; and
(h) constructing a sequence of one or more Markov models for each ith common segment based on the ith label of the prototype string and the ith substrings of the other strings.

4,819,272
INTERMITTENTLY DRIVEN TRANSMITTER
Norio Shimo, and Norio Numata, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 13, 1987, Ser. No. 25,626
Claims priority, application Japan, Mar. 26, 1986, 61-67944
Int. Cl.[4] H01Q 11/12
U.S. Cl. 455—127 7 Claims



1. An intermittent transmitter for intermittently transmitting a signal comprising: a transmission signal forming circuit which forms a signal which is to be transmitted; a power amplifying circuit for amplifying said transmission signal formed by said transmission signal forming circuit; a power source voltage supply, a boosting circuit for boosting the power source voltage from said power source voltage supply to a substantially higher boosted voltage; a capacitor receiving a voltage from said boosting circuit; and a constant voltage circuit connected to said capacitor to receive the voltage stored in said capacitor and generating and regulating a constant voltage output which is higher than said power source voltage but lower than said boosted voltage, wherein said constant voltage output from said constant voltage circuit is supplied to said power amplifying circuit as a power source to intermittently drive said power amplifying circuit.

4,819,273
MINING MACHINE CONTROL SYSTEM
William Gordon, Lanark, United Kingdom, assignor to Anderson Strathclyde PLC, Motherwell, United Kingdom
PCT No. PCT/GB86/00321, § 371 Date Jan. 28, 1987, § 102(e) Date Jan. 28, 1987, PCT Pub. No. WO86/07409, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 6, 1986, Ser. No. 7,945
Claims priority, application United Kingdom, Jun. 7, 1985, 8514516
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—605 7 Claims



1. A mining machine including a flameproof enclosure containing electrical control equipment, at least one control station spaced from the flameproof enclosure and a communication system between the control station and the electrical control equipment, the communication system comprising a number of channels each having a first fibre optic pathway communicating light from a source within the enclosure to the control station, manually operable means in the control station for selectively modifying the light received, a second fibre optic pathway returning the modified light to the enclosure, the manually operable means including means for varying the intensity of the returned light to provide a first intensity level and a second intensity level in accordance with predetermined positions of the manually operable means, and a monitoring means being responsive to the absence of return light to generate an alarm signal.

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DESIGN PATENTS

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ERRATA

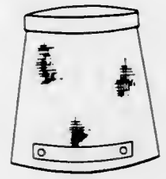
For CLASS	See PATENT NO.
D03-076	300,509
D15-070	300,543

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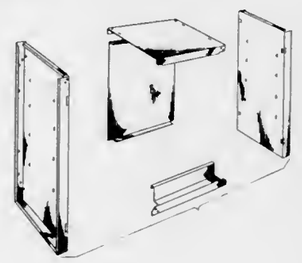
DESIGNS

APRIL 4, 1989

300,480
COMBINED SKIRT AND AMUSEMENT DEVICE
Doris Seymore, 505 N. Lake Shore Dr., Chicago, Ill. 60611
Filed Dec. 30, 1985, Ser. No. 814,896
Term of patent 14 years
U.S. Cl. D2—223



300,481
KITCHEN CABINET FRAME
Franciaco D. Irace, Rosario, Argentina, assignor to Fabrica Sideral Sociedad de Responsabilidad Limitada, Argentina
Filed Feb. 12, 1986, Ser. No. 833,486
Claims priority, application Argentina, Aug. 20, 1985, 48368
Term of patent 14 years
U.S. Cl. D6—329



300,482
CHAIR
Kenneth Clark, 3394 E. 146th St., Clevelaad, Ohio 44120
Filed Aug. 6, 1986, Ser. No. 893,730
Term of patent 14 years
U.S. Cl. D6—358



300,483
CHAIR
David C. Jenkins, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Mar. 31, 1986, Ser. No. 847,567
Term of patent 14 years
U.S. Cl. D6—366



300,484
CHAIR
Massimo Vignelli; Lelia Vignelli, both of New York, and David B. Law, Brooklyn, all of N.Y., assignors to Knoll International Inc., New York, N.Y.
Filed Sep. 20, 1989, Ser. No. 778,459
Term of patent 14 years
U.S. Cl. D6—373

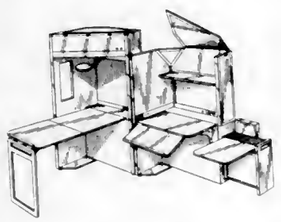


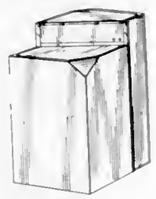
VOL 1101 ISS 1 AP 4 1989 UMI

300,485
COAT-STAND
Winfried Scholl, Düsseldorf, Fed. Rep. of Germany, assignor to FA. Hewi Heinrich Wilke GmbH, Arolsen, Fed. Rep. of Germany
Division of Ser. No. 771,051, Aug. 30, 1985, Pat. No. Des. 296,164. This application Mar. 17, 1988, Ser. No. 169,336
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, MR246
Term of patent 14 years
U.S. Cl. D6—411

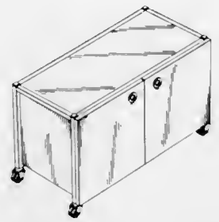


300,486
FOLDABLE WORKSTATION
Audrey G. Kaplan, and Peter A. D. Mill, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Exploitation Limitee, Ontario, Canada
Filed Jul. 28, 1986, Ser. No. 889,914
Claims priority, application Canada, Jun. 30, 1986, 3006861
Term of patent 14 years
U.S. Cl. D6—430

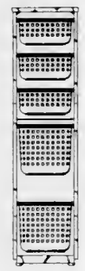




300,487
CABINET
David C. Dyer, Enfield, England, assignor to Ultimate Swivel Systems Limited, Hertfordshire, England
Filed Mar. 14, 1986, Ser. No. 840,284
Claims priority, application United Kingdom, Sep. 24, 1985, 1029456; Dec. 31, 1985, 1031351
Term of patent 14 years
U.S. Cl. D6—446

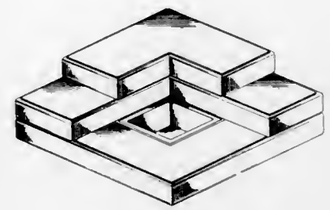


300,488
STORAGE RACK
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Jul. 28, 1986, Ser. No. 890,840
Claims priority, application Japan, Feb. 26, 1986, 6755/1986
Term of patent 14 years
U.S. Cl. D6—465

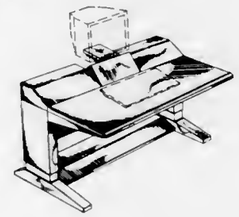




300,489
TABLE
Nino Antonellis, 4 Francine Rd., Framingham, Mass. 01701
Filed May 27, 1986, Ser. No. 867,388
Term of patent 14 years
U.S. Cl. D6—466

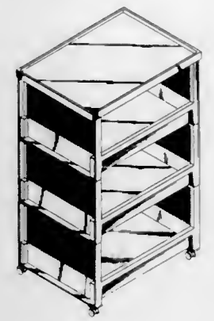


300,490
OPERATOR WORKSTATION
Edmond J. Helstab, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed May 8, 1986, Ser. No. 862,426
Term of patent 14 years
U.S. Cl. D6—474

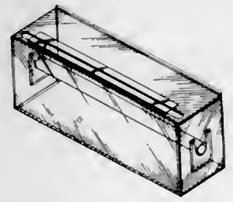




300,491
MODULAR MOBILE STORAGE UNIT
Gary Grossman, Riverside, Conn., assignor to Eagle Affiliates, Inc., Brooklyn, N.Y.
Filed Jun. 24, 1986, Ser. No. 877,836
Term of patent 14 years
U.S. Cl. D6—479



300,492
TRANSPARENT DISPENSER FOR ROLLED FILM
William A. Pearce, Rt. 3, Box 548, Glen Allen, Va. 23060
Filed Mar. 31, 1986, Ser. No. 847,555
Term of patent 14 years
U.S. Cl. D6—518

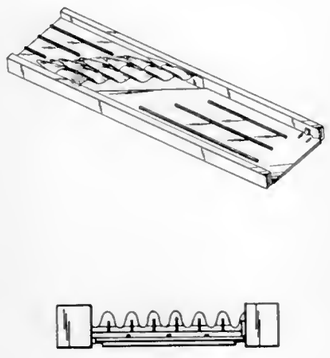


300,493
DECALCOMANIA FOR CHINA DINNERWARE OR SIMILAR ARTICLES
Helen Z. Shoreman, Washington, D.C., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Oct. 11, 1985, Ser. No. 786,525
Term of patent 14 years
U.S. Cl. D7—39

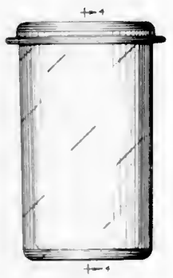


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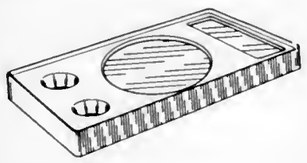
300,494
CUTTING APPARATUS
Ambrose Batiz, 1135 Clark St., Linden, N.J. 07036
Filed Dec. 1, 1986, Ser. No. 936,659
Term of patent 14 years
U.S. Cl. D7—47



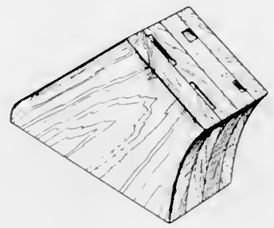
300,495
INSULATED BOTTLE HOLDER
Fario Minuti, Macerata, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jul. 16, 1984, Ser. No. 631,539
Claims priority, application Italy, Jan. 24, 1984, 20625/84[U]
Term of patent 14 years
U.S. Cl. D7—70



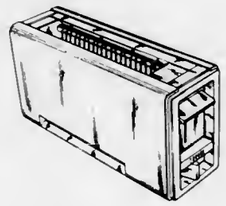
300,496
TRAY FOR ATTACHMENT TO A WALKER OR THE LIKE
Richard J. Childress, 1631 Strand Way #11, Coronado, Calif.
Filed May 5, 1986, Ser. No. 859,767
Term of patent 14 years
U.S. Cl. D7—71



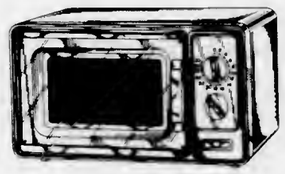
300,497
KNIFE BLOCK
Richard Goebel; Michael Luebke, and Gary Hoffman, all of Hutchinson, Minn., assignors to Chicago Cutlery Company, Minneapolis, Minn.
Filed Apr. 21, 1986, Ser. No. 856,127
Term of patent 14 years
U.S. Cl. D7—74

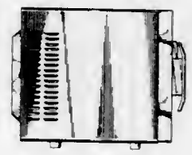


300,498
TOASTER
Pierre Ansel, Vagney, France, assignor to SEB, Selongey, France
Filed Apr. 14, 1986, Ser. No. 852,029
Claims priority, application France, Oct. 16, 1985, 854.836
Term of patent 14 years
U.S. Cl. D7—330

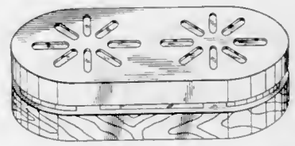


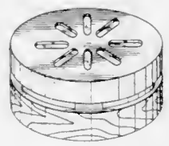
300,499
MICROWAVE OVEN
Hideo Nishikawa, Higashi Osaka; Kenzo Okamoto, Osaka; Fumihiko Kitada, Neyagawashi, and Jun Yoshikado, Sakaishi, all of Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed May 31, 1985, Ser. No. 740,202
Claims priority, application Japan, Dec. 26, 1984, 59-054224
The portion of the term of this patent subsequent to Sep. 20, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351



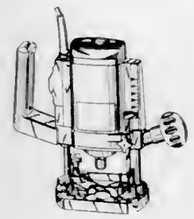


300,500
HOTPLATE
Friedhelm Pickhan, Rotenhain 11, 5900 Siegen, Fed. Rep. of Germany
Filed Mar. 18, 1986, Ser. No. 844,998
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 68526641[U]
Term of patent 14 years
U.S. Cl. D7—367

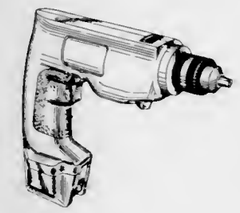




300,501
ROUTER
Donald W. Zarwelle, Lutherville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 27, 1986, Ser. No. 836,595
Term of patent 14 years
U.S. Cl. D8—67



300,502
CORDLESS DRILL
William H. Schultz, Northbrook, Ill., assignor to Skil Corporation, Chicago, Ill.
Filed May 29, 1987, Ser. No. 55,745
Term of patent 14 years
U.S. Cl. D8—68

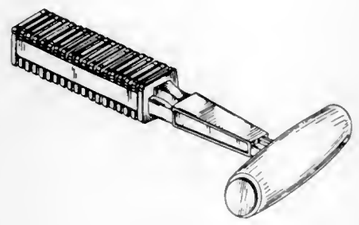


300,503
CORDLESS DRILL
William H. Schultz, Northbrook, Ill., assignor to Skil Corporation, Chicago, Ill.
Filed Jun. 1, 1987, Ser. No. 56,534
Term of patent 14 years
U.S. Cl. D8—68



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300,504
HAMMER
Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Tokyo, Japan
Filed Jul. 7, 1987, Ser. No. 70,512
Term of patent 14 years
U.S. Cl. D8—77



300,505
PULL
James M. Palm, Jr., Rockford, and Teresa R. B. Pittenger, Arlington Heights, both of Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Mar. 3, 1987, Ser. No. 32,093
Term of patent 14 years
U.S. Cl. D8—318





300,506
ORNAMENTAL DESIGN FOR A HANDLE GRIP
James V. Pedone, P.O. Box 13, 1653½ Main St., Peninsula, Ohio 44224
Filed Feb. 24, 1986, Ser. No. 834,485
Term of patent 14 years
U.S. Cl. D8—303



300,507
TETHER RESTRAINER DEVICE, OR SIMILAR ARTICLE
James C. Rabb, 14110 E. Dickenson Dr., Apt. A, Aurora, Colo. 80014
Filed Feb. 24, 1986, Ser. No. 836,470
Term of patent 14 years
U.S. Cl. D8—367

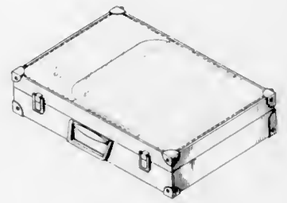




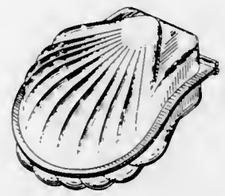
300,508
WEDGED DOUBLE-HEAD NAIL
Brian H. Viening, 1107 S. Griffin, Grand Haven, Mich. 49417
Filed Mar. 24, 1986, Ser. No. 845,761
Term of patent 14 years
U.S. Cl. D8—391



300,509
SUITCASE
Volker Zitt, Frankenthal, Fed. Rep. of Germany, assignor to ZIKA-Plastik GmbH, Frankenthal, Fed. Rep. of Germany
Filed Mar. 25, 1986, Ser. No. 847,032
Term of patent 14 years
U.S. Cl. D3—76



300,510
FOLDING PACKAGE
Stanley I. Mason, Jr., Weston, Conn., assignor to A/S Norconserv Products, Stavanger, Norway
Filed Dec. 6, 1985, Ser. No. 804,876
Term of patent 14 years
U.S. Cl. D9—310



300,511
BOTTLE
Ronald G. Cramer, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Jan. 29, 1986, Ser. No. 823,703
Term of patent 14 years
U.S. Cl. D9—396



300,512
COMBINED DISPENSING NOZZLE AND CAP FOR A PRESSURIZED CONTAINER
Carl S. Ahlberg, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 24, 1986, Ser. No. 923,731
Term of patent 14 years
U.S. Cl. D9—448



300,513
WRIST WATCH
Kaoru Tsukahara, Kodaira, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 17, 1986, Ser. No. 887,115
Term of patent 14 years
U.S. Cl. D10—30

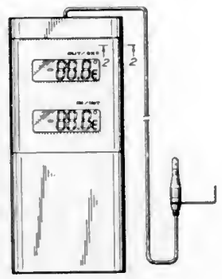


300,514
COMBINED WRIST WATCH AND CALCULATOR
Takashi Morishima, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed May 9, 1986, Ser. No. 862,381
Claims priority, application Japan, Dec. 3, 1985, 60-50351
Term of patent 14 years
U.S. Cl. D10—31

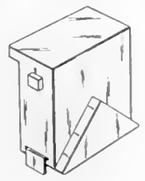


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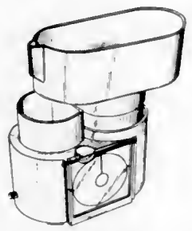
300,515
THERMOMETER WITH AN EXTERNAL SENSOR
Raymond Chan, Hong Kong, Hong Kong, assignor to Integrated Display Technology, Ltd., Hong Kong
Filed Dec. 22, 1986, Ser. No. 945,322
Claims priority, application United Kingdom, Jul. 28, 1986, 1035662
Term of patent 14 years
U.S. Cl. D10—57



300,516
TAPE MEASURE
Steven Foster, P.O. Box 461, Dana Point, Calif. 92629, and James D. Sieger, 2803 Bello Panorama, San Clemente, Calif. 92672
Filed Jun. 27, 1986, Ser. No. 879,561
Term of patent 14 years
U.S. Cl. D10—72



300,517
DIETING SCALE OR THE LIKE
Jack D. Bankier, Northbrook, Ill., and Kenneth J. Muderlak, Shorewood, Wis., assignors to Lifestyle Technologies, Inc., Highland Park, Ill.
Filed Aug. 6, 1986, Ser. No. 893,499
Term of patent 14 years
U.S. Cl. D10—91



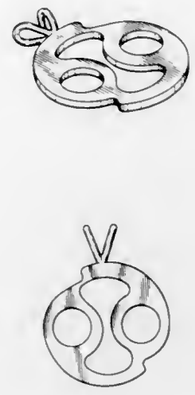
300,518
WATCH DIAL
Fernando Fontana, Sesto Calende, Italy, assignor to Omega SA, Bieane, Switzerland
Division of Ser. No. 780,345, Sep. 26, 1985. This application Feb. 24, 1988, Ser. No. 159,974
Claims priority, application Italy, Mar. 26, 1985, 21244/85[U]
Term of patent 14 years
U.S. Cl. D10—126



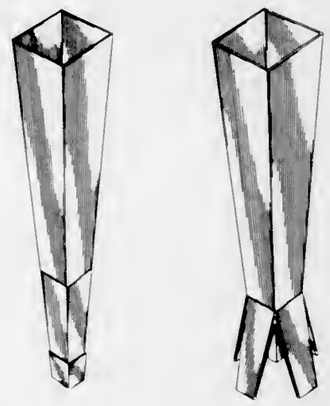
300,519
BRACELET OR THE LIKE
Donald L. Crane, 2500 Light Rd., Apt. 107, Oswego, Ill. 60543
Filed Apr. 24, 1986, Ser. No. 857,611
Term of patent 14 years
U.S. Cl. D11—4



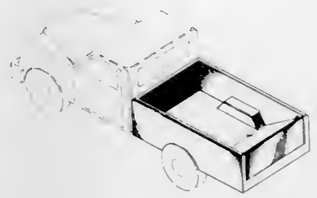
300,520
PENDANT
Martha P. Baird, 2923 Country Place Ct., Carrollton, Tex. 75006
Filed Feb. 28, 1986, Ser. No. 838,009
Term of patent 14 years
U.S. Cl. D11—79



300,521
FLOWER HOLDER
Randall R. Toltzmaa, 4704 E. Paradise Village Pkwy. North, #249, Phoenix, Ariz. 85032
Filed Mar. 10, 1987, Ser. No. 24,332
Term of patent 14 years
U.S. Cl. D11—155



300,522
TRUCK BED
George H. Wegner, 2316 33rd St., Santa Monica, Calif. 90405
Filed Apr. 23, 1986, Ser. No. 857,451
Term of patent 14 years
U.S. Cl. D12—98



300,523
MOTORCYCLE
Mamoru Ito, and Fujio Nakamura, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 4, 1986, Ser. No. 927,413
Claims priority, application Japan, May 19, 1986, 61-18794
Term of patent 14 years
U.S. Cl. D12—110



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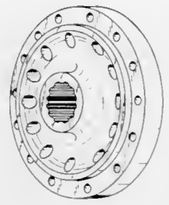
300,524
AUTOMOBILE TRUNK LINER
David P. Reynolds, Charlotte; John D. Shepard, Marion, and Samuel L. Stone, Jr., Old Fort, all of N.C., assignors to Collins & Aikman Corporation, New York,, N.Y.
Filed Oct. 28, 1986, Ser. No. 924,497
Term of patent 14 years
U.S. Cl. D12—155



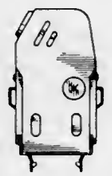
300,525
BALANCE PANEL FOR AN AUTOMOBILE
Hideto Kikuchi, Hachioji, and Hideyuki Sakurado, Hino, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 28, 1986, Ser. No. 889,854
Term of patent 14 years
U.S. Cl. D12—181



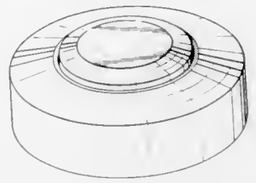
300,526
WHEEL CENTER FOR A RACE CAR WHEEL OR THE LIKE
James D. Gilliam, Rte. 1, Box 187, Meeker, Okla. 74855
Filed Aug. 17, 1967, Ser. No. 85,782
Term of patent 14 years
U.S. Cl. D12—210



300,527
HOUSING FOR AN ELECTRICAL CONNECTOR PLUG
Shigeru Kikuta, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Apr. 16, 1986, Ser. No. 852,922
Claims priority, application Japan, Dec. 17, 1985, 60-52418; Dec. 17, 1985, 60-52420
Term of patent 14 years
U.S. Cl. D13—24



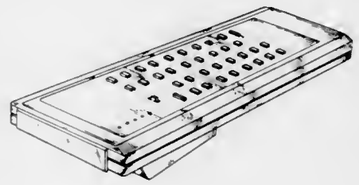
300,528
PUSH BUTTON BELL CHIME
John H. Drane, London, England, assignor to Bridisco Limited, London, England
Filed Mar. 30, 1988, Ser. No. 175,372
Claims priority, application United Kingdom, Nov. 10, 1987, 1046214
Term of patent 14 years
U.S. Cl. D13—38



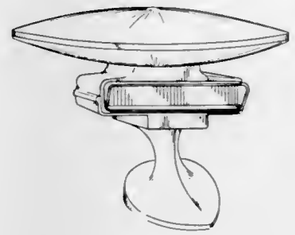
300,529
RADIO RECEIVER
Masaharu Kobayashi, Omiya, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 14, 1986, Ser. No. 818,672
Claims priority, application Japan, Jul. 24, 1985, 60-31716
Term of patent 14 years
U.S. Cl. D14—198



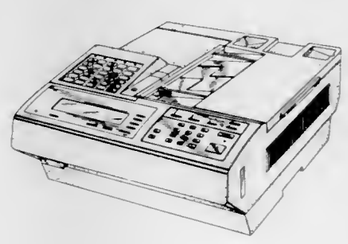
300,530
REMOTE CONTROL DEVICE
Alexander N. Stagnitta, Chesapeake, Va., assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Jan. 7, 1986, Ser. No. 816,764
Term of patent 14 years
U.S. Cl. D14—218



300,531
AUTOMOBILE TELEVISION ANTENNA
Kelly Higgins, 28970 Crags Dr., Agoura, Calif. 91301
Filed Mar. 20, 1986, Ser. No. 845,395
Term of patent 14 years
U.S. Cl. D14—230



300,532
FACSIMILE TRANSCEIVER/RECEIVER
Manzo Yoshihama, Kanagawa, Japan, assignor to Ricoh Company, Tokyo, Japan
Filed Jan. 10, 1986, Ser. No. 817,886
Claims priority, application Japan, Jul. 10, 1985, 60-029594
Term of patent 14 years
U.S. Cl. D14—118



300,533
COMBINED COMPUTER DISPLAY TERMINAL AND TELEPHONE
Takao Oura; Hideki Okada, and Masayoshi Hosaka, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 24, 1986, Ser. No. 888,991
Term of patent 14 years
U.S. Cl. D14—101

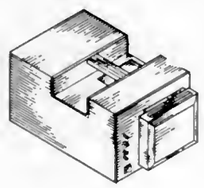


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300,534
DIGITAL DISPLAY SPELLING DICTIONARY
Ngoc M. Luong, West Chester, Pa., assignor to Franklin Computer Corporation, Mt. Holly, N.J.
Filed Nov. 19, 1986, Ser. No. 932,904
Term of patent 14 years
U.S. Cl. D14—100



300,535
VIDEO FILM RECORDER
Arthur J. Sable, and Jeffrey T. Samson, both of Boulder, Colo., assignors to Sable Instruments, Inc., Boulder, Colo.
Filed Jan. 27, 1986, Ser. No. 822,788
Term of patent 14 years
U.S. Cl. D16—221



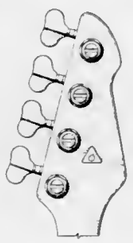
300,536
GOGGLES
Sam B. Williams, Walled Lake, Mich., assignor to Williams International, Walled Lake, Mich.
Filed Feb. 13, 1986, Ser. No. 834,011
Term of patent 14 years
U.S. Cl. D16—107



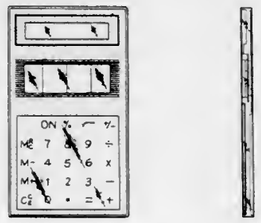
300,537
GUITAR HEAD
Michael V. Powers, and Hartley D. Peavey, both of Meridian, Miss., assignors to Peavey Electronics Corporation, Meridian, Miss.
Filed Jan. 13, 1986, Ser. No. 818,357
Term of patent 14 years
U.S. Cl. D17—20



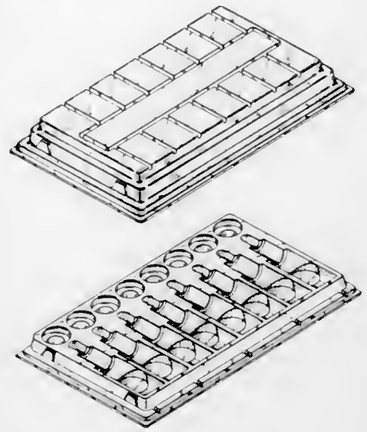
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GUITAR HEAD
Michael V. Powers, and Hartley D. Peavey, both of Meridian, Miss., assignors to Peavey Electronics Corporation, Meridian, Miss.
Filed Jan. 13, 1986, Ser. No. 818,494
Term of patent 14 years
U.S. Cl. D17—20



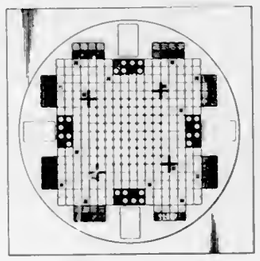
300,539
CALCULATOR
Robert Wong, Kowloon, Hong Kong, assignor to Joseph Leeb Enterprises, Upper Saddle River, N.J.
Filed Aug. 7, 1987, Ser. No. 83,414
Term of patent 14 years
U.S. Cl. D18—7



300,540
ART SUPPLY PACKAGE
Lawrence R. Salis, Broward County, Fla., assignor to Salis International, Inc., Hollywood, Fla.
Filed Jan. 6, 1986, Ser. No. 816,232
Term of patent 14 years
U.S. Cl. D19—35



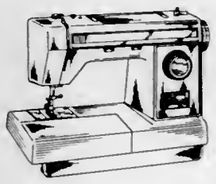
300,541
GAME BOARD
Bohumil Sypal, 48 Highview Crescent, Toronto, Ontario, Canada
Filed Apr. 18, 1986, Ser. No. 855,779
Term of patent 14 years
U.S. Cl. D21—24



300,542
STACKING TOY
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, England, assignors to Hestair Kiddicraft Limited, Bristol, England
Filed Apr. 22, 1986, Ser. No. 857,430
Claims priority, application United Kingdom, Nov. 4, 1985, 1030231
Term of patent 14 years
U.S. Cl. D21—59



300,543
SEWING MACHINE
Yoshihide Yoneda, Osaka, Japan, assignor to Marazen Sewing Machine Co., Ltd., Osaka, Japan
Division of Ser. No. 625,533, Jun. 28, 1984. This application Jan. 21, 1987, Ser. No. 6,092
Claims priority, application Japan, Mar. 23, 1984, 59-11393; Apr. 6, 1984, 59-13787
Term of patent 14 years
U.S. Cl. D15—70



300,544
PAPER FOLDING TOY DONKEY
Hwei M. Lee, Kuang Fu St., Lane 2, No. 5 2F, Yong Ho City, Taipei, Hsien, and Kuo C. Yu, Chung Ho St., Lane 502, Alley 13, No. 4, Peitou, Taipei, both of Taiwan
Filed May 9, 1986, Ser. No. 862,405
Term of patent 14 years
U.S. Cl. D21—148



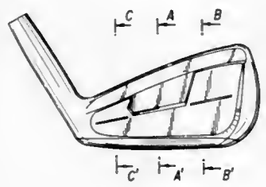
300,545
PAPER FOLDING TOY TIGER
Kuo C. Yn, Chung Ho St., Lane 502, Alley 13, No. 4, Peitou, Taipei, Taiwan
Filed May 9, 1986, Ser. No. 862,406
Term of patent 14 years
U.S. Cl. D21—163



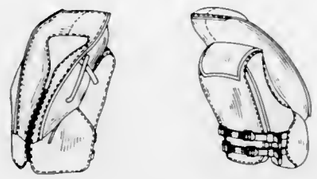
300,546
GOLF CLUB HEAD
David Boone, 4633 Wingate St., Oceanside, Calif. 92054
Filed Jun. 21, 1985, Ser. No. 747,812
Term of patent 14 years
U.S. Cl. D21—220



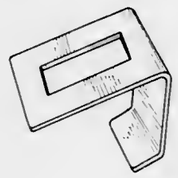
300,547
GOLF CLUB HEAD
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1986, Ser. No. 836,469
Claims priority, application Japan, Aug. 23, 1985, 60-35697
Term of patent 14 years
U.S. Cl. D21—220



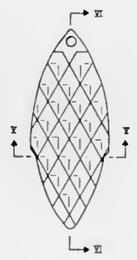
300,548
INFLATABLE FLOTATION JACKET
Ralph E. Steger, Baxley, Ga., assignor to Ero Industries, Inc., Chicago, Ill.
Filed Jul. 28, 1986, Ser. No. 891,367
Term of patent 14 years
U.S. Cl. D21—238



300,549
LOADING TOOL FOR PISTOL BULLET CLIPS
Weston W. Crow, 4001 Alta Dena La., San Jose, Calif. 95127
Filed Apr. 21, 1986, Ser. No. 856,146
Term of patent 14 years
U.S. Cl. D22—108



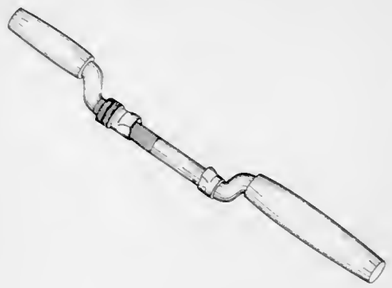
300,550
FISHING LURE BLADE
Charles E. Spence, Germantown, Tenn., assignor to Strike King Lure Company, Inc., Collierville, Tenn.
Filed Jul. 30, 1987, Ser. No. 79,783
Term of patent 14 years
U.S. Cl. D22—129



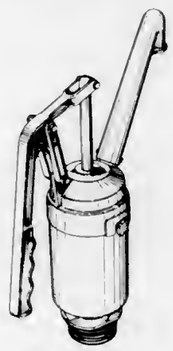
300,551
HANDLE FOR A FISHING ROD
James E. Andraesen, Magnolia Springs, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Filed Feb. 20, 1986, Ser. No. 834,475
Term of patent 14 years
U.S. Cl. D22—142



300,552
HANDLE FOR A FISHING ROD
Charles C. Worth, Kentfield, Calif., assignor to Charles C. Worth Corporation, Kentfield, Calif.
Filed Jan. 12, 1987, Ser. No. 3,018
Term of patent 14 years
U.S. Cl. D22—142

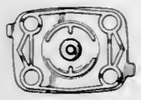


300,553
DRUM PUMP
Karl Willis, Appleton, England, assignor to Bowser Pumps Limited, Warrington, England
Filed Nov. 10, 1986, Ser. No. 929,201
Claims priority, application United Kingdom, Oct. 14, 1986, 1037358
Term of patent 14 years
U.S. Cl. D23—231

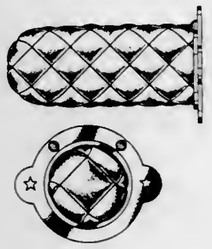


300,554
DIAPHRAGM FROM A DIAPHRAGM VALVE
Yoshihiro Kiyota, and Hideaki Hatanaka, both of Saitama, Japan, assignors to Sekusui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed May 28, 1985, Ser. No. 737,851
Claims priority, application Japan, Nov. 26, 1984, 59-48537; Nov. 26, 1984, 59-48538
Term of patent 14 years
U.S. Cl. D23—249

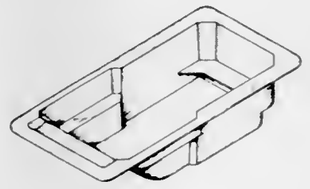




300,555
WATER HYDRANT INSULATED COVER
Daniel J. Patterson, 130 Jacksonian Dr., Hermitage, Tenn. 37076
Filed Jul. 24, 1986, Ser. No. 889,071
Term of patent 14 years
U.S. Cl. D23—249

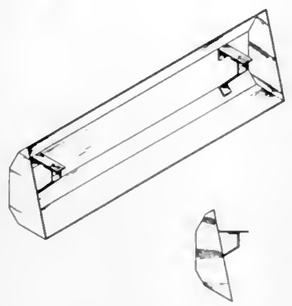


300,556
BATHTUB
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Dec. 1, 1986, Ser. No. 936,660
Claims priority, application Int'l Pat. Institute, May 29, 1986, DM/006976
Term of patent 14 years
U.S. Cl. D23—281

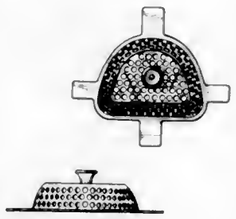


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300,557
SMOKE DIRECTOR FOR A CONVEYOR OVEN
Russell L. Breidinger, Rochester, Ind., assignor to LDI Mfg. Co., Inc., Logansport, Ind.
Filed Nov. 5, 1986, Ser. No. 927,420
Term of patent 14 years
U.S. Cl. D23—387



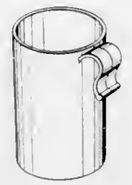
300,558
COMBINED STRAINER AND SHIELD FOR USE WITH A DENTAL FLASK
Casper P. Warnekros, 1410 Clearview Rd., Santa Barbara, Calif. 93101
Filed Oct. 8, 1986, Ser. No. 916,539
Term of patent 14 years
U.S. Cl. D24—16



300,559
BREATH ANALYZER FOR TESTING BLOOD ALCOHOL LEVELS
Hugh Butler, Constantia, South Africa, assignor to Red Line Products (PTY) Limited, Constantia, South Africa
Filed Jul. 16, 1986, Ser. No. 886,219
Claims priority, application South Africa, Feb. 3, 1986, 86/0075
Term of patent 14 years
U.S. Cl. D24—17



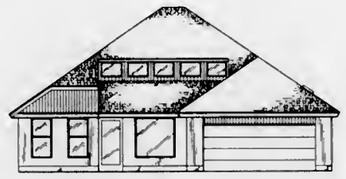
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BABY BOTTLE HOLDER OR THE LIKE
Ralph Losito, 23681 Mariner #49, Laguna Niguel, Calif. 92677
Filed Mar. 25, 1985, Ser. No. 715,923
Term of patent 14 years
U.S. Cl. D24—48



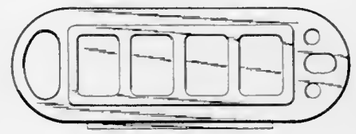
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FLUID DISPENSER TIP
Maurice Asa, 11 Crest Rd., Piedmont, Calif. 94611, and David Asa, 2001 Broadway #404, San Francisco, Calif. 94115
Filed Dec. 4, 1985, Ser. No. 804,524
Term of patent 14 years
U.S. Cl. D24—55



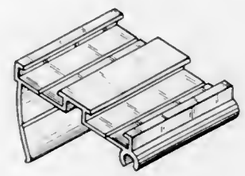
300,562
HOUSE STRUCTURE
Ronald J. Wilson, Oklahoma City, Okla., assignor to Edgar B. Wilson, Inc., Oklahoma City, Okla.
Filed May 6, 1986, Ser. No. 860,320
Term of patent 14 years
U.S. Cl. D25—17



300,563
LADDER MOUNTABLE CONTAINER
Robert H. Burkhart, Sr., 1380 N. Dunkenfield Ave., Crystal River, Fla. 32629
Filed Jul. 7, 1986, Ser. No. 882,616
Term of patent 14 years
U.S. Cl. D25—68



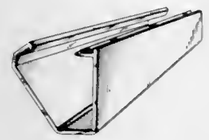
300,564
SHAPED BAR FOR WINDOW FRAMES
Maurice Meshulam, Kiryat Motzkin, Israel, assignor to Klil Industries Ltd., Israel
Filed Jan. 7, 1987, Ser. No. 1,099
Claims priority, application Israel, Jul. 24, 1986, 11817
Term of patent 14 years
U.S. Cl. D25—119



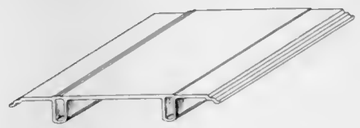
300,565
SHAPED BAR FOR WINDOW FRAMES
Maurice Meshulam, Kiryat Motzkin, Israel, assignor to Klil Industries Ltd., Israel
Filed Jan. 7, 1987, Ser. No. 1,098
Claims priority, application Israel, Jul. 24, 1986, 11816
Term of patent 14 years
U.S. Cl. D25—119



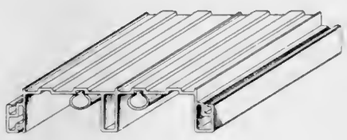
300,566
WALL TRACK EXTRUSION
Harvey C. Fein, New York, N.Y., assignor to DFB Sales, Inc., Long Island City, N.Y.
Filed Jul. 10, 1986, Ser. No. 884,133
Term of patent 14 years
U.S. Cl. D25—124



300,567
WINDOW FRAME EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to P. H. Tech Inc., Levis, Canada
Filed Mar. 18, 1987, Ser. No. 27,696
Claims priority, application United Kingdom, Sep. 18, 1986, 1,036,790
Term of patent 14 years
U.S. Cl. D25—124



300,568
WINDOW FRAME EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to P. H. Tech Inc., Levis, Canada
Filed Mar. 18, 1987, Ser. No. 27,697
Claims priority, application United Kingdom, Sep. 18, 1986, 1036791
Term of patent 14 years
U.S. Cl. D25—124

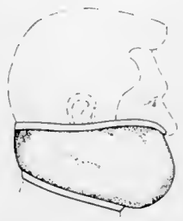


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300,569
COMBINED FLUORESCENT LANTERN AND TORCH
Chi H. Kung, and Wai M. Lau, both of New Territories, Hong Kong, assignors to Brinkmann International (Hong Kong) Limited, Kowloon, Hong Kong
Filed Aug. 13, 1986, Ser. No. 895,945
Term of patent 14 years
U.S. Cl. D26—42

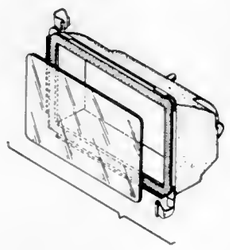


300,571
PRE-SHAVING WRAP
George E. Waters, Jr., R. R. 2, Westfield, Ind. 46074
Filed Mar. 8, 1985, Ser. No. 709,815
Term of patent 14 years
U.S. Cl. D28—44

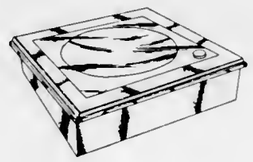




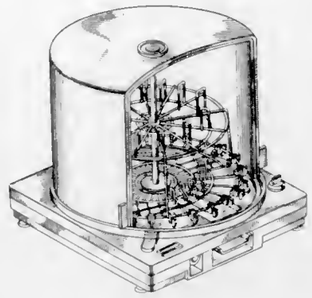
300,570
FLOODLIGHT
Giovanni DeCandia, Germantown, Tenn., assignor to FL Industries, Inc., Livingston, N.J.
Filed Mar. 14, 1986, Ser. No. 845,022
Term of patent 14 years
U.S. Cl. D26—63



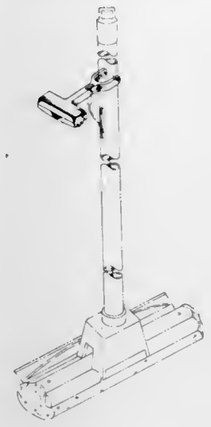
300,572
COMBINED AQUARIUM AND TABLE
Luis Del Rosario, 4524 Brazil St., Los Angeles, Calif. 90039
Filed Jul. 20, 1987, Ser. No. 75,325
Term of patent 14 years
U.S. Cl. D30—104



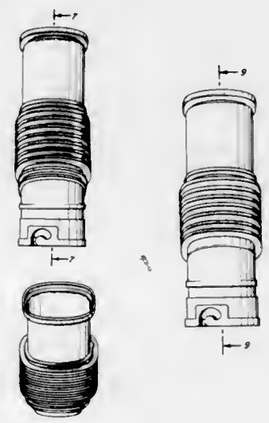
300,573
DISHWASHER
Joseph Faggard, Laguna Hills, Calif., and Brian Hawker, Kent, England, assignors to AC Industries, Ltd, Lake Forest, Calif.
Filed Sep. 23, 1985, Ser. No. 778,876
Term of patent 14 years
U.S. Cl. D32—2



300,575
OPERATING LEVER FOR A WRINGER MOP
William J. O'Neil, Jr., Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Filed Mar. 6, 1986, Ser. No. 842,017
Term of patent 14 years
U.S. Cl. D32—44



300,574
VACUUM CLEANER HOSE COUPLING
Maurice Smith, P.O. Box 526, Camino, Calif. 95709
Filed Apr. 30, 1986, Ser. No. 858,286
Term of patent 14 years
U.S. Cl. D32—31



300,576
HANDLE FOR A STEAM IRON
Giovanni Cartabbia, Via Fusline, 36, 25036 Palazzolo Sull'oglio (Brescia), Italy
Filed Sep. 15, 1986, Ser. No. 908,144
Claims priority, application Italy, Mar. 21, 1986, 21319/86[U]
Term of patent 14 years
U.S. Cl. D32—72

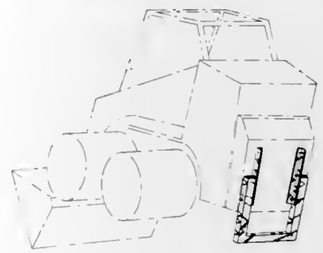


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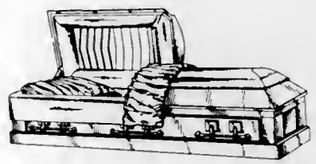
300,577
MOTORIZED GOLF BAG CART
Timothy T. Pope, Spartanburg; Edmund H. Machen, and Edgar B. Montague, both of Charlotte, N.C., assignors to Kangaroo Golf Ltd., d/b/a, Kangaroo Products Company, Columbus, N.C.
Filed Aug. 31, 1987, Ser. No. 91,429
Term of patent 14 years
U.S. Cl. D34—15



300,578
JACK
Richard T. Plummer, Atlanta, Ga., assignor to Thunder Point Company, Atlanta, Ga.
Filed Aug. 13, 1986, Ser. No. 896,004
Term of patent 14 years
U.S. Cl. D34—31



300,579
BURIAL CASKET
Michael L. Beardsley, 93 Woodgate Rd., Chittenango, N.Y. 13037
Filed Oct. 15, 1987, Ser. No. 109,844
Term of patent 14 years
U.S. Cl. D99—7



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PATENTS WERE ISSUED ON THE 4TH DAY OF APRIL, 1989

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ABC Extrusion Company: *See—*
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Abe, Hideaki, to NEC Corporation. Electrophotographic recording apparatus for forming a multicolor image. 4,819,028, Cl. 355-4.000.

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Adams, David R. Combination suitcase-garment bag. 4,817,791, Cl. 206-287.100.

Adams, Richard P.; Holland, Richard J.; and Bodak-Cumming, Patricia A., to Colgate-Palmolive Co. Fabric softening detersive article. 4,818,422, Cl. 252-8.800.

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Billoud, Alain; Lorin, Victor; and Vanney, Alain, 4,817,806, Cl. 215-12.100.
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Ohta, Morio; and Inoue, Hideaki, 4,819,186, Cl. 364-519.000.
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Cassese, Antoine. Device for assembling, by clipping, moldings incorporating several rabbets. 4,817,965, Cl. 227-3.000.
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Taylor, William M.; and Cassity, Thomas G., 4,817,716, Cl. 166-277.000.
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Delucia, R. Ralph; Wolf, Daniel J.; and Casteel, Eric P., 4,819,233, Cl. 371-19.000.
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Coutant, Alan R., 4,817,770, Cl. 192-3.580.
Oertley, Thomas E., 4,818,041, Cl. 305-56.000.
Purcell, Robert J.; Simmons, Gerald P.; and Farris, Robert R., 4,817,746, Cl. 180-9.100.
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Burkholder, Gary F., 4,818,171, Cl. 414-497.000.
Caudill, Charles R. Tobacco leaf cleaning device. 4,817,639, Cl. 131-325.000.
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Sallee, Hebert; and Quenard, Daniel, 4,817,436, Cl. 73-708.000.
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Tinner, Friedrich, 4,817,915, Cl. 251-199.000.
Cetronio, Antonio; Moretti, Sergio; and Di Bona, Maurizio, to Selenia Industrie Elettroniche Associate S.P.A. Photolithographic method of aligning a structure on the back of a substrate. 4,818,724, Cl. 437-203.000.
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Chenest, Gerard, to Unisys Corporation. Endless ink ribbon cassette. 4,817,844, Cl. 226-118.000.
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Cherian, Gabe. Anti-glare visor system. 4,818,011, Cl. 296-97.200.
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Mathison, Allen D.; and Nelson, Dale K., 4,817,671, Cl. 138-89.000.
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Cherry Semiconductor Corporation: *See—*
Gontowski, Walter S., Jr., 4,819,122, Cl. 361-93.000.
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Cheval, Benoit: *See—*
Pfeiffer, Pierre; Cheval, Benoit; and Sigwalt, Paul, 4,817,811, Cl. 220-85.0SP.
Chevalkova, Inna E., administrator: *See—*
Milov, Vladimir N.; Loginov, Anatoly A.; Ostrenko, Nikolai S., deceased; Gorsky, Viktor I.; Demyanovich, Nikolai A.; Davletkhanov, Rifkhat B.; Klimets, Sergei N.; Dokshin, Gennady P.; Telyatnikov, Jury A.; Yarkin, Vladislav I.; Ostrenko, Ekaterina A., administrator; Chevalkova, Inna E., administrator; and Stebakova, Alla E., administrator, 4,817,700, Cl. 164-259.000.
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Nguyen, Tanh V.; Davenport, C. Brent; Stevens, Christopher E.; Reis, John C.; and Millhone, Ralph S., 4,817,713, Cl. 166-252.000.
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Saito, Shinichi; Inukai, Takashi; Inoue, Hiromichi; Miyazawa, Kazutoshi; and Ohno, Kouji, 4,818,429, Cl. 252-299.610.
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Chou, Song-Tien, to ASD, Inc. Asbestos decomposition. 4,818,143, Cl. 405-128.000.
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Christensen, Mary Jane. Retractable vehicle cover and apparatus therefor. 4,817,654, Cl. 135-90.000.
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Braig, Adalbert, 4,818,777, Cl. 524-83.000.
Moser, Peter, 4,818,815, Cl. 534-607.000.
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Weith, Andrr J.; and Narbel, Philippe M., 4,818,765, Cl. 514-440.000.

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Jachowicz, Janusz; and Wong, Michael, 4,818,245, Cl. 8-188.000.

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CliniCom Incorporated: *See—*
Gombrich, Peter P.; and Seeland, Donna L., 4,818,850, Cl. 235-494.000.

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Colella, James A. Disposable cover for telephone. 4,819,265, Cl. 379-452.000.

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Clarke, Jane; Patel, Amrit; and Robbins, Clarence R., 4,818,523, Cl. 424-70.000.

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Kidera, Kenji: *See—*
Takeda, Takashi; Omori, Katsumi; Ohkuma, Toshiyuki; Kidera, Kenji; Nakagawa, Shigeru; and Hirose, Tetsuzo, 4,818,148, Cl. 405-234.000.

Kiel, Bernd: *See—*
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Kikuchi, Atsushi: *See—*
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Kikuchi, Hidehiko: *See—*
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Kikuchi, Katsuya; and Kato, Haruo, to Kabushiki Kaisha Toshiba. Color image processing system. 4,819,077, Cl. 358-98.000.

Kikuchi, Kiyoshi; and Mori, Akio, to Kabushiki Kaisha Toshiba. Computer system with multiwindow presentation manager. 4,819,189, Cl. 364-521.000.

Kim, Han J.: *See—*
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Kimberly-Clark Corporation: *See—*
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DaPonte, Diego H.; Fox, Norman K.; and Funk, Robert A., 4,818,597, Cl. 428-284.000.
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Kimura, Asa: *See—*
Fukui, Hiroshi; Namba, Ryujiro; Saito, Tsutomu; Ohtsu, Yutaka; Kimura, Asa; Nakano, Motokiyo; Nakata, Okitsugu; Tomita, Kenichi; Tokubo, Kazuo; Ohno, Kazuhisa; Yoneyama, Toshio; Ogawa, Takashi; Moroboshi, Hideo; Koyama, Junichi; Kanda, Taketoshi; Kawaguchi, Kunihiro; and Shimizu, Yuzo, 4,818,614, Cl. 428-403.000.

Kimura, Fumio, to Computer Services Corporation. Binary encoding method for data read from optical record and device therefor. 4,819,222, Cl. 369-124.000.

Kimura, Kaoru: *See—*
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Kimura, Katsuhiko: *See—*
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Kimura, Kiyoshi, to Alps Electric Co., Ltd. Coordinate input apparatus including a detection circuit to determine proper stylus position. 4,818,826, Cl. 178-19.000.

Kimura, Kiyoshi, to Alps Electric Co., Ltd. High precision coordinate input device using sequentially driven conductors in an input plane and stored correction values. 4,818,851, Cl. 235-472.000.

Kimura, Motohiko, to Kabushiki Kaisha Toshiba. Expandable and contractible arms. 4,818,175, Cl. 414-730.000.

Kimura, Shigenobu, to Yamaha Corporation. Digital-to-analog converting circuit. 4,818,996, Cl. 341-144.000.

Kimura, Toshihiko: *See—*
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King, Donald W.: *See—*
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King-Seeley Thermos Co.: *See—*
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King, Stephen H.: *See—*
Breen, Thomas J.; and King, Stephen H., 4,817,310, Cl. 40-299.000.

King, Stephen P.; and Hughes, Christopher I., to Westland plc. Method and apparatus for reducing vibration of a helicopter fuselage. 4,819,182, Cl. 364-508.000.

Kingsley, Richard J., to Saturn Corporation. Vehicular rain skirts. 4,817,976, Cl. 280-154.000.

Kinlen, Patrick J.; and Heider, John E., to Monsanto Company. Solid state indicator electrode and method of making same. 4,818,365, Cl. 204-433.000.

Kinoshita, Hiroshi: *See—*
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Kinoshita, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Pinion stopper for engine starter motor. 4,818,889, Cl. 290-48.000.

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Kamata, Yoshikiyo; and Fukuoka, Takashi, 4,817,923, Cl. 267-63.00A.

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Kirk, Frank A.: *See—*
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Kitamura, Yutaka; and Aso, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Vehicle mounted A.C. generator. 4,818,906, Cl. 310-58.000.

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Kohnen, Klaus; Niermann, Hans; and Ullrich, Norbert, to Krupps Koppers GmbH. Device for gasifying finely divided fuels under increased pressure. 4,818,253, Cl. 48-67.000.

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Imaide, Takuya; Nishimura, Ryuji; and Noda, Masaru, 4,819,075, Cl. 358-213.180.

Nishimura, Shinichi, to Nissan Motor Co., Ltd. Seat belt anchor-equipped seat slide device. 4,818,022, Cl. 297-473.000.

Nishimura, Shinichi: *See*—
Munakata, Kiyohiko; and Nishimura, Shinichi, 4,817,904, Cl. 248-429.000.

Nishimura, Yukinobu: *See*—
Yamada, Toshihiro; Takebayashi, Hiroyuki; Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,817,573, Cl. 123-494.000.

Nishimura, Yukuo: *See*—
Haruta, Masahiro; Matsuda, Hiroshi; Munakata, Hirohide; and Nishimura, Yukuo, 4,818,665, Cl. 430-494.000.

Nishiwaki, Kokichi, to Kabushikikaisha Toshonishiwaki. Process for the waterproof working with the use of deposition layer including mesh reinforcing bar. 4,818,573, Cl. 427-403.000.

Nishizaki, Hirozumi: *See*—
Taguchi, Norikazu; Nishizaki, Hirozumi; Masui, Hisashi; and Ishizuka, toshiyasu, 4,818,911, Cl. 310-259.000.

Nishizawa, Jun-ichi. Semiconductor device having a pn junction. 4,819,058, Cl. 357-17.000.

Nissan Motor Co., Limited: *See*—
Morita, Tatsuo, 4,819,171, Cl. 364-431.080.
Munakata, Kiyohiko; and Nishimura, Shinichi, 4,817,904, Cl. 248-429.000.
Murakami, Koichi, 4,819,044, Cl. 357-23.400.
Murakami, Koichi, 4,819,045, Cl. 357-23.400.
Murata, Kazuo; Togo, Shigeru; and Furuta, Masamichi, 4,817,748, Cl. 180-79.100.
Nakaniwa, Shinpei; Hoshino, Yukio; Tomisawa, Naoki; Otani, Seiichi; Ariga, Tadashi; and Furuhashi, Shouji, 4,817,572, Cl. 123-492.000.
Nishimura, Shinichi, 4,818,022, Cl. 297-473.000.
Saitoh, Hiroshi; Noso, Kazunori; Kurami, Kunihiko; and Kishi, Norimasa, 4,819,169, Cl. 364-424.020.

Nisshin Steel Co., Ltd.: *See*—
Deguchi, Takenori; Suzuki, Masaru; Watanabe, Sanae; and Uchida, Kazuko, 4,818,568, Cl. 427-226.000.

Nitta, Kiyosi: *See*—
Yamakawa, Masahiro; Arai, Toyoichi; and Nitta, Kiyosi, 4,818,781, Cl. 524-407.000.

Nitta, Sigeyuki: *See*—
Takahashi, Michiaki; Yoshida, Mitsuo; Miyazawa, Kazuyoshi; Nitta, Sigeyuki; Fujisawa, Junichi; Obara, Nobuji; Hayashibe, Shoji; and Sawada, Yoshikazu, 4,818,935, Cl. 213-232.000.

Nittetsu Jitsugyo Co., Ltd.: *See*—
Hamada, Takatoshi; and Huang, Wen-Ho, 4,817,737, Cl. 173-115.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Ikeda, Kenichi; Yamamoto, Shouichi; and Ito, Hiroki, 4,818,387, Cl. 210-490.000.

Nixdorf Computer AG: *See*—
Brockmann, Werner, 4,818,902, Cl. 307-465.000.

Nobue, Mamoru: *See*—
Ito, Hisao; Nobue, Mamoru; Nishihara, Yoshio; and Suzuki, Teiichi, 4,819,082, Cl. 358-294.000.

Noda, Masaru: *See*—
Imaide, Takuya; Nishimura, Ryuji; and Noda, Masaru, 4,819,075, Cl. 358-213.180.

Noguchi, Matsusaburo: *See*—
Tadokoro, Joji; and Noguchi, Matsusaburo, 4,819,078, Cl. 358-256.000.

Nohara, Shigezo: *See*—
Hirata, Shunsaku; Nohara, Shigezo; and Hirata, Sadao, 4,818,575, Cl. 428-36.700.

Nohr, Franz J.: *See*—
Leifeld, Ferdinand; and Nohr, Franz J., 4,817,247, Cl. 19-105.000.

Nolan, Gaillard R.: *See*—
Herms, James K.; Nolan, Gaillard R.; McGrath, Jonathan; and Tolkoff, Mark J, 4,817,600, Cl. 128-303.00R.

Nolan, James M., Jr.: *See*—
Stiffler, Jack J.; Budwey, Michael J.; and Nolan, James M., Jr., 4,819,154, Cl. 364-200.000.

Noll, Erwin: *See*—
Braehler, Manfred; Rousek, Heinz; and Noll, Erwin, 4,817,903, Cl. 248-419.000.

Noll, Tobias; and Ulbrich, Walter, to Siemens Aktiengesellschaft. Saturable carry-save adder. 4,819,198, Cl. 364-787.000.

Nolte, Gerhard: *See*—
Preisler, Eberhard; Holzem, Johannes; Mietens, Gerhard; and Nolte, Gerhard, 4,818,354, Cl. 204-96.000.

Nonami, Takayuki: *See*—
Furuno, Kenichi; Tooko, Yoshio; and Nonami, Takayuki, 4,819,174, Cl. 364-444.000.

Nopper, Leroy N.; and Miller, Meryl E., to Duralith Corporation. Integrally molded composites of silicone rubber. 4,818,829, Cl. 200-512.000.

Norddeutsche Affinerie Aktiengesellschaft: *See*—
Langner, Bernd; May, Artur; and Wilde, Rene-Holger, 4,818,280, Cl. 75-0.50A.

North American Philips Consumer Electronics Company: *See*—
Magocs, Stephen, 4,818,073, Cl. 350-337.000.

Northern Telecom Limited: *See*—
Scheithauer, Eric A., 4,817,270, Cl. 29-622.000.

Northrop Corporation: *See*—
Rickborn, Steven F.; and Rogers, Donald Z., 4,818,607, Cl. 428-323.000.
Tully, John W., 4,818,712, Cl. 437-26.000.

Nose, Hiroyasu, to Canon Kabushiki Kaisha. Objective lens driving device. 4,818,066, Cl. 350-247.000.

Noso, Kazunori: *See*—
Saitoh, Hiroshi; Noso, Kazunori; Kurami, Kunihiko; and Kishi, Norimasa, 4,819,169, Cl. 364-424.020.

Noumi, Yoshihiro: *See*—
Katoh, Hideo; Hamano, Hisashi; Hasegawa, Kinji; and Noumi, Yoshihiro, 4,818,581, Cl. 428-143.000.

Nova Technologies, Inc: *See*—
Fisher, Patrick W.; and Hagen, James P., Jr., 4,818,170, Cl. 414-401.000.

Novacorp International Consulting Ltd.: *See*—
Yip, David; and Gibb, Peter R., 4,817,992, Cl. 285-18.000.

Novo Industri A/S: *See*—
Eigtved, Peter, 4,818,695, Cl. 435-134.000.

Nowotnik, David P.; and Canning, Lewis R., to Amersham International plc. Complexes of Technetium 99m with propylene amine oximes. 4,818,813, Cl. 534-14.000.

Nozaki, Tsutomu: *See*—
Itoyama, Seiji; Nakato, Hakaru; Nozaki, Tsutomu; Habu, Yasuhiro; Bessho, Nagayasu; and Fujii, Tetsuya, 4,817,702, Cl. 164-432.000.

Nukii, Takashi: *See*—
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Numata, Norio: *See*—
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Nunberg, Jack H.; Doyle, Michael; Newell, Arthur; and White, Thomas, to Cetus Corporation. Method of controlling stress-related disease in livestock by administration of human IL-2. 4,818,769, Cl. 514-2.000.

N.V. Bekaert S.A.: *See*—
Bourgois, Luc, 4,818,631, Cl. 428-605.000.

Nyman, Bror G.; and Hummelstedt, Leif Erik I., to Outokumpu Oy. Extraction process for removing and recovering metals from aqueous solutions. 4,818,503, Cl. 423-10.000.

Nyquist, Richard A.: *See*—
Naegeli, Andrew H.; Grau, Juan; and Nyquist, Richard A., 4,818,931, Cl. 324-77.00B.

O & J Design: *See*—
Olejniczak, Andrzej J., 4,817,285, Cl. 30-47.000.

O. Key Printed Wiring Co., Ltd.: *See*—
Ozaki, Risuke, 4,817,280, Cl. 29-846.000.

Obara, Haruki; Aso, Toshiyuki; Kinoshita, Hiroshi; and Ishibashi, Tamotsu, to Fanuc Limited. Automatic wire connecting apparatus for wire cut electric discharge machine. 4,818,848, Cl. 219-69.120.

Obara, Nobuji: *See*—
Takahashi, Michiaki; Yoshida, Mitsuo; Miyazawa, Kazuyoshi; Nitta, Sigeyuki; Fujisawa, Junichi; Obara, Nobuji; Hayashibe, Shoji; and Sawada, Yoshikazu, 4,818,935, Cl. 213-232.000.

Obara, Takashi: *See*—
Sato, Susumu; Kurosawa, Mitsumasa; Suzuki, Hideo; Obara, Takashi; and Tsunoyama, Kozo, 4,818,299, Cl. 148-2.000.

Oberg, Gary R. Damped magnetic head suspension assembly. 4,819,094, Cl. 360-104.000.

O'Brien, Edward M.; and Otto, Donald R., to Ametek, Inc. Aircraft fuel loading management system. 4,819,183, Cl. 364-509.000.

Occidental Chemical Corporation: *See*—
Kem, Kenneth M., 4,818,774, Cl. 521-31.000.

O'Connell, Michael P.: *See*—
Appelbaum, Edward R.; McLoughlin, Thomas J.; and O'Connell, Michael P., 4,818,696, Cl. 435-172.300.

Ocvirk, Norbert; Weise, Lutz; Becker, Horst-Peter; and Determann, Otto, to Alfred Teves GmbH. Vehicular brake system with electronic anti-lock control and traction slip control. 4,818,038, Cl. 303-119.000.

Ocwieja, Thomas V., to Amco Tool and Stamping Co., Inc. Durable trowel construction. 4,817,231, Cl. 15-235.400.

Oda, Shunri: *See*—
Ishihara, Shunichi; Ohno, Shigeru; Kanai, Masahiro; Oda, Shunri; and Shimizu, Isamu, 4,818,563, Cl. 427-55.000.

Odani, Yusuke; Akechi, Kiyoaki; and Kuroishi, Nobuhito, to Sumitomo Electric Industries, Inc. Aluminum alloy and method for producing the same. 4,818,308, Cl. 148-437.000.

Odenheimer, Ronald P., to Tektronix, Inc. Concurrent memory access system. 4,818,932, Cl. 324-121.00R.

Odom, Douglas M.: *See*—
Ipcinski, Ralph G.; and Odom, Douglas M., 4,818,827, Cl. 200-5.00A.

O'Donnell & Associates, Inc.: *See*—
Porowski, Jan S.; Badlani, Manu L.; Hampton, Edward J.; and O'Donnell, William J., 4,817,441, Cl. 73-863.120.

O'Donnell, William J.: *See*—
Porowski, Jan S.; Badlani, Manu L.; Hampton, Edward J.; and O'Donnell, William J., 4,817,441, Cl. 73-863.120.

Oertley, Thomas E., to Caterpillar Inc. Idler wheel assembly for track-type vehicle. 4,818,041, Cl. 305-56.000.

Oestreicher, Feodor: *See*—
Heppke, Gerd; and Oestreicher, Feodor, 4,818,076, Cl. 350-346.000.

Ogata, Toshikazu: *See*—
Ono, Nobuyuki; and Ogata, Toshikazu, 4,817,708, Cl. 165-54.000.

Ogawa, Kazutoshi: *See*—
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Ogawa, Noboru: *See*—
Sugiura, Akira; Sawanishi, Shigeru; and Ogawa, Noboru, 4,818,458, Cl. 264-182.000.

Ogawa, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide emulsions comprising grains with (100) surfaces having conjugated (110) surface crystals thereon and method for the preparation thereof. 4,818,674, Cl. 430-567.000.

Ogawa, Takashi: *See*—
Fukui, Hiroshi; Namba, Ryujiro; Saito, Tsutomu; Ohtsu, Yutaka; Kimura, Asa; Nakano, Motokiyo; Nakata, Okitsugu; Tomita, Kenichi; Tokubo, Kazuo; Ohno, Kazuhisa; Yoneyama, Toshio; Ogawa, Takashi; Morohoshi, Hideo; Koyama, Junichi; Kanda, Taketoshi; Kawaguchi, Kunihiro; and Shimizu, Yuzo, 4,818,614, Cl. 428-403.000.

Ogio International, Inc.: *See*—
Pratt, Michael J., 4,817,802, Cl. 206-579.000.

Ogirima, Masahiko: *See*—
Nakazato, Kazuo; Nakamura, Tohru; Miyazaki, Takao; Natsuaki, Nobuyoshi; Ogirima, Masahiko; and Nagata, Minoru, 4,819,055, Cl. 357-59.000.

Ogishima, Tetsuo: *See*—
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Oguchi, Tatsuki: *See*—
Matsuura, Junichi; Oguchi, Tatsuki; and Okada, Munehisa, 4,818,255, Cl. 55-16.000.

Ohachi, Tadashi: *See*—
Fujiki, Yoshinori; Watanabe, Mamoru; Sasaki, Takayoshi; Onoda, Yoshito; Ohachi, Tadashi; and Mitsuhashi, Takefumi, 4,818,735, Cl. 501-134.000.

Ohara, Osamu: *See*—
Shimizu, Shin; Tanaka, Tsugane; Ohara, Osamu; and Inoue, Taisei, 4,818,321, Cl. 156-254.000.

Ohba, Masahiro: *See*—
Takeuchi, Hitoshi; Tsujii, Masao; and Ohba, Masahiro, 4,819,172, Cl. 364-431.070.

Ohba, Tetsuya: *See*—
Yatsuzuka, Takashi; Ohba, Tetsuya; Tanabe, Kouji; Kojima, Tatsuo; Kobayashi, Tatsunobu; and Katou, Kouki, 4,817,410, Cl. 72-199.000.

Ohbayashi, Keiji; Okumura, Mitsuhiro, Kojima, Takaaki; and Tanaka, Shigeo, to Konishiroku Photo Industry Co., Ltd. Rapidly processable silver halide color photosensitive material. 4,818,671, Cl. 430-550.000.

Ohe, Junzo; and Kondo, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Automobile antenna system. 4,819,001, Cl. 345-712.000.

Ohi Seisakusho Co., Ltd.: *See*—
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Ohishi, Akio: *See*—
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Ohkuma, Toshiyuki: *See*—
Takeda, Takashi; Omori, Katsumi; Ohkuma, Toshiyuki; Kidera, Kenji; Nakagawa, Shigeru; and Hirose, Tetsuzo, 4,818,148, Cl. 405-234.000.

Ohloff, Gunther: *See*—
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Ohta, Toshihiko; Fuse, Kazuyoshi; Ohmi, Kunio; Sato, Toshiaki; and Shinozaki, Masayuki, 4,818,853, Cl. 235-492.000.

Ohno, Kazuhisa: *See*—
Fukui, Hiroshi; Namba, Ryujiro; Saito, Tsutomu; Ohtsu, Yutaka; Kimura, Asa; Nakano, Motokiyo; Nakata, Okitsugu; Tomita, Kenichi; Tokubo, Kazuo; Ohno, Kazuhisa; Yoneyama, Toshio; Ogawa, Takashi; Morohoshi, Hideo; Koyama, Junichi; Kanda, Taketoshi; Kawaguchi, Kunihiro; and Shimizu, Yuzo, 4,818,614, Cl. 428-403.000.

Ohno, Kouji: *See*—
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Saito, Shinichi; Inukai, Takashi; Inoue, Hiromichi; Miyazawa, Kazutoshi; and Ohno, Kouji, 4,818,429, Cl. 252-299.610.
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Miyasaka, Nobuaki; Ikeda, Hideo; Sakai, Minoru; Ohno, Shigeru; and Mukunoki, Yasuo, 4,818,675, Cl. 430-567.000.
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Ohno, Tadayoshi: *See*—
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Ohno, Yoshimi: *See*—
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Ohshima, Tadao: *See*—
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Ohshita, Yoshihiro: *See*—
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Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Katayama, Hiroyuki; Hirokane, Junji; and Murakami, Yoshiteru, to Sharp Kabushiki Kaisha. Optical memory element. 4,818,648, Cl. 430-17.000.

Ohta, Minoru: *See*—
Sakakibara, Nobuyoshi; Katada, Mitutaka; Ohta, Minoru; Hattori, Tadashi; and Tominaga, Takayuki, 4,819,037, Cl. 357-4.000.

Ohta, Morio; and Inoue, Hideaki, to Casio Computer Co., Ltd.; and Casio Electronics Manufacturing Co., Ltd. Waveform generating apparatus for driving liquid crystal device. 4,819,186, Cl. 364-519.000.

Ohta, Tadashi: *See*—
Konno, Chisato; Umetani, Yukio; Hirayama, Hiroyuki; and Ohta, Tadashi, 4,819,161, Cl. 364-300.000.

Ohta, Toshihiko; Fuse, Kazuyoshi; Ohmi, Kunio; Sato, Toshiaki; and Shinozaki, Masayuki, to Kabushiki Kaisha Toshiba. Data card with inductive signal transfer device. 4,818,853, Cl. 235-492.000.

Ohta, Wasaburo: *See*—
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Ohta, Yukio: *See*—
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Ohtani, Shigeki; and Suzuoki, Kazuhiro, to Ciba-Geigy Corp.; and Asahi Kasei Kogyo Kabushiki Kaisha. Single tow prepreg. 4,818,613, Cl. 428-396.000.

Ohtsu, Yutaka: *See*—
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Ohuchi, Kiyomi: *See*—
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Ohwada, Junichi; and Kondo, Katsumi, to Hitachi, Ltd. Ferroelectric liquid crystal device and method of driving the same. 4,818,077, Cl. 350-350.00S.

Oishi, Yoshihisa: *See*—
Koizumi, Hisao; and Oishi, Yoshihisa, 4,818,845, Cl. 219-314.000.

Oji Seitai Kaisha, Ltd.: *See*—
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Okabe, Mitsuo; Tomita, Hirohito; and Kubo, Shoichi, to Dai Nippon Insatsu Kabushiki Kaisha. Packaging materials. 4,818,588, Cl. 428-201.000.

Okada, Hiroo: *See*—
Miyazaki, Tasuhiro; Okada, Hiroo; Tsurukawa, Toshio; and Kobayashi, Shohei, 4,819,220, Cl. 369-45.000.

Okada, Kazuo; and Nakayama, Yoshiaki, to Fuji Photo Film Co., Ltd. Rotary magnetic recording-reproducing apparatus with disc track checking. 4,819,093, Cl. 360-78.060.

Okada, Masahiro: *See*—
Takahashi, Toshiro; Kuwabara, Ken-ichi; Kameoka, Kimitaka; and Okada, Masahiro, 4,818,659, Cl. 430-264.000.

Okada, Munehisa: *See*—
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Okada, Sadao; Yamamoto, Tetsu; and Yumura, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Slidable carriage mount for disc memory apparatus. 4,819,109, Cl. 360-106.000.

Okamoto, Akio: *See*—
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Okamoto, Atsutoshi: *See*—
Matsushima, Takeshi; Okamoto, Atsutoshi; Takai, Hiromitsu; Ohshima, Tadao; Yamashita, Mutsushi; and Yamamoto, Hiroshi, 4,818,856, Cl. 235-472.000.

Okamoto, Atutoshi: *See*—
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Okamoto, Ichiro: *See*—
Okamoto, Yoshio; Hatada, Koichi; Shibata, Tohru; Okamoto, Ichiro; and Nakamura, Hiroyuki, 4,818,394, Cl. 210-198.200.

Okamoto, Katsuo: *See*—
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Okamoto, Kiyokazu: *See*—
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Okamoto, Masayoshi: *See*—
Naito, Katsuyuki; Okamoto, Masayoshi; Mizushima, Koichi; Nakayama, Toshio; Sugiuchi, Masami; and Miura, Akira, 4,819,057, Cl. 357-17.000.

Okamoto, Yoshio; Hatada, Koichi; Shibata, Tohru; Okamoto, Ichiro; and Nakamura, Hiroyuki, to Daicel Chemical Industries, Ltd. Separating agent. 4,818,394, Cl. 210-198.200.

Okamura, Hiroshi, to Kabushiki Kaisha Toshiba. Apparatus for reproducing data from magnetic recording medium. 4,819,103, Cl. 360-51.000.

Okamura, Morihito: *See*—
Tsutsumi, Hiroshi; Okamura, Morihito; and Matsunaga, Osamu, 4,818,496, Cl. 422-172.000.

Okamura, Nobuyuki: *See*—
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Okaya, Takuji: *See*—
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Sato, Toshiaki; Yuki, Ken; Yamauchi, Junnosuke; and Okaya, Takuji, 4,818,788, Cl. 525-62.000.

Okazaki, Hiroshi; Matsuyama, Fumio; and Watabe, Seiji, to Sumitomo Electric Industries, Ltd. Aluminum material coated with fluorine resin. 4,818,618, Cl. 428-421.000.

Okey, David W.: *See*—
Scanlon, John F.; Bolgert, Thomas A.; Okey, David W.; and Sherman, William D., 4,817,853, Cl. 228-121.000.

Oki Electric Industry Co., Ltd.: *See*—
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Oki, Ken-ichi; Kawai, Satoru; Yanai, Ken-ichi; and Takahara, Kazuhiro, to Fujitsu Limited. Active matrix display device and method for driving the same. 4,818,981, Cl. 340-784.000.

Oko, Uriel M.: *See*—
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Aoyama, Kazuo; Murata, Yukitaka; Hattori, Kiyoshi; Okamoto, Akio; Takahashi, Kiyoshi; Sasaki, Takashi; and Hanari, Shigeko, 4,817,707, Cl. 165-46.000.

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O'Leary, Raymond P., 4,819,120, Cl. 361-58.000.

S Smith & Son Pty Ltd.: *See—*
Whitford, Darryl R., 4,818,546, Cl. 426-231.000.

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Nilsson, Nils H., 4,817,766, Cl. 188-281.000.

Sabot, Jean-Louis: *See—*
Delloye, Thierry; and Sabot, Jean-Louis, 4,818,504, Cl. 423-157.000.

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Hirai, Kenji; Futikami, Takamasa; Murata, Atsuko; Hirose, Hiroaki; Yokota, Masahiro; and Nagato, Shoin, 4,818,272, Cl. 71-88.000.

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Kawaji, Mikinori; Takakura, Toshihiko; Uchida, Akihisa; Kuroda, Shigeo; Tamaki, Yoichi; Shiba, Takeo; Sagara, Kazuhiko; and Kawamura, Masao, 4,819,054, Cl. 357-49.000.

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Bravet, Jean-Louis; and de Toytot, Francois, 4,818,622, Cl. 428-425.600.

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Wonnacott, Roger J., 4,817,866, Cl. 206-427.000.

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Shirai, Shigeru; Saito, Keishi; Arai, Takayoshi; Kato, Minoru; and Fujioka, Yasushi, 4,818,655, Cl. 430-60.000.

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Asano, Isao; Saito, Shoichiro; Kaneko, Tooru; Kowaguchi, Toru; Mitsuishi, Tetsuya; and Yoshida, Hiroshi, 4,819,095, Cl. 360-77.040.

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Mose, Tadao; Hirata, Akio; Saito, Suzuo; and Kikuchi, Hidehiko, 4,818,890, Cl. 290-52.000.

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Itoh, Michio; Saito, Tadashi; Okamura, Nobuyuki; Yamamoto, Hisao; Iseda, Yutaka; and Takagi, Hirohiko, 4,818,601, Cl. 428-297.000.

Saito, Tatsuya: *See—*
Iwata, Tetsuya; and Saito, Tatsuya, 4,819,112, Cl. 360-126.000.

Saito, Tsutomu: *See—*
Fukui, Hiroshi; Namba, Ryujiro; Saito, Tsutomu; Ohisu, Yutaka; Kimura, Asa; Nakano, Motokiyo; Nakata, Okitsugu; Tomita, Kenichi; Tokubo, Kazuo; Ohno, Kazuhisa; Yoneyama, Toshio; Ogawa, Takashi; Morohoshi, Hideo; Koyama, Junichi; Kanda, Taketoshi; Kawaguchi, Kunihiro; and Shimizu, Yuzo, 4,818,614, Cl. 428-403.000.

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Fukuda, Hiroyuki; Shigeta, Masatomo; Ohuchi, Kiyomi; Kaji, Hisatsugu; Saitoh, Kuniyuki; and Funabashi, Masayuki, 4,818,640, Cl. 429-38.000.

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Asami, Ken; Sakai, Kazunori; Hori, Shinichi; Nakashima, Noriyuki; Okuda, Yutaka; and Tamura, Kimio, 4,817,418, Cl. 73-118.100.

Sakai, Minoru: *See—*
Miyasaka, Nobuaki; Ikeda, Hideo; Sakai, Minoru; Ohno, Shigeru; and Mukunoki, Yasuo, 4,818,675, Cl. 430-567.000.

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Asano, Hiroaki; Nakamura, Keiichi; Yamamoto, Masaji; Tanooka, Shigeo; and Sakai, Toshifumi, 4,817,751, Cl. 180-233.000.

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Hara, Masahiro; Okamoto, Atutoshi; Sakai, Toshiyasu; Oshima, Tadao; Yamamoto, Hiroshi; and Takai, Hiromitsu, 4,818,847, Cl. 235-455.000.

Sakai, Toshiyuki, to Brother Kogyo Kabushiki Kaisha. Electronic typewriter with word correction function including pitch changing means. 4,818,125, Cl. 400-63.000.

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Tanuma, Jiro; Hayashi, Kuniharu; Katakura, Shinichi; and Sakaino, Hiroshi, 4,818,129, Cl. 400-323.000.

Sakakibara, Nobuyoshi; Katada, Mitutaka; Ohta, Minoru; Hattori, Tadashi; and Tominaga, Takayuki, to Nippon Soken, Inc. Semiconductor device. 4,819,037, Cl. 357-4.000.

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Murakami, Haruhiko; Takeda, Hirofumi; and Sakamoto, Hiroshi, 4,818,791, Cl. 525-124.000.

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Kochi, Tadashi; and Sakamoto, Naotaka, 4,819,133, Cl. 362-61.000.

Sakanishi, Shoichi: *See—*
Ono, Toyoichi; Ono, Yoshihisa; Ichimura, Yasuhiko; and Sakanishi, Shoichi, 4,818,107, Cl. 356-375.000.

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Katada, Katsuo; and Sakata, Yoshiyuki, 4,817,521, Cl. 100-240.000.

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Sakurai, Hideya: *See—*
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Sakurai, Kazuo: *See—*
Tamura, Takahiro; and Sakurai, Kazuo, 4,818,198, Cl. 418-55.000.

Salatin, Timothy D.: *See—*
Martin, Glenn E.; Salatin, Timothy D.; and Cook, Vincent C., 4,818,792, Cl. 525-286.000.

Salazar, Ramon A.: *See—*
Lape, Larry J.; and Salazar, Ramon A., 4,817,273, Cl. 29-741.000.

Salem Furnace Co.: *See—*
Docherty, James P.; and Johnson, Beverly E., 4,818,222, Cl. 432-138.000.
Erfort, Thomas J., Jr., 4,817,920, Cl. 266-252.000.

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Mueller, Denis A.; and Saletta, Gary F., 4,819,118, Cl. 361-25.000.

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Konzal, Daryl; and Salnajs, Gunars, 4,817,366, Cl. 53-451.000.

Salomon, Mark: *See—*
Plichta, Edward J.; and Salomon, Mark, 4,818,647, Cl. 429-218.000.

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Desbiolles, Jack; and Feche, Pierre, 4,817,981, Cl. 280-633.000.

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Sampson, Thomas D.: *See—*
Zoghby, David R.; Hines, Leon F.; and Sampson, Thomas D., 4,817,673, Cl. 138-174.000.

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Hargarten, James W.; and Samson, Allan L., 4,817,448, Cl. 73-861.380.

Samsung Electronics Co., Ltd.: *See—*
Bark, Kwan, 4,819,084, Cl. 358-296.000.
Dongil, Song; Chul-Jin, Kim; and Byung-Jin, Kim, 4,819,062, Cl. 358-31.000.

Sanchez, Domingo: *See—*
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Sanchez, George: *See—*
Dimitriu, Paul; Boyajian, John; Fils, Isaac; and Sanchez, George, 4,817,218, Cl. 4-515.000.

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Case, Christopher; Loferski, Joseph J.; and Sanchez-Quesada, Francisco, 4,818,357, Cl. 204-192.250.

Sanderson, John E., to Schering Corporation. Transdermal delivery of enantiomers of phenylpropanolamine. 4,818,541, Cl. 424-448.000.

Sandstrom, Richard: *See—*
Holleman, Timothy W.; Sandstrom, Richard; Rugland, Roger; and Williams, Terrell M., 4,817,634, Cl. 128-784.000.

Sandvik AB: *See—*
Andersson, Lars; Stenlund, Berndt; and Wiberg, Rolf, 4,818,497, Cl. 422-179.000.

Sanik, Paul S.; Shreve, Dennis H.; and Varrasso, Eugene C., to Owens-Corning Fiberglas Corporation. Distributed control system. 4,819,149, Cl. 364-132.000.

Sanitation Equipment Limited: *See—*
Stewart, John M., 4,817,215, Cl. 4-236.000.

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Ishikawa, Toshimitsu; and Tamura, Katsuhide, 4,817,367, Cl. 53-454.000.

Sano, Shinichi: *See—*
Takeuchi, Yasuhito; Higashiizumi, Takao; Akasaka, Hideya; Jibiki, Takao; and Sano, Shinichi, 4,817,617, Cl. 128-660.050.

Sano, Takao, to Toray Industries, Inc. Suction device for yarn-threading. 4,817,843, Cl. 226-97.000.

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Kawamura, Minoru; and Inoue, Seiji, 4,817,466, Cl. 74-858.000.

Santrade Ltd.: *See—*
Ekstrom, Thommy C.; and Ingelstrom, Nils A., 4,818,635, Cl. 428-698.000.
Strandell, Ingemar H.; and Svensson, Ingemar S. L., 4,818,153, Cl. 407-113.000.

Sanville, Frank E. Fluid flow control valves. 4,817,666, Cl. 137-596.170.

Saotome, Shigeru: *See—*
Matsuda, Terumi; Aagano, Toshitaka; Miyahara, Junji; Nakajima, Nobuyoshi; and Saotome, Shigeru, 4,818,880, Cl. 250-327.200.

Saraydar, Michael. Self-aligning sulky. 4,817,975, Cl. 280-63.000.

Sarnoff, Norton; and Fletcher, Carl R., to Ensa Corporation. Holding frame for an oven pan. 4,817,812, Cl. 220-85.00H.

Sasabe, Masazumi: *See—*
Shioji, Shobu; Sasabe, Masazumi; Dairoku, Yorimichi; and Fujiwara, Teruaki, 4,818,783, Cl. 524-425.000.

Sasaki, Ikuo: *See—*
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Sasaki, Takashi: *See—*
Aoyama, Kazuo; Murata, Yukitaka; Hattori, Kiyoshi; Okamoto, Akio; Takahashi, Kiyoshi; Sasaki, Takashi; and Hanari, Shigeko, 4,817,707, Cl. 165-46.000.

Sasaki, Takayoshi: *See—*
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Sato, Akira: *See—*
Arai, Tohru; Fujita, Hironori; Sugimoto, Yoshihiko; Ohta, Yukio; Moriyama, Shigeo; and Sato, Akira, 4,818,351, Cl. 204-39.000.

Sato, Heikichi: *See—*
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Sato, Hideki, to Kabushiki Kaisha Toshiba. Stereo X-ray fluorography apparatus. 4,819,255, Cl. 378-42.000.

Sato, Hideki: *See—*
Koizumi, Haruyuki; Sato, Hideki; Hashizume, Shinichi; and Omae, Koichi, 4,819,194, Cl. 364-556.000.

Sato, Isao: *See—*
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Sato, Koji: *See—*
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Sato, Masahiko: *See—*
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Sato, Mitsuo: *See—*
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Sato, Nobukatsu; Kuriyama, Haruo; and Agoh, Masanobu, to Maruishi Seiyaku Kabushiki Kaisha. 2-(4-pyridylaminomethyl)-benzimidazole derivatives having antiviral activity. 4,818,761, Cl. 514-341.000.
Sato, Susumu; Kurosawa, Mitsumasa; Suzuki, Hideo; Obara, Takashi; and Tsunoyama, Kozo, to Kawasaki Steel Corporation. Method of manufacturing cold-rolled steel sheets. 4,818,299, Cl. 148-2.000.
Sato, Takeshi, to Kabushiki Kaisha Toshiba. Ultrasonic imaging apparatus. 4,817,433, Cl. 73-620.000.
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, to Kuraray Co., Ltd. Process for producing polyvinyl ester having a high degree of polymerization and process for producing polyvinyl alcohol having a high degree of polymerization. 4,818,787, Cl. 525-62.000.
Sato, Toshiaki; Yuki, Ken; Yamauchi, Junnosuke; and Okaya, Takuji, to Kuraray Co., Ltd. Process for producing polyvinyl ester having a high degree of polymerization and process for producing polyvinyl alcohol having a high degree of polymerization. 4,818,788, Cl. 525-62.000.
Sato, Toshiaki: *See—*
Ohta, Toshihiko; Fuse, Kazuyoshi; Ohmi, Kunio; Sato, Toshiaki; and Shinozaki, Masayuki, 4,818,853, Cl. 235-492.000.
Sato, Toyomi: *See—*
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Sato, Yasuhiro: *See—*
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Satoh, Hiroshi; and Yahagi, Tadao, to TDK Corporation. Composite part and method of manufacturing same. 4,818,960, Cl. 333-185.000.
Satten, Michael I.: *See—*
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Sattin, William; and Gatchalian, Eric E., to Picker International, Inc. Audio coded imaging. 4,818,938, Cl. 324-309.000.
Saturn Corporation: *See—*
Kingsley, Richard J., 4,817,976, Cl. 280-154.000.
Saubolle, Malcolm C. Low cost appliance for continuously monitoring levels of ionizing radiation in premises for human occupation. 4,818,884, Cl. 250-388.000.
Saunders, Alex M., to Becton Dickinson and Company. Blood partitioning method. 4,818,418, Cl. 210-782.000.
Saunders, John H. Control system with memory for electric guitars. 4,817,486, Cl. 84-1.150.
Saurwein, Albert C. Check valve assembly for fluid pressure intensifying apparatus. 4,818,194, Cl. 417-567.000.
Sawada, Daisaku: *See—*
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Sawada, Yoshikazu: *See—*
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Sawanishi, Shigeru: *See—*
Sugiura, Akira; Sawanishi, Shigeru; and Ogawa, Noboru, 4,818,458, Cl. 264-182.000.
Sawchuk, David L. M.; and Olsen, Ronald H., to Polysar Limited. Biological degradation of chemicals bearing an oxydibenzene nucleus. 4,818,406, Cl. 210-611.000.
Scampini, Daniel. Fluid exchange pump. 4,818,187, Cl. 417-137.000.
Scampoli, Mario: *See—*
Riti, Gionfranco; and Scampoli, Mario, 4,817,256, Cl. 29-33.00L.
Scanlon, Barry F. Vehicular airfoils. 4,818,015, Cl. 296-180.100.
Scanlon, John F.; Bolgert, Thomas A.; Okey, David W.; and Sherman, William D., to Sundstrand Corporation. Composite, method of forming a composite, and article of manufacture. 4,817,853, Cl. 228-121.000.
Scapillato, James E.: *See—*
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Schachter, Rozalie: *See—*
Michel, Christian G.; Schachter, Rozalie; Kuck, Mark A.; Baumann, John A.; and Raccah, Paul M., 4,818,636, Cl. 428-704.000.
Schaefer, Ronald E. Low impedance fan safety guard. 4,818,183, Cl. 416-247.00R.
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Schaffner, Hans Peter: *See—*
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Schatz, Oskar. Method for the supply of combustion air to the combustion chamber of an internal combustion engine. 4,817,386, Cl. 60-605.100.
Scheithauer, Eric A., to Northern Telecom Limited. Method of manufacturing a heat coil assembly for a protector unit. 4,817,270, Cl. 29-622.000.
Schellenberger, Friedrich: *See—*
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Schenstrom, Sture. Sitting bathtub. 4,817,219, Cl. 4-555.000.
Schering AG: *See—*
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Gold, Elijah H.; Neustadt, Bernard R.; and Smith, Elizabeth M., 4,818,749, Cl. 514-19.000.
Sanderson, John E., 4,818,541, Cl. 424-448.000.
Scheuble, Bernhard; Weber, Georg; and Krause, Joachim, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystal phase. 4,818,428, Cl. 252-299.100.
Schibinger, Joseph S.: *See—*
Jennings, Andrew T.; Schibinger, Joseph S.; and Kalemba, Ronald J., 4,819,150, Cl. 364-200.000.
Schillings, Helmut: *See—*
Baesgen, Harald; Schillings, Helmut; and Berg, Ernst, 4,817,400, Cl. 66-195.000.
Schindl, Klaus; and Moser, Karl, to Reichert-Jung Optische Werke A.G. Microscope having an easily removable lamp structure. 4,818,085, Cl. 350-528.000.
Schintgen, Jean-Marie; and Zeitoun, Bruno. Control cable for a biopsy forceps. 4,817,630, Cl. 128-751.000.
Schippers, Jacob. Process and apparatus for automatically positioning an explosive charge above the surface of snow. 4,817,529, Cl. 102-302.000.
Schlafer, Ludwig, to Hoechst Aktiengesellschaft. Water-soluble disazo compounds containing the 1-amino-8-hydroxy-3,6-disulfo-naphthalene moiety as a bivalent coupling component and an aniline or naphthylamine compound having a fiber-reactive group, and a 2-sulfo-5-acylamino-aniline. 4,818,814, Cl. 534-642.000.
Schlak, Ottfried: *See—*
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Schlake, Bernard H., to Neyra Industries, Inc. Double-acting diaphragm pump system. 4,818,191, Cl. 417-390.000.
Schlawne, Friedhelm, to Mannesmann AG. Defect detection in cylindrical objects. 4,817,431, Cl. 73-600.000.
Schlegel Corporation: *See—*
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Schleich, Gunther: *See—*
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Schlowsky, George: *See—*
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Schlumberger Technology Corporation: *See—*
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Schmalz, Robert E., Jr.; Luedtke, Kenneth R.; and Owens, Timothy E., to Graymills Corporation. Parts washer device. 4,817,649, Cl. 134-58.00R.
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Campisi, Carl; Kaliszek, Andrew; Klein, Elmer M.; Schmid, Richard G.; and Bradfish, Thomas J., 4,817,272, Cl. 29-741.000.
Schmid, Steven L.; Hining, Larry D.; and O'Toole, Frank K., to Deere & Company. Implement structure for facilitating easy mounting to and disconnection from a lawn and garden tractor. 4,817,728, Cl. 172-273.000.
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Schmidt, Karl H.: *See—*
Roscher, Gunter; Schmidt, Karl H.; Hey, Hansjorg; Langner, Horst; and Andereya, Erwin, 4,818,347, Cl. 203-42.000.
Schmidt, Norman B.: *See—*
DeBold, Terry A.; Magee, John H., Jr.; and Schmidt, Norman B., 4,818,484, Cl. 420-46.000.
Schmitt, Paul W.; and Gardner, Charles W., Jr., to Mine Safety Appliances Company. Device for monitoring hydrocarbons in groundwater. 4,818,976, Cl. 340-605.000.
Schmitz, Peter J.: *See—*
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Schmoock, Helmuth. Packaging comprising substrate, metallic layer and antifriction film. 4,818,609, Cl. 428-336.000.
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Busenhart, Peter; Oswald, Heinz; and Schneeberger, Ruedi, 4,817,896, Cl. 242-18.0PW.
Schneider, Gerd; Boost, Franz-Wilhelm; and Leimbach, Frank, to Pierburg GmbH. Method and apparatus for analyzing the composition of the exhaust gas of any internal combustion engine. 4,818,705, Cl. 436-164.000.

Schneider, Uwe: *See—*
Kicherer, Robert; Schreder, Felix; Reif, Stefan; and Schneider, Uwe, 4,818,846, Cl. 219-458.000.
Schnepp-Pesch, Wolfram; Lindenberg, Josef; and Kohler, Dieter. Method for removing tissue from a body. 4,817,631, Cl. 128-753.000.
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Rippingale, John B., 4,818,944, Cl. 324-326.000.
Schopf, Hans-J; Kizler, Wolfgang; Dahm, Wolfram; and Thom, Rudolf, to Daimler-Benz Aktiengesellschaft. Rotary body subjected to centrifugal forces. 4,817,454, Cl. 74-572.000.
Schosser, John F., to Duracell Inc. Battery pack. 4,818,928, Cl. 320-2.000.
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Schram, Richard R., deceased; and Schram, Gary R., executor, 4,818,169, Cl. 414-331.000.
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Schregardus, Ralph B.: *See—*
DeLange, Daniel H.; and Schregardus, Ralph B., 4,817,352, Cl. 52-235.000.
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Schrenk, Hartmut, to Siemens Aktiengesellschaft. Release process for an access-controlled user memory and apparatus for carrying out the process. 4,819,202, Cl. 364-900.000.
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Schroeder, Hans G.: *See—*
DeLuca, Patrick P.; Kanke, Motoko; Sato, Toyomi; and Schroeder, Hans G., 4,818,542, Cl. 424-491.000.
Schubert & Salzer: *See—*
Lovas, Kurt, 4,817,380, Cl. 57-263.000.
Schuil, Roelof E., to U.S. Philips Corporation. Protective package for a display tube window. 4,817,793, Cl. 206-328.000.
Schuler, Michael J. Machine tool extension table and method for installing same. 4,817,693, Cl. 144-359.000.
Schuller, Ferdinand: *See—*
Sos, Sigmund; and Schuller, Ferdinand, 4,817,398, Cl. 66-121.000.
Sos, Sigmund; and Schuller, Ferdinand, 4,817,399, Cl. 66-123.000.
Schuller, Wolfgang. Track installation for model railways. 4,817,867, Cl. 238-10.00A.
Schulte-Schlagbaum Aktiengesellschaft: *See—*
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Schultz, Elmer J.; and Wagner, David G., to Moore Business Forms, Inc. Business form sealer/conveyor. 4,818,332, Cl. 156-499.000.
Schulze, Elfriede; and Rudolph, Eberhard. Device for eliminating scale and for preventing the formation of scale. 4,818,395, Cl. 210-222.000.
Schumacher, Larry L. Beam vibration damping system. 4,817,768, Cl. 188-378.000.
Schussler, Mortimer: *See—*
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Schuurman, Teunis: *See—*
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Schwartz, Albert B.: *See—*
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Schweiss, Peter; and Dorflinger, Hans-Dieter, to J.M. Voith GmbH. Defrothing method and apparatus. 4,818,377, Cl. 209-164.000.
Schwerdt, Hans-Werner, to Carl Freudenberg, Firma. Hydraulically damped tubular rubber spring. 4,817,926, Cl. 267-140.100.
Scientific Growth, Inc.: *See—*
Crisp, William E.; Kudlicki, Richard C.; and Smith, Judson L., 4,817,651, Cl. 134-102.000.
Scifres, Donald R.; and Worland, D. Philip, to Spectra Diode Laboratories, Inc. Optical system with bright light output. 4,818,062, Cl. 350-96.290.
Scimat Limited: *See—*
Cook, John A.; and Singleton, Raymond W., 4,818,596, Cl. 428-265.000.
Scobie, William B., to Keystone International, Inc. Method for forming a torus and a piston made therefrom for use in a rotary actuator. 4,817,213, Cl. 29-527.600.
Scott, Carl D.; Nagy, Kornel; Roberts, Barney B.; Ried, Robert C.; Kroll, Kenneth R.; and Gamble, Joe, to United States of America, National Aeronautics and Space Administration. Aerobraking orbital transfer vehicle. 4,817,895, Cl. 244-138.00R.
Scott, Christopher R. Construction systems and elements thereof. 4,817,356, Cl. 52-729.000.
Scott, James W.: *See—*
Yawberg, Richard C.; and Scott, James W., 4,817,365, Cl. 53-438.000.
Scott, John H. Body scrubber. 4,817,227, Cl. 15-21.00R.
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Scripps Clinic and Research Foundation: *See—*
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Thornton, George B.; Moriarty, Ann M.; Milich, David R.; and McLachlan, Alan, 4,818,527, Cl. 424-88.000.
Scully, Keith J.; and Singh, Harinder S., to International Business Machines Corporation. Electronic calendaring method to establish calendar floating triggers for calendared events and processes. 4,819,191, Cl. 364-518.000.
Seaborne, Jonathan, to General Mills, Inc. Amphoteric ceramic microwave heating susceptor. 4,818,831, Cl. 219-10.55E.
Sears, Jerome; Parfomak, Walter; and Kluss, Walter, to Allied-Signal Inc. Optical commutation for permanent magnet motors. 4,818,922, Cl. 318-313.000.
Secondo, Pierre: *See—*
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Sedillo, Michael J., to Winchar Enterprises. Quick change wipe down knife with rotatable blade. 4,817,229, Cl. 15-104.00S.
Seegers, Gunter, to WABCO Westinghouse Fahrzeugbremsen GmbH. Multiple-circuit valve apparatus. 4,817,497, Cl. 21-29.000.
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Seidel, Jurgen: *See—*
Rohde, Wolfgang; and Seidel, Jurgen, 4,817,703, Cl. 164-476.000.
Seidel, Peter-Rudolf; Horstmann, Harald; Traber, Jorg; Dompert, Wolfgang; Glaser, Thomas; and Schuurman, Teunis, to Troponwerke GmbH & Co., KG. 2-pyrimidinyl-1-piperazine derivatives, processes for their preparation and medicaments containing them. 4,818,756, Cl. 514-224.200.
Seifert, Josef, to Kurz Kunststoffe GmbH. Individual container that can be assembled to a multiple storage container. 4,817,792, Cl. 206-309.000.
Seikosha Co., Ltd.: *See—*
Nemoto, Ichiro; Aosaki, Ko; Misawa, Atsushi; and Otora, Takahito, 4,819,017, Cl. 354-288.000.
Seki, Gen; and Hayashi, Seiichi, to Hitachi, Ltd. Apparatus for positioning magnetic head. 4,819,108, Cl. 360-104.000.
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Asakura, Masahiko; Kawanabe, Tomohiko; Muroya, Minoru; Kubota, Shin'ichi; Kimura, Katsuhiko; Seki, Yasunari; and Matsuura, Kouji, 4,818,362, Cl. 204-406.000.
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Seko, Osamu; and Moriya, Masaichi. Door handle device for a door of an automotive vehicle. 4,818,003, Cl. 292-336.300.
Selbiger, Lawrence, to AVIA Group International, Inc. Athletic shoe having a dual side lacing system. 4,817,303, Cl. 36-50.000.
Selenia Industrie Elettroniche Associate S.P.A.: *See—*
Cetronio, Antonio; Moretti, Sergio; and Di Bona, Maurizio, 4,818,724, Cl. 437-203.000.
Seng, Stephen; and Macdonald, Frank J., to Owens-Corning Fiberglas Corporation. Glass melt furnace. 4,819,247, Cl. 373-30.000.
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Sentry Piping Systems, Inc.: *See—*
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Sequoia Systems, Inc.: *See—*
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Serv-Tech, Inc.: *See—*
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Servel, Michel: *See—*
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Seskus, Edward A.: *See—*
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Sessions, Robert W.; and Rodzen, Richard A., to Ferris Manufacturing Company. Rotary snap machine. 4,817,261, Cl. 29-429.000.
Seward, Barry, to Mars G. B. Limited. Beverage packages. 4,818,544, Cl. 426-77.000.
Seyler, Peter G., to Perfection Spring & Stamping Corp. Paint drain closure attaching method. 4,817,262, Cl. 29-458.000.
SGS-Thomson Microelectronics Inc.: *See—*
Turner, Timothy E., 4,818,727, Cl. 437-209.000.
Shafir, Aharon. Method and apparatus for making shoe lasts and/or shoe components. 4,817,222, Cl. 12-146.00L.
Shapiro, Ruth. Fragrance releasing envelope. 4,817,860, Cl. 229-80.000.
Shapland, J. Edward; and Bach, Stanley M., Jr., to Mirowski, Mieczyslaw. Cardioverting transvenous catheter/patch electrode system and method for its use. 4,817,608, Cl. 128-419.00P.
Sharma, Shri C.: *See—*
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Sharp Corporation: *See—*
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Sharp, Edward J.; Shurtz, Richard R., II; Elser, Wolfgang; and Wood, Gary L., to United States of America, Army. Laser Q-switch. 4,819,239, Cl. 372-12.000.
Sharp Kabushiki Kaisha: *See—*
Fukumoto, Shigeaki, 4,818,832, Cl. 219-10.55E.
Isaka, Kinishi; Kawaguchi, Masashi; and Uede, Hisashi, 4,818,913, Cl. 315-169.300.
Itoh, Tetsuya; Iwai, Shougo; and Yoshikawa, Shizuo, 4,817,877, Cl. 241-34.000.
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Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Katayama, Hiroyuki; Hirokane, Junji; and Murakami, Yoshiteru, 4,818,648, Cl. 430-17.000.
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Shaw, Bon F.; and Bond, Gary M., to Fike Corporation. Computerized exercise monitoring system and method for comparing present and past exercise activities. 4,817,940, Cl. 272-93.000.
Shaw, Howard C., Jr. Insertion-removal monitor/control for seal carrier manufacture. 4,817,255, Cl. 29-33.00R.
Shaw, James J.; and Sharma, Shri C., to Warner-Lambert Company. Ingestible aggregate and delivery system prepared therefrom. 4,818,539, Cl. 424-441.000.
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Chatterjee, Ananda M.; and Job, Robert C., 4,818,799, Cl. 526-123.000.
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Geenen, Peter V.; and Bennis, Jan, 4,818,224, Cl. 432-248.000.
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Weichselbaum, Edwin G., 4,818,320, Cl. 156-227.000.
Shiba, Masataka: *See—*
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Shibano, Tomobumi, to Ricoh Company, Ltd. Cleaning device for cleaning toner image carrier. 4,819,030, Cl. 355-15.000.
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Shibata, Koichiro, to Cuisinarts, Inc. Rotatable tool power lock retention apparatus for food processor. 4,817,878, Cl. 241-282.200.
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Shigematsu, Takashi; Watanabe, Tomoyuki; Tokoro, Setsuo; and Sawada, Daisaku, to Toyota Jidosha Kabushiki Kaisha. Automatic transmission for automobile and method of controlling same. 4,817,469, Cl. 74-866.000.
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Shimizu, Hidetoshi; Terada, Shigeru; and Mishio, Yasuhiko, to Toyota Jidosha Kabushiki Kaisha. Driving power control system. 4,819,163, Cl. 364-424.100.
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Shimizu, Shin; Tanaka, Tsugane; Ohara, Osamu; and Inoue, Taisei, to Koyo Sangyo Co., Ltd. Preparation of laminated material. 4,818,321, Cl. 156-254.000.
Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Motor-driven power steering system for automotive vehicles. 4,819,170, Cl. 364-424.050.
Shimizu, Yoshiaki, to Kabushiki Kaisha Toshiba. Capacitive liquid level sensor for automatic chemical analyzer. 4,818,492, Cl. 422-100.000.
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Shimo, Norio; and Numata, Norio, to Sony Corporation. Intermittently driven transmitter. 4,819,272, Cl. 455-127.000.
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Shipley, Dale L.; Arnett, Joan D.; Arnett, William A.; Baumel, Steven D.; Bhavnani, Anil; Chou, Chuenpu J.; Nelson, David L.; Soha, Maty; and Yamada, David H., to Tolerant Systems, Inc. Distributed multiprocess transaction processing system and method. 4,819,159, Cl. 364-200.000.
Shipp, Peter W., Jr., to Kimberly-Clark Corporation. Agricultural protective fabric. 4,818,585, Cl. 428-198.000.
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Steiner, Carl A.; and Jensen, Henry R., to TM Industrial Supply, Inc. Self cleaning strainer. 4,818,402, Cl. 210-411.000.

Steiner, Ferdinand; and Rieth, Thomas E., to Pepperidge Farm, Incorporated. Preservative method and preserved fruit or vegetable product, using citric acid, sodium and calcium chloride-containing preservative composition. 4,818,549, Cl. 426-267.000.

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Steingroever, Erich, to Magnetfabrik Bonn GmbH. Process for the production of elongated articles, especially magnets, from hard powdered materials. 4,818,305, Cl. 148-103.000.

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Stock, Larry A. Method and material for checking drilled printed circuit boards. 4,818,617, Cl. 428-412.000.

Stockel, Gunter, to Siemens Aktiengesellschaft. Electronic control system for controlling several remote devices. 4,818,993, Cl. 340-825.060.

Stoddart, Hugh F.; and Lewis, Gary D., to Somanetics Corporation. Method and apparatus for interpreting optical response data. 4,817,623, Cl. 128-665.000.

Stoka, Roberto, to ITT Industries, Inc. Spot-type disc brake. 4,817,764, Cl. 188-73.440.

Stoltz, Herman, to Automated Pool Cleaners (Pty) Ltd. Swimming pool cleaning device. 4,817,225, Cl. 15-1.700.

Stone, Myron. Flying toy with return-flight flying pattern. 4,817,961, Cl. 273-426.000.

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TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF APRIL, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See—*
Orsic, Milo, Re. 32,900, Cl. 370-54.000.

Dechelette, Helen, to Molex Incorporated. Multigauge insulation displacement connector and contacts therefor. Re. 32,898, Cl. 439-395.000.

Laidman, Jerry H. Low voltage lighting system replaceable bulb assembly. Re. 32,899, Cl. 362-226.000.

Molex Incorporated: *See—*
Dechelette, Helen, Re. 32,898, Cl. 439-395.000.

Nilssen, Ole K. Series-resonant electronic ballast circuit. Re. 32,901, Cl. 315-244.000.

Orsic, Milo, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Fast circuit switching system. Re. 32,900, Cl. 370-54.000.

LIST OF REEXAMINATION PATENTEES

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Argon Medical Corp.: *See—*
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Johnson, Lennart B., to Teradyne, Inc. Electrical connection apparatus. B1 1,029,513, 4-4-89, Cl. 439-485.000.

O'Neill, William J., to Argon Medical Corp. Removable hemostasis valve. B1 4,436,519, 4-4-89, Cl. 604-175.000.

Pioneer Industrial Products Company: *See—*
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Slosser, James D.: *See—*
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Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de la Londe. Carnation named Lontoyo. 6,710, 4-4-89, Cl. 70.000.
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Hacker, Theodore R. Hacker's August Gold apple tree. 6,724, 4-4-89, Cl. 34.000.
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Satterstrom, Joseph W. Plum tree, Viking Pride. 6,712, 4-4-89, Cl. 38.000.
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Betts, Robert E.; and Crawford, John F., to United States of America, Army. Aging gauge. H630, 4-4-89, Cl. 374-106.000.
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Day, Gary A., to A. E. Staley Manufacturing Company. Flavor modification of distilled spirits. H621, 4-4-89, Cl. 426-592.000.
Feinleib, Julius M.; and Schmutz, Lawrence E., to United States of America, Air Force. High speed/low light wavefront sensor system. H615, 4-4-89, Cl. 356-121.000.
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Handlin, Dale L., Jr.; Lutz, Robert G.; and Korcz, William H., to Shell Oil Compay. Polybutylene gel filled cables. H624, 4-4-89, Cl. 428-462.000.
Hartman, Richard L., to United States of America, Army. Method of making a pre-aligned optical correlator. H616, 4-4-89, Cl. 350-162.130.
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Kageyama, Shigeki; Kawasaki, Kazuya; and Katsuyama, Harumi, to Fuji Photo Film Co., Ltd. Analytical element for measuring activity of creatine kinase. H622, 4-4-89, Cl. 435-14.000.
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McDaniel, Earl W.; Sams, Terry L.; and Tallent, Othar K., to United States of America, Energy. Grout formulation for disposal of low-level and hazardous waste streams containing fluoride. H625, 4-4-89, Cl. 252-628.000.
McDaniel, Robert S., Jr.; Vanderburgh, Leonard F.; and Sommer, Stephen J., to A. E. Staley Manufacturing Company. Preparation of alkyl glycosides. H619, 4-4-89, Cl. 536-18.600.
Mclngvale, Pat H., to United States of America, Army. Universal automatic landing system for remote piloted vehicles. H628, 4-4-89, Cl. 342-33.000.
Merkel, Harold S., to United States of America, Air Force. Interpupillary distance measuring device. H618, 4-4-89, Cl. 351-204.000.
Miyazako, Takushi, to Fuji Photo Film Co., Ltd. Integral multilayer analysis element. H623, 4-4-89, Cl. 456-170.000.
Murdoch, Francis J., to United States of America, Army. Non-destructive semiconductor chip bonding and chip removal. H629, 4-4-89, Cl. 357-75.000.
Norman, Robert R., Sr. Method to connect drill holes utilizing signalling devices. H614, 4-4-89, Cl. 299-4.000.
Peace, Duncan P., to Shell Oil Company. Semi-submersible vessel. H611, 4-4-89, Cl. 114-264.000.
Peng, Yueng-Kay M., to United States of America, Energy. Spherical torus fusion reactor. H627, 4-4-89, Cl. 376-142.000.
Sams, Terry L.: *See*—
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Young, Donald C. Conifer growth stimulation and forest management. H620, 4-4-89, Cl. 71-28.000.

CLASSIFICATION OF PATENTS

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732 4,817,357
747 4,817,360

CLASS 53
48 4,817,361
307 4,817,363
374 4,817,364
438 4,817,365
451 4,817,366
454 4,817,367
460 4,817,368
571 4,817,369

CLASS 55
16 4,818,255
93 4,818,256
97 4,818,257
158 4,818,258
227 4,818,259
316 4,818,254
385.4 4,818,260
498 4,818,261

CLASS 56
12.8 4,817,372
41 4,817,370

CLASS 57
100 4,817,371
263 4,817,380
265 4,817,381
281 4,817,373

CLASS 60
39.281 4,817,375
4,817,376
225 4,817,377
261 4,817,378
4,817,379
268 4,817,382
274 4,817,383
4,817,384
288 4,817,385
313 4,817,374
605.1 4,817,386
611 4,817,387
721 4,817,388
739 4,817,389

CLASS 62
6 4,817,390
17 4,817,391
18 4,817,392
22 4,817,393
4,817,394
4,818,262
175 4,817,395
306 4,817,396
514 R 4,817,397

CLASS 65
2 4,818,263
4.3 4,818,264
135 4,818,265
271 4,818,266
375 4,818,267

CLASS 66
121 4,817,398
123 4,817,399
195 4,817,400

CLASS 70
58 4,817,401
4,817,402
69 4,817,403
134 4,817,404
247 4,817,405
394 4,817,406

CLASS 71
5 4,818,268
83 4,818,269
88 4,818,270
4,818,271
4,818,272
90 4,818,273
92 4,818,275
4,818,276
4,818,277
93 4,818,278
106 4,818,274

CLASS 72
8 4,817,407
92 4,817,408
94 4,817,409
199 4,817,410
255 4,817,411
305 4,817,412

CLASS 73
24 4,817,413
25 4,817,414
40.5 R 4,817,415
55 4,817,416
118.1 4,817,418
4,817,419
119 R 4,817,420
146 4,817,421
147 4,817,422
153 4,817,423
159 4,817,424
160 4,817,425
180 4,817,426
204.16 4,817,427
434 4,817,428
459 4,817,429
579 4,817,430
600 4,817,431
602 4,817,432
620 4,817,433
625 4,817,434
660 4,817,417
700 4,817,435
708 4,817,436
756 4,817,437
835 4,817,438
861.04 4,817,439
861.38 4,817,448
862.04 4,817,440
862.36 4,817,444
863.12 4,817,441
863.56 4,817,442
864.22 4,817,443
864.62 4,817,445
865.5 4,817,446
865.6 4,817,447
866.5 4,817,449
4,817,450

CLASS 74
333 4,817,451
335 4,817,468
522 4,817,452
572 4,817,453
4,817,454
573 R 4,817,455
604 4,817,456
640 4,817,457
665 GE 4,817,458
687 4,817,459
4,817,460
720 4,817,461
740 4,817,462
781 R 4,817,463
793 4,817,464
817 4,817,465
858 4,817,466
864 4,817,467
866 4,817,469
4,817,470
4,817,471
869 4,817,472
4,817,473
4,817,474

CLASS 75
0.5 A 4,818,280
0.5 C 4,818,279
51.5 4,818,281
63 4,818,282
247 4,818,283

CLASS 81
121.1 4,817,475
177.85 4,817,476

CLASS 83
23 4,817,477
35 4,817,478
169 4,817,479
174.1 4,817,480
355 4,817,481
438 4,817,482
488 4,817,483

CLASS 84
1.04 4,817,485
1.15 4,817,486
1.16 4,817,484
179 4,817,487
319 4,817,488
411 P 4,817,489
422.1 4,817,490

CLASS 86
19 4,817,491

CLASS 89
1.11 4,817,495
1.14 4,817,493
1.8 4,817,492
8 4,817,494
191.02 4,817,496

CLASS 91
361 4,817,498
4,817,499
376 R 4,817,500
446 4,817,501
4,817,502

CLASS 92
98 R 4,817,503
125 4,817,504
237 4,817,505

CLASS 98
40.03 4,817,507
41.1 4,817,508
42.21 4,817,506

CLASS 99
330 4,817,509
331 4,817,510
349 4,817,511
367 4,817,512
383 4,817,513
419 4,817,514
454 4,817,515
483 4,817,516
4,817,517
516 4,817,518

CLASS 100
32 4,817,519
41 4,817,520
240 4,817,521

CLASS 101
93.34 4,817,522
123 4,817,523
4,817,524
219 4,817,525
329 4,817,526
389.1 4,817,527
395 4,817,528

CLASS 102
302 4,817,529
306 4,817,531
322 4,817,530
482 4,817,532

CLASS 104
289 4,817,533

CLASS 105
30 4,817,534
158.2 4,817,535
182.1 4,817,536
404 4,817,537

CLASS 106
1.23 4,818,286
20 4,818,284
22 4,818,285
38.3 4,818,287
90 4,818,288
117 4,818,289
4,818,290
124 4,818,291
210 4,818,292
476 4,818,293
487 4,818,294

CLASS 108
108 4,817,538

CLASS 110
243 4,817,539
266 4,817,540

CLASS 112
80.6 4,817,541
121.11 4,817,542
121.12 4,817,543
141 4,817,544
241 4,817,545
262.1 4,817,546
457 4,817,547

CLASS 114
61 4,817,548
102 4,817,549
230 4,817,551
4,817,552
255 4,817,553
270 4,817,554
360 4,817,555

CLASS 118
503 4,817,556
719 4,817,557
725 4,817,558
731 4,817,559

CLASS 119
1 4,817,560
5 4,817,561
96 4,817,562

CLASS 122
4 D 4,817,563
17 4,817,564
197 4,817,565

CLASS 123
52 MV 4,817,566
231 4,817,567
431 4,817,568
470 4,817,569
472 4,817,570
492 4,817,571
4,817,572
494 4,817,573
4,817,574
506 4,817,575
519 4,817,576
651 4,817,577
668 4,817,578

CLASS 124
23 R 4,817,579
4,817,580

CLASS 125
14 4,817,581

CLASS 126
21 A 4,817,582

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41 R 4,817,583
66 4,817,584
200 4,817,585

CLASS 127

1 4,818,295
2 4,818,296

CLASS 128

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80 C 4,817,588
80 E 4,817,589
90 4,817,590
92 YZ 4,817,591
155 4,817,594
4,817,595
201.24 4,817,596
205.17 4,817,597
207.14 4,817,598
303 R 4,817,599
4,817,600
303.1 4,817,601
305 4,817,602
329 R 4,817,603
346 4,817,604
419 P 4,817,608
419 PG 4,817,606
419 PT 4,817,605
419 R 4,817,607
420.6 4,817,609
630 4,817,610
642 4,817,611
648 4,817,620
653 4,817,612
658 4,817,613
660.02 4,817,615
660.05 4,817,614
4,817,617
661.09 4,817,618
4,817,619
662.03 4,817,621
662.06 4,817,616
664 4,817,622
665 4,817,623
692 4,817,624
721 4,817,625
728 4,817,626
731 4,817,627
741 4,817,628
748 4,817,629
751 4,817,630
753 4,817,631
769 4,817,632
782 4,817,633
784 4,817,634
804 4,817,635
844 4,817,593
848 4,817,636
855 4,817,592
899 4,817,637

CLASS 131

29 4,817,638
325 4,817,639
359 4,817,640

CLASS 132

201 4,817,641
324 4,817,642
329 4,817,643

CLASS 134

6 4,817,644
12 4,818,297
15 4,817,645
22.11 4,818,298
26 4,817,646
40 4,817,647
57 R 4,817,648
58 R 4,817,649
76 4,817,650
102 4,817,651
4,817,652
168 R 4,817,653

CLASS 135

90 4,817,654
101 4,817,655

CLASS 137

2 4,817,656
38 4,817,657
75 4,817,658
88 4,817,659
116 4,817,660
119 4,817,661
312 4,817,662
385 4,817,663
458 4,817,664
494 4,817,665
596.17 4,817,666
613 4,817,667
614.04 4,817,668
627.5 4,817,669
884 4,817,670

CLASS 138

89 4,817,671
113 4,817,672
174 4,817,673

CLASS 139

35 4,817,675
57 4,817,676
99 4,817,677
353 4,817,678
380 4,817,679
436 4,817,680
450 4,817,681

CLASS 140

113 4,817,682

CLASS 141

1 4,817,683
4 4,817,684
11 4,817,685
12 4,817,686
65 4,817,687
140 4,817,688
198 4,817,689
338 4,817,690
390 4,817,691

CLASS 144

3 D 4,817,692
359 4,817,693

CLASS 148

2 4,818,299
4,818,300
11.5 N 4,818,301
13.1 4,818,302
20 4,818,303
103 4,818,304
4,818,305
404 4,818,306
414 4,818,307
431 4,817,695
437 4,818,308

CLASS 149

2 4,818,309

CLASS 152

540 4,817,696

CLASS 156

48 4,818,310
51 4,818,311
52 4,818,312
62.2 4,818,315
64 4,818,313
87 4,818,314
88 4,818,316
89 4,818,317
166 4,818,318
192 4,818,319
227 4,818,320
254 4,818,321
272.8 4,818,322
286 4,818,323
292 4,818,324
315 4,818,325
345 4,818,326
4,818,327
350 4,818,328
391 4,818,329
473 4,818,330
485 4,818,331
499 4,818,332
628 4,818,333
643 4,818,334
644 4,818,335
651 4,818,336
659.1 4,818,337

CLASS 157

13 4,817,697

CLASS 160

107 4,817,698
327 4,817,699

CLASS 162

4 4,818,338
4,818,339
125 4,818,340
168.2 4,818,341
207 4,818,342
286 4,818,343

CLASS 164

259 4,817,700
415 4,817,701
432 4,817,702
476 4,817,703

CLASS 165

10 4,817,704
12 4,817,705
30 4,817,706
46 4,817,707
54 4,817,708
151 4,817,709

CLASS 166

242 4,817,710
248 4,817,711
249 4,817,712
252 4,817,713
4,817,714
266 4,817,715
277 4,817,716
278 4,817,717
292 4,817,719
295 4,817,720
4,817,721
297 4,817,718
310 4,817,722
321 4,817,723
337 4,817,724
376 4,817,725

CLASS 172

9 4,817,726
192 4,817,727
273 4,817,728
311 4,817,729
328 4,817,730
464 4,817,731
548 4,817,732

CLASS 173

2 4,817,733
29 4,817,734
30 4,817,735
93 4,817,736
115 4,817,737
162.1 4,817,738

CLASS 174

36 4,818,820
52.4 4,818,821
53 4,818,822
68.5 4,818,823
92 4,818,824
212 4,818,825

CLASS 175

38 4,817,739
74 4,817,740
398 4,817,741
410 4,817,742
411 4,817,743

CLASS 177

145 4,817,744
212 4,817,745

CLASS 178

19 4,818,826

CLASS 180

9.1 4,817,746
22 4,817,747
79.1 4,817,748
119 4,817,749
168 4,817,750
233 4,817,751
247 4,817,752
249 4,817,753
268 4,817,754

CLASS 181

106 4,817,755
214 4,817,756
288 4,817,757

CLASS 182

16 4,817,758
36 4,817,759

CLASS 187

9 R 4,817,760
116 4,817,761

CLASS 188

67 4,817,762
73.2 4,817,763
73.44 4,817,764
218 A 4,817,765
281 4,817,766
348 4,817,767
378 4,817,768

CLASS 190

18 R 4,817,769

CLASS 192

0.092 4,817,776
3.58 4,817,770
16 4,817,771
48.91 4,817,772
53 F 4,817,773
58 B 4,817,774
89 B 4,817,775

CLASS 193

46 4,817,777

CLASS 198

346.1 4,817,778
346.2 4,817,694
365 4,817,779
465.4 4,817,780
627 4,817,781
710 4,817,782
750 4,817,783
781 4,817,784
803.01 4,817,785
834 4,817,786

CLASS 200

5 A 4,818,827
4,818,828
341 4,818,830
512 4,818,829

CLASS 202

163 4,818,345
176 4,818,344
197 4,818,346

CLASS 203

42 4,818,347

CLASS 204

1 T 4,818,348
15 4,818,349
29 4,818,350
39 4,818,351
59 R 4,818,352
74 4,818,353
96 4,818,354
170 4,818,355
181.1 4,818,356
192.25 4,818,357
298 4,818,358
4,818,359
299 R 4,818,360
406 4,818,361
4,818,362
408 4,818,366
426 4,818,363
427 4,818,364
433 4,818,365

CLASS 206

0.5 4,817,788
3 4,817,787
5.1 4,817,789
205 4,817,790
287.1 4,817,791
309 4,817,792
320 B1 3,904,039
328 4,817,793
4,817,795
372 4,817,794
396 4,817,796
411 4,817,798
427 4,817,866
428 4,817,797
445 4,817,799
484 4,817,800
519 4,817,801
579 4,817,802
602 4,817,803

CLASS 208

23 4,818,367
50 4,818,368
100 4,818,369
106 4,818,370
4,818,371
113 4,818,372
252 4,818,373
413 4,818,374

CLASS 209

18 4,818,375
135 4,818,376
164 4,818,377
225 4,818,378
254 4,818,379
534 4,817,804
565 4,818,380
573 4,818,381
4,818,382
702 4,818,383

CLASS 210

86 4,818,384
90 4,818,385
97 4,818,386
167 4,818,388
169 4,818,389
170 4,818,390
195.3 4,818,391
4,818,392
197 4,818,393
198.2 4,818,394
222 4,818,395
232 4,818,396
4,818,397
238 4,818,398
242.3 4,818,399
262 4,818,400
330 4,818,401
411 4,818,402
488 4,818,403
490 4,818,387
603 4,818,404
4,818,405
611 4,818,406
614 4,818,407
4,818,408
638 4,818,409
639 4,818,410
668 4,818,411
704 4,818,412
739 4,818,413
744 4,818,414
748 4,818,415
749 4,818,416
768 4,818,417
782 4,818,418
796 4,818,419
798 4,818,420

CLASS 211

71 4,817,805

CLASS 213

232 4,818,935

CLASS 215

12.1 4,817,806
253 4,817,807

CLASS 219

10.55 E 4,818,831
4,818,832
10.57 4,818,833
69.12 4,818,848
69.17 4,818,834
76.14 4,818,839
121.12 4,818,838
121.51 4,818,837
121.54 4,818,836
121.6 4,818,835
121.72 4,818,840
121.83 4,818,841
205 4,818,842
275 4,818,843
279 4,818,844
314 4,818,845
354 4,818,849
458 4,818,846

CLASS 220

20 4,817,808
23.4 4,817,809
85 H 4,817,810
4,817,812
85 SP 4,817,811
86 R 4,817,813
209 4,817,815
359 4,817,816
445 4,817,817

CLASS 221

1 4,817,818
2 4,817,819
279 4,817,820

CLASS 222

3 4,817,821
4,817,828
38 4,817,822
103 4,817,823
105 4,817,824
129.2 4,817,825
192 4,817,826
238 4,817,827
259 4,817,829
286.5 4,817,830
499 4,817,831
530 4,817,832

CLASS 224

36 4,817,833
42.06 4,817,834
150 4,817,835
158 4,817,836
250 4,817,837
319 4,817,838

CLASS 225

2 4,817,839
7 4,817,840

CLASS 226

74 4,817,842
92 4,817,841
97 4,817,843
118 4,817,844
172 4,817,845

CLASS 227

3 4,817,965
19 4,817,847

CLASS 228

102 4,817,848
103 4,817,849
110 4,817,814
114 4,817,852
119 4,817,850
4,817,851
121 4,817,853
124 4,817,854
171 4,817,855
176 4,817,856
183 4,817,857
193 4,817,858
226 4,817,859

CLASS 229

80 4,817,860
122 4,817,861

CLASS 235

381 4,818,854
440 4,818,855
455 4,818,847
472 4,818,851
4,818,856
488 4,818,852
492 4,818,853
494 4,818,850

CLASS 236

10 4,817,862
49.4 4,817,863
4,817,864
49.5 4,817,865

CLASS 238

10 A 4,817,867

CLASS 239

55 4,817,868
157 4,817,870
222.17 4,817,869
265.39 4,817,871
300 4,817,872
397.5 4,817,873
434 4,817,874
542 4,817,875
585 4,817,876

CLASS 241

34 4,817,877
282.2 4,817,878

CLASS 242

7.09 4,817,888
18 PW 4,817,896
35.5 R 4,817,879
47.01 4,817,880
55.19 A 4,817,881
56 R 4,817,882
66 4,817,883
67.1 R 4,817,884
107.4 A 4,817,885
186 4,817,887
192 4,817,886

CLASS 244

1 R 4,817,889
3.23 4,817,891
15 4,817,892
135 R 4,817,890
138 R 4,817,895
142 4,817,893
158 R 4,817,894

CLASS 248

68.1 4,817,897
4,817,910
161 4,817,898
205.1 4,817,899
225.1 4,817,900
231 4,817,901
345.1 4,817,902
419 4,817,903
429 4,817,904
459 4,817,905
542 4,817,906
558 4,817,907
564 4,817,908
610 4,817,909

CLASS 249

82 4,817,911
83 4,818,204

CLASS 250

201 4,818,858
4,818,865
213 R 4,818,857
221 4,818,859
4,818,866
227 4,818,860
229 4,818,867
235 4,818,861
252 4,818,868
282 4,818,869
287 4,818,862
288 4,818,863
4,818,870
291 4,818,864
308 4,818,871
309 4,818,872
310 4,818,873

4,818,874
327.2 4,818,880
338.1 4,818,881
343 4,818,875
4,818,882
361 C 4,818,883
388 4,818,884
484.1 4,818,876
4,818,877
492.2 4,818,885
507.1 4,818,878
548 4,818,879
561 4,818,887
566 4,818,886

CLASS 251

11 4,817,912
40 4,817,913
129.15 4,817,914
163 4,817,916
199 4,817,915

CLASS 252

8.8 4,818,421
4,818,422
49.6 4,818,423
91 4,818,424
94 4,818,425
99 4,818,426
174.21 4,818,427
299.1 4,818,428
299.61 4,818,429
4,818,430
4,818,431
299.66 4,818,432
301.4 R 4,818,433
301.4 S 4,818,434
378 R 4,818,435
400.23 4,818,436
511 4,818,437
4,818,438
4,818,439
546 4,818,440

CLASS 254

30 4,817,917

CLASS 260

396 R 4,818,441
405.5 4,818,442
501.18 4,818,443

CLASS 261

30 4,818,444
87 4,818,445
122 4,818,446
4,818,447

CLASS 264

29.2 4,818,448
4,818,449
39 4,818,450
40.1 4,818,463
40.3 4,818,451
41 4,818,452
4,818,453
59 4,818,454
65 4,818,455
103 4,818,456
130 4,818,457
182 4,818,458
295 4,818,459
310 4,818,460
325 4,818,461
328.8 4,818,462
510 4,818,464
522 4,818,465
555 4,818,466
564 4,818,467

CLASS 266

87 4,817,918
245 4,817,919
252 4,817,920

CLASS 267

33 4,817,921
63 A 4,817,923
64.21 4,817,922
91 4,817,924
140.1 4,817,925
4,817,926
155 4,817,927
219 4,817,928

CLASS 269

43 4,817,929
73 4,817,930

CLASS 270

37 4,817,931
47 4,817,932

CLASS 271

3.1 4,817,933
296 4,817,934

CLASS 272

1 A 4,817,935
27 R 4,817,936
31 R 4,817,937
73 4,817,938
4,817,939
76 4,817,941
93 4,817,940
98 4,817,942
117 4,817,943
123 4,817,944

CLASS 273

2 4,817,945
25 4,817,946
37 4,817,947
86 B 4,817,948
139 4,817,949
143 R 4,817,951
148 B 4,817,950
153 S 4,817,952
188 R 4,817,953
191 R 4,817,954
201 4,817,955
246 4,817,956
248 4,817,957
249 4,817,958
4,817,959
410 4,817,960
426 4,817,961

CLASS 277

1 4,817,962
4,817,963
4,817,964
3 4,817,966
9 4,817,846
25 4,817,970
199 4,817,967
226 4,817,968
235 B 4,817,969

CLASS 279

1 K 4,817,971

CLASS 280

11.2 4,817,974
63 4,817,975
154 4,817,976
304 4,817,977
418.1 4,817,980
487 4,817,978
512 4,817,979
633 4,817,981
644 4,817,982
668 4,817,983
690 4,817,985
781 4,817,973
4,817,986
788 4,817,987
817 4,817,988

CLASS 282

9 R 4,817,989

CLASS 283

101 4,817,990

CLASS 285

7 4,817,991
18 4,817,992
54 4,817,993
93 4,817,994
98 4,817,995
149 4,817,996
256 4,817,997

CLASS 290

43 4,818,888
48 4,818,889
52 4,818,890

CLASS 292

113 4,817,999
147 4,818,000
304 4,818,001
307 R 4,818,002
336.3 4,818,003

CLASS 294

1.1 4,817,998
81.3 4,818,004
88 4,818,005

CLASS 296

24.1 4,818,007
32 4,818,006
37.7 4,818,010
37.8 4,818,008
78.1 4,818,012
97.13 4,818,013
97.2 4,818,011
106 4,818,009
146 4,818,014
180.1 4,818,015

CLASS 297

174 4,818,016
194 4,818,017
284 4,818,018
303 4,818,019
313 4,818,020
440 4,818,021
473 4,818,022
483 4,818,023

CLASS 298

27 4,818,024

CLASS 299

31 4,818,025
42 4,817,972
56 4,818,026
92 4,818,027

CLASS 300

10 4,818,028

CLASS 301

5 VH 4,818,029
4,818,030
36 R 4,818,031
37 AT 4,818,032
37 CD 4,818,033
63 PW 4,818,034

CLASS 303

7 4,818,035
50 4,818,036
97 4,818,037
113 4,818,039
119 4,818,038

CLASS 305

12 4,818,040
56 4,818,041

CLASS 307

64 4,818,891
106 4,818,892
254 4,818,893
269 4,818,894
303.1 4,818,895
362 4,818,896
4,818,897
425 4,818,899
427 4,818,898
450 4,818,900
451 4,818,901
465 4,818,902
521 4,818,903
594 4,818,904

CLASS 310

42 4,818,905
58 4,818,906
67 R 4,818,907
171 4,818,908
208 4,818,909
233 4,818,910
259 4,818,911

CLASS 312

38 4,818,042
138 R 4,818,043
257 SM 4,818,044

CLASS 313

457 4,818,912

CLASS 315

60 4,818,915
111.21 4,818,916
169.1 4,818,968
169.3 4,818,913
4,818,914
171 4,818,917
244 Re.32,901
4,818,918
371 4,818,919

CLASS 318

16 4,818,920
269 4,818,921
313 4,818,922
318 4,818,923
561 4,818,924
567 4,818,925
618 4,818,926
798 4,818,927

CLASS 320

2 4,818,928

CLASS 323

316 4,818,929

CLASS 324

57 DE 4,818,947
58.5 B 4,818,930
61 P 4,818,948
77 B 4,818,931
4,818,949
83 R 4,819,080
121 R 4,818,932
158 F 4,818,933
158 T 4,818,934
208 4,818,939
232 4,818,936
309 4,818,937
4,818,938
4,818,940
4,818,941
312 4,818,942
318 4,818,943
326 4,818,944
339 4,818,946
457 4,818,945

CLASS 328

134 4,819,081
155 4,818,950

CLASS 330

254 4,818,951

CLASS 331

78 4,818,955
96 4,818,956
108 R 4,818,952
114 4,818,953
183 4,818,954

CLASS 333

12 4,818,957
24.1 4,818,963
28 R 4,818,959
111 4,818,964
114 4,818,958
185 4,818,960
194 4,818,961
239 4,818,962

CLASS 335

274 4,818,965
296 4,818,966

CLASS 337

202 4,818,967

CLASS 340

425.5 4,819,050
539 4,818,970
543 4,818,971
566 4,818,972
568 4,819,015
572 4,818,973
574 4,818,974
584 4,818,975
605 4,818,976
633 4,818,977
706 4,818,978
723 4,818,979
784 4,818,980
4,818,981
4,818,991
793 4,818,982
794 4,818,983
825.060 4,818,993
825.31 4,818,986
825.47 4,818,987
825.5 4,818,985
825.54 4,818,984
825.730 4,818,989
825.85 4,818,988
870.07 4,818,990
870.21 4,818,994
970 4,818,992

CLASS 341

13 4,819,051
80 4,818,969
94 4,818,995
144 4,818,996

CLASS 342

20 4,818,997
44 4,818,998
59 4,818,999
353 4,819,053
408 4,819,000

CLASS 343

765 4,819,002
771 4,819,003
778 4,819,004
786 4,819,005
840 4,819,007
880 4,819,006

CLASS 345

712 4,819,001

CLASS 346

75 4,819,009
76 PH 4,819,008
4,819,010
4,819,011
140 R 4,819,012
4,819,014
159 4,819,013

CLASS 350

3.7 4,818,045
4,818,048
6.8 4,818,046
96.13 4,818,063
96.14 4,818,050
96.15 4,818,049
4,818,052
4,818,064
96.16 4,818,051
96.18 4,818,053
96.20 4,818,054
4,818,055
4,818,056
4,818,057
4,818,058
96.21 4,818,059
4,818,061
96.23 4,818,060
96.29 4,818,062
96.33 4,818,047
174 4,818,065
247 4,818,066
255 4,818,067
272 4,818,068
321 4,818,069
334 4,818,070
336 4,818,072
337 4,818,073
338 4,818,074
339 F 4,818,075
346 4,818,076
390 S 4,818,077
4,818,078
354 4,818,079
355 4,818,080
423 4,818,081
427 4,818,082
4,818,083
508 4,818,084
528 4,818,085
552 4,818,086
622 4,818,087
632 4,818,088
634 4,818,089
4,818,090

CLASS 351

49 4,818,091
113 4,818,093
136 4,818,092
157 4,818,094
159 4,818,095
163 4,818,096
203 4,818,097

CLASS 353

122 4,818,098

CLASS 354

5 4,819,018
82 4,819,016
288 4,819,017

CLASS 355

3 DD 4,819,027
3 FU 4,819,020
3 R 4,819,019
4 4,819,028
7 4,819,029
13 4,819,021
14 E 4,819,066
14 FU 4,819,022
14 R 4,819,024
4,819,025
14 SH 4,819,023
15 4,819,026
4,819,030
4,819,031
27 4,819,032
41 4,819,034
53 4,819,033
55 4,819,035

CLASS 356

5 4,818,099
4,818,100
28.5 4,818,071
4,818,101
43 4,818,102
72 4,818,103
138 4,818,104
315 4,818,105
318 4,818,106
350 4,818,109
358 4,818,110
360 4,818,108
374 4,818,111
375 4,818,107

CLASS 357

4 4,819,036
4,819,037
4,819,038
17 4,819,039
4,819,048
4,819,057
4,819,058
23.13 4,819,046
4,819,047
23.3 4,819,043
23.4 4,819,044
4,819,045
24 4,819,067
40 4,819,049
42 4,819,040
49 4,819,052
4,819,054
59 4,819,055
80 4,819,041
4,819,042
4,819,056

CLASS 358

12 4,819,059
29 4,819,060
31 4,819,061
4,819,062
75 4,819,063
88 4,819,064
98 4,819,065
4,819,077
113 4,819,068
191.1 4,819,069
209 4,819,074
213.11 4,819,070
213.16 4,819,071
213.18 4,819,075
213.29 4,819,072
214 4,819,073
229 4,819,076
245 4,819,085
256 4,819,078
260 4,819,079
294 4,819,082
4,819,083
296 4,819,084
343 4,819,086

CLASS 360

10.1 4,819,101
14.3 4,819,087
17 4,819,102
19.1 4,819,088
22 4,819,089
27 4,819,092
32 4,819,090
35.1 4,819,097
37.1 4,819,098
51 4,819,103
77.04 4,819,095
78.06 4,819,093
84 4,819,099
97.01 4,819,091
4,819,100
98.01 4,819,104
98.08 4,819,105
104 4,819,094
4,819,108
106 4,819,106
4,819,109
4,819,110
108 4,819,096
121 4,819,107
125 4,819,111
126 4,819,112
4,819,113
133 4,819,114

CLASS 361

18 4,819,116
4,819,117
23 4,819,123
25 4,819,118
58 4,819,120
76 4,819,119
85 4,819,121
93 4,819,122
97 4,819,124
4,819,125
207 4,819,126
273 4,819,127
302 4,819,130
308 4,819,115
321 4,819,128
365 4,819,129
414 4,819,131

CLASS 362

61 4,819,132
4,819,133
4,819,134
72 4,819,135
81 4,819,136
102 4,819,137
183 4,819,139
189 4,819,140
200 4,819,153
207 4,819,141
226 Re.32,899
4,819,142
282 4,819,143
419 4,819,138

CLASS 363

21 4,819,144

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56 4,819,157
63 4,819,145
98 4,819,146
127 4,819,147
161 4,819,148

CLASS 364

132 4,819,149
167.01 4,819,167
200 4,819,150
4,819,151
4,819,152
4,819,154
4,819,155
4,819,156
4,819,158
4,819,159
4,819,164
4,819,165
4,819,166
300 4,819,160
4,819,161
401 4,819,162
413.23 4,819,188
424.01 4,819,168
424.02 4,819,169
424.05 4,819,170
424.1 4,819,163
431.01 4,819,187
431.07 4,819,172
4,819,173
431.08 4,819,171
444 4,819,174
449 4,819,175
468 4,819,176
476 4,819,177
481 4,819,178
484 4,819,179
492 4,819,180
507 4,819,181
508 4,819,182
509 4,819,183
513 4,819,184
518 4,819,185
4,819,191
519 4,819,186
521 4,819,189
4,819,190
522 4,819,192
526 4,819,193
556 4,819,194
571.05 4,819,195
602 4,819,196
715.06 4,819,197
787 4,819,198
807 4,819,199
841 4,819,200
900 4,819,201
4,819,202
4,819,203
4,819,204

CLASS 365

1 4,819,205
106 4,819,206
4,819,210
189 4,819,208
222 4,819,207
230 4,819,209
4,819,211
4,819,212
233 4,819,213

CLASS 366

2 4,818,112
76 4,818,113
130 4,818,114
212 4,818,115
311 4,818,116
341 4,818,117

CLASS 367

27 4,819,214
135 4,819,215
154 4,819,216

CLASS 368

10 4,819,217

CLASS 369

32 4,819,219
45 4,819,220
50 4,819,218
4,819,221
124 4,819,222
275 4,819,223

CLASS 370

3 4,819,224
16 4,819,225
54 Re.32,900
55 4,819,226
75 4,819,227
85 4,819,228
89 4,819,229
94 4,819,230
4,819,231

CLASS 371

9 4,819,232
19 4,819,233
4,819,234
22 4,819,235
38 4,819,236
66 4,819,237

CLASS 372

2 4,819,238
12 4,819,239
26 4,819,240
38 4,819,241
4,819,242
45 4,819,243
46 4,819,244
48 4,819,245
107 4,819,246

CLASS 373

30 4,819,247
39 4,819,248

CLASS 374

1 4,819,249
7 4,818,118
104 4,819,250
208 4,818,119

CLASS 375

30 4,819,253
119 4,819,251
122 4,819,252

CLASS 376

195 4,818,468
203 4,818,469
245 4,818,470
254 4,818,471
260 4,818,472
261 4,818,473
267 4,818,474
282 4,818,475
294 4,818,476
419 4,818,477
435 4,818,478
442 4,818,479

CLASS 378

21 4,819,254
42 4,819,255
87 4,819,256
99 4,819,257
111 4,819,258
125 4,819,259
137 4,819,260

CLASS 379

27 4,819,261
157 4,819,262
390 4,819,263
452 4,819,264
4,819,265
454 4,819,266

CLASS 380

23 4,819,267

CLASS 381

14 4,819,268
24 4,819,269
26 4,819,270
43 4,819,271

CLASS 383

5 4,818,120
6 4,818,121
10 4,818,122

CLASS 384

106 4,818,123
208 4,818,124

CLASS 400

63 4,818,125
4,818,131
120 4,818,126
121 4,818,127
124 4,818,133
166 4,818,128
323 4,818,129
697 4,818,130
708 4,818,132

CLASS 401

195 4,818,134

CLASS 403

104 4,818,135

CLASS 404

6 4,818,136
4,818,137
14 4,818,138
81 4,818,139
118 4,818,140

CLASS 405

30 4,818,141
55 4,818,142
128 4,818,143
132 4,818,144
203 4,818,145
212 4,818,146
224 4,818,147
228 4,818,149
234 4,818,148
262 4,818,150
303 4,818,151

CLASS 406

88 4,818,152

CLASS 407

113 4,818,153

CLASS 408

111 4,818,154
130 4,818,155
150 4,818,156
240 4,818,157
241 R 4,818,158

CLASS 409

136 4,818,159
202 4,818,160
233 4,818,161

CLASS 410

116 4,818,162

CLASS 411

44 4,818,163
82 4,818,164
178 4,818,165
361 4,818,166
386 4,818,167

CLASS 412

37 4,818,168

CLASS 414

124 4,817,550
331 4,818,169
401 4,818,170
497 4,818,171
686 4,818,172
730 4,818,175
735 4,818,173
4,818,174

CLASS 415

9 4,818,176
49 4,818,177
115 4,818,178

CLASS 416

117 4,818,180
134 A 4,818,179
196 A 4,818,181
215 4,818,182
247 R 4,818,183

CLASS 417

48 4,818,184
50 4,818,185
63 4,818,186
137 4,818,187
201 4,818,188
295 4,818,189
360 4,818,190
372 4,818,192
390 4,818,191
423.15 4,818,193
567 4,818,194

CLASS 418

15 4,818,195
22 4,818,196
48 4,818,197
55 4,818,198
4,818,199
61.3 4,818,200

CLASS 419

27 4,818,480
33 4,818,482
67 4,818,481

CLASS 420

45 4,818,483
46 4,818,484
57 4,818,485
442 4,818,486
530 4,818,487

CLASS 422

23 4,818,488
46 4,818,490
56 4,818,491
84 4,818,489
100 4,818,492
102 4,818,493
133 4,818,566
145 4,818,495
172 4,818,496
179 4,818,497
186.2 4,818,498
191 4,818,494
227 4,818,499
249 4,818,500
300 4,818,501
310 4,818,502

CLASS 423

10 4,818,503
157 4,818,504
210 4,818,505
242 4,818,506
328 4,818,507
4,818,508
329 4,818,509
335 4,818,510
344 4,818,511
462 4,818,512
488 4,818,513
558 4,818,514
625 4,818,515

CLASS 424

9 4,818,516
44 4,818,518
53 4,818,519
61 4,818,520
62 4,818,521
66 4,818,522
70 4,818,523
76.1 4,818,524
81 4,818,525
84 4,818,526
88 4,818,527
92 4,818,528
93 4,818,529
4,818,530
111 4,818,531
150 4,818,532
195.1 4,818,533
404 4,818,534
407 4,818,535
409 4,818,536
427 4,818,537
436 4,818,538
441 4,818,539
448 4,818,540
4,818,541
488 4,818,517
491 4,818,542

CLASS 425

78 4,818,201
90 4,818,202
115 4,818,203
117 4,818,205
204 4,818,206
289 4,818,207
392 4,818,209
394 4,818,208
411 4,818,210
425 4,818,211
529 4,818,212
533 4,818,213
549 4,818,217

CLASS 426

2 4,818,543
77 4,818,544
107 4,818,545
231 4,818,546
233 4,818,547
265 4,818,548
267 4,818,549
281 4,818,550
420 4,818,551
422 4,818,552
549 4,818,553
564 4,818,554
599 4,818,555
615 4,818,556
618 4,818,557
634 4,818,558

CLASS 427

2 4,818,559
38 4,818,560
4,818,561
53.1 4,818,562
55 4,818,563
69 4,818,564
74 4,818,565
216 4,818,567
226 4,818,568
242 4,818,569
273 4,818,570
286 4,818,571
327 4,818,572
403 4,818,573
422 4,818,574

CLASS 428

36.5 4,818,577
36.7 4,818,575
40 4,818,576
57 4,818,578
102 4,818,579
113 4,818,580
143 4,818,581
148 4,818,584
189 4,818,582
195 4,818,583
198 4,818,585
4,818,586
4,818,587
201 4,818,588
4,818,589
213 4,818,590
216 4,818,591
4,818,592
220 4,818,593
224 4,818,594
229 B1 4,526,828
245 4,818,595
265 4,818,596
284 4,818,597
4,818,598
288 4,818,599
290 4,818,600
297 4,818,601
304.4 4,818,602
316.6 4,818,603
319.9 4,818,604
321.3 4,818,605
323 4,818,606
4,818,607
327 4,818,608
336 4,818,609
345 4,818,610
364 4,818,611
367 4,818,612
396 4,818,613
403 4,818,614
407 4,818,615
411.1 4,818,616
412 4,818,617
421 4,818,618
4,818,619
422 4,818,620
424.6 4,818,621
425.6 4,818,622
447 4,818,623
4,818,624
457 4,818,625
469 4,818,626
551 4,818,627
561 4,818,628
594 4,818,629
605 4,818,630
4,818,631
613 4,818,632
614 4,818,633
677 4,818,634
698 4,818,635
704 4,818,636

CLASS 429

15 4,818,637
20 4,818,638
34 4,818,639
38 4,818,640
61 4,818,641
105 4,818,642
188 4,818,643
192 4,818,644
209 4,818,645
213 4,818,646
218 4,818,647

CLASS 430

17 4,818,648
21 4,818,649
56 4,818,650
57 4,818,651
4,818,652
59 4,818,653
4,818,654
60 4,818,655
65 4,818,656
114 4,818,657
156 4,818,658
264 4,818,659
281 4,818,660
320 4,818,661
348 4,818,662
358 4,818,663
430 4,818,664
494 4,818,665
495 4,818,666
502 4,818,667
505 4,818,668
509 4,818,669
544 4,818,670
550 4,818,671
558 4,818,672
566 4,818,673
567 4,818,674
4,818,675
574 4,818,676

CLASS 431

35 4,818,214
126 4,818,215
154 4,818,216
158 4,818,218
261 4,818,219
264 4,818,220

CLASS 432

99 4,818,221
138 4,818,222
205 4,818,223
248 4,818,224

CLASS 433

18 4,818,225
20 4,818,226
27 4,818,227
54 4,818,228
127 4,818,229
215 4,818,230
4,818,231

CLASS 434

23 4,818,232
245 4,818,233
247 4,818,234

CLASS 435

4 4,818,677
5 4,818,678
6 4,818,679
4,818,680
4,818,681
7 4,818,682
4,818,683
4,818,684
4,818,685
4,818,686
4,818,688
4,818,689
13 4,818,690
15 4,818,691
18 4,818,692
68 4,818,694
134 4,818,695
172.3 4,818,696
173 4,818,697
189 4,818,698
240.49 4,818,693
4,818,699
252.33 4,818,700
311 4,818,701

CLASS 436

66 4,818,702
98 4,818,703
111 4,818,704
164 4,818,705
180 4,818,706
513 4,818,707
516 4,818,708
518 4,818,687
4,818,709
527 4,818,710

CLASS 437

21 4,818,711
22 4,818,721
26 4,818,712
31 4,818,713
44 4,818,715
49 4,818,716
52 4,818,717
4,818,718
58 4,818,720
61 4,818,235
044 4,818,714
057 4,818,719
129 4,818,722
200 4,818,723
203 4,818,724
4,818,725
207 4,818,726
209 4,818,727
4,818,728

CLASS 439

34 4,818,236
42 4,818,238
55 4,818,239
64 4,818,240
65 4,818,241
395 Re.32,898
485 B1 Re.29,513
693 4,818,237

CLASS 455

127 4,819,272
605 4,819,273

CLASS 501

4 4,818,729
15 4,818,730
17 4,818,731
81 4,818,732
97 4,818,733
128 4,818,734
134 4,818,735
136 4,818,736

CLASS 502

67 4,818,738
4,818,739
68 4,818,737
101 4,818,741
211 4,818,743
244 4,818,744
313 4,818,740
327 4,818,745
527 4,818,746

CLASS 503

201 4,818,742

CLASS 512

14 4,818,747

CLASS 514

2 4,818,763
16 4,818,748
19 4,818,749
50 4,818,750
54 4,818,751
4,818,752
155 4,818,753
210 4,818,754
224.2 4,818,756
228.2 4,818,755
231.5 4,818,757
252 4,818,758
260 4,818,759
338 4,818,760
341 4,818,761
356 4,818,766
383 4,818,762
397 4,818,764
440 4,818,765
555 4,818,767
558 4,818,768
564 4,818,770
616 4,818,771
651 4,818,772

CLASS 521

31 4,818,774
32 4,818,773
107 4,818,775

CLASS 522

31 4,818,776

CLASS 524

83 4,818,777
4,818,778
188 4,818,779
407 4,818,781
413 4,818,782
425 4,818,783
430 4,818,780
463 4,818,784
576 4,818,785

CLASS 525

55 4,818,786
62 4,818,787
4,818,788
64 4,818,789
103 4,818,790
124 4,818,791
183 4,818,793
286 4,818,792
327.8 4,818,794
4,818,795
329.5 4,818,796
329.9 4,818,797
390 4,818,803
539 4,818,798

CLASS 526

106 4,818,800
123 4,818,799
211 4,818,804
247 4,818,801
305 4,818,802

CLASS 528

15 4,818,805
26 4,818,806
176 4,818,812
191 4,818,807
275 4,818,808
364 4,818,809
392 4,818,810
4,818,811

CLASS 534

14 4,818,813
607 4,818,815
642 4,818,814

CLASS 536

1.1 4,818,817
6.4 4,818,818
55.2 4,818,816

CLASS 544

279 4,818,819

CLASS 600

16 4,817,586

CLASS 604

175 B1 4,436,519

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D2— 223 300,480
D3— 76 300,509
D6— 329 300,481
358 300,482
366 300,483
373 300,484
411 300,485
430 300,486
446 300,487
465 300,488
466 300,489
474 300,490
479 300,491
518 300,492
D7— 39 300,493
47 300,494
70 300,495
71 300,496
74 300,497
330 300,498
351 300,499
367 300,500
D8— 67 300,501
68 300,502
300,503
77 300,504
303 300,506
318 300,505
367 300,507
391 300,508
D9— 310 300,510
396 300,511
448 300,512
D10— 30 300,513
31 300,514
57 300,515
72 300,516
91 300,517
126 300,518
D11— 4 300,519
79 300,520
155 300,521
D12— 98 300,522
110 300,523
155 300,524
181 300,525
210 300,526
D13— 24 300,527
38 300,528
D14— 100 300,534
101 300,533
118 300,532
198 300,529
218 300,530
230 300,531
D15— 70 300,543
D16— 107 300,536
221 300,535
D17— 20 300,537
300,538
D18— 7 300,539
D19— 35 300,540
D21— 24 300,541
59 300,542
148 300,544
163 300,545
220 300,546
300,547
D22— 238 300,548
108 300,549
129 300,550
142 300,551
300,552
D23— 231 300,553
249 300,554
300,555
281 300,556
387 300,557
D24— 16 300,558
17 300,559
48 300,560
55 300,561
D25— 17 300,562
68 300,563
D26— 42 300,569
63 300,570
D28— 44 300,571
D30— 104 300,572
D32— 2 300,573
31 300,574
44 300,575
72 300,576
D34— 15 300,577
31 300,578
D99— 7 300,579
119 300,564
300,565
124 300,566
300,567
300,568

CLASSIFICATION OF PLANTS

P.— 14 6,714
26 6,713
34 6,724
38 6,712
52 6,709
68 6,715
6,716
6,717
6,718
6,719
6,720
6,721
6,722
6,723
70 6,710
71 6,711

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351— 204 H618
356— 121 H615
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428— 462 H624
434— 19 H613
435— 14 H622
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PATENTS

01 :	4,817,520		4,817,485		4,818,114		4,818,769		4,818,097		4,818,782
	4,817,590		4,817,486		4,818,121		4,818,812		4,818,371		4,818,898
	4,817,998		4,817,557		4,818,123		4,818,829		4,818,490	12 :	4,817,242
	4,818,104		4,817,586		4,818,161		4,818,838		4,818,850		4,817,287
	4,818,142		4,817,605		4,818,169		4,818,842		4,818,933		4,817,320
	4,818,310		4,817,609		4,818,172		4,818,852		4,819,092		4,817,327
	4,818,881		4,817,610		4,818,180		4,818,855		4,819,180		4,817,352
	4,819,264		4,817,613		4,818,186		4,818,868	09 :	4,817,283		4,817,387
04 :	4,817,214		4,817,622		4,818,190		4,818,869		4,817,315		4,817,389
	4,817,488		4,817,625		4,818,207		4,818,872		4,817,549		4,817,401
	4,817,626		4,817,646		4,818,226		4,818,886		4,817,562		4,817,417
	4,817,639		4,817,654		4,818,227		4,818,894		4,817,644		4,817,455
	4,817,651		4,817,657		4,818,234		4,818,896		4,817,801		4,817,483
	4,817,656		4,817,683		4,818,238		4,818,914		4,817,814		4,817,589
	4,817,855		4,817,691		4,818,239		4,818,924		4,817,899		4,817,602
	4,817,939		4,817,701		4,818,254		4,818,931		4,817,990		4,817,612
	4,817,946		4,817,712		4,818,259		4,818,950		4,818,000		4,817,805
	4,817,977		4,817,713		4,818,268		4,818,958		4,818,102		4,817,817
	4,818,004		4,817,756		4,818,269		4,818,964		4,818,113		4,817,857
	4,818,323		4,817,758		4,818,273		4,819,064		4,818,158		4,817,865
	4,818,461		4,817,759		4,818,324		4,819,081		4,818,179		4,817,940
	4,818,519		4,817,768		4,818,375		4,819,091		4,818,205		4,818,007
	4,818,821		4,817,789		4,818,390		4,819,096		4,818,245		4,818,064
	4,818,986		4,817,800		4,818,405		4,819,098		4,818,333		4,818,103
	4,819,051		4,817,831		4,818,412		4,819,139		4,818,360		4,818,141
	4,819,053		4,817,834		4,818,418		4,819,141		4,818,436		4,818,216
	4,819,205		4,817,848		4,818,468		4,819,147		4,818,518		4,818,229
05 :	4,817,321		4,817,850		4,818,470		4,819,153		4,818,549		4,818,284
	4,817,551		4,817,868		4,818,475		4,819,159		4,818,615		4,818,419
	4,817,560		4,817,905		4,818,527		4,819,165		4,818,637		4,818,420
06 :	Re.32,899		4,817,906		4,818,529		4,819,166		4,818,639		4,818,534
	4,817,212		4,817,917		4,818,530		4,819,167		4,818,681		4,818,541
	4,817,218		4,817,943		4,818,536		4,819,190		4,818,730		4,818,595
	4,817,224		4,817,953		4,818,537		4,819,196		4,818,778		4,818,630
	4,817,229		4,817,957		4,818,550		4,819,200		4,818,875		4,818,686
	4,817,237		4,817,971		4,818,561		4,819,223		4,818,905		4,818,725
	4,817,264		4,817,978		4,818,607		4,819,227		4,818,916		4,818,833
	4,817,266		4,817,979		4,818,617		4,819,228		4,818,928		4,818,843
	4,817,269		4,817,991		4,818,625		4,819,238		4,818,972		4,818,901
	4,817,284		4,817,996		4,818,638		4,819,263		4,819,116		4,818,975
	4,817,312		4,818,011		4,818,649		4,819,267		4,819,122		4,819,005
	4,817,323		4,818,037		4,818,677		4,819,269		4,819,176		4,819,018
	4,817,325		4,818,048		4,818,678		4,819,270		4,819,216	13 :	4,817,353
	4,817,326		4,818,062		4,818,693	08 :	4,817,235		4,819,217		4,817,412
	4,817,329		4,818,072		4,818,700		4,817,302	10 :	4,817,435		4,817,514
	4,817,359		4,818,079		4,818,701		4,817,346		4,818,277		4,817,689
	4,817,369		4,818,084		4,818,702		4,817,423		4,818,278		4,817,949
	4,817,388		4,818,086		4,818,711		4,817,448		4,818,337		4,818,015
	4,817,432		4,818,089		4,818,712		4,817,655		4,818,435		4,818,060
	4,817,451		4,818,091		4,818,714		4,817,711		4,818,454		4,818,294
	4,817,452		4,818,098		4,818,723		4,817,818		4,818,660		4,818,311
	4,817,465		4,818,109		4,818,743		4,817,861		4,818,688		4,818,464
	4,817,477		4,818,110		4,818,753		4,818,051		4,818,734		4,818,543

	4,818,585		4,818,143		4,817,947		4,817,450		4,818,514		4,818,370
	4,818,597	21 :	4,817,234		4,817,999		4,817,476		4,818,528		4,818,442
	4,818,600		4,817,784		4,818,009		4,817,563		4,818,636		4,818,516
15 :	4,817,950		4,817,882		4,818,010		4,817,650		4,818,650		4,818,548
	4,818,974		4,817,945		4,818,013		4,817,663		4,818,684		4,818,745
16 :	4,817,837		4,818,200		4,818,014		4,817,685		4,818,739		4,818,800
	4,818,256		4,818,542		4,818,017		4,817,809		4,818,741		4,818,997
	4,818,957		4,818,709		4,818,019		4,817,935		4,818,770		4,819,105
17 :	Re.32,900	22 :	4,817,243		4,818,031		4,817,954		4,818,828		4,819,214
	Re.32,901		4,817,395		4,818,035		4,817,958		4,818,885	41 :	4,817,221
	4,817,216		4,817,415		4,818,045		4,817,961		4,818,943		4,817,260
	4,817,231		4,817,553		4,818,100		4,817,975		4,818,953		4,817,303
	4,817,261		4,817,554		4,818,162		4,818,053		4,818,955		4,817,304
	4,817,262		4,817,725		4,818,164		4,818,058		4,818,990		4,817,340
	4,817,270		4,817,739		4,818,230		4,818,120		4,819,016		4,817,480
	4,817,272		4,818,146		4,818,264		4,818,135		4,819,021		4,817,783
	4,817,274		4,818,243		4,818,303		4,818,211		4,819,026		4,818,056
	4,817,310		4,818,603		4,818,361		4,818,241		4,819,031		4,818,263
	4,817,316		4,818,752		4,818,378		4,818,271		4,819,038		4,818,285
	4,817,348		4,818,888		4,818,437		4,818,275		4,819,073		4,818,287
	4,817,361	23 :	4,818,586		4,818,438		4,818,276		4,819,126		4,818,932
	4,817,459	24 :	4,817,377		4,818,620		4,818,318		4,819,138		4,819,049
	4,817,461		4,817,393		4,818,628		4,818,334		4,819,185		4,819,076
	4,817,475		4,817,394		4,818,697		4,818,350		4,819,218	42 :	4,817,258
	4,817,519		4,817,762		4,818,707		4,818,369		4,819,258		4,817,344
	4,817,527		4,818,116		4,818,717		4,818,373		4,819,265		4,817,392
	4,817,535		4,818,136		4,818,779		4,818,386		4,819,268		4,817,403
	4,817,544		4,818,265		4,818,792		4,818,389		4,819,271		4,817,424
	4,817,561		4,818,335		4,818,823		4,818,415	37 :	4,817,263		4,817,441
	4,817,582		4,818,434		4,818,834		4,818,421		4,817,364		4,817,464
	4,817,583		4,818,661		4,818,849		4,818,422		4,817,635		4,817,536
	4,817,611		4,818,737		4,818,920		4,818,426		4,817,679		4,817,565
	4,817,628		4,818,949		4,818,947		4,818,463		4,817,695		4,817,673
	4,817,649		4,818,982		4,819,107		4,818,480		4,817,743		4,817,742
	4,817,693	25 :	4,817,440		4,819,117		4,818,481		4,817,782		4,817,777
	4,817,731		4,817,457		4,819,130		4,818,510		4,817,808		4,817,781
	4,817,746		4,817,460		4,819,142		4,818,520		4,817,815		4,817,832
	4,817,770		4,817,556		4,819,225		4,818,522		4,817,959		4,817,852
	4,817,794		4,817,598	27 :	4,817,322		4,818,523		4,818,258		4,817,889
	4,817,812		4,817,600		4,817,324		4,818,526		4,818,274		4,817,893
	4,817,853		4,817,623		4,817,504		4,818,539		4,818,316		4,817,894
	4,817,864		4,817,624		4,817,509		4,818,540		4,818,443		4,817,908
	4,817,870		4,817,902		4,817,512		4,818,642		4,818,533		4,817,912
	4,817,913		4,817,916		4,817,539		4,818,647		4,818,538		4,817,920
	4,817,914		4,817,964		4,817,608		4,818,679		4,818,750		4,817,941
	4,817,931		4,817,989		4,817,627		4,818,689		4,818,759		4,817,980
	4,817,967		4,818,040		4,817,634		4,818,699		4,819,118		4,818,001
	4,817,969		4,818,044		4,817,643		4,818,721	39 :	4,817,210		4,818,105
	4,817,983		4,818,087		4,817,652		4,818,738		4,817,211		4,818,152
	4,817,995		4,818,137		4,817,671		4,818,749		4,817,278		4,818,222
	4,818,032		4,818,173		4,817,688		4,818,757		4,817,290		4,818,237
	4,818,041		4,818,174		4,817,779		4,818,802		4,817,307		4,818,293
	4,818,071		4,818,344		4,817,795		4,818,803		4,817,318		4,818,300
	4,818,108		4,818,433		4,817,799		4,818,819		4,817,350		4,818,301
	4,818,151		4,818,488		4,817,816		4,818,824		4,817,351		4,818,302
	4,818,157		4,818,576		4,817,830		4,818,922		4,817,357		4,818,349
	4,818,168		4,818,624		4,817,872		4,818,970		4,817,358		4,818,355
	4,818,348		4,818,627		4,818,119		4,819,039		4,817,363		4,818,392
	4,818,366		4,818,634		4,818,183		4,819,061		4,817,365		4,818,402
	4,818,368		4,818,645		4,818,261		4,819,101		4,817,378		4,818,404
	4,818,397		4,818,658		4,818,382		4,819,137		4,817,482		4,818,416
	4,818,407		4,818,680		4,818,565		4,819,235		4,817,510		4,818,471
	4,818,413		4,818,687		4,818,577		4,819,253		4,817,579		4,818,473
	4,818,506		4,818,703		4,818,589	35 :	4,817,379		4,817,585		4,818,476
	4,818,551		4,818,742		4,818,610		4,817,434		4,817,593		4,818,477
	4,818,629		4,818,866		4,818,694		4,817,494		4,817,788		4,818,478
	4,818,780		4,818,891		4,818,726		4,819,135		4,817,833		4,818,484
	4,818,789		4,818,893		4,818,801	36 :	4,817,228		4,817,890		4,818,491
	4,818,984		4,818,915		4,818,831		4,817,232		4,817,922		4,818,493
	4,819,007		4,818,942		4,818,837		4,817,233		4,818,016		4,818,509
	4,819,009		4,818,963		4,818,899		4,817,285		4,818,082		4,818,532
	4,819,120		4,818,968		4,818,994		4,817,313		4,818,094		4,818,562
	4,819,129		4,818,969		4,819,094		4,817,345		4,818,118		4,818,567
	4,819,140		4,818,979		4,819,111		4,817,368		4,818,171		4,818,593
	4,819,146		4,818,988		4,819,156		4,817,642		4,818,191		4,818,685
	4,819,226		4,818,998		4,819,162		4,817,699		4,818,203		4,818,713
	4,819,237		4,819,000	28 :	4,818,439		4,817,709		4,818,212		4,818,729
	4,819,249		4,819,013		4,818,951		4,817,747		4,818,312		4,818,755
18	4,817,297		4,819,059	29 :	4,817,227		4,817,769		4,818,364		4,818,767
	4,817,298		4,819,154		4,817,599		4,817,785		4,818,367		4,818,774
	4,817,604		4,819,234		4,817,658		4,817,803		4,818,410		4,818,796
	4,817,640		4,819,256		4,818,006		4,817,819		4,818,414		4,818,909
	4,817,765		3,904,039		4,818,233		4,817,826		4,818,513		4,818,912
	4,817,810	26	4,817,239		4,818,257		4,817,839		4,818,555		4,818,929
	4,817,820		4,817,240		4,818,270		4,817,842		4,818,558		4,818,945
	4,817,841		4,817,255		4,818,320		4,817,854		4,818,569		4,818,976
	4,817,909		4,817,301		4,818,365		4,817,860		4,818,578		4,818,977
	4,818,399		4,817,317		4,818,483		4,817,911		4,818,598		4,818,980
	4,818,486		4,817,319	31 :	4,817,727		4,817,948		4,818,641		4,819,006
	4,818,531		4,817,463		4,818,494		4,817,966		4,818,708		4,819,015
	4,818,706		4,817,468	32 :	4,817,330		4,818,021		4,818,732		4,819,041
	4,819,056		4,817,471		4,818,822		4,818,088		4,818,917		4,819,114
	4,819,136		4,817,473	33 :	4,817,438		4,818,132		4,818,938		4,819,119
	4,819,252		4,817,506		4,817,580		4,818,155		4,819,115		4,819,148
19 :	4,817,244		4,817,513		4,817,601		4,818,187		4,819,149		4,819,150
	4,817,370		4,817,523		4,817,851		4,818,260		4,819,177		4,819,155
	4,817,405		4,817,616		4,818,080		4,818,266		4,819,195		4,819,168
	4,817,728		4,817,629		4,818,133		4,818,286		4,819,247		4,819,179
	4,817,730		4,817,632		4,818,213		4,818,322		4,819,248		4,819,183
	4,817,732		4,817,645		4,818,827		4,818,332		4,526,828		4,819,233
	4,818,043		4,817,684		1,029,513		4,818,342	40 :	4,817,337		4,819,246
	4,818,304		4,817,705	34 :	4,817,209		4,818,359		4,817,437	44	4,818,357
	4,818,862		4,817,735		4,817,279		4,818,455		4,817,715		4,819,152
	4,818,989		4,817,824		4,817,306		4,818,460		4,817,721	45 :	4,817,254
20 :	4,817,581		4,817,828		4,817,416		4,818,508		4,817,723		4,818,775
	4,817,796		4,817,929		4,817,419		4,818,512		4,818,197	47 :	4,817,343

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4,818,073	4,817,714	4,818,398	4,818,590	4,817,524	4,817,508
4,818,139	4,817,716	4,818,400	4,818,854	4,817,526	4,817,511
4,818,185	4,817,717	4,816,401	4,818,937	4,817,528	4,817,564
4,818,385	4,817,718	4,818,507	50 : 4,817,584	4,817,618	4,817,566
4,818,448	4,817,719	4,818,584	4,818,240	4,817,621	4,817,577
4,818,485	4,817,720	4,818,604	4,816,295	4,817,845	4,817,637
48 : 4,817,213	4,817,722	4,818,727	4,818,820	4,817,874	4,817,823
4,817,217	4,817,724	4,818,786	51 : 4,817,495	4,817,928	4,817,994
4,817,273	4,817,740	4,818,798	4,817,537	4,817,934	4,818,170
4,817,282	4,817,745	4,818,799	4,817,636	4,817,976	4,818,208
4,817,295	4,817,787	4,818,859	4,817,638	4,818,025	4,818,225
4,817,335	4,817,836	4,818,897	4,817,744	4,818,099	4,818,329
4,817,342	4,817,862	4,818,900	4,817,807	4,818,101	4,818,336
4,817,518	4,817,895	4,818,946	4,818,232	4,818,140	4,818,353
4,817,531	4,817,944	4,818,999	4,818,384	4,818,154	4,818,383
4,817,555	4,817,962	4,819,040	4,818,411	4,818,194	4,818,592
4,817,567	4,817,974	4,819,047	4,818,944	4,818,479	4,818,696
4,817,587	4,817,997	4,819,052	4,819,134	4,818,495	4,818,840
4,817,588	4,818,034	4,819,068	4,819,199	4,818,559	4,818,895
4,817,633	4,818,055	4,819,070	4,819,239	4,818,632	4,818,918
4,817,653	4,818,138	4,819,164	4,819,262	4,818,839	4,818,967
4,817,661	4,818,145	4,819,191	53 : 4,817,292	4,818,992	4,819,042
4,817,667	4,818,201	4,819,251	4,817,360	54 : 4,817,786	4,817,328
4,817,668	4,818,249	4,436,519	4,817,382	4,818,482	56 : 4,817,835
4,817,669	4,818,250	49 : 4,817,791	4,817,391	4,818,776	

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01 : 300,551	300,552	11 : 300,493	300,519	300,538	40 : 300,526
04 : 300,521	300,558	12 : 300,540	18 : 300,557	34 : 300,494	300,562
06 : 300,496	300,560	300,563	300,571	36 : 300,484	42 : 300,534
300,507	300,561	13 : 300,348	24 : 300,501	300,566	47 : 300,550
300,508	300,572	300,578	25 : 300,489	300,579	300,555
300,516	300,573	17 : 300,480	26 : 300,483	37 : 300,524	300,570
300,522	300,574	300,502	300,536	300,577	48 : 300,520
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01 : H616	06 : H620	H621	39 : H618	48 : H624	51 : H613
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H630	17 : H619	34 : H629	H627		

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Robert A. Mosbacher, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

The withdrawal of the Norwegian declaration under PCT Article 64(1)(a), that Norway shall not be bound by PCT Chapter II, as from Jan. 1, 1989, was announced at 1096 O.G. 34 on Nov. 22, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Oct. 26, 1988.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on April 8, 1986 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,580,296 through 4,581,770
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 6, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,322,858 through 4,324,002
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and 7 years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant . . . $ 445.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 445.00
By other than a small entity . . . . . $ 890.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 22, 1989, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,494,246	06/381,558	1/22/85
4,494,248	06/379,183	1/22/85
4,494,249	06/519,919	1/22/85
4,494,251	06/374,595	1/22/85
4,494,258	06/415,084	1/22/85
4,494,275	06/401,217	1/22/85
4,494,276	06/354,675	1/22/85
4,494,284	06/266,617	1/22/85
4,494,285	06/488,454	1/22/85
4,494,297	06/427,305	1/22/85
4,494,299	06/445,622	1/22/85
4,494,309	06/540,405	1/22/85
4,494,312	06/415,429	1/22/85
4,494,313	06/462,578	1/22/85
4,494,317	06/492,413	1/22/85
4,494,323	06/374,074	1/22/85
4,494,328	06/520,893	1/22/85
4,494,333	06/505,362	1/22/85
4,494,342	06/451,980	1/22/85
4,494,344	06/487,658	1/22/85
4,494,349	06/402,777	1/22/85
4,494,351	06/409,228	1/22/85
4,494,352	06/283,021	1/22/85
4,494,358	06/356,583	1/22/85
4,494,360	06/341,992	1/22/85
4,494,370	06/457,884	1/22/85
4,494,371	06/521,601	1/22/85
4,494,373	06/378,580	1/22/85
4,494,380	06/602,193	1/22/85
4,494,384	06/553,490	1/22/85
4,494,398	06/465,916	1/22/85
4,494,402	06/414,979	1/22/85
4,494,407	06/376,332	1/22/85
4,494,410	06/466,838	1/22/85
4,494,416	06/416,885	1/22/85
4,494,421	06/360,772	1/22/85
4,494,422	06/418,858	1/22/85
4,494,426	06/496,614	1/22/85
4,494,431	06/375,874	1/22/85
4,494,434	06/394,504	1/22/85
4,494,442	06/363,569	1/22/85
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4,494,477	06/400,419	1/22/85
4,494,483	06/563,699	1/22/85
4,494,492	06/482,361	1/22/85
4,494,510	06/379,844	1/22/85
4,494,533	06/366,096	1/22/85
4,494,537	06/386,396	1/22/85
4,494,553	06/250,068	1/22/85
4,494,558	06/427,956	1/22/85
4,494,559	06/464,136	1/22/85
4,494,563	06/441,311	1/22/85
4,494,571	06/439,701	1/22/85
4,494,576	06/511,485	1/22/85
4,494,586	06/328,537	1/22/85
4,494,594	06/299,999	1/22/85
4,494,600	06/526,392	1/22/85
4,494,605	06/329,906	1/22/85
4,494,613	06/357,270	1/22/85
4,494,615	06/314,466	1/22/85
4,494,625	06/518,702	1/22/85
4,494,627	06/490,375	1/22/85
4,494,629	06/406,983	1/22/85
4,494,631	06/424,060	1/22/85
4,494,632	06/477,816	1/22/85
4,494,643	06/320,683	1/22/85
4,494,661	06/351,259	1/22/85
4,494,667	06/478,174	1/22/85
4,494,669	06/447,683	1/22/85
4,494,670	06/526,652	1/22/85
4,494,672	06/522,539	1/22/85
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4,494,676	06/283,560	1/22/85
4,494,683	06/426,172	1/22/85
4,494,686	06/495,939	1/22/85
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4,494,694	06/425,181	1/22/85
4,494,698	06/508,072	1/22/85
4,494,710	06/547,957	1/22/85
4,494,714	06/446,656	1/22/85
4,494,718	06/387,862	1/22/85
4,494,719	06/461,828	1/22/85
4,494,724	06/422,448	1/22/85
4,494,725	06/462,210	1/22/85
4,494,733	06/466,346	1/22/85
4,494,736	06/404,715	1/22/85
4,494,738	06/356,219	1/22/85
4,494,740	06/506,100	1/22/85
4,494,749	06/272,884	1/22/85
4,494,752	06/484,071	1/22/85
4,494,753	06/497,605	1/22/85
4,494,755	06/454,321	1/22/85
4,494,766	06/456,272	1/22/85
4,494,770	06/498,105	1/22/85
4,494,784	06/327,759	1/22/85
4,494,785	06/505,835	1/22/85
4,494,804	06/315,412	1/22/85
4,494,810	06/493,487	1/22/85
4,494,818	06/529,419	1/22/85
4,494,819	06/566,699	1/22/85
4,494,822	06/389,682	1/22/85
4,494,827	06/435,522	1/22/85
4,494,829	06/420,581	1/22/85
4,494,831	06/319,619	1/22/85
4,494,835	06/403,596	1/22/85
4,494,837	06/488,085	1/22/85
4,494,860	06/518,644	1/22/85
4,494,869	06/391,078	1/22/85
4,494,870	06/263,785	1/22/85
4,494,875	06/328,864	1/22/85
4,494,894	06/473,294	1/22/85
4,494,896	06/460,278	1/22/85
4,494,899	06/372,542	1/22/85
4,494,901	06/404,198	1/22/85
4,494,903	06/385,447	1/22/85
4,494,912	06/419,011	1/22/85
4,494,926	06/522,052	1/22/85
4,494,927	06/493,248	1/22/85
4,494,936	06/600,225	1/22/85
4,494,949	06/456,751	1/22/85
4,494,960	06/626,597	1/22/85
4,494,964	06/597,023	1/22/85
4,494,979	06/387,951	1/22/85
4,494,981	06/525,061	1/22/85
4,494,982	06/548,178	1/22/85
4,494,986	06/292,953	1/22/85
4,494,989	06/399,916	1/22/85
4,495,004	06/543,727	1/22/85
4,495,010	06/460,504	1/22/85
4,495,015	06/528,675	1/22/85
4,495,021	06/535,909	1/22/85
4,495,034	06/373,154	1/22/85
4,495,045	06/589,155	1/22/85
4,495,057	06/376,251	1/22/85
4,495,071	06/478,313	1/22/85
4,495,072	06/469,546	1/22/85
4,495,077	06/461,730	1/22/85
4,495,079	06/487,306	1/22/85
4,495,096	06/275,014	1/22/85
4,495,113	06/381,557	1/22/85
4,495,114	06/571,431	1/22/85
4,495,131	06/430,994	1/22/85
4,495,135	06/406,374	1/22/85
4,495,147	06/227,507	1/22/85
4,495,148	06/457,145	1/22/85
4,495,151	06/394,473	1/22/85
4,495,155	06/496,893	1/22/85
4,495,159	06/398,832	1/22/85
4,495,184	06/496,673	1/22/85
4,495,185	06/436,801	1/22/85
4,495,188	06/324,425	1/22/85
4,495,190	06/436,522	1/22/85
4,495,191	06/477,080	1/22/85
4,495,199	06/432,397	1/22/85
4,495,213	06/431,072	1/22/85
4,495,214	06/566,181	1/22/85
4,495,217	06/369,594	1/22/85
4,495,228	06/442,120	1/22/85
4,495,230	06/509,303	1/22/85
4,495,233	06/576,319	1/22/85
4,495,246	06/545,938	1/22/85
4,495,279	06/402,352	1/22/85
4,495,280	06/265,276	1/22/85
4,495,291	06/241,226	1/22/85
4,495,297	06/507,829	1/22/85
4,495,302	06/517,400	1/22/85
4,495,307	06/551,063	1/22/85
4,495,320	06/498,622	1/22/85
4,495,348	06/324,475	1/22/85
4,495,350	06/417,744	1/22/85
4,495,351	06/451,539	1/22/85
4,495,354	06/363,332	1/22/85
4,495,355	06/448,505	1/22/85
4,495,358	06/438,658	1/22/85
4,495,373	06/582,565	1/22/85
4,495,375	06/531,718	1/22/85
4,495,388	06/624,272	1/22/85
4,495,423	06/300,731	1/22/85
4,495,428	06/386,157	1/22/85
4,495,446	06/452,910	1/22/85
4,495,464	06/380,747	1/22/85
4,495,466	06/366,732	1/22/85
4,495,467	06/286,198	1/22/85
4,495,475	06/337,920	1/22/85
4,495,481	06/393,810	1/22/85
4,495,484	06/337,833	1/22/85
4,495,486	06/626,231	1/22/85
4,495,491	06/561,125	1/22/85
4,495,499	06/299,656	1/22/85
4,495,501	06/373,084	1/22/85
4,495,502	06/343,042	1/22/85
4,495,505	06/493,387	1/22/85
4,495,517	06/289,602	1/22/85
4,495,518	06/433,002	1/22/85
4,495,531	06/473,375	1/22/85

Patent Number	Serial Number	Issue Date
4,495,532	06/465,097	1/22/85
4,495,535	06/333,981	1/22/85
4,495,540	06/453,131	1/22/85
4,495,542	06/545,063	1/22/85
4,495,543	06/551,837	1/22/85
4,495,547	06/365,917	1/22/85
4,495,550	06/603,364	1/22/85
4,495,552	06/448,935	1/22/85
4,495,557	06/330,848	1/22/85
4,495,558	06/392,118	1/22/85
4,495,573	06/363,389	1/22/85
4,495,581	06/312,530	1/22/85
4,495,587	06/328,345	1/22/85
4,495,612	06/371,167	1/22/85
4,495,613	06/613,332	1/22/85
4,495,617	06/416,312	1/22/85
4,495,622	06/377,844	1/22/85
4,495,623	06/414,094	1/22/85
4,495,637	06/491,297	1/22/85
4,495,641	06/512,345	1/22/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,063,311, Re. S.N. 306,754, Filed Feb. 6, 1989, Cl. 350/357, ELECTROCHROMIC DEVICE, Mino Green, Owner of Record: *Inventor,* Attorney or Agent: Watson T. Scott, Ex. Gp.: 252

4,311,421, Re. S.N. 307,522, Filed Feb. 8, 1989, Cl. 411/059, FASTENER, Katsuo Sato, et al., Owner of Record: *Kato Hatsujou Kabushiki Kaisha; Nissan Jidosha Kabushiki Kaisha, Kanagawa, Japan,* Attorney or Agent: Mitchell W. Shapiro, Ex. Gp.: 358

4,533,408, Re. S.N. 304,150, Filed Jan. 31, 1989, Cl. 148/103, PREPARATION OF HARD MAGNETIC ALLOYS OF A TRANSITION METAL AND LANTHANIDE, Norman C. Koon, Owner of Record: *United States of America as Represented by the Secretary of the Navy,* Attorney or Agent: Thomas E. McDonnell, Ex. Gp.: 111

4,611,244, Re. S.N. 242,316, Filed Sept. 6, 1988, Cl. 358/227, AUTO-FOCUS SYSTEM FOR VIDEO CAMERA, Kentara Hanma, et al., Owner of Record: *Inventor,* Attorney or Agent: Gregory E. Montone, Ex. Gp.: 262

4,617,158, Re. S.N. 296,714, Filed Jan. 13, 1989, Cl. 264/0.5, PROCESS FOR TREATING A METAL OXIDE POWDER, Camille Braun, et al., Owner of Record: *Commissariata l'Energie Atomique, Paris, France,* Attorney or Agent: Norman F. Oblon, Ex. Gp.: 223

4,639,580, Re. S.N. 302,207, Filed Jan. 26, 1989, Cl. 219/541, COUPLING DEVICES FOR USE WITH ELECTROFUSION FITTING OF THERMOPLASTIC MATERIAL, Alan Johnson, Owner of Record: *British Gas P.L.C., London, England,* Attorney or Agent: Thomas P. Sarro, Ex. Gp.: 216

4,640,117, Re. S.N. 305,381, Filed Feb. 1, 1989, Cl. 072/410, CRIMPING TOOL, J. Edward C. Anderson, et al., Owner of Record: *The Bares Group, Chagrin Falls, Ohio,* Attorney or Agent: Thomas E. Fisher, Ex. Gp.: 321

4,640,605, Re. S.N. 306,609, Filed Feb. 3, 1989, Cl. 355/004, APPARATUS FOR FORMING MULTICOLOR ELECTROPHOTOGRAPHIC IMAGES THROUGH WET-TYPE DEVELOPING PROCESS, Kenzo Ariyama, et al., Owner of Record: *Ricoh Co., Ltd., Tokyo, Japan,* Attorney or Agent: Guy M. Shoup, Ex. Gp.: 215

4,641,026, Re. S.N. 308,696, Filed Feb. 3, 1989, Cl. 250/229, OPTICALLY ACTIVATED KEYBOARD FOR DIGITAL SYSTEM, Felix Garcia, Jr., Owner of Record: *Texas Instruments Inc., Dallas, Tex.,* Attorney or Agent: Jay M. Cantor, Ex. Gp.: 255

4,642,495, Re. S.N. 308,022, Filed Feb. 9, 1989, Cl. 310/052, ELECTRIC ROTARY MACHINE HAVING SUPERCONDUCTING ROTOR, Yutaka Fukui, et al., Owner of Record: *Inventor,* Attorney or Agent: William I. Solomon, Ex. Gp.: 212

4,642,629, Re. S.N. 303,631, Filed Jan. 27, 1989, Cl. 340/825.03, ENHANCED DISTANCE DATA TRANSMISSION SYSTEM, James H. Milligan, Owner of Record: *Megabit Communications Inc., Little Canada, Minn.,* Attorney or Agent: Robert C. Baker, Ex. Gp.: 264

4,642,635, Re. S.N. 308,762, Filed Feb. 9, 1989, Cl. 379/107, REMOTE METER READING SYSTEM, Alvin A. Snaper, Owner of Record: *Inventor,* Attorney or Agent: James W. Paul, Ex. Gp.: 261

4,654,090, Re. S.N. 304,671, Filed Jan. 31, 1989, Cl. 148/01.5, SELECTIVE DISORDERING OF WELL STRUCTURES BY LASER ANNEALING, Robert D. Burnham, et al., Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: W. Douglas Carothers, Jr., Ex. Gp.: 111

4,690,223, Re. S.N. 302,965, Filed Jan. 30, 1989, Cl. 172/44, ROD WEEDER ATTACHMENT FOR AN AGRICULTURAL IMPLEMENT, Diane C. Haukass, Owner of Record: *Inventor,* Attorney or Agent: Adrian D. Battison, Ex. Gp.: 331

4,712,189, Re. S.N. 304,118, Filed Jan. 31, 1989, Cl. 364/900, TABLE DRIVEN TRANSLATOR, Shunji Mohri, Owner of Record: *Hitachi Ltd., Tokyo, Japan,* Attorney or Agent: Donald E. Stout, Ex. Gp.: 231

4,717,215, Re. S.N. 307,759, Filed Feb. 7, 1989, Cl. 312/184, FILING MODULE, Kenneth A. Everts, Owner of Record: *St. Reve, Ltd., Westwood, Miss.,* Attorney or Agent: William R. McClellan, Ex. Gp.: 357

4,718,570, Re. S.N. 309,298, Filed Feb. 13, 1989, Cl. 220/253, DISPENSER FOR PASTRY COMPOSITIONS, Horst Diener, Owner of Record: *Vita Zahnfabrik H. Rauter GmbH and Co., Rickenbach, Germany,* Attorney or Agent: Charles L. Hartman, Ex. Gp.: 311

4,721,381, Re. S.N. 284,136, Filed Dec. 14, 1988, Cl. 355/14R, DUPLEX COPYING APPARATUS, Hirokazu Matsuo, Owner of Record: *Minolta Camera Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: Joseph W. Price, Ex. Gp.: 215

4,724,240, Re. S.N. 305,667, Filed Feb. 3, 1989, Cl. 514/847, LATTICE-ENTRAPPED EMOLLIENT-MOISTURIZER COMPOSITION, Eric S. Abrutyn, Owner of Record: *Wickhen Products Inc., Huguenot, New York,* Attorney or Agent: Jim L. Decesar, Ex. Gp.: 125

4,734,851, Re. S.N. 305,851, Filed Feb. 2, 1989, Cl. 364/200, WRITE, PROTECT CONTROL CIRCUIT FOR COMPUTER HARD DISC SYSTEMS, Dennis Director, Owner of Record: *Inventor,* Attorney or Agent: Patrick G. Burns, Ex. Gp.: 231

4,738,731, Re. S.N. 302,306, Filed Jan. 23, 1989, Cl. 148/18, METHOD OF HEAT TREATING METAL USING A WASHABLE SYNTHETIC QUENCHANT, Robert W. Foreman, et al., Owner of Record:

Park Chemical Co., Detroit, Mich., Attorney or Agent: Ronald W. Citkowski, Ex. Gp.: 111

4,741,686, Re. S.N. 318,142, Filed Mar. 2, 1989, Cl. 424/381, EXTRUSION DIE FOR PLASTIC MATERIAL, Gilberto Cazzani, Owner of Record: *Omipa Italia S.N.C. Di Cazzon Gilbert and Co., Morazzono, Italy,* Attorney or Agent: Robert J. Patch, Ex. Gp.: 135

4,747,122, Re. S.N. 306,548, Filed Feb. 6, 1989, Cl. 379/057, MOBILE PAGING CALL BACK SYSTEM AND RELATED METHOD, Jai P. Bhagat, et al., Owner of Record: *Com/Nav Marine Inc., Jackson, Miss.*, Attorney or Agent: Unknown, Ex. Gp.: 261

4,750,371, Re. S.N. 302,603, Filed Jan. 27, 1989, Cl. 73/862.36, TORQUE SENSOR FOR DETECTING A SHAFT TORQUE AND AN ELECTRIC MACHINE IN WHICH THE TORQUE SENSOR IS MOUNTED, Tadahiko Kobayashi, et al., Owner of Record: *Kabushiki Kaisa Toshiba, Kawasaki, Japan,* Attorney or Agent: Gregory J. Maier, Ex. Gp.: 268

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,956,327, Reexam. No. 90/001,720, Requested: Feb. 23, 1989, Cl. 260/256.4, METHOD OF PREPARING 2,4-DIAMINO-5-BENZYL PYRIMIDINES, Ronald M. Cresswell, Owner of Record: *Burroughs Wellcome Co., Research Triangle Park, N.C.*, Attorney or Agent: Donald Brown, Ex. Gp.: 120, Requester: Bucknam & Archer, Garden City, N.Y.

4,140,707, Reexam. No. 90/001,716, Requested: Feb. 14, 1989, Cl. 260/429, MALONATO PLATINUM ANTI-TUMOR COMPOUNDS, Michael J. Clare, et al., Owner of Record: *Research Corp Technologies Inc., Tucson, Ariz.*, Attorney or Agent: S. Leslie Misrock, Ex. Gp.: 110, Requester: Owner

4,366,479, Reexam. No. 90/001,714, Requested: Feb. 9, 1989, Cl. 340/825.50, CONTROL INFORMATION-COMMUNICATION METHOD AND SYSTEM THROUGH A COMMON SIGNAL, Kinji Mori, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan,* Attorney or Agent: Unknown, Ex. Gp.: 260, Requester: Owner

4,610,608, Reexam. No. 90/001,717, Requested: Feb. 3, 1989, Cl. 417/413, AIR PUMP CONSTRUCTION, Benton H. Grant, Owner of Record: *Grant Airmass Corp., Stamford, Conn.*, Attorney or Agent: St. Onge, Steward, et al., Ex. Gp.: 350, Requester: Gaymar Industries Inc., Orchard Park, N.Y.

4,617,649, Reexam. No. 90/001,719, Requested: Feb. 23, 1989, Cl. 365/189, ERASABLE FPLA, Mikio Kyomasu, et al., Owner of Record: *Ricoh Co., Tokyo, Japan,* Attorney or Agent: Gregory J. Maier, Ex. Gp.: 230, Requester: Owner

4,726,659, Reexam. No. 90/001,718, Requested: Feb. 21, 1989, Cl. 350/341, DISPLAY DEVICE HAVING DIFFERENT ALIGNMENT LAYERS, Neal D. Conrad, et al., Owner of Record: *GE/RCA Corp., Princeton, N.J.*, Attorney or Agent: Lester L. Hallacher, Ex. Gp.: 250, Requester: Owner

4,767,628, Reexam. No. 90/001,713, Requested: Feb. 8, 1989, Cl. 424/426, CONTINUOUS RELEASE PHARMACEUTICAL COMPOSITION, Francis G. Hutchinson, Owner of Record: *Imperial Chemical Industries, P.L.C., London, England,* Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 180, Requester: Owner

4,769,435, Reexam. No. 90/001,715, Requested: Feb. 13, 1989, Cl. 528/28, PROCESS FOR THE MANUFACTURE OF THERMOPLASTIC POLYURETHANES, Gianflavio Lunardon, et al., Owner of Record: *Ausimont S.P.A., Milan, Italy,* Attorney or Agent: Stevens, Davis, et al., Ex. Gp.: 150, Requester: The Dow Chemical Co., North Havien, Conn.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Windsor Communications Group, Inc., Dover, Del., Reg. No. 967,583 for the mark "SMALL WONDERS", Canc. No. 17,247.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Patents Available for Licensing or Sale

4,135,596. HOSE TRAY FOR LIQUID TRANSPORTER. *Glen R. Silba*, R.R. 7, Box 357A, Springfield, Mo. 65802.

4,185,407. DISPLAY DEVICE ELECTRIC OR BATTERY RUN. *Jack W. Lamb*, 10822 Magnolia Blvd., #142, North Hollywood, Calif. 91601.

4,266,112. WEB-CUTTING PROCESS. *William P. Niedermeyer*, 1024 Mount Mary Dr., Green Bay, Wis. 54301.

4,497,854. ARTIFICIAL CROSS-COUNTRY SKI SURFACE. *John R. Mykrantz*, 6510 Page Blvd., St. Louis, Mo. 63133.

4,505,902. SKIN TREATMENT PREPARATION. *Mary Alice Millard*, 2068 Belover Dr., Memphis, Tenn. 38127.

4,531,696. KNIFE HOLDER AND CARRYING CASE. David L. Garrison, Garrison & Stratton P.S., 2100 Fifth Ave. Bldg., Seattle, Wash. 98121.

4,538,312. PLAYPEN PAD COVER. *Gabriella Marki*, A-7100 Neusiedl am See, Kellergasse 8a, Austria, Europe.

4,576,178. AUDIO SIGNAL GENERATOR. Guy W. Shoup, Wyatt, Gerber, Shoup & Badie, One Rockefeller Plz., New York, N.Y. 10020.

4,791,300. MINIATURE GAMMA CAMERA. *Stephen Sheltzer*, QTR Corp., 1709 Glastonberry Rd., Rockville, Md. 20854.

4,792,399. LIQUID COLLECTING AND RETAINING DEVICE. *Kyle Haney*, P.O. Box 16741, Atlanta, Ga. 30321.

07/158,398. ELECTRONIC DIGITAL DICE II. *Glenn E. Simpson*, 204 N. 3rd St., Libertyville, Ill. 60048.

07/209,313. MEDICAL SHIRT. *Helen Rodriguez*, 345 Sacramento Ave., Spring Valley, Calif. 92077.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 11, 1989

Re. 32,655	4,751,348	4,771,703	4,778,238
D. 294,620	4,752,748	4,771,975	4,778,439
4,540,573	4,752,818	4,771,986	4,778,493
4,559,300	4,754,091	4,772,036	4,778,666
4,576,566	4,755,206	4,772,688	4,779,107
4,633,164	4,755,239	4,772,788	4,779,187
4,633,864	4,757,096	4,772,900	4,779,676
4,638,349	4,758,219	4,772,911	4,779,818
4,645,415	4,758,386	4,772,958	4,779,820
4,652,171	4,760,556	4,773,061	4,780,325
4,659,463	4,760,591	4,773,181	4,780,848
4,670,782	4,761,166	4,773,205	4,780,922
4,673,712	4,761,184	4,773,269	4,781,445
4,684,609	4,761,268	4,773,400	4,781,828
4,684,728	4,762,551	4,773,630	4,781,945
4,705,194	4,762,940	4,773,681	4,782,358
4,710,413	4,763,281	4,773,825	4,783,133
4,710,536	4,763,413	4,773,850	4,784,017
4,712,678	4,764,006	4,773,985	4,784,231
4,715,921	4,764,526	4,774,216	4,784,247
4,717,536	4,764,843	4,774,293	4,784,279
4,722,102	4,765,060	4,774,296	4,784,350
4,724,845	4,766,175	4,774,566	4,784,438
4,729,994	4,766,417	4,774,771	4,784,516
4,734,899	4,766,465	4,775,204	4,784,522
4,734,932	4,766,484	4,775,532	4,784,771
4,735,296	4,767,226	4,775,543	4,785,165
4,735,806	4,767,551	4,775,637	4,785,824
4,737,583	4,767,656	4,775,668	4,785,844
4,738,837	4,768,546	4,775,746	4,786,010
4,738,859	4,768,919	4,776,442	4,786,236
4,738,992	4,769,022	4,776,462	4,786,369
4,739,700	4,769,236	4,776,480	4,786,876
4,739,902	4,769,812	4,776,661	4,787,720
4,740,039	4,769,818	4,776,747	4,788,061
4,740,485	4,770,126	4,777,303	4,788,218
4,740,829	4,770,413	4,777,390	4,788,473
4,741,229	4,770,569	4,777,494	4,788,557
4,741,892	4,770,758	4,777,544	4,788,795
4,744,684	4,770,856	4,777,616	4,789,141
4,748,005	4,770,925	4,777,636	4,789,147
4,749,867	4,771,403	4,777,694	4,789,992
4,751,062	4,771,404	4,778,093	4,797,292

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Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue
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PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

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	Sacramento: California State Library	(916) 322-4572
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Delaware	Newark: University of Delaware Library	(302) 451-2965
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 11, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	8-21-86
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	11-24-86
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	12-18-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	7-7-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	8-12-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during February 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,638,239 to 3,646,613, inclusive

Plant Patents ..... None

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,902

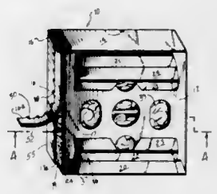
CARTON WITH IMPROVED OPENING STRUCTURE

Morris W. Kuchenbecker, Neenah, Wis., assignor to James River Norwalk, Inc., Norwalk, Conn.

Original No. 4,538,732, dated Sep. 3, 1985, Ser. No. 489,131, Apr. 27, 1983. Continuation of Ser. No. 274,790, Jun. 18, 1981, abandoned. Application for reissue Aug. 20, 1987, Ser. No. 87,262

Int. Cl.⁴ B65D *5/70*

U.S. Cl. 206—613 **6 Claims**



1. In a carton structure formed from paperboard characterized by inclusion of a relatively narrow wall portion to be opened in a controlled and predictable manner by tearing, the combination comprising:

relatively narrow inner and outer flaps folded in overlying relation and adhered to one another along their lengths in formation of said wall portion;

means defining a first cut score line along which said inner flap is folded to form an outside facing edge of the set up carton;

means defining a second cut score line in said inner flap parallel to and intermediate said first cut score line and the free edge of said inner flap;

said inner flap having a first upper surface portion bounded by said first and second cut score lines, a second upper surface portion bounded by said second cut score line and said free edge of said inner flap, said inner flap having a lower surface portion on the side opposite said first and second upper surface portions; the first upper surface portion of the inner flap being separable from the lower surface portion of the inner flap by delamination; and

means defining a line of weakness in said outer flap [coincident with and overlying] *aligned with* said second cut score line, the recited adherence of said flaps to one another being in the region of the first upper surface portion between said cut score lines on said inner flap and between said line of weakness and the free edge of said outer flap;

said outer flap being graspable at one end thereof in a region between said line of weakness and the corresponding free edge portion, and adapted to be pulled away from the lower surface portion and the second surface portion of the underlying inner flap to effect separation of the first upper surface of the inner flap from the second surface portion along the second cut score line and from the lower surface portion between the first and second cut score lines by delamination, the first surface portion of the inner flap remaining adhered to the outer flap during the delamination of the inner flap between said cut score lines, said first cut score line for facilitating said delamination of said inner flap, whereby said carton is opened.

6. In a carton structure formed from paper board characterized by inclusion of a relatively narror wall portion to be opened in a controlled and predictable manner by tearing, the combination comprising:

relatively narrow inner and outer flaps folded in overlying relation and adhered to one another along their lengths in formation of said wall portion;

means defining a first cut score line along which said inner flap is folded to form an outside facing edge of the set up carton;

means defining a second cut score line in said inner flap parallel to and intermediate said first cut score line and the free edge of said inner flap;

said inner flap having a first upper surface portion bounded by said first and second cut score lines, a second upper surface portion bounded by said second cut score line and said free edge of said inner flap, said inner flap having a lower surface portion on the side opposite said first and second upper surface portions; the first upper surface portion of the inner flap being separable from the lower surface portion of the inner flap by delamination; and

means defining a line of weakness in said outer flap [coincident with and overlying] *aligned with* said second cut score line, the recited adherence of said flaps to one another being in the region of the first upper surface portion between said cut score lines on said inner flap and between said line of weakness and the free edge of said outer flap;

said outer flap being graspable at one end thereof in a region between said line of weakness and the corresponding free edge portion, and adapted to be pulled away from the lower surface portion and the second surface portion of the underlying inner flap to effect separation of the first upper surface of the inner flap from the second surface portion along the second cut score line and from the lower surface portion between the first and second cut score lines by delamination, the first surface portion of the inner flap remaining adhered to the outer flap during the delamination of the inner flap between said cut score lines, said first cut score line for facilitating said delamination of said inner flap, whereby said carton is opened;

a notch disposed between said first and second cut score lines in one end of said inner flap, said notch being generally V-shaped and having one leg substantially aligned with said second score line and another leg intersecting the end of said inner flap at a point closely spaced from said first cut score line for ensuring initiation of delamination of said inner flap end in a region between said point and said first cut score line, said notch of the inner flap underlying said one end of said outer flap a sufficient distance from said one end of said outer flap to accommodate grasping said one end of said outer flap and pulling said outer flap away from said inner flap.

Re. 32,903

MOTOR VEHICLE WHEEL CENTER INCLUDING AN ANTI-THEFT FEATURE

Martin Braungart, Alpirsbach, Fed. Rep. of Germany, assignor to BBS Kraftfahrzeugtechnik, GmbH and Co. KG., Schiltach, Fed. Rep. of Germany

Original No. 4,544,209, dated Oct. 1, 1985, Ser. No. 575,011, Jan. 30, 1984. Application for reissue Nov. 13, 1986, Ser. No. 939,512

Claims priority, application European Pat. Off., May 27, 1983, 83105259

Int. Cl.⁴ B60B *7/02, 1/00*

U.S. Cl. 301—37 AT **17 Claims**

1. An improved motor vehicle wheel center apparatus for attachment to the lug bolts of a vehicle axle and including an

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anti-theft feature associated therewith, said apparatus comprising:

a spoke disk member;

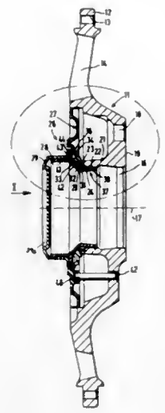
said spoke disk member having a central bore aligned co-axially with respect to the axis of rotation of said wheel;

a plurality of co-axially positioned passage holes formed about the periphery of said central bore and provided to allow for the aligned passage therethrough of said lug bolts for the fastening of same thereabout by aligned corresponding lug nuts to in turn restrainably affix said spoke disk member to the axle wheel hub of said vehicle;

a hub cap member;

said hub cap member consisting of a cover plate having a central aperture and a shaft member passing therethrough;

said cover plate being operably co-axially maintained in a position interposed between said shaft member and said spoke disk member upon the outer surface of said spoke disk member at a position substantially correspondingly shaped to the innermost surface of said cover plate;



said shaft member being operably and removably attachable to the central bore of said spoke disk member through hub cap attachment means operably disposed about the periphery of said shaft member;

said hub cap member being so removably attachable to the outer surface of said spoke disk member to enable said cover plate to cover said lug nuts and bolts;

theft prevention means operably associated with said hub cap member so as to impede undesired removal of said hub cap member from its position about said spoke disk member and in turn impede unauthorized access to said lug nuts;

alignment means operably associated with said cover plate and said spoke disk member so as to maintain consistent restrained orientation and prevent relative rotation therebetween, and;

a plurality of sealing means operably positioned between said hub cap member and said spoke disk member to prevent migration of fluid substances therebetween.

Re. 32,904

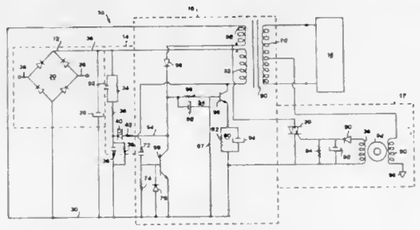
POWER SUPPLY FOR GAS DISCHARGE DEVICES

David R. Pacholok, 437 N. Crystal St., Elgin, Ill. 60120

Original No. 4,613,934, dated Sep. 23, 1986, Ser. No. 637,916, Aug. 6, 1984. Continuation-in-part of Ser. No. 590,868, Mar. 19, 1984, abandoned. Application for reissue Jun. 9, 1988, Ser. No. 204,421

Int. Cl.[4] **H02M** *7/537*

U.S. Cl. 363—131 **20 Claims**



16. A supply circuit for generating high frequency, high voltage output to a gas-filled tube, comprising

a. a transformer having leakage reactance and including a primary winding a feedback winding and a secondary winding connected to the gas-filled tube,

b. a power oscillator connected to said primary and feedback windings, said oscillator including high frequency tube actuation means connected to said primary winding for activating said tube, and means for controlling said tube actuation means connected to said feedback winding and said primary winding, and

c. bypass means connected to said power oscillator and said secondary winding and operable to deactivate said tube actuation means if any loading on said secondary winding becomes unbalanced.

Re. 32,905

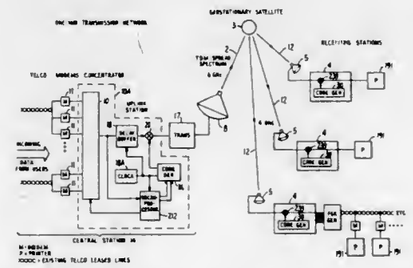
SATELLITE COMMUNICATIONS SYSTEM AND APPARATUS

Paul Baran, Menlo Park, Calif., assignor to Equatorial Communications Company, Mountain View, Calif.

Original No. 4,455,651, dated Jun. 19, 1984, Ser. No. 198,296, Oct. 20, 1980. Continuation of Ser. No. 795,868, Nov. 7, 1985, abandoned. Application for reissue Aug. 3, 1988, Ser. No. 229,737

Int. Cl.[4] **H04J** *3/06;* **H04B** *7/185, 7/19, 7/195*

U.S. Cl. 370—104 **22 Claims**



1. An earth satellite communications system for transmitting data from a plurality of users through a repeating geostationary satellite to a plurality of receiving earth stations, comprising

A central transmitting station receiving data from a plurality of users, said station including

means for converting the format of said data into a form suitable for transmission to a satellite,

means for spread spectrum processing the converted data, and

means for transmitting the spread spectrum processed converted data to a repeating geostationary satellite, and

A plurality of receiving earth stations, each of said receiving earth stations including [wide beamwidth, low gain] antenna means, said antenna means including a *small, in the sense that a dish antenna with a diameter substantially less than 16 feet operating at 4 GHz in a system if which the orbital spacing of the geostationary satellites is 4 degrees is small, and consequently relatively wide beamwidth and concomitant low-gain* fixed directional antenna [having a beamwidth wider than the standard orbital spacing of geostationary satellites, whereby said antenna receives signals from more than one geostationary satellite,] *having, at its operating frequency, a directional radiation pattern, in the sense that a 2 foot dish operating at 4 GHz has a directional radiation pattern, the beamwidth and gain of which pattern depends on the operating frequency and the antenna size,* and

detection means coupled to said antenna means,

said detection means including spread spectrum processing [means,] *means* for recovering data sent to said receiving earth station via said repeating geostationary [satellite] *satellite even if and when the low gain and wide beamwidth of the antenna, resulting from its small size, leads to the reception of signals from said repeating geostationary satellite along with interfering signals from at least one other geostationary satellite, said spread spectrum processing means having a processing gain sufficient to substantially suppress said interfering signal.*

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PLANT PATENTS

GRANTED APRIL 11, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,725

ROSE PLANT JACIENT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Nov. 17, 1987, Ser. No. 121,748
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant and parts thereof of the grandiflora class substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, upright habit, a medium number of prickles, glossy mature foliage and coral pink flowers.

6,726

JAPANESE PEAR TREE

Kitsuo Kanato; Yutaka Machida; Itaru Kozaki, all of Ibaraki; Tsutomu Chiba, Chigasaki; Osamu Kishimoto, Utsunomiya; Kanetsugu Seike, Tokyo; Isao Shimura, Fuchu; Kazuo Kotobuji; Mitsuo Omura, both of Ibaraki; Ichiro Kajiura, Shimizu; Yoshihiko Sato, and Teruo Kozono, both of Ibaraki, all of Japan, assignors to Fruit Tree Research Station, Ministry of Agriculture Forestry and Fisheries, Tsukuba, Japan

Filed Mar. 13, 1987, Ser. No. 25,892
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of Japanese pear tree, substantially as illustrated and described herein, characterized over known Japanese pear trees by (A) having a moderate vigor, an easily maintained moderate spur development, a resistance to black spot disease and no sensitivity to pear necrotic spot disease, (B) being as productive as 'Hosui', (C) being cross-imcompatible with 'Kosui' and being assumed to have a S_4S_5 genotype, (D) having brown young leaves and white large flowers which have a pale red color at the pit at fat bud and bloom middle to late in the season and at almost the same time as 'Nijisseiki', and (E) producing an oblate-shaped fruit (a) maturing early in the season and about two weeks earlier than 'Nijisseiki' and (b) having (1) a large size which is larger than that of 'Nijisseiki' (2) a skin with somewhat large dots, which is covered partly with more russet when cultivated without bagging than shown by 'Nijisseiki' under the same condition, the color of the skin being at early maturity of the yellowish green color identified in the Munsel ® Book of Color as follows:

Hue symbol: 2.5 gy
Chroma: 6
Value: 9,

and at full maturity of the yellow color identified in the Munsel ® Book of Color as follows:

Hue Symbol: 10 y
Chroma: 6
Value: 9,

(3) a white flesh which is soft, crisp and very juicy, with a high sweetness, a low acidity, no astringency, and a slight aromatic flavor, giving an excellent dessert quality, and (4) a normal keeping quality when compared with other cultivars having the same harvesting time as this new variety of Japanese pear tree.

6,727

PRINCETON GOLD

William Flemer, III, Princeton, N.J., assignor to New Plant Associates, Princeton, N.J.

Filed Oct. 5, 1987, Ser. No. 105,271
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of Norway Maple tree substantially as herein shown and described, characterized particularly as to novelty by the unique combination of the bright yellow foliage which foliage remains bright yellow throughout summer months and which yellow foliage is retained without sun scorching or burning during this period, the other characteristics being substantially similar to the usual Norway Maple, but rapid growth being an attribute which is of value in such trees of ornamental nature.

6,728

IMPATIENS PLANT NAMED VANESSA

Ludwig Kientzler, Bad Kreuznach, Fed. Rep. of Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed Nov. 12, 1987, Ser. No. 119,772
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Vanessa, as illustrated and described, and parts thereof.

6,729

IMPATIENS PLANT NAMED PHOEBIS

Ludwig Kientzler, Bad Kreuznach, Fed. Rep. of Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed Nov. 12, 1987, Ser. No. 119,773
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Phoebis, as illustrated and described, and parts thereof.

6,730

IMPATIENS PLANT NAMED SAMIA

Ludwig Kientzler, Bad Kreuznach, Fed. Rep. of Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed Nov. 12, 1987, Ser. No. 119,774
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Samia, as illustrated and described, and parts thereof.

6,731

IMPATIENS PLANT NAMED SELENIA

Ludwig Kientzler, Bad Kreuznach, Fed. Rep. of Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed Nov. 12, 1987, Ser. No. 119,776
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Selenia, as illustrated and described, and parts thereof.

6,732

IMPATIENS PLANT NAMED ADELA

Ludwig Kientzler, Bad Kreuznach, Fed. Rep. of Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed Nov. 12, 1987, Ser. No. 119,800
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Adela, as illustrated and described, and parts thereof.

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6,733
NAVEL ORANGE PLANT NAMED POWELL LATE NAVEL
Clive N. Powell, and Joyce Powell, both of Delta Road, Carlwaa, New South Wales, Australia
Filed Nov. 18, 1987, Ser. No. 122,260
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—45 1 Claim

1. A new and distinct variety of navel orange plant named Powell Late Navel, as herein described and illustrated.

6,734
CHRYSANTHEMUM PLANT NAMED SALMON IMPALA
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 123,901
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct Chrysanthemum plant named Salmon Impala, as described and illustrated, and parts thereof.

6,735
CHRYSANTHEMUM PLANT NAMED GREEN PEAS
Jacques C. M. Van Der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 123,902
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—77 1 Claim

1. A new and distinct cultivar of Chrysanthemum named Green Peas, as illustrated and described, and parts thereof.

6,736
CHRYSANTHEMUM PLANT NAMED KLONDIKE
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 123,903
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Klondike, as illustrated and described, and parts thereof.

6,737
CHRYSANTHEMUM PLANT NAMED BROADWAY
Jacques C. M. Van der Knapp, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 123,904
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Broadway, as illustrated and described, and parts thereof.

PATENTS
GRANTED APR. 11, 1989
ERRATA

For CLASS	See PATENT NO.
062-052	4,819,454
089-046	4,819,518
600-028	4,819,616
600-007	4,819,618
074-089	4,819,743
128-344	4,819,751
128-773	4,819,753
273-138	4,819,818
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272-116	4,819,951
356-401	4,820,055
400-249	4,820,125
411-188	4,820,235
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220-006	4,820,383
423-132	4,820,498
549-214	4,820,758
524-083	4,820,772
546-118	4,820,822
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548-422	4,820,824
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549-078	4,820,827
549-362	4,820,828
556-087	4,820,829
560-158	4,820,830
568-033	4,820,831
540-205	4,820,832
540-220	4,820,833
540-504	4,820,834
540-577	4,820,835
548-512	4,820,836
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362-083	4,821,019
355-014	4,821,052
354-402	4,821,074
358-022	4,821,086
358-034	4,821,087
358-048	4,821,088
364-420	4,821,164
368-255	4,821,257

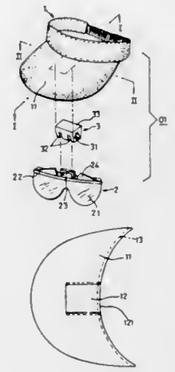
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GRANTED APRIL 11, 1989

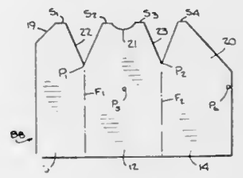
GENERAL AND MECHANICAL

4,819,274
VISOR CAP WITH A DETACHABLE EYE SHIELD
Shenq T. Day, 1 Chung Yang North Road, Ching Shui, Taichung Hsien, Taiwan
Filed Dec. 14, 1987, Ser. No. 132,552
Int. Cl.[4] A42B *1/20, 1/24*
U.S. Cl. 2—10 **3 Claims**



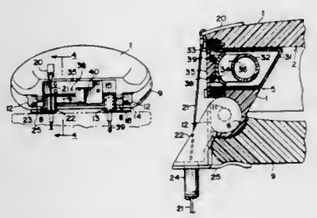
1. A visor cap having a detachable eye shield member, comprising:
a cap body;
a forwardly projecting visor member attached along the rear edge thereof to the cap body, said visor member having formed in the bottom surface thereof a dovetail shaped attachment groove extending in a longitudinal direction away from said cap body; and
a mounting block engaged in said groove and movable along said groove, said mounting block having a mounting shaft detachably and pivotally mounted thereon and an eye shield member mounted on said mounting shaft for being raised up and down relative to said visor member on said shaft.

4,819,275
DISPOSABLE GOWN FOR MEDICAL PATIENTS
Audrey T. Lunt, 6371 Vermont Hill Rd., South Wales, N.Y. 14139
Filed Nov. 18, 1987, Ser. No. 122,175
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—114 **6 Claims**



1. A disposable, double-breasted gown for medical patients formed, without sewing, of non-woven synthetic plastic fabric sheeting which is soft and ultrasonically sealable, said gown comprising:
A a body formed from a rectangular blank having a straight upper long edge that is die cut to form chamfered corners on either side, an off-center arcuate neck indentation and isosceles triangular arm hole indentations on the left and right sides of the arcuate indentation, the resultant straight edge shoulder segments formed between the corners and the indentations all having the same length and a common line, the peaks of the triangular indentations being aligned with parallel left and right transverse fold lines that define between the lines a rear gown section on one side of which is a relatively narrow left-front section and on the other side of which is a broad right-front section, the left-front section being folded over the rear section and the right-front section being folded over the folded left-front section to overlap this section, the straight edge segments of the left and right front sections being ultrasonically seamed to the corresponding segments of the rear section to define left and right arm holes; and
B a pair of sleeves whose inlets are ultrasonically seamed to the arm holes of the body, each sleeve being formed of a relatively small rectangular blank having at its upper edge an isosceles triangular indentation whose peak is aligned with a center transverse fold line, and having a straight lower edge, such that when this blank is folded in half, and the folded over lower straight edge is ultrasonically seamed, this creates a tubular sleeve having an inlet which is ultrasonically seamed to the arm holes of the body of the gown.

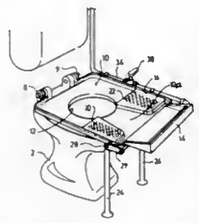
4,819,276
GERMICIDAL TOILET SEAT
Robert B. Stevens, P.O. Box 26284, Honolulu, Hi. 96825
Filed Mar. 26, 1987, Ser. No. 30,374
Int. Cl.[4] A47K *9/02*
U.S. Cl. 4—233 **1 Claim**



1. A toilet seat and lid combination hinged in the rear to provide for pivotal movement to raised or lowered positions about an axis of rotation, said lid having an opening in the rear that accepts a tubular germicidal ultraviolet lamp such that the germicidal lamp is proximal to the axis of rotation and wherein the germicidal lamp's center of axis is generally parallel with the axis of rotation, wherein the tubular germicidal lamp is encased in a module, said module being comprised of a germicidal ultraviolet light transparent glass capsule and a module plate, wherein the module plate provides a means for holding: the germicidal lamp, the electrical power-control wires that attach to the germicidal lamp, a ultraviolet light reflector, a tilt switch which automatically interrupts the electrical current to the germicidal lamp when the lid is raised, and a means for preventing damage due to pressure-temperature increases; and wherein the opening in the rear of the lid supports the module.

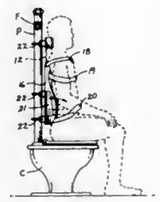
VOL 1101 ISS 2 APR 11 1989 UMI

4,819,277
SANITARY APPLIANCE
Berko Sikirov, 6 Menachem Street, Bnei-Brak 51 403, Israel
Filed Oct. 6, 1987, Ser. No. 105,142
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—254 17 Claims



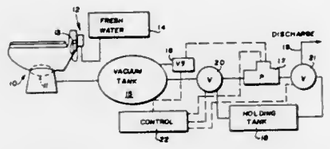
1. A sanitary appliance comprising a platform mountable over a toilet bowl and formed with an opening therethrough aligned with the toilet bowl; said platform being constructed to support a user in a natural squatting position over said opening and over the toilet bowl, and including a urinal pan located to serve as a urinal when the user is in said squatting position; said urinal pan being pivotally mounted to said platform to either an operative inclined position, or to an inoperative folded position with respect to said platform.

4,819,278
INVALID COMMODE SUPPORT APPARATUS
Francisca Ramos, 40 Sharp St., Haverstraw, N.Y. 10927
Filed Mar. 2, 1988, Ser. No. 163,306
Int. Cl.[4] A47C *7/36*
U.S. Cl. 4—254 8 Claims



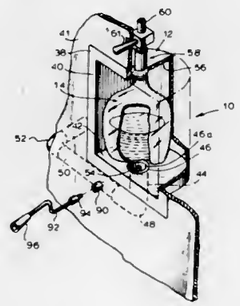
1. An invalid commode support apparatus for use in combination with a commode including an elongate stanchion pipe vertically extending from said commode wherein said apparatus comprises,
a neck support including means for clampingly engaging said neck support to said stanchion pipe and for complementarily accepting a human neck positioned thereon; and
a back support connected to said neck support and including means for clampingly securing said back support to said stanchion pipe and underlying said neck support;
said back support further including a plurality of interengaging securement paired means for securement of an individual to said back support.

4,819,279
VACUUM TOILET SYSTEM
James Sigler; Richard W. Sprang; Ronald J. Bailey, and Edward McKiernan, all of Big Prairie, Ohio, assignors to Sealand Technology, Inc., Big Prairie, Ohio
Filed Sep. 28, 1987, Ser. No. 101,788
Int. Cl.[4] F03D *1/00*
U.S. Cl. 4—300 10 Claims



1. A vacuum toilet system for a vehicle comprising:
a vacuum toilet including a valve;
a vacuum tank operatively connected to said vacuum toilet below said valve;
a vacuum pump operatively connected to said vacuum tank; and
a holding tank operatively connected to said vacuum pump;
said vacuum tank comprising a plastic tank including at least three ports, each of said ports being substantially identical to the other ports to allow interchangeability of the connection between said ports and other components;
an inlet conduit operatively connected to one of said ports;
an outlet conduit operatively connected to another of said ports; and
a vacuum sensor operatively connected to a third of said ports;
at least one of said ports defined by a continuation of a wall of said tank so that said port can be operatively connected to an outlet conduit so that no accumulation of sewage material within said tank take place.

4,819,280
PORTABLE HANDHELD URINAL AND COMPLEMENTARY FLUSH SYSTEM FOR SAME
Paul Rickard, 66 Tennyson Ave., Westbury, N.Y. 11590
Filed Nov. 23, 1987, Ser. No. 124,064
Int. Cl.[4] E03D *13/00*; A47K *11/12*
U.S. Cl. 4—301 10 Claims

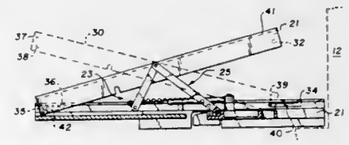


1. A waste disposal system for handicapped persons comprising, a water closet having a water supply port and a discharge drain spaced oppositely to each other, and a waste receiving bottle removably insertable between said water supply port and said discharge drain, said bottle having an inlet at the top and a normally closed outlet at said bottom, said bottle outlet and said discharge drain having cooperating means for opening said normally closed outlet on interaction of said outlet and said drain, said water closet having means for introducing water from said supply port for flushing said bottle with water on interaction of said bottle inlet and said supply.

4,819,281
Patent Not Issued For This Number

4,819,282
TILTING MECHANISM FOR USE WITH INFANT BASSINETTE
James McArthur, Coquitlam, and Herbert W. Bentz, Vancouver, both of, assignors to Med-Ex Diagnostics of Canada Inc., Coquitlam, Canada
Filed Dec. 7, 1987, Ser. No. 129,811
Int. Cl.[4] A61G *7/00*
U.S. Cl. 5—62 8 Claims

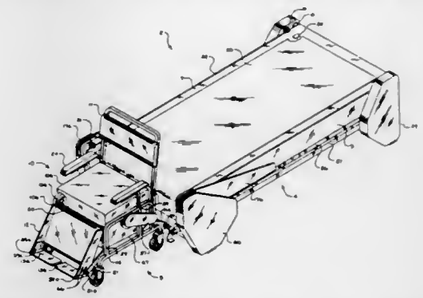
1. A two-way tilting mechanism for use with infant bassinettes, comprising:
a pivotable support adapted to receive an infant bassinet;
a base upon which said pivotable support is pivotally mounted;
a pivoting mechanism connecting said pivotable support to said base comprising a pivotable actuating member having first and second pivotal axes, said first axis being pivotally connected to said base, and said second axis being pivotally connected to said pivotable support along a line intermediate the ends of said pivotable support to define an axis about which said support is tiltable;



locking means extending from said second axis of said pivoting mechanism for holding said support in a tilted position; and
means for releasing said locking means.

4,819,283
INVALID TRANSFER ARRANGEMENT
Paul DiMatteo, Dix Hills; Charles F. Chubb, Brookville, and Robert Segnini, Stony Brook, all of N.Y., assignors to Nova Technologies Inc., Hauppauge, N.Y.
Continuation-in-part of Ser. No. 731,533, May 7, 1985, Pat. No. 4,776,047. This application Dec. 2, 1986, Ser. No. 937,015
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 R 46 Claims

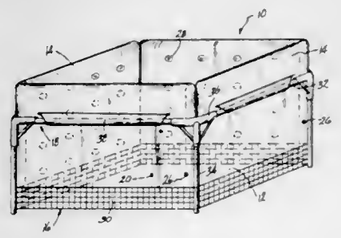
43. An invalid transfer arrangement comprising; a wheelchair removably positioned at the end of a bed; said wheelchair having a leg rest and a seat; said bed having a mattress adjacent to and at substantially the height of the seat; a transport sheet extending across the mattress; roller means for moving said



transport sheet and transporting a reclining person across the mattress and partly onto said seat and leg rest; sand lift means for raising said reclining person to a sitting position on the seat.

4,819,284
INFLATABLE CRIB
Kenneth A. Brown, P.O. Box 149, Weatogue, Conn. 06089
Filed Dec. 18, 1987, Ser. No. 134,855
Int. Cl.[4] A47D *7/00*
U.S. Cl. 5—98 R 10 Claims

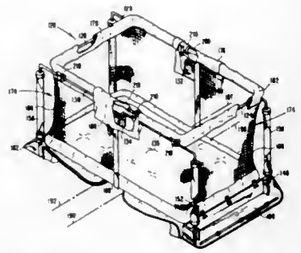
1. An inflatable crib for accommodating a child/infant which comprises:
an enclosure defined by an inflatable base portion, a plurality of inflatable sidewalls, and pieces of webbing connecting said inflatable sidewalls to said base portion;
said webbing permitting observation of said child/infant being accommodated within said crib and allowing air to pass through said crib;
all of said sidewalls and said base portion being independently inflatable; and



each piece of webbing being substantially coextensive with a respective one of said sidewalls which it connects to said

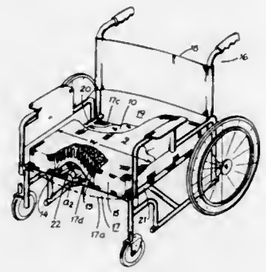
base portion, such that a substantially continuous band of webbing extends about the bottom of the enclosure.

4,819,285
PORTABLE COLLAPSIBLE BABY CRIB
G. David Fetters, West Lafayette, Ind., assignor to Indwell Products Corporation, West Lafayette, Ind.
Continuation-in-part of Ser. No. 884,487, Jul. 11, 1986, Pat. No. 4,692,953. This application Jun. 1, 1987, Ser. No. 56,416
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.[4] A47C *29/00*
U.S. Cl. 5—99 R **16 Claims**



1. A portable collapsible crib, comprising:
a rigid frame that is separable generally at the midpoints of a pair of opposing sides thereof into a first frame half and a second frame half;
rotatable hinging means, coupling said first and second frame halves at said midpoints, hingingly operable about first axes for foldably collapsing said first and second frame halves one upon the other about said midpoints, defining a frame collapsing position, and rotatably operable about second axes that are perpendicular to said first axes for rigidly supporting said first and second frame halves in inflexible planar alignment, defining a frame inflexible position;
leg means, mounted to said frame and rotatable concurrently with said rotatable hinging means, for elevating said frame to a predetermined height when rotated downwardly from said frame, said rotatable hinging means being concurrently rotated into said frame inflexible position, said leg means being further rotatable into parallel planar alignment with said first and second frame halves, said rotatable hinging means being concurrently rotated into said frame collapsing position; and
a collapsible crib structure mounted to and supported about the perimeter of said frame and disposed downwardly therefrom, having rigid floor means with rigid floor supports removably attachable to said leg means at predetermined points below said rigid frame when said leg means are disposed downwardly from said frame, said floor meanings being operable to receive said rigid frame, said leg means, and said collapsible crib structure within the area bounded by the perimeter of said floor means when said leg means are rotated into parallel planar alignment with the said first and second frame halves, said rotatable hinge means being concurrently rotated into said frame collapsing position, said rigid floor means being further operable to fold about and enclose said first and second frame halves and said collapsible crib structure in said frame collapsing position, forming a valise structure thereabout.

4,819,286
STIFFENER FOR DRY FLOTATION CUSHIONS USED IN WHEELCHAIRS
David J. Beauchamp, 2814 E. 20th, Tucson, Ariz. 85716
Filed Feb. 22, 1988, Ser. No. 158,787
Int. Cl.[4] A47C *7/00, 7/62*
U.S. Cl. 5—431 **10 Claims**

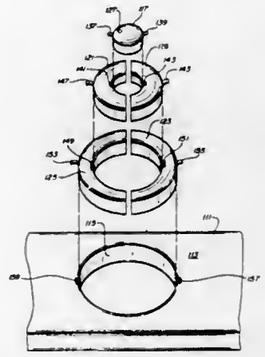


1. A stiffener and support structure for improving the seating support provided by dry flotation cushions used on wheelchairs, said stiffener and support structure comprising:
(a) a substantially rectangular rigid plate having a frontward section and a rearward section, said plate being adapted for positioning within a fabric covering and beneath a plurality of flotation cells provided on said dry floatation cushions for stiffening and improving seating support of said dry flotation cushions; and
(b) said frontward section provided with a void for maintaining a portion of said plurality of flotation cells frontwardly located in a loose and unsupported state.

4,819,287
MATTRESS TO SUPPORT A WOMAN DURING PREGNANCY
Debra A. Halverson, Hillsborough Township, Somerset County, N.J., assignor to Jabiru Incorporated, Flagtown, N.J.
Continuation-in-part of Ser. No. 9,810, Feb. 2, 1987, Pat. No. 4,737,999. This application Feb. 17, 1988, Ser. No. 156,603
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] A47C *27/10*
U.S. Cl. 5—455 **18 Claims**

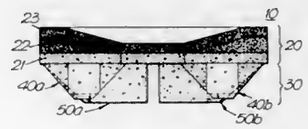
1. A mattress for a pregnant woman, of a size sufficient to support a substantial portion of the body of a pregnant woman, which comprises:
(a) a main mattress section having an opening for a plurality of toroidal cushions for abdominal support; and,

(b) a plurality of individual toroidal cushions which are arranged concentrically and are located within said open-



ing of said main mattress section, at least one of said cushions being non-inflatable.

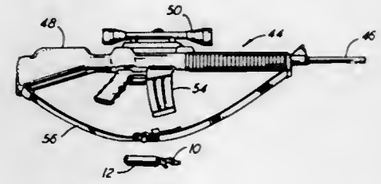
4,819,288
CUSHIONS
Peter T. Lowthian, Watford, England, assignor to National Research Development Corporation, London, England
Filed Aug. 4, 1987, Ser. No. 81,225
Claims priority, application United Kingdom, Aug. 6, 1986, 8619186
Int. Cl.[4] A47C *27/15*
U.S. Cl. 5—481 **9 Claims**



1. A chair seat cushion made of foamed elastomeric material and bounded by upper, lower, front, rear and two opposed side surfaces, said cushion comprising:
an upper part supported by a lower part;
said upper part extending continuously to border the whole of said upper surface;
said lower part having a rear portion formed by two like blocks mutually spaced transversely of said side surfaces;
each said block extending to border part of a respective different one of said side surfaces, each said block being of multi-layered construction including at least two layers extending generally parallel with said side surfaces, and with a first one of said two layers in each said block being the furthest layer of its block from the respective side surface and being of less density than the adjoining second one of such two layers.

4,819,289
RIFLE FIELD SERVICE TOOL
Philip W. Gibbs, Camillus, N.Y., assignor to Camillus Cutlery Co., Syracuse, N.Y.
Filed Jul. 15, 1988, Ser. No. 219,146
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—118 **7 Claims**

1. A hand tool for assisting in field servicing a firearm of conventional design, said tool comprising:
(a) an elongated handle portion extending along an axis between front and rear end portions;
(b) a substantially flat blade having a proxal end attached to said front end portion of said handle and extending therefrom along said axis to a distal end, said blade including:
(i) a forward, linear edge substantially perpendicular to said axis and having a predetermined width;
(ii) first and second longitudinal edges extending from said forward edge to said proxal end, each of said first and second edges including a first, linear portion extending from said forward edge perpendicularly thereto and parallel to one another, whereby said first linear portions are spaced from one another by said predetermined width;
(iii) a convex edge portion of said first edge, curved outwardly from said axis, and extending from said first linear portion of said first edge toward said proxal end;



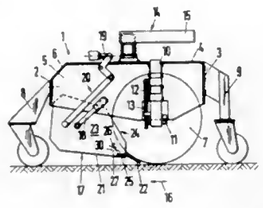
(iv) a second linear portion of said first edge extending from said convex edge portion to said proxal end substantially parallel to said axis;
(v) a concave edge portion of said second longitudinal edge having a first portion curved inwardly toward said axis and extending from said first linear portion of said second longitudinal edge toward said proxal end, and a second portion curved inwardly toward said proxal end and extending from said first portion of said concave edge portion to a terminal end spaced farther from said axis than said first, linear portion of said second longitudinal edge;
(vi) a blunt tip directed toward said distal end on said second longitudinal edge of said blade at the terminus of said second portion of said concave edge portion; and
(vii) a terminating edge portion of said second longitudinal edge extending from said blunt tip to said proxal end of said blade.

4,819,290
SWEEPING MACHINE
Hermann Schulte, Salzbergen, Fed. Rep. of Germany, assignor to Hermann Schulte GmbH & Co. KG, Salzbergen, Fed. Rep. of Germany
Filed May 31, 1988, Ser. No. 200,610
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 870978
Int. Cl.[4] E01H *1/04*
U.S. Cl. 15—83 **16 Claims**

1. A sweeping machine comprising a housing, a rotary broom rotatably supported in said housing, said rotary broom being rotatable about an axis perpendicular to the direction of movement of the sweeping machine, a collection container having an opening for receiving the sweepings swept by said rotary broom, pivot-support means mounted on said housing for pivoting said container between an operable position to receive sweepings and an emptying position for emptying collected sweepings from the container, and pivotal flap means pivotably mounted on said container adjacent said container opening and pivotal between a retention position in which said pivotal flap means retains the collected sweepings in said con-

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tainer when the latter is in said operable position and a discharge position which allows said collected sweepings to be



emptied from said container when the latter is in said emptying position.

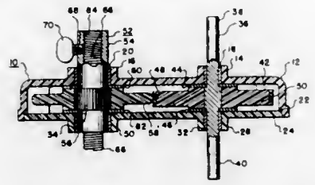
4,819,291
CLEANING BRUSH
Armen G. Gunjian, Montreal, Canada, assignor to Brushtech, Inc., Plattsburgh, N.Y.
Filed Nov. 12, 1987, Ser. No. 119,729
Int. Cl.[4] A46B *3/18*
U.S. Cl. 15—104.2 **4 Claims**



1. A cleaning brush for cleaning the internal surface of a hollow workpiece comprising a handle, an elongated stem extending from the handle , and bristle means at the free end of the stem, characterized in that the stem is a one-piece, flexible, elongated coil spring having a uniform diameter, and an elongated rigid member is fixed to the handle and is fixed concentric with and rigidifies the coil spring stem and extends within the a length less than the length of the coil spring stem to a point spaced from the bristle means at the end of the stem, said rigid member limiting the flexibility of the coil spring to only the portion between the end of the stiff member and the bristle means whereby the elongated coil spring can serve to scrape the inner surface of a hollow work piece.

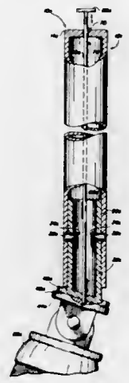
4,819,292
TRANSMISSION DEVICE FOR PLUMBING SNAKES
Stanton W. Kerr, 4164 Calavo Dr., La Mesa, Calif. 92041
Filed Oct. 13, 1987, Ser. No. 106,814
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.33 **6 Claims**

1. A transmission device for plumbing snakes comprising,
a housing,
drive means journalled in said housing,
driven means journalled in said housing,
said drive means engaging said driven means,
said driven means having a threaded bore,
an adapter releasably secured to said driven means,
said adapter having a threaded bore,
said threaded bore of said adapter being of smaller diameter than said threaded bore of said driven means.



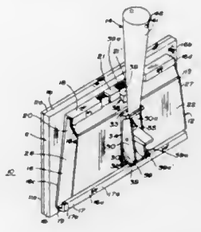
said threaded bores of said driven means and said adapter being in axial communication with one another, and
a flexible helically-coiled wire plumbing snake threadedly engaged with said threaded bore of said adapter.

4,819,293
ADAPTER AND POLE ASSEMBLY
Donald Nicholson, Canoga Park, Calif., assignor to Aquality, Inc., Chatsworth, Calif.
Filed Jan. 11, 1988, Ser. No. 142,175
Int. Cl.[4] F16D *1/10*; **F16B** *7/10*
U.S. Cl. 15—172 **5 Claims**



1. An improved adapter for a pool cleaning pole, said adapter comprising, in combination:
(a) a first member comprising
1. a generally vertically extending cylindrical hollow tubular portion, said hollow tubular portion bearing first releasable connection means for releasable connection thereof to the inside of a pool cleaning pole, and
2. a substantially flat base portion lying in a substantially horizontal plane;
(b) a second member having
1. a flat portion lying generally in a plane substantially parallel to the plane of said base portion, and
2. a second releasable connection means for releasable connection of pool cleaning accessories to said second member;
(c) pivot means rotatably interconnecting said base portion and said flat portion, and
(d) locking means for releasably securing said flat portion and said base portion together to prevent relative rotation thereof,
(e) wherein said limit means comprises one of a pin releasably disposed in alignable openings in said base portion and said flat portion and a clamp fixed to said base portion and releasably clampable to said flat portion and remote actuating means connected to said pin or clamp for releasably remotely withdrawing said pin or clamp from said flat portion.

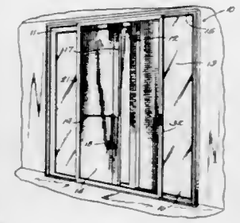
4,819,294
PAD-TYPE APPLICATOR WITH ADJUSTING HANDLE
Peter W. Calvert, Johnson City, Tenn., assignor to Thomas Industries, Inc., Louisville, Ky.
Filed Mar. 6, 1987, Ser. No. 22,680
Int. Cl.[4] B05C *17/00, 1/06*
U.S. Cl. 15—209 R **11 Claims**

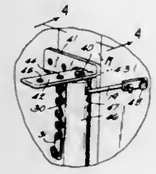


1. A pad holder assembly for releasably receiving a paint applicator pad, said pad holder assembly comprising:
a base having an upper surface and a lower surface;
a handle including a hand grip portion and a mounting portion constructed and arranged for releasably attaching said handle to said base at its upper surface for pivotal movement relative to said base;
securing means for releasably securing the paint applicator pad to said base at its lower surface;
said base having a recess in its upper surface for attaching said handle to said base, said recess having serrations on a concave arcuate surface of said recess and guide means defining at least one guide channel for said handle;
said mounting portion of said handle including at least one guide member, and when said handle is assembled with said base, said guide member being located within said guide channel for movement along said guide channel as said handle is pivoted relative to said base;
and locking means operable to prevent pivotal movement of said handle relative to said base, said locking means including a locking member carried by said mounting portion and having a convex arcuate surface with a tongue portion having a convex outer surface overlying said concave serrated surface of said recess and being movable into and out of engagement with the serrated portion of said upper surface of said base, driving the serrated tongue portion into and out of engagement with said serrations on said base upper surface, and a lever means operatively coupled to said locking member for moving said locking member into and out of engagement with said serrated portion of said base upper surface.

4,819,295
SLIDING SCREEN CLOSER
John A. Kaftan, Jordan Heights Rd., DePere, Wis. 54115
Continuation-in-part of Ser. No. 895,000, Aug. 7, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 177,220
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—72 **2 Claims**

1. A device for closing a door-opening, said device including a sliding screen or door having an inboard vertical member and an outboard vertical member,
said door-opening including a frame having a vertical non-movable inboard member,
a closer for said door, including
a vertically mountable housing containing a spring-tensioned block-and-tackle arrangement,
a cord connected to said block-and-tackle arrangement,
said cord arranged to extend horizontally from said closer,
a hook adjustably secured to said cord whereby the spring-tension can be increased or decreased depending upon the position of said hook,
means for mounting the closer in a generally vertically central portion of the non-movable inboard member of the door frame with the cord and hook extending away from the door-opening so that the hook can engage the inboard vertical member of the door or screen,
said housing including an adjustable support whereby to speed up or slow down the closing of the door by rotating the housing in relation to the support,
whereby the closer can move the door across the door-opening without said cord obstructing said door-opening when the screen or door is in an open position.





4,819,296
DOOR SAFETY BRACE HAVING A HINGE WITH ANGLED END FACES
Donald J. Wilkins, Gooding, Id., assignor to Wilco Enterprises, Gooding, Id.
Filed Mar. 24, 1987, Ser. No. 43,605
Int. Cl.[4] E05F *5/02*
U.S. Cl. 16—82 **1 Claim**



1. A removable door safety brace for securing between a handle of a closed hinged door and a floor comprising:
hinged rod means comprising hollow tubular upper rod means having yoke means inserted into said rod means at

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its upper end for engaging the handle of the closed door and hollow tubular lower rod means having foot means comprising resilient cup means at its lower end for frictionally engaging the brace against the floor, and

over-center locking hinge means pivotally connecting together said upper rod means at its lower end and said lower rod means at its upper end for locking said hinged rod means in a rigid, substantially rectilinear position, wherein a downward force exerted on the over-center locking hinge means in a direction toward the closed door locks the hinge, an upward force exerted on the over-center locking hinge means in a direction away from the closed door opens the hinge, and a force on the opposite side of the closed door acts on the locked over-center hinge to further brace the door against opening, said over-center locking hinge means further comprising:

hinge means of said upper rod means having means for inserting into a hollow lower end of said upper rod means, and end face means for forming an over-center hinge angled at between ½° and 2½° from a plane perpendicular to the longitudinal axis of said upper rod means, and

hinge means of said lower rod means pivotally connected to said hinge means of said upper rod means, said hinge means of said lower rod means having means for inserting into a hollow upper end of said lower rod means, and end face means for forming an over-center hinge angled at between ½° and 2½° from a plane perpendicular to the longitudinal axis of the lower rod means,

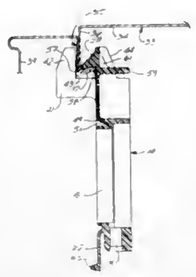
wherein said end face means of said upper rod means engages against said end face means of said lower rod means forming a rigid, substantially rectilinear brace when said hinge is in over-center locked position secured between said handle of the closed door and the floor, and said pivotal connection of the hinge means is substantially perpendicular to the pivot axis of the door hinges.

4,819,297

SLIDING DOOR TOP GUIDE OR HANGER

Kenneth Jacobs, Esher, England, and Torsti T. T. Jerila, West Covina, Calif., assignors to Acme General Corportion, San Dimas, Calif.

Filed Apr. 28, 1987, Ser. No. 43,496
Int. Cl.⁴ E05D *15/06*
U.S. Cl. 16—87 R **37 Claims**



1. A sliding door hanger or guide for engaging a horizontal overhead track with a downwardly extending generally L-shaped limb comprising:

a body;

means for connecting the body to the top of a door;

rigid means on top of the body for engaging such a track on at least the face opposite the foot of the L; and

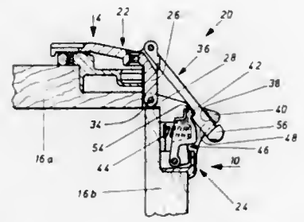
elastically flexible means for fitting over the top of the foot of the L-shaped track in an unflexed position nearer the rigid means for supporting the weight of the door and for clearing the foot of the L-shaped track in a flexed position further from the rigid means.

4,819,298

SELF-CLOSING HINGE FOR CORNER CABINETS

Reinhard Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger GmbH & Co. KG, Reinheim, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,852
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729531
Int. Cl.⁴ E05D *7/04;* **E05F** *1/12*
U.S. Cl. 16—237 **8 Claims**



1. A self-closing hinge for hanging a first, free leaf of a two-part corner door of a cabinet on a second door leaf hung on a carcase of the cabinet, comprising: a first hinge member to be disposed on the inside of the second door leaf, said first hinge member having at least one first corner projection extending close to an edge of the first door leaf, said corner projection having a free end with a first bore, a hinge pin in said first bore and about which said first and second leaves are pivotable by 90° from a first position in which the leaves are held approximately at right angles to one another when the corner cabinet is closed, to a second position in which the leaves are aligned parallel to each other when the corner door is open, and vice versa; a second hinge member, configured as a recess-mounting cup disposed in a mortise in the inside of the first leaf and broken out at an edge thereof, said second hinge member having at least one second corner projection which extends close to a front edge of the first door leaf, and which is offset in height from said first corner projection and has a second bore in alignment with said first bore, said second hinge member having a crossbar; a self-closing element having a cam surface opposite said crossbar so as to define therewith a gap; an elongated strap-like connecting element articulated to said first hinge member and having a free end extending through said gap, a spring biasing said self-closing element toward said crossbar; said connecting element having an end section facing said cam surface when the corner door is closed, and also having a transitional surface forming a step adjacent said end section, which comes into engagement with said cam surface so that the latter is displaced against the bias of the spring in the sense of an increase in the size of the gap between said crossbar and said cam surface.

4,819,299

SELF-CLOSING HINGE

Leif A. Holan, P.O. Box 3527, Clear Lake Highlands, Calif. 95422

Filed Dec. 28, 1987, Ser. No. 138,142
Int. Cl.⁴ E05F *1/12*
U.S. Cl. 16—278 **14 Claims**

1. A hinge assembly comprising:

a first leaf and a second leaf having sleeves in coaxial alignment with one another;

a hinge pin coaxially journaled within said sleeves for pivotally interconnecting said first leaf and said second leaf for angular movement relative to one another;

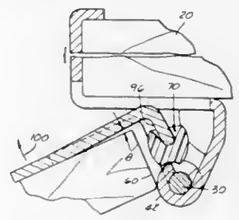
said first leaf having an integral spring means having a head portion projecting substantially radially with respect to said hinge pin and with respect to said sleeve of said second leaf;

said sleeve of said second leaf being formed with a pocket that is aligned and in registration with said head portion of said spring means when said second leaf is in a closed position relative to said first leaf; and

a hard substantially incompressible follower means mounted between said head portion of said spring means and said sleeve of said second leaf in a manner to be co-moveable with said first leaf relative to said second leaf;

said spring means biasing said follower means in the direction of said hinge pin and into contact with an external surface of said sleeve of said second leaf along a thrust axis that is distally offset relative to the axis of said hinge pin;

contacting parts of said head portion of said spring means, said follower, and one edge of said pocket of said sleeve of said second leaf having shape characteristics such that when said leaves are in a relatively open condition said follower is restrained against rocking movement relative to said head portion of said spring means and such that when said head portion of said spring means and said follower are rotated past said edge of said pocket said follower undergoes rocking movement relative to said head portion of said spring means and relative to said edge of said pocket.



4,819,300

STRUT ASSEMBLY

Frank T. Jackson, Norco, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Apr. 13, 1987, Ser. No. 37,333
Int. Cl.⁴ E05D *11/10;* **E05C** *17/32*
U.S. Cl. 16—327 **11 Claims**



1. A strut assembly comprising

a first section;

a second section;

a link pivotally joining said first and second sections;

a sleeve slidably disposed on said first section and engageable with said second section, said sleeve being spring biased toward engagement with said second section;

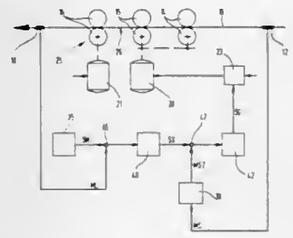
a member pivotally mounted by a pivot pin to said link and biased to extend into the path of extension of said sleeve, one of said link and said member including a stop extending to adjacent the other of said link and said member to limit relative rotation therebetween.

4,819,301

METHOD AND APPARATUS FOR CONTROLLING THE DRAFTING OF SLIVER IN A DRAWING FRAME

Herbert Konig, Ebersbach/Fils, and Gerhard Stahle, Adelberg, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,247
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622584
Int. Cl.⁴ D01H *5/38, 5/42*
U.S. Cl. 19—240 **11 Claims**



1. In a method of controlling the drafting of sliver in a draw frame, which method includes sensing variations in mass characteristics of traveling sliver in advance of drawing, said advance sensing including time-delaying variations sensed by said advance sensing in relation to the time of travel of a sliver from the advance sensing to the drafting, sensing the mass of sliver after drawing, and varying drafting in response to said time-delayed advance sensing and to said after sensing, the improvement comprising:

(a) selecting a theoretical value for mass per unit length of sliver,

(b) alternately switching between the steps of: (i) determining the difference between the selected theoretical value and the mass sensed by said after sensing, applying said difference to a control means to produce a theoretical variable signal and temporarily storing said signal, and (ii) combining said stored signal with said time-delayed variation and applying the combination to said control means to produce a correcting signal, and

(c) varying said drafting in response to said correcting signal.

4,819,302

SWINGINGLY MOVABLE CLEARER MECHANISM SUSPENDED FROM A DRAFT ROLLER

Tatemi Fukuda, Aichi; Yoshio Kawasaki, Fujieda; Masao Wakai, Shimada; Kenji Negishi, Fujieda; Isao Ono, and Isao Arita, both of Hirakata, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kanpatsu Kogyo Kabushiki Kaisha, both of Hirakata, Japan

Filed Feb. 22, 1988, Ser. No. 158,588
Claims priority, application Japan, Mar. 24, 1987, 62-69400
Int. Cl.⁴ D01H *5/62*
U.S. Cl. 19—262 **9 Claims**

1. A clearer mechanism for a draft roller comprising:

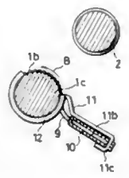
a clearer member made of a soft sheet material;

a clearer holder receiving therein said clearer member such that a distal end of the clearer member protrudes out of the clearer holder and is positively held against a peripheral surface of a draft roller of the machine; and

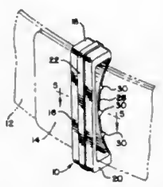
a suspensory member being supported by the draft roller and suspended therefrom such that said suspensory member is

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swingingly movable along the peripheral surface of the draft roller, said suspensory member detachably supporting said clearer holder such that the latter longitudinally confronts the draft roller.



4,819,303
BELT LOOP STAY
Mark J. Udelhofen, Park Ridge, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Oct. 2, 1987, Ser. No. 103,660
Int. Cl.[4] A44B *11/00*
U.S. Cl. 24—182 **1 Claim**

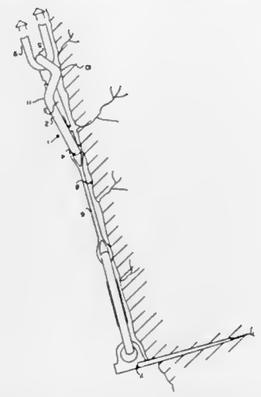


1. For use as a belt loop stay, a one-piece article fabricated into a closed loop from a flexible material comprising first and second elongated strips joined together at each end by a flange to define said closed loop, where said first strip when unstressed is straight and substantially in a right angle relationship to the end flanges and where said second strip is more flexible than said first strip and when unstressed is bowed towards said first strip between the end flanges, and a continuous reinforcing rib extending longitudinally along the centerline of the entire length of said strip and along the centerline of the entire length of each of said end flanges, said first and second strips and said end flanges having the same width to provide said closed loop one-piece article with constant width wherein said second strip has a plurality of stiffening ribs extending laterally across said second strip in the middle portion of its length and wherein said first strip has beveled edges facing said second strip.

4,819,304
SNAP HOOK, ESPECIALLY FOR MOUNTAIN CLIMBERS
Stefan Engers, Marl, Fed. Rep. of Germany, assignor to Stubai-Werkzeugindustrie RGenMBH, FulpmesTirol, Austria
PCT No. PCT/EP87/00162, § 371 Date Dec. 24, 1987, § 102(e) Date Dec. 24, 1987, PCT Pub. No. WO87/05817, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 23, 1987, Ser. No. 133,032
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610669
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—232 R **5 Claims**

1. In a snap hook, especially for mountain climbers, consisting of a C-shaped element having ends which are connected to each other by an elastic locking catch to form a closed, elongate ring, generally defining a plane, with first and second narrow sides interconnected by a flange element and said locking catch, a holding element being attachable to a first narrow side and the second narrow side forming a guide region for a safety rope, the improvement comprising:

projecting means included in said elongate ring projecting perpendicular to the plane of said elongate ring on both sides thereof so that when the elongate ring is applied against a planar surface, the guide region is maintained at a distance therefrom, sufficient to give clearance to said safety rope.



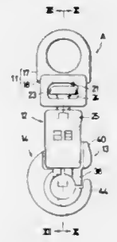
4,819,305
LINE HOOK FOR FISHING FLOAT
Kishiro Ooe, 404-1, Oaza-shimizu; Iwade-cho, Naga-gun, Wakayama-ken, Japan
Filed Jul. 27, 1987, Ser. No. 77,729
Int. Cl.[4] A44B *13/02*; A01K *91/04*
U.S. Cl. 25—237 **1 Claim**



1. A line hook for a fishing float which comprises an elongated wire of spring steel having first and second ends, said wire is wound two times substantially at its middle section to form first and second ovals, said first end of the wire including a first proper portion extending from said first oval, said second end of the wire including a second proper portion extending from said second oval, said first proper portion being longer than said second proper portion, said first and said second proper portions of the wire being extended at one side of said first and second long ovals and spaced from each other, said first and second ends bent to face in opposite directions to one another to form a third long oval, said first end of said first proper portion of the wire bent greatly to cross said third long oval to form a ring control portion having a tip end, said ring control portion being bent inclinedly to cross said second proper portion slightly with the tip end of the ring control portion extending across the space between said first and second proper portions ending close to said first proper portion, in

a rest position, whereby a line and a ring of a fishing float may be inserted into and disengaged from said third long oval through a clearance between said first and second ends of the wire and said first and second proper portions thereof by using elasticity of the wire.

4,819,306
SWIVEL JOINT
Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Jul. 15, 1988, Ser. No. 219,485
Claims priority, application Japan, Jul. 16, 1987, 62-109226[U]
Int. Cl.[4] A44B *13/02*
U.S. Cl. 24—241 SL **7 Claims**



1. A swivel joint comprising:

a central member having a joint barrel having a first insertion hole and a second insertion hole which are defined therein parallel, to each other at one surface of said joint barrel, a slot defined in a side wall of the joint barrel in communication with said first insertion hole, a pair of first confronting inner surfaces defining said first insertion hole therebetween and having a pair of first locking ledges respectively, and a pair of second confronting inner surfaces defining said second insertion hole therebetween and having a pair of second locking ledges, said first inner surfaces including respective slanted surfaces slanted progressively inwardly toward each other toward an inner closed end of said first insertion hole;

a retainer member having a retainer fitted in said slot and a pair of first resilient legs projecting from said retainer and inserted in said first insertion hole, said first resilient legs having respective first locking fingers on distal ends thereof engaging said first locking ledges, respectively, and slidable respectively on said slanted surfaces under resiliency of said first resilient legs; and

a hook member having a hook and a pair of second resilient legs projecting from said hook and inserted in said second insertion hole, said second resilient legs having respective second locking fingers engaging said second locking ledges, respectively.

4,819,307
HOSE CLAMP
David L. Turner, Department of Engineering, University of Warwick, Coventry CV4 7AL, United Kingdom
PCT No. PCT/GB86/00408, § 371 Date Apr. 24, 1987, § 102(e) Date Apr. 24, 1987, PCT Pub. No. WO87/00602, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 15, 1987, Ser. No. 42,944
Claims priority, application United Kingdom, Jul. 19, 1985, 8518277
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—274 R **11 Claims**

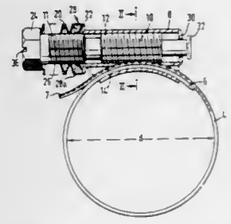
1. A hose clamp to clamp an overlapping junction between a hose and a pipe end extending into the hose, the hose clamp comprising:

a loop to encircle and clamp against the hose in pressure engagement therewith, the loop having first and second ends, with the first end overlapping the second end;

holding means connected to the second end of the loop and engaging the first end thereof to hold said ends together in said overlapping relation; and

adjusting means connected to the holding means and acting in response to a relaxation of the loop to force the holding means to move the first end of the loop relative to the second end of the loop to help maintain a preset pressure between the loop and the hose;

the adjusting means including

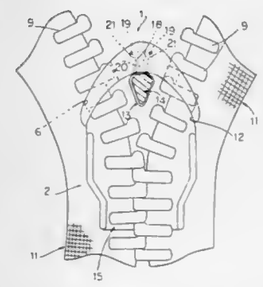


(i) a rod connected to the holding means and supported for movement along an axis, wherein linear movement of the rod in a first axial direction forces the holding means to move the first end of the loop away from the second end thereof, and

(ii) spring means engaging said rod and urging the rod in said first direction;

wherein the holding means includes a sprag means mounted on and engaging the rod, the spray means restricting linear movement of the rod in said first direction when the pressure of the loop against the hose is below the preset pressure to allow the force of the spring means against the rod to increase to a given level.

4,819,308
ZIPPER GUARD
Julian K. Baroky, 1624 Shipman, Oxford, Mich. 48051
Filed Mar. 14, 1988, Ser. No. 167,517
Int. Cl.[4] A44B *19/30*
U.S. Cl. 24—415 **3 Claims**



1. A zipper guard which attaches to the slider of a zipper fastener, said slider having forward openings adapted to receive opposing clasp elements secured to respective tape pieces, said slider also including a post joining top and bottom halves of said slider, said guard comprising:

a guard piece having a rear inside surface and forward outside surface, said inside surface shaped to be fit to the forward end of said slider;

said guard having two entryway openings entering into the

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outside surface closely fit to receive said clasp elements to ride through and into said openings of said slider, said guard piece also having two grooves on each side extending into said entryway openings which are sized to receive a respective one of said tapes on which said clasp elements are attached;

a spring clip having a portion formed to fit closely around said slider post, said clip having forwardly projecting diverging legs, said guard piece being formed with a cavity formed into the inside surface adapted to receive said legs of said clip when pressed together, to connect said guard piece to said slider.

4,819,309

FASTENER WITH PARTS HAVING PROJECTING ENGAGING PORTIONS

D. James Behymer, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 27, 1987, Ser. No. 90,212
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—576 14 Claims



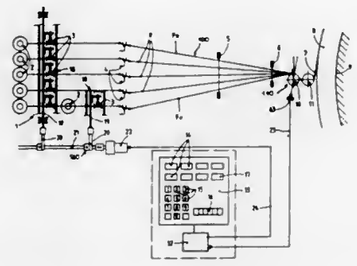
1. A fastener comprising two similar parts, each part having a uniform cross section along an axis and including a base portion including means for securing said fastener part to other objects, and major and minor projecting portions projecting in spaced relationship from said base portion, said major projecting portion projecting a greater distance from said base than said minor portion, having a ridge along its distal end parallel to said axis, having a recess along the side of said major portion opposite said minor projecting portion parallel to said axis and defining the side of said ridge adjacent said base portion, and having a plurality of corrugations along the side surface of said major projecting portion adjacent said minor projecting portion and parallel to said axis, said minor projecting portion having a lip along its side adjacent said major projecting portion and parallel to said axis, said major and minor projecting portions of said parts being shaped and spaced from each other to define slots therebetween adapted so that the slot on each part can simultaneously receive the ridge on the other major projecting portion from the other of said parts with said corrugations of said major projecting portions in face to face relationship and the lips on each of said parts in the recess of the other, and said ridges, corrugations and lips of said parts having cam surfaces adapted to engage each other to resiliently bend said parts to afford simultaneous entry of said ridges into said slots and said corrugations into face to face relationship to engage said parts when said parts are pressed together in directions at right angles to their axes, and having cam surfaces adapted to engage each other to resiliently bend said parts to afford simultaneous movement of said ridges out of said slots and movement of said corrugations over each other to disengage said parts when said parts are pulled away from each other in said directions at right angles to their axes.

4,819,310

APPARATUS FOR REGULATING THE WARP SECTION TENSION DURING WARPING

Markus Beerli, Kirchberg, and Erich Guntli, Niederuzwil, both of Switzerland, assignors to Benninger AG, Uzwil, Switzerland

Filed Mar. 30, 1987, Ser. No. 31,818
Claims priority, application Switzerland, Apr. 2, 1986, 1286/86
Int. Cl.[4] D02H *13/24*
U.S. Cl. 28—185 6 Claims



1. An apparatus for regulating the warp section tension at a warping machine provided with a warping drum during warping of threads removed from the bobbins of a warp creel, comprising:

a respective adjustable and settable thread brake;

a warping carriage of the warping machine;

a reed mounted on the warping carriage;

said threads removed from the bobbins of the warp creel defining a thread field with each said thread passing through an associated one of the respective adjustable and settable thread brakes and then through said reed and being ordered at the region of the warping carriage in the form of a warp section prior to winding onto the warping drum;

a tension measuring device for measuring the tension of the removed threads;

a central brake adjustment device operatively coupled with said tension measuring device and automatically controlling the adjustable and settable thread brakes during the operation of the warping machine;

said tension measuring device comprising a measuring roller;

at least one displacement path transducer cooperating with said measuring roller;

deflection means arranged between said measuring roller and said warping drum;

said measuring roller and said deflection means deflecting the warp section located between the reed and the warping drum;

said measuring roller when exposed to the tension of the warp section producing an actual value signal representative of said tension of the warp section by means of said at least one displacement path transducer;

a processor cooperating with said at least one displacement path transducer; and

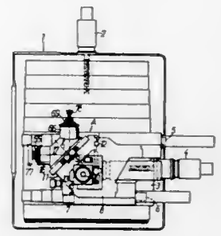
said actual value signal being compared in said processor with a previously entered set value and in the presence of a set value-actual value difference controlling the central brake adjusting device in the sense of correcting the thread tension by means of said adjustable and settable thread brakes.

4,819,311

MACHINE TOOL

Hitoshi Hashimoto; Tsutomu Fujita; Eiji Ryukawa, and Hideo Kodachi, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 62,506
Claims priority, application Japan, Dec. 26, 1986, 61-310856
Int. Cl.[4] B33C *1/00*
U.S. Cl. 29—40 9 Claims



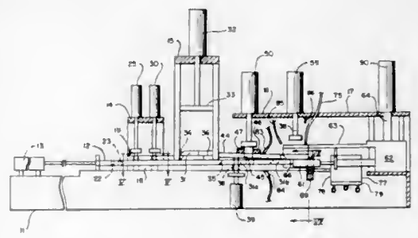
1. A machine tool comprising a column, a tool-driving unit movable upwardly and downwardly relative to said column, and a pair of guide rails mounted on a front surface of said column to extend vertically thereon and horizontally spaced from each other for guiding upward and downward movements of said tool-driving unit, said tool-driving unit including a lift frame slidable on said guide rails and a tilting-type turret head supported on a front surface of said lift frame and rotatable about an axis inclined with respect to a fore and aft direction of the frame in a horizontal plane, wherein one of the pair of guide rails is relatively disposed forwardly of the other guide rail, so that the individual guide rails both assume positions close to the turret head.

4,819,312

APPARATUS FOR REMOVING BABBITTS FROM KNIVES

Randall K. Melvin, 3 Hitching Post Ct., Rockville, Md. 20852

Filed Dec. 2, 1987, Ser. No. 128,530
Int. Cl.[4] B23L *1/00*; B23P *19/02*; B23Q *41/00*; B27L *1/00*
U.S. Cl. 29—56.5 31 Claims



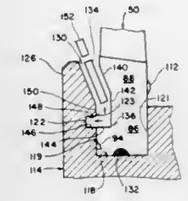
1. In an apparatus for removing babbitts from knives to which babbitts have been attached for accurately positioning the knives in holders and the like, the combination of a frame, a magazine on said frame for storing a plurality of knives each having at least one babbitt attached thereon, means on said frame for transferring a knife from said magazine to a first predetermined position on said frame spaced from said magazine, and means on said frame for removing babbitts from said knife in said first predetermined position.

4,819,313

METHOD OF SALVAGING STATIONARY BLADES OF A STEAM TURBINE

Ghanshyam M. Dadhich, Orlando, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 3, 1988, Ser. No. 201,715
Int. Cl.[4] B21K *3/00*
U.S. Cl. 29—156.8 R 18 Claims



1. A method of salvaging stationary blades of a steam turbine cylinder coaxially disposed around a rotor, wherein the stationary blades are arranged in a plurality of rows with each stationary blade of a row having a root, a platform and an airfoil portion, the stationary blades of a row being shrouded together in groups at the tips of the airfoil portions and being mounted by the roots in an annular groove provided in the cylinder for each row, said method comprising the steps of:

separating the cylinder from the rotor;

connecting adjacent stationary blades of a shrouded group within each row near the roots;

cutting the cylinder at an area adjacent to the root of each stationary blade of each row to disconnect the stationary blades from the cylinder; and

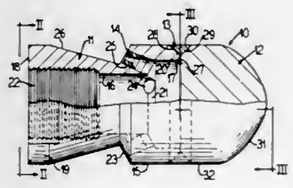
mounting the roots of the stationary blades in a new cylinder.

4,819,314

JET NOZZLES

Roland E. Shaddock, Streator, Ill., assignor to The Pullman Peabody Company, Princeton, N.J.

Division of Ser. No. 005,946, Jan. 22, 1987, Pat. No. 4,764,180.
This application Jul. 11, 1988, Ser. No. 219,072
Int. Cl.[4] B21D *53/24*
U.S. Cl. 29—157 C 12 Claims



1. A self-propelling jet nozzle for attachment to a high pressure water conduit which comprises a tubular body member having means at its trailing end for attachment to the high pressure water conduit and a nose cap covering its leading end, said tube having radially and rearwardly inclined ledge around the interior thereof spaced rearwardly from said nose cap, said tube having an inclined exterior ledge substantially parallel with the inclined inner ledge and spaced rearwardly therefrom, a ring of inclined bores connecting said ledges and tapered along the length thereof to provide inner ends of larger diameter than outer ends, and wear resistant jet nozzle tubes wedged in said bores discharging jet stream rearwardly and

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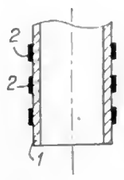
outwardly from the tube whereby high pressure water from a conduit attached to the trailing end of the tube flows forwardly through the tube against the nose cap and thence rearwardly through the bores and nozzle tubes to propel the jet nozzle forwardly.

4,819,315

PROCESS FOR ATTACHMENT OF A HOLLOW CYLINDRICAL COMPONENT WITHIN A TUBE AND CYLINDRICAL COMPONENT FOR CARRYING OUT THIS PROCESS

Jean P. Cartry, and Bruno Fraissenet, both of Lyons, France, assignors to Framatome, Courbevoie, France

Filed Jun. 4, 1987, Ser. No. 57,997
Claims priority, application France, Jun. 4, 1986, 86 08065
Int. Cl.⁴ B23P *15/26, 11/02*
U.S. Cl. 29—157.4 **9 Claims**



1. Process for strong and tight fastening of a hollow cylindrical component within a tube by diametrical expansion and crimping of the cylindrical component within the tube, and embedding in the tube and the cylindrical component, at the level of their connection zone, of at least one element of a hard material disposed between the tube and the cylindrical component, said process comprising the steps of

(a) depositing a hard coating material around the cylindrical component the initial outer diameter of which is less than the inner diameter of the tube, on the outer surface of the component, in at least two zones of annular shape, the hardness of rings obtained by deposition being greater than the hardness of the tube and greater than that of the cylindrical component, and the thickness of the rings being less than the difference between an inner radius of the tube and an initial outer radius of the cylindrical component;

(b) introducing the cylindrical component on which the rings has been deposited into the tube so that the rings are located in a part of the tube in which the fastening of the cylindrical component is to be carried out; and

(c) carrying out expansion followed by crimping of the cylindrical component, at least in its part comprising the rings of hard coating material, so as to embed both rings in the cylindrical component and the tube at the same time.

4,819,316

METHOD OF MAKING A PRE-ADJUSTED ORTHODONTIC BRACKET ASSEMBLY

Robert S. Rossini, Arvada, and Walter J. Steinhauser, Lakewood, both of Colo., assignors to RMO, Inc., Denver, Colo.

Filed Jul. 29, 1987, Ser. No. 79,246
Int. Cl.⁴ B21F *43/00*
U.S. Cl. 29—160.6 **17 Claims**

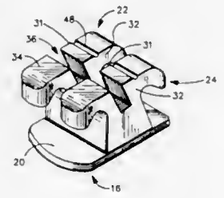
1. A method of making an orthodontic bracket assembly, comprising:

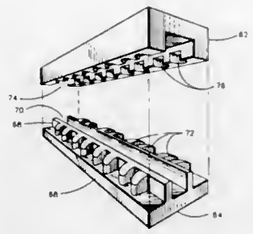
providing a strip of metal;

providing a die means, said die means including first and second rounded cutting means, wherein each said first cutting means is positioned offset from each said second cutting means at a first angle;

machining said metal strip to define a slot along the longitudinal extent of said metal strip;

machining said metal strip to define a number of tie wings, each of said tie wings having a pair of tips with substantially angular corners;





rounding said substantially angular corners by machining at least some of said tips using said die means; and

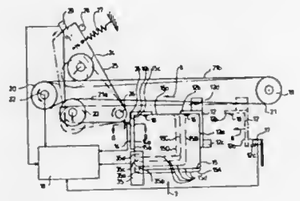
severing at least one of said tie wings from said metal strip.

4,819,317

ARRANGEMENT FOR UNLOADING AND LOADING OF X-RAY FILM CASSETTES

Walter Bauer, Munich; Manfred Schmidt, Kirchheim; Herbert Plaschke, Gernlinden, and Otto Butz, Neufahrn, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,876
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639344
Int. Cl.⁴ B23P *19/00, 21/00*
U.S. Cl. 29—407 **23 Claims**



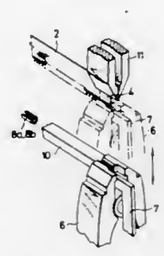
1. An arrangement for unloading and loading of X-ray sheet film cassettes which have flat sides with standarized but different sizes and which also can be used for receiving different sheet film sorts and reloadable with respective sheet film sorts, the arrangement comprising a light-tight closable shaft for receiving a cassette; transporting means for inserting and withdrawing of the cassettes; means for positioning the cassette so that one corner of cassettes of different types is positioned at the same location; a mechanically-electronic comparison device for determining a format of a cassette; a device for opening the cassette; means for withdrawing a film and inserting of a new film into the cassette; and means for automatically distinguishing cassette types with the same sizes or size regions and loadable with different film sorts, said automatically distinguishing means including at least one outwardly sensible marking provided on the cassettes of at least one type, at least one sensor arranged to sense the marking with a positioned cassette, and a comparison device which is connected with said sensor for automatic selection of a sheet film size or sort for further loading.

4,819,318

METHOD OF ATTACHING PARTS OF SEPARABLE BOTTOM END ASSEMBLY TO A CONTINUOUS SLIDE FASTENER CHAIN

Toshiaki Sodeno, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 18, 1985, Ser. No. 777,354
Claims priority, application Japan, Sep. 18, 1984, 59-195456
Int. Cl.⁴ B21D *53/50*
U.S. Cl. 29—408 **6 Claims**



1. In the production of separable slide fasteners each having a separable bottom end assembly, a method of attaching a box with a channel-shaped pin or insertion pin as a channel-shaped pin to one longitudinal edge of a continuous fastener stringer at one of a number of longitudinally spaced successive element-free portions thereof, said method comprising the steps of:

(a) moving the fastener stringer longitudinally along a substantially horizontal path;

(b) temporarily terminating the movement of the fastener stringer when one of the successive element-free portions arrives at an attaching station;

(c) threading the channel-shaped pin onto said one element-free portion of the one longitudinal edge of the fastener stringer by moving the pin in a direction perpendicular to the edge as the latter is at rest; and

(d) fixedly securing the threaded channel-shaped pin to said one element-free portion by compressing said pin into a final shape around said one longitudinal edge of the fastener stringer while the latter is at rest.

4,819,319

POWER CHUCK RETAINER FOR ROTATING SPINDLE

Günter H. Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed May 14, 1987, Ser. No. 50,634
Claims priority, application Fed. Rep. of Germany, May 15, 1986, 3616473
Int. Cl.⁴ B23B *19/00;* **B23Q** *3/00*
U.S. Cl. 29—568 **3 Claims**

1. A chuck assembly for rotary lathe spindle, comprising:

a power-operated chuck;

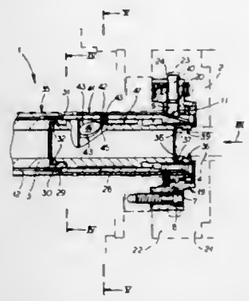
a head mounted at one end of said spindle and provided with:

means for centering said chuck on said spindle;

a plurality of chuck-engaging radial pins displaceable into and out of locking engagement with said chuck; and

a wedge drive receiving an axial displacement for shifting said pins radially, said chuck having a power-actuating element extending axially through said head;

a first actuator extending through said spindle and provided with a rotary bayonet coupling connecting said first actuator with said power-actuating element, said rotary coupling comprising a pair of relatively rotatable members axially interconnected in one position for transmitting axial force from said first actuator to said power-actuating element and being detachable in another position for separation of said power-actuating element from said first actuator;



a second actuator extending through said spindle and connected to said wedge drive for axially displacing said wedge drive;

respective fluid-powered members at an opposite end of said spindles operatively connected to said first and second actuators for displacing same; and

means operatively connecting said second actuator with said coupling for releasing said element from said first actuator upon displacement of said second actuator to enable retraction of said pins from engagement with said chuck to enable release thereof from said head.

4,819,320

AUTOMATIC DRILL BIT CHANGE APPARATUS FOR ROBOT DRILLING

Royston H. Cairns, and John R. Thompson, both of Preston, England, assignors to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 793,761, Nov. 1, 1985, abandoned. This application Oct. 19, 1987, Ser. No. 111,079
Claims priority, application United Kingdom, Nov. 3, 1984, 8427853
Int. Cl.⁴ B23Q *3/157*
U.S. Cl. 29—568 **7 Claims**

1. Apparatus for automatically effecting drill bit assembly change in a drill unit carried by robot means, the drill unit including chuck means rotatable about an axis of rotation for accepting, holding, and releasing a drill bit assembly, the chuck means having relatively movable means for effecting a chuck open condition in which the drill bit assembly can be accepted and released, and for effecting a chuck closed condition in which the drill bit assembly can be held,

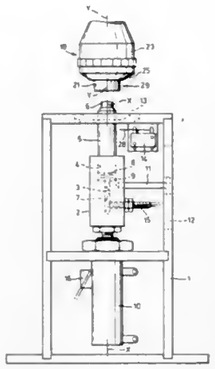
the apparatus characterised by including a drill bit assembly storage unit having a plurality of holding means for holding a corresponding number of drill bit assemblies in an attitude for acceptance by chuck means positioned by the robot means, with respect to a selected drill bit assembly, and the holding means therefor,

urging means for axially urging each holding means from a storage position to a position in which the drill bit assembly held thereby is presented to the chuck means,

chuck engagement means on said unit for each of said holding means positioned to engage the relatively movable

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means to effect sequential opening and closing of the chuck means, and



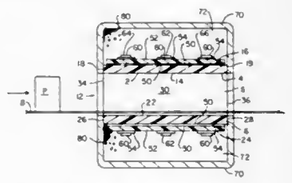
sequencing means responsive to the position of the chuck means relative to the selected holding means to effect urging of the drill bit assembly into the chuck means in correct sequence.

4,819,321

METHOD FOR MAKING THE SEARCH COIL ASSEMBLY FOR METAL DETECTORS

James M. Moran, Leominster, Mass., assignor to Barkley & Dexter Laboratories, Inc., Fitchburg, Mass.

Filed Aug. 18, 1987, Ser. No. 86,650
Int. Cl.[4] H01F 7/06
U.S. Cl. 29—602.1 9 Claims



1. A method for making search coil assemblies for metal detectors, comprising providing a frame of non-metallic material, said frame defining an aperture therethrough of a selected size for inspection of a selected product of a given size, applying a coating of carbon material to the exterior of said frame, applying a layer of plastic material over said carbon material, winding electrically conductive strands about said frame, fixing said frame to a rigid metal housing providing an enclosed void around the exterior of the coated frame and said strands, and applying foam plastic in liquid form to said frame and said strands, until said void is filled by said plastic.

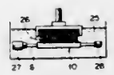
4,819,322

METHOD FOR MANUFACTURING A FLAT COIL

Shigetaka Higuchi; Isao Noguchi; Shuji Kurita, and Yasutomo Kodachi, all of Tochigi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 5, 1987, Ser. No. 58,560
Claims priority, application Japan, Jun. 8, 1986, 61-132513; Feb. 2, 1987, 62-22028
Int. Cl.[4] H01F 7/06
U.S. Cl. 29—605 11 Claims





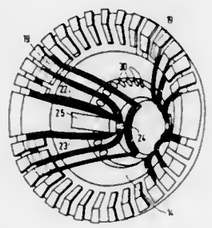
1. A process for producing a flat coil, comprising the steps of;
forming an insulator layer on a ribbon of metal foil,
winding said ribbon and said insulator layer about a center shaft while pressing the insulator layer toward said center shaft to form a rolled up metal foil body, and
cutting the rolled up body in a direction transverse to the axis of said center shaft by electric discharge machining into individual flat coils of a predetermined thickness.

4,819,323

METHOD OF MANUFACTURING AN ELECTRO-MAGNETIC DEFLECTION UNIT FOR A CATHODE RAY TUBE

Adriaan J. Groothoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1987, Ser. No. 99,584
Claims priority, application Netherlands, Feb. 6, 1987, 8700280
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[4] H01F 7/06
U.S. Cl. 29—605 3 Claims



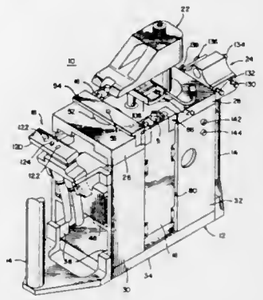
1. A method of manufacturing an electro-magnetic deflection unit for a cathode ray tube, which unit comprises a field deflection coil consisting of two saddle-shaped parts, a line deflection coil consisting of two saddle-shaped parts and an annular core of a magnetizable material surrounding the two coils; such method comprising: winding the two parts of the line deflection coil on a hollow, funnel shaped line deflection coil support having an annular flange at its wide end, winding the two parts of the field deflection coil on the inside of a funnel-shaped field coil support, and then passing the line deflection coil support on which the two line deflection coil parts are wound into the field coil support.

4,819,324

NUTPLATE INSTALLATION TOOL

Robert M. Roberts, Glenolden, Pa., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 913,273, Sep. 30, 1986, Pat. No. 4,736,519. This application Jan. 12, 1988, Ser. No. 143,040
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[4] B23P 21/00
U.S. Cl. 29—771 18 Claims



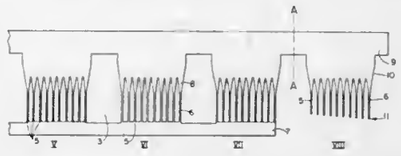
1. A nutplate installation tool for installing nutplates in a structural part, comprising:
a housing;
nutplate supply means mounted to the housing;
pick-up and transfer means mounted to the housing for transferring the nutplates from the nutplate supply means for engagement with the structural part; and
retaining means for retaining the engaged nutplate to the structural part.

4,819,325

METHOD OF FORMING ELECTRO-DISCHARGE MACHINING ELECTRODE

Jack A. Cross, Cincinnati, and Cletis M. Jackson, West Chester, both of Ohio, assignors to Technical Manufacturing Systems, Inc., Mason, Ohio

Filed Jun. 1, 1987, Ser. No. 57,120
Int. Cl.[4] H01R 43/00
U.S. Cl. 29—825 2 Claims



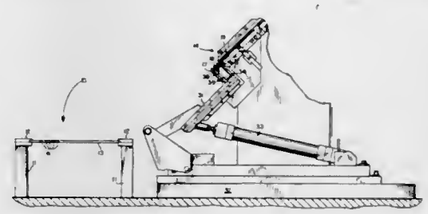
1. A method of forming, from a thin ribbon of malleable electro-conductive material, an electrode for use in electro-discharge machining, said electrode having at least one tooth, each said tooth having a straight forward section, the cross-section of said forward section being substantially circular, and a cone-like head section diverging from said forward section and being connected to a body section, which comprises the steps of:
removing elongated sections of said material from said ribbon transverse to the length of said ribbon to leave a series of spaced teeth extending between a body strip and a base strip,
said teeth being narrow for a length at the forward section which connects with said base strip, and being triangular-shape at the head section which connects with the said body strip,
compressing said teeth to reduce the thickness of said forward section to a desired thickness and to taper the thickness of said triangular-shape head section from the full thickness where it connects with said body strip to the compressed thickness of said forward section,
trimming said teeth to a desired width along said forward section,
coining said forward section of said teeth to a substantially circular cross-section shape,
coining said head section of said teeth to a cone-like shape, and
cutting electrodes from said ribbon.

4,819,326

METHOD FOR ROBOTIC PLACEMENT OF ELECTRONIC PARTS ON A CIRCUIT BOARD

Karl H. Stannek, 20122 Kline Dr., Santa Ana Heights, Calif. 92707

Filed Jun. 16, 1988, Ser. No. 207,197
Int. Cl.[4] H05K 3/30
U.S. Cl. 29—837 1 Claim



1. In a method for robotic placement of parts having depending electrical leads on a circuit board having pre-drilled holes to receive said leads therethrough, said method including a cycle comprising
selectively abstracting one of said parts from a supply thereof by a robotic arm, the terminal end of which is adapted to selectively engage and temporarily hold said part,
mechanically actuating said robotic arm to move said abstracted part from said supply and emplace said part on said circuit board with said leads extending through said pre-drilled holes, and
releasing said emplaced part and repeating said cycle,
the improvement in said method comprising the steps of arranging said parts in said supply so that said leads extend upwardly, and re-orienting said part during movement thereof from said supply to said circuit board, such that said leads extend downwardly when said part is emplaced on said circuit board.

4,819,327

SOLDERING METHOD FOR PRINTED CIRCUIT BOARD

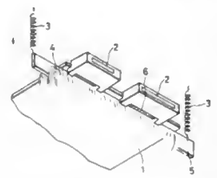
Syuuzi Tatsuoka, Katsuta; Hiroshi Sekiyama, Hadano, and Kanji Ishige, Ashigarakamigun, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 17,532
Claims priority, application Japan, Feb. 26, 1986, 61-40784
Int. Cl.[4] A05K 3/34
U.S. Cl. 29—840 12 Claims

1. A soldering method of a printed circuit board by dipping said printed circuit board into a molten solder inside a solder-

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ing bath, said soldering method characterized in that a member equipped at the edge thereof with the width substantially equal to and the length at least equal to those of a solder connection portion of said printed circuit board is dipped into said molten solder together with said printed circuit board when said printed circuit board is dipped into said molten solder, said printed circuit board is pulled up from said molten solder while



the edge of said member keeps contact with said solder connection portion when said printed circuit board is pulled up from said molten solder, and the edge of said member is separated from said connection portion after said printed circuit board and said member are pulled out from said molten solder in order to remove part of the solder adhering to said connection portion by surface tension.

4,819,328

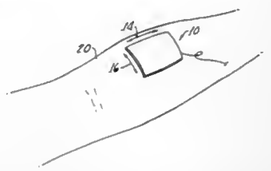
ELECTRICAL STIMULATION ELECTRODE MANUFACTURING METHOD

Jens Axelgaard, 730 Golden La., Fallbrook, Calif. 92028-3446, and Theodore Grussing, Huntington Beach, Calif., assignors to Jens Axelgaard, Fallbrook, Calif.

Continuation-in-part of Ser. No. 745,018, Jun. 14, 1985, Pat. No. 4,722,354. This application Oct. 28, 1987, Ser. No. 114,457

Int. Cl.[4] A61N *1/04*

U.S. Cl. 29—855 **9 Claims**



1. A method of producing electrical stimulation electrodes comprising:
- disposing a release layer on a portion of a back side of a conductive fabric;
- adhering a non-conductive backing sheet onto the release layer and portions of the conductive fabric back side not covered by the release layer;
- applying a conductive adhesive onto a face sheet;
- disposing a face side of conductive fabric onto the conductive adhesive;
- cutting the backing sheet, release layer, conductive fabric, conductive adhesive and face sheet into a plurality of individual electrodes, each electrode having a portion of the fabric back side covered by the release layer;
- peeling the release layer from the fabric back side;
- disposing an electrical lead wire onto the fabric back side from which the release layer was peeled;
- separating the release layer from the non-conductive backing sheet;
- adhering the non-conductive backing sheet over electrical lead wire and the fabric back side from which the release layer was peeled; and
- pressing each individual electrode to enhance adhesion of the non-conductive backing sheet to the fabric back side.

4,819,329

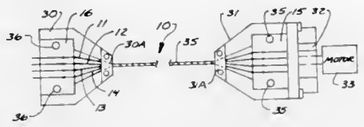
METHOD OF MANUFACTURING MULTIWIRE LEAD ASSEMBLIES

Thomas W. Haley, Minneapolis; Vladimir Drits, Minnetonka, and Dale R. Johnson, St. Louis Park, all of Minn., assignors to Innovex Inc., Hopkins, Minn.

Filed Sep. 9, 1987, Ser. No. 94,569

Int. Cl.[4] H01R *43/00, 43/02*

U.S. Cl. 29—860 **12 Claims**



1. A method of manufacturing multiwire lead assemblies comprising the steps of:
- positioning multiple wire retainers at desired spaced locations;
- placing the wires on the retainers and affixing end portions of the wires thereto in a desired orientation;
- retaining the end portions of the wires spaced apart and twisting center portions to form a twisted wire portion;
- providing insulation material for protecting the twisted wire portion in at least selected sections thereof; and
- forming locations where contacts can be made to the wires adjacent to the wire retainers.

4,819,330

LIVE-ACTION BLADE SHAVER

Lawrence E. Fenn, 101 Landsdowne, Westport, Conn. 06880, and Leo Chateanneuf, 16 Russ Rd., Trumbull, Conn. 06611

Filed Oct. 5, 1987, Ser. No. 104,502

Int. Cl.[4] B26B *19/28*

U.S. Cl. 30—45 **21 Claims**



1. An electric shaver comprising, in combination:
- (a) a handle,
- (b) a shaver head having a cutting blade,
- (c) attachment means for movably mounting the shaver head on the handle,
- (d) an electric motor in said handle, having a driving member,
- (e) a weight member,
- (f) journal means mounting said weight member in the shaver head for oscillating movement therein, and
- (g) drive means for imparting movement to the weight member in response to movement of said driving member.

4,819,331

APPARATUS FOR CRACKING THE HUSKS OF NUTS

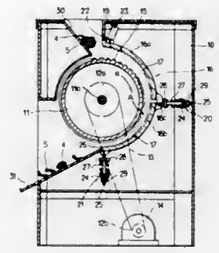
Norio Joyama, Kawasaki, Japan, assignor to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,582

Claims priority, application Japan, Nov. 11, 1986, 61-171960[U]

Int. Cl.[4] A23N *5/00*

U.S. Cl. 30—120.2 **7 Claims**



1. An apparatus for cracking the husks of nuts comprising: a casing, a cylindrical rotor having a plurality of cracking projections on its circumference, the cylindrical rotor being rotatably and horizontally fixed to the casing; a semicircular suspension stator having a plurality of cracking projections on its inner surface, the stator being positioned against a corresponding sector of the cylindrical rotor with said cracking projections on said stator facing said rotor and with a downwardly decreasing gap between the stator and the rotor, and being suspended from the casing with resilient means; and a hopper with an opening at the bottom for dispensing nuts to the gap between the stator and the rotor, said semicircular stator being composed of upper and lower sectors connected to each other at one of their ends by hinge means, the other end of the upper sector being link-connected to the casing, and the other end of the lower sector being connected to the casing with resilient means, and said hinge means connecting said sectors being further connected to said casing with resilient means.

4,819,332

OIL SUPPLY STRUCTURE OF CHAIN SAW

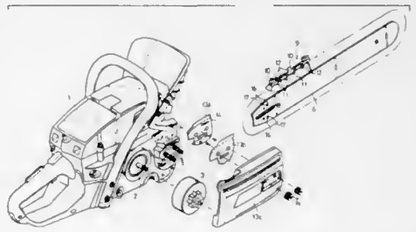
Hideo Sugihara, Owashi; Mitsukazu Takisita, and Daijo Hirose, both of Gifu, all of Japan, assignors to Sugihara Rinki Co., Ltd., Gifu, Japan

Filed Jul. 27, 1987, Ser. No. 78,377

Claims priority, application Japan, Feb. 26, 1987, 62-043398

Int. Cl.[4] B23D *59/04*

U.S. Cl. 30—123.4 **20 Claims**



20. An oil supply structure operable to supply oil to the chain of a chain saw, said oil supply structure comprising:
- a guide bar having a periphery adapted to support thereon a driven chain and including a first passageway communicating with one side of the chain and a second passageway communicating with the diametricly opposite side of the chain on the same side of the guide bar; and
- means communicating within said guide bar and with each of said first and second passageways for conveying lubricating oil from a source to each of said first and second passageways.

4,819,333

CUTTER HEAD FOR GRASS TRIMMER

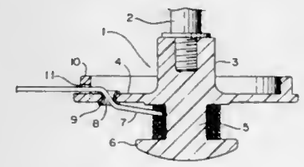
Toru Baba, Yokosuka, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 165,089

Claims priority, application Japan, Mar. 10, 1987, 62-34648[U]

Int. Cl.[4] A01G *3/06*

U.S. Cl. 30—276 **3 Claims**



1. A cutter head for a grass trimmer comprising:
- a boss portion adapted to be mounted on a rotary drive shaft of the grass trimmer;
- a disc portion formed coaxially and integrally with said boss portion;
- a cord winding portion around which a cutter cord is to be wound, said cord winding portion extending in an axial direction of said disc portion, said cord winding portion being formed integrally with said disc portion on an opposite side to said boss portion;
- a flange portion formed integrally with an axially outward end of said cord winding portion;
- a hole means formed in said disc portion for guiding a distal end of the cord from said cord winding portion toward said boss portion; and
- an annular flange portion formed integrally with a circumferential portion of said disc portion on the side of said boss portion, and said annular flange portion having a hole through which the distal end of the cord is fed radially outwardly of said disc portion.

4,819,334

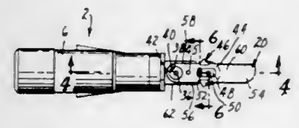
ORBITAL SAW DEVICE

Douglas R. Mongeon, Orange, Calif., assignor to Minnesota Mining and manufacturing Company, St. Paul, Minn.

Filed May 6, 1983, Ser. No. 492,042

Int. Cl.[4] B23D *49/04*

U.S. Cl. 30—393 **1 Claim**



1. An elongate, integral saw blade having opposite major surfaces and a peripheral edge surface, said blade comprising:
- a. a first end portion having a cylindrical drive surface between said major surfaces defining a through drive aperture adapted to receive a drive bearing;
- b. an intermediate portion extending from said first end

portion and having a guide aperture between said major surfaces adapted to engage a guide, said guide aperture being partially defined by facing guide surfaces located between said major surfaces and longitudinally aligned with said blade;

c. a second end portion extending from said intermediate portion opposite said first end portion and having a plurality of cutting edges along said peripheral edge surface; and

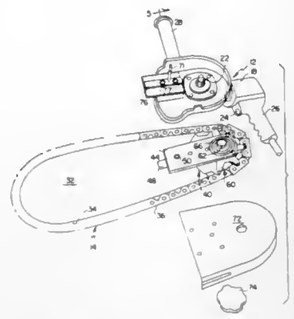
d. means between said drive aperture and said guide aperture for preventing reception of said drive bearing and engagment of said guide from one of said opposite major surfaces.

4,819,335

DETACHABLE BLADE ASSEMBLY FOR A CHAIN SAW

Carl J. Alexander, Three Rivers, Mich., assignor to Pro Power Corporation, Kalamazoo, Mich.

Filed Sep. 9, 1987, Ser. No. 94,715
Int. Cl.[4] B27B *17/14*
U.S. Cl. 30—500 **24 Claims**



1. A power-driven saw, comprising:

a power unit including a housing, motor means disposed within said housing, and driven shaft means rotatably-mounted in said housing and adapted to be driven by said motor means;

an integrated, self-contained, elongate, narrow cutting assembly unit adapted to be attached and detached as a unit on the housing of said power unit and to operatively connect with said driven shaft when attached and disconnect from said driven shaft when detached so that said power unit drives said cutting assembly unit when it is attached to said housing;

means for detachably mounting said cutting assembly unit as a unit on said housing,

said cutting assembly unit including a cutting element support means, an endless-belt cutting element means supporting by said support means for movement thereabout, and a cutting element drive assembly rotatably mounted on said support means which is adapted to drivingly-engage said cutting element means for moving said cutting element means about said support means;

said cutting element support means, said endless-belt cutting element means, and said cutting element assembly being integrated into a unitary structure which can be attached to or detached from the housing of said power unit as an intact unit which is operative both when said cutting assembly unit is attached to the housing of said power unit and when it is not;

coupling means for coupling aid cutting element drive assembly with said drive shaft means when said cutting assembly unit is mounted on said housing; and

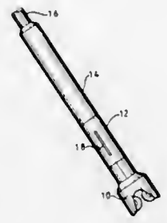
tension-maintaining means on said cutting assembly unit for maintaining a selected tension of said endless-belt cutting element means whether or not said cutting assembly unit is attached to the housing of said power unit.

4,819,336

METHOD OF DETERMINING THE ORIENTATION OF A SURVEYING INSTRUMENT IN A BOREHOLE

Anthony W. Russell, Turriff, Scotland, assignor to NL Sperry-Sun, Inc., Houston, Tex.

Filed Jan. 20, 1987, Ser. No. 4,954
Claims priority, application United Kingdom, Jan. 22, 1986, 8605123
Int. Cl.[4] E21B *47/022*
U.S. Cl. 33—304 **3 Claims**



1. A method of determining the orientation of a surveying instrument in a borehole, which method comprises:

(a) determining the inclination angle θ of the instrument in the borehole;

(b) determining the highside angle ϕ of the instrument in the borehole;

(c) determining two transverse components Bx and By of the local magnetic field perpendicular to the longitudinal axis of the instrument as measured at the instrument in the borehole;

(d) ascertaining the vertical component Bev of the true earth's magnetic field at the location of the borehole;

(e) determining a value Ψa for the azimuth angle of the instrument in the borehole from the expression:

$$\frac{\sin \psi a}{\cos \psi a} = \frac{-By'}{(Bx' + Bev \cdot \sin)/\cos}$$

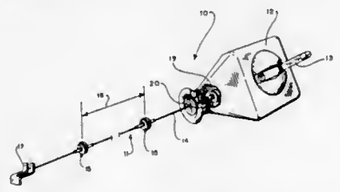
where $Bx' = Bx \cdot \cos\phi - By \cdot \sin\phi$
and $By' = Bx \cdot \sin\phi + By \cdot \cos\phi$.

4,819,337

CHALK LINE MARKING DEVICE

Tim I. Noyes, 4375 S. Weber River Dr., Ogden, Utah 84401

Filed Dec. 7, 1987, Ser. No. 129,131
Int. Cl.[4] B44D *3/38*
U.S. Cl. 33—414 **19 Claims**



1. A chalk line marking device for producing marks at preselected intervals along a working surface, said device comprising:

a flexible cord generally resistant to the retention of chalk dust;

a multiplicity of rigid chalk dust retaining units affixed at intervals along the cord, each unit extending perpendicularly from the cord and including chalk dust retaining material, of which only portions substantially distant from the cord are exposed, so that the flexible cord tends to be prevented from contacting the working surface during use of the device; wherein each chalk dust retaining unit comprises

a pair of rigid, chalk resistant washers radially outstanding from the flexible cord; and

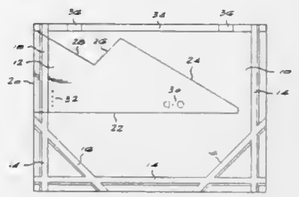
a washer of chalk retaining material sandwiched between the rigid washers and extending at least to all points of the peripheries thereof, so as to contact the working surface when the cord is stretched thereon for use, and to hold the cord away from said working surface.

4,819,338

DRAWING INSTRUMENTS

Christiaan B. Lategan, Randburg, and Theodore E. Schwellnus, Verwoerdburg, both of South Africa, assignors to Cibela Patents C.C., Randburg, South Africa

Filed Mar. 16, 1987, Ser. No. 26,141
Claims priority, application South Africa, Mar. 20, 1986, 86/2080
Int. Cl.[4] B43I *13/02*
U.S. Cl. 33—437 **12 Claims**



1. A drawing board and drawing instrument combination, comprising:

a drawing board having a rectangular planar surface with four edges, corners between the edges, and linear engaging formations formed on the board respectively adjacent three of the edges and across the two corners therebetween at 45° to the edges thereat; and

a drawing instrument having opposite, substantially-flat sides with at least two straight edges therebetween, and complementary engaging formations respectively on the opposite sides for fitting slidably along the linear engaging formations of the drawing board when the corresponding side of the drawing instrument is on the planar surface of the drawing board, the straight edges of the drawing instrument being at different angles to the complementary engaging formations.

4,819,339

METHOD OF MEASURING ROTARY-TABLE DEVIATIONS

Horst Kunzmann, Braunschweig; Karl Schepperle, Oberkochen; Gerhard Trieb, Konigsbronn, and Franz Wildele, Braunschweig, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 116,509
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637410
Int. Cl.[4] G01B *7/03*
U.S. Cl. 33—503 **12 Claims**

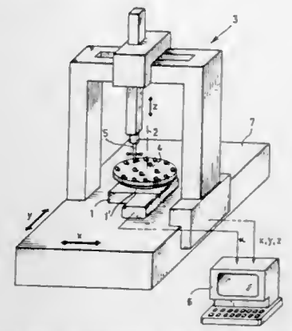
1. The method of using a multiple-coordinate measuring machine to calibrate a rotary table adapted to support a workpiece for measurement by said machine, wherein the machine includes a prove for measurement of the coordinates of a succession of different contacts with a workpiece, which method comprises the steps of

(a) selecting a ball plate having at least three mutually spaced balls fixedly mounted to said plate,

(b) mounting said plate to the rotary table so as to expose said balls for probe-contact measurement,

(c) performing a first set of different multiple-contact measurements on each ball for a first angular position of the rotary table and calculating therefrom the positional coordinates of each ball center when in said first angular position,

(d) repeating step (c) for each of a succeeding plurality of angularly indexed positions of the work table, for at least one complete rotation of the table,



(e) statistically determining from the plural angularly-indexed positional coordinates of the centers of said balls, a selected one or more of a plurality of different deviations as a function of indexed angular position and for said at least one rotation, said different deviations comprising:
axial-travel deviation, $f_a(\alpha)$,
radial-travel deviation, $f_r(\alpha)$,
wobble deviation, $f_t(\alpha)$, and
angular-position deviation, p_w,

(f) storing the predetermined deviation values as a function of indexed angular position; and

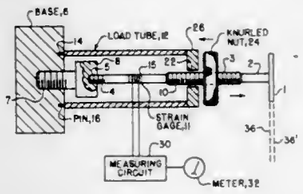
(g) using the stored deviation values as corrections to coordinate measurements on a workpiece mounted to and indexed via the rotary table.

4,819,340

COMPACT FOCAL PLANE PRECISION POSITIONING DEVICE AND METHOD

Allen L. DeForrest, Santa Ynez, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 24, 1987, Ser. No. 124,640
Int. Cl.[4] G01B *5/00*
U.S. Cl. 33—613 **20 Claims**



13. A device for precisely positioning a first terminal portion of an elongated tensile member with respect to a base member coupled to a second terminal portion of said tensile member, said tensile member having a threaded portion, and a strain

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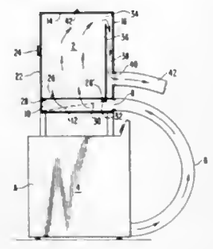
gage receiving portion having an electrical strain gage measurement means thereon, a load tube, positioned about said tensile member, with a first terminal tube portion positioned against said base member, and a second terminal tube portion positioned about the threaded portion of said tensile member, and a nut member, mounted upon the threaded portion of said tensile member and positionable against said second terminal portion of said load tube, for producing compression of said tube and tension within said tensile member, to enable said measurement means to produce a signal indicative of the position of the first terminal portion of said tensile member with respect to said base member.

4,819,341

DRYER FOR PERMANENT PRESS FABRICS

Donald Gayso, 1092 Perkins Ter., Memphis, Tenn. 38117

Filed Oct. 17, 1986, Ser. No. 920,261
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—86 **9 Claims**



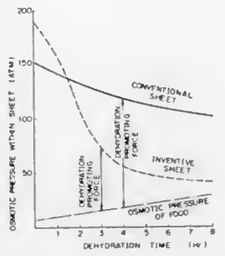
1. A free-standing drying cabinet for permapress clothing utilizable as an accessory for a conventional rotary clothes dryer used in a domestic laundry room, the conventional rotary clothes dryer having an air inlet and an exhaust outlet, said drying cabinet comprising:
- rigid wall means including side, rear, bottom and top walls and defining a cabinet enclosure surrounding an interior stationary drying zone;
- a door on one side of said cabinet for providing access to said interior drying zone and for allowing clothing to be placed in said interior drying zone;
- means, mounted within said cabinet enclosure, for supporting clothes hangers with clothing thereon in a manner whereby the clothing is allowed to hang freely from the clothes hanger;
- a hot air inlet port for introducing hot air into said interior stationary drying zone;
- a lint filter adjacent said hot air inlet port;
- a hot air outlet port for discharging air from said interior stationary drying zone;
- an air distribution plate for distributing the introduced hot air evenly throughout the interior of said cabinet, said air distribution plate being located between said inlet and said interior stationary drying zone; and
- first conduit means having one end connected to said hot air inlet port and another end adapted to be fixed to the exhaust outlet of the conventional rotary dryer,
- second conduit means, connected to said hot air outlet port, for exhausting the hot air at a point exterior to the room in which the drying cabinet is located.

4,819,342

WATER ABSORPTION CONTROLLED DEHYDRATING DEVICE

Mamoru Matsubara, and Masami Takuno, both of Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,534
Claims priority, application Japan, Nov. 18, 1987, 62-289270
Int. Cl.[4] F26B *13/26*
U.S. Cl. 34—95 **10 Claims**



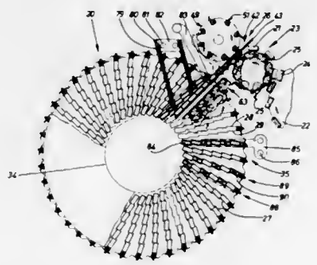
1. A water absorption controlled dehydrating device which comprises covering a high osmotic pressure substance and a water soluble thickening agent with a supporting material provided at least partly with a water-permeable semipermeable membrane.

4,819,343

APPARATUS FOR THE STORAGE OF (CIGARETTE) PACKS

Heinz Focke, Verden, and Hans J. Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Feb. 5, 1987, Ser. No. 11,486
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605177
Int. Cl.[4] F26B *11/00*
U.S. Cl. 34—187 **21 Claims**



1. Apparatus for the storage of cigarette packs, especially for the setting of glue spots, including a rotating drying turret which has a plurality of pockets distributed along the periphery of the turret, each pocket intended for storing a plurality of packs, characterized in that each of the pockets (27) is elongated in an approximately radial direction of the circular turret and has in its longitudinal direction a plurality of radially spaced, circumferentially staggered steps (30) each capable of supporting a pack (21), wherein chambers (31), each for storing a pack (21), are defined in the pockets (27) by said steps (30) which are formed by a stepped design of pocket side walls (28,

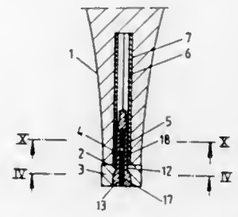
29) extending in a direction parallel to a center axis of the circular turret.

4,819,344

SHOE, IN PARTICULAR LADIES HIGH-HEELED SHOE

Günter Schüller, Bergstrasse 24, 5060 Bergisch-Gladbach 2, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,277
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 8633827[U]
Int. Cl.[4] A43B *21/42, 21/36*
U.S. Cl. 36—35 A **17 Claims**



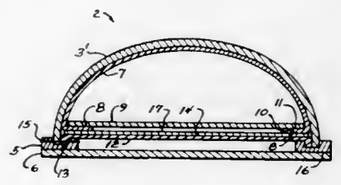
1. A shoe, in particular a ladies high-heeled shoe, comprising:
- a heel and a heel tap;
- an expandable pin fastening the heel tap to the heel, the pin having a longitudinal bore of circular cylindrical shape;
- an expandable sleeve disposed within the heel; and
- an expansion nail; and wherein
- the pin has an expandable head which extends non-rotatably forming an expansion seat through a hole in the heel tap, said head has a frustoconical section extending in axial direction over a greatest portion of the axial length of said head, said longitudinal bore extends in said frustoconical section, and said pin extends, forming an expansion seat, within the expandable sleeve of the heel,
- the expansion nail having a non-circular cross section greater than the cross section of said longitudinal bore, said expansion nail being driven into the longitudinal bore extending up into said head and therebeyond in said pin.

4,819,345

WATERPROOF SHOE CONSTRUCTION AND MANUFACTURE

John J. Mulcahy, Rochester, N.H., and I. David Hill, Milwaukee, Wis., assignors to Starensier, Inc., Newburyport, Mass. and Enka America Inc., Asheville, N.C.

Filed Feb. 29, 1988, Ser. No. 161,885
Int. Cl.[4] A41B *23/07, 15/00*
U.S. Cl. 36—17 R **6 Claims**



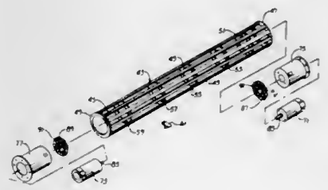
1. A waterproof shoe construction (1) comprising:
- (a) an upper section (2) with side panel portions (3 & 3'), and a top opening (4) arranged to receive a foot;
- (b) a liner (7) connected to the inside of said upper section (2), said liner (7) being impervious to liquid water, but pervious to water vapor, said liner (7) with a folded-over flange portion (8) on its lower end;
- (c) a first innersole (9) cemented on its bottom peripheral side (10) to the top side (11) of said folded-over flange portion (8) of said liner (7);
- (d) a second innersole (12), with rib (13) extending down from its bottom peripheral side;
- (e) a film (17) impervious to liquid but pervious to water vapor overlapping the entire periphery of said folded over flange portion (8), and bonded on its top side thereto and bonded on its bottom side to the top side of said second innersole (12);
- (f) a channel-shaped welt (5) with its open end facing upwards for receiving the lower end of the upper section side panel portions (3 & 3') and the rib (13) extending down from the second innersole (12), said welt (5) being connected to the side panel portions (3 & 3') and the rib (13) by a substantially horizontal stitch (15) passing through both walls of the welt (5), the side panel portions (3 & 3') and the rib (13); and,
- (g) an outersole (6) cemented on its top peripheral side to the flat bottom end (16) of said channel-shaped welt (5).

4,819,346

DREDGE CUTTING HEAD WITH SHOCK ABSORBER

C. Gene Maitlen, Oklahoma City, Okla., assignor to VMI, Inc., Oklahoma City, Okla.

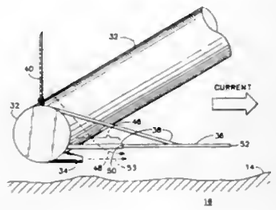
Continuation of Ser. No. 843,655, Mar. 25, 1986, Pat. No. 4,765,071. This application Feb. 4, 1988, Ser. No. 152,309
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.[4] E02F *3/88*
U.S. Cl. 37—66 **16 Claims**



1. An improved dredge device of the type having a boat supporting a lowerable boom with a linear suction intake, rotor and rotor drive on the lowerable end thereof for dredging material on the floor of bodies of water, the improvement comprising:
- said rotor comprising a cylindrical cage of cutter bars,
- said bars having a plurality of teeth extending therefrom, for digging, shredding and conveying sludge material to the linear suction intake and into which cage and through which cage vegetation and sludge material can pass in route to said linear intake, said linear intake being disposed along and adjacent said rotor so as to draw sludge material through said cage, said cylindrical cage being connected for rotation to said rotor drive by a support ring rigidly connected to said cutter bars; and
- shock absorbing means connected between said support ring and said rotor drive for absorbing axial,
- radial and tangential shocks received by said cage of cutter bars.

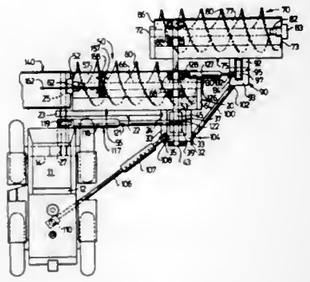
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4,819,347
SYSTEM FOR REMOVING SUBMERGED SANDWAVES
Robert W. Lofgren, Vancouver, Wash., assignor to Riedel International, Inc., Portland, Oreg.
Filed Jan. 19, 1988, Ser. No. 144,959
Int. Cl.[4] E02F *5/28*
U.S. Cl. 37—78 **11 Claims**



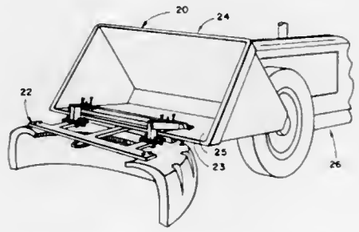
1. An apparatus for moving submerged sedimentary material comprising:
(a) a plurality of fluid jets having parallel-oriented outlets spaced apart in a transverse direction;
(b) means for pumping a fluid under pressure through said jets in a flow direction generally perpendicular to said transverse direction for producing a directional flow in a surrounding fluid, said transverse direction and flow direction defining a flow plane; and
(c) a transversely-elongate plate extending down-flow from the outlets of said jets and located above said outlets, and a transversely-elongate member located up-flow from the outlets of said jets and spaced from said transversely-elongate plate, said plate and said member defining therebetween a transversely-extending orifice above said outlets having a lowermost extremity extending along said flow direction between transversely-extending orifice boundaries located up-flow and down-flow, respectively, of said outlets for conducting a restricted flow of said surrounding fluid toward said flow plane in a downward direction.

4,819,348
DITCH FORMING MACHINE
Charles H. DeBolt, R.R. #1, Box 95, Washburn, Ill. 61570
Filed Aug. 17, 1987, Ser. No. 85,949
Int. Cl.[4] E02F *5/04*
U.S. Cl. 37—81 **17 Claims**



1. A ditch forming machine comprising:
a mobile auger frame adapted for earth traversing movement in a predetermined forward generally longitudinal direction of travel along such a ditch;
a pair of elongated powered earth engaging screw-auger assemblies mounted on said auger frame in offset oppositely extended relation from each other substantially transversely of said longitudinal direction of travel;
said auger frame including an elongated rocker shaft disposed in elevated position thereon and having an axis substantially aligned with said longitudinal direction of travel;
and means individually mounting said screw-auger assemblies on said rocker shaft in fore and aft staggered relation.

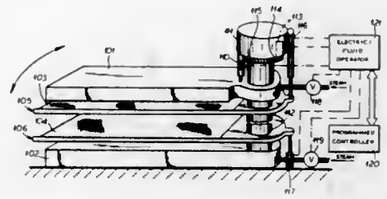
4,819,349
OFFAL SCRAPER
Donald Mensch, 2721 Bauer Rd., Jenison, Mich. 49428
Filed Feb. 25, 1987, Ser. No. 18,625
Int. Cl.[4] E02F *3/76*
U.S. Cl. 37—117.5 **14 Claims**



12. A scraper assembly comprising:
a generally horizontally opening bucket defining a bottom wall and a front edge;
prime mover means for rotating and horizontally moving said bucket;
a scraper element comprising substantially a quarter portion of a vehicle tire, said scraper element having a top mounting surface comprising a portion of a sidewall of said tire, an outwardly forwardly curved scraping wall perpendicular to said mounting surfaces defined by a portion of a tread section of said tire and means defining a bottom edge of said scraping wall extending in a plane that is generally parallel said mounting surface; and
mounting means for mounting said scraper element to said bucket including means for transmitting downward forces from said bucket to said scraper element to selectively engage a horizontal surface with said bottom edge and to slide said bottom edge over the horizontal surface in a squeegee fashion, said mounting means including a mounting bracket assembly having a base portion rigidly attached to said mounting surface and support means rigidly attached to said base portion, said support means having surface means for defining a rearwardly opening throat configured to receive a forward portion of said bucket bottom wall in order to selectively raise, lower and forwardly propel said scraper element.

4,819,350
IRONING MACHINE
Harald Engel, Vienna, Austria, assignor to Texma Textilmaschinen und Armaturen Gesellschaft m.b.H., Vienna, Austria
Filed Jul. 17, 1987, Ser. No. 74,768
Claims priority, application European Pat. Off., Jul. 18, 1986, 86 890212
Int. Cl.[4] D06F *71/00*
U.S. Cl. 38—30 **16 Claims**

1. An ironing machine, comprising:
at least one pressing plate having a surface;
a lower frame spanned by a respective elastically stretchable web juxtaposed with said surface of said pressing, plate and adapted to be stretched across said surface; and
an upper frame spanned by a respective elastically stretchable web juxtaposed with said surface of said pressing plate and adapted to be stretched across said surface

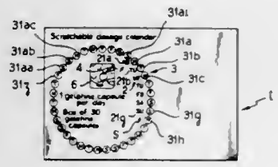


whereby an article received between said webs is smoothed upon said frames being displaced relative to said plate so that the webs are stretched across said surface.

4,819,351
BOOKCOVER-LIKE FOLDER FOR GUIDED MENU
Maria Boitani, Via Bissolati, No. 54, 001870 Rome, Italy
Filed Apr. 21, 1987, Ser. No. 41,739
Claims priority, application Italy, Oct. 31, 1986, 36223/86[U]
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—642 **3 Claims**

1. A folder for containing the information of a menu, said folder comprising:
a flexible upper sheet having inner and outer surfaces;
a flexible lower sheet having an inner surface, an outer surface and a recess defined therein between the inner and outer surfaces thereof;
a rigid rib securing said upper sheet to said lower sheet along respective corresponding lateral edges thereof so that said upper sheet, said lower sheet and said rib collectively define a first folder-like section, the inner surfaces of said upper and said lower sheets facing each other in a closed position of said first folder-like section, and said first folder-like section being openable from said closed position to an open position thereof at which the inner surfaces of said upper and said lower sheets are flexed away from each other;
a supplemental sheet disposed in the recess of said lower sheet and removable therefrom;
a second folder-like section disposed on and secured relative to the outer surface of said upper sheet of said first folder-like section, said second folder-like section comprising a first sheet having inner and outer surfaces, and a second sheet having inner and outer surfaces, said first sheet being joined to said second sheet along corresponding lateral edges thereof, the inner surfaces of said first and said second sheets facing each other in a closed position of said second folder-like section,
said second folder-like section being openable from said closed position thereof to an open position at which the inner surfaces of said first and said second sheets are disposed away from each other; and
two button-like closing members rotatably mounted to the outer surface of said upper sheet and rotatable between engaging and disengaging positions, said closing members engaged with said second folder-like section when in said engaging position for maintaining said second folder-like section in said closed position thereof, and said closing members being out of engagement with said second folder-like section when in said disengaging position.

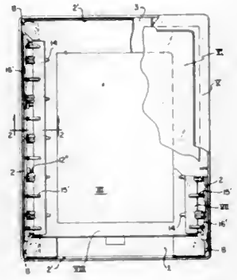
4,819,352
DOSAGE CALENDAR
Jean Maunand, Gevrey Chambertin, France, assignor to Fournier Innovation et Synergie, Paris, France
Filed Feb. 16, 1988, Ser. No. 155,828
Claims priority, application France, Feb. 13, 1987, 87 01814
Int. Cl.[4] G09D *3/00*
U.S. Cl. 40—107 **7 Claims**



1. A dosage calendar for facilitating the success of and compliance with a therapeutic drug treatment by aiding in confirming that a drug has actually been administered and in adhering to a prescribed dosage over a period of time, said calendar comprising:
at least two series of calendar indicia, including:
a first series (2) of calendar indicia consisting of a chronological sequence of first unit elements (21*a*, 21*b* . . .) of a first time group, said first unit elements (21*a*, 21*b* . . .) corresponding in number to the periodicity of administration of a unit dose of a drug such that said first unit elements represent
(i) numbers of the days of the month when the first time group is a month, and
(ii) names of the days of the week, or their abbreviations, when the first time group is a week, and
(iii) portions of a day when the first time group is a day, week or month and the periodicity of administration is greater than one unit dose per day, and
a second series (3) of calendar indicia consisting of a chronological sequence of second unit elements (31*a*, 31*b* . . .) of a second time group of at least one week, the number of second unit elements in said second time group being seven or a whole multiple of seven and being equal to or just greater than a total number of unit doses of the drug which are to be administered, according to whether or not said total number of unit doses is divisible by seven,
the calendar indicia of at least one of said first and second series (2, 3) of indicia each having a manually user-changeable recognition mark for recording thereon each prescribed administration and prescribed non-administration of a unit does corresponding with a respective one of said unit elements, said first and second series (2, 3) of calendar indicia corresponding with one another such that, by the changing of respective ones of said recognition marks at the time of prescribed administration or prescribed non-administration of each unit dose of the drug, the respective unit elements of said first and second time groups corresponding to the start of the treatment, the last unit dose administered and the next unit dose to be administered are made recognizable, during treatment, by visual or manual reading of said dosage calendar.

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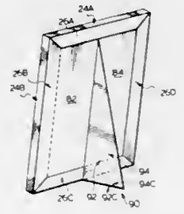
4,819,353
ILLUMINATED PICTURE FRAME
Dov Z. Glucksman, 137 Larch Row, Wenham, Mass. 01984; Paul K. Cohen, 23 Fifer Ln., Lexington, Mass. 02173, and Jorg Ratzlaff, 617 Hudson St., New York, N.Y. 10014
Filed Jul. 31, 1987, Ser. No. 79,956
Int. Cl.[4] G09F *13/18*; A47G *1/06*
U.S. Cl. 40—152.2 2 Claims



1. An illuminated picture frame comprising
a housing in the shape of an open box comprising a rear wall, means for fastening a picture to said rear wall, four side walls and an inwardly projecting front rim of a size leaving a frontal opening coextensive with the size of said picture;
at least two illuminating fixtures extending along at least two of said side walls, each said fixture consisting of a bar of a dielectric material comprising a linear reflector of uniformly curved cross section on the side facing said picture, said reflector is inclined toward the surface of said picture, a plurality of spaced-apart bulb sockets and means for holding conductor wires extending along said bar in spaced-apart relationship, both on the side of said bar facing said side wall;
a plurality of light bulbs, one bulb inserted into each said socket and conductively connected to said conductor wires, said sockets are in the form of longitudinally slotted bushings adapted to hold said bulbs by clamping and to permit their placement along said sockets to effect each light filament to coincide with the focus of said curved reflector;
at least one electric battery conductively connected to said conductor wires, said battery(ies) being housed in a battery housing attached to the outside of said rear wall, said battery housing having a cover with an integral support leg serving to keep said frame in a standing position; and
switch means adapted to close the circuit containing said battery(ies) and said light bulbs.

4,819,354
ONE-PIECE FOLDABLE FRAME ASSEMBLY
Zelko Papov, 2825 Islington Ave. N., Weston, Canada M9L 2K1
Filed Apr. 30, 1987, Ser. No. 44,291
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40—154 19 Claims

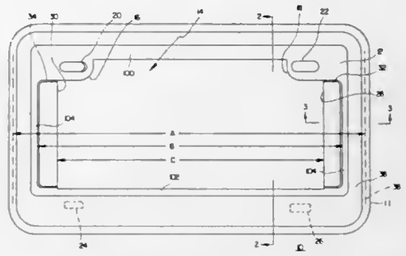
1. A one-piece, picture frame made from suitably-foldable material, for framing material to be framed which comprises at least one flat, planar object to be framed, comprising:
a front piece having a plurality of sides and having at least one viewing opening therethrough;
an edge piece foldably extending from each respective side of the front piece;
a back piece foldably extending from each respective edge piece, wherein each back piece has a back edge;
a backing member having a first part and a second part, each part having a first edge and a second edge; and
a supporting member comprising a plurality of adjacent, foldably-connected parts, and having a first edge and a second edge;
wherein the first part of the backing member is foldably connected at the first edge thereof to one back piece at the back edge thereof;
a first part of the supporting member is foldably connected at the first edge of the supporting member to the first part of the backing member at the second edge thereof;
a second part of the supporting member is foldably-connected at the second edge of the supporting member to the second part of the backing member at the first edge thereof;
wherein each of the parts of the supporting member has a bottom edge, and the bottom edge of at least one of the parts of the supporting member is formed so as to provide at least one support point for supporting the picture frame;



wherein the frame is folded such that:
the edge pieces form side faces extending in the same direction and substantially at right angles to the front piece;
the back pieces form back faces extending inwardly from the respective side faces;
an open channel is formed between each back face and the front piece;
the depth of each channel is substantially the same as the depth of the material to be framed; and
the first and second edges of the supporting member are proximate each other such that the supporting member is generally normal to the backing member; and
further comprising:
a first backing sheet adhered to the first and second parts of the backing member; and
a second backing sheet positioned within the respective channels and adjacent to the back pieces, and having an opening for receiving the first backing sheet.

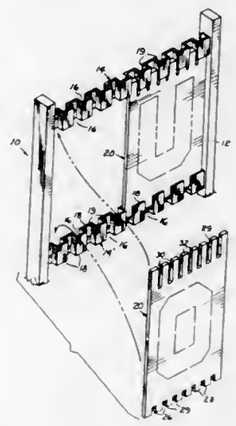
4,819,355
MOTORCYCLE LICENSE PLATE FRAME
Joseph E. Solow, Plainview, N.Y., assignor to Wolo Manufacturing Corporation, Deer Park, N.Y.
Filed Jul. 28, 1987, Ser. No. 78,531
Int. Cl.[4] B60R *13/10*
U.S. Cl. 40—209 1 Claim

1. A license plate frame adapted to mount license plates of more than one size, such license plates being of the conventional type having top and bottom edges and a pair of laterally spaced mounting holes adjacent to the upper edge, said frame comprising:
a generally planar frame member including upper, lower, and side frame portions, wherein the frame portions have front and back faces and define a rectangular opening sized to frame a first size license plate;
lower engagement means projecting from the back face of said lower frame portion for engaging the lower edge of a license plate;
a pair of laterally spaced tabs projecting from said upper frame portion into said opening, wherein each tab includes a laterally elongated slot positioned to be aligned with one of the license plate mounting holes when the plate is positioned in the lower engagement means; and
a pair of removable frame portions projecting from said side



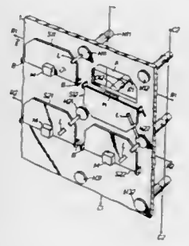
frame portions into said opening, wherein each removable frame portion is adjoined to the respective side frame portion by a frangible joint, and wherein the removable frame portions are sized to frame a second, narrow license plate.

4,819,356
CHANGEABLE SIGN LETTER SUPPORT FOR MARQUEE SIGNS
Gilbert Spidell, 1321 Andy, Altus, Okla. 73521
Continuation-in-part of Ser. No. 842,581, Mar. 21, 1986, abandoned. This application Jul. 23, 1987, Ser. No. 77,133
Int. Cl.[4] G09F *7/02*
U.S. Cl. 40—618 3 Claims



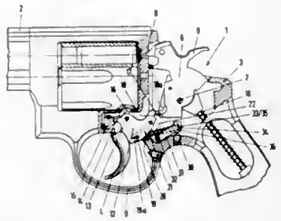
1. A changeable character sign, comprising:
a sign support;
a plurality of elongated rack means rigidly secured horizontally in vertically spaced relation to said sign support and defining a sign plane having forward and rearward surfaces,
each said rack means having a series of juxtaposed alternately forwardly and rearwardly facing vertically oriented grooves;
a plurality of sign character panels extending between adjacent said rack means and having upper and lower ends; and,
means on said panel ends cooperatively engaging said racks for normally preventing lateral movement of said panels relative to each other or the sign plane.

4,819,357
INFORMATION DISPLAY DEVICES
Hassan P. A. Salam, 63 Lowther Rd., Barnes, London SW13, England
Continuation-in-part of Ser. No. 459,223, Jan. 19, 1983, abandoned. This application May 23, 1985, Ser. No. 737,041
Claims priority, application United Kingdom, Jan. 22, 1982, 8201779; May 23, 1984, 8413139
Int. Cl.[4] G09F *9/00*
U.S. Cl. 40—449 5 Claims



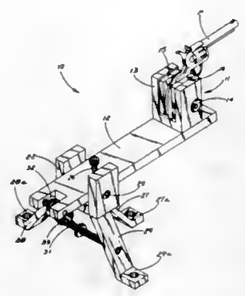
1. A display matrix, comprising
(a) a generally planar support (1) containing a plurality of display elements;
(b) a plurality of display members (S) rotatably connected with said support associated with said display elements, respectively, said display members being rotatable between first and second positions to alter the appearance of the display elements;
(c) a plurality of permanent magnets (M) connected with said display members, respectively;
(d) first ferromagnetic members (L) connected with said display members, respectively, in spaced relation from said permanent magnets;
(e) actuating means connected with said support for rotating said display members between said first and second positions, said actuating means including
(1) second ferromagnetic members (D) arranged adjacent said permanent magnets, respectively, at least when said display members are in said first positions; and
(2) first coil means (R) connected with a group of said second ferromagnetic members to magnetize said group of second ferromagnetic members upon energization of said first coil means to urge rotation of a group of adjacent display members by interaction with the adjacent permanent magnets; and
(f) current controlled holding means connected with said support for selectively retaining display members against rotation in response to said actuating means, said holding means including
(1) third ferromagnetic members (H) connected with said support and arranged adjacent said first ferromagnetic members, respectively, at least when said display members are in said first position; and
(2) second coil means (C) connected with a set of said third ferromagnetic members arranged so that selective predetermined energization of said second coil means prevents, by interaction between said set of third ferromagnetic members and adjacent first ferromagnetic members, rotation of selected display members of said group that are urged to rotate by energization of said first coil means.

4,819,358
DEVICE FOR ADJUSTING THE TRIGGER WEIGHT OF A REVOLVER
Josef Eder, Anton-Burgmeier-Strasse 3a, D-8060 Dachau, Fed. Rep. of Germany
Filed Nov. 2, 1987, Ser. No. 115,873
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639746
Int. Cl.[4] F41C *19/00, 1/00*
U.S. Cl. 42—65 **9 Claims**



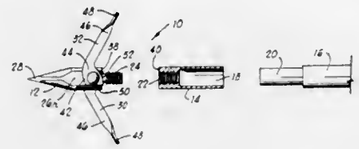
1. A device for adjusting the trigger weight of a revolver wherein a trigger is pivotally mounted about a trigger pivot joint in the body of the revolver and is movable within a trigger guard to actuate a hammer, comprising a thrust rod articulately connected to the trigger at one of its ends and having the other of its ends slidably coupled through a guide, which guide is movable relative to said body, a spring engageable between said trigger and said guide, and means for moving said guide relative to said gun body to modify the angular position of the thrust rod with respect to the trigger.

4,819,359
PISTOL REST
Earl R. Bassett, 820 Wepo Trail, Flagstaff, Ariz. 86001
Filed Jan. 19, 1988, Ser. No. 145,414
Int. Cl.[4] F41C *29/00*
U.S. Cl. 42—94 **8 Claims**



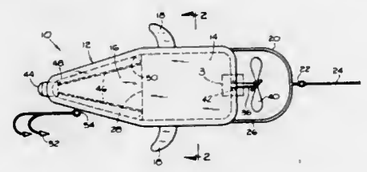
1. A pistol rest apparatus for the securement and discharge of a pistol comprising:
a support plate including a first and second end,
a securement means for securement of a pistol including a "U" shaped pistol mount, said mount includes a first stationary jaw surface and a second reciprocable jaw mounted within said "U" shaped pistol mount, and
a first end of a dampener secured to said support plate at the second end and a second end of said dampener secured to a support means underlying said support plate wherein said support means is secured to a "U" shaped yoke means for pivotal securement of said support plate intermediate said first and second ends of said support plate, and
wherein said "U" shaped pistol mount is removably secured to said support plate including a threaded securement means positionable through an opening in said support plate to secure said "U" shaped pistol mount to said support plate, and
wherein said dampener is positioned within a "U" shaped recess formed within the second end of said support plate.

4,819,360
BOWFISHING ARROWHEAD
Larry Thomas, Rte. 2, Box 76, Baxter Springs, Kans. 66713
Filed Jul. 13, 1987, Ser. No. 72,515
Int. Cl.[4] A01K *81/04*
U.S. Cl. 43—6 **7 Claims**



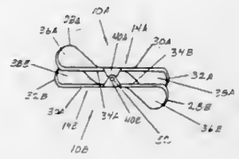
1. An arrow device for bowfishing, comprising:
an arrow shaft having a front end;
a collar means secured on said shaft front end and having an axial threaded bore formed therein;
an arrow point formed as a generally round rear base tapering to a front point and having an axial threaded shaft extending rearward from said rear base to be threadedly received in said threaded bore; and
first and second barb vanes each having first and second ends with the first ends pivotally affixed on opposite sides of said point section adjacent the rear base, and with the respective second ends similarly formed as a wing tip at a preselected angle relative to the remainder of the barb vane to impart fluid responsive axial rotation to the arrow device during flight;
whereby said arrow point may be firmly affixed in threaded engagement in said collar means to place the barb vanes in a selected one of the attack position and the quiver position.

4,819,361
FISHING LURE
Robert Boharski, 7914 W. 92nd St., Hickory Hills, Ill. 60437
Filed Oct. 6, 1986, Ser. No. 916,020
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—17.6 **10 Claims**



1. A fishing lure of the kind adapted for connection to a line, and cast into the water, and drawn in, and having a leading end and a trailing end relative to the direction of drawing in, comprising,
a body including a shell made up of a pair of substantially identical halves fused together,
an electric light mounted in the shell, with the major portion of the light confined between the shell halves and being exposed to the exterior at the rear,
an electrical generator confined in the shell halves and operably connected to the light, and having an operating shaft exposed through the front of the shell to the exterior, and
a propeller mounted on the shaft, on the exterior of the shell, and operably in response to drawing the lure through the water for operating the generator and a boil mounted to the leading end of the body and extending around said propeller with a forward end for attachment to said line.

4,819,362
FISHING LURE AND BLADE THEREFOR
Millard C. Lewis, 641 Alabama Ave., Sellersburg, Ind. 47172
Filed Jan. 20, 1988, Ser. No. 146,198
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.2 **2 Claims**



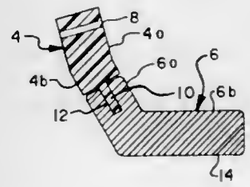
1. A fish lure comprising:
(a) a first blade comprising:
a generally planar central body generally triangular in peripheral configuration having a first side edge and second side edge diverging in a rearward direction of the central body from the apex at the front end of the central body;
swivel mounting means defining a swivel axis of the blade bisecting the apex angle and extending along the length of the central body from the apex at the front end of the blade to the rear end of the blade;
a first impeller projecting outwardly from one planar surface of the central body at the rear end of the triangular central body proximate the one base corner of the triangular central body;
a second impeller projecting outwardly from the other planar surface of the central body at the rear end of the triangular central body proximate the other base corner of the triangular center body; and,
the second impeller is offset from the first impeller in the longitudinal direction of the swivel axis;
(b) a second blade comprising:
a generally planar central body generally triangular in peripheral configuration having a first side edge and a second side edge diverging in a rearward direction of the central body from the apex at the front end of the central body;
swivel mounting means defining a swivel axis of the blade bisecting the apex angle and extending along the length of the central body from the apex at the front end of the blade to the rear end of the blade;
a first impeller projecting outwardly from one planar surface of the central body at the rear end of the triangular central body proximate one base corner of the triangular central body;
a second impeller projecting outwardly from the other planar surface of the central body at the rear end of the triangular central body proximate the other base corner of the triangular central body; and,
the second impeller is offset from the first impeller in the longitudinal direction of the swivel axis;
(c) the first and second blades are disposed in mutual overlaying spaced apart, mirror image relationship with their swivel axes coinciding, the first impeller of the first blade and second impeller of the second blade in mutual overlaying spaced apart relationship, and the second impeller of the first blade and first impeller of the second blade in mutual overlaying spaced apart relationship; and,
(d) a common swivel axle interconnecting the swivel mounting means of the first blade and swivel mounting means of the second blade such that the first and second blades are free to swivel about the swivel axle.

4,819,363
FISHING PLUG WITH TREBLE HOOK STORAGE SLOT
Ronald K. Parsonage, P.O. Box 234, Lot 115 N. Park Lake, South Bend, Nebr. 68058
Filed Dec. 4, 1986, Ser. No. 937,995
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.4 **10 Claims**



1. In a fishing plug including an elongated plug body and at least one treble hook having a central shank and three arcuate hook portions extending outwardly from said shank, said treble hook being pivotally suspended from the plug body for free swinging movement toward and away from said plug body and with at least limited freedom of rotation of the shank, the improvement comprising,
an elongated hook storage slot in the bottom side of said plug body,
said slot being of a size and location for receiving one hook portion of said treble hook upon rotation of the shank to align said one hook portion with said slot and upon pivotal movement of the aligned hook portion toward said plug body and into said slot, and
means for releasably securing said hook in said slot, said slot defining an opening through a surface of the plug body, said opening being substantially linear, the length of said opening substantially exceeding the width thereof and the depth of said slot being substantially equal to the perpendicular distance between the shank and tip of said one hook portion.

4,819,364
PULL APART FISHING WEIGHT
Robert J. Lill, 1477 Cardinal La., Chaska, Minn. 55318
Filed Apr. 7, 1988, Ser. No. 178,632
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—43.1 **10 Claims**



1. A pull-apart fishing weight, comprising:
a weight member;
a separable head member with integral line attachment means having at least one pin member depending therefrom and received in a friction fit in a corresponding aligned aperture in said weight member, whereby said pin member is retained in said weight member and said head

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member and said weight member are detachably assembled together under normal fishing conditions, and said pin member is slidably detachable from said aligned aperture when a predetermined resistance force is applied to said weight member, thereby allowing said separable head member to detach from said weight member as when said weight member becomes caught on an underwater obstruction;

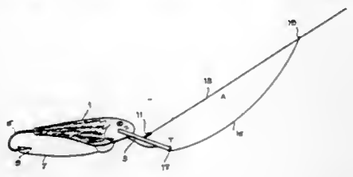
said separable head member has a generally rectangular base with an elongated face, and said pin member depends from said elongated face of said rectangular base; and

said weight member has an elongated face on the end thereof adjacent to said head member, and said aperture is formed within said adjacent end of said weight member in alignment with said pin member, whereby said elongated face of said base of said head member and said face of said weight member are in confronting relation when said pin member is inserted into said aperture and said weight member and said head member are assembled together.

4,819,365
FISHING LURE

Louis Landuydt, 280 Ducharme, Dorval, Quebec, Canada H9S 2H7

Filed May 29, 1987, Ser. No. 55,634
Claims priority, application Canada, Jun. 20, 1986, 512117
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.47 **16 Claims**



1. A fishing lure, comprising:

a body having a front part provided with an eye to which is connected a fishing line,

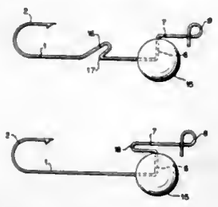
a guiding lip provided at said front part, and

deformable means for preventing algae and seaweeds from being caught between the fishing line and the lip, said deformable means having a first end pivotally attached to said lip and a second end slidably attached to said fishing line at a distance from said eye.

4,819,366
LEAD-HEADED JIG

Joseph T. Manno, Star Rte., Kane, Pa. 16735

Continuation-in-part of Ser. No. 136,538, Dec. 22, 1987, abandoned, which is a continuation of Ser. No. 916,237, Oct. 7, 1986, abandoned. This application Mar. 25, 1987, Ser. No. 11,627
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—44.81 **16 Claims**



1. An integral fishing device structure for ready, knotless attachment to a strand, said structure comprising:

a first forward end comprising a fish hook;

first and second shank portions offset from each other and separated by a connecting portion, said second shank portion terminating at a second rearward end which faces generally toward said first forward end;

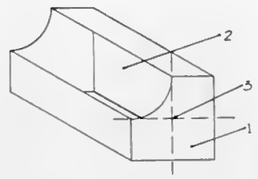
a weight securely fastened to said connecting portion and said first shank portion, said weight comprising a lead ball formed with a strand wrapping projection thereon; said second shank portion spaced from said wrapping projection by a distance less than the thickness of the strand; and

said structure further provided with an open loop between said lead ball and said second shank portion, wherein said strand wrapping projection and said open loop comprise means for permitting secure but knotless attachment to a strand.

4,819,367
WORM CRADLE BAIT BOX

Roland C. Ponder, Jr., Rte. 1, Box 1, Oskaloosa, Kans. 66066, and Henry H. Guck, 1405 Apple La., Apt. #12, Lawrence, Kans. 66044

Filed Mar. 24, 1988, Ser. No. 172,368
Int. Cl.[4] A01K *97/00, 97/04*
U.S. Cl. 43—55 **2 Claims**

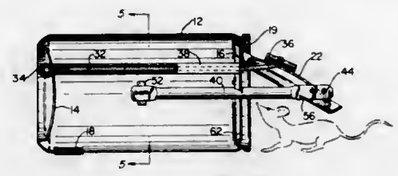


1. A storage container consisting of a rectangular one-piece box with a single opening extending the length of the box substantially along one lengthwise corner, such that the lengthwise edges of the opening extend essentially along the centerline of each of two adjacent lengthwise surfaces of the box, whereby the storage container can be rotated 90° in two directions, with one hand, while maintaining said single opening upwardly opposite the other two lengthwise surfaces of said box, which acts as alternative support surfaces.

4,819,368
DISPOSABLE MOUSETRAP

John Fodor, 13 Village Park Cir., Morgantown, W. Va. 26505

Filed Nov. 14, 1983, Ser. No. 552,153
Int. Cl.[4] A01M *23/18, 23/02*
U.S. Cl. 43—61 **15 Claims**



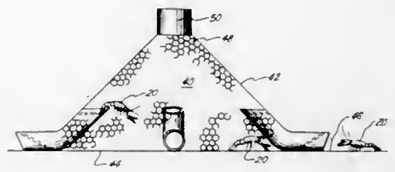
1. A disposable rodent trap comprising a container defining an internal chamber, an end wall having an entry opening therein of sufficient size to permit a rodent to pass therethrough so as to enter said internal chamber, a door member provided externally of said end wall and movable from an open position toward said end wall into a closed position covering

and blocking said entry opening, biasing means comprising a rubber band for urging said door member toward its closed position, latch means having a portion inside said chamber and extending between said door member and a catch surface on, and forming part of, said end wall comprising an edge surface adjacent said entry opening for normally holding said door member in its open position but being movable by rodent contact inside said chamber out of contact with said catch surface to permit said biasing means to move said door member to its closed position to entrap the rodent in said internal chamber and wherein said container is a disposable beverage can having a cylindrical body wall, a bottom end wall and a dispensing end wall with said entry opening being provided in said dispensing end wall which comprises a wall from which beverage would normally be dispensed during usage of said beverage container for its original purpose.

4,819,369
APPARATUS FOR THE "BAITLESS" HARVESTING OF CRAWFISH

Ed Bodker, 364 Peachtree Blvd., Baton Rouge, La. 70806

Filed Jan. 5, 1987, Ser. No. 638
Int. Cl.[4] A01K *69/04*
U.S. Cl. 43—102 **18 Claims**



1. An underwater baitless crawfish harvesting apparatus for use on a water bottom comprising:

a. A primary collection chamber having an interior;

b. enticing passageway means adapted for underwater use and communicating with the positioned adjacent the water bottom during operation and collection chamber for baitlessly enticing the crawfish to enter an area proximate the collection chamber, defining a conduit for crayfish entrance into the collection chamber the passageway means including a darkened hide section and an entrance for enticing crawfish to enter the passageway means from exterior the primary collection chamber, and an exit for allowing crawfish to exit the passageway means into the primary collection chamber, and

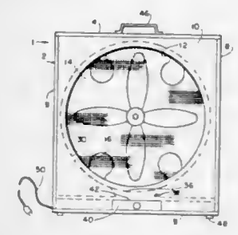
c. means for allowing crawfish on the water bottom to freely enter, but not exit, the primary collection chamber underwater via the passageway means and including a door positioned adjacent the darkened hide section that prevents escape after the crawfish enters the hide section.

4,819,370
FLYING INSECT ELIMINATOR

James L. Woodruff, 854 Kealahou St., Honolulu, Hi. 96825

Filed Sep. 21, 1987, Ser. No. 98,788
Int. Cl.[4] A01M *01/04*
U.S. Cl. 43—113 **19 Claims**

1. Insect killing apparatus comprising a frame, support means connected to the frame for supporting the frame, a front face having a circular opening, a fine screen mounted within the circular opening, and a circular gutter having a U-shaped cross-section surrounding a front of the screen, an opening and a chute in a lower portion of the circular gutter and a collector supported in the frame having an opening adjacent the chute, a motor supported by the frame and a fan drivingly connected to the motor and positioned inside the screen and the circular opening, a shaft projecting through a central opening in the screen and a monofilament mounted on a front end of the shaft for rotating the monofilament adjacent a front of the screen as the fan rotates adjacent a rear of the screen, whereby flying insects are drawn toward the screen by the fan, and the monofilament rotating adjacent the outside of the screen kills insects near or on the screen and sweeps the insects into the gutter and directs the insects through the chute into the upward opening of the collector for subsequent removal of insect remains, lamp

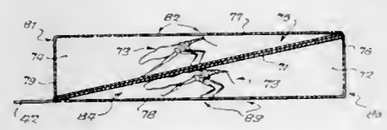


means mounted within the frame, an electrical power supply connected to the lamp means and to the motor for supplying power to the lamp means and to the motor and a relatively large aperture rear access screen closure releasably attached to a rear of the frame for permitting access to the lamp means and for permitting flow through the frame of air drawn into the frame by the fan.

4,819,371
INSECT TRAPS

Harold L. Cohen, Buffalo, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Mar. 13, 1987, Ser. No. 25,436
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 **10 Claims**



1. An insect trap which comprises a generally rectangular-shaped enclosure having outer opposing side walls and outer opposing end walls engaging with said side walls to provide a closed interior chamber, said trap comprising divider means for separating said interior chamber into adjacent right triangular shaped hollow bodies in which two adjoining outer side walls provide a right angle for each triangular shaped body, each body of said trap having at least first and second insect entrances of sufficient size, said first entrance being located at said right angles, and said second entrance being located in a planar surface of an outer side wall.

4,819,372
SUPPORT FOR SECURING SLOPE COVERS AGAINST SLIPPAGE

Heinrich Schürholz, Dorsten, Fed. Rep. of Germany, assignor to DE-KO-WE Schürholz Teppichfabrik GmbH, Dorsten, Fed. Rep. of Germany

Continuation of Ser. No. 852,310, Mar. 31, 1986, abandoned. This application Jun. 21, 1988, Ser. No. 212,103
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1984, 8422934[U]
Int. Cl.[4] A01G *7/00;* **E02B** *3/12*
U.S. Cl. 47—9 **12 Claims**

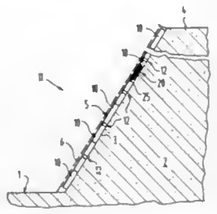
1. A slope cover of granular material secured by an embed-

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ded support against slippage along an inclined slope surface, said support comprising:

(a) a plurality of support bands consisting of a fabric having warp and filler threads of coconut fibers;

(b) a plurality of pegs driven into the slope surface and



having said support bands fixed thereto to extend on edge along and substantially normally to the slope surface to form a network covering the slope surface; and

(c) said support bands being attached to said pegs by lateral loops formed by a warp thread of the fabric and extending around the pegs.

4,819,373

METHOD OF THINNING FRUITLETS OR FRUITS OF CROPS

Prakash G. Kadkade, Marlboro, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 22, 1983, Ser. No. 516,401
Int. Cl.[4] A01G *1/00*
U.S. Cl. 47—58 **1 Claim**

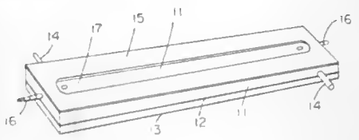
1. A method of thinning fruitlets or fruits of crops, wherein said crops are bean crops of the variety "Dark Red Kidney", comprising exposing said crops to far-red night-break lighting at certain stages of flower and fruit growth and development with light selected from the group consisting of fluorescent and high-intensity-discharge, having a λ-emission peak centered around 740 nm and/or 760 nm; wherein said light has an intensity of 25 $\mu W/cm^2$ to 150 $\mu W/cm^2$; and said night-break lighting is for a period of two hours per night, is applied during the period 11 p.m. to 1 a.m. each day, and is initiated about ten days prior to full bloom of said crops.

4,819,374

THERMOPLASTIC FILMS FOR SOIL TREATMENT

Gregory Gemgnani, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 510,719, Jul. 5, 1983, abandoned, which is a division of Ser. No. 317,029, Nov. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 102,728, Dec. 13, 1979, abandoned. This application Mar. 5, 1985, Ser. No. 708,110
Int. Cl.[4] A01C *23/00*
U.S. Cl. 47—58 **14 Claims**



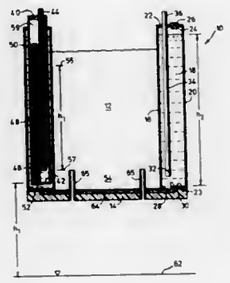
1. A method for maintaining volatile agricultural fumigants in intimate contact with soil which comprises injecting soil fumigants into said soil and subsequently covering the fumigant treated soil with a laminar film comprising a polyolefin layer having adhered to the surface thereof a polyamide coating layer.

4,819,375

AQUAPOT

Norbert Baumgartner, R.R. 5, Belwood, Ontario N0B 1J0; David E. Elrick, 27 Vardon Dr., Guelph, Ontario, N1G 1W8, and W. Daniel Reynolds, 271 Grange St., Guelph, Ontario, N1E 6R5, all of Canada

Filed Mar. 10, 1986, Ser. No. 837,735
Int. Cl.[4] A01G *25/00*
U.S. Cl. 47—80 **11 Claims**



1. In combination:

means defining an upwardly open receptacle for plants or the like, said means including a bottom wall for the receptacle,

a closed reservoir adjacent the receptacle, having an opening at the bottom in communication with the bottom region of the receptacle,

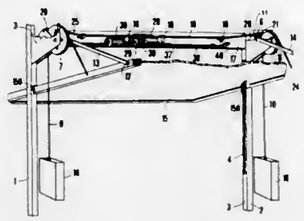
and a compartment having a first conduit communicating the atmosphere with a first location within the compartment, and a second conduit communicating a second location within the compartment with a location in the reservoir adjacent the lower region of the receptacle, said second location being above said first location, said compartment being adapted to contain liquid to a level between the two said locations, the compartment being sealed from the atmosphere except for said first conduit.

4,819,376

DRIVING AND GUIDING APPARATUS FOR A HORIZONTALLY PIVOTED WING

Silvio Taddei, Pergine, Italy, assignor to Silvelox S.p.A., Pergine, Italy

Filed Oct. 19, 1987, Ser. No. 110,168
Claims priority, application Italy, Oct. 24, 1986, 84954 A/86
Int. Cl.[4] E05F *15/00*
U.S. Cl. 49—200 **7 Claims**



1. A driving and guiding apparatus for a horizontally pivoted counterweighed wing arranged to close an opening provided with lintel portion, which apparatus comprises

a wingcarrying frame structure to be embedded in, or secured to, the opening the wing is designed to close, and having two side vertical guides therein,

an articulation rod on each side of the wing having one end linked to the said frame structure and its other end pivoted to a respective side of the wing,

a pin projecting from each side of the wing and slidably engaging a respective side vertical guide in the frame structure,

two lateral pulleys mounted for rotation on said frame structure, each having a respective cable turning around it, one end of the cable being secured to a respective side of said wing at a intermediate position between the pivoted end of the respective articulation rod and the projecting pin thereof, and its other end carrying a respective counterweight, and

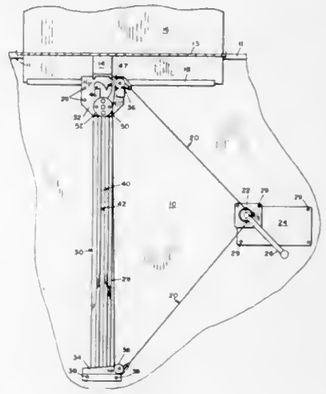
a drive means equipped with reversible motor means for synchronized rotation of said pulleys in either direction, the rotation of said pulleys in one direction resulting in controlled unwinding of said cables and thus the lowering of the counterweights and the opening or lifting of the wing and their rotation in the opposite direction resulting in raising of the counterweights and closing or lowering, of the wing.

4,819,377

FLUSH WINDOW REGULATOR

Barney J. Bauer, Grosse Pointe Woods, Mich., and William E. Buehler, Toledo, Ohio, assignors to Dura Automotive Hardware Division of Wickes Manufacturing Company, Toledo, Ohio

Filed Jun. 22, 1988, Ser. No. 209,923
Int. Cl.[4] E05D *15/10*
U.S. Cl. 49—221 **10 Claims**



1. A reciprocating driving mechanism for vertically and horizontally moving the lower edge of a window in a housing, comprising:

(1) a substantially vertical tract in said housing having a vertical guiding slot ending at its upper end into bifurcated cam slots,

(2) a carrier for the lower edge of said window comprising a horizontal movable portion attached to said edge of said window and a rotary portion connected by a helical cam means to said horizontal portion, whereby oscillation of said rotary portion reciprocates horizontally said horizontal portion, said rotary portion having a pulley means and a pair of diametrically spaced pins guided in said vertical guiding slot and in and out of said bifurcated cam slots for oscillating said rotary portion,

(3) cable means attached to said pulley means of said rotary portion for vertically reciprocating said carrier along said tract in said vertical cam guiding slot and oscillating said rotary portion guided by said pins in said bifurcated slots,

(4) drum means for winding and unwinding said cable means, and

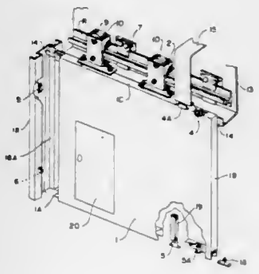
(5) means for reversibly rotating said drum means; whereby when said window is closed, its lower edge moves outwardly to be more flush with the outside surface of said housing.

4,819,378

SELF-CLOSING DOOR SEALING STRUCTURE

Kazuaki Ando, 418, Aza Kawaharabata, Amagasaki-shi, Hyogo, 661, Japan

PCT No. PCT/JP85/00529, § 371 Date Sep. 24, 1986, § 102(e) Date Sep. 24, 1986, PCT Pub. No. WO86/03131, PCT Pub. Date Jun. 5, 1986
PCT Filed Sep. 25, 1985, Ser. No. 896,861
Claims priority, application Japan, Nov. 27, 1984, 59-180317; Mar. 26, 1985, 60-063073
Int. Cl.[4] E05D *15/10*
U.S. Cl. 49—225 **2 Claims**



1. Self-closing fire door sealing structure comprising

a sliding door having an open and closed position,

a passage frame having three sides and positioned to be closed by said sliding door,

supports carrying suspension wheels and being attached to said sliding door by hinges, said suspension wheels being adapted for rolling on a rail and said hinges providing that said door may be swung,

means for holding said door in an open position,

electromagnetic release means, operated by a sensor indicating a fire, for releasing said holding means,

means for closing said door upon actuation of said electromagnetic release means,

first inclined guide members mounted above and below said sliding door to engage rollers mounted on the upper and lower portions of said sliding door in said closed position, and

second inclined guide members mounted on upper and lower portions of a side post of said passage frame, and positioned to engage an angular edge of said sliding door in said closed position.

4,819,379

ELECTROMAGNETIC GARAGE DOOR LOCKING APPARATUS

Joseph E. Kenzelmann, and Frederick J. Kenzelmann, both of Huntington Beach, Calif., assignors to Automatic Electrolock, Inc., Huntington Beach, Calif.

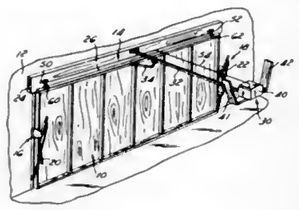
Filed Mar. 6, 1987, Ser. No. 22,752
Int. Cl.[4] E05F *15/00*
U.S. Cl. 49—280 **13 Claims**

1. An electromagnetic door lock apparatus for securing an overhead garage door, said electromagnetic door lock apparatus comprising:

an electrically actuated overhead garage door assembly, said assembly having an opener motor of the type selectively

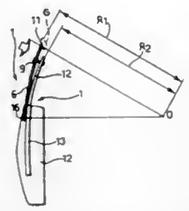
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actionable for moving a garage door between a generally vertical closed position received within a door frame and a generally horizontal open position, said open position providing an access opening through the door frame;
a bracket for mounting on the door frame;
a solenoid core affixed to the bracket, said solenoid core having an inner core cavity;
a solenoid plunger received within a portion of said inner core cavity, said plunger being oriented so that it has a core end received within said solenoid core, and an opposite locking end, said plunger being selectively positionable with respect to said solenoid core, (i) to a locked position wherein said locking end of said core plunger is extended away from said solenoid, and (ii) to an unlocked position wherein said core end of said plunger is withdrawn within said solenoid core;



means for biasing said solenoid plunger in a direction away from said solenoid core and toward the locked position;
means responsive to the movement of said plunger for sensing the locked and the unlocked position of said plunger;
means operably connected to said sensing means for (i) rendering said garage door opener motor actuable only when said plunger is in the unlocked position, and (ii) preventing actuation of said opener motor when said plunger is in the locked position; and
a latch member for mounting on the door, said latch member being affixed in a position such that the latch receives the locking end of said solenoid plunger in the locked position;
whereby said solenoid plunger secures the door in the closed position while said actuation prevention means precludes actuation of the opener motor in order to prevent the possibility of damage to the door opener assembly.

4,819,380
VEHICLE DOOR WITH SLIDING WINDOW
Giorgio Trebbi, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy
Filed Aug. 4, 1987, Ser. No. 81,199
Int. Cl.[4] B60T *1/16*
U.S. Cl. 49—374 **7 Claims**



1. A vehicle door comprising a body having two approximately vertical end sides and an approximately horizontal upper side, and a window having a respective upper edge slidable through an upper side of the body of the door between a lowered position and a raised position, in which a part of the door projecting above the upper side is constituted essentially of the window alone, wherein a device is provided for guiding the movement of the window, said device including a rail which can extend from the upper edge of the body of the door in a direction substantially parallel to the two end sides and positioned intermediate the two end sides, the sliding window is constituted by a single unit having at least one runner slidingly cooperating with the rail, and a fixed part is mounted in the body of the door and slidingly coupled to the rail whereby the rail can slide relative to the fixed part to follow the window in its movement between the lowered position and the raised position.

4,819,381
WEATHERSTRIP FOR VEHICLE CLOSURES
Kazuhiko Kitaura, Zama; Satoru Ugawa, Hadano, and Kouzi Ogawa, Isehara, all of Japan, assignors to Nissan Motor Co., Ltd., Japan
Filed Feb. 10, 1987, Ser. No. 13,251
Claims priority, application Japan, Feb. 14, 1986, 61-30444; Apr. 25, 1986, 61-97383
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—493 **11 Claims**

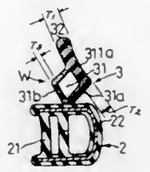


1. A weatherstrip for providing a seal between a roof side rail and a slidable automotive vehicle window and adapted to be installed on the roof side rail by means of a retainer having channel-shaped inner and outer ends, said weatherstrip comprising:
a mounting base made of a relatively soft material land extending between the inner and outer end portions of the retainer to have inner and outer ends fitted therein;
a seal lip made of a relatively soft material and spanning between the inner and outer ends of said mounting base and cooperating therewith to form a hollow weatherstrip configuration;
said seal lip having a main lip portion for contact with said window and an outer lip portion for preventing outward movement of the window glass in its closed position; and
a glass holder made of a relatively hard material and including portions embedded in said mounting base and said seal lip in such a manner as to extend from said outer lip portion of said seal lip along said mounting base to the inner end of said mounting base, said glass holder being supported at two points on the inner and outer end portions of the retainer so as to prevent rotation of said glass holder in one direction about the outer end portion of the retainer.

4,819,382
WEATHER STRIP FOR AUTOMOBILE
Satoshi Suzuki, Kakegawa, and Kiyoshi Shigeki, Fukuroi, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Filed Jan. 12, 1988, Ser. No. 143,122
Claims priority, application Japan, Apr. 3, 1987, 62-050880
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—497 **3 Claims**

1. A weather strip for an automobile, comprising:
a base portion to be mounted along an opening of a window of an automobile body;

a seal portion projecting from said base portion to come in contact with a window glass;
said seal portion being composed of a pair of dogleg-shaped portions each having an upper half portion above a respective bend and a lower portion below the respective bend, said dogleg-shaped portions defining a hollow portion having a nearly lozenge-shaped section and a top, and a lip portion extending upwards from the top of said hollow seal portion as an approximately coplanar extension in an extending direction, of the upper half portion of one of said pair of dogleg-shaped portions, said lip portion



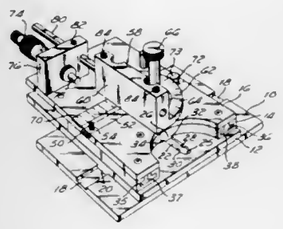
being positioned to be pressed by said window glass when said window glass is closed;
the thickness(T1) of said lip portion, the thickness(T2) of said one of said pair of dogleg-shaped portions, and the thickness(T3) of the other of said dogleg-shaped portions having a relation expressed by the following inequality: $T1>T2>T3$; and
said lip portion extending in a direction which is more nearly vertical as compared with said extending direction of said upper half portion of said one of said pair of dogleg-shaped portions.

4,819,383
DOOR SYSTEM WITH INTERLOCKING PANELS
H. Smith McKann, and Wendel W. Haney, both of Fredericksburg, Va., assignors to General Products Company, Inc., Fredericksburg, Va.
Filed May 24, 1988, Ser. No. 197,956
Int. Cl.[4] E06B *3/00*
U.S. Cl. 49—501 **20 Claims**



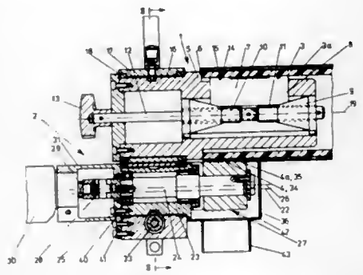
1. A door, comprising:
first and second panels, each of said panels being formed of a unitary piece of sheet metal and including
a rectangular face member with opposite side and end edges,
a side flange extending substantially perpendicularly from said face member along one of said side edges, said side flange having a width substantially equal to a thickness of the door,
a first latch means formed along a free lateral edge of said side flange remote from said face member,
a second latch means formed along the other side edge of said face member, and
end flanges extending substantially perpendicularly from said face member along said end edges;
said first and second latch means of said first panel engaging said second and first latch means, respectively, of said second panel to secure said panels and form the door, said latch means being located at diametrically opposite corners of the door; and
a core member located between said panels.

4,819,384
OFFHAND TOOLING ATTACHMENT FOR RADIUS GRINDING
Wayne R. Clark, 1455 S. State, Space 249, Hemet, Calif. 92343
Filed Oct. 5, 1987, Ser. No. 105,551
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—218 R **19 Claims**



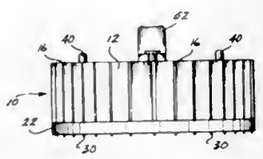
1. A fixture for pivotal manipulation of a workpiece, said fixture comprising:
an upper platform member having upper and lower surfaces and a plurality of outer edges defining the outer periphery thereof, said upper platform member being provided with an arcuate guide rail having first and second ends, said arcuate guide rail being attached to said lower surface of the upper platform member and a means for positioning a workpiece attached to said upper surface thereof, said means for positioning a workpiece being operative to position said workpiece such that a portion of the workpiece extends outside of the outer periphery of the upper platform member; and
a lower platform member having upper and lower surfaces and a plurality of outer edges defining the outer periphery thereof, said lower platform member being provided with an arcuate guide track positioned on said upper surface thereof, said guide track being analogous in configuration to said guide rail with at least one end thereof being terminally flush with and open to an edge of said lower platform member;
said upper and lower platform members being closely juxtapositioned such that said arcuate guide rail is slidably disposed within said arcuate guide track, thereby permitting partial rotational movement of said upper platform member with respect to said lower platform member such that a portion of said guide rail may emerge from and extend out of the terminally open end of said guide track;
said partial rotational movement of said upper platform member with respect to said lower platform member being effective to pivot said workpiece about a pivot point lying beyond the outer periphery of the upper platform member.

4,819,385
DEVICE FOR TREATING THE ENDS OF TUBULAR COMPONENTS
Gerhard Baumann, Schaffhausen, Switzerland, and Herbert Kramer, Singen, Fed. Rep. of Germany, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland
Filed Jul. 17, 1987, Ser. No. 74,556
Claims priority, application Switzerland, Jul. 24, 1986, 02969/86
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—241 B 9 Claims



1. In a device for treating the ends of tubular plastic components such as pipes and fittings by making grooves in the outer circumferential surface thereof, including a rotatable treating tool movable relative to the tubular component circumference, the treating tool being movable in radial direction toward the tubular component, the improvement comprising an internal chuck capable of being centered by contacting the inner circumference of the tubular component, a rotary body supporting the treating tool, the rotary body being supported so as to be rotatable concentrically with the internal chuck, a drive shaft for the treating tool, a bushing rotatably mounted in the rotary body, the drive shaft being mounted eccentrically relative to the bushing and two stops for the bushing, a range existing between the two stops, wherein the bushing is adjustable by means of a worm drive in the range of the two stops.

4,819,386
OPTIC FIBER SANDING FIXTURE AND METHOD OF USING
William H. Struyf, Des Moines, Inwa, assignor to Northwestern Bell Corporation, Omaha, Nebr.
Filed Jul. 20, 1987, Ser. No. 75,146
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—281 R 15 Claims



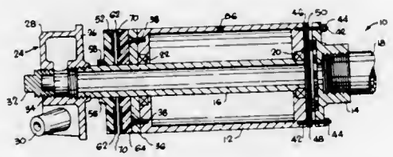
7. The method of claim 5, wherein a helical spring is used to bias the optical fiber and ferrule assembly outwardly of the borehole.

4,819,387
METHOD OF SLICING SEMICONDUCTOR CRYSTAL
Josephine A. Harbarger, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 16, 1987, Ser. No. 133,863
Int. Cl.[4] B24B *27/06*
U.S. Cl. 51—283 R 1 Claim



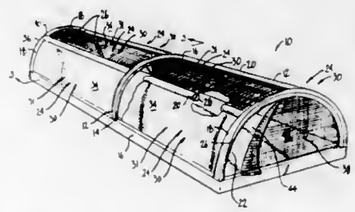
1. A method of slicing a semiconductor crystal comprising the steps of:
providing a mounting beam comprising a first portion and a second portion, a surface of said first portion having a V-shape and a plurality of grooves therein, said second portion being coupled to said first portion and defining an opening therein, and dressing means for dressing a blade, said dressing means being disposed in the opening defined by said second portion;
bonding said semiconductor crystal onto said V-shaphed first surface of said mounting beam adjacent said grooves whereby said grooves prevent the formation of voids in the material used to bond said crystal to said first surface;
inserting said semiconductor crystal and said mounting beams into a slicing apparatus;
slicing said semiconductor crystal with a blade of said slicing apparatus;
slicing said first portion of said mounting beam;
slicing said second portion of said mounting beam; and
dressing said blade by slicing said dressing means disposed in the opening of said second portion of said mounting beam.

4,819,388
SPIN-BLAST TOOL WITH ROTATIONAL VELOCITY RESTRAINT
Wyatt S. Kirkland, 1536 Chanticleer Ave., Santa Cruz, Calif. 95062
Continuation-in-part of Ser. No. 277,813, Jun. 26, 1987, Pat. No. 4,704,826. This application Nov. 3, 1987, Ser. No. 115,991
Int. Cl.[4] B24C *3/06*
U.S. Cl. 51—411 9 Claims



1. A pine spin-blast tool comprising,
a handle member having inflow and outflow ends, said inflow end having a connector means for attachment to a material supply,
a material transfer conduit having at least a portion projecting outwardly from said outflow end in rotational relation with said handle member, said material transfer conduit in fluid communication with said inflow end and having a rotational axis,
a jet head coaxially mounted to said material transfer conduit in spaced-apart relation to said handle member, said jet head having at least one nozzle means for directing a blast of material, thereby producing a reaction force for rotating said material transfer conduit,
a first annular disc fixedly connected to said handle member coaxial to said material transfer conduit between said handle member and said jet head, said first annular disc having first means for developing a first magnetic flux,
a second annular disc coaxially mounted on said material transfer conduit for rotation in conformity with said jet head, said second annular disc disposed between said jet head and said first annular disc in spaced apart relation to said first annular disc, said second annular disc having second means for developing a second magnetic flux, said second flux magnetically interacting with said first flux, thereby providing a drag to rotation of said material transfer conduit,
wherein said first means for developing a magnetic flux is a plurality of ferromagnetic members equidistantly spaced about a surface of the first annular disc facing said second annular disc, and said second means of developing a magnetic flux is a plurality of ferromagnetic members equidistantly spaced about a surface of the second annular disc facing said first annular disc, said ferromagnetic members of said first and second annular discs each having coinciding poles of like polarity aligned parallel the rotational axis of said material transfer conduit.

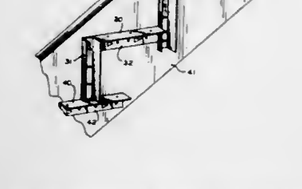
4,819,389
INFLATABLE TENT
John P. Kihn, 200 Montura Way, Novato, Calif. 94947
Filed Sep. 28, 1987, Ser. No. 101,524
Int. Cl.[4] E04B *1/34*
U.S. Cl. 52—2 16 Claims



1. An inflatable tent structure, comprising:
a first inflatable frame defining an interior region, said first inflatable frame including a plurality of interconnecting first frame elements defining openings into said interior region;
a second inflatable frame, independently inflatable of said first inflatable frame, said second inflatable frame including a plurality of interconnecting second frame elements, said second inflatable frame sized and positioned such that said second inflatable frame fits entirely within the interior region relative to said first inflatable frame; and
supporting fabric secured to at least one of said first and second frames to cover at least one of said openings.

4,819,390
SUPPORTING ASSEMBLIES
Bruce Capper, 34 Howlett Road, and George J. Heelass, 7 Beenwerrin Crescent, both of Capalaba, QLD 4157, Australia
PCT No. PCT/AU85/00033, § 371 Date Oct. 24, 1985, § 102(e) Date Oct. 24, 1985, PCT Pub. No. WO85/03965, PCT Pub. Date Sep. 12, 1985
PCT Filed Feb. 28, 1985, Ser. No. 800,131
Claims priority, application Australia, Feb. 28, 1984, PG3810; Aug. 3, 1984, PG6376; Nov. 1, 1984, PG7944
Int. Cl.[4] E04B *2/82, 5/60*
U.S. Cl. 52—95 20 Claims

1. An eave assembly comprising:
a fascia spaced from a wall;
inner and outer longitudinal frame means extending along the wall and the fascia respectively, and soffit panels arranged in end-to-end relationship along the eave with their opposite longitudinal sides secured to said inner and outer longitudinal frame means;
transverse elongate supporting members terminating between and adjacent said inner and outer frame means, each said transverse elongate supporting member being formed as a plastics extrusion and having web means extending upwardly from a horizontally extending lower flange and beyond an intermediate flange which is spaced from said lower flange a distance greater than the thickness of the soffit panels, said lower flange and said intermediate flange extending beyond opposite sides of said web means to form respective opposed channel shaped panel edge recesses in which respective adjacent transverse edges of said panels are secured;



said intermediate flange having respective extension portions which extend outwardly beyond opposite sides of said lower flange and downwardly into firm engagement with respective said soffit panels whereby said soffit panels are forced into tight engagement with said lower flange, and whereby soffit panels may, during erection or repair of said eave assembly, be inserted into a respective said panel edge recess from beneath said frame means and subsequently be secured thereto from beneath said panels;
said transverse elongated supporting members each forming a beam which extends stiffly between said inner and outer frame means whereby the load applied to each elongate supporting member through respective said transverse edges is transferred by said elongate supporting members to the opposite side portions of said panels at respective locations inwardly of said inner and outer longitudinal frame means.

4,819,391
STAIR BRACKET
Larry D. Tassin, P.O. Box 8018, Nashua, N.H. 03060, and John W. Ayer, 63 Belmont Dr., Merrimack, N.H. 03054
Filed Apr. 18, 1988, Ser. No. 182,951
Int. Cl.[4] E06C *7/50*
U.S. Cl. 52—182 11 Claims

8. A stair bracket comprising a single strip of metal configured as follows:
(a) having on one edge a flange formed from said strip, upturned at about 90° and extending a distance from one

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end of said strip at least equal to the depth of a stair tread, and

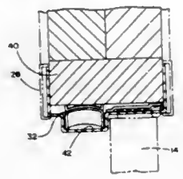
(b) having on the same edge a channel formed from said strip, the base of which channel downturns from said strip at about 90°, said channel extending from the other end of said strip a distance at least equal to the height of a riser, said flange and channel meeting at a line in the middle of said strip.

4,819,392

METAL FRAME SYSTEM

Robert L. Day, 9990 Edmore, Sun Valley, Calif. 91352

Filed May 7, 1987, Ser. No. 46,638
Int. Cl.[4] E06B *1/04*
U.S. Cl. 52—211 **2 Claims**



1. An improved framing assembly such as for use as a frame, for doors and windows; the assembly having a pair of prefabricated metal vertical members adapted for attachment to a corresponding pair of wood or steel studs defining a border for the frame; the improvement comprising:

at least one set of wedge members, each such set having a pair of oppositely facing compressively engaged wedges having contiguously abutting surfaces, the abutting surface of each such wedge having an elongate arcuate shape, one such wedge abutting surface being an inversion of the other wedge abutting surface, whereby one such wedge may be rotated relative to the other such wedge while maintaining such compressively engaged contiguously abutting relation for enabling compressive stable affixation of said vertical members to said studs despite a warped wood or steel stud surface; and

an elongated channel along each such vertical member for receiving said set of wedge members between said vertical members and said studs.

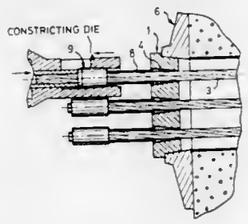
4,819,393

DEVICE FOR ANCHORING ONE END OF AT LEAST ONE TENSIONED CABLE OR BAR, IN PARTICULAR FOR A PRESTRESSED CONCRETE STRUCTURE

Jean-Pierre Augoyard, Domont, France, assignor to Gtm-Entrepose, Quentin, France

Continuation-in-part of Ser. No. 865,887, May 21, 1986, abandoned. This application Nov. 12, 1987, Ser. No. 122,547
Claims priority, application France, May 24, 1985, 85 07844
Int. Cl.[4] E04C *5/12*
U.S. Cl. 52—223 L **5 Claims**

1. A device for achoring one end of at least one tensioned cable or bar, comprising an anchoring head having at least one conical bore through which the cable or bar is passed, and a set of conical keys located within the bore in order to clamp the cable or bar therein, wherein said device further comprises a sleeve which is permanently fixedly secured to the cable or bar at a distance from the largest end face of said conical keys, and a given spacer tube disposed around the cable or bar between said conical keys and said sleeve and adapted to cooperate with said sleeve in order to maintain said conical keys within said conical bore of said anchoring head and in order to prevent any relative displacement between the cable or bar and said conical keys in the direction of slackening of said conical keys, said spacer tube being longitudinally incompressible and operatively abutting said sleeve at one end and said conical keys at the other end.

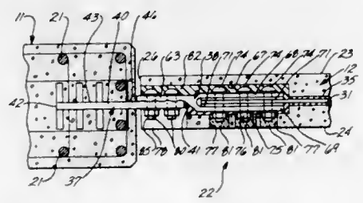


4,819,394

QUICK-CONNECT LATERAL FORCE COUPLING

Lloyd A. Compton, Visalia, Calif., assignor to M & J Operations Corporation, Visalia, Calif.

Filed Nov. 2, 1987, Ser. No. 116,070
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—252 **57 Claims**



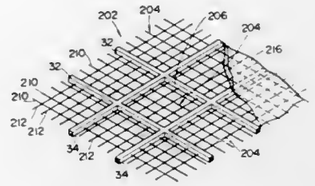
1. A connector for mounting of building components to columns in a building, the connector comprising a base member and an element member each having a mating end portion defining a generally flat yet locally contoured mating surface, the base member having a base portion adapted to be securely affixed to a building column with the mating surface on the mating end portion thereof disposed in a desired plane relative to the column, the element member having a connection part adapted to be connected to a selected building component and to be coupled to the base member by engagement of the mating surface of its mating end portion with the mating surface of a base member and by clamping together of the mating end portions, the mating surface of each moiety being contoured to define, in a manner essentially identical to that of the other moiety's mating surface, a regular pattern of projections and recesses in each of two orthogonal directions in the mating surface, the dimensions of the projections and recesses in combination with the area thereof on the mating surfaces and with the material of which the coupling moieties are defined providing a joint of desired shear strength substantially in the plane of the mating surfaces when the mating surfaces are engaged with the projections of one mating surface disposed in the recesses of the other moiety's surface and the mating end portions are clamped together.

4,819,395

TEXTILE REINFORCED STRUCTURAL COMPONENTS

Minoru Sugita; Teruyuki Nakatsuji; Tadashi Fujisaki, all of Tokyo; Hisao Hiraga, Yokohama; Takashi Nishimoto, and Minoru Futagawa, both of Sagamihara, all of Japan, assignors to Shimizu Construction Co., Ltd., Tokyo and Dainihon Glass Industry Company Ltd., Sagamihara, both of, Japan

Continuation-in-part of Ser. No. 894,832, Aug. 8, 1986, Pat. No. 4,706,430. This application Jul. 2, 1987, Ser. No. 69,483
Claims priority, application Japan, Dec. 26, 1985, 60-295751; Feb. 26, 1986, 61-41197
Int. Cl.[4] E04F *15/10*; **B32B** *3/10*; **F16B** *2/14*
U.S. Cl. 52—309.16 **17 Claims**



1. A textile reinforced structural component comprising:

(a) a structural component body made of a structural filler;

(b) first parallel reinforcement elements;

(c) second parallel reinforcement elements crossing said first parallel reinforcement elements at first crossing portions, each of both said first reinforcement elements and said second reinforcement elements including at least one row of first textiles and a first resin matrix, made of a first resin, for bonding said first textiles thereof; and

(d) attaching means for attaching said first reinforcement elements and said second reinforcement elements at corresponding first crossing portions to form a grid member, said attaching means comprising said first resin,

wherein:

(e) said first and said second reinforcement elements are impregnated with said first resin before attachment thereof;

(f) said grid member is embedded in said structural component body;

(g) at least one of both said first reinforcement elements and said second reinforcement elements each comprise a plurality of textile rows;

(h) the textile rows of both a corresponding first reinforcement element and a corresponding second reinforcement element are alternately stacked at said first crossing portions,

(i) said first reinforcement elements and said second reinforcement elements are bonded with said first resin at said first crossing portions;

(j) said grid member includes a plurality of grid openings; and

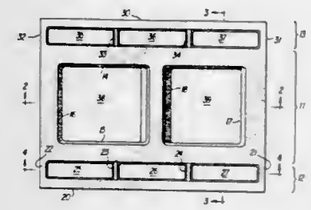
(k) said textile reinforced structural component further comprises first resin impregnated mesh textiles and second resin impregnated mesh textiles, each of said first and second resin impregnated mesh textiles passing through at least one of both said first reinforcement elements and said second reinforcement elements to form a mesh in each of said grid openings.

4,819,396

INSULATED CONCRETE MASONRY UNIT WITH LOW DENSITY HEAT BRIDGES

Thomas E. Cruise, 968 Allamanda Dr., Delray Beach, Fla. 33444

Division of Ser. No. 727,085, Apr. 25, 1985, Pat. No. 4,670,204. This application Dec. 5, 1986, Ser. No. 938,441
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.[4] F04C *1/40*
U.S. Cl. 52—405 **14 Claims**



1. A concrete masonry unit having a composition of a uniform concrete masonry material and comprising:

a load-bearing portion of said concrete masonry material comprising a first load-bearing side wall, a second load-bearing side wall in a substantially parallel relationship with said first load-bearing side wall, and means for attaching said first load-bearing side wall to said second load-bearing sidewall;

a first non-load-bearing portion of said concrete masonry material, comprising a first outer side wall in a substantially parallel relationship with said first load-bearing side wall; and

a first means for connecting said load-bearing portion to said first non-load-bearing portion so as to form a first insulation core, wherein said first connecting means:

are of said concrete masonry material;

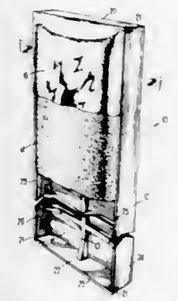
are of significantly lower density than said load-bearing portion due to a greater amount of air being present in said concrete masonry material of said connecting means.

4,819,397

WALL PANEL

Robert J. Gerndt, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 18, 1987, Ser. No. 98,256
Int. Cl.[4] E09B *2/00*
U.S. Cl. 52—406 **9 Claims**



1. A wall panel comprising:

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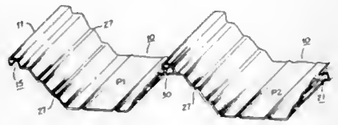
(a) a box frame having a back wall and connected side walls which together form a compartment with an opening;
(b) an insulative resilient insert within the compartment;
(c) a flexible, decorative facing fabric web directly engaging the side walls and extending across the opening to enclose the compartment; and
(d) means for engaging said facing fabric web to tighten it across said resilient insert providing a convex fabric surface.

4,819,398

IMPROVED ROOF PANEL APPARATUS AND PANEL LOCKING METHOD

Joseph T. Dameron, 3357 E. Pennsylvania St., Tucson, Ariz. 85714

Filed Nov. 20, 1987, Ser. No. 123,240
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—529 **10 Claims**



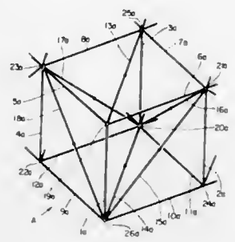
1. A roof panel and roof panel lock, said roof panel and roof panel lock comprising:
(a) a first, manually snap-fitting, interlocking member of a roof panel lock, said first interlocking member including:
(i) a first vertical member integrally extending upward from an end of a first side member or said roof panel,
(ii) an angled member integrally extending downward from said first vertical member,
(iii) a second vertical end member integrally extending upward from said angled member and parallel to said first vertical member, said second vertical end member being shorter than said first vertical member, and
(iv) a substantially small, gutter-like portion being formed therebetween said angled member and said second vertical member;
(b) a second, manually snap-fitting, interlocking member of a roof panel lock, said second interlocking member includes:
(i) a first vertical member integrally extending from an end of a second side member of said roof panel,
(ii) a horizontal member integrally extending outwardly from said first vertical member,
(iii) a second vertical member integrally extending downwardly from said horizontal member and parallel to said first vertical member, and
(iv) an angled end member integrally extending inwardly and upwardly from said second vertical member; and
(c) a roof panel lock, said roof panel lock being formed by mating, in a manually snap-fitting manner, said first interlocking member of a first roof panel with an adjoining second interlocking member of an other identical roof panel, said first and second interlocking members being designed to have respective lock members that direct siphoned moisture to said substantially small, gutter-like portion on said first interlocking member, said roof panel lock having a locking shape that compensates to produce a tighter lock when increasingly stronger wind forces are experienced.

4,819,399

DEPLOYABLE TRUSS

Junjiro Onoda, 1986-10 Kanaimachi, Machida, Japan, assignor to Hitachi, Ltd., Tokyo, Japan and Junjiro Onoda, Machida, Japan

Continuation of Ser. No. 786,830, Oct. 11, 1985, abandoned. This application Feb. 24, 1987, Ser. No. 17,629
Claims priority, application Japan, Oct. 12, 1984, 59-214991; Oct. 15, 1984, 59-215967
Int. Cl.[4] E04H *12/18*
U.S. Cl. 52—646 **6 Claims**



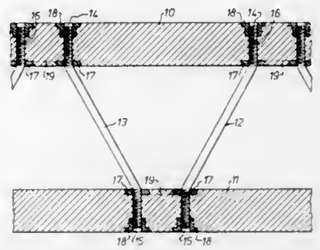
1. A deployable truss comprising:
(a) a plurality of three-dimensional truss units;
(b) each said three-dimensional truss unit including:
a plurality of ridge members located in the position of ridges of an imaginary substantial hexahedron having a front face, a rear face and four side faces, those of said ridge members which are not located in the front face and rear face being able to be elongated;
a plurality of side face diagonal members each located in the position of one of two diagonal lines of each side face of the hexahedron, said side face diagonal members being oriented such that each member is not parallel to the diagonal member in the opposed side face and is connected to the same vertex as the diagonal member in the adjacent side faces; and
a front face diagonal member and a rear face diagonal member located in the position of one of two diagonal lines of the front face and in the position of one of the two diagonal lines of the rear face, respectively, and each having an articulated joint located in the intermediate position so as to be bendable;
(c) said three-dimensional truss units being oriented and joined together in such a manner that each unit shares with the adjacent unit one side face of the hexahedron and the ridge members and side face diagonal member of said one side face, and the side face diagonal members of each unit are in mirror-image relation to the corresponding members of the adjacent unit with respect to the shared one side face; and
(d) said diagonal members and ridge members of each said three-dimensional truss unit being dimensioned such that the lengths thereof satisfy a predetermined geometrical condition which enables each unit to be folded and allows same to maintain the geometrical configuration, whereby the deployable truss can be folded to occupy a small space by bending the front face and rear face diagonal members and elongating the ridge members which are not located in the front face and rear face and can be deployed by straightening the bent diagonal members and restoring the elongated ridge members to the original length.

4,819,400

BEAM AND METHOD FOR THE PRODUCTION THEREOF

Bengt A. Kindberg, Malmö, Sweden, assignor to Björn Larsson, Hestra, Sweden, a part interest

PCT No. PCT/SE86/00127, § 371 Date Jan. 7, 1987, § 102(e) Date Jan. 7, 1987, PCT Pub. No. WO86/05537, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 24, 1986, Ser. No. 940,766
Claims priority, application Sweden, Mar. 22, 1985, 8501413
Int. Cl.[4] E04C *3/00*
U.S. Cl. 52—693 **12 Claims**



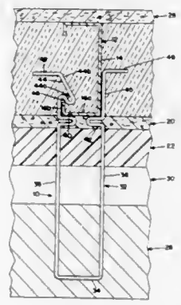
1. A beam comprising flanges of wood and a web interconnecting said flanges, said flanges having blind bores therein and having recesses which extend around said bores, said web being formed of metal rods inclined relative to each other in the plane of the web like the bars in a trapezoidal curve, characterized in that the opposite end portions of each metal rod are bent in the same plane and at the same angle but in opposite directions and have a length which is less than the flange thickness, that a washer is provided at the transition between the central portion of the rod and each end portion, and that the end portions are secured in said blind bores in the beam flanges with the washer accommodated with close fit in a recess around the bore, said end portions being provided with circumferential flanges or ridges and being secured in their bores by means of said circumferential flanges or ridges engaging the walls of the bores.

4,819,401

WIRE ANCHOR FOR METAL STUD/BRICK VENEER WALL CONSTRUCTION

G. Ward Whitney, Jr., 2129 Lockhart Dr., Charlotte, N.C. 28203

Filed Apr. 8, 1988, Ser. No. 179,054
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—713 **5 Claims**



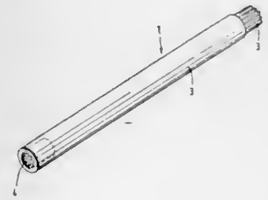
1. A wire anchor for metal stud/brick veneer wall construction comprising a member bent from metal wire and having a generally U-shaped external portion adapted to span and maintain a space between a stud and a brick veneer wall and a pair of attachment portions adapted to be snapped into a retained position on the stud, which stud includes a web portion and outwardly and inwardly positioned L-shaped flange portions, each having a base leg part and an inturned leg part, each attachment portion of the member being joined integrally to a respective leg of the external portion at a juncture that includes a transverse offset portion engageable with an external portion of the base leg part of the outwardly positioned flange portion of the stud, one attachment portion further including an arm engageable with the external surface of the web portion of the stud, and the other attachment portion including an arm engageable with the external surface of the inturned leg part of the outwardly positioned flange portion the stud and an inturned portion defining a slot adapted to snap resiliently onto and be captured by the edge of the inturned leg part of the outwardly positioned flange portion.

4,819,402

STRUCTURAL ELEMENT FOR CONSTRUCTIONAL SYSTEMS

Siegfried Schneider, Turnerstrasse 22, D-5650 Solingen 13, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,529
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 8701515[U]
Int. Cl.[4] E04C *3/36, 3/32*
U.S. Cl. 52—726 **4 Claims**



1. Structural element for constructional systems, for example for building frames, said element comprising a rod-shaped basic body having first and second ends and a respective plug of eight-cornered profiled cross-section on each of said ends, said plugs being either male or female and of the same profiled cross-section.

4,819,403

METHOD FOR INSTALLING ELEVATOR DOORS

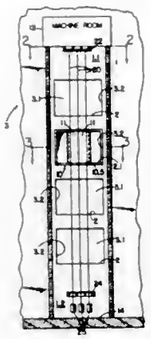
Alain M. R. Penicaut, Paris, and Jean C. Chapelain, Sainte Genevieve, both of France, assignors to Otis Elevator Company, Farmington, Conn.

Filed Jun. 17, 1987, Ser. No. 62,989
Claims priority, application France, Sep. 11, 1986, 8612714
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—741 **7 Claims**

1. A method for installing an elevator hall door in a space connecting a first floor and the elevator shaft in a building having a plurality of floors adjacent the shaft, the door having a horizontal surface characterized by the steps of:
a. placing alignment marks along a horizontal surface on the door;
b. suspending in the shaft and from a location one or more floors away from the first floor, a plurality of spaced apart plumb lines that are colinear on an imaginary straight line that is at a reference distance, common to each floor, for adjusting the distance between the elevator hall door and the shaft, each plumb line corresponding to an alignment

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mark on the hall door, the placement of the lines being based on the dimensions of the shaft and the intended location of the car that is to be installed in the elevator shaft after the elevator hall door is installed;



c. placing the elevator hall door on the first floor in a position opposite the plumb lines and adjusting the position of the elevator hall door relative to the lines so that each line is opposite its corresponding mark on the door and each line is the same distance from its corresponding mark and then attaching the door to the building.

4,819,404

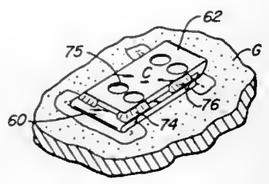
APPARATUS AND METHOD FOR MOUNTING STONE SIDING

Maurice Lafayette, Jr., Danville, Calif., assignoc to Lafayette Manufacturing, Inc., Hayward, Calif.

Division of Ser. No. 23,769, Jan. 23, 1987, which is a continuation of Ser. No. 805,161, Dec. 4, 1985, abandoned. This application Dec. 30, 1987, Ser. No. 139,503

Int. Cl.⁴ F04B *1/38*

U.S. Cl. 52—749 **5 Claims**



1. A method of attaching a clamp to a stone panel having two parallel surfaces defined on either side thereof, said method comprising the steps of:

making first and second spaced apart planar cuts in said stone panel, said cuts commencing at one parallel surface of said panel and extending into the panel towards but not through the other parallel surface of said panel, said cuts each being made along oppositely inclined planes with respect to said two parallel surfaces;

providing first and second clamp sections for penetrating said respective cuts, each clamp section including a clamp portion for penetrating said cuts, a back portion for extending parallel to the parallel surfaces of said panels and a bend therebetween;

placing said clamp portions of said clamp sections in said cuts;

juxtaposing said backs of said clamp sections overlying one another;

fastening said backs one to another with said clamp portions penetrating said cuts whereby said clamp is fastened to said panel.

4,819,405

OPAQUE CLADDING PANEL

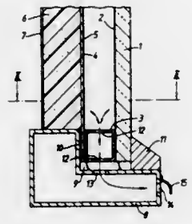
James R. Jackson, Newburgh, England, assignor to Pilkington Brothers plc, St. Helens, England

Filed Jun. 26, 1987, Ser. No. 66,541

Claims priority, application United Kingdom, Jul. 4, 1986, 8616351

Int. Cl.⁴ E04C *2/34*; E06B *7/12*

U.S. Cl. 52—810 **8 Claims**



1. A composite spandrel panel unit for incorporation in a fully-glazed facade of a building, the panel unit comprising in combination:

an outer glass sheet including a coating on the inner surface thereof, said glass sheet defining a surface area;

an opaque backing sheet superimposed relative to substantially all of said area of said glass sheet, the backing sheet comprising an aluminum sheet which has a blackened surface immediately facing said coating on said glass sheet; and a peripheral spacer separating the opaque sheet and said glass sheet to define an interspace therebetween, wherein there is at least one venting aperture in said peripheral spacer to ventilate said interspace to prevent deterioration of the appearance of said spandrel panel and said coating due to condensation of water and organic vapor thereon, and to equalize the pressure on both sides of said glass sheet to prevent distortion thereof.

4,819,406

COMPACT FORM-FILL-SEAL MACHINE FOR AUTOMATIC PRODUCTION OF SEALED PACKAGES

Sanford Redmond, Stamford, Conn., assignor to Sanford Redmond Inc., Bronx, N.Y.

Filed Sep. 25, 1987, Ser. No. 101,227

Int. Cl.⁴ B65B *61/18, 47/02*

U.S. Cl. 53—51 **5 Claims**

1. A machine for automatically simultaneously producing a predetermined number of filled and sealed finished packages, including:

pneumatically driven adjustable indexing drive means driving a main shaft member;

sprocket means mounted to said main shaft engaging and adapted to intermittently advance and rest a pair of web transporting roller chains in response to movement of said main shaft;

said web transporting roller chains including a series of upstanding pin members;

rotary impaler cylinder means driven by said roller chains;

roller means transporting a bottom thermoformable web material from a supply roll to said impaler cylinder,

said impaler cylinder impaling each of the opposed lateral edges of said bottom web onto said roller chain pin members;

means intermittently indexing said bottom web material to a heating station where said web is heated to thermoformability;

means intermittently indexing said heated web to a forming station, said forming station including

retractable forming die means forming a series of cup-like pockets in said bottom web;

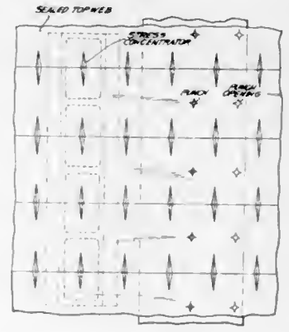
means intermittently indexing the formed bottom web to a filler station, said filler station including means filling each of said cup-like pockets with an equal amount of a product supplied to said filler station;

driven roller means simultaneously advancing a thermoformable top web material in timed sequence with the intermittent advance, forming and filling of said bottom web member;

said top web driven roller means transporting said top web into substantially parallel closely adjacent proximity to said bottom web after the cup-like pockets formed therein are filled;

means intermittently indexing both said bottom web and said top web together to a sealing station, said sealing station including

retractable heat sealing die and clamping means heat sealing the top and bottom webs together;



means intermittently indexing said sealed top and bottom web members to a punch station, said station including a series of punch dies which punch rounded openings in the sealed web members at the location of the corners of the individual packages to be formed;

means intermittently indexing and pulling said sealed top and bottom web members to a longitudinal cutting station wherein knife means slit said top and bottom web members along first opposed sides of said cup-like pockets and adjacent the pin engaging edge portions of said bottom web;

transverse cutting means slitting said top and bottom web members along second opposed sides of said cup-like pockets to thereby separate the individual finished packages from one another;

means transporting said finished packages away from said machine; and

take up roller means removing the bottom web trim from said roller chain pins.

4,819,407

PACKAGING MACHINE, ESPECIALLY FOR CIGARETTE PACKS

Heinz Focke; Jürgen Focke, and Kurt Liedtke, all of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,479

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1986, 3639994

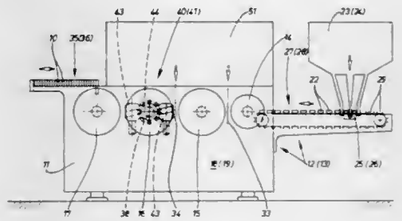
Int. Cl.⁴ B65B *19/00*

U.S. Cl. 53—202 **8 Claims**

1. Packaging machine for producing cigarette packs and having rotating folding turrets for the folding of blanks and having conveyors for cigarette groups,

wherein, for the simultaneous production of two cigarette packs (**10**) at a time, two parallel longitudinal production tracks (**12, 13**) are arranged on opposite sides of a common supporting stand (**11**);

wherein each production track (**12, 13**) comprises successively, in a direction from an upstream end to a downstream end of the track, a cigarette magazine (**23, 24**) with a feeding conveyor (**27, 28**), a receiving turret (**14**), tin foil-folding and paper-folding turrets (**15, 16**), a drying turret (**17**), and a discharging conveyor (**35, 36**) which feeds a transverse collecting track (**37**) common to both production tracks;



wherein, in the two production tracks, the mutually corresponding receiving turrets (**14**), folding turrets (**15, 16**), drying turrets (**17**), feeding conveyors (**27, 28**) and discharging conveyors (**35, 36**) are mounted equiaxially on respective opposite transversely-spaced sides of the supporting stand (**11**); and

wherein the cigarette magazines (**23, 24**) and the feeding (**27, 28**) and discharging (**35, 36**) conveyors of the two production tracks (**12, 13**) are not arranged symmetrically relative to the longitudinal mid-plane of the machine, but are transversely off-set in parallel relative to said mid-plane, so that the cigarettes in both of the two production tracks (**12, 13**) are always arranged, fed and discharged in the same orientation of the cigarettes.

4,819,408

MACHINE FOR WRAPPING METAL STRIP COILS

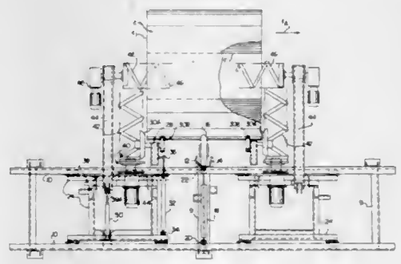
Luigi Bertolotti, Incisa Valdarno, Italy, assignor to Nuova Italsider SpA, Genoa and Bertolotti SpA, Incisa Valdarno, both of, Italy

Filed Nov. 28, 1986, Ser. No. 935,989

Claims priority, application Italy, Nov. 28, 1985, 9529 A/85

Int. Cl.⁴ B65B *11/04, 49/12*

U.S. Cl. 53—211 **19 Claims**



1. Machine for wrapping a sheet of material around metal strip coils, comprising:

a dispenser feeding out a sheet of material (N);

means for making a metal strip coil (C) having a cylindrical

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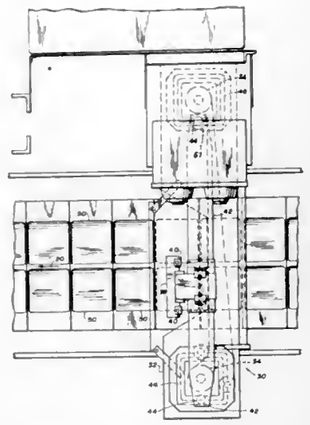
surface and circular sides revolve on a number of supporting rolls (5);
guide rolls (16, 30B) resting of the cylindrical surface of the coil;
primary folding devices (30A, 42), flanking the said cylindrical surface of the coil, for bending and pleating the open ends of the sheet of material against the circular sides (C1) of the coil, said primary folding devices including slanted disks which flank said circular sides of the coil; and
secondary folding devices (46) for bending back the edges of the sheet of material into the hollow core (F) of the coil.

4,819,409

APPARATUS FOR FORMING AN ADHESIVE SEALED PACKAGE

Reid A. Mahaffy, Montclair; George W. Anderson, Little Falls, both of N.J.; Eugene Garson, Bronx, N.Y.; John A. Giordano, West Paterson, N.J.; Robert E. Hirt, Waldwick, N.J., and Milan R. Ostrow, Pequannock, N.J., assignors to Mahaffy & Harder Engineering Co., Fairfield, N.J.

Continuation of Ser. No. 56,642, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 910,406, Sep. 22, 1986, abandoned, which is a continuation of Ser. No. 663,866, Oct. 23, 1984, abandoned. This application Dec. 28, 1987, Ser. No. 138,648
Int. Cl.[4] B65B *7/28, 51/02*
U.S. Cl. 53—282 **3 Claims**



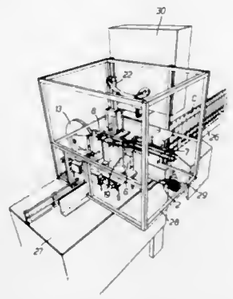
1. In packaging apparatus of the type for forming packages comprising a plastic cup-shaped container with a top sealed thereto around a seal line in a peripheral area of the container, the apparatus including means to support said cup-shaped containers and to move them through a number of operating stations; said apparatus comprising:
adhesive applicator means at a first operating station to lay down hot melt adhesive around the seal lines of said containers;
said applicator means including a gun mounted for movement around the complete periphery of each container to lay down adhesive around that periphery while the container is stopped in said first operating station;
means at a second operating station to lay down a plastic sheet over said containers to form tops thereover;
movable intermediate means actuable into a position beneath said adhesive applicator means to prevent adhesive from dripping down onto a package or product therebeneath;
means for de-activating said intermediate means to move it away from said position beneath said adhesive applicator means whenever said gun is actuated to dispense adhesive, thereby to permit an adhesive application to be made;
means for activating said intermediate means to its drip-preventing position when said gun has been de-actuated after an adhesive application has been made by said applicator means and to de-activate said intermediate means prior to the next actuation of said gun for the next application of adhesive; and
means operable after the application of adhesive to complete the sealing of the packages.

4,819,410

METHOD AND APPARATUS FOR ATTACHING A HANDLE TO A GROUP OF CARTONS

Edward A. Skinner, and Donald E. House, both of Welwyn Garden City, United Kingdom, assignors to Elopak Limited, Hertfordshire, England

Filed Jul. 29, 1987, Ser. No. 79,094
Int. Cl.[4] B65B *61/14*
U.S. Cl. 53—413 **19 Claims**



1. A method of attaching together an article and a handle, comprising bringing two separate tapes to adjacent to respective opposite sides of the article, bringing respective opposite end zones of the handle to said respective opposite sides of the article, and automatically and adhesively attaching together the tapes, the article and the handle at said respective opposite sides of the article, said respective opposite end zones being brought to said respective opposite sides before said tapes are applied to said handle.

4,819,411

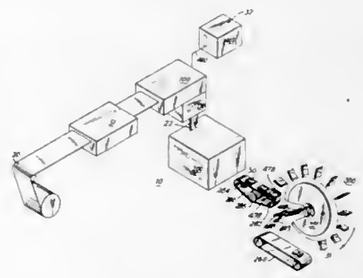
HIGH CAPACITY CONTINUOUS PACKAGE SEAM AND TAB FOLDING AND TACKING APPARATUS AND METHOD

Daryl Konzal, Colgate, and Gunars Salnajs, Milwaukee, both of Wis., assignors to International Paper Company, Purchase, N.Y.

Division of Ser. No. 942,850, Dec. 17, 1986, Pat. No. 4,776,147. This application Jun. 28, 1988, Ser. No. 212,687
Int. Cl.[4] B65B *61/24, 1/24, 7/20*
U.S. Cl. 53—439 **4 Claims**

1. A method of forming a substantially rectangular container from a sealed package having excess packaging material in a package forming machine having a transfer conveyor, including a pallet for receiving a package, a pair of side pressing members disposed on opposite sides of the conveyor for folding the seams, and a top pressing endlessly advancing belt disposed above the transfer conveyor, a package forming wheel rotatable about its axis including a plurality of package receiving receptacles having flanges and opposing tab folding members, the tab folding members having an open position and a closed position, a heater means disposed adjacent the wheel periphery, and guide rails disposed along the wheel periphery, the method comprising
placing the package into a substantially rectangular cross section;

passing the package on the pallet, between opposing side pressing members, and under the top pressing belt;
folding the side seams against the corresponding package side panels by passing the seams against the respective side pressing members;
inserting the package into a package forming wheel receptacle as the wheel advances continuously about its axis;
pressing the package against the flanges of the package forming wheel receptacle by advancing the package against the plurality of guide rails; thereby squaring the



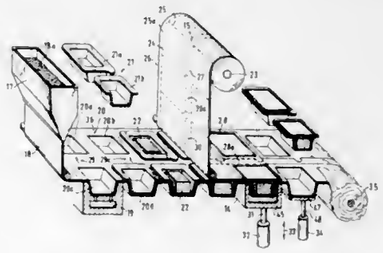
corners of the package and forming tabs of excess material at each package corner;
heating the tabs and their corresponding package side and bottom panels as the package is rotated by the heater means; and
folding and holding the heated tabs against the corresponding heated side panels by rotating the opposing tab folder members closed about the package so that the heated outer thermoplastic layers stick and adhere together as they cool, thereby tacking the tabs.

4,819,412

PROCESS AND APPARATUS FOR THE MANUFACTURE OF A PACKAGE MADE OF A THERMOPLASTIC SYNTHETIC SHEET

Karl H. Sengewald, Kreisstr. 16, D-4801 Halle in Westf. 1, Fed. Rep. of Germany

Filed Jan. 14, 1988, Ser. No. 144,264
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701770
Int. Cl.[4] B65B *7/28*
U.S. Cl. 53—471 **14 Claims**



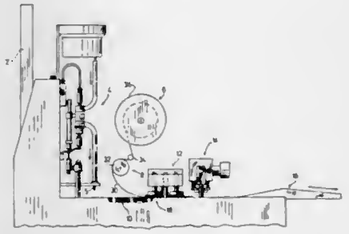
1. A process for the manufacture of packages made of prefabricated containers substantially dimensionally stable and having at a filling end an outwardly projecting flange edge on which a cover sheet is fixed by welding, hot sealing or bonding, said process comprising the steps of:
(a) providing a service belt consisting of a continuous thermoplastic sheet material produced in a continuous sheet forming process,
(b) moving the continuous service belt along a path through a package forming, filling and closing work station,
(c) forming recesses in the service belt for receiving said containers and incorporating the prefabricated containers in succession and in a close spaced relationship into the recesses of the service belt,
(d) filling the prefabricated containers with material,
(e) supplying a continuous sheet web including weakening lines defining the outer edge surface dimension of a cover for each of the containers disposed in said recesses,
(f) applying the sheet web to the containers to register a cover which each of the containers,
(g) separating the covers along the weakening lines to form closed, filled containers, and
(h) removing the remaining thermoplastic sheet material in the service belt as waste after the covers have been separated thereby using the service belt only once as a disposable service belt to form the packages of the process.

4,819,413

PRECISION LID FIT FILLING MACHINE

Derek V. Mancini, Markham, Canada, assignor to Consumers Glass Company Limited, Etobicoke, Canada

Continuation of Ser. No. 114,943, Jan. 23, 1980, abandoned. This application Feb. 2, 1982, Ser. No. 345,008
Int. Cl.[4] B65B *7/28*
U.S. Cl. 53—478 **9 Claims**



1. In a process for sealing a container with the first lid of a series of like lids interconnected by severable tabs where each lid has a body portion of essentially the same size as the container flange peripheral edge and a tab projecting from the body for removing the lid comprising in sequence the steps of:
(a) dispensing a container into a conveyor provided with an upwardly opening guide means for first loosely receiving the flange edge of a container and subsequently by said guide means contacting the flange edge precisely locating the flange edge in the conveyor;
(b) positioning said lid loosely within the guide means of the conveyor;
(c) urging said lid downwardly within the guide means, and
(d) cutting said lid from the series of interconnected lids thereby allowing said lid to be precisely located at the base of the guide means above the flange of a container by virtue of the peripheral edge of said lid contacting said guide means whereby said flange edge and said lid edge are essentially aligned, said lid remaining in position above said container flange in preparation for sealing due to the continuing contact of said guide means with said lid edge.

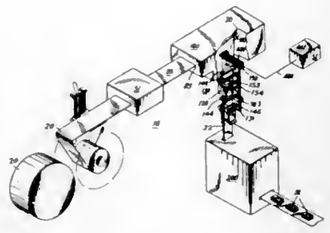
VOL 1101 ISS 2 APR 11 1989 UMI

4,819,414

APPARATUS FOR FORMING A TUBE FROM POLYFOIL WEB FOR HIGH CAPACITY ASEPTIC FORM, FILL, AND SEAL MACHINES

Donald G. Worden, Sheboygan, and Kenneth Storm, Glendale, both of Wis., assignors to International Paper Company, Purchase, N.Y.

Continuation of Ser. No. 942,849, Dec. 17, 1986, Pat. No. 4,731,980. This application Dec. 23, 1987, Ser. No. 137,185
The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.
Int. Cl.[4] B65B *9/08*
U.S. Cl. 53—551 13 Claims



1. Apparatus for forming a continuous web of polyfoil material into a tube that can be filled with a product and sealed into packages, comprising:

means for advancing the polyfoil web;

a frame;

web guide means for bending the polyfoil web so that the longitudinal edges of the web are gradually brought close together into a superimposed and opposing relationship as the web is advanced along the web guide means;

a pair of first rollers, mounted on the frame a distance apart, one first roller being disposed on each side of the polyfoil web, the first rollers extending from the frame so as to contact the bent polyfoil web to flatten the portions of the web adjacent to the opposing longitudinal edges as the web advances;

groove means for receiving and aligning the longitudinal edes of the web disposed proximate to the longitudinal edges of the web as the web advances;

a pair of second rollers spaced a distance apart and adapted to receive the superimposed and opposing longituidnal edges and pinch them together, the second rollers having parallel axes of rotation that are at an angle to the longitudinal edge of the web so as to exert a component of force on the web edges perpendicular to the direction of advance of the web to urge the edges into the groove means and longitudinally into alignment;

a third roller mounted in the frame and disposed to contact the web portion between the two flattened web portions to urge the web edges into the groove means, longitudinally aligning the web edges, thereby providing the web with a substantially triangular cross sectional configuration;

means for heating the opposing longitudinal web edges; and

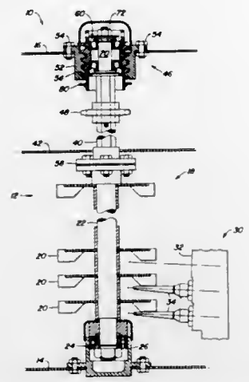
a pair of fourth rollers spaced a distance apart and adapted to receive the heated superimposed and contacting longitudinal edges and press them together so that they fuse together to form a homogeneous longitudinal seal.

4,819,415

AUTOMATICALLY ADJUSTABLE DOFFER COLUMN FOR A COTTON PICKER

Jonathan L. Engelstad, Ankeny, and William A. Best, West Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 29, 1987, Ser. No. 67,023
Int. Cl.[4] A01D *46/16*
U.S. Cl. 56—41 12 Claims



1. Adjustable supporting structure for positioning an upright column of doffer pads mounted for rotation about an axis on a shaft adjacent vertically spaced picking spindles, said supporting structure comprising:

a housing located above the pads;

a bearing located in the housing for vertical adjustment with respect thereto and rotatably supporting the shaft, the vertical adjustment of the bearing determining the axial location of the shaft; and

means for automatically adjusting the bearing vertically to axially locate the doffer pads with respect to the spindles as the doffer pads are rotated, said means for automatically adjusting including means for producing a first force dependent on rotation of the shaft for urging the bearing a first upright direction in the housing, means for producing a second force dependent upon the weight of the doffer column to move the column in the direction opposite the first direction in the housing, and means for adjusting the relative magnitude of the first and second forces to cause the doffer column to move downwardly until the pads touch the spindles.

4,819,416

ROTARY CUTTING MEMBER FOR USE WITH LAWNMOWERS AND THE LIKE

Dallas W. Jones, Hartford, N.Y., assignor to The UnBlade Co., Utica, N.Y.

Filed Feb. 17, 1988, Ser. No. 156,597
Int. Cl.[4] A01D *34/64*; A01G *3/06*
U.S. Cl. 56—12.7 27 Claims

1. An apparatus for cutting grass and the like, comprising:

(a) a rotary cutting means having upper and lower surfaces;

(b) said rotary cutting means including a hub and at least first and second arm means extending cantilevered from and circumferentially spaced about said hub;

(c) flexible cutting means operably associated with each of said at least first and second arm means, respectively;

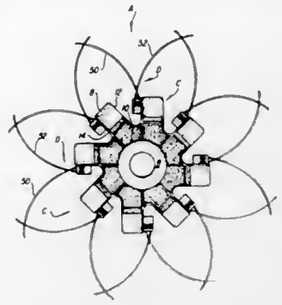
(d) means operably associated with each of said at least first and second arm means for securing said flexible cutting means thereto;

(e) said rotary cutting means having at least a first cut-out formed intermediate said first and second arm means;

(f) said at least first cut-out extending through said rotary cutting means from said upper surface to said lower surface thereby forming a space between said first and second arm means;

(g) said arm means including leading and trailing edges and first and second ends;

(h) said second end of said arm means is positioned adjacent said hub means and said first end is positioned away therefrom;



(i) said first end includes upper and lower surfaces;

(j) said first end of said arm means being wedge-shaped in entire cross-section for thereby creating an air foil means for creating a low pressure area along said upper surface of said rotary cutting means; and

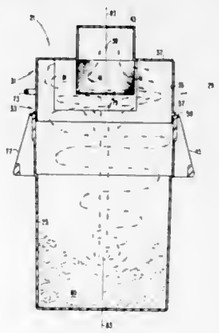
(k) the distance between said lower and upper surfaces of said first end increases with the distance from said leading edge.

4,819,417

GRASS CLIPPING CATCHER

James G. Bryant, Greencastle, and Ronald G. Hayden, Bainbridge, both of Ind., assignors to F.H. & H. Limited, Rosedale, Ind.

Filed Jul. 22, 1987, Ser. No. 76,396
Int. Cl.[4] A01D *34/70*
U.S. Cl. 56—202 21 Claims



1. An improved grass clipping catcher for use with a riding lawn mower having a clipping exhaust comprising:

a cylindrical housing having a housing wall, an upper end, a lower end and an air exhaust port centrally located in said upper end of said cylindrical housing;

a grass clipping container located below said cylindrical housing;

a delivery chute tangentially engaging said cylindrical housing and adapted and arranged to deliver grass clippings and air into said cylindrical housing in a vortex, said vortex having a vortex axis and an upward flow along said vortex axis; and

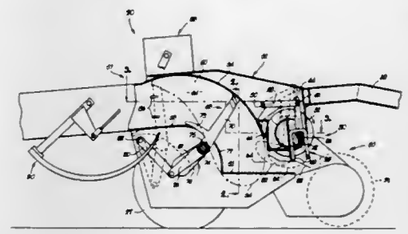
vortex exhaust baffle means comprising a flat plate having a round profile suspended below said air exhaust port and adapted and arranged for diverting said upward flow.

4,819,418

SIMPLIFIED CROP BALER

Howard J. Ratzlaff, Hesston, and Ferol S. Fell, Newton, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Sep. 29, 1987, Ser. No. 102,040
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—341 17 Claims



1. A baler comprising:

structure defining a baling chamber having an inlet and an outlet;

means for introducing crop materials through said inlet and into said chamber;

a plunger assembly having a plurality of spaced apart elements each presenting a crop engaging face for receiving crop materials introduced into said chamber and compacting the crop materials into the form of a bale;

restricted orifice means located at said outlet of said baling chamber for extruding a bale of crop materials from said baling chamber during the time that said crop engaging faces of said plunger elements are compacting the crop materials of an upstream bale against the resistance presented by an extruded bale; and

means for shifting said elements of said plunger assembly through a closed loop path of travel including a compaction stroke portion for compacting the crop materials into a bale and a return stroke portion for receiving additional crop materials,

said structure defining said baling chamber including means defining a number of openings each corresponding to one of said plurality of plunger elements,

said means for shifting said elements including means for retracting at least a substantial portion of said elements through the respective openings and out of said baling chamber during a part of said return stroke portion of said closed loop path of travel for enabling said elements to return to a position behind crop materials introduced into said chamber.

4,819,419

ARRANGEMENT FOR PNEUMATIC FALSE-TWIST SPINNING

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Oct. 14, 1987, Ser. No. 108,218
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638110
Int. Cl.[4] D01H *15/00*
U.S. Cl. 57—261 33 Claims

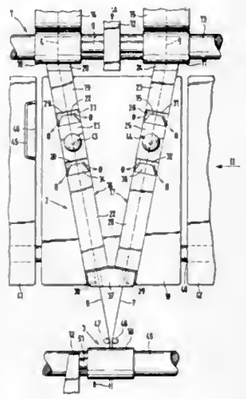
1. An arrangement for pneumatic false-twist spinning of the

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type having pneumatic false-twist nozzle means interposed between delivery roller means of a sliver supplying drafting frame and yarn withdrawal device means, said arrangement comprising:

pneumatic false-twist nozzle means having sliver inlet means for accepting sliver from drafting frame delivery roller means,

nozzle adjusting means for adjustably moving the nozzle means between an operating position with the sliver inlet



means disposed adjacent the delivery roller means and a piecing position with the sliver inlet means disposed offset with respect to the delivery roller means, and

suction tube means movable between an inoperative position spaced from the delivery roller means to a piecing position adjacent the delivery roller means, said suction means being operable to control withdrawal of said sliver from the delivery roller means for piecing operations thereby assuring a correctly drafted sliver being available for piecing.

4,819,420

PROCESS AND DEVICE FOR PIECING TO AN OPEN-END FRICTION SPINNING DEVICE

Kurt Lovas, Bohmfeld, and Werner Billner, Ingolstadt, both of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/DE86/00235, § 371 Date Apr. 13, 1987, § 102(e) Date Apr. 13, 1987, PCT Pub. No. WO87/00215, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 5, 1986, Ser. No. 30,853

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1985, 3522517

Int. Cl.⁴ D01H *15/02*

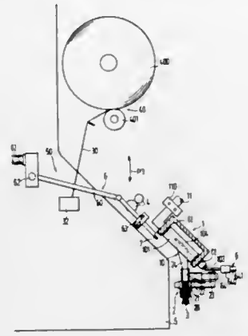
U.S. Cl. 57—263 **39 Claims**

1. Process for piecing to an open-end friction spinning device having two friction spinning elements driven in the same direction and forming a nip, with fibers being fed into a thread forming zone of such nip and subsequently drawn off from such thread forming zone in the form of a continuous thread, said process including feeding fibers into the nip to be twisted into a fiber bundle, grasping such fiber bundle and securing one end thereof against rotation so that the remainder of the bundle is twisted with fibers entering said nip incorporated thereinto, withdrawing said fiber bundle from said thread forming zone with the thread end which is secured against rotation forming the leading end of said thread, while simultaneously twisting-in fibers in the remainder thereof to form a thread which is withdrawn and transferred to a winding device.

34. A device for piecing on an open-end friction spinning machine including a pair of friction spinning elements defining a spinning nip therebetween for forming thread from fibers fed thereinto, to be drawn off by draw-off rollers and wound onto a bobbin, said apparatus comprising:

an auxiliary conveying mechanism for controllably at least partially displacing a fiber bundle residing in the machine spinning nip from such nip; and

a grabber associated with said auxiliary conveying mechanism for seizing a fiber bundle displaced thereby from the nip; further wherein



said auxiliary conveying mechanism is movable, between a first position relatively adjacent the spinning nip and a second position relatively adjacent a bobbin, with said grabber received thereon for movement therewith, so that piecing of a fiber bundle to such bobbin with newly formed thread tied into such fiber bundle can be selectively accomplished without requiring a piecing thread to be returned from such bobbin.

4,819,421

METHOD AND APPARATUS FOR MONITORING A PREDETERMINED YARN QUALITY AT A TEXTILE MACHINE, ESPECIALLY AT A FRICTION SPINNING APPARATUS

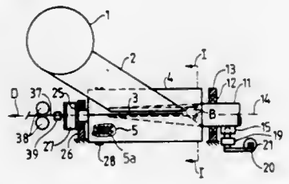
Herbert Stalder, Kollbrunn; Peter Egloff, Aadorf; Rolf Binder, Schottikon, and Josef Baumgartner, Sirnach, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Apr. 25, 1988, Ser. No. 185,687

Claims priority, application Switzerland, Apr. 27, 1987, 01601/87

Int. Cl.⁴ D01H *13/10, 1/135*

U.S. Cl. 57—264 **36 Claims**



1. A method for monitoring a predeterminate yarn quality of a yarn spun by a friction spinning apparatus, comprising the steps of:

delivering fibers to a friction spinning element moving at a predeterminate speed;

forming at the friction spinning element a fiber tube from which the yarn is produced;

the fiber tube constituting a rotating fiber tube rotating practically without slip in relation to the predeterminate speed of movement of the friction spinning element;

forming a spun yarn from the fiber tube;

delivering the spun yarn as a running yarn;

measuring the mechanical tension of the running yarn to obtain a measured value of such measured mechanical tension in order to determine the quality of the spun yarn; and

upon deviation of the determined quality of the spun yarn controlling operation of the friction spinning apparatus so as to establish a predeterminate desired tension of the running yarn.

4,819,422

ARRANGEMENT FOR WINDING A DOUBLE YARN ONTO A CROSS-WOUND SPOOL

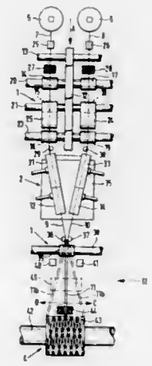
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Suessen, both of Fed. Rep. of Germany

Filed Oct. 8, 1987, Ser. No. 105,544

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638185

Int. Cl.⁴ D02G *3/28;* **B65H** *54/28*

U.S. Cl. 57—328 **13 Claims**



1. An arrangement for forming cross-wound spools of double yarn, comprising

pneumatic false twist spinning means for forming two pre-strengthened yarn components,

feeding means disposed downstream of the false twist spinning means and including means for feeding the two yarn components at a very slight distance from one another,

winding spool means for forming a pre-strengthened double yarn package with the two yarn components wound thereon for use in a subsequent finish spinning operation,

spool winding means for rotatably driving the winding spool means to form the pre-strengthened double yarn package,

cross-winding means disposed between the winding spool means and feeding means for cross-winding the double yarn onto the winding spool means, said cross-winding means including movable traverse motion guide means for guiding the double yarn to the winding spool means,

and yarn path deflecting means disposed between the feeding means and the traverse motion guide means for deflecting the double yarn synchronously with the traverse motion guide means so that always an appropriately equally long travel path exists for the double yarn between the feeding means and the traverse motion guide means, said yarn path deflecting means including a first yarn guide element disposed in a relatively fixed position and a second yarn guide element which is movable with respect to the first yarn guide element to vary the yarn path length between the feeding means and the first yarn guide element.

4,819,423

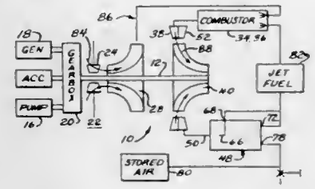
INTEGRATED POWER UNIT

Roy W. Vershure, Jr., Escondido; Colin Rodgers, and Jack R. Shekleton, both of San Diego, all of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 1,818, Jan. 8, 1987. This application Feb. 22, 1988, Ser. No. 158,896

Int. Cl.⁴ F02C *7/26*

U.S. Cl. 60—39.02 **4 Claims**



1. A method of generating emergency power with a power plant including

a gas turbine engine including a centrifugal compressor coupled to a radial turbine;

a generator coupled to said turbine engine to be driven thereby;

an air inlet to said compressor including at least one movable vane for controlling air flow through said inlet;

a first reservoir for a combustible fuel;

a first combustor for receiving and combusting compressed air from said compressor and fuel from said first reservoir to generate gasses of combustion and feeding said gasses of combustion to said turbine;

a second reservoir for containing a compressed oxidant for combusting fuel from said first reservoir;

a second combustor for receiving and combusting fuel from said first reservoir and oxidant from said second reservoir to generate gasses of combustion;

means for introducing fuel from said first reservoir into the gasses of combustion from said second combustor to vaporize such fuel; and

means for directing combined gasses of combustion and vaporized fuel to said turbine to drive the same;

said method comprising the steps of

(a) using said vanes (5) to substantially close said inlet while

(b) directing fuel and compressed oxidant to said second combustion to combust the same and

(c) directing fuel to said introducing means.

4,819,424

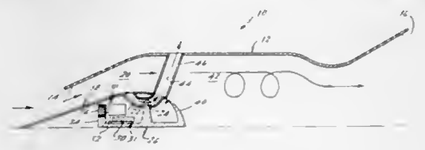
SWIRL STABILIZED RAM AIR TURBINE ENGINE

Michael J. Bak, Union Lake, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Sep. 16, 1987, Ser. No. 97,103

Int. Cl.⁴ F02C *7/22;* **F02K** *7/10*

U.S. Cl. 60—39.183 **1 Claim**



1. A ram air turbine engine comprising

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an elongated cylindrical combustor housing having an air inlet at a front end thereof and a nozzle at a rear end thereof,

a turbine housing disposed centrally of said combustor housing at the front end thereof having a conical frontal portion,

a hollow swirl vane extending radially outwardly from said turbine housing and communicating with the interior thereof and exterior of said combustor housing,

a bypass air passage in said turbine housing communicating with said combustor air inlet and said hollow swirl vane,

a ram air turbine in said turbine housing having a blade extending into said bypass passage,

a fuel slinger mounted directly on said turbine and within said turbine housing and rearwardly of said swirl vane for slinging a slurry fuel radially outwardly from said turbine housing into said combustor, and

a fuel pump within said turbine housing and driven by said turbine for pumping fuel to said fuel slinger.

4,819,425

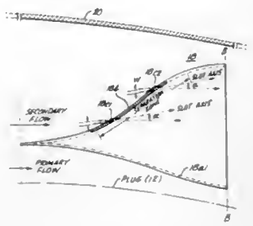
PRIMARY-SECONDARY VENTILATED FLOW MIXER NOZZLE FOR HIGH BYPASS TURBO FAN JET PROPULSION SYSTEM

Bannister W. Farquhar, Bellevue, and Jagdish S. Sokhey, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 359,478, Mar. 18, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 620,528

Int. Cl.⁴ F02C *1/28, 3/02*

U.S. Cl. 60—226.1 **6 Claims**



1. A thrust efficient noise suppression mixer nozzle for use in high-bypass ratio turbofan jet propulsion engines and the like having a combustion chamber to combine a primary discharge formed by engine combustion chamber discharge gases with a secondary discharge formed by ram air and fan-driven air, said nozzle comprising: (a)a flow confining and directing tubular inner duct for receiving said primary discharge and directing the same rearwardly in a primary jet flow along a nozzle axis; (b) a flow confining generally annular tubular outer duct coaxial with and surrouning said inner duct for receiving said secondary discharge and confining the same to flow rearwardly around and along said inner duct to be discharged rearwardly in a secondary jet flow along said nozzle axis, said inner duct having a generally annular tubular upstream portion that merges into a tubular multilobe discharge mixer downstream portion having circumferentially spaced alternating lobes and valleys, said lobes having outer crests that diverge rearwardly and outwardly from said nozzle axis at a divergence angle, said divergence angle being such that boundary layer separation of said primary discharge from the lobe crest interiors occurs at an intermediate location along said lobe crest interiors in the absence of a means for preventing such separation, said divergence angle and the interior of said flow confining generally annular tubular outer duct being such that the confined secondary discharge in the outer duct upon the lobe crest exteriors remains attached to the lobe valley exteriors; and, (c) means for preventing said boundary layer separation of said primary discharge comprising slots in said lobe crests located upstream of said intermediate locations, whereby said secondary discharge is forced into the lobe crest interiors, said secondary discharge adding rearwardly directed momentum energy to boundary layer flow within the lobe crests that prevents boundary layer separation of said primary discharge, and initiates mixing of the primary and secondary discharges within the inner duct.

4,819,426

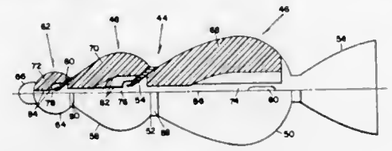
ROCKET PROPELLED VEHICLE FORWARD END CONTROL METHOD AND APPARATUS

Victor Singer, and Barry E. Kerrigan, both of Newark, Del., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed May 8, 1987, Ser. No. 47,760

Int. Cl.⁴ F02K *9/06*

U.S. Cl. 60—250 **13 Claims**



1. A multi-stage rocket comprising,

a lower stage rocket motor including a first nozzle and having a first solid propellant and a first case, said first solid propellant having a perforation therein forming a first central combustion chamber, said first case having a forward end and an aft end with said nozzle being attached to said aft end of said first case,

at least a first upper stage rocket motor including a second nozzle and having a second solid propellant and a second case, said second solid propellant having a forward end and an aft end with said second case being open at the aft end of said second solid propellant and attached to said second nozzle, said second solid propellant having a perforation therein forming a second central combustion chamber with a first layer of slow burning material covering the surface defining said second central combustion chamber, and

ignition means provided in operative association with said first and second combustion chambers and operative when activated, to ignite said propellants in said lower and upper stages approximately simultaneously,

the burn rate and thickness of said slow burning material covering the surface defining said second central combustion chamber being arranged so that, upon operation of said ignition means, burning of said slow burning material lasts through substantially the entire burn of said first solid propellant and delays for a corresponding period exposure of the surface defining said second central combustion chamber and thereby burning of said second solid propellant,

whereby said upper stage at least is pressurized during burning of said first solid propellant, such pressurization reducing compressive stresses in said second case induced by transmission of lower stage thrust to forward portions of the rocket by superimposing counteracting tensile stresses therein, and additionally providing a source for the secondary discharge of gas during burning of said first solid propellant.

4,819,427

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED EXHAUST EMISSION CHARACTERISTICS

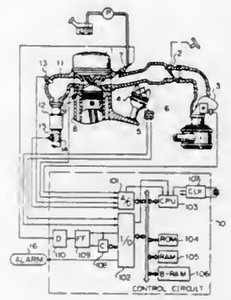
Toshinari Nagai, Ann Arbor, Mich.; Takatoshi Masui, Mishima, and Toshiyasu Katsuno, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 943,797, Dec. 19, 1986, Pat. No. 4,747,265. This application Mar. 9, 1988, Ser. No. 166,049

Claims priority, application Japan, Dec. 23, 1985, 60-287783; Dec. 28, 1985, 60-293477

Int. Cl.⁴ F01N *3/20;* **F02D** *41/22*

U.S. Cl. 60—274 **20 Claims**



1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, comprising the steps of:

adjusting an actual air-fuel ratio in accordance with the outputs of said upstream-side and downstream-side air-fuel ratio sensors;

determining whether said upstream-side air-fuel ratio sensor is activated;

determining whether said upstream-side air-fuel ratio sensor is in an abnormal state when said upstream-side air-fuel ratio sensor is activated; and

prohibiting the adjustment of said actual air-fuel ratio in accordance with the output of said downstream-side air-fuel ratio sensor when said upstream-side air-fuel ratio sensor is in an abnormal state and carrying out the adjustment of said actual air-fuel ratio in accordance with the output of said upstream-side air-fuel ratio sensor.

4,819,428

EXHAUST SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

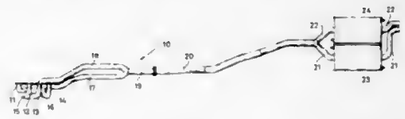
Angelo Ciccarone, Milan, Italy, assignor to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Jan. 30, 1987, Ser. No. 9,248

Claims priority, application Italy, Feb. 27, 1986, 21071/86[U]

Int. Cl.⁴ F01N *7/10*

U.S. Cl. 60—323 **5 Claims**



1. Exhaust system for a multicylinder internal combustion engine comprising at least a manifold formed by the individual exhaust ducts connected to the engine's cylinders, connector pipes, into which groups of individual ducts come together, a common exhaust pipe into which said connector pipes join each other, and silencer mufflers, said silencer mufflers being positions in side-by-side adjacent relationship at an end of said common exhaust pipe, said silencer mufflers also being positioned along side respective end pipes connected to said common exhaust pipe, said end pipes generally extending in the general direction of said common exhaust pipe and said silencer mufflers being parallel to one another.

4,819,429

HYDRAULICAL DRIVE SYSTEM

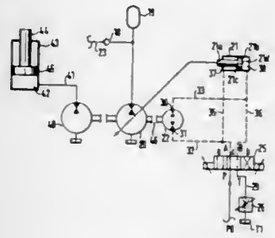
Rolf Kordak, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Dec. 28, 1982, Ser. No. 453,932

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3202015

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—414 **8 Claims**



1. A hydraulical drive system, comprising a hydrostatic machine of variable displacement, an adjusting device coacting with said machine to vary the displacement thereof, a signal generator comprising a hydrostatic machine selectively operating either as a pump or as a motor, said signal generator delivering a signal in response to the speed of said variable displacement machine to said adjusting device including a cylinder, wherein a first port of the signal generator is hydraulically connected to a first cylinder space and a second port of the signal generator is hydraulically connected to the opposite second space of said adjusting cylinder, further comprising a metering means hydraulically connected to said first and second ports of said signal generator to supply fluid to said signal generator or to remove fluid therefrom, said metering means having a flow cross section determining the desired speed of said variable displacement machine, characterized in that said signal generator is mechanically coupled to said variable displacement machine for simultaneous rotation therewith, a hydrostatic fixed displacement machine is provided which is mechanically connected to the hydrostatic variable displacement machine and which is hydraulically connected to a load in the form of a working cylinder, said fixed displacement machine being operative as either a pump or a motor and accumulative means for receiving pressurized fluid from said variable displacement hydrostatic machine when driven as a pump by said fixed displacement hydrostatic machine as a motor.

4,819,430

VARIABLY CHARGED HYDRAULIC CIRCUIT

Lanson Becker, Galesburg, Mich., assignor to Hydreco, Inc., Augusta, Ga.

Filed Jan. 21, 1983, Ser. No. 460,051

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—421 **6 Claims**

1. A fluid circuit system comprising:

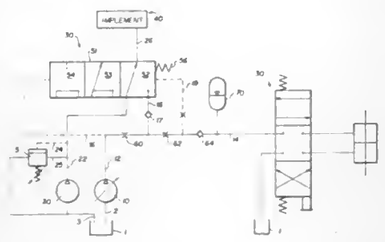
an output circuit;

a variable displacement pump and a fixed displacement

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pump, said variable displacement pump being the primary fluid source for said output circuit; and

a means responsive to variations in the differential fluid pressure between said output circuit and the output of said variable displacement pump so as to switch varying



amounts of the output of said fixed displacement pump into said output circuit when said differential fluid pressure exceeds a predetermined amount, the amount of said output of said fixed displacement pump so switched being a direct function of said variations in the differential fluid pressure.

4,819,431

METHOD OF AND SYSTEM FOR CONTROLLING A FLUIDIC VALVE

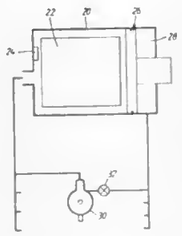
Adrian Abbott, Southampton, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Sep. 18, 1986, Ser. No. 908,764

Claims priority, application United Kingdom, Sep. 18, 1985, 8523086

Int. Cl.⁴ F02K *9/26*

U.S. Cl. 60—204 **3 Claims**



1. A method of controlling the flow of gas emerging from the outlet of a fluidic vortex valve, the method comprising feeding a supply fluid to an inlet of a vortex chamber defined within the fluidic vortex valve whereby a supply gas flow is injected into the vortex chamber in a substantially radial direction, feeding in a controlled manner a control fluid to a second inlet of the vortex chamber whereby a control fluid flow is injected into the vortex chamber in a substantially tangential direction wherein the improvement lies in providing the control fluid in the form of a liquid monopropellant, feeding the liquid monopropellant to the second inlet of the vortex chamber via a liquid control valve, and injecting the supply gas at a temperature sufficient to ignite the liquid monopropellant so that the liquid monopropellant burns and becomes gaseous forming a vortex in the vortex chamber which controls the flow of gas emerging from the outlet of the fluidic vortex valve.

4,819,432

INSTALLATION FOR HARNESSING THERMAL ENERGY

Christian Schneider, Reuthgasse 7, D-8650 Kulmbach; Hans P. Doetsch, Neudrossenfeld; Helmut Krauss, Mainleus, and Hans Höfer, Wallenfeld, all of Fed. Rep. of Germany, assignors to Christian Schneider, Kulmbach, Fed. Rep. of Germany

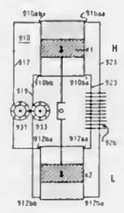
PCT No. PCT/EP86/00777, § 371 Date Aug. 21, 1987, § 102(e) Date Aug. 21, 1987, PCT Pub. No. WO87/03932, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 23, 1986, Ser. No. 111,788

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, 3545936

Int. Cl.⁴ F02G *1/04*

U.S. Cl. 60—525 **18 Claims**



1. An installation for harnessing thermal energy, in which in a first part of an operating cycle a working fluid is positively displaced out of a first fluid chamber into a second fluid chamber, in which a higher temperature prevails than in the first, and in the second part of the operating cycle working fluid is positively displaced from the second fluid chamber back into the first fluid chamber, wherein thermal energy is supplied to the working fluid on its passage from the first to the second fluid chamber and removed from the working fluid on its passage from the second to the first fluid chamber, said installation comprising

a first reciprocating piston engine unit having a first housing and a first piston mounted for reciprocating movement in said housing, said first unit operating at a relatively high temperature level;

a second reciprocating piston engine unit having a second housing and a second piston mounted for reciprocating movement in said second housing, said second unit operating at a relatively low temperature level;

means for coupling said pistons with one another so that they each simultaneously move towards a first and second end of the associated housing;

a first working fluid duct connecting the first end of the housing of the first unit with the second end of the housing of the second unit;

a second working fluid duct connecting the second end of the housing of the first unit with the first end of the housing of the second unit;

a third working fluid duct coupling the second end of the first unit with the second end of the second unit.

4,819,433

HYDRAULIC BRAKE SYSTEM

Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 502,913

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230082

Int. Cl.⁴ B60T *13/00*

U.S. Cl. 60—547.1 **2 Claims**

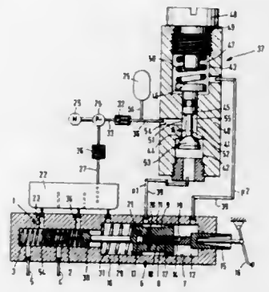
1. A hydraulic brake system for automotive vehicles comprising:

at least one wheel brake circuit pressurized by a master brake cylinder actuated by a hydraulic power booster,

said power booster having a pressure chamber in which an auxiliary pressure is adjustable by a brake valve in said power booster;

an auxiliary pressure source; and

a pressure-reducing valve having an approximately hemispherical valve closure member and a corresponding valve seat defining a valve passage therein, a spring and an adjusting bolt means acting thereon, said spring acting on said closure member to adjustably spring load said closure member in a first direction, said pressure-reducing valve further including a piston acted upon by said auxiliary pressure guided in a cylindrical bore and mechanically connected to said closure member by a tappet having a smaller diameter than said cylindrical bore, said tappet



and said cylindrical bore forming an annular chamber in fluid communication with said auxiliary pressure source, said fluid communication taking place independent of the position of the brake valve, and pressure-reducing valve being connected between said auxiliary pressure source and said brake valve and to said pressure chamber to enable said auxiliary pressure to act on said closure member in said first direction to open said valve passage and to expose said closure member to reduced pressure of said pressure-reducing valve such that a force is exerted on said closure member in a second direction to close said valve passage, said force being related to the corresponding surfaces of said closure member and said valve seat and said reduced pressure.

4,819,434

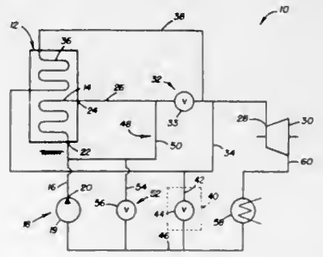
STEAM TURBINE

Chris R. Gudmundson, 3116 Merrywood Dr., Sacramento, Calif. 95825

Filed Feb. 19, 1987, Ser. No. 16,255

Int. Cl.⁴ F01K *7/34*

U.S. Cl. 60—653 **20 Claims**



1. In a steam turbine apparatus having a boiler having a first superheater, a first conduit having an inlet end and an outlet end, said outlet end being connected to said first superheater, a pressurized liquid working fluid source connected to said inlet end of said first conduit, said first superheater being adapted to convert said liquid working fluid to superheated vapor, a second conduit having an input end and an output end, said input end being connected to receive said vapor from said first superheater, and a turbine connected to receive said vapor from said output end of said second conduit, an improvement comprising:

restricting means for restricting flow through said second conduit;

a second superheater;

a third conduit adapted to conduct a first portion of said superheated vapor from said second conduit from downstream of said restricting means to said second superheater wherein said first portion of said superheated vapor is further superheated; and

a fourth conduit adapted to conduct said further superheated vapor from said second superheater to said turbine.

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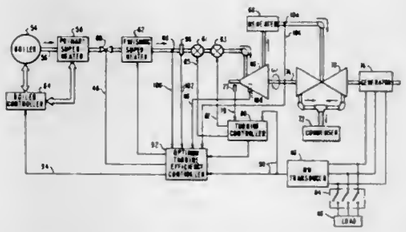
METHOD FOR REDUCING VALVE LOOPS FOR IMPROVING STREAM TURBINE EFFICIENCY

George J. Silvestri, Jr., Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 11, 1988, Ser. No. 217,515

Int. Cl.⁴ F01K *13/02*

U.S. Cl. 60—646 **4 Claims**



1. A method of reducing valve loops in a partial-arc steam turbine having a plurality of control valves for controlling steam flow into the turbine, the steam being supplied from a boiler through a division valve and a secondary superheater, the turbine being controlled in response to load demands by a microcomputer based controller coupled to at least the division valve and the control valves, the method comprising the steps of:

computing in the controller the amount of steam flow required to establish a power output of the turbine commensurate with the load demand;

determining a first intersection point of a first reduced steam flow valve loop formed by gradual closing of a one of the control valves with a corresponding reduced steam flow caused by gradual closing of the division valve;

gradually closing the division valve to reduce steam pressure at the control valves until the first intersection point is reached as indicated by monitored steam flow;

fully opening the division valve to return steam pressure to its normal value while simultaneously closing the one of the control valves so that steam flow is maintained at the value of the first intersection point;

gradually closing the one of the control valves in correspondence with the first valve loop until it is fully closed;

sensing closure of the one of the control valves;

determining a second intersection point of a second reduced steam flow valve loop formed by closing of another of the control valves with a corresponding reduced steam flow caused by closing of the division valve;

gradually closing the division valve to reduce steam pressure

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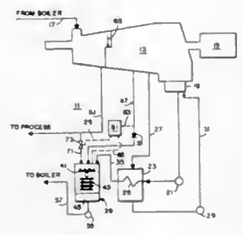
at the control valves until the second intersection point is reached;
fully opening the division valve to return steam pressure to its normal value while simultaneously closing the another of the control valves so that steam flow is maintained at the value of the second intersection point;
gradually closing the another of the control valves until it is fully closed; and
repeating the steps of closing and opening of the division valve and sequentially closing the control valves for each of a plurality of valve loops.

4,819,436

DEAERATOR PRESSURE CONTROL SYSTEM

David J. Ahner, Ballston, and Philippe J. Dupin, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 26, 1988, Ser. No. 199,227
Int. Cl.[4] F01K *13/02, 7/34*
U.S. Cl. 60—657 **11 Claims**



1. In a steam turbine power plant including a steam turbine and having a steam extraction line connected to a deaerator for providing steam to the deaerator; and, a second steam line connected to provide additional steam to the deaerator during periods of insufficient steam from the steam extraction line; a system for regulating deaerator pressure comprising:
a valve for regulating the flow of steam from the second steam line into the deaerator;
a valve controller for operating the valve to provide a variable valve position signal which tracks the availability of steam to the deaerator in the steam extraction line in accordance with the rate of decrease of pressure in the extraction steam line.

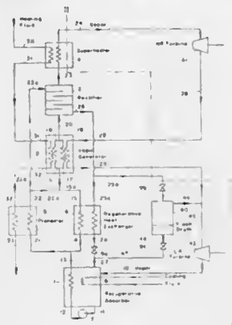
4,819,437

METHOD OF CONVERTING THERMAL ENERGY TO WORK

Abraham Dayan, 27 Schaffer Rd., P.O. Box 115, Alpine, N.J. 07620

Filed May 27, 1988, Ser. No. 197,505
Int. Cl.[4] F01K *25/06*
U.S. Cl. 60—673 **9 Claims**

1. A method of converting sensible heat energy of a heating fluid supplied by a high-temperature heat source to work, by means of a thermodynamic cycle employing a multi-component working fluid, wherein:
a solution having a higher concentration of a lower boiling component, or components, (hereinafter "rich solution") generated in an absorber is pressurized by means of a pump and is divided into at least a first and a second parts;
said first part of the rich solution is passed through a preheater in indirect counter-current heat exchange with the partially exhausted heating fluid emerging from a vapor generator, whereby said first part of the rich solution extracts additional heat from said heating fluid and is heated to the liquid saturation state;
said second part of the rich solution is passed through a regenerative heat exchanger so as to extract heat from at least one internal stream of the cycle by indirect counter-current heat exchange, and is then introduced, into said vapor generator and heated therein by indirect counter-current heat exchange with the heating fluid to produce a vapor-liquid mixture;
said vapor-liquid mixture generated in the vapor generator is fed into a lower zone of a rectifier for counter-current mass and heat exchange with at least a portion of said first part of the rich solution emerging from said preheater at the liquid saturation state which is fed into an upper zone of the rectifier, thereby forming a solution having a lower concentration of said lower boiling component, or components, (hereinafter "first lean solution") and a first vapor mixture having an increased concentration of the lower boiling component or components;
the enthalpy of said first vapor mixture is increased by passing it through a superheater in counter-current heat exchange with said heating fluid at its highest temperature; the first vapor mixture is then expanded in a first turbine to an intermediate pressure level; thereby to generate work;
a first part of said first lean solution emerging from the rectifier is passed through said regenerative heat exchanger for counter-current heat transfer to said second part of the rich solution, and is then decompressed to a low pressure level by means of a first expansion device and fed to said absorber;
a second part of said first lean solution emerging from the rectifier is decompressed by means of a second expansion device to said intermediate pressure and is introduced into a flash drum wherein it separates into a second vapor mixture and a second lean solution;
said second vapor mixture is combined with the partially spent first vapor mixture from said first turbine and the combined vapor mixture is expanded in a second turbine to said low pressure level, thereby to generate additional work;
said second lean solution is decompressed to said low pressure level by means of a third expansion device and fed to the absorber; and
the combined spent vapor mixture from said second turbine is introduced into the absorber wherein to dissolve in the combined first part of said first lean solution and said second lean solution, under heat rejection to an external coolant, so as to regenerate said rich solution.



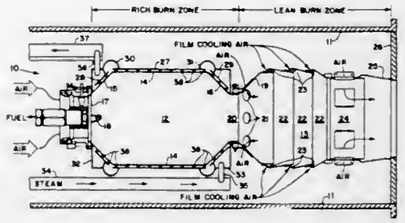
4,819,438

STEAM COOLED RICH-BURN COMBUSTOR LINER

Donald F. Schultz, Middleburg Hts., Ohio, assignor to United States of America, Washington, D.C.

Filed Dec. 23, 1982, Ser. No. 452,465
Int. Cl.[4] F02C *7/12, 7/18*
U.S. Cl. 60—730 **7 Claims**

1. A combustor system including a primary rich burn section having a liner and followed by one or more lean burn sections and comprising:
a cylindrical jacket disposed outwardly of said combustor rich burn section liner to form an annular space;
a plurality of barriers disposed in said annular space, each barrier being in the form of a spiral, thereby forming a plurality of spiral passageways;
a first annular manifold disposed at one end of said rich burn section liner adjacent said one lean burn section and communicating with said annular space;
a second annular manifold disposed at the other end of said rich burn section liner and communicating with said annular space; and
means for directing steam into said first manifold at a pressure approximately equal to the discharge pressure of said rich burn section, said steam flowing in a plurality of spiral streams through said annular space into said second annular manifold, said barriers being attached to said liner and wherein said jacket does not sealingly contact said barriers when said rich burn section of said combustor is not operating but does when said combustor is operating, and wherein said combustor liner has a first conical section at one end adjacent said one lean burn section and a second conical section at its other end, said jacket including first and second conical jacket sections outside of said first and second combustor liner sections, respectively, said conical jacket sections being separated from said cylindrical jacket section by first and second annular gaps, and first and second annular expansion tubes enclosing said first and second gaps, respectively.

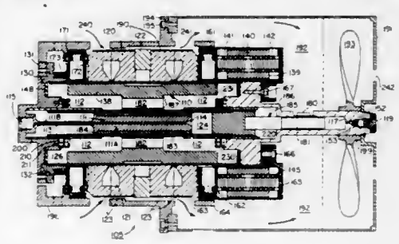


4,819,439

LINEAR DRIVE MOTOR WITH IMPROVED DYNAMIC ABSORBER

Graham J. Higham, Ashland, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Oct. 8, 1987, Ser. No. 106,630
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **8 Claims**



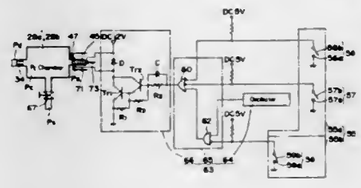
1. A cryogenic refrigerator having a compressor comprising a reciprocating armature which alternately compresses and expands a gaseous fluid in a working volume, a linear drive motor for driving the armature, and a vibration isolator system, the isolator system comprising:
a mounting frame supporting the compressor;
a counterbalance mass attached to the compressor such that an antiphase movement is produced relative to the reciprocating armature for substantially countering the resulting force exerted by the armature on the mounting frame; and
a unitary spring on which the counterbalance is centrally mounted.

4,819,440

SLIDING-VANE ROTARY COMPRESSOR WITH DISPLACEMENT -ADJUSTING MECHANISM, AND CONTROLLER FOR SUCH VARIABLE DISPLACEMENT COMPRESSOR

Nobuyuki Nakajima, and Shigeru Okada, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,410
Claims priority, application Japan, Sep. 25, 1986, 61-227056; Feb. 19, 1987, 62-37167
Int. Cl.[4] B60H *1/32;* **F25B** *1/00*
U.S. Cl. 62—133 **6 Claims**



1. A sliding-vane rotary compressor including a displacement-adjusting mechanism, said compressor comprising:
(a) a rotor slidably carrying thereon a plurality of radial vanes and rotatably disposed in a space defined by a cylinder and a pair of side blocks disposed on opposite ends of said cylinder;
(b) means defining a plurality of compression chambers which are variable in volume with each revolution of said rotor, said chamber-defining means including said cylinder, rotor, side blocks and plurality of radial vanes, and said compression chambers being defined by said cylinder, rotor, side blocks and vanes;
(c) an adjustment member rotatably disposed in one of said side blocks for adjusting a compression starting position;
(d) resilient means for urging said adjustment member to turn in one direction;
(e) means defining a pressure chamber communicating with a high pressure chamber through an orifice for producing a pressure acting on said adjustment member for urging said adjustment member in the opposite direction against the force of said resilient means;
(f) a first control valve, said first control valve including a bellows and being operative in response to the pressure in a low pressure chamber for adjusting the rate of communication between said pressure chamber and said low pressure chamber; and
(g) a second control valve, said second control valve including a solenoid valve and being operative in response to an external signal of the type representing the rate of acceleration of a vehicle for adjusting the rate of communication between said pressure chamber and said low pressure chamber.

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4,819,441

TEMPERATURE CONTROLLER FOR A TRANSPORT REFRIGERATION SYSTEM

Jay L. Hanson, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 27, 1987, Ser. No. 20,259
Int. Cl.[4] F25B *1/00, 49/00*; G05D *23/20*
U.S. Cl. 62—160 **16 Claims**



1. A method of controlling the load temperature of a transport refrigeration system with digital signals, comprising the steps of:
selecting a set point temperature,
sensing the load temperature of the transport refrigeration system,
providing an analog ratio between the set point temperature and the load temperature,
converting the analog ratio to a digital signal having a predetermined number of bits,
providing a logic array programmed to provide a plurality of transport refrigeration system control signals in response to predetermined values of the digital signal,
programming the logic array to provide a true first in-range signal when the load temperature sensed by the sensing step is within a predetermined temperature range, which range includes the set point temperature selected by the selecting step,
timing the duration of the true first in-range signal,
and providing a second in-range signal which goes true when the first in-range signal remains true for a predetermined period of time,
and delaying at least one predetermined additional timing function of the transport refrigeration system until the second in-range signal goes true.

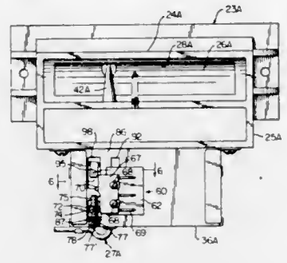
4,819,442

REFRIGERATOR SYSTEM, CONTROL DEVICE THEREFOR AND METHODS OF MAKING AND OPERATING THE SAME

Roger P. Sepso, Stratford, and Charles J. Everett, Killingworth, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 24, 1988, Ser. No. 159,883
Int. Cl.[4] F25D *17/08*
U.S. Cl. 62—187 **24 Claims**

2. In a refrigerator system having a frozen food compartment and a non-frozen food compartment interconnected together by an air circulating means that has a control valve means therein for controlling the amount of opening of said air circulating means between said compartments, said control valve means comprising a housing means having a movable valve member and a temperature sensing means operatively interconnected to said valve member to control the position of said valve member in relation to the temperature sensed by said temperature sensing means, said system having a fan means for forcing an air flow through said air circulating means from said frozen food compartment to said non-frozen food compartment when said fan means is operating and said valve member is in an open condition thereof, the improvement wherein said system has means for causing said fan means to be operating only when said valve member is in a certain open condition thereof, said means of said system for causing said fan means to



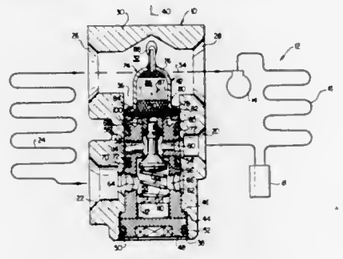
be operating only when said valve member is in a certain open condition thereof comprising an electrical switch means carried by said housing means, said switch means causing said fan means to be operating only when said switch means is actuated to a certain condition thereof, said temperature sensing means having means operatively interconnected with said switch means to actuate said switch means to said certain condition thereof only when said temperature sensing means is causing said valve member to be in said certain open condition thereof.

4,819,443

EXPANSION VALVE

Masaru Watanabe, Kawasaki, and Osamu Yamamoto, Tokyo, both of Japan, assignors to Fujikoki America, Inc., Dallas, Tex.

Filed Jun. 30, 1987, Ser. No. 67,865
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—225 **6 Claims**



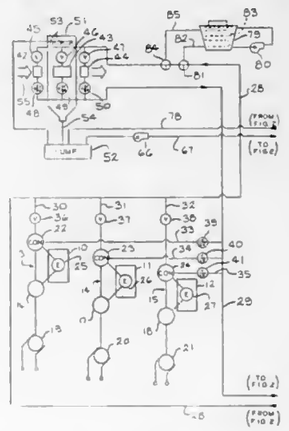
1. An expansion valve for an air conditioner having an evaporator and a compressor, the expansion valve comprising;
a body assembly defining a first flow path for high pressure refrigerant flow from the compressor to the evaporator and a second flow path for low pressure refrigerant flow from the evaporator to the compressor,
a cartridge, including:
(a) a valve member positioned in the first flow path for varying the flow cross section through the first flow path for modulating refrigerant flow;
(b) means positioned within the second flow path for sensing the superheat of the low pressure refrigerant flow and for moving the valve member in response to the sensed superheat to modulate the refrigerant flow;
the cartridge being self-contained and pre-calibrated to modulate the refrigerant flow in response to the superheat sensed independent of the body assembly, permitting use in a variety of body assembly configuration;
the body assembly defining a uniform diameter passage having a first end and a second end, the first flow path opening into the passage through a wall thereof and exiting the first end, the valve member having a first portion defining a conical seal surface and a second portion defining a stem extending from the conical seal surface into the passage and beyond the opening in the passage wall to a cylindrical end;
an annular seal retainer received in the passage proximate the second end thereof which supports the cylindrical end of the stem concentric with a passage center line;
a cup shaped high pressure seal positioned between the cylindrical end of the stem and a wall of the passage and supported by said annular seal retainer to balance pressure forces from the refrigerant acting on the valve member.

4,819,444

AIR CONDITIONING APPARATUS

Gershon Meckler, Monmouth Beach, N.J., assignor to Manville Sales Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 883,013, Jul. 8, 1986, abandoned, and a continuation of Ser. No. 732,561, May 9, 1985, abandoned. This application Feb. 3, 1988, Ser. No. 151,856
Int. Cl.[4] F25B *27/02*
U.S. Cl. 62—238.6 **99 Claims**



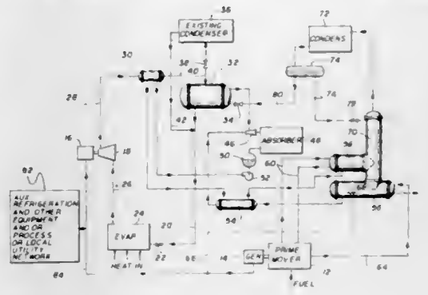
1. Apparatus for conditioning the air of a closed space and for removing heat from a refrigerated display case therein, said apparatus comprising, in combination, first refrigeration apparatus which comprises a heat rejecting section, a compressor, and a heat absorbing section operatively associated to transfer heat from the refrigerated case, second refrigeration apparatus which includes a heat absorbing section and a heat rejecting section, a chemical dehumidifier which uses a desiccant, a regenerator for said dehumidifier, means for transferring heat from the heat rejecting section of said second refrigeration apparatus, from the conversion of a fuel into heat, or from both to said regenerator to enable regeneration of the desiccant of said dehumidifier, means for transferring heat from the condenser of said first refrigeration apparatus to the heat absorbing section of said second refrigeration apparatus, and means for causing air to flow in dehumidifying relationship with said dehumidifier and then into said space, said apparatus being operable to maintain the temperature of the case below that of the closed space and to deliver dehumidified air to the space to maintain a humidity ration in the closed space below about 50 grains of moisture per pound of dry air.

4,819,445

INTEGRATED CASCADE REFRIGERATION SYSTEM

John S. Scherer, 1021 Hill St., Suite No. 5, Santa Monica, Calif. 90405

Filed Apr. 9, 1987, Ser. No. 36,711
Int. Cl.[4] F25B *27/02*
U.S. Cl. 62—238.3 **21 Claims**



19. A high efficiency cascade refrigeration system comprising:
an absorption refrigeration circuit, said absorption circuit including means for separating the absorption circuit refrigerant from the absorbent;
a compression refrigeration circuit, said compression circuit including a compressor:
engine means for generating electricity, said engine generating heat;
means for supplying heat from said engine to said absorption circuit separating means;
means for cooling and condensing the refrigerant used in said compression circuit by the evaporation of the refrigerant in said absorption circuit;
said engine having a hot gas exhaust and heated liquid coolant, and wherein means are provided for heating the absorption circuit separating means from both said hot gas exhaust and said heated liquid coolent; and
said separating means including a fractionting column, and first and second associated reboilers, with the gas exhaust being coupled to a first one of said reboilers, and said liquid coolant being coupled to said second reboiler;
whereby a fully integrated, self-modulating system is provided, wherein increased cooling demand causes increased engine power and heat, boosting the absorption circuit capacity, thereby reducing compression ratio in the compression circuit, and system efficiency is increased.

4,819,446

WASTE HEAT COOLING APPARATUS

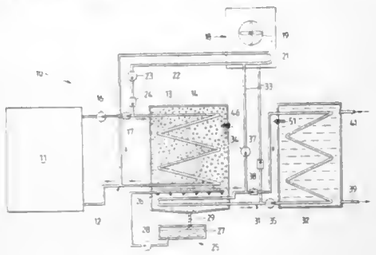
Roy A. Moore, Rte. 1, Box 637-Cl, Jacksonville, Ala. 36265

Continuation-in-part of Ser. No. 941,709, Dec. 15, 1986, Pat. No. 4,703,629. This application Sep. 8, 1987, Ser. No. 95,010
The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—238.3 **20 Claims**

1. Apparatus for cooling a desired volume of space comprising:
(a) waste heat recovery means for heating water to a predetermined temperature from a waste heat source and storing said water at or above said temperature;
(b) chamber means for housing a quantity of desiccant at a subatmospheric pressure;

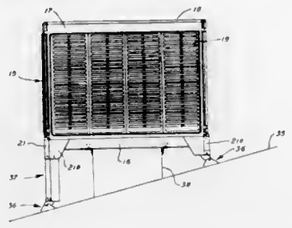
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(c) reservoir means for holding chilled water;
(d) adsorbate means for introducing and removing water from said chamber means;
(e) first means for circulating water through said waste heat recovery means and through said desiccant in said chamber means;
(f) second means for circulating water through said reservoir means and a portion of said chamber means proximal said adsorbate means;



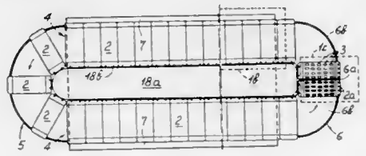
(g) ambient temperature heat exchanger means for cooling the water in said first or second means for circulating water operably connected to divert water selectively from said first or second means for circulating water;
(h) circuit means for controlling water flow through said first and second means for circulating water and said adsorbate means responsive to the temperature in said chamber means and said reservoir means; and
(i) output means connected to said reservoir means for circulating chilled water therein to cool said volume.

4,819,448
EVAPORATIVE COOLER
Charles M. Campbell, Tempe, Ariz., and Charles J. Bardo, Fort Worth, Tex., assignors to Tradewinds Technologies, Inc., Phoenix, Ariz.
Filed Sep. 11, 1987, Ser. No. 95,552
Int. Cl.[4] F28D *5/00*
U.S. Cl. 62—304 **18 Claims**



1. An evaporative cooler comprising a molded plastic base, a plurality of side panels mountd on the base, and a top cap above the side panels, the base including a plurality of molded legs, a leg extension attached to at least one of the molded legs for mounting the cooler on a sloping surface, and a leveler support bracket attached to the leg extension and having a flat supporting surface, the leveler support bracket being adjustably attached to the leg extension whereby the angle of the flat supporting surface can be adjusted to correspond to the slope of the roof.

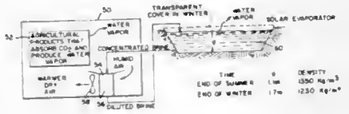
4,819,449
CLOSED LOOP SYSTEM FOR MAKING ICE CONFECTIONS HAVING A HOLDING STICK EMBEDDED THEREIN
Carlo Curti, and Luciano Cattani, both of Milan, Italy, assignors to Sauer S.p.A., Milan, Italy
Filed Sep. 24, 1987, Ser. No. 100,608
Int. Cl.[4] A23G *9/14*
U.S. Cl. 62—345 **6 Claims**



2. A closed loop system for making ice confections having a holding stick embedded therein comprising:
dies for said ice confections;
rigid plates and each supporting plural rows of said dies;
guide members effective to move said plates and defining together with said plates a closed loop path substantially coplanar with said plates and having:
two straight, side-by-side main sections; and
two minor sections disposed between said main sections including:
a first minor section extending along a semicircle; and
a second minor section having a straight middle portion and end portions connecting said middle portion to said main sections;
a thermally insulating case extending below said main path sections, said plates in said main path sections realizing an upper cover of said case;
at least one station for filling said dies, located at said straight main sections, and a station whereat said ice confections

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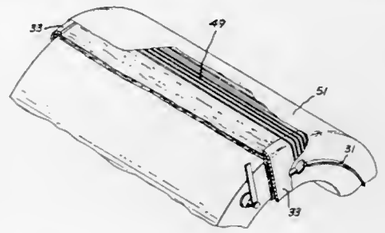
4,819,447
METHOD AND MEANS FOR CONTROLLING THE CONDITION OF AIR IN AN ENCLOSURE
Gad Assaf, Rehovot, Israel, assignor to Geophysical Engineering Company, Seattle, Wash.
Continuation-in-part of Ser. No. 377,368, Jul. 30, 1982, abandoned. This application Mar. 25, 1983, Ser. No. 479,009
Int. Cl.[4] F25D *23/00*
U.S. Cl. 62—271 **2 Claims**



1. Apparatus for controlling the condition of air in an enclosure:
(a) a direct-contact heat exchanger;
(b) a reservoir of concentrated brine for supplying concentrated brine to the heat exchanger;
(c) means for recirculating air in the enclosure through the heat exchanger which produces diluted brine as the air is dehumidified;
(d) means for returning diluted brine from the heat exchanger to the reservoir; and
(e) an evaporating pond for evaporating water from the reservoir.

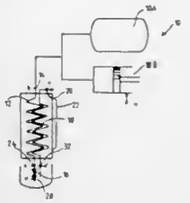
are shaken out, located at said middle portion of said second minor section;
and means of chilling said dies located at said main sections;
said guide members comprising:
a drive chain engaging all said plates and extending along both said main sections and said minor sections, said drive chain having chain pins and links and being of the endless type to engage with each of said plates at least two spaced-apart locations;
a side ledge for guiding said chain pins located on one side of said chain having:
straight portions, flanking said main sections and said middle portion;
a rounded portion, flanking said first minor section;
rounded-edge portions flanking said end portions; and
cutouts formed in said rounded-edge portions of said side ledge, at said cutouts said chain pins being guided by said side ledge along arcuate paths and said chain links arranging themselves along chords of said arcuate paths followed by said chain pins.

4,819,450
LOW COST INTERMEDIATE RADIATION SHIELD FOR A MAGNET CRYOSTAT
Russell S. Miller, Ballston Spa, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 816,086, Jan. 3, 1986, Pat. No. 4,694,663. This application Jun. 1, 1987, Ser. No. 56,173
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R **6 Claims**



1. A radiation shield assembly for a cryostat having a generally cylindrical inner helium vessel, said cryostat defining a penetration for cooling the helium vessel, said radiation shield assembly comprising:
a plurality of layers of multilayer insulation surrounding the helium vessel;
a pair of rigid end rings each having a flange extending axially from the ring periphery, said rings fabricated from nonmagnetic material and having a diameter greater than the ends of the generally cylindrical inner helium vessel when surrounded by said multilayer insulation, one of said end rings situated adjacent to each end of the helium vessel with said end ring flanges extending over the multilayer insulation and supported thereby;
a flexible shield including means for conducting heat toward the cryostat penetration and means for providing an isothermal surface, said shield surrounding the multilayer insulation wrapped helium vessel and said rigid end rings; and
clamping means for holding said flexible shield under tension around said end rings to prevent said flexible shield from sagging.

4,819,451
CRYOSTATIC DEVICE FOR COOLING A DETECTOR
Uwe G. Hingst, Rebenstrasse 18, 7991 Oberteuringen, Fed. Rep. of Germany
Filed Dec. 10, 1987, Ser. No. 131,219
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642683
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 JT **6 Claims**



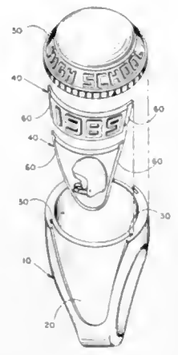
1. Cryostatic device in which the Joule-Thomson effect is used, for cooling a detector, particularly for target seeking missiles, comprising
(a) a pressurized gas source,
(b) a countercurrent heat exchanger (**68**) having a forward flow conduit (**40**) connected with an inlet end (**80**) to the pressurized gas source, and return flow passage means in heat conducting contact therewith,
(c) an expansion nozzle (**44**) provided at an outlet end of the forward flow conduit (**40**), the expanded pressurized gas flowing out through the return flow passage means,
(d) a Dewar vessel (**46**) having an inner and an outer wall (**48,50**) and surrounding the heat exchanger (**68**) and the expansion nozzle (**44**), and carrying on its inner wall (**48**) in the area of the expansion nozzle (**44**), the detector (**62**) to be cooled,
characterized in that
(e) the inlet end (**80**) of the forward flow conduit (**40**) is cooled by additional cooling means formed by Peltier elements (**90, 98**),
(f) the inlet end (**80**) of the forward flow conduit (**40**) is mounted on a carrier (**82,92**) of well heat conducting material in good heat conducting contact therewith, and
(g) the carrier (**82,92**) is mounted through the Peltier elements (**90,98**) on a heat dissipating base, the cold side of the Peltier elements (**90,92**) being in contact with the carrier (**82,92**).

4,819,452
METHOD OF MAKING RINGS
Russell Bjella, 10315 27th Avenue North, Plymouth, Minn. 55441
Filed Nov. 13, 1987, Ser. No. 120,474
Int. Cl.[4] A44C *9/00*
U.S. Cl. 63—15 **12 Claims**

1. A finger ring comprising:
(a) a preformed ring blank, said ring blank defining a closed substantially circular band of metal having an outer surface, said outer surface presenting a flattened surface and having at least one slotted design cavity intersecting said flattened surface and extending along a portion of the circumference of said outer surface with each said at least one slotted cavity defining an overlying flange;
(b) at least one design panel constructed and arranged to be

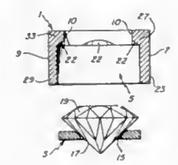
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slidably received within said at least one slotted design cavity; and



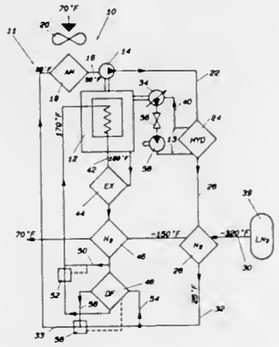
(c) a bezel attached to the ring blank thereby securing the design panel.

4,819,453
JEWELRY SETTING
Francis J. McNamara, 35 Jeffrey Pl., Manhasset Hills, N.Y. 11040
Filed Jul. 30, 1987, Ser. No. 79,587
Int. Cl.[4] A44C *17/02*
U.S. Cl. 63—28 **22 Claims**



1. A jewelry setting for holding at least one decoration gem stone comprising:
a frame (3) having an upper surface bounded by side edges and having a plurality of openings (15) formed in said upper surface, said openings (15) each being seized to receive herein a lower surface of a respective decoration gem stone (19); and
a housing (1) having an opening (5) bounded by sidewalls (7, 9, 11, 13), each sidewall having a bottom portion and a top portion, said opening (5) of said housing (1) being sized to accommodate therein the frame (3) between said sidewalls, said top portions of said sidewalls having a lip (10) extending into said opening (5) formed by said sidewalls, each of said lips (10) being above said frame (3) and having a surface facing downwardly toward said frame and said bottom portions of said sidewalls, and said downwardly facing surfaces being adapted to contact an upper surface of said gem stones (19) received in said openings (15) of said frame (3);
said lip (10) of at least two of said sidewalls including a plurality of downwardly facing cut-out portions or recesses (22) formed in said downwardly facing surfaces thereof, said cut-out portions or recesses (22) having surfaces which face and are unobstructedly open toward said bottom portion;
said cut-out portions or recesses (22) being positioned and sized to accommodate therein a peripheral upper surface portion of a respective one of said gem stones (19) which is mounted in said frame (3), the surfaces of each of said cut-out portions or recesses abutting and contacting said upper peripheral surface of said respective gem stones at least at two spaced apart points on the upper peripheral surface of said respective gem stones without contacting lower surfaces of said respective gem stones;
whereby gem stones (19) mounted in said frame (3) have a lower surface supported in an opening (15) of said frame (3) and an upper surface in abutment with said downwardly facing surfaces of said cut-out portions or recesses to thereby secure and substantially immovably retain said gem stones (19) between said frame and said lips in said jewelry setting.

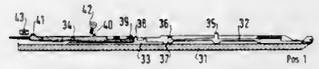
4,819,454
LIQUID CRYOGENIC VAPORIZER UTILIZING AMBIENT AIR AND A NONFIRED HEAT SOURCE
William D. Brigham, Huntington Beach, and Dinh Nguyen D., Orange City, both of Calif., assignors to Zwick Energy Research Organization, Inc., Huntington Beach, Calif.
Filed Jan. 22, 1988, Ser. No. 146,846
Int. Cl.[4] F17C *7/02*
U.S. Cl. 62—52 **20 Claims**



1. An apparatus for vaporizing a liquid cryogen comprising:
a heat source;
first means for extracting heat from said heat source;
second means for extracting heat from the ambient environment;
third means for transferring heat from one of said first and second means to said liquid cryogen to partially vaporize said liquid cryogen; and
separate fourth means for transferring heat from said heat source to said liquid cryogen to completely vaporize said partially vaporized liquid cryogen,
whereby said liquid cryogen is completely vaporized at high flow rate in an economic manner.

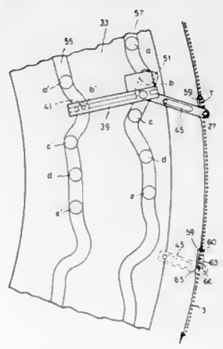
4,819,455
FLAT KNITTING MACHINE
Reinhold Schimko, Aalen-Wasseralfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Fed. Rep. of Germany
Filed May 6, 1988, Ser. No. 190,972
Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715212
Int. Cl.[4] D04B *7/00*
U.S. Cl. 66—75.1 **10 Claims**

1. A flat knitting machine comprising:
spring shaft needles (32) arranged in needle grooves of needle beds (31), which spring shaft needles (32) are respectively provided with a first forward needle butt (35) always projecting out of the needle bed (31) and a rear second needle butt (36) which disappears due to the resilience of the needle shaft itself in the needle bed (31);
slide jacks arranged behind the spring shaft needles (32) which are respectively provided with a working butt an a front end which is for the selective raising of the second needle butt (36) slidable under a spring shaft of the spring shaft needle (32);
jacquard jacks (34) which are arranged behind said slide jacks and are displaceable in sliding manner on them, having at least two butts; and
a cam system for the selection and activation of the needles and jacks which has at least two withdrawal cam elements (22, 24), arranged symmetrically to a central longitudinal axis (M) of the cam system and displaceable in the cam plane, in the area of the second needle butt (36),
(a) the slide jack being designed as a purely displaceable



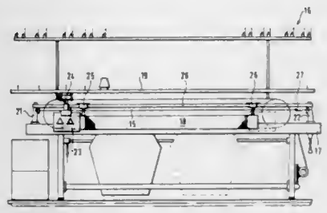
lifting jack (33) having a lifting jack butt (38) and a stop arranged in front of it, on which the rear needle end (38) of the spring shaft needle (32) can impact when the spring shaft is raised,
(b) the jacquard jack (34) being designed with a front jacquard jack butt (39), a central selection butt (40) and a rear sliding butt (41) which can be selectively lowered into said needle bed (31), and
(c) pivotable selection flaps (42) being provided in the cam system for selective needle selection by cooperation with the selection butts (40), and fixed cam parts (43) being provided in the cam system for raising selected jacquard jacks (34) by engagement on their sliding butt (41).

4,819,456
NEEDLE WRAPPING DEVICE FOR CIRCULAR KNITTING MACHINE
José M. D. Güell, Barcelona, Spain, assignor to Jumberca, S.A., Barcelona, Spain
Continuation of Ser. No. 802,334, Nov. 26, 1985, abandoned. This application Jun. 12, 1987, Ser. No. 61,033
Claims priority, application Spain, Nov. 28, 1984, 538047
Int. Cl.[4] D04B *9/32*
U.S. Cl. 66—135 **19 Claims**



1. A circular knitting machine comprising:
(a) a plurality of needles:
(b) a cylinder slotted to receive said plurality of needles:
(c) means for actuating said plurality of needles:
(d) yarn wrapper assembly means for introducing yarn into the hooks of selected needles, said wrapper assembly means including a first member adapted for radial movement relative to the cylinder, and a second, rotatable member pivotably mounted to said first member for rotatable movement relative thereto and having yarn feeding means at an outer extremity thereon; and
(e) synchronized camming means, having dual, continuous and unbroken cam raceways integral in a common camplate member, for independently actuating said first and second members and for imparting cooperative movements thereto throughout substantially the full extents thereof, whereby superimposing the radial movement of the first member with the rotatable movement of the second member an individual yarn is introduced into the hooks of selected needles.

4,819,457
YARN GUIDE ELEMENT FOR TEXTILE MACHINES
Dieter Wurst, and Gerhard Nissle, both of Reutlingen, Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Reutlingen, Fed. Rep. of Germany
Filed Nov. 18, 1987, Ser. No. 122,222
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641426
Int. Cl.[4] D04B *15/44*
U.S. Cl. 66—146 **2 Claims**



2. A yarn guide apparatus for a textile machine comprising:
a smooth wire having two ends which said wire serves to guide a yarn loosely laid about said wire at least one turn;
a fixing means for fixing one said end of said wire to the textile machine; and
a resilient fixing means for fixing the other said end of said wire to the textile machine such that said wire is stretched along a yarn path of the textile machine, said resilient fixing means including a tension spring for tensioning said wire.

4,819,458
HEAT SHRUNK FABRICS PROVIDED FROM ULTRA-HIGH TENACITY AND MODULUS FIBERS AND METHODS FOR PRODUCING SAME
Sheldon Kavesh, Whippany; Dusan C. Prevorsek, and Gary A. Harpell, both of Morristown, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Sep. 30, 1982, Ser. No. 429,942
Int. Cl.[4] D04B *1/16, 21/16;* D03D *15/00;* D06C *7/02*
U.S. Cl. 66—202 **10 Claims**

1. A method for preparing fabrics which comprises the steps:
(a) forming a fabric from stretchcd fibers of tenacity at least about 20 g/denier and tensile modulus at least about 600 g/denier containing polyethylene of weight average molecular weight at least about 500,000, and

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(b) heating the fabric at a temperature between about 120° C. and about 145° C. sufficient and for a time sufficient for



the fibers to shrink between about 1% and about 10% of their length in the fabric formed in step a.

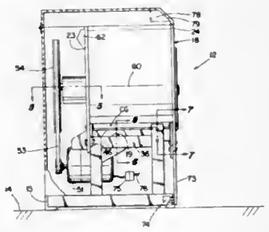
10. A heat-shrunk fabric produced by the method of claim 1.

4,819,459

FRONT LOADING CLEANING MACHINE

John R. Keith, 1845 Fay Dr., Parma, Ohio 44134

Filed Aug. 19, 1988, Ser. No. 234,279
Int. Cl.[4] D06F *37/20*
U.S. Cl. 68—3 R **20 Claims**



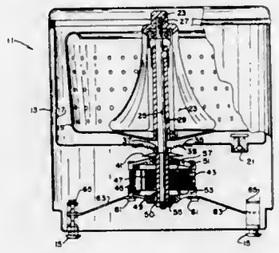
1. A front loading cleaning machine comprising, in combination:
- a base adapted to be stationary;
- a cleaning machine unit having a watertight outer container;
- a perforated container within said outer container;
- means journaling said perforated container in said outer container;
- a front loading door on said outer container providing access to the interior of said perforated container;
- a drive mechanism including an electric motor and a drive connection from said motor to rotate said perforated container; and
- a pivot connection between said base and said cleaning machine unit along a horizontal pivot line parallel to the front door of said unit, whereby said unit may be tipped from a substantially vertical position of said front door forwardly to a substantially horizontal position of said front door to thus expose said drive mechanism on an upper portion of said unit.

4,819,460

WASHING MACHINE WITH DIRECT DRIVE SYSTEM

Ilija J. Obradovic, Belgrad, Yugoslavia, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 2, 1987, Ser. No. 57,167
Claims priority, application Yugoslavia, Jun. 18, 1986, 13214/86
Int. Cl.[4] D06F *17/08, 23/04, 37/40*
U.S. Cl. 68—23.7 **10 Claims**



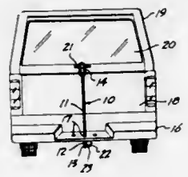
1. A washing machine comprising:
- a rotatable member adapted for contact with clothes to be washed, said rotatable member being rotatable about its longitudinal axis;
- a switched reluctance motor having a stator and a rotor, said rotor being cyclically operable in first and second opposed directions at a first relatively slow speed to agitate the clothes being washed and operable continuously in the first direction at a second, relatively high speed, said rotor carrying a motor shaft defining the longitudinal axis of the motor, said longitudinal axes of the rotatable member and of the motor being coincident;
- a frame to which the motor is securely fastened, said rotor being rotatable with respect to the frame; and
- means for connecting the rotatable member and the motor shaft so that rotation of the motor shaft causes corresponding rotation of the rotatable member, cyclical operation of the rotor in the first and second opposed directions at a relatively low speed thereby causing agitation of the clothes being washed and continuous operation of the rotor in the first direction at the high speed thereby providing a spin cycle for the washing machine;
- said motor shaft being hollow and the connecting means extending through the motor shaft.

4,819,461

TRUCK CANOPY AND TAILGATE LOCKING MEANS

M. Nicholas Pearson, 23516 94th W., Edmonds, Wash. 98020

Filed Jun. 16, 1988, Ser. No. 207,191
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **2 Claims**



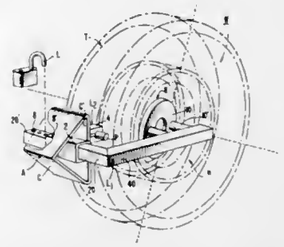
1. A locking device comprising an elongated bar having a shaped end which secures about the handle apparatus of truck canopy rear door and having an attached lower member having a plurality of circular orifices to define a hasp receiving passage which extends vertically through an orifice in a truck bumper with said hasp receiving passage, whereby to permit the passage of the hasp of a lock therethrough for preventing movement of said elongated bar between said handle apparatus and said truck bumper.

4,819,462

LOCKING CLAMP FOR A TRAILER TIRE-CARRYING WHEEL AND THE LIKE

Sheldon Apsell, Newton, Mass., assignor to Micrologic, Inc., Watertown, Mass.

Filed May 6, 1987, Ser. No. 47,198
Int. Cl.[4] B62H *5/16*
U.S. Cl. 70—14 **10 Claims**



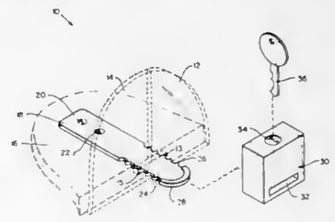
1. A locking clamp for a wheel secured by external lug bolts to an axle of a trailer or other vehicle and having an inner annular hub peripherally surrounded by a tire, the clamp having, in combination, first and second interlocking L-shaped members, the first member comprising a chock and carrying a tubular bar as one leg and the inner surface of which is to be juxtaposed against the rear of the tire, and the other leg of which extends inwardly of the inner side tire surface and carries a rear spacer adjustable to bear against the hub on its inner surface; and the second member comprising an L-shaped tubular bar, the rear leg of which is of cross-section less than that of the first member tubular bar in order to slide through the same and extend inwardly therebeyond across the said rear of the tire, with the other leg extending parallel to the said other leg of the first member but across the outer side of the tire, and carrying a hub disc adjustable to cover the wheel outer hub lug bolts and prevent access to the same, and means at the inward extension of the second member rear leg for receiving locking means.

4,819,463

STEREO CABINET LOCK

Russell G. Jacobs, 195 Sawmill Rd., Brick, N.J. 08724

Filed Nov. 20, 1987, Ser. No. 125,140
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **16 Claims**



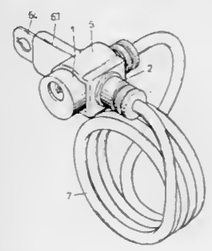
1. A new and improved stereo cabinet lock for use with a stereo cabinet having an interior floor and two swinging doors meeting along a vertical line in a closed position, comprising:
- a thin flat lock bar;
- said lock bar having a tip portion having toothed side edges and a radiused end;
- a rubber U shaped bumper on said radiused end;
- said lock bar having a mounting portion having a pair of spaced apertures;
- a threaded fastener extending through each of said apertures for mounting said lock bar on said interior floor of said stereo cabinet with said tip portion extending exteriorly of said cabinet transversely to said swinging doors and intersecting said vertical line;
- a rubber spacing washer around each of said threaded fasteners;
- a lock cylinder block for selective locking engagement over said lock bar tip portion;
- a slot in said lock cylinder block;
- a keyed cylinder extending transversely to said slot;
- a pair of arcuate cam lugs on opposite sides of said keyed cylinder;
- a pair of lock arms adjacent each of said cam lugs on opposite sides of said slot;
- and
- a pair of leaf springs, one of said springs biasing each of said lock arms towards a central portion of said slot.

4,819,464

WIRELOCK PROTECTOR

Wen T. Kuo, No. 16, Lane 459, Sec. 1, An Ho Road, Tainan, Taiwan

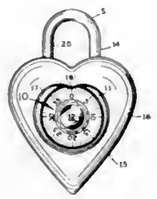
Filed Nov. 27, 1987, Ser. No. 125,833
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—18 **3 Claims**



1. A wirelock protector comprising a lock housing, a lock, a latch, a latching housing and a lock shell surrounding the lock housing, said lock housing having a lock insertion hole, a wire insertion hole, a latch insertion hole and a key seat, said lock insertion hole being formed at one end of the lock housing for the insertion of said lock into said locking housing, said wire insertion hole being formed at the other end of the lock housing for the insertion of a wire, said wire insertion hole being smaller in size than the lock to prevent the lock from being pulled therethrough, said latch insertion hole being formed on one side of said lock housing for the insertion of said latch, said key seat being formed at an inner end of said lock housing to receive a key way on the lock to prevent the lock from rotating within the lock housing;
- said lock housing having a circular chamfer and a protuberance both at one end thereof and a wire insertion hole at an other end thereof, said chamfer contacting with said latch insertion hole of said lock housing, said protuberance engaging a step portion of the latch to hold the latch in the latch housing, said wire insertion hole being formed smaller in size than said latch to prevent said latch from being pulled therethrough;
- and a hub welded to the lock housing to prevent dirt or water from permeating therethrough.

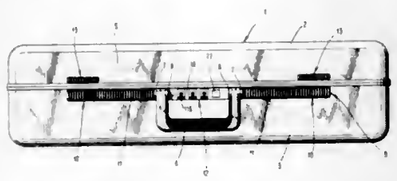
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4,819,465
PADLOCK COVER
Judith A. Stanich, Pompano Beach, Fla., assignor to Hot Locks, Inc., Pompano Beach, Fla.
Continuation-in-part of Ser. No. 618,685, Jun. 8, 1984, Pat. No. 4,555,920, which is a continuation-in-part of Ser. No. 554,903, Nov. 25, 1983, Pat. No. 4,534,190. This application Nov. 27, 1985, Ser. No. 803,084
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] E05B 67/38
U.S. Cl. 70—56 4 Claims



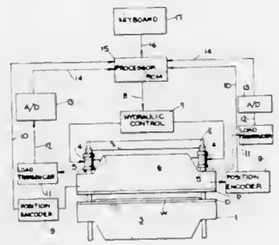
1. A cover for attachment to a padlock of the type having a body portion and an inverted, U-shaped shackle extending from the body portion, said cover having front and rear portions and including:
an outer wall portion;
retaining means adapted to prevent movement of the body portion of the padlock within said cover in a first plane defined by the shackle, said retaining means comprising an inner wall portion spaced laterally inward from said outer wall portion and adapted to receive and capture the body portion of the padlock; and
securing means adapted to prevent movement of the body portion of the padlock within said cover in a second plane perpendicular to the first plane.

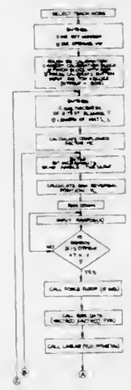
4,819,466
CLOSURE MECHANISM FOR A CASE
Hans U. Werner, Solingen, Fed. Rep. of Germany, assignor to S. Franzen Sohne (GmbH & Co.), Solingen, Fed. Rep. of Germany
Filed Oct. 23, 1987, Ser. No. 111,806
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637698
Int. Cl.[4] E05B 65/62
U.S. Cl. 70—70 25 Claims



1. In a case comprising a pair of closable sections, a hasp mounted on a first of said sections, and a closure mechanism mounted on a second of said sections for acting on said hasp to secure said sections closed, said closure mechanism comprising:
means defining a hasp-receiving zone,
a closure element mounted for movement between:
a first position enabling said hasp to enter said zone in a first direction of travel,
a second position in which a drawing surface of said closure element overlaps a portion of said hasp, and
a third position engaging said hasp and retaining said hasp in a terminal position of securement in said zone, and
manually actuable means for displacing said closure element from said second position to said third position in a second direction substantially parallel to said first direction, said manual actuable means including an actuating lever rotatable about an axis oriented parallel to said second direction.

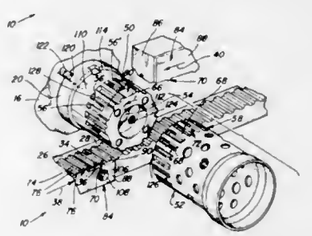
4,819,467
ADAPTIVE CONTROL SYSTEM FOR HYDRAULIC PRESS BRAKE
Raymond J. Graf, and Scott D. Tucker, both of Cincinnati, Ohio, assignors to Cincinnati Incorporated, Cincinnati, Ohio
Filed Sep. 17, 1986, Ser. No. 911,915
Int. Cl.[4] G06F 15/46
U.S. Cl. 72—8 15 Claims





1. In a press brake for bending metallic material sheet workpieces to a desired bend angle of the type having a movable forming member and a fixed forming member and an appropriate tooling set comprising a punch affixed to one of said movable forming member and said fixed forming member and a V-die affixed to the other of said forming members for providing the desired bend angle in the workpiece, means for moving said movable forming member toward said fixed forming member and reversing means for moving said movable forming member away from said fixed forming member, means for sensing the position of said movable forming member to produce a signal representative of the position thereof with respect to said fixed forming member, and means for sensing the actual force exerted against the workpiece by said movable member during a bending operation to produce a signal representative thereof, the improvement in combination therewith comprising digital data processing means responsive to said position and force signals, said processing means having a test workpiece teach mode and a production workpiece bend mode, said processing means having memory means, said processing means having means for defining mathematical relationships between material strength, material thickness, movable forming member position and bend angle from in-process measurements during said teach mode, means for storing said relationships in said memory means, and said processing means having means for utilizing in-process measurements of material thickness and material strength during said production workpiece bend more in combination with said stored relationships from said teach more to calculate and determine the precise reversal position at which to activate said reversing means to cause said movable forming member to begin moving away from said fixed forming member in order to compensate for workpiece spring-back so as to produce with said particular punch and die set the desired bend angle in each production workpiece.

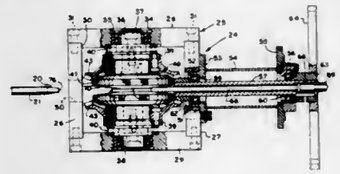
4,819,468
ROLL FORMING NOTCHES IN A THIN-WALL POWER TRANSMISSION MEMBER
Carl Anderson, Mt. Clemens, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.
Filed Aug. 21, 1987, Ser. No. 88,696
Int. Cl.[4] B21H 5/00; B21D 28/30
U.S. Cl. 72—71 9 Claims



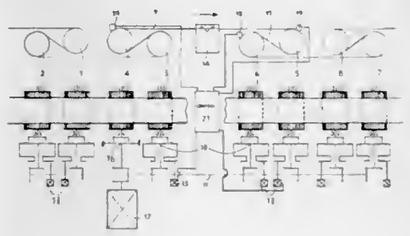
1. An apparatus (10) for forming a power transmission member from a thin-walled blank, said apparatus (10) comprising: die means (84) having opposed work surfaces; a mandrel (50) positioned between said opposed work surfaces of said die means (84) for receiving a blank (52) to be formed and rotated upon movement of said work surfaces in opposite directions during a forming operation, said mandrel (50) including a work surface for cooperating with said work surfaces of said die means (84); and characterized by notch forming means (70) on said work surfaces of said die means (84) cooperable with said work surface of said mandrel (50) for roll punching notches (72) through the blank (52) as the blank (52) is rotated between the moving die means (84).

4,819,469
METHOD FOR ROLLING TAPERED THREADS ON BARS
Anton M. Kies, Oisterwijk; Harry C. van den Nieuwelaar, Gilze, and Geoff M. Bowmer, Oisterwijk, all of Netherlands, assignors to Erico International Corporation, Solon, Ohio
Filed Mar. 18, 1987, Ser. No. 27,319
Int. Cl.[4] B21H 3/04
U.S. Cl. 72—89 15 Claims

1. A method of rolling tapered threads of uniform taperangle on the end of a bar comprising the steps of providing a concrete reinforcing bar having an end, positioning such bar end between opposed circular conical surface thread dies each having an arc segment length, such that the axes of such dies intersects the axis of the bar, and then rotating the dies in opposite directions against the bar end to produce a uniformly tapered thread, whereby the bar-die contact speeds along the pitch cone of the tapered threads being formed is substantially synchronized.



4,819,470
METHOD FOR CONTINUOUSLY STRAIGHTENING THIN METAL STRIPS
Oskar Noé; Rolf Noé; Andreas Noé, all of Mülheim, and Hermann Koppers, Duisburg, all of Fed. Rep. of Germany, assignors to BWG Bergwerk-und Walzwerk-Maschinenbau GmbH, Fed. Rep. of Germany
Continuation of Ser. No. 776,435, Sep. 16, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 140,955
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1986, 3514357
Int. Cl.[4] B21D 1/02, 25/00
U.S. Cl. 72—161 5 Claims



1. A method for the continuous straightening of metal strips with a tensioning device having a first tensioning roll and a second tensioning roll, the method comprising the steps of:
passing the metal strip over the first tensioning roll in a first rotational direction;
passing the metal strip over the second tensioning roll in a rotational direction opposite to that of said first rotational direction;
forming a stretcher levelling section between the first and second tensioning rolls such that the metal strip is curved in a first direction by the first tensioning roll and in a second direction by the second tensioning roll;
selectively operating the first tensioning roll at a first rotational speed; selectively operating the second tensioning roll at a second rotational speed different from said first rotational speed so as to selectively cause a longitudinal stretching in said stretcher levelling section plastically elongating the metal strip throughout its entire cross-section; and
subjecting the metal strip to a stretching and bending in a stretching and bending device by feeding the metal strip through stretching and bending rolls at a location longitudinally separate from the first and second tensioning rolls, said metal strip being continuously passed through said stretcher levelling section and said stretching and bending device.

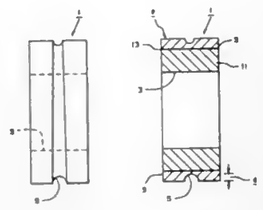
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4,819,471

PILGER DIE FOR TUBING PRODUCTION

Charles S. Cook, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1986, Ser. No. 925,765
Int. Cl.[4] B21B *17/02, 21/02*
U.S. Cl. 72—214 12 Claims



1. A die for a pilgering apparatus for reducing a tube, said die comprising a ring-shaped member capable of being rotated and having along the outer periphery thereof a generally circular groove extending into said member a predetermined distance, whose transverse cross section is a generally circular arc decreasing progressively from a first point along said outer periphery to a second point along said outer periphery, said member having an internal bore for supporting said member on a shaft, said ring shaped member consisting of at least two steel alloy sections, a first steel alloy section comprising a hardened steel alloy having a hardness of 53 to 63 Rockwell C, hardened by transforming to martensite under predetermined heat treating conditions, extending from said outer periphery a distance inwardly beyond the predetermined distance of said groove and up to about 25 percent of the thickness of said die, to a point spaced from said bore, and a second steel alloy section having a hardness of 35 to 45 Rockwell C, comprising a major portion of said die, extending from said point to said bore, said second steel alloy composed of a material that does not transform to martensite when exposed to said heat treating conditions used to harden the first alloy section.

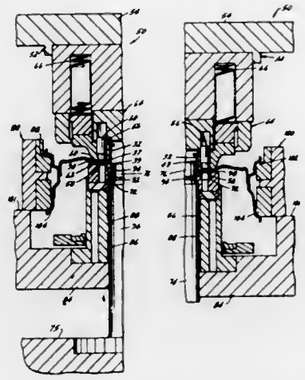
5. A die for a pilgering apparatus for reducing a tube, said die comprising a ring-shaped member capable of being rotated and having along the outer periphery thereof a generally circular groove extending into said member a predetermined distance, whose transverse cross section is a generally circular arc decreasing progressively from a first point along said outer periphery to a second point along said outer periphery, said member having an internal bore for supporting said member on a shaft, said ring shaped member consisting of three steel alloy sections, a first steel alloy section comprising a hardened steel alloy, hardened by transforming to martensite under predetermined heat treating conditions, extending from said outer periphery a distance inwardly beyond the predetermined distance of said groove to a point spaced from said bore, a second steel alloy section, comprising a major portion of said die, extending from said point towards said bore, said second steel alloy composed of a material that does not transform to martensite when exposed to said heat treating conditions used to harden the first alloy section, and a third steel alloy section extending from said bore to a point spaced from said first alloy section, said third alloy section comprising a hardened steel alloy, hardened by transforming to martensite under said predetermined heat treating conditions.

4,819,472

METHOD OF WHEEL MANUFACTURE FOR CORRECTING ROTATIONAL NON-UNIFORMITY OF A PNEUMATIC TIRE AND WHEEL ASSEMBLY

Anwar R. Dandi, E. Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Division of Ser. No. 846,365, Mar. 31, 1986, Pat. No. 4,736,611, which is a continuation-in-part of Ser. No. 667,338, Nov. 1, 1984, abandoned. This application Dec. 14, 1987, Ser. No. 132,269
Int. Cl.[4] B21D *53/26*
U.S. Cl. 72—335 3 Claims



1. A method of forming bolt and center-pilot mounting openings (**36, 30**) in a disc vehicle wheel (**16** or **112**) having a rim (**18**) with a tire bead seat region (**20, 22**) and a wheel mounting disc (**24**) with a preformed under-size center opening (**30**) carried internally of said rim, said method comprising the steps of:

(a) locating said wheel on a bead seat axis by engaging and holding said bead seat region without plastic deformation to said rim or disc,

(b) forming said bolt openings in said disc while said wheel is so located by engaging said disc from one direction parallel to said axis with a plurality of first punch means mounted in a first die assembly which moves against said disc in a direction parallel to said bead seat axis to pierce all of said bolt openings substantially simultaneously and centered on a bolt opening axis at a preselected relationship to said bead seat axis, and then

(c) with said wheel still fixtured per said step (a), shearing said preformed center-pilot opening by engaging said disc from the opposing direction parallel to said axis with a shear punch on a center-pilot opening axis at a preselected relationship to both said bolt-opening axis and said bead seat axis.

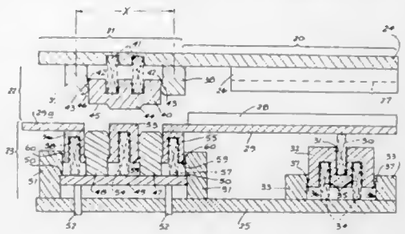
4,819,473

PRESS FORMING SHEET METAL

Matthys B. J. Jansen, Caringbah, Australia, assignor to Australian Design Marketing PTY., Ltd., Australia

PCT No. PCT/AU86/00373, § 371 Date Aug. 4, 1987, § 102(e) Date Aug. 4, 1987, PCT Pub. No. WO87/03518, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 8, 1986, Ser. No. 124,943
Claims priority, application Australia, Dec. 12, 1985, PH3851
Int. Cl.[4] B21D *5/04*
U.S. Cl. 72—382 10 Claims

1. A method of press forming sheet metal wherein a trip of the metal is progressively advanced through a multi-stage die and a forming operation is effected in each stage of the die during each closing stroke of the die, wherein, during a first time interval of each closing stroke, one portion of the metal strip is press formed in one stage of the die whilst a further portion of the metal strip is movably clamped in the or each



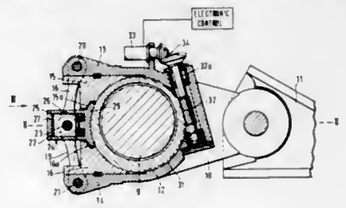
further stage of the die, and wherein, during a second time interval of each closing stroke, the metal strip is clamped substantially immovably in all stages of the die.

4,819,474

METAL FORMING MACHINE HAVING A STROKE POSITION ADJUSTING ASSEMBLY

Norbert Gober, Leverkusen, Fed. Rep. of Germany, assignor to Eumuco Aktiengesellschaft für Maschinenbau, Leverkusen, Fed. Rep. of Germany

Filed Jan. 26, 1988, Ser. No. 148,645
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705235
Int. Cl.[4] B21J *9/20*
U.S. Cl. 72—441 18 Claims



1. A metal forming machine comprising:

(a) an adjusting assembly for the stroke position of a pitman arranged between a crank drive and ram means,

(b) said adjusting assembly having an eccentric bushing adapted to be related at its periphery by worm shaft means and to be fixed by clamping means,

(c) said pitman including flexible pitman legs having fixed thereto adapting pieces resting against the eccentric bushing, and that the pitman legs are connected to tie-rods operable by a piston cylinder unit,

(d) the pitman legs are connected to tie-rods in a knuckle joint arrangement,

(e) said tie-rods pivotally engage a piston of a cylinder unit, and

(f) the piston is biased under the action of a spring system.

4,819,475

TOOL FOR ALUMINUM SIDING APPLICATORS

Mario M. Irvello, 3808 Landis Mill Rd., Collegeville, Pa. 19426

Filed Aug. 4, 1987, Ser. No. 81,337
Int. Cl.[4] B21D *22/04*
U.S. Cl. 72—447 7 Claims

1. An aluminum siding applicator's tool comprising:

an elongated body having a straight axis;

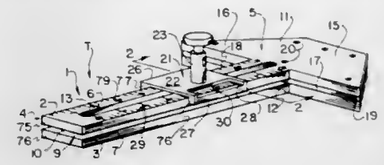
the body being open at one end, closed at the opposite end, and open on opposite sides to form a receiving slot extending along said axis to receive a portion of an aluminum trim strip to be punched with datum dimples;

the body being formed with track means extending along the body parallel to said axis;

the body, at the closed end, having a datum surface oriented perpendicular to said axis, the datum surface being for use in engaging the edge of the portion of said aluminum trim strip received in the receiving slot to orient said track means perpendicular to the edge of the aluminum trip strip;

a slider mounted on said body in engagement with said track means for reciprocating motion along the track means;

holding means on said slider to hold the slider in any desired



position along said track means with respect to said datum surface;

punch means mounted on said slider for movement through the receiving slot to engage the portion of said aluminum trim strip in the receiving slot to punch a datum dimple in the trim strip and to be moved away from the trim strip when dimple forming operation is completed; and

said body at the open end being formed with first abutment means and said slider being formed with second abutment means which extends outwardly from one side of said body and said first and second abutment means being for use respectively in engaging the lower edges of adjacent aluminum siding strips to gauge the distance between the lower edges.

4,819,476

TOOLING FOR FORMING MACHINES HAVING IMPROVED GUIDANCE, TOOL MOUNTING, AND PILOT PIN SYSTEMS

Johannes C. W. Bakermans, Harrisburg, and Dimitry G. Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 17, 1987, Ser. No. 74,656
Int. Cl.[4] B21D *37/12*
U.S. Cl. 72—456 19 Claims

1. Apparatus for performing operations, such as punching and forming operations, on strip material, the apparatus comprising first and second tooling assemblies which comprise first and second tool holder means and first and second tooling means carried by the first and second tool holder means, tooling assembly actuating means for reciprocating the first and second tooling assemblies towards and away from each other between an open position and a closed position, the tooling assemblies being remote from each other in their open positions and being proximate to each other in their closed positions, guide means for guiding the tooling assemblies along their paths of reciprocation, the strip material being fed along a strip feed path which extends transversely of the paths of reciprocation so that the tooling means performs operations on the strip material, the apparatus being characterized in that:

the guide means has a continuous passageway extending therethrough, the first and second tooling assemblies being in the passageway, the passageway having passageway surfaces which serve as bearing and guiding surfaces for the tooling assemblies,

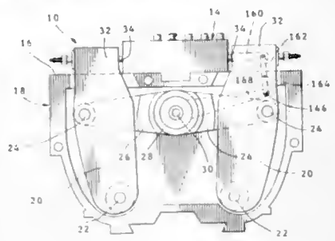
each of the tooling assemblies comprises a ram member having a leading end and a trailing end, the leading ends being opposed to each other, each of the ram members

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having ram bearing surface portions which bear against the passageway surfaces,

the first and second tool holder means are carried by the first and second ram members on the leading ends thereof, the first tooling assembly having a face plate means thereon, the first tool holder means being between the face plate means and the leading end of the first ram,

the first tooling assembly has guide plate means thereon, the face plate means being precisely held by the guide plate means, the guide plate means extending from the face



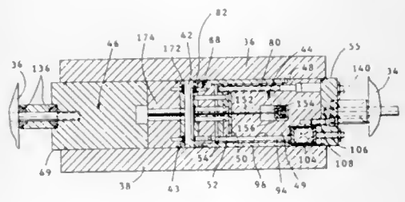


plate means towards the trailing end of the first ram past the first tool holder means and at least partially over the surface of the first ram, portions of the guide plate means being between the first ram and the passageway surfaces, the guide plate means having guide plate bearing surface portions which bear against the passageway surfaces whereby,

the face plate means, the guide plate means, the tool holder means and the rams are all located in the apparatus by the passageway surfaces and the tooling assemblies are guided along their paths of reciprocation by the passageway surfaces.

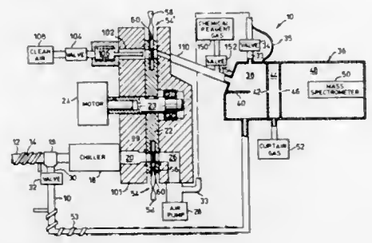
4,819,477

METHOD AND APPARATUS FOR TRACE SAMPLE COLLECTION

William H. Fisher, Thornhill; William R. Stott, Aurora; Bruce A. Thomson, Etobicoke, and Adam Weisz-Margulescu, Thornhill, all of Canada, assignors to MDS Health Group Limited, Etobicoke, Canada

Filed Feb. 25, 1987, Ser. No. 18,637
Claims priority, application Canada, Feb. 27, 1986, 502923
Int. Cl.[4] G01N *1/22, 31/06*
U.S. Cl. 73—23 **27 Claims**

1. Apparatus for collecting and analyzing trace substances, said apparatus comprising inlet means for receiving a stream of warm gas containing particulates and low volatility vapours of said trace substances, collection means connected to said inlet means for collecting said trace substances, cooling means located between said inlet means and said collection means for cooling said warm air flowing from said inlet means said collection means, thereby to increase the efficiency of collection of said collection means, analyzer means for analyzing said trace substances, bypass conduit means extending between said inlet means and said analyzer means to direct a portion of said stream of warm gas to said analyzer means, and control means for controlling said analyzer to analyze said portion of said



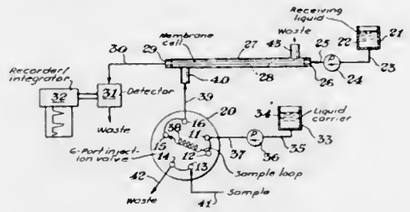
stream of warm gas simultaneously with the collection of trace substances at said collection means.

4,819,478

MEMBRANE ASSISTED FLOW INJECTION ANALYSIS

Richard G. Melcher, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 4, 1988, Ser. No. 164,151
Int. Cl.[4] B01D *15/08*
U.S. Cl. 73—61.1 C **10 Claims**



1. A method for rapid and sensitive membrane assisted Flow Injection Analysis, comprising the steps of:

(a) injecting a predetermined volume of a liquid sample into a flowing stream of liquid carrier to form a dispersion of the sample in the carrier, the sample containing a component of interest;

(b) flowing the dispersion of the sample in the carrier into fleeting contact with one side of a two-sided membrane, the membrane absorbing at least a portion of the component of interest from the dispersion of the sample in the carrier to form a dispersion of the component of interest in the membrane;

(c) contacting the other side of the membrane with a flowing stream of a receiving liquid, so that the dispersion of the component of interest in the membrane is essentially completely desorbed from the membrane in less than about 5 minutes and forming a dispersion of the component of interest in the receiving liquid, the partition coefficient of the component of interest between the membrane and the receiving liquid being less than about 1×10^1;

(d) detecting the component of interest in the dispersion of the component of interest in the receiving liquid.

4,819,479

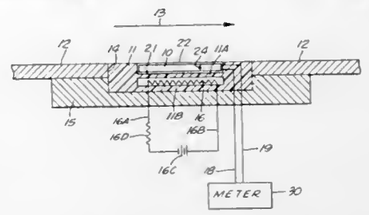
Patent Not Issued For This Number

4,819,480

MEANS AND TECHNIQUES USEFUL IN DETECTING ICE ON AIRCRAFT SURFACES

Cullen M. Sabin, San Diego, Calif., assignor to Geoscience, Ltd., Solana Beach, Calif.

Filed Jan. 25, 1988, Ser. No. 148,030
Int. Cl.[4] B64D *15/20;* **G01W** *1/00*
U.S. Cl. 73—170 R **10 Claims**



1. The method of detecting the presence of ice on a surface, mounting a heat flow transducer flush with such surface, mounting a heater below said surface to produce a first heat flow therefrom in a first path that extends from said heater to and through said transducer,

mounting a heat sink to produce a second heat flow from said heater in a second path, opposite from said first path, to said heat sink,

limiting the amount of total heat produced by said heater so that the presence of ice on said transducer, due to the high impedance of the ice, causes a change in balance between said first and said second heat flows and a lessening of the output of said transducer.

4,819,481

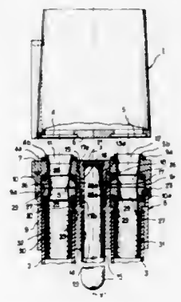
Patent Not Issued For This Number

4,819,482

DEVICE FOR CONNECTING AND SUPPORTING A WATER-METER

Alain Rappart, Lalbenque; Henri Loosdregt, Paris; Paul Persohn, Prechac, and Philippe Persohn, Bazas, all of France, assignors to Manufacture d'Appareillage Electrique de Cahors, Cahors; Lyonnaise des Eaux, Paris and Persohn S.A., Bazas, all of, France

Filed Mar. 14, 1988, Ser. No. 170,683
Claims priority, application France, Mar. 13, 1987, 87 03453
Int. Cl.[4] G01F *15/18*
U.S. Cl. 73—201 **27 Claims**



1. A water meter assembly including a device for connecting and supporting said water-meter, said assembly comprising

a water-meter (**1**),

a water-inlet pipe (**2**) and water-outlet pipe (**3**),

said water-meter including a water-inlet (**4**) and a water-outlet (**5**) each having apertures arranged in a side-by-side relationship upon a face of said water-meter, said water-meter being supported by support means (**8**) for said water-meter,

said support means (**8**) comprising a stationary seat (**9**) upon which are mounted in substantially parallel relationship said water-inlet pipe (**2**) and said water-outlet pipe (**3**),

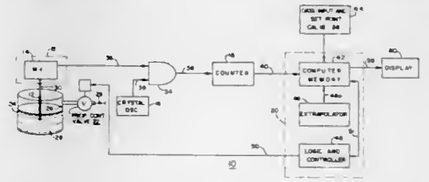
said seat (**9**) having mounted thereupon plate (**10**) including two water conduits (**11, 12**) connected to water-inlet j(**4**) and water-outlet (**5**), respectively, said plate (**10**) being rotatably mounted on said seat (**9**) about an axis (X–X') which axis is parallel to and passes between said water inlet and outlet pipes (**2, 3**), said plate (**10**) being rotatable between a position in which said water-conduits (**11, 12**) permit communication between said water-inlet and outlet pipes (**2, 3**) and said water-inlet and outlet (**4, 5**), respectively, and a position in which said water conduits are offset angularly with regard to said water-inlet and outlet pipes (**2, 3**) so as to prohibit such communication and shut off the flow of water between said pipes and said water meter.

4,819,483

LEVEL INDICATOR CONTROL SYSTEM FOR USE WITH CAPACITANCE PROBES IN TANKS CONTAINING SUBSTANCES

Raymond H. Emplit, Glen Mills, and Donald Y. Daily, Havertown, both of Pa., assignors to Custom Controls Co., Inc., Broomall, Pa.

Continuation of Ser. No. 31,166, Mar. 26, 1987, abandoned, which is a continuation of Ser. No. 851,319, Apr. 9, 1986, abandoned, which is a continuation of Ser. No. 755,541, Jul. 15, 1985, abandoned, which is a continuation of Ser. No. 585,025, Mar. 5, 1984, abandoned, which is a continuation of Ser. No. 330,065, Dec. 15, 1981, abandoned. This application Jul. 12, 1988, Ser. No. 219,864
Int. Cl.[4] G01F *23/00*
U.S. Cl. 73—304 C **7 Claims**



1. An on-line level indicator system having memory for automatically measuring an unknown present substance level within a container as a function of a capacitance between the container and a capacitance probe positioned within the container, comprising:

time interval means connected to the capacitance probe for providing and storing in memory, level time interval signals representative of selected actual low and high substance levels of the container, comprising:

means coupled to said capacitance probe for providing a time duration waveform having a time duration proportional to the capacitance between the container and the capacitance probe;

oscillator means for producing oscillator pulses of constant predetermined frequency;

logic means for receiving the time duration waveform and the oscillator pulses and for transmitting the oscillator pulses only during the time duration;

means coupled to the logic means for counting the oscillator pulses transmitted by the logic means; and

means for storing values produced by said counting means in said memory as level time interval signals;

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said time interval means including means for reading and storing into memory a time interval signal representative of the unknown present substance level;

calibration means for providing and storing in memory (1) a low level calibration value representative of the selected actual low substance level and (2) a high level calibration value representative of the selected actual high substance level; and

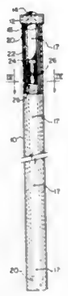
extrapolating means coupled to the memory for calculating, from the low and high level time interval signals, the low and high level calibration values and the unknown actual level time interval signal, an extrapolated output value representative of the unknown present substance level, wherein, the extrapolated unknown present level may be below the selected low level, above the selected high level or between the selected low and high levels.

4,819,484

PORTABLE LIQUID LEVEL GAUGE

Michael G. White, 6A Oak Street, Red Deer, Alberta, Canada T3P 3A1

Filed Jun. 1, 1988, Ser. No. 201,011
Claims priority, application Canada, Jul. 29, 1987, 543289
Int. Cl.[4] G01F *23/30*
U.S. Cl. 73—321 **5 Claims**



1. A readily portable liquid level gauge for measuring liquid levels in tanks, comprising a tube having an upper and a lower end and having an opening for liquid at the lower end, a guideway totally within said tube and having a float guided for longitudinal rectilinear movement in said guideway, a roller rotatably supported adjacent each of the upper and lower ends of the tube, and a loop of flexible tape held taut by said rollers and having indicia on its outer surface, said tape having a connection to said float which is eccentric of the float and such that liquid in the tube can lift the float and cause corresponding movement of the tape, the guideway maintaining alignment of the float such as to prevent jamming in spite of said eccentric connection; and viewing means allowing observation of the indicia on the tape to indicate the level of liquid in the tube.

4,819,485

MUSCLE TESTING APPARATUS

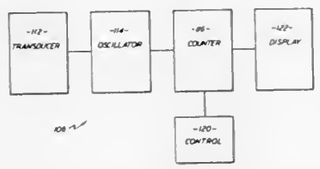
Daniel DelGiorno, Fort Salonga; Russell A. Pellicano, North Bay Shore, and Henry Medina, Melville, all of N.Y., assignors to Myo-Tech Corp., Boca Raton, Fla.

Filed May 30, 1986, Ser. No. 869,135
Int. Cl.[4] A61B *5/22*
U.S. Cl. 73—379 **16 Claims**

12. Control means for muscle testing apparatus of the type having a pressure pad to engage a body area of a person subjected to a force from a muscle or muscle group, the control means comprising:

a pressure transducer connected to the pressure pad to generate a variable magnitude electric current in response to the force applied to the pressure pad;

a variable capacitance oscillator connected to the pressure transducer to receive the electric current therefrom and to generate electric pulse signals at a frequency dependent on the magnitude of the electric current from the pressure transducer;



a pulse counter connected to the variable capacitance oscillator to count the electric pulse signals generated thereby;

a counter control circuit to control the counter to count only the pulses generated by the variable capacitance oscillator during the test period; and

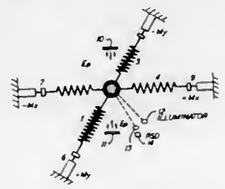
display means connected to the counter to display the number of the electric pulse signals counted by the counter.

4,819,486

OPTOELECTRONIC ACCELEROMETER

Bernd Kunkel, Kirchheim; Karl Keller, Munich, and Reinhold Lutz, Bernhaupten, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkowe-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 3, 1987, Ser. No. 21,088
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1986, 3606875
Int. Cl.[4] G01P *15/08;* **G01V** *7/02*
U.S. Cl. 73—382 R **22 Claims**



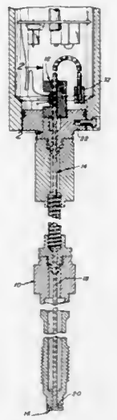
1. A device for acceleration measurements of a body along all three axes of motion and, in particular, for gravitational field measurements of a body in earth orbits, comprising means for both movably holding the body within a force field and applying an anisotropic force to the body, said force being, at least in a direction of the acceleration to be determined, a nonlinear function of the deflection of the body from its resting position, said non-linear function having a linear term, and further comprising, position detector means for detecting the location of the body and means for applying a controllable force to act on the body in one direction of acceleration to substantially cancel the linear term of said anisotropic force.

4,819,487

HIGH PRESSURE TRANSDUCER

William Wareham, Marion, Mass., assignor to Dynisco, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 798,169, Nov. 14, 1985, Pat. No. 4,679,438, which is a continuation-in-part of Ser. No. 689,385, Jan. 7, 1985, Pat. No. 4,680,972. This application May 28, 1987, Ser. No. 54,747
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] G01L *7/08, 9/04*
U.S. Cl. 73—726 **17 Claims**



1. A pressure transducer comprising;

an elongated frame having an elongated passage therethrough,

a capillary tube extending through the frame passage and terminating at one end adjacent one end of the frame,

a coupler at said one end of the frame and defining with the frame a chamber in communication with the capillary tube,

a sensing member disposed at the other end of the frame and having a passage therein for receiving the capillary tube,

said sensing member and capillary tube defining therebetween a sensing chamber formed between said sensing member passage and said capillary tube,

a liquid filling the capillary tube and sensing chamber,

said sensing member further having means defining a sensing surface forming a relatively thin wall adjacent said sensing chamber,

and means for sensing pressure at said wall.

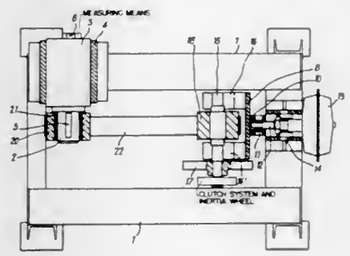
4,819,488

APPARATUS FOR TESTING THE RESISTANCE TO CLEAVAGE OF CARDBOARD TUBES

Jean-Michel Morel, Seas, France, assignor to Lhomme S.A., Pont sur Yonne, France

PCT No. PCT/FR87/00188, § 371 Date Jan. 21, 1988, § 102(e) Date Jan. 21, 1988, PCT Pub. No. WO87/07379, PCT Pub. Date Dec. 3, 1987
PCT Filed May 29, 1987, Ser. No. 162,318
Claims priority, application France, May 29, 1986, 86/07729
Int. Cl.[4] G01N *3/24*
U.S. Cl. 73—845 **10 Claims**

1. Apparatus for testing the resistance to cleavage of cardboard tubes which have been previously cut into test pieces which comprises a keying mandrel which is mounted free to rotate, at least one sleeve for each test piece having a different outer diameter, the inner diameter of said at least one sleeve being approximately equal to the outer diameter of a test piece such that for each test piece there corresponds at least one sleeve for housing the test piece, the keying mandrel being adapted to receive each test piece which is housed in a corresponding sleeve, while a drive device and belt are provided to



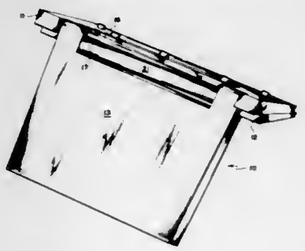
rotate a drive assembly that includes the keying mandrel and a test piece which is housed in an a corresponding sleeve, whereby the apparatus tests the resistance to cleavage of the cardboard tubes.

4,819,489

DEVICE AND METHOD FOR TESTING THE ADHERENCE OF A COATING LAYER TO A MATERIAL

Jordan R. Nelson, Pennington; Gilbert L. Green, Sr., Trenton, both of N.J.; Randall E. McCoy, McConnellsburg, Pa., and Richard Williams, Princeton, N.J., assignors to RCA Licensing Corp., Princeton, N.J.

Filed May 9, 1988, Ser. No. 191,453
Int. Cl.[4] G01N *3/20;* **B05L** *11/00*
U.S. Cl. 73—854 **11 Claims**



1. A device for testing the adherence of a coating layer to a material comprising:

a base member having a support surface;

a guide member supported by said support surface, said guide member having a tapered thickness to form a tapered surface;

a cone section, having a preselected angle, supported on said tapered surface at a preselected distance from said tapered surface for forming a guide slot for guiding said material between said cone section and said tapered surface;

actuation means pivotally attached to said base member in the proximity of said cone section;

bending means actuated by said actuation means for bending said material around said cone section and for forming a tapered bend in said material.

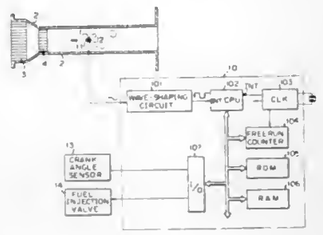
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4,819,490

KARMAN VORTEX SENSOR TYPE FLOW RATE MEASURING SYSTEM

Toshiaki Isobe, Nagoya, and Hidehiro Oba, Aichi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 10, 1986, Ser. No. 884,187
Claims priority, application Japan, Jul. 16, 1985, 60-155083; Sep. 3, 1985, 60-193207
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.22 2 Claims



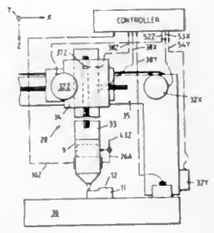
1. A flow rate measuring system comprising:
a Karman vortex sensor for generating a signal having a period in response to a flow rate of a fluid;
means for calculating said period of said signal;
means for calculating a correction coefficient in accordance with said period of said signal; and
means for calculating said flow rate of a fluid in accordance with said period of said signal and said correction coefficient.

4,819,491

POSITION-DETERMINING APPARATUS

David R. McMurtry, Wotton-Under-Edge, United Kingdom, assignor to Renishaw plc, United Kingdom

PCT No. PCT/GB87/00747, § 371 Date Jun. 17, 1988, § 102(e) Date Jun. 17, 1988, PCT Pub. No. WO88/02843, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 20, 1987, Ser. No. 206,342
Claims priority, application United Kingdom, Oct. 20, 1986, 8625052
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—865.8 10 Claims



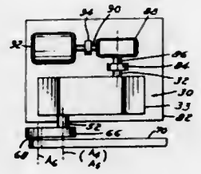
1. Apparatus for determining the position of a surface of an object, comprising a support, a first member supported on the support for movement relative thereto, a primary positioning system for positioning the first member relative to the support in response to a first error signal and so as to keep the first member at a constant distance from said surface, a second member supported on the first member for movement relative thereto, the second including a sensing point and intended to have a first predetermined relationship to the first member and a second predetermined relationship to said surface, first sensing means for sensing said first relationship and adapted to generate said first error signal, second sensing means for sensing said second relationship, a secondary positioning system responsive to said second sensing means for tending to maintain said second relationship constant thereby tending to disturb said first relationship if there is a change in the position of the surface relative to the first member, and the first error signal cooperating to restore said first relationship.

4,819,492

REVERSING MECHANISM HAVING GREAT KINEMATIC VERSATILITY

John H. Brems, Apt. 11G, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Continuation-in-part of Ser. No. 793,558, Oct. 31, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 81,127
Int. Cl.[4] F16H *21/32*
U.S. Cl. 74—52 14 Claims



1. A reciprocating mechanical drive system capable of providing an extremely wide variety of kinematic objectives, including very long dwells at the ends of the stroke, unequal dwells at opposite ends of the stroke, intermediate dwells between the ends of a stroke, and non-symmetrical movement when moving in one direction, as compared to the movement in the other direction, comprising:
a. a combination mechanism comprising a rotary drive means which drives a reciprocating output drive system, and in which said rotary drive means comprises:
1. a frame,
2. an output shaft member mounted for rotation in said frame,
3. an output member mounted on said output shaft member and adapted for tangential driving and having a given pitch radius,
4. a first rotating pair supported in said frame comprising:
(i) a first rotating member mounted for rotation in said frame,
(ii) a first eccentric member mounted eccentrically, in non-rotational relation to, and on said first rotating member,
5. a second rotating pair mounted in fixed spatial relationship with said first rotating pair comprising:
(i) a second rotating member,
(ii) a second eccentric member, having a given pitch radius, mounted eccentrically in non-rotational relation to, and on said second rotating member,
6. means connecting for rotation said first rotating pair and said second rotating pair for substantially an integral angular velocity ratio,
7. means connecting said output member and said second eccentric member in a driving relationship, and
8. power means connected to one of said rotating pairs to impart a rotary motion to that of said rotating pair; whereby rotation of said rotary pair by said power means at a presumed substantially constant angular velocity causes said output shaft member to undergo a series of acceleration-deceleration cycles and the angular distance traversed by said output shaft member during one such cycle is known as the index angle,

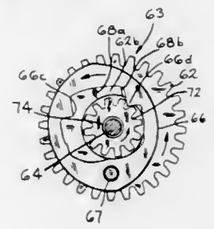
b. and in which said reciprocating output drive system comprises:
1. a crank member mounted at one end to said output shaft member,
2. connecting rod means journalled at one end to the other end of said crank member,
3. reciprocating output means mounted for reciprocation in said frame, and pivotally connected to the other end of said connecting rod means.

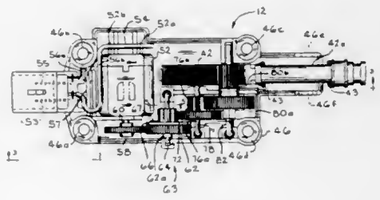
4,819,493

AUTOMOBILE ELECTRIC DOOR LOCK ACTUATOR

Arthur E. Dornan, Ypsilanti, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.

Filed Sep. 21, 1987, Ser. No. 98,654
Int. Cl.[4] F16H *19/04*; F16D *19/00*
U.S. Cl. 74—89.17 10 Claims





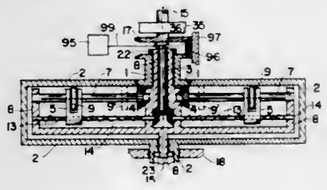
1. An automobile door lock actuator comprising:
a casing;
a reversible electric motor mounted in said casing adjacent one end thereof, said motor having an output shaft;
a rack reciprocably mounted in said casing, said rack having an extension projecting outwardly from said casing and being movable alternately to extended and retracted positions with respect to said casing, said rack adapted to be coupled to operate the door lock;
a motor drive gear fixedly secured on said output shaft for rotation therewith;
a clutch assembly in said casing and coupled to be driven by said motor drive gear, said clutch assembly including
a first mounting shaft mounted in the casing,
a clutch drive gear rotatably mounted on said first mounting shaft and operatively engaged with said motor drive gear, said clutch drive gear having a pin mounting hole disposed eccentrically of said first mounting shaft and an arcuate slot therethrough diametrically opposite said pin mounting hole,
a pin mounted on said clutch drive gear in said pin mounting hole,
a clutch plate pivotally mounted on said pin on one side of said clutch drive gear, said clutch plate having an opening therethrough defining a pair of arcuately spaced driving teeth,
a driven clutch gear rotatably mounted on said first mounting shaft on said one side of said clutch drive gear, said driven clutch gear having an end portion disposed in said opening in said clutch plate for operative engagement alternately with said driving teeth, and
a torsion coil spring mounted on said clutch drive gear on an opposite side thereof from said clutch plate and having a pair of arcuately spaced straight end portions extending through said arcuate slot in said clutch drive gear and into said opening in said clutch plate respectively adjacent said driving teeth, said spring normally biasing said clutch plate toward a neutral position wherein neither of said driving teeth is operatively engaged with said driven clutch gear;
gear means for operatively connecting said driven clutch gear to said rack for reciprocating said rack along a linear path.

4,819,494

CONTINUOUSLY VARIABLE TRANSMISSION

Robert L. Giuliani, 1456 Thurston Ave., Honolulu, Hi. 96822; Mark A. Giuliani, and Karen A. Giuliani, both of 45-310 Akimala Pl., Kaneohe, Hi. 96744

Continuation-in-part of Ser. No. 32,544, Apr. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 854,108, Apr. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 749,486, Jun. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 416,453, Feb. 4, 1983, abandoned. This application Jun. 27, 1988, Ser. No. 213,126
Int. Cl.[4] F16H *15/08*
U.S. Cl. 74—190 15 Claims



1. A continuously variable torque drive apparatus, the combination comprising:
a support;
a common axis;
a drive member rotatably sustained by the support about the common axis, the drive member comprising a substantially radially expanded first end;
a driven member rotatably sustained by the support about the common axis, the driven member comprising a substantially radially expanded second end;
at least one shaft rotatably carried by the support;
a first rotational axis for the first shaft, the first rotational axis essentially fixed in a nonparallel relationship with the common axis;
the first shaft nonrotatably supporting a first roller;
the first roller shiftable along the first rotational axis for varying the distance between the first roller and the common axis;
a first communication between the first shaft and one of the ends for transmitting torque therebetween;
a shiftable communication between the first roller and the other of the ends for transmission of torque therebetween;
a second shaft rotatably carried by the support, the second shaft comprising a second rotational axis in spaced apart essentially parallel relationship to the first rotational axis;
a third shaft, the third shaft rotatably sustained by the support, the third shaft essentially coaxial with the common axis;
an actuator means for actuating a shiftable rotation of the third shaft;
a second communication between the second shaft and the

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third shaft for transmitting the shiftable rotation therebetween; and

an operative coupling between the second shaft and the first roller for shifting the shiftable communication at the urging of the second shaft wherein the actuation of the third shaft by the actuator means actuates the second shaft for shifting the shiftable communication to effect the continuously variable torque drive between the drive and driven members.

4,819,495

GEAR FOR CONVERTING A ROTARY INTO A TRANSLATIONAL MOTION

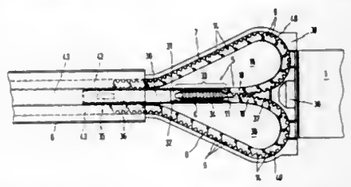
Michael Hörmann, Steinhagen/Westf., Fed. Rep. of Germany, assignor to Hörmann KG Antriebs- und Steuerungstechnik, Harsewinkel, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 8,935

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1986, 3603122; Feb. 1, 1986, 3603121

Int. Cl.[4] F16H *1/18*

U.S. Cl. 74—424.6 **19 Claims**



1. An arrangement for converting rotary motion into translational motion, comprising: driving motor means; rotary drive means connected to said motor means; motion-transmission means moveable translationally and divided longitudinally along a direction of motion into tow strings; guide means for guiding said strings transversely, said strings being positioned outside said guide means at one end and separated from each other, said strings being united at the other end inside said guide means, said guide means preventing the united end of the strings from being laterally removable from each other; engagement means for connecting said strings to said rotary drive means where they are united, said strings having teeth on sides facing each other in vicinity of said guide means, said strings engaging each other by said teeth; an intermediate component in said guide means remote from said rotary drive means, said strings having ends secured to said intermediate component, said intermediate component being common to both strings; said strings being disengaged from said engagement means in vicinity of said intermediate component; a worm extending along said guide means and engaging a worm-engagement thread on facing sides of said strings in vicinity of said guide means and adjacent to a section of said strings carrying said teeth, said worm connecting said strings to said rotary drive means at a location where said strings are united, said teeth extending substantially perpendicular to a longitudinal axis of said guide means, said worm-engagement thread being divided into two halves by an axial midplane, said strings being connected to said intermediate component.

4,819,496

SIX DEGREES OF FREEDOM MICROMANIPULATOR

Gad Shelef, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 17, 1987, Ser. No. 121,493

Int. Cl.[4] B25J *17/02*; G05G *11/00*

U.S. Cl. 74—479 **2 Claims**

1. A micromanipulator assembly for use with a robot arm which moves a robot finger element with large scale motions, said robot finger element being moved with a small scale motions, said micromanipulator assembly being fixed between said robot arm and said robot finger element to move said robot finger elements with intermediate scale motions, said micromanipulator assembly comprising:

a planar base plate;

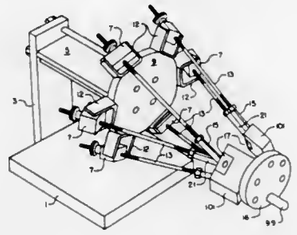
a means for attaching said planar base plate to said robot arm;

a plurality of base plate yokes which are fixed to and evenly distributed about the circumference of said planar base plate;

a plurality of drive rods, each of which are retractably fixed to one of said base plate yokes so that they may individually be extended and retracted with respect to said planar base plate;

a plurality of drive rod trunnions which are each pivotally connected to one of the base plate yokes about said planar base plate, each of said drive trunnions having a central aperture through which one of said drive rods extends; each of said drive rod trunnions also having a narrow slot which is perforated by said central aperture;

a plurality of manually rotated drive nuts, each of which are



threaded and disposed to advance along one of said drive rods, each of said manually rotated rive nuts having a narrow waist, and a raised lower annular flange which fits in the narrow slot and one of said plurality of drive rod trunnions so that each of the manually rotated drive nuts are fixed to one of the drive rod trunnions, and will extend and retract its respective drive rod as it is rotated;

a manipulator plate which is fixed to said robot finger and said drive rods so that the robot finger may be positioned with multiple degrees of freedom as the manipulator plate is tipped and tilted into a desirable position by retracting and extending the drive rods;

a plurality of manipulator plate support yokes, each of which are attached to a side of said manipulator plate;

a plurality of coupling yoke trunnions each of which are pivotally attached to one of the manipulator plate yokes; and

a plurality of rod ends, each of which are attached to one of the coupling yoke trunnions and two of said drive rods, said rod ends each allowing said manipulator plate to be tipped and tilted as its respective drive rods are retracted and elongated.

4,819,497

FAST OPENING ARRANGEMENT FOR SHOES OF BICYCLE BRAKES

Antonio Romano, Padova, Italy, assignor to Campagnolo S.P.A., Vicenza, Italy

Filed Mar. 23, 1987, Ser. No. 28,339

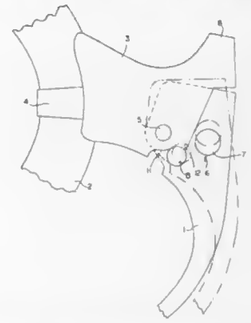
Claims priority, application Italy, Mar. 25, 1986, 21349/86[U]

Int. Cl.[4] G05G *11/00*; F16C *1/10*

U.S. Cl. 74—489 **4 Claims**

1. Fast opening arrangement for shoes of bicycle brakes, wherein control is obtained, by cable, through a control lever pivotally mounted on a body fixed to the bicycle handle bar, comprising means inserted across the control lever and axially

movable through the said control lever between two positions in which said means alternatively rests with a lateral surface against one or the other of two sidewalls of the body on which said lever is pivotally mounted, said sidewalls projecting to different extents so that for normal braking said means rest



against one said sidewall which is so positioned that said shoes are close to but spaced from a bicycle tire and for wheel removal said means rest against the other said sidewall which is so positioned that said shoes are spaced further from the bicycle tire.

4,819,498

TILT STEERING APPARATUS FOR VEHICLES

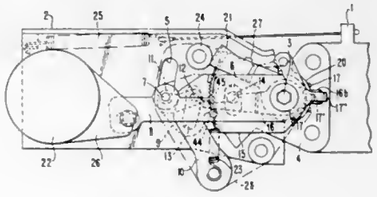
Masumi Nishikawa, Toyoake; Masanobu Ishikawa, and Hiroshi Watanabe, both of Nagoya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 20, 1987, Ser. No. 16,798

Claims priority, application Japan, Feb. 22, 1986, 61-037643

Int. Cl.[4] B62D *1/18*

U.S. Cl. 74—493 **10 Claims**



1. A tilt steering apparatus for vehicles comprising;

a fixed bracket member fixed on a vehicle body;

a rotatable bracket member pivotally mounted about a pivot axis on said fixed bracket member;

a ratchet member disposed on one side of one of said rotatable bracket member and said fixed bracket member, said ratchet member having a teeth portion formed around said pivot axis;

a pawl member pivotally mounted on the other of said rotatable bracket member and said fixed bracket member, said pawl member being engageable with said teeth portion of said ratchet member,

a rotary actuator mounted on said other bracket member;

a lever member rotatably mounted around said pivot axis between said rotatable bracket member and said fixed bracket member at one end thereof, said lever member operatively connected to said rotary actuator at the other end thereof;

means for operatively connecting said lever member to said pawl member so as to disengage said pawl member from said teeth portion of said ratchet member, and

means for memorizing an original position of said rotatable bracket member before said pawl member is disengaged from said teeth of said ratchet member.

4,819,499

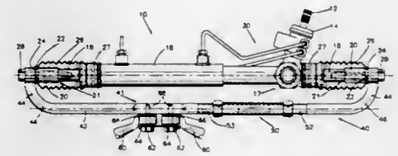
RACK AND PINION STEERING GEAR

Philip C. Morell, Sterling Heights, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jul. 16, 1987, Ser. No. 74,345

Int. Cl.[4] B62D *1/20*

U.S. Cl. 74—498 **14 Claims**



1. A rack and pinion steering gear assembly for use in a vehicle having a steering wheel, comprising:

an elongate rack means movable, longitudinally for effecting vehicle steering, said rack means having opposite end portions;

means for moving said rack means longitudinally in response to turning movement of the vehicle steering wheel; and

a bracket connected to said opposite end portions of said rack means and extending therebetween,

said bracket having connections intermediate its ends for attachment of vehicle steering linkage thereto.

4,819,500

PEDAL BRACKET ASSEMBLY AND METHOD OF INSTALLING SAME ON STRUCTURAL BODY

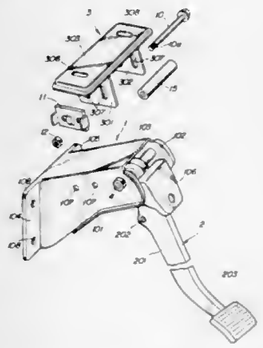
Raita Musumiya, and Masaaki Minakawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1987, Ser. No. 21,696

Claims priority, application Japan, Mar. 4, 1986, 61-30865[U]

Int. Cl.[4] G05G *1/14*

U.S. Cl. 74—513 **6 Claims**



1. A pedal bracket assembly for installation on a structural body having a vertical member and a transverse member projecting transversely from the vertical member, the pedal bracket assembly comprising:

a support member having vertical flanges adapted to be

fastened to the vertical member of the structural body and side walls joined to said vertical flanges and extending vertically;

a pedal pivotally coupled to said side walls; and

a holder member having first adjustable means adapted to be connected to the transverse member of the structural body with first bolts and first nuts for positional adjustment in a first direction in which the transverse member projects, and second adjustable means adapted to be connected to said side walls with second bolts and second nuts for positional adjustment in a second direction normal to the transverse member.

4,819,501

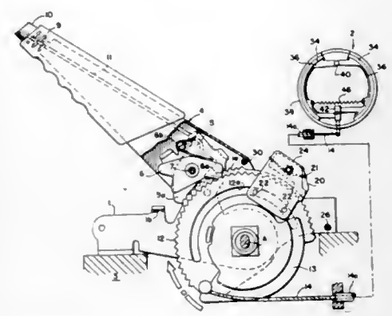
SELF-ADJUSTING BRAKE MECHANISM

James R. Kraus, Hagerstown, Md., and Eugen O. Rothacker, Gerrardstown, W. Va., assignors to Handy & Harman Automotive Group, Inc., Martinsburg, W. Va.

Filed Apr. 12, 1988, Ser. No. 180,496

Int. Cl.[4] G05G *1/04, 1/06*

U.S. Cl. 74—538 **8 Claims**



1. A self-adjusting lever mechanism for applying tension to a cable, comprising:

a frame member;

a fixed sector, immobile with respect to said frame member, comprising a plurality of teeth;

a control lever, movable with respect to said fixed sector from a rest position to an actuated position;

a first pawl movable between an engaged position, in which said first pawl locks said control lever with respect to said fixed sector, and a disengaged position, in which said control lever can move with respect to said first sector;

a cable sheave means, adapted to positively pull said cable with respect to said frame member to apply tension to said cable, and comprising a sheave sector;

a second pawl, biased with respect to said sheave sector to lock said control lever to said sheave sector, such that motion of said lever in a predetermined direction from said rest position causes said sheave to pull said cable;

means for causing said second pawl to release said sheave from said control lever when said control lever is returned to its rest position;

a third pawl means, carried by and movable with respect to said sheave sector;

means for moving said third pawl means with respect to said sheave sector in response to motion of said lever in said predetermined direction beyond a predetermined degree; and

means for adjusting the relative rest position of said sheave with respect to said control lever when said lever is returned to its rest position responsive to motion of said third pawl means with respect to said sheave sector.

6. A self-adjusting auxiliary brake actuating mechanism for a vehicle, comprising:

a frame member adapted to be affixed to said vehicle, defining a pivot axis and comprising a first arcuate fixed sector;

a control lever, mounted for rotation away from a rest position with respect to said frame member about said pivot axis;

a cable sheave, also mounted for rotation with respect to said frame member about said pivot axis, adapted for winding a brake cable thereupon in response to rotation in a first direction, and comprising a second arcuate sheave sector;

a first pawl pivoted on said lever and biased to allow rotation of said lever with respect to said fixed sector in said first direction;

release means, for pivoting said first pawl so as to allow rotation of said lever in the opposite direction with respect to said fixed sector;

a second pawl pivoted on said lever and biased to lock said lever to said sheave sector whereby when said lever is rotated in said first direction, said sheave is likewise rotated, winding said brake cable thereon;

means for pivoting said second pawl against said bias, whereupon said sheave is released from said lever when said lever is returned to its rest position;

sliding pawl means riding with said sheave for defining the relative angular positions of said lever and said sheave when said lever is in its rest position and adapted to be moved with respect to said sheave sector when the rotation of said lever from its rest position exceeds a fixed amount; and

means for rotating said sheave with respect to said lever when said sheave is released from said lever in its rest position to a degree responsive to the position of said sliding pawl means with respect to said sheave.

4,819,502

FLYWHEEL DEVICE

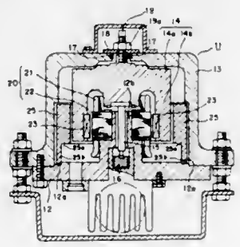
Toshio Nakajima; Hiroshi Kumatani, both of Aichi; Masayuki Miyazaki, Hyogo, and Kazuo Tezuka, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1986, Ser. No. 924,552

Claims priority, application Japan, Oct. 31, 1985, 60-244598; Oct. 31, 1985, 60-244604; Oct. 31, 1985, 60-244605; Oct. 31, 1985, 60-244606

Int. Cl.[4] G05G *1/00*; H02K *1/22*

U.S. Cl. 74—572 **16 Claims**



1. A flywheel device comprising

a casing including a cover having an opening therein and a frame base closing said opening, said cover having an inner circumferential wall;

a stator supported on said frame base;

a rotating body rotatably supported within said casing, said rotating body comprising a rotor and a flywheel mounted integrally with said rotor, said rotating body being rotatable at a high speed by electromagnetic action with said stator and accumulating rotating energies which can be converted into electric energies; and

a protective ring disposed between said inner circumferential wall of said casing and the outer periphery of said rotor and spaced from said rotor during normal operation of the flywheel device, said rotor expanding centrifugally upon the occurrence of an abnormally high speed of said rotating body to engage said protective ring;

said protective ring being free to rotate relative to said casing whereby upon engagement of said protective ring by said rotor under abnormally high speed said protective ring rotates with said rotor to increase the rotating mass and act as a braking force.

6. A flywheel device comprising a casing including a cover having an opening therein and a frame base closing said opening, said cover having an inner circumferential wall;

a stator supported on said frame base;

a rotating body rotatably supported within said casing, said rotating body comprising a rotor and a flywheel mounted integrally with said rotor, said rotating body being rotatable at a high speed by electromagnetic action with said stator and accumulating rotating energies which can be converted into electric energies; and

a protective ring disposed between said inner circumferential wall of said cover and the outer peripheral surface of said rotor inner circumferential wall of said cover until engagement of said outer peripheral surface of said rotor with said protective ring responsive to an abnormally high speed rotation of said rotor assumes a predetermined force, said protective ring being free to rotate with said rotor relative to said cover when the force exerted on said protective ring by said rotor exceeds said predetermined force, said protective ring being then rotated.

4,819,503

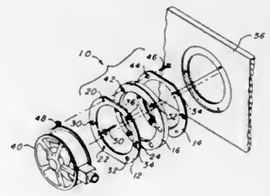
LOW FREQUENCY STRUCTUREBORNE VIBRATION ISOLATION MOUNT

Valentino N. Fazi, Jr., New London; Ronald G. Murdock, Ledyard; Ernest O. Hancock, Fitchville, and John W. McCready, East Lyme, all of Conn., assignors to Unites States of America as represented by the Secretay of the Navy, Washington, D.C.

Filed Dec. 22, 1987, Ser. No. 137,558

Int. Cl.[4] F16M *1/00*; F16F *15/10*

U.S. Cl. 74—574 **6 Claims**



1. A low frequency structureborne vibration isolation mount for reducing the structureborne vibrations of a moving piece of equipment being transferred to a stationary piece of equipment, attached thereto wherein said mount comprises:

a first and second matching annular plates of the same shape;

a matching annular disk pad made of an acoustic damping material sandwiched and secured in between said first and second annular plates;

the first annular plate having a first plurality of holes of a first diameter and a second plurality of holes of a second diameter larger than the first diameter and interspersed between said first plurality of holes located along the circumference of said first annular plate;

a third plurality of holes of said second diameter along the circumference thereof and matching and corresponding to said first plurality of holes of said first annular plate and a fourth plurality of holes of said first diameter along the circumference of said second annular plate matching and corresponding to said second plurality of holes of said first annular plate;

a fifth plurality of holes of said second diameter along the circumference of said annular disk pad matching and corresponding to said first plurality of holes and said second plurality of holes along the circumference of said first annular plate;

means for securing said first annular plate to the moving piece of equipment; and

means for securing said second annular plate to the stationary piece of equipment.

4,819,504

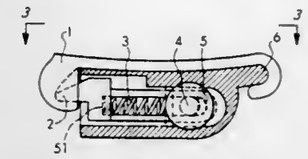
SELF CONTAINED BRAKING SYSTEM FOR BICYCLE PEDALS

Eric A. Sampson, Denver, Colo., assignor to Sampson Sports, Inc., Denver, Colo.

Filed May 27, 1987, Ser. No. 54,577

Int. Cl.[4] G05G *1/14*; B62M *3/08*

U.S. Cl. 74—594.4 **9 Claims**



6. A bicycle pedal system comprising:

a bicycle pedal body and a horizontally disposed axle about which said pedal body can rotate;

a normally extended and horizontally movably detent in said pedal body,

a U-shaped brake element having the legs of said U horizontally oriented and with the ends of said legs being affixed to an inner side of said detent, said U-shaped brake element being positioned within said pedal body so that said axle extends perpendicular to and between said legs of said U-shaped element,

spring means for forcing said detent outwardly from said pedal body so that an inner surface of a U-shaped portion of said brake element bears against said axle to inhibit rotation of said body about said axle when said pedal body is not engaged by a cleat of a rider's shoe, and

means for forcing said detent inwardly against said spring means and towards said pedal body when said cleat engages said pedal body so that said inner surface is moved away from contact with said axle to enable said rotation.

4,819,505

BALANCER SHAFTS FOR USE IN MULTICYLINDER ENGINES

Hiroichi Takubo, Miyanomachi; Kazuo Isayama, Hamadahonmachi, and Syoji Yamashita, Kure, all of Japan, assignors to Mazda Motor Corporation, Japan

Filed Feb. 11, 1987, Ser. No. 13,930

Claims priority, application Japan, Feb. 19, 1986, 61-35886; Mar. 5, 1986, 61-47956

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—603 **10 Claims**

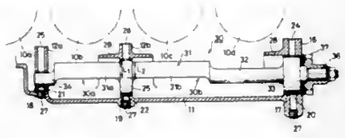
1. A balancer shaft for use in multicylinder engine, which is sustained by a cylinder block of the engine to be arranged in substantial parallel with a crank shaft in the engine and driven to rotate by the crank shaft, the balancer shaft comprising:

a balance weight part formed to be eccentric in relation to a rotation axis of the balancer shaft and disposed at a central area in the cylinder block in a direction along an alignment of cylinders,

an elongated shaft part having one end portion connected

with one end portion of the balance weight part and extending from the balance weight part in the direction of the alignment of cylinders with an axis coinciding with the rotation axis of the balancer shaft, and

first, second and third journals provided on the other end portion of the elongated shaft part, a central portion of the balance weight part and the other end portion of the



balance weight part, respectively, so that the balancer shaft journals by first, second and third bearing portions provided in the engine;

wherein a first portion of the balancer shaft extending from the second journal to the first journal is longer than a second portion of the balancer shaft extending from the second journal to the third journal.

4,819,506

POWER TRANSMITTING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

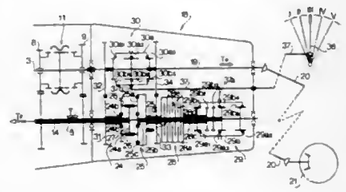
Rempei Matsumoto, Ohta, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1987, Ser. No. 72,159

Claims priority, application Japan, Jul. 18, 1986, 61-169272; Jul. 18, 1986, 61-169274; Jul. 29, 1986, 61-179216; Jul. 29, 1986, 61-179219

Int. Cl.⁴ F16H *37/06*

U.S. Cl. 74—665 T **5 Claims**



1. In a power transmitting system for a four-wheel drive vehicle having an engine, front and rear wheels, a transmission for transmitting power of the engine through a clutch, and a transfer device including a front power path to transmit output power of the transmission to the front wheels and a rear power path to transmit the output power to the rear wheels, respectively, the improvement wherein the transfer device comprises means comprising,

center differential means for permitting variable speed difference between the front and rear power paths, and

torque ratio providing means from providing a plurality of torque ratios between the front and rear power paths and a locking condition of the center differential means, and the transfer device further comprising

selecting means for selecting at least one of the plurality of torque ratios and the locking condition to select output conditions of the torque ratio providing means in accordance with at least one of driving conditions and a preference of a driver of the vehicle so as to improve driveability of the vehicle.

4,819,507

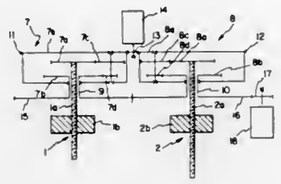
DEVICE FOR SIMULTANEOUSLY DRIVING THE SCREWS OF TWO PARALLEL SCREW-AND-NUT SYSTEMS

Michel Peacher, Ferrieres en Gatinais, France, assignor to Societe Redex, France

Filed Apr. 21, 1988, Ser. No. 184,577

Int. Cl.⁴ F16H *37/06*; B21B *31/24*

U.S. Cl. 74—665 GA **7 Claims**



1. A device for simultaneously driving the two screws of two parallel fixed-nut, screw-and-nut systems in equal amplitude translation in the same direction or in opposite directions, the device comprising two planetary gear trains each having two sun wheels and each having an outlet coupled to respective one of the two screws, wherein each screw is coupled to rotate with one of the sun wheels of the corresponding planetary gear train, with the planet carrier of each of them being coupled to the outlet shaft of a first motor in such a manner as to provide equal amplitude and same-direction rotation, and with the other sun wheels of the planetary gear trains being coupled to each other to rotate through the same amplitude in opposite directions under the effect of a second motor for driving one of them.

4,819,508

TRANSMISSION SYSTEM FOR WORKING VEHICLES

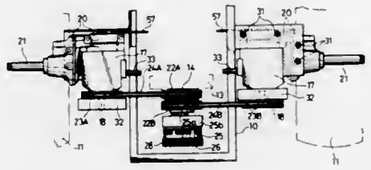
Kojiro Yamaoka, Nishinomiya, and Shusuke Nemoto, Yao, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Nov. 18, 1987, Ser. No. 122,276

Claims priority, application Japan, Dec. 5, 1986, 61-289999

Int. Cl.⁴ F16H *37/06, 47/00, 1/14*; B60K *17/356*

U.S. Cl. 74—665 GC **4 Claims**



1. A working vehicle comprising:

a frame;

an engine mounted on said frame, said engine including an engine output shaft which extends towards a rear of said frame;

a first and second rear wheel disposed outside of said frame at opposite sides of the rear of said frame and rotatably mounted on first and second axles respectively; and

a transmission assembly for transmitting the power of said engine to said first and second rear wheels with a continuously variable speed, said transmission assembly including:

a first hydrostatic transmission disposed at one of said transverse sides of the rear of said frame proximate the first rear wheel and a second hydrostatic transmission disposed at the opposite transverse side of said frame proximate the said second rear wheel, each of said hydrostatic transmissions including a transmission input shaft which extends from said hydrostatic transmission towards the rear of the vehicle, a transmission output shaft which extends from said hydrostatic transmission away from the rear of the vehicle, and

a control shaft extending from said hydrostatic transmission of the vehicle for controlling the transmission ratio of said hydrostatic transmission;

a first L-shaped gear box secured to said first hydrostatic transmission and a second L-shaped gear box secured to said second hydrostatic transmission, each of said gear boxes extending over front and outer side of the hydrostatic transmission to which it is secured, the front side of each hydrostatic transmission consisting of a side thereof which is farthest from the rear of said frame and the outer side of each hydrostatic transmission consisting of a side thereof which faces away from said vehicle, said transmission output shaft of said first hydrostatic transmission extending into the first gear box, said transmission output shaft of said second hydrostatic transmission extending into said second gear box, said first axle being journaled in said first gear box, said second axle being journaled in said second gear box, each of said gear boxes including therein:

a rotatable, intermediate shaft extending parallel with said transmission output shaft,

a first reduction gear train having a first spur gear fixedly mounted on said transmission output shaft and a second spur gear mounted on said intermediate shaft, said second spur gear meshing with said first spur gear,

and a second reduction gear train having a first bevelled gear fixedly mounted on said intermediate shaft and a second bevelled gear mounted on the wheel axle, said second bevelled gear meshing with said first bevelled gear; and

transmitting means for drivingly connecting the engine output shaft with the transmission input shafts of said pair of hydrostatic transmissions and wherein said transmission output shafts lie in a first plane, said axles lie in a second plane substantially the same as said first plane, a length of said engine output shaft lies in a third plane parallel to and separate from said first plane and said transmission input shafts lie in a forth plane parallel to and between said first and third planes.

4,819,509

HYDRODYNAMIC-MECHANICAL TRANSMISSION

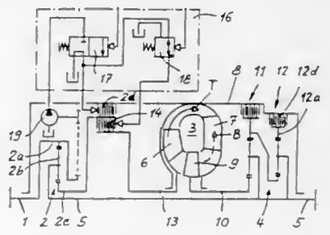
Elmar Rohne, and Gottfried Ruetz, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Aug. 4, 1987, Ser. No. 81,469

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1986, 3627370

Int. Cl.⁴ F16H *47/08*

U.S. Cl. 74—688 **18 Claims**



1. A hydrodynamic mechanical transmission for vehicles including motor vehicles, said transmission comprising:

an input drive shaft;

an output drive transmission; and

a differential gear unit connected to said input drive shaft and said output drive transmission; and

a hydrodynamic mechanical torque converter connected to said differential gear unit, said torque converter having a housing and including:

a pump located in said housing and adapted to rotate in response to output from said differential gear unit;

a stator located in said housing and positioned in communication with said pump, said stator being secured to said housing;

a turbine located in said housing and positioned in communication with said pump and said stator, said turbine adapted to rotate in response to output from said output transmission, wherein said turbine rotates in a direction opposite to the direction of rotation of said pump during a traction operation; and

a device for causing reversal of the direction of rotation of said turbine for braking the vehicle, and having an arrangement which during braking causes a controlled rotational motion of said pump of said torque converter which rotation is opposite to the rotation of said pump during traction.

4,819,510

THREE-ELEMENT MULTI-STAGE TORQUE CONVERTER

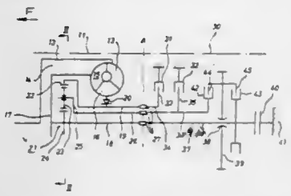
Kiyoharu Murakami, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Apr. 13, 1987, Ser. No. 37,677

Claims priority, application Japan, Apr. 15, 1986, 61-86677

Int. Cl.⁴ F16H *47/08, 57/10*

U.S. Cl. 74—688 **7 Claims**



1. A three-element multi-stage torque converter, wherein a turbine wheel adapted to be rotated by hydraulic power from a pump impeller and a stator wheel disposed therebetween are installed in a space formed by a housing to which an engine power is inputted and the pump impeller connected to the engine, an input side turbine shaft connected to said turbine wheel is disposed on a center line of said converter and is connected to a main output shaft, and a cylindrical stator shaft connected to the stator wheel is installed coaxially with and around said output side turbine shaft; characterized by that a planetary gear mechanism comprising a sun gear fixed to the turbine shaft, a planetary gear meshing with the sun gear, an internal gear fixed to the stator shaft and meshing with the planetary gear, and a planetary carrier carrying the planetary gear, is provided in said space; and a cylindrical carrier shaft coaxial with and around said turbine shaft is fixed to the planetary carrier.

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ACTIVATION APPARATUS FOR A DIFFERENTIAL PAWL WITH AN ACTUATOR

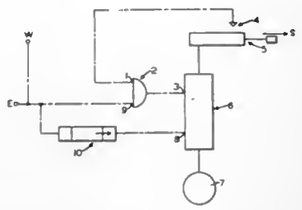
Horst Deike, Clausen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 30, 1987, Ser. No. 44,912

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614863

Int. Cl.⁴ F16H *1/44*

U.S. Cl. 74—711 **22 Claims**



1. An activation apparatus for a differential pawl, said activation apparatus comprising:

(a) an actuator which is movable in an engagement position of such differential paul by an energy supply;

(b) a control logic circuit to control said energy supply, said control logic circuit including a first and a second signal input, the first of these inputs receiving a wheel slip signal which is a function of a wheel slip;

(c) a timing element to which said wheel slip signal is fed as an input signal;

(d) said timing element being capable of emitting an output signal which is fed to said second signal input of said control logic circuit;

(e) said control logic circuit being designed so that when only its second signal input receives a signal it will release energy to said actuator; and

(f) said timing element emitting said output signal when fed with said wheel slip signal and continues to emit said output signal for a pre-determined break delay after said wheel slip signal has disappeared.

4,819,512

DIFFERENTIAL GEAR FOR A TWO WHEEL OR FOUR WHEEL DRIVE VEHICLE

Hitoshi Azuma, Toyota, and Hitoshi Mizutani, Aichi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 26, 1987, Ser. No. 53,682

Claims priority, application Japan, May 26, 1986, 61-119060; Jun. 10, 1986, 61-132718; Jun. 17, 1986, 61-139169; Jun. 24, 1986, 61-146128; Jun. 24, 1986, 61-146129

Int. Cl.⁴ F16H *1/40*

U.S. Cl. 74—713 **10 Claims**

1. A differential gear comprising:

first and second cases supported rotatably about a co-axis and spaced axially from each other;

pinions disposed rotatably in each of said cases;

first and second side gears meshing with the pinions and disposed rotatably in each of said cases;

a first shaft supported rotatably about the co-axis of said cases and extending from the second side gear in the first case to the first side gear in the second case;

a second shaft supported rotatably about the co-axis and extending from the first side gear in the first case;

a third shaft supported rotatably about the co-axis and extending from the second side gear in the second case in the opposite direction to said second shaft;

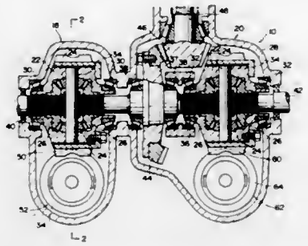
driven means provided in one of said first, second and third shafts;

first rotary means for rotating said driven means to transmit driving force to said first, second and third shafts;

a first worm wheel provided in the first case;

a second worm wheel provided in the second case;

second rotary means having a first worm meshing with the first worm wheel;



third rotary means having a second worm meshing with the second worm wheel; and

a control device for calculating, on the basis of signals from a steering angle sensor and a vehicle speed sensor, the number of revolutions of at least one of said second and third rotary means.

4,819,513

TRANSMISSION RATIO CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

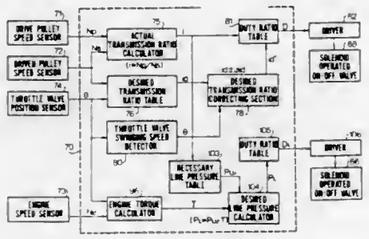
Yoshihiko Morimoto, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1987, Ser. No. 31,947

Claims priority, application Japan, Mar. 31, 1986, 61-073689

Int. Cl.⁴ B60K *41/18*

U.S. Cl. 74—866 **13 Claims**



1. A control system for a continuously variable transmission for transmitting power of an internal combustion engine to driving wheels of a motor vehicle, the transmission having a drive pulley including a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley including a shiftable disc and a belt engaged with both pulleys, the control system including a transmission ratio control valve having ports and a spool, and a first hydraulic circuit having a pump for supplying oil to the first hydraulic cylinder through the transmission ratio control valve, the control system further comprising:

first detecting means for producing a first speed signal representing input speed of the transmission;

second detecting means for producing a second speed signal representing output speed of the transmission;

third detecting means for detecting load on the engine and for producing a load signal;

first means responsive to the first and second speed signals for producing an actual transmission ratio signal;

second means responsive to the load signal and to the second speed signal for producing a desired transmission ratio signal;

a memory storing a plurality of control signals which are arranged in accordance with desired transmission ratio signals and actual transmission ratio signals divided into an upshift region and downshift region in dependency on both the ratio signals being different;

one of said control signals being derived from the memory in response to and in accordance with the desired transmission ratio signal and the actual transmission ratio signal;

third means responsive as a function of said one control signal for shifting the spool of the transmission ratio control valve so as to provide a transmission ratio; and

said memory having a desired transmission ratio correction section storing a plurality of corrected desired transmission ratio signals which are arranged in accordance with desired transmission ratio signals and actual transmission ratio signals divided into an upshift region and downshift region in dependency on both the latter ratio signals being different, said memory further includes another section storing said plurality of control signals arranged in accordance with corrected desired transmission ratio signals and actual transmission ratio signals.

4,819,514

PULLEY ACTUATING HYDRAULIC PRESSURE CONTROL FOR CONTINUOUSLY VARIABLE TRANSMISSION

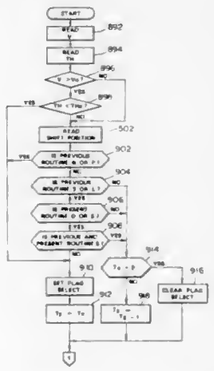
Sigeaki Yamamuro, Zushi, and Haruyoshi Kumura, Kamakura, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 17, 1987, Ser. No. 74,984

Claims priority, application Japan, Jul. 25, 1986, 61-173727

Int. Cl.⁴ B60K *41/12*

U.S. Cl. 74—868 **5 Claims**



1. A hydraulic pressure control system for a continlusly variable transmissiom drivingly connected to an engine of an automotive vehicle, the continously variable transmission including a transmission belt drivingly connected between a driver pulley and a follower pulley which are hydraulically actuatable, said control system comprising:

a manual selector valve having a plurality of forward drive positions and being shiftable in a first direction from one to the other of two forward drive positions selected from said plurality of forward drive positions and in a second direction opposite to said first direction from said other to said one of said two forward drive positions selected;

means for generating a pulley actuating hydraulic fluid pressure;

means for hydraulically actuating the driver pulley and the follower pulley in response to said hydraulic fluid pressure in such a manner as to effect an upshifting in a reduction ratio between the driver and follower pulleys in response to said manual selector valve having been shifted in said first direction from said one to said other of said two forward drive positions selected; and

control means for causing said hydraulic fluid pressure generating means to temporarily increase the level of said hydraulic fluid pressure whenever said manual selector valve is shifted in said first direction from said one to said other of said two forward drive positions selected.

4,819,515

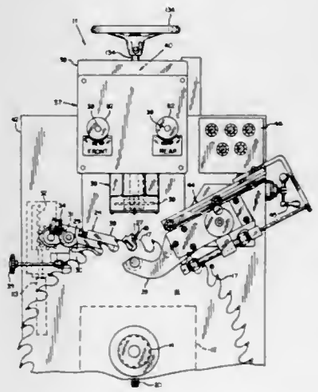
METHOD AND APPARATUS FOR GRINDING SAW TEETH

James R. Pfaltzgraff, Beaverton, Oreg., assignor to Armstrong Manufacturing Company, Portland, Oreg.

Filed Jun. 26, 1987, Ser. No. 67,523

Int. Cl.⁴ B24B *49/04*; B23D *63/14*

U.S. Cl. 76—41 **20 Claims**



1. Apparatus for grinding the working portion of a tool to a preselected dimension comprising:

securing means for positioning said working portion in a grinding position;

grinding means for grinding said working portion, said grinding means being mounted for movement toward and away from said grinding position;

measuring means for measuring a dimension of said working portion to be ground by said grinding means, said measuring means being mounted for movement toward and away from said grinding position;

first feed means for feeding said grinding means toward and away from said grinding position;

second feed means for feeding said measuring means toward and away from said grinding position; and

control means operable to sequentially:

(a) operate said first feed means to feed said grinding means into said grinding position to grind said working portion to a first dimension and then feed said grinding means away from said grinding position;

(b) operate said second feed means to feed said measuring means into said grinding position to measure the first dimension of the working portion and then feed said measuring means away from said grinding position;

(c) compare said first dimension to said preselected dimension; and

(d) repeat functions (a), (b), and (c) in sequence to grind,

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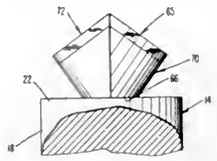
measure and compare subsequent ground dimensions of said working portion until the ground dimension substantially equals the preselected dimension.

4,819,516

METHOD OF FORMING A CUTTING ELEMENT HAVING A V-SHAPED DIAMOND CUTTING FACE

Mahlon D. Dennis, Kingwood, Tex., assignor to Diamant Boart-Stratabit (USA) Inc., Houston, Tex.

Filed Jan. 7, 1988, Ser. No. 141,533
Int. Cl.[4] B21K *5/02*
U.S. Cl. 76—101 R **12 Claims**



1. A method of forming a cutting member comprising the steps of:

(A) providing a blank including:

(A1) a substrate having a front surface, a rear surface, and a side surface interconnecting said front and rear surfaces, and

(A2) a diamond layer disposed on said front surface, said diamond layer including an exposed cutting surface,

(B) cutting two similar segments from said blank along first and second cut lines, each cut line extending from adjacent an outer peripheral edge of said rear surface to a location on said exposed cutting surface disposed adjacent a longitudinal center point thereof, said cut lines forming equal acute angles with said exposed cutting surface, each said segment being three-sided and including:

(B1) a curved side defined partially by said side surface of said substrate and partially by said diamond layer,

(B2) a flat front side formed by a segment of said exposed cutting surface, and

(B3) a flat base side formed by cut-off surfaces of said substrate and diamond layer,

(C) joining said base sides together wherein said cutting surfaces are contiguous and form therebetween an included angle less than 180 degrees, and

(D) truncating said segments along a third cut line extending through said curved sides and transversely of said base sides to form a mounting surface defined partially by each said segment.

4,819,517

SELECTED BEARING COUPLE FOR A ROCK BIT JOURNAL AND METHOD FOR MAKING SAME

Edward Vezirian, P.O. Box 2255, Vista, Calif. 92083

Filed Jul. 5, 1988, Ser. No. 215,050
Int. Cl.[4] B21K *5/02*
U.S. Cl. 76—108 A **2 Claims**

1. A method to provide a preselected bearing couple at a rotary interface of a rock cutting cone with a load bearing journal in a rotary cone rock bit comprised of steps;

choosing a material for said bearing couple,

forming a thin walled bushing to near net shape from said material,

heat treating said bushing as required,

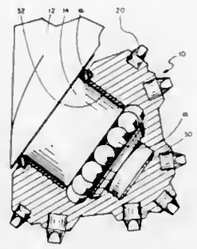
finish forming said bushing, providing for an interference fit with a bore formed within said rock cutting cone,

providing a high heat capacity fixture, said fixture to emulate said load bearing journal shaft,

fixturing said bushing on said fixture,

establishing a predetermined temperature differential between said rock cutting cone and said fixture with said bushing attached,

assembling said fixtured bushing to said rock cutting cone, allowing said differential temperatures to equalize,



removing said fixture from assembly,

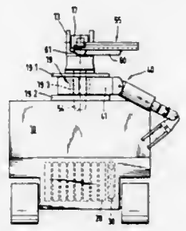
assembling said load bearing journal shaft to said rock cutting cone, said rock cutting cone having said bearing bushing installed therewithin.

4,819,518

LOADING SYSTEM FOR CONTAINERS HOLDING CARTRIDGED AMMUNITION

Klaus-Dieter Pahnke, Solingen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 21, 1988, Ser. No. 146,697
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702603
Int. Cl.[4] F41F *9/04, 9/06*
U.S. Cl. 89—46 **13 Claims**



1. In a loading system for containers holding ammunition in an armored vehicle having a tubular weapon composed of a gun cradle and a barrel having a bore axis, the weapon being mounted in a top gun mount which is rotatable about an azimuth axis, which system includes a first transporting device for transporting a container from a magazine holding a plurality of containers and disposed in a rear section of the armored vehicle into a loading position behind the top gun mount, the improvement wherein:

(a) said system comprises a plurality of such containers, each composed of at least two cells, each said cell accommodating a respective cartridge, and connecting means for connecting said cells in a form and force locking manner for transport to the loading position;

(b) said first transporting device comprises a combined depositing and conveying device which is fixed on the gun cradle and extends transversely to the bore axis of the gun barrel, said combined device including means for transporting the cells of a said container to an insertion position aligned with the bore axis; and

(c) said system further comprises a second transporting device composed of a basic body rotatable about the azimuth axis of the top gun mount independently of the

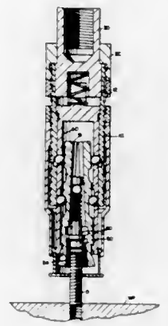
rotation of the top gun mount about the azimuth axis, a gripping device for gripping a container in the rear section magazine of the armored vehicle, and means including at least four further members arranged one behind the other in a multiple joint arrangement connecting said gripping device to said basic body.

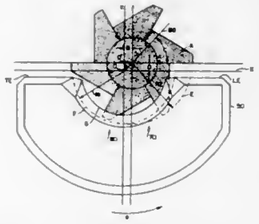
4,819,519

AUTOMATIC STUD DRIVER HAVING THREAD RELIEF FOR HIGH TORQUE APPLICATIONS

John A. McKean, Fairview, Pa., assignor to Titan Tool Company, Fairview, Pa.

Filed Feb. 2, 1988, Ser. No. 151,559
Int. Cl.[4] B25B *19/00*
U.S. Cl. 81—53.2 **16 Claims**





1. An automatic stud driver comprising:

a plurality of stud gripping and rotationally driven jaws, each of said jaws having a leading edge area and a trailing edge area with reference to a rotational direction of said jaws;

said plurality of jaws forming a substantially cylindrical assembly having a central longitudinal axis, a transverse cross-section of each jaw defining an arc of a circle having a thread center point located along said center longitudinal axis, said thread center point defining an intersection of first and second mutually orthogonal transverse axes, one of said transverse axes centrally dividing said arc to define said leading edge area and trailing edge area;

each of said jaws having an internal thread with a predetermined radius R1 originating from said thread center point;

only the leading edge area of each of said jaws having thread relief with a radius R2 originating from a thread relief center point located at a distance b from the thread center point in a direction away from the trailing edge area of said jaw;

wherein R2 and b satisfy the following equations:

$$R2=(0.75 \text{ to } 1.5)\times R1$$

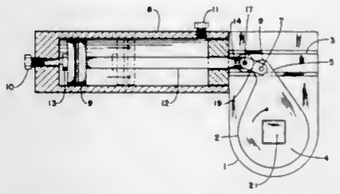
$$b=(0.2 \text{ to } 0.5)\times R2.$$

4,819,520

STATIONARY CYLINDER TORQUE WRENCH

Bob W. Collins, New Orleans, La., assignor to Power Tork Hyraulics, Inc., New Orleans, La.

Filed Apr. 23, 1987, Ser. No. 41,682
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—57.39 **12 Claims**



1. A stationary cylinder, hydraulic wrench for applying torque to a workpiece, comprising:

(a) a wrench housing;

(b) a lever arm within said wrench housing, said lever arm having a pivoting end engaged with said wrench housing, said lever arm further having a traveling end with a convex edge;

(c) a cylinder fixedly connected to said wrench housing, said cylinder positioned so that the axis of said cylinder lies in the same plane as the plane of movement defined by an arc made by said traveling end of said lever arm;

(d) a piston slidable within said cylinder;

(e) a piston rod, having one end connected to said piston and said piston rod further having a distal end extending into said wrench housing said distal end having a convex edge in slidable contact with said convex edge of said traveling end of said lever arm;

(f) a rigid retraction bar pivotally connected at one end to said distal end of said piston rod and pivotally connected at an opposite end to said traveling end of said lever arm;

(g) a track, fixedly connected within said wrench housing and extending longitudinally along the same axis as said cylinder;

(h) a roller, traveling within said track and connected to said distal end of said piston rod; and

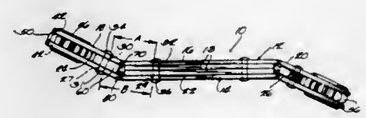
(i) a means for connecting said pivoting end of said lever arm to a workpiece.

4,819,521

RATCHET BOX WRENCH WITH OFFSET HANDLE

John W. Lang, Racine, Wis., assignor to A & E Manufacturing Company, Racine, Wis.

Continuation of Ser. No. 375,419, May 6, 1982, Pat. No. 4,748,875. This application Mar. 16, 1988, Ser. No. 168,688
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—63 **1 Claim**

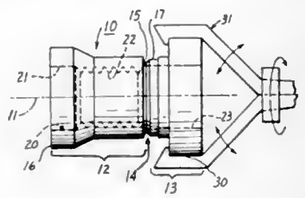


1. In a wrench having opposed upper and lower plates defining a plate handle portion with spacers separating the plates, sockets, and said plates having integral plate head portions with socket apertures at the ends of the handle portion for receiving and supporting said sockets, and said plate head portions having rivet apertures and said upper plate head portion forming a first juncture with said upper plate handle

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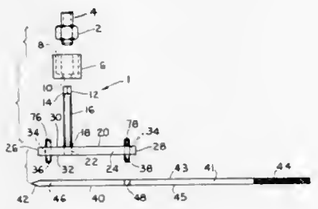
portion and said lower plate forming a second juncture with said lower plate portion and wherein said sockets are provided with peripheral teeth, and ratchet means for locking said socket against rotation in one of clockwise or counter-clockwise direction while permitting ratcheting movement in the other of the clockwise and counter-clockwise direction, said ratchet means including a pawl having corners engageable with said peripheral teeth, said pawl being pivotally supported by the socket plate head portions, the improvement wherein said head portions are offset at an oblique angle with respect to said plate handle portion, said angle facilitating manipulation of said wrench and providing clearance beneath the wrench for the user's fingers, and said pawl having a pawl part oppositely located with respect to said sockets and movable in an arc at the juncture of said plate head portions and said plate handle portion and between said plates, and a spring-loaded plunger projecting longitudinally from said handle portion into said juncture and engageable with said pawl part in said juncture to lock said ratchet means in the selected position for the desired torqueing direction, and wherein said pawl is supported by a rivet extending through rivet apertures in said upper and lower plate head portions, said rivet also securing said upper and lower plates together, and wherein the spacing of the rivet aperture on the upper plate portion from said first juncture is less than the spacing of the rivet aperture in said lower plate portion from said second juncture and wherein said plates are sized and rivet apertures spaced from the socket apertures so that when the plates are assembled the socket apertures and rivet apertures are aligned.

4,819,522
TORQUE-OFF COLLAR FOR INSTALLATION BY UNIVERSAL EQUIPMENT
Dennis D. Stinson, Whittier, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.
Filed Sep. 10, 1987, Ser. No. 95,354
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—113 **5 Claims**



1. In a torque-off collar of the type which comprises: a unitary body having a central axis, a driven section, a driver section, and a shear section interconnecting said driven section and said driver section, an axial passage extending from end to end through said body, a first counterbore in the passage adjacent the free end of the driven section, an internally threaded portion in said driven section, and an unthreaded second counterbore at the free end of the driver section, in that order, said shear section constituting the region of least resistance to torque between the driver section and the free end of the driven section, the second counterbore extending through said driver section and through said shear section, the improvement comprising: a circular exterior surface on said driver section centered on said axis adapted to be gripped by a torque tool at any rotational angle around said axis, said exterior surface having a diameter.

4,819,523
LUG NUT WRENCH
Alejandro Y. Souza, 2956 Numana Rd., Honolulu, Hi. 96819
Filed Apr. 27, 1987, Ser. No. 42,820
Int. Cl.[4] B25B *23/16*
U.S. Cl. 81—177.2 **12 Claims**

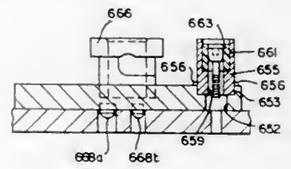


1. Lug nut wrench apparatus having a plate approximately eight inches by one inch by one-sixteenth inch, a pipe approximately five inches in length fixed at one end in perpendicular arrangement to the plate at a position about two inches from a longitudinal end of the plate and six inches from a second longitudinal end of the plate, first and second studs extending from the plate on a second side thereof opposite a first side from which the pipe is extended, the first and second studs being positioned near first and second longitudinal ends of the plate, the pipe terminating outwardly opposite the plate in a driving means for driving a lug nut receiving socket, a leverage bar about 18 inches in length and having a first proximal end tapered to an edge for removing a hub cap cover and having a second distal end and handle means at the second distal end and having a first stud receiving opening near the first proximal end for receiving the first stud and having a second stud receiving opening spaced along the leverage bar from the first opening toward the handle and positioned for receiving the second stud whereby the leverage bar may be connected to the leverage plate with the openings in the leverage bar receiving the studs mounted on the plate for turning the plate, the pipe and a lug nut receiving socket attached to the pipe in a tightening direction when a first side of the leverage bar is adjacent the second side of the plate with first opening receiving the first stud and the second opening receiving the second stud and whereby the leverage bar, plate, pipe and lug nut receiving socket attached to the pipe may be turned in a lug nut loosening direction when a second side of the leverage bar is adjacent the second side of the plate with the second opening near the end of the leverage bar receiving the first stud and the first opening of the leverage bar receiving the second study, whereby in the second loosening position of the leverage bar, the handle is positioned at a greater distance from the pipe than when the leverage bar is in the first tightening position.

4,819,524
SCREW INSTALLATION PLATE FOR USE IN A FUEL ASSEMBLY REPAIR AND RECONSTITUTION SYSTEM
Ralph W. Tolino, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 916,683, Oct. 8, 1986, Pat. No. 4,724,636.
This application Aug. 19, 1987, Ser. No. 88,768
Int. Cl.[4] G21C *19/00;* **B25B** *23/02*
U.S. Cl. 81—488 **2 Claims**

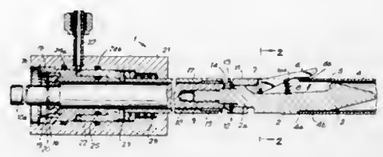
1. An apparatus for remotely delivering and for aligning a pattern of screws over the thimble screw holes of a bottom nozzle of a fuel assembly, comprising a plate having a pattern of bores registrable with said screw holes, a sleeve of resilient material mounted over each bore for receiving, retaining and aligning the threaded end of a screw with one of said screw holes, means for mounting each resilient sleeve over its respective screw hole including a tubular member having an annular recess for receiving said sleeve of resilient material, alignment

plate means registrable with pre-existing bores in the nozzle for aligning the bores in the plate with the screw holes in the



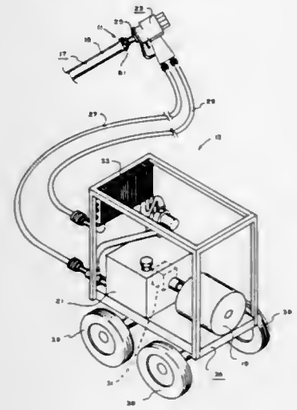
nozzle, and a collar means connected to said plate for facilitating the remote handling and positioning of the plate over the nozzle of a fuel assembly.

4,819,525
ROTARY CUTTING TOOL DEVICE AND METHOD FOR USE
George B. Rabe, Sparta, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.
Continuation of Ser. No. 832,545, Feb. 24, 1986, abandoned. This application Mar. 30, 1987, Ser. No. 32,960
Int. Cl.[4] B23D *13/02*
U.S. Cl. 82—1.11 **16 Claims**



1. A rotary cutting tool useful for remotely machining tube ends, comprising:
(a) an elongated main body having a central portion, a reduced diameter front end portion, and a reduced diameter rear portion, said body having at least one longitudinal groove formed therein;
(b) a cutting blade provided within each said groove, said blade being pivotally attached at its rearward end to the central portion of said main body, said blade having an inner radial cutting surface provided at the blade forward end and adapted for machining the outside surface of a tube;
(c) a cylindrical collar located around the rear portion of said main body and being slidable relative to the body, said collar being in contact with the rearward end of each said cutting blade;
(d) first spring means located in each said groove between the groove bottom and said cutting blade therein, said first spring means adapted for forcing said pivotable cutting blade outwardly from said body;
(e) an elongated shaft means connected to the rear portion of said body;
(f) second spring means encircling said body rear portion and located between said cylindrical collar and said shaft, said second spring means being adapted for limiting the outward pivotal movement of said cutting blade; and
(g) actuating means attached to said main body rear portion by an elongated sleeve surrounding said elongated shaft means for providing axial movement fo said cylindrical collar through said second spring means, whereby said tool body front end portion can be remotely inserted into a tube end and each cutting blade pivotably adjusted to contact the outerside of the tube end, after which the cutting tool is rotated to remotely machine the tube end to a desired shape.

4,819,526
CUTTING TOOL AND SYSTEM
Samuel C. Geise, Memphis, Tenn., assignor to Specialty Tool Company, Memphis, Tenn.
Continuation-in-part of Ser. No. 831,168, Feb. 20, 1986, abandoned. This application Jun. 12, 1986, Ser. No. 873,612
Int. Cl.[4] B23B *3/22, 5/16*
U.S. Cl. 82—113 **23 Claims**



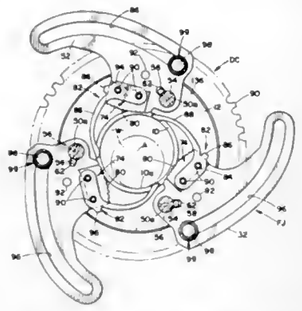
1. A hand-held system for use by a workperson in cutting a precise angle into the end of a fixed, non-movable boiler tube, said system comprising:
(a) a cutting tool; and
(b) a freely movable hydraulic motor for being hand-held by the workperson and for rotating said cutting tool at a speed of at least 3,000 revolutions per minute; said cutting tool including:
(1) pilot means insertable into the end of the tube for rotation within the end of the tube and for maintaining the axis of said cutting tool aligned with the axis of the end of the tube as said cutting tool is rotated;
(2) a plurality of spaced apart cutting means engaging the end of the tube for cutting a precise angle into the end of the tube as said cutting tool is rotated and for removing no more than 0.002 of an inch from the end of the tube per revolution, each of said cutting means having a small clearance angle to limit the maximum cut thereof to 0.002 of an inch; and
(3) body means attached to said cutting means, said pilot means and said hydraulic motor for rigidly joining said cutting means to said pilot means and said hydraulic motor.

4,819,527
THREADING MACHINE CHUCK
James C. Redman, Amherst, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.
Filed Nov. 23, 1987, Ser. No. 123,719
Int. Cl.[4] B23B *5/22*
U.S. Cl. 82—165 **29 Claims**

1. A workpiece chuck comprising, spindle tube means having a spindle axis and axially spaced apart front and rear ends, front and rear workpiece jaw members, means respectively supporting said front and rear jaw members on said front and rear ends of said spindle tube means for pivotal displacement about corresponding jaw member axes parallel to said spindle

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axis, drive means for pivotally displacing said front and rear jaw members about said jaw member axes radially inwardly and outwardly of said spindle axis, said spindle tube means having an inner periphery and said front and rear jaw members being pivotal inwardly and outwardly of said spindle axis between closed and open positions, said jaw members including workpiece engaging means, said workpiece engaging means in said closed positions of said jaw members engaging a



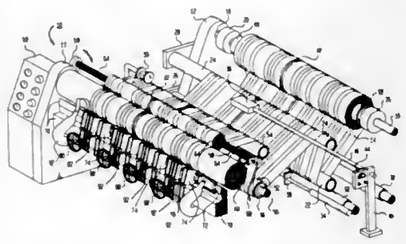
workpiece extending through said spindle tube means in a centered position with respect to said spindle axis, said workpiece in said open positions of said jaw members being in a resting position against said inner periphery, and means separate from said workpiece engaging means and pivotal with said front and rear jaw members for displacing said workpiece from said resting to said centered position during pivotal movement of said jaw members from said open to said closed positions thereof.

4,819,528

RIBBON CUTTING APPARATUS HAVING MULTIPLE, INDEPENDENTLY DRIVEN GROUPS OF CUTTING BLADES

Arthur Chadwick, Mt. Vernon, N.Y., assignor to Essex Manufacturing Company, New York, N.Y.

Filed Dec. 3, 1987, Ser. No. 128,334
Int. Cl.⁴ B26D *1/03*; B26H *7/14*
U.S. Cl. 83—13 **15 Claims**



1. A ribbon cutting apparatus for cutting ribbons from a web of patterned material having at least one reference mark located in the patterned portion of said material, said apparatus comprising:
- a frame;
- a platen attached to said frame;
- a plurality of cutter blades;
- at least a first and second blade carrying means attached to said frame for carrying at least three cutter blades each such that the cutter blades carried by said first and second blade carrying means are separated by at least one ribbon width from each other; and,
- blade carrier positioning means for independently positioning said first and second blade carrying means on opposite sides of said reference mark as said web of patterned material travels over said platen,
- wherein said blade carrier positioning means independently positions said first and second blade carrying means to adjust for changes in said web of material.

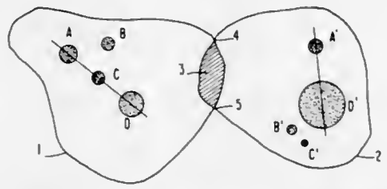
15. A method for cutting ribbons from a web of patterned material having at least one reference mark located in the patterned portion of said material, said method comprising the steps of:
- running said web of material over a platen;
- detecting said reference mark as it travels over said platen;
- positioning a first group of blade carrying means including at least a first blade carrying means having at least three circular blades thereon separated by a ribbon width from each other to one side of said traveling reference mark;
- positioning a second group of blade carrying means including at least a second blade carrying means having at least three circular blades thereon separated by a ribbon width from each other to the side of said traveling reference mark opposite from said first group of blade carrying means;
- bringing said circular blades of said first and second groups of blade carrying means into contact with said web thereby cutting ribbons from said web on both sides of said traveling reference mark; and
- independently repositioning at least one of said blade carrying means to adjust for changes in the pattern of said web.

4,819,529

METHOD OF CUTTING OUT SHEET OR PLATE MATERIAL

Jean-Marc Loriot, 15 rue Lakanal, 75015 Paris, France

Filed Nov. 13, 1986, Ser. No. 929,890
Claims priority, application France, Nov. 13, 1985, 85 16721
Int. Cl.⁴ B26D *5/00*
U.S. Cl. 83—32 **6 Claims**



1. A method of cutting parts out from sheet or plate material, the method comprising the steps of:
- placing templates having the shapes and sizes of the said parts upon said sheet or plate of material;
- recognizing the respective shapes, sizes, orientations, and positions of the templates on the material by means of distinctive signs characteristic of the shapes and sizes of the respective templates;
- a first cutting step of cutting out parts from said sheet or plate material along outlines defined by said templates in areas not overlapped by two or more of said templates;
- detecting any overlaps between templates;
- determining one or more modified lines of cut where the templates have been detected to overlap according to a selected cutting mode line selected from a first cutting mode line of a straight line interconnecting the points of intersection between outlines of said overlapping temples, a second cutting mode line of an average line equidistant from the outlines of the templates between the points of intersection of the outlines of the overlapping templates, and a third cutting mode line of the outline of one or other of the overlapping templates;

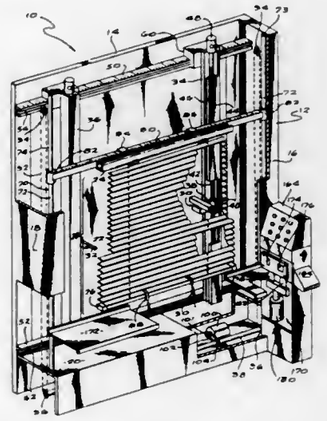
- selecting one of said first, second and third cutting mode lines for each detected overlap as a function of the types of the overlapping templates and of the portions of template outlines concerned; and
- a second cutting step of cutting out parts from said sheet or plate material along said modified line of cut.

4,819,530

APPARATUS AND METHOD FOR TRIMMING A VENETIAN BLIND ASSEMBLY

Chung-Chen Huang, Taipei, Taiwan, assignor to Teh Yor Industrial Co., Ltd., Taipei, Taiwan

Filed May 13, 1987, Ser. No. 49,608
Claims priority, application Australia, Nov. 17, 1986, 65195/86; Nov. 24, 1986, 64371/86
Int. Cl.⁴ E06B *9/266*
U.S. Cl. 83—39 **19 Claims**



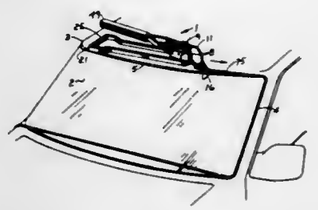
10. A method for trimming very generally planar slats of standard size and shape preassembled in a standard venetian blind, comprising the following steps, wherein the directions "normal" and "parallel" as recited in any step are taken with respect to the plane of a slat identified in the same step:
- (a) supporting the preassembled blind;
- (b) while the standard blind remains preassembled, providing relative normal alignment between a cutter and a particular one of the slats; and then
- (c) while the standard blind remains preassembled, providing relative parallel juxtaposition between the cutter and the particular slat with which the cutter is now normally aligned;
- (d) then while the standard blind remains preassembled, operating the cutter to cut that particular slat to a custom size;
- (e) then while the standard blind remains preassembled, effecting relative parallel motion between the cutter and that particular slat, to provide clearance for relative normal motion of the cutter and that particular slat;
- (f) then while the standard blind remains preassembled, providing relative normal alignment between the cutter and another particular uncut slat;
- (g) then repeating steps (c) through (e) with respect to the just-mentioned other particular uncut slat, thereby cutting that slat to substantially the same custom size;
- (h) then repeating steps (f) and (g) in turn, with respect to slats or a slat remaining uncut before each repetition, until all the slats of the blind have been cut; except that after cutting the last slat the repetition of the clearing step (e) may be omitted.

4,819,531

CUTTING APPARATUS AND METHOD FOR SEPARATING A VEHICLE GLAZING SEAM

Stephen C. Lawhon, 916 N. 19th St., St. Joseph, Mo. 64501

Filed Oct. 9, 1987, Ser. No. 107,024
Int. Cl.⁴ B26D *3/00, 3/10*; B26B *7/00*
U.S. Cl. 83—56 **19 Claims**



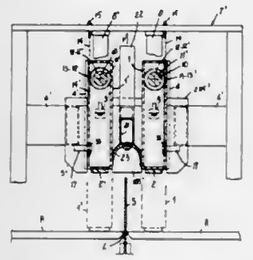
15. A method of separating a seam with a cutting tool including a blade rigidly connected to a winch and a cable, which comprises the steps of:
- (a) anchoring the cable with the cutting tool in proximity to the seam;
- (b) inserting the blade in said seam; and
- (c) operating said winch to retract said cable to advance said winch and blade whereby said blade is advanced through said seam.

4,819,532

SAWING MACHINE

deceased Benuzzi, late of Bologna, Italy, and by Piergiorgio Benuzzi, heir-at-law, 5 Via Angelo Castode, Bologna, Italy

Filed May 9, 1986, Ser. No. 861,396
Claims priority, application Italy, May 10, 1985, 15170/85[U]
Int. Cl.⁴ B27B *5/06*
U.S. Cl. 83—100 **3 Claims**

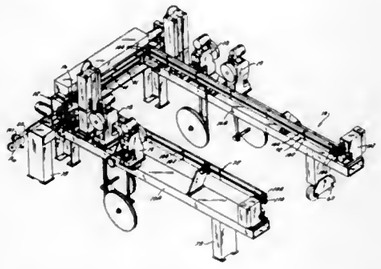


1. A sawing machine for cutting workpieces such as panels or packs of panels (P), of the type comprising a horizontal workpiece support table (A) having a straight longitudinal slot (L) defining a cutting line, a sawing tool (S) movable along said cutting line and a longitudinal pressure device arranged above said workpiece support table and extending along the entire length of said cutting line, wherein said pressure device consists of two pressure beams (1, 1') arranged at both sides of said cutting line, parallel thereto, and comprising means for raising and lowering each pressure beam (1, 1') independently of the other, and an auxiliary beam (21) arranged between said two pressure beams (1, 1') parallel thereto and fixed with respect thereto, said auxiliary beam having on its bottom, at both sides facing said two pressure beams (1, 1') a longitudinal sealing element (23) extending for the entire length of said auxiliary beam and contacting said inner faces of said pressure beams (1, 1') in such a manner as to form a duct (C) along which said

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sawing tool (S) is moved, said duct (C) being connected to a suction source (22) for removing saw dust.

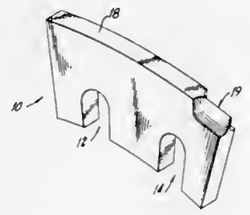
4,819,533
WIRE PROCESSING APPARATUS HAVING PUSHBAR AND CONVEYOR MECHANISMS
Kenneth Wollermann, Mukwonago; Ragnar Gudmestad, Waukesha; Terry R. Kroening, Cedarburg, and John E. Conrardy, Jackson, all of Wis., assignors to Artos Engineering Company, New Berlin, Wis.
Filed Aug. 11, 1987, Ser. No. 84,688
Int. Cl.[4] B26D *7/06*; B65G *15/14*
U.S. Cl. 83—154 **16 Claims**



1. Wire processing apparatus comprising:
a wire selector/feed mechanism (12) comprising a wire selector device and a wire feed device, said wire selector device comprising a pair of spaced apart rotatable plates for releasably supporting a plurality of wire strands and means for rotating said plates to present a selected one of said strands to said wire feed device which is located between said plates and which operates to advance the selected strand along a first path;
a wire insertion mechanism (14) comprising a wire guide having a passage co-axial with said first path for receiving said selected strand and further comprising two extendable/retractable pushbars operable by two separately operable pushbar actuators for laterally expelling a wire from said passage;
a cutter mechanism (16) between said wire selector/feed mechanism (12) and said wire insertion mechanism (14) and operable by one of said pushbars to cut a wire segment from said strand;
and a conveyor mechanism (10) for receiving and conveying a wire segment laterally expelled from said passage along a second path transverse to said first path with said wire segment disposed transverse to said second path,
said conveyor mechanism comprising a pair of laterally spaced apart conveyor units, each unit having a support and a flexible belt type conveyor assembly mounted on said support and into which an end of a wire segment is inserted by a pushbar, said conveyor mechanism further comprising means to adjustably position a flexible belt type conveyor assembly relative to its respective support.

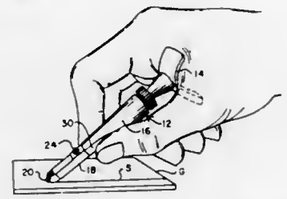
4,819,534
REMOVABLE KNIVES FOR PUNCHING CARDBOARD SLOTS
Frades Sanchez, 3625 E. 10 Ave., Hialeah, Fla. 33013
Filed Mar. 25, 1988, Ser. No. 173,659
Int. Cl.[4] B31B *1/22*; B26D *3/14*
U.S. Cl. 83—671 **4 Claims**

1. A knife assembly for punching slots through cardboard sheets and being removably mounted on a rotating wheel, comprising:
A. a flat arc section having two ends and a flat outer edge for punching slots in said sheet and having an inner end that includes at least one bay, and said outer end including a sharpened section so that a slit terminates the punched slot; and



B. fastening means for removably mounting said arc section to said wheel.

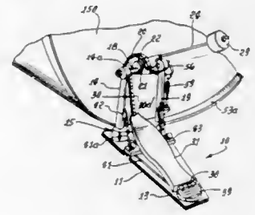
4,819,535
GLASS CUTTING APPARATUS
Carroll M. Thomas, P.O. Box 7418, Boulder, Colo. 80306
Filed Sep. 25, 1987, Ser. No. 100,978
Int. Cl.[4] C03B *33/12*
U.S. Cl. 83—880 **22 Claims**



1. A hand held glass cutting apparatus for use in scoring glass including:
an elongated body portion having an external surface, a front end, a back end, a length dimension, and an axial center line, said front end designed to receive and secure a glass scoring element; and
a handle member secured to said back end of said body portion, said handle member including a portion extending at an angle to said axial center line of said body portion, as projected beyond said back end, said extended portion of said handle member being designed and shaped to fit in the hand of a user in the crotch formed between the thumb and forefinger, with the portion which is to rest in the crotch of the hand between the thumb and forefinger being substantially flat to provide a comfortable fit with that portion of a user's hand.

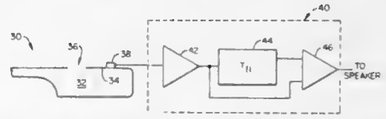
4,819,536
DRUM PEDAL MOVEMENT RESPONSIVE DEVICE TO PRODUCE ELECTRICAL SIGNAL
Donald G. Lombardi, 2118 E. Hillcrest Dr., Thousand Oaks, Calif. 91360
Continuation-in-part of Ser. No. 001,356, Jan. 8, 1987, Pat. No. 4,756,224. This application Dec. 14, 1987, Ser. No. 132,892
Int. Cl.[4] G10D *13/02*; G10H *1/46*
U.S. Cl. 84—1.01 **19 Claims**

14. In a drum beating assembly the combination comprising:
(a) a base in the form of a metal plate, a first drum beater, a support for the beater mounted on the base, and a pedal pivotally mounted to the base and operatively connected to the beater to pivot same as the pedal is pivoted by the drummer's foot,
(b) and means located beneath and proximate the pedal to sense downward movement of the pedal to predetermined downward position, and to produce an electrical signal usable to effect production of phenomena corresponding to a drum beat,



(c) said beater support including upright structure on the plate, an axle carried by said structure, the beater mounted on the axle, there being a rotor on the axle and a flexible member connecting the rotor to the forward extent of the petal.

4,819,537
HELMHOLTZ RESONANT SIMULATOR
Joseph F. Hayes, 64 Great Buckingham St., Redfern, N.S.W., and Warwick H. Holmes, 14 Gale St., Woolwich, N.S.W., both of Australia
Continuation of Ser. No. 764,832, Aug. 9, 1985, abandoned. This application May 19, 1987, Ser. No. 54,069
Claims priority, application Australia, Aug. 10, 1984, PG6507
Int. Cl.[4] G10H *1/12, 3/18*
U.S. Cl. 84—1.11 **4 Claims**



1. For electronically reproducing the total sound of a stringed musical instrument, the stringed musical instrument having a hollow air chamber, a sound board and a sound hole, wherein the sound board generates sound board vibrations and the sound hole generates sound hole vibrations such that the sound board vibrations and the sound hole vibrations combine to form the total sound, and further wherein the sound hole includes a mass of air that creates air resistance, an electronic acoustic reproduction system comprising
vibration transducer means mounted on the sound board for receiving only the sound board vibrations and transforming the sound board vibrations into sound board electrical signals; and
electronic filter means for processing the sound board electrical signals and generating sound hole electrical signals representative of the sound hole vibrations of the stringed musical instrument, wherein said electronic filter means has a transfer function characteristic of

$$T[\Lambda](i\omega) = \frac{-\omega_h^2}{\omega_h^2 - \omega^2 + i\omega \frac{R_a}{M_a}},$$

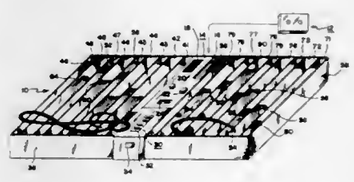
where
ω=angular frequency variable
ω_h=angular frequency of the resonance of the air chamber
R_a=air resistance of the mass of air in the sound hole
M_a=mass of vibrating air in the sound hole
$i=\sqrt{-1}$
to produce said sound hole electrical signals, said filter means further having means for combining said sound board electrical signals and said sound hole electrical signals to produce a total electrical signal representative of the total sound.

4,819,538
FLUTES
Harold Nelson, 104 Executive Dr., Manhasset Hills, N.Y. 11040
Filed Jan. 25, 1988, Ser. Nn. 148,045
Int. Cl.[4] G10D *7/02*
U.S. Cl. 84—384 **5 Claims**



1. A flute having an elongated tube closed at one end; an embouchure hole in the tube near its closed end; normally open venting holes and keys therefor distributed along the tube and finger pieces for operating certain of said keys; said venting holes including a series at the same side of the tube as the embouchure hole; the first four of said series of said venting holes in their sequence starting nearest the embouchure hole being the C-sharp, B, B-flat and A venting holes, the keys of said B-flat and A venting holes being operable directly by the middle finger and the ring finger of the left hand, respectively, one of said finger pieces being spaced from but coupled to the key of the C-sharp venting hole, characterized in that the last-named finger piece has a portion disposed over and spaced from the key of the B venting hole for engagement by the left-hand forefinger.

4,819,539
MUSIC TEACHING SYSTEM AND APPARATUS
John W. Searing, 92 Ravine Ave., West Caldwell, N.J. 07006
Filed May 20, 1988, Ser. No. 196,667
Int. Cl.[4] G09B *15/02*
U.S. Cl. 84—476 **5 Claims**



1. In an educational method for teaching musical notes utilizing the following:
(a) a first display means for displaying:
a first plurality of individual images of nouns beginning with the letter D corresponding to a musical note D;
a first plurality of individual images of nouns beginning with the letter E corresponding to a musical note E;
a first plurality of individual images of nouns beginning with the letter F corresponding to a musical note F;

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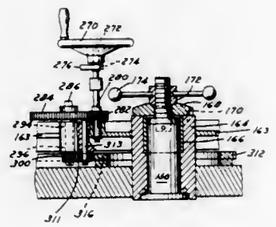
a first plurality of individual images of nouns beginning with the letter G corresponding to a musical note G;
a first plurality of individual images of nouns beginning with the letter A corresponding to a musical note A;
a first plurality of individual images of nouns beginnig with the letter B corresponding to a musical note B;
a first of individual images of nouns beginning with the letter C corresponding to the musical note C;
a second plurality of individual images of nouns beginning with the letter D corresponding to the musical note D;
a second plurality of individual images of nouns beginning with the letter E corresponding to the musical note E; and,
a second plurality of individual images of nouns beginning with the letter F corresponding to the musical note F;
(b) a treble clef holding means for holding said first display means, said holding means comprising a dark colored receptacle containing a portion of said display means, said portion being those displayed nouns representing each of the treble line notes E, G, B, D and F, respectively, said dark colored receptacles each separated by a light colored receptacle containing another portion of said display means, said portion being those displayed nouns representing each of the treble space notes F, A, C and E, respectively, said receptacles being arranged adjacent each other to conform to a musical scale arrangement comprising the notes E, F, G, A, B, C, D, E and F, said treble clef holding means having a treble clef symbol located thereon; and,
(c) a second display means for individually displaying:
a third plurality of individual images of nouns beginning with the letter D corresponding to the musical note D;
a third plurality of individual images of nouns beginning with the letter E corresponding to the musical note E;
a third plurality of individual images of nouns beginning with the letter F corresponding to a musical note F;
a second plurality of individual images of nouns beginning with the letter G corresponding to the musical note G;
a second plurality of individual images of nouns beginning with the letter A corresponding to the musical note A;
a second plurality of individual images of nouns beginning with the letter B corresponding to the musical note B;
a second plurality of individual images of nouns beginning with the letter C corresponding to the musical note C;
a fourth plurality of individual images of nouns beginning with the letter D corresponding to the musical note D;
a fourth plurality of individual images of nouns beginning with the letter E corresponding to the musical note E; and,
a fourth plurality of individual images of nouns beginning with the letter F corresponding to the musical note F; and,
(d) bass clef holding means for holding said second display means, said holding means comprising a dark colored receptacle containing a portion of said display means, said portion being those displayed nouns representing each of the respective images of the notes E, C, B, D and F, said dark colored receptacles each separate a light colored receptacle containing another portion of said display means, said portion being those displayed nouns representing each of the respective images of the notes F, A, C and E, said receptacles being arranged adjacent each other to conform to a musical scale arrangement comprising the notes E, F, C, A, B, C, D, E, F and G, said bass clef holding means having a bass clef symbol located thereon; and,
(e) an audio means for producing a sound representative of one of the musical notes A, B, C, D, E, F and G in the treble clef and in the bass clef;
the method comprising the steps of:
(1) randomly generating a sound representing one of the musical notes A, B, C, D, E, F or G from either the bass clef or the treble clef;
(2) directing a user to select an image from the treble clef or bass clef holding means which corresponds to said randomly generated sound;
(3) selecting an image in response to said randomly generated sound;
(4) providing a display of elapsed time required for selecting an image according to step three of the method; and,
(5) repeating steps (1) through (4) a finite number of times whereby a user is taught a location for each musical note which location is displayed in relationship to a musical scale.

4,819,540

WEAPON MOUNT USEFUL FOR COMBAT VEHICLE

Theodore A. Jackson, Utica, Mich., assignor to Cadillac Gage Textron Inc., Warren, Mich.

Division of Ser. No. 659,812, Oct. 11, 1984, abandoned. This application Mar. 13, 1987, Ser. No. 25,647
Int. Cl.[4] F41D *11/06*
U.S. Cl. 89—37.05 **12 Claims**



1. A weapon mount comprising a support frame with an annular track, a weapon carriage supported on the support frame and having retractible roller means for engaging said track, means on the carriage for biasing the roller means toward the track, pivot means disposed centrally of said track between the support frame and the carriage for permitting relative rotation therebetween with the roller means and the track in engagement, and means on said pivot means for clamping the carriage and the support frame together with the roller means retracted against the bias of the biasing means to releasably lock the relative position of the carriage and the support frame during weapon firing.

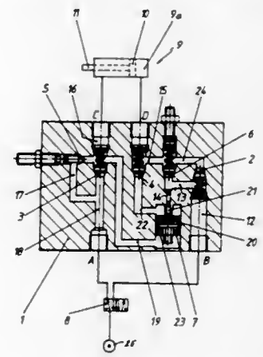
4,819,541

CONTROL OF A DOUBLE-ACTION PNEUMATIC DRIVE

Franz F. Pitsch, Moerfelden-Walldorf; Hans E. Winkelmann, Roedermark; Helmut W. Frohnheiser, Obertshausen, and Guenther Herbert, Dreieich, all of Fed. Rep. of Germany, assignors to Lothar Schmitt GmbH, Dreieich and Hans E. Winkelmann GmbH, Roedermark, both of, Fed. Rep. of Germany

Filed Mar. 7, 1986, Ser. No. 837,596
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508277
Int. Cl.[4] F01B *25/02*; F15B *11/08*
U.S. Cl. 91—6 **3 Claims**

1. An apparatus for purposes of controlling the movement of a piston within a cylinder of a double action pneumatic drive, comprising:
means connected for reducing externally applied pressure for obtaining relatively slowly moving said piston; and
means included in said drive and being responsive to stopping of said piston during displacement on account of an impediment, for obtaining full operating pressure to be applied to said piston so as to obtain a higher holding force than the force that was applied to and exerted by the piston during said motion phase.

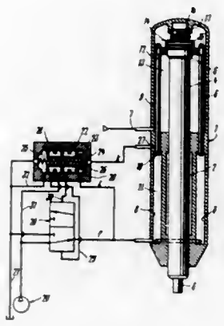


4,819,542

PERCUSSIVE TOOL

Petr Y. Fadeev; Vladimir Y. Fadeev; Vladlen V. Korobkov; Rim A. Kulagin, and Nikolai P. Ermilov, all of Novosibirsk, U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro Gidroimpulsnoi Tekhniki Sibirskogo Otdelenia Akademii Nauk SSSR, Novosibirsk, U.S.S.R.

PCT No. PCT/SU85/00101, § 371 Date Aug. 21, 1987, § 102(e) Date Aug. 21, 1987, PCT Pub. No. WO87/03925, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 23, 1985, Ser. No. 124,780
Int. Cl.[4] F01B *25/04*; F15R *11/22*; F01L *25/00, 15/00*
U.S. Cl. 91—172 **5 Claims**



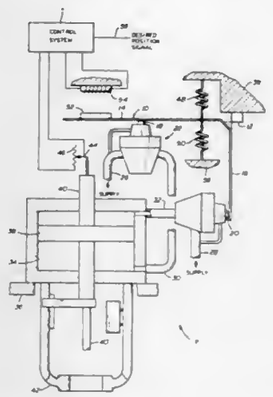
1. A percussive tool for creating impact impulses acting upon the medium being worked so as to change its form, said percussive tool comprising:
a housing accommodating a striker adapted to reciprocate and having a front-end portion for acting upon the medium being worked and a shank arranged in a power cylinder secured to said housing and filled with a compressible fluid under pressure for accumulating potential energy when compressed in the cocking of said striker and for acting upon an end face of said shank of said striker during its working stroke, as well as a striker cocking drive with a gripping mechanism, incorporating at least one hydraulic cylinder secured with its body on a periphery of said housing and having a rod, one end of which is received in an interior space of said hydraulic cylinder and another end is received in an interior space of said power cylinder and connected with said gripping mechanism intended to interact with said striker in the process of cocking thereof, a control unit having a spool valve means to control a two-position, three-way distribution means which alternately communicates said interior space of said hydraulic cylinder with a working fluid source for cocking said striker and with a discharge line for moving said gripping mechanism to follow said striker after its working stroke, said spool valve means being provided with a casing accommodating a spring-loaded spool capable of taking a first or a second extreme position in said casing of said spool valve means and defining by its end faces of said spool valve means two chambers constantly interconnected through a throttling means, one chamber being constantly connected with said discharge line and another chamber being periodically put in communication with said interior space of said hydraulic cylinder when said gripping mechanism follows said striker after its working stroke, said spool being spring-loaded with respect to said casing of said spool valve means on a side of said one chamber communicating with said discharge line so as to take its first position under the action of the spring.

4,819,543

ELECTRIC AND PNEUMATIC FEEDBACK CONTROLLED POSITIONER

Chris M. Leines, Houston, Tex., assignor to Topworks, Inc., Houston, Tex.

Filed Oct. 23, 1987, Ser. No. 113,010
Int. Cl.[4] F15B *9/03*
U.S. Cl. 91—363 R **20 Claims**



1. A control element positioning apparatus activated by an external control signal and utilizing electrical energy, comprising:
a balance beam, said balance beam being coupled to a pivot element;
a pair of pneumatic force balance elements each having an air nozzle, the nozzle of each force balance element being disposed adjacent to said balance beam and positioned whereby movement of said balance beam towards one nozzle moves said balance beam away from the other nozzle, each of said force balance elements having a pneumatic output element;
a cylinder, said cylinder having a piston disposed therein, said piston being coupled to a shaft;
each of said pneumatic output elements being coupled to an end of said cylinder;
magnetic material means located on said balance beam;

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variable magnet means operating on electrical energy located adjacent said balance beam magnetic means for producing a varying magnetic field for developing a varying force between said variable magnet means and said balance beam magnetic material means, said variable magnet means producing the magnetic field only while supplied with electrical energy;

zero bias means coupled to said balance beam for biasing said balance beam equidistant from each nozzle in the absence of a magnetic field produced by said variable magnet means;

means for producing a signal indicative of said piston position; and

means for controlling the magnetic field produced by said variable magnet means responsive to the external control signal and said piston position signal to move said piston to the desired position.

4,819,544

TWO-STAGE REACTION DEVICE FOR VACUUM BRAKE BOOSTER VALVES

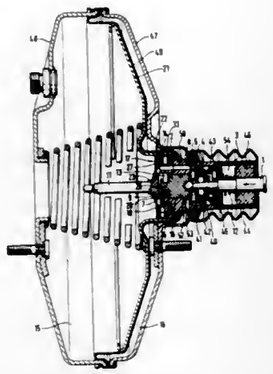
Wilfried Wagner, Hattersheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,842

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247701

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369.4 5 Claims



1. A two-stage reaction device for a vacuum brake booster comprising: a vacuum chamber in which a constant pressure prevails and a working chamber in which varying pressures prevail, the chambers being separated by a movable wall and having a central axis, a control housing including a control valve actuatable by a brake pedal and governing differentials of pressure acting on the movable wall, a push rod coupled to act on a master cylinder and being generally aligned with the central axis of the chambers, said push rod having a pressure member connected thereto, levers in engagement with the movable wall at a first location and with the pressure member at a second location, the said first location being arranged radially farther outwardly from said central axis than the second location, the levers being acted upon by a crowned spring at a third location, the said crowned spring being positioned on the side of the levers nearest to the vacuum chamber, the third location having a smaller radial distance from said central axis than the first location, a spring plate interposed between the crowned spring and the levers, a valve piston being displaceable by a piston rod upon actuation of the brake, said piston rod being supported in the control housing, said valve piston including at an end close to the push rod two oppositely disposed abutment surfaces against which the radially inwardly disposed edges and the lateral surface of the levers abut, the distance between the two abutment surfaces, which surfaces partially embrace the facing ends of the levers enabling a tilting movement of the levers in the event of the relative movement between the push rod and the valve piston, with said pressure member connected to said push rod bearing against the lever, the valve piston in conjunction with the two abutment surfaces being a rotationally symmetric element, said valve piston including a flange-like head having one of said abutment surfaces thereon and said flange-like head being connected to the valve piston adjacent to the piston rod by a neck portion.

4,819,545

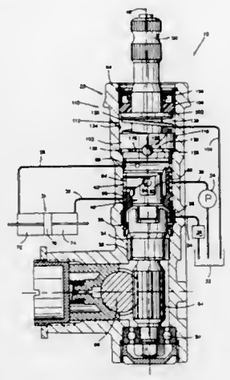
POWER STEERING SYSTEM

Richard W. Dymond, Rochester, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jul. 28, 1987, Ser. No. 78,840

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—371 26 Claims



1. An apparatus comprising:

first and second valve members which are relatively movable to port fluid to a vehicle power steering motor; and

force transmitting means for resisting relative movement between said first and second valve members with a force which varies as a function of vehicle speed, said force transmitting means including:

a force transmitting member connected with said first valve member and movable toward and away from said second valve member,

means for increasing the resistance to relative movement between said first and said second valve members as said force transmitting member moves toward said second valve member,

means for applying to said force transmitting member a force which urges said force transmitting member away from said second valve member to reduce the resistance to relative movement between said first and second valve members, and

means for decreasing said force as vehicle speed increases to increase the resistance to relative movement between said first and second valve members as vehicle speed increases.

4,819,546

DEVICE FOR MEASURING FEED MOVEMENT

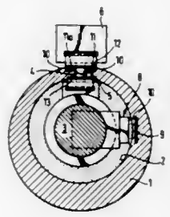
Alfons Ernst, Traunreut, and Alfons Spies, Seebruck, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Continuation of Ser. No. 551,281, Nov. 14, 1983, abandoned. This application Apr. 7, 1987, Ser. No. 35,208

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244616

Int. Cl.[4] F01B *25/26*

U.S. Cl. 92—5 R 6 Claims



1. In a device for measuring feed movements comprising a measuring scale and a scanning unit for scanning the scale to produce at least one signal indicative of feed movement, the improvement comprising:

a tubular housing defining a wall and a longitudinal axis and comprising a chember located in the wall and extending along the longitudinal axis, the chamber adapted to receive the mesuring scale, the tubular housing further comprising a cylinder and a slit in communication with the cylinder;

a piston disposed within the cylinder and movable along the cylinder in response to differential fluid pressure across the piston, the scanning unit coupled to the piston and arranged inside the tubular housing such that movement of the piston along the cylinder causes the scanning unit to move along the measuring scale; and

a transfer member coupled to the piston to extend out of the cylinder through the slit.

4,819,547

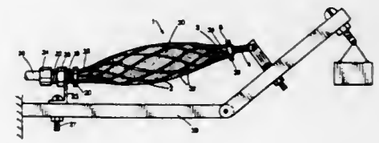
AXIALLY CONTRACTABLE ACTUATOR

Mirko Kukolj, 5490 Braelawn Drive, Burnaby, British Columbia, Canada V5B 4R7

Filed Mar. 28, 1988, Ser. No. 172,764

Int. Cl.[4] F01B *19/00*

U.S. Cl. 92—261 18 Claims



1. The method of assembling an axially contractable actuator, comprising the steps of:

(a) providing an impermeable expansible enclosure having an axis and means for introducing and withdrawing pressurized fluid for thereby causing expansion and contraction thereof along the axis and the enclosure further having means for connection to an article;

(b) providing an axially deformable network-shaped structure having a plurality of open areas and each open area defined by a plurality of non-extensible pivotally interconnected side members and the side members being axially parallel in the elongated state and disposed at a substantial angle to the axis in the contracted state;

(c) enveloping the enclosure with the structure so that contraction of the enclosure causes the structure to assume the contracted state and portions of the enclosure to thereby bulge through the open areas and expansion of the enclosure causes the structure to assume the elongated state.

4,819,548

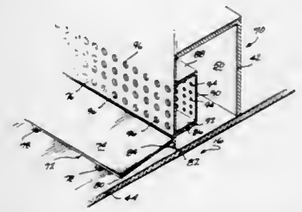
DUAL NOZZLE CABIN VENTILATION SYSTEM

Raymond H. Horstman, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 7, 1987, Ser. No. 46,631

Int. Cl.[4] B60H *1/24*

U.S. Cl. 98—1 19 Claims



1. Apparatus for supplying a fluid to an enclosed space along a surface extending into the space, comprising:

(a) a pressurized fluid supply duct extending adjacent the surface, in fluid communication with a source of a fluid having a pressure in excess of that in the enclosed space and operative to convey the pressurized fluid;

(b) nozzle means in fluid communication with the pressurized fluid supply duct and disposed adjacent the surface, for directing a flow of the pressurized fluid from said supply duct into the space with sufficient velocity that the flowing fluid attaches to the surface, following it into the space; and

(c) diffuser means also in fluid communication with the pressurized fluid supply duct and disposed adjacent the nozzle means, for directing a flow of pressurized fluid from said supply duct into the space at a substantially lower flow velocity and a higher volumetric flow rate than the fluid flow-directed by the nozzle means, the fluid at the lower flow velocity mixing with and being carried along with the fluid at the higher flow velocity as it flows from the nozzle, and into the space along the surface.

4,819,549

END SEAL FOR CLEAN ROOM CEILING SUPPORTS

Gary R. Gillingham, Prior Lake, and Joseph C. Tokar, Apple Valley, both of Minn., assignors to Donaldson Company Inc., Minneapolis, Minn.

Filed Feb. 5, 1988, Ser. No. 152,634

Int. Cl.[4] B01D *46/00*

U.S. Cl. 98—1 2 Claims

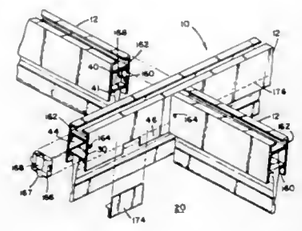
1. A system for providing airtight/particle tight hermetic sealing of a plurality of interfacing grid members, each of said grid members having vertically oriented and horizontally oriented wall portions defining an internal chamber, and each of said grid members comprising:

(a) an aperture extending through a wall portion of said grid member, said aperture permitting infusion of caulking compound into said grid member internal chamber proximate a first end of said grid member designed for interface with another grid member;

(b) a plurality of protrusions located on said first end of said

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grid member; said protrusions permitting caulking compound leakage past said interface;
(c) caulking stop means located within said grid member internal chamber; said caulking stop means permitting a predetermined volume of caulking compound to be infused into said internal chamber;



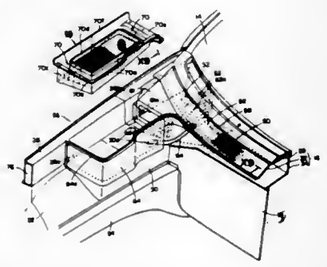
(d) whereby when said predetermined volume of caulking compound is infused into said internal chamber through said aperture, an amount of caulking compound is urged out of said internal chamber past said protrusions; and,
(e) whereby said caulking compound leakage seals said interface between said plurality of grid members.

4,819,550

AIR INTAKE STRUCTURE OF AN AUTOMOBILE

Tadashi Ioka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 26, 1988, Ser. No. 224,351
Claims priority, application Japan, Jul. 28, 1987, 62-186616; Aug. 10, 1987, 62-200467
Int. Cl.[4] B60H *1/28*
U.S. Cl. 98—2.17 **18 Claims**



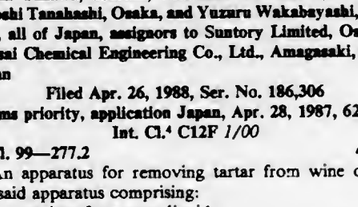
1. An air intake structure of an automobile comprising:
a dash panel constituting a forward wall member of a vehicle chamber, said dash panel being disposed underneath a front glass window;
a cowl frame member extending in a transverse direction of a vehicle body, said cowl frame member comprising an upper member portion supporting a bottom portion of said front glass window and a lower member portion connecting said upper member portion to an upper portion of said dash panel;
an air passage communicating a first air opening with a second air opening, said first air opening capable of introducing open air into the air passage and said second air opening capable of introducing the air introduced from said air passage into the vehicle chamber;
one of said first and second air openings having an opening facing the inside of said cowl frame member at a transversely opposite end portion of the vehicle body, the other air opening positioned at the outside of said cowl frame member; and
said air passage comprising a first air passage section and a second air passage section, said first passage section being formed in the space within said cowl frame member at the transversely opposite end portion thereof and being communicated with said one air opening, and said second air passage section formed outside said cowl frame member and being communicated with said other air opening.

4,819,551

SAFETY SYSTEM FOR SMOKE AND FUMES

John Vole, 600 Avon Ctr., Vernon Hills, Ill. 60061

Filed Jan. 4, 1988, Ser. No. 140,579
Int. Cl.[4] F24F *7/013*; **E05F** *15/20*
U.S. Cl. 98—42.04 **5 Claims**



1. Safety apparatus for use in a space in an enclosure in which fumes occur and tend to accumulate, wherein the enclosure has a closer capable of being opened for providing a closable opening from the space to the exterior, electrically operated power means for moving the closer between open and closed positions, and an electrical circuit for operating the power means, comprising,
electrically operated exhaust means for exhausting gas from said space,
a detector unit in said space capable of detecting fumes of a predetermined concentration, and in response thereto producing an electrical signal of relatively low voltage,
the electrical circuit including first control means operable in response to production of said electrical signal for operating said power means and moving the closer to open position, and constantly holding it in that position until the electrical circuit is activated in a reset step,
the electrical circuit including second control means operable in response to production of a said electrical signal for operating said exhaust means, and constantly holding it in operating condition until the electrical circuit is activated in a reset step, and
manually activated reset means for placing the electrical circuit in the condition it assumed before production of said electrical signal.

4,819,552

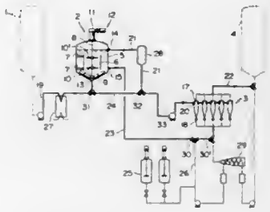
APPARATUS FOR CONTINUOUS TARTAR SEPARATION

Toshiaki Tazawa, Ibaraki; Masahiro Yotsumoto, Yokohama; Hiroshi Tanahashi, Osaka, and Yuzuru Wakabayashi, Amagasaki, all of Japan, assignors to Suntory Limited, Osaka and Kansai Chemical Engineering Co., Ltd., Amagasaki, both of, Japan

Filed Apr. 26, 1988, Ser. No. 186,306
Claims priority, application Japan, Apr. 28, 1987, 62-105998
Int. Cl.[4] C12F *1/00*
U.S. Cl. 99—277.2 **4 Claims**

1. An apparatus for removing tartar from wine or grape juice, said apparatus comprising:
(a) a container for source liquid;
(b) a crystallizer which comprises a crystallizing vessel, a draft tube, a stirrer and a cooling jacket,

said draft tube being disposed in a center portion of the vessel so as to define an annular zone between the inner periphery of said vessel and the outer periphery of said draft tube, and said draft tube having a height of ½ to ¾ the height of the vessel and a cross section smaller than the annular zone,
said stirrer being adapted to produce a circulation of liquid along the draft tube,
said cooling jacket being disposed on the outer periphery of the vessel, and
said vessel having an inlet for source liquid at the bottom thereof, an outlet for treated liquid in the upper portion thereof and an inlet for tartar suspension in the lower portion thereof;



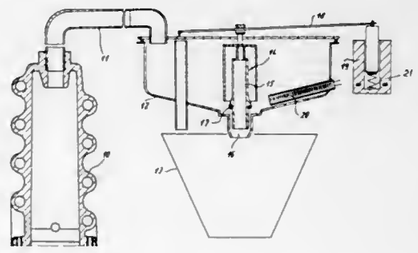
(c) a hydrocyclone which has an outlet for upward stream on the top portion thereof, an outlet for downward stream on the bottom portion thereof and an inlet on the upper portion thereof; and
(d) a container for product liquid;
wherein said container for source liquid is connected with the inlet for source liquid of the crystallizer, said outlet for treated liquid of the crystallizer is connected with the inlet of the hydrocyclone, said outlet for upward stream of the hydrocyclone is connected with the container for treated liquid, and said outlet for downward stream of the hydrocyclone is connected with the inlet for tartar suspension of the crystallizer.

4,819,553

COFFEE OR TEA MAKER

Hans D. Heyn, and Werner Edler, both of Porta Westfalica, Fed. Rep. of Germany, assignors to Melitta-Werke Bentz & Sohn, Minden, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,635
Claims priority, application Fed. Rep. **of Germany, Jun. 6, 1987, 8708082**
Int. Cl.[4] A47J *31/00*
U.S. Cl. 99—305 **3 Claims**



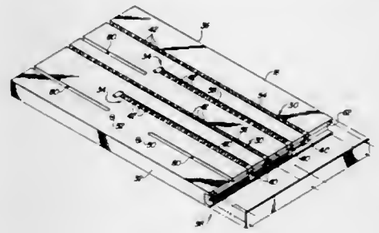
1. In a device for making extracts of coffee or tea, including a continuous-flow water heater;
a collecting container coupled to the water heater for receiving hot water therefrom;
a filter vessel adapted to receive ground coffee or tea leaves;
siphon emptying means disposed in said collecting container for discharging hot water from the collecting container into the filter vessel;
the improvement comprising:
(a) means defining an outlet opening at a lowest location of said collecting container;
(b) an outlet pipe forming part of said siphon emptying means and projecting into said outlet opening;
(c) a seal provided on an exterior surface of said outlet pipe; and
(d) a support means for axially displaceably holding said outlet pipe; said support means including an actuating means for moving said outlet pipe into a first position in which said seal closes said outlet opening and for moving said outlet pipe into a second position in which said seal opens said outlet opening for allowing water to be emptied from said collecting container into said filter vessel through said outlet opening.

4,819,554

TRANSFER AND QUICK CHANGE SYSTEM

Dennis G. Fleischer, Horicon; Robert J. Smola, Watertown, and James H. Draeger, Beaver Dam, all of Wis., assignors to Deere & Company, Moline, Ill.

Filed Aug. 28, 1987, Ser. No. 90,649
Int. Cl.[4] B30B *15/02*
U.S. Cl. 100—224 **19 Claims**



1. A system for maximizing machine utilization comprising:
a machine having a bolster;
means, operatively connected to said machine, for operating selected dies of a plurality of dies to produce a plurality of parts;
means, operative connected to said machine for pre-staging at least two of said plurality of dies thereon and for transferring said selected dies from said pre-staging means to said machine;
first means, operatively connected to said bolster, for adjusting said selected dies parallel to said operating means;
second means, operative connected to said bolster, for adjusting said selected dies perpendicular to said operating means; and
means, operatively connecting said first and said second adjusting means, for selectively actuating and deactuating said first and said second adjusting means so that said selected dies are rapidly and accurately positioned on said operating means with a minimum of time and effort, said selectively actuating and deactuating means having at least three positions, when in one position, both of said first and said second adjusting means are deactuated, when in another position, only one of said first and said second adjusting means is deactuated and the other is actuated, when in a position different from the two previous positions, only the one of said first and said second adjusting means which was actuated is deactuated and the one that was deactuated is now actuated.

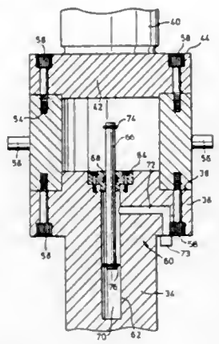
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PRESS WITH ADJUSTABLE PLATEN SPACING

Ronald Ballantyne, Burlington, and Leon Malashenko, Toronto, both of Canada, assignors to John T. Hepburn, Limited, Mississauga, Canada

Filed Jul. 8, 1987, Ser. No. 71,143
Claims priority, application Canada, Jul. 23, 1986, 514483
Int. Cl.[4] B30B *7/02, 1/32, 15/04*
U.S. Cl. 100—257 **16 Claims**



1. A press, comprising:
a base structure including a lower platen;
a multiplicity of vertical posts, each of the posts having
(a) a lower post portion mounted to the base structure,
(b) an upper post portion, and
(c) joining means for releasably joining the upper and lower post portions to define a substantially unitary post structure, the joining means including mechanical spacing means for spacing the upper and lower post portions, an upper flange formed at the bottom of the upper post portion, a lower flange formed at the top of the lower post portion, the upper and lower flanges being adapted to retain the spacing means between the flanges, and threaded fastener means for releasably connecting the upper and lower flanges;
an upper platen mounted on the upper post portions above the lower platen; and,
means for displacing the upper and lower platen relative to one another.

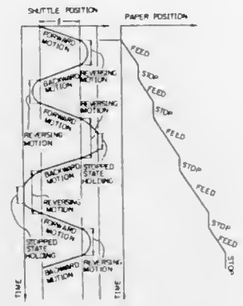
4,819,556

SHUTTLE PRINTER WHICH STOPS SHUTTLE FOR PAPER FEED

Akihiro Abe, Yokohama; Akinori Kamata, Kawasaki; Satoshi Yoshino, Kawasaki, and Hirotomo Terada, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 6, 1987, Ser. No. 117,570
Claims priority, application Japan, Nov. 7, 1986, 61-264032; Dec. 17, 1986, 61-302108
Int. Cl.[4] B41J *3/12*
U.S. Cl. 101—93.04 **8 Claims**

1. A dot matrix printer comprising:
a printing unit carrying a plurality of dot printing elements arranged along a print line;
a drive means for reciprocating said printing unit along said print line, said drive means reciprocating said printing unit through a print section for effecting a dot printing operation and between a pair of reversal sections, one of which is arranged at each stroke end of said print section for reversing the travel direction of said printing unit;
stopper means for providing a stopping position of said printing unit, said stopper means being arranged at the end of each of said reversal sections;
a first control means for effecting a constant speed control for controlling said drive means so that said printing unit moves at a constant speed in said print section, a reversal control for accelerating and decelerating said drive means so that said printing unit carries out a reversal motion in each of said reversal sections, and a stopping control for controlling said drive means so that said printing unit is pressed onto one of said stopper means;
a paper feed means for transferring papers by a line at which a dot printing operation can be carried out by said dot printing elements, in a direction perpendicular to said print line during one of the reversal motions of said printing unit;



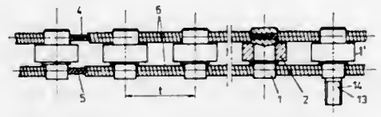
an instructing means for instructing said first control means to stop said reversal control, when a command is output to said paper feed means for feeding a plurality of lines of paper continuously, while said printing unit is travelling from said print section to either of said reversal sections and instructing said stopping control of said printing unit; and
a releasing means for commanding an instruction to stop said reversal control and to release said stopping control, in correspondence with a timing of termination of the paper feed operation by means of said paper feed means.

4,819,557

FLEXIBLY COUPLED ROLLER CHAIN FOR THREADING A SUBSTRATE WEB IN A ROTARY WEB PRINTING MACHINE

Walter Handschuher, Königsbrunn, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,806
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 3725634
Int. Cl.[4] B41F *13/54;* **B65H** *20/00*
U.S. Cl. 101—228 **16 Claims**



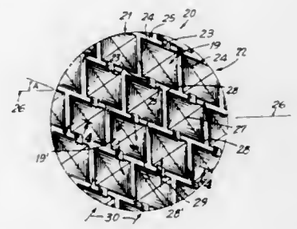
1. Web threading roller chain for threading a paper web into a printing machine along a predetermined guide path having
a plurality of bolt elements (**16**);
roller means (**19**) rotatably supported on the bolt elements for rotation thereabout,
flexible cable means (**22**) connected to and coupling together adjacent bolt elements (**1, 16**) for transfer of tension forces therebetween, and
spacer elements (**24**) surrounding the cable means and positioned between the adjacent bolt elements,
wherein each bolt element (**16**) carries two roller means (**19**) axially spaced from each other;
the flexible cable means (**22**) and the spacer elements (**24**) are located axially between said roller means;
wherein the bolt elements (**16**) are each formed with an essentially diametrical through-bore (**23**), the flexible cable means (**22**) extending through said through-bore; and
wherein said bolt elements are deformed in the region of the through-bores to pinch or clamp the bolt elements (**16**) on the flexible cable means (**22**).

4,819,558

HIGH EFFICIENCY FLUID METERING ROLL

Cletus J. Counard, Willingboro, N.J., assignor to Pamarco Incorporated, Roselle, N.J.

Filed Apr. 18, 1985, Ser. No. 724,778
Int. Cl.[4] B41F *1/46, 31/14*
U.S. Cl. 101—348 **7 Claims**



1. A liquid metering roll comprising a cylinder having a multiplicity of outwardly open cells depressed into the surface thereof in cell concentrations of from about 45 to 360 cells per lineal inch, said cells being arranged in helically extending connected chains of cells defined by walls, the walls defining each chain of cells separating each such chain from each adjacent chain, the tops of said walls forming the outermost periphery of said roll, the walls defining each cell including side portions extending circumferentially of said roll along planes generally perpendicular to the roll axis, and end portions linking the terminal of said side portions, said end portions extending at an angle of from about 22° to 28° and optimally at 26° relative to the longitudinal axis of said roll, each said cell being thus defined by a pair of said side wall portions and a pair of said end wall portions, the cells comprising said chains being linked by channels formed in said end wall portions, said channels being of lesser depth that the maximum depth of said cells, said channels entering and exiting said cells at positions displaced from the circumferentially leading and trailing edges of said cells, the flow paths defined by the channels of the cells being displaced one from the other.

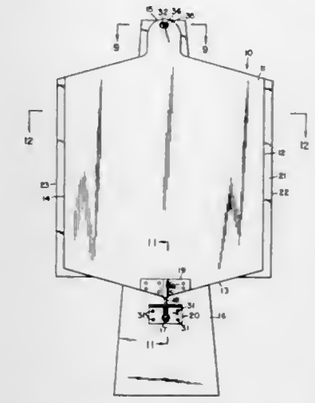
4,819,559

PALLET ASSEMBLY FOR IMPROVED PRINTING OPERATION

Sandor Szarka, Franklin Lakes, N.J., assignor to Precision Screen Machines, Inc., Hawthorne, N.J.

Filed Oct. 7, 1987, Ser. No. 105,326
Int. Cl.[4] B41F *15/18*
U.S. Cl. 101—474 **6 Claims**

1. A printing indexer pallet assembly comprising: a substantially plate-like pallet bounded by side edges and upon which a garment can be placed to receive print images; a hinge assembly joining one of said side edges of the pallet to a transport member of a printing indexer, said hinge assembly having at least two axes of freedom for permitting movement of said pallet relative to said transport member, said hinge assembly being adapted to effectuate mounting, selectively rotating and removal of said garment to be printed upon; keeper means located on said transport member adjacent said pallet side edge that is spaced distally from said hinge assembly for engaging said positioning said pallet on said transport member; and a flat parallel support member, between and parallel to said pallet and said transport member, said support member having the same general shape as said pallet but being wider than said pallet such that said support member, having lateral edges, projects laterally beyond the lateral side edges of said pallet, wherein the thickness of said pallet is sized such that said pallet support member supports the image imprinting elements when they engage a garment on said pallet and overhang the width of said pallet.

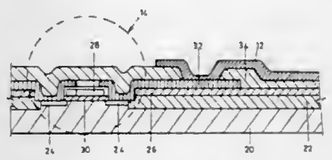


4,819,560

DETONATOR FIRING ELEMENT

Vivian E. Patz, Yeoville, and Stafford A. Smithies, Pretoria, both of South Africa, assignors to Detonix Close Corporation, South Africa

Filed May 21, 1987, Ser. No. 53,150
Claims priority, application South Africa, May 22, 1986, 86/3818; Dec. 8, 1986, 86/9263
Int. Cl.[4] F42C *19/12*
U.S. Cl. 102—202.5 **16 Claims**



1. A detonator firing element which includes a suitable substrate for the fabrication of an integrated circuit, at least one energy dissipation device which is located a selected one of on and in said suitable substrate, an explosive adjacent the energy dissipation device which, upon being actuated, initiates the explosive by the dissipation of energy, and a passivation layer between at least a portion of the substrate and at least a portion of the explosive.

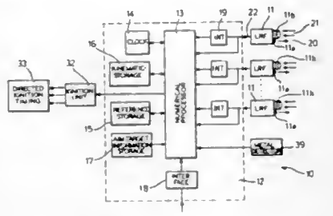
VOL 1101 ISS 2 AP 11 1989 UMI

4,819,561

SENSOR FOR ATTACKING HELICOPTERS

Gunthard Born, Munich, and Gunther Sepp, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 154,805
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3707888
Int. Cl.[4] F42C *13/02*
U.S. Cl. 102—213 21 Claims



1. A sensor for use in a warhead of a missile, which missile is launched for an attack against a helicopter, said sensor comprising:

(a) at least one laser range finder (LRF) having high resolution in respect of time and space for generating first signals,

(b) said at least one laser range finder being mounted on said missile at a position inclined forwardly in the direction of flight of said missile,

(c) transmitter means coupled to said laser range finder for transmitting said first signals forwardly of said missle for scattering off objects,

(d) receiving means for receiving second signals, said second signals comprising the reflection of said first signals scattered back from an object,

(e) an evaluation unit coupled to said receiving means for processing said second signals,

(f) said evaluation unit including a numerical processor and a clock,

(g) said numerical processor being coupled to a reference storage storing reference patterns and to a kinematics storage storing a velocity/flying time profile,

(h) said numerical processor being operable to process said second signals in relation to said reference patterns, said velocity/flying time profile and an elapsed time measurement of said clock to determine characteristics indicative of a helicopter and to determine the direction, range, position, presence and type of said helicopter.

4,819,562

EXPLOSIVE CHARGE CONTAINING MAGAZINE FOR RAM SETTING GUN

Edward W. Bowman, 1309 Ridgeway Avenue, North Vancouver, British Columbia, Canada V7L 3R9

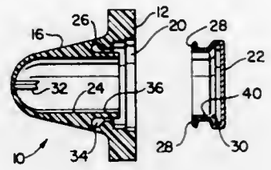
Continuation-in-part of Ser. No. 93,302, Sep. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 243, Jan. 2, 1987, abandoned. This application Dec. 28, 1987, Ser. No. 138,431
Int. Cl.[4] F42B *39/08;* C06C *7/02*
U.S. Cl. 102—281 28 Claims

1. A propellant containing device for use in association with a gun which is adapted to utilize the propellant to drive an attachment member into a structure comprising:

(a) a base;

(b) means on the base to enable the base to be moved by a movement mechanism in the gun;

(c) a plurality of hollow members each integral with the base, the members being closed at the end removed from the base and open at the end adjacent the base, each opening in the base having an annular groove therearound; and



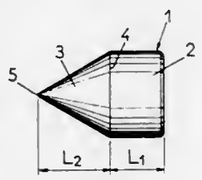
(d) a plurality of closure means adapted to fit within the openings in the base, each closure means having a peripheral rim which fits in the annular groove surrounding the opening of the base.

4,819,563

BULLETS FOR FIRE ARMS

Fabrice Bodet, 55, rue de St. Cloud, 92410 Ville D'Avray, France

Continuation of Ser. No. 612,681, May 22, 1984, abandoned, which is a continuation of Ser. No. 40,647, May 21, 1979, abandoned. This application May 23, 1985, Ser. No. 737,570
Claims priority, application France, Jun. 19, 1978, 78 18260
Int. Cl.[4] F42B *11/00*
U.S. Cl. 102—501 5 Claims



1. A bullet for a portable firearm of a calibre between 5 and 12 mm, said bullet being formed of a solid homogeneous bloc piece of copper or copper alloy having an outer surface in the form of a cylinder of revolution connected along a sharp edge to a coaxial cone of revolution whose angle at the apex of said cone is between 50° and 80°, the axial length of said cylinder being smaller than the axial length of said cone and smaller than said calibre, said bullet when fired having a starting velocity greater than the speed of sound, said starting velocity being of the order of 550 to 600 meters per second, whereby the convex angular zone on the outer surface of said bullet creates shock waves which, on impact at close range, create an explosive effect; but said fired bullet loses its speed and energy over a short distance and is thereby ineffective at longer range or after passing through a first obstacle.

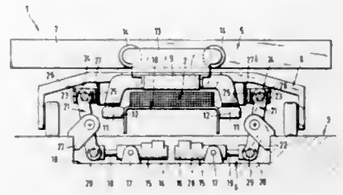
4,819,564

LINEAR MOTOR DRIVEN CONVEYING INSTALLATION AND BRAKING DEVICE THEREFOR

Curt Brandis, Bremen; Heinrich Schulze-Buxloh, Werl-Hilbeck, and Siegfried Piragg, Hamm, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Scharf GmbH, Hamm, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 127,510
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641326
Int. Cl.[4] B60L *13/04;* B60T *13/02*
U.S. Cl. 104—292 10 Claims

1. A conveying installation with a linear motor drive, comprising a plurality of stator portions placed one behind the other along a travel path and at least one conveyor unit with at least one permanent magnet, the conveyor unit being guided along the stator portions in a constrained manner, each con-



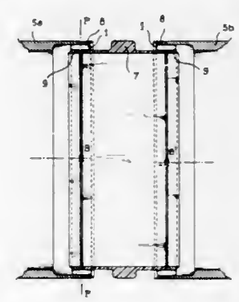
veyor unit having braking surfaces, and each stator portion including at least one stationary braking device which is capable of interacting with the braking surfaces of the conveyor units.

4,819,565

TUBULAR JOINT FORMED BY TWO ROLLING MEMBRANES UNDER LOW PRESSURIZATION FOR INTERCOMMUNICATION RING

Jean-Pierre Bechu, Courbevoie, France, assignor to Kleber Industrie, Versailles, France

Filed May 27, 1987, Ser. No. 54,860
Claims priority, application France, May 27, 1986, 86 07696
Int. Cl.[4] B61D *17/22*
U.S. Cl. 105—11 12 Claims



1. A tubular joint for connecting an intercommunication tunnel placed between two successive vehicles or two members of an access gangway to a ship or plane, said vehicles and members having upper and lower walls that are generally horizontal and lateral walls that are generally vertical to form an enclosed passenger passageway, said tubular joint comprising:

a pair of rolling membranes that are U-shaped and mounted to form a gas tight chamber therebetween on the opposite sides of a symmetry plane;

said chamber being inflated with a gas under a relative pressure of about 0.1 to 0.5 bar; and

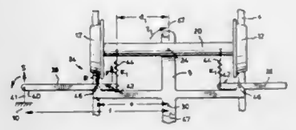
said membranes each having one end fitted to the upper, lower and lateral walls of one of said vehicle or member and an opposite end fitted to said tunnel with the respective ends of said membranes secured by fastener means extending through said symmetry plane and effective to withstand all pulls exerted on the intercommunication tunnel forming said passageway.

4,819,566

STABILIZED STEERABLE TRUCK

Roy E. Smith, and Ron J. Anderson, both of Kingston, Canada, assignors to Urban Transportation Development Corp., Ltd., Canada

Continuation of Ser. No. 765,088, Aug. 13, 1985, abandoned. This application Jun. 24, 1987, Ser. No. 63,774
Int. Cl.[4] B61F *5/44*
U.S. Cl. 105—168 4 Claims



1. A railroad vehicle for movement on a railroad track comprising:

a body having a longitudinal axis;

a truck having a longitudinal axis;

outboard and inboard axles connected to said truck for pivotal movement about respective vertical axes;

a pair of wheels supported by each of said axle for rotation therewith, each said pair of wheels being disposed for operative engagement with said track and for bearing substantially the same load as said other pair of wheels;

steering means operatively interconnecting said axles, truck and body for radially aligning said axles when said truck is on a curved track in response to the angle between the longitudinal axes of said body and said truck; and

means connecting said truck to said body for pivotal movement about a vertical axis on the longitudinal axis of said truck, said vertical axis being offset towards said outboard axle a predetermined distance from the midpoint between said axles to generate a moment about said vertical axis tending to resist deviation of said truck from a generally parallel relationship between the longitudinal axis of said truck and a straight track and a generally tangential relationship between the longitudinal axis of said truck and a curved track.

4,819,567

METHOD AND APPARATUS FOR FORMING A DESK

Marvin W. Thompson, Pasadena; Timothy C. Jennings, Arcadia; James A. Scott, Anaheim, all of Calif.; Ronald W. Phenicie, Warrenton, Va.; Margaret H. Murphy, La Verne, Calif.; Gabriel D. Nakash, Phillips Ranch, Calif.; James R. Biggers, Ontario, Calif.; Lyanlee M. Boudreau, Monrovia, Calif., and Jorge H. Curiel Contreras, Baldwin Park, Calif., assignors to Anvil Cases, Inc., Rosemead, Calif.

Filed Jun. 2, 1987, Ser. No. 57,124
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—38 11 Claims

1. A storage apparatus for conversion into a desk comprising:

(a) a first storage member having a bottom portion with four sides and a bottom wall and a removable top portion;

(b) means for releasably securing said top portion to said bottom portion;

(c) said top portion having a top surface and four top sidewalls;

(d) attaching means for securing said top portion to one of said sides of said bottom portion with said top surface being substantially coplanar with one of said four sides of said bottom portion;

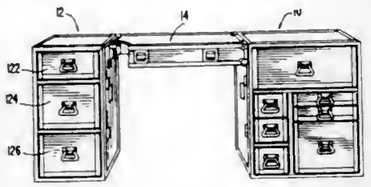
(e) said attaching means being a separable fastener including

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a first part of said separable fastener affixed to a side of said bottom portion and a second part of said separable fastener fixed to said top portion;

(f) said separable fastener being located beneath the planes defining the exterior surfaces of said top portion and bottom portion to which the respective parts of said separable fastener are secured;

(g) said separable fastener including a first engaging member moveable between an open and a closed position wherein said first engaging member is in a retracted portion within



said sidewalls when in said closed position and extends beyond said sidewalls when in said open position, a recess in at least one of the surfaces of said bottom portion of a storage member with complementary engaging member for engaging said first engaging member to secure said top portion to said bottom portion of said storage member;

(h) support means for supporting said top portion when attached to said bottom portion; and

(i) said top portion, said bottom portion, said attaching means, and said support means cooperating to form a desk.

4,819,568

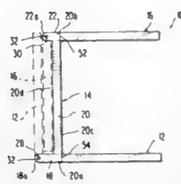
MULTI-WAY PORTABLE WRITING DESK

John C. Coffrin, 38 Village Green, West Lebanon, N.H. 03784

Filed Dec. 14, 1987, Ser. No. 132,454

Int. Cl.⁴ A47B *73/00*

U.S. Cl. 108—43 **4 Claims**



1. A multi-way portable writing desk for use by a user comprising: a unitary structure of generally U-shaped configuration consisting of a flat, rectangular base panel for placement horizontally between legs of the user and partially beneath buttocks of the user or horizontally beneath a leg of the user and at one side thereof, a right angle vertical riser panel having upper and lower ends, said lower end being joined to one end of the base panel and extending upwardly at right angles thereto, and a lap panel integral with the upper end of said riser panel and extending parallel to the base panel, on the same side of said riser panel as said base panel and overlying said base panel and being spaced from said base panel a distance capable of accommodating a leg or legs of the user, such that the lap panel may overlay a lap of the user whether, the U-shaped unitary structure is positioned on its side, with an open end of the U-shaped structure facing a waist of the user and with the legs of the user straddling the riser panel or positioned to a side of the user, with the base panel inserting beneath a leg of the user and with the riser panel extending vertically upward along the outside of the user's leg and wherein said base panel, said riser panel and said lap panel are formed of planar members, said riser panel comprises an upright side wall, integral upper and lower arms projecting at right angles to said upright side wall and joined to opposite, top and bottom edges of said side wall on a rear face thereof and terminate in free ends, and means for hinging said base panel and said lap panel at one end respectively to said free ends of said upper and lower arms of said side wall for pivoting about 270° from positions where said base panel and said lap panel extend parallel to each other and project at right angles from a front face of the side wall remote from the rear face thereof carrying said arms, to positions where, said base panel and said lap panel overlap and extend parallel to said side wall and in proximity to said side wall rear face from which said arms project and projecting upwardly and downwardly from respective arms.

4,819,569

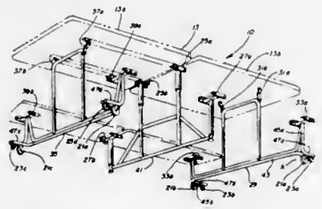
MOVABLE TABLE WITH STABILIZING APPARATUS

John M. Bastian, Manitowoc; David C. Pflieger, Two Rivers, and Robert F. Seitz, Manitowoc, all of Wis., assignors to Hamilton Industries, Inc., Two Rivers, Wis.

Filed Feb. 19, 1988, Ser. No. 158,204

Int. Cl.⁴ A47B *3/00*

U.S. Cl. 108—113 **5 Claims**



1. A movable table assembly operable between open and closed positions, said assembly comprising: a table top; a rigid leg support assembly subtending said table top and pivotally mounted to said table top, said leg support assembly supporting said table top in an open generally horizontal position and in a closed generally vertical position; primary caster means for engaging and rolling on a supporting surface when said table top is disposed in a closed generally vertical position, said primary caster means subtending said leg support assembly and mounted to said support assembly; and auxiliary caster means for engaging said supporting surface when said table top is disposed in a closed generally vertical position and said table being to tip over to stabilize said table, said auxiliary caster means mounted to said leg support assembly and disposed a predetermined distance above said supporting surface when said table lies in an upright position and a predetermined distance away from said primary caster means.

4,819,570

STRONGBOX HAVING AN INTEGRAL ANTITHEFT MECHANISM

Melvin E. Ballet, 320 W. Prospect St., Seattle, Wash. 98119, and Kenneth W. Fane, 3160 W. King Edward Ave., Vancouver, Canada V6L 1V5

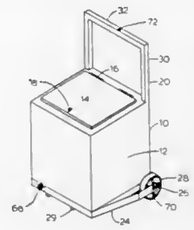
Continuation of Ser. No. 859,908, May 5, 1986, abandoned. This application Nov. 10, 1987, Ser. No. 122,643

Int. Cl.⁴ E05G *3/00, 1/00*

U.S. Cl. 109—23 **14 Claims**

1. A strongbox having an integral antitheft mechanism, said strongbox comprising a container having an interior adapted for storing valuables, a lid for selectively opening and closing of said container interior, a locking means associated with said lid and adapted to lock said lid in a closed position, at least one rigid, rod-like projection having a normal retracted position

within a perimeter of said strongbox, actuating means for rapid movement of said projection from said retracted position to a radial, extended position beyond said strongbox perimeter and



a dolly integral with said strongbox, said dolly having a pair of wheels and at least one said projection being adapted to extend through an opening in at least one wheel when in the extended position to prevent rotation of said wheel.

4,819,571

PROCESS FOR THE DESTRUCTION OF ORGANIC WASTE MATERIAL

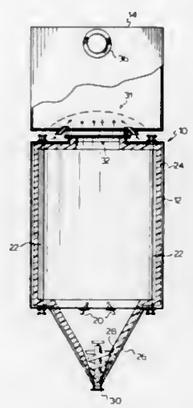
Douglas J. Hallett, Acton, Canada, assignor to Eli-Eco Logic Inc., Rockwood, Canada

Filed Aug. 5, 1987, Ser. No. 82,452

Claims priority, application Canada, Aug. 8, 1986, 515603

Int. Cl.⁴ F23G *7/00*

U.S. Cl. 110—346 **45 Claims**



1. A process for the destruction of organic waste material which comprises subjecting said waste material to direct reduction by intimate mixture with a gaseous reducing agent at a temperature above about 600° C. within an isolated first zone, wherein the hot reaction mixture thus obtained is at a temperature in the range of from about 800° C. to about 900° C.; transferring the thus reduced gaseous components to a second zone, and thereafter subjecting the hot reaction mixture thus obtained to oxidation with a gaseous oxidizing agent at a temperature above about 1000° C.

4,819,572

FOLDING DEVICE FOR AN AUTOMATIC SEWING MACHINE

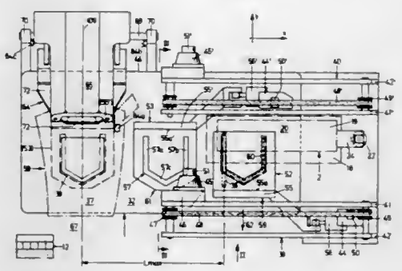
Hans Scholl, Wellbachstrasse 13, D-4811, Oerlinghausen-Lipperreihe, and Wolfram Schulze, Petristrasse 81, D-4800, Bielefeld 1, both of Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,263

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709232

Int. Cl.⁴ D05B *21/00*

U.S. Cl. 112—121.15 **10 Claims**



1. Folding device for an automatic sewing machine, comprising

a carrier plate (**32**) for a first workpiece (**37**);

a sword (**80**) attached to a sword carrier (**76**) for receiving a second workpiece (**38**);

an outer frame (**72**) attached to an outer frame carrier (**65**) and having creasing devices (**83**) for folding the second workpiece (**38**) around the sword (**80**);

a lower working position of the sword (**80**) on the carrier plate (**32**) and an upper working position of the sword (**80**) above the carrier plate (**32**);

means for moving the sword carrier (**76**) bearing the sword (**80**) between said lower working position and said upper working position;

a lower working position of the outer frame (**72**) on the carrier plate (**32**), a central working position of the outer frame (**72**) which is substantially identical with the upper working position of the sword (**80**) and above this central working position, and an upper work starting position of the outer frame (**72**);

means for moving the outer frame carrier (**65**) into the said lower, central and work starting positions of the outer frame (**72**); and

means for drawing out the sword (**80**) of one of its working positions into a retracted position out of the second workpiece (**38**); wherein

means are provided for moving the outer frame (**72**) out of its working positions into a retracted position in the outer frame carrier (**65**).

4,819,573

ELECTRONIC SEWING MACHINE

Flavio Bisson, Cava Manara; Giacomo Cattaneo, Pavia, and Domenico Peiretti, Turin, all of Italy, assignors to Necchi Societa per Azioni, Pavia, Italy

Filed Nov. 19, 1987, Ser. No. 122,690

Claims priority, application Italy, Nov. 20, 1986, 42916 A/86

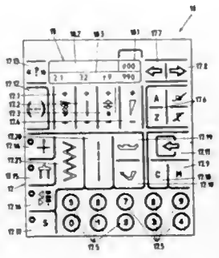
Int. Cl.⁴ D05B *3/02*

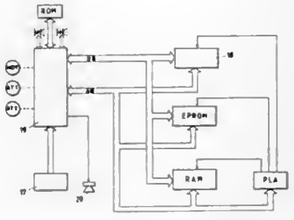
U.S. Cl. 112—454 **20 Claims**

1. An electronic sewing machine comprising a keyboard, a display unit, a microprocessor unit connected to said keyboard, to said display unit, to a first memory unit containing data corresponding to a pattern series, and to a second memory unit for storing data of patterns displayed in said display unit, en-

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abling modification of parameters of each pattern and pattern series at the same time while displayed, said keyboard comprising keys for recovering on the display unit the alphanumeric type shaped patterns contained in said first memory unit, keys for setting the sewing parameters of the recovered patterns, a key for storing in said second memory unit the recovered patterns and the corresponding sewing parameters, said display unit comprising a first zone and a second zone along which the series of the set patterns slides and a third zone in





which said sewing parameters are displayed, said first zone being moreover provided for displaying the pattern to be set, the pattern in phase of sewing, and the pattern on which operations are to be effected, the parameters of the pattern displayed in said first zone being in the meantime displayed in said third zone, the remaining patterns of the pattern series being displayed in said second zone, said remaining patterns and correspoding parameters persisting in said second memory during the operations to be effected on the above mentioned pattern.

4,819,574

RUDDERLESS SAILBOAT

Charles W. Westerman, 24446 Peacock St., El Toro, Calif. 92630

Filed Apr. 21, 1987, Ser. No. 40,994
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—39.1 **5 Claims**

1. A sailing craft comprising:

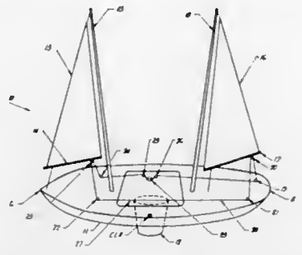
a hull offering a minimum of hydrodynamic resistance to yawing motion of said sailing craft thereby allowing aerodynamic forces to control yaw stability said hull having a bow, a stern, a cockpit area located approximately midway between the bow and the stern, a fore deck located intermediate the cockpit area and the bow, and an aft deck located intermediate the cockpit area and the stern;

a first sail supported by a forward-leaning first mast stepped in a forward position of said hull for transforming the action of the wind into a driving force acting at the forward end of said hull;

a second sail supported by an aft-leaning second mast stepped in an aft position of said hull for transforming the action of the wind into a driving force acting at the aft end of said hull;

a keel attached to said hull at a balance point between said first and second sails for producing a hydrodynamic side-force thereby acting as fulcrum;

a steering means consisting of a single continuous rope passing from a cleat near said cockpit area through one side of an adjacent double block to the fore deck, there forming a first tackle between the fore deck and the end of a boom at the foot of said first sail, thence passing across said cockpit area and forming a second tackle between the aft deck and the end of a boom at the foot of said second sail, thence back through the second pulley of said double



block and then secured to said adjacent cleat whereby with the ends of said rope uncleated and handled together as one rope the sails can be trimmed in unison to alter the coarse heading or adjust the angle of heel and with the ends cleated that part of said rope passing across said cockpit area between said first and second tackles is used to trim the sails differentially for steering said sailing craft onto a desired coarse heading; and

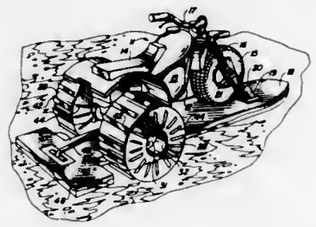
said first and second sails producing forces both for driving the craft forward through the water and for developing moments about said keel for steering said sailing craft.

4,819,575

MARINE CONVERSION FOR CYCLE

Jimmie D. Dixon, 7146 W. Bluefield Ave., Peoria, Ariz. 85345

Filed May 11, 1987, Ser. No. 47,465
Int. Cl.[4] B63B *35/86*
U.S. Cl. 114—270 **5 Claims**



1. In a marine conversion for an engine powered cycle normally possessing a steerable wheel and a pair of drive wheels, the combination of an elongated float positioned beneath the steering wheel and secured to the support for said wheel whereby the float turns laterally, drive wheel mounting means comprising a drive shaft and a drive flange for each of said drive wheels, a pair of rotatable paddle floats mounted on the cycle in place of said pair of drive wheels, each of said paddle floats having an inboard side and an outboard side, each of said paddle floats having a toroidal configuration and having a central opening therethrough sized to receive the drive flange of said wheel mounting means, a mounting plate carried by each of said floats and extending across the opening through its respective float intermediate the inboard and outboard sides

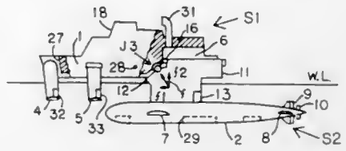
of the float, each said mounting plate having a set of openings therein for connecting the plates to said drive flanges.

4,819,576

HYDROFOIL - SUBMARINE VESSEL SYSTEM

Chung-Chen C. Shaw, 1626 Belle View Blvd., Alexandria, Va. 22307

Filed Jan. 20, 1988, Ser. No. 146,103
Int. Cl.[4] B63B *1/24*
U.S. Cl. 114—248 **3 Claims**



1. A hydrofoil-submarine hybrid vessel system comprising:

a. a surface craft for housing passenger, crew, control systems and military load;

b. at least one foil mounted at the bottom of said surface craft for controlling roll and pitch of said surface craft, and providing some lifting force when said vessel system is at high cruising speed;

c. a sub-craft for machinery, fuel, ballast, heavy stuff storage and military load;

d. a strut mounted on top of the said subcraft, access means enclosed in the said strut;

e. one pair of main foils are mounted symmetrically on both sides of the sub-craft to provide stabilizing and lifting force when said vessel system is at high cruising speed;

f. propulsion means, diving planes and rudders are mounted on the said sub-craft;

g. a separable joint means for connecting the surface craft and the sub-craft, having three degrees of rotating freedom, is mounted at the top of the strut of the said sub-craft and the bottom of the said surface craft;

h. a V-shape cutout is provided at the bottom of the said surface craft and around the top of said strut of the said sub-craft; and

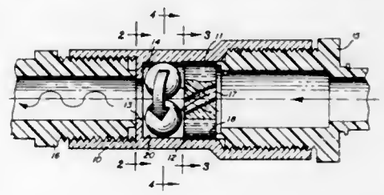
i. auxiliary propulsion and steering means are mounted on said surface craft to provide a force for moving the surface craft when the surface craft is separated from the sub-craft.

4,819,577

FLUID FLOW INDICATOR

Daniel N. Campau, Grand Rapids, Mich., assignor to Flow-Rite Controls, Ltd., Grand Rapids, Mich.

Filed May 20, 1988, Ser. No. 196,421
Int. Cl.[4] G01F *15/00*
U.S. Cl. 116—264 **6 Claims**



1. An apparatus for visually indicating fluid flow comprising:

(a) a transparent housing defining a generally longitudinal main passageway for conveying fluids through said housing;

(b) said housing having an inlet and an outlet;

(c) means positioned adjacent to said inlet for creating in said fluid passing through said housing a flow component which is transverse to the longitudinal axis of said housing;

(d) at least two generally spherical flow indicators positioned within said housing downstream of said transverse flow creating means; and

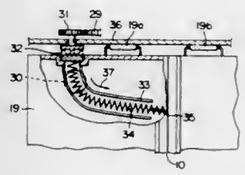
(e) said outlet including an abutment extending radially inward to retain said spherical flow indicator within said housing.

4,819,578

TONER COLLECTING DEVICE

Junichi Koiso; Takayoshi Hashimoto, and Toshio Shida, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Company Ltd., Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,187
Claims priority, application Japan, Mar. 11, 1986, 61-53252
Int. Cl.[4] G03G *15/08*
U.S. Cl. 118—652 **20 Claims**



1. A toner collecting device for collecting toner which has been removed from an image retainer by means of a cleaning device, after a toner image formed upon said image retainer with toner has been transferred to a transfer material, comprising:

a toner collecting container;

a conveyor device, for conveying said removed toner from said cleaning device to said toner collecting container, disposed within said toner collecting container and comprising a rotatable screw having a first proximal end portion for receiving said removed toner from said cleaning device and a second distal end portion for discharging said conveyed removed toner into an interior portion of said toner collecting container; and

a diffusion member mounted upon said second distal end portion of said rotatable screw for distributing and conveyed removed toner throughout said toner collecting container.

4,819,579

COATING OF SEMICONDUCTOR WAFERS AND APPARATUS THEREFOR

George M. Jenkins, Dunrobin, Canada, assignor to Northern Telecom Limited, Ontario, Canada

Continuation of Ser. No. 508,411, Jun. 28, 1983, Pat. No. 4,466,381, which is a continuation of Ser. No. 250,163, Apr. 2, 1981, abandoned. This application Jun. 7, 1984, Ser. No. 618,140
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] C23C *10/00*
U.S. Cl. 118—728 **6 Claims**

1. An apparatus for producing coatings on semiconductor wafers, comprising:

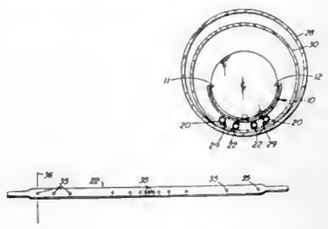
a boat for carrying said wafers, said boat comprising:

an elongated, transversely curved bottom member having an open top and open ends, the transverse curvature of said

bottom member being similar to the peripheral curvature of a wafer to be positioned in said bottom member;

means for supporting wafers in said bottom member such that lower edges of said wafers are spaced from said bottom member;

openings formed in said bottom member to enable gases to flow into said bottom member; and



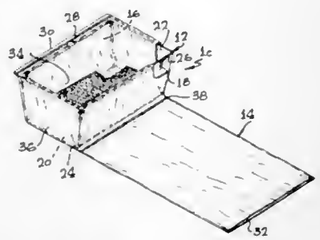
means for enclosing said open top of said bottom member, said enclosing means being positioned in close proximity to and spaced from upper edges of said wafers in said bottom member to cause excess gases to flow out of said open ends.

4,819,580

DISPOSABLE CAT LITTER BOX

David A. Foldes, Reseda, Calif., assignor to A KAD Co., Brewster, N.Y.

Filed Jan. 9, 1987, Ser. No. 1,872
Int. Cl.[4] A01K *45/00*
U.S. Cl. 119—1 **10 Claims**



1. A disposble cat litter box comprising:

a receptacle having a bottom and having a top edge mounted on said bottom and extending above said bottom, said top edge defining an interior space within said receptacle which is open at the top;

a flexible waterproof tube, said flexible waterproof tube having a portion which is sufficiently large to receive therein said receptacle and being sufficiently large so that said tube portion can extend below said top edge of said receptacle to form a recess within and below said top edge of said receptacle to receive litter;

said tube having a closed end thereon and said receptacle being positioned within said tube portion adjacent said closed end of said tube; and

said tube extending away from said receptacle to an open end, said tube having an intermediate closure between said portion of said tube which contains said receptacle and said open end, said tube being sufficiently long from said intermediate closure to said open end so that said open end of said tube can be inverted over the portion of said tube which contains said receptacle to enclose said receptacle and said recess in said receptacle formed by said tube.

4,819,581

METHOD OF INDUCING FEEDING BEHAVIOR IN FISH

Robert W. Lakey, Sr., Rte. 2 Box 219, Longview, Tex. 75605

Filed Sep. 14, 1987, Ser. No. 96,372
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 **11 Claims**

1. A method of inducing accelerated feeding behavior in fish contained within a natural or artificial impoundment of water for the purpose of enticing such fish to seek out and strike a baited hook, comprising the steps of:

selecting for introduction into the water of the impoundment a water soluble chemical oxidizing agent characterized by liberation of free oxygen upon solution in the water of the impoundment, and having a low level of toxicity to the fish confined within said impoundment;

initially introducing into and dispersing through the water of the impoundment a sufficient quantity of said oxidizing agent to elevate the dissolved oxygen concentration of the water of the impoundment by not less than 1 part per million by weight above the concentration immediately prior to the introduction of said oxidizing agent, to a level within the range of not more than 1.5 parts per million by weight below to 3 parts per million by weight above the saturation concentration of dissolved oxygen in the water of said impoundment, such that accelerated feeding behavior of the fish contained within said impoundment is induced;

continuing introduction into and dispersion through the water of the impoundment a sufficient quantity of said oxidizing agent at such time intervals as necessary to maintain the dissolved oxygen concentration of the water of the impoundment within said range of not more than 1.5 parts per million by weight below to 3 parts per million by weight above the saturation concentration for such period of time as accelerated feeding behavior is desired; and

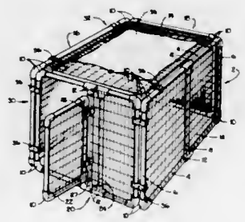
discontinuing introduction of said oxidizing agent to the water of said impoundment for at least one day following not more than three consecutive days of treatment of said water with said oxidizing agent.

4,819,582

KNOCK-DOWN ANIMAL CAGE

Jerry L. Lichvar, 161 San Marcos Blvd., San Marcos, Calif. 92069

Filed Oct. 26, 1987, Ser. No. 112,514
Int. Cl.[4] A01K *31/00*
U.S. Cl. 119—17 **8 Claims**



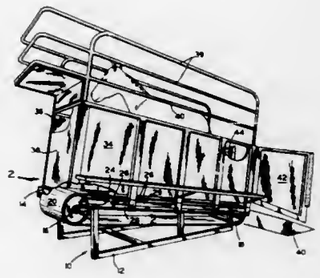
1. A knock-down cage comprising a plurality of rectangular panels each having a marginal frame comprised of a plurality of lengths of hollow plastic tubing, each length having a hardened outer skin to resist cold-flow, the lengths being glued at their ends by plastic elbow means in closed orthogonal relation, the panels being adjacent and marginally connected together by clamping means to form an enclosure of at least closed sides and closed top, the area defined by each panel being covered by mesh material connected to each length of tubing forming the panel and impassable to the cagee except for at least one panel which defines a portal for passage of the cagee into and out from the cage, and a door means associated with each portal hingedly hung on a cross member by a straight member of the door frame rigidly clamped to and in close juxtaposed relation with a sleeve loosely fitted over the cross member, associated with each portal for latchingly closing its associated portal.

4,819,583

EXERCISING APPARATUS

Gerald T. Guerra, Sandusky, Ohio, assignor to Lake Erie Welding & Fabricating, Inc., Sandusky, Ohio

Filed Oct. 10, 1986, Ser. No. 917,892
Int. Cl.[4] A01K *31/00*
U.S. Cl. 119—29 **10 Claims**



1. In an animal exercising device having a movable floor, with side walls and cooperating end walls for containing the animal on the floor, the improvement comprising:

frame means;

a first roller means attached to said frame means to rotate about an axis;

a second roller means attached to said frame means in spaced relation to said first roller means to rotate about an axis parallel to the axis of rotation of said first roller means;

an endless belt looped around said first and said second roller means, the upper run of said belt comprising said movable floor for supporting the animal;

a plurality of closely spaced supporting roller means disposed beneath said belt at least in the region thereof defining the movable floor for supporting said animal, each said supporting roller means having stub axles extending from the opposite ends thereof; and

means yieldably supporting each of the stub axles of said supporting roller means to permit each of said supporting roller means to yield independently of the others and the stub axles at opposite ends of each of said supporting roller means to yield relative to one another to effectively cushion the impact of the weight of the animal during exercise.

4,819,584

ERECTABLE BIRD FEEDER

Dennis Rozumek, 57 Mill St., Middleton, Mass. 01949

Filed Nov. 12, 1987, Ser. No. 119,792
Int. Cl.[4] A01K *39/00*
U.S. Cl. 119—51 R **2 Claims**

1. An erectable bird feeder comprising a station for holding bird feed, an articulated support post normally maintaining said station in an elevated position, said articulated support post including a fixed and a pivotable portion, a hinge member including a first angle member attached to said fixed portion and a second angle member fixed to said pivotable portion, a pivot shaft joining said fixed and pivotable portions, a retractable pin, said fixed and pivotable portions having matching openings formed therethrough for receiving said pin, removal of said pin permitting said pivotable portion to pivot relative to said fixed portion whereby said station may be lowered from said elevated position to facilitate the placement of bird feed in said station, said station includes a frame mounted rigidly atop said baffle and supported by said post, a bird feed container pivotally suspended from and within said frame, such that said



container is maintained in a substantially horizontal, upright position irrespective of the axial relationship of said sections of said post.

4,819,585

FREEZE RESISTANT ADJUSTABLE FLOW RATE ANIMAL NIPPLE WATERER

Roger Dolan, 411 E. Market, Lisbon, Iowa 52253, and Clifford Streed, 711 Meadow Lane Ct., Mount Vernon, Iowa 52314

Filed Jan. 16, 1987, Ser. No. 3,806
Int. Cl.[4] A01K *7/00*
U.S. Cl. 119—72.5 **12 Claims**



1. An animal watering apparatus, of the type having a maximum flow rate which is adjustable by a stockman, comprising:

a. first rotary valving means for controlling flow rate, which is capable of allowing separate selective regulation, by the stockman, of the maximum flow rate through the watering apparatus, by the stockman setting a variable maximum flow rate which is independent of the normal on-off operation of the watering apparatus;

b. a valve body for housing said first rotary valving means;

c. second valving means additionally housed in said valve body for on-off control of the animal watering apparatus; and

d. means for selectively engaging, by the stockman, said second valving means with said first rotary valving means for adjusting said flow rate by selectively manipulating said second valving means, while allowing normal on-off operation otherwise independent of said maximum flow rate.

4,819,586

CRACKING FURNACE WITH IMPROVED HEAT TRANSFER TO THE FLUID TO BE CRACKED

Walter Kreuter, Penzberg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 13, 1988, Ser. No. 144,877
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1987, 3701161
Int. Cl.[4] F22B *15/00*
U.S. Cl. 122—235 C **13 Claims**

1. A furnace for transferring heat to a fluid, comprising:

a housing defining at least one furnace chamber;

heaters in said chamber defining a radiant-heating zone therein; and

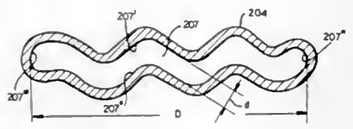
at least one tubular element traversing said radiant-heating

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zone and provided with means for feeding said fluid to said tubular element and with means for removing said fluid from said tubular element so that said fluid is heated as it passes through said tubular element, said tubular element defining a flow passage for said fluid having a cross-sectional width greater than a cross-sectional height thereof, each said tubular element satisfying the following criteria:

$d_h = F/U \leqq 40$ mm, and

$D/d \geqq 2$, wherein:



d_h = the hydraulic diameter of the flow passage defined as the ratio of the flow cross-sectional area to the inner peripheral dimension therearound;
F = the flow cross-sectional area;
U = the inner peripheral dimension of the flow cross section;
d = the cross-sectional height of the flow cross section; and
D = the width of the flow cross section;
wherein said flow passage has a meander-shaped cross section such that d is equal to the smallest distance between juxtaposed walls bounding the flow cross section and D corresponds to the distance between ends of the meander-shaped cross section.

4,819,587

MULTIPLE-PURPOSE INSTANTANEOUS GAS WATER HEATER

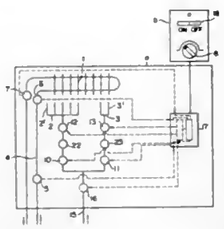
Osamu Tsutsui; Hideki Kawaguchi; Keiji Hayashi; Masahiro Kayano; Shingo Tanaka, all of Fukuoka; Hiroshi Kobayashi, Shiga; Hisashi Nakamura, Shiga, and Atsuo Makita, Shiga, all of Japan, assignors to Toto Ltd., Fukuoka, Japan

Filed Jul. 9, 1986, Ser. No. 883,773

Claims priority, application Japan, Jul. 15, 1985, 60-156593; Jul. 19, 1985, 60-160770; Jul. 26, 1985, 60-166983; Oct. 24, 1985, 60-238850; Jan. 10, 1986, 61-3153; Jan. 10, 1986, 61-3154

Int. Cl.⁴ F22B *37/42*

U.S. Cl. 122—488 R **27 Claims**



1. A multiple-purpose instantaneous gas water heater comprising:
(a) a first burner;
(b) a second burner;
(c) a heat exchanger positioned adjacent said first burner and said second burner, said first and second burner being operably connected to selectively heat water contained in said heat exchanger;
(d) means for independent setting of the highest and lowest combustion capacities of said first burner and said second burner, wherein the highest combustion capacity of said second burner is slightly larger than the lowest combustion capacity of said first burner;
(e) means for detecting a water flow rate;
(f) means for detecting the temperature of feeding water;
(g) means for detecting the temperature of hot water, said means for detecting being arranged sequentially, respectively, along a feeding water pipeline channel extending through said heat exchanger;
(h) a control panel including means for setting water temperature;
(i) a microprocessor including:
(i) an arithmetic-logic means for receiving data from each of said means for detecting and said means for setting water temperature; and
(ii) means for defining a required heat load in response to said data;
(j) means for selectively operating said first burner and said second burner depending upon the required heat load automatically determined by said microprocessor; and
(k) means for selectively generating a combustion-off signal for intermittently operating said second burner;
(l) means for generating a proportional combustion signal for operating said first burner; and
(m) means for generating a proportional combustion signal for operating said first burner and said second burner, said means for selectively generating being operable in response to a burner selected by said means for selectively operating a burner;
(n) first and second electrical valves;
(o) first and second proportional control valves; and
(p) a fuel gas feeding pipeline, said first and second electrical valves being operable to selectively open said fuel gas feeding pipeline and said first and second proportional valves including means for continuously controlling the fuel gas flow rate through said gas feeding pipeline.

4,819,588

INTAKE APPARATUS FOR AN ENGINE

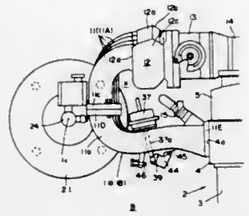
Toshinobu Itoh; Noriyuki Nakano; Takashi Takino, and Mutsukata Mishima, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 6, 1987, Ser. No. 22,874

Claims priority, application Japan, Mar. 8, 1986, 61-50991; Mar. 17, 1986, 61-57074

Int. Cl.⁴ F02M *35/10*

U.S. Cl. 123—52 M **16 Claims**



1. An intake apparatus for an engine, comprising:
an engine body having a plurality of cylinders arranged in series along an axis and having on one side surface thereof an opening to an intake port for each of the cylinders;
a surge tank located above said engine body and extending in a direction parallel to the axis;
a plurality of separate intake tubes connecting independently openings in said surge tank to the intake port for each of said cylinders and being juxtaposed with each other in the direction parallel to the axis;
each of said separate intake tubes having a substantially identical length and effective cross-sectional area, and being of a shape extending in a direction away from one side surface of said surge tank and then curving toward the one side surface of said engine body; and
the openings for each of said separate intake tubes on said surge tank being arranged such that an opening on a first end side of said surge tank along the direction parallel to the axis is higher than an opening on a second end side of said surge tank along the direction parallel to the axis.

4,819,589

SUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

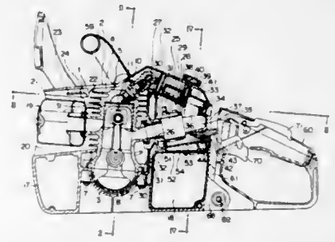
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 41,616, Apr. 23, 1987, abandoned. This application Jun. 2, 1988, Ser. No. 203,623

Claims priority, application Japan, Apr. 23, 1986, 61-61585[U]

Int. Cl.⁴ F02B *75/18*

U.S. Cl. 123—52 M **8 Claims**



1. A suction system for an internal combustion engine, comprising
an air cleaner and an elbow tube through which air cleaned by said air cleaner is supplied to a carbureter,
said elbow tube including a first passage portion extending coaxially with an inlet of said carbureter, said first passage portion having a top side, and a second passage portion extending along an axis which crosses the axis of said first passage portion at an angle,
wherein a first end of said first passage portion is coupled with the inlet of said carbureter, while the other end thereof is closed, and a first end of said second passage portion is coupled with an outlet of said air cleaner, while the other end thereof opens into said top side of said first passage portion from above, at an intermediate portion of said first passage portion between said first and other end of said first passage portion, wherein fuel blown back into said first passage portion from said carbureter via said inlet thereof is prevented from reaching said air cleaner via said second passage portion, as a result of the blown-back fuel being blown into said closed end of said first passage portion, and said second passage portion and said air cleaner being above said first passage portion.

4,819,590

CONTROL VALVE DRIVING DEVICE IN AN INTERNAL COMBUSTION ENGINE

Masaki Ban, Tokyo; Kazuman Taniuchi, and Hiroyuki Morita, both of Asaka, all of Japan, assignors to Honda Research and Development Co., Ltd., Tokyo, Japan

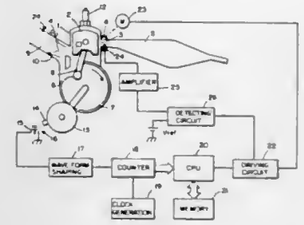
Filed Aug. 13, 1987, Ser. No. 85,079

Claims priority, application Japan, Aug. 13, 1986, 61-189937

Int. Cl.⁴ F02B *75/02;* **F02D** *39/04*

U.S. Cl. 123—65 P **6 Claims**

1. A control valve driving device comprising
a control valve provided in at least one gas transfer passage of an internal combustion engine;
the opening angle of said control valve being changeable to permit one of an intake or an exhaust characteristic to be changed,
said device being characterized in that said device includes:
a pressure sensor for detecting a pressure near said control valve;



means for calculating a target value for driving said control valve in response to an operating condition of said internal combustion engine,
means for driving said control valve in response to said target value,
said driving means being actuatable at any stage of combustion, at any time that said detected pressure is lower than a predetermined value.

4,819,591

POPPET VALVE ASSEMBLIES

Ronald E. Valentine, Wittersham, United Kingdom, assignor to Collins Motor Corporation Limited, Perth, Australia

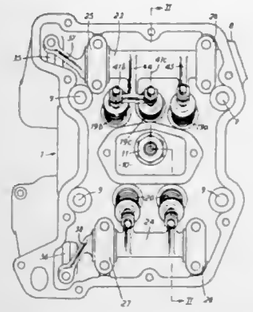
PCT No. PCT/GB87/00159, § 371 Date Dec. 17, 1987, § 102(e) Date Dec. 17, 1987, PCT Pub. No. WO87/05356, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 6, 1987, Ser. No. 135,160

Claims priority, application United Kingdom, Mar. 7, 1986, 8605619

Int. Cl.⁴ F01L *1/26*

U.S. Cl. 123—90.44 **14 Claims**



1. A poppet valve assembly comprising a plurality of simultaneously-operated inlet poppet valve members cooperating with a single combustion chamber, said inlet poppet valve members having valve stems and being slidably mounted for reciprocating movement between their open and closed positions along axes passing through their valve stems, the axes of said valve stems not all being parallel with each other; a rocker mounted for rocking movement about a rocking axis transverse to each valve stem axis, the rocker having a tappet element for each inlet valve member for engaging an end face of

the respective valve stem, the respective lengths of the valve stems being such that the points of engagement of the tappet elements with the end faces of the valve stems do not all lie in the same axial plane passing through the rocker axis and said valve stems being positioned such that for each inlet valve member, in an intermediate position of said reciprocating movement, a line from the rocker axis to the point of engagement of the tappet element with the end face of the valve stem is perpendicular to the respective valve stem axis.

4,819,592

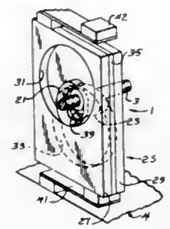
ENGINE BALANCER

Robert H. van Ligten, 3691 Karen Pkwy., Pontiac, Mich. 48054

Filed Feb. 1, 1988, Ser. No. 151,028

Int. Cl.[4] F16F *15/26*

U.S. Cl. 123—192 B **30 Claims**



1. An improved balancer for reducing vibration generated by a rotating shaft comprising:

a cam means secured to rotating shaft comprising at léast one approximately elliptical cam offset from another approximately elliptical cam 90 degrees; and

a mass having a means for contacting said cam means such that the mass is linearly reciprocated at twice the rotational frequency of the shaft.

4,819,593

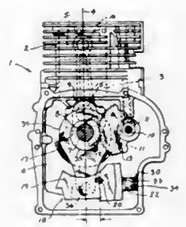
PIVOTING BALANCER SYSTEM

Patrick J. Bruener, Hartland; Joseph R. Harkness, Germantown; Norbert M. Vogl, Milwaukee, and Glen C. Eifert, Hartford, all of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Apr. 28, 1988, Ser. No. 187,440

Int. Cl.[4] F16F *15/28*

U.S. Cl. 123—192 B **17 Claims**



1. In an apparatus of the type having a cylinder defining a cylinder axis and a crankcase, a crankshaft rotatably mounted in the crankcase, said crankshaft defining a crankshaft axis substantially normal to said cylinder axis and having a crankpin flanked by a pair of crankarms that connect the crankpin to the crankshaft in eccentrically offset relation to the crankshaft axis, and a piston axially reciprocable in the cylinder and connected with the crankpin, counterbalancing means comprising:

a counterbalance weight defining a center of gravity;

first mounting means for pivotally connecting said counterbalance weight to said crankcase to provide a stationary pivot axis for said weight;

second mounting means for pivotally connecting said counterbalance weight to said crankshaft to provide reciprocal motion for said weight; and

the center of gravity of said counterbalance weight being disposed between said cylinder axis and said stationary pivot axis.

4,819,594

REVERSIBLE ROTARY INTERNAL COMBUSTION ENGINE

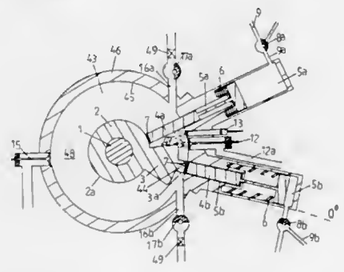
George B. Tsakiroglou, No. 25 Porchester Pl., Flat 95, London, Great Britain W2 2PE

Continuation-in-part of Ser. No. 786,400, Oct. 7, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 144,740

Claims priority, application United Kingdom, Feb. 6, 1984, 8403062; Jul. 12, 1984, 8417766

Int. Cl.[4] F02B *53/06*

U.S. Cl. 123—201 **10 Claims**



1. A reversible rotary internal combustion engine comprising:

a stator comprising a cylindrical chamber;

a drive shaft extending through said chamber;

a rotor comprising a cylindrical hub fixed to said drive shaft and a rotor arm extending radially from said hub to the inner peripheral surface of said chamber;

first and second radially movable wall members mounted to said stator at respective locations that are spaced radially from one another around said stator, each of said first and said second radially movable wall members being movable in respective directions that extend substantially between a retracted position at which faces of the wall members lying radially innermost with respect to said cylindrical chamber are respectively flush with the inner peripheral surface of said chamber and an inserted position at which said faces contact the outer peripheral surface of the hub of said rotor;

an air receiving means, and respective compressed air outlet ports, one of which is associated with one of said wall members and the other of which is associated with the other of said wall members, said air outlet ports extending between said cylindrical chamber and said air receiver means;

selector means for moving said first wall member to the inserted position and said second wall member to the retracted position when said rotor is to be rotated in a first rotational direction within said cylindrical chamber during operation, and for moving said first wall member to the retracted position and said second wall member to the inserted position when the output of the combustion engine is to be reversed and said rotor is to be rotated in a second rotational direction within said cylindrical chamber that is opposite to said first rotational direction,

a combustion chamber being defined within said cylindrical chamber between one side of the one of said wall members that is at the inserted position and said rotor, and an air compression chamber being defined between the other side of the one of said wall members that is at the inserted position and said rotor;

fresh air introduction port means open to said air compression chamber and comprising an air pump for pumping fresh air into said cylindrical chamber;

opening and closing means for opening the one of said compressed air outlet ports that is associated with the one of said wall members that is at the inserted position to place the cylindrical chamber in communication with said air receiver means and for closing the other of said compressed air outlet ports;

inlet means operatively connected between said air receiver means and the combustion chamber defined within said cylindrical chamber for introducing air from said air receiver means into said combustion chamber and for introducing fuel into said combustion chamber with the air introduced therein,

such that the air and the fuel in said combustion chamber when ignited generate combustion gases which expand to force said rotor to rotate in said first rotational direction if said first wall member is at the inserted position and to force said rotor to rotate in said second rotational direction if said second wall member is at the inserted position thereby compressing the fresh air pumped into the compression chamber through said fresh air introduction port means, most of which passes through the open one of said compressed air outlet ports to said air receiver means;

exhaust means communicating with said cylindrical chamber; and

timing means synchronized with the rotation of said rotor for retracting the one of said wall members that is at the inserted position from the inserted position to the retracted position after the rotor has rotated a predetermined amount within said stator that corresponds to at least 80% of the engine cycle such that the fresh air pumped into the compression chamber and compressed by the rotor that remains in the cylindrical chamber expands through said cylindrical chamber to scavenge the expanded combustion gases within the cylindrical chamber from said cylindrical chamber through said exhaust means, and said timing means for reinserting the same said one of said wall members after it has been retracted to the retracted position back to the inserted position after said rotor arm of said rotor has rotated past the space within said cylindrical chamber that is occupied by the same said one of said wall members when at the inserted position.

4,819,595

METHOD OF OPERATING CATALYTIC IGNITION CYCLIC ENGINES

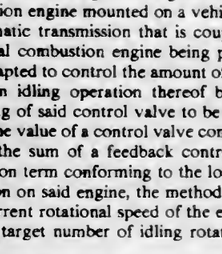
William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

Divisions of Ser. No. 907,062, Sep. 12, 1986, Pat. No. 4,773,368, and a continuation-in-part of Ser. No. 895,468, Aug. 11, 1986, and Ser. No. 526,530, Aug. 26, 1983, Pat. No. 4,646,707, which is a continuation-in-part of Ser. No. 249,075, Mar. 30, 1981, abandoned, said Ser. No. 895,468, is a division of Ser. No. 526,530,. This application Feb. 19, 1988, Ser. No. 157,695

Int. Cl.[4] F02B *51/02*

U.S. Cl. 123—272 **18 Claims**

1. A piston for use in compression ignition engines which comprises a crown, an oxidation catalyst intimately bonded to said crown, insulating means as part of said crown to reduce heat loss through said crown, said catalyst having a surface sufficiently nonporous so as to be substantially non-wettable by



fuel at engine operating conditions whereby said catalyst is effective for ignition of said fuel when said catalyst is hot.

4,819,596

METHOD FOR CONTROL OF IDLE ROTATIONS OF INTERNAL COMBUSTION ENGINE

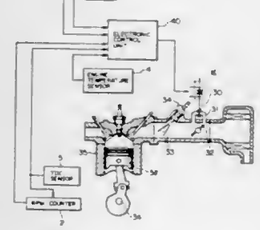
Akimasa Yasuoka; Takeo Kiuchi, and Takahiro Iwata, all of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 865,692, May 22, 1986, Pat. No. 4,760,823. This application Feb. 16, 1988, Ser. No. 155,676

Claims priority, application Japan, Jun. 24, 1985, 60-137446; Jun. 24, 1985, 60-137447

Int. Cl.[4] F02D *41/16*

U.S. Cl. 123—339 **4 Claims**



1. A method for controlling the idling rotational speed of an internal combustion engine mounted on a vehicle, said vehicle having an automatic transmission that is coupled to said engine, said internal combustion engine being provided with a control valve adapted to control the amount of inlet air to said engine during an idling operation thereof by allowing the degree of opening of said control valve to be controlled proportionately to the value of a control valve command obtained on the basis of the sum of a feedback control term and an addition correction term conforming to the load of said automatic transmission on said engine, the method comprising:

sensing the current rotational speed of the engine,

determining a target number of idling rotations of the engine,

calculating the deviation of said current rotational speed from said target number of idling rotations,

calculating said feedback control term in accordance with said deviation of the current rotational speed from said target number of idling rotations,

sensing whether said automatic transmission is in its drive range or in its neutral range, and

calculating the addition correction term when the automatic

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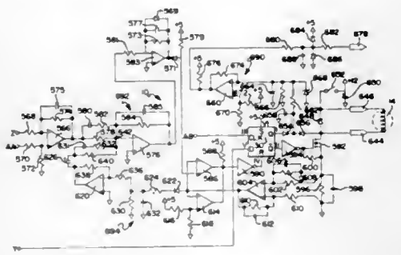
transmission is in its drive range, the addition correction term consisting of the product of a predetermined value fixed for a standard load of the automatic transmission on the engine and a correction value obtained on the basis of the difference between the standard operating state and an actual operating state of the internal combustion engine at the time said control valve command is generated, said correction value being predetermined as a function of the deviation of the actual vehicle speed from the standard value thereof.

4,819,597

CLOCKED CURRENT TORQUE MOTOR CONTROL

Allan R. Gale, Allen Park, and James M. Slicker, Union Lake, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 5, 1988, Ser. No. 177,714
Int. Cl.[4] G05B *11/28*; F02D *9/00*
U.S. Cl. 123—399 **16 Claims**



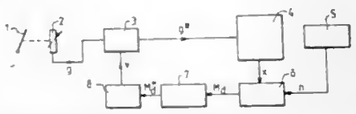
1. A control circuit for selectively energizing a load, said circuit comprising:
means operative to receive a pwm demand signal and to generate an input signal as a time averaged function thereof;
first comparator means operative to generate an error signal as a function of the difference between said input signal and a sensed load condition signal;
second comparator means operative to generate a switch logic signal as a function of the difference between said error signal and sensed load current;
switch means operative to selectively energize said load in response to a switch command signal; and
gating means operative to output said switch command signal in response to receiving both said pwm and switch logic signals.

4,819,598

METHOD AND APPARATUS FOR PREVENTING TROUBLESOME LOAD CHANGE SHOCKS CAUSED BY A COMBUSTION ENGINE

Eckart Mueller, Gifhorn, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 23, 1987, Ser. No. 123,962
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640536
Int. Cl.[4] F02D *9/08*
U.S. Cl. 123—399 **6 Claims**



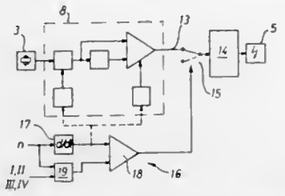
1. A method for preventing troublesome load change shocks caused by a combustion engine used to propel a vehicle, the method comprising the step of transmitting with a time delay control commands for a power control element which are delivered by an accelerator pedal, said time delay being limited to a region of the torque curve of the engine where the torque changes between positive and negative values.

4,819,599

DEVICE FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Eberhard Chemaitzer, Lehrensteinsfeld, Fed. Rep. of Germany, assignor to Audi AG, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 71,908
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1986, 3623829
Int. Cl.[4] F02P *5/14*
U.S. Cl. 123—425 **10 Claims**



1. Apparatus for controlling the ignition timing of an internal combustion engine, including a first device for establishing the normal ignition timing of the engine independence upon factors comprising vehicle parameters, a second device acting as a knocking control means for preventing or minimizing knocking of the engine when running, which comprises a knocking sensor, a signal processing means connected thereto for recognizing knocking, a control circuit arranged to provide stepped retarding adjustments of the ignition point in relation to the normal stipulated ignition point when knocking occurs and stepped resetting advancement, and including a third device for recognizing an acceleration state or an increase in engine speed per unit time dn/dt where n indicates the speed, and which in the event of certain acceleration values where dn/dt is equal to or exceeds a threshold value x_n acts on the knocking control so as to effect this less actively than during steady-state operation in which the acceleration threshold value at which the acceleration device takes effect is of variable height depending upon the speed.

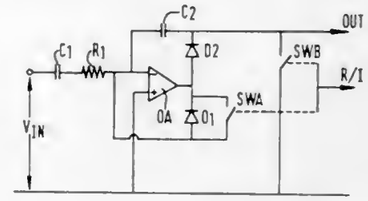
4,819,600

SIGNAL INTEGRATING CIRCUIT

David Mainprize, Sutton Coldfield, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Nov. 24, 1987, Ser. No. 124,578
Claims priority, application United Kingdom, Dec. 6, 1986, 8629247
Int. Cl.[4] F02P *5/155*
U.S. Cl. 123—425 **12 Claims**

10. A knock detection system for an internal combustion engine, comprising:
a rectifying and integrating circuit;
a transducer for attaching to the internal combustion engine and providing a signal to said rectifying and integrating circuit; and
means, responsive to the output of the rectifying and integrating circuit, for controlling ignition timing of said engine, said rectifying and integrating circuit comprising:
an operational amplifier having an input for receiving a signal to be rectified and integrated;
an integrating capacitor having one side connected to an output of the operational amplifier and its other side connected to said input of the operational amplifier, said one side of the integrating capacitor delivering an output signal from the circuit;
a first rectifying means connecting the output of the operational amplifier to said one side of the capacitor; and



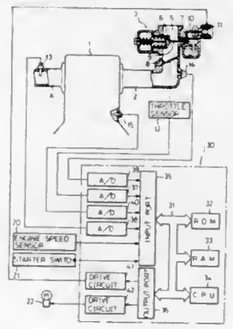
a second, oppositely-poled rectifying means connecting the output of the operational amplifier to its said input, said second rectifying means and said capacitor comprising a sole means for feeding said output signal to said input during integration.

4,819,601

DIAGNOSTIC SYSTEM OF AN AIR-FUEL RATIO CONTROL DEVICE

Kenichi Harada, Susono; Nobuki Uchitani, Tokushima; Tatuyoshi Kamohara, Toyota; Koichi Satoya, Susono, and Takashi Kato, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 12, 1988, Ser. No. 181,264
Claims priority, application Japan, Apr. 15, 1987, 62-090711; Jun. 10, 1987, 62-143264; Jun. 23, 1987, 62-154307; Jun. 24, 1987, 62-155516
Int. Cl.[4] F02M *7/00, 51/00*; F02D *41/22, 41/14*
U.S. Cl. 123—438 **23 Claims**



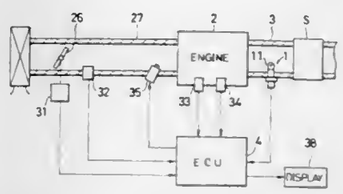
1. A diagnostic system of an air-fuel ratio control device for use in an internal combustion engine, said diagnostic system comprising:
detecting means for detecting a temperature of the engine;
diagnostic means for determining whether or not said air-fuel ratio control device has malfunctioned; and
control means for controlling said diagnostic means in response to an output signal of said detecting means to prohibit a determination by said diagnostic means when said temperature of the engine exceeds a predetermined temperature.

4,819,602

SYSTEM OF ABNORMALITY DETECTION FOR OXYGEN CONCENTRATION SENSOR

Toshiyuki Mieno; Toyohei Nakajima; Yasushi Okada, and Nobuyuki Oono, all of c/o Kabushiki Kaisha Honda, 4-1, Chuo 1-chome, Wako-City, Saitama, Japan

Filed Mar. 27, 1987, Ser. No. 30,494
Claims priority, application Japan, Mar. 27, 1986, 61-69095
Int. Cl.[4] F02D *41/22*
U.S. Cl. 123—479 **3 Claims**



1. A system for abnormality detection in an air/fuel ratio control apparatus of an internal engine comprising:
an oxygen concentration sensor including two pairs of electrodes disposed in mutual opposition, each said pair sandwiching an oxygen ion-conductive solid electrolytic member:
gas diffusion control means for providing an exhaust gas of an internal combustion engine to the vicinity of one electrode of each of said two pairs of electrodes;
control means for applying a pump voltage, determined in accordance with a voltage difference between a sensor voltage which is produced between a first pair of said two pairs of electrodes and a reference voltage determined between a second pair of said two pairs of electrodes to maintain said sensor voltage at said reference voltage, said control means thereby producing, as an output which represents an oxygen concentration sensing value, a value of pump current which flows between said second pair of electrodes;
means for deriving an air/fuel ratio compensation value, in accordance with said oxygen concentration sensing value, for controlling an air/fuel ratio of a mixture supplied to said internal combustion engine such as to maintain said air/fuel ratio at a target air/fuel ratio;
drive means for driving an air/fuel ratio control means of said internal combustion engine in accordance with a corrected air/fuel control value which is obtained by applying compensation to an air/fuel ratio control value in accordance with said air/fuel ratio compensation value; and
means for detecting an abnormality of an electrical connection system of said second pair of electrodes based upon said pump current and upon said air/fuel ratio compensation value.

4,819,603

SYSTEM AND METHOD FOR CONTROLLING IGNITION TIMING FOR AN INTERNAL COMBUSTION ENGINE

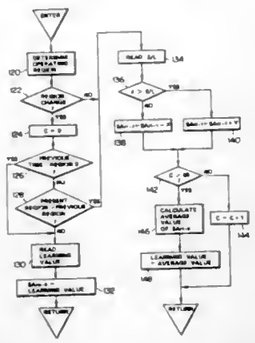
Tatsuo Morita, Yokosuka; Terufumi Hidaka, Yokohama, and Yuichi Kashimura, Katsuta, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa and Hitachi, Ltd., Tokyo, both of, Japan

Filed Oct. 22, 1986, Ser. No. 921,484
Claims priority, application Japan, Oct. 22, 1985, 60-235817
Int. Cl.[4] F02P *5/15*
U.S. Cl. 123—425 **9 Claims**

1. A system for controlling ignition timing for an internal combustion engine, comprising:
(a) first means for detecting an engine operating condition;

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(b) second means for detecting an occurrence of engine knocking in the engine;
(c) third means for determining a current engine operating region on the basis of the engine operating condition detected by the first means;
(d) fourth means for setting a basic ignition timing angle on the basis of the engine operating condition detected by said first means;
(e) fifth means for learning a retardation angle correction amount by which the set basic ignition timing angle is corrected toward a retardation angle side so as to suppress the engine knocking when the second means detects the occurrence of engine knocking as that corresponds to the similar engine operating region and storing a learning value of the retardation angle correction amount into a predetermined memory area allocated according to the corresponding engine operating region;



(f) sixth means for reading the learning value as the retardation angle correction amount when the engine operating region is changed to a predetermined engine operating region from the predetermined area in said fifth means;
(g) seventh means for calculating the retardation angle correction amount on the basis of the retardation angle correction amount read by the sixth means and depending on whether the engine knocking occurs in at least one of the cases when the engine operating region remains unchanged and when the engine operating region is changed to the predetermined operating region; and
(h) eighth means for producing an ignition signal upon the receipt of which air-fuel mixture supplied to the engine is ignited at a timing of the set basic ignition timing angle which is corrected by the retardation angle correction amount calculated by the seventh means.

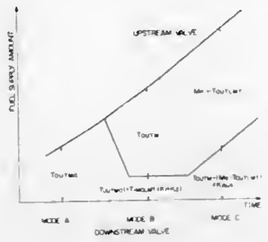
4,819,604

FUEL SUPPLY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Yuzuru Koike, and Kiyoshi Tsukimura, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1987, Ser. No. 131,225
Claims priority, application Japan, Dec. 10, 1986, 61-294284; Dec. 10, 1986, 61-294285
Int. Cl.[4] F02D *41/34, 41/10*
U.S. Cl. 123—492 **9 Claims**

1. A method of controlling the supply of fuel to an internal combustion engine having a plurality of cylinders, an intake passage having an intake manifold connected to said cylinders, a throttle valve arranged in said intake passage at a location upstream of said intake manifold, at least one first fuel injection valve arranged in said intake passage at a location upstream of said intake manifold, and at least one second fuel injection valve arranged in said intake passage at a location upstream of said intake manifold and upstream of said first fuel injection valve, wherein said first and second fuel injection valves are selectively operated to supply fuel to said cylinders in dependence on operating conditions of said engine, the method comprising the steps of:
(a) determining whether or not said engine is operating in a predetermined low load condition;
(b) supplying fuel in an amount responsive to said predetermined low load condition to said cylinders through said first fuel injection valve alone, when said engine is determined to be operating in said predetermined low load condition; and



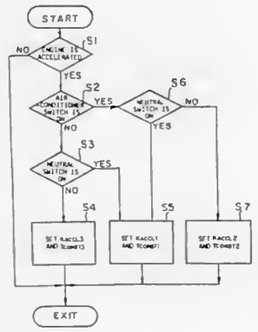
(c) supplying fuel to said cylinders through both said first and second fuel injection valves when said engine is determined to be operating in an operating condition other than said predetermined low load condition in a manner such that (1) said second fuel injection valve supplies a first amount of fuel which is required for said operating condition other than said predetermined low load condition and (2) said first fuel injection valve supplies a second amount of fuel which compensates for a portion of said first amount of fuel supplied by said second injection valve which portion is not immediately and directly supplied to said cylinders.

4,819,605

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

Tsunee Iizuka, Hohya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,364
Claims priority, application Japan, Apr. 2, 1987, 62-081596
Int. Cl.[4] F02D *5/00, 17/00;* **F02B** *3/10*
U.S. Cl. 123—492 **4 Claims**



1. A fuel injection control system for an automotive engine having an air-conditioner and a fuel injection system which produces an injection pulse width signal for main fuel injection, the system comprising:

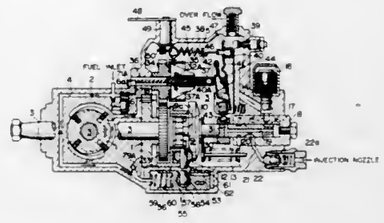
detector means for detecting acceleration of the engine and for producing an acceleration signal;
an air-conditioner switch for producing an air-conditioner signal when the air-conditioner switch is closed;
auxiliary injection means responsive to the acceleration signal and air-conditioner signal for producing an auxiliary injection pulse width first signal which is injected independent of the main fuel injection,
the auxiliary injection pulse width first signal having a smaller value than a second signal when the air-conditioner switch is opened, thereby reducing auxiliary injection pulse width.

4,819,606

FUEL INJECTION TIMING CONTROL APPARATUS OF DISTRIBUTOR INJECTION PUMP FOR USE IN A DIESEL ENGINE

Hiroto Kawano, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 27, 1987, Ser. No. 126,053
Claims priority, application Japan, Nov. 28, 1986, 61-281892
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—502 **14 Claims**



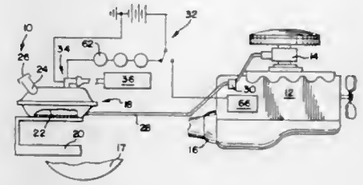
1. A fuel injection apparatus comprising a distributor injection pump for use in a diesel engine, injection timing advancing means for advancing fuel injection timing of said distributor injection pump at an advancing rate according to engine loading, and fuel injection timing control means for controlling said injection timing advancing means, said fuel injection timing control means comprising:
(a) retarding means for, in a low range of engine loading, substantially retarding fuel injection timing by diminishing the advancing rate of said injection timing advancing means lower than a predetermined advancing rate for a high range of engine loading;
(b) varying means for, in said low range of engine loading, continuously varying the advancing rate of said injection timing advancing means between the diminished advancing rate and a mostly advanced rate higher than said predetermined advancing rate of said injection timing advancing means;
(c) pressure sensitive means for forcing said varying means to effect continuous variation of the advancing rate of said injection timing advancing means in accordance with atmospheric pressure;
(d) first advancing rate varying means for, in the high range of engine loading, maintaining the advancing rate of said injection timing advancing means substantially at the predetermined advancing rate, and
(e) second advancing rate varying means for, in the range of engine loading between the low and high ranges of engine loading, advancing the advancing rate of said injection timing advancing means responsive to said pressure sensitive means from the diminished advancing rate to the predetermined advancing rate and retarding the advancing rate of said injection timing advancing means responsive to said pressure sensitive means from the mostly advanced rate higher than the predetermined advancing rate to the predetermined advancing rate as engine loading increases.

4,819,607

VAPOR VENT VALVE APPARATUS

John A. Aubel, Decatur, Ill., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Oct. 9, 1987, Ser. No. 106,207
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—519 **26 Claims**



1. A valve apparatus for controlling the flow of liquid from a vehicle fuel tank having a closable fuel inlet leading from a liquid receiving tank interior, said valve apparatus comprising:
vapor vent conduit means opening into said tank interior for purging vapors from said tank;
valve means arranged in a cooperative relationship with said conduit means and effective to regulate the flow of fluid from said tank;
electrically energizable circuit means responsive to: first operative means including an operator influenced switch having at least two positions, second operative means for monitoring fuel level in said tank, third operative means for monitoring whether the inlet port is open or closed, fourth operative means including resettable timer means for monitoring when and for how long the inlet port is open; and, solenoid means for influencing the effectiveness of said valve means, wherein said circuit means is completed and said solenoid means is controlled to open said valve means for a predetermined period of time extending from the opening of said fuel inlet and after said switch means is moved by the operator to one of said two positions and when said second operative means senses the fuel level in said tank has attained a predetermined level.

4,819,608

ARCHERY BOW LIMB CONSTRUCTED OF SYNTACTIC FOAM

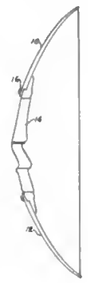
Gary W. Filice, Moorpark, Calif., and Earl H. Hoyt, Jr., Bridgeton, Mo., assignors to Hoyt/Easton Archery Co., Salt Lake City, Utah

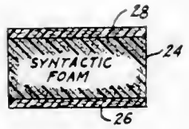
Filed Aug. 24, 1987, Ser. No. 89,039
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—23 R **18 Claims**

1. An archery bow, comprising a handle section; a pair of bow limbs attached to and extending outwardly from the handle section to provide a pair of spaced limb tips, each limb having a side adapted to face the archer and a side adapted to face away from the archer when the bow is in use, and each limb including a core of a syntactic foam material, a strip of tension material intimately secured along its length to the core along the side of the limb adapted to face away from the ar-

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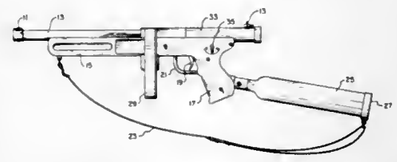
cher, and a strip of compression material intimately secured along its length to the core along the side of the limb adapted





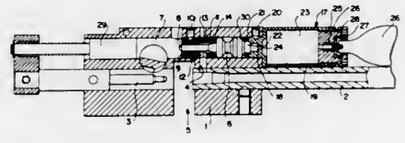
to face the archer; a bowstring; and means coupling the bowstring to the limb tips.

4,819,609
AUTOMATIC FEED MARKING PELLET GUN
Dennis J. Tippmann, 12708 Parent Rd., New Haven, Ind. 46774
Filed Dec. 22, 1986, Ser. No. 944,222
Int. Cl.[4] F41B *11/02, 11/00*; F41C *25/00*
U.S. Cl. 124—72 **21 Claims**



21. A compressed gas powered gun for discharging projectiles and, upon the discharge of one projectile, to automatically position another projectile in a location within the gun to be subsequently discharged therefrom comprising:
- a compressed gas source;
- a projectile supply magazine containing a plurality of projectiles, each projectile having a generally circular cross-sectional configuration;
- a barrel through which projectiles may be sequentially discharged;
- means including a user actuable trigger, a spring loaded slide which is released to move under spring urging upon user actuation of the trigger, and a valve assembly actuable by slide impact to release compressed gas thereby selectively supplying compressed gas from the source to expel a projectile through the barrel, the slide and valve assembly being axially aligned with the barrel;
- means for sequentially aligning projectiles from the supply magazine with the barrel, the means for sequentially aligning including at least one projectile containing clip formed as a rigid open-ended hollow cylinder having an inside diameter substantially the same as the circular cross-section diameter of the projectile, the magazine receiving, in a generally spiral pattern, a plurality of projectile containing clips with their respective cylindrical axes parallel;
- a generally constant force spring within the magazine for urging projectile containing clips from the magazine; and
- a clip latch for holding a clip in alignment with the barrel against the urging of the constant force spring, the clip latch releasing in response to gas pressure as a projectile is propelled from its clip and along the barrel to allow the constant force spring to eject the clip and position a next projectile containing clip from the magazine into position in alignment with the barrel, the clip latch comprising a pivotable arm one end of which, when in a first position, engages a clip to hold that clip in alignment with the barrel, the arm pivoting to a second position releasing the clip in response to said gas pressure, the arm having another end which, when the arm is in the second position, lies in the path of ejected clips, so that, when a clip is ejected, the clip strikes the arm returning the arm to the first position.

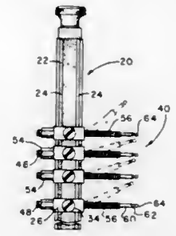
4,819,610
DEVICE FOR FEEDING WEAPONS WITH COMPRESSED GAS
Jean S. Lacam; René E. Pons, both of Saint-Etienne, and Pierre J. Simand, Saint-Marcelin, all of France, assignors to Etat Francais, Paris, France
Filed Dec. 23, 1986, Ser. No. 945,521
Claims priority, application France, Dec. 27, 1985, 85 19282
Int. Cl.[4] F41B *11/06*
U.S. Cl. 124—75 **9 Claims**



1. A device intended to feed with compressed gas a weapon of the type which includes a gas reserve and a valve housing, an unbiased valve having a valve rod, said valve being freely axially movable inside a bore formed in said valve housing, and a valve seat located in the valve housing holding and guiding the valve and valve rod, said valve being engageable with the valve seat, wherein said device includes an expansion unit interposed between the gas reserve and the valve seat, said expansion unit comprising a first expansion chamber communicating with the gas reserve and a second chamber communicating with the bore, said first chamber being several times larger than the valve housing bore and said second chamber, the chambers being separated by a calibrated orifice, said orifice having a diameter less than the diameters of either of the first or second chambers, the first and second chambers and calibrated orifice cooperating with said valve to discharge a substantially constant quantity of gas for each opening of said valve.

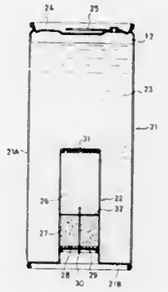
4,819,611
ARCHERY BOW FLEXIBLE SIGHT PIN
Donald R. Sappington, 504 Highfield, St. Charles, Mo. 63303
Filed May 23, 1988, Ser. No. 197,817
Int. Cl.[4] F41G *1/00*
U.S. Cl. 124—87 **8 Claims**

1. A flexible sight pin for an archery bow sighting device in which the flexible sight pin is mounted to the body of the sighting device, said flexible sight pin being attached to and extending from said body, said flexible sight pin comprising a first portion attached to said body, a second portion including an elongated flexible element which is connected to said first portion at one end thereof and to a third portion at an opposite end, said third portion terminating in an archer's sight at an outer free end of said sight pin, said second portion providing



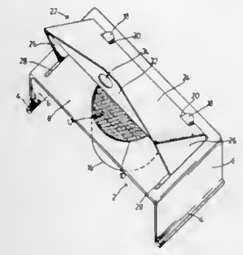
universal flexing of the elongated flexible element thereof when the sight pin is contacted by a force.

4,819,612
SELF-HEATING CONTAINER
Toshiaki Okamoto, Tokyo; Tomoji Sunagawa, and Shun'ichi Sato, both of Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed May 7, 1987, Ser. No. 46,618
Claims priority, application Japan, May 8, 1986, 61-103795; Jul. 31, 1986, 61-178729; Aug. 20, 1986, 61-192770
Int. Cl.[4] F24J *1/00*
U.S. Cl. 126—263 **10 Claims**



1. A self-heating container comprising:
- a container for containing a substance to be heated;
- an exothermic material storage chamber which is made of metal and is projected into the interior of said container;
- a non-fusible self-combustible exothermic material charged at the innermost portion of said exothermic material storage chamber and located substantially in the core portion of said container;
- a heat insulating layer of a porous inorganic material disposed outwardly adjacent to said exothermic material; and
- a fuse comprising a bundle of metal fibers or carbon fibers impregnated with a self-combustible agent having a leading end extending through the heat insulating layer and connected to said exothermic material for igniting said exothermic material.

4,819,613
INLET VENTS FOR FIREPLACES
Brian A. McDonald, 97 Burnaby Boulevard, Toronto, Ontario, Canada M5N 1G3, and Kaye Baldwin, 6 Forest Laneway, Apt. 2806, Willowdale, Ontario, Canada
Filed Mar. 25, 1988, Ser. No. 173,143
Int. Cl.[4] F24B *13/02*
U.S. Cl. 126—515 **3 Claims**

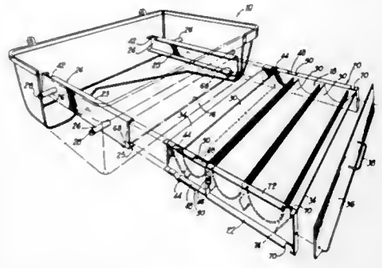


1. A fresh air vent for installation in the hearth of a fireplace comprising:
- a body having a flat, rectangular top wall, opposite vertical walls descending from two opposite sides of the top, flanges out-turned from the bottoms of the vertical walls, the body less the flanges having the dimensions of a hearth brick, the top wall defining a central opening and having a screen located in the opening, and further defining two slots adjacent and parallel to the vertical walls;
- a tubular flange extending downwardly from the top wall beneath the periphery of the opening for substantially the full height of the body, the tubular flange being sized to accept the end of a cylindrical air duct as a push fit;
- a lid member having a flat., rectangular top wall slightly smaller than the top wall of the body, a rear edge of the lid member being hingedly connected to the top wall of the body adjacent a rear edge of the latter and depending side walls at each end extending through the slot in the top wall of the body;
- each side wall being slightly laterally inclined to the vertical so as frictionally to engage sides of the slots upon upward movement of the lid about its hinged connection, and provided with a stop means to prevent its complete withdrawal from the associated slot;
- and an upturned flange provided on a front edge of the lid member, the flange being means to provide a purchase for a tool used to lift the lid;
- the body and lid being formed of sheet steel of a gauge sufficient to provide the vent with a heft similar to that of a hearth brick.

4,819,614
DUEL FUEL BARBECUE GRILL
Robert J. Hitch, Columbus, Ga., assignor to W. C. Bradley Company, Columbus, Ga.
Filed Jun. 29, 1988, Ser. No. 213,109
Int. Cl.[4] F24C *1/02*
U.S. Cl. 126—36 **20 Claims**

1. In a barbecue grill assembly having a firebox with a burner element mounted near the floor of the firebox for producing and sustaining heat therein, wherein the improvement comprises support track means disposed in opposing relationship along opposed side walls of said firebox, a tray means received in said track means and including a plurality of primary channel members spanning said tray means and disposed in a plane above and parallel to the plane of said burner element, said tray means having a first position in which said primary channel members are disposed so as to receive char-

coal briquettes therein and an inverted position in which said channel members are disposed in shielding relationship to said



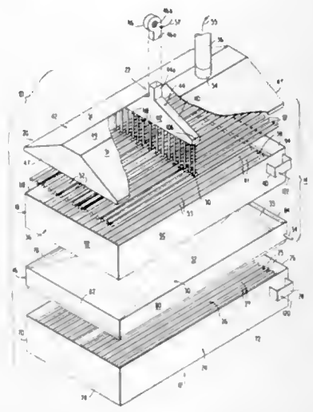
burner element for absorbing and radiating heat generated therefrom.

4,819,615

PIGGY BACK EVAPORATOR FOR MAPLE SYRUP EVAPORATOR APPARATUS OR THE LIKE

Gordon L. Richardson, and James G. Richardson, both of Woodstock, Vt. 05091

Filed May 29, 1987, Ser. No. 55,225
Int. Cl.[4] B01D *1/26*; C13F *1/00*
U.S. Cl. 127—9 5 Claims



1. A piggy back evaporator coupled in stacked overlying position to a syrup evaporator apparatus including an upright box flue pan carrying syrup for evaporation subject to an underlying fire to boil off vaporazable constituents thereof, said piggy back evaporator comprising:

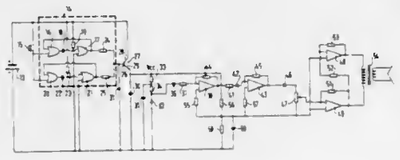
a drip pan sized to the flue pan, mounted to the flue pan and overlying said flue pan, said drip pan including an oblique condensate drain sheet plate extending over the major length of the same, a steam hole within said condensate drain plate, a piggy back pan sized to and mounted to the top of the drip pan, said piggy back pan being upwardly open and including a corrugated bottom wall defining a series of laterally spaced troughs therein interiorly of the piggy back pan and a series of vertical flues on the exterior of the piggy back pan bottom wall facing said drip pan, a hood covering an open top of said piggy back pan, being sealed about edges thereof to said piggy back pan, said drip pan, said piggy back pan and said hood comprising a vertically stacked assembly, at least one steam exhaust chimney carried by said hood and extending upwardly therefrom, a plenum assembly mounted to said hood, said plenum assembly including a high pressure air blower, an air inlet passing through said hood and connected to said blower, a plenum chamber internally of said hood and connected to said air inlet, said piggy back evaporator further comprising a plurality of downpipes projecting downwardly from said plenum chamber and opening to the interior of the plenum chamber and a plurality of sparging tubes extending the length of the piggy back pan and being connected to respective downpipes, said sparging tubes being located within the bottoms of said troughs, longitudinally spaced holes within said sparging tubes, means for feeding sap to the piggy back pan of the piggy back evaporator and the flue pan of the evaporator apparatus, means for drawing off concentrate from the piggy back pan and adding the drawnoff concentrate to the flue pan, and means for drawing off concentrate from the flue pan and wherein, the capacity of the blower, the number and size of the holes within said sparging tubes, the size of said at least one steam exhaust chimney and the vertical length of said at least one chimney are such that the steam from the flue pan is caused to condense on the bottom wall of the piggy back pan to effectively boil off the sap within the piggy back pan, and nearly all of the steam resulting from boiling off water content of the sap within the flue pan condenses on the undersurface of the piggy back pan due to the application of sparging air flow via said blower, said plenum chamber and said sparging tubes to the surface of the upper side of the piggy back pan, scouring the metal surfaces of the troughs within the piggy back pan bottom wall and creating an effective frothing action with the sap to form a sap and air mixture whereby the air in passing through the sap is effectively heated and saturated with moisture with the resulting evaporation of the moisture captured by the air consuming a large quantity of heat to maintain the temperature differential between the sap and air mixture and the condensing steam under the piggy back pan at a level to insure that almost all of the steam is condensed in the area between the drip pan and the piggy back pan to increase liquid concentration of the sap processed thereby.

4,819,616

BABY CALMER

Ilan Samson, 13, Eton Avenue, London NW3, England

PCT No. PCT/EP86/00476, § 371 Date Apr. 13, 1987, § 102(e) Date Apr. 13, 1987, PCT Pub. No. WO87/01044, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 12, 1986, Ser. No. 65,029
Claims priority, application European Pat. Off., Aug. 13, 1985, 85110161.8
Int. Cl.[4] A61M *21/00*
U.S. Cl. 600—28 14 Claims



1. A baby calmer device for producing when energized a single sequence of sound levels adapted to calm a crying baby, comprising generator means for generating noise over an audio frequency range extending up to at least two thousand hertz and reducing means connected to said generator means for automatically reducing the level of said noise by a single sequential step change from an initial sound level to a lower second sound level and subsequently by a single sequential step change to an imperceptible third sound level after which the device is automatically switched OFF.

4,819,617

VISCOELASTIC MATERIAL FOR OPHTHALMIC SURGERY

Eugene P. Goldberg, Gainesville, and A. Jayakrishnan, Kerala, both of Fla., assignors to University of Florida, Gainesville, Fla.

Filed Sep. 4, 1986, Ser. No. 903,445
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—897 17 Claims

1. A composition particularly adapted for use as an ophthalmic viscoelastic surgical material in the anterior chamber of the eye consisting essentially of an aqueous solution containing at least about 1.5%, by weight, of a physiologically acceptable, water-soluble carbomethylcellulose or salt thereof having a molecular weight greater than 500,000 and a DS of 0.4 to 3.0, said aqueous solution having a viscosity of about 10,000 to about 50,000 centipoises.

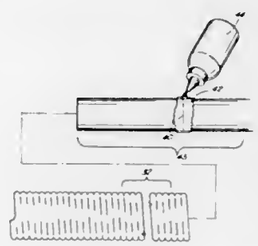
9. In an ophthalmic surgical procedure wherein the anterior chamber of the eye is filled with a viscoelastic space-filling and corneal endothelium protective surgical material, the improvement comprising the utilization as an ophthalmic surgical material a composition consisting essentially of an aqueous solution containing at least about 1.5%, by weight, of a physiologically acceptable, water-soluble carbomethylcellulose or salt thereof having a molecular weight greater than 500,000 and a DS of 0.4 to 3.0, said aqueous solution having a viscosity of about 10,000 to about 50,000 centipoises.

4,819,618

IRIDIUM/PLATINUM IMPLANT, METHOD OF ENCAPSULATION, AND METHOD OF IMPLANTATION

Sam F. Liprie, P.O. Box 834, Lake Charles, La. 70602-0834

Continuation-in-part of Ser. No. 897,544, Aug. 18, 1986, which is a continuation-in-part of Ser. No. 778,410, Sep. 20, 1985, abandoned. This application Mar. 11, 1987, Ser. No. 24,663
Int. Cl.[4] A61N *5/00*
U.S. Cl. 600—7 20 Claims



1. An apparatus for maneuvering a radioactive implant through a human body, the apparatus comprising:

(a) a guide member;

(b) a radioactive implant; and

(c) a wire member,

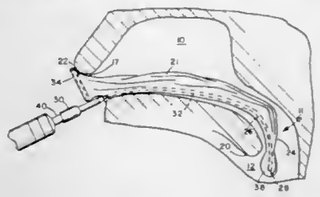
wherein the implant is positioned in the guide member, the wire member is secured to the implant, and the guide member is secured to the wire member and the implant adjacent the juncture of the implant and the wire member, and the guide member is secured to the wire member at a plurality of points not adjacent the juncture of the wire member and the implant.

4,819,619

DEVICE FOR INSERTING A NASAL TUBE

Scott D. Augustine, 1601 Stonecrest Ct., and Douglas J. Augustine, 503 S. 23rd St., Both of Blue Springs, Mo. 64015

Filed Jan. 16, 1987, Ser. No. 3,752
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—200.26 20 Claims



1. A device for introducing a nasal tube, comprising:

an elongate, porous sleeve formed from a collapsible material which is non-self-sustaining and tends to collapse without internal support, the sleeve having proximal and distal ends with openings at said proximal and distal ends;

an elongate, relatively slender arcuate guiding member attached to said sleeve along a longitudinal sleeve dimension extending between said proximal and distal ends; and

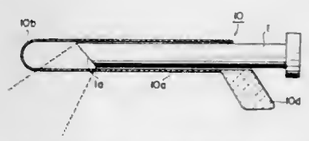
a soft, blunt distal tip formed on said guiding member and extending beyond said distal end.

4,819,620

ENDOSCOPE GUIDE PIPE

Ichiro Okutsu, 1-13-15, Kita-Obtsuka, Toshima-ku, Tokyo, Japan

Filed Aug. 13, 1987, Ser. No. 85,060
Claims priority, application Japan, Aug. 16, 1986, 61-191201
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 11 Claims



1. A medical instrument for guiding an endoscope to be inserted therein for viewing a subcutaneous structure of a body, comprising:

an endoscope; and

an elongated pipe member having a first end, which is closed and generally convergent in shape, and a second end, which is opposite said first end and which is open, thereby allowing said endoscope to be loosely fitted into said pipe member to permit said endoscope to rotate around a longitudinal axis thereof as being located inside of said guide pipe, said elongated pipe member including a transparent portion comprising at least a predetermined part thereof.

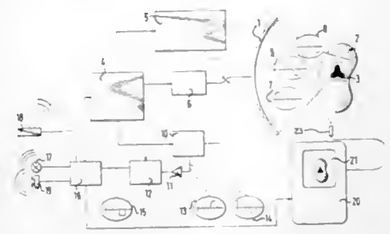
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4,819,621

METHOD FOR DETECTION OF CAVITATIONS DURING MEDICAL APPLICATION OF HIGH SONIC ENERGY

Friedrich Ueberle, Dossenheim, and Rainer Riedlinger, Karlsruhe, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 17,752
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3607949
Int. Cl.[4] A61H *1/00*; A61B *17/22*, *10/00*
U.S. Cl. 128—24 A 18 Claims



1. In a method for predicting possible tissue damage caused by cavitation during the application of sonic high energy to the body of a patient, the sonic energy being generated extraneously by a sonic transducer and transmitted via a coupling means into the body of the patient, the sonic field traversing a spacial section internal to the body and being focused on a target zone for destruction of a target that is present within the target zone, the improvement comprising the steps of:
- generating an acoustic test signal comprising at least one pulse having at least one known characteristic;
- applying the acoustic test signal to the target zone;
- receiving at least one reflection of the acoustic test signal from the target zone;
- converting the received at least one reflection into a reception signal;
- comparing the at least one known characteristic of the test signal against a corresponding characteristic of the reception signal;
- using the results of said comparison as an indication of whether or not a jump in acoustic impedance is present;
- generating a control signal when the results of said comparison indicate that an impedance jump is present; and
- using the presence or absence of the control signal as an indication of possible tissue injuries from cavitation caused by sonic high energy at the target zone.

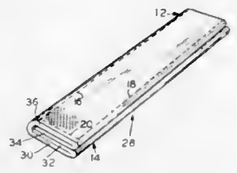
4,819,622

ORTHOPEDIC CERVICAL SUPPORT COLLAR AND METHOD OF MAKING THE SAME

Natalee E. Taylor, 13201 SE. 197th, Boring, Oreg. 97009, and John P. Bonica, 16323 SE. Stark, Portland, Oreg. 97233

Filed Jul. 6, 1987, Ser. No. 70,344
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—75 8 Claims

1. An orthopedic, cervical, support collar comprising:
- a rectangular piece of thick, absorbent cloth material having longitudinal sides and opposite end portions, folded to form an elongated, multi-plies pad having at least four layers constituting the entire thickness of the collar; said pad having a length sufficient to encircle the neck and provide an area of overlap at said opposite end portions,
- ply interengaging means maintaining the piece in flat, pad-forming condition,
- and releasable fastening means mounted on the pad in the area of the overlap and end portions for releasably fastening together the overlapped end portions when mounting the pad collar-wise on the neck of the user.

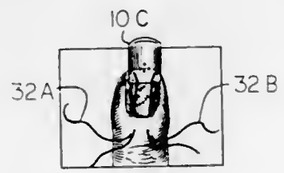


4,819,623

DEVICE TO FOSTER COSMETICALLY PLEASING HEALING OF NAIL BED TISSUE

E. Olayinka Ogunro, 625 Ray Ave., DeSoto, Tex. 75115

Continuation-in-part of Ser. No. 605,112, Apr. 30, 1984, abandoned. This application Oct. 1, 1985, Ser. No. 782,318
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 A 9 Claims



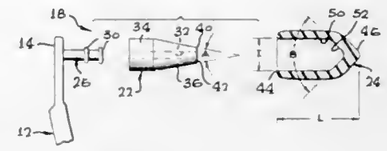
1. An article of manufacture adapted for temporary use in the manner of a splint on the digits of a person's hand or foot in order to foster beneficial healing promptly after a nail plate has been removed, comprising:
- (a) a generally elongated sheet of thin but substantially rigid plastic material which is generally rectangular when seen in a plan view, and said sheet being inert to body fluids and being essentially transparent, and having a curvature so that it approximates the natural shape of a human nail plate, and said sheet having a first radius which defines a curve in a longitudinal plane and a second radius which defines a curve in a transverse plane, and the transverse radius being appreciably less than the longitudinal radius, and the width of the sheet between its two sides corresponding to approximately a 70 degree segment of the circle defined by the transverse radius, and the sheet having a smooth, concave and substantially uninterrupted lower surface that is adapted for being installed so that it is in contact with and covers the nail bed, and the sheet having a proximal end that is approximately perpendicular to the sides of said sheet, whereby the proximal end of the sheet is adapted to fit under the eponychial fold of the person's digit for the purpose of preserving said fold during the healing of the nail bed; and
- (b) means depending from the two sides of said sheet for engaging the tissue of the person's nail bed so as to hold said tissue and inhibit it from contracting significantly during healing of said nail bed, whereby the healing nail bed is restricted to taking on the smooth shape of the juxtaposed sheet as it heals, and whereby a healed nail bed has a size that tends to be almost as large as its pre-injured size, and whereby a new nail plate will tend to be as smooth as the sheet when the nail plate progressively grows underneath the sheet and over the healing nail bed.

4,819,624

BANDED EARPLUG

Howard S. Leight, 3945 Ridgemont Dr.; Charles Leight, 3511 Shoreheights Dr., both of Malibu, Calif. 90265, and Frederic A. Leight, 8210 Bobby-Boyar St., Canoga Park, Calif. 91304

Filed Jun. 18, 1987, Ser. No. 64,173
Int. Cl.[4] A61F *11/00*
U.S. Cl. 128—866 5 Claims



1. A band earplug comprising:
- a band with opposite ends, which fits about halfway around the head of a person with said ends lying opposite the ears of the person, said band constructed to urge said opposite ends towards each other to press towards the person's ears;
- a pair of earplug assemblies, each including an armature coupled to one of said band ends and a shell of soft resilient material mounted on the armature;
- said shells have substantially open rear ends and closed front ends, and each armature projects through the open rear end of a shell and has a front armature end lying behind the front of the shell to help support the shell front end against rearward deflection;
- the front end of each of said shells having a center which can enter the outer end of the person's ear canal and an outer portion that is designed to press against the walls of the ear that surround the entrance to the ear canal, the diameter of said outer portion being too great to enter the ear canal of a person even when pressed against the walls around the entrance of a person's ear canal;
- each corresponding armature and shell constructed with the armature supporting the center of the front end of the shell against rearward deflection, but with an air gap between the outer portion of the shell front end and the armature to allow the outer portion to be deflected when it presses against the ear walls that surround the entrance to the ear canal;
- each earplug shell front end has an extreme front end at said center, and said shell front end is tapered to have a progressively smaller diameter at locations progressively closer to said extreme front end, at both the inside and outside of the shell; and
- each armature has a tapered front portion which has a smaller taper angle than the inside of said shell tapered front end, to form said air gap.

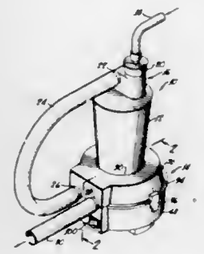
4,819,625

NEBULIZER HEATER

Blair E. Howe, Rancho Santa Margarita, Calif., assignor to Cimco, Inc., Costa Mesa, Calif.

Filed Nov. 12, 1987, Ser. No. 120,080
Int. Cl.[4] A61M *11/00*
U.S. Cl. 128—200.18 17 Claims

13. A nebulizer for producing a stream of moisturized gas for inhalation therapy, said nebulizer comprising:
- a container having a circular wall for confining a quantity of liquid, having an upper portion and a lower portion,
- said container including a mixing body connected to said upper portion of said container,
- means in said mixing body for projecting a stream of gas toward the interior of the container,
- means in the mixing body for drawing liquid from the container and mixing such liquid with the stream of gas to provide a stream of moisturized gas,
- output port means for discharging moisturized gas from the container,
- means for supporting said container and heating both the liquid in the container and the discharged moisturized gas, said last mentioned means comprising a heat transfer housing for receiving and supporting said lower portion of said container and for providing heat to said container and to said moisturied gas, and
- conduit means for flowing moisturized gas discharged from the container into said heat transfer housing, said heat transfer housing comprising:
  - a top plate support in contact with and supporting said lower portion of said container,
  - an aerosol accumulator housing section defining an annular conduit circumscribing outer edges of said top support plate and extending downwardly therefrom, said aerosol accumulator housing section having an inner wall cooperating with said top plate to define a downwardly opening heater receiving recess,
  - a heater received in said recess and having an upper portion in heat transmitting contact with a lower side of said top support plate and having an outer side in contact with an inner wall of said aerosol accumulator housing section,
  - a peripheral container support wall secured to an outer peripheral edge of said top support plate and extending upwardly therefrom along sides of said lower portion of said container, and
  - a heater assembly housing surrounding and supporting said aerosol accumulator housing section, said heater recess and said container support top plate.



4,819,626

CONTAMINATION PREVENTION DEVICE FOR DIVER'S BREATHING APPARATUS

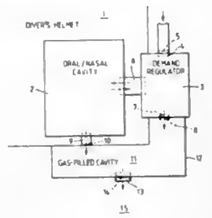
Ian A. Himmens, Portsmouth, England, assignor to The Secretary of State for Defence in her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 13, 1987, Ser. No. 120,375
Claims priority, application United Kingdom, Nov. 14, 1986, 8627323
Int. Cl.[4] A62B *18/00*
U.S. Cl. 128—201.28 6 Claims

1. A diver's mask comprising:
- a mask frame;
- a face visor;
- an oral/nasal cavity within said mask frame;
- breathing gas demand regulator having an inhale port fitted with a non-return valve, an exhale port fitted with a non-return valve and an inlet/outlet port connected to said oral/nasal cavity;
- a second exhale port directly from said oral/nasal cavity through said mask frame; and
- an enclosure means, fitted in a water/tight fashion over said

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demand regulator exhale port and said second exhale port, for forming a gas-filled cavity, said enclosure means having at least one exhale port incorporating a non-return valve, wherein said enclosure means comprises a manifold



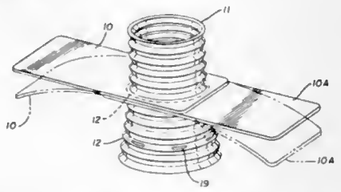
around the demand regulator exhale port and said second exhale port, through which, in operation, a diver's exhaled breathing gas passes before exiting to the surroundings through said enclosure means exhale port.

4,819,627

CARDIOPULMONARY RESUSCITATION DEVICE

Donald J. Connors, 118 S. Midlothian Blvd., Youngstown, Ohio 44507

Filed Feb. 8, 1988, Ser. No. 157,841
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—203.11 **5 Claims**



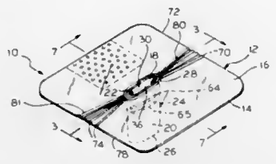
1. A device for use in mouth-to-mouth resuscitation and cardiopulmonary resuscitation comprising a planar body member, said planar body member comprising a first planar body member and a second planar body member, each having upper and lower surfaces and each having an aperture therein adjacent one end thereof, said first and second planar body members secured to one another in superimposed relation with said apertures in registry with one another, a first tubular member positioned on the upper surface of said first planar body member in communication with said aperture therein and a second tubular member positioned on the lower surface of said second planar body member in communication with said aperture therein, a one-way flap valve member formed integrally with said second planar body member so as to be largely separated therefrom and connected thereto by a live hinge portion and positioned for movement toward and away from said aperture in said second planar body member so as to permit fluid entering the device through the first tubular member and prevent fluid entering the device through said second tubular member from entering said first tubular member.

4,819,628

MOUTH-TO-MOUTH RESUSCITATOR DEVICE

Melvin I. Eisenberg, and Mark Westfall, both of Skokie, Ill., assignors to Plasco, Inc., Gurnee, Ill.

Filed Jul. 23, 1987, Ser. No. 76,949
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—203.11 **24 Claims**



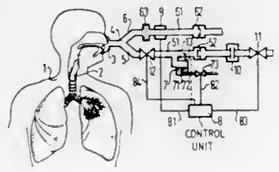
20. A mouth to mouth resuscitator device for use by a rescuer for resuscitating a victim, comprising:
- a sheet of flexible material having a top side for contacting the rescuer and a bottom side for contacting the victim, said sheet having a mouth opening formed therein at substantially the center thereof;
- a hollow rigid tube insertible in the victim's mouth and having an input end and an output end, the input end of said tube being secured to the periphery of said mouth opening and said tube extending outward therefrom to said output end;
- a self closing one-way valve is positioned inside said tube, said valve normally having a closed condition for preventing back flow of air and/or liquid flowing form the victim to the rescuer, said valve having an open condition when the rescuer exhales air under pressure into said valve via said mouth opening and said input of the tube, for discharging air into the mouth of the victim; and
- air pathway means extending from adjacent said mouth opening
- at least one air pathway on the bottom side of the sheet extending from adjacent said mouth opening to an outer edge of the sheet.

4,819,629

METHOD AND APPARATUS FOR DELIVERING AEROSOL TO THE AIRWAYS AND/OR LUNGS OF A PATIENT

Björn Jonson, Paris, France, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 20, 1987, Ser. No. 110,449
Claims priority, applicatioo Fed. Rep. of Germany, Oct. 28, 1986, 3636669
Int. Cl.[4] A61M *15/08*
U.S. Cl. 128—203.22 **20 Claims**



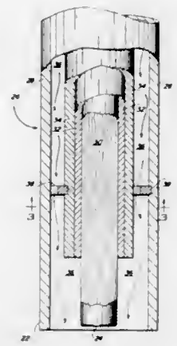
1. An apparatus for delivering aerosol to the airways and/or lungs of a patient, comprising:
- an inspiration line and a separate expiration line connected to said patient;
- an aerosol generator connected to said inspiration line;
- means for monitoring the respiration cycle of said patient and generating control signals corresponding thereto; and said aerosol generator being connected to said means for monitoring and being supplied with a control signal therefrom such, that said aerosol generator generates aerosol only during the expiration phase of said patient and deposits the generated aerosol in said inspiration line during said expiration phase.

4,819,630

FLEXIBLE LIGHT TRANSMISSIVE APPARATUS AND METHOD

Anthony G. DeHart, Winter Park, Fla., assignor to Laser Photonics, Inc., Orlando, Fla.

Filed Mar. 20, 1987, Ser. No. 28,388
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **14 Claims**



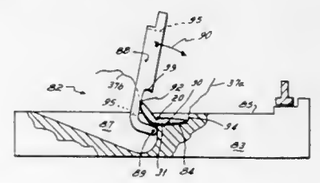
1. An optical energy transmission device comprising:
- a fiber optic rod having a protective sleeve;
- a sheath surrounding and spaced from said fiber optic rod and sleeve; and
- at least one spacing disc having plural tip ends extending in edge contact with said sleeve and engaging said sheath for supporting said fiber optic rod within said sheath, said spacing disc having a discontinuity for permitting the expansion and contraction of said disc.

4,819,631

FOLDED INTRAOCULAR LENS, METHOD OF IMPLANTING IT, RETAINER, AND APPARATUS FOR FOLDING LENS

Brooks J. Poley, 2 Greenway Gables, Minneapolis, Minn. 55403

Division of Ser. No. 31,250, Mar. 26, 1987, Pat. No. 4,769,034. This application Apr. 21, 1988, Ser. No. 184,432
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **7 Claims**



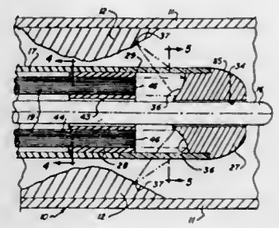
1. Apparatus for folding an intraocular lens about a transverse axis of folding, comprising,
- a base presenting a lens seat shaped to support a first portion of said lens on one side of said axis of folding, a second portion of the lens extending off said seat and over a cavity in said base, an abutment adjacent said seat to hold the lens from moving off the seat during folding,
- a swing arm mounted for rotation about a pivot axis which is parallel to but offset from said axis of folding, said arm being swingable about said pivot axis to a lens folded position,
- said swing arm having a pocket which receives and engages said second portion of said lens as said arm is swung about said pivot axis, said pocket urging said second portion toward said abutment as the arm is swung about the pivot axis.

4,819,632

RETROLASING CATHETER AND METHOD

David H. Davies, 6A Cranmer Road, Cambridge, England CD3 9BL

Continuation of Ser. No. 865,073, May 19, 1986, Pat. No. 4,672,961. This application May 19, 1987, Ser. No. 52,231
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **16 Claims**



1. A catheter adapted to be inserted in a body passage, comprising:
- a flexible tube having a proximal end and a distal end, having a forward direction from the proximal end toward the distal end and having a reverse direction from the distal end toward the proximal end;
- at least one optical fiber having a distal end and extending through said tube to transmit laser energy in the forward direction from a source to said distal end of said tube; and
- tip assembly means for reflecting substantially all of the laser energy delivered through the distal end of said at least one optical fiber in a range of acute angles to said reverse direction for treatment with the laser energy of a selected portion of said body passage.

4,819,633

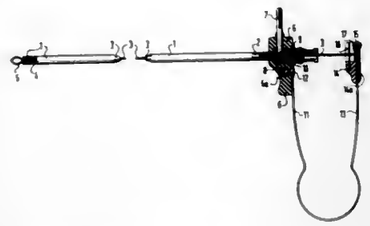
COAGULATION FORCEPS

Siegfried Bauer, Heidelsheim, and Ernst Falk, Sternenfels-Diefenbach, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Jul. 29, 1987, Ser. No. 79,021
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629809
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.17 **3 Claims**

1. A coagulation forceps comprising: a tubular metal shaft having an external insulating layer, a distal end and a proximal end, an HF connector being connected to the proximal end of the shaft, a metal actuating rod extending axially through said shaft having a distal end and a proximal end, a pair of forcep jaws being connected to the distal end of said rod to extend out of the distal end of the shaft, actuating means for moving said rod axially in the shaft to move the jaws between a position with the jaws closed to a position with the jaws opened, said actuating means comprising a handle having a first branch and

a second branch being urged apart by a spring bias, a first insulator element and a second insulator element being separately produced, said first insulator element being mounted on a free end of the first branch and having means for coupling a proximal end of the rod to said first branch, said second insulator element being mounted on the shaft to surround the proximal end of the shaft and the HF connector and having means forming an insulating connection of the second branch to said shaft, said HF connector being a plug pin having a metal coupling element, said coupling element being provided within the



second insulator element and having a cylindrical extension which surrounds the shaft and extends to the proximal end of the shaft, said cylindrical extension having external screw-threads and being welded to the shaft at an extremity of the proximal end of the shaft, an insulating tube cover being threaded on said external screw-threads of the extension, said first insulator element having a recess forming a thumb stop and said second insulator element having a recess forming a stop for a finger so that pressing the insulator elements towards one another with the thumb and finger causes the actuating rod to move the jaws to an open position.

4,819,634

ROTARY-CATHETER FOR ATHERECTOMY SYSTEM

Samuel Shiber, Mundelein, Ill., assignor to Surgical Systems & Instruments, Mundelein, Ill.

Continuation-in-part of Ser. No. 18,083, Feb. 24, 1987, which is a continuation-in-part of Ser. No. 874,546, Jun. 16, 1986, Pat. No. 4,732,154, which is a continuation-in-part of Ser. No. 609,846, May 14, 1984, abandoned. This application Jul. 27, 1987, Ser. No. 78,042

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[4] A61B *17/32*

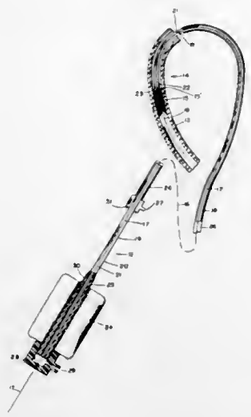
U.S. Cl. 128—305 **22 Claims**

1. A mechanical atherectomy system insertable into a human blood vessel for remotely cutting and removing an obstruction therein, comprising in combination:

a flexible guide-wire insertable into said blood vessel,

a flexible rotary-catheter defining a channel and having distal and proximal ends, said flexible rotary-catheter being rotatably disposed and slidable over said guide-wire, a tubular-blade mounted to said distal end, said tubular-blade having a through-hole forming with said channel a continuous passage for passing obstruction material ingested into said through-hole, into said flexible rotary-catheter,

coupling means at said proximal end of said flexible rotary-catheter for rotating said flexible rotary-catheter and said tubular-blade around said guide-wire,



means for diametricaly stabilizing and means for transmitting torque being incorporated in said flexible rotary-catheter.

4,819,635

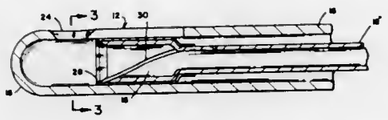
TUBULAR MICROSURGERY CUTTING APPARATUS

Henry Shapiro, 328 Downham Ct., Walnut Creek, Calif. 94598

Filed Sep. 18, 1987, Ser. No. 98,330

Int. Cl.[4] A61B *17/20*

U.S. Cl. 128—305 **8 Claims**



1. In a surgical instrument including an outer tubular member having an open end and a closed end, a cutout portion through said outer tubular member defining an entry port into the interior of said outer tubular member, said entry port being located adjacent to said closed end of said outer tubular member and axially along said outer tubular member, an inner tubular sleeve having an open end and a cutting end within said outer tubular member, said cutting end of said inner tubular sleeve being formed as a circumferential edge around said inner tubular sleeve and perpendicular to the axis of said tubular sleeve, said inner tubular sleeve being adapted to reciprocate axially within said outer tubular member with said open end adjacent to said open end of said outer tubular member and said cutting end adjacent to said closed end of said outer tubular member, and a cutout portion in said inner tubular sleeve defining an axial slot beginning at said cutting end and extending toward said open end of said inner tubular sleeve, the improvement comprising:

said axial slot being cut in a spiral path axially along said inner sleeve from said cutting end and extending toward said open end thereof, and said inner tubular sleeve having an increased diameter axially along said sleeve at least as long as said axial distance of said spiral axial slot.

4,819,636

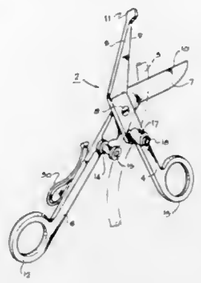
MEDICAL DEVICE

Horst Gerich, 24034 Welby Way, Canoga Park, Calif. 91307, and Thomas V. Meter, 9957 Stonehurst Ave., Sun Valley, Calif. 91352

Filed Jan. 14, 1986, Ser. No. 818,887

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—318 **5 Claims**



1. A medical device for cutting and squeezing tubing comprising:

a pair of elongated arm members; integral pivot means connecting the arm members together for movement relative to each other about a single fixed pivot axis, said pivot axis of the pivot means extending transversely of the arm members at a point between the ends of the arm members,

each arm member having a first end remote from the pivot means, said first end on each arm member being movable toward and away from the other first end, each of said first ends having a cutting edge, so that the arms may pivot toward each other in a scissor cutting action about the pivot means;

each arm member having a second end remote from the pivot means, said second end on each arm member being movable toward and away from the other second end, each of said second ends having an area engageable by a user's fingers to move the ends toward each other in a scissor action about the pivot means;

first and second rollers mounted rotatably on individual axes affixed to said arm members between said pivot means and said second ends; each of said axes being affixed to a different arm member; said axes being substantially parallel to each other and to said pivot axis of the pivot means,

whereby when the user's fingers engage said second ends and squeeze them together, said cutting edges engage each other in said cutting action and the rollers move toward each other until they reach a fixed position relative to each other sufficient to permit tubing to be squeezed between the rollers.

4,819,637

SYSTEM FOR ARTIFICIAL VESSEL EMBOLIZATION AND DEVICES FOR USE THEREWITH

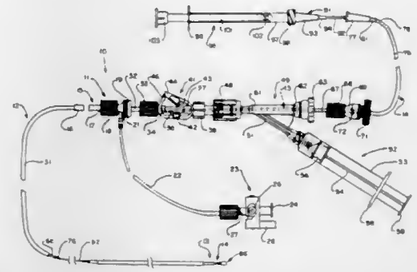
Ray H. Dormandy, Jr., and Julie D. Bell, both of South San Francisco, Calif., assignors to Interventional Therapeutics Corporation, South San Francisco, Calif.

Filed Sep. 1, 1987, Ser. No. 92,079

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—325 **26 Claims**

1. In a system for artificial vessel embolization, a catheter adapted to be inserted into the vessel and having a passage extending therethrough, a balloon delivery catheter slidably mounted in the passage in the first named catheter, the balloon delivery catheter comprising a flexible elongate element having proximal and distal extremities, the distal extremity having a smooth outer cylindrical surface of a predetermined diameter, a detachable balloon detachably secured to the distal extremity of the flexible elongate element and means carried by the proximal extremity of the flexible elongate element permitting inflation and deflation of the detachable balloon, the detachable balloon including a cylindrical valve base having a smooth surface cylindrical bore extending therethrough, a self-sealing valve mounted on the valve base, said detachable



balloon being mounted by a friction interference fit between the valve base and the distal extremity of the flexible elongate member, the size of the bore of the valve base being selected to provide the desired detachment force for the detachable balloon and a lubricant disposed in the bore to reduce static friction between the valve base of the detachable balloon and the flexible elongate element.

4,819,638

APPARATUS FOR NON-CONTACTING DISINTEGRATION OF CALCULI

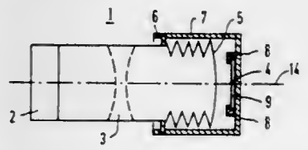
Manfred Rattner, Buckenhof, and Erich Noske, Weher, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,186

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1986, 8622104

Int. Cl.[4] A61B *17/00*

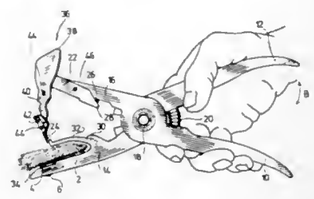
U.S. Cl. 128—328 **7 Claims**



1. A test device in combination with an apparatus for non-contacting disintegration of calculi in the body of a patient, said apparatus including a fluid-filled shock wave tube having a source of shock waves and means for focusing the shock waves at a pre-determined point, said tube on an output end being terminated by a flexible membrane which enables yieldingly pressing the tube against the patient to couple the apparatus to the patient, the test device comprising a test member and a test member mount, said mount having means for detachably connecting the mount to the output end of the shock tube and means for holding the test member in a proposed focal point for the shock wave tube, said test member being a plate member of a material, which will be disintegrated by shock waves, and said means for holding the test member including a receptacle for receiving said plate member.

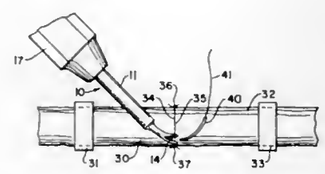
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4,819,639
EAR TAG APPLICATOR
Michael S. Gardner, Auckland, New Zealand, assignor to Tagland New Zealand Limited, Remuera, New Zealand
Filed Jul. 23, 1987, Ser. No. 76,616
Claims priority, application New Zealand, Jul. 25, 1986, 216968
Int. Cl.[4] A61B 17/00
U.S. Cl. 128—330 5 Claims



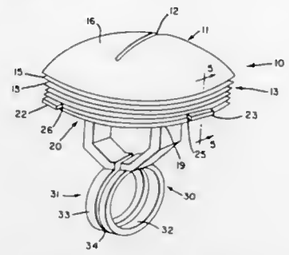
1. An applicator for use in the application of ear tags to livestock, including at least two main members connected one with the other, each of said main members comprising at least one handle member extending into or being attached to at least one jaw, a first of said jaws being provided with an elongate pin pivotally connected or attached adjacent one end thereof, and a second of said jaws including a forward portion with an elongate recess or opening therein, and a pivotal bar, capable of extending across said recess or opening, so as to define a restricted recess or opening, through which said pin may move, said pivotal bar being adapted to pivot away from said recess or opening so as to allow said pin to pivot freely out of and away from said recess or opening.

4,819,640
MICROSURGERY ANASTOMOSIS TOOL
Krishna Narayanan; Marc D. Liang, and Frank R. Walters, all of Pittsburgh, Pa., assignors to The Montefiore Hospital Association of Western Pennsylvania, Pittsburgh, Pa.
Filed Oct. 1, 1986, Ser. No. 914,164
Int. Cl.[4] A61B 17/04
U.S. Cl. 128—334 R 2 Claims



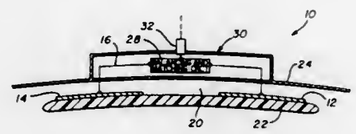
1. A microsurgery tool for use in combination with a microsurgery suture needle to anastomosize small vessels, comprising:
a thin shaft secured at one end to a holding member and having, at its distal end a pair of projecting tines defining a sloping throat therebetween,
said shaft being adapted to enter into a small vessel through a cut in said vessel and being further adapted to receive in said sloping throat the pointed end of a microsurgery suture needle penetrating said vessel adjacent to said cut.

4,819,641
SANITARY BABY PACIFIER
Joseph W. Russell, and Toni M. Russell, both of 8018 2nd Ave., Inglewood, Calif. 90302
Filed Oct. 30, 1987, Ser. No. 115,448
Int. Cl.[4] A61J 17/00
U.S. Cl. 128—360 7 Claims



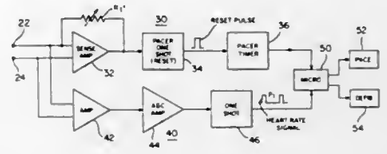
1. A baby pacifier comprising:
a domed base member defining an interior concave surface, and a pair of slots;
a nipple member having an elongated nipple stem joined to and extending from said interior surface and a generally rounded nipple end;
means attaching said base member to said top member to enclose said nipple member; and
handle means for collapsing said top member against said base member and exposing said nipple member through said elongated slot, said handle means include a pair of arms extending through said pair of slots and joined to said top member.

4,819,642
ELECTROMAGNETIC APPLICATOR AND METHOD FOR LOCALIZING HYPERTHERMIA HEATING IN A SYSTEM
Jorgen B. Andersen, and Povl Raskmark, both of Aalborg, Denmark, assignors to The Danish Hyperthermia Foundation, Aalborg, Denmark
Division of Ser. No. 748,815, Jun. 26, 1985, Pat. No. 4,702,262.
This applicatioo Jul. 27, 1987, Ser. No. 78,175
Claims priority, application Denmark, Jun. 27, 1984, 3128/84
Int. Cl.[4] A61N 1/40
U.S. Cl. 128—419 R 3 Claims



1. A method for tuning an array of hyperthermia applicators comprising the steps of:
placing a transmitting element within a lossy medium representative of a tumor location in a human body;
transmitting a signal from said element;
placing an array of applicators about said lossy medium;
detecting the amplitude and phase of said transmitted signal with said applicators; and
deriving from said detected signal with said applicators the relative amplitude and phase parameters for an electromagnetic wave to be propagated from each applicator to obtain a relative maximum radiated power density from said propagated wave adjacent said tumor.

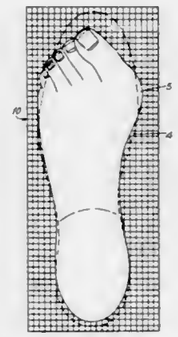
4,819,643
METHOD AND APPARATUS FOR CARDIOVERTER/PACER FEATURING A BLANKED PACING CHANNEL AND A RATE DETECT CHANNEL WITH AGC
John Menken, Champlin, Minn., assignor to Mieczyslaw Mirowski, Owings Mills, Md.
Filed Nov. 18, 1986, Ser. No. 931,854
Int. Cl.[4] A61N 1/00; H05G 00/00
U.S. Cl. 128—419 P 17 Claims



1. An implantable system including pacing and cardioverting capabilities for detecting abnormal heart rates by sensing the electrical activity of the heart and stimulating the heart accordingly, the system comprising:
sensing means for sensing said electrical activity of the heart and for carrying a cardiac signal indicative thereof;
time and amplitude determining means connected to said sensing means for issuing a pacer signal when the amplitude of said cardiac signal fails to exceed a first predetermined threshold within a predetermined time period;
amplifying and detection means connected to said sensing means for amplifying said cardiac signal and producing a heart rate signal when the amplified cardiac signal exceeds a second predetermined threshold, said amplifying and detection means including an automatic gain control for variable amplifying said cardiac signal, said automatic gain control being reset by the amplitude of said cardiac signal and includes an inherent time constant;
said system including a heart condition detection means connected to said time and amplitude determining means and to said amplifying and detection means for receiving said pacer signal and said heart rate signal, said heart condition detection means ignoring the occurrence of said pacer signal for a set period of time such that the gain of the
automatic gain control increases with time based upon said amplitude of said cardiac signal for further amplifying said heart rate signal; and,
stimulating means connected to said heart condition detection means for stimulating said heart based upon said pacer signal and said heart rate signal.

4,819,644
BASE PLATE TO FORM AN INSOLE FOR AN ORTHOTIC FOOT BRACE AND A METHOD OF FORMING AN ORTHOTIC FOOT BRACE
Jaime G. Cherniak, Ave. Tiradentes No. 10, Centro, Commercial Dayln, Ens. Naco, Santo Domingo, Dominican Republic
Filed Oct. 29, 1987, Ser. No. 114,036
Int. Cl.[4] A61F 5/14
U.S. Cl. 128—596 8 Claims

8. A method of forming an orthotic foot brace for therapeutic treatment of the foot of a patient under the care of a health care provider, including:
providing a base plate including a stiffly flexible, yet shearable, rectangular planar sheet having,
a thickness,
a pair of opposed parallel surfaces separated by said thickness, and a graph inscribed on one of said surfaces, said graph having
at least one pair of orthogonal axes, and
means for indicating the coordinates, relative to the said axes, of positions for attaching said podiatric appliances, said means including,
at least one set of spaced, first coordinate markings, located along one of the said axes, and,
at least one set of spaced, second coordinate markings, located along the other of the said axes, said first and said second coordinate markings defining said positions;
providing at least one podiatric appliance having a basewall member opposite to and brought into and abutting, overlying relationship to the said graph;
providing means, associated with said base plate and said basewall member, for securing said podiatric appliance at



its said basewall member to the said sheet in an abutting overlying relationship to the said graph;
placing said foot against said one surface, within the boundaries of the said graph;
forming a traced outline of the said foot on said graph with a marking device;
attaching said basewall member of said podiatric appliance, by said securement means, to said sheet at a said position prescribed by said health care provider to said patient by said first coordinate markings and said second coordinate markings, and,
cutting said sheet to the said traced outline of the said foot to form said orthotic foot brace.

4,819,645
DERMAL SUBSTANCE COLLECTION METHOD
Carl C. Peck, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Division of Ser. No. 660,778, Oct. 8, 1985, Pat. No. 4,706,676.
This application Nov. 4, 1987, Ser. No. 116,763
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—632 20 Claims



1. A method for the non-invasive, immediate and continuous collection of a chemical substance from a dermal surface, said method comprising the steps of
I. applying to the skin to collect said chemical substance from said surface a dermal surface a dermal substance collection device (DSCD) comprised of:
(a) a binding reservoir material for binding with said dermal substance to prevent back transfer loss of said dermal substance from said collection device to the dermal surfaces;
(b) a liquid bridge transfer medium which allows the instantaneous and continuous transfer of said dermal substance

from the dermal surface to said binding reservoir material, said binding reservoir material being maintained in a wet-state by said liquid bridge transfer medium; and

(c) a cover means for occlusively containing said binding reservoir material and said liquid bridge transfer medium and for occlusively maintaining said liquid bridge transfer medium in continuous contact with the dermal surface upon application of said collection device to the dermal surface;

II. maintaining the DSCD in a substantially air tight relation with the skin surface over the collection period;

III. removing the binding reservoir material from the DSCD; and

IV. analyzing the chemical substance collected in the binding reservoir.

4,819,646

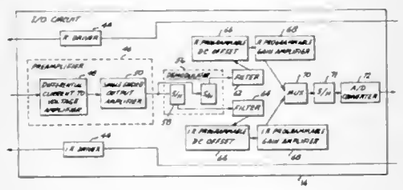
FEEDBACK-CONTROLLED METHOD AND APPARATUS FOR PROCESSING SIGNALS USED IN OXIMETRY

Peter W. Cheung, Mercer Island; Karl F. Gauglitz, Kirkland; Lee R. Mason, Issaquah; Stephen J. Prosser, Lynnwood; Robert E. Smith, Edmonds; Darrell O. Wagner, Monroe, and Scott W. Hunsaker, Seattle, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Aug. 18, 1986, Ser. No. 897,664

Int. Cl.[4] A61B *5/00, 6/00*

U.S. Cl. 128—633 **27 Claims**



1. A method of processing information signals that contain information about the oxygen saturation of arterial blood flowing in tissue, comprising the steps of:

subtracting from said information signal a controlled portion of said information signal, the magnitude of said controlled portion being determined by a subtraction control signal;

producing a subtraction output that is substantially equal to the portion of said information signal remaining after said controlled portion is subtracted therefrom; and

producing said subtraction control signal, the magnitude of said subtraction control signal produced being a function of said subtraction output and indicating any adjustment to be made in said controlled portion subtracted from said information signal.

4,819,647

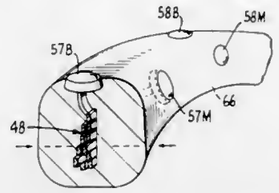
INTRACOCHLEAR ELECTRODE ARRAY

Charles L. Byers, Vacaville, Calif.; Gerald E. Loeb, Clarksburg, Md.; Michael M. Merzenich, and Stephen J. Rebscher, both of San Francisco, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 855,089, Apr. 22, 1986, abandoned, which is a continuation of Ser. No. 607,019, May 3, 1984, abandoned. This application Feb. 9, 1988, Ser. No. 154,025

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—642 **14 Claims**



1. An intracochlear multielectrode array having a direction of curvature defining a spiral shape at least generally conforming to the scala tympani of a cochlea, said array comprising

elastomeric carrier means having an elastic memory for assuming said spiral shape after it has been straightened and then relaxed, and

a plurality of electrode means carried by said carrier means for electrically stimulating an auditory nerve, said electrode means including

a plurality of electrodes spaced apart from each other in the direction of curvature of said spiral shape, and

a plurality of elongated lead means, each connected to a respective one of said electrodes, supported in encapsulated relationship at least generally centrally within said carrier means to form a spiraled rib structure for allowing flexion and straightening of said array in the direction of curvature of said spiral shape, but for preventing flexion of said array in a perpendicular direction relative to said direction of curvature, at least two of said lead means being disposed in vertical alignment relative to each other in said perpendicular direction and each said lead means comprising a flattened metallic wire having a width in said perpendicular direction that is greater than the thickness thereof, when said wire is viewed in cross-section.

4,819,648

NON-INVASIVE ELECTROMAGNETIC TECHNIQUE FOR MONITORING TIME-TRENDS OF PHYSIOLOGICAL CHANGES AT A PARTICULAR LOCATION IN THE BRAIN

Harvey W. Ko, Columbia, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 791,864, Oct. 28, 1985, Pat. No. 4,690,149. This application Sep. 1, 1987, Ser. No. 92,268

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—653 **9 Claims**

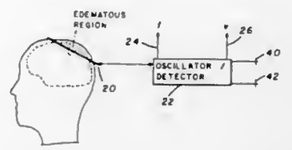
1. An apparatus for sensing physiological changes in an animal or human brain, comprising:

a coil adapted to generate a magnetic field in a selected portion of a patient's brain;

a pad which is adapted to be placed on a patient's head over a selected localized site, wherein said coil is mounted in said pad;

an oscillator/detector means for exciting said coil with a time-varying electrical signal, for detecting changes in mutual inductance of said coil, and for outputting an information signal corresponding to such detected changes in mutual inductance, wherein changes in mutual inductance are caused by a secondary induced magnetic field which varies in response to the impedance of brain matter and fluid located in said selected portion of the patient's brain;

a calibration means for exciting said coil with a calibration current having a set value;



a controller and data memory means for periodically actuating said calibration means and for storing values for said information signal, wherein calibration data is stored when said calibration means is actuated, and measurement data is stored when said calibration means is off;

a means for correcting said measurement data for drift and background noise based on calibration data; and, a display means for displaying corrected measurement data.

4,819,649

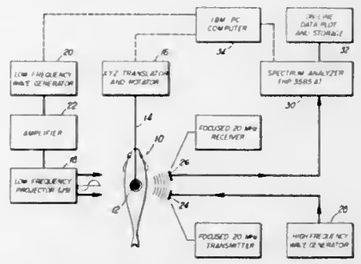
NONINVASIVE VIBRATION MEASUREMENT SYSTEM AND METHOD FOR MEASURING AMPLITUDE OF VIBRATION OF TISSUE IN AN OBJECT BEING INVESTIGATED

Peter H. Rogers, Sandy Springs, and Helen M. Cox, Atlanta, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Nov. 3, 1986, Ser. No. 926,452

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660.02 **9 Claims**



1. The method of investigating an acoustically vibrating object which comprises the steps of obtaining an acoustically vibrating object, transmitting a focused beam of ultrasonic continuous wave energy along one axis into the object, receiving a focused beam of reflected ultrasonic energy along a second axis from the object, intersecting the axes of the transmitted and received beams such that the beams at the intersection of their axes define a small, concentrated spot within the object, relatively positioning the object under investigation and the concentrated spot so that the received beam is phase modulated by the vibration of the object, the modulated received beam including a carrier and sidebands and determining the amplitude of vibration of the object from the phase modulation of the received beam.

4,819,650

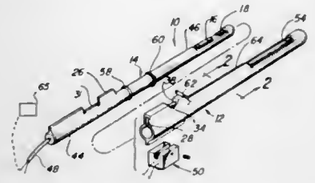
BIPLANE PROBE INCLUDING CENTERLINE HIGHLIGHTING

Albert Goldstein, Ann Arbor, Mich., assignor to Wayne State University, Detroit, Mich.

Filed Oct. 30, 1987, Ser. No. 114,502

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—661.01 **6 Claims**



1. A biplane ultrasound probe assembly (**10**) comprising: a probe member (**14**) including a body portion (**46**) defining a longitudinal axis; a plurality of scanning means (**16, 18**) mounted on said body portion (**46**) aligned along said longitudinal axis and being shiftable to a unitary scanning position for respectively ultrasound scanning different overlapping orthogonal planes (**23, 25**) of an adjacent object (**20**) and acquiring the scans to a visual image processing system when positioned in said unitary position, each of said planes (**23, 25**) including a common line shared with the other of said planes when positioned in said unitary position; and registering means for setting any one of said scanning means (**16, 18**) at said unitary scanning position, said probe assembly (**10**) including common line indicating means for producing an image of said common line of said scan plane (**23, 25**) from each scanning means (**16, 18**) at said unitary scanning position.

4,819,651

ULTRASONIC PROBE

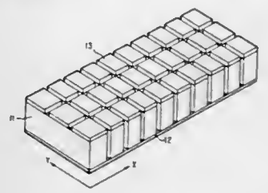
Yutaka Matsui, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1987, Ser. No. 138,710

Claims priority, application Japan, Dec. 24, 1986, 61-306302; Dec. 26, 1986, 61-315375

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—662.03 **6 Claims**



1. An ultrasonic probe, comprising:

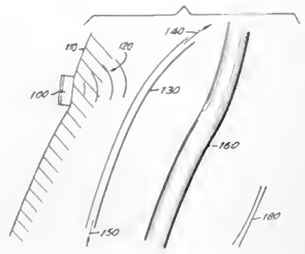
a piezoelectric substrate divided into a plurality of separated substrate sections aligned in one direction;

a common electrode on one side of said piezoelectric substrate electrically connected with all of the separated substrate sections;

a plurality of individual electrodes on the other side of said piezoelectric substrate, plural of said separated substrate sections being electrically connected to plural respective of the individual electrodes, wherein respective of the individual electrodes of the separated substrate sections are aligned in a different direction relative to the one direction.

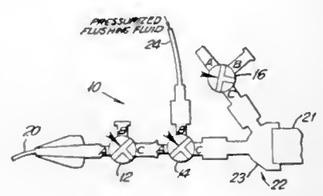
VOL 1101 ISS 2 APR 11 1989 UMI

4,819,652
C W AND PULSE DOPPLER DIAGNOSTIC SYSTEM
Alexander J. Micco, Lakewood, Colo., assignor to University Patents, Inc., Westport, Conn.
Filed Feb. 8, 1985, Ser. No. 699,676
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—661.09 **23 Claims**



1. In an ultrasonic diagnostic apparatus including a transmitting means for generating drive signals, a receiving means for producing output signals for diagnosis, and ultrasound transducer means connected to said transmitting means for emitting ultrasound pulses in response to said drive signals and for apply signals to said receiving means in response to ultrasound pulses received in response to said emitted ultrasound pulses, the improvement wherein said transmitting means comprises means for generating a train of Doppler pulse signals each comprised of a burst of a plurality of cycles followed by a receiving cycle, means for generating range gate signal for applying gate signals to said receiving means to enable reception of signals, by said receiving means corresponding to said Doppler pulse signals only during predetermined periods following each Doppler pulse signal, means for applying said Doppler signals to said transducer means as said drive signals, and means for adjusting the time between each Doppler pulse signal and the respective range gate signal while maintaining the time between each Doppler pulse signal and the immediately preceding range gate signal substantially constant and while simultaneously varying the power of emitted ultrasound pulses in the same sense.

4,819,653
MULTI-FUNCTION FLUID COMMUNICATION CONTROL SYSTEM
Lloyd A. Marks, 29 Woody Ln., Northport, N.Y. 11768, assignor to Lloyd A. Marks, Bryn Mawr, Pa.
Filed Apr. 11, 1986, Ser. No. 850,758
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—673 **21 Claims**



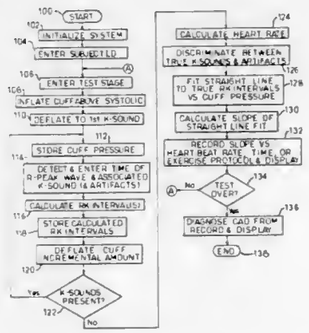
1. Multi-function fluid communication control system for effecting selective automated simultaneous and step-wise connection for fluid communication between fluid reservoirs, fluid sources, instruments, and various pressure conditions, comprising

more than one stopcock multi-port fluid communication valve, each said stopcock having fluid path selection levers,

fluid passage conduits connecting ports of each of said stopcocks to provide said selective fluid communication between said fluid reservoirs, sources, instruments, and various pressure conditions responsive to command signals, said control means comprising stepper motors connected for selective step-wise adjustment of said stopcocks to provide desired fluid flow between certain ports and a programmable electrical signal-sending unit for sending electrical signals to said stepper motor, said stepper motors connected to said stopcocks by means of a linkage from an output drive armature of said motor to a means for directly driving said levers whereby said stopcocks are selectively adjusted, and

command means connected to said control means for delivery of command signals thereto whereby said selective fluid communication connections are effected.

4,819,654
METHOD AND APPARATUS FOR DIAGNOSIS OF CORONARY ARTERY DISEASE
Charles S. Weaver, Palo Alto, and Constance T. Chittenden, Los Altos, both of Calif., assignors to SRI International, Menlo Park, Calif.
Division of Ser. No. 272,542, Jun. 11, 1981, Pat. No. 4,649,929.
This application Sep. 18, 1986, Ser. No. 908,604
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—680 **27 Claims**



1. Apparatus for use in identifying subjects having coronary artery disease comprising,

an inflatable cuff for encircling a subject's arm,

means for inflating and deflating said cuff through a range of pressures between systolic pressure and diastolic pressure within which pressure range Korotkov sounds are produced,

pressure transducer means responsive to cuff pressure and having an output signal related thereto,

electrode means for sensing electrocardiographic signals from the subject,

R-wave peak detector means for detecting the peak of the R-wave in the electrocardiographic signals,

transducer means for sensing Korotkov sounds during a cuff deflation,

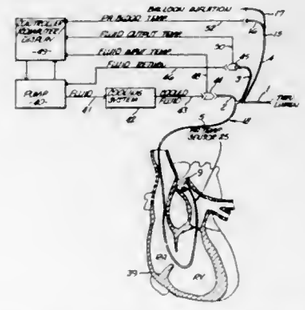
Korotkov sound detecting means for detecting Korotkov sounds in the output from said Korotkov sound transducer means,

means responsive to the outputs from said pressure transducer, R-wave peak detector, and Korotkov sound detector means for producing a signal representative of the systolic slope of blood pressure waves during a cuff deflation,

means for recurrently operating said means for producing a signal representative of the systolic slope for obtaining a plurality of said signals representative of systolic slope during different periods of an exercise cycle that includes aerobic exercise performed by the subject,

means for detecting and evaluating changes in said signals representative of systolic slope occurring during said exercise cycle for identifying subjects having coronary artery disease.

4,819,655
INJECTATELESS THERMAL CARDIAC OUTPUT DETERMINATION METHOD AND APPARATUS
William E. Webler, 151 Seaspray South, Laguna Niguel, Calif. 92677
Filed Aug. 4, 1987, Ser. No. 81,352
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—713 **8 Claims**



1. A method of providing injectateless thermal cardiac output determinations comprising the steps of

inserting a catheter into a heart cavity, the catheter having temperature measuring means for measuring blood temperature within the heart, and the catheter including lumen means for providing a closed loop flow of a fluid through the catheter into and out of the heart and confined within the catheter,

adjusting the temperature of the fluid, measuring the temperature of the fluid prior to entering the catheter, and supplying the temperature adjusted fluid to the catheter and thus into the vicinity of the heart,

measuring the temperature of the fluid returned from the vicinity of the heart by the catheter,

measuring the flow rate of the fluid, and

calculating cardiac output based on the temperature of the fluid entering and exiting the catheter, flow rate of the fluid, and change in blood temperature.

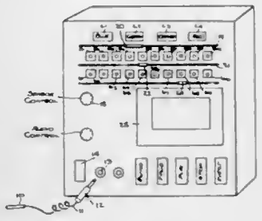
4,819,656
BIOFEEDBACK THERAPY SYSTEM
Donald Spector, 380 Mountaio Rd., Union City, N.J. 07087
Filed Apr. 30, 1985, Ser. No. 728,770
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—736 **7 Claims**

1. A biofeedback therapy system for training an individual to regulate his internal stress, which individual at the outset of a training run may be in a relatively unstressed state, said system comprising:

A means including a sensor continuously to monitor a physiologic function of the individual in the course of the training run to produce a signal representing the individual's prevailing level of stress;

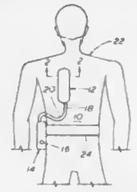
B a scale responsive to said signal to visually indicate the level of stress, making it possible for the individual mentally to regulate the function being monitored; and

C means to subject the individual being monitored during the course of the training run to a series of startling and disquieting stress-inducing sound stimuli which differ from each other and which appear at random intervals, and are therefore unexpected, to induce internal stress in



the individual in the course of the run, said means being constituted by a tape recording having startling sounds recorded thereon at intermittent times which are disturbing to the listener.

4,819,657
AUTOMATIC ALLERGY DETECTION SYSTEM
Thomas L. Kraft, Houston; Howard A. Vick, Missouri City, and James W. Meador, Houston, all of Tex., assignors to KVM Engineering, Inc., Houston, Tex.
Continuation of Ser. No. 722,798, Apr. 12, 1985, abandoned.
This application Jun. 16, 1987, Ser. No. 60,974
Int. Cl.[4] A61M *37/00*
U.S. Cl. 128—736 **41 Claims**



1. A system for measuring allergic response, including:

allergen delivery means for transcutaneously delivering an ionizable selected substance into the skin of a subject to test for allergic response of the subject to said substance, said means including charging and return electrodes positioned for spaced topical placement on the subject's skin effective to provide a conductive path through the tissue of the skin for transcutaneous transport of said selected substance, said charging electrode including a charging member responsive to a first electric signal and, in contact with said charging member, a medium for containing said selected substance, said medium being positioned to separate said charging member from contact with the skin upon said topical placement of said charging electrode;

temperature sensing and signaling means adapted for placement in thermal contact with an area of skin of the subject at a location in juxtaposition with said path, for sensing instantaneous temperature of the skin at said location and for outputting a second electric signal manifesting said instantaneous temperature;

processing control means for controlling the application of said first electric signal and for receiving and processing said second electric signal, said processing control means including sampling and storing means for sampling said second signal during a plurality of times and for storing data manifesting the sensed temperature for each sampling time, and

means for providing an output of the stored data indicating

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change in temperature of said area of skin with respect to time.

4,819,658

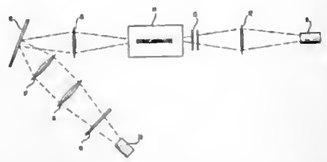
METHOD AND APPARATUS FOR MEASURING THE TEMPERATURE PROFILE OF A SURFACE

Paul R. Kolodner, Hoboken, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 623,958, Jun. 25, 1984, abandoned, which is a continuation of Ser. No. 434,635, Oct. 15, 1982, Pat. No. 4,455,741, which is a continuation-in-part of Ser. No. 347,783, Feb. 11, 1982, abandoned. This application Jun. 30, 1987, Ser. No. 65,619

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—736 **24 Claims**



1. A method for measuring a temperature profile of a surface exhibiting spatial and/or temporal variations in temperature, comprising the steps of:

forming a layer, including fluorescent material, in thermal contact with said surface, the fluorescence of said material varying as the temperature of said surface varies;

subjecting said material to fluorescence-inducing energy; and detecting the resulting fluorescence of said material, characterized in that

said fluorescent material is essentially free of inorganic material.

4,819,659

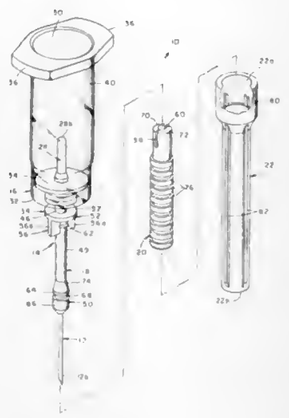
BLOOD WITHDRAWAL DEVICE WITH MOVABLE NEEDLE GUARD MEMBER

Dennis L. Sitar, Trabuco Canyon, Calif., assignor to ICU Medical, Inc., Mission Viejo, Calif.

Filed Sep. 21, 1987, Ser. No. 99,331

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—764 **5 Claims**



1. A medical device of the type used to withdraw blood or other fluids from a patient into a vacuum tube having a seal in an open end, said seal being adapted to be penetrated by a needle, including

an elongated needle having a hollow shaft terminating at a first end and a first open tip adapted to penetrate the body of a patient and a second end opposite said first end and terminating in a second open tip adapted to penetrate the seal of said tube,

a unitary structure including

(a) tube holding means having an open end into to which the tube is inserted during use and a cavity which receives the sealed end of the tube, said second end of the needle extending into the cavity but displaced inwardly from said open end in the tube holding means, and said first end of the needle extending outwardly from the tube holding means,

(b) locking means bonded to the portion of the shaft of needle extending outwardly from the tube holding means, and including an elongated stem member made of a polymeric material through which a substantial portion of said shaft extends, said stem being bonded to the shaft during molding, with the stem being formed about the needle shaft by application of pressure to the molten polymeric material which, upon cooling, shrinks and bonds to the surface of said shaft; and

a guard member carried on the portion of the shaft extending outwardly from the tube holding means and movable axially along said shaft between a first position where the guard member is inwardly from said first tip to enable said first tip to penetrate the body of a patient and a second position where the guard member covers said tip to prevent accidental needle sticks, said locking member permanently locking the guard member into position upon movement of said guard member from said first position to said second position.

4,819,660

PROSTHETIC SHAPE SENSOR

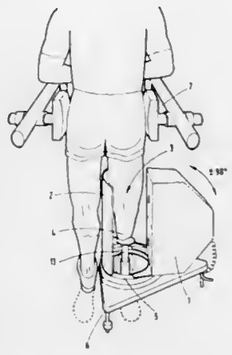
David M. Smith, Surrey, England, assignor to University of College london, London, England

Filed Jun. 23, 1987, Ser. No. 65,406

Claims priority, application United Kingdom, Jun. 27, 1986, 8615749

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—774 **3 Claims**



1. A prosthetic shape sensor comprising a single camera unit and a reflecting surface, each mounted on a turntable and arranged opposite each other to define therebetween a space for a stump of a patient, the reflecting surface being shaped to fit between the stump and a leg of the patient and being formed of retro-reflective material, wherein the camera unit includes a double fresnel lens, means to provide illumination along each axis of said lens, and at least one camera to record the images reflected from the reflecting surface through said lens, and wherein the camera unit and the reflecting surface are rotatable together on the turntable about the stump through at least 180°, whereby the camera unit can collect a series of silhouette views of the stump upon rotation about the stump.

4,819,661

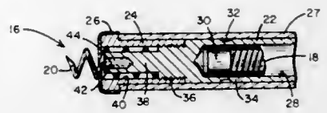
POSITIVE FIXATION CARDIAC ELECTRODE WITH DRUG ELUTION CAPABILITIES

Ronald W. Heil, Jr., Roseville, and Robert C. Owens, Forest Lake, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Oct. 26, 1987, Ser. No. 112,519

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—786 **15 Claims**



1. An intravascular lead implantable inside a patient, including:

an elongate and flexible electrical conductor;

a lead distal end assembly including an electrode, a fixation element fixed with respect to said electrode for effecting penetration into endocardial tissue at a selected location to secure said electrode at said selected location, and a coupling means for electrically and mechanically joining said electrode and a distal end section of said conductor, wherein said electrode includes an elongate annular sleeve and a porous electrode tip at a distal end of the sleeve, said porous electrode tip comprising an electrically conductive fine wire crimped and packed adjacent said distal end of the sleeve, and a screen overlying said wire and fastened to the sleeve to secure said wire relative to the sleeve;

a flexible, biocompatible and dielectric sheath surrounding said conductor along substantially the entire length thereof, and surrounding said assembly along at least a proximal end region thereof;

means forming a chamber in said assembly and open to a distal end thereof; and

a matrix impregnated with a therapeutic drug and retained in said chamber.

4,819,662

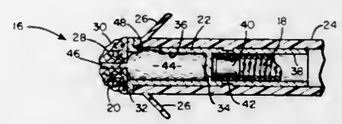
CARDIAC ELECTRODE WITH DRUG DELIVERY CAPABILITIES

Ronald W. Heil, Jr., Roseville; Robert C. Owens, Forest Lake, and Brian D. Pederson, St. Paul, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Oct. 26, 1987, Ser. No. 112,518

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—786 **25 Claims**



1. An intravascular lead implantable inside a patient, including:

an electrically conductive electrode having a porosity of at least seventy-five percent; a flexible electrical conductor; a flexible, biocompatible and dielectric sheath surrounding said conductor along substantially the entire length thereof; a coupling means for electrically and mechanically joining said electrode with respect to the distal end of said conductor, said electrode joined to and substantially covering the distal end of said coupling means; means forming a recess in said coupling means and open to said electrode; and a matrix containing a water soluble drug and retained in said recess; and

wherein said electrode is loaded with a therapeutic drug, and is positionable for fixation to body tissue at a selected location, said electrode being sufficiently porous to freely dispense said drug at said selected location upon contact with bodily fluid, and further sufficiently porous to facilitate dispensing of the drug from said matrix to said selected location.

4,819,663

SITTING PATIENT LEG RESTRAINT

Rita Matre, 720 Judith Dr., Kettering, Ohio 45429

Filed Apr. 11, 1989, Ser. No. 115,464

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—876 **1 Claim**



1. A method of holding a patient in a sitting position upon a chair or the like, comprising

providing a restraint device having an elongated padded central section with a width sufficient to distribute restraining pressure over a substantial area,

and

tie means attached to opposite ends of the central section,

wrapping the restraint device about the mid-section and sides of a patient's torso and looping the central section around one thigh of the patient, then connecting the tie means behind the chair to restrain the patient fully into the chair in a generally up-right seated position with the patient's thighs extending approximately at right angles to the patient's torso.

4,819,664

DEVICE FOR SELECTIVE BRONCHIAL INTUBATION AND SEPARATE LUNG VENTILATION, PARTICULARLY DURING ANESTHESIA, INTENSIVE THERAPY AND REANIMATION

Stefano Nazari, Via Bignanico, 12, Como, Italy

Continuation of Ser. No. 890,199, Jul. 8, 1986, abandoned. This application Feb. 17, 1988, Ser. No. 159,426

Claims priority, application Italy, Nov. 15, 1984, 23603 A/84; Jun. 5, 1985, 21025 A/85

Int. Cl.[4] A61M *16/00, 29/00, 15/00*

U.S. Cl. 128—207.15 **3 Claims**

1. A device for selective bronchial intubation and separate lung fluid media ventilation, comprising:

an elongated tracheal tube structure adapted to be inserted into a human trachea and having a forward end, a rearward end and a length sufficient to allow the forward end of said tracheal tube structure to be positioned in the trachea at a location near the carina defining bifurcation of the trachea into right and left main bronchi,

said tracheal tube structure having an inner surface defining

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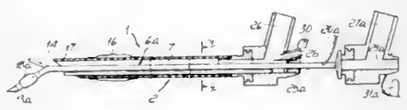
an internal cavity having an internal cavity diameter and extending lengthwise within said tracheal tube structure between said forward and rearward ends,

first inflatable sealing means mounted on the outer periphery of said tracheal tube structure near the forwaard end thereof, said first inflatable sealing means being adapted upon inflation thereof to expand into substantial sealing contact with the inner surface of the trachea near the carina defining bifurcation thereof and

an endobronchial tube structure defining a first lumen for the fluid passage therethrough and having an external diameter which is smaller than said internal cavity diameter, said endobronchial tube structure being removably inserted into said internal cavity of said tracheal tube structure for longitudinal sliding movement therein,

said endobronchial tube structure having an external surface defining with said inner surface of said tracheal tube structure a second lumen for the flow of fluid media therethrough,

said endobronchial tube structure having a rearward end portion and a forward end portion with a forward tip made of flexible material and upon insertion into said



tracheal tube structure extending beyond said forward end of said tracheal tube structure and at the outside thereof, said forward end portion being bent at an angle with respect to the remaining portion of the endobronchial tube structure for insertion into the right main bronchus,

a second inflatable sealing means on said forward end portion, said second inflatable sealing means being adapted upon inflation thereof to expand into substantial sealing contact with the inner surface of the right main bronchus behind the first bifurcation thereof,

an arm of flexible material extending from said forward end portion between said tip and said second sealing means at an acute angle with respect to said forward tip, said forward end portion and said arm defining bifurcation means for positioning into the first bifurcation of the right bronchus to stop progression of said endobronchial structure, first and second duct means connectable with said first and second sealing means, respectively, and with a source of fluid pressure for inflation thereof and stopper means at said rearward end of said tracheal tube for cooperation with said endobronchial tube structure while still allowing fluid flow into and out of said second lumen.

4,819,665

AEROSOL DELIVERY ARTICLE

Donald L. Roberts; Carl C. Morrison; Johnny L. Brooks; Evon L. Crooks, and Bradley J. Ingebrethsen, all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jan. 23, 1987, Ser. No. 6,191

Int. Cl.[4] A24F *1/00*; A24D *1/02*

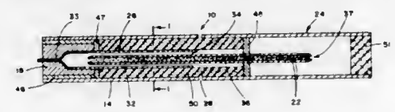
U.S. Cl. 131—195 **44 Claims**

1. A cigarette-type aerosol delivery article comprising:

(a) a carbonaceous, combustible fuel element having a length of less than about 30 mm prior to use;

(b) aerosol generating means physically separate from the fuel element and including at least one aerosol forming substance;

(c) barrier means physically separate from the fuel element, and positioned between the fuel element and the aerosol generating means for substantially precluding combustion gases from the fuel element from passing directly through the article; and



(d) means for providing a source of air to the aerosol generating means through the periphery of the article.

4,819,666

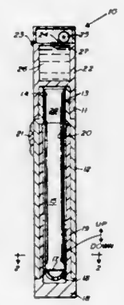
SMOKE-LESS CIGARETTE CONTAINER

Carlos S. Turver, Circunvalacion Providencia, 1105, Sector Hidalgo, Guadalajara, Jalisco, Mexico

Filed Aug. 6, 1987, Ser. No. 82,781

Int. Cl.[4] A24F *7/04*

U.S. Cl. 131—175 **4 Claims**



1. A device for helping a cigarette smoker to reduce his daily cigarette consumption, including in combination:

an elongated container having a main body holding interiorly helically threaded means in an elongated opening at least as long as a cigarette and an upper end that is exteriorly threaded,

a container cap having threads engageable with the body's exterior threads for closing the container,

a serrated cup and ash holder in said container engaging said interior threads, and

a knob connected to said interiorly threaded means for rotating said means and thereby causing said cup and ash holder to go up or down in said container, depending on the direction of rotation.

4,819,667

TREATMENT OF TOBACCO TO REDUCE TAR AND NICOTINE CONTENT

Nikola Drazic, 38 Evenlea Walk, Winnipeg, Manitoba, Canada R2G 2N7

Filed Jul. 31, 1987, Ser. No. 80,081

Int. Cl.[4] A24B *15/28*

U.S. Cl. 131—310 **12 Claims**

1. A process for treating tobacco comprising passing through the tobacco in combination steam and starch.

4,819,668

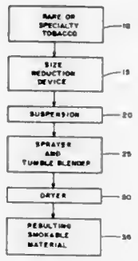
CIGARETTE CUT FILLER CONTAINING RARE AND SPECIALTY TOBACCOS

Gary R. Shelar, Greensboro, and Bruce R. Bullings, Winston-Salem, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 2, 1987, Ser. No. 33,963

Int. Cl.[4] A24B *15/18*

U.S. Cl. 131—371 **30 Claims**



1. A process for applying low amounts of at least one type of tobacco relatively uniformly within a blend of smokable material for use as cigarette cut filler, the process comprising:

(i) providing at least a portion of the smokable material for the blend;

(ii) providing a suspension of a selected tobacco material in finely divided particulate form within a liquid; and

(iii) applying the suspension as a casing to the smokable material.

4,819,669

METHOD AND APPARATUS FOR SHAVING THE BEARD

Eugène J. Politzer, 65, rue Jouffroy, FR-75017 Paris, France

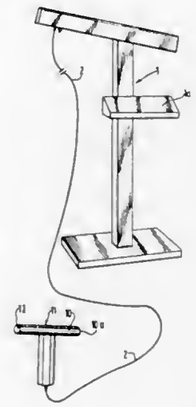
PCT No. PCT/FR86/00109, § 371 Date Nov. 26, 1986, § 102(e) Date Nov. 26, 1986, PCT Pub. No. WO86/05676, PCT Pub. Date Oct. 9, 1986

PCT Filed Apr. 1, 1986, Ser. No. 943,259

Claims priority, application France, Mar. 29, 1985, 8504825; Jun. 12, 1985, 8508860

Int. Cl.[4] A45D *26/00*

U.S. Cl. 132—200 **2 Claims**



1. A method of shaving a beard, comprising the steps of:

passing hairs of the beard through an electrically and thermally insulating grid; and,

applying energy delivered by a laser source of selected wave lengths to the ends of the hairs passing through the grid, whereby the hairs are singed along their entire length, and thereby eliminated.

4,819,670

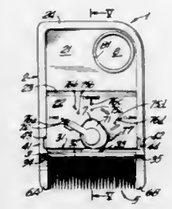
FLEXIBLE LICE COMB

Albert Saferstein; Gilbert Spector, both of 2500 Westchester Ave., Purchase, N.Y. 10577, and Larry Tsuyuki, 116 Brown Rd., Scarsdale, N.Y. 10583

Filed Aug. 20, 1987, Ser. No. 87,531

Int. Cl.[4] A45D *24/00*

U.S. Cl. 132—156 **6 Claims**



1. A lice comb comprising:

a handle;

a resiliently flexible elongated member;

a plurality of closely spaced comb teeth mounted in a row on a first side of the member and extending outwardly therefrom and wherein the teeth terminate in free ends;

means connecting end portions of the member to the handle to dispose the free ends of the teeth away from the handle; and

manually movable means mounted on the handle for contacting the member on a second side opposite said first side and intermediate of the end portions thereof to flex the member outwardly relative to the handle between a minimum flexure position wherein the teeth have a minimum spacing therebetween and a maximum flexure position wherein the teeth have a maximum spacing therebetween and whereby the comb can be used for different textures of hair and the teeth can be easily cleaned, wherein the manually movable means has means mounting same for movement into any one of a plurality of positions each corresponding to a different amount of flexure by the member and thereby a different spacing between the teeth comprising a cam member rotatably mounted on the handle and having a cam surface for contacting said second side of the flexible member and a lever connected to the cam and manually movable to rotate the cam.

4,819,671

ACCESSORY FOR THE HAIR

Lindsey J. Walker, 1 Norfolk Road, St. John's Wood, Londoo NW8, Great Britain

Continuation of Ser. No. 395,913, Jul. 7, 1982, abandoned. This application Apr. 22, 1985, Ser. No. 726,020

Claims priority, application United Kingdom, Jul. 13, 1981, 8121555; Nov. 13, 1981, 8134352

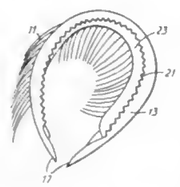
Int. Cl.[4] A45D *8/00*

U.S. Cl. 132—54 **5 Claims**

1. A hair accessory, comprising a single decorative, horseshoe-shaped arch having an inner and an outer surface, made of rigid material and adapted, in use, releasably to engage, be retained on and extend substantially from ear to ear over a forward part of the head of the wearer so as to be visible

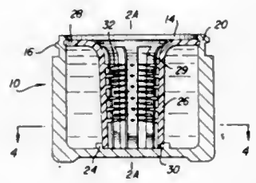
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on top of the hair of the wearer, and a fringe having a free end and remotely therefrom a further end attached to said arch at



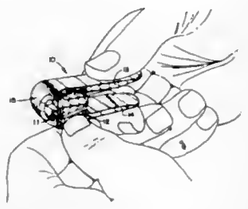
said inside surface thereof so as, in use, to extend from one side only of said arch forwardly over the hair at the front of the head and over the forehead of the wearer.

4,819,672
NAIL POLISH REMOVER CONTAINER
Alvin M. Walker, Seminole, and Charles E. Tighe, Dunedin, both of Fla., assignors to Walker Marketing Inc., Clearwater, Fla.
Filed Oct. 9, 1987, Ser. No. 106,260
Int. Cl.[4] A45D *29/20*
U.S. Cl. 132—75 12 Claims



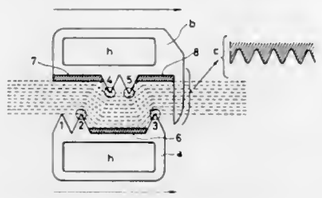
10. A manicuring device for the treatment of fingernails comprising a cylindrical receptacle closed at one end, an inner wall surface of said cylindrical receptacle defining channel means and an inner bottom surface defining a brush member retainer means, a one piece integrally molded brush member inserted into said receptacle and locked in place in said channel means and positioned against said bottom retainer means, said brush member comprising a flanged slitted sleeve.

4,819,673
NAIL CLIPPER
Thomas J. McMullen, Jr., 9270 Overlook Trail, Eden Prairie, Minn. 55344
Filed Apr. 1, 1987, Ser. No. 33,342
Int. Cl.[4] A45D *29/02*
U.S. Cl. 132—75.5 45 Claims



1. A nail clipper, comprising:
(a) a U-shaped body having a front and back end, including upper and lower, spaced-apart longitudinal handles interconnected by a central arc portion integral with said handles and between said handles proximate said front end, said handles being resiliently biased by said central arc portion into a partially extending, normal resting position whereby said central arc portion serves as a hinge means; and
(b) upper and lower blades, said blades facing each other and rigidly secured along a longitudinal edge of said upper and lower handles respectively, said blades being located closer to the front end of the nail clipper than to the back end.

4,819,674
CURLY HAIR CORRECTING IRON
Toyosaku Takimae, 2-26, 2-chome, Takanawa, Minato-ku, Tokyo, Japan
Filed Mar. 4, 1987, Ser. No. 21,871
Claims priority, application Japan, Dec. 26, 1986, 61-308764
Int. Cl.[4] A45D *2/40*
U.S. Cl. 132—224 4 Claims

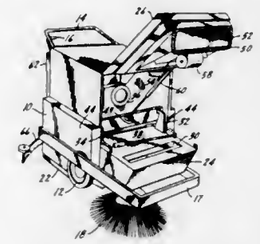


1. A hair straightening iron comprising a first and second rod each having a heater therein and a substantially planar inner surface, said first and second rods being connected at one end thereof with said planar inner surfaces being each other in a manner such that a plurality of curly hairs can be held therebetween laterally to said first and second rod, said first rod having at least one row of continuous projections, each projection extending longitudinally with a substantially uniform height along said first rod substantially along the central axis of said planar inner surface, at least a pair of first planar heat-resistant cushion layers being provided upon said planar inner surface at both sides of said at least one row of continuous projections, and second rod having at least two spaced projections, each of said projections extending longitudinally with a substantially uniform height along said second rod and each being located substantially spaced from said at least one row of continuous projections and at least a second planar heat-resistant cushion layer being provided upon said planar inner surface of said second rod positioned between said two spaced projections, wherein each of said first and second planar heat-resistant cushion layers has a substantial width such that hairs held therebetween can be straightened.

4,819,675
CHEMICAL REMOVAL OF DENTAL PLAQUE
Edward L. Wilkinson, New Hope, and David C. Sayles, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 5, 1988, Ser. No. 192,740
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—321 5 Claims

1. A method for the mechanical and chemical removal of dental plaque employing chemically impregnated cotton filaments in the form of a dental floss, said method comprising:
(i) providing cotton filaments of a size suitable for passing between teeth as a dental floss;
(ii) impregnating said cotton filaments by soaking in a saturated solution of potassium hydrogen tartrate and potassium hydrogen citrate to form chemically impregnated cotton filaments;
(iii) drying said chemically impregnated cotton filaments to remove moisture; and,
(iv) passing said dried chemically impregnated cotton filaments in the form of a dental floss between teeth and over the surfaces of the teeth which are coated with plaque compositions containing a calcium phosphate compound to thereby contact said calcium phosphate compound of said plaque compositions with said potassium hydrogen tartrate and said potassium hydrogen citrate contained in said floss to cause a reaction to occur to convert said calcium phosphate to the more soluble compounds of calcium citrate and calcium tartrate which go into solution, and the plaque is, thus, removed from the surfaces of the teeth.

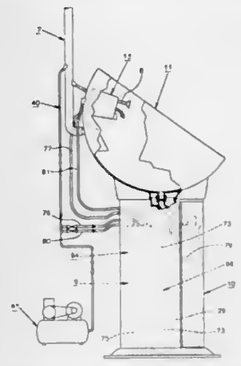
4,819,676
COMBINATION SWEEPING AND SCRUBBING SYSTEM AND METHOD
Michael L. Blehert, Crystal, and Archie A. Weidner, Minneapolis, both of Minn., assignors to Tennant Company, Minneapolis, Minn.
Filed Jan. 16, 1986, Ser. No. 819,911
Int. Cl.[4] B08B *5/04*
U.S. Cl. 134—21 23 Claims



10. A method of operating a surface cleaning machine in either a sweeping mode or a scrubbing mode for either sweeping or scrubbing a surface to be cleaned, the machine having a mobile frame, a rotatably mounted brush on the frame with a clean solution tank, a recovery solution tank, a pick-up squeegee for dirty solution, a vacuum system for preventing dusting during the sweeping mode and for picking up dirty solution from the floor by the squeegee during the scrubbing mode, and a hopper for receiving debris, including the steps of fixing the recovery tank on the rear of the frame when the unit is operating in either mode, interchangeably mounting the clean solution tank and the debris hopper on the front of the frame in operative position opposite the brush, the clean solution tank during the scrubbing mode and the debris hopper during the sweeping mode, alternately connecting the vacuum system to either the debris hopper to prevent dusting during the sweeping mode or to the recovery tank to draw dirty solution from the floor by the squeegee to the recovery tank during the scrubbing mode, and raising the squeegee out of contact with the surface when the unit is operating in the sweeping mode.

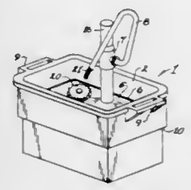
23. In a combination sweeping and scrubbing machine, a mobile frame, a rotatably mounted cylindrical brush on the frame for removing soilage and for propelling debris from a surface to be cleaned, a debris hopper on the frame with an opening therein for receiving debris propelled by the brush when the machine is operated as a sweeper, a filter and vacuum system on the frame for reducing dusting around the cylindrical brush, means for removably mounting the debris hopper on the frame, a clean solution tank adapted to be mounted in place of the debris hopper when the debris hopper is removed to convert the machine to a scrubber, a recovery tank and squeegee on the frame for picking up dirty solution when the machine is being operated as a scrubber, and a connection between the vacuum system and the recovery tank for communicating vacuum from the vacuum system through the recovery tank and squeegee, the clean solution tank and the debris hopper being sized such that said tank and debris hopper may be manually handled by an operator without auxiliary mechanical lift equipment.

4,819,677
CONTAINER FOR HAZARDOUS DETERGENTS
Leif E. Stern, Fattershus S-225, 90 Lund, Sweden
Filed Aug. 26, 1987, Ser. No. 89,529
Claims priority, application Sweden, Sep. 9, 1986, 8603759
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—104.2 8 Claims



1. An apparatus for use in cleaning polluted implements with a hazardous detergent, preferably a solvent, said apparatus comprising an outer container having an inner space for containing clean detergent, a pump device for pumping clean detergent from the inner space of said outer container toward a use location, and an inner container located within the inner space of said outer container, said inner container having an inner space for receiving the detergent withdrawn from said outer container and polluted through its use at the use location and an opening through which the polluted detergent flows into the inner space of said inner container from the use location, said inner container having walls made of a flexible material for enabling said inner container to expand upon being filled with polluted detergent.

4,819,678
PORTABLE CLEANER
James F. Nolan, 30 Millbank St., Rochester, N.Y. 14619
Filed Jun. 1, 1988, Ser. No. 200,938
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—186 13 Claims



1. A portable cleaning unit comprising a containing vessel, a dividing shelf, and a pump, said containing vessel comprising a

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ridge projecting inwardly from interior wall of said vessel, said dividing shelf resting on and supported by said ridge, said dividing shelf forming above its upper surface a parts chamber and below its lower surface a liquid chamber which houses a liquid cleaner, said dividing shelf having an aperture through which said pump fits and is supported thereby, said dividing shelf having a peripheral portion with dimensions slightly shorter than a peripheral portion of said interior wall of said vessel to form a gap thereby.

4,819,679

DISPOSABLE UMBRELLA

James R. Rex, 506 Mount Holyoke, Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 48,093, Apr. 23, 1987, Pat. No. 4,754,773. This application Jun. 29, 1988, Ser. No. 212,806

Int. Cl.[4] **A45B** *13/00, 19/00*

U.S. Cl. 135—19.5 **8 Claims**



1. A disposable umbrella, comprising a water resistant sheet and tongues cut from a single piece of material, the sheet including:

two essentially imperforate panels having a common edge; and

a panel fold line for folding the sheet into an essentially peaked-roof shape, the fold line being disposed between the two panels (and essentially perpendicular to the common edge;

a tongue being positioned on each of the said panels and folding along a tongue fold line disposed at the common edge of each panel, the tongues being adapted to cooperatively form a handle and position the umbrella in a peaked-roof shape.

4,819,680

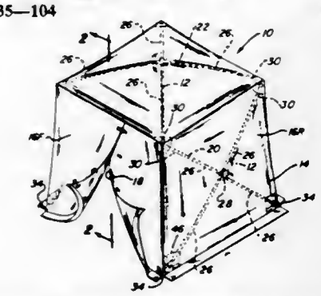
SPRING-BIASED TENT FRAME FOOT

Allan E. Beavers, Grand Junction, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed Jun. 9, 1988, Ser. No. 204,531

Int. Cl.[4] **E04H** *15/40*

U.S. Cl. 135—104 **9 Claims**



1. In a tent with essentially non-stretchable four-sided fabric wall panels having upper and lower corners supported in free-standing relation by foldable subframes consisting of a centrally-located hub from which radiate at least four struts, crossed pairs consisting of one upper strut and one lower strut of which define intersecting diagonals having the remote ends of the upper two struts secured in the upper corners of the panel while the remote ends of the lower two struts rest on the ground, and in which each such subframe is movable from a first partially-folded position wherein the diagonals formed by the strut pairs and hub are bowed inwardly out into a third fully-extended and outwardly-bowed panel-supporting position after passing through a second intermediate substantially straight line relation in which the diagonals are significantly elongated, the improvement which comprises: first strut-end-receiving apertured abutments attached to the wall panel in spaced relation above the lower corners thereof, a second abutment attached to each lower strut in spaced relation above the terminal end thereof, and a loose wound helical compression spring mounted on each lower strut below the second abutment, said spring and first and second abutments cooperating with one another and with the wall panel upon elongation of the diagonals to yieldably resist the stretching of said panel when the terminal ends of said lower struts are inserted within the apertures in said first abutments for reciprocating movement within the latter.

4,819,681

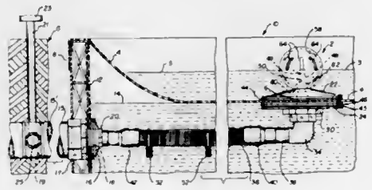
APPARATUS AND METHOD FOR DRAINING A SWIMMING POOL COVER

Frank J. Hodak, E. Cruikshank Rd., Valencia, Butler County, Pa. 16059

Filed Oct. 13, 1988, Ser. No. 257,396

Int. Cl.[4] **E03B** *9/00, 11/00*

U.S. Cl. 137—1 **12 Claims**



12. A method for draining excess accumulated water from a swimming pool cover comprising:

providing a hole through the pool cover;

affixing a drain means around the hole in the cover, said drain means having a through passage with an inlet end positioned at a height and spaced above said cover to determine a certain volume of water on said cover for weighting and maintaining said cover on a swimming pool and an outlet end positioned below said cover;

affixing a first end of a conduit to the outlet end of the drain means; and

affixing a second end of the conduit to a sidewall return port of the swimming pool, whereby, excess water accumulating on the cover at an elevation above the inlet end of the drain means flows into said inlet end and is discharged through said sidewall return port.

4,819,682

PNEUMATICALLY OPERABLE VALVE

Karel C. Van Marcke, Kasteelstratt 7, B-9770, Kruisboutem, Belgium

Filed May 19, 1986, Ser. No. 864,537

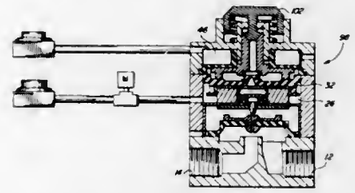
Int. Cl.[4] **F16K** *31/145, 31/08*

U.S. Cl. 137—1 **28 Claims**

9. A method for actuating a valve to regulate fluid flow between an inlet and an outlet by repositioning a magnet located in a first chamber between a first state and a second state to magnetically influence the state of a disc located in a second chamber and to reposition the disc between a first state and a second state to restrict and accommodate, respectively, fluid flow between the inlet and the outlet, said method comprising the steps of:

(a) mechanically relocating the magnet from its first state to its second state to relocate the disc from its first state to its second state;

(b) said step of relocating including the step of exerting the magnetic force of the magnet directly upon the disc to carry out said step of relocating;



(c) returning the magnet to its first state on completion of said step of relocating to withdraw the effective magnetic field of the magnet away from the disc to a degree sufficient to permit relocation of the disc to its first state;

(d) contracting the first chamber within the valve independent of carrying out said relocating step; and

(e) translating the contraction of the first chamber into repositioning of the magnet from its first state to its second state to urge relocation of the disc to its second state.

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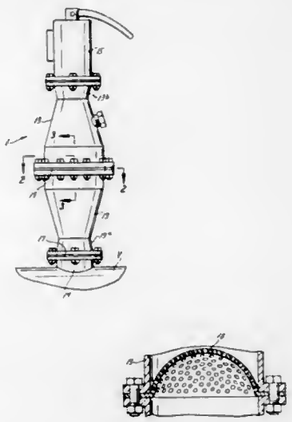
PRESSURE RELIEF DEVICE

Brian W. Buffham, Merseyside, England, and Daniel J. Marquardt, Waterloo, Ill., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Jan. 29, 1988, Ser. No. 150,341

Int. Cl.[4] **F16K** *17/14*

U.S. Cl. 137—71 **4 Claims**



1. A pressure release device for sealably mounting on a vessel adapted to contain a fluid under pressure not to exceed a predetermined maximum pressurization limit comprising:

(a) a pressure release conduit having an inlet and an outlet and providing an escape passage for the fluid to move from an outlet opening of the vessel through the inlet end of the conduit and out the outlet end of the conduit, said opening being generally circular;

(b) a recloseable self-activated fluid pressure release valve disposed in the outlet end of the conduit;

(c) a nonrecloseable disc having a portion rupturable into fragments when the pressurization limit is exceeded and being disposed within the conduit between the outlet opening of the vessel and the release valve;

(d) a flat porous member having a diameter larger than the diameter of said outlet opening of said vessel and disposed in the conduit between said nonrecloseable disc and said release valve, said flat porous disc having a total cross sectional open area at least about the sum of the cross sectional area of the rupturable portion of said nonrecloseable disc and the cross sectional area of the outlet opening, such that when the said disc ruptures in response to the pressurization limit being exceeded, fragments of the disc are restrained by said porous member from moving to the release valve, yet substantially clogging of said porous member is prevented such that said porous member maintains a cross sectional open area of at least about the cross sectional area of the outlet opening and the flow of the fluid through the conduit to the release valve is not substantially impeded; and

(e) said conduit being of generally circular cross section and having a relatively enlarged inside diameter about said porous member and relatively reduced diameter at each of said inlet end and said outlet end.

4,819,684

INJECTION SHUT-OFF VALVE

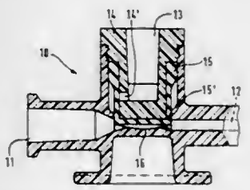
Paul Zangg, Lutzelfluh, and Werner Kiesinger, Winterthur, both of Switzerland, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Mar. 24, 1987, Ser. No. 29,749

Claims priority, application European Pat. Off., Apr. 11, 1986, 86105010.2

Int. Cl.[4] **A61M** *37/00*

U.S. Cl. 137—112 **7 Claims**



1. An injection shut off valve comprising:

a housing having a fluid inlet line, a fluid outlet line and an elongate orifice body having a bore adapted to receive an end of an injection syringe, the bore being substantially perpendicular to the inlet and outlet lines, and

a valve device located in the housing, the valve device comprising a cap-shape deformable diaphragm which includes at least one notch, the valve device being comprised of a portion of the housing, the orifice body located in the housing, and the diaphragm which is located between the orifice body and the inlet and outlet lines, the diaphragm being movable between a first non-injection state wherein the inlet and outlet lines are in fluid communication with each other and the bore is sealed from both the inlet and outlet lines, and a second injection state whereby the diaphragm is deformed, deformation of the diaphragm sealing and preventing fluid flow between the fluid inlet line on the one hand and the fluid outlet line and the bore on the other hand, deformation of the diaphragm permitting fluid flow communication between the bore and the fluid outlet line.

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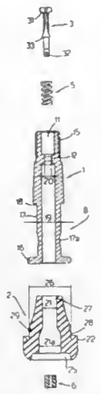
TUBELESS TIRE VALVE

Ezio Pagani, Bergamo, Italy, assignor to Bridge Products, Inc., Northbrook, Ill.

Division of Ser. No. 885,377, Jul. 14, 1986, Pat. No. 4,739,813, which is a continuation of Ser. No. 601,223, Apr. 17, 1984, abandoned. This application Apr. 21, 1988, Ser. No. 184,267

Int. Cl.[4] B60C *23/10*

U.S. Cl. 137—223 **4 Claims**



1. A tire valve comprising:

a one-piece, integral valve body having a central passageway formed therein, said passageway defining an upper region, a central region and a lower region, said central region being smaller in cross-sectional dimension than the upper and lower regions and bounded by an upwardly facing upper shoulder and a downwardly facing lower shoulder;

a one-piece, integral valve pin having a head sized to fit within the upper region, a first shank extending away from the head to an enlargement, and a second shank extending away from the enlargement, said first shank sized to slide in the central region, said enlargement having a maximum dimension larger than the central region to create an interference fit therewith, said maximum dimension selected such that the enlargement can be forced through the central region into the lower region of the central passageway; and

a resilient internal gasket mounted over the second shank and sized to bear against the lower shoulder to seal the central passageway, said internal gasket adapted to be mounted on the second shank in the lower region after the second shank has been passed through the central region.

4,819,686

PRESSURE DROP INDICATING VALVE CAP FOR PNEUMATIC TIRES

Rainer Achterholt, Paul-Zoll-Str. 3, D-8963 Waltenhofen 1, Fed. Rep. of Germany

Continuation of Ser. No. 945,566, Dec. 23, 1986, abandoned. This application Jul. 9, 1987, Ser. No. 71,581

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1985, 3546338

Int. Cl.[4] F16K *15/20, 37/00*

U.S. Cl. 137—229 **20 Claims**

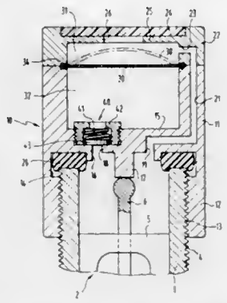
1. A pressure drop indicating valve cap for a pneumatic tire equipped with a valve having a valve tube, the valve cap comprising:

a housing including a wall, threaded means for mounting the housing to the valve tube, a closed end portion having a transparent section, and an open end portion, the housing wall and the closed end portion defining an interior of the housing;

a sealing element for sealing the valve tube to the open end portion of the housing;

an actuator for opening the tire valve;

a deflectable indicator diaphragm which separates the housing interior into a first chamber adjacent to the transparent section of the closed end portion of the housing and a second chamber adjacent to the housing wall, said first chamber being in flow connection with the tire valve via



at least one permanently open flow path recessed in the housing and said second chamber being in flow connection with the tire valve via a port in the housing wall; and

sealing means for hermetically sealing said port whereby with the initial tire pressure being permanently maintained in the second chamber, a reduction of the actual tire pressure relative to the initial tire pressure causes the diaphragm to deflect closer to the transparent housing portion and become visible through said transparent section of the closed end portion of the housing.

4,819,687

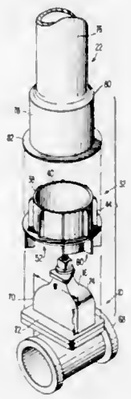
VALVE BOX STABILIZER

Joseph S. Alberico, 508 Peale St., Joliet, Ill. 60433; Carmine Corsetti, 3209 Jeffrey Dr., Joliet, and Flore Brandolino, 1713 Highland Ave., Crest Hill, both of Ill. 60435

Filed Nov. 30, 1987, Ser. No. 126,732

Int. Cl.[4] F16L *5/00*

U.S. Cl. 137—367 **15 Claims**



1. A valve box stabilizer for stabilizing a valve box covering an underground valve housing having a valve body and a valve neck extending vertically from said valve body, and wherein the valve box includes a tubular lower end for receiving the valve neck, said valve box stabilizer comprising,

a hollow body for receiving said valve neck and for being received within said valve box lower end,

said stabilizer having a wall portion with an inner surface for contact with at least a portion of said valve neck along a substantial vertical length of said valve neck,

said wall portion also having at least one rigid outer surface fitting within said valve box lower end and contacting a portion of said lower end along a substantial vertical length of said valve box lower end,

said outer surface extending radially outwardly from said inner surface a distance sufficient to contact said valve box along said substantial vertical length of said valve box lower end with at least two diametrically opposed points on a circumference of said outer surface contacting said valve box simultaneously.

4,819,688

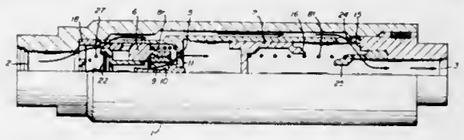
VOLUMETRIC, SELF-RESETTING, HYDRAULIC FUSE

Stanley R. Field, Garden Grove, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 147,272, Jan. 22, 1988, abandoned. This application Sep. 6, 1988, Ser. No. 240,621

Int. Cl.[4] F16K *17/26*

U.S. Cl. 137—493.6 **1 Claim**



1. A hydraulic fuse comprised of,

an encircling housing having a bore,

a tubular guide element mounted and axially aligned within said housing bore, said tubular guide element having outlet and inlet slots formed in its wall, such that fluid may travel into the interior of the tubular element, and thereafter outwardly through the outlet slot, located in an upstream portion of the guide element, to an annular-like region formed between the outer surface of the guide element and the inner surface of the housing bore, and then re-enter the interior of the tubular element through the inlet slot, located in a downstream portion of the guide element, and from said interior, pass through an exit port in the fuse, the fluid path so-formed being the primary fluid path;

a regulating piston, slidably supported for axial movement within an upstream portion of the guide element, and a timing piston, slidably supported for axial movement within a downstream portion of the guide element, the pistons being reciprocated within the guide element in one direction by fluid pressure and in the opposite direction by respective biasing springs;

a cylindrical pin axially mounted within an upstream portion of the guide element, at least a portion of the pin having a peripheral surface tapering slightly in the primary direction of fluid flow;

the regulating piston having: (i) a port formed within its wall, said port being at least partially matable with the outlet slot of the guide element; (ii) a shoulder at the upstream end thereof controlling the fluid flow to said primary fluid path; and (iii) a flange facing toward the tapered, peripheral surface of the pin, such that the peripheral pin surface confronts the innermost flange surface, whereby the taper of the pin causes an orifice to be created which increases in size as the regulating piston slides in the primary flow direction, the resulting orifice permitting fluid flow from the upstream portion of the guide element to act against the timing piston causing movement of the timing piston in the primary flow direction;

the timing piston having a poppet, at the downstream end thereof, such that travel of the timing piston downstream will control the fluid flow from the inlet slot of the guide element, by closing the primary flow path at the downstream limit of the timing piston.

4,819,689

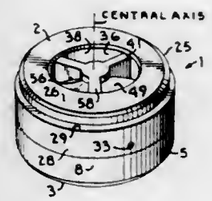
HEAD-GUIDED POPPET VALVE MEMBER AND VALVE ASSEMBLY

Herbert B. Owsley, and James S. Bunn, both of, Shawnee, Kans., assignors to Ball Valve Company, Olathe, Kans.

Filed Feb. 1, 1988, Ser. No. 151,223

Int. Cl.[4] F16K *15/02*

U.S. Cl. 137—512.1 **5 Claims**



1. A poppet valve assembly, which comprises:

(a) an inlet side;

(b) an outlet side;

(c) a cage including;

(1) an outer face at said valve assembly outlet side;

(2) an inner face;

(3) a peripheral surface;

(4) a spring boss having a cage spring bore open at said cage inner face and terminating at a blind end; and

(5) a plurality of cage fluid passages encircling said spring boss and each extending between said cage outer and inner faces;

(d) a seat including:

(1) an outer face at said valve assembly inlet side;

(2) an inner face positioned in opposed relation to said cage inner face; and

(3) a seat fluid passage including a seat mating portion adjacent said seat inner face and a guide portion adjacent said seat outer face;

(e) a poppet valve member including:

(1) an upstream end;

(2) a downstream end;

(3) a head with a substantially flat base at said valve member downstream end, a valve member mating portion with a beveled, frusto-conical configuration projecting inwardly and in an upstream direction from said base, and a convex center portion extending inwardly and in an upstream direction from said mating portion;

(4) a spring bore open at said valve member base and terminating at a blind end;

(5) a guide fin assembly including a coaxial guide fin boss with an upstream end projecting in an upstream direction from said head center portion and a plurality of guide fins extending radially outwardly from said guide fin boss, each said guide fin including an upstream edge at said valve member upstream end and a bearing edge extending in parallel, spaced relation to said guide fin boss, said guide fin upstream edges being substantially flush with said guide fin boss upstream end at said valve member upstream end; and

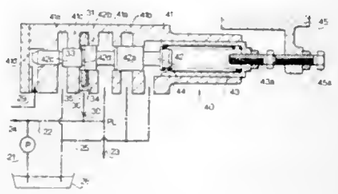
(6) said valve member being mounted between said cage and said seat and adapted for movement between a closed position with said valve member mating portion engaging said seat mating portion and an open position

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with said mating portions in spaced relation, said valve member being guided between its open and closed positions by said guide fin bearing edges slidably engaging said seat passage, said valve member being completely spaced upstream from said cage inner face; and

(f) a return spring including a downstream end received in said cage spring bore and an upstream end received in said seat spring bore, said return spring biasing said valve member towards its closed position.

4,819,690
PRESSURE CONTROL VALVE
Masahiko Takahashi, Kodaira, Japan, assignor to Fuji Jukogyo Kabnshiki Kaisha, Tokyo, Japan
Filed Dec. 10, 1987, Ser. No. 130,881
Claims priority, application Japan, Dec. 17, 1986, 61-300632
Int. Cl.[4] F16K *47/02*
U.S. Cl. 137—514 **13 Claims**



1. A pressure control valve comprising

a valve body having opposite land-engaging portions,

a spool having a first land and a second land spaced opposite each other, said spool is slidably mounted at the land-engaging portions in said valve body at the lands,

said valve body defining an annular chamber between the land-engaging portions and between the first and second lands of said spool, the annular chamber having a larger outer diameter than that of the first and second lands,

a passage formed in the valve body communicating with said annular chamber so as to apply oil pressure to said first and second lands, and

oil guide means secured in the passage for reducing the cross-sectional area of the passage to increase resistance of the passage so as to reduce noise.

4,819,691
VALVE DEVICE
Peter Löfgren, Hovas, and Nils I. Aarthun, Partille, both of Sweden, assignors to Steridose Systems AB, Akim, Sweden
Continuation of Ser. No. 921,238, Oct. 21, 1986, abandoned. This application Feb. 22, 1988, Ser. No. 161,378
Int. Cl.[4] F16K *7/12*
U.S. Cl. 137—556 **6 Claims**

1. A valve device for controlling flow of a fluid, comprising:

a valve housing, said valve housing having an inwardly extending circumferential rim;

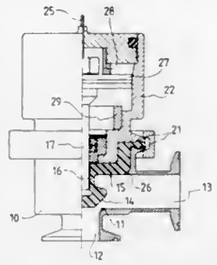
a valve body located within said housing for abutment against and displacement from a valve seat, said valve body including an integrally formed membrane of a resilient material;

a first portion of said membrane forming inner and outer concentric permanent seals spaced a predetermined distance apart and formed in cooperation with said valve housing, said first portion being substantially L-shaped with a vertical leg and a horizontally extending outer flange, said inner seal formed between said rim of said housing and said vertical leg and said outer seal formed between said housing and one end of said horizontally extending outer flange;

a second portion of said membrane acting as an adjustable flow-controlling seal which cooperates with said valve seat, said first and second portions and said housing being substantially smooth so as to not trap contaminants;

a third portion of said membrane defining a well in the side of said membrane that faces away from the fluid;

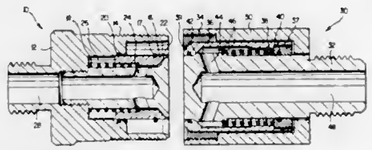
a manoeuvering pin which has an enlarged head gripped by



the bottom of the well of said third portion, the remainder of the well generating no friction with the manoeuvering pin;

wherein, when no membrane deforming forces are acting on said membrane, said membrane forms a flow opening between said valve seat and said valve body.

4,819,692
STRAIGHT CONNECTING HYDRAULIC QUICK COUPLER
Robn L. Olson, North Richland Hills, and Jose G. Caero, Fort Worth, both of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.
Filed Apr. 29, 1987, Ser. No. 49,395
Claims priority, application PCT Int'l Appl., Apr. 29, 1987, PCT/US87/00935
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.03 **2 Claims**



1. An hydraulic coupler for quick connection and disconnection, comprising

a female connector having a first axis, a first poppet seat, a first fluid port, and a first annular check valve, said first check valve slidably disposed within said female connector for translation along said first axis;

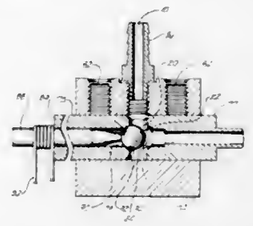
a first means for biasing said first check valve against said first poppet seat to close said first fluid port;

a male connector having a second axis, a second poppet seat, a second fluid port, and a second annular check valve, said second check valve slidably disposed around said male connector for translation along said second axis and having a means for forming a seal with said first check valve;

a second means for biasing said second check valve against said second poppet seat to close said second fluid port; and

an annular coupling nut slidably disposed around said second annular check valve for rotation about and translation along said second axis, said coupling nut adapted to align said axes, to engage said female connector, and to urge said second check valve into contact with said first check valve to form said seal, unseat said first and second check valves, and open said first and second fluid ports.

4,819,693
FAST OPERATING BISTABLE VALVE
Jerome A. Rodder, 775 Sunshine Dr., Los Altos, Calif. 94022
Continuation-in-part of Ser. No. 713,088, Mar. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 508,811, Jnn. 28, 1983, abandoned. This application Apr. 30, 1986, Ser. No. 859,140
Int. Cl.[4] F16K *31/06*
U.S. Cl. 137—625.4 **21 Claims**



1. A fast-operating, bistable valve comprising:

a body in which a chamber is formed, the chamber having first and second ends;

a spherical plug made of magnetic material disposed in the chamber;

a bore opening into the chamber at the first end, the bore having a circumferential edge that forms a first seating surface having a curvature that matches the curvature of the plug;

a tapered pole piece made of magnetic material disposed in the bore such that the end of the pole piece contacts the plug when the plug is seated on the first seating surface, leaving between the pole piece and the first seating surface an area of non contact with the plug;

a first port opening into the chamber at the second end in axial alignment with the bore to form a second seating surface having a curvature that matches the plug;

a second port opening into the chamber so as to communicate with the first port when the plug unseats from the second seating surface;

a source of electric current;

means responsive to the electric current for generating a magnetic field in the pole piece to attract the plug to the first end of the chamber and seat the plug on the first seating surface; and

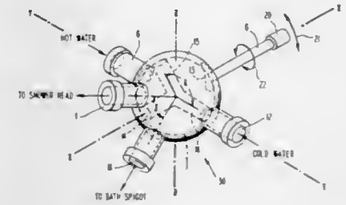
means in the absence of the magnetic field for seating the plug on the second seating surface at the second end of the chamber.

4,819,694
WATER CONTROL VALVE
Ying Z. Jiang, Beijing, China, assignor to Ling Nan Flexible & Shaft Factory of Guang zhou, Guangzhou, China
Filed Sep. 21, 1987, Ser. No. 98,812
Int. Cl.[4] F16K *11/087*
U.S. Cl. 137—625.47 **10 Claims**

1. A valve for controlling flow of water between hot and cold water supply pipes and first and second outlet pipes, comprising;

a valve body having a generally spheroidal cavity therein, having inlet ports for connection to said hot and cold water supply pipes and outlet ports for connection to said first and second outlet pipes further formed therein, the centerlines of said inlet ports being disposed at a first angle to one another, the centerlines of said outlet ports being disposed at a second angle to one another in a first plane, and said first plane making a third angle with respect to a second plane containing the centerlines of said inlet ports;

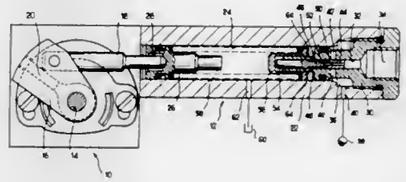
a spheroidal valve ball, said ball fitting within said cavity in said valve body and having first and second inlet passages formed therein, the centerlines of said inlet passages formed being in a plane including the centerlines of said inlet ports in said valve body, and at a fourth angle to one another different from the first angle between said inlet ports in said valve body, and joining one another substantially at a point located at the center of said ball, said ball further having an outlet passage formed therein, the centerline of said outlet passage lying in the first plane including the center lines of the outlet ports in said valve body, meeting those of said inlet passages at their junction, and extending therefrom to the surface of said ball; and



a control member connected to said ball and adapted to rotate said ball about first and second axes, whereby said inlet passages in said ball are controllably registrable with said inlet ports in said valve body, and said outlet passage in said ball is controllably registrable with said outlet ports in said valve body; and

wherein said outlet ports in said valve body are of equal or greater area than the outlet passage in said ball.

4,819,695
PRESSURE SERVO REGULATOR
Gilbert Kervagoret, Argenteuil, France, assignor to Bendix France, Drancy, France
Continuation of Ser. No. 64,920, Jun. 19, 1987, abandoned. This application May 18, 1988, Ser. No. 196,710
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **3 Claims**



1. A hydraulic pressure servo-regulator, intended to supply a hydraulic fluid at a pressure corresponding to the magnitude of a given electrical signal, the servo-regulator comprising valve means which includes a first bore provided longitudinally and connected with a low pressure fluid reservoir, a closure member closing said first bore and having a second bore coaxial with said first bore and connected with a fluid pressure outlet, said closure member being provided with at least one lateral opening communicating with said first bore and with at least one lateral opening communicating with a high pressure fluid source, piston means mounted slidably inside said first bore, a spool valve mounted slidably in said second bore and having a recessed annular portion defining, with said second bore, an annular space which communicates with said fluid pressure outlet, the length of said annular portion being less than the distance between said lateral openings provided in said closure member in order that the annular space may communicate selectively with one of the lateral

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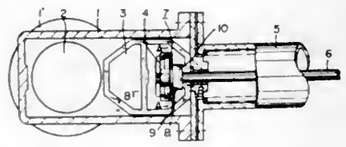
opening communicating with said first bore and the lateral opening communicating with said high pressure fluid source, and a spring connecting said piston means to said spool valve, and an electromechanical device comprising a geared motor having a shaft to which is fixed a lever on which is pivotably mounted a push-rod for displacing said piston means into said first bore.

4,819,696

SLIDE TYPE EXHAUST BRAKE SYSTEM

Kazunori Takikawa, Numazu, and Ryoichi Suzuki, Mishima, both of Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Sunto, Japan

Filed Jan. 22, 1988, Ser. No. 146,841
Int. Cl.[4] F16K *3/02*
U.S. Cl. 137—630.12 **2 Claims**



1. In an exhaust brake system, in which a plate valve member having an exhaust pressure regulating port extending through its surface is fitted in an exhaust brake body housing having a valve member reciprocation passage extending generally at a right angle from and communicating with an exhaust flow passage having exhaust pipe joint walls projecting at its two side end portions, and in which a pressure regulating valve is so fastened to the leading end of a piston rod of an air cylinder mechanism extending from an end portion of said reciprocation passage as to engage with said plate valve member so that movement of said piston rod out of said air cylinder effects closure of said exhaust flow passage by said plate valve member, and further effects closure of said exhaust pressure regulating port by said pressure regulating valve, and with said plate valve member being pushed by the leading end portion of said piston rod, whereas, movement of said piston rod into said air cylinder effects opening of said exhaust pressure regulating port by said pressure regulating valve and moves said pressure regulating valve into engagement with said plate valve member to pull the plate valve member out of the exhaust flow passage,

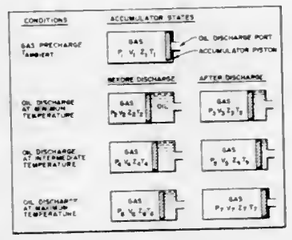
a slide type exhaust brake system wherein said pressure regulating valve includes: a pressure regulating valve seal carrier having a generally C-shaped section and attached to the piston rod; a block member mounted to said piston rod intermediate said carrier and said air cylinder, said block being engageable with said plate valve member to move said plate valve member out of said exhaust flow passage upon movement of said piston rod into said cylinder; and a pressure regulating valve seal of generally C-shape and having a sealing portion for sealing said exhaust pressure regulating port in said plate valve member and a pair of walls extending in a common direction from opposed ends of said sealing portion, said pair of walls being fitted in said seal carrier for slidable movement relative to said seal carrier parallel to said exhaust flow passage, such that upon movement of said piston rod, said C-shaped pressure regulating valve seal carrier exerts equal forces on said walls of said pressure regulating valve seal to move said pressure regulating valve seal without tilting.

4,819,697

HELIUM CHARGED HYDRAULIC ACCUMULATORS

James Randa, Columbus, and John L. Ucker, Gahanna, both of Ohio, assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 766,223, Aug. 16, 1985, abandoned. This application Jul. 28, 1987, Ser. No. 7,546
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 **4 Claims**



1. An accumulator for use in high pressure hydraulic fluid systems, comprising:

a housing;

a chamber within said housing, said chamber sealingly containing a gas under pressure, said gas being helium, said gas under pressure in excess of approximately 3000 psi throughout an entire operative range of operating temperatures and pressures, the size of said chamber being substantially in accord with the equation:

$$V_a = V_0\left[1 + \frac{\left(\frac{P_2}{P_6}\right)\left(\frac{Z_6}{Z_2}\right)\left(\frac{T_6}{T_2}\right)}{\left(\frac{P_2}{P_3}\right)\left(\frac{Z_3}{Z_2}\right)\left(\frac{T_3}{T_2}\right) - 1}\right]$$

where

V_a = accumulator volume = oil (hydraulic fluid) volume plus gas volume in the accumulator,

V_0 = hydraulic oil (fluid) required to power a given device,

T_2 = lowest accumulator gas temperature before oil discharge,

P_2 = accumulator gas pressure at T_2,

Z_2 = Compressibility factor, a function of T_2 and P_2,

T_3 = accumulator gas temperature after oil discharge,

P_3 = accumulator gas pressure at T_3,

Z_3 = compressibility factor, a function of T_3 and P_3,

T_6 = highest accumulator gas temperature before oil discharge,

P_6 = accumulator gas pressure at T_6,

Z_6 = compressibility factor, a function of T_6 and P_6;

metal bellows mounted in said chamber for allowing expansion of said gas in said chamber in order to transmit the force of said gas under pressure to the hydraulic fluid to displace a desired volume of hydraulic fluid in the system from said housing, throughout the range of operating temperatures and pressures.

4,819,698

WATER HAMMER ARRESTER

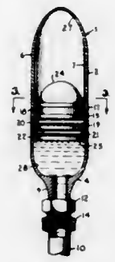
Joseph P. Ismert, Peculiar, Mo., assignor to Sioux Chief Manufacturing Company, Inc., Peculiar, Mo.

Filed Oct. 26, 1987, Ser. No. 113,631
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—31 **1 Claim**

1. A water hammer arrester comprising:

(a) an elongate one piece cylindrical chamber having an upper spun closed conical end and a lower end spun to a neck of reduced diameter, said neck including means for connection to a water pipe;

(b) a lightweight, domed piston matching said upper end and of water and gas impervious synthetic resinous material emplaced in said chamber and moveable up and down therein in response to water pressure, said piston dividing said chamber into a sealed upper chamber portion and a lower chamber portion communicating with said water pipe;



(c) said upper chamber portion having a super atmospheric charge of gas;

(d) said piston having upper, middle and lower annular grooves therearound; and

(e) O-ring seals of lesser thickness than said grooves and mounted in said grooves and maintaining substantially leak free separation of said upper and lower chamber portions, said O-ring seals tending to provide a rolling action upon initial movement of said piston.

4,819,699

CARTRIDGE FEED SYSTEM FOR AUTOMATIC PCB LOADING MACHINE

Robert N. Brown, Los Gatos, and James J. Farquhar, San Jose, both of Calif., assignors to Alliance Automation Systems, Inc., Rochester, N.Y.

Filed Feb. 24, 1987, Ser. No. 17,370
Int. Cl.[4] H05K *3/30;* **B21F** *1/00*
U.S. Cl. 140—105 **7 Claims**

1. A part feeder (**29**) for moving individual parts (**34,100**) from a roll (**21**) containing a plurality of parts (**34,100**) formed of a component plus leads (**35,36,100***a*) and joined by at least one tape (**37,101**) said parts (**34,100**) secured to said at least one tape (**37,101**) at a spaced distance therebetween, said parts (**34,100**) positioned by said part feeder (**29**) to be picked up and thereafter moved to a work station for insertion of a portion (**35,36,100***a*) of the part (**34,100**) into a receiving opening (**27**) in a workpiece (**26**), said part feeder (**29**) comprising:

a table (**32**) adapted to support at least one part feeder (**29**),

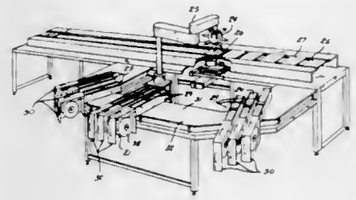
a cassette (**30**) adapted to be detachably secured to said table (**32**) including a housing portion (**30***a*) and a single reel (**38**) received in said housing portion (**30***a*), means rotatably holding the reel to allow a tape roll (**21**) placed on the reel (**38**) to unroll and present the parts (**34,100**) in single file order;

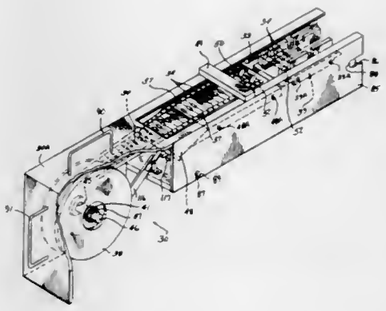
said cassette (**30**) further including walls (**85**) extending away from said housing portion (**30***a*);

guide means (**48,33,104**) affixed to said cassette walls (**85**) comprising means for prepositioning the at least one tape (**37**) and attached parts (**34,100**) unwound from said roll (**21**);

a dressing assembly (**43,107**) separate from said cassette including a frame (**83**) fixed to said table (**32**), and readily releasable securement means (**85,86,88,89**) for readily releasably securing said cassette (**30**) with respect tos aid frame (**83**);

said dressing assembly (**43,107**) including parts advancing means (**51,52,54,70,109,110,112**) at least partially enclosed by said cassette walls to align said guide means (**48,33,104**) with said parts advancing means so as to capture parts (**34,100**) prepositioned by said guide means (**48,33,104**)





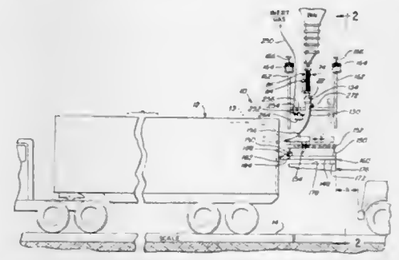
with said parts advancing means and advance said parts (**34,100**) one at a time from said guide means, and dressing said part leads (**35,36,100***a*) by straightening and aligning the part leads (**35,36,100***a*) preparatory to pickup.

4,819,700

SYSTEM FOR LOADING BULK CONTAINERS WITH FLUENT MATERIAL FROM OVERHEAD STORAGE BIN

Tracy W. Sommer; Charles D. Hill; Dean P. Muka, and Ryland S. Beecham, all of Mt. Pleasant, S.C., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 3, 1987, Ser. No. 33,671
Int. Cl.[4] B65D *25/16;* **B65B** *3/28*
U.S. Cl. 141—1 **25 Claims**



1. A system for bulk loading a container through an opening therein with fluent material, including flowable communicated solids and the like, from a storage bin above the container, said system comprising:

(a) a discharge conduit having an inlet end and an outlet end, said inlet end of said discharge conduit being connected to

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said storage bin and said outlet end of said discharge conduit being movable at least vertically;

(b) an exhaust conduit having an inlet end and an outlet end and being adjacent said discharge conduit and associated dust collection means for effecting flow of dust through said exhaust conduit, said outlet end of said exhaust conduit being connected to said dust collection means and said inlet end of said exhaust conduit being movable at least vertically;

(c) a discharge spout having an inlet for being releasably connected to said discharge conduit outlet and having an outlet for communicating with said container opening;

(d) gas injection means for injecting gas into said discharge spout;

(e) an exhaust spout having an outlet for being releasably connected to said exhaust conduit inlet and having an inlet for communicating with said container opening; and

(f) support means for supporting said discharge and exhaust spouts for movement together between (1) a loading position wherein said spouts communicate with said container opening and can be connected with said conduits and (2) a retracted position wherein said spouts are spaced away from said container opening and said conduits to accommodate the movement of said container therepast.

17. A process for bulk loading a flexible, collapsed container through an opening therein with particulate material from a storage bin above the container, said process comprising:

(a) positioning said container on a scale in a loading station below said bin;

(b) inflating said flexible container with gas;

(c) measuring the weight of said container on said scale prior to effecting the following step (d);

(d) discharging said material from said bin into said container;

(e) exhausting said container interior ambient atmosphere during step (d);

(f) monitoring the weight of said container on said scale during step (d);

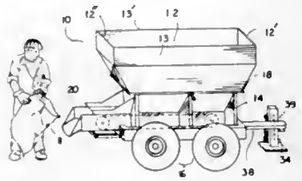
(g) terminating steps (d) and (e) when the monitored weight reaches a predetermined value in excess of the weight measured in step (c).

4,819,701

PORTABLE PARTICULATE MATERIAL BAGGING MACHINE

C. J. Thornton, 4452 Rogers Ln., Clarmore, Okla. 74017

Filed Nov. 20, 1987, Ser. No. 123,541
Int. Cl.[4] B65B *1/00*
U.S. Cl. 141—231 **7 Claims**



1. A portable particulate material bagging machine mounted on a wheeled carriage, comprising:

a hopper superstructure being deployed over the wheeled carriage, said hopper superstructure having vertically inclined front walls, back walls and side walls extending downwardly to a hopper floor, said hopper floor including a lever actuated chute;

a chain conveyor; means for actuating said chain conveyor deployed under said lever actuated chute, siad chain conveyor extending longitudinally from said front wall to said back walls, said conveyor extending substantially between said walls, and having a bagger filling chute depending rearwardly therefrom; and

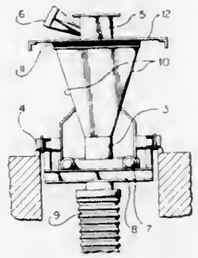
said chain conveyor elevated within a range of two feet to four and one-half feet above road level whereby said lever actuated chute deposits particulate matter onto said chain conveyor and said chain conveyor moves said particulate material to said bagger filling chute whereby an operator deploys a bag thereunder for filling.

4,819,702

APPARATUS FOR CHARGING A FILLER CONNECTION

Ruland Gerlach, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,171
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 8621956[U]
Int. Cl.[4] B67C *3/34*
U.S. Cl. 141—232 **2 Claims**



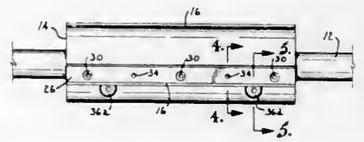
1. A powder gravity filing device for connecting a stationary tubular connector to an upwardly extending opening of a tank mounted on a vehicle, comprising a stationary vertically disposed tubular member, said vertically disposed tubular member terminating in a downwardly facing opening, a horizontally disposed planar member mounted about the opening of said vertically disposed tubular member and substantially flush therewith, said planar member having a downwardingly facing underside, said opening extending downwardly through said horizontally disposed planar member, a vertically extending elongated funnel member mounted on a movable first carriage below said horizontally disposed planar member, said funnel member having an upwardly facing rim vertically displaced from the undersided of said horizontally disposed planar member, a flexible wiping seal, said seal being mounted on said rim of said funnel and dimensioned in an upward vertical direction whereby it is in wiping abutment with the underside of said horizontally disposed planar member, said movable carriage being mounted on a first set of wheels, said first set of wheels being disposed on a second carriage whereby said first carriage may be reciprocatingly moved in one direction, said second carriage being mounted on a second set of wheels, said second set of wheels being disposed on a stationary horizontal surface whereby said second carriage for reciprocatingly may be moved in a direction transverse to the movement of said first carriage, said funnel terminating downwardly in a flexible conduit whereby to transport therethrough downwardly the powder into the said opening of said tank.

4,819,703

BLADE MOUNT FOR PLANAR HEAD

Verle L. Rice, Harrisonville, and Richard A. Keener, Garden City, both of Mo., assignors to Verle L. Rice, Harrisonville, Mo.

Filed May 23, 1988, Ser. No. 197,668
Int. Cl.[4] B27G *13/00*
U.S. Cl. 144—230 **2 Claims**



1. A planing head comprising:

a shaft adapted to be coupled with a prime mover;

a cylinder rigid with said shaft and having a slot in its surface extending parallel to the axis of the cylinder,

said slot having a flat bottom and first and second sidewalls extending upwardly from said bottom, said sidewalls being closer together at said bottom than at the cylinder surface, a plurality of threaded openings being present in said bottom;

blade means disposed in said slot along said first sidewall and having a cutting edge projectig from said cylinder; and

gib means having a configuration generally corresponding to the configuration of said slot and provided with a plurality of openings and screws therein aligned with the threaded openings in said slot bottom,

whereby when said gib means is placed in said slot along with said blade and said screws are tightened, said blade is firmly held in said slot,

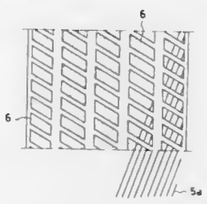
said gib means further including a plurality of threaded through openings spaced from said first mentioned openings whereby when screws are threaded through said second mentioned openings they engage the bottom of said slot and said gib means is forced upwardly.

4,819,704

RADIAL TIRE HAVING REDUCED PLY STEER

Makoto Misawa; Shinji Kawakami, and Ryoji Hanada, all of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 62,981
Claims priority, application Japan, Jul. 4, 1986, 61-156129
Int. Cl.[4] B60C *9/18, 11/11*
U.S. Cl. 152—209 R **4 Claims**



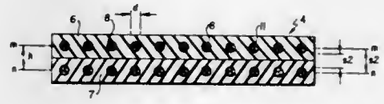
1. A radial tire having at least two belt layers of which the cords cross each other and a tread pattern formed by a plurality of blocks on the tread area with each block having a shear rigidity and each block being formed between circumferential grooves and lateral grooves, wherein (1) certain ones of said plurality of blocks having an axis oriented at an angle θ of the direction in which the maximum shear rigidity is attained relative to the circumferential direction of the tire in the range of $40° \leqq \theta \leqq 75°$, (2) the direction in which the maximum shear rigidity of said certain ones of said blocks is attained and the direction of the cords of the outermost belt layer are opposite to each other with respect to the circumferential direction of the tire, (3) the ratio of the maximum shear rigidity of said certain ones of said blocks to the minimum shear rigidity of said certain ones of said blocks is in the range 1.4 to 1.8, and (4) the total surface area of said certain ones of said blocks is 65% or more of the total surface area of said plurality of blocks.

4,819,705

VEHICLE TIRES WITH LOW ABSORPTION OF HORSE-POWER

Renato Caretta, Gallarate, Italy, assignor to Industrie Pirelli S.p.A., Italy

Continuation of Ser. No. 368,570, Apr. 15, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 555,447
Claims priority, application Italy, Apr. 16, 1981, 21212 A/81
Int. Cl.[4] B60C *09/18*
U.S. Cl. 152—527 **7 Claims**



1. A tire for a vehicle wheel with a carcass comprising radial cords, two sidewalls spaced apart a maximum distance, which, in the axial sense, determines the width of the tire section, two bead-heels each one of which comprises at least one bead-core around which are turned-up, from the inside towards the outside, the ends of the cords of the carcass, a tread-band disposed on the crown of the carcass, and an annular reinforcing structure that is circumferentially inextensible, interposed between said tread-band and said carcass, said annular reinforcing structure having a width that is substantially equal to that of said tread-band and comprising two radially overlapped layers of rubberized fabric reinforced with metallic cords, said metallic cords being parallel to each other in each layer and crossed with the cords of the facing layer and inclined at an angle of between 5° and 30° with respect to the equatorial plane of the tire, the reciprocal distance between the centers of two facing cords, on the plane of a cross-section of the tire, being not larger than 1 mm throughout the entire width of said annular reinforcing structure, said tire being characterized by the fact that said metallic cords are twisted strands made from at least three individual wires with a diameter of 0.12 to 0.25 mm, the diameters of said metallic cords being not larger than 0.603 mm, and being distributed in each layer with a density greater than 60 cords per decimeter.

4,819,706

TRAVEL LOCK FOR RETRACTABLE AWNING

Antony W. Quinn, Westminster, Colo., assignor to Carefree/-Scott Fetzer Company, Broomfield, Colo.

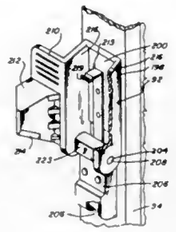
Filed May 11, 1987, Ser. No. 48,228
Int. Cl.[4] E04F *10/06*
U.S. Cl. 160—67 **11 Claims**

1. In a retractable awning mounted on a substantially vertical surface, said awning having a roll bar about which a canopy can be rolled, a pair of channel-shaped support arms having a longitudinal groove formed therein and with one end of the support arms operatively connected to an associated end of the roll bar and another end for contacting a supporting surface, and a pair of rafter arms having one end operatively secured to said substantially vertical surface and the other end operatively securable to an associated one of said support arms whereby each of said rafter arms can be longitudinally re-

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ceived in the groove of the associated support arm, the improvement comprising,

a lock arm mounted on at least one of said support arms and moveable between a first position overlying at least a portion of said groove to selectively retain the associated rafter arm in the groove and a second position which is



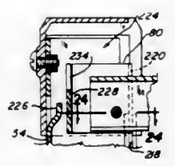
unobstructive of the groove, said lock arm having a cam surface means for partially overlying the groove in said first position and for interacting with an associated rafter arm in moving the lock arm toward its second position upon movement of a rafter arm into said groove when the lock arm is in the first position.

4,819,707

SLIDE LATCH SYSTEM FOR RETRACTABLE AWNING

Carl C. Watson, Broomfield, and Antony W. Quinn, Westminster, both of Colo., assignors to Carefree/Scott Fetzer Company, Broomfield, Colo.

Filed May 11, 1987, Ser. No. 48,413
Int. Cl.[4] E04F *10/06*
U.S. Cl. 160—67 **6 Claims**



1. In a retractable awning mounted on a substantially vertical surface for movement between an extended and a retracted position, said awning having a roll bar about which a canopy can be rolled, a pair of channel-shaped support arms having a longitudinal groove formed therein and with one end of the support arms operatively connected to an associated end of the roll bar and another end for contacting a supporting surface, and a pair of rafter arms having one end operatively secured to said substantially vertical surface and the other end operatively securable to an associated one of said support arms by a slide member attached to said rafter arm, said support arms each having confronting grooves extending longitudinally thereof and said slide member including a pair of flanges slideably received in the confronting grooves so as to be said longitudinal groove of the associated support arm, wherein the improvement comprises:

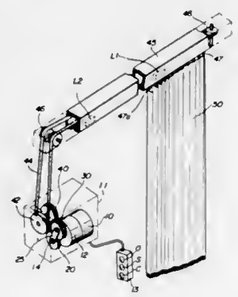
a latch system means on said support arms for releasably retaining the slide member of the associated rafter arm at a preselected location on said support arm to retain the awning in the extended condition, said slide member being confined within said groove for sliding movement therein and the latch system means includes a pocket and a retaining means for cooperating with the slide member in releasably retaining the slide member in the pocket, said pocket being disposed in the associated support arm at a distal end thereof, said pocket is defined by a discontinuance of said confronting grooves whereby when the slide member is positioned in said pocket the flanges are removed from the confronting grooves to assist in releasably retaining the slide member in the pocket.

4,819,708

MANUALLY OPERABLE ELECTRIC CURTAIN

Hiroshi Onosato; Hiroshi Horikoshi, and Masahiro Hirahara, all of Tokyo, Japan, assignors to Toso Kabushiki Kaisha (Toso Company Limited), Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,575
Claims priority, application Japan, Mar. 17, 1987, 62-060010
Int. Cl.[4] A47H *5/00*
U.S. Cl. 160—331 **3 Claims**



1. A manually operable electric curtain provided with a curtain rail, a multiplicity of runners movably mounted in said rail, a curtain cloth suspended by said runners, a cord pulley provided on one end or in the vicinity of said curtain rail, a tension pulley provided on the other end or in the vicinity of said curtain rail, a cord looped between said cord pulley and said tension pulley to move along said curtain rail and attached to one of said runners, an electric motor adapted to rotate said cord pulley, open, close and stop switches, a main motor-driving circuit for supplying an electric current to rotate said motor in either direction when said open or close switch is activated and interrupting the current when said stop switch is activated,

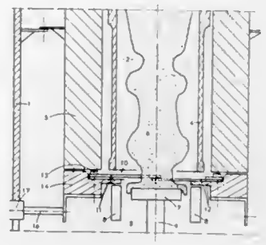
said curtain comprising a sun gear fixed to the output axis of said motor, an arm rotatably mounted on the output axis of said motor, a planet gear rotatably mounted on said arm to engage said sun gear, a driven gear integrally fixed to said cord pulley and selectively engageable with said planet gear, said arm being arranged to have a less rotational resistance than that of said planet gear, said planet gear being engaged with one side of said driven gear when said open switch is activated and with the other side of said driven gear when said close switch is activated, a pulse-generating circuit for transmitting pulses for a predetermined short time as a result of said stop switch being activated, and an auxiliary motor-driving circuit for supplying an inverse electric current to the current supplied by said main motor-driving circuit while said auxiliary motor-driving circuit is receiving the pulses from said pulse-generating circuit, whereby, when said stop switch is activated, said planet gear disengages from said driven gear and allows said curtain cloth to be easily drawn by hand without receiving the rotational resistance of said motor.

4,819,709

HEAT SHIELD FOR A CASTING FURNACE

Bernard L. Lallement, Levallois-Perret, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Paris, France

Filed Apr. 18, 1988, Ser. No. 182,414
Claims priority, application France, Apr. 23, 1987, 87 05713
Int. Cl.[4] B22D *27/04*
U.S. Cl. 164—154 **6 Claims**



1. In a furnace for casting metal, in particular superalloy cast parts having oriented structures, having a heating zone accommodating a mold for heating metal in a mold, a cooling zone for solidifying the metal in the mold and means to move the mold between the heating and cooling zones along a path of travel, the improvement comprising:

(a) a heat shield separating the heating and cooling zones having at least two laterally disposed heat shield elements; and

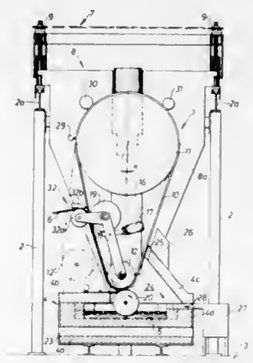
(b) actuating means to move the elements of the heat shield generally perpendicularly to the path of travel of the mold.

4,819,710

ARRANGEMENT FOR CONTINUOUS CASTING A VERY THIN METAL FILM

Rolf Ignell, Chemin de Mourex, France, assignor to Roby Teknik AB, Lund, Sweden

Filed Sep. 18, 1987, Ser. No. 98,236
Claims priority, application Sweden, Oct. 7, 1986, 8604250
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—423 **8 Claims**



1. An arrangement for the manufacture of a thin, in particular very thin, film (6) from a molten metal or metallic alloy in a bath (5), the arrangement comprising:

a holder arrangement (8) located above the bath (5), the holder arrangement (8) adapted to be raised and lowered;

an upper rotating roll (11) and a lower rotating roll (12) supported by the holder arrangement (8);

a driven endless band (10) connecting the rotating rolls (11, 12), the band (10) serving as a movable, cooled support; and

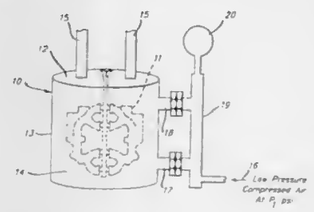
a third rotating roll (20) supported by the holder arrangement (8), the third roll (20) arranged partially immersed in the molten metal or metallic alloy in the bath (5) and closely adjoining the endless band (10), below the lower rotating roll (20), wherein the third roll (20) makes possible a transfer of the metal or metallic alloy from the bath (5) to the endless band (10) for cooling, so as to form the thin film (6).

4,819,711

COMPACTABILITY AND PERMEABILITY CONTROL FOR FABRICATING ECP MOLD

Richard Chancellor, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1988, Ser. No. 251,275
Int. Cl.[4] B22D *46/00*
U.S. Cl. 164—456 **11 Claims**



10. A method to control fabrication of an ECP mold comprising:

(a) suspending a polystyrene foam cluster of patterns within the interior of a flask with internal voids of such patterns having their entrances directed between zero and 90° of a horizontal;

(b) introducing sand into said flask about said suspended cluster while changing the density of said sand mass through mechanical means;

(c) vibrating said flask to compact and densify said free-flowing sand body around the suspended foam pattern;

(d) passing a gas through said sand body at a constant source pressure and measuring the back pressure of said gas at a plurality of stations along the height of said sand supply, the difference between said measured pressure and the source pressure rendering an indicator of the degree of compactness of said sand body; and

(e) ceasing vibration when said back pressure reaches a certain level and noting the period it took for vibration to achieve such permeability.

4,819,712

METHOD AND APPARATUS FOR CONTINUOUS CASTING OF MOLTEN METAL

Edwin S. Bartlett, Worthington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 101,525, Sep. 28, 1987, Pat. No. 4,749,024. This application Mar. 9, 1988, Ser. No. 165,931
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—463 **19 Claims**

1. Apparatus for direct casting of controlled thickness sheet from the melt on a chilled casting surface of the type comprising,

a molten-metal-containing tundish including a backwall,

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opposed sidewalls and a floor therebetween and having the sidewalls and floor closely adjacent and contoured with the chilled casting surface such that a layer of molten metal is delivered over a lip on the tundish to the casting surface during casting,

the lip being a portion of the floor adjacent the casting wheel and said lip including an offset away from the casting surface, thus allowing a longer solidification distance of the melt with the casting surface and a consequent thicker sheet in the vicinity of the offset,

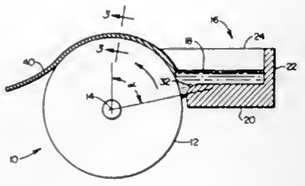
said lip offset being in the form of a continuously sloping convex surface inclined downwardly from the horizontal,

whereas the angle formed between a horizontal line and a line tangent to the lip means at the point where the molten metal separates from the lip means is in the range of about 20° to about 70°, and

said lip means being configured to deliver said molten metal by gravity during continuous casting and with a change in flow direction of the molten metal from the point where the molten metal leaves the surface of the means forming the lip to the point said molten metal contacts the casting surface of in excess of about 55°.

5. A method for providing a desired thickness contour across the width of a metal sheet which is cast on a chilled casting surface directly from the melt comprising,

providing a tundish containing a pool of molten metal and



including a backwall, opposed sidewalls, and a floor therebetween wherein the floor and sidewalls are closely adjacent and contoured with the chilled casting surface such that the casting surface forms a barrier contacting the molten metal pool,

removing a portion of the floor adjacent the casting surface including a portion of an upper surface of the floor to form a lip having a downwardly sloping surface in the tundish, said sloping surface being adjacent the casting surface, thus allowing greater depth of contact of the melt with the casting surface to control the sheet thickness profile across its width,

moving the casting surface through the melt pool thereby building a solidified layer of metal with the desired thickness contour of the casting surface,

adjusting the tundish with respect to the casting surface whereby the angle between a vertical plane through the center of rotation of the casting surface and another plane through the center and the point of separation of molten metal from the lip is in the range of about 30° to about 60°, and

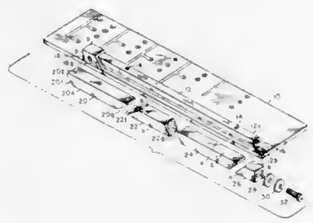
said lip means being configured to deliver said molten metal by gravity during continuous casting and with a change in flow direction of the molten metal from the point where the molten metal leaves the surface of the means forming the lip to the point said molten metal contacts the casting surface of in excess of about 55°.

4,819,713

RETAINER FOR ELECTRONIC MODULES

Arnold M. Weisman, Glendora, Calif., assignor to Calmark Corporation, San Gabriel, Calif.

Filed Apr. 23, 1987, Ser. No. 42,461
Int. Cl.⁴ F28F *7/00*
U.S. Cl. 165—1 **21 Claims**



1. A retainer for retaining an electronic module in a holder, comprising:

a rail;

a wedge component configured to be slidingly received by the rail, the rail and wedge component being configured such that said wedge component is substantially prevented from rotating about said rail, said wedge component including a side surface portion that fits about an outer surface of the rail; and

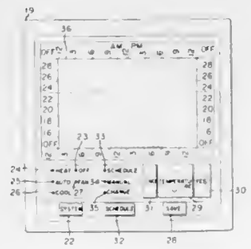
first and second stops provided at each end of the rail to retain the wedge component onto the rail.

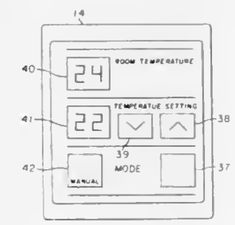
4,819,714

AIR CONDITIONING APPARATUS

Nobuo Otsuka, Kamakura, Japan; Peter F. Thompson, Cypress, Calif., and Seiji Wada, Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,283
Claims priority, application Japan, Sep. 22, 1986, 61-224373
Int. Cl.⁴ G05D *23/00;* **F24F** *3/044;* **F25B** *29/00*
U.S. Cl. 165—12 **21 Claims**





1. An air-conditioning apparatus comprising:

means for producing temperature controlled air including a heat source device and a heat exchanger device connected to said heat source;

means for delivering said temperature controlled air to each one of a plurality of rooms said means including an air-blower placed in the vicinity of said heat exchanger and an air-duct system containing said heat exchanger and said air blower wherein said air-duct system distributes said air from said heat exchanger to said plurality of rooms;

a plurality of air quantity adjusting dampers each of which is associated with a respective one of said rooms in order to regulate the air quantity fed to each of said rooms;

a controlling apparatus for controlling said dampers, said heat source device and said air-blower;

a main controller connected to said controlling apparatus wherein said main controller is provided with a room temperature detector; and

a room controller provided in each of said rooms including a room temperature detector which is connected to said controlling apparatus, wherein;

said main controller is further provided with an operation mode changing means, a temperature schedule inputting means for determining a temperature schedule for each of said rooms at all times, an interactive input means for determining initial data, a first display means having a first portion for displaying questions on the operations of said interactive input means and a temperature schedule by said temperature schedule inputting means, said main controller further including a schedule selecting means for determining whether or not the room in which said main controller is installed is to be subjected to scheduled air-conditioning;

and wherein said room controller is further provided with a mode selecting means for determining whether or not the room in which said room controller is installed is to be subjected to scheduled air-conditioning, said room controller further including a room temperature setting means for determining an established room temperature when said room is not in the scheduled air-conditioning and a second display means for displaying a temperature of said room.

4,819,715

AUTOMATIC AIR CONDITIONING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Shinma Kobayashi, Hiratsuka, Japan, assignor to Nissan Shatai Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 603,841, Apr. 25, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 891,430
Claims priority, application Japan, Sep. 14, 1983, 58-169733
Int. Cl.⁴ G05D *23/00;* **F25B** *29/00*
U.S. Cl. 165—16 **3 Claims**

1. An automatic air conditioning system for an automotive vehicle comprising:

an air induction system including a cool air source and a hot air source;

a first air mix chamber connecting said induction system and a first lower air outlet;

a second air mix chamber connecting said induction system and a second upper air outlet;

a first means for controlling the proportions of cool air and hot air delivered by said induction system to said first and second air mix chambers;

a passage connecting the outlet of said hot air source to said first and second air mix chambers, said passage including a first end opening to said first air mix chamber and a second end opening to said second air mix chamber;

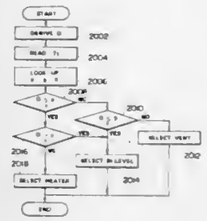
first and second shutter doors respectively adapted to open and close said first and second air outlets, each of said first and second shutter doors being movable between a first position in which it closes the corresponding one of said first and second air outlets and a second position in which it opens the corresponding air outlet;

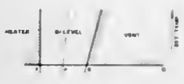
a temperature selecting means for designating a desired room temperature to which the passenger compartment air temperature is to be adjusted;

a second means for detecting at least one preselected external condition and deriving the heat value required to adjust the room temperature to said designated desired room temperature;

an air flow control means for controlling a flow rate of cool air and hot air to said first and second chambers on the basis of said heat value; and

a mode selector means, responsive to said second means, for deriving a control signal to operate said first and second shutter doors to corresponding ones of said first and second positions in accordance with the derived heat value, said mode selector means comparing said heat value with a first heating/cooling selector criterion which is a criterion for determining a heating condition requiring addition of heat to the room air and a cooling condition requiring removal of heat from the room air, a second cooler





mode selecting criterion so as to operate said first shutter door to said first position and said second shutter door to said second position when said heat value is greater than said first heating/cooling selector criterion and is greater than said second cooler mode selecting criterion, with a third heater mode selecting criterion so as to operate said first shutter door to said second position and said second shutter door to said first position when said heat value is smaller than said first heating/cooling selector criterion and is smaller than said third heater mode selecting criterion, and said mode selector means operating said first and second shutter doors to said second position when said heat value is greater than said third criterion and is smaller than said second criterion, and said mode selector means varying the heat value difference between said second cooler mode selecting criterion and said third heater mode selecting criterion depending upon said designated desired room temperature.

4,819,716

ADVANCED ZONE DAMPER SYSTEM

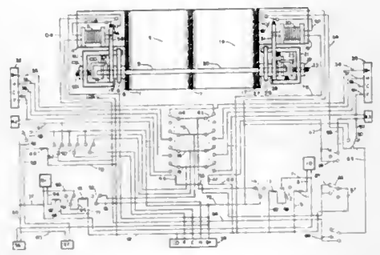
Stephen A. Beachboard, P.O. Box 616448, Orlando, Fla. 32861-6448

Continuation-in-part of Ser. No. 638,244, Aug. 6, 1984, Pat. No. 4,673,029. This application Apr. 17, 1987, Ser. No. 39,444
Int. Cl.⁴ F24F *3/00, 7/00*
U.S. Cl. 165—21 **1 Claim**

1. In an air conditioning system for a plurality of zones including a heating and cooling means and using a plurality of zone thermostats and damper means each associated with a particular zone which damper means both open freely, when unlocked, by air flow and pressure and close by gravity and are locked closed the improvement comprising:

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means allowing said damper means to open an adjustable amount determined by spring tension when locked closed;
control means which allow individual zone thermostats to unlock each of said damper means individually while locking the remainder of the damper means closed thereby allowing an adjustable amount of air to pass to each zone as determined by spring tension;
said control means further having means allowing a plurality of said damper means to be unlocked simultaneously by at least one of a manual switch and humidity activated switch while one or more of said zone thermostats is connected to control said heating means and said at least one switch activates said cooling means to accomplish

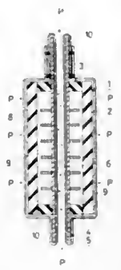


dehumidification, said heating means being controlled by one or more of said plurality of zone thermostats;
said control means having a plurality of interrupter circuit means to restore normal operation to the system after a predetermined period of time has elapsed after said at least one manual switch and humidity activated switch is activated by deactivating the heating and cooling means entirely for a predetermined time sufficient to allow all of the air flow to cease so that the dampers can return by gravity to their closed positions;
said control means further having a mode which allows a plurality of said damper means to be unlocked simultaneously by an individual of said plurality of thermostats.

4,819,717
HEAT EXCHANGING UNIT WITH A HYDROGEN ADSORPTION ALLOY

Hiroshi Ishikawa; Keisuke Oguro; Hiroshi Suzuki; Akihiko Kato; Teruya Okada; Shizuo Sakamoto; Iwao Nishimura, all of Osaka, and Keizo Sakaguchi, Hyogo, all of Japan, assignors to Agency of Industrial Science and Technology and Kurimoto Ltd., Osaka, both of, Japan

Filed Apr. 14, 1986, Ser. No. 851,622
Claims priority, application Japan, Feb. 24, 1986, 61-38743
Int. Cl.[4] F25B *17/08*
U.S. Cl. 165—104.12 **14 Claims**



1. The combination comprising:
a heat exchanging unit including: an elongated heat transfer element defining an outer surface; and a quantity of fine particles of hydrogen adsorption alloy surrounding the outer surface of the heat transfer element for at least a part of its length in a condition such that the fine particles of hydrogen adsorption alloy are bonded to each other to form a close-packed compact, said compact being bonded to the outer surface of the heat transfer element which it surrounds; and
a hollow cylindrical elastic mold defining an inner surface, wherein;
said heat transfer element is mounted to the mold such that the outer surface thereof is coextensive with a portion of the inner surface of the mold with the diameter defined by said portion being greater than the diameter defined by said outer surface; and
said heat transfer element and said mold form a sealed unit due to the elasticity of the mold when a pressure is applied to said combination, so that an even pressure is applied by the inner surface of the mold and the outer surface of the heat transfer element to the fine particles of hydrogen adsorption alloy for the integral formation of the heat exchanging unit.

4,819,718
HEAT EXCHANGING UNIT WITH A HYDROGEN ADSORPTION ALLOY

Hiroshi Ishikawa; Keisuke Oguro; Hiroshi Suzuki; Akihiko Kato; Teruya Okada; Shizuo Sakamoto; Iwao Nishimura, all of Osaka, and Keizo Sakaguichi, Hyogo, all of Japan, assignors to Agency of Industrial Science & Technology and Kurimoto Ltd., Nishi, Japan

Filed Apr. 14, 1986, Ser. No. 851,624
Claims priority, application Japan, Feb. 24, 1986, 61-38744
Int. Cl.[4] F25B *17/08*
U.S. Cl. 165—104.12 **14 Claims**

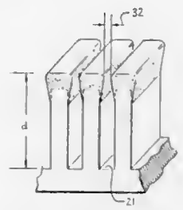


1. The combination comprising:
a heat exchanging unit including: an elongated heat transfer element defining an inner surface; and a quantity of fine particles of hydrogen adsorption alloy coextensive with the inner surface of the heat transfer element for at least a part of its length in a condition such that the fine particles of hydrogen adsorption alloy are bonded to each other to form in close-packed compact, said compact being bonded to the inner surface of the heat transfer element with which it is coextensive;
two spaced apart elastic cap members; and
a hollow cylindrical elastic core mold, wherein:
said core mold defines an outer surface the diameter of which is less than the diameter of the inner surface of the heat transfer element;
each of said elastic cap members has an inner surface and an outer surface which surfaces engage a portion of the outer surface of the core mold and a portion of the inner surface of the heat transfer element, respectively; and
said heat transfer element, core mold and cap members for a sealed unit due to the elasticity of the core mold and cap members when a pressure is applied to said combination, so that an even pressure is applied by the cap members, the inner surface of the heat transfer element and the outer surface of the core mold to the fine particles of hydrogen adsorption alloy for the integral formation of the heat exchanging unit.

4,819,719
ENHANCED EVAPORATOR SURFACE

Michael G. Grote, St. Louis; John A. Stark, Florissant, and Edward C. Tefft, III, St. Louis, all of Mo., assignors to McDonnell Douglas Corporation

Filed Jan. 20, 1987, Ser. No. 4,625
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.26 **11 Claims**

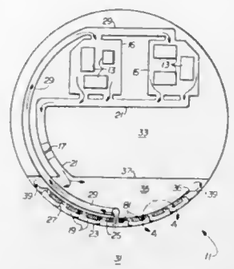


1. An enhanced capillary assisted evaporative surface comprising:
a conductive substrate;
a plurality of grooves located in said conductive substrate, said grooves having a generally rectangular shape with a generally radiused, necked-down opening;
land between and connecting said grooves; and
a dendritic surface on said lands and said generally radiused, necked-down openings of said grooves.

4,819,720
SKIN HEAT EXCHANGER

Robert W. Howard, Anaheim, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 670,067, Nov. 9, 1984, Pat. No. 4,739,823.
This application Oct. 26, 1987, Ser. No. 114,428
Int. Cl.[4] H01L *23/46;* **F28F** *3/12*
U.S. Cl. 165—104.34 **17 Claims**

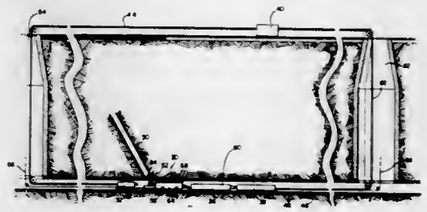


1. A skin heat exchanger comprising:
(a) an envelope formed by a wall and a flexible liner spaced apart from said wall;
(b) said liner having flexible attachment means for removably attaching said liner to said wall; whereby
(c) said liner can be simply installed and removed, allowing for easy access to the surface of said wall which opposes said liner;
(d) a container;
(e) means for said container to communicate with said envelope;
(f) said communication means, said envelope, and said container forming a closed loop;
(g) said closed loop containing fluid medium; and
(h) pump means for pumping said fluid medium through said closed loop; whereby
(i) heat is transferred from said container by said fluid medium being pumped through said closed loop.

4,819,721
REMOTELY CONTROLLED ARTICULATABLE HYDRAULIC CUTTER APPARATUS

Charles A. Long, Jr., Birmingham, Ala., assignor to Long Technologies, Inc., Birmingham, Ala.

Filed Jun. 9, 1987, Ser. No. 60,126
Int. Cl.[4] E03F *3/06*
U.S. Cl. 166—55 **18 Claims**



1. A remotely controlled, articulatable hydraulically operated cutter apparatus for use within a conduit having an axis, the cutter apparatus comprising:
control means located outside of the conduit for generating a plurality of control signals for controlling the operation of the cutter apparatus;
three structural units located within the conduit and sequentially coupled together end to end for concurrent movement within the conduit;
a first of said structural units including a source of pressurized hydraulic fluid;
a second of said structural units including valve means in fluid communication with the fluid source and connected with the control means for receiving pressurized hydraulic fluid from the fluid source and the control signals from the control means and for distributing the received hydraulic fluid in accordance with the received control signals;
the third of said structural units comprising a cutter supporting subassembly, a holder subassembly and a cutter positioning subassembly;
a hydraulically powered cutter motor pivotally supported by the cutter supporting subassembly and extending along an axis generally perpendicular to the axis of the conduit, the cutter motor including a cutting tool, said cutter motor being in fluid communication with the valve means and receiving hydraulic fluid from the valve means for driving the cutting tool;
first hydraulically actuated means comprising a single hydraulic cylinder within the holder subassembly and in fluid communication with the valve means for receiving hydraulic fluid from the valve means for axially centering the third structural unit within the conduit and for holding the third structural unit at a fixed axial position within the conduit as long as the received hydraulic fluid exceeds a predetermined minimum;
second hydraulically actuated means within the cutter positioning subassembly and in fluid communication with the

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valve means for receiving hydraulic fluid from the valve means for varying the axial position of the cutter motor with respect to the third structural unit in accordance with the received hydraulic fluid;

third hydraulically actuated means within the cutter positioning subassembly and in fluid communication with the valve means for receiving hydraulic fluid from the valve means for varying the radial position of the cutter motor with respect to the third structural unit in accordance with the received hydraulic fluid;

fourth hydraulically actuated means within the cutter positioning subassembly and in fluid communication with the valve means for receiving hydraulic fluid from the valve means for rotating the cutter motor up to 180 degrees about the axis of the conduit in either a clockwise or counterclockwise direction with respect to an initial position in accordance with the received hydraulic fluid; and

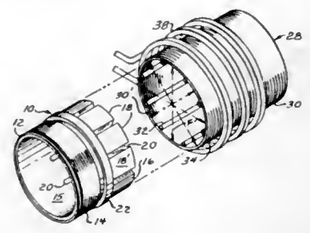
fifth hydraulically actuated means within the cutter supporting subassembly and in fluid communication with the valve means for receiving hydraulic fluid from the valve means for pivoting the cutter motor about the axis extending generally perpendicular to the axis of the conduit, the first, second, third, fourth and fifth hydraulically actuated means cooperating to position the cutter motor in accordance with the control signals to facilitate the cutting by the cutting tool.

4,819,722

METAL WELL SCREEN ASSEMBLY WITH PLASTIC END FITTING AND METHOD OF ATTACHING SAME

Raymond A. Daly, Castletown, Ireland, assignor to Johnson Filtration Systems, Inc., New Brighton, Minn.

Filed Jan. 19, 1988, Ser. No. 145,310
Int. Cl.[4] B29C *27/08;* **E21B** *43/08;* **F16L** *47/02*
U.S. Cl. 166—231 **15 Claims**



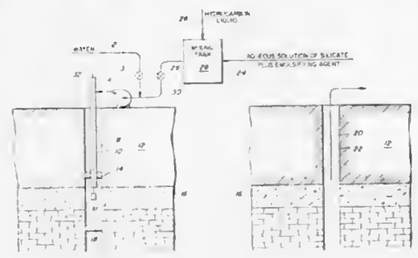
11. A method of assembling a cylindrical plastic fitting member which has been formed of a thermoplastic material which is heat and pressure softenable and deformable, to a cylindrical metal well screen of the type which has a plurality of internal, circumferentially spaced, longitudinal support rods wrapped transversely with wire which is welded to said support rods to form closely spaced slots along the length thereof, said method comprising the steps of forming the inner end of the fitting so as to have a plurality of circumferentially spaced tongue portions which have an outer diameter which is no greater than the internal diameter of the wrapped wire portion of the well screen but which is greater than the internal diameter of the support rod portion; providing a plurality of longitudinal slots in at least the radially outermost region of the inner end portion which separate said spaced tongue portions from each other and which accommodate the internal longitudinal support rods of the well screen to which the fitting is to be attached; telescopically positioning the inner end of the fitting into the end of said well screen so that said longitudinal support rods are received within said longitudinal slots; applying sufficient heat to said spaced tongue portions of the inner end of said fitting which lie between said longitudinal slots to soften said tongue portions and cause at least some melting of its radially outermost surface; and, applying radially outward pressure to said spaced tongue portions sufficient to cause said tongue portions to be deformed and partially extruded radially outwardly into those closely spaced slots in said well screen which overlie said tongue portions.

4,819,723

REDUCING THE PERMEABILITY OF A ROCK FORMATION

Donald L. Whitfill; Nick O. Wolf, and Jerry D. Purkaple, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Apr. 6, 1987, Ser. No. 36,933
Int. Cl.[4] E21B *33/138, 36/04*
U.S. Cl. 166—248 **8 Claims**



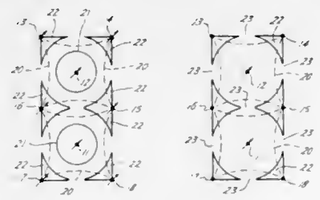
1. A method for reducing permeability in a highly permeable subsurface zone surrounding a well bore which comprises (1) injecting down the well bore and into the zone an emulsion of an aqueous solution of an alkali metal silicate liquid in a hydrocarbon, (2) thereafter transmitting microwave energy into the zone adjacent the well bore to break the emulsion, release alkali metal silicate to form a plug of gel through contact with formation brines adjacent the well bore and thereby seal off the remainder of the zone from the well bore and (3) thereafter allowing the emulsion in the remainder of the zone to break and release alkali metal silicate to gel and plug the remainder of the zone over a period of time.

4,819,724

MODIFIED PUSH/PULL FLOOD PROCESS FOR HYDROCARBON RECOVERY

Sami Bou-Mikael, Kenner, La.; Robert B. Alston, Missouri City, and Donald L. Hoyt, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 3, 1987, Ser. No. 92,750
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—263 **20 Claims**



1. A method for recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least two wells, which comprises:

injecting a recovery fluid into an underground formation simultaneously through at least two wells until about 5% to about 25% pore volumes of recovery fluid has been injected,

said recovery fluid selected from the group consisting of carbon dioxide, nitrogen, sulfur dioxide, methane, ethane, propane, butane and mixtures thereof;

shutting in one well of the two wells for a soak period of about one to about 60 days while continuing injection of recovery fluid through the second well;

converting the shut in well to a production well; and

producing hydrocarbons and other fluids from the production well while continuing to inject recovery fluid through the second well.

4,819,725

RECOVERING OIL BYPASSED BY A STEAM OVERRIDE ZONE

Donald S. Mims, and Donald L. Hoyt, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 28, 1987, Ser. No. 137,991
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—271 **7 Claims**

1. A method of recovering oil from an existing production well bypassed by a steam override zone during a steamflood which comprises:

drilling a production well below the oil producing zone into an underlying interval;

closing off the well perforations in the oil producing zone to prevent oil and steam from entering the existing production well from the oil producing zone;

fracturing the underlying interval to establish fluid communication between the underlying interval and the oil producing zone;

completing the production well for production through the fractured portion of the underlying interval;

injecting steam through an injection well to increase the pressure in the oil producing zone and drive the oil and steam downward through the fractures to the production well in the underlying interval; and

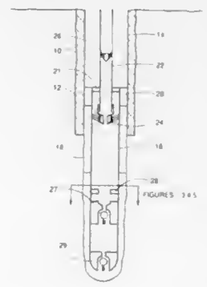
producing hydrocarbons and other fluids through the production well.

4,819,726

METHOD FOR INDICATING THE POSITION OF A CEMENT WIPER PLUG PRIOR TO ITS BOTTOMHOLE ARRIVAL

Robert M. Beirute, Broken Arrow, and Robert C. Smith, Inola, both of Okla., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 743,183, Jun. 10, 1985, abandoned. This application Oct. 20, 1987, Ser. No. 112,024
Int. Cl.[4] E21B *33/16*
U.S. Cl. 166—291 **5 Claims**



1. A method for cementing a pipe within a wellbore, comprising:

(a) introducing a first plug within the pipe;

(b) introducing a cement slurry within the pipe;

(c) introducing a second plug within the pipe;

(d) introducing a displacement liquid within the pipe to displace the cement through an opening in a lower portion of the pipe and into the wellbore;

(e) displacing the first plug past, without shearing, a restricting device affixed within a lower portion of the pipe;

(f) monitoring at the surface a pumping pressure of the displacement liquid; and

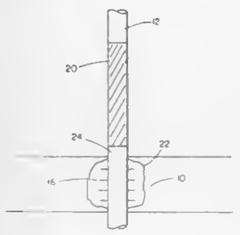
(g) determining the volume of liquid required to seat the second plug in a landing assembly located within the pipe after the monitored occurrence of a rapid increase and decrease of the pumping pressure caused by the second plug engaging and shearing the restrictive device.

4,819,727

METHOD FOR SUSPENDING WELLS

Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 21, 1986, Ser. No. 887,687
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—292 **18 Claims**



1. A method for filling and suspending a well which minimizes formation damage comprising:

(a) directing a pumpable solidifiable gel mixture into a wellbore and into the productive interval of a formation which mixture contains an oxygen scavenger material selected from the group consisting of sodium thiosulfate and a short chain alcohol;

(b) causing said gel mixture to become a solid thereby forming a gel plug within said wellbore and a formation gel within said formation sufficient to withstand environmental formation conditions and pressures which cause hydrocarbonaceous fluids to flow into said wellbore from the formation areas near said wellbore; and

(c) placing in said wellbore on top of said plug an amount of cement sufficient to isolate said productive interval while being supported by said plug.

4,819,728

PRESSURE RELIEF SYSTEM FOR DOWN HOLE CHEMICAL CUTTERS

Louis D. Lafitte, 104 Marcel St., Houma, La. 70364

Filed Sep. 1, 1987, Ser. No. 92,087
Int. Cl.[4] E21B *29/02*
U.S. Cl. 166—298 **5 Claims**

1. An apparatus for cutting an object within an earth bore in a desired application area, comprising a generally elongated, cylindrical structure which includes:

(a) suspension means for suspending the apparatus within the earth bore;

(b) gas generation means for generating gas under pressure when ignited;

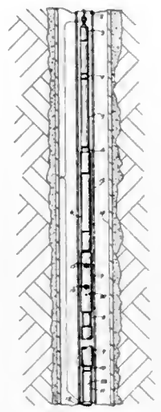
(c) firing means associated with said generation means for ignition of said gas generation means for generating the gas under pressure;

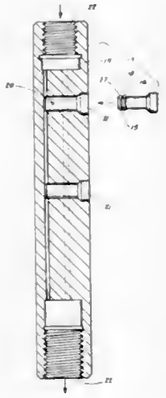
(d) a chamber, and movable anchor means in said chamber associated with and activated by pressure produced by said gas generation means for maintaining the apparatus in

a substantially axial position in relation to the earth bore during the cutting operation;

(e) chemical releasing means for releasing a chemical cutting agent contained within the apparatus to the earth bore;

(f) discharge means for discharging a chemical cutting agent utilizing said gas generation means via said releasing means to the desired application area; and





(g) pressure relief means for pressure relief intermediate said gas generation means and said chemical releasing and located within said chamber of said anchor means for providing automatic means of pressure relief in the event that the cutting apparatus malfunctions, facilitating retraction of said anchor means and allowing the malfunctioned apparatus to be removed from the hole.

4,819,729

METHOD FOR RECOVERING PETROLEUM USING OLIGOMERIC SURFACTANTS

J. H. Bae, and S. I. Chou, both of Anaheim, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 24, 1987, Ser. No. 66,582

Int. Cl.⁴ E21B *43/22*

U.S. Cl. 166—305.1 **5 Claims**

1. A method for recovering petroleum from a subterranean, petroleum-containing formation comprising:

(a) injecting into said formation a formulation comprising a surfactant wherein said surfactant has the following formula:

$$R—X—(CH_2—CR_1Y)_a—(CH_2—CR_2Z)_b—H$$

wherein R is a linear or branched alkyl or alkylaryl radical having from 6 to 24 carbon atoms; R_1 is selected from the group consisting of hydrogen, methyl, and ethyl; R_2 is selected from the group consisting of hydrogen, methyl, ethyl, and a hydrocarbon having the formula CH_2COOH; X is selected from the group consisting of —S—, sulfonyl, or sulfinyl; Y is selected from the group consisting of hydrocarbons having the formulas CN, $CONH_2$, CH_2CONH_2, $CONHCH_3$, $CONHC_2H_5$, $COOCH_3$, $COOC_2H_5$, $COOC_2H_4OH$, $COOC_3H_6OH$, and $CONHC-H_2OH$; Z is selected from the group consisting of hydrocarbons having the formulas COOH, CH_2COOH, OCH_3, OC_3H_5, CH_2OH, and salts thereof; a+b is from 2 to 50; and 1/(a+b) is from 0 to 0.8; and

(b) recovering said petroleum from said formation.

4,819,730

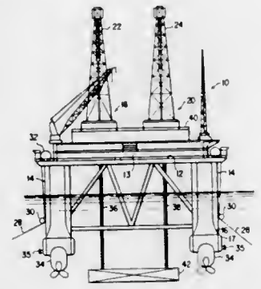
DEVELOPMENT DRILLING SYSTEM

Frank B. Williford, Frisco; James M. Luke, Keller, and Paul V. Devlin, Rowlett, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 24, 1987, Ser. No. 77,365

Int. Cl.⁴ E21B *7/128;* **E02D** *21/00;* **B63H** *25/00*

U.S. Cl. 166—355 **20 Claims**



1. A system for conducting hydrocarbon production operations which may include drilling, hydrocarbon fluid handling or subsea manipulation of apparatus useful in drilling or hydrocarbon production, while experiencing more than three of: vertical movement, x horizontal movement, y horizontal movement, yaw, pitch and roll, comprising:

(a) a surface floating work platform for positioning above a well location on the sea floor;

(b) a first work station situated on said floating work platform;

(c) a second work station situated on said floating work platform;

(d) a first longitudinally extending means depending from said first work station and extending toward the floor of the sea for performing first subsea operations;

(e) a second longitudinally extending means depending from said second work station and extending toward the floor of the sea for performing second subsea operations, said first and second longitudinally extending means being subject to sea current deflection;

(f) means for monitoring the relative positions of said first and second longitudinally extending means; and

(g) means responsive to said position monitoring means and supported by said floating platform for coordinating simultaneous management of said first and second longitudinally extending means while performing said first and second subsea operations.

17. A method for simultaneously conducting dual hydrocarbon production operations which may include drilling and/or hydrocarbon fluid handling, or subsea manipulation of apparatus useful in drilling or hydrocarbon production, from a surface floating vessel while experiencing more than three of: vertical movement, x horizontal movement, y horizontal movement, yaw, pitch and roll, comprising the steps of:

(a) suspending a first longitudinally extending element from a first work station situated on said floating vessel;

(b) suspending a second longitudinally extending element for conducting a second operation from a second work station situated on said floating vessel, said first and second elements being subject to sea current deflection;

(c) determining parametric values of variables which could influence the stress or position of said first and second longitudinally extending elements;

(d) determining, from calculations using models of said first and second elements, and said parametric values, a predicted stress or position of said first and second longitudinally extending elements; and

(e) in response to said predictions, instituting corrective action designed to prevent the interference of one of said elements with the other of said elements.

4,819,731

HORSESHOE AND METHOD OF APPLYING SAME

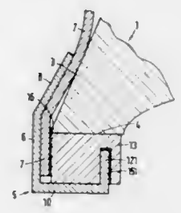
Peter Stübbe, Schenkenberger Weg 17, 2061 Bliestorf, Fed. Rep. of Germany

Continuation of Ser. No. 789,180, Oct. 18, 1985, abandoned. This application Jun. 29, 1987, Ser. No. 67,404

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441417

Int. Cl.⁴ A01L *3/00, 7/02*

U.S. Cl. 168—4 **12 Claims**



1. A horseshoe comprising

a formable frame having an upstanding outer wall and laterally inwardly extending support surface segments, said frame being bendable into a U-shape to conform to the peripheral shape of the sole of a horse's hoof with said outer wall partially surrounding said hoof and said support segments lying beneath said hoof such that, in use, the outer surfaces of said segments contact the ground;

a preformed sole member formed from a plate of polymeric material, the periphery of said sole member being shaped to match the peripheral shape of the sole of said hoof;

a plurality of attachment means connected to said outer wall, said attachment means being attachable to said hoof for securing said frame to said hoof; and

a plurality of projections extending upwardly from said support segments a distance no greater than the thickness of said sole member and being fixedly attached to said support segments, each of said projections being generally parallel with an adjacent portion of said upstanding outer wall and being spaced from said wall by a predetermined distance, said sole member being attached to said frame within said outer wall and in lateral contact with said projections with at least a part of said sole member lying within a space between said projections and said outer wall so that the sole of said hoof rests on said sole member within said outer wall and firmly engages said sole member between the sole of said hoof and said support segments, the upper edge of said wall being above the upper surface of said sole member.

4,819,732

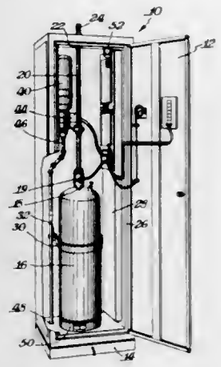
FIRE-FIGHTING EQUIPMENT

Hugh M. Laumeister, St. Davids, Pa., assignor to Uptime Technologies, Inc., New York, N.Y.

Filed Sep. 8, 1987, Ser. No. 93,639

Int. Cl.⁴ A62C *37/18*

U.S. Cl. 169—61 **5 Claims**



1. A self-contained vapor fire-extinguishing assembly having a rectangular cabinet, the base of which is no larger than about two feet by about three feet, a tank of compressed fire-extinguishing vapor sufficient to extinguish a substantial fire fitted within the cabinet, a valve-controlled tank discharge conduit extending up through the top of the cabinet, the bottom of the cabinet having an opening site through which a second discharge conduit can be fitted, space within the cabinet for mounting a second tank of compressed fire-extinguishing vapor that can be connected to the second discharge conduit so as to discharge the vapor through the bottom opening site, aural and visual warning means in the cabinet and connected to indicate the operative condition of the assembly, electrically operated triggering means within the cabinet connected to cause the discharge of said compressed vapor through at least one of the discharge conduits in response to a fire, the triggering means including connectors in the cabinet for connection to fire-detector means, and stand-by battery means within the cabinet connected to energize the assembly in the event the supply of external electrical power fails.

4,819,733

AUTOMATIC FIRE EXTINGUISHING EQUIPMENT

Yoshio Aria, Sagamihara; Kouji Akiba, and Akira Kitajima, both of Yokohama, all of Japan, assignors to Hochiki Corp., Tokyo, Japan

Filed Mar. 20, 1986, Ser. No. 841,937

Claims priority, application Japan, Mar. 26, 1985, 60-61719

Int. Cl.⁴ A62C *37/18*

U.S. Cl. 169—61 **6 Claims**

1. An automatic fire extinguishing equipment comprising:

means for detecting flames in a supervised zone and producing a detecting signal;

a flame detecting apparatus including:

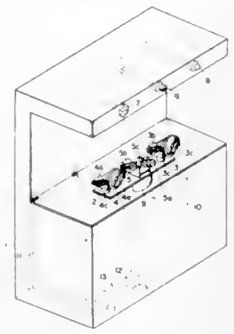
a first detecting element for detecting infra-red radiation from flames occurring within said zone and which produces fire signals corresponding to the energy of said radiation;

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scanning means for driving the first detecting element in horizontal and vertical directions so as to scan the entire zone for such flames in response to said detecting signal; and

control means responsive to the fire signals to produce data concerning each flame in said zone;

a storage section for storing the detection data produced by the flame detecting apparatus;

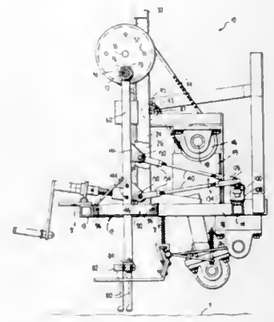


a fire extinguishment controlling section which, from the detection data stored in the storage section, determines the relative sizes of the flames in said zone;

a nozzle assembly including a nozzle for discharging a fire extinguishing liquid to extinguish the flames; and

means for controlling the positioning of the nozzle to direct the fire extinguishing liquid towards the largest flame in said zone.

4,819,734
LAWN AERATOR WITH ROCKER ARM TINE SYNCHRONIZING MEANS
Alvin T. Classen, P.O. Box 172, Norfolk, Nebr. 68701
Filed Mar. 15, 1988, Ser. No. 168,196
Int. Cl.[4] A01B *45/02*
U.S. Cl. 172—22 **7 Claims**



1. In an aerating machine for turf comprising:

a frame for traversing over said turf, a crankshaft, means for rotatably mounting said crankshaft on said frame transversely across said frame at right angles to the direction of travel of the frame;

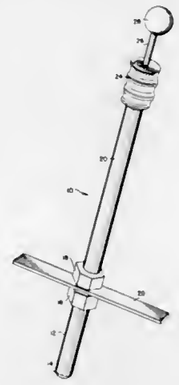
means forming a plurality of cranks along said shaft, a plurality of laterally spaced crank arms rotatably mounted, respectively at one end to said cranks for near vertical reciprocation by said crankshaft during rotation of the crankshaft, at least one tine rigidly fixed to another end of the crank arm, remote from said cranks;

means for rotating said crankshaft;

guide means fixed to said frame and defining a plurality of slots extending in the direction of movement of said frame and receiving the lower ends of respective crank tine arms for vertical reciprocation therein and for horizontal oscillation longitudinally thereof in the direction of said slots, whereby upon forward motion of the machine, the tines upon projection into the turf remain momentarily horizontally stationary during aerating machine movement forwardly, the improvement comprising:

at least one rocker arm, means for mounting said at least one rocker arm at its center to said frame, rearwardly of a slot for pivoting about a vertical axis generally parallel to the direction of reciprocation of said crank arms and a pair of connecting rods pivotably mounted at one end to said rocker arm, respectively to opposite sides of the pivot axis of said rocker arm on said frame and having the other end pivotably coupled to laterally adjacent crank arms and being of equal length so as to cause said crank arms to oscillate 180° out of phase, within guide means slots and in opposition to each other during alternate projection of the tines of respective crank arms into the turf and retraction therefrom.

4,819,735
HAND-OPERATED LAWN AERATOR
Donald L. Puckett, 1220 Custer Ave., Billings, Mont. 59102
Filed Mar. 8, 1988, Ser. No. 165,590
Int. Cl.[4] A01B *1/24, 45/02*
U.S. Cl. 172—22 **6 Claims**



1. A hand-operated lawn aerator for extracting a plug of earth from the ground comprising:

a tubular body having an inside wall;

a tubular cutting head coaxially secured to the tubular body at a lower end thereof, the cutting head having an inside wall;

a plunger disc located inside the cutting head;

a movable plunger rod axially located within the tubular body and having the plunger disc mounted at a lower end thereof;

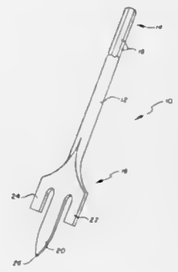
a plunger handle mounted at an upper end of the plunger rod;

a first supple and expandable washer connected to the plunger rod immediately above the plunger disc, the first supple and expandable washer having an outside diameter sized to scrape the inside wall of the cutting head when the plunger disc is moved inside the cutting head;

a second supple and expandable washer positioned in the tubular body above the cutting head, the second supple and expandable washer having an outside diameter sized to abut the inner wall of the tubular body and further having a centrally located hole therethrough sized to slidably receive the plunger rod; and

a compression spring positioned within the tubular body above the second resilient washer, the spring being connected between the plunger rod and the tubular body to normally bias the plunger rod to an uppermost position in which position the plunger disc connected to the plunger rod is located adjacent the upper end of the cutting head.

4,819,736
WEED REMOVAL TOOL
Virgil E. Hedgepeth, 704 Hillcrest Dr., Bradenton, Fla. 33529
Filed Mar. 24, 1987, Ser. No. 29,861
Int. Cl.[4] A01B *33/00*
U.S. Cl. 172—25 **8 Claims**



1. A tool for removing plants comprising:

an elongated main body member having a first, proximal end and a second, distal end;

said proximal end including means for coupling said main body member to a means for rotating said main body member about a longitudinal axis thereof; and

said distal end "being generally planar and" including means for engaging and disrupting a root system and soil surrounding the base of an unwanted plant including a prong element having a longitudinal axis parallel to the longitudinal axis of said main body member and having a pointed distal end and first and second blade elements each being generally coplanar and parallel to said prong element and spaced laterally at each side therefrom by a gap, said prong element having a length greater than a length of each of said blade elements, said first and second blade elements and said prong element each having a width "as measured across said blade elements which is" greater than or equal to the gap defined between a said blade element and said prong element.

4,819,737
ROW CROP CULTIVATOR
Roland J. Frase, Roselle, Ill., assignor to J. I. Case Company, Racine, Wis.
Filed Sep. 24, 1987, Ser. No. 100,733
Int. Cl.[4] A01B *39/08, 39/14*
U.S. Cl. 172—156 **10 Claims**

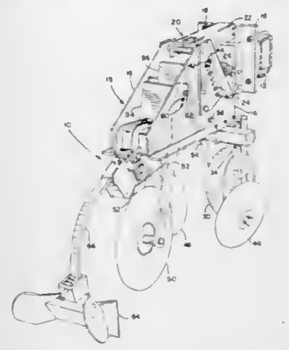
1. A row crop cultivator comprising:

a frame attachable for towing to a mobile power source;

a plurality of earth-working tools dependingly mounted from said frame;

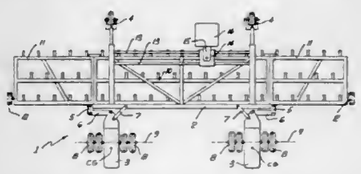
a gauge wheel assembly pivotally mounted to said frame and including a gauge wheel projecting forwardly of said frame, and further including at least one elongated arm pivotally mounted on said frame intermediate the length of said elongated arm; and

gauge wheel adjustment means on said frame for controlling the pivotal movement of said assembly and the elevation of said gauge wheel relative to the frame and thereby regulating the depth of penetration of said tools into the soil, said gauge wheel adjustment means comprising pin-receiving means defined by said frame, and adjustment pin



means selectively positionable in said pin-receiving means so that an upper portion of said elongated arm of said gauge wheel assembly contacts and bears against said pin means to limit the pivotal movement of said elongated arm of said gauge wheel assembly relative to said frame.

4,819,738
VEHICLE FOR SUPPORTING AN IMPLEMENT
Glen L. Fountain, 63 Hospital Road, Dalby, Queensland 4405, Australia
Filed Jul. 28, 1986, Ser. No. 889,710
Claims priority, application Australia, Jul. 29, 1985, PH1686
Int. Cl.[4] A01B *51/02, 73/02*
U.S. Cl. 172—292 **6 Claims**

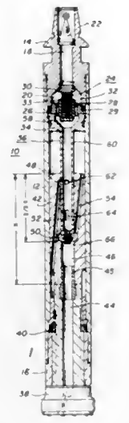


1. An implement supporting vehicle which is convertible between a working configuration and a transport configuration comprising an elongate implement support frame which has two ends, two sides, a central longitudinal axis, and a central transverse axis; said vehicle being selectively movable in a first working direction which is parallel to said central transverse axis, and a second transport direction which is parallel to said central longitudinal axis; two independent drive units mounted on one side of said frame substantially equally spaced from and on opposite sides of said central transverse axis of the vehicle, at least one support wheel mounted on said frame on the side remote from said drive units, each said drive unit including a pivot arm having one end pivotally attached to said frame and a second end pivotally attached to said drive unit whereby each drive unit may be selectively oriented in a first working position in which said vehicle can be propelled in said first direction and reoriented in a second transport position in which said vehicle can be propelled in said second direction, said drive units lying on said central longitudinal axis at opposite ends of the frame when the vehicle is in its transport configuration, each drive unit including an engine and a drive wheel for rotation about a drive axis, and the center of gravity

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of each drive unit being located outwardly of said drive axis away from the frame to impose an upwardly directed supporting force on the frame.

4,819,739
FLUID ACTUATED ROCK DRILL HAMMER
Dennis D. Fuller, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Aug. 31, 1984, Ser. No. 646,740
Int. Cl.[4] B23Q *5/00*
U.S. Cl. 173—17 **4 Claims**



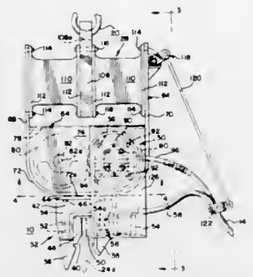
1. An improved fluid actuated rock drill hammer comprising a cylinder defining an axially extending cylindrical inner wall and housing a reciprocal piston therein having a cylindrical surface in sliding engagement with said inner wall, means for directing pressurized fluid into said cylinder at one end, and a bit mounted to and extending from the cylinder at the opposite end with a portion thereof within the cylinder for impact by said piston, said piston having an axially extending central bore concentric with said inner wall and a first air passage means for fluid communication between one face of said piston and said bore and a second air passage means for fluid communication between the opposite face of said piston and said bore, and a control tube mounted within said cylinder having an enlarged head portion at one end having an inlet passage for receiving said pressurized fluid and with a tube portion axially extending from one side of said head portion and defining fluid distributing apertures therein and disposed in sliding sealing engagement with said piston bore, with said apertures aligned to distribute said pressurized fluid to said passages in said piston in accordance with alternately directing pressurized fluid to opposite faces thereof as said piston reciprocates, wherein said improvement comprises:

said control tube head portion and tube portion comprising a unitary structure and said head portion defining an axially extending piloting section directly engaging the cylindrical inner wall of said cylinder;

said cylindrical inner wall further having a shoulder in a plane perpendicular to the axis of said inner cylindrical wall and said head portion of said control tube defining a like transverse shoulder perpendicular to said piloting section for seating engagement with said cylinder shoulder; and

said tube portion extending axially from said head portion and perpendicular to said shoulder on said head portion and concentric with said piloting section whereby said tube portion positively extends axially parallel with and concentric to the cylinder wall and thereby the bore of said piston throughout its length.

4,819,740
VIBRATORY HAMMER/EXTRACTOR
Don C. Warrington, Cleveland, Tenn., assignor to Vulcan Iron Works Inc., Chattanooga, Tenn.
Filed Nov. 16, 1987, Ser. No. 121,666
Int. Cl.[4] E02D *7/18*
U.S. Cl. 173—49 **16 Claims**



1. A vibratory hammer/extractor for use with elongated pilings and the like, extended into the earth comprising:

a clamping assembly for selectively releasing and securing said hammer to an upper end portion of a piling to be extended into the earth;

a vibratory exciter mounted on said clamping assembly for generating vibratory forces to be imparted through said clamping assembly to said piling while clamped by said clamping assembly;

a suspension device for supporting said exciter and isolating the vibration thereof from hammer supporting means;

said exciter including a hollow case having a lower end portion secured to said clamping assembly and at least one eccentric mounted on shaft means therein for rotation about an axis transversely of said clamped piling for imparting vibratory forces thereto through said clamping assembly upon rotation of said shaft means, said eccentric comprising a unitary body of dense material having a generally circular periphery and coaxially mounted on said shaft, said body having a slot formed on one side between said shaft means and an outer rim portion adjacent said periphery thereby creating an eccentric center of gravity on an opposite side of said shaft means from said slot;

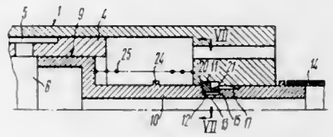
said hollow case comprising a top wall, a pair of spaced apart, relatively thick, opposite side plates having openings therein for support of said shaft means at a level spaced above lower edges of said side plates, and a relatively thin, U-shaped wall member integrally forming a pair of opposite end walls and a bottom wall and extending transversely between said side plates, said bottom wall of said U-shaped wall member positioned below and supporting said side plates at a level spaced below said shaft means, and said integral end walls of said U-shaped wall member having upper end portions projecting upwardly of said top wall;

said clamping assembly including an upper mounting plate secured adjacent said bottom wall of said U-shaped member and threaded cap screw means projecting upwardly of said mounting plate and said bottom wall into elongated threaded engagement within upwardly extending, threaded bores provided in said relatively thick side plates for securing and retaining said hollow case and said clamping assembly together while vibratory forces are generated by said exiter and for transmitting said forces from said side plates to said clamping assembly and piling;

said suspension device comprising a depending support element extending downwardly and centrally positioned between said integral end walls of said U-shaped wall member and having an upper end adapted to be connected to said hammer supporting means, and resilient, vibration isolation means supportively interconnecting opposite faces of said support element and said upper end portions of said end walls of said U-shaped wall member for isolating said support element from the vibration of said exciter; and

said exciter including motor means on said case for directly rotating said shaft means.

4,819,741
REVERSIELE PERCUSSION DEVICE
Alexei D. Terskov, ulitsa Ippodromskaya, 31, kv. 154; Vladimir D. Plavskikh, ulitsa Ivanova, 30, kv. 7; Alexandr D. Kostylev, ulitsa Derzhavina, 18, kv. 44; Nikolai G. Nazarov, ulitsa Gogolya, 3, kv. 10; Nikolai P. Chepurnoi, ulitsa 1905 Oktyabrya, 28, kv. 92; Evgeny N. Cherednikov, Vokzalnaya magistral, 5, kv. 329, and Andron T. Karavaev, Pervomaiskaya ulitsa, 118, kv. 19, all of Novosibirsk, U.S.S.R.
PCT No. PCT/SU79/00045, § 371 Date Feb. 25, 1981, § 102(e) Date Feb. 25, 1981, PCT Pub. No. WO81/00124, PCT Pub. Date Jan. 22, 1981
PCT Filed Jul. 2, 1979, Ser. No. 243,915
The portion of the term of this patent subsequent to Nov. 11, 2000, has been disclaimed.
Int. Cl.[4] B25D *9/16*
U.S. Cl. 173—91 **4 Claims**



1. A reversible percussive device comprising:

(a) a casing;

(b) a striker mounted in said casing for reciprocation under the action of a pressurized fluid medium; and

(c) a system for distributing the pressurized fluid in said casing to cause the striker to reciprocate in said casing so as to impart blows to a front-end part of the casing when the device is set for a forward movement operation and to impart blows to a rear-end part of the casing when the device is set for a rearward movement operation, the system having:

(i) a control member movably coupled with the striker for controlling the distribution of said pressurized fluid medium when in a first position and for controlling the distribution of said pressurized fluid medium for the rearward movement operation when in a second operation; and

(ii) locking means for axially locking said control member with respect to said casing, and including:

(A) a port in fluid communication with a source of said pressurized fluid medium;

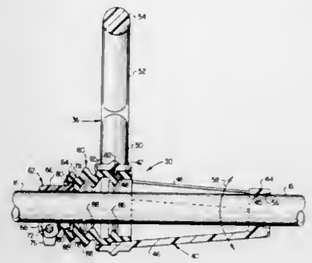
(B) a seat formed in an external surface of said control member and in fluid communication with said port, said seat being in the form of a substantially crescent-shaped groove arranged eccentrically with respect to the longitudinal axis of the device;

(C) a substantially crescent-shaped movable body positioned in said seat; and

(D) receiving means in said casing for receiving said movable body to lock the control member with respect to the casing;

(E) wherein said pressurized fluid passes through said port and biases said movable member into said receiving means to axially lock the control member with respect to said casing in said first position and permits axial movement of said control member with respect to said casing in said second position.

4,819,742
VIBRATION-DAMPING CONTROL HANDLE FOR A PORTABLE POWER TOOL
Bernard M. Driggers, Shreveport, La., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Jun. 12, 1987, Ser. No. 62,059
Int. Cl.[4] B27B *17/02*
U.S. Cl. 173—162.2 **47 Claims**



19. A power tool comprising:

a portion subject to vibration during operation of said power tool; and

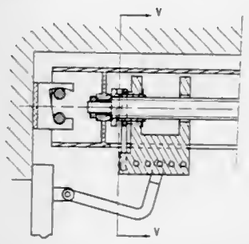
handle means for supporting and controlling the motion of said power tool, said handle means including:

a vibration damping member connected to said portion subject to vibration and having a cantilevered free end portion spaced apart from and resiliently deflectable toward said portion subject to vibration,

an elongated handle body having a first and second opposite end portions, said first end portion being secured to said cantilevered free end portion of said vibration damping member, said second end portion being directly connected to said portion subject to vibration in a manner preventing appreciable relative lateral translational movement between said second end portion of said handle body and said portion subject to vibration, and

a handgrip secured to said handle body and adapted to be grasped by an operator of said power tool.

4,819,743
ELECTROMECHANICAL OPERATING DEVICE FOR A SLIDINGLY MOVABLE DOOR
André J. Rousselot, Scionzier, and Georges Charnay, Cluses, both of France, assignors to Somfy, France
Filed May 21, 1987, Ser. No. 52,838
Claims priority, application France, Jun. 4, 1986, 86 08059
Int. Cl.[4] E05F *15/14*
U.S. Cl. 74—89.15 **1 Claim**

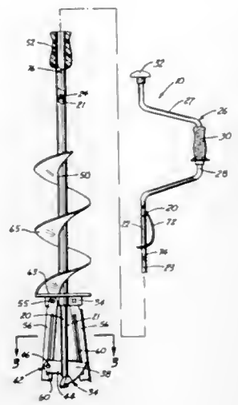


1. An electromechanical linear device for a slidingly movable door comprising a motor driving a worm, said worm threadably engaging a nut which is connected to the slidingly

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movable door, said nut comprising an inner part and a concentric outer part rotatably mounted on said inner part, said inner part and said outer part having means to limit relative rotation to less than one revolution; rotation of said nut being limited by a finger projecting radially from said outer part into a slide guide, said slide guide having an enlarged portion forming a step, said finger on said outer part rotates relative to said inner part so as to engage said step when said slidingly movable door is in a closed position, whereby said step acts as a stop to prevent movement of said nut is urged by said slidingly movable door.

4,819,744
FUNNEL HOLE ICE AUGER
Ty J. Caswell, Rte. 1, Box 351, Zimmerman, Minn. 55398
Filed Apr. 18, 1988, Ser. No. 182,875
Int. Cl.[4] F25C *5/04;* **E21B** *10/32, 17/07*
U.S. Cl. 175—18 **11 Claims**



1. An ice auger for boring a cyclindrical ice fishing hole through ice into water and for reaming a bottom portion of the hole to form an inverted funnel shape opening to facilitate removal of a hooked fish through the hole, said ice auger including:

(a) a straight inner drive bar;

(b) means attached to a top portion of the drive bar for rotating the drive bar and for selectively either forcing it down toward the ice for boring a cylindrical hole through the ice or forcing it up away from the ice for reaming an inverted funnel shape hole to replace a portion of the bored cylindrical hole;

(c) ice boring blade means permanently attached to a bottom portion of the drive bar, said boring blade means being operative upon rotation and forcing down of the drive bar to bore a cylindrical hole of predetermined diameter into and through the ice;

(d) a tubular outer ream control sleeve in concentric, surrounding, longitudinally sliding relation and fixed angular relation with respect to said inner drive bar, said sleeve being movable between a first, upper, boring condition, and a second, lower, reaming condition with respect to the drive bar;

(e) releasable means to retain said ream control sleeve selectively in either its first condition or its second condition;

(f) at least two longitudinally extending ice reaming blades, each pivotally attached at a top portion thereof with respect to a bottom portion of the ream control sleeve to have a pivot point at less radial distance from the longitudinal axis of the drive bar than the predetermined radius determined by the boring blade means, and each blade having a longitudinally extending positioning track extending over a substantial portion of its length;

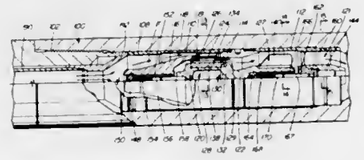
(g) reaming blade camming support bar means integrally attached to a bottom portion of the drive bar to be in horizontal alignment with said boring blade means, the support bar means extending radially outwardly from the drive bar to have at least two outer end portions aligned with said reaming blade tracks;

(h) at least two reaming blade camming carriages extending outwardly from said camming support bar end portions, each carriage to be in tracking relation to one of said reaming blade tracks, said carriages each being spaced at a greater radial distance from the drive bar axis than the top pivot point of its associated ice reaming blade;

(i) means to move sleeve between said first condition wherein said camming carriages lie in lower ends of said reaming blade tracks to retain said reaming blades within the predetermined diameter of a bored ice hole and said second condition wherein said camming carriages have moved up said tracks forcing at least lower portions of said reaming blades to position outside of said predetermined diameter of the bored hole; and

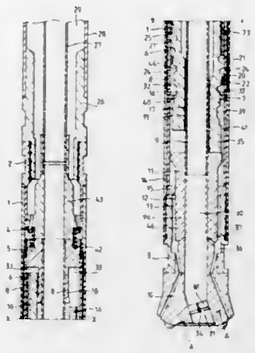
(j) wherein said reaming blades are operative when positioned below a cylindrical hole bored through the ice with the sleeve in its second condition and upon rotation and forcing up of said drive bar to ream a portion of said bored cylindrical hole to have an inverted funnel shape.

4,819,745
FLOW PULSING APPARATUS FOR USE IN DRILL STRING
Bruno H. Walter, Edmonton, Canada, assignor to Intech Oil Tools Ltd, Edmonton, Canada
Continuation-in-part of Ser. No. 626,121, Jun. 29, 1984, abandoned. This application Jan. 30, 1987, Ser. No. 8,963
Claims priority, application Canada, Jul. 8, 1983, 432054
Int. Cl.[4] E21B *4/02*
U.S. Cl. 175—107 **31 Claims**



1. Apparatus for providing pulsations in a flow of drilling fluid to a rotary drill bit comprising: a housing adapted to be connected in a tubular drill string above a drill bit and to be supplied, in use, with pressurized drilling fluid via the tubular drill string, said housing having flow passage means for the flow of the drilling fluid therethrough from an inlet to an outlet end of said housing; rotor means in said housing adapted to rotate relative to said housing about an axis of rotation in response to the flow of fluid through said housing, said rotor means having a valving section including a rotary valve member; bearing means for rotatably supporting said rotor means in said housing; said flow passage means including valve port means located in a valving section of said housing, and said rotary valve member being arranged to rotate about the axis of rotation in close cooperating relation to said port means to alternately open and close said port means during rotation in close cooperating relation to said port means to alternately open and close said port means during rotation of the rotor means to provide a cyclical restriction of the flow passing through said flow passage means to create, during use, a water hammer effect in the drilling fluid thus resulting in pressure peaks in the fluid being supplied to the drill bit and a pulsating mechanical force on the drill bit; said rotor means, including its rotary valve member, being arranged relative to said housing and the valving section such that in use, the rotor means is substantially fully exposed to and bathed in the drilling fluid and the hydraulic forces acting on said rotor means during use are taken up internally by said rotor means and are not transmitted to any substantial degree to said bearing means.

4,819,746
REVERSE CIRCULATION DOWN-THE-HOLE HAMMER DRILL AND BIT THEREFOR
John C. A. T. Brown, Sheffield, England; Patrick Purcell, Shannon, and Peter J. Sweeny, Limerick, both of Ireland, assignors to Minroc Technical Promotions Ltd., Smithtown, Ireland
Filed Dec. 18, 1987, Ser. No. 134,833
Claims priority, application Ireland, Jan. 13, 1987, 73/87; Sep. 1, 1987, 2339/87
Int. Cl.[4] E21B *4/14, 10/38, 10/60*
U.S. Cl. 175—296 **33 Claims**



1. A bit for a reverse circulation down-the-hole drill, which defines a central return passageway, actuated by fluid under pressure adapted in use to be suspendably mountable in a chuck secured to the forward end of the drill, comprising:

a stem portion slidably mountable within the chuck, and adapted to extend into the drill,

a body portion extending from the stem portion to terminate in a bit face adapted to support abrading means,

main fluid exhaust means comprising a duct defined by an outer surface of the stem portion and passing through the body portion to communicate with a plurality of exhaust outlets defined in the bit face whereby substantially all exhausted fluid is conveyed through the body portion to the bit face; and

a return outlet defined by the body portion and opening to the bit face, which is in fluid communication through the bit with the central return passageway in the drill.

4,819,747
TRIANGULAR OIL WELL DRILL BIT FOR USE IN UNCONSOLIDATED FORMATIONS
Paul G. Walton, 211 Hamner Dr., Houma, La. 70364, and Percy A. Little, 5825 Cherokee La., Alexandria, La. 71301
Continuation of Ser. No. 882,228, Jul. 7, 1986, Pat. No. 4,683,965. This application Jul. 24, 1987, Ser. No. 77,612
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.
Int. Cl.[4] E21B *10/26*
U.S. Cl. 175—385 **8 Claims**

1. A drill bit apparatus comprising:

a. a tool body having a generally triangular horizontal cross-sectional area with a lower tip portion;

b. means for forming a removable connection between the tool body and a drill string;

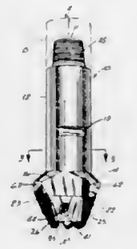
c. the tool body having an open-ended flow conveying longitudinal internal bore for circulating fluids between the tool body and a drill string connected thereto;

d. three longitudinal, radially spaced apart blade members on the tool body;

e. three generally flat flow zone surfaces which span between the blade members, each defining a substantially vertical surface area and an inclined surface area connected with the vertical surface, the substantially vertical surfaces generally defining an upper, large horizontal cross-section of the tool body and the inclined surfaces generally defining a lower, tapered section of the tool body;

f. at least one of the blade members having contact surface area means thereon for defining the radial dimensional limit of the tool body during a rotation of the tool body and a connected drill string; and

g. one or more jets extending between the tool bore and the generally flat flow zone surfaces.



4,819,748
ROOF DRILL BIT
Aaron S. Truscott, 202 N. Frontage Rd., Helper, Utah 84526
Filed Feb. 20, 1987, Ser. No. 16,879
Int. Cl.[4] F21B *10/58, 10/60*
U.S. Cl. 175—410 **42 Claims**



1. A mining drill bit for attachment to a hollow drill steel to rotate therewith and to cut a bore hole in rock or concrete, said drill bit comprising:

(a) a shank insertable in a socket in one end of the drill steel to permit said drill bit to be driven in rotation by the drill steel during drilling;

(b) a drill bit head having a distal end and a base at the end opposite therefrom, said drill bit head being rigidly attached at said base to said shank in axial alignment for rotation therewith;

(c) a generally planar cutting member retained in said distal end of said drill bit head for rotation therewith in alignment with the longitudinal axis thereof for bearing against the end of said bore hole during drilling to dislodge cut-

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tings therefrom, said cutting member having a chisel edge traversing said cutting member between opposite faces thereof at the center of the portion of said cutting member that bears against the end of the bore hole during drilling, said chisel edge removing cuttings from the end of said bore hole to lead the cutting of same; and

(d) irrigation means for injecting water into the end of said bore hole during drilling to remove cuttings from the vicinity of said rotating cutting member, said irrigation means comprising:

(i) a primary water conduit axially formed through said shank and opening on the interior of said drill steel; and

(ii) at least one secondary water conduit formed in said drill bit head communicating at one end thereof with said primary water conduit and terminating at the other end thereof in a water opening in said distal end of said drill bit head, said water opening being located in radial proximity to said rotating cutting member with at least a portion of said water opening being adjacent a leading edge thereof.

38. An attachment system for securing a mining drill bit to a hollow drill steel for cutting a bore hole in rock or concrete, the drill bit having a shank insertable in a socket portion in one end of the drill steel and a primary water conduit axially formed through the shank and opening on the interior of the drill steel, said attachment system comprising:

a. a first radially disposed retention passageway formed in the shank communicating therethrough with the primary water conduit;

b. a second radially disposed retention passageway formed in the socket portion of the drill steel and communicating through the drill steel to the interior thereof, said first and second passageways being alignable one with another by inserting the shank into the socket portion of the drill steel;

c. a selectively removable retention pin having a resilient arcuate tip for insertion first through said second retention passageway and then through said first retention passageway when said first and second retention passageways are aligned, such that said arcuate tip comes to reside within the primary water conduit out of alignment with said first and second retention passageways, thereby securing said retention point in said retention passageways and retaining the shank of the drill bit in the drill steel.

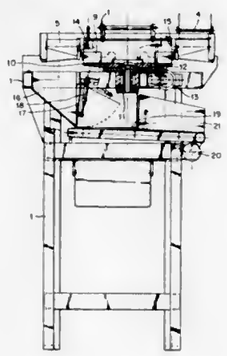
4,819,749

AUTOMATIC WEIGHING MACHINE FOR FOOD PRODUCTS AND THE LIKE

Agustin D. Guardiola, Badalona, Spain, assignor to Talleres Daumar, SA, Barcelona, Spain

Filed Feb. 16, 1988, Ser. No. 156,203
Claims priority, application Spain, Feb. 27, 1987, 8700794
Int. Cl.[4] G01G *13/00, 21/28*
U.S. Cl. 177—25.18 **7 Claims**

1. Automatic weighing machine for food products, of the type that comprises a support structure or frame and having machine members, driving means for said machine, feeding means for the corresponding product, means for weighing it, storage areas for storing it and provided with means for discharging it over means for directing it towards the exit of the machine, and a programmer processing unit that registers the actual weight of the product unit as it is entering into the machine, as it is weighed and also the actual weight of the product unit that at any given moment is contained in all and each of the storage areas for temporary storage, and when the weight of a batch of the product units contained in a selected storage area reaches a value prefixed by the machine user, the programmer processing unit orders the discharging of the batch of product units having said final prefixed weight linkage means disposed between said programmer processing unit and the corresponding members of the machine, characterized in that the means for feeding the product into the entry of the machine is actuated by the programmer processing unit comprising a hopper, a channel and at least an endless band which band end terminates above a series of troughs opened in the upper part in order to receive the product unit being discharged from said end, circularly arranged and connected, to corresponding weighing means, radially aligned and located more near to the center than said troughs, said weighing means are linked with the programmer processing unit and are mounted on a horizontal and rotating platform, through suitable means, in relation to the central vertical axis of the machine; in that said troughs have at least one movable wall,



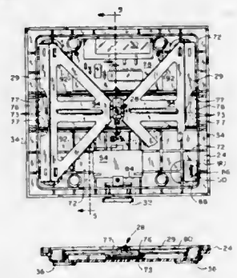
operated by suitable means actuated by the programmer processing unit; and under said troughs are located a series of stationary storage areas, opened at the upper part in order to receive the corresponding product previously weighed and with at least one movable wall, also operated by suitable means actuated by the programmer processing unit, in order to allow the discharging of each batch of units of product with a final predetermined weight, which discharging is effected onto the means for directing said batches of product towards the machine exit.

4,819,750

ELECTRONIC BATH SCALE

Francesco L. Carnevale, Waynesboro, Miss., assignor to Sunbeam Corporation, Downers Grove, Ill.

Filed Feb. 16, 1988, Ser. No. 156,422
Int. Cl.[4] G01G *21/08, 5/04, 3/14*
U.S. Cl. 177—256 **24 Claims**



1. A platform scale comprising:

a platform;

a generally rectangular base defining four corners, mechanically coupled to said platform; and

means disposed in said based for providing a signal representative of the weight on the platform including a transducer and a pair of actuation levers pivotally mounted and supported at said four corners within said base, defining fulcrums generally parallel to each other, wherein each of said actuation levers directly engages said transducer.

4,819,751

VALVULOPLASTY CATHETER AND METHOD

Lynn M. Shimada, Fullerton; Guy R. Lowery, Mission Viejo, and Glen L. Lieber, Yorba Linda, all of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 16, 1987, Ser. No. 109,761
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 **10 Claims**



1. In a catheter which includes a catheter body having a distal end and a through lumen, a tube extending through the through lumen and movable axially in the through lumen relative to the catheter body and having a distal end portion extending distally beyond the distal end of the catheter body, and a radially expandable and axially contractable balloon having opposite end portions coupled, respectively, to the catheter body and the distal end portion of the tube and inflatable through the catheter body whereby inflation of the balloon from a relaxed uninflated condition expands the balloon radially and contracts the balloon axially, the improvement comprising:

said catheter body having a distal end portion at least partially within the balloon which is less stiff than the region of the catheter body proximally of the distal end portion of the catheter body to avoid an abrupt change of stiffness within the balloon, said catheter body including a main body and said distal end portion of said catheter body being a separate member and being joined to the main body of the body.

4,819,752

BLOOD CONSTITUENT MEASURING DEVICE AND METHOD

Michael P. Zelin, Plainsboro, N.J., assignor to Datascope Corp., Paramus, N.J.

Filed Oct. 2, 1987, Ser. No. 103,713
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—633 **60 Claims**



1. A blood constituent measuring device for measuring a constituent of blood in a person's body, said device comprising:

means for sensing electromagnetic energy passing through a portion of the body at a plurality of wavelengths and for producing, for each wavelength, a respective electrical signal comprising a pulsatile component and a non-pulsatile component, wherein said sensing and producing means produces each of the signals in response to the electromagnetic energy received at the respective wavelength;

means for subtracting and storing at least a portion of the non pulsatile component from the signal for each wavelength;

means for processing the pulsatile component of the signal for each wavelength and for computing the amount of the blood constituent as a function of the processed pulsatile component of each signal and the stored portion of the non pulsatile component of each signal; and

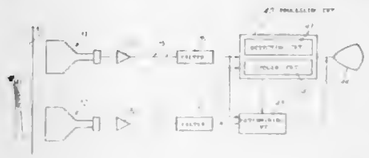
means for amplifying, with a controllable gain, the pulsatile component of each signal after at least a portion of the non pulsatile component is subtracted from the respective signal, wherein said amplifying means amplifies the signals, after subtraction by said subtracting and storing means, to a sufficient extent that the amplified subtracted output signals are within a predetermined sensitivity range of said processing and computing means.

4,819,753

FUNCTIONAL EVALUATION DEVICE CAPABLE OF EVALUATING AN ARTIFICIAL DEVICE BY THE USE OF ACOUSTIC EMISSION

Yakichi Higo, 5-3-1-101, Yagumo, Meguro-ku, Tokyo; Shigetomo Nunomura, and Masashi Ono, both of Kawasaki, all of Japan, assignors to Yakichi Higo, Tokyo, Japan

Filed Nov. 13, 1986, Ser. No. 929,771
Claims priority, application Japan, Nov. 16, 1985, 60-255851
Int. Cl.[4] A61B *7/00*
U.S. Cl. 128—773 **8 Claims**



1. A functional evaluation apparatus for evaluating the functional condition of an artificial joint buried in a living body which generates an inherent acoustic emission, the presence of the artificial joint causing the occurrence of an additional acoustic emission in response to each of a plurality of different movement forms of the living body, said additional acoustic emission having an acoustic frequency domain which is peculiar to the artificial joint and which is higher than the acoustic frequency domain of said inherent acoustic emission, the acoustic frequency domain for a properly functioning artificial joint differing from that of an improperly functioning artificial joint for each said movement form, said apparatus comprising:

first and second sensors, each of said sensors comprising a resonance body having a first and second oppositely positioned open ends, the first open end of each sensor having a pipe portion attached thereto and extending therefrom, the second open end of each sensor having a film attached thereto for converting the inherent acoustic emissions and the additional acoustic emissions into air vibration within said resonance body;

transducing means mounted inside the pipe portion of each sensor, with an air ventilation hole being provided within said pipe portion, for transducing said air vibration into an electrical signal with a component of said inherent acoustic emission removed from said electric signal, said electrical signal having a frequency domain corresponding to the frequency domain of said additional acoustic emission; and

frequency analyzing means coupled to said first and second sensors for analyzing the frequency domain of said electic signal to judge whether or not said artificial joint is properly functioning.

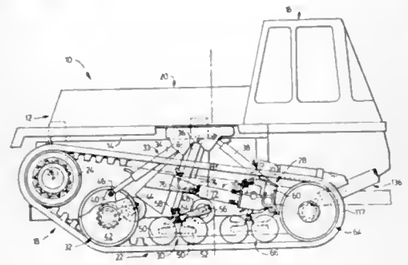
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4,819,754

MULTIPLE MODE VEHICLE SUSPENSION SYSTEM

Robert J. Purcell, Washington, and Robert R. Farris, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 23, 1987, Ser. No. 137,553
Int. Cl.[4] B60G *5/06, 13/06;* B62D *55/14*
U.S. Cl. 180—9.1 11 Claims



1. A suspension system for a vehicle having a frame with opposite lateral sides comprising:

first and second vehicle support apparatus disposed on opposite lateral sides of said frame wherein each support apparatus includes a wheel juncture device, a front wheel assembly, a following wheel assembly, and a pivoting beam connecting said wheel assemblies and being pivotally connected to said wheel juncture device;

first means for resiliently connecting the first vehicle support apparatus and the frame including a first strut having a fifth and a sixth chamber;

second means for resiliently connecting the second vehicle support apparatus and the frame including a second strut having a seventh and an eighth chamber;

a third, fourth, fifth, and sixth accumulator respectively associated with said eighth, sixth, seventh, and fifth chambers wherein said third and fourth accumulators are in respective fluid communication with said eighth and sixth chambers; and

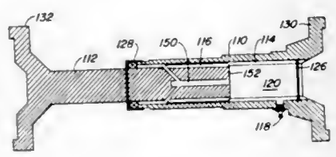
means for selectively fluidly connecting said fifth and seventh chambers with their associated accumulators and for selectively fluid connecting said fifth chambers, wherein said sixth chamber and said eighth chamber are fluidly isolated from said fifth and seventh chambers.

4,819,755

TELESCOPING DRIVE SHAFT HAVING LUBRICATING PASSAGE

Alfred S. Smemo; Daniel J. Paisley, and Gary L. Baskerville, all of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 14, 1988, Ser. No. 167,600
Int. Cl.[4] B60K *17/00*
U.S. Cl. 180—70.1 6 Claims



1. A telescoping drive shaft comprising:

a first shaft element having a hollow interior for holding lubricant, the first shaft element is also provided with longitudinally extending internal splines;

a second shaft element having a central longitudinal axis is inserted into the first shaft element and is free to reciprocate therein, the second shaft element is also provided with a lateral end face which is located adjacent to the hollow interior of the first shaft element, the second shaft element is further provided with longitudinally extending external splines which cooperate with the longitudinally extending internal splines of the first shaft element to transmit rotational movement between the drive shaft elements; and

a non-positive seal is positioned between the first shaft element and the second shaft element, the seal permitting the exhaust flow of fluid between the first and second shaft elements;

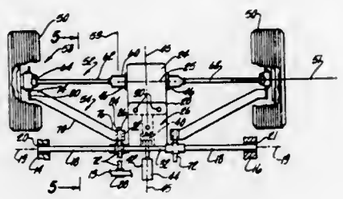
whereby the second shaft element is provided with a lubricating passage which communicates with the hollow interior of the first shaft element and for transmitting lubricant from the hollow interior to the engaging assemblies, a portion of the lubricating passage extends along the central longitudinal axis of the second shaft element, the lubricating passage is also provided with a plurality of radial passageways which extend outward from the lubricating passage portion extending along the central longitudinal axis of the second drive shaft element, the radial passageways communicating with the internal and external splines of the first and second drive shaft elements at the termination point of the second shaft element.

4,819,756

INDEPENDENT WHEEL SUSPENSION SYSTEM USING THRUST BEARING CONSTANT VELOCITY UNIVERSAL DRIVE JOINTS, BENDING AND TORSIONAL MOTION RESISTANCE SUSPENSION MEMBERS AND A TRANSVERSELY PIVOTABLE DIFFERENTIAL

Werner Krude, Grosse Pointe Park, Mich., assignor to GKN Automotive Inc., Auburn Hills, Mich.

Continuation of Ser. No. 586,012, Mar. 5, 1984, Pat. No. 4,671,370. This application Oct. 10, 1986, Ser. No. 917,426
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] B60K *20/00*
U.S. Cl. 180—73.3 5 Claims



1. An independent wheel suspension for a wheel assembly of a vehicle having support means for supporting a vehicle chassis comprising:

transverse support means pivotably mounted to said vehicle support means so as to allow a pivoting about a transverse support axis defined therethrough:

power delivery means defining a longitudinal power delivery axis therethrough, said power delivery means being fixedly mounted to said transverse support means to allow pivoting therewith about said transverse axis and defining a drive axis extending transversely therethrough spaced rearward of and substantially parallel to said transverse support axis by a drive axis offset;

an inboard universal joint mounted to a lateral side of said power delivery means along said drive axis to define a swing axis substantially parallel to and at a lateral offset from said longitudinal power delivery axis;

an outboard universal joint mounted to said wheel assembly;

drive shaft means coupling said inboard and outboard universal joints to define a swing length therebetween for carrying both driving torque and axial thrust loads therebetween while also allowing said wheel assembly to swing at said swing length about said swing axis; and

wheel motion resistance means coupled to said wheel assembly and said transverse support means for resisting movement of said wheel assembly relative to said vehicle support means about both said swing axis and said transverse support axis;

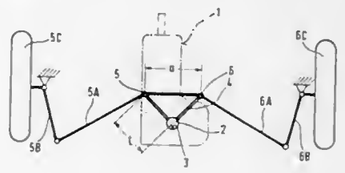
whereby said inboard and outboard universal joints permit a drive axis pivoting of said power delivery means about said drive axis as said wheel motion resistance means moves about one of said swing axis and said transverse support axis.

4,819,757

POWER STEERING FOR MOTOR VEHICLES

Dieter Elser, Essingen, and Friedemann Weiler, Böbingen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 134,076
Claims priority, application Luxembourg, Dec. 13, 1986, 00747
Int. Cl.[4] B62D *5/00*
U.S. Cl. 180—79 3 Claims



1. A steering linkage for motor vehicles for manual steering when booster steering power fails and wherein the steering linkage is then actuated by manual power through a steering shaft (2) at the output end of a steering gear mechanism (1); said steering shaft having thereon a steering link (4) carrying spaced pivots (5, 6) connecting with the ends of respective tie rods (5A, 6A) having pivotal connection means (5B, 6B) to the steered wheels (5C, 6C) of a vehicle wherein the link (4), is rocked by the shaft (2) for actuating the tie rods (5A, 6A) at said pivots (5, 6);

the improvement wherein the distance (a) between the spaced pivots on the link (4) is at least 0.8 times a distance (L) between the shaft (2) and either of said pivots (5, 6) whereby the manual steering force required decreases beyond a predetermined steering angle.

4,819,758

VEHICLE FOR DELIVERING LARGE CYLINDRICAL SHAPED LOADS AND THE LIKE

H. Jack Greene, Plantation; Russell J. Royer, Pembroke Pines; Robert L. Smidl, Jr., Davie, and Scott D. Renkes, Miami Lakes, all of Fla., assignors to EDS Technologies Inc., Hialeah, Fla.

Continuation of Ser. No. 618,045, Jun. 7, 1984, abandoned. This application Jul. 29, 1987, Ser. No. 85,231
Int. Cl.[4] B62D *1/24*
U.S. Cl. 180—168 14 Claims

1. A vehicle, having one longitudinal side thereto whose height is significantly less than an opposite longitudinal side to faciliate pick up and drop off of a load, for transporting a generally cylindrical-shaped load comprising

a frame having front and rear ends and first and second longitudinal sides;

a load cradling platform arranged in said frame, said platform comprising first, second, and third elongated plates arranged a predetermined distance from one another extending between the front and rear of said frame;

the first plate, having a lower side and an upper side, inclined with the lower side closer than the upper side to the second plate;

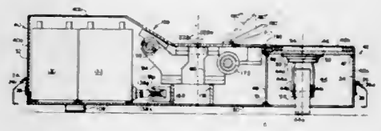
means for moving the third plate between a first position substantially aligned with said second plate and a second position inclined relative to said second plate;

first and second drive wheel assemblies arranged along one of the longitudinal sides of said frame between said one of said longitudinal sides and the upper side of said inclined first plate;

each of said drive wheel assemblies including a drive wheel;

first and second drive means for rotating the drive wheel of the respective first and second drive wheel assemblies;

means within said housing for rotating the first and second drive wheel assemblies from a first angular orientation for moving the vehicle in either a forward or rearward direction to a second angular orientation transverse to said first angular orientation for moving said vehicle in a direction transverse to said forward and rearward direction;



first and second caster assemblies each having freewheeling rollers;

said first and second caster assemblies being arranged along the remaining one of said longitudinal sides of said frame opposite the longitudinal side where said first and second drive wheel assemblies are mounted and between said remaining one of said longitudinal sides and said third plate;

means for driving said drive wheel of said first and second drive wheel assemblies when in the second angular orientation for moving said vehicle to a location for delivering the load;

a plurality of sensors arranged at spaced intervals between said first and third plates along an imaginary line parallel to the longitudinal sides of said vehicle for providing signals representative of the presence, length, and position of a load on said vehicle; and

means responsive to at least one of said plurality of sensors for raising the third plate to the inclined position at times when the load is placed upon said at least one of said plurality of sensors and for lowering the third plate at times when the load is removed from the plurality of sensors.

4,819,759

TELESCOPING ACTUATOR FOR IMPULSIVE SEISMIC SOURCE

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

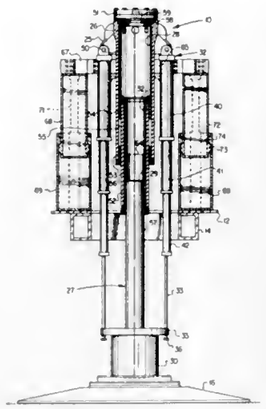
Filed Mar. 14, 1988, Ser. No. 168,076
Int. Cl.[4] G01V *1/147*
U.S. Cl. 181—121 10 Claims

1. Apparatus for impacting an earth coupled target to generate a seismic signal comprising:

(a) a hollow cylindrical firing tube having a closed and an open end and including an outer tubular section and an inner tubular section joined therewith in slidable telescopic relation for limited relative movement so as to provide a continuous cylindrical bore of variable length wherein the outer and inner sections respectively include such closed and open ends, the outer section further hav-

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ing a side wall penetrated by at least one port opening into the bore;
(b) means for suspending the outer section in spaced relation above and directed toward the target so that the closed end is uppermost;
(c) piston means projecting partially within the firing tube through the open end, such piston means terminating beneath such open end in an enlarged diameter portion;
(d) a source of compressed air in communication with the bore through the port so as to expose the inner section to a continuous downward axial force;
(e) first annular seal means mounted in the side wall of the outer section between the port and the closed end;
(f) means for releasably supporting the piston means in a cocked position such as to engage the first seal means and to thereby form a clearance within the bore between the closed end and the piston means which is isolated from the



compressed air and so that the enlarged diameter portion of the piston means is spaced from the target, and disposed in dependent supportive engagement with the inner section so as to resist the axial force thereon;
(g) means for removing such supporting means so as to allow the piston means and the inner section to fall, thereby means and thus enabling the compressed air to enter the clearance and in combination with the continuous axial force simultaneously to drive the piston means and the inner section downwardly, firing the bore being lengthened thereby in proportion to the downward movement of the inner section to enable the enlarged portion of the piston means to strike the target without disengagement of the piston means from the firing tube through the open end; and
(h) lift means adjustably secured between the outer section and the enlarged portion of the piston means for returning the piston means to the cocked position.

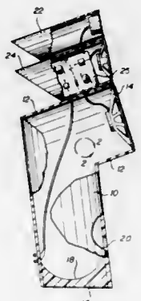
4,819,760
LOCKING ARM FOR WELL TOOL
Steven G. Petermann, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Filed May 3, 1988, Ser. No. 189,867
Int. Cl.[4] G01V *1/40*
U.S. Cl. 181—102 **11 Claims**

1. A well tool comprising:
a housing;
a locking arm mounted in said housing for movement between a retracted position and a deployment position;
a first piston for moving said arm from said retracted position to said deployed position; and
a second piston having a cross-sectional area larger than the cross-sectional area of said first piston for locking said arm in said deployed position wherein said first piston is slid-



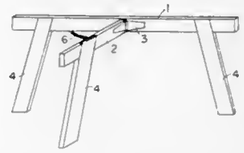
ably positioned within a bore formed in said second piston.

4,819,761
TUBULAR LOUDSPEAKER SYSTEM
Roderick A. Dick, 2250 Ridgepoint #1013, Austin, Tex. 78754
Filed Jan. 11, 1988, Ser. No. 141,779
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—145 **10 Claims**



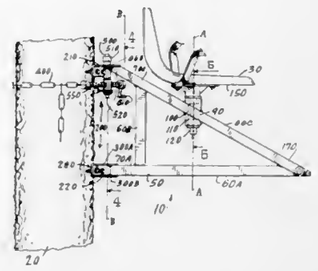
1. A loudspeaker-enclosure combination comprising:
(a) at least first and second loudspeakers, the first having a lower frequency response and a larger outer dimension than the second;
(b) at least first and second hollow tubes having inner dimensions which correspond substantially to the outer dimensions of said first and second loudspeakers respectively, said first tube including upper and lower portions which lie in different planes, said second tube being attached along an outer surface of said upper portion of said first tube, with one end of said second tube substantially parallel to an outer end of said upper portion of said first tube;
(c) means closing an outer end of said lower portion of said first tube;
(d) means mounting said first and second loudspeakers in said outer end of said upper portion of said first tube and said one end of said second tube respectively, said loudspeakers facing outwardly of said tubes; and
(e) means defining a port adjacent the closed end of said lower portion of said first tube.

4,819,762
FOLDING THREE LEGGED SAWHORSE
William R. Osborne, Sr., 65 Mill St., Binghamton, N.Y. 13900
Filed Apr. 7, 1988, Ser. No. 178,591
Int. Cl.[4] B27B *21/06;* **B25H** *1/06*
U.S. Cl. 182—153 **3 Claims**



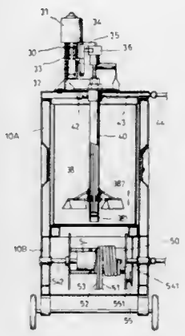
1. Sawhorse type support means suitable for use alone or in combination with another of the same, comprising:
(a) a first horizontal beam;
(b) a second horizontal beam;
(c) hinge means for connecting said second horizontal beam at an angle substantially perpendicular near the midpoint of said first horizontal beam;
(d) three vertical support members;
(e) means for joining said vertical support members to said horizontal beams;
(f) said hinge means including a hinge pin for connecting said second horizontal beam to said first horizontal beam near its midpoint, whereby said second horizontal beam can fold from its open substantially perpendicular position to a closed position parallel to said first horizontal beam;
(g) a spring means being attached by one end to the underside of said first horizontal beam and by the other end to the underside of said second horizontal beam;
(h) said spring being tensioned in a direction and position on one side of the hinge pin to hold said second horizontal beam in its open perpendicular position during use and said spring being tensioned in a direction and position on the other side of said hinge pin to lock said second horizontal beam in its closed position parallel to said first horizontal beam.

4,819,763
TREE STAND FOR OBSERVATION POST
James N. Grote, Route #2, Cloverdale, Ohio 45827
Filed Jan. 4, 1988, Ser. No. 140,577
Int. Cl.[4] A45F *3/26*
U.S. Cl. 182—187 **1 Claim**



1. A stand for observation purposes, capable of being attached at an elevated position on a longitudinally extending vertical member affixed in the group, said device comprising:
(a) a frame member; said frame member comprising a right triangular member, as viewed from a side elevational view, with the lower leg of such triangle being adapted to be parallel to the ground and the upper leg being the hypotenuse of such triangle;
(b) means in hypotenuse leg of such triangle said frame member to pivotally hold a support portion of a seat member;
(c) attachment means affixed to said frame member to affix said frame member to a portion of said longitudinally extending member, said attachment means comprising pivotable members affixed to the frame member, which pivotable members are in turn provided with means to affix said attachment means to the vertical member.

4,819,764
FULLY AUTOMATIC SINGLE-PERSON OPERATED GREASE INJECTION DEVICE
Huang, Chuan-Guo, No. 130, Jong-Jeng N. Rd., Ruey-Suey Hsiang, Hwa Lien Hsien, Taiwan
Filed Jun. 22, 1987, Ser. No. 64,876
Int. Cl.[4] F16N *21/00*
U.S. Cl. 184—36 **7 Claims**



1. A fully automatic single-person operated grease gun injection device comprising:
an exterior case body divided into a hollow top layer (**10A**) defining a grease barrel-reception cavity, and a bottom layer (**10B**) located below said top layer, said bottom layer including a square cushion tube (**13**) extending thereabout to bear the weight of a grease barrel located in the aforementioned cavity;
handle means (**20**) attached to said top layer;
means (**14**) locking the two layers together;
motion-generating means (**30**) located on said top layer; said motion-generating means comprising first motor (**31**), a worm (**33**) driven by said motor, a worm wheel (**32**) driven be said worm, and a crank element (**34**) rigidly connected to said worm wheel; said motion-generating means further comprising an arm structure (**36**) driven by said crank element for vertical oscillatory motion;
a grease pump comprising stationary vertical tube (**40, 40A**) extending downwardly from said top layer within the aforementioned cavity for disposition within a grease barrel, and a piston means (**38,381**) extending downwardly from said arm structure (**36**) within said tube, whereby
vertical reciprocation of said piston means moves grease upwardly through said tube;
a grease scratching-collecting means comprising a control rod (**39**) depending from said arm structure (**36**), and a grease-displacing means (**48**) connected to the lower end of the control rod for moving grease toward the space

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adjacent to the lower end of the aforementioned vertical tube;

a rotary drum (**50**) located within said bottom layer; a second motor (**54**) connected to said drum for rotating same around the drum axis; a flexible grease pipe (**51**) coiled around said drum whereby drum rotation causes said flexible pipe to be drawn onto or off of the drum surface; conduit means (**43,44**) interconnecting said vertical tube and one end of the flexible grease pipe, whereby operation of the pump causes grease to flow through the flexible pipe;

a grease gun (**60**) having a nozzle (**61**) connected to the other end of the flexible pipe for discharging grease out of the injection device; an electrical control switch (**63**) carried on said grease gun;

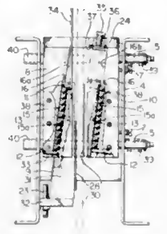
and an electrical cable (**52**) extending along said flexible pipe in electrical connection with said control switch and said second motor.

4,819,765

ARRESTER DEVICE FOR ELEVATORS

Hugo Winkler, Vienna, Austria, and Johannes De Jong, Jarvenpaa, Finland, assignors to Kone Elevator GmbH, Baar, Switzerland

Filed May 4, 1987, Ser. No. 45,462
Claims priority, application Finland, May 6, 1986, 861892
Int. Cl.[4] B66B *5/16*
U.S. Cl. 187—88 **4 Claims**



1. An elevator arrester device actuable to unidirectionally brakingly pinch engage opposite sides of an elongate vertical elevator guide member (**30**), comprising:

(a) a frame (**4**) disposed flanking the elevator guide member,

(b) a wedge housing (**8**) disposed within the frame and displaceable laterally relative thereto, said housing defining first and second substantially parallel guide surfaces (**16***a*, **16***b*) inclined at substantially equal but opposite acute sides thereof, respectively,

(c) an active wedge (**9**) slideably displaceable parallel to the first guide surface and having a braking face frictionally engageable with one side of the elevator guide member,

(d) a counterwedge (**10**) slideably displaceable parallel to the second guide member and having a braking face frictionally engageable with another, opposite side of the elevator guide member,

(e) a compression spring (**24**) disposed between the housing and one end of the counterwedge for continuously urging the counterwedge in a direction substantially parallel to the second guide surface,

(f) means (**5**, **39**, **40**) for biasing the housing laterally of the frame, and

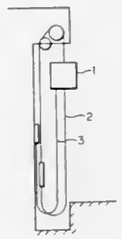
(g) means for selectively urging the active wedge in a direction parallel to the first guide surface such that the braking face thereof frictionally engages said one side of the elevator guide member, which attendantly displaces the housing laterally against the force of the biasing means to frictionally engage the braking face of the counterwedge with said opposite side of the elevator guide member and displace the counterwedge against the force of the compression spring to pinch the guide member between the braking faces.

4,819,766

GROUP SUPERVISING SYSTEM FOR OUTDOOR OBSERVATORY ELEVATOR

Takaharu Saito, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 2, 1988, Ser. No. 203,294
Claims priority, application Japan, Jun. 4, 1987, 62-140331
Int. Cl.[4] B66B *1/18*
U.S. Cl. 187—124 **3 Claims**



1. A group supervising system for positioning an outdoor observatory elevator cage having at least one cable disposed in a shaft on the exterior of a building in a geometrically balanced disposition during period of low usage, the system comprising:

first means for directing the cage to move to a predetermined floor during periods of low usage, the predetermined floor providing a geometrically balanced disposition of the cage, the first means being connected to the cage; and

second means for directing the cage to move to a floor other than the predetermined floor (a) after lapse of a predetermined time period during which the cage has waited at the predetermined floor and no hall call has been received or (b) responsive to a hall call received prior to lapse of the predetermined time, and for directing the cage subsequently to move back to the predetermined floor to prevent damage to devices or implements in the shaft resulting from air currents causing the cable to sway back and forth and to collide with the devices and implements, the second means being connected to the cage.

4,819,767

HAND BRAKE APPARATUS FOR HAND TRUCKS

Oscar B. Laird, 13430 Bandera, Houston, Tex. 77015

Filed Sep. 11, 1987, Ser. No. 95,107
Int. Cl.[4] B60T *1/04, 7/10*
U.S. Cl. 188—2 D **6 Claims**

1. A hand brake apparatus for installation on wheeled trucks of the type having a load supporting frame and at least two laterally opposed support wheels having a fixed direction supporting the frame for movement over the ground and an handle portion for moving and directing the load supporting frame, said hand brake apparatus comprising:

an elongate hollow tubular housing formed of square tubing releasably attached to the load supporting frame horizontally between and parallel to the rotational axis of two laterally opposed support wheels having a fixed direction, said tubular enclosed at least one end by an end cap having a central hole therethrough,

at least one extensible rectangular bar retractably carried within said housing and having a cylindrical portion extending through said end cap hole and extensible outwardly from said enclosed end,

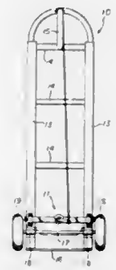
a brake pad of resilient material removably secured on the outer end of said cylindrical portion to frictionally engage the sidewall of said wheels in the extended position and thereby prevent rotation thereof,

a cam member rotatably mounted in said housing in operative engagement with the inward end of said rectangular bar to move said brake pad axially outward relative to said enclosed end upon rotation thereof,

hand lever means releasably attached to said load supporting frame handle portion in position to be grasped by one hand and operatively connected to said cam member for rotating same to move said brake pad outwardly from the end of said housing to engage the sidewall of said support wheels,

a length of cable having one end connected to said hand lever means and its other end connected to said cam member for rotating said cam member,

said hand lever means comprises an elongate tubular housing having a clamp assembly for releasably securing same to



the load supporting frame handle portion and at least one elongate bar slidably mounted in said hand lever tubular housing and adapted at its lower end to receive one end of said cable and a hand grip lever member secured to said sliding bar to manually slide same within said hand lever tubular housing to cause rotation of said cam member,

a link member adjustably connected to said one member and said cable for connection in varying angular positions relative to the cam rotational axis for selectively altering the amount of pivotal movement required to rotate said cam member to effect movement of said rectangular bar, and

a compression spring carried on said rectangular bar cylindrical portion in said elongate hollow tubular housing and biased between said cap and the rectangular portion of said bar for maintaining said brake pad in a normally retracted position spaced inwardly adjacent the wheel sidewall.

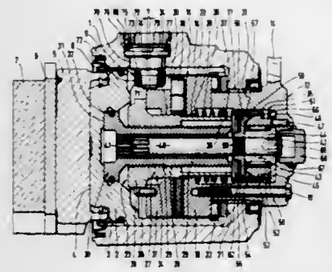
4,819,768

ACTUATING DEVICE FOR A DISC BRAKE FOR AUTOMOTIVE VEHICLES

Erhard Czich, Bremthal-Eppstein; Wolfgang Endler, Hofheim, and Joergen Wagner, Oberursel-Weiss-kirchen, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,244
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631036
Int. Cl.[4] F16D *65/38, 65/56*
U.S. Cl. 188—196 D **4 Claims**

1. An actuating device for a disc brake used in automotive vehicles, said device comprising a rotatable actuating member, a transforming device cooperatively connected to said actuating member for transforming rotary motion into an axial motion, said transforming device including an axially moveable component for acting against a brake application member to apply an axial force to said brake application member, a holding element retained in a brake housing for holding said component of said transforming device to preclude rotation of said component while allowing axial movement of said component, said holding element including a first element fastened to said housing and a rotatable member rotatably supported on said first element and a friction-reducing means provided between



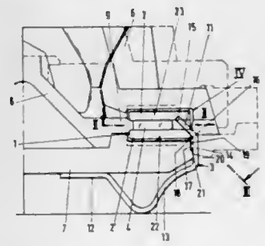
said rotatable member and said first element, said first element comprising a bolt and said friction reducing means comprising a coating provided between said bolt and said rotatable member, said bolt including a portion thereof with a conical configuration in the area of support of the rotatable member.

4,819,769

BRAKE DISC DEVICE

Horst Metzler, and Guenther Schwarz, both of Tuttlingen, Fed. Rep. of Germany, assignors to Schwaebische Huettenwerke Gesellschaft mit beschraenkter Haftung, Aalen-Wasseralfingen, Fed. Rep. of Germany

Filed Apr. 17, 1987, Ser. No. 39,224
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612896
Int. Cl.[4] F16D *65/10*; **B22D** *19/00*
U.S. Cl. 188—218 XL **7 Claims**



1. A cast brake disc device for an inwardly gripped disk brake for a motor vehicle, comprising:

(a) first and second axially spaced generally circular brake plates having a longitudinal axis and contact surfaces for brake pads,

(b) webs positioned between said brake plates and interconnected thereto, said webs being circumferentially spaced to define spaced cooling channels between said plates, certain of said webs being provided with widened end sections at their radially outer ends to receive a carrier for said brake disc,

(c) a brake disc carrier including a cylindrical section spaced radially outwardly of and partially surrounding said brake disc from the outside, said cylindrical section of said carrier being formed at an end thereof adjacent said disc brake with circumferentially spaced connecting parts, said connecting parts protruding obliquely to said axis from a point radially outside of said brake plates into the radially

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outer ends of said widened end section of said certain of said webs so that said connecting parts dare anchored therein during casting, and

(d) an insulating member positioned between the radially outer edge of said first brake plate and an opposed wall of said cylindrical section of said carrier formed with said connecting parts.

4,819,770

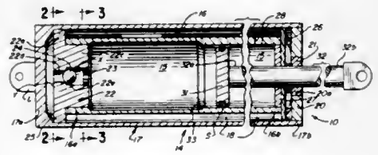
HYDRAULIC CONTROL DEVICE

Norbert Hahn, South Milwaukee, Wis., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 65,261, Jun. 22, 1987, abandoned. This application Oct. 13, 1987, Ser. No. 108,262

Int. Cl.[4] F16F *9/48*

U.S. Cl. 188—284 12 Claims



1. A hydraulic device for controlling changes in the rate of relative movement of first and second members between predetermined first and second stations, said device comprising a housing adapted to be connected to the first member, said housing including an interior elongated cylindrical first cavity for hydraulic fluid, and a second cavity for hydraulic fluid segregated from said first cavity, said first and second cavities being substantially filled with hydraulic fluid, said first cavity being provided with contiguous first and second segments, the first segment having a smaller cross-sectional area than the second segment; said contiguous first and second segments providing a substantially abrupt change in crosssectional area of said first cavity; first means disposed adjacent one end portion of said first cavity first segment remote from said second segment and allowing a first predetermined flow of hydraulic fluid between said cavities during predetermined portions of relative movement of the first and second members; a piston mounted for reciprocatory movement within said first cavity, said piston having an exposed portion adapted to be connected to the second member, and a concealed head portion in sliding sealing engagement with only the first segment of the first cavity during said predetermined portions of relative movement of the first and second members; and second means remote from said first means and effecting a second predetermined flow of hydraulic fluid from the first cavity to the second cavity during a predetermined portion of relative movement of the first and second members from the first station to the second station, said second means effecting a third predetermined flow of hydraulic fluid from the second cavity to the first cavity during a predetermined portion of relative movement of the first and second members from the second station to the first station; said first means and second means coacting to appreciably impede by hydraulic pressure movement of said concealed head portion only during movement of the latter in said first segment of said first cavity in a direction towards said second segment.

4,819,771

VIBRATION DAMPER FOR VEHICLES

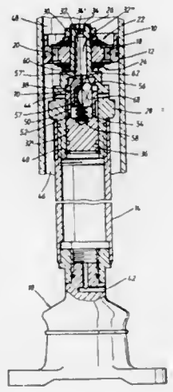
Manfred Britze, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 15,712

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604844

Int. Cl.[4] F16F *9/46*

U.S. Cl. 188—299 14 Claims



1. An adjustable damping force vibration damper for vehicles and the like, comprising:

a cylinder filled with damping fluid,

a working piston dividing the cylinder into first and second cylinder spaces, said piston being disposed fixedly on a piston rod extending out of the cylinder,

damping valve means at the working piston for communicating damping fluid between the first and second cylinder spaced during relative moment of the working piston and cylinder,

and damping level adjusting means for adjusting the flow of damping fluid between the first and second cylinder spaces, comprising:

a connecting duct means disposed in the working piston in bypassing relationship to said damping valve means and having respective first and second duct opening means opening to said respective first and second cylinder spaces, said first duct opening means being disposed at one axial end face of the working piston and said second duct opening means being disposed at an annular circumferential surface of the working piston, said connecting duct means including a first throttling bore in said working piston between said first and second duct opening means,

a control piston axially displacable in the working piston between respective positions blocking and unblocking said second duct opening means in response to selective supply of control fluid to said control piston, thereby blocking and unblocking said connecting duct means, and

a throttling piston axially guided with a guide bore at one end of the control piston, said throttling piston having an axially extending second throttling bore and being pressure dependably moveable into a throttling position blocking the connecting duct while permitting flow from said connecting duct to said second duct opening means through said second throttling bore in response to one moving direction of the working piston and into an open position permitting flow to the second duct opening means without throttling in response to an opposite moving direction of the working piston.

4,819,772

MOTION-DAMPING APPARATUS FOR A VEHICLE

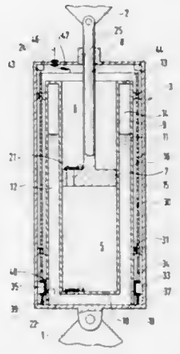
Erich Rubel, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 6, 1988, Ser. No. 178,169

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712349

Int. Cl.[4] B60G *17/10;* F16F *9/46*

U.S. Cl. 188—299 21 Claims



1. An adjustable motion-damping apparatus for vehicles, comprising an outer tubular jacket (**15**), an inner tubular jacket having an open end and a closed end within said outer tubular jacket in coaxial alignment therewith, a piston in said inner jacket which divides said inner tubular jacket into first and second work chambers for receiving an electrorheological damping fluid, a piston rod secured to said piston, said piston rod extending from said inner tubular jacket through said outer tubular jacket, a control chamber surrounding said inner tubular jacket for receiving said damping fluid, said control chamber including two plate electrodes to which an electrical source is connected to generate an electrostatic field to adjust the damping, said first electrode (**30**) being axially displaceably disposed in a damping fluid flow direction, a control slide device (**35**) connected to said first electrode, said control slide device is adapted to control the size of an overflow cross section of at least one opening (**40**) in said control chamber which controls the damping fluid, and said work chambers communicating with one another via said overflow cross section, the size of which is defined by said control slide device, the position of which is determined by said axially movable first electrode, the intensity of the electrostatic field developed between the electrodes influencing the magnitude of the shear stress of the electrorheological damping fluid flowing in said control chamber and hence deflection of said first electrode.

4,819,773

VALVE STRUCTURE FOR HYDRAULIC DAMPER

Hidekuni Ito, and Heihati Kondo, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Showa Seisakusho, Japan

Filed Jul. 14, 1987, Ser. No. 72,865

Claims priority, application Japan, Jul. 14, 1986, 61-107823[U]

Int. Cl.[4] F16F *9/34*

U.S. Cl. 188—322.15 2 Claims

1. A piston assembly for a hydraulic damper, comprising:

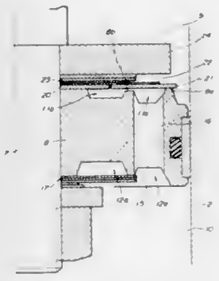
a generally cylindrical piston having a longitudinally extending central axis and including upper and lower surface, a first passage extending between the upper and lower surfaces, and a second passage extending between the upper and lower surfaces;

a piston rod attached to the piston and extending along the longitudinal axis;

first valve means for normally closing one end of said first passage and opening said one end of the first passage only during the compression stroke;

second valve means normally closing one end of said second passage and opening said one end of the second passage only during the extension stroke;

said piston further including inner and outer annular ridges, said outer annular ridge being greater in height than said inner annular ridge in a direction parallel to the longitudinal axis of the piston;



said first valve means including a spacer fit around said piston rod and resting on the upper surface of the piston, a leaf ring concentric with said spacer and resting on the outer annular ridge, and a disk fit around said piston rod and superimposed on said spacer and said leaf ring, said disk allowing said leaf ring to open only during the compression stroke while preventing flexure of the leaf ring during the extension stroke.

4,819,774

DRIVE ARRANGEMENT FOR COMMERCIAL MOTOR VEHICLES

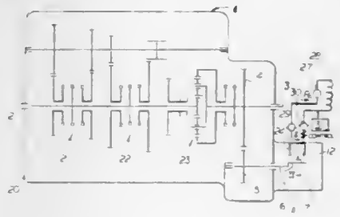
Gerold Bieber, Langenargen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 887,171 filed as PCT EP85/00554 on Oct. 21, 1985, Published as WO86/02608 on May 9, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 140,466

Claims priority, application PCT Int'l Appl., Oct. 24, 1984, PCT/EP84/00326; Oct. 21, 1985, PCT/EP85/00554

Int. Cl.[4] B60K *41/26;* F16D *57/06*

U.S. Cl. 192—4 A 1 Claim



1. A drive arrangement for a commercial motor vehicle, comprising:

a variable-speed transmission having a driven output shaft;

a brake shaft offset from but parallel to said driven output shaft;

step-up gearing including a large drive gear on said driven output shaft and a small driven gear on said brake shaft;

a continuous duty brake connectable to said brake shaft and including a radial-piston machine having a radial piston and a lifting element driven by said brake shaft, said radial piston being engageable with and disengageable from said

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lifting element, said radial piston being reciprocatable in a cylinder between a radially inner position and a radially outer position to vary a volume of a chamber of said cylinder; and

means including a check valve permitting flow from said chamber and a spring check valve permitting flow to said chamber for selectively applying a control pressure to said piston for maintaining said piston in engagement with said lifting element for displacement of said piston to brake said brake shaft exclusively upon the application of said control pressure, and for selectively relieving said control pressure for disengaging said piston from said lifting element exclusively upon the elimination of said control pressure to decouple said brake from said brake shaft, said piston remaining in the radially outer position while said brake is decoupled from said brake shaft.

4,819,775

FREE WHEEL WITH CLAMPING BODIES

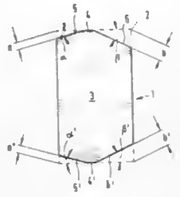
Arnold Witt, Oberursel, and Alfred Skrivanek, Limeshain, both of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Sep. 1, 1987, Ser. No. 91,882

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3629999

Int. Cl.[4] F16D *41/07*

U.S. Cl. 192—41 A 5 Claims



1. A method of establishing a predetermined drag contact pressure for a set of spring biased clamping bodies during an overrunning operation of a free wheel wherein the clamping bodies (**1**) are in radially outward thrust transmitting engagement with a cylindrical outer ring (**7**) and wherein the clamping bodies (**1**) are operatively arranged between a cylindrical inner ring (**8**) and the cylindrical outer ring (**7**) of the free wheel, and each have a first partially cylindrical area (**3**) on its radially outer side engaging the outer ring (**7**) on a contact line (**9**) about which the spring biasing tends to rotate them forwardly and a second partially cylindrical area (**3'**) on its radially inner side engageable with the inner ring (**8**) along a contact line (**10**), comprising the steps of:

determining the position of the center of gravity (S) of a clamping body (**1**);

determining the moment acting on said one body about said contact line (**9**) between said outer ring (**7**) and said first partially cylindrical area (**3**) caused by the spring force (F_F) and centrifugal force (F_C) acting on said body and

changing the centrifugal force induced moment (M_c) acting on said body by removing material from the opposite lateral side surfaces (**4**, **4'**) at one of the front and rear portions of the latter and at predetermined angles (α, α' or B, B') to said lateral side surfaces (**4**, **4'**) thereby forming converging bevelled surfaces (**5**, **5'** or **6**, **6'**) on said body so as to change the position of the center of gravity (S) of said body.

4,819,776

ROLLER CAGE FOR OVERRUNNING CLUTCHES

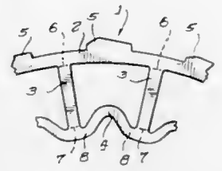
Hermann Leitz, and Herbert Moser, both of Heidelberg, Fed. Rep. of Germany, assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Continuation of Ser. No. 869,763, Jun. 2, 1986, abandoned. This application Aug. 19, 1987, Ser. No. 87,061

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1985, 3519812

Int. Cl.[4] F16D *15/00, 41/06*

U.S. Cl. 192—45 11 Claims



1. A one-piece, seamless metal cage for housing clutch rollers in an overrunning clutch, the cage including an annular side plate having an axis and two opposite faces perpendicular to said axis, a plurality of integral circumferentially spaced crossbars extending parallel to said axis from one face and terminating in free ends, each crossbar adapted to support a folding spring associated with a clutch roller, and an annular side ring having a wavy form and formed integral with and perpendicular to the free ends of said crossbars spaced from and generally parallel to said side plate.

4,819,777

SYSTEM FOR INTEGRALLY CONTROLLING AN ENGINE AND AN AUTOMATIC TRANSMISSION HAVING A DEVICE FOR DETERMINING ENGAGEMENT OF THE LOCKUP CLUTCH WHEN A CERTAIN TIME DURATION ELAPSES AFTER OUTPUT OF AN ENGAGEMENT SIGNAL

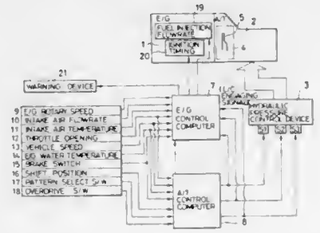
Hideki Yasue, and Kagenori Fukumura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 9, 1987, Ser. No. 36,467

Claims priority, application Japan, Apr. 14, 1986, 61-85534

Int. Cl.[4] B60K *41/28;* F16H *45/02*

U.S. Cl. 192—0.062 4 Claims



1. A system for integrally controlling an engine and an automatic transmission with a lock-up clutch, wherein said system includes means for automatically switching gear stages for automatically shifting gears in accordance with a preset shift map, means for outputting an engaging signal to engage said lockup clutch of a torque converter for engaging said lock-up clutch during at least one gear stage, and torque change control means for changing engine torque during shifting based on whether the lock-up clutch is engaged to maintain satisfactory shift characteristics, said system comprising:

means for sensing output of the engaging signal for engaging said lockup clutch;

means for determining a predetermined time duration after said engaging signal is outputted; and

means for determining that said lockup clutch is engaged when said engaging signal is outputted and said predetermined time duration elapses after the output of said engaging signal to determine an engagement state of the lock-up clutch.

3. A system for integrally controlling an engine and an automatic transmission, wherein said system includes means for automatically switching gear stages for automatically shifting gears in accordance with a preset shift map, means for outputting an engaging signal to engage said lockup clutch of a torque converter for engaging said lockup clutch during at least one gear stage, and torque change control means for changing engine torque during shifting based on whether the lock-up clutch is engaged to maintain satisfactory shift characteristics, said system comprising:

means for sensing output of the engaging signal for engaging said lockup clutch;

means for detecting a turbine rotary speed of said torque converter;

means for detecting an engine rotary speed;

means for determining whether said turbine rotary speed and said engine rotary speed are substantially equal to each other; and

means for determing that said lockup clutch is engaged when said engaging signal is outputted and said turbine rotary speed and said engine rotary speed are substantially equal to each other.

4,819,778

ENGAGEMENT DEVICE FOR AN ELECTROMAGNETIC SPRING-WOUND CLUTCH

Isamu Shirai; Susumu Ujiie, both of Isesaki, and Takeshi Koitabashi, Annaka, all of Japan, assignors to Sanden Corporation, Isesaki-Shirai, Japan

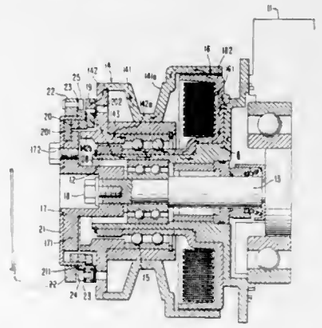
Filed Aug. 6, 1984, Ser. No. 637,799

Claims priority, application Japan, Aug. 6, 1983, 58-144317

The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.

Int. Cl.[4] F16D *27/10*

U.S. Cl. 192—84 T 4 Claims



1. In an electromagnetic spring-wound clutch including a first rotatable member having an axial end plate of magnetic material, a second rotatable member coaxially positioned with respect to said first rotatable member, an armature plate member coaxially postioned with respect to said first rotatable member and frictionally engageable therewith, a coil-wound spring wound around said first rotatable member and being connected at its respective ends to said second rotatable member and said armature plate member, a cover plate fixed to said second rotatable member and covering the outer peripheral surfaceof said coil-wound spring, and electromagnetic means associated with said axial end plate of said first rotatable member for attracting said armature plate member to said axial end plate so that rotation of said first rotatable member is transmitted to said second rotatable member through said armature plate member and said coil-wound spring by the operation of said electromagnetic means, the improvement comprising an inelastic guide member disposed on said cover plate and coaxially rotatable with said first rotatable member, said armature plate member being connected to said guide member by a plurality of leaf springs to maintain a predetermined axial air gap between said axial end plate of said first rotatable member and said armature plate member wherein said guide member is rotatable with respect to said cover plate.

4,819,779

CENTRIFUGAL CLUTCH

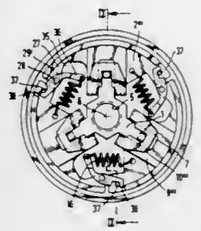
Hans Nickel, Cottenweiler; Michael Wissmann, Schorndorf-Weiler, and Horst Scholz, Adelberg, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Apr. 8, 1987, Ser. No. 36,016

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611694

Int. Cl.[4] F16D *43/18*

U.S. Cl. 192—105 BA 8 Claims



1. A centrifugal clutch for apparatus such as a motor-driven chain saw or the like, the centrifugal clutch comprising:

a carrier adapted to be rotatably driven about a rotational axis by the motor of the apparatus;

an output member arranged in surrounding relationship to said carrier;

a plurality of centrifugal weights mounted on said carrier so as to be movable radially of said rotational axis between a rest position whereat said weights are disengaged from said output member and an active position whereat said weights are in contact engagement with said output member for transmitting torgue thereto from said carrier;

restraining means for restraining said weights to prevent their movement out of said rest position until after a predetermined value of force on said weights is exceeded;

tension spring means for said centrifugal weights into their respective rest positions;

radial guide means for radially guiding said centrifugal weights on said carrier so as to move against the force of said springs means from said rest position whereat said weight is disengaged from said clutch drum and an active position whereat said weights are in contact engagement with said clutch drum;

said tension means including a plurality of springs corresponding to respective ones of said centrifugal weights; and,

said restraining means including: a plurality of levers pivotally mounted on corresponding ones of said centrifugal weights, each of said levers having two lever arms having respective outer ends; each one of said springs having one end connected to the outer end of one lever arm of one of

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said levers and an other end of said one spring being connected to the centrifugal weight directly adjacent the centrifugal weight on which said one lever is pivotally mounted; and, releasable latching means for latching the other arm of said one lever to said centrifugal weight directly adjacent the centrifugal weight on which said one lever is pivotally mounted until said predetermined value of force is exceeded.

4,819,780

DEVICE FOR VERIFYING COINS

Bernhard Trummer, Bern, and Stefan Luder, Burgdorf, both of Switzerland, assignors to Autelca AG., Gümligen, Switzerland

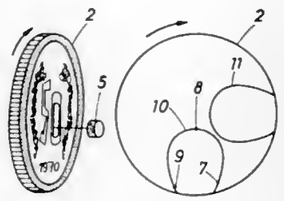
PCT No. PCT/CH86/00105, § 371 Date Mar. 25, 1987, § 102(e) Date Mar. 25, 1987, PCT Pub. No. WO87/00661, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 25, 1986, Ser. No. 43,346

Claims priority, application Switzerland, Jul. 26, 1985, 3254/85

Int. Cl.⁴ G07D *5/08*

U.S. Cl. 194—317 **6 Claims**



1. A device for coin verification, comprising a coin guide (1, 3) with a roll track surface (1) for the coin (2) to be checked and a lateral, steep guide surface (3) along which the coin (2) rolling on the roll track surface (1) slides in contact therewith; at least one inductive probe (5) excited by high frequency and arranged at the guide surface, for scanning on a track (10, 11) on that side of a coin (2) passing along the coin guide (1, 3) which slidingly contacts the guide surface (3) and thereby obtaining a signal (14) constituting information on the portion of the impress design extending along the track (10, 11); a scanner (20) and an analog-to-digital converter (23) connected in circuit with said at least one inductive probe (5), for the derivation of a sequence of digital signals corresponding to discrete values (21) of the signal (14) obtained from the coin to be checked, which discrete values follow one another at identical time intervals; evaluating means (25) including a memory (33) for storing the sequence of digital signals obtained for each track (10, 11) from various starting positions for each coin type acceptable while sliding with one and while sliding with the other coin side along the guide surface (3); and comparison means (34, 36, 38) connected with said analog-to-digital converter (23) and said memory (33) for comparing the signal sequence obtained from the coin (2) to be checked, with each of the stored signal sequences in the memory (33) and yielding a coin design coincidence signal if the signal sequence obtained from the coin to be checked corresponds within certain limits to one of the stored signal sequences.

4,819,781

PASSENGER CONVEYOR WITH UNITARY BALUSTRADE PANEL SUPPORT MEMBERS

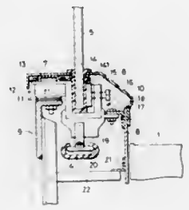
Chuichi Saito, and Masamitsu Hanano, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Elevator Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Apr. 22, 1987, Ser. No. 41,229

Claims priority, application Japan, Apr. 22, 1986, 61-91248

Int. Cl.⁴ B66B *23/22, 23/24*

U.S. Cl. 198—335 **8 Claims**



1. A passenger conveyor comprising a main body frame extending from one of two landing areas to the other, a plurality of steps connected together and mounted on said frame to circulate endlessly, a pair of moving handrails driven in synchronism with said steps and in the same direction as said steps, a pair of balustrades supported by said main body frame, disposed on opposite sides of said steps to form side walls and supporting said moving handrails, each of said balustrades including an upstanding balustrade panel, an inner deck cover, an outer deck cover and a skirt guard, characterized by comprising a plurality of structural support members mounted on said main body frame in spaced relation in the length direction of said main body frame, each of said structural support members made of one piece and having a U-shaped support portion extending in the length direction of said main body frame and providing opposite two, first and second, upstanding wall portions between which a lower portion of said balustrade panel is inserted, a mounting flange portion formed on one side of said U-shaped support portion and having an upper mounting portion on an upper side thereof for mounting thereon said outer deck cover, and a lower mounting portion on a lower side thereof for securing said structural support member to said body frame by screw means extending between said lower mounting portion and said main body frame, and a mounting projection formed on the other side of said U-shaped support portion, a bar elongated in the length direction of said main body frame and mounted on said mounting projection, said bar being common to said plurality of structural support members and secured thereto, said inner deck cover being mounted on said mounting projection through said bar, fastening means for pressing one side of said lower portion of said balustrade panel on said first upstanding wall portion of said U-shaped support portion by clamping force produced between said second upstanding wall portion and the other side of said lower portion of said balustrade panel opposing said second upstanding wall portion, and wherein said structural support member has at least one downwardly projecting projection extending from a lower side of said U-shaped support portion and a handrail guide mounted on said downwardly projecting projection for supporting a moving handrail.

4,819,782

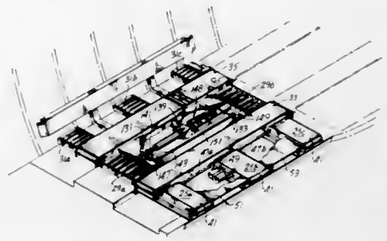
LOWER LOBE CARGO TRANSFER PLATFORM CONVEYOR SYSTEM

James A. Fenner, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1985, Ser. No. 811,360

Int. Cl.⁴ B65G *37/00*

U.S. Cl. 198—372 **8 Claims**



1. A cargo transfer platform for transversely changing the direction of movement of cargo containers at a junction comprising:

lateral conveyor means for moving cargo containers in a first direction, said lateral conveyor means including a plurality of belt conveyors located along one edge of said cargo transfer platform, each of said belt conveyors comprising a wide belt and a plurality of rollers for supporting the upper surface of the wide belt;

longitudinal conveyor means interspersed with said lateral conveyor means for moving said cargo containers in a second direction transverse to said first direction, said longitudinal conveyor means including a plurality of belt conveyors, each of said belt conveyors comprising a wide belt and a plurality of rollers for supporting the upper surface of the wide belt;

raising and lowering means associated with one of said lateral and longitudinal conveyor means for vertically raising and lowering the conveying surface of said one of said lateral and longitudinal conveyor means between a first horizontal level and a second horizontal level; and,

a control system for controlling the energization of said lateral and longitudinal conveyor means such that said lateral and longitudinal conveyor means cannot be energized when said one of said lateral and longitudinal conveyor means is being raised or lowered and such that only the upper one of said lateral and longitudinal conveyor means can be energized.

4,819,783

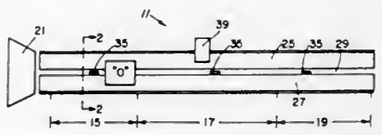
AUTOMATED INSPECTION SYSTEM AND METHOD

James A. Pinyan, Sunnyvale; B. S. Buckley, and Peter D. Galitzine, both of San Jose, all of Calif., assignors to Cochlea Corporation, San Jose, Calif.

Filed Jul. 29, 1986, Ser. No. 890,298

Int. Cl.⁴ B65G *43/08, 47/24*

U.S. Cl. 198—395 **16 Claims**



1. A method for automated inspection of objects to determine characteristics of objects by detecting changes in fields of waves interacting with the objects against an unmoving background, comprising the steps of:

receiving and continuously transporting objects one-by-one at generally equal intervals against an orientation means which urges said objects, during transport, to change position toward a stable equilibrium orientation in common with an orientation taken by other transported objects;

initiating inspections of transported objects at a predetermined location during transport; and

inspecting transported objects by detecting fields which interact with said transported objects and with the background provided by the orientation means while the objects are in a common and stable equilibrium orientation.

6. An automated inspection system for identifying characteristics of objects by detecting changes in fields of waves interacting with the objects against an unmoving background, comprising:

orienting means for receiving and continuously conveying objects one-by-one for inspection at generally equal intervals and at a generally constant velocity, the orienting means including at least one traveling means to engage and convey objects for inspection and at least one stationary orientation member mounted to abut against objects during conveyance to urge said objects to change position and move toward a stable equilibrium orientation common to the orientation taken by other objects during conveyance;

inspection means including wave transmitting and receiving means to detect fields which interact with objects conveyed by the orienting means and the background provided by said at least one stationary orientation member, and signals processing means to generate signals derived from the fields to provide identification of at least one geometrical characteristic of said conveyed objects; and

triggering means operated in coordination with the orienting means to initiate operation of the inspection means upon object being conveyed to a predetermined location against the background of the at least one orientation member.

4,819,784

ARRANGEMENT FOR FEEDING PARTS

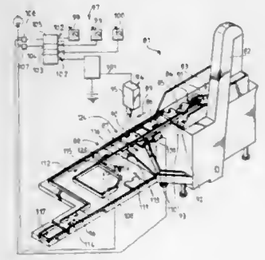
Walter Sticht, Attnang-Puchheim, Austria, assignor to STIWA-Fertigungstechnik Sticht Gesellschaft m.b.H., Attnang-Puchheim, Austria

Continuation of Ser. No. 808,230, Dec. 12, 1985, abandoned, Division of Ser. No. 540,900, Oct. 11, 1983, abandoned. This application Sep. 17, 1987, Ser. No. 103,131

Claims priority, application Austria, Oct. 25, 1982, 3901/82

Int. Cl.⁴ B65G *43/08*

U.S. Cl. 198—395 **5 Claims**



1. An arrangement for feeding parts having a number of orders of orientation, which comprises

(a) a storage bin for the parts,

(b) a conveyor means for moving the parts from the storage bin in a feeding direction,

(c) means for singling the moving parts and for pre-orienting

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the singled parts to assume more than two possible orders of orientation while returning the moving parts which have not been singled to the storage bin, said singling and pre-orienting means being arranged downstream of the conveyor means in the feeding direction,

(d) further conveyor means for moving the singled, pre-oriented parts in the feeding direction, said further conveyor means comprising

(1) at least two conveyor paths leading to a discharge station and

(2) another conveyor path leading back to the storage bin,

(e) a single distributing means for the singled, pre-oriented parts between the pre-orienting means and the conveyor paths of the further conveyor means for distributing each one of the singled, pre-oriented parts to a selected one of the conveyor paths in dependence on a respective order of orientation of said part, the distributing means including

(1) respective transfer means capable of assuming transfer positions for distributing each part to the selected conveyor path,

(2) a drive for each one of the transfer means for imparting a respective transfer position to the respective transfer means,

(3) a control for each one of the drives,

(4) a monitoring device ascertaining characteristic data indicating the respective one of more than two orders of orientation of each part and emitting more than two output signals respectively corresponding to the respective order or orientation of each part, and

(5) comparator means for simultaneously receiving and comparing the output signals from the monitoring device and more than two additional signals indicating selected characteristic orientation data indicating the respective order of orientation of each part either for return thereof to the conveyor path leading to the storage bin or for distribution to one of the conveyor paths leading to the discharge station, and for transmitting output signals to the drive controls when the output signals from the monitoring device and the additional signals conform, a respective one of the transfer means being driven in response to the output signals from the comparator means to return the part to the conveyor path leading to the storage bin or to distribute the part to a respective one of the conveyor paths leading to the discharge station, and

(f) further orienting means in at least one of the conveyor paths leading to the discharge station.

4,819,785

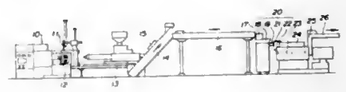
DEVICE FOR SUPPLYING PIECES FOR BLOW-MOLDING CONTAINERS

Yoshiyuki Ichizawa, Sohka, and Tsugio Nomoto, Higashi Kurume, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 396,263, Jul. 8, 1982, abandoned, which is a continuation of Ser. No. 253,290, Apr. 13, 1981, abandoned, which is a continuation of Ser. No. 37,058, May 8, 1979, abandoned. This application Nov. 5, 1984, Ser. No. 668,186

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—404 **9 Claims**



1. Apparatus for supplying semi-sphericalbottomed cylindrical plastic pieces having an open neck end to jigs on which said pieces circulate through a blow-molding machine, said apparatus comprising:

piece supplying means, piece inverting means, jig feeding means, jig conveying means and a single means for intermittently driving both said piece inverting means and said jig feeding means, wherein:

said piece supplying means is adapted to supply said semi-spherical bottomed pieces in a neck end upward position to said piece inverting means;

said piece inverting means is adapted to grasp said pieces from said piece supplying means at portions of said pieces which will form a portion of a finished blow-molded product, invert said pieces 180° to a neck end downward position and supply said pieces to said jig feeding means;

said inverting means comprises a holding member for holding said pieces, means for inverting said holding member and means for transferring said holding member from a piece pick up position to a piece delivery position, said holding member transferring means comprising a rotating mechanism for horizontally rotating said holder member from said piece pick up position to said piece delivery position during inversion of said holding member by said holding member inverting means;

said jig feeding means is adapted to deliver said pieces from said piece inverting means to said jigs; and

said jig conveying means is adapted to circulate said jigs past said jig feeding means and through said blow-molding machine.

4,819,786

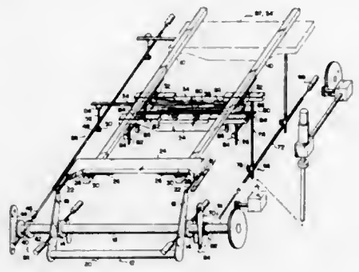
WORK INDEXING APPARATUS WITH A HEIGHT ADJUSTMENT FOR A PAIR OF TRANSFER BARS

Toshihiro Tanaka, and Hiateru Yamashita, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,333

Int. Cl.⁴ B65G *25/04*

U.S. Cl. 198—621 **3 Claims**



1. Apparatus for indexing work through a succession of processing stations, comprising:

(A) a pair of transfer bars extending horizontally in parallel spaced relation to each other;

(B) means for longitudinally reciprocating the transfer bars;

(C) means for moving the transfer bars toward and away from each other;

(D) lift carrier means carrying the transfer bars for joint up-and-down motion therewith, the lift carrier means allowing the transfer bars to reciprocate longitudinally and move toward and away from each other;

(E) a lift cam mechanism comprising a disc cam and a lift lever oscillated thereby; said lift cam mechanism being effective to cause the descent of the transfer bars against the biasing force of a resilient means which bias the transfer bars upward;

(F) a rack-and-pinion linkage operatively connecting the lift lever of the lift cam mechanism to the lift carrier means for causing the latter, and therefore the transfer bars, to move up and down in response to the oscillation of the lift lever;

(G) a height adjustment mechanism interposed between the lift lever of the lift cam mechanism and the rack-and-pinion linkage to provide a variable length of connection therebetween and hence to correspondingly vary the upper and lower limits between which the transfer bars are moved up and down, said height adjustment mechanism including,

(i) a first link pivotally connected at one end to the lift lever of the lift cam mechanism,

(ii) multiple abutment means pivotally and rotatably connected to another end of the first link and providing a plurality of abutments directed toward the first link, the abutments being located at different distances from the first link and in different angular positions about the axis of rotation of the multiple abutment means,

(iii) a second link rigidly connected at one end of the rack-and-pinion linkage and at least partly slidably received in the multiple abutment means for both relative longitudinal and rotary motions,

(iv) hook means on another end of the second link for selective engagement with the abutments of the multiple abutment means depending upon the angular position of the multiple abutment means relative to the second link,

(v) means for longitudinally displacing the second link toward the first link relative to the multiple abutment means in order to hold the hook means out of engagement with all the abutments during revolution of the multiple abutment means, and

(vi) drive means for revolving the multiple abutment means relative to the second link to allow selective engagement of the hook means with the abutments, said drive means including,

(a) a driven gear formed on the multiple abutment means for joint rotation therewith,

(b) drive gear means in mesh with the driven gear,

(c) a rack in mesh with the drive gear means, and

(d) a linear actuator coupled to the rack for linearly moving same;

(H) a switch actuator rod connected colinearly to the rack of the drive means;

(I) a plurality of limit switches adapted to be actuated by the switch actuator rod for terminating the linear travel of the rack in any of several predetermined positions where the abutments of the multiple abutment means lie opposite to the hook means on the second link;

(J) a lockpin movable into and out of any of a plurality of holes formed in the switch actuator rod at longitudinal spacings, the lockpin when received in any of the holes being effective to lock the switch actuator rod, and therefore the rack of the drive means, against longitudinal displacement; and

(K) a second linear actuator for moving the lockpin into and out of the holes in the switch actuator rod.

4,819,787

APPARATUS FOR TRANSPORTING MATERIALS

Volker Burkhardt, Lerchenstrasse 29, 7085 Bopfigen, Fed. Rep. of Germany

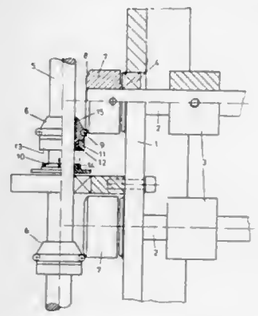
Continuation of Ser. No. 446,268, Dec. 2, 1982, abandoned. This application Jun. 26, 1985, Ser. No. 749,118

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148176

Int. Cl.⁴ B65G *13/06*

U.S. Cl. 198—781 **4 Claims**

1. An apparatus for transporting material which comprises a frame having two longitudinally extending support members each having journalled therein for rotation the opposite ends of a plurality of roller shafts disposed along the length of said support members, each roller shaft having a shaft roller securely fixed at one end and at least one conveyor roller securely fixed between its ends whereby said roller shaft and said conveyor roller rotate only when said shaft roller is rotated; and means for rotating said shaft roller comprising a drive shaft extending longitudinally along side one of said support members having mounted thereon in frictional rotational engagement therewith a drive roller which is also in frictional rotational engagement towards one of its ends with said shaft roller; an annular groove towards the other end of said drive roller in which is positioned a check ring having a smooth continuous contact surface in frictional rotational engagement with a complementary surface of said annular groove of said drive roller; an adjustment ring securely fixed to said drive shaft for rotation therewith, said adjustment ring being fixed to



said drive shaft at a preselected distance from said check ring; a spring surrounding said drive shaft one end of which contacts said adjustment ring for rotation therewith and the other end of which contacts said check ring for rotating it; and adjusting means for securing said adjustment ring to said drive shaft whereby its distance from said check ring and the tension on said spring can be preselected, the rotary motion of said drive shaft being transmitted to said shaft roller by means of the frictional engagement of said check ring and said drive shaft with said drive roller, and said drive roller with said shaft roller.

4,819,788

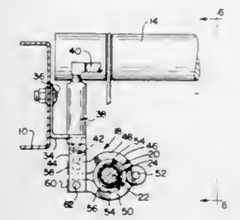
ZERO PRESSURE ACCUMULATION CONVEYOR AND BRAKE ASSEMBLY

Donn R. Van Der Schie, Grand Haven, Mich., assignor to Ermanco Incorporated, Spring Lake, Mich.

Continuation of Ser. No. 900,268, Aug. 26, 1986, abandoned, which is a continuation of Ser. No. 689,509, Jan. 8, 1985, abandoned, which is a continuation of Ser. No. 343,222, Jan. 27, 1982, abandoned. This application Feb. 11, 1988, Ser. No. 154,521

Int. Cl.⁴ B65G *13/06*

U.S. Cl. 198—781 **10 Claims**



1. A zero pressure accumulation conveyor system comprising:

a frame;

a plurality of spaced-apart rollers rotatably mounted on said frame to form a generally planar conveying surface;

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a rotatable drive shaft in spaced-away relation to said conveying surface;

at least one hollow torque tube of a predetermined length which is shorter than that of said drive shaft disposed over said drive shaft in generally coaxial alignment therewith, said torque tube frictionally engaging said drive shaft for co-rotation therewith;

at least one pulley coaxially mounted on the exterior surface of said torque tube for co-rotation therewith;

a resilient belt looped over and engaging said pulley and one of said roller for rotatably driving said roller;

a brake assembly including at least a pair of clamping members, each of said clamping members having a substantially semi-cylindrical arcuate clamping surface which is generally concentric with the arcuate surface of said torque tube, said clamping members being movable between a first position disengaged from said exterior surface of said torque tube, and a second position in which said clamping members each engage said torque tube to restrain the rotation thereof; and

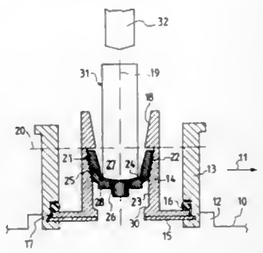
actuating means coupled to said clamping members and responsive to a control signal for moving each of said clamping members to said second position upon application of said control signal, whereby rotation of said torque tube is restrained when said control signal is applied to said actuating means.

4,819,789

DEVICE IN A TUBE FILLING MACHINERY

Hans Linnér, Kalmar, Sweden, assignor to Norden Packaging Machinery AB, Kalmar, Sweden

Filed Oct. 2, 1987, Ser. No. 103,708
Claims priority, application Sweden, Oct. 6, 1986, 8604235
Int. Cl.⁴ B65G *17/46*
U.S. Cl. 198—803.8 **6 Claims**



1. A device for maintaining individual tubes in fixed positions in support members on a conveyor in a tube filling machinery, where the conveyor forwards the support members between successive processing stations along the conveyor, and where each support member comprises a support member part attachable to the conveyor and having a tube receiving cavity extending generally perpendicular to the conveyor and generally symmetric around an axis in said perpendicular direction, comprising:

a displaceable tube breast receiving sleeve supported in the cavity of the support member and displaceable therein along said symmetry axis thereof, said sleeve being arranged for radial expansion and contraction in at least certain portions thereof, the sleeve being formed of a material having a mechanical memory whereby the sleeve positively returns to a nominal dimension for a predetermined cavity size after undergoing said expansion and contraction;

an internal guide surface provided in the cavity of the support member for controlling the displacement of the sleeve in the direction of said symmetry axis, said internal guide surface including a generally conical portion opening outwardly along said symmetry axis and engaged by said sleeve for controlling the radial expansion and contraction of said sleeve, said internal guide surface being terminated by end stops at respective axial ends thereof for limiting displacement of said sleeve along said symmetry axis; and

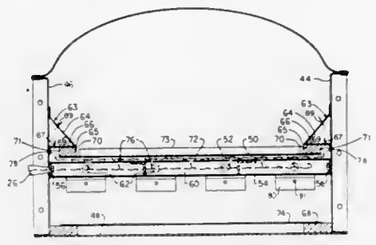
a grip portion extending inwardly towards the symmetry axis arranged at an end of the sleeve facing the conveyor for gripping a breast portion of a tube under contraction of said sleeve and releasing the tube under expansion of said sleeve.

4,819,790

LEAKPROOF ENDLESS BELT CONVEYOR

Jimmy L. Adcock, Pleasant Garden, N.C., assignor to M. L. Eakes Co., Greensboro, N.C.

Continuation of Ser. No. 561,772, Dec. 15, 1983, Pat. No. 4,674,626. This application Jun. 17, 1987, Ser. No. 63,487
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.⁴ B65G *15/60*
U.S. Cl. 198—811 **8 Claims**



1. An endless belt conveyor for receiving and delivering particulate matter deposited thereon toward a discharge end comprising:

(a) a pair of spaced side walls extending the length of said conveyor;

(b) a drive roller journalled in and extending between said side walls at the discharge end of said conveyor and a return roller journalled in and extending between said side walls at the rear end of said conveyor;

(c) a bottom dust pan connecting the lower edges of said side walls and extending beneath the area defined by said drive roller, said return roller, and said side walls;

(d) an upper support pan extending between said side walls generally parallel to said bottom dust pan at a level intermediate the top and bottom of said side walls, said upper support pan extending between said drive roller and said return roller and comprising an air chamber formed by top and bottom panels and side and end walls, perforations in said top panel, and means for introducing a flow of air into said chamber which air escapes through said perforations in said top panel;

(e) an endless belt extending around said drive roller and said return roller, the upper flight of said belt resting on the top panel of said support pan in the absence of said air flow but being lifted to form an air slide conveyor in the presence of air, and the lower flight of said belt being spaced above said dust pan, said belt being narrower in width than the corresponding width of said support pan and dust pan, whereby the opposite site side edges of said belt are spaced from said side walls, said belt further including at least one cleat extending transversely of said belt and upstanding therefrom, the height of said cleat above the surface of said belt being at least as great as the space between said lower flight and dust pan whereby the cleat wipes the dust pan clean as the lower flight passes thereby;

(f) a sealing block mounted on each side wall above the side edges of said upper flight and extending the length of said upper flight, the spacing of said sealing block from the top panel of said support pan being greater than the thickness of said endless belt so that upon introduction of said air flow the upper flight of said belt is lifted until the lateral edges thereof engage the underside of each of said sealing blocks to aid in formation of a side seal and prevent passage of air and particulate matter therebetween; and

(g) a selvage strip extending longitudinally of and attached to said side walls at a point above said endless belt, said selvage strip comprising an angular member extending downwardly and inwardly from the inner surface of the adjacent side walls to a termination point spaced above the side edges of said upper flight and a horizontal member extending from said termination point to said side wall, said sealing block being attached to the undersurface of said horizontal member, whereby said selvage strip provides an angular side wall to contain particulate material on said endless belt as well as providing a support means for the sealing block, the outer edge of said sealing block being spaced from said side wall, and a longitudinal air channel formed between said side wall, said sealing block, the undersurface of said horizontal member, and the top surface of said support pan for capturing some of the air escaping through the perforations in the top panel of said support pan.

4,819,791

CONVEYOR BELT FOR BULK MATERIAL HANDLING

Sverker Melander, Landskrona, Sweden, assignor to Arne Wehtje, Lund, Sweden

Continuation of Ser. No. 881,683, Filed as PCT SE85/00409 on Oct. 22, 1985, published as WO86/02621 on May 9, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 220,903
Claims priority, application Sweden, Oct. 23, 1984, 8405284
Int. Cl.⁴ B65G *15/40*
U.S. Cl. 198—818 **8 Claims**



1. Conveyor belt for transportation of bulk material, comprising a central part and two integrated side parts which side parts are in an unbiased, free-state form angled in relation to the central part to obtain a substantial inherent stiffness, and to achieve self aligning of the belt; a lower portion of the central part comprises a longitudinal and transversal reinforcement and that an upper portion thereof comprises resisting material and said side parts are covered with wear resistant material and longitudinal and transversal reinforcements in their bulk material carrying part; the transversal reinforcement covers the side part and extends partly into the central part in order to increase the resistance to transveral bending; the transversal reinforcement maintains the side parts in an angled state throughout all operations of the conveyor belt; and the side parts having equal height and the thickness of the central part being equal to or thicker than the thickness of the side parts.

4,819,792

FOLDING DISPLAY

George T. Christian, 3112 Moore St., San Diego, Calif. 92110

Continuation of Ser. No. 825,529, Feb. 3, 1986, abandoned. This application Jan. 13, 1987, Ser. No. 3,377
Int. Cl.⁴ B65D *5/50*
U.S. Cl. 206—45.25 **1 Claim**

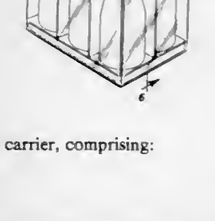
1. A folding display which is free-standing when folded, comprising:

(a) a first panel having first side edges and defining detent means at said side edges;

(b) a second panel having second side edges with side panels extending therefrom into contact with the detent mean of said first panel; and,

(c) said side panels having locking means for engaging said detent means such that when said locking means and detent means are engaged said panels are maintained in a substantially fixed orientation relative to one another;

(d) said locking means comprising an elongated recess defined in each of said first side panels, said recesses each being defined at opposite ends by opposed, inwardly directed ears, and said locking means comprising an elongated lobe with opposed outwardly directed ears, such that each of said lobes locks in the respective recess with the respective ears in the lock;



(e) said display being defined in its entirety from a single sheet of uniform thickness having linear folds between said side panels and front panels, and between said floor panels and the respective front and rear panels, said linear folds being comprised of die-cut score marks each cut with a rounded cross section to create a maximally durable hinge therealong;

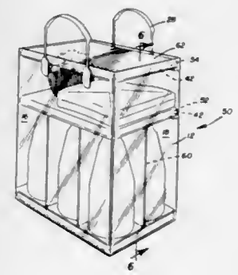
(f) said side panels each having a foot defined in its lower region which extends behind said first panel to help support said display on an underlying horizontal surface to maintain said display in a free-standing mode each of said feet being a unitary part of the respective side panel to which it is a part, such that no bending is required to define said feet so that they are rigid, planar extensions of the respective side panels.

4,819,793

BEVERAGE CARRIER

Charles Willard, Penngrove, and Roy Fong, San Francisco, both of Calif., assignors to Charles, Fong and Associates, San Francisco, Calif.

Filed Oct. 13, 1987, Ser. No. 108,072
Int. Cl.⁴ A45G *11/20;* **F25D** *3/08;* **B65D** *25/28, 33/06*
U.S. Cl. 206—162 **28 Claims**

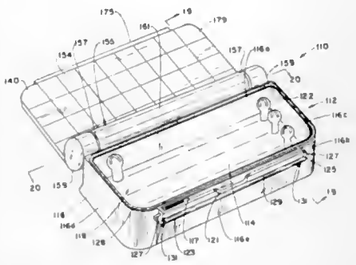


1. A beverage carrier, comprising:

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a flexible container having a bottom and upstanding side walls and a top opening;
flooring means for supporting beverages in the container, nesting compatibly adjacent the bottom;
means for cooling the beverages in the container, located between the bottom and the flooring means; and
separator means for spacing apart beverages in the container from one another.

4,819,794
FILM SPOOL STORAGE CASE
Steven Silverstein, Paris, France, and Christopher Scholz, New York, N.Y., assignors to Light and Shadow, Inc., Los Angeles, Calif.
Filed Feb. 16, 1988, Ser. No. 156,211
Int. Cl.[4] B65D *85/671*
U.S. Cl. 206—225 **17 Claims**

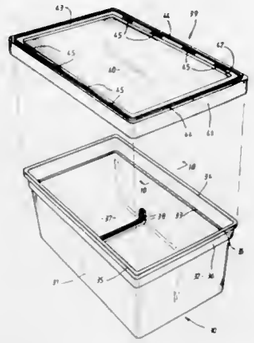


1. A film spool storage case comprising:
a main housing having a base and a side wall, said base and said side wall defining a cavity for receiving a plurality of film spools therein, said side wall having a height at least as great as the height of said spools and said side wall defining an opening at an upper end thereof;
a cover hingedly secured to said housing in covering relation to said opening;
a plurality of projecting positioning means secured to said base for positioning said film spools in said cavity in spaced relation in a predetermined pattern; and
said cover having a surface with a grid representation thereon corresponding to said predetermined pattern for receiving information with respect to each said spool.

12. A film spool storage case comprising:
a main housing having a base and a side wall, said base and said side wall defining a cavity for receiving a plurality of film spools therein, said side wall having a height at least as great as the height of said spools and said side wall defining an opening at an upper end thereof;
a cover hingedly secured to said housing in covering relation to said opening; and
a plurality of projecting positioning means secured to said base for positioning said film spools in said cavity in spaced relation, each projecting positioning means including a post having a plurality of spring fingers for engaging against a side of said film spools.

13. A film spool storage case comprising:
a main housing having a base and a side wall, said base and said side wall defining a cavity for receiving a plurality of film spools therein, said side wall having a height at least as great as the height of said spools and said side wall defining an opening at an upper end thereof;
a cover hingedly secured to said housing in covering relation to said opening and movable between an open position and a closed position;
a plurality of projecting positioning means secured to said base for positioning said film spools in said cavity in spaced relation; and
means for holding said cover in a plurality of discrete pivoted positions with respect to said main housing, between said open and closed position.

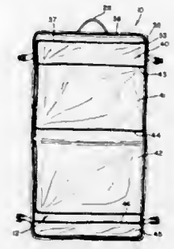
4,819,795
PACKAGE FOR FOOTWEAR
John W. Swaney, 8 Stintons Road, Donvale, Victoria, Australia 3111
Continuation-in-part of Ser. No. 23,805, Dec. 2, 1987, abandoned. This application Jan. 15, 1988, Ser. No. 144,480
Int. Cl.[4] B65D *85/18*
U.S. Cl. 206—278 **5 Claims**



1. A shoe box comprising a housing for containing footwear, said housing having a base, an open top opposed side walls and opposed end walls, a lid for covering said top, said housing and lid being formed of plastics material moulded to the desired shape and having some flexibility when moulded and sufficient rigidity to support thereon, a considerable number of like shoe boxes containing footwear when said boxes are stacked, said walls extending upwardly and outwardly from said base, to form a slightly tapering housing, at least one pair of closely spaced partition walls extending inside said housing on said base and having a height sufficient to support a baffle wall for dividing said housing into smaller compartments and to prevent complete nesting when one housing is placed within another, said lid having a flat top, a raised perimeter portion around said flat top and downwardly depending sides for extending over the upper part of the walls of said housing, said sides being norma 1 to said flat top and said flat top accommodating the base of a further box when a plurality of boxes are stacked whereby said raised perimeter portion prevents sliding movement between the stacked boxes, means on said lid for facilitating stacking of a plurality of lids and said lid having vent means for enabling a small amount of air to circulate into said housing when said lid is placed thereon.

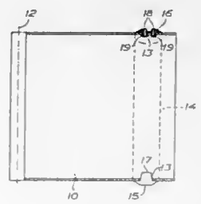
4,819,796
EXPANDABLE GARMENT CARRIER
Edward L. Gerch, Chicago, and Warner D. Rosenfeld, Glencoe, both of Ill., assignors to Kingport International Corporation, Evanston, Ill.
Filed Mar. 1, 1988, Ser. No. 162,424
Int. Cl.[4] A45C *7/00, 13/00;* **B65D** *85/18*
U.S. Cl. 206—291 **8 Claims**

1. In a generally rectangular garment carrier of the type being foldable along a transverse fold line, said garment carrier including a generally rectangular outside panel and a similarly shaped inside panel, each joined along its periphery to at least one edge of an elongate side panel extending therearound, and means for manual user carrying of said garment carrier when in folded position, an improvement comprising:
means for backfolding at least a portion of said side panel along its width substantially around the periphery of said garment carrier and selectably releasably maintaining same in backfolded condition to define the base size of said garment carrier, and to define the expanded size of said garment carrier when said portion of said side panel is released to a fully extended position, and



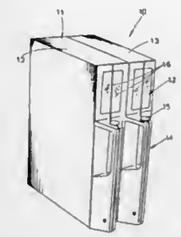
expandable means for hanger support positioned adjacent one end of the interior of said garment bag, said expandable means for hanger support, when in expanded position, fitting within said garment carrier when said side panel is in a fully extended position.

4,819,797
SEAL FOR A BOX ENCLOSING A COMPACT DISC OR TAPE CASSETTE
Kjell Ake B. Holmgren, Trelleborg, Sweden, assignor to MW Trading APS, Glyngore, Denmark
Filed Nov. 12, 1986, Ser. No. 929,746
Claims priority, application Sweden, Nov. 13, 1985, 8505353; European Pat. Off., Nov. 5, 1986, 86850387.1
Int. Cl.[4] B65D *85/57, 85/672*
U.S. Cl. 206—309 **5 Claims**



1. A safety system for a box comprising two rectangular box halves which are hingedly connected to each other, and forming two flat side walls and two pairs of opposite edge walls one of said edge walls forming an aperture therein, said system comprising a blocking frame defining a space for the closed box to enclose the box at the side walls and two opposite edge walls, a latch mechanism on said frame including a latch element displaceable between a first position in which the latch element extends into the space defined by the frame to engage said aperture for locking the frame to the box, and a second position in which the latch element is withdrawn from said space, cooperating means on said latch element and said frame for latching the latch element in said first position by mutual engagement between the latch and the frame, and a tool for actuating said cooperating means to disengage the latch element from the frame for withdrawal of the latch element from said aperture to said second position.

4,819,798
MULTIPLE CONTAINER
Makio Hasuike, Milan, Italy, assignor to Seima Italiana SpA, Tolmezzo, Italy
Filed Mar. 18, 1988, Ser. No. 169,939
Claims priority, application Italy, Jul. 21, 1987, 60409/87[U]
Int. Cl.[4] B65D *85/57, 85/672*
U.S. Cl. 206—309 **7 Claims**

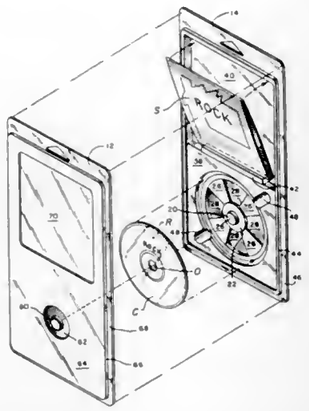


1. Multiple container suitable to hold computer disks, compact-disks, video and audio cassettes and various documents and comprising an outer case open on one side and having a substantially parallelepipedal form and at least one independently usable attache case removably lodged within such outer case, the attache case comprising two half-bodies facing each other lengthwise and hinged together at their rear, each half-body comprising a lateral cover, in which the lateral cover is replaceable and removable.

5. Multiple container suitable to hold computer disks, compact-disks, video and audio cassettes and various documents, and comprising:
a rectangular, outer case having two relatively wide side walls spaced by three narrower edge walls, said outer case having its fourth, front edge open; and
at least one independently usable attache case removably lodged within such outer case with only the front edge wall of the attache case exposed, the attache case comprising two half-bodies facing each other lengthwise and hinged together at their rear, the attached cases having at its front a handle defined by two opposed half-handles on the front of the two half-bodies respectively, the front edge wall of the attache case being divided into three approximately equal-length parts, namely:
a. a tent-shaped bottom part, namely of inverted V-shaped cross-section, split along the ridge line to form half-parts on the respective half-bodies,
b. a middle part upwardly continuing the shape of the tent-shaped bottom part but cross penetrated by a hand opening to form said handle, and
c. a flat top part above the handle and defined by two substantially coplanar half-parts on the respective half-bodies, the flat top part comprising respective coplanar identification windows for displaying a list of the contents of the attache case, the top end of the handle sloping up and inward toward said flat top part and therewith forming a convenient thumb rest for the hand of the user along the joinder of the two half-bodies,
the tent-shaped bottom and middle parts of said attache case front wall protruding forwardly out from the open front edge of said multiple container, said windows being visible from the front of said container, said multiple container being of width sufficient to receive at least two said attache cases in side-by-side relation, the tent shape of said bottom part and handle defining a V-shaped valley between handles of side-by-side attache cases in said multiple container to facilitate insertion of the hand of the user into the hand opening of the handle of a given said attache case in said multiple container to facilitate removal of said attache case from said multiple container.

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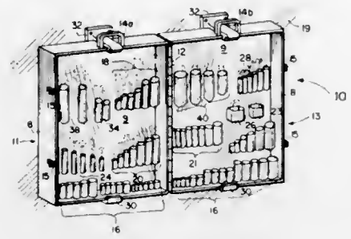
4,819,799
OPTICAL DISC PACKAGE
Ram R. Nomula, Huntsville, Ala., and Robert S. Parish, Minnetonka, Minn., assignors to Laservideo, Inc., Chicago, Ill.
Filed Dec. 18, 1987, Ser. No. 134,805
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—310 **15 Claims**



1. A package for an optical disc having a central opening and for an optical disc sleeve shaped to enclose the optical disc, said package comprising:
upper and lower formed plastic sheets sized to receive and support therebetween the optical disc and the optical disc sleeve in side by side relationship, at least one of the plastic sheets being transparent to allow the optical disc and the optical disc sleeve to be seen through the transparent plastic sheet;
one of said sheets comprising a hub having an enlarged end portion which in its relaxed state is larger than the central opening of the optical disc and a reduced diameter neck portion such that the optical disc can be snapped in place over the end portion and the optical disc, once inserted on the hub, is held on the hub by an interference fit between the enlarged end portion and the optical disc;
said lower sheet defining a depression shaped to receive the optical disc;
said upper sheet shaped to cover the optical disc and the optical disc sleeve;
said upper and lower sheets defining peripheral shoulders shaped to fit together to increase the rigidity of the sheets.

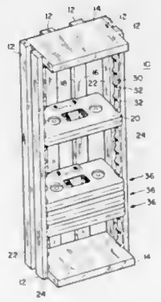
4,819,800
TOOL STORAGE SYSTEM
Tony E. Wilson, 219 Skipper Dr., Port Orange, Fla. 32019
Filed Apr. 4, 1988, Ser. No. 179,207
Int. Cl.[4] B65D *25/10*
U.S. Cl. 206—373 **5 Claims**

1. A tool box and supports comprising:
first and second, essentially identical and rectangular, shallow boxes hingedly attached together to permit closing to form a closed tool box, each of said boxes having a planar wall portion and a frame portion;
a pair of lower hangar supports for attachment to a vertical wall to receive and support a lower side of each of said frame portions when said tool box is in an open position;
a pair of upper hangar supports, each having an operable clamp element, said pair of upper supports for attachment to a vertical wall for clamping an upper side of each of said frame portions when said tool box is in an open position, said lower sides being supported by said pair of lower hangar supports;
a plurality of tool holders attached to said planar wall portion to hold tools in a vertical position when said open tool box is disposed in said upper and lower hangar supports;



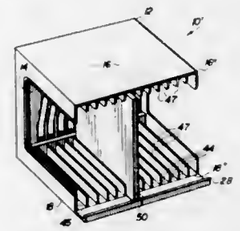
locking means for locking said first and second shallow boxes together to form said closed tool box when removed from said upper and lower supports; and
carrying means for carrying said closed tool box.

4,819,801
STORAGE CASE
William A. Howard, Barrington, N.H., assignor to Savoy Leather Manufacturing Corporation, Haverhill, Mass.
Filed Jan. 11, 1988, Ser. No. 141,720
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 **4 Claims**



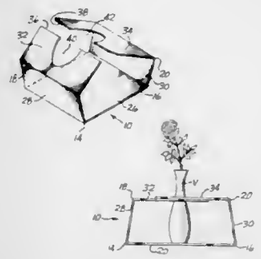
1. A storage case for storing items having length, width and thickness from the group consisting of electronic recording devices and their boxes, comprising:
a base, two end walls and two side walls, each fixedly connected together to form an open box, said side walls comprising an outside and an inside portion, said inside portion being adjacent said base and said outside portion being between said base and the open end of said box, wherein said outside portions, but not said inside portions, comprise a plurality of paired ribs spaced to allow a said item to be inserted through said ribs and held in a position in said case generally perpendicular to said base,
said base being formed by a pair of spaced slats secured at each end to respective ones of said end walls and separated from each other,
each of said side walls being formed by an inside slat forming said inside portion and an outside slat having an inside surface opposite the inside surface of the other outside slat forming said outside portion secured at each end to respective ones of said end walls and separated from each other by a gap with the width of each side wall being less than the width of an item stored therein and the separation between said side walls corresponding substantially to the length of an item stored therein,
each of said inside surfaces having a plastic strip formed with said ribs lengthwise-spaced with adjacent ribs separated by a distance corresponding substantially to the stored item thickness for snugly engaging a stored item and allowing easy insertion and removal.

4,819,802
HOLDER AND EJECTOR ASSEMBLY FOR CASSETTE-TYPE CASINGS
Julian Gutierrez, 6205 SW. 116th St., Miami, Fla. 33156
Filed Jan. 13, 1988, Ser. No. 144,197
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 **19 Claims**



1. A holder assembly for the storage and dispensing of a plurality of casings such as, but not limited to, audio or video cassettes, said assembly comprising:
a. a housing having a base portion, two wall portions and two end portions each connected at one end to said base portion and extending outwardly therefrom in spaced, substantially parallel relation to one another,
b. said two wall portions and said two end portions extending outwardly from said base an equal distance and having substantially correspondingly positioned outer opposite ends disposed in spaced apart relation and at least partially defining an open face of said housing,
c. said open face oppositely disposed relative to said base portion and extending along a length of said housing and dimensioned and disposed to expose an outer portion of any of a plurality of casings within said housing,
d. a plurality of channel means formed within said housing and extending between said base portion and said open face for retention of the plurality of casings in spaced and adjacent relation to one another,
e. a retaining means for maintaining the plurality of casings within said housing and comprising a flange structure secured to one of said two walls and disposed adjacent to open end of each of said plurality of channel means,
f. said flange structure extending outwardly from said one wall in substantially blocking relation to a front peripheral end portion of each casing exiting any of said channel means through said open face and having a length sufficient to connect to said two end portions and extend continuously therebetween,
f. an ejector assembly comprising a spring means for biasing the plurality of casings towards and out of the open face, said spring means comprising a plurality of spring elements each extending outwardly from an inner surface of said base portion and into engagable relation with each of the casings within separate ones of said plurality of channel means,
g. said plurality of spring elements being disposed to engage the inner portion of a correspondingly positioned one casing at a proximate transverse center thereof but between said transverse center and one end of the casing disposed closest to said one wall furthest from said retaining means,
h. said spring means disposed to force the plurality of casings into interruptive, abutting engagement with said retaining means to define a retained position thereof, and
i. said spring means disposed and said housing cooperatively dimensioned both relative to said plurality of casings to define an ejected position of the casing, said ejected position further defined by an extension of an outer portion of the casing beyond said retaining means and out of said open face.

4,819,803
STABILIZING CARRIER FOR A FLORAL CONTAINER
J. Ray Neiser, 7503 S. M St., Tacoma, Wash. 98408
Filed Feb. 25, 1986, Ser. No. 833,326
Int. Cl.[4] B65D *85/52*
U.S. Cl. 206—423 **12 Claims**



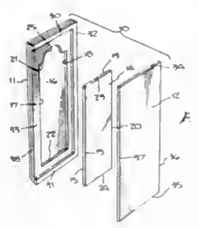
1. A stabilizing carrier for a floral container, comprising:
a rectangular base panel having two ends;
two end panels having lower ends which are hinge connected to the ends of the base panel, and upper ends;
two top panels having outer ends which are hinge connected to the upper ends of the end panels, and inner free ends, with one of the top panels overlapping the other top panel, said top panels together forming a top for the carrier;
each top panel including a semi-oval recess extending inwardly from its free edge, said recesses complementing each other to form an opening in said top when said one top panel is overlapping the other top panel;
wherein in use the base of a floral container sets on said base panel and above the base said container is received within said top opening;
wherein said base panel is substantially larger than the base of the floral container; and
wherein each semi-oval recess has a concave curved closed end portion and a concave curved region on each side of the closed end;
wherein the depth of each recess is substantially larger than the maximum width of the recess;
wherein said recesses progressively increase in width from said closed end outwardly to said maximum width and are of a shape to make engaging contact with opposing side regions of a plurality of different size floral containers by a mere adjustment of the amount of top panel overlap; and such adjustment of the top panel overlap changes both the length and width size of the opening.

4,819,804
SLIDE HOLDER
Abner Levy, 325 N. Oakhurst Dr., P4, Beverly Hills, Calif. 90210
Filed Mar. 21, 1988, Ser. No. 170,812
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—456 **8 Claims**

1. A holder for a specimen slide of substantially rectangular shape, said holder comprising a base sheet of lightweight yieldable moldable material of the same general configuration as

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said slide, a recess in the upper face of the base sheet of substantially the same configuration as said slide and spaced inwardly of peripheral edges of the base sheet forming a frame around said recess, said recess having a size no greater than the size of the slide and providing thereby retention means for holding the slide in the recess, a cover sheet of light-weight formable



material and of substantially the same configuration as said base sheet, a retention ridge at the edge of said base sheet and extending for a distance around the perimeter defining a receptive area, said cover sheet having a size no smaller than said receptive area whereby the cover sheet is adapted to be held by the ridge in closed position over the recess.

4,819,805

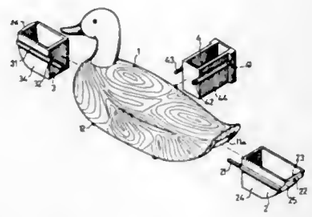
DECORATIVE WOODEN WATER-BIRD

Un-Chen Sen, No.52-2, Chi Tzu Rd., Hsiao I Li, Hou Lung Jenn, Miaoli Hsien, Taiwan

Filed Nov. 16, 1987, Ser. No. 121,221

Int. Cl.[4] A47G *29/00*

U.S. Cl. 206—457 **1 Claim**



1. A decorative water bird comprising a duck-shaped housing having at least three walls; a first compartment slidably received in an aperture in said first wall, a second compartment slidably received in an aperture in said second wall opposite said first wall, and a third compartment slidably received in an opening on said third wall adjacent to said first and second walls;

the first compartment having a lock in one wall thereof and a first element attached thereto and protruding therefrom;

the second compartment having a second element attached thereto and extending therefrom;

the third compartment having another first element and another second element, each attached to and protruding from said third compartment; each of said second elements having a bore therein;

the compartments and protruding elements being oriented such that each said bore will receive one of said first elements whereby the second and third compartments may be locked within said housing by said first compartment.

4,819,806

THERMOPLASTIC BAG, BAG PACK AND METHOD OF MAKING THE SAME

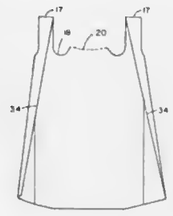
Timothy W. Pistner, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 777,110, Sep. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 672,756, Nov. 19, 1984, Pat. No. 4,562,925. This application Apr. 13, 1987, Ser. No. 37,110

The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.[4] B65D *85/62*

U.S. Cl. 206—554 **7 Claims**



1. A thermoplastic film bag structure comprising, in its lay-flat condition, front and rear bag walls, a two-film heat seal bottom; the outer side margins and adjacent wall film regions of the full length of the bag being folded over and onto the outer surface of one of said bag walls, said margin being spaced from each other, the top most edge of each fold being heat sealed through the four films thereof along lines corresponding to the width of the folds, an open mouth top portion being characterized by having double film handle loops at opposite ends of said mouth, said double film loops being extensions of the folded regions of said bag and the corresponding regions of said front and rear bag walls.

4,819,807

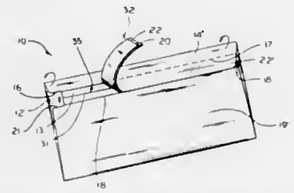
TEAR-STRIP OPENING ENVELOPE APPARATUS

Charles Giger, 658 Hillcrest, Elmhurst, Ill. 60126

Filed Jan. 5, 1988, Ser. No. 141,112

Int. Cl.[4] B65D *27/38*

U.S. Cl. 206—610 **19 Claims**



1. A tear-strip opening envelope apparatus for the protective maintenance of enclosures therewithin, in which said apparatus is configured for the facilitated closing, sealing, opening and emptying thereof, and for subsequent storage of enclosures as desired, said tear-strip opening envelope apparatus comprising:

front panel means having a top and bottom side opposite one another;

back panel means having a top and bottom side opposite one another, said back panel means being positionable in a substantially overlying relation to said front panel means,

said front panel means and said back panel means being joined along at least a substantial portion of their respective bottom sides to define a contents enclosure region, with a remaining unjoined portion proximate to the respective top sides of both said front and back panel means defining a contents insertion region substantially opposite to said joined bottom sides;

back panel tear-strip means operably emanating from said back panel means for covering at least a portion of said contents insertion region, said back panel tear-strip means being capable of being separated in a facilitated manner from said back panel means;

top panel means operably emanating from the top side of said front panel means and covering at least a portion of said contents insertion region upon folding back of said top panel means over said front panel means;

top panel tear-strip means operably positioned along at least a portion of said top panel means, said top panel tear-strip means being capable of being separated in a facilitated manner from said top panel means,

said to panel tear-strip means being disposed at a position removed from said top side of said front panel means,

said back panel tear-strip means and said top panel tear-strip means being positioned in substantially congruent overlying registry relative to each other upon juxtapositioning of said back and top panel means with both of said top and back panel means being folded over the front panel means prior to separation of said back and top panel tear-strip means from said back and top panel means respectively,

said back panel tear-strip means and said top panel tear-strip means having adhesive means operably positioned between the overlying regions thereof, for restrainably affixing said back panel tear-strip means to said top panel tear-strip means, thereby sealing said top and back panel means to each other and, in turn, said envelope apparatus, with said enclosures therewithin, while simultaneously forming a reinforced multi-ply tear-strip member for facilitated opening of said envelope apparatus,

said sealed envelope apparatus being openable by grasping said reinforced multi-ply tear-strip member at a first end thereof and pulling said first end across said apparatus until said reinforced multi-ply tear-strip member is separated from said apparatus to the extent needed to expose said enclosures for facilitated removal thereof, and

said top panel means remaining substantially intact upon separation of said reinforced multi-ply tear-strip member from said apparatus.

4,819,808

APPARATUS AND METHOD EMPLOYING MAGNETIC FLUIDS FOR SEPARATING PARTICLES

Uri T. Andres, London, United Kingdom; Alan L. Devernoe, and Michael S. Walker, both of Schenectady, N.Y., assignors to Mag-Sep Corp., Guilderland, N.Y.

Continuation of Ser. No. 380,753, May 21, 1982, Pat. No. 4,594,149. This application Jun. 2, 1986, Ser. No. 869,397

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] B03B *5/32*; B03C *1/00*

U.S. Cl. 209—1 **61 Claims**

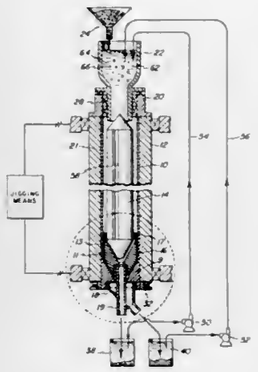
1. A method of separating a collection of particles having a range of densities and such magnetic properties as they may possess into two groups of particles based on the combination of each particle's magnetic property and density, the method comprising the following steps:

(A) establishing along a longitudinal axis and confined within at least part of a surrounding coaxial space a flowing stream comprising the particles to be separated in a fluid medium of positive magnetic property whose density is less than that of all of the particles;

(B) establishing with respect to substantially the same axis throughout a separation region of said stream a magnetic field with magnitude which decreases from a point exterior of the flowing stream to the said axis, said field being of such a configuration as to produce substantially only radially directed forces on the medium and the particles;

(C) rotating the stream about its said axis;

(D) performing steps (A), (B) and (C) simultaneously while employing a field strength and speed of rotation such that a substantial net radially outward sum of centrifugal and direct magnetic forces exists on all the particles and such that the radially outward attraction of the magnetic fluid by the field provides, additionally, a radially inwardly directed buoyant force on the particles of such magnitude that some of the particles, those having relatively lower



combined density and magnetic susceptibility, move inwardly; and

(E) separately collecting the particles having a relatively lower combined density and magnetic susceptibility as a radially inner fraction and the remaining particles as a radially outer fraction from the stream after it has passed through the separation region.

4,819,809

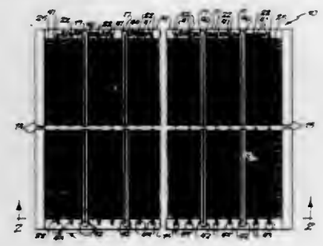
REINFORCED POLYURETHANE VIBRATORY SCREEN

James W. Derrick, East Aurora, N.Y., assignor to Derrick Manufacturing Corporation, Buffalo, N.Y.

Continuation of Ser. No. 773,994, Sep. 9, 1985, abandoned. This application Jan. 1, 1987, Ser. No. 70,102

Int. Cl.[4] B07B *1/06*

U.S. Cl. 209—275 **24 Claims**



1. A vibratory screen comprising a flexible molded polyurethane body, screen openings in said body, substantially parallel flexible dividing strips defining opposite sides of said screen openings, elongated flexible aramid fibers molded integrally with said flexible dividing strips to impart tensile strength to said screen while maintaining flexibility thereof, said body having side edge portions at opposite ends of said body between which said fibers extend to enable tensioning of said body along the length of said fibers and strips, said openings being elongated with a greater length dimension along said sides and between ends thereof than a width dimension between said sides and with their length dimensions extending in a direction transverse to said side edge portions, said body

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having an upper surface and a lower surface, integrally molded ribs extending transversely to said dividing strips and having portions extending upwardly above said upper surface, and said ribs comprising relatively large ribs alternating with relatively small ribs.

4,819,810

SCREENING MACHINE WITH FLOATING ECCENTRIC SHAFT

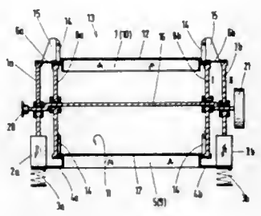
Kurt Hoppe, Hilden, Fed. Rep. of Germany, assignor to Heln, Lehmann AG, Dusseldorf, Fed. Rep. of Germany

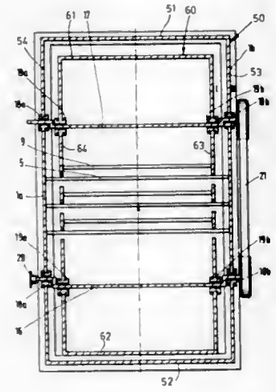
Continuation of Ser. No. 882,275, Jul. 7, 1986, abandoned. This application Dec. 18, 1987, Ser. No. 135,514

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524895

Int. Cl.[4] B07B *1/28*

U.S. Cl. 209—315 5 Claims





1. A screening machine, comprising:
a base;
a first frame resiliently mounted on said base and supported only by resilient means on the base for oscillatory movement relative to said base, said first frame including:
a pair of side members, and
a plurality of uniformly spaced first crossmembers lying perpendicular to and spanning said side members of said first frame and defining a screening plane;
a second frame oscillatory movable relative to said first frame and supported only thereon, said second frame including:
a pair of side members parallel to the side members of said first frame, and
a plurality of uniformly spaced second crossmembers alternating with said first crossmembers generally in said plane and spanning the side members of said second frame;
a flexible screen layer affixed to said first and second crossmembers so that webs of said layer between a first and a second crossmember are alternately stretched and contracted upon relative oscillatory displacement of said first and second frames; and
oscillating means mounted and journaled exclusively on said frames and free from any journal on said base for effecting relative oscillatory displacement of said first and second frames, said oscillating means including two generally parallel spaced apart eccentric shafts, each of said eccentric shafts extending transversely to said side members, each of said eccentric shafts being journaled to the side members of said first frame about a respective first axis and journaled to the side members of said second frame about a respective second axis parallel to the respective first axis as the exclusive journals of each of said eccentric shafts, and means coupling said eccentric shafts for joint rotation.

4,819,811

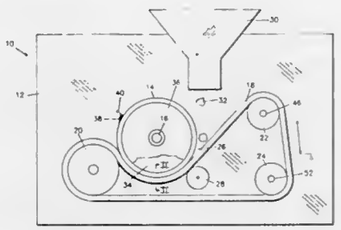
SEPARATING APPARATUS WITH WOBBLING TAKE-UP ROLLER

Richard C. Ewing, Assonet; Walter V. Kuczewski, New Bedford, and Gerald A. Thurber, Rehobeth, all of Mass., assignors to Baader North America Corporation, New Bedford, Mass.

Filed Sep. 14, 1987, Ser. No. 95,666

Int. Cl.[4] B07C *9/00*; A22C *17/00*

U.S. Cl. 209—699 4 Claims



1. A separating machine comprising:
a separating drum;
a plurality of foramina penetrating said separating drum;
a resilient belt reeved over said separating drum;
a pressure roller applying pressure through said resilient belt to a surface of said separating drum, whereby material to be separated disposed between said resilient belt and said pressure roller is urged through said plurality of foramina into an interior of said separating drum and a remainder of material remains on a surface of said separating drum;
at least one take-up roller;
said at least one take-up roller being disposed upstream of said separating drum and being effective for shaping said resilient belt to form a nip with said surface of said separating drum; and
means for wobbling said at least one take-up roller with respect to an axis thereof, whereby said resilient belt is caused to wobble approaching said nip and a tendency for bridging said nip is overcome.

4,819,812

SELF-CONTAINED PORTABLE HANGING CLOTHES DRYER

Russell G. Demarest, Jr., 60 Forest Rd., Glen Rock, N.J. 07452

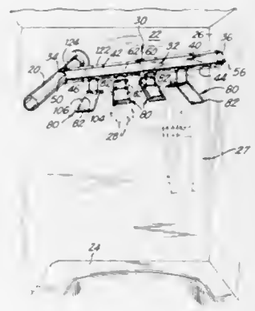
Filed Jul. 5, 1988, Ser. No. 215,343

Int. Cl.[4] A47B *53/00*

U.S. Cl. 211—1.3 13 Claims

1. A self-contained, portable dryer for use in drying articles of clothing by supporting the dryer between existing opposed structural members spaced apart by a given lateral distance, such as a shower curtain rail and an opposite shower wall, and

hanging the articles of clothing from the dryer, the dryer comprising:
a hanger bar having opposite ends and extending longitudinally between opposite ends and including a first segment and a second segment, the first segment having a sleeve-like configuration for receiving the second segment in telescoping engagement therewith, and each segment including a wall extending along the length of the respective segment;
selective securement means on the hanger bar for selectively securing the first and second segments against relative telescoping movement when the first and second segments are at either one of a collapsed position, wherein the second segment is substantially entirely telescoped within the first segment for compact carrying, and an extended position, wherein the second segment is essentially tandem with the first segment and the length of the hanger bar between the ends thereof exceeds at least slightly the lateral distance between the opposed existing structural members for supporting the hanger bar between the structural members;
a plurality of suspension elements integral with the wall of at least one of the first and second segments, the suspension elements being spaced longitudinally from one another along the length of the one segment;
a plurality of hangers, each hanger having laterally-extending hanger members and a bail associated with the hanger members;
collapsing means coupling each bail with corresponding hanger members such that the bail is selectively movable between a first position wherein the bail is extended to project altitudinally relative to the laterally-extending hanger members, and a second position wherein the bail is collapsed to extend laterally in coextensive relationship with the hanger members;
each bail including connector means for selective engagement with and disengagement from a suspension element when the bail is in the extended position for selectively suspending and releasing the corresponding hanger from the hanger bar, with each bail oriented altitudinally and the hanger members oriented laterally for the reception of the articles to be hung for drying; and
a chamber within the hanger bar for reception of the hangers, when the respective bails are in the collapsed position, for storage of the hangers when not in use.



4,819,813

DEVICE FOR HOLDING OBJECTS AND ARRANGEMENT PROVIDED WITH SUCH DEVICES

Otto Schubert, Vienna, Austria, assignor to Lift Verkaufsgerate-Gesellschaft m.b.H., Vienna, Austria

PCT No. PCT/AT85/00049, § 371 Date Jul. 25, 1986, § 102(e) Date Jul. 25, 1986, PCT Pub. No. WO86/03327, PCT Pub. Date Jun. 5, 1986

PCT Filed Nov. 21, 1985, Ser. No. 899,225

Claims priority, application Austria, Nov. 27, 1984, 3757/84; Feb. 1, 1985, 291/85

Int. Cl.[4] A47G *19/08*

U.S. Cl. 211—41 29 Claims



1. A device for receiving rigid flat articles, such as CD, audio or video cassettes or the like, comprising a generally planar base supporting the articles substantially erect for display and arranged one after the other in either of two oppositely inclined, stable positions, said base having a plurality of upstanding support walls forming a series of identical parallel transverse recesses for preventing the articles from unintentional shifting, said recesses each having in cross-section a bottom wall profile and a cooperating pair of opposed side walls formed to facilitate pivoting the articles between said two stable positions without removing said articles from said base, said opposed side walls providing first and second pairs of cooperating support areas, said first pair of support areas cooperating with said bottom wall profile so that the articles are held in the first stable position inclined in one direction relative to said planar base, and said second pair of support areas cooperating with said bottom wall profile so that the articles are held in the second stable position inclined in an opposite direction relative to said planar base.

4,819,814

SNAP-FIT DISPLAY ASSEMBLY

John Fogelgren, 647 Binnacle Dr., Naples, Fla. 33940

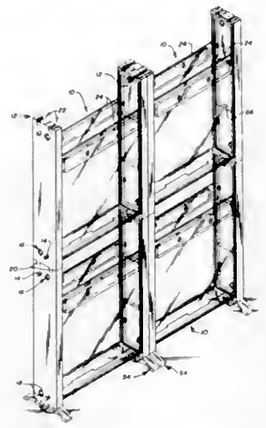
Filed Oct. 30, 1987, Ser. No. 114,597

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—50 18 Claims

1. A display module comprising:
a front panel having a substantially planar front face portion;
a rear panel having substantially planar rear face portion;
means defining a base wall interconnecting the front face portion of said front panel and the rear face portion of said rear panel; and
first and second side wall elements, each releasably coupled to said front panel and said rear panel so as to define an interior space for receiving objects to be displayed;

each said side wall element further including means for releasably coupling a horizontally next adjacent display

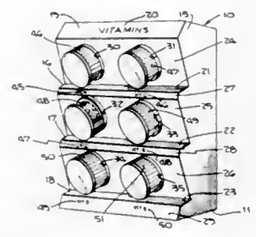


module and means for releasably coupling to a vertically next adjacent display module.

4,819,815
CONTAINER DISPLAY STAND AND CONTAINERS THEREFORE

Kenneth A. Tarlow, Playa del Rey, Calif., and Barbara D. Arner, 1901 Polaris Dr., Glendale, Calif. 91208, assignors to Barbara D. Arner, Oxnard, Calif.

Continuation-in-part of Ser. No. 44,962, May 1, 1987, abandoned. This application Mar. 15, 1988, Ser. No. 170,061
Int. Cl.[4] A47B *73/00*
U.S. Cl. 211—74 **8 Claims**

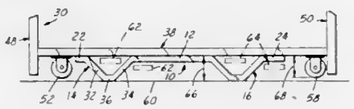


1. A combination display stand and container comprising:
a stand having a bottom wall, a rear wall connected to the bottom wall and an upstanding front wall spaced from said rear wall extending upwardly from said bottom wall;
a plurality of spaced and downwardly angled aligned apertures extending through the front and rear walls, said apertures having a plane at an angle so that a line passing through the center thereof is an angle with the horizontal;
at least one container adapted to contain a plurality of discrete pellets therein disposed in at least one downwardly angled aligned set of said apertures extending through the front and rear wall of said stand, each of said containers having a jar portion with a threaded neck portion with said threaded neck portion disposed at the lower end of said container where said container extends through the front wall of said stand, an insert member having a first end threaded to said threaded neck portion and a second threaded end extending into the aperture from the rear wall of said stand, a flange member separating said first end from said second end and abutting against the rear wall of said stand, a closure member normally closing off the neck portion of said jar portion having a first end extending into said aperture and threadably engaging the second end of said insert member, a flange member separating the first end of said closure member from a second end thereof having an opening leading into the interior of said closure member, said last-mentioned flange member abutting against said front wall of said stand and closure means associated with the opening leading into the interior of said closure member for selectively opening and closing the same, said closure member including an imperforate curved bottom wall and the opening leading into the interior thereof includes an open top portion defined by spaced curved side flanges, said closure means including a curved cover plate encircling said curved bottom wall in a first position thereby exposing said open top portion and reciprocal over said side flanges to close off said open top portion in a second position whereby, when said curved cover plate is reciprocated over said side flange to expose said open top portion, any pellets in said container, having moved by gravity to said neck portion, are selectively removable from said container through said open top portion.

4,819,816
COMBINATION SHIPPING RACK AND SUPPORT PALLET CONSTRUCTION

William L. Noble, Sr., Village of Wolverine Lake, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Feb. 17, 1988, Ser. No. 156,764
Int. Cl.[4] A47B *47/00*
U.S. Cl. 211—189 **3 Claims**



1. The combination comprising a shipping rack and support pallet therefor, the shipping rack including a generally rectangular bottom wall having a width and a length defining four corners, an upstanding end wall at each end of the length of the bottom wall, at least four spaced apart casters on the underside of the bottom wall each being positioned adjacent to one of said corners, the casters normally being ground engaging to permit the shipping rack to be rolled along a surface, the pallet being fabricated of a single metallic plate having a width and a length and including a generally flat support shelf, a downwardly extending trough extending transversely of the pallet along each of two opposed edges of said support shelf, a generally flat support wing extending from one of the troughs in the same plane as that defined by any support shelf, the troughs having a depth greater than the distance from the underside of the shipping rack bottom wall to the bottom of the casters, the pallet being received beneath the shipping rack between the pairs of casters at each longitudinal end of the shipping rack with the shipping rack being supported by said support shelf and support wing and with the casters out of ground engagement, the troughs being spaced apart a distance to accommodate reception of the spaced apart fingers of a fork lift transversely of the pallet so that the shipping rack may be lifted from the support pallet, and the wing being positioned with respect to the space beneath the support shelf to accommodate the reception of one finger of said fork lift transversely therebeneath with the other finger of said fork lift being received transversely beneath the support shelf so that the support pallet and shipping rack may be lifted as a unit while maintaining the same spacing of the fork lift fingers as that used for lifing the shipping rack.

4,819,817
ANIMAL TREE

Gregg Mar, 3030 Monticello Ln., Chico, Calif. 95926

Filed Dec. 7, 1987, Ser. No. 129,590
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—205 **6 Claims**

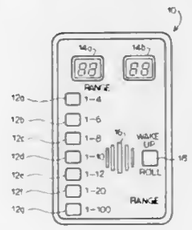


1. A vertical pole hanger for children's stuffed animals and dolls comprising;
a hollow tubular pole assemblage configured of measured sections selectable to produce said assemblage vertically aligned with a first terminal end adjacent a dwelling ceiling and a second terminal end adjacent said dwelling floor, there being extended compressible means at said first terminal end and extendable adjustment means at said second terminal end to cooperatively secure said pole assemblage temporarily affixed between said ceiling and said floor of said dwelling;
means for removably attaching said measured sections to each other in continuous alignment;
means for hanging said stuffed animals and dolls to said assemblage vertically aligned.

4,819,818
RANDOM NUMBER GENERATOR

John J. Simkus, 9N831 Beckman Trail, Elgin, Ill. 60123, and George Dell, Morton Grove, Ill., assignors to John J. Simkus, Huntley, Ill.

Filed May 8, 1987, Ser. No. 47,114
Int. Cl.[4] G06F *1/02*
U.S. Cl. 273—138 A **18 Claims**

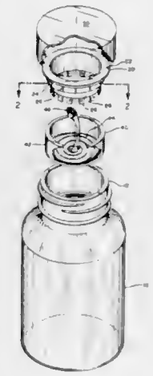


1. Electronic apparatus for generating data selection in response to operational signals within preselected range comprising:
micro-computer processor means;
range selection means coupled to said processor means for selecting a dual range of data for simultaneous data selection sequencing operations;
sequencing means under control of said processor means for concurrently sequencing through said data selection sequencing operations;
switch means for causing said processor means to terminate the first of said data selection sequencing operations in response to the push of said switch means and to select data therefrom, and to terminate the second of said data selection sequencing operations in response to the release of said switch means and to select data therefrom; and
display means under control of said processor means for displaying said selected data.

4,819,819
TAMPER-EVIDENT CLOSURE

Bertram D. Robertson, Jr., 1741 Detroit Ave., No. 21, Concord, Calif. 94520

Filed Mar. 28, 1988, Ser. No. 173,805
Int. Cl.[4] B65D *51/22*
U.S. Cl. 215—230 **10 Claims**



1. A tamper evident/tamper resistant seal closure for a container, having a generally cylindrical open throat, comprising: an annular element bonded to the throat of the container, the annular element including a consistent internal diameter, and an outer diameter that is varied to form firstly a lip for mating with the rim of the container throat, secondly a section which has an outer diameter only slightly smaller than the internal diameter of the container throat, and thirdly a section of reduced outer diameter; and an inverted cap comprised of an upwardly extending cylindrical portion sized to fit tightly over the third section of the annular element, and a flattened bottom, including frangible seal means therein.

4,819,820
CARGO CONTAINERS

Ronald Weiner, East Brighton, Australia, assignor to TCS Containers Pty. Ltd., Australia

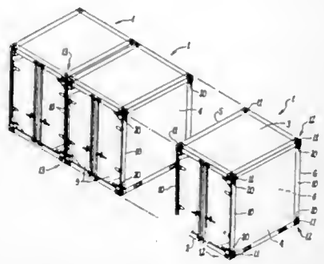
PCT No. PCT/AU87/00049, § 371 Date Oct. 21, 1987, § 102(e) Date Oct. 21, 1987, PCT Pub. No. WO87/04994, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 20, 1987, Ser. No. 137,536
Claims priority, application Australia, Feb. 21, 1986, PH4725
Int. Cl.[4] A44B *21/00*
U.S. Cl. 220—1.5 **12 Claims**

1. A cargo container for carrying cargo alone as an individual container or to be rigidly connected to one or more other identical containers for handling together as a rigid container unit, the container including:
a top wall, a bottom wall and a series of side walls;
corner castings located at each corner region formed between the walls;
a plurality of male coupling parts, each male coupling part having a mounting structure rigidly mounting that respective part adjacent one of the container side walls and providing an elongate mounting bore of substantial length

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opening therefrom, each male coupling part also having an elongate connecting element of substantial length slidingly mounted in a respective mounting bore for limited linear movement along a longitudinal mounting bore axis between a projected position projecting from the bore and extending beyond the one container side wall and a retracted position, the male coupling parts being located entirely within an outline of the container defined by the corner castings when the connecting elements are in the retracted position;

a plurality of female coupling parts, each female coupling part having a mounting structure rigidly mounting that respective part adjacent an opposite container side wall and providing an elongate receiving bore of substantial length opening therefrom, the female coupling parts also being located entirely within the outline of the container by the corner castings, the coupling parts being arranged so that, when the container and an identical container are



placed with their opposing side walls in complete face-to-face relation and immediately adjacent one another, the connecting elements of the male coupling parts of the container co-axially align with respective receiving bores of the female coupling parts of the identical container, whereby the connecting elements are slidingly received in the receiving bores when linearly moved in the projected position, the connecting elements slidingly fitting in their respective mounting bores and receiving bores along generally the substantial lengths thereof and in the absence of any other means to hold the container side walls in the face-to-face relation and prevent shifting of the containers out of the relation; and

locking elements for positively securing the connecting elements of the male coupling parts of the container to the female coupling parts of the identical container when received in the receiving bores thereby to releasably couple the coupling parts together and hold the containers rigidly together as a rigid container unit.

4,819,821

CYLINDRICAL-SHAPED STORAGE TANKS WITH FORMED OUTER JACKET

Bruce R. Sharp, 4090 Rose Hill Ave., Cincinnati, Ohio 45229

Filed Mar. 30, 1988, Ser. No. 175,104

Int. Cl.[4] B65D *6/00, 8/00*

U.S. Cl. 220—5 A **37 Claims**

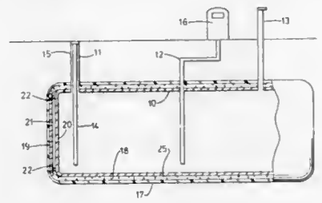
24. A storage tank for liquids having secondary containment capability, comprising:

(a) a rigid inner cylindrical-shaped tank with substantially flattened ends for storing the liquid;

(b) an end plate mounted on each flattened end of the tank, said end plates mounted so that an open space exists between the end plate and the tank, further wherein the open space is in communication with the space adjacent the outer side walls of the tank;

(c) a separating agent on the side walls of the inner tank and any portion of the flatten tank ends not covered by an end plate; and

(d) a jacket made of a fibrous reinforced resinous material which covers the surface area of the storage tank to form a closed space, said jacket being independent from the side walls of the rigid inner tank because of the separating agent, having sufficient structural strength to contain



liquid in the rigid inner tank which may leak therefrom, and being capable of withstanding external or internal load forces normally encountered by underground storage tanks without suffering cracking and/or collapsing.

4,819,822

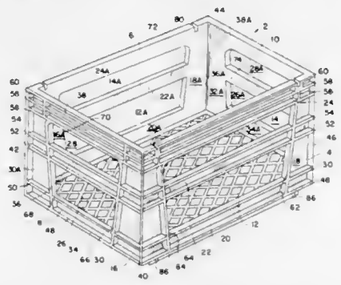
PILFER RESISTANT BEVERAGE CASE

Thomas Box, Shrewsbury, N.J., assignor to Spectrum International, Inc., Tinton Falls, N.J.

Filed Dec. 30, 1987, Ser. No. 139,624

Int. Cl.[4] B65D *21/02*

U.S. Cl. 220—72 **9 Claims**



1. A beverage case for holding a plurality of bottles and cartons comprising:

two longitudinal sides having a lower solid horizontal panel, an intermediate solid horizontal panel, an upper solid horizontal panel, two solid vertical end panels and lower and upper openings defined by the solid horizontal panels and solid vertical end panels;

two lateral sides each having a lower solid horizontal panel, an intermediate solid horizontal panel, an upper solid horizontal panel, two solid vertical end panels and lower and upper openings defined by the solid horizontal panels and solid vertical end panels; and

a rib structure surrounding the solid horizontal and vertical end panels and which are integrally formed with the solid horizontal and vertical end panels.

4,819,823

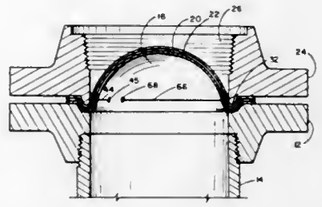
SAFETY PRESSURE RELIEF DEVICE AND METHOD FOR MAKING THE SAME

Dixit B. Kadakia, Tulsa, and Wayne V. Wright, Cushing, both of Okla., assignors to BS & B Safety Systems, Inc., Tulsa, Okla.

Continuation of Ser. No. 018,206, Feb. 24, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 183,420

Int. Cl.[4] F16K *13/04*

U.S. Cl. 220—89 A **44 Claims**



1. A vacuum support for using with a safety pressure relief rupture member comprising:

a disk having a convex side and a concave side, and defining a slit through said disk sides having a pair of opposing ends, wherein said disk includes:

an upper disk portion generally above said slit, said upper disk portion being positionable against one side of the rupture member for supporting the rupture member when the pressure on said concave side of said disk is lower than the pressure on the other side of the rupture member;

a lower disk portion generally below said slit;

a vacuum support hinge defined between said opposing slit ends for swinging movement of said upper disk portion relative to said lower disk portion; and

means for supporting said upper disk portion against swinging movement on said vacuum support hinge in a direction away from the rupture member in the presence of reverse pressure, said supporting means consisting solely of a pair of opposed substantially planar disk edges defining opposite sides of said slit, said edges being urged substantially flushly against one another when the pressure on said concave side of said disk is lower than the pressure on the other side of the rupture member.

4,819,824

LIDDED CONTAINERS

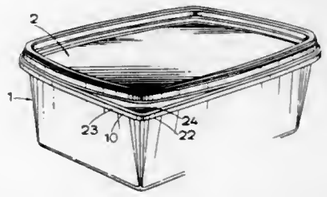
Karl Longbottom, Burton-on-Trent; Norman Whiteley, Walsall, and Paul J. H. Bagnall, NR. Rugeley, all of England, assignors to Barker, Brettell & Duncan, Edgbaston, England

Filed Feb. 24, 1988, Ser. No. 159,697

Claims priority, application United Kingdom, Feb. 25, 1987, 8704434

Int. Cl.[4] B65D *41/48*

U.S. Cl. 220—266 **3 Claims**



1. A lidded container comprising a container having a rim and a lid having a skirt which surrounds said rim and has a lower portion, said rim being of an inverted generally U-section including an outer depending limb having an outwardly and downwardly inclined lower portion from which a circumferential flange extends outwards underneath said skirt, said circumferential flange having an upstanding retention portion which surrounds said lower portion of said skirt, said skirt and said retention portion having mechanically interlocked formations which extend continuously around said container, said flange being formed with a line of weakening and said retention portion having a portion adjacent to said line of weakening which is separable at least partially from the remainder of said flange at said line of weakening to enable the mechanical interlock between said formations to be released.

4,819,825

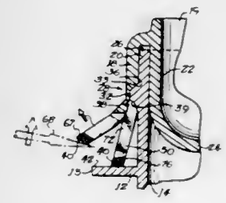
TEAR STRIP CLOSURE WITH IMPROVED TAMPER INDICATION

H. Richard Landis, Oak Lawn, Ill., assignor to Landis Plastics, Inc., Chicago Ridge, Ill.

Continuation-in-part of Ser. No. 927,337, Nov. 5, 1986, Pat. No. 4,732,293. This application Feb. 5, 1988, Ser. No. 152,771

Int. Cl.[4] B65D *17/40*

U.S. Cl. 220—276 **20 Claims**



1. A container and closure assembly comprising:

a container having a substantially circular opening and an outer wall with a retention bead and a substantially continuous radially outwardly extending security ring on the outer wall; and

a closure including

a one-piece plastic body having a top panel,

an encircling skirt depending from the top panel so as to be integrally attached thereto, and having a lower edge adjacent the security ring,

a locking means on the skirt for interlocking with said retention bead to retain the closure on the container,

a removable tear strip having a lower free edge and located on a lower portion of the skirt for removal to indicate that the closure has been opened,

means providing a line of weakness in the lower portion of the skirt and defining a breakable connection between the tear strip and skirt, and

weakening means for weakening said tear strip so as to form a plurality of circumferentially-spaced weakened segments in the tear strip throughout substantially the entire lower free edge thereof, the segments separable from one another in response to a prying force applied to the tear strip at the lower free edge thereof so as to indicate that a prying force has been applied to said closure.

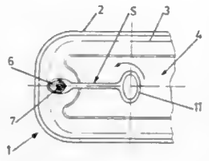
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4,819,826

TOOL FOR OPENING A CAN WITH A TOP WHICH IS EASY TO OPEN

Ricardo R. Lopez, Vigo, Spain, assignor to Envases Carnaud, S.A., Spain

Filed Oct. 15, 1987, Ser. No. 109,153
Claims priority, application Spain, Oct. 20, 1986, 8602679
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—273 7 Claims



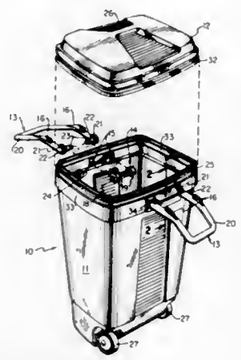
1. An easy opening container comprising
a wall having a line of weakness therein, said weakness line defining a tear portion at least partially removable from said container wall, and
a tool connected to said tear portion, said connection permitting said tool to pivot in a piercing plane generally normal to said wall, and said connection also permitting said tool to pivot in a tear off plane generally parallel to said wall, said tool comprising
a piercing point located adjacent a section of said weakness line when said tool is in a storage position, said piercing point functioning to pierce said wall at said section when said tool is pivoted in said piercing plane, and
a handle located within the periphery of said wall when said tool is in a storage position, said handle being of such length that it extends beyond the periphery of said wall after said tool has been pivoted to tear off position, said tool being rotatable when in said tear off position so as to roll up said tear off portion thereon after said wall has been pierced in order to open said container.

4,819,827

REFUSE CONTAINER WITH LOCKING HANDLE

Frank DiSesa, Lunenburg, Mass., assignor to Kidde Holding, Inc., Saddle Brook, N.J.

Filed Oct. 16, 1987, Ser. No. 109,476
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—318 13 Claims



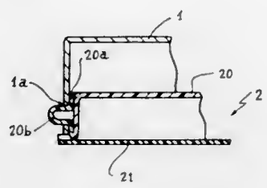
1. A refuse container comprising:
a container body of a deformable material with a vertical side wall defining a central opening at the top thereof;
a removable lid for fitting on the top of said side wall to cover said central opening;
a hollow protrusion formed on said side wall and extending outwardly therefrom, said protrusion having an irregular internal cross-sectional shape;
at least one locking element in said hollow protrusion having portions with an irregular shape generally corresponding to that of said protrusion internal cross-sectional shape;
a generally U-shaped handle;
means at the end of each arm of said handle for extending into said protrusion to engage and rotate said locking element as said handle is rotated;
said handle being locked in a substantially upright vertical position by alignment of the correspondingly shaped irregularities of said locking element and protrusion internal cross-section, said locking element entering and leaving a locked position when the handle is locked by moving over, deforming, and releasing a part of said protrusion;
and a finger extending from each arm of the handle to overlie the periphery of the lid when the handle is in the upright vertical locked position.

4,819,828

IMPROVEMENTS IN BOXES HAVING ARTICULATED LIDS

Bruno Mirabel, Aubenas, France, assignor to Vincent-Jouret S.A., Aubenas, France

Filed Sep. 25, 1987, Ser. No. 101,197
Claims priority, application France, Oct. 1, 1986, 86 13905
Int. Cl.[4] B65D *43/14, 51/00*
U.S. Cl. 220—338 8 Claims



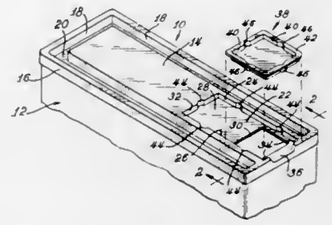
1. In a case having a box which is selectively covered by a lid, the improvement comprising, said box having a bottom and base elements, said lid having side walls having an opening therein, said bottom element of said box having lateral walls, at least one of said bottom element and said base element having a projecting lug means extending outwardly from said lateral walls, said projecting lugs being foldable into abutment with said lateral walls of said bottom element, boss elements extending from each of said projecting lugs and extending outwardly of said lateral walls of said bottom element when said projecting lugs are abutting said lateral walls, and said boss elements being selectively receivable within said openings of said side walls of said lid to thereby pivotably assemble said lid to said box.

4,819,829

CLOSURE FOR POURABLE MATERIALS CONTAINER

David B. Rosten, Cambridge, Minn.; William C. Perchak, Chicago, Ill.; Douglas E. Foos, Barrington, Ill.; Richard L. Partlow, Jr., Naperville, Ill., and Gary G. Buhrke, Sandwich, Ill., assignors to Plastofilm Industries, Inc., Wheaton, Ill.

Continuation-in-part of Ser. No. 122,779, Nov. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 49,125, May 12, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 182,257
Int. Cl.[4] B65D *43/20, 51/18*
U.S. Cl. 220—346 20 Claims



1. A closure for a container, comprising
a. generally planar cover member,
b. means for attaching said cover member to a container,
c. a slideway formed in the cover member and extending generally from one edge thereof, said slideway extending at least a predetermined length and including
i. spaced, parallel sidewalls,
ii. a floor extending between said sidewalls, and
iii. an opening in the floor to permit removal of the contents through the opening,
d. a slide disposed in said slideway, said slide having a length less than said predetermined length,
e. means mounting said slide in said slideway for sliding movement along the length of said slideway, said mounting means also retaining said slide in said slideway, and
f. means formed in said cover member for facilitating insertion of said slide within said slideway, said facilitating means comprising an indented portion formed in each said sidewall, said indented portions being opposite one another and being separated a distance at least equal to a lateral dimension of said slide.

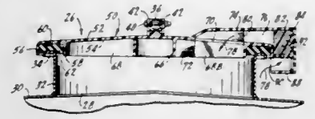
4,819,830

VENTED HATCH COVER

Francis R. Schultz, Woodridge, Ill., assignor to Salco Products Incorporated, Romeoville, Ill.

Filed Feb. 11, 1988, Ser. No. 155,088
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—371 19 Claims

1. A hatch cover for a container of the type having an opening defining a hatch, and a coaming on the exterior of the container surrounding the hatch opening, said cover comprising; a single shell member sized to fit over and enclose the hatch opening and having an interior surface to close the hatch opening and an exterior surface exposed to atmosphere, said shell member further having at least one air passage therethrough, seal means on the interior surface of the shell member adapted to contact and seal against the coaming, a wall formed on the exterior surface of said shell member defining a plenum overlying said at least one air passage, said wall defining an air inlet passage to said plenum disposed radially outward of said seal means and below said air passage defined by said shell member.

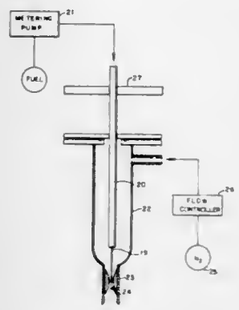


4,819,831

DROPLET GENERATING APPARATUS

Gary J. Green, Yardley, Pa.; Frederick L. Dryer, Pennington, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 917,288, Oct. 9, 1986, Pat. No. 4,717,049, which is a continuation of Ser. No. 596,990, Apr. 5, 1984, abandoned. This application Sep. 22, 1987, Ser. No. 99,860
Int. Cl.[4] B65D *47/18*
U.S. Cl. 222—420 19 Claims



1. A method of producing uniform droplets of a liquid comprising:
supplying a stream of gas to a concentric tube, said stream of gas flowing through said concentric tube;
supplying said liquid to a first end of a capillary tube positioned in said concentric tube;
accelerating said stream of gas toward said first end of said capillary tube; and
decelerating said stream of gas after said steam of gas passes said first end of said capillary tube;
wherein said accelerating stream of gas detaches uniform droplets of diameter less than 450 micrometers of said liquid from said first end of said capillary tube as said accelerating stream of gas flows past said first end of said capillary tube, said detached droplets being spaced apart by a distance in the range of 100–600 droplet diameters.

4,819,832

PUMP TYPE DISPENSER WITH SWIVELLABLE NOZZLE FOR LOCKING THE PUMP

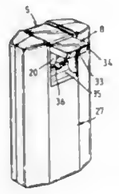
Thomas J. Lawson, Leicester, England, assignor to The English Glass Company Limited, United Kingdom

Filed Aug. 14, 1987, Ser. No. 85,209

Claims priority, application United Kingdom, Aug. 18, 1986, 8620072

Int. Cl.[4] B67D *5/32*

U.S. Cl. 222—153 **10 Claims**



1. A pump dispenser for discharging fluid from a container comprising:
- a casing having wings,
- a pump head,
- means for mounting the pump head in the casing between the wings, one wing on each lateral side thereof, for movement of the head relative to the casing in straight-line pumping movements,
- a nozzle swivellably mounted on a front face of the pump head,
- the nozzle being swivellable to and between first and second limit positions about an axis generally perpendicular to the direction of said straight-line pumping movement, the nozzle in the first said limit position engaging, by its end remote from the swivellable mounting, an abutment of the casing whereby to prevent said pumping movement of the head relative to the casing,
- a duct in the nozzle,
- a duct in the head,
- means cutting off fluid communication between the said ducts when the nozzle is in its first said limit position,
- the nozzle projecting outwardly from a lateral plane joining the fronts of the wings, in the second limit position the nozzle being free of said abutment and said ducts being in fluid communication with each other whereby the head may undergo said pumping movement relative to the casing and fluid may be dispensed in response to said pumping movement via the ducts in the head and the nozzle.

4,819,833

MEASURING, METERING, AND MIXING CAN FOR GASOLINE AND OIL

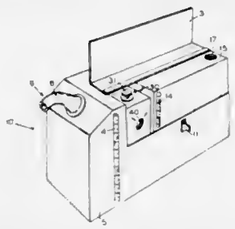
Earl M. Huddleston, Boise, Id., and Garry F. Jervis, Paris, Calif., assignors to Hudd Investment Trust, Inc., Las Vegas, Nev.

Filed Jan. 25, 1988, Ser. No. 148,032

Int. Cl.[4] B67D *5/38;* **B65D** *1/24*

U.S. Cl. 222—155 **9 Claims**

1. A portable measuring, metering, and mixing can comprising:
- a first compartment provided with a filler spout and a pour spout;
- a first compartment gauge for visually determining an amount of liquid within said compartment; and
- a second compartment provided with a filler spout;
- a second compartment gauge for visually determining an amount of liquid within said second compartment; and
- metering means in fluid communication with said first and second compartments for withdrawing a selected amount of liquid from said second compartment as visually determined by said second compartment gauge, based upon an amount of liquid in said first compartment as visually determined by its gauge, and injecting said liquid into said first compartment for mixing in to a predetermined ratio based upon the volume of said first compartment and the ratio of liquids desired.



4,819,834

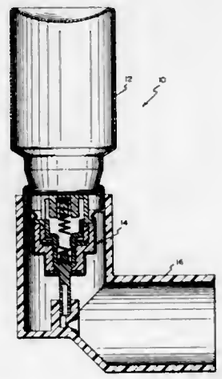
APPARATUS AND METHODS FOR DELIVERING A PREDETERMINED AMOUNT OF A PRESSURIZED FLUID

Charles G. Thiel, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 9, 1986, Ser. No. 905,306

Int. Cl.[4] G01F *11/10*

U.S. Cl. 222—355 **61 Claims**



1. A valve for delivering a predetermined amount of a fluid, comprising:
- a valve housing;
- a valve stem movably mounted within said valve housing between a first position and a second position, said valve stem in said second position defining with said valve housing a metering chamber dimensioned to receive said predetermined amount of fluid, said valve stem in said first position occupying substantially the entire volume of said metering chamber, said valve stem having a first portion which is generally external to said valve housing and a second portion which is generally internal to said valve housing when said valve stem is in the first position, said second position being configured so as to occupy substantially the entire volume of said metering chamber when said valve stem is in the first position, said first portion being configured such that, when said valve stem is in the second position, at least a part of said first portion is positioned within said valve housing so as to form said metering chamber between said valve stem and said valve housing;

- means for supplying fluid to said metering chamber as said metering chamber is formed; and
- means for releasing the fluid from said metering chamber.

55. A method for delivering a predetermined amount of a fluid, comprising the steps of:
- providing a valve having a valve housing and a valve stem movably mounted within said valve housing between a first position and a second position, said valve stem having a first portion which is generally external to said valve housing and a second portion which is generalaly internal to said valve housing when said valve stem is in the first position, said valve stem in said second position defining with said valve housing a metering chamber dimensioned to receive said predetermined amount of fluid, said valve stem in said first position occupying substantially the entire volume of said metering chamber;
- positioning the valve stem in the first position such that the valve stem occupies substantially the entire volume of the metering chamber;
- moving the valve stem from the first position to the second position so as create said metering chamber;
- filling the metering chamber with fluid as it is created; and
- expelling the fluid from the metering chamber.

61. A valve for delivering a predetermined amount of a fluid, comprising:
- a valve housing;
- a valve stem movably mounted within said valve housing between a first position and a second position, said valve stem in said second position defining with said valve housing a metering chamber dimensioned to receive said predetermined amount of fluid, said valve stem in said first position occupying substantially the entire volume of said metering chamber;
- means for supplying fluid to said metering chamber as said metering chamber is formed;
- means for releasing the fluid from said metering chamber; and
- a discharge piece positioned around said releasing means so as to receive fluid discharged from said releasing means, said discharge piece being configured for insertion into a body cavity of a patient to whom the fluid is to be administered.

4,819,835

TRIGGER TYPE LIQUID DISPENSER

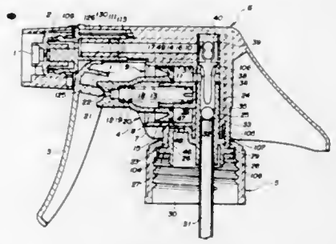
Takaharu Tasaki, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1987, Ser. No. 74,727

Claims priority, application Japan, Jul. 21, 1986, 61-111764; Dec. 27, 1986, 61-203540; Jul. 8, 1987, 62-105112; Jul. 8, 1987, 62-105113

Int. Cl.[4] B67D *5/40*

U.S. Cl. 222—383 **4 Claims**



1. A trigger type liquid dispenser having a nozzle unit including a nozzle at its front end, a pump operated by a trigger and a container mount, comprising said pump operated by the trigger having an annular cylinder including concentric outer and inner cylindrical members of double wall shape projected forwardly of a body, and a piston unit telescoped in the annular cylinder and having an annular piston sliding on the inner surface of the outer cylindrical member and the outer surface of the inner cylindrical member, said piston unit having skirts annularly flared at the axial edges of the sliding surfaces which coact with the surface of the inner and outer cylindrical members to form a pump chamber, a spring contained in a spring chamber formed of a bore in the inner cylindrical member of the annular cylinder and the piston unit telescoped about the inner cylindrical member, said spring urging the piston unit outwardly of the annular cylinder, said spring chamber capable of communicating with the atmosphere through the piston unit, and an intake valve on said outer cylindrical member for communicating atmospheric air with the neck of the container upon which the assembly is mounted whenever the piston unit is operated by the trigger.

4,819,836

DISPENSER FOR DISPENSING PASTE COMPOSITIONS

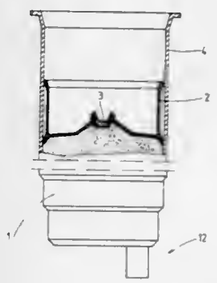
Fritz Meckenstock, Wuppertal, Fed. Rep. of Germany, assignor to Mega Plast product- u. Verpackungsentwicklung Marketing Gesellschaft mit beschränkter Haftung & Co., Neuenburg, Fed. Rep. of Germany

Filed Nov. 15, 1987, Ser. No. 125,425

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719252

Int. Cl.[4] B65D *5/42;* **B29C** *65/00*

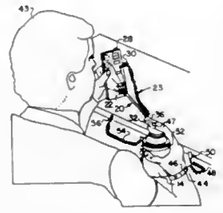
U.S. Cl. 222—386 **17 Claims**



1. A dispenser for the dispensing of paste compositions comprising:
- a piston movable in an emptying direction within a dispenser housing;
- a stopper part for closing the piston, adapted to be driven in sealing manner into the piston including radial arms connected thereto;
- a stopper seat being developed in said piston and the dispenser housing being evacuatable by an air vent zone located in the region of the stopper seat, said zone being defined by slots formed between the stopper seat and the stopper part which are interrupted by said radial arms of the stopper part,
- said arms forming two separate sections which lie one behind the other in an axial direction, and which are separated from each other by a free space, wherein at least those arms lying in a cross-sectional plane of one section of said two sections are formed as tear-off arms.

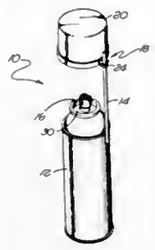
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4,819,837
AEROSOL STATIC DISSIPATOR
Melvin L. Goforth, Amarillo, Tex., assignor to Tech Spray, Inc., Amarillo, Tex.
Filed Jan. 24, 1986, Ser. No. 822,011
Int. Cl.⁴ B65D *83/00*
U.S. Cl. 222—402.1 **8 Claims**



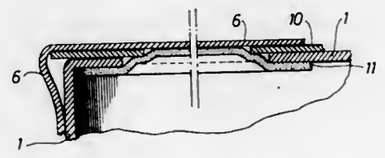
1. A device for dissipating static electricity from an aerosol stream, comprising:
a. an actuator having a nozzle,
b. the actuator being fluidly connectable to an outlet valve of an aerosol can containing an aerosol propellant for discharging and aerosol stream through said nozzle,
c. an electrically conductive tube fluidly connected to the nozzle at one end and open at an opposite, discharge end, so that any aerosol stream discharged from said nozzle will flow through the tube and out of the discharge end,
d. an electrically conductive wire electrically connecting the tube and a connector,
e. the connector providing means for electrically connecting the tube through the wire to a selected ground, and
f. a can fluidly connecting to the actuator being grounded when the actuator is operated.

4,819,838
SPRAY TUBE AND SUPPORT ASSEMBLY FOR SPRAY CONTAINER
Charles R. Hart, Jr., 919 Santa Monica Blvd., Ste. 300, Santa Monica, Calif. 90406
Filed Apr. 8, 1987, Ser. No. 35,888
Int. Cl.⁴ B05B *15/06*
U.S. Cl. 222—538 **11 Claims**



1. A spray tube and support assembly for use in combination with a spray container having a spray nozzle unit for outward discharge of fluid from the spray container, and a protective cap for mounting onto the spray container in a position over the spray nozzle unit, said assembly comprising:
a support member carried by said protective cap, said support member including a relatively short outwardly projecting support arm terminating in an upwardly open support ring member; and
an elongated spray tube having a size and shape for mounting onto said spray nozzle unit for in-line passage of fluid discharged from said spray container, said spray tube further having a size for sliding reception through said support ring member and including at least one outwardly radiating tab near one end thereof, said tab resting upon said support ring member when said spray tube is received therethrough to support said spray tube relative to said container when said cap is mounted on said container.

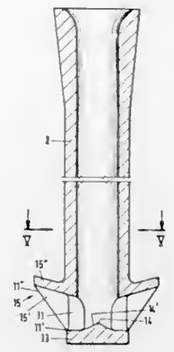
4,819,839
OPENING ARRANGEMENT ON PACKING CONTAINERS
Lars Carlsson, Blentarp; Kjell Martensson, Malmö, and Hans-Georg Melle, Höör, all of Sweden, assignors to Tetra Pak International AB, Lund, Sweden
Filed Mar. 6, 1985, Ser. No. 708,824
Claims priority, application Sweden, Mar. 23, 1984, 8401616
Int. Cl.⁴ B65D *47/10*
U.S. Cl. 222—541 **9 Claims**



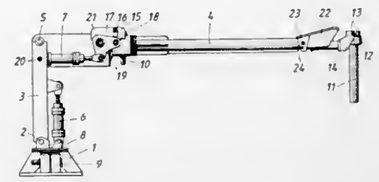
1. In an opening arrangement for a packing container of the type including a packing container wall having a pouring opening, a removable cover strip applied over said pouring opening and a pouring rim element situated between the cover strip and the packing container wall, wherein the improvement comprises the pouring rim element being joined to the cover strip by a first seal and said pouring rim element being joined to the packing container wall by a second seal, the first seal between the pouring rim element and the cover strip being weaker than the second seal between the pouring rim element and the packing container wall, said pouring rim element having an edge portion extending along said pouring opening, said edge portion projecting partially over said pouring opening, and a liquid-tight layer of material closing said pouring opening, said layer being joined to an inside surface of said packing container wall about said pouring opening and being joined to said edge portion and to said cover strip through said pouring opening, whereby upon opening of the packing container and pouring contents therefrom, said liquid-tight layer substantially prevents contents from being absorbed between said container wall and said rim element.

4,819,840
REFRACTORY SUBMERGED POURING NOZZLE
Hermann Lax, Düsseldorf, and Karl-Ulrich Köhler, Neukirchen-Vluyn, both of Fed. Rep. of Germany, assignors to Thyssen Stahl Aktiengesellschaft, Duisburg, Fed. Rep. of Germany
Filed Jul. 10, 1987, Ser. No. 72,088
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623660
Int. Cl.⁴ B22D *11/10*
U.S. Cl. 222—606 **12 Claims**

1. In a submerged pouring nozzle for the continuous casting of molten metals into thin slabs in a mold having narrow sides and wide sides and an upper region which is funnel shaped, wherein the nozzle has a closed bottom and means forming outflow orifices disposed opposite each other laterally in a nozzle wall upstream of the bottom and facing the narrow sides of the mold, the improvement wherein the means forming the outflow orifice comprises for each orifice a guide element projecting radially outwardly and upwardly from an outside surface of the nozzle wall at an upper region of the orifice and at an acute angle to the nozzle wall and means forming a breakaway edge at a lower region of the orifice comprising at least one of the nozzle wall and the bottom.

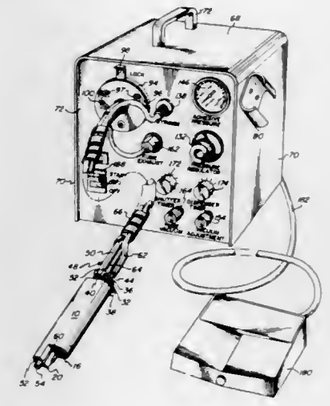


4,819,841
MANIPULATOR FOR ENGAGING A POURING TUBE WITH A DISCHARGE GATE VALVE OF A POURING LADLE
Kurt Stangl, A-4844 Regau 106, Austria
Filed Oct. 2, 1987, Ser. No. 104,804
Claims priority, application Austria, Oct. 22, 1986, 2801/86
Int. Cl.⁴ B22D *37/00*
U.S. Cl. 222—607 **5 Claims**



1. A manipulator for engaging a pouring tube with a discharge gate valve of a pouring ladle, comprising:
(a) a supporting structure including an abutment,
(b) a boom pivoted to said supporting structure for pivoting about a horizontal axis and adapted to hold said pouring tube, the boom being operable to engage said pouring tube with said discharge gate valve, and
(c) a fluid-operable pivoting cylinder arranged between said abutment and said boom for pivotally moving said boom about said axis, one end of the cylinder bearing on the abutment and an opposite cylinder end being connected to said boom, wherein the improvement comprises
(d) a spring supporting one of the cylinder ends, the spring having an initial stress of a smaller force than the pressure force required to engage the pouring tube with the discharge gate valve.

4,819,842
RADIATION SUPPLY AND ADHESIVE DISPENSING SYSTEM
Richard A. Westervelt, Winsted, Conn., assignor to Dymax Corporation, Torrington, Conn.
Filed Sep. 3, 1987, Ser. No. 92,566
Int. Cl.⁴ B65D *83/14*
U.S. Cl. 222—642 **17 Claims**



11. A control unit for use in a system for dispensing a radiation-curable liquid substance, comprising:
(a) a housing having an opening therefrom;
(b) radiation source means in said housing in effective registry with said opening;
(c) shutter means including a shutter means adapted and disposed for blocking the passage of radiation from said source means through said opening, said shutter means being selectively operable to cause said shutter member to either prevent or permit such passage of radiation;
(d) air valve means selectively operable to either prevent or permit the passage of air supplied thereto;
(e) coupling means for operatively connected radiation-transmitting means and pneumatically operated substance-dispensing means to said housing opening and said valve means, respectively, and for connecting said valve means to a pressurized air supply, whereby said unit can be used to control both the dispensation and also the irradiation of liquid substance at a location remote therefrom;
(f) a first variable timer operatively connected to said valve means for controlling the period during which such passage of air is permitted; and
(g) a second variable timer operatively connected to said shutter means for controlling the period during which such passage of radiation is permitted, whereby said unit can be used to dispense substance during an initial period of time, controlled by said first time, and to effect the passage of radiation for a second period of time following said initial period, controlled by said second timer.

4,819,843
DRINK CONTAINER HOLDER
Hiromichi Nakayama, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Nov. 4, 1987, Ser. No. 116,295
Claims priority, application Japan, Nov. 6, 1986, 61-262743
Int. Cl.⁴ B60N *3/00*; **B60R** *7/00, 11/00*
U.S. Cl. 224—42.45 R **15 Claims**

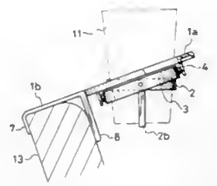
1. A drink container holder, comprising:
an annular mounting base having a substantially U-shaped, inverted bracket-type mounting means, said mounting base including a pair of dependent shaft bearing portions

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integral with said annular mounting base and disposed at diametrically opposed positions along a first pivot axis with the center of said annular mounting base defined between said bearing portions;

an annular holding framework including a substantially U-shaped cup holding frame, dependently supported from and integral with said annular holding framework, disposed internally within said annular mounting base, said holding framework including a pair of shaft bearing portions disposed at diametrically opposed positions along a second pivot axis, which is disposed substantially perpendicular to said first pivot axis, with the center of said annular holding framework defined between said pair of shaft bearing portions of said annular holding framework; and

an annular intermediate framework interposed between said



annular mounting base and said annular holding framework, said intermediate framework including first and second pairs of shaft bearing portions for respectively accommodating said shaft bearing portions of said annular mounting base and said annular holding framework, the first pair of shaft bearing portions of said annular intermediate framework being provided at diametrically opposed positions along said first axis, the second pair of shaft bearing portions of said annular intermediate framework being provided at diametrically opposed positions along said second axis crossing said first axis at right angles thereto, said first pair of shaft bearing portions of said intermediate framework pivotably bearing said shaft bearing portions of said mounting base, said second pair of shaft bearing portions of said intermediate framework pivotably bearing said shaft bearing portions of said holding framework.

4,819,844

CARRYING STRAP FOR A WEAPON

Pekka Niemelä, Säpikäsmutak 2 A, 96440 Rovaniemi 44, Finland

Continuation of Ser. No. 787,330, Oct. 15, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 18,742

Claims priority, application Finland, Oct. 15, 1984, 844036

Int. Cl.⁴ F41C *33/00*

U.S. Cl. 224—150 **5 Claims**



1. A carrying strap for a weapon which is carried in an upright ready to fire position, the strap being attached to the weapon at first and second attachment points on the barrel of the weapon and at the stock of the weapon, respectively, so that said strap forms a loop across the shoulder and back of the person carrying the weapon;

the carrying strap including a stiffener within said strap forming a stiff section, wherein said stiff section is disposed near said first attachment point in such manner that the weapon is free to turn between a lower position and a raised firing position;

said strap further including a first extension resting against an upper point of the stock plate of the weapon and pivotally attached to said second attachment point under the stock, said second attachment point being located at a point forward of the rear of the stock plate such that said first extension pivots between a horizontal position and a position which is inclined with respect to a longitudinal axis of the weapon, said first extension comprising stiff steel wire.

4,819,845

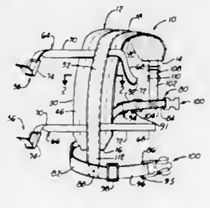
SKI CARRIER APPARATUS

Gary S. Byrd, 13425 Chinaberry La., Edmond, Okla. 73034

Filed Mar. 12, 1985, Ser. No. 710,971

Int. Cl.⁴ A45C *11/78*

U.S. Cl. 224—204 **4 Claims**



1. An apparatus for carrying elongate skiing equipment, comprising:

a load-carrying element having a first end and a second end, the load-carrying element comprising:

a hook section formed adjacent the first end of the load-carrying element, the hook section having a concavity sized to permit the hook section to fit over a single shoulder of a wearer of the apparatus; and

an equipment attachment section disposed adjacent the hook section and terminating at the second end of the load-carrying element, the equipment attachment section sized to fit diagonally across the back of a wearer of the apparatus;

attachment means, supported by the load-carrying element, for releasably securing elongate skiing equipment to the equipment attachment section;

stabilizer means, supported by the load-carrying element, for releasably holding the load-carrying element in a stable position when the hook section has been fitted over the shoulder of a wearer and the equipment attachment section extends diagonally across the wearer's back, comprising:

a waist belt supported by the equipment attachment section and having a first end and a second end, the waist belt sized to fittingly extend around the waist of a wearer of the apparatus,

a first cross belt which interengages the first end of the load-carrying element and the waist belt; and

a second cross belt which interengages the second end of the load-carrying element and the waist belt;

in which the first and second cross belts are integral sections of a shoulder belt which extends in overlying relationship to the load-carrying element and which is engaged with the waist belt.

4,819,846

SPORTSMAN'S BELT HAVING A PLURALITY OF POCKETS

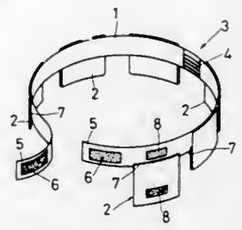
Nils Haanemann, 89 Eastbourne, Carlswald, Midrand 1685, Transvaal Province, South Africa

Filed May 19, 1987, Ser. No. 51,408

Claims priority, application South Africa, May 19, 1986, 86/3694

Int. Cl.⁴ A45F *3/00*

U.S. Cl. 224—240 **3 Claims**



1. An article of sportman's equipment comprising a belt made of flexible sheet material for encircling a user's waist, cooperable mat and pad-type friction fastening means at opposite ends of the belt for releasably securing same around the user's waist, and at least two spaced closable pouches on the belt for receiving nutrients and the like, each pouch including a back sheet of flexible material having an upper edge portion and a lower edge portion and a front sheet of material having an upper edge portion and a lower edge portion, securing means fastening the upper edge portion of the back sheet to the belt adjacent a lower edge of the belt and cooperable attachment means on the belt above said securing means and on the lower edge portion of the front sheet of the pouch for mutual engagement of said attachment means to fold and close the pouch, and wherein the belt and pouch are each made of sheet material weighing less than 7.5 ounces/sq. yard i.e. 200 g/m^2.

4,819,847

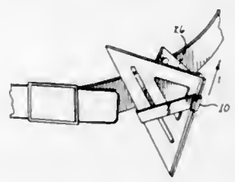
HOLDER FOR TRIANGULAR CARPENTER'S SQUARE

Ron Anderson, Mesa, Ariz., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 14, 1987, Ser. No. 37,989

Int. Cl.⁴ A45F *5/00*

U.S. Cl. 224—252 **9 Claims**



1. A speed square tool holder, comprising:

a generally triangular-shaped holding mechanism having first and second substantially co-planar members forming an apex of said generally triangular-shaped holding mechanism and a third member spaced apart from said two substantially co-planar members, defining a base of said generally triangular-shaped holding mechanism and a slot therebetween;

a locking mechanism having a generally T-shaped cross-section and providing a connection between one of said first and second substantially co-planar members and third member of said generally triangular-shaped holding mechanism, for engaging a T-shaped edge of a speed square tool and frictionally locking the speed square within said generally triangular-shaped holding mechanism the other of said first co-planar members being directly connected to said third member;

a support member securely fastened to said generally triangular-shaped holding mechanism; and

clip means for removeably attaching said support member to a wearer, said clip means being freely rotatable with respect to said support member.

4,819,848

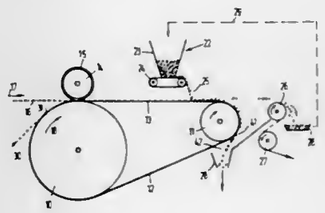
APPARATUS FOR MAKING PERFORATED ROOFING MATERIAL

Jan Hollander, Zuidborn, Netherlands, assignor to B.V. Asphalt-en Chemise Fabrieken Smid & Hollander, Groningen, Netherlands

Division of Ser. No. 880,418, Jun. 30, 1986. This application Jan. 26, 1988, Ser. No. 148,413

Int. Cl.⁴ B26F *3/02*

U.S. Cl. 225—96 **12 Claims**



1. Apparatus, for use with roofing material of the type having perforations formed through a bitumenized web material and a non-adhesion surface on one side of the web material and a metal foil covering both the other side of the web material and the perforations, for removing the metal foil covering the perforations, comprising:

a first, weakening station for weakening the metal foil along the circumferential edges of the perforations; and

a second, removing station for removing the circumferentially weakened metal foil portion covering the perforations.

4,819,849

TRACTOR WITH LOCKING ACTION

Karl G. Seitz, Goshen, Conn., assignor to Data Motion, Inc., Torrington, Conn.

Filed Dec. 22, 1987, Ser. No. 137,260

Int. Cl.⁴ G03B *1/22*

U.S. Cl. 226—74 **14 Claims**

1. In a drive tractor for web material adapted to be slidably mounted on substantially parallel extending support and drive shafts of a printer assembly, the combination comprising:

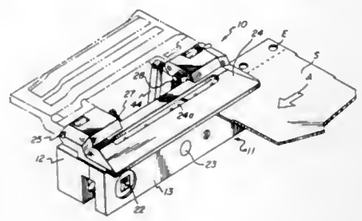
(a) a tractor chassis having a pair of spaced passages extending transversely therethrough;

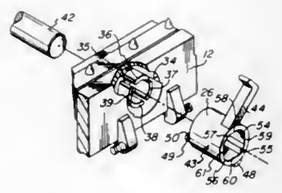
(b) a drive sprocket rotatably mounted in one of said passages in said tractor chassis and adapted to receive an associated drive shaft for sliding therealong and for driving engagement therewith upon rotation of the associated drive shaft about its longitudinal axis;

(c) an endless belt disposed about said tractor chassis in engagement with said drive sprocket to be driven thereby upon rotation of said sprocket by the associated drive shaft, the outer surface of said drive belt being adapted to engage an associated web material and advance it through the tractor upon driving motion of said drive belt by said sprocket; and

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(d) clamping means about the other of said passages in said chassis for clamping said chassis to the associated support shaft and including a generally annular recess in one surface of said chassis about said other passage, said recess being defined by an end wall and a circumferential wall, said clamping means also including a plurality of resiliently deflectable fingers integral with and projecting coaxially from said end wall of said recess and defining a portion of said other passage for said support shaft, said





fingers being inwardly spaced from said circumferential wall of said recess, a rotatable clamping member having a generally cylindrical body portion disposed within said recess about said fingers, said body portion having interior cam surfaces which, in a first rotated position of said clamping member, flex said fingers inwardly to clamp the associated support shaft extending therethrough, and, in a second position, release said fingers from said deflection to permit said chassis to slide on the associated support shaft and said drive shaft.

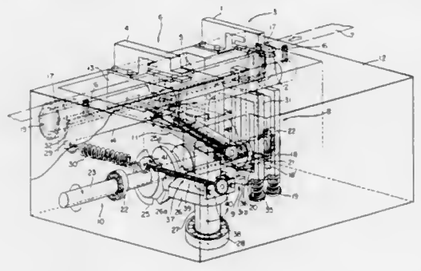
4,819,850

MATERIAL FEEDING APPARATUS

Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Company, Ltd., Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 96,094
Claims priority, application Japan, Sep. 22, 1986, 61-224297
Int. Cl.[4] B65H *20/18*
U.S. Cl. 226—162 **1 Claim**

1. A material feeding apparatus comprising:
a first gripper device having a first fixed gripper and a first movable gripper for cooperation with each other in clamping and unclamping a material therebetween;
a slide block provided for reciprocatory sliding movement along the path of feed of said material;
a second gripper device arranged on said slide block at a distance from said first gripper device along the path of feed of said material and having a second fixed gripper and a second movable gripper for cooperation with each other in clamping and unclamping said material therebetween;
a first gripper actuating device having a first actuating member movable between a clamping position where it holds said first movable gripper at a position near said first fixed gripper and an unclamping position where it allows said first movable gripper to be spaced apart from said first fixed gripper;
a second gripper actuating device having a second actuating member movable between a clamping position where it holds said second movable gripper at a position near said second fixed gripper and an unclamping position where it allows said second movable gripper to be spaced apart from said second fixed gripper;
an oscillating shaft and an oscillating arm for connecting said oscillating shaft to said slide block;
a cam device adapted to be driven continuously in one direction;
said cam device having a first cam and a second cam which are operatively connected to the first actuating member and the second actuating member, respectively, thereby causing said first actuating member and said second actuating member to be moved between the respective clamping and unclamping positions, said cam means further having a third cam adapted to convert the continuous rotation of said cam device into an oscillatory motion of said oscillating shaft which is operatively connected to said slide block through said oscillating arm so as to cause



the reciprocatory sliding movement of said slide block in a predetermined timing with respect to the oscillatory motion of said oscillating shaft and
wherein said second gripper actuating device includes a rotary shaft provided with an actuating tab for actuating said second movable gripper and oscillatably mounted on said slide block, said rotary shaft, when rotated in one direction, causes said actuating tab to drive said second movable gripper close t said second fixed gripper and, when rotated in the other direction, causes said actuating tab to move said movable gripper apart from said second fixed gripper, and a spring which always urges said rotary shaft rotationally in said one direction, and wherein said second actuating member has an engaging portion engageable with said actuating tab and movable between said clamping position where it causes said rotary shaft to rotate in said other direction against the force of said spring and said clamping position where it allows said rotary shaft to rotate in said one direction by the force of said spring.

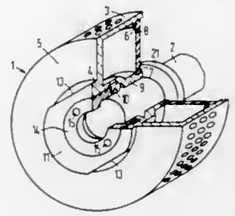
4,819,851

ARRANGEMENT FOR FIXING THE CAPSTAN OF A MAGNETIC TAPE RECORDER MEANS

Armin Ulber, Karlsfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 25, 1987, Ser. No. 66,215
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 3626518
Int. Cl.[4] B65H *20/02;* **F16B** *2/00*
U.S. Cl. 226—194 **5 Claims**

1. An arrangement for fixing a capstan to the shaft stub of a drive motor in a magnetic tape recorder means, said shaft stub being composed of a ceramic material, wherein the capstan is fashioned in light weight structure as a hollow cylinder having a perforated generated surface and comprises a bearing sleeve formed as an annular wall for the acceptance of the shaft stub, wherein at an end of said bearing sleeve at the motor side, said bearing sleeve comprises a guide ring narrowly toleranced with respect to an outside diameter of the shaft stub, comprises a threaded bore at its opposite outer end for the acceptance of a tensioning nut having outside thread, and comprises only a single, thin-walled, integral and annular tensing or clamping lip in a transition region between the guide ring and the threaded



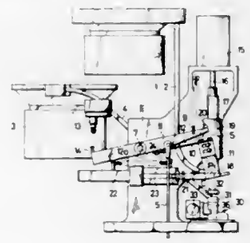
bore, being offset from an inside end of the guide ring by a V-shaped incision and being inclined relative to the axial direction of the shaft stub, this tensing or clamping lip having an uninterrupted circular inner circumference wedging against the shaft stub in rotational-symmetrical fashion when the capstan is mounted on the shaft stub, deforming under the compressive pressure of the tensioning nut and as a result of the inclination of the tensing or clamping lip, the point at which the tensioning nut engages the lip lies close to the surface of the shaft stub.

4,819,852

AUTOMATIC FASTENER ASSEMBLING APPARATUS

Sumio Toyota, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,751
Claims priority, application Japan, Jul. 16, 1986, 61-109028[U]
Int. Cl.[4] A41H *37/04*
U.S. Cl. 227—8 **2 Claims**



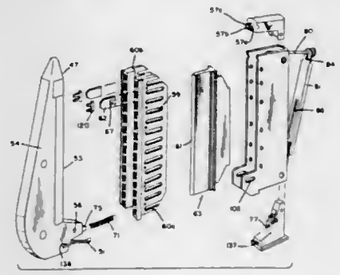
1. An apparatus for automatically assembling a pair of fastener elements of a garment fastener with a garment fabric sandwiched therebetween, comprising:
(a) a frame;
(b) a pair of vertically aligned upper and lower units supported by said frame for receiving the respective fastener elements, said lower unit including a die, said upper unit including a ram reciprocably supported by said frame and having a punch movable, in response to reciprocating movement of said ram, toward and away from said die to join the two fastener elements together;
(c) an air cylinder operatively connected with said ram for moving the latter vertically;
(d) a switch operatively connected with air cylinder for energizing the latter to initiate the lowering of said ram;
(e) an acutating lever pivotally mounted on said frame and having a tapered front end portion and a rear end portion engageable with an actuator of said switch, said tapered end portion having a lower sloping edge;
(f) an extension spring normally urging said front end portion of said actuating lever upwardly;
(g) a leaf spring fixedly connected at its rear end to a lower level edge of said actuating lever and resiliently supporting at its front end a safety cover, said leaf spring defining in a free form with said lower sloping edge a triangular space, said leaf spring having a yield strength higher than the yield strength of said extension spring; and
(h) a pull rod connected at its upper end to said front end portion of said actuating lever and at its lower end to a foot pedal.

4,819,853

SURGICAL FASTENER CARTRIDGE

David T. Green, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Dec. 31, 1987, Ser. No. 140,030
Int. Cl.[4] A61B *17/00*
U.S. Cl. 227—19 **9 Claims**



1. In a surgical fastener cartridge which is adapted for use with an actuator apparatus having a rigid frame and a generally U-shaped portion for receiving the fastener cartridge, the actuator apparatus actuating the fastener cartridge to form an incision in body tissue and to apply rows of fasteners to the tissue on both sides of the incision, the fastener cartridge including:
(a) a fastener holder containing a quantity of fasteners, the fasteners being driven, upon actuation of the fastener cartridge, through substantially parallel rows of apertures defined upon a fastener ejecting surface of the fastener holder;
(b) an anvil connected to the fastener holder and having a surface opposed to the fastener ejecting surface of the fastener holder and, upon actuation of the fastener cartridge, cooperating therewith to apply substantially parallel rows of fasteners to body tissue positioned between the fastener holder and anvil;
(c) means for driving the fasteners through the apertures upon actuation of the fastener cartridge;
(d) a tissue cutting knife, the knife edge of which is recessed within the fastener holder in the non-actuated condition of the fastener cartridge and which, upon actuation of the fastener cartridge, extends beyond a knife slot disposed between the rows of apertures; and,
(e) means for driving the knife edge of the tissue cutting knife through the knife slot upon actuation of the fastener cartridge, the improvement which comprises:
(f) at least one pair of substantially continuous tissue gripping elements provided upon the fastener ejecting surface

of the fastener holder and/or the anvil surface opposed thereto, the tissue gripping elements being arranged on both sides of the knife slot and being substantially coextensive with, and parallel to, the knife slot such that upon actuation of the fastener cartridge resulting in the formation of an incision in the tissue and application of the fasteners to the tissue on each side of the incision, the tissue gripping elements will apply a substantially continuous gripping force to the tissue preventing or impeding lateral movement of tissue away from the fasteners.

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SEAL FOR BEARINGS AND SYSTEM FOR SEALING BEARINGS

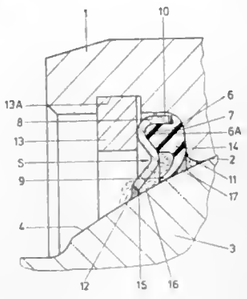
Peter Schmehr, Bubingen, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 3, 1986, Ser. No. 937,561

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 8534101[U]

Int. Cl.[4] F16J *15/24*

U.S. Cl. 277—47 **11 Claims**



1. In combination, inner and outer ring members and a seal for sealing the space between the ring members comprising a sealing ring made of an elastic material and a retaining member and means mounting the seal with a predetermined axial pretension to firmly seat the seal to one of said ring members in a manner to resist radial movement of the sealing ring and retaining member.

4,819,855

TAG-PIN ATTACHING APPARATUS

Akira Satoh, and Shin-ichi Sato, both of Tokyo, Japan, assignors to Satoh Gosei Co., Ltd., Tokyo, Japan

Filed May 4, 1988, Ser. No. 190,643

Claims priority, application Japan, May 11, 1987, 62-113943

Int. Cl.[4] B25C *1/00*

U.S. Cl. 227—67 **1 Claim**

1. In a tag-pin attaching apparatus comprising:

(a) a tag-pin feeding mechanism for intermittently feeding a leading tag pin of a tag-pin assembly to a cut-off position, which tag-pin assembly consists of a plurality of tag pins, each tag pin comprising a head part and a lateral rod which are integrally connected through a filament, and each tag pin being separable from said tag-pin assembly at said cut-off position,

(b) a guide needle situated in front of said cut-off position,

(c) a guide groove for guiding the lateral rod of said tag-pin assembly in the feeding direction thereof,

(d) a transporting mechanism, situated behind said tag-pin feeding mechanism, for pushing the tag pin positioned at the cut-off position into the guide needle, and

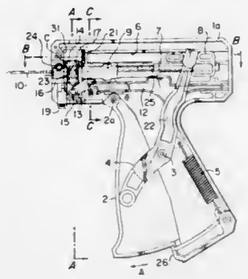
(e) a driving mechanism for driving each of said mechanisms, the improvement wherein said feeding mechanism comprises:

a slide body which is movably disposed in the feeding direction of said tag pin,

a toggle link comprising a first link and a second link, an external edge portion of one of said first and second links being rotatably supported by said slide body,

a slide link for rotatably supporting an external edge portion of the other link, said slide link being disposed in such a manner as to be movable within said slide body,

a pawl portion which extends from said first link of the toggle link, situated in such a manner that the tip of said pawl portion partly comes out from between the lateral rods of said tag-pin assembly as said toggle link extends,



a stopper for regulating the extension of said toggle link consisting of the first and second links at a position where said toggle link bends in such a direction as to move away from the lateral rod of said tag-pin assembly, with the fulcrum of said toggle link being positioned on a side of a line connecting positions of support of said first and second links opposite said lateral rod of said tag-pin assembly, and

a brake mechanism for braking the slide body, with said slide link being connected with said driving mechanism.

4,819,856

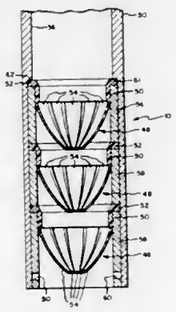
METHOD AND APPARATUS FOR INSERTING FASTENERS

John W. Davern, North Tonawanda, and Frank T. Mazurik, Williamsville, both of N.Y., assignors to Gemcor Engineering Corp., Buffalo, N.Y.

Continuation of Ser. No. 947,851, Dec. 30, 1986, abandoned. This application Jun. 28, 1988, Ser. No. 220,407

Int. Cl.[4] B25C *7/00*

U.S. Cl. 227—119 **9 Claims**



1. A device for receiving, transferring and inserting fasteners into a hole in workpiece; said device comprising:

an anvil having a face movable from a first upper position

spaced away from a workpiece to a second lower position spaced closely adjacent said workpiece;

carrier means including a bore extending through said carrier means, said bore being coaxial with the anvil, the face of the anvil passing through the bore as it moves from its first upper position to its second lower position, said carrier means additionally being provided with a side port extending through the carrier means from the bore to its exterior surface and through which a fastener may be fed into the bore when the anvil face is in its upper position; and

a plurality of coaxially arranged fastener engaging means entirely mounted within the bore of said carrier means below the side port and one on top of another, each fastener engaging means being formed of a resilient material and including an annular cylindrical collar portion and a plurality of resilient fingers integral with and of the same material as the collar portion, the resilient fingers extending from the collar portion towards the center of the bore and being angled away from the face of said anvil when the anvil is in its first position;

the parts being so arranged and constructed that a fastener initially fed through said port is received on top of the uppermost fastener engaging means and during movement of the anvil from its upper position to its lower position said fastener is transferred from said initial location to an axially oriented location as its sidewalls are engaged by said resilient fingers, the fastener then being inserted into the hole in the workpiece as the anvil completes its movement towards its lower position.

4,819,857

METHOD FOR FABRICATING COMPOSITE STRUCTURE

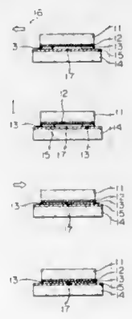
Kenichi Mizuishi; Masahide Tokuda, both of Hachioji, and Katuaki Chiba, Akigawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,449

Claims priority, application Japan, Oct. 17, 1986, 61-245252; Mar. 13, 1987, 62-56528

Int. Cl.[4] B23K *35/14*

U.S. Cl. 228—121 **21 Claims**



1. A method for fabricating a composite structure, said composite structure being formed in such a manner that an intermediate member is sandwiched between first and second members said method comprising the steps of:

disposing the intermediate member along only the periphery of a spatial region formed between facing surfaces of the first and second members so that said spatial region is enclosed by said intermediate member;

increasing the fluidity of said intermediate member under an atmosphere having a predetermined pressure; and

increasing the pressure of said atmosphere to make said intermediate member flow into said spatial region.

4,819,858

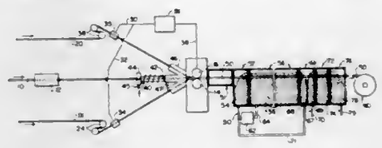
METHOD OF CLADDING A STEEL CORE ROD WITH ANOTHER METAL

William M. Malone, and Malcolm J. Fraser, both of Pittsburgh, Pa., assignors to Copperweld Corporation, Pittsburgh, Pa.

Filed Jun. 10, 1983, Ser. No. 502,968

Int. Cl.[4] B21D *39/04*

U.S. Cl. 228—173.7 **17 Claims**



1. A method of cladding a steel core rod with at least one cladding strip composed of another metal by preheating said core rod and said strip, positioning said strip around said core rod and effecting solid-phase bonding of said cladding strip to said core rod while said core rod and said strip are advancing comprising,

subsequent to effecting said bonding immersing said clad steel rod in a first cooling liquid quench at a temperature of about 160° F. to boiling temperature of said cooling liquid, and

subsequently immersing said clad rod in second cooling liquid quench having a temperature below said first cooling liquid quench whereby undesired formation of acicular transformation products in said core rod is resisted and oxidation formation on the exterior surface of said cladding is resisted.

4,819,859

LAMINATION OF OXIDE DISPERSION STRENGTHENED PLATINUM AND ALLOYS

Ronald L. Schwenninger, Ridgeley, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 18, 1987, Ser. No. 135,108

Int. Cl.[4] B23K *20/00, 20/22, 20/24;* C03B *37/00*

U.S. Cl. 228—190 **20 Claims**

1. A method of fabricating an article of oxide dispersion strengthened platinum comprising:

from a relatively thick mass of platinum or platinum alloy having a minor oxide phase dispersed therein, working the mass to a thin layer so as to elongate the grains of the metal microstructure; and

superimposing a plurality of similarly worked layers with a joint in each layer offset from a joint in an adjacent layer, and bonding the layers below the melting point so as to form an article that is laminated substantially throughout its extent.

4,819,860

WRIST-MOUNTED VITAL FUNCTIONS MONITOR AND EMERGENCY LOCATOR

James L. Hargrove, Vancouver, Canada; Lloyd D. Lillie, 35 - 1825 Atkinson Street, Penticton B.C., Canada V2A 6Y5, and Arthur T. Whittaker, 35 Westminster Avenue E., Penticton, B.C., Canada V2A 1H7, assignors to Lloyd D. Lillie and Arthur T. Whittaker, both of British Columbia, Canada

Filed Jan. 9, 1986, Ser. No. 817,518

Int. Cl.[4] A61G *5/04*

U.S. Cl. 228—668 **9 Claims**

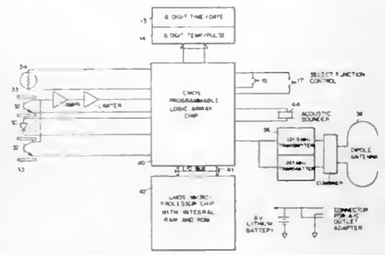
1. A portable vital functions monitoring device and emergency signal generator comprising:

(a) a housing adapted for mounting against the skin of an individual

(b) means for securing said housing against the skin of said individual;

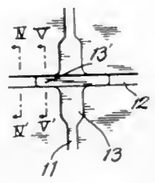
VOL 1101 ISS 2 AP 11 1989 UMI

(c) pulse rate sensing means mounted on said housing for contact with said skin and for sensing the pulse rate of an individual and for producing a pulse rate output signal representative thereof;
(d) computing means responsive to said pulse rate output signal for computing an instantaneous pulse rate of said individual and for producing a signal representative thereof;
(e) clock means for measuring a period of time;
(f) information storage means;
(g) means for monitoring said instantaneous pulse rate over a period of time sufficient to include periods of rest and



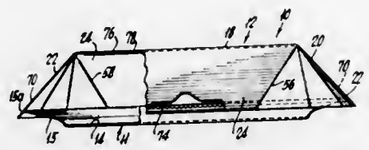
periods of extreme physical activity of said individual and for storing in said information storage means the highest and lowest values of said instantaneous pulse rate monitored over said period of time;
(h) comparison means for comparing said instantaneous pulse rate value to said stored values in said information storage means; and
(i) means for producing an emergency radio alarm signal in the event that said comparison indicates that said instantaneous pulse rate value is above the highest stored value in said information storage means or below said lowest stored value in said information storage means.

4,819,861
PAPER CONTAINER FOR LIQUID
Kiichiro Nagata, Tokyo, Japan, assignor to Jujo Paper Co., Ltd., Tokyo, Japan
Filed Feb. 2, 1987, Ser. No. 9,890
Claims priority, application Japan, Feb. 12, 1986, 61-18650[U]
Int. Cl.[4] B65D *5/42*
U.S. Cl. 229—16 R **10 Claims**



1. A paper container for liquid comprising a plurality of vertical folding line grooves and a plurality of horizontal folding line grooves intersecting said vertical line grooves at right angles, wherein at least one of said vertical and horizontal folding line grooves is formed different in configuration in its width for a predetermined length at the intersecting portion, said one of the vertical and horizontal folding line grooves formed at the intersecting portion is formed thinner than the other.

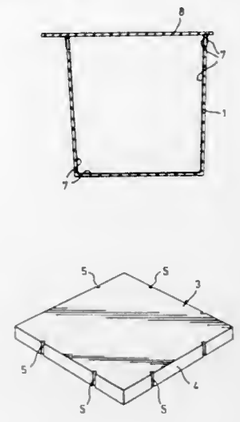
4,819,862
DISPOSABLE PLATE LID AND FOOD CONTAINER INCLUDING SAME
Raymond V. Maroszek, Neenah, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.
Filed May 5, 1986, Ser. No. 859,660
Int. Cl.[4] B65D *43/06*
U.S. Cl. 229—125.27 **1 Claim**



1. A container for food or the like, comprising
(a) a disposable plate having opposed convexly arcuate edge portions, and
(b) a unitary lid of foldable, resilient sheet material for overlying the plate and engaging the edge portions thereof, formed from an initially flat sheet blank and including a flat central panel and a skirt which is manipulable between a first, unstressed position and a second, open position wherein the skirt flares obliquely outwardly and downwardly from said central panel for surrounding the periphery of the plate, said skirt comprising four side panels integral with and disposed in succession around the periphery of the central panel, said side panels being arranged in two opposed pairs, each of said side panels having an outer edge, opposed cut end edges, and opposed foldable end flaps, the end flaps of each side panel of one of said pairs being respectively overlappingly adhered to adjacent end flaps of the side panels of the other of said pairs, the side panels of said one pair respectively having slots for receiving said plate edge portions and being disposed, in the unstressed position, with their respective outer edges below the central panel and spaced inwardly from their locations in the open position, and the side panels of said other pair being disposed, in the unstressed position, with their respective outer edges spaced outwardly from their locations in the open position, such that upon outward bending of said one pair of side panels, the side panels of said other pair are bent inwardly toward each other and, in resisting such bending, exert on said one pair of panels a force for urging them into secure engagement with the plate edge portions;
(c) said plate being of planar, circular configuration and said skirt being dimensioned, when in said second position overlying and engaging the edge portions of the plate, to enclose with clearance an article of food such as a pizza or the like lying on the plate.

4,819,863
FLUID-TIGHT SEALED CONTAINER WITH LID
Tor Oppedal, Drammen, Norway, assignor to Elopak A/S, Lier, Norway
PCT No. PCT/NO85/00074, § 371 Date Jul. 24, 1986, § 102(e) Date Jul. 24, 1986, PCT Pub. No. WO86/03174, PCT Pub. Date Jun. 5, 1986
Continuation of Ser. No. 890,851, Jul. 24, 1986, abandoned. This PCT application Nov. 28, 1985, Ser. No. 219,229
Claims priority, application Norway, Nov. 28, 1984, 844733
Int. Cl.[4] B65D *43/02, 43/08*
U.S. Cl. 229—125.35 **17 Claims**

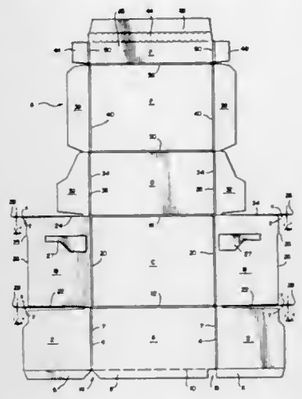
1. A fluid-tight sealed container comprising:
a container body having a bottom, an open top and side walls defining a narrow rim about said open top, the width of said rim being substantially equal to the thickness of said side walls; and
a lid engaging said rim, sealingly closing said open top and detachably secured to said body;
said lid, at least in the area thereof engaging said rim, having a weldable coating of a flowable polymer having a thickness of about 100 μm,



said rim being coated with aluminum foil, and said lid being welded to said rim by having been melted by heat into said polymer coating and penetration thereinto to a depth of from about 10 μm to about 90 μm whereby because of the relative dimension of said rim a mechanical interlock is formed between said rim and said lid and sealing and securement of said lid to said body is ensured but said lid can be easily torn off of said body.

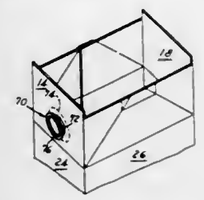
4,819,864
CARTON AND BLANK FOR PACKING ICE CREAM AND THE LIKE
Frank G. Capuano, Rochester, N.Y., assignor to Rolph-Clark-Stone Packaging Corp., Newport News, Va.
Filed Apr. 20, 1988, Ser. No. 183,934
Int. Cl.[4] B65D *5/02*
U.S. Cl. 229—135 **12 Claims**

1. A carton for packaging ice cream and the like, comprising;
(a) a receptacle, including operably connected front, bottom and rear panels;
(b) said front panel and said rear panel each having top, bottom, left and right edges;
(c) said bottom panel having front, rear, left and right edges;
(d) said front panel being operably connected at its bottom edge to said front edge of said bottom panel;
(e) said bottom panel being operably connected at its rear edge to said bottom edge of said rear panel;
(f) a cover including a cover panel having front, rear, left and right edges;
(g) said cover further including a closure flap;
(h) said cover panel being operably connected at its rear edge to said top edge of said rear panel;
(i) means for securing said closure flap to said front panel;
(j) said panels each having left and right end flaps connected to said left and right edges respectively forming hinge lines therebetween;
(k) said left and right front panel end flaps each having a membrane flap extending from said top edges;
(l) said front panel having a membrane flap extending from said top edge of said front panel;
(m) said left and right front panel end flap membranes and said front panel membrane forming a substantially continuous lip extending inwardly and along and at least a portion of the outer periphery of said receptacle;
(n) said end flaps having dimensions to form a substantially sealed right and left ends of said carton;
(o) said end flaps of said bottom panel including front, rear, outer and inner edges;
(p) hinge line shoulders formed inwardly by said hinge lines between said panels and said end flaps to provide lateral



support to said bottom panel end flaps along substantially said entire front and rear edges of said bottom panel end flap in the erected position;
(q) said dimensions of said end flaps of said bottom panel are such that they engage said hinge line shoulders when in the erected position and prevents bowing of said front and rear panels; and
(r) said dimension of said bottom panel end flaps includes a taper on said front and rear edges such that said outer edge is narrower than said inner edge.

4,819,865
LOW STRESS FLAT END CLOSURE ARRANGEMENT FOR THERMOPLASTIC COATED PAPERBOARD CARTON
Robert E. Lisiecki, West Bloomfield, Mich., assignor to Elopak Systems A.G., Walled Lake, Mich.
Continuation of Ser. No. 129,661, Dec. 7, 1987, Pat. No. 4,785,993. This application Oct. 24, 1988, Ser. No. 261,638
Int. Cl.[4] B65D *5/06, 5/08*
U.S. Cl. 229—137 **5 Claims**



1. In a thermoplastic coated paperboard container for carrying liquids, said container having four side wall panels, and opposite end closures, the improvement involving one of said end closures and comprising oppositely disposed inner panels, each having score lines converging from one side thereof toward the other and defining a central folded-in panel segment and two adjacent folded-back panel segments, and a

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central folded-back portion formed on only one of said central folded-in panel segments adjacent said other side thereof and sealed intermediate said one of said central folded-in panel segments and an end portion of the other of said central folded-in panel segments; and oppositely disposed outer panels, each overlapping and secured to a pair of folded-back panel segments, said pair consisting of one folded-back panel segment of each inner panel.

4,819,866

DISPENSING AND DEPOSIT MACHINE

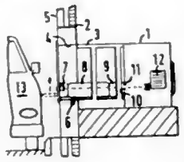
Anthony Kenyon, 124 Belsize Rd., London, England NW6 4BG

Filed Jul. 29, 1987, Ser. No. 79,074

Claims priority, application United Kingdom, Jul. 31, 1986, 8618689

Int. Cl.⁴ B65G *11/04*

U.S. Cl. 232—43.3 **35 Claims**



1. A dispensing machine comprising a container in which goods may be stored, at least one component, located remote from the container whereby a user may instruct the machine to dispense goods, and carriage means acting between the container and the component in response to instructions from the user to collect goods from the container and transfer the goods to the component to be dispensed.

4,819,867

THERMOSTATIC MIXING VALVE

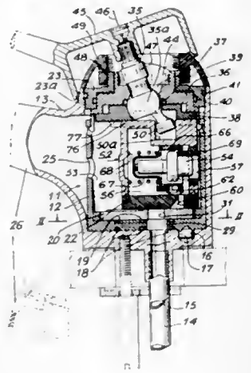
Claude A. Delpla; Henri D. Limet, both of Reims, and Francois P. Janicaud, Jonchery S/VESLE, all of France, assignors to Compagnie Internationale Des Produits Sanitaires "CIPS", Paris, France

Filed Sep. 19, 1988, Ser. No. 246,573

Claims priority, application France, Jan. 11, 1988, 88 00204

Int. Cl.⁴ G05D *23/13*

U.S. Cl. 236—12.16 **11 Claims**



1. A thermostatic mixing valve for mixing two flows at different temperatures, of the type comprising a body containing two plates having two respective flat and smooth faces, in sliding contact against each other, one fixed plate immobilized in said body having two orifices respectively in communication with inlet pipes for the two flows and a mobile plate coupled to a ball lever for the combined control of the flow rate and the temperature of said mixture, said mobile plate being adapted so as to close said orifices of said fixed plate in a variable way and an outlet for said mixture being formed in the wall of a main mixing chamber defined in said body, in which valve said mobile plate forms a part of a mobile regulation case adapted for movement in said main mixing chamber under the action of said ball lever, this case defining an auxiliary mixing chamber in communication with said main mixing chamber, said mobile plate comprises two through passages providing respectively communication between each of the orifices of said fixed plate and said auxiliary mixing chamber; and said auxiliary mixing chamber has a thermostatic regulation element coupled to an arrangement for the variable closure of the orifices of the two through passages situated in said auxiliary mixing chamber.

4,819,868

ELECTROMECHANICAL DEVICE ASSOCIATED WITH THERMOACTUATORS FOR USE IN VEHICLE CLIMATE CONTROL AND AIR CONDITIONING SYSTEMS

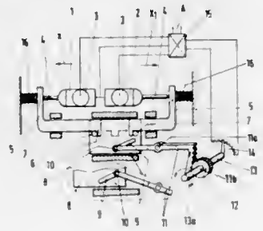
Paolo Fornasari, Casale Monferrato, Italy, assignor to Eltek, S.p.A., Alessandria, Italy

Filed Mar. 22, 1988, Ser. No. 171,818

Claims priority, application Italy, May 29, 1987, 67464 A/87

Int. Cl.⁴ F24F *13/10*

U.S. Cl. 236—49.5 **4 Claims**



1. An electromechanical device associated with thermoactuators, particularly for the control of valves in vehicle climate control or air conditioning systems, comprising a pair of thermoactuators being associated with heaters; two "L"-shaped parts being mounted in a mobile fashion moving, against the reaction of calibrated springs, on a plate having stops interfering with teeth of said "L"-shaped parts; said plate being equipped with a slot engaging a sliding pin carried on one end of a mobile arm, said mobile arm having a curved rack on an opposite side of said mobile arm from said sliding pin, said curved rack always engaged by a pinion integral with a shaft incorporating a potentiometer electrically connected to an electronic control unit; said shaft having the function of controlling a butterfly valve, in turn controlling the flow of air exiting from a radiator of an air conditioning system.

4,819,869

TOGGLE TIE PLATE FASTENING SYSTEM

Gordon E. Matlock, 554 Sappington Bridge Rd., Sullivan, Mo. 63080

Filed Mar. 5, 1987, Ser. No. 22,113

Int. Cl.⁴ F01B *9/16*

U.S. Cl. 238—298 **1 Claim**

1. In combination, an elongated, substantially horizontally disposed wood cross tie having opposite ends,

a horizontally disposed wear plate mounted on the upper surface of said cross tie adjacent each end thereof,

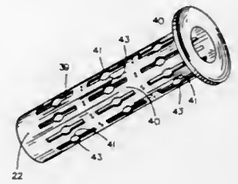
each of said wear plates having a plurality of spaced-apart teeth extending downwardly therefrom,

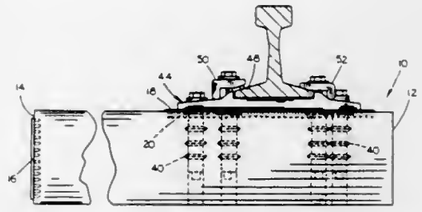
said wear plate having said teeth positioned at substantially the entire underside thereof,

said plurality of teeth being embedded in said cross tie to bond said wear plate to said cross tie,

said cross tie having a plurality of vertically disposed openings formed therein beneath each of said wear plates,

each of said wear plates having a plurality of openings formed therein which register with the openings in said tie, said wear plate having a plurality of tubular toggle members secured thereto extending downwardly therefrom into the openings on said cross tie, each of said toggle members having internally threaded portions adjacent the lower end thereof adapted to threadably receive a bolt member,





a tie plate positioned on each of said wear plates adapted to support a rail thereon, each of said tie plates having openings formed therein which register with said toggle members,

bolt members extending downwardly through the openings in said tie plate and being threadably received by the threaded portions of said toggle members whereby rotation of said bolt members in one direction will cause the toggle members to expand outwardly into anchoring engagement with the tie,

and means for securing the rails to said tie plates,

said toggle member being a single-piece tubular member having a plurality of sets of openings spaced longitudinally therealong, said sets of openings adapted to form expansion portions upon the tightening of said bolt members in said toggle members.

4,819,870

RAIL FASTENING ASSEMBLY

Jack Clark, and Norman R. Geedes, both of Lonsdale, Australia, assignors to Omark Industries, Inc., Portland, Oreg.

Filed Feb. 21, 1985, Ser. No. 703,696

Int. Cl.⁴ E01B *9/48*

U.S. Cl. 238—351 **6 Claims**

1. An assembly for securing a railroad rail comprising:

a rail base plate having an upper surface and a lower surface;

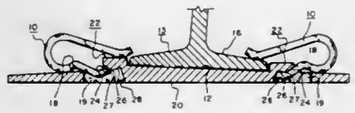
a rail seat formed in the upper surface of the base plate adapted to receive a rail foot of a railroad rail;

at least one clip locking shoulder formed in the upper surface of the rail plate adjacent the rail seat;

the clip locking shoulder including an undercut therein having a first clip engaging surface sloping downwardly and joining a second clip engaging surface sloping upwardly in a direction transverse to and toward the rail seat to form a generally V-shaped clip interlock;

at least one resilient fastener clip of a generally U-shaped configuration having an upper limb, a lower limb and a heel interconnecting the upper and lower limbs; and

the lower limb of the fastener clip terminating in a clip lock of configuration generally complementary to the configuration of the clip interlock of the clip locking shoulder



whereby the fastener clip may be driven into locking engagement with the base plate to secure a rail in place with the upper limb of the fastener clip in engagement with the rail foot, the heel of the fastener clip in engagement with the upper surface of the base plate and the clip lock of the lower limb of the fastener clip in locked engagement with the first and second clip engaging surfaces that form the clip interlock of the clip locking shoulder.

4,819,871

PROCESS OF MANUFACTURING A FUEL INJECTION NOZZLE BODY AND APPARATUS FOR CARRYING OUT THE PROCESS

Maximilian Kronberger, Steyr, and Edwin Till, Asten, both of Austria, assignors to Voest-Alpine-Friedmann Gesellschaft M.B.H., Linz, Austria

Filed Oct. 21, 1986, Ser. No. 921,195

Claims priority, application European Pat. Off., Oct. 22, 1985, 85890262

Int. Cl.⁴ B21K *1/20*; **F02M** *55/00*

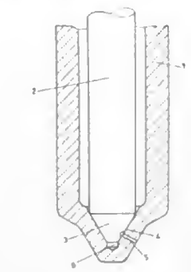
U.S. Cl. 239—533.3 **8 Claims**

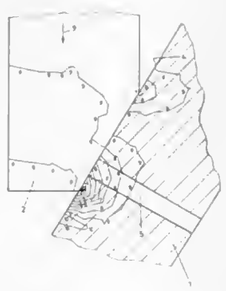
1. A fuel injection nozzle body for fuel injection nozzles for internal combustion engines, particularly for high-speed diesel engines, the nozzle body having a wall defining a seat face through which fuel injection holes extend, said seat face having inherent compressive stresses between 50 and 300 N/mm², which from the seat face decrease to approximately zero over a depth of 30 to 70% of the thickness of said wall.

8. Apparatus for manufacturing a fuel injection nozzle body of the kind having a wall which defines a bore terminating in a seat face and fuel injection holes in the seat face, said apparatus comprising: a support for the nozzle body; a mandrel having a shank portion complementary to the bore in the nozzle and the shank portion having a free end and an opposite end which is a conical, multiconical or crowned pressure-applying surface; and axial drive means for applying an axial force to said free end of said mandrel shank portion, when said mandrel has been inserted into the bore of a nozzle body with said pressure-applying surface contacting the seat face of the nozzle

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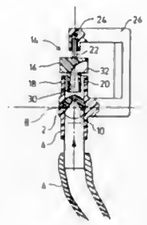
body, that plastically deforms the seat face to effect compressive stresses between 50 and 300 N/mm^2 which from the seat





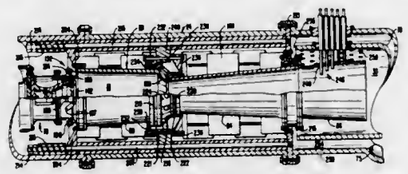
face decrease to approximately zero over a depth of 30% to 70% of the thickness of the wall of the nozzle body.

4,819,872
LIQUID DISPENSING DEVICE AND WATER SPRINKLER INCLUDING SAME
Peretz Rosenberg, Moshav Beit Shearim, Israel
Filed Jun. 10, 1987, Ser. No. 60,177
Claims priority, application Israel, Jul. 1, 1986, 79296; Jan. 5, 1987, 81170
Int. Cl.^{4} B05B *15/02*
U.S. Cl. 239—119 **14 Claims**



1. A liquid dispensing device, comprising a body member having an inlet end connectable to a source of pressurized liquid and a nozzle carried by said body member and having an inlet communicating with said source of pressurized liquid, and an outlet throat for discharging the pressurized liquid therethrough in the form of a jet; said nozzle being rotatably mounted in said body member from an operative position wherein its inlet faces said source of pressurized liquid for discharging the pressurized liquid through its outlet throat, to a self-cleaning position wherein its outlet throat faces said source of pressurized liquid for flushing out clogging particles through the nozzle inlet; said nozzle inlet having a cross-sectional area of conical configuration decreasing in diameter from the inlet end of the body member to the outlet throat; said nozzle being split along a plane extending parallel to the jet discharged therefrom to define a first section and a second section; said first section being formed with a partial bore constituting a part of the cross- sectional area of said nozzle inlet and said nozzle throat; said second section being presettable to a plurality of different positions with respect to said first section and being formed with a complementary partial bore having recesses of differnt cross-sectional areas facing the partial bore of the first section and cooperable therewith to define a plurality of outlet throats of different cross-sectional areas according to the preset position of said second section with respect to said first section.

4,819,873
METHOD AND APPARATUS FOR COMBUSTING FUEL IN A PULSE COMBUSTOR
Hanford N. Lockwood, Jr., San Mateo, Calif., assignor to NEA Technologies, Inc., San Mateo, Calif.
Division of Ser. No. 852,854, Apr. 16, 1986, Pat. No. 4,708,159.
This application Apr. 23, 1987, Ser. No. 41,804
Int. Cl.^{4} F23C *11/04*
U.S. Cl. 239—8 **12 Claims**

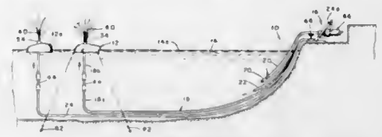


1. A method for combusting fuel in a combustion chamber of a pulse combustor comprising the steps of:
atomizing a liquid fuel with a gaeous fuel;
directing the atomized liquid fuel through a nozzle and into the combustion chamber of the pulse combustor; and
igniting the fuel.

7. A fuel system for a pulse combustor comprising:
a first nozzle in fluid communicating with a combustion chamber of the pulse combustor for flowing a fuel into the combustion chamber;
means, in fluid communication with the nozzle, for selectively flowing a gaseous fuel through the nozzle;
means for selectively atomizing a liquid fuel with a gas, the gas being one of either the gaseous fuel or air; and
means, in fluid communication with the atomizing means and with the first nozzle, for selectively flowing the gas-atomized liquid fuel through the nozzle;
so that the fuel flowing through the nozzle and into the combustion chamber selectively comprises gaseous fuel, gaseous-fuel-atomized liquid fuel, or air-atomized liquid fuel.

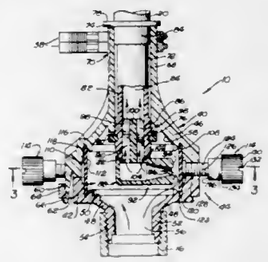
4,819,874
FLOATING ROCK ISLAND FOUNTAINS
Emery A. Geiger, 1340 East Wilshire Avenue, Santa Ana, Calif. 92705
Filed Jul. 28, 1987, Ser. No. 78,526
Int. Cl.^{4} B05B *17/08*
U.S. Cl. 239—23 **6 Claims**

6. Apparatus for circulating water within a body of water, comprising
a simulated rock structure adapted to float on the surface of the body of water including a nozzle element above said surface,
said simulated rock structure having therein a centrally located passageway wherein a conduit section passes therethrough and is connected to the nozzle element, said passageway providing a substantial clearance between the conduit section passing therethrough to allow the simulated floating rock structure while floating on the surface of the water to move relative to the conduit section in the passageway and assume an equilibrated position, where-



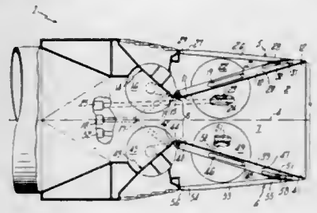
upon the passageway is filled with foam material to hold the conduit in a fixed position relative to the floating rock structure, and
pumping means remote from the body of water having a water inlet and a water outlet, and submersible conduit means for connecting the water inlet of the pumping means to the body of the water and for connecting the outlet of the pumping means to the nozzle element so that the water is drawn from the body of water and forced under pressure through the nozzle element.

4,819,875
CONTOUR CONTROL DEVICE FOR ROTARY IRRIGATION SPRINKLERS
Glenn I. Beal, Vista, Calif., assignor to Rain Bird Consumer Products Mfg. Corp., Glendora, Calif.
Filed Jun. 22, 1987, Ser. No. 64,851
Int. Cl.^{4} B05B *3/06*
U.S. Cl. 239—97 **42 Claims**



1. A contour control device for use with a rotary irrigation sprinkler of the type including a body adapted for rotation about an axis and having an inlet through which water from a pressurized source is received, and means for rotating said body together with said inlet about said axis, said control device comprising:
means for coupling said sprinkler body to said housing for relative rotation;
a generally cylindrical chamber formed within said housing;
means for coupling said chamber with said pressurized water source;
means defining a radially opening inlet from said chamber to said sprinkler inlet and fixed for rotation with said sprinkler body; and
throttling means for controlling the flow of water from said chamber into said sprinkler inlet including a deformable band having a wall extending peripherally about said chamber and normally disposed in radially spaced, confronting relation with said radially extending inlet, and means for adjusting the radial spacing of said wall relative to said radially extending inlet to control the flow of water from said chamber into said sprinkler inlet in accordance with the rotary position of said sprinkler body relative to said housing.

4,819,876
DIVERGENT FLAP ACTUATION SYSTEM FOR A TWO-DIMENSIONAL EXHAUST NOZZLE
Edward B. Thayer, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Jun. 25, 1987, Ser. No. 66,365
Int. Cl.^{4} F02K *1/12*
U.S. Cl. 239—265.39 **4 Claims**



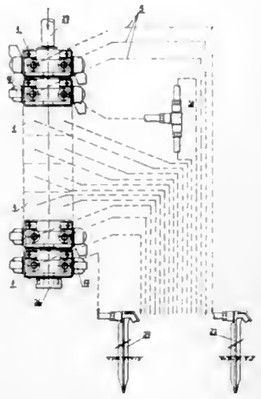
1. A two dimensional exhaust nozzle for a gas turbine engine powered aircraft, the nozzle having a centerline and including exhaust duct means having spaced apart stationary sidewalls, an upper flap assembly and a lower flap assembly, each flap assembly including a divergent nozzle flap with a forward edge and a rearward edge, each flap extending between said sidewalls, and having side edges adjacent said sidewalls, said flaps being movable for forming a controllable gas exit area defined by the proximity of said flaps to each other, the proximity of said forward edges defining an inlet area and the proximity of said rearward edges defining an outlet area, said flaps being movable through a range of positions, said flap assemblies further including means for moving said forward edges for varying said inlet area, and means for moving said rearward edges independently of said forward edges and independently of each other, for varying said outlet area and for vectoring an exhaust gas passing therethrough, at least one of said flap assemblies having rearward edge moving means comprising:
a pair of oppositely disposed rotatable disks essentially flush mounted to said sidewalls, said disks located between said forward and said rearward edge of said flap, each disk including off centered engagement means for engaging said flap at a side edge thereof, said off centered engagement means comprising drive pins fixed at an outward edge of said disks, said drive pins extending normal thereto, said flap including slot means in said side edges for slidably engaging said drive pins disposable therein, said rearward edges being movable from a first position of maximum outlet area to a second position of minimum outlet area through movement of said rearward edge relative to said centerline in response to rotation of said disks; and drive means for rotation said disks.

4,819,877
MODULAR ELEMENT BASED LIQUID DISTRIBUTOR
Gino Ciccolallo, Lavagna, and Giancarlo Simoni, Genoa, both of Italy, assignors to Siroflex s.r.l., Italy
Filed Oct. 8, 1987, Ser. No. 106,606
Claims priority, application Italy, Oct. 17, 1986, 12559 A/86
Int. Cl.^{4} B05B *1/20, 1/14;* **A62C** *31/22, 31/02*
U.S. Cl. 239—266 **6 Claims**

1. Multiple liquid distribution system, consisting of modular elements each having two or more independent valve con-

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trolled outlets, characterized by the fact that each two-outlet modular element (1) consists of: (a) a body with lateral jacket (2) through which a tubular duct (3) passes transversely, provided at its upper part with two branch pipes (4) to be plugged in (5) and secured by means of a cap nut (6), and at its lower end two drilled cylindrical bodies (7) for stable installation of the stopcocks or valves (15) by means of a plug (8) and also providing two opposed ports (9, 10) located at right angle to the body axis, leading to two fittings, one recessed (11) and the other projecting (12) having the same threading, through which the liquid flows, (b) two opposed stopcocks or control valves (15) located within the transverse duct (3) each valve cock consisting of a hollow cylindrical body (16) and a control head (17), the cylindrical body (16) and a control head (17), the cylindrical body beng provided at both ends with a coaxial annular gasket (18) and with a recessed substantially elliptical gasket (19) on the outer surface of the body, in the middle of which is a through-hole (2) coinciding with the branch tube (4) of the duct (3), thus ensuring communication between the valve (16) and the branch tube (4) when the cock is open, so



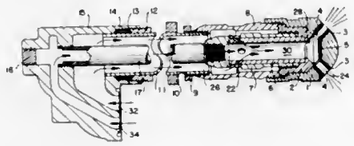
that the liquid can freely flow through the ports (9, 10) of the duct (3) into the watering pipe (5), the valve body (16) being provided at one end with a radial slot (21) covering an angle of slightly more than 90°, adapted to receive the pin (8) fitted into the drilled cylinders (7) of the body (1) so as to prevent rotation and to determine the maximum opening and closing positions of the stopcock (c) the necessary number of spike bases (27) to secure and support the watering tube (5) at the outlet point, (d) a number of Tee Unions to convey the flow of each branch pipe (5) to two tubes feeding two spikebases, so that when assembling a given number of modular elements, by screwing the projecting fitting of one element to the recessed fitting of the next element, it will be possible to form a multiple distribution system according to need, this system being connected by its free end to a supply main (25) whereas the other end fitting is closed by a plug (26) thus making it possible to feed the various branch tubes (5) at a controlled flow rate for uniform watering of flower beds and/or pots by means of appropriate Tees (30) and spike bases (27) at low delivery rates, unaffected by pressure variations, even if the number of elements forming the distribution system is changed.

4,819,878

DUAL FLUID ATOMIZER

Ralph T. Bailey, Uniontown; Robert B. Myers, Copley, and Richard C. Vetterick, Akron, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 14, 1987, Ser. No. 73,043
Int. Cl.[4] B05B *7/06, 7/04, 1/14*
U.S. Cl. 239—427 **10 Claims**



1. An atomizer for mixing together and atomizing at least two fluids, comprising:

a mixing chamber housing defining a mixing chamber with an open entry end and an open discharge end, said mixing chamber having an axis and an inside diameter, one of the fluids being supplied to said entry end, said mixing chamber housing having at least one entry port for admitting the other fluid into said mixing chamber, said entry port extending toward said axis of said mixing chamber at an angle and being spaced upstream from said discharge end and downstream of said entry end with respect to a flow of the first fluid along said axis;

a volume chamber communicating with and adjacent to said discharge end of said mixing chamber, said volume chamber having a diameter which is larger than said mixing chamber inside diameter, said volume chamber being defined by a spray head engaged around said discharge end of said mixing chamber and having a conical inner surface defining part of said volume chamber, and an end cap having a conical recess therein defining another part of said volume chamber and engaged over said spray head and having at least one atomizing nozzle having an entry end communicating with said volume chamber and being disposed outside a periphery of said mixing chamber discharge end, said entry end of said at least one nozzle having a center point lying outboard of a circle centered on said axis, the diameter of said circle being larger than the sum of said mixing chamber inside diameter, plus the inside diameter of said at least one nozzle, said spray head conical inside surface intersecting the inside surface of said end cap at a tangential circle which encompasses the outside edge of the entry end of said at least one nozzle by a tolerance of up to 0.25 inches; and

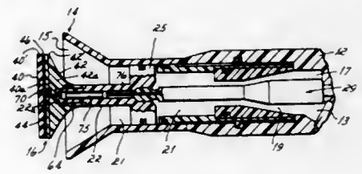
whereby the first and second fluids are mixed together in said mixing chamber to form a thoroughly homogenized mixture, the mixture passing into said volume chamber and being impacted against an impact surface defined on said end cap in said recess extending substantially perpendicular with respect to said axis, said impact surface being on a side of said volume chamber opposite said discharge end of said mixing chamber, and is atomized through said at least one nozzle, said impact surface being spaced from said discharge end by an amount equal to about one to three times the inside diameter of said mixing chamber.

4,819,879

PARTICLE SPRAY GUN

John Sharpless, Oberlin; Alan J. Knobbe, Lorain; Keaneth A. White, Sheffield Lake, and Gerald W. Crum, Elyria, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 791,352, Oct. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 724,392, Apr. 18, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 72,780
Int. Cl.[4] B05B *5/02*
U.S. Cl. 239—691 **82 Claims**



48. An electrostatic spray coating apparatus comprising:

a particle spray device having a particle-spraying opening therein from which a stream of particles is sprayed in a path in a forward direction toward an article to be electrostatically coated;

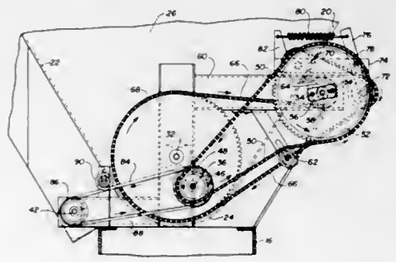
a multipoint electrode comprising a substantial number of closely spaced electrode elements located generally transverse of said forwardly directed particle stream path and having electrode points in direct exposure to said opening, said electrode elements, including said electrode points, not extending significantly into said opening through which said particle stream passes to be electrostatically charged in its path toward said article to be coated, said electrode elements being connectable to an electrostatic voltage source for establishing a plurality of simultaneous corona discharges at said corona charging points to enhance transfer efficiency.

4,819,880

MANURE SPREADER DRIVE SYSTEM

Gilbert W. Linde, Oxford, and Loren G. Sadler, Stevens, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Sep. 5, 1984, Ser. No. 647,945
Int. Cl.[4] A01C *23/00, 19/00*
U.S. Cl. 239—662 **12 Claims**



1. In a manure spreader having a tank for containing manure, an auger rotatably mounted in said tank for moving manure toward an opening formed in said tank, an expeller disposed at said opening to discharge manure from said tank, drive means for rotating said auger and said expeller, said drive means comprising:

a shaft adapted for connection to the PTO of a tractor;

first and second drive members mounted on said shaft for rotation in a first direction;

a third drive member connected to said first drive member for rotation in said first direction;

a fourth drive member connected for rotation with said third drive member in said first direction;

a fifth drive member connected to said fourth drive member for rotation in a second direction which is opposite said first direction, said fifth drive member being connected to said auger to rotate said auger in said second direction; and

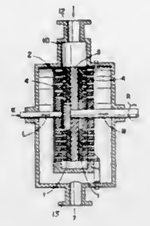
means connecting said second drive member to said expeller to rotate said expeller in said first direction.

4,819,881

REFINER FOR PROCESSING A FIBER STOCK SUSPENSION FOR PAPER FABRICATION

Paul-Wilhelm Sepke, Ravensburg-Weissenau, Fed. Rep. of Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,704
Int. Cl.[4] B02C *7/12*
U.S. Cl. 241—88.1 **8 Claims**



1. A refiner for processing fiber stock suspensions for paper fabrication, comprising:

at least one pair of cooperating substantially planar grinding elements;

means for delivering the fiber stock suspension so as to flow between the pair of substantially planar grinding elements during refinement of the fiber stock suspension;

one of said grinding elements of said pair of substantially planar grinding elements being provided with a set of grinding tools;

the other grinding element of said pair of substantially planar grinding elements comprising a perforated plate having perforations;

each of said perforations of the other grinding element having a side confronting the set of grinding tools of the one grinding element;

the perforations of the other grinding element being provided at said side confronting the set of grinding tools with grinding edges for processing of the fiber stock suspension; and

the fiber stock suspension experiencing a forced flow during the refinement thereof through the perforations of the other grinding element.

4,819,882

FOOD PROCESSOR FOOD PUSHER POSITIONING APPARATUS

Richard L. Stottmann, Louisville, Ky., and Edward F. Ponikwia, Dayton, Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

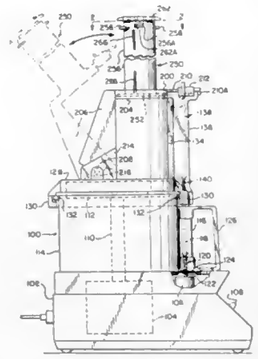
Filed Jan. 7, 1988, Ser. No. 141,438
Int. Cl.[4] B02C *18/12*
U.S. Cl. 241—92 **5 Claims**

1. In a food processor having a primary feed tube for introducing food products into said processor and a feed tube cover

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including an opening for slidingly receiving a primary food pusher, an improved food pusher support comprising:

compression spring means formed into said feed tube cover for supporting said primary food pusher at one or more positions relative to said feed tube cover; and



interference means formed on said primary food pusher for engaging and compressing said compression spring means whereby said primary food pusher is supported by frictional engagement between said interference means and said compression spring means.

4,819,883

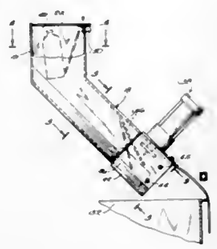
BOTTLE BREAKING APPARATUS

Eric P. Weil, Greenfield, and Matthew T. Boswell, Pewaukee, both of Wis., assignors to Galland Henning Nopak, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 8,649, Jan. 29, 1987. This application Jul. 22, 1987, Ser. No. 76,310

Int. Cl.[4] B02C *19/14*

U.S. Cl. 241—99 **6 Claims**



1. A bottle breaking apparatus comprising

a bottle breaking chamber having a normally open lower end,

a bottle breaking member located in said bottle breaking chamber and movable between a bottle breaking position and a retracted position, and

means for blocking said lower end of said chamber in response to movement of said bottle breaking member to said retracted position and for opening said lower end of said chamber in response to movement of said bottle breaking member to said bottle breaking position, said means including a blocking member movable between a first position wherein said blocking member blocks said lower end of said chamber and a second position wherein said blocking member opens said lower end of said chamber, and means for moving said blocking member to said first position in response to movement of said bottle breaking member to said retracted position and for moving said blocking member to said second position in response to movement of said bottle breaking member to said bottle breaking position, said blocking member being gravitationally biased to said second position, and said means for moving said blocking member to said first position including roller means mounted on said blocking member and engageable with said bottle breaking member.

4,819,884

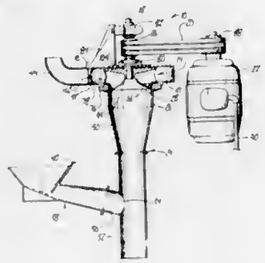
MEANS OF PNEUMATIC COMMINUTION

Allen C. Wiley, Coralville, Iowa, assignor to MicroFuel Corporation, Coralville, Iowa

Continuation-in-part of Ser. No. 697,042, Jan. 31, 1985. This application Dec. 24, 1987, Ser. No. 138,363

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—39 **11 Claims**



1. A centrifugal pneumatic comminutor comprising, a housing containing a fan mounted on a vertical axis capable of operative connection to a motor means, said housing having an inlet opening aligned with the rotational axis of said fan, and each blade of said fan having a lower portion of one length and an upper portion which has a length greater than said one length, wherein said lengths are measured radially from the rotational axis of said fan, and said upper and lower portions are joined so as to form a continuous fan structure, and said inlet opening has a diameter which is larger than twice said one length, an inlet conduit defining and extending outwardly from said inlet opening, an outlet opening, and an outlet conduit surrounding and extending outwardly from said outlet opening, an annular rotational impact zone surrounded by liner means secured to said inlet conduit at a position immediately below said fan, said liner means having a diameter which is larger than twice said one length, said liner means having an inner-facing surface, and said inner-facing surface being abrasive to promote grinding of particles being comminuted in said comminutor.

4,819,885

MEANS OF PNEUMATIC COMMINUTION

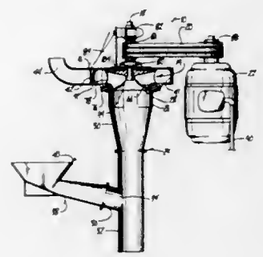
Allen C. Wiley, Coralville, Iowa, assignor to MicroFuel Corporation, Ely, Iowa

Division of Ser. No. 697,042, Jan. 31, 1985. This application Dec. 24, 1987, Ser. No. 138,351

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—39 **11 Claims**

1. A pneumatic comminutor, comprising a fan rotatably mounted on a vertical axis within a housing, said housing having a vertical inlet aligned with the axis of said fan and outlet along the periphery of said housing, means to operatively power said fan connected to said fan, a vertical input conduit having a vertical conical section defining said vertical inlet, said fan being comprised of an axle for operatively connecting to said power means, a sleeve member slidably insertable over said axle and securable thereto, a first plate secured annularly to said sleeve, a plurality of fan blades attached at one end to said sleeve and extending outwardly therefrom at spaced apart locations and having first side edges attached to said first plate and having opposite side edges, a second plate means secured to said opposite side edges of said fan blades and having a substantial annular opening therein and including a ring member of annular configuration including an annular opening on its inside surfaces and a flange means on its outside surfaces, said ring member being mateably insertable into a journal means surrounding said inlet of said housing by means of mating said flange means with corresponding flange means



on the inside surface of said journal means to create an air tight seal for enhancing particle-to-particle impact at the inlet side of the fan and to simultaneously enhance the effect of partial vacuum on the particles on the fan inlet side and positive pushing pressure on the fan outlet side, and each blade of said fan having a lower portion of one length and an upper portion which has a length greater than said one length, wherein said lengths are measured radially from the rotational axis of said fan and said upper and lower portions are joined so as to form a continuous fan structure, and said inlet opening has a diameter which is larger than twice said one length.

4,819,886

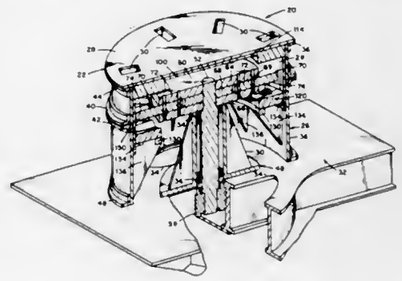
ROTARY HAMMER MILL FOR BREAKING STONE AND SIMILAR MATERIAL

Gene F. Lambert, 2023 Cochran Rd., Maryville, Tenn. 37801

Filed Jan. 6, 1988, Ser. No. 142,482

Int. Cl.[4] B02C *13/282*

U.S. Cl. 241—186.1 **14 Claims**



1. A rotary hammer mill for breaking stone and similar material to reduce the material to a desired size comprising a housing, a plurality of hammerheads rotatably supported in said housing for rotation in a substantially horizontal plane to define by their path of movement a substantially horizontally disposed annular breaking zone, means for rotatably driving said hammerheads at a breaking speed sufficient to reduce material impacting against said hammerheads in said breaking zone, material discharge means for discharging reduced material from said housing, material feed means for feeding material into said housing, said feed means being configured to introduce the feed of material down into said annular breaking zone in an annular pattern so that the feed is annularly distributed rather than concentrated at a single feed location, and a plurality of a elongate radially extending upper breakers supported in said housing above said breaking zone, said feed means comprising circumferentially spaced apart feed openings which are configured to distribute material circumferentially down into said breaking zone through said breakers, said upper breakers being configured to break material flung against upper breakers by said hammerheads, whereby the proportion of the total material feed which is broken up initially upon entering said annular breaking zone is increased as compared to that of a hammer mill having a single feed location to promote uniform, rapid reduction of the material in the mill and thereby reduce the production of excessively reduced material caused by retention of material in the mill.

4,819,887

RACK FOR STORING AND DISPENSING ROLLED FLOOR COVERING

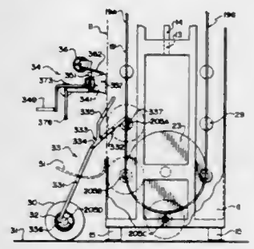
Willie B. Dueck, NE-33-23-2e Vidir, Arborg, Manitoba, Canada R0C 0A0

Filed Dec. 10, 1987, Ser. No. 130,956

Claims priority, application Canada, Jan. 14, 1987, 527294

Int. Cl.[4] B65H *19/00*; **A47F** *07/18*

U.S. Cl. 242—56 R **20 Claims**



1. A rack device for storing and dispensing rolled sheet material comprising a frame structure having ground engaging means such that the frame structure can stand on the ground defining an upper portion and a lower portion, two elongate flexible members each arranged adjacent a respective end of the frame structure, a first and second pair of wheels each pair arranged to engage and support a respective one of said flexible members such that it forms an endless loop with the pairs defining two upper wheels rotatable about a common upper axis and two lower wheels rotatable about a common lower axis, means for driving said flexible members such that they rotate synchronously about said upper and lower axes, each of said members carrying a plurality of support means thereon for rotation therewith, with the support means of one aligned with the support means of the other, said aligned support means being arranged to releasibly support an elongate member extending thereacross for receiving thereon a roll of said sheet material such that the rolls can be supported on the members in parallel spaced relation for rotation therewith and presentation of each in turn at a station forwardly of the frame structure, means mounted at said station for winding up a length of said sheet material drawn from that roll presented at that time at said station, and knife means having a guide for guiding the knife means in movement transversely to the length of the sheet material to sever said wound length means at one end of the frame for actuating movement of said knife thereacross, and means for lifting a respective elongate member and attached roll onto a respective one of said support means, said lifting means comprising a member having means for engaging said elongate member and means for engaging one of said support means and associated elongate members spaced from

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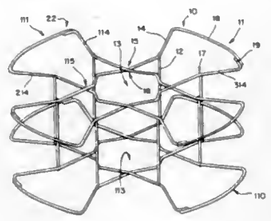
said respective support means such that rotation of said flexible members causes said respective elongate member and attached roll to be lifted to move into engagement with said respective support means.

4,819,888

SUPPORT FOR WINDING PACKAGES OF WIRE

Ercole Masera, Roveredo in Piano, Italy, assignor to Ferriere Nord Spa, Osoppo, Italy

Filed Jan. 29, 1987, Ser. No. 8,552
Claims priority, application Italy, Feb. 6, 1986, 83311 A/86
Int. Cl.[4] B65H *75/20*
U.S. Cl. 242—77.2 **11 Claims**



1. A support for winding packages of wire such as welding wire, copper wire, tubular elements, steel wire, etc., comprising two side members spaced apart by spacers, each of said side members being formed essentially in the shape of a cross having four arms and having a substantially flat outer face and a hub which cooperates directly with a winding machine and with a usage machine, wherein each of said side members comprises at least two elements crossed over each other and interlocked at interlocking points so as to form the arms of the cross, each of said elements comprises at least one substantially straight portion and at least one shaped portion, each of said interlocking points is located where the substantially straight portion of one member intersects the shaped portion of another member, and at each interlocking point, the straight portion is located on a same side of the side member, relative to the shaped portion.

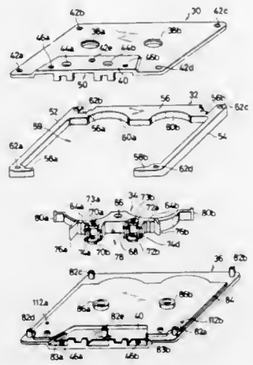
4,819,889

MAGNETIC TAPE CASSETTE

Takateru Satoh, Nagano, Japan, assignor to TDK Corporation, Japan

Filed Sep. 19, 1986, Ser. No. 909,492
Claims priority, application Japan, Sep. 20, 1985, 60-144791[U]; Oct. 2, 1985, 60-151433[U]
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] G11B *23/087*
U.S. Cl. 242—199 **13 Claims**

1. A magnetic tape cassette comprising:
- a top cover plate, having front, left and right side and rear portions;
- a bottom cover plate, having substantially the same construction as the top cover plate, and having front, left and right side and rear portions;
- an intermediate frame arranged between the top and the bottom cover plates, having front, left and right side and rear portions corresponding to those of the top and the bottom cover plates, with the front portions being partially cut out;
- a tape guide block formed separate from said top and bottom cover plates and said intermediate frame, and having front, rear, upper and lower surfaces ad left and right side end portions, which is arranged in the cut-out front portion of the intermediate frame and arranged between the top and the bottom cover plates at the front portions thereof; and



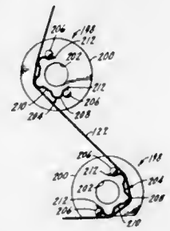
- means for aligning the tape guide block with the top and the bottom cover plates.

4,819,890

MAGNETIC TAPE CASSETTES

William M. Carroll, Milwaukee, Wis., assignor to Kolier Manufacturing Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 53,348, May 22, 1987, Pat. No. 4,773,615, which is a continuation-in-part of Ser. No. 30,698, Mar. 25, 1987, Pat. No. 4,770,367. This application Sep. 28, 1987, Ser. No. 101,795
Int. Cl.[4] G11B *15/60, 23/04*;.**B65H** *23/04*
U.S. Cl. 242—199 **36 Claims**



1. A tape guide for use in a magnetic tape cassette comprising an insert mounted in the cassette, the insert having a plurality of spaced ribs and a web connecting adjacent pairs of ribs to form a groove between the ribs and thereby impart to the insert a corrugated configuration such that the tape contacts the insert only on the peaks of the ribs as it passes the guide, said insert being formed of relatively thin metal and extending less than 360 degrees.

4,819,891

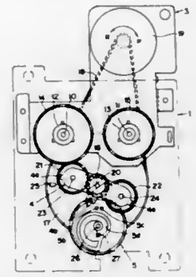
MODE CHANGING MECHANISM IN TAPE RECORDER

Masao Kamijo, Tokyo, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano and Tokyo Pigeon Co., Ltd., Tokyo, both of, Japan

Filed Apr. 19, 1988, Ser. No. 183,131
Claims priority, application Japan, Sep. 24, 1987, 62-237352
Int. Cl.[4] G11B *15/44*
U.S. Cl. 242—201 **3 Claims**

1. A mode changing mechanism of a tape recorder comprising:
- a motor rotatable in opposite directions;

- a flywheel driven by said motor and having a capstan shaft integrally formed therewith;
- a gear arm provided concentrically with said capstan shaft;
- gears provided at opposite ends of said gear arm and continuously engaging a capstan gear;
- a takeup reel gear and a supply reel gear selectively engaging said gears on said gear arm;
- an assist gear engageable with said capstan gear and having a cutout in which a circumferential gear train of the assist gear is interrupted;
- an engaging member formed on said assist gear to engage a projection formed on said gear arm;



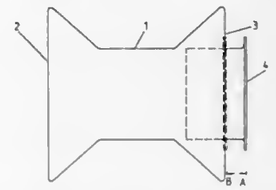
- a member for moving a pinch roller to and away from said capstan shaft;
- an eccentric cam formed on said assist gear to drive said pinch roller moving member;
- said assist gear being engaged with said capstan gear by a trigger means in which said engaging member of said assist gear is pushed by said projection of said gear arm pivoted in the same direction as a selected rotating direction of said motor; and
- said eccentric cam being configured to drive said pinch roller moving member to move said pinch roller to or away from said capstan shaft when said assist gear is engaged with and driven by said capstan gear.

4,819,892

YARN CARRIER FOR WINDING A FILAMENTARY THREAD AND A METHOD OF FORMING A THREAD RESERVE

Hans Schürmann, Emmen, and Walter Settele, Lucerne, both of Switzerland, assignors to Viscosuisse SA, Emmenbrücke, Switzerland

Filed Jul. 9, 1987, Ser. No. 70,914
Claims priority, application Switzerland, Jul. 11, 1986, 02797/86
Int. Cl.[4] B65H *54/02, 54/34, 75/24, 75/28*
U.S. Cl. 242—18 PW **11 Claims**



1. A bobbin for winding a filament thread comprising: a cylindrical barrel having first and second conical ends, a take-up ring having a portion for forming a thread reserve thereon, means mounting the take-up ring in said first conical end of the bobbin for coaxial displacement from a contracted position wherein said thread reserve forming portion is within said first conical end and to an extended position wherein said thread reserve forming portion extends axially beyond said first conical end.

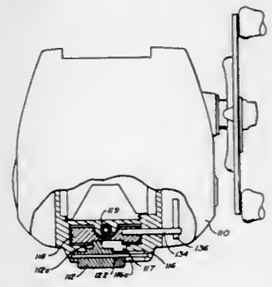
10. A method for forming a filament thread reserve in a cylindrically-barrelled bobbin comprising:
- extending a take-up ring from a contracted position within a conical end of the cylindrical barrel to an entended position wherein the take-up ring projects axially beyond said conical end;
- winding the filament thread in a space defined by an outer edge of the take-up ring and an outer edge of the conical end; and
- moving said take-up ring from said extended position to said contracted position inside the conical end of the barrel.

4,819,893

CLUTCH MECHANISM THUMB BUTTON MOUNTING FOR FISHING REEL

Tadashi Ueno, Udea, Japan, assignor to Matsuo Kogyo Kabushiki Kaisha, Japan

Filed Oct. 16, 1987, Ser. No. 109,438
Int. Cl.[4] A01K *89/015*
U.S. Cl. 242—220 **2 Claims**

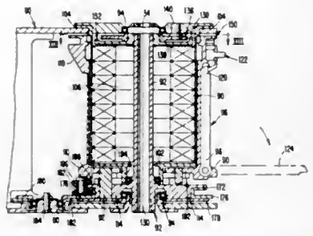


1. In a bait casting reel wherein there is a reel body with generally parallel, spaced side plates, a spool rotatably mounted between said side plates, a crank, a clutch mechanism interposed between said crank and said spool, operative when engaged to enable an angler to rewind a fishing line manually and when disengaged to enable the spool to rotate freely, and a clutch actuating lever operative in a first position to engage said clutch mechanism and in a second position to disengage said clutch mechanism;

the improvement comprising:
- a frame mounted on said reel body between said side plates;
- a thumb button slidably mounted in said frame;
- means engaged between said thumb button and said clutch actuating lever so that said lever is moved to said second position by full depression of said push button;
- a selector control slidably mounted on said frame;
- complementary stop members on said selector control and said thumb button operative when said control is in a first position to enable full depression of said thumb button and when said selector control is in a second position to enable only partial depression of said thumb button whereby when said thumb button is released said clutch actuating lever returns to said first position.

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4,819,894
RETRACTING DEVICE
Joe E. Sternberger, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.
Filed Oct. 2, 1987, Ser. No. 103,595
Int. Cl.[4] B64D *1/02*
U.S. Cl. 244—137.4 **12 Claims**



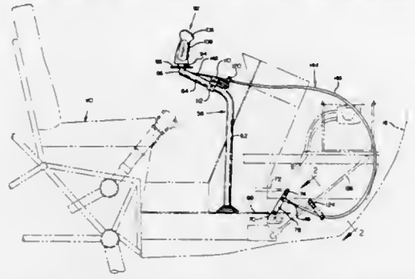
1. A device for retracting a separable component of an object on separation of the object from a launcher, said device comprising:
a housing attached to said launcher;
power spring means in said housing for retracting said component, said power spring means being adapted for connection to said component;
means in said housing for winding said power spring means;
lock means in said housing for automatically fixing said power spring means in a predetermined wound position;
means in said housing responsive to operation of said winding means for automatically preventing over winding of said power spring means; and
means responsive to separation of said object from said launcher for releasing said lock means.

4,819,895

Patent Not Issued For This Number

4,819,896
HAND-OPERATED AIRCRAFT CONTROL SYSTEM
James L. Narad, 274 Zandecki Rd., Chehalis, Wash. 98532
Filed Jan. 29, 1986, Ser. No. 823,612
Int. Cl.[4] B64C *13/04*
U.S. Cl. 244—234 **18 Claims**

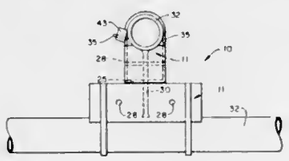
15. A method of converting a foot pedal-operated aircraft control system to a hand-operated control system in an aircraft having a foot pedal which operates an orientation linkage for controlling a first orientation surface of the aircraft and a generally upright hand-operated control stick for controlling at least one other orientation surface of the aircraft, the method comprising the steps of:
mounting a hand-operated control cable actuating means on a top end of the control stick such that the actuating means is bidirectionally rotatable about a longitudinal axis generally defined by the control stick;



operatively connecting a fist end of a control cable means to the actuating means: and
operatively connecting a second end of the control cable means to the orientation linkage for controlling the first orientation surface of the aircraft and no other surface through hand rotation of the actuating means.

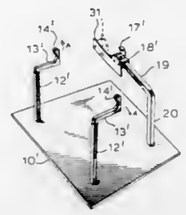
4,819,897
ANTI-CHAFE SUPPORTING OF FLEXIBLE TUBULAR ARTICLES
Robert J. Gooding, R.D. 2, Chester Springs, Pa. 19425
Continuation-in-part of Ser. No. 852,294, Apr. 15, 1986, abandoned. This application Aug. 11, 1987, Ser. No. 84,287
Int. Cl.[4] F16L *3/22;* **B23P** *11/00*
U.S. Cl. 248—68.1 **17 Claims**

1. Method of supporting cables, hoses, or other flexible tubular articles in mutually anti-chafing relationship,
comprising the steps of
juxtaposing a plurality of such flexible tubular articles to respective cylindrically concave faces of supporting members spaced apart from and substantially parallel to one another,
securing each such flexible tubular article in place along and against such face of the supporting member to which it was so juxtaposed by binding the article to the supporting member, and



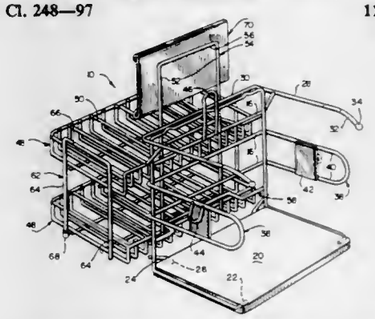
joining said supporting members, thereby enabling each secured tubular article and support member to swivel freely about an axis at any selected orientation relative to one another but only in separate mutually parallel planes of movement in non-chafing relationship.
16. Anti-chafing supporting means for an adjacent pair of cables, hoses, or like flexible tubular articles subject to frequent, rapid, repetitive, or vibratory movement, comprising
a pair of saddle members each having a side and having opposite such side a cylindrically concave face facing away therefrom and adapted to receive part of the circumferential extent of such a cylindrical article thereagainst,
tie means holding two such tubular articles respectively along and against such respective concave faces, and
non-elastomeric spring-free pivot means
secured to such saddle members with their respective aforesaid sides mutually adjacent, and
retaining the saddle members in swivelling relationship about a given swivel axis relative to one another, regardless of the orientation of the articles relative to one another or to the ground.

4,819,898
BAG HOLDING, DISPENSING, LOADING AND DISCHARGE SYSTEM
Gordon L. Benoit, Macedon; Lewis E. Sable, Rochester, and Richard A. Wenzel, Pittsford, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Apr. 10, 1987, Ser. No. 36,599
Int. Cl.[4] B65B *67/04*
U.S. Cl. 248—97 **7 Claims**



1. Apparatus for holding a supply of flexible bags and for facilitating the opening and loading of individual bags from the supply, which comprises:
a base member;
means adapted for supporting a supply of bags, the bag supply supporting means being mounted on the base; and
means adapted for supporting an individual bag from the supply of bags at portions thereof and for holding the bag in an open, loadable condition, the individual bag supporting means including a pair of support legs mounted on the base and extending upwardly therefrom and spaced from each other and from the bag supply supporting means, each leg having mounted thereon a free-standing hooked end having a bag caming surface, the hooked ends and caming surfaces thereof being adapted to receive a folded down portion of an individual bag and to cause the bag to cam downwardly against the hooked end caming surfaces when the bag is loaded, the bag supply supporting means including a single vertical post mounted on the base member, a horizontal support bar joined to the vertical post, a flexible bag support member mounted on an end of the support bar, and an upwardly extending protrusion mounted on the support bar, the flexible bag support member being sufficiently rigid so as to be adapted to support a supply of bags thereon and being flexible in a rearward direction away from the support legs so as to facilitate the removal of loaded individual bags from the apparatus.

4,819,899
MERCHANDISING RACK
Geoffrey L. Weil, Florence, S.C., assignor to Sonoco Products Company, Hartsville, S.C.
Filed Mar. 14, 1988, Ser. No. 168,072
Int. Cl.[4] A63B *55/04*
U.S. Cl. 248—97 **11 Claims**



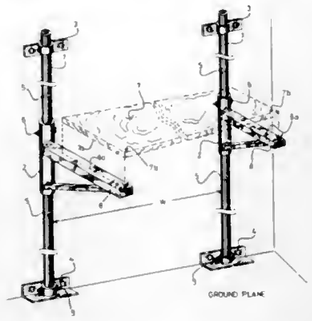
1. A merchandising rack for the storage and dispensing of merchandise and bags, said rack including a central vertical support wall having opposed first and second sides, a horizontal base rigid with said wall and projecting outward relative to said first side, bag support means rigid with said wall and projecting outward relative to said first side in vertically spaced relation over said base, and merchandise display means mounted on and projecting outward relative to the second side of the vertical support wall and in an opposed direction from said base relative to said vertical support wall, said bag support means comprising a pair of laterally spaced parallel arms engageable with selected portions of a bag for suspension of the bag therefrom said merchandise display means comprising at least one mechandise tray, a vertical support member paralleling said vertical support wall, means fixing said vertical support member to said support wall adjacent the second side thereof, said tray being fixed to said vertical support member.

4,819,900
ADJUSTABLE, HEAVY DUTY GARAGE SHELF ASSEMBLY
George W. Funk, 22512 Neptune Ave., Carson, Calif. 90745
Filed Sep. 8, 1988, Ser. No. 241,490
Int. Cl.[4] E04G *5/06*
U.S. Cl. 248—244 **3 Claims**

1. A garage shelf assembly having adjustable shelves and constructed to support heavy loads while fastened to a garage wall, the assembly comprising:
(a) two vertical tube supports that may be fastened to a wall;

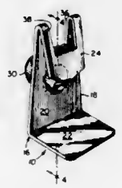
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(b) a multiplicity of shelf bracket assemblies that, when secured to said vertical tube supports, provide a surface for supporting and fastening shelves thereto;
(c) two tube-clamp assemblies, one per vertical tube support, adapted and designed to fasten said vertical tube support to a wall near the top of the tube-support leaving clearance between the wall and said vertical tube support to allow movement up or down of said shelf bracket assemblies;
(d) two shoe-clamp assemblies, one per vertical tube-support, adapted and designed to fasten said vertical tube support to a wall at the floor and to provide floor support; and
(e) a multiplicity of shelves;
said vertical tube supports being made of mild steel seamless tubing with a wall thickness of a least 0.100 inches, an outside diameter of 1.5 inches and a maximum length of 9 feet, said supports being capable of supporting 100 pounds weight per support; said vertical tube supports having a multiplicity of holes bored axially through each support at intervals to receive bolts that fasten said shelf-bracket assemblies thereto; said vertical tube supports having an outside diameter of 1.75 inches or 2.0 inches for load rating of more than 100 pounds per support;
said shelf bracket assemblies being made of mild steel and comprising: a tube slider, a main bracket and a support bar; said slider, bracket and support bar being welded



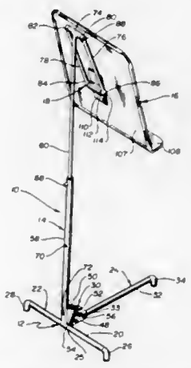
together in three places forming a triangular cantilevered support; said tube slider being made of seamless steel tubing, with a wall thickness of a least 0.100 inches and an outside diameter which is selected to match the outside diameter of said vertical tube support, so that it can slide over said tube support; said tube slider having a first hole bored axially through it to accomodate a bracket fastening bolt; said main bracket being made of rectangular tubing 2 inches by 1 inch in cross-sectional dimension, having a wall thickness of 0.100 inch and a length of from 12 to 16 inches; said main bracket having second and third holes located near one end and bored axially through it perpendicular to the bracket wider surfaces; said main bracket being welded at the distal end perpendicularly to the axis of said tube slider; said support bar being made of square cross-section tubing approximately 0.50 inch by 0.50 inch, said support bar being welded at one end to the under surface of said main bracket near to its free end, and welded at its distal end to said tube slider so that said support bar, said main bracket and said tube slider form a right triangle with the enclosed angle between said support bar and main bracket being approximately 15 degrees; said shelf bracket assembly being rigid and constructed to support loads in excess of 100 pounds; said shelf bracket assembly being able to move up or down said vertical tube support to desired locations and fixed in place;
said tube-clamp assemblies being made of mild steel and comprising a plate and a first segment of tubing; said plate having a first and second hole bored axially in it to accomodate wall fastening bolts; said first segment of tubing being made of seamless steel tubing with a wall thickness of a least 0.100 inches and an out-side diameter which is selected to match the outside diameter of said vertical tube suport, so that said tube-clamp assembly can fit over said tube support; said first segment of tubing being sized to fit the width of said plate and welded at the center of said plate with its axis at 90 degrees to the length of said plate; said plate having a thickness of 0.125 inch, and this plate thickness being selected to provide clearance between the wall and said vertical tube support to allow movement up or down for adjusting said shelf bracket assemblies;
said shoe-clamp assemblies being made of mild steel and comprising an an angle-piece and a second segment of tubing; said second segment of tubing being identical in size to said first segment of tubing that is used in said tube-clamp assembly; said angle piece being made of 0.125 inch thick steel angle and having a length of at least three times the diameter of said second segment of tubing; said angle piece having first and second holes bores in it and located to accomodate wall fastening bolts; said second segment of tubing having holes bored axially through it to accomodate a bolt or pin that is used to fasten said vertical tube support in place, preventing rotation; said second segment of tubing being located and welded at the center of said angle piece, so that one end of said tubing rests on and is enclosed by, a horizontal surface of said angle piece, the distal end of said second segment of tubing being open to receive and accomodate the lower end of said vertical tube support;
said shelves being typically 0.75 inch thick or 1 inch thick plywood, from 12 inches to 16 inches wide and a maximum of 36 inches long; said shelves having two holes bored in each shelf near its distal ends to accomodate bolts fastening it to said shelf bracket assembly.

4,819,901
METAL SHELF LOCK
Paul M. McDonald, Scituate, Mass., assignor to P. X. Industries, Inc., West Hanover, Mass.
Filed Jun. 27, 1988, Ser. No. 214,025
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—250 **11 Claims**



1. A metal shelf lock comprising:
(a) a unitary body formed of a metal and having an L-shaped frame;
(b) said L-shaped frame including an upright section and a horizontal section;
(c) a flexible portion connecting at an angle to said upright section and provided with a tab at its free end; and
(d) a hollow peg formed in said upright section in operative association with said tab and extending from said upright section in a direction opposed yet parallel to said horizontal section;
(e) said upright section being confined between edges which converge in a direction away from said horizontal section.

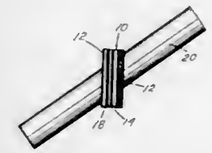
4,819,902
COLLAPSIBLE MUSIC STAND
Kari J. Wenger, Cincinnati, Ohio, and Eugene N. Reshanov, Golden Valley, Minn., assignors to Wenger Corporation, Owatonna, Minn.
Filed Jul. 16, 1987, Ser. No. 74,413
Int. Cl.[4] A47B *97/08*
U.S. Cl. 248—460 **18 Claims**



1. A collapsible stand for supporting and displaying sheet music or the like, comprising:
a generally upright support member having a generally vertical stem rod and a generally horizontal stem tee carried at the top of said stem rod, said stem tee extending radially outwardly to opposed sides of said stem rod at a distance sufficient to present a hand graspable stem tee handle;
a rack member adapted for carrying said sheet music or the like;
an elongated rack member mounting assembly having a first end and a second, opposed end;
first pivot means for pivotally coupling said rack member first end to said stem tee about a first, generally horizontal pivot axis; and
second pivot means for pivotally coupling said rack member second end to said rack member about a second, generally horizontal pivot axis,
said mounting assembly comprising first and second, spaced apart arms, each of said arms extending between said stem tee and said rack member, and each of said arms including a first end pivotally coupled to said stem tee by said first pivot means and a second end pivotally coupled to said rack member by said second pivot means, whereby said rack member can be shifted to a collapsed position abutting said stem rod without said arms coming into interfering contact with said stem rod and said stand can be easily lifted by said stem tee handle.

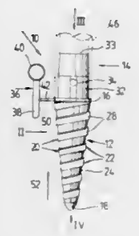
4,819,903
FISHING POLE HOLDER FOR PORTABLE CHAIRS
Louis M. Jimenez, P.O. Box 1916, Oroville, Calif. 95965
Filed Jul. 12, 1988, Ser. No. 217,954
Int. Cl.[4] A01K *97/10*
U.S. Cl. 248—538 **1 Claim**

1. A fishing pole holder for removable snap-on attachment to round tubular framing members of portable chairs, comprising:
a chair attachment clamp structured of resilient material in the form of an elongated cylindrical open ended tube-like structure open along one longitudinal side between two curved side walls;
two outwardly curved guide flanges, one on each of two terminal edges of said two curved side walls adjacent said longitudinal opened side extending the full length of said attachment clamp;
an outwardly extending U-shaped ridge positioned oppositely of said longitudinal opened side extending the full length of said attachment clamp;



a fishing pole handle receiver structured of a rigid elongated open ended tube diametrically sized to loosely retain a handle and of a fishing pole, and substantially longer than said attachment clamp;
said fishing pole handle receiver permanently affixed centrally to said U-shaped ridge of said attachment clamp at an approximate forty-five degree angle.

4,819,904
SUPPORT MEMBER
Leonid Shpigel, 9 Horak Avenue, Camps Bay 8001, and Jeffrey C. Berzack, "Dobs Den" Peter Cloete Avenue, Constantia 7800, both of South Africa
Filed Oct. 27, 1987, Ser. No. 113,164
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—545 **7 Claims**



1. A support device for fitting to the end of a tubular member, which device includes a cone-shaped body having a base at its broad end and a pointed tip at its narrow end; an external screw-thread formation having a screw thread extending spirally several times around the cone-shaped body between the base and the pointed tip; a cylindrical connection member extending from the base of the cone-shaped body in a direction opposite to the tip and being adapted to be fitted into an open end of a tubular member; two substantially flat continuous surfaces extending from the base to the tip on opposite sides of the cone-shaped body so as to define an acute angle between them and interrupting the screw-thread formation into interrupted thread sections; and at least one connection recess in the cylindrical member for receiving an associated projecting part extending from a tubular member, for locking engagement therewith.

4,819,905
TROLLING MOTOR MOUNT FOR PLEASURE BOATS
Conrad L. McCain, 613 S. First St., Atwood, Kans. 67730
Filed Jan. 4, 1988, Ser. No. 140,545
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—642 **12 Claims**

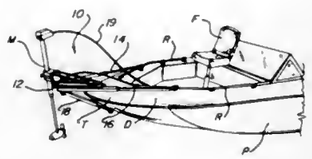
1. A trolling motor mount for pleasure boats, said motor

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mount being capable of being quickly installed and removed from the boat so that the boat can be converted for fishing purposes, the motor mount comprising:

(a) a base plate means;

(b) an elongated mounting plate pivotally mounted near one end on said base plate means, said mounting plate being arranged to receive a mounting assembly of a trolling motor for propelling and maneuvering the boat at slow speeds;



(c) a pair of support arm means each attached at one end to the boat deck in a spaced relation to each other and the opposite ends each pivotally connected to the base plate means so that they can rotate in a plane parallel to the base plate means; and

(d) a support leg means attached at one end to the bow of the boat and the opposite end pivotally connected to a clevis means attached to the base plate means so that the support leg means rotates in a plane perpendicular to the base plate means, said perpendicular plane being aligned substantially along the longitudinal axis of the boat.

4,819,906

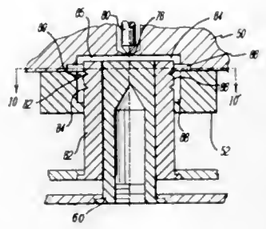
MOLD FOR IMPROVED PRESS-ON CAP AND SEAL

Benjamin A. Cochrane, 181 Sonora Ave., Danville, Calif. 94526

Continuation-in-part of Ser. No. 709,534, Mar. 8, 1985, Pat. No. 4,632,265, which is a continuation-in-part of Ser. No. 507,342, Jun. 24, 1983, abandoned. This application Dec. 29, 1986, Ser. No. 947,043

Int. Cl.[4] B29C *39/34, 45/40*

U.S. Cl. 249—67 **18 Claims**



1. A mold for forming a plastic cap having an annular tear band with a laterally offset tear tab dependent from said tear band which comprises:

a. an upper half cavity member with a first cylindrical recess surrounded by a shallow, discontinuous annular recess;

b. a lower half cavity member with a second cylindrical recess having a diameter equal to the diameter of the first cylindrical recess and mating on a parting plane with said upper half cavity member to form a cylindrical mold cavity;

c. a core member slidably received in said lower half cavity member to form said mold cavity with a thin circular cavity and a thin annular cavity in open communication therewith;

d. a laterally offset cavity in said lower half cavity member, open to said parting plane and separated from said second cylindrical recess by a discontinuous wall, thereby providing open communication between said recess and said laterally offset cavity;

e. a central bore in said core member; and

f. ejector means slidably received in said central bore, and operable to eject a plastic cap from said lower half member of said mold.

4,819,907

FLOW CONTROL ASSEMBLIES FOR GASEOUS FUEL

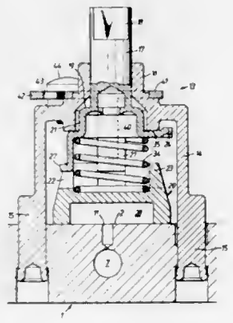
Benjamin F. Gostelow, Warrington, England, assignor to New World Domestic Appliances Limited, London, England

Continuation of Ser. No. 39,767, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 782,485, Oct. 1, 1985, abandoned. This application Jan. 25, 1988, Ser. No. 149,916

Claims priority, application United Kingdom, Oct. 3, 1984, 8424905

Int. Cl.[4] F16K *11/00*

U.S. Cl. 251—96 **3 Claims**



1. A gaseous fuel flow control assembly for controlling the supply of gaseous fuel to gaseous fuel burners comprising in combination:

(1) an elongate extruded gas supply rail with a longitudinal bore,

(2) a flat seating surface formed on the external surface of the gas supply rail along the length thereof,

(3) a first series of passageways formed in the gas supply rail and spaced along the length of the flat seating surface,

(4) said first series of passageways leading from the longitudinal bore to respective exit orifices in the flat seating surface and spaced along the length thereof,

(5) a series of inlet orifices in the flat seating surface and spaced along the length thereof, each inlet orifice being associated with a respective one of the exit orifices,

(6) a series of outlet ports in the gas supply rail and spaced along the length thereof,

(7) a second series of passageways formed in the gas supply rail and spaced along the length thereof, each passageway of the second series extending from a respective one of the inlet orifices to a respective one of the outlet ports,

(8) at least three of flow control valve units spaced in-line along the flat seating surface, each of the units having a housing portion mounted upon the flat seating surface in a position to allow the unit to control gaseous fuel flow from one of the exit orifices to the respective associated inlet orifice,

(9) each said housing portion forming, with the flat seating surface on which it is mounted, a housing for the respective valve unit,

(10) each valve unit having a rotatable flow control member located within the housing, the flow control member having a flat surface in contact with flat seating surface and overlying an exit orifice and its associated inlet orifice,

(11) each flow control member having a flow connecting passage for connecting the said exit orifice and the inlet orifice associated with the said exit orifice,

(12) means, in each housing, for resiliently urging the flat surface of the flow control member against the flat seating surface, and,

(13) for each flow control valve unit, a respective valve control member that extends through the housing portion and is coupled to the flow control member for rotating the latter.

4,819,908

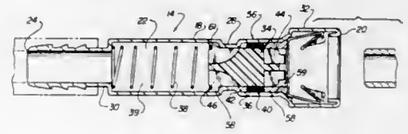
QUICK CONNECT FLUID COUPLING

Phillip J. Norkey, Jackson, Mich., assignor to Edwards Industries, Inc., Royal Oak, Mich.

Filed Apr. 12, 1988, Ser. No. 180,307

Int. Cl.[4] F16L *37/28*

U.S. Cl. 251—149.6 **10 Claims**



1. A quick connect fluid coupling comprising:

a tubular cylindrical male part having a cylindrical outer periphery and an open end,

a female part having an open end and defining a fluid passageway, said open end of said male part being insertable into said female part open end to a connected position whereupon said fluid passageways register with each other,

a valve member contained within said female part fluid passageway, said valve member being movable between an open position and a closed position, wherein in said closed position said valve member blocks fluid flow through said female part fluid passageway and wherein in said open position said valve member enables fluid flow through said female part fluid passageway,

means for urging said valve member towards said closed position,

means on said male part for moving said valve member to said open position upon insertion of said male part into said female part to said connected position,

means for locking said male part and said female part together in said connected position,

said valve member comprising an elongated body having a central cylindrical portion,

a fluid seal, and

means for mounting said seal in said female part fluid passageway so that said fluid seal radially compresses and sealingly engages said valve member cylindrical portion when said valve member is in said closed position and so that said seal radially compresses and sealingly engages a central portion of said outer periphery of said male part when said male part is in said connected position,

wherein said valve member comprises cut-out portions on each axial end of said cylindrical portion, said cut-out portions forming part of the fluid passageway through said female part when said valve member is in said open position and wherein said cut-outs are open to the outer periphery of said body of said valve member.

4,819,909

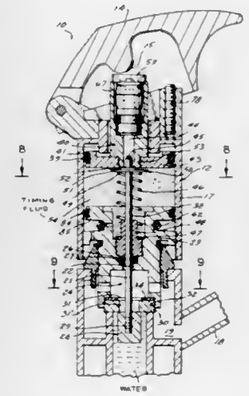
SELF-CLOSING VALVE FOR SANITARY INSTALLATIONS

Thomas G. Hart, Piscataway; Karl G. Ohaus, Chatham; Earl W. Nickerson, Ocean City, and David J. Meisner, Monmouth Beach, all of N.J., assignors to American Standard Inc., New York, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,437

Int. Cl.[4] F16K *21/06, 31/122*

U.S. Cl. 251—48 **38 Claims**



1. A self-closing faucet comprising:

an actuating member, a valve body defining a water passageway, an inlet, an outlet and a valve means mounted in said passageway and positioned between said inlet and outlet openings;

said valve means including an axially mounted reciprocating valve stem, a stationary valve seat positioned between said inlet and outlet openings, and an axially displaceable valve seat mounted on one end of said valve stem;

a shiftable air metering means, said air metering means including an air chamber and said piston, said piston being movable within said air chamber and being operably coupled to said valve stem when said actuating member engages and shifts said air metering means;

one-way valve means, mounted on said valve body, is operably coupled to said air chamber so that air is expelled through said one-way valve means to the atmosphere when said piston is shifted axially, at the same time, said valve stem is shifted away from said fixed valve seat, allowing water flow through said discharge passageway; and

said air metering means having an orifice to control the rate of flow of air into said air chamber, thereby providing a substantially constant rate of water discharged through said valve outlet opening as said reciprocating valve stem automatically returns to its closed position.

4,819,910

TRAILER LEVELER

Paul F. Johnston, 1432 Nunneley Rd., Paradise, Calif. 95969

Filed Aug. 1, 1988, Ser. No. 227,004

Int. Cl.[4] E02C *3/00*

U.S. Cl. 254—88 **3 Claims**

1. A drive-on height adjustment device for raising the wheels of a vehicle, and which comprises:

a. a two piece leveling ramp;

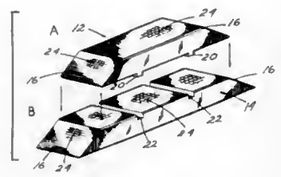
said leveling ramp being two substantially rectangular beveled ended interlocking blocks; said blocks structured for longitudinal placement horizontally with a first said block positioned on top of a second said block;

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said first block being the top block and said second block being the base block; each said block having a top and bottom surface, two side edges, and two inclined said beveled ends which, when assembled with said bottom surface of said top block to said top surface of said base block, form one continuous inclined ramp at each said end terminating upwardly into a flattened area sized to maintain one of said vehicle wheels thereon;

b. a releasable attachment means;

said attachment means being interlocking transverse grooves and ridges; said top surface of said base block



having at least two said transverse grooves one adjacent each said inclined beveled end; said bottom surface of said top block having at least two said transverse ridges one adjacent each said inclined beveled end, said transverse ridges sized and positioned to align with said transverse grooves and fit releasably inserted therein;

c. a non-slip texture on said top and said beveled end surfaces of each said block;

d. said two piece drive-on leveling ramp being of a length to fit between said vehicle wheels with said wheels arranged in tandem.

4,819,911

CLAMP FOR GRIPPING A FLEXIBLE MEMBER

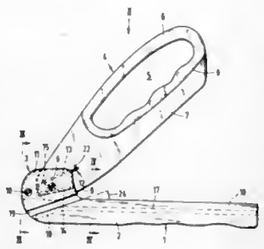
Werner Cielker, Emil-Hoffman-Strasse 9, D-5000 Koln 50, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 129,612

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710922

Int. Cl.⁴ B65M *59/00*

U.S. Cl. 254—134.3 FT **10 Claims**



1. A clamp for gripping a flexible member, such as flexible bars for pulling cables into cable-protective conduits, comprising a clamp body having a generally elongated longitudinal groove adapted to receive therein a portion of a flexible member, said clamp body having opposite end portions, a handle, said handle having opposite end portions, means pivotally connecting first of said handle end portions to a first of said clamp body end portions, said handle having an elongated strip in opposed aligned relationship to and size generally to mate with said longitudinal groove when the second of said handle and clamp body end portions are pivoted from a second position remote from each other to a first position contiguous each other, an assembly plate, means for securing said handle first end portion between said assembly plate and said clamp body first end portion, and said assembly plate includes a surface in generally parallel spaced relationship to a portion of said elongated longitudinal groove adjacent said clamp body first end portion.

4,819,912

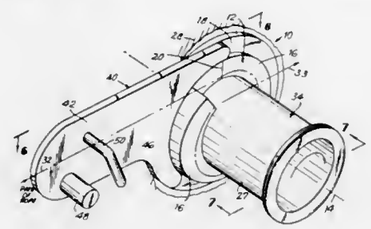
RAMPED GUIDE FOR CAPSTAN

Jeffrey J. Plummer, Rockford, Ill., assignor to Greenlee Textron Inc., Rockford, Ill.

Filed Dec. 16, 1987, Ser. No. 133,322

Int. Cl.⁴ B66D *1/38*

U.S. Cl. 254—266 **14 Claims**



1. A guide for laying turns of rope or cable on a capstan, said capstan being positioned on a mounting surface and including a generally cylindrical body mounted for rotation relative to said mounting surface about the longitudinal axis of said body, comprising:

a ramp concentric with said axis and extending away from said mounting surface in a helix, said ramp having a first end and a second end, said first end being closer to said mounting surface then said second end; and

a transition surface extending from said second end of said ramp toward said mounting surface, said transition surface terminating at a distance from said mounting surface equal to the distance of said first end from said mounting surface,

a flange plate, said plate having a circular opening and being fixedly connected to said ramp for positioning intermediate said ramp and said mounting surface, said circular opening being concentric with said ramp and sized to allow passage of said cylindrical capstan body therethrough, and an arm connected to at least one of said ramp and flange plate, said arm extending transversely to said rotational axis, and entrapment means connected to said arm for constraining said rope to said arm as said rope advances toward said capstan for winding therearound.

4,819,913

LEVER TYPE HOISTING MACHINE

Yosaku Nishimura, Osaka, Japan, assignor to Vital Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1987, Ser. No. 113,161

Claims priority, application Japan, Nov. 15, 1986, 61-272413

Int. Cl.⁴ B66D *1/14;* **F16D** *19/00*

U.S. Cl. 254—350 **8 Claims**

1. A lever type hoisting machine in a structure wherein:

a load sheave is linked to a drive shaft having a threaded part

a pressure bearing member is fixed to said drive shaft, and a pressure drive wheel is screwed into the threaded part of the drive shaft opposite to said pressure bearing member;

the engaging relation of said pressure drive wheel is composed so as to approach the direction of said pressure bearing member when the pressure drive wheel is rotated in the hoisting-up direction;

a reverse rotation preventive wheel is inserted between said pressure drive wheel and pressure bearing member having means rendering the same rotatable only in one direction,

and friction members are disposed at both sides of said reverse rotation preventive wheel;

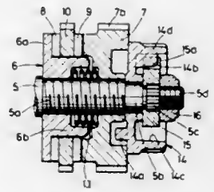
an operation lever is linked to said pressure drive wheel detachably by way of a rotating direction change pawl;

an operation wheel is rotatably supported on said drive shaft at a position disposing one side adjacent to the pressure drive wheel;

a collision force regulating member is held on said drive shaft adjacently at the opposite side of said operation wheel;

said pressure drive wheel having a side part and said operation wheel has an inside collision part disposed at the pressure drive wheel side part and an outside collision part at the opposite side part of the pressure drive wheel;

a collision wall capable of being engaged with the inside collision part of said operation wheel is formed on said pressure drive wheel;



a collision element capable of being engaged with the outside collision part of said operation wheel is formed on said regulating member; and

said inside collision part is disposed at the side of rotating the pressure drive wheel in the hoisting-down direction with respect to the collision wall, while the collision element is disposed at the side of rotating the operation wheel in the hoisting-down direction with respect to the outside collision part, wherein the central angle of the gap, formed by the outside collision part and collision element of the regulating member when the inside collision part is contacting with the collision wall of the pressure drive wheel having a central angle is set so as to be slightly smaller than the central angle of the gap formed by the inside collision part and the collision wall when the collision element is contacting with the outside collision part.

4,819,914

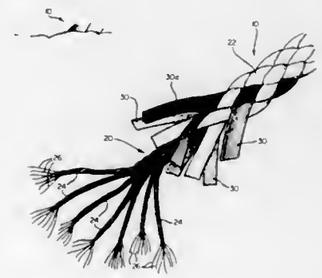
ELECTRICAL FENCE FOR LIVESTOCK

Richard A. Moore, Glen Ellyn, Ill., assignor to All Line, Inc., Naperville, Ill.

Continuation of Ser. No. 752,032, Jul. 5, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 6,253

Int. Cl.⁴ A01K *3/00;* **H01B** *5/08*

U.S. Cl. 256—10 **10 Claims**



1. An electrical conducting fence rope for use on electrical fencing of livestock and supplying electric shocks to livestock contacting an outer surface of said fence rope comprising:

an inner core of stranded conductor cable, each strand formed of a plurality of twisted, galvanized wires; and

an insulating outer layer of synthetic fiber filaments completely surrounding the conductor cable to physically isolate the conductor cable with said synthetic fiber filaments so that no conductive portion of the conductor cable is exposed and contactable by livestock on said outer surface of said fence rope, said outer insulating layer being formed of multiple filament carriers with each carrier comprising a plurality of twisted synthetic fiber filaments,

said electrical conducting fence rope providing electric shocks to livestock contacting only the insulating outer layer of synthetic fiber filaments on said outer surface of said fence rope.

4,819,915

FLEXIBLE BARRIER FOR ARRESTING FALLING ROCKS

Gianangelo Cargnel, Viale Fantuzzi, 8, I-32100 Belluno, Italy

PCT No. PCT/EP86/00440, § 371 Date Apr. 29, 1987, § 102(e) Date Apr. 29, 1987, PCT Pub. No. WO87/00878, PCT Pub. Date Feb. 12, 1987

PCT Filed Jul. 25, 1986, Ser. No. 42,941

Claims priority, application Italy, Jul. 31, 1985, 21809 A/85

Int. Cl.⁴ E01F *7/02;* **B64F** *1/02*

U.S. Cl. 256—12.5 **5 Claims**



1. A structure for an elastic rockfall fence comprising

a plurality of spaced poles (**10**) and an arresting net (**40**) extending therebetween for catching boulders;

said supporting poles (**10**) being each pivotally anchored to the ground (T) by anchor means permitting at least one degree of free rotation of the pole with respect to the ground (T);

each pole being maintained in position by a plurality of windbracing cables (**21, 22, 23**) anchored to the ground by anchoring means (**13**) and secured to the top of the pole;

wherein said windbracing cables (**21, 22, 23**) comprise upstream cables (**21, 22**) and downstream cable (**23**) with said holding net (**40**) being supported by a series of spaced horizontal ropes (**30**) mounted on the upstream windbracing cables (**21, 22**) so that the net (**40**), when at rest, is spaced from the poles (**10**),

said horizontal ropes being mounted on said upstream windbracing cables (**21, 22**) in a manner which supports said ropes on said windbracing cables but permits lateral movement of said ropes along said windbracing cables, said horizontal ropes (**30**) being anchored at their extremities (**33**) so that in the event of the fall of a boulder, the arresting net coacts with the horizontal cables (**30**), the windbracing cables (**21, 22, 23**) and the poles (**10**) to serve as an elastic barrier.

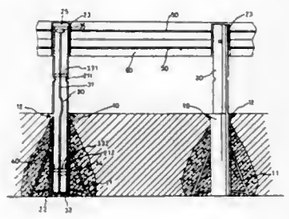
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4,819,916

SYSTEM OF REPLACEABLE ROAD RAILING

Kwou Wun-chung, FL. 3-1, No. 306, Hsing I Rd. Sec. 4, Taipei, Taiwan

Filed Jan. 27, 1988, Ser. No. 149,018
Int. Cl.[4] A01K *3/00*
U.S. Cl. 256—13.1 4 Claims



1. A replaceable road railing system comprising:

(a) a sleeve member extending from a lower end beneath a ground surface to an upper end adjacent said ground surface, said sleeve member having inclined frame members secured to a lower portion of said sleeve member beneath said ground surface, said frame members being encased in cement;

(b) a substantially hollow tubular pillar member insertable into said sleeve member, said pillar member having a pair of concavities formed within an external surface, one of said concavities being located above said ground surface and the other of said concavities being located below said ground surface, said pillar member having a lower section defining a plurality of blade members, and an upper section having a cover member and a block member fixedly secured thereto, said block member for interfacing with and coupling an undulating steel plate member to said pillar member; and,

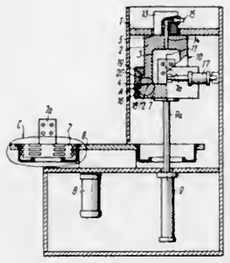
(c) replacement and adjustment means located within said pillar member for providing securement to and removal of said pillars from said sleeve member, said replacement and adjustment means including an extended threaded rod, said threaded rod having an upper end defining a rod head member and a lower end located within said lower section of said pillar member, said threaded rod being threadedly coupled to an upper fixing block member located within said pillar member above said concavity formed above said ground surface and to a lower fixing block member located within said pillar member below said concavity formed below said ground surface, said upper and lower fixing block members being displaceably constrained by respective concavities, said lower end of said threaded rod being secured to a wedge member having a truncated cone contour, said wedge member being displaced upwardly when said rod head member is rotated in a first direction for displacing said blade members in an outward radial direction against an inner wall of said sleeve member for securing said pillar member to said sleeve member, said wedge member being displaced downwardly when said rod head member is rotated in a second direction for releasing said blade members from said inner wall of said sleeve member to allow said pillar member to be removed from said sleeve member.

4,819,917

APPARATUS FOR DEBURRING WORKPIECES BY GAS DETONATION

Alexandr F. Cherendin; Oleg L Stoyanovsky; Lev N. Shepelev; Vladislav V. Mitrofanov; Viktor I. Manzhalei, all of Novosibirsk; Abram D. Tsemakhovich; Georgy P. Moskvitin, both of Barnaul, and Valery G. Galutsky, Novosibirsk, all of U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro Gidroimpulsnoi Techniki Sibirskogo Otdeleniva Akademli Nauk SSSR, Novosibkrsk, U.S.S.R.

PCT No. PCT/SU86/00066, § 371 Date Feb. 17, 1988, § 102(e) Date Feb. 17, 1988, PCT Pub. No. WO87/07861, PCT Pub. Date Dec. 30, 1987
PCT Filed Jun. 20, 1986, Ser. No. 183,150
Int. Cl.[4] B23K *7/00*
U.S. Cl. 266—51 8 Claims



1. An apparatus for deburring workpieces by gas detonation comprising a bed (1) having mounted thereon a casing (2) with a cavity (3) open at one end (4) of the casing (2), an indexing table (6) with bottoms (7) arranged alternately opposite to the open end (4) of the casing (2), a drive (9) for reciprocating the successive bottom (7) toward the open end (4) of the casing (2) to form during their connection a gas detonation chamber (10), a seal (12) between the casing (2) and bottom (7), and a system (13) for feeding gases to the gas detonation chamber (10) to form an explosive mixture with a spark plug (15) to ignite the explosive mixture, characterized in that the casing (2) is connected to the bottom (7) by a bayonet joint (16), one element of which is kinematically linked with a drive (17) to turn it relative to the other element thereof.

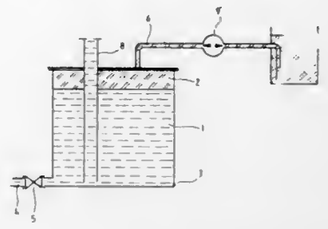
4,819,918

APPARATUS FOR THE PROTECTION OF A LIQUID AGAINST THE EFFECTS OF OXYGEN FROM THE SURROUNDINGS

Horst Mitzner, Viersen, and Franz Deilen, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Rheinische Maschinenfabrik & Eisengiesserei, Anton Roeper GmbH & Co. KG, Viersen, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 144,568
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1987, 3711701
Int. Cl.[4] C22B *7/00*
U.S. Cl. 266—207 3 Claims

1. An apparatus for storing molten metal including an uprightly mounted container in which the molten metal is placed, said molten metal being protected by a protective liquid against oxygen from the surroundings, the specific weight of said protective liquid being less than that of said molten metal; the container including a supply line having an integral valve near the bottom of the container and connected with a source for molten metal; the container 3 including further a riser tube in a vertical position having one open end near said bottom of the container and ending with another open end above a top plate of said container, said top plate sealing the container at its upper end; the container further including a supply pipe introduced through said top plate into a space between said top plate and an upper surface of the molten metal and including a



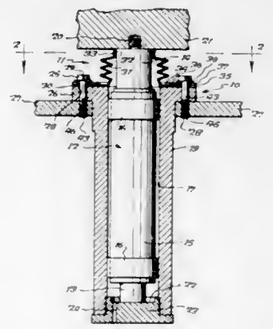
pressure controller to introduce a gaseous medium or the protective liquid into said space.

4,819,919

BOOT SEAL FOR LIQUID SPRING USED IN CORROSIVE ENVIRONMENTS

Douglas P. Taylor, Tonawanda, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Continuation of Ser. No. 558,856, Dec. 7, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,424
Int. Cl.[4] F16F *9/38*
U.S. Cl. 267—64.13 24 Claims



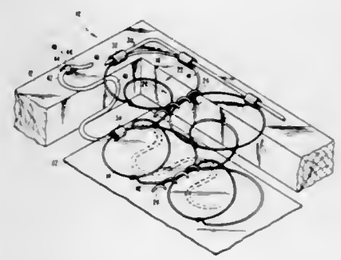
1. In a shock absorber construction mounted on a deck including a shock absorber having a casing, a sleeve mounting said casing for reciprocatory motion therein, a sleeve flange on said sleeve, a sleeve end portion on said sleeve remote from said sleeve flange, a piston in said casing in effective abutting relationship with said sleeve end portion, a casing end portion on said casing remote from said sleeve end portion located proximate said sleeve flange, attachment means on said casing and portion for attachment to a member which is to be supported by said shock absorber, and a plurality of bolts having bolt heads for effectively bearing on said sleeve flange and extending through said sleeve flange and received in said deck for securing said sleeve flange to said deck, the improvement comprising an annular contractible boot having a longitudinal axis and first and second boot ends, a boot portion on said first boot end in contiguous abutting relationship with said casing proximate said attachment means, securing means for securing said boot portion on said first boot end to said casing in sealing relationship, an annular resilient boot flange on said boot at said second boot end, said annular boot flange having a first thickness and extending substantially perpendicularly to said longitudinal axis of said boot for placement in contiguous abutting relationship with said sleeve flange, annular trim ring means having a second thickness and interposed between said bolt heads and said annular boot flange, and retention and spacer washer means interposed between each of said bolt heads and said sleeve flange, each of said retention and spacer washer means having a first washer portion and a second washer portion, said first washer portion being of an axial length which is shorter than the sum of said second thickness and said first thickness when the latter is uncompressed, said second washer portion comprising a washer flange extending outwardly from said first washer portion, said bolt heads bearing on said second washer portions, whereby the tightening of said bolts simultaneously secures said sleeve flange to said deck and causes said washer flanges to compress said annular resilient boot flange an amount which is equal to the difference in thickness between said axial lengths of said first washer portions and the sum of the thicknesses of said trim ring and the uncompressed thickness of said annular resilient boot flange to thereby provide a good seal with said sleeve flange.

4,819,920

SPRING COIL ASSEMBLY

James R. Barber, Anderson, Ind., assignor to Barber Manufacturing Company, Inc., Anderson, Ind.

Filed May 23, 1988, Ser. No. 197,204
Int. Cl.[4] F16F *3/00*; A47C *23/00, 23/04*
U.S. Cl. 267—90 11 Claims



1. A spring cushion assembly for a piece of furniture comprising:

a frame with an internal surface area sized to define the intended weight bearing area of the piece of furniture;

a plurality of hour-glass coil springs, said plurality of hour-glass coil springs being arranged in an assembly having rows and columns with the external surface area dimensions of the coil spring assembly being slightly smaller than the internal surface area of said frame;

a plurality of helical wires, each helical wire extending between adjacent columns to connect two adjacent hour-glass coils in each row, a number of said plurality of helical wires connecting top convolutions of two adjacent hour-glass coils in each row and others of said plurality of helical wires connecting bottom convolutions of two adjacent hour-glass coils in each row;

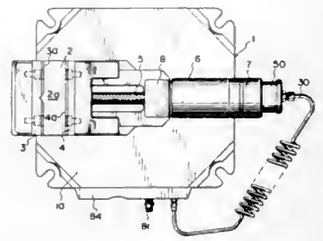
a border wire extending around a margin of said assembly, said border wire being connected to the top convolutions of the marginal hour-glass coils;

a piece of transparent material positioned below the bottom convolutions of said coil spring assembly;

a plurality of sinuous support springs positioned below said piece of transparent material, each sinuous support spring underlying a selected row of hour-glass coils and being connected to said selected row by clips extending through said piece of transparent material, said plurality of sinuous springs each having an integral upwardly extending suspending arm with an outwardly extending shepherd's hook shaped attachment arm extending therefrom on each end, said shepherd's hook shaped attachment arm being attached to said frame by attaching means.

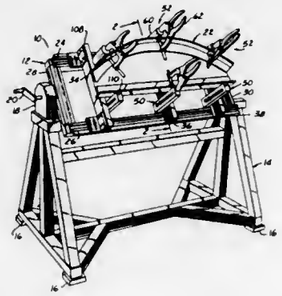
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4,819,921
VICE
Shiro Takahashi, Tokyo, Japan, assignor to Man Design Co., Ltd., Tokyo, Japan
Filed Jan. 21, 1988, Ser. No. 146,708
Claims priority, application Japan, Jan. 29, 1987, 62-12041[U]; Jan. 29, 1987, 62-12042[U]
Int. Cl.[4] B23Q *3/08*
U.S. Cl. 269—32 **17 Claims**



1. A vice comprising:
a base having an upper face and an underface, a reception depression formed in the underface, and an adjustment hole having an inner wall and penetrating through the base from the reception depression to the upper face;
a slider having an upper face and a underface slidable on the base and an engagement depression formed in the underface of the slider, said engagement depression having an engagement portion;
a fixing-releasing mechanism for selectively fixing the slider to and releasing the slider from, the base;
a stationary clamp element fixed to the upper face of the slider;
a movable clamp element reciprocatingly mounted on the upper face of the slider with respect tot he stationary clamp element;
a lead screw having two ends, one end being connected to the movable clamp element and extending away therefrom;
a piston-cylinder assembly holding the other end of the lead-crew, for reciprocating the lead screw with respect to the stationary clamp element, said piston-cylinder assembly comprising a cylinder tube fixed onto the upper face of the slider and extending along the lead screw, said cylinder tube having a cylindrical inner face, a female screw tube axially slidable in the cylinder tube and biased reversely from the stationary clamp element, said female screw tube engaging the lead screw, and a piston assembly having an outer periphery fitted with the inner face of the cylinder tube and, when inserted fully in the cylinder tube, surrounding a greater part of the lead screw, said piston assembly comprising a plurality of piston sets arranged within the cylinder tube in series theralong, and an end piston located within the cylinder tube serially adjacent to a most remote one of said piston sets relative to the movable clamp element, said piston-cylinder assembly having an end member disposed more remote from the end piston with respect the movable clamp element in the cylinder tube, a first space defined between the end member and the piston assembly, second spaces defined between adjacent ones of said piston sets, and valve means provided in the end member for selectively conducting a pressurized fluid into and from said first space and said second spaces, for selectively moving the piston assembly, as well as the lead screw, towards and away from the stationary clamp element;
said fixing-releasing mechanism comprising a casing mounted in the reception depression and having an interior and a bottom, a flexible diaphragm having an upper face and a bottom which divides the interior of the casing into a first chamber at the side of the bottom and a second chamber more remote from the bottom than the first chamber, an actuator having a lower face, said actuator comprising a guide portion having a thickness providing a gap between the inner wall of the adjustment hole and the guide portion which allows for adjustment of the slider with respect to the base, and an abutment portion provided on the engagement portion of the slider when compressed air is not supplied to the first chamber and being separated from the engagement portion by the diaphragm when the compressed air is supplied to the first chamber; and
urging means provided in said casing for elastically urging the actuator towards the diaphragm to enable the lower face of the actuator to press against the upper face of the diaphragm.

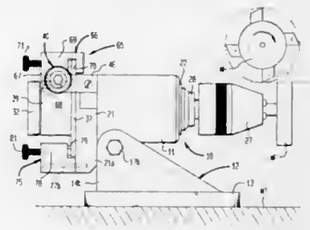
4,819,922
CLAMPING APPARATUS
Charles R. Boike, 24051 Cottrell, Mt. Clemens, Mich. 48043
Filed Feb. 11, 1988, Ser. No. 155,133
Int. Cl.[4] B23Q *3/02*
U.S. Cl. 269—45 **17 Claims**



1. A clamping system for holding a workpiece comprising
a locating member having a portion with a convex arcuate surface extending to one end of the locating member for abutting the workpiece while clamped and a hole in said end along the axis of the surface; and
a clamp having a pair of jaws and means for moving the jaws between an opened position and a closed position where said first jaw has means for insertion in said hole and said second jaw includes a clamping surface aligned to abut and hold a workpiece positioned on the surface of the abutment position when the first jaw is inserted in said hole and the jaws are in the closed position.

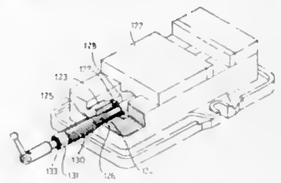
4,819,923
GEARLESS INDEXING DEVICE
Peter C. Zumbusch, 110 Gordonhurst Ave., Upper Montclair, N.J. 07043
Filed May 27, 1987, Ser. No. 54,844
Int. Cl.[4] B23Q *1/04*
U.S. Cl. 269—63 **22 Claims**

1. A gearless indexing device for positioning and repositioning a workpiece comprising,
a. housing means,
b. shaft means rotatable mounted in said housing means for positioning and repositioning the workpiece on rotation of the shaft means,
c. holder means for the workpiece fixedly connected to said shaft means and rotatable with said shaft means,
d. actuating means including, means for setting a predetermined measured distance for positioning and repositioning the workpiece,
e. said actuating means selectively and operatively connectable to the shaft means for serially rotating the shaft means an arcuate distance equivalent to the said set predetermined measured distance,
f. gearless transfer means on said actuating means operatively connectable between the means for setting the predetermined incremental distance and said shaft means for converting the predetermined measured distance into an equivalent arcuate distance and for transmitting the same to said shaft means, and
g. locking means for operative coaction with the gearless transfer means and detachably connectable selectively and operatively to the shaft means for serially rotating the



shaft means the arcuate distance equivalent to the set predetermined measured distance, wherein said locking means includes,
i. a first locking member detachable connectable selectively and operatively to said gearless transfer means and said shaft means adapted in the locked position to rotate said gearless transfer means and said shaft means from an initial position an arcuate distance equivalent to the predetermined measured distance,
ii. a second locking member detachably connectable to said shaft means and in the locked position thereof to hold the same at the said arcuate distance, and
iii. said first locking member in the unlocked position to permit the gearless transfer means to rotate freely back to the initial position to permit further rotation of the shaft means.

4,819,924
HEAVY DUTY VISE
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan
Filed Dec. 16, 1987, Ser. No. 133,658
Int. Cl.[4] B25B *1/10*
U.S. Cl. 269—241 **4 Claims**



1. A heavy duty vise comprising a base, a fixed jaw formed integrally with the base, an upstanding boss formed integrally with the base and spaced from the fixed jaw, a movable jaw guided for limited reciprocating movement substantially between the boss and the fixed jaw, the boss having a hole formed therein, a cylindrical sleeve having an outer diameter provided with fine threads cooperating with internal threads formed in the hole in the boss, the sleeve having a portion extending outwardly of the boss beyond the base and having a sleeve handle carried by the outwardly extending portion of the sleeve, an elongated rod passing through the sleeve and having a forward end portion on which the movable jaw is carried, the elongated rod being provided with coarse threads, the elongated rod extending outwardly of the base and beyond the handle on the sleeve, and a rod handle carried by the outwardly extending portion of the elongated rod, such that rotation of the rod handle provides coarse adjustment of the movable jaw, and such that rotation of the sleeve handle provides fine adjustment of the movable jaw.

4,819,925
DECONTAMINATION TABLE
Roger Linnemann, Wallingford; Thomas E. Linnemann, Holland, both of Pa.; Mary E. Berger, Port St. Lucie, Fla., and Wayne G. Richardson, Ardmore, Pa., assignors to Radiation Management Consultants, Inc., Philadelphia, Pa.
Filed Jul. 2, 1987, Ser. No. 69,499
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—327 **12 Claims**



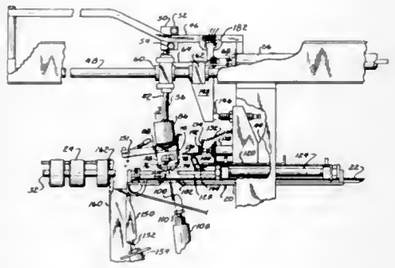
1. A decontamination table device for use with a gurney, comprising a backboard and a table having a base:
said backboard having a predetermined shape and size to provide a patient support area, said backboard including a plurality of spaced apart slots through the thickness thereof to permit fluid flow from said patient to the underside of said backboard, a plurality of ribs projecting a predetermined distance from said underside to provide a clearance between the backboard and base of said table; and
said table including a basin sized to receive said backboard, said basin including a drain for removal of fluids, said table further having a raised lip portion around the periphery of said table and a ledge portion spaced inwardly from said lip to provide an enlarged patient support area, said basin having a plurality of rails facing the underside of said backboard and cooperatively associated with said ribs to support said backboard against movement in said basin, said table further including a plurality of runners on the underside of said table positioned to support said table on a gurney, and locking means for attaching said table to said gurney.

4,819,926
SLEEVE HANDLING DEVICE
Robert L. Kosrow, Hoffman Estates; Richard Prochut, Streamwood, and Maximilian Adamski, Jr., Palatine, all of Ill., assignors to Union Speical Corporation, Chicago, Ill.
Filed May 18, 1987, Ser. No. 50,989
Int. Cl.[4] B42C *1/00*
U.S. Cl. 270—45 **26 Claims**

16. A sleeve handling device, comprising:
a first moving conveyor;
a second moving conveyor disposed at an angle to the first conveyor;

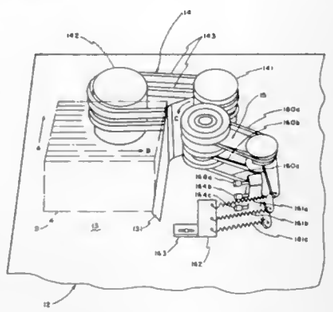
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means for picking up a cloth on the first conveyor at a central portion thereof;
means for moving the picking up means to a location above the second conveyor;
a carriage including a clamping member;
means for moving the carriage along with the picking up means;



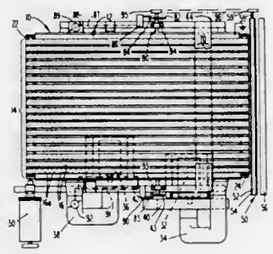
means for clamping a trailing edge of the cloth by the clamping member adjacent the second conveyor;
means for releasing the cloth by the picking up means; and
means for releasing the trailing edge of the fabric by the clamping member.

4,819,927
FLAT ARTICLE FEEDING APPARATUS COMPRISING A PLURALITY OF REVERSEDLY DRIVEN AND INDIVIDUALLY URGED PULLEYS
Masahiko Noguchi; Kiyoshi Tsuda, and Tsutomu Sasage, all of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Apr. 1, 1988, Ser. No. 176,732
Claims priority, application Japan, Apr. 2, 1987, 62-82321; Apr. 2, 1987, 62-82322
Int. Cl.[4] B65H *3/04*
U.S. Cl. 271—34 **9 Claims**



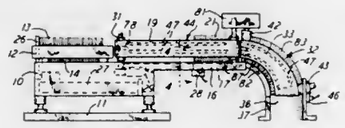
1. Flat article feeding apparatus comprising:
an endless feed belt defining a feed plane at a predetermined portion thereof;
first driving means for driving said feed belt to make said feed belt feed a plurality of approximately flat articles one by one with each of said flat articles fed substantially along said feed plane;
a predetermined number of idler pulleys;
pulley supporting means for supporting said idler pulleys substantially perpendicular to said feed plane;
urging means for individually urging said idler pulleys towards said feed plane so that said idler pulleys are in contact with one of said flat articles that is fed on said feed plane as a particular article; and
second driving means for driving said idler pulleys to make said idler pulley reversedly feed said particular article, thereby avoiding overlap of the flat articles being fed by said feed belt.

4,819,928
PLASTIC FILM AIR TABLE CONVEYOR
Paul V. Osborn, Webster, N.Y., and Clyde C. Tendick, Jacksonville, Ill., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Sep. 21, 1987, Ser. No. 99,275
Int. Cl.[4] B65H *5/22*
U.S. Cl. 271—276 **13 Claims**



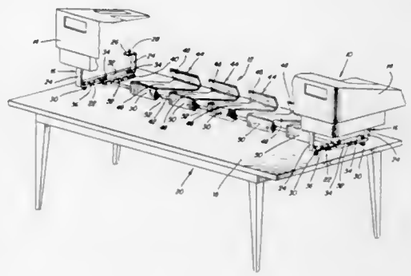
13. A method of operating a plastic film handling apparatus comprising the steps of:
placing a length of plastic film on a conveyor and moving the conveyor across a surface;
applying a first air pressure level less than atmospheric air pressure to the length of plastic film through a first portion of the surface and the conveyor to cause the length of plastic film to adhere by suction to the conveyor when passing over the first portion of the surface;
applying a static electric charge to the length of plastic film on the conveyor to cause the length of plastic film to adhere to the conveyor after the length of plastic film is moved beyond the first portion of the surface by the conveyor; and
applying a positive air pressure level greater than atmospheric air pressure to the length of plastic film through another portion of the surface spaced from the first portion.

4,819,929
APPARATUS AND METHOD FOR FEEDING SHEETS TO A SHEET GATHERER
Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.
Filed Feb. 24, 1987, Ser. No. 17,550
Int. Cl.[4] B65H *29/38*
U.S. Cl. 271—177 **15 Claims**



1. In a conveyor for feeding sheets along a horizontal and then downward path to a sheet gatherer which includes a hopper for receiving sheets in a reclining orientation, the improvement comprising a sheet-supporting movable conveyor, a first portion of said conveyor having means for supporting sheets in an orientation of standing on one edge and for advancing the sheets along said horizontal path and toward the hopper, and a second portion of said conveyor including two spaced-apart upright sides directed and movable downwardly along said downward path and respectively engaging said sheets two opposite edges which are contiguous to said one edge, for directing and supporting said sheets into said reclining orientation, and for depositing said sheets horizontally into the hopper.

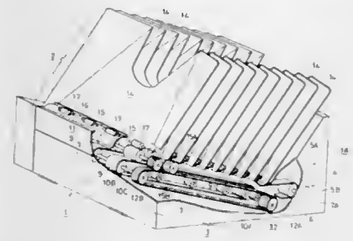
4,819,930
APPARATUS FOR STACKING COPY SHEETS
Richard W. Jackson, Barrington, and Eugene P. Oddo, Mt. Prospect, both of Ill., assignors to AM International, Inc., Chicago, Ill.
Filed Apr. 23, 1984, Ser. No. 602,777
Int. Cl.[4] B65H *31/00*
U.S. Cl. 271—209 **22 Claims**



1. An apparatus for stacking large copy sheets discharged from the exit port of a whiteprint, blueprint or similar copying machine, comprising:
means for supporting and spacing said copying machine above a subjacent support surface such as a tabletop or the like to define an open space immediately below and extending rearwardly beneath the copying machine; and
receptacle means disposed below and outwardly of said exit port for arresting the leading edges of said copy sheets as the sheets are discharged from the machine in an exiting direction and for causing the sheets to bow opposite said exiting direction onto a stack substantially beneath the machine in the space between the copying machine and the subjacent support surface.

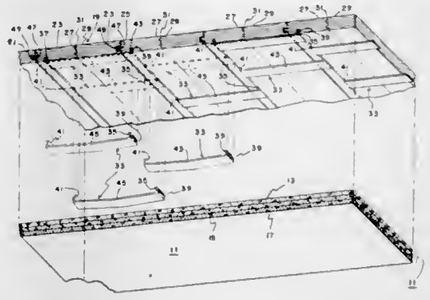
4,819,931
SORTING APPARATUS
Chikado Goto, and Hiroshi Tobita, both of Ibaraki, Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan
Filed Apr. 21, 1987, Ser. No. 41,699
Claims priority, application Japan, Sep. 9, 1986, 61-210677; Sep. 9, 1986, 61-210678; Sep. 9, 1986, 61-210679; Sep. 9, 1986, 61-210680; Sep. 9, 1986, 61-137366[U]
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—287 **10 Claims**

1. A sorting apparatus comprising:
feeding means on a first frame including a first belt extended across a rotatable first feed-in roller and a rotatable first feed-out roller mounted on a common shaft, for feeding sheets introduced from a feed opening, said sheets being fed in a face-up mode in a feed direction;
transport means on a second frame downstream of said first frame in the feed direction, said transport means including a second belt extended across a rotatable second feed-in roller mounted on said common shaft and a rotatable second feed-out roller, and having a transport path for transporting said sheets in the feed direction, said transport path being formed on an upper surface of said second belt and having an incline rising in the feed direction of said sheets;
a plurality of trays disposed in parallel at equivalent intervals, each of said plurality of trays having a flange for housing sheets on its base edge, side walls on both sides of said base edge, and protrusions on said side walls;
tray support means on a third frame downstream from said first frame for supporting said base edge portion of said plurality of trays by engaging with said protrusions along said transport path and in a predetermined leaning attitude toward said transport path;
discharging means including a discharge roller supported on a tray shaft rotatably supported on said side walls, for



discharging successively and selectively each of said sheets into one of said plurality of trays while inverting said sheet into a face-down mode, said discharge roller making contact with said second belt of said transporting means when each of said plurality of trays is supported by said tray supporting means; and
said common shaft being rotatably supported on said third frame, said first and second frames being swingably pivoted about said common shaft, said common shaft being driven by a driving means.

4,819,932
AEROBIC EXERCISE FLOOR SYSTEM
Phil Trotter, Jr., 9292 East 131st St., Noblesville, Ind. 46060
Filed Feb. 28, 1986, Ser. No. 834,819
Int. Cl.[4] A63J *3/00*
U.S. Cl. 272—3 **7 Claims**



1. A cushioned floor comprising in combination:
a lower layer of a foamed pad having sufficient thickness and compressive strength that it will always yield when used with static and impulsive loading caused by humans doing exercise on the floor;and
an attrition resistant upper layer of at least two distinct boards each board comprised of a pair of adjacent contiguous strips, said strips joined to each other by a longitudinal dove tail joint centrally located in said board, said at least two distinct boards having at least one tongue and groove pivoting joint joined with play, said at least one tongue and groove pivoting joint having one lengthwise

direction, a slot running parallel to said lengthwise direction of said pivoting joint in alternate strips of said at least two distinct boards, a U-shaped resilient monolithic clip having upright legs inserted into the slots overlapping and asymmetrical to said centrally located longitudinal dove tail joint, one leg of which contains at least one cleat which protrudes away from the directions of the legs and toward a wall of one slot, the combined width of the cleats and the leg inserted in the one slot being wider thus the one slot before insertion into the slot whereby the leg containing said at least one cleat is locked into the slot into which it is inserted thus holding the spring clip in place, the boards being held together by tension in the spring clip, the spring clip being curved in the lengthwise direction between the legs when there is no load on the boards; so that when a load is applied and the boards flex, the curved portion straightens so as not to unduly restrain the joint from flexing.

4,819,933

ALL WEATHER SURFACES

Victor J. Armond, Newark, England, assignor to Fibresand Limited, Nottinghamshire, England

Continuation-in-part of Ser. No. 891,877, Jul. 30, 1986. This application Mar. 27, 1987, Ser. No. 32,061

Claims priority, application United Kingdom, Dec. 14, 1985, 8530844; Mar. 13, 1986, 8606208

Int. Cl.[4] A01N *3/00*; **A41G** *1/00*

U.S. Cl. 272—3 **20 Claims**

1. An all weather surface for equestrian events or sports events comprising a layer of material laid on top of a prepared drainage base, the material comprising a mixture of sand and synthetic fibres, the fibres being randomly dispersed as separate individual fibres throughout the sand to produce a relatively soft surface.

4,819,934

AUTOMATED BOXING MACHINE

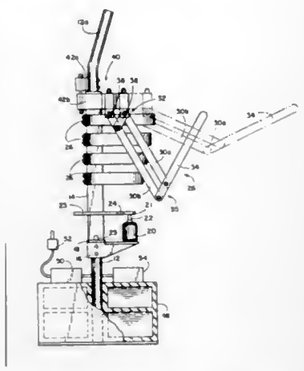
Jerry L. Wilson, 485 NW. 170th Dr., Beaverton, Oreg. 97005, and Gerald E. Nagode, Aloha, Oreg., assignors to Jerry L. Wilson, Beaverton, Oreg.

Continuation of Ser. No. 6,779, Jan. 27, 1987, Pat. No. 4,765,609, which is a continuation-in-part of Ser. No. 896,880, Aug. 15, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 150,925

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[4] A63B *69/00*

U.S. Cl. 272—76 **3 Claims**



1. An exercise machine which simulates a human boxer by throwing punches at the receiving punches thrown by the user, comprising:

(a) a support having a vertical axis;

(b) a simulated shoulder element having opposed ends, said shoulder element having a place of attachment intermediate said ends where said shoulder element is attached to said support with said shoulder element being oriented substantially horizontally;

(c) means for rotating said shoulder element in a substantially horizontal plane about said place of attachment;

(d) a pair of simulated arms having first ends which are attached to the ends of said shoulder element and second ends which have simulated gloved fists located thereon; and

(e) said shoulder element and said arms including means for moving the arm which is attached to the end of said shoulder element which is being rotated toward its associated arm to an extended position and moving the arm which is attached to the end of said shoulder element which is being rotated away from its associated arm to a retracted position.

4,819,935

TRAINING BAT FOR BALL GAMES

John L. Dirksing; William P. Dirksing, both of 5208 Horizonvue Dr., Cincinnati, Ohio 45239, and John W. Dirksing, 6176 W. Fork, Cincinnati, Ohio

Continuation of Ser. No. 822,101, Jan. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 722,820, Apr. 12, 1985, abandoned. This application Dec. 2, 1987, Ser. No. 127,778

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—124 **13 Claims**



1. An adjustably weighted training bat for ball games, said bat comprising a handle which conforms substantially to standard size and shape characteristics of ball bats and having a grip portion and end knob to provide for safe handling and use of the bat, a ballast means, and a ballast adjustment means, said ballast adjustment means further comprising an adjustment stem attached to said handle and ballast attachment means connecting said ballast means to said adjustment stem, said handle, stem and ballast means being attached coaxially to one another, said ballast attachment means including external thread convolutions formed along the axial length of said adjustment stem adapted to provide selective adjustability of said ballast means relative said handle along the longitudinal axis of said bat by rotation of said ballast means relative said handle while said handle, adjustment stem and ballast means are integrally attached.

4,819,936

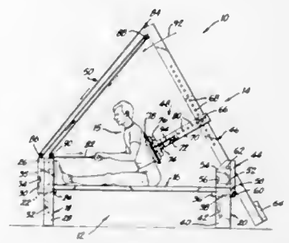
BACK AND LEG STRETCHER

Donald Muller, 65 Tam O'Shanter Dr., Mahwah, N.J. 07430

Filed Feb. 5, 1988, Ser. No. 152,468

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—126 **4 Claims**



1. A back and leg stretcher comprising:

a seat assembly for supporting an operator;

wherein the seat assembly includes a horizontal seat unit, a lower frame for supporting a lower end of the horizontal seat unit, and an upper frame for supporting an upper end of the horizontal seat unit, wherein the lower frame has a left leg and a right leg and wherein the upper frame has a left leg and a right leg, and,

a pusher assembly for applying a pusher force on an operator,

wherein said pusher assembly includes a pivot assembly supported by the seat assembly, a pivot beam pivotally connected to the pivot assembly, a pusher unit pivotally connected to the pivot beam, and a pulley system for pivoting the pivot beam and pusher unit, wherein said pivot assembly has a pair of upright members disposed on each side of the pivot beam, and has a pivot bolt extending through the pair of upright members and through the pivot beam, and wherein the pivot beam has counterweight means at a lower end thereof, and wherein the pusher unit includes at least one pusher arm pivotally connected at one end to said pivot beam and a back engaging member at the other end for applying a pusher force on the operator.

4,819,937

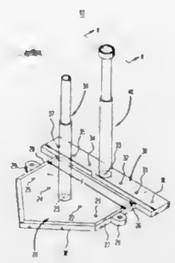
COMBINED BATTING TEE AND STRIKE INDICATOR

James Gordon, 350 Sorrento Ranches Dr., Nokomis, Fla. 34275

Filed Jul. 12, 1988, Ser. No. 217,944

Int. Cl.[4] A63B *69/40*

U.S. Cl. 273—26 R **18 Claims**



1. A baseball batting practice device comprising:

a planar base plate representative of home plate;

a base plate extender abutting the frontal edge of said base;

said extender including a plurality of first mounting means arranged substantially parallel to said frontal edge and said base plate including a plurality of second mounting means arranged substantially parallel to said first mounting means along an intermediate transversal portion of said base;

first adjustable pole means adapted for vertical mounting on at least one of said first mounting means, said first pole means having a baseball support at its top; and

second adjustable pole means adapted for vertical mounting on at least one of said second mounting means; wherein said first and second pole means are cooperatively positioned on their respective mounting means and adjusted in height so that a batter connects with the baseball in said support, over said extender and in front of said base, with a swinging motion determined by the combined positions and adjustments of both said pole means.

4,819,938

GOLF BALL AND TEE PLACEMENT AND RETRIEVAL TOOL

Norman C. Hill, Ocean Parks E-204, Jupiter, 300 A-1-A, Fla. 33458

Filed Jul. 29, 1987, Ser. No. 79,041

Int. Cl.[4] A63B *57/00*

U.S. Cl. 273—32.5 **8 Claims**

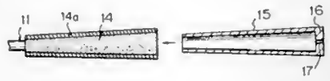


1. An apparatus for simultaneously positioning a golf ball and golf tee and for retrieving a golf ball and golf tee comprising an elongated shaft having upper and lower ends, a ball engaging socket member, means for mounting said socket member in fixed relationship to said lower end of said shaft, a pair of opposing generally concavely configured jaw elements movably mounted adjacent said lower end of said shaft and on opposite sides of said ball engaging socket member, each of said jaw elements having upper and lower ends, said jaw elements being pivotably connected to one another adjacent the upper end thereof, pivotable linkage means connected at said upper of said jaw elements, control rod means connected to said pivotable linkage means so that said linkage means are movable with respect thereto and extending from said pivotable linkage means towards said upper end of said shaft and being in generally spaced parallel relationship thereto, handle means secured adjacent said upper end of said shaft and connected to said control rod means so as to effectuate the movement of said control rod means by said handle means, a pair of depending gripping elements carried by said lower end of said opposing jaw elements, said gripping elements being formed having opposed generally concave surfaces defining a groove along the length thereof, and resilient means connected to said pivotable linkage means for normally urging said gripping

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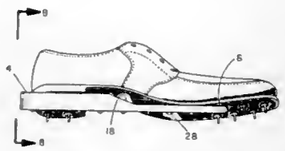
elements and said jaw elements outwardly with respect to one another.

4,819,939
GRIP FOR A GOLF CLUB SHAFT
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Oct. 28, 1986, Ser. No. 924,000
Claims priority, application Japan, Oct. 30, 1985, 60-241578; Jan. 25, 1986, 61-12981
Int. Cl.[4] A63B *49/08*
U.S. Cl. 273—81 R **11 Claims**



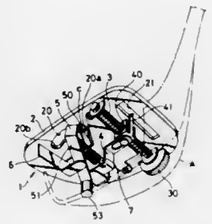
1. A double-layered tubular grip for a golf club shaft having a butt end portion, comprising:
a tubular inner layer made of a porous material having an elasticity, said inner layer being molded on and securely fixed to the outer surface of the butt end portion of said shaft; and
a tubular outer layer made of a non-porous material having an elasticity greater than that of said inner layer, a wear-resistant property greater than that of said inner layer, and being formed separately from said inner layer, said outer layer being pushed over said inner layer and detachably fixed thereto after said inner layer is molded on and securely fixed to said outer surface of said butt end portion of said shaft.

4,819,940
GOLF STANCE TRAINING AID
Eddie L. Davis, 2704 Rincon Dr., Grand Junction, Colo. 81503
Filed Apr. 8, 1988, Ser. No. 179,072
Int. Cl.[4] A63B *69/36*; A43B *5/00*; A43C *15/00*
U.S. Cl. 273—187 B **4 Claims**



1. A device for removable attachment to the bottom surface of a golf shoe which aids in the teaching of a correct golf stance and swing comprising a generally wedge shaped rectangular bar which causes the golfer's foot to tilt forwardly and inwardly simultaneously, said device being adapted to be worn on the bottom surface and along the outside edge of the golf shoe farthest from the golfer's target; said device having an upper surface which supports essentially the entire length of the golfer's foot, and having on its lower surface a plurality of spikes; said upper surface having a sole supporting portion and a heel supporting portion, the heel portion being raised slightly relative to the sole portion so that the golfer's foot tilts forwardly; said device having a solid outer wall running the length thereof and inner edge running the length thereof, said outer wall being substantially higher than the inner edge so that the golfer's foot is caused to tilt inwardly; said device having a first slot disposed lengthwise in the sole portion and a second slot disposed lengthwise in the heel portion adapted for attaching the device to the shoe and permitting forward and rearward adjustment of the device, said device being constructed of a flexible polymeric material.

4,819,941
DEVICE FOR DETERMINING SWING SPEED OF ROTATABLE IMPLEMENTS
Yoshihisa Tanaka, Tokyo, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Jul. 24, 1987, Ser. No. 77,354
Claims priority, application Japan, Jul. 25, 1986, 61-114216[U]
Int. Cl.[4] A63B *69/00, 69/36*; G01L *5/06*
U.S. Cl. 293—186 A **2 Claims**

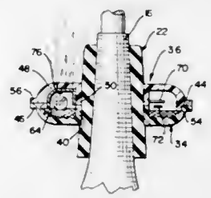


1. A device for determining swing speed of a swingable practice sporting goods implement such as a golf club, wherein the practice of one's swing may be performed seriatim, comprising in combination with the sporting goods implement:
(A) a supporting base plate fixedly mounted horizontally within the head body of the implement, said base plate defining an longitudinally oriented arcuate slot therein, said base plate bearing
(B) a rotatable screw-shaft secured upon the base plate in parallel relation thereto;
(C) a open-ended arcuately movable U-shaped member having opposed upper and lower legs of relative uneven length, the lower leg being longest and having a balancer adjacent an open end thereof, the upper leg being the shorter, said U-shaped member being pivot connected to the base, intermediate ends thereof and the respective legs having slidable pin contact with the arcuate slot of the base plate;
(D) an adjustor pivoted at one end to the base plate and threadedly connected at another end to said screw shaft to enable segmental rotation of the adjustor as the screw-shaft may be rotated, said adjustor having tension spring connection with the pin of the movable member, whereby determination of the maximum swing speed by tension of the spring upon the adjustor and the movable member causes a centrifugal force movement to the movable member during swinging of the implement and,
(E) a stopper fixed to the base plate upon which the movable member may impinge to thus produce a hitting sound.

4,819,942
GOLF SWING INDICATOR
Sung Y. Lee, Aiea, and Lloyd Nakama, Waimanalo, both of Hi., assignors to Swinglite, Inc., Aiea, Hi.
Filed Oct. 6, 1987, Ser. No. 104,978
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 A **17 Claims**

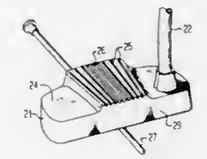
1. A golf swing indicator mountable on a golf club in surrounding relation to the hosel thereof; said indicator including a housing of a generally toroidal configuration with an inner annular periphery and an outer annular periphery, said inner annular periphery defining a central passage through said housing, a source of artificial light within said housing, said housing including an upper wall of light transmitting material

for transmitting artificial light from said source, a lower wall, and means for illuminating said source in response to movement of the indicator in conjunction with swinging of an indicator-mounting club, said means for illuminating said source of artificial light being completely contained within said hous-



ing and includes battery means, conductor means forming an electrical circuit with said battery means and said artificial light source, and a normally open switch in said circuit, said switch closing in response to and during swinging movement of the indicator.

4,819,943
PUTTING PRACTICE DEVICE AND METHOD
Harry Szczepanski, 755 Oakleigh, NW., Grand Rapids, Mich. 49504
Filed Jul. 6, 1987, Ser. No. 69,775
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 C **5 Claims**



3. A golf putter having a head providing a striking face and a central reference mark on the top surface of said head, and also having a tubular shaft secured to said head, wherein the improvement comprises:
a reference rod removably received in said shaft, said rod having a length substantially greater than the width of said head, said shaft having a grip of resilient material extending over the end of said shaft, and said rod is received through an opening in said material at said end.

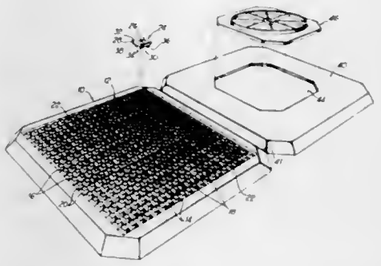
4,819,944
GOLF CLUB SWING TRAINING DEVICE
James J. Doane, 112 Bombay Avenue, Downsview, Ontario, Canada M5H 1C3
Continuation of Ser. No. 11,473, Feb. 5, 1987, abandoned. This application Jul. 8, 1988, Ser. No. 217,093
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—193 A **1 Claim**

1. A training device for golf comprising a shaft having a longitudinal axis terminating at one end with a weight having a front surface and a longitudinal axis and terminating at the other end with a first grip, a single lateral crosspiece permanently affixed to the shaft below the first grip extending laterally from the shaft defining a first plane perpendicular to a second plane defined by the longitudinal axis of the weight and the longitudinal axis of the shaft, a second grip terminating lower than the first grip by about 2–3 inches and having a longitudinal axis extending upwardly from the crosspiece parallel to the first grip and spaced from the longitudinal axis of the first grip in the said first plane by about 3–4 inches, the crosspiece being in the said first plane on a side of the shaft opposite to the front surface of the weight, whereby swinging of said training device on a backswing and downswing simu-



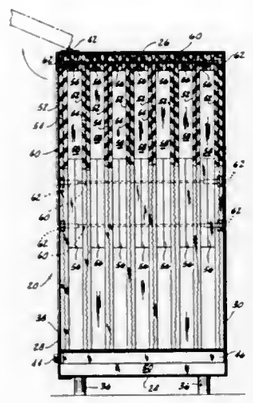
lates the swinging of a single shaft golf club while maintaining the front surface of the weight substantially perpendicular to the plane of the swing.

4,819,945
WORD GAME
Edmond J. Porcheddu, 4439 Thoroughbred Dr., Roswell, Ga. 30075
Filed Mar. 11, 1988, Ser. No. 166,642
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—272 **8 Claims**



6. A word game comprising a game board of generally planar configuration and having a grid pattern formed therein defined by a plurality of regularly spaced horizontal and transverse groove means intersecting at regular intervals, said groove means having upwardly diverging side walls being wider at the intersections thereof, and a plurality of playing pieces for said game of generally rectangular configuration having generally planar top and bottom surfaces with a letter of the alphabet on said top surface and a plurality of projections depending downwardly from said bottom surface for engaging said groove means so as to enable said pieces to be moved horizontally and transversely along said grid pattern.

4,819,946
BULLET TRAP
James E. Kahler, 2212 Westport Rd., Peoria, Ill. 61615
Filed Oct. 7, 1987, Ser. No. 105,327
Int. Cl.[4] F41J 1/12
U.S. Cl. 273—404 19 Claims



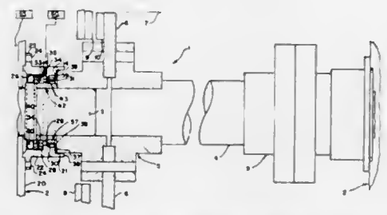
13. A bullet trap cell for installation in a bullet trap device to catch bullets fired at the device, the cell comprising:
a plurality of panels of resilient energy absorbing bullet-penetrable material aligned in face-to-face relation;
spacers sandwiched between successive panels, the spacers positioned generally adjacent the marginal edges of the panels to provide open spaces between the central portions of successive panels through which spent bullets can fall if they cannot penetrate the next successive panel.

4,819,947
AERIAL PROJECTILE GAME APPARATUS
Lawton Mackey, 7247 Godfrey Dr., Fay, N.C. 28303
Filed Feb. 2, 1988, Ser. No. 151,497
Int. Cl.[4] A63B 65/00, 67/06
U.S. Cl. 273—412 3 Claims



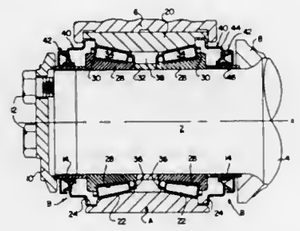
1. A hoop-shu game apparatus comprising an aerial projectile and horseshoe shaped catchers to be utilized by opposing players with each player having a catcher for catching the projectile launched by hand in a predetermined trajectory by an opposing player, said aerial projectile being of annular configuration and provided with an enlarged center opening and having aerodynamic characteristics to enable it to follow a generally stable flight path when thrown by hand, each of said catchers including a generally U-shaped horseshoe having spaced legs terminating in free ends defining an opening to receive the annular portion of the projectile, the distance between the legs being substantially greater than the radial dimension of the annular portion of the projectile and a handle on the horseshoe to enable the players to manipulate the catcher in a manner to catch the aerial projectile while in flight, said handle extending radially outwardly from the bight portion of the horseshoe catcher with the handle being in substantially the same plane as the horseshoe and in the form of an elongated rigid cylindrical member.

4,819,948
SUBMERGED SHAFT SEAL
G. David Merrifield, deceased, late of St. Louis County, Mo. (by Eileen Merrifield, administratrix), assignor to Delta Dredge and Pump Corporation, St. Louis, Mo.
Filed Sep. 1, 1983, Ser. No. 528,598
Int. Cl.[4] F16J 15/40, 15/447
U.S. Cl. 277—3 14 Claims



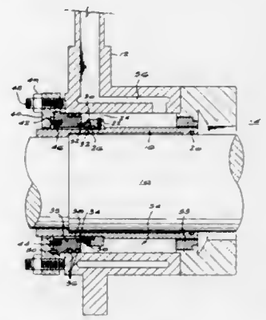
1. In a submerged rotating shaft mechanism wherein a cylindrical shaft projecting from a gearbox rotates in a gland an outer end of which, beyond which the shaft projects, is below the level of liquid in which the shaft rotates, the improvement comprising at least one substantially fluid tight inner seal surrounding said shaft, an outer, labyrinth seal spaced from said inner seal in a direction toward the outer end of said gland to define, with said inner seal and an interior surface of said gland, a chamber, a gas connection communicating with said chamber and a source of gas under super-ambient pressure communicating with said connection, hence said chamber, whereby gas is forced outwardly from said chamber through said labyrinth seal.

4,819,949
SHIELDED SEAL ASSEMBLY
Dennis L. Otto, Malvern, Ohio, assignor to Timken Company, Canton, Ohio
Continuation-in-part of Ser. No. 79,175, Jul. 29, 1987, which is a continuation of Ser. No. 811,657, Dec. 19, 1985, abandoned.
This application Nov. 23, 1987, Ser. No. 124,814
Int. Cl.[4] F02F 11/00
U.S. Cl. 277—29 21 Claims



1. In combination with a sealing surface having an overhanging section that is presented inwardly toward an axis of rotation, a seal for establishing a barrier with the sealing surface so as to isolate a region generally between two components, one of which carries the seal and the other the sealing surface, when relative rotation exists between the components, said seal comprising a labyrinth having a first face that is presented toward the sealing surface and a second face that is presented toward the isolated region; a flexible dirt lip contacting the sealing surface beyond the labyrinth; and a secondary lip extended toward the overhanging portion of the sealing surface, the labyrinth, dirt lip and secondary lip being arranged along the sealing surface in that order away from the isolated region.

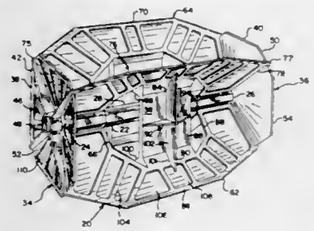
4,819,950
MECHANICAL SEAL
Denis M. W. Winslow, PO Box 8311, Edenglen 1610, South Africa
Filed Nov. 16, 1987, Ser. No. 121,282
Claims priority, application South Africa, Nov. 14, 1986, 86/8657
Int. Cl.[4] F16J 15/34, 15/48
U.S. Cl. 277—93 SD 5 Claims



1. A mechanical shaft seal for sealing a rotatable shaft with respect to a casing through which the shaft passes from the interior to the exterior of a space which will, in operation, contain a pressurised fluid, the seal comprising a first annular sealing member locatable about the shaft so as to rotate with the shaft and a second annular sealing member locatable non-rotatably about the shaft with the first and second sealing members presenting opposing sealing faces, characterised by an annular reaction member locatable about the shaft, means for connecting the reaction member to the casing, one or more springs arranged to bear at one end upon the reaction member and to bear at the opposite end upon the second sealing member thereby to bias the second sealing member towards the first sealing member and cause the sealing faces to make sealing contact with one another, the means for connecting the reaction member to the casing being adjustable to vary the axial position of the reaction member so that the spring or springs are able to apply an appropriate biasing force to the second sealing member for sealing contact between the sealing faces to be maintained as sealing face wear takes place.

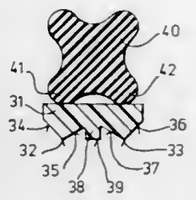
4,819,951
AQUATIC DUMBELL
Daniel S. Solloway, 11121 Ashford Dr., Yukon, Okla. 73099
Filed Jul. 20, 1987, Ser. No. 75,357
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—116 10 Claims

1. An aquatic exercise assembly for use in water to strengthen muscles, improve muscle tone and enhance muscular coordination, comprising:
a generally impact-resistant water-engageable shaft formed of substantially water-impermeable material having transverse fin-engaging end portions and a manually grippable portion for being grasped under water extending between said transverse fin-engaging end portions, said shaft being elongated and extending in an axial direction along an axis, said manually grippable portion of said shaft having a maximum width defining a thickness taken in a radial direction generally transverse to said axis and said shaft being movable in said water;
substantially symmetrical axially opposite transverse end fins secured to and extending transversely outwardly from said end portions of said shaft for creating an axial pressure head to water flow as said shaft is moved axially through the water to enhance hydrodynamic resistance to axial movement of said shaft through said water;
a plurality of elongated axial fins extending between and connecting said transverse fins for creating a transverse pressure head to water flow as said shaft is arcuately



pivoted or moved transversely through the water to enhance hydrodynamic resistance to pivoting and transverse movements of said shaft in said water; and
at least one lateral bridge fin providing a side barrier extending between and connecting said axial fins, said bridge fin positioned transverse to said shaft and creating a lateral pressure head when said shaft is moved laterally in the water.

4,819,952
SEALING AND WIPER ARRANGEMENT
Roy Edlund, Stuttgart, Fed. Rep. of Germany, assignor to Busak + Luyken GmbH & Co., Stuttgart, Fed. Rep. of Germany
Filed Jan. 29, 1988, Ser. No. 149,425
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 3702977
Int. Cl.[4] F16J 15/32
U.S. Cl. 277—165 14 Claims



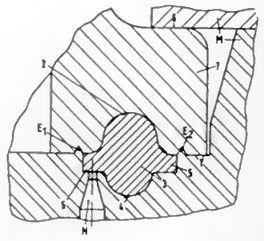
1. Sealing and wiper arrangement comprising a sealing ring made from a tough elastic material fitted in a groove of one of two machine parts which are movable relative to each other in a direction perpendicular to the said groove, and a stressing ring arrangement made from a rubber-elastic material, arranged between the sealing ring and the base of the groove and loading the sealing ring in the radial direction, the sealing ring being provided near its ends with edges resting against the other machine part, both edges acting in operation simultaneously as sealing edges and defining an annular space which extends concentrically relative to the sealing ring and which is sealed off from both the high-pressure area on the one side of the arrangement and the low-pressure area on the other side of the arrangement, at least one of said edges being formed by the line of intersection of two conical surfaces rising in opposite directions, characterized in that the said stressing ring structure comprises two portions, each of them loading substantially one of the said two edges.

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4,819,953
CYLINDER HEAD COVER WITH GASKET AND METHOD OF MAKING THE GASKET

Günter Joh, Gelnhausen, Fed. Rep. of Germany, assignor to Karl Joh Gummiwarenfabrik GmbH, Gelnhausen, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,685
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3639218
Int. Cl.⁴ F16J *15/06;* **C07F** *7/10*
U.S. Cl. 277—235 B **14 Claims**

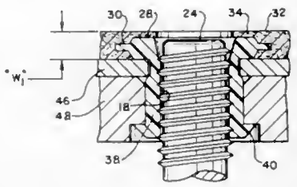


1. A cylinder head cover comprising a hollow body defining at least one cavity and having a marginal portion arranged to be placed adjacent a cylinder head and surrounding said at least one cavity; and a cover gasket provided on said marginal portion and including a sealing element of elastic material, and at least one coupling agent between said sealing element and said marginal portion, said material being applied at an elevated temperature in plasticized state and having a predetermined outline as a result of shaping between the at least one coupling agent on said marginal portion and a separable mold during curing at said elevated temperature.

4,819,954
FASTENER

Joseph G. Fucci, Holbrook, and Melvyn J. L. Clough, Acton, both of Mass., assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 9, 1987, Ser. No. 36,332
Int. Cl.⁴ F16J *15/12;* **F02F** *11/00*
U.S. Cl. 277—235 B **13 Claims**



1. A plastic fastener component adapted to be molded into a gasket to provide means for securing the gasket to an associated structure and retaining a threaded fastener, said fastener component comprising:

a generally cylindrical body terminating in first and second axially spaced ends and having an axial opening of uniform transverse cross-section extending between said ends and adapted to receive a threaded fastener;

a circumferential flange extending radially outward about the first end of said body, said flange having a relatively thick and rigid portion adjacent said body and terminating in a relatively thin outer periphery;

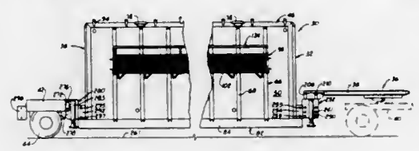
a plurality of flexible and resilient leg members extending axially outward from the second end of said body and terminating in free end portions, said legs being spaced circumferentially about said opening, each leg having a radially inwardly facing surface which forms a continuation of the inner surface of said opening, said inwardly facing surface of each leg and the corresponding axially aligned portions of the inner surface of said opening extending radially inward relative to the remaining portions of the inner surface of said opening to define a plurality of axially extending raised portions for engaging a threaded fastener positioned in said opening; and,

retaining means carried on the free end portions of said legs, said retaining means including hook sections extending radially outward substantially beyond the maximum radial extent of said cylindrical body.

4,819,955
MOBILE STORAGE TANK BATTERY

James R. Cobb, Oklahoma City, Okla., assignor to Incorporated Tank Systems, Inc., Oklahoma City, Okla.

Filed May 19, 1987, Ser. No. 52,605
Int. Cl.⁴ B60P *3/22, 3/40*
U.S. Cl. 280—837 **14 Claims**



1. A mobile storage tank battery, comprising:

a rectangular container having external walls enclosing the interior of the tank battery and at least one internal wall dividing the container into separate tanks of the tank battery, wherein the external walls comprise:

two spaced apart, substantially parallel, planar, rectangular side walls;

two spaced apart, substantially parallel, planar end walls, each end wall attached to one end of both side walls and extending between the side walls, wherein each internal wall is positioned in a substantially parallel relation to the end walls, whereby each tank of the tank battery is provided with a substantially constant lateral cross section from the lower edges of the side walls to the upper edges thereof;

a top wall attached to the upper edges of the side walls and end walls; and

a bottom wall attached to the lower edges of the side walls and the end walls;

means, on the walls of the container, for supporting hydrostatic pressure of liquids in the tanks of the tank battery;

a detachable towing frame connected to one end of the container; and

a detachable dolly connected to the opposite end of the container.

4,819,956
CONVERTIBLE SIDECAR/TRAILER

John M. Campbell, 8795 Big Bend Rd., Martinsville, Ind. 46151

Filed May 11, 1987, Ser. No. 48,244
Int. Cl.⁴ B62K *27/00*
U.S. Cl. 280—203 **6 Claims**

1. A vehicle attachment for attachment to a motorcycle and a snowmobile comprising:

a storage compartment designed and arranged to contain cargo, said compartment being of sufficient size to allow a person to be seated therein;

a frame attached to said storage compartment, said frame having a proximate end, a distal end, a first side, defined as that side of the frame which would be adjacent to said motorcycle when said vehicle attachment is used as a sidecar, and a second side opposite said first side; and

configuration conversion means for converting the configuration of said vehicle attachment between a first configuration wherein said storage compartment and said frame are designed and arranged to be a trailer for a motorcycle, a second configuration wherein said storage compartment and said frame are designed and arranged to serve as a sidecar for a motorcycle and a third configuration wherein said storage compartment and said frame are designed and arranged to serve as a trailer for a snowmobile, said configuration conversion means comprising:

a first ground engaging wheel designed and arranged to serve as a spare wheel for the motorcycle to which the vehicle attachment is to be attached, said first wheel being removably attachable to said first side of said frame so that said wheel is attached to said first side of said frame when said configuration conversion means is in said first configuration and so that said first wheel is not attached to said first side when said configuration conversion means is in said second configuration or in said third configuration;

a second ground engaging wheel, said second wheel being removably attachable to said second side of said frame so that said wheel is attached to said second side of said frame when said configuration conversion means is in said first configuration and said second configuration, and so that said second wheel is not attached to said second side when said configuration conversion means is in said third configuration;

a plurality of ground engaging skis designed and arranged to be removably attachable to the first side and the second side of said frame, said skis being attached to said first side and said second side of said frame when said configuration conversion means is in said third configuration, and said skis not being attached to said second side when said configuration conversion means is in said first configuration and said second configuration;

convertible attachment means for attaching said vehicle attachment to the motorcycle or snowmobile, said convertible attachment means being convertible between a trailer attachment means when said configuration conversion means is in said first or third configuration and a sidecar attachment means when said configuration conversion means is in said second configuration, said convertible attachment means comprising:

a tongue portion removably attached to said proximate end of said frame, said tongue portion extending beyond said proximate end of said frame when said configuration conversion means is in said first or third configuration;

a forward sidecar attachment means attached to said frame for attaching said vehicle attachment to the side of a motorcycle, said forward sidecar attachment means comprising:

a bracket attached to said proximate end of said frame, said bracket having a first plate and a second plate, said first plate being secured to said proximate end of said frame, said second plate extending substantially horizontally from said proximate end when said configuration conversion means is in said second configuration;

a motorcycle attachment member designed and arranged to be securely but removably attachable to said motorcycle; and

an adjustable connector designed and arranged to properly align said second wheel of said vehicle attachment with the wheels of said motorcycle, said adjustable connector being attached to said bracket and said motorcycle attachment member; and

a rear sidecar attachment means attached to said frame for attaching said vehicle attachment to the side of a motorcycle.

4,819,957
KICKSTAND BEARING SUPPORT PAD

Richard J. Printy, R.R. #1 Box 459, Laveen, Ariz. 85339

Filed May 13, 1988, Ser. No. 193,593
Int. Cl.⁴ B62H *1/02*
U.S. Cl. 280—293 **3 Claims**

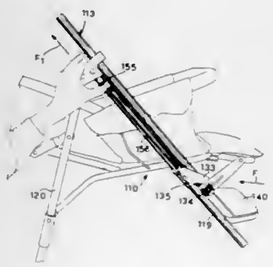


1. A kickstand support comprising a planar support pad adapted to provide support for a kickstand on soft terrain, with mounting means at an outer edge thereof and a collapsible rigid handle pivoted at one end to the mounting means and including grip means at the opposite end, said handle being comprised of two or more sections of approximately the same length which may be collapsed together to approximately the same length as said pad, and being pivotable at said mounting means to lie flat against said pad.

4,819,958
CHILD'S FOLDING PUSHCHAIR WITH SAFETY DEVICE FOR LOCKING THE PUSHCHAIR IN THE OPENED POSITION

Gianluca Perego, Arcore, Italy, assignor to Peg Perego Pines SpA, Italy

Filed May 7, 1987, Ser. No. 47,901
Claims priority, application Italy, Oct. 29, 1986, 23509/86[U]
Int. Cl.⁴ B62B *7/08, 9/00*
U.S. Cl. 280—644 **3 Claims**



1. A child's folding pushchair of the type comprising an articulated frame made of tubular elements, said frame includ-

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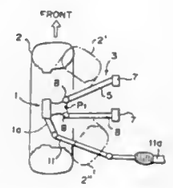
ing a pair of opposed sides each having first and second respective locking units acting between adjacent first and second tubular elements, said first and second locking units being movable between a first operative position in which the pushchair is locked in an open position and a second inoperative position in which the pushchair can be folded, at least one locking unit having a safety device maintaining said units temporarily in said inoperative position, said safety device comprising a tooth on said first tubular element and a tongue supported from said second tubular element engageable with said tooth and preventing relative movement between said first and second tubular elements, one of said tubular elements comprising a handle bar of the pushchair, said safety device being releasable by moving said tongue out of engagement with said tooth to thus enable the pushchair to be folded.

4,819,959

VEHICLE SUSPENSION SYSTEM

Hitoshi Inoue; Toshiro Kondo; Naoto Takata, and Takeshi Edahiro, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Oct. 29, 1987, Ser. No. 114,205
Claims priority, application Japan, Oct. 31, 1986, 61-261030
Int. Cl.[4] B60G *3/20*
U.S. Cl. 280—660 **17 Claims**



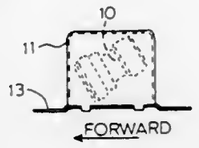
1. A vehicle suspension system for supporting a dirigible wheel comprising a wheel support which rotatably supports the dirigible wheel, an upper wheel-support support member which connects an upper portion of the wheel support to the vehicle body, and a lower wheel-support support member which connects a lower portion of the wheel support to the vehicle body, the upper and lower wheel-support support members being arranged to respectively define upper and lower pivot points which define an imaginary kingpin axis, at least one of the upper and lower wheel-support support members comprising a pair of separate link members one end of each of which is pivoted on the vehicle body at different portions of the vehicle body and the other end of each of which is rotatably connected to the wheel support at different portions of the wheel support, characterized in that the upper and lower wheel-support support members are arranged so that a displacement in the transverse direction of the vehicle body of a point on the upper portion of the wheel support is larger, when displacement toward the inner side of the vehicle body is assumed to be positive, than that of a point on the lower portion of the wheel support which is symmetrical to said point on the upper portion of the wheel support with respect to a horizontal plane including the wheel center when the dirigible wheel on the wheel support makes a turn as an outer wheel in response to operation of the steering wheel, and the former displacement is smaller than the latter displacement when the dirigible wheel on the wheel support makes a turn as an inner wheel in response to operation of the steering wheel.

4,819,960

ANGLED VEHICLE CRASH SENSOR

David S. Breed, Boonton Township, Morris County, N.J., assignor to Breed Automotive Technology, Inc., N.J.

Filed Nov. 21, 1986, Ser. No. 933,552
Int. Cl.[4] B60R *21/32*; G01D *21/00*
U.S. Cl. 280—734 **15 Claims**



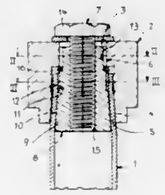
1. A safety restraint system for a vehicle, comprising a sensor, means for mounting said sensor on the vehicle other than on the steering wheel and means for mounting said sensor angularly with respect to horizontal plane, thereby said sensor being responsive to horizontal and vertical components of acceleration.

4,819,961

DEVICE FOR ADJUSTING THE ANGULAR POSITION OF A STEERING WHEEL ON A MOTOR VEHICLE STEERING COLUMN AND STEERING WHEEL PROVIDED WITH SAID DEVICE

Christian Henigue, Delle, France, assignor to Ecia Equipements et Composants pour L'Industrie Automobile, Audincourt, France

Filed Feb. 10, 1988, Ser. No. 154,410
Claims priority, application France, Feb. 11, 1987, 87 01720
Int. Cl.[4] B62D *1/18*
U.S. Cl. 280—775 **9 Claims**



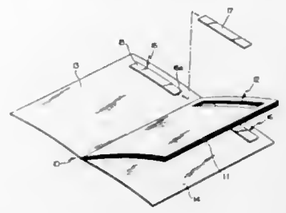
1. A device for adjusting the angular position of a steering wheel on a motor vehicle steering column, said device comprising a steering column in the form of a tube defining a frustoconical outer surface and a frustoconical inner surface, a hub provided on the steering wheel and defining an axial bore which has a portion defining a frustoconical surface complementary to said frustoconical outer surface of the tube, first means provided in the bore and forming splines disposed angularly in accordance with a given pitch, an intermediate member comprising a portion defining a frustoconical surface cooperative with said frustoconical inner surface of the tube, and second means cooperative with said first means forming splines for locking the hub and the intermediate member in rotation and means for clamping the hub to the tube and including means for clamping the hub and the intermediate member in such manner as to jam the tube between the hub and the intermediate member and thus permit a locking of the steering wheel in the desired position of adjustment of the steering wheel on the tube.

4,819,962

NOTEBOOK PROVIDED WITH PAGES CONTAINING A WINDOW-LIKE APERTURE

Hiromitsu Takai, Fujisawa, Japan, assignor to Ori-Pro Company, Limited, Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,215
Claims priority, application Japan, Dec. 5, 1986, 61-186799
Int. Cl.[4] B42D *1/00, 1/08, 3/00, 15/00*
U.S. Cl. 281—15.1 **4 Claims**



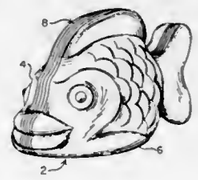
1. A notebook having unapertured front and back covers and a series of pages bound at one edge thereof comprising, at least one series of substantially aligned window-like apertures being disposed through said pages, with all of said window apertures being of the same size, pocket means disposed on an inside portion of each of said front and back covers, said pocket means being in proximity to a top edge of said pages, said pocket means further including a transparent face portion and at least one open edge adapted to allow said pocket to receive a flat, indicia-bearing element for storage therewithin, said transparent face portion allowing said indicia-bearing element to be viewed through said window-like apertures.

4,819,963

COMBINATION BOOK AND SCULPTURE

Bruce E. Wolski, P.O. Box 2024, Boulder, Colo. 80306

Filed Apr. 21, 1987, Ser. No. 40,807
Int. Cl.[4] B42D *1/00, 15/00*; G09F *19/00*
U.S. Cl. 281—15.1 **16 Claims**



1. A combination book and three-dimensional sculpture system, including:

a bifurcated three-dimensional sculpture including a first three-dimensional portion and a second three-dimensional portion, said first and second three-dimensional portions defining between them a plurality of pairs of mating, substantially adjacent circumferential edges;

means for hingedly fastening together said first and second sculpture three-dimensional portions at one pair of said mating, substantially adjacent, circumferential edges so that said first and second three-dimensional sculpture portions can be either closed, or pivoted away from one another to create a space therein-in-between; and

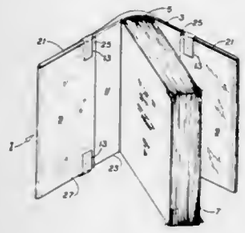
one or more printed or printable sheet, between said bifurcated first and second sculpture portions, each of said one or more sheet having marginal edges, one said marginal edge of each said one or more sheet being in substantial registration with, and also connected in combination with said hingedly fastening means, and wherein further the marginal dimensions of said one or more sheet and the marginal dimensions of said sculpture are selected, such that when said first and second three-dimensional portions of said sculpture are in their closed position, said one or more sheets are not readily discernible; whereby said system provides at least a first position, in which said sculpture is closed and appears to be a substantially continuous, monolithic three-dimensional object, and a second position in which said first and second three-dimensional sculpture portions are pivoted away from one another at said hingedly fastening means, so that said sculpture is open and reveals and makes accessible said one or more sheet connected in combination between said first and second portions of said sculpture.

4,819,964

COMBINATION BOOK JACKET COVER

Emmanuel Dupuis, 21 Prince Philip Drive, St. Catherines, Ontario, Canada L2N 3H9

Filed May 18, 1988, Ser. No. 195,605
Int. Cl.[4] B42D *3/00, 1/00, 9/00, 15/00*
U.S. Cl. 281—35 **2 Claims**



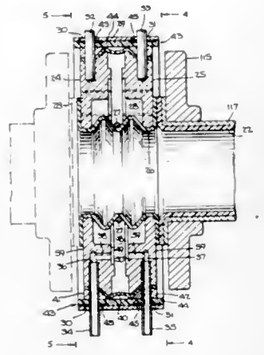
1. A combination book jacket cover removably secured to a book to protect the book and to prevent the book's hard covers from pulling out of the jacket cover's end flaps upon the book's back or spline being flexed, or from sliding up or down, thereby preventing tear or damage of the jacket cover, or the book's hard covers and back; said combination book cover jacket comprising a book jacket cover and jacket-tapes; said book jacket cover being of one-piece construction and being made of hard paper, said jacket cover having exterior top and bottom portions, said book having hard covers and a back, said hard covers having exterior portions, said book jacket covering the area corresponding to said exterior portions of said hard covers and back, said jacket cover being disposed in superposed relationship with said hard covers, said book's hard covers having interior portions, and jacket cover having end flaps, said end flaps being disposed in superposed relationship upon said interior portions of said book's hard covers, said jacket-tapes having end portions and non-adhesive middle portions, each of said end portions of said jacket-tapes having a side adhesively coated, said hard covers of said book having top edges and bottom edges, said non-adhesive middle portions of said jacket-tapes being engaged with said book's top and bottom edges, said end flaps having top and bottom portions, said adhesively coated sides of said end portions flaps of said jacket-tapes being engaged with said top and bottom portions of said end flaps and with said exterior top and bottom portions of said jacket cover, said hard covers jof said book having lateral edges, said adhesively coated sides of said end portions of said jacket-tapes being engaged with said top and bottom portions of said jacket cover and end flaps at sufficient distances from said lateral edges of said book's hard covers to prevent said book's hard covers from pulling out from said end flaps upon said back or spine of said book being flexed.

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4,819,965
FAIL-SAFE BELLOWS ASSEMBLY WITH FLOATING GUARD

Irving D. Press, West Orange, and Helm A. Rink, North Haledon, both of N.J., assignors to Unidynamics Corporation, New York, N.Y.

Filed Oct. 2, 1987, Ser. No. 103,950
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—14 **24 Claims**



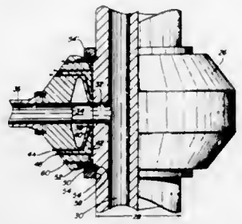
1. A fail-safe bellows assembly comprising in combination with first and second spaced apart pipe flanges and a bellows element interconnecting said flanges, a cylindrical substantially rigid, form-stable guard completely encircling said bellows element and flanges, generally concentric therewith, and means coupling said guard to said flanges for maintaining said guard in position bridging the space between said flanges and at least partially overlapping each flange around the entire periphery thereof while permitting limited movement of said flanges relative to one another, said limited movement being restricted to a safe magnitude to protect said bellows element against excessive elongation and articulation, said means comprising a plurality of apertures formed in said guard and distributed circumferentially thereabout in two annular axially spaced apart arrays, each array overlying the periphery of a different one of said flanges, and a corresponding number of pin-shaped members each mounted at the periphery of one of said flanges, said pin-shaped members being spaced circumferentially about said flanges and each extending radially outwardly through a corresponding one of said apertures.

4,819,966
SEALING MEANS FOR A MULTIPATH, MULTIPASS SWIVEL

Peter R. Gibb, Port Coquitlam, Canada, assignor to Canocean Engineering Ltd., Canada

Continuation of Ser. No. 867,693, May 28, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 119,242
Claims priority, application Canada, May 28, 1985, 482512
Int. Cl.[4] F16L *17/00*
U.S. Cl. 285—18 **13 Claims**

1. In a multi-path multi-pass swivel, a fluid swivel assembly comprising a central cylindrical member having an exterior cylindrical surface, a central bore, an essentially radially outwardly opening exit port and an annular ring surrounding said cylindrical member; said annular ring having an annular groove adapted to register with said exit port, and an outlet port on the exterior of said annular ring; said annular ring communicating with said outlet port on the exterior of said annular ring; and cylindrical radially inner lip surfaces to each side of said groove and sealed against said exterior cylindrical surface of said cylindrical member by at least two axially spaced apart seals; and including means for introducing a fluid under pressure between said two seals at a higher pressure than fluid in the bore; said two seals being such that in such conditions, the fluid interconnected between the seals passes more

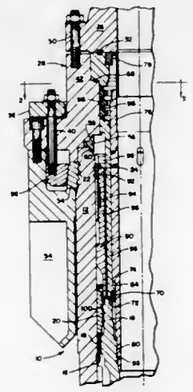


easily across the seal to the annular groove than across the other of the two seals.

4,819,967
CONDUCTOR TIEBACK CONNECTOR

Ian D. Calder, and Stephen A. Cromar, both of Aberdeen, Scotland, assignors to Vetco Gray Inc., Houston, Tex.

Filed Feb. 14, 1983, Ser. No. 466,236
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—18 **12 Claims**

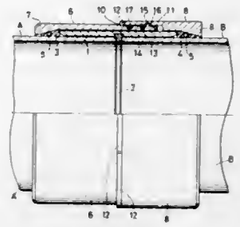


1. A connector for tying back a production riser from a subsea wellhead to a platform; said wellhead having external grooves and a casing hanger set therein, comprising: a downwardly-extending funnel secured to the bottom of said riser; locking means on said funnel adapted to mate with and lock in the external grooves; an internal hollow cylindrical stab pin sealingly secured internally to said funnel, extending downwardly therefrom, and having an inwardly-extending, upwardly-facing shoulder near the lower end; a seal ring carried on said stab pin and adapted to seal with the casing hanger; an internal torque sleeve having an outwardly-extending, downwardly-facing shoulder, engageable with the shoulder of said stab pin, and having threads engageable with threads in the casing hanger, whereby said torque sleeve may be rotated to draw said stab pin downwardly into sealing engagement with the casing hanger; said stab pin having a longitudinally flexible portion between the upwardly-facing shoulder and the location where it is secured to said funnel.

4,819,968
PIPE JOINT

Mitsuji Abe, Ashigarakami, Japan, assignor to Tannan Co., Ltd., Kanagawa, Japan

Filed Mar. 1, 1988, Ser. No. 162,686
Claims priority, application Japan, Mar. 2, 1987, 62-28846[U]
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—81 **5 Claims**



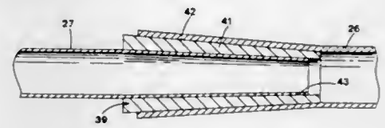
1. A pipe joint comprising:
a retainer having opposite open ends;
a seal member mounted within said retainer for positioning pipes inserted through said open ends by abutting against the pipes;
annular packing members disposed at opposite ends of said retainer and adapted to be fitted over the pipes, respectively;
a joint body fitted over said retainer and adapted to extend axially from one of the pipes to the other pipe, said joint body having an inner surface for pressing one of said packing members against one of the ends of said retainer;
a socket holder formed on and around an end of said joint body remote from said inner surface, said socket holder having a peripheral step and a positioning groove defined in a peripheral surface thereof;
a positioning member removably disposed along said step;
a spring disposed in said positioning groove and normally urged to move radially outwardly; and
a socket fitted over said socket holder and adapted to be disposed around the other pipe, said socket being movable toward said joint body and having an inner surface for pressing the other packing member against the other end of said retainer, said socket having defined in an inner peripheral surface a smaller-diameter annular recess for allowing said spring to be resiliently displaced partly into said smaller-diameter annular recess while partly remaining in said positioning groove when said socket is moved toward said joint body into abutment against said positioning member, and a larger-diameter annular recess disposed contiguous to said smaller-diameter annular recess for allowing said spring to be displaced fully out of said positioning groove when said positioning member is removed and said socket is moved toward said step.

4,819,969
COUPLING DEVICE AND METHOD FOR TUBULAR ELEMENTS

Anthony D. Williams, 1011 American St., San Carlos, Calif. 94070

Filed Apr. 8, 1988, Ser. No. 179,062
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—177 **10 Claims**

1. In a device for joining together first and second tubular elements of different diameters: a sleeve having a conically tapered inner wall for press fit engagement with the outer wall of the first tubular element and a conically tapered outer wall for press fit engagement with the inner wall of the second tubular element, the inner wall of the sleeve having an angle of taper less than about 0.40°, and the outer wall having an angle

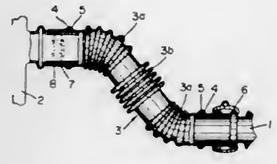


of taper on the order of twice the angle of taper of the inner wall.

4,819,970
THIN FLEXIBLE METAL TUBE

Kazumasa Umehara, Tagata, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Santo, Japan

Filed Oct. 2, 1987, Ser. No. 103,899
Claims priority, application Japan, Oct. 4, 1986, 61-152765[U]
Int. Cl.[4] F16L *11/14, 33/26*
U.S. Cl. 285—227 **7 Claims**

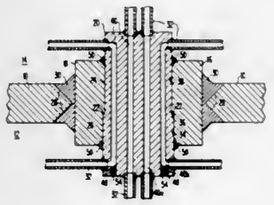


1. A thin flexible metal tube comprising a flexible bendable portion having a plurality of generally U-shaped corrugations defining a first height, and a straight flexible vibration absorbing portion having a plurality of generally omega-shaped corrugations defining second height, said second height being greater than the first height, whereby the portion of the tube having lower height corrugations facilitates bending of the tube, and whereby the straight portion having greater height corrugations provides enhanced absorption of vibrations transmitted externally through the bendable portion of the tube.

4,819,971
PRESSURE VESSEL PENETRATION FITTING

Clinton W. Stallard, III, Hampton, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Sep. 2, 1987, Ser. No. 92,401
Int. Cl.[4] F16L *5/00*
U.S. Cl. 285—131 **19 Claims**



1. Apparatus for providing a plurality of channels across a pressure boundary, comprising:

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a wall forming said pressure boundary, said wall including an aperture;

cylindrical sleeve received within said aperture and mounted to said wall to compensate for said aperture and distribute structural and pressure stresses in the vicinity of said aperture, said sleeve being made of material that can be welded to said wall;

a penetrating means received within said sleeve, said penetrating means including a plurality of channels passing through said penetrating means, whereby said channels pass across said pressure boundary, and said penetrating means comprising a cylinder that is solid except for said plurality of channels, said penetrating means being made of material that can be welded to said sleeve;

and wherein at least one of said channels extends through a side of said cylinder on each of two ends of said cylinder, one of said ends being located on a low pressure side of said pressure boundary and a second one of said ends being located on a high pressure side of said boundary.

4,819,972

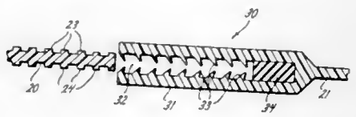
GRIP JOINTS FOR PLASTIC DUCTS

Gary Champa, Rte. I, Box 237A, Bunker Hill, Ill. 62014, and Joseph E. Jones, 225 Riverwoods Cove, East Alton, Ill. 62024

Continuation of Ser. No. 816,792, Jan. 7, 1986, abandoned. This application May 4, 1987, Ser. No. 45,206

Int. Cl.⁴ F16L *25/00*

U.S. Cl. 285—331 **1 Claim**



1. A continuous air-tight conduit system for use in heating and cooling systems in buildings comprising:

a plurality of connected rigid plastic gas-conveying ducts of standard length, the length of the conduit being adjustable to other than a multiple of said standard length, each of said ducts having an interior and an exterior surface, a receptacle integral therewith at one end thereof and the remainder of the duct having a substantially uniform cross-section and grippable means on the exterior and interior surfaces extending along the entire length thereof, said receptacle having a size and configuration for mating with the end of another one of said ducts, wherein the receptacle has a circumferential slot therein, the slot being engageable with the end of another duct, and wherein the slot has a plurality of rows of releasable gripping means formed therein, said gripping means being directly engageable with the grippable means on said interior and exterior surface when the ducts are joined; and

the length of at least one of said ducts being shortenable by cutting the duct at an angle substantially perpendicular to the duct axis along the portion of uniform cross-section and grippable means to form a cut end, the cut end being engageable with the receptacle of another duct to form a connection therebetween.

4,819,973

HERMETIC CONNECTION DEVICE AND METHOD OF PROVIDING HERMETIC CONNECTION

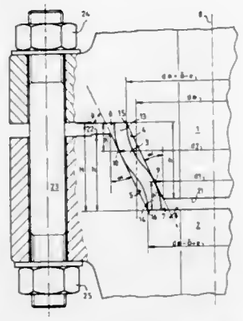
Daniel Pegon, Montreuil, France, assignor to Societe Precision Generale, Montreuil, France

Filed Nov. 6, 1987, Ser. No. 118,033

Claims priority, application France, Nov. 6, 1986, 86 15485

Int. Cl.⁴ F16L *19/06*

U.S. Cl. 285—332.3 **11 Claims**



1. A hermetic connection device comprising a double curve ductile seal joint having two extreme ends, two supports, said seal joint being positioned between the two supports, means for urging said two supports toward each other in a clamping direction, the supports defining two parallel inclined surfaces with respect to the clamping direction so that the seal joint when in its clamped condition is not permanently deformed and contacts an inclined surface of each support only along a line of contact extending in a plane oriented perpendicularly to said clamping direction with each extreme end of the seal joint also contacting a facing surface of one of the supports, the geometric characteristics of the supports and the seal joint being such that each extreme end of the seal joint come into contact with the facing surface of one of the supports at the same time as contact between the seal joint and the inclined surfaces takes place during movement of the supports toward each other in a clamping direction.

4,819,974

PIPE COUPLING

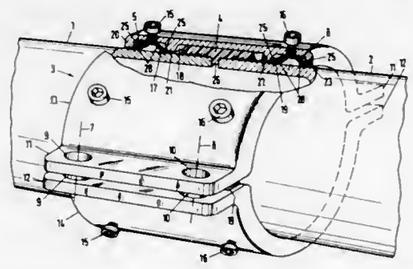
Siegmund Zeidler, Hanau, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Jul. 29, 1987, Ser. No. 79,659

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626289; Sep. 22, 1986, 3632127

Int. Cl.⁴ F16L *21/06*

U.S. Cl. 285—373 **23 Claims**



1. A coupling for pipes and similar objects, comprising a tubular housing having an internal surface arranged to surround the objects to be coupled to each other and at least one annular groove in said surface, said housing including two annular portions flanking said groove and having oppositely inclined flanks which diverge toward said internal surface and make first acute angles with the axis of said housing; and an annular gripping member in said groove, said gripping member including a web and two oppositely inclined legs which are movable relative to each other in the axial direction of said gripping member, said legs flanking said web and having teeth in the region of said internal surface to penetrate into the object which is surrounded by said groove in response to the application to said web of a radial force which acts through said housing, at least one of said legs making with said axis a second acute angle smaller than said first angle, the teeth of said one leg being closely or immediately adjacent one annular portion of said housing.

4,819,975

ENGINE STARTER MOTOR

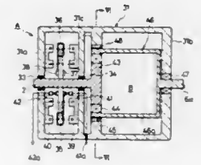
Akira Morishita, and Toshinori Tanaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

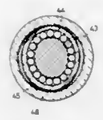
Filed Apr. 11, 1988, Ser. No. 179,810

Claims priority, application Japan, Apr. 22, 1987, 62-61815[U]; Jun. 15, 1987, 62-149445

Int. Cl.⁴ F02N *15/02*

U.S. Cl. 290—48 **7 Claims**





1. An engine starter motor, comprising: a d.c. motor, and a transmission device of high reduction ratio, said d.c. motor having an output shaft connected through said transmission device to an input shaft of an engine (**17**), said transmission device including a wave generator connected to said output shaft of said d.c. motor, an internal gear (**48**) formed integrally with a housing (**31**) of said d.c. motor, and a flexible gear (**45**) having an output shaft connected to said input shaft of said engine and meshing with said internal gear, wherein said wave generator includes an ellipsoidal cam member (**43**) fixedly mounted on said output shaft of said d.c. motor, and said flexible gear is supported by said ellipsoidal cam member through rollers (**44**).

4,819,976

DOOR LATCH

Brian J. Bert, Chester, Ill., assignor to American Device Manufacturing Company, Steeleville, Ill.

Filed Apr. 20, 1987, Ser. No. 39,958

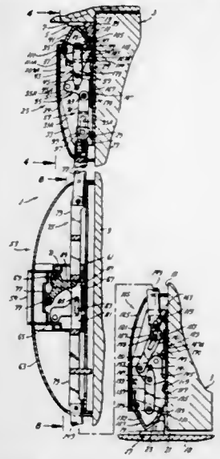
Int. Cl.⁴ E05C *9/04*

U.S. Cl. 292—48 **20 Claims**

1. In an emergency exit vertical door latch adapted for mounting on a door for selectively engaging and disengaging a door strike, the door latch having a vertically operating latch mechanism, the improvement comprising:

a latch bolt means for movement along a line of action to disengage a strike and allow a door to be opened, the latch bolt means being operated by the vertically operating latch mechanism;

dead lock means for preventing unwanted opening of a door and including means for blocking movement of the latch bolt means along its line of action, the blocking means being connected between the latch bolt means and the vertically operating latch mechanism; and,



means for releasing the blocking means to enable the latch bolt means to move along its line of action and including means for displacing the blocking means to permit the latch bolt means to disengage a strike on operation of the vertically operating latch mechanism.

4,819,977

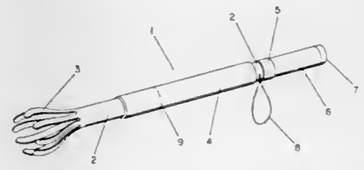
OBJECTIONABLE WASTE MATERIAL RETRIEVAL AND BAGGING DEVICE

Robert E. Cooper, Las Vegas, Nev., assignor to Alfred Sites, Las Vegas, Nev.

Filed Aug. 24, 1987, Ser. No. 88,660

Int. Cl.⁴ A47F *13/06*

U.S. Cl. 294—1.4 **1 Claim**



1. Device to be used for retrieving and bagging dog feces and similar and other objectionable waste material comprising:

(a) a tubular body with eight flexible finger endings and removable tubular sleeve

(b) a plastic or similar pliant material bag inserted into the eight flexible fingers, the fingers and bag brawn into the sleeve with the excess bag folded over the sleeve and held by a rubber band placed over the bag and sleeve

(c) moving the body forward from the sleeve to expose the bag around the eight flexible fingers secured by a rubber band

(d) operation means by placing the device over the material to be retrieved, and moving the sleeve over the fingers thereby gathering and bagging the material and tying the bag and containing the bag within the device

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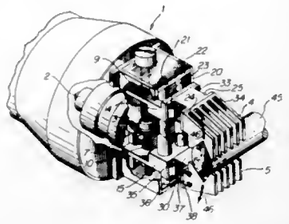
(e) ejecting the tied and bagged material by pulling the sleeve back.

4,819,978

GRASP FORCE SENSOR FOR ROBOTIC HANDS

Victor D. Scheinman, Woodside; Antal K. Bejczy, Pasadena, and Howard C. Primus, La Crescenta, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jun. 27, 1986, Ser. No. 879,802
Int. Cl.[4] B25J *15/08, 19/02*
U.S. Cl. 294—119.1 **11 Claims**



1. A robotic hand including a pair of opposed claws positioned in parallel and aligned with each other for grasping an object as at least one of said claws is moved toward the other along a common direction of movement, and means for moving at least one of said claws, said hand comprising:

a slide member, selectively moveable by said claw moving means along said common direction of claw movement, said slide member having a flat outwardly facing surface mounting plane;

at least one claw member of said pair of claws having an inwardly directed flat surface mounting plane matching said mounting plane of said slide member;

a hollow rectangular cylinder mounting base with opposed and spaced parallel forward and rearward facing sides each having flat surface mounting planes conforming to said surface mounting planes of said slide member and said one claw member;

means securably positioning said flat surface mounting planes of said sides of said base against the mounting planes of said slide member and said one claw member to fixably join said base between said slide member and said one claw member; and

said mounting base, as force is applied to said object by movement of said one claw member along said common direction, being characterized as translationally deformable, essentially as a parallelogram wherein said parallel sides of said base remain essentially parallel and move relative to one another in a direction corresponding to the direction of claw movement, and deflect inwardly toward each other in a direction transverse to said direction, whereby said claws remain aligned and parallel with each other as force is applied to said object.

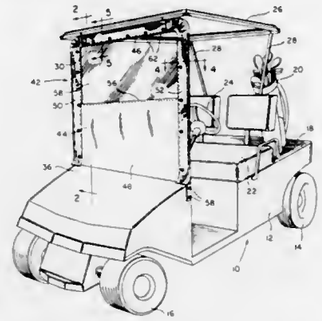
4,819,979

GOLF CART WINDSHIELD

John A. Moglia, 128 N. Marshall St., Allentown, Pa. 18104

Filed Dec. 7, 1987, Ser. No. 129,523
Int. Cl.[4] B60J *1/02*
U.S. Cl. 296—77.1 **8 Claims**

1. In combination with a recreational vehicle of the type including a forward, upstanding, inverted, generally U-shaped top support frame incorporating a pair of upstanding opposite side legs interconnected at their upper ends by a horizontal bight portion extending therebetween and wherein the lower ends of said legs are anchored relative to opposite side body portions of said vehicle between which a front cowl portion of said body extends and the forward marginal edge of a top structure is supported from and in spaced relation relative to said bight portion through the utilization of support members extending between and secured to said forward marginal edge portion and said bight portion, a removable windbreak and windshield assembly, said assembly including an upright flexible panel having upper and lower marginal edge portions, as well as upstanding opposite side marginal edge portions and being of a height greater than the effective height of said bight portion above said cowl and a width greater than the distance between said legs, said panel being disposed immediately forward of and in front-to-rear registry with said frame, said upper marginal edge portion being folded rearwardly over and downwardly behind said bight portion and including a free edge portion disposed below said bight portion, said opposite



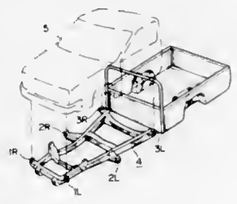
side marginal edge portions being folded rearwardly and inwardly behind said legs and including free edge portions spaced inwardly of said legs, and first means releasably securing said free marginal edge of said upper marginal edge portion to the rear side of said panel upper marginal edge portion below said bight portion and second means releasably securing said free edge portions of said side marginal edge portions to the rear side of said side edge portions marginal inwardly of said legs, said panel including a flexible panel-like transparent insert disposed therein including upper and opposite side margins spaced below and inwardly of said upper and opposite side marginal edge portions and a lower margin spaced appreciably above said lower marginal edge portion, said lower marginal edge portion edgewise overlapping at least an upper marginal portion of said cowl extending between said legs.

4,819,980

BODY MOUNTING ARRANGEMENT FOR TRUCK

Tetshin Sakata, Tokyo; Kazuto Kuzuu, Hatano City; Hideo Ito, Yokohama, and Akira Oouchi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Jan. 7, 1987, Ser. No. 1,327
Claims priority, application Japan, Jan. 10, 1986, 61-3135
Int. Cl.[4] B62D *23/00*
U.S. Cl. 296—35.1 **2 Claims**



1. In a truck:

a frame;

a bonnet type body including a cabin with a floor, said body having a first pair of mounting sites located near the front thereof, a second pair of mounting sites located at a front portion of said floor, and a third pair of mounting sites at a rear portion of said floor;

a first pair of mount rubbers operatively connected between said first pair of mounting sites and said frame;

a second pair of mount rubbers operatively connected between said second pair of mounting sites and said frame; an

a third pair of mount rubbers operatively connected between said third pair of mounting sites and said frame;

said first and second pairs of mount rubbers being generally identical to each other and constructed and arranged such that, when said body moves vertically relative to said frame, they are elastically compressed to bear the stress due to such vertical movement, while when said body moves horizontally relative to said frame, they elastically shear to bear the stress due to such horizontal movement;

said third pair of mount rubbers being different from the first and second pairs and constructed and arranged such that, when said body moves vertically relative to said frame, they elastically shear to bear the stress due to such vertical movement, while when said body moves horizontally relative to said frame, they are elastically compressed to bear the stress due to such horizontal movement, wherein said first and second pairs of mounting sites are displaced forwardly of the center of gravity of said body, and said third pair of mounting sites are displaced rearwardly of the center of gravity of said body, wherein said third pair of mount rubbers exhibit a greater stiffness coefficient upon bearing the stress due to the horizontal movement than the combined equivalent stiffness coefficient of said first and second pairs of mount rubbers.

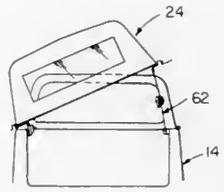
4,819,981

SIDE OPENING, REMOVABLE PICKUP TRUCK CAP

Gilmore L. Moe, Rt. 2, Box 209, Alexandria, Minn. 56308, and Gleo Swenson, P.O. Box 22, Glenwood, Minn. 56334

Filed Dec. 29, 1987, Ser. No. 138,955
Int. Cl.[4] B60P *7/02*
U.S. Cl. 296—100 **6 Claims**





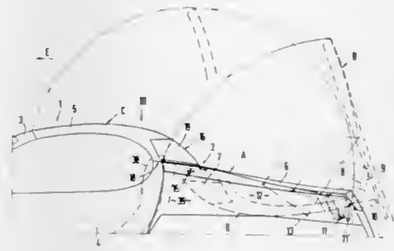
1. In combination with a pickup truck including a rear load bed of the type incorporating a transverse front wall and opposite side walls extending rearwardly from said transverse front wall and having a bed floor extending between and interconnecting lower margins of said front wall and side walls, upper marginal portions of said front wall and side walls being at least generally horizontally registered, a downwardly opening cap for said load bed including a front transverse wall structure and opposite side wall structures extending rearwardly from said cap front transverse wall structure with a top wall structure extending between and interconnecting upper margins of said front transverse wall structure and opposite cap side wall structures, said cap front transverse wall structure and cap opposite side wall structures including generally horizontally registered lower marginal portions overlying and disposed in juxtaposed position to said load bed upper marginal portions, each pair of juxtaposed opposite load bed side wall and cap opposite side wall structure upper and lower marginal portions including front and rear pairs of cap upper and load bed lower mounting structures mounted from said cap lower and upper marginal portions, respectively, each pair of cap upper and load bed lower mounting structures including coacting first and second vertically separable pivotal axis defining projection and recess means operatively vertically engaged with each other to prevent lateral shifting of said cap relative to said load bed transversely of the latter, readily vertically separable relative to each other and supporting each front and rear pair of cap upper mounting structures from the corresponding front and rear load bed lower mounting structures for angular displacement relative thereto about a horizontal axis extending between the last-mentioned load bed lower mounting structures for upward swinging of the other cap side wall structure lower marginal portion away from the corresponding load bed side wall upper marginal portion, each pair of corresponding cap upper and load bed lower mounting structures including coacting releasable latch means independently operative, when applied, to prevent vertical separation of the corresponding pair of cap upper and load bed lower mounting structures, articulated link structures operatively connected between each pair of corresponding cap upper and load bed lower mounting structures limiting vertical separation thereof and operative to support the corresponding cap side wall structure in the upper limit position of movement relative to the associated load bed side wall.

4,819,982

ROTATABLE TOP FOR A PASSENGER CAR

Wolfgang Eyb, Leonberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1988, Ser. No. 151,190
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702901
Int. Cl.[4] B60J *7/16*
U.S. Cl. 296—107 **12 Claims**



1. A rotatable top for a passenger car having a front and a rear spaced along a longitudinal axis of the car as well as a

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front windshield frame, at least one side door and a rear lid, the rotatable top comprising:

a roof member rotatably movable between open and closed positions about a swivelling axis extending transversely to the longitudinal axis of the car, the roof member extending between the front windshield frame and the rear lid, in the closed position, with a dome-shaped end area of the roof member positioned behind the side door, said end area having a lower edge, adjacent the rear lid;

a substantially horizontal plate-spaced element positioned adjacent the lower edge of the dome-shaped end area of the roof member with at least a rear edge connected to the roof member, the plate-shaped element extending substantially over the entire width of the dome-shaped end area of the roof member;

an upper peripheral surface of the plate-shaped element forming an interior storage surface when the roof member is in the closed position; and

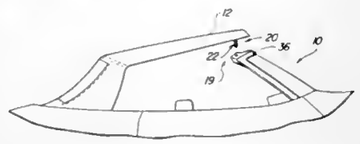
a peripheral surface of the plate-spaced element located on an outside of the vehicle when the roof member is in the open position forming an exterior cover located in front of the rear lid.

4,819,983

POWER LATCH SYSTEM

Michael P. Alexander, Grosse Ile, and Allan J. Adams, Lincoln Park, both of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Sep. 24, 1987, Ser. No. 100,529
Int. Cl.[4] B60J *7/12, 7/185*
U.S. Cl. 296—121 **13 Claims**



1. A power latching mechanism comprising:

(a) a threaded pin;

(b) a keeper assembly which receives the pin, comprising:

(1) a pair of opposed dogs which engage the pin;

(2) means for biasing the dogs into engagement with the pin; and

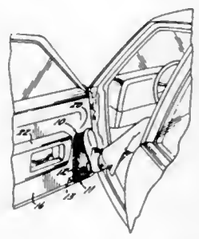
(3) means for rotating the dogs to cause threadable engagement between the dogs and the pin.

4,819,984

AUTOMOBILE DOORMAT

Bruce B. Wylie, 9500 Big Cone Pl., Charlotte, N.C. 28210

Filed Oct. 26, 1987, Ser. No. 112,420
Int. Cl.[4] B60J *1/20*
U.S. Cl. 296—152 **9 Claims**



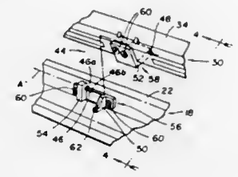
1. An automobile doormat comprising a bracket, means for attaching the bracket in a near vertical plane and in inwardly spaced parallel relation to the inside of an automobile door, a cleaning element, and means for releasably supporting the cleaning element on the bracket with a portion of the cleaning element positioned for use in inwardly spaced parallel relation to the near vertical plane of the bracket.

4,819,985

VEHICLE SUNROOF HINGE

Randy S. Williams, Livonia, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Filed Dec. 8, 1986, Ser. No. 938,818
Int. Cl.[4] B60J *7/11, 7/19*
U.S. Cl. 296—218 **5 Claims**



1. A vehicle sunroof comprising:

a peripheral frame that is mountable within an opening in a vehicle roof, the frame having rear and front portions, and the frame having laterally spaced side portions extending between the rear and front portions;

a panel for opening and closing the roof opening in which the frame is received, the panel having rear and front edge portions respectively positionable adjacent the rear and front portions of the frame, and the panel having laterally spaced side edge portions extending between its rear and front edge portions;

a detachable latch assembly for connecting and detaching the rear edge portion of the panel and the rear portion of the frame, the latch assembly being operable to move the rear edge of the panel upwardly and downwardly between an upper vented position and a lower closed position, and the latch assembly also being detachable to permit removal of the panel; and

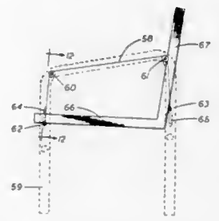
a detachable hinge for detachably securing the front edge portion of the panel to the front portion of the frame for movement about a pivotal axis, the hinge including a rigid stop member having a pintle on one of the front portions, the other front portion defining a hole for receiving the pintle upon lateral movement of the panel with respect to the frame with the rear edge portion of the panel raised above the vented position, the hinge also including a pair of cooperable rigid blocking members on the front portion of the frame and on the front edge portion of the panel, the rigid stop member and the rigid blocking member on the one front portion being spaced from each other with the pintle located therebetween extending from the rigid stop member thereon toward the rigid blocking member thereon, the rigid stop member being engaged by the other rigid blocking member to limit insertion of the pintle into the hole, and the rigid blocking members being engageable with each other to (a) prevent insertion of the pintle into the hole when the rear edge portion of the panel is at or lower than the vented position, (b) permit insertion of the pintle into the hole when the rear edge portion of the panel is above the vented position, and (c) prevent reverse lateral movement of the panel with respect to the frame and consequent withdrawal of the pintle from the hole when the rear edge portion of the panel is at the upper vented position or lower to thereby prevent unintended removal of the panel during use.

4,819,986

RECLINING CHAIR WITH SUSPENDED SEATING

Isidoro N. Markus, 65-36 99th St.(1E), Rego Park, N.Y. 11374

Continuation of Ser. No. 154,336, Feb. 10, 1988. This application Jul. 12, 1988, Ser. No. 217,823
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—325 **4 Claims**



1. A reclining chair comprising:

a tubular frame having on opposite sides thereof substantially horizontal and vertical members;

a seating disposed within said frame movably supported by said members, said seating comprising a seat board and a back board; and,

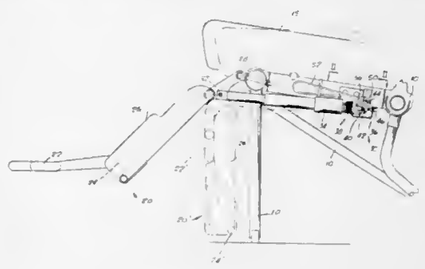
supporting means on each of said opposite sides for supporting said seating to said frame; said supporting means including: a flexible strap member connected at its ends to said seating and a plurality of guide rolls located inside said tubular frame, said flexible strap being disposed along a path passing over said rolls; a first pin connected to said seat board; a second pin connected to said back board; a first slot in one of said frame members capturing said first pin; and, a second slot in another of said frame members capturing said second pin.

4,819,987

AIRCRAFT SEAT LEG SUPPORT RELEASE DEVICE

Calvin R. Stringer, Saugus, Calif., assignor to Weber Aircraft, Burbank, Calif.

Filed Nov. 18, 1987, Ser. No. 122,101
Int. Cl.[4] A47C *7/50*
U.S. Cl. 297—434 **22 Claims**



1. A footrest comprising:

a frame member;

an extendable member pivotally attached to the frame member and having a stowed position and an extended position;

a piston and cylinder combination attached to the frame member and to the extendable member and being slidably expandable and contractable as said extendable member pivots, wherein the piston and cylinder combination has an orifice having an open position and a closed position and biased to the closed position such that the piston and cylinder combination may slidably expand and contract when the orifice is in the open position;

a controller for actuating the orifice to the open position; and

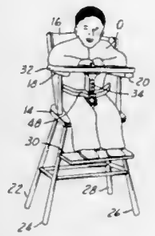
a pressure relief system comprising a means for actuating the orifice to the open position when a given force is applied on the extendable member toward the stowed position thereby permitting the extendable member to move to the stowed position.

4,819,988

RESTRAINING DEVICE FOR A CHAIR

Thomas Hellstrom, 30018 Manhattan, St. Clair Shores, Mich. 48082

Filed Jul. 1, 1987, Ser. No. 68,927
Int. Cl.[4] A47C *31/00*
U.S. Cl. 297—467 **11 Claims**



1. In a device for restraining an occupant of a chair having a seat, arms, and a tray extending across the front of the occupant, the invention characterized by:

post means disposed midway between the arms and extending generally vertically between the seat and tray and secured to one of them;

thigh engaging limb means mounted on the post means for vertically adjustable positioning and extending laterally thereof toward the arms to overlie in juxtaposition the thighs of an occupant and prevent escape from the chair; and

detent means for locking the limb means in vertically adjusted positions to adapt the limb means to the thighs of the occupant to be restrained.

4,819,989

PROPULSION SYSTEMS FOR MINERAL MINING MACHINES

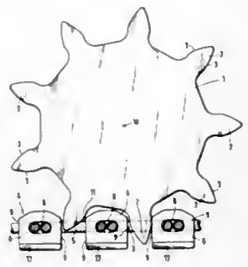
Herbert Kleine, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia GmbH, Fed. Rep. of Germany

Filed Jun. 29, 1987, Ser. No. 67,692
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 3622110
Int. Cl.[4] E21C *29/10*
U.S. Cl. 299—43 **9 Claims**

1. In a reactive-track propulsion system for a mineral mining machine comprising at least one sprocket wheel with teeth provided on the machine and driven to rotate about an axis; a chain with a longitudinal axis disposed along the path of movement of the machine; the sprocket wheel meshing with the chain to make driving engagement therewith; carrier and guide means for locating the chain and hold-down means for holding the machine down in relation to the carrier and guide means to maintain the meshing engagement between the sprocket wheel and the chain; the improvement comprising the chain is composed of first links oriented to lie in a plane predominantly parallel to the axis of rotation of the sprocket wheel and second links oriented to lie in a plane predominantly perpendicular to the axis of rotation of the sprocket wheel, the first links are of

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greater length relative to the longitudinal axis than the second links, the first and second links have openings therein for receiving looped end regions of adjacent links, with the openings in the second links having lengths measured in the direction of the longitudinal axis which are just slightly greater than



twice the diameter of the looped end regions of the first links received therein, and the second links have end faces relative to the longitudinal axis of the chain which are parallel and planar and extend perpendicular to said longitudinal axis with flanks of the teeth of the sprocket wheel making drive contact with the end faces of the second links.

4,819,990

FLOOR CUTTERS FOR MINERAL WINNING PLOUGHS

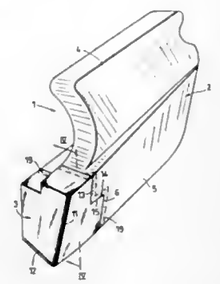
Oswald Breuer, Dortmund; Christoph Rassmann, Lunen; Egon Pfefferle, Hamm, and Gunther-Dietmar Schoop, Ottmarsbocholt, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfallia GmbH, Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 115,886

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1986, 3638135

Int. Cl.⁴ E21C *35/18*

U.S. Cl. 299—80 **4 Claims**



1. A floor cutter for use in mineral winning machines, such as ploughs; said cutter comprising a first component formed with a shank for detachable reception in a holder and a base portion opposite the shank and a second component formed with cutting edges extending in different directions, the second component being fixed by welding to the base portion of the first component with the cutting edges respectively defining a cutting depth relative to a mineral face of a mine working and a cutting height relative to a floor of the working; and complementary step-like surfaces provided on the base portion of the first component and the second component which contact and positively interengage to position the components relatively prior to welding; wherein said surfaces include first surfaces of the base portion and of the second component which lie in a first plane, support surfaces of the base portion and the second component which extend transversally of the components and substantially perpendicular to the first surfaces and further surfaces of the base portion and second component which lie in a further plane substantially parallel to the first plane and wherein the support surfaces are superimposed in supportive contact with each other to permit the second component to adopt any position relative to the first component to provide a plurality of defined different cutting depths while maintaining the same cutting height relative to the floor and the components are welded together around the junctions of the step-like surfaces with other external surfaces of the components once the relative position of the components has been selected to provide the defined cutting depth.

4,819,991

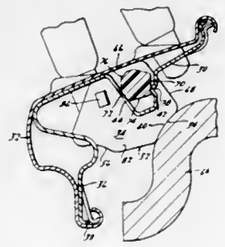
WHEEL TRIM RETENTION SYSTEM

Norbert F. Ostrowski, New Boston; Larry N. Bouman, Canton, and Heinrich J. Hempelmann, Livonia, all of Mich., assignors to NI Industries, Inc., Novi, Mich.

Filed Apr. 29, 1985, Ser. No. 728,104

Int. Cl.⁴ B60B *7/06*

U.S. Cl. 301—37 SS **25 Claims**



1. A wheel trim for a vehicle wheel comprising:

a generally circular trim member having a decorative axially outwardly facing surface;

a plurality of spring clips attached to the periphery of said trim member in circumferentially spaced relationship;

spacer means associated with and retained on said trim member by said spring clips and including first and second discrete surfaces, said spacer means being movable so as to position one of said first and second discrete surfaces for engagement with a vehicle wheel as said wheel trim is assembled thereto so as to aid in centering of said trim member with respect to said vehicle wheel, said spring clips being positioned in spaced relationship to said vehicle wheel.

4,819,992

DUPLEX-TYPE DISTRIBUTOR FOR A PNEUMATIC BRAKING SYSTEM FOR A MOTOR VEHICLE EQUIPPED WITH AN AUXILIARY SLOWING DEVICE

Domenico Angelillo, Sesto S. Giovanni, and Antonio Riversa, Cologno Monzese, both of Italy, assignors to Industrie Magneti Marelli S.r.l., Milan, Italy

Filed Oct. 27, 1987, Ser. No. 113,097

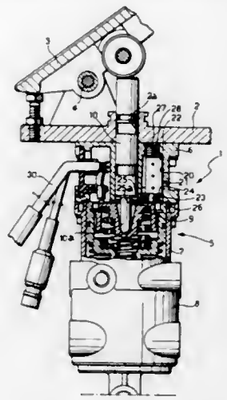
Claims priority, application Italy, Oct. 27, 1986, 54009/86[U]

Int. Cl.⁴ B60T *7/06*

U.S. Cl. 303—20 **6 Claims**

1. A control duplex-type pneumatic distributor for controlling a pneumatic braking system for a motor vehicle fitted with an auxiliary slowing device, comprising a body in which a movable brake valve operating pusher is mounted for movement as a result of the actuation of a brake pedal, and electrical sensor means for detecting the position of said operating pusher relative to the body, said electrical sensor means including a linear potentiometer including a casing fitted in said body and a control pusher which is movable through an opening in

said casing for controlling the operation of the potentiometer as a result of movement of the control pusher, so that the operation of the potentiometer depends on the position of the operating pusher relative to the distributor body, and mechani-



cal regulating means provided in said body and associated with said casing for enabling the resistance of the potentiometer to be calibrated in correspondence with a reference position of the operating pusher.

4,819,993

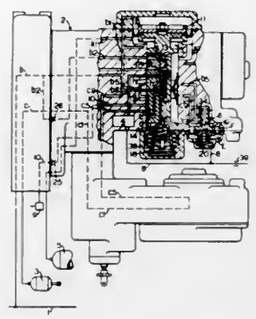
FREIGHT BRAKE CONTROL VALVE DEVICE HAVING IMPROVED QUICK SERVICE FUNCTION

Edward W. Gaughan, Irwin, and Theodore B. Hill, North Versailles, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Nov. 5, 1987, Ser. No. 116,942

Int. Cl.⁴ B60T *15/42, 15/32, 15/46*

U.S. Cl. 303—38 **10 Claims**



1. For controlling the brakes on a railway car having a brake pipe normally charged with fluid at a certain chosen pressure, an auxiliary reservoir charged with fluid under pressure from said brake pipe, and a fluid pressure actuated brake cylinder device, there is provided a brake control valve device comprising:

(a) a service piston abutment subject opposingly to said brake pipe fluid under pressure and said auxiliary reservoir fluid under pressure; (b) a supply passage connected to said brake cylinder device; (c) a quick service volume; (d) first valve means carried by said service piston abutment for establishing a preliminary quick service connection of fluid pressure from said brake pipe to said quick service volume during initial movement of said service piston from a release position to a service position in response to a reduction of said brake pipe fluid under pressure relative to said auxiliary reservoir fluid under pressure, and during subsequent movement, cutting off said preliminary quick service connection, while concurrently establishing a service connection of said auxiliary reservoir fluid under pressure to said supply passage and a secondary quick service connection of said brake pipe fluid under pressure to said supply passage; (e) quick service limiting valve means comprising:

(i) a control piston forming first and second pressure chambers on opposite sides thereof;

(ii) bias means acting on said control piston for urging said control piston toward a first position, said first pressure chamber being subject to fluid under pressure supplied to said brake cylinder device via said secondary quick service connection to effect actuation of said control piston to a second position when said brake cylinder pressure exceeds a predetermined value; and

(iii) second valve means operable in said first position of said control piston for conducting flow of fluid under pressure from said brake pipe to said supply passage and operable in said second position of said control piston for interrupting flow of fluid under pressure from said brake pipe to said supply passage; and

(f) suppression means comprising means for effecting fluid pressurization of said second pressure chamber to thereby suppress said actuation of said control piston to said second position when said first valve means establishes said second quick service connection, whereby premature operation of said quick service limiting valve means is prevented from occurring prior to said brake cylinder pressure exceeding said predetermined value.

4,819,994

ANTI LOCK BRAKING SYSTEM FOR VEHICLE

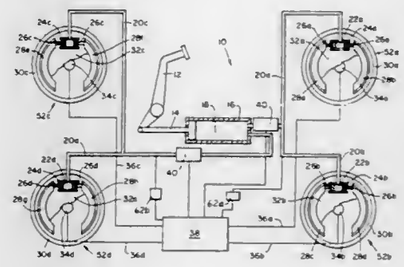
Trevor J. Holroyd, Mickleover, United Kingdom, assignor to Rolls-Royce, London, United Kingdom

Continuation-in-part of Ser. No. 6,065, Jan. 22, 1987, abandoned. This application Nov. 17, 1987, Ser. No. 121,870

Claims priority, application United Kingdom, Apr. 17, 1986, 8609378

Int. Cl.⁴ B60T *8/58*

U.S. Cl. 303—100 **12 Claims**



1. An antilock braking system for a vehicle comprising

a wheel having a confronting surface, at least one brake pad arranged to move into frictional contact with the confronting surface of the wheel,

a transducer acoustically coupled to the at least one brake pad, the transducer providing an electrical output signal dependent upon the degree of acoustic emission activity produced by frictional contact between the brake pad and the confronting surface of the wheel during a braking operation,

detector means for analyzing the electrical output signal of

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said transducer which corresponds to the level of acoustic emission activity,

control means which controls the pressure applied to wheel by the at least one brake pad,

wherein the detector means analyzes the electrical output signal to determine if there is locking of the wheel, the detector means sending a feedback signal to the control means when locking of the wheel is detected so as to at least reduce the pressure applied to the wheel in one mode of operation to prevent locking of the wheel.

4,819,995

CONTROL SYSTEM FOR VEHICLE ANTI-LOCKING BRAKE SYSTEM AND DRIVE TRACTION REGULATION SYSTEM

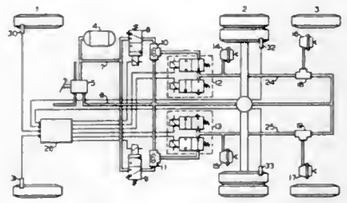
Berthold Löhmann, Hanover, and Erwin Petersen, Wunstorf, both of Fed. Rep. of Germany, assignors to Wabco Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 141,795

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1987, 3700716

Int. Cl.⁴ B60T *8/40*

U.S. Cl. 303—110 **7 Claims**



1. A brake control system for a motor vehicle, said brake control system comprising:

(a) an anti-locking brake means positioned on such motor vehicle for preventing a locking of a wheel during a brake application;

(b) a drive traction regulation means positioned on such motor vehicle for preventing slippage of a wheel during a start-up process;

(c) a plurality of speed sensing means positioned adjacent a plurality of wheels for determining a speed of rotation of a respective one of such plurality of wheels by a respective one of said plurality of speed sensing means;

(d) a four-channel electronic system positioned on such motor vehicle and electrically connected to receive a signal from each one of said plurality of speed sensing means and electrically connected to each of said anti-locking brake means and said drive traction regulation means for providing appropriate control signals to said each of said anti-locking brake means and said drive traction regulation means respectively during a brake application and a start-up process respectively;

(e) a source of fluid pressure positioned on such motor vehicle to provide a source of brake pressure during a brake application;

(f) a plurality of brake cylinders positioned on such motor vehicle and connected to receive fluid pressure from said source of fluid pressure to brake a respective wheel associated with a respective one of said plurality of brake cylinders;

(g) a double check valve connected intermediate said brake cylinders on each side of such motor vehicle and such source of fluid pressure, each said double check valve capable of being activated simultaneously by a common brake line; and

(h) a brake application means connected intermediate said source of fluid pressure and said double check valve for initiating a brake application.

4,819,996

AUTOMOTIVE VEHICLE BRAKING DEVICE

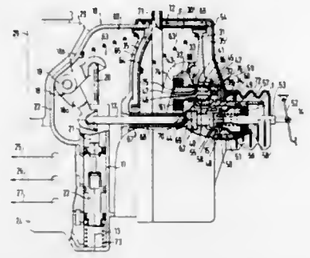
Juan Belart, Moerfelden-Walldorf, Spain, and Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,373

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625815

Int. Cl.⁴ B60T *8/44, 13/52*

U.S. Cl. 303—114 **14 Claims**



1. Automotive vehicle braking device comprising a hydraulic master cylinder having at least one piston therein for pressurizing the wheel cylinders connected thereto, and a vacuum brake force booster for coupling a brake pedal and the hydraulic piston, said master cylinder being integral with the construction of the vacuum brake force booster,

wherein said vacuum brake force booster is enclosed in a metal housing which opens in the longitudinal direction of said housing on the side thereof facing away from said brake pedal and wherein said brake force booster includes a central push rod operatively coupled to said brake pedal and extending along said longitudinal direction,

wherein said master cylinder is integrally formed with a die-cast housing which opens towards and is joined with said metal housing at the opening thereof and wherein said master cylinder includes a piston rod extending in the longitudinal direction of said master cylinder and generally transverse to the longitudinal direction of said master cylinder and generally transverse to the longitudinal direction of the brake force booster housing,

a reversing lever pivotally mounted in said die-cast housing and having a first lever arm for engaging said central push rod and a second lever arm for engaging said piston rod wherein translation of said push rod translates said piston rod, and

a fixed internal portion coaxially mounted about the axis of said central push rod and internally separating the integral housing formed by said metal housing and said die-cast housing.

11. Automotive vehicle braking device comprising a hydraulic master cylinder and a vacuum brake force booster arranged in an integral housing, said vacuum brake force booster including vacuum and pressure chambers, a piston and a vacuum valve, an electromagnetically actuated changeover valve built into a wall of the piston for operation by a brake slip control system for alternatively connecting a vacuum channel and an atmosphere connecting channel to the vacuum chamber and/or the pressure chamber, said brake slip control system including control circuitry for switching the changeover valve such that a beginning brake slip action is corrected, said changeover valve comprising a four-way/two-position double poppet valve with an axially sliding valve push rod provided in the piston wall, two circular valve seats arranged axially opposite each other, said valve seats cooperating with a cup spring

sealed all around and arranged with axial play between and concentrically with the valve seats, said sup spring being axially movable back and forth between two circular valve surfaces axially provided at the piston wall, a vacuum line coming from outside and the vacuum channel leading to the vacuum valve open radially outward of a first of the valve seats and radially inward of a first of the valve surface, the atmospheric pressure connecting channel coming from the vacuum valve opens radially outward of the second of the valve seats and radially inward of the second of the valve surfaces, and the pressure chamber channel opens radially outward of the second valve surface, and an inner chamber connected radially inward of the two valve seats by means of a vacuum connecting channel located inside the sliding valve push rod with the vacuum chambers.

4,819,997

SLIP-CONTROLLED BRAKE SYSTEM

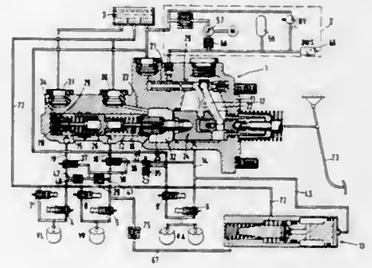
Hans D. Reinartz, Frankfurt am Main, and Helmut Steffes, Hattersheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,369

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3701018

Int. Cl.⁴ B60T *8/32*

U.S. Cl. 303—115 **4 Claims**



1. A slip-controlled brake sytem, in particular for motor vehicles, comprising a hydraulic power booster and a master cylinder arranged downstream of the power booster, wherein a pressure chamber of the power booster is acted upon by an external pressure depending on the position of a pedal-actuatable brake valve, an auxiliary cylinder, comprising a fast-fill cylinder connected to a dynamic brake circuit and acted upon by the dynamic pressure, said fast-fill cylinder connected to a static brake circuit and supplying pressure fluid to the static brake circuits of the master cylinder, said fast-fill cylinder including a three-step bore, wherein a piston with three shoulders is longitudinally displaceably arranged, a first chamber in front of a large drive surface of the piston is connected to the dynamic brake circuit through a pressure fluid line and a second chamber in front of an end face of a small step is connected to a static brake circuit through another pressure fluid line, a first annular chamber formed between a large shoulder of the piston and a medium-sized step of the stepped bore communicates with a second annular chamber formed between the medium-sized shoulder of the piston and the small step of the stepped bore through a pressure fluid channel and a control valve, said second annular chamber is connected to a return line.

4,819,998

DUAL-CIRCUIT BRAKE SYSTEM

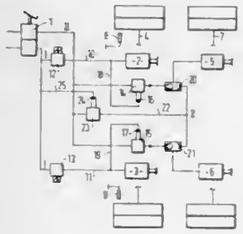
Hermann-Josef Goebels, Schwieberdingen, and Reiner Emig, Tamm, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 11, 1987, Ser. No. 84,070

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637420

Int. Cl.⁴ B60T *8/38, 15/12, 8/64*

U.S. Cl. 303—118 **8 Claims**



1. A dual-circuit brake system, which includes sensed and non-sensed wheel brakes including brake cylinders, an anti-skid apparatus having wheel sensors, electronic switchgear and first and second pressure control valves inserted into separate brake lines of a first brake circuit (I) leading to the wheel brakes, and which is equipped with an anti-drive-slip system (ASR), wherein said first and second pressure control valves (12, 13) directly control fluid pressure at said brake cylinders of the sensed wheel brakes of said first brake circuit (I), said brake system further including at least one relay valve (14, 15) with which brake pressure of non-sensed wheels of a second brake circuit (II) is controlled;

a relay valve (30) which is connected to the brake lines of said first brake circuit (I) which are controlled by said first and second pressure control valves (12, 13), and which always passes the brake fluid having the lower brake pressure;

a brake pressure lock valve (23) which controls the brake fluid pressure of one brake circuit with respect to the other brake circuit, said brake pressure lock valve (23) including a housing having an inlet and an outlet; and

a control and closing member (31) embodied as a switching diaphragm between said inlet and outlet, and a spring that applies a spring tension onto said switching diaphragm, whereby pressure applied onto said switching diaphragm prevents fluid flow through said brake pressure lock valve (23) to said second brake circuit.

4,819,999

END FACE SEAL ASSEMBLY

Richard E. Livesay, Peoria; Robert J. Purcell, Washington, and Blair A. Maust, Dunlap, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jul. 13, 1987, Ser. No. 72,933

Int. Cl.⁴ F16J *15/34, 15/38;* **B62D** *55/88*

U.S. Cl. 305—11 **17 Claims**

1. An end face seal assembly adapted for use in sealing a joint wherein a first member of said joint is pivotable about an axis relative to a second member thereof, said first member having an annular, axially opening seal cavity about said axis, said seal assembly comprising:

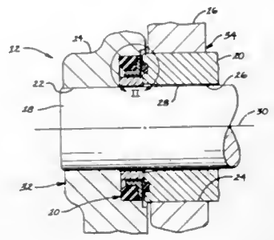
a first seal ring (50) of a rigid metal construction positionable within said seal cavity and having an L-shaped cross sectional configuration defining a radially outwardly extending flange portion and an axially extending flange portion said radial flange portion having a hard, wear and corrosion resistant radial sealing surface;

a resilient second seal ring having an annular seal lip of a

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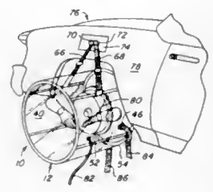
wear resistant polyurethane, said lip being disposed for axial sealing engagement against said radial sealing surface of said rigid first seal ring;

an elastomeric load ring being positionable between said seal cavity and said rigid first seal ring for axially urging said radial sealing surface into axial sealing engagement against said seal lip of said resilient second seal ring; and



means for maintaining said second seal ring in a fixed, non-rotative relationship relatively to said second member during pivoting of said joint, said means including said second member having an annular groove opening toward said radial sealing surface of said first seal ring and said second seal ring having a body portion positionable within said groove.

4,820,000
GLOVE BAG WASTE REMOVAL SYSTEM FOR ASBESTOS IMPREGNATED BRAKES
Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014
Filed Jan. 7, 1987, Ser. No. 1,075
Int. Cl.[4] A61G *11/00*
U.S. Cl. 312—1 **14 Claims**

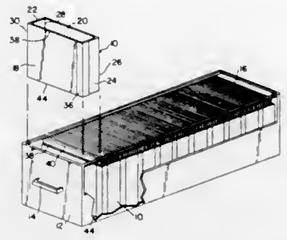


1. A glove bag waste removal system for asbestos impregnated brakes, comprising:

a containment bag having at least one glove sleeve means therein and flexible opening means for mounting said bag over a brake assembly, said bag including a clear body formed in a substantially cylindrical shape, which includes a pair of substantially rigid end rings secured thereto at opposite ends thereof to form said body substantially into a cylindrical shape, said opening means formed in a first end thereof substantially in a plane formed by a first end ring, said opening means including flexible sealing membrane means having at least a pair of cross slits therein, said cross slits formed orthogonally to one another to form a button/buttonhole like assembly for inserting over the brake assembly and having a second end formed opposite said first end adjacent a second end ring, said second end sealed to said second end ring and a plurality of stiffening means inserted between said rings substantially parallel to one another in sleeves secured to said body to form said cylindrical shape; and

means for supporting said bag adjacent the brake assembly.

4,820,001
FILE DRAWER DIVIDERS
Bernard Paul, 350 E. Tioga St., Philadelphia, Pa. 19134
Continuation of Ser. No. 4,890, Jan. 20, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 170,126
Int. Cl.[4] A47B *63/00*
U.S. Cl. 312—183 **1 Claim**



1. The combination of a file drawer of the type having a floor, front and rear walls and left and right sidewalls extending upwardly from the floor for storing a plurality of the file folders and a plurality of similar, separate, discreet self supporting dividers movably supported within said file drawer, one said wall of said file drawer having an inwardly extending flange, each said divider comprising

a folded blank of cut and scored corrugated board material, the blank being folded to define a front panel, a rear panel, a right side panel and a left side panel, the folded blank having no top panel and no bottom panel,

the said panels defining a file folder receiving area of rectangular cross-sectional configuration therewithin,

a strip of tape joining the adjacent edges of two of the panels to maintain said rectangular configuration,

one said panel of the folded blank being provided with a U-shaped cut to define an extended tab, the tab being positioned on said panel to extend beneath said flange for preventing upward displacement of said divider in said file drawer,

each divider being freely movable over the floor of the file drawer for supporting file folders in selected positions within the file drawer, each file folder receiving area comprising an unrestricted open top and an unrestricted open bottom, the open bottom of the file folder receiving area being positioned immediately above the file drawer floor,

whereby the file folders are maintained in upright position within the file folder receiving area while the file folders themselves rest directly upon the file drawer floor.

4,820,002
SAFETY INTERLOCK
Lloyd Lechner, and Kent Thomas, both of Mayville, Wis., assignors to Tab Products Company, Palo Alto, Calif.
Filed Nov. 24, 1987, Ser. No. 124,614
Int. Cl.[4] E05C *7/06*
U.S. Cl. 312—221 **6 Claims**

1. A safety file cabinet comprising:

a. a housing having a side wall and an open front;

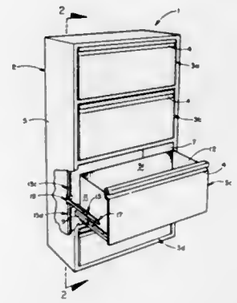
b. a plurality of vertically aligned drawers;

c. suspension means attached to the housing and the drawers for reciprocating the drawers between opened and closed positions relative to the housing open front;

d. a plurality of catches, each catch being of single piece construction and having elongated strip sections and first and second ends and being vertically aligned in a column on the housing side wall with adjacent catches being in endwise abutting contact and being adapted to reciprocate vertically on the cabinet side wall, the ends of adjacent catches having respective tab means for defining vertical gaps between the respective adjacent catches wherein the strip section of each catch is fabricated with at least one longitudinally extending slot therein, and each catch is laterally retained to the cabinet housing by a headed fastener passing through the strip section slot and fastened to the housing to thereby enable catch reciprocation along the housing and prevent relative lateral motion between the catch and the housing, and wherein the catch tab means comprises:

i. a first generally U-shaped tab having a center leg and side legs, the tab center leg being flush with the edge of the first end, the tab center and side legs being approximately the same thickness as the strip section; and

ii. a second generally U-shaped tab having a center leg and side legs, the tab center leg being spaced a predetermined distance from the edge of the second end, the tab center and side legs being approximately the same thickness as the strip section; and



e. actuator means mounted to each drawer for entering the gap defined by the tab means of two adjacent catches when the associated drawer is pulled to the opened position and for displacing upwardly any catches above the actuator means of the opened drawer to enlarge the gap and to displace the side legs of the first tabs of any catches above the actuator means of the opened drawer into the paths of the actuator means of any drawers located above the opened drawer to thereby prevent opening any drawers located above the opened drawer, the actuator means leaving undisplaced any catches located below the actuator means of the opened drawer, the actuator means of the opened drawer being in the path of any catches located below the actuator means of the opened drawer to thereby prevent upward displacement of any catches below the actuator means of the open drawer,

so that only one cabinet drawer at a time can be opened.

4,820,003
WHEELED STORAGE AND DISPLAY CART
Harold C. Lloyd, 1205 Birdneck Lake Dr., Virginia Beach, Va. 23451
Filed Apr. 7, 1988, Ser. No. 178,608
Int. Cl.[4] A47B *81/00*
U.S. Cl. 312—234 **13 Claims**

1. An improved storage and display cart, comprising:

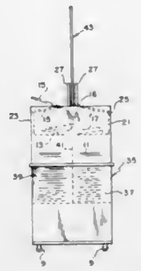
(a) a base portion having an underside with a plurality of wheels mounted thereon;

(b) a plurality of walls extending upwardly from said base portion;

(c) a container partially defined by said walls at an upper portion thereof, said container having a generally flat first top surface and a side wall formed by a portion of one of said walls, said first top surface being pivotably mounted and having a lockable latch;

(d) a second top surface fixedly mounted between said walls adjacent said first top surface and a card holder mounted on said second top surface;

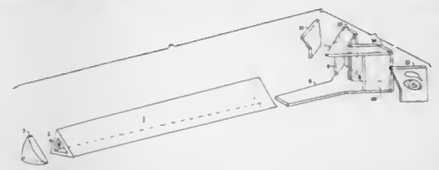
(e) a frame mounted on said second top surface and adapted to removably receive one of a plurality of signs;



(f) a writing instrument holder mounted on said second top surface; and

(g) storage means between said container and said base portion.

4,820,004
BINOCULAR KALEIDOSCOPE
Jonathan K. Briskin, 24 Dearborn Rd., Medford, Mass. 02155
Filed Jun. 30, 1986, Ser. No. 880,579
Int. Cl.[4] G02B *23/00*
U.S. Cl. 350—4.1 **3 Claims**



1. A kaleidoscope comprising a single hollow elongated housing having a front end and a rear end: a pattern-producing device adjacent said front end: reflecting means disposed within said housing, extending between said front and rear ends to define a varying composite image when viewed: a binocular eyepiece assembly adjacent to said rear end, providing means for a two-eyed user to view said varying composite image with both eyes simultaneously.

4,820,005
METHOD OF FIXING A POLYGON MIRROR AND AN OPTICAL DEFLECTOR HAVING SUCH POLYGON MIRROR
Yoshio Hashimoto, Tokyo, and Hiroki Tajima, Natori, both of Japan, assignors to Ricoh Company, Ltd., Tokyo and Toboku Ricoh Co., Ltd., Shibata, both of, Japan
Filed Dec. 21, 1987, Ser. No. 135,267
Claims priority, application Japan, Dec. 27, 1986, 61-315417
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **6 Claims**

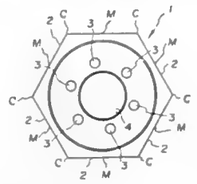
5. An optical deflector comprising:

a rotational shaft;

a polygonal mirror, and

means for fixing said mirror to said rotational shaft at predetermined positions, said positions being equiangularly spaced with each other round a center of rotation of said mirror, said positions being identical in number with reflective surfaces of said mirror, each of said positions opposing to a point between a corner portion of said mirror and a midportion of each of said reflective surfaces,

said corner portion being disposed between said reflective surfaces adjacent to each other, whereby the strain states



of said respective reflective surfaces can be uniformed and a good jitter characteristic of said optical deflector can be ensured.

4,820,006

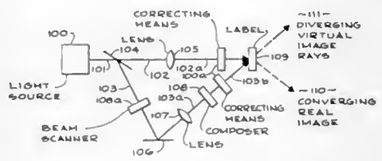
HOLOGRAPHIC IDENTIFICATION SYSTEM USING INCOHERENT LIGHT

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 850,361, Nov. 10, 1977, abandoned, which is a continuation-in-part of Ser. No. 614,236, Sep. 17, 1975, abandoned. This application May 12, 1983, Ser. No. 493,041

Int. Cl.[4] G03H *1/22*

U.S. Cl. 350—3.85 **20 Claims**



1. In a labeling system for identifying objects using labels, the combination of:

holographic means for encoding labels using incoherent light directly illuminating labels;

a plurality of objects with a holographically encoded label for each object; and

holographic means for decoding labels.

4,820,007

CABLE CLOSURE AND METHODS OF ASSEMBLING

Robert R. Ross, Gainsville, and Ilona Vedejs, Duluth, both of Ga., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 12, 1988, Ser. No. 155,194

Int. Cl.[4] G02B *6/36;* **H01R** *4/00*

U.S. Cl. 350—96.20 **14 Claims**

1. A cable closure for enclosing a splice between two cable portions each of which includes a core, a metallic shield and a jacket, said closure comprising:

a splice tray which includes means for holding a splice on one side thereof;

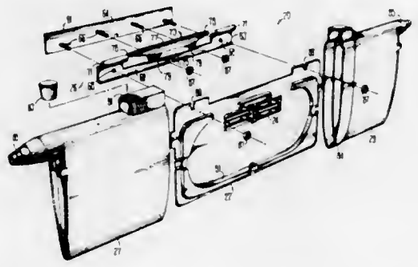
a bonding and gripping assembly which is adapted to be assembled with said splice tray and which includes opposing portions adapted to be engaged with the shields and adjacent portions of the cable portions to establish electrical contact with the shields and to grip the jackets of the cable portions; and

mating cover portions which are adapted to be moved toward each other to enclose said splice tray and to be secured together.

10. A method of providing a closure for an optical fiber splice, said method including the steps of:

moving one cover portion over an end of a cable end portion of a first optical fiber cable to be spliced and another cover portion over an end of a second optical fiber cable which is to be spliced to the first cable, each of the cables including at least one optical fiber;

removing a metallic shield and jacket from a length of each cable end portion and exposing the at least one optical fiber of each cable end portion;



causing end portions of a bonding and gripping assembly to be moved between the metallic shields and cores of the cable end portions;

splicing the optical fiber of one end portion of the first cable to the optical fiber of an end portion of the second cable;

moving the cover portions into engagement with each other to enclose the optical fiber splice; and

securing together the cover portions.

4,820,008

INTEGRATED OPTICS RING RESONATOR

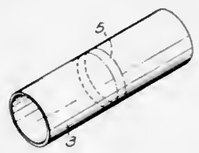
Alan R. Malvern, Bracknell, England, assignor to British Aerospace Public Limited Company, London, England

Filed Nov. 13, 1987, Ser. No. 120,534

Claims priority, application United Kingdom, Nov. 18, 1986, 8627570

Int. Cl.[4] G02B *6/00*

U.S. Cl. 350—96.10 **20 Claims**



1. A ring resonator waveguide for a laser gyroscope comprising a hollow cylindrical substrate, said hollow cylindrical substrate having an interior surface, an exterior surface and an axis of generation, said ring resonator waveguide further comprising a ring of waveguide material extending around a part of one of said interior and exterior surfaces of said hollow cylindrical substrate, said waveguide material preventing light from leaving said waveguide material in a radial direction relative to said cylinder so that said ring forms a resonate optical cavity.

4,820,009

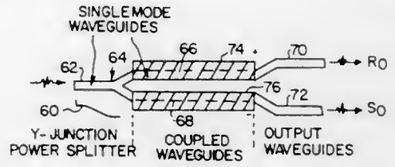
ELECTROOPTICAL SWITCH AND MODULATOR

Suwat Thaniyavarn, Bellevue, Wash., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 13, 1987, Ser. No. 84,723

Int. Cl.[4] G02F *1/01;* **G02B** *6/10, 6/26, 6/42*

U.S. Cl. 350—96.13 **7 Claims**



1. An electrooptical modulator, comprising:

an input waveguide section, including a power splitter providing two equal outputs from a single input;

a pair of coupled waveguides connected to receive energy from the power splitter, and position in close coupling proximity to each other;

an output waveguide connected to one of the coupled waveguides; and

means for applying an electric field to the coupled waveguides;

whereby the intensity of optical output from the output waveguide varies approximately linearly with the strength of the applied electric field, over a range of both positive and negative values of field strength and without a dc bias being applied to the modulator.

4,820,010

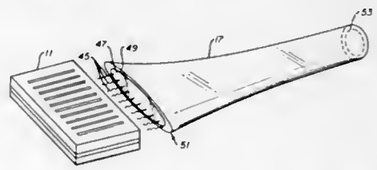
BRIGHT OUTPUT OPTICAL SYSTEM WITH TAPERED BUNDLE

Donald R. Scifres, and D. Phillip Worland, both of San Jose, Calif., assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.

Division of Ser. No. 43,612, Apr. 28, 1987, Pat. No. 4,763,975. This application Apr. 12, 1988, Ser. No. 180,469

Int. Cl.[4] G02B *6/26, 6/32*

U.S. Cl. 350—96.15 **2 Claims**



1. An optical system for producing a bright light output comprising,

a plurality of light sources emitting light therefrom, and

a plurality of fiberoptic waveguides, each of said waveguides having an input end positioned relative to one of said light sources for accepting light therefrom, each of said waveguides having an output end, the waveguides being arranged at said output ends to form a bundle,

wherein said bundle has a fused output end with a taper to a smaller output diameter than a characteristic bundle diameter.

4,820,011

OPTICAL WAVELENGTH CONVERSION DEVICE, AND A METHOD OF MAKING THE SAME

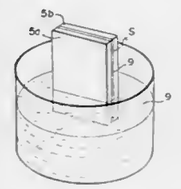
Shinsuke Umegaki; Yoji Okazaki, and Kozi Kamiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 7, 1987, Ser. No. 70,442

Claims priority, application Japan, Jul. 7, 1986, 61-159292; Jul. 7, 1986, 61-159293

Int. Cl.[4] G02B *6/34, 6/26*

U.S. Cl. 350—96.19 **4 Claims**



1. An optical wavelength conversion device constituted by a pair of substrates disposed facing each other, and an optical waveguide formed of a nonlinear optical material and disposed between the substrates, thereby to convert a fundamental wave entering the optical wavelength conversion device to a second harmonic which is phase matched by Cherenkov radiation,

wherein the improvement comprises providing at least one of said substrates with a first grating to facilitate entry of said fundamental wave, said first grating being formed on a surface contacting said optical waveguide, and providing said at least one substrate with a second grating to facilitate radiation of said second harmonic, said second grating being formed on a surface opposite to said surface contacting said optical waveguide.

4,820,012

ELECTRIC WIRE

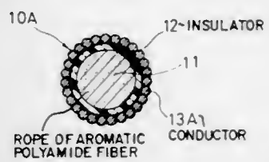
Masaki Asai, Nagoya, Japan, assignor to Kabushiki Kaisha MEC Laboratories, Nagoya, Japan

Filed Nov. 4, 1987, Ser. No. 116,301

Claims priority, application Japan, Nov. 14, 1986, 61-272317

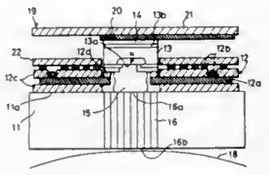
Int. Cl.[4] G02B *6/44;* **H01B** *5/10*

U.S. Cl. 350—96.23 **7 Claims**



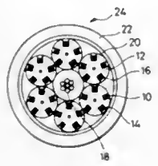
1. An electric wire comprising an electrical insulating core rope made of aromatic polyamide fiber, an electrical insulating intermediate layer which covers the electrical insulating core, and an outer core conductor which surrounds the intermediate layer, said outer conductor being composed of conductive elongated pieces which are located on the intermediate layer to form a tubular layer.

4,820,013
LED ARRAY HEAD
Masashi Fuse, Morioka, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Nov. 9, 1987, Ser. No. 118,845
Claims priority, application Japan, Jan. 6, 1987, 62-473[U]; Jan. 13, 1987, 62-5695
Int. Cl.[4] G02B 6/08
U.S. Cl. 350—96.27 2 Claims



1. An LED array head comprising:
a plurality of LED array chips each having a plurality of light emitting portions;
a fiber plate having fiber bundles mounted therein which are composed of a plurality of optical fibers having substantially no self-focusing characteristic; and
flexible printed circuits having electrode patterns formed thereon supported on the fiber plate;
wherein each of the LED array chips is supported on one of the flexible printed circuits with the light emitting portions of the LED array chip opposing one end face of the fiber bundles and connected to the electrode pattern of the flexible printed circuit.

4,820,014
OPTICAL CABLE
Akira Nishimura, and Shuzo Suzuki, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Feb. 25, 1988, Ser. No. 160,241
Claims priority, application Japan, Feb. 25, 1987, 62-42010
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 6 Claims



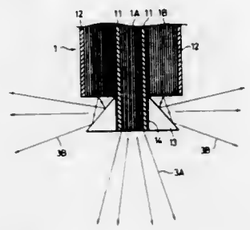
1. An optical cable comprising:
a predetermined plurality n of tape-shaped optical fiber bundles having a thickness T and a width W_T; and
at least one core having at least one groove therein, said groove having a width W_S and a depth D_S satisfying the equations:

$$1.2 < (W_S/W_T) < 1.45$$

$$1.3 < (D_S/nT) < 1.55$$

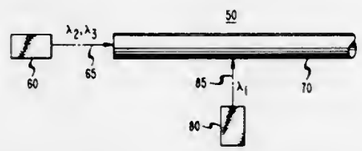
said bundles being disposed in said groove.

4,820,015
OPTICAL FIBER BUNDLE HAVING IMPROVED TERMINAL STRUCTURE
Masaharu Mogi, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Dec. 29, 1987, Ser. No. 139,310
Claims priority, application Japan, Jan. 14, 1987, 62-7300
Int. Cl.[4] G02B 6/00, 6/04
U.S. Cl. 350—96.24 12 Claims



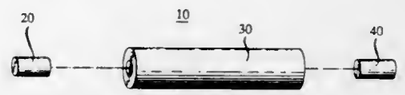
1. An optical fiber bundle comprising:
a first plurality of optical fibers, their end faces forming a terminal structure;
a second plurality of optical fibers surrounding said first plurality of optical fibers;
reflecting means surrounding said terminal structure, said reflecting means radially reflecting light emitted from said second plurality of fibers and allowing light emitted from said first plurality of fibers to pass without reflection.

4,820,016
WAVEGUIDE-CONTAINING COMMUNICATIONS AND SENSING SYSTEMS
Leonard G. Cohen, Berkeley Heights, and John Hegarty, Summit, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Feb. 21, 1986, Ser. No. 832,457
Int. Cl.[4] G02B 6/28; G02F 1/17
U.S. Cl. 350—96.29 15 Claims



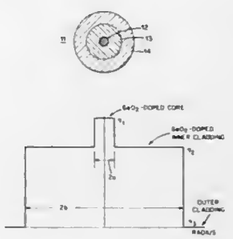
1. A system, comprising:
a source of electromagnetic radiation; and
a waveguide including an interior, a first surface defining a boundary between said interior and the exterior of said waveguide, and means for receiving electromagnetic radiation to be guided by said waveguide into said interior, said means including a second surface, said source being in optical communication with said second surface and said waveguide being capable of guiding at least a portion of the electromagnetic radiation emitted by said source, characterized in that
the intensity of the electromagnetic radiation emitted by said source is substantially constant,
said system further comprises a source of energy which is capable of directing a beam of energy at at least a portion of said first surface, and
said waveguide includes means for reducing the intensity of the electromagnetic radiation guided by said waveguide in response to energy from said directed energy beam or a combination of energy from said energy beam and a stimulus.

4,820,017
OPTICAL FIBER SYSTEMS EMPLOYING MULTICOMPONENT HALIDE GLASS OPTICAL FIBERS
Malcolm E. Lines, Millington, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Sep. 9, 1987, Ser. No. 94,562
Int. Cl.[4] G02B 6/10, 6/00, 6/02
U.S. Cl. 350—96.30 4 Claims



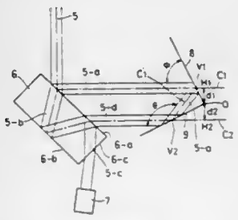
1. An optical system, comprising:
a source of electromagnetic radiation; and
transmission means, in optical communication with said source, for transmitting at least a portion of said radiation, said transmission means including a glass body, characterized in that
said glass body includes at least one material region having a composition which includes at least two halides, with each of said halides including the same halogen,
said source is chosen in relation to the composition of said glass body so that the wavelength of at least a portion of said electromagnetic radiation is substantially equal to λ_{min}, the wavelength at which an optical loss coefficient for said glass body as a whole, α, is minimized, the loss coefficient at each point of said material region, α, being equal to the sum of the weighted, multiphonon absorptions associated with the individual halides, with each weight being equal to the corresponding halide mole fraction at that point, and the intrinsic scattering associated with said region at that point.

4,820,018
OPTICAL FIBER FOR LIGHT AMPLIFICATION
Paul Melman, Newton, and Mark L. Dakss, Sudbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Oct. 30, 1987, Ser. No. 114,927
Int. Cl.[4] G02B 6/22
U.S. Cl. 350—96.33 6 Claims



1. An optical fiber for transmitting light wave energy in a single mode comprising:
a cylindrical core of a first light transmitting material, doped with a substantial concentration of GeO_2 at x mol percent;
an inner cladding of a second light transmitting material, doped with a sizable concentration of GeO_2 at y mol percent, surrounding said core; and
an outer cladding of material, substantially free of GeO_2, surrounding said inner cladding.
wherein x is greater than y; and
wherein a GeO_2-enhanced Raman effect is produced.

4,820,019
OPTICAL DEVICE
Toshihiko Yoshida, Tenri; Haruhisa Takiguchi, Osaka, and Shinji Kaneiwa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 9, 1985, Ser. No. 774,240
Claims priority, application Japan, Sep. 12, 1984, 59-191190
Int. Cl.[4] G02B 27/00; G01B 9/02
U.S. Cl. 350—163 2 Claims



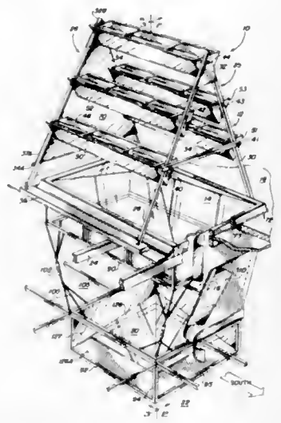
1. An optical device comprising a transparent plate having planar first and second reflecting surfaces for causing a beam incident on the first reflecting surface of the plate at a predetermined angle to be partially reflected as a first divided beam and partially transmitted to the second reflecting surface and reflected therefrom to the first reflecting surface, said reflected beam being partially reflected and partially transmitted by the first reflecting surface, the transmitted portion of said reflected beam being a second divided beam, a mirror for reflecting one of the first and second divided beams and a screen for superimposing the divided beam reflected from the mirror with the other divided beam so as to form interference fringes on the screen, said mirror and screen being relatively fixed in a predetermined angular relationship and being mounted for conjoint rotation so that the predetermined angular relationship of said mirror and screen is maintained as the mirror and screen are rotated.

4,820,020
PASSIVE DAYLIGHTING SYSTEM
Frank E. Terrill, Rt. 1, Box #36-A, Arlington, Kans. 67514
Filed Nov. 19, 1987, Ser. No. 122,928
Int. Cl.[4] G02B 17/00, 27/00
U.S. Cl. 350—259 18 Claims

1. A daylighting system for solar lighting a space having a roof with an opening therein for admission of light, said system comprising:
(a) a frame adapted to be positioned substantially above said opening;
(b) a plurality of generally horizontally extending reflectors on said frame having reflective surfaces adapted to redi-

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rect solar insolation to said opening at least during early and late periods in the solar day;



(c) shading means associated with said reflectors positioned to at least partially shade said opening from solar insolation during at least a portion of the mid solar day.

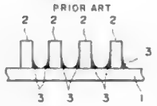
4,820,021

LIGHT-SHIELDING SCREEN AND A PROCESS FOR PRODUCING THE SAME

Yutaka Usuhuchi, Fuji, and Masayoshi Mizuno, Mishima, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 712,203, Mar. 15, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 105,474
Claims priority, application Japan, Mar. 19, 1984, 59-51189
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—276 R 13 Claims

FIG. 1
PRIOR ART



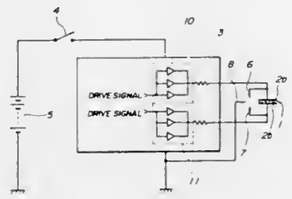
1. A light-shielding screen produced by the process which comprises:
(a) providing a self-supporting resin composition layer;
(b) image-wise exposing the photocurable resin composition layer to actinic radiation through an image-bearing transparency to convert the photocurable resin composition layer to a modified layer having photocured image portions and a plurality of remaining uncured portions, each of said uncured portions extending from one surface of the layer to the other surface of the layer; and
(c) applying a developer to said modified layer to remove said uncured portions, thereby forming hollow portions passing through said modified layer, said hollow portions having their respective upper and lower openings, said upper openings being arranged in coplanar relationship on one surface of said modified layer and said lower openings being arranged in coplanar relationship on the other surface of said modified layer, each hollow portion having an inner wall extending from the circumference of the lower opening substantially parallel with the axis of said hollow portion, said axis being defined by an imaginary straight line extending from the center of the upper opening to the center of the lower opening.

4,820,022

LIQUID CRYSTAL ANTIDAZZLE MIRROR

Hiroshi Demura; Kazuml Hayashi, both of Toyota; Yasuo Oyama, Toyota; Sadao Kokubu; Kouji Takizawa, both of Tanba, and Shigeru Iguchi, Tanba, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Kabushiki Kaisha Tokai Rika Denki Seisakusho, Tanba, both of, Japan

Filed Jul. 16, 1986, Ser. No. 886,539
Claims priority, application Japan, Jul. 17, 1985, 60-109435[U]
Int. Cl.[4] G02F *1/13;* G02B *17/00*
U.S. Cl. 350—331 R 2 Claims



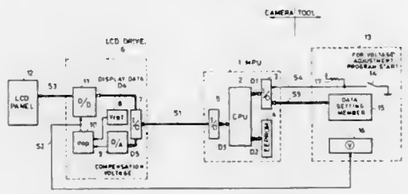
1. A liquid crystal antidazzle mirror comprising;
discharging electrodes respectively provided at liquid crystal electrodes of a liquid crystal element, and
a groundig electrode opposed to the discharging electrodes for discharging static electricity charged in the liquid crystal section element between the discharging electrodes and the grounding electrode.

4,820,023

VOLTAGE ADJUSTING APPARATUS

Toshifumi Ohsawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,383
Claims priority, application Japan, Jan. 12, 1987, 62-3129
Int. Cl.[4] G02F *1/13;* G09G *3/18*
U.S. Cl. 350—331 R 7 Claims



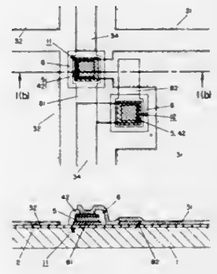
1. A voltage adjusting apparatus for generating an adjustable voltage for use in a device, comprising:
a reference voltage generator for generating a reference voltage;
an electrically erasable non-volatile memory for memorizing an adjusted digital value to change the voltage supplied from said reference voltage generator;
a digital to analog converter for converting the memorized digital value in said memory to a corresponding analog voltage;
a voltage supply for generating an adjustable voltage corresponding to the voltage from said reference voltage generator and the analog voltage value from said digital to analog converter; and
a controller connected to said memory and to said digital to analog converter and arranged to supply a digital value corresponding to the memorized digital value to said digital to analog converter.

4,820,024

ACTIVE MATRIX DISPLAY

Masaharu Nishiura, Yokosuka, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 10, 1986, Ser. No. 929,389
Claims priority, application Japan, Nov. 8, 1985, 60-250149
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—333 3 Claims



1. An active matrix display which employs a pair of transparent insulated substrates between which is positioned an active display material for excitation and includes either scanning or data linear electrodes and pixel electrodes on each substrate and which further includes on one of the substrates a diode ring comprising a parallel pair of first and second oppositely poled diodes between each pixel electrode and each linear electrode characterized in that said one substrate includes a metallic linear electrode and a transparent pixel electrode between which are to be connected in parallel and oppositely poled the pair of thin film diodes; each diode having a first electrode and a second electrode
a metallic wiring layer;
and a transparent conductive wiring layer, characterized in that a portion of the metallic linear electrode interposed between said one substrate and first diode serves as the first electrode of the first diode and a portion of the transparent conductive wiring layer electrically connects the metallic linear electrode and the second electrode of the second diode, and a portion of the pixel electrode electrically contacts the second electrode of the first diode, and the metallic wiring layer provides the first electrode of the second diode and electrically connects it to the pixel electrode.

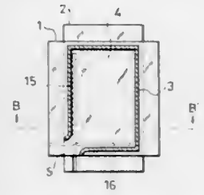
4,820,025

LIQUID CRYSTAL CELL

Jun Nakanowatari, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jan. 12, 1987, Ser. No. 2,193
Claims priority, application Japan, Mar. 6, 1986, 61-49351
Int. Cl.[4] G02F *1/13, 1/133*
U.S. Cl. 350—334 2 Claims

1. In a liquid crystal cell having a pair of opposed substrates, a sealing member for sealing and joining peripheral portions of said substrates so as to form an enclosed interior space defined by said sealing member and opposed inner surfaces of said substrates, and an injection hole formed by an opening in a part of said sealing member for injecting a liquid crystal into said interior space under vacuum pressure,
the improvement comprising:
a groove formed in the inner surface of one of said substrates leading from said injection hole into said interior space, which facilitates rapid injection of said liquid crystal into said interior space, wherein said groove has a width of 300 μm and a depth of 200 μm and a length extending along a corresponding length of one peripheral portion of said substrates.

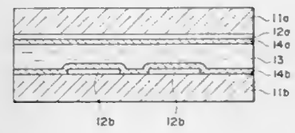


4,820,026

FERROELECTRIC LIQUID CRYSTAL DEVICE WITH MODIFIED POLYVINYL ALCOHOL ALIGNMENT FILM

Shinjiro Okada, Kawasaki; Kazuo Yoshinaga, Machida; Osamu Taniguchi; Hideyuki Kawagishi, both of Kawasaki; Akira Tsuboyama, Tokyo; Yukio Hanyu, Yokohama; Masataka Yamashita, Kawasaki, and Kazuharu Katagiri, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1987, Ser. No. 26,977
Claims priority, application Japan, Mar. 20, 1986, 61-063457; May 15, 1986, 61-109444; May 15, 1986, 61-109445; May 15, 1986, 61-109446; May 15, 1986, 61-109447; May 15, 1986, 61-109448; May 15, 1986, 61-109449; May 15, 1986, 61-109450; May 15, 1986, 61-109451; May 22, 1986, 61-118531; Jun. 3, 1986, 61-128811; Jun. 3, 1986, 61-128812; Jun. 11, 1986, 61-133774; Jun. 11, 1986, 61-133775
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—341 49 Claims



1. In a liquid crystal device, comprising: a pair of parallel substrates and a ferroelectric liquid crystal disposed between the substrates so as to have an arrangement of molecules forming a plurality of layers perpendicular to the faces of said pair of parallel substrates; the improvememt wherein at least one of said pair of parallel substrates has an alignment control film formed of a modified polyvinyl alcohol resin containing silicon having a function of aligning said plurality of layers preferentially in one direction.

4,820,027

ACHROMATIC LIQUID CRYSTAL SHUTTER FOR STEREOSCOPIC AND OTHER APPLICATIONS

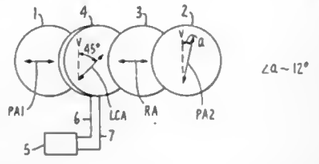
Lenny Lipton, Greenbrae; Arthur Berman, San Jose, and Lawrence D. Meyer, Mill Valley, all of Calif., assignors to Stereo-Graphics Corporation, San Rafael, Calif.

Filed Oct. 30, 1987, Ser. No. 116,242
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—347 E 28 Claims

1. An achromatic liquid crystal shutter system, including:
(a) a first polarizer, having an absorption axis oriented in a first direction;
(b) a first surface mode liquid crystal cell, having a rub axis oriented in a second direction; and

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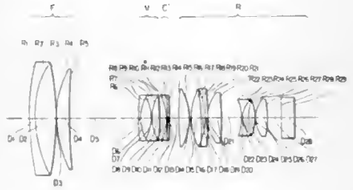
(c) a first analyzer, having a slow axis oriented in a third direction;



$\angle a \sim 12°$

wherein the first, second, and third directions are selected so that the system is capable of being driven so as to have optimal dynamic range.

4,820,028
ZOOM LENS WITH A VARIABLE REFRACTIVE INDEX ELEMENT
Shigeyuki Suda, Tokyo, and Takeshi Baba, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 24, 1985, Ser. No. 813,227
Claims priority, application Japan, Dec. 28, 1984, 59-276492
Int. Cl.[4] G02B *7/11, 15/14, 9/64*
U.S. Cl. 350—423 **3 Claims**



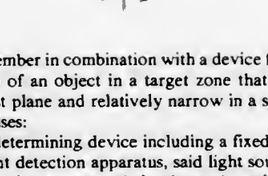
1. An apparatus comprising:
an object optical system imaging an object image and having at least one variable refractive power element;
drive means for varying the refractive power of said variable refractive power element;
an image receiving device for receiving an object image through said object optical system;
first control means for controlling said drive means to move said object image along an optical axis by a predetermined distance;
sharpness detection means for detecting a sharpness of an image projected on said image receiving device in accordance with an image signal derived from said image receiving device and for determining the direction of adjustment by comparing the image signals obtained before and after moving the object image by the predetermined distance; and
second control means for controlling said drive means in accordance with the direction of adjustment.

4,820,029
OBJECTIVE LENS FOR OPTICAL PICKUP
Masato Iwai, Miyagi; Ichiro Morishita, Iwanuma, and Masaru Nakayama, Kakuda, all of Japan, assignors to Alps Electric Co., Ltd., Japan
Filed Aug. 27, 1987, Ser. No. 90,223
Claims priority, application Japan, Oct. 20, 1986, 61-250020
Int. Cl.[4] G02B *3/02*
U.S. Cl. 350—432 **1 Claim**

1. An objective lens for an optical pickup, said lens having a first aspherical surface on which parallel light rays impinge and a second spherical surface that faces an optical disk,
the first aspherical surface lying in a meridian plane of a cartesian coordinate system whose X-axis is taken on the optical axis, the Y-axis is taken in a radial direction of the lens, and the origin is taken at the apex of the aspherical surface,
the first aspherical surface which is axially symmetrical being given by

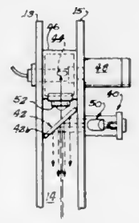
$$x=(y^2/r_1)/\{1+\sqrt{1-(k+1)(y^2/r_1^2)}\}+d\,y^4+e\,y^6+f\,y^8+g\,y^{10}$$

where r_1 is the radius of curvature of a reference inscribed sphere at the apex of the aspherical surface, k is a conic



constant, d is an expansion coefficient of the fourth order, e is an expansion coefficient of the sixth order, f is an expansion coefficient of the eighth order, and g is an expansion coefficient of the tenth order,
the aspherical surface satisfying the following three conditions:
(1) $0.34<(N/2)-\{(N^2-1)/N^2\}(r_1/F)<0.38$
(2) $(1.1\times N)-2.55<k<(0.5\times N)-1.35$
(3) $N\geqq 1.7$
where N is the index of refraction of the medium of the lens at the wavelength of the incident light, and F is the focal length.

4,820,030
LENS ARRANGEMENT
James L. Griffin, Carpentersville, Ill., assignor to Wells-Gardner Electronics Corporation, Chicago, Ill.
Filed Jul. 29, 1985, Ser. No. 759,807
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—434 **9 Claims**



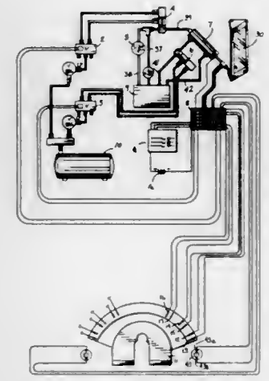
1. A lens member in combination with a device for determining a location of an object in a target zone that is relatively broad in a first plane and relatively narrow in a second plane, which comprises:
a location determining device including a fixed light source and a light detection apparatus, said light source and said light detection apparatus being located outside the target zone, and reflector assemblies extending around a portion of the periphery of the target zone for reflecting light from the light source back toward the light detection apparatus, and
a lens member for redirecting beams of light which diverge in a generally conical pattern from the fixed light source, said lens member configured and located between said light source and said target zone for passing said diverging beams of light from said light source therethrough substantially without changing the direction of said beams in a first plane, and for redirecting said diverging beams of light from said light source into substantially parallel beams of light as they pass through said lens member in any cross-sectional plane through said lens member which is substantially perpendicular with said first plane, said light distribution means distributing the beams redirected in said first plane generally into the broad first plane of the target zone, thereby intensifying the light distributed in the relatively broad first plane of the target zone and reflected back toward the light detection apparatus by the reflector assemblies.

4,820,031
BINOCULAR PERISCOPE VIEWING DEVICE INCLUDING TRIPLE PRISM FOR IMAGE SPLITTING AND ELONGATE HEAD COLUMN
William A. Kastendieck, Wylie, and Robert Wallace, Garland, both of Tex., assignors to Varo, Inc., Garland, Tex.
Continuation of Ser. No. 884,731, Jul. 11, 1986, Pat. No. 4,737,023. This application Feb. 8, 1988, Ser. No. 153,079
Int. Cl.[4] G02B *23/04, 23/12, 23/08, 27/10*
U.S. Cl. 350—538 **15 Claims**



1. A binocular periscope viewing system, comprising:
a reflector for redirecting an image from a top incoming horizontal path to a vertical optical path;
an objective lens assembly disposed in said vertical optical path;
an electron image intensifier disposed in said vertical optical path for intensifying the image;
an integral triple prism having a first reflective surface disposed in the vertical optical path for redirecting the image forwardly in a lower horizontal optical path, second and third reflective surfaces each disposed in the lower horizontal optical path for redirecting the image in opposite lateral horizontal directions orthogonal to said vertical optical path and orthogonal to said lower horizontal optical path;
a pair of turning reflectors each for redirecting a respective image of one of said opposite lateral horizontal directions to a common parallel forward horizontal path, the common parallel forward horizontal paths being displaced with respect to the incoming horizontal path; and
an elongate head column incorporating said reflector, said column comprised of a material having an index of refraction substantially greater than unity, said head column incorporating a large portion of said vertical optical path and operable to keep the light of the image concentrated.

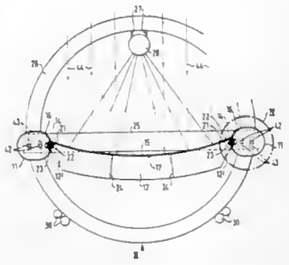
4,820,032
AUTOMATED ANGULATING MIRROR
Robert W. Thompson, Jr., 1125 University St., Clarkston, Wash. 99403
Filed Aug. 18, 1987, Ser. No. 86,645
Int. Cl.[4] B60R *1/06, 1/08;* **G02B** *7/18*
U.S. Cl. 350—605 **7 Claims**



1. An actuating device for automatically controlling the position of a movable mounted mirror in response to a relative positioning of the vehicle with respect to a trailer pivotably mounted to the vehicle about and axis, said device comprising;
mirror actuating means comprising a motor and means for powering hydraulic fluid from a reservoir;
a hydraulic actuated electrical piston and cylinder arrangement, said piston being directly connected to said mirror;
a first electric power source for powering said motor;
a check valve in direct hydraulic connection to said reservoir;
a first solenoid valve in direct hydraulic connection to said hydraulic actuated electrical cylinder;
said first solenoid valve for directional flow control of said hydraulic fluid between said reservoir and said hydraulic actuated electrical cylinder;
a first switching means for opening said first solenoid valve and for closing said check valve and causing flow of said hydraulic fluid to said hydraulic actuated electrical cylinder whereby said piston is moved to directly move said mirror;
a second switching means for closing said first solenoid valve, causing said hydraulic fluid to open said check valve to return hydraulic fluid to said reservoir;
a third switching means for opening a second solenoid valve, releasing said hydraulic fluid from said hydraulic actuated electrical cylinder to said reservoir;
a fourth switching means for closing said second solenoid valve;
a second electrical power source for said first, second, third and fourth switching means;
and a circuit board for controlling current between all said switching means and said first and said second solenoid valves.

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4,820,033
SOLAR MIRROR APPARATUS
Erwin Sick, Icking, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany
Filed Dec. 23, 1987, Ser. No. 137,209
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1986, 3644759
Int. Cl.[4] G02B 5/10; F24J 3/02
U.S. Cl. 350—613 12 Claims



1. A solar mirror apparatus, comprising:
an elongate carrying frame, having a longitudinal axis, adapted to be rotated about said longitudinal axis;
first and second clamping section supports, spaced apart and disposed parallel to said longitudinal axis, each said support including an elongate abutment, parallel to and facing said longitudinal axis, adapted to exert a compressive force, and further including an elongate slot, parallel to said longitudinal axis;
means for adjustably connecting said supports to said frame such that each said support can swivel about a support swivel axis parallel to said longitudinal axis;
a parabolic web including first and second parallel sides, each said side including a swivel pin defining a web swivel axis parallel to said longitudinal axis;
first and second pivotal connecting means for pivotally connecting said web to said supports, each said pivotal connecting means adapted to slidadably attach to a said support and rotably engage a said swivel pin, thereby pivotally connecting said web to said supports;
an elastically flexible sheet metal mirror having first and second parallel sides, adapted to be releasably held against and conformed to the shape of said parabolic web, said mirror sides contacting said abutments and being forced by the compressive force exerted by said abutments to conform to the parabolic shape of said web, an upper surface of said mirror defining a parabolic mirror having a focal line parallel to said longitudinal axis when so shaped; and
an elongate radiation receiver, held by said frame and disposed at said focal line, for receiving solar radiation reflected by said mirror;
said means for adjustably connecting allowing the supports to be swiveled to a release position permitting said mirror to be placed on or removed from said web, whereupon said means for adjustably connecting is tightened placing said supports in a mirror retaining position,
said pivotal connecting means controlling the contact between said mirror sides and said abutments, and controlling thereby the compressive force exerted by said abutments to force said mirror to assume the parabolic shape of said web;
said frame being rotated to cause said mirror to face the sun.

4,820,034
TEMPLE END PIECE FOR A TEMPLE OF A SPECTACLE FRAME
Wilhelm Anger, St. Moritz, Switzerland, assignor to Eyemetrics-Systems AG, Chur, Switzerland
Division of Ser. No. 741,847, Jun. 6, 1985, Pat. No. 4,684,226.
This application Nov. 10, 1986, Ser. No. 929,006
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446184
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.[4] G02C 5/16
U.S. Cl. 351—123 2 Claims

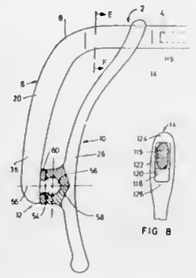
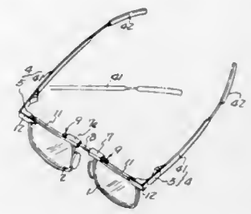


FIG 8

1. A temple end piece for a temple of a spectacle frame having an essentially straight first segment extending in the longitudinal direction of the temple, an elongated fitting segment intended for contacting the head and/or behind the ear and extending downwardly with respect to the first segment, and a connecting segment being more rigid than said fitting segment connecting the first segment to the fitting segment at or below the longitudinal middle of of the fitting segment whereby at least the upper half of the fitting segment constitutes an end region projecting freely upwardly toward said first segment, from a transition area between the connecting and the fitting segments, said fitting segment being deflectable relative to said connecting segment in said transition area, and the upper end of the fitting segment being engageable with the first segment in such a manner that said upper end can be moved freely in the longitudinal direction of the first segment from a first position rearwardly toward said connecting segment and simultaneously the first segment is enclosed by the upper end of the fitting segment, said connectings segment and said fitting segment being separately made components, further comprising a ball-and-socket joint connecting the connecting segment with the fitting segment.

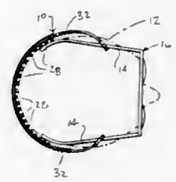
4,820,035
COLLAPSIBLE SPECTACLES
Kouji Kanda, Osaka, Japan, assignor to Kanda Optical Co., Ltd., Japan
Continuation of Ser. No. 596,505, Apr. 3, 1984, abandoned, which is a continuation of Ser. No. 325,437, Nov. 6, 1981, abandoned. This application Feb. 28, 1985, Ser. No. 708,101
Claims priority, application Japan, Aug. 1, 1980, 55-109910
Int. Cl.[4] G02C 5/22
U.S. Cl. 351—153 2 Claims

1. Collapsible glasses which are foldable to a flat shape fittable into a carrying case and easily removable from the case, said glasses comprising two lens frames provided with temples and connected together by a bridge extending from an upper side of one lens frame and being slidably engaged with an upper side of the other lens frame to render one lens frame movable toward or away from the other, characterized in that the bridge permits said lens frames to both be moved towards each other to a near position for folding and storage in the carrying case and also be moved away to a distant position for the wearer;
each of said temples further comprising:
an auxiliary temple segment pivotally hinged at its end portion to an upper side of the lens frame for rotation in a plane perpendicular to and from the plane of said lens frames to the flat shape for storage in the case;



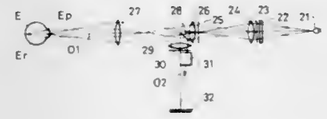
a temple main body hinged to the other end of said auxiliary temple segment, thereby permitting rotation of said temple main body in a plane perpendicular to the plane of rotation of said auxiliary temple segment, to and from the flat shape when the case is open; and
biasing means between said auxiliary temple segment and said lens frames for biasing said auxiliary temple segment toward the plane perpendicular to the plane of said lens frames and out of the case when the case is opened.

4,820,036
HEADBAND FOR RETENTION OF GLASSES
Wilson Seet, 116 Lobo Vista, Novato, Calif. 94947
Filed May 11, 1987, Ser. No. 49,138
Int. Cl.[4] G02C 3/02, 1/00
U.S. Cl. 351—156 19 Claims



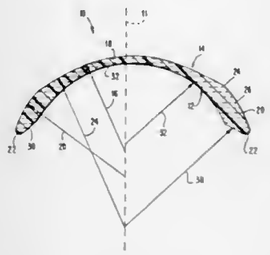
1. A headband for retention of glasses on a wearer's head, comprising,
an integrally formed, one-piece strap of flexible material,
the strap of material having end members at its two ends, each end member having an opening for tightly receiving a temple of a pair of glasses, inserted through the opening,
and the strap having a multiplicity of nipples on an inside surface positioned to engage the back of the wearer's head, whereby the nipples tend to engage in the hair of the wearer to prevent slipping movement of the headband and whereby the nipples tend to space the headband away from the head sufficiently to allow some air circulation between the headband and the wearer's head for comfort of the wearer.

4,820,037
APPARATUS FOR MEASURING THE REFRACTIVE POWER OF AN EYE
Yoshimi Kobayakawa, Yokohama, and Kazuhiro Matsumoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 814,966, Dec. 31, 1985, abandoned.
This application Aug. 15, 1988, Ser. No. 232,558
Claims priority, application Japan, Jan. 10, 1985, 60-2494; Jun. 14, 1985, 60-129399; Jul. 5, 1985, 60-146647
Int. Cl.[4] A61B 3/10, 3/14
U.S. Cl. 351—211 15 Claims



1. An apparatus for measuring the refractive power of an eye having:
a target projecting system having no moving parts for projecting a target onto a fundus of an eye to be examined through a predetermined optical path of a pupil of the examined eye;
light-receiving optical means for receiving light beams reflected by the eye fundus through paths corresponding to at least three meridian directions of the pupil other than said predetermined path, said light-receiving optical system having a plurality of image rotating prisms for rotating the meridian direction of each respective each light beam into a predetermined direction common with the other respective light beams; and
light detecting means for detecting the position of each eye fundus reflection light beam in said predetermined common direction and determining the refractive power of an examined eye.

4,820,038
HYDROGEL CONTACT LENS
Ronald G. Seger, Mountain View, and Donald O. Mutti, San Jose, both of Calif., assignors to CooperVision, Inc., Palo Alto, Calif.
Filed Aug. 14, 1986, Ser. No. 895,456
Int. Cl.[4] G02C 7/04
U.S. Cl. 351—160 H 50 Claims



1. A soft contact lens comprising:
a body hydrogel lens material having a water content at least 60% of total weight,
said body having a low minus power configuration of −0.50 to −5.00 diopters,
said body having an anterior surface, a posterior surface, an anterior central optical zone, a peripheral edge, and a

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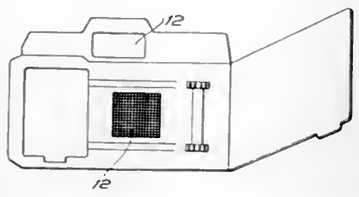
peripheral zone generally between said optical zone and said peripheral edge,
said posterior surface being formed by molding, cast-molding or spin casting said material to the desired surface shape with an ultra-smooth surface finish,
said posterior surface being defined by a base curve in said posterior optical zone and a posterior secondary curve generally adjacent said peripheral edge.
said body having a diameter less than 14.5 mm,
said body having a center thickness in cross section no greater than 0.08 mm,
said peripheral zone having a thickness in cross section greater than said center thickness of said body,
said peripheral zone defining an annular lens rim enlarged from the surface of said anterior surface, and
said rim having a thickness sufficient so that the eyelid pushes said body on the surface of the eye and so that said body is not distorted and has enough rigidity for proper centration.

4,820,039

MEDICAL APPARATUS FOR DIAGNOSING EYE CONDITIONS

Riyaz Ahmad, 9 Melrose Grove, Spinneyfield, Rotherham S60 3NA, England

Filed Nov. 9, 1987, Ser. No. 117,821
Claims priority, application United Kingdom, Mar. 11, 1986, 8626188
Int. Cl.[4] A61B *3/10, 3/14*
U.S. Cl. 351—212 **5 Claims**



1. A photographic apparatus for use in diagnosing an monitoring various conditions of the eye comprising:
a camera;
a transparent screen mounted in a plane of said camera in which an image is produced, said transparent screen having uniform markings thereon with known spaces therebetween so that said markings are reproduced on a photograph or transparency of an image produced by the camera and so that when a photograph or transparency of a patient's eye has been produced, dimensions of the features of the eye can be determined with reference to the uniform markings;
a disc of circles mounted on a lens of the camera for producing reflections of the circles on a patient's cornea so that the circles are reproduced on a photograph or transparency of an image produced by within the camera.

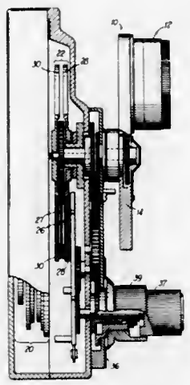
4,820,040

CROSSED CYLINDER LENSES REFRACTOR AND METHOD OF USE

Clinton N. Sims, 3432 W. Riverside Dr., Fort Myers, Fla. 33901

Continuation of Ser. No. 670,398, Nov. 9, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 23,900
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—234 **20 Claims**

1. A refractor, comprising of a pair of batteries, each battery comprising:
a. a viewing tube,
b. a selectable crossed cylinder lens assembly, the assembly comprising at least one lens-carrying crossed cylinder disc carrying a plurality of crossed cylinder lenses of graded power, and



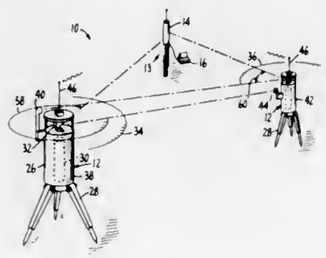
c. means for rotating the disc whereby any selected one crossed cylinder lens in the disk may be positioned in alignment with the viewing tube.

4,820,041

POSITION SENSING SYSTEM FOR SURVEYING AND GRADING

Richard W. Davidson, Dublin, and John W. Fletcher, Pleasanton, both of Calif., assignors to Agtek Development Co., Inc., Livermore, Calif.

Filed Nov. 12, 1986, Ser. No. 930,792
Int. Cl.[4] G01C *3/20, 15/06;* **G01B** *11/26;* **E02F** *3/76*
U.S. Cl. 356—1 **91 Claims**



1. A position sensing apparatus comprising:
a first energy beam transmitter operable for projecting a first energy beam that sweeps in a plane across an area in which position sensing is to occur;
first reference signal means for generating a first reference signal when said first energy beam is aligned with a first reference line;
a second energy beam transmitter operable for projecting a second energy beam that sweeps in a plane across said area, wherein said first and second energy beam transmitters are positioned apart;
second reference signal means for generating a second reference signal when said second energy beam is aligned with a second reference line;
an energy beam receiver operable for detecting said first and second energy beams, wherein said energy beam receiver is placed at a location at which the position is to be determined;

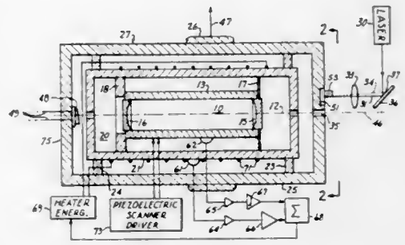
a reference signal receiver operable for receiving said first and second reference signals; and
processing means coupled to said energy beam and reference signal receivers and responsive to the timing of the detection of said energy beams relative to the receipt of said reference signals for determining the position of said energy beam receiver relative to said reference lines and said energy beam transmitters.

4,820,042

OPTICAL CAVITY SYSTEMS

Richard L. Barger, Rollinsville, Colo., assignor to Newport Corporation, Fountain Valley, Calif.

Filed Oct. 15, 1987, Ser. No. 108,750
Int. Cl.[4] G01B *11/26*
U.S. Cl. 356—153 **18 Claims**



1. A method of mode coupling a light beam into an optical cavity having a cavity axis, comprising in combination the steps of:
positioning a mirror at right angles to, but laterally of, said cavity axis;
providing a rigid interconnection of said mirror and cavity;
effecting a reflection of light of said beam with said mirror along a geometric ray originating at said mirror;
adjusting said rigidly interconnected mirror until the latter ray coincides with said beam; and
retaining said geometric ray in place while moving said mirror and optical cavity so that said cavity axis moves translatorily relative to said retained geometric ray, until said cavity axis coincides with said retained geometric ray and thereby with said light beam.

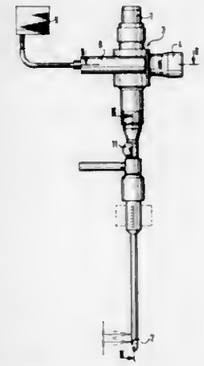
4,820,043

TECHNOSCOPE FOR DETERMINING THE EXTENT OF DAMAGE TO AN OBJECT

Jörg Diener, Oberderdingen, Fed. Rep. of Germany, assignor to Richard Wolf, GmbH, Knittlingen, Fed. Rep. of Germany

Filed Mar. 7, 1988, Ser. No. 164,831
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707073
Int. Cl.[4] G01B *11/02;* **G02B** *23/26*
U.S. Cl. 356—241 **2 Claims**

1. In a technoscope for determining the extent of damage to an object and including an endoscope having a proximal ocular, a distal prism for lateral viewing, and being displaceable axially by a fixed stroke in a guide which can be fixed with respect to the object, and a scale for coinciding with a point of the object and being observable through the ocular in both terminal positions of the endoscope stroke, the improvement which comprises:
a transparent screen plate which incorporates said scale and which is displaceable transversely of the endoscope axis by means of a micrometer screw which is operable from outside the endoscope, a first measurement value transmitter for mechanically detecting the displacement value of the endoscope and for converting the said displacement value into an electrical signal which is fed to a calculator to calculate the object distance, means for pivotally displacing said distal prism, and a second measurement value transmitter for mechanically detecting the pivotal displacement value of said distal prism and for converting the



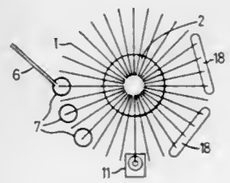
pivotal displacement value into an electrical signal which is fed to the calculator to calculate the extent of the damage.

4,820,044

TRANSPORT DETECTOR SYSTEM

James S. Crighton, Farnborough, and David J. Malcolme-Lawes, Buckhurst Hill, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Nov. 12, 1987, Ser. No. 119,575
Claims priority, application United Kingdom, Nov. 15, 1986, 8627362; Jul. 11, 1987, 8716384
Int. Cl.[4] G01N *21/72, 30/68, 30/74, 30/82*
U.S. Cl. 356—315 **8 Claims**



1. A transport detector system comprising
(a) means for supplying liquid,
(b) a plurality of moveable spokes, the spokes being positioned to pass in sequence across the liquid supply means whereby liquid is deposited on the spokes, the spokes being constructed from a refractory inorganic material of low thermal conductivity,
(c) one or more evaporators, positioned so that the spokes pass sequentially through it or them after liquid has been deposited on the spokes,
(d) a detector positioned so that the spokes pass sequentially through it after passage through said one or more evaporators,
(e) one or more coolers, positioned so that the spokes pass through it or them after passage through the detector, and
(f) a stepper motor adapted to move the spokes in a series of discrete steps.

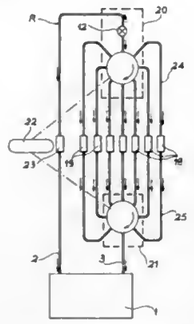
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4,820,045

EQUIPMENT FOR THE EMISSION AND DISTRIBUTION OF LIGHT BY OPTICAL FIBERS, PARTICULARLY FOR IN-LINE SPECTROPHOTOMETRIC CONTROL WITH THE AID OF A DOUBLE BEAM SPECTROPHOTOMETER

Gilbert Boisde, Bures, and Michel Quanquin, Montigny Le Bretonneux, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Sep. 3, 1985, Ser. No. 772,243
Claims priority, application France, Sep. 4, 1984, 84 13611
Int. Cl.[4] G01J *3/42*
U.S. Cl. 356—319 **4 Claims**



1. A device for the emission and distribution of light by optical fibres, particularly for in-line spectrophotometric control, to be used in conjunction with a double beam spectrophotometer having one channel for the reference and one channel for the measurement, an internal emitting light source, a monochromator, a compartment having optical probes and a light detector, said device comprising:
- at least one complementary light source emitting through a series of optical fibres;
- means for passing light through one of said series of optical fibres permanently towards a reference cell;
- means for passing light through at least one of the remaining series of optical fibres sequentially towards each of n measuring cells; and
- means including said series of optical fibres for passing light information from the reference cell and sequentially from each of the n measuring cells, respectively, to the reference channel and the measuring channel of the spectrophotometer.

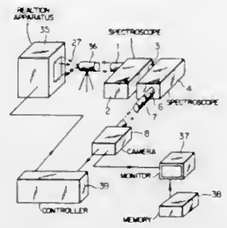
4,820,046

SPECTROSCOPE APPARATUS AND REACTION APPARATUS USING THE SAME

Kenichi Sohma; Shigeru Azuhata, both of Hitachi; Kiyoshi Narato, Ibaraki; Tooru Inada, Hitachi; Hironobu Kobayashi, Katsuta; Norio Arashi, and Hiroshi Miyadera, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 120,593
Claims priority, application Japan, Dec. 1, 1986, 61-286282; Apr. 8, 1987, 62-84762
Int. Cl.[4] G01J *3/18, 3/30, 3/443*
U.S. Cl. 356—328 **5 Claims**

1. An apparatus for controlling reaction which is accompanied by light emission, comprising:
- a reaction apparatus for generating a light emitting body;
- an optical guide for light from said light emitting body;
- a spectroscope apparatus for separating light from said optical guide into spectral components, said spectroscope apparatus including a first spectroscope, a second spectroscope coupled with said first spectroscope through an intermediate slit, and drive means, said first spectroscope being made up of a collimator system and a light dispersing optical system, said light dispersing optical system including a light dispersing grating and a first optical system for leading the dispersed light from said light dispersing grating to said intermediate slit, said collimator system converting light rays from said optical guide into parallel rays incident on said light dispersing grating, said second spectroscope being made up of a light mixing optical system and an image formation optical system for forming an image of mixed light from said light mixing optical system, said light mixing optical system including a light mixing grating and a second optical system for focusing light from said intermediate slit on said light mixing grating, said drive means driving said light dispersing optical system and said light mixing optical system so



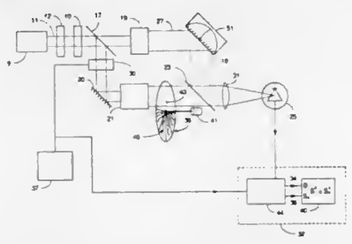
that said light dispersing optical system and said light mixing optical system are optically symmetrical with respect to said intermediate slit;
- a monitor for displaying an image, said image being formed of mixed light corresponding to that part of said spectral components which exists in one of different wavelength ranges;
- a memory for storing a plurality of reference images; and
- a controller for comparing a plurality of images corresponding to said wavelength ranges with the reference images read out of said memory, to control variable quantities concerning the state of said light emitting body so that at least one of said images agrees with a corresponding one of said reference images.

4,820,047

LASER HETERODYNE APPARATUS FOR MEASURING OPTICAL POWER

James J. Snyder, 707 Broadmoor Dr., San Jose, Calif. 95129

Filed Dec. 22, 1987, Ser. No. 136,919
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 **13 Claims**



1. An apparatus for measuring optical power comprising:
means for producing two optical beams such that at some point and thereafter along an optical path of the beams, a well defined frequency difference exists between the two beams, one of the two beams having a known or constant optical power, said beam hereinafter called the reference beam, and the other of the two beams being the beam whose power is to be measured, said measured beam hereinafter called the test beam;
combining means for coherently combining the two optical beams;
optical detection means for receiving the combined two optical beams, and in response thereto for providing an electrical signal that is modulated at the difference frequency of the optical fields of the two optical beams, the electrical signal being functionally related to the heterodyne product of the two fields;
electrical power detector means for measuring the electrical power of said electrical signal.

4,820,048

DETECTOR FOR A SPECTROMETER

Thomas W. Barnard, Weston, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 19, 1987, Ser. No. 123,025
Int. Cl.[4] G01J *3/18, 3/36*
U.S. Cl. 356—328 **21 Claims**



1. A solid state array detector useful in an optical spectrometer of the type that includes a crossed dispersion system receptive of radiation for producing a two dimensional display of spectral lines characteristic of at least one atomic element, comprising:
- a solid-state chip with a front surface having thereon a two dimensional array of photosensitive pixels receptive of radiation of selected spectral lines and proximate background radiation, the pixels being arranged in a plurality of sub-arrays with each sub-array consisting of at least one of the pixels and being positioned at a projection location on the front surface such as to be receptive of at least one of the selected spectral lines and the proximate background radiation, each sub-array having an area on the surface only at a corresponding projection location of the selected spectral line and the proximate background radiation; and
- readout means operatively connected to the pixels for producing readout signals correlating with intensities of the selected spectral lines, the readout means including a plurality of electronic components formed in the chip among the sub-arrays.

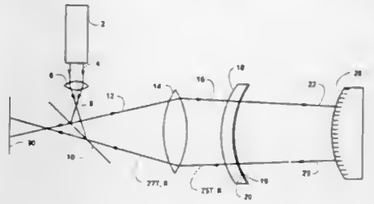
4,820,049

COATING AND METHOD FOR TESTING PLANO AND SPHERICAL WAVEFRONT PRODUCING OPTICAL SURFACES AND SYSTEMS HAVING A BROAD RANGE OF REFLECTIVITIES

James F. Biegen, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Oct. 16, 1987, Ser. No. 109,715
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—360 **20 Claims**

1. In a test system comprising a Fizeau spherical or plano wavefront interferometer, said interferometer comprising a source of light for providing a wavefront, a plano or spherical test surface, an optical element located in said wavefront and having a reference surface normal to said wavefront, said reference surface comprising a last surface with respect to the direction of said wavefront, said reference surface producing a reflected reference wavefront and a transmitted test wavefront which is directed at a common center of curvature of said reference surface and said plano or spherical test surface, said test wavefront interacting with said test surface and being returned from said test surface by reflection back through said reference surface, and means for interfering said reflected



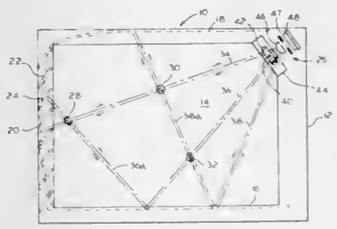
wavefront and reflected test wavefront for producing two beam interference fringes; the improvement comprising a partially reflective, partially absorbtive, partially transmissive beam splitting coating on said reference surface, said coating having a fixed reflectivity and transmittance such that there will be only two beam interference and the contrast of said two beam interference fringes is substantially equalized with respect to said test surface reflectivity.

4,820,050

SOLID-STATE OPTICAL POSITION DETERMINING APPARATUS

James L. Griffin, Carpentersville, Ill., assignor to Wells-Gardner Electronics Corporation, Chicago, Ill.

Filed Apr. 28, 1987, Ser. No. 43,503
Int. Cl.[4] G01B *11/00, 11/03*
U.S. Cl. 356—375 **19 Claims**



1. An optical position determining apparatus for detecting radiant energy reflected from a target zone comprising:
- emission means for generating and for emitting of radiant energy;
- means for redirecting the radiant energy across the target zone;
- means for reflecting the radiant energy back from the target zone;
- detector means for sensing the presence of radiant energy;
- said emission means being stationary and emitting a beam of radiant energy toward said redirecting means to be directed therefrom along a primary beam path in a first direction to the target zone;
- said detector means being located along said primary beam path for detecting the radiant energy reflected from the target zone back along the primary beam path in a second direction substantially opposite to said first direction;
- said redirecting means being configured for permitting at least a portion of an incident beam traveling in said second

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direction along said primary beam path to pass therethrough for detection by said detector means;

said detector means including a CCD (charge coupled device) linear image sensor formed of a plurality of sensor elements, said sensor elements being pulsed in successive order for scanning the target zone for the presence of the reflected radiant energy and for producing an electrical signal which is proportional to the intensity of the radiant energy reflected from the target zone in response to the presence of such reflected radiant energy; and electronic processing circuit means connected to said linear image sensor for processing of said electrical signal, said electronic processing circuit means including interface circuit means for indicating angular displacements from a reference so that when an obstruction is located within the target zone a first notch having a secondary angle and a second notch having a primary angle will appear in said electrical signal.

4,820,051

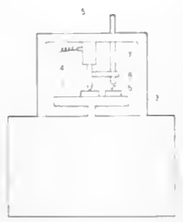
APPARATUS FOR DETERMINING MICROHARDNESS

Masahiro Yanagisawa, and Yoshihiro Motomura, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Aug. 21, 1986, Ser. No. 899,334

Int. Cl.[4] G01B *11/22*; G01N *3/00, 3/48*

U.S. Cl. 356—378 **12 Claims**



1. An apparatus for determining the microhardness of a specimen by measuring both a penetration depth of an indenter into the specimen and a load applied to the indenter for penetrating the same into the specimen, said apparatus comprising:

means connected directly in a straight line to the indenter for directly applying a load to the indenter in order to penetrate the indenter into the specimen;

means having a load receiving center located in alignment with the indenter and receiving the specimen which is penetrated by the indenter for measuring the load applied to the indenter; and

means for detecting the penetration depth of the indenter into the specimen, the penetration-depth detecting means including means mounted to move together with the indenter for emitting a light beam to a predetermined position which is positioned at a level which is maintained unchanged with respect to the level of a surface of the specimen, means for receiving the light beam reflected from said predetermined position, and means for detecting the intensity of the received light beam to determine the penetration depth of the indenter in response to the variation of the intensity of the received light beam, said intensity variation being responsive to the displacement of the indenter.

4,820,052

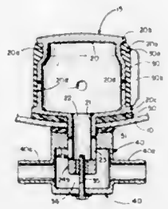
AIR DISTRIBUTION HEAD

Fred C. Krysel, Minnetonka, Minn., assignor to Polar Tank Trailer, Inc., Holdingford, Minn.

Filed Dec. 23, 1987, Ser. No. 136,951

Int. Cl.[4] B01F *13/02*; B05B *1/30*

U.S. Cl. 366—101 **9 Claims**



1. Apparatus for agitating and aerating finely divided material in a hopper, said apparatus comprising:

a hollow generally cylindrical air distributor body having upper and lower portions and defining a chamber therewithin with air flow passages formed there-through,

a resiliently yieldable skirt member mounted around the outer side wall of said cylindrical distributor body to form a head assembly and being anchored at the upper portion of said body with the lower circumferential portion of said skirt being free to expand under the pressure of air discharged through the air flow openings,

means for supplying air under pressure into the chamber within said body, and

means for mounting the head assembly within a lower portion of a hopper unit to permit the air discharged around the lower circumferential portion of the resilient skirt portion to flow into finally divided material contained in the hopper to assist in discharging said material through an opening in the bottom of the hopper.

4,820,053

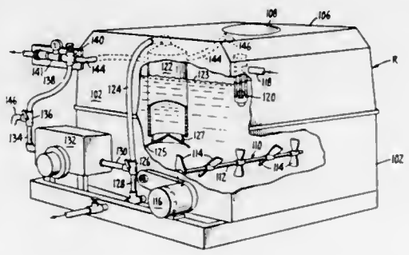
GYPSUM DISSOLUTION SYSTEM

Jerry B. Rivers, Visalia, Calif., assignor to Domtar Gypsum Inc., Oakland, Calif.

Division of Ser. No. 87,695, Aug. 20, 1987. This application May 17, 1988, Ser. No. 194,942

Int. Cl.[4] B01F *15/02*

U.S. Cl. 366—137 **8 Claims**



1. Apparatus for mixing gypsum powder and water in order to form a gypsum slurry with water and to dissolve gypsum therein for use in an irrigation system comprising,

a tank for mixing gypsum and water to form a gypsum slurry, said tank having an upper section and a lower section,

valve means for maintaining said gypsum slurry at a constant level within said tank,

means located in the lower section of said tank for vigorously agitating said gypsum and water to obtain thorough mixing thereof,

means for recirculating part of said gypsum and water within said tank having an inlet in the upper section of said tank through which said gypsum slurry is discharged from said tank and a return outlet in the lower section of said tank through which said gypsum slurry is discharged back into the tank for further mixing and blending with newly fed gypsum and water,

pump means intermediate said inlet and said return outlet,

elongated extractor means in the upper section of said tank extending from approximately the midsection thereof to above the level of the gypsum slurry therein, said extractor means having a bottom, a top, and openings at the bottom and top thereof to enable the gypsum slurry to pass through a relatively quiescent zone as the gypsum slurry flows upwardly through said extractor means, and

a pump for withdrawing said gypsum and water from said tank through said upper discharge opening in said extractor means.

4,820,054

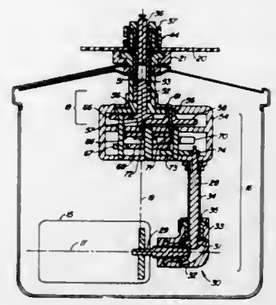
STIRRING MECHANISM

Don M. Wong, 2296 Bunker Hill Dr., San Mateo, Calif. 94402

Filed Dec. 31, 1987, Ser. No. 140,176

Int. Cl.[4] B01F *7/14*; A47J *27/00*

U.S. Cl. 366—287 **12 Claims**



1. Apparatus for use in food preparation for automatically stirring or otherwise manipulating ingredients in a cooking vessel, comprising:

an ingredient-manipulating implement disposed within said vessel for engaging said ingredients;

first means, coupled to said implement, for revolving said implement about a generally horizontal axis disposed to bring said implement into manipulative association with said ingredients wherein said first means comprises:

a horizontal shaft coupled to said implement;

a first vertical shaft;

angle-conversion means rotationally coupling said horizontal and first vertical shafts, whereby rotation of said first vertical shaft produces rotation of said implement about said horizontal axis;

a second vertical shaft adapted to be coupled to a drive means and disposed coaxially with said vertical axis of rotation; and offset means for rotationally coupling said first and second vertical shafts and for providing an offset of said first vertical shaft from said vertical axis of rotation so as to enhance the permissible horizontal reach of said implement within said vessel; and

second means for revolving said implement and said horizontal axis about a vertical axis, whereby said implement is horizontally displaceable about said vessel and the motions of said implement about said horizontal and vertical axes co-function to produce a desired manipulation of said ingredients.

4,820,055

APPARATUS FOR ADJUSTING A MASK WITH AT LEAST ONE ADJUSTMENT MARK RELATIVE TO A SEMI-CONDUCTOR WAFER PROVIDED WITH AT LEAST ONE LATTICE STRUCTURE

Karl-Heinz Müller, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 25, 1986, Ser. No. 899,925

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1985, 3530439

Int. Cl.[4] G03F *9/00*; H01L *21/68*

U.S. Cl. 356—401 **8 Claims**



1. In an apparatus for adjusting a mask relative to a semi-conductor wafer, said wafer being provided with at least one lattice structure, said mask being provided with at least one adjusting mark, each of said lattice structures comprising diffraction gratings having different grid directions, said apparatus including means for imaging an adjustment mark of the mask onto a lattice structure by projecting light at the structure, and means for receiving a diffracted light patterns from the structure, the improvements comprising at least one of said lattice structures comprising at least two gratings having different grid directions, each of said gratings having at least two sub-gratings with different grid spacings to discriminate misalignment in opposite directions, said adjustment mark having at least one portion for each of the gratings provided with two opposite edges so that misalignment in each of the opposite directions presents uncovered parts of sub-gratings with different grid spacings for each direction respectively.

4,820,056

FLUIDIZATION APPARATUS

Arkadijus Rese, Trübbach, Switzerland, assignor to Wagner International AG, Switzerland

Filed Apr. 2, 1987, Ser. No. 34,209

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1986, 3611039

Int. Cl.[4] B01F *11/00*

U.S. Cl. 366—101 **10 Claims**

1. A powder fluidization apparatus comprising:

a housing having an upper portion and a lower portion separated by an airpermeable filter, said upper housing portion having a floor with an opening substantially the same size as said filter;

means for feeding powder to said upper portion of said housing;

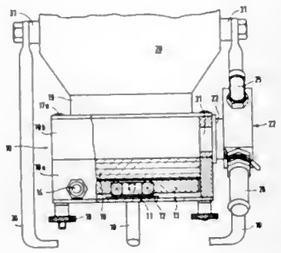
an air turbine mounted in said lower portion of said housing;

means for rotating said air turbine and for generating an air flow through said filter to fluidize said powder in said upper portion of said housing;

said air turbine having an unbalanced mass so that said turbine, during rotation, mechanically vibrates said housing

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and said powder therein to assist in fluidizing said powder; and



means connected to said upper portion of said housing for entraining the fluidized powder therein in a further air flow for discharging the entrained, fluidized powder from said upper portion of said housing.

4,820,057

METHOD AND APPARATUS TO CONTACTLESSLY MEASURE THE BRAKE TEMPERATURES OF PASSING RAILROAD CARS

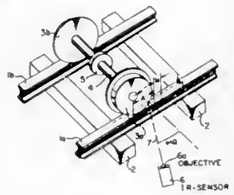
Dietmar Berndt, Koblenz, Fed. Rep. of Germany, assignor to Signaltechnik GmbH, Koblenz, Fed. Rep. of Germany

Filed Oct. 16, 1987, Ser. No. 109,931

Claims priority, application European Pat. Off., Oct. 28, 1986, 86/114939.1

Int. Cl.⁴ G01J *5/10*

U.S. Cl. 374—141 **2 Claims**



1. A method for contactlessly measuring the brake temperature of railroad cars comprising an objective followed by an infrared sensor feeding infrared rays emitted from a brake or wheel to said infrared sensor along a measurement axis defined by said sensor and said objective, wherein:

(a) said measurement axis (7) is directed toward passing wheels, (*3a*, *3b*) of rail cars so that it is incident on a wheel flange (*3a*) at a height (H) from 1 to 5 cm above the top of rails on which said rails ride;

(b) said measurement axis (7) subtends a height angle alpha of 10° to 20° with a plane of two upper edges of said rails;

(c) said measurement axis (7) subtends a side angle omega of 7° to 18° with a plane of two upper edges of said rails (*1a*, *1b*);

(d) activating a measurement apparatus the moment the wheel has entered said measurement axis by a defined segment and emitting a signal when the wheel leaves to define a time range; and

(e) extending the active time of said measurement apparatus by a time factor N after the wheel has left the time range.

4,820,058

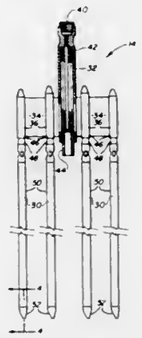
CONTROL ROD END PLUG WITH A STABILIZING CONFIGURATION

John F. Wilson, Murrysville Boro; Samuel Cerni, Churchill Boro, and Robert K. Gjertsen, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 26, 1984, Ser. No. 634,729

Int. Cl.⁴ G21C *7/10*

U.S. Cl. 376—327 **5 Claims**



1. In a nuclear reactor including at least one guide thimble and at least one control rod received in said guide thimble and supported for movement relative thereto, the improvement which comprises:

an end plug having a central axis and an imperforate asymmetrical tip configuration attached to an end of said control rod, said asymmetrical tip configuration defining a lower terminal end on said end plug which is offset to one side of said central axis and produces, in response to axial flow of coolant along said control rod and within its respective guide thimble, a non-symmetric coolant flow velocity pattern about said end plug and a lateral substantially steady state force on said control rod which presses said control rod end plug against a wall of said guide thimble so as to substantially prevent lateral vibration of said control rod due to said axial flow of the coolant.

4,820,059

SPEECH PROCESSING APPARATUS AND METHODS

James D. Miller, St. Louis, Mo., and Hisao M. Chang, Stamford, Conn., assignors to Central Institute for the Deaf, St. Louis, Mo.

Continuation-in-part of Ser. No. 792,965, Oct. 30, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 60,246

Int. Cl.⁴ G01L *1/00*

U.S. Cl. 381—43 **18 Claims**

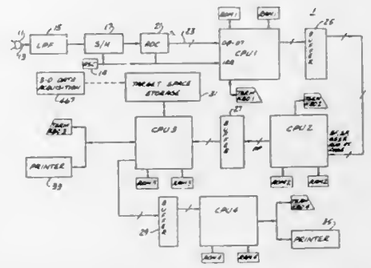
1. Speech processing apparatus comprising:

means for electronically deriving from speech over time a series of coordinate values representing positions of points on a path in a mathematical space which path positions represent the speech;

electronic memory means for prestoring phonetic representations in correspondence with indicia of a glide in the path which indicia represent a nucleus in the space at which the glide begins and a range of directions from the nucleus; and

means for electronically computing a trajectory parameter from the series of coordinate values and, when both the trajectory parameter satisfies a predetermined condition for significance and at least one of the coordinate values currently reached by the speech is within a predetermined region of such values, producing a signal, for electronically analyzing the speech on the path in response to the signal and, upon occurrence of a point position in the

nucleus and an offglide on the path in said range of directions which offglide happens before another significant



trajectory parameter occurs, obtaining from said electronic memory means the phonetic representation corresponding to the glide indicia.

4,820,060

SPACER BUSHING FOR TWO-ROW BALL BEARING

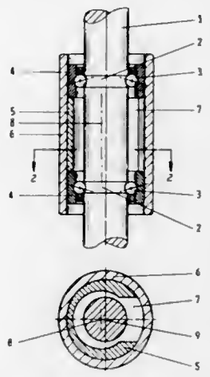
Gerhard Braune, Euerbach, and Reinhard Hock, Dittelbrunn, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jul. 13, 1988, Ser. No. 218,664

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726629

Int. Cl.⁴ F16C *23/10*

U.S. Cl. 384—447 **11 Claims**



1. A two-row ball bearing comprising two inner races axially spaced apart, two outer rings radially spaced outwardly from and each extending around a respective inner race, and a respective row of bearing balls between each inner race and its respective outer ring;

a spacer bushing disposed in the axial space between the outer rings and of a length for engaging the outer rings; the spacer bushing having a circular bore defined in it and having an outer surface around it; the spacer bushing having an axial slot extending along its length and radially through the spacer bushing; the axial slot being of a width that is large enough that the spacer bushing may be moved in the direction radially of the two outer rings past an object on which the inner races are supported and to the position axially between the outer rings;

the bore in the bushing being eccentric of the spacer bushing in a direction away from the slot in the bushing and offset with respect to the center of the diameter of the outer surface of the spacer bushing.

4,820,061

ROLLING BEARING ASSEMBLY

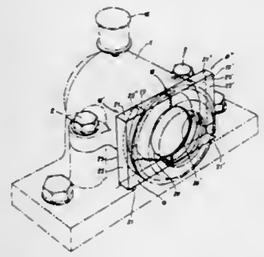
Hendrik Dolfsma, Tull En'T Waal, and Jacobus Zwarts, Nieuwegein, both of Netherlands, assignors to SKF Industrial Trading and Development Company, Nieuwegein, Netherlands

Filed May 4, 1988, Ser. No. 189,987

Claims priority, application Netherlands, May 7, 1987, 8701080

Int. Cl.⁴ F16C *33/66;* **F01M** *9/00;* **F16N** *7/02*

U.S. Cl. 384—462 **7 Claims**



1. Rolling bearing assembly for mounting a shaft or similar member, comprising a housing encircling the shaft with at least one rolling bearing installed therein between two securing rings, consisting of an outer and an inner race and at least one row of rolling elements therebetween, there being first and second annular chambers in the housing on either side of said bearing, closed off on their outer edges by annular sealing means attached to the housing, and a hole opening into said first annular chamber being made through the wall of the housing, capable of being placed in communication on the outside with a feeding device for introducing a lubricant into the housing, characterized in that there are two channels (**17**, **17'**) extending through the wall of the housing (**1**) and located diametrally opposed to each other, each opening into the second annular chamber (**8**), and in that a trough-like receptacle (**18**) is accommodated in said channels, in which an excess of lubricant can be collected.

4,820,062

BEARING FOR STEERING WHEEL SHAFT OF VEHICLES

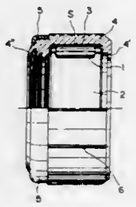
Takashi Shirane, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,604

Claims priority, application Japan, May 6, 1988, 63-108954

Int. Cl.⁴ F16C *33/60*

U.S. Cl. 384—486 **2 Claims**



1. A bearing for interposition between the steering wheel

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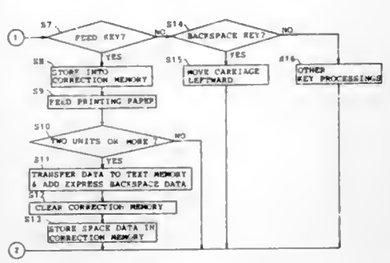
shaft and steering wheel column of a vehicle, said bearing comprising a number of needle-like rollers, a retainer for retaining said needle-like rollers, a thin-walled cylindrical race member circumscribing said needle-like rollers, and an elastic cylindrical member fitted on said cylindrical race member and comprising a cylindrical portion positioned outwardly of said cylindrical race member and inwardly directed flange portions at the opposite ends of said cylindrical portion, which is characterized in that said cylindrical race member has a cylindrical shape with a C-shaped cross section as well as a generally S-shaped split formed along and extending the full axial length thereof with respect to the axis of said race.

4,820,063

TYPEWRITER WITH A CORRECTION FUNCTION

Masaharu Mori, Anjo, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 17, 1987, Ser. No. 15,148
Claims priority, application Japan, Feb. 28, 1986, 61-36743
Int. Cl.[4] B41J *11/44, 19/14*
U.S. Cl. 400—76 **7 Claims**



1. In an electronic typewriter comprising:
a keyboard having a plurality of character keys including a space key for generating respective character code data and a space code data, and having a fore feed key and a back feed key for generating respective feed code data;
a printing mechanism having a carriage including a print head, a carriage transport mechanism and a paper feed mechanism; and
control means for printing respective characters on a printing paper by the print head, for controlling the carriage transport mechanism to move the carriage forward responsive to the character code data and for controlling the paper feed mechanism to feed forward and backward the printing paper responsive to the fore and back feed code data respectively, including a line memory for storing the character code data and the feed code data in the operated order;
wherein the improvement is that the control means further comprises data clear means forming part of said control means for clearing data in the line memory responsive to the printing paper being fed both in a forward or a backward direction more than a preset amount of lines and for keeping the data in the line memory in other cases.

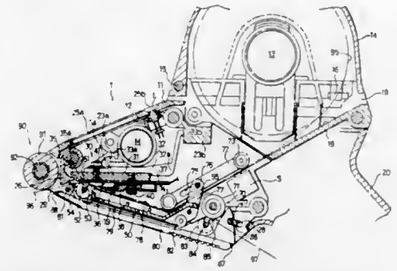
4,820,064

ELECTRONIC HAND LABELER

Yo Sato, Tokyo, and Tadao Kashiwaba, Iwate, both of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Jun. 10, 1987, Ser. No. 60,621
Claims priority, application Japan, Jun. 10, 1986, 61-132713
Int. Cl.[4] B41J *3/20;* **B65C** *11/02*
U.S. Cl. 400—120 **14 Claims**

1. A labeler, comprising:
a labeler housing which defines an interior for supporting a label printing mechanism therein;
an openable bottom cover mounted to the labeler housing;
thermal print head supported in the labeler housing for printing information on labels which are conveyed through the labeler, means for securing the print head in the labeler and further means for loosening the securing means to allow the print head to be individually withdrawn from the interior, said securing means including a retainer plate for supporting the print head in the interior of the labeler, a baseplate which is mounted to the labeler housing and a screw for coupling the retainer plate to the baseplate, the screw being capable of being tightened to hold the print head tightly in place;



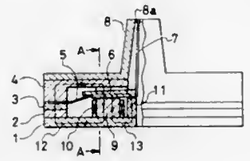
a platen arm mounted in the interior of the labeler and disposed generally between the bottom cover and the print head, the platen arm being movable between a closed position and an open position, the platen arm including screw-driver-access opening therein which opening is aligned, when the platen arm is in said open position, with the screw to enable the screw to be reached and tightened by a tool which is insertable through the platen arm;
a platen roller supported on the platen arm and so positioned on the platen arm that in the closed position of the platen arm the platen roller lies adjacent the print head; and
means for rotating the platen roller to thereby cause a backing sheet to which the labels are detachably attached to be conveyed past the print head.

4,820,065

WIRE-TYPE PRINTING HEAD

Tatsuya Koyama; Tetsuhiro Yamada; Hirokazu Ando, and Katsuya Kanimura, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 122,240
Claims priority, application Japan, Nov. 25, 1986, 61-179816
Int. Cl.[4] B41J *3/10*
U.S. Cl. 400—124 **14 Claims**



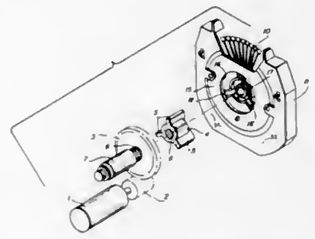
8. A wire-type print head comprising
printing wires extending forward substantially parallel with each other,
armatures in association with the respective print wires, a rear end of each print wire being fixed to a respective one of the associated armatures,
main cores in association with the respective armatures, each main core having its forward end adjacent to a rear surface of a respective one of the armatures,
coils in association with the respective main cores, each of the coils being wound on a respective one of the main cores,
a permanent magnet,
leaf springs in association with the respective armatures, each leaf spring having a first end fixed near the permanent magnet and a second end fixed to a respective one of the armatures,
auxiliary cores in association with the respective main cores, each auxiliary core being positioned between the permanent magnet and a respective one of the main cores, and having a forward end adjacent to a rear surface of a respective one of the armatures,
said permanent magnet being in the form a ring surrounding said armatures, said main cores, said leaf springs and said auxiliary cores,
first magnetic path means for completing a closed magnetic path for the magnetic flux from the permanent magnet, through the armature and the main cores,
second magnetic path means for completing a closed magnetic path for the magnetic flux from the permanent magnet through the armatures and the auxiliary cores,
means for causing an electric current to flow through the coils for generating a magnetic flux through the main cores in a direction to cancel the magnetic flux through the main cores from the permanent magnet,
wherein when each of the coils is not energized the associated armature is attracted toward the associated main core to resiliently deform the associated leaf spring, and
when each of the coils is energized the associated armature is released and moved forward by the action of the associated leaf spring, and
the rear surface of each of the armatures is kept in contact with the front end of the associated auxiliary core so that the front end of the associated auxiliary core forms a fulcrum point for swinging of the associated armature.

4,820,066

METHOD AND DEVICE FOR COUPLING A CASSETTE SUPPORTED TYPEWHEEL TO A TYPEWHEEL POSITIONING SHAFT IN TYPEWRITERS OR SIMILAR MACHINES

Manfred Link, Nuremberg, Fed. Rep. of Germany, assignor to TA Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 20,347
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606545
Int. Cl.[4] B41J *1/30*
U.S. Cl. 400—144.2 **3 Claims**



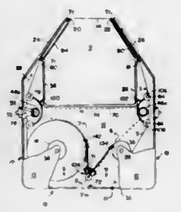
1. A device for automatically coupling a typewheel to a rotary positioning motor of an electronically controlled typewriter or the like comprising:
a cassette in which the typewheel is rotatably mounted;
a rotary positioning shaft connected to the rotary positioning motor;
means to rotate said shaft in either of two directions to provide a searching movement;
a spring-biased clutch part connected to said rotary shaft, said clutch part adapted to adjoin a hub of the typewheel during the coupling process;
a raised ring comprising a plurality of coupling slots provided on the typewheel;
a plurality of coupling projections provided on said clutch part adapted to connect with said plurality of coupling slots;
spring means for biasing said clutch part towards said typewheel such that said plurality of coupling projections connect with said plurality of coupling slots during the searching movement in both directions of rotation, wherein upon rotation of said clutch part, said typewheel remains stationary responsive to inertial and frictional forces until the coupling process is completed.

4,820,067

RIBBON CARTRIDGE

Tyrone N. Surti, 424 Harding Industrial Dr., Nashville, Tenn. 37211

Continuation-in-part of Ser. No. 855,072, Apr. 22, 1986, Pat. No. 4,685,817, Continuation-in-part of Ser. No. 725,931, Apr. 22, 1985, Pat. No. 4,629,346. This application Jun. 8, 1987, Ser. No. 59,597
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.
Int. Cl.[4] B41J *32/00*
U.S. Cl. 400—208 **9 Claims**



1. A ribbon cartridge for a printer having a drive member, and comprising:
a case including broad opposite face sides, front and rear opposite sides, and first and second opposite end sides, said sides defining a cavity, and said case provided at said front side with a pair of spaced guide members;
first and second spaced drive means within said case, said first drive means including a drive roller adapted to be driven from said printer through one said broad side of said case, said second drive means including a drive roller adapted to be driven from said printer through an opposite said broad side of said case, and said drive rollers positioned generally adjacent said end sides of said case, whereby one of said rollers would be driven at a time;
a ribbon carried in said cavity;
ribbon storage and dispensing means disposed in said cavity for storage of said ribbon and for dispensing said ribbon for travel thereof in a prescribed path through an impact region, said ribbon storage and dispensing means comprising first and second spools, said first spool being positioned generally proximate said first drive means, and said second spool being positioned generally proximate said second drive means;
an idler roller positioned inward of said ribbon storage and dispensing means;
a belt extending around said drive rollers and said idler roller for rotation of said drive rollers and for movement in a prescribed path over and in contact with said ribbon on said storage and dispensing means and said idler; and

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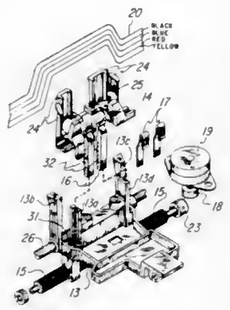
alignment and guide means carried in said cavity for aligning the center line of said belt and said ribbon in a common plane and for limiting movement of said drive belt and said ribbon in a direction normal to said common plane, said alignment and guide means including a first and second alignment and guide member respectively positioned in spaced relation in said case generally adjacent said first and second opposite end sides and disposed for guiding said ribbon in spaced relation past said drive rollers and between said pair of spaced guide members while simultaneously guiding said belt around said drive rollers and said idler roller and while maintaining the center lines of said ribbon and said belt in alignment.

4,820,068

PRINTER HAVING RIBBON SHIFT MECHANISM

Larry D. Mitcham, Cypress, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 794,039, Oct. 31, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 39,840
Int. Cl.[4] B41J *35/14*
U.S. Cl. 400—216.1 **14 Claims**



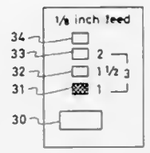
1. A printer, including a frame, having a print ribbon for presentation at a printing position, comprising:
(a) ribbon shift means, configured to include a print ribbon guide;
(b) rack means, having a section of gear rack, attached to the ribbon shift means;
(c) carriage means configured to slideably receive the ribbon shift means and to engage the section of gear rack to pass at least partially through the carriage means;
(d) printhead means having a printing end, positioned to have the printing end adjacent the print ribbon for contacting the print ribbon when printing is desired;
(e) gear shaft means, rotatably mounted on the frame, positioned to engage the section of gear rack to cause the rack means to move vertically and in turn to cause the ribbon shift means and the print ribbon to move vertically in a desired direction for a predetermined distance to adjust the vertical position of the print ribbon relative to the printing end; and
(f) motive means, mounted on the frame, connected to selectively rotate the gear shaft means in either direction.

4,820,069

SHEET-FEEDING APPARATUS WITH SELECTABLE UNIT FEED AND COEFFICIENT THEREFOR

Hiroshi Torii, Inazawa, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 10, 1987, Ser. No. 60,154
Claims priority, application Japan, Jun. 16, 1986, 61-139689
Int. Cl.[4] B41J *19/92*
U.S. Cl. 400—568 **7 Claims**



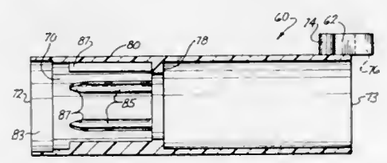
1. A print apparatus comprising:
inputting mean for inputting data of characters and symbols to be printed,
a printing mechanism for printing data inputted by said inputting mean on a printing medium,
a feeding mechanism for relatively moving a printing head of said printing mechanism and said printing medium,
unit feed amount selecting means for selecting a unit amount of feed of said relative movement,
feed amount setting means for selecting coefficient to multiply said unit amount of feed selected by said unit feed amount selecting means and for setting an actual amount of feed, and said feed amount setting means including a coefficient select key for selecting said coefficient and displaying means for displaying said selected unit amount of feed and said selected coefficient to multiply said selected unit amount of feed, said displaying means having a number of display lamps less than the total number of coefficients, and said display means displays some of the coefficients by lighting plural display lamps simultaneously and some of the coefficients by lighting only one display lamp at a time in accordance with said coefficient selected by said coefficient select key, and
controlling means for controlling said feed mechanism so that the amount of feed of said relative movement is said set actual amount of feed based on an output from said feed amount setting means.

4,820,070

DISPENSING DEVICE FOR COSMETIC STICKS AND THE LIKE

Walter Spatz, Pacific Palisades, Calif., assignor to Spatz Laboratories, Marina Del Rey, Calif.

Filed Jul. 13, 1984, Ser. No. 630,759
Int. Cl.[4] A45D *40/00, 40/06, 40/12*
U.S. Cl. 401—87 **10 Claims**



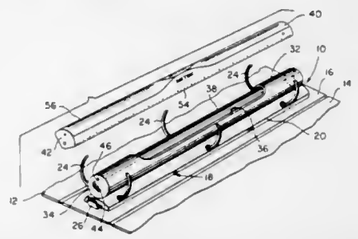
1. In a dispenser for use with a stick type product in which the stick type product tends to shrink radially with the passage of time, wherein said dispenser includes a housing for said stick type product, an improved cup member for supporting said stick type product with said housing, said cup member comprising:
a hollow member having an opening at one end thereof and an interior cylindrical wall,
said hollow member being adapted to receive a stick type product initially dimensioned such that the outer surface of said product is in contact with said cylindrical wall and wherein said product tends to shrink radially with time,
said wall including a plurality of spaced, radially inwardly extending ribs disposed axially of said cup member, and
at least some of said ribs having a root dimension at the junction of said wall which is of a dimension less than the dimension of the radially inwardly extending surface thereof whereby said ribs engage said stick type product to lock the same within said cup member to prevent axial and rotational movement of said stick type product as the latter shrinks.

4,820,071

ACCESSORY HOLDER FOR RING BINDER

Robert J. Steinfield, and Sterling Woodruff, both of Palo Alto, Calif., assignors to Woodfield Products, Palo Alto, Calif.

Filed Feb. 22, 1988, Ser. No. 158,772
Int. Cl.[4] B42F *13/00, 13/16, 13/40*
U.S. Cl. 402—4 **17 Claims**



1. In combination with a ring binder of the type including an elongated ring assembly base extending along and secured to the inner surface of a binder back relative to opposite longitudinal side marginal portions of which front and rear panels of the binder are pivotly attached and wherein the ring assembly base includes aligned, openable and closable rings spaced along said base and disposed in planes generally normal to the longitudinal extent of said base, an accessory holder including an elongated tubular body closed at its opposite ends by transverse end walls and having a first longitudinal side overlying and secured to said base within the confines of said rings, a second longitudinal side of said body remote from said first side having an access opening therein through which articles may be inserted into and removed from the interior of said body, a thin wall cover closely overlying and conforming to the shape of said second side and closing said opening, said cover being guidingly mounted from said body for shifting relative thereto between positions opening and closing said opening, said body and cover being spaced from the inner surfaces of said rings, when the latter are closed, sufficient to enable sheets of paper slidingly mounted on said rings to slide thereabout without interference with said body or cover.

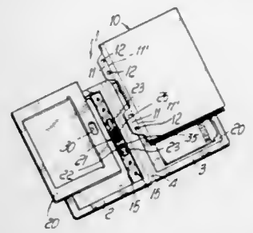
4,820,072

NOTE-BOOK

Rinaldo Nava, Milan, Italy, assignor to Nava Milano S.p.A., Milan, Italy

Filed Jan. 15, 1988, Ser. No. 144,344
Claims priority, application Italy, Jan. 23, 1987, 20606/87[U]
Int. Cl.[4] B42F *3/00, 13/12, 13/36, 9/00*
U.S. Cl. 402—64 **10 Claims**

1. A note-book comprising a cover in association with at least one replaceable stack of sheets, said cover having one front and one rear supporting flap formed of substantially rigid material and having a substantially rectangular shape, a spine formation of substantially flexible material for mutually joining said front and rear supporting flaps along adjacent edges thereof and allowing said flaps to substantially close over each other, means being provided on said flaps proximately to said adjacent edges thereof for removably connecting said stack of sheets to said cover, the sheets of said stack being separably joined to each other along a lateral edge thereof to form the back of said stack, wherein said stack of sheets comprises a pair of connecting tabs projecting away from said back at longitudinally spaced locations thereof, and wherein said means for removably connecting said stack of sheets to said cover comprise at least one separate and substantially planar tray element arranged to face the inner surface of one of said supporting flaps with the interposition of said pair of connecting tabs, and further comprise operable locking means mounted on said inner surface of one of said flaps for cooperating with said at least one tray element, whereby actuation of said operable locking means causes said tray element to be firmly held in place against said inner flap surface so releasably locking said pair of connecting tabs to thereby removably associate said stack of sheets to said cover.

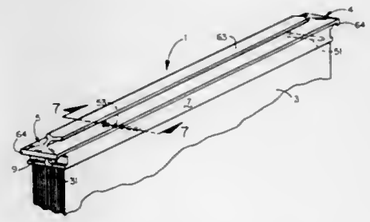


4,820,073

DOCUMENT CARTRIDGE

Kent Thomas, Mayville; Daniel R. Bullis, Jr., Madison, and Thomas J. Bottelson, Baraboo, all of Wis., assignors to Tab Products Company, Palo Alto, Calif.

Filed Feb. 8, 1988, Ser. No. 153,344
Int. Cl.[4] B42F *13/12, 3/04, 13/20, 15/00*
U.S. Cl. 402—68 **23 Claims**



1. A cartridge for binding a plurality of papers together comprising:
a. a frame comprising:
i. a flat elongated center strip having first and second longitudinal edges and opposed ends;
ii. a first elongated side member having a side strip pivotally joined to the center strip for pivoting between opened and closed configurations, the first side member

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having first tab means for defining an opening therethrough; and

iii. a second elongated side member having a side strip pivotally joined to the center strip for pivoting between opened and closed configurations relative thereto, the second side member cooperating with the center strip and first side member to form a generally U-shaped channel for receiving the papers when in the closed configuration, the second side member having second tab means for cooperating with the first tab means to releasably lock the frame in the closed configuration; and

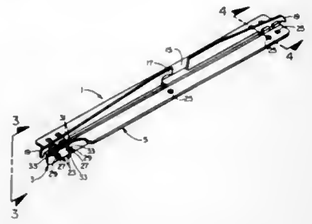
b. pin means for holding the papers in the frame when the frame is in the closed configuration.

4,820,074

UNIVERSAL CENTER HOOK

Kent Thomas, Mayville; Daniel R. Bullis, Jr., Madison, and Thomas J. Bottelson, Baraboo, all of Wis., assignors to Tab Products Company, Palo Alto, Calif.

Filed Feb. 8, 1988, Ser. No. 153,345
Int. Cl.⁴ B42F *13/00, 13/22, 13/36, 13/26*
U.S. Cl. 402—75 **15 Claims**



1. A universal center hook comprising:

a. an elongated frame having a generally planar cross section with generally flat opposed sides;

b. a pair of elongated side members having respective generally rectangular across sections with opposed surfaces, the side members being attached to the respective opposed sides of the frame and pivotable between an open inoperative configuration wherein the plane of the frame is approximately perpendicular to the planes of the side members and a closed operative configuration wherein the side members lie alongside and generally in facing contact with the respective frame opposed sides; and

c. lock means for releaseably locking the side members to the frame in the closed operative configuration.

4,820,075

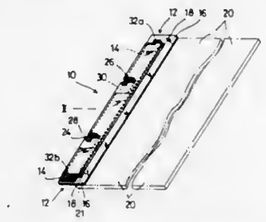
FILING DEVICE

Katsuo Osono, Tokyo, Japan, assignor to King Jim Co. Ltd., Tokyo, Japan

Filed Mar. 6, 1987, Ser. No. 22,762
Int. Cl.⁴ B42F *13/00, 5/00, 3/02, 13/30*
U.S. Cl. 402—79 **1 Claim**

1. A filing device comprising:

a binding element (**12**) comprising a file mounting side edge (**16**) for communicating with a document (**20**) and a binding portion (**18**) extending from said file mounting side edge and trebly folded to form a longitudinal cavity (**18c**) with a sliding element (**14**) therein; said binding portion (**18**) having a plurality of guiding grooves (**24**) spaced apart from each other at a predetermined distance to guide binding rods (**22**) to a plurality of binding holes (**26**) located in said binding portion (**18**) adjacent to said guiding grooves (**24**); and said sliding element (**14**) comprising a first position having means for guiding said binding rods to said binding holes, and a second position having means for closing said guiding grooves (**24**) thereby fixing said binder rods (**22**) in said binding holes (**26**), said sliding element (**14**) being further provided at both ends with means for moving the sliding element from said first position to said second position and for limiting said sliding element (**14**) to a plurality of predetermined positions in said cavity.

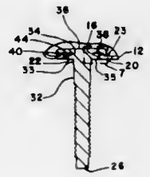


4,820,076

STAKED STUD TORQUE RETENTION RIBS

Louis P. Rossigno, Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 669,674, Nov. 8, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 934,974
Int. Cl.⁴ F16D *1/12;* **B23P** *11/02*
U.S. Cl. 403—284 **2 Claims**



1. In a brake booster having a shell made of a thin gauge metal, a plurality of fastener members for attaching an end member of the shell to another member whereby a seal is maintained even though the fastener members may be subjected to lateral forces, each of said fastener members comprising:

a reinforcing ring surrounding an opening located in said end member of the shell, said end member having an inner surface and an outer surface, said reinforcing ring being offset from said outer surface a distance less than a thickness of the thin gauge metal in said end member; and

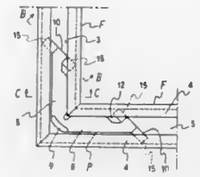
a stud member located in said opening, said stud member having a head attached to a shaft, said head having a groove located between an arcuate surface adjacent its periphery and said shaft, said head having a series of radial ribs located in said groove, said ribs having a first series of surfaces and second series of surfaces, said first and second series of surfaces extending in a plane that is perpendicular to said groove, said radial ribs having a height of about one half the depth of said groove, said shaft having a cylindrical surface adjacent said head that is deformed to define an annular projection that engages said outer surface to bring said arcuate surface into engagement with said inner surface, said inner surface flowing into said groove and into engagement with said first and second series of surfaces on said ribs until said annular projection is in a plane substantially the same as said inner surface of said end member, said arcuate surface on engagement with said inner surface limiting an engagement of said reinforcing ring with said ribs to prevent the ribs from completely piercing the thin gauge metal of said reinforcing ring, said another member engaging said end member when a nut is attached to said shaft, said first series of surfaces engaging said inner surface to prevent rotative torque applied to the nut from rotating said shaft said reinforcing ring and arcuate surface uniformly distributing any lateral forces applied to said shaft into said end member and thereby prevent stress failures in the end member which would effect the seal between the arcuate surface and inner surface such that a leak path could occur from the inner surface to the outer surface of the end member.

4,820,077

FRAMING BAR CONNECTOR FOR A FRAME

Nobuyoshi Sawada, and Kenji Takeshima, both of Toyama, Japan, assignors to Origin Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1987, Ser. No. 58,468
Int. Cl.⁴ B25G *3/36*
U.S. Cl. 403—402 **18 Claims**



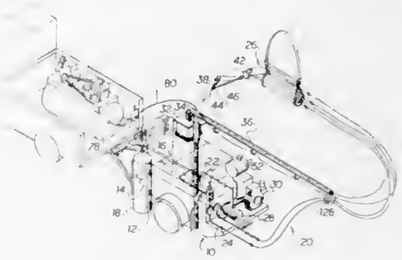
1. An apparatus comprising two adjacent framing bars which each have a dovetail groove opening thereinto between two flanges defining a backside thereof, each said groove having on a side opposite said flanges a bottom surface and having on each said flange an inner surface which faces said bottom surface, and a framing bar connector which includes a bifurcate lever having a pair of legs each having at a respective free end thereof a pivot cam which is disposed in a respective said groove and moves into firm engagement with the bottom surface and one of the inner surfaces of the groove when the lever is turned about an axis from a position in which said legs project rearwardly from said framing bars to a position in which outer surfaces of said legs are flush with outer surfaces of said flanges.

4,820,078

APPARATUS FOR ROAD SURFACE REPAIR WITH FIBER-REINFORCED ASPHALT

George D. Brocious, R.D. #1, Box 81, Mayport, Pa. 16240

Filed Dec. 29, 1986, Ser. No. 946,772
Int. Cl.⁴ E01C *19/17*
U.S. Cl. 404—92 **5 Claims**



1. Apparatus for pavement repair, comprising:

a mobile rig,

a system mounted on the rig for storing and dispensing liquid asphalt and fiber reinforcing material to a pavement repair site, including a first sub-system for storing and dispensing the liquid asphalt, a second sub-system for storing and dispensing the reinforcing material, and a manually-guided delivery nozzle assembly adapted for operator-use substantially away from the rig;

the first sub-system comprising an asphalt reservoir, heating means for maintaining the asphalt in the reservoir in a liquid flowable state, conduit means including outlet and inlet portions communicating with the reservoir and interconnecting by a flexible hose leading out to and back from the delivery nozzle assembly and establishing a flow circuit for conducting a flow of liquid asphalt from the reservoir to the nozzle assembly and back to the reservoir, pump means disposed to selectively maintain the flow of liquid asphalt in the circuit, means for selectively evacuating asphalt from, and purging, the conduit means including a first valve on the outlet portion adjacent the reservoir for shutting off the flow from the reservoir to the conduit means, a second valve for selectively directing compressed air to the conduit means to push liquid asphalt out of the conduit means and into the reservoir, valve means for temporarily entirely isolating the conduit means from the reservoir, means for selectively directing a solvent flow into the conduit means at a point between the reservoir and the pump means, and means for draining pumped solvent from the conduit means at a point on the inlet portion and closely adjacent the reservoir;

the second sub-system comprising storage means on the rig for dispensably retaining coiled fiber roving, means for guiding the roving along a path directed outwardly from the rig to the delivery nozzle assembly;

the delivery nozzle assembly comprising an asphalt dispensing nozzle in flow communication with the circuit, manually-operable valve means for selectively discharging asphalt from the circuit and through the nozzle, a fiber chopping device mounted closely adjacent and on a level above the asphalt dispensing nozzle and disposed to intercept the fiber roving and chop it into discrete filament segments, and the chopping device having an outlet tube for delivering a steady gravity flow of chopped fiber filaments to a point adjacent the dispensing nozzle for uniform dispersion in the liquid asphalt dispensed from the nozzle.

4,820,079

METHOD OF COASTAL EROSION CONTROL USING MASSIVE SEA BLOCK SYSTEM

Jack L. Wheeler, 1738 Hodges, Lake Charles, La. 70601

Filed Jul. 24, 1987, Ser. No. 77,582
Int. Cl.⁴ E02B *3/06*
U.S. Cl. 405—23 **15 Claims**



1. A method of coastal erosion control comprising the steps of:

a. transporting a plurality of massive and transportable hollow concretious blocks of concrete reinforced with steel to a coastal site where erosion is to be controlled;

b. arranging the massive blocks in an array that extends

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along the erosion site so that the blocks can dissipate wave action;

c. filling the hollow blocks with loose fill material until each of the blocks has a weight of at least twenty five (25) tons; and

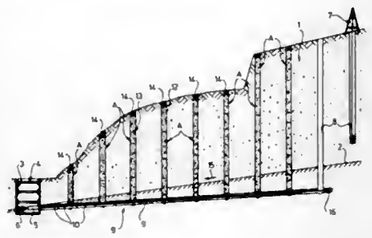
d. sealing each block after the loose fill material is added so that wave action cannot scatter the fill material during heavy seas.

4,820,080

PROCESS FOR THE CONSTRUCTION OF A DRAIN SYSTEM

László Várkonyi; Gyula Váci, both of Miskolc, U.S.S.R., and Csaba Asszonyi, Budapest, Hungary, assignors to Comporgan System House, Hungary

Filed Mar. 11, 1987, Ser. No. 24,775
Claims priority, application Hungary, Mar. 21, 1986, 1195/86
Int. Cl.⁴ E02B *11/00*
U.S. Cl. 405—45 **19 Claims**



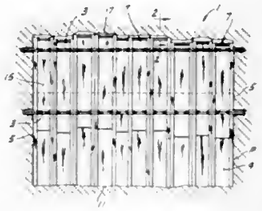
1. Process for the construction of a drain system, wherein a catchment body and at least one interconnected suction body are laid into the soil to be dewatered, wherein, from a working pit or bank, a nearly horizontal hole is drilled for the catchment body, and a hole or shaft—preferably reaching the vicinity of an impermeable clay layer—is made from the ground surface for a filled suction body, said hole or shaft directed transversely to and so be in communication with the hole of the catchment body.

4,820,081

HEAD SEAL FOR A MINE STOPPING

John M. Kennedy, and William R. Kennedy, both of P.O. Box 38, Taylorville, Ill. 62568

Filed Jan. 19, 1988, Ser. No. 145,213
Int. Cl.⁴ E21F *1/14*
U.S. Cl. 405—132 **5 Claims**



1. A mine stopping of the type comprising a plurality of extensible panels adapted to extend in side-by-side relation from the floor to the roof of a passageway in a mine, each panel comprising a first elongate member constituting a lower member of the panel adapted for engagement of its lower end with the floor of the passageway, and a second elongate member constituting an upper member of the panel adapted for engagement of its upper end with the roof of the passageway, each of said panel members being a sheet metal member of channel shape in cross section having a web and flanges at opposite sides of the web, each flange having an inturned portion at its outer edge extending generally parallel to the web, one of said members having a telescoping sliding fit in the other with the webs of the members in engagement, the improvement comprising a head seal comprising:

a head in the form of a sheet metal member at the upper end of an upper member of each panel, said head having a length less than the distance between the flanges of the upper member and greater than the distance between the inner edges of said inturned portions of the flanges;

the head being generally of channel shape in transverse cross section having a web of a width less than the distance between the web of the upper panel member and said inturned portions of the flanges and fitting between the web of the upper member and said inturned portions, a first flange extending up from one edge of the web of the head spaced from the inside face of the web of the upper panel member, and a second flange extending up from the other edge of the web generally adjacent said inturned portions of the flanges; and

a sealing member of compressible material pocketed in the head between said first and second flanges and extending up out of the upper end of said upper member of the panel for pressure engagement with the roof when the upper and lower members of the panel are telescopically extended relative to one another, the sealing member being compressible during said pressure engagement with the roof and being adapted to exert lateral expansive forces against portions of said first and second flanges of the head;

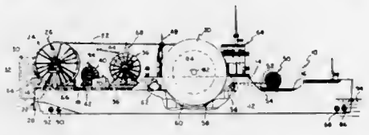
said portions of the first and second flanges of the head being substantially symmetric about a vertical plane extending in side-to-side direction with respect to the panel midway between the web of the upper member of the panel and the inturned portions of the flanges of the upper member of the panel whereby the lateral expansive force exerted during compression by said sealing member against the first flange is approximately equal to the lateral expansive force exerted against the second flange thereby to avoid canting of the panel with respect to said vertical plane.

4,820,082

PIPELINE LAYING SYSTEM AND VESSEL

Carlos E. Recalde, Irvine, Calif., assignor to Santa Fe International Corporation, Alhambra, Calif.

Continuation of Ser. No. 757,790, Jul. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,112, Aug. 31, 1984, Pat. No. 4,687,376. This application May 11, 1987, Ser. No. 48,454
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.⁴ F16L *1/04*; B63B *35/04*
U.S. Cl. 405—168 **36 Claims**



1. A pipelaying system adapted for deployment on a vessel for use in a body of water comprising:

at least one reel for storage and layout out of a rigid walled pipeline;

a pipeline laying device adapted for being mounted adjacent the stern of said vessel downstream of said reel in the direction of unspooling;

pipeline support means incorporated in said laying device and defining a turn for said pipeline, said pipeline support means comprising a single pipe take-off drum for mounting on said vessel for rotation about a horizontal drum axis, with the surface of said drum providing continuous contact with said pipeline so that said drum and pipeline move simultaneously at the same angular velocity around said turn as said drum rotates;

a pipe take-off structure mounted in said laying device and adapted for arcuate movement in spaced relationship about the periphery of said pipe take-off drum to permit adjustment of the water entry angle of the pipeline,

with said pipe take-off structure pivotally mounted on said axis of rotation of said drum so that said drum and said take-off structure move about the same axis of rotation, and including first straightener means for applying a force on the pipeline inward toward said drum axis and second straightener means for applying a force on the pipeline outward away from said drum axis, with said drum and first and second straightener means providing three point straightening to the pipeline as the pipeline leaves said drum; and

motive means operably interconnected to said reel and adapted to permit control of the rate of layout of said pipeline.

29. A method of unspooling and laying out a pipeline into a body of water from a pipelaying system which includes a laying device with a drum adapted for being mounted adjacent the stern of a vessel for rotation about a horizontal drum axis, said method comprising the steps of:

moving the pipeline off of a storage reel and past the drum around an arcuate turn defined by the surface fo the drum;

providing moving contact between the pipeline and the drum with the pipeline and drum moving about the same axis;

changing the direction of movement of the pipeline from the vessel to a downward direction;

straightening the pipeline subsequent to said moving step by contact with a pipe take-off structure pivoting about the same axis as the drum and providing three force points for the contact as the pipeline leaves the drum, with the three force points rotating about a common axis as the downward direction is changed; and

providing for adjustment of the pipeline water entry angle and providing for pipe handling changes within said laying system and laying out the pipeline from the vessel in a downward direction into the body of water.

4,820,083

FLEXIBLE FLOWLINE CONNECTION TO A SUBSEA WELLHEAD ASSEMBLY

Johnce E. Hall, Kingwood, Tex., assignor to Amoco Corporation, Chicago, Ill.

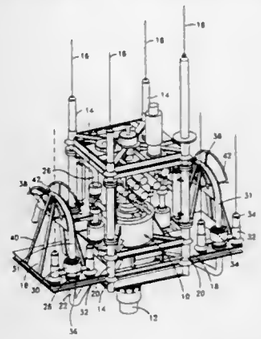
Filed Oct. 28, 1987, Ser. No. 114,474
Int. Cl.⁴ F16L *1/04*
U.S. Cl. 405—169 **7 Claims**

1. A flexible flowline support for connection to a subsea wellhead assembly, comprising:

a flow line support base connectable to a subsea wellhead assembly, said flowline support base comprising at least one horizontally disposed frame extending laterally from the subsea wellhead assembly;

a flowline connector having a first end upwardly disposed and mounted to the flowline support base and having a second end operatively connectable to the subsea wellhead assembly; and

a cradle assembly mounted to the flowline support base adjacent the first end of the flowline connector, and having a curved trough over which the flexible flowline can lay for connection to the first end of the flowline connector.

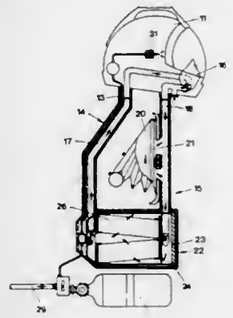


4,820,084

DEVICE FOR HEAT-INSULATED DIVING SUITS FOR WORK AT GREAT DEPTHS UNDER WATER

Gunnar Dahlback, Linkoping, Sweden, assignor to Advanced Underwater Techology. Goteborgs, Sweden

PCT No. PCT/SE86/00532, § 371 Date Jul. 28, 1987, § 102(e) Date Jul. 28, 1987, PCT Pub. No. WO87/03262, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 12, 1986, Ser. No. 84,791
Claims priority, application Sweden, Nov. 28, 1985, 8505614
Int. Cl.⁴ B63C *11/02*
U.S. Cl. 405—186 **6 Claims**



1. A heat conservation system for an underwater diving suit, comprising:

an overalls-type diving suit joined with a helmet at a neckband, said diving suit including a layer of thermal insulation for protecting a diver, while submerged, against body heat loss;

a substantially closed respiration circuit including a breathing mask disposed with the helmet, a carbon dioxide removal unit disposed outside said helmet, an exhaling bose connecting the breathing mask with an inlet side of the carbon dioxide removal unit, and an inhaling hose connecting an outlet side of the carbon dioxide removal unit with the breathing mask;

said substantially closed respiratory system, except within said helmet, being substantially enclosed within said layer of thermal insulation.

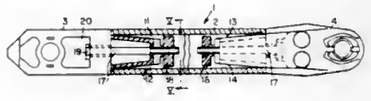
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4,820,085

ARTICULATING STEEL CAP FOR UNDERGROUND MINING SUPPORT STRUCTURES

Martha-Catharina Helliger, Hochkeppel 11, 5160 Kreuzau, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,591
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 8632139
Int. Cl.[4] E21D *17/00*
U.S. Cl. 405—288 **7 Claims**



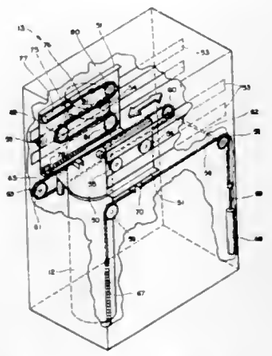
1. An articulating steel cap for mining support structures, comprising a hollow box section having a given inner cross-sectional shape, a cap tip at one end of said hollow box section, a cap fork at the other end of said hollow box section, plug-in connection means for securing said cap tip and said cap fork to said hollow box section, said plug-in connection means comprising a profiled plug (5, 6) rigidly connected to said cap tip and to said cap fork, each profiled plug having a cross-section corresponding to said given inner cross-sectional shape of said hollow box section, each profiled plug having wall members with at least one longitudinally inclined surface (7–10), a movable wedge element (11–14) arranged for cooperation with the respective longitudinally inclined surface, and means for pulling each wedge element into a space between said longitudinally inclined surface (7–10) and an inner surface (15, 16) of said hollow box section for wedging said profiled plugs into a locking position and for also moving said plugs into a release position.

4,820,086

PNEUMATIC TUBE CARRIER SYSTEM AND METHOD

John P. Kieronski, Charlotte, N.C., assignor to Donald R. Gilreath, Concord, N.C.

Filed Jan. 6, 1987, Ser. No. 000
Int. Cl.[4] B65G *51/26*
U.S. Cl. 406—112 **10 Claims**



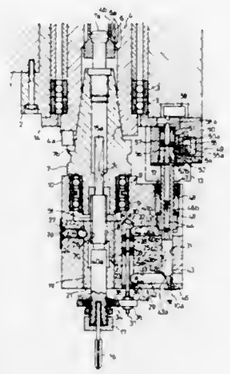
1. A pneumatic tube carrier system comprising:
(a) a first carrier receiving and sending terminal;
(b) a second carrier receiving and sending terminal;
(c) a carrier having an open end for receiving contents therethrough and a cover closing said open end;
(d) a pneumatic tube interconnecting said first and second terminals for movement of the carrier back and forth between and into said first and second terminals; and
(e) discharge means operatively associated with at least one of said first and second terminals for automatically removing contents from the carrier at said at least one terminal before returning the carrier to the other of said first and second terminals, said discharge means comprising:
(i) means for removing the cover from the open end of the carrier;
(ii) means for orienting the carrier to permit contents of the carrier to be discharged;
(iii) means for replacing the cover onto the carrier; and
(iv) means for reversing the position of the carrier to reorient the open end of the carrier with the cover thereon to define the leading end thereof during movement of the carrier to the other of the first or second terminal.

4,820,087

TAP DRIVE UNIT FOR MACHINE TOOLS

Shigeru Ikemoto, 250-banchi, Nomamede-cho, Nakagawa-ku, Nagoya, Aichi, and Minoru Ohta, Nagoya, both of Japan, assignors to Shigeru Ikemoto, Japan

Filed Oct. 8, 1987, Ser. No. 106,581
Claims priority, application Japan, Oct. 14, 1986, 61-243787; Jan. 30, 1987, 62-162652
Int. Cl.[4] B23B *47/14*
U.S. Cl. 408—9 **5 Claims**



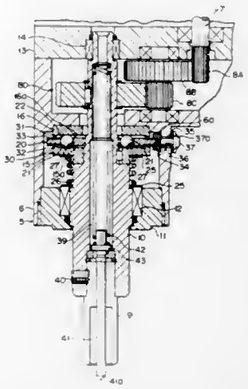
1. A tap drive unit for a machine tool of the type having a main spindle, which is coupled to a machine-head of the machine tool such as a machining center, said tap drive unit comprising:
(a) a driver detachably coupled to the main spindle of the machine tool so as to be rotated with the main spindle;
(b) a support member rotatably supporting said driver, said support member being fixedly mounted on a stationary portion of the machine tool when said driver is coupled to the main spindle of the machine tool;
(c) a tubular guide member supported by said support member so as to be coaxial relative to said driver, said guide member being provided with an internal thread formed in the inner periphery thereof, said guide member being moved axially when a load larger than a predetermined value acts thereon;
(d) a rotational shaft provided with a tap detachably mounted on one end thereof and an external thread formed in the outer periphery thereof, the external thread being threadedly engaged with the internal thread of said guide member, said rotational shaft being coupled to said driver so as to be rotated by the driver, the rotational shaft being movable axially relative to said driver when rotated both in one direction and in the other;
(e) a travel mechanism comprising first and second working shafts each provided on said support member so as to be parallel to said rotational shaft, said first working shaft being moved either when said rotational shaft is moved by a predetermined distance in the direction in which a thread to be normally formed with the tap in a prepared hole in a workpiece is advanced or when said guide member is moved axially when the load larger than the predetermined value acts upon said guide member, said second working shaft being moved when said rotational shaft is moved by a predetermined distance in the direction opposite to the direction in which the thread to be formed with the tap in the prepared hole in the workpiece is advanced; and
(f) a detecting switch means provided on a stationary portion of the machine tool for detecting an amount of displacement of each of said first and second working shafts.

4,820,088

BORING DEVICE

Yasumasa Ooki; Osamu Asano, and Toshio Mikiya, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1987, Ser. No. 82,351
Claims priority, application Japan, Sep. 9, 1986, 61-210603; Sep. 9, 1986, 61-210604
Int. Cl.[4] B23B *47/00*
U.S. Cl. 408—17 **5 Claims**



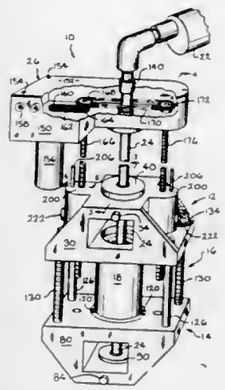
1. A boring device comprising:
a casing;
a tool spindle supported in said casing and movable in axial directions thereof, one direction being a feed direction and the other direction being a return direction;
means for biasing said tool spindle in said return direction;
a first thrust ring fixed to said tool spindle and coaxially disposed with respect thereto, said first thrust ring having a flange-like shape and a track surface;
a second thrust ring coaxially disposed with respect to said tool spindle and fixed to said casing, said second thrust ring having a disk-like shape and a track surface facing said track surface of said first thrust ring;
a rolling element retaining ring disposed between said first and second thrust rings and movable in said feed and return directions, said rolling element retaining means having at least three rolling element receiving bores facing said track surface of said first and second thrust rings, and said rolling element receiving bores being spaced apart from each other in a circumferential direction of said rolling element retaining ring;
rolling elements respectively received in said rolling element receiving bores such that said rolling elements are in rolling contact with said track surface of said first and second thrust rings;
receptacles formed in the track surface of one of said first and second thrust rings so as to be arranged in the same circumferentially spaced relation as said rolling element receiving bores, such that said receptacles simultaneously receive said rolling elements; and
coupling means for causing said rolling element retaining ring to operatively engage and disengage with respect to the other one of said first and second thrust rings, said coupling means comprising (i) access means for causing said rolling element retaining ring to approach and separate from the other one of said first and second thrust rings, (ii) projections formed on one of the track surfaces of said other one of said first and second thrust rings and that surface of said rolling element retaining ring which faces said other one of said first and second thrust rings, and (iii) recesses engageable with said projections and formed on the other one of said track surfaces of said other one of said first and second thrust rings and said surface of said rolling element retaining ring.

4,820,089

APPARATUS FOR BORING ARTICLES

Leo C. Shiets, Fremont, Ohio, assignor to Axle Surgeons, Inc., Fremont, Ohio

Filed May 6, 1987, Ser. No. 46,519
Int. Cl.[4] B22D *19/10;* **B60B** *35/00*
U.S. Cl. 408—111 **17 Claims**



1. An apparatus for boring articles comprising, in combination, a first clamp member, a second clamp member, means extending between said first and said second clamp members for clamping said members about an article to be bored, a first bushing in said first clamp member, a second bushing in said second clamp member, a boring bar extending between said first and said second bushings, drive means for axially advancing said boring bar and means for selectively coupling said drive means to one of said clamp members.

4,820,090

MULTIPURPOSE HANDLE GRIP FOR HOLDING ELECTRIC TOOLS

Pi-Chi Chen, No. 1-1, East Lane, Lai Tsuo, Taichung, Taiwan

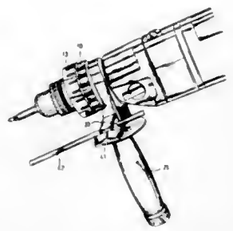
Filed Jun. 3, 1988, Ser. No. 201,816
Int. Cl.[4] B23B *47/00*
U.S. Cl. 408—241 R **2 Claims**

1. A multipurpose handle grip for holding electric tools comprising:
a driver head strap having a plurality of slip holes around the circumference and arranged in good order, a plurality of division plates arranged among the slip holes, a central circular hole, an inner thread at the rear end, and a revolv-

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ing cover at the front end, said revolving cover having a circular outlet;

a handle plate comprising a handle and a holder plate, said holder plate being located at a top end and having a locating hole, a flange, an outer thread on the flange, said handle having a plurality of channel holes around the inner wall arranged in good order and a revolving cap at a bottom end, said revolving cap comprising a circular outlet;



a locating bushing having a smaller inner diameter, said locating bushing being inserted into the locating hole of the holder plate to accommodate a variety of electric tools;

by means of the above assembly the strap is attached to the holder plate of the handle plate through the inner and outer threads and by means of the central hole the strap is slipped on the electric tool so as to reduce the vibration during operation and by means of the arrangement of the slip holes and the channel holes, the drill and driver heads are conveniently carried and stored.

4,820,091

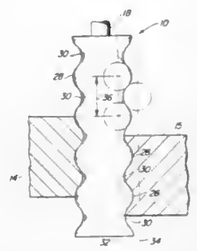
TOOL AND METHOD FOR FORMING PANEL JOINTS

John T. Koski, 171 Honey La., Battle Creek, Mich. 49015

Filed Dec. 31, 1987, Ser. No. 140,298

Int. Cl.[4] B23C 0/00

U.S. Cl. 409—132 **16 Claims**



1. A rotatable cutting tool for forming matching wave form profiles in the adjacent edges of panel members to be joined comprising:

a body member rotatable about an axis,

at least one cutting blade extending radially from said axis, said cutting blade having a cutting edge formed of a plurality of adjoining waves extending generally axially, each of said waves including a concave one-half wave portion and an adjacent convex one-half wave portion,

means for positioning said blade in a first position relative to the edge of a first flat panel member for movement relative thereto with the face of said panel bisecting a selected one-half wave portion during cutting of said edges of said first panel member, and

means for positioning said blade in a second position relative to the edge of a second flat panel member with the face of said panel member bisecting a one-half portion wave adjacent to said selected concave half-wave portion during cutting of said edge of said second work piece whereby complementary wave form surfaces are formed in the adjacent edges of the panels to be joined.

4,820,092

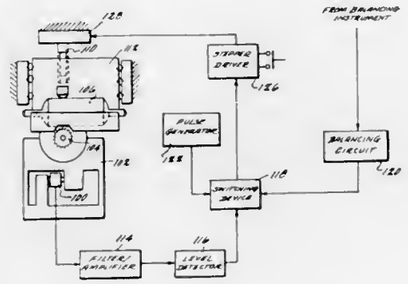
TOUCH SENSING METHOD AND APPARATUS

Richard Mueller, and Guenter Fietzke, both of Lynchburg, Va., assignors to American Hofmann Corporation, Lynchburg, Va.

Filed Nov. 4, 1987, Ser. No. 116,307

Int. Cl.[4] B23C 9/00

U.S. Cl. 409—133 **35 Claims**



1. An apparatus for balancing a workpiece comprising:

means for removing a portion of said workpiece;

means for mounting said workpiece and removing means;

means for causing relative motion between said removing means and said workpiece to bring said removing means into contact with, and thereafter remove material from, said workpiece at a predetermined location;

force transducer means coupled to said mounting means for producing a first electrical signal in response to the force resulting from contact between said removing means and said workpiece to indicate contact;

means for determining the amount of material to be removed from said workpiece at said predetermined location and producing a second electrical signal indicating said amount of material to be removed; and

control means for receiving said first and second signals and controlling said motion controlling means to remove said determined amount of material.

4,820,093

RETRACTABLE ROPE HOOK ARRANGEMENT FOR VEHICLE

Hidemasa Hirakui, Yokohama, and Masayoshi Kishima, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd. and Ohi Seisa Kusho Co., Ltd., both of, Japan

Filed Aug. 6, 1985, Ser. No. 762,862

Claims priority, application Japan, Aug. 7, 1984, 59-164274

Int. Cl.[4] B60P 7/08

U.S. Cl. 410—107 **7 Claims**

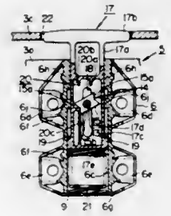
1. A rope hook arrangement for a vehicle, comprising

housing means adapted to be fixed to a body of the vehicle,

a movable member mounted on the housing means, the movable member being movable relative to the housing means along a straight line in outward and inward directions between a projected position and a depressed position, the movable member having a rope hook having an outwardly facing outward face, the rope hook being projected outwardly from a predetermined reference surface stationary relative to the housing means when the movable member is in the projected position, and depressed inwardly below the predetermined reference surface when the movable member is in the depressed position,

biasing means disposed between the housing means and the movable member for urging the movable member outwardly to the projected position,

latching means for selectively allowing the movable member to move into the projected position and maintaining the movable member in a middle position lying between the projected and depressed positions, the outward face of the rope hook lying on the reference surface when the movable member is in the middle position, the latching means comprising fixed means and a rotatable member one of which is mounted on the housing means and the other of which is mounted on the movable member, the fixed means being fixedly mounted, and the rotatable member being mounted so that the rotatable member is rotatable about a rotation axis, the fixed means comprising an engaging projection and an actuating projection, the rotatable member having a plurality of first side surfaces and



second side surfaces which are arranged alternately around the rotation axis, the rotatable member occupying a lock position and a release position alternately when the rotatable member rotates in one direction, the engaging projection preventing the movable member from moving from the middle position to the projected position by engaging with one of the first side surfaces of the rotatable member when the rotatable member is in the lock position, and allowing the movable member to move from the middle position to the projected position when the rotatable member is in the release position, the actuating projection causing the rotatable member to rotate from the lock position to the release position when the movable member is moved to the depressed position with the rotatable member in the lock position and to rotate from the release position to the lock position when the movable member is moved from the projected position to the depressed position with the rotatable member in the release position.

4,820,094

ROPE HOOK ARRANGEMENT FOR VEHICLE

Hidemasa Hirakui, Yokohama, and Masayoshi Kishima, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Dec. 14, 1984, Ser. No. 681,659

Claims priority, application Japan, Dec. 20, 1983, 58-238869

Int. Cl.[4] B60P 7/08

U.S. Cl. 410—107 **8 Claims**

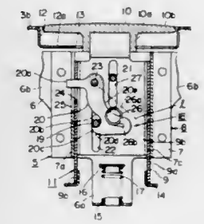
1. A rope hook arrangement for a vehicle, comprising

housing means adapted to be fixed to a vehicle body,

a movable member mounted on the housing means, the movable member being movable relative to the housing means rectilinearly in outward and inward directions between a projected position and a depressed position, the movable member having a rope hook having an outwardly facing outward face, the rope hook being projected outwardly from a predetermined reference surface stationary relative to the housing means when the movable member is in the projected position, and depressed inwardly below the predetermined reference surface when the movable member is in the depressed position,

biasing means disposed between the housing means and the movable member for urging the movable member outwardly to the projected position, and

latching means for selectively allowing the movable member to move into the projected position and maintaining the movable member in a middle position lying between the projected and depressed positions, the outward face of the rope hook of the movable member lying on the reference surface when the movable member is in the middle position, the latching means comprising fixed means and swingable means one of which is mounted on the housing means and the other of which is mounted on the movable member, and fixed means being fixedly mounted, and the



swingable means being mounted in such a manner that the swingable means is swingable between a lock position and a release position, the fixed means comprising first actuating means which engages with the swingable means and thereby prevents the movable member from moving outwardly from the middle position to the projected position when the movable member is in the middle position while at the same time the swingable means is in the lock position and which forces the swingable means to swing from the lock position toward the release position by pushing the swingable means when the movable member moves inwardly from the middle position to the depressed position, and second actuating means which forces the swingable means to swing from the release position toward the lock position when the movable member moves outwardly from the middle position to the projected position.

4,820,095

ANCHOR DEVICE FOR SECURING ROCK BOLTS

Dennis Mraz, Saskatoon, Canada, assignor to Engineered Instruments, Inc., Canada

Filed Feb. 26, 1988, Ser. No. 160,640

Int. Cl.[4] F16B 39/02; E21B 20/02

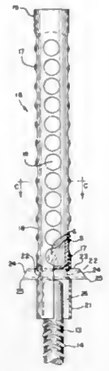
U.S. Cl. 411—82 **11 Claims**

1. Anchor device for securing a rock bolt in a borehole, said anchor device comprising an elongated cage having a perforated elongated wall confining an elongated chamber, said chamber containing bonding means for bonding the rock bolt within the borehole,

said cage having a leading end and a trailing end, and said trailing end comprising an elongated section having a central bore in communication with said chamber, said bore being sized to receive the leading end of a rock bolt, and a pin passing transversely through said elongated

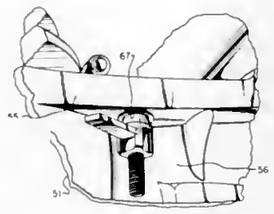
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section adjacent to said chamber, whereby said bonding means rests upon said pin and said pin rests upon said rock



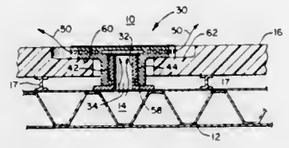
bolt when the cage is mounted on the rock bolt with said trailing end located below said leading end of said cage.

4,820,096
NUT APPARATUS
Michael R. Knight, Irving, Tex., assignor to Dal-Tex Specialty & Mfg. Co., Dallas, Tex.
Filed Sep. 14, 1987, Ser. No. 95,911
Int. Cl.[4] F16B *39/28*
U.S. Cl. 411—169 **2 Claims**



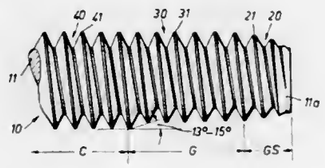
1. A nut apparatus for use for securing a toilet seat to a toilet, comprising:
a body member having two ends with a threaded aperture extending through said body member between said two ends for receiving the threaded shank of a bolt or the like,
said body member having a tapered portion which tapers from a base position toward one of said two ends,
said base position being spaced from said one end,
a single arm means extending from said body member at a position between said base position and the other of said two ends transversely to the axis of said threaded aperture for engaging structure of the toilet to hold said nut body stationary while the bolt is screwed into said threaded aperture or unscrewed from said threaded aperture of said body member,
said body member, said tapered portion, and said arm means being integral with each other and being formed of a plastic material,
said arm means having a free end spaced from said body member, and
a scored line extending across the width of said arm means to facilitate breaking of said arm means to shorten said arm means if desired,
said scored line being located between said free end and said body member and being spaced from said body member.

4,820,097
FASTENER WITH AIRFLOW OPENING
Edwin V. Maeda, West Palm Beach, and James R. Black, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Mar. 18, 1988, Ser. No. 170,484
Int. Cl.[4] F16B *35/00*
U.S. Cl. 411—366 **4 Claims**



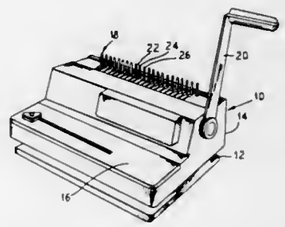
1. A high temperature resistant fastener assembly for securing a thermal liner to a substrate comprising:
a threaded stud secured to said substrate and having an axial opening therethrough, said axial opening in fluid communication with a supply of cooling air;
a fastener formed of a hollow threaded stem having a central chamber and a retaining disk at the end of said stem, said fastener threadedly connected to said stud; and
a plurality of equally spaced openings through said retaining disk extending outwardly from said central chamber in involute form and in fluid communication with said central chamber.

4,820,098
SCREW
Hubert Taubert, and Rudolf Webendörfer, both of Neuwied, Fed. Rep. of Germany, assignors to Friedr. Boesner GmbH, Neuwied, Fed. Rep. of Germany
Continuatioo of Ser. No. 364,318, Apr. 1, 1982, abandoned. This application May 3, 1985, Ser. No. 729,095
Claims priority, application European Pat. Off., Feb. 18, 1982, 82101211.9
Int. Cl.[4] F16B *25/00, 35/04*
U.S. Cl. 411—411 **7 Claims**



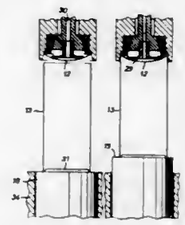
1. In combination with a structure having a threaded hole, a screw having a tip and a thread for engagement with the thread of said hole, wherein on the first plurality of turns of the thread running from the screw tip there is an envelope circle diameter which increases away from the screw tip, contiguous with said plurality of turns there being a transition area of increasing envelope circle diameter, and contiguous with said transition area there being a threaded portion with a multi-lobed thread geometry with constant envelope circle diameter of the screw thread and following onto the threaded portion with the multi-lobed thread shape there is a further threaded portion with a circular thread shape in an envelope of circular configuration, said envelope circles being defined by the crest of the thread, there being an angle of inclination between a plane formed by the external diameter of the thread of the threaded portion with the circular thread shape and a plane formed by the external diameter of the thread of the threaded portion with the lobular thread shape, said angle of inclination being such that when taken in conjunction with the magnitude of said external diameter of the threaded portion of circular shape and the dimensions of the thread of said bole enables said last-mentioned threaded portion to be threaded into said hole without clearance to form a liquid tight seal thereat.

4,820,099
BINDER SLIDE FAILURE PREVENTION SYSTEM
Thomas T. Battisti, Buffalo Grove, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Nov. 4, 1987, Ser. No. 116,549
Int. Cl.[4] B42C *9/00, 5/08*
U.S. Cl. 412—37 **6 Claims**



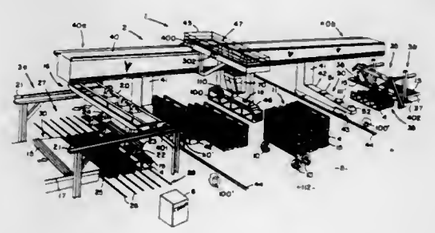
1. A binding mechanism for use with an apparatus constructed to bind apertured material together with a binding element having means defining a backbone and curled aperture-engaging binding fingers, said binding mechanism including means defining a comb having spaced and upstanding tines for engaging said binding element and between which said fingers can extend, and movable hook means having a terminal end portion for engaging the interior of said fingers and opening said fingers by uncurling them from the curled position; wherein the improvement comprises said binding mechanism including slidable and biased comb means, constructed to slide from an original position to a second position in the event a hook means end engages the side edge of a finger and urges the binder element against the comb, and said comb means constructed to be biased to the original position after binding.

4,820,100
METHOD OF FITTING A TOP OR A BOTTOM TO THE BODY OF A CAN AND MACHINE FOR EXECUTING THIS METHOD
Maurice Riviere, Bois D'Arcy, France, assignor to Carnaud S.A., Boulognesur Seine, France
Filed Jul. 7, 1987, Ser. No. 70,443
Claims priority, application France, Jul. 8, 1986, 86 09897
Int. Cl.[4] B21D *51/32*
U.S. Cl. 413—6 **8 Claims**



1. Method of fitting, without soldering or welding, a circular can top or bottom to the cylindrical straight-walled body of a can, said body having a longitudinal axis, said method comprising the steps of: placing inside a die having a rolling surface a circular can top or bottom having a preformed radially inwardly rolled edge that defines a circumferential support surface adapted to be substantially mated with at least part of said rolling surface; then inserting an unrolled circular end portion of said can body between said rolling surface and said support surface; and then axially thrusting said can body into said die, and said end portion against said rolling surface, to cause said end portion to become radially inwardly rolled and to envelop said support surface.

4,820,101
AUTOMATED IN-PROCESS PIPE STORAGE AND RETRIEVAL SYSTEM
Ronald L. Fenn, 7652 Olde Eight, Hudson, Ohio 44236
Continuation of Ser. No. 430,746, Sep. 30, 1982, Pat. No. 4,642,017. This application Oct. 9, 1986, Ser. No. 917,363
Int. Cl.[4] B65G *1/10*
U.S. Cl. 414—21 **45 Claims**



45. Automated storage and retrievel system, comprising a computer, a memory, a storage/retrievel crane, a storage yard, a plurality of containers, each being capable of containing material for storage, and load/unload apparatus, and said computer including means for monitoring and controlling said storage/retrieval crane and said load/unload apparatus and including means for coordinating operation and movement of both of said storage/retrieval crane and said load/unload apparatus to make storage and retrieval of such containers relatively efficient, and said load/unload apparatus and storage/retrieval crane being moveable independently of one another under the control of said computer.

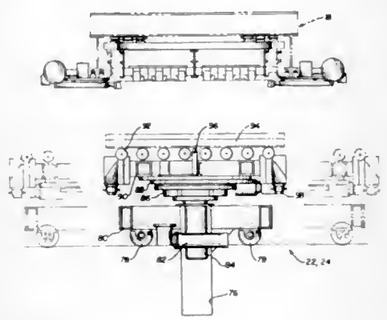
4,820,102
ARRANGEMENT FOR AND METHOD OF STACKING BLANKS
Robert H. Messerly, Warren; William Semenik, Chardon; Norman H. Fobes, Cortland, and Robert J. Prox, Warren, all of Ohio, assignors to Wean Incorporated, Pittsburgh, Pa.
Filed Mar. 10, 1986, Ser. No. 838,277
Int. Cl.[4] B65H *29/30, 31/34*
U.S. Cl. 414—788.9 **7 Claims**

1. In an arrangement for handling magnetic material in blank form in a generally horizontal plane exiting from a source, such as a press or a shear at a predetermined high rate of exit speed, and for conveying said blank along a generally horizontal path of travel, comprising:
first overhead magnetic conveyor means located adjacent said source and having means for picking up said blank at its said high rate of speed and transporting said blank along said first conveyor means,
said picking up and transporting means having a plurality of rail elements,
said rail elements each containing a plurality of non-driven, freely rotatable rollers, and an array of electromagnets mounted inwardly of and adjacent to said rollers to exert a holding force against said blank in a non-contacting

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relationship with said blank upon said path of travel of said blank,

said each roller being mounted in and partially projecting from its respective rail element and having a surface capable of being in a direct contacting relationship with said blank, such that initially said blank travels along said rail



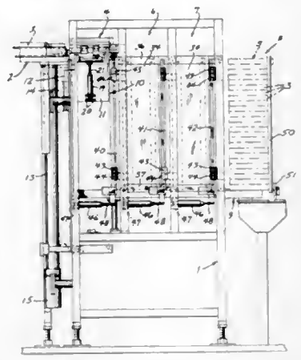
elements at substantially the same rate of speed as its exit speed and thereafter travels at a progressively reduced or diminished speed on its own accord due in part to frictional forces in said arrangement until said blank substantially stops in it of travel along said first magnetic conveyor means whereby damage to said blank is substantially avoided.

4,820,103

APPARATUS FOR VERTICALLY STACKING AND STORING ARTICLES

Wolfgang C. Dorner, Oconomowoc, and Kenneth N. Hansen, Waukesha, both of Wis., assignors to Dorner Mfg. Corp., Hartland, Wis.

Filed Nov. 9, 1987, Ser. No. 118,549
Int. Cl.⁴ B65G *57/02*; B65H *31/30*
U.S. Cl. 414—790 **10 Claims**



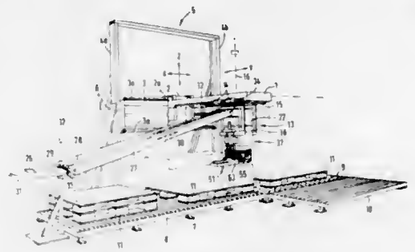
10. An apparatus for stacking articles, comprising a frame, a stacking station including a carriage mounted for vertical travel on the frame, drive means for moving said carriage on said frame, support means disposed on said carriage and including a pair of support members mounted for pivotal movement on said carriage from a generally horizontal supporting position and a downwardly disposed release position wherein the distance between said support members is greater than the width of said articles, conveying means disposed beneath said stacking station and having a width less than the distance between said support members when in said supporting position, said drive means being operable to lower said carriage as each successive article is fed to said carriage to form a stack on said support members, said carriage being movable to a lower position to thereby deposit said stack on said conveyor means, and fluid cylinder means for pivoting said support members between said release position and said horiziontal supporting position, said fluid cylinder means containing a compressible fluid and comprising the sole support for said support members when in the supporting position.

4,820,104

DEVICE FOR THE STACKING AND/OR PALLETING OF, IN PARTICULAR, THIN PRODUCTS OF A PRINTING PRESS OPERATION

Gerd-Georg Kwauka, Gutersloh, Fed. Rep. of Germany, assignor to Mohndruck Graphische Betriebe GmbH, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 892,340
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1985, 3527902
Int. Cl.⁴ B65G *57/112*
U.S. Cl. 414—791 **47 Claims**



1. A device for stacking and/or palleting of, in particular, thin products of a printing press operation, comprising:

a gathering and depositing station (13) rotatable about a vertical axis (16);

said gathering and depositing station (13) including a prestacking shaft (22) and a depositing shaft (37);

said prestacking shaft (22) being arranged vertically over said depositing shaft (37) whereby products are fed into the prestacking shaft to form a stack which is then released to fall into the depositing shaft;

first means for rotating said prestacking shaft (22) about said vertical axis (16) relative to and independently of said depositing shaft (37);

said first means including a first carrying plate (15) of said device arranged over said gathering and depositing station (13), a carrying pipe (18) extending freely downwardly through a hole (17) provided through said first carrying plate (15) so that a lower end of said carrying pipe (18) is below said first carrying plate (15) and so that said carrying pipe (18) can rotate relative to said first carrying plate (15);

an upper end of said carrying pipe (18) being provided with a circular annular disk (19) disposed at a right angle to said vertical axis (16), said circular annular disk (19) being rotatably supported on an upper surface of said first plate (15);

a second carrying plate (21) being seated on said lower end of said carrying pipe (18) so that said second carrying plate (21) can rotate together with said carrying pipe (18);

said prestacking shaft (22) being connected to said lower end of said carrying pipe (18) by said second carrying plate (21) securely mounted therebetween so that said prestacking shaft (22) also rotates with said carrying pipe (18); and

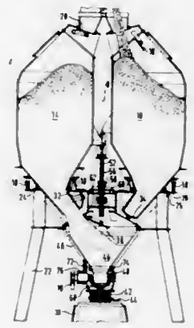
second means for rotating said depositing shaft (37) about said vertical axis (16) relative to and independently of said prestacking shaft (22).

4,820,105

APPARATUS FOR CHARGING A SHAFT FURNACE

Edouard Legille, Luxembourg; Emile Lonardi, Bascharage, and Germain Schilz, L-Esch sur Alzette, all of Luxembourg, assignors to Paul Wurth, S.A., Luxembourg

Filed Mar. 4, 1987, Ser. No. 21,816
Claims priority, application Luxembourg, Mar. 4, 1986, 86336
Int. Cl.⁴ B66C *17/08*; B65G *65/32*
U.S. Cl. 414—200 **8 Claims**



1. A charging apparatus for a shaft furnace comprising a rotating or oscillating distribution spout, a hopper with a flow duct above the spout, the flow opening of the flow duct being controlled by a first metering member, at least two containers mounted above the discharge duct, each container being provided with upper and lower sealing valves and a metering member for regulating the flow of charge material towards the hopper, and further including:

frame means on said furnace;

a sealable chamber mounted on said frame means, said hopper being located in said sealable chamber; and

suspension means for suspending said hopper wherein said hopper is selectively physically connected to one of the containers which is being emptied of charge material and physically disconnected from the other container which is being filled with charge material.

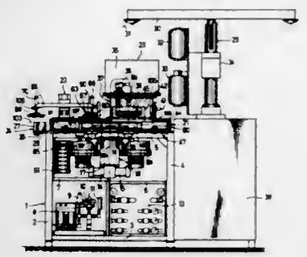
4,820,106

APPARATUS FOR PASSING WORKPIECES INTO AND OUT OF A COATING CHAMBER THROUGH LOCKS

Michael Walde, and Jaroslav Zejda, both of Rodenbach, Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Sep. 2, 1987, Ser. No. 92,171
Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716498
Int. Cl.⁴ C23C *14/22*
U.S. Cl. 414—217 **13 Claims**

1. Apparatus for passing a substantially flat workpiece into and out of an evacuated coating chamber through a lock, and for moving and turning the workpiece into and out of the range of a coating source for the purpose of treating the workpiece surface, characterized by a coating system disposed in the area of the coating chamber and having one or more caplike workpiece holder means for bringing the workpieces into a position, adjacent an opening in a cover of the coating chamber, and for closing the opening on one side, a lifting plate means held and guided on a turntable rotatably mounted within the coating chamber for the closing the other side of the opening, the workpiece holder means being able to be pressed against the opening in the cover of the coating chamber by a jack supported on the loading device, and the lifting plate



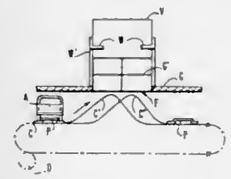
means being able to be pressed against the opening by a lifting means fastened to a bottom plate.

4,820,107

DELIVERY VESTIBULE SYSTEM AND METHOD FOR AUTOMOBILE CONVEYOR GARAGING AND OTHER STORAGE AND RETRIEVAL FUNCTIONS

Jacob I. Nevo-Hacohen, Brookline, Mass., assignor to Auto-Veyor, Inc., Brookline, Mass.

Continuation of Ser. No. 870,847, Jun. 5, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 131,242
Int. Cl.⁴ B65G *17/18*
U.S. Cl. 414—261 **6 Claims**



1. In a garage apparatus for automobiles in which a vestibule is provided for the entrance and exit of automobiles to and from a garage, the vestibule having a bottom opening through which automobiles are lowered and raised, a conveyor system comprising parallel continuous loop conveyors each including a transverse elevator section below said bottom opening of said vestibule and a pair of longitudinal sections extending substantially horizontally from opposite ends of said elevator section so that said elevator section is intermediate said longitudinal sections, a series of automobile-carrying platforms extending between and mounted on said conveyors, drive means for operating said conveyors to move said platforms therealong, each of said elevator sections including a pair of longitudinally staggered incline-decline means for raising said automobile-carrying platforms from said longitudinal sections substantially to the level of said bottom opening of said vestibule and for lowering said platforms to said longitudinal sections, said drive means having means for stopping said conveyors with any one of said platforms aligned with said bottom opening of said vestibule, each platform having an area less than the area of said bottom opening, means operable when one of said platforms is moved to alignment with said bottom opening for inserting walkway means beside said one platform and aligned therewith to permit access thereto and therefrom, and means for removing said walkway means from beside said one platform when said one platform is to be moved from alignment with said opening.

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ARRANGEMENT FOR THE ESSENTIALLY UNIFORM LEVEL PLACEMENT OF BULK MATERIAL IN AN UPRIGHT CIRCULAR CYLINDRICAL VESSEL

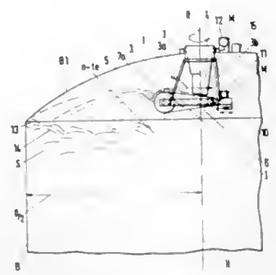
Franz X. Kneer, Eschenburg-Eibelhausen, Fed. Rep. of Germany, assignor to Gebrüder Weiss K.G.

Filed Apr. 7, 1987, Ser. No. 35,476

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611785

Int. Cl.[4] B65G *65/30*

U.S. Cl. 414—301 1 Claim



1. In an arrangement for the essentially uniform level of placement of bulk material in an upright circular cylindrical vessel, comprising a throwing means for throwing the bulk material into the vessel, the throwing means mounted at the top of the vessel, a feeding means for feeding the bulk material onto the throwing means, the throwing means being rotatable about a vertical axis, the rate of rotation of the throwing means being controllable, the throwing means including first and second guide rollers and an essentially horizontally extending endless conveyor belt guided on the guide rollers, a control unit for controlling the conveying speed of the conveyor belt, the length of the conveyor belt being smaller than a quarter of the diameter of the vessel, the first guide roller being located at the discharge end of the conveyor belt, the first guide roller having a greater diameter that the second guide roller at the other end of the conveyor belt, the throwing means including a conveyor belt frame for supporting the guide rollers, the conveyor belt frame mounted longitudinally movably in a radial direction in a support unit which is rotatable about the vertical axis of the vessel, and the support unit including fork-like front and rear support members slidably connected to the conveyor belt frame, a cylinder means connected between the fork-like rear member and the conveyor belt frame for moving the conveyor belt frame longitudinally, the conveying speed of the conveyor belt being adjustable by the control unit after each complete rotation of the throwing means about the vertical axis of the vessel, the range of adjusting the conveying speed of the conveyor belt ranging from a minimum speed for throwing the bulk material into the center region of the vessel and a maximum speed for throwing the bulk material into the area of the periphery of the vessel, so that the throwing means deposits the bulk material in the interior of the vessel in the form of a level heap of material.

4,820,109

BIDIRECTIONAL TRANSFER MECHANISM

William F. Witt, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 11, 1986, Ser. No. 851,008

Int. Cl.[4] B65G *1/00*

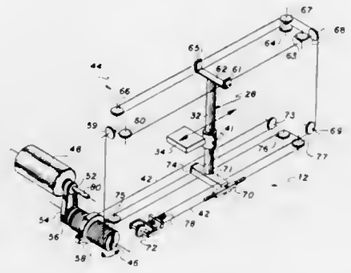
U.S. Cl. 414—282 36 Claims

36. In a cassette storage and playback system having a cassette storage library with a plurality of prerecorded cassettes stored within individual designated bins and playback equipment including at least one playback unit, a method of transferring cassettes back and forth between the library and the playback equipment, comprising the steps of:

mounting a cassette pick-up and release unit on a generally upright support post for sliding movement along the support port generally in a y-axis direction;

mounting the support post on a machine frame for sliding movement generally in an X-axis direction;

threading a first drive cable including at least three drive portions, the drive cable engaging at least upper and lower stabilizing members provided on the support post at least one of said stabilizing members having end portions which extend laterally to either side which respectively connect to the drive cable at a point spaced from said support post, with the other member connected to the drive cable at at least one point spaced form said support post, thereby to stabilize the support post and to permit a resultant X-axis displacement force to act upon the support post generally through the center of mass thereof;



applying the drive force through a first set of pulleys to include a plurality of drive portions extending generally in X-axis direction adjacent opposite ends of the support post and connecting said drive portions to the stabilizing members provided on said support post;

wrapping a portion of the first cable about a first winding drum;

rotating the first winding drum to displace the cable drive portions in unison and in the same direction along the X-axis to displace the support post in the X-axis direction;

threading a second drive cable over a second set of pulleys mounted on the support post and the pick-up unit and having free cable ends secured to the frame;

wrapping a portion of the second drive cable about a second winding drum; and

rotating the second winding drum to displace the second drive cable for displacing the pick-up unit in the Y-axis direction.

4,820,110

CONTAINER TRANSPORT SYSTEM

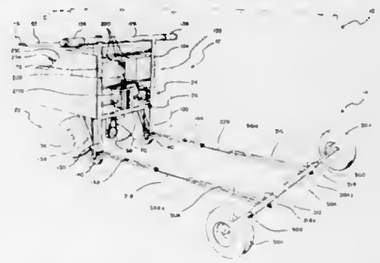
Alex M. Efird, 1925 Brookhaven Rd., Wilmington, N.C. 28403

Filed Feb. 29, 1988, Ser. No. 161,767

Int. Cl.[4] B60P *3/00*

U.S. Cl. 414—458 13 Claims

1. A self propelled portable van to house a container carrier system for transporting a container having a base with opposite ends having fork openings therein, the container carrier system comprising: first and second separate wheel supported modules with the first module having a steerable wheel assembly and a main frame assembly supported on the steerable wheel assembly that permits relative rotation between the main frame assembly and the wheel assembly; a container bulk head formed on a rear of the first module for engaging and confining one end of a container to be transported; a pair of laterally spaced forks projecting rearwardly from a lower portion of the bulk head; the second module having a pair of rear forks projecting forwardly therefrom; a cable assembly mounted on one module and having two cables that extend underneath the forks of the first and second modules and interconnect the first and second modules; the cable assembly including means for tensioning the cables and pulling the first and second modules together which results in the forks lifting the container and sandwiching the container between the first and second modules and wherein the pair of laterally spaced forks and the pair of rear forks are designed to be of a length such that inward ends thereof terminate in spaced apart relationship underneath the container such that the container is supported by both pairs of forks and the cables and wherein the base of the container is held firmly between the bulk head and the second module in such a fashion that the base of the container actually forms a part of a carrier system chassis; a power source mounted on the main frame; a load carrying rotating plate rotatively mounted to the main frame; a plurality of circumferentially spaced bearing assemblies secured to the main frame and having the rotating plate rotatively mounted therein, each circumferentially spaced bearing assembly including a pair of vertically spaced rollers that sandwich and confine the rotating plate



such that as the plate is rotated the plate is confined between the vertically spaced rollers, and a circumferential roller disposed outwardly of the rotating plate and generally engaged with the edge of the plate as the plate is rotated so as to generally horizontally confine the rotating plate; and wherein the wheel assembly includes a pair of wheels interconnected by an axle and wherein the rotating plate is connected to the wheel assembly such that as the wheels are turned the rotating plate rotates with respect to the main frame; drive means interconnecting the power source and the wheel assembly thereby making the carrier assembly self propelled; a walk along steering assembly operatively connected to the wheel assembly of the first module and projecting outwardly therefrom for enabling an operator to walk along adjacent the first module for steering the first module while the carrier is being powered by the power source; the steering assembly being directly connected to the rotating plate and extending upwardly therefrom and including a vertical central post that is disposed centrally over the rotating plate and which extends upwardly therefrom in coaxial relationship with the rotation plate, and a generally horizontal transverse arm secured to a top portion of the central post and extending generally horizontally therefrom.

4,820,111

BOAT TRAILER WITH PIVOTAL KEEL AND HULL SUPPORTS

Byron L. Godbersen, Lake LaJune Estates, Ida Grove, Iowa 51445

Filed Oct. 26, 1987, Ser. No. 112,476

Int. Cl.[4] B60P *3/10*

U.S. Cl. 414—534 8 Claims

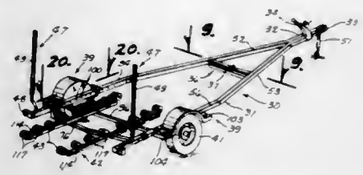
1. A trailer for transporting a boat or the like comprising:

a frame having a forward end adapted to be detachably connected to a prime mover;

a wheel unit including transversley spaced wheels mounted to the rear of said frame;

means for supporting the keel of a boat secured to said frame forwardly of said wheels and including an element for receiving the keel in a nested condition, said element disposed longitudinally of said frame;

means for supporting the bottom side of the hull of the boat comprising a pair of transversely spaced, elongated units extended parallel each other and longitudinally of said frame, each of said units adapted to engage a predetermined length of the bottom sides of the hull of the boat;



a cross member connected at each end to said frame and extended transversely of said frame, said hull supporting units mounted on said cross member;

and further wherein said element is movable relative to the remainder of said keel supporting means, said element movement being a pivotal movement about a transverse, horizontal axis.

4,820,112

CLAW ATTACHMENT FOR BACKHOES AND EXCAVATORS

Ralph Mullican, P.O. Box 688, Yuba City, Calif. 95992

Filed Mar. 8, 1988, Ser. No. 165,617

Int. Cl.[4] B66C *3/02*

U.S. Cl. 414—704 8 Claims



1. A non-hydraulic claw for attachment to the crowd of a backhoe or excavator for removing boulders and other large objects from the ground in cooperation with the bucket of the backhoe or excavator, which claw comprises:

a clamp having a main body portion, which body portion has a blunt nose section at the distal end of a main section and a rear mount section at the proximal end of the main section, and

a pair of trapezoidal ears extending outwardly and forwardly on each side of the main body portion of said clamp, said ears being disposed normal to the main body portion,

including a generally triangular stowage portion on the underside of the main section of the body portion, said stowage portion having a throughbore therein,

said claw being removably mountable in a first operative position in a mounting bracket fixedly mountable on said crowd, by the rear mount section of the clamp and being removably mountable in said bracket in a second storage position by its rear mount section and its stowage portion.

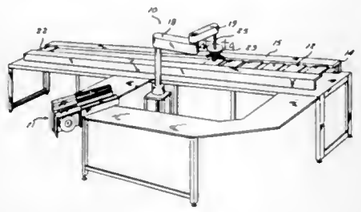
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4,820,113

HEAD FOR ATTACHMENT TO A ROBOT TO PICK UP ARTICLES

James J. Farquhar, San Jose, Calif., assignor to Alliance Automation Systems, Inc., Rochester, N.Y.

Filed Aug. 3, 1987, Ser. No. 80,619
Int. Cl.⁴ B66C *1/10*
U.S. Cl. 414—736 **7 Claims**



1. A parts manipulator comprising:
a part positioning device (**10**) having movable portions (**18, 19, 25**) and carrying a gripper mount (**26**) attached to one (**25**) of said movable portions of said part positioning device (**10**);
a plurality of gripper mechanisms (**21**) mounted about said gripper mount (**26**);
each of said gripper mechanisms (**21**) including a set of relatively movable opposed gripper finger portions (**51**) and means (**60,61,62,64,65**) for selectively moving said gripper finger portions (**51**) together so as to enable said gripper mechanism (**21**) to grip a part;
a plurality of mounting means, (**37,50**) each mounting a set of said gripper finger portions (**51**) of a respective one of said gripper mechanisms (**21**) to be shiftable as a set about a horizontal axis relative to said mount (**26**) between a first upper orientation and a second lower orientation, said gripper finger portions (**51**) in said first orientation directed in another direction than when in said second orientation;
actuation means (**42**) associated with each of said gripper mechanisms (**21**) operable to enable each set of said finger portions (**51**) to be shifted between said first and second orientations independently of each other, whereby the finger portions (**51**) of any selected one of said plurality of gripper mechanisms (**21**) may be positioned in either said first or second orientations for handling of a part upon actuation by said actuation means (**42**).

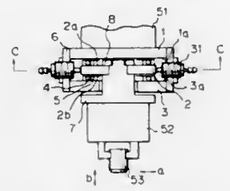
4,820,114

COMPLIANCE APPARATUS OF A ROBOT HAND

Ryohei Inaba; Yusaku Azuma, both of Yokohama, and Shozou Kasai, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 869,616, Jun. 2, 1986, abandoned. This application Apr. 12, 1988, Ser. No. 183,348
Claims priority, application Japan, Jun. 5, 1985, 60-121880
Int. Cl.⁴ B66C *1/10*
U.S. Cl. 414—751 **1 Claim**

1. An apparatus comprising:
a movable member;
means for supporting said movable member in a vertical direction and permitting translational and rotational movement in a horizontal plane, said movable member having having three end surfaces on an outer periphery thereof;
grip means for gripping an article, said means being attached to said movable member;
control means for controlling said movable member in a movable condition in the horizontal plane and in a fixed condition;
said control means comprising,
a plurality of cylinders provided opposed to each said end surface,
a spring member provided in each of said cylinders,
a plurality of retractable pistons for pressing said end surfaces of said movable member, each said piston being



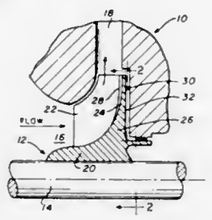
inserted in said cylinder and having one end thereof projected through an opening of said cylinder by a biasing force of said spring;
lock means connected to said cylinder for locking the movement of said piston, wherein a locking operation of said lock means is released when said grip means grips and inserts the article into a predetermined position.

4,820,115

OPEN IMPELLER FOR CENTRIFUGAL COMPRESSORS

Phiroze Bandukwalla, Olean, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 12, 1987, Ser. No. 119,838
Int. Cl.⁴ F04D *29/08*
U.S. Cl. 415—98 **2 Claims**



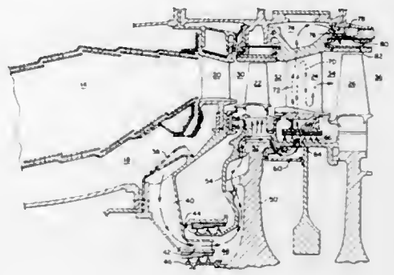
1. An improved open impeller for a centrifugal compressor comprising:
a hub portion having an axis of rotation and a bore therethrough for receiving a shaft;
an annular disc portion extending radially from said hub portion and having an outer periphery, a front surface, and a rear surface;
a plurality of circumferentially spaced blades located on and projecting axially from the front surface of said disc portion and extending generally from said hub portion to said outer periphery; and,
a plurality of elongated vanes, each having a cross-section of generally airfoil configuration located on said rear surface proximate said outer periphery and disposed between said blades with a chord of each of said vanes aligned generally tangent to a circle having as its center said axis of rotation.

4,820,116

TURBINE COOLING FOR GAS TURBINE ENGINE

Edward J. Hovan; Guilford E. Stephens, both of Manchester, and Samuel C. Peele, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 18, 1987, Ser. No. 99,180
Int. Cl.⁴ F01D *5/18*
U.S. Cl. 415—115 **2 Claims**



1. A gas turbine engine having:
a compressor;
a first stage rotor blade set having a cooling flowpath through the blades;
a first stage rim structure supporting said first stage rotor blades;
a first stage disk supporting said rim structure;
a second stage stator vane set having cooling flowpaths through the vanes;
a second stage interstage labyrinth seal sealing around said second stage stator vane set;
a second stage rotor blade set;
stator nozzles mounted in said stator adjacent to said first stage disk and angled to direct airflow passing therethrough in the direction of rotation of said disk;
means for conveying cooling air from substantially a compressor outlet to said stator nozzles;
said rim structure having cooling airflow openings therethrough from an upstream side to a downstream side of said disk;
means for conveying airflow through said rotor from said stator nozzles to said cooling airflow openings in said rim structure;
nozzles secured to said rotor, angled to direct flow therethrough opposite the direction of rotation of said rotor and located to discharge air into a plenum between seal sections of said second stage interstage labyrinth seal; and
the cooling flowpath through said second stage vanes being in fluid communication with said seal plenum.

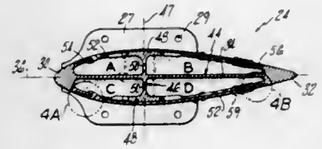
4,820,117

CROSSED I-BEAM STRUCTURAL STRUT

John R. Larrabee, Portland, and Philip F. Kravsow, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 9, 1987, Ser. No. 71,516
Int. Cl.⁴ F01D *25/16*
U.S. Cl. 415—142 **15 Claims**

1. A strut for a bearing support structure for a gas turbine engine, said support structure comprising an annular inner support, a concentric annular outer support, and a plurality of said struts extending therebetween and attached thereto, each strut comprising:
(a) a base portion for attachment to said inner support structure;
(b) a tip portion for attachment to said outer support structure;
(c) a forward edge extending between said base portion and said tip portion;
(d) a rearward edge extending between said base portion and said tip portion;
(e) a first web integral with said forward and rearward edges, and extending between said base and tip portions; and



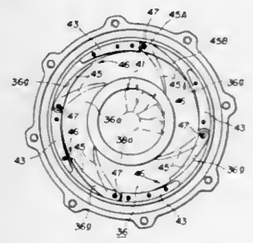
(f) a second web integral with said first web and extending between said base and tip portions transversely to said first web, said second web including spaced apart flanges substantially perpendicular to said second web, each flange extending between said base and tip portions on each side of said first web.

4,820,118

VARIABLE-DISPLACEMENT TURBINE

Shunji Yano, and Masato Hayama, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1988, Ser. No. 148,254
Claims priority, application Japan, Jan. 23, 1987, 62-13833
Int. Cl.⁴ F04D *17/16*
U.S. Cl. 415—161 **8 Claims**



1. A variable-displacement turbine comprising:
a turbine wheel supported on an output shaft;
a support member by which said output shaft is rotatably supported;
a vane casing including an annular base plate through which said output shaft rotatably extends and which is disposed concentrically rearwardly of said turbine wheel, an annular top plate having a central exhaust outlet opening and disposed parallel to said base plate concentrically forwardly of said turbine wheel, and a vane mechanism disposed annularly in surrounding relation to said turbine wheel and between confronting annular end surfaces of said base and top plates around entire peripheries thereof;
a turbine housing accommodating said vane casing therein and having an exhaust inlet tubular member for introducing a stream of exhaust gases from an engine through said vane mechanism, said turbine housing being coupled to said support member;
said vane mechanism including a plurality of drive shafts rotatably extending through said base plate and disposed at substantially equally spaced angular intervals between said annular end surfaces, said drive shafts being rotatably actuatable by an actuator, and a plurality of movable vanes extending between said annular end surfaces, said

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movable vanes having base end portions mounted respectively on said drive shafts in slidable contact with said base plate and wing portions extending respectively from said base end portions and spaced from said base and top plates by distances, said movable vanes being tiltable between said annular end surfaces in response to rotation of said drive shafts, respectively, for regulating said stream of exhaust gases, and

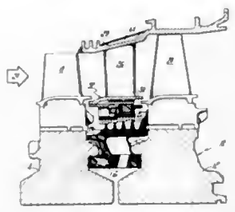
said annular end surfaces of the base and top plates having stepped walls which will extend along outer peripheral surfaces of said movable vanes in a position in which the movable vanes are prevented from being tilted to allow said vane mechanism to have a minimum opening, said stepped walls having respective thicknesses greater than said distances.

4,820,119

INNER TURBINE SEAL

Michael J. Joyce, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 23, 1988, Ser. No. 197,726
Int. Cl.[4] F01D *11/02*
U.S. Cl. 415—172 A **6 Claims**



1. An inner turbine seal for sealing a turbine stator stage and a rotor from gas bypass around said stator stage comprising:

a full annulus vane platform structure;

a plurality of stator vanes secured to said vane platform structure and extending radially outward therefrom;

a full annulus seal land structure located coaxially inside said vane platform structure;

a plurality of axially extending spline grooves on one of said vane platform structure and seal land structure;

a plurality of axially extending splines engaging locking means for axially restraining relative axial movement of said vane platform structure and seal land structure;

a piston ring sealingly engaging both said vane platform structure and said seal land structure; and

said seal land structure including a full annulus abradable seal land around the inner periphery thereof located in flow sealing proximity to said rotor.

4,820,120

STATOR ASSEMBLY FOR THE FAN OF A MULTI-FLOW TURBO-JET ENGINE

Thierry Feuvrier, Noisy-le-Roi, and Alexandre Forestier, Vaus Le Penil, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A.", Paris, France

Filed Jun. 18, 1987, Ser. No. 63,431
Claims priority, application France, Jun. 18, 1986, 86 08775
Int. Cl.[4] F01D *9/02*
U.S. Cl. 415—189 **3 Claims**

1. In a multi-flow turbo-jet engine including a fan and a fan casing,

a stator assembly for the fan, comprising:

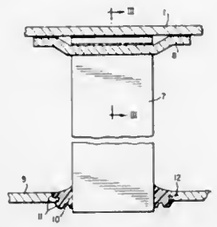
an inner ring,

an outer ring of sheet metal placed on the inside of said fan casing,

means defining a plurality of slot-like openings disposed evenly around the circumference of said outer ring, and

a stage of fixed vanes evenly arrayed between said inner and outer rings,

said vanes each comprising:



an aerofoil portion, and

an angle portion which is bent at right angles to said aerofoil portion at a radially outer end thereof,

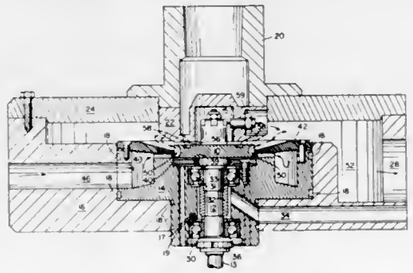
said angle portion being inserted in one of said openings of said outer ring.

4,820,121

TURBINE HAVING A BEARING CARTRIDGE

Anthony Enos, Revere, and Robert Gauthier, Reading, both of Mass., assignors to Barbour Stockwell, Co., Cambridge, Mass.

Continuation of Ser. No. 937,964, Dec. 4, 1986, abandoned. This application Jul. 18, 1988, Ser. No. 219,908
Int. Cl.[4] F01D *9/02*
U.S. Cl. 415—202 **12 Claims**



1. A high speed turbine comprising:

an air box having an inlet for receiving pressurized fluid and an exhaust for exhausting the fluid;

a removable bearing cartridge including a rotor shaft positioned by bearings within a stationary portion which fits within the air box, the rotor shaft extending axially beyond the bearings to receive a rotor disc thereon;

a rotor disc which is supported on the rotor shaft of the bearing cartridge and positioned to receive the pressurized fluid from the inlet of the air box causing it to spin and perform work; and

a nozzle plate mounted to an end face of the stationary portion of the bearing cartridge for directing pressurized fluid from the inlet to the rotor disc;

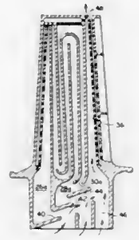
the bearing cartridge being removeable with the rotor disc and nozzle plate and the cartridge, rotor disc and nozzle plate being coupled to each other such that different bearing cartridges and rotor discs and nozzle plates of different diameters are selectively mountable within the air box.

4,820,122

DIRT REMOVAL MEANS FOR AIR COOLED BLADES

Kenneth B. Hall, Jupiter; Thomas A. Auxier, Palm Beach Gardens, and Wesley D. Brown, Jupiter, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 25, 1988, Ser. No. 185,227
Int. Cl.[4] F01D *5/18*
U.S. Cl. 416—97 R **3 Claims**



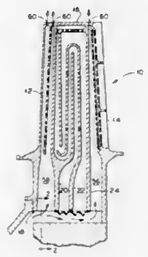
1. An internally cooled blade for a gas turbine engine, said blade having a root section and tip section, wall means between said root section and tip section defining the airfoil of said blade, a plurality of ribs defining passageways extending spanwise in said blade for communicating cooling air through said blade discharging into the turbine engine's gas path through apertures formed in said airfoil, means for preventing dirt from clogging said apertures, said means including at least one straight through passageway and hole formed in said tip section sized for the largest particle of dirt anticipated to be entrained in said cooling air, and at least one rib at the root section having a baffle-like shaped portion angularly disposed relative to said passageways for directing the dirt entrained air into said straight through passageway and preventing said dirt entrained air from entering said other passageways.

4,820,123

DIRT REMOVAL MEANS FOR AIR COOLED BLADES

Kenneth B. Hall, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 25, 1988, Ser. No. 185,226
Int. Cl.[4] F01D *5/18*
U.S. Cl. 416—97 R **4 Claims**



1. An internally cooled turbine blade supported in a turbine disk for a gas turbine engine, said blade having a root section mounted in a recess formed in said disk and a tip section, wall means between said root section and tip section defining an airfoil of said blade, means including an inlet internally in said blade for routing cooling air through said inlet into said airfoil and discharging through openings in said wall into the gas path of said gas turbine engine, means for preventing dirt from clogging said openings, said means including a sheet metal generally rectangularly shaped and having a portion stamped out so as to have a depending deflector portion extending angularly therefrom, means for securing said sheet metal to the root section of said blade so that said deflector portion is angularly disposed relative to said inlet and being in overlying relationship, means for admitting cooling air in said recess between said root section and said disk and an opening in said disk for discharging a portion of said air out of said disk and bypassing said inlet, whereby said deflector deflects the dirt entrained airstream into the discharging air while permitting the relatively dirt-free entrained air to enter said inlet by turning around the angle formed by said deflector.

4,820,124

METHOD OF MANUFACTURING ROTATING THERMAL MACHINE BLADING CONSISTING OF AN AIRFOIL, A ROOT AND A SHROUD PLATE OR A SHROUD BY FASTENING A SHROUD PLATE, AND A BLADE MANUFACTURED BY THIS METHOD

Reinhard Fried, Nussbaumen, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Apr. 13, 1988, Ser. No. 181,104
Claims priority, application Switzerland, Apr. 13, 1987, 1419/87
Int. Cl.[4] F01D *5/22*
U.S. Cl. 416—191 **15 Claims**



9. Blading for a rotating thermal machine, consisting of an airfoil (**1**), a root (**4**) and a shroud plate (**5**) or a shroud, either of the last two being fastened to the tip (**2**) of the airfoil (**1**), wherein the tip (**2**) of the airfoil (**1**) has a spigot-type step (**11**) with an external semicircular groove (**12**) extending around the whole periphery of the generated surface, wherein the shroud plate (**5**) or the shroud has a recess (**7**), corresponding to the step (**11**) of the airfoil (**1**), with an internal semi-circular groove (**8**) extending around the whole of the periphery, and wherein the circular cross-section duct thus formed by the grooves (**8**, **12**) mentioned is filled in such a way by one or more bent, firmly seating pieces of a heat-resisting wire (**10**) that a purely mechanical, firm connection exists between the tip (**2**) of the airfoil (**1**) and the shroud plate (**5**) or the shroud.

4,820,125

RIBBON DEVICE FOR TYPEWRITERS OR SIMILAR OFFICE MACHINES

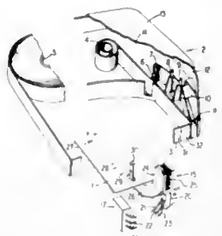
Alfred Keiter, and Manfred Sauer, both of Wilhelmshaven, Fed. Rep. of Germany, assignors to AEG Olympia AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 142,977
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1987, 3700636
Int. Cl.[4] B41J *35/36*
U.S. Cl. 400—249 **10 Claims**

1. An end-of-ribbon sensing device for an office machine, which machine includes a printing station for receiving a replaceable member provided with a supply reel, a take-up reel

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and a nonreusable ribbon extending between the reels, and means for advancing the ribbon through the printing station while the ribbon is being unwound from the supply reel and wound onto the take-up reel, the ribbon having a scannable marking at its trailing end, the scannable marking has a light reflecting surface, said device comprising: receiving means mounted at the printing station for receiving the replaceable member; ribbon scanning means carried by said receiving means and having scanning elements which are exposed to the ribbon when the ribbon is received by said receiving means for scanning the scannable marking disposed at the end of the ribbon and for generating a signal upon scanning of the scannable marking, said ribbon scanning means comprise an optical scanner arranged to cooperate with the light reflecting surface to indicate the ribbon end, said scanning elements include a light transmitter having a light transmitting surface and a light receiver having a light receiving surface; a control circuit connected to said scanning means for processing the signal generated by said scanning means so as to generate a ribbon end signal; a covering element for selectively covering and cleaning said scanning elements of said scanning means, said covering element comprising a scouring material; and support



means supporting said covering element and carried by said receiving means, said support means being maintained in a first position, when a replaceable member is not present at said receiving means, in which said covering element covers said scanning elements, and said support means being movable in response to reception of a replaceable member by said receiving means, and under control of the replaceable member, into a second position in which said covering element is displaced so as to expose said scanning elements to the ribbon and its scannable marking, said support means being operative to return to said first position upon removal of a replaceable member and said covering element preventing transmission of light to said optical scanner when said support means is in said first position, thereby preventing generation of a ribbon end signal and permitting the machine to remain operational to perform functions not requiring a ribbon, and said scouring material of said covering element effecting a cleaning action on said scanning elements during return of said support means from said second position to said first position, said covering element being operative for covering, contacting and effecting the cleaning action on said light transmitting and light receiving surfaces.

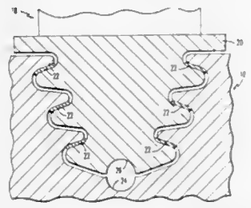
4,820,126

TURBOMACHINE ROTOR ASSEMBLY HAVING REDUCED STRESS CONCENTRATIONS

William A. Gavilan, Pfafftown, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 22, 1988, Ser. No. 158,814
Int. Cl.[4] F01D *5/30*
U.S. Cl. 416—221 **15 Claims**

1. A turbomachine rotor assembly having reduced stress concentrations comprising:
(a) a rotor disk rotatably about a central axis, defining at least one groove having at least a portion of one side forming a first bearing surface;
(b) at least one turbine blade having a root portion slidably received in the at least one groove, the root portion defining at least one second bearing surface located adjacent and extending generally parallel to the first bearing surface;
(c) a layer of superplastic metal in contact with the at least one first and second bearing surfaces to maximize the area



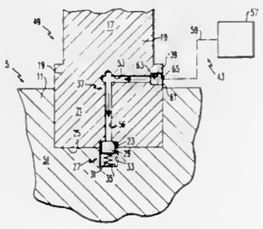
of contact between the first and second bearing surfaces, thereby reducing stress concentrations in the blade root portion and the rotor disk; and
(d) a pre-load device disposed between the groove of said rotor disk and the root of said blade such that a preload is applied to compress and deform said superplastic metal to increase the contact area therebetween.

4,820,127

BLADE SUPPORT AND BLADE ASSEMBLY

Albert Coben, Winter Springs; James T. Lipscomb, Oviedo; Richard J. Antos, and Anthony E. Wesson, both of Winter Springs, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1988, Ser. No. 149,315
Int. Cl.[4] F04B *1/06*
U.S. Cl. 416—221 **9 Claims**



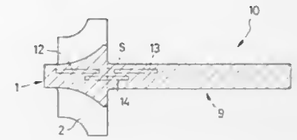
1. A blade support and blade assembly which comprises:
a cylindrical blade support having a slot in the outer periphery thereof and a hollow extending radially inwardly from said slot;
a blade having an airfoil section, a base, and a root section disposed in said slot, the root section having a radially extending groove therein;
a locking pin having a radially outer end portion positioned for outward radial movement into the groove of said root section to secure said root section to the blade suport and for inward radial movement from said groove; and
a coil spring situate in said hollow of said blade suport radially inward of said locking pin for biasing said radially outer portion of said pin into said groove;
said blade having a continuous bore formed therein extending completely through said blade root from the outer surface thereof to the location of the radially outer end of said locking pin when the latter is biased radially outwardly, such that a pin displacement means is operative from the outer surface of said base through said bore to oppose the biasing force of said coil spring and displace the radially outer portion of said pin radially inwardly from said groove, to permit removal of the blade root and blade from said slot wherein said bore, adjacent the outer surface of said blade base is adapted to be engaged with a pressure line, and a source of pressure is provided, with said pressure line connected to said source of pressure, such that a fluid pressure from said source of pressure is exertable through said bore to contact said pin and displace the same from said groove.

4,820,128

COMPOSITE CERAMIC STRUCTURE AND METHOD FOR MANUFACTURING THE SAME

Shigenori Ito, Kasugai, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Division of Ser. No. 781,713, Sep. 30, 1985, Pat. No. 4,696,777.
This application Jul. 1, 1987, Ser. No. 69,019
Claims priority, application Japan, Oct. 4, 1984, 59-208962
Int. Cl.[4] F01D *5/34*
U.S. Cl. 416—241 B **9 Claims**



1. A sintered composite ceramic structure comprising:
a first pre-sintered ceramic piece formed of a molded mass of ceramic powder and having a first end portion and an oppositely located second end portion; and
a second pre-sintered ceramic piece formed of a mass of ceramic powder and having a first end portion and an oppositely located second end portion, said first end portion of said second pre-sintered piece being molded to said second end portion of said first pre-sintered ceramic piece such that the first end portion of said second pre-sintered ceramic piece has a surface contour which corresponds exactly to that of the second end portion of said first pre-sintered ceramic piece, said pre-sintered ceramic pieces thus forming a pre-sintered composite ceramic structure having a pre-sintered ceramic joint portion therebetween;
said pre-sintered composite ceramic structure being sintered to form said composite structure which after sintering has a bending strength of at least 69 kg/mm^2 at the previous location of said pre-sintered ceramic joint portion.

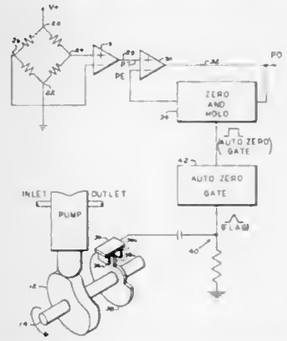
4,820,129

PRESSURE MEASUREMENT IN FLUID PUMP SYSTEMS

Haakon T. Magnussen, Jr., Pinole, Calif., assignor to Altex Scientific, Inc., Calif.

Filed Jun. 8, 1982, Ser. No. 386,453
Int. Cl.[4] F04B *49/06, 49/00*
U.S. Cl. 417—18 **3 Claims**

1. A fluid pump system comprising:
fluid pump means including a chamber into which a fluid is drawn, in which said fluid is pressurized, and from which said fluid is delivered, during respective filling, pressurizing and delivery intervals of a cycle of said pump means;
means for measuring the pressure of fluid in said chamber and generating a pressure signal indicative thereof;
means for generating an error signal during a portion of the chamber fill interval when pressure in said chamber is zero or less than zero, indicating error in zero pressure measurement by said pressure measuring means; and



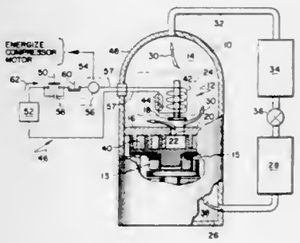
means for summing the error signal generated with the measured pressure signal to derive a corrected pressure output signal for use with said fluid pump system.

4,820,130

TEMPERATURE SENSITIVE SOLENOID VALVE IN A SCROLL COMPRESSOR

David H. Eber; Peter A. Kotlarek, both of La Crosse, and Ronald W. Okoren, Holmen, all of Wis., assignors to American Standard Inc., New York, N.Y.

Filed Dec. 14, 1987, Ser. No. 133,576
Int. Cl.[4] F04B *39/08*
U.S. Cl. 417—32 **23 Claims**



1. A refrigeration apparatus comprising:
(a) a condenser;
(b) an evaporator;
(c) a scroll compressor disposed inside a hermetic shell and connected to deliver refrigerant from said evaporator to said condenser, said compressor having a stationary scroll plate with a discharge opening therethrough; and
(d) a solenoid valve disposed inside said shell adjacent to said discharge opening to pass substantially all of said refrigerant being delivered from said evaporator to said condenser, said valve being adapted to close said discharge opening to substantially block any refrigerant from being delivered from said evaporator to said condenser.

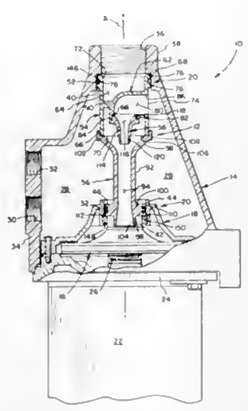
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4,820,131

VENTURI NOZZLE ASSEMBLY CONSTRUCTION IN A SHALLOW WELL PUMP CASING

Charles S. Johnson, Fort Wayne, Ind., assignor to Wayne/Scott Fetzer Company, Fort Wayne, Ind.

Filed Sep. 2, 1987, Ser. No. 92,155
Int. Cl.[4] F04B *23/04, 39/12*
U.S. Cl. 417—83 13 Claims



1. A venturi nozzle assembly in a centrifugal pump casing, said assembly comprising:

a supply and recirculation fluid cylindrical intake tube defining a supply fluid intake passageway therethrough and having opposite inner and outer threadless end portions with openings defined respectively thereat, a first annular seal-receiving seat formed on said intake tube about said outer end portion thereof, a side opening in said intake tube at a location between said opposite inner and outer end portions thereof, and a generally elbow-shaped pipe disposed within said intake tube and extending in a generally transverse relation thereto, said pipe defining a recirculation fluid intake passageway therethrough and having first and second cylindrical threadless ends with openings defined thereat and being oriented at approximately ninety degrees with respect to one another, said pipe at its first end being integrally connected with said intake tube and being disposed in communication with said side opening of said intake tube, said pipe at its second end being disposed in concentric relation with said intake tube and spaced radially inward therefrom and, at its second end opening, facing toward but spaced from said inner end portion of said intake tube;

a venturi tube having a hollow body defining a supply and recirculation fluid transfer passageway therethrough, said body having tandemly-disposed and integrally-connected outer substantially cylindrical and inner frusto-conical portions and opposite outer and inner threadless end portions with openings defined respectively thereat, said inner threadless end portion of said body being defined on said inner frusto-conical portion thereof and said outer threadless end portion of said body being defined on said outer cylindrical portion thereof, a cylindrical rim formed on said inner end portion of said body and having an inside diameter greater than the inside diameter of said outer end portion thereof and greater than the outside diameter of said inner end portion of said intake tube for receiving said inner end portion of said intake tube within said cylindrical rim in a slip fit relation for attachment of said intake tube and venturi tube together, and a second annular seal-receiving seat formed on said exterior surface of said body about said outer end portion thereof; and,

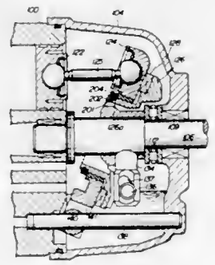
a nozzle having a hollow member defining a recirculation fluid injecting passageway therethrough, said member having tandemly-disposed and integrally-connected inner cylindrical base and outer frusto-conical nose portions and opposite inner and outer threadless ends with openings defined thereat, said inner threadless end of said member being defined on said inner cylindrical base portion thereof and said outer threadless end of said member being defined on said outer frusto-conical nose portion thereof, and an outer cylindrical edge portion and an inner annular flange portion defined in a tandem arrangement on said inner threadless end of said member, said outer edge portion having an outside diameter less than the outside diameter of said inner flange portion and less than the inside diameter of said second end of said generally elbow-shaped pipe for receiving said outer edge portion of said inner end of said nozzle within said second end of said pipe in a slip fit relation for attachment of said nozzle and pipe together.

4,820,132

VARIABLE DISPLACEMENT WOBBLE PLATE TYPE COMPRESSOR

Shinichiro Higashihara, and Terukazu Shinto, both of Tokyo, Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1987, Ser. No. 97,144
Claims priority, application Japan, Sep. 19, 1986, 61-142619[U]
Int. Cl.[4] F04B *1/18, 1/28*
U.S. Cl. 417—222 5 Claims



1. In a wobble plate variable capacity compressor

a drive shaft selectively connectable to a source of rotational energy:

a drive plate pivotally connected to said drive shaft in a manner to be pivotal with respect thereto and synchronously rotatable therewith;

a wobble plate operatively disposed on said drive plate, said wobble plate being supported on said drive plate by a thrust bearing and held stationary with respect to said drive plate in a manner that relative movement occurs therebetween when said drive shaft is driven to rotate; and

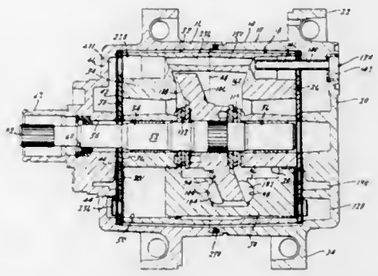
a spring mounted and rotatably locked into a biasing position on said driven plate, said spring applying a bias to said wobble plate which urges said wobble plate into constant engagement with the thrust bearing.

4,820,133

AXIAL PISTON COMPRESSOR WITH DISCHARGE VALVING SYSTEM IN CAST HOUSING HEAD

David G. Steele, Connersville, Ind., and Duane F. Steele, Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1987, Ser. No. 128,311
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[4] F04B *1/16, 1/18*
U.S. Cl. 417—269 6 Claims



1. In an air conditioning compressor having two cast housing heads that form parts of a cylinder housing, said housing enclosing cylinder blocks with axial cylinders formed therein; said air conditioning compressor comprising

two cast generally cylindrical parts that form a bipartite compressor housing, each housing part having an end wall forming a housing head and a generally cylindrical portion, the generally cylindrical portions of said housing parts being joined in end-to-end juxtaposed relationship at a location intermediate the housing heads for said housing parts;

means for clamping said housing parts together with a force that is axially directed with respect to the housing axis;

a cylinder block in each housing part defining axially disposed cylinders, the cylinder block for one housing part abutting the cylinder block for the other housing part in axially aligned, juxtaposed relationship whereby the cylinders of one block form continuations of the cylinders for the other block, thus defining common cylinder openings;

a double-acting piston in each cylinder opening; a swashplate and driveshaft assembly having a swashplate drivably engageable with each piston and a driveshaft mounted in each cylinder block coaxially therewith;

a valve assembly having a valve plate with refrigerant delivery and supply ports therein located between each housing head and an adjacent surface of a cylinder block;

each cylinder block having formed therein high pressure and low pressure flow passages that communicate with each cylinder of the adjacent cylinder block;

flat radial surfaces on each housing head;

an inlet valve disc between each valve plate and the adjacent surface of a cylinder block including valve reeds that provide controlled flow from said low pressure passages to said cylinders;

a discharge valve disc located between said radial surfaces and said valve plate including discharge valve reeds that provide controlled flow from said cylinders to said high pressure passages; and

a seal plate between said valve plate and said radial surfaces including porting for accommodating axial flow of high pressure fluid and low pressure fluid;

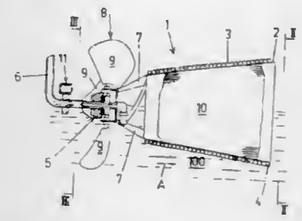
said clamping means applying a sealing and retaining force on said cylinder blocks, said valve disc, said valve plate and said seal plate.

4,820,134

LOOP PUMP

Per-Olof Karlsson Box 51, S-980 21 Jukkasjärvi, Sweden

PCT No. PCT/SE86/00479, § 371 Date Jun. 15, 1987, § 102(e) Date Jun. 15, 1987, PCT Pub. No. WO87/02425, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 16, 1986, Ser. No. 67,917
Claims priority, application Sweden, Oct. 18, 1985, 8504905
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—336 4 Claims



1. A buoyant loop pump for use in a streaming watercourse having a fluid flow direction, comprising:

a pipe arranged about an axis in an axially elongated spiral having a plurality of turns, said pipe having an inlet located off said axis and an outlet located on said axis;

a floating body located at least partly radially within said spiral so as to be radially surrounded at least partially by said pipe;

a vane means connected with said floating body for interacting with said streaming watercourse for converting flow energy of water flowing in said fluid flow direction into rotation of said vane means, floating body and pipe as a unit, whereby alternating quantums of air and water are introduced into said pipe through said inlet, the quantums of air are compressed in said pipe, and said quantums of water and compressed air are expelled from said pipe through said outlet;

an outlet line having an inlet end and an outlet end, said outlet end being located above said axis;

a rotary joint connecting said inlet end of said outlet line to said outlet of said pipe, so that as said vane means, floating body and pipe rotate as a unit said quantums of water and compressed air issue from said outlet end of said outlet line; and

an anchor connected to one of said outlet line and a relatively non-rotary end of said rotary joint, and being arranged for tethering said unit for generally pivotal movement in a generally horizontal plane for maintaining alignment of said unit with said fluid flow direction;

said pump being externally substantially frameless, and said rotary joint providing a sole bearing point between said unit and said outlet line.

4,820,135

FLUID DRIVEN PUMPING APPARATUS

Peter E. Simmons, London, England, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 9, 1987, Ser. No. 12,919
Claims priority, application United Kingdom, Feb. 28, 1986, 8605033
Int. Cl.[4] F04B *9/10*
U.S. Cl. 417—391 24 Claims

1. A fluid driven pumping apparatus comprising:

a twin rotor screw type positive displacement motor comprising:

a driving fluid inlet;

a driving fluid outlet; and

a pair of motor screw rotors;

a twin rotor screw type positive displacement pump having

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a greater fluid displacement volume than said motor, said pump comprising:

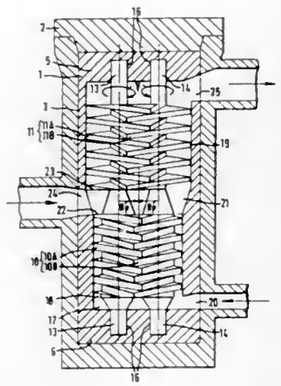
a pumped fluid inlet in fluid communication with the driving fluid outlet;

a pumped fluid outlet; and

a pair of pump screw rotors, each having a larger tip diameter and correspondingly smaller base diameter than the motor screw rotors;

an elongated housing having the driving fluid inlet substantially at one end and the pumped fluid outlet substantially at the other end and providing a chamber between said motor and said pump in the interior of the housing which forms the driving fluid outlet and at which a port opening in the housing provides fluid communication with the chamber as the pumped fluid inlet; and

a pair of parallel shafts rotatably mounted in the housing, each shaft carrying one of the pump screw rotors and one of the motor screw rotors having identical pitch diameter and helix angle.



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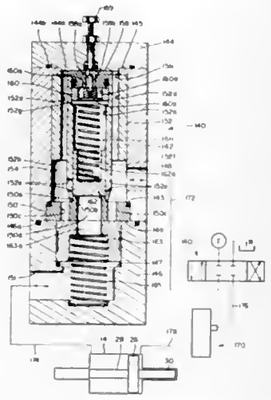
FLUID PRESSURE INTENSIFYING SYSTEM

Albert C. Saurwein, 5 F St., SE., Auburn, Wash. 98002

Filed Jun. 11, 1987, Ser. No. 60,498

Int. Cl.[4] F04B *9/10;* **F15B** *15/22*

U.S. Cl. 417—397 **9 Claims**



1. A recompression valve for regulating working fluid flow into and out of a hydraulic working fluid cylinder comprising a valve assembly having a valve body with a first passage in fluid communication with said control valve and a second passage in fluid communication with said one side of said low pressure chamber, and a metering cylinder having an interior defining a metering chamber in fluid communication with both first; and second passages, said metering cylinder having a plurality or apertures in its cylindrical wall providing fluid communication between said metering chamber and said first passage:

an inlet element means within said valve body in fluid communication with and between said first and second passages responsive to working fluid pressure to permit working fluid to either (a) flow from said control valve to said low pressure chamber when working fluid is directed to pressurize said one side of said low pressure chamber, or (b) flow from said low pressure chamber to an outlet element when working fluid is vented from said one side of said low pressure chamber;

an outlet element means located in said metering chamber between said inlet element means and said first passage responsive to working fluid pressure and so arranged as to normally seal said apertures from fluid communication with said metering chamber but in response to working fluid pressure will shift to expose the metering cylinder apertures to vent working fluid to permit working fluid to flow from said second passage to said first passage solely through said metering chamber when venting said one side of said low pressure chamber; and

a metering element means located in said metering chamber and so arranged as to control the position of said outlet element means in response to reduced working fluid pressure in said first passage whereby said flow through said metering chamber to said first passage occurs at a progressively greater rate as working fluid is initially vented from said one side of said working chamber.

4,820,137

WELL PUMP

Donald I. G. MacLeod, 46 Waitara Crescent, Greenwood 6024, Australia

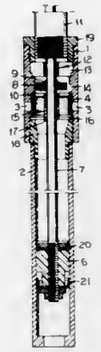
PCT No. PCT/AU86/00376, § 371 Date Aug. 10, 1987, § 102(e) Date Aug. 10, 1987, PCT Pub. No. WO87/03649, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 9, 1986, Ser. No. 124,777

Claims priority, application Australia, Dec. 11, 1985, PH03826

Int. Cl.[4] F04B *39/10, 21/00*

U.S. Cl. 417—566 **5 Claims**



1. A well pump comprising a barrel adapted to be supported by a delivery pipe and arranged to be submerged in a fluid to be pumped, a piston within the barrel adapted to be coupled by a plunger rod to a reciprocating mechanism and including inlet and outlet flow control valves positioned to surround the said plunger rod in an extension at the delivery end of the barrel and coextensive therewith, said pump being arranged in a first stroke of the piston in one direction to cause a flow of fluid through the inlet valve into the barrel on the retreating side of the piston and in a second stroke in the opposite direction to discharge the fluid from the advancing side of said piston in the barrel through the outlet valve to the delivery pipe, said inlet valve being a reed valve positioned in a chamber in the extension over fluid inlet ports through the wall of the extension, said extension having a step inwardly extending into said chamber, and a webbed seat for the outlet valve urged against one side of the step by a flow-through holding member to form a flow-through cage for the reed valve.

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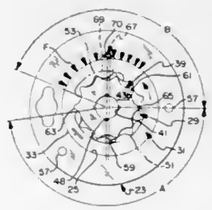
GEAR-WITHIN-GEAR FUEL PUMP AND METHOD OF PRESSURE BALANCING SAME

Steven R. Bollinger, County of St. Louis, Mo., assignor to Carter Automotive Company, Inc., St. Louis, Mo.

Filed Sep. 25, 1987, Ser. No. 101,265

Int. Cl.[4] F04C *2/10*

U.S. Cl. 418—71 **1 Claim**



1. A liquid pump (1) comprising a housing (3) that is internally contoured to define two parallel end faces (16 and 21) and an endless circular wall (25) extending therebetween, to define a cylindrical pump chamber; said endless circular wall defining a first axis; an internal driven ring gear rotatably seated on and within said circular surface for rotation around said first axis; an external pinion drive gear located within the ring gear for rotation around a second axis that is parallel to but offset from the first axis; said first and second axes defining an imaginary plane that subdivides the pump chamber into a first zone where teeth on the two gears gradually unmesh, and a second zone where teeth on the two gears gradually come into mesh; an arcuate liquid inlet opening in one of the aforementioned chamber end faces operable to feed liquid into the intertooth spaces in the first zone; an arcuate liquid outlet opening in one of the aforementioned end faces operable to discharge liquid from the intertooth spaces in the second zone; said endless circular surface having an axial groove therein located on a second imaginary plane that extends radially from said first axis through the outlet opening and normal to the first mentioned plane; and a passage continuously interconnecting said outlet opening and said axial groove, whereby said ring gear is continually pressure biased against liquid pressure forces generated in the intertooth spaces; said inlet opening extending around a major portion of said first zone; said outlet opening extending only around a minor portion of said second zone, whereby each end of said outlet opening is spaced from the adjacent end of the inlet opening by at least one tooth distance.

4,820,139

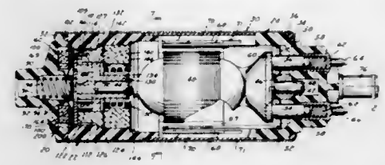
SELF-CONTAINED ROTARY FUEL PUMP

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Continuation of Ser. No. 123,103, Feb. 19, 1980, Pat. No. 4,352,641. This application Jun. 24, 1982, Ser. No. 391,561

Int. Cl.[4] F04C *15/02;* **F04B** *35/04*

U.S. Cl. 418—135 **1 Claim**



1. A pump body for a rotary fuel pump having an inlet end and an outlet end in which said inlet end comprises a first end plate on the inlet end of the pump, a circumferential housing having a pumping chamber closed at the inlet end by said first end plate, an outlet plate pressed into said chamber of said circumferential housing having a face to lie perpendicular to the axis of said housing, said outlet plate being positioned axially by way of a press fit into said pumping chamber of said circumferential housing to a position fixed in the housing to provide a pumping chamber with a fixed predetermined axial dimension, and a rotor in said pumping chamber between said first end plate and said face of said outlet plate with predetermined axial clearance for rotation in the pumping chamber thus formed within said circumferential housing.

4,820,140

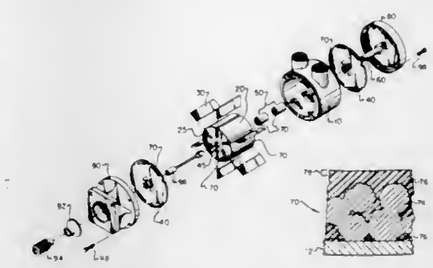
SELF-LUBRICATING ROTARY VANE PUMP

Jerry B. Bishop, Wichita, Kans., assignor to Sigma-Tek, Inc., Augusta, Kans.

Filed Oct. 26, 1987, Ser. No. 112,485

Int. Cl.[4] F04C *18/344, 29/00;* **F16C** *33/24*

U.S. Cl. 418—152 **1 Claim**



1. A rotary pump comprising: a metallic liner, a cylindrical rotor of a material having properties substantially similar to aluminum, the rotor including a plurality of radial vane slots therein and having end facing surfaces, a plurality of vanes slidably disposed in said slots and engaging said liner, a pair of stationary air transfer end plates disposed facing the end facing surfaces of said rotor transversely to its axis of rotation, a pair of metallic cylindrical bushings centrally located in said rotor with an internal bearing surface and a shaft having an exterior surface facing the internal bearing surfaces of said cylindrical bushings, the improvement which comprises:

a self-lubricating, solid coating of predetermined thickness covering the exterior end facing surfaces of said rotor, end facing surfaces of said air transfer end plate, and internal

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bearing surfaces of said cylindrical bushings; wherein the self-lubricating, solid coating of predeterined thickness covering the exterior end facing surfaces of said rotor comprises an aluminum oxide layer with surface asperities impregnated with a polytetrafluoroethylene polymer; wherein the selflubricating, solid coating of predetermined thickness covering the end facing surfaces of said air transfer end plates comprises a metallic interface contiguous with a porous, powdered bronze innerstructure layer with a homogeneous mixture of lead and polytetrafluoroethylene interspersed throughout the innerstructure layer; and wherein the self-lubricating, solid coating of predetermined thickness covering the internal bearing surfaces of said metallic cylindrical bushings comprises a metallic interface contiguous with a porous, powdered bronze innerstructure layer with a homogeneous mixture of lead and polytetrafluoroethylene interspersed throughout the innerstructure layer and a surface layer consisting of a homogeneous mixture of lead and polytetrafluoroethylene overlaying the innerstructure layer.

4,820,141

METHOD FOR THE MANUFACTURE OF FORMED PRODUCTS FROM POWDERS, FOILS, OR FINE WIRES

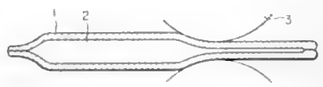
Hideo Shingu, Kyoto; Mitsunobu Abe, Kawasaki; Takashi Sato, Kawasaki, and Toshio Yamada, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,715

Claims priority, application Japan, Dec. 12, 1986, 61-294664; Mar. 31, 1987, 62-76042; Mar. 31, 1987, 62-76043

Int. Cl.[4] G22F 7/00

U.S. Cl. 419—8 **7 Claims**



1. In a method for forming a non-equilibrium and/or metastable metallic or non-metallic powder, foil or fine wire material into a solid shaped product which comprises charging said material into a metal container of sufficient strength to resist a rolling step;

heating said metal container containing said powder, foil, or fine wire materials;

subjecting said container containing said powder, foil, or fine wire material to a forced rolling step whereby a solid shaped product is formed; and

cooling said product; the improvement which comprises carrying out said heating by rapidly heating said metal container together with said powder, foil, or fine wire material to a property preserving temperature, and rapidly cooling the obtained solid shaped product.

4,820,142

APPARATUS FOR MAKING A SPUN-FILAMENT FLEECE

Hermann Balk, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Nov. 10, 1987, Ser. No. 119,141

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713862

Int. Cl.[4] B29C 47/34

U.S. Cl. 425—66 **4 Claims**

1. An apparatus for making spun-filament fleece comprising

a spinneret for continuously emitting a multiplicity of thermoplastic filaments;

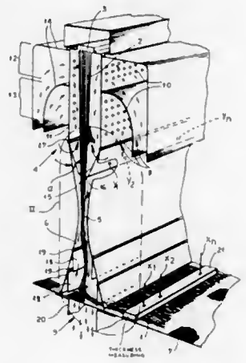
a cooling shaft connected to said spinneret, and receiving said filaments;

a stretching gap downstream of said cooling shaft;

a diffuser shaft downstream of said gap;

a continuously moving fleece-receiving conveyor below said diffuser shaft;

a device associated with said conveyor for feeding process air and for pulling outflowing air through the fleece-receiving conveyor, said cooling shaft having a shaft wall providing with a plurality of air orifices through which air required for cooling can pass to provide an air flow which is at least partially drawn through said fleece-receiving conveyor;



a thickness measuring device along said conveyor for measuring the thickness of a mat of spun-filament fleece deposited on said conveyor and which is measurable at said mat of spun-filament fleece to provide respective measured values; and

a pair of oppositely positioned elastically deformable air control flaps each having a respective horizontal pivot axis upstream of said stretching gap along the path of said filaments and having setting angles variable along their respective lengths and against said air flow according to the deviation of respective measured values form setpoint values.

4,820,143

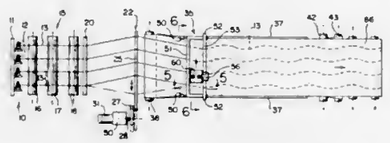
APPARATUS FOR MAKING A CORD REINFORCED POLYURETHANE CONVEYOR BELT

Richard E. Eroskey, Munroe Falls, and Winthrop S. Worcester, Akron, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Division of Ser. No. 802,918, Nov. 29, 1985, Pat. No. 4,770,290. This application Jul. 7, 1987, Ser. No. 70,761

Int. Cl.[4] C01F 1/00

U.S. Cl. 425—122 **8 Claims**



1. An apparatus for fabricating a reinforced polyurethane belt having a horizontally disposed table, a carrier member mounted on said table for movement in a longitudinal direction thereover, a take-up reel mounted on one end of said table for winding up said carrier member, the other end of said table having a reel device for storing said carrier member for movement onto and over said table, a box shaped molding device with solid side, front and rear surfaces mounted on said table, said molding device having a slit directed to said other end of said table on said front surface and an opening directed toward said one end of said table on said rear surface, a reciprocating mixing head mounted on said molding device for movement transversely to said longitudinal direction and for discharging polyurethane into said molding device and onto said carrier member for forming a conveyor belt thereon as said carrier member is advanced through and beyond said molding device, a feed device for continuously feeding a plurality of laterally spaced cords in a longitudinal direction through said slits into said box shaped molding device for reinforcing the polyurethane belt formed therein, and a cam device operatively interposed between said feed device and said slit for continuously imparting a wavy pattern to said cords that are continuously fed into said molding device to impart a serpentine disposition to said cords into said polyurethane belt being formed and cured on said carrier member.

4,820,144

TILE MAKING MACHINES

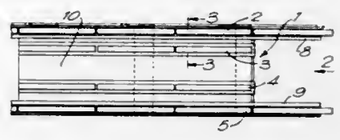
David R. Brittain, Crowborough, United Kingdom, assignor to Marley Tile A.G., Zurich, Switzerland

Filed Nov. 19, 1986, Ser. No. 932,308

Claims priority, application United Kingdom, Nov. 19, 1985, 8528397

Int. Cl.[4] B28B 5/04

U.S. Cl. 425—183 **9 Claims**



1. In a tile making machine in which tiles are formed in pallets conveyed in succession through the machine, the improvement including means for supporting the pallets comprising track means adjustable in height to accommodate pallets of different depth, said track means including a first fixed track arranged to provide a relatively low track level, and a second track removably arranged above said first track to provide a higher track level.

4,820,145

POLYCRYSTALLINE SILICON WAFER TRAY

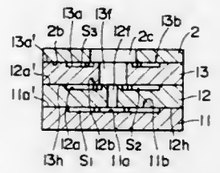
Takashi Yokoyama; Ichiro Hide; Keiji Sawaya, and Takeshi Matsuyama, all of Sapporo, Japan, assignors to Hoxan Corporation, Japan

Continuation of Ser. No. 594,107, Mar. 28, 1984, abandoned. This application Nov. 3, 1986, Ser. No. 926,131

Claims priority, application Japan, Mar. 30, 1983, 58-54453; Mar. 31, 1983, 58-56592; Dec. 14, 1983, 58-192615[U]

Int. Cl.[4] A01J 21/00

U.S. Cl. 425—425 **1 Claim**



1. A fabrication tray arrangement for producing a plurality of polycrystalline silicon wafers when liquid silicon material is poured therein and the tray arrangement is rapidly rotated so that the liquid material is spread outwardly by centrifugal force, comprising:

(1) a turntable and associated means to rapidly rotate said turntable;

(2) a vertical stack of circular wafer-forming tray bodies supported concentrically by said turntable including a top and a bottom tray body, each tray body except the bottom tray body having a substantially central aperture, the apertures being aligned, the aperture of the top tray body being larger than that of the tray next to the top body, the aperture or apertures of the lower tray body or bodies being progressively smaller than that of the aperture or apertures of the upper tray bodies;

(3) wafer forming cross-shaped grooves in each tray body arranged so as to form four substantially square wafers when liquid material is flowed thereon, said squares having an inner portion towards the apertures, a coupling communicating between wafer units forming a notched part at each inner portion to separate the wafers;

(4) a stack cover having a central aperture for receiving liquid material therethrough stacked on top of said vertical stack of tray bodies with its aperture aligned with the apertures of said vertical stack of tray bodies; and

(5) means to pour silicon liquid through the cover aperture and into the wafer forming grooves.

4,820,146

SUPER HARD ALLOY DIES FOR EXTRUDING HONEYCOMB STRUCTURES

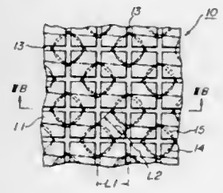
Satoru Inoue, Hazu, and Shoji Futamura, Kawasaki, both of Japan, assignors to NGK Insulators, Ltd., Nagoya and Institute of Technology Precision Electrical Discharge Works, Kawasaki, both of, Japan

Filed Aug. 11, 1987, Ser. No. 84,026

Claims priority, application Japan, Aug. 14, 1986, 61-190745

Int. Cl.[4] B29C 47/12

U.S. Cl. 425—461 **8 Claims**



1. A die for extruding honeycomb structures, comprising:

a die body made of a super hard alloy, said die body having an entrance surface and an exit surface, said surfaces being located on opposite parallel sides of said die body;

a plurality of intersecting forming channels formed in said exit surface in a direction substantially normal to said exit surface, said forming channels having a geometric configuration substantially corresponding to a geometric configuration of a honeycomb structure to be formed thereby; and

a plurality of independent opening holes formed in said entrance surface in a direction substantially normal to said entrance surface such that said opening holes communicate with said forming channels;

wherein the center of each opening hole is coaxial with an intersection of the center planes of at least two forming channels.

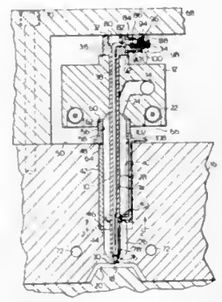
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4,820,147

INJECTION MOLDING ELONGATED PROBE HAVING INTEGRAL HEATING ELEMENT AND LOCATING MEANS

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1

Filed Apr. 27, 1988, Ser. No. 186,551
Claims priority, application Canada, Apr. 13, 1988, 563,983
Int. Cl.[4] B29C *45/20*
U.S. Cl. 425—549 **5 Claims**



1. In an injection molding system having an elongated heated probe and a melt passage which extends to convey pressurized melt from a heated manifold to a gate in a cavity plate leading to a cavity, the heated probe having a generally cylindrical outer surface and a forward tip end, the heated probe being mounted to extend through the manifold and centrally axially into a straight portion of the melt passage which leads to the gate, said melt passage being substantially larger in diameter than the heat probe, the heated probe extending to a position wherein the tip end of the heated probe is adjacent the gate and the melt flows around the probe longitudinally to the gate, the improvement wherein;

a locating sleeve having a forward end and a rear end is seated in the cavity plate in coaxial alignment with the straight portion of the melt passage, the sleeve having a central bore extending axially therethrough which is equal in diameter to and forms part of the straight portion of the melt passage with the heated probe extending centrally therethrough, the locating sleeve having a plurality of spaced locating means extending radially inward into the central bore to contact the outer surface of the probe to accurately locate the probe centrally in the straight portion of the melt passage with the tip end of the probe in central alignment with the gate, at least one of the locating means being partially hollow to receive a thermocouple therein to measure the temperature of the melt flowing past the said one locating means.

4,820,148

WINDSHIELD REPAIR DEVICE

Douglas B. Anderson, P.O. Box 555, Rigby, Id. 83442

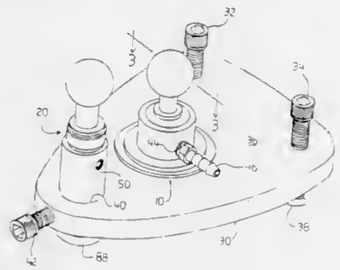
Filed Jul. 6, 1987, Ser. No. 70,324
Int. Cl.[4] B32B *35/00*; **B29F** *5/00*
U.S. Cl. 425—12 **8 Claims**

1. A windshield repair deice for repairing imperfections in glass windshields, comprising:

a. a first vacuum device comprising:

1. an outer housing having a lower edge portion defining a larger evacuated area, said housing having an aperture therethrough;
2. an inner housing within said outer housing and having a lower edge portion defining a smaller evacuated area, said inner housing having an aperture therethrough;
3. a first gasket adapted to seal said larger evacuated area from intrusion of air so as to form a vacuum therein;
4. a second gasket adapted to seal said smaller evacuated area from intrusion of air and produce a vacuum therein;
5. a plunger housing confined within said inner housing;
6. a plunger adapted to direct windshield repair fluid through said plunger housing such that said fluid is in contact with the imperfection in a glass windshield;
7. a vacuum source affixed to the aperture in said outer housing such that a vacuum is simultaneously drawn in the larger and smaller evacuated areas;

b. a second vacuum device for repairing small imperfections about the periphery of a glass windshield, comprising:



1. an outer housing having an aperture therethrough for affixation to said vacuum source;
2. a plunger housing within the outer housing and having an aperture therethrough;
3. a plunger adapted to direct windshield repair fluid through said plunger housing to said windshield;
4. gasket means affixed to the lower edge of the outer housing and the plunger housing, such that the plunger housing defines an evacuated area adjacent the imperfection in the windshield;

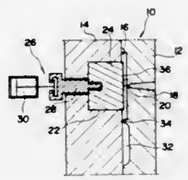
c. platen means to which said first and second vacuum devices can be attached, thereby insuring proper sealing engagement between said devices and said windshield.

4,820,149

APPARATUS FOR MANUFACTURING AN INJECTION-MOLDED PRODUCT HAVING A PARTLY THIN PORTION

Yoshiharu Hatakeyama, Tokyo, and Tatsuo Ishikawa, Funabashi, both of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,181
Claims priority, application Japan, May 28, 1987, 62-129981; Jun. 3, 1987, 62-138298
Int. Cl.[4] B29C *45/30*
U.S. Cl. 425—555 **9 Claims**



1. An apparatus for injection molding a product having a partly thin portion comprising:

a molding die including a male die and a female die for defining a cavity therebetween, said cavity having a volume larger than a volume of the product, and said molding die further including a gate for injecting a molten resin material from an injection molding machine into said cavity;

a slide block disposed in one of said male die and said female die and having in cross section a dimension corresponding to a dimension of the thin portion of the product, and said slide block being movable between a retracted position whereat the volume of said cavity is substantially maintained and an advanced position to project into said cavity thereby reducing the volume of said cavity for forming the thin portion;

drive means for moving said slide block, said drive means being adapted to advance said slide block before the resin material injected into said cavity is solidified;

a hollow space formed in said molding die and communicating with said cavity for permitting an excess of the resin material to be discharged from said cavity into said hollow space during the advance of said slide block;

a closure member fitted in said hollow space for normally closing the same; and

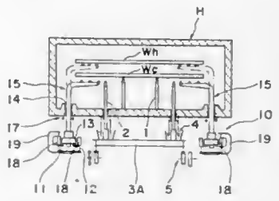
closure member drive means comprising spring means for urging said closure member to a retracted position and a power drive unit for maintaining said closure member in an advanced position against said spring means, said closure member driving said closure member in synchronism with said slide block drive means, whereby said closure member is retracted to open said hollow space substantially simultaneously with the advance of said slide block and is advanced to reduce a volume of said hollow space immediately after said slide block reaches said advanced position.

4,820,150

WALKING BEAM TYPE REHEATING FURNACE

Shigemi Ushijima, Nagaokakyo, Japan, assignor to Chugai Ro Co., Ltd., Osaka, Japan

Continuation of Ser. No. 888,432, Jul. 23, 1986, Pat. No. 4,741,695. This application Aug. 25, 1987, Ser. No. 89,063
Claims priority, applicatioo Japan, Aug. 9, 1985, 60-176077
Int. Cl.[4] F27B *9/14*
U.S. Cl. 432—121 **7 Claims**



1. A walking beam type reheating furnace which comprises:

a furnace housing having a charge opening defined at one end thereof for charging a workpiece therethrough and a discharge opening defined at the other end thereof for discharging said workpiece therefrom, with an exhaust port for exhausting gas inside said housing being formed on the charge end of the furnace and a door being arranged on each of said openings;

a plurality of stationary beams extending in a longitudinal direction of the furnace;

a plurality of movable beams parallel to said stationary beams and extending in said longitudinal direction of the furnace, said movable beams being separated at least into first movable beams on the charge side of the furnace and second movable beams on the discharge side thereof, each of which movable beams is provided with a vertical and a horizontal drive unit;

workpiece transfer means for removing an individual workpiece from any position on said stationary beams and said first movable beams in the charge end of the furnace and moving the individual workpiece to a position in the vicinity of a separating portion of the furnace at which the first and the second movable beams are separated from each other in the longitudinal direction, said transfer means being movable vertically a distance sufficient to lift the individual workpiece above any other workpieces on the first movable beams and stationary beams in the charge end of the furnace and being movable longitudinally to move the individual workpiece over any other workpieces located in the charge end of the furnace during transfer of the individual workpiece to the separating portion of the furnace; and

an intermediate door movable in a vertical direction and arranged on a top wall of the furnace at the separating portion of the first and the second movable beams, with an exhaust port being defined in a portion of the furnace containing the second movable beams and in the vicinity of said intermediate door;

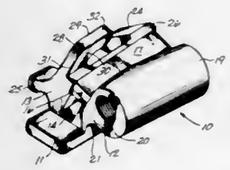
wherein a workpiece can be transferred to said separating portion, while being supported on said workpiece transfer means in a zone where said first movable beams are located.

4,820,151

ORTHODONTIC BRACKET

Jirina V. Pospisil, Monrovia, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed May 8, 1987, Ser. No. 47,785
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—17 **4 Claims**



1. An orthodontic bracket for a molar tooth, comprising:

a tooth-facing base;

a bracket body extending from the base, and having spaced-apart occlusal and gingival portions which define therebetween an arch-wire slot, the portions being adapted to receive a cap for closing an outer end of the slot during an initial treatment phase;

the gingival portion defining a buccal tube with a passage therethrough, and the occlusal portion defining spaced-apart mesial and distal tie wings which cooperate with the buccal tube to provide anchorage for a ligature; and

a distally opening hook having a base extending generally buccally at a gingival inclination from the occlusal portion, and an arm extending distally from the base, the hook being positioned between a pair of spaced-apart planes which are generally perpendicular to the base and parallel to a longitudinal axis of the arch-wire slot, the planes containing the most occlusally and gingivally extending portion of the bracket;

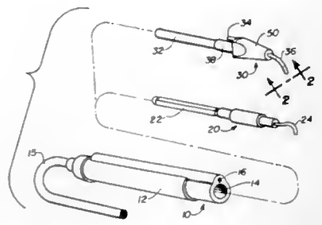
the base, body and hook being integrally formed of stainless steel.

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4,820,152
SINGLE MULTI-FUNCTION HANDPIECE FOR DENTAL INSTRUMENTS

George E. Warria, North Merrick; Rene J. Perdreaux, Brooklyn; Richard H. Paschke, Medford; Teodor E. Constantinescu, Astoria, and Robert McGill, Carona, all of N.Y., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Apr. 21, 1987, Ser. No. 40,649
Int. Cl.[4] A61C *1/07*
U.S. Cl. 433—86 28 Claims

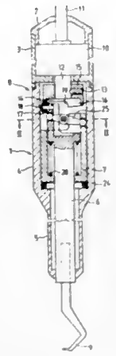


1. A single multi-function handpiece for multiple dental treatments comprising:
(a) a housing having a longitudinal bore therein adapted to receive a variety of dental tool inserts therein,
(b) means in said housing for establishing an alternating electromagnetic or electrostrictive field
(c) at least one inlet into said housing for introduction of gas therein, and
(e) means for detecting the presence or absence of a particular insert used.

4,820,153
PROCESS AND APPARATUS FOR CLEANING A TOOTH

Ludwig Römhild, Am Kugelfeld 3, Berchtesgaden, Fed. Rep. of Germany; Erwin Hartmann, Möriken, and Peter Reinhard, Weingartenstrasse 8, Spreitenbach, both of Switzerland, assignors to Ludwig Römhild, Berchtesgaden, Fed. Rep. of Germany and Peter Reinhard, Spreitenbach, Switzerland

Filed Nov. 4, 1986, Ser. No. 927,008
Claims priority, application Switzerland, Nov. 6, 1985, 4763/85; Sep. 15, 1986, 3691/86
Int. Cl.[4] A61C *1/07*
U.S. Cl. 433—118 13 Claims

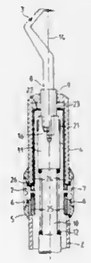


2. A scaler for use in the treatment of periodontitis, said scaler comprising:
an elongated striking rod having a bore in one end;
a scraper having a projection with a cutting edge, the scraper having an opposite end disposed in said bore;
an elongated handle, the scraper being disposed in the handle and being longitudinally movable back and forth along the direction of elongation within the handle, the bore containing end of the rod extending out of the handle;
means in the handle for periodically initiating an action at which the rod is first moved rapidly outward with respect to the handle and almost immediately thereafter is moved rapidly inward to be returned to the original position in the handle, said means including a movable striking body coupled to the rod, said striking rod contained in part within said striking body, and an additional mechanism for causing the body to move in an opposite direction to the rod and produce a like counteraction when the action is periodically initiated.

4,820,154
DENTAL INSTRUMENT WITH A TOOL FOR TREATING THE TEETH

Ludwig Römhild, Am Kugelfeld 3, Berchtesgaden, Fed. Rep. of Germany; Erwin Hartmann, Möriken, and Peter Reinhard, Weingartenstrasse 8, Spreitenbach, both of Switzerland, assignors to Ludwig Römhild, Berchtesgaden, Fed. Rep. of Germany and Peter Reinhard, Spreitenbach, Switzerland

Filed Apr. 1, 1987, Ser. No. 33,522
Claims priority, application Switzerland, Apr. 2. 1986, 1290/86
Int. Cl.[4] A61C *1/14*
U.S. Cl. 433—128 17 Claims

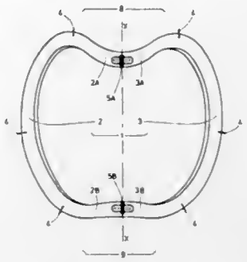


1. A dental instrument comprising:
a tool having an upper portion for treating teeth and a lower portion defining a shank;
a hollow elongated gripping shaft;
an elongated rod positioned in said shaft and having at an upper end thereof a chuck portion removably receiving said shank;
a control sleeve displaceably mounted on said rod, said control sleeve having two longitudinal slots, said chuck portion having a groove;
a coupling pin situated in said groove and extending into said slots to be moved in said slots in a direction normal to an axis of elongation of said shaft for coupling said chuck portion with and releasing said chuck portion from said control sleeve;
an actuating sleeve positioned in said shaft and having a flange cooperating with said control sleeve and two arms; and
an actuating ring disposed on said shaft and having two externally actuated push-buttons cooperating with said arms and operated to release said arms to displace said control sleeve from a coupled position with said chuck portion to a release position from said chuck portion, said shank having a groove-like depression engaging said coupling pin when said chuck portion and said control sleeve are in the coupled position and being disengaged from said coupling pin when said chuck portion and said control sleeve are in the release position.

4,820,155
DAM FRAME FOR USE DURING ENDODONTIC SURGERY

Marie-Joseph G. Sauveur, 26, Rue du Four, 91540 Ormoy, France

Filed Aug. 11, 1987, Ser. No. 84,388
Claims priority, application France, Aug. 13, 1986, 86 11689
Int. Cl.[4] A61C *5/14*
U.S. Cl. 433—136 4 Claims



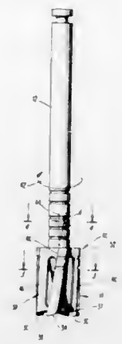
1. A dam frame and a sheet of material which is adapted to be positioned around a tooth (or group of teeth) which is or are to be treated and stretched over the frame, characterised in that the frame consists of at least two parts connected by an articulating means comprising two hinges that open only in one direction and which makes it possible at least partially to fold one part over in relation to the other, the frame being a closed loop with a concave part and spaced barbs in its outer periphery

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4,820,156
TREPHINE DENTAL DRILL

Stanley E. Ross, Boca Raton, Fla., assignor to Ross Systems Corporation, Palm Beach, Fla.

Filed Dec. 29, 1986, Ser. No. 947,176
Int. Cl.[4] A61C *3/02*
U.S. Cl. 433—165 12 Claims

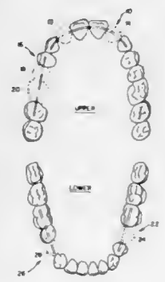


1. A dental trephine drill of the type which cuts a bore having a central core, said drill comprising a shank having a fluid passage extending longitudinally therethrough for conducting drilling fluid, a cutting head disposed at a front end of said shank, said head being hollow to form an interior portion communicating with said passage for receiving drilling fluid, said head including a front end face and a side face extending longitudinally rearwardly from an outer periphery of said end face, said end face surrounding a central hole adapted to receive a core formed in bone tissue being cut, a plurality of end cutting edges disposed on said end face and extending from said hole to said outer periphery of said end face, said side face including a plurality of longitudinally oriented grooves extending rearwardly from said end face, a circumferentially trailing edge of each groove defining a longitudinally extending side cutting edge at least a substantial portion of which being spaced at a constant distance from a rotary axis of said drill so as to cut a cylindrical bore, aperture means in each groove communicating said grooves with the interior portion of said head for conducting drilling fluid from the interior portion into said grooves to cool and flush said side cutting edges and relieve fluid pressure within the interior portion.

4,820,157
DENTAL BRIDGE

Christopher A. Salvo, 656 King St., Port Chester, N.Y. 10573

Continuation-in-part of Ser. No. 800,782, Nov. 22, 1985, Pat. No. 4,735,571. This application Dec. 16, 1986, Ser. No. 943,319
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] A61C *13/225*
U.S. Cl. 433—180 18 Claims



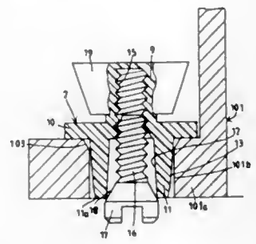
1. A method for providing a dental bridge to replace at least one missing tooth without substantial removal of portions of abutment teeth comprising the steps of:
providing a substantially rigid bar member having a chemically reactive bondable surface;
providing a plurality of dental pontics, each having an area therethrough dimensioned to receive said bar;
selecting a dental pontic from said plurality of pontics most corresponding to the missing tooth;
rigidly mounting said pontic on said bar by extending said bar through the slot therein;
forming a dental preparation in the surfaces of said abutment teeth substantially conforming in cross sectional configuration to said bar and extending only into the dentin of said teeth, said preparation having a flat floor and walls perpendicular thereto;
providing a filled resin composite material and a bonding agent for bonding said bar composite and tooth material;
coating the walls and floor and the ends of said bar extending from said pontic with said bonding agent;
coating the floor of said preparation with said composite;
mounting said bar and said preparation on said composite coating; and
covering said bar with said composite so that said composite, bar and teeth will be chemically bonded to form a unitary structure.

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4,820,158
DEVICE FOR COUPLING DENTURES TO TOOTH CROWNS

Frank Speckmann, Hagen, Fed. Rep. of Germany, assignor to Nova-Pro Attachment GmbH, Meinerzhagen, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,321
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722326
Int. Cl.⁴ A61C *13/225*
U.S. Cl. 433—182 **12 Claims**



1. A device for separably coupling a denture to a tooth crown, comprising a substantially ring-shaped socket on the crown; a male detent member having a first portion rigid with the denture and a radially expandable sleeve-like second portion receivable in said socket, at least said second portion consisting of a tough wear-resistant plastic material and having an open end, a conical internal surface which diverges in a first direction toward said open end and a conical external surface which diverges in a second direction away from said open end; and means for expanding said second portion so as to move said external surface into frictional engagement with said socket when the latter receives said second portion, said expanding means comprising a deforming element insertable into said second portion through said open end and having a conical outer surface which diverges in said first direction and has a maximum diameter greater than the maximum diameter of said internal surface in unexpanded condition of said second portion so that the second portion expands radially and moves said external surface against the socket in response to insertion of the deforming element into said second portion.

4,820,159
DENTAL POST AND CORE ASSEMBLY

Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed Jul. 23, 1987, Ser. No. 76,639
Int. Cl.⁴ A61C *5/04*
U.S. Cl. 433—225 **25 Claims**

1. A dental post and core assembly for use in the formation of a dental restoration, comprising a support structure for positioning onto a prepared tooth root to be restored, at least one leg depending from the support structure for insertion into an ancillary bore pre-drilled into the tooth root adjacent a central bore pre-drilled through a canal in the tooth root, an axial aperture through the center of the support structure, and a pin matingly fitting into and adjustably insertable through the axial aperture to adjust its length dependent from the support structure and into the central bore until seated therein, said leg being contiguous with the pin.

23. A method of fabricating cast cores and posts for dental restoration of a tooth structure using a prefabricated assembly including a support structure having a depending leg and a post axially adjustable through an aperture in said support structure, the post and leg being contiguous, the method comprising:

drilling a central bore into a canal of the tooth root;

drilling at least one ancillary bore contiguous with the central bore and of a fixed depth corresponding to the length of the leg;

inserting the prefabricated dental post assembly into the prepared tooth root with the leg seated in the ancillary bore and the support structure positioned on top of the tooth root;



inserting the post into the axial aperture in the support structure;

adjusting the post through the support structure until it bottoms into the central bore;

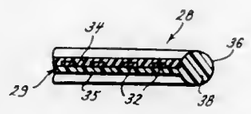
securing the position of the post with respect to the support platform, and

casting a core and post using the prefabricated assembly.

4,820,160
METHOD OF PRODUCING AN ELEMENT FOR PERSONAL IDENTIFICATIONS

Marvin Cohen, and Susanne C. Mancin, both of St. Louis, Mo., assignors to Ident Corporation of America, Inc., Creve Coeur, Mo.

Filed Dec. 1, 1986, Ser. No. 936,597
Int. Cl.⁴ A61C *13/00*
U.S. Cl. 433—229 **20 Claims**



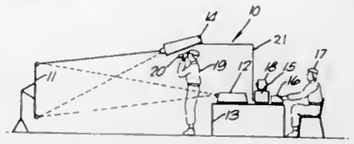
1. A method of producing a chip of specific personal indicia used for individual identification and the like comprising formating the indicia, reducing the size of the indicia and printing the reduced indicia on photosensitive film, cutting the printed indicia from the photosensitive film as a discrete identifying element and producing a raised edge on the element around substantially the entire perimeter thereof.

10. The method of attaching a chip of specific personal indicia for individual identification to the tooth of an individual or other animal comprising bonding the chip to the tooth, the chip being a discrete element of photographic film having identifying indicia thereon, the chip further having a raised edge, the bonding step further comprising encapsulating the chip in a dental adhesive and bonding the dental adhesive to a tooth, the adhesive being applied over the surfaces of the chip including the raised edges to encapsulate the chip, the raised edge of the chip assisting the dental adhesive in substantially encapsulating the chip.

4,820,161
TRAINING AID

Peter L. Wescott, Kingsbury Episcopi, England, assignor to Westland System Assessment, Ltd., Somerset, England

Filed Aug. 27, 1987, Ser. No. 89,991
Claims priority, application United Kingdom, Sep. 3, 1986, 8621272
Int. Cl.⁴ F41G *11/00*
U.S. Cl. 434—16 **3 Claims**



1. A method of simulating artillery fire for training an artillery observer comprising the steps of:

a. projecting a computer generated line frame on a projection screen through a video projector,

b. projecting on the projection screen a terrain photographic image so that the boundaries thereof are aligned with the boundaries of the line frame,

c. entering ion a memory of the computer the grid co-ordinates and height above sea level of the location at which the photographic image was taken,

d. entering in the computer memory the grid co-ordinates of at least two locations marked on the projected terrain photographic image by cross-hair cursor lines drawn by the computer and projected through the video projector,

e. entering in the computer grid co-ordinates of a target location commanded by a trainee observer positioned to observe the projection screen,

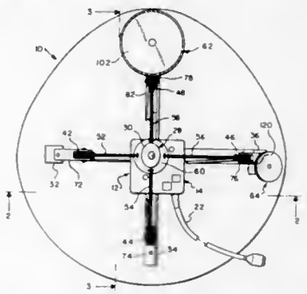
f. calculating in the computer from the information stored therein by steps c, d, and e the corresponding position of the target location on the projected terrain photographic image,

g. overlaying on the projected terrain photographic image at said corresponding position a computer generated artillery shell burst image by projection through the video projector.

4,820,162
JOYSTICK CONTROL ACCESSORY FOR COMPUTERIZED AIRCRAFT FLIGHT SIMULATION PROGRAM

Robert Ross, 10502 Katella, Anaheim, Calif. 92804

Filed Nov. 23, 1987, Ser. No. 124,054
Int. Cl.⁴ A63F *9/22*
U.S. Cl. 434—45 **12 Claims**

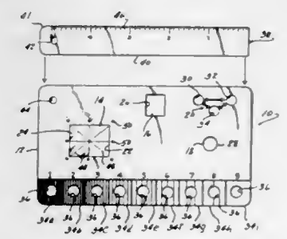


1. In a computer loaded with an aircraft flight simulation program and in which operator inputs are provided by manipulating a movable lever of computer joystick assembly relative to the housing of said computer joystick assembly and wherein said computer joystick assembly is connected to said computer by means of an umbilical connecting cable, the improvement comprising a joystick control including a mounting base, means for securing said computer joystick assembly housing on said mounting base, a joystick lever extension at least fifteen inches in length coupled as a linear extension of said computer joystick lever, pedestal means projecting upwardly from said base, four pulleys mounted by swivels on said pedestal means above said base and located orthogonally about said movable lever of said computer joystick assembly, four springs secured at orthogonal connections to said joystick lever extension, wherein each of said springs is held in tension and extends over a separate one of said pulleys and is secured to said pedestal means beneath said pulleys, and means for independently adjusting tension on each of two adjacent ones of said springs.

4,820,163
ARTIST'S AID

Lorraine C. McCarty, 1112 Pinehurst, Royal Oak, Mich. 48073

Filed Feb. 9, 1988, Ser. No. 154,093
Int. Cl.⁴ G09B *11/00*
U.S. Cl. 434—81 **15 Claims**



1. An artist's aid comprising a sheet member including:

means for determining the differences in reflected light among various surfaces appearing in a visual field, the determining means comprising an aperture formed on the sheet member, the aperture being covered by a transparent filter;

means for framing a selected portion of said visual field;

means for visually isolating a relatively small portion of an object appearing in said visual field; and

means for visually separating a plurality of objects appearing in said visual field, the separating means comprising a plurality of spaced apertures formed in the sheet member and arranged in a predetermined group.

4,820,164
TODDLER'S TRAINING APPAREL

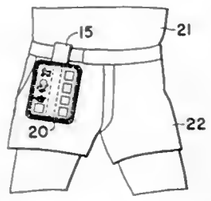
Alicia W. Kemper, Tallahassee, Fla., assignor to Innovec, Inc., Tallahassee, Fla.

Filed Oct. 16, 1987, Ser. No. 108,956
Int. Cl.⁴ G09B *1/06*
U.S. Cl. 434—238 **20 Claims**

1. Toddler's training reward system comprising underpants including a waist encircling band, leg encircling bands, and front and back body covering portions, a display panel, means for removably fastening said display panel to said underpants,

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said display panel having on its front side a plurality of small figures appealable to a toddler, a plurality of patches respectively covering said figures and means for releasably attaching said patches to said display panel.



4,820,165

METHOD AND KIT FOR LEARNING SCIENCE AS A LANGUAGE

Dorothy J. Kanapa, Kensington, Md., assignor to Zero Information Based/Science Productivity Systems, Inc., Kensington, Md.

Continuation-in-part of Ser. No. 60,475, Jun. 11, 1987. This application Jun. 20, 1988, Ser. No. 209,334

Int. Cl.[4] G09B *23/00, 50/60*

U.S. Cl. 434—276 **3 Claims**



1. A method for teaching physical science as a primary language comprising the steps of:

(a) having a person motivated and prepared to learn physical science, without requiring said person to have more than high school reading skill and prior knowledge of said science, completely study pictorially illustrated science concept and language telescoping zero information based material; then

(b) requiring the person in step (a) to completely follow instructions contained, at least partly, in audio means specifically prepared for zero information based teaching; then

(c) requiring said person to verbally present the material studied in steps (a) and (b) in a group of persons treated similar to steps (a) and (b), videotaping means being provided as an analytical tool for performance evaluation, reinforcement or feedback as needed; and

(d) repeating step (c) a plurality of times the same day so that the person in step (a) acquires knowledge and verbalization of the material in step (a), without class room lecture by a teacher, in an amount at least equal to or more than and in a time period substantially less than that of conventional method.

2. A kit for zero information based learning of physical science as a primary language, comprising a specific, zero-information-based (ZIB) telescoping material on a science subject desired to be learnt; means for audio programming and feedback reinforcing of specific contents of said material; and instructions for ZIB learning.

4,820,166

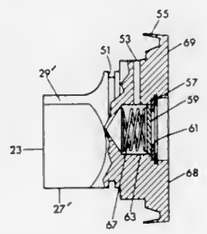
APPARATUS AND SYSTEM FOR SELECTIVELY DEFLATING TIRES, AND CAUSING POWER STEERING AND POWER BRAKE FAILURES FOR TRAINING DRIVERS

Donald A. Farrell, II, P.O. Box 306, Yucca, Ariz. 86438

Filed Jul. 23, 1986, Ser. No. 888,397

Int. Cl.[4] G09B *250/00*

U.S. Cl. 434—376 **15 Claims**



1. In an apparatus for selectively deflating and inflating a wheel mounted tire, an improved valve assembly comprising:

(a) a valve housing member having a cavity therein, a gas inlet port adjacent a first end of said cavity, an exhaust port adjacent a second end of said cavity opposite said first end, a hollow cylindrical guide channel extending between said cavity and said exhaust port, and a plurality of gas outlet ports communicating with said cavity intermediate said gas inlet and exhaust port,

(b) a valve body received in said cavity having a piston plate at one end thereof, said plate having a first surface exposed to said gas inlet port, a second surface exposed to said gas outlet ports, gas directing channel means communicating between said first and second surfaces, said valve body being reciprocally movable in said valve housing cavity between a first position wherein said gas exhaust port is closed and a second position wherein said gas exhaust port is open, said valve body having a guide member formed thereon opposite said piston plate and extending into said guide channel said guide member having a plurality of guide surfaces slidably engaging said guide channel in said first and said second positions,

(c) a gas sealing member cooperating with said valve body for forming a gas-tight seal between said gas exhaust port and said cavity when said valve body is in said first position, and

(d) a one-way valve member movably secured on said valve body for alternately opening and closing said gas directing channel means when said valve body is in said first and second positions, respectively.

4,820,167

ELECTRONIC SCHOOL TEACHING SYSTEM

Anthony A. Nobles, 3134 One 45th St. #13, Gardina, Calif. 90249; Verne H. Nobles, 1505 Purdue #305, Los Angeles, Calif. 90025; Jon H. Fleming, 5816 Still Forest Dr., Dallas, Tex. 75252; Charles T. Terrell, 4817 Auburndale, Dallas, Tex. 75205, and Alexander K. Lai, 6911 S. Lacienega Blvd., Los Angeles, Calif. 90045

Filed Jan. 14, 1987, Ser. No. 3,076

Int. Cl.[4] G09B *7/00*

U.S. Cl. 434—336 **37 Claims**

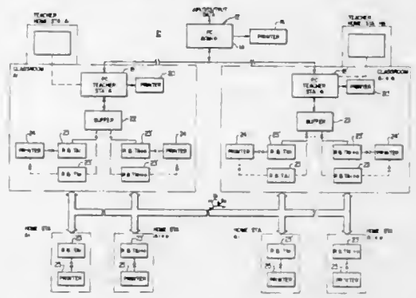
1. An electronic school teaching system comprising:

a data collection computer, a teacher's computer, and a plurality of read and test (R&T) devices;

The data collection computer for location at an administrative office and having information input/output means connected to the teacher's computer for issuing command signals for collecting school related data including attendance and grade data;

the teacher's computer for location at a classroom remote to the administration office and outputting the requested school related information responsive to the command of the data collection computer, the teacher computer having a grading means, and an input/output means for inputting teacher generated information including homework assignments, and test questions for computer distribution to students and inputting student identification and responses to teacher generated information for grading by the grading means, and outputting information including class attendance information, and homework and test grades for the teacher; and

the plurality of read and test (R&T) devices being portable electronic read and test (R&T) devices each having: a connector, a plurality of modules including a textbook module and a data storage module, a keyboard, a display, an input/output means, and a control means including a control storage means, said connector for selectively connecting the input/output means to the teacher's computer for inputting identification information or attendance reporting and receiving and storing the teacher information in the data storage module and disconnecting the R&T device from the second computer for removal of the device from the classroom for doing this homework; said modules, keyboard, display, and control storage means connected to the control means wherein the control means responsive to keyboard command selectively displays the homework assignment, the pages of text, the test questions, and answers to the questions for selection, and stores the homework and test question answers in the control memory for subsequent entry into the teacher's computer when again connected by the connector to the teacher's computer for grading and for receipt of any answer correction and grades.



4,820,168

ELECTRICALLY CONDUCTIVE CONNECTION BETWEEN ABUTTING CONDUCT RAIL SECTION

Diether V. Scarpatetti, Esslingen, and Dietrich Sahm, Bad Urach, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,617

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1987, 3719214

Int. Cl.[4] B60M *5/00*; **H01R** *41/00*

U.S. Cl. 439—33 **9 Claims**

1. Electrically conductive connection between abutting individual sections of conductor rails, comprising a current conduction cable formed of a multi-wire bunched conductor and of two contact portions which are electrically and securely attached to the ends of the bunched conductor, said rail sections having opposed end faces and said contact portions are attached to the opposed end faces of the conductor rails,



wherein each of the contact portions are constituted in the form of at least one of a cylindrical or prismatic connector pin which are inserted into a corresponding cylindrical or prismatic axially extending opening of corresponding shape in said opposed end faces of the conductor rails.

4,820,169

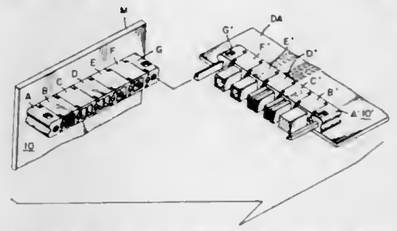
PROGRAMMABLE MODULAR CONNECTOR ASSEMBLY

Ronald M. Weber, Lebanon; Robert C. Swengel, Jr., York; Charles H. Weidler, Lancaster, and James H. Wise, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 855,225, Apr. 22, 1986. This application Sep. 15, 1986, Ser. No. 907,696

Int. Cl.[4] H01R *9/00*

U.S. Cl. 439—65 **12 Claims**



1. A modular connector assembly for the distribution of power to a printed circuit board comprising:

pairs of first and second matable individual connector modules, the first connector module of each pair having a pluggable mating face and a board-engaging face and the second connector module of each pair having a complementary pluggable mating face and a board-engaging face, each first individual module of respective pairs being provided with means to link itself with adjacent first modules to form a composite connector body, and each second individual module of respective pairs being provided with means to link itself with adjacent second modules to form a complementary composite connector body; and

wherein at least one of the pairs of modules is adapted to carry high current levels, the first connector module of one pair including a terminal with a forward contact portion at a contact face, a body portion extending longitudinally rearwardly from the contact portion, and a series of circuit board connecting post extending from the body portion at longitudinally spaced-apart intervals, successive posts that are of increased separation from the contact portion being of different resistivities thereby to tend to equalize the current flow through such posts to the circuit on the board to which it is mounted.

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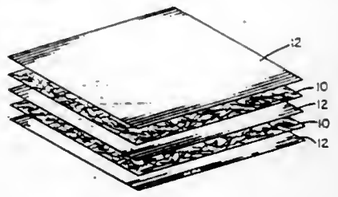
LAYERED ELASTOMERIC CONNECTOR AND PROCESS FOR ITS MANUFACTURE

John P. Redmond, Mechanicsburg; Ray N. Sheak, Lebanon; Albert Shirk, Palmyra, and Larry A. Cracraft, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 898,857, Aug. 20, 1986, abandoned, which is a contiauation of Ser. No. 683,987, Dec. 20, 1984, abandoned. This application Jan. 27, 1988, Ser. No. 148,191

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—66 **20 Claims**



1. An electrical connector for electrically connecting conductive areas of first and second members comprising an elongated member which defines a length axis and a cross sectional surface that extends between the first and second member, said elongated member comprising:

a plurality of electrically conductive fibrous mat layers, each of said mat layers coextensive with said cross sectional surface each mat layer having randomly positioned fibers which are in electrical engagement with each other;

a plurality of dielectric elastomeric layers, each disposed between a respective adjacent pair of said mat layers such that the elastomeric layers separate said mat layers and prevent electrical transmission therebetween and adjacent pairs of said mat layers are aligned along the length axis, said mat layers and said elastomeric layers adhered together to form said elongated member;

whereby the conductive fibrous mat layers of the electrical connector have enhanced conducting characteristics due to the low resistance of the fibers of the fibrous mat layers, and the dielectric elastomeric layers, as well as the conductive fibrous mat layers, have the resilient characteristics to insure that a positive electrical connection is effected between the conductive areas of the first and the second members.

4,820,171

COUPLING PLATE HAVING A PLURALITY OF ELECTRIC COUPLING POINTS, A METHOD OF PRODUCING SUCH A PLATE AND A USE OF THE COUPLING PLATE AS A PLANNING BOARD

Per Kortegaard, Aalborg, Denmark, assignor to A/S Modulex, Billund, Denmark

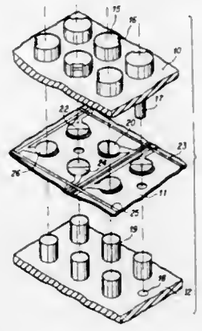
Filed Sep. 14, 1987, Ser. No. 96,626

Claims priority, application Denmark, Sep. 12, 1986, 4369/86

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—75 **12 Claims**

1. A coupling plate consisting of a number of layers and having a plurality of electric coupling points adapted to cooperate with electric coupling means on some elements when these are placed on the coupling plate, characterized in that the plate comprises two parallel plates, between which there is provided at least one electrically insulating carrier layer for a pattern of a plurality of mutually isolated electrically conducting areas, some of which being partially punched, and that an electric coupling point comprises at least one depression in one of the plates for receiving a partially punched flap of an electrically conducting area in a position transverse to the plane of the coupling plate.



4,820,172

COMPOSITE ELECTRICAL CONNECTOR FOR APPARATUS INSTALLED IN A VEHICLE

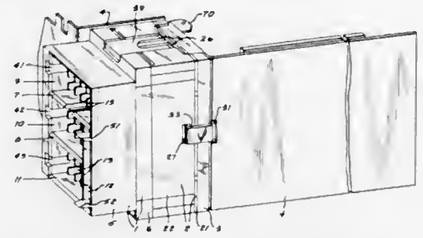
Klaus Wolkewitz; Alfons Scheck, both of Hildesheim, and Kurt Seeberger, Bad Salzdetfurth, all of Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,807

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1987, 3701373

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—76 **21 Claims**



1. Composite electrical connector for connecting an electrical apparatus installed in a vehicle to cabling mounted in said vehicle and having a mating connector, comprising:

a first contact and circuit unit (1) detachable from and attachable to the remainder of the composite connector, having a first set of contact members (13) mounted in a manner for fitting a first side of said first unit to a said mating connector of cabling of a vehicle for electrical connection of said first set of contact members thereto and having a second set of contact members (15) and also a first circuit board (14) interconnecting at least some contact members (13) of said first set respectively with at least some contact members (15) of said second set;

a second contact and circuit unit (2) having a set of contact members (23) for respectively engaging contact members (15) of said second set of said first contact and circuit unit (1) when the first unit is attached to said second contact and circuit unit, said second contact and circuit unit (1) also having a second circuit board (21) connected to said contact members (23) of said second contact and circuit unit and carrying components for protection of circuits from electrical disturbance and providing connection to said components and also carrying means for allowing permanent electrical connections to be made between said second circuit board (21) and connection conductors serving an electrical apparatus installed in said vehicle;

said second set of contacts (15) of said first contact and circuit unit (1) being disposed for making contact with said set of contact members (23) of said second contact and circuit unit (2) when a side of said first contact and circuit unit other than said first side thereof is fitted against a first side of said second contact and circuit unit for connection of said first to said second unit, and

means for securing said first and second contact circuit units to a structural surface of said electrical apparatus in a manner in which a side of said second contact and circuit unit other than said first side thereof is put against at least a part of said structural surface.

4,820,173

PLUG CONNECTOR STRIP COMPRISING CONTACT SPRINGS ARRANGED IN AT LEAST TWO PARALLEL ROWS

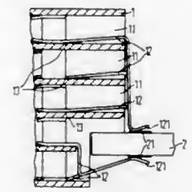
Guenter Thom, Gauting, and Georg Neuber, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 7,518, Jan. 28, 1987, abandoned. This application May 2, 1988, Ser. No. 188,692

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606387

Int. Cl.[4] H01R *23/70*

U.S. Cl. 439—79 **4 Claims**



1. In a plug connector strip which comprises contact springs arranged in respective chambers of a housing in at least two parallel rows for electrical and physical connection to contact pads on both sides of a printed circuitboard, the housing including an exterior surface and the chambers opening to the exterior through the exterior surface, the improvement wherein:

each of said contact springs is resilient and is mounted at a respective clamping point within the respective chamber spaced inwardly from the exterior surface and extends out of the respective chamber;

the contact springs of at least one row each include a straight section extending at a right angle immediately after emergence from the respective housing chamber;

each of said contact springs of said at least one row includes a distal end section having a contact portion for pressing substantially perpendicularly against the respective contact pad; and

said distal section comprises a bent section defining an arc as said contact portion for engagement with the respective contact pad,

wherein a portion of said contact springs of one row, when pressed against said contact pads, become elevated over a floor of their respective chambers due to the force of the contact pads on said distal end section.

4,820,174

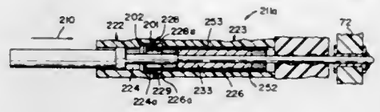
MODULAR CONNECTOR ASSEMBLY AND FILTERED INSERT THEREFOR

John C. Farrar, Harrisburg; Reuben E. Ney, Mount Joy; James L. Schroeder, III, Palmyra, and Patrick F. Yeager, Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 6, 1986, Ser. No. 893,800

Int. Cl.[4] H01R *4/66*

U.S. Cl. 439—95 **8 Claims**



1. An electrical connector assembly comprising:

an electrically conductive shell, said shell including at least one insert-receiving aperture;

a filtered connector insert positioned within said insert-receiving aperture, said insert including;

a housing;

at least one filtered contact assembly within said housing, each filtered contact assembly including an electrical contact and filter means electrically coupled to said contact;

means for defining a grounding plane electrically coupling said filter means to said shell for providing a grounding path from said filter means to said shell for dissipating filtered interference, said means for defining said ground plane including first grounding means on each filtered contact assembly, an electrically conductive eyelet surrounding said filter means, and second grounding means on said housing comprising an electrically conductive ground plate in said housing;

respective means associated with each filtered contact for releasably retaining each filtered contact assembly within said housing, said retaining means comprising spring finger means on said filtered contact assembly, and an internal shoulder in said aperture in said housing said spring finger means being integral with and extending from said eyelet and engaging said shoulder upon insertion at said filtered contact assembly into said aperture to oppose the withdrawal of said filtered contact assembly, said spring finger means further comprising first coupling means for releasably electrically coupling said eyelet of said filter means to said second grounding means when said filtered contact assembly is in said housing; and

means for releasably mounting said insert within said shell.

4,820,175

ELECTRICAL CONNECTOR FOR AN ELECTRICAL CABLE

Izumi Hasegawa, and Takashi Kamono, both of Yokohama, Japan, assignors to AMP Incorporated, Harrisburg, Pa.

PCT No. PCT/US86/00595, § 371 Date Nov. 28, 1986, § 102(e) Date Nov. 28, 1986, PCT Pub. No. WO86/06553, PCT Pub. Date Nov. 6, 1986

PCT Filed Mar. 24, 1986, Ser. No. 938,082

Claims priority, application Japan, Apr. 25, 1985, 60-089878

Int. Cl.[4] H01R *4/66*

U.S. Cl. 439—98 **20 Claims**

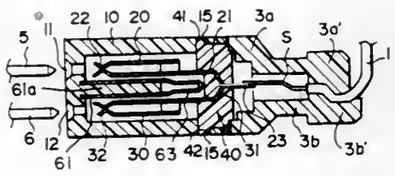
1. An electrical connector for connection to signal conductors and ground conductors of an electrical cable comprising an insulating housing member having signal contacts and ground contacts disposed therein for electrical connection respectively to the signal conductors and ground conductors of the electrical cable, wherein

said signal contacts are disposed in said housing member in two rows and have contact sections in alignment with

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respective holes at a front end of said housing member for electrical connection with respect signal terminal members;

said ground contacts are disposed in a row between said two rows of said signal contacts and have contact sections in alignment with respective holes at said front end of said housing member for electrical connection with respective ground terminal members;



a shield plate member is disposed in said housing member between said two rows of said signal contacts to prevent crosstalk between the signal contacts;

said signal contacts and ground contacts are secured in an insulating holding member mounted in said housing member;

said holding member comprises holding portions in which the respective signal contacts and ground contacts are secured; and

said holding portions have mated serrated surfaces.

4,820,176

ELECTRIC POWER SUPPLY CONNECTOR

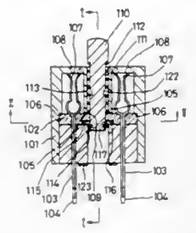
Isamu Niikura, Hiratsuka, Japan, assignor to Shiraishi Electric Corporation, Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,778

Claims priority, application Japan, Sep. 7, 1987, 62-136697[U]; Sep. 7, 1987, 62-136698[U]; Oct. 14, 1987, 62-157374[U]

Int. Cl.⁴ H01R *13/635*

U.S. Cl. 439—152 **18 Claims**



1. An electric power supply connector for supplying a power source voltage to an electrical appliance, comprising:

connecting means made of a metallic material having high electrical conductivity and formed to be projected from or recessed into the surface of a main part of said connector;

actuating means resiliently urged to project from the inside to the outside of said connector so as to be able to project from a surface of said main part of said connector;

locking means including a locking groove formed in a wall of said actuating means and a portion of an interlocking member which is movable in the direction perpendicular to said actuating member and urged by a spring, said portion of said interlocking member being engageable with said locking groove by the force of said spring when said, said locking means being adapted to lock, through the engagement between said portion of said interlocking member and said locking groove, said actuating member in a retracted state where the end of said actuating member is held near the surface of said main body of said connector; and

unlocking means for unlocking said actuating member from said retracted state by urging said interlocking member against the force of said spring.

4,820,177

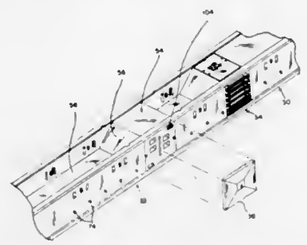
ELECTRICAL DISTRIBUTION SYSTEM HAVING SPECIALLY FORMED AND INSULATED BUS BARS

Allan E. Slicer, Brookville, Ind., assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 920,925, Oct. 16, 1986, abandoned, which is a continuation of Ser. No. 650,376, Sep. 13, 1984, abandoned. This application Mar. 18, 1988, Ser. No. 171,216

Int. Cl.⁴ H01R *25/16*

U.S. Cl. 439—207 **7 Claims**



1. A plug-in busway section having opposite ends adapted for splice connection to an adjacent busway section, said plug-in busway section comprising:

a housing including a pair of opposite side rails, an upper section ground bus and a lower section ground bus connected to said side rails intermediate said side rails, said housing having a plurality of plug-in openings longitudinally located along the length of said housing;

a plurality of bus bars having a top portion and a bottom portion and opposite edges, said bus bars sandwiched between said upper section ground bus and said lower section ground bus, each of said bus bars having opposite ends and including a flared portion at each end and a plurality of humps and transition portions intermediate and said ends; said bus bars associated in stacked back-to-back relationship intermediate said openings between said opposite ends and associated in spaced apart relationship at each of said plug-in openings to facilitate tap-off connection therefrom, said bus bars associated in spaced apart relationship at said opposite ends to facilitate splice connection, a plurality of said bus bars being identically formed and positioned in mirror image relationship with each other; and

insulating means for insulating said bus bars from each other, said insulating means comprising a plurality of insulating tubes wrapped around each bus bar, each tube including opposite ends, adjacent tubes on each bus bar spaced apart at the humps of the bus bar and extending over the adjacent transition portion, hump insulator strips respectively extending longitudinally along each hump portion of each bus bar on said top portion and on said bottom portion, said tubes provided with notched out segments in overlying relationship with said edge of said transition portions of said bus bars; and a plurality of hump edge insulators covering the edges of said bus bars exposed through said notched out segments.

4,820,178

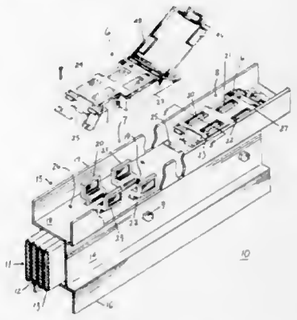
OUTLET BOX FOR ELECTRIC BUSWAY SYSTEM

John D. Anderson; Lynn M. Harton, both of Selmer, Tenn., and David A. Hibbert, South Windsor, Conn., assignors to General Electric Company, New York, N.Y.

Filed Jun. 8, 1988, Ser. No. 203,952

Int. Cl.⁴ H01R *25/16*

U.S. Cl. 439—212 **10 Claims**



1. A molded plastic outlet box for electric busway systems comprising:

a molded plastic base including means for attachment to an electric busway system at a bottom surface of said base and means defining a planar surface at a top surface of said base, said planar surface having a plurality of slots extending therethrough coextensive with bus bar contact blades extending from said busway system, said base further including a pair of side members extending downwardly from said planar surface;

a molded plastic cover hingably and removably attached to one end of said top surface by means of a hinge pin; and

a pair of first arcuate projections integrally formed on said top surface at said one end, said hinge pin being trapped under said first arcuate projections in press-fit relation therewith for holding said cover in an open position on said one end of said top surface.

4,820,179

MULTI-CONTACT ELECTRICAL CONNECTOR

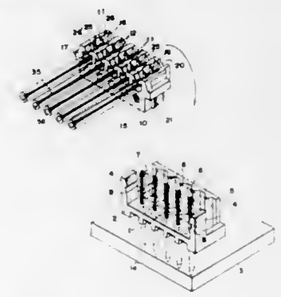
Yoshihiro Saijo, Osaka, Japan, assignor to Nippon Acchakutanshi Seizo Kabushiki kaisha, Osaka, Japan

Filed Aug. 31, 1983, Ser. No. 528,147

Claims priority, application Japan, Aug. 31, 1982, 57-152389

Int. Cl.⁴ H01R *13/41, 13/11, 4/24*

U.S. Cl. 439—224 **13 Claims**



1. A multi-contact electrical connector for connecting a plurality of insulation clad wires to a circuit means, the electrical connector comprising:

a plurality of electrical contact means adapted to be respectively connected to the insulation clad wires, each of the electrical contact means are fashioned as a stamped one piece sheet metal member bent into a predetermined shape and includes a substantially box shaped contact body and a pair of spaced pressing means provided with opposed side ridges, with the space between the pressing means being less than a diameter of a conductor in the wires whereby the insulation cladding of the wires is penetrated by the side ridges to enable a contact between the electrical contact means and the conductor, said pressing means being formed by opposed side walls of said contact body;

a housing means including a plurality of chamber means for respectively accommodating the electrical contact means, means for holding the respective wires in the housing means, and means adapted to receive electrical terminal means connected to the circuit means, the means for receiving being arranged in a lower portion of the respective chamber means and extending substantially parallel to the means for holding the respective wires; and

means provided on each of said electrical contact means for establishing a detachable electrical connection between the electrical contact means and the terminal means including an extension portion provided on at least two opposed side walls of said contact body, said extension portions terminating in rolled ends so as to impart a biasing force thereto.

4,820,180

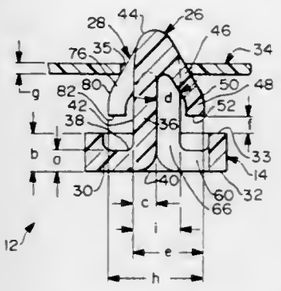
FLOATING PANEL MOUNT FOR ELECTRICAL CONNECTOR

Rene A. Mosquera, Elk Grove, and Wayne A. Zahlit, Downers Grove, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 9, 1988, Ser. No. 204,481

Int. Cl.⁴ H01R *13/74*

U.S. Cl. 439—248 **24 Claims**



1. A floating panel mount for mounting an electrical connector to a panel, said panel having at least one mounting aperture therein, said floating panel mount comprising a pair of multiple cantilevered latch structures, each said latch structure including:

a mounting flange having opposed forward and rearward surfaces;

a lower arm cantilevered at a first end from said mounting flange extending generally parallel to and disposed between said forward and rearward surfaces of the mounting flange;

an upper arm cantilevered from a location on said lower arm remote from said first end and extending beyond the forward surface of the mounting flange; and

a locking arm cantilevered from a location on said upper arm remote from said lower arm, said locking arm being angularly aligned to said upper arm, such that the locking arm and said lower arm extend from generally opposed sides of said upper arm and the angular alignment of said locking arm to said upper arm being such that said locking arm is directed generally toward the mounting flange, the length of said locking arm being such that an end of the

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locking arm remote from the upper arm is spaced from the forward surface of the mounting flange by a distance slightly greater than the thickness of the panel; and

each of said latch structures being dimensioned and disposed to enable the panel to be engaged intermediate the locking arms thereof and the mounting flange, and to enable float relative to the engaged panel.

4,820,181

WATERTIGHT CONNECTOR

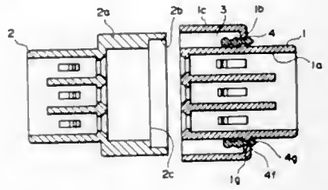
Katsutoshi Kuzuno; Shigeo Ishizuka; Kazuaki Sakurai, and Hiroshi Watanabe, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,791

Claims priority, application Japan, Apr. 13, 1987, 62-54805[U]

Int. Cl.⁴ H01R *13/52*

U.S. Cl. 439—272 **1 Claim**



1. A watertight connector comprising a male connector housing and a mating female connector housing, a first one of said connector housings including an outer wall, an upstanding rear wall extending outwardly along the periphery of said outer wall, a water-intrusion preventive wall extending forward from the outer end of said rear wall in parallel to said outer wall to surround the corresponding portion of said outer wall, and a packing, said outer wall, said rear wall and said water-intrusion preventive wall defining a cavity for containing said packing therein, and the other connector housing including a hollow columnar portion adapted to be inserted into said cavity to compress said packing thereby completing a watertight joint, wherein said packing is formed with an end surface opposed by the rear wall of said first connector housing and an engaging projection extending from said end surface, and said rear wall is formed with a mating aperture to be engaged in a watertight manner by said engaging projection of said packing, said engaging projection having a leading end portion which is partly exposed from said aperture after said engaging projection is fitted into said aperture, said exposed portion of said engaging projection being deformed into an expanded engaging head.

4,820,182

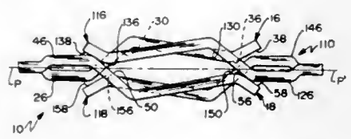
HERMAPHRODITIC L. I. F. MATING ELECTRICAL CONTACTS

Frank A. Harwath, and Russell J. Leonard, both of Downers Grove, Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Dec. 18, 1987, Ser. No. 134,635

Int. Cl.⁴ H01R *13/28*

U.S. Cl. 439—290 **8 Claims**



1. A low insertion force mating electrical contact structure comprising: a pair of hermaphroditic terminals, each terminal including a base and two cantilevered contact beams unitary with and extending forwardly from said base, each said contact beam having a rear end adjacent said base and an opposed front end, said beams each including a plurality of bends such that said beams are disposed generally on opposite sides of a central plane, each beam further including:

a front cam surface adjacent the front end angularly aligned to said central plane;

a front contact surface intermediate said front cam surface and said rear end spaced from said central plane and defined on a surface of said beam facing toward the central plane;

a rear cam surface angularly aligned to said central plane intermediate said front contact surface and said rear end; and

a rear contact surface intermediate said rear cam surface and said base extending parallel to and spaced from said central plane and defined on a surface of said beam facing away from the central plane,

each terminal thereby including a pair of opposed front contact surfaces spaced at a first distance apart and a pair of opposed rear contact surfaces spaced at a second distance apart which is greater than said first distance apart,

whereby, as the pair of terminals are mated, the front cam surfaces of each terminal slidingly engage the rear cam surfaces of the other terminal and the front contact surfaces of each terminal are gradually deflected away from the central plane from said first distance apart to said second distance apart until a final mated position is achieved wherein the front contact surfaces of each terminal are electrically engaged on the rear contact surfaces of the other terminal to provide four independent points of electrical contact between the mated terminals.

4,820,183

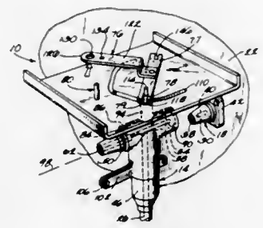
CONNECTION MECHANISM FOR CONNECTING A CABLE CONNECTOR TO A BUSHING

Todd K. Knapp, Waukesha; Harvey W. Mikulecky, Oconomowoc, and Paul R. Reicher, Hubertus, all of Wis., assignors to Cooper Power Systems, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 906,720, Sep. 12, 1986, abandoned. This application Jun. 11, 1987, Ser. No. 60,575

Int. Cl.⁴ H01R *13/62*

U.S. Cl. 439—310 **13 Claims**



1. A connection mechanism for connecting and disconnecting a cable connector to a bushing mounted on an electrical apparatus, said mechanism comprising

a saddle shroud adapted to be connected to the cable connector,

means connected to the electrical apparatus adjacent the bushing for supporting said saddle shroud and for permitting movement of the cable connector relative to the bushing,

a lever mechanism for driving the cable connector onto and away from the bushing, said lever mechanism comprising: an elongated lever including an end adapted to receive said saddle shroud, said lever being pivotally connected spaced from said end to said shroud supporting means so that, when said shroud is received in said lever end, said lever can be pivoted so that the cable connector is forced onto the bushing when said lever is pivoted in one direction, and the cable connector is forced away from the bushing when said lever is pivoted in the opposite direction, and

arm means for pivoting said lever, said arm means comprising an arm connected to said elongated lever at a fixed angle relative to the lever at the point of pivotal connection of said lever to said shroud supporting means, said arm having a shotgun stick receiving end, and

means connected to said shroud supporting means for receiving said lever mechanism and releasably preventing pivoting of said lever mechanism in said opposite direction after the cable connector is forced onto the bushing.

4,820,184

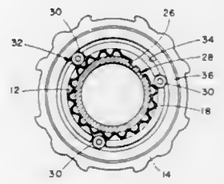
ELECTRICAL CONNECTOR RETAINING RATCHET

Henning F. Brandes, Yucaipa, Calif., assignor to Interconnection Products Incorporated, Santa Ana, Calif.

Filed Oct. 5, 1987, Ser. No. 103,967

Int. Cl.⁴ H01R *13/62*

U.S. Cl. 439—321 **21 Claims**



1. An electrical connector comprising:

(a) interconnectable plug and receptacle mechanisms for carrying coactable electrical contact sets for interconnecting pairs of electrical cables;

(b) the mechanisms including coactable structure for selectively securing the mechanisms in interconnected relationship;

(c) a disconnection inhibiting structure interposed between the mechanisms for inhibiting disconnecting relative movement of the mechanisms, the structure including an elongated corrugated ratchet strip of resilient material and at least one coacting ratchet element;

(d) one of the mechanisms including at least one strip engagement surface coactable with the strip for maintaining the strip and the one mechanism in substantially constant relative circumferential relationship; and,

(e) the other of the mechanisms including at least one element engagement surface for maintaining the other mechanism and the element in substantially constant relative circumferential relationship;

(f) whereby on relative movement of the mechanisms the element will be caused to index selectively from coaction with one strip corrugation to coaction with another corrugation and thus to another.

4,820,185

ANTI-BACKLASH AUTOMATIC LOCKING CONNECTOR COUPLING MECHANISM

Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 20, 1988, Ser. No. 145,869

Int. Cl.⁴ H01R *13/62*

U.S. Cl. 439—321 **23 Claims**

1. A coupling mechanism comprising:

a receptacle element having an open cavity therein;

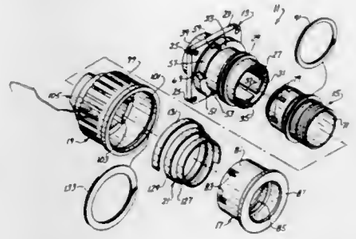
a plug element receivable in said cavity and held against rotation in said cavity;

a rotatable coupling member drivingly coupled to said elements, said coupling member coupling the plug element to the receptacle element in response to rotation of the coupling member;

a locking member;

means for mounting the locking member for rotation with the coupling member and for translation relative to the coupling member;

a resilient member acting between the locking member and the coupling member for urging the locking member to translate with the coupling member as the coupling member is rotated to couple the plug element to the receptacle element;



cooperating means on the locking member and one of said elements for limiting the translation of the locking member with the coupling member as the coupling member is rotated to couple the plug element to the receptacle element until a predetermined angular position of the locking member and said one element is reached whereby the resilient member is progressively compressed by the rotation of the coupling member and the locking member to store energy in the resilient member; and

said cooperating means including interlocking means on the locking member and said one element and responsive to the stored energy in the resilient member and to the locking member and said one element being in said predetermined angular position to interlock to retain the locking member against rotation relative to said one element in a direction that would allow decoupling of the receptacle element and the plug element.

4,820,186

IC CARD CONNECTOR

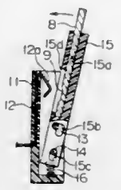
Noriaki Fujii, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 22, 1988, Ser. No. 171,901

Claims priority, application Japan, Mar. 31, 1987, 62-79915

Int. Cl.⁴ H01R *13/04*

U.S. Cl. 439—326 **11 Claims**

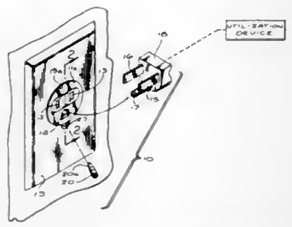


1. An IC card connector capable of holding an IC card and providing electrical contact with each of the electrode terminals of said IC card, said connector comprising:

VOL 1101 ISS 2 AP 11 1989 UMI

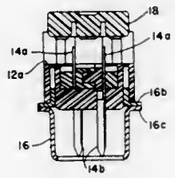
a fixed frame;
electrode pieces which are attached to said fixed frame and have ends extending in said fixed frame to form contact portions;
a moving frame having a holding portion in which an IC card can be inserted and held and a window through which said electrode terminals of said IC card are exposed for contact with said electrode pieces when said IC card is inserted into said holding portion; and
support means for supporting said moving frame on said fixed frame so that said moving frame can be rotated between a first position, at which each of said electrode terminals of said IC card inserted into said holding portion of said moving frame is brought into contact with a corresponding one of said contact portions of said electrode pieces through said window, and a second position, at which the contact between each of said electrode terminals of said IC card and a corresponding one of said contact portions of said electrode pieces is broken by rotating said moving frame to a position, which is at a certain angle with respect to said fixed frame, said support means being operable to hold said moving frame at said first position when said moving frame is rotated to take said first position.

4,820,187
TAMPER-PROOF ELECTRICAL RECEPTACLE
Donald M. May, 19842 Avenue of the Oaks, Newhall, Calif. 91321
Filed Oct. 16, 1987, Ser. No. 108,946
Int. Cl.[4] H01R *13/621*
U.S. Cl. 439—359 **2 Claims**



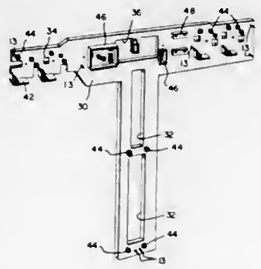
1. In a system including a three-conductor electrical receptacle which includes a solid insulating body for supporting socket members corresponding to said three conductors for mating to a three-pin cord-end cap having pins in a corresponding format, a first of said pins and its corresponding socket member constituting a normally non-conducting safety ground connection, said system including a cover plate over said receptacle body, said cover plate having an aperture therethrough permitting access from mating said cord-end cap to said receptacle, the combination comprising:
a threaded bore through said receptacle body at an angle from a point of contact with said first pin within said corresponding socket member to an external point adjacent to the inside surface of said cover plate;
a set screw within said threaded bore said screw being controllable at said external point to bear against said first cord cap pin to secure said cord cap against removal;
and an opening in said cover plate aligned with said threaded bore at said external point for insertion of a tool to control said set screw.

4,820,188
METAL SHELL ELECTRICAL CONNECTOR AND SUBASSEMBLY THEREFOR
William H. Collier, Iselin, N.J.; Matthew J. Fadule, Easton, and James S. Dunn, Doylestown, both of Pa., assignors to Thomas & Betts Corporation, Bridgewater, N.J.
Filed Mar. 28, 1988, Ser. No. 174,258
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—395 **13 Claims**



1. An electrical connector for insulation displacement connection to conductors of a flat multiconductor cable comprising an elongate insulative housing having two transversely spaced side walls and two longitudinally spaced end walls defining a cavity therein, at least one insert subassembly received in said housing cavity and latchably secured therein, said subasembly including an elongate insulative insert supporting a plurality of insulation displacement contacts in longitudinally spaced disposition, each contact including an insulation displacement contact end having two, spaced tines projecting upwardly from said insert, said tines defining a conductor slot therebetween, there being aligned with each insulation displacement contact end a cable support surface for supporting said multiconductor cable, a recess extending into each cable support surface and downwardly spaced from the bottom of the slot in each insulation displacement contact end, each recess extending transversely along said insert and in substantial registry with each slot in the contact end, there being longitudinally between each cable support surface a groove extending transversely along said insert, each groove having a bottom surface extending downwardly into said insert and spaced from the cable support surfaces, an outer surface of each tine having a cutout therein adjacent each groove.

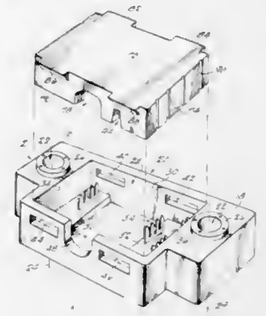
4,820,189
METHOD AND APPARATUS FOR ELECTRICAL WIRING OF STRUCTURAL ASSEMBLIES
Ronald G. Sergeant, Miami, Fla., and Allan J. Sykora, Kernersville, N.C., assignors to AMP Incorporated, Harrisburgh, Pa.
Filed Dec. 17, 1987, Ser. No. 134,328
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—395 **22 Claims**



1. In a method for wiring apparatus of a type characterized

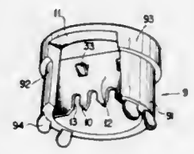
in having a multi-element housing including a variety of components interconnected by electrical wires, the steps comprising:
a. providing an element which is a structural part of said apparatus including substantial portions residing in a plane to define a flat surface with grooves in said element opening onto said surface, said grooves being disposed in a pattern to define major portions of a harness interconnecting the components of the said apparatus,
b. inserting conductor wires in one segment of the said grooves,
c. positioning a wire insertion means over said one segment and drawing said means over the said flat surface in bearing engagement therewith to drive the said wires into the said grooves along the remaining length of the said grooves in said surface, and
d. terminating said wires in said element at appropriate positions to provide interconnection for the said components.

4,820,190
ELECTRICAL COMPONENT MOUNTING AND CONNECTION ASSEMBLY
David T. Humphrey, Mechanicsburg, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.
Filed Sep. 18, 1987, Ser. No. 98,183
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—395 **21 Claims**



1. An electrical component mounting and connection assembly comprising:
a connector block having at least one abutment having slots of a first type formed therein for receiving electrical conductor leads and having a slot of a second type associated with each of the slots of the first type, the slot the second type transverse to and intersectioning the slots of the first type, the slots of the first type defining respective conductor lead guiding paths, each having first and second path portions aligned at a selected angle relative to another and joined by an intermediate curvilinear portion;
a base member for intergaging said connector block to form an assembly;
a plurality of insulation displacement contacts mounted in said base member and positioned to be received within the slots of the second type, each said contact having a first and second spaced apart tines defining a conductor receiving slot therebetween, the contacts being insertable into the slots of the second type to establish electrical connection with conductor leads received in the respective slots of the first type; and
means for retaining a wiring cable to said assembled connector block and base member.

4,820,191
CONNECTION DEVICE
Jacques Lacroix, 12 Allée de Pommeraie, 91570 Bievres, France
Filed Nov. 6, 1987, Ser. No. 117,530
Claims priority, application France, Nov. 7, 1986, 86 15553
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—402 **8 Claims**

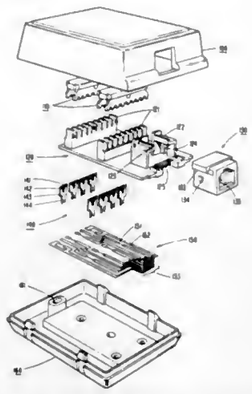


1. A connection device for connecting at least two connecting sheathed wires each surrounded by an insulating sheath, comprising:
a housing having an opening in which a passage is formed inserting an end portion of each of the sheathed wires;
means for receiving said sheathed wire end portions in the housing;
means adapted for being inserted into the housing transversely to the sheaths, having at least two slits for gripping the sheaths of the wires and pulling them inwardly and towards the bottom of the housing and adapted for cooperating with the sheathed wire reception means for stripping the wires longitudinally, characterized in that said means for gripping and pulling the sheaths comprises means for locking on the reception means, the reception means include means for locking to the housing, the bottom of the housing being stepped and having an abutment surface for cooperating with the gripping and pulling means carried by a plug having an end portion extending short of the gripping and pulling slits, of a section larger than said passage opening of the housing and wherein said plug includes a skirt having a section greater than a diameter of the opening of the housing, into which the plug is to be driven, the skirt being connected to a cap by a portion having a section less than said opening diameter.

4,820,192
CONNECTING BLOCK CONSTRUCTION
W. John Denkmann; Leonard H. Drexler, both of Carmel, Ind.; Ronald H. Guelden, Shreveport, La., and William T. Spitz, Indianapolis, Ind., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Jun. 10, 1988, Ser. No. 204,811
Int. Cl.[4] H01R *23/02*
U.S. Cl. 439—404 **15 Claims**

1. A connecting block comprising:
a metallic lead frame having a plurality of flat elongated conductive elements, said conductive elements terminating in closely spaced flat wires at one end of said lead frame;
a plurality of metallic connectors of generally flat elongated construction, each connector including at least two pairs of opposing, insulation-displacing contact fingers integral with, and extending upwardly from, a common region thereof, each common region engaging one of the conductive elements at the other end of the lead frame;
a dielectric block which holds the metallic lead frame and

contains the upwardly extending contact fingers of the connectors; and



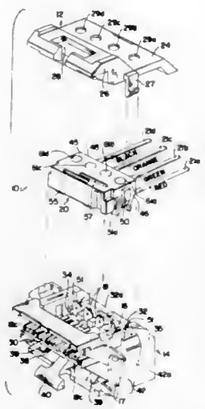
a dielectric jack housing, adapted to receive a modular telephone plug inserted therein, and which contains the closely spaced flat wires of the lead frame.

4,820,193

PANEL MOUNTED ELECTRICAL CONNECTOR INCLUDING MEANS FOR PROVIDING AN INDICATION OF CORRECT CONDUCTOR TERMINATION

Peter Noorily, Bridgewater, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Apr. 4, 1988, Ser. No. 176,830
Int. Cl.[4] H01R *3/00*
U.S. Cl. 439—488 **16 Claims**



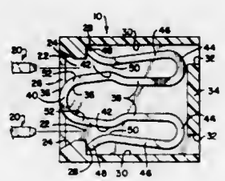
1. A conductor termination assembly comprising:
plural discrete insulated electrical conductors having distinguishing markings thereon;
an insulative termination housing having a first end accommodating said conductors and an open second end for cooperative electrical engagement with an electrical connector;
a plurality of electrical contacts supported in said housing each contact having an insulation displacing portion adjacent said first end of said housing and a terminal portion adjacent said second end of said housing;
an insulative conductor holding block including individual discrete support elements arranged in side-by-side relation each retentively supporting one of said plurality of said conductors, said holding block being supported in said housing to dispose said conductors in electrical engagement with said insulation displacing portions of said electrical contacts, said holding block further including identifying indicia adjacent each of said support elements, said identifying indicia corresponding to said distinguishing markings of said conductors; and
a cover supported on said housing over said holding block, said cover including visual accessing means for permitting visual inspection of said identifying indica on said holding block to assure correspondence of each of said distinguishing markings of said conductors to said identifying indicia of said holding block.

4,820,194

MINATURE ELECTRICAL SHUNT CONNECTOR

Jon D. Stine, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 30, 1987, Ser. No. 103,233
Int. Cl.[4] H01R *31/08*
U.S. Cl. 439—510 **8 Claims**



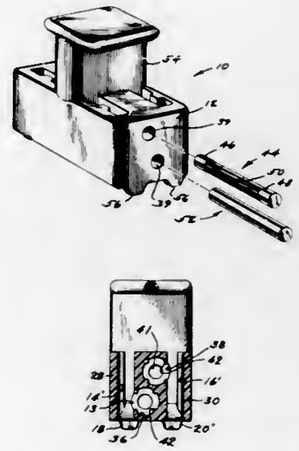
1. A miniature electrical shunt connector for commoning of adjacent terminal posts of at least one pair of posts of a post array, comprising:
housing means having at least one cavity extending rearwardly from an entrance at a mating face to a rear wall thereof;
at least one shunt member disposed in a respective said cavity; and
means for retaining each said shunt member in a respective said cavity,
each said shunt member being essentially disposed in a plane having a thickness substantially equal to the diameter of terminal posts with which it is to shunt, and each said shunt member having a central portion and end sections, said central portion including leg sections joined to and extending rearwardly from a large front bight, said end and leg sections being associated in pairs and joined to and coextending forwardly from respective rear bights to receive respective terminal posts therebetween, said end section and leg section of each said pair converging toward each other proceeding forwardly from said respective rear bight to a respective constriction and curving outwardly forwardly thereof defining a pair of outer and inner contact sections at said constriction engageable with a respective terminal post received therebetween, each said constriction being smaller than the dimension of the terminal post so that said outer and inner contact sections establish an assured electrical connection therewith, and said shunt member being adapted so that said end and leg sections of each said pair are simultaneously relatively urgeable apart at said constrictions by respective said terminal posts received simultaneously therebetween, and
each said shunt member being formed of a length of extruded wire having spring characteristics whereby the surfaces of said shunt member engaging a terminal post are formed by extrusion and are smooth and substantially free of surface irregularities to enhance adhesion of plating material thereto and to minimize damage to the post.

4,820,195

SNEAK CURRENT PROTECTOR WITH FUSE

John A. Siemon, Watertown, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Oct. 30, 1987, Ser. No. 115,531
Int. Cl.[4] H01H *85/54*
U.S. Cl. 439—510 **39 Claims**



1. A terminal bridging device for mounting on a terminal block, the terminal block having a plurality of outwardly extending terminals, comprising:
an insulative block having opposed upper and lower surfaces and opposed first and second end surfaces;
at least two aligned slots defining a first slot and a second slot and extending through at least a portion of said block, each of said slots terminating at said lower surface at a pair of first openings;
at least one bore through at least a portion of said block terminating at said first end surface at a second opening, said bore communicating between said two aligned slots;
electrically conductive component means in said bore, said component means having conductive first and second end terminations wherein said first conductive end termination communicates with said first slot and said second conductive end termination communicates with said second slot; and
said first and second slots each having a preselected size for receiving a terminal extending from a terminal block and said first and second slots each defining an open void for allowing the received terminal to electrically mate along a terminal portion located within the void with one of said first and second end terminations of said electrically conductive component means.

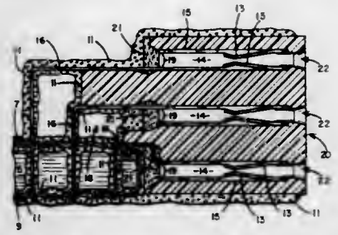
4,820,196

SEALING OF CONTACT OPENINGS FOR CONFORMALLY COATED CONNECTORS FOR PRINTED CIRCUIT BOARD ASSEMBLIES

Paul J. Roselle, Savage, Minn., and Richard T. Benkusky, Dunedin, Fla., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 1, 1987, Ser. No. 103,335
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—519 **6 Claims**

1. In an electrical connector having a housing, a connecting portion and at least one contact member in a cavity in said housing comprising a connecting contact tail that emerges from said housing and a conformal coating over at least a portion of said housing and said contact tails, the improvement comprising a thixotropic, curable sealing material that is applied under sufficient pressure so that the viscosity of said thixotropic material is lowered so that it flows into said cavities far enough to seal-off said cavities while said pressure is applied and before the conformal coating is applied, but not so far that said thixotropic material electrically insulates said connecting portion, wherein said thixotropic material is curable



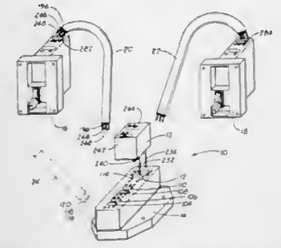
upon the release of said pressure and while so located in said cavities.

4,820,197

THREE-WAY SWITCH SYSTEM AND ADAPTER THEREFOR

Phillip W. Stumpff, Madill, and Richard D. Taylor, Kingston, both of Okla., assignors to Philrich Innovators Research Manufacturing and Development, Inc., Madill, Okla.

Filed Dec. 8, 1987, Ser. No. 130,140
Int. Cl.[4] H01R *9/24*
U.S. Cl. 439—535 **26 Claims**



1. An adapter for interconnecting a junction box and a pair of three-way switches, said adapter comprising:
an insulating housing defining a plurality of sets of wire receiving housing openings disposed through one wall thereof;
a first common electrical contact strip disposed in said housing and having a wire receiving strip opening therein in registry with a wire receiving housing opening of one of said sets of wire receiving housing openings;
a second common electrical contact strip disposed in said housing and having a wire receiving strip opening therein in registry with a wire receiving housing opening of the other of said sets of wire receiving housing openings;
a first switch electrical contact strip disposed in said housing and having a plurality of wire receiving strip openings in registry with a corresponding wire receiving housing opening of each of said sets of wire receiving housing openings;
a second switch electrical contact strip disposed in said housing and having a plurality of wire receiving strip openings in registry with a corresponding wire receiving housing opening of each of said sets of wire receiving housing openings;
first strip engaging means in electrical communication with said first common electrical contact strip and extending through another wall of said housing for engaging an electrical contact strip in said junction box; and

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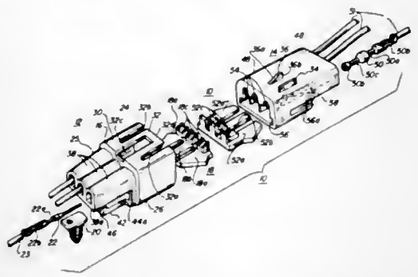
second strip engaging means in electrical communication with said second common electrical contact strip and extending through the same wall as said first strip engaging means for engaging another electrical contact strip in said junction box.

4,820,198

IN-LINE CABLE ASSEMBLY, LOCK BAR THEREFOR

Allen R. Lulko, Canton, and David A. LesCamela, Mt. Clemens, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 23, 1987, Ser. No. 111,908
Int. Cl.[4] H01R *13/40*
U.S. Cl. 439—595 **2 Claims**



1. An in-line cable assembly for connecting two separate cable circuits using female receptacle terminals in a connector and male pin terminals in a plug;

wherein a plurality of pin terminals are positioned in a plurality of arch-shaped channels disposed in a housing of the plug;

wherein a plurality of receptacle terminals are positioned in a plurality of arch-shaped channels disposed in a housing of the connector;

wherein each of the plurality of pin and receptacle terminals has a circular grooved slot at a chosen position along the body of the terminal for use in locking the terminal into the housing;

wherein each of the pin and receptacle terminals includes a pair of crimping arms at a rear end for crimping a wire to the terminal;

wherein each of the plurality of channels disposed in the connector housing and the plug housing has a locking keeper arranged therein which snaps into the circular grooved slot of the terminal for providing primary locking of each terminal in each channel to prevent accidental retraction of the terminal during use;

wherein the plug housing is comprised of two molded sections, a front undivided cavity for receiving the connector and a rear divided cavity comprised of the plurality of channels in which the plurality of pin terminals are positioned;

wherein the connector housing is a single section structure having the plurality of channels extending the length of the housing in which the plurality of receptacle terminals are positioned; said cable assembly comprising:

(a) a locking bar receiving cavity disposed under the rear divided cavity of the plug, said cavity having a pair of sidewalls, each of said pair of sidewalls having an aperture extending substantially the length of said sidewalls;

(b) another locking bar receiving cavity disposed under a front portion of the single section cavity of the connector, said another cavity having a pair of sidewalls, each of said pair of sidewalls having an aperture extending substantially the length of said sidewalls;

(c) a male pin terminal secondary locking bar for insertion in said plug receiving cavity, locking each of the plurality of locking keepers in the circular grooved slot of each of the plurality of male pin terminals, said male pin locking bar having a pair of outer laterally directed triangular shaped resilient material locking fingers and at least one rectangular shaped finger disposed between said pair of outer fingers, said outer laterally directed fingers flexing inward upon entry into the receiving cavities and then outward when the outer edges of the outer fingers enter the apertures in the sidewalls of the plug locking bar receiving cavity, said male pin terminal secondary locking bar having a plurality of upright struts disposed at a terminating end of the bar, each of which having a concave-shaped distal end that engages an under portion of the periphery of the pin terminal and mates with the arch-shaped channels in the plug housing in a complimentary fashion so as to prevent wobble movement of the pin end of each terminal when the cable assembly connector and plug are joined, and

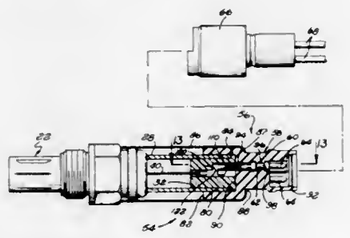
(d) a female pin terminal secondary locking bar for insertion in said connector receiving cavity under a bottom portion of each of the plurality of locking keepers so as to lock the keepers in the circular grooved slot of each female receptacle terminal, said female pin locking bar having a pair of laterally directed triangular shaped resilient material locking fingers and at least one rectangular shaped finger disposed between said pair of outer fingers, said outer laterally directed fingers flexing inward upon entry into the receiving cavities and apertures in the side walls of the connector locking bar receiving cavity.

4,820,199

ELECTRICAL CONNECTOR ADAPTER

Steven Z. Muzslay, Huntington Beach, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,889
Int. Cl.[4] H01R *13/40*
U.S. Cl. 439—599 **15 Claims**



1. An electrical connector adapter comprising:

an insulative body comprising first and second parts;

at least two contact passages extending lengthwise through said first and second parts, each said passage comprising a cavity in said first part communicating with a corresponding cavity in said second part;

each said cavity in said first part being laterally offset from its corresponding cavity in said second part at the junction of said parts;

a contact mounted in each of said passages;

each said contact having first and second contacting end portions and an intermediate bendable portion;

each said contact in each of said passages having said first contacting portion positioned in said cavity in said first part and said second contacting portion positioned in said cavity in said second part, said intermediate portion of said contact having a bend therein adjacent to said junction; and

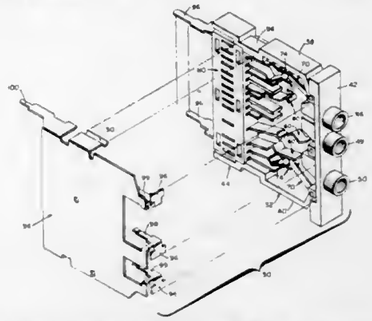
one of said parts being formed of a resilient material, said material having sufficient resilience to create said bend in said intermediate portion of each said contact by resilient engagement of the wall of the corresponding cavity in said one part with said contact.

4,820,200

SLAB-LIKE JACK MODULE

Frederick L. Lau, Skokie, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Filed Feb. 13, 1987, Ser. No. 14,909
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—607 **13 Claims**



1. An electrical jack module, comprising:

a molded dielectric housing having front and back ends, said front end having at least one plug receiving aperture, said housing having a plurality of elongated substantially parallel slots each aligned in the direction between said front and back ends of said housing;

a plurality of metal strip conductors each having a tab on at least one edge, each of said tabs on said at least one edge of said conductors being engaged in a corresponding one of said slots of said housing for holding at least the tabs of said metal strip conductors in substantially parallel alignment with each other, each of said conductors having a first end extending towards said front end of said housing and a second end extending past said back end of said housing for connection to an electrical circuit, at least one of said first ends of said metal strip conductors being positioned for engagement by a plug inserted through said plug receiving aperture wherein said at least one end is moved in a direction away or towards another of said metal strip conductors wherein electrical contact between adjacent said metal strip conductors is either made or broken due to insertion or removal of said plug; and

said housing further comprising an elongated dielectric spacer having one end positioned between two said metal strip conductors and the opposite end rotatably coupled to said housing wherein said one end and the two metal strip conductors can move laterally in response to a plug being inserted into or removed from said plug receiving aperture.

4,820,201

CABLE SHIELD TERMINATION FOR AN ELECTRICAL CONNECTOR

Michael K. Van Brunt, Ventura, and Robert J. Nicoletti, Camarillo, both of Calif., assignors to G & H Technology, Inc., Santa Monica, Calif.

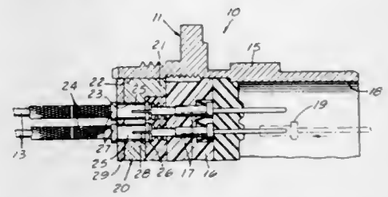
Filed Aug. 24, 1987, Ser. No. 88,410
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—610 **11 Claims**

1. A cable shield termination system, comprising:

an electrical connector part having a metal shell with an open end via which the cable with an electrical contact on its end it introduced;

a metal disk received within the shell open end, said disk having edges which conductively engage an inner wall of the metal shell and an opening extending through the disk of sufficient dimensions to enable passage of the cable and electrical contact;

a hollow metal grounding plug of external dimensions permitting fitting and contacting receipt within the disk opening and an internal opening sufficient to allow the cable to pass therethrough said grounding plug having a slotted side wall, first and second radially extending flanges larger than the disk opening cross-section, and the spacing between the first and second flanges being approximately equal to the disk thickness; and



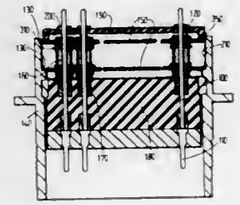
a predetermined length of a hollow tubular metal shield with one end conductively secured within the grounding plug opening, the other end of said tubular metal shield being for receipt on the cable and for conductive securement to the cable shield.

4,820,202

STRESS-FREE FILTER ARRAY FOR MULTI-WAY CONNECTORS

Geoffrey S. Edwards, Grange-over-Sands, and Trevor Armistead, Ulverston, both of England, assignors to Oxley Development Company Limited, London, England

Filed May 18, 1988, Ser. No. 195,533
Claims priority, application United Kingdom, May 21, 1987, 8711998
Int. Cl.[4] H01R *13/66*
U.S. Cl. 439—620 **6 Claims**



1. A multi-way connector incorporating an integral filter array, comprising:

(a) a metal outer casing;

(b) an inner housing in the form of a solid block of an electrically insulating material disposed within the outer casing;

(c) a plurality of electrical contacts having lead-through terminations which extend through the housing block, the free ends of said terminations extending from the block carrying respective filter capacitors whose outer electrodes are connected electrically to a metal ground plane which is itself connected electrically to the metal outer casing;

(d) there being disposed around each said lead-through termination a respective collet which is received within a respective recess in the housing block so as to firmly grip said termination to relieve same of mechanical stresses during connection of a mating connector part with said contacts, and

(e) the free ends of the lead-through terminations, outboard of the filter capacitors, extending through respective holes in a rigid plate of electrically insulating material in such a manner as to prevent mechanical stresses in said terminations during the soldering of components thereto and during handling of the connector, the outer periphery of

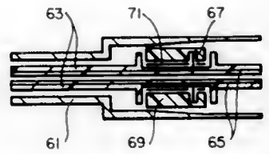
the plate not being connected rigidly to the outer casing to allow slight movement of the ends of said terminations.

4,820,203

MULTICONTACT CONNECTOR

Frank M. Figone, Belmont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 14, 1988, Ser. No. 143,796
Int. Cl.[4] H01R *13/66*
U.S. Cl. 439—620 **11 Claims**



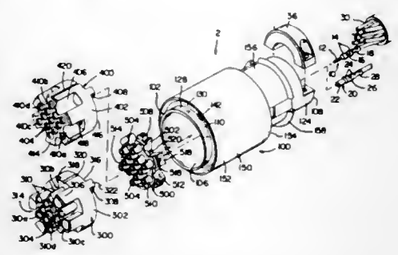
1. A multicontact connector for making connections between first and second sets of conductors, comprising:
(a) a housing;
(b) a plurality of contact pins mounted in the housing for connection to respective conductors of each of the first and second sets;
(c) a removable module comprising one or more electronic components which are electrically connected to one or more of the contact pins, the components adapted to alter an electrical signal passing through the pins; and
(d) a shell having a space within it into which the housing and the module can be inserted, the space being so shaped that the module and pins are forced towards one another when inserted in the shell.

4,820,204

MODULAR ELECTRICAL CONNECTOR ASSEMBLY

William Batty, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 12, 1986, Ser. No. 940,835
Int. Cl.[4] H01R *13/64*
U.S. Cl. 439—681 **26 Claims**



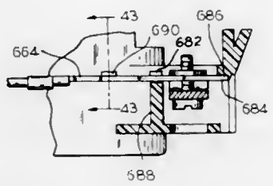
1. A modular electrical connector assembly for interconnecting a plurality of conductors in a first ordered array with a like plurality of conductors in a second correspondingly ordered array, the assembly comprising matable first and second connectors, each connector containing a plurality of terminals attachable to the conductors, and a connector housing, each housing comprising:
an outer housing shell, each shell being polarized by first keying means and matable with the outer housing shell of the other connector in only one mutual angular orientation;
an inner body, the terminals being mounted within the inner body, each inner body including second keying means for engaging with a complementary inner body in the other connector in only one angular orientation, and third keying means for orienting the inner body relative to the corresponding shell in one of a plurality of specified angular orientations, the mutual orientation between the first and second keying means in each corresponding inner body and shell being different in each specified orientation of the inner body relative to the shell, the first and second keying means being both engagable with complementary first and second keying means on the matable connector when the angular orientation between the inner body and the shell in the first connector corresponds to the angular orientation of the inner body relative to the shell in the second connector; and
latching means on the first and second connector comprising a plurality of resilient collet fingers having enlarged ends on the outer housing shell of one connector, the other connector having a ridge on the outer housing shell and an outer shiftable sleeve, the collet fingers being deflectable over the ridge, the sleeve being shiftable over the collet fingers to retain the collet finger ends between the ridge and the sleeve;
whereby a plurality of distinct first and second connectors can be constructed from interchangeable outer housing shells and inner bodies, each distinct connector assembly being suitable for interconnecting conductors in a first ordered array only with conductors in a corresponding second ordered array.

4,820,205

TERMINAL STRUCTURE FOR A COIL

James P. Schmiedel, Brown Deer, and Lawrence D. Moye, Shorewood, both of Wis., assignors to Square D Company, Palatine, Ill.

Division of Ser. No. 721,983, Apr. 9, 1985, Pat. No. 4,705,341.
This application Aug. 19, 1987, Ser. No. 87,500
Int. Cl.[4] H01R *13/422*
U.S. Cl. 439—733 **8 Claims**



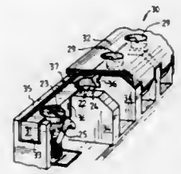
1. A terminal assembly for a coil comprising:
a housing made of molded insulating material;
a projection molded into said housing;
a lug made of electrically conductive material and having a recess therein for accepting said projection molded into said housing for preventing motion of said lug in a first direction;
a support molded into said housing for supporting said lug, said lug being capable of rotation about said support;
means for preventing said lug from rotating about said support in a first rotational sense by preventing a first end of said lug from moving in said first rotational sense;
means for preventing said lug from rotating about said support in a second rotational sense by preventing a second end of said lug from moving in a second rotational sense opposite to said first rotational sense in order to secure said lug to said housing.

4,820,206

SCREW CONNECTION DEVICE FOR ELECTRIC CONDUCTORS

Claude Jullien, Mouans Sartoux; Gérard Lerude, Antibes, and Raymond Llabres, Saint Laurent Du Var, all of France, assignors to La Telemecanique Electrique, France

Filed Mar. 4, 1988, Ser. No. 164,362
Claims priority, application France, Mar. 5, 1987, 87 03275
Int. Cl.[4] H01R *4/44*
U.S. Cl. 439—782 **4 Claims**



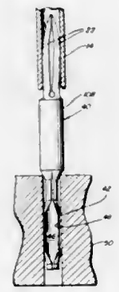
1. A connection device for electric conductors, having at least one terminal which includes:
a clamping screw which may be screwed into a tapped orifice of a contact piece, said screw having a head;
a clamping piece mounted so as not to be lost under the screw head;
an insulating body with an access opening for a tool for actuating the screw head and a housing for the screw-clamp assembly, the walls of this housing cooperating with the clamping piece so as to permit a translational movement thereof and the clamping or unclamping of at least one conductor between the clamping piece and a contact piece following rotation of the screw;
means for retaining the screw-clamp assembly in the fully open position of the terminal, wherein
the means for retaining the screw-clamp assembly are formed by a gripping projection of the insulating body, partially surrounding the screw head and having at least one heel applicable against an inclined face of the clamp and adapted so as to hold the screw-clamp assembly in position against removal along the axis of the screw and against tipping towards the side of the conductor.

4,820,207

ELECTRICAL CONTACT

Richard Zic, Chicago, Ill., assignor to Labinal Components and Systems, Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 815,479, Dec. 31, 1985, abandoned.
This application Aug. 19, 1987, Ser. No. 787,136
Int. Cl.[4] H01R *13/05*
U.S. Cl. 439—825 **14 Claims**



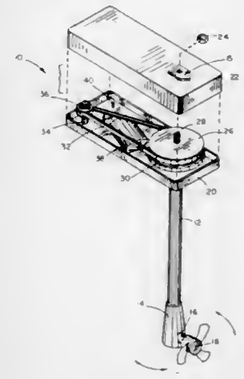
1. A low insertion force, microminiature contact resulting from the die formation of a resilient, electrically conductive material of fabrication; said contact having a first generally tubular portion formed by said die formation comprising at least two cantilever spring leaves having proximal ends extending from an inner annulus comprising a continuous periphery and terminal distal ends; a second tubular portion extending from said annulus in a direction opposite to said leaves; said first and second tubular portions and the interconnecting annulus being integrally formed in the course of said die formation of said resilient material of fabrication; said leaves being in substantially parallel, spaced relationship relative to the contact longitudinal axis; central portions of said leaves between said proximal and distal ends being bowed outwardly relative to said longitudinal axis so as to define portions of a maximum circumference defined by said leaves and the said terminal distal ends being fused for restricting the independent longitudinal movement of any one of said leaves relative to the other whereby insertion of said first contact portion in a mating socket having a receiving opening smaller than said maximum circumference results in substantially uniform resilient flexing of the leaf portions to assure electrical contact to said leaves with the inner periphery of said socket.

4,820,208

DIRECTIONAL CONTROL MECHANISM FOR A TROLLING MOTOR

Walter A. Phillips, Sr., 9000 N. Nettie School Rd., Morris, Ill. 60450

Filed Feb. 12, 1988, Ser. No. 155,582
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—7 **5 Claims**

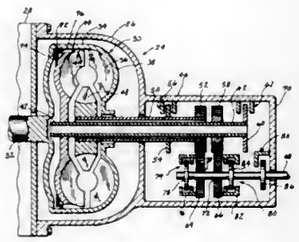


1. A new and improved directional control mechanism for a trolling motor, comprising:
an outer stationary hollow shaft;
a motor mount secured to said outer shaft for rotation around said outer shaft;
an electric trolling motor secured to said motor mount;
a hollow inner shaft coaxially received in said outer shaft, said inner shaft connected for rotating said motor mount;
mounting plate means on an upper end of said stationary shaft;
said inner shaft extending upwardly through said mounting plate means;
pulley means on said inner shaft;
belt and pulley drive means operatively connected to said pulley means;
directional control motor means on said mounting plate means;
gear reduction means on said mounting plate means operatively connected to said directional control motor means;
said gear reduction means having a rotary output shaft operatively connected to said belt and pulley drive means;

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battery means operatively connected for powering said trolling motor and said directional control motor means;
foot pedal control means for reversing polarity of said directional control motor means; and
rotary electrical contact means on said pulley means for transmitting electrical current to said trolling motor.

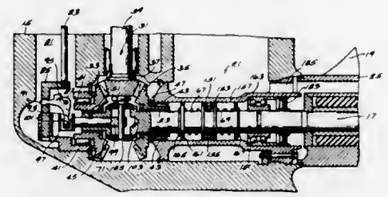
4,820,209
TORQUE CONVERTER MARINE TRANSMISSION WITH VARIABLE POWER OUTPUT
Neil A. Newman, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Nov. 9, 1987, Ser. No. 118,862
Int. Cl.[4] B63H *23/26*
U.S. Cl. 440—74 **12 Claims**



1. In a marine drive for a boat, said marine drive including an engine having a rotatable crankshaft, and a propulsion unit, the improvement comprising:
a fluid coupling interposed in the marine drive between the engine and the propulsion unit, said fluid coupling including a rotatable fluid pump rotatable in resposne to rotation of the engine crankshaft, a rotatable turbine adapted to be driven by said fluid pump in a first rotational direction, and a rotatable reactor adapted to be driven by said fluid pump in a second rotational direction;
a turbine shaft interconnected with said rotatable turbin and adapted to be driven in response to rotation of said rotatable turbine;
a reactor shaft interconnected with said rotatable reactor and adapted to be driven in response to rotation of said rotatable reactor;
wherein
one of said shafts is tubular in cross section, and wherein the other of said shafts is disposed in the interior of said tubular shaft;
output means comprising a rotatable output shaft for transferring power from said engine to said propulsion unit;
coupling means for selectively coupling said turbine shaft or said reactor shaft to said output shaft for selectively providing rotation of said output shaft in either a first or second rotational direction; and
governing means acting on said output shaft for governing the power transferred from said engine to said propulsion unit, said governing means including means for variably controlling the power output of said output shaft.

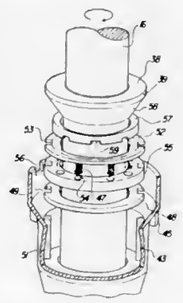
4,820,210
LOWER GEARCASE SHIFT MECHANISM FOR MARINE PROPULSION DEVICE
Robert G. Dretzka, South Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Nov. 18, 1987, Ser. No. 122,221
Int. Cl.[4] B63H *23/08*
U.S. Cl. 440—75 **21 Claims**

1. A marine propulsion device including a lower unit having a power transmission mechanism comprising a bevel gear having a first clutch element, a propeller shaft having a second clutch element and mounted in said lower unit for rotational movement and for axial movement between a neutral position and a drive position with said propeller shaft clutch element in engagement with said first clutch element, selectively engageable means on said bevel gear and on said propeller shaft for rotating said propeller shaft at a rate less than the rotational



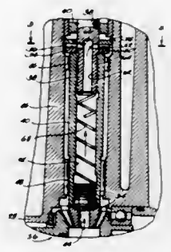
rate of said bevel gear and so as to facilitate engagement of said first and second clutch elements, and means biasing said propeller shaft to said neutral position in the absence of an overcoming force which is created by propeller shaft rotation and which displaces said propeller shaft to said drive position.

4,820,211
DRIVESHAFT SUPPORTING DEVICE FOR MARINE PROPULSION ENGINE
Akihiro Onoue, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Jun. 25, 1987, Ser. No. 66,818
Claims priority, application Japan, Jul. 4, 1986, 61-156159
Int. Cl.[4] B63H *21/28*
U.S. Cl. 440—83 **5 Claims**



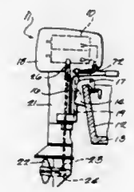
1. A thrust bearing arrangement for a driveshaft of a marine outboard drive comprising an outer housing adapted to be affixed to the transom of an associated water craft, a driveshaft supported for rotation about a vertically extending axis relative to said outboard housing by means including a thrust bearing acting only in an upward direction, an annular collar encircling said driveshaft and, biasing spring means comprising a plurality of coil springs disposed around said driveshaft and acting directly in said annular collar for yieldably urging said driveshaft in an upward direction for maintaining pressure upon said thrust bearing.

4,820,212
MARINE PROPULSION DEVICE BEARING LUBRICATION SYSTEM
Kennedy K. McElroy, Lindenhurst; Jeffrey P. Higby, Waukegan, both of Ill., and Philip A. Zorc, St. Joseph, Mich., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Oct. 15, 1987, Ser. No. 108,924
Int. Cl.[4] B63H *21/10*
U.S. Cl. 440—88 **30 Claims**



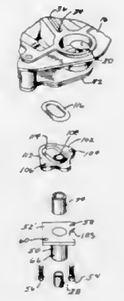
21. A marine propulsion device comprising an engine, a lower unit adapted to be mounted on the transom of a boat for pivotal movement relative thereto o about a generally vertical steering axis, said lower unit including a lower gearcase having therein lubricant, a generally vertical drive shaft rotatably supported in said lower unit and including an upper end driven by said engine, a lower end extending into said gear case and adapted to be drivingly connected to a propeller, and an axial bore extending upwardly from said lower end, and means providing internal threads within said axial bore for pumping lubricant from said lower gearcase upwardly through said axial bore.

4,820,213
FUEL RESIDUAL HANDLING SYSTEM
Theodore J. Holtermann, Brookfield, and James L. Hofmann, Milwaukee, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Oct. 5, 1987, Ser. No. 105,177
Int. Cl.[4] B63H *21/14*
U.S. Cl. 440—88 **18 Claims**



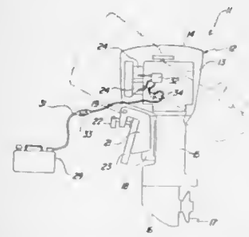
1. A marine propulsion device comprising an internal combustion engine operable in a predetermined mode and adapted to be drivingly connected to a propeller, said engine including an engine block, a controllable valve, a fluid conduit communicating with said controllable valve and with a preselected location within said engine block, control means responsive to operation of said engine in said predetermined mode for opening said controllable valve when said engine is operating in said predetermined mode, and a sump having a single outlet solely communicating with said controllable valve and having an unobstructed inlet communicating with said engine block to provide a free gravity flow path for fuel drains from said engine block ino said sump.

4,820,214
MARINE PROPULSION UNIT WITH SEAL BETWEEN WATER TUBE AND ADAPTER PLATE
Paul D. Lefeber, North Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Mar. 24, 1988, Ser. No. 173,183
Int. Cl.[4] B63H *21/10*
U.S. Cl. 440—88 **10 Claims**



1. An outboard marine propulsion unit having a lower gearcase with a water tube supplying cooling sea water to a powerhead including an internal combustion engine mounted on an adapter plate at the top of said gearcase, said adapter plate having a water passage which is vertically non-aligned with said water tube, sealing structure connecting said water tube to said adapter plate comprising a first fitting receiving the top of said water tube in sealing relation, a second fitting communicating with said first fitting and sealed to said adapter plate along a horizontally extended area having a first section vertically aligned with said water tube and a second section vertically aligned with said water passage in said adapter plate.

4,820,215
FUEL SUPPLYING SYSTEM FOR OUTBOARD MOTOR
Norihito Mizusawa; Yoshihiro Gohara, and Yoshikazu Nakayasu, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Continuation of Ser. No. 901,192, Aug. 28, 1986, abandoned.
This application Apr. 26, 1988, Ser. No. 186,760
Claims priority, application Japan, Aug. 29, 1985, 60-188463
Int. Cl.[4] F16K *17/36*
U.S. Cl. 440—88 **15 Claims**

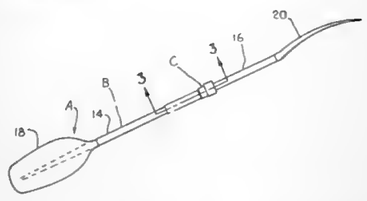


1. In a fuel supply system for an outboard motor having a charge former and an engine driven fuel pump for delivering fuel to said charge former, said outboard motor being supported for pivotal movement about a generally horizontally extending tilt axis between a normal running position and a tilted up position, a remote fuel tank adapted to be carried in the hull of an associated watrcraft, conduit means extending from said fuel tank to said fuel pump for delivering fuel

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thereto, and manually operated priming pumping means external of said outboard motor for pumping fuel through said conduit means, the improvement comprising position responsive valve means in said conduit means for precluding flow to said engine driven fuel pump and said charge former when said outboard motor is in its tilted up position and if said manually operated priming pump is operated.

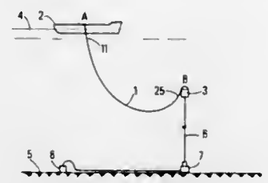
4,820,216
ADJUSTABLE KAYAK PADDLE
William E. Masters, 313 Dogwood La., Easley, S.C. 29640
Filed Jan. 25, 1988, Ser. No. 148,055
Int. Cl.[4] B63H *16/04*
U.S. Cl. 440—101 **15 Claims**



4. An adjustable kayak paddle comprising:
a first handle section having a first blade attached at one end;
a second handle section having a second paddle blade affixed to one end;
an adjustable joint for joining said first and second handle sections together and adjusting the relative axial position of said first and second handle sections relative to each other;
said second handle section having a cylindrical shaft with a reduced diameter which fits within said first handle section;
first threads formed on an outside diameter of said first handle section;
a compression nut received over said second handle section having interior threads for mating with said first threads;
an annular compression member received over said shaft of said second handle section having opposing free ends defining a gap, said annular compression member having outer beveled edges and a planar interior bearing surface extending between said outer beveled edges on an interior circumference of said annular compression member which bears against said shaft of said second handle section; and complimentary beveled surfaces formed on an end of said first handle section and on said compression nut for compressing said compression member forcing said opposing ends towards each other to close said gap in a manner that said interior bearing surface of said compression member tightens upon said shaft of said second handle section to positively lock said first and second handle sections together against rotational and axial movements.

4,820,217
DEVICE FOR PREVENTING A FLEXIBLE LINE FROM TWISTING
Philippe Joubert, Jouy En Josas, and Jean Falcimaigne, Bois Colombes, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France
Filed Dec. 30, 1986, Ser. No. 947,754
Claims priority, application France, Dec. 30, 1985, 85 19428
Int. Cl.[4] B63B *21/00*
U.S. Cl. 441—5 **8 Claims**

1. A device for avoiding twisting of a flexible line having two ends, one end of which is connected to a revolving joint having two parts, one of these two parts being integral with said one end, the other part of said revolving joint being integral with a floating installation which is movable with respect to said other end of said flexible line, including means for setting one of the parts for said revolving joint in rotation relative to the other and means for determining the variation of the relative position of said two ends of said line, said means for determining the variation of the relative position of said two ends being adapted for measuring the angles Theta, Alpha, Beta and h wherein:
angle Theta is formed by the orthogonal projection on a horizontal plane of a point of connection of the one end of said flexible line to said floating installation before and after displacement of said floating installation and of a connection point between an immersed installation and the other end of said flexible line, an apex of said angle Theta being formed by a projection of said connection point between the immersed installation and the other end of the flexible line;

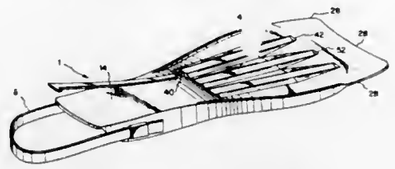


angle Alpha is formed by the end of the flexible line integral with said floating installation and a vertical half axis;
angle Beta is formed by the other end of said flexible line, with a vertical half axis of the same orientation as that used for defining the angle Alpha; and
angle h is an angle of variation of the heading of the floating installation; said means for setting one of said parts in rotation being adapted for rotating said parts of the revolving joint with respect to each other through an angle Gamma wherein:

$$\text{Gamma} = \text{Theta}\,(1+\cos(\text{Beta}))/(\cos(\text{Alpha}))) + h$$

where cos designates the cosine function.

4,820,218
SWIM FIN
Herbert D. Van de Pol, Riviera Beach, Fla., assignor to Wenoka Seastyle, West Palm Beach, Fla.
Filed Dec. 11, 1987, Ser. No. 131,573
Int. Cl.[4] A63B *31/08*
U.S. Cl. 441—64 **5 Claims**

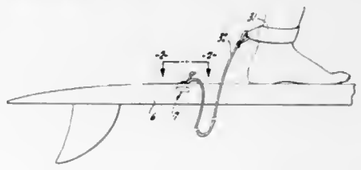


4. A swim fin comprising an elongated flexible blade and an integrally formed foot portion formed in part by one end of said blade and a vamp shaped to extend over the forepart of the wearer's foot, said blade having a thickness that tapers from a thick cross section at said one end to a thinner cross section at the other end, said blade having reinforcing ribs extending longitudinally of and along a major portion of each side edge of the blade from said one end to said other end, said ribs being thicker in cross section at their lower longitudinal edges adjacent to said blade than at their upper longitudinal edges remote from said blade, said ribs flared angularly outwardly from a plane in which said blade lies and each having an outer concave surface.

4,820,219
RECREATIONAL DEVICE
Thomas H. Fortier, Jr., 2404 W. San Miguel, Phoenix, Ariz. 85015, and Carl J. Buetzow, 5915 West Holly, Phoenix, Ariz. 85035
Filed Dec. 7, 1984, Ser. No. 679,482
Int. Cl.[4] A63C *15/00*
U.S. Cl. 441—66 **10 Claims**

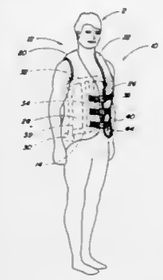
1. A floatable recreational device for use in water sport comprising an elastomeric annular tube capable of expanding when filled with gaseous fluid without disrupting a long-wearing, corrosion resistant, heat dissipating coating integrally formed therewith on the outer surface thereof, said coating comprising an elastomer containing chlorosulfonated polyethylene as its principal ingredient.

4,820,220
SURFBOARD TETHER
Bradley E. Fruzzetti, 21462 Bradford Dr., Castro Valley, Calif. 94546, and Micheal Jack, 417 Sunset Rd., Alameda, Calif. 94501
Continuation of Ser. No. 745,449, Jun. 17, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 102,827
Int. Cl.[4] A63C *15/06*
U.S. Cl. 441—74 **2 Claims**



1. A device for securing a tether to a surfboard comprising
(a) an anchor block imbedded in said surfboard, said anchor block having a non-circular internal recess in the upper portion thereof accessible at the exterior surface of said surfboard and a threaded perforation at the lower portion thereof,
(b) a retainer having a portion of its exterior similarly non-circular to said recess in said anchor block said retainer having a cylindrical portion of its exterior having an external threaded surface,
(c) a perforated tab having an aperture therein adapted to surround said threaded portion of said retainer,
(d) a nut engaging said tab and said threaded portion of said retainer and adapted to secure said perforated tab to said retainer while permitting said perforated tab to rotate about said retainer at said aperture,
(e) a tether attached to said tab at said perforation,
(f) said retainer having a bolt, a threaded portion on said bolt threadedly engaging said threaded perforation of said anchor block,
(g) and means at the exterior of said retainer defining a keyway for a key engageable with said bolt the use of said key enabling the rotation of said bolt with respect to said retainer and said anchor block whereby said bolt is secured to said threaded perforation in said anchor block and said tether is secured to said surfboard.

4,820,221
UPPER BODY BUOYANT GARMENT WITH IMPLANTED POSITIVE LUMBAR SUPPORT STRUCTURE
Martin G. Aubrey, 1307 Rothes Rd., Cary, N.C. 27511
Filed Mar. 21, 1988, Ser. No. 170,986
Int. Cl.[4] A16F *5/02;* **B63C** *9/08*
U.S. Cl. 441—106 **3 Claims**



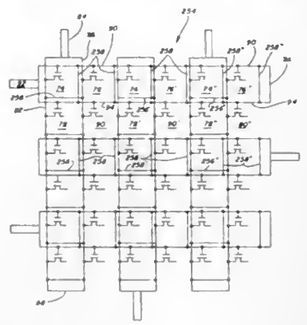
1. A positive lumbar support garment adapted to be worn about the torso of a patient for immobilizing and supporting the lumbar region of the patient comprising:
(a) a relatively soft and pliable buoyant garment that extends around the lower torso and lumbar region of the patient and includes back, side and front areas with the front being openable;
(b) positive lumbar support structure means implanted into the back area of the buoyant garment and extending outwardly to the side area for positively immobilizing and supporting the lumbar region of the patient;
(c) the positive lumbar support structure including a relatively hard frame structure that as implanted extends over the lumbar region and around the lower torso of the patient where the frame acts to positively immobilize and support the lumbar region; and
(d) means for pulling the implanted lumbar support structure firmly against the back and lumbar region of the patient and maintaining the implanted lumbar support structure in that position while the same is held about the patient's lower torso through the buoyant garment wherein the implanted lumber support structure acts to positively immobilize and support the lumbar region.

4,820,222
METHOD OF MANUFACTURING FLAT PANEL BACKPLANES INCLUDING IMPROVED TESTING AND YIELDS THEREOF AND DISPLAYS MADE THEREBY
Scott H. Holmberg, and Richard A. Flasck, both of San Ramon, Calif., assignors to Alphasil, Inc., Fremont, Calif.
Filed Dec. 31, 1986, Ser. No. 948,224
Int. Cl.[4] G09G *3/22*
U.S. Cl. 445—3 **31 Claims**

1. A method of manufacturing matrix display backplanes and displays therefrom, comprising:
providing a substrate;
providing a pattern of pixels on said substrate; and
providing a plurality of sets of intersecting pixel activation bus lines and coupling each said pixel to a pair of said sets of intersecting bus lines to provide each pixel with a redundant pair of activation bus lines, including connecting each of said pixels to one of its redundant pair of activation bus lines and interconnecting each end of said redundant pair of activation bus lines to one another to provide

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said redundancy and dividing each pixel into a plurality of subpixels and connecting each of said subpixels to one of



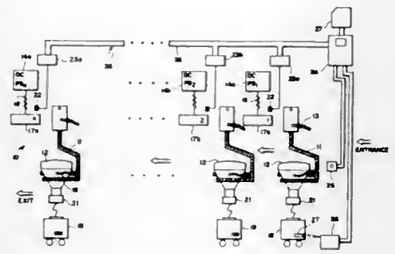
its redundant pair of activation bus lines through an active device, independent of any other pixel activation bus lines.

4,820,223

SYSTEM AND METHOD FOR MONITORING SPOT-KNOCKING OF CRTS

Samuel P. Benigni, Lititz, and Richard W. Collins, Pequea, both of Pa., assignors to RCA Licensing Corp., Princeton, N.J.

Filed Jun. 2, 1988, Ser. No. 201,243
Int. Cl.[4] H01J *9/26*
U.S. Cl. 445—6 **8 Claims**



1. In a system for spot-knocking cathode ray tubes (CRT's) carried along a conveyor on hangers, each of said hangers having a wiper for applying a high anode potential to a CRT supported on said hanger, said system also including a plurality of carts moving along with said conveyor for applying a spot-knocking potential to said tubes an improvement comprising:

a plurality of anode bus bar segments arranged along said conveyor to sequentially engage the wiper of a tube hanger moving along said conveyor; each of said anode bus bar segments being associated with a voltage source for applying a high voltage to said anode bus bar segments;

a plurality of sensor means individually arranged in the proximity of said anode bus bar segments, said sensor means sensing spot-knocking discharges within said CRT;

a plurality of counter means individually responsive to said sensor means for counting the number of discharges occurring along each of anode said bus bar segments;

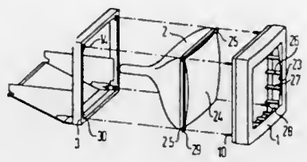
computer means for receiving and storing said discharge counts, said computer means also averaging said discharge counts for each of said anode bus bar segments, for each of said hangers, and for each of said carts whereby too low a discharge count can indicate faulty spot-knocking equipment, and too high a count can indicate a faulty tube.

4,820,224

METHOD AND APPARATUS FOR THE ASSEMBLY OF PICTURE SCREEN DEVICES

Josef Lemche, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 13, 1987, Ser. No. 14,436
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604626; Feb. 14, 1986, 3604647
Int. Cl.[4] H04N *5/645*
U.S. Cl. 445—23 **7 Claims**



1. In a method for assembling picture screen devices whereby a picture tube having a spherical picture screen surface and retaining clips arranged at the outer circumference thereof is arranged between a closed carrying frame and a frame-like bezel with lateral centering surfaces disposed on the interior of said bezel and with an inside edge mount which is adaptable to the curvature of the spherical picture screen surface of the picture tube and defines the frame cutout of the bezel on all sides thereof, the improvement comprising:

centrally locating the front face of said picture tube with respect to said bezel;

placing said carrying frame over the rear face of said picture tube;

pressing said bezel against said carrying frame with a prescribed amount of pressure; and

affixing said carrying frame to said bezel with a plurality of fastening means, having first and second clamp elements, to and around said carrying frame and bezel, whereby said first and second clamp elements are capable of engaging one another to accomplish affixing during the pressing process.

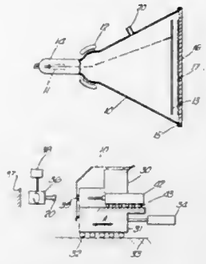
4,820,225

METHOD OF SEALING A PUMP STEM TO A CATHODE RAY TUBE ENVELOPE PART

Kathryn C. Thompson-Russell, Eindhoven, Netherlands, and Roger A. Black, Retford, United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1986, Ser. No. 855,235
Claims priority, application United Kingdom, May 8, 1985, 8511637
Int. Cl.[4] B23K *27/00*; H01J *9/26*
U.S. Cl. 445—43 **12 Claims**

1. A method of sealing a generally tubular pump stem in a vacuum-tight manner to a mild steel envelope part of a cathode ray tube, characterised by the steps of forming the generally tubular pump stem with a closed end, rotating the pump stem around its axis and relative to the envelope part and forcing the closed end of the pump stem against the surface of the envelope part so as to cause the closed end of the pump stem and the envelope part to be friction welded and sealed together,



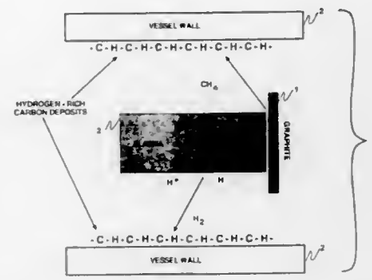
and thereafter extending the bore of the generally tubular pump stem through the closed end.

4,820,226

GETTER PUMP FOR HYDROGEN AND HYDROCARBON GASES

Wen L. Hsu, Danville, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 14, 1987, Ser. No. 108,326
Int. Cl.[4] H01J *41/16, 41/12*
U.S. Cl. 445—55 **11 Claims**



1. A device for gettering hydrogen isotopes and gaseous hydrocarbon within a vacuum or an inert atmosphere, comprising a plasma and graphite as the cathodic material.

4,820,227

METHOD AND APPARATUS FOR SUPPORTING CATHODE-RAY TUBE PANEL

Hidetoshi Itiki, Himeji, and Yoshihisa Kozasa, Hyogo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 17, 1987, Ser. No. 39,282
Claims priority, application Japan, Apr. 18, 1986, 61-89498
Int. Cl.[4] H01J *9/22*
U.S. Cl. 445—66 **8 Claims**

1. An apparatus for supporting individual cathode-ray tube panels having different sizes and surfaces which face each other, comprising:

a pair of holders adapted to come close to each other and to be separated from each other;

transporting means for positioning the panel between said pair of holders;

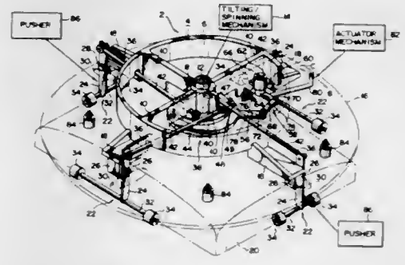
moving means for moving said pair of holders to the surfaces after the panel is moved to a position between said pair of holders by said transporting means;

urging means for moving said pair of holders, which have been moved to the surfaces by said moving means, to come close, to each other by a predetermined distance regardless of the size of the panel, thereby urging said pair of holders against the surfaces of the panel and hence causing said pair of holders to hold the panel said urging means including:

an actuator pivoted in a first direction in a synchronism with closing movement of said pair of holders and in second direction in synchronism with opening movement thereof, said actuator being adapted to move said pair of holders so that said pair of holders come close to each other upon a pivotal movement of said actuator in the first direction, and said actuator being adapted to move said pair of holders so that said pair of holders are separated from each other upon a pivotal movement of said actuator in the second direction;

a pivotal member concentric with said actuator;

one-way pivot regulating means for allowing pivotal movement of said actuator in the first direction relative to said pivot member and for inhibiting pivotal movement of said actuator in the second direction relative to said pivot member;



a lock mechanism movably disposed between first and second positions, said lock mechanism being adapted to pivot said pivot together with said actuator through said one-way pivot regulating means by a predetermined angle in the first direction and to maintain the predetermined angle in the first position when said lock mechanism is moved from the first position to the second position, and said lock mechanism being adapted to pivot said pivot member together with said actuator by said one-way pivot regulating means in the second direction when said lock mechanism is moved from the second position to the first position; and

releasing means for releasing said actuator from said pivot member by said one-way pivot regulating means so as to allow said actuator to pivot in the second direction when said lock mechanism is moved from the second position to the first position and said pivot member together with said actuator is pivoted by the predetermined angle in the second direction by said one-way pivot regulating means.

4,820,228

SEALING APPARATUS FOR PICTURE TUBE

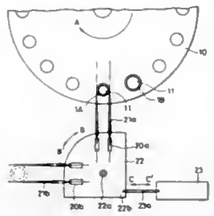
Koichi Yasuda, Yotsukaido, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1987, Ser. No. 21,644
Claims priority, application Japan, Mar. 20, 1986, 61-60536
Int. Cl.[4] H01J *9/26*
U.S. Cl. 445—67 **1 Claim**

1. A picture tube sealing apparatus comprising, a plurality of sealing holders for retaining glass bulbs concentrically with tubular shafts thereof, a mount pin holding an electron gun structure which is mounted on a stem structure to be provided in a neck portion of one of said glass bulbs, and a heating unit

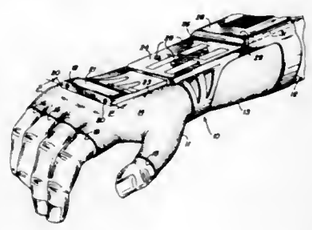
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for heating said stem structure and said neck portion of said one of said glass bulbs so as to weld and seal the same, wherein said heating unit includes a plurality of burner units, each of which has two burners whose flames define a diameter which corresponds to the diameter of said neck portion and which are arranged unitarily and fixedly on a table so that said burner units have a predetermined angle with respect to each other, and switch means for moving a selected one of said burner units in accordance with the diameter of the neck portion of



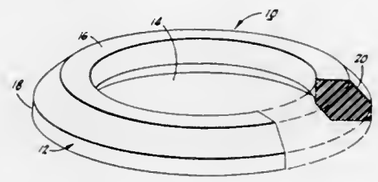
each of said glass bulbs to a position where the flame of said selected one of said burner units can heat said stem structure and said neck portion, said switch means further including means for turning said table so as to move said selected one of said burner units to said position, whereby said sealing holders are operatively arranged accurately to move to predetermined places at regular time intervals sufficient to weld and seal said stem structure and said neck portion so as to successively seal a plurality of picture tubes having neck portions of different diameters.

4,820,229
AMUSEMENT DEVICE
Gary L. Spraggins, 1928 E. Colgate Dr., Tempe, Ariz. 85283
Filed Feb. 17, 1987, Ser. No. 15,439
Int. Cl.[4] A63H *5/00, 33/26*
U.S. Cl. 446—26 **13 Claims**



1. An amusement device for use on a human arm comprising:
a body member having an arm surrounding portion, a hand surrounding portion and a mouth portion, said hand surrounding portion having a palm surface and a back surface, said mouth portion providing an opening for introducing the user's hand into said hand surrounding portion and the user's arm into said arm surrounding portion; effect emitting means secured to said body member on said back surface of said hand surrounding portion, said effect emitting means comprising a light source, light collimating means operatively disposed in front of said light source to collimate the light emitted therefrom and direct the light away from said body portion, sound producing means, and housing means enclosing said effect emitting means; a control assembly secured to said arm surrounding portion adjacent said hand surrounding portion, said control assembly having a housing member and switching means disposed within said housing member; power means attached to said arm surrounding portion; mixer means operatively interposed between said control assembly and said effect emitting means and electrical connector means operatively connecting said power means to said effect emitting means through said control assembly and said mixer to selectively activate said sound producing means and said light source to create one or more of a variety of interrelated laser and phasor simulating sights and sounds therewith.

4,820,230
TOSSING RING AND SAUCER
Marvin D. Richards, 418 Del Sol, Pleasanton, Calif. 94566
Continuation of Ser. No. 1,169, Jan. 6, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 181,746
Int. Cl.[4] A63H *27/00;* **A63B** *71/09*
U.S. Cl. 446—48 **6 Claims**



1. A tossing ring, comprising:
an annular body constructed of light weight foam material, said annular body including, when viewed in section, a flattened upper surface and a flattened outer side surface, said flattened upper and outer side surfaces being disposed substantially orthogonally relative to one another; a first flattened mitred surface interposed between said upper and outer side surfaces; a flattened bottom surface disposed substantially parallel to said flattened upper surface; and a flattened inner side surface disposed substantially parallel to said flattened outer side surface; and a second mitred surface interposed said flattened inner side surface and said flattened bottom surface;
said flattened bottom surface, said flattened upper surface, said flattened outer side surface, said flattened first mitred surface, said flattened inner side surface, and said flattened second mitred surface being interconnected to extend completely around and form the exterior surface of said annular body.

4,820,231
MANNEQUIN DEVICE
Nancy L. Mikitka, Orland Park; Emerson J. Purkapile, and Duane R. Picht, both of Chicago, all of Ill., assignors to Samaritan Industries, Inc., Orland Park, Ill.
Filed Apr. 20, 1987, Ser. No. 39,717
Int. Cl.[4] A63H *33/00;* **G09F** *19/08*
U.S. Cl. 446—73 **17 Claims**

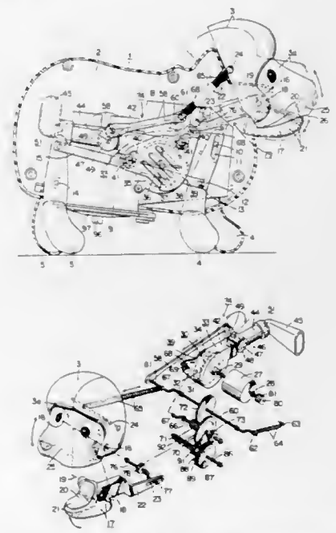
1. A portable mannequin comprising in combination:
a carrying case having a top, a bottom, and sides separating the top and bottom to define an enclosure, the top hinged to a side and pivotable to expose the interior of the enclosure; and
collapsible mannequin form within the case including a torso form and an attached head form on the torso form, said torso form supported by attachment to the case, said head form supported by attachment to the torso form; the head form and torso form both being foldable into the enclosure defined by the case and expandable from the case to replicate an upright body form supported by the case, the body form extending generally vertically, said torso form comprised of a shoulder form, said torso form also including

bracket means pivotally attached at one end to the case and at its opposite end to the shoulder form, said shoulder



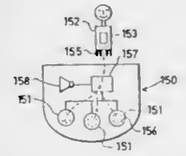
form having a flexible chest portion, a generally rigid shoulder portion and a generally rigid back portion.

4,820,232
VOICE MAKING DEVICE FOR MOVING ANIMAL TOY AND MOVING ANIMAL TOY USING THE VOICE MAKING DEVICE
Hajime Takahashi, and Eiichi Maeda, both of Tokyo, Japan, assignors to Iwaya Corporation, Tokyo, Japan
Filed May 20, 1988, Ser. No. 196,683
Claims priority, application Japan, Dec. 4, 1987, 62-307022
Int. Cl.[4] A63H *33/40, 3/31, 3/28, 3/22*
U.S. Cl. 446—178 **2 Claims**



1. A voice making device for a moving animal toy comprising an air blower having a fan rotatably installed in a blower chamber with air suction slits, the air blower also having a voice generating member with a vibrating piece installed in an exhaust portion of an exhaust passage communicating with the blower chamber; a cock rotatably installed between the blower chamber and the exhaust passage to control an air flow supplied to the voice generating member; and an adjust plate installed rotatably with respect to the air suction slits of the blower chamber, the adjust plate having communicating holes and blocking portions to open and close the air suction slits and thereby regulate an amount of external air drawn into the blower chamber; motor means for moving said animal toy, said motor means also for operating said cock, said fan, and said adjust plate.

4,820,233
SOUND-PRODUCING AMUSEMENT DEVICES
Avish J. Weiner, 39 Yehuda Hanassi Street, Ramat-Aviv, Tel-Aviv, Israel
Filed Jan. 13, 1987, Ser. No. 3,040
Claims priority, application Israel, Jan. 26, 1986, 77705; Jan. 2, 1987, 81146
Int. Cl.[4] A63H *3/28, 5/00*
U.S. Cl. 446—303 **1 Claim**



1. A talking toy comprising a plurality of toy figures; and a holder formed with a plurality of like sockets each for receiving any one of said toy figures; each of said toy figures including a read-only memory unit having recorded therein digital data representing sounds characteristic of the respective toy figure, and connectors for connection to one of the sockets of said holder; said holder including a transducer for reproducing the sound represented by the data stored in the read-only memory unit of the toy figures inserted in its sockets, and a battery supply for supplying power to both the transducer of the holder and the memory unit of each toy received in one of its sockets.

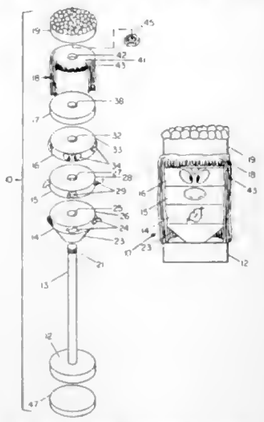
4,820,234
DOLL HAVING A PLURALITY OF WHEELS WITH VARYING FACIAL EXPRESSIONS TO EFFECT MOOD CHANGES
Asad F. Isaf, 38 Homer Ave., Cortland, N.Y. 13045
Filed Oct. 13, 1987, Ser. No. 107,677
Int. Cl.[4] A63H *3/16, 3/44*
U.S. Cl. 446—321 **10 Claims**

1. A novelty doll, comprising:
a base and a post supported by said base;
a mouth wheel removably supported on said post and including a disk-shaped portion rotatable about said post and a plurality of mouth expressions formed along the periphery of said disk-shaped portion, each mouth expression displaced radially about said mouth wheel from the adjacent mouth expressions;
a nose wheel removably supported on said post above said mouth wheel, said nose wheel including a disk-shaped portion rotatable about said post and a plurality of nose types formed along the periphery of said disk-shaped nose wheel, each nose type displaced radially about said nose wheel from the adjacent nose types;
an eye wheel removably supported on said post above said nose wheel, said eye wheel including a disk-shaped portion rotatable about said post and a plurality of eye expressions formed along the periphery of said disk-shaped eye wheel, each eye expression displaced radially about said eye wheel from the adjacent eye expressions;
a top piece supported on said post with said mouth wheel,

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nose wheel and eye wheel positioned between said base and said top piece;

means associated with said top piece and said post for removably connecting said top piece to said post and for releasably clamping said eye, ear and nose wheels, and hair extending over said eye, nose and mouth wheels to



cover all but one mouth expression, nose type and eye expression on each respective wheel;

each said mouth wheel, nose wheel and eye wheel being separately rotatable on said post to align varying and selectable combinations of mouth expressions, nose types and eye expressions.

4,820,235

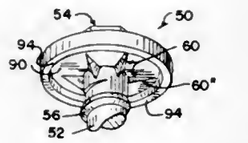
THREADED FASTENER

David Weber, Elk Grove Village, and Stanley Marcbewka, Chicago, both of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Jul. 28, 1987, Ser. No. 78,875

Int. Cl.[4] F16B *39/282*

U.S. Cl. 411—188 **16 Claims**



1. A threaded fastener having a generally cylindrical shank; a head connected to said shank; and a thread form on said shank terminating in spaced relation below said head; said head having a lower surface extending peripherally around said shank; said fastener further including a plurality of lugs located above said thread form and circumferentially disposed around said shank seriatim from a first lug to a last lug with a space defined between each two adjacent lugs; each said lug having an upper margin connected to said head lower surface and having a side margin connected to said fastener shank above said thread form; each said lug having two exposed surfaces which each extend from said side margin along said shank and from said upper margin along said head lower surface at an angle to each other; said two exposed surfaces of each said lug intersecting to define an exposed engaging edge connecting said two exposed surfaces, said engaging edge of at least some of said lugs functioning to engage at least a top sheet when the fastener is installed to fasten the top sheet to a bottom sheet; each said surface of each said lug being a planar surface intersecting said lower surface of said head along a straight line, intersecting the other planar surface of said lug along a straight line at said exposed engaging edge, and intersecting the cylindrical surface of said shank along an arcuate line; said upper margins of said lugs progressively increasing in radial dimension from said first lug to said last lug while the corresponding side margins of said lugs progressively decrease in axial dimension whereby said acute angle becomes progressively greater.

4,820,236

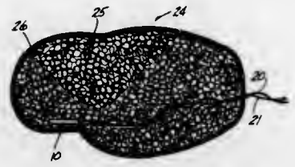
DOLL WITH SENSING SWITCH

William Berliner, Essex, Conn., and Mark B. Johnson-Williams, East Longmeadow, Mass., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Oct. 22, 1987, Ser. No. 111,364

Int. Cl.[4] A63H *3/28*

U.S. Cl. 446—369 **4 Claims**



1. In combination, a doll or the like having a simulated figure portion which is resiliently deformable, said portion having a simulated flexible skin providing the outer surface thereof and a filler therewithin; a resiliently deflectable piezoelectric sensing element secured in said figure portion closely adjacent to said outer surface thereof, said sensing element comprising a flexible piezoelectric synthetic resin film which generates an electrical signal when subjected to stress, and a pair of electrodes in electrical contact with said film; an electrical sound generating device within said doll, the flexibility of said sensing element substantially eliminating any hard spot in said figure portion where it is disposed; and electrical leads extending from said electrodes of said sensing element to said device to transmit a signal to said device, said sensing element being sensitive to pressure applied to said skin disposed thereover to cause deflection thereof and thereby generate a signal.

4,820,237

COIN CONVEYING AND STACKING APPARATUS

Takashi Shinozaki, and Hiroshi Tachikawa, both of Chiba, Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1987, Ser. No. 16,007

Claims priority, application Japan, Feb. 28, 1986, 61-28851[U]

Int. Cl.[4] G07D *9/06*

U.S. Cl. 453—61 **1 Claim**

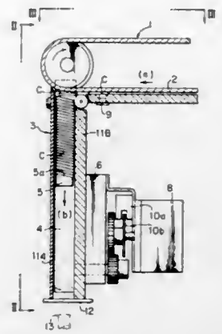
1. A coin stacking apparatus comprising:

conveyor means for conveyingt coins edgewise one at a time in a predetermined direction along a horizontal path of travel, and

receiver means for receiving coins from a terminal portion of said horizontal path of travel at an outlet end of said conveyor means, said receiver means including a pair of endless belts cooperating with each other to define a coin receiving space therebetween,

each of said endless belts having support means extending therefrom,

said support means including a surface on which the coins are to be placed, said surface being inclined upwardly and forwardly relative to said predetermined direction along said horizontal path of travel of coin conveyance in said conveyor means so that a leading edge of said surface is higher than a trailing edge of said surface for guiding at an incline the initial contact of a leading edge of a first coin and each subsequently stacked coin received from said terminal portion of said horizontal path of travel onto said surface for said first coin and onto an upper face of a



previously stacked coin lying at an incline on said surface for each of the subsequently stacked coins resulting in a trailing edge of each stacked coin being located below said terminal portion of said horizontal path of travel.

4,820,238

UNIVERSAL JOINT HAVING A FLEXIBLE BOOT

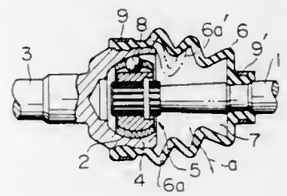
Susumu Ucbida, Susono, and Satoru Konishi, Gotenba, both of Japan, assignors to Keeper Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1987, Ser. No. 80,974

Claims priority, application Japan, Feb. 27, 1987, 62-44804

Int. Cl.[4] F16D *3/84*

U.S. Cl. 464—15 **6 Claims**



1. A universal joint, comprising:

a joint body having an inner ring disposed at one end of a first shaft;

an outer ring disposed at one end of a second shaft, said inner ring being operatively disposed in said outer ring; and

a flexible boot fitted at its opposite ends to said outer ring and said first shaft, respectively, to define a sealed space therein, said sealed space enclosing grease for lubricating said joint body and being charged with nitrogen gas.

4,820,239

TORSIONAL DAMPER DEVICE FOR TORQUE TRANSMISSION SYSTEMS

Dominique Despres, Clichy, and Jacques Paquin, Villeneuve-la-Garenne, both of France, assignors to Valeo, Paris, France

Filed Aug. 19, 1987, Ser. No. 86,887

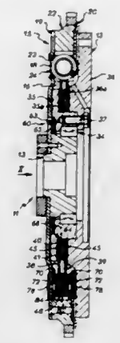
Claims priority, application France, Aug. 21, 1986, 86 11937

Int. Cl.[4] F16D *3/12;* **F16F** *15/10*

U.S. Cl. 464—68 **8 Claims**

1. Torsional damper device comprising coaxial first and second parts adapted to rotate relative to each other to a limited degree, two substantially parallel annular flanges on said first part, at least one plate on said second part disposed axially between said flanges, base members on one of said parts,

springs disposed substantially circumferentially between said base members, first engagement means on said base members, first complementary engagement means on one of said parts adapted to cooperate with said first engagement means, second engagement means on said base members, and second complementary engagement means on the other of said parts adapted to cooperate with said second engagement means, and at least one of said complementary engagement means being attached separate members being formed selectively from an elastomer material, each flange having circumferentially elongate windows in facing relationship, one of said springs being accom-



modated in each pair of said facing windows, journal members on each base member, rounded notches in first separate members being disposed on two substantially radial edges of said facing windows in which said journal members pivot, whereby said base members are pivoted between said flanges at the ends of said windows, said at least one plate having radial arms each having two oppositely directed substantially circumferential fingers each having a rounded end, rounded hollows in said base members in which said rounded ends of said fingers pivot, and second separate members attached to said radial arms and shaped to define at least said fingers.

4,820,240

CONSTANT VELOCITY JOINT

Sobby L. Girguis, Magdelenenstrasse 19, D-5210 Troisdorf-Oberlar, Fed. Rep. of Germany

Continuation of Ser. No. 834,913, Feb. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 529,610, Sep. 6, 1983, Pat. No. 4,575,362. This application May 19, 1987, Ser. No. 53,584

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233753

The portion of the term of this patent subsequent to Mar. 11, 2003, has been disclaimed.

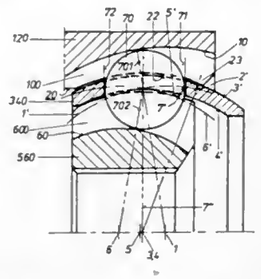
Int. Cl.[4] F16D *3/23*

U.S. Cl. 464—145 **14 Claims**

1. A constant velocity joint comprising an outer part having an inner surface in which grooves are provided, an inner part having an outer surface in which grooves corresponding to said grooves of said outer part are provided, a cage interposed between said inner and outer parts, said cage having an outer and an inner surface of generally spherical shapes, said inner surface of said outer part and said outer surface of said cage providing major centering surfaces mating with each other, said inner surface of said cage encompassing said outer surface of said inner part to provide minor spherical centering surfaces having clearance therebetween, said outer and inner parts and said cage being adapted for relative angular travel about a joint center, said cage having windows therein and balls disposed in said windows, the centers of said balls lying in a ball plane, each of said balls being received in one of said grooves of said outer and of said inner parts, the contact points of said balls

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with said grooves of said outer and said inner part are located on one side of said ball plane with the joint in a straight position and under torque, whereby as a result of said clearance, said inner part is axially displaced, relative to said cage, towards said one side so that said tracks of said inner part run out of mirror image to those of said outer part in relation to said ball plane, the improvement wherein said major centering surfaces



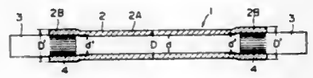
consist of one short bearing surface and one spherical guide surface, the contact zone therebetween lying on the other side of and remote from said ball plane, said spherical guide surface extending on both sides of said contact zone, and the center of curvature of said bearing surface lying on the line comprising said contact of said bearing surface lying on the line comprising said contact zone and the center point of said guide surface.

4,820,241

TUBULAR TRANSMISSION SHAFT

Masanobu Nakamura, Kamakura, Japan, assignor to Mitsui & Co., Ltd., Tokyo and Kokan Kako Co., Ltd., Yokohama, both of, Japan

Filed Oct. 6, 1987, Ser. No. 105,184
Claims priority, application Japan, Oct. 13, 1986, 61-241393
Int. Cl.[4] F16C *3/02*
U.S. Cl. 464—183 **4 Claims**



1. A transmission shaft, comprising:
a metal tubular member having opposite first and second end portions and a middle portion between said end portions, said end portions each having a section modulus which is a factor of between 1.05 and 1.8 larger that a section modulus of said middle portion; and
first and second solid metal shaft members respectively disposed in the first and second end portions of said tubular member and pressure tightened therein so as to be integrally connected thereto.

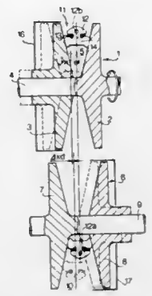
4,820,242

CONTINUOUSLY VARIABLE TRANSMISSION

Keiji Sato, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1987, Ser. No. 18,507
Claims priority, application Japan, Oct. 22, 1986, 61-251232
Int. Cl.[4] F16H *11/06*
U.S. Cl. 474—8 **7 Claims**

1. In a continuously variable transmission for transmitting power of an internal combustion engine, including a drive pulley having a fixed disc secured to a main shaft, and an axially movable disc axially slidably mounted on the main shaft, said discs defining a groove therebetween having a center line, a driven pulley having a fixed disc secured to an output shaft, and an axially movable disc axially slidably mounted on the output shaft, said discs of said driven pulley defining a groove therebetween having a center line, and a belt engaged with both pulleys between the grooves, the widths of the grooves between the respective discs being continuously variable and defining continuously variable pulley ratios with corresponding belt speeds, the improvement comprising:



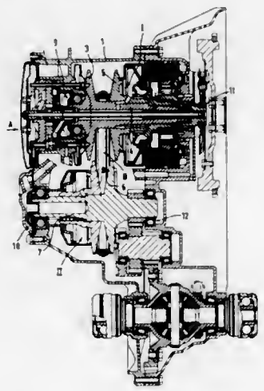
amount of offset between the center line of the groove of the drive pulley and the center line of the groove of the driven pulley is substantially zero when the widths of the respective grooves of the respective discs of the drive and driven pulleys define a pulley ratio providing a maximum belt speed.

4,820,243

BEARING ASSEMBLY FOR A CONTINUALLY VARIABLE CONE-PULLEY BELT DRIVE TRANSMISSION

Josef Fub, Elsdorf, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 18, 1988, Ser. No. 169,670
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718682
Int. Cl.[4] F16H *55/52*
U.S. Cl. 474—43 **12 Claims**



1. A bearing assembly for supporting a shaft of a continually variable transmission comprising:
a first pulley rotatably supported on the shaft and axially nondisplaceable with respect to the shaft, defining a first conical surface;

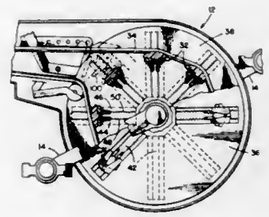
a second pulley rotatably supported and displaceable along the axis of the shaft, defining a second conical surface facing the first conical surface, the first and second conical surfaces defining a track adapted to drivably engage a drive belt;
a transmission casing;
an inner bearing including an inner race supported on the shaft, an outer race, and a first set of bearing balls located between the inner and outer races, each ball spaced angularly from adjacent balls about the axis of the bearing assembly;
an outer bearing including an outer race supported on the transmission casing having axially extending recesses spaced angularly, an inner race located on the outer race of the inner bearing having axially extending recesses aligned angularly with the recesses of the outer race of the outer bearing, and a second set of bearing balls located between the inner and outer races of the outer bearing within the recesses of the outer and inner races; and
means for preventing rotation of the outer race of the inner bearing relative to the outer race of the outer bearing.

4,820,244

VARIABLE RATIO DRIVE MECHANISM

Jack Lander, 55 Mill Plain Rd., #23-5, Danbury, Conn. 06811

Filed Jul. 11, 1988, Ser. No. 217,452
Int. Cl.[4] F16H *55/54*
U.S. Cl. 474—56 **13 Claims**



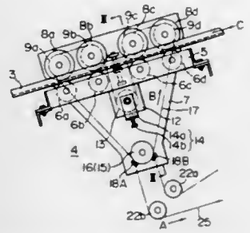
1. In a variable ratio drive mechanism, the combination comprising:
a rotatably mounted drive mechanism having a plurality of tracks with tooth like formations therein;
an endless drive member;
a plurality of movable sheave segments, each sheave segment mounted in association with a track and including toothed means and cam locking means, said cam locking means movable relative to each said sheave segment and engaged by said endless drive member when said drive mechanism traverses through a predetermined arc of rotation, but disengaged from said drive member when said drive mechanism is outside said predetermined arc of rotation, said cam locking means impelled by pressure exerted when engaged with said endless drive member to rigidly bias said toothed means against said track; and
means associated with each said sheave segment for resiliently biasing its toothed means into engagement with said track.

4,820,245

POWER TRANSMITTING APPARATUS HAVING CHAIN RETAINING MEMBER

Hiroumi Iyoda, and Hayashi Nakazawa, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1987, Ser. No. 83,214
Claims priority, application Japan, Aug. 11, 1986, 61-186812
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—140 **10 Claims**



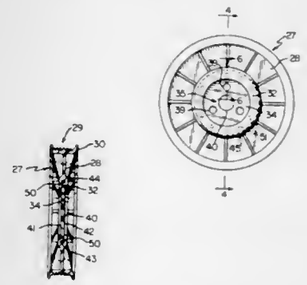
1. A power transmitting apparatus including a first sprocket adapted to be driven and rotated;
a second sprocket arranged at a location spaced apart from and above said first sprocket;
a chain wound on said first sprocket and adapted to transmit power to said second sprocket;
said chain being wound on said first sprocket in such a manner that the chain extends from upside toward said second sprocket and is returned toward said first sprocket to be wound on an area of said first sprocket below an axis of rotation of said first sprocket; and
chain retaining means arranged at a location within said area for maintaining driving engagement between said chain and said first sprocket.

4,820,246

PULLEY CONSTRUCTION, DRIVE SYSTEM UTILIZING THE SAME AND METHODS OF MAKING THE SAME

Michael E. Allen, Morrisville, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Filed Sep. 21, 1987, Ser. No. 99,174
Int. Cl.[4] F16H *55/36, 55/48*
U.S. Cl. 474—174 **20 Claims**

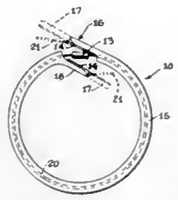


1. In a pulley construction for use with an endless drive belt means, said pulley construction comprising a body member having a peripheral groove means therein for receiving part of said belt means therein and having securing means, and a hub member having securing means secured to said securing means of said body member so as to hold said members in aligned assembled relation to rotate in unison, said hub member having

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means for being interconnected to a shaft means so that said pulley construction and said shaft means will be adapted to rotate in unison, the improvement wherein said securing means are so constructed and arranged that said securing means of one of said members has a part thereof that is adapted to break away from said one member under a certain normal driving force of said belt means when said shaft means is prevented from rotating so as to permit relative rotational movement between said members while said securing means maintains the thus relatively rotatable members in said aligned assembled relation thereof.

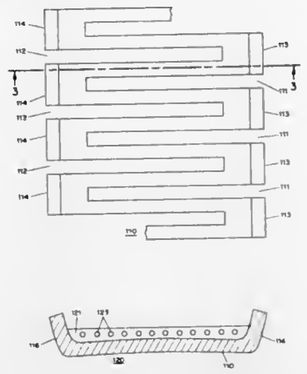
4,820,247
EMERGENCY V-BELT
Henry K. Wojdylo, 2421 Ala Wai Blvd., Ste. 2006-A, Honolulu, Hi. 96830
Filed Jan. 21, 1988, Ser. No. 146,741
Int. Cl.[4] F16G *3/00*
U.S. Cl. 474—255 **1 Claim**



1. A replacement drive belt construction for broken drive belts wherein the drive belt construction comprises:
a drive belt member comprising an elongated belt element having free ends; wherein, the free ends of the belt element are provided with reduced thickness elongated lip portions which are dimensioned to overlie one another in their operative disposition;
securing means comprising a layer of adhesive deposited on at least one of the reduced thickness elongated lip portions of one of the free ends of the drive belt member wherein both of the free ends of the drive belt member may be joined together in their operative disposition;
a reinforcing cable member comprising an elongated cable element that is embedded in the elongated belt element wherein the cable element is provided with free ends that project out of the free ends of the elongated belt member; and,
a cable locking member comprising a discrete deformable locking collar element; wherein, the locking collar element is dimensioned to receive the opposed free ends of the cable element; and, wherein the walls of the locking collar element are adapted to be crushed into frictional engagement with the free ends of the cable element relative to one another; wherein, said plurality of recesses comprise an elongated narrow recess that is dimensioned to receive a portion of one of the free ends of the cable elements; and, an enlarged recess that is dimensioned to receive a portion of the locking collar element.

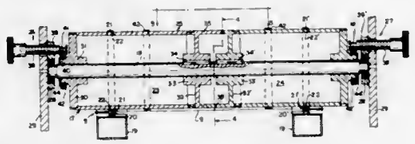
4,820,248
BELT FOR USE IN A TRANSMISSION SYSTEM
Frederick L. Parsons, Pearce, Ariz., assignor to Neuberne H. Brown, Jr., Jensen Beach, Fla., a part interest
Filed Mar. 16, 1988, Ser. No. 168,858
Int. Cl.[4] F16H *9/16*; F16G *1/08*
U.S. Cl. 474—268 **8 Claims**

1. In a continuously variable transmission that includes a driving pulley and a driven pulley, a belt for transmitting torque between the two pulleys comprising
a resilient matrix,
longitudinal means embedded within the resilient matrix for carrying the belt torque, and
a metallic grid member including a main sheet portion em-



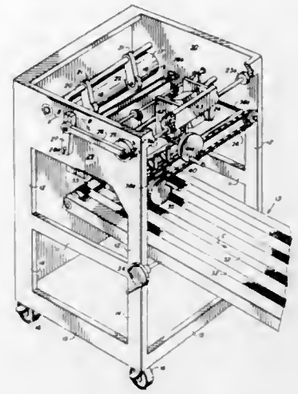
bedded within the resilient matrix and free flexible finger portions extending from a pair of opposite edges of the main sheet portion and bent to form tapered surfaces for contacting sidewalls of the pulleys.

4,820,249
MULTIPLE SEAM FORMING APPARATUS FOR CONTINUOUSLY RUNNING WEBS
Robert J. Wech, Green Bay, Wis., assignor to Amplas, Inc., Green Bay, Wis.
Filed Feb. 22, 1988, Ser. No. 158,420
Int. Cl.[4] B31B *1/64, 23/86*
U.S. Cl. 493—192 **14 Claims**



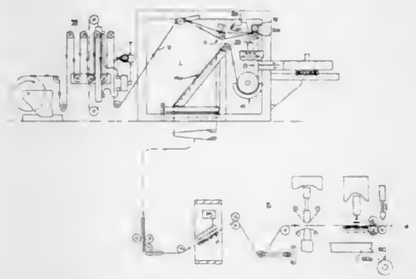
1. A hem sealer apparatus sealing of a hem formed in a plastic web having the edges folded inwardly to form on open hem for forming a heat generated seam extending longitudinally of the folded edge to seal the hem in the forming of draw tape bags, comprising a sealing drum unit for receiving of said hem folded web passing therearound with said edge folded on itself to form an open hem, heating means for heating a longitudinal line of said web moving around said drum and including a heat control element on said drum unit, said drum unit including first and second drum members mounted in coaxial alignment together defining a single essentially continuous drum surface for supporting of said web, and adjustable means for axially positioning of said drum members to adjust the axial length of said drum unit for controlling the location of said heat central element.

4,820,250
TIMING ADJUSTMENT MECHANISM FOR CONTINUOUS FORM STATIONERY FOLDING MACHINE
Earnest B. Bunch, Jr., 9619 N. 21st Dr., Phoenix, Ariz. 85021
Filed Jun. 23, 1988, Ser. No. 210,360
Int. Cl.[4] B65H *45/20, 45/105*
U.S. Cl. 493—414 **2 Claims**



1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein, said apparatus including,
a frame, an oscillating chute mounted on a support shaft rotatably journalled in said frame for alternately distributing said successive lines of weakening in said paper in substantially opposite directions, said support shaft including a first outer end, said chute oscillating between first and second furthest points of travel and traveling an equal distance to either side of said support shaft, rollers carried on said frame for dispensing said continuous strip of paper into said oscillating chute,
folding means carried on said frame and operatively associated with said oscillating chute for urging said paper distributed by said chute into a folded condition, said folding means including,
spirals shaped and dimensioned to receive and carry away from said oscillating chute creased edges of paper distributed by said chute, said spirals being independently adjustable prior to the operation of said apparatus,
beaters for periodically tamping said paper distributed by said chute, said beaters assisting in the folding and positioning of said paper and being independently adjustable prior to the operation of said apparatus,
said spirals and beaters moving in synchronous relationship with said chute during the operation of said apparatus,
a support surface for receiving paper dispensed by said spirals and beaters,
paper stops positioned above said support surface, each of said paper stops having at least one upstanding face for stopping the lateral travel of creased edges of paper distributed by said chute, gear train means for transmitting motive power to said rollers, oscillating chute, and folding means such that generally synchronized movement thereinbetween is maintained, a portion of said gear train means actuating said chute and said folding means, said portion actuating said chute and folding means without actuating said rollers,
power means to drive said gear train means,
means for simultaneously adjusting
the length of the arc of swing of said chute, and
the timing of said chute in relation to said folding means, while maintaining said generally synchronous movement between said chute and folding means, said adjustment means including
(a) at least one rotary drive shaft positioned along said gear train means and transmitting motive power to said portion of said gear train means actuating said oscillating chute and said folding means, said drive shaft having a first end;
(b) a cam mounted on said first end of said drive shaft and having a plurality of spaced apart attachment points, said cam being rotated by said drive shaft about the axis of said drive shaft;
(c) a fold length bar attached to said first outer end of said support shaft;
(d) a crank rod having a first end pivotally attached to said fold length bar and having a second end;
(e) a first fixed timing point on said frame;
(f) a second timing point on said cam, said beaters and spirals each being in a selected reference orientation when said first and second timing marks align;
(g) means for pivotally removably attaching said second end of said crank rod to ay selected one of said attachment points;
said axis of said drive shaft and said first and second timing marks lying in a common reference plane when said timing points are aligned, each of said plurality of attachment points, when said second end of said rod is pivotally connected thereto with said attaching means,
(h) being a radial distance from said axis to cause said chute to oscillate through an arc having a selected length to fold said strip of paper into segments having a selected length, said radial distance and the length of said arc differing for each of said attachment points;
(i) being at an angle from said reference plane to position said chute in a selected orientation when said spirals and beaters are in said reference orientation, said angle and selected orientation of said chute with respect to said reference orientation of said spirals and beaters differing for each of said attachment points;
(j) maintaining the equal distance of travel of said chute to either side of said support shaft; and,
(k) maintaining the synchronous rate of oscillation of said chute with respect to the rate of rotation of said spirals and beaters.

4,820,251
WEB NOTCHING CONTROL APPARATUS
Giles R. Blaser, Green Bay, Wis., assignor to Amplas, Inc., Green Bay, Wis.
Filed Feb. 22, 1988, Ser. No. 157,770
Int. Cl.[4] B31B *1/14, 23/86*
U.S. Cl. 493—1 **13 Claims**



7. In notched web forming apparatus having a notching means for cutting equispaced notches in a continuously moving web with the speed of said web moving past said notching means changing during selected periods of web travel, the improvement in a drive unit for said notching means, comprising a control adapted to actuate said notching means to notch said web, a main drive signal source for actuating said control

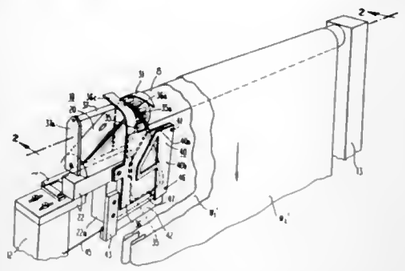
during periods other than said selected periods to establish said equispaced notches, a selected period drive signal source for actuating said control during said selected periods, said selected period drive signal source including means to determine the actual length of web moving through said notching means and actuating said notching means to establish said equispaced notches, and interlock means establishing control signals at the start and end of any selected period, said interlock means operating to disable said main drive signal source and enable said selected period drive signal source during said selected periods.

4,820,252

METHOD AND APPARATUS FOR FORMING A PAIR OF HEMS IN SUPERPOSED LAYERS OF A MOVING THERMOPLASTIC FILM WEB

Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 19, 1988, Ser. No. 195,915
Int. Cl.[4] B65H *45/22*
U.S. Cl. 493—440 **14 Claims**



1. Apparatus for forming a pair of inwardly turned hems in the adjoining free edges of superposed layers of a longitudinally folded moving pliable material web comprising:

a roller having a cylindrical surface over which the moving web passes, the web comprising an inner layer engaging the cylindrical surface of said roller and an outer layer superposed on the inner layer;

shaft means at each end of said roller for supporting said roller on a horizontal axis;

a forming block at one end of said roller for supporting an end of one of said shaft means, said block having at said one end a semi-cylindrical peripheral shape generally coaxial with the cylindrical surface of said roller, said block having a corresponding semi-cylindrical peripheral shape at the opposite end and having an axis below the axis of said roller so that a semi-cylindrical surface is formed between said ends of said block extending at an acute angle with respect to the horizontal axis of said roller, one side of said block being upstream with respect to the moving web and the other side of said block being downstream with respect to the moving web;

a plurality of horizontal rollers supported at said one end of said block and disposed around the axis of said first-named roller said plurality of rollers including upstream and downstream rollers, the surfaces of said upstream rollers extending substantially to the semi-cylindrical periphery of said block and the surfaces of said downstream rollers being recessed with respect to the semi-cylindrical periphery of said block;

means supported adjacent the upstream side of said block for separating the free edges of the inner and outer layers of the web so that the inner layer of the web passes over said plurality of upstream rollers and the outer layer of the web passes over said separating means; and

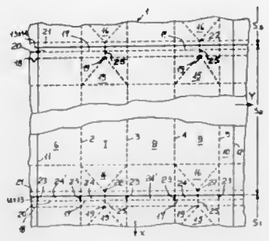
hem folder means supported adjacent the downstream side of said block to receive the free edges of the layers of the web, said hem folder means comprising a plurality of spaced parallel members being constructed and arranged to fold the free edge of the inner layer of the web inwardly adjacent the inner layer of the web to form a hem and to fold the free edge of the outer layer of the web inwardly against the outer layer of the web to form a hem to provide a pair of inwardly turned hems in the adjoining free edges of the opposing layers of the web.

4,820,253

METHOD FOR OBTAINING A CONTAINER BLANK

Franco Mercurio, Milan, Italy, assignor to Elopak A/S, Norway

Division of Ser. No. 910,807, Sep. 22, 1986, Pat. No. 4,721,243, which is a continuation of Ser. No. 652,458, Sep. 19, 1984, abandoned. This application Nov. 5, 1987, Ser. No. 117,626
Claims priority, application Italy, Sep. 20, 1983, 22929 A/83
Int. Cl.[4] B31B *1/25*
U.S. Cl. 493—59 **19 Claims**



1. A method of forming a container from a blank having the upper profiled pattern adapted alternatively for upper gable-top or upper flat-top closures obtained from a rectangular container blank, said method comprising: scoring and cutting a blank to form a container having

two straight side edges and upper and lower edges,

four side panels and a narrower fifth side closure panel defined by score lines parallel to each other and the side edges and score lines at an upper edge and at a lower edge of the panels at right angles to the parallel score lines, the fifth panel being seamable to another panel in forming a container,

upper and lower closure panels defined by extensions of the parallel score lines and further score lines outside of the side panels at right angles to the parallel score lines, alternate ones of which closure panels provide triangles defined by score lines extending from the respective upper and lower edges of the adjacent side panels to an apex at the further score line, one triangle on each closure panel having a base coincident, respectively, with the upper or lower edge of the adjacent side panels, the triangles permitting folding of the closure panels to form upper and lower closures of the container,

lip panels adjacent each closure panel defined by extensions of the parallel score lines to the upper and lower edges of the blank and a score line joining the apices of the upper and lower closure triangles and respectively the lower and upper edge of the blank, at least the lip panels at the top end of the blank having an intermediate score line parallel to and lying between the upper edge of the blank and the further score line separating the closure and lip panels;

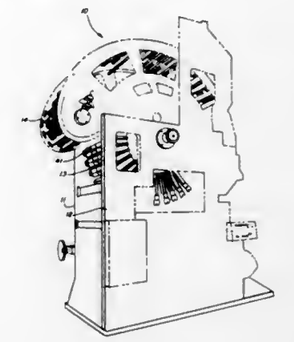
forming short cut lines extending from the upper edge of the blank to the intermediate score line along said extensions of the parallel score lines forming the respective side panels defining the lip panels as four upper lips; folding two of said four upper lips over about the intermediate score line obtaining the upper gable-top profile.

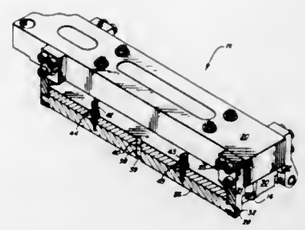
4,820,254

CLAMP FOR BAG PRODUCING MACHINE

Paul Ziegelhoffer, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Mar. 23, 1988, Ser. No. 172,189
Int. Cl.[4] B32B *1/64*
U.S. Cl. 493—194 **6 Claims**





5. A clamp assembly for a bag making machine comprising a relatively elongated clamp mounting bar, a pair of transversely spaced pivot shafts pivotally connected to one side of said clamp mounting bar for pivotal movement in a transverse direction, a clamp member resiliently, floatingly mounted on each pivot shaft adjacent said one side of said clamp mounting bar and also coupled to said clamp mounting bar,

each of said clamp members being generally L-shaped in cross-section with one leg of the L-shape conformingly contoured to said pivot shaft and with the other leg extending away from said clamp mounting bar one side,

said coupling of each clamp member to said clamp mounting bar includes spring-loaded bolt means.

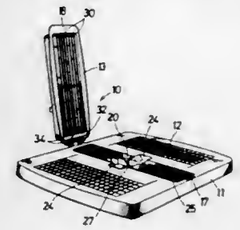
4,820,255

SHEET FOLDING DEVICE

Hiroo Nanami, Shizuoka, Japan, assignor to Kabushikigaisha Nanami, Shizuoka, Japan

Filed Feb. 25, 1988, Ser. No. 160,374
Int. Cl.[4] B65H *45/20, 45/18*
U.S. Cl. 493—451 **9 Claims**

1. A device for folding a sheet in an accordion fashion, comprising a fixed base having a sheet receiving table at the top thereof, a movable member mounted for movement between an inoperative position in which a sheet can be placed on said sheet receiving table of said base and an operative position in which said movable member is positioned above said fixed base with a predetermined gap left therebetween, a set of fixed folding plates provided on said fixed base and arranged in parallel to each other with predetermined spacings left therebetween, a set of movable folding plates mounted on said movable member for individual parallel movement in the same planes with said spacings between said fixed folding plates, each of said movable folding plates being movable, when said movable member is in the operative position, between an inoperative position in said movable member and an operative position wherein it is fitted in a corresponding one of said spacings between said ribs, and a manually operable actuating means for successively moving, when said movable member is in the operative position, said movable folding plates relative to said movable member from the inoperative positions to the operative positions to fold, cooperating with said fixed folding plates, a sheet received on said sheet receiving table of said base in an accordion fashion.

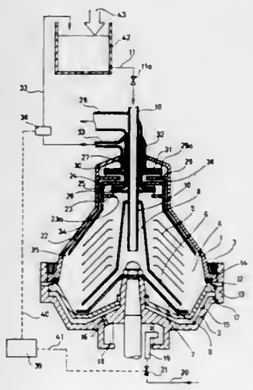


4,820,256

CENTRIFUGAL SEPARATOR

Torbjörn Nordström, Norsborg, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden

Filed May 30, 1986, Ser. No. 868,518
Claims priority, application Sweden, Jun. 7, 1985, 8502830
Int. Cl.[4] B04B *11/00*
U.S. Cl. 494—3 **9 Claims**

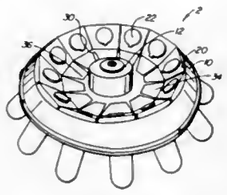


1. In a centrifugal separator, the combination of a rotor having a separation chamber (4) and an inlet (9) for supplying to said chamber a mixture of light and heavy liquids and solids, the rotor being operable to form in said chamber an interface layer between a radially inner layer of separated light liquid and a radially outer layer of separated heavy liquid, the rotor having three outlets, namely, a first outlet (23*a*) for separated light liquid and situated at the central part of the separation chamber, peripheral outlet means (12) for separated heavy liquid and solids and situated at the periphery of the separation chamber, and a second outlet (35) for light liquid and situated radially intermediate said first outlet and said peripheral outlet means, means (13–21) for intermittently opening said peripheral outlet means (12) during operation of the rotor, stationary recirculating means (31–33) through which the liquid discharging from the motor via said intermediate outlet (35) is returned

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to the rotor, a sensing device (38) associated with said recirculating means (31–33) for sensing when said interface layer has moved radially inward to a predetermined level, control means (39) coacting with said sensing device (38) and said opening means (13–21) to emit a signal to the opening means in response to said movement of the interface layer to the predetermined level, and throttle means (37) for limiting the flow through said stationary recirculating means (31–33) and formed in the rotor between said radially intermediate outlet (35) and said recirculating means, the throttle means (37) having less throughflow capacity than said recirculating means.

4,820,257
ROTOR NOISE SUPPRESSION
Kenzo Ishimaru, San Jose, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed May 10, 1988, Ser. No. 192,257
Int. Cl.[4] B04B *5/02*
U.S. Cl. 494—16 **10 Claims**

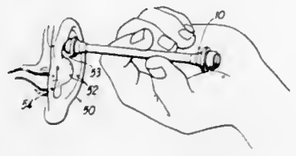


1. In a centrifuge of the type including
a rotor having a center about which said rotor rotates: and
a plurality of adaptors, each inserted into said rotor and having an opening into which a tube may be inserted:
the improvement comprising:
a flexible flap having a fixed end mounted on said rotor at an adaptor and having a free end, said free end opposite to said fixed end and extending radially inward toward said center of said rotor when said rotor is not rotating, said free end folded by centrifugal force back over the opening in said adaptor when said rotor is rotating, whereby the audible noise made when said rotor is rotating without a tube inserted in said opening is substantially eliminated.

4,820,258
RADIOSENSITIZING BIOLOGICAL TISSUES
Gérard Mondain-Monval, Paris, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France
Filed Mar. 24, 1987, Ser. No. 30,260
Claims priority, application France, Apr. 14, 1986, 86 05277
Int. Cl.[4] A61N *5/10*
U.S. Cl. 600—1 **8 Claims**

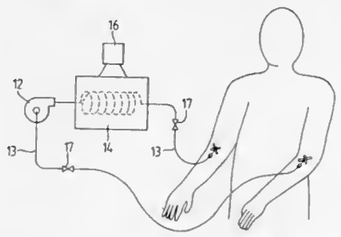
1. A method for delivering radiation to target tissue of a patient undergoing cancer radiotherapy, comprising the steps of:
administering a nonhypoxic gaseous mixture comprising at least about 50% by volume of nitrous oxide to a patient by inhalation until at least some of said patient's biological tissues are saturated with nitrous oxide;
discontinuing administration of said gaseous mixture; then,
exposing said target tissue to radiation from a source maintained external to said patient's body after any saturated biological tissues of said patient which eliminate nitrous oxide faster than said target tissue become desaturated with respect to nitrous oxide.

4,820,259
EXTERNAL EAR CLEANING DEVICE
Robert B. Stevens, P.O. Box 36222, Grosse Pointe, Mich. 48236
Filed Jun. 1, 1987, Ser. No. 55,950
Int. Cl.[4] A61M *35/00*
U.S. Cl. 604—2 **9 Claims**



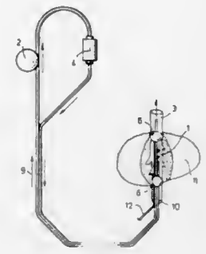
1. A generally dowel-shaped device for cleaning an external ear having an ear opening and further having a plurality of curved portions which define surfaces, the device comprising:
a substantially inflexible shaft;
a moisture absorbent end piece positioned over at least one end of said shaft, said end piece including:
a first portion attached to said end of said shaft and having a first outer circumference;
a second portion attached to said first portion on a side opposite said shaft and extending outward from said first portion and said shaft, said second portion having a second outer circumference smaller than said first outer circumference;
wherein said first portion of said end piece has at least one cross-sectional dimension larger than the diameter of the ear opening to prevent insertion of said first portion into said ear opening, and wherein at least said second portion of said end piece is engageable with both the outer surface portion of the auditory canal and the surfaces of the curved portions of the external ear for cleaning said surfaces.

4,820,260
METHOD AND APPARATUS FOR EXTRAVASCULAR TREATMENT OF RED BLOOD CELLS
Steven M. Hayden, 2105 Canterburry Rd., Alexander City, Ala. 35010
Continuation-in-part of Ser. No. 928,563, Nov. 10, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 118,763
Int. Cl.[4] A61M *37/00*; **A61H** *1/00*
U.S. Cl. 604—4 **14 Claims**



1. Apparatus for extravascular sonication of red blood cells comprising:
(a) means for generating an ultrasound field of predetermined strength and frequency within a confined region; and
(b) extravascular means for exposing red blood cells within said region for a predetermined duration, wherein the parameter of said ultrasound field and the duration of said exposure are such that the cavitational threshold of said red blood cells is not reached during treatment including a blood pump and conduit means passing through said ultrasonic field from said blood pump with said conduit means being transmissive to said ultrasound field.

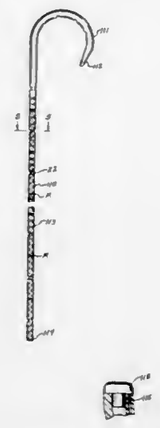
4,820,261
DEVICE FOR THE REMOVAL OF THERAPEUTIC SUBSTANCES LOCALLY APPLIED FOR USE AGAINST SOLID TUMORS
Hans-Joachim Schmoll; Ekkehard Schmoll, both of Hanover, and Edmund R. Lax, Essen, all of Fed. Rep. of Germany, assignors to Bissendorf Peptide GmbH, Fed. Rep. of Germany
Filed Aug. 19, 1987, Ser. No. 86,816
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705637
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—4 **5 Claims**



1. A device for removing a substance from the human circulatory system comprising (a) a first catheter having one end positionable in a blood vessel distally from a tumor for removing blood from the vessel, (b) a second catheter having one end positionable in the blood vessel for returning blood to the vessel and forming with the first catheter a double catheter along at least part of their length such that the one end of the first catheter is joined to the second catheter at a distance from the one end of the second catheter, (c) a pump connected to the first and second catheters, (d) at least one container holding immobilized antibodies to the substance and connected to the first and second catheters such that blood passes from the first catheter to the second catheter through the container, and (e) an inflatable balloon for blocking the blood vessel when inflated and located on the second catheter between the end of the first catheter and the end of the second catheter.

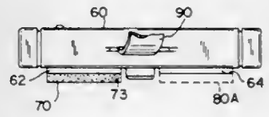
4,820,262
URETERAL STENT
Roy P. Finney, Bayport, Fla., assignor to Medical Engineering Corporation, Racine, Wis.
Filed Dec. 12, 1985, Ser. No. 808,443
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—8 **2 Claims**

1. An elongated member for use in preparing a custom length ureteral stent for a specific patient, said stent having hooks at the proximal and distal ends and an elongated intermediate section, said member having a preformed hook at the proximal end and an elongated, substantially straight distal end which is removable, said distal end including a reinforcing strip of spring wire in a wall thereof, said spring wire being trimmable and permitting said distal end to be readily formed into a second hook which can be straightened with a guide wire and



which will resume its hook shape when the guide wire is removed.

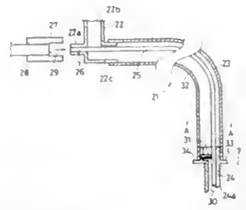
4,820,263
APPARATUS AND METHOD FOR IONTOPHORETIC DRUG DELIVERY
Richard Spevak, Minneapolis; Gary A. Lattin, Forest Lake, and Allan H. Jevne, Anoka, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Division of Ser. No. 241,150, Mar. 6, 1981, abandoned. This application Nov. 7, 1987, Ser. No. 105,929
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—20 **8 Claims**



1. A device for use in iontophoretically introducing an ionic substance into body tissue through the skin of a patient, comprising:
an insulative casing;
a source of direct electrical current, mounted within said casing;
active electrode plate means mounted on the exterior of said casing for removably mounting on said casing an active electrode element containing said ionic substance and for electrically coupling said active electrode element to said current source;
indifferent electrode plate means mounted on the exterior of said casing for removably mounting on said casing an indifferent electrode element and for electrically coupling said indifferent electrode element to said current source;
an adhesive active electrode element containing said ionic substance, removably mounted on said active electrode plate means; and
an adhesive indifferent electrode element removably mounted on said indifferent electrode plate means;
wherein said active and indifferent electrode elements are sufficiently adhesive to retain said housing on said skin of said patient.

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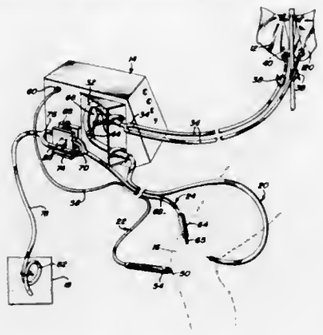
4,820,264
INFUSION INSTRUMENT
Mizuo Matsui, Urawa; Fumio Ohtomo, Tokyo; Koji Sato, Tokyo, and Yoshihiro Takahashi, Tokyo, all of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 29, 1986, Ser. No. 857,171
Claims priority, application Japan, May 1, 1985, 60-92343; May 1, 1985, 60-92344; Jun. 20, 1985, 60-132958
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—21 **20 Claims**



1. An infusion instrument for use in vitrectomy comprising:
an infusion having an input end, an insertion member for insertion into an eyeball and an infusion passage means connected between the input end and the insertion member so as to form a flow path for infusing an intraocular irrigating solution from the input end through the flowpath and through the insertion member into an eyeball;
a source of fluid in fluid communication with the input end of the infusion means;
the infusion passage means having a resilient portion made of a resilient material at least near the insertion member;
an illumination unit including a light source for illuminating an inside portion of an eyeball; and
a light transmitting means made of a resilient material and having an input end connected to the light source and an output end connected to the insertion member for receiving light entering through the input end from the light source and transmitting the light out of the output end to an interior portion of an eyeball, wherein at least a portion of the light transmitting means is arranged inside the flowpath located in the resilient portion of the infusion passage means; and
the insertion member including attachment means, comprising a flange portion of the insertion member, for permitting attachment of the insertion member to an eyeball without additional support by an operator, wherein the insertion member comprises a connection portion located on one side of the flange portion, for connecting to the infusion passage means, and an insertion portion located on an opposite side of said flange portion, for insertion into an eyeball, said flowpath passing through both said connection portion and said insertion portion and wherein said light transmitting means terminates inside of said insertion portion.

4,820,265
TUBING SET
Allen H. DeSatnick, Marblehead; Herbert D. Marcus, Winchester, both of Mass., and Kenneth E. Merte, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 16, 1986, Ser. No. 942,271
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—30 **20 Claims**

9. For use in an arthroscopic irrigation system, a replaceable unitary tubing set, said set including three distinct elongate fluid lines joined, for a substantial portion of the central length of each, in parallel non-communicating relationship, said lines comprising an inflow line, an outflow line, and a pressure sensing line, said lines having first laterally separated end lengths extending from one end of the joined central lengths and terminating in patient communicating outer ends, said lines having second laterally separated end lengths extending from the other end of the joined central lengths and including equipment engaging components therealong, and wherein the first separated end length of said inflow line comprises a pair of inflow supply tubes each terminating in an outer end including means for communication with a source of liquid, a single header tube between and in liquid passing communication with said pair of supply tubes and the central length of the inflow line, and means on said supply tubes for selectively closing and



opening these tubes relative to flow therethrough, and wherein the second separated end length of said inflow line comprises a delivery tube, said delivery tube and central length of the inflow line being of a substantially constant internal diameter, said header tube defining a pumping component for pumping liquid from the source to said delivery tube, said header tube having an internal diameter greater than the constant internal diameter of said delivery tube, and wherein the first separated end length of said outflow line includes a discharge tube terminating in an outer discharge end, said discharge tube, inward of said discharge end, including liquid seal means for selective trapping of a liquid column within said discharge tube.

4,820,266
METHOD OF STOPPING NOSE BLEEDS
Yale J. Berry, 134 Clinton Rd., Brookline, Mass. 02100
Continuation of Ser. No. 822,940, Jan. 27, 1986, which is a continuation of Ser. No. 611,396, May 18, 1984, abandoned, which is a continuation of Ser. No. 163,160, Jun. 26, 1980, abandoned, which is a continuation of Ser. No. 901,299, May 1, 1978, abandoned. This application Jan. 27, 1988, Ser. No. 149,159
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—54 **5 Claims**



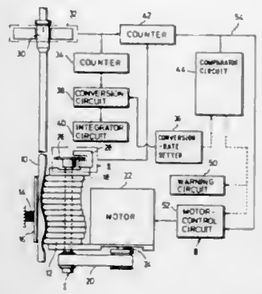
1. A method of stopping nose bleeds at the Little's area of a person's nose, consisting of the following steps: (1) providing a single-piece flattened strip of material that is to be inserted into a nostril of the nose, the strip having an upper end and a lower end and having a predetermined length defined by the distance between said upper end and said lower end, the strip having thickness substantially less than the strip width and having sufficient rigidity to permit said strip to be manually inserted into said nostril lengthwise by grasping a lower region of the strip between the thumb and fingers of a person's hand and using the hand to insert the strip into the nostril, the strip having a region intermediate said upper end and said lower end with side surface area of said intermediate region sufficient to be coextensive with substantially the complete Little's area, and the strip being flexible enough to conform to the shape of the Little's area; (2) manually inserting only said strip into said nostril with the strip grasped as aforesaid and using the hand to push the strip lengthwise into said nostril to a position at which said upper end is beyond said Little's area and at which said intermediate region at one side of the strip is placed directly proximal to the adjacent surface network of blood vessels of the Little's area of the nasal septum and said intermediate region extends coextensively over said surface network, with said predetermined length of the strip extending straight from said lower end to said upper end and with the width of the strip extending transversely to said length; (3) and then compressing the nose from the outside into direct engagement with the strip and thereby clamping said strip against said Little's area with said intermediate region of the strip at said one side in direct conforming pressure-applying engagement with said surface network of the Little's area, to terminate bleeding of vessels within said network.

4,820,267
CARTRIDGE INJECTOR FOR PELLET MEDICAMENTS
Sherman M. Harman, Ellicott City, Md., assignor to Endocon, Inc., Boston, Mass.
Filed Feb. 19, 1985, Ser. No. 703,108
Int. Cl.[4] A61M *5/18*
U.S. Cl. 604—60 **2 Claims**

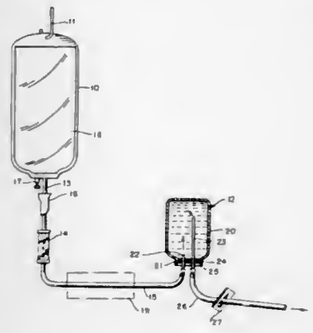
1. In a device for subcutaneous implantation of elongated medicament pellets including a cannula, a barrel, open at distal end and closed at a proximal end, surrounding said cannula, and slidably movable relative thereto; and an obturator carried by said barrel at said proximal end, and slidably engaged with said cannula, the improvement comprising: said cannula having a hollow hub surrounding a proximal end thereof, said hub having a laterally extending finger-engaging flange; said barrel element having an elongated axially extending slot having first and second locking notches therein, said flange being slidably disposed within said slot for movement between said notches, whereby said cannula may be selectively immobilized relative to said barrel in first and second positions; said slot in said barrel being open ended to permit disengagement of said cannula from said barrel for the loading of said cannula with a medicament pellet.

4,820,268
TRANSFUSION APPARATUS
Takao Kawamura, and Tetsuya Miyatake, both of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan
Filed Oct. 30, 1987, Ser. No. 114,739
Claims priority, application Japan, Nov. 5, 1986, 61-262041
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—67 **4 Claims**

1. A transfusion apparatus comprising a pump section for sequentially pressing and blocking a transfusion tube to feed a liquid, a detecting section for detecting a given cycle of pump operation in said pump section, and a drive-control section for driving and controlling said pump section, characterized in that the transfusion tube on an upstream side above the pump section is provided with a dropping cylinder on which is arranged a detector for counting the number of droplets, said detector comprising a drop sensor arranged at the dropping cylinder and a counter for counting output signals from said drop sensor as the number of droplets during said given cycle detected by a position detector in the pump section, said apparatus further comprising a comparator for comparing the number of droplets resulting from the output of the drop detector and the detecting section during said given cycle of the pump operation with a predetermined value to determine the numerical relation therebetween for discriminating the transfusion set for adults or for children.



4,820,269
MIXER APPARATUS FOR CONTROLLING INTRAVENOUS DRUG INFUSION
James G. Riddell, Belfast, Ireland, assignor to Vanderbilt University, Nashville, Tenn.
Continuation-in-part of Ser. No. 723,215, Apr. 15, 1985, Pat. No. 4,623,334, which is a continuation-in-part of Ser. No. 472,926, Mar. 7, 1983, abandoned. This application Nov. 6, 1986, Ser. No. 927,810
The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—85 **5 Claims**



1. An intravenous drug infusion apparatus for controlling the delivery of a drug, comprising a container with an intravenously administrable aqueous carrier therein for discharge through an outlet thereof, a mixing vessel providing a defined interior volume for containing a solution of the drug to be infused, said defined volume providing upper and lower portions in spaced apart relation, a hollow inlet needle having an inner end extending into and terminating in said defined volume lower portion, conduit means connected to the outer end

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of said inlet needle providing communication between said inlet needle and said container outlet for transfer of the aqueous carrier into said mixing vessel, a hollow outlet needle having an inner end extending into and communicating with said defined volume upper portion, and delivery conduit means connected to the outer end of said outlet needle for infusion of said drug, said inlet and outlet needles being dimensioned and arranged to provide a turbulent mixing of the drug within said vessel with the incoming liquid so that admixed liquid is discharged through the outlet needle to the delivery conduit means.

4,820,270

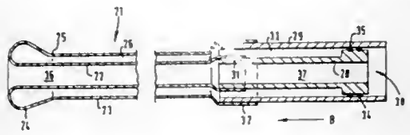
BALLOON CATHETER AND PROCESS FOR THE MANUFACTURE THEREOF

David Hardcastle; John C. Higginson, 10 Brindley Road, Gorse Lane Industrial Estate, both of Clacton-on-Sea, Essex, and John W. Kennedy, The Master's Lodge, Flemish Cottages, Dedham, Essex, all of England

Continuation of Ser. No. 918,506, Oct. 14, 1986, abandoned, which is a continuation of Ser. No. 617,998, filed as PCT GB83/00251 on Oct. 7, 1983, published as WO84/01513 on Apr. 26, 1984, abandoned. This application Aug. 6, 1987, Ser. No. 82,284 Claims priority, application United Kingdom, Oct. 8, 1982, 8228837

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—96 **25 Claims**



1. A self-supporting catheter device for passage into a body cavity through a natural or surgical opening in the body, said device comprising:

a one-piece stem section having primary and secondary ends, being formed from one continuous flexible member comprising:

concentric inner and outer tube portions having respective first and second ends, said inner tube portion having an interior passage and having an external diameter that is smaller than the internal diameter of said outer tube portion, thereby providing an annular passage between said inner tube portion and said outer tube portion and permitting the relative movement thereof,

wherein said respective tube portions are each of a length permitting passage of said device into a body cavity, and

an inflatable end wall portion closing the space formed between said respective first ends of said inner tube portion and said outer tube portion, and covering said annular passage at said primary end, said inflatable end wall portion permitting axial movement of said inner tube portion relative to said outer tube portion,

whereby axial movement of said inner tube portion relative to said outer tube portion in the direction of said secondary stem end draws said inflatable end wall portion to within said outer tube portion, and movement of said inner tube portion relative to said outer tube portion in the direction of said primary stem end pushes said inflatable end wall portion outside of said outer tube portion, and whereby said inflatable end wall portion can be inflated to a larger dimension, within the body cavity, by supply of a fluid to said annular passage, while maintaining access to the body via said primary passage.

4,820,271

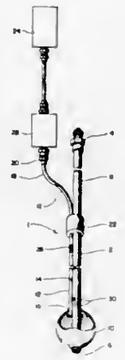
GUIDING CATHETER SYSTEM

Larry-Stuart Deutsch, 1940 Malcolm Ave., Apt. 102, Los Angeles, Calif. 90025

Continuation of Ser. No. 839,927, Mar. 17, 1986, abandoned. This application Jul. 21, 1987, Ser. No. 76,064

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—99 **12 Claims**



1. A guidance catheter system of a size to fit within the human vascular or coronary system for providing a stabilizing platform proximate the ostium of a vessel that will minimize trauma and edema to the tissue of the vessel walls forming the ostium of the vessel, for inserting and guiding a surgical catheter therethrough and into the vessel to a selected position, comprising:

a first hollow tubular body of semi-rigid, non-kinking material having an entry and an exit port and a first lumen therethrough, said first lumen having a diameter sufficient to permit the free passage therethrough of the surgical catheter inserted thereinto at said entry port so that it may exit therefrom at said exit port of said first hollow tubular body into the vessel;

a fixation balloon of soft elastomeric material surrounding said first hollow tubular body proximate said exit port;

a second hollow tubular body of semi-rigid non-kinking material attached in a lengthwise fashion to said first hollow tubular body and having a second lumen therethrough, said second hollow tubular body operatively attached at one end to said fixation balloon, and at an opposite second end connected to a source of liquid for selectively inflating and deflating said fixation balloon by applying a pressure differential to liquid applied to said second lumen, said second lumen providing a passageway for communicating said liquid under pressure to selectively inflate and deflate said fixation balloon;

limiting means operatively coupled between said second hollow tubular body and said source of liquid for limiting the pressure differential applied to selectively inflate and deflate said fixation balloon to a selected pre-set limit that is sufficient to resist dislodging of said fixation balloon from the vessel ostium by the passage of the surgical catheter through said first lumen of said first hollow tubular body, and insufficient to cause dilation injury to the tissues forming the wall of the vessel ostium surrounding said fixation balloon when said fixation balloon is fully inflated; and

a plurality of fluid passageway means extending from said exit port of said first hollow tubular body to the exterior surface thereof adjacent to and on the opposite side of said fixation balloon for communicating fluid contained in the vessel around said inflated fixation balloon, said fluid passageway means having a diameter less than that of said first lumen so as to be adapted to prevent the exit therethrough of the surgical catheter as it is advanced through said first lumen of said first hollow tubular body,

whereby when said exit port of said first hollow tubular body is inserted into and positioned proximate the inside portion of a vein proximate a selected vascular ostium and said fixation balloon is inflated to said pre-set pressure limit to form an anatomically conforming seal against the inner walls of said vein, thereby holding said exit port of said first hollow tubular body in position, said guidance catheter system provides a stable guiding passageway through said first lumen of said first hollow tubular body for inserting and guiding an angioplasty catheter therethrough and into said vascular ostium.

4,820,272

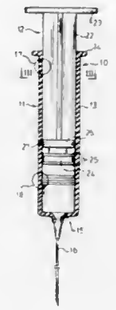
NON-REUSABLE HYPODERMIC SYRINGE

Michele M. Palmer, Hummelwaldstr. 10-12, CH 8645 Jona, Switzerland

Filed Sep. 2, 1987, Ser. No. 92,047

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—110 **10 Claims**



1. A non-reusable hypodermic syringe, comprising:

(a) a cylinder comprising a resilient material open at one end and substantially closed at the other end;

(b) a hollow member attached to said closed end and defining an internal duct communicating with the interior of said cylinder, said hollow member being configured and dimensioned to have a hypodermic needle affixed to it;

(c) a plunger comprising a shaft and a piston attached to an end of said shaft, said piston fitting to the interior of said cylinder, said cylinder defining an engagement zone in a region close to but spaced from said closed end;

(d) retention means positioned on the interior of said cylinder in said engagement zone;

(e) a projecting member positioned in said engagement zone at a point further from said closed end than said retention means, said projecting member dimensioned and configured to cause slight yet noticeable hindrance in the motion of the plunger to give a tactile indication of said plunger's proximity to said retention means;

(f) an engagement member mating with said retention means and positioned on said shaft adjacent to said piston, said engagement member cooperating with said retention means to allow insertion of said member in said cylinder into said engagement zone and to prevent withdrawal thereof.

4,820,273

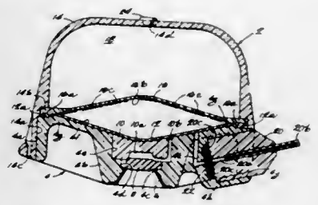
IMPLANTABLE MEDICATION INFUSION DEVICE AND BOLUS GENERATOR THEREFOR

Robert H. Reinicke, Mission Viejo, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 1, 1988, Ser. No. 162,766

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—141 **30 Claims**



1. An implantable medication infusion device comprising:

a housing comprising a main body, an interior cavity contiguous with said main body, and a fixed perforated barrier extending across said cavity in spaced relation to said main body;

a flexible bladder disposed in said cavity between said barrier and said main body, said bladder being attached along its periphery to said housing forming with said main body a sealed medication reservoir and with a remaining portion of said cavity a pressure sealed chamber;

pressurized inert gas in said chamber acting on said bladder forcing said bladder against said main body;

a recess in an exterior surface of said main body;

a passageway in said main body communicating between said recess and said reservoir;

a penetrable self-sealing septum positioned in said housing adjacent said recess and closing off said passageway whereby said reservoir can be filled by injection through said septum, filling of said reservoir moving said bladder toward said barrier, thereby compressing said inert gas and increasing the pressure thereof, and abutment of said bladder against said barrier providing a positive limit to reservoir capacity; and

flow restrictor means positioned in a recess in said main body, said flow restrictor means having an inlet connected to said reservoir, an outlet communicating with the exterior of said housing, and a flow restrictive passageway between said inlet and said outlet to limit flow of medication from said reservoir in response to pressure on said bladder to a predetermined rate.

4,820,274

MEDICAL TUBE AND/OR CABLE HOLDER

Pradip V. Choksi, 10935 Yolanda Ave., Northridge, Calif. 91326, and Jamie M. Ten Napel, Pacific Palisades, Calif., assignors to Pradip V. Choksi, Northridge, Calif.

Filed Aug. 27, 1987, Ser. No. 89,597

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—174 **13 Claims**

1. A medical tube or cable holder, comprising:

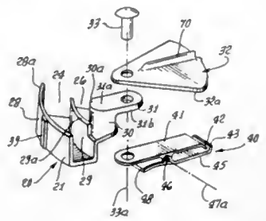
(a) a holder body defining at least one curved path for reception of a medical tube or cable, and characterized in that the tube or cable when inserted in said path is frictionally retained therein against lengthwise displacement relative to the holder body,

(b) and means attached to said body for anchoring the body and a tube or cable to be received in said path to support fabric associated with said tube or cable,

(c) said body including a receptacle forming said path which is sidewardly open for sideward reception of the tube or cable into said path, and a cover movable into position on

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the receptacle to sidewardly close said path, the cover being pivotally attached to the receptacle to swing into and out of said path closing position,



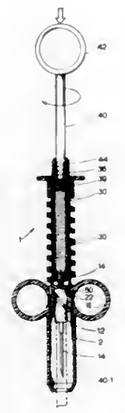
(d) the body also defining a plate projecting away from said path, the cover and the anchoring means both pivotally attached to that plate.

4,820,275

RETRACTABLE NEEDLE SYRINGE WITH INTEGRAL SPRING

Terry M. Haber, Lake Forest; Clark B. Foster, El Toro, and John A. Lewis, Jr., Costa Mesa, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Dec. 21, 1987, Ser. No. 135,607
Int. Cl.[4] A61M 5/32
U.S. Cl. 604—198 **20 Claims**



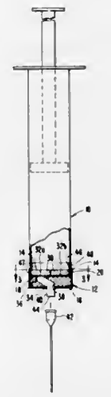
1. A syringe comprising:
an outer cylinder having open proximal and distal ends:
an inner cylinder containing a pre-filled medication cartridge and being slideable through said outer cylinder;
a double ended hypodermic needle adapted to communicate at a first end thereof with the interior of said medication cartridge;
means for carrying said needle being slideable with said inner cylinder through said outer cylinder;
a pair of finger retaining means attached to said outer cylinder, at least one of said finger retaining means having a tab projecting therefrom;
a first locking catch formed in said inner cylinder within which to receive the tab of said at least one finger retaining means for locking said inner cylinder at a relatively distal position within said outer cylinder, such that the second end of said needle projects outwardly from the distal end of said outer cylinder for injecting the contents of said medication cartridge; and
a second locking catch formed in said inner cylinder within which to receive the tab of said at least one finger retaining means for locking said inner cylinder at a relatively proximal position within said outer cylinder, such that the second end of the needle is located inwardly of and completely shielded by said outer clinder.

4,820,276

FILTER ASSEMBLY FOR USE WITH A HYPODERMIC SYRINGE

Enrique Moreno, Post Office Box 1750, Mayaguez, P.R. 00709

Filed Feb. 8, 1988, Ser. No. 153,093
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—190 **7 Claims**



1. A filter assembly for use with a hypodermic syringe comprising a filter unit which includes a bottom wall having inner and outer faces, side walls fixed to one of said faces to define a plurality of open top compartments which are fluidly separated from each other by said side and bottom walls, filter material in at least one of said compartments, said bottom wall having ports therethrough leading into each of the respective compartments, the centers of said ports being on a common radius whose center, when said unit is in its position of use, is coaxial with a syringe barrel, a fluid passage member rotatably carried by said filter unit and having a first fluid passage therein having a first end which is selectively movable by relative rotation between said member and unit into fluid connection with any one of the ports through the bottom wall of said filter unit, said first fluid passage having a second end, said member including a needle-receiving hub having a second fluid passage therethrough the second end of said first fluid passage at all times communicating with said second fluid passage through said hub, and means for mounting said assembly onto the end of a syringe barrel with the open tops of said compartments in communication with the interior of said barrel.

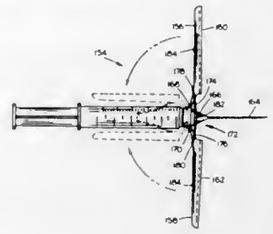
4,820,277

SAFETY COVER FOR SYRINGE NEEDLES

Robert A. Norelli, 1010 Road 9, Powell, Wyo. 82435

Filed Feb. 16, 1988, Ser. No. 156,544
Int. Cl.[4] A61M 5/32
U.S. Cl. 604—192 **8 Claims**

1. For use with a convention syringe having a male connecting portion thereon for connection to the female connecting portion of a conventional needle, a safety cover, comprising:
a base having female connecting means thereon for removable connection to said male connecting portion of said syringe;
a needle mounted on said base;
a pair of jaw members pivotally mounted on diametric sides of said base to move between a closed position, wherein said jaws are longitudinally abutting, and an open position, wherein said jaws are disposed generally parallel to each other on diametric sides of base;



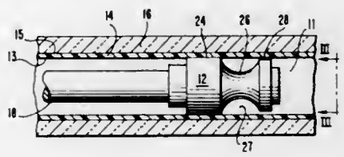
means on said jaws for selectively, releasably locking said jaws in said closed position; and
said jaws having a longitudinal groove therein adapted to form a selectively lockable tubular aperture between said jaws to encase said needle when said jaws are in the closed position.

4,820,278

NON-CONTAMINATING RENEWABLE SYRINGE

Todd A. Baliaky, Fullerton, Calif., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 13, 1988, Ser. No. 143,181
Int. Cl.[4] A61M 5/315
U.S. Cl. 604—218 **8 Claims**



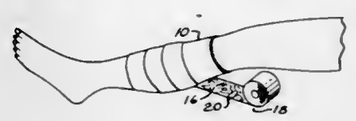
1. A syringe comprising:
a dimensionally stable, annular, elongate barrel having an internal wall of a predetermined dimension;
an annular, elongate liner of a fluorinated polymer material disposed in said annular barrel, said liner having an external wall dimensioned for intimate physical engagement with said internal wall of said barrel, said liner having an internal wall forming a bore of a second predetermined dimension;
a plunger head of a fluorinated polymer material, having first and second axially spaced sealing surfaces disposed in said bore;
said first sealing surface having a first radial dimension for slidably engaging said bore of said liner with a radial force sufficient to draw liquid into and force liquid out of said bore in response to axial movement of the plunger head along said bore in opposite directions;
said plunger head having a portion of reduced diameter between said first and second sealing surfaces for collecting particles of said fluorinated polymer material abraded from said liner and said plunger; and
said second sealing surface, having a second radial dimension, forming a particle trap with said bore to prevent said particles from passing through the particle trap.

4,820,279

ARTICLE AND METHOD FOR PREPPING A PATIENT PRIOR TO SURGERY

Richard G. Dedo, 175 Denise Dr., Hillsborough, Calif. 94010

Filed Mar. 31, 1986, Ser. No. 846,147
Int. Cl.[4] A61M 35/00
U.S. Cl. 604—290 **31 Claims**



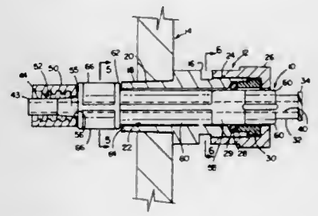
1. A method of prepping the skin of a patient prior to surgery, comprising the steps of:
covering the skin in the region of the site of surgery with a material retaining sufficient bactericidal agent to apply the agent to the skin;
covering the retaining material with a liquid and bacteria impervious material;
maintaining the skin in the covered condition for a prolonged period of time; and
removing the retaining and liquid impervious materials prior to surgery.

4,820,280

PASS-THROUGH TUBE FOR PRESURIZED CHAMBER

Stephen W. Berch, Arvada, and Leslie M. Baines, Boulder, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jan. 23, 1987, Ser. No. 6,366
Int. Cl.[4] A61M 5/005
U.S. Cl. 604—248 **3 Claims**



1. The combination
comprising a pressure chamber wall carrying a wall connector that passes through it, is sealed thereto and has an interior sealing surface, and
a disposable plastic pass-through tube for use in conveying intravenous fluid to a patient in said pressurized chamber, said tube comprising
an elongated tubular body having an outer sealing surface shaped and sized to sealably mate with said interior sealing surface of said connector passing through said wall of said pressurized chamber, said body having an axial flow passage through it,
said outer sealing surface having a cylindrical surface over a sealing portion of said tube,
axial fins along another portion of said tube,
a first end having a first generally cylindrical surface adapted to sealably engage a similarly shaped surface of a mating first connector and first locking members for locking with mating locking members on said first connector, and
a second end having a second generally cylindrical surface adapted to sealably engage a similarly shaped surface of a mating second connector and second locking mem-

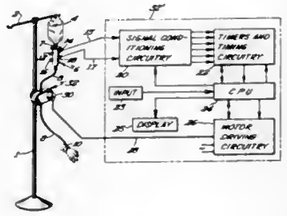
bers for locking with mating locking members on said second connector.

4,820,281

DROP VOLUME MEASUREMENT SYSTEM

Casimir E. Lawler, Jr., Eden Prairie, Minn., assignor to Ivy Medical, Inc., Minneapolis, Minn.

Filed May 21, 1987, Ser. No. 52,470
Int. Cl.[4] A61M *5/165, 31/00*
U.S. Cl. 604—253 **17 Claims**



1. Intravenous fluid delivery apparatus of the type comprising a fluid container, a transpartent drip chamber connected to the outlet of said fluid container, a length of flexible tubing attached in fluid flow communication between the discharge side of said drip chamber and injection means for intravenous fluid introducing into a patient, wherein the improvement comprises:

flow regulating means operatively associated with said flexible tubing for regulating the flow of intravenous fluid through the delivery apparatus;

drive means for said flow regulating means;

a drop orifice at the top of said drip chamber opening freely into unobstructed interior space of said drip chamber, said drip chamber being a standard, commercially available device having a such a width between laterally spaced side walls separated by an uninterrupted space that drops sequentially formed on at a time at said drop orifice may freely fall through said drip chamber without contact with an confining wall surface;

first sensor means positioned in proximity to said drip chamber for sensing drop presence and emitting a first signal in response thereto, said first sensor means comprising a first light emitting source generating a first sensing field projecting generally transversely across said drip chamber and an aligned light detector, said first light source and its generated sensor field being so positioned a predetermined distance below the outlet of said drop orifice that each separate drop does not enter the first sensing field until the drop is in free fall;

second sensor means positioned in proximity to said drip chamber for sensing drop presence and emitting a second signal in response thereto, said second signal being utilized in cooperated with said first signal to determine a drop size dimension, and said second sensor means comprising a second light emitting source generating a second sensing field projecting generally transversely across said drop chamber and a second light detector in alignment therewith, said second light source being vertically spaced below said first light source a predetermined distance along the height of said drip chamber, whereby two vertically spaced sensor fields are established;

timer means operatively associated with said first and second sensor means to receive signals therefrom to measure the elapsed time for each drop to pass through each of said two sensor fields and through a known vertical distance between the fields, as an indication of the vertical drop size dimension in the direction of drop free fall;

circuit means incorporating said drive means and said first and second sensor means and said timer means, said circuit means further comprising electronic processor means programmed to calculate the actual volumetric flow rate of fluid, based on a multiplication function of drop rate as indicated by the number of drops sensed by either said first or second sensor means in a unit of time and drop volume as a function of said drop size dimension, and comparator means for comparing said actual volumetric flow rate to a predetermined, desired volumetric flow rate; and

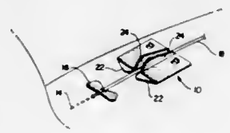
drive signal generating means in said circuit connected to said drive means for producing a drive signal based on the output of said comparator means to adjust said drive means as necessary to maintain a predetermined flow rate.

4,820,282

SHEATH FOR BUTTERFLY NEEDLES

J. Martin Hogan, Long Beach, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

Continuation-in-part of Ser. No. 920,613, Oct. 20, 1986, abandoned. This application Sep. 29, 1987, Ser. No. 102,428
Int. Cl.[4] A61M *5/325*
U.S. Cl. 604—263 **23 Claims**



1. A protective disposable sheath for hypodermic needles having butterfly-shaped side strips, said sheath comprising:

(a) a continuous flat base plate;

(b) two upper walls approximately horizontal to and terminating in spaced apart parallel edges near the base plate midsection

said upper walls being positioned above said base plate at least near the midsection thereof to provide a recess for receipt of said needle side strips;

(c) retaining means to permit said needle side strips to enter and not be withdrawn from said recess

said sheath being dimensioned to cover said needle completely when said side strips are secured by said retaining means;

(d) juxtaposed gripping surface means extending upwardly from each of said upper walls and defining a channel above said spaced apart parallel edges of said upper walls.

4,820,283

SHEAR FORCE GAUGE

David P. Schickling, Orange, and Patrick M. Maloney, El Toro, both of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 13, 1988, Ser. No. 143,738
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—280 **18 Claims**

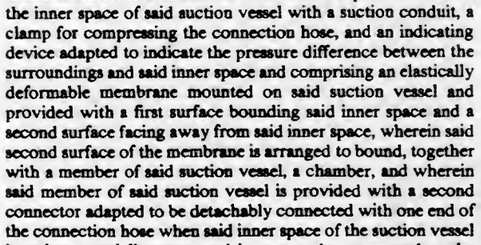
1. A device for use in withdrawing a catheter from a vessel, comprising:

an elongated body member extending along a longitudinal axis from a proximal end to a distal end, the body member defining a passageway through which to pass a catheter, the passageway extending along the longitudinal axis to an open distal end of the body member;

means for coupling the body member to a catheter disposed within the passageway in order to enable a user to withdraw the catheter from a vessel by moving the body member axially, and for so coupling the body member to the catheter adjustably in order to enable the user to select a desired maximum amount of axially-directed force that can be coupled from the body member to the catheter;

a handle member mounted on the body member, which handle member is dimensioned and arranged to be grasped by a user for purposes of applying an axially-directed force to the body member;

means for coupling the handle member to the body member so that the handle member can move axially relative to the body member to a position indicative of the magnitude of an axially-directed force that the user applies with the handle member to the body member; and



means for providing an indication of relative handle member position as an indication of the force applied to the body member;

wherein the means for coupling the handle member to the body member includes:

a guidepost member that fits coaxially through the handle member to threadingly engage the body member;

the guidepost member having at least one radially outwardly extending portion;

the handle member having a hollow interior through which the guidepost member fits; and

the hollow interior having a star-shaped cross section dimensioned and arranged so that the radially outwardly extending portion engages the handle member to inhibit rotation of the guidepost member relative to the handle member.

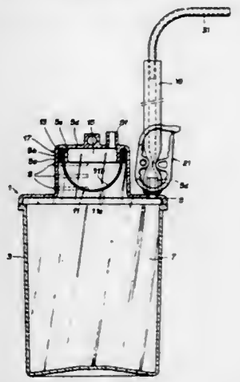
4,820,284

SUCTION DEVICE FOR THE DRAINAGE OF WOUNDS AND USE OF THE DEVICE

Hermann Hauri, Oensingen, Switzerland, assignor to Genossenschaft VEBO Solothurnische Eingliederungsstätte für Behinderte, Oensingen, Switzerland

Filed Apr. 22, 1987, Ser. No. 41,297
Claims priority, application Switzerland, Apr. 24, 1986, 1684/86
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—318 **12 Claims**

1. Suction device for the drainage of wounds, the device comprising a suction vessel, a connection hose fastened to a first connector of said suction vessel and adapted to connect the inner space of said suction vessel with a suction conduit, a clamp for compressing the connection hose, and an indicating device adapted to indicate the pressure difference between the surroundings and said inner space and comprising an elastically deformable membrane mounted on said suction vessel and provided with a first surface bounding said inner space and a second surface facing away from said inner space, wherein said second surface of the membrane is arranged to bound, together with a member of said suction vessel, a chamber, and wherein said member of said suction vessel is provided with a second connector adapted to be detachably connected with one end of the connection hose when said inner space of the suction vessel is at least partially evacuated in turn to be connected to the suction conduit before performing a wound drainage, said member of said vessel comprises a ring-shaped part protruding towards said inner space and wherein the peripheral part of said membrane is fixedly mounted, by means of a ring, on a



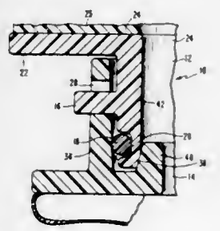
ring-shaped surface of said ring-shaped part, wherein said membrane including its peripheral, fastened part is arranged completely inside the vessel.

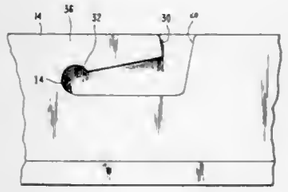
4,820,285

BAYONET COUPLING FOR OSTOMY DEVICE

Walter F. Leise, Yardley, Pa., and Kenneth A. Johnsen, Piscataway, N.J., assignors to E.R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 16, 1987, Ser. No. 96,989
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—339 **3 Claims**





1. An improved coupling device for use in connecting an ostomy bag to a wearer of the type comprising a body side flange having a substantially circular shape with an aperture therein adapted to surround a stomal opening in a wearer and a flat surface thereon adapted to interface with an adhesive material for connecting said body side flange to said wearer, and a bag side flange adapted to be connected to said body side

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flange, said bag side flange holding a bag for receiving material which passes from said wearer, wherein the improvement comprises the combination of a bayonet coupling with an O-ring seal said bayonet coupling said body side flange to connect to said bag side flange without requiring significant pressure being applied against said body side flange and an O-ring seal adapted to seal said body side flange to said bag side flange, said body side flange comprising an annular arm at the periphery of said body said aperture and extending away from said flat surface, said body side arm having an annular detent therein wherein said O-ring seal is resiliently held, said body side flange further including a plurality of pins extending radially from said body side arm away from said aperture; said bag side flange comprising a first annular arm having a plurality of L-shaped openings for receiving said pins and a second annular arm spaced apart from said first annular arm to receive said body arm and press said O-ring therebetween.

4,820,286

AUTOMATIC INJECTOR

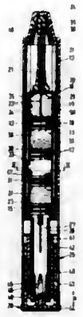
Gillis P. van der Wal, Oist, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands

Filed May 12, 1987, Ser. No. 48,884

Claims priority, application Netherlands, May 15, 1986, 8601228

Int. Cl.⁴ A61M *37/00*

U.S. Cl. 604—89 **17 Claims**



1. An automatic injector for injecting one or more injection liquids, in which, prior to use, different substances which are not allowed to be in contact with each other for a long period of time can be stored separately comprising an assembly of a discharge mechanism, a cartridge in a cartridge holder, and an outer sleeve which is telescopically slidable around the cartridge holder, the cartridge comprising:

a hollow, substantially cylindrical barrel which is open at its rear end,

a piston which is movable in the barrel and seals same,

a number of separating stoppers equal to one less than the number of injection liquids, said separating stoppers being movable in the barrel and having circumferences that adjoin the inner wall of the barrel in a sealing manner, thereby keeping the injection liquids in the barrel separated from each other prior to use of the injector,

a needle holder connected to the front end of the barrel in a sealing manner and comprising a neck for sealingly gripping a needle,

which injector is characterized in that

one of the substances in the injector is solid and can be injected as an injection liquid after dissolving in a solvent,

the discharge mechanism is in operative relationship with the piston via a plunger and its capable of telescoping movement relative to the cartridge holder, permitting the injector to be made ready for use by a single or repeated forward movement of the piston in the barrel,

prior to using the injector, the cartridge at its front end is provided with a sealing means to prevent injection liquid from leaving the injector via the needle during making the injector ready for use,

a passable stopper, movably provided in the barrel in front of the piston and which, prior to making the injector ready for use, adjoins the inner wall of the barrel in a circumferentially sealing manner and keeps the solid separated from the solvent, and

a solvent by-pass for liquid is situated in the barrel wall over a length slightly exceeding the length of the passable stopper, said solvent by-pass permitting the solvent to pass the passable stopper and reach the solid in front of said stopper and dissolve same upon making the injector ready for use.

4,820,287

SYRINGE FOR HIGH PRESSURE INJECTION OF FLUID OR PASTE PRODUCTS

Henry Leonard, Besancon, France, assignor to Micro-Mega, Besancon, France

Filed Mar. 25, 1987, Ser. No. 30,709

Claims priority, application France, Mar. 27, 1986, 86 04657

Int. Cl.⁴ A61M *5/00*

U.S. Cl. 604—209 **22 Claims**



1. A syringe for applications involving pressure generation for moving fluids comprising

a syringe casing;

a plunger having a head, adapted to move inside the syringe casing and having a rear area relative to its position in the casing;

an axially mobile assembly movably disposed in the syringe casing in an area to the rear of the plunger;

a calibrated helical compression spring engaging the axially mobile assembly and the compression spring transmittingly forcing the assembly into motion;

a toothed rack attached to the plunger;

a lever pivoted to the axially mobile assembly and engaging the toothed rack for limiting a pressure exerted by the plunger head upon the fluid to be ejected by the syringe, such that the calibrated helical compression spring interposed in a kinematic chain converts an angular displacement of the lever of the syringe into an axial displacement of the toothed rack controlling the said plunger, with the calibration setting corresponding to a maximum admissible pressure to be exerted upon the fluid for ejection;

a ratchet attached to the lever for engaging the toothed rack and for providing support to the toothed rack on the rear side in order to assure a forward motion of the plunger;

a button means for manual actuation for moving the lever to disengage the ratchet from the toothed rack.

4,820,288

CONNECTOR FOR THERAPEUTIC TUBING AND MEDICAL SOLUTION BAG DEVICE USING THE CONNECTOR

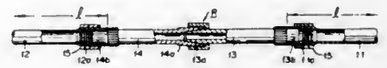
Keinosuke Isono, Kawaguchi, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 785,024, Oct. 4, 1985, Pat. No. 4,668,217, which is a continuation of Ser. No. 727,618, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 647,262, Sep. 4, 1984, abandoned, which is a continuation of Ser. No. 390,628, Jan. 21, 1982, abandoned. This application Jan. 9, 1987, Ser. No. 1,673

Claims priority, application Japan, Jun. 23, 1981, 56-95898; Dec. 25, 1981, 56-215398

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 604—280 **17 Claims**



1. Connector means for connecting first and second medically therapeutic tubes to one another under flame sterilization, thereby preventing microorganic invasion into the interior of the tubes through the connector means comprising:

a tubular male connector made of a thermally resistant and corrosionproof material, said male connector member having a tubing end adapted to be connected to said first therapeutic tube;

said material from which said male connector member is made also being flame-resistant and flame-sterilizable;

said tubing end of the male connector member being liquid-tightly insertable into an end of said first therapeutic tube;

a first retaining and holding member covering a portion of said tubing end of said tubular male connector in the vicinity of the portion of said male connector which is insertable into said first therapeutic tube, said first retaining and holding member being hand-holdable by a user during a flame sterilization operation and a connection operation;

a tubular female connector member made of a thermally resistant and corrosionproof material, said female connector member having a tubing end adapted to be connected to said second therapeutic tube;

said material from which said female connector member is made along being flame-resistant and flame-sterilizable;

said tubing end of the female connector member being liquid-tightly insertable into an end of said second therapeutic tube;

a second retaining and holding member covering a portion of said tubing end of said tubular female connector in the vicinity of the portion of said female connector which is insertable into said second therapeutic tube, said second retaining and holding member being hand-holdable by a user during a flame sterilization operation and a connection operation;

an O-ring provided in a middle portion of said female connector member;

said male and female connector members each having mutual engagement means which are mutually engageable to connect said first and second therapeutic tubes together, said male connector member being in contact with said O-ring when engaged with said female connector member;

a locking mechanism on said male and said female connector members for locking said male and female connector members for locking said male and female connector members liquid-tightly to one another when placed in an engaged state;

at least one of said male and female connector members being flame sterilized by a flame directed thereat, thereby sterilizing at least the area which is contacted by the flame;

said mutual engagement means of said male and female connector members including means engageable with one another without relative twisting movement therebetween during said flame sterilization; and

means for actuating said locking mechanism on said connector members to lock said male and female connector members together after said flame sterilization and engagement therebetween, thereby preventing microorganic invasion into the interior of said first and second therapeutic tubes through said connector means.

4,820,289

MALE EXTERNAL CATHETER

Frank Coury, Highland Park; Margaret A. Frank, Lawrenceville, and Daniel M. Sivilich, Freehold Township, Monmouth County, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 29, 1987, Ser. No. 102,080

Int. Cl.⁴ A61F *5/44*

U.S. Cl. 604—349 **11 Claims**

1. In a male external condom catheter for use in male urinary evacuation or male incontinence, which catheter comprises a sheath of a thin, flexible, elastomeric material, having an inside surface and an outside surface, adapted to fit over the penis, and having a constricted downstream end portion adapted to provide a fluid-tight connection with a drain tube;

the improvement wherein at least one of said surfaces of said sheath is flocked wherein said flocking comprises a thin uniform layer of adhesive on said surface and a plurality of particles of a fiber uniformly covering, and bonded to, said adhesive such that a smooth felt-like surface is provided.

4,820,290

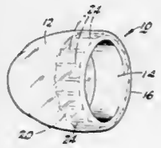
PROPHYLATIC DEVICE

James H. Yahr, 2999 Regent St., Berkeley, Calif. 94705

Filed Sep. 15, 1987, Ser. No. 96,488

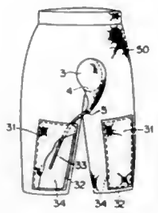
Int. Cl.⁴ A61F *5/44*

U.S. Cl. 604—349 **10 Claims**



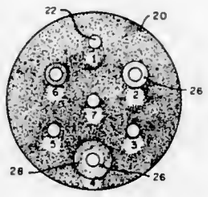
1. An abbreviated condom comprising a thin sheath formed in a hood with an open end, and, a relatively wide and thick elastic band, the open end of the hood having a continuous sealed connection with the band, the band forming an open end to the condom, the hood and band being constructed and sized to adapt to the end of a penis with the hood covering the glans and the band seating around the control sulcus and providing a seal for retaining fluid received in the hood, wherein the relatively wide and thick band is at least three magnitudes wider than it is thick and forms a continuous roll-preventing perimeter at the open end of the condom.

4,820,291
URINARY APPLICANCE
Ryugo Terauchi, Tokyo, and Kyoshi Fukushima, Saitama, both of Japan, assignors to Nippon Medical Supply Corporation, Tokyo, Japan
Continuation of Ser. No. 835,240, Feb. 27, 1986, abandoned, which is a continuation of Ser. No. 509,431, Jun. 6, 1983, abandoned. This application Jul. 20, 1987, Ser. No. 75,607
Int. Cl.[4] A61F 5/44; A47K 11/00
U.S. Cl. 604—349 3 Claims



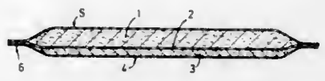
1. A urinary appliance comprising a genital receiving bag, said genital receiving bag made of a soft and flexible material that is air permeable, and water repellent to permit air to escape therefrom to maintain the interior of said bag in continuous communication with atmospheric pressure;
an undergarment adapted to encircle a portion of a user's body, said undergarment having a pair of legs, each leg thereof being adapted with an external bag made of a soft, flexible fabric material;
said genital receiving bag is funnel shaped and including an opened substantially circularly shaped larger opening at one end thereof adapted to be fitted over a penis of a male user, and to engage the user's genital area adjacent the penis;
means for attaching removably said genital receiving bag to said undergarment;
said genital receiving bag further including an opened urine outlet at a smaller end thereof to allow the urine to escape therefrom;
said genital receiving bag being composed of cloth material, and enlarged at said larger end for increased capacity, to accommodate readily and comfortably variations in the size of the user's penis;
wherein said larger end of said genital receiving bag is closed partially by a sealing sheet;
said sealing sheet being generally annularly-shaped and composed of a flat, soft, flexible, fabric material that is permeable to air and water repellent;
said annular sealing sheet being attached to the genital receiving bag along the periphery of said larger end to extend tautly across the opening and to enable said sealing sheet to engage directly and conform to the shape of the genital area adjacent the penis of the user for sealing said sheet to the body of the user in a comfortable manner;
said annular sheet having an insertion hole to be fitted over the penis of the user, and a wide body-engageable portion extending from the periphery of said larger end of said genital receiving bag to said insertion hole, for sealing purposes;
a cylinder composed of a soft, flexible, cloth fabric material that is air permeable and water repellent and attached integrally to said sheet around a periphery of the insertion hole thereof for sealing said sheet to the penis of such a user;
said cylinder extending over a substantial portion of the axial length of the male penis to support the penis within said cylinder for enhancing the sealing engagement of the urinary appliance and for causing the penis to be spaced-apart from the inner surface of said genital receiving bag, for minimizing skin irritation resulting from the penis contacting and rubbing against the genital receiving bag;
a tube;
a first urine storage bag disposably contained in one of said external bags wherein said first urine storage bag is connected in fluid communication by said tube to the urine outlet of said genital receiving bag for receiving and storing urine;
wherein said first urine storage bag is substantially closed, and includes means defining a small opening through which said tube extends a substantial distance into said first urine storage bag, sufficient to prevent said tube from backing out of the interior of said first urine storage bag;
said tube having a relatively short length disposed outside of said first urine storage bag for reducing the risk of accidental disengagement from said first urine storage bag;
wherein a highly water-absorbent resin which absorbs the gels urine is disposed inside said first urine storage bag to absorb and gel urine and to inhibit the flow of urine back out of the urine storage bag;
a second urine storage bag disposably contained in the other of said external bags, said second urine storage bag being adapted to be connected in fluid communication by said tube to the urine outlet of said genital receiving bag for receiving and storing urine when said first urine storage bag becomes substantially full of gelled urine;
said second urine storage bag being substantially closed and including means defining a small opening through which said tube may be received and extended a substantial distance into said second urine storage bag, sufficient to prevent said tube from backing out of the interior of said second urine storage bag when received therein; and
wherein a highly water-absorbent resin which absorbs and gels urine is disposed inside said second urine storage bag to absorb and gel urine and to inhibit the flow of urine back out of said second urine storage bag when said tube is inserted therein.

4,820,292
ANTI-MICROBIAL SENSITIVITY TEST AND TESTING STRATUM
Bernard Korol, Highland Beach, Fla., and Paul Nathan, Cincinnati, Ohio, assignors to Enguay Pharmaceutical Associates, Boca Raton, Fla.
Continuation-in-part of Ser. No. 815,874, Jan. 3, 1986, Pat. No. 4,747,845, which is a continuation-in-part of Ser. No. 542,754, Oct. 17, 1983, Pat. No. 4,563,184. This application May 27, 1988, Ser. No. 199,379
Int. Cl.[4] C08K 5/41, 5/34, 5/15, 5/10
U.S. Cl. 435—32 13 Claims



1. An anti-microbial sensitivity testing stratum for evaluating the sensitivity of anti-microbial agents relative to identifiable microbial contaminants, said stratum comprising a particulate, hydrophilic, water swellable polymer of an acrylate or acrylamide ranging approximately from 20%-55% by weight of said stratum; a hydrogen bonding plasticizer of dimethysulfoxide ranging approximately up to 20% by weight of said stratum; an inert, non-toxic water miscible organic solvent of polyethylene glycol ranging approximately 20%-65% by weight of said stratum; and an anti-microbial agent, constituting the remainder by weight of said stratum.

4,820,293
ABSORBENT BODY WITH SEMIPERMEABLE MEMBRANE
Carl G. Kamme, Bengt Lidforss väg 8, S-223 65 Lund, Sweden
PCT No. PCT/SE82/00397, § 371 Date Jul. 25, 1983, § 102(e) Date Jul. 25, 1983, PCT Pub. No. WO83/02054, PCT Pub. Date Jun. 23, 1983
PCT Filed Nov. 25, 1982, Ser. No. 525,046
Claims priority, application Sweden, Dec. 11, 1981, 8107437
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—368 23 Claims



1. An absorbent body for absorbing a fluid from a fluid-discharging region, comprising:
an absorbent layer adapted to absorb said fluid;
a jacket which is positioned immediately to contact with said absorbent layer, at least a portion of the jacket which is facing said absorbent layer been made of a micro-porous semi-permeable membrane film, which is permeable to said fluid discharged from said fluid-discharging region and absorbed by said absorbent layer, the remainder of said jacket being made of a liquid-tight material;
a fluid absorbent substance causing osmotic activity being enclosed in said jacket and adapted to absorb said fluid, said membrane film being non-permeable to said fluid-absorbing substance;
said semi-permeable membrane being liquid-tight when the osmotic pressure differential across said membrane is zero and being permeable to said fluid due to an osmotic pressure differential across said membrane.

4,820,294
APERTURED FILM FACING AND METHOD OF MAKING THE SAME
Ronald R. Morris, Watchung, N.J., assignor to Chicopee, New Brunswick, N.J.
Division of Ser. No. 866,830, May 22, 1986, Pat. No. 4,755,413. This application Apr. 4, 1988, Ser. No. 177,291
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—383 8 Claims



1. An improved disposable absorbent article comprising:
an absorbent core means for absorbing liquid, said absorbent core means having a first and a second opposed face;
a liquid impermeable backsheet overlaying said first opposed face of said absorbent core; and
a liquid permeable topsheet overlaying said opposed face of said absorbent core means, said topsheet being a hydrophobic film having a multiplicity of apertures therethrough, the edge of said apertures being coated with a hydrophilic material.

4,820,295
ABSORBENT BODY WITH FLUID TRANSPORT MEANS
Richard B. Chapas, East Windsor, and Pramod Mavinkurve, Kendall Park, both of N.J., assignors to Personal Products Company, Milltown, N.J.
Continuation-in-part of Ser. No. 858,883, Apr. 24, 1986, abandoned, which is a continuation of Ser. No. 530,320, Sep. 8, 1983, abandoned. This application Feb. 11, 1987, Ser. No. 13,475
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—385.1 5 Claims



1. An absorbent body of fibrous material for absorbing body fluids, said body being generally planar and elongated and having a substantially uniformly compressed peripheral edge extending about essentially the entire periphery of the body;
said peripheral edge having a bulk density of at least ten times greater than the least dense portion of the body, said dense peripheral edge extending inwardly from the extreme periphery for a distance of at least 0.1 cm;
said body provided with a longitudinal density gradient, said longitudinal gradient extending from a point of least density longitudinally toward said compressed peripheral edge with said density increasing toward said peripheral edge at an increasing rate
said body provided with a transverse density gradient, said transverse qradient extending from a point of least density transversely toward said compressed peripheral edge and said transverse density increasing toward said peripheral edge at an increasing rate;
whereby body fluid striking the body at a point in proximity to the peripheral edge will be transported rapidly away from said point.

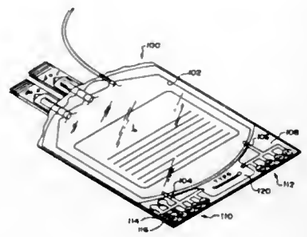
4,820,296
POST-OPERATIVE GARMENT
Carol A. Masliyah, 1206 Nautilus, La Jolla, Calif. 92037
Filed Apr. 15, 1985, Ser. No. 723,168
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—385.1 4 Claims



1. A post operative patient garment comprising:
(a) a front dimensioned to expand from the crotch area over the abdominal region of the patient up to just beneath the breasts;
(b) a rear panel defining a continuation of said front panel from the crotch area and dimensioned to extend up the back of the patient;
(c) fastener means for joining respective upper portions of said panels together above the abdominal region just below the breasts of the patient; and
(d) an adhesive patch defined on the interior of said garment in the crotch area for bonding an absorptive pad thereto.

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4,820,297
FLUID DELIVERY SYSTEM WITH INTEGRALLY FORMED SAMPLE CELL
Stephen B. Kaufman, Gurnee; Robert Patterson, Riverwoods; David V. Bacehowski, Wildwood; Arnold C. Bilstad, Deerfield, and Patrick N. Huehls, Highland Park, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.
Filed Dec. 12, 1986, Ser. No. 940,816
Int. Cl.[4] A61B 19/00
U.S. Cl. 604—409 56 Claims



1. A fluid delivery system comprising:
a container defining a volume in which a quantity of a pre-selected fluid can be accumulated; and
at least one member defining a sample volume and attached to said container for receiving at least a sample of the pre-selected fluid and isolatable from the remainder of the fluid in said container means for testing contained within said defined sample volume such that the portion of fluid in said sample volume may be selectively tested while said sample volume defining member is attached to said container and said testing means including means for displaying a selected visible characteristic in response to the presence of a predetermined characteristic in the sample.

4,820,298
INTERNAL VASCULAR PROSTHESIS
Eric G. Leveen, 141 S. Battery, Charleston, S.C. 29401, and Robert F. Leveen, 312 Lombard St., Philadelphia, Pa. 19147
Filed Nov. 20, 1987, Ser. No. 123,367
Int. Cl.[4] A61F 2/06, 2/02; A61B 17/04
U.S. Cl. 623—1 17 Claims



1. A medical stent for use in aneurysms comprising a flexible tubular body defining a lumen and strand means mounted to said tubular body, said tubular body being adapted to assume a substantially linear configuration when mounted on inserter means and constructed of a material having a recovery memory which causes it to expand to a helical configuration when it is removed from said inserter means, said strand means extending substantially between successive coils of the tubular body when in a helical configuration.

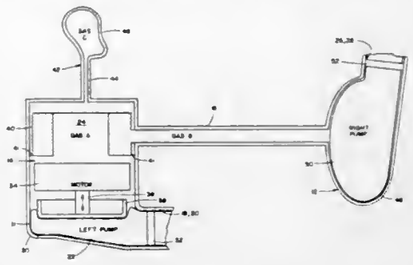
4,820,299
PROSTHETIC CARDIAC VALVE
Perrier Philippe, St. Nom-la-Bretecne, and Lapeyre Didier, Chaignes, both of France, assignors to Avions Marcel Dassault-Breguet Aviation, Vaucresson, France, a part interest
Filed Sep. 23, 1986, Ser. No. 910,621
Claims priority, application France, Sep. 23, 1985, 85 14051
Int. Cl.[4] A61F 2/24
U.S. Cl. 623—2 21 Claims



1. A prosthetic cardiac valve of the type including:
a plurality of flaps having a concave internal face and being movable, under the action of cardiac pulsations, between an open position in which they allow the blood to flow in a forward direction and a closed position in which they prevent reversal of the blood flow in a reverse direction, each closure means having two lateral corners, a leading edge and a trailing edge which converge in two corners,
a base supporting the flaps and having an internal wall definng a central passage for the blood flow, as well as an upper edge and a lower edge,
suture means by means of which the base is fixed to cardiac and vascular tissues, and
rotational guide and retaining means for each flap between and in said open and closed positions, respectively, wherein
the rotational guide and retaining means of each flap define an axis of rotation disposed at a distance from the axis of the valve which is greater than 75% of an internal radius of the base measured perpendicularly to the rotation axis of each flap, while allowing the flow between the external face of a flap and an adjacent internal wall of the base for rinsing of said guide and retaining means,
the axis of rotation of each said flap being situated entirely outside the flap and being off-centered with respect to the centre of gravity of the flap so that the resultant force of the friction forces acting on the flap has, with respect to said axis during reversal of the blood flow, a sufficient moment for starting closure of said flap, and
in the open position the corners of each flap bear on the internal wall of the base at zones which are situated at a distance from the axis of rotation of each said flap which is greater than 25% of an internal radius of the base measured perpendicularly to the rotation axis of each said flap, for reducing, on the one hand, the forces required for limiting opening of each said flaps and, on the other, for reducing the forces acting on the rotational guide and retaining means.

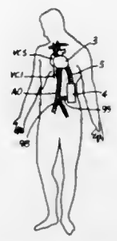
4,820,300
ARTIFICIAL HEART
William S. Pierce, Harrisburg, and Gerson Rosenberg, Lebanon, both of Pa., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.
Continuation-in-part of Ser. No. 747,096, Jun. 20, 1985, abandoned. This application Jun. 1, 1987, Ser. No. 56,576
Int. Cl.[4] A61F 2/22
U.S. Cl. 623—3 30 Claims

1. An artificial heart, comprising:
a. a left blood pump including a pump housing, a flexible blood sac, a fluid chamber containing a fluid, and a motion translating means for contracting and expanding said flexible blood sac, said motion translating means also being operative to displace the fluid located within said fluid chamber;
b. a right blood pump coupled to said fluid chamber of said left blood pump by a fluid line, said right blood pump including a pump housing, a blood chamber, and a fluid powered pumping means for causing blood to enter and



exit said blood chamber, said fluid line being generally external to and linking said right and left pump housings, said fluid powered pumping means being driven solely by the fluid displaced through said fluid line by said motion translating means of said left blood pump, such that the fluid displaced through said fluid line by said motion translating means of said left blood pump cyclically drives the fluid powered pumping means of said right blood pump.

4,820,301
TOTAL ARTIFICIAL HEART COMPRISING TWO DISCONNECTED PUMPS ASSOCIATED INTO ONE FUNCTIONALLY INDISSOCIABLE UNIT
Jean-Louis Chareire, Levallois, and Didier Lapeyre, Pacy-Sur-Eure, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Dec. 12, 1986, Ser. No. 941,044
Claims priority, application France, Dec. 12, 1985, 85 18425
The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.
Int. Cl.[4] A61F 2/22
U.S. Cl. 623—3 9 Claims



1. A total cardiac prosthesis comprising two pumps, respectively representing the right heart and the left heart, as well as a control device of said pumps (89, 90, 92, 93), actuating said pumps in opposition, said prosthesis also comprising an undissociable functional unit formed of:
a pericardial unit (3) destined to be housed in the cavity (2) of the natural heart to be replaced (1) and enclosed in a tight envelope (8) provided with three coupling orifices (25, 26, 29), respectively adapted to be connected to the right auricle RA, to the pulmonary artery PA and to the left auricle LA, said orifices (25 and 26) for coupling for the right auricle and the pulmonary artery PA being provided with valves used respectively as inlet orifice and outlet orifice of a first pump (13, 14) housed in said envelope (8) and destined to assume the right heart function of the natural heart to be replaced;
an extra-pericardial unit (4) destined to be housed in the abdominal cavity of the receiving sick person and to assume the function of the left heart of the natural heart to be replaced (1), said extra-pericardial unit comprising a second pump (50, 52) enclosed in a tight envleope (40) provided with an inlet orifice (53) and an outlet orifice (56), each provided with a valve said outlet orifice (56) being coupled to the abdominal part of the aorta;
a functional connection line (5) between said units, comprising:
a first duct (33) passing through said envelope (8) of said pericardial unit (3) and connecting the orifice (29) of the latter corresponding to the left auricle LA with the inlet orifice (53) of the section pump (50, 52) incorporated into said extra-pericardial unit (4),
a duct (32) establishing communication for the gases between the sides of said first and second pumps opposite top the blood flow therethrough.

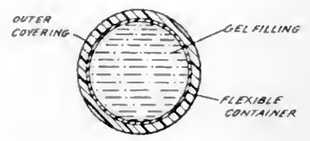
4,820,302
BIO COMPATIBLE AND BLOOD COMPATIBLE MATERIALS AND METHODS
E. Aubrey Woodroof, Santa Ana, Calif., assignor to Sterling Drug Inc., New York, N.Y.
Continuation-in-part of Ser. No. 370,977, Apr. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 5,319, Jan. 22, 1979, abandoned. This application Jun. 25, 1982, Ser. No. 392,018
Int. Cl.[4] A61F 2/52
U.S. Cl. 623—8 10 Claims

1. An implantable breast prosthesis comprising:
a three dimensional member having an outer surface at least a portion of which is adapted to be in contact with tissue and the like in a host recipient,
at least said portion of said member having functional groups extending therefrom, said functional group being selected from the group consisting of primary and secondary amino groups,
said amino groups having attached thereto a reactive group selected from the group consisting of aldehyde and aryl-halide groups,
a biological having functional groups selected from the group consisting of primary and secondary amino groups and hydroxyl groups being coupled to said portion of said member through reaction between the functional groups of said biological and the aldehyde or aryl-halide groups attached to said primary or secondary amino groups which extend from said portion of said member, and
said biological operating to provide bio- and blood compatible qualities to said surface portion.

4,820,303
IMPLANTABLE PROSTHETIC DEVICES
Daniel Brauman, 141 Brush Hollow Crescent, Rye Brook, N.Y. 10572
Division of Ser. No. 630,124, Aug. 30, 1984, Pat. No. 4,648,880. This application Nov. 28, 1986, Ser. No. 935,915
Int. Cl.[4] A61F 2/02, 2/12
U.S. Cl. 623—8 4 Claims

1. In an implantable prosthetic device for use in a human body including a flexible container and a soft gel or liquid filling the flexible container;
the improvement which comprises providing an outer plastic covering made of an expanded tetrafluoroethylene polymer and bonded to the flexible container, said outer plastic covering having a rough textured external surface

thereby providing a multiplicity of pores and/or interstices, said outer plastic covering encases the flexible



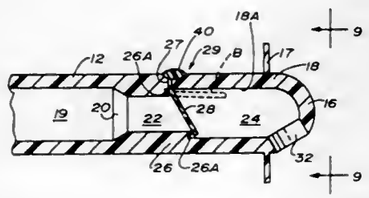
container in order to prevent the contraction of scar tissue around the prosthetic device from pulling the prosthetic device into a hard, spherical shape.

4,820,304

SPEECH PROSTHESIS DEVICE

William A. Depel, Lowell, Ind., and Bernd Weinberg, Tucson, Ariz., assignors to Bivona, Inc., Gary and Purdue Research Foundation, West Lafayette, both of, Ind.

Filed Jul. 13, 1987, Ser. No. 72,545
Int. Cl.⁴ A61F *2/20*
U.S. Cl. 623—9 **23 Claims**



1. A speech prosthesis device which may be used with a treacheostoma valve and adapted to be placed in a surgically created opening between the trachea and esophagus and including a tubular housing having a proximal end and a distal end, an air inlet opening on the proximal end adapted to cooperate with the tracheostoma valve, an air outlet at the distal end opening into the esophagus, and a one-way check valve assembly positioned between said inlet port and said outlet, said one-way check valve assembly comprised of an annular valve seat positioned within said housing and a membrane-like oval-shaped tabbed valve disc anchored adjacent its periphery to said housing so as to close against said annular valve seat when necessary to prevent entry of esophageal content into the trachea through said housing, the improvement comprising:

wherein the plane of said annular valve seat is inclined relative to the longitudinal axis of the tubular housing by an amount sufficient to substantially reduce the resistance of the valve assembly to the flow of air therethrough without substantial flexing of said valve disc as the valve disc is opened, and

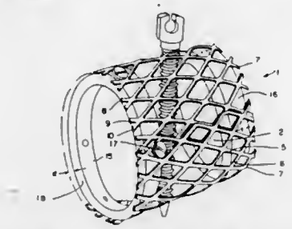
wherein said valve disc includes at least one tab portion which is anchored superiorly to said tubular housing to permit pivotal movement of said valve disc between an open position and a closed position with respect to said annular valve seat.

4,820,305

PLACE HOLDER, IN PARTICULAR FOR A VERTEBRA BODY

Jürgen Harms, Am Rüppurrer schloss, 7500 Karlsruhe, and Lutz Biedermann, Am Schäferstelg 8, 7730 VS-Villingen, both of Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,178
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637314
Int. Cl.⁴ A61F *2/28, 2/44*
U.S. Cl. 623—16 **10 Claims**



1. A prosthesis for insertion in a gap between vertebra wherein a damaged vertebra body has been removed and/or for insertion in a gap between parts of a bone from which a damaged part has been removed, comprising a generally cylindrical jacket disposed in the gap to be secured at its opposite ends to the opposite ends of the vertebra at opposite ends of the gap and/or the opposed ends of the parts of the bone at opposite ends of the gap, said cylindrical jacket comprising a metal tubular structure of a cross section corresponding to substantially the cross section of the opposed ends to be connected, said tubular structure containing a plurality of apertures disposed circumferentially and longitudinally thereof and wherein there are teeth at the opposite ends of the tubular structure, adjacent teeth extending peripherally in opposite directions and wherein the tubular structure is formed of sheet material formed into a cylinder with its ends overlapping and secured to each other by one or more screws engaged within apertures in the overlapping ends and wherein the teeth are bezelled such that the bezelled ends define acute angles forming cutting edges.

4,820,306

METHOD FOR AUGMENTATION OF THE AVEOLAR RIDGE

William G. Gorman, East Greenbush, and David A. Byron, Bethlehem, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 379,779, May 19, 1982, Pat. No. 4,551,135, which is a continuation-in-part of Ser. No. 275,861, Jun. 22, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 573,262
Int. Cl.⁴ A61F *2/00*
U.S. Cl. 623—16 **29 Claims**



1. A method of augmenting alveolar ridges in an edentulous patient, said method comprising the steps of: (1) providing a charge of particulate dental restorative material; (2) providing a physiologically compatible delivery liquid; (3) mixing said delivery liquid with said charge to form a wetted extrudable semi-plastic mass; (4) forming a mucoperiosteal tunnel on the lateral aspect of the patient's jaw adjacent the alveolar ridge; (5) depositing said wetted extrudable mass in said tunnel by extruding said mass from a barrel having a bore which is slightly flared from its upper to its lower end for facilitating extrusion by relieving frictional forces between said wettable mass and barrel during said depositing step.

4,820,307

CATALYSTS AND PROCESSES FOR FORMALDEHYDE-FREE DURABLE PRESS FINISHING OF COTTON TEXTILES WITH POLYCARBOXYLIC ACIDS

Clark M. Welch, Metairie, and Bethlehem K. Andrews, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

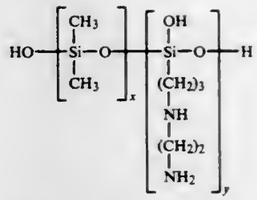
Filed Jun. 16, 1988, Ser. No. 207,461
Int. Cl.⁴ D06M *43/00*
U.S. Cl. 8—120 **24 Claims**

1. A process for treating fibrous cellulosic material, comprising: impregnating fibrous cellulosic material with a treating solution containing a polycarboxylic acid and a curing catalyst;

the polycarboxylic acid being selected from the group consisting of: aliphatic, alicyclic and aromatic acids either olefinically saturated or unsaturated and having at least three carboxyl groups per molecule; aliphatic, alicyclic and aromatic acids having two carboxyl groups per molecule and having a carbon-carbon double bond located alpha, beta to one or both of the carboxyl groups; aliphatic acids either olefinically saturated or unsaturated and having at least three carboxyl groups per molecule and a hydroxyl group present on a carbon atom attached to one of the carboxyl groups of the molecule; and, said aliphatic and alicyclic acids wherein the acid contains an oxygen or sulfur atom in the chain or ring to which the carboxyl groups are attached; one carboxyl group being separated from a second carboxyl group by either two or three carbon atoms in the aliphatic and alicyclic acids; one carboxyl group being ortho to a second carboxyl group in the aromatic acids; and, one carboxyl group being in the cis configuration relative to a second carboxyl group where two carboxyl groups are separated by a carbon-carbon double bond or are both connected to the same ring;

the curing catalyst being selected from the group consisting of alkali metal hypophosphites, alkali metal phosphites, alkali metal polyphosphates and alkali metal dihydrogen phosphates; and,

heating the material to produce esterification and crosslinking of the cellulose with the polycarboxylic acid in the material.



(I)

in which x and y are integers which depend on the molecular weight, which is approximately between 5,000 and 10,000,

(ii) polymers of formula:

$$(R_1)_aG_{3-a}—Si(OSiG_2)_a—[OSiG_b(R_1)_{2-b}]_m—O—SiG_{3-a}(R_1)_a \quad \text{(II)}$$

in which

G is chosen from the group consisting of hydrogen, phenyl, OH and C_1–C_8 alkyl, a denotes 0 or an integer from 1 to 3 and b denotes 0 or 1,

the sum n+m signifies an integer from 1 to 2,000, n denoting a number from 0 to 1,999 and m denoting a number from 1 to 2,000, R_1 is a monovalent radical of formula $C_qH_{2q}L$ in which q is an integer from 2 to 8 and L is chosen from the groups:

$—N(R_2)CH_2—CH_2—N(R_2)_2$

$—N(R_2)_2$

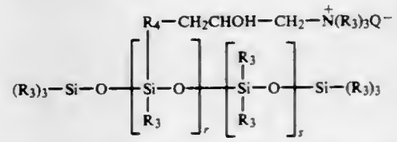
$—N^{\oplus}(R_2)_3A^{\ominus}$

$—N^{\oplus}(R_2)H_2A^{\ominus}$

$—N(R_2)CH_2—CH_2—N^{\oplus}R_2H_2A^{\ominus}$

in which R_2 denotes hydrogen or phenyl or benzyl groups, or a saturated hydrocarbon radical, and $A^{\ominus}$ denotes a halide ion, or:

(iii) polymers of formula:



(III)

in which R_3 denotes a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R_4 denotes a divalent hydrocarbon radical, $Q^{\ominus}$ is a halide ion, r denotes an average statistical value from 2 to 20 and s denotes an average statistical value from 20 to 200,

(c) a cationic surfactant used in proportions of between approximately 0.05 and 2.5% by weight and

(d) a cationic polymer present in proportions of between 0.05 and 5% by weight chosen from

(i) a quaternary derivative of cellulose ethers corresponding to the formula:



(IV)

where R_{Cell} is the residue of an anhydroglucose unit, y

4,820,308

DETERGENT COSMETIC COMPOSITIONS CONTAINING A SOAP AND CATIONIC COMPOUND AND DIRECT DYE

Annie Madrange, Saint Germain en Laye, and Patrick Canivet, Paris, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 786,247, Oct. 10, 1985, Pat. No. 4,710,314. This application Oct. 16, 1987, Ser. No. 111,498
Claims priority, application France, Oct. 12, 1984, 85 589
Int. Cl.⁴ A61K *7/13;* C11D *3/40, 3/37*
U.S. Cl. 8—405 **16 Claims**

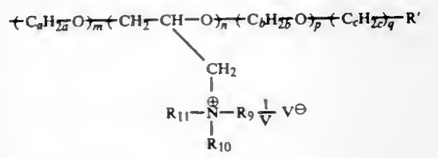
1. Detergent cosmetic composition containing a direct dye, which composition is stable on storage, comprising in a cosmetically acceptable aqueous medium:

(a) an alkali metal or alkanolamine fatty acid soap present in proportions of between approximately 1 and 8% by weight,

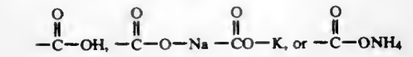
(b) a silicone cationic polymer present in proportions of between 0.05 and 2.5% by weight consisting of a polysiloxane having one of the following meanings:

(i) polymers of formula:

is a number equal to between about 50 and about 20,000 and each R individually denotes a substitutent which is a group of general formula:



where
a is an integer equal to 2 or 3;
b is an integer equal to 2 or 3;
c is an integer equal to 1 to 3;
m is an integer equal to 0 to 10;
n is an integer equal to 0 to 3;
p is an integer equal to 0 to 10;
q is an integer equal to 0 or 1;
R′ is a hydrogen atom or a radical of formula:



with the proviso that when p equals zero R′ denotes —H;

R_9, R_{10} and R_{11}, taken individually, each represent an alkyl, aryl, aralkyl, alkylaryl, cycloalkyl, alkoxyalkyl or alkoxyaryl radical, each of the radicals R_9, R_{10} and R_{11} being able to contain up to 10 carbon atoms, it being clearly understood that when the radical is an alkoxyalkyl radical there are at least two carbon atoms which separate the oxygen atom from the nitrogen atom, and it also being clearly understood that the total number of carbon atoms present in radicals denoted by R_9, R_{10} and R_{11} is between 3 and 12;

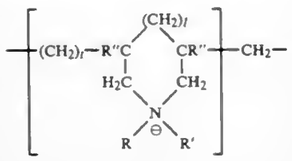
R_9, R_{10} and R_{11}, taken together, can denote, with the nitrogen atom to which they are attached, one of the following radicals; pyridine, α-methylpyridine, 3,5-dimethylpyridine, 2,4,6-trimethylpyridine, N-methylpiperidine, N-ethylpiperidine, N-methylmorpholine or N-ethylmorpholine; X is an anion;

V is an integer equal to the valency of X;

the average value of n per anhydroglucose unit in this cellulose ether is between 0.01 and approximately 1, and the average value of (m+n+p+q) per anhydroglucose unit in this cellulose ether is between approximately 0.01 and approximately 4,

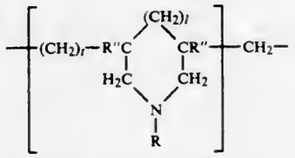
(ii) a copolymer of cellulose or cellulose derivative grafted with a water-soluble quaternary ammonium monomer is a graft copolymer of hydroxyalkylcellulose with a (methacryloylethyl)trimethylammonium salt, a (methacrylamidopropyl)trimethylammonium salt or a dimethyldiallylammonium salt,

(iii) a cationic cyclopolymer having a molecular weight of between 20,000 and 3,000,000 and containing units of formulae:



(X)

-continued



(X′)

in which l and t are equal to 0 or 1 and l+t=1, R″ denotes hydrogen or methyl, R and R′ denote independently of each other an alkyl group having from 1 to 22 carbon atoms, a hydroxyalkyl group in which the alkyl group preferably has 1 to 5 carbon atoms, or a lower amidoalkyl group, and is which R and R′ can also denote, conjointly with the nitrogen atom to which they are attached, heterocyclic groups chosen from piperidinyl or morpholinyl groups, as well as copolymers containing units of formula (X) or (X′) and acrylamide and diacetone acrylamide units, $Y^{\ominus}$ being an anion chosen from bromide, chloride, acetate, borate, citrate, tartrate, bisulphate, bisulphite, sulphate and phosphate,

(e) direct dyes selected from the group consisting of nitrobenzene derivatives, azo, anthraquinone and naphthoquinone dyes, indoamines, indoanilines and indophenols, present in proportions of between approximately 0.01 and 3% by weight.

4,820,309

1:2-CHROMIUM COMPLEX DYES FOR TANNED LEATHER

Herbert Holliger, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

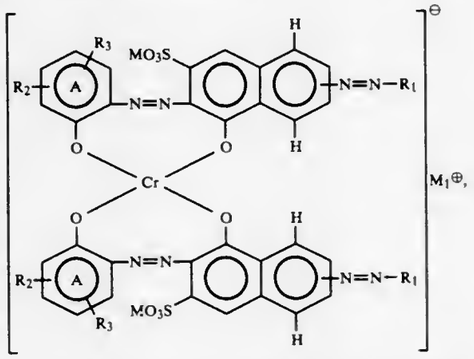
Filed Mar. 3, 1988, Ser. No. 163,442

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707044

Int. Cl.⁴ D06P *3/32*; C09B *45/00*

U.S. Cl. 8—437 **32 Claims**

1. A complex of the formula



(X)

wherein each R_1 is independently (a) the radical of a coupling component of the active methylene non-cyclic or homocyclic series, (b) the radical of a coupling component of the heterocyclic series or (c) the radical of a coupling component of the monocyclic benzene series, with the proviso that at least one R_1 is the radical of a coupling component of the active methylene non-cyclic or homocyclic series,

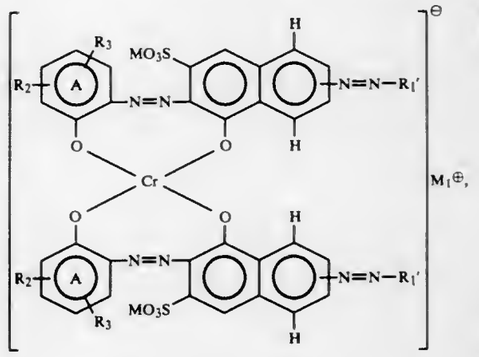
each R_2 is independently hydrogen, C_{1-4}alkyl or $—SO_2NR_4R_5$,

each R_3 is independently hydrogen, halo, C_{1-4}alkyl or $—SO_2NR_4R_5$, and

each M and $M_1\oplus$ is independently hydrogen or a cation,

wherein each R_4 is independently hydrogen, C_{1-4}alkyl or C_{2-3}hydroxyalkyl, and

each R_5 is independently hydrogen, C_{1-4}alkyl, C_{2-3}-hydroxyalkyl, cyclohexyl, cyclohexyl substituted by methyl, phenyl or phenyl substituted by methyl, with the proviso that at least one of Ring A and R_1 of each diasazo ligand bears an $—SO_2NR_4R_5$ group, a mixture of such complexes or a mixture of such a complex or mixture of complexes with at least one complex of the formula



wherein each R'_1 is independently (b) the radical of a coupling component of the heterocyclic series or (c) the radical of a coupling component of the monocyclic benzene series, and

each R_2, R_3, M and $M_1\oplus$ is as defined above, with the proviso that at least one of Ring A and R'_1 of each diasazo ligand bears an $—SO_2NR_4R_5$ group.

4,820,310

METHOD OF PRODUCING CHARACTERS, SYMBOLS, PATTERNS ON THERMOPLASTIC RESIN MOLDED ARTICLE BY RESERVE DYEING

Kiichiro Fukui, Fuji, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Filed Jan. 21, 1988, Ser. No. 146,535

Claims priority, application Japan, Jan. 21, 1987, 62-12117

Int. Cl.⁴ B05D *1/32*; B41M *1/30*

U.S. Cl. 8—456 **7 Claims**

1. A method of forming color-contrasted indicia on a surface of a molded thermoplastic article, which method comprises the steps of:

(a) covering preselected surface regions of molded thermoplastic article which correspond to indicia to be formed on said surface of said article with a removable covering material which does not substantially penetrate into said molded thermoplastic article yet is impenetrable to sublimative dye;

(b) effecting impregnation dyeing on said molded thermoplastic article surface in regions peripheral to said covered preselected surface regions by bringing said peripheral surface regions into contact with a sublimative dye having a color which contrasts to a color of said molded thermoplastic article, and allowing said sublimative dye to penetrate into the molded thermoplastic article to a desired depth below said peripheral surface regions; and then subsequently

(c) removing said covering material so as to expose said preselected surface regions of said molded thermoplastic article, whereby said color-contrasted indicia are formed on said surface of said molded thermoplastic article.

4,820,311

SOLID FORMULATION OF ANIONIC DYES CONTAINING AN ETHOXYLATED STEARYL DIPHENYLOXYETHYL DIETHYLENE-TRIAMINE

Ernst Tempel, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 25, 1988, Ser. No. 198,267

Claims priority, application Switzerland, Jun. 3, 1987, 2096/87

Int. Cl.⁴ C09B *67/02*

U.S. Cl. 8—524 **10 Claims**

1. A solid formulation comprising at least one water-soluble anionic dye and additional optional assistants, which formulation contains an ethoxylated stearyl diphenyloxyethyl diethylenetriamine in conjunction with at least one anionic dispersant.

4,820,312

PROCESS FOR DYEING TEXTILES MADE OF POLYESTER FIBER/WOOL BLENDS ON JET-DYEING MACHINES

Hans-Ulrich von der Eltz, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 27, 1987, Ser. No. 90,162

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629576

Int. Cl.⁴ D06P *3/82*; D06B *3/28*

U.S. Cl. 8—533 **1 Claim**

1. In a process for the batchwise dyeing of textile material consisting of a fibrous mixture which is circulating in the form of an endless rope in a jet-dyeing machine, with aqueous liquors jointly containing dyes suitable for each of the particular fiber type by the exhaust dyeing technique, the forward feed for the transport of the textile rope within the closed loop machine via the actuation of the jet system being effected by means of the kinetic energy of a circulating gas stream which is not inert with respect to the coloristic behavior of dyes and fiber material, and to which at the same time, in the jet section for driving the textile rope, the dyeing liquor or a treatment agent formulation being added in an atomized form and thus, having been brought therein into contact with the fibrous material under the preselected temperature and pressure conditions, are allowed to act together directly in the fixing state, the improvement which comprises: selecting a textile material composed of linear polyester fibers in a blend with wool, and modifying the above procedure—in order to avoid evenness problems and fastness losses on the wool portion of the textile material, whilst the different dyestuff types being simultaneously fixed at the respective fiber portions of the blend, and without necessitating addition of formaldehyde or other wool-protecting agents—such that following the isothermal addition of the dyeing liquor containing the dyes for the two fiber types and pH-regulants into the driving gas stream the textile material is subsequently treated therewith at the boil or at a temperature around 106° C. for 10–20 minutes, only then metering into the driving gas stream the dispersion/emulsion of a carrier in an amount sufficient to secure liquor exhaustion as to the polyester-type dyestuff under boiling temperature conditions, the carrier substance comprising substituted aromatics, phenols or salicylates or mixtures thereof, optionally further containing hydrocarbons, and finally completing the dyeing in the course of a further 10–30 minutes treatment therewith under isothermal conditions.

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4,820,313

COAL PROCESSING METHOD AND APPARATUS

John J. Kelmar, McKeesport, Pa., assignor to Kelmar Energy Corporation, McKeesport, Pa.

Filed Sep. 17, 1986, Ser. No. 908,270
Int. Cl.[4] C10L 5/00
U.S. Cl. 44—622 25 Claims

7. In the cleaning of raw, ungraded coal to separate sulphur, minerals and ash therefrom, the method comprising:

providing a mixture comprised at least of such coal and a pressure generating medium;

heating said mixture to a predetermined elevated temperature of approximately 300° to 500° C. and elevated pressure of approximately 3000 to 5000 PSI to internally pressurize individual coal particles;

rapidly depressurizing said mixture to create a pressure differential between interior and exterior regions of the coal particles; and

utilizing said pressure differential to fracture the carbon matrix of the coal particles for releasing and separating sulphur, minerals and ash from the coal while simultaneously reducing the coal to small particles.

14. The method as claimed in claim 7 wherein said mixture is provided additionally with selected oxidation inhibiting agent means.

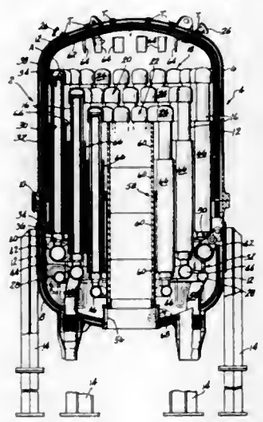
16. The method as claimed in claim 7 wherein said mixture is provided additionally with selected de-sulphurizing agent means.

4,820,314

FUEL CELL POWER PLANT REFORMER

Ronald Cohen, West Hartford; Ole L. Olesen; Joseph J. Faintani, both of South Windsor, and George T. Suljak, Vernon, all of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Feb. 11, 1987, Ser. No. 13,596
Int. Cl.[4] B01J 8/06; F22B 37/24
U.S. Cl. 48—94 15 Claims



1. For use in a fuel cell power plant, a catalytic reformer assembly for converting raw hydrocarbon fuel to a hydrogen-rich gaseous fuel, said reformer assembly comprising:

(a) a housing having a cylindrical side wall, a first dome-shaped end wall, and a second end wall opposite said first wall;

(b) a burner in said housing positioned coaxially with said housing side wall, said burner opening through said housing second wall and including a hot gas tube which extends toward said first wall of said housing;

(c) a plurality of catalyst tubes disposed in said housing, each of said catalyst tubes having a first closed end and an opposite second end, and each of said catalyst tubes being provided with a ceramic heat-insulating cover having an annular free edge and overlying said closed end of each catalyst tube, said covers extending a short distance toward said second ends of said catalyst tubes, said catalyst tubes being arranged in a plurality of circular arrays each of which is concentric with said burner, said arrays being disposed in tiers so that the first ends of all of the catalyst tubes in a first tier extend beyond the first ends of all the catalyst tubes in a second tier to the extent that a first imaginary plane containing the endmost point in each ceramic cover in said second tier is closer to said housing second wall than a secondary imaginary plane containing the annular free edges of each ceramic cover in said first tier; and

(d) at least one optical temperature sensor means mounted on said housing and focused on the portions of said catalyst tubes in said first tier which lie between said imaginary planes to monitor the temperature of catalyst tubes in said first tier.

10. For use in a fuel cell power plant, a catalytic reformer assembly for converting raw hydrocarbon fuel to a hydrogen-rich gaseous fuel, said reformer assembly comprising:

(a) a housing having a cylindrical side wall, a dome-shaped top wall, and a bottom wall;

(b) a burner in said housing positioned coaxially with said housing side wall, said burner opening through said housing bottom wall and being arranged to direct hot gases toward said top wall;

(c) a plurality of catalyst tubes disposed in said housing, said catalyst tubes being arranged in a plurality of circular tiers, each of which is concentric with said burner;

(d) a plurality of annular gaseous fuel manifolds in said housing proximate said housing bottom wall, each of said catalyst tube tiers being mounted on a respective one of said gaseous fuel manifolds, with the individual catalyst tubes being connected at their bottom ends to the gaseous fuel manifolds so that the hydrogen-rich gaseous fuel produced in said catalyst tubes is exhausted into said gaseous fuel manifolds from said catalyst tubes, said gaseous fuel manifolds being vertically offset one from another to provide the tiers in which said catalyst tubes are disposed;

(e) a plurality of radial spoke tubes interconnecting said gaseous fuel manifolds with each other to stabilize the positioning of said gaseous fuel manifolds with respect to each other, and to provide for flow of the gaseous fuel between the gaseous fuel manifolds; and

(f) hanger means for flexibly suspending said gaseous fuel manifolds from said housing side wall and above said housing bottom wall, said hanger means being constructed so as to automatically adjust to thermally induced expansion and contraction of said gaseous fuel manifolds during operation of the reformer assembly.

4,820,315

VACUUM LOADER AND PROCESS FOR REMOVING ASBESTOS AND OTHER PARTICULATE MATERIAL

Thomas M. DeMarco, 5815 N. Cicero, Chicago, Ill. 60646

Filed Nov. 27, 1987, Ser. No. 126,185
Int. Cl.[4] B01D 45/12
U.S. Cl. 55—1 19 Claims

1. A vacuum loader for removing asbestos hazardous material, and other particulate matter, comprising:

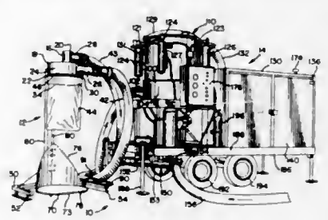
first separator means for partially dedusting and separating a substantial amount of particulates from a dusty fluid;

second separator means positioned downstream of and communicating with said first separator means for further dedusting and substantially removing the remaining particulates from said partially dedusted fluid;

first conduit means connected to and communicating with said first and second separator means for passing said partially dedusted fluid from said fluid separator means to said second separator means;

reinjection means located between and communicating with said first and second separator means, said reinjection means comprising a collection chamber positioned downstream of said second separator means for collecting particulates removed by said second separator means;

inlet conduit means comprising an influent vacuuming hose connected directly to and communicating with said collection chamber for vacuuming a dusty fluid containing particulates of asbestos or other material under a substantially continuous negative pressure and for passing said



dusty fluid containing said particulates to said collection chamber; and

second conduit means positioned downstream of said second separator means and connected to and communicating with said first separator means and said collection chamber for feeding and recycling said collected particulates and said dusty fluid from said collection chamber to said first separator means; and

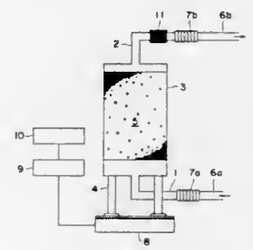
said reinjection means comprising substantially continuous air lock means for regulating ingress of said particulates into said collection chamber and for regulating egress of said dusty fluid and said particulates into said recycle hose.

4,820,316

METHOD OF FORESEEING BREAK-THROUGH IN GAS ADSORBING APPARATUS

Hisayuki Mizuno; Masao Miura; Hiroyuki Fukushima, all of Ube; Mamoru Miyamoto, Ichihara; Kyouhei Ohizumi, Ichihara, and Yoshio Nishimura, Ichihara, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan

Continuation of Ser. No. 774,294, Sep. 10, 1985, abandoned. This application Aug. 5, 1987, Ser. No. 82,932
Claims priority, application Japan, Sep. 11, 1984, 59-191267; Feb. 22, 1985, 60-35065; Jun. 28, 1985, 60-140209; Jul. 26, 1985, 60-165242
Int. Cl.[4] B01D 53/04
U.S. Cl. 55—18 6 Claims



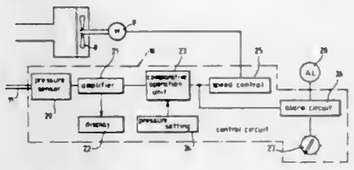
1. In a method for foreseeing breakthrough of a gas in a gas-adsorbing apparatus utilizing a gas-adsorbing material, said gas-adsorbing apparatus being connected to a gas-supplying pipe and a gas-discharging pipe, the improvement in which the gas-adsorbing apparatus is connected to the gas-supplying pipe and gas-discharging pipe both via a flexible or bendable tube and is mounted on a load-cell type weighing means, and the break-through is foreseen by detecting the weight of the gas adsorbed by the gas-adsorbing material in the gas-adsorbing apparatus using the load cell type weighing means and by emitting an alarm signal when the weight of the adsorbed gas in said apparatus measured by said weighing means reaches a predetermined weight level, the predetermined weight level being set in the range of 80 to 99% of the weight of adsorbed gas at which the break-through would start.

4,820,317

METHOD AND APPARATUS FOR CONTROLLING THE SUCTION PRESSURE IN A DUST COLLECTING DUCT

James Fahey, 99 New North Road, Edgerton, Huddersfield, West Yorkshire HD1 5QL, England

Continuation of Ser. No. 900,084, Aug. 25, 1986, Pat. No. 4,753,665. This application Dec. 7, 1987, Ser. No. 129,585
Claims priority, application Japan, Aug. 23, 1985, 60-186177
Int. Cl.[4] B01D 39/38
U.S. Cl. 55—21 1 Claim



1. A method for controlling the operation of a pneumatic dust, fiber or yarn collecting system comprising a plurality of suction heads connected into a duct; a motor driven suction device arranged to suck air through suction heads and said duct, and a filter located in the path of the airstream flowing through said suction heads and said duct, so that solid material entrained in said airstream is collected on said filter, wherein a physical characteristic of the air in said duct is detected upstream of the filter, and wherein an electrical signal is generated proportional to the detected physical characteristic; this generated electrical signal is compared with a predetermined value electric signal corresponding to the physical characteristic which would exist in said duct given the desired constant suction pressure, and wherein, if the generated signal varies from the reference signal, a speed control signal is issued to said driving motor to vary the speed of said motor to bring about restoration of the constant suction pressure in said duct to maintain suction pressure in said duct as near constant as possible.

4,820,318

REMOVAL OF ORGANIC COMPOUNDS FROM GAS STREAMS USING CARBON MOLECULAR SIEVES

Chin-Hsiung Chang, Palatine, and Gary J. Seminara, Chicago, both of Ill., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 24, 1987, Ser. No. 137,685
Int. Cl.[4] B01D 53/04
U.S. Cl. 55—68 15 Claims

1. A process for removing a volatile organic compound from a gas stream which comprises contacting the gas stream at adsorption-promoting conditions with a bed of an adsorbent comprising a carbon molecular sieve which has been manufactured by a method comprising the steps of:

(a) polymerizing a cross-linking agent and a precursor monomer, with both the cross-linking agent and the monomer being essentially free of molecular oxygen, and producing a cross-linked polymer;

(b) shaping a quantity of the polymer into an article having a desired configuration without employing a binder material; and,

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(c) carbonizing the resultant shaped article into a finished product comprising carbon molecular sieves and having a density of 0.7–1.05 gm/ml, an average pore volume of 0.4–0.8 cc/gm and having the same overall shape as the article.

4,820,319

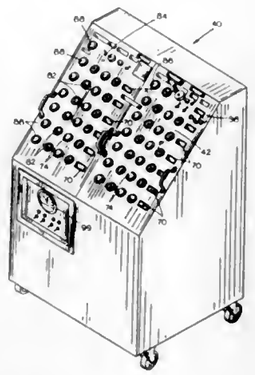
REMOTE CONTROL AND MONITOR MEANS

Steven C. Griffis, 2929 Ave. D, Council Bluffs, Iowa 51501

Continuation-in-part of Ser. No. 72,044, Jul. 10, 1987, Pat. No. 4,750,922. This application May 9, 1988, Ser. No. 191,567

Int. Cl.[4] B01D *46/02*

U.S. Cl. 55—213 **5 Claims**



1. In combination,
an enclosed work area in which an asbestos abatement action is taking place,
at least one air filtration unit in said enclosed space and having an intake end, a discharge end, a filter means positioned therebetween, and a powered blower fan means for pulling air therethrough,
a pressure differential sensing means in said air filtration unit for sensing the pressure differential between the intake and discharge sides of said filter means,
a remote control-monitor console means located remotely of said work area,
said console means having a first readout means for indicating the said pressure differential,
and first means operatively connecting said pressure differential sensing means and said first readout means whereby the condition of said filter means may be monitored at said console means without entering said work area.

4,820,320

COMPACT DUST COLLECTOR

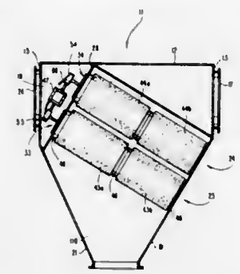
Donald G. Cox, 14 Briar Patch Rd., Bargersville, Ind. 46106

Filed Feb. 16, 1988, Ser. No. 156,037

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—302 **18 Claims**

1. A dust collector comprising:
a housing having an upper wall, side walls depending from said upper wall, and an entrance opening and an exit opening;
filtering means mounted within said housing and operable to filter air moving in a first direction therethrough, said filtering means comprising at least two substantially parallel rows of filter elements including a lowermost row, wherein filter elements within said lowermost row are vertically staggered with respect to all upper filter elements within an adjacent row located immediately thereabove;
pulsing means operably associated with said filtering means and operable to direct pulses of pressurized air flow in a direction opposite from said first direction and of a magnitude greater than said air moving in said first direction through said filter means dislodging foreign particulate matter from said filter means, said housing having a lowermost portion positioned to receive said foreign particulate matter from said filter means as said pulsing means dislodges same; and,
transfer means in said lowermost portion of said housing for transferring said particulate matter from within said lowermost portion to a location exterior to said housing.



4,820,321

METHOD AND APPARATUS FOR FABRICATING AN EXPANDED BEAM CYLINDRICALLY TERMINATED OPTICAL FIBER TAPER

Herman M. Presby, Highland Park, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 13, 1987, Ser. No. 85,048

Int. Cl.[4] C03B *37/025*

U.S. Cl. 65—2 **4 Claims**



1. A method of fabricating expanded beam optical fiber tapers, the method comprising the steps of:
(a) fixedly mounting a first and a second opposite end of a reduced diameter preform rod in a first and second selectively rotatable holding means, respectively, where the reduced diameter optical preform rod comprises (1) a single core of predetermined uniform diameter including a material with a first index of refraction, a cladding layer of a material with a second index of refraction surrounding the core, and (3) an external diameter that is greater than the external diameter of a standard optical fiber but less than the external diameter of a standard optical preform rod;
(b) heating a circumference of a predetermined portion at an intermediate point of the reduced diameter optical preform rod with a uniform heat to a predetermined temperature;
(c) applying a longitudinal pulling force to the first end of the reduced diameter optical preform rod at a first predetermined uniform rate when the predetermined temperature is attained for (1) first forming a longitudinal elongation at the intermediate point that evolves into a first and a second inwardly directed taper on either side of the intermediate point, with each taper including a configuration that prevents mode conversion in a lightwave signal when propagating therethrough, and (2) then, with the continued application of the uniform rate pulling force to the first end of the reduced diameter preform rod, forming a short predetermined length cylindrical central section between the two narrow ends of the first and second tapers including a diameter smaller than that of the cylindrical end sections of the reduced diameter optical preform rod and corresponding to a standard diameter optical fiber;
(d) concurrent with achieving the short cylindrical central section in step (c), longitudinally moving the predetermined portion of the reduced diameter preform rod being heated towards one of the tapers and in the direction from the second end toward the first end at a second predetermined uniform rate, which second predetermined uniform rate is slower than the first predetermined uniform rate, concurrent with the continued application of the first predetermined uniform pulling rate force on the first end of the reduced diameter optical preform rod of step (c), to provide material from the reduced diameter optical preform rod for extending the length of the cylindrical central section while maintaining the configuration of each preciously formed taper and the diameter of the cylindrical central section; and
(e) severing the reduced diameter rod into two said fiber tapers by severing said rod at said cylindrical central section.

4,820,322

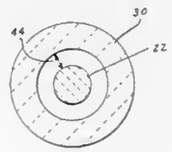
METHOD OF AND APPARATUS FOR OVERCLADDING A GLASS ROD

Jerry W. Baumgart, Norcross; Anthony T. D'Annessa, Marietta, both of Ga.; Franz T. Geyling, Morristown, N.J.; William M. Flegal, Tucker, Ga., and Thomas J. Miller, Belle Mead, N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill and AT&T Technologies, Inc., Berkeley Heights, both of, N.J.

Continuation of Ser. No. 856,739, Apr. 28, 1986, abandoned. This application Sep. 23, 1987, Ser. No. 99,441

Int. Cl.[4] C03B *37/025*

U.S. Cl. 65—3.11 **23 Claims**



1. A method of providing an overclad optical preform in which an overcladding is disposed substantially concentrically about a core of an optical preform rod, said method including the steps of:
providing a substantially straight optical preform rod which includes a core and a cladding which has an outer diameter and a longitudinal axis;
providing an overcladding tube which is made of an optical material having suitable optical and geometrical characteristics and which has an inner diameter with the difference between the inner diameter of the tube and the outer diameter of the rod being relatively small, said overcladding tube having a longitudinal axis;
causing the preform rod to become disposed within the tube and then holding the preform rod at one end and the tube at an opposite end in positions fixed relative to each other in directions along the longitudinal axes thereof; and
subjecting successive increments of length of the tube with the rod disposed therein to a relatively narrow zone of heat having a controlled temperature gradient; while
causing a pressure gradient between the outside and the inside of the tube to be established and to be maintained with the pressure outside being substantially greater than that inside, the pressure gradient in cooperation with the relatively narrow zone of heat and the relatively small difference between the inner diameter of the tube and the outer diameter of the rod being effective to cause the tube to collapse substantially into engagement with the preform rod and with the overcladding tube being disposed substantially concentrically about the core of the preform rod, the difference between the inner diameter of the tube and the outer diameter of the rod being sufficiently small to prevent substantially any buckling of the tube as the tube is caused to collapse onto the rod.

4,820,323

METHOD OF FABRICATING OPTICAL WAVEGUIDES FOR THE MIDINFRARED PORTION OF THE SPECTRUM

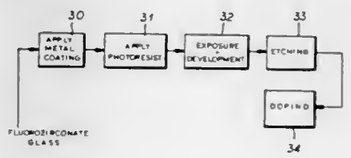
Carlo DeBernardi, and Eros Modone, both of Turin, Italy, assignors to Centro Studi e Laboratori Telecomunicazioni Spa, Turin, Italy

Filed Sep. 25, 1987, Ser. No. 101,186

Claims priority, application Italy, Sep. 25, 1986, 67732 A/86

Int. Cl.[4] C03C *21/00*

U.S. Cl. 65—3.12 **7 Claims**



1. A method of making an optical midinfrared waveguide, comprising the steps of:
masking a surface of a fluorozirconate glass substrate having a composition substantially of:

$$ZrF_4{:}BaF_2{:}TrF_3{:}X_aF_b$$

wherein Tr is a rare earth element, X is an atom of an element whose concentration in the glass of the substrate determines the refractive index or whose concentration variation determines the refractive index variation of the substrate, and a and b are respectively the numbers of atoms of X per molecule and the number of atoms of F bonded to X to satisfy the valence sites thereof, at predetermined regions and exposing at least one other region of said surface; and
diffusing into said other region of said surface under an electric field, while said other region of said surface is exposed, a dopant consisting of at least one cation bonded to fluoride, selected from the group which consists of AlF_3, PbF_2, BiF_3, LiF and NaF, and capable of increasing the refractive index in said other region, thereby forming an optical midinfrared waveguide in said other region while the predetermined regions at which said surface was masked do not form an optical midinfrared waveguide.

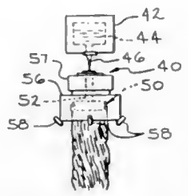
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4,820,324

GLASS CORROSION RESISTANT COBALT-BASED ALLOY HAVING HIGH STRENGTH

David J. Gaul, and Dennis L. McGarry, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 18, 1987, Ser. No. 29,824
Int. Cl.[4] C03B *37/04*
U.S. Cl. 65—8 19 Claims



1. As a composition of matter a glass corrosion resistant, high strength alloy consisting essentially of the following elements in the approximate ranges indicated in percent by weight:

Element	Range
Cr	30 to 40%
Ni	5 to 15%
W	4 to 7%
Ta	2 to 5%
Zr	0.1 to 0.4%
Si	0.01 to 0.15%
C	0.5 to 1.0%
B	0.005 to 0.04%
Y	0.5 to 1.5%
Co	Balance

and wherein said alloy is free of Hf and wherein said alloy contains 0–1% by weight of iron.

14. In a method of making mineral or glass fibers comprising passing molten material through a foraminous wall of a metal alloy spinner to form such fibers, the improvement wherein the spinner comprises a high strength alloy, said alloy being of the composition of claim 1.

4,820,325

TREATMENT OF TOXICANT-IMPREGNATED FILTER CAKE

Donald R. Wheeler, Nashville, Tenn., assignor to Stauffer Chemical Company, Shelton, Conn.

Filed Oct. 22, 1987, Ser. No. 111,828
Int. Cl.[4] C03B *5/00*; C03C *3/04*
U.S. Cl. 65—27 7 Claims

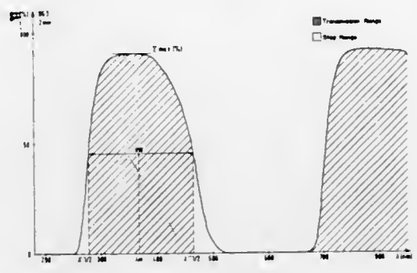
1. A process for the fixation of a normally leachable toxicant within a filter cake formed of a glass precursor material, thereby rendering the toxicant substantially more non-leachable therefrom, which comprises forming a filter cake of siliceous glass precursor material having toxicant material entrapped therein, heating the filter cake containing the toxicant to fusion temperature to form a molten composition, and cooling said molten composition to form a glass containing the toxicant.

4,820,326

METHOD FOR PRODUCING SOLARIZATION-STABLE ULTRAVIOLET FILTER GLASSES FOR THE 280-500 NM TRANSMISSION RANGE

Burkhard Speit, Mainz, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 136,191
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 364342
Int. Cl.[4] C03C *3/076, 8/10*
U.S. Cl. 65—30.11 3 Claims



1. A process for reducing the solarization effect in an alkali silicate glass for the 280–500 nm transmission range, comprising the steps of:
forming an alkali silicate glass having the composition:
SiO_2: 52–71% by weight
B_2O_3: 0–17.5% by weight
Al_2O_3: 0–3.0% by weight
PbO: 2.5–17.0% by weight
SnO_2: 0.1–1.7% by weight
Na_2O: 5.0–18.5% by weight
K_2O: 0.5–10.0% by weight
ZnO: 0 10.5% by weight
$MgO+CaO+SrO+BaO$: 0–8.6% by weight
$\Sigma NiO+CoO$: 0.1–4.4% by weight
$\Sigma As_2O_3+Sb_2O_3$: 0.05–0.5% by weight,
said alkali silicate glass further including a refining agent selected from the group consisting of F^-, As^2O^3, Sb_2O_3 and a combination thereof;
reinforcing the refining action produced by said refining agent in said forming step wherein said alkali silicate glass further includes a composition for reinforcement being employed in a quantity of up to 0.3% by weight of said alkali silicate glass and selected from a member of the group consisting of SO_3, NH_4Cl and a combination thereof; and,
coloring said alkali silicate glass with a member selected from the group consisting of Co^{2+} and (Co^{2+} and Ni^{2+}) for use as a solarization-stable UV filter glass in said transmission band.

4,820,327

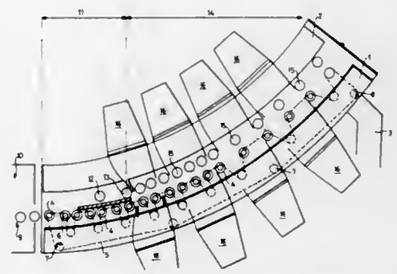
BENDING AND TEMPERING OF GLASS PLATES ADVANCING ON A SHAPING BED CURVED IN THE DIRECTION OF ADVANCE

Bernard Letemps, Thourotte, France, and Ignacio Gonzalez-Blasqnez, Tarragone, Spain, assignors to Saint-Gobain Vitrage, Courbevole, France

Filed Oct. 1, 1987, Ser. No. 103,413
Claims priority, application France, Oct. 1, 1986, 86 13704
Int. Cl.[4] C03B *23/033*
U.S. Cl. 65—104 19 Claims

1. A process for bending and tempering glass plates, comprising the steps of:
bending a heated glass plate by moving the glass plate to be bent at a speed of at least 10 cm/second along the top of a bed of rollers defining a path curved in the direction of movement of the glass plate, said curvature defining an upwardly facing concavity, without contacting the surface of said glass plate opposite said bed of rollers during the normal passage of said glass plate along said rollers, whereby the glass sheet acquires a curved profile corresponding to that of said bed;
advancing said glass plate through a tempering zone, which step of advancement includes contacting said glass plate at the face opposite said bed of rollers with an upper roller means; and
tempering said bent glass plate.

7. A machine for bending and tempering glass plates, comprising:
a bed formed of an array of lower rollers, said bed being curved in the direction of the length of the array to define an upturned concavity, said bend comprising, at its upstream end, a bending zone, and downstream thereof a tempering zone;



means for feeding glass plates of a predetermined thickness to one end of said bed such that the glass plates move along the top of said lower rollers, the bed, in said bending zone, being so constructed so as to be free of any structure which would contact the glass plates on the surface opposite that in contact with the lower rollers, save for a roller means located opposite said lower rollers at the boundary between said bending and said tempering zone, which said roller means contacts the glass plate from above so as to advance it into the tempering zone;
means for providing tempering air to said tempering zone;
means for driving said lower rollers and said roller means so as to advance a glass plate along said bed at a minimium speed of 10 cm/second.

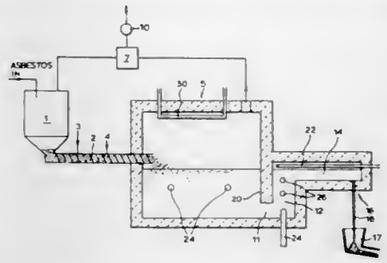
4,820,328

VITRIFICATION OF ASBESTOS WASTE

David Roberts, Washington, D.C., and Johnson H. Stuart, Sheffield, England, assignors to King Taudevin & Gregson (Holdings) Limited, Sheffield, England

Continuation-in-part of Ser. No. 899,630, Aug. 25, 1986, Pat. No. 4,678,493, which is a continuation of Ser. No. 672,475, Nov. 16, 1984, abandoned. This application Jul. 2, 1987, Ser. No. 69,179
Claims priority, application United Kingdom, Nov. 21, 1983, 8331031
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[4] C03B *5/02*; C03C *3/087*
U.S. Cl. 65—134 15 Claims

1. A process for converting waste asbestos into a glass which comprises:
heating within an electrical glass melting furnace a body of molten glass so as to maintain said body of molten glass at a temperature above the decomposition temperature of asbestos;
supplying asbestos to the furnace by conveyor means discharging above the body of molten glass so that the asbestos falls onto the molten glass and becomes decomposed and is melted to glass, the asbestos that has fallen onto the molten glass being subjected for a sufficient period to a temperature above its decomposition temperature that it is completely melted and becomes part of the body of molten glass and the asbestos being supplied in an amount such that a substantial proportion of the molten glass in



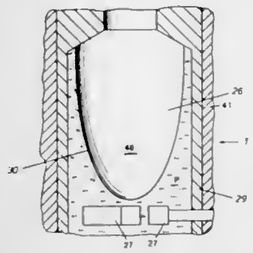
said body is derived therefrom, wherein said conveyor means discharges the asbestos into a melting chamber containing partition means contacting the body of molten glass and defining a submerged throat in said furnace; and withdrawing molten glass from the furnace at a temperature of at least 1000° C.

4,820,329

METHODS FOR THE BATCHWISE PRODUCTION OF GLASS

Franz Günthner, Mainz-Lerchenberg, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 735,404, May 17, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 936,938
Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418284
Int. Cl.[4] C03B *5/14*
U.S. Cl. 65—134 13 Claims



1. A process for the production of molten glass for subsequent processing from batches of solid glass pieces by a series of melting, refining and discharging operations, comprising the steps of:
providing a plurality of similar vessels for retaining the glass, each vessel having heating electrodes positioned adjacent the bottom thereof and closable opening in the bottom thereof for discharging the glass into a distribution system;
performing all of said operations in a single vessel for each batch of glass:
for each batch of glass, melting a mass of solid glass pieces comprising the glass for one batch by covering the electrodes of the vessel with the mass of solid glass pieces and heating the mass of solid glass pieces to produce a mass of molten glass;
retaining the entire mass of molten glass for the one batch in

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a single vessel, and while keeping the electrodes completely immersed in the mass of molten glass in the single vessel, performing the refining step by rotating the vessel at a speed sufficient to produce a parabolic surface on the mass of molten glass through which parabolic surface occluded gas bubbles escape as the glass is refined;

stopping rotation of the vessel after sufficient refining, and

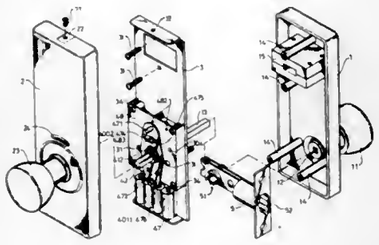
discharging the entire batch of refined glass after stopping the vessel.

4,820,330

STRUCTURE FOR CONTROLLING THE DEAD BOLT USED IN AN ELECTRONIC LOCK

Jui-Chang Lin, Kaohsiung, Taiwan, assignor to Jeun-Knen Lee, Taipei, Taiwan and In-Jyh Liou

Filed Jul. 30, 1987, Ser. No. 79,418
Int. Cl.[4] E05B *47/00*
U.S. Cl. 70—277 17 Claims



1. An electronic lock apparatus for a door or the like having an inside and an outside comprising:

a movable dead bolt;

an outside cover on the outside of the door including an outside turning knob and an outside square shaft extending inwardly of the door from said outside knob and turning therewith;

an engaging disc which is engaged by said outside square shaft and which turns therewith;

a base plate on the inside of the door which is coupled to said outside cover such that said base plate and said outside cover are held in place on the door;

an inside cover which is attached to said base plate, said inside cover including a cover slot, an inside turning knob, and an inside square shaft extending inwardly toward said outside square shaft from said inside knob and turning therewith;

an engaging base which is coupled to said dead bolt to move said dead bolt when said engaging base is rotated, said engaging base also being engaged with said inside square shaft to be rotated thereby and being disposed adjacent said engaging disc of said outside shaft;

a moving base which engages said engaging base and which is movable into and out of engagement with said engaging disc;

an urging means for resiliently urging said moving base into engagement with said engaging disc;

a control means provided between said inside cover and said base plate and including a portion extending through the cover slot provided in said inside cover and being movable between an open setting and a closed setting, said control means allowing said urging means to move said moving base into engagement with said engaging disc when said portion of said control means is in the open setting and said control means moving said moving base out of engagement with said engaging disc when said portion of said control means is in the closed setting whereby said inside knob is always capable of rotating said engaging base and said outside knob is capable of rotating said engaging base when said portion of said control means is in the open setting but is not ordinarily capable of rotating said engaging base when said portion of said control means is in the closed setting; and

a sensor located adjacent said outside cover which senses a predetermined correct enabling mechanism and which actuates a sensor moving means for allowing said urging means to move said moving base temporarily into engagement with said engaging disc such that said outside knob is temporarily capable of rotating said engaging base when said portion of said control means is in the closed setting.

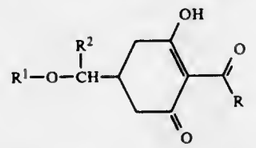
4,820,331

CYCLOHEXENONE DERIVATIVES USEFUL FOR REGULATING PLANT GROWTH

Michael Keil, Freinsheim; Ulrich Schirmer, Heidelberg; Dieter Kolassa, Ludwigshafen; Juergen Kast, Iggelheim; Wilhelm Rademacher, and Johann Jung, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,451
Int. Cl.[4] A01N *43/16, 35/02;* C07D *309/12;* C07C *49/543*
U.S. Cl. 71—88 13 Claims

1. A cyclohexenone derivative of the formula I



(I)

where R is C_1–C_6-alkyl, cyclopropyl, phenyl or C_2–C_6-alkyoxyalkyl, R^1 is hydrogen, tetrahydropyran-2-yl, benzoyl or unsubstituted or halosubstituted C_1–C_6-alkanoyl, and R^2 is hydrogen or C_1–C_6-alkyl, and phyto-physiologically tolerable salts thereof.

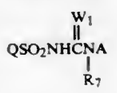
4,820,332

HERBICIDAL SULFONAMIDES

Mark E. Thompson, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

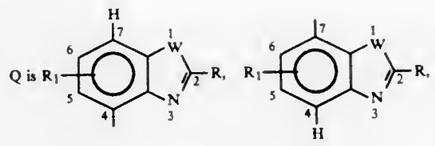
Division of Ser. No. 743,303, Jun. 13, 1985, Pat. No. 4,643,759, which is a continuation-in-part of Ser. No. 630,895, Jul. 13, 1984, abandoned. This application Oct. 30, 1986, Ser. No. 925,034
Int. Cl.[4] C07D *403/12, 417/12;* A01N *43/70, 43/68*
U.S. Cl. 71—90 31 Claims

1. A compound of the formula



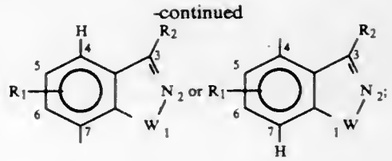
1

wherein



Q-1 Q-2

-continued



Q-3 Q-4

W_1 is O or S;

R_7 is H or CH_3;

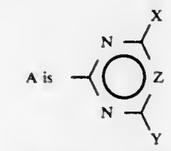
R is H, C_1–C_4 alkyl optionally substituted with 0–3 halogen atoms selected from 1–3 F, 1–2 Cl or 1 Br, C_1–C_4 alkylthio, C_1–C_4 alkoxy, CH_2OCH_3, $CH_2CH_2OCH_3$ or CH_2SCH_3;

R_1 is H, halogen, C_1–C_3 alkyl, C_1–C_3 haloalkyl, nitro, C_1–C_3 alkoxy, di(C_1–C_2)alkylaminosulfamoyl, C_1–C_3 alkylthio, C_1–C_3 haloalkoxy, C_1–C_3 haloalkylthio, cyano, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, C_2–C_3 alkoxycarbonyl, CH_2OCH_3, CH_2SCH_3 or CH_2CN;

R_2 is H or CH_3;

W is O, S or NR_3;

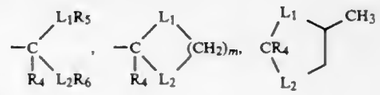
R_3 is H or CH_3;



A-1

X is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkoxy, C_1–C_3 haloalkyl, C_1–C_3 haloalkylthio, C_1–C_3 alkylthio, C_2–C_3 alkoxyalkyl, C_2–C_3 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3)alkylamino;

Y is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkoxy, C_1–C_3 haloalkylthio, C_1–C_3 alkylthio, halogen, C_2–C_3 alkoxyalkyl, C_2–C_3 alkoxyalkoxy, amino C_1–C_3 alkylamino, di(C_1–C_3)alkylamino, C_3 alkenyloxy, C_3 alkynyloxy, C_2–C_3 alkynyl, C_2–C_3 alkylthioalkyl, C_2–C_3 alkylsulfinylalkyl, C_2–C_3 alkylsulfonylalkyl, C_1–C_3 haloalkyl, cyclopropyl, C(O)R_4,



or $N(OCH_3)CH_3$;

m is 2 or 3;

L_1 and L_2 are independently O or S;

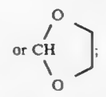
R_4 is H or CH_3;

R_5 and R_6 are independently C_1–C_2 alkyl;

Z is N;

and their agriculturally suitable salts; provided that

(a) when W_1 is S, then R_7 is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$



;

(b) X or Y is other than OCF_2H;

(c) when R_1 is di(C_1–C_2)alkylaminosulfamoyl or C_2–C_3 alkoxycarbonyl, then Q is Q-1 and R_1 is in the 5-position; or Q is Q-2 and R_1 is in the 6-position; and

(d) when the total number of carbon atoms of X and Y is greater than four, then the number of carbon atoms of R is less than or equal to two, and the number of carbon atoms of R_1 is less than or equal to two.

14. An agriculturally suitable composition for controlling the growth of undesired vegetation comprising an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

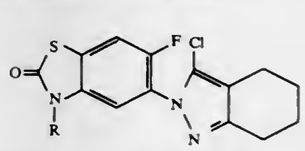
4,820,333

INDAZOLE COMPOUNDS, AND THEIR PRODUCTION AND USE

Toru Haga, Takarazuka; Eiki Nagano, Nishinomiya; Kouichi Morita, and Ryo Sato, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 29, 1987, Ser. No. 8,314
Claims priority, application Japan, Jan. 29, 1986, 61-19044; Apr. 7, 1986, 61-79661; Apr. 7, 1986, 61-79662; Apr. 7, 1986, 61-79663; Apr. 9, 1986, 61-81420; Apr. 9, 1986, 61-81421
Int. Cl.[4] C07D *417/02;* H01N *43/82*
U.S. Cl. 71—90 8 Claims

1. A compound of the formula:



wherein R is a C_1–C_5 alkyl group, a C_3–C_4 alkenyl group, a C_3–C_4 alkynyl group or a C_1–C_3 alkoxy(C_1–C_2alkyl group.

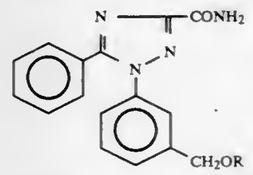
4,820,334

1,2,4-TRIAZOLE-3-CARBOXAMIDE COMPOUND AND A HERBICIDAL COMPOSITION CONTAINING THE SAME

Takafumi Shida; Shiro Yamazaki, and Hiroyasu Shinkawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 918,111
Claims priority, application Japan, Oct. 25, 1985, 60-239151; Aug. 7, 1986, 61-185940; Oct. 9, 1986, 61-239092
Int. Cl.[4] A01N *43/653;* C07D *249/10*
U.S. Cl. 71—92 9 Claims

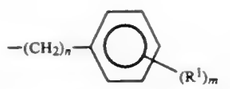
1. A 1,2,4-triazole-3-carboxamide compound represented by the formula (I):



(I)

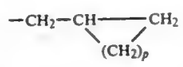
wherein R represents a straight-chain or branched-chain saturated (C_2–C_{10})alkyl group which is unsubstituted or substituted by fluorine atom(s); a cyclic saturated (C_3–C_{10})alkyl group which is unsubstituted or substituted by fluorine atom(s); a straight-chain, branched-chain or cyclic unsaturated (C_3–C_{10})alkyl group which is unsubstituted or substituted by fluorine atom(s); a group represented by the formula (II):

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(II)

wherein R^1 represents a halogen atom, a (C_1–C_3)alkyl group, a (C_1–C_3)alkoxy group or a fluorine-substituted (C_1–C_3)alkyl group, m is an integer of from 0 to 5 and n is 0 or 1; a straight-chain or branched-chain saturated (C_1–C_8)alkoxy(C_2–C_{10})alkyl group; a straight-chain or branched-chain unsaturated (C_1–C_8)alkoxy(C_2–C_{10})alkyl group; a phenoxy(C_2–C_6)alkyl group; an aralkoxy(C_2–C_6)alkyl group; a phenoxy(C_2–C_6)alkyl group having phenyl group(s) substituted by halogen atom(s) or (C_1–C_3)alkyl group(s); an aralkoxy(C_2–C_6)alkyl group having phenyl group(s) substituted by halogen atom(s) or (C_1–C_3)alkyl group(s); a [(C_1–C_8)alkoxy(C_2–C_{10})alkoxy](C_2–C_{10})alkyl group; or a group represented by the formula (III):



(III)

wherein p is an integer of from 1 to 8.

4,820,335

1-SUBSTITUTED IMIDAZOLE-5-CARBOXYLIC ACID DERIVATIVES, THEIR PREPARATION AND THEIR USE AS BIOCIDES

Thomas Maier, Frankfurt am Main; Roland Schmierer, Gersthofen; Klaus Bauer, Rodgau; Hermann Bieringer, Eppstein/-Taunus; Helmut Bürstell, Frankfurt am Main, and Burkhard Sachse, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 547,937, Nov. 2, 1983, abandoned. This application May 27, 1986, Ser. No. 867,813

Int. Cl.[4] A01N *43/50;* **C07D** *211/70*

U.S. Cl. 71—92 **12 Claims**

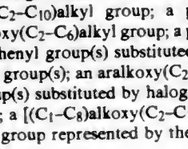
1. A 1-substituted imidazole-5-carboxylic acid derivative of the formula (I)

(I)

in which

X is O,

R^1 is hydrogen, phenyl, C_2–C_6-alkenyl or C_1–C_{12}-alkyl, the latter being unsubstituted or substituted by halogen or up to three C_1–C_6-alkoxy or C_1–C_3-dialkylamino groups, and if X is N, two identical or different radicals R^1 are attached to N, or, if X is O or S, R^1 also is a metal cation or ammonium, and R^2 is a radical of the formula (II)



(II)

in which

R^3 and R^4 independently of one another is a C_1–C_4-alkyl group, and each R^5 is identical or different and is a H, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen.

3. A process for treating plants, which comprises applying an effective amount of the compound according to formula I of claim 1 to the plants or a cultivated area of the plants to be treated.

4,820,336

HERBICIDAL SPRAY MIXTURES

Stanley Tocker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 741,625, Jun. 5, 1985, abandoned. This application Jan. 7, 1987, Ser. No. 1,335

Int. Cl.[4] A01N *43/707, 33/06*

U.S. Cl. 71—93 **7 Claims**

1. In a method for controlling unwanted vegetation, which method comprises:

(1) combining in an aqueous medium (a) an agriculturally useful formulation coprising metribuzin, and (b) an aromatic hydrocarbon-based, emulsifiable, grass-killing trifluralin herbicide formulation to produce a formulation mixture in which crystal growth of metribuzin occurs over time; and

(2) spraying the formulation mixture onto a locus on which the control of unwanted vegetation is desired, the improvement comprising;

including in the formulation mixture, in an amount effective to retard the crystal growth of metribuzin, the compound 4-amino-6(1,1 dimethylethyl)-3-(ethyllthio)-1,2,4-triazine-5(4H)-one.

4,820,337

1-(2-OXYAMINOSULPHONYLPHENYLSULPHONYL)-3-TRIAZINYL-UREAS

Hans-Joachim Diehr; Christa Fest, both of Wuppertal; Rolf Kirsten, Monheim; Joachim Kluth, Langenfeld; Klaus-Helmut Müller, Duesseldorf; Theodor Pfister, Monheim; Uwe Priesnitz, Solingen; Hans-Jochem Riebel, Wuppertal; Wolfgang Roy, Langenfeld; Hans-Joachim Santel, Cologne, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

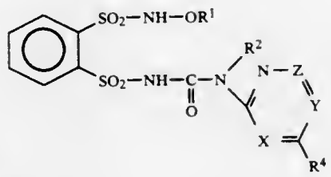
Continuation-in-part of Ser. No. 769,224, Aug. 23, 1985, Pat. No. 4,666,505, and Ser. No. 889,978, Jul. 24, 1986. This application Mar. 24, 1987, Ser. No. 30,195

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431929; May 25, 1985, 3518876; Aug. 6, 1985, 3528100

Int. Cl.[4] C07D *251/42, 251/48, 251/18;* **A01N** *43/66*

U.S. Cl. 71—93 **4 Claims**

1. A 1-(2-oxyaminosulphonylphenylsulphonyl)-3-triazin-yl-urea of the formula (I)



in which

R^1 represents C_1–C_{12}-alkyl (which is optionally substituted by fluorine, chlorine, cyano, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkyl-carbonyl, C_1C_4-alkoxy-carbonyl, C_1–C_4-alkylaminocarbonyl or di-(C_1–C_4-alkyl)-amino-carbonyl), or represents C_3–C_6-alkenyl (which is optionally substituted by fluorine, chlorine or bromine), C_3–C_6-alkinyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C_1–C_2-alkyl or phenyl-C_1–C_2-alkyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl), or represents benzhydryl, or represents phenyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, C_1–C_2-fluoroalkoxy, C_1–C_4-alkylthio, trifluoromethylthio or C_1–C_4-alkoxy-carbonyl,

R^2 represents hydrogen or C_1–C_4-alkyl (which is optionally substituted by fluorine, chlorine, cyano, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkyl-carbonyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkylamino-carbonyl or di-(C_1–C_4-alkyl)-aminocarbonyl), or represents C_3–C_6-alkenyl, C_3–C_6-alkinyl or phenyl-C_1–C_2-alkyl (which is optionally substituted by fluorine, chlorine, nitro, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl),

R^4 represents hydrogen, fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkylthio (which is optionally substituted by fluorine and-/or chlorine), amino, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)amino,

X represents nitrogen,

Y represents nitrogen,

Z represents an optionally substituted methine bridge C–R^6, and

R^6 represents hydrogen, fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkylthio (which is optionally substituted by fluorine and-/or chlorine), amino, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino.

4. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1 and a diluent.

4,820,338

MAGNETIC POWDER COMPOSITION

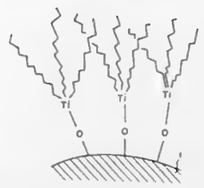
Kumi Ochiai, Yokohama; Hiromichi Horie, Yokosuka; Itsuo Arima, Kawasaki, and Mikio Morita, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 660,930, Oct. 15, 1984, abandoned. This application Nov. 17, 1986, Ser. No. 930,942

Claims priority, application Japan, Nov. 16, 1983, 58-215237

Int. Cl.[4] H01F *1/09, 1/26*

U.S. Cl. 75—233 **15 Claims**



1. A magnetic powder core consisting essentially of:

(a) a powder of a soft magnetic metal or alloy, or a mixture of these, said magnetic metal or alloy comprising pure iron, alloys of Fe—Si, Fe—Al, Fe—Si—Al, Fe—Ni or Fe—Co, or an amorphous magnetic alloy selected from the group consisting of at least one element of Fe, Co, Ni, Nb, and at least one element of Si, B, and C, and said powder having an average particle size of 10–300 μm;

(b) an electrically insulating binder polymer for binding the powder; and

(c) a coupling agent consisting of an organo-metallic compound for coupling the powder and the binder polymer, said coupling agent being selected from the group consisting of (i) a titanium coupling agent having the formula:

$$R_m—Ti—X_n$$

wherein R is a readily hydrolyzable group selected from the group consisting of a monoalkoxy, hydroxyacetic acid and ethylene glycol group; X is a lipophilic hydrocarbon group which is not readily hydrolyzable, and m and n are positive integers such that $4 \leqq m+n \leqq 6$ and $1 \leqq m \leqq 4$,; (ii) a silane coupling agent having the formula:

wherein RO is a lower alkoxy group, X is an organo-functional group, and n is 2 or 3; and (iii) an aluminum coupling agent having the formula:

$$(RO)_n—Al—X_{3-n}$$

wherein RO is an alkoxyl group, X is a lipophilic group, and n is 1 or 2.

4,820,339

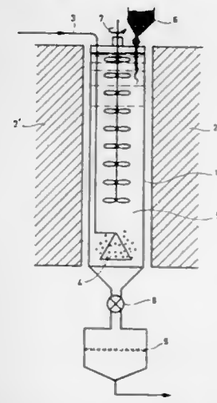
PRODUCTION OF METAL POWDERS BY REDUCTION OF METAL SALTS IN FUSED BATH

Gérard-Pierre Bleuveau, Sevrar; Bernard Chaleat, Norcier; Dominique Dubruque, Boane; Jean-Claude Girardot, and Philippe Vaxelaire, both of Ville La Grand, all of France, assignors to Cerex, Annemasse, France

Filed Jun. 9, 1987, Ser. No. 59,700

Int. Cl.[4] C22B *27/00*

U.S. Cl. 75—0.5 BB **18 Claims**



1. A process for the production of a metal by reduction of a salt of said metal, said process comprising providing a reducing metal dissolved in a bath of fused metal salts and adding the salt to be reduced under conditions in which the reducible metal in the state of reduced metal is immiscible in the bath in the presence of the reducing metal in the state of salt dissolved in said bath, said reducing metal being introduced into said bath in the state of a mixture with a halide of another metal forming with the halide of said reducing metal a eutectic mixture which constitutes said bath.

4,820,340

METHOD FOR SLAG FUMING AND REDUCTION

Gregory G. Richards, Burnaby; Steven L. Cockcroft, Delta; James K. Brimacombe, Vancouver, and Gerald W. Toop, Trail, all of Canada, assignors to Cominco Ltd and University of British Columbia, both of Vancouver, Canada

Filed Aug. 17, 1987, Ser. No. 86,412

Claims priority, application Canada, Aug. 18, 1986, 516181

Int. Cl.[4] C22B *13/00*

U.S. Cl. 75—24 **7 Claims**

1. The method for the fuming of metallurgical slag contain-

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ing non-ferrous metal values including zinc and lead which method includes feeding molten slag to a furnace and injecting a fuel/reductant and an oxygen-bearing gas into said molten slag through a multiplicity of tuyeres in amounts sufficient to volatilize the volatile constituents in the slag, characterized in that a portion of said fuel/reductant is injected with a gas at a ratio between said fuel/reductant and said gas in the range of about 25 to 35 kg fuel/reductant per normal m^3 gas into said molten slag through at least one high-velocity tuyere at a velocity greater than the velocity of said fuel/reductant and oxygen-bearing gas injected through the remaining tuyeres, said velocity through said at least one high velocity tuyere being in the range of about 50 to 115 m/s at a pressure in the range of about 400 to 700 kN/m^2, for contact with and entrainment of the fuel/reductant into said molten slag.

4,820,341

PROCESS FOR PRODUCING SILICON OR FERROSILICON IN A LOW-SHAFT ELECTRIC FURNACE

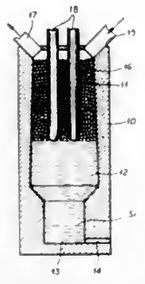
Gert-Wilhelm Lask, Berus, Fed. Rep. of Germany, and Robert Nooden, Terre Haute, Ind., assignors to International Minerals & Chemical Corporation, Northbrook, Ill.

Filed May 20, 1986, Ser. No. 865,164

Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518151; Nov. 21, 1985, 3541125

Int. Cl.[4] C01B *33/02*; C22C *38/02*

U.S. Cl. 75—10.61 **12 Claims**



1. A process for producing silicon which comprises the steps of:

(a) molding bodies of quartz sand, an amorphous fine-grain silica powder having a specific internal surface area of at least 5 m^2/g, a carbon carrier and a bituminous binder in an amount such that the carbon of said bodies is in excess of that required to reduce the silicon dioxide of the bodies to silicon carbide and such that upon reduction of the silicon dioxide of said bodies to silicon carbide said bodies have a coke structure agglomerate with a specific internal carbon surface area of more than 5 m^2/g, said bodies being formed with 4 to 20% by weight of said bituminous binder and silica powder in an amount of 2 to 20% by weight of said bituminous binder;

(b) forming a melt of silicon dioxide at a bottom part of a low-shaft electrical furnace at least in part by melting silicon dioxide in lump form;

(c) introducing into an upper portion of said low-shaft electrical furnace a charge to supply said melt, said charge consisting primarily of said bodies and silicon dioxide in lump form;

(d) reducing the silicon dioxide in said bodies to silicon carbide at a temperature of less than 1600° C. in said upper portion of said low-shaft electrical furnace while heating said silicon dioxide in lump form of said charge so that the heated silicon dioxide in lump form passes into said melt and a coke structure agglomerate with a specific internal carbon surface area of more than 5 m^2/g is formed in said bodies, said bodies thereafter passing into said melt;

(e) reacting said bodies with said melt at a temperature in excess of 1600° C. so that said carbon of said coke structure agglomerate reduces silicon dioxide of said melt to form silicon; and

(f) tapping said silicon from said furnace.

4,820,342

METHOD OF REDUCING LINING WEAR

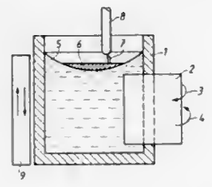
Hans Ekander; Clas Ericson; Göte Tallbäck; Hernan Tinoco, and Staffan Öström, all of Västerås, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Apr. 11, 1988, Ser. No. 180,333

Claims priority, application Sweden, Apr. 13, 1987, 8701525

Int. Cl.[4] C22B *4/00*

U.S. Cl. 75—10.65 **11 Claims**



1. A method of reducing lining wear in connection with heating by at least one electric arc, steel melt being stirred in a horizontal direction by means of an electromagnetic stirring device, thus creating a concave surface to the melt, wherein the slag present in the bath accumulates towards the center of the concave surface and the attack by slag against the lining is avoided, wherein said arc heats the charge and also melts the slag, but wherein the lining is partly protected from radiation heating from the arc by the outer parts of the concave surface; wherein a perturbing device is immersed into the interface between the melt and the slag in order to bring about an efficient mixing of the steel melt and the slag for intensifying the sulphur removal.

4,820,343

PROCESS FOR TRANSFERRING METAL IONS USING MICROPOROUS MEMBRANES

Karl Ostertag, Erlenbach am Main, Fed. Rep. of Germany, assignor to AKZO N.V., Netherlands

Filed May 20, 1985, Ser. No. 736,077

Claims priority, application Fed. Rep. of Germany, May 21, 1984, 3418825; Mar. 21, 1985, 3510187

Int. Cl.[4] C22B *15/08*

U.S. Cl. 75—101 BE **22 Claims**

1. A process for the recovery of metal ions, comprising:

providing at least one first transfer zone in which a first aqueous liquid containing said metal ions is separated from a non-aqueous liquid,

said non-aqueous liquid being substantially immiscible with said first aqueous liquid, containing at least one complexing agent for said metal ions, and being a solvent for complexes of said metal ions and said complexing agent, and

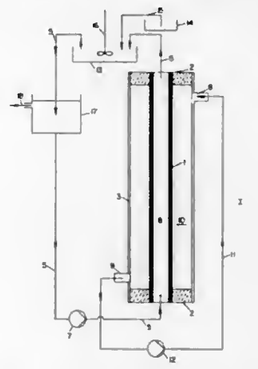
said first transfer zone comprising at least one microporous hydrophobic membrane having pores which contain a portion of said non-aqueous liquid;

said first aqueous liquid being separated from said non-aqueous liquid in said first transfer zone by said at least one microporous hydrophobic membrane;

circulating said non-aqueous liquid from said first transfer zone to at least one second transfer zone;

mechanically mixing said non-aqueous liquid with a second aqueous liquid which is substantially immiscible with said non-aqueous liquid to form a mixture, and subsequently mechanically separating at least part of a resulting aqueous liquid from said mixture in said second transfer zone;

removing said at least part of said resulting aqueous liquid; and



circulating the remainder of said mixture containing said non-aqueous liquid from said second transfer zone back to said first transfer zone;

whereby said non-aqueous liquid takes up said metal ions from said first aqueous liquid in said first transfer zone, carries said metal ions to said second transfer zone, and releases said metal ions to said second aqueous liquid in said second transfer zone.

4,820,344

AQUEOUS COMPOSITIONS FOR VISUAL INSPECTION AND CLEANING OF METALLIC SURFACES

Juergen Geke, and Bernhard Zange, both of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 871,646, Jun. 6, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 144,753

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3521952

Int. Cl.[4] C04B *9/02*

U.S. Cl. 106—14.13 **30 Claims**

1. An aqueous concentrate composition for use in visually inspecting metal surfaces using a highlighting procedure or flux procedure consisting essentially of:

(A) an organic corrosion inhibitor which is at least one C_{1-4} alkanolamine, present in about 5 to 40% by weight;

(B) at least one carboxylic acid selected from

(1) cinnamic acid;

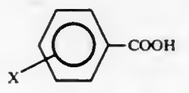
(2) a linear or branched aliphatic carboxylic acid having the general formula

$$C_mH_{2m+1}COOH$$

wherein m is an integer from 5 to 17; or

(3) aromatic carboxylic acid having the general formula

(II)



wherein x is —H, —NO_2, —COOH, —OH, —SO_3H, or a linear or branched alkyl of the formula C_nH_{2n+1} where n is an integer from 1 to 4, present in about 5 to 25% by weight;

(C) at least one glycerol and/or polyglycerol, present in about 3% to 50% by weight;

(D) at least one dihydric alcohol, alcohol ether or polyethylene glycol present in about 10 to 70% by weight;

(E) at least one biodegradable cationic or nonionic tenside present in about 2 to 10% by weight;

(F) at least one ultraviolet-active compound, present in 0 to up to about 0.5% by weight;

(G) at least one nonferrous metal inhibitor, present in 0 to up to about 0.5% by weight;

(H) at least one light metal inhibitor, present in 0 to up to about 5.0% by weight:

(I) at least one solubilizing agent, present in 0 to about 10% by weight; and

(J) water, q.s. to 100% of concentrate.

4,820,345

WATER AND FIRE RESISTANT BUILDING MATERIAL

Johannes G. Berg, Hovik, and Robert Smith-Johannsen, Borgheim, both of Norway, assignors to Norsk Proco AS, Oslo, Norway

Filed Jan. 12, 1987, Ser. No. 2,064

Claims priority, application Norway, Jan. 10, 1986, 860066; Nov. 12, 1986, 864501

Int. Cl.[4] C09D *5/16*

U.S. Cl. 106—18.12 **33 Claims**

1. Water and fire resistant building material characterized by a composition built up in individual layers and then shaped and hardened said layers each including at least one component selected from the group consisting of an absorbent component, magnesia cement, one or more lignin sulfonate, and chemically active fumed silica, and an alkali silicate being present in at least one layer, whereby after hardening, the final composition includes two binder systems, one consisting of said water resistant magnesia cement and lignin sulfonate, and the other consisting of the reaction product between said chemically reactive fumed silica, magnesium oxide and alkali silicate.

4,820,346

INK JET PRINTER INK

Michael T. Nowak, Gardner, Mass., assignor to Howtek, Inc., Hudson, N.H.

Continuation-in-part of Ser. No. 748,768, Jun. 25, 1985, abandoned. This application Mar. 31, 1987, Ser. No. 33,040

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—22 **25 Claims**

1. In an ink jet printer ink for jetting through a nozzle, the improvement comprising a solid organic solid having a melting point less than about 150° C. and a thermosetting resin having a hydroxyl number greater than 50.

4,820,347

BENEFICIATED TALCS

Kenneth E. Weber, Pacific Palisades, Calif., assignor to Cyprus Minerals Company, West Los Angeles, Calif.

Filed Jan. 14, 1987, Ser. No. 3,242

Int. Cl.[4] C04B *14/00*

U.S. Cl. 106—469 **6 Claims**

1. A beneficiated talc suitable for use as a filler for thermoplastic resinous compositions comprising a talc which, when used in the unbeneficiated state as a filler in articles molded from commercially available, heat-stabilized polypropylene resins, gives molded articles exhibiting a G.E. brightness of less than about 20% and unable to withstand oven aging at 155° C. in an atmosphere of air for at least 10 days, said talc thus being a talc which, in the unbeneficiated state, is incompatible or unsuitable for such filler use, admixed with:

(a) one or a mixture of octyl- or nonylphenol/poly(ethylene oxide) condensates, and

(b) one or a mixture of poly(ethylene glycols) or alkoxypoly(ethylene glycols),

said (a) and said (b) each being present in amount ranging from

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about 0.05% to about 4.0% by weight, with the total combined amount of said substances being no more than about 5.0% by weight, said weight percents being based on the weight of the unbeneficiated talc.

4,820,348

PROCESS FOR THE SPECIFIC SEPARATION OF LACTOSE FROM MILK

Matti Harju, Nummela, Finland, assignor to Yalio Meijerien Keskusosuusliike, Helsinki, Finland

Filed Nov. 12, 1986, Ser. No. 930,505
Claims priority, application Finland, Nov. 14, 1985, 854485
Int. Cl.⁴ C13D *3/14;* **C13K** *5/00;* **B01D** *59/30*
U.S. Cl. 127—46.2 **9 Claims**

1. A process for accomplishing specific chromatographic separation of lactose from milk, said process comprising the steps of

(a) packing a column with a particulate cation exchange resin,

(b) balancing said cation exchange resin by passing fatless milk through the cation exchange resin in an amount of at least ten times the volume of the resin,

(c) flushing the resulting balanced cation exchange resin with water,

(d) treating fatless feed milk in a column with said balanced cation exchange resin at a temperature of about 50° to about 80° C., and

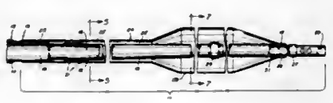
(e) eluting the column with water to recover successively a protein containing fraction and lactose fraction from the bottom of the column.

4,820,349

DILATATION CATHETER WITH COLLAPSIBLE OUTER DIAMETER

Mark A. Saab, Lawrence, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Aug. 21, 1987, Ser. No. 88,098
Int. Cl.⁴ A61M *29/02*
U.S. Cl. 128—344 **19 Claims**



1. A dilatation catheter comprising:

an elongated flexible shaft having a proximal segment and a distal segment, the distal segment of the shaft being smaller in diameter than the proximal segment of the shaft;

the proximal segment having an inflation lumen extending therethrough;

a sleeve extending over the distal segment of the shaft, the proximal end of the sleeve being attached to the shaft and being in communication with the inflation lumen;

the distal end of the sleeve being attached to the distal end of the shaft;

the sleeve having an integral enlarged diameter balloon portion, both the balloon and the sleeve being formed from a thin walled, flexible material and being inflatable and deflatable, both the sleeve and balloon being collapsible about the shaft in response to a negative pressure applied to the inflation lumen,

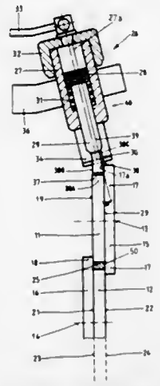
whereby the diameter of the catheter in the region of the sleeve may be made to conform closely to the smaller reduced diameter of the distal segment of the shaft.

4,820,350

DEVICE FOR CLEANING AT LEAST ONE SENSOR ROLLER AND METHOD OF CLEANING SUCH SENSOR ROLLER

Robert Demuth, Nürensdorf, and Anton Wüest, Effretikon, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Dec. 5, 1985, Ser. No. 806,370
Claims priority, application Switzerland, Dec. 10, 1984, 05846/84
Int. Cl.⁴ B08B *7/00*
U.S. Cl. 134—6 **14 Claims**



1. A sensor roller cleaning arrangement comprising:

a sensor roller pair which serve to measure the thickness of a fiber sliver and to produce a signal proportional to the measured thickness thereof;

each of the sensor rollers of said sensor roller pair having a respective end face and a respective peripheral surface;

said end faces lying in mutually parallel planes;

said sensor rollers of said sensor roller pair being spaced from each other such that the fiber sliver travelling between the peripheral surfaces of the sensor rollers is subjected to a pressure at a pressure position;

flange-like disc portions provided on the end faces of the sensor rollers of said sensor roller pair and which flange-like disc portions collectively form a groove at such pressure position;

at least one cleaning device operatively associated with said sensor roller pair for cleaning at least one sensor roller of said sensor roller pair;

said at least one cleaning device containing at least one scraper means for scraping at least said peripheral surface of said at least one sensor roller;

said at least one cleaning device further containing at least one moving means drivingly connected to said at least one scraper means for alternatingly placing said at least one scraper means into and out of a scraping position at least at said peripheral surface of said at least one sensor roller;

at least said peripheral surface of said at least one sensor roller being placed by said at least one moving means into scraping contact with said at least one scraper means during a first period of time and out of scraping contact with said at least one scraper means during a second period of time so that at least said peripheral surface is only scraped and thus cleaned during said first period of time; and

said first period of time being shorter than said second period of time.

12. A method of cleaning at least one sensor roller of a sensor roller pair which serve to measure the thickness of a fiber sliver and to produce a signal proportional to the measured thickness thereof, each of the sensor rollers of said sensor roller pair having a respective end face and such end faces lying in mutually parallel planes, said sensor roller pair being biased towards each other at a variable mutual spacing, the fiber sliver traveling between peripheral surfaces of the sensor rollers and thereby being subjected to a pressure at a pressure position, flange-like discs provided on the end faces of the sensor rollers, and which collectively form a groove at the pressure position, scraper means for cleaning the peripheral surface of said at least one sensor roller, and means for moving said scraper means intermittently into engagement with the peripheral surface of said at least one sensor roller in a scraping position of said scraper means and for retracting such scraping means from said scraping position, said method comprising the step of:

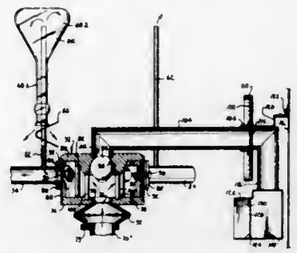
controlling the moving means such that the relationship of the period of cleaning intervals of the scraper means to the period of the intervals in a rest position of the scraper means is such that the same lies between 1:15 and 1:360.

4,820,351

FLASK WASHER WITH VACUUM DRY

Larry G. Hambleton, Olathe, Kans.; Claude L. Sears, Liberty, and Elmer B. Offutt, Independence, both of Mo., assignors to Labconco Corporation, Kansas City, Mo.

Division of Ser. No. 804,788, Dec. 5, 1985, Pat. No. 4,708,153. This application Sep. 4, 1987, Ser. No. 92,898
Int. Cl.⁴ B08B *5/04*
U.S. Cl. 134—21 **10 Claims**



1. A method of cleaning a plurality of laboratory glassware articles each having a body and an elongate neck extending from the body and terminating in an open top end, said method comprising the steps of:

placing the articles in an inverted position on open ended tubes with each tube extending through the neck to locate said open end in the body of the article;

providing a manifold for delivery of cleaning liquid to all of said tubes;

coupling a source of cleaning liquid with said manifold;

pumping cleaning liquid through said manifold out the open ends of said tubes and into the interior of each article for washing of the inside of the body and neck;

coupling a vacuum source with said manifold;

applying a vacuum to said manifold to draw air from the interior of said articles and cause air from outside said articles to circulate through the articles before being drawn into said manifold; and

providing valve means responsive to the flow of cleaning liquid into said manifold to block off said vacuum source during said pumping step and block off said cleaning liquid source during said vacuum applying step.

4,820,352

CLEANING AND CONDITIONING SOLUTIONS FOR CONTACT LENSES AND METHODS OF USE

Thomas M. Riedhammer, Rochester, and Francis X. Smith, Walworth, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 730,907, May 6, 1985, abandoned, which is a continuation of Ser. No. 456,960, Jan. 10, 1983, abandoned. This application Jan. 22, 1986, Ser. No. 821,228
Int. Cl.⁴ C11D *1/44, 3/48;* **B08B** *30/00*
U.S. Cl. 134—30 **19 Claims**

1. An aqueous composition for effectively cleaning and conditioning contact lenses at ambient and elevated temperature conditions, consisting essentially of

(a) from about 0.01 to about 15 weight percent of a poly(oxypropylene)-poly(oxyethylene) adduct of ethylene diamine having a molecular weight from about 7500 to about 27,000 wherein at least 40 weight percent of said adduct is poly(oxyethylene).

(b) a germicidal agent in a sufficient amount of preserve sterility of the composition, and

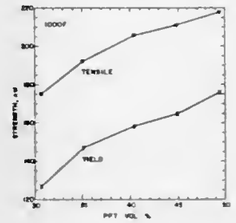
(c) water, said composition being free of amounts of thickening agents which materially alter its viscosity.

4,820,353

METHOD OF FORMING FATIGUE CRACK RESISTANT NICKEL BASE SUPERALLOYS AND PRODUCT FORMED

Keh-Minn Chang, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,271
Int. Cl.⁴ C22F *1/10*
U.S. Cl. 148—2 **11 Claims**



5. The method of preparing a nickel-base superalloy which has a high content of γ′ precipitate but which retains good forgeability which comprises

preparing a melt to consist essentially of the following ingredients,

Ingredient	Concentration in weight percent From	To
nickel	balance	
chromium	14	18
cobalt	10	14
molybdenum	4	6
tungsten	4	6
aluminum	2	3
titanium	4	6
zirconium	0.02	0.08
boron	0.01	0.05
carbon	0.0	0.10

casting the melt to form an ingot,

supersolvus annealing the ingot,

slowly cooling the ingot after the anneal at a rate below 240° F./min.

9. The method of claim 5 wherein the cast alloy is forged to final shape.

4,820,354

METHOD FOR PRODUCING A WORKPIECE FROM A CORROSION- AND OXIDATION-RESISTANT NI/AL/SI/B ALLOY

Mohamed Nazmy, Fislisbach, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Aug. 19, 1987, Ser. No. 86,781
Claims priority, application Switzerland, Sep. 2, 1986, 3517/86
Int. Cl.⁴ C22F *1/10*
U.S. Cl. 148—2 **5 Claims**

1. A method for producing a workpiece from a corrosion-

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and oxidation-resistant Ni/Al/Si/B alloy, wherein an alloy containing consisting essentially of

Al=12 to 23 atom-%,
Si=1 to 12 atom-%,
B=0.1 to 2 atom-%, with
Al+Si+B being=24 atom-%, and
Ni=remainder

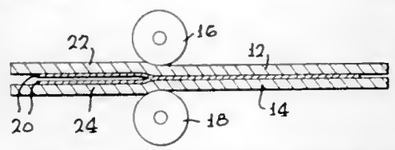
is melted in a vacuum induction furnace and cast into an ingot which is then annealed at a temperature of 1,100° C. for 60 h in an argon atmosphere and cooled, and its casting skin and scale layer are removed mechanically, whereupon the processed ingot is inserted into a soft steel capsule and the latter is sealed, and wherein the whole is isothermally deformed in the temperature range between 1,050° and 1,150° C. with a deformation rate of $\epsilon=6\times10^{-5}$ s^{-1} until a deformation of $\epsilon=1.6$ is reached, where

$$\epsilon = \left| \ln \frac{h_o}{h} \right|$$

$$\epsilon = \frac{d\left| \ln \frac{h_o}{h} \right|}{dt}$$

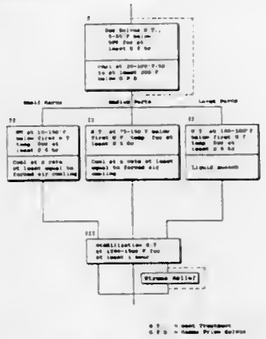
h_o=original height of the workpiece,
h=height of the workpiece after deformation, and
t=time in seconds.

4,820,355
METHOD FOR FABRICATING MONOLITHIC ALUMINUM STRUCTURES
Clifford C. Bampton, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Mar. 30, 1987, Ser. No. 31,637
Int. Cl.⁴ C22F *1/04*
U.S. Cl. 148—11.5 A **33 Claims**



33. A method of producing a monolithic aluminum or aluminum alloy structure formed of a plurality of heat treatable aluminum or aluminum alloy sheets, comprising:
heating the sheets to approximately 920° F.;
fluid quenching the sheets to a desired minimum temperature immediately after said heating;
isothermally heating the sheets at approximately 750° F. for approximately 8 hours;
isothermally heating the sheets at approximately 455° F. for approximately 24 hours in order to soften the sheets;
positioning the sheets in a stack so that the sheets have opposing surfaces;
applying stop-off material to at least one selected areas of the opposing surfaces of the sheets in order to prevent bonding of the sheets at said area;
cooling the sheets to approximately room temperature;
applying a rolling pressure at ambient temperature to outer surfaces of the sheets in order to concurrently roll bond the sheets at desired portions thereof and plastically deform the sheets;
rapidly heating the sheets to a desired maximum temperature to recrystallize the alloy in said sheets, said rapid heating being sufficient to provide a desired fine grain structure to the sheets;
providing a tunnel between at least two of the opposing surfaces of the sheets at edge portions of the sheets for insertion of a tube therebetween, the tube providing a passageway for pressurized gas between the sheets to said area where the stop-off material has been applied;
heating the sheets to superplastic forming temperature; and
injecting pressurized gas through the tube into the area between the sheets where stop-off material has been applied, the pressurized gas being sufficient to superplastically deform and elongate at least a portion of the sheets in order to provide the desired structure.

4,820,356
HEAT TREATMENT FOR IMPROVING FATIGUE PROPERTIES OF SUPERALLOY ARTICLES
Martin J. Blackburn, Kensington; Daniel F. Paulonis, Higganum; Robert H. Caless, Bolton, and Anne L. D'Orvilliers, Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 24, 1987, Ser. No. 137,853
Int. Cl.⁴ C22F *1/10*
U.S. Cl. 148—12.7 N **8 Claims**

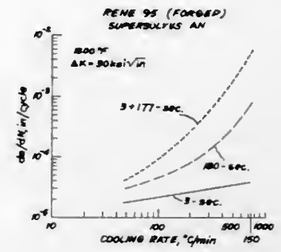


1. Method of heat treating a nickel base superalloy article containing 40–70 volume % of the gamma-prime phase, having a gamma prime solvus temperature and a starting grain size, including the steps of:
a. producing a concentration of coarse gamma prime particles concentrated at the grain boundaries by holding the article at a first heat treat temperature about 10°–50° F. below the gamma prime solvus for at least 0.5 hour and cooling the article at about 20°–200° F./per hour to a temperature at least about 200° F. below the first heat treat temperature;
b. producing a fine dispersion of the gamma prime phase within the grains by heating to a second heat treat temperature about 10°–250° F. below the first heat treat temperature for at least 0.5 hour and then rapidly cooling to below about 1200° F.; and
c. stabilizing the gamma prime particles within the grains by heating the article to 1200°–1500° F. for about 1–25 hours;
whereby a fatigue resistant structure containing coarse grain boundary gamma prime and fine gamma prime particles within the grains, and having a grain size essentially that of the starting grain size results.

4,820,357
LOW GRADE MATERIAL AXLE SHAFT
Kent E. Davison, Columbia City, and Ervin M. Rickert, Fort Wayne, both of Ind., assignors to Dana Corporation, Toledo, Ohio
Filed Mar. 10, 1988, Ser. No. 166,178
Int. Cl.⁴ C21D *8/00*
U.S. Cl. 148—12.4 **19 Claims**

1. In a method of forming an axle shaft with a minimum body diameter of 1.70 inches from an alloy steel consisting essentially of 0.40–0.48% carbon, 1.35–1.61% manganese, 0.16–0.30% silicon, 0–0.20% chromium and the balance iron and other materials not affecting the hardenability of the steel, with a critical diameter of 2.1–2.6", the steps of forging the ends of a shaft to form a spline at one end thereof and a flange at the other end thereof, machining said ends to a final configuration and dimension, and induction hardening said shaft without any intervening annealing or normalizing after forging.

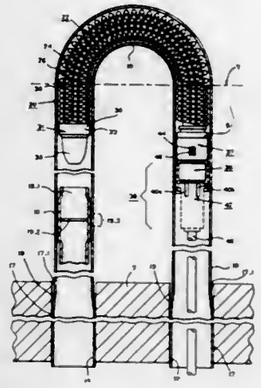
4,820,358
METHOD OF MAKING HIGH STRENGTH SUPERALLOY COMPONENTS WITH GRADED PROPERTIES
Keh-Minn Chang, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Apr. 1, 1987, Ser. No. 32,661
Int. Cl.⁴ C22F *1/10*
U.S. Cl. 148—13 **6 Claims**



1. A method of providing superior operating characteristics to a disk of a jet engine formed of a γ′ strengthened nickel base superalloy and having an inner portion which operates in the jet engine at lower temperature and an outer portion which operates at higher temperatures which comprises,
providing a disk having a small grain size throughout its structure and at both an outer rim portion and an inner bore portion,
differentially heating said disk to about its annealing temperature to establish a temperature gradient of at least 50° C. over the radius of said disk to bring the rim portion of said disk to above its supersolvus annealing temperature but below its incipient melting temperature to substantially enlarge the grain size of the grains at the rim of said disk,
and said differentially heating of said disk operating to heat the bore portion of said disk structure to a subsolvus annealing temperature to dissolve only a portion of the strengthening precipitate therein and to limit grain growth to less than that occurring in the rim portion of the disk,
cooling the disk while preserving a radial temperature gradient therein to cool the bore portion of said disk at a rate which is at least twice as rapid as the rate at which the rim portion is cooled,
to thereby impart a different set of mechanical properties to the bore portion as compared to those of the rim portion.

4,820,359
PROCESS FOR THERMALLY STRESS-RELIEVING A TUBE
Bruce W. Bevilacqua, Penn Township, Westmoreland County; Wenche W. Cheng, Monroeville; Donald R. Stoner, Murrysville Boro; Fredric W. Pement, Pittsburgh; Robert D. Burack, Pleasant Hills, and Joseph M. Gilkison, Murrysville Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 12, 1987, Ser. No. 24,941
Int. Cl.⁴ H05B *3/06*; B23K *1/02*
U.S. Cl. 148—127 **30 Claims**

1. A process for thermally stress-relieving a U-bend section of a nickel alloy conduit having at least one open end by means of a heater comprising the steps of:
(a) inserting said heater into said open end of the conduit and positioning it adjacent to at least a portion of said section;
(b) heating said portion of said section of said conduit to between about 1150 degrees F. to 1500 degrees F.;



(c) maintaining said temperature for a time period of between about 4 and 8 minutes, and
(d) withdrawing said heater from said conduit.

4,820,360
METHOD FOR DEVELOPING ULTRAFINE MICROSTRUCTURES IN TITANIUM ALLOY CASTINGS
Daniel Eylon, Dayton; Francis H. Froes, Xenia, both of Ohio, and Charles F. Yolton, Coraopolis, Pa., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Dec. 4, 1987, Ser. No. 128,839
Int. Cl.⁴ C22F *1/18*
U.S. Cl. 148—133 **6 Claims**



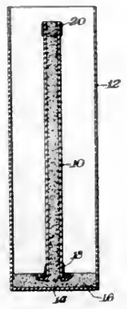
1. A method for improving the microstructure of cast titanium alloy articles which comprises the steps of hydrogenating the cast article at a temperature near or greater than the titanium-hydrogen eutectoid temperature of 815° C., said temperature of hydrogenation being in the range of about 780° to 1020° C. to a hydrogen level of about 0.50 to 1.50 weight percent, cooling the thus-hydrogenated article to room temperature at a controlled rate, heating the thus-cooled, hydrogenated article to a temperature of about 650° to 750° C., applying a vacuum to dehydrogenate the article and cooling said article to room temperature at a controlled rate.

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4,820,361
EMULSION EXPLOSIVE CONTAINING ORGANIC MICROSPHERES
Lee F. McKenzie, Riverton, and Lawrence D. Lawrence, Sandy, both of Utah, assignors to IRECO Incorporated, Salt Lake City, Utah
Filed Dec. 3, 1987, Ser. No. 128,096
Int. Cl.[4] C06B 45/00
U.S. Cl. 149—2 9 Claims

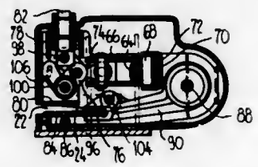
1. A water-in-oil emulsion explosive comprising a water-immiscible organic fuel as a continous phase; an emulsified aqeous inorganic oxidizer salt solution as a discontinuous phase; an emulsifier selected from the group consisting of polypropenyl or polybutenyl succinic anhydride and polypropenyl or polybutenyl phenol, each of which has been derivatized with an alcohol, amine or alkanolamine; and organic microspheres as a density control agent.

4,820,362
METAL DIFFUSION AND COMPOSITION
Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.
Continuation-in-part of Ser. No. 479,211, Mar. 23, 1983, Pat. No. 4,476,744, and a continuation-in-part of Ser. No. 571,510, Jan. 17, 1984, Pat. No. 4,537,927, and a continuation-in-part of Ser. No. 310,085, Oct. 9, 1981, Pat. No. 4,617,202, and a continuation-in-part of Ser. No. 416,353, Jun. 2, 1982, abandoned, and a continuation-in-part of Ser. No. 359,212, Mar. 18, 1982, Pat. No. 4,443,557, and a continuation-in-part of Ser. No. 584,538, Feb. 28, 1984, and a continuation-in-part of Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913, and a continuation-in-part of Ser. No. 507,174, Jun. 23, 1983, Pat. No. 4,694,036, and a continuation-in-part of Ser. No. 538,541, Oct. 3, 1983, and a continuation-in-part of Ser. No. 559,334, Dec. 8, 1983, abandoned, and a continuation-in-part of Ser. No. 643,782, Jul. 17, 1984, and a continuation-in-part of Ser. No. 000,220, Feb. 23, 1982, and a continuation-in-part of Ser. No. 488,103, Apr. 25, 1983, which is a continuation-in-part of Ser. No. 172,671, Jul. 28, 1980, Pat. No. 4,435,481, which is a continuation-in-part of Ser. No. 238,500, Feb. 26, 1981, Pat. No. 4,350,719, which is a continuation-in-part of Ser. No. 851,504, Nov. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 242,350, Mar. 10, 1981, Pat. No. 4,464,430, which is a continuation-in-part of Ser. No. 071,741, Aug. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 230,333, Feb. 2, 1981, Pat. No. 4,347,267, which is a continuation-in-part of Ser. No. 302,979, Sep. 17, 1981, abandoned. This application Dec. 27, 1984, Ser. No. 685,910
Int. Cl.[4] C06G 45/00
U.S. Cl. 149—2 9 Claims



1. A composition that is stable when cold, but when heated generates a copious quantity of NO_2, the composition consisting essentially of a powdered nitrate that liberates NO_2 when heated, mixed with a powdered trigger that starts such generation upon heating, the trigger being stabilized Raney iron combined with boron.

4,820,363
TENSIONING AND CONNECTING APPARATUS FOR CONNECTING OVERLAPPING STRAP ENDS OF SYNTHETIC MATERIAL
Karl Fischer, Stansstad, Switzerland, assignor to Strapex AG, Wohlen, Switzerland
Filed Jan. 17, 1986, Ser. No. 819,581
Claims priority, application Switzerland, Jan. 23, 1985, 271/85
Int. Cl.[4] B32B 31/00; B65B 13/34
U.S. Cl. 156—494 22 Claims

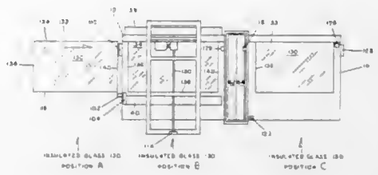


1. An apparatus for tensioning a strap of synthetic material and connecting mutually overlapping ends of the strap of synthetic material, comprising:
a tensioning device defining a direction of tensioning a strap of synthetic material having mutually overlapping ends;
a friction welding device arranged upstream of said tensioning device in said direction of tensioning;
said friction welding device including means defining a gap accomadating said mutually overlapping ends of said strap;
said gap-defining means comprising a clamping shoe arranged at one side of said gap for substantially immobilizing an outermost end of said mutually overlapping ends of said strap;
said gap-defining means further including a welding element arranged substantially directly opposite said clamping shoe at an opposite side of said gap;
means for oscillating said welding element in relation to said clamping shoe generating frictional heat;
a retention means for retaining said strap in a tensioned state upon tensioning thereof under the action of said tensioning device;
said retention means being arranged downstream of said friction welding device in said direction of tensioning;
said welding element comprising a welding tongue for engaging an innermost free end of said mutually overlapping ends of said strap;
said oscillating means serving for oscillatingly driving said welding tongue with a to-and-fro oscillating motion substantially transverse to said mutually overlapping ends of said strap and to thereby move said innermost free end relative to said substantially immobilized outermost end and to this frictionally weld to each other said mutually overlapping ends of said strap;
a cutter for severing said outermost end of said mutually overlapping ends of said strap; and
said cutter being coupled to said welding tongue such that said cutter is driven synchronously with said welding tongue and with the same stroke as said welding tongue substantially without relative movement between said cutter and said innermost free end of said strap.

4,820,364
METHOD FOR SEALING CAPSULES
Dean M. Graham, Hobart, N.Y., assignor to Capsulbond Incorporated, Hobart, N.Y.
Filed May 23, 1983, Ser. No. 497,449
Int. Cl.[4] B65B 7/28
U.S. Cl. 156—69 19 Claims

1. A method for sealing telescopically assembled capsules comprising a capsule body, and a capsule cap disposed in overlapping relationship thereover, said method consisting essentially of:
A. forming an assembled capsule by placing said capsule cap telescopically over said capsule body;
B. locating a quantity of an adhesion-promoting fluid interstitially between the adjacent overlapping surfaces of said capsule body and said capsule cap, wherein said adhesion-promoting fluid is a liquid that possesses a high dielectric constant, is a non-solvent for the material constituting said capsule body and said capsule cap, and possesses a boiling point below the melting point of said material; and
C. applying dielectric energy to the capsules having said adhesion-promoting fluid disposed interstitially between said capsule body and said capsule cap, said dielectric energy applied in the vicinity of said adhesion-promoting fluid at a level and in an amount sufficient to form a bond between said adjacent overlapping surfaces by the solvation of said surface with said adhesion-promoting fluid, but insufficient to cause the melting of said adjacent overlapping surfaces.

4,820,365
GLASS EDGE SEALANT CURING SYSTEM
Curtis Brumm, Mason City, Iowa; Randi Ernst, Lorreto, and Lyle H. Rogalla, Hugo, both of Minn., assignors to Dimension Industries, Inc., Maple Grove, Minn.
Filed Sep. 30, 1987, Ser. No. 102,626
Int. Cl.[4] C03C 27/10
U.S. Cl. 156—109 10 Claims



1. Process for curing sealant about edges of a stack of insulated glass units comprising the steps of:
a. conveying a stack of insulated glass units to a first location;
b. surrounding three sides of said stack of insulated glass units including the front end, with heating units;
c. heating said three sides with a heater energy;
d. conveying said stack of insulated glass units to a second location down stream of said first location;
e. Surrounding said rear end with a heater;
f. heating said rear end; and,
g. conveying said stack away from said second location.

4,820,366
APPARATUS AND METHOD FOR PULTRUDING REINFORCED PLASTIC ARTICLES
William H. Beever, and Larry M. Selby, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Mar. 6, 1987, Ser. No. 22,386
Int. Cl.[4] B32B 27/02, 31/12
U.S. Cl. 156—166 16 Claims



1. An apparatus for pultruding reinforced plastic parts, said apparatus comprising:
supply means for supplying a plastic resin-impregnated reinforcing material;
first forming means for partially consolidating said material and for shaping the partially consolidated material to an oversized form, said first forming means being heated and comprising a tapered portion which is tapered from an entry side thereof to a constant cross-section portion, said constant cross-section portion opening at an exit side of said first forming means, wherein an intersection of said tapered and constant cross-section portions is nearer said exit side than said entry side of said first forming means for minimizing frictional buildup between said material and said first forming means;
second forming means, spaced from said first forming means, for finally consolidating said material and for shaping the finally consolidated material to a final form, said second forming means being cooler than said first forming means and comprising a tapered portion which is tapered from an entry side thereof to a constant cross-section portion, said constant cross-section portion opening at an exit side of said second forming means, said tapered portion of said second forming means being shorter than said tapered portion of said first forming means for providing fast consolidation of said material without cooling said material too quickly before said material enters said constant cross-section portion of said second forming means; and
pulling means for pulling said material from said supply means and through said first and second forming means.

4,820,367
BONDING METHOD EMPLOYING POLYAMIDE OLIGOMER-EPOXY POLYMER ADHESIVES
Daniel Cuzin, Bernay, France, assignor to Atochem, France
Division of Ser. No. 768,415, Aug. 22, 1985, Pat. No. 4,673,723. This application Jun. 1, 1987, Ser. No. 56,385
Claims priority, application France, Aug. 27, 1984, 84 13244
Int. Cl.[4] B32B 31/00
U.S. Cl. 156—283 6 Claims

1. A method for adhesively joining two surfaces which method comprises applying a composition comprising a mixture of at least one polyepoxide and at least one polyamide oligomer, which polyepoxide and oligomer can react to form a polymer, and wherein the oligomer is a primary monoamine, an alpha,omega-primary or -secondary diamine, an alpha,omega-diacid, or an alpha-primary amine,omega-acid to at least one of the surfaces, heating the composition to form the polymer, and contacting the surface or surfaces to which the composition has been applied to join the surfaces while the composition is heated.

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4,820,368

THERMALLY STABLE REACTIVE HOT MELT URETHANE ADHESIVE COMPOSITION HAVING A THERMOPLASTIC POLYMER, A COMPATIBLE, CURING URETHANE POLYALKYLENE POLYOL PREPOLYMER AND A TACKIFYING AGENT

Virginia C. Markevka, Maplewood; John M. Zimmel, St. Paul; Elizabeth R. Messman, Minneapolis, and William L. Bunnelle, Stillwater, all of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Filed May 7, 1987, Ser. No. 47,686
Int. Cl.[4] C09J 5/02
U.S. Cl. 156—307.3 28 Claims

1. A reactive hot-melt urethane adhesive composition having pot stability, initial green strength, bond heat stability, and cured bond strength which comprises:

(a) a urethane prepolymer composition comprising the reaction product of a polyalkylene diol or triol and an isocyanate compound;

(b) about 1 to 200 parts by weight per each 100 parts of the prepolymer composition of a thermoplastic polymer selected from the group consisting of an A-B-A block copolymer, an A-(B-A)$_n$-B block copolymer, and a radial A-B-A block copolymer wherein n is an integer from about 2–50, each A is a polystyrene block and each B is a rubbery block; and

(c) about 1 to 200 parts by weight per each 100 parts of the prepolymer composition of an aliphatic, aromatic or mixed aliphatic-aromatic tackifying resin.

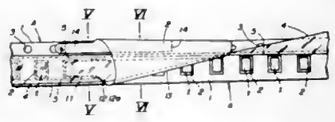
27. A method of bonding at least two substrates which comprises applying to a bondline that can join at least two surfaces an effective bonding amount of the adhesive of claim 1 and curing the adhesive.

4,820,369

METHOD FOR REMOVING TOP TAPE ELEMENT FROM CHIP TAPE AND DEVICE THEREFOR

Masahiro Kubo, Sagamihara, Japan, assignor to Nitto System Technology Inc., Elk Grove Village, Ill.

Filed Oct. 26, 1987, Ser. No. 112,090
Claims priority, application Japan, Oct. 30, 1986, 61-259558
Int. Cl.[4] B32B 31/18
U.S. Cl. 156—344 4 Claims



1. A method for removing a top tape element of a chip tape from a main tape element thereof, comprising the steps of:

arranging a guide shoe at a position predetermined with respect to said chip tape, said guide shoe being provided with a tongue-like element;

feeding said chip tape using a suitable means and causing said tongue-like element to enter a gap between said top tape element and said main tape element;

successively feeding said chip tape;

removing said top tape element from an upper surface of chip receiving holes of said main tape element to expose chips charged in said chip receiving holes; and

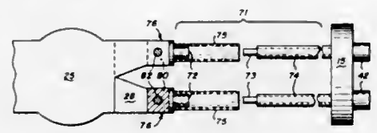
discharging said removed top tape element.

4,820,370

PARTICLE SHIELDED R. F. CONNECTOR FOR A PLASMA ENHANCED CHEMICAL VAPOR PROCESSOR BOAT

Charles E. Ellenberger, Elko, Nev., assignor to Pacific Western Systems, Inc., Mountain View, Calif.

Filed Dec. 12, 1986, Ser. No. 941,030
Int. Cl.[4] H01J 37/00; C23C 16/00
U.S. Cl. 156—345 6 Claims



1. In a plasma enhanced chemical vapor processing boat for processing workpieces within an evacuable envelope containing the plasma enhanced chemical vapor and workpieces at substmospheric pressure:

first and second sets of electrode means for disposition within the envelope, one set of said electrode means being electrically insulated from the other and said first and second sets of electrode mears being interleaved with each other for establishing, when energized with electrical potential, an electrical plasma discharge within said evacuable envelope in the processing gaps between adjacent ones of said interleaved electrode means;

electrical connector means for disposition within said evacuable envelope for making electrical connection to said electrode means and having slidably mating male and female portions disposed within said envelope; and

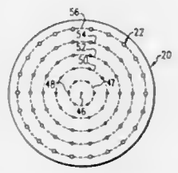
shield means disposed surrrounding said mating male and female portions for at least partially containing particulates released from the slidably mating male and female portions, whereby particulate contamination of said workpieces is reduced in use.

4,820,371

APERTURED RING FOR EXHAUSTING PLASMA REACTOR GASES

Alan D. Rose, Wylie, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 15, 1987, Ser. No. 132,306
Int. Cl.[4] B44C 1/22; C23C 14/00
U.S. Cl. 156—345 18 Claims



1. Apparatus adapted for use with a plasma reactor of the type having a reaction chamber for dispensing a gas, and a semiconductor slice holder for subjecting a semiconductor slice to the gas, comprising:

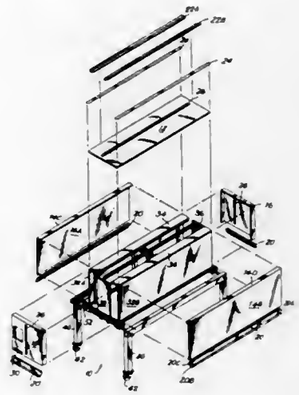
a ring having an outside dimension for engaging a sidewall of the reaction chamber, an inside dimension defining a central opening aperture for receiving therein and laterally confining the semiconductor slice.

4,820,372

APPARATUS AND SYSTEM FOR FABRICATING REFRIGERATION CABINETS

Edward Gideg, 87-77 Lefferts Blvd., Richmond Hill, N.Y. 11418

Division of Ser. No. 608,189, May 9, 1984, Pat. No. 4,676,852.
This application May 1, 1987, Ser. No. 45,905
Int. Cl.[4] B05C 7/00
U.S. Cl. 156—356 83 Claims



37. An apparatus for fabricating refrigeration cabinets of the type including an outer shell and an inner shell each formed substantially of a plurality of plate members, said inner shell being separated from said outer shell by a thermal insulating foam, which comprises:

(a) a first mold fixture for receiving and supporting a plurality of prefinished plate members in a predetermined arrangement forming the outer shell, said outer shell having a plate member defining a rear outer wall and four plate members extending substantially perpendicular to said rear outer wall plate member in end to end relation therewith about the periphery thereof to form respectively, a top outer wall, a bottom outer wall and two side outer walls, said outer shell having positioned therein an inner shell formed of a plurality of prefinished plate members, said inner shell plate members forming a rear inner wall and four plate members extending substantially perpendicular to said rear inner wall plate member along the periphery thereof, the dimensions of the rear inner wall plate member being less than the corresponding dimension of the rear outer wall plate member such that the inner shell and the outer shell define a space therebetween for reception of polymerizable thermal insulating foam forming components therein, said inner shell having extending along the forward peripheral portions, substantially non-heat conducting means to form a thermal barrier between the inner shell and the atmosphere outside said inner shell, said substantially non-heat conducting means including a bridging portion dimensioned, positioned and configured to extend across the space defined between said inner and outer shells at the forward marginal portion thereof, the end of said bridging portion distal from said inner shell being in contact with the forward peripheral portions of said outer shell, and said first mold fixture including a plurality of upright plate members, at least two of which are movable and lockable to spaced positions corresponding to the respective outer dimensions of said outer shell, said first mold fixture plate members being of sufficient strength to restrain movements of said outer shell plate members in outward directions;

(b) a second mold fixture movable from positions into and out of said first mold fixture, said second mold fixture having main support means having a plurality of downwardly extending plate members, at least two of which are movable and lockable to relative positions corresponding to the respective dimensions of said inner shell plate members, said second mold fixture plate members being of sufficient strength to restrain uniformly, inward movements of said inner shell plate members;

(c) at least one foam gun for dispensing polymerizable thermal insulating foam forming components which react to form a polymerized thermal insulating foam within the space between the inner and outer shells, the dispensing portion of said foam gun being positioned for insertion and removal through an aperture defined by at least one of said upright plate members of said first mold fixture and also through an aperture defined by the corresponding plate member of said outer shell substantially in alignment with said first mentioned aperture such that the dispensing portion of said foam gun is positionable within the space defined between said inner and outer shells; and

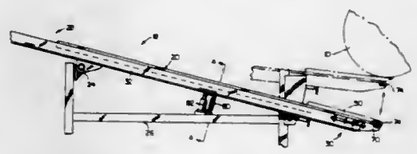
(d) means for supplying said polymerizable thermal insulating foam forming components and for controlling the amounts and rates of said components to said foam gun for dispensing into said space defined by said inner and outer shells said components necessary to form, upon setting, a polymerized thermal insulating foam, to substantially fill the entire space therebetween, said polymerized thermal insulating foam being of the type which expands during polymerization and which adheres to the plate members defining the inner and outer shells, the support members of said first and second mold fixtures being of sufficient strength and having continuous surfaces to maintain the corresponding respective contacting plate members of said inner and outer shells in a correspondingly substantially flat condition against the forces provided therebetween by expansion of said polymerized thermal insulating foam during polymerization, said bridging portion of said substantially non-heat conducting means extending across the forward portion of said space defined by said inner and outer shells and being positioned to prevent outward expansion of said thermal insulating foam during polymerization such that upon final setting, said thermal insulating foam adheres to the respective plate members of said inner and outer shells and retains them in their respective relative positions thereby substantially avoiding the need for other securing and retention means and final finishing step.

4,820,373

APPARATUS FOR APPLYING TREAD STOCK TO A TIRE CARCASS

Karl W. Klose, Findlay, Ohio, assignor to Cooper Tire & Rubber Company, Findlay, Ohio

Filed Sep. 24, 1986, Ser. No. 911,031
Int. Cl.[4] B29D 30/30
U.S. Cl. 156—405.1 12 Claims



1. Tire building apparatus for application of a length of tread stock to the periphery of a belt package for subsequent assembly onto a green tire carcass, the tread stock having an outer face and an inner face, said outer face defining a centering groove along the length of the stock, said apparatus comprising:

a cylindrical drum for mounting the belt package;

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means for mounting said drum for circumferential rotation about a horizontal axis;

an elongated servicer means having a frame defining a delivery end and a loading end for delivering and directing said tread stock to said drum;

stationary conveyor means located on said servicer means for defining a planar movement surface onto which said tread stock may be placed and over which said tread stock may be moved from said loading end to said delivery end;

means for retaining said tread stock in a centered position along said servicer during movement of said stock along said servicer, including an elongated plate disposed edgewise along a central line defined along the length of said servicer means, the upper periphery of said plate defining a shape for cooperating with said centering groove to engage said groove as said stock is moved therepast;

means for supporting said servicer means with said delivery end lower than said loading end; and

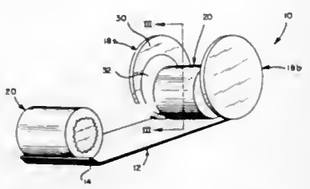
means for supporting said servicer means in a working position with said delivery end disposed beneath said drum and spaced apart therefrom by a distance slightly greater than a thickness of said tread stock, said servicer means being supported at an angle with respect to said drum such that the tread stock carried on said servicer means contacts a lower portion of said drum along a line tangent to the periphery of said drum, whereby stock approaches the belt package supported on said drum with said outer face down and away from the drum for application of the tread stock to the belt package.

4,820,374

ROLL HEADER PLATEN

Vernon L. Lamb, Sparta, Mich., assignor to Fortifiber Corporation, Los Angeles, Calif.

Filed Aug. 20, 1984, Ser. No. 642,569
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—538 **8 Claims**



1. A roll header comprising:

roll means for supporting a roll of paper; and

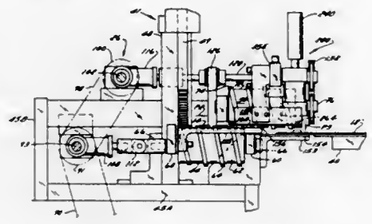
first and second platens on opposite sides of said roll means for selectively engaging the opposite ends of a roll of paper supported on said roll means, each of said platens including a generally circular outer heatable face and a generally circular inner face positioned therein, said outer face being heatable independently of said inner face, said inner and outer faces being generally coplanar and facing the other platen, said outer face surrounding said inner face, said inner face being eccentric within said outer face toward said roll means, said inner face being located above said roll means, whereby the entire perimeter of the end of a roll of paper supported on said roll means and extending upwardly beyond said inner face can be heated by said outer face alone and further whereby the area on the end of the roll of paper covered by said inner face can remain unheated.

4,820,375

SCREW TYPE ROD FEEDING AND PLACEMENT MECHANISM

Robert A. Memmel, Jr., Clearwater; Daryl A. Wilfong, Palm Harbor, and George A. Collins, St. Petersburg, all of Fla., assignors to Condes Corporation, Largo, Fla.

Filed Nov. 16, 1987, Ser. No. 121,789
Int. Cl.[4] B65B *15/00*
U.S. Cl. 156—566 **18 Claims**



1. A mechanism for feeding and placing a rod in a specific location comprising:

means for supporting a plurality of elongated rods in a stack;

a first screw means comprising a pair of screws for releasably engaging the endmost rod at one end of said stack and for advancing it laterally along a rod path to a second screw means comprising a second pair of screws located on the opposite side of the rod path to further advance and release it at an at-rest position spaced from said specific location;

guide means for supporting a rod being advanced toward said at-rest position by said screw means;

means for releasably maintaining a rod in said at-rest position;

and rod placement means for moving a rod from said at-rest position to said specific location.

4,820,376

FABRICATION OF CPI LAYERS

William R. Lambert, Mendham; Neng-Hsing Lu, and Ray D. Rust, both of Berkeley Heights, all of N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 5, 1987, Ser. No. 116,988
Int. Cl.[4] H01R *43/00*
U.S. Cl. 156—643 **9 Claims**



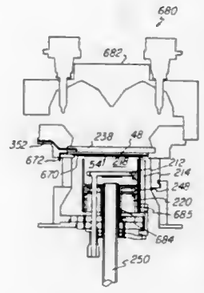
1. A method of fabricating a layer of silicone elastomer material including chains of electrically conducting particles extending essentially perpendicular to the major surfaces of the layer, the method comprising the step of removing a portion of at least one of said major surfaces by plasma etching so that the particles at the ends of said chains protrude through the etched surface.

4,820,377

METHOD FOR CLEANUP PROCESSING CHAMBER AND VACUUM PROCESS MODULE

Cecil J. Davis, Greenville; Robert T. Matthews, Plano; Rhett B. Jucha, Celeste, and Lee M. Loewenstein, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 16, 1987, Ser. No. 74,422
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **52 Claims**



48. A method for cleanup of a processing chamber comprising the steps of:

(a) introducing free radicals to the process chamber; and

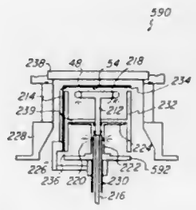
(b) removing undesired deposits from the processing chamber.

4,820,378

PROCESS FOR ETCHING SILICON NITRIDE SELECTIVELY TO SILICON OXIDE

Lee M. Loewenstein, Plano, Tex., assignor to Texas Instruments Incorporated, Del.

Filed Jul. 17, 1987, Ser. No. 75,017
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **12 Claims**



1. A process for etching silicon nitride on the face of a wafer with the face including silicon nitride and silicon oxide comprising the steps of:

(a) disposing said wafer in a low pressure chamber;

(b) introducing remote generated plasma produced from a gas including SF_6 and Helium at the face of said wafer at low pressure.

4,820,379

METHOD FOR DEINKING WASTEPAPER WITH A HALOGENATED POLYETHYLENE OXIDE AND A POLYMERIC MATERIAL

William B. Darlington, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 919,513, Oct. 16, 1986, abandoned. This application May 2, 1988, Ser. No. 188,948
Int. Cl.[4] D21C *5/02*
U.S. Cl. 162—5 **8 Claims**

1. A method of removing ink from secondary fiber, said method comprising the steps of:

(a) pulping the secondary fiber containing ink in an aqueous medium in the presence of a polymeric material having a glass transition temperature in the range of from about 20° C. to 70° C. degrees centigrade;

(b) contacting the pulped secondary fiber with a compound or mixture of compounds represented by the formula:

$$R(OCH_2CH_2)_nR^1$$

wherein:

R is C_6 to C_{20} linear or branched alkyl;

R^1 is halogen, and n denotes the average number of ethylene oxide units and is a whole or fractional number ranging from 1 to 20, said polymeric material and said compound being present in an amount sufficient and for a time sufficient to agglomerate the ink into discrete masses; and

(c) separating the agglomerated ink from the pulp-containing aqueous medium.

4,820,380

STABILIZED STARCH SUSPENSIONS

William O'Callaghan, Gerrards Cross, and John W. Cruse, Robertsbridge, both of United Kingdom, assignors to P. T. Chemicals, Limited, Buckinghamshire, England

Division of Ser. No. 689,048, filed as PCT GB84/00141 on Apr. 25, abandoned. This application Nov. 5, 1985, Ser. No. 795,259
Claims priority, application United Kingdom, Apr. 25, 1983, 8311152
Int. Cl.[4] D21H *1/34*
U.S. Cl. 162—135 **5 Claims**

1. In a process for manufacture of paper or board in which a starch suspension is applied to the paper or board, the improvement which comprises applying to a surface of said paper or board an aqueous suspension comprising (a) uncooked starch, (b) a minor amount of xanthan gum effective to prevent dilantancy and to increase the viscosity thereof substantially to prevent settlement of starch particles during storage and transportation of said suspension, and a minor amount of a water-soluble polymer having the property of forming a film on application of said suspension to paper or board.

4,820,381

PULP REFINER WITH FLUIDIZING INLET

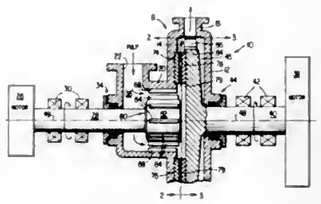
Kenton J. Brown, Mobile, Ala., assignor to International Paper Company, Purchase, N.Y.

Division of Ser. No. 20,150, Feb. 25, 1987, abandoned, which is a continuation of Ser. No. 770,169, Aug. 28, 1985, abandoned. This application Oct. 26, 1987, Ser. No. 112,326
Int. Cl.[4] B02C *7/02, 7/06, 13/20*; D21D *1/30*
U.S. Cl. 162—261 **6 Claims**

1. A pulp refiner and pulp fluidizing apparatus for the treatment of paper pulp stock, the apparatus including a rotary pulp refiner and a rotary pulp fluidizer housed within a casing, at least a portion of the fluidizer being connected to and rotatable by a first shaft, at least a portion of the refiner being connected to and rotatable by a second shaft, said first and second shafts being coaxial to define a common axis and are rotatable independently of each other, whereby the fluidizer can be operated at a greater rotary speed than the rotary speed of the refiner, the output of the fluidizer being positioned contiguously to the input of the refiner, whereby the fluidizer deflocculates the paper pulp stock and the deflocculated stock substantially

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immediately passes to the input of the refiner while it is still deflocculated, whereby clogging of the refiner is inhibited and therefore higher paper pulp stock consistency can be refined by the disc refiner without clogging, and wherein the fluidizer is defined by said first rotary shaft carrying a cylindrical member having angularly spaced raised portions on its exterior cylindrical surface, and by a stationary cylindrical member carried by the casing and having angularly spaced raised portions uniformly on its interior, cylindrical surface, the two said cylindrical surfaces being coaxial and the raised portions of each radially spaced from each other, the paper pulp stock being adapted to be fed to one axial end of the two cylindrical



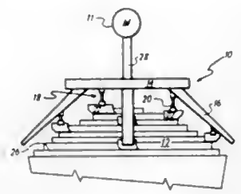
surfaces, and adapted to pass from the other axial end of the two cylindrical surfaces, said other axial end of the two cylindrical surfaces being positioned contiguously to the input of the refiner, the rotary speed of the fluidizer being completely independent of the rotary speed of the refiner and wherein said other axial end of the said two fluidizer cylindrical surfaces lies substantially in a radial plane which is at right angles to said common axis, and wherein the input zone to the pulp refiner lies substantially in said radial plane, the refiner being of the disc type having ridges and wherein the radial spacing between the raised portions of said cylindrical surfaces of said fluidizer is uniform and is greater than the spacing between the opposed ridges of the refiner.

4,820,382

METHOD AND APPARATUS FOR REMOVING SOLIDS FROM AN UPWARDLY MOVING BED CHAMBER

Delwin E. Cobb, Peoria, Ill., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 712,552, Mar. 15, 1985, abandoned. This application Apr. 11, 1988, Ser. No. 180,624
Int. Cl.[4] C10B *1/04, 49/06, 53/06*
U.S. Cl. 201—32 **17 Claims**



1. A method for removing particulate matter from an exposed upper surface of a body of particulate matter being transported upwardly through a chamber, the method comprising the steps of:
(a) arranging a plurality of scraper blades in a vertically-stepped relationship and in a radially outwardly-stepped relationship relative to a vertical axis;
(b) mounting the arrangement of scrapper blades in the path of said exposed upper surface of the particulate matter body as the particulate matter is transported upwardly through the chamber; and
(c) rotating, about the vertical axis, the arrangement of scraper blades and forming a plurality of vertically-and radially outwardly stepped annular terraces in said exposed upper surface of the particulate matter body as said body is transported upwardly through the chamber and thereby removing particulate matter from the exposed upper surface of the body of particulate matter by the scraping action of the rotating scraper blades spilling particulate matter from each one of the plurality of annular terraces.

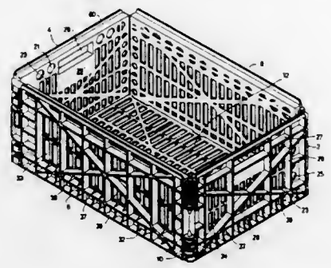
6. In combination with a chamber through which a body of particulate matter is transported upwardly, apparatus for removing particulate matter from an exposed upper surface of said particulate matter body, the apparatus comprising:
(a) scraping means for scraping particulate matter from the upper surface of the particulate matter body, said scraping means including a shaft having a vertical axis and a plurality of scrapers secured to said shaft and arranged in a vertically spaced-apart relationship and in a radially outwardly-stepped relationship relative to the vertical axis of said shaft;
(b) means for rotatably mounting said shaft about the vertical axis; and
(c) means for causing rotation of the shaft, wherein rotation of the scraping means will form a plurality of vertically-and radially outwardly-stepped annular terraces in the exposed upper surface of the body of particulate matter as it is transported upwardly through the chamber and thereby removing particulate matter from the exposed upper surface of the body by the scraping action of the rotating scrapers spilling particulate matter from each one of the plurality of annular terraces.

4,820,383

COLLAPSIBLE PLASTIC CONTAINER

Shlomo Shchamorov, Tel-Aviv, and Aharon Schnapp, Givatayim, both of Israel, assignors to Mercaz Haargazim Ltd., Tel Aviv, Israel

Filed Jun. 30, 1986, Ser. No. 879,961
Claims priority, application Israel, Jul. 29, 1985, 75934
Int. Cl.[4] B65D *6/18*
U.S. Cl. 220—6 **10 Claims**



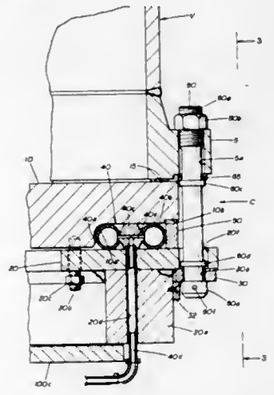
1. A collapsible plastic container, comprising:
a pair of side walls of plastic material formed with a plurality of air-circulation openings therethrough;
a pair of end walls of plastic material formed with a plurality of air-circulation openings therethrough;
hinges mounting each end wall between a pair of side walls to form a container in which said walls are hinged for movement either to an open condition wherein said walls are disposed perpendicularly to each other to form a container of rectangular configuration, or to a collapsed condition wherein said walls are folded on top of each other for storage or transportation;
each of said walls including internally-extending bottom ledges;
and a bottom wall of plastic material formed with a plurality of air-circulation openings therethrough supported on said bottom ledges in the open condition of the container so as to rigidify the container, said bottom wall being removable from said ledges to permit collapse of the container;
at least one of contiguous side and end walls being integrally formed at one end with a laterally-extending retainer tongue, and the other contiguous wall being formed with a retainer member having a slot adapted to releasably receive said retainer tongue in the open condition of the container to retain said walls in their open condition until said bottom wall is applied over said bottom ledges.

4,820,384

REMOTELY OPERABLE VESSEL COVER POSITIONER

Raymond E. Pechacek, 1846 Latexo, Houston, Tex. 77018

Filed May 18, 1987, Ser. No. 51,580
Int. Cl.[4] C10B *25/04, 25/10*
U.S. Cl. 202—245 **14 Claims**



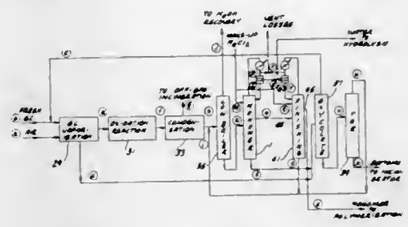
1. A remotely operable vessel cover positioner in combination with a vessel for remotely connecting and disconnecting a vessel cover to and from the vessel wherein the vessel includes an opening, a mounting rim surrounding the opening and a cover having a perimeter sized to fit against the mounting rim to provide a closure over the vessel opening, comprising;
a plurality of connector pins affixed to and extending outwardly from the vessel mounting rim;
initial cover positioning means supporting the cover for moving the cover to and from an initial position in which the cover is substantially adjacent to and aligned with the vessel mounting rim;
pin connection means having a first portion attached to the cover on a side of the cover opposite from the mounting rim, said first portion having openings therein into which the pins extend when the cover is moved into the inital position, and a second portion which is movable relative to the first portion for interlocking the pins extending into the openings in the first portion with the first portion and thereby locking the cover in the initial position;
final positioning means disposed substanatially between the cover and the pin connection means for moving the cover from the initial locked position into a desired final position against the vessel rim and for prestressing the connector pins interlocked with the pin connection means; and
final position lock means, disposed substantially adjacent the final positioning means between the cover and the pin connection means, movable relative to the cover from an initial position to a final locking position for locking the cover in the desired final position in which the connector pins are prestressed.

4,820,385

PURIFICATION OF ALKYL GLYOXYLATE IN A CONTINUOUS COLUMN BY AZEOTROPIC DISTILLATION

Dario R. Cova, Kirkwood, and John M. Thorman, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 18, 1988, Ser. No. 156,874
Int. Cl.[4] B01D *3/36, 3/42;* **C07C** *69/66*
U.S. Cl. 203—2 **30 Claims**



1. In a process for the preparation of an alkyl ester of glyoxylic acid, said process comprising oxidizing an alkyl ester of glycolic acid to said glyoxylic acid ester and producing a monomer mixture comprising a glyoxylic acid ester, a glycolic acid ester, alcohol and water, the improvement which comprises treating said monomer mixture to remove low boilers and recovering said glyoxylic acid ester from said treated monomer mixture by an azeotropic distillation operation, said operation comprising:
feeding said treated monomer mixture to a multi-stage monomer distillation column;
maintaining a concentration of an azeotroping agent in the upper stages of said monomer column, said azeotroping agent forming a low boiling binary azeotrope with water and being immiscible with water to permit a gravity separation of water from said agent;
condensing vapor from the uppermost stage of said monomer column, thereby producing an overheads condensate;
separating the azeotroping agent from the water of said overheads condensate and returning the azeotroping agent to the uppermost stage of said monomer column as reflux;
removing a glyoxylic ester fraction from said column at a stage intermediate the feed point and said uppermost stage; and removing from the bottom of said monomer column a fraction comprising glycolic acid ester, a glyoxylic acid ester hydrate, and a glyoxylic acid ester hemiacetals.

4,820,386

DIFFUSION-TYPE SENSOR CELL CONTAINING SENSING AND COUNTER ELECTRODES IN INTIMATE CONTACT WITH THE SAME SIDE OF A PROTON-CONDUCTING MEMBRANE AND METHOD OF USE

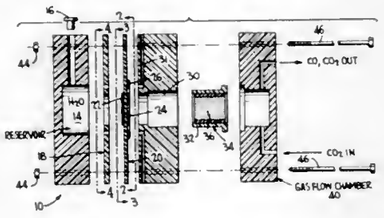
Anthony B. LaConti, Lynnfield, and Arthur E. Griffith, Lynn, both of Mass., assignors to Giner, Inc., Waltham, Mass.

Filed Feb. 3, 1988, Ser. No. 151,937
Int. Cl.[4] G01N *27/28, 27/54*
U.S. Cl. 204—1 T **27 Claims**

16. A gas-diffusing sensor cell for measuring the level of a gas in a fluid medium comprising water reservoir means, a proton-conducting membrane, a reference electrode in intimate contact with one surface of said membrane and in contact

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with water in said reservoir means; a gas sensing electrode in contact with the second surface of said membrane and positioned directly opposite of said reference electrode; and a counter electrode in contact with said membrane surrounding said sensing electrode; means for maintaining said sensing and counter electrodes separated from each other and forming a compartment around said electrodes; means for distributing air to said counter electrode; means for distributing a fluid medium containing a gas to be detected and measured to said



sensing electrode; potentiostatic circuit means for maintaining the sensing, reference and counter electrodes at predetermined potentials; and means for measuring the current flowing between the counter and sensing electrodes as a function of the gas being detected in said fluid medium.

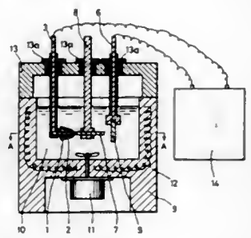
24. The method of detecting a gas in an atmosphere comprising subjecting the sensor cell of claim 16 to an atmosphere containing a gas to be detected and determining the amount of said detected gas with said sensor cell.

4,820,387

METHOD AND APPARATUS FOR MAKING THE INNER CROWNS OF COMPOSITE-LAYERED CROWNS FOR RESTORING CROWNS

Atsushi Yamashita, Okayama, and Ikuo Kyotani, Kitamoto, both of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,463
Claims priority, application Japan, Apr. 10, 1987, 62-86761
Int. Cl.[4] C25D *1/00, 17/00*
U.S. Cl. 204—4 **14 Claims**



1. A method for making an inner crown of a composite-layered crown for the restoration of crowns, said inner crown being composed mainly of a noble metal, comprising the steps of: applying and solidifying an electrically conductive coating material undissolvable in a plating bath on an inner crown-forming surface on a working model of a tooth on which the state of the tooth to be restored is reproduced and which is formed of a non-conductive material, making an electrical connection so as to render said conductive coating material cathodic while said working model of a tooth with said coating material is immersed in said plating bath; immersing an anode in said plating bath while said anode is fixedly located on a position opposite to said inner crown-forming surface; immersing and fixing an auxiliary electrode having one end and formed of the same metal as the metal to be plated in said plating bath between said anode and said cathode, while an other end of said auxiliary electrode is opposite and adjacent to a recess in said cathode; and impressing a pulse current between said anode and said cathode at a pulse width of 0.01 to 50 msec. and a pulsed current density of 1 to 20 A/dm^2 and in a duty cycle of 1 to 30% for electroplating, thereby making said inner crown.

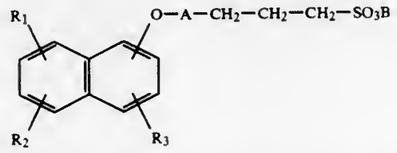
4,820,388

POLYALKYLENE GLYCOL NAPHTHYL-3-SULFOPROPYL DIETHER COMPOUNDS AND THEIR SALTS, PROCESS FOR PREPARING SAME AND ELECTROPLATING BATHS CONTAINING SAME

Werner Kurze, Neuhofen, and Klaus-Peter Klos, Trebur, both of Fed. Rep. of Germany, assignors to Raschig AG, Ludwigshafen and Elektro-Brite GmbH & Co. KG, Trebur, both of, Fed. Rep. of Germany, a part interest

Filed Jun. 13, 1988, Ser. No. 205,631
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722778
Int. Cl.[4] C07C *143/30, 143/32, 143/34*
U.S. Cl. 204—44.2 **7 Claims**

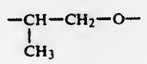
1. A polyalkyleneglycol naphthyl-3-sulfopropyl diether compound, or salt thereof, of the formula:



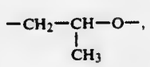
wherein,

R_1, R_2 and R_3 represent a member selected from the group consisting of hydrogen and a lower alkyl group C_pH_{2p+1} wherein p is an integer from 1 to 4;

A represents a member selected from the group consisting of $-(PO)_m-(EO)_n-$, $-(EO)_n-(PO)_m-$ and $-(EO)(PO)_n$, wherein EO is a $-CH_2CH_2-O-$ group and PO is a member selected from the group consisting of



and



m is an integer of from 0 to 15, and n is an integer from 1 to 40; and,

B is a member selected from the group consisting of hydrogen, an alkali metal, an earth alkali metal and an ammonium cation of the formula $NR_4R_5R_6R_7$ wherein R_4-R_7 are independently selected from the group consisting of hydrogen, an alkyl group of from 1 to 4 carbon atoms, an aryl and an aralkyl group.

2. A process for the preparation of a polyalkyleneglycol naphthyl-3-sulfopropyl diether compound, or a salt thereof, of the formula:

wherein,

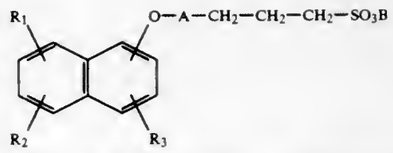
R_1, R_2 and R_3 represent a member selected from the group consisting of hydrogen and a lower alkyl group C_pH_{2p+1} wherein p is an integer from 1 to 4;

A represents a member selected from the group consisting of $-(PO)_m-(EO)_n-$, $-(EO)_n-(PO)_m-$ and $-(EO)(PO)_n$, wherein EO is a $-CH_2CH_2-O-$ group and PO is a member selected from the group consisting of

and

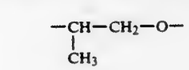
m is an integer of from 0 to 15, and n is an integer from 1 to 40; and,

B is a member selected from the group consisting of hydrogen, an alkali metal, an earth alkali metal and an ammonium cation of the formula $NR_4R_5R_6R_7$ wherein R_4-R_7 are independently selected from the group consisting of hydrogen, an alkyl group of from 1 to 4 carbon atoms, an aryl and an aralkyl group.

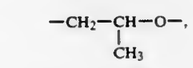


wherein, R_1, R_2 and R_3 represent a member selected from the group consisting of hydrogen and a lower alkyl group C_pH_{2p+1} wherein p is an integer from 1 to 4;

A represents a member selected from the group consisting of $-(PO)_m-(EO)_n-$, $-(EO)_n-(PO)_m-$ and $-(EO)(PO)_n$, wherein EO is a $-CH_2CH_2-O-$ group and PO is a member selected from the group consisting of



and

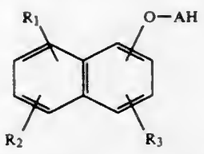


m is an integer of from 0 to 15, and n is an integer from 1 to 40; and,

B is a member selected from the group consisting of hydrogen, an alkali metal, an earth alkali metal and an ammonium cation of the formula $NR_4R_5R_6R_7$ wherein R_4-R_7 are independently selected from the group consisting of hydrogen, an alkyl group of from 1 to 4 carbon atoms, an aryl and an aralkyl group.

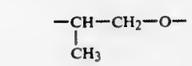
comprising the step of:

reacting a compound of the formula: formula II:

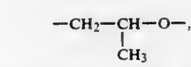


wherein, R_1, R_2 and R_3 represent a member selected from a group consisting of hydrongen and a lower alkyl group C_pH_{2p+1} wherein p is an integer from 1 to 4; and

A represents a member selected from the group consisting of $-(PO)_m-(EO)_n-$, $-(EO)_n-(PO)_m-$ and $-(EO)(PO)_n$, wherein EO is a $-CH_2CH_2-O-$ group and PO is a member selected from the group consisting of

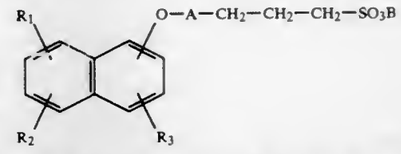


and



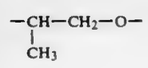
m is an integer of from 0 to 15, and n is an integer from 1 to 40, with propane-1,3-sultone in the presence of a member selected from the group consisting of an alkali hydroxide, an earth alkali hydroxide and ammonium hydroxide of the formula $NR_4R_5R_6R_7OH$, wherein R_4-R_7 are independently selected from the group consisting of an alkyl group of from 1 to 4 carbon atoms, an aryl and an aralkyl group.

5. An electroplating bath or an electroless chromium plating bath comprising at least one polyalkyleneglycol naphthyl-3-sulfopropyl diether compound, or a salt thereof, of the formula:

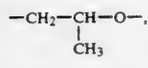


wherein, R_1, R_2 and R_3 represent a member selected from a group consisting of hydrogen and a lower alkyl group C_pH_{2p+1} wherein p is an integer from 1 to 4;

A represents a member selected from the group consisting of $-(PO)_m-(EO)_n-$, $-(EO)_n-(PO)_m-$ and $-(EO)(PO)_n$, wherein EO is a $-CH_2CH_2-O-$ group and PO is a member selected from the group consisting of



and



m is an integer of from 0 to 15, and n is an integer from 1 to 40; and,

B is a member selected from the group consisting of hydrogen, an alakli metal, an earth alkali metal and an ammonium cation of the formula $NR_4R_5R_6R_7$ wherein R_4—R_7 are independently selected from the group consisting of hydrogen, an alkyl group of from 1 to 4 carbon atoms, an aryl and an aralkyl group.

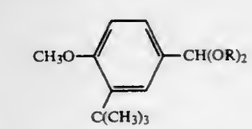
4,820,389

NOVEL BENZALDEHYDE DIALKYL ACETALS AND PREPARATION AND USE THEREOF

Dieter Degner, Dannstadt-Schauernheim; Walter Gramlich, Edingen-Neckarhausen; Franz Lanzendoerfer, Ellerstadt, and Hardo Siegel, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 13, 1988, Ser. No. 181,120
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713732
Int. Cl.[4] C25G *3/02*
U.S. Cl. 204—78 **7 Claims**

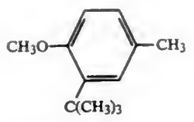
1. A benzaldehyde dialkyl acetal of the formula



where R is alkyl of 1 to 4 carbon atoms.

4. A process for preparing a benzaldehyde dialkyl acetal as claimed in claim 1, which comprises oxidizing 3-tert-butyl-4-methoxytoluene of the formula

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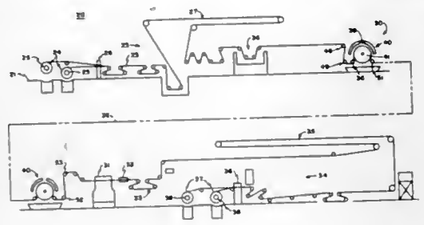
electrochemically in the presence of an alkanol of the formula ROH where R is alkyl of 1 to 4 carbon atoms.

4,820,390

APPARATUS AND METHOD FOR CONTINUOUS ELECTROCHEMICAL MACHINING OF STRIP MATERIAL

John E. Schuster, Flossmoor, Ill., assignor to The Interlake Companies, Inc., Oak Brook, Ill.

Filed Jul. 6, 1987, Ser. No. 69,865
Int. Cl.[4] B23H *3/10, 7/32, 7/36*
U.S. Cl. 204—129.5 **34 Claims**



27. A method for continuous electrochemical machining of a metal web comprising the steps of: moving the web continuously through a working region, disposing a first electrode at the working region a predetermined distance from the portion of the web disposed in the working region so as to establish a working gap between the first electrode and a predetermined working area of the portion of the web disposed in the working region which extends over substantially the full width of the web, continuously flowing an electrolyte fluid through the working gap in contact with the first electrode and with the portion of the web disposed in the working region at a pressure substantially greater than atmospheric pressure, disposing a second electrode in electrical and rigid supporting contact with the sheet over a predetermined contact area thereof which completely overlaps said working area, and applying a negative electrical potential to the first electrode and a positive electrical potential to the second electrode for promoting a flow of direct current through the first and second electrodes and the electrolyte fluid and the portion of the web disposed in the working region to effect electrochemical removal of material from the portion of the web disposed in the working region.

4,820,391

EXHAUST GAS CLEAN UP PROCESS

Richard J. Walker, McMurray, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

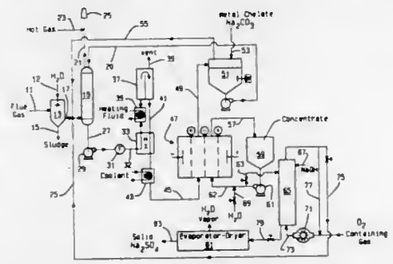
Filed Jun. 16, 1988, Ser. No. 207,562
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 **19 Claims**

1. A method of regenerating a spent absorbent used in removing NO_x and SO_2 from exhaust gases, said absorbent including sulfite and bisulfite ions and a metal chelate at least partially loaded with NO_x values, said method comprising:

heating and venting the loaded absorbent for at least 4 hours at a temperature of at least 60° C. to regenerate the metal chelate in respect to NO_x absorption;

depleting sulfite and bisulfite ions from said absorbent in a first compartment of an electrodialysis cell having an anode and cathode, said first compartment defined between a first cation selective membrane disposed towards the cathode and an anion selective membrane disposed toward the anode;

concentrating sulfite and bisulfite ions in an aqueous solution in a second compartment adjacent to said first compartment across said anion selective membrane in the electrodialysis cell, said second compartment defined between said anion selective membrane and a second cation selective membrane towards said anode;



oxidizing a portion of the sulfite concentrated in the second compartment to form a sulfate salt and drying the sulfate salt to a solid for withdrawal;

adding a soluble carbonate to the spent absorbent to convert bisulfite to sulfite ions and thereby regenerate the absorbent in respect to SO_2 absorption;

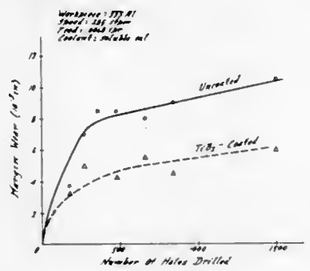
returning the regenerated absorbent into contact with said exhaust gases.

4,820,392

METHOD OF INCREASING USEFUL LIFE OF TOOL STEEL CUTTING TOOLS

David Moskowitz, Southfield; David W. Hoffman, Ann Arbor, and Duane J. Schmatz, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1987, Ser. No. 135,881
Int. Cl.[4] C23C *14/46*
U.S. Cl. 204—192.11 **4 Claims**



1. A method of increasing the wear life of a high-speed tool steel cutting bit, comprising:

(a) grinding a surface of said bit to a finish of about 15 microinches or less;

(b) cleansing said bit surface by subjection to one beam of dual ion beam guns with the beam having an energy range of 1200–1700 electron volts;

(c) heating and coating said cleansed bit surface, while preventing the temperature of said cleansed bit surface from rising above 350° C., by condensing atoms of titanium and boron sputtered from a TiB_2 target thereonto to form a coating of TiB_2 having a thickness of 2–6 microns, said sputtering being effected by use of a second beam from said dual ion beam guns having an energy range of 1300–1800 electron volts and such use overlapping simultaneously a portion of the use of said one beam.

4,820,393

TITANIUM NITRIDE SPUTTER TARGETS

Teodoro E. Brat, Reynoldsburg, and Charles E. Wickersham, Columbus, both of Ohio, assignors to Tosoh SMD, Inc., Grove City, Ohio

Filed May 11, 1987, Ser. No. 48,153
Int. Cl.[4] C23C *14/34;* **C22C** *32/00;* **C01B** *21/076;* **C04B** *35/58*
U.S. Cl. 204—192.15 **13 Claims**

10. A process for depositing a titanium nitride film on a substrate comprising the steps of

providing a titanium nitride target having a density of at least 90% of the theoretical density of 100% pure titanium nitride; and

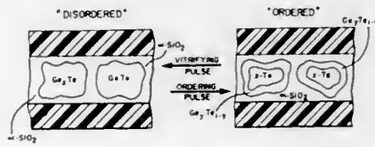
sputtering said target under conditions designed to deposit a titanium nitride film on said substrate.

4,820,394

PHASE CHANGEABLE MATERIAL

Rosa Young, Troy, Mich., and Eugenia Mytilineou, Peristeri, Greece, assignors to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 674,112, Nov. 21, 1984, Pat. No. 4,653,024.
This application Dec. 1, 1986, Ser. No. 935,881
Int. Cl.[4] C23C *14/58*
U.S. Cl. 204—192.21 **20 Claims**



1. In a method of forming an optical data storage device having a state changeable chalcogenide phase change layer reversibly switchable between at least two detectable states, which method comprises co-depositing a chalcogen and a cross linking agent on to a substrate, the improvement comprising:

(a) co-depositing the chalcogen, the cross linking agent, and an encapsulant on to the substrate and forming a substantially uniform deposit thereof; and

(b) crystallizing and vitrifying the deposit to substantially irreversibly separate the deposit into a substantially continuous, non-switchable encapsulant phase and discrete cells of state changeable phase disposed through the encapsulant phase, wherein said dispersed, discrete cells of the state changeable phase are reversibly switchable between:

(i) an anorphous, first chalcogen-cross linking agent composition; and

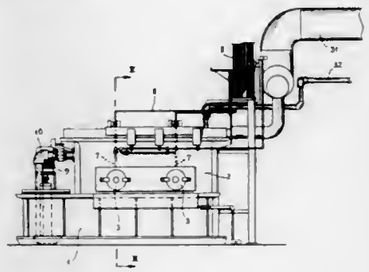
(ii) crystalline chalcogen, and an amorphous, second, chalcogen-cross linking agent composition, said second chalcogen-cross linking agent composition having a lower chalcogen content then said first chalcogen-cross linking agent composition, said amorphous, first chalcogen-cross linking agent composition separating into said crystalline chalcogen and said amorphous, second chalcogen-cross linking agent composition.

4,820,395

CELL FOR CONTINUOUS ELECTROLYTIC DEPOSITION TREATMENT OF BARS AND THE LIKE

Sergio Angelini, Residenza del Cantone 61, Segrate (Milan), Italy

Filed Sep. 11, 1987, Ser. No. 96,054
Claims priority, application Italy, Sep. 12, 1986, 21686 A/86
Int. Cl.[4] C25D *17/00*
U.S. Cl. 204—207 **12 Claims**



1. A cell for continuous electrolytic deposition treatment of bars, said cell comprising:

a closed outer vessel;

at least one tubular anode provided in said outer vessel through which a bar to be electrolytically processed can be conveyed in an axial direction;

respective inlet and outlet mouthpieces each provided with sealing means and each mounted on said outer vessel in alignment with said tubular anode so that said bar can be inserted into said outer vessel through said inlet mouthpiece and withdrawn from said outer vessel through said outlet mouthpiece;

means for supplying a flow of an electrolytic bath to said anode and transferring said electrolytic bath from said anode to said outer vessel, whereby said bath flows in said anode parallel to said bar; and

dielectric spacing means between said inlet mouthpiece and a proximal end of said anode and adapted to provide a zone of controlled chemical attack on said bar prior to electrolytic deposition thereon.

4,820,396

RACK OR TRANSPORT TOOL FOR THE MANUFACTURING OF PRINTED WIRED BOARDS

Amerigo de Masi, Brandenburgerstr., 62-6073 Egelsbach, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 686,471
Int. Cl.[4] C25D *17/04;* **B05C** *11/14*
U.S. Cl. 204—297 W **16 Claims**

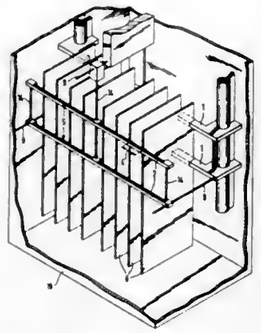
1. A rack to securely hold, transport and provide an electrical contact, to one of multiple lots of panels in a magazine form, withstanding any vibration or pressure throughout a production process for manufacturing printed wired boards, comprising means for holding vertically secured panels of dielectric, cladded with conductive metallic foils, and permitting said panels to be inserted, with no obstruction into a process tank to perform duties of different natures, whereby said means for holding can enter vertically said tank without dismounting the panels carried, while maintaining an electrical contact, with an inside slanted surface of notches provided on panels of said means for holding and avoiding any damage to conductors of the printed wired boards etched in a conductive surface, already bonded on a dielectric base material, said means for holding comprising:

a panel carrying frame means with two parallel frame members for firmly securing a plurality of panels;

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two first frame members assembled one over the other, parallel to each other, and rigidly connected by a plurality of metallic bars, exhibiting equally spaced first notches distributed at an appropriate distance for receiving plural panels;

second frame members opposing said first frame members comprising two bars and plural means for rigidly joining said bars, said bars exhibit equally spaced second notches corresponding to and directed toward opposing first notches;



means for displaceably fixing said first members at a distance from said second members and a tightening device for adjusting relational securing of said frame members:

wherein said first and second notches are shaped in a manner to form electrical contact with notched edges of the panels;

wherein said panels are arranged between said frame members so that the panels are kept captive sideways, and their weight pressing downward to provide electrical contact and being supported by said frame members at said notches wherein said first and second notches are at 90 degrees to said panel notches.

4,820,397

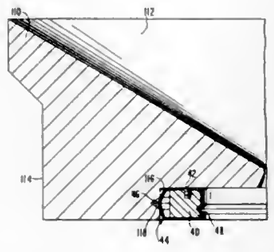
QUICK CHANGE SPUTTER TARGET ASSEMBLY

Kenneth B. Fielder; Robert L. Belli, both of Columbus, and Conrad E. Fuchs, Grove City, all of Ohio, assignors to Tosoh SMD, Inc., Grove City, Ohio

Filed Apr. 4, 1988, Ser. No. 176,911

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—298 **12 Claims**



1. A sputter source having a quick change target from which material is sputtered comprising:

a removable, annularly shaped, target from which material is sputtered, said target having an outer rim;

an annular cooling wall adjacent to said outer rim of said sputter target;

the diameter of said sputter target being dimensioned such that the sputter target fits loosely within said cooling wall when said sputter target is at a temperature substantially below its normal operating temperature so that the target is easily inserted and removed from said source when it is substantially below its normal operating temperature and such that said sputter target tightly contacts said cooling wall when the target is heated to its normal operating temperature, so that good thermal contact is maintained between said cooling wall and said sputter target when said source is in operation;

spring means for releasably gripping said target so that said target is held in place adjacent to said cooling wall while said cooling wall is substantially below its normal operating temperature, said spring means being actuated by axial force on said sputter target whereby by said sputter target can be inserted and removed from said spring means by said axial force.

4,820,398

ELECTROPHORESIS GEL SHEET

Shoichi Yamamoto, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

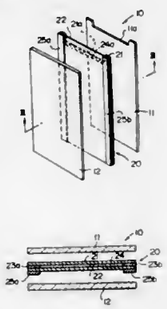
Filed May 14, 1987, Ser. No. 50,542

Claims priority, application Japan, May 15, 1986, 61-111643

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[4] G01N *27/28, 27/26*

U.S. Cl. 204—299 R **4 Claims**



1. An electrophoresis gel sheet composed of two supporting members formed of an electrically non-conductive organic polymer film, gel-casing spacers having predetermined thicknesses and disposed at both side edge portions between the two organic polymer films, and an electrophoresis medium of uniform thickness encapsulated between the two organic polymer films at the zone between the gel-casing spacers,

wherein the improvement comprises the provision of a gap-forming spacer secured to an outer surface of at least one of said organc polymer films constituting said electrophoresis gel sheet so that, when said electrophoresis gel sheet is inserted between electrically non-conductive supporting plates before electrophoresis, a gap is formed by said gap-forming spacer between a surface of said supporting plate and the surface of said electrophoresis gel sheet which stand facing each other, whereby the surface of said supporting plate and the surface of said electrophoresis gel sheet which stand facing each other are prevented from closely contacting each other.

4,820,399

ENZYME ELECTRODES

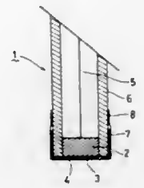
Mitsugi Senda; Tokuji Ikeda, and Isao Katsubo, all of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Aug. 28, 1985, Ser. No. 770,202

Claims priority, application Japan, Aug. 31, 1984, 59-183124; Aug. 31, 1984, 59-183125; Dec. 17, 1984, 59-266941; Dec. 17, 1984, 59-266942

Int. Cl.[4] G01N *27/54*

U.S. Cl. 204—403 **13 Claims**



1. An enzyme electrode including a carrier, said carrier comprising:

(a) a storage layer impregnated with a substance capable of functioning as an electron transfer mediator;

(b) an enzyme-immobilized layer, positioned adjacent to said storage layer, containing an immobilized enzyme;

(c) a thin film coating said enzyme-immobilized layer permeable to a substrate for said enzyme; and

(d) an internal electrode capable of applying voltage to said enzyme-immobilized layer.

4,820,400

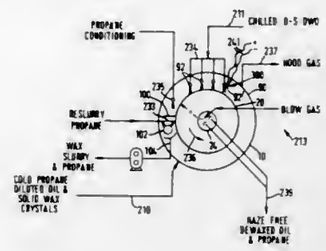
PROCESS FOR REMOVING HAZE FROM DEWAXED HYDROCARBON OIL MIXTURE BOILING IN THE LUBRICATING OIL RANGE (OP-3379)

Douglas G. Ryan, Rockaway; Donald B. Trust, Denville, and Rudolph R. Savory, Chatham, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 787,385, Oct. 15, 1985, abandoned. This application Jan. 6, 1988, Ser. No. 202,601

Int. Cl.[4] C10G *33/02;* B03C *5/00*

U.S. Cl. 208—38 **11 Claims**



1. A method of removing haze from dewaxed hydrocarbon oil mixture boiling in the lubricating oil range which is hazy, comprising the steps of (a) passing undewaxed hydrocarbon oil mixture boiling in the lubricating oil range through a dewaxing plant including a filtration stage, (b) introducing the hazy oil mixture into the dewaxing plant directly at its filtration stage, so as to combine the hazy oil mixture and the undewaxed oil mixture and subject them to concurrent filtering in said filtration stage, and (c) introducing free charge which is net unipolar into the hazy dewaxed oil mixture before that oil mixture is combined with the undewaxed oil mixture, the introduction of free charge being effected at least predominantly by electron emission which causes the dewaxed hydrocarbon oil mixture to act as a medium through which volumetric distribution of the introduced charge takes place by charge motion relative to the dewaxed hydrocarbon oil mixture, there being a sufficient excess of free charge introduced such that the volumetric charge distribution causes, in the filtration stage of the dewaxing plant, both an electric field to be induced in the oil mixture in said filtration stage and the haze therein to become charged, and the induced electric field and the charge on the haze interact to produce an electrical driving force acting on the haze to promote removal of haze from the dewaxed oil mixture during the filtering.

4,820,401

PROCESS FOR THE PREPARATION OF MESOPHASE PITCHES

Masatoshi Tsuchitani, Ichihara; Sakae Naito, Chiba, and Ryoichi Nakajima, Ichihara, all of Japan, assignors to Kozo Iizuka and Maruzen Petrochemical Co., Ltd., both of Tokyo, Japan

Filed May 11, 1987, Ser. No. 48,376

Claims priority, application Japan, May 19, 1986, 61-114221

Int. Cl.[4] C10C *3/00*

U.S. Cl. 208—40 **17 Claims**

1. A process for preparing a mesophase pitch with a Mettler method softening point of lower than 320° C., a mesophase content of higher than 90% when examined on a polarized microscope, a quinoline insoluble content of lower than 20% and a xylene soluble content of lower than 20% for manufacturing high performance carbon fibers comprising

(a) a first step of subjecting a heavy oil of petroleum or coal origin, or a heavy component obtainable from said heavy oil by a distillation, a heat treatment or a hydro-treatment thereof, said heavy oil or said heavy component having no or substantially no xylene insoluble component, to a heat treatment in a tubular heater at a temperature of 400° to 600° C. under a pressure of 1 to 100 $Kg/cm^2.G$ measured at the outlet of said tubular heater for 1 to 2000 sec so as to obtain a heat-treated material having 3 to 30 wt% of xylene insoluble component;

(b) a second step of adding to the thus heat-treated material, a monocyclic aromatic hydrocarbon solvent in an amount of 1 to 5 times based on said heat-treated material, and recovering the newly formed insoluble component as an essentially isotropic high molecular weight bituminous material;

(c) a third step of subjecting said high molecular weight bituminous material to a hydrogenation treatment at a temperature of 400° to 460° C. and a pressure of 20 to 200 $Kg/cm^2.G$ with the addition of 1 to 5 times amount of a hydrogen-donating solvent based on said high molecular weight bituminous material thereby obtaining an essentially isotropic hydrogenated pitch; and

(d) a fourth step of heat treating said hydrogenated pitch at 350° to 500° C. under a pressure up to atmospheric pressure to convert said mesophase pitch into said mesophase pitch.

4,820,402

HYDROCRACKING PROCESS WITH IMPROVED DISTILLATE SELECTIVITY WITH HIGH SILICA LARGE PORE ZEOLITES

Randall D. Partridge, Princeton, and Rene B. LaPierre, Medford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 744,897, Jun. 17, 1985, abandoned, which is a continuation of Ser. No. 586,483, Mar. 5, 1984, abandoned, which is a division of Ser. No. 379,400, May 18, 1982. This application May 27, 1987, Ser. No. 56,341

Int. Cl.[4] C10G *47/18, 47/20*

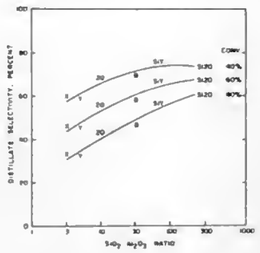
U.S. Cl. 208—111 **22 Claims**

1. A process for increasing the selectivity of the production of higher boiling distillate range product in hydrocracking reactions which can produce gasoline boiling range product

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and higher boiling distillate range product, which process comprises,

contacting a feedstock to be hydrocracked in a hydrocracker, in the presence of hydrogen and under hydrocracking conditions, with a catalyst comprising a hydrogenation component and a zeolite which has a porous lattice structure having pores with a dimension greater than 6 Angstroms and a hydrocarbon sorption capacity



for hexane of at least 6 percent and has a framework silica:alumina ratio of at least about 50:1, whereby the selectivity of the process for production of the higher boiling distillate range product is preferentially increased, wherein the distillate selectivity is defined by reference to the amounts of the 165° C.–343° C. (330° F.–650° F.) fraction and the total 343° C.-fraction in the hydrocracker effluent as follows:

$$\frac{\text{Dist. Select.} = 165^\circ\text{ C.} - 343^\circ\text{ C. fraction (wt)} \times 100}{\text{Total } 343^\circ\text{ C.} - \text{fraction (wt)}}$$

4,820,403

HYDROCRACKING PROCESS

L. Charles Gutberlet, Wheaton, and Jeffrey T. Miller, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 23, 1987, Ser. No. 124,280
Int. Cl.⁴ C10G *47/16*
U.S. Cl. 208—111 **15 Claims**

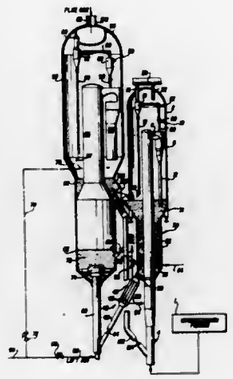
1. A process for the hydrocracking of a feedstock comprising a light catalytic cycle oil having a boiling range from about 350° F. to about 750° F. which comprises reacting the feedstock with hydrogen at hydrocracking conversion conditions in the presence of a catalyst comprising a hydrogenation component comprising a nickel component and a tungsten component wherein the nickel component is present in an amount ranging from about 1 to about 10 wt. % and the tungsten component is present in an amount ranging from about 10 to about 30 wt. %, both calculated as oxides and based on the total catalyst weight and a support component consisting essentially of a crystalline molecular sieve component and an alumina component wherein the crystalline molecular sieve component is present in the support in an amount less than about 60 wt. % and greater than about 25 wt. % based on the total weight of the support component.

4,820,404

COOLING OF STRIPPED CATALYST PRIOR TO REGENERATION IN CRACKING PROCESS

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 814,714, Dec. 30, 1985, abandoned.
This application Feb. 17, 1987, Ser. No. 14,964
Int. Cl.⁴ C10G *11/18*
U.S. Cl. 208—159 **9 Claims**



1. A process for controlling the fluid catalytic cracking of a feedstock containing hydrocarbons, comprising the steps of:

passing a mixture comprising catalyst and said feedstock through a riser conversion zone under fluid catalytic cracking conditions to crack said feedstock;

passing said mixture, having a riser exit temperature, from said riser into a fluid catalytic cracking reactor vessel;

separating a portion of catalyst from said mixture, with the remainder of said mixture forming a reactor vessel gaseous stream;

heating said separated catalyst portion by a heating step consisting essentially of combining said separated catalyst portion with a portion of regenerated catalyst from a fluid catalytic cracking regenerator vessel to form combined catalyst;

stripping said combined catalyst, by contact with a stripping gas stream, consisting essentially of steam at a stripping temperature between 100° F. above said riser exit temperature and 1500° F., said regenerated catalyst portion having a temperature between 100° F. above said stripping temperature and 1600° F. prior to heating said separated catalyst to produce a stripped catalyst;

cooling said stripped catalyst, prior to passing it into said regenerator vessel, to a temperature sufficient to cause said regenerator vessel to be maintained at a temperature between 100° F. above said stripping temperature and 1600° F., wherein said cooling step comprises passing said stripped catalyst stream to a heat-exchanger located outside said reactor vessel; and

regenerating said cooled catalyst stream in said fluid catalytic cracking regenerator vessel by contact with an oxygen-containing stream at fluid catalytic cracking regeneration conditions.

4,820,405

METHOD OF LIQUEFYING COAL

Tatsuo Fukuyama, Kawasaki; Toshihiko Okada; Sanseki Moriguchi, both of Yokohama; Yoshio Kamiya, Kawasaki, and Eisuke Ogata, Chiba, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1986, Ser. No. 921,795
Claims priority, application Japan, Sep. 29, 1984, 59-204231; Sep. 29, 1984, 59-204232; Sep. 29, 1984, 59-204235; Sep. 29, 1984, 59-204236; Sep. 29, 1984, 59-204237; Sep. 29, 1984, 59-204240
Int. Cl.⁴ C10G *1/00*
U.S. Cl. 208—423 **14 Claims**

1. A method of liquefying coal to produce a hydrogenation product wherein the ratio of the total content of gas and THF soluble substance to the total hydrogenation product is not less than 85.0, comprising adding hydrogen at high temperature and pressure to a mixture of coal ad a solvent in the presence of laterite ore as a coal liquefaction catalyst and in the absence of sulfur or sulfur compounds, said laterite ore containing 10 to 50% by weight of iron, having a specific surface area of 50 to 100 m^2/g, and having been subjected to a catalytic activity improvement treatment including the steps of immersing or washing in water for a period of time long enough to dissolve catalyst poisons therefrom, drying, heating, and then reducing with a reducing gas.

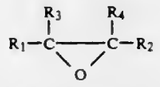
4,820,406

METHOD FOR THE FROTH FLOTATION OF COAL

Robert D. Hansen, and Richard R. Klimpel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 6, 1987, Ser. No. 46,357
Int. Cl.⁴ B03D *1/02*
U.S. Cl. 209—166 **14 Claims**

1. A method for recovering coal using froth flotation comprising the step of floating coal in an aqueous frothing medium containing from about 0.001 kg/metric ton of coal ore calculated on a dry weight basis to about 1.0 kg/metric ton of coal ore calculated on a dry weight basis of an epoxy conditioner compound of the general structural formula:



(I)

wherein each R_1, R_2, R_3, and R_4 are independently hydrogen, alkyl, aralkyl, alkaryl, aryl or OR_5 group or monovalently substituted alkyl, aralkyl, alkaryl, aryl or OR_5 group where R_5 is a hydrocarbyl group of 10 or less carbon atoms provided at least one R_1, R_2, R_3, or R_4 is not hydrogen and the total number of carbon atoms in the compound is at least six but not more than 14 and recovering the coal from the froth.

4,820,407

SOLIDS SCREENS

Kenneth R. Lilie, Houston, Tex., assignor to CPI Sales, Inc.

Filed Apr. 24, 1987, Ser. No. 42,469
Int. Cl.⁴ B07B *1/46*
U.S. Cl. 209—397 **4 Claims**

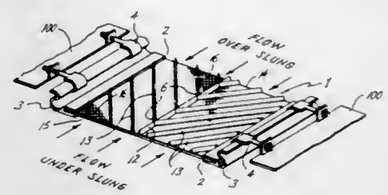
1. A screen assembly for solids filtering for connection to vibratory equipment, having hooks connected to the vibratory equipment, to direct the flow of trapped solids in a given direction, comprising:

a screen having longitudinal edges;

hooking clasps connected at a first end to the hooks and at a second end to one of said longitudinal edges; said screen including:

a screen layer having a longitudinal center and said longitudinal edges;

a set of flexible ribs, said ribs covering a portion of said screen layer and including two opposing sets of diagonal ribs, each set having a series of spaced ribs beginning at said longitudinal edges of said screen layer and extending diagonally and laterally toward said longitudinal center, each rib converging with its corresponding rib of the opposite set of said diagonal ribs to form a chevron;



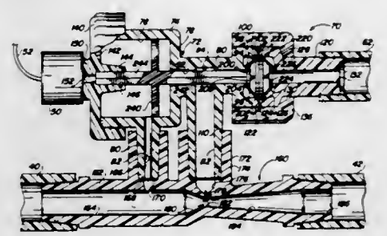
wherein said screen layer is overslung and the longitudinal direction of the flow of trapped solids across said screen layer is the same as the longitudinal direction of each said diagonal rib from its end at said longitudinal edge toward said longitudinal center.

4,820,408

DOUBLE VALVE APPARATUS

Bruce D. Sandig, Phoenix, Ariz., assignor to Dial Manufacturing, Inc., Phoenix, Ariz.

Filed Jul. 22, 1988, Ser. No. 223,102
Int. Cl.⁴ C02F *1/68*
U.S. Cl. 210—98 **8 Claims**



1. Valve and venturi apparatus in combination with a swimming pool having a chlorine generator to generate chlorine gas, comprising:

pump means for pumping water from and to the swimming pool;

venturi means for receiving at least a portion of the water pumped by the pump means to the swimming pool, including

a first bore portion into which the pumped water flows,

a second bore portion communicating with the first bore portion,

an inwardly tapering portion connected to the first bore portion,

a throat portion connected to the inwardly tapering portion,

an outwardly tapering portion connected to the throat, the inwardly tapering portion, the throat portion, and the outwardly tapering portion cooperating to provide vacuum pressure at the throat from the pumped water,

a groove at the throat portion, and a third bore portion communicating with the groove; and

valve means for controlling the flow of chlorine gas from the chlorine gas generator to the venturi means and for

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controlling the flow of water from the venturi means to the chlorine generator, including

a first bore,

a second bore communicating with the first bore and with the second bore portion of the venturi means,

a third bore communicating with the first bore,

a piston in the first bore and movable therein between the second and third bores in response to pumped water in the first and second bore portions and the second and first bores,

a first piston rod secured to the piston and movable in the third bore in response to movement of the piston,

a fourth bore extending between the third bore and the third bore portion for communicating the vacuum pressure from the throat portion, the groove, and the third bore portion to the third bore,

valve bore means communicating with the third bore for receiving the flow of chlorine gas from the chlorine generator, including

a valve bore communicating with the third bore,

a first valve seat in the valve bore at the third bore,

a fifth bore communicating with the valve bore and receiving the flow of chlorine from the chlorine generator,

a second valve seat in the valve bore at the fifth bore,

first valve means seated on the first valve seat and movable away from the first valve seat in response to movement of the piston rod when water is pumped, and

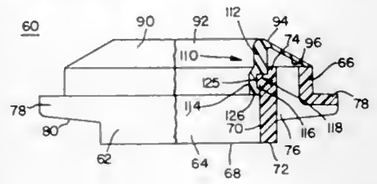
second valve means seated on the second valve seat and movable away from the second valve seat in response to vacuum pressure from the pumped water through the venturi means to allow chlorine gas to flow from the chlorine generator through the fifth bore, the valve bore, the third bore, the fourth bore, the third bore portion, and the groove to the throat of the venturi means and to the pumped water through the venturi means.

4,820,409

PLASTIC PRESSURE RELIEF VALVE ASSEMBLY

John Lowsky; Scott Trierwiler, and Nicholas Torchia, all of Fayetteville, N.C., assignors to Facet Enterprises, Inc., Tulsa, Okla.

Filed Apr. 19, 1988, Ser. No. 183,144
Int. Cl.[4] B01D *27/10*
U.S. Cl. 210—130 **23 Claims**



1. A pressure relief valve assembly for a fluid filter, comprising:

(a) a valve body having

(i) a sleeve portion including a central outlet, and

(ii) a slotted portion formed on the sleeve portion and including plural radial inlets, and

(b) a valve having

(i) an axial portion, and

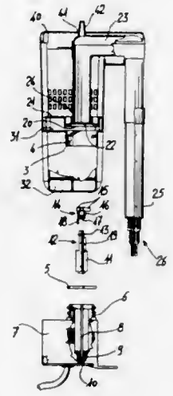
(ii) a radial portion normally in a seated position over the radial inlets and being flexible away from the seated position to a non-seated position in response to fluid flowing through the radial inlets at a predetermined pressure.

4,820,410

FILTER DEVICE, PARTICULARLY FOR AQUARIUMS

Vittorio Cavalcante, Dueville, Italy, assignor to ASKOLL S.r.l., Dueville, Italy

Filed May 1, 1987, Ser. No. 44,851
Claims priority, application Italy, May 6, 1986, 30693/86[U]
Int. Cl.[4] A01K *63/04*
U.S. Cl. 210—169 **6 Claims**



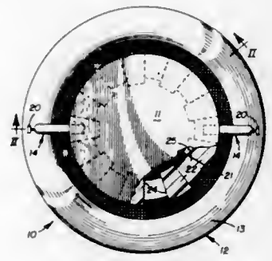
1. Filter device for aqariums comprising: a filter chamber having a first connection with a water supply chamber, an impeller chamber downwardly connected to said filter chamber through a second connection and upwardly connected to said water supply chamber, said impeller chamber housing an impeller operated by a motor and adapted to pump water into said filter chamber through said second connection, the device further comprising an aspiration tube substantially U-shaped and having a first end operatively connected to said impeller chamber and a second end positioned into said aquarium, said second end having a longitudinal axis, said first end of said tube abutting against a sector, said sector separating said impeller chamber from said water supply chamber and being provided with a hole connecting said impeller chamber and said supply chamber, said first end of said tube having a cross-section substantially equal to the diameter of said hole and being slideable on said sector from a first position in which said first end coincides with said hole and in which said impeller chamber receives water exclusively from said tube, and a plurality of further positions in which said first end is partially obstructed by said sector and said impeller chamber receives water from said supply chamber and at least partially from said aspiration tube, said supply chamber receiving water from said filter chamber through said first connection, said first end being slideable by acting on said tube for controlling the rate of flow of water to be filtered, said filter chamber having at least one outlet adapted to discharge filtered water into said aquarium wherein said filter chamber comprises a removable container housing filtering means, said container having walls provided with holes constituting said first connection between said filter chamber and said water supply chamber, said container also having a bored bottom connecting said container with a lower part of said filter chamber, said lower part being connected to an annular chamber surrounding said impeller.

4,820,411

SWIMMING POOL SKIMMER

Paul S. Lempio, 11 Fay Dr., Kentfield, Calif. 94904

Filed Sep. 6, 1985, Ser. No. 773,450
Int. Cl.[4] E04H *3/16*
U.S. Cl. 210—169 **14 Claims**



1. A swimming pool skimmer having a water line comprising, in combination,

float means having a specific gravity of less than 1.0 for floating on water,

skimming means fixedly positioned relative to said float means and defining a fixed and curved upper skimming surface, having leading and trailing end portions and a curved intermediate portion, projecting above the surface of said water and the water line of said pool skimmer for receiving debris floating on said water thereover and for preventing retrograde movement of said debris, said skimming surface defining a curved foil and wherein the leading and trailing end portions of said skimming surface are disposed beneath the surface of said water and vertically below said water line,

receptacle means for receiving and retaining said debris therein, said skimming means defining means for preventing said debris from floating out of said receptacle means, and

fixed and continuously fully open opening means defined in said skimmer for conducting said debris from said skimming means to said receptacle means.

14. A swimming pool skimmer having a water line comprising, in combination,

float means having a specific gravity of less than 1.0 for floating on water,

skimming means positioned relative to said float means and defining a fixed and curved upper skimming surface, having leading and trailing end portions and a curved intermediate portion, projecting above the surface of said water and the water line of said pool skimmer for receiving debris floating on said water thereover and for preventing retrograde movement of said debris,

receptacle means for receiving and retaining said debris therein, said skimming means defining means for preventing said debris from floating out of said receptacle means,

fixed and continously fully open opening means defined in said skimmer for conducting said debris from said skimming means to said receptacle means, and

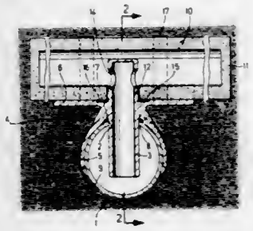
means for vertically adjusting the position of said skimming means relative to said float means and the extent of projection of an upper surface of said skimming means above the surface of said water.

4,820,412

ELEMENT FOR THE TRANSFER OF GAS INTO LIQUIDS, IN PARTICULAR, FOR THE TRANSFER OF OXYGEN IN SEWAGE TREATMENT PLANTS

Karl U. Meyer-Rudolphi, Am Nonnensee 12, 7180 Crailsheim, and Alexander Herle, Schemppstrasse 36, 7000 Stuttgart 75, both of Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 14,982
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1986, 3605024
Int. Cl.[4] C02F *3/20*
U.S. Cl. 210—220 **8 Claims**



1. A gas transfer element for the transfer of gas into liquids, in particular, for the transfer of oxygen into sewage treatment plants, with a porous gas transfer member into which gas is introduced via a feeder line and after passage through the porous gas transfer member is given off in the form of gas bubbles into the liquid surrounding the gas transfer member, comprising: at least one gas tranfer member which is in the form of a circular-cylindrical pipe made of porous material which is closed at both faces by an end section wherein the pipe is sealingly positioned on a common supply line and connected with its interior via a gas feeder line and in that the longitudinal axis of the least one tubular gas member extends at an angle to the longitudinal direction of the supply line wherein the sealingly position of the at least one tubular gas transfer member on the supply line includes a gas feeder line section with an upwardly open shell-type carrier for accommodation of the at least one tubular gas transfer member and a downwardly open shell-type support on the supply line wherein the gas feeder line section is in sealed communication with the interior the at least one gas-transfer member and of the supply line, respectively, through openings in the at least one tubular gas transfer member and the supply line.

4,820,413

ANNULAR MODULE FOR FILTERING A PRESSURIZED LIQUID BY REVERSE OSMOSIS

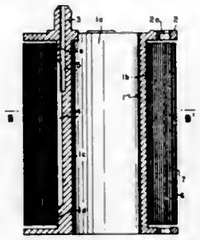
Fernand Lopez, 27 rue Emile Barriere, 31200 Toulouse, France

Filed May 13, 1987, Ser. No. 49,116
Claims priority, application France, May 16, 1986, 86 07171
Int. Cl.[4] B01D *13/00, 29/06*
U.S. Cl. 210—321.83 **5 Claims**

1. An annular reverse osmosis filtration module for a liquid under pressure comprising a generally cylindrical tubular support having an external peripheral surface and a hollow central volume open at the ends thereof and sealed from and out of fluid communication with said external peripheral surface, at least one slit formed in said external peripheral surface along a generatrix of said spool and extending along the length of said spool and having a depth less than the thickness of said spool, said spool further having radially extending flanges at each end thereof, an axial duct extending through a stud on one of said flanges and being in fluid communication with said slit and out of fluid communication with said central volume, a pair of reverse osmosis filtration membranes spirally wound around said external peripheral surface and having a perforate spacer layer between said membranes so that each turn com-

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prises two mutually opposite membranes separated by said spacer layer, a perforate fastening of the inner turn on said external peripheral surface positioned such that said perforated space layer covers said slit and that the space between said



membranes empties into said slit, means for imperviously fastening the lateral edges of said membranes together along substantially their entire length and means for imperviously fastening the outermost ends of said membranes together.

4,820,414

CYCLONE SEPARATOR

Noel Carroll, Sherbrooke Road, Sherbrooke, Victoria 3789, and Gavan J. J. Prendergast, Glen Iris, both of Australia, assignors to Noel Carroll, Victoria, Australia

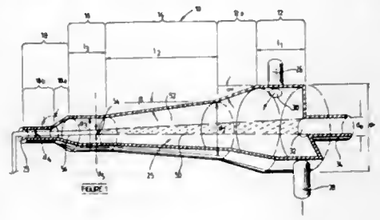
PCT No. PCT/AU84/00195, § 371 Date Aug. 26, 1985, § 102(e) Date Aug. 26, 1985, PCT Pub. No. WO85/01454, PCT Pub. Date Apr. 11, 1985

PCT Filed Oct. 5, 1984, Ser. No. 758,643

Claims priority, application Australia, Oct. 6, 1983, PG1721/83; Jan. 24, 1984, PG3312/84

Int. Cl.⁴ B01D *17/038*

U.S. Cl. 210—512.1 **18 Claims**



1. A cyclone separator comprising elements designed, sized and arranged for treating an oil-water mixture for separating the more dense water component from the less dense oil component thereof, said separator having a separating chamber in the form of an axially extending elongate surface of revolution with first, second and third contiguous portions arranged in that order, the first portion being of greater diameter than the second portion and the third portion being of lesser diameter than the second portion, the second portion being of a length which is at least ten times its diameter adjacent to the first portion, the first portion having an overflow outlet at the end thereof opposite to said second portion and at least one feed inlet arranged for inlet of said mixture to the separating chamber with a tangential component of motion, said separating chamber having an underflow outlet at an end thereof opposite said overflow outlet characterized by the provision of an axially positioned third outlet from said separating chamber and located towards said end of said separating chamber opposite said overflow outlet to in use receive flow of said less dense oil component.

4,820,415

POLYMER CARRIER MASSES AS CARRIERS IN BIOCHEMICAL CONVERSION PROCESSES IN THE AQUEOUS PHASE

Artur Reischl, Höchenschwand, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 21, 1987, Ser. No. 40,912

Claims priority, application Fed. Rep. of Germany, May 3, 1986, 3615103

Int. Cl.⁴ C02F *3/08*

U.S. Cl. 210—616 **2 Claims**

1. In the biological treatment of an aqueous, waste-containing liquid by the removal of organic matter by microorganisms wherein a carrier material for said microorganisms is added to said liquid and wherein said carrier material comprises a filler-containing, hydrophilic, open-celled polymer in the form of separate individual particles, the improvement which comprises: continuously introducing the liquid to be treated into the upper region of a container filled with water and the carrier material, and continuously removing the treated liquid from the lower region of the container, wherein said polymer particles, contain from 3 to 60% by weight of fillers based on the dry weight of carrier material, wherein said carrier material has a density below 0.3 g/cm³ in the anhydrous state, and when saturated with water and charged with biomass at least 70 volume-% of the carrier material have an average density of slightly below the density of said liquid and thereby are suspended in the upper two-thirds of said liquid.

4,820,416

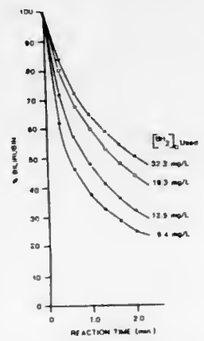
REMOVAL OF BILIRUBIN BY THE PSEUDOPEROXIDASE ACTIVITY OF IMMOBILIZED HEMOGLOBIN

Thomas M. S. Chang, St-Lambert, and Joseph N. Daka, Montreal, both of Canada, assignors to The Royal Institution for the Advancement for Learning (McGill University), Moutreal, Quebec, Canada

Filed Sep. 10, 1987, Ser. No. 95,413

Int. Cl.⁴ B01D *15/00, 43/00*

U.S. Cl. 210—632 **14 Claims**



1. A process for oxidizing bilirubin which comprises reacting a solution containing bilirubin with immobilized hemoglobin in the presence of an oxidizing agent.

4,820,417

USE OF CITRIC ACID PARTIAL ESTERS FOR THE EXTRACTION OF IRON

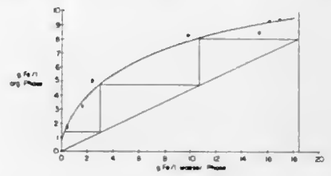
Willi Buchmeier; Ralf Kehl, both of Duesseldorf, and Werner Schwab, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,174

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1987, 3705721

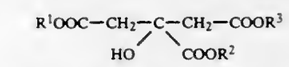
Int. Cl.⁴ B01D *11/00*

U.S. Cl. 210—638 **16 Claims**



1. A process for the extraction of iron from an aqueous solution in which iron ions are a component thereof comprising the steps of:

A. contacting an aqueous solution containing iron ions with an organic extractant containing an iron extracting quantity of at least one citric acid partial ester of the formula



(I)

in which R^1, R^2 and R^3 represent hydrogen or a straight-chain or branched C_4C_{20} alkyl radical or an acid-soluble non-ferrous metal atom, with the proviso that at least one but at most two of the substituents R^1, R^2 and R^3 represent such an alkyl radical, to extract iron from the aqueous solution; and

B. separating the organic extractant from the aqueous solution.

4,820,418

WATER-ALCOHOL SEPARATING MEMBRANE AND METHOD FOR SEPARATION OF WATER AND ALCOHOL BY THE USE THEREOF

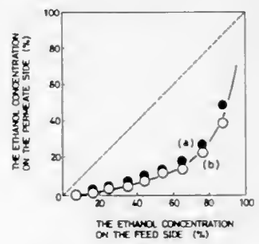
Toshihiro Hirotsu, Tsukuba, and Shigeru Nakajima, Fuchu, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 3, 1988, Ser. No. 152,039

Claims priority, application Japan, Feb. 3, 1987, 62-22814

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—640 **4 Claims**



1. A method for the separation of water from a water-alcohol mixture, which method comprises subjecting a silk fibroin film to a treatment capable of rendering said silk fibroin film insoluble in said water-alcohol mixture, disposing said water-alcohol mixture on one side of said insolubilized silk fibroin membrane and vacuumizing the space on the other side of said insolubilized silk fibroin membrane, thereby permitting preferential permeation of water from said water-alcohol mixture through said insolubilized silk fibroin membrane and proportionately increasing the alcohol concentration in said water-alcohol mixture.

4,820,419

MEMBRANES

Brian N. Hendy, Middlesbrough, and John W. Smith, Liverpool, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 35,235, Apr. 6, 1987, Pat. No. 4,714,725, which is a continuation of Ser. No. 793,756, Nov. 1, 1985, abandoned. This application Nov. 18, 1987, Ser. No. 125,144

Claims priority, application United Kingdom, Nov. 12, 1984, 8428525

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—651 **4 Claims**

1. A process for the production of an asymmetric semipermeable membrane of a sulphonated polyaryletherketone, which process comprises casting a solution of a sulphonated polyaryletherketone in a solvent mixture onto a support to form a layer of solution on the support, immersing the support and layer in a coagulation bath and recovering a membrane, wherein said solution comprises a sulphonated polyaryletherketone and a solvent mixture which contains at least three components each of which is a non-solvent or poor solvent for the sulphonated polyaryletherketone and which are

(a) a liquid or a low melting solid containing at least one hydroxylic group and having a delta-H with a value of at least 8;

(b) a liquid or a low melting solid having a delta-D with a value of at least 8 and a delta-P with a value of not more than 3; and

(c) a liquid or a low melting solid having a delta-P with a value of at least 8.5 and a delta-H with a value of not more than 3; wherein the solvent mixture forms a single liquid phase and none of the components of the solvent mixture reacts or complexes with another of the components of the solvent mixture or with the sulphonated polyaryletherketone.

4,820,420

PROCESS FOR THE SECONDARY PURIFICATION AND STABILIZATION OF LIQUIDS CONTAINING POLYPHENOLS AND/OR PROTEINS, PARTICULARLY BEVERAGES AND MORE ESPECIALLY BEER

Norbert Hums, Landshut, and Helmut Schafft, Mögglingen, both of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Fed. Rep. of Germany

PCT No. PCT/DE86/00117, § 371 Date Nov. 19, 1986, § 102(e) Date Nov. 19, 1986, PCT Pub. No. WO86/05511, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 19, 1986, Ser. No. 946,571

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509892

Int. Cl.⁴ B01D *15/00*

U.S. Cl. 210—669 **18 Claims**

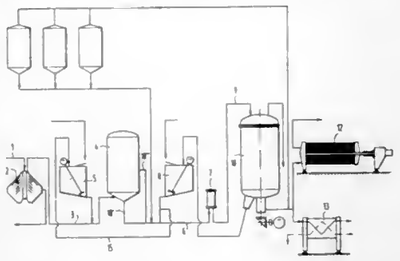
1. A process for purification and stabiliation of liquids and beverages that contain polyphenols nd proteins, wherein said liquid, after a primary purification, is mixed with a stabilization substance adsorbent of polyphenols and proteins, and the stabilization substance is partially regenerated and again recycled through the process, the improvement comprising the steps of:

(a) performing a primary purification of said liquid by centrifugation;

(b) utilizing a mixture of at least one of fibers and granulated material to form a filter material;

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(c) adding said filter material and said stabilization substance to said liquid after the primary purification;
(d) transferring said liquid thus treated to a filter apparatus and filtering said liquid whereby said stabilization substance and said filter material form a solid cake on the



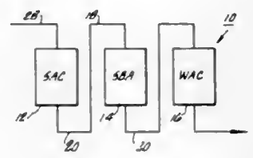
bottom of the filter apparatus and the liquid is simultaneously stabilized and purified; and thereafter
(e) regenerating said solid cake to reclaim said stabilization substance and said filter material and recycling said stabilization substance and said filter material through the process.

4,820,421

SYSTEM AND METHOD FOR DEMINERALIZING WATER

David C. Auerswald, 908 Firmona Ave., Redondo Beach, Calif. 90278

Filed May 1, 1987, Ser. No. 45,079
Int. Cl.[4] C02F *1/42*
U.S. Cl. 210—670 **40 Claims**



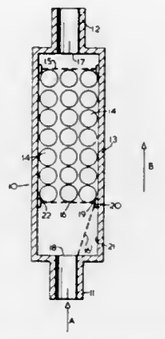
1. A process for demineralizing water for use in a system such as a power plant, the process comprising the sequential steps of:
(a) passing the water through a strong acid cation resin zone comprising a strong acid cation resin for removing cations from water to yield a first effluent;
(b) passing the first effluent through a first anion resin zone comprising an anion resin for removing anions from water to yield a second effluent;
(c) passing the second effluent through a weak acid cation resin zone comprising a weak acid cation resin for removing cations from water without substantially splitting any salts present in the water to yield a third effluent; and
(d) delivering the third effluent to the system without passing the third effluent through any additional ion exchange resin zones.

4,820,422

METHOD FOR COUNTERING SCALE FORMATION IN FLUID CONDUITS

Robert J. Spencer, Dublin, Ireland, assignor to Envirecon Services Limited, Dublin, Ireland

Division of Ser. No. 825,923, Feb. 4, 1986, abandoned. This application May 4, 1988, Ser. No. 190,143
Claims priority, application Ireland, Feb. 5, 1985, 276/85
Int. Cl.[4] C02F *5/00*
U.S. Cl. 210—696 **7 Claims**



1. A method for countering scale formation in a fluid flow system, said method comprising the steps of:
connecting into the system a housing having an inlet and an outlet, the housing having a flow cross-sectional area which is substantially greater than that of the inlet and outlet and containing a plurality of substantially spherical shaped members loosely retained therein, said substantially spherical shaped members being formed of an alloy which comprises at least cooper and nickel;
forcing a fluid through said housing, the orientation of the housing and the direction of fluid flow being such that the fluid flows upwardly through the housing;
rubbing the substantially spherical shaped members together in a random manner in response to said forcing, said substantially spherical shaped members tending to rise upwardly due to fluid pressure and to fall downwardly under gravity to thereby rub together in a random manner; and
preventing formation of scale in said fluid flow system, said preventing being in part responsive to at least said rubbing.

4,820,423

BRANCHED ALKYL ACRYLAMIDE TYPES OF POLYMER-ZINC CORROSION INHIBITOR

Guy A. Crucil, Bloomingdale, and Laura J. Blaser, Western Springs, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 848,014, Apr. 3, 1986, abandoned. This application Sep. 1, 1987, Ser. No. 91,628
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[4] C02F *5/14*
U.S. Cl. 210—697 **9 Claims**

1. A method of preventing corrosion and scale formation on metals exposed to industrial recirculation waters, having a pH ranging between about 7.0 to about 9.5, which consists essentially of adding to said industrial recirculating waters, in the presence of at least about 2 ppm, based on said waters, of 2-phosphonobutane-1,2,4-tricarboxylic acid, or its water soluble salts, an effective amount of a combination of a water-soluble zinc salt, a nitrogen-containing N-alkylated acrylamide zinc-complexing polymer and an orthophosphate ion source, wherein:
(a) the weight ratio of zinc to nitrogen-containing zinc-complexing polymer ranges between about 2:1 to about 1:20;
(b) the weight ratio of zinc to orthophosphate ion ranges between about 1:1 to about 1:5; and
(c) the nitrogen-containing N-alkylated acrylamide zinc-complexing polymer has a weight average molecular weight ranging between about 2,000 to about 25,000 and is a terpolymer containing from 20–80 weight percent acrylic acid or its water-soluble salts; from 10–40 weight percent methacrylic acid or its water-soluble salts; and at least 10 weight percent of a branched alkyl substituted N-alkylated acrylamide monomer with a N-alkylated group containing from 3–12 carbon atoms.

4,820,424

PRODUCTS AND PROCESSES FOR THE FLOCCULATION OF AQUEOUS SUSPENSIONS

John R. Field, and Nicholas D. Smith, both of West Yorkshire, England, assignors to Allied Colloids Ltd., England

Filed Jul. 27, 1987, Ser. No. 78,033
Claims priority, application United Kingdom, Jul. 28, 1986, 8618339
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—716 **14 Claims**

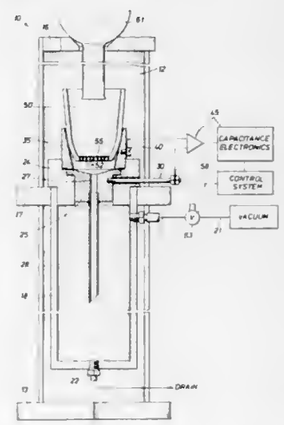
1. A shaped body which comprises a shape retaining mixture of 50 to 99% by volume water soluble multivalent metal coagulant particles having a size of 25 to 2000 microns and 50 to 1% by volume water soluble organic polymeric floccculant and in which the polymeric flocculant is in the form of substantially discrete particles having a size of 10 to 750 microns and the surface of the body is erodable by immersion in a flowing stream of water to form a solution of the coagulant in which the polymeric flocculant particles are entrained and subsequently dissolved.

4,820,425

LIQUID SENSOR FOR ROBOTIC FILTRATION STATION

Alexander Telfer, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 28, 1988, Ser. No. 149,254
Int. Cl.[4] C02F *1/52*
U.S. Cl. 210—746 **17 Claims**



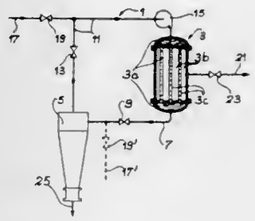
1. A sensor for a filtration station for sensing when filtration of a liquid has completed, independently of the time required for the liquid to be filtered, by detecting when the liquid has finished passing through the filter in the filtration station, comprising:
(a) a first electrode supportable substantially adjacent the filter in such a station;
(b) a second electrode positioned substantially adjacent said first electrode; and
(c) monitoring means including capacitance electronics means connected to said electrodes for determining the base inter-electrode capacitance of said electrodes before such liquid is present at said electrodes, and for subsequently indicating when substantially all of the liquid being filtered has passed through the filter by detecting when the inter-electrode capacitance has returned substantially to said original base capacitance, independently of the time required for the liquid to pass through the filter.

4,820,426

PROCESS FOR THE PROCESSING OF FLUIDS CONTAINING SUSPENDED PARTICLES

Roger Pfertzel, Gif sur Yvette, and Maurice Quenault, Paris, both of France, assignors to Societe Technique Pour l'Energie Atomique Technicatome, Paris, France

Filed Mar. 24, 1987, Ser. No. 29,754
Claims priority, application France, Apr. 4, 1986, 86 04843
Int. Cl.[4] B01D *37/04, 46/00*
U.S. Cl. 210—779 **7 Claims**



1. A process for filtering a fluid containing suspended particles, wherein the fluid is filtered through a filtering apparatus having pores which restrict the passage of the particles comprising the steps of:
(a) continuously separating part of the particles present in the fluid to be processed in order to reduce the number of particles therein,
(b) circulating the resulting fluid of step (a) in a filtering apparatus subdivided into first and second compartments by at least one porous, permeable wall having pores with dimensions smaller than those of the particles, so that at an outlet from said first compartment particle-enriched fluid is obtained and purified fluid is diffused into the second compartment,
(c) recovering the purified fluid which has diffused into the second compartment and
(d) recycling the particle-enriched fluid leaving the first compartment with separation of a part of the particles therein in order to subject it to further processing in said first compartment with the fluid to be processed in order to control the particle concentration in the first compartment and reduce the tendency to clog said pores with particles.

2. A process for filtering a fluid containing suspended particles, wherein the fluid is filtered through a filtering apparatus having pores which restrict the passage of the particles of the process comprising the steps of:
(a') circulating the fluid to be processed in a filtering apparatus subdivided into first and second compartments by at least one porous, permeable wall having pores with dimensions smaller than those of the particles, so that at an

outlet of said first compartment particle-enriched fluid is obtained and purified fluid is diffused into the second compartment,

(b') recovering the purified fluid which has diffused into the second compartment,

(c') continuously separating part of the particles present in the fluid leaving the first compartment in order to bring about particle depletion of the fluid and

(d') recycling the thus depleted fluid in order to subject it to further processing in said first compartment with the fluid to be processed in order to control the particle concentration in the first compartment and reduce the tendency to clog said pores with particles.

4,820,427

METHOD OF SEQUENTIALLY SEPARATING A MEDIUM INTO DIFFERENT COMPONENTS

Seppo I. Ryynänen, Vaasa, Finland, assignor to Nobar Ky, Vaasa, Finland

Continuation of Ser. No. 883,042, Jul. 11, 1986, Pat. No. 4,702,846, which is a continuation of Ser. No. 689,037, Jan. 8, 1985, abandoned, which is a continuation of Ser. No. 469,518, Feb. 24, 1983, abandoned. This application Jul. 30, 1987, Ser. No. 23,824

Claims priority, application Finland, Jan. 21, 1983, 830199

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.[4] B01D *21/26, 45/16;* B04C *3/04, 5/24*

U.S. Cl. 210—788 **1 Claim**



1. A method of sequentially separating a medium into different components by means of centrifugal force, comprising steps of:

forming a first array of at least three successive separating vortexes alternately rotating in opposite flow directions between at least one initial vortex and at least one terminal vortex at spaced-apart at least one entry and at least one discharge ends of the first array, the at least one initial vortexes each being different from the at least one terminal vortexes, with each having a center and defining center lines between adjacent pairs of vortexes, and with each having radially central and radially outer vortex portions such that particles having a comparatively larger mass concentrate in the outer portion of a vortex and those having a comparatively smaller mass concentrate in the inner portion of a vortex;

partially overlapping the at least three successive separating vortexes of the vortex array to substantially back up adjacent separating vortexes on each other in corresponding interfaces both upstream and downstream relative to the corresponding center lines and flow directions and to allow downstream flow of the comparatively larger mass particles between individual adjacent vortexes to run from the outer portion of one vortex into the outer portion of its succeeding vortex without any substantial axial movement and in such a way that the flow area and the backup interfaces of the partially overlapping successive separating vortexes is substantially smaller than the flow area of the successive separating vortexes elsewhere;

feeding a medium having different components to be separated including the comparatively larger mass particles into said initial ones of the successive separating vortexes at said at least one entry end of said first array the comparatively larger mass particles being fed therefrom into one or more of vortexes intermediate the initial and terminal vortexes of the first array of at least three successive separating vortexes, and from there, said particles being further fed into said terminal vortexes for removal; and

separately removing the different components from said first array after separation including removing the comparatively larger mass particles from said terminal ones of the successive separating vortexes of said at least one discharge end thereof.

4,820,428

ANTIMICROBIAL COMPOSITIONS AND METHODS

John M. McLennan, Calgary, Canada; Keith D. Brunt, East Bridgford, and Walter G. Guthrie, East Leake, both of England, assignors to Oilfield Speciality Products Manufacturing Ltd., of Canada, Canada and The Boots Company, plc, of England, England, a part interest

Filed Nov. 21, 1986, Ser. No. 933,548

Claims priority, application United Kingdom, Nov. 21, 1985, 8528729

Int. Cl.[4] E21B *41/02, 43/00*

U.S. Cl. 252—8.551 **11 Claims**

1. An antibacterial composition in the form of a solid block for the inhibition of bacterial growth in gas and oil wells, consisting essentially of at least 80% by weight of a solid antibacterial nitroalkanol effective against sulphate-reducing bacteria and a binding agent selected from the group consisting of, cetomacrogol, polyethyleneglycol, polyvinylpyrrolidone, sodium alginate, microcrystalline cellulose and a cellulose ether, the composition having a density of at least 1.5 g/cm^3, being able to withstand the pressure of the gas or the hydrostatic pressure of the oil and being adapted to dissolve, disintegrate or disperse in water but not in oil.

4,820,429

SURFACTANT COMPOSITIONS FOR STEAMFLOODS

Timothy Lim, Auburn, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 851,301, Apr. 7, 1986, abandoned, which is a continuation of Ser. No. 608,286, May 8, 1984, abandoned. This application Jun. 2, 1987, Ser. No. 58,626

Int. Cl.[4] E21B *43/24*

U.S. Cl. 252—8.554 **7 Claims**

1. A composition useful for displacing oil within the pores of or for producing oil from an oil-containing reservoir, comprising (a) an aqueous liquid, present in the composition, at a temperature substantially equalling its boiling temperature at the reservoir pressure, in both a liquid phase and vapor phase of steam, and (b) a functionally effective amount of a surfactant mixture consisting essentially of an α-olefin sulfonate surfactant and mono- or di-alkylated diphenyl oxide sulfonate surfactant wherein the alkyl portion of the alkylated diphenyl oxide sulfonate contains from about 6 to about 24 carbon atoms.

4,820,430

COPPER SALTS OF THIODIPROPIONIC ACID DERIVATIVES AS ANTIOXIDANT ADDITIVES AND LUBRICANT COMPOSITIONS THEREOF

Liehpao O. Farng, Lawrenceville, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 29, 1987, Ser. No. 79,186

Int. Cl.[4] C10M *105/22*

U.S. Cl. 252—48.6 **13 Claims**

1. An improved lubricant composition comprising a minor amount of a copper salt of a thiodipropionic acid derivative or mixtures thereof sufficient to impart multifunctional/antioxidant characteristics thereto and a major amount of a lubricant comprising anoil of lubricating viscosity or grease or other solid lubricant prepared therefrom.

12. An improved lubricant composition comprising a major amount of an oil of lubricating viscosity or grease or other solid lubricant prepared therefrom and a minor effective amount of a multifunctional/antioxidant additive wherein said additive is prepared by reacting a suitable thiodipropionic acid deriviate or mixtures thereof with a suitable alcohol or amine containing compound.

4,820,431

RAILWAY LUBRICATING OIL

Steven Kennedy, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 834,605, Feb. 28, 1986, Pat. No. 4,734,211. This application Jan. 14, 1988, Ser. No. 144,249

The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.

Int. Cl.[4] C10M *105/38*

U.S. Cl. 252—56 R **6 Claims**

1. A method for reducing silver wear in marine and railway diesel engines which comprises the step of lubricating the internal portion thereof with a lubricating oil composition having a TBN of at least 5 and comprising a silver protective compound selected from the group consisting of (1) C_8 to C_{22} fatty acid esters of C_1 to C_{12} polyhydroxy alcohols or mixtures of such esters, wherein the alcohol portion of the ester has at least two unesterified hydroxyl groups; and (2) a mixture comprising the polyhydroxy compound of (1), above, and a chlorinated paraffin.

4,820,432

LACTONE-MODIFIED, MANNICH BASE DISPERSANT ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

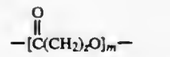
Robert D. Lundberg, Bridgewater, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jnl. 24, 1987, Ser. No. 77,713

Int. Cl.[4] C10M *159/16*

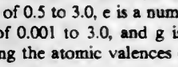
U.S. Cl. 252—51.5 A **94 Claims**

1. A poly(C_5–C_9 lactone) modified Mannich base hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material useful as an oil additive and formed by reacting a C_5–C_9 lactone, an amine, an aldehyde, an N-hydroxyaryl amine and a hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material, said hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material being formed by reacting an olefin polymer of a C_2–C_{10} monoolefin having a number average molecular weight of about 700 to about 10,000 and a C_4–C_{10} monounsaturated dicarboxylic acid material, wherein there is an average of 0.7 to about 2.0 dicarboxylic producing moieties per molecule of said olefin polymer used in the reaction, and said poly (C_5–C_9 lactone) modified Mannich base adduct containing the unit



wherein m has a average value of from 0.2 to about 100, and z is 4 to 8.

25. An oleaginous composition comprising a lubricating oil and a poly (C_5–C_9 lactone) modified Mannich base adduct material prepared by reacting an amine, a hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material, an aldehyde, an N-hydroxy-arylamine and a C_5–C_9 lactone, said hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material being formed by reacting an olefin polymer of a C_2–C_{10} monoolefin of 700 to about 10,000 M_n with a C_4–C_{10} monounsaturated dicarboxylic acid material, wherein there is an average of from about 0.7 to about 2.0 dicarboxylic acid producing moieties per molecule of said olefin polymer used in the reaction, and wherein said poly (C_5–C_9 lactone) modified Mannich base adduct material contains the unit



where m is a number having an average value of from 0.2 to about 100, and z is 4 to 8.

4,820,433

MAGNETIC POWDER FOR MAGNETIC RECORDING

Haruhisa Yamamoto, Kawasaki, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Sep. 2, 1987, Ser. No. 92,210

Claims priority, application Japan, Sep. 5, 1986, 61-208887; Sep. 5, 1986, 61-208888; Sep. 11, 1986, 61-214844; Sep. 19, 1986, 61-221612; Sep. 19, 1986, 61-221613

Int. Cl.[4] C04B *35/26*

U.S. Cl. 252—62.57 **2 Claims**

1. A magnetic powder for magnetic recording which has an average particle diameter of 0.01 to 0.3 micrometers and is represented by the following general composition formula

$$Fe_aCo_bTi_cM^I_dM^{II}_eM^{III}_fO_g$$

wherein M^I represents at least one metal element selected from Ba, Sr, Ca and Pb, M^{II} represents at least one element selected from Si, Sn, Mo and W, M^{III} represents at least one element selected from Ni, Cu, V, Zr, La, Ce, Nd, Sm, Mg, P, Cr, In, Tl and Ge, a, b, c, d, e, f and g respectively represent the numbers of Fe, Co, Ti, M^I, M^{II}, M^{III} and O atoms, a is a number of 8 to 11.8, b is a number of 0.05 to 2.0, c is a number of 0.05 to 2.0, d is a number of 0.5 to 3.0, e is a number of 0.001 to 3.0, and f is a number of 0.001 to 3.0, and g is the number of oxygen atoms satisfying the atomic valences of the other elements.

4,820,434

LUBRICATING OIL COMPOSITIONS FOR TRACTION DRIVE

Hitoshi Hata, Chiba, and Hisashi Machida, Machashi, both of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,028

Claims priority, application Japan, Mar. 2, 1987, 62-47398

Int. Cl.[4] C10M *105/04, 143/00*

U.S. Cl. 252—75 **8 Claims**

1. A lubricating oil composition for traction drive, which consists essentially of:

(A) a base oil containing as the main component a saturated hydrocarbon or hydrocarbons having fused ring and/or nonfused ring,

(B) an ethylene-α-olefin copolymer having a number-average molecular weight of 800 to 8,000, and

(C) an anti-wear agent.

4,820,435

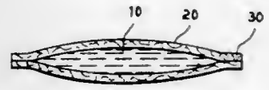
LIQUID-DISPENSING POUCH

Dimitri P. Zafiroglu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1988, Ser. No. 189,089

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—90 **5 Claims**



1. A pouch having an internal chamber which contains a

liquid and is bounded by walls of the pouch, at least one of the walls being a nonwoven porous material having an average pore size of no greater than 0.14 millimeters in diameter and a Gurley porosity of at least 3 seconds, the inner surface of the nonwoven wall being in contact with the liquid, the nonwoven wall preventing seepage of the liquid when its outer surface is dry but permitting release of liquid when the outer surface of the nonwoven wall is wetted with a solvent for the liquid.

4,820,436

DETERGENTS FOR LOW LAUNDERING TEMPERATURES

Hans Andree; Horst Baumann, both of Leichlingen; Manfred Biermann, Mulheim; Frantisek Jost; Horst-Juergen Krause, both of Duesseldorf; Fritz Lange, Essen; Herbert Leiter; Alfred Meffert, both of Monheim; Uwe Ploog, Haan; Harald Schnegelberger, Leichlingen; Eduard Smulders, Hilden; Eric Sung, Monheim; Andreas Syldatk, Duesseldorf; Guenter Uphues, Monheim, and Guenther Vogt, Toenisvorst, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP86/00356, § 371 Date Feb. 20, 1987, § 102(e) Date Feb. 20, 1987, PCT Pub. No. WO86/07603, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 16, 1986, Ser. No. 19,278

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1985, 3522389; Mar. 3, 1986, 3606828

Int. Cl.[4] C11D *3/26, 3/28, 3/18, 3/30*

U.S. Cl. 252—544 **7 Claims**

1. A laundry detergent composition comprising at least one anionic or nonionic surfactant and an aliphatic amine compound, wherein said amine compound has a pK_b value of at least 14 minus the pH value of a 1% aqueous solution of said detergent composition, said amine compound consisting essentially of an alkyl, alkenyl or hydroxyalkyl derivative of glucamine or morpholine wherein the alkyl, alkenyl or hydroxyalkyl group has 6 to 22 carbon atoms.

4,820,437

BLEACHING COMPOSITION

Yasuhiro Akabane, Chiba; Takamitsu Tamura, Tanashi, and Masami Fujiwara, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 92,884

Claims priority, application Japan, Sep. 18, 1986, 61-220214; Dec. 26, 1986, 61-315200; May 28, 1987, 62-132698

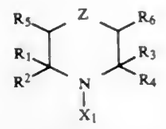
Int. Cl.[4] C11D *7/54*

U.S. Cl. 252—102 **10 Claims**

1. A bleaching composition comprising:

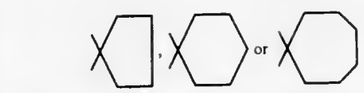
(A) hydrogen peroxide, a hydrogen peroxide addition compound or mixtures thereof; and

(B) at least one activator is a 1-halopiperidine having the following Formula (I):

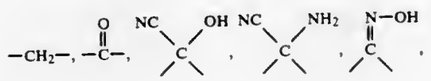


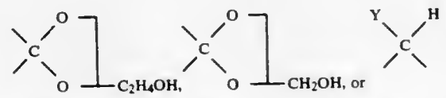
[I]

(wherein R_1 and R_6 each denotes a hydrogen or alkyl group and may be the same as or different from each other; R_1 and R_2 or R_3 and R_4 may be bonded to each other to form the following cycles involving the carbon atoms to which they are bonded:

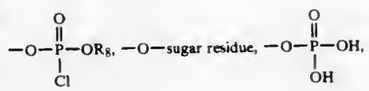


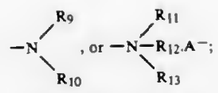
X_1 denotes a halogen atom; and Z denotes a group having the following formula:





wherein Y denotes an alkoxyl, hydroxyl, or carboxyl group, —NCS, —$CONH_2$,





R_8 is an alkyl having 1 to 16 carbon atoms, phenyl; R_9 and R_{10} may be the same or different and each denotes C_mH_{2m+1}, $C_mH_{2m}OH$, $C_mH_{2m-1}(OH)_2$, $C_mH_{2m}COOM_1$ wherein M_1 denotes H or an alkali metal, or an alkanoyl group; R_{11} and R_{12} may be the same or different and each denote C_mH_{2m+1}, $C_mH_{2m}OH$ or C_mH_{2m}; R_{13} denotes a hydrogen atom or C_mH_{2m+1}; m is an integer from 1 to 4; and A^- denotes an anionic residue; the hydrolysis constant of the activator being within the range of 1×10^{10} to 5×10^{-6} (at 25° C.).

4,820,438

NOVEL SOAP BAR COMPOSITION

Karl T. Zilch, Cincinnati, Ohio, assignor to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Jan. 29, 1988, Ser. No. 149,722

Int. Cl.[4] C11D *9/00, 15/00, 13/00*

U.S. Cl. 252—108 **9 Claims**

1. A soap bar composition for preparing a refined and plodded soap bar comprising:

a neutralizable blend of about 68% to about 84% by weight tallow fatty acid, about 28% to about 14% by weight coconut-type fatty acid, and about 2% to about 5% by weight pelargonic acid;

a neutralizing amount of a base selected from the group consisting of sodium hydroxide, potassium hydroxide, triethanolamine, and mixtures thereof; and

about 5% to about 30% by weight water intimately mixed with said blend and said base.

4,820,439

WASHING AND CLEANING AGENT CONTAINING SURFACTANTS, BUILDER, AND CRYSTALLINE LAYERED SODIUM SILICATE

Hans-Peter Rieck, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 721,287, Apr. 9, 1985, Pat. No. 4,664,839. This application Feb. 27, 1987, Ser. No. 20,079

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 3413571

Int. Cl.[4] C11D *3/08, 3/12*

U.S. Cl. 252—135 **5 Claims**

1. In a washing and cleaning composition containing effective amounts of surfactant and builder the improvement wherein said builder comprises a crystalline layered sodium silicate having the composition $NaMSi_xO_{2x+1}\cdot yH_2O$, in which M denotes sodium or hydrogen, x is a number from 1.9 to 4 and y is a number from 0 to 20.

4,820,440

PHOSPHATE-FREE DISHWASHER DETERGENT

Dieter Hemm, Hilden, and Norbert Schindler, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 810,965, Dec. 18, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 125,724

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447291

Int. Cl.[4] C11D *3/36*

U.S. Cl. 252—135 **19 Claims**

1. A detergent composition for dishwashers consisting essentially of:

(a) 10–60% of at least one anhydrous alkali carbonate;

(b) 20–70% of at least one anhydrous alkali metasilicate;

(c) 0–7% of at least one chlorine donor;

(d) 0–15% of at least one oxygen donor;

(e) 0–10% of at least one alkali hydroxide;

(f) 0–40% of at least one anhydrous alkali sulfate;

(g) 0–10% of at least one water soluble complexing agent; and

(h) 0–1.5% of at least one binder;

all percentages being by weight and based on the weight of the entire formulation; with the proviso that:

(1) said alkalis consist of at least two cations selected from potassium, sodium, lithium, ammonium, or an organoammonium of the formula $NR_1R_2R_3R_4(+)$ wherein each said R is a $C_{1\text{-}20}$ hydrocarbon and may be the same or different, and wherein the potassium cations are present in an amount of about 30 to about 80% by weight of all of the alkali cations in the composition;

(2) said composition is substantially phosphate-free; and

(3) ingredients (c) and (d) are not simultaneously present.

4,820,441

PROCESS FOR THE PREPARATION OF A GRANULAR DETERGENT COMPOSITION

Elfed H. Evans, Clwyd, Wales, and Peter C. Knight, South Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,757

Claims priority, application United Kingdom, Apr. 30, 1987, 8710291

Int. Cl.[4] C11D *3/22*

U.S. Cl. 252—174.18 **9 Claims**

1. A process for the preparation of a granular detergent composition, which comprises the steps of:

(i) preparing a first aqueous slurry in a first vessel, the slurry comprising a carbonate-based salt selected from the group consisting of sodium carbonate monohydrate, hydrated sodium carbonate/sodium bicarbonate double salt, anhydrous sodium carbonate/sodium sulfate double salt, and mixtures thereof, and an effective amount of a crystal growth modifier which is an organic material having at least three carboxyl groups in the molecule, the crystal growth modifier being incorporated in the slurry not later than the sodium carbonate;

(ii) preparing a second aqueous slurry in a second vessel, the slurry comprising a surfactant selected from the group consisting of anionic surfactants, nonionic surfactants, and mixtures thereof;

(iii) mixing the first and second slurries and spray-drying the resultant mixed slurry to form a powder including a crystal-growth-modified carbonate-based salt.

4,820,442

PRESERVATIVE COMPOSITION

Shimesu Motoyama; Shigeru Ohno, and Seiichi Umeda, all of Tokyo, Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1986, Ser. No. 945,364

Claims priority, application Japan, Dec. 26, 1985, 60-292199; Mar. 19, 1986, 61-59367; May 7, 1986, 61-103153

Int. Cl.[4] C09K *15/18*

U.S. Cl. 252—188.28 **7 Claims**

1. A preservative composition, which comprises;

(i) 60% to 98% by weight of an iron powder or a granulated product thereof,

(ii) 1% to 40% by weight of an alkali metal halide or an alkaline earth metal halide, and

(iii) 0.1% to 10% by weight of polyallylamine, the amounts of the respective components (i), (ii) and (iii) being based on the sum of the three components (i), (ii) and (iii).

4,820,443

CYCLOHEXANE DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME

Yasuyuki Goto, and Tetsuya Ogawa, both of Yokohamashi, Japan, assignors to Chisso Corporation, Japan

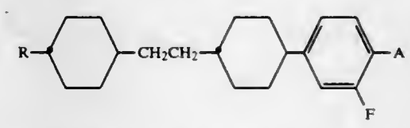
Filed Feb. 1, 1988, Ser. No. 151,192

Claims priority, application Japan, Feb. 6, 1987, 61-25683; Jul. 20, 1987, 61-180238

Int. Cl.[4] G02F *1/13;* **C09K** *19/30;* **C07C** *19/08, 25/18, 121/00*

U.S. Cl. 252—299.63 **5 Claims**

1. A cyclohexane derivative expressed by the formula



wherein R represents an alkyl group of 1 to 10 carbon atoms and A represents a hydrogen atom, a halogen atom of F, Cl or Br or a cyano group.

4,820,444

4'OPTICALLY ACTIVE ALKOXY-4-ALKOXY CARBONYLOXY-BIPHENEYL AND MIXTURES THEREOF

Takashi Inukai, Yokohamashi; Kenji Furukawa, Yokosukashi; Kanetsugu Terashima, and Shinichi Saito, both Yokohamshi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 837,110, Mar. 7, 1986, abandoned, and Ser. No. 568,060, Jan. 4, 1984, Pat. No. 4,596,667. This application Dec. 31, 1987, Ser. No. 140,205

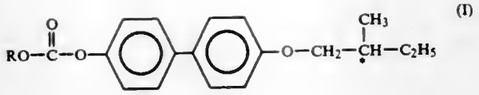
Claims priority, application Japan, Jan. 6, 1983, 58-640; May 4, 1983, 58-78594

Int. Cl.[4] C09K *19/12, 19/20;* **C07C** *69/96*

U.S. Cl. 252—299.65 **3 Claims**

1. An optically active liquid crystal compound expressed by the formula

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(I)

where R is a C_4–C_9 alkyl group.

4,820,445

ACTIVE MATERIAL FOR THE MANUFACTURE OF LASER RODS

Wladyslaw Piekarczyk; Marek Berkowski; Gabriel Jasiolek, all of Warsaw; Witold Ryba-Romanowski, Wroclaw, and Mieczyslaw Chabiera, Warsaw, all of Poland, assignors to Polska Akademia Nauk, Instytut Fizyki, Warsaw and Polska Akademia Nauk, Instytut Niskich Temperatur i Baden Strukturalnych, Wroclaw, both of, Poland

Filed Jun. 9, 1987, Ser. No. 59,953

Claims priority, application Poland, Jun. 27, 1986, 260309

Int. Cl.[4] C09K *11/04*

U.S. Cl. 252—301.4 R **1 Claim**

1. An active material for the manufacture of a laser rod, consisting of a single crystal of the formula $A_{1+x}B_{1-y}C_{3-x-y}O_{7-0.5x}$, wherein A is a material selected from the group consisting of barium, strontium, calcium and a mixture thereof; B is a material selected from the group consisting of lanthanum, yttrium, and a mixture thereof; C is a material selected from the group consisting of gallium, aluminum and a mixture thereof; and x and y are parameters assuming each is between −0.12 and +0.12; and as a dopant an active element chosen from the group consisting of praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, erbium, thulium and ytterbium in an amount of from 0.02 to 8.33 atomic percent in relation to all atoms in the formula.

4,820,446

ELECTRICALLY CONDUCTIVE, POTENTIALLY ADHESIVE COMPOSITION

Christian Prud'Homme, Lyon, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 6, 1987, Ser. No. 117,717

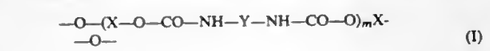
Claims priority, application France, Nov. 14, 1986, 86 16045

Int. Cl.[4] H01B *1/06*

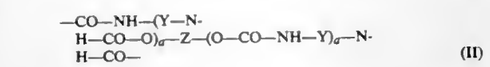
U.S. Cl. 252—511 **16 Claims**

1. An electrically conductive, potentially adhesive composition which comprises

(a) a thermoplastic block copolymer having elastic properties and consisting of polysiloxane and urethane groups with a concatenation of recurring repeat units of formula I and formula II



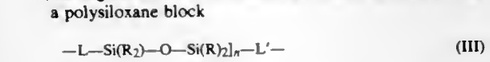
(I)



(II)

in which

Z, having the formula III, denotes a divalent radical bearing a polysiloxane block



(III)

wherein

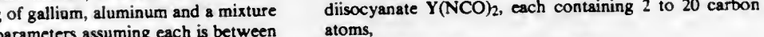
L and L', which are identical or different, denote divalent radicals of formula IV



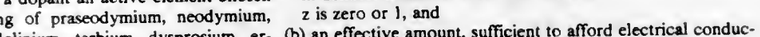
(IV)

where

T denotes a divalent radical forming part of the molecular structure of an unsaturated isocyanate or an unsaturated alcohol of the formulae



or



these radicals T being hydrocarbon in nature and containing 1 to 20 carbon atoms, or said radicals including one or more hetero atoms or groups chosen from oxygen, sulfur, silicon and nitrogen atoms and ester or amide groups,

R_1, R_2 and R_3 independently denote a hydrogen atom or an alkyl or aryl group, or R_1 and R_2 together are alkylene,

R, which are identical or different, denote alkyl radicals containing 1 to 5 carbon atoms or said alkyl radicals containing 1 to 7 chlorine or fluorine atoms or mixture thereof; cycloalkyl containing 3 to 8 carbon atoms or said cycloalkyl radicals containing 1 to 4 chlorine or fluorine atoms or mixture thereof; alkenyl radicals containing 2 to 5 carbon atoms; aryl or alkylaryl radicals containing 6 to 8 carbon atoms, or said aryl radicals containing 1 to 4 chlorine or fluorine atoms or mixture thereof;

n is a number from to 1000,

X and Y denote divalent radicals of hydrocarbon nature corresponding, respectively, to the diol $X(OH)_2$ and to the diisocyanate $Y(NCO)_2$, each containing 2 to 20 carbon atoms,

m denotes a number from 1 to 20, and

z is zero or 1, and

(b) an effective amount, sufficient to afford electrical conductivity to the composition, of particles with at least the surface of said particles being electrically conductive.

4,820,447

MILD SKIN CLEANSING SOAP BAR WITH HYDRATED CATIONIC POLYMER SKIN CONDITIONER

Ralph F. Medcalf, Jr., West Chester; Martha O. Visscher, Cincinnati; John R. Knochel, Cincinnati, and Richard M. Dahlgren, Cincinnati, all of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 803,742, Dec. 2, 1985, abandoned. This application Oct. 30, 1987, Ser. No. 119,284

Int. Cl.[4] C11D *3/37, 9/30, 17/00*

U.S. Cl. 252—117 **21 Claims**

1. A mild soap bar composition comprising:

(1) 50–90% soap;

(2) an effective amount of a hydrated cationic polymeric skin conditioner uniformly distributed and incorporated in said soap bar, said cationic polymeric skin conditioner having a molecular weight of from 1000 to 3,000,000, said cationic polymeric skin conditioner comprising: from about 0.2% to about 5% of a hydrated cationic guar gum having a molecular weight of at least about 200,000; and from 0% to 5% of another cationic polymeric skin conditioner selected from the group consisting of:

(I) other cationic polysaccharides;

(II) cationic copolymers comprising monomers selected from saccharides and synthetic cationic monomers, and mixtures thereof;

(III) synthetic polymers selected from the group consisting of:

(A) cationic polyakylene imines,

(B) cationic ethoxypolyalkylene imines, and

(C) cationic poly(N-(3-(dimethylammonio)propyl)N'-(3-(ethyleneoxyethylene dimethylammonio)propyl-)urea dichloride); and

(IV) mixtures thereof;

wherein said bar is substantially free of unhydrated polymeric particles greater than 30 microns; and

(3) said soap bar having about 7–15% moisture.

4,820,448

SURFACTANT MIXTURES AND THEIR USE

Ingo Wegener, Duesseldorf; Alfred Meffert, Monheim, and Ditmar Kischkel, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 93,859

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1986, 3630533

Int. Cl.[4] C11D *3/065, 1/12, 1/755, 9/22*

U.S. Cl. 252—533 **16 Claims**

1. A low-water content surfactant mixture which is pourable and pumpable at ambient conditions having high wetting power and detergency when used in a fabric detergent composition, said surfactant mixture having a water content of less than about 20% by weight, and consisting of:

1. from about 50 to about 65% by weight of a C_{12}–C_{18} fatty alcohol ethoxylate containing an average of about 10 moles of ethylene oxide which is a solid at room temperature and has a melting point of about 30° C.;
2. from about 5 to about 15% by weight of an alkali metal salt of a C_{16}–C_{18} tallow alcohol sulfate which is a solid at room temperature and has a melting point of from about 55° to about 60° C.;
3. from about 4 to about 15% by weight of a C_{12}–C_{16} alkane sulfonate alkali metal salt or the disodium salt of n-octyl sulfosuccinate which is a solid at room temperature; and
4. from about 5 to about 13% by weight of a free C_{16}–C_{18} fatty acid having a melting point of about 55° C.,

all weights being based on the total weight of said surfactant mixture.

4,820,449

CLEANING BLOCK FOR FLUSH TOILET TANKS

Ronald Menke, Mettmann; Bernd-Dieter Holdt, Duesseldorf, and Gerd Praus, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,693

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1986, 3640090

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—544 **32 Claims**

1. A cleaning block for insertion in the tank of flush toilets, consisting essentially of (all percentages being by weight and based upon the total composition weight):

(a) 10 to 30% of at least one mono- C_{12-14}- alkyl sulfate, sodium salt;

(b) 5 to 40% of at least one amide selected from the group consisting of monoalkanolamide of a 12 to 18 carbon atom fatty acid with a 3–6 carbon atoms amine, and a dialkanolamide of a 12 to 18 carbon atom fatty acid with a 2 to 6 carbon atoms amine;

(c) 15 to 60% of at least one water-soluble inorganic alkali salt;

(d) 0 to 20% of at least one solid, water-soluble, low molecular weight carboxylic acid having a complexing constant for calcium above 10^1 as determined at room temperature in aqueous solutions having an ionic strength of 0.2, or an equivalent quantity of an alkali salt thereof;

(e) 0 to 15% of at least one perfume oil;

(f) 0 to 20% of at least one water-soluble dye;

(g) 0 to 5% of at least one antimicrobial agent; and

(h) 0 to 10% of at least one auxiliary.

4,820,450

COMPOSITION FOR PRECIPITATING DIRT AND OTHER CONTAMINANTS FROM WASH WATER AND METHOD OF CLEANING

Raymond G. Wile, Liberty, Mo., and Ismail F. Middlen, Kansas City, Kans., assignors to E and R Investments, Kansas City, Kans.

Continuation of Ser. No. 878,671, Jun. 26, 1986, abandoned. This application May 12, 1987, Ser. No. 48,797

Int. Cl.[4] C11D *1/94, 3/30*

U.S. Cl. 252—545 **31 Claims**

1. An additive for use in an aqueous cleaning solution at a level of 1–30% by weight of the total solution, said additive comprising:

a water soluble polyamine or polyacrylamide polyelectrolyte flocculant characterized by the ability to precipitate contaminant particles present in said solution; and

a water soluble phosphobetaine of the formula

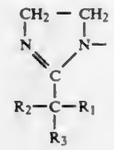


wherein

A is selected from OH, OM and OYR

B is selected from OH and OM

R is an imidazoline reactant moiety of the formula



where

R_1 and R_2 are selected from hydrogen, propionic acid, propionitrile, propionamide, propionate esters of C_1–C_{12} alkyls, alkylaryl or alkylcycloaliphatic, or alkali metal or alkaline earth metal salts or amine salts of propionic acid with the proviso that at least one of R_1 and R_2 is a propionate derivative;

R_3 is alkyl, alkenyl, alkoxy, hydroxyalkyl or hydroxyalkenyl of from 2 to 20 carbon atoms each or aryl or alkylaryl or cycloaliphatic of up to 20 carbon atoms,

Y is alkylene of up to 12 carbon atoms optionally interrupted by up to 3 oxygen atoms, which alkylene may be optionally substituted with lower alkyl or alkoxy of not more than 10 carbon atoms, and

M is selected from alkali metals, alkaline earth metals and amines,

said flocculant and said phosphobetaine being present in a ratio of from 1:1 to 1:15 flocculant:phosphobetaine; and

said flocculant and stabilizer being present in a ratio from 1:5 to 15:1, stabilizer:flocculant.

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4,820,451

PROCESS FOR THE PRODUCTION OF MOBILE PASTES OF WASHING-ACTIVE α-SULFOFATTY ACID ESTER SALTS OF HIGH SOLIDS CONTENT

Robert Piorr, Ratingen-Hoesel; Hans-Josef Rommerskirchen; Horst Ritterbex, both of Duesseldorf, and Frantisek Jost, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 31, 1986, Ser. No. 925,442

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538910

Int. Cl.⁴ C07F *143/90*

U.S. Cl. 260—400 **20 Claims**

1. A process for the production of aqueous pastes of washing-active α-sulfofatty acid ester salts which, despite high solids contents, are mobile and, in particular, pumpable even at moderately elevated temperatures, said process comprising: (1) sulfonating fatty acid alkylesters with sulfur trioxide in molar ratios of up to 1:2 thereby producing crude sulfonic acid; (2) subjecting said sulfonic acid to a post-reaction with at least about 0.5 mole equivalent, based on the sulfur trioxide unused in the sulfonation, of monohydric alcohols and/or alkoxylation products thereof at temperatures above about 70° C.; (3) bleaching and neutralizing said crude sulfonic acid; and (4) working up the bleached and neutralized sulfonic acid to obtain α-sulfofatty acid ester salts in a solids content above 35% by weight.

4,820,452

BECHAMP REDUCTION OF DNS TO DAS USING H_2SO_4 AND TRACE OF HOAC

Richard B. Lund, Jackson, and Glenn W. Brown, Wagarville, both of Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 787,883, Oct. 16, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 908,429

Int. Cl.⁴ C07C *143/62*

U.S. Cl. 260—510 **3 Claims**

1. In the process for the Bechamp reduction of 4,4'-dinitrostilbene-2,2'-disulfonic acid to 4,4'-diamino-stilbene-2,2'-disulfonic acid by reduction with metallic iron in an acidic medium, the improvement which comprises conducting the reduction in an acidic medium essentially consisting of 0.02 to 0.27% of acetic acid and 0.18 to 1.18% by weight of sulfuric acid in water.

4,820,453

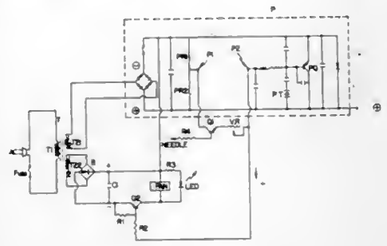
WATER LEVEL DETECTOR AND CIRCUIT FOR AN ELECTRIC HUMIDIFIER

Chuang-Pang Huang, No. 30, Lane 628, Gong Yuan Road, Tainan, Taiwan

Filed Nov. 17, 1987, Ser. No. 122,031

Int. Cl.⁴ B01D *47/00*

U.S. Cl. 21—26 **1 Claim**



1. An electric humidifier comprising:
a water cistern;
an ultrasonic oscillation circuit;
an ultrasonic transducer connected to the ultrasonic oscillation circuit for being driven thereby;
a fan;
a power supply including a transformer having a primary coil connectable to a source of AC supply current, a first secondary coil supplying AC power directly to the ultrasonic oscillation circuit, and a second secondary coil connected to a rectification circuit for supplying DC power to the fan;
a bias current supply loop circuit for supplying a bias current to the ultrasonic oscillation circuit, the bias current supply loop circuit including a first transistor biased via a variable resistor for conducting when a positive bias is applied to a base thereof, and a second transistor arranged for conducting supply current to the fan when a positive bias is supplied to a base thereof upon conduction of said first transistor; and
water level detector means arranged at a bottom of the cistern for detecting a normal water level condition and an insufficient water level condition, the water level detector means including a needle detector connected for supplying a positive bias to the base of the first transistor when a normal water level is present in the cistern, whereby when an insufficient water level is present in the cistern the needle detector cuts off supply of positive bias to the base of the first transistor to cause the first transistor to cut off, causing the cutoff of bias current supply to the ultrasonic oscillation circuit and the cutoff of positive bias supply to the base of the second transistor.

4,820,454

STARTING AID FOR SMALL INTERNAL COMBUSTION ENGINES

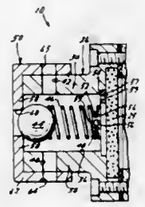
William A. Scott, Mt. Zion, and Carl Dull, Decatur, both of Ill., assignors to Tillotson Limited, Tralee, Ireland

Continuation of Ser. No. 848,409, Apr. 4, 1986, Pat. No. 4,711,744. This application Oct. 14, 1987, Ser. No. 108,489

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.⁴ F02M *1/14*

U.S. Cl. 261—64.4 **18 Claims**



1. A starting aid for small internal combustion engines having carburetors with a single bore for enabling combustion air to enter into said carburetors, said single bore having one end in communication with a source of combustion air and another end of the bore in communication with a piston cylinder of the internal combustion engines, said starting aid comprising:
inertia valve means for controlling an amount of air entering into the single bore, said inertia valve means positioned in the single bore adjacent to the end in communication with a source of combustion air;
means for seating said inertia valve means, said means for seating being coupled with said single bore at the end in communication with a source of combustion air and associated with said inertia valve means for enabling metering of combustion air entering said single bore;
resilient biasing means secured in the single bore for resiliently securing said inertia valve means in the single bore;
means for retaining said biasing means in said single bore, said retaining means positioned in said single bore such that said biasing means and inertia valve means are positioned between said seating means and said retaining means, said biasing means retaining means including an annular holding rim with one or more apertures for enabling sufficient combustion air to pass through said retaining means for forming a fuel air mixture for starting an internal combustion engine, said inertia valve means moving between said seating means and retaining means in said single bore, and said resilient biasing means expanding to exert a force on said inertia valve means to retain said inertia valve means against said seating means; and
wherein said inertia valve means is responsive to vibration of said internal combustion engine and said resilient biasing means compressing to enable said inertia valve means to move away from said seating means to nonlinearly control the amount of air entering said single bore subsequent to combustion in said engine.

4,820,455

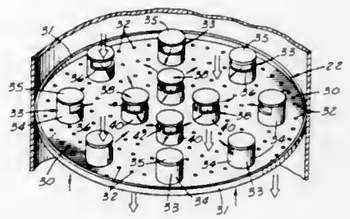
APPARATUS FOR REDISTRIBUTION OF VAPOR AND LIQUID IN A PACKED COLUMN

John G. Kunesh, Burbank, Calif., and Frederik J. Zuiderweg, Bussum, Netherlands, assignors to Fractionation Research, Inc., South Pasadena, Calif.

Filed Aug. 13, 1987, Ser. No. 84,890

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—96 **1 Claim**



1. Redistribution apparatus for reducing liquid to vapor concentration gradients in a packed column within which liquid and vapor counterflow, comprising:
a base plate interconnected to the column at a predetermined location therealong, said base plate having a plurality of drip point openings therein arranged in a substantially uniform density over the plate and which openings are the sole means by which liquid collected on the base plate can pass downwardly to the remainder of the column;
a plurality of first vapor risers mounted on said base plate closely adjacent the base plate outer edge and arranged in a closed path, said first vapor risers emitting vapor generaly parallel to the plate and directly solely inwardly of the closed path; and
a plurality of second vapor risers mounted on the base plate inwardly of the closed path, said second vapor risers emitting vapor generally parallel to the base plate and over substantially 360 degrees.

4,820,456

MASS-TRANSFER APPARATUS

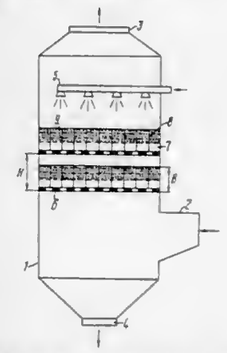
Viktor M. Kiselev, Kharkov, U.S.S.R., assignor to Ukrainsky Nauchno-Issledovatelsky Institut Prirodnykh Gazov "Ukrniigaz", Kharkov, U.S.S.R.

PCT No. PCT/SU86/00050, § 371 Date Jan. 22, 1988, § 102(e) Date Jan. 22, 1988, PCT Pub. No. WO87/07174, PCT Pub. Date Dec. 3, 1987

PCT Filed May 29, 1986, Ser. No. 171,001

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—111 **7 Claims**



1. A mass-transfer apparatus comprising a case (1) accommodating at least one horizontal perforated tray (6) and a froth retainer (7) mounted directly on the tray (6) and made in the form of a grid composed of vertical bars (8) making up interconnected cells (9), wherein the lower portions of the bars (8) of the froth retainer (7), contiguous with the tray (6), are made solid, and the cells (9) of thh grid communicate with one another through perforations in the upper portions of the bars of the froth retainer (7).

4,820,457

APPARATUS FOR AERATING WATER

Sebastian Jäger, Burgdorf, Fed. Rep. of Germany, assignor to Arnold Jäger, Burgdorf, Fed. Rep. of Germany

Filed Sep. 2, 1987, Ser. No. 92,046

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629786

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—120 **8 Claims**



1. An apparatus for aerating water, comprising:
a common feed line that is connected to a source of air; and
a plurality of aeration heads that are each connected to said feed line, for receiving air therefrom, via a respective flexible line,
each aeration head having a disk-like configuration,
said flexible connecting line being a hose that is provided with pull-resistant inserts that extend in the longitudinal direction of said hose,
said aeration head essentially comprising a rigid disk having a back side that is connected to said flexible line via a fitting, and a front side on which is disposed a thin rubber

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sheet that has a number of small and very narrow slits for the discharge of air,

said feed line being disposed at least near the bed of a body of water, and each of said aeration heads being disposed above said feed line,

each aeration head can be moved in the direction of, and/or transverse to the direction of, said feed line,

said aeration head being disposed above said feed line in such a way that it floats and can swing.

4,820,458

PROCESS FOR CONTINUOUSLY LINING A TUNNEL WITH EXTRUDED CONCRETE

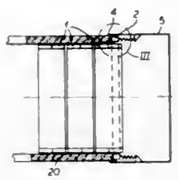
Siegmund Babendererde, Bad Vilbel; Gunnar Lah, Erzhausen, and Otto Braach, Hattingen, all of Fed. Rep. of Germany, assignors to Hochtief Ag Vorm. Gebr. Helfmann, Essen, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 882,274

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3529998

Int. Cl.⁴ B28B *1/14;* **E21D** *11/10*

U.S. Cl. 264—34 **3 Claims**



1. A method of forming a continuous lining in a tunnel having an inner surface, a circumference, and extending along an axis with pumpable concrete having a predetermined hardening time and by means of a form having a stationary annular wall form and an axially, forwardly movable front wall adjacent the inner surface of the tunnel, which movable front wall is resiliently supported against forward displacement, the method comprising the steps of: successively injecting equal-sized batches of pumpable concrete circumferentially about the circumference of the tunnel through a plurality of angularly equispaced ports in the movable front wall, the batches being injected axially backwardly through the ports at such a rate that succeeding batches are injected through each port at a time interval that is substantially smaller than the concrete hardening time and at such a pressure as to forwardly displace the resiliently supported front wall; and

forwardly displacing the front wall at such a rate and dimensioning the batches such that each batch spreads at the inner surface of the tunnel in a predetermined axial and a predetermined angular distance such that the latter is greater than the former.

4,820,459

PROCESS FOR MAKING SPUN-FILAMENT FLEECE FROM ENDLESS SYNTHETIC RESIN FILAMENT

Hans Reifenhäuser, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Nov. 10, 1987, Ser. No. 119,400

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713862

Int. Cl.⁴ D01D *5/12*

U.S. Cl. 264—40.3 **2 Claims**

1. A process for making a spun fleece from endless synthetic resin filaments, comprising the steps of:

(a) spinning a multiplicity of endless synthetic resin filaments in a downwardly directed spinning nozzle system so that spun filaments pass downwardly from said spinning nozzle system:

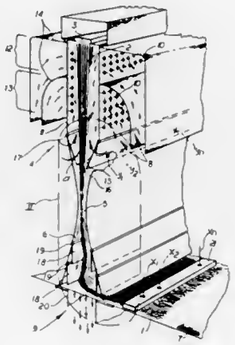
(b) passing said spun filaments through a cooling shaft below said spinning nozzle system and directing cooling air against said spun filaments in said shaft from opposite sides to cool said spun filaments;

(c) thereafter entraining the cooled filaments with said air through a stretching aperture defined between converging walls at an entrance side of said aperture, thereby stretching said cooled filaments

(d) passing the stretched filaments through a downwardly diverging diffuser shaft below said stretching aperture;

(e) collecting said stretched filaments below said diffuser shaft as a spun fleece layer on a fleece-collecting conveyor movable generally horizontally in a downstream direction away from said diffuser shaft, while drawing at least part of said air through said fleece-collecting conveyor;

(f) measuring thicknesses of said spun fleece layer on said fleece-collecting conveyor at a plurality of measuring locations $x_1, x_2, \ldots x_n$ across a width of said laid layer and obtaining respective measured-thickness values;



(g) providing at said entrance side of said stretching aperture on opposite sides of cooled filaments respective flaps movable to define variable setting angles with the respective converging walls, said flaps extending generally horizontally across a width of said cooled filaments and at least one of said flaps being elastically deformable to permit establishment or different setting angles of the elastically deformable flap across the width of said cooled filaments;

(h) controlling flow through said stretching aperture by has been inserted comparing said measured-thickness values with a predetermined setpoint value and, upon a deviation of a measured-thickness value from the setpoint value, controlling the setting angle of the elastically deformable flap at a corresponding location $y_1, y_2 \ldots y_n$ across the width of said cooled filaments so that upon a positive deviation with the measured value greater than the setpoint the respective setting angle is increased and upon a negative deviation with the measured value less than the setpoint, the respective setting angle is decreased, thereby controlling the thickness of said spun fleece layer.

4,820,460

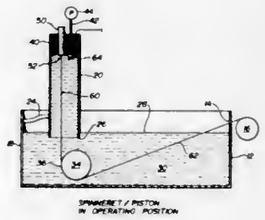
METHOD OF MANUFACTURING A HOLLOW POROUS FIBER

Ronald V. Repetti, Guilford; Scott P. Yaeger, Cheshire, both of Conn., and Chaokang Chu, Lexington, Mass., assignors to CUNO, Incorporated, Meriden, Conn.

Filed Apr. 27, 1987, Ser. No. 43,003

Int. Cl.⁴ D01D *5/247*

U.S. Cl. 264—41 **8 Claims**



1. A method of manufacturing a hollow porous fiber from a liquid polymer solution, comprising the steps of:

(a) placing into a vessel a chemical quenching liquid which is capable of solidifying and forming pores in an extruded liquid polymer fiber;

(b) placing a spinneret having a spinneret outlet in a tube having a top and a bottom opening, which tube is partially submerged in and extends vertically from said chemical quenching liquid such that the spinneret outlet is proximate said chemical quenching liquid;

(c) sealing the spinneret in the tube;

(d) moving the sealed spinneret up through the tube so as to draw a vacuum behind the rising spinneret and hence, draw the quenching liquid into the tube;

(e) extruding liquid polymer solution out through the spinneret outlet and down through the tube and into the vessel; and

(f) redirecting the fiber in the vessel into a generally horizontal direction through the vessel.

4,820,461

PRODUCTION OF CERAMIC ARTICLES INCORPORATING POROUS FILLER MATERIAL

Dave K. Creber, and Adam J. Gesing, both of Kingston, Canada, assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 907,939, Sep. 16, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 212,112

Int. Cl.⁴ C04B *35/60*

U.S. Cl. 264—57 **15 Claims**



1. A method of making a ceramic article comprising a substantially functionally inert filler material incorporated in a cermaic matrix of an oxidation reaction product, including the steps of

(a) orienting a body of a parent metal and a permeable mass of filler material relative to each other for infiltration of the oxidation reaction product into the permeable mass;

(b) in the presence of a vapor phase oxidant, melting the parent metal body and reacting the molten metal with the oxidant to form oxidation reaction product, by heating to a predetermined temperature and at said temperature maintaining at least a portion of said oxidation reaction product in contact with and between said body of molten metal and said oxidant, to progressively draw molten metal through the oxidation reaction product towards the oxidant and the filler material so that the oxidation reaction product continues to from within said mass of filler material at the interface between the oxidant and previously formed oxidation reaction product and continuing said reaction for a time sufficient to infiltrate at least a portion of said mass of filler material,

wherein the improvement comprises

(c) the permeable mass comprising a first pore system constituted of interparticle porosity distributed throughout the mass and a second pore system constituted of intraparticle porosity also distributed throughout the mass, both systems of porosity being defined within or between portions of the filler material, and at least the portions of the filler material defining the second pore system being structurally stable, during infiltration of oxidation reaction product, in maintained pore-defining arrangement.

4,820,462

METHOD OF REMOVING BINDER MATERIAL FROM SHAPED PREFORM BY EXTRACTING IN LIQUIDIZED FLUID

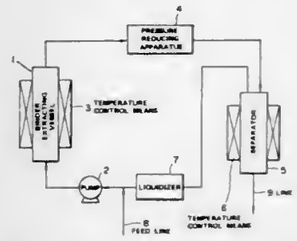
Nobuaki Nakajima, 1-2-2, Minamihara Hiratsuka-city, Kanagawa; Seiji Yasuhara, 409-5, Guzo Hiratsuka-city, Kanagawa, and Mamoru Ishihara, 216-2, Ino Hiratsuka-city, Kanagawa, all of Japan

Filed Dec. 24, 1985, Ser. No. 813,222

Claims priority, application Japan, Dec. 26, 1984, 59-273487

Int. Cl.⁴ C04B *35/64*

U.S. Cl. 264—63 **7 Claims**



1. A process for removing binder material(s) from a preform in a prefiring preparation for the production of ceramics in a given shape, which comprises the steps of exposing a preform comprising refractory particulate materials and binder materials in a given shape, to a liquidized fluid of a substance under pressure which is a gas under ambient temperature and atmospheric pressure thereby to dissolve binder material(s) in the fluid; discharging the fluid from a vessel under liquidizing conditions; and isolating said binder material(s) from a vaporized fluid by reducing the pressure of the fluid or elevating the temperature of the fluid thereby to recover the binder material(s) and fluid for further use thereof.

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4,820,463

PROCESS OF DEGASSING AND PELLETIZING POLYOLEFINS

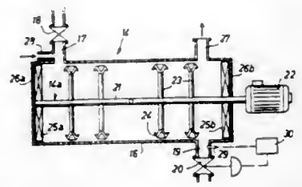
Charles Raufast, Saint Julien les Martigues, France, assignor to BP Chemicals Limited, London, England

Filed Apr. 30, 1987, Ser. No. 44,442

Claims priority, application France, May 6, 1986, 86 06548

Int. Cl.[4] B29C *35/02, 47/36, 47/90;* **C08J** *7/00*

U.S. Cl. 264—68 **9 Claims**



1. A process for degassing and pelletizing polyolefin particles produced by a gas phase polymerization comprising:

submitting the polyolefin particles to a primary degassing comprising separating a major quantity of gas from the polyolefin particles,

subjecting the polyolefin particles to a secondary degassing step comprising agitating the polyolefin particles by means of a mechanical stirrer and converting mechanical energy therefrom into heat in such a way that the temperature of the polyolefin particles rises and is brought up to a temperature between 80° C. and 120° C., which is close to a minimum sintering temperature Ts, so that the polyolefin particles are substantially freed from the gases accompanying them, and

pelletizing the heated degassed polyolefin particles in an extruder of a pelleting unit.

4,820,464

METHOD FOR CONTROLLING INJECTION MOLDING MACHINE

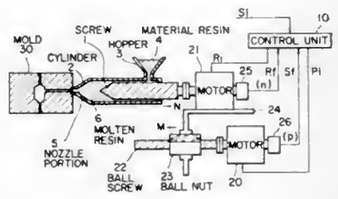
Yoshinari Sasaki; Etsuji Oda; Hirozumi Nagata; Naoki Kurita, and Hiroyuki Maehara, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,623

Claims priority, application Japan, Jul. 19, 1984, 59-150371; Jul. 19, 1984, 59-150372

Int. Cl.[4] B29C *45/04, 45/08, 45/28*

U.S. Cl. 264—40.1 **7 Claims**



1. A method for controlling an injection molding machine comprising an injection means and a mold in which molten resin is injected into a mold cavity defined by movable and stationary mold halves of the mold from a nozzle portion of a heating cylinder of the injection means, comprising the steps of:

moving said movable mold half towards said stationary mold half of the mold under speed control of said movable mold half with respect to the stationary mold half;

measuring a pressure between said movable mold half and said stationary mold half;

comparing the measured pressure with a predetermined set pressure; and

switching said speed control of said movable mold half to a pressure control of said movable mold half at a time when it is detected that the measured pressure is equal to the predetermined set pressure by said comparison.

4,820,465

METHOD FOR PRODUCING A SHAPED SYNTHETIC MEMBER

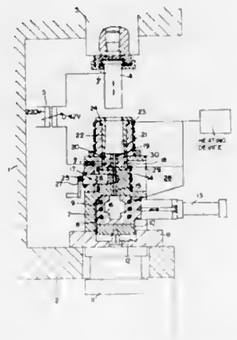
Karl Göhring, Leonorenstr. 11, 7000 Stuttgart 70, and Hermann Kress, Schubertweg 1, 7024 Filderstadt 1, both of Fed. Rep. of Germany

Filed Apr. 6, 1987, Ser. No. 34,538

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611688

Int. Cl.[4] B29C *43/02, 69/02*

U.S. Cl. 264—119 **1 Claim**



1. A method for producing a shaped synthetic member comprising the steps of

(a) introducing granulated particles into a first zone and heating the granulated particles while in this first zone to plasticize the surface of the granulated particles,

(b) extruding the surface-plasticized granulated particles from said first zone into a spaced apart moulding cavity through at least one passageway in the form of at least one thin strand until the molding cavity is filled,

(c) then compression molding the material thus introduced into said molding cavity to produce said shaped synthetic member,

(d) controlling the size of said at least one passageway so that its cross section is smaller than the cross section of the individual granulated particles, whereby the granulated particles are mechanically deformed as they pass from said first zone to said moulding cavity.

4,820,466

PROCESS FOR OBTAINING ULTRA-HIGH MODULUS PRODUCTS

Anagnostis E. Zachariades, 65 Glengarry Way, Hillsborough, Calif. 94010

Continuation-in-part of Ser. No. 877,896, Jun. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 697,211, Jan. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 578,171, Feb. 8, 1984, abandoned. This application Jan. 22, 1987, Ser. No. 6,008

Int. Cl.[4] B29C *59/04*

U.S. Cl. 264—119 **14 Claims**

1. A method for producing high-modulus semicrystalline polymer products comprising:

Solid-state extruding a polymer having an initial polymer morphology by feeding under pressure through an extrusion-rotation die having a static entry position and a succeeding friction-reducing moving portion, said succeeding friction-reducing moving portion of said die comprising a pair of oppositely rotating members, each having integral, shaped wall surfaces strictly confining, engaging, and compressing the entire perimeter of the polymer during extrusion and providing the geometry of a die exit and a profile for extrudate which has practically the same cross-sectional area and lateral dimensions as the cross-sectional area and lateral dimensions of the die exit, said static and succeeding friction-reducing moving portions of the die having a polymer-containing zone with convergent geometry through which the polymer is compressed, oriented, and extruded under conditions of minimal friction between the polymer and the die surface for reducing the extrusion pressure, said minimal friction being obtained by substantially synchronous movement of the rotating members of the die and the polymer, said extrusion being at a temperature near but below the crystalline melting point of said polymer, to obtain an extruded polymer product having a markedly transformed morphology as compared with said initial polymer morphology, comprised of oriented and extended molecular chains and markedly enhanced tensile properties, the values of which are for the Young's modulus within the range of 2 to 220 GPa and for the tensile strength within the range of 0.15–4 GPa, and which depend upon the extent of the cross-sectional area reduction during extrusion.

4,820,467

PROCESS FOR THE PUNCHING AND REMOVING OF THE SPRUE IN AN INJECTION MOLDING TOOL

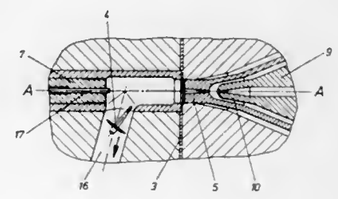
Ernst Ehrler, Munich; Martin Eichlseder, Tettenweis, and Edmund Theiss, Freising, all of Fed. Rep. of Germany, assignors to Krauss-Maffei A.G., Fed. Rep. of Germany

Division of Ser. No. 799,337, Nov. 18, 1985, Pat. No. 4,715,806. This application Oct. 19, 1987, Ser. No. 111,072

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1984, 3442023

Int. Cl.[4] B29C *45/38*

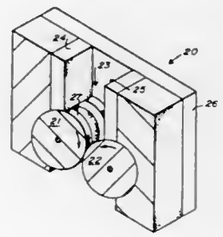
U.S. Cl. 264—161 **12 Claims**



1. A method of punching and removal of a sprue part of a molded article in a two-part injection molding tool wherein the two parts are axially displaceable with respect to each other comprising the steps of:

axially punching the sprue part into a part of the injection molding tool past a die;

removing the sprue part and dust particles generated in the punching step from the injection molding tool through an orifice leading out from the injection portion of the injection molding tool by suctioning the sprue part and the dust particles generated by the step of punching through the orifice.



4,820,468

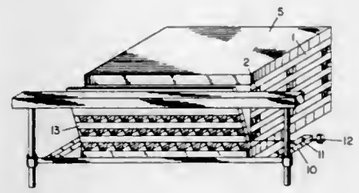
METHOD FOR MAKING WELDED HOLLOW PLASTIC PLATE HEAT EXCHANGERS

Martval J. Hartig, 218 Rowland Park Blvd., Wilmington, Del. 19803

Filed Mar. 22, 1985, Ser. No. 714,942

Int. Cl.[4] B29C *65/22;* **B32B** *3/28;* **F28F** *3/12*

U.S. Cl. 264—163 **5 Claims**



1. A method for making a welded plastic hollow plate heat exchanger comprising the steps of:

(a) stacking two or more hollow plastic plates open at two opposite edges and closed at the other two edges alternately with hollow spacer strips running parallel to the open edges of the hollow plastic plates with at least two spacer strips, each one adjacent to the open edges of the hollow plastic plate, said hollow spacer strips having at least one septum running the full

length of the strip,

(b) holding the array of plates and spacers in place with a mechanical or adhesive means or both,

(c) providing melt sealing means, such as a taut hot wire,

(d) heating the melt sealing means to a temperature substantially above the melting point of the plastic forming the array,

(e) passing the hot sealing means in a place parallel to the open edge of the sheet and bisecting the spacer strip thereby cutting and melting together the skin on the bottom of the hollow plate to the skin of the top of the adjacent spacer and the skin of the bottom of the spacer to the skin on the top of the hollow plate immediately below the spacer until the entire array is melted together,

(f) removing the thin sheet formed from the cut-off edges and spacer to prevent it from rewelding to the cut-off face,

(g) allowing the array to cool to a temperature below the melting point of the plastic to form a welded together face,

(h) repeating the step (d), (e), (f), and (g) on the opposite side face of the array to form a welded monolithic hollow plastic plate heat exchanger.

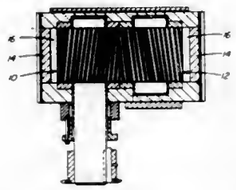
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4,820,469

METHOD AND APPARATUS FOR PRODUCING THERMOPLASTIC AND PRODUCTS PRODUCED THEREFROM

Martin J. Walsh, and Enfredo G. Maury, both of Brampton, Canada, assignors to Colortech Inc., Ontario, Canada

Filed Jul. 7, 1986, Ser. No. 882,263
Claims priority, application Canada, Jul. 9, 1985, 486540
Int. Cl.[4] B29C *47/00*
U.S. Cl. 264—506 **29 Claims**



7. A system for extruding products comprising in combination,

mixing and heating means which simultaneously heat and mix a material to be extruded to at least the melting temperature thereof and to a point where the material is in the form of a non-flowable, self-sustaining mass and which is in a partially molten state, the mass having a low density and having entrapped air therein to help prevent the mass from being flowable;

means for feeding the mass in this state to a separate compression component;

said compression component comprising a fixed rigid surface and a moving rigid surface of a gear pump for densifying and compressing said mass to a flowable form; and

means for extruding the resultant densified and compressed flowable product through a restricted opening.

27. A method for forming a corrugated tube product which comprises subjecting a source of resin to a high intensity mixing step and forming a heated, high bulk resinous mass having a temperature of at least the melting point of the resin but not high enogh to cause fluid flow thereof and wherein the mixing is carried out until the material is in the form of a relatively low density, non-flowable, self-sustaining mass in a partially molten state and having entrapped air therein, and in a second, separate step densifying said high bulk, relatively low density, non-flowable, self-sustaining resinous mass in a partially molten state, into a molten flowable resinous mass by passing the mass between a fixed rigid surface and a moving rigid surface of a gear pump, extruding directly through a tubing die to form an extruded tube shape, and cooling said tube and corrugating said tube.

4,820,470

METHOD AND APPARATUS FOR EXTRUSION, PARTICULARLY FOR EXTRUDING MASSES OF FOOD PRODUCTS

Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Turin, Italy

Filed Jul. 10, 1987, Ser. No. 71,876
Claims priority, application Italy, Jul. 11, 1986, 67561 A/86
Int. Cl.[4] B29B *9/06*
U.S. Cl. 264—555 **14 Claims**

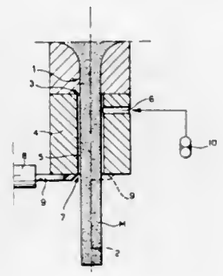
1. A method for extruding masses through an extrusion duct (die) having an outlet end of fixed diametral dimensions, in which the mass to be extruded is forced into the duct and emerges in the extruded state from the outlet end of the extrusion duct in a generally axial direction relative to the extrusion duct, including the operation of generating around the outlet end of the extrusion duct, an annular flow of fluid oriented in an axial direction relative to the extrusion duct itself and surrounding the extruded mass emerging from the outlet end so as to prevent bending of the extruded mass at the outlet of the extrusion duct.

6. A device for the extrusion of edible masses including

(a) an extrusion duct having an outlet end of fixed diametral dimension, in which a mass to be extruded is forced into the duct and emerges in an extruded state from the outlet end of the extrusion duct in a generally axial direction relative to the extrusion duct, and

(b) means for preventing the extruded mass from bending at the outlet of the extrusion duct, comprising:

(i) a tubular sleeve extending as an elongation of the extrusion duct from its outlet end in an axial direction relative to the extrusion duct itself; the tubular sleeve having diametral dimensions generally greater than the predetermined diametral dimensions of the outlet end of the extrusion duct so that, in use, the tubular sleeve defines an annular separation zone around the extruded mass emerging from the outlet end of the extrusion duct, and



(ii) pressurized-fluid supply means provided with outlets opening into the annular separation zone so as to generate around the outlet end of the extrusion duct, an annular flow of fluid oriented in an axial direction relative to the extrusion duct itself and surrounding the extruded mass emerging from the outlet end of the extrusion duct, and thereby prevent bending of the extruded mass at said outlet.

4,820,471

PROCESS FOR THE PREPARATION OF BLOWN FILM

Theodorus J. van der Molen, Vijlen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Jul. 30, 1986, Ser. No. 890,570
Claims priority, application Netherlands, Aug. 6, 1985, 8502190
Int. Cl.[4] B29C *47/86*
U.S. Cl. 264—564 **14 Claims**

1. Process for the preparation of highly oriented blown film from a polymer feed composition comprising the steps of:

(a) melting an ethylene polymer feed composition having a density of less than 910 kg/m^3 or a blend of at least 50 wt%, relative to the total polymer, of polyethylene having a density of less than 910 kg/m^3 with a member of the group consisting of:

(i) low density polyethylene having a density of 910–940 kg/m^3;

(ii) high density polyethylene having a density of higher than 940 kg/m^3;

(iii) polypropylene; and

(iv) mixtures thereof

wherein said polymer feed composition has a melt index of at least 2 dg/min;

(b) extruding the melt through an extruder having an annular die gap width of at least 2 mm, at a temperature of the melt at the die of at most 160° C. to form an extruded tube;

(c) supplying a gas via an opening within said annular die to inflate said extruded tube to form an expanded balloon;

(d) thereafter cooling said balloon with cold air or water to solidify the polymer; and

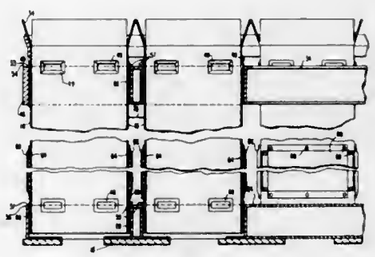
(e) flattening and winding up the resulting film, wherein said film exhibits an X-ray diffraction intensity ratio I max/min of at least 20, and an angle α of at most 15° between the average direction of orientation of the polymer molecule and the direction of film extrusion.

4,820,472

NUCLEAR REACTOR SPENT FUEL STORAGE RACK

Octavio J. Machado; William M. Flynn; Harry E. Flanders, Jr., and Larry W. Booker, all of Pensacola, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 14, 1981, Ser. No. 282,991
Int. Cl.[4] G21C *19/40*
U.S. Cl. 376—272 **23 Claims**



15. A fuel rack for use in storing nuclear fuel assemblies in a nuclear fuel storage pool having a floor on which an upwardly projecting stud is mounted; the said fuel rack comprising:

a base structure at the lower end of the fuel rack including base-plate means having flow openings therein, said base-plate means supporting a first network of interlaced beams which form a multiplicity of polygonal openings;

a second network of interlaced beams forming polygonal openings positioned in spaced vertical alignment with corresponding polygonal openings in the first network of beams;

a plurality of cells, each cell having sides bounded by inner and outer surfaces and being of a size and configuration designed to hold therein a fuel assembly, each said cell being positioned in a corresponding pair of said aligned polygonal openings, each said cell being open at both ends with a guiding funnel at the upper end, and said cells being positioned over said flow openings in said base-plate means, thereby to permit flow of coolant through said cells;

spaced, outwardly directed, projections on said outer surfaces of the sides of said cells near the tops and bottoms of the sides thereof, each said cell together with said projections thereon being sized to be received within a corresponding of said pair of aligned polygonal openings in which said cells are respectively positioned; and

means fixedly securing said projections to the beams in the first and second networks of beams thereby to provide a substantially rigid fuel rack of modular design;

neutron absorbing material mounted on the outer surfaces of the sides of at least some of said cells between said spaced top and bottom projections, said neutron absorbing material having a thickness no greater than the outward extent of said projections; and

leveling means for said base structure, located between the fuel storage pool floor and said base structure, for adjusting the base-plate and the cells thereon to a level condition; said leveling means for the base structure including:

multiple leveling pads beneath said base structure, each of said pads including a base member having vertically adjustable means therein arranged to engage the underside of said base structure and thereby provide, upon adjustment, a horizontal surface to help ensure vertical alignment of the cells, said vertically adjustable means including a frame having upstanding arms which engage the underside of the base structure and an adjustable foot arranged to coact with said frame to adjust vertically the base structure to assure vertical alignment of the cell walls, said frame having a central opening and said adjustable foot being screw threaded into said opening so that when said foot is adjusted vertically, said frame and frame arms move relative to the pool floor to achieve leveling of the base structure and also to assure vertical alignment of the cell walls; the said nuclear fuel rack also including:

means, connected to the foot, actuable to permit the foot centerline to lie perpendicular to said base structure even though the floor of the pool on which said vertically adjustable means rests is uneven, said actuable means including:

a pedestal to be positioned on the pool floor,

a spherical surface on said pedestal, and

a complementary spherical surface on the bottom of said foot which engages the pedestal on the spherical surface thereof thus permitting the foot to move on said spherical surface of said pedestal relative to the pedestal and assume a vertical position when the pedestal rests on a non-horizontal surface;

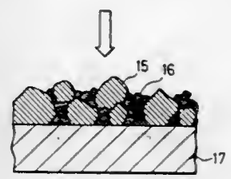
said foot and said pedestal having coaxial openings to accommodate the upwardly projecting stud; and locking means on said foot and pedestal, cooperative with said stud, for locking said foot and pedestal in position on said floor.

4,820,473

METHOD OF REDUCING RADIOACTIVITY IN NUCLEAR PLANT

Kenya Ohashi, Hitachi; Takashi Honda; Yasumasa Furutani, both of Katsuta; Eizi Kashimura, Naka; Akira Minato, and Katsumi Ohsumi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,466
Claims priority, application Japan, Nov. 6, 1984, 59-233507
Int. Cl.[4] G21C *19/30*
U.S. Cl. 376—305 **25 Claims**



1. A method of reducing radioactivity in a nuclear plant by preliminarily forming oxide films on the surfaces of metallic structural members to be in contact with high-temperature and high-pressure reactor water containing radioactive substances before said metallic structural members are exposed to said reactor water, comprising the steps of:

subjecting said structural members to a first-step oxidation treatment of heating said structural members in water of a temperature of at least 200° C., and

further subjecting the thus treated structural members to a second-step oxidation treatment of heating said treated structural members in water, of a temperature of at least 200° C., having a higher oxidizing capacity than that of said water in said first-step oxidation treatment, such that in the first-step oxidation treatment a relatively thick and

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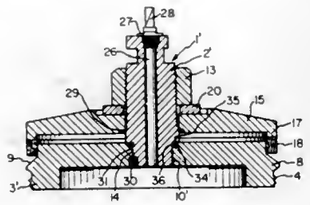
porous oxide film, as compared to the oxide film formed in the second-step oxidation treatment, is formed, and in the second-step oxidation treatment a relatively denser and thinner oxide film than the oxide film obtained in said first-step oxidation treatment is formed, so that adherence of radioactive substances to said metallic structural members is suppresed as compared to adherence of radioactive substances to metallic structural members not having been subjected to both the first and second-step oxidation treatments.

4,820,474

PRESSURE SEAL STUD HOLE PLUG UNIT

Bruce E. Leslie, Baden; Paul N. Shadle, Kensington, and Herman C. Wolf, Mars, all of Pa., assignors to Thaxton, Inc., Mars, Pa.

Filed Dec. 2, 1987, Ser. No. 127,445
Int. Cl.[4] G21C *13/06*; F16J *15/00*; B65D *53/00*
U.S. Cl. 376—203 **9 Claims**



1. A reactor stud hole plug unit comprising a mandrel having a central stem with a threaded upper portion and a lower portion having a diameter less than said upper portion, a longitudinal passageway extending through said stem, a mandrel plate fixed to the lower end of said stem, said mandrel plate having threads on its periphery adapted to engage with internal threads on a stud hole in a nuclear reactor, an annular stop at the upper end of said threads on said mandrel plate adapted to engage a shoulder on the stud hole when said mandrel plate is in position in the stud hole, a compression plate having an upper surface, a lower surface and a peripheral edge, a central opening through said compression plate having a diameter larger than the diameter of the upper portion of said mandrel stem so that said compression plate can fit over said mandrel stem, an annular sealing ring positioned about the periphery of said mandrel plate above said annular stop and in contact with said compression plate when said compression plate is placed over said mandrel stem, a drive nut threadably engaging the threads on the upper portion of said mandrel stem to maintain the stud hole plug unit in assembled relationship and adapted to force said compression plate toward said mandrel plate to compress said sealing ring so that said sealing ring substantially fills the space defined by the upper edge of said mandrel plate, the upper surface of said annular stop and the wall of the stud hole being plugged.

4,820,475

BURNABLE ABSORBER ROD PUSH OUT ATTACHMENT JOINT

Joseph B. Mayers, Greensburg; Robert K. Gjertsen, Monroeville, and John F. Wilson, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

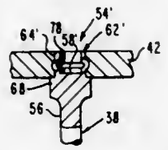
Division of Ser. No. 774,850, Sep. 12, 1985, abandoned. This application Aug. 25, 1987, Ser. No. 89,384
Int. Cl.[4] G21C *7/04*
U.S. Cl. 376—327 **1 Claim**

1. In a cluster assembly including a support plate and at least one burnable absorber rod, an attachment joint for detachably connecting an upper end of said absorber rod to said support plate, comprising:

(a) a plug insert defined on said upper end of said rod;

(b) means defining at least one hole through said support plate for receiving said plug insert and defining an annular groove having a concave cross-sectional shape in said support plate within said hole therein;

(c) said plug insert being a cylindrical hollow annular uninterrupted wall disposed within said support plate hole and having a cavity coextensive with the depth of said hole in said support plate for allowing deformation of said wall into conformity with said groove in said hole to provide an interengaging nonthreaded connection to said support plate; and



(d) an enlarged lower flange being solid in cross-section and integrally formed on said upper end of said rod with and below said annular wall of said plug insert to form a bottom of said plug insert cavity at the level of a bottom side of said support plate, said flange being disposed at its upper end in contact with said bottom side of said support plate about said hole such that together with said deformed annualar wall said flange maintains said plug insert in said hole of said support plate;

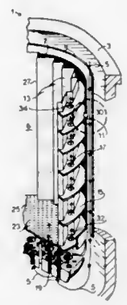
(e) said annular wall of said plug insert being redeformable out of conformity with the shape of said groove in said hole of said support plate upon application of a predetermined axially-directed force on said plug insert so as to remove said plug insert from said support plate hole and thereby detach said rod from said support plate.

4,820,476

SYSTEM AND METHOD FOR PLUGGING THE CORE BARREL OF A NUCLEAR REACTOR

Craig H. Popalis, Pensacola, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1987, Ser. No. 19,759
Int. Cl.[4] G21C *13/06*
U.S. Cl. 376—203 **19 Claims**



1. A method for plugging a port in the wall of a vessel wherein access to said port is impeded by a wall that is spaced adjacent to the port a distance L by means of a plug having a plug body including a shell and a tapered mandrel disposed therein that is insertable within the port and expandible into sealing engagement therewith when said mandrel is moved along said shell, and a retaining ring that is telescopically connected to the plug body for engaging the outer surface of the vessel that surrounds the port and for limiting the extent to which the plug body is inserted into the port, comprising the steps of:

(a) contracting the length of the plug to a distance less than L by aliding the retaining ring toward the middle of the plug body;

(b) delivering the contracted plug to a port and inserting the plug body into the port until further insertion is prevented by the retaining ring, and

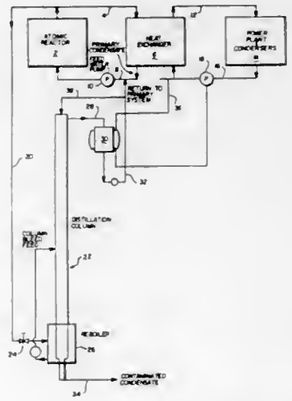
(c) expanding the plug body into sealing engagement with the port by moving said tapered mandrel along said shell by means of a hydraulic ram means.

4,820,477

METHOD AND APPARATUS FOR PROVIDING A NON-RADIOACTIVE COOLANT FOR A NUCLEAR REACTOR

Lillian McNally, 1444 Rhode Island Ave., NW., Washington, D.C. 20036

Continuation of Ser. No. 509,027, Jun. 29, 1983, abandoned. This application Dec. 23, 1986, Ser. No. 946,156
Int. Cl.[4] G21C *19/30*; G21F *9/00*
U.S. Cl. 376—310 **10 Claims**



1. In a light-water cooled nuclear reactor, a method for preventing formation of tritium in a circulating light-water coolant medium for said nuclear reactor comprising diverting only a portion of said circulating light water coolant medium to means for removing deuterium to continuously remove deuterium from said portion of said circulating medium during normal operation of said reactor.

4,820,478

NUCLEAR REACTOR CONTROL ROD WITH UNIFORMLY CHANGEABLE AXIAL WORTH

Thomas R. Freeman, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 816,780, Jan. 7, 1986, Pat. No. 4,707,329. This application Aug. 25, 1987, Ser. No. 89,387
Int. Cl.[4] G21C *7/10*
U.S. Cl. 376—333 **6 Claims**

1. A control rod for use in a nuclear reactor core to provide xenon compensation, comprising:

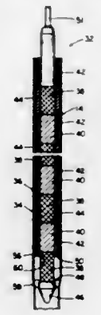
(a) an elongated inner cylindrical member having a lower end; and

(b) an elongated outer cylindrical member surrounding said inner member and having a lower end with concentrically-arranged inner and outer edge portions defined thereon;

(c) each of said members being composed of alternating poison and nonpoison regions;

(d) said inner member being axially movable relative to said outer member to adjust the degree to which said poison regions of said members overlap with said nonpoison regions thereof and thereby change the overall worth of said rod;

(e) said lower end of said inner member having defined thereon a radially outwardly projecting ledge for supporting in a rest relationship thereon said lower end of said



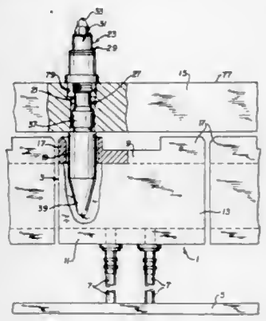
outer member at only its inner edge portion for retaining said outer member about said inner member, said outer edge portion of said outer member lower end extending radially outwardly from said inner edge portion thereof and from said ledge on said inner member lower end for providing an exposed abutment engagable with a guide thimble stop structure to maintain said outer member in a stationary position upon axial movement of said inner member which moves its ledge away from said inner edge portion of said outer member lower end to change the degree in which said poison regions of said members overlap with said nonpoison regions thereof.

4,820,479

GUIDE PIN ASSEMBLY FOR A NUCLEAR REACTOR

Leonard P. Hornak, Forest Hills, and Robert E. Meuschke, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 10, 1988, Ser. No. 154,404
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 **12 Claims**



1. A guide pin assembly for aligning the upper hold down

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plate of the top nozzle of a fuel assembly with the upper core plate of a pressurized water nuclear reactor comprising:

a guide pin having a generally circular cross-section including:

a nose having engagement means thereon;

a threaded portion, adjacent said nose, having a threaded outer surface;

a shaft, adjacent said threaded portion, having an upper section, a lower section, and a radial alignment section between said upper and lower sections, said radial alignment section of said shaft having a diameter that is approximately the diameter of a first bore in the upper core plate of a nuclear reactor, said lower section of said shaft having a diameter less than that of said radial alignment section; and

an end, adjacent said shaft, including a top having a diameter greater than that of the diameter of the said first bore in the said upper core plate;

said guide pin being adapted to be inserted within a second bore in the upper hold down plate of the top nozzle of a fuel assembly and through the said first bore in the said upper core plate of a nuclear reactor from the bottom of the said first bore in the said upper core plate so that said nose and at least a portion of said threaded portion of said guide pin protrude above the said upper core plate;

a nut adapted to be threaded onto said threaded surface of said guide pin, said nut including a top and a bottom; and

an annular locking cup securable about said nut and adapted to engage said engagement means on said nose of said guide pin when said nut has been tightened onto said threaded surface of said threaded portion of said guide pin so that said bottom of said nut abuts the upper surface of the said upper core plate.

4,820,480

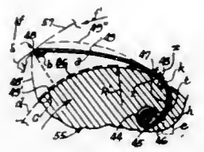
FLEXIBLE CONFORMABLE VANES MADE OF CARBONACEOUS MATERIALS

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Division of Ser. No. 866,944, May 27, 1986, Pat. No. 4,702,205, which is a continuation-in-part of Ser. No. 789,451, Oct. 21, 1985, Pat. No. 4,653,274, which is a continuation-in-part of Ser. No. 586,812, Mar. 6, 1984, Pat. No. 4,561,252. This application Oct. 8, 1987, Ser. No. 78,383

Int. Cl.[4] F01C *5/02*; F04C *5/00*

U.S. Cl. 418—153 **6 Claims**



1. A flexible conformable vane structure extending between a centrally located rotor for rotation relative to a fixed outer housing, and between two adjacent flanges mounted on said housing and supporting a shaft mounted on said rotor having an outer cylindrical surface of revolution about the shaft axis facing an inner cylindrical surface of the housing and off-centered with respect to the rotor outer surface, whereby the flat facing surfaces of the flanges orthogonally oriented relative to the shaft axis cooperate with the outer and inenr cylindrical surfaces to define a space between two contiguously located vanes, each vane being attached to the rotor outer surface and caused to rotate therewith, the relative positioning of both cylindrical surfaces and the housing inner surface contour being such that said space volume is caused to vary as the rotor rotates and as the distance separating the vane attachment from the housing inner surface concomitantly varies, thus causing the vanes to vary their degree of bending for conformance with variations of said distance as the rotor rotates, and comprising:

means for forming adjacent sheets of springy material in which adjacent layers of carbonaceous fibers are laid in a manner such that the fibers contained in two adjacent layers form an approximate right angle with one another;

means for enabling the end portions of said fibers to form angles with a vane side edge that are approximately half of a right angle on the three unattached edges of the vane;

means for embedding said fibers in each layer in a dense carbonaceous matrix material so as to form a thin flat flexible and springy structure;

means for enabling adjacent sheets to slide against each other in the flexible portion of the vane and to form a solid wedge in a rigid portion of the vane attached to the rotor; and

means in the rotor for anchoring said wedge.

4,820,481

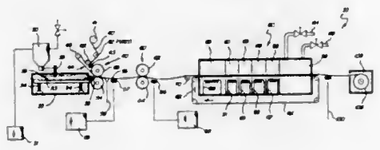
METHOD FOR THE CONTINUOUS FABRICATION OF HYDROGEN STORAGE ALLOY NEGATIVE ELECTRODES

Merle Wolff, Rochester; Mark A. Nuss, Rochester Hills; Michael A. Fetcenko, Royal Oak, and Andrea L. Lijoi, Utica, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 25, 1988, Ser. No. 185,598

Int. Cl.[4] B22F *5/00*

U.S. Cl. 419—3 **19 Claims**



1. A method of substantially continuously fabricating a large area, metal hydride electrochemical hydrogen storage alloy negative electrode for use in a rechargeable nickel-metal hydride battery, said method comprising the steps of:

providing a continuous, wire mesh screen substrate;

providing a measured amount of powdered metal hydride electrochemical hydrogen storage alloy material;

continuously disposing a layer of the hydrogen storage alloy material into contact with the wire mesh screen substrate, in a substantially inert atmosphere;

compacting the hydrogen storage alloy material into the wire mesh screen so as to form a g-reen deposit thereof;

pre-heating the green deposit of hydrogen storage alloy wire mesh screen;

sintering the green deposit of hydrogen storage alloy wire mesh screen in an anhydrous, substantially oxygen free inert atmosphere so as to liberate moisture therefrom; and

cooling said sintered hydrogen storage alloy wire mesh screen in a controlled hydrogen atmosphere so as to impart a partial charge thereto.

4,820,482

CEMENTED CARBIDE BODY WITH A BINDER PHASE GRADIENT AND METHOD OF MAKING THE SAME

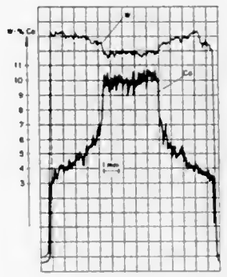
Udo K. R. Fischer, Vallingby; Erik T. Hartzell, and Jan G. H. Akerman, both of Stockholm, all of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Filed May 5, 1987, Ser. No. 47,004

Claims priority, application Sweden, May 12, 1986, 8602146

Int. Cl.[4] B22F *00/00*; C22C *32/00*

U.S. Cl. 419—15 **11 Claims**



8. A method of making a cemented carbide body comprising (i) sintering a mixture of WC having a substoichiometric amount of carbon and a binder metal selected from the group consisting of cobalt, iron, nickel and alloys thereof to form a sintered body including WC, binder metal and eta phase carbide and then (ii) carburizing the sintered body sufficient to remove all eta phase thereby producing a carburized body having a lower binder metal content in the surface than in the center of the body.

4,820,483

PROCESS FOR THE PRODUCTION OF CHROMIUM-ALUMINUM BALLS FOR ADDING CHROMIUM INTO MOLTEN ALUMINUM BATHS

Alain Defrance, Les Loges en Josas, France, assignor to Delachaux SA, France

Filed Dec. 22, 1987, Ser. No. 137,661

Claims priority, application France, Dec. 22, 1986, 86 17981

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—23 **12 Claims**

1. A process for the production of balls containing x % of Cr and y % of Al where x and y are gravimetric contents corresponding to the following relationships:

$$70 \leqq x \leqq 80$$

$$20 \leqq y \leqq 30$$

$$x+y=100$$

for adding Cr into molten aluminum baths, by producing a powder containing x % of Cr and y % of Al and then compacting this powder into balls, wherein said powder is produced by a succession of stages consisting in:

(a) producing, by melting, an alloy of Cr and Al containing gravimetric Cr and Al contents approximating x by an excess and y by a deficit respectively,

(b) finely grinding said alloy into a crude powder and analyzing the gravimetric Cr and Al contents respectively in said alloy or in said crude powder, and

(c) if the gravimetric Al content of the alloy or of the crude powder is less than y, adding to the crude powder an additional amount of finely divided Al in order to obtain said powder containing x % of Cr and y % of Al, said additional amount of finely divided Al corresponding to less than 10% by weight of the crude powder.

4,820,484

METHOD IN PRODUCING A MOLDING OF AN IRON ALLOY

Ragnar Ekbom, Finspang, Sweden, assignor to Asea Stal AB, Finspang, Sweden

PCT No. PCT/SE86/00070, § 371 Date Oct. 2, 1986, § 102(e) Date Oct. 2, 1986, PCT Pub. No. WO86/04841, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 19, 1986, Ser. No. 929,105

Claims priority, application Sweden, Feb. 19, 1985, 8500773

Int. Cl.[4] C22F *1/00*

U.S. Cl. 419—49 **6 Claims**

1. Method in producing a shaped molding of an iron alloy, characterized in that the molding is produced by hot isostatic pressing of a prealloyed powder comprising 0.5 to 2.8 % coal by weight, 24 to 35 % chromium by weight, from effective amount to 2 % silicon by weight, from effective amount to 1.5 % manganese by weight, 0 to 2.3 % nickel by weight, and 0 to 3.0 % molybdenum by weight, and the residue iron.

4,820,485

METHOD OF PRODUCING AN IRON-, COBALT- AND NICKEL-BASE ALLOY HAVING LOW CONTENTS OF SULPHUR, OXYGEN AND NITROGEN

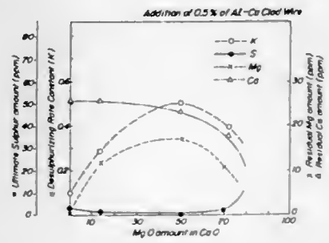
Tobel Ototani, Tokyo; Toru Degawa, Kurashiki; Kenichi Kusumoto, and Makoto Ebata, both of Tokyo, all of Japan, assignors to Mitsui Engineering and Ship Building Co., Ltd. and Metal Research Corporation, both of, Japan

Division of Ser. No. 937,426, Dec. 3, 1986, Pat. No. 4,729,787, which is a continuation-in-part of Ser. No. 799,382, Nov. 18, 1985, abandoned. This application Feb. 3, 1987, Ser. No. 10,598

Claims priority, application Japan, Apr. 26, 1985, 60-90571; Oct. 7, 1985, 60-223888

Int. Cl.[4] C21C *7/02*

U.S. Cl. 420—78 **4 Claims**



1. An iron base alloy consisting essentially of 0.005%–7.0% of aluminum, 0.005%–7.0% of silicon, 0.0005%–0.005% of magnesium, 0.0001–0.005% of calcium, 0.0001%–0.002% of oxygen, 0.0001%–0.002% of sulphur, and 0.0005%–0.003% of nitrogen, less than 2% of carbon, minor amount of phosphorous and manganese and the remainder iron.

4,820,486

LOW ALLOY STEEL HAVING GOOD STRESS CORROSION CRACKING RESISTANCE

Kazutoshi Shimogori; Kazuo Fujiwara, both of Kobe; Kiyoshi Sugie, Akashi; Kikuo Morita, Kakogawa; Takenori Nakayama, Kobe; Mutsuhiro Miyakawa, and Yasushi Torii, both of Kakogawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 31, 1986, Ser. No. 846,102

Claims priority, application Japan, Apr. 5, 1985, 60-73368; Nov. 6, 1985, 60-249707

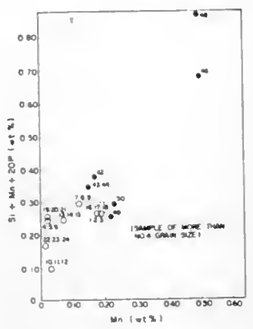
Int. Cl.[4] C22C *38/44*

U.S. Cl. 420—108 **2 Claims**

1. A low alloy austenitic steel having good stress corrosion cracking resistance consisting essentially of C:≦0.40%,

Si: ≦0.15%, Mn: ≦0.60%, P: ≦0.010%, S: ≦0.030%, Ni: 0.50 to 4.00%, Cr: 0.50 to 2.50%, Mo: 0.25 to 4.00% and V: ≦0.30% and further containing at least one element selected from the following (i) and (ii) groups:

(i) At least one of Al, Ti, Nb, W, B or Ce: 0.001 to 0.50% in total



(ii) Sn: 0.003 to 0.015%

the remainder being Fe and unavoidable impurities, the austenite crystal grain size thereof being in excess of 4 of ASTM crystal grain size number.

4,820,487

GOLD ALLOY

Vittorio Antoniazzi, Avenida Alvear 1891 - 4th Floor, Buenos Aires, Argentina

Continuation-in-part of Ser. No. 116,483, Nov. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 924,192, Oct. 28, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 173,253

Claims priority, application Argentina, Dec. 6, 1985, 302493

Int. Cl.[4] C22C *5/02*

U.S. Cl. 420—512 **3 Claims**

1. A gold alloy comprising the following ingredients, by weight:

(1) gold	80 to 88%
(2) nickel	3 to 6%
(3) chromium	2 to 3%
(4) molybdenum	0.1 to 0.4%
(5) vanadium	1 to 3%
(6) carbon	0.1 to 1.5%
(7) tungsten	0.1 to 1.5%
(8) iron	3 to 6%

4,820,488

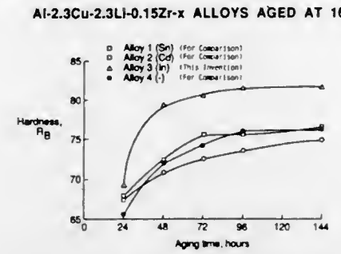
ALUMINUM ALLOY

Linda B. Blackburn, Hampton, and Edgar A. Starke, Jr., Charlottesville, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1988, Ser. No. 172,102

Int. Cl.[4] C22C *21/00*

U.S. Cl. 420—529 **6 Claims**



1. An aluminum-copper-lithium alloy which precipitates a T_1 phase and includes at least about 0.1 percent by weight of indium as an essential component.

4,820,489

TEST STRIPS AND A PROCESS FOR THE PRODUCTION THEREOF

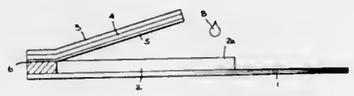
Anselm Rothe, Birkenau; Wolfgang-Reinhold Knappe, Bürstadt, and Heinz-Friedrich Trasch, Ludwigshafen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 560,916, Dec. 13, 1983, Pat. No. 4,604,264. This application Jul. 9, 1986, Ser. No. 883,612

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247608

Int. Cl.[4] G01N *31/22*

U.S. Cl. 422—56 **8 Claims**



1. A test strip made by a process which comprises:

providing a carrier layer having an upper side and a lower side and being made of one of a multifilar fabric or fleece;

applying and thereafter drying a coating mass of one of a suspension or dispersion of at least one synthetic resin in a solvent as a layer on the carrier layer so that most of the coating mass remains on the upper side of the carrier layer to obtain a fabric or fleece coated with a film layer of said coating mass wherein said film layer is coatingly embedded at least preponderantly on and into only one side of the carrier layer; and

introducing at least one reagent by at least one of admixing with the resin before the film is formed or impregnating the coated film or fleece.

4,820,490

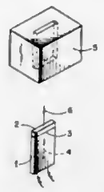
DEVICE AND METHOD FOR CHEMICAL ANALYSIS OF FLUIDS WITH A REAGENT COATED LIGHT SOURCE

David A. N. Morris, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Division of Ser. No. 906,086, Sep. 11, 1986, Pat. No. 4,717,545. This application Jul. 20, 1987, Ser. No. 75,844

Int. Cl.[4] G01N *21/25, 1/48;* **G01J** *3/51*

U.S. Cl. 422—58 **12 Claims**



1. A light-emitting diode consisting of

a light-emitting diode end surface through which light from the diode can pass;

a liquid permeable, light-transmitting coating on the end surface of the diode;

a reagent composition for a ligand from a body fluid, wherein the reagent composition is contained in the coating and is chemically reactive with the ligand to produce a change in transmittance of light by the coating.

8. A method for determining the presence or concentration of a ligand in a specimen by measuring transmission of light in a device comprising light source means for illuminating the specimen and means for measuring light from the specimen, wherein the method comprises

providing a transparent or translucent coating on an end surface of the light source through which light from the light source passes, wherein the coating contains a reagent that displays chemical reactivity with a ligand by a change in optical characteristics;

measuring light from the light source transmitted from the coating to said measuring means;

applying a liquid specimen containing the ligand onto the coating;

allowing sufficient time to react substantially all of the ligand in the liquid specimen to form an optically discernible product; and

measuring light from the light source transmitted from the coating containing the reaction product to said measuring means.

4,820,491

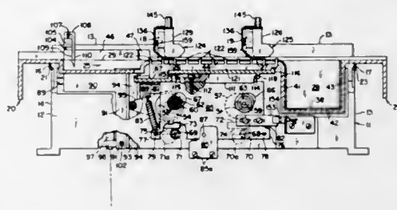
REAGENT TEST STRIP READING INSTRUMENT

Mirza A. Khoja, Elkhart, and Frank W. Wogoman, South Bend, both of Ind., assignors to Miles, Inc., Elkhart, Ind.

Division of Ser. No. 649,363, Sep. 11, 1984, Pat. No. 4,689,202. This application Apr. 1, 1987, Ser. No. 32,607

Int. Cl.[4] G01N *35/00*

U.S. Cl. 422—63 **2 Claims**



1. In combination, a base frame; a tray removably mounted on said base frame, said tray having a reading platform providing a flat surface support for a test strip overlaying said platform; strip engaging means positioned on mounting means adjacent said reading platform, said strip engaging means having an operative position in which a test strip on said platform is engaged thereby at spaced points and is pressed thereby against the platform, said mounting means being above said base frame and tray and being adjustable to effect movement of the strip engaging means between said operative position and a retracted position in which the strip engaging means is spaced from the reading platform; and cooperable shoulder means on said mounting means and on said tray positioned for engagement when said strip engaging means is in its operative position to thereby prevent removal of said tray from the base frame, said shoulder means being disengageable by adjustment of the mounting means effecting movement of the strip engaging means to its retracted position, whereby said tray can be removed from the base frame only when said strip engaging means is in its retracted position.

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APPARATUS FOR DENITRATION

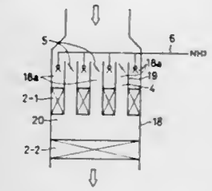
Toshimichi Wada, Hiroshima; Hiroshi Kuroda, Kure; Tomihisa Ishikawa, Kure, and Yoshimichi Mori, Kure, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1987, Ser. No. 13,522

Claims priority, application Japan, Feb. 12, 1986, 61-26950

Int. Cl.[4] G05D *7/00;* **B01D** *53/36;* **F01N** *3/28*

U.S. Cl. 422—111 **5 Claims**



1. An apparatus for the denitration of the NO_x-containing untreated gas from an offgas source and comprising:

(a) a denitration reactor with a catalyst packed therein, said catalyst being one which catalyzes the reaction between ammonia and NO_x,

the denitration reactor being constructed by packing the catalyst in at least one of plural gas flow passages divided within a casing by partition members arranged along the direction of the flow of the untreated gas through the casing,

and said reactor being adapted to receive an NO_x-untreated gas and ammonia therein so that the untreated gas and ammonia are brought into contact with the catalyst to reduce the NO_x contained in the untreated gas and produce a treated gas;

(b) feeding means connected to the denitration reactor for feeding an NO_x-containing untreated gas to the reactor;

(c) ammonia-injecting means connected to the feeding means (b) for charging ammonia into the untreated gas and being provided upstream of said at least one gas flow passage of the denitration reactor;

(d) discharging means connected to the denitration reactor for discharging the treated gas from the denitration reactor;

(e) bypass means constructed by at least one of the remaining gas flow passages and being connected (i) to the feeding means (b) at a location upstream of the locatiion where the ammonia-injecting means (c) is connected to said feeding means and (ii) to the discharging means (d), for removing a portion of untreated gas from the feeding means (b) and

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feeding said portion of untreated gas to the discharging means (d) where it mixes with the treated gas; and

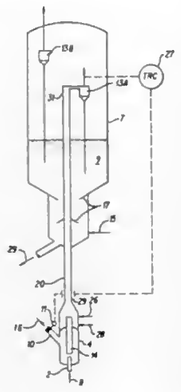
(f) flow-rate regulating means for regulating the amount of untreated gas passed through the bypass means (e), said flow-rate regulating means being provided at the side of the inlet of said at least one gas flow passage as the bypass means.

4,820,493

APPARATUS FOR MIXING FLUID CATALYTIC CRACKING HYDROCARBON FEED AND CATALYST

James H. Haddad, Princeton Junction, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 50,269, May 15, 1987, Pat. No. 4,717,467.
This application Aug. 6, 1987, Ser. No. 82,400
Int. Cl.[4] B01J *9/08;* **C10G** *35/14*
U.S. Cl. 422—143 **10 Claims**



1. An apparatus for mixing fluid catalytic cracking catalyst and hydrocarbon feedstock comprising:

an enclosed chamber having an outlet end;

an elongated tubular riser having an upstream end and a downstream end said upstream end being arranged in fluid communication with the outlet end of said chamber;

a catalyst inlet conduit attached to and in fluid communication with the interior of said enclosed chamber;

a first vertical conduit for introducing lift gas into the interior of said enclosed chamber, said first conduit having an upstream end and a downstream end;

a second vertical conduit having an upstream end and a downstream end, said second conduit upstream end being within said enclosed chamber, said second conduit downstream end being in fluid communication with said riser, said second conduit being axially aligned with said riser and said first conduit; and

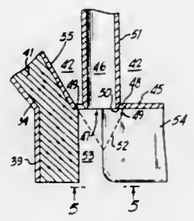
means for passing said hydrocarbon feedstock in atomized form in annular flow from said outlet end of said enclosed chamber into said riser upstream end.

4,820,494

SOLIDS FEEDING DEVICE AND SYSTEM

Robert J. Gartside, 2073 Commonwealth Ave., Auburndale, Mass. 02166, and Herman N. Woebcke, 41 Quaker Ridge Rd., Stamford, Conn. 06903

Division of Ser. No. 86,951, Oct. 22, 1979, Pat. No. 4,338,187.
This application Oct. 19, 1981, Ser. No. 312,377
The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.
Int. Cl.[4] B01J *8/08*
U.S. Cl. 422—145 **16 Claims**



1. An apparatus to continuously feed a regulated flow of particulate solids to a reaction chamber comprising:

a. an upper reservoir containing the particulate solids in the non-fluidized state.

b. a conduit having an inlet extending downwardly from the reservoir to a reaction chamber, said conduit being in open communication with the reservoir and the reaction chamber; and

c. a plurality of aeration nozzels spaced symmetrically around the inlet of said conduit for introducing a quantity of aeration gas to the upper reservoir only in the vicinity above said conduit, said quantity of aeration gas being ouly that necessary for local fluidization of the solids above the conduit thereby enabling said locally fluidized solids and a portion of the aeration gas to flow by gravity downwardly through the conduit; and

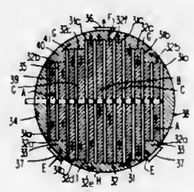
d. an annular orifice located peripherally around the opening of the conduit facing the reaction chamber for introducing said fluid feed to the reaction chamber.

4,820,495

PLATE REACTORS FOR CHEMICAL SYNTHESES UNDER HIGH PRESSURE IN GASEOUS PHASE AND WITH HETEROGENEOUS CATALYSIS

Quang D. Vu, Neuilly sur Seine; Clande Pradel, Rueil-Malmaison; Jean-Paul Euzen, Dardilly, and Jean-Francois Le Page, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 555,260, Nov. 25, 1983, Pat. No. 4,544,544.
This application Aug. 23, 1985, Ser. No. 768,780
Claims priority, application France, Nov. 26, 1982, 82 20026
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] B01J *8/04*
U.S. Cl. 422—148 **4 Claims**



1. A chemical reactor having a cylindrical reaction chamber

defined by a reaction chamber wall with a cylindrical inner surface formed about a central axis, the reaction chamber having catalyst material therein, the reactor comprising:

gas inlet means passing through the reaction chamber wall;

inlet plenum means within the reaction chamber and communicating with the gas inlet means; the inlet plenum means being positioned adjacent the cylindrical inner surface of the reaction chamber wall;

gas outlet means spaced from the gas inlet means and passing through the reaction chamber wall;

outlet plenum means within the reaction chamber and communicating with the gas outlet means, the outlet plenum means being positioned adjacent the inner surface of the reaction chamber wall;

a plurality of spaced, hollow walls extending parallel to the axis of the reaction chamber and being parallel to one another to define a plurality of parallel compartments of which a first group are remote from the axis, a second group is juxtaposed with the axis and a third group is between the first and second group, each of the compartments being further defined by first and second pervious end walls which cooperate with the hollow walls to retain the catalyst material in the compartments and which interface with the inlet plenum means, the outlet plenum means and connecting plenum means, which connecting plenum means connects first ends of compartments of the third group with adjacent ends of compartments of the first group and second ends of compartments of the third group with adjacent ends of the second group, wherein gas under pressure introduced through the gas inlet means follows a sinusoidal path through the inlet plenum means, through the first group of compartments, into connecting plenum means, through the third group of compartments, into other connecting plenum means, through the second group of compartments, into the outlet plenum means and out of the gas outlet means, and

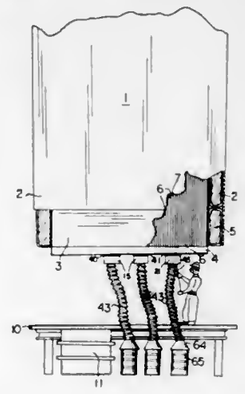
inlet and outlet lines in communication with the hollow walls for circulating heat transfer fluid in the hollow walls as the gas being treated by the catalyst flows through the compartments.

4,820,496

CATALYST RECOVERY TROUGH FOR UNLOADING MULTI-TUBE REACTORS WITH MAXIMUM DUST CONTAINMENT

Paul C. Sapoff, Louisville, Ky., assignor to Catalyst Technology, Inc., Buckner, Ky.

Filed Jul. 15, 1983, Ser. No. 514,287
Int. Cl.[4] B08B *9/06;* **B65G** *65/40*
U.S. Cl. 422—197 **15 Claims**



1. A catalyst recovery and dust control apparatus, for direct application to the tube sheet of a multi-tube catalytic reactor, for unloading catalysts therefrom, which comprises:

A. a receiving trough having:

i. an open top,

ii. side members,

iii. a bottom member having at least two guide tubes opening into the bottom and extending vertically upward in alignment with the tubes of a multi-tube reactor,

iv. a large tubular collar defining an opening in said trough and extending outwardly of said trough for connection to an outlet line,

v. guide means for aligning said guide tubes in alignment with the tubes of a tube sheet, and

vi. fastening means for fastening said trough to a tube sheet;

B. an outlet line for attachment to said tubular collar at one end, and in operative relation at the other end with a solids-dust receiver;

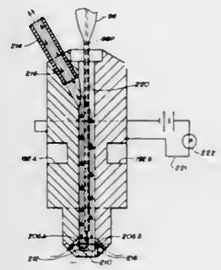
C. narrow, elongated rods of spring steel for insertion through the guide tubes of said trough and for vertical movement through the tubes of a catalytic reactor, which are in alignment with said guide tubes to dislodge any catalytic material from said reactor tubes.

4,820,497

MOVABLE CLEANING ASSEMBLY FOR AN ASPIRATING NEEDLE

Gary W. Howell, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 23, 1986, Ser. No. 877,635
Int. Cl.[4] G01N *35/00*
U.S. Cl. 422—63 **29 Claims**



1. A liquid dispensing apparatus comprising:

a support member;

a dispensing needle translatable with respect to the support member from a first to a second position; and

a cleaning assembly mounted to the dispensing needle for movement therewith with respect to the support member, the cleaning assembly having an enclosed, well-like needle receiving chamber having a closed bottom for receiving the needle therein.

4,820,498

METHOD FOR PRODUCING SUBSTANTIALLY PURE ALUMINA MATERIAL

Marc S. Newkirk, Newark, Del., assignor to Lanxide Technology Company, LP, Newak, Del.

Filed Sep. 16, 1986, Ser. No. 907,934
Int. Cl.[4] C01F *1/00, 7/00;* **B01D** *11/00*
U.S. Cl. 423—132 **15 Claims**

1. A method for upgrading the quality of an alumina material comprising the steps of:

(a) positioning an aluminum parent metal adjacent to a permeable mass of an alumina-based filler material, said

alumina-based filler material containing at least one aluminothermically reducible constituent, so that formation of an oxidation reaction product of the aluminum parent metal will occur in s direction towards and into said mass of alumina-based filler material;

(b) heating said parent metal to a temperature range above its melting point but below the melting point of its oxidation reaction product to form a body of molten parent metal and reacting the molten parent metal with an oxygen-containing vapor-phase oxidant at, said temperature to form said oxidation reaction product, and at said temperature maintaining at least a portion of said oxidation reaction product in contact with and extending between said body of molten metal and said oxidant, to draw molten metal through the oxidation reaction product towards the oxidant and towards and into the adjacent mass of said alumina-based filler material so that fresh oxidation reaction product continues to form within said mass of alumina-based filler at an interface between the oxidant and previously formed oxidation reaction product, and continuing said reacting for a time sufficient to embed at least a portion of said mass of alumina-based filler within said oxidation reaction product to produce a ceramic body comprising alumina and at least one residual metallic constituent, whereby said at least one aluminothermically reducible constituent is at least partially reduced and is contained in said at least one residual metallic constituent;

(c) comminuting said ceramic body;

(d) providing at least one leachant capable of dissolving or removing said at least one residual metallic constituent without substantially degrading said alumina in the produced ceramic body and contacting said comminuted ceramic body with said at least one leachant for a time sufficient to remove or dissolve away said at least one residual metallic constituent from said comminuted ceramic body to produce a substantially pure alumina material having a purity of not less than 99.9 weight percent alumina; and

(e) recovering said substantially pure alumina material.

4,820,499

CLOSURE FOR A STERILIZING CONTAINER

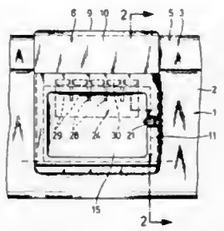
Wolfgang Taschner, Tuttlingen, Fed. Rep. of Germany, assignor to Aesculap-Werke AG, Fed. Rep. of Germany

Filed Nov. 14, 1986, Ser. No. 931,180

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541309

Int. Cl.⁴ A61L *2/00;* **B65D** *45/16, 55/02*

U.S. Cl. 422—310 **7 Claims**



1. Closure for a sterilizing container comprising a bottom part and a lid, with a pivotable locking bar which in a closed position fixes the lid in the closed position on the bottom part and in an open position releases the lid for removal from the bottom part, and with an opening safety means for the locking bar which is damaged when the locking bar is pivoted from the closed position to the open position, wherein the improvement comprises having an opening safety means comprising

a data carrier card which can be pushed into or put into an interior of a holding device, on the sterilizing container

a securing member that prevents removal of the data carrier card from the holding device when the locking bar is in the closed position, and

a marking element that penetrates the data carrier card secured in the holding device during pivotal motion of the locking bar from the closed position to the open position.

4,820,500

PROCESS FOR CONTROLLED AFTERBURNING OF A PROCESS EXHAUST GAS CONTAINING OXIDIZABLE SUBSTANCES

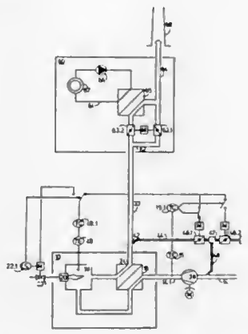
Herbert J. Obermüller, Linsengericht-Grossenhausen, Fed. Rep. of Germany, assignor to Katec Betz GmbH & Co., Hasselroth, Fed. Rep. of Germany

Filed Feb. 12, 1987, Ser. No. 14,030

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, 3605415

Int. Cl.⁴ B01D *53/34*

U.S. Cl. 423—210 **10 Claims**



1. Process for the controllable thermal afterburning of process exhaust gas containing oxidisable substances, fed through an afterburning appliance in which the process exhaust gas is conveyed via a gas inlet, heat exchanger, burner, combustion chamber and from there, in purified form, via the heat exchanger to a gas outlet, characterised by the process exhaust gas to be fed into the afterburning appliance being mixed with purified process exhaust gas which has been directly mixed with fresh air so as to simultaneously maintain the temperature of gas entering the combustion chamber and the concentration of oxidisable substances in the combustion chamber at a constant value.

4,820,501

METHOD FOR REMOVING ORGANIC MATERIALS DISSOLVED IN PURIFIED PHOSPHORIC ACID

Masaki Nakatani, Tokuyama, Japan, assignor to Tosoh Corporation, Shin-nanyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,123

Claims priority, application Japan, Mar. 9, 1987, 62-52142

Int. Cl.⁴ C01B *25/16*

U.S. Cl. 423—321 R **8 Claims**

1. A method for removing organic materials dissolved in phosphoric acid, which comprises the steps of:

(i) decomposing said organic materials with hydrogen peroxide to obtain a purified phosphoric acid which contains residual hydrogen peroxide; and

(ii) contacting said purified phospboric acid with a reducing phosphorus compound which is at least one member selected from the group consisting of elemental phosphorus, phosphorus hydrides, and lower oxyacids of phosphorus,

such that the amount of said reducing phosphorus compound is at least stoichiometric to said residual hydrogen peroxide and at a temperature of at least 80° C. to obtain a further purified phosphoric acid.

4,820,502

SYNTHETIC CRYSTALLINE SILICATE

Mae K. Rubin, Bala Cynwyd, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 17,288, Feb. 20, 1987, abandoned. This application Nov. 6, 1987, Ser. No. 117,859

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—328 **11 Claims**

1. A synthetic crystalline material characterized by an X-ray diffraction pattern including the following values:

Interplanar d-Spacing (Angstroms)	Relative Intensity
7.42 ± 0.2	w
6.72 ± 0.2	w
4.28 ± 0.1	s–vs
4.02 ± 0.1	w
3.68 ± 0.05	w
3.35 ± 0.05	s–vs
3.29 ± 0.05	m–vs
3.14 ± 0.05	w–m
2.946 ± 0.02	w
2.791 ± 0.02	w
2.716 ± 0.02	w
2.532 ± 0.02	w–s
2.381 ± 0.02	w
2.357 ± 0.02	w
2.182 ± 0.02	w
2.013 ± 0.02	w
1.946 ± 0.02	w
1.911 ± 0.02	w
1.843 ± 0.02	w
1.815 ± 0.02	w
1.688 ± 0.02	w
1.672 ± 0.02	w
1.640 ± 0.02	w
1.587 ± 0.02	w
1.565 ± 0.02	w

wherein w=weak, m=medium, s=strong and vs=very strong.

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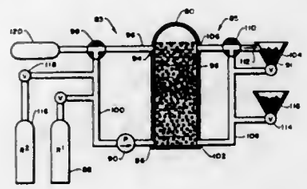
CATALYTIC HOLLOW SPHERES

Taylor G. Wang, Glendale; Daniel D. Elleman, San Marino; Mark C. Lee, La Canada, and James M. Kendall, Jr., Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 602,901, Apr. 23, 1984, Pat. No. 4,576,926. This application Jun. 13, 1985, Ser. No. 740,733

Int. Cl.⁴ C01C *1/04*

U.S. Cl. 423—362 **12 Claims**



1. A reaction medium comprising a fluid reactant containing a uniform suspension of uniformly-sized, hollow, gas-impervious catalyst spheres in the form of a gas-impervious shell containing a gas at a pressure greater than atmospheric and having a layer of catalyst on the surface thereof, said spheres having a preselected density not varying more than ±10 percent of the density of the fluid reactant.

5. In a method of catalytically converting a fluid reactant into a product, the improvement comprising the steps of:

forming a uniform suspension of uniformly sized, hollow, gas-impervious catalytic spheres within a body of the fluid reactant, said spheres being in the form of a gas-impervious shell containing a gas at a pressure above atmospheric, having a layer of catalyst on the surface thereof and having a preselected density within ±10 percent of the density of the fluid reactant;

catalytically reacting the reactant by means of the catalyst layer to form a reaction product; and

separating the catalyst spheres from the reaction product.

4,820,504

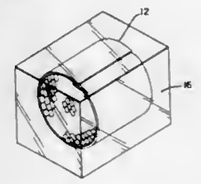
MULTI-SPECIMEN TISSUE BLOCKS AND SLIDES

Hector A. Battifora, Arcadia, Calif., assignor to City of Hope, Duarte, Calif.

Continuation-in-part of Ser. No. 828,775, Feb. 12, 1986, abandoned. This application Feb. 6, 1987, Ser. No. 11,689

Int. Cl.⁴ G01N *1/28, 33/531, 33/577*

U.S. Cl. 424—3 **37 Claims**



1. A method of preparing multi-specimen tissue block sections comprising:

disposing a plurality of different antigenically reactive tissue specimens in the shape of rods having greater length than width in substantially parallel relationship on a casing;

wrapping said specimen rods in said casing to form a specimen rod bundle;

embedding said specimen rod bundle in embedding medium to provide a multi-specimen tissue block; and

slicing said block to provide a plurality of sections each comprising a transverse cross-section of each of said tissue specimen rods in said specimen rod bundle.

4,820,505

DETECTION OF ACTIVATED PLATELETS WITH ANTIBODIES TO THROMBOSPONDIN

Mark H. Ginsberg, and Edward F. Plow, both of San Diego, Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Apr. 4, 1985, Ser. No. 720,032

Int. Cl.⁴ A61K *49/00;* **G01N** *33/53*

U.S. Cl. 424—9 **26 Claims**

23. A method for detecting the presence of a thrombus in a mammal comprising the steps of:

(a) intravenously injecting into the mammal an effective amount of anti-thrombospondin receptors that are labeled with an in vivo indicting means, said anti-thrombospondin receptors binding to a blood platelet in a stimulated state, but not substantially binding to a non-stimulated blood platelet;

(b) maintaining the injected mammal for a predetermined period of time sufficient for the receptors to react with thrombospondin present in the mammal on the surface of platelets in a thrombus and form a complex; and

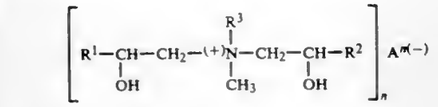
(c) assaying for the presence of any complex that formed in step (b).

4,820,506
SALIVARY STIMULANT
Israel Kleinberg, Smithtown, and Leo M. Sreebny, East Setauket, both of N.Y., assignors to Research Foundation, State University of New York, Albany, N.Y.
Filed May 1, 1987, Ser. No. 45,618
Int. Cl.[4] A01N 25/06
U.S. Cl. 424—40 13 Claims

1. A composition for promoting the production of human saliva consisting essentially of
an aqueous liquid solution of water having dissolved therein:
(a) from about 2 to about 3 wgt percent food-grade organic acidulent;
(b) a food-grade sweetener benign to stomic microflora selected from the group consisting of a sugar, a synthetic sweetener, and a reduced, sugar-related compound, and
(c) a saturated calcium phosphate solution,
whereby the production of human saliva is promoted in situ without corrosion, infection, or dissolution of human teeth.

4,820,507
ORAL AND DENTAL HYGIENE PREPARATIONS
Hans-Juergen Klueppel, Duesseldorf; Walter Ploeger, Hilden; Horst Rutzen, Langenfeld, and Rudolf Lehmann, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Continuation of Ser. No. 672,425, Nov. 16, 1984, abandoned. This application Mar. 2, 1987, Ser. No. 18,762
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345781
Int. Cl.[4] A61K 7/22, 7/16, 7/24
U.S. Cl. 424—54 34 Claims

1. An oral and dental hygiene composition for the care of the oral cavity of a mammal comprising a quaternary ammonium compound of the formula



wherein;
R^1 is C_8–C_{12}-n-alkyl;
R^2 is hydrogen, $—CH_3$ or $—CH_2OH$;
R^3 is $—CH_3$ or $—CH_2CH(OH)—R_2$;
A is an inorganic or organic anion which forms a water-soluble salt with the quaternary ammonium compound which is physiologically compatible with the oral cavity of said mammal; and
n is the basicity of the anion A; and
wherein said quaternary ammonium compound is present in the hygiene composition in an amount effective to significantly inhibit the formation of dental plaque and ineffective to significantly inhibit microbial activity in the oral cavity.

4,820,508
SKIN PROTECTIVE COMPOSITION
Mitchell S. Wortzman, Los Angeles, Calif., assignor to Neutrogena Corporation, Los Angeles, Calif.
Filed Jun. 23, 1987, Ser. No. 65,348
Int. Cl.[4] A61K 7/40, 7/42, 7/44
U.S. Cl. 424—59 4 Claims

1. A method of protecting mammalian skin from the harmful effects of solar infrared radiation having a wave length of from 700–2600 nanometers comprising applying to skin in need thereof a preparation containing, in weight percent, from about 0.5 to about 4 percent titanium dioxide and from about 0.5 to about 5 percent mica, each dispersed in a nontoxic, non-irritating cosmetically acceptable carrier.

4,820,509
NAIL COSMETIC COMPOSITION
Kazunori Yamazaki; Yoshikazu Soyama; Muneo Tanaka, and Chigusa Kitamura, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan
Continuation of Ser. No. 720,828, Apr. 8, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,762
Claims priority, application Japan, Apr. 11, 1984, 59-72373
Int. Cl.[4] A61K 7/043
U.S. Cl. 424—61 18 Claims

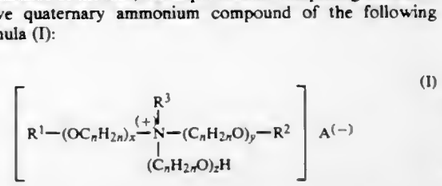
1. A nail cosmetic composition comprising 1% to 4% by weight of sucrose benzoate in a nail cosmetic base containing 4 to 12% by weight of a sulfonamide resin, nail coatings made therefrom exhibiting improved peeling resistance.

4,820,510
COSMETIC MAKE-UP COMPOSITION
Jean-Pierre Arrandeau; Jeanne Patraud, both of Paris, and Louis Le Gall, Bures S/Yvette, all of France, assignors to L'Oreal, Paris, France
Continuation-in-part of Ser. No. 909,725, Sep. 22, 1986, abandoned, which is a continuation of Ser. No. 540,752, Oct. 11, 1983, Pat. No. 4,659,562. This application Apr. 21, 1987, Ser. No. 40,667
Claims priority, application France, Oct. 12, 1982, 82 17051
The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.
Int. Cl.[4] A61K 7/021
U.S. Cl. 424—63 13 Claims

1. An anhydrous cosmetic make-up composition for application to the face, eyes or lips comprising
(a) from 5 to 98 weight percent of a fatty body selected from the group consisting of an oil and a mixture of an oil and a wax, said oil comprising a member selected from the group consisting of paraffin oil, petrolatum oil, mineral oil having a boiling point between 310° and 410° C., Purcellin oil, perhydrosqualene, calophyllum oil, sweet almond oil, palm oil, avocado oil, olive oil, ricin oil, wheat germ oil, dimethylpolysiloxane, butyl myristate, isopropyl myristate, cetyl myristate, isopropyl palmitate, butyl stearate, hexadecyl stearate, isopropyl stearate, octyl stearate, isocetyl stearate, decyl oleate, hexyl laurate, propylene glycol dicaprylate, diisopropyl adipate, oleyl alcohol, linoleic alcohol, linolenic alcohol, isostearyl alcohol, octyl dodecanol, isopropyl lanolate, isocetyl lanolate, glycol octanoate, glycerol octanoate, glycol decanoate, glycerol decanoate and cetyl ricinoleate, said wax comprising a member selected from the group consisting of a microcrystalline wax, paraffin wax, petrolatum wax, ozokerite, montan wax, beeswax, spermaceti wax, lanolin wax, lanolin alcohols, hydrogenated lanolin, hydroxylated lanolin, acetylated lanolin, lanolin fatty acids, alcohol of acetylated lanolin, candellila wax, Carnauba wax, Japan wax cocoa butter, hydrogenated ricin oil, hydrogenated palm oil, hydrogenated tallow, hydrogenated coconut oil, polyethylene wax, propylene glycol monomyristate, myristyl myristate, silicone wax, cetyl alcohol, stearyl alcohol, mono-, di- and triglycerides solid at 25° C., stearyl monoethanolamide, rosin, glycol abietate, glycerol abietate, sucroglyceride, and the oleates, myristates, lanolates, stearates and dihydroxy stearates of calcium, magnesium, zinc and aluminum;
(b) from 0.5 to 40 weight percent of a mineral or organic charge selected from the group consisting of talc, rice starch, wheat starch, corn starch, oat or wheat germ powder and kaolin;
(c) from 0 to 80 weight percent of a solvent comprising a member selected from the group consisting of isoparaffins, linear or cyclic silicones having a boiling point lower than 200° C. and chlorinated solvents;
(d) from 0 to 30 weight percent of at least one colored pigment selected from the group consisting of black iron oxide, carbon black, chromium oxide, yellow iron oxide, brown iron oxide, red iron oxide, ultramarine, titanium dioxide, silver metallic powder, aluminum metallic powder, manganese pyrophosphate, ferric blue, carmine and organic lakes; and
(e) from 0.5 to 20 weight percent, as a binding agent for components (a)–(d), above, a mixture of from 5 to 95 percent by weight of said mixture of finely divided silica having an average particle diameter of from 2 to about 10μ and about 95 to about 5 percent by weight of said mixture of finely divided polyethylene fibers having a fibrillar structure and having a specific area of 5 to $15m^2/g$.

4,820,511
HAIR CARE AND AFTERTREATMENT PREPARATIONS
Horst Hoeffkes, Duesseldorf; Fritz Lange, Essen, and Karl Glede, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Aug. 26, 1987, Ser. No. 89,714
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629510
Int. Cl.[4] A61K 7/06, 7/08, 7/11
U.S. Cl. 424—70 13 Claims

1. In a cosmetic composition for improving the condition or appearance of the hair, the improvement comprising a surface-active quaternary ammonium compound of the following formula (I):

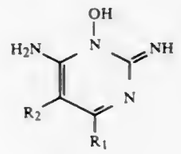


(I)

in which R^1 and R^2, independently of one another, are linear C_8–C_{22} alkyl; R^3 is C_1–C_4-alkyl, benzyl, or $—(C_nH_{2n}O)_zH$; n is 2 or 3; x, y, and z are, independently of one another, 1 to 20; and A is the anion of a mineral acid, or of a C_1–C_6-carboxylic acid, or is $R^4OSO_3^{(-)}$, wherein R^4 is C_1–C_4 alkyl.

4,820,512
COMPOSITION IN THE FORM OF A GEL FOR INDUCING AND STIMULATING HAIR GROWTH AND FOR DECREASING THEIR LOSS, BASED ON PIPERIDINOPYRIMIDINE DERIVATIVES
Jean F. Grollier, Paris, France, assignor to L'Oreal, Paris, France
Filed Aug. 6, 1987, Ser. No. 82,223
Claims priority, application Luxembourg, Aug. 7, 1986, 86548
Int. Cl.[4] A61K 7/06
U.S. Cl. 424—70 14 Claims

1. Composition in the form of a gel for inducing and stimulating hair growth and for decreasing hair loss, said composition comprising an effective amount of at least one compound of formula (I):



(I)

4,820,513
INSECT ATTRACTANT
Philip E. Howse, Southampton, England, assignor to University of Southampton, Southampton, United Kingdom
Filed Jul. 29, 1986, Ser. No. 911,265
Claims priority, application United Kingdom, Aug. 2, 1985, 8519540
Int. Cl.[4] A01N 25/00
U.S. Cl. 424—84 17 Claims

1. In a method for attracting fruit flies of the family Trypetidae to a particular location, the improvement comprising:
(1) placing at said location a lure containing an effective attractant composition consisting essentially of linalool and an upwind flight stimulant for said fruit flies, said location being upwind of said fruit flies;
(2) stimulating upwind flight of said fruit flies; and
(3) stimulating said fruit flies to land and remain at said location of said lure.

4,820,514
LOW DOSAGE OF INTERFERON TO ENHANCE VACCINE EFFICIENCY
Joseph M. Cummins, Amarillo, Tex., assignor to Texas A&M University System, College Station, Tex.
Filed Dec. 30, 1985, Ser. No. 814,317
Int. Cl.[4] A61K 45/02
U.S. Cl. 424—85.4 7 Claims

1. In a method of enhancing the efficiency of a vaccine in a warm blooded vertebrate by administering to said vertebrate, in conjunction with the administration of a vaccine, a biologically active interferon, the improvement which comprises administering interferon orally to said vertebrate in a dosage no greater than 5 IU/lb of body weight per day.

4,820,515

METHOD OF USING INTERFERON IN LOW DOSAGE TO REGULATE APPETITE AND EFFICIENCY OF FOOD UTILIZATION

Joseph M. Cummins, Amarillo, Tex., assignor to Texas A&M University System, College Station, Tex.

Continuation-in-part of Ser. No. 448,951, Dec. 13, 1982, Pat. No. 4,497,795. This application Jan. 4, 1985, Ser. No. 688,868

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] A61K *45/02*

U.S. Cl. 424—85.7 5 Claims

1. A method for increasing the appetite and efficiency of food utilization in warm-blooded vertebrates by administering to a warm-blooded vertebrate a biologically active interferon in a dosage no greater than 5 IU/lb of body weight per day.

4,820,516

HYALURONIDASE

Roy T. Sawyer, and Jeffrey Edwards, both of Swansea, United Kingdom, assignors to Biopharm (UK) Limited, Swansea, United Kingdom

Filed Feb. 14, 1986, Ser. No. 829,785

Claims priority, application United Kingdom, Feb. 16, 1985, 8504025

Int. Cl.[4] A61K *37/54*

U.S. Cl. 424—94.62 17 Claims

1. A hyaluronic acid-specific endo-β-glucuronidase derived from the leech of the sub-family Hirudinariinae.

4,820,517

PROCESS FOR OBTAINING A PEPPER EXTRACT WITH INSECTICIDAL ACTIVITY

Hans Pfeiffer, Haan; Manfred Biermann, Muelheim; Peter Schroeder, Viersen; Gerd Goebel, Erkrath, and Annemarie Mueller, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP85/00333, § 371 Date Jul. 24, 1986, § 102(e) Date Jul. 24, 1986, PCT Pub. No. WO86/01981, PCT Pub. Date Apr. 10, 1986

PCT Filed Jul. 6, 1985, Ser. No. 878,886

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1984, 3436859

Int. Cl.[4] A01K *65/00*

U.S. Cl. 424—195.1 16 Claims

1. A process for preparing a pepper extract having insecticidal activity comprising the steps of:

(a) extracting black pepper in ground form with CO_2 at a temperature in the range of 30° to 70° C. and a pressure in the range of 150 to 500 bar;

(b) removing sharp tasting fractions from the resulting extract in a first expansion step at a temperature in the range of 25° to 35° C. and at a pressure in the range of 70 to 150 bar;

(c) separating an oily fraction containing the insecticidally active components as well as most of the essential oils present in the pepper in a second expansion step at a temperature in the range of 15° to 30° C. and a pressure lower than the pressure in steps (b) in the range of 40 to 70 bar;

(d) removing the essential oils from the insecticidally active components in the oily fraction by steam distillation.

4,820,518

COSMETIC POWDER PRODUCT

John H. Murphy, Germantown, Tenn.; Ernest S. Curtis, Milford, Pa., and Donald D. Horton, Glen Spey, N.Y., assignors to Kolmar Laboratories Inc., Port Jervis, N.Y.

Filed Dec. 11, 1986, Ser. No. 940,431

Int. Cl.[4] A61K *6/00*; B29B *9/00*

U.S. Cl. 424—401 13 Claims

1. A non-pressed solid powder cosmetic product, comprising a mixture of a finely divided cosmetically acceptable filler, an organic binder, an evaporable organic carrier, and cosmetic coloring materials, said cosmetic coloring materials including inorganic pigments coated with a non-polar water insoluble organic dielectric material, said coated pigments being hydrophobic and free of static charge.

4,820,519

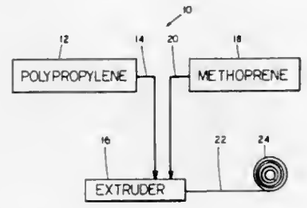
METHOD AND COMPOSITION FOR STORAGE OF PLANT MATERIAL

Paul C. Gillette, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 17, 1987, Ser. No. 134,286

Int. Cl.[4] A01N *25/34*; A61K *9/70*

U.S. Cl. 424—412 7 Claims



6. A film product comprising polymeric material and from 0.10 to 20 mg of isopropyl-(E,E)-11-methoxy-3,7,11-trimethyl-2,4 dodecadienoate per gram of polymeric material, said film product having a thickness of from 0.01 to 0.2 mm and being biaxially oriented.

4,820,520

ANTISEPTIC AGENT FOR FOOD AND DRINK AND METHOD OF ANTISEPTIC TREATMENT THEREOF

Koki Yokotsuka; Tadae Kushida, both of Yamanashi; Yumiko Kanai, Tokyo; Toshihide Aihara, Yamanashi; Mizuo Yajima, Tokyo, and Tomoyoshi Nakajima, Urayasu, all of Japan, assignors to Asama Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,724

Claims priority, application Japan, Mar. 31, 1981, 56-46196; Mar. 31, 1981, 56-46197

Int. Cl.[4] C08B *37/06*; A23L *3/34*; A61K *31/715*

U.S. Cl. 424—439 10 Claims

1. A method for inhibiting growth of microorganisms in an edible food or drink wherein said microorganisms are capable of spoiling said food or drink, which comprises: incorporating in the food or drink, an effective amount of a preservative consisting of a pectin decomposition product obtained by enzymatically decomposing pectin with pectinase until there is formed said pectin decomposition product having a molecular weight in the range of from 600 to 5,000.

4,820,521

SUSTAINED ABSORPTION PHARMACEUTICAL COMPOSITION

Donald E. Panoz, and Edward J. Geoghegan, both of Athlone, Ireland, assignors to Eland Corporation P.L.C., Athlone, Ireland

Continuation of Ser. No. 870,293, May 21, 1986, Pat. No. 4,663,150, which is a continuation of Ser. No. 597,716, Apr. 6, 1984, abandoned. This application Jan. 16, 1987, Ser. No. 3,736

Claims priority, application Ireland, Apr. 16, 1983, 789/83

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[4] A61K *9/52, 9/22, 9/26, 31/52*

U.S. Cl. 424—458 17 Claims

1. A sustained absorption active ingredient-containing pellet for oral administration, said pellet comprising a core of an active ingredient selected from the group consisting of anhydrous theophylline, aminophylline, dyphylline, theophylline calcium salicylate and theophylline sodium glycinate and an organic acid selected from the group consisting of citric acid, tartaric acid, succinic acid, malic acid, ascorbic acid and fumaric acid or a mixture thereof embedded in a polymeric material which contains a major proportion of a water-soluble polymer and a membrane of a film-forming polymer or mixture thereof surrounding the core whereby said active ingredient is released at a controlled rate in an aqueous medium and said pellet has a dissolution rate in an aqueous medium which is substantially independent of pH and which when measured is a basket assembly according to U.S. Pharmacopoeia XX at 37° C. and 75 r.p.m., in a buffer solution at pH 7.5 has the following characteristics:

(a) from 0 to 15% of said active ingredient is released after two hours of measurement in said assembly;

(b) from 15 to 35% of said active ingredient is released after 7 hours of measurement in said assembly;

(c) from 45 to 65% of said active ingredient is released after 13 hours of measurement in said assembly; and

(d) from 80 to 100% of said active ingredient is released after 24 hours of measurement in said assembly.

4,820,522

ORAL SUSTAINED RELEASE ACETAMINOPHEN FORMULATION AND PROCESS

Galen W. Radebaugh, Maple Glen; John L. Murtha, Holland, and Robert Glinecke, Glenside, all of Pa., assignors to McNeilab, Inc., Spring House, Pa.

Filed Jul. 27, 1987, Ser. No. 78,138

Int. Cl.[4] A61K *9/22*

U.S. Cl. 424—468 17 Claims

10. A process of preparing an acetaminophen sustained release bi-layer tablet comprising a first layer of immediate release and a second layer of sustained slow release of acetaminophen according to the steps of:

(A) preparing an immediate release layer comprising acetaminophen and pharmaceutically acceptable excipients; and

(B) preparing a sustained release layer comprising acetaminophen as the active ingredient according to the steps of:

(1) forming a granulating agent by dissolving about 5–25 parts by weight of the total sustained release layer of Povidone in alcohol or an alcohol-water mixture;

(2) blending together a sufficient amount of acetaminophen to comprise 68 to 94 percent of the total weight of the sustained release layer with the following ingredients in dry powder form in parts by weight of the total sustained release layer as indicated:

Ingredient	Parts by Weight
hydroxyethyl cellulose	5–25
wicking agent	5–25;

(3) adding the granulating agent from Step 1 to the blended powders from Step 2, and forming a wet granulation;

(4) drying the wet granulation of Step 3;

(5) milling the dried granulation Step 4;

(6) thoroughly blending the milled dried granulation from Step 5 with the following ingredients in dry powder form;

Ingredient	Parts by Weight
erosion promoter	1–15
wicking agent	5–45
lubricant	0–10
glidant	0–5; and

(C) combining and compressing the immediate release layer of Step A with the sustained release layer of Step B into a bi-layered tablet.

4,820,523

PHARMACEUTICAL COMPOSITION

Liudoslava V. Shtohryn, Budd Lake, and David Peters, Long Valley, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 15, 1986, Ser. No. 852,471

Int. Cl.[4] A61K *9/22, 9/26*

U.S. Cl. 424—469 10 Claims

1. A pharmaceutical composition of matter for use in the treatment of sinus, allergy, and cold symptoms, which comprises an effective amount of a pharmaceutically acceptable salt of phenindamine entrapped in a leachable non-toxic wax matrix in combination with an effect amount for use in the treatment of sinus, allergy and cold symptoms of at least one analgesic non-entrapped in said wax matrix, said phenindamine salt being present in the wax matrix in an amount of at lest one part leachable wax matrix to one part phenindamine salt, said wax matrix protecting said phenindamine salt to prevent contact with any phenindamine isomerization agent in said composition to prevent isomerization of said phenindamine salt to isophenindamine.

4,820,524

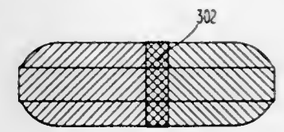
GELATIN COATED CAPLETS AND PROCESS FOR MAKING SAME

Norbert I. Berta, Radnor, Pa., assignor to McNeilab, Inc., Spring House, Pa.

Filed Feb. 20, 1987, Ser. No. 16,914

Int. Cl.[4] A61K *45/00*

U.S. Cl. 424—474 7 Claims



1. A simulated capsule-like medicament comprising:

(a) A solid caplet having a first and a second end, said caplet comprising a generally cylindrical shape;

(b) A first gelatinous coating of a first color provided on said second end of said caplet;

(c) A second gelatinous coating, of a color different from said first color, provided on said first end of said caplet, partially overlapping said first gelatinous coating and forming a seam circumscribing said medicament at about a midway point of a longitudinal axis of said medicament to form a simulated capsule-like medicament.

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4,820,525

TRANSDERMAL DRUG DELIVERY SYSTEM

Thomas W. Leonard, Plattsburgh; Robin P. Enever, Rouses Point, and Karol K. Mikula, Morrisonville, all of N.Y., assignors to American Home Products Corporation (Del.), New York, N.Y.

Filed Sep. 17, 1987, Ser. No. 97,998
Int. Cl.[4] A61K *9/70*
U.S. Cl. 424—486 **5 Claims**

1. In a transdermal/transmucosal pharmaceutical delivery system comprising a drug reservoir, an occlusive backing for the drug reservoir and means for adhesively applying the drug reservoir to the skin, the improvement which comprises using as the drug reservoir a dosage form consisting essentially of a thin layer of foamed material produced from high molecular weight/high density polyethylene, the foamed material having a void volume of at least about 20% to about 70% per unit of surface area and a pore size variation of from about 0 to 8 microns per unit of surface area, the pore size of the polyethylene foam being within the range of about 10 to 70 microns.

4,820,526

METHOD OF IMPROVING FEATHERING IN BIRDS

Sebastian M. Laurent, Greenwell Springs, and Robert N. Sanders, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 934,457, Nov. 24, 1986, Pat. No. 4,759,932, Ser. No. 934,458, Nov. 24, 1986, Ser. No. 934,460, Nov. 24, 1986, Ser. No. 934,461, Nov. 24, 1986, and Ser. No. 846,188, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 741,572, Jun. 5, 1985, abandoned, which is a division of Ser. No. 475,370, Mar. 14, 1983, Pat. No. 4,556,564, said Ser. No. 934,457, Ser. No. 934,458, Ser. No. 934,460, and Ser. No. 934,461, each is a continuation-in-part of Ser. No. 846,188,. This application Aug. 6, 1987, Ser. No. 82,256
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] A23K *1/24*
U.S. Cl. 426—2 **11 Claims**

1. A method of improving the feathering of feathered animals, said method comprising regularly feeding to said animals a small effective amount of zeolite A, sufficient to improve the feathering of said feathered animals.

4,820,527

METHOD OF FEEDING RUMINANTS

Borge H. Christensen, Alsgarde, and Ebbe Storm, Fredensborg, both of Denmark, assignors to Damino A/S, Gesten, Denmark

Continuation of Ser. No. 760,752, Jul. 25, 1985, abandoned. This application Feb. 4, 1988, Ser. No. 159,421
Claims priority, application Denmark, Nov. 29, 1983, 5452/83; Nov. 14, 1984, 5421/84
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 **45 Claims**

1. A method of feeding cows with fully developed rumens in which the feed is divided into two parts, comprising:

(a) automatically supplying a liquid feed to a herd of said cows in a repetitive manner by use of a dispensing device which comprises supply means for supplying said liquid feed to said cows and a teat-like member adapted to discharge said liquid feed when activated by said cows and located at a feeding place in such a position that the cows are forced to stretch their necks and heads upwards in order to reach the teat-like member, said dispensing device being so designed that the liquid feed is stored and supplied under anaerobic conditions,

said liquid feed being supplied to each cow in an amount of 0.5 to 10 liters at each feed period from 2 to 8 times a day, while stimulating each cow to close its oesophageal groove by means of visual stimuli provided by placing the teat-like member out of reach of the cow when not in use and making the teat-like member appear at the beginning of each feed period to stimulate the cow to start suckling and concomitantly close its oesophageal groove,

said liquid feed comprising a solution, suspension or slurry of proteins, peptides or amino acids in an amount in the range of 25–100% by weight of the dry matter in said liquid feed, easily digestible carbohydrates in an amount in the range of 0–50% by weight of the dry matter in said liquid feed, and fats in an amount in the range of 15–100% by weight of the dry matter in said liquid feed, in an acceptable liquid, one or more of the components of said liquid feed being partially or completely hydrolyzed, the liquid feed having a pH of less than 6;

(b) supplying a solid feed to each cow in such a way that the oesophageal groove reflex of each cow is not activated during ingestion of said solid feed, said solid feed comprising less digestible carbohydrates constituting at least about 30% of the dry matter in said solid feed and non-protein nitrogen-containing compounds constituting at least about 1% of the dry matter in said solid feed,

said liquid feed and said solid feed being independently available through separate dispensing systems, the cows being cows which have been conditioned as young calves to ingest said liquid feed from said dispensing device in the manner indicated in (a), whereby it is possible to re-establish reflexive closure of the oesophageal groove when said cow has not activated said reflex for a period of 12 to 14 months.

4,820,528

SWEETENER COMPOSITION

John J. Stroz, Randolph, and Abraham I. Bakal, Parsippany, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Mar. 27, 1987, Ser. No. 32,148
Int. Cl.[4] A23G *3/30;* **A23L** *1/236*
U.S. Cl. 426—3 **21 Claims**

1. A codried composition consisting essentially of about 99.9 to 90 weight % of acid saccharin and about 0.1 to 10 weight % of halodeoxysugar.

4,820,529

PROCESS FOR PREPARING PASTY PROTEINOUS MATERIAL OR PROTEINOUS FOOD FROM CRUSTACEANS

Yasuzo Uchida; Hitoshi Nagasaki, and Makoto Itoh, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1987, Ser. No. 65,264
Claims priority, application Japan, Jun. 26, 1986, 61-149994; May 8, 1987, 62-113306
Int. Cl.[4] A23J *1/04;* **A23L** *1/325*
U.S. Cl. 426—7 **10 Claims**

1. A process for preparing a pasty proteinous material or a proteinous food from crustacean materials comprising residual meat, bones and carapaces which comprises:

inactivating enzymes contained in said crustaceans by heating to sufficient temperature(s) for inactivating the enzymes and milling said crustaceans materials to such an extent as to reduce the particle size of said crustacean materials to 200 microns or less; and thereafter

reacting said crustacean materials with proteolytic enzyme(s) or proteolytic microorganism(s) for both until there is produced a 5 to 50% content of water-soluble proteins, based on the total proteins, in the pasty proteinous material or proteinous food and a 40 to 90% content of peptides of molecular weight of 40,000 to 70,000, based on the total peptides except water-soluble peptides and amino acids, in the pasty proteinous material or proteinous food.

4,820,530

MANUFACTURE OF CURD AND CHEESE FROM A MILK RETENTATE

James W. Moran, Lindenhurst; James R. Posdal, Glenview, and Gary W. Trecker, Wheeling, all of Ill., assignors to Kraft, Incorporated, Glenview, Ill.

Filed Sep. 11, 1984, Ser. No. 649,838
Int. Cl.[4] A23C *19/05, 19/00, 19/024, 19/028*
U.S. Cl. 426—40 **10 Claims**

1. In a process for the manufacture of cheese curd from milk comprising the steps of:

a. removing salts and lactose from the milk to provide a retentate having between about 50 percent and about 83 percent moisture, between about 0.7 percent and about 2.5 percent salts, and less than about 1.8 percent lactose;

b. adding cheese-making cultures to the retentate and fermenting the retentate to a pH of between about 5.6 and about 4.8 without coagulation;

c. spreading the uncoagulated rententate on a surface under vaccum and evaporating moisture from the retentate to a total solids content of 55 percent or more on the surface and providing a curd under quiescent conditions on the surface;

d. doctoring off the curd from said surface without substantially disrupting the curd structure; and

e. collecting the curd with minimum working of the curd and without substantial break down of the curd structure.

4,820,531

BACTERIAL TREATMENT TO PRESERVE HAY QUALITY BY ADDITION OF MICROORGANISMS OF THE GENUS BACILLUS

Nancy J. Tomes, West Des Moines, Iowa, assignor to Pioneer Hi-Bred International, Des Moines, Iowa

Filed Oct. 22, 1987, Ser. No. 111,300
Int. Cl.[4] C12K *1/00*
U.S. Cl. 426—52 **17 Claims**

1. A method of preserving hay quality in stored high moisture hay, which consists essentially of:

treating fresh hay under aerobic condition with a small but hay quality preserving and heat reducing effective amount of the microorganism *Bacillus pumilus* or mutants thereof.

4,820,532

PREPARATION OF A LOW-DUST FREE-FLOWING CHOLINE CHLORIDE POWDER

Robert Bayer, Steinsfurt; Guenter Boettger, Bad Duerkheim; Rainer Hiller, Muenster; Michael Huber, Schifferstadt; Wolfgang Koernig, Leimen, and Wolfgang Fritz, Karlsruhe, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 30, 1987, Ser. No. 68,061
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623922
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—74 **7 Claims**

1. A process for the preparation of a low-dust, free-flowing powder containing choline chloride and a natural organic carrier or a silica carrier which consists essentially of the steps:

(a) mixing an aqueous choline chloride solution with a natural carrier or a porous silica carrier in the ratio of 70 to 40% by weight of choline chloride and 30 to 60% by weight of a natural carrier, or 70 to 20% by weight to choline chloride and 30 to 80% by weight of silica to form a moist mixture;

(b) spraying the mixture from step (a) continuously into a fluidized bed, said bed already containing added dry choline chloride powder, and drying the mixture within the bed at a temperature of from 90° to 180° C.; to form a powder containing choline chloride and a natural organic carrier or a silica carrier and

(c) continuously removing the powder from the fluidized bed and cooling the powder to below 50° C.;

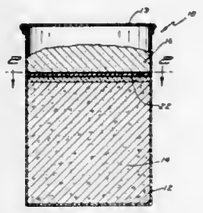
(d) controlling the particle size of the components of the mixture to produce a low dust, free flowing powder having a final particle size range of 100–1000 μm.

4,820,533

EDIBLE BARRIER FOR COMPOSITE FOOD ARTICLES

Jonathan Seaborne, Corcoran, and David C. Ebgerg, Plymouth, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 803,358, Dec. 2, 1985, abandoned, which is a continuation of Ser. No. 740,797, Jun. 3, 1985, Pat. No. 4,661,359, and a continuation-in-part of Ser. No. 788,178, Oct. 16, 1985, Pat. No. 4,710,228. This application Nov. 2, 1987, Ser. No. 117,403
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] A21D *15/08;* **A23C** *19/14;* **A23G** *3/00;* **B65D** *25/08*
U.S. Cl. 426—76 **17 Claims**



1. An edible laminated barrier useful in composite food articles to separate food phases and resistant to moisture migration, comprising:

A. an edible, smooth rigid frangible substrate in the form of a sheet;

B. a layer overlying said substrate; and

C. a layer underlying said substrate; and wherein each layer is in the form of an edible, continuous, flexible, non-water swelling, low-water vapor permeable film comprising a member selected from the group consisting of

(1) a composition comprising the heat cured reaction polymer product of

(A) unbleached, refined, dewaxed, filtered, carbon black decolorized, virgin edible shellac, and

(B) a first reactant member selected from the group consisting of hydroxypropyl cellulose and hydroxypropyl methyl cellulose and mixtures thereof,

wherein the ratio of the reactant member and shellac ranges from 0.001 to 2:1,

and wherein the product has an average molecular weight of at least 2,000; and

(2) a composition comprising the heat cured reaction polymer product of:

refined, unbleached, dewaxed, filtered, carbon black decolorized virgin, edible shellac

wherein the heat cured reaction product has an average molecular weight ranging from about 1,500 to 6,000; and

(3) mixtures of composition (1) and composition (2) thereof.

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4,820,534

FIXATION OF VOLATILES IN EXTRUDED GLASS SUBSTRATES

Fouad Z. Saleeb, Pleasantville, and John G. Pickup, Peekskill, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 945,180, Dec. 16, 1986, abandoned, Continuation of Ser. No. 768,100, Sep. 23, 1985, abandoned, Continuation-in-part of Ser. No. 591,150, Mar. 19, 1984, abandoned. This application Jun. 10, 1988, Ser. No. 205,532

Int. Cl.[4] A23L *1/221, 1/222*

U.S. Cl. 426—96 **15 Claims**

1. A method for fixing volatile flavorants in an extruded, glass, moisture-stable substrate at a level which is effective to impart flavor to a food composition comprising the steps of:

(a) preparing a homogeneous mixture of a substrate and a volatile flavorant without any added moisture, said substrate being comprised of about 10% to about 30% by weight of a minor component, said minor component having a molecular weight of from 90 to 500 and consisting of water-soluble carbohydrates having a melting point of from about 80° C. to about 180° C., adipic acid, citric acid, malic acid and combinations thereof, and at least 70% by weight of water-soluble, polymeric, carbohydrate material which contains at least 95% polymeric carbohydrate material having a an average molecular weight above 1,000;

(b) heating said homogeneous, dry-blended mixture within a screw extruder such that the temperature of the mixture in the extruder is above the glass transition temperature of the substrate and at or just above the melting point of the minor ingredient, such that the minor ingredient melts and the major component dissolves into the minor component to form a molten mass; and

(c) extruding the molten mass through a diehead and cooling the extruded material to produce an amorphous, homogeneous, single-phase glass with entrapped volatile flavorant, said glass having a glass transition temperature above ambient temperature.

4,820,535

PROCESS FOR PREPARING A REFORMED MEAT PRODUCT AND PRODUCT THEREOF

Royce G. Gibson, Murwillumbah, Australia, assignor to Tendapak Holdings PTY. Limited, Brisbane, Australia

Continuation of Ser. No. 824,709, Feb. 19, 1986, abandoned. This application Oct. 15, 1987, Ser. No. 110,046

Claims priority, application Australia, Apr. 19, 1984, PG4670

Int. Cl.[4] A23L *1/317*

U.S. Cl. 426—272 **16 Claims**

1. A process for forming a meat product, comprising the steps of:

grinding or mincing sinewed meat derived from mammals or poultry to such an extent that the sinews therein are rendered substantially organoleptically undetectable;

coarsely severing sinewless meat derived from mammals or poultry;

subjecting said coarsely severed sinewless meat to physical disorientation while substantially preserving its fibrous character to such an extent that when said physically disoriented sinewless meat is pressed between a person's fingers, it freely smears apart while showing clearly visible meat fibers;

roughly mixing the sinewed meat and the sinewless meat together;

subjecting the roughly mixed meat to a further physical disorientation of the fibers of the sinewless meat to intimately mix the sinewed meat with the sinewless meat; and then

forming the resulting intimately mixed meat into a self-supporting product.

4,820,536

METHOD FOR COOKING MEAT IN A BAG

Howard C. Lippincott; Stephen C. Quickert, and Larry C. Gundlach, all of Madison, Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Apr. 21, 1986, Ser. No. 854,279

Int. Cl.[4] B65B *29/08*

U.S. Cl. 426—412 **1 Claim**

1. A method for cooking meat in a bag which comprises:

(a) vacuum sealing and shrinking a cling film around the meat wherein the cling film is untreated with ionizing radiation, said untreated cling film having a cavity for forming the meat and being capable of adhering to the meat sufficiently to minimize purge of meat juices during cooking of said meat but not clinging sufficiently to cause substantial tearing of the meat skin when the bag is removed;

(b) then vacuum sealing and shrinking an outer film around the vacuum sealed and shrunk cling film to form a sealed bag, wherein the outer film comprises a layer selected from the group consisting of polyethylene and polypropylene, said outer film having a softening point above the cook temperature of the meat; and

(c) heating the meat in the bag including said cling film untreated with ionizing radiation to the cook temperature of the meat wherein the meat in the bag is cooked to an internal temperature above 140° F.

4,820,537

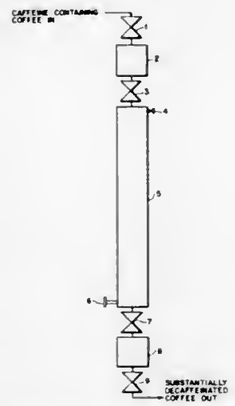
METHOD FOR DECAFFEINATING COFFEE WITH A SUPERCRITICAL FLUID

Saul N. Katz, Monsey, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 24,906, Mar. 13, 1987, abandoned, which is a continuation of Ser. No. 752,879, Jul. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 506,750, Jun. 22, 1983, abandoned. This application Mar. 8, 1988, Ser. No. 166,748

Int. Cl.[4] A23F *5/20*

U.S. Cl. 426—481 **10 Claims**



1. A method of extracting caffeine from green coffee comprising:

(a) continuously feeding essentially caffeine-free supercritical carbon dioxide containing non-caffeine solids and saturated with water to the lower end of an elongate, substantially vertical extraction vessel containing green coffee beans having a moisture content of 25-50% by weight, continuously countercurrently contacting the supercritical carbon dioxide and the green coffee beans in said extraction vessel to affect extraction of caffeine from the coffee into the supercritical carbon dioxide, and continuously withdrawing supercritical carbon dioxide containing caffeine and non-caffeine solids from the upper end of the extraction vessel;

(b) discharging a portion of the coffee beans in said vessel from the lower end of the extraction vessel, the discharged portion comprising decaffeinated coffee beans;

(c) moving the remaining coffee beans downwardly in the extraction vessel to an extent corresponding substantially to the amound of decaffeinated coffee beans discharged from the extraction vessel;

(d) introducing moist green coffee beans having a moisture content of 25–50% into the upper end of said extraction vessel in an amount corresponding substantially to the amount of decaffeinated coffee beans discharged from the extraction vessel;

(e) maintaining the temperature in the extraction vessel at from 80°–140° C.;

(f) feeding the supercritical carbon dioxide containing caffeine and non-caffeine solids withdrawn from the upper end of the extraction vessel to an absorber;

(g) continuously countercurrently contacting the supercritical carbon dioxide containing caffeine and non-caffeine solids with water in the absorber at a temperature and pressure substantially the same as in the extraction vessel to extract substantially all of the caffeine contained in the supercritical carbon dioxide but extracting no appreciable amount of said non-caffeine solids therefrom;

(h) witbdrawing caffeine-laden water from the absorber;

(i) withdrawing substantially caffeine-free supercritical carbon dioxide containing non-caffeine solids from said absorber;

(j) recycling the substantially caffeine-free supercritical carbon dioxide containing non-caffeine solids to the lower end of the extraction vessel as required by step (a); and

(k) periodically repeating steps (b), (c) and (d) while carrying out steps (a) and (e) through (j) to effect extraction of caffeine from said green coffee beans.

4,820,538

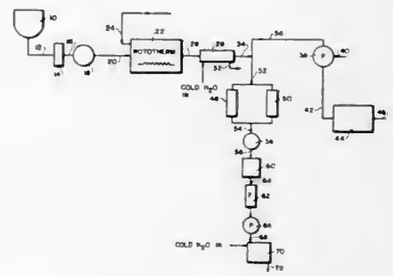
PROCESS TO PRODUCE A CHARCOAL BROILED FLAVOR

Marvin Schulman, Howell; Harry Hannah, Toms River; Richard B. Stevenson, Manalapan, and Gerald P. Case, Jackson, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 27, 1987, Ser. No. 54,639

Int. Cl.[4] A23L *1/232*

U.S. Cl. 426—533 **5 Claims**



1. An improved process for preparing a flavor composition comprising:

(a) subjecting a thin film of a fat or oil suitable for producing a charcoal broiled flavor to a temperature of at least 600° F. in the presence of oxygen in a thin film heat exchanger for a period of time less than 2 minutes, said time and temperature being sufficient to cause the oil or fat to undergo a phase change to produce an exothermic gaseous material having a temperature of at least 650° F., the time period that the oil or fat is in the gaseous phase representing a major percent of the reaction time; and

(b) rapidly cooling the gaseous material to produce an oil phase within the temperature range of 210° F. to 230° F. and a minor portion of a vapor phase containing tarry and acrid notes which is removed under a vacuum from said oil phase to produce an improved flavor composition free of harsh flavor notes.

4,820,539

METHOD OF MAKING BUTTER

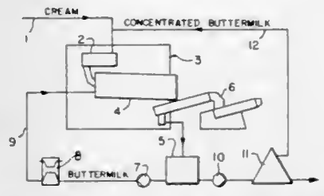
Haano Lehmann; Werner Vennewald, both of Oelde, Fed. Rep. of Germany, and Wolfram Hoffmann, Buckland Beach, New Zealand, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Sep. 14, 1987, Ser. No. 96,693

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1986, 3632898

Int. Cl.[4] A23C *15/06*

U.S. Cl. 426—581 **18 Claims**



1. In a method of making butter with a buttering machine with two buttering cylinders and a buttermilk collector, comprising processing cream into butter grain and buttermilk in a first buttering cylinder of the buttering machine, transferring the resulting mixture to a second buttering cylinder of the buttering machine to separate the buttermilk, transferring the buttermilk to a buttermilk collector, and removing a preliminary portion of the buttermilk from the collector to chill same and returning the chilled buttermilk to the buttering machine, the improvement comprising: adding a predetermined amount of a product containing concentrated non-fat dry substance to the buttering machine by supplying the buttermilk from the collector to a separator to obtain an output of concentrated buttermilk with a high level of non-fat dry substance and an output of concentrated buttermilk with a low level of non-fat dry substance and supplying the output of the separator to the buttering machine.

4,820,540

METHOD AND APPARATUS FOR CONTINUOUSLY PRODUCING CHEESE UTILIZING BRINE SALTING

Burnell E. Budahn, Norwood, Minn. 55368

Filed Nov. 30, 1987, Ser. No. 126,622

Int. Cl.[4] A23C *19/024, 19/064, 19/072;* **A01J** *11/00*

U.S. Cl. 426—582 **28 Claims**

1. A method of continuously producing cheddar cheese consisting of:

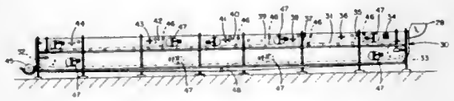
(a) producing a slurry of mixed cheese curd and whey;

(b) separating the major portion of the whey from said curds while continuously discharging said curds upon one end portion of a power-driven elongated endless first conveyor and carrying the curd thereon for approximately 45 minutes to the opposite end portion of the conveyor while the curd mats, fuses and drains;

(c) continuously transferring said fused curds from said first conveyor onto a second power-driven elongated endless conveyor and cheddaring and draining said curds on said second conveyor for approximately 40–45 minutes;

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(d) thereafter, milling the cheddared curds into small discrete pieces;
(e) continuously transferring said milled discrete pieces of cheese curd onto a third endless conveyor for salting and mellowing and continuously transporting said pieces of curd on said third conveyor at a uniform speed from its front end portion across to its rear end portion such that said transporting is for a period of time approximating 30 minutes, during which time said discrete pieces of curd are periodically sprayed over a period of time of between approximately 14 and 20 minutes with an excess of saturated water-based brine having a temperature of approxi-



mately 80° F. and a pH of approximately 5.1 to obtain curd pieces having approximately 60% to 70% salt retention within the curd; said pieces of curd being sprayed with a continuous sheet of brine spray at each of a plurality of locations spaced periodically along at least substantially the front half of the third conveyor;
(f) agitating said discrete pieces of curd at periodic intervals while upon that third conveyor to distribute the brine more uniformly therethrough;
(g) maintaining the temperature of the curd throughout each of steps (c)–(f) inclusive, at approximately 98° F.; and
(h) thereafter transferring said salted pieces of curd into a container for consolidation into a block of cheese.

4,820,541
SPREAD CONTAINING DAIRY FAT
Petrus G. Haring, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 16, 1987, Ser. No. 39,188
Int. Cl.⁴ A23C *13/14*
U.S. Cl. 426—586 **15 Claims**

1. Spread having a dairy fat content between 9 and 65% (w/w), wherein the spread comprises (a) a dairy cream which has been heated to a temperature of from 70° C. up to 105° C. for from 20 minutes up to 3 hours and which includes whey proteins and at least 30% (w/w) of dairy fat, with at least 50% (w/w) of the whey proteins being present in said cream in a denatured form, and (b) 25–90% (w/w) of water and/or non-dairy fat.

4,820,542
PROCESS FOR DRYING VEGETABLE MATTER USING HIGH-PRESSURE STEAM
Olivier de Mathan, Olivet, France, assignor to France Luzerne Complexe Agricole du Mont-Bernard, Chalons, France
Filed Jul. 2, 1987, Ser. No. 69,147
Claims priority, application France, Jul. 4, 1986, 86 09792
Int. Cl.⁴ A23K *1/00*
U.S. Cl. 426—636 **6 Claims**

1. A process for drying vegetable matter utilizing a separating site, a treatment site, a drying site, at least one ejector-compressor connected to the separating site and the treatment site and a source of high pressure and high temperature steam, comprising the steps of:
directing a first quantity of steam from the high pressure and high temperature steam source to the input of at least one ejector-compressor and passing said first quantity of steam through said at least one ejector-compressor to reduce its pressure and temperature;
heating the vegetable matter at the separating site with a part of the reduced pressure and temperature steam;
pressing the heated vegetable matter at the separating site to produce thereby a liquor and moist pressed fibrous vegetable matter;
passing the liquor to the treatment site and the moist pressed fibrous vegetable matter to the drying site;
subjecting the liquor at the treatment site to the remainder of the reduced pressure and temperature steam to dry the liquor and produce thereby a gaseous effluent;
passing a part of the gaseous effluent to the input side of the ejector-compressor;
passing the remainder of the gaseous effluent to the drying site; and
drying the pressed fibrous vegetable matter at the drying site utilizing the remainder of the gaseous effluent.

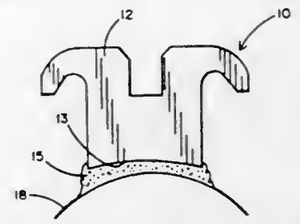
4,820,543
METHOD OF STABLY FIXING AROMATIC COFFEE SUBSTANCE
Hide Osawa, Tokyo, Japan, assignor to Ajinomoto General Foods, Inc., Tokyo, Japan
Filed Jul. 14, 1987, Ser. No. 73,034
Claims priority, application Japan, Jul. 17, 1986, 61-168699
Int. Cl.⁴ A23L *1/234*; A23F *5/46*
U.S. Cl. 426—650 **6 Claims**

1. In a method of fixing an aromatic coffee substance comprising homogenizing an oleaginous solution of the aromatic coffee substance and a non-protein hydrophilic colloidal aqueous solution to form an emulsion, extruding or dropping said emulsion in the shape of a thread through a small bore into an agglutination-solution which is non-toxic and insoluble in the discontinuous phase of said emulsion while stirring said solution to form a capsuled substance, then dehydrating and drying this capsuled substance to obtain capsuled particles;
The improvement which comprises using as a solvent for said oleaginous solution of the aromatic coffee substance, a medium chain triglyceride wherein the fatty acid portion consists of a fatty acid having from 6 to 12 carbon atoms or a mixture of coffee oil and said medium chain triglyceride in a weight ratio of coffee oil to said triglyceride of about 40:60 to about 20:80, and said agglutination solution containing from about 5 to about 50% of a medium chain triglyceride wherein the fatty acid portion consists of a fatty acid containing from 6 to 12 carbon atoms.

4,820,544
UNIQUE FLAVOR COMPOSITION
Shirley A. Barcelon, Randolph; Mamoun M. Hussein, Mountain Lakes, both of N.J.; Leonard P. Abbazia, Brooklyn, N.Y., and Allan H. Graff, Randolph, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Oct. 22, 1987, Ser. No. 112,313
Int. Cl.⁴ A23G *3/00*
U.S. Cl. 426—660 **23 Claims**

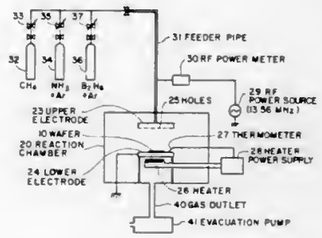
1. A hard boiled candy composition having a unique flavor perception comprising:
(A) An effective amount of a hard boiled candy base; and
(B) An effective amount of a blend of flavoring agents comprising:
(i) corn mint oil in an amount of about 20 to about 94.9% by weight of said blend;
(ii) eugenol in an amount of about 5 to about 40% by weight of said blend;
(iii) cardamom in an amount of about 0.1 to about 3.0% by weight of said blend; and
(iv) menthol such that the total menthol content of said blend is about 40 to about 75% by weight of said blend;
wherein the total amount of the components of the blend equals 100%, and the total amount of the components in the composition equals 100%.

4,820,545
METHOD OF BONDING CERAMIC ORTHODONTIC APPLIANCES
John A. Negrych, Westminster, Calif., assignor to Ceradyne, Inc., Costa Mesa, Calif.
Filed Sep. 29, 1986, Ser. No. 912,286
Int. Cl.⁴ B44C *1/22*; A01N *1/02*; B05D *3/02*; A61C *5/00*
U.S. Cl. 427—2 **14 Claims**



1. A method for increasing the bond strength between a ceramic and a bonding agent such as acrylic resin, the method comprising the steps of:
applying a glass-like material coating to the ceramic, said glass-like material coating having particles of powdered glass-like material therein and having a pre-selected content of silica in said particles;
firing said glass-like material coating to a temperature sufficient to melt said particles;
cooling said glass-like material coating to harden same; and
etching said glass-like material coating to remove said silica whereby to increase the surface area of said coating for increasing the area for receiving said acrylic resin; and
silanating said etched glass-like material coating with an organofunctional silane adhesion promoter.

4,820,546
METHOD FOR PRODUCTION OF X-RAY-TRANSPARENT MEMBRANE
Masafumi Nakaishi, Inagi, and Masao Yamada, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Sep. 18, 1987, Ser. No. 98,402
Claims priority, application Japan, Sep. 19, 1986, 61-219217; Sep. 19, 1986, 61-219781
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—38 **17 Claims**



1. A method for producing a hydrogenated amorphous boron nitride carbide membrane for an X-ray mask by a plasma chemical vapor deposition using a diborane gas and ammonia gas both diluted by an inert gas, and a methane gas, the method comprising:
depositing a membrane on a substrate;
maintaining gas pressure during deposition at 60 to 250 Pascal; and
correlating deposition temperature and a flow rate ratio of said ammonia gas to said diborane gas according to the following ranges, where R indicates flow rate ratio of ammonia to diborane and T indicates deposition temperature in degree centigrade:
R is between $R=0.01\ T-2.8$ and $R=0.01\ T-3.2$; and T is between 350° to 450° C.

4,820,547
ACTIVATORS FOR COLLOIDAL CATALYSTS IN ELECTROLESS PLATING PROCESSES
Deborah J. Lindsay, and Nathan Feldstein, both of Princeton, N.J., assignors to Surface Technology, Inc., Princeton, N.J.
Continuation of Ser. No. 41,992, Apr. 24, 1987, abandoned, which is a continuation of Ser. No. 927,456, Nov. 6, 1986, abandoned, which is a continuation of Ser. No. 422,301, Sep. 23, 1982, abandoned, which is a continuation of Ser. No. 279,788, Jul. 2, 1981, abandoned. This application Jun. 27, 1988, Ser. No. 211,651
Int. Cl.⁴ C23C *18/30*
U.S. Cl. 427—97 **19 Claims**

1. A process for the electroless plating of a non-conductor substrate comprising the steps of:
(a) contacting said substrate with an aqueous colloidal dispersion, said dispersion comprising a non-noble catalytic metal for the electroless plating initiation, a colloidal stabilizer and an activator, said activator being a reducing agent capable of reducing metallic ions of said catalytic metal and further wherein said activator is incorporated into said colloidal dispersion subsequent to the step of colloidal nucleation thereby extending the useful life for said colloidal dispersion, and thereafter
(b) contacting the treated substrate with a compatible electroless plating bath to deposit a metallic layer thereof.

4,820,548
THREE STEP PROCESS FOR TREATING PLASTICS WITH ALKALINE PERMANGANATE SOLUTIONS
Constantine I. Courduvelis, Orange, and Anthony R. DelGobbo, Watertown, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.
Division of Ser. No. 860,100, May 6, 1986, abandoned, which is a division of Ser. No. 614,912, May 29, 1984, abandoned, which is a division of Ser. No. 791,804, Oct. 28, 1985, Pat. No. 4,629,636, which is a division of Ser. No. 618,281, Jun. 7, 1984, Pat. No. 4,592,852. This application Mar. 25, 1988, Ser. No. 173,068
Int. Cl.⁴ B05D *5/12*
U.S. Cl. 427—98 **33 Claims**

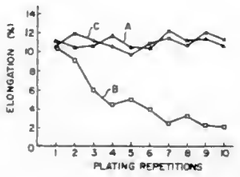
1. A process for treating plastics to improve the adhesion of electroless metal plating comprising the steps of:
(a) contacting the plastic with a solvent composition to enhance the etching of step (b);
(b) thereafter etching the solvent treated plastic with an alkaline permanganate solution for an effective time at an elevated temperature to improve said adhesion, said solution including a secondary oxidant capable of oxidizing manganate ion to permanganate ion; and
(c) controlling in said alkaline permanganate solution, at desired intervals, the ratio of permanganate ion concentration to the sum of the permanganate and manganate ion concentration at a level above 0.5 by adding, as needed, an effective amount of the secondary oxidant to the solution.

4,820,549

PHOTO-CURABLE RESIST RESIN COMPOSITION FOR ELECTROLESS PLATING, PROCESS FOR PREPARING A PRINTED CIRCUIT BOARD WITH THE SAID RESIST RESIN COMPOSITION AND A PRINTED CIRCUIT BOARD HAVING RESIST PREPARED FROM THE SAID RESIST RESIN COMPOSITION

Kiyoshi Ozaki, Koshigaya; Atsushi Mori, Chiba; Hideo Tsuda, Abiko; Mineo Kawamoto, Hitachi; Kanji Murakami, Mito, and Motoyo Wajima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 19, 1987, Ser. No. 51,518
Claims priority, application Japan, May 20, 1986, 61-115141
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—98 3 Claims



1. A process for preparing a printed circuit board, where a circuit is formed by electroless plating a circuit-forming part having at least a noble metal catalyst reactive to deposition of electroless plating on an adhesive layer surface provided on the insulating substrate, the other parts than the circuit-forming part being coated with a plating resist, which comprises forming the plating resist with a photo-curable resist resin composition for electroless plating, which comprises:

an epoxy resin having a viscosity of at least 150 poises at 25° C., and at least two glycidyl ether groups in one molecule, the glycidyl ether groups being directly bonded to the aromatic ring, as Component A,

an oxirane ring-containing compound having a boiling point of at least 140° C. and a molecular weight of not more than 500 as Component B, and

a photo-sensitive aromatic onium salt as Component C, wherein the Component A is in an amount of 90 to 40 parts by weight per total 100 parts by weight of the Components A and B, and the component C is in an amount of 0.1 to 5 parts by weight per total 100 parts by weight of the Components A and B, and, if any, other resin components.

4,820,550

PROCESS FOR PRODUCING A SHEET OF COLOR-DEVELOPER FOR PRESSURE-SENSITIVE RECORDING PAPER

Makoto Naoki, and Shouzou Aoyagi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,182
Claims priority, application Japan, Oct. 16, 1986, 61-244239
Int. Cl.[4] B41M *5/16*
U.S. Cl. 427—150 7 Claims

1. A process for producing a sheet of a color-developer for pressure-sensitive recording paper, which process comprises the steps of:

dissolving an organic color-developer in an organic solvent which has a boiling point of not higher than 170° C. under atmospheric pressure or forms an azeotropic mixture with water, is not dissolved in water to the extent of more than 5 wt% at ordinary temperature and dissolves said organic color-developer to the extent of more than 10 wt% at a heating temperature at which said organic solvent is removed from said liquid droplets,

adding the solution of the color-developer into an aqueous solution dissolving a surfactant and a water-soluble high polymer in an amount of not less than 0.2 parts by weight and not more than 50 parts by weight of said solution of the color-developer,

emulsifying the resulting mixture thereby forming minute liquid droplets with a diameter of from 0.01 to 2 μm comprising said solution of the color-developer, then

heating the liquid emulsion under agitation, thereby removing said organic solvent from said liquid droplets, and

obtaining an aqueous slurry of said color-developer, and finally

applying the aqueous slurry of said color-developer onto a supporting sheet.

4,820,551

METHOD FOR FABRICATING THERMO-INKING RIBBONS FOR THERMO-TRANSFER PRINTING, AND THERMO-INKING RIBBON OBTAINED THEREBY

Heinrich Kranter, Neustadt; Albert Schmedes, Pattensen; Norbert Mecke, Hanover, and Wieland Kuchenreuther, Isernhagen, all of Fed. Rep. of Germany, assignors to Pelikan Akteingesellschaft, Hanover, Fed. Rep. of Germany

PCT No. PCT/EP86/00335, § 371 Date Feb. 3, 1987, § 102(e) Date Feb. 3, 1987, PCT Pub. No. WO86/07311, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 4, 1986, Ser. No. 15,056
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520308
Int. Cl.[4] B41M *3/12*
U.S. Cl. 427—146 4 Claims

1. Process for the production of a reusable thermocolor ribbon for thermal printing having a plastic foil carrier provided on one side with a color layer, said color layer comprising a wax or wax-like substance, a coloring agent and a thermoplastic binding agent, said process comprising the steps of:

preparing a coating liquid containing said thermoplastic binding agent completely in solution and said meltable wax or wax-like substance in finely dispersed solid form, the ratio of wax or wax-like substance to binding agent being in a ratio from about 5:1 to 1:1 and the solids content initially present in said solution being about 20 to about 80% by weight, said solution being a mixture of a solvent and a non-solvent for said thermoplastic binding agent at room temperature, said solvent having a boiling point lower than that of said non-solvent;

applying said coating liquid to said plastic foil carrier;

evaporating said mixture of solvent and non-solvent such that the solvent capability for solubilizing the thermoplastic binding agent is concurrently reduced.

4,820,552

COATED ZINC, CHEMISTRY AND MANUFACTURING PROCESS

José G. Espinosa-C., and Mauricio Fernandez-Garza, Both of Monterrey, Nuevo Leon, Mexico

Filed Jun. 22, 1987, Ser. No. 64,810
Int. Cl.[4] B05D *7/00*
U.S. Cl. 427—216 15 Claims

1. A process of making zinc metal flakes coated with metal oxides, comprising

(a) providing zinc in particulate form;

(b) dispersing the zinc particles in a liquid vehicle to provide a zinc particle dispersion;

(c) adding a coating material to the zinc particle dispersion;

(d) dispersing the coating material in the zinc particle dispersion to provide a dispersion of coated zinc particles; and

(e) drying the dispersion of coated zinc particles to a desired consistency.

4,820,553

METHOD FOR PRETREATMENT OF POLYESTERS FOR METAL PLATING

Peter Sopchak, Syracuse, and Adam L. Skovrinski, Memphis, both of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 9, 1984, Ser. No. 587,794
Int. Cl.[4] B05D *3/04;* C25D *5/54*
U.S. Cl. 427—304 5 Claims

1. In an improved process for metal plating a polyamide material by conditioning said material to improve metal adhesion and depositing a metal coating upon said conditioned surface from an electroless plating bath, wherein said improvement comprises a conditioning step in which said material is exposed to a composition comprising a solvent system containing water and one or more substantially water-soluble organic solvents and an effective amount of solvated hydroxyl ions.

2. An improved process for plating one or more metals onto the surfaces of a polyamide material which comprises:

(a) exposing said material to a solution comprising water, one or more substantially water-soluble organic solvents and an effective amount of hydroxyl ions;

(b) coating said contacted material with a catalyst for electroless plating of one or more metals thereon; and

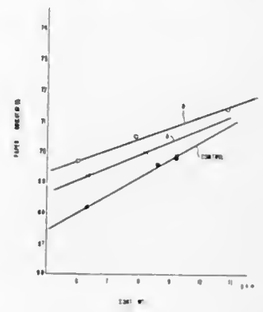
(c) depositing one or more metal coatings on said catalyzed material by electroless plating.

4,820,554

COATED PAPER AND PROCESS

J. Philip E. Jones, Sandersville, and Rasik H. Raythatha, Tennille, both of Ga., assignors to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 802,843, Nov. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 754,475, Jul. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 493,356, May 10, 1983, abandoned. This application Oct. 14, 1986, Ser. No. 918,632
Int. Cl.[4] B05D *3/02;* B32B *9/06;* D21F *1/10;* C09C *3/00*
U.S. Cl. 427—391 27 Claims



1. A method for producing improved coated papers and paperboard products which comprises:

A. producing a structured kaolin pigment having enhanced light scattering and opacifying properties by a process comprising the steps of:

(a) forming a feed mixture of a fine particle size kaolin; and

(b) chemically reacting said feed mixture in particulate form with a metal chloride having the general formula MCl_x, where M is Si, Al or Ti; and x is 3 or 4 in accordance with M, to aggregate the kaolin particles to form the structured pigment;

the moisture level present in the said feed mixture reacted in step (b) being sufficient to at least partially hydrolyze the metal chloride; and

steps (a) and (b) being conducted under conditions such that the basic kaolinite crystalline structure is not altered; and

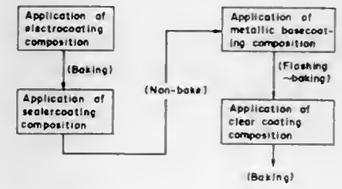
B. coating the said paper or paperboard product with a coating composition having a pigment component wherein said structured kaolin pigment comprises from 5 to 60% by weight thereof.

4,820,555

METALLIC/CLEAR COAT SYSTEM

Teruaki Kuwajima, Higashiosaka; Shinichiro Umeda, Kyoto, and Hidefumi Okuda, Toyonaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Mar. 17, 1987, Ser. No. 26,986
Claims priority, application Japan, Mar. 17, 1986, 61-60363
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—407.1 14 Claims



1. A coating method for forming a metallic coat comprising the successive steps of:

(a) coating an article with an electrocating composition and baking it,

(b) coating the thus-baked article with a sealer coating composition,

(c) coating the sealer coated article with an aqueous metallic base coating resinous composition without curing the sealer coating composition,

(d) flashing and/or baking the article obtained in Step (c),

(e) coating the article obtained in Step (d) with a thermosetting clear coating resinous composition, and,

(f) baking the coated article.

4,820,556

DECORATIVE SHELF SYSTEM FOR AQUARIUM OR TERRARIUM

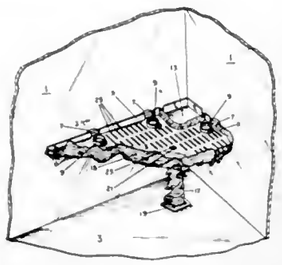
Jerome Goldman, New York; Marvin Goldman, Great Neck; Gerald Phillips, Glen Cove, and Eric Sauerman, East Atlantic Beach, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.

Continuation of Ser. No. 743,179, Jun. 10, 1985, abandoned. This application Jun. 1, 1987, Ser. No. 56,301
Int. Cl.[4] A47G *33/04;* A01N *1/00;* A01K *63/00;* E04H *3/16*
U.S. Cl. 428—7 19 Claims

1. A shelf system for an aquarium or terrarium comprising:

(a) a shelf in the form of a rigid planar sheet of a suitable to size to fit inside of an aquarium tank on at least one inside wall surface thereof,

(b) a means for securely and removably attaching the shelf to the inside wall surface of the aquarium, in a manner so that



the attachment does not disrupt the integrity of and does not alter the wall of the aquarium.

4,820,557

THERMOPLASTIC PACKAGING FILM OF LOW I_{10}/I_2

Thomas C. Warren, Greer, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Sep. 17, 1987, Ser. No. 98,426

Int. Cl.[4] B32B *27/08;* **C08F** *110/02, 110/14*

U.S. Cl. 428—34.9 **15 Claims**

1. A heat-shrinkable packaging film of improved abuse resistance comprising at least one layer of a linear copolymer of ethylene and an alpha-olefin with a density of about 0.935 g/cc or less selected from ethylene/alpha-olefin copolymer having (a) a low I_{10}/I_2 melt flow ratio of about 7.2 when said alpha-olefin is octene or (b) a low I_{10}/I_2 melt flow ratio of about 9.9 and a comonomer of hexene.

4,820,558

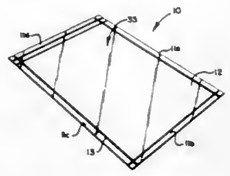
DISPOSABLE CLEANING ARTICLE

Bo S. Sundberg, 791 44 Falun, Stjarnvagen, Sweden

Continuation-in-part of Ser. No. 69,508, Jul. 2, 1987, abandoned. This application Dec. 2, 1987, Ser. No. 127,443

Int. Cl.[4] A47L *13/18, 13/38*

U.S. Cl. 428—34.3 **15 Claims**



1. A disposable cleaning article comprising:

(a) first plastic sheet having inner and outer surfaces, said outer surface coated with an adhesive material suitable for collecting particulate matter;

(b) a second plastic sheet overlaying and aligned with said first plastic sheet and having first and second surfaces, said second plastic sheet affixed along the periphery thereof to said first plastic sheet, thereby forming a pocket area between said first and second plastic sheets, access to said pocket being provided by a slit in said first sheet along one dimension of said article proximate the periphery, said slit dividing said affixed first and second sheets into a handle section and a surface cleaning section; and

(c) cover means detachably secured to said adhesive material.

4,820,559

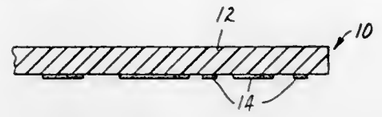
GRAPHICS TRANSFER MEDIUM

Ronald S. Steelman, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 110,550, Oct. 19, 1987, Pat. No. 4,770,732, which is a continuation of Ser. No. 519,528, Aug. 1, 1983, abandoned. This application Jun. 6, 1988, Ser. No. 202,881

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—36.1 **7 Claims**



1. A graphics transfer medium comprising a flexible low-adhesion carrier web carrying a coating in the form of graphics thereon, which when contacted with a transfer fluid is capable of being transferred to a display surface, said coating comprising a mixture of:

(a) sufficient matrix resin to prevent smearing of said coating during transfer, said matrix resin being resistant to said transfer fluid,

(b) sufficient binder resin to provide adhesion of said coating to said display surface, said binder resin being at least partially soluble in said transfer fluid, said matrix resin and said binder resin being thoroughly mixed, and said matrix resin comprising at least 2 percent by weight of total matrix and binder resins, and

(c) light-altering agent,

wherein said coating, when wet with said transfer fluid in an amount at least sufficient to wet the entirety of said coating, is capable of forming a bond to said display surface sufficient to enable said coating to be transferred from said carrier web to said display surface.

4,820,560

CABLE WRAPPING STRIP

Holger Buchwald, Hemsbach, and Ingrid Schaffert, Hirschberg-Leutershausen, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 21, 1987, Ser. No. 52,280

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639895

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—35.1 **5 Claims**

1. A cable wrapping strip capable of swelling comprising: a strip in the form of a fibrous flat material without perceptible layered construction, wherein the fibers are aligned mainly lengthwise of the strip and are 95 to 75 wt.-% in the form of viscose fibers and 5 to 25 wt.-% in the form of shrunken polyvinylalcohol fibers soluble in water beginning at 80° C., said flat material being uniformly impregnated with a binding agent which under the action of water loses its ability to adhere, the strip containing swelling powder particles which swell upon the access of water but do not dissolve, the swelling agent being distributed in an amount of 20 to 40 g/m^2, the strip being capable of swelling at the place of access of the water to at least 90% of its achievable thickness in approximately one minute.

4,820,561

RECOVERABLE ARTICLE FOR ENCAPSULATION

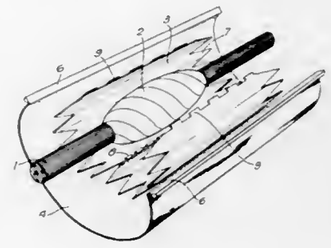
Kenneth B. Pithouse, Lesulis, France; Thomas A. Kridl, Union City, and James T. Triplett, Livermore, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 925,349, Oct. 30, 1986, Pat. No. 4,761,193, which is a division of Ser. No. 567,130, Dec. 30, 1983, Pat. No. 4,626,458. This application Mar. 16, 1988, Ser. No. 168,726

Claims priority, application United Kingdom, Jan. 6, 1983, 8300221; Aug. 16, 1983, 8322004

Int. Cl.[4] B29C *27/00*

U.S. Cl. 428—34.5 **28 Claims**



1. A dimensionally heat-recoverable article comprising a composite structure of a heat-recoverable fabric and a polymer matrix material, wherein:

(a) the heat-recoverable fabric comprises fibers that comprise cross-linked polymeric material and will recover when heated, the fibers having a recovery stress (Y) of at least 5×10^{-2} MPa at a temperature above their recovery temperature; and

(b) the polymer matrix material has an elongation/temperature profile such that there exists a temperature (T), which is at or above the recovery temperature of the fibers, at which temperature the polymer matrix material has an elongation to break of greater than 20% and a 20% secant modulus (X) of at least 10^{-2} MPa (measured at a strain rate of 300% per minute), and at which temperature the inequality (1) is satisfied:

$$X/Y(1-R)/R \text{ is less than one} \quad (1)$$

where R is the mean effective volume fraction of heat recoverable fibers in the composite structure along a given direction based on the total volume of the composite structure, or relevant portion thereof.

4,820,562

METALLIZING COMPOSITION FOR SINTERED CERAMIC ARTICLE

Shunichiro Tanaka; Akio Sayano, both of Yokohama, and Tsuneji Kameda, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Division of Ser. No. 905,458, Sep. 10, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,288

Claims priority, application Japan, Sep. 10, 1985, 60-200204; Sep. 26, 1985, 60-211053

Int. Cl.[4] F16L *5/02;* **B05B** *7/00*

U.S. Cl. 428—34.6 **3 Claims**

1. A rotary sintered ceramic article having an electroconductive surface layer within a hole formed along an axis of rotation of and within said article, said electroconductive surface layer consisting essentially of a sintered ceramic including at least one nitride-forming element selected from Group IVb of the Periodic Table and at least one element selected from the group consisting of tungsten and molybdenum, said article being produced by a method comprising applying a metallizing composition onto a surface of said hole onto which said electroconductive surface layer is to be formed, said metallizing composition comprising at least one metal salt selected from the group consisting of tungstic acid and molybdic acid, at least one metal compound selected from the group consisting of an oxide, boride, carbide and organic compound of a metal selected from Group IVb of the Periodic

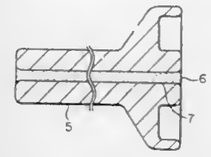


Table and a binder, drying said metallizing composition, heating said metallizing composition to fuse said at least one metal salt and firing said metallizing composition in a nonoxidizing atmosphere to react said sintered ceramic with said at least one metal compound to result in said electroconductive surface layer.

4,820,563

TIRE BEAD ASSEMBLY

Doyle W. Rausch, Niles, Mich., assignor to National-Standard Company, Niles, Mich.

Filed Aug. 13, 1987, Ser. No. 85,642

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—35.8 **106 Claims**



1. A weftless tire bead ring assembly, comprising;

a predetermined length of a wire tape material comprised of a plurality of elongated wires enveloped in polymeric material wound about an axis to provide a plurality of convolutions of the wire tape material superimposed on each other to provide a tire bead ring assembly having an inside and outside surface, with one end of said predetermined length of tape material being engageable with said inside surface of the tire bead ring assembly, and

wherein said one end of said predetermined length of tape material is mechanically deformed to minimize stress concentration between said one end of the predetermined length of tape material and said inside surface of the tire bead assembly.

4,820,564

BLIND-SIDE REPAIR PATCH KIT

Rudy L. Cologna, Bellevue, and Melvin D. Eng, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 29, 1984, Ser. No. 665,809

Int. Cl.[4] B32B *3/10;* **E04G** *23/02*

U.S. Cl. 428—63 **29 Claims**

1. A blind-side repair patch kit for repairing a hole in a composite material panel having a blind-side to which access is restricted, and opposite to said blind-side, a near-side which is readily accessible, comprising:

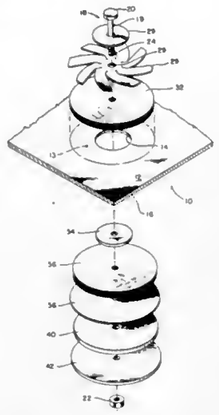
a threaded rod;

a washer having an outside diameter approximately equal to the diameter of said hole;

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means for generating tensile force in said rod on the near-side of said panel;

means for transmitting tensile force generated in said rod on the near-side of said panel to said washer on the blind-side of said panel;



at least one unitary flexible washer formed from stiff and resilient sheet material, and having a central aperture through which said rod extends when said patch is assembled, said flexible washer being larger than said hole and adapted to be bonded to the marginal regions around said panel hole by a bonding agent while pressed in place against said panel blind-side by said washer.

4,820,565

MAGNETIC RECORDING MEDIUM

Masaya Funahashi, Osaka; Teruhisa Miyata, Otokuni; Kenichi Inoue, Muko, and Akira Miyake, Otokuni, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 833,199, Feb. 27, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 132,686
Claims priority, application Japan, Feb. 27, 1985, 60-38358
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—64 **3 Claims**

1. A magnetic recording disc improved in wear-resistance and durability, which comprises a substrate and a magnetic layer comprising magnetic powder and a resinous binder formed on at least one surface of the substrate, characterized in that the magnetic layer further comprises

(A) a monovalent alcohol ester of oleic acid, and

(B) a straight chain saturated fatty acid ester of not less than 28 carbon atoms derived from a saturated fatty acid of 16 to 30 carbon atoms and a saturated alcohol of 12 to 30 carbon atoms, wherein the combined amount of (A) and (B) is from 0.1 to 20% by weight based on the weight of the magnetic powder and the weight proportion of (A) and (B) is from about 99:1 to 1:99.

4,820,566

TUFTED CARPET WITH TUFTS OF FINE FIBERS AND TUFTS OF CRIMPED COARSE FIBERS

Richard F. Heine, and Gene E. Tharp, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 47,654, May 8, 1987, abandoned. This application Jan. 11, 1988, Ser. No. 142,017
Int. Cl.[4] B32B *3/02, 33/00*
U.S. Cl. 428—88 **14 Claims**

1. Tufted carpet comprising a backing having thereon tufts of fine denier fibers and tufts of stiff, crimped, coarse denier fibers, said tufts of crimped, coarse denier fibers providing a very open structure in said carpet which is capable of easily receiving said obscuring dirt once it enters therein.

4,820,567

MICROCRACK RESISTANT FIBER REINFORCED RESIN MATRIX COMPOSITE LAMINATES

Daniel A. Scola, Glastonbury, and David J. Parker, Newtown, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 22, 1986, Ser. No. 921,997
Int. Cl.[4] B32B *5/12, 9/00;* **C01B** *31/00*
U.S. Cl. 428—105 **6 Claims**



1. A composite laminate, comprising a plurality of plies of graphite fiber reinforced resin, having the graphite fibers aligned in substantially unidirectional orientation within each ply, and having the plies aligned in layers and laid up in the laminate according to the formula:

$$(A_xB_yA_x)_n$$

wherein A and B denote the orientation of the fibers in successive layers as the angular displacement of the fiber direction relative to a reference direction of 0°, and x and y denote the number of plies comprising each of the successive layers, and n denotes the number of times the three-layer unit $(A_xB_yA_x)$ is repeated in the laminate, and

$A=90°\pm10°$

$B=0°$

$x=2$, 3, 4 or 5

$y=7$, 8 or 9 if $x=2$, and 2, 7, 8 or 9 if $x=3$, and 2 or 3 if $x=4$ or 5

$n=$an integer $\geqq 1$ if $y=7$, 8 or 9, and an integer $\geqq 2$ if $y=2$ or 3,

said fiber having a tensile modulus between 30 million and 60 million, said resin requiring processing at temperatures between 300° F. and 500° F. and exhibiting a strain to failure ratio of less than about 2%, and said composite laminate being substantially microcrack free.

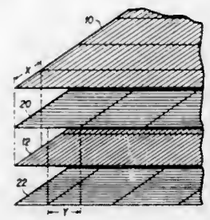
4,820,568

COMPOSITE AND ARTICLE USING SHORT LENGTH FIBERS

G. A. Harpell, Morris Township, Morris County; H. L. Li, Parsippany; Y. D. Kwon, Mendham, and D. C. Prevorsek, Morris Township, Morris County, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 3, 1987, Ser. No. 81,260
Int. Cl.[4] B32B *5/12*
U.S. Cl. 428—113 **24 Claims**

1. A prepreg layer comprising an array of at least two adjacent coplanar fibrous elements, with each element comprising a plurality of unidirectional fibers embedded in a polymeric matrix, the fibers being up to eight inches in length, the adjacent elements connected by the polymer matrix.

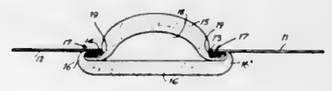


4,820,569

LOW LOSS FLEXIBLE CONNECTOR FOR AIR DUCTS

Milton Hinden, Rt. #110, Farmingdale, N.Y. 11735

Filed May 7, 1987, Ser. No. 46,681
Int. Cl.[4] F16L *59/14*
U.S. Cl. 428—124 **3 Claims**



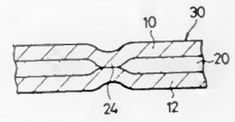
1. A low thermal loss flexible connector stock material comprising a coil comprised of two elongate metal strips substantially flat in transverse section, upper and lower superposed resilient compressible foraminous polymeric webs of thickness, in the unstressed condition, greater than the thickness of said strips, mounted between said strips, a side margin of each said strip being bent into overlapping clamping connection with a different one of the margins of said webs, said webs being disposed in face-to-face engagement when said strips are in overlapping relation, said upper web being deflected into spaced relation from said lower web when said strips are folded outwardly into co-planar alignment.

4,820,570

LAMINATED INSULATION

Masakazu Hasegawa; Michio Takaoka; Syotaroh Yoshida, and Kazuya Akashi, all of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Continuation of Ser. No. 732,810, May 10, 1985, abandoned, which is a continuation of Ser. No. 476,760, Mar. 18, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 857,504
Claims priority, application Japan, Mar. 19, 1982, 57-44907
Int. Cl.[4] B32B *3/10, 27/10*
U.S. Cl. 428—140 **13 Claims**



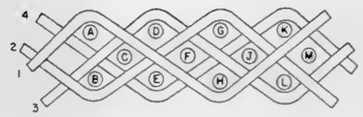
1. A laminated insulation paper, comprising; an integral construction of two sheets of cellulose paper and a film-like plastic sheet sandwiched therebetween, through holes locally provided in said plastic sheet formed by contact with a heated pin, at least one of said two sheets of cellulose paper being pressed into said through holes by said pin to fill said through holes, said two sheets of cellulose paper directly contacting with each other by means of said through holes.

4,820,571

HIGH TEMPERATURE INDUSTRIAL FABRICS

Harry I. Searfass, Wayne, Pa., assignor to Asten Group, Inc., Charleston, S.C.

Filed Jul. 12, 1983, Ser. No. 513,047
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—225 **21 Claims**



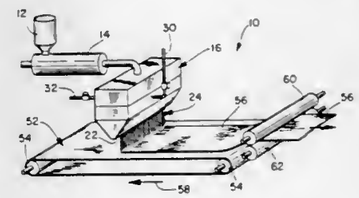
1. A papermaker's fabric having machine direction and cross machine direction threads interwoven with one another in a repeated pattern and finished into an endless belt with the threads of the belt being thermally set after weaving to stabilize the fabric, wherein certain of the threads are monofilaments of a melt extrudable polyaryletherketone selected from the group consisting of polyetherketones having repeating units of —ϕ—O—ϕ—CO—, —ϕ—O—ϕ—CO— and/or —ϕ—O—ϕ—CO—ϕ—O—.

4,820,572

COMPOSITE ELASTOMERIC POLYETHER BLOCK AMIDE NONWOVEN WEB

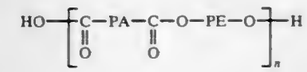
Thomas M. Killian, Green Bay, and Tony J. Wisneski, Kimberly, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 919,299, Oct. 15, 1986, Pat. No. 4,724,184. This application Oct. 13, 1987, Ser. No. 108,506
Int. Cl.[4] D03D *3/00*
U.S. Cl. 428—227 **15 Claims**



1. A composite elastic nonwoven web comprised of:

from about 50–99 percent, by weight, of a coherent matrix of meltblown fibers of a polyether block amide copolymer having the formula:



where n is a positive integer, PA represents a polyamide segment and PE represents a polyether segment; and

from about 1–50 percent, by weight, of at least one type of other fibers.

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4,820,573

FIBER GLASS MAINLY COMPOSED OF CALCIUM PHOSPHATE

Hideo Tagai, Tokyo; Masahiro Kobayashi, Funabashi; Shigeo Niwa, Aichi; Hiroyasu Takeuchi, Yokoze, and Mikiya Ono, Hanno, all of Japan, assignors to Mitsubishi Mining and Cement Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 883,231, Jul. 8, 1986, abandoned, which is a division of Ser. No. 624,658, Jun. 26, 1984, Pat. No. 4,613,577. This application Aug. 28, 1987, Ser. No. 91,367

Int. Cl.[4] B32B *17/02;* D03D *3/00*

U.S. Cl. 428—228 5 Claims

1. A woven filler for filling in a defect or hollow portion of bone, wherein said woven filler is prepared by weaving fiber glass filaments, said fiber glass having a negative zeta potential of minus 1.2 to minus 8.0 and consisting essentially of calcium phosphate having a molar ratio of Ca to P of not less than 0.2 and less than 0.6, and 1 to 15% by weight of an inorganic oxide said fiber glass being prepared by cooling a molten mass containing a mixture of at least one phosphorous-containing compound with at least one compound selected from the group consisting of calcium phosphate compounds and other calcium-containing compounds, said molten mass having a melting temperature of 900° C. to 1300° C.

4,820,574

FILLING MATERIAL FOR CUSHIONS AND COVERS

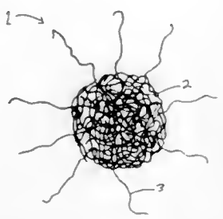
Günter Tesch, Fribourg, Switzerland, assignor to Gunter Tesch, Fribourg, Switzerland

Filed Aug. 26, 1987, Ser. No. 89,403

Claims priority, applicatioo Switzerland, Aug. 29, 1986, 03468/86

Int. Cl.[4] B32B *5/02;* D03D *3/00*

U.S. Cl. 428—234 13 Claims



1. A filler material for cushions and covers comprising fiber aggregates containing individual cut fibers which are intertwined with each other, characterized in that the fiber aggregates are able to form connections with other parts of the filler material, wherein the individual fiber ends are projecting from the surface of the fiber aggregate which has a spherical shape, the projecting fiber ends forming releasable connections.

4,820,575

REINFORCING MATERIAL

Klaus K. Kölzer, Bearather Schlossufer 65b, D-4000 Düsseldorf, Fed. Rep. of Germany

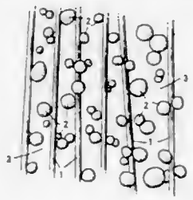
Filed Nov. 13, 1986, Ser. No. 930,471

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540537

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—240 10 Claims

1. A reinforcing material for duroplastics in the form of a roving, a yarn or a loosely spun double yarn of continuous elementary filaments arranged parallel with a high modulus of elasticity, characterized by a substantial part of the parallel elementary filaments free of any binding agent being spread apart or separated, by the cavities between the elementary filaments being predominantly filled by hollow plastic micro-



spheres with a diameter of 20 to 300 μm and the resin pick up and specific weight being reduced.

4,820,576

FIRE RETARDANT POLYMER RESIN

Harold E. Duryea, Saco, Me., assignor to Fiber Materials, Inc., Biddeford, Me.

Filed Feb. 18, 1988, Ser. No. 157,483

Int. Cl.[4] B32B *7/00;* C08G *8/00;* C08K *3/38, 3/40*

U.S. Cl. 428—246 14 Claims

11. A flame retardant polymeric material comprising a heat-cured mixture of

(1) a liquid condensation reaction product of a mixture of a first aldehyde and a polyhydric phenol in a molar ratio of one mole of said polyhydric phenol with less than one mole of said first aldehyde and reacted in the presence of an alkaline catalyst;

(2) a liquid condensation reaction product of a mixture of a second aldehyde and a second phenol in a ratio of one mole of phenol with more than a mole of said second aldehyde and reacted in the presence of an alkaline catalyst; and

(3) a comminuted oxyborate.

12. A flame retardant polymeric material as defined in claim 11 and comprising one or more layers of reinforcing scrim embedded in said heat-cured mixture.

4,820,577

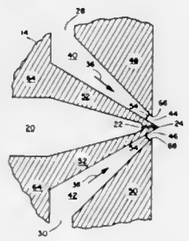
MELTBLOWN SUPERABSORBENT THERMOPLASTIC COMPOSITIONS

Michael T. Morman; Sharon L. Greene, both of Alpharetta; Jose F. Pazos, Roswell, and Augusto Rodriguez, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 22, 1986, Ser. No. 944,713

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—228 7 Claims



1. A superabsorbent meltblown nonwoven web comprising fibers composed of a superabsorbent, thermoplastic polymeric composition.

4,820,578

POLYKETONE ROOFING MEMBRANES

Richard L. Danforth, Missouri City, and Dennis W. Gilmore, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 28, 1988, Ser. No. 187,191

Int. Cl.[4] C08G *67/02*

U.S. Cl. 428—291 10 Claims

1. A weatherproof coating for roofs or decks is formed when an adhering material is used in conjunction with a nonwoven mat formed from a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon.

4,820,579

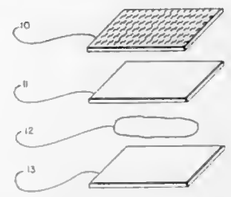
SCRUBBER PAD

Harry W. Aszman, Englishtown, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jun. 7, 1988, Ser. No. 202,473

Int. Cl.[4] C11D *17/00;* B32B *3/26, 9/00*

U.S. Cl. 428—304.4 9 Claims



5. A scrubber pad characterized by good cleaning properties, safety to surfaces and soap retention comprising a backing member bonded to a custom foam having the desired density and porosity impregnated with a detergent formulation containing alkyl aryl sulfonate, sodium carbonate, magnesium sulfate, sodium sulfate and perfume, the edges of said pad being sealed with an adhesive.

4,820,580

PROCESS FOR THE PRODUCTION OF A COMPOSITE SYSTEM OF A HIGHLY ELASTIC MATERIAL AND A POLYURETHANE FOAM LAYER AND PRODUCT FORMED THEREBY

Jürgen Hocker, Gladbach; Jürgen Faehndrich, Leverkusen, both of Fed. Rep. of Germany; Hans Hespe, Pittsburgh, Pa.; Kirkor Sirinyan, Gladbach, and Dieter Wecker, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Apr. 12, 1988, Ser. No. 180,509

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1987, 3713178

Int. Cl.[4] B32B *3/26, 5/18;* B05D *5/00;* B29C *37/00*

U.S. Cl. 428—314.4 9 Claims

1. A process for the production of a composite system of a highly elastic material and a polyurethane foam layer in which the surface of the highly elastic material is subjected to a plasma treatment and a polyurethane foam layer is then foamed thereon.

6. A composite of a highly elastic material and a polyurethane foam layer produced by the process of claim 1.

4,820,581

MAGNETIC RECORDING MEDIUM

Shinji Saito; Hiroshi Ogawa; Akihiro Matsufuji, and Yasuo Tamai, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Nov. 15, 1985, Ser. No. 798,760

Claims priority, application Japan, Nov. 16, 1984, 59-240459; Nov. 16, 1984, 59-240460

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—323 12 Claims

1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer provided on said support, in which said magnetic recording layer comprises:

a ferromagnetic metal alloy powder having a specific surface are of not less than 40 m^2/g and

an abrasive having a Mohs' scale of hardness of not less than 6,

both being dispersed in a binder containing a polycarbonate-polyurethane having a weight average molecular weight of 5,000 to 200,000.

4,820,582

WATERPROOF PHOTOGRAPHIC PAPER SUPPORT

Heinz-Otto Merz, Bramsche; Alois-Bernhard Kerkhoff, Bissendorf, and Wolfgang Storbeck, Belm, all of Fed. Rep. of Germany, assignors to Felix Schoeller, Jr. GmbH & Co. KG, Osnabruck, Fed. Rep. of Germany

Filed Oct. 15, 1987, Ser. No. 108,746

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636790

Int. Cl.[4] B32B *23/08;* D21H *3/02, 5/00;* G03C *1/87*

U.S. Cl. 428—328 46 Claims

1. A waterproof paper support for photographic coatings comprising a base paper with a polyolefin coating thereon, wherein said base paper is internally sized with a cationic aqueous dispersion of an alkylketene dimer which is a behenyl ketene containing dimer having a behenyl ketene content of between 60 to 98 mole % and which contains in the dimer less than 40% alkyl residues shorter than C_{18}-alkyl.

4,820,583

TRANSPARENT COMPOSITE POLYESTER FILMS CAPABLE OF BEING USED IN PARTICULAR FOR PRODUCING HIGH-GLOSS METALLIZED FILMS

Huquette Miquel, Chaponost, and Marcel Eyraud, Lyons, both of France, assignors to Rhone-Poulenc Films, Courbevoie, France

Division of Ser. No. 10,544, Feb. 3, 1987. This application Dec. 17, 1987, Ser. No. 134,072

Claims priority, application France, Feb. 14, 1986, 86 02207

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—333 16 Claims

1. A metallized composite film which comprises as a base, a transparent, drawn polyester thermoplastic composite film having low surface roughness and having an essentially unfilled middle layer (A) covered on at least one of its surfaces with a filled layer (B) containing fine particles dispersed therein, said base having the following properties:

percentage of scattered light < 1

total roughness of the outer faces $R_T < 0.15$

coefficient of film-on-film friction measured in a dynamic and static regime such that

$\mu_s < 0.6$ (static regime)

$\mu_d < 0.5$ (dynamic regime),

and deposited on said base a metallic coating.

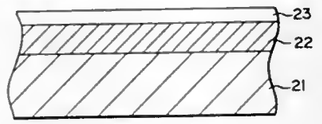
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MAGNETIC RECORDING MEDIUM AND METHOD OF MANUFACTURING THE SAME

Hiroshi Morita, Kawasaki, and Osamu Osada, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 10, 1987, Ser. No. 60,388
Claims priority, application Japan, Jun. 12, 1986, 61-134771
Int. Cl.[4] G11B *5/72, 5/64*
U.S. Cl. 428—336 11 Claims



1. A magnetic recording medium comprising:
a non-magnetic substrate;
a magnetic recording layer formed on said non-magnetic substrate; and
a lubricant layer having a thickness of 150–300 Å and consisting of first and second sub-layers, formed on said magnetic recording such that said first sub-layer is in direct contact with the magnetic recording layer, the first sub-layer consisting of carbon which is not chemically bonded to another element, and the second sub-layer having a thickness of 50 to 200 Å and consisting of elemental carbon and and a non-polymer carbon compound with at least one element selected from a group consisting of hydrogen and halogen.

4,820,585

ACRYLIC FIBERS HAVING IMPROVED DISPERSABILITY IN VISCOUS ORGANIC OR INORGANIC MATRICES

Raffaele Tedesco, Mestre; Socrate Bocus, Marghera, and Luigi Signoretti, Mestre, all of Italy, assignors to Montefibre S.p.A., Milan, Italy

Filed Jan. 29, 1987, Ser. No. 8,172
Claims priority, application Italy, Jan. 31, 1986, 19263 A/86
Int. Cl.[4] B32B *13/02;* D02J *11/00;* D06M *15/05, 15/263, 15/333*
U.S. Cl. 428—360 4 Claims

1. Agglomerates of fibers having improved dispersability in viscous inorganic matrices, constituted by staple acrylic fibers based on homopolymers or copolymers of acrylonitrile containing at least 50% by weight of acrylonitrile, and having a tenacity higher than 50 cN/tex, an initial modulus higher than 1000 cN/tex, and an elongation at break not higher than 15%, each fiber having a diameter less than 50 microns and a length greater than 3 mm and less than 60 mm, bonded to each other by a cohesion conferring-agent soluble or swellable in water or in an alkaline aqueous solution, said cohesion conferring-agent being employed in an amount within the range of from 1.5 to 7% by weight relative to the fibers, said fibers being obtained by: extrusion of the polymer through a die; coagulation of the filaments exiting the die; washing and wet-drafting, drying, collapsing at 150°–200° C.; further drafting of the filaments in the plastic state, up to a total draft ratio of at least 8; cooling down of the filaments under hindered retraction conditions; the number of acrylic fibers for each agglomerate being equal to or greater than

$$\left(\frac{L}{D50}\right)^2$$

wherein L is the length of the fibers and D is the diameter of the fibers, both in millimeters.

4,820,586

PYROELECTRIC AND ISOTROPIC PIEZOELECTRIC POLYMER BLENDS

Dennis L. Krueger, Hudson, Wis.; Neil W. Loeding, Mounds View, and Claudia L. Poser, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 832,965, Feb. 25, 1986, abandoned, which is a continuation of Ser. No. 720,459, Apr. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 273,901, Jun. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 171,299, Jul. 23, 1980, abandoned. This application Oct. 26, 1987, Ser. No. 112,364
Int. Cl.[4] C08L *27/08;* B32B *15/08, 27/28*
U.S. Cl. 428—421 4 Claims

1. A non-mechanically oriented polymeric film having stable pyroelectric and isotropic piezoelectric properties comprising a blend of polyvinylidene fluoride and at least one polymer which is miscible with said polyvinylidene fluoride, said blend having been maintained in an amorphous state prior to poling, said pyroelectric and isotropic piezoelectric properties displaying polarization of at least about 0.5 volts/°C.-mil.

4,820,587

POLYSILICON PRODUCED BY A FLUID BED PROCESS

Marcelian F. Gautreaux, and Robert H. Allen, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 899,906, Aug. 25, 1986, abandoned. This application Jan. 16, 1987, Ser. No. 4,116
Int. Cl.[4] B32B *5/16;* B05D *7/00;* C01B *33/02*
U.S. Cl. 428—403 5 Claims



1. A semiconductor grade polysilicon in the form of approximately spherical particles having:
(i) a surface morphology illustrated by FIGS. 3 and 3A,
(ii) a size distribution of from about 400 to 1000 microns,
(iii) an average size of 650 to 750 microns,
(iv) a boron content within the range of 0.01 to 0.25 ppba,
(v) a phosphorus content within the range of 0.01 to 0.19 ppba,
(vi) a carbon content within the range of 0.16 to 0.33 ppm, and
(vii) a surface dust content less than about 0.08 weight percent bonded to said particles by a silicon layer of 0.1 to about 5 microns thick;
said semiconductor grade polysilicon being free flowing and suitable for continuous melt replenishment systems for producing monocrystalline silicon.

4,820,588

SHAPED ARTICLES OF POLYFLUOROPOLYETHERS HAVING PENDANT PERFLUOROALKOXY GROUPS

Steven P. Brinduse, Minneapolis; Anthony B. Clinch, Woodbury; Daniel K. McIntyre, St. Paul; Allen L. Noreen, Lake Elmo, and Mark J. Pellerite, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 902,315, Aug. 29, 1986, Pat. No. 4,743,300. This application Jan. 26, 1988, Ser. No. 148,683
Int. Cl.[4] B32B *27/06;* B28B *7/36;* C07C *179/02*
U.S. Cl. 428—422 13 Claims

1. An article comprising a substrate having a release coating thereon, said release coating comprising a polymer having a backbone comprising randomly distributed, perfluorooxyalkylene units represented by the formulas

$$-CF_2O-,\ -\underset{|}{CFO}-,\ \text{and}\ -\underset{|}{CF_2CFO}-,$$

and backbone-pendant perfluoroalkoxy groups, the terminal ether oxygen atoms of which are bonded to carbon atoms of the —CFO and —CF_2CFO backbone units.

4,820,589

CLING/NO CLING-SLIP STRETCH WRAP FILM

David V. Dobreski, Fairport; Robert J. Metz, Rochester, both of N.Y., and James Morris, Bertrange, Luxembourg, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 931,315, Nov. 17, 1986, abandoned. This application Jun. 1, 1988, Ser. No. 205,045
Int. Cl.[4] B32B *27/08, 27/32, 27/34*
U.S. Cl. 428—422 12 Claims

1. In a stretch wrap film having one-sided cling comprising a thermoplastic A/B layer film structure where, with the surfaces of A/B in their stretched condition, the A surface has a comparatively high cling force to the surface of B and the surface of B has no cling force to itself and has a slide property when the surface of B is in contact with itself with relative motion therebetween, the improvement comprising wherein the surface of B presents at least a sufficient area of another thermoplastic organic polymer of a member selected from the group consisting of a polyamide and a polyfluoro-olefin which of its very nature causes said no cling force and said slide property.

4,820,590

ORIENTED ELASTOMERIC FILM AND METHOD OF MANUFACTURE

William J. Hodgson, Jr., Baytown, and Jeffrey A. Middlesworth, Webster, both of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 732,127, May 8, 1985, Pat. No. 4,714,953. This application Nov. 23, 1987, Ser. No. 123,774
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—516 6 Claims

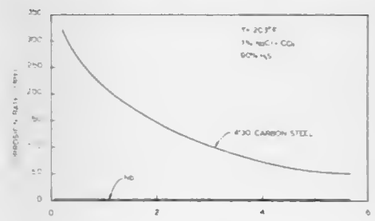
1. A composite comprising
(a) a first layer comprising an oriented film having a blend composition comprising from 10 to 40 weight percent of an olefinic elastomers, from 2 to 10 weight percent of a normally liquid process oil, and from 50 to 80 weight percent of a thermoplastic ethylene copolymer, said film being stretch oriented in draw ratio of between 1.3:1 and 6:1 and being dimensionally stable, thermally unstable in the stretch oriented condition and contractible to a thermally stable and elastic condition by application of heat; and
(b) a second layer of stretch oriented film adhered to said first layer and comprising a polymer or copolymer of ethylene having a Melt Index of at least 3.0, said second layer being no thicker than 7 microns in the stretched condition and comprising from 2 to 15 weight percent of the composite.

4,820,591

CORROSION RESISTANT ARTICLE AND METHOD OF MANUFACTURE

Trikur A. Ramanarayanan, Somerset, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 11, 1987, Ser. No. 48,541
Int. Cl.[4] F16L *9/14;* C23C *14/06*
U.S. Cl. 428—628 11 Claims



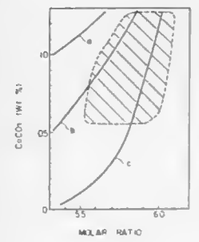
1. A composite, corrosion-resistant article comprising a metal substrate, a layer of a refractory metal on said substrate and a sulfide coating of said refractory metal formed on said refractory metal layer.

4,820,592

PERMANENT OXIDE MAGNET AND METHOD OF COATING SAME

Motoharu Shimizu, Kumagaya; Masayoshi Minegishi, Fukaya; Nobuyuki Yamada, and Kohji Kobayashi, both of Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Feb. 19, 1987, Ser. No. 16,747
Claims priority, application Japan, Feb. 10, 1987, 62-28457; Feb. 24, 1986, 61-38762; Mar. 28, 1986, 61-69961
Int. Cl.[4] B32B *1/00;* H01F *7/02*
U.S. Cl. 428—692 10 Claims



1. A permanent oxide magnet having a basic composition of $MO.Fe_2O_3$, where M represents one or more elements selected from the group consisting of Sr, Ba, Pb, in a molar ratio of $Fe_2O_3/MO = 5.3$ to 6.2, a volume resistivity of less than 10^7 Ω-cm and a density of 4.80 g/cm^3 or more wherein the magnet contains 0.1–1.0 weight % of SiO_2 and 0.1–1.2 weight % of CaO, the weight ratio of CaO/SiO_2 being less than 1.5, said magnet being coated with an electrodeposition paint layer.

4,820,593

STABILISED METALLIC OXIDES

Terence A. Egerton; Edmund J. Lawson, both of Stockton on Tees, and Peter W. Frost, London, all of England, assignors to Tioxide Group PLC, London, England

Continuation of Ser. No. 905,139, Sep. 9, 1986, abandoned. This application Dec. 17, 1987, Ser. No. 136,435

Claims priority, application United Kingdom, Oct. 1, 1985, 8524140

Int. Cl.[4] B32B *13/04*

U.S. Cl. 428—698 15 Claims

1. A solid ceramic body manufactured from a plurality of zirconia particles which have been shaped and fired to form said ceramic body, a majority of the particles before shaping and firing having a diameter of less than or equal to 0.5 micron and having a coating comprised of a hydrous oxide of zirconium and a hydrous oxide of yttrium, calcium, magnesium, strontium or cerium.

4,820,594

METHOD OF STARTING FUEL CELL POWER GENERATION SYSTEM

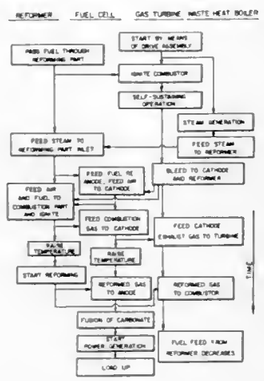
Shigehisa Sugita; Kazuhito Koyama, both of Hitachi; Koji Shiina, Mito; Seiichiro Sakaguchi, Hitachi; Michio Kuroda, Hitachi, and Yoshiki Noguchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,170

Claims priority, application Japan, Feb. 7, 1986, 61-23822

Int. Cl.[4] H01M *8/06*

U.S. Cl. 429—17 18 Claims



1. A method of starting a fuel cell power generation system provided with (a) a fuel reformer having a reforming part through which a heated raw fuel is passed and a heating part which affords heat to said reforming part, wherein said reforming part is packed with reforming catalyst; (b) a fuel cell provided with an anode and a cathode in which a fuel containing hydrogen is fed to the anode and a gas containing oxygen is fed to the cathode to effect power generation; and (c) pipe lines connecting an outlet of said reformer reforming part to said fuel cell anode; characterized in that at the time of starting said fuel cell power generation system, the heated raw fuel is introduced to said reformer reforming part and then is introduced through said pipe lines into said fuel cell anode, thereby to raise the temperature of said reformer and said fuel cell.

4,820,595

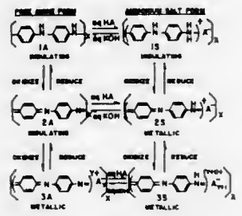
ELECTROCHEMISTRY EMPLOYING POLYANILINE

Alan G. MacDiarmid, Drexel Hill, and Nanayakkara L. D. Somasiri, Philadelphia, both of Pa., assignors to University Patents, Inc., Westport, Conn.

Continuation of Ser. No. 620,446, Jun. 14, 1984, abandoned. This application Sep. 12, 1986, Ser. No. 906,994

Int. Cl.[4] H01M *4/00, 4/86, 4/60*

U.S. Cl. 429—27 2 Claims



1. A fuel cell for reacting an oxidizing agent and a fuel, comprising anode means, cathode means and electrolyte, at least one of the electrodes comprising an aniline polymer; wherein the oxidizing agent comprises gaseous oxygen.

4,820,596

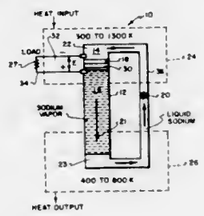
ALKALI METAL-REFRACTORY METAL BIPHASE ELECTRODE FOR AMTEC

Roger M. Williams, Azusa; Clyde P. Bankston, Studio City; Terry Cole, La Canada; Satish K. Khanna, Pasadena; Barbara Jeffries-Nakamura, San Marino, all of Calif., and Bob L. Wheeler, Houston, Tex., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 895,360, Aug. 11, 1986, abandoned. This application Aug. 6, 1987, Ser. No. 82,889

Int. Cl.[4] H01M *6/20*

U.S. Cl. 429—50 14 Claims



1. An electrode comprising in combination:

a body of solid, microcrystalline, ceramic electrolyte capable of transporting sodium ions from a first surface to a second surface selected from beta-alumina or beta" alumina;

an electrode film of porous metal applied to one of said surface, said film being non-volatile at a temperature up to 1300 K and being formed of the composition M^1M^2 where M^1 and M^2 are refractory metals, M^1 is a platinum group metal capable of forming a liquid phase with sodium and-/or exhibiting a strong surface adsorption of sodium atoms, and M^2 a metal selected from Groups IVB, or VB or VIB of the Periodic Table which is insoluble in sodium and in said liquid phase.

4,820,597

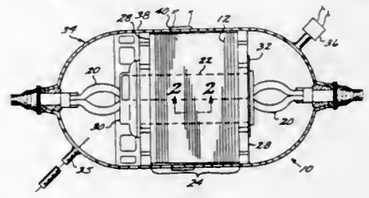
EXTENDED LIFE NICKEL-HYDROGEN STORAGE CELL

Hong S. Lim, Agoura, and Scott A. Verzwyvelt, Newbury Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 11, 1987, Ser. No. 131,974

Int. Cl.[4] H01M *10/34*

U.S. Cl. 429—50 14 Claims



8. An electrical storage cell having an extended life under deep discharge operating conditions, comprising:

an active plate set, the plate set including a nickel positive electrode, a hydrogen negative electrode, a separator between the positive electrode and the negative electrode, and an electrolyte including at least about 30 mole percent of a hydroxide selected from the group consisting of rubidium hydroxide and cesium hydroxide, the concentration of the hydroxide being no greater than about 8 molar; and

a pressure vessel that contains the positive electrode, the negative electrode, the separator, and the electrolyte.

4,820,598

ACTIVATABLE BATTERY USING THE LI/$SOCL_2$ OR LI/SO_2CL_2 COUPLES

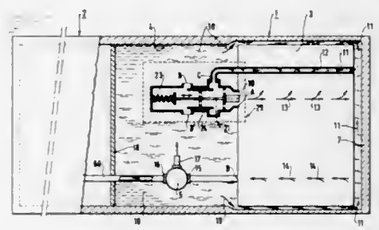
Jean-Pierre Descroix, Footenay Sous Bois, and Yannick Leben, Bobigny, both of France, assignors to SAFT, S.A., Romainville, France

Filed Apr. 7, 1988, Ser. No. 178,923

Claims priority, application France, Apr. 13, 1987, 87 05203

Int. Cl.[4] H01M *6/38*

U.S. Cl. 429—62 6 Claims



1. An activatable battery using the $Li/SOCl_2$ or Li/SO_2Cl_2 couples, and comprising:

an electrochemical block comprising a large number of couples;

a network for irrigating the couples in said block;

a heat exchanger;

a pump for causing electrolyte to circulate through said network and said heat exchanger; and

a device for storing electrolyte and transferring it to said block, said device including a supply of electrolyte which is connected firstly to a gas generator and secondly to the inlet of the circulation pump;

wherein said gas generator is connected to the top portion of said electrolyte supply, and the supply is split into two compartments, a main compartment connected to said gas generator and a "buffer" compartment connected to said pump, said buffer compartment being separated from said main compartment by a non-electrolyte-proof partition provided at its top with a dip tube ending in the bottom portion of said main compartment.

4,820,599

NON-AQUEOUS ELECTROLYTE TYPE SECONDARY CELL

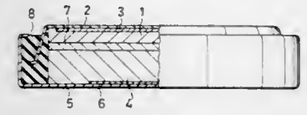
Nobuhiro Furukawa, Hirakata; Toshihiko Saito, Kyoto; Ikuro Nakane, and Hiroshi Watanabe, both of Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 17, 1988, Ser. No. 195,046

Claims priority, application Japan, May 18, 1987, 62-120801

Int. Cl.[4] H01M *6/14*

U.S. Cl. 429—194 20 Claims



1. A rechargeable non-aqueous secondary cell comprising;

a positive electrode having a rechargeable active material as a main component,

a negative electrode formed of lithium-aluminum alloy and having an aluminum plate added with manganese as a base,

a separator disposed between said positive electrode and said negative electrode, and

a non-aqueous electrolyte.

4,820,600

ELECTROPHOTOGRAPHIC PHOTORECEPTOR HAVING A BISAZO COMPOUND

Yutaka Akasaki; Akihiko Tokita; Kaoru Torikoshi; Akira Imai, and Touru Ishii, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

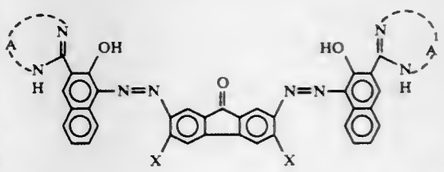
Filed Aug. 5, 1987, Ser. No. 81,509

Claims priority, application Japan, Aug. 5, 1986, 61-182695

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—58 9 Claims

1. An electrophotographic photoreceptor comprising a conductive support having provided thereon a photosensitive layer containing a bisazo compound represented by the formula (I)



wherein X represents a halogen atom or a nitro group, and A represents a substituted or unsubstituted divalent aromatic hydrocarbon group or a substituted or unsubstituted divalent nitrogen-containing heterocyclic group.

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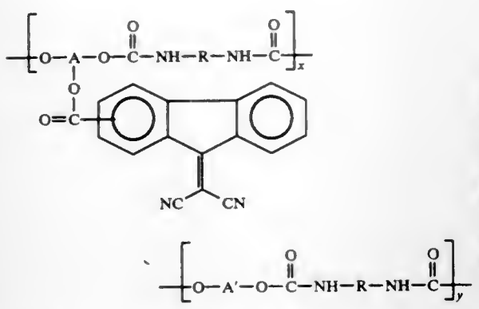
4,820,601

PHOTORESPONSIVE IMAGING MEMBERS WITH PROTECTIVE COPOLYURETHANE OVERCOATINGS

Beng S. Ong; Dasarao K. Murti, both of Mississauga, and John R. C. Fuller, Oakville, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 1, 1988, Ser. No. 150,871
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—58 **30 Claims**

1. An imaging member comprised of a photoconductive layer, and a protective copolyurethane coating of the formula:



wherein A is a trivalent group; A′ is a bivalent group; R is selected from the group consisting of alkylene, substituted alkylene, arylene, and substituted arylene; x and y are number mole fractions of from about 0.05 to about 0.95 subsequent to the provision that the sum of x+y is equal to 1.0.

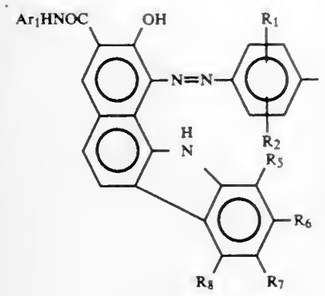
4,820,602

ELECTROPHOTOGRAPHIC PHOTOSENITIVE MEMBER COMPRISING DISAZO COMPOUNDS HAVING NON-SYMETRIC COUPLER PORTIONS

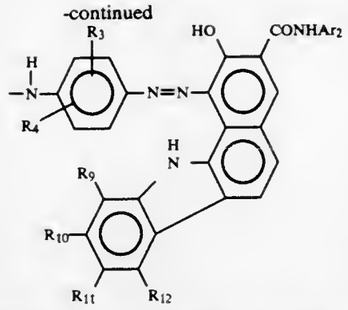
Masakazu Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 14, 1987, Ser. No. 73,174
Claims priority, application Japan, Jul. 22, 1986, 61-172579
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—72 **16 Claims**

1. An electrophotographic photosensitive member having a photosensitive layer on an electroconductive support, wherein said photosensitive layer contains a compound represented by the formula (1):



-continued



wherein Ar_1 represents a phenyl group having one or more groups selected from alkoxy groups and alkyl groups, Ar_2 represents a phenyl group having one or more groups selected from nitro groups, cyano groups and halogen atoms, R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11} and R_{12} represent hydrogen atom, halogen atom, alkyl group, aralkyl group, alkoxy group, nitro group, cyano group, trifluoromethyl group or substituted amino group, with proviso that R_5 and R_6, R_6 and R_7, R_7 and R_8, R_9 and R_{10}, R_{10} and R_{11}, R_{11} and R_{12} may form a fused aromatic ring together with a part of the carbazole ring.

4,820,603

MAGNETIC TONER

Kiichiro Sakashita, Inagi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1987, Ser. No. 54,445
Claims priority, application Japan, May 28, 1986, 61-122641
Int. Cl.[4] G03G *9/14*
U.S. Cl. 430—106.6 **29 Claims**

1. A magnetic toner comprising a binder resin and a magnetic portion, said magnetic portion comprising iron oxide and 0.1–1.5 wt. % silicon (based on total iron content), provided that an amount (A) of at most 0.7 wt. % silicon (based on iron content) when said magnetic portion is dissolved in an amount of not more than about 10 wt. % based on said total iron content and an amount (B) of 0.2–5 wt. % silicon (based on iron content) when the magnetic portion is dissolved in an amount of about 90–100 wt. % based on said total iron content, are present in a ratio of B/A of above 1.

4,820,604

TONER AND DEVELOPER COMPOSITIONS WITH SULFUR COTAINING ORGANOPOLYSILOXANE WAXES

Richard D. Manca, Walworth, and Angelo J. Barbetta, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1987, Ser. No. 103,338
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—110 **31 Claims**

1. A toner composition comprised of resin particles, pigment particles, and an effective amount of a sulfur containing organopolysiloxane wax.

4,820,605

MODIFIED LIQUID ELECTROSTATIC DEVELOPER HAVING IMPROVED IMAGE SCRATCH RESISTANCE

Lyla M. El-Sayed, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1987, Ser. No. 125,290
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—115 **68 Claims**

1. A liquid electrostatic developer consisting essentially of

A. nonpolar liquid having a Kauri-butanol value of less than 30, percent in a major amount,
B. at least one thermoplastic resin having an average by area particle size of less than 10 μm,
C. a charge director compound,
D. particles of a blend of a wax and at least one metallic soap or inorganic metal salt present in an amount of 0.001 to 5% by weight based on the total weight of developer solids.

4,820,606

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tsutomu Miyasaka; Masaki Okazaki, and Tadao Sugimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 1, 1987, Ser. No. 127,137
Claims priority, application Japan, Dec. 1, 1986, 61-284271
Int. Cl.[4] G03C *1/12, 1/28*
U.S. Cl. 430—139 **15 Claims**

1. A silver halide photographic material having at least one silver halide emulsion layer spectrally sensitized with an adsorbable spectral sensitizing dye, wherein a hydrophilic dispersion medium contains a substantially non-adsorbable luminescent dye which is easily removable by development processing and satisfies the following conditions (1) to (4):

(1) the luminescent dye has an equilibrium adsorption of not more than 5×10^{-7} mol per m^2 of silver bromide grain surface in a 5% by weight gelatin aqueous solution contianing silver bromide grains whose outer surface is composed substantially of a face under conditions of a 40° C. in temperature, 6.5 ±0.05 in pH, and 10^{-4} mol/l in dye concentration in the solution phase;
(2) the luminescent dye has an emission quantum yield of not less than 0.1 at room temperature in dry gelatin at a concentration of -10^{-4} mol/dm3;
(3) the luminescent dye has an emission band at least a part of which overlaps an optical absorption band of the adsorbable spectral sensitizing dye on silver halide grains; and
(4) the luminescent dye is one which absorbs light and luminesces in the visible region.

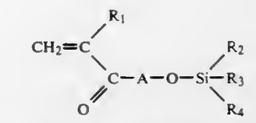
4,820,607

PHOTOSOLUBILIZABLE COMPOSITION

Toshiaki Aoai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1986, Ser. No. 896,368
Claims priority, application Japan, Aug. 19, 1985, 60-181420
Int. Cl.[4] G03C *1/495*
U.S. Cl. 430—190 **21 Claims**

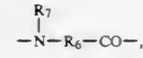
1. A photosolubilizable composition containing (a) a first compound capable of producing an acid by irradiation with actinic radiation and (b) a high molecular weight compound, whose solubility in a developing solution is increased by the action of an acid, said high molecular weight compound incorporating at least 1 mol% of a monomer unit represented by formula (I)



(I)

wherein R_1 represents a hydrogen atom, a halogen atom or an alkyl group; R_2, R_3, and R_4 each represents a hydrogen atom, an alkyl group, an aryl group or —OR_5; R_5 represents an alkyl group or an aryl group; and

A represents a single chemical bond, —O—R_6—CO— or



wherein R_6 represents a divalent aliphatic or aromatic hydrocarbon residue; and R_7 represents a hydrogen atom, an alkyl group, an aryl group or —CO—R_8, wherein R_8 represents an alkyl group or an aryl group; provided that at least one of R_2, R_3 and R_4 represents a group other than the group consisting of a hydrogen atom, a methyl group or —OR_5.

4. A photosolubilizable composition as in claim 1, wherein said first compound (a) is orthoquinonediazidosulfonyl chloride, an s-triazine derivative substituted by a halomethyl group, or an oxadiazole derivative substituted by a halomethyl group.

4,820,608

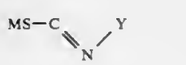
DYE DIFFUSION TRANSFER IMAGING PROCESS AND IMAGE RECEPTOR USED THEREIN

Daniël A. Claeys; Daniël M. Timmerman, both of Mortsel; Antonius A. Rutges, Boechout; Eddy A. Michiels, Kontich; Luc J. Vanmaele, and Piet Kok, both of Ghent, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

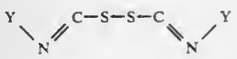
Filed Oct. 21, 1987, Ser. No. 110,797
Claims priority, application European Pat. Off., Oct. 23, 1986, 86201855
Int. Cl.[4] G03C *5/54*
U.S. Cl. 430—213 **11 Claims**

1. Image receptor element for dye diffusion transfer imaging processes comprising a support and an image-receiving layer incorporating

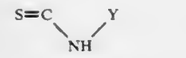
a hydrophilic colloid,
a non-polymeric phosphonium mordanting agent comprising at least one long chain hydrocarbon group and capable of fixing acid image dyes transferred to said image-receiving layer by diffusion, and
a polymer comprising free acid groups, wherein said polymer is a copolymer latex comprising free weak acid groups and said image-receiving layer also comprises at least one heterocyclic compound corresponding to one of the following general formulae I, II, and III :



(I)



(II)



(III)

wherein:

Y represents the non-metallic atoms needed to complete a saturated or unsaturated 5- or 6-membered heterocyclic nucleus, which may carry a fused-on aromatic ring system, and
M represents hydrogen, an alkali metal atom, a quaternary ammonium group, or a negative charge forming an inner salt with a quaternized nitrogen atom of the heterocyclic compound.

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4,820,609

HIGHLY SENSITIVE POSITIVE RESIST MIXTURE

Kazumi Iwadate, Higashimurayama, and Katsuhiro Harada, Tokyo, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

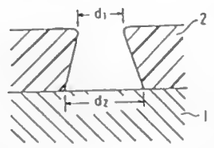
Division of Ser. No. 847,907, Filed as Pct JP85/00411 on Jul. 22, 1985, Published as WO86/01009 on Feb. 13, 1986, Pat. No. 4,699,870.

This application Jun. 25, 1987, Ser. No. 67,263

Claims priority, application Japan, Jul. 23, 1984, 59-151269; Aug. 27, 1984, 59-176851; Jul. 10, 1985, 60-151860

Int. Cl.[4] G03C *1/495*

U.S. Cl. 430—270 **6 Claims**



1. A positive resist mixture which comprises an intermolecular cross-linked copolymer produced from a copolymer formed of 50 to 95 mole % phenyl methacrylate and 50 to 5 mole % methacrylic acid to which 0.1 to 5 weight % $ZnBr_2$ was added and the mixture thereafter subjected to heat treatment to form intermolecular cross-linking.

2. A positive resist mixture which comprises an intermolecular cross-linked copolymer produced from a copolymer which is polymethyl methacrylate-co-methacrylic acid containing a 30 mole % methacrylic acid unit to which 0.1 to 5 weight % $ZnBr_2$ was added and the mixture thereafter subjected to heat treatment to form intermolecular cross-linking.

4,820,610

PROCESS FOR PREPARATION OF LIGHT-SENSITIVE COMPOSITION POLYMERIZABLE COMPOSITION CONTAINING A SILVER HALIDE IN-WATER EMULSION

Taku Nakamura; Tsumoru Hirano, and Eiji Funatsu, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 933,515, Nov. 21, 1986, abandoned. This application May 25, 1988, Ser. No. 198,355

Claims priority, application Japan, Nov. 21, 1985, 60-261887

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—270 **14 Claims**

1. A process for the preparation of a light-sensitive composition in which droplets of a silver halide-in-water emulsion are dispersed in an ethylenically unsaturated polymerizable liquid compound, which comprises the steps of:

dissolving a polymer in the polymerizable compound to prepare a solution, said polymer having a principal chain consisting essentially of a hydrocarbon chain substituted in part with hydrophilic groups which contain, in their terminal groups, —OH or nitrogen atom having a lone electron-pair, and said polymer being used in an amount of 0.01 to 2 weight % based on the amount of the polymerizable compound; and

emulsifying the silver halide-in-water emulsion in the solution, said silver halide-in-water emulsion being used in such amount that the amount of the polymerizable compound is in the range of 5 to 120,000 times by weight the amount of silver halide contained in the silver halide-in-water emulsion.

4,820,611

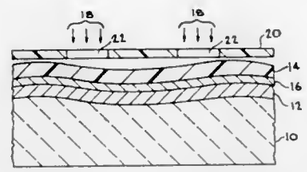
TITANIUM NITRIDE AS AN ANTIREFLECTION COATING ON HIGHLY REFLECTIVE LAYERS FOR PHOTOLITHOGRAPHY

William H. Arnold, III, Cupertino; Mohammad Farnaam, Santa Clara, and Jack Sliwa, Los Altos Hills, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 24, 1987, Ser. No. 42,402

Int. Cl.[4] G03C *1/94*

U.S. Cl. 430—271 **10 Claims**



1. A process for reducing the amount of light (**18**) having a preselected wavelength reflected back from a highly reflective wafer surface (**12**) into a resist layer (**14**) formed thereover, said wafer surface comprising a metal selected from the group consisting of aluminum and titanium, said process comprising forming a layer (**16**) of titanium nitride between said wafer surface and said resist layer, said layer of titanium nitride formed to a thickness ranging from about 300 to 500 Å where said highly reflective wafer surface comprises aluminum and from about 150 to 350 Å where said highly reflective wafer surface comprises titanium, thereby reducing said amount of light reflected to less than about 5% of the incident radiation.

4,820,612

ELECTRONIC DEVICE AND ITS MANUFACTURING METHOD

Akira Mase; Toshimitsu Konuma; Mitsunori Sakama; Takashi Inushima, and Shunpei Yamazaki, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

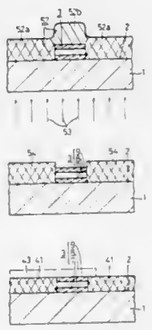
Division of Ser. No. 82,908, Aug. 10, 1987, Pat. No. 4,780,794, which is a division of Ser. No. 813,515, Dec. 26, 1985, abandoned. This application Aug. 18, 1987, Ser. No. 86,646

Claims priority, application Japan, Dec. 26, 1984, 59-277412

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—315 **5 Claims**



1. An electronic device manufacturing method comprising the steps of:

forming a non-linear, multi-layered electronic element on a substrate having an insulating surface;

forming, on the substrate, a photosensitive organic resin layer extending over the non-linear, multi-layered electronic element; and

forming from the photosensitive organic resin layer, an insulating layer surrounding the non-linear, multi-layered electronic element on the substrate;

wherein the substrate is a light transparent substrate;

wherein the non-linear, multi-layered electronic element is far lower in light transparency than the light transparent substrate; and

wherein the insulating layer forming steps includes (a) exposure of the photosensitive organic resin layer to light applied from the side of the light transparent substrate, (b) development of the exposed photosensitive organic resin layer, (c) heat-hardening of the photosensitive organic resin layer prior to the exposure of the photosensitive organic resin layer, and (d) heat-hardening of an organic resin layer resulting from the development of the photosensitive organic resin layer such that the heat-hardened, organic resin layer is in close contact with all sides of the non-linear, multi-layered electronic element, the contact between the heat-hardened organic, resin film and the sides of the non-linear, multi-layered electronic element being such that electrical short circuits between the layers of the non-linear, multi-layered electronic element are prevented.

5. The manufacturing method according to claim 1 including forming a conductive electrode overlying said non-linear, multi-layer electronic element.

4,820,613

PHOTOGRAPHIC SURFACE LAYERS COMPRISING DEXTRAN DERIVATIVES

Joan T. Vermeersch, Deinze; Hubert Vandenabeele, Mortsel; Jacques L. Vervecken, Berchem, and Daniël M. Timmerman, Mortsel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Jul. 29, 1987, Ser. No. 79,081

Claims priority, application European Pat. Off., Sep. 23, 1986, EP86201641.7

Int. Cl.[4] G03C *1/30*

U.S. Cl. 430—496 **12 Claims**

1. Method of hardening a proteinaceous layer of a photographic silver halide element by incorporating in said proteinaceous layer a reaction product of dextran and an epihalohydrin capable of functioning as a hardener.

4,820,614

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL SUITABLE FOR RAPID PROCESSING

Shun Takada; Kazuhiro Murai, and Kaoru Onodera, all of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 121,473

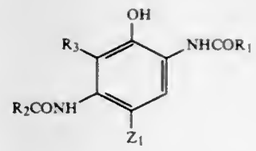
Claims priority, application Japan, Nov. 19, 1986, 61-276082

Int. Cl.[4] G03C *7/20, 7/34*

U.S. Cl. 430—505 **15 Claims**

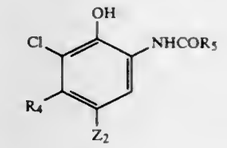
1. A silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer comprising a silver halide grain comprising not less than 90 mol% of silver chloride, a cyan-dye forming coupler represented by the following formula [C-1], a cyan-dye forming coupler represented by the following formula [C-2], a non-color forming compound represented by the following formula [I], and a compound represented by the following formula [IIa], [IIb] or [IIc]:

Formula [C-1]



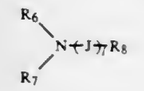
wherein R_1 and R_2 are an alkyl group, a cycloalkyl group, an alkenyl group, an aryl group or a heterocyclic group, respectively; R_3 is a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group and may be form a ring together with R_2; and Z_1 is a group capable of being split off upon reaction with the oxidized product of a color developing agent,

Formula [C-2]



wherein R_4 is an alkylgroup; R_5 is a ballast group and Z_2 is a group capable of being split off upon reaction with the oxidized product of a color developing agent,

Formula [I]



wherein R_6 and R_7 are a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group, respectively; R_8 is an alkyl group, an aryl group, a cyano group or a heterocyclic group; J is an $—SO_2—$ group, a —CO— group, an —SO— group, a —COO— group, a —CS— group, an

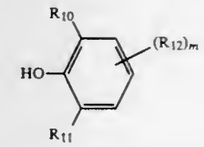


group or a



group, in which R_9 is a hydrogen atom, an alkyl group, an aryl group or a heterocyclic group; one of R_6 and R_7 may be bonded with R_9 to form a ring, and l is an integer of 0 or 1,

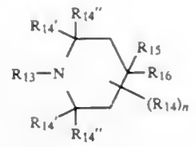
Formula [IIa]



wherein R_{10} and R_{11} are an alkyl group, respectively; R_{12} is an alkyl group, an —NHR′ group, an —SR′ group or a —COOR″ group, in which R′ is a monovalent organic group and R″ is a hydrogen atom or a monovalent organic group; and m is an integer of 0 to 3,

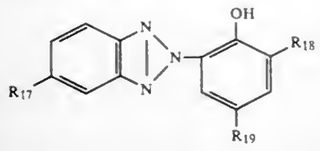
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Formula [IIb]



wherein R_{13} is a hydrogen atom, a hydroxy group, an oxiradical, an —SOR'$_{13}$ group, an —SO_2R'$_{13}$ group, an alkyl group, an alkenyl group, an alkinyl group or a —COR"$_{13}$ group, in which R'$_{13}$ is an alkyl group, or an aryl group and R"$_{13}$ is a hydrogen atom or a monovalent organic group; R_{14}, R'$_{14}$ and R"$_{14}$ are are alkyl group, respectively; R_{15} and R_{16} are a hydrogen atom or an —COOR"', respectively; and R_{15} may be form a heterocyclic ring together with R_{16}, in which R"' is a monovalent organic group; and n is an integer 0 to 4,

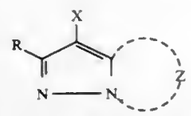
Formula [IIc]



wherein R_{17}, R_{18} and R_{19} are a hydrogen atom, a halogen atom, a hydroxy group, a nitro group, an alkyl group, an alkoxy group, an aryl group or an alkenyl group, respectively.

9. The silver halide photographic light-sensitive material of claim **1**, wherein said light-sensitive material comprises a silver halide emulsion layer comprising a magenta-dye forming coupler represented by the following formula [M-1]:

Formula [M-1]



wherein Z is a group of non-metallic atoms necessary for completing a nitrogen-containing heterocyclic ring; X is a hydrogen atom or a group capable of being split off upon reaction with the oxidized product of a color developing agent and R is a hydrogen atom or a substituent, provided that R is a substituent or said heterocyclic ring represented by Z has a substituent and at least one of said substituent contains an —$NHSO_2$— group.

4,820,615

PHOTOGRAPHIC SILVER HALIDE ELEMENT HAVING A PROTECTIVE LAYER COMPRISING BEADS OF RESINOUS MATERIAL AND WATER-INSOLUBLE WAX

Hubert Vandenabeele, Mortsel, and Jacques L. Vervecken, Berchem, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Division of Ser. No. 30,484, Mar. 27, 1987, Pat. No. 4,766,759. This application Aug. 4, 1988, Ser. No. 228,169

Claims priority, application European Pat. Off., Apr. 8, 1986, 86200592.3

Int. Cl.[4] **G03C** *1/76*

U.S. Cl. 430—531 **6 Claims**

1. Photographic element comprising a support and on one or on both sides of said support in the given order at least one photosensitive silver halide emulsion layer and at least one protective hydrophilic colloid layer comprising finely divided solid beads having an average size ranging from 0.5 to about 20 μm, wherein said beads comprise at least one photographically inert hydrophobic polymeric resinous material and, distributed throughout said resinous material, at least one water-insoluble wax, in a ratio by weight ranging from 10:0.1 to 10:5.

4,820,616

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Reinhart Matejec; Manfred Becker; Heinrich Odenwälder, all of Leverkusen, and Hans-Joerg Metz, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 11, 1987, Ser. No. 13,427

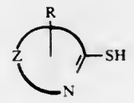
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1986, 3605713

Int. Cl.[4] **G03C** *1/06, 7/26*

U.S. Cl. 430—543 **5 Claims**

1. Color photographic recording material containing at least one silver halide emulsion layer containing binder and a non-diffusible compounds associated with this layer, which compound is capable of releasing a diffusible fogging or development accelerating compound as a result of a reaction with the oxidation product of a color developer compound, and said silver halide emulsion also containing a silver halide stabilizer, characterised in that the silver halide stabilizer corresponds to the following general formula I

I



wherein

Z denotes the atoms required for completing an oxazole or oxazine ring and

Y denotes a condensed aromatic ring system having at least one aromatic ring substituted with an acid group or Y denotes a substituent carrying an acid group.

4,820,617

HEAT-DEVELOPABLE PHOTOSENSITIVE MATERIAL

Tetuya Higuchi; Akira Tsukada, and Yukio Takegawa, all of Tokyo, Japan, assignors to Oriental Photo Industrial Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 857,410, Apr. 28, 1986, abandoned, which is a continuation of Ser. No. 618,606, Jun. 8, 1984, abandoned. This application Dec. 30, 1987, Ser. No. 142,285

Int. Cl.[4] **G03C** *1/34*

U.S. Cl. 430—570 **11 Claims**

1. In a heat-developable photosensitive material prepared by forming, on a support, a single layer or multiple layers of a heat-developable photosensitive element comprising at least (a) an oxidation-reduction image-forming component comprising a long-chain fatty acid silver salt and a reducing agent, (b) a photosensitive silver halide and/or a photosensitive silver halide-forming component, (c) a binder and (d) an antifogging agent, the improvement which comprises: said antifogging agent consists essentially of at least one member selected from the dicarboxylic acid compounds represented by the following general formula:

HOOC—R—COOH

wherein R represents an alkylene or alkenylene group of at least 4 carbon atoms, which group may be liner or branched, and the amount of said anitfogging agent (d) is from 0.1 mol to 2 mols per mol of said long-chain fatty acid silver salt.

4,820,618

METHOD OF FORMING A COLOR PROOF BY COLOR ELECTROSTATOGRAPHY

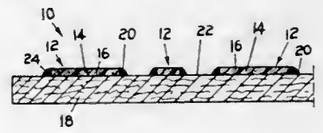
Terence M. Lawson, Aldgate, and Gregory A. Quilliam, Henley Beach, both of Australia, assignors to Stork Colorproofing B.V., Netherlands

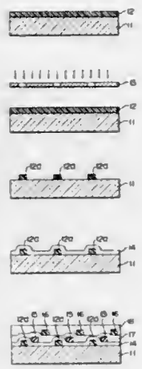
Filed Oct. 17, 1986, Ser. No. 920,510

Claims priority, application Australia, Oct. 24, 1985, PH03075

Int. Cl.[4] **G03G** *13/20, 13/22*

U.S. Cl. 430—45 **4 Claims**





1. The method of producing an electrostatographic color proof having substantially the same appearance as color prints printed by offset or gravure processes with regards to transparency and gloss of image areas relative to image-free areas, wherein said electrostatographic color proof comprises a receptor sheet containing on its surface image-free areas and image areas, said image areas consisting of color deposits in the form of at least one color layer, said method comprising the steps of:

forming an image of electroscopic marking particles of appropriate color consisting of colorant and a polymeric binder for same to form said color deposit on said electrostatographic recording member;

transferring said deposit of said appropriate color for a period of time sufficient to solvate from said electrostatographic recording member onto the receptor sheet, forming a continuum by applying a solvent to the surface of said receptor sheet, said binder in said electroscopic marking particles forming said color deposit thereon thereby to transparentize and increase the gloss of said color deposit without affecting the gloss of said receptor sheet in the image-free areas; and

removing said solvent from said receptor sheet.

4,820,619

PHOTOSENSITIVE RESIN COMPOSITION AND METHOD OF MANUFACTURING COLOR FILTER USING THE SAME

Shinichi Sanada, Yokohama, and Masataka Miyamura, Kamakura, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 21, 1986, Ser. No. 933,215

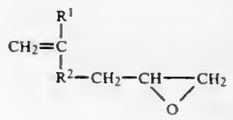
Claims priority, application Japan, Nov. 29, 1985, 60-267220

Int. Cl.[4] **G03C** *5/24*

U.S. Cl. 430—197 **9 Claims**

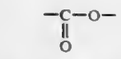
1. A photosensitive resin composition consisting essentially of:

at least one copolymer consisting essentially of at least one glycidyl compound represented by the following general formula



where

R^1 is hydrogen atom or methyl group, and R^2 is



or —O—, with 5 to 80 mol % of at least one comonomer selected from the group consisting of esters and amides of methacrylic and acrylic acids each having a quaternary ammonium salt structure; and

a photosensitizer comprising an aromatic azide compound in an amount effective to sensitize said copolymer.

4,820,620

SUPERSENSITIZATION OF AND REDUCTION OF DARK DECAY RATE IN PHOTOCONDUCTIVE FILMS

Donald J. Carolla, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 887,074, Jul. 17, 1986, abandoned. This application Nov. 2, 1987, Ser. No. 115,695

Int. Cl.[4] **G03G** *5/04*

U.S. Cl. 430—84 **20 Claims**

1. A supersensitized photoconductive film comprising a dispersion of a resinous binder, at least one photosensitive material, and an effective amount of at least one organic acid which has at least one carboxyl group and at least one hydroxyl group, wherein said organic acid is substantially not copolymerized with said binder resin.

4,820,621

DEVELOPER SOLUTION FOR POSITIVE-WORKING PHOTORESIST COMPOSITIONS COMPRISING A BASE AND A NON-IONIC SURFACTANT

Hatsuyuki Tanka; Yoshiyuki Sato, both of Samukawa; Hidekatsu Kohara, Chigasaki, and Toshimasa Nakayama, Hiratsuka, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Filed Jun. 26, 1987, Ser. No. 67,312

Claims priority, application Japan, Jul. 18, 1986, 61-167897

Int. Cl.[4] **G03C** *5/18;* **G03F** *7/26*

U.S. Cl. 430—331 **6 Claims**

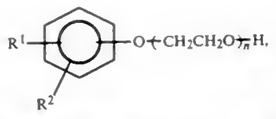
1. An aqueous developer solution for a positive working photoresist composition which comprises:

(a) water or a mixture of water and a minor amount of a water-miscible organic solvent;

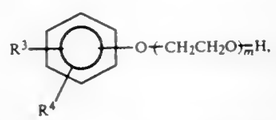
(b) a water-soluble organic basic compound dissolved in component (a); and

(c) a non-ionic surface active agent which is polyoxyethylene alkyl-substituted phenylether represented by the general formula

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in which R^1 is an alkyl group having 5 to 15 carbon atoms, R^2 is a hydrogen atom or an alkyl group having 1 to 15 carbon atoms and n is a positive integer in the range from 5 to 60, or a polyoxyethylene alkyl-substituted or unsubstituted naphthyl ether represented by the general formula



in which R^3 and R^4 are each, independently from the other, a hydrogen atom or an alkyl group having 1 to 15 carbon atoms and m is a positive integer in the range from 5 to 60, dissolved in component (a) in the range from 50–5000 ppm by weight.

4,820,622

HEAT DEVELOPMENT IMAGE FORMING METHOD

Hiroyuki Hirai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 8, 1988, Ser. No. 179,448
Claims priority, application Japan, Apr. 8, 1987, 62-86123
Int. Cl.[4] G03C *5/54*
U.S. Cl. 430—351 **7 Claims**

1. A method for forming an image, comprising the steps of

imagewise exposing a heat-developable photosensitive material comprising at least (a) a photosensitive silver halide, (b) a reducing agent or a precursor thereof, (c) a dye-providing substance which forms or releases a diffusible dye in proportion or counter-proportion to the reduction of the silver halide into silver, and (d) a binder on a support,

during or after the imagewise exposure of the photosensitive material, maintaining the photosensitive material in such conditions for a predetermined time that the reaction between the silver halide and the reducing agent preferentially takes place rather than the reaction of forming or releasing a diffusible dye, and

thereafter heat developing the exposed material in the presence of a base and/or a base precursor to imagewise produce a diffusible dye.

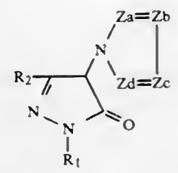
4,820,623

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Toshio Koshimizu, and Keiji Mihayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 3, 1988, Ser. No. 151,848
Claims priority, application Japan, Feb. 4, 1987, 62-24377
Int. Cl.[4] G03C *1/08, 5/24, 7/26, 7/32*
U.S. Cl. 430—376 **17 Claims**

1. A method for processing a silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer and containing a magenta dye forming coupler represented by formula (I) shown below and a compound represented by formula (II) shown below in the same layer, wherein the silver halide color photographic material is subjected to color development using a replenisher for a color developing solution, whose concentration of bromide is not more than 3×10^{-3} mol per liter and an amount of the replenisher for a color developing solution is not more than 900 ml per m^2 of the silver halide color photographic material, wherein formula (I) is represented by



(I)

wherein R_1 represents an aromatic group, an aliphatic group or a heterocyclic group; R_2 represents a substituent; Za, Zb, Zc and Zd, which may be the same or different, each represents an unsubstituted methine group, a substituted methine group or —N═; and formula (II) is represented by

$$(R'—COO^-)_n M^{n+} \quad \text{(II)}$$

wherein R' represents a substituent which imparts a diffusion-resistant property to the compound represented by formula (II); M^{n+} represents a hydrogen ion, a metal ion, or an ammonium ion; and n represents an integer from 1 to 4.

4,820,624

CORNER DEVELOPMENT TYPE SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Kazunori Hasebe; Masahiro Asami: Naoto Ohshima; Keisuke Shiba, and Toshihiro Nishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1987, Ser. No. 138,405
Claims priority, application Japan, Dec. 26, 1986, 61-311131; Apr. 8, 1987, 62-86163
Int. Cl.[4] G03C *1/02, 1/12, 1/19*
U.S. Cl. 430—567 **13 Claims**



1. A corner development type silver halide photographic emulsion wherein the silver halide crystals in the silver halide emulsion are cubic or tetradecahedral grains having at least substantial (100) planes and the emulsion is controlled so that at least 70% of developed silver halide crystals (grains), which are observed on applying a light exposure of 1/50 second to the emulsion under the light-exposure condition corresponding to (maximum density—minimum density)×¾ of the silver image in the characteristic curve of the emulsion obtained by the developer, developing under the development condition which are used for processing a photographic light-sensitive material formed by coating the emulsion on a support, and stopping the development with an aqueous solution of 5% glacial acetic acid just after the initiation of the development, are developed at one or more corners of the cubic or tetradecahedral crystals or at the vicinity of at least one of the corners.

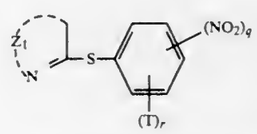
4,820,625

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Naomi Saeki; Nobuaki Inoue; Toshinao Ukai, and Yuji Mihara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

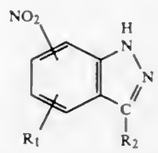
Filed Sep. 21, 1987, Ser. No. 98,660
Claims priority, application Japan, Sep. 19, 1986, 61-221168; Sep. 19, 1986, 61-221171
Int. Cl.[4] G03C *1/485*
U.S. Cl. 430—596 **15 Claims**

1. A direct positive silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer comprising a prefogged direct-positive silver halide emulsion, said emulsion layer or a hydrophilic colloid layer adjacent to said emulsion layer containing at least one compound represented by the following general formula (I):



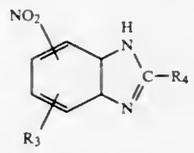
(I)

wherein Z_1 represents a group of nonmetallic atoms necessary to complete a nitrogen-containing hetero ring; T represents an alkyl group, a cycloalkyl group, an alkenyl group, a halogen atom, a cyano group, a trifluoromethyl group, an alkoxy group, an aryloxy group, a hydroxy group, an alkoxycarbonyl group, a carboxyl group, a carbamoyl group, a sulfamoyl group, an aryl group, an acylamino group, a sulfonamido group, a sulfo group, or a benzocondensed ring, each of which is or is not further substituted; q represents 1, 2, or 3; and r represents 0, 1, or 2, and when said r is 2, two T's may be the same or different, wherein at least one compound represented by the following general formulae (II) or (III) is further contained in said silver halide emulsion layer or said hydrophilic colloid layer adjacent thereto:



(II)

wherein R_1 represents a hydrogen atom, an alkyl group, a halogen atom —SO_3M, or —COOM (wherein M represents a hydrogen atom, an alkali metal ion or ammonium ion); and R_2 represents a hydrogen atom or a lower alkyl group:



(III)

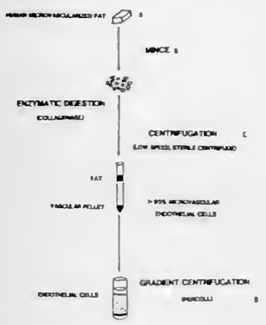
wherein R_3 represents a hydrogen atom, an alkyl group, a halogen atom, —SO_3M, or —COOM (wherein M represents a hydrogen atom, an alkali metal ion or an ammonium ion); and R_4 represents a hydrogen atom or an alkyl group.

4,820,626

METHOD OF TREATING A SYNTHETIC OR NATURALLY OCCURING SURFACE WITH MICROVASCULAR ENDOTHELIAL CELLS, AND THE TREATED SURFACE ITSELF

Stuart K. Williams, Drexel Hill, and Bruce E. Jarrell, Philadelphia, both of Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Filed Jun. 6, 1985, Ser. No. 742,086
Int. Cl.[4] A01N *01/02;* A61K *49/00, 35/44;* C12N *05/00*
U.S. Cl. 435—1 **38 Claims**



1. A method of treating an implant intended for implantation in a human patient, comprising:

obtaining human microvascular rich tissue from that patient;

separating microvascular endothelial cells from said patient's tissue; applying said separated uncultured microvascular endothelial cells onto said implant to provide at least about 50% confluence of said cells on the surface of said implant to be treated; and

implanting said implant into a patient without culturing.

4,820,627

METHOD OF PREPARING PARTICLES SUITABLE FOR TABLETTING INTO DIAGNOSTIC REAGENTS

John K. McGeehan, Woodbury, N.J., assignor to EM Diagnostic Systems, Inc., Gibbstown, N.J.

Filed Mar. 24, 1986, Ser. No. 842,968
Int. Cl.[4] C12Q *1/00*
U.S. Cl. 435—4 **42 Claims**

1. A process for the preparation of a completely water-soluble, solid, labile biochemical-containing diagnostic reagent, comprising the steps of:

(a) providing an aqueous solution of labile biochemical;

(b) providing particulate, inert, completely water-soluble solid bulking agent;

(c) atomizing and uniformly spraying said aqueous solution of labile biochemical in the form of fine droplets, in a small amount, over an extended time period, onto said particulate bulking agent, the latter undergoing continuous agitation while in contact with a surrounding gaseous medium, and continuously evaporating water from said aqueous solution of labile biochemical while incorporating said labile biochemical on said particulate bulking agent under conditions effective to provide uniform distribution of said labile biochemical on said particulate bulking agent and to prevent substantial agglomeration of said bulking agent or build-up of substantial wetness in said bulking agent;

(d) drying resultant labile biochemical-coated bulking agent to the desired dryness; and

(e) then forming resultant dried labile biochemical-coated bulking agent into a tablet suitable for a diagnostic test reagent, said tablet having a predetermined rate of dissolution.

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4,820,628

FETAL LUNG MATURITY TEST EMPLOYING LAMELLAR BODY SOLUBILIZATION

Stephen L. Weitz, Portland, Oreg., assignor to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University, Portland, Oreg.

Filed May 30, 1986, Ser. No. 868,452
Int. Cl.⁴ C12Q *1/00*
U.S. Cl. 435—4 **14 Claims**

1. A method for assaying fetal or neonatal lung maturity which comprises the steps of (a) measuring at least one physical property of a fluid containing the lamellar bodies present in a defined amount of a mother's amniotic fluid, which property is one which is affected by the concentration of particulate bodies which are suspended in a liquid; (b) destroying partially or totally the lamellar body structure of the lamellar bodies in that liquid; and (c) measuring the change or rate of change in that physical property of the liquid resulting from such partial or total destruction of the lamellar body structure said change or rate of change being an indication of said lung maturity.

4,820,629

IMMUNOASSAY FOR ANTIBODIES TO PSEUDORABIES VIRUS USING MEDIUM-ELABORATED VIRAL ANTIGENIC FACTOR

Kenneth B. Platt, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 499,204, May 31, 1983, abandoned. This application Oct. 22, 1985, Ser. No. 790,130
Int. Cl.⁴ C12Q *1/70*; G01N *33/535*
U.S. Cl. 435—5 **1 Claim**

1. The method for testing swine serum to determine the presence of antibodies to pseudorabies virus as distinguished from antibodies to lectin-binding pseudorabies glycoproteins in which an enzyme-linked immunosorbent assay is is performed on the swine serum using a pseudorabies virus antigen preparation, wherein the improvement comprises employing as said pseudorabies antigen preparation a solution containing a medium-elaborated antigenic factor which is antigenically distinct from the lectin-binding glycoproteins of pseudorabies virus, said medium-elaborated antigenic factor solution having been prepared by the following steps:

(a) growing mammalian kidney cells adapted for in vitro propagation to produce a cell culture;

(b) infecting the cell culture with replicable pseudorabies virus using about 3 to 12 virus per cell;

(c) replicating the pseudorabies virus in the infected cells in contact with an aqueous culture medium without changing the medium, said medium being free of fetal calf serum;

(d) interrupting the virus replication at an intermediate time in the replication cycle of from about 4 to 6 hours after the start of the replication when the medium-elaborated antigenic factor is present in the medium in essentially antigenically pure form; and

(e) separating the culture medium from the infected cells to obtain said aqueous solution of the medium-elaborated antigenic factor.

4,820,630

ASSAY FOR NUCLEIC ACID SEQUENCES, PARTICULARLY GENETIC LESIONS, USING INTERACTIVE LABELS

Floyd Taub, Rockville, Md., assignor to Digene Diagnostics, Incorporated, Md.

Filed Nov. 23, 1984, Ser. No. 674,190
Int. Cl.⁴ C12Q *1/68, 1/70, 1/28, 1/32*
U.S. Cl. 435—5 **25 Claims**

1. A method of detecting the presence or absence of a site for a restriction endonuclease enzyme, which comprises:

(a) providing a sample nucleic acid to be detected for a site for a restriction endonuclease enzyme;

(b) exposing said sample nucleic acid to a restriction endonuclease enzyme;

(c) stably hybridizing said sample nucleic acid with

(i) a first labeled nucleic acid probe capable of stably hybridizing to a region 5' to said site to be detected, and

(ii) a second labeled nucleic acid probe capable of stably hybridizing to a region 3' to said site to be detected,

the labels in said first and second nucleic acids probes together constituting a signal-generating system wherein said labels are in sufficient physical proximity so as to be capable of interacting with each other to yield a detectable signal when said site is absent but are in insufficient physical proximity so as to be less capable of yielding a detectable signal when said site is present; and

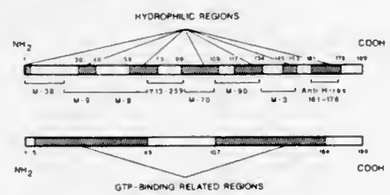
(d) detecting said signal generating system, to thereby detect the presence or absence of said site.

4,820,631

DELETION MUTANTS AND MONOCLONAL ANTIBODIES AGAINST RAS PROTEINS

Juan C. Lacal, Bethesda, Md., and Stuart A. Aaronson, Vienna, Va., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jul. 30, 1986, Ser. No. 890,510
Int. Cl.⁴ C12Q *1/68*; G01N *33/53, 33/577*; C12N *5/00*
U.S. Cl. 435—6 **7 Claims**



1. Monoclonal antibodies which recognize specific regions of ras p21 molecule wherein said regions are involved in GTP-binding, said monoclonal antibodies being selected from the group consisting of M38 (ATTC HB 9158) which recognizes amino acid sequence comprising residues 1–23; M8 (ATCC HB 9158) which recognizes amino acid sequence comprising residues 24–69; M70 (ATCC HB 9158) which recognizes amino acid sequence comprising residues 90–106; M90 (ATCC HB 9158) which recognizes amino acid sequence comprising residues 107–130; M30 (ATCC HB 9158) which recognizes amino acid sequence between residues 131–152; and a combination thereof.

4,820,632

AGENT AND PROCESS FOR THE DETECTION OF REDOX SYSTEMS

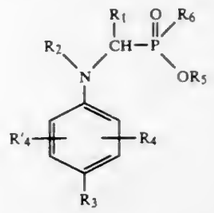
Günter Frey, Ellerstadt, and Gerd Zimmermann, Mannheim; both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,353
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433946
Int. Cl.⁴ G01N *21/78*
U.S. Cl. 435—7 **8 Claims**

1. A composition for the detection of hydrogen peroxide in the presence of peroxidase or peroxidatively reactive substances, wherein an aniline derivative and an oxidizable coupling compound are oxidatively coupled to form a colored compound, comprising,

(a) said oxidizable coupling compound and

(b) said aniline derivative of the formula



wherein R_1 is hydrogen, C_1–C_6 alkyl, C_6–C_{10} aryl or C_6–C_{10} aryl substituted by C_1–C_6 alkyl,

R_2 is hydrogen, C_1–C_6 alkyl or C_1–C_6 alkyl substituted by hydroxyl, amino, carboxyl, lower alkoxycarbonyl, lower alkanoylamido, C_6–C_{10} aryl substituted by C_1–C_6 alkyl or C_6–C_{10} aryl or by a group of the structure:



in which R_5 is hydrogen or C_1–C_6 alkyl and R_6 is hydroxyl, C_1–C_6 alkoxy, C_1–C_6 alkyl, C_6–C_{10} aryl or C_6–C_{10} aryl substituted by C_1–C_6 alkyl;

R_3 is hydrogen, fluorine, chlorine, bromine, iodine or carboxyl;

R_4 and R'_4 which can be the same or different, are hydrogen, fluorine, chlorine, bromine, iodine, carboxyl, C_1–C_6 alkoxy or C_1–C_6 alkyl;

and the salts thereof with acids and bases.

4,820,633

PROCESS FOR PRODUCTION OF AN IMMUNE REACTIVE, POROUS CARRIER MATERIAL FOR HETEROGENEOUS IMMUNOLOGICAL ANALYSIS

Uwe Herrmann, Kirchheim, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 8, 1987, Ser. No. 59,066
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620653
Int. Cl.⁴ G01N *33/543, 33/545*
U.S. Cl. 435—7 **19 Claims**

17. Method for carrying out heterogeneous immunological analysis comprising contacting a liquid sample containing both an analyte to be determined and a labeled binder which specifically binds to said analyte to an immune carrier, said carrier containing a receptor which binds said labelled binder impregnated therein, wherein said receptor has been impregnated into said carrier by contacting said receptor with a receptor precipitating immune reactive component and said carrier to precipitate said receptor thereon, wherein said receptor and said receptor precipitating immune reactive component are contacted to said carrier in a molar ratio greater than the Heidelberger maximum, to complex free labelled binder to said receptor impregnated in said carrier, said contacting taking place under conditions favoring complexing a measurable component of said sample to said carrier and measuring said component in either said liquid or on said carrier as a direct or indirect measurement of said analyte.

4,820,634

IMMUNOASSAY METHOD AND IMMUNOREACTIVE CELL REAGENT

Fumio Watanabe, Hachioji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 521,073, Aug. 8, 1983, abandoned. This application Jun. 15, 1987, Ser. No. 62,383
Claims priority, application Japan, Aug. 11, 1982, 57-139454; Nov. 5, 1982, 57-195116; Nov. 5, 1982, 195117
Int. Cl.⁴ G01N *33/53*
U.S. Cl. 435—7 **9 Claims**

1. An immunoassay method for quantitatively determining an antigen or antibody in a sample, the method comprising the steps of:

(1) mixing a sample containing complement and antigen or antibody to be quantitatively determined, together with an antibody or antigen which specifically interacts with the antigen or antibody to be determined to consume a portion of the complement;

(2) mixing a resultant mixture of step (1) with a reagent comprising (a) cells having cell membranes of a specific antigen, said cell membranes being capable ofbeing lysed by complement upon activation thereof; (b) a specific antibody which is bound on outer surfaces of the cell membranes and which forms complex with the specific antigen of the cell membranes, and (c) quantitatively determinable substance contained in said cells, thereby lysing the cell membranes of said cells by a remaining portion of the complement and liberating the determinable substance from said cells; and

(3) determining the amount of the determinable substance which was liberated from said cells as an indication of an amount of the antigen or antibody in the sample to be quantitatively determined.

4,820,635

KIT FOR ASSAYING ACTIVATION OF TERMINAL COMPLEMENT CASCADE

Martin E. Sanders, Gaithersburg; Keith A. Joiner, Rockville; Michael M. Frank, Bethesda, and Carl H. Hammer, Gaithersburg, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 769,684, Aug. 27, 1985, Pat. No. 4,722,890. This application Jul. 31, 1987, Ser. No. 79,925
Int. Cl.⁴ G01N *33/53*
U.S. Cl. 435—7 **2 Claims**

1. A kit for assaying activation of terminal complement cascade comprising a plurality of containers containing a first antibody having specificity for poly C9 neoantigen, a second antibody different from the first antibody having a specificity for a constituent of terminal complement cascade, a third antibody which recognizes the second antibody, a substrate splitting enzyme, a substrate for said enzyme which produces a color reaction when split and SCb-9 standard, microtiter plate, micropipettes and instructions for performing the assay.

2. A kit for assaying activation of terminal complement cascade comprising a plurality of containers containing a first antibody having specificity for poly C9 neoantigen, a second ligand-conjugated antibody different from the first antibody having a specificity for constituent of terminal complement cascade, a ligand-conjugated substrate splitting enzyme, a substrate for said enzyme which produces a color reaction when split, and SCb-9 standard, microtiter plate, micropipettes, and instructions for performing the assay.

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4,820,636

ELECTROCHEMICAL ASSAY FOR CIS-DIOLS

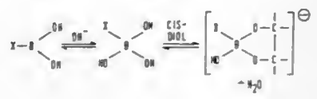
Hugh A. O. Hill, Oxford, and Monika J. Green, Leckhampstead, both of Great Britain, assignors to Medisense, Inc., Cambridge, Mass.

Filed Feb. 21, 1986, Ser. No. 832,452

Claims priority, application United Kingdom, Feb. 21, 1985, 8504521

Int. Cl.[4] C12Q *1/54, 1/48;* G01N *33/72;* C07F *9/02*

U.S. Cl. 435—14 6 Claims



1. A method of electrochemical assay for cis-diol in a sample, which assay includes the steps of:

(a) providing a measured amount of metallocene boronic acid compound which is an electroactive mediator capable of mediating an enzyme-catalyzed reation and which is able to bind the cis-diol to modify the mediating capability of said metallocene boronic acid compound;

(b) treating the sample with a known excess of said metallocene boronic acid compound to bind to any cis-diol in said sample and to leave unbound some of said metallocene boronic acid compound;

(c) providing substrate and enzyme for said enzyme-catalysed reaction;

(d) electrochemically determining unbound metallocene boronic acid compound by admixing said treated sample with said substrate and said enzyme, and monitoring electrical charge passed by said unbound metallocene boronic acid compound acting as a mediator; and

(e) determining said cis-diol by derivation from said determination of said unbound metallocene boronic acid compound.

4,820,637

DETECTION OF FUNGI AND/OR ALGAE WITH STILBENE HAVING AT LEAST 4 SULPHO GROUPS

Herbert A. Koch, Düsseldorf, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 12, 1987, Ser. No. 25,133

Claims priority, application Switzerland, Mar. 21, 1986, 1141/86

Int. Cl.[4] C12Q *1/02*

U.S. Cl. 435—29 11 Claims

1. A method for the detection of fungi or algae or both, comprising treating an animal or human tissue or body fluid with an optical stilbene whitening agent having at least 4 sulpho groups or a salt thereof and examining the animal or human tissue or body fluid using a fluorescence microscope.

4,820,638

NOVEL ALPHA INTERFERON SPECIES PRODUCED BY RECOMBINANT MEANS

Peter Swetly; Eva Dworkin-Rastl, and Peter Meindl, all of Vienna, Austria, assignors to Dr. Karl Thomae GmbH, Fed. Rep. of Germany

Filed May 19, 1983, Ser. No. 495,944

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220116

Int. Cl.[4] C12N *1/20, 15/00;* C12P *21/00, 21/02*

U.S. Cl. 435—68 8 Claims

1. A recombinant DNA (rDNA) molecule comprising a genetic sequence coding for a derivative of human alpha interferon, wherein said derivative comprises the following polypeptide formula:

cys—asp—leu—pro—gln—thr—his—ser—leu—gly—ser—
arg—arg—thr—leu—met—leu—leu—ala—gln—met—arg—
arg—ile—ser—leu—phe—ser—cys—leu—lys—asp—arg—
arg—asp—phe—gly—phe—pro—gln—glu—glu—phe—gly—
asn—gln—phe—gln—lys—ala—glu—thr—ile—pro—val—
leu—his—glu—met—ile—gln—gln—ile—phe—asn—leu—
phe—ser—thr—lys—asp—ser—ser—ala—ala—trp—asp—
glu—thr—leu—leu—asp—lys—phe—tyr—thr—glu—leu—
tyr—gln—gln—leu—asn—asp—leu—glu—ala—cys—val—
ile—gln—gly—val—gly—val—thr—glu—thr—pro—leu—
met—lys—glu—asp—ser—ile—leu—ala—val—arg—lys—
tyr—phe—gln—arg—ile—thr—leu—tyr—leu—lys—glu—
lys—lys—tyr—ser—pro—cys—ala—trp—glu—val—val—
arg—ala—glu—ile—met—arg—ser—phe—ser—leu—ser—
thr—asn—leu—gln—glu—ser—leu—arg—ser—lys—glu.

4,820,639

PROCESS FOR ENHANCING TRANSLATIONAL EFFICIENCY OF EUKARYOTIC MRNA

Lee Gehrke, Framingham, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 4, 1985, Ser. No. 804,672

Int. Cl.[4] C12P *21/00, 19/34;* C12N *15/00*

U.S. Cl. 435—68 19 Claims

1. A process for increasing protein production from a eukaryotic nucleotide sequence comprising

(a) selecting a guanine-deficient 5' non-translated nucleotide sequence from a eukaryotic viral protein gene,

(b) selecting a nucleotide sequence encoding a protein to be expressed, wherein the selected sequence is non-cognate to the protein sequence from which the 5' non-translated sequence was isolated and the 5' non-translated sequence does not form stable structure with itself or the protein encoding sequence due to the relatively low incidence of guanosine-cytosine base pair formation within the 5' non-translated sequence and between the 5' non-translated sequence and the protein encoding sequence,

(c) joining said non-translated nucleotide sequence to the 5' terminus of the nucleotide sequence encoding the protein to be produced to yield a chimeric protein-encoding nucleotide sequence,

(d) expressing the protein, and

(e) selecting the chimeric sequences wherein the chimeric mRNA is translated more efficiently than the protein encoding sequence in combination with its cognate 5' non-translated leader sequence, wherein the rate of translation is measured as the rate of initiation of protein synthesis and the increase in translational efficiency is not dependent on the presence of a Shine-Delgarno sequence in the 5' non-translated sequence.

4,820,640

METHOD OF PRODUCING DEXTRANASE

Donal F. Day, and David W. Koenig, both of Baton Rouge, La., assignors to Louisiana State University and Agriculture and Mechanical College, Batoo Rouge, La.

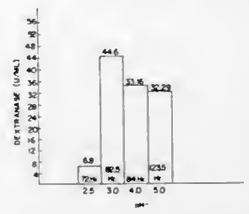
Filed Mar. 10, 1986, Ser. No. 837,839

Int. Cl.[4] C12N *9/46, 1/16;* C12R *1/645*

U.S. Cl. 435—211 6 Claims

1. A method for producing an extracellular dextranase

which comprises culturing a yeast of the genus Lipomyces at a controlled pH in the range of about 2.5 to 4.0 in the presence



of an assimilable carbon source and separating the vegetative cells to produce a dextranase-containing culture supernate.

4,820,641

MONOCLONAL ANTIBODY CAPABLE OF SPECIFICALLY DISTINGUISHING HUMAN HEPATO-CARCINOMA CELLS

Toshihiro Nakanishi, Ibaraki; Yoshiaki Fukuda, Takatsuki; Kenju Miura, Kyoto, and Hiroshi Nakazato, Ibaraki, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Jun. 27, 1985, Ser. No. 749,564

Claims priority, application Japan, Jun. 29, 1984, 59-134556

Int. Cl.[4] C12N *5/00, 12/00;* C07K *15/04*

U.S. Cl. 435—240.27 7 Claims

1. A monoclonal antibody belonging to sub-class IgG_{2a} which is produced by hybridoma cell line HY-2014 and specifically binds to human hepato-carcinoma cells.

4,820,642

AMPLIFIED EXPRESSION VECTOR

Jeffrey C. Edman, Davis; William J. Rutter, San Francisco; Robert A. Hallewell, San Francisco; Pablo D. T. Valenzuela, San Francisco, and Howard M. Goodman, San Francisco, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 4, 1983, Ser. No. 481,879

Int. Cl.[4] C12N *1/20, 15/00, 1/00;* C12P *21/00;* C07H *21/04*

U.S. Cl. 435—252.33 6 Claims

1. A hybrid plasmid useful for amplified expression of a foreign DNA sequence, comprising a β-lactamase gene having said foreign DNA sequence inserted into said β-lactamase gene.

wherein said β-lactamase gene is linked to a β-lactamase promoter and a trp promoter located upstream from said β-lactamase promoter,

wherein said trp promoter overrides said βlactamase promoter in effecting expression of said foreign DNA sequence.

4,820,643

PROCESS FOR DETERMINING THE ACTIVITY OF A PALLADIUM-TIN CATALYST

William J. Amelio, Austin, Tex.; Kenneth R. Czarnecki, Vestal, N.Y.; Gary K. Lemon, Endwell, N.Y.; Voya Markovich, Endwell, N.Y.; Carlos J. Sambucetti, Croton-on-Hudson, N.Y., and Richard S. Zarr, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 837,917, Mar. 10, 1986, abandoned.

This application Feb. 17, 1988, Ser. No. 161,233

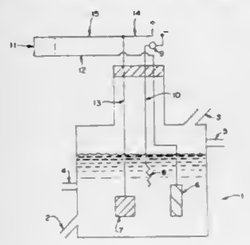
Int. Cl.[4] G01N *21/00, 33/20*

U.S. Cl. 436—37 14 Claims

1. A method for characterizing as active or nonactive a palladium-tin colloidal catalyst for subsequent plating thereon which comprises:

determining the cyclic voltammetric Sn—Pd colloid peak of a dried sample of said catalyst;

comparing the cyclic voltammetric Sn—Pd colloid peak to the cyclic voltammertric Sn—Pd colloid peak of an active reference palladium-tin colloid catalyst known to be active, determining the optical density of a coating of a sample of said catalyst on a glass substrate and comparing it to reference optical density of a reference palladium-tin colloid catalyst, determining the time for electrolessly plating a metal onto a glass substrate catalysed with a sample of the catalyst and comparing the time to reference time of a reference palladium-tin colloid catalyst; and



determining the thickness of the coating on glass and comparing it to a reference coating of a reference palladium-tin colloid catalyst; and a catalyst is determined to be active when the following conditions are obtained; said Sn—Pd colloid peak must be at least equal to that of the said reference to be considered active; the time for electrolessly plating be at least as fast as that of the said reference to be considered active; and the thickness being at least as thick as that for the said reference to be considered active; and said optical density is such as to provide light transmission of about 40% to about 72% to be considered active.

4,820,644

PROCESS FOR THE PREPARATION OF AN IMMUNE-REACTIVE POROUS CARRIER MATERIAL

Rainer Schäfer, Seehaupt, and Helmut Jering, Tutzing, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Dec. 10, 1985, Ser. No. 807,454

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446636

Int. Cl.[4] G01N *33/543, 33/537, 33/539*

U.S. Cl. 436—518 17 Claims

1. In a process for the preparation of a porous carrier material containing an immuno-reactive first component by application to said carrier material of a solution of said first component and a solution of a second component which immuno-precipitates said first component without perturbing the immuno-reactivity of said first component, and subsequent drying of the carrier material impregnated with said immuno-precipitated first component, wherein the improvement comprises the steps of impregnating said carrier material with a solution of said first and second components plus an inhibitor of the immuno-precipitation reaction, and initiating said immuno-precipitation by removal of said inhibitor or by neutralization of its inhibiting action.

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4,820,645
TESTING POLYELECTROLYTES
John R. Field; David Farrar, and Peter Flesher, all of West Yorkshire, United Kingdom, assignors to Allied Colloids, Ltd., United Kingdom
Filed Apr. 23, 1986, Ser. No. 855,518
Claims priority, application United Kingdom, Apr. 25, 1985, 8510496; Jul. 3, 1985, 8516869
Int. Cl.[4] G01N *27/48*
U.S. Cl. 436—55 13 Claims

1. A method of analyzing a polyelectrolyte to estimate the amount of its chain branching and cross-linkig comprising measuring the ionic value Y of an aqueous solution of a sample of the polyelectrolyte before shearing the polyelectrolyte, shearing the solution measuring the ionic value X of the sheared polyelectrolyte solution and determining the difference between X and Y.

4,820,646
FECAL OCCULT BLOOD TEST METHOD
Paul J. Lawrence, Campbell, Calif., assignor to Litmus Concepts, Inc., Santa Clara, Calif.
Continuation of Ser. No. 869,573, Jun. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 680,357, Dec. 11, 1984, Pat. No. 4,615,982, and a continuation-in-part of Ser. No. 2,446, Dec. 10, 1985. This application Mar. 28, 1988, Ser. No. 174,108
Int. Cl.[4] G01N *21/78, 33/72*
U.S. Cl. 436—66 2 Claims

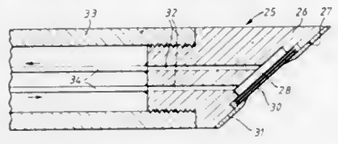
1. In a method for detecting the presence of a peroxidatively active substance in a sample suspected of containing such a substance wherein the sample is contacted with a chromogen and a hydroperoxide, the improvement wherein the chromogen is a mixture of guaiac and 2,2'-azino-di-(3-ethylbenzyl) thiazoline sulfonic acid (ABTS) in a weight ratio of guaiac to ABTS in the range of 1:5 to 5:1.

4,820,647
METHOD FOR DETECTING A METAL ION IN AN AQUEOUS ENVIRONMENT
Ian Gibbons, Menlo Park, Calif., assignor to Biotrack, Inc., Mountain View, Calif.
Filed Dec. 3, 1986, Ser. No. 937,307
Int. Cl.[4] G01N *21/78, 33/20, 33/50*
U.S. Cl. 436—79 9 Claims

1. A method for detecting the presence of a metal ion in an aqueous environment, comprising:
contacting a micelle-forming material, a hydrophobic or amphiphilic dye, and a hydrophilic ionophore capable of selectively binding said ion, wherein said hydrophobic ionophore is a molecule separate from said dye, with a sample of said aqueous environment to form a micelle-containing mixture, and
detecting a change in absorbance of light by said dye in said mixture, wherein said change in absorbance is dependent on binding of said hydrophobic ionophore to said ion.

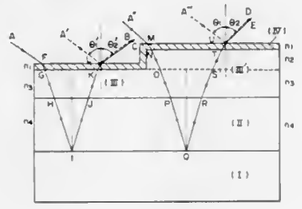
4,820,648
METHODS FOR USE IN THE MASS ANALYSIS OF CHEMICAL SAMPLES
Richard M. Caprioli, Bellaire, Tex., and John S. Cottrell, Manchester, England, assignors to Spectros Limited, United Kingdom
Filed Aug. 21, 1985, Ser. No. 767,820
Int. Cl.[4] G01N *1/28, 24/00*
U.S. Cl. 436—89 2 Claims

1. A method for the continous analysis of a sample of a boipolymer comprising reacting a biopolymer sample in a carrier liquid with a substance which sequentially removes terminal units of the biopolymer and forms reaction products, defining a surface and locating said surface in a stationary position in a vacuum environment, causing a supply of liquid containing said reaction products to flow continuously from a high pressure region to said surface and be deposited thereon, ionising the deposited reaction products by causing a beam of particles or of radiation to impinge thereon, and mass analysing



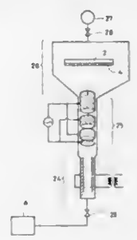
the ions produced by the ionisation thereby identifying the terminal units sequentially removed from the biopolymer by determining the reduction with time of the molecular mass of the biopolymer as the terminal units are removed.

4,820,649
METHOD AND KIT HAVING LAYERED DEVICE FOR DETECTING BIOLOGICAL COMPONENT BY INTERFERENCE COLOR
Takeyuki Kawaguchi, Hachioji, and Takashi Shiro, Hino, both of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Sep. 22, 1987, Ser. No. 99,906
Int. Cl.[4] G01N *33/53, 33/553*
U.S. Cl. 436—501 28 Claims



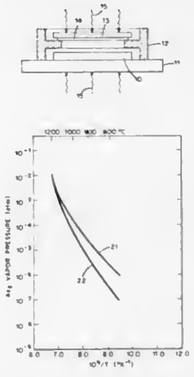
1. A method for detecting a component of a biological system, which comprises providing a biological component detecting device composed of a light reflecting substrate (I), made of a metal or metal alloy itself or having a surface of a metal or metal alloy, and being substantially free from diffused reflection, a light interference layer (II) formed on the substrate (I), and a layer (III) of a substance for detecting said biological component provided at least in a region on the layer (II), wherein the light interference layer (a) does not have substantial reflecting characteristics to visible light, namely a wavelength of 300 to 800 nm, (b) has a thickness and refractive index controlled such that an increase in the thickness of the layer (III) appears as a change in interference color, and (c) has a surface with sufficient affinity for the layer (III); contacting said device with a solution containing the biological component to be detected; then forming a light-transmitting reflecting layer (IV) on its surface, wherein said layer (IV) is a layer of a metal; and thereafter detecting the color of light interference or the brightness of the reflected light on the surface of the device.

4,820,650
INTRODUCING LATTICE DEFECT WITH ICE PARTICLES IN SEMICONDUCTOR WAFER
Akemi Nagae; Shinichi Satou; Takaaki Fukumoto, and Toshiaki Ohmori, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 16, 1987, Ser. No. 121,357
Claims priority, application Japan, Nov. 14, 1986, 61-272153; Mar. 30, 1987, 62-79123
Int. Cl.[4] H01L *21/463*
U.S. Cl. 437—10 7 Claims



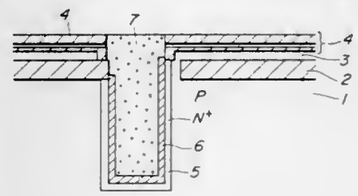
1. A method of introducing lattice defect into a back surface of a semiconductor wafer, comprising the steps of;
preparing particles of ice (A),
transporting said particles of ice prepared (27),
ionizing and accelerating said particles of ice (24, 25),
placing in the path of said accelerated particles of ice said semiconductor wafer into which said lattice defect is to be introduced, so that said accelerated particles of ice impinge upon said semiconductor wafer.

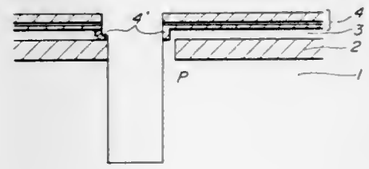
4,820,651
METHOD OF TREATING BODIES OF III-V COMPOUND SEMICONDUCTOR MATERIAL
Francisco C. Prince, Waltham, and Craig A. Armiento, Burlington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Nov. 1, 1985, Ser. No. 793,869
Int. Cl.[4] H01L *21/477*
U.S. Cl. 437—22 16 Claims



1. The method of introducing conductivity type imparting material into a body of III-V compound semiconductor material comprising
implanting conductivity type imparting material into a region of a body of III-V compound semiconductor material;
placing said body in close proximity to a second body of III-V compound semiconductor material having as a constituent element a Group V element which is also a constituent element of the III-V compound semiconductor material of said first-mentioned body, said second body having a layer of a material on the surface thereof facing said first-mentioned body, the material of said layer forming a solution with the constituent elements of said second body, the vapor pressure of the Group V element which is a constituent element of the III-V compound semiconductor material of the first-mentioned body and of the III-V compound semiconductor material of said second body in equilibrium with said solution being greater than the vapor pressure of the same Group V element in equilibrium with a solution of the constituent elements of said second body alone; and
heating the resulting assemblage to anneal the first-mentioned body whereby the second body and layer of material serve as a source of vapor of the Group V element producing a localized overpressure of the Group V element at the surface of the first-mentioned body.

4,820,652
MANUFACTURING PROCESS AND STRUCTURE OF SEMICONDUCTOR MEMORY DEVICES
Hisao Hayashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 1, 1986, Ser. No. 936,512
Claims priority, application Japan, Dec. 11, 1985, 60-278182; Dec. 11, 1985, 60-278183; Dec. 12, 1985, 60-279957
Int. Cl.[4] H01L *29/94*
U.S. Cl. 437—52 20 Claims





1. A manufacturing process for a semiconductor memory device, each memory cell thereof comprising one transistor and one capacitor, the process comprising the steps of:
(a) selectively forming an insulating layer on a semiconductor substrate;
(b) forming a semiconductor layer on the insulating layer, the semiconductor layer being connected to the semiconductor substrate via an opening in the insulating layer;
(c) forming a protective layer on the semiconductor layer;
(d) forming a window through the protective layer at a position of the protective layer offset from the opening in the insulting layer and forming a trench through the window with the insulating layer and protective layer serving

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as masks so that the semiconductor layer is still connected to the semiconductor substrate via the opening in the insulating layer; and

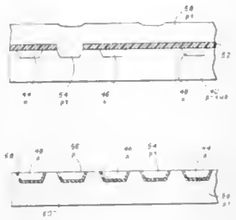
(e) forming the capacitor in the trench with the transistor formed in the semiconductor layer.

4,820,653

TECHNIQUE FOR FABRICATING COMPLEMENTARY DIELECTRICALLY ISOLATED WAFER

William G. Easter, Reading, and Daniel D. Leffel, Earl Township, Berks County, both of Pa., assignors to American Telephone and Telegraph Company and AT&T Technologies, Inc., both of Berkeley Heights, N.J.

Filed Feb. 12, 1988, Ser. No. 155,409
Int. Cl.[4] H01L *29/06, 29/165*
U.S. Cl. 437—62 **4 Claims**



1. In the fabrication of a dielectrically isolated device, a method of forming regions of at least two different resistivities, in the initial silicon substrate, the method comprising the steps of:

(a) providing a single crystal silicon substrate of a first conductivity type;

(b) patterning said substrate to define locations selected to comprise a first resistivity value;

(c) etching said substrate to remove material from the locations defined in step (b);

(d) forming epitaxial material of the first resistivity value in the locations exposed in step (c);

(e) repeating steps (b)-(d) for subsequent group locations, each group defined to comprise a different resistivity value.

4,820,654

ISOLATION OF REGIONS IN A CMOS STRUCTURE USING SELECTIVE EPITAXIAL GROWTH

Steven S. Lee, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 9, 1987, Ser. No. 130,481
Int. Cl.[4] H01L *21/316, 21/318, 21/32*
U.S. Cl. 437—067 **12 Claims**

1. A process for forming trench-like isolation structures in a semiconductor substrate, comprising the steps of:

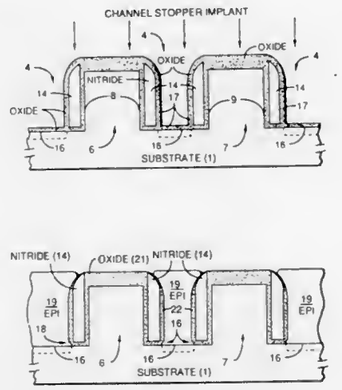
forming recesses with substantially vertical sidewalls in selected regions of a semiconductor substrate;

forming a relatively thin conformal buffer layer of first dielectric material over the semiconductor substrate;

forming a relatively thicker and conformal isoloation dielectric layer of second dielectric material;

selectively removing the second dielectric material to expose horizontally disposed substrate surfaces at the recess bottoms;

following a selective removal of the second dielectric material, forming over the vertically disposed surfaces of the second dielectric material a relatively thin layer of third dielectric material; and



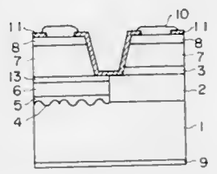
selectively growing onto exposed substrate an expitaxial semiconductor region.

4,820,655

METHOD FOR MANUFACTURING SEMICONDUCTOR OPTICAL INTEGRATED DEVICE WITH OPTICAL WAVEGUIDE REGIONS

Yukio Noda; Masatoshi Suzuki; Yukitosbi Kushiro, and Shigeyuki Akiba, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1987, Ser. No. 15,953
Claims priority, application Japan, Feb. 21, 1986, 61-35097
Int. Cl.[4] H01L *21/20, 21/203, 21/205*
U.S. Cl. 437—129 **1 Claim**



1. A method for manufacturing a semiconductor optical integrated device with optical wavelength regions in which a first semiconductor element region including a first optical waveguide region and a second semiconductor element region including a second optical waveguide region are integrated on a single substrate, characterized by:

a first step in which at least one layer for providing the first optical waveguide of the first semiconductor element region and a protective layer therefor are formed over an entire area of a predetermined region on the substrate which includes the first and second semiconductor element regions, and then the at least one layer and the protective layer are removed from the region which will ultimately constitute the second semiconductor element region;

a second step in which the second optical waveguide region and a semiconductor layer of an energy gap greater than that of the second semiconductor optical waveguide region are formed on the region from which the at least one layer and the protective layer have been removed;

a third step in which at least a clad layer is formed on the protective layer of the first semiconductor element region and the semiconductor layer of the second semiconductor element region;

a fourth step in a which a film of silicon nitride is deposited over the entire area of the contact layer and then selectively removed after which the contact layer and clad layer are etched away in a V-shape groove using the film of silicon nitride as a mask; and

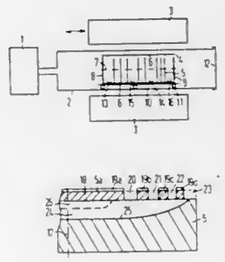
a fifth step in which the silcon nitride film is deposited all over surfaces of the contact layer and upper clad layer and is partly removed to form windows for electrodes, and then electrically separated electrodes are provided.

4,820,656

METHOD FOR PRODUCING A P-DOPED SEMICONDUCTOR REGION IN AN N-CONDUCTIVE SEMICONDUCTOR BODY

Hans-Joachim Schulze, Anzing, and Reinhold Kuhnert, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 19, 1987, Ser. No. 86,914
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633299
Int. Cl.[4] H01L *21/223, 21/383*
U.S. Cl. 437—169 **4 Claims**



1. A method of producing a p-doped semiconductor region in an n-conductive silicon body which comprises:

positioning said silicon body within a hollow silicon member comprising a two part hollow cylinder having end disk of silicon closing off its end faces along with a vaporizable source of aluminum and boron.

then positioning the hollow silicon member within a refractory tube,

evacuating said refractory tube, and

heating the interior of said tube for a time and at a temperature sufficient to diffuse both aluminum and boron into said silicon body.

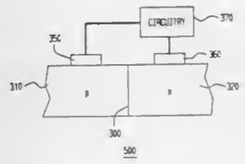
4,820,657

METHOD FOR ALTERING CHARACTERISTICS OF JUNCTION SEMICONDUCTOR DEVICES

David W. Hughes, Chamblee, and Robert K. Feeney, Doraville, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 11,611, Feb. 6, 1987, abandoned. This application May 26, 1987, Ser. No. 53,475
Int. Cl.[4] H01L *21/326*
U.S. Cl. 437—172 **13 Claims**

1. A method for altering an electrical characteristic of a circuit having at least one junction formed from a first and a second semiconductor and having an electrode contacted to the first semiconductor and an electrode contacted to the second semiconductor, the method comprising the step of applying at least one electrical pulse across the junction, including applying the pulse to the electrodes, the pulse having sufficient amplitude of one or more of its electrical parameters and time duration to degrade the electrical transport characteristics of the junction, and, thereby, alter the electrical characteristic of the circuit, the amplitudes of the electrical parameters and the time duration of the at least one pulse being low enough so that dendrites or filaments of material from the electrodes are not formed in the first or second semiconductor.

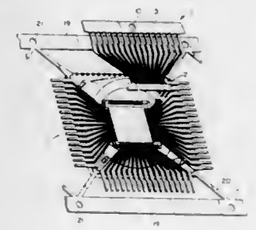


4,820,658

METHOD OF MAKING A PACKAGED IC CHIP

Thomas G. Gilder, Jr., York, and Raymond D. O'Dean, Dover, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 41,519, Apr. 23, 1987, which is a continuation of Ser. No. 910,358, Sep. 22, 1986, Pat. No. 4,663,651, which is a continuation of Ser. No. 851,917, Apr. 14, 1986, abandoned, which is a continuation of Ser. No. 584,080, Feb. 27, 1984. This application May 23, 1988, Ser. No. 203,529
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[4] H01L *21/66*
U.S. Cl. 437—209 **3 Claims**



1. The method of making a packaged IC chip comprising the steps of:

(a) preparing a longitudinal strip containing a plurality of substantially identical lead frame segments, each lead frame segment having a multiplicity of leads connected to opposing continuous rails, said leads having spaces therebetween with the spaces being wider adjacent one of said rails than at the other of said rails;

(b) preparing a longitudinal strip containing a plurality of substantially identical lead frame supports, each of said supports being formed from an electrically insulative, thermoplastic material and having a pad area at the center thereof, said pad area being square or rectangular, and having

(i) lead frame segment receiving and aligning means proximate said pad area, on all four sides thereof;

(c) severing a first lead frame segment, including its rails, from said strip thereof, and positioning said first lead frame segment on said support by means of said segment receiving and aligning means;

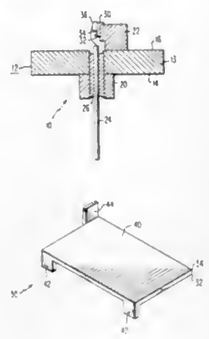
(d) removing said rails;

(e) repeating step (c) and step (d) until a lead frame segment

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has been positioned on said support in each quadrant thereof;
(f) disposing an IC chip in said pad area;
(g) making electrical connections between said chip and said leads;
(h) testing said electrical connections; and
(i) subsequently disposing a cover on said support and sealing said cover to said support.

4,820,659
METHOD OF MAKING A SEMICONDUCTOR DEVICE ASSEMBLY
Anil R. Dholakia, Cranbury, and Louis Trager, Raritan, both of N.J., assignors to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 886,077, Jul. 16, 1986. This application Oct. 15, 1987, Ser. No. 108,665
Int. Cl.[4] H01L *23/12*
U.S. Cl. 437—209 **12 Claims**



1. A method of making a semiconductor device assembly which comprises the steps of:
forming by photolithography and etching a metallic thermally conductive mounting plate having first and second major mounting surfaces for attachment to a header;
attaching said mounting plate to the first surface of said header; and
attaching said semiconductor device to said second mounting surface.

4,820,660
LIGHT TRANSMITTING CALCIUM PHOSPHATE GLASS-CERAMICS
Yoshio Mohri, and Kinji Sano, both of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan
Filed Dec. 22, 1987, Ser. No. 136,377
Claims priority, application Japan, Dec. 26, 1986, 61-308828
Int. Cl.[4] C03C *10/02, 10/06*
U.S. Cl. 501—8 **7 Claims**

1. A light transmitting glass-ceramics, consisting essentially of a glass and fine crystals crystallized from the glass so as to be uniformly dispersed in the a glass matrix provided by the uncrystallized part of the glass, said fine crystals comprising crystals of calcium phosphate;
said glass consisting essentially of, expressed as oxides, 38–52 wt % of SiO_2, 4–16 wt % of P_2O_5, 20–33 wt % of a divalent metal oxide component which is at least one oxide selected from the group consisting of CaO, MgO, BaO, SrO and ZnO with the proviso that CaO amounts to at least 2/5 of the divalent metal oxide component, 6–18 wt % of a trivalent metal oxide component which is at least one oxide selected from the group consisting of Al_2O_3 and La_2O_3 with the proviso that Al_2O_3 amounts to at least ½ of the trivalent metal oxide component, 4–17 wt % of a tetravalent metal oxide component which is at least one oxide selected from the group consisting of ZrO_2 and TiO_2 with the proviso that ZrO_2 amounts to at least ⅓ of the tetravalent metal oxide component, 0–0.5 wt % of an alkali metal oxide component which is at least one oxide selected from the group consisting of Na_2O, K_2O and Li_2O, 0–1 wt % of fluorine, 0–3 wt % of B_2O_3, and 0–1 wt % of a clarifying agent selected from the group consisting of As_2O_3 and Sb_2O_3;
the molar ratio of P_2O_5 to said tetravalent metal oxide component in said glass being not greater than 3:1.

4,820,661
GLASS CERAMIC DIELECTRIC COMPOSITIONS
Kumaran M. Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 885,827, Jul. 15, 1986, abandoned. This application Jun. 3, 1988, Ser. No. 205,002
Int. Cl.[4] C03C *3/006, 10/06*
U.S. Cl. 501—79 **2 Claims**

1. An amorphous aluminoborosilicate glass frit which is crystallizable at thick film processing conditions to form a single phase of celsian in a matrix of remainder glass the amorphous glass consisting essentially by weight of 30% SiO_2, 8% TiO_2, ZrO_2 or mixtures thereof, 10% Al_2O_3, 10% BaO, 10% ZnO, 24% CaO and 8% B_2O_3.

4,820,662
SILICOPHOSPHATE LASER GLASS
Tetsuro Izumitani; Michimasa Matsukawa, and Chiemi Hata, all of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan
Filed Mar. 17, 1986, Ser. No. 839,990
Claims priority, application Japan, Mar. 19, 1985, 60-53424
Int. Cl.[4] C03C *3/062*
U.S. Cl. 501—73 **1 Claim**

1. A silicophosphate laser glass having a composition consisting, essentially of, in % by mole,
45 to 70% P_2O_5;
5 to 20% SiO_2;
60 to 95% $P_2O_5+SiO_2+Al_2O_3$);
$10\% < Al_2O_3 \leqq 20\%$;
$20\% < (Al_2O_3+SiO_2) \leqq 30\%$;
4 to 30% $Li_2O+Na_2O+K_2O$;
0.01 to 12% Nd_2O_3;
0 to 5% $La_2O_3+Y_2O_3+B_2O_3$;
0 to 10% R'O; and
0 to 1% $Nb_2O_5+CeO_2$,
wherein R' is Mg, Ca, Sr, Ba, Zn or Pb.

4,820,663
WHISKER REINFORCED CERAMIC AND A METHOD OF CLAD/HOT ISOSTATIC PRESSING SAME
Pankaj K. Mehrotra, Greensburg; Joyce L. Swiokla, Ligonier, and Elizabeth R. Billman, Pittsburgh, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.
Filed Sep. 2, 1987, Ser. No. 92,118
Int. Cl.[4] C04B *35/56, 35/62, 35/64, 35/80*
U.S. Cl. 501—87 **50 Claims**

1. A method of achieving a density greater than 95% of theoretical in a shaped ceramic article incorporating a ceramic whisker phase therein by hot isostatic pressing comprising the steps of
(a) forming a compact substrate of sinterable ceramic composition having at least 5 volume percent ceramic whiskers therein,
(b) applying a coating to the compact substrate by vapor deposition of a ceramic composition that does not become vitreous before or during the subsequent isostatic pressing step, and
(c) heating and isostatically pressing the coated compact substrate in an atmosphere that reacts with the coating and/or the compact substrate at temperatures and pressures to cause the compact to approach theoretical density.

4,820,664
PIGGY BACK METHOD FOR PRODUCING CERAMIC FIBERS AND NON-CIRCULAR CERAMIC FIBERS IN PARTICULAR
Charles C. Fain, Clemson, S.C., assignor to Clemson University, Clemson, S.C.
Filed Jan. 20, 1987, Ser. No. 4,617
Int. Cl.[4] C04B *35/02; D02G 3/00*
U.S. Cl. 501—95 **10 Claims**

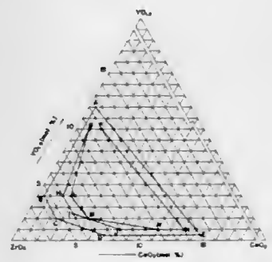
1. A piggyback method of forming a ceramic fiber from a wet chemical precursor including a metal oxide and being capable of being sintered to form ceramic material, the method consisting essentially of:
providing an elongated micro-mold carrier fiber, said carrier fiber being formed of a material other than ceramic material and to which said precursor adheres, said elongated carrier fiber defining an elongated cavity therein and over a substantial portion of the length thereof;
wetting the cavity of said carrier fiber with the wet chemical precursor;
setting the chemical precursor in the cavity of said carrier fiber until the wet chemical precursor is nested in the cavity;
placing said carrier fiber with the nested chemical precursor into an oxygen-free environment;
heating said carrier fiber with the nested chemical precursor in the oxygen free environment to a temperature sufficient to sinter the nested chemical precursor into a ceramic fiber and form a dual fiber having a ceramic fiber nested in said carrier fiber; and
removing said carrier fiber of said dual fiber to yield said ceramic fiber.

4,820,665
CERAMIC SINTERED BODIES AND A PROCESS FOR MANUFACTURING THE SAME
Noriyuki Ukai; Issei Hayakawa, both of Nagoya; Mithuru Miyamoto, Kariya, and Tadaaki Matsuhisa, Kasugai, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Dec. 7, 1987, Ser. No. 129,135
Claims priority, application Japan, Dec. 16, 1986, 61-297756; Jan. 8, 1987, 62-1132; Feb. 18, 1987, 62-35233; Mar. 31, 1987, 62-78228
Int. Cl.[4] C04B *35/58, 35/48*
U.S. Cl. 501—97 **26 Claims**



1. A process for producing a silicon nitride sintered body, comprising:
mixing a silicon nitride raw material powder with a sintering aid selected from the group consisting of a compound of Mg, Zr and Y, which forms MgO, ZrO_2 and Y_2O_3, respectively, upon heating;
granulating said resultant mixture to form a granulated powder;
forcibly drying said granulated powder;
shaping said dried, granulated powder to form a shaped body; and
firing the shaped body.
15. A process for producing a ZrO_2 sintered body, comprising:
mixing a ZrO_2 raw material powder with a sintering aid selected from the group consisting of a compound of Mg, Y and Al, which forms MgO, Y_2O_3 and Al_2O_3, respectively, upon heating;
grinding a resultant mixture of said ZrO_2 raw material powder and said sintering aid;
granulating said resultant mixture to form a granulated powder;
forcibly drying said granulated powder;
shaping said dried, granulated powder to form a shaped body; and
firing the shaped body.

4,820,666
ZIRCONIA BASE CERAMICS
Masanori Hirano, Toyoake, and Hiroshi Inada, Nagoya, both of Japan, assignors to Noritake Co., Limited, Nagoya, Japan
Filed Mar. 21, 1986, Ser. No. 842,496
Claims priority, application Japan, Mar. 22, 1985, 60-59154; Mar. 25, 1985, 60-60503; Jul. 8, 1985, 60-149472
Int. Cl.[4] C04B *35/48*
U.S. Cl. 501—104 **26 Claims**



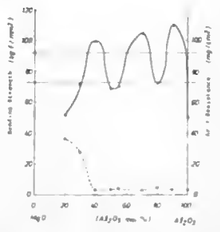
1. Zirconia base ceramics which:
(a) consist essentially of at least 40 weight % of paritally stabilized zirconia of the ZrO_2-Y_2O_3-CeO_2 system wherein the proportion of ZrO_2, Y_2O_3 and CeO_2 is within the range defined by the line connecting points F, G, L, M, N, and K in a ternary diagram (ZrO_2, $YO_{1.5}$, CeO_2), the vertices of said points being given by the following molar % of ZrO_2, $YO_{1.5}$ and CeO_2, respectively:
F (88, 10, 2),
G (89, 10, 1),
L (93.5, 4, 2.5),
M (93, 2, 5),
N (88, 1, 11), and
K (86, 1, 13),
and 3 to 60 weight % of Al_2O_3, and
(b) has a mean crystal grain size not exceeding 2 micrometers and a bending strength of at least 100 kgf/mm^2, said ZrO_2 containing a minimum of 50 vol % tetragonal crystal structure and a maximum of 5 vol % monoclinic crystal structure when tested in steam of 180° C. and 10 atm for 10 hours.

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HIGH STRENGTH ZIRCONIA CERAMIC

Kyosuke Tsunekawa, Chita; Ken Fukuta, Ama, and Muneyuki Iwabuchi, Handa, all of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Filed Aug. 17, 1987, Ser. No. 86,388
Claims priority, application Japan, Aug. 18, 1986, 61-193180; Mar. 24, 1987, 62-70072; Aug. 12, 1987, 62-201315
Int. Cl.[4] C04B *35/48, 35/50, 35/10, 35/04*
U.S. Cl. 501—104 5 Claims



1. A pressureless sintered zirconia ceramic composition consisting essentially of a compound of ZrO_2 consisting essentially of 0.5–5.0 mol% Y_2O_3 as a stabilizer and 1–30 wt% aluminum and magnesium contents to the amount of said compound of ZrO_2 in terms of Al_2O_3 and MgO,

wherein a molar ratio between the aluminum and magnesium contents is selected from one of the following ranges in terms of Al_2O_3 and MgO:

(a) 35–45/65–55
(b) 60–75/40–25
(c) 85–99/15–1.

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PROCESS FOR PREPARING POWDERED CERAMIC RAW MATERIALS OF COMPLEX OXIDE

Yoshiharu Kato; Shinsei Okabe, both of Takatsuki; Shozo Kojima, Nagaokakyo, and Yasunobu Yoneda, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 16, 1986, Ser. No. 852,612
Claims priority, application Japan, Apr. 17, 1985, 60-83555
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—134 10 Claims

1. A process for preparing a powdered ceramic raw material composed of complex oxides comprising the steps of:

(a) adding gaseous carbon dioxide or an aqueous solution of a water-soluble carbonate to a first aqueous solution containing at least nitrate or chloride of elements selected from the group consisting of Ba, Sr, Ca and Mq in a first vessel to adjust the pH of the first aqueous solution to a value within the range of 7 to 10 thereby preparing a slurry containing at least one carbonate of said elements,

(b) adding ammonia gas or an aqueous solution of a water-soluble hydroxide to a second aqueous solution containing at least one of titanium chloride, zirconium chloride, tin chloride and tin nitrate in a second vessel to adjust the pH of the second aqueous solution to a value within the range or 7 to 10 thereby preparing a slurry of at least one hydroxide of said elements,

(c) adding ammonia gas or an aqueous solution of a water-soluble hydroxide to a third aqueous solution containing lead acetate or lead nitrate to adjust the pH of the third aqueous solution to a value within the range of 7 to 10 thereby preparing a slurry containing lead hydroxide,

(d) mixing the three slurries thus prepared precipitated from the first aqueous solution, the hydroxide precipitated from the second solution, and hydroxide precipitated from the third aqueous solution, filtering the mixture, washing the filter cake with water and drying; and

(e) calcining the resultant mixture to form said complex oxides,

at least one of said first and second aqueous solutions initially containing a chloride.

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PROCESS FOR PREPARING POWDERED CERAMIC RAW MATERIALS OF COMPLEX OXIDE

Yoshiharu Kato; Shinsei Okabe, both of Takatsuki; Shozo Kojima, Nagaokakyo, and Yasunobu Yoneda, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 25, 1986, Ser. No. 856,038
Claims priority, application Japan, Apr. 30, 1985, 60-94078
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—134 11 Claims

1. A process for preparing a powdered ceramic raw materal of complex oxides comprising the steps of

(a) adding ammonia gas or an alkali to a first aqueous solution containing a water soluble salt of lead capable of being precipitated as a hydroxide until the pH of the first solution reaches a value within the range of 9 to 10, thereby forming lead hydroxide;

(b) adding ammonia gas or alkali to a second aqueous solution containing at least one compound selected from the group consisting of titanium chloride, zirconium chloride, tin chloride and tin nitrate until the pH of the second solution reaches a value within the range of 9 to 10, thereby forming at least one hydroxide of said elements;

(c) combining the reaction mixture resulting from the first aqueous solution and the reaction mixture resulting from the second aqueous solution, filtering the combined mixtures, washing the resulting filter cake with water and drying the resulting filter cake; and

(d) calcining the resulting filter cake to form complex oxides of said ceramic components.

4,820,670

DIELECTRIC CERAMIC COMPOSITION

Harunobu Sano; Hiroaki Ichikawa; Goro Nishioka, and Yukio Sakabe, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 25, 1987, Ser. No. 125,483
Claims priority, application Japan, Nov. 26, 1986, 61-282772; Dec. 16, 1986, 61-300251; Dec. 16, 1986, 61-300252
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—136 4 Claims

1. A dielectric ceramic composition consisting essentially of a main component of a $SrTiO_3$—$PbTiO_3$—Bi_2O_3—TiO_2—$CaTiO_3$ system and secondary components of manganese oxides, at least one oxide of rare earth elements selected from the group consisting of Nd, La, Ce, Pr and Sm, and one of complex perovskite compounds expressed by the general formula:

$$A(Cu_{\frac{1}{3}}W_{\frac{1}{3}})O_3$$

(where A is at least one element selected from the group consisting of Pb, Sr and Ca),

$$A(Cu_{\frac{1}{3}}Ta_{\frac{1}{3}})O_3$$

(where A is at least one element selected from the group consisting of Pb, Sr and Ca), and

$$A(Cu_{\frac{1}{3}}Nb_{\frac{1}{3}})O_3$$

(where A is at least one element selected from the group consisting of Pb, Sr and Ca), said main component consisting essentially, by weight, of 19.5 to 42.8% of $SrTiO_3$, 8.0 to 37.6% of $PbTiO_3$, 4.2 to 33.9% of $CaTiO_3$, 4.4 to 26.9% of Bi_2O_3, 4.2 to 13.6% of TiO_2 and 0.5 to 12% of SnO_2, the contents of said secondary components per 100 parts by weight of said main component being 0.02 to 0.50 parts by weight for manganese oxide in terms of MnO_2, 0.1 to 5.0 parts by weight for oxides of rare earth elements in terms of Re_2O_3, and 0.1 to 5.0 parts by weight for said at least one complex perovskite compound.

4,820,671

REGENERATION OF AN ORGANOURANIUM CATALYST

Thomas A. Chamberlin, and James C. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 11, 1988, Ser. No. 142,167
Int. Cl.[4] B01J *31/40, 38/10;* C07F *5/00;* C07C *2/26*
U.S. Cl. 502—53 21 Claims

1. A process for regenerating a spent catalyst containing a uranium (poly-substituted cyclopentadienyl) complex, said catalyst being susceptible to regeneration, wherein the process comprises contacting the deactivated uranium catalyst with hydrogen under conditions sufficient to regenerate the activity of the catalyst in the dimerization of propylene to 4-methyl-1-pentene.

4,820,672

HYDROCARBON SOLUBLE AND INSOLUBLE ORGANO MAGNESIUM CHLORIDE COMPLEXES, PROCESSES AND USES

Vijay C. Mehta, Gastonia, N.C., assignor to Lithium Corporation of America, Gastonia, N.C.

Continuation-in-part of Ser. No. 67,061, Jun. 25, 1987, abandoned. This application May 9, 1988, Ser. No. 192,750
Int. Cl.[4] B01J *31/26*
U.S. Cl. 502—115 37 Claims

1. A process for producing a magnesium halide alcohol complex, comprising: reacting in an ether free hydrocarbon reaction medium, a reactant selected from magnesium metal, dialkyl magnesium, alkyl magnesium halide, alkyl magnesium alkoxide, magnesium dialkoxide and alkoxy magnesium halide with an anhydrous hydrogen halide in the presence of up to six moles of a chlorosubstituted alcohol containing 1 to 10 carbon atoms per mole of magnesium halide.

4,820,673

ALKOXYLATION USING CALCIUM CATALYSTS AND PRODUCTS THEREFROM

Robert J. Knopf, St. Albans, and Louis F. Theiling, Jr., Charleston, both of W. Va., assignors to UOP, Des Plains, Ill.

Division of Ser. No. 916,012, Oct. 6, 1986, Pat. No. 4,754,075, which is a division of Ser. No. 621,991, Jun. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 510,804, Jul. 5, 1983, abandoned. This application Feb. 18, 1988, Ser. No. 156,733
Int. Cl.[4] B01J *31/26*
U.S. Cl. 502—167 31 Claims

1. A method for providing an alkoxylation catalyst, comprising solubilizing, at least partially, calcium oxide, calcium hydroxide, or mixtures thereof, by mixing any of them with an activator having the formula

$$Z_a—X—Q—Y—Z'_b$$

wherein X and Y are the same or different electronegative, hetero-atoms a selected from the group consisting of oxygen, nitrogen, sulfur and phosphorus; a and b are the same or different integers satisfying the valency requirements of X and Y; Q is an organic radical which is electropositive or essentially neutral relative as to X and/or Y; Z and Z' are the same or different and are either hydrogen or an organic radical which does not prevent said solubilizing, thereby forming a calcium-containing composition which has titratable alkalinity.

4,820,674

PROCESS FOR PREPARING A HYDROSILYLATION CATALYST

Kouji Shiozawa, Saitama; Yoshiharu Okumura, Tokyo; Chihiro Imai, Kanagawa, and Nobukazu Okamoto, Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1988, Ser. No. 149,092
Claims priority, application Japan, Jan. 29, 1987, 62-18916
Int. Cl.[4] B01J *31/00*
U.S. Cl. 502—169 4 Claims

1. A process for preparing a hydrosilylation catalyst which comprises the steps of dissolving chloroplatinic acid H_2PtCl_6 in a cyclic ether or cyclic ester containing at least 3 carbon atoms, and maintaining the resulting solution at a temperature of at least 30° C.

4,820,675

ETHYLENE OXIDE CATALYST & PROCESS FOR PREPARING THE CATALYST

Ann M. Lauritzen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 926,025, Oct. 31, 1986, Pat. No. 4,761,394. This application Apr. 20, 1988, Ser. No. 183,816
Int. Cl.[4] B01J *23/04, 23/24, 23/36, 23/50*
U.S. Cl. 502—216 42 Claims

1. An ethylene oxide catalyst for the vapor phase production of ethylene oxide from ethylene and oxygen comprising a catalytically effective amount of silver, a promoting amount of cesium plus lithium alkali metal, a promoting amount of rhenium and a promoting amount of rhenium co-promoter selected from sulfur, molydenum, tungsten, chromium and mixtures theroef on a porous refractory support comprising alpha alumina having a surface area ranging from about 0.05 to about 10 m^2/g.

4,820,676

TREATED ALUMINA MATERIAL FOR FIXED HYDROFINING BEDS AND PROCESS FOR ITS PREPARATION

Simon G. Kukes, Naperville, Ill., and Karlheinz K. Brandes, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 24,756, Mar. 11, 1987, Pat. No. 4,767,523. This application May 26, 1988, Ser. No. 199,744
Int. Cl.[4] B01J *21/04, 23/74, 23/85, 27/053*
U.S. Cl. 502—220 33 Claims

1. A process for preparing impregnated, substantially spherical alumina-containing particles, suitable for use in a fixed hydrotreating catalyst bed, said process comprising the steps of

(A) impregnating (i) a starting material of substantially spherical alumina-containing particles having an initial average particle size of at least about 0.05 inch; an initial surface area, as determined by the BET method employing N_2, at least about 20 m^2/g; an initial pore volume, as determined by mercury intrusion porosimetry, of at least about 0.1 cc/g; and an initial content of AI_2O_3 of at least about 80 weight-%; with (ii) a solution comprising dissolved ammonium sulfonate; and

(B) heating the material obtained in step (A) at a temperature in the range of from about 500° to about 900° C. for a period of time of at least 10 minutes, under such heating conditions as to obtain a material having a higher retention of crush strength than said starting material; wherein said crush strength is measured after exposure for about 100 hours to a liquid hydrocarbon-containing stream which contains at least about 0.5 weigt-% sulfur, under hydrotreating conditions at about 2250 psig total pressure,

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about 400 psig partial pressure of steam and a temperature of about 700° F.

6. A process in accordance with claim 1, wherein said solution used in step (A) additionally comprises at lest one compound of at least one element selected from the group consisting of Y, La, Ce, Ti, Zr, Hf, Cr, Mo, W, Mn, Re, Ni, Co, Cu, Zn and P.

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AMORPHOUS, IRON PROMOTED MO AND W SULFIDE HYDROPROCESSING CATALYSTS AND PROCESS FOR THEIR PREPARATION

Allan J. Jacobson, 169 Cedar La., Princeton, N.J. 08540; Teh C. Ho, 887 Jason Ct., Bridgewater, N.J. 08807; Russell R. Chianelli, 151 Station Rd., Somerville, N.J. 08876, and Theresa Pecoraro, 2145 Canyon Oak La., Danville, Calif. 94526

Continuation-in-part of Ser. No. 595,908, Apr. 2, 1984, abandoned, which is a continuation of Ser. No. 454,383, Dec. 29, 1982, abandoned. This application Dec. 28, 1984, Ser. No. 687,536

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.⁴ B01J *27/049*

U.S. Cl. 502—220 **9 Claims**

1. A bulk, unsupported catalyst composition (of matter comprising) consisting essentially of an amorphous sulfide of iron and a metal selected from the group consisting of Mo, W and mixture thereof.

4,820,678

METHOD FOR PREPARING RARE EARTH METAL CATALYSTS WITH HONEYCOMB-LIKE ALLOY SUPPORTS AND CATALYSTS OBTAINED THEREBY

Jinghang Xu, Beijing, China, assignor to Beijing Polytechnic University and China National Petroleum & Chemical Equipment Engineering, both of Beijing, China

Filed Jul. 27, 1987, Ser. No. 78,468

Claims priority, application China, Jul. 30, 1986, 86105768

Int. Cl.⁴ B01J *21/04, 23/10, 35/04*

U.S. Cl. 502—303 **24 Claims**

1. A method for preparing rare earth metal catalysts with a support having a honeycomb-like cross-section comprising the following steps:

A. Preparing an activated support tape from an alloy comprising Fe-Cr-Al alloy or Ni-Cr-Al alloy by perforating, intermittently at distances of 1.1 mm to 1.2 mm apart, from both top and bottom surfaces of the tape to form small holes with metal burrs, crimping the tape to form a corrugated tape with an amplitude of 1.0 to 2.0 and a distance between wave heights of between about 2mm to 3mm and subjecting the perforated and crimped tape to degreasing, acid etching, roughening and heat activation to form a protective layer of γ-Al_2O_3 on the surface of the tape;

B. Coating a solution of a rare earth metal salt or a mixture of rare earth metal salts onto the surfaces of the support tape;

C. Drying the support tape;

D. Decomposing the rare earth metal salt or mixture coated on the support tape by heating at a temperature between about 350° C. to 450° C.;

E. Oxidizing the rare earth metal salt or mixture on the support tape into catalytic materials having chemical structures selected from the group consisting of ABO_3, wherein, of the sites of A, from about 60% to 80% are occupied by cations of rare earth metal or mixture and about 40% to 20% are occupied by cations of an alkaline earth metal selected from the group consisting of strontium, calcium and mixtures thereof; and, of the sites of B, from about 50% to 80% are occupied by cations of iron and from 50% to 20% are occupied by cations of metals selected from the group consisting of manganese, copper, nickel, mixtures thereof, and optionally about 1% are occupied by palladium, or A_2BO_4, wherein, of the sites of A, from about 70% to 90% are occupied by cations of the rare earth metal or mixture and from about 30% to 10% are occupied by cations of an alkaline earth metal selected from the group consisting of strontium, calcium and mixtures thereof, and, of the sites of B, from about 50% to 80% of cations of iron and from 50% to 20% are occupied by cations of nickel; and

F. Forming the support tape into structures with a honeycomb-like cross-section.

4,820,679

HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 20, 1987, Ser. No. 123,510

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.⁴ B01J *23/88, 23/85, 27/049;* **C10G** *45/08*

U.S. Cl. 502—314 **36 Claims**

1. A process for preparing highly active catalysts having surface areas at least about 300 m^2/g and at least about 70% of the pore volume in pores having diameters less than about 70 Å, which process comprises:

(a) titrating an aqueous solution of one or more aluminum salt(s) with a titrating agent, thereby forming a precipitate,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with salts of nickel and salts of a heavy metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof, at a pH in the range between about 4.0 and about 10.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the metal salts onto the precipitate is sufficient to yield a final catalyst having from about 1% w to about 6% w nickel and from about 8% w to about 40% w heavy metal,

(e extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

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HYDROTREATING CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 24, 1987, Ser. No. 100,659

The portion of the term of this patent subsequent to Jan. 5, 2002, has been disclaimed.

Int. Cl.⁴ B01J *23/88, 23/84, 21/04;* **C10G** *45/08*

U.S. Cl. 502—314 **57 Claims**

1. A process for preparing highly active hydrotreating catalysts having surface areas at least about 300 m^2/g, at least about 20% of the pore volume in pores having diameters greater than about 350 Å and at least about 20% of the pore volume in pores having diameters less than abouty 70 Å, which process comprises:

(a) titrating an aqueous solution of one or more aluminum salt(s) with a titrating agent, thereby forming a precipitate,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with salts of an element selected from the group consisting of nickel, cobalt, and mixtures thereof, and salts of a heavy metal selected from the group consisting of molybdenum, tungsten, and mixtures thereof, at a pH in the range between about 4.0 and about 9.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the salts onto the precipitate is sufficient to yield a final catalyst having from about 1% w to about 5% w cobalt and/or nickel and from about 8% w to about 32% w heavy metal,

(e) partially drying the product of step (d) to reduce loss on ignition to between about 55% and about 65%,

(f) extruding the product of step (e), and

(g) drying and calcining the product of step (f) at a temperature ranging from about 300° C. to about 900° C.

4,820,681

PREPARATION OF HYDROPHOBIC CARBON MOLECULAR SIEVES

Chin-Hsiung Chang, Palatine, and Gary J. Seminara, Chicago, both of Ill., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 24, 1987, Ser. No. 137,684

Int. Cl.⁴ C01B *31/02, 31/00;* **B01J** *20/20, 21/18*

U.S. Cl. 502—418 **7 Claims**

1. A method of producing shaped products comprising a homogeneous hydrophobic molecular sieve material which comprises the steps:

(a) performing a bulk or solution polymerization of an oxygen-free monomer in the presence of 0.5–0.9 wt. percent of an oxygen-free cross-linking agent, and producing free flow granules of a cross-linked polymer;

(b) producing shaped articles from a quantity of said granules without a binder material; and,

(c) carbonizing the resultant shaped articles in an oxygen-free environment in the presence of an inert gas into shaped products having a density of 0.7–1.05 gm/ml and an average pore volume of 0.4–0.8 cc/gm.

4,820,682

HEAT SENSITIVE RECORDING MATERIALS

Akihiro Shimomura, and Toshimasa Usami, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 8, 1987, Ser. No. 105,648

Claims priority, application Japan, Oct. 8, 1986, 61-240299

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 503—207 **10 Claims**

1. A heat sensitive recording material which comprises on a transparent support a heat sensitive layer and a protective layer successively, in which said heat sensitive layer is prepared by coating a composition containing an emulsified dispersion prepared by dispersing a color developer dissolved into an organic solvent slightly soluble or insoluble in water and microcapsules containing a colorless or light colored electron donating dye precursor and then drying the coat, and said protective layer is comprised of at least a polyvinyl alcohol modified with silicon and a colloidal silica.

4,820,683

THERMALLY-RESPONSIVE RECORD MATERIAL

Steven L. Vervacke, and Kenneth D. Glanz, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Dec. 4, 1987, Ser. No. 128,857

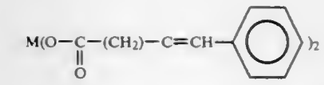
Int. Cl.⁴ B41M *5/18*

U.S. Cl. 503—210 **11 Claims**

1. A thermally-responsive record material comprising a support member bearing a thermally-sensitive color-forming composition comprising

a chromogenic material and an acidic developer material in contiguous relationship, whereby the melting, softening or sublimation of either material produces a change in color by reaction between the two,

a metal salt of the compound of the formula



wherein M is a metal selected from Zn, Sn, Ni, Cu, Al, Co, and Mg, and

a suitable binder therefor.

4,820,684

PRESSURE-SENSITIVE RECORDING SHEET

Shojiro Sano, and Keiso Saeki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

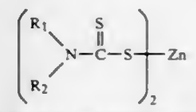
Filed Jun. 13, 1986, Ser. No. 873,916

Claims priority, application Japan, Jun. 13, 1985, 60-129066

Int. Cl.⁴ B41M *5/16, 5/22*

U.S. Cl. 503—212 **25 Claims**

1. A pressure-sensitive recording sheet which produces a color image by reaction between a substantially colorless electron donating dye precursor and an electron accepting color developer, said sheet comprising a support and an electron accepting color developer consisting essentially of (a) a metal salt of an aromatic carboxylic acid and (b) a zinc salt of dithiocarbamic acid represented by formula (I)



(I)

wherein R_1 and R_2 each represents an alkyl or aryl group; and wherein said metal salt of an aromatic carboxylic acid is a zinc, aluminum, or calcium salt.

4,820,685

TRANSFER SHEETS FOR THERMAL TRANSFER RECORDING

Yukichi Murata, 8-26, Miyashita-honcho 3-chome, Sagamihara-shi, Kanagawa, Japan

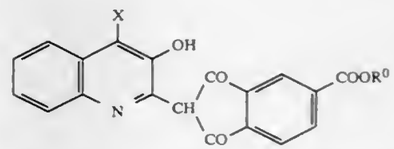
Filed Jan. 21, 1988, Ser. No. 146,420

Claims priority, application Japan, Jan. 23, 1987, 62-13649; Jan. 31, 1987, 62-20872

Int. Cl.⁴ B41M *5/035, 5/26*

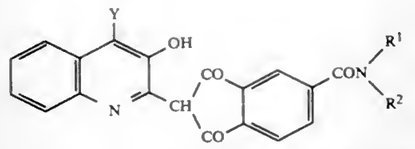
U.S. Cl. 503—227 **14 Claims**

1. A transfer sheet for thermal transfer recording system having on one surface of a base film a color material layer containing a binder and a sublimable dye, wherein said sublimable dye in the color material layer is a quinophthalone series dye represented by following formula (I) and/or a quinophthalone dye represented by following formula (II):



(I)

wherein X represents a hydrogen atom or a halogen atom and R^0 represents an alkyl group, an alkoxyalkyl group which may be substituted, an aralkyloxyalkyl group which may be substituted, an allyloxyalkyl group which may be substituted, an aryloxyalkyl group which may be substituted, a tetrahydrofurfuryl group, a furfuryl group, a cycloalkyl group, an allyl group, or an aralkyl group:



(II)

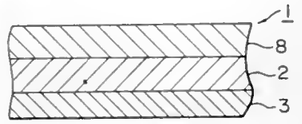
wherein Y represents a hydrogen atom or a halogen atom and R^1 and R^2 each represents a hydrogen atom, an alkyl group, an alkoxyalkyl group, a cycloalkyl group, an allyl group, an aryl group which may be substituted, an aralkyl group, a furfuryl group, a tetrahydrofurfuryl group, or a hydroxyalkyl group.

4,820,686

SHEET FOR HEAT TRANSFERENCE

Yoshikazu Ito; Masanori Akada; Masaki Kutsukake, all of Tokyo; Mineo Yamauchi, Ichikawa; Masanori Saito, Tokyo; Atsushi Takano, Tokyo; Hidetchiro Takeda, Tokyo, and Hitoshi Arita, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 833,039, Feb. 26, 1986, Pat. No. 4,720,480.
This application Aug. 6, 1987, Ser. No. 82,225
Claims priority, application Japan, Feb. 28, 1985, 60-39934; Feb. 28, 1985, 60-39935; Apr. 15, 1985, 60-79857
The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **11 Claims**



1. A heat transfer sheet comprising a base sheet having first and second surfaces on opposite sides thereof,

a heat transfer layer positioned on said first surface of said base sheet, said heat transfer layer being formed of a material containing a dye substantially dissolved in a binder with a weight ratio of the dye to the binder (dyė/-binder ratio) of 0.3 or more, and

a heat-resistant slipping layer provided on said second surface of said base sheet, said heat-resistant slipping layer comprising (a) a reaction product of a polyvinyl butyral and an isocyanate, (b) an alkali metal salt or alakline earth metal salt of a phosphoric acid ester and (c) a filler.

4,820,687

IMAGE RECEIVING SHEET AND PROCESS FOR PRODUCING THE SAME

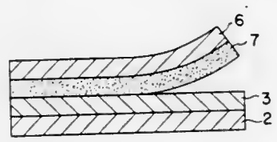
Sadanobu Kawasaki, Tokorozawa; Mineo Yamauchi, Ichikawa, and Masanori Akada, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 871,918
Claims priority, application Japan, Jul. 25, 1983, 58-135627
The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **12 Claims**

1. An image-receiving sheet for use in an image-forming system wherein said sheet is brought into contact with a heat transfer sheet, said heat transfer sheet having a support and a heat transfer layer provided on the support comprising a heat transferable dye contained in a synthetic resin binder, wherein an image is formed on the image-receiving sheet by contacting the heat transfer layer with the image-receiving sheet and selectively heating at least a portion of the heat transfer sheet with heating means to transfer the dye selectively from the heat transfer layer to the image-receiving sheet, the image-receiving sheet comprising:

a substrate; and

an image-receiving layer provided on the substrate for receiving dye transferred from the heat transfer layer of the heat transfer sheet, said image-receiving layer comprising



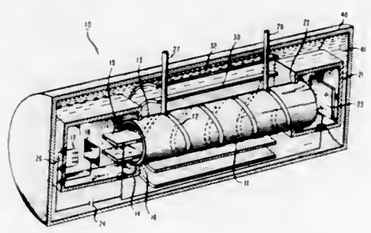
a synthetic resin for receiving the dye and a releasing agent for preventing adhesion of the synthetic resin binder of the heat transfer sheet to said image-receiving sheet upon heating thereof by the heating means, at least a portion of the surface of the synthetic resin being covered by the releasing agent.

4,820,688

TRAVELING WAVE TUBE OSCILLATOR/AMPLIFIER WITH SUPERCONDUCTING RF CIRCUIT

Louis J. Jasper, Jr., 16 Wooley Way, Ocean, N.J. 07712

Filed Nov. 27, 1987, Ser. No. 126,080
Int. Cl.[4] H01J *25/42, 25/44*
U.S. Cl. 505—855 **17 Claims**



1. A device comprising:

an electron gun for producing an electron beam;

a collector for collecting said electron beam;

a vacuum housing surrounding said electron beam and having an integral slow wave circuit, said circuit being made from superconducting ceramic material;

means for maintaining the temperature of said superconducting ceramic below its critical temperature;

means for extracting an output signal from said slow wave circuit;

means for creating a magnetic field within said vacuum housing so that interaction between said electron beam and said slow wave circuit produces said output signal.

4,820,689

PHARMACEUTICAL COMPOSITION CONTAINING A GLYCOPROTEIN

Masanori Ikezawa, Tachikawa; Yoshiharu Oguchi, Tokyo; Kenichi Matsunaga, Tokyo; Noriyuki Toyoda, Sagamihara; Takao Furusho, Machida; Takayoshi Fujii, Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1986, Ser. No. 898,900
Claims priority, application Japan, Aug. 11, 1983, 58-147231; Aug. 11, 1983, 58-147232; Aug. 11, 1983, 58-147233; Aug. 11, 1983, 58-147234; Aug. 11, 1983, 58-147235; Aug. 11, 1983, 58-147236; Aug. 11, 1983, 58-147237; Aug. 11, 1983, 58-147238; Aug. 11, 1983, 58-147239; Aug. 11, 1983, 58-147240; Aug. 11, 1983, 58-147241
Int. Cl.[4] A61K *37/02, 35/70*
U.S. Cl. 514—8 **2 Claims**

1. A method for raising a level of low density lipoprotein receptor in a patient's body, which comprises:

administering to a human suffering from hyperlipemia a therapeutically effective amount of glycoprotein having a molecular weight of 5,000 to 300,000 as determined by ultracentrifugation and is to 38% by weight of proteins, produced by culturing a basidiomycetous fungal species belonging to the genus Coriolus;

extracting the thus proliferated mycelia or fruit bodies with hot water or an aqueous alkaline solution; and

removing low molecular weight substances having a molecular weight of less than 5,000 from the extract.

4,820,690

DUODENAL AND GASTRIC ULCER TREATMENT WITH ORAL UROGASTRONE

Harold Gregory, Macclesfield, and Keith G. McCullagh, Princes Risborough, both of United Kingdom, assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 723,978, Apr. 16, 1985, abandoned.
This application Jul. 2, 1987, Ser. No. 69,550
Claims priority, application United Kingdom, Apr. 17, 1984, 8409960
Int. Cl.[4] A61K *37/24*
U.S. Cl. 514—12 **5 Claims**

1. A method of promoting the healing of duodenal and gastric ulcers in a mammal without inhibiting gastric acid secretion which comprises orally administering to said mammal an amount of beta-urogastrone or a urogastrone fragment selected from the group consisting of

a polypeptide comprising amino acids 1-46 of urogastrone,

a polypeptide comprising amino acids 1-47 of urogastrone,

a polypeptide comprising amino acids 1-48 of urogastrone,

a polypeptide comprising amino acids 1-49 of urogastrone,

a polypeptide comprising amino acids 1-50 of urogastrone,

a polypeptide comprising amino acids 1-51 of urogastrone,

a polypeptide comprising amino acids 1-52 of urogastrone;

wherein said amount is effective to promote the healing of duodenal and gastric ulcers in mammals without inhibiting gastric acid secretion.

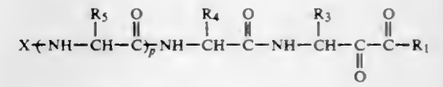
4,820,691

AMINO ACID 1,2-DIKETO DERIVATIVES AS RENIN INHIBITORS

Dinesh V. Patel, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

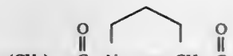
Filed Jun. 24, 1987, Ser. No. 66,596
Int. Cl.[4] A61K *37/43;* **C07K** *5/06, 5/08;* **C07D** *279/10, 265/30, 241/04, 211/60, 211/70*
U.S. Cl. 514—19 **11 Claims**

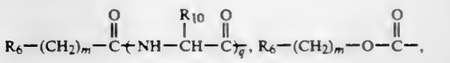
1. A compound having the formula

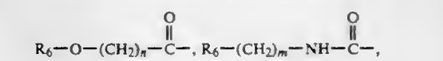


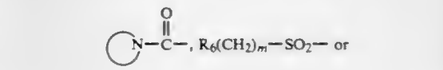
wherein

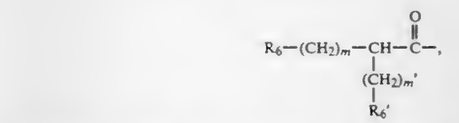
X is $R_6-(CH_2)_m-$,











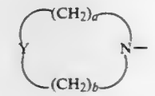
R_1 is hydrogen, alkyl, arylalkyl, aryl, heteroalkyl or a fully saturated, partially saturated, or unsaturated monocyclic heterocyclic ring of 5 or 6 atoms which is attached to



by way of an available carbon atom;



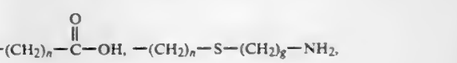
representss a heterocyclic ring of the formula



wherein

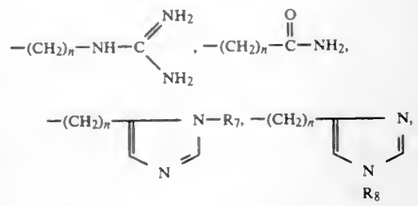
Y is $-CH_2-$, O, S, or $N-R_9$, a is an integer from 1 to 4, and b is an integer from 1 to 4 provided that the sum of a plus b is an integer from 2 to 5;

R_3, R_4, R_5 and R_{10} are independently selected from hydrogen, lower alkyl, halo substituted lower alkyl, $-(CH_2)_n$-aryl, $-(CH_2)_n$-heterocyclo, $-(CH_2)_n-OH$, $-(CH_2)_n-O$-lower alkyl, $-(CH_2)_n-NH_2$, $-(CH_2)_n-SH$, $-(CH_2)_n-S$-lower alkyl, $-(CH_2)_n-O-(CH_2)_g-OH$, $-(CH_2)_n-O-(CH_2)_g-NH_2$, $-(CH_2)_n-S-(CH_2)_g-OH$,



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-continued



and —$(CH_2)_n$-cycloalkyl;

R_6 and R_6' are independently selected from lower alkyl, cycloalkyl, aryl and heterocyclo;

p is zero or one;

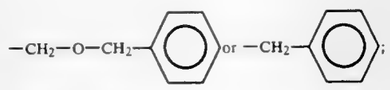
q is zero or one;

m and m' are independently selected from zero and an integer from 1 to 5;

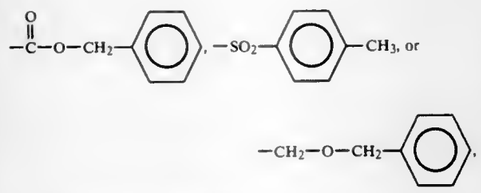
n is an integer from 1 to 5;

g is an integer from 2 to 5;

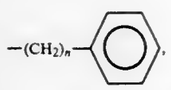
R_7 is



R_8 is 2,4-dinitrophenyl,



R_9 is hydrogen, lower alkyl,



or —$(CH_2)_n$-cycloalkyl;

wherein the term heterocyclo refers to fully saturated or unsaturated rings of 5 or 6 atoms containing one or two oxygen or sulfur atoms and/or one to four nitrogen atoms provided that the total number of hetero atoms is 4 or less, and wherein the ring is attached by way of an available carbon atom, and further including bicyclic rings wherein the hetero-containing 5- or 6-membered ring is fused to a benzene ring.

4,820,692

METHYLTHIORIBOSE ANALOGS, THEIR PREPARATION AND USE AS MEDICINAL AGENTS AND BIOCIDES

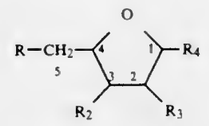
Michael K. Riscoe, Tualatin; John H. Fitchen, Portland, and Adolph J. Ferro, Corvallis, all of Oreg., assignors to State of Oregon, acting by and through the Oregon State Board of Higher Education, acting for and on behalf of the Oregon Health Sciences University and Oregon State University, Portland, Oreg.

Continuation-in-part of Ser. No. 823,929, Jan. 30, 1986, abandoned. This application Jan. 9, 1987, Ser. No. 1,778

Int. Cl.[4] A61K *31/70;* **C07H** *15/00, 15/04;* **C12P** *13/12*

U.S. Cl. 514—23 **53 Claims**

1. A compound of the formula:

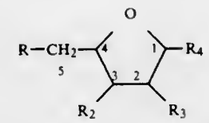


wherein R is R_1S— in which R_1 is C_1–C_{10} linear or branched chain alkyl or halogenated linear or branched chain alkyl,

wherein R_2, R_3 and R_4 are the same or different and each is H or OH,

with the proviso that at least one of R_2, R_3 and R_4 is hydroxy and the further proviso that when R_2, R_3 and R_4 are all OH, R_1 is other than methyl or isobutyl.

15. A method of treating a mammal infected with a 5-deoxy-5-methylthioribose (MTR) kinase-containing microorganism, comprising administering systemically, to said mammal an amount effective to ameliorate the infection, of a compound of the formula



wherein R is H—, Cl—, F—, Br—, I— or R_1S—, in which R_1 is C_1–C_{10} linear or branched chain alkyl or halogenated C_1–C_{10} linear or branched chain alkyl,

wherein R_2, R_3 and R_4 are the same or different and each is H— or —OH with the proviso that at least one of R_2, R_3 and R_4 is —OH and the further proviso that when R_2, R_3 and R_4 are all —OH, R_1 is other than methyl.

4,820,693

METHOD AND COMPOSITION FOR ARRESTING ANGIOGENESIS AND CAPILLARY, CELL OR MEMBRANE LEAKAGE

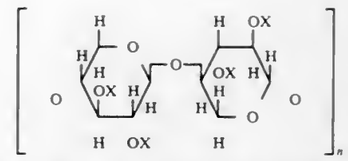
Larrian Gillespie, Brentwood, Calif., assignor to Angiogenics, Ltd., San Francisco, Calif.

Continuation-in-part of Ser. No. 865,981, May 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 848,288, Apr. 4, 1986, abandoned. This application Mar. 2, 1987, Ser. No. 20,859

Int. Cl.[4] A61K *31/70, 31/725, 31/56*

U.S. Cl. 514—25 **53 Claims**

1. A composition for arresting angiogenesis, and cell, capillary or membrane leakage comprising a pharmaceutically effect amount of angiostatic steroid and pentosan polysulfate, having the formula:



wherein X is at least one member selected from the group consisting of H and —SO_3Y, and Y is at least one member selected from the group consisting of H and a pharmaceutically acceptable cation.

4,820,694

MODIFICATIONS OF 3-O-DEMETHYLMYCINOSE IN MACROCIN AND LACTENOCIN

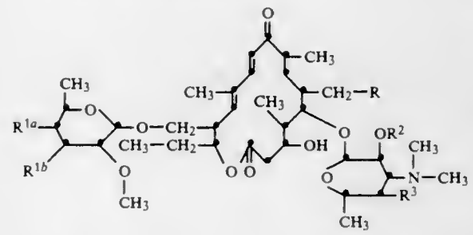
Manuel Debono; Herbert A. Kirst, and James P. Leeds, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 29, 1986, Ser. No. 912,890

Int. Cl.[4] A61K *31/70;* **C07H** *17/08*

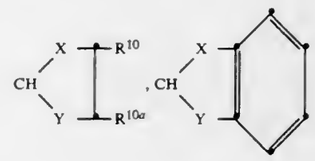
U.S. Cl. 514—30 **36 Claims**

1. A compound of the formula:



wherein

R is CHO, CH_2Z,



or $CH(W)_2$;

Z is hydrogen, halo, OR^4, SR^5, N_3 or NR^6R^7;

X and Y independently represent O, S, N-CH_3, N-phenyl or N-benzyl;

W is O(C_1–C_4-alkyl), S-phenyl or S-(R^{11}-substituted-phenyl);

R^{1a} and R^{1b} are:

(1) both hydrogen;

(2) independently OH or O(COR^1), except that both R^{1a} and R^{1b} cannot be OH;

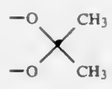
(3) together form a valence bond;

(4) together form a



group wherein W represents O or S; or

(5) together form a



group;

R^1 is hydrogen, phenyl, R^{11}-substituted phenyl, C_1–C_6-alkyl or C_1–C_6-alkyl having one to three halo, C_1–C_3-alkoxy, hydroxy, acetoxy, phenyl, R^{11}-substituted-phenyl, phenoxy, R^{11}-substituted phenoxy, C_3–C_6-cycloalkyl, protected-amino or $NR^{12}R^{13}$ substituents;

R^2 is hydrogen, C_1–C_5-alkanoyl, halo-substituted-C_1–C_5-alkanoyl, or benzoyl, phenylacetyl or phenylpropionyl, each of which may have an R^{11} substituent on the phenyl ring;

R^3 is hydrogen, OR^2 or mycarosyloxy;

R^4 is C_1–C_4-alkyl; C_1–C_4-alkanoyl; cyclohexyl; phenyl, benzyl, phenethyl or phenoxyethyl, each of which may have an R^{11} substituent on the ring; or a heteroaryl group selected from pyridinyl, pyrimidinyl, pyridazinyl or pyrazinyl;

R^5 is C_1–C_4-alkyl; cyclohexyl; phenyl, benzyl or phenethyl, each of which may have an R^{11} substituent on the phenyl ring; or a heteroaryl group selected from pyridinyl, tetrazolyl, oxazolyl or thiazolyl;

R^6 and R^7 independently are C_1–C_8-alkyl or a group of the formula:

$(CH_2)_n$(Cyc)

where n is 0, 1 or 2, and Cyc is C_3–C_8-cycloalkyl, phenyl or R^{11}-substituted phenyl; or taken together with the adjacent nitrogen atom form a saturated or unsaturated heterocyclic monocyclic ring containing from 5 to 16 ring atoms or a bicyclic or tricyclic ring system containing from 8 to 20 ring atoms wherein one or more of the ring atoms may be substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, hydroxy, C_1–C_4-alkanoyloxy, halo, NR^8R^9, phenyl or R^{11}-substituted phenyl;

R^8 and R^9 independently are C_1–C_4-alkyl or $(CH_2)_n$(Cyc); or taken together with the adjacent nitrogen atom form a saturated heterocyclic monocyclic ring containing from 5 to 8 ring atoms;

R^{10} and R^{10a} independently are hydrogen, methyl, phenyl, methoxycarbonyl, ethoxycarbonyl or phenoxycarbonyl; and

R^{11} is halo, C_1–C_3-alkyl, C_1–C_3-alkoxy, nitro or hydroxy; and

R^{12} and R^{13} independently are hydrogen, C_1–C_4-alkyl, $(CH_2)_n$(Cyc) or R^{11}-substituted-$(CH_2)_n$(Cyc) or taken together with the adjacent nitrogen atom form a saturated heterocyclic monocyclic ring containing from 5 to 8 ring atoms or an R^{11}-substituted saturated heterocyclic monocyclic ring containing 5 to 8 ring atoms; and the acid addition salts of these compounds.

26. A compound of claim **1** wherein the salt is pharmaceutically acceptable.

32. A composition useful for treating infections caused by susceptible Mycopolasma species comprising an effective amount of a compound of claim **26** and a suitable pharmaceutical vehicle.

36. A method for treating infections caused by susceptible Mycoplasma species which comprises administering an effective amount of a composition of claim **32** to an animal.

4,820,695

C-20-DIHYDRO-DEOXY-(CYCLIC AMINO)-DERIVATIVES OF MACROLIDE ANTIBIOTICS

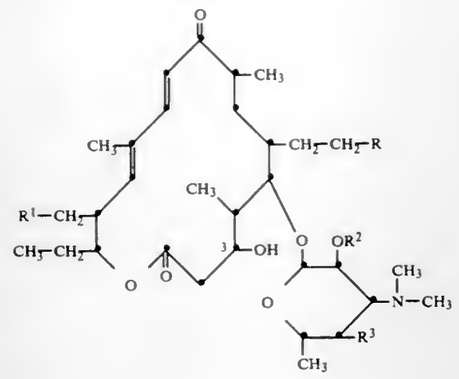
Manuel Debono, and Herbert A. Kirst, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 645,936, Aug. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 517,136, Jul. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 417,247, Sep. 13, 1982, abandoned. This application May 28, 1987, Ser. No. 54,966

Int. Cl.[4] A61K *31/71;* **C07H** *17/08*

U.S. Cl. 514—30 **63 Claims**

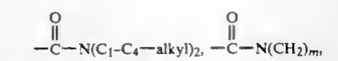
1. A compound of the formula



wherein

R is a saturated or unsaturated secondary amino group of the formula

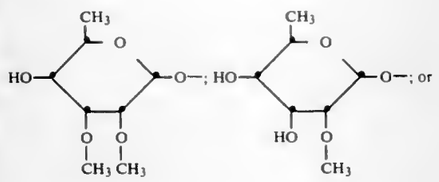
in which the nitrogen atom is part of an otherwise carbocyclic ring system selected from a monocyclic ring containing from 5 to 16 ring atoms or a bicyclic or tricyclic ring system containing from 8 to 20 ring atoms or such a group wherein one or more of the carbon atoms is substituted by C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_4 alkoxy, C_1–C_4 alkoxycarbonyl, hydroxyl, C_1–C_4 alkanoyloxy, halo, halo-C_1–C_4 alkyl, —$N(C_1$–C_4 alkyl$)_2$, —$N(CH_2)_m$,



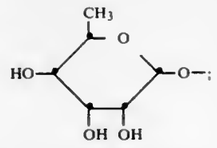
cyano, ethylenedioxy, benzyl, phenyl, or phenyl substituted by from 1 to 3 substituents selected from nitro, halo, C_1–C_4-alkyl, C_1–C_4 alkoxy, hydroxy, amino, or mono- or di-(C_1–C_4 alkyl)amino;

m is an integer from 4 through 7;

R^1 is

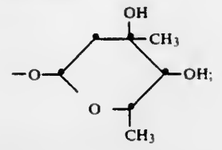


-continued



R^2 is hydrogen; C_1–C_5-alkanoyl or C_1–C_5-alkanoyl having from one to three halo substituents; benzoyl, phenylacetyl or phenylpropionyl or benzoyl, phenylacetyl or phenylpropionyl having from one to five halo or methyl or from one to two methoxyl, nitro or hydroxyl substituents;

R^3 is hydroxy; C_1–C_5 alkanoyloxy; C_1–C_5-alkanoyloxy having from one to three halo substituents; benzoyloxy, phenylacetoxy or phenoxyacetoxy or benzoyloxy, phenylacetoxy or phenoxyacetoxy having from one to five halo or methyl of from one to two methoxyl, nitro or hydroxyl substituents; or



and the acid addition salts thereof.

48. A composition useful for the treatment of bacterial or mycoplasmal infections comprising an effective amount of a compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof and a suitable pharmaceutical vehicle.

4,820,696

MODULATION OF AIDS VIRUS-RELATED EVENTS BY DOUBLE-STRANDED RNAS

William A. Carter, Birchrunville, Pa., assignor to HEM Research, Inc., Rockville, Md.

Division of Ser. No. 900,614, Aug. 26, 1986, Pat. No. 4,795,744, which is a continuation-in-part of Ser. No. 886,363, Jul. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 769,494, Aug. 26, 1985, abandoned. This application Sep. 30, 1988, Ser. No. 251,372

Int. Cl.[4] A61K *31/715*

U.S. Cl. 514—44 **4 Claims**

1. A method of restoring an anergic immune state to a substantially normal immune state, as measured by skin testing, said method comprising administering to a person having an anergic immune state induced by an HIV infection an effective amount of dsRNA.

4,820,697

4,5-DIHYDRO-4,4-DIALKYL-6-(SUBSTITUTED)PHENYL-3(2H)-PYRIDAZINONES USEFUL AS CARDIOTONIC AGENTS

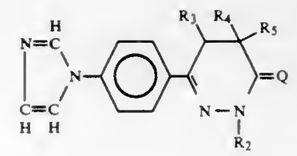
Ila Sircar; James A. Bristol, and Richard W. Skeean, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 685,640, Dec. 24, 1989, abandoned. This application Nov. 10, 1986, Ser. No. 928,434

Int. Cl.[4] C07D *237/04;* **A61K** *31/50*

U.S. Cl. 514—252 **8 Claims**

1. A compound of the formula:



wherein Q is oxygen or sulfur; R_2 and R_3 are independently hydrogen or lower alkyl; R_4 and R_5 are independently lower alkyl.

4,820,698

ANTIMICROBIAL AGENTS AND PROCESS FOR THEIR MANUFACTURE

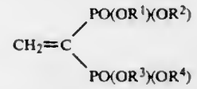
Charles R. Degenhardt, Cincinnati, and Duane L. Charbonneau, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 795,306, Nov. 4, 1985, abandoned. This application Apr. 23, 1986, Ser. No. 855,877

Int. Cl.[4] A61K *31/66*

U.S. Cl. 514—102 **10 Claims**

1. A method for treating infectious diseases in humans or animals caused by pathogenic bacteria which comprises administering to a human or animal in need of such treatment a safe and effective amount for treatment of said infectious diseases of a tetraalkyl ethenylidenebisphosphonate compound of the formula:



wherein R^1, R^2, R^3 and R^4 are independently selected from the groups of C_1 to C_7 straight and branched chain alkyl.

4,820,699

NOVEL BACTERICIDAL USE

Walter R. Stevenson, and Arthur Kelman, both of Madison, Wis., assignors to Sandoz, Ltd., Switzerland

Continuation of Ser. No. 107,330, Oct. 13, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 230,695

Int. Cl.[4] A01N *57/10*

U.S. Cl. 514—147 **2 Claims**

1. A method for controlling bacterial infection which comprises applying to the bacteria a bacteria-controlling amount of O-(2,6-dichloro-4-methylphenyl) O,O-dimethyl phosphorothioate.

4,820,700

NOVEL ANDROSTANE-17β-CARBOXYLIC ACID ESTERS, A PROCESS AND INTERMEDIATES FOR THEIR PREPARATION, COMPOSITIONS AND METHOD FOR THE TREATMENT OF INFLAMMATORY CONDITIONS

Ralph L. Brattsand, Lund, and Bror A. Thalen, Bjärred, both of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

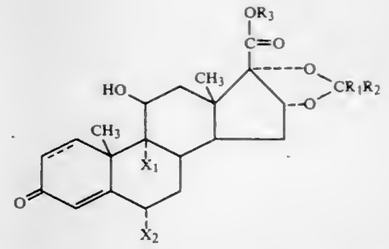
Continuation of Ser. No. 670,885, Nov. 13, 1984, abandoned. This application Jan. 5, 1987, Ser. No. 946,658

Claims priority, application Sweden, Nov. 18, 1983, 8306370

Int. Cl.[4] A61K *31/58;* **C07J** *71/00*

U.S. Cl. 514—174 **10 Claims**

1. A compound of the formula



in the form of a stereoisomeric mixture or an epimer of the R or S type regarding the orientation of a substituents in the carbon atom at position 20, in which formula

the 1,2-position is saturated or is double bond,

X_1 is hydrogen, fluorine, chlorine or bromine,

X_2 is hydrogen, fluorine, chlorine or bromine,

R_1 is hydrogen or methyl,

R_2 is n-propyl, and

R_3 is hydrogen or a straight or branched chain alkyl group having 1–12 carbon atoms, a lower alkyl group substituted by 1–5 halogen atoms or an unsubstituted or substituted phenyl or benzyl group.

4,820,701

PENAM DERIVATIVES

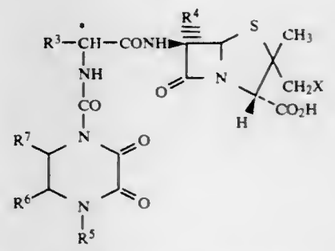
Robert Southgate, and Colin H. Frydrych, both of Betchworth, England, assignors to Beecham Group p.l.c., England

Filed Oct. 21, 1987, Ser. No. 112,103

Int. Cl.[4] C07D *499/76;* **A61K** *31/43*

U.S. Cl. 514—194 **30 Claims**

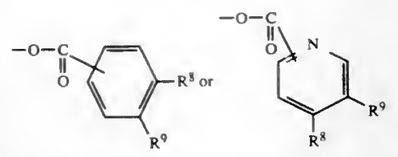
1. A compound of the formula:



a pharmaceutically acceptable salt or in vivo hydrolyzable ester thereof wherein R^3 is phenyl, unsubstituted or substituted by up to three substituents selected from the group consisting of alkyl of 1 to 6 carbon atoms, phenyl, halo, alkoxy of 1 to 6 carbon atoms, amino, nitro, hydroxy, alkylamido of 1 to 6 carbon atoms, alkylcarbonyloxy of 1 to 6 carbon atoms in the alkyl moiety, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, haloalkyl of 1 to 6 carbon atoms, oxoalkyl of 1 to 6 carbon atoms, alkylcarbonyl of 1 to 6 carbon atoms in the alkyl moiety, aryloxy, aralkyloxy, arylcarbonyl, alkylamino of 1 to 6 carbon atoms in the alkyl moiety, dialkylamino of 1 to 6 carbon atoms in each alkyl moiety and protected amino, cyclohexenyl, cyclohexadienyl or a 5- or 6-membered heterocyclic ring containing up to three heteroatoms selected from the group consisting of oxygen, sulphur and nitrogen unsubstituted or substituted by hydroxy, amino, halo or alkoxy of 1 to 6 carbon atoms, and wherein aryl is phenyl or naphthyl unsubstituted or substituted with up to five substituents selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, phenyl, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, nitro, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms, alkoxycarbonylalkyl of 1 to 6

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carbon atoms in each of the alkoxy and alkyl moieties, alkylcarbonyloxy of 1 to 6 carbon atoms in the alkyl moiety and alkylcarbonyl of 1 to 6 carbon atoms in the alkyl moiety; R^4 is hydrogen or formamido; R^5 is hydrogen, alkyl of 1 to 6 carbon atoms, aryl or aralkyl wherein aryl is as above defined and alkyl is of 1 to 6 carbon atoms; R^6 and R^7 are the same or different and each is hydrogen, alkyl of 1 to 6 carbon atoms, halo, amino, phenyl unsubstituted or substituted with up to three substituents selected from the group consisting of alkyl of 1 to 6 carbon atoms, phenyl, halo, alkoxy of 1 to 6 carbon atoms, amino, nitro, hydroxy, alkylamido of 1 to 6 carbon atoms, alkylcarbonyloxy of 1 to 6 carbon atoms in the alkyl moiety, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, haloalkyl of 1 to 6 carbon atoms, oxoalkyl of 1 to 6 carbon atoms, alkylcarbonyl of 1 to 6 carbon atoms in the alkyl moiety, aryloxy, aralkyloxy, arylcarbonyl, alkylamino of 1 to 6 carbon atoms in the alkyl moiety, dialkylamino of 1 to 6 carbon atoms in each alkyl moiety and protected amino, hydroxy or alkoxy of 1 to 6 carbon atoms, or R^6 and R^7 form the residue of a 5- or 6-membered carbocyclic ring or a 5- or 6-membered beterocyclic ring containing up to three hetero atoms selected from the group consisting of oxygen, sulphur and nitrogen unsubstituted or substituted by hydroxy, amino, halo, or alkoxy of 1 to 6 carbon atoms; and X is



or tautomers thereof wherein R^8 and R^9 are the same or different and each is hydroxy, or protected hydroxy.

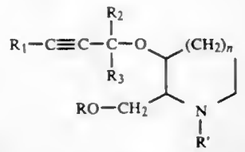
4,820,702

NEW SUBSTITUTED PIPERIDINE OR AZEPINE COMPOUNDS WHICH HAVE USEFUL CALCIUM-ANTAGONISTIC ACTIVITY

Patrick Carlier, Chatel-Guyon; Jacques A. Simond, Les-Martres-de-Veyre, and André J. Monteil, Chatel-Guyon, all of France, assignors to Riom Laboratories C.E.R.M., Riom, France

Filed Dec. 22, 1987, Ser. No. 136,583
Claims priority, application France, Dec. 23, 1986, 86 18082
Int. Cl.⁴ A61K *31/445;* **C07D** *211/40*
U.S. Cl. 514—212 **5 Claims**

1. A compound of the formula:



in which R and R' denote an alkyl radical having 1 to 7 carbon atoms; R_1 denotes hydrogen or an alkyl radical having 1 to 7 carbon atoms; and R_2 and R_3 denote, separately, an alkyl radical having 1 to 7 carbon atoms or a phenyl radical, or, together with the carbon atom to which they are attached, a cycloalkyl radical having at most 7 carbon atoms; n may assume the values 2 or 3; or a salt thereof.

5. Pharmaceutical composition comprising an effective amount of a compound according to claim 1 for providing calcium-antagonistic activity and an inert carrier.

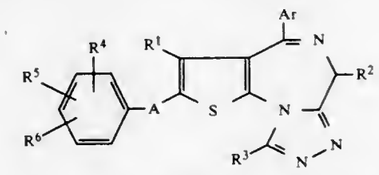
4,820,703

PAF-ANTAGONISTIC THIENOTRIAZOLODIAZEPINE COMPOUNDS AND PHARMACEUTICAL USES THEREOF

Tetsuya Tahara; Minoru Moriwaki, both of Oita; Masao Abe, and Shuji Yuasa, both of Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries Ltd., Japan

Filed Nov. 17, 1987, Ser. No. 121,834
Claims priority, application Japan, Nov. 17, 1986, 61-273395; Apr. 15, 1987, 62-94058; Sep. 4, 1987, 62-222721
Int. Cl.⁴ C07D *495/12, 495/04;* **A61K** *31/55*
U.S. Cl. 514—220 **5 Claims**

1. A thienotriazolodiazepine compound of the formula:



wherein Ar is pyridyl, phenyl or phenyl substituted by one to three substituents optionally selected from the group consisting of halogen, hydroxy, trifluoromethyl, straight or branched chain alkyl having 1 to 5 carbon atoms and straight or branched chain alkoxy having 1 to 5 carbon atoms, A is alkylene having 1 to 8 carbon atoms or alkylene having 1 to 8 carbon atoms substituted by straight or branched chain alkyl having 1 to 5 carbon atoms, R^1 is hydrogen or straight or branched chain alkyl having 1 to 5 carbon atoms, R^2 and R^3 are the same or different and each is hydrogen, trifluoromethyl or straight or branched chain alkyl having 1 to 5 carbon atoms, and R^4, R^5 and R^6 are the same or different and each is hydrogen, halogen, hydroxy, trifluoromethyl, straight or branched chain alkyl having 1 to 8 carbon atoms, straight or branched chain alkyl having 1 to 8 carbons atoms substituted by trifluoromethyl, straight or branched chain alkoxy having 1 to 8 carbon atoms, phenyl, phenoxy, aralkyl, aralkyloxy, or phenyl, phenoxy, aralkyl or aralkyloxy substituted by one to three substituents optionally selected from the group consisting of halogen, hydroxy, straight or branched chain having 1 to 5 carbon atoms, trifluoromethyl and straight or branched chain alkoxy having 1 to 5 carbon atoms on the aromatic ring, and pharmaceutically acceptable acid addition salts thereof.

5. A method for the prevention or treatment of various PAF-induced diseases which comprises administering a therapeutically effective amount of at least one compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof.

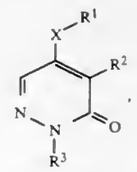
4,820,704

PYRIDAZINONE DERIVATIVES AND THEIR USE AS FUNGICIDES

Winfried Richarz; Gernot Reissenweber, both of Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 435,963, Oct. 22, 1982, abandoned. This application Jul. 11, 1985, Ser. No. 754,666
Int. Cl.⁴ C07D *237/14;* **A01N** *43/58*
U.S. Cl. 514—247 **6 Claims**

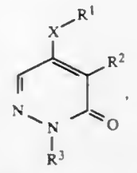
1. A pyridazinone of the formula



(I)

where R^1 is methyl, ethyl, propyl, i-propyl, tert.-butyl, cyclohexyl, phenyl or p-chlorophenyl, R^2 is chlorine or bromine, R^3 is hydrogen, methyl, ethyl, i-propyl, cyclohexyl, phenyl, 4-chlorophenyl, 3,5-dichlorophenyl, 4-bromophenyl, 3-trifluoromethylphenyl, 3-methylphenyl, 4-methylphenyl, 4-acetoxyphenyl or 3-(pentafluoroethoxy)-phenyl and X is SO or SO_2, with the proviso that R^1 is not methyl when X is SO_2, R^2 is chlorine and R^3 is phenyl or methyl.

3. A process for combating plant pathogenic fungi, wherein the fungi or the agricultural plant or seed threatened by fungus attack are treated with a fungicidally effective amount of a pyridazinone derivative of the formula



(I)

where R^1 is methyl, ethyl, propyl, i-propyl, tert.-butyl, cyclohexyl, phenyl or p-chlorophenyl, R^2 is chlorine or bromine, R^3 is hydrogen, methyl, ethyl, i-propyl, cyclohexyl, phenyl, 4-chlorophenyl, 3,5-dichlorophenyl, 4-bromophenyl, 3-trifluoromethylphenyl, 3-methylphenyl, 4-methylphenyl, 4-acetoxyphenyl or 3-(pentafluoroethoxy-phenyl and X is SO or SO_2, with the proviso that R^1 is not methyl when X is SO_2, R^2 is chlorine and R^3 is phenyl.

7. A method for treatment of thromboembolic diseases in warm-blooded animals which comprises administering an effective amount of a compound as recited in claim 1.

8. A method for prophylaxis of thromboembolic diseases in warm-blooded animals which comprises administering an effective amount of a compound as recited in claim 1.

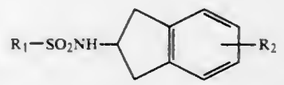
4,820,705

BENZENESULPHONAMIDOINDANYL COMPOUNDS, MEDICAMENTS THEREOF, AND PROCESSES OF PREPARATION

Josef Nickl; Armin Heckel; Erich Muller; Berthold Narr; Johannes Weisenberger; Wolfgang Eisert, and Thomas Muller, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Jul. 16, 1987, Ser. No. 73,950
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623944
Int. Cl.⁴ C07D *237/04, 237/24, 237/14;* **A61K** *31/50*
U.S. Cl. 514—247 **8 Claims**

1. Benzenesulfonamidoindanyl compounds of general formula



(I)

in which

R_1 is phenyl optionally mono-, or disubstituted by halo, methyl or methoxy, and

R_2 is 4,5-dihydro-pyridazin-3(2H)-on-6-yl or pyridazin-3(2H)-on-6-yl, optionally substituted in the 4- or 5-position by C_1–C_3 alkyl or in the 4-position by (C_1–C_3-alkoxy)-carbonyl.

7. A method for treatment of thromboembolic diseases in warm-blooded animals which comprises administering an effective amount of a compound as recited in claim 1.

8. A method for prophylaxis of thromboembolic diseases in warm-blooded animals which comprises administering an effective amount of a compound as recited in claim 1.

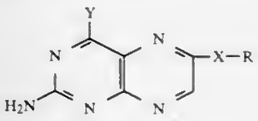
4,820,706

PTERIDINE DERIVATIVES AND METHOD OF TREATING LEUKEMIA EMPLOYING SAME

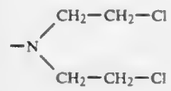
M. Abu Khaled, Helena; Frederick Benington, and Richard D. Morin, both of Birmingham, all of Ala., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 576,581, Feb. 3, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 822,988
Claims priority, application Canada, Feb. 1, 1985, 473410
Int. Cl.⁴ A61K *31/505;* **C07D** *475/04, 475/08*
U.S. Cl. 514—249 **6 Claims**

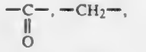
1. Compounds of the formula



wherein Y is NH_2, OH or SH, R is



and X is



3. The method of inducing regression of leukemia in a mammal comprising administering to said mammal an effective antineoplastic amount of a compound of claim 1.

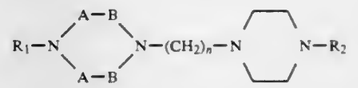
4,820,707

2,6-PIPERAZINEDIONE COMPOUNDS

Gilbert Lavielle, La Celle Saint Cloud, and Jean C. Poignant, Bures snr Yvette, both of France, assignors to ADIR Et Cie, Neuilly-sur-Seine, France

Filed Jul. 8, 1987, Ser. No. 70,967
Claims priority, application France, Jul. 9, 1986, 86 09977
Int. Cl.⁴ A61K *31/495;* **C07D** *401/14, 403/08*
U.S. Cl. 514—252 **14 Claims**

1. A compound of general formula I



(I)

in which

A and B each denote a methylene radical or a carbonyl radical with the proviso, however, that A and B never simultaneously denote the same radical,

R_1 denotes a diphenylmethyl radical optionally substituted on the benzene rings with a halogen atom, a cyclohexyl radical, a pyridylmethyl group, or a benzyl radical optionally substituted with a halogen atom or with an alkoxy radical containing from 1 to 4 carbon atoms,

R_2 denotes a pyrimidinyl radical or a phenyl radical option-

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ally substituted with a halogen atom, with an alkyl radical having from 1 to 4 carbon atoms, with a trifluoromethyl radical or with an alkoxy radical containing from 1 to 4 carbon atoms,

n is an integer which can assume values from 2 to 4,

and their salts formed by addition to a pharmaceutically acceptable inorganic or organic acid.

14. A method of treating a subject in need of anxiolytic or antiaggression, medication, comprising the step of administering to the said subject an effective anxiolytic or antiaggression amount of a compound of claim **1**, or a pharmaceutical composition containing the same together with a pharmaceutically-acceptable excipient or vehicle.

4,820,708

PYRIMIDYLALKYLTHIO BENZIMIDAZOLE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND USE

Robert J. Ife, Stevenage, and Thomas H. Brown, Tewin, both of England, assignors to Smith Kline & French Laboratories, Welwyn Garden City, England

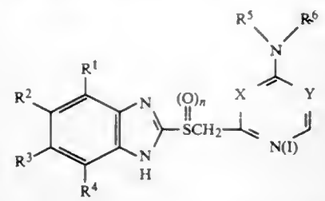
Division of Ser. No. 829,366, Feb. 14, 1986, Pat. No. 4,777,172. This application Jul. 22, 1988, Ser. No. 223,181

Claims priority, application United Kingdom, Mar. 5, 1985, 8505615; Dec. 23, 1985, 8531605

Int. Cl.[4] A61K *31/505, 31/535;* **C07D** *491/056*

U.S. Cl. 514—232.8 **10 Claims**

1. A compound of structure (I)



in which

R^1 and R^4 are the same or different and are each hydrogen, C_{1-6}alkyl, halogen, trifluoromethyl, C_{1-6}alkoxy, C_{1-6}alkanoyl or C_{1-6}alkoxycarbonyl, RCF_2O, an ethoxy group substituted by 3 to 5 fluorine atoms; R^2 and R^3 together form a group $—O(CR_2)_mO—$ where m is 1 or 2, and each group R is hydrogen or fluorine;

n is 0 or 1;

R^5 and R^6 are the same or different and are each hydrogen, C_{1-6}alkyl or C_{3-6}cycloalkyl, or R^5 and R^6 together with the nitrogen atom to which they are attached form an azetidino, pyrrolidino, piperidino, piperazino, N-C_{1-4}alkylpiperazino or morpholino group; and

one of X and Y is a nitrogen atom, and the other is a group CR^7 where R^7 is hydrogen, C_{1-4}alkyl or NH_2,

or a pharmaceutically acceptable salt thereof.

10. A method of treatment of gastrointerstinal diseases and other conditions caused or exacerbated by gastric acidity which comprises administering to a mammal in need thereof an effective amount of a compound as claimed in claim **1**.

4,820,709

6-THIOXANTHINE DERIVATIVES

Peter Hofer, Liestal, Switzerland, assignor to Euroceltique, S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 699,254, Feb. 7, 1985, Pat. No. 4,710,503. This application Jul. 22, 1987, Ser. No. 75,937

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] C07D *473/06;* **A61K** *31/52*

U.S. Cl. 514—263 **13 Claims**

1. A compound selected from the group consisting of 3-ethyl-8-methyl-6-thioxanthine, 3-ethyl-6-thioxanthine, 3-ethyl-8-ethyl-6-thioxanthine, 3-butyl-8-methyl-6-thioxanthine, and pharmaceutically acceptable salts thereof.

4,820,710

BENZIMIDAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Philippe Manoury, Verrieres le Buisson; Jean Binet, Breuillet, and Gerard Defosse, Paris, all of France, assignors to Synthelabo, Paris, France

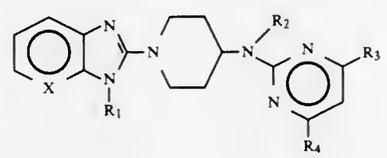
Filed Sep. 10, 1986, Ser. No. 906,279

Claims priority, application France, Sep. 11, 1985, 8513453

Int. Cl.[4] A61K *31/505;* **C07D** *239/04*

U.S. Cl. 514—272 **12 Claims**

1. A compound of formula (I)



(I)

in which

X is CH or N,

R_1 is hydrogen; unsubstituted benzyl; benzyl substituted by up to 3 substituents chosen from halogen, trifluoromethyl, (C_{1-4})alkyl, (C_{1-4})alkoxy, cyano, methylthio, methylsulphinyl and methylsulphonyl; or heterocyclylmethyl in which the heterocyclic moiety is a pyridyl, thienyl or furyl;

R_2 is hydrogen or (C_{1-4})alkyl;

R_3 is hydrogen or hydroxy; and

R_4 is hydrogen or (C_{1-4})alkyl, and tautomers and pharmaceutically acceptable acid addition salts thereof.

9. A method for treating a human or animal having an allergy comprising administering a therapeutically effective non-toxic amount for treating said allergy of a compound of formula (I) according to claim **1** and an orally or parenterally administrable carrier or excipient therefor to a human or animal having said allergy.

4,820,711

METHOD FOR TREATING ACTINIC KERATOSIS WITH CYTOTOXIC AGENTS

Dale L. Pearlman, 21063 Christensen Dr., Cupertino, Calif. 95014

Filed May 15, 1987, Ser. No. 50,985

Int. Cl.[4] A61K *31/505*

U.S. Cl. 514—274 **6 Claims**

1. A method for treating actinic keratosis consisting essentially of applying a therapeutically sufficient quantity of a composition consisting essentially of 5-fluorouracil dissolved in a penetration enhancing agent to an actinic keratosis growth until remission occurs, the composition being applied in one or more pulses at about one week intervals, each pulse comprising applying to the growth one or more times over a period of up to 48 hours, an amount of the composition sufficient to wet the lesion.

4,820,712

SPARSOMYCIN (SC-RS) COMPOUNDS HAVING ANTITUMOR ACTIVITY, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING SPARSOMYCIN (SC-RS) COMPOUNDS

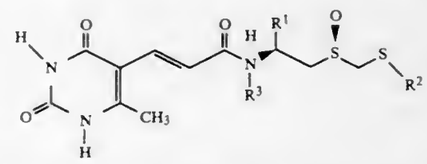
Henricus C. J. Ottenheijm, Milsbeek, Netherlands, assignor to Stichting Katholieke Universiteit, Netherlands

Filed Aug. 27, 1986, Ser. No. 900,779

Int. Cl.[4] A61K *31/505;* **C07D** *239/54*

U.S. Cl. 514—274 **10 Claims**

1. A sparsomycin (S_c-R_s) compound having the formula:



wherein R^1 is C_1–C_6 alkyl, benzyl, imidazolmethyl, or 3-indolylmethyl; R^2 is C_1–C_{10} alkyl, or benzyl; and R^3 is hydrogen; or R^1 and R^3 taken together is $(CH_2)_n$ wherein n is 1, 2, 3, 4, or 5.

10. A pharmaceutical composition for the treatment of tumors comprising an anti-tumor effective amount of a sparsomycin (S_c-R_s) compound according to claim **1** in association with a pharmaceutically acceptable carrier, diluent, solvent or excipient.

4,820,713

KETOALKANOL ESTERS OF DIHYDROLYSERGIC ACID USEFUL AS 5HT RECEPTOR ANTAGONISTS

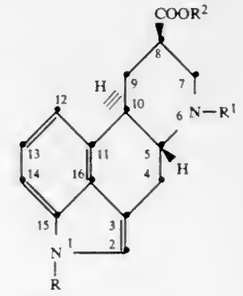
Gifford P. Marzoni, and William L. Garbrecht, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 782,342, Oct. 1, 1985, Pat. No. 4,772,709. This application May 23, 1988, Ser. No. 197,732

Int. Cl.[4] A61K *31/48;* **C07D** *457/04*

U.S. Cl. 514—288 **20 Claims**

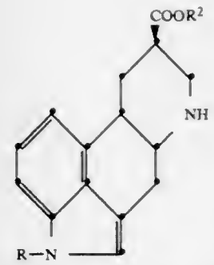
1. A compound of the formula:



wherein R is primary or secondary C_{1-8} alkyl, CH_2—C_{2-4} alkenyl, C_{3-8} cycloalkyl or C_{3-6} cycloalkyl-substituted C_{1-5} primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R^1 is H, allyl or C_{1-4} straight chain alkyl, and R^2 is C_{3-6} ketoalkyl and pharmaceutically-acceptable salts thereof.

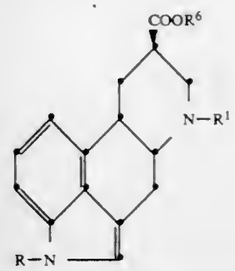
10. A method of blocking $5HT_2$ receptors which comprises administering to a mammal having an excess of serotonin centrally or peripherally an $5HT_2$ blocking dose of a compound according to claim **1**.

18. A compound of the formula



wherein R is primary or secondary C_{1-8} alkyl, CH_2—C_{2-4} alkenyl, C_{3-8} cycloalkyl or C_{3-6} cycloalkyl-substituted C_{1-5} primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; and R^2 is C_{3-6} ketoalkyl.

19. An intermediate of the structure



wherein R is primary or secondary C_{1-8} alkyl, CH_2—C_{2-4} alkenyl, C_{3-8} cycloalkyl or C_{3-6} cycloalkyl-substituted C_{1-5} primary or secondary alkyl, the total number of carbon atoms in R not to exceed 8; R^1 is H, C_{1-4} straight chain alkyl or allyl; and R^6 is a primary or secondary C_{3-6} alkyl containing a protected keto group.

4,820,714

USE OF PHOSPHOLIPASE INHIBITORS IN THE TREATMENT OF *CLOSTRIDIUM DIFFICILE* DIARRHEA

Richard L. Guerrant, Charlottesville, and Aldo M. Lima, University Garden, both of Va., assignors to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed May 2, 1986, Ser. No. 858,674

Int. Cl.[4] A61K *31/44, 31/225*

U.S. Cl. 514—297 **12 Claims**

1. A method of treating antibiotic-associated diarrhea in animals and humans, comprising administering an effective amount to reduce hemorrhagic fluid secretion of a composition of a phospholipase inhibitor selected from the group consisting of quinacrine, quinacrine hydrochloride and dimethyl d,l-2,3-distearoyloxypropyl-2'-hydroxyethyl ammonium acetate and pharmaceutically acceptable acid addition salts, and a pharmaceutical therefor.

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ANTI-EMETIC QUINUCLIDINYL BENZAMIDES

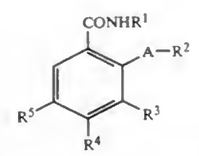
Ivo Monkovic, Fayetteville, and David Willner, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 876,020, Jun. 19, 1986, which is a continuation-in-part of Ser. No. 729,513, May 6, 1985, which is a continuation-in-part of Ser. No. 625,742, Jun. 28, 1984, abandoned. This application May 18, 1987, Ser. No. 51,880

Int. Cl.[4] **A61K** *31/445;* C07D *453/02*

U.S. Cl. 514—305 **14 Claims**

1. A compound of the formula



XXI

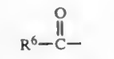
wherein

R^3 is hydrogen or, when R^4 and R^5 are each hydrogen, R^3 may be (lower)alkoxy;

R^4 is hydrogen, amino, lowerallylamino, acetamido or (lower)alkoxy;

R^5 is hydrogen, chloro, bromo, fluoro, trifluoromethyl, (lower)alkylthio, (lower)alkanesulfinyl, (lower)alkanesulfonyl,

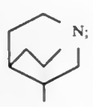
sulfamyl or



or R^4 and R^5, taken together, may be —HN—N=N—;

R^6 is (lower)alkyl, (lower)alkenyl or (lower)alkynyl;

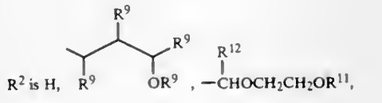
R^1 is

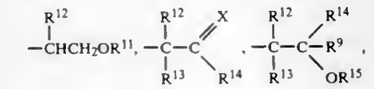


wherein

A is oxygen or







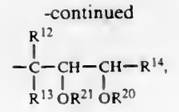


R^2 is H, , , ,

,

, lower alkenyl, lower alkynyl or

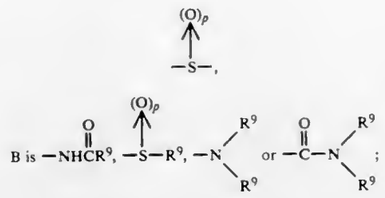
-continued



wherein

X is oxygen, sulfur or =NOR[16];

Z is $-(CH_2)_p-$, O, N or

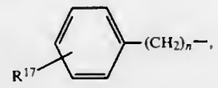


p is 0, 1 or 2;

q is an integer of from 0 to 4, inclusive;

R^9 is hydrogen or (lower)alkyl;

R^{11}, R^{12}, R^{13}, R^{15}, and R^{16} are the same or different, and are hydrogen, (lower)alkyl, (lower)alkenyl, (lower)alkynyl, (lower)alkoxy(lower)alkyl, cycloalkyl containing from 5 to 7 carbon atoms, inclusive, or

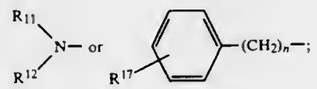


wherein

R^{17} is hydrogen, halogen, hydroxy, (lower)alkyl or (lower)alkoxy; provided that, when R^{11}, R^{15} or R^{16} is (lower)alkenyl or (lower)alkynyl, the unsaturated carbon atom may not be directly attached to an oxygen or nitrogen atom;

R^{15} can additionally be loweralkylcarbonyl;

R^{14} is hydrogen, halogen, (lower)alkyl, (lower)alkenyl, (lower)alkynyl, cycloalkyl containing from 5 to 7 carbon atoms, inclusive, hydroxy, (lower)alkoxy, (lower)alkenyloxy, (lower)alkoxycarbonyl(lower)alkenyl, hydrazino, acetylhydrazino, thienyl, phenyl,



R^{20} and R^{21} are each hydrogen

or R^{12} and R^{13}, taken together with the carbon atom to which they are attached, may form a saturated ring of from 5 to 7 atoms, inclusive;

or R^{12} and R^{14}, taken together with the carbon atoms to which they are attached, may form a saturated or unsaturated ring of from 5 to 7 atoms, inclusive;

or a nontoxic pharmaceutically acceptable salt, hydrate, solvate or quaternary ammonium salt thereof.

13. A method of alleviating nausea and vomiting in a warm-blooded mammal in need thereof, which comprises administering to said mammal an effective antiemetic amount of at least one compound of Formula XXI of claim 1, or a salt, hydrate or solvate thereof, in a pharmaceutically acceptable carrier.

4,820,716

7-(1-PYRROLIDINYL)-QUINOLONECARBOXYLIC ACID DERIVATIVES

Uwe Petersen, Leverkusen; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal-Elberfeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

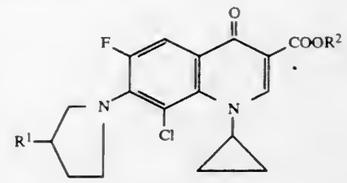
Filed Feb. 12, 1987, Ser. No. 13,744

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3606698

Int. Cl.[4] **A61K** *31/47, 31/435;* C07D *215/56, 471/04*

U.S. Cl. 514—312 **10 Claims**

1. A 7-(1-pyrrolidinyl)-3-quinolonecarboxylic acid derivative having the formula



in which

R^1 is hydroxymethyl and

R^2 is hydrogen, or alkyl, having 1 to 4 carbon atoms,

or a pharmaceutically acceptable hydrate, alkali metal alkaline earth metal, silver or guanidinium salt.

4,820,717

ANTIMICROBIAL AROMATIC DERIVATIVES SUBSTITUTED BY AN (OMEGA AMINO) ALKANOL GROUP AND COMPOSITIONS CONTAINING THEM

Madeleine Mosse; Henri Demarne, both of Montpellier, and Vincenzo Proietto, Saint Georges D'Orques, all of France, assignors to Sanofi, Paris, France

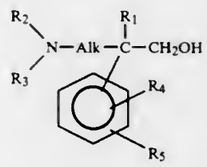
Filed Sep. 30, 1986, Ser. No. 913,361

Claims priority, application France, Oct. 11, 1985, 85 15102

Int. Cl.[4] **A61K** *31/445, 31/135;* C07C *91/06;* C07D *211/14*

U.S. Cl. 514—317 **12 Claims**

1. A compound corresponding to the formula:



wherein:

Alk represents an alkylene group with 2 to 10 carbon atoms,

R_1 represents hydrogen or an alkyl group with 1 or 2 carbon atoms,

R_2 represents a cyclohexyl group or a straight or branched alkyl group with 1 to 3 carbon atoms,

R_3 represents a cyclohexyl group, a straight or branched alkyl group with 1 to 3 carbon atoms, or benzyl, or

R_2 and R_3 together with the nitrogen atom to which they are bonded form a heterocycle selected from the group consisting of pyrrolidino, piperidino, azepino, hexamethyleneimino, 4-methylpiperidino, 4-phenylpiperidino, 4-benzylpiperidino, or 1,2,3,4-tetrahydro-2-isoquinolyl,

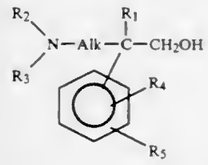
R_4 represents hydrogen, halogen, methyl or phenyl,

R_5 represents hydrogen, halogen or methyl, or

R_4 and R_5 together with the benzene ring to which they are bonded constitute 1-naphthyl or 2-naphthyl,

or a pharmaceutically acceptable salt with a mineral or organic acid thereof.

7. An antimicrobial liquid composition comprising a liquid selected from the group consisting of water and lower alkyl alcohols and an effective antimicrobial amount of a compound corresponding to the formula:



wherein:

Alk represents an alkylene group with 2 to 10 carbon atoms,

R_1 represents hydrogen or an alkyl group with 1 or 2 carbon atoms,

R_2 represents a cyclohexyl group or a straight or branched alkyl group with 1 to 3 carbon atoms,

R_3 represents a cyclohexyl group, a straight or branched alkyl group with 1 to 3 carbon atoms, or benzyl, or

R_2 and R_3 together with the nitrogen atom to which they are bonded form a heterocycle selected from the group consisting of pyrrolidino, piperidino, azepino, hexamethyleneimino, 4-methylpiperidino, 4-phenylpiperidino, 4-benzylpiperidino, or 1,2,3,4-tetrahydro-2-isoquinolyl,

R_4 represents hydrogen, halogen, methyl or phenyl,

R_5 represents hydrogen, halogen or methyl, or

R_4 and R_5 together with the benzene ring to which they are bonded constitute 1-naphthyl or 2-naphthyl,

or a pharmaceutically acceptable salt with a mineral or organic acid thereof.

4,820,718

N-ALKYL-(2- OR 5-SUBSTITUTED-2-METHOXYCARBONYL AMINOALKYL FURANYL)-SUBSTITUTED CYCLIMMONIUM SALTS AND USE THEREOF IN PAF INHIBITION

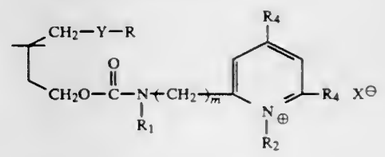
John C. Tomesch, Succasunna, N.J., assignor to Sandoz Pharm. Corp., Hanover, N.J.

Filed Sep. 17, 1987, Ser. No. 98,350

Int. Cl.[4] C07D *401/00;* **A61K** *31/44*

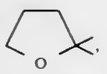
U.S. Cl. 514—336 **21 Claims**

1. A compound of formula I:



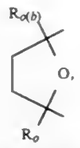
I

wherein T is a group of the formula (a)



(a)

or a group of the formula (b)

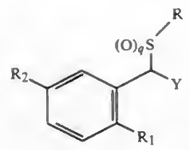


where both R_o's are the same and are either hydrogen or methyl;
Y is —O— or



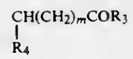
R is n-C_{12}–C_{20}alkyl, alkenyl or alkynyl;
each R_1, independently, is hydrogen, acetyl, pivaloyl, benzoyl or C_1–C_4alkyl;
m is an integer 1 to 8;
R_2 is methyl or ethyl;
each R_4, independently, is hydrogen or methyl;
and $X^{\ominus}$ is chloride, bromide, iodide or C_1–C_4alkylsulfonate.
7. A method of inhibiting PAF-induced blood platelet aggregation comprising administering to a subject in need of such treatment a therapeutically effective amount of a compound according to claim 1.

4,820,719
LEUKOTRIENE ANTAGONISTS
John G. Gleason, Downingtown; Ralph F. Hall, Villanova; Thomas Wen-Fu Ku, Dresher, and Carl D. Perchonock, Philadelphia, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.
Continuation of Ser. No. 926,314, Oct. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 848,608, Apr. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 725,264, Apr. 19, 1985, abandoned. This application May 16, 1988, Ser. No. 195,355
Int. Cl.[4] A61K *31/41*; C07D *233/64*
U.S. Cl. 514—381 **39 Claims**
1. A compound represented by the following structural formula (I):

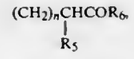


(I)

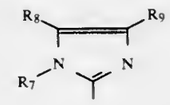
wherein
R_1 is C_8 to C_{13} alkyl, C_7 to C_{12} alkoxy, C_7 to C_{12} alkylthio, C_{10} to C_{12} 1-alkynyl, 10-undecynyloxy, 11-dodecynyl, phenyl-C_4 to C_{10} alkyl, phenyl-C_3 to C_9 alkoxy, phenylthio-C_3 to C_9 alkyl with the phenyl optionally mono substituted with bromo, chloro, trifluoromethyl, C_1 to C_4 alkoxy, methylthio or trifluoromethylthio, furyl-C_4 to C_{10} alkyl, trifluoromethyl-C_7 to C_{12} alkyl or cyclohexyl-C_4 to C_{10} alkyl;
R_2 is hydrogen, bromo, chloro, methyl, trifluoromethyl, hydroxy, C_1 to C_4 alkoxy or nitro; or R_1 is hydrogen and R_2 is C_8 to C_{13} alkyl, C_7 to C_{12} alkoxy, C_7 to C_{12} alkylthio, C_{10} to C_{12} 1-alkynyl, 10-undecynyloxy, 11-dodecynyl, phenyl-C_4 to C_{10} alkyl, phenyl-C_3 to C_9 alkoxy, phenylthio-C_3 to C_9 alkyl with the phenyl optionally mono substituted with bromo, chloro, trifluoromethyl, C_1 to C_4 alkoxy, methylthio or trifluoromethylthio, furyl-C_4 to C_{10} alkyl, trifluoromethylC$_7$ to C_{12} alkyl or cyclohexyl-C_4 to C_{10} alkyl;
q is 0, 1 or 2, with the proviso that any of R_1 and R_2 above are not alkylthio or phenylthioalkyl when q is 1 or 2;
Y is,



or
R_3 is hydroxy or amino;
R_4 is C_1 to C_4 alkoxy, or hydroxy;
m is 0 or 1;
R is



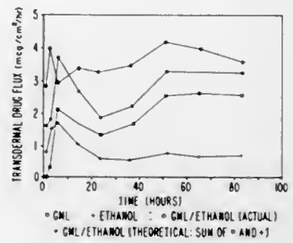
$CH(CO_2H)CH_2CO_2H$, CH_2CH_2Z or



n is 0 to 6;
R_5 is hydrogen, amino, or $NHCOCH_2CH_2CH(NH_2)CO_2H$;
R_6 is hydroxy, amino or $NHCH_2CO_2H$;
Z is SO_3H, SO_2NH_2 or CN;
R_7 is hydrogen, C_1 to C_4 alkyl or C_3 to C_4 alkenyl;
R_8 is hydrogen, C_1 to C_4 alkyl, carboxyl or carboxamido, or $(CH_2)_pCO_2H$, wherein p is 1 or 2, when R_7 and R_9 are hydrogen or C_1 to C_4 alkyl; and
R_9 is hydrogen, C_1 to C_4 alkyl or CH_2CO_2H, with the proviso that when n is 0, R_5 is hydrogen and further that R_7, R_8 and R_9 are not all hydrogen; or a pharmaceutically acceptable salt thereof.
30. A method of treating allergic rhinitis in a subject in need thereof comprising administration to such subject of an effective amount of a compound of claim 1.

4,820,720
TRANSDERMAL DRUG COMPOSITION WITH DUAL PERMEATION ENHANCERS
Harold F. Sanders, Palo Alto; Yu-Ling Cheng, Cupertino; David J. Enscore, Saratoga, and Shari B. Libicki, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Continuation of Ser. No. 88,767, Aug. 24, 1987, Pat. No. 4,764,379. This application Mar. 29, 1988, Ser. No. 174,932
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—356 **10 Claims**
1. A composition of matter for application to a body surface or membrane to deliver a drug at a therapeutically effective

rate by permeation through a body surface or membrane comprising, in combination: a dual permeation enhancer comprising glycerol monolaurate and ethanol, and the drug to be delivered.



4,820,721
1-ARYL-5-(2-OXO-1-PYRROLIDINYL)-1,2,3-TRIAZOLINES AS NOVEL ANTICONVULSANTS
Pankaja K. Kadaba, 3411 Brookhaven Dr., Lexington, Ky. 40502
Filed Apr. 11, 1988, Ser. No. 180,163
Int. Cl.[4] A61K *31/41*; C07D *249/06*
U.S. Cl. 514—359 **9 Claims**
1. A compound of the following formula:

wherein R^1 is 2-oxo-1-pyrrolidinyl, and R^2 is hydrogen or p-chloro.

4,820,722
DISUBSTITUTED TETRAZOLES AND THEIR USE AS LEUKOTRIENE ANTAGONISTS
F. Patrick Carr, Indianapolis; Robert D. Dillard, Zionsville; Winston S. Marshall, Bargersville, and Doris E. McCullough, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed Aug. 14, 1987, Ser. No. 85,586
Int. Cl.[4] C07D *403/06, 257/04*; A61K *31/41*
U.S. Cl. 514—381 **37 Claims**
1. A compound of the formula

wherein:
R_1 is C_1 to C_3 alkyl;
R_2 is C_1 to C_6 alkyl or C_3 to C_6 alkenyl;
R_3 is a hydrogen atom, chloro, bromo, nitro, or a group of the formula

wherein R_a and R_b are the same or different and are a hydrogen atom, C_1 to C_4 alkyl, phenyl, benzyl, or C_1 to C_4 acyl;
R_4 and R_5 are the same or different and are a hydrogen atom or C_1 to C_3 alkyl;
W is from one to six;
Z is O, S or a group of the formula

(wherein R_e is a hydrogen atom, C_1 to C_4 alkyl, C_1 to C_4 acyl, phenyl, or benzyl);
n is 0 to 6;
R_c and R_d are the same or different and are hydrogen, hydroxy, halo or an ether group of the formula —O—(C_1–C_6 alkyl);
[Tet] is a disubstituted 1H- or 2H-tetrazolyl ring of the formula

wherein:
L is
(1) C_1 to C_{10} alkylidene; or
(2) a group of the formula

p' wherein y is 1 to 3 (and the phenyl ring is bonded to A);
A is
(1) 5-(tetrazolyl);
(2) carboxy;
(3) —NR_fR_g, wherein R_f and R_g are the same or different and are a hydrogen atom, C_1 to C_4 alkyl, phenyl, benzyl or C_1 to C_4 acyl; or
(4) a group of the formula

wherein q is 0, 1 or 2 and R_h is C_1 to C_4 alkyl, phenyl or benzyl;
or a pharmaceutically-acceptable base addition salt thereof.
32. A method of treating a mammal suffering from or susceptible to any condition characterized by an excessive release of leukotrienes C_4, D_4, and E_4, which comprises administering to said mammal a leukotriene antagonizing amount of a compound of claim 1.

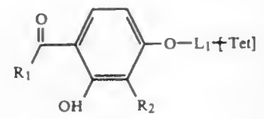
4,820,723

DISUBSTITUTED TETRAZOLE LEUKOTRIENE ANTAGONISTS AND METHODS FOR THEIR USE THEREAS

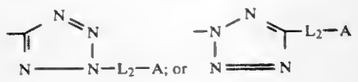
Winstoo S. Marshall, Bargersville; Sandra K. Sigmund, Carmel, and Celia A. Whitesitt, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 14, 1987, Ser. No. 85,588
Int. Cl.[4] C07D *257/04, 403/06;* A61K *31/41*
U.S. Cl. 514—381 42 Claims

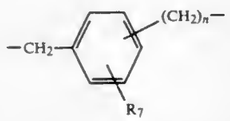
1. A compound of the formula



wherein:
R_1 is C_1 to C_8 alkyl or phenyl;
R_2 is C_2 to C_8 alkyl or C_3 to C_8 alkenyl;
L_1 is C_4 alkylidene or phenyl;
[Tet]is a disubstituted 2H-tetrazolyl ring of the formula:



L_2 is
(1) a C_2 to C_{10} alkylidene group; or
(2) a benzyl group of the formula:



wherein R_7 is a hydrogen atom, hydroxy group, or acetoxy; and n is from 0 to 3; (and the single methylene group bonded to the ring is also bonded to the tetrazolyl ring [Tet]);

A is
(1) a group of the formula —COOH; or
(2) a 5-(tetrazolyl) group; with the proviso that when L_1 is phenyl, —L_2—A cannot be bonded to the five position of [Tet] tetrazolyl ring;

or a phamaceutically-acceptable salt thereof.

33. A method of treating a mammal suffering from or susceptible to any condition characterized by an excessive release of either leukotriene C_4, D_4, or E_4 or any combination thereof, which comprises administering to said mammal a leukotriene antagonizing amount of a compound of claim 1.

4,820,724

DUAL PHASE SOLVENT CARRIER SYSTEM

Marcel E. Nimni, Santa Monica, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Mar. 31, 1986, Ser. No. 846,171
Int. Cl.[4] A61K *31/415, 31/34, 31/21, 31/12*
U.S. Cl. 514—396 21 Claims

1. A dual phase solvent carrier system comprising:
a pharmaceutically effective amount of a pharmaceutically active compound;
from about 5 to about 15 weight percent of one or more delivery solvents; and
a major amount of one or more fugitive solvents having a boiling point of less than 110° C.

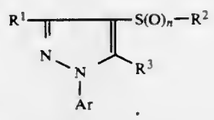
4,820,725

1-ARYL-PYRAZOLES, PESTICIDAL COMPOSITIONS AND USE

Uta Jensen-Korte, Duesseldorf; Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Heinz-Jürgen Wroblowsky, Langenfeld; Benedikt Becker, Mettmann; Wilhelm Stendel, Wuppertal; Berhard Homeyer, Leverkusen, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 4, 1986, Ser. No. 893,133
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529829
Int. Cl.[4] A01N *43/56;* C07D *231/18*
U.S. Cl. 514—407 10 Claims

1. A 1-aryl-pyrazole of the formula



in which
R^1 represents hydrogen or C_1–C_4 alkyl,
R^2 represents C_1–C_8 alkyl or C_1–C_8 halogenoalkyl,
R^3 represents halogen,
Ar represents phenyl which is mono-, di-, tri-, tetra- or pentasubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, bromine, methyl, ethyl, trifluoromethyl and trifluoromethoxy, and
n represents the number 0, 1 or 2.

8. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of a compound according to claim 1 and a diluent.

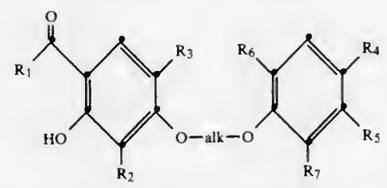
4,820,726

OXALOAMINO SUBSTITUTED FLUORINATED RESORCINOL ETHERS AND ANTI-ALLERGIC AND ANTI-INFLAMMATORY USE THEREOF

Andreas Beck, Freiburg, Fed. Rep. of Germany; Alfred Sallmann, Bottmingen, Switzerland; Robert W. Lang, Pratteln, Switzerland, and Paul Wenk, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 801,012, Nov. 22, 1985, Pat. No. 4,670,604. This application Jan. 14, 1987, Ser. No. 3,156
Claims priority, application Switzerland, Sep. 17, 1985, 4016/85-9
Int. Cl.[4] C07C *103/14;* A61K *31/165*
U.S. Cl. 514—476 12 Claims

1. A 2-fluoroalkylated 4-acylresorcinol ether of the formula



(I)

in which R_1 is lower alkyl, R_2 is fluorinated lower alkyl, R_3 is hydrogen, lower alkoxy, trifluoromethyl or halogen, alk is an alkylene or hydroxyalkylene radical which is uninterrupted or interrupted by oxygen, one of the radicals R_4, R_5 and R_7 is a group of the formula —NH—C(=O)—R_8, a radical R_4 or R_5 which differs from this is a radical R_9 and a radical R_7 which differs from this is a radical R_{10}, R_6 is hydrogen, lower alkyl,

trifluoromethyl, halogen, lower alkanoyl, carboxyl, lower alkoxycarbonyl, cyano, carbamoyl or N-mono- or N,N-di-lower alkylcarbamyl, R_8 is carboxyl. R_9 is hydrogen, lower alkyl, lower alkoxy, halogen or trifluoromethyl and R_{10} is hydrogen, lower alkyl, lower alkoxy, halogen, trifluoromethyl, carboxyl, lower alkoxycarbonyl, cyano, carbamyl or N-mono or N,N-di-lower alkylcarbamyl, or a pharmaceutically acceptable salt thereof.

12. Method of treatment of allergies and inflammations characterised in that a therapeutically effective amount of a compound claimed in claim 1, or a pharmaceutically acceptable salt thereof, is administered.

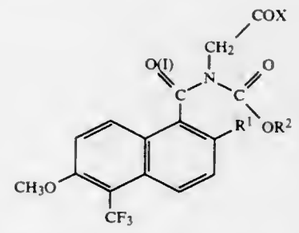
4,820,727

N-ACYL-N-NAPHTHOYLGLYCINES AS ALDOSE REDUCTASE INHIBITORS

Jay E. Wrobel, Lawrenceville, and Kazimir Sestanj, Monmouth Junction, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 23, 1987, Ser. No. 137,406
Int. Cl.[4] C07C *125/065;* A61K *31/27*
U.S. Cl. 514—510 11 Claims

1. A compound of formula (I)



wherein R^1 is halogen or lower perfluoroalkoxy containing 1 to 3 carbon atoms; R^2 is lower alkyl containing 1 to 3 carbon atoms; X is —OH or —NH_2, or the pharmaceutically acceptable salt thereof, wherein X is —OH.

9. A pharmaceutical composition for preventing or relieving neuropathy, nephropathy, retinopathy, or cataracts in a diabetic mammal, which comprises an alleviating or prophylactic amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

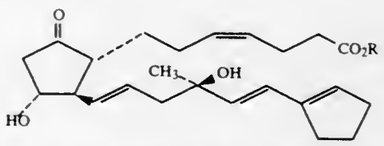
4,820,728

TETRAENYL PROSTAGLANDINS

Paul W. Collins, Deerfield, and Alan F. Gasiecki, Vernon Hills, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 801,370, Nov. 25, 1985, Pat. No. 4,683,328. This application Jun. 30, 1987, Ser. No. 68,608
The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.
Int. Cl.[4] C07C *177/00;* A01K *31/557*
U.S. Cl. 514—530 3 Claims

1. A compound according to the formula:



wherein R represents hydrogen or lower alkyl having 1–6 carbon atoms.

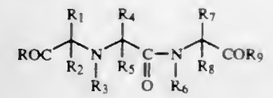
4,820,729

N-SUBSTITUTED-AMIDO-AMINO ACIDS

Raymond D. Youssefyeh, Tarrytown; Jerry W. Skiles, Tuckahoe, both of N.Y.; John T. Suh, Greenwich, Conn., and Howard Jones, Ossining, N.Y., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Mar. 30, 1981, Ser. No. 248,172
Int. Cl.[4] A61K *31/215, 31/195;* C07C *101/02, 101/72, 61/08*
U.S. Cl. 514—542 20 Claims

1. Compounds of the formula



possessing angiotensin converting enzyme inhibitory activity, wherein
R and R_9 are independently hydroxy or lower alkoxy,
R_1 is hydrogen, lower alkyl or aryl-lower alkyl,
R_2, R_3, R_4, R_5, R_7 and R_8 are hydrogen or lower alkyl, and
R_6 is cycloalkyl having 3 to 20 carbon atoms, aryl-lower alkyl, or aryl, substituted and unsubstituted,
and their pharmaceutically acceptable salts.

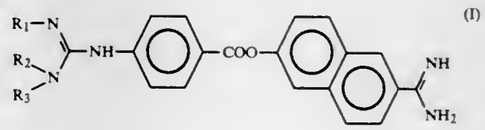
4,820,730

6-AMINO-2-NAPHTHYL 4-GUSNICHINOBENZOATE DERIVATIVES AND PHARMACEUTICAL COMPOSITION CONTAINING THEM

Setsuro Fujii, Kyoto; Toshiyuki Okutome, Tokyo; Toyoo Nakayama, Funabashi; Shigeki Nunomura; Kimio Sudo, both of Chiba; Shinichi Watanabe, Otsu; Masateru Kurami, Narita, and Takuo Aoyama, Sakura, all of Japan, assignors to Torii & Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 835,853, Feb. 24, 1986, Pat. No. 4,777,182. This application Jul. 11, 1988, Ser. No. 217,405
Claims priority, application Japan, Jul. 25, 1984, 59-155045
Int. Cl.[4] A61K *31/24;* C07C *129/12*
U.S. Cl. 514—510 7 Claims

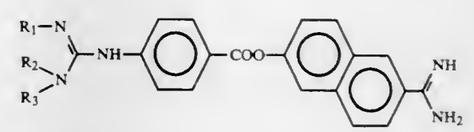
1. Compound of formula (I):



(I)

wherein
R_1 and R_2 each represent hydrogen or a straight or branched chain alkyl group of 1 to 6 carbon atoms;
R_3 represents a straight or branched chain alkyl group of 1 to 6 carbon atoms;
and when R_1 is hydrogen, then R_2 is other than hydrogen;
or a pharmaceutically acceptable acid addition salt thereof.

7. A pharmaceutical composition having anti-trypsin, anti-plasmin, anti-kallikrein, anti-thrombin and anti-complement activities and which may be administered orally comprising a therapeutically effective amount of a compound of the formula:



wherein

VOL 1101 ISS 2 AP 11 1989 UMI

R_1 and R_2 each represent hydrogen or a straight or branched chain alkyl group of 1 to 6 carbon atoms;
R_3 represents a straight or branched chain alkyl group of 1 to 6 carbon atoms;
and when R_1 is hydrogen, then R_2 is other than hydrogen;
or a pharmaceutically acceptable acid addition salt thereof, or mixtures thereof, and a pharmaceutically acceptable carrier therefor.

4,820,731

PARENTERAL DIETARY SUPPLEMENT AND METHOD OF MINIMIZING EFFECTS OF INFECTION THROUGH DIET

Edward A. Mascioli, Cambridge; George L. Blackburn, Jamaica Plain; Bruce R. Bistrian, Ipswitch, and Vigen K. Babayan, Waban, all of Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.

Division of Ser. No. 630,732, Jul. 12, 1984, Pat. No. 4,752,618. This application Jun. 15, 1988, Ser. No. 207,122
Int. Cl.[4] A61K *31/22*
U.S. Cl. 514—549 **20 Claims**

1. A dietary supplement for parenteral administration comprising:
at least 10% by weight of an oily fraction formed of a mixture of oils selected from a group consisting of oils which have ω6 fatty acids as their primary fatty acids and oils which have ω3 fattyy acids as their primary fatty acids, said oils having ω3 fatty acids as their primary fatty acids forming 10–90% by weight of said oily fraction;
1–2% by weight emulsifier; and
sterile water.

4,820,732

METHOD AND COMPOSITIONS FOR REDUCING DYSFUNCTION IN ANGIOPLASTY PROCEDURES

William E. Shell, Los Angeles, and Jackie R. See, Fullerton, both of Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 784,160, Oct. 4, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,233
Int. Cl.[4] A61K *31/19, 31/557*
U.S. Cl. 514—573 **9 Claims**

1. A method for preventing or treating arterial dysfunction resulting from angioplasty procedures in an artery of human beings, said method comprising: initially introducing into said artery prostaglandin E_1 or a prostaglandin pharmacologically equivalent thereto, in an amount of at least 25 nanograms prior to beginning said procedure and then continuing to introduce into the artery the prostaglandin compound during said procedure.

4,820,733

METHOD OF PREVENTING OR REDUCING PLATELET LOSS DURING EXTRACORPOREAL CIRCULATION USING A THROMBOXANE A_2 RECEPTOR ANTAGONIST

Gary J. Grover, Stockton, N.J., assignor to E.R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 7, 1988, Ser. No. 165,065
Int. Cl.[4] A61K *31/16*
U.S. Cl. 514—613 **12 Claims**

1. A method preventing or reducing platelet loss during extracorporeal circulation, in a mammalian species, which comprises administering to a mammalian species in need of such treatment an effective amount of thromboxane A_2 receptor antagonist alone or with prostacyclin and/or a prostacyclin minic.

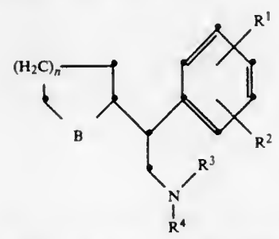
4,820,734

PHENETHYLAMINE DERIVATIVES

Karl Bernauer, Oberwil, and Hans Bruderer, Biel-Benken, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 649,349, Sep. 11, 1984, abandoned. This application Nov. 4, 1987, Ser. No. 117,190
Claims priority, application Switzerland, Sep. 15, 1983, 5032/83; Jul. 4, 1984, 3231/84
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—649 **30 Claims**

1. A compound of the formula



wherein R^1 and R^2 each signify hydrogen, halogen, trifluoromethyl, lower alkoxy, lower alkyl, hydroxy or nitro, with the proviso that at least one of R^1 and R^2 is different from hydrogen, R^3 and R^4 each signify lower alkyl, n signifies the number 1, 2, 3 or 4 and B signifies the group —CO— or —CHOH—, and pharmaceutically acceptable acid addition salts thereof.

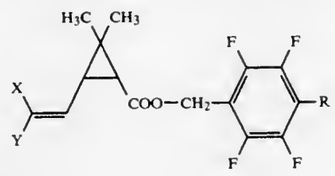
4,820,735

VINYLCYCLOPROPANECARBOXYLIC ACID ESTERS

Klaus Naumann, Leverkusen; Rudolf Braden, Odenthal; Wolfgang Behrenz, Overath; Benedikt Becker, Mettmann; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 848,353, Apr. 4, 1986, abandoned. This application Aug. 18, 1987, Ser. No. 87,999
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1985, 3513978
Int. Cl.[4] C07C *147/14, 149/40;* A01N *53/00*
U.S. Cl. 514—531 **7 Claims**

1. A vinylcyclopropanecarboxylic acid ester of the formula



in which
R is methylthio or methylsulphinyl, and
X and Y each is halogen.

4,820,736

USE OF CLOMIPHENE TO PREDICT FERTILITY IN A HUMAN FEMALE

Pamela S. Jensen, Camden, Me., and Florence Comite, New Haven, Conn., assignors to Yale University, New Haven, Conn.

Filed Mar. 20, 1987, Ser. No. 28,371
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—651 **2 Claims**

1. A method for predicting fertility in a human female comprising administering to a human female an effective amount of clomiphene or its citrate salt, said effective amount of clomiphene being sufficient to increase the bone mass of a human, said clomiphene being administered alone or in admixture with a diluent and determining if said female experiences increased bone mass, whereby an increase in bone mass would be predictive of fertility.

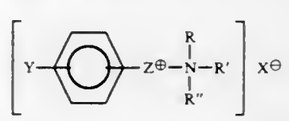
4,820,737

LACRIMAL SECRETION STIMULANT (LSS)

Ronald D. Schoenwald, and Charles F. Barfknecht, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Continuation of Ser. No. 015,117, Feb. 17, 1987, abandoned. This application Mar. 16, 1988, Ser. No. 168,680
Int. Cl.[4] A61K *31/14*
U.S. Cl. 514—654 **12 Claims**

1. A method of stimulating lacrimal secretion, comprising:
topically applying to the eye to stimulate the eye itself to produce more tears from about 0.1% to about 5% on a weight volume basis of a topical ophthalmic preparation of a compound of the formula:



wherein Y is selected from the group consisting of hydrogen, hydroxy, amino, C_1 to C_5 alkyl, C_1 to C_5 hydroxyalkoxy and C_1 to C_5 alkoxy; Z is selected from the group consisting of C_1 to C_6 alkylene, C_1 to C_6 oxyalkylene, and C_1 to C_6 aminoaklylene; R is selected from the group consisting of C_1 to C_6 alkyl and C_3 to C_7 cycloalkyl; R' is selected from the group consisting of hydrogen, C_1 to C_6 alkyl and C_3 to C_7 cycloalkyl; R" is selected from the group of hydrogen and C_1 to C_6 alkyl; and X is a pharmaceutically acceptable counteranion.

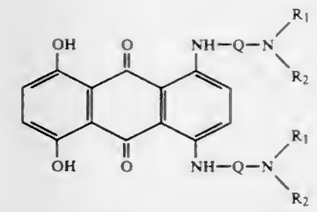
4,820,738

1,4-BIS(SUBSTITUTED-AMINO)-5,8-DIHYDROXY-ANTHRAQUINONES AND LEUCO BASES THEREOF

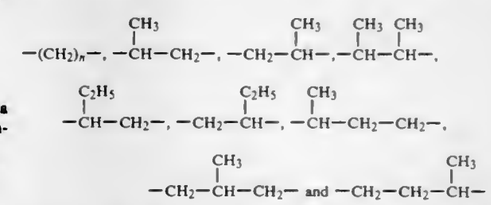
Keith C. Murdock, Pearl River, N.Y., and Frederick E. Durr, Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 485,143, Apr. 15, 1983, and a continuation of Ser. No. 244,452, Nov. 2, 1981, Pat. No. 4,430,501, which is a division of Ser. No. 63,285, Aug. 2, 1979, Pat. No. 4,278,689, which is a division of Ser. No. 923,602, Jul. 11, 1978, Pat. No. 4,197,249, which is a continuation-in-part of Ser. No. 873,040, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 824,822, Aug. 15, 1977, abandoned. This application Jan. 28, 1986, Ser. No. 823,265
Int. Cl.[4] A61K *31/135*
U.S. Cl. 514—656 **12 Claims**

1. The method of inhibiting growth of solid tumors in a mammal which comprises administering to said mammal an amount effective to inhibit growth of solid tumors of a compound capable of inhibiting growth of solid tumors, said compound selected from the group consisting of those of the formulae:



wherein Q is a divalent moiety selected from the group consisting of those of the formulae:



wherein n is an integer from 2 to 4, inclusive; R_1 and R_2 are each individually selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms and monohydroxyalkyl having from 2 to 4 carbon atoms and wherein the carbon atom alpha to the nitrogen atom may not bear an hydroxy group; the leuco bases and tautomers thereof; and the pharmacologically acceptable acid-addition salts thereof; said solid tumors being those that are susceptible to growth inhibition in said mammal by administration of said compound.

4,820,739

FAT SUPPRESSANT

Tomas A. Ramallo; Francisco M. Puchal; Juan C. Pinol, and Enric Julia, all of Barcelona, Spain, assignors to Lucta, S.A., Barcelona, Spain

Division of Ser. No. 642,376, Aug. 20, 1984, Pat. No. 4,665,099, which is a continuation-in-part of Ser. No. 392,728, Jun. 28, 1982, abandoned. This application Apr. 7, 1987, Ser. No. 35,352
Int. Cl.[4] A61K *31/015*
U.S. Cl. 514—763 **12 Claims**

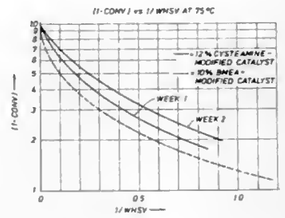
1. A fat suppressant composition comprising
(a) an animal feed; and
(b) about 0.05 to about 5%, by weight of feed, of polyterpene having the formula $(C_{10}H_{16})_n$, where n is an integer from 2 to 4.

4,820,740

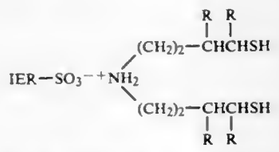
PROCESS AND CATALYST FOR PRODUCTION OF BISPHENOL-A

Simon M. Li, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

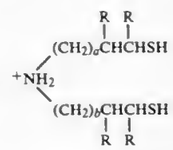
Filed Oct. 30, 1986, Ser. No. 925,779
Int. Cl.[4] C08F *5/20*
U.S. Cl. 521—32 **7 Claims**



1. A sulfonated cationic exchange resin of general formula



in which IER is the backbone of a sulfonated cationic exchange resin having sulfonic acid sites, each of a and b is an integer from 0 to about 5 and each R is selected independently for H, OH, SH and alkyl, said sulfonated cationic exchange resin having at least about 2 of the sulfonic acid sites ionically bound to an aminomercaptan group of the formula



4,820,741

SEMI-ORGANIC FOAMS

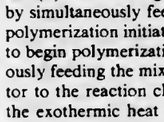
Thomas J. Miranda, Clay Township, St. Joseph County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 112,547, Oct. 26, 1987, which is a division of Ser. No. 948,116, Dec. 13, 1986. This application Jun. 13, 1988, Ser. No. 205,635
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—123 **10 Claims**

1. A foam prepared by a process comprising the steps of:
reacting a composition comprising a first adduct having the structure

$$CH_2{=}CR{-}COO{-}R'{-}O{-}CO{-}Z{-}COOH$$

where,
R=H, CH_3, CN, C_6H_{11}(CYCLOHEXYL), X (X=F, Cl, Br)
R'+$-CH_2-CH_2-$, $-CXR-CXR-$, $-(CH_2-CH_2-)$ where n=1, 2, . . . 8, and
Z=—CH=CH—, phthalic, trimellitic, naphthoic, -naphthoic, substituted phthalic anhydrides of the structure



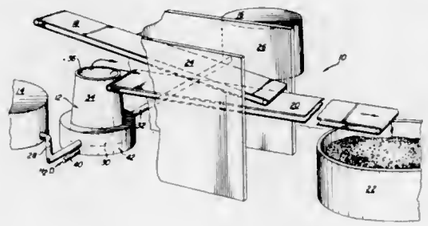
wherein
R"=Cl, F, Br, I, CH_3, CN, CH_3, C_nH_{2n+2};
a fluorocarbon blowing agent;
an initiator; and
including therein a fire retardant filler material.

4,820,742

METHOD FOR CONTINUOUS MANUFACTURE OF SOLID WATER ABSORBING RESIN

William Alexander, Naperville, Ill., and Maynard Teppo, Fourche, S. Dak., assignors to American Colloid Company, Arlington Heights, Ill.

Continuation of Ser. No. 748,246, Jun. 24, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,614
Int. Cl.[4] C08F *2/10, 20/06*
U.S. Cl. 521—131 **6 Claims**



1. A process for continuously preparing a solid water absorbing resin comprising mixing a monomer solution (A) acrylic acid neutralized 70–100 mole percent, wherein the neutralizing agent comprises a potassium alkali; and (B) a water-miscible to water-soluble polyvinyl monomer in a combined concentration of at least 30 wt. % to 80 wt. %; with water to form a mixed monomer solution wherein the monomers of the mixed monomer solution consist essentially of (A) and (B) and initiating polymerization of monomers (A) and (B) by simultaneously feeding the mixed monomer solution and a polymerization initiator each through a reaction chamber inlet to begin polymerization in the reaction chamber; and continuously feeding the mixed solution and the polymerization initiator to the reaction chamber such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, cross-linking and to drive off sufficient water to obtain a solid cross-linked resin having a water content of 15 percent by weight or less.

4,820,743

POLYMER/POLYOL COMPOSITION, PROCESSES FOR MAKING THE SAME AND POLYURETHANE THEREFROM

Isao Ishikawa, Obtsu, and Tsuyoshi Tomosada, Kyoto, both of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Dec. 9, 1987, Ser. No. 130,656
Claims priority, application Japan, Dec. 9, 1986, 61-292836
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—137 **20 Claims**

1. A polymer/polyol composition, which is convertible by reaction with a polyisocyanate to a polyurethane, wherein the polymer of said composition is formed by polymerizing one or more ethylenically unsaturated monomers in situ in a blend of at least one polyol and at least one polyamine; said polyol comprising a polyol having a hydroxyl number of 15–100, selected from the group consisting of polyether polyols, polyester polyols, urethane-modified polyols, polyols containing polymerizable unsaturated bonds in the molecule, and polymer/polyols previously prepared in situ in any of these polyols; said polyamine being selected from the group consisting of aromatic polyamines, aliphatic polyamines, alicyclic polyamines, heterocyclic polyamines, araliphatic polyamines, polyamide polyamines, polyether polyamines and dicyandiamide; the amount of said polyamine being 0.5–60 parts by weight per 100 parts by weight of said polyol; and said polymer being present in an amount of 1–70% based on the weight of said composition.

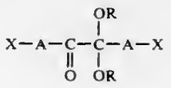
4,820,744

COMPOSITIONS FOR DENTAL RESTORATION

Takao Kubota, Kamakura; Tetsuro Sakuma, and Ryoji Nakazato, both of Tokorozawa, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Apr. 1, 1987, Ser. No. 32,626
Claims priority, application Japan, Apr. 18, 1986, 61-88161
Int. Cl.[4] C08F *2/50;* **A61K** *6/08*
U.S. Cl. 522—13 **14 Claims**

1. A combined chemical-/light-polymerization type composition for dental restoration consisting of a formulation A consisting essentially of (a) an ethylenically polymerizable unsaturated compound, (b) a photo-polymerization initiator and (c) a reducing agent, and a formulation B consisting essentially of (d) a filler and (e) an organic peroxide,
said formulations A and B being separately packaged and designed to be mixed for use, wherein said photo-polymerization initiator consists of one or two or more ketal base compounds expressed in terms of the following general formula I:



wherein
X is H, Cl, an alkyl group having 1 to 5 carbon atoms or an alkoxy group having 1 to 5 carbon atoms,
A is a six-membered aromatic group, and
R is an alkyl group having 1 to 10 carbon atoms, an aralkyl group having 7 to 9 carbon atoms or a

$$+C_nH_{2n}O\rightarrow_m R'$$

in which n is an integer of 2 to 5, m is an integer of 1 to 5 and R' is an alkyl group having 1 to 5 carbon atoms, and any one or combination of anthraquinone, 1-chloroanthraquinone and 1,2-benzanthraquinone.

4,820,745

PRESSURE-SENSITIVE ADHESIVES BASED ON RADIATION-CURABLE POLYESTERS CONTAINING (METH)ACRYLIC GROUPS

Hartmut Müller, Troisdorf, and Hans Huber, Lohmar, both of Fed. Rep. of Germany, assignors to Huels Troisdorf Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,635
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3516351
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.[4] C08F *2/54, 20/36, 20/58*
U.S. Cl. 522—90 **26 Claims**

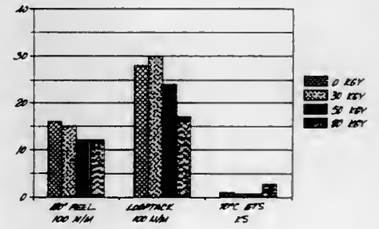
1. A foliar material having a permanently tacky pressure-sensitive adhesive surface, said adhesive comprising
(a) base polyesters which are hydroxyl polyesters liquid at room temperature having hydroxyl numbers of 10 to 100, acid numbers lower than 5, a glass transition temperature lower than 0° C., and average molecular weight of from 2,000 to 5,000, said polyesters being fluid at 20° C. and having straight-chain alkyl or branched alkyl side chains of 4 to 36 carbon atoms directly bound through ester bonds or ether bonds of at least one trifunctional of polyfunctional carboxylic acids, triols or polyfunctional polyols and hydroxydicarboxylic acids along the main chain of the polyesters, the molar ratio of ester segments of the main chain to the alkyl side chains ranging from 1:0.2 to 1:2.0, and in which 10 to 90% of the hydroxyl groups of said polyesters have been reacted with
(b) acrylate compounds or methacrylate compounds having additional reactive groups capable of reacting with the hydroxyl groups of said polyesters,
(c) the resultant (meth)acrylated polyester being spread as a thin coating on said foliar material and then crosslinked by means of electron beams or ultraviolet radiation.

4,820,746

RADIATION-CURED RUBBER-BASED PRESSURE-SENSITIVE ADHESIVE

Cassandra S. Rice, Long Beach; Yukihiko Sasaki, Claremont, and Sebastian S. Plamthottam, Pasadena, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Filed Aug. 12, 1986, Ser. No. 896,127
Int. Cl.[4] C08J *3/28;* **C08L** *25/10*
U.S. Cl. 522—127 **46 Claims**



1. A radiation-curable rubber-based pressure-sensitive adhesive which comprises at least one elastomeric rubber-baseed pressure-sensitive adhesive comprising a block copolymer selected from the group consisting of styrene-butadiene-styrene, styrene-butadiene, styrene-isoprene-styrene, styrene-isoprene and mixtures thereof and, as a crosslinking agent, a polythiol present in an amount sufficient to increase upon exposure to electron-beam radiation or ultraviolet radiation in the further presence of a photoinitiator, the elevated temperature shear properties of said rubber-based prressure-sensitive adhesive, with a minimum change in ambient temperature properties of 180° peel and loop tack of said rubber-based

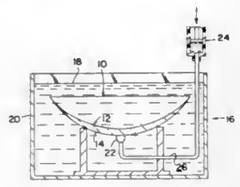
pressure-sensitive adhesive relative to such properties of the same rubber-based pressure-sensitive adhesive cured in the absence of said polythiol.

4,820,747

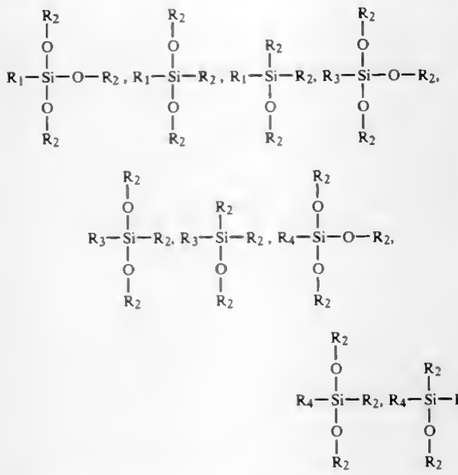
GAS PERMEABLE CONTACT LENS AND METHOD AND MATERIALS FOR ITS MANUFACTURE

Richard Y. S. Chen, Raleigh, N.C., assignor to Ocular Technologies, Inc., Raleigh, N.C.

Contiauation of Ser. No. 63,312, Jun. 18, 1987. This application Sep. 7, 1988, Ser. No. 241,191
Int. Cl.[4] C08F *30/08*
U.S. Cl. 523—107 **9 Claims**

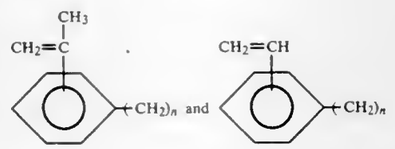


1. A method of making a contact lens characterized in that mixture is formed comprising initiators and at least one polymerizable silicone monomer selected from the group consisting of



and mixtures thereof, where

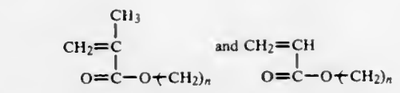
R_1 is selected from the group consisting of



where n=1 to 6, and mixtures thereof,

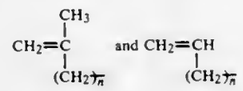
R_2 is selected from the group consisting of an alkyl group having from 1 to 8 carbon atoms, a saturated cyclic group and a benzene ring, and mixtures thereof,

R3 is selected from the group consisting of



where n=1 to 6, and mixtures thereof, and

R_4 is selected from the group consisting of



energy is supplied to said mixture so that said mixture polymerizes to form a polymer that is transparent, hard, machinable and oxygen permeable wherein said polymer is formed into a contact lens.

4,820,748

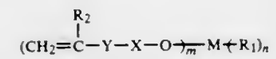
ANTIFOULING COATING COMPOSITION

Naoki Yamamori, and Kazunori Kanda, both of Osaka, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

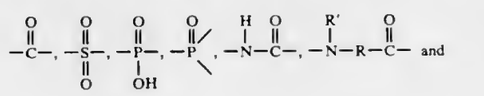
Filed Sep. 15, 1987, Ser. No. 96,404
Claims priority, application Japan, Sep. 16, 1986, 61-217781
Int. Cl.[4] C08L *43/00*
U.S. Cl. 523—122 **8 Claims**

1. In an antifouling coating composition comprising (A) a film-forming polymer, (B) a volatile organic liquid diluent in which the polymer (A) is dissolved, (C) an antifouling agent and (D) optionally other additives, the improvement comprising, in addition to said (A), (B), (C) and (D), disintegration type, crosslinked acrylic resin microparticles having an average grain diameter of 0.01 to 250μ and containing a number of metal ester bond bearing crosslinks uniformly distributed within the particle bodies, prepared by polymerizing 5 to 98% by weight of at least one metal ester bond bearing multifunctional polymerizable monomer represented by the formula:





in which R_2 is hydrogen or a methyl group; X is a radical selected from the group consisting of



R' is a hydrogen, methyl or ethyl group; R is a hydrocarbon residue having 1 to 20 carbon atoms; p is 0 or 1 to 5; R_1 is a hydrocarbon residue having 1 to 10 carbon atoms; M stands for metal whose valency is 2 or more; Y is an organic residue; m and n are positive intgers fulfilling the requirements of $2 \leqq m \leqq q$ and $n = q - m$ in which q is equal to the metal valency, and 95 to 2% by weight of at least one polymerizable monomer other than said metal ester bond bearing multifunctional monomer, the solid weight ratio of said microparticles to the film-forming polymer being 1:99 to 70:30.

4,820,749

REINFORCED POLYMER COMPOSITES WITH WOOD FIBERS GRAFTED WITH SILANES

Alphons D. Beshay, 3595 de Courval, Trois-Rivières, Quebec, Canada (G8Z 1S8)

Continuation-in-part of Ser. No. 739,469, May 29, 1985, Pat. No. 4,717,742. This application Sep. 11, 1987, Ser. No. 95,119
The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.
Int. Cl.[4] C08K *9/06*; C08L *25/06, 23/06*
U.S. Cl. 523—203 **20 Claims**

1. A composite material comprising a polymeric or copolymeric substance selected from thermoplastic or thermosetting material, or rubber, and an organic material selected from the group consisting of cellulosic or starch material, wherein said cellulosic or starch material is essentially grafted by a free radical generating process with a silylating agent.

4,820,750

PIGMENTED VINYL CHLORIDE POLYMER OR BLEND THEREOF HAVING IMPROVED MECHANICAL PROPERTIES

Marvin H. Lehr, Akron, and John V. Standish, Cleveland, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Feb. 11, 1988, Ser. No. 154,828
Int. Cl.[4] G08K *9/06*
U.S. Cl. 523—213 **19 Claims**

1. A pigmented polymer resin composition of improved cohesion properties, comprising:

a polymer resin, said polymer resin being a chlorinated polyvinyl chloride resin having from about 58 to about 72 percent by weight of chlorine, or a blend of a chlorinated polyvinyl chloride resin containing up to about 30 percent by weight of a polyvinyl chloride resin, and

a pigment which does not cause discoloration of said resin, said pigment coated with an effective amount of an amino silane so that said polymer has improved creep resistance, wherein said amino silane is represented by the formula

$H_2N(CH_2)_x[NH(CH_2)_y]_zSi(OR)_3$ (FORMULA I),

where x is 2 to 5, where y is 2 to 5, where z is 0 to 3, and R is an alkyl having from 1 to 6 carbon atoms, and wherein said amino silane is bonded to said polymer resin.

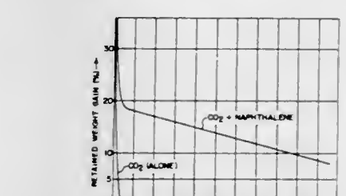
4,820,751

RUBBER COMPOSITION FOR TIRES

Michitaka Takeshita, Koganei; Uchu Mukai, Kodaira, and Toshio Sugawara, Higashiyamato, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,745
Claims priority, application Japan, Apr. 23, 1987, 62-98501; Feb. 16, 1988, 63-31864
Int. Cl.[4] C08K *3/04, 9/00*; C08L *21/00*
U.S. Cl. 523—215 **5 Claims**

1. A rubber composition for tires, comprising a rubber ingredient selected from the group consisting of natural rubber, diene series synthetic rubber and a blend thereof, and 30~150 parts by weight of a reinforcible carbon black having a specific surface area (N_2SA) of 70~250 m^2/g as measured by nitrogen adsorption process, a dibutyl phthalate absorption (DBP absorption) of 80~150 ml/100 g, a concentration of total acidic group introduced into the surface of carbon black of 0.25~2.0 μeq/m^2, a ratio of weak acidic group in the total acidic group of at least 65% and a pH value of 3~5.5, 0~40 parts by weight of silica based on 100 parts by weight of said rubber ingredient, and 4.65×10^{-5} m·s~4.65×10^{-3} m·s (m is parts by weight of carbon black added and s is a value of N_2SA of carbon black) of at least one silane coupling agent selected from compounds having the following general formulae (1) and (2):



4,820,752

PROCESS FOR INCORPORATING AN ADDITIVE INTO A POLYMER AND PRODUCT PRODUCED THEREBY

Alan R. Berens, 6376 Elmcrest Dr., Hudson, Ohio 44236; Gary S. Huvard, 1085 Karen Dr., and Richard W. Korsmeyer, 1257 Weathervane La., both of Akron, Ohio 44313

Continuation of Ser. No. 882,802, Jul. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 789,671, Oct. 21, 1985, abandoned. This application Jun. 17, 1987, Ser. No. 63,034
Int. Cl.[4] C08K *3/18*
U.S. Cl. 523—340 **38 Claims**

1. A process for infusing into a rubber or plastic polymeric material a normally solid or liquid additive that has a degree of solubility in said polymeric material when said polymeric material is in a swollen state which process comprises:

(a) dissolving said additive in a compressed normally gaseous fluid solvent that has a boiling point when measured at atmospheric pressure (14.7 psia, 101.3 kPa) below room temperature (22° C.) to form a solution, said compressed fluid solvent having a density of at least 0.01 g/cc and said solution of said compressed fluid solvent and said additive being soluble in said polymeric material and being capable of swelling said polymeric material;

(b) contacting said solution of said compressed normally gaseous fluid solvent and said additive with said polymeric material for a time sufficient to allow at least a part of said solution to be absorbed by said polymeric material; and

(c) separating at least essentially all of said fluid solvent from said polymeric material leaving additive infused within said polymeric material.

4,820,753

ACOUSTIC WINDOW AND MATERIAL THEREFOR

Samuel J. Caprette, Jr., Chagrin Falls, and Wilson N. Smith, Jr., Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 15, 1988, Ser. No. 168,211
Int. Cl.[4] C08K *3/04;* C08L *1/08, 7/00*
U.S. Cl. 524—41 19 Claims

1. A sheet-like acoustic window having a frequency range from about 10 kHz to about 100 kHz comprising: an elastomer and a fibre reinforcement;

the elastomer being selected from a group consisting of: natural, synthetic natural, chlorinated, and silicon rubbers; acrylonitrile-butadiene copolymer; styrene-butadiene copolymer; polyurethanes; and mixtures thereof, and further including a filler and a resin;

the fibre reinforcement being selected from chopped fiber or fibrils of a material selected from a group consisting of: steel, polyester, polyamide, polyaramid, polyimide, rayon, polyvinyl alcohols, nylon and mixtures thereof and imparting to the sheet-like acoustic window entrapped air not in excess of 0.10% of the volume of the acoustic window;

the fibre reinforcement, the elastomer, the filler and the resin being substantially uniformly and blendedly present in desired, effective proportions to provide a Young's modulus of between about 2000 psi and about 40,000 with the sheet-like acoustic window being formed and processed to possess desired physical dimensions and being of a configuration providing effective strength when employed as a sonic window.

4,820,754

DRYWALL COATING COMPOSITION

Robert H. Negri, Palatine, and Peter M. Attard, Elk Grove, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 12,493, Feb. 9, 1987, Pat. No. 4,743,475.
This applicatioo Jan. 22, 1988, Ser. No. 146,912
Int. Cl.[4] C08L *1/28;* C08K *3/26*
U.S. Cl. 524—44 6 Claims

1. A dry powder easily dispersible in water to make a coating composition at a job site for a drywall having varying porosities and surface textures, said powder consisting essentially of, on a weight basis::

from about 16% to about 25% calcium carbonate,
from about 20% to about 30% kaolin,
from about 3% to about 5% attapulgus clay,
from about 8% to about 12% mica,
from about 16% to about 24% sodium potassium aluminum silicate,
from about 4.5% to about 10% vinyl acetate/ethylene copolymer,
from about 1% to about 3% of a water soluble cellulose ether,
a 2% aqueous solution of which has a viscosity of from about 5000 to about 50,000 cps at a shear rate of 2 sec^{-1} and a viscosity of from about 50 to about 90 cps at a shear rate of 10,000 sec^{-1},
and a dispersant.

4,820,755

RADIATION STERILIZABLE COMPOSITION AND ARTICLES MADE THEREFROM

Joseph R. Webster, Closter, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 18, 1987, Ser. No. 86,746
Int. Cl.[4] C08K *5/34, 5/09, 5/10, 5/36*
U.S. Cl. 524—88 23 Claims

1. An improved radiation sterilizable composition of the type comprising

(a) a semi-crystalline polymer having a narrow molecular weight distribution; and an effective, radiation stabilizing amount of

(b) a radiochromic hindered phenolic stabilizer, said improvement comprising using as said polymer a controlled-rheology polypropylene having a melt flow of greater than about 5 and including in said composition

(c) a blue compound in an amount sufficient to form in the composition a green color by interaction with said radiochromic hindered phenolic stabilizer after said composition has been subjected to a sterilizing dose of gamma irradiation.

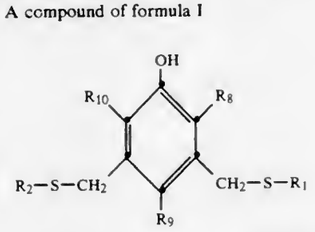
4,820,756

THIOETHER SUBSTITUTED PHENOLS AND THEIR USE AS STABILIZERS

Rita Pitteloud, Fribourg, and Paul Dubs, Marly, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

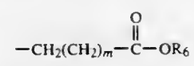
Filed Jun. 22, 1987, Ser. No. 65,226
Claims priority, application Switzerland, Jun. 26, 1986, 2589/86
Int. Cl.[4] C07C *149/273;* C08K *5/37, 5/36*
U.S. Cl. 524—289 9 Claims

1. A compound of formula I



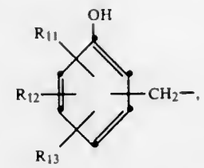
(I)

wherein R_1 and R_2 have the same meaning and are hydrogen, C_6–C_{20}alkyl with at least one tertiary C-atom, a group of the formula Ib



(Ib)

or a group of the formula Id



(Id)

m is zero or 1, R_6 is C_6–C_{18}-alkyl, R_{11} is C_1–C_6-alkyl, R_{12} and R_{13} independently of one another are hydrogen or C_1–C_6-alkyl, and R_8, R_9 and R_{10} are C_1–C_4-alkyl.

9. A composition containing an organic material which is sensitive to degradation by heat or oxidation or induced by radiation and an effective stabilizing amount of at least one compound of the formula I according to claim 1.

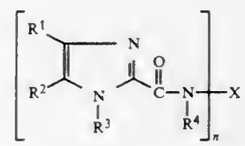
4,820,757

POLYMERS PHOTOSTABILIZED BY NOVEL IMIDAZOLE-2-CARBOXANILIDES

Peter Spang, St. Ingbert; Peter Neumann, Wiesloch; Gerhard Wagenblast, Frankenthal, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,726
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708292
Int. Cl.[4] C08K *5/34*
U.S. Cl. 524—93 11 Claims

1. A photostabilized polymer containing as photostabilizer one or more compounds of the formula



(I)

where

n is 1 or 2,

R^1 and R^2 or one of the radicals R^1 or R^2 are each independently of the other phenyl, pyridyl, furyl, quinolyl or thiophenyl, which each are unsubstituted or substituted by C_1-C_{12}-alkyl, C_1–C_{12}-alkoxy, phenoxy, halogen or trifluoromethyl, and the other of the radicals R^1 or R^2 is hydrogen, C_1–C_{12}-alkyl, C_7-C_9-phenalkyl or —$COOR^5$, where R^5 is linear or branched C_1-$_{12}$-alkyl, C_5-C_8-cycloalkyl, phenyl or C_7-C_{10}-phenalkyl, where cycloalkyl and phenyl are unsubstituted or substituted by C_1-C_4-alkyl, or



is a fused-on benzene ring which is unsubstituted or substituted by hydroxyl, halogen, C_1-C_{12}-alkyl, C_1-C_{12}-alkoxy, C_7-C_9-phenylalkyl, phenyl, —$COOR^6$, —CO—R^6, —CO—NH—R^6, —COOH, —O—COR^6, —NH—CO—R^6, —SO_2—R^6 or —CN, where R^6 is linear or branched C_1-C_{12}-alkyl, C_5-C_8-cycloalkyl, phenyl or C_7-C_{10}-phenalkyl and the cycloalkyl and phenyl radicals are unsubstituted or substituted by C_1-C_4-alkyl,

R^3 and R^4 are each hydrogen or one of the radicals R^3 or R^4 is C_1-C_4-alkyl or C_7-C_9-phenalkyl and,

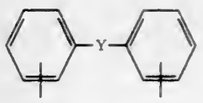
if n is 1,

X (a) is phenyl, naphthyl or a 5- or 6-membered aromatic heterocyclic which may be benzofused, these radicals being unsubstituted or monosubstituted or disubstituted by C_1-C_{12}-alkyl, C_1-C_{12}-alkoxy, methylenedioxy, ethylenedioxy, phenoxy, C_7-C_9-phenylalkoxy, C_7-C_9-phenylalkyl, trifluoromethyl, hydroxyl, halogen, —S—R^7, —COR^7, —$COOR^7$, $OCOR^7$, —COOH, —CN, —CONH—R^7, —NH—R^7, —$N(R^7)_2$ or —NH—COR^7, where R^7 is linear or branched C_1-C_{12}-alkyl, C_5-C_8-cycloalkyl, phenyl or C_7-C_{10}-phenalkyl, in which cycloalkyl and phenyl are unsubstituted or substituted by C_1-C_4-alkyl, or

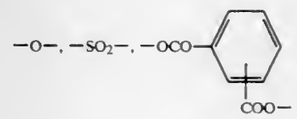
if n is 2

X (b) is phenylene or naphthylene, these radicals being unsubstituted or substituted by C_1-C_{12}-alkyl, C_1-C_{12}-alkoxy or halogen, or

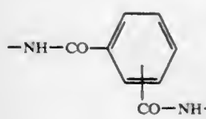
(c) is a radical of the formula



where Y is a radical of the formula —$(CH_2)_m$—, —CO—, —CO—$(CH_2)_p$CO—, —OCO—$(CH_2)_p$COO—, —NH—CO—$(CH_2)_p$—CO—NH—,



or



m is 1, 2 or 3, p is 0 or an integer from 1 to 8.

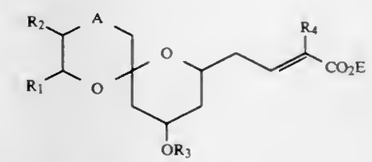
4,820,758

NOVEL [5.5]-SPIROKETALS

Stephen J. Nelson, Climax, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 757,659, Jul. 22, 1985, Pat. No. 4,680,419.
This application May 6, 1987, Ser. No. 47,364
Int. Cl.[4] C07D *311/00*
U.S. Cl. 549—214 3 Claims

1. A compound of Formula X



X

wherein A is —CH, or —CH_2;

wherein is a single bond when A is —CH_2 and a double bond when A is —CH;

wherein R_1, R_2 and, being the same or different, are hydrogen or C_1–C_5 alkyl;

wherein R_3 is hydrogen; C_1–C_5 alkyl; benzoyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_3 alkoxy, halo, C_1–C_3 alkylthio, trifluoromethyl, nitro; phenyl (C_1–C_3) alkyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, nitro or trifluorometyl; C_2–C_5 alkoxyalkyl; C_2–C_6 alkylthioalkyl; C_1–C_6 alkanoyl; tetrahydropyranyl; C_1–C_4 alkyl diphenyl silyl; di(C_1–C_4 alkyl) phenyl silyl; or tri(C_1–C_4)alkyl silyl; and

wherein E is C_1–C_5 alkyl.

4,820,759

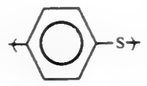
POLYARYLENE THIOTHER COMPOSITION

Yukio Ichikawa; Takayuki Katto, and Zenya Shiiki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 95,620
Claims priority, application Japan, Sep. 9, 1986, 61-211951
Int. Cl.[4] C08G 75/14; C08L 81/02
U.S. Cl. 524—413 9 Claims

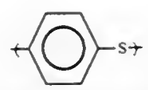
1. A polyarylene thioether composition comprising:

100 parts by weight of a polyarylene thioether (A) having an average particle size of spherulites of not more than 2 μm formed upon crystallization of the molten polymer at 250° C. obtained by treating a polyarylene thioether having a repeating unit of



as a main constituent and an inherent solution viscosity, which is measured at 206° C. in 1-chloronaphthalene at a polymer concentration of 0.4 g/100 ml solution, of 0.30 to 0.90 dl/g with an aqueous solution of non-oxidative strong acid or non-oxidative strong-acid-weak-base salt; and

11 to 200 parts by weight of a polyarylene thioether (B) having a necessary time for 50% crystallization of not more than 50 seconds upon crystallization of the molten polymer at 250° C. obtained by treating a polyarylene thioether having a repeating unit of



as a main constituent and an inherent solution viscosity, which is measured at 206° C. in 1-chloronaphthalene at a polymer concentration of 0.4 g/100 ml solution, of 0.05 to 0.25 dl/g with an aqueous solution of non-oxidative strong acid or non-oxidative strong-acid-weak-base salt.

4,820,760

NON PLATEOUT MOLDING COMPOSITION

Mir L. Ali, Bryan, Ohio; John F. Bateman, Lawrenceville, Calif., and Ming Man, Stow, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Filed May 28, 1987, Ser. No. 55,421
Int. Cl.[4] C08K 3/30
U.S. Cl. 524—423 27 Claims

1. A non-plateout, pigmented molding composition having improved thermal and oxidation stability and increased compatibility of the components comprising:

(A) at least one moldable thermoplastic resin selected from the group consisting of ethylene polymers and copolymers, propylene polymers and copolymers, acrylonitrile polymers and copolymers, polymers and copolymers of acrylic acid, methacrylic acid and their esters;

(B) at least one fluorescent pigment; and an effective amount of plateout inhibiting agents comprising:

(C) at least one metal salt or complex selected from the group consisting of metal sulfates, carbonates, silicates, oxides, chromates and mixtures thereof; and

(D) at least about 5% by weight of at least one polymer or oligomer reagent containing a reactive functionality reactive with plateout substances present or produced during the molding process and selected from the group consisting essentially of carboxy and the polyvalent salts thereof, hydroxy, epoxy, amino and combinations thereof.

4,820,761

AROMATIC POLYSULFONE RESIN COMPOSITION

Teruo Saito, Kusatsu; Haruo Hayashida, Osaka, and Kazuo Hieda, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 629,910, Jul. 11, 1984, abandoned. This application Jul. 5, 1988, Ser. No. 217,139
Claims priority, application Japan, Jul. 19, 1983, 58-132571
Int. Cl.[4] C08K 3/34
U.S. Cl. 524—456 8 Claims

1. An aromatic polysulfone molding resin composition consisting essentially of 20 to 80% by weight of an aromatic polysulfone, 10 to 70% by weight of wollastonite, and 0.5 to 20% by weight of a fluororesin, wherein the combined content of wallastonite with the fluororesin is 20 to 80% by weight based on the total weight of the composition.

4,820,762

RESIN-FORTIFIED EMULSION POLYMERS AND METHODS OF PREPARING THE SAME

Sheng-Liang Tsaur, Racine County, Wis., assignor to S.C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 899,281, Aug. 22, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 205,536
Int. Cl.[4] C08F 2/16
U.S. Cl. 524—460 14 Claims

1. A method of preparing a resin-fortified polymer emulsion having Newtonian-like flow characteristics, the method comprising:

(a) emulsion-polymerizing a first monomer charge comprising at least one emulsion-polymerizable monomer in the presence of a surfactant and an initiator under emulsion-polymerization reaction conditions effective for initiating emulsion polymerization of the emulsion-polymerizable monomer, for producing an emulsion-polymerization mixture which includes an emulsion polymer product, the surfactant being present in an amount effective for preventing coagulation of emulsion polymer particles which are forming in the emulsion-polymerization mixture; and thereafter

(b) adding to the emulsion-polymerization mixture, while emulsion polymerization of the emulsion-polymerizable monomer is occurring, an effective amount of at least one support resin for controllably affecting the physical characteristics of the emulsion polymer product, said resin being selected from the group consisting of water soluble resins, water dispersible resins, alkali soluble resins, alkali dispersible resins and mixtures thereof, said resin having been produced either by a solution-polymerization method or by a bulk-polymerization method, wherein the resin is produced from at least one ethylenically-unsaturated monomer selected from the group consisting of olefins, mono vinylidene aromatics, alpha beta ethylenically-unsaturated carboxylic acids and esters thereof, ethylenically-unsaturated dicarboxylic anhydrides, and mixtures thereof,

for producing a resin-fortified polymer emulsion having Newtonian-like flow characteristics.

4,820,763

POLY(VINYL CHLORIDE) POLYBLEND CONTAINING A CRYSTALLINE POLYESTER WITH LIMITED MISCIBILITY AND REINFORCED COMPOSITES THEREOF

Wei-Yeih Yang, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 763,498, Aug. 8, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 38,103
Int. Cl.[4] C08L 27/06, 67/02
U.S. Cl. 524—505 14 Claims

1. A polyblend consisting essentially of from about 30:70 to about 70:30 parts by weight of poly(vinyl chloride) homopolymer ("PVC") and a copolyester ("CPE") having limited miscibility in the PVC, as evidenced by

a first co-continuous CPE-rich phase in which domains of PVC microparticles and CPE are present as distinct discernible phases and the PVC domains have diffuse boundaries, and,

a dispersed PVC-rich phase consisting essentially of macroparticles of PVC suffused with a non-elastomeric CPE, said CPE having

(i) the formula

$$-(MR)_x-(MQ)_y- \quad (I)$$

wherein, $(MR)_x$ represents an ester segment having a repeating unit with a mol wt of about 204 or 220;

$(MQ)_y$ represents an ester segment consisting essentially of the residue of a polyester diol;

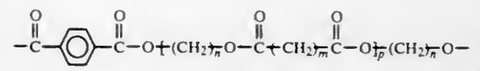
M represents the residue of terephthalic acid which may include a minor amount of isophthalic acid;

R represents the residue of 1,3-propane diol or 1,4-butane diol;

Q represents the residue of a (cyclo)aliphatic polyester of an aliphatic or cycloaliphatic dibasic acid having from 2 to about 12 carbon atoms, and, an alkane or cycloalkane diol having from 2 to about 12 carbon atoms; and,

x and y represent the mole fractions present, y being in the range from 0.03–0.10 when x is 1.0, so that a majority of all MQ segments have a residue of a polyester diol having a number average molecular weight less than 600;

said MQ (cyclo)aliphatic polyester segment having the structure



wherein m is an integer in the range from 0 to about 12,

n is an integer in the range from 2 to about 12, and, p is an integer in the range from 1 to 50;

(ii) crystallinity in the range from 30–90%, and an elongation at break less than 100%, and,

(iii) a melting temperature (Tm) in the range of the processing temperature of the PVC,

so that said polyblend has a crystallinity in the range from 25% to about 55%, and a flexural modulus of $3.8 \pm 0.5 \times 10^5$ psi.

4,820,764

HIGH GAS OIL RATIO RESISTANT ELASTOMER

Ray L. Guzy, Tulsa, and David W. Livingston, Claremore, both of Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jun. 6, 1988, Ser. No. 203,040
Int. Cl.[4] C08L 61/00, 51/00, 1/00; C08K 7/14
U.S. Cl. 524—512 6 Claims

1. A sulfur curable elastomeric composition having improved resistance to deformation in hot, high gas content environments, comprising:

a conjugated diolefin polymer rubber containing at least 50 percent by weight of said conjugated diolefin;

from about 12 to 60 parts, per hundred parts conjugated diolefin polymer rubber, of a polybutadiene having a molecular weight in the range from 1,000–10,000 grams/mole and having about 70–80% 1, 2 polymerized units; and

from about 5 to 30 parts, per hundred parts of conjugated diolefin polymer rubber, of a randomly oriented flocked fiber.

4,820,765

POLYAMIDE FROM DIAMINE AND EXCESS AROMATIC DICARBOXYLIC ACID

Paul D. Whyzmuzis, Plymouth, Minn., assignor to Henkel Corporation, Ambler, Pa.

Division of Ser. No. 811,209, Dec. 20, 1985, Pat. No. 4,722,963. This application Oct. 19, 1987, Ser. No. 110,142
Int. Cl.[4] C08G 69/26
U.S. Cl. 524—606 18 Claims

1. A polyamide resin having improved solubility in aqueous solutions formed from a mixture comprising X equivalent percent of an acid component substantially free from a polymeric fat acid and comprising an aromatic dicarboxylic acid alone or in admixture with up to about 50 equivalent percent of a copolymerizing aliphatic dicarboxylic acid containing from 2–25 carbon atoms and Z equivalent percent of a diamine component wherein the ratio of Z to X is less than 1, and further provided that when said diamine is an alkylene diamine or a polyether diamine having an average molecular weight above 250 there is also present a copolymerizing acid or amine in said acid or amine component and provided said polyether diamine comprises in excess of 25 equivalent percent of said copolymerizing amine in said amine component.

4,820,766

HIGHLY STABLE SULFONATED MELAMINE-FORMALDEHYDE CONDENSATE SOLUTION

Shawqui Lahalih, and Ma'mun Absi-Halabi, both of P.O. Box 24885, Safat, Kuwait

Continuation-in-part of Ser. No. 788,133, Oct. 16, 1985, Pat. No. 4,677,159. This application Feb. 12, 1987, Ser. No. 13,734
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] C08G 12/30
U.S. Cl. 524—843 13 Claims

1. A stable aqueous sulfonated melamine-formaldehyde condensate solution made in accordance with the following process which includes the steps of:

(a) condensing melamine and formaldehyde in an aqueous reaction medium having a formaldehyde:amino group ratio of from about 1:1 to about 1.33:1 and a pH of from about 10 to about 13, said condensation being conducted at a temperature of from about 45° to about 55° C.;

(b) sulfonating the melamine-formaldehyde condensate formed in step (a) by adding a sulfonating agent to the reaction medium obtained in step (a) and by heating said reaction medium to a temperature of from about 70° to about 90° C., said sulfonation being carried out at a pH of from about 10 to about 13;

(c) further condensing the sulfonated melamine-formaldehyde condensate formed in step (b) by reducing the temperature of the reaction medium from step (b) to about 40°–60° C., adjusting the pH thereof to about 2.5–4.0, maintaining said temperature and pH conditions for a period of from about 5 to about 150 minutes, and stopping said further condensation prior to gelation of the further condensed sulfonated melamine-formaldehyde condensate by adjusting the pH of the reaction medium to about 6.5–9.0; and (d) stabilizing the aqueous sulfonated melamine-formaldehyde condensate solution formed in step (c) by heating the reaction mixture obtained in step (c) to a temperature of from about 70° to about 100° C. for a period of from about 30 to about 180 minutes

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4,820,767

PROCESS FOR THE PRODUCTION OF POLY(VINYL ACETATE) AND POLY(VINYL ALCOHOL)

Tse C. Wu, Morristown, N.J., assignor to Allied-Signal Inc., Morris Township, N.J.

Filed Nov. 23, 1984, Ser. No. 674,400
Int. Cl.[4] C08F 8/00
U.S. Cl. 525—62 19 Claims

1. A bulk polymerization process for producing poly(vinylacetate) which comprises polymerizing vinyl acetate essentially in the absence of ionizing radiation at a temperature in the range of from about 0° to about 40° C., and in the presence of from about 1×10^{-6} to about 1×10^{-3} mole percent of an initiator based on the total moles of vinyl acetate monomer, said initiator of the formula:

$$R_1—N=N—R_2$$

wherein: R_1 and R_2 are the same or different and are straight or branched chain lower alkyl, lower alkoxyalkyl, cycloalkyl, nitrile substituted alkyl, or phenylalkylnitrile, for a time sufficient to provide essentially linear poly(vinylacetate) having an average molecular weight of at least about 1.0×10^6.

4,820,768

MODIFIED BLOCK COPOLYMER COMPOSITION

Toshinori Shiraki, Yamato; Fusakazu Hayano, Chigasaki, and Hideo Morita, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 432,923, Sep. 30, 1982, Pat. No. 4,628,072.
This application Apr. 2, 1986, Ser. No. 847,257
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[4] C08L 53/02, 77/00
U.S. Cl. 525—92 12 Claims

1. A modified block copolymer composition comprising:
(a) a polyamide; and
(b) at least one modified block copolymer which comprises a base block copolymer of
at least one monovinyl substituted aromatic hydrocarbon polymer block A and
at least one olefin compound polymer block B having an ethylenic unsaturation degree not exceeding 20%,
said base block copolymer having at least one molecular unit grafted thereto, said at least one molecular unit containing at least one member selected from a carboxylic acid group and groups derived therefrom, said monovinyl substituted aromatic hydrocarbon being contained in said base block copolymer in an amount of 5 to 60% by weight based on said base block copolymer;
said polyamide (a) being present in a weight ratio of 70:30 up to 98:2 relative to said modified block copolymer (b).

4,820,769

HOT MELT ADHESIVE COMPOSITION

Morio Gaku, Saitama, and Hidenori Kinbara, Tokyo, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 914,976, Oct. 3, 1986, abandoned. This application Nov. 10, 1987, Ser. No. 118,910
Claims priority, application Japan, Oct. 3, 1985, 60-219254; Oct. 30, 1985, 60-241268; Feb. 17, 1986, 61-30969
Int. Cl.[4] C08L 31/04, 23/08
U.S. Cl. 525—113 5 Claims

1. A hot melt adhesive composition consisting essentially of
(A) 99 to 80 wt% of an ethylene-vinyl acetate copolymer and
(B) 1 to 20 wt% of a monofunctional or polyfunctional cyanate ester compound having at least one cyanato group in the molecule.

4,820,770

POLYAMIDE COMPOSITION

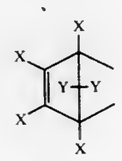
Robert A. Schleifstein, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jan. 25, 1988, Ser. No. 148,025
Int. Cl.[4] C08F 8/18; C08L 71/04, 77/06
U.S. Cl. 525—133 15 Claims

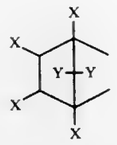
1. A thermoplastic formulation having:
(a) a first part comprising,
(i) nylon 6,6, nylon 6 or a mixture thereof, and
(ii) a halogenated polyphenylene ether flame retardant; and
(b) a second part, in admixture with said first part, said second part comprising, a Diels-Alder adduct having the formula,

$$A—R—(A)_n$$

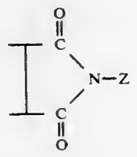
wherein n=0, 1, or 2,
A is a polyhalogenated cycloalkylene group having the structure,



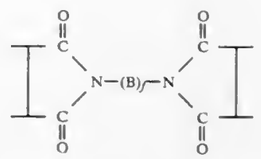
or the structure



in which each X is independently a chloro, bromo or hydro group and each Y is independently a chloro, bromo, hydro, hydrocarbyl or hydrocarbyloxy group, and the total of said X's and Y's which are chloro or bromo groups, is at least two,
R, when n=0, is a divalent saturated cyclic polybromohydrocarbon group having 7 to 20 carbon atoms and 2 to 6 bromine atoms which are paired in vicinal positions, or a group having the structure,



which Z has up to 8 carbon atoms and is an alkyl, aryl, alkaryl, aralkyl cycloalkyl group, or a halogenated derivative thereof, and
R, when n=1 or 2, is, respectively, tetra- or hexavalent saturated cyclic hydrocarbon group having 7 to 20 carbon atoms and 0 to 4 chloro or bromo atoms which are paired in vicinal positions, or a group having the structure,



in which f=0 or 1 and B has up to 8 carbon atoms and is an alkylene, arylene, alkarylene, aralkylene, cycloalkene group or a halogenated derivative thereof,
said Diels-Alder adduct being present in an amount sufficient to provide said formulation with a melt index, as measured by ASTM 1238 k, which ia greater than that obtainable with said first part alone.

4,820,771

HIGH IMPACT POLYAMIDES

Bernhard Müssig, Seevetal; Rolf-Volker Meyer, Krefeld; Bert Brassat, Krefeld, and Rolf Dhein, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 744,466, Jun. 13, 1985, abandoned, which is a continuation of Ser. No. 536,620, Sep. 28, 1983, abandoned. This application Apr. 25, 1986, Ser. No. 856,164
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3237401
Int. Cl.[4] C08L 77/00
U.S. Cl. 525—183 8 Claims

1. A thermoplastic polyamide molding composition produced from a mixture consisting essentially of:
(a) 70 to 98.95%, by weight, of a thermoplastic polyamide;
(b) 1 to 30%, by weight, of a long-chain polyester-, polyether-or hydrocarbon-polyol having a number average molecular weight of from 500 to 2,500, a softening point of 100° C. or less and a functionality of 4 or less; and
(c) 0.5 to 5%, by weight, of at least one polyanydride selected from an adduct of maleic acid anydride with a polybutadiene oil; or a compolymer of maleic acid anhydride with styrene, ethylene, (meth)acrylic ester or acrylonitrile, having a functionality of at least five, a polyepoxide or mixtures thereof;
the sum total of components a) to c) being 100%, by weight.

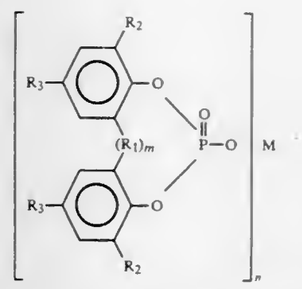
4,820,772

POLYOLEFIN COMPOSITION

Nobuo Goto; Hiroshisa Ishii, and Hirokazu Nakajima, all of Ichiharashi, Japan, assignors to Chisso Corporation, Japan

Filed Apr. 18, 1988, Ser. No. 182,520
Claims priority, application Japan, Apr. 20, 1987, 62-96639; Apr. 20, 1987, 62-96640; Apr. 21, 1987, 62-97908
Int. Cl.[4] C08K 5/52, 5/46; C08L 23/32, 23/10
U.S. Cl. 524—83 9 Claims

1. A polyolefin composition comprising
(A) 65 to 98 parts by weight of a crystalline α-olefin-propylene random copolymer, (B) 1 to 15 parts by weight of a high density ethylene polymer and (C) 1 to 20 parts by weight of a non-crystalline ethylene-propylene random copolymer or a non-crystalline ethylene-propylene-non-conjugated diene random copolymer, the total weight of the components (A), (B) and (C) being 100 parts by weight,
having blended with said components (A), (B) and (C), 0.01 to 1 part by weight of a phosphate compound expressed by the following formula (I) (abbreviated to compound (a)):



[I]

wherein R_1 represents sulfur or an alkylidene group of 1 to 4 carbon atoms; R_2 and R_3 each represent a hydrogen atom or the same or different alkyl groups of 1 to 8 carbon atoms; M represents a monovalent, divalent or trivalent metal atom; m represents 0 or 1; and n represents an integer of 1 to 3.

4,820,773

WATER ABSORBENT RESINS PREPARED BY POLYMERIZATION IN THE PRESENCE OF STYRENE-MALEIC ANHYDRIDE COPOLYMERS

William Alexander, Naperville; Mark Anderson, Wheaton, and Barbara R. Regan, Glenview, all of Ill., assignors to American Colloid Company, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 854,000, Apr. 21, 1986, Pat. No. 4,677,174, which is a continuation-in-part of Ser. No. 872,654, Jun. 10, 1986, Pat. No. 4,755,562. This application Jun. 25, 1987, Ser. No. 67,233
Int. Cl.[4] C08F 8/30, 8/32, 2/00
U.S. Cl. 525—274 41 Claims



1. A process for preparing a solid water absorbing resin of improved water absorbency comprising mixing a solution of (A) acrylic acid neutralized 70–100 mole percent; (B) a water-soluble styrene-maleic anhydride resin in an amount of about 1% to about 25% based on the weight of acrylic acid and neutralized 70–100 mole percent; and (C) a water-miscible to watersoluble polyvinyl monomer in a combined concentration of (A), (B) and (C) of at least 30 wt. %; with water to form a mixed solution and initiating polymerization of monomers (A) and (C) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, crosslinking and to drive off sufficient water to obtain a solid crosslinked resin including resin (B) and having a water content of 15 percent by weight or less.

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4,820,774

ELASTOMER COMPOSITION

Hiroyoshi Takao, Chiba; Yoshio Tanimoto, Sakura; Kiyosi Ikeda, Ichihara, and Masahiro Fukuyama, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 14, 1987, Ser. No. 108,499
Claims priority, application Japan, Oct. 27, 1986, 61-256598; Oct. 27, 1986, 61-256599
Int. Cl.[4] C08L *23/16, 23/26, 23/08, 33/14*
U.S. Cl. 525—208 22 Claims

1. A vulcanizable elastomer composition comprising 1–99% by weight of an alpha-olefin copolymer rubber comprising ethylene and at least one alpha-olefin and 99–1% by weight of an ethylene copolymer consisting essentially of ethylene, at least one member selected from the group consisting of acrylic and methacrylic esters, and at least one unsaturated glycidyl ester.

4,820,775

ALPHA-OLEFIN BLOCK COPOLYMER PARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

Akinobu Shiga, Ichihara; Masahiro Kakugo, Narashino; Hajime Sadatoshi, Ichihara; Hiroyuki Kora, Ichihara; Toshio Sasaki, Ichihara; Junpei Kojima, Ichihara; Kazuki Wakamatsu, Ichihara, and Syozo Kawamata, Ichihara, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed May 23, 1986, Ser. No. 866,369
Claims priority, application Japan, May 23, 1985, 60-110977
Int. Cl.[4] C08F *297/08*
U.S. Cl. 525—247 8 Claims

I. A process for the production of α-olefin block copolymer particles which comprises the steps of

(1) homopolymerizing propylene or copolymerizing propylene with a comonomer of ethylene or an α-olefin having 4 to 6 carbon atoms so that the comonomer content of the copolymerization product produced is not more than 6% by mole, said polymerization being carried out utilizing propylene in a liquid or gaseous phase,

(2) in the presence of the product produced by step (1), homopolymerizing ethylene or copolymerizing ethylene with propylene, with an α-olefin having 4 to 6 carbon atoms or with a mixture thereof so that the ethylene content in the copolymerization product produced is not less than 10% by mole, said copolymerizing being carried out utilizing propylene in a liquid or a gaseous phase when present, the polymerization being carried out in the degree of 10 to 70% by weight based on the total polymerization amount, said polymerizaton in said first and second steps being carried out in the presence of a catalyst system comprising

(A) a solid catalyst component containing at least titanium, chlorine and an electron-donating compound and having a pore volume of not less than 0.08 cc/g in the range of a pore radius of 200 to 15,000 Å, a mean particle size of 5 to 100 μm, and a geometric standard deviation (σg) of the particle distribution of not more than 2, and

(B) an organic aluminum compound.

4,820,776

HYDROCARBON COMPOSITIONS CONTAINING POLYOLEFIN GRAFT POLYMERS HAVING AMINE AND PHENOTHIAZINE GRAFTED MOIETIES

Maria M. Kapuscinski, Carmel; Larry D. Grina, Wappingers Falls; Ronald E. Jones, Glenham, and Rodney L. Sung, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,567
Int. Cl.[4] C08F *255/06, 255/04*
U.S. Cl. 525—279 3 Claims

1. A graft polymer characterized by its ability to serve as a dispersant, anti-oxidant viscosity index improver comprising an oil-soluble, substantially linear, carbon-carbon backbone polymer bearing (i) first graft units derived from a first monomer amine containing a polymerizable, ethylenically unsaturated double bond and (ii) bonded to said graft polymer, second units derived from phenothiazine as second monomer.

4,820,777

REACTIVE, ACRYLIC RESIN MICRO-PARTICLES, THEIR PREPARATION AND CURABLE COMPOSITION CONTAINING THE SAME

Kazunori Kanda, Osaka; Satoshi Urano, Kyoto; Kei Aoki, Nara, and Hisaichi Muramoto, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Oct. 6, 1986, Ser. No. 915,795
Claims prinrity, application Japan, Oct. 9, 1985, 60-225683
Int. Cl.[4] C08F *271/00, 273/00*
U.S. Cl. 525—291 3 Claims

1. A reactive acrylic resin microparticle comprising a particulate body resin and a number of linear segments attached to said body resin and extending outwardly therefrom, wherein said particulate body resin is composed of an internally cross-linked acrylic resin derived from at least one α,β-ethylenically unsaturated monomer and a polyfunctional monomer having at least two α,β-ethylenically unsaturated bonds and has a mean grain diameter of 0.01 to 20μ, and each of said linear segments is composed of a linear, methylene chain having 1 to 100 carbon atoms or a linear methylene chain having 2 to 100 carbon atoms interrupted by oxygen, sulfur or nitrogen, one end of each methylene chain being connected to said particulate body resin through a urethane, an acyl urethane, a urea or an acyl urea bond and the other end of each methylene chain bearing a reactive ethylenically unsaturated bond.

4,820,778

RANDOM COPOLYMER CONTAINING HEXAGONAL IMIDE UNITS, A PROCESS FOR PRODUCING THE SAME, AND AN OPTICAL DISC SUBSTRATE MADE OF THE RANDOM COPOLYMER

Ikuji Ohtani, Yokohama; Akihiro Watanabe, Shinagawa; Akibiro Wada, Inagi, and Rin-ichi Kakuta, Tokyo, all of Japan, assignors to Asahi Kasei Kokyo Kabushiki Kaisha, Osaka, Japan

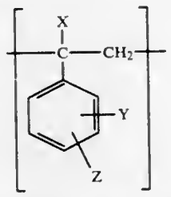
Filed Mar. 3, 1987, Ser. No. 21,267
Claims priority, application Japan, Dec. 25, 1986, 61-308042; Dec. 25, 1986, 61-308043
Int. Cl.[4] C08F *8/32*
U.S. Cl. 525—329.9 19 Claims

1. A random copolymer comprising:

(A) 29 to 92% by weight, based on the copolymer, of methyl methacrylate units,

(B) 5 to 67% by weight, based on the copolymer, of aromatic vinyl compound units of the formula (I)

(I)

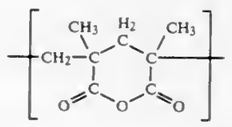


wherein X is selected from the group consisting of a hydrogen atom and a methyl group, and Y and Z are independently selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, and a chlorine atom,

(C) 1 to 10% by weight, based on the copolymer, of methacrylic acid units,

(D) 0 to 48% by weight, based on the copolymer, of hexagonal anhydride units of the formula (II)

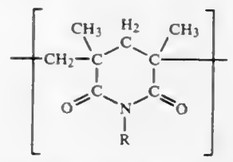
(II)



and

(E) 2 to 50% by weight, based on the copolymer, of hexagonal imide units of the formula (III)

(III)



wherein R is selected from the group consisting of a hydrogen atom and R^1 in which R^1 is selected from the group consisting of an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 5 to 12 carbon atoms, an aralkyl group having 7 to 22 carbon atoms and an aryl group having 6 to 12 carbon atoms,

the sum of said units (A) and (B) and the sum of said units (D) and (E) being respectively in the ranges of 49 to 97% by weight and 2 to 50% by weight based on the copolymer,

wherein the random copolymer has a reduced viscosity (ηsp/C) of 0.15 to 2 dl/g as measured at 25° C. with respect to 0.5 dl of a solution of 0.15 g of the random copolymer in chloroform.

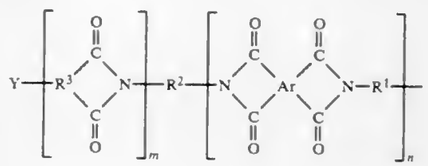
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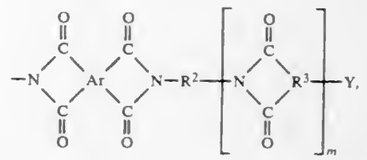
ADDUCT OF A CARBINOL-CONTAINING POLYIMIDE OLIGOMER TERMINATED WITH EPOXIDE-REACTIVE GROUPS AND A POLYEPOXIDE

Jules E. Schoenberg, Scotch Plains, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

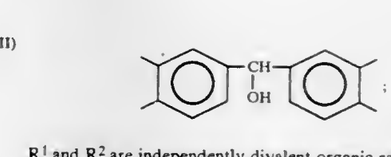
Filed Jul. 1, 1986, Ser. No. 880,844
Int. Cl.[4] C08G *59/06, 73/10*
U.S. Cl. 525—533 23 Claims

1. A carbinol-containing, crosslinkable polyimide-polyepoxide adduct, which comprises the addition reaction product of a polyepoxide and a carbinol-containing polyimide oligomer terminated with epoxide-reactive end groups, which has the structure





wherein Ar is



R^1 and R^2 are independently divalent organic radicals; R^3 is a trivalent organic radical; Y is an epoxide-reactive group selected from the group consisting of an amine, a phenol, a thiol and a carboxyl group; m is 0 or 1 and n is 0–10; and wherein when the opposite epoxide groups of the polyepoxide are reacted with amine epoxide-reactive end groups, hydroxy substituted amine moieties are formed; or when the epoxide groups are reacted with phenol groups, hydroxy ether moieties are formed; or when the epoxide groups an reacted with thiol groups, hydroxy thioether moieties are formed; or when the epoxide groups are reacted with carboxyl groups, hydroxy ester moieties are formed.

4,820,780

MODIFICATION OF RUBBER WITH N-CHLOROTHIO-SULFONAMIDE

Roger J. Hopper, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 15, 1987, Ser. No. 108,654
Int. Cl.[4] C08C *19/22*
U.S. Cl. 525—351 17 Claims

1. In a method of preparing a N-chlorothio-sulfonamide modified terpolymer by reacting a terpolymer of ethylene, an α-olefin containing from 3 to 6 carbon atoms, and a non-conjugated diene containing from 6 to 12 carbon atoms with a N-chlorothio-sulfonamide; the improvement which comprises conducting the reaction in the presence of stearic acid.

4,820,781

BLENDS OF SILICONE COPOLYMER AND POLYETHERIMIDE

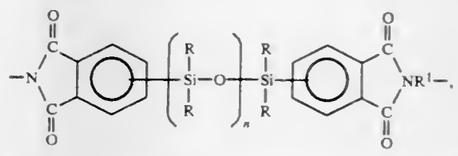
Peter P. Policastro, Niskayuna; Pamela K. Hernandez, and Mark W. Davis, both of Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 067,200, Jun. 29, 1987, abandoned. This application Feb. 22, 1988, Ser. No. 158,434
Int. Cl.[4] C08L *77/00*
U.S. Cl. 525—431 10 Claims

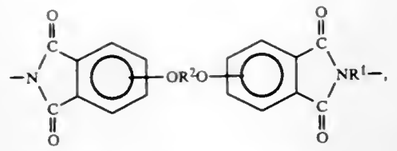
1. A silicone copolymer-polyetherimide blend having a T_g of at least 190° C. comprising by weight,

(A) about 1–99% of polyetherimide, and

(B) about 99%–1% of silicone copolymer comprising from about 10 to 70 mole percent of disiloxane units of the formula,



intercondensed with from 90 to 30 mole % of etherimide units of the formula,



where R is a member selected from the class consisting of the same or different $C_{(1-14)}$ monovalent hydrocarbon radicals and $C_{(1-14)}$ monovalent hydrocarbon radicals substituted with radicals inert during intercondensation, R^1 is selected from the class consisting of divalent $C_{(2-20)}$ organic radicals and halogenated derivatives thereof, R^2 is a divalent $C_{(6-30)}$ aromatic organic radical, and n is an integer having a value of 1 to 5 inclusive.

4,820,782

ARTICLE HAVING THERMAL RECOVERY PROPERTY

Keiji Ueno, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 8, 1986, Ser. No. 938,917

Claims priority, application Japan, Dec. 9, 1985, 60-277472; Dec. 9, 1985, 60-277473

Int. Cl.⁴ C08F *283/00*

U.S. Cl. 525—454 **9 Claims**

1. A shaped article having a thermal recovery property comprising a urethane resin composition, wherein said urethane resin composition comprises 100 parts by weight of a thermoplastic urethane resin and from 0.1 to 50 parts by weight of at least one polyfunctional monomer selected from the group consisting of trimethylolpropane triacrylate, trimethylolpropane trimethacrylate, and triacrylformal, said composition is irradiated with electron beams or gamma-rays for a total dose of from 3 to 50 Mrad, subsequently deformed at a temperature not lower than the softening point of said composition, and then cooled to a temperature lower than said softening point while maintaining the deformed shape of said resin composition.

4,820,783

METHOD FOR FORMING NEW PRECERAMIC POLYMERS FOR SIC AND SI_3 N4/SIC

Dietmar Seyferth, Lexington, Mass.; Timothy G. Wood, North Wales, Pa., and Yuan-Fu Yu, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 756,353, Jul. 18, 1985, Pat. No. 4,645,807. This application Oct. 3, 1986, Ser. No. 915,134

Int. Cl.⁴ C08F *283/00*

U.S. Cl. 525—474 **18 Claims**

1. A ceramic material formed by pyrolyzing a physical mixture of polymers of the formulas $[(RSiH)_x(RSi)_y]_n$ and $[(R^1SiHNH)_a(R^1SiN)_b(R^1SiHNE)_c]_m$, where $x+y=1$, n is an integer greater than 1, R is a lower alkyl group having from 1 to about 6 carbon atoms, a lower alkenyl group having 2 to about 6 carbon atoms, a substituted or unsubstituted lower aryl group having from 6 to about 10 carbon atoms; R^1 is a lower alkyl group having from 1 to about 6 carbon atoms, a substituted or unsubstituted alkenyl group having from 2 to about 6 carbon atoms, a substituted or unsubstituted lower aryl group having from 6 to about 10 carbon atoms, a tri(lower)alkyl- or di(lower)alkylsilyl group or a di(lower)alkylamino group, n and m are integers greater than 1, and E is a moiety introduced by reaction of an electrophile, E-X, where X is a halogen, sulfate or sulfonate, with $[(R^1SiNH)_a(R^1SiN)_b(R^1SiNM)_c]_m$ where M is an alkali metal or one-half equivalent of an alkaline earth metal.

4,820,784

MODIFIED ADVANCED EPOXY RESINS

John L. Massingill, Jr., and Raul A. Pabon, Jr., both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 13, 1988, Ser. No. 143,558

Int. Cl.⁴ C08G *59/14, 59/02*

U.S. Cl. 525—481 **41 Claims**

1. A modified advanced epoxy resin which results from reacting

(A) an advanced epoxy resin which results from reacting

(1) an epoxy resin composition comprising

(a) at least one epoxy resin having an average of more than one, but not more than two vicinal epoxy groups per molecule and which contains at least one oxyalkylene or substituted oxyalkylene group per molecule; and

(b) optionally at least one epoxy resin which has an average of more than one but not more than about two vicinal epoxy groups per molecule and which is different from the epoxy resin of (1) above;

wherein components (a) and (b) are present in amounts such that from about zero to about 100 equivalent percent of the epoxide groups are derived from component (a) and from about 5 to about 95 equivalent percent of the epoxide groups are derived from component (2); with

(2) at least one compound having two aromatic hydroxyl groups per molecule;

wherein components (1) and (2) are employed in amounts which provide a ratio of aromatic hydroxyl groups per epoxy group of from about 0.005:1 to about 200:1; with

(B) a phosphorus-containing compound selected from

(1) phosphoric acid;

(2) super phosphoric acid;

(3) phosphate esters; or

(4) any combination of components (B-1), (B-2) or (B-3);

wherein components (A) and (B) are present in an amount such that the ratio of moles of component (B) to epoxy groups contained in component (A) is from about 0.1:1 to about 5:1.

4,820,785

IN SITU COMONOMER GENERATION IN OLEFIN POLYMERIZATION

Max P. McDaniel; Douglas Klendworth; Donald D. Norwood; Eric T. Hsieh, and Elizabeth A. Boggs, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 874,977, Jun. 16, 1986, Pat. No. 4,735,931. This application Feb. 24, 1988, Ser. No. 159,873

Int. Cl.⁴ C08F *4/62*

U.S. Cl. 526—105 **16 Claims**

1. A polymerization process comprising contacting an ethylene feedstream with a catalyst system made by a process comprising

(a) forming a chromium catalyst component on a predominantly silica support;

(b) subjecting the composition of (a) to activation in an oxygen-containing ambient at an elevated temperature sufficient to convert at least a portion of any chromium in a lower valent state to the hexavalent state;

(c) thereafter subjecting the activated catalyst composition of (b) to carbon monoxide under reducing conditions; and

(d) thereafter contacting the thus reduced supported catalyst composition of (c) with a cocatalyst selected from trialkyl boron compounds and dialkyl aluminum alkoxide compounds.

4,820,786

PROCESS FOR THE PREPARATION OF LINEAR LOW DENSITY POLYETHYLENE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 527,625, Aug. 29, 1983, abandoned. This application Sep. 18, 1986, Ser. No. 909,136

Int. Cl.⁴ C08F *210/08, 4/02, 4/64*

U.S. Cl. 526—152 **15 Claims**

1. A process for the preparation of linear low density polyethylene by the copolymerization of ethylene and 1-butene which comprises contacting ethylene with a feedstock comprising 1-butene in the presence of a catalyst comprising:

(a) a solid supported titanium tetrahalide complex, wherein said complex is prepared by contacting a mechanically pulverized solid support with titanium tetrahalide in the absence of mechanical pulverization, and

(b) a cocatalyst comprising a mixture of a dialkyl aluminum halide and a dialkyl magnesium or alkyl lithium compound.

4,820,787

SHAPED ARTICLE OF AN ORIENTED TETRAFLUOROETHYLENE POLYMER

Hiroshi Katsoka; Kinya Matsuzawa, both of Tokyo, and Hiroji Oda, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 18, 1987, Ser. No. 27,540

Claims priority, application Japan, Mar. 18, 1986, 61-58271; Aug. 6, 1986, 61-183293; Nov. 4, 1986, 61-260574

Int. Cl.⁴ C08F *14/18;* **B27J** *5/00;* **B29D** *7/22*

U.S. Cl. 526—255 **16 Claims**

1. A shaped article comprising a tetrafluoroethylene polymer comprising an at least biaxially oriented tetrafluoroethylene polymer having a number average molecular weight of at least about 10^6, which has a draw ratio (D) of at least 3.0, a specific gravity of at least 1.8 and an orientation release stress at 200° C. of at least 5 Kg/cm^2.

4,820,788

POLY(SILYL SILANE)HOMO AND COPOLYMERS

John M. Zeigler, 2208 Lester Dr. NE., Albuquerque, N. Mex. 87112, assignor to John M. Zeigler, Albuquerque, N. Mex.

Filed Oct. 31, 1986, Ser. No. 925,552

Int. Cl.⁴ C08G *77/04*

U.S. Cl. 528—33 **31 Claims**

1. In a linear polysilane having a main chain of at least ten catenated Si atoms and pendant side groups, the improvement wherein at least one side group is a silyl group.

4,820,789

PROCESS FOR THE PRODUCTION OF OLIGOURETHANES CONTAINING TERMINAL MERCAPTO GROUPS

René- Andrés A. González, Duesseldorf; Winfried Emmerling, Erkrath; Tore Podola, Monheim, and Klaus Noltzer, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 13, 1987, Ser. No. 2,826

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601189

Int. Cl.⁴ C08G *18/30*

U.S. Cl. 528—55 **15 Claims**

1. A process for the production of oligourethanes containing terminal mercapto groups, comprising the steps of:

(a) forming a propylene oxide adduct containing hydroxyl groups by reacting a reactant consisting of propylene oxide with one or more trifunctional aliphatic alcohols selected from the group consisting of trimethylol ethane, glycerol and trimethylol propane:

(b) adding to said propylene oxide adduct of step (a) an excess, based on said hydroxyl groups, of a mixture of isomeric tolylene diisocyanates to form a prepolymer having terminal isocyanate groups; and

(c) reacting said prepolymer of step (b) with mercaptoethanol.

4,820,790

CHAIN-EXTENDED POLY(ARYL ETHER KETONES)

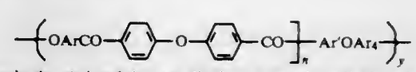
Paul A. Winslow, Millington, and Markus Matzner, Edison, both of N.J., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 13, 1987, Ser. No. 25,367

Int. Cl.⁴ C08G *8/02, 14/00*

U.S. Cl. 528—125 **5 Claims**

1. A tough, linear chain-extended poly(aryl ether ketone) polymer of the formula



wherein Ar, Ar' and Ar_4 are divalent aromatic radicals, n is at least three, and y is one or greater; with the proviso that Ar_4 cannot be the residue of 4,4'-dihydroxybenzophenone.

4,820,791

POLYIMIDES CONTAINING CARBONYL AND ETHER CONNECTING GROUPS

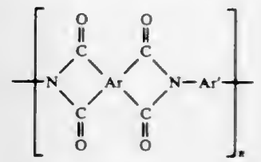
Paul M. Hergenrother, Yorktown, and Stephen J. Havens, Newport News, both of Va., assignors to United States of America, Washington, D.C.

Filed Feb. 5, 1987, Ser. No. 11,693

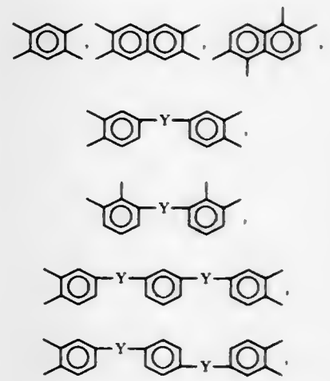
Int. Cl.⁴ C08G *8/02, 14/00*

U.S. Cl. 528—125 **3 Claims**

1. A high molecular weight linear polyimide having high strength, modulus, toughness, and solvent resistance, the polyimide having the general structural formula:

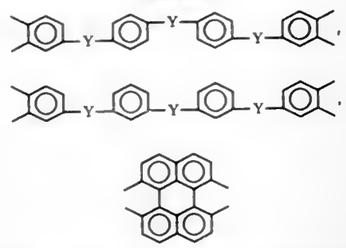


(a) wherein Ar is a radical selected from the group consisting of:



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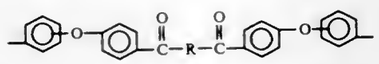
-continued



wherein Y is not a substituent or is a substituent selected from the group consisting of:
O, S,



SO_2, CH_2, $C(CH_3)_2$, $C(CF_3)_2$ and $Si(CH_3)_2$;
(b) wherein Ar' is a radical having the structural formula:



wherein R is a radical selected from the group consisting of:

wherein Y is not a substituent or is a substituent selected from the group consisting of:
O, S,



SO_2, CH_2, $C(CH_3)_2$, and $C(CF_3)_2$,
and mixtures thereof; and
(c) wherein n is an integer between 4 and 100.

4,820,792

PREPARATION OF AROMATIC POLYKETONES USING A STRONG ACID CATALYST WITH A WEAKER ACID SOLVENT

Ian D. H. Towle, Cirencester, England, assignor to Raychem Limited, London, England

Filed Apr. 9, 1987, Ser. No. 36,655
Claims priority, application United Kingdom, Apr. 11, 1986, 8608870
Int. Cl.[4] C08G *67/00, 75/23*
U.S. Cl. 528—126 **14 Claims**

1. A method for the preparation of an aromatic polyketone which comprises reacting under anhydrous conditions either:
(I) a compound of the formula

X—CO—B—Ar—H

which is self-polymerizing and reacts to produce a polymer containing the repeat unit

—[—CO—B—Ar—]—

or
(II) a mixture of:
(i) a compound of the formula:

X—CO—(—B'—CO—)$_b$—X

and
(ii) a compound of the formula:

H—Ar—B''—Ar—H

the compounds reacting to produce a polymer containing the repeat unit

—[—CO—(—B'—CO—)$_b$—Ar—B''—Ar—]—

or
(iii) a combination of (I) and (II),
where
each Ar is independently an aryl moiety;
B and B' are each independently an aromatic, aliphatic, aromatic/aliphatic, heterocyclic, alicyclic, or alkylhalide moiety and B is linked to Ar by —O—, —S—, or a direct bond;
B'' is an aromatic, aliphatic, aromatic/aliphatic, heterocyclic, alicyclic or alkylhalide moiety, an oxygen or sulphur atom or a chemical bond;
X is a halogen atom, an —OH group, or the group —O$^-$M$^+$ where M is an alkali metal;
O is an oxygen atom;
H is a hydrogen activated towards electrophilic substitution and bonded to an aromatic carbon atom of Ar; and
b is zero or 1,
the reaction being carried out in the presence of a substantially only catalytic amount of a strong acid having an acid strength at least as great as that of methane sulphonic acid, and in a solvent system that (a) has an acid strength less than that of the chosen strong acid, and (b) comprises a second acid other than phosphoric acid having an acid strength at least as great as that of chloroacetic acid,
with the proviso that when X is an —OH group the reaction mixture contains a dehydrating agent, which may constitute the solvent system or a component thereof, or may be an additional compound, to remove water produced during the reaction.

4,820,793

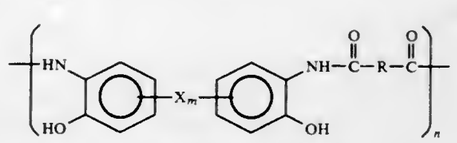
METHOD OF PREPARING AROMATIC POLYAMIDES AND POLYBENZOXAZOLES

Yoshio Imai, Tokyo; Masaaki Kakimoto, Yokohama; Yoshiyuki Oishi, Tokyo, and Yutaka Maruyama, Kawasaki, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 28, 1987, Ser. No. 54,965
Claims priority, application Japan, May 30, 1986, 61-125153; May 30, 1986, 61-125154
Int. Cl.[4] C08G *73/06*
U.S. Cl. 528—183 **16 Claims**

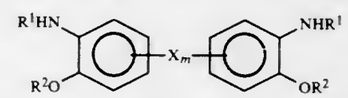
1. A method of preparing an aromatic polyamide represented by the general formula (I), comprising the step of reacting an aromatic diamine represented by the general formula (II) with an aromatic dicarboxylic acid dihalide represented by the general formula (III) in an organic solvent:

(I)



wherein X is a divalent organic group, m is 0 or 1, R is a divalent aromatic group, and n is an integer from 1 to 200;

(II)



wherein R^1 is a monovalent organosilicon group, R^2 is a monovalent organosilicon group, X is said divalent organic group, and m is 0 or 1;

(III)



wherein R is said divalent aromatic group, and Y is a halogen atom.

4,820,794

PROCESS FOR PREPARING POLYKETONE IN THE PRESENCE OF PERFLUOROALKYL SULFONIC ACID AND OXIDE OF PHOSPHORUS

William R. Darnell, Weber City, Va., and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1987, Ser. No. 38,682
Int. Cl.[4] C08G *83/00*
U.S. Cl. 528—271 **16 Claims**

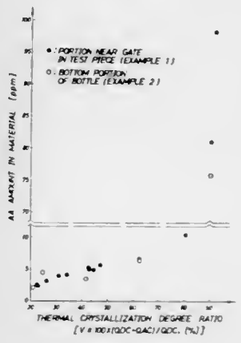
1. Process for preparing polyketones comprising reacting
I. (A) a dicarboxylic acid selected from
(a) aromatic dicarboxylic acids having 8–30 carbon atoms wherein the carboxyl groups are attached directly to the aromatic ring and are separated from each other by at least 3 carbon atoms,
(b) cycloaliphatic dicarboxylic acids having 6 to 20 carbon atoms wherein the carboxyl groups are attached directly to the cyclic ring and are separated from each other by at least 3 carbon atoms, or
(c) aliphatic carboxylic acids having 6 to 20 carbon atoms wherein the carboxyl groups are separated from each other by at least 4 carbon atoms, and
(B) at least one aromatic compound having at least 10 carbon atoms and at least 2 hydrogen atoms bound to an aromatic ring, or
II. a self-polymerizable aromatic monocarboxylic acid having at least 13 carbon atoms wherein reacting hydrogen atom and the carboxyl group are on different aromatic rings, or
III. mixture of I and II as defined above in the presence of a perfluoroalkylsulfonic acid containing 1 to 4 carbon atoms and an oxide of phosphorus having at least one —P—O—P— unit in an amount of at least one gram-mole of —P—O—P— unit is present per gram-mole of carboxyl contained in the dicarboxylic acid, monocarboxylic acid, or mixture thereof, at a temperature of about 0°–150° C. until the desired degree of polymerization is achieved.

4,820,795

POLYESTER VESSEL AND PACKAGE

Sadao Hirata, Kamakura, and Yoshihiko Watanabe, Yokohama, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Dec. 4, 1987, Ser. No. 128,948
Claims priority, application Japan, Dec. 5, 1986, 61-288706
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 **10 Claims**



1. In a polyester vessel having mouth, side wall and bottom portions formed of a polyester composed mainly of ethylene terephthalate units, the improvement wherein said polyester is a thermoplastic polyester containing (i) a catalyst residue comprising Ge or Ti in an amount smaller than 1000 ppm as the metal and (ii) a phosphoric acid type stabilizer in an amount larger than 15 ppm as P in the case of the Ge-catalyst or in an amount larger than 55 ppm as P in the case of the Ti-catalyst, the upper limit of the amount of the phosphoric acid type stabilizer being smaller than 500 ppm as P, and in the thermoplastic polyester constituting the bottom portion of the vessel, the ratio of the thermal crystallization degree (V) represented by the following formula:

$$V=100\times(Q_{DC}-Q_{AC})/Q_{DC} \quad (1)$$

wherein Q_{AC} stands for the heat quantity of crystallization at elevation of the temperature and Q_{DC} stands for the heat quantity of crystallization at lowering of the temperature, is lower than 90%.

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4,820,796

TRANSPARENT POLYAMIDE ELASTOMER FROM CARBOXY POLYCAPROLACTAM AND POLY(TETRAMETHYLENE OXY)GLYCOL

Yoshio Suzuki; Mikihiko Nakamura, both of Fuji, and Atsushi Aoshima, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP86/00209, § 371 Date Dec. 15, 1986, § 102(e) Date Dec. 15, 1986, PCT Pub. No. WO86/06390, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 25, 1986, Ser. No. 1,657

Claims priority, application Japan, Apr. 26, 1985, 60-88873; Jun. 5, 1985, 60-120599; Sep. 25, 1985, 60-210175; Oct. 30, 1985, 60-241271

Int. Cl.[4] C08G *69/44*

U.S. Cl. 528—292 **31 Claims**

1. A polyamide elastomer having a relative viscosity of 1.5 or above in m-cresol (0.5 weight/volme %); at 30° C. . a polyamide partition ratio of from 0.7 to 1.3, a Shore hardness of 60 A to 50 D, a tensile strength of 150 kg/cm^2 or above, and a haze of 75% or below at a thickness of 1 mm, said elastomer having a structure of dehydration condensate produced from (A) a polycapramide having carboxyl end groups and a number average molecular weight of 500 to 5,000, which is derived from a dicarboxylic acid having 4 to 20 carbon atoms selected from aliphatic dicarboxylic acids, alicyclic dicarboxylic acids or aromatic dicarboxylic acid and caprolatam and (B) a polyoxytetramethylene glycol having a number average molecular weight of 800 to 5,000 or a modified polyoxytetramethylene glycol having a number average molecular weight of 800 to 5,000 and having, in the molecular chain, the units represented by the general formula

—O—R—

wherein R is a branched chain alkylene group having 4 to 20 carbon atoms or a straight chain alkylene group having 5 to 20 carbon atoms, the units content being 50% by weight or less and the weight ratio of the component (A) to the component (B) in the elastomer being from 10 : 90 to 60 : 40.

4,820,797

CYANATE FUNCTIONAL MALEIMIDE THERMOSETTING COMPOSITION

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 27,776, Mar. 18, 1987, Pat. No. 4,769,440, which is a division of Ser. No. 782,644, Oct. 1, 1985, Pat. No. 4,683,276. This application May 17, 1988, Ser. No. 194,703

Int. Cl.[4] C08G *83/00, 73/12*

U.S. Cl. 528—322 **12 Claims**

1. A composition which comprises

(A) at least one thermosettable compound which simultaneously contains both a maleimide group and a cyanate group and

(B) a mixture of any two or more of the following components 1–4 in any combination

(1) at least one aromatic polycyanate;

(2) at least one polymaleimide;

(3) at least one material having an average of more than one vicinal epoxide group per molecule; or

(4) at least one polymerizable ethylenically unsaturated material;

wherein component (A) comprises from about 1 to about 99 percent by weight of the combined weight of components (A) and (B).

4,820,798

CYANATE FUNCTIONAL MALEIMIDE THERMOSETTING COMPOSITION

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 27,776, Mar. 18, 1987, Pat. No. 4,769,440, which is a division of Ser. No. 782,644, Oct. 1, 1985, Pat. No. 4,683,276. This application May 17, 1988, Ser. No. 194,709

Int. Cl.[4] C08G *83/00, 73/12*

U.S. Cl. 528—322 **12 Claims**

1. A composition which comprises

(A) at least one thermosettable compound which simultaneously contains both a maleimide group and a cyanate group and

(B) at least one of

(1) at least one polymaleimide;

(2) at least one material having an average of more than one vicinal epoxide group per molecule; or

(3) at least one polymerizable ethylenically unsaturated material;

wherein component (A) comprises from about 1 to about 99 percent by weight of the combined weight of components (A) and (B).

4,820,799

PROCESS FOR PRODUCING WATER-SOLUBLE POLYELECTROLYTE

Farykhdzhon A. Artykov, Tashkent; Ljudmila A. Lilbok; Jury P. Novikov, both of Navoi; Karim S. Akhmedov, Tashkent; Aziz S. Zainutdinov, Tashkent, and Sadriddin Zainutdinov, Tashkent, all of U.S.S.R., assignors to Institut Khimi Akademii Nauk Uzbekskoi SSR, Tashkent, U.S.S.R.

Filed Jan. 12, 1988, Ser. No. 143,450

Int. Cl.[4] C08F *3/44*; C08G *63/44*

U.S. Cl. 528—363 **1 Claim**

1. A process for producing a water-soluble polyelectrolyte comprising mixing an acid selected from the group consisting of acrylic acid and methacrylic acid with ammonium carbonate and a polyhydric alcohol selected from the group consisting of glycerol and ethylene glycol at a molar ratio of the acid to ammonium carbonate and said polyhydric alcohol of 2–6:1–2:1 respectively; adding hydrogen peroxide to the resulting reaction mass in an amount of from 0.1 to 1.0% by mass of said acid; polymerization of said reaction mass first at a temperature ranging from 60° to 80° C. for 3 to 6 minutes, then at a spontaneous elevation of temperature to 110°–140° C.

4,820,800

ARYLENE SULFIDE POLYMERS

Jon F. Geibel, Bartlesville, Okla., and Guy Senatore, Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

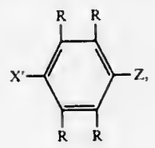
Filed Feb. 25, 1988, Ser. No. 160,389

Int. Cl.[4] C08G *75/16, 75/02*

U.S. Cl. 528—388 **21 Claims**

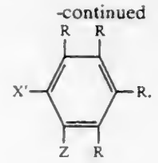
1. A process for preparing arylene sulfide polymer comprising:

(a) admixing at least one sulfur source, at least one polyhalo-substituted aromatic compound, at least one polar organic compound and at least one organic monohalo compound selected from the group of compounds represented by the formulas:

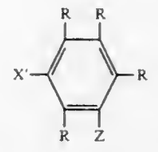


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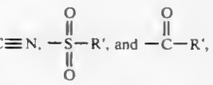
-continued



and



wherein X′ is a halogen selected from the group consisting of fluorine, chlorine, bromine and iodien; R is selected from the group consisting of hydrogen and an alkyl group of 1–4 carbon atoms; and Z is an activating group selected from the group consisting of



where R′ is selected from the group consisting of phenyl, an alkyl radical of 1–12 carbon atoms, phenyl to the ring bearing X′ by a valence bond or an alkylene bridging group of 1–12 carbon atoms, and an alkyl radical of 1–12 carbon atoms attached to the ring bearing X′ by a valence bond or an alkylene briding group of 1–12 carbon atoms and

(b) subjecting said admixture to polymerization conditions sufficient to produce a polymerization reaction mixture comprising said arlyene sulfide polymer.

4,820,801

POLYPHENYLENE SULFIDE CONTAINING COVALENTLY BONDED CHLORINE IN A REDUCED AMOUNT

Hiroshi Inoue; Toshikazu Kato; Masaaki Otsuru, all of Shinnanyo, and Noriaki Emura, Tokuyama, Japan, assignors to Tosoh Corp. and Hodogaya Chemical Co., Ltd., both of, Japan

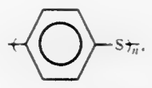
Filed Oct. 29, 1986, Ser. No. 924,915

Claims priority, application Japan, Nov. 2, 1985, 60-245318; Dec. 12, 1985, 60-277913

Int. Cl.[4] C08G *75/14*

U.S. Cl. 528—388 **2 Claims**

1. A polyphenylene sulfide consisting of at least 90 mole % of a first moiety represented by



wherein n is an integer of at least 20, and the remainder being of a second moiety wherein said second moiety is a copolymerizable component selected from the group consisting of o- or m- phenylene group, biphenylene group, naphthalene group, tri- or tetra-valent phenylene group, which contains covalently bonded chlorine in an amount of 500 ppm or less and is substantially free from ionically bonded chlorine and sodium.

4,820,802

IMPROVED PROCESS OF PREPARING CARBON MONOXIDE/OLEFIN COPOLYMER WITH ORTHO SUBSTITUTED PHOSPHINE CATALYST COMPOSITION.

Eit Drent; Richard L. Wife, and Petrus W. N. M. Van Leeuwen, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1987, Ser. No. 135,427

Claims priority, application Netherlands, Feb. 3, 1987, 8700255

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **7 Claims**

1. In the process of producing a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon in the presence of a catalyst composition formed from a palladium compound and a phosphine ligand, the improvement which comprises employing in the catalyst composition the anion of a non-hydrohalogenic acid having a pKa less than about 4 and an ortho-substituted triphenylphosphine.

4,820,803

PROCESS FOR RECOVERING ETHYLENE-VINYL ACETATE COPOLYMERS FROM AN AQUEOUS DISPERSION

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 29, 1985, Ser. No. 802,891

Int. Cl.[4] C08F *6/00*

U.S. Cl. 528—487 **20 Claims**

1. In a process for improving the parting characteristic of particulate ethylene-vinyl acetate polymers comprising from about 25 percent to about 85 percent vinyl acetate units and corresponding hydrolyzed ethylene-vinyl acetate polymers which comprises agitating, in the molten state, said polymer in an aqueous dispersion system comprising an alkali metal soap and cooling the resulting dispersion to obtain said polymer as finely divided particles; converting said soap in situ to the corresponding carboxylic acid or to the corresponding alkaline earth metal soap to coat said particles; and recovering said particles by filtration and drying, the improvement which comprises:

adding, subsequent to the formation of the polymer dispersion and prior to the filtration thereof, about 3% to about 5% by weight, based on the total water weight, of a water-soluble, substantially neutral salt inert to said soap whereby the filtration time is substantially reduced, the solids content of the filter cake is substantially increased and the drying time of the filter cake is substantially reduced compared to the time required in the absence of said neutral salt.

4,820,804

ANALOGS OF [1,7-DI-ALANINE, DES-19-LEUCINE]CALCITONIN

Ronald C. Orlowski, Frankfort; Jay K. Seyler; James E. Geever, both of Bourbonnais, and Everett Flanigan, Kankakee, all of Ill., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Apr. 21, 1987, Ser. No. 40,964

Int. Cl.[4] C07K *7/36*

U.S. Cl. 530—307 **8 Claims**

1. [N-alpha-X, 1,7-Di-Alanine, (8-Y) Des-19-Leucine] calcitonin, wherein

X is the N-alpha amino substituent and is H or an acyl group derived from a carboxylic acid having 1–10 carbon atoms,

Y is L-valine, glycine, L-methonine, L-alanine, L-leucine or L-isoleucine and

wherein the calcitonin is salmon, eel or chicken calcitonin.

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4,820,805

UNDENATURED VIRUS-FREE TRIALKYL PHOSPHATE TREATED BIOLOGICALLY ACTIVE PROTEIN DERIVATIVES

Alexander R. Neurath, New York, and Bernard Horowitz, New Rochelle, both of N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Continuation of Ser. No. 514,375, Jul. 14, 1983, Pat. No. 4,540,573, which is a division of Ser. No. 631,675, Jul. 17, 1984, Pat. No. 4,764,369. This application Apr. 22, 1985, Ser. No. 726,200

Int. Cl.[4] C07K *15/00;* **A61K** *37/02*

U.S. Cl. 530—410 **3 Claims**

1. A process for obtaining a protein-containing composition which is substantially free of lipid-containing viruses without incurring substantial denaturation of any labile proteins contained therein, comprising contacting said protein-containing composition with an effective amount of di- or trialkylphosphate for a sufficient period of time, wherein said protein-containing composition is the product of a cancerous cell or the product of gene splicing.

4,820,806

METAL-FREE AZO COMPOUNDS CONTAINING A VINYLSULFONYL GROUP AND AT LEAST ONE BASIC GROUP AND 1:1 AND 1:2 METAL COMPLEXES THEREOF

Werner Baumann, Charlotte, N.C.; Joseph V. Diest, Binningen; Herbert Eichenberger, Kaiseraugst, both of Switzerland, and Max Oppliger, Allschwil, Switzerland, assignors to Sandoz, Ltd., Basle, Switzerland

PCT No. PCT/EP85/00305, § 371 Date Feb. 28, 1986, § 102(e) Date Feb. 28, 1986, PCT Pub. No. WO86/00632, PCT Pub. Date Jan. 30, 1986

PCT Filed Jun. 25, 1985, Ser. No. 847,405

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1984, 3424320

Int. Cl.[4] C09B *62/507, 62/51, 62/513, 62/515*

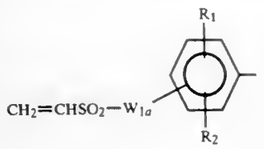
U.S. Cl. 534—605 **18 Claims**

1. A metal-free compound of the formula

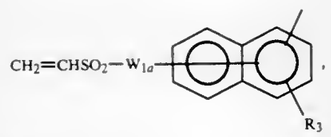
Da—N=N—Ka,

a 1:1 or 1:2 metal complex of a metallizable metal-free compound of said formula or an acid addition salt of a metal-free compound of said formula or of a 1:1 or 1:2 metal complex of a metallizable metal-free compound of said formula, wherein

Da is



or



wherein

each of R_1 and R_2 is independently hydrogen, halo, hydroxy, cyano, nitro, trifluoromethyl, carboxy, C_{1-4}alkyl, C_{1-4}alkoxy, phenoxy, phenoxy substituted by 1 to 3 halo substituents, sulfamoyl, C_{1-4}alkylsulfamoyl, di-(C_{1-4}alkyl)sulfamoyl, C_{1-4}alkylsulfonyl, (C_{1-4}alkyl)carbonylamino, benzamido or phenylamino,

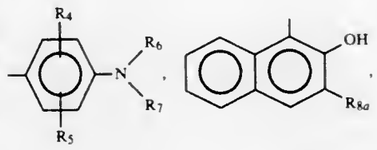
R_3 is hydrogen, halo, hydroxy, amino, C_{1-4}alkyl, C_{1-4}alkoxy, phenoxy, phenylamino, C_{1-4}alkylamino, di-(C_{1-4}alkyl)amino, (C_{1-4}alkyl)carbonylamino or benzamido, and

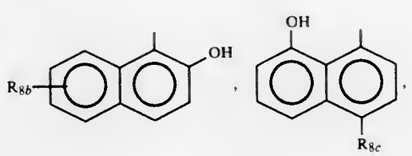
W_{1a} is a direct bond; W_3; linear or branched C_{2-6}alkenylene; linear or branched C_{1-6}alkylene or linear or branched C_{2-6}alkenylene monosubstituted by halo, hydroxy, C_{1-4}alkoxy or phenyl; linear or branched alkylene or linear or branched alkenylene having a maximum of 6 carbon atoms which is interrupted by a nitrogen, oxygen or sulfur atom; linear or branched alkylene or linear or branched alkenylene having a maximum of 6 carbon atoms which is monosubstituted by halo, hydroxy, C_{1-4}alkoxy or phenyl and interrupted by a nitrogen, oxygen or sulfur atom; —NH—X_a—; —CONH—X_a—; —NHCO—X_a—; —CO—X_a—; —SO_2NH—X_a—; —NHNHCO—X_a—; —CH_2—CONH—CH_2— or —CH_2—NHCO—CH_2—, wherein

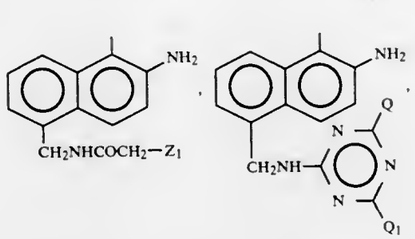
X_a is linear or branched C_{1-4}alkylene or linear or branched C_{2-4}alkenylene,

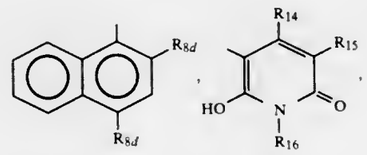
with the proviso that when W_{1a} contains an X_a radical, the X_a radical is attached to the CH_2=CH—SO_2— group, and

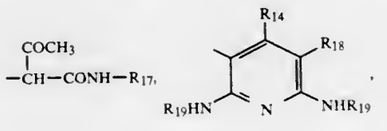
Ka is





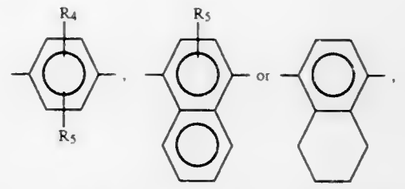






wherein

M is



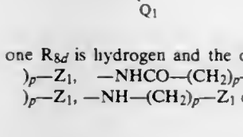
wherein R_4 and R_5 are as defined below,

R_4 is hydrogen, halo, hydroxy, C_{1-4}alkyl, C_{1-4}alkoxy, (C_{1-4}alkyl)carbonylamino, ureido, sulfamoyl, C_{1-4}alkylsulfamoyl, di-(C_{1-4}alkyl)sulfamoyl, —NHCO—$(CH_2)_p$—Z_1 or —SO_2N[$(CH_2)_p$—Z_1]$_2$,

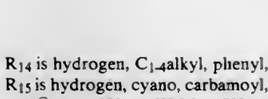
R_5 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, halo or hydroxy,

R_6 is hydrogen; C_{1-6}alkyl; C_{1-6}alkyl monosubstituted by hydroxy, phenyl, halo or cyano or disubstituted by hydroxy; —$(CH_2)_p$—NHCO—$(CH_2)_p$—Z_1; —W_3—Z_1 or linear or branched C_{1-6}alkylene-Z_1 the alkylene radical of which is substituted by 1 or 2 hydroxy groups,

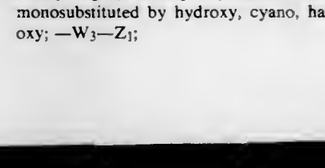
R_7 is hydrogen; C_{1-6}alkyl; C_{1-6}alkyl monosubstituted by hydroxy, phenyl, halo or cyano or disubstituted by hydroxy; —CO—CH_2—Z_1; linear or branched C_{1-8}alkylene-Z_1; linear or branched C_{1-8}alkylene-Z_1 the alkylene radical of which is substituted by 1 or 2 hydroxy groups; linear or branched alkylene-Z_1 the alkylene radical of which has a maximum of 8 carbon atoms and is interrupted by —NH—, —NCH_3—, —S—, —O—, —NHCO— or —OCO—; linear or branched alkylene-Z_1 the alkylene radical of which has a maximum of 8 carbon atoms and is substituted by 1 or 2 hydroxy groups and interrupted by —NH—, —NCH_3—, —S—, —O—, —NHCO— or —OCO—; or



R_{8a} is —CONH—$(CH_2)_p$—Z_1,



or



R_{8b} is —NHCO—$(CH_2)_p$—Z_1, —SO_2NH—$(CH_2)_p$—Z_1 or

R_{8c} is —NHCO—$(CH_2)_p$—Z_1, —NH—$(CH_2)_p$—Z_1 or

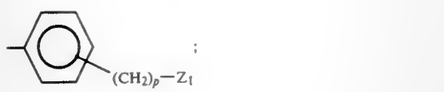
one R_{8d} is hydrogen and the other is —CONH—$(CH_2)_p$—Z_1, —NHCO—$(CH_2)_p$—Z_1, —SO_2NH—$(CH_2)_p$—Z_1, —NH—$(CH_2)_p$—Z_1 or

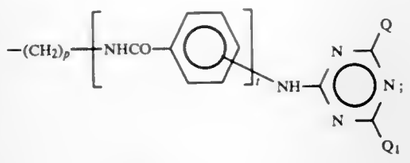
R_{14} is hydrogen, C_{1-4}alkyl, phenyl, benzyl or cyclohexyl,

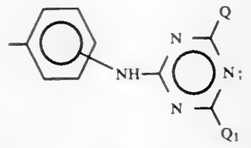
R_{15} is hydrogen, cyano, carbamoyl, sulfamoyl, pyridinium $A^{\ominus}$ or —CH_2—NHCO—CH_2—Z_1,

R_{16} is hydrogen; amino; phenylamino; C_{1-4}alkyl; C_{1-4}alkyl monosubstituted by hydroxy, cyano, halo or C_{1-4}alkoxy; —W_3—Z_1;

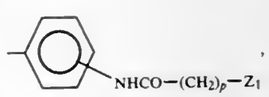
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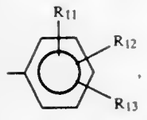




$-(CH_2)_p-NHCO-(CH_2)_p-Z_1$ or

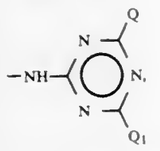


R_{17} is $-W_3-Z_1$ or



wherein each of R_{11} and R_{12} is independently hydrogen, halo, nitro, amino, cyano, hydroxy, C_{1-4}alkyl or C_{1-4}alkoxy, and

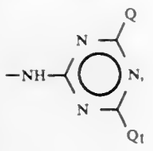
R_{13} is $-W_{2a}-Z_1$ or



R_{18} is hydrogen, cyano or carbamoyl,

each R_{19} is independently hydrogen; C_{1-4}alkyl; C_{1-4}alkyl monosubstituted by hydroxy or C_{1-4}alkoxy; or $-W_3-Z_1$, and

Y_d is $-(CH_2)_p-Z_1$, $-CO-CH_2-Z_1$ or



wherein

each Q is independently $-NH-(CH_2)_q-Z_1$,

each Q_1 is independently halo, hydroxy, amino, C_{1-4}alkoxy, phenoxy, phenylamino, cyclohexylamino, C_{1-4}alkylamino, di-(C_{1-4}alkyl)amino or $-NH-(CH_2)_q-Z_1$, and

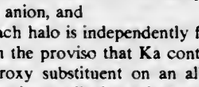
W_{2a} is W_3; linear or branched C_{2-6}alkenylene; linear or branched C_{1-6}alkylene or linear or branched C_{2-6}alkenylene monosubstituted by halo, hydroxy, C_{1-4}alkoxy or phenyl; linear or branched alkylene or linear or branched alkenylene having a maximum of 6 carbon atoms which is interrupted by a nitrogen, oxygen or sulfur atom; linear or branched alkylene or linear or branched alkenylene having a maximum of 6 carbon atoms which is monosubstituted by halo, hydroxy, C_{1-4}alkoxy or phenyl and interrupted by a nitrogen, oxygen or sulfur atom; $-NH-X_a-$; $-CONH-X_a-$; $-NHCO-X_a-$; $-CO-X_a-$; $-SO_2NH-X_a-$; $-NHNHCO-X_a-$; $-CH_2-CONH-CH_2-$ or $-CH_2-NHCO-CH_2-$,

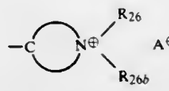
wherein X_a is linear or branched C_{1-4}alkylene or linear or branched C_{2-4}alkenylene,

with the proviso that when W_{2a} contains an X_a radical, the X_a radical is attached to the Z_1 group,

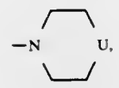
wherein each W_3 is independently linear or branched C_{1-6}alkylene,

each Z_1 is independently

$-NR_{20}R_{21}$, $-\overset{\oplus}{N}R_{22}R_{23}R_{24}\,A^{\ominus}$,  or



wherein each of R_{20} and R_{21} is independently hydrogen; C_{1-4}alkyl; C_{2-4}alkyl monosubstituted by hydroxy, C_{1-4}alkoxy, halo or cyano; C_{5-6}cycloalkyl; phenyl(C_{1-4}alkyl) or phenyl(C_{1-4}alkyl) the phenyl group of which is substituted by 1 to 3 substituents selected from chloro, C_{1-4}alkyl and C_{1-4}alkoxy, or $-NR_{20}R_{21}$ is

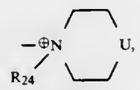


wherein U is a direct bond, $-CH_2-$, $-O-$, $-S-$, $-SO-$, $-SO_2-$, $-NH-$, $-N(C_{1-4}alkyl)$ or $-N^{\oplus}(C_{1-4}alkyl)_2\,A^{\ominus}$,

each of R_{22} and R_{23} is independently C_{1-4}alkyl; C_{2-4}alkyl monosubstituted by hydroxy, C_{1-4}alkoxy, halo or cyano; C_{5-6}cycloalkyl; phenyl(C_{1-4}alkyl) or phenyl(C_{1-4}alkyl) the phenyl group of which is substituted by 1 to 3 substituents selected from chloro, C_{1-4}alkyl and C_{1-4}alkoxy,

R_{24} is C_{1-4}alkyl or phenyl(C_{1-4}alkyl), or

$-N^{\oplus}R_{22}R_{23}R_{24}$ is pyridinium, pyridinium substituted by 1 or 2 methyl groups or



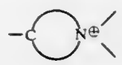
wherein R_{24} and U are as defined above,

R_{25} is hydrogen or C_{1-4}alkyl,

each R_{26} is independently C_{1-4}alkyl,



is a 5- or 6-membered saturated, partially unsaturated or unsaturated protonatable heterocyclic ring, with the proviso that when it is a saturated ring, b is 1,



is a 5 or 6-membered saturated, partially unsaturated or unsaturated quaternized heterocyclic ring,

with the proviso that when it is a saturated ring, b is 1, and

b is 0 or 1

each p is independently 1, 2, 3 or 4,

each q is independently 1, 2, 3, 4, 5 or 6, and

each t is independently 0 or 1,

wherein each $A^{\ominus}$ is independently a non-chromophoric anion, and

each halo is independently fluoro, chloro, bromo or iodo,

with the proviso that Ka contains 1 to 4 Z_1 groups and each hydroxy substituent on an alkyl group, alkylene radical or alkenylene radical attached to a nitrogen atom is attached to a carbon atom other than a carbon atom directly attached to the nitrogen atom, or a mixture thereof.

4,820,807

TUBULAR REACTOR METHOD FOR CONDUCTING HETEROGENEOUS REACTIONS

Vladimir Arnold, and Bernhard Rumo, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 922,975, Oct. 24, 1986, Pat. No. 4,737,349. This application Jan. 11, 1988, Ser. No. 142,166

Claims priority, application Switzerland, Nov. 1, 1985, 4834/85; Jul. 16, 1986, 2831/86

Int. Cl.[4] **C07C** *107/06, 113/04;* **C09B** *29/01*

U.S. Cl. 534—565 **7 Claims**

1. The method of using a tubular reactor comprising a reactor tube having two open tube ends, closure means for each of said tube ends, inlet means at one of said tube ends, for the substances to be processed, at least one outlet at the other tube end, for the product to be obtained, inset means in the reactor tube being axially displaceable therein, and drive means for an axial to-and-fro displacement of said inset means relative to to reactor tube, said inset means consisting essentially of a piston having a longitudinal piston axis, a piston skirt and, in said piston skirt, circumferential grooves whose depth t is less than about half the maximal radius of the piston taken in a plane radially to said piston axis, for continuously performing a heterogeneous reaction, which method comprises

(a) introducing simultaneously and continuously into a lower end of said reactor tube, at least one suspension in a reaction medium, each such suspension being introduced containing a reaction participant being insoluble in the reaction medium, and at least one solution, each such solution containing a reaction participant being soluble in the reaction medium;

(b) effecting periodic linear up-and-down movements of said piston in said reactor tube thereby thoroughly mixing and conveying upwardly through said reactor tube said at least one suspension and said at least one solution, while avoiding any substantial re-mixing of volume units having different sojourn times in said reaction tube; and

(c) removing the resulting mixture containing the reaction product from the upper end of said reaction tube.

4,820,808

COPPER COMPLEXES OF DISAZO COMPOUNDS HAVING TWO SUBSTITUTED 2-HYDROXYPHENYL DIAZO COMPONENT RADICALS AND TWO 3-METHYLPYRAZOL-5-ONE COUPLING COMPONENT RADICALS

Kurt Brenneisen, Grenzach, and Friedrich Lehr, Efringen Kirchen, both of Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

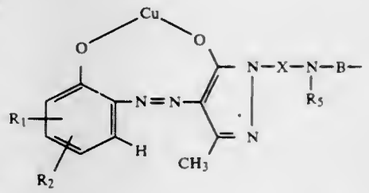
Filed Nov. 5, 1986, Ser. No. 927,555

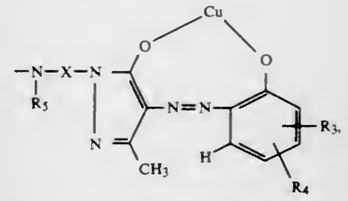
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539462

Int. Cl.[4] **C09B** *45/28, 62/095;* **D06P** *1/38, 1/382*

U.S. Cl. 534—624 **19 Claims**

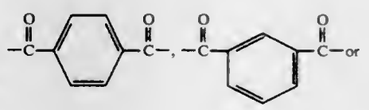
1. A complex of the formula

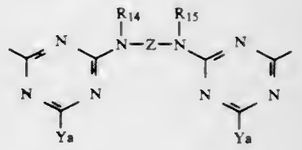




or a salt thereof each cation of which is independently a non-chromophoric cation,

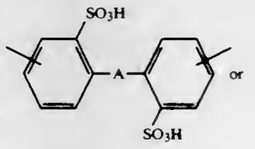
wherein B is



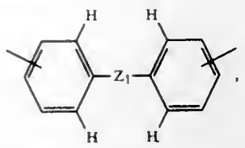


wherein each of R_{14} and R_{15} is independently hydrogen or C_{1-4}alkyl, and

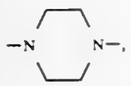
Z is linear or branched C_{2-6}alkylene; linear or branched C_{3-6}alkylene monosubstituted by hydroxy; C_{5-6}cycloalkylene; C_{5-6}cycloalkylene substituted by 1 to 3 C_{1-4}alkyl groups; phenylene; phenylene substituted by 1 or 2 substituents selected from halo, C_{1-4}alkyl, C_{1-4}alkoxy, sulfo and carboxy;



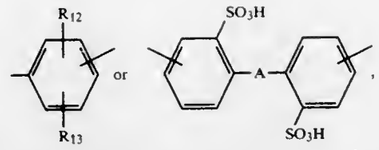
-continued



wherein A is —CH=CH— or —CH_2CH_2—, and
Z_1 is —NHCONH— or —NHCO—, or
—NR_{14}—Z—NR_{15}— is



and
each Ya is independently chloro; hydroxy; methoxy; amino; C_{1-4}alkylamino; N,N—di(C_{1-4}alkyl)amino; C_{2-4}hydroxyalkylamino; methoxy(C_{2-4}alkyl)amino; amino(C_{2-4}alkyl-)amino; sulfo(C_{1-4}alkyl)amino; C_{3-4}dihydroxyalkylamino; N,N—di—(C_{2-4}hydroxyalkyl)amino; phenylamino; phenylamino the phenyl group of which is substituted by 1 or 2 substituents selected from chloro, methyl, methoxy, acetamido, sulfo, carboxy and 2-sulfatoethylsulfonyl; piperidino or morpholino,
each of R_1, R_2, R_3 and R_4 is independently hydrogen, halo, nitro, C_{1-4}alkyl, C_{1-4}alkoxy, —NHCO—R_6, —CO—R_7 or —SO_2—R_8,
wherein R_6 is C_{1-4}alkyl or phenyl,
R_7 is hydroxy; —OR_9; C_{1-4}alkyl; phenyl; phenyl substituted by 1 or 2 substituents selected from halo, nitro, C_{1-4}alkyl and C_{1-4}alkoxy; cyclohexyl; cyclohexyl substituted by 1 to 3 C_{1-4}alkyl groups; or —$NR_{10}R_{11}$,
wherein R_9 is C_{1-4}alkyl; phenyl; phenyl substituted by 1 or 2 substituents selected from halo, nitro, C_{1-4}alkyl and C_{1-4}alkoxy; phenyl(C_{1-4}alkyl) or phenyl(C_{1-4}alkyl) the phenyl group of which is substituted by 1 or 2 substituents selected from halo, nitro, C_{1-4}alkyl and C_{1-4}alkoxy,
R_{10} is hydrogen, C_{1-4}alkyl; C_{1-4}alkyl substituted by 1 or 2 substituents selected from hydroxy, C_{1-4}alkoxy, halo and cyano; phenyl; phenyl substituted by 1 or 2 substituents selected from halo, nitro, C_{1-4}alkyl and C_{1-4}alkoxy; cyclohexyl or cyclohexyl substituted by 1 to 3 C_{1-4}alkyl groups, and
R_{11} is hydrogen; C_{1-4}alkyl; C_{1-4}alkyl substituted by 1 or 2 substituents selected from hydroxy, C_{1-4}alkoxy, halo and cyano; cyclohexyl or cyclohexyl substituted by 1 to 3 C_{1-4}alkyl groups, or —$NR_{10}R_{11}$ is morpholino, piperidino, piperazino or pyrrolidino,
R_8 is hydroxy; C_{1-4}alkyl; C_{1-4}alkyl monosubstituted by halo or sulfato; C_{2-4}alkenyl; phenyl; phenyl substituted by 1 or 2 substituents selected from halo, nitro, C_{1-4}alkyl and C_{1-4}alkoxy; cyclohexyl; cyclohexyl substituted by 1 to 3 C_{1-4}alkyl groups; or —$NR_{10}R_{11}$, wherein R_{10} and R_{11} are as defined above,
with the proviso that at least one of R_1, R_2, R_3 and R_4 is —SO_2—R_8,
each R_5 is independently hydrogen, C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by hydroxy, halo or cyano, and
each X is independently



wherein A is —CH=CH— or —CH_2CH_2—,
R_{12} is hydrogen or sulfo, and
R_{13} is hydrogen, halo, C_{1-4}alkyl or C_{1-4}alkoxy,
or a mixture of such complexes each of which is in free acid form or salt form each cation of which is independently a non-chromophoric cation.

4,820,809

HETEROCYCLIC AZO DYES

Udo Bergmann, Darmstadt; Erwin Hahn, Heidelberg, and Guenter Hansen, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

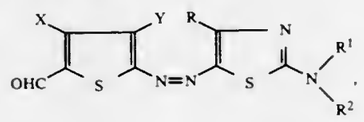
Continuation of Ser. No. 4,826, Jan. 12, 1987, abandoned, which is a continuation of Ser. No. 758,450, Jul. 24, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,648

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427201

Int. Cl.[4] **C09B** *29/36*

U.S. Cl. 534—765 **8 Claims**

I. A compound of the formula I



I

where X is hydrogen, nitro or unsubstituted or substituted alkyl, alkenyl, cycloalkyl, aryl or hetaryl, Y is cyano, nitro, alkanoyl, aroyl, alkylsulfonyl, arylsulfonyl, carboxyl, a carboxylic ester group or unsubstituted or substituted carbamyl, R is unsubstituted or substituted alkyl or aryl, R^1 is hydrogen or R^2, and R^2 is unsubstituted or substituted alkyl, alkenyl, cycloalkyl, aralkyl or aryl.

4,820,810

UREA CATALYST FOR PREPARATION OF SUCROSE POLYOLS USEFUL FOR RIGID POLYURETHANE FOAMS

Howard P. Klein, and Michael E. Brennan, both of Austin, Tex., assignors to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed Oct. 30, 1986, Ser. No. 924,660

Int. Cl.[4] **C08G** *18/14, 65/26*

U.S. Cl. 536—4.1 **20 Claims**

1. A polyol having reduced color prepared by a process comprising reacting a polyhydric initiator or mixtures thereof with one or more alkylene oxides in the presence of a catalytically effective amount of urea such that the mole ratio of urea to the polyhydric initiator is from about 0.1:1 to about 10:1.

2. The polyol having reduced color prepared by a process comprising reacting a polyhydric initiator or mixtures thereof with one or more alkylene oxides in the presence of a catalytically effective amount of urea such that the mole ratio of urea to the polyhydric initiator is from about 0.1:1 to about 10:1, wherein the polyhydric initiator is selected from the group consisting of ethylene glycol, polyethylene glycol, propylene glycol, polypropylene glycol, glycerine, sorbitol, trimethylolpropane, sucrose, alpha-methylglucoside and pentaerythritol.

4,820,811

AMINE REACTED THERAPEUTIC AGENTS

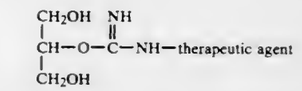
Lin-nar L. Teng, Bothell, Wash., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 804,214, Dec. 3, 1985, Pat. No. 4,654,327, which is a division of Ser. No. 720,664, Apr. 8, 1985, Pat. No. 4,604,376, which is a continuation-in-part of Ser. No. 370,155, Apr. 21, 1982, Pat. No. 4,510,135, which is a continuation-in-part of Ser. No. 452,493, Dec. 23, 1982, Pat. No. 4,582,820. This application Dec. 4, 1986, Ser. No. 937,665

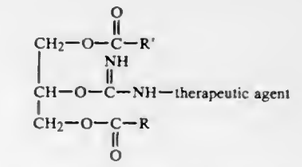
Int. Cl.[4] **C08B** *37/10;* **C07K** *5/00*

U.S. Cl. 536—21 **1 Claim**

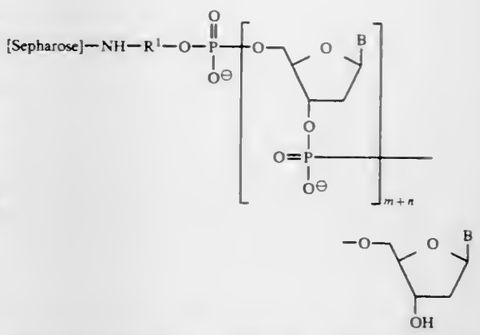
1. A compound selected from the group consisting of



where the therapeutic agent is heparin, a biologically active peptide or protein or a protein antineoplastic agent possessing amine functionality; and



where R and R′ are the same or different and are saturated or unsaturated aliphatic containing at least 10 carbon atoms; and the therapeutic agent has the meanings given above.



wherein B is a base residue comprising a nucleoside selected from the group consisting of adenine, guanine, cytosine and thymine;
R_t is a straight or branched divalent hydrocarbon group having 2 to 20 carbon atoms;
m is an integer from 0 to 6;
n is an integer from 0 to 40;
m+n is an integer from 1 to 46; and wherein each B in the formula is the same or different from the other.

4,820,812

OLIGONUCLEOTIDE DERIVATIVES AND PRODUCTION THEREOF

Kenichi Miyoshi, and Toru Fuwa, both of Hiroshima, Japan, assignors to Wakunaga Seiyaku Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 790,658, Oct. 24, 1985, Pat. No. 4,667,025. This application Feb. 20, 1987, Ser. No. 16,889

Int. Cl.[4] **C07H** *21/04*

U.S. Cl. 536—27 **4 Claims**



1. An immobilized oligodeoxyribonucleotide represented by the formula:

4,820,813

GRINDING PROCESS FOR HIGH VISCOSITY CELLULOSE ETHERS

Gary J. Schulz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 858,421, May 1, 1986, abandoned. This application Feb. 12, 1988, Ser. No. 155,399

Int. Cl.[4] **B27J** *7/00, 11/00;* **C01B** *1/00*

U.S. Cl. 536—84 **12 Claims**

1. A process of reducing the particle size of a high molecular weight, a high viscosity cellulose ether without substantial change in viscosity, which process comprises grinding a substantially dry, high molecular weight cellulose ether in a high speed air swept impact mill, wherein prior to grinding, the cellulose ether has a viscosity greater than about 100,000 cps at 20° C.

4,820,814

PROCESS FOR PRODUCING COLORLESS BUTYLOLIGOGLYCOSIDES

Harald Lueders, Recklinghausen, Fed. Rep. of Germany, assignor to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 21, 1987, Ser. No. 40,601

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624863

Int. Cl.[4] **C07H** *1/06, 15/04, 15/00;* **C07G** *3/00*

U.S. Cl. 536—127 **13 Claims**

1. A process for producing colorless or light colored butylglycosides or butyloligoglycosides from a crude butylglycoside or butyloligoglycoside reaction product containing colored impurities, comprising the steps of:
adjusting the acid number of said crude reaction product to 0–12 mg KOH/g by adding an acid or base to said reaction product;
extracting said adjusted reaction produve with water to produce a water extract containing said butylglycosides or butyloligoglycosides and a residual crude produce containing the colored impurities; and
isolating said butylglycoside or butyloligoglycoside from said water extract.

VOL 1101 ISS 2 AP 11 1989 UMI

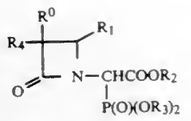
4,820,815

AZETIDINONE N-PHOSPHONOMETHYL ESTERS

Marvin J. Miller, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Filed Sep. 1, 1987, Ser. No. 91,804
Int. Cl.[4] C07F *9/65*
U.S. Cl. 540—200 17 Claims

1. A compound of the formula



wherein

R_4 is hydrogen, amino or protected amino;

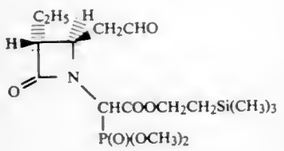
R^0 is hydrogen when R_4 is protected amino or amino, or C_1–C_4 alkyl when R_4 is hydrogen;

R_1 is hydrogen, methyl, a group $—(CH_2)_nY$ wherein Y is hydroxy, protected hydroxy, hydroxymethyl, protected hydroxymethyl, halogen, carboxy or protected carboxy; n is 1 or 2; or R_1 is a thioester group $—(CH_2)_{1-2}C(O—SR_1'$ wherein R_1' is $C_1—C_4$ alkyl or $C_1—C_4$ alkyl substituted by amino, acetylamino, C_1–C_4 alkylamino or di-(C_1–C_4 alkyl-)amino;

R_2 is hydrogen or a carboxy-protecting group;

R_3 is C_1–C_4 alkyl, phenyl or benzyl, or phenyl or benzyl mono-substituted by C_1–C_4 alkyl, halogen or C_1–C_4 alkoxy; and when R_2 is hydrogen, the base addition salts thereof, and when R_4 is amino, the acid addition salts thereof.

9. The compound of the formula



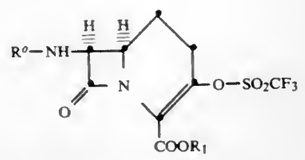
4,820,816

3-TRIFUOROMETHYLSULFONYLOXY-SUBSTITUTED 1-CARBACEPHALOSPORINS AS INTERMEDIATES FOR ANTIBIOTICS

David A. Evans, Concord, and Eric B. Sjogren, Arlington, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Division of Ser. No. 18,668, Feb. 25, 1987, Pat. No. 4,778,884, which is a division of Ser. No. 761,647, Aug. 2, 1985, Pat. No. 4,643,737. This application Aug. 17, 1988, Ser. No. 233,088
Int. Cl.[4] C07D *221/02*
U.S. Cl. 540—205 5 Claims

1. The compound of the formula



wherein R^* is hydrogen or a conventional amino-protecting group and R_1 is a carboxy-protecting group.

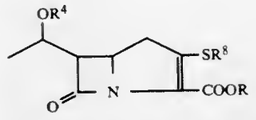
4,820,817

PROCESS FOR PREPARING 3-SUBSTITUTED-6-SUBSTITUTED-7-OXO-1-AZABICYCL(3.2.0)-HEPT-2-ENE-2-CARBOXYLIC ACID

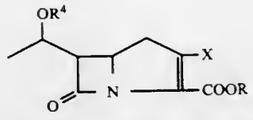
Burton G. Christensen, Scotch Plains, and Ronald W. Ratcliffe, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 649,047, Sep. 10, 1984, abandoned, which is a continuation of Ser. No. 209,172, Nov. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 143,658, Apr. 25, 1980, abandoned, which is a continuation of Ser. No. 052,643, Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 843,479, Oct. 19, 1977, abandoned. This application Oct. 15, 1985, Ser. No. 787,018
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[4] C07D *484/04;* A61K *31/40*
U.S. Cl. 540—350 3 Claims

1. A process for preparing a compound having the structure:



and the pharmaceutically acceptable salts thereof wherein R^4 is hydrogen, acyl or lower alkyl having 1–6 carbon atoms; R is H; pharmaceutically acceptable salt cation; or a pharmaceutically acceptable ester moiety; and R^8 is selected from the group consisting of hydrogen, substituted and unsubstituted: alkyl, alkenyl, and alkynyl, having from 1–10 carbon atoms; cycloalkyl, cycloalkylalkyl, and alkylcycloalkyl, having 3–6 carbon atoms in the cycloalkyl ring and 1–6 carbon atoms in the alkyl moieties; phenyl, aralkyl, aralkenyl, and aralkynyl wherein the aryl moiety is phenyl and the linear chain has 1–6 carbon atoms; heteroaryl, heteroaralkyl, heterocyclyl and heterocyclylalkyl wherein the substituent or substituents relative to the above-named R^8 radicals are selected from the group consisting of: amino, mono-, di- and trialkylamino, hydroxyl, alkoxyl, mercapto, alkylthio, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano and carboxy; and wherein the hetero atom or atoms in the above-named heterocyclic moieties are selected from the group consisting of 1–4 oxygen, nitrogen or sulphur atoms; and wherein the alkyl moieties of the above-recited substituents have 1–6 carbon atoms; comprising reacting:



with a reagent, HSR^8, calculated to provide the substituent $—SR^8$, wherein X is a leaving group.

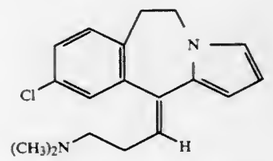
4,820,818

PROCESS FOR THE GEOMETRIC STEREOSELECTIVE DEHYDRATION OF 3-(9-CHLORO-5,6-DIHYDRO-11H-11-HYDROXY-PYRROLO-(2,1-B)(3)-BENZAZEPIN-11-YL)-N,N-DIMETHYL-1-PROPANAMINE

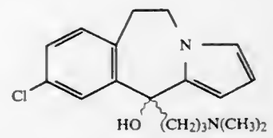
Ruth V. Wattley, Edison, and Gerard R. Kieczykowski, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 2, 1988, Ser. No. 189,009
Int. Cl.[4] C07D *487/04*
U.S. Cl. 540—586 3 Claims

1. In a process for the preparation of the compound of structural formula:



which comprises the treatment of a compound of structural formula:



with an acid or acid precursor in the presence of a tertiary amine in a halocarbon solvent at about 0° to 100° C., wherein the improvement comprises conducting the reaction at −90° to −50° C.

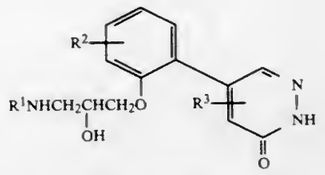
4,820,819

5-PHENYL-3[2H]-PYRIDAZINONE DERIVATIVES

Anthony M. Roe, Hatfield; William J. Coates, Welwyn Garden City; Robert A. Slater, Letchworth, and Stephen P. Breukelman, Bristol, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, United Kingdom

Division of Ser. No. 896,498, Aug. 13, 1986, Pat. No. 4,678,786, which is a continuation of Ser. No. 642,979, Aug. 21, 1984, abandoned. This application Mar. 20, 1987, Ser. No. 28,375
Claims priority, application United Kingdom, Sep. 2, 1983, 8323553
Int. Cl.[4] C07D *237/04, 237/14;* A61K *31/50*
U.S. Cl. 544—239 10 Claims

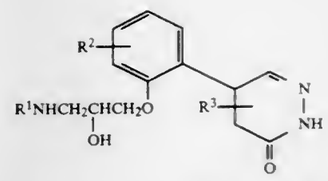
1. A compound of the formula (III):



(III)

or a pharmaceutically acceptable salt thereof wherein R^1 is isopropyl or tertiary-butyl, R^2 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, hydroxy, or amino; and R^3 is hydrogen.

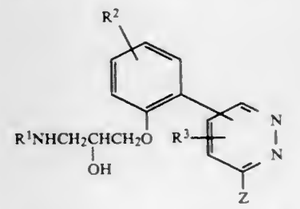
2. A compound of the formula (V):



(V)

wherein R^1 is isopropyl or tertiary-butyl, R^2 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, hydroxy, or amino and R^3 is hydrogen.

3. A compound of the formula (VI):



(VI)

wherein R^1 is isopropyl or tertiary-butyl; R^2 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, hydroxy, or amino and R^3 is hydrogen and Z is C_{1-6}alkoxy, allyloxy or benzyloxy.

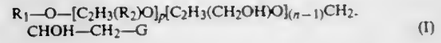
4,820,820

CATIONIC SURFACE-ACTIVE COMPOUNDS

Henri Sebag, Paris, and Guy Vanlerberghe, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 276,817, Jun. 24, 1981, abandoned. This application Sep. 23, 1987, Ser. No. 102,818
Claims priority, application France, Jun. 25, 1980, 80 14148
Int. Cl.[4] C07C *93/04;* C07D *295/08*
U.S. Cl. 544—177 17 Claims

1. A cationic surface-active product of the formula:



(I)

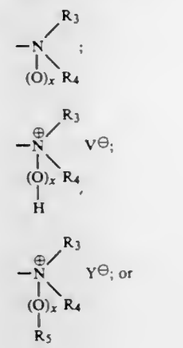
in which R_1 denotes a linear or branched, saturated aliphatic radical containing from 6 to 18 carbon atoms; R_2 is

(1) a linear or branched alkyl radical having from 8 to 20 carbon atoms;

p denotes an integral or decimal number from 1 to 2.5;

n denotes an integral or decimal number from 2 to 20; and

G is chosen from:



(a)

(b)

(c)

-continued

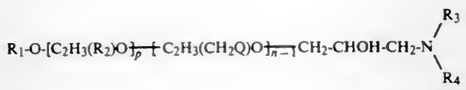
(d)



in which x denotes 0 or 1; R_3 and R_4 independently denote an alkyl or hydroxyalkyl radical having from 1 to 3 carbon atoms, or alternatively R_3 and R_4 together with the nitrogen atom to which they are attached, form a 5- or 6-membered heterocyclic ring; V^- denotes an anion of a mineral or organic acid; R_5 denotes an alkyl or hydroxyalkyl radical having from 1 to 3 carbon atoms; Y^- denotes an anion; and T^- denotes a methylcarboxylate or propylsulphonate anion.

16. Intermediary products of formula

(VII)



in which

R_1 denotes a linear or branched, saturated aliphatic radical containing from 6 to 18 carbon atoms;

R_2 is: (1) a linear or branched alkyl radical having from 8 to 20 carbon atoms;

p denotes an integral or decimal number from 1 to 2.5;

n denotes an integral or decimal number from 2 to 20;

Q denotes a chlorine or bromine atom; and

R_3 and R_4 independently denote an alkyl or hydroxyalkyl radical having from 1 to 3 carbon atoms, or alternatively R_3 and R_4 together with the nitrogen atom to which they are attached, form a 5- or 6-membered heterocyclic ring.

4,820,821

NOVEL PYRIDAZINONE-IMINES AND THEIR PHYSIOLOGICALLY TOLERATED ADDITION SALTS WITH ACIDS, THEIR PREPARATION AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Rudolf Kropp, Limburgerhof; Marco Thyes, Ludwigshafen; Rainer Schlecker, Bissersheim; Albrecht Franke, Wachenheim; Franz Reicheneder, Ludwigshafen; Dora I. Reicheneder, Ludwigshafen; August Amann, Ludwigshafen; Hans-Juergen Tescheodorf, Ludwigshafen; Rolf Kretzschmar, Gruenstadt; Martin Traut, Heidelberg, and Josef Gries, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 438,751, Nov. 3, 1982, abandoned. This application Apr. 17, 1987, Ser. No. 39,765

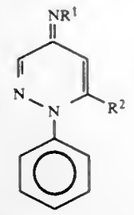
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144138

Int. Cl.[4] C07D *239/06;* **A61K** *31/50*

U.S. Cl. 544—224 **6 Claims**

1. A compound of the formula I

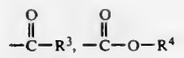
(I)



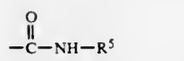
wherein

R^1 is

(d)



or



in which R^3 is alkyl of 1 to 3 carbon atoms, cyclopropyl or allyl, R^4 is alkyl of 1 to 3 carbon atoms or allyl and R^5 is alkyl of 1 to 3 carbon atoms, and

R_2 is hydrogen,

and its addition salts with a physiologically tolerated acid.

4,820,822

NOVEL N-(BICYCLIC HETEROCYCLYL)-4-PIPERIDINAMINES

Frans E. Janssens, Bonheiden; Joseph L. G. Torremans, Beerse; Jozef F. Hens, Nijlen, and Theophilus T. J. M. Van Offenwert, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica, Beerse, Belgium

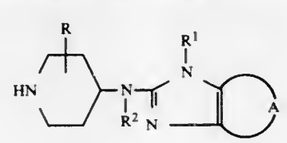
Continuation of Ser. No. 800,587, Nov. 21, 1985, Pat. No. 4,760,074, which is a division of Ser. No. 487,774, Apr. 22, 1983, Pat. No. 4,556,660, which is a continuation-in-part of Ser. No. 397,626, Jul. 12, 1982, abandoned. This application Nov. 2, 1987, Ser. No. 115,272

Int. Cl.[4] C07D *401/14*

U.S. Cl. 546—118 **9 Claims**

1. A piperidine of the following formula (III-a):

(III-a)



wherein

A is a bivalent radical having the formula

—CH=CH—CH=CH— (a)

—N=CH—CH=CH— (b)

—CH=N—CH=CH— (c)

—CH=CH—N=CH— (d) or

—CH=CH—CH=N— (e),

wherein one or two hydrogen atoms in said radicals (a)–(e) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is lower alkyl substituted with methyl substituted furanyl;

R^2 is a member selected from the group consisting of hydrogen, lower alkyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, —CO— and Ar^2-lower alkyl;

and wherein Ar^2 is a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)—CO.

4,820,823

PROCESS OF PRODUCING α-KETO ACIDS

Masato Tanaka, Yatabe; Toshiaki Kobayashi, and Toshiyasu Sakakura, both of Sakura, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan

Filed Feb. 21, 1986, Ser. No. 831,538

Claims priority, application Japan, Feb. 27, 1985, 60-38297

Int. Cl.[4] C07C *51/10*

U.S. Cl. 548—200 **11 Claims**

1. A process of producing an α-keto acid having the general formula

RCOCOOH

wherein R is selected from the group consisting of substituted or unsubstituted aryl, alkenyl and heterocyclic groups, which comprises reacting an organic halogenide having the general formula RX wherein R has the same meaning as above and X is a halogen atom, with carbon monoxide at a partial pressure of at least 10 atmospheres and water in the presence of basic compound and a palladium containing catalyst, in accordance with the equation:

$$RX + CO + H_2O \rightarrow RCOCOOH + HX.$$

4,820,824

MITOMAYCIN COMPOUNDS

Motomichi Kono, Tokyo; Masaji Kasai, Kanagawa; Yutaka Saito, Tokyo; Makoto Morimoto, and Tadashi Ashizawa, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

Filed Aug. 19, 1987, Ser. No. 87,128

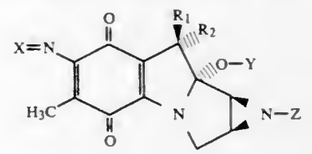
Claims priority, application Japan, Aug. 26, 1986, 61-199519

Int. Cl.[4] C07D *487/14;* **A61K** *31/40*

U.S. Cl. 548—422 **6 Claims**

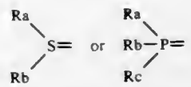
1. Mitomycin compounds represented by the formula:

(I)



wherein

X is



(wherein Ra, Rb and Rc each independently represent lower alkyl, cycloalkyl having 3–7 carbon atoms or phenyl; or Ra and Rb are bonded together to form a poly-methylene group having 2–5 carbon atoms);

one of R_1 and R_2 represents carbamoyloxymethyl and the other represents hydrogen; or R_1 and R_2 may together form an exocyclic methylene group;

and Y and Z each independently represents hydrogen or methyl.

4,820,825

METHOD FOR PURIFYING TRYPTOPHAN

Masaru Ootani; Masami Kojima, and Toshio Kitahara, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 143,847

Claims priority, application Japan, Jan. 14, 1987, 62-7003

Int. Cl.[4] C07D *209/20*

U.S. Cl. 548—496 **8 Claims**

1. A process for obtaining purified tryptophan from an aqueous solution containing tryptophan and impurities, said process comprising:

treating an aqueous solution containing tryptophan and impurities at a pH in the range of from 1 to 4, with activated carbon and a non-polar highly porous resin;

neutralizing the treated solution with an alkaline substance; and

crystallizing the tryptophan from said solution in the presence of a C_{1-6} aliphatic alcohol or a C_{3-9} aliphatic ketone.

4,820,826

METHOD OF SYNTHESIZING FORSKOLIN FROM 9-DEOXYFORSKOLIN

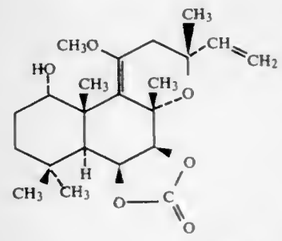
Nicholas J. Hrib, Somerville, N.J., assignor to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 846,550, Mar. 31, 1986, Pat. No. 4,734,513. This application Jan. 25, 1988, Ser. No. 147,476

Int. Cl.[4] C07D *493/06*

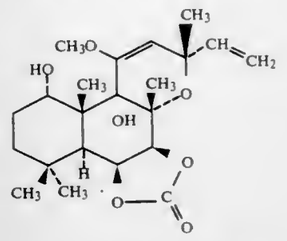
U.S. Cl. 549—229 **2 Claims**

1. The compound having the formula



which is 9,11-dehydro-8,13-epoxy-11-methoxy-1α6β, 7β-trihydroxylabd-14-ene-6,7-carbonate.

2. The compound having the formula



which is 11,12-dehydro-8,13-epoxy-11-methoxy-1α,6β,7β,9α-tetrahydrolabd-14-ene-6,7-carbonate.

4,820,827

2,3-DIARYL-5-BROMOTHIOPHENE COMPOUNDS OF USE FOR THE TREATMENT OF INFLAMMATON AND DYSMENORRHEA

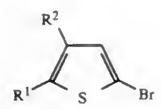
Stephen B. Haber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 570,450, Jan. 17, 1984, Pat. No. 4,590,205, which is a continuation of Ser. No. 354,300, Mar. 3, 1982, abandoned. This application Feb. 10, 1984, Ser. No. 577,650

Int. Cl.⁴ C07D *333/16, 333/08*

U.S. Cl. 549—78 **5 Claims**

1. A compound of the formula:



(I)

wherein

R^1 is 4-fluorophenyl, 4-methylthiophenyl, or 4-methylsulfonylphenyl; and

R^2 is 4-fluorophenyl, 4-methylthiophenyl, or 4-methylsulfonylphenyl;

with the proviso that there must be one, and only one, 4-fluorophenyl substituent selected for R^1 and R^2.

4,820,828

CINNAMOHYDROXAMIC ACIDS

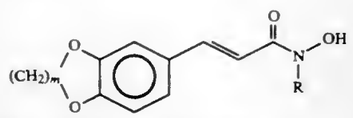
James P. Demers, New York, N.Y.; William V. Murray, Belle Mead, and Richard B. Sulsky, Somerville, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Mar. 4, 1987, Ser. No. 21,819

Int. Cl.⁴ C07D *319/18, 317/52*

U.S. Cl. 549—362 **2 Claims**

1. A compound of the formula



wherein R, is hydrogen; C_1–C_6-lower alkyl; or C_3–C_6-cycloalkyl; and m is 1 or 2.

4,820,829

SUBSTITUTED O-PHTHALALDEHYDES

Alfred Steinmann, Villars-sur-Glâne, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

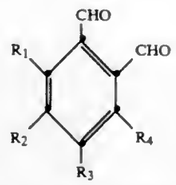
Filed Jan. 8, 1987, Ser. No. 1,309

Claims priority, application Switzerland, Jan. 16, 1986, 146/86

Int. Cl.⁴ C07F *7/02, 7/22, 7/30*

U.S. Cl. 556—87 **10 Claims**

1. A substituted o-phthalaldehyde of formula



(I)

wherein at least one of the substituents R_1, R_2, R_3, R_4 is $Q(C_1$–C_{12}-alkyl$)_3$, $—CH_2—Q(C_1$–C_{12}-alkyl$)_3$, $—O—Q(C_1$–C_{12}-alkyl$)_3$, $—Q$(aryl$)_3$ or $—Q(C_1$–C_4-alkylene-aryl$)_3$, wherein Q is Si, Sn or Ge, the aryl groups being phenyl, naphthyl or halogen- or nitro-substituted phenyl or naphthyl, and each of the remaining substituents R_1 and R_4 is a hydrogen or halogen atom or a cyano, nitro, carboxyl or hydroxyl group, a C_1–C_4alkoxy, C_1–C_4alkylthio or an alkoxycarbonyl group with 1 to 4 carbon atoms in the alkoxy moiety.

4,820,830

CERTAIN HYDROXYALKYL CARBAMATES, POLYMERS AND USES THEREOF

Werner J. Blank, Wilton, Conn., assignor to King Industries, Inc., Norwalk, Conn.

Filed Mar. 2, 1987, Ser. No. 20,431

Int. Cl.⁴ C07C *125/06*

U.S. Cl. 560—158 **6 Claims**

1. A hydroxyalkyl carbamate compound produced by reacting a cyclic carbonate with a diamine with the following structural formula:

$$H_2N—(—A)—NH_2$$

wherein A is a branched alkylene moiety having from 6 to 18 carbon atoms.

4,820,831

PROCESS FOR PREPARING 4,4'-DIHYDROXYDIPHENYL SULFONE HAVING HIGH PURITY

Eiji Ogata; Koji Ono, both of Wakayama, and Nobuyuki Nate, Kainan, all of Japan, assignors to Konishi Chemical Industry Co., Ltd., Wakayama, Japan

PCT No. PCT/JP86/00194, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/06370, PCT Pub. Date Nov. 6, 1986

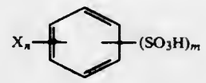
PCT Filed Apr. 17, 1986, Ser. No. 10,095

Claims priority, application Japan, Apr. 19, 1985, 60-84875

Int. Cl.⁴ C07C *147/10*

U.S. Cl. 568—33 **6 Claims**

1. In a process for preparing 4,'-dihydroxydiphenyl sulfone by condensation of phenolsulfonic acid and phenol, wherein the condensation is effected by heating in an inert, non-aqueous solvent while removing the water of dehydration by azeotropic distillation, followed by heating at a temperature between 100° and 200° C. for a period of at least three hours while slowly removing solvent by distillation, to isomerize 2,4'-dihydroxydiphenyl sulfone to 4,4'-dihydroxydiphenyl sulfone, the improvement comprising adding an aromatic sulfonic acid represented by the formula:



wherein X is a halogen atom, n is 0, 1 or 2, and m is 1 or 2, in an isomerization catalyst amount.

4,820,832

PROCESS FOR PREPARING 3-UNSUBSTITUTED CEPHALOSPORINS AND 1-CARBA(DETHIA)CEPHALOSPORINS

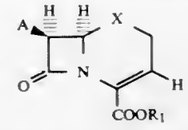
Gwendolyn K. Cook, and John H. McDonald, III, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 23, 1988, Ser. No. 172,099

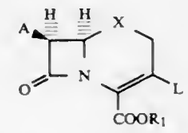
Int. Cl.⁴ C07D *501/04*

U.S. Cl. 540—205 **13 Claims**

1. A process for preparing a compound of the formula



wherein A is a protected amino group or an acylamino group R(CO)NH; X is sulfur or $—CH_2—$; and R_1 is a carboxy-protecting group; which comprises reacting a 3-cephem ester of the formula



wherein A, X and R_1 have the same meanings as defined above, L is trifluoromethanesulfonyloxy, methanesulfonyloxy, p-toluenesulfonyloxy, chloro, bromo or iodo in an inert solvent in the presence of palladium (O) with tetra-(C_2–C_6 alkyl) stannane and in the presence of an alkli metal halide when L is trifluoromethanesulfonyloxy, methanesulfonyloxy or p-toluenesulfonyloxy.

4,820,833

PREPARATION OF A HIGHLY PURE, SUBSTANTIALLY AMORPHOUS FORM OF CEFUROXIME AXETIL

Harold A. Crisp, Harrow Weald; John C. Clayton, Fastcote; Leonard G. Elliott, Great Urswick, and Edward M. Wilson, St. John's Close, all of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 781,505, Sep. 30, 1985, abandoned, which is a continuation of Ser. No. 711,559, Mar. 14, 1985, abandoned, which is a continuation of Ser. No. 635,797, Jul. 30, 1984, abandoned, which is a continuation of Ser. No. 518,671, Jul. 29, 1983, abandoned. This application Dec. 4, 1986, Ser. No. 938,140

Claims priority, application United Kingdom, Jul. 30, 1982, 8222019

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.⁴ A61K *31/545;* C07D *501/24*

U.S Cl. 540—220 **5 Claims**

1. A process for preparing a highly pure, substantially amorphous form of cefuroxime axetil which comprises preparing a highly pure solution of cefuroxime axetil and spray drying said solution to recover highly pure, substantially amorphous cefuroxine axetil.

4,820,834

BENZODIAZEPINE ANALOGS

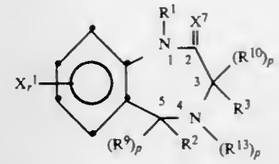
Ben E. Evans, Lansdale; Roger M. Freidinger, and Mark G. Bock, both of Hatfield, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 741,972, Jun. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 705,272, Feb. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 624,854, Jun. 26, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 26,420

Int. Cl.⁴ C07D *243/24, 243/22, 243/20;* A61K *31/55*

U.S. Cl. 540—504 **13 Claims**

1. A compound of Formula II:

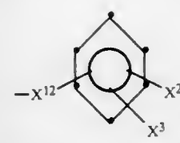


II

wherein

R^1 is H, C_1–C_6 linear or branched alkyl, loweralkenyl, lower alkynyl, $—X^{12}COOR^6$, $—X^{11}$-cycloloweralkyl, $—X^{12}NR^4R^5$, $—X^{12}CONR^4R^5$, $—X^{12}CN$, or $—X^{11}CX_3^{10}$,

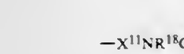
R^2 is H, loweralkyl, substituted or unsubstituted phenyl (wherein the substitutents may be 1 or 2 of halo, loweralkyl, loweralkoxy, loweralkylthio, carboxyl, carboxyloweralkyl, nitro, $—CF^3$, or hydroxy), 2-, 3-, 4-pyridyl,



$—X^{12}SCH_3$, $—X^{12}SOCH_3$, $—X^{12}SO_2CH_3$, or $—X^{12}COOR^6$;

^{3} is

$—X^{11}NR^{18}(CH_2)_qR^{16}$

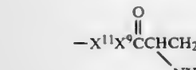


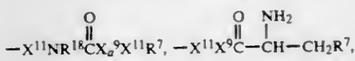
$—X^{11}NR^{18}CX^{11}R^7$

$—NH(CH_2)_{2-3}NHR^7$, $—NH(CH_2)_{2-3}NHCOR^7$,

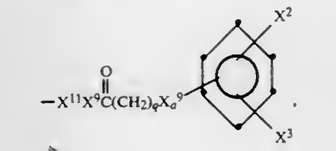


$—X^{11}CX^9X^{11}R^7$,





$—X^{11}NR^{18}CX_a^9X^{11}R^7$, $—X^{11}X^9C—CH—CH_2R^7$,



-continued

with the priviso that R^{10} is not H or $-CH_3$ when R^3 is

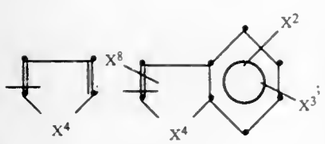
R^4 and R^5 are independently R^6 or in combination with the N of the NR^4R^5 group form an unsubstituted or mono or disubstituted, saturated or unsaturated, 4–7 membered heterocyclic ring, or benzofused ,4–7 membered heterocyclic ring wherein said heterocyclic ring or said benzofused heterocyclic ring may contain a second heteroatom selected from O and NCH_3 and the substituent(s) is/are independently selected from C_1-C_4alkyl;

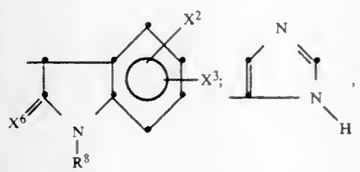
R^6 is H, loweralkyl, cycloloweralkyl, substituted or unsubstituted phenyl, or substituted or unsubstituted phenylloweralkyl wherein the phenyl or phenylloweralkyl substituents may be 1 or 2 of halo, loweralkyl, loweralkoxy, nitro, or CF_3;

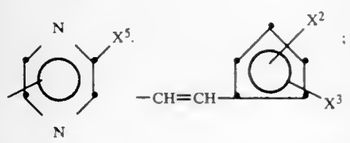
R^7 is α- or β-naphthyl, substituted or unsubstituted phenyl (wherein the substituents may be independently 1 to 2 of halo, $-NO_2$, $-OH$,$-X^{11}NR^4R^5$, loweralkyl, CF_3, CN, SCF_3, $C{\equiv}CH$, CH_2SCF_3,

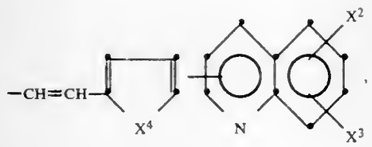


$OCHF_2$, SH, SPh, PO_3H, loweralkoxy, loweralkylthio or COOH), 2-, 3-, 4- pyridyl,

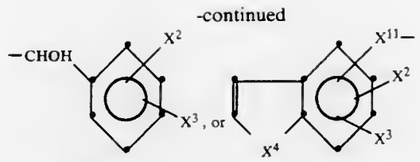




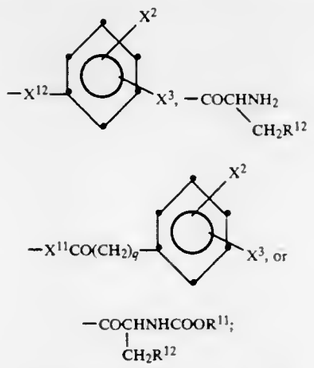




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R^8 is H, loweralkyl, cycloloweralkyl, $-X^{12}CONH_2$, $-X^{12}COOR^6$, $-X^{12}$-cycloloweralkyl, $-X^{12}NR^4R^5$,



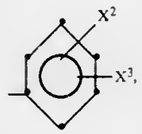
R^9 and R^{10} are independently H, —OH, or $-CH_3$;

R^{11} and R^{12} are independently loweralkyl or cycloloweralkyl;

R^{13} is H, loweralkyl, acyl, O, or cycloloweralkyl;

R^{14} is loweralkyl or phenylloweralkyl;

R^{15} is H, loweralkyl,



or $-NH_2$;

R^{16} alpha or beta naphthyl or 2-indolyl;

R^{18} is H or loweralkyl;

p is 0 when its adjacent ═ is unsaturated and 1 when its adjacent ═ is saturated except that when R^{13} is O, p=1 and --- is unsaturated;

q is 0–4;

r is 1 or 2;

X^1 is H, $-NO_2$, CF_3 CN, OH, loweralkyl, halo, loweralkylthio, loweralkoxy, $-X^{11}COOR^6$, or $-X^{11}NR^4R^5$,

X^2 and X^3 are independently H, —OH,$-NO_2$, halo, loweralkylthio, loweralkyl, or loweralkoxy;

X^4 is S, O, CH_2, or NR^8;

X^5 is H, CF_3, CN, $-COOR^6$, NO_2, or halo;

X^6 is O or HH;

X^7 is O, S, HH, or NR^{15} with the proviso that X^7 can be NR^{15} only when R^1 is not H;

X^8 is H, loweralkyl;

X^9 and X_a^9 are independently NR^{18} or O;

X^{10} is F, Cl, or Br;

X^{11} is absent or C_{1-4} linear or branched alkylidene;

X^{12} is C_{1-4} linear or branched alkylidene;

--- is a saturated or unsaturated bond;

with the proviso that when X_r^1 is Cl in the seven position, R^1 is H and R^2 is unsubstituted phenyl, then R^3 is not

$NHCO(CH_2)_2C_6H_5$ or $NHCOC_6H_5$ or pharmaceutically acceptable salt thereof.

4,820,835

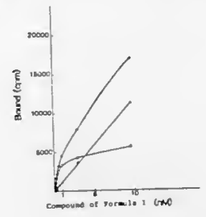
RADIOLABELED BENZAZEPINE

Walter Burger, Midland Park; Arnold A. Liebman, Verona, both of N.J., and Clark W. Perry, Danbury, Conn., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 30, 1986, Ser. No. 880,228

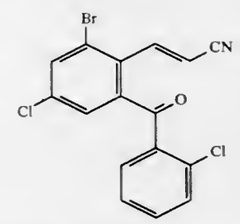
Int. Cl.[4] C07D *121/70, 487/04, 207/34*

U.S. Cl. 540—577 **5 Claims**

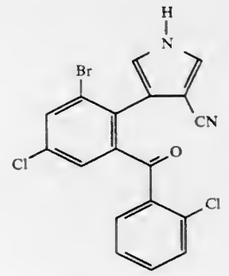




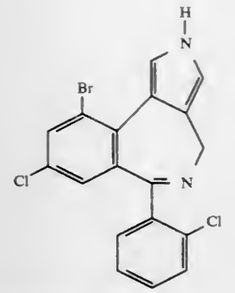
1. A compound of the formula



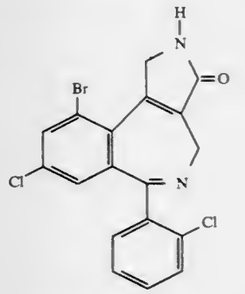
2. A compound of the formula



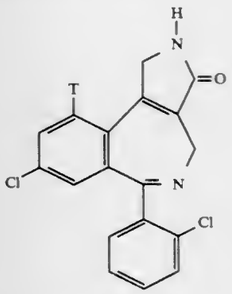
3. A compound of the formula



4. A compound of the formula



5. A compound of the formula



wherein T is a tritium atom.

4,820,836

PROSTACYCLIN (PGI_2) ANALOGUES

Sachio Mori; Hikozo Iwakura, and Shozo Takechi, all of Hyogo, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Mar. 13, 1987, Ser. No. 25,807

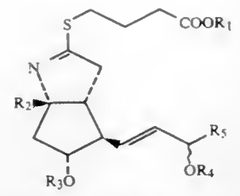
Claims priority, application Japan, Mar. 31, 1986, 61-74932

Int. Cl.[4] C07D *209/52*

U.S. Cl. 548—512 **20 Claims**

1. A compound represented by the formula:

VOL 1101 ISS 2 AP 11 1989 UMI



wherein R_1 is hydrogen or lower alkyl; R_2 is lower alkynyl, R_3 and R_4 each is hydrogen; R_5 is straight or branched C_1–C_8 alkyl which may be substituted with nitrogen-, oxygen-, or sulfur-containing 5-membered heterocycle, straight or branched C_2–C_8 alkynyl, or C_3–C_8 cycloalkyl; the wavy line indicates an R- or S- configuration, or their mixture; or a salt thereof.

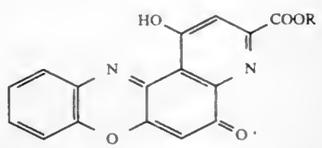
4,820,837

1-HYDROXY-OXO-5H-PYRIDO(3,2-A)PHENOXAZINE-3-CARBOXYLIC ACID ESTERS

Hideo Terayama, Itami, and Jun Inoue, Settsu, both of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jun. 30, 1987, Ser. No. 68,159
Claims priority, application Japan, Jul. 15, 1986, 61-166066
Int. Cl.[4] C07D *498/04*
U.S. Cl. 544—99 5 Claims

1. A compound of the formula



wherein R is. ethyl, propyl, isopropyl, or butyl.

4,820,838

PROCESS FOR THE PREPARATION OF DEPOGEN

Antal Friesz; Zsuzsanna Nad, Both of Budapest; Lajos Nagy, Szentendre, and Tamas Kallay, Budapest, all of Hungary, assignors to Chinoin Gyogyszer- Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Sep. 26, 1986, Ser. No. 912,997
Claims priority, application Hungary, Oct. 3, 1985, 3831/85
Int. Cl.[4] C07D *473/08;* A61K *31/52*
U.S. Cl. 544—268 13 Claims

1. A process for the preparation of pure 1-(3',4'-diethoxybenzyl)-6,7-diethoxy-3,4-dihydroisoquinolinium-theophylline-7-acetate, free of contaminating oxidation products, which comprises the steps of:

(a) preparing in situ a first solution of 1-(3',4'-diethoxybenzyl)-6,7-diethoxy-3,4-dihydroisoquinoline in a first organic solvent and water by adding 1-(3',4'-diethoxybenzyl)-6,7-diethoxy-3,4-dihydroisoquinoline hydrochloride and an alkali to the water and the first organic solvent;
(b) removing water from the first solution formed in step (a);
(c) preparing a second solution containing theophylline-7-acetic acid, water, and a second organic solvent, the molar amount of theophylline-7-acetic acid being about equal to the molar amount of 1-(3',4'-diethoxybenzyl)-6,7-diethoxy-3,4-dihydroisoquinoline hydrochloride used to form the first solution in step (a);
(d) combining the first and second solutions to form a reaction mixture and heating the reaction mixture;
(e) filtering the heated reaction mixture to form a hot filtrate;
(f) cooling the hot filtrate to precipitate crystals of 1-(3',4'-diethoxybenzyl)-6,7-diethoxy-3,4-dihydroisoquinoline-theophylline-7-acetate monohydrate;
(g) separating the precipitated crystals from the reaction mixture; and
(h) dehydrating the precipitated crystals to form the desired product.

4,820,839

NITROGEN-CONTAINING HETEROCYCLIC ESTERS

Joachim Krause, Dieburg; Andreas Wächtler, Griesheim; Volker Reiffenrath, Darmstadt-Eberstadt, all of Fed. Rep. of Germany; Bernhard Scheuble, Yokohama, Japan, and Reinhard Hittich, Modautal, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00293, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/07055, PCT Pub. Date Dec. 4, 1986
PCT Filed May 16, 1986, Ser. No. 9,329
Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518734
Int. Cl.[4] C09K *19/34;* C02F *1/13;* C07D *239/02*
U.S. Cl. 544—316 16 Claims

1. A nitrogen-containing heterocyclic ester of the formula

$$R^1—A^1—Z^1—A^2—R^2$$

wherein

R^1 and R^2 are each independently alkyl of 1 to 12 C-atoms, in which one or two non-adjacent CH_2 groups may be replaced by —O—, —CO—, —O—CO—, O—COO— and/or —CO—O—, and/or which may be monosubstituted by fluorine, chlorine or cyano,

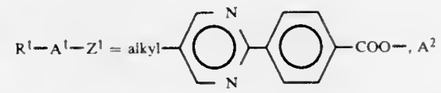
A^1 is —Pyr—Phe— or —Phe—Pyr— wherein —Phe— is 1,4-phenylene optionally substituted by one or two F atoms and —Pyr— is pyrimidine-2,5- or -5,2-diyl,

A^2 and A^3 are each independently trans-1,4-cyclohexylene, or 1,4-phenylene which is unsubstituted or substituted by one or two of F, Cl, Br or CN,

Z^1 is —CO—O— or —O—CO—,

with the provisos that

(1) said ester contains at least one laterally substituted 1,4-phenylene group and
(2) when



is 1,4-phenylene which is laterally substituted by fluorine or is 1,4-phenylene which is substituted in the position ortho to R^2 by Cl, Br or CN.

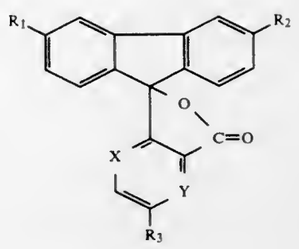
4,820,840

PROCESS FOR PRODUCING FLUORENE COMPOUNDS

Seishi Ikegami, and Satoshi Nakao, both of Osaka, Japan, assignors to Appleton Papers Inc., Appleton, Wis.

Continuation-in-part of Ser. No. 84,590, Aug. 11, 1987, abandoned. This application Jan. 22, 1988, Ser. No. 146,874
Claims priority, application Japan, Jan. 23, 1987, 62-13654
Int. Cl.[4] C07D *211/00, 305/14, 401/00;* C07F *493/00*
U.S. Cl. 546—15 27 Claims

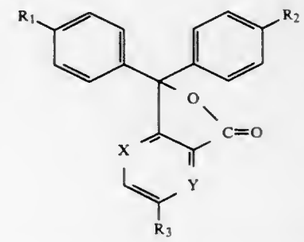
1. A process for the preparation of a fluorene compound represented by the formula (II)



(II)

which comprises:

reacting a lactone compound represented by the formula (I)



(I)

together with a mixture of an aluminum halide, a carbonyl compound selected from the group consisting of urea, N-methylpyrrolidone, formamide, dimethylformamide, sodium formate, sodium acetate an mixtures thereof, and a compound having at least one hydroxyl group, selected from the group consisting of water, inorganic salt hydrates, metal hydroxides and mixtures thereof,

wherein, in formulas (I) and (II), R_1 R_2 and R_3 are independently selected from hydrogen, alkylamino, dialkylamino, pyrrolidino and piperidino,

with the provision that R_1 and R_2 are not hydrogen simultaneously,

X and Y are independently carbon or nitrogen.

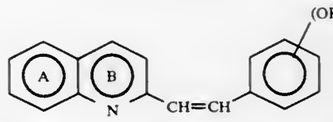
4,820,841

CHROMOGENIC QUINOLINE COMPOUNDS

Hideaki Fujisaki, Kyoto; Kouzou Mizuno, Uji; Yukihiko Sueto, and Katsuhiko Tsunemitsu, both of Kyoto, all of Japan, assignors to Yamada Chemical Co., Ltd., Kyoto, Japan

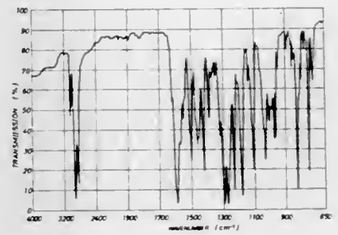
Continuation-in-part of Ser. No. 580,604, Feb. 16, 1984, Pat. No. 4,598,150. This application Aug. 26, 1986, Ser. No. 900,771
Claims priority, application Japan, Feb. 16, 1983, 58-27142
Int. Cl.[4] C07D *215/12, 215/18, 215/20*
U.S. Cl. 546—152 2 Claims

1. A chromogenic compound represented by the formula (I):



(I)

wherein R represents an alkyl group of 6 to 12 carbon atoms or benzyl group, and ring A and ring B in the quinolyl group may be substituted by a chlorine atom, a methyl group or an ethoxy group.



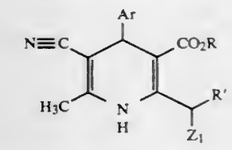
4,820,842

2-SUBSTITUTED-1,4-DIHYDROPYRIDINES

Kevin R. Anderson, Cedar Rapids, Iowa, and Ila Sircar, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 932,751, Nov. 19, 1986, Pat. No. 4,723,014. This application Sep. 11, 1987, Ser. No. 96,109
Int. Cl.[4] C07D *471/02, 413/04, 405/04, 411/04, 453/02, 453/04, 409/04, 417/04*
U.S. Cl. 546—135 7 Claims

1. A compound of the formula (X)



X

and pharmaceutically acceptable salts thereof;

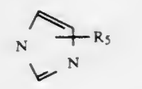
wherein

Ar is aryl or heteroaryl;

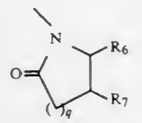
R' is hydrogen, lower alkyl, or aryl;

R is a straight or branched hydrocarbon chain of from two through six carbons; and

Z_1 is

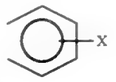


wherein R_5 is lower alkyl, aryl, aralkyl, or heteroaryl; or



wherein q is one or two, and R_6 and R_7 are independently hydrogen, alkyl of from one to four carbons, alkenyl of from two to four carbons, or taken together wherein R_6, R_7 and - - - form

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wherein X is halogen, lower alkyl, trifluoromethyl, nitro, amino, mono- or di-lower alkyl amino, cyano, lower alkoxy, or lower alkylthio.

4,820,843

TETRAZOLE INTERMEDIATES TO ANTIHYPERTENSIVE COMPOUNDS

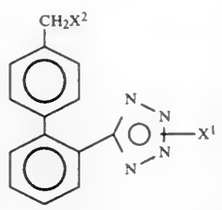
Paul E. Aldrich, Wilmington; John Jonas V. Duncia, Newark, and Michael E. Pierce, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 22, 1987, Ser. No. 53,198

Int. Cl.[4] C07D *257/02, 401/10, 401/14, 403/14, 413/14*

U.S. Cl. 548—252 **10 Claims**

1. A tetrazole having the formula:

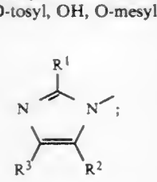


(I)

wherein

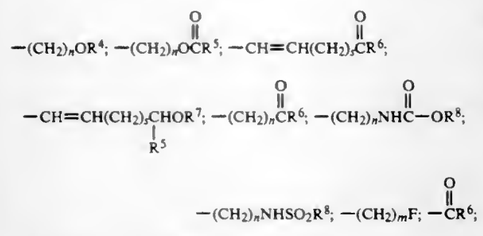
X^1 is H, —C(Phenyl)$_3$, p-nitrobenzyl, or β-propionitrile.

X^2 is H, Cl, Br, I, O-tosyl, OH, O-mesyl, or



R^1 is alkyl of 3–10 carbon atoms, alkenyl of 3 to 10 carbon atoms, alkynyl of 3 to 10 carbon atoms, and benzyl substituted with up to two groups selected from alkoxy of 1 to 4 carbon atoms, halogen, alkyl of 1 to 4 carbon atoms, nitro and amino;

R^2 is phenylalkenyl wherein the aliphatic portion is 2 to 4 carbon atoms, —$(CH_2)_m$—imidazoyl-1-yl, —$(CH_2)_m$—1,2,3-triazolyl optionally substituted with one or two groups selected from CO_2CH_3 and alkyl of 1 to 4 carbon atoms, $(CH_2)_m$-tetrazolyl,



R^3 is H, F, Cl, Br, I, NO_2, CF_3, or CN;

R^4 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

R^5 is H, alkyl or perfluoroalkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

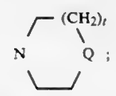
R^6 is H, alkyl of 1–5 carbon atoms, OR^9 or $NR^{10}R^{11}$;

R^7 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, benzyl, acyl of 1 to 4 carbon atoms, phenacyl;

R^8 is alkyl of 1 to 6 carbon atoms or perfluoroalkyl of 1 to 6 carbon atoms, 1-adamantyl, 1-napthyl, 1-(1-napthyl)ethyl, or $(CH_2)_pC_6H_5$;

R^9 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, or phenyl;

R^{10} and R^{11} independently are H, alkyl of 1 to 4 carbon atoms, phenyl, benzyl or taken together to form a ring of the Formula



Q is NR^{12}, O, or CH_2;

R^{12} is H, alkyl of 1 to 4 carbon atoms, or phenyl;

m is 1 to 5;

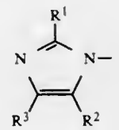
n is 1 to 10;

s is 0 to 5;

p is 0 to 3;

t is 1.

with the proviso that when X^1=H then X^2 cannot be



4,820,844

RADIATION SENSITIZER

Tsutomu Kagiya, Kyoto; Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuki; Ryoji Kimura, Kyoto; Tsuneo Tsubakimoto, Toyonaka; Ryoichi Oshiumi, Ibaraki, and Koichi Sakano, Kyoto, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Tokyo and Kyoto University, Kyoto, both of, Japan

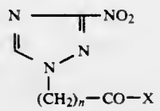
Filed Aug. 12, 1986, Ser. No. 896,135

Claims priority, application Japan, Aug. 15, 1985, 60-178549; Dec. 12, 1985, 60-277975

Int. Cl.[4] C07D *249/08*

U.S. Cl. 548—266 **2 Claims**

1. A radiation sensitizer containing a nitrotriazole compound represented by following formula (I) as an active ingredient:



(I)

wherein, n is one or two, X is —NH—R_1—OH R_1 is alkylene group having two or three carbon atoms.

4,820,845

ALKYLATION OF 3(5)-CYANO-1H-PYRAZOLE-4-CARBOXYLIC ACID ESTERS

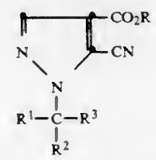
James R. Beck; James A. Aikins, and Eddie V. P. Tao, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 1, 1987, Ser. No. 32,662

Int. Cl.[4] C07D *231/14*

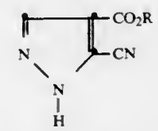
U.S. Cl. 548—378 **18 Claims**

1. A process for preparing 1-tertiary alkyl-5-cyano-1H-pyrazole-4-carboxylic acid esters of the formula



wherein:

R is C_1–C_6 alkyl; R^1 is C_1–C_4 alkyl; and R^2 and R^3 independently are C_1–C_3 alkyl, or when combined with the carbon atom to which they are attached form a C_5–C_6 cycloalkyl; with the proviso that when R^2 and R^3 are independently C_1–C_3 alkyl the total number of carbon atoms contained in R^1, R^2 and R^3 is C_3–C_7, comprising reacting a 3(5)-cyano-1H-pyrazole-4-carboxylic acid ester of the formula



with a C_4–C_8 alkene, or a C_5–C_6 cycloalkene substituted at the 1-position with a C_1–C_4 alkyl group, and a strong acid, in a solvent which has a nitro or nitrile group.

4,820,846

TRIARYLMETHANE COMPOUNDS, THEIR PREPARATION AND USE AS PHOTOCONDUCTIVE SYSTEMS

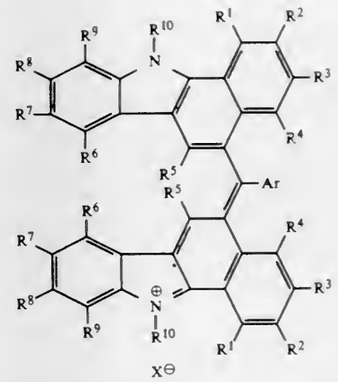
D. E. Brown, Stanstead, and Kenneth Reynolds, Chigwell, both of United Kingdom, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 12, 1983, Ser. No. 531,820

Int. Cl.[4] C07D *209/82*

U.S. Cl. 548—420 **20 Claims**

1. A compound of the general formula:



(I)

in which:

like symbols represent identical substituents,

at least 4 of R^1 to R^9 represent hydrogen atoms and the remaining R^1 to R^9 pairs of groups independently represent:

(i) hydrogen, an alkyl group having from 1 to 18 carbon atoms, a substituted alkyl group, or an aryl or substituted aryl group,

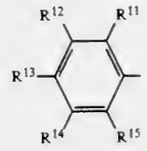
(ii) a halogen atom, a cyano group, a carboxy or alkoxycarbonyl group, a hydroxy group, an alkoxy group, a nitro group or a sulfonic acid group, providing that not more than two such groups (ii) are present in each ring,

(iii) an acylamino group, a secondary acylamino group or a tertiary amino group in which the pendant substituent groups on the nitrogen atom are alkyl, aryl or aralkyl, providing not more than two such groups (iii) may be present in each benzocarbazole ring, and

(iv) any two groups R^1 to R^9 on adjacent carbon atoms in a ring may represent the necessary atoms to complete a fused alicylic, aromatic or heterocyclic ring,

R^{10} represents an alkyl or substituted alkyl group, an aralkyl group, or an aryl or substituted aryl group,

Ar represents a heteroaromatic nucleus containing 5 or 6 members in the ring at least one of which is O, N or S, or an aromatic ring of the formula:



in which:

R^{11} to R^{15} independently represent a hydrogen or halogen atom, an alkyl, substituted alkyl, an aryl or substituted aryl, hydroxy, alkoxy or aryloxy group,

one of R^{11} to R^{15} may additionally represent an aldehyde or acetyl group, or a dialkylamino group,

up to two of R^{11} to R^{15} may additionally represent a cyano, carboxy, alkoxycarbonyl, sulfonic acid or nitro group, and

any two adjacent R^{11} to R^{15} groups may represent the necessary atoms to complete a fused alicyclic, aromatic or heterocyclic ring, and

X represents an anion.

4,820,847

PROCESS FOR THE PREPARATION OF 4-SUBSTITUTED 1-ARYL-5-AMINO-PYRAZOLES

Bernd Gallenkamp, Wuppertal; Heinz-Jürgen Wroblowsky, Langenfeld, and Dietmar Bielefeldt, Ratingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

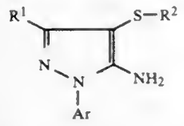
Filed Sep. 3, 1987, Ser. No. 92,747

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631003

Int. Cl.[4] C07D *231/44, 401/04*

U.S. Cl. 548—362 **9 Claims**

1. A process for the preparation of a 4-substituted 1-aryl-5-amino-pyrazole of the formula



in which

R^1 represents hydrogen or alkyl,

R^2 represents alkyl or halogenoalkyl, and

Ar represents polysubstituted phenyl or polysubstituted pyridyl,

wherein a arylhydrazine hydrohalide of the formula

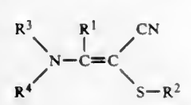
$$Ar—NH—NH_2 \times HHal$$

in which

Hal represents halogen, and

Ar has the abovementioned meaning,

is reacted with an acrylonitrile derivative of the formula



in which

R^1 and R^2 have the abovementioned meaning, and

R^3 and R^4, each independently represent alkyl or phenyl, or

R^3 and R^4, together with the nitrogen atom to which they are bound, represent a saturated heterocyclic ring,

at temperatures between 60° C. and 90° C.

4,820,848

SUBSTITUTED AROMATIC SULFONAMIDES AS ANTIGLAUCOMA AGENTS

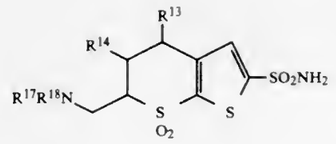
Gerald S. Posticello, and Charles N. Habecker, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 67,333, Jun. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 863,225, May 14, 1986, Pat. No. 4,677,115, which is a continuation-in-part of Ser. No. 777,654, Sep. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 680,684, Dec. 12, 1984, abandoned. This application Apr. 4, 1988, Ser. No. 177,211

Int. Cl.[4] C07D *335/00*

U.S. Cl. 549—23 **3 Claims**

1. A process for preparing a compound of structural formula:



wherein

R^{13} is

(a) hydrogen,

(b) phenyl either unsubstituted or substituted with one or more of

(1) hydroxy,

(2) C_{1-3}alkoxy,

(3) $R^{17}R^{18}N—C_{1-5}$alkyl, wherein R^{17} and R^{18} are independently selected from:

(i) hydrogen or

(ii) C_{1-5}alkyl, or taken together with the nitrogen to which they are attached from a heterocycle selected from morpholine, piperidine, pyrrolidine, and piperazine,

(c) —OH,

(d) =O; or

(e) $—NR^{17}R^{18}$

R^{14} is

(a) hydrogen,

(b) —CN,

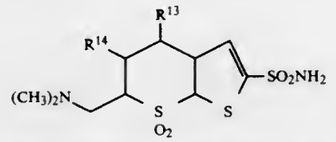
(c) phenyl-C_{1-3}alkyl, wherein the phenyl is either unsubstituted or substituted with one or more of

(1) hydroxy,

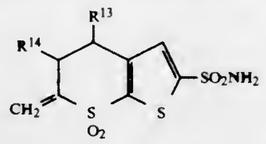
(2) C_{1-3}alkoxy,

(3) $R^{17}R^{18}N$-C_{1-5}alkyl,

which comprises treating a compound of structural formula:



with Oxone® (potassium peroxymonosulfate) in an aqueous ethanolic solution to provide the compound of formula:



followed by treatment with an amine of formula $R^{17}R^{18}NH$ in a C_{1-3}alkanol at 12°–30° C. for 5 to 24 hours.

4,820,849

PROCESS FOR REDUCING CORROSIVE IMPURITIES IN SULFOLANE USED FOR EXTRACTING AROMATIC HYDROCARBONS

Zaida Diaz, Houston, and James H. Miller, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1987, Ser. No. 139,494

Int. Cl.[4] C07D *333/48*

U.S. Cl. 549—87 **7 Claims**

1. A process for reducing the level of corrosive impurities in sulfolane solution originating from a process for the extraction of aromatic hydrocarbons from petroleum, which solution contains corrosive impurities and has pH value of at least 8.5, which process comprises in sequence:

(a) adding a sulfolane-soluble polyprotic acidic substance or an anhydride of a polyprotic acid to said sulfolane solution to form a solid phase containing at least a portion of said corrosive impurities and a liquid phase having reduced corrosive impurity content, and

(b) separating said liquid phase from step (a) from said solid phase.

4,820,850

PROCESS FOR α-C-ALKYLATION OF THE 8-ACYL GROUP ON MEVINOLIN AND ANALOGS THEREOF

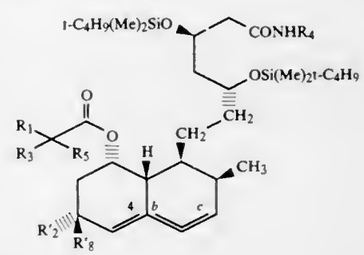
Thomas R. Verhoeven, Cranford, and David Askin, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 10, 1987, Ser. No. 72,066

Int. Cl.[4] C07D *309/10*

U.S. Cl. 549—292 **21 Claims**

1. A process for the preparation of a compound of structural formula (V):



(V)

wherein:

R_1 is C_{1-5} alkyl;

R'_2 is selected from the group consisting of H, CH_3, $OSi(Me)_2t$-C_4H_9 or $CH_2OSi(Me)_2t$-C_4H_9;

R_3 is H or C_{1-3} alkyl;

R_4 is C_{3-5} alkyl;

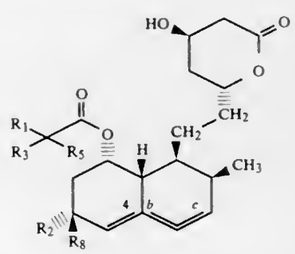
R_5 is C_{1-3} alyl; and

R'_8 is selected from the group consisting of H or $OSi(Me)_2tC_4H_9$ or $CH_2Si(Me)_2tC_4H_9$; provided that at least one of R'_2 or R'_8 is H;

a, b and c each represent single bonds or one of a, b and c represents a double bond or both a and c represent double bonds;

which comprises:

(A) treatment under a inert atmosphere of a compound of structural formula (III):



(III)

wherein

R_2 is selected from the group consisting of H, CH_3, —OH, or $—CH_2OH$;

R_8 is selected from the group consisting of H or CH_2OH; provided that at least one of R_2 or R_8 is H;

with an alkyl amine R_4NH_2, followed by hydroxyl protection with tert-butyldimethylsilyl chloride and imidazole; then

(B) treatment with an alkali metal amide of formula $M^+N^-R_6R_7$;

wherein M^+ is a cation derived from sodium potassium or lithium, and

R_6 and R_7 are independently C_{1-3} alkyl, or R_6 and R_7 joined together with the nitrogen to which they are attached form a 5 or 6 membered heterocyclic ring; followed by contact with R_5X, wherein X is chloro, bromo or iodo.

4,820,851

INTERMEDIATES FOR ANTIATHEROSCLEROTIC FUROCHROMONES

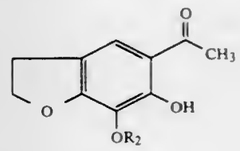
Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 603,533, Apr. 25, 1984, Pat. No. 4,614,809, which is a division of Ser. No. 378,686, May 17, 1982, Pat. No. 4,459,420. This application Jul. 14, 1986, Ser. No. 885,365

Int. Cl.[4] C07D *307/86*

U.S. Cl. 549—462 **2 Claims**

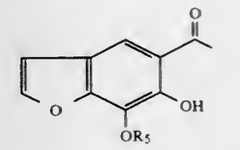
1. A benzofuran of formula III:



III

wherein R_2 is C_1–C_4 alkyl.

2. A benzofuran of formula IV:



IV

wherein R_5 is C_2–C_4 alkyl.

4,820,852

PROCESS FOR THE PREPARATION OF DIACYL-DIANHYDRO HEXITOLS

Tibor Szabó; Ildikó Vidra née Sándor; Gyula Dalmadi; Judit Kaczmarek née Sebestyén, and János Óri, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara, Budapest, Hungary

PCT No. PCT/HU85/00002, § 371 Date Nov. 4, 1985, § 102(e) Date Nov. 4, 1985, PCT Pub. No. WO85/03293, PCT Pub. Date Aug. 1, 1985

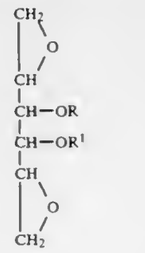
Continuation of Ser. No. 778,186, Nov. 4, 1985, abandoned. This PCT application Jan. 16, 1985, Ser. No. 178,876

Claims priority, application Hungary, Jan. 18, 1984, 194/84

Int. Cl.[4] C07D *301/00*

U.S. Cl. 549—539 **5 Claims**

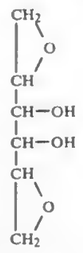
1. A process for preparing a compound of the Formula (I)



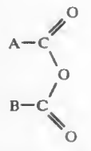
VOL 1101 ISS 2 AP 11 1989 UMI

wherein R and R^1 are each C_3 to C_6 alkanoyl substituted by a free carboxy group and the configuration of the Formula (I) skeleton is that of dulcitol, mannitol, or iditol, which comprises the steps of:

(a) acylating a hexitol of the Formula (II)



wherein the configuration of the Formula (II) skeleton is that of dulcitol, mannitol, or iditol, with a compound of the Formula (III)



wherein A and B together form an alkylene group having 2 to 5 carbon atoms, at a temperature of 0° to 30° C. in the presence of a trialkylamine acid binding agent in a dipolar aprotic solvent selected from the group consisting of dimethyl sulfoxide and dimethyl formamide and in the presence of a catalyst selected from the group consisting of 4-dimethylaminopyridine and 4-pyrrolidino-pyridine, to form a solution containing as an intermediate a carboxylate salt of the monoacyl compound corresponding to the diacyl compound of the Formula (I) and formed with the trialkylamine acid binding agent;

(b) continuing the acylation reaction to completion to obtain the compound of the Formula (I) in solution in the form of its diacyl salt; and

(c) acidifying the solution formed in step (b) with sodium hydrogen sulfate to yield the desired compound of the Formula (I).

4,820,853

PROCESS FOR THE PREPARATION OF ALKYL DIARYL PHOSPHITES AND DIARYL HALOPHOSPHATES

Karl E. Reineke, Brewster, N.Y., assignor to Akzo America Inc., New York, N.Y.

Filed Mar. 20, 1987, Ser. No. 28,440

Int. Cl.[4] C07F *9/141, 9/14*

U.S. Cl. 558—99 **17 Claims**

1. A process for preparing diaryl phosphites of improved purity which comprises reacting monosubstituted dihalophosphite, wherein the monosubstituent is a radical which forms a monosubstituted dihalophosphite which can be separated from any impurities, with a sufficient amount of a phenol to provide a diaryl phosphite of improved purity.

11. A process for preparing diaryl halophosphates which comprises reacting an alkyl dihalophosphite of the formula $A^1—O—PY_2$ with a phenol of the formula Ar^1OH to provide an alkyl diaryl phosphite of the formula $A^1—O—P(OAr^1)_2$ and halogenating the alkyl diaryl phosphite to prepare diaryl halophosphates of the formula $(Ar^1O)_2P(O)Y$, wherein A^1 represents alkyl, cycloalkyl, heterocyclyl, aralkyl and substituted derivatives thereof; Ar^1 represents 1 or more aryl rings, biphenyl and derivatives thereof which are non-reactable with halogen during the halogenation reaction, and Y is chlorine, bromine or iodine.

4,820,854

PHOSPHATE-CONTAINING AND PHOSPHONATE-CONTAINING PHOSPHATE ESTERS

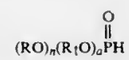
Thomas A. Hardy, Thousand Oaks, Calif., and Edward N. Walsh, New City, N.Y., assignors to Akzo America Inc., New York, N.Y.

Division of Ser. No. 737,374, May 23, 1985, Pat. No. 4,697,030. This application Jun. 26, 1987, Ser. No. 66,664

Int. Cl.[4] C07F *9/09*

U.S. Cl. 558—119 **13 Claims**

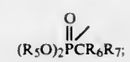
1. A compound of the formula:



wherein R is:



and R is



R_1, R_3 and R_5 are the same or different and are alkyl, haloalkyl, aryl or haloaryl;

R_6 and R_7 are the same or different and are hydrogen, alkyl, haloalkyl, aryl or haloaryl;

R_4 is alkylene or haloalkylene;

n is an integer from 1–2;

a is an integer from 1–2;

z is an integer from 1–10.

10. A process for the preparation of the compound of claim 1 which comprises transesterifying a phosphorus-containing alcohol with a dialkyl phosphite.

4,820,855

PROCESS FOR PRODUCING POLYFUNCTIONAL CYANATE ESTER POLYMER

Morio Gaku. and Hidenori Kimbara, both of Saitama, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 109,199

Claims priority, application Japan, Oct. 17, 1986, 61-245456; Dec. 25, 1986, 61-307778

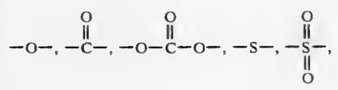
Int. Cl.[4] C07F *9/09;* **C07C** *122/00*

U.S. Cl. 558—167 **4 Claims**

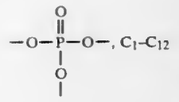
1. A process for polymerizing a polyfunctional cyanate ester compound which comprises heating at least one polyfunctional cyanate ester compound having the formula:

R—OCN)m

wherein m is an integer of at least 2 and not more than 5; R is selected from the group consisting of arylene, C_1–C_4 alkyl, or halogen-substituted arylene, or a plurality of arylene or C_1–C_4 alkyl or halogen-substituted arylene linked by a group selected from the group consisting of



-continued



alkylene, C_5–C_{12} cycloalkylene, and the cyanato groups are bonded to the arylene ring of said aromatic group, in the presence of a catalytic amount of a dialkyl tin oxide having the formula:

R^1R^2SnO

wherein each of R^1 and R^2 is C_1–C_{30} alkyl.

4,820,856

PROCESS FOR THE PRODUCTION OF ALKYL THIOCHLOROFORMATES

Patricia Gauthier, Cerny; Thierry Malfroot, Saintry sur Seine, and Jean-Pierre Senet, Herbeauvilliers-Buthiers, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

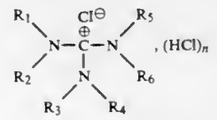
Filed Oct. 16, 1987, Ser. No. 108,996

Claims priority, application France, Oct. 17, 1986, 8614407

Int. Cl.[4] C07C *68/02*

U.S. Cl. 558—249 **7 Claims**

1. Process for the production of thiochloroformates, comprising: reacting phosgene with a mercaptan, in the presence of a catalyst, wherein said catalyst is a hexaalkylguanidinium chloride or the corresponding hydrochloride of general formula:



in which R_1, R_2, R_3, R_4, R_5 and R_6 are identical or different and represent C_1 to C_4 alkyl radicals, and in which n may take the values of 0 to 1.

4,820,857

α-BROMODIETHYLCARBONATE

Derek R. Palmer, Heswall, and Robert G. Tyson, Prestatyn, both of Great Britain, assignors to Astra Lakemedel Aktiebolag, Sweden

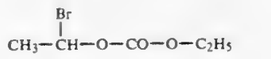
Continuation of Ser. No. 838,168, Mar. 10, 1986, abandoned, which is a division of Ser. No. 507,716, Jun. 23, 1983, Pat. No. 4,606,865. This application Apr. 13, 1988, Ser. No. 183,428

Claims priority, application United Kingdom, Sep. 20, 1982, 8226751; Oct. 6, 1982, 8228622; Nov. 16, 1982, 8232629; Jan. 7, 1983, 8300331

Int. Cl.[4] C07C *69/96*

U.S. Cl. 558—277 **1 Claim**

1. The compound of the formula



4,820,858

PROCESS FOR THE PREPARATION OF 2-(HYDROXYALKYL)ACRYLIC COMPOUNDS

Neil S. Isaacs, Henley-on-Thames, and Jonathan Hill, Reading, both of England, assignors to Stamicarbon B.V., Geleen, Netherlands

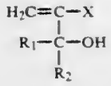
Continuation of Ser. No. 841,838, Mar. 20, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 169,137

Claims priority, application Netherlands, Mar. 20, 1985, 8500804

Int. Cl.[4] C07C *121/30, 121/34, 121/48, 121/70*

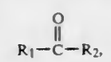
U.S. Cl. 558—372 **7 Claims**

1. Process for the preparation of 2-(hydroxyalkyl)acrylic compounds having the formula



wherein X represents a —CN group, a —$COOR_3$ group, a —COR_4 group or a —$CONR_4R_5$ group wherein R_3 is an alkyl group containing 1–4 C atoms and R_4 and R_5 independently represent an H atom or R_3, and

wherein R_1 and R_2 and independently represent an H atom or an alkyl group with 1–4 C atoms or a (hetero) aryl selected from the group consisting of phenyl, naphthyl, furyl and thienyl, or R_1 and R_2 together represent a carbocyclic compound with 5–12 C atoms by contacting an acrylic compound $H_2C═CH—X$ with a carbonyl compound of the formula



wherein X, R_1 and R_2 denote the same as in the above, this being effected in the liquid phase in the presence of a, tertiary amine selected from the group consisting of trialkylamines with 1–4 C-atoms per alkyl group and diazabicyclo-(2,2,2)-octane as a catalyst, the reaction being carried out at a pressure between 5,000 and 18,000 bar.

4,820,859

PROCESS FOR THE PRODUCTION OF HIGH ENERGY MATERIAL

Ross W. Millar, Hertford; Norman C. Paul, Hoddesdon, and David H. Richards, Waltham Abbey, all of United Kingdom, assignors to Secretary of State for Defence in Her Majesty's Government of the United Kingdom, London, United Kingdom

Continuation of Ser. No. 507,170, Jun. 27, 1983, abandoned. This application Nov. 5, 1985, Ser. No. 794,340

Claims priority, application United Kingdom, Jul. 15, 1982, 8220082

Int. Cl.[4] C07C *77/02*

U.S. Cl. 558—483 **15 Claims**

1. A process for the production of a high energy material comprising:

(a) reacting, in an inert organic solvent, a heterocyclic compound selected from the group oxirane, aziridine, oxetane and azetidine with a nitrogen oxide selected from the group dinitrogen tetroxide (N_2O_4) and dinitrogen pentoxide (N_2O_5) to afford, when the nitrogen oxide is N_2O_4, a product A containing O - nitro and O-nitroso substituents or a product B containing O - nitro and N - nitroso substituents, and, when the nitrogen oxide is N_2O_5, a product C containing 0 - nitro substituents or a product D containing O - nitro and N - nitro substituents,

(b) when the nitrogen oxide is N_2O_4, oxidising product A to product C or product B to product D by treating product A or product B with ozone, and

(c) isolating either product C or product D.

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4,820,860

NOVEL THYRONINE DERIVATIVES

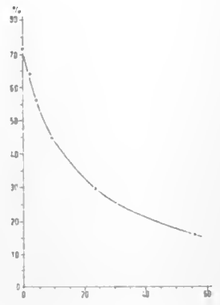
Hans Wissmann, Bad Soden am Taunus; Guido Simons, Ingelheim am Rhein, and Helmut Strecker, deceased, late of Pfungstadt, all of Fed. Rep. of Germany (by Renate Strecker née Weihrauch, legal heir), assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 87,805

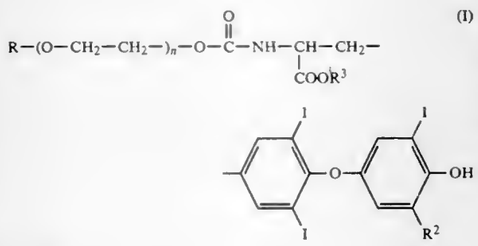
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1986, 3628795

Int. Cl.⁴ C07C *101/32*

U.S. Cl. 560—40 **8 Claims**



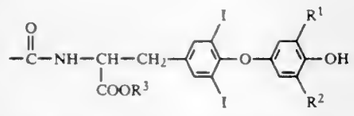
1. A compound of the formula I



(I)

in which

R denotes hydrogen, (C_1–C_6)-alkyl or a radical of the formula



R^1 and R^2 are identical or different and denote iodine or hydrogen,

R^3 denotes hydrogen or (C_1–C_6)-alkyl, and

n represents an integer between 10 and 400,

and the physiologically acceptable salts thereof with cations.

4,820,861

PROCESS FOR THE PRODUCTION OF N-FORMYL-ALPHA-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Toshihide Yukawa; Haruo Kawasaki; Masao Nakamura, all of Kawasaki; Takashi Yamashita, and Toshiaki Tsuji, both of Yokkaichi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 17, 1986, Ser. No. 931,123

Claims priority, application Japan, Dec. 24, 1985, 60-291180

Int. Cl.⁴ C07C *101/02*

U.S. Cl. 560—41 **3 Claims**

1. In the process for the production of N-formyl-α-L-aspartyl-L-phenylalanine methyl ester by the reaction of N-formyl-L-aspartic acid anhydride with L-phenylalanine methyl ester the improvement comprising carrying out said reaction in a reaction solvent other than acetic acid and in the presence of acetic acid or acetic acid and formic acid, the amount of acetic acid or acetic acid and formic acid present being 10–150% by weight based on the reaction solvent, in a complete mixing type continuous reaction mode.

4,820,862

PROCESS FOR THE PREPARATION OF DIMETHYL TEREPHTHALATE

Gerhart Hoffmann, Ranzel-Kolonie, Fed. Rep. of Germany; Karl Irlweck, Vienna, Austria, and Rudolf Cordes, Ranzel, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 121,151, Mar. 4, 1971, abandoned. This application Jul. 12, 1984, Ser. No. 630,264

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1970, 2010137

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.⁴ C07C *67/39, 67/08*

U.S. Cl. 560—77 **5 Claims**

1. In a process for the preparation of dimethyl terephthalate by the air oxidation of a mixture of p-xylene and methyl p-toluate, in the presence of an oxidation catalyst at a temperature of from about 80° to about 250° C., esterification of the thus-produced acids and recycling of the methyl p-toluate into the oxidation step, the improvement which comprises utilizing a mixture of cobalt and manganese compounds as the oxidation catalyst to improve the yield of dimethyl terephthalate, said compounds being soluble in the reaction medium used, being water soluble salts, or being oxides and hydroxides, the cobalt concentration in the reaction medium and the manganese concentration in the reaction medium being in a ratio of from 1:1 to 10:1.

4,820,863

SURFACE ACTIVE POLYCARBODIIMIDES

James W. Taylor, S. Charleston(Kanawha), W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1986, Ser. No. 845,982

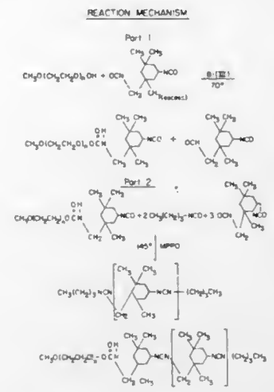
Int. Cl.⁴ B01F *17/16*; C07C *125/06*

U.S. Cl. 560—115 **3 Claims**

1. A surface-active polycarbodiimide of the formula

R—X—R′

wherein R is a residue of a hydrophobic organic compound containing at least two carbodiimide groups; R′ is a residue of an organic compound having a hydrophilic segment and at least one functional group capable of reacting with a carbodiimide group; and X is a group formed by the reaction of a said carbodiimide group with a said functional group; wherein R′ is a residue of a hydroxyl-containing poly(alkylene oxide)-based surfactant and wherein the poly(alkylene oxide)-based surfactant is alkoxy-capped.



4,820,864

METHOD FOR RACEMIZATION OF OPTICALLY ACTIVE CHRYSANTHEMIC ACID OR ITS ESTER

Gohfu Suzukamo, Osaka; Yoji Sakito, Hyogo, and Masami Fukao, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

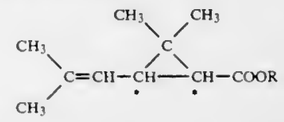
Filed Mar. 9, 1988, Ser. No. 166,014

Claims priority, application Japan, Mar. 9, 1987, 62-533519; Mar. 26, 1987, 62-73355; Jun. 10, 1987, 62-145467

Int. Cl.⁴ C07C *51/353*

U.S. Cl. 560—124 **18 Claims**

1. A method for preparing racemized chrysanthemic acid or its ester by treating an optically active chrysanthemic acid or its ester having the formula:



wherein R represents a hydrogen atom, an alkyl group of 1–20 carbon atoms, a cycloalkyl group of 3–20 carbon atoms of an aralkyl group of 7–20 carbon atoms and • mark represents asymmetric carbon atom, which comprises contacting with at least one compound selected from the group consisting of a carboxylic acid bromide, a silicon bromide, an S-bromine compound, an N-bromine compound, a halo-bromine compound and an SH compound in the presence of a peroxide or an azo compound.

4,820,865

MB-530B DERIVATIVES CONTAINING THEM

Akira Terahara, and Minoru Tanaka, both of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

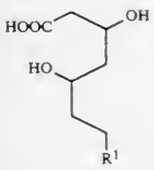
Continuation of Ser. No. 682,252, Dec. 17, 1984, abandoned. Division of Ser. No. 410,889, Aug. 24, 1982, Pat. No. 4,517,373. This application Sep. 17, 1986, Ser. No. 908,969

Claims priority, application Japan, Aug. 27, 1981, 134558

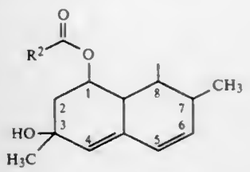
Int. Cl.⁴ C07C *67/02*

U.S. Cl. 560—256 **23 Claims**

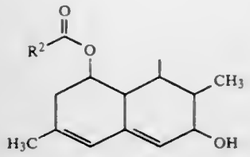
1. A compound of the formula



wherein R^1 represents a group of formula



or



4,820,866

PROCESS FOR THE PRODUCTION OF DIISOCYANATES, SELECTED DIISOCYANATES PRODUCED THEREBY AND THE PRODUCTION OF POLYURETHANE PLASTICS THEREFROM

Josef Sanders, Koeln, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

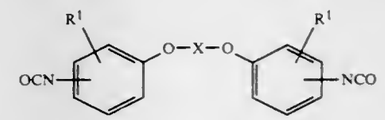
Filed Aug. 12, 1987, Ser. No. 84,547

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628316

Int. Cl.⁴ C07C *69/00*

U.S. Cl. 560—347 **4 Claims**

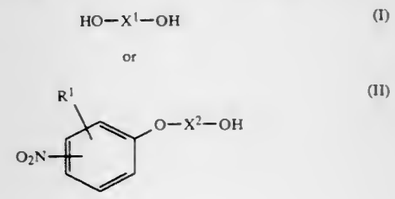
1. A process for the production of diisocyanates corresponding to the formula



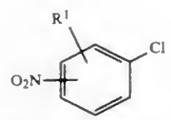
comprising

(a) reacting

(1) a monofunctional or difunctional alcohol corresponding to the following formula I or formula II

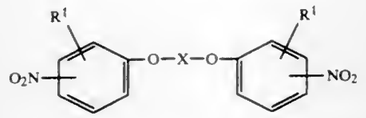


with
(2) a compound corresponding to the formula



(III)

in the presence of
(3) powdered sodium hydroxide and/or potassium hydroxide in a quantity sufficient to neutralize eliminated hydrogen chloride and
(4) a strongly polar, aprotic solvent to form a dinitro compound corresponding to the formula

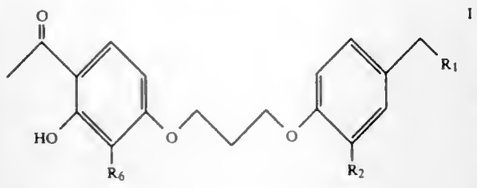


(IV)

with the radicals in each of formulae (I) through (IV) having the following meanings:
R^1 represents hydrogen or a methyl group
X^1 represents a difunctional aliphatic hydrocarbon radical containing from 2 to 31 carbon atoms
X^2 represents a difunctional aliphatic hydrocarbon radical containing from 2 to 9 carbon atoms which may be interrupted by ether bridges provided that at least two carbon atoms are present before such interruption and
X represents X^1 or X^2
(b) hydrogenating the dinitro compound to produce the corresponding diprimary diamine and
(c) phosgenating the diamine obtained in (b) to produce the desired isocyanate.

4,820,867
PHENOXYPROPOXY HALOPHENYLACETIC ACIDS AS LEUKOTRIENE ANTAGONISTS
Patrice Belanger, Dollard des Ormeaux; Rejean Fortin, Montreal; Yvan Guindon, Quebec; Christiane Yoakim, Montreal, and Joshua Rokach, Laval, all of Canada, assignors to Merck Frosst Canada, Inc., Quebec, Canada
Continuation of Ser. No. 591,344, Mar. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 487,434, Apr. 21, 1983, abandoned. This application Apr. 22, 1986, Ser. No. 855,051
Int. Cl.[4] C07C *65/01*
U.S. Cl. 562—478 **9 Claims**

1. Compounds having the formula:



(I)

wherein
R_1 is $COOR_3$; CH_2OH; CHO; or $CH_2NHSO_2R_4$;
R_2 is fluoride or bromide;
R_3 is H or alkyl of 1 to 6 carbon atoms which may be straight chain, branched or cyclic;
R_4 is OH; alkyl, or alkoxy of 1 to 6 carbon atoms; phenyl or phenyl substituted by alkyl or alkoxy groups of 1 to 3 carbon atoms, halogen, hydroxy, haloalkyl, COOH, CN, formyl, acyl of 1 to 6 carbon atoms; or perfluoroalkyl of 1 to 4 carbon atoms;
R_6 is independently H or alkyl of 1 to 4 carbons;
and pharmaceutically acceptable salts or acid addition salts thereof.

4,820,868
PROCESS FOR PREPARATION OF NAPHTHALENE-2,6-DICARBOXYLIC ACID DIALKALI METAL SALTS
Shuichi Mitamura; Koichi Fujishiro, and Hiroharu Inoue, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Sep. 29, 1986, Ser. No. 912,957
Claims priority, application Japan, Sep. 30, 1985, 60-215179; Oct. 31, 1985, 60-242845
Int. Cl.[4] C07C *51/353*
U.S. Cl. 562—482 **7 Claims**

1. An improvement in a process for the preparation of a naphthalene-2,6-dicarboxylic acid dialkali metal salt which comprises heating an alkali metal salt of naphthalene-dicarboxylic acid selected from the group consisting of a 1,2-isomer, a 1-3 isomer, a 1,4-isomer, a 1,5-isomer, a 1,6-isomer, a 1,7-isomer, a 1,8-isomer, a 2,3-isomer, a 2,7-isomer, or a mixture thereof, under pressure with carbon dioxide gas in the presence of a catalyst, the improvement comprising using naphthalene as a reaction medium, wherein the amount of the naphthalene is 0.5 to 10 times the amount of the starting material by weight.

4,820,869
METHOD FOR THE SEPARATION OF LEUCINE
Masaru Otani; Masami Kojima, and Toshio Kitahara, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Filed Dec. 29, 1987, Ser. No. 139,307
Claims priority, application Japan, Jan. 7, 1987, 62-1279
Int. Cl.[4] C07C *99/12*
U.S. Cl. 562—554 **4 Claims**

1. A method for separating leucine from a mixture of amino acids containing at least leucine and isoleucine, which comprises subjecting an aqueous solution of a mixture of amino acids to centrifugal force, and forcing by the application of pressure a water-saturated organic solvent immiscible with water to pass through the aqueous solution against the centrifugal force, to selectively extract leucine in said water-saturated organic solvent.

4,820,870
ACIDIC ALKALI CITRATE AND COMPOSITIONS FOR ADJUSTING THE PH OF URINE
Rolf Madaus, Köln-Brück; Werner Stumpf; Klaus Görler, both of Bensberg-Refrath, all of Fed. Rep. of Germany, and Alfonso Carcasona-Beltran, Barcelona, Spain, assignors to Dr. Madaus & Co., Ostmerheimer Str., Fed. Rep. of Germany
Continuation of Ser. No. 852,093, Apr. 14, 1986, abandoned, which is a continuation of Ser. No. 692,323, Jan. 16, 1985, abandoned, which is a continuation of Ser. No. 469,493, Feb. 24, 1983, abandoned, which is a division of Ser. No. 223,646, Jan. 9, 1981, Pat. No. 4,400,535, which is a continuation of Ser. No. 112,994, Jan. 17, 1980, abandoned, which is a continuation of Ser. No. 916,373, Jun. 16, 1978, abandoned. This application Apr. 1, 1987, Ser. No. 33,916
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1977, 2727304
Int. Cl.[4] C07C *59/265*
U.S. Cl. 562—584 **3 Claims**

1. Acidic alkali citrate of the formula

$$K_6Na_6H_3(C_6O_7H_5)_5{\cdot}2\text{-}4H_2O.$$

4,820,871
PROCESS FOR THE PREPARATION OF N,N-DIARYL-UREAS
Wolfram Kissener, Bergisch Gladbach; Joachim Franke, Cologne; Helmut Fiege, Leverkusen, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Oct. 7, 1987, Ser. No. 105,856
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636190
Int. Cl.[4] C07C *127/19*
U.S. Cl. 564—55 **10 Claims**

1. A process for the preparation of N,N-diaryl-ureas of the formula

$$R^1—NR^2—CO—NH—R^3$$

in which
R^1 and R^2 are independent of one another and denote aryl and
R^3 denotes alkyl, aralkyl or aryl, characterized in that a diarylamine of the formula

$$R^2—NH—R^2$$

is reacted with an isocyanate of the formula

$$R^3—NCO$$

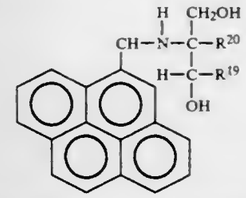
wherein R^1, R^2 and R^3 have the above meaning, in the presence of inorganic and organic Bronstedt acid compounds and in the presence or absence of an inert solvent, diluent or mixtures thereof, at an elevated temperature wherein 0.001 to 0.3 moles of the acid compound are employed per mole of the diarylamine.

4,820,872
PROCESS FOR HYDROLYZING NITRILES
David Farrar; Peter Flesher, and Gerald Benn, all of West Yorkshire, England, assignors to Allied Colloids Ltd., Great Britain
PCT No. PCT/GB85/00320, § 371 Date Mar. 6, 1986, § 102(e) Date Mar. 6, 1986, PCT Pub. No. WO86/00614, PCT Pub. Date Jan. 30, 1986
Continuation-in-part of Ser. No. 437,385, Oct. 28, 1982, Pat. No. 4,543,423. This PCT application Jul. 16, 1985, Ser. No. 852,250
Claims priority, application United Kingdom, Jul. 17, 1984, 8418136; Sep. 7, 1984, 8422640; Dec. 12, 1984, 8431292
Int. Cl.[4] C07C *102/08*
U.S. Cl. 564—128 **27 Claims**

1. In a process for making an amide of formula $NCONH_2$ where R is an ethylenically unsaturated hydrocarbon group of 2 to 10 carbon atoms by hydrolysis of the corresponding nitrile RCN in a reaction mixture comprising a solid, substantially black, copper catalyst for the hydrolysis reaction, water an oxidizing agent that is selected from oxygen metered into the reaction mixture, iodate, chlorate, bromate, nitrate and nitrate that that increases the activity of the catalyst for the formation of the amide and of by-products by forming oxidised, catalytically active, sites on the catalysts and a polymerisation inhibitor for inhibiting polymerisation of the said amine, the improvement comprising reducing the formation of the by-products without substantially reducing the formation of the amide by incorporating in the reaction mixture a reagent selected from reducing agents and the acids, and non-interfering salts thereof that are non-oxidising relative to the said oxidising agent, in an amount that results in reduction of by-product formation but substantially no reduction in formation of the amide.

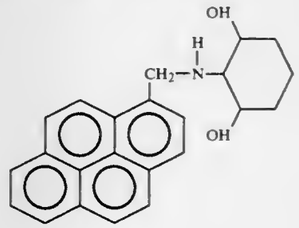
4,820,873
PYRENE DERIVATIVES
Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.
Continuation of Ser. No. 661,801, Oct. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 499,330, May 31, 1983, abandoned. This application Sep. 28, 1987, Ser. No. 102,275
Claims priority, application United Kingdom, May 16, 1984, 84105584
Int. Cl.[4] C07C *87/28*
U.S. Cl. 564—387 **4 Claims**

1. A compound of the formula:



where R^{19} is hydrogen or methyl and R^{20} is hydrogen, methyl or ethyl or a pharmaceutically acceptable acid addition salt thereof.

4. A compound of the formula:



4,820,874
INCREASING THE YIELD OF 2.5.6-TRIMETHYLCYCLOHEX-2-EN-1-ONE
Peter Tavs, Limburgerhof; Harald Laas, Maxdorf; Horst Schauer, Mutterstadt, and Lothar Arnold, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Oct. 23, 1987, Ser. No. 111,603
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636057
Int. Cl.[4] C07C *45/67*
U.S. Cl. 568—350 **8 Claims**

1. In a process for producing 2,5,6-trimethylcyclohex-2-en-1-one by reacting diethyl ketone, in the presence of an alkali, with crotonaldehyde or a compound which is converted to crotonaldehyde and distilling the reaction mixture to recover the 2,5,6-trimethylcyclohex-2-en-1-one formed, wherein a distillation residue is also obtained in the reaction whicb contains compounds having a molecular weight of 224, the improvement which comprises: converting said compounds having a molecular weight of 224 into a mixture of additional 2,5,6-trimethylcyclo-hex-2-en-1-one and diethyl ketone by
(a) heating the distillation residue at from 120° to 250° C. with the addition of a catalytic amount of an alkali, or
(b) heating the distillation residue at from 150° to 250° C. without the addition of said alkali, and separating said mixture by distillation.

4,820,875

SYNTHESIS OF CARBONYL COMPOUNDS

Dennis E. Webster, Royston, and Phillip J. Player, Hitchin, both of United Kingdom, assignors to Johnson Matthey Public Limited Company, London, United Kingdom

Filed Dec. 23, 1987, Ser. No. 137,001

Claims priority, application United Kingdom, Dec. 23, 1986, 86 30727

Int. Cl.[4] C07C *45/39*

U.S. Cl. 568—360 6 Claims

1. In the process for the vapour-phase synthesis of an aldehyde or ketone product from an alcohol of 6 to 10 carbon atoms, the improvement comprising passing a gaseous mixture containing the alcohol and oxygen over a catalyst comprising metallic silver, in which the concentration of alcohol:oxygen is below the lower explosive limit and the reaction temperature is in the range of 200° to 450° C.

4,820,876

POLYETHYLENE WAX

Hugo J. C. Nuttens, Schoten, and Gerard Van Haeren, Rixensart, both of Belgium, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 691,951, Jan. 15, 1985. This application May 27, 1987, Ser. No. 54,636

Claims priority, application United Kingdom, Jan. 20, 1984, 8401567

Int. Cl.[4] C07C *47/20*

U.S. Cl. 568—494 8 Claims

1. A polyethylene wax having mn of 250 to 3,000 as measured by gel permeation chromatography, a density of 0.930 to 0.960, a viscosity of 10 to 100 mPa.s measured at 121 degrees C. and a degree of CO incorporation of 0.2 to 12 wt.% CO as measured by elemental analysis of oxygen.

4,820,877

ETHERIFICATION PROCESS IMPROVEMENT

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,745

Int. Cl.[4] C07C *41/06, 41/34*

U.S. Cl. 568—697 5 Claims

1. In a process for the manufacture of methyl tertiary butyl ether comprising contacting a methanol feedstream containing a stoichiometric excess of methanol based on iso-olefins and a C_4+ hydrocarbon feedstream rich in isobutylene with an acidic etherification catalyst in an etherification zone under etherification conditions; passing said etherification zone effluent stream to a fractionator for separation; recovering a fractionator bottom stream containing methyl tertiary butyl ether and an overhead fraction containing unreacted methanol and hydrocarbon azeotrope, the improvement comprising: contacting said C_4+ hydrocarbon feedstream with a stoichiometric excess of methanol based on iso-olefins of between 3% and 100% whereby conversion of isobutylene is increased to produce methyl tertiary butyl ether; passing a refinery fuel gas into a mid-portion of said fractionator to enhance the separation of unreacted methanol into the overhead stream containing C_4 hydrocarbons; and cooling said overhead stream to separate vapor containing methanol and said fuel gas and liquid containing C_4 hydrocarbons.

4. In a process for the manufacture of methyl tertiary butyl ether comprising contacting a methanol feedstream containing up to a 3% stoichiometric excess of methanol based on iso-olefins and a C_4+ hydrocarbon feedstream rich in isobutylene with an acidic etherification catalyst in an etherification zone under etherification conditions; passing said etherification zone effluent stream to a fractionator for separation; recovering a fractionator bottom stream containing methyl tertiary butyl ether and an overhead fraction containing unreacted methanol and hydrocarbon azeotrope, the improvement comprising: separating said overhead stream in a water wash extraction tower into an overhead stream comprising C_4 hydrocarbons and a bottom stream comprising aqueous unreacted methanol; and contacting said aqueous methanol with refinery fuel gas in a stripping zone whereby methanol is separated from unreacted aqueous methanol.

4,820,878

TOLAN-TYPE NEMATIC LIQUID CRYSTALLINE COMPOUNDS

Haruyoshi Takatsu, Kodaira; Makoto Sasaki, Urawa; Yasuyuki Tanaka, and Hisato Sato, both of Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

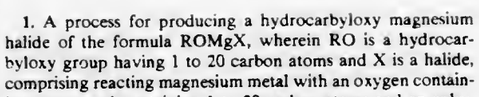
Division of Ser. No. 692,570, Jan. 18, 1985, abandoned. This application Feb. 11, 1987, Ser. No. 14,256

Claims priority, application Japan, Jan. 23, 1984, 59-8519; Jan. 24, 1984, 59-10658; Mar. 29, 1984, 59-59588; Mar. 29, 1984, 59-59589; Jun. 19, 1984, 59-124489; Dec. 11, 1984, 59-261413; Dec. 11, 1984, 59-261414

Int. Cl.[4] C07C *43/66, 43/168;* C09K *19/30*

U.S. Cl. 568—659 1 Claim

1. A compound of the general formula



wherein R and R', independently from each other, represent a linear alkyl group having 1 to 10 carbon atoms, and the cyclohexane ring has a trans(equatorial-equatorial) configuration.

4,820,879

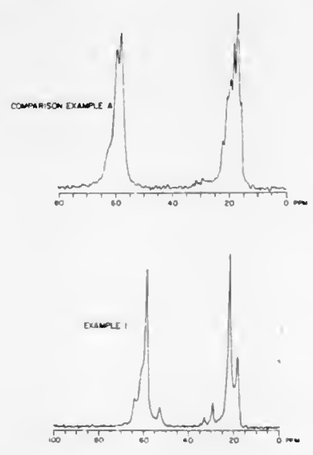
PREPARATION OF HYDROCARBYLOXY MAGNESIUM HALIDES

Vijay C. Mehta, Gastonia, N.C., assignor to Lithium Corporation of America, Gastonia, N.C.

Filed Jun. 5, 1987, Ser. No. 58,480

Int. Cl.[4] C07C *29/70, 31/28, 39/02*

U.S. Cl. 568—851 15 Claims



1. A process for producing a hydrocarbyloxy magnesium halide of the formula ROMgX, wherein RO is a hydrocarbyloxy group having 1 to 20 carbon atoms and X is a halide, comprising reacting magnesium metal with an oxygen containing compound containing 1 to 20 carbon atoms and an anhydrous hydrogen halide under anhydrous conditions, in an inert atmosphere and in a hydrocarbon reaction medium.

4,820,880

PROCESS FOR THE PRODUCTION OF 3,4-DIDEOXYHEXITOL

Branko Urbas, Darien, Ill., assignor to Michigan Biotechnology Institute, Lansing, Mich.

Filed May 18, 1987, Ser. No. 50,650

Int. Cl.[4] C07C *27/00*

U.S. Cl. 568—861 2 Claims

1. In the process of producing 3,4-dideoxyhexitol from a member selected from a hexitol and a compound which yields hexitol upon reaction with hydrogen, which method comprises heating said member in an organic solvent with hydrogen, under a pressure of at least about 50 atmospheres, in the presence of a copper chromite catalyst until hydrogen uptake is complete; the improvement which comprises employing a copper chromite catalyst which contains 80–85% by weight of CuO and which produces superior yields of 3,4-dideoxyhexitol.

4,820,881

DECOLORIZATION

Robert J. Kupper, Mt. Airy, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 24, 1988, Ser. No. 198,021

Int. Cl.[4] C07C *79/04, 79/10;* C01B *11/04*

U.S. Cl. 568—947 14 Claims

1. A process for decolorizing liquid nitro compounds containing color bodies comprising contacting the nitrocompound with an alkaline earth metal hypochlorite salt.

4,820,882

PREPARATION OF BETA-ARYL ALCOHOLS

Heinz Eckhardt, Ludwigshafen, and Manfred Eggersdorfer, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

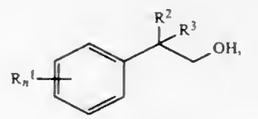
Filed Jan. 15, 1988, Ser. No. 144,169

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702621

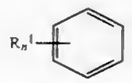
Int. Cl.[4] C07C *31/135, 33/22*

U.S. Cl. 568—715 7 Claims

1. A process for preparing a β-aryl alcohol of the general formula I



where R^1, R^2 and R^3 are identical or different and each is hydrogen, C_1–C_{20}-alkyl, C_5–C_7-cycloalkyl, aryl, C_7–C_{12}-aralkyl or C_7–C_{12}-alkaryl, n is 0, 1, 2, 3 or 4, or where two adjacent R^1's are linked to form a 5- or 6-membered ring, by reacting an aromatic of the formula II



with an alkylene oxide of the formula III



where R^1, R^2 and R^3 have the abovementioned meanings, in the presence of a Friedel-Crafts catalyst, which comprises carrying out the reaction in the presence of a titanium(IV) alcoholate at from −20° to +40° C. in the presence or absence of a solvent.

4,820,883

DEFLUORINATION PROCESS USING ACTIVATED CARBON

Frank J. Weigert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 73,878, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 785,960, Oct. 10, 1985, abandoned. This application Nov. 24, 1987, Ser. No. 129,372

Int. Cl.[4] C07C *17/24, 17/34, 21/18*

U.S. Cl. 570—153 9 Claims

1. A process for preparing an unsaturated alipbatic or cycloaliphatic perfluorocarbon having at least six carbon atoms and having at least two carbon-carbon double bonds comprising contacting the corresponding unsaturated aliphatic or cycloaliphatic perfluorocarbon starting material having at least one carbon-carbon double bond in which both olefinic carbon atoms are quaternary with activated carbon at a temperature of from about 300° to about 500° C. to defluorinate said starting material, thereby forming the corresponding unsaturated aliphatic or cycloaliphatic perfluorocarbon having at least two carbon-carbon double bonds.

4,820,884

DEFLUORINATION PROCESS USING ACTIVATED CARBON

Frank J. Weigert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 73,878, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 785,960, Oct. 10, 1985, abandoned. This application Nov. 24, 1987, Ser. No. 129,371

Int. Cl.[4] C07C *17/24, 21/18, 21/24*

U.S. Cl. 570—156 10 Claims

1. A process for preparing an unsaturated aliphatic or cycloaliphatic perfluorocarbon having at least six carbon atoms and having at least one carbon-carbon double bond comprising contacting the corresponding perfluoroalkane or perfluorocycloalkane having at least two adjacent tertiary carbon atoms with activated carbon at a temperature of from about 300° to about 500° C. to defluorinate said perfluoroalkane or perfluorocycloalkane, thereby forming the corresponding unsaturated aliphatic or cycloaliphatic perfluorocarbonn having at least one carbon-carbon double bond.

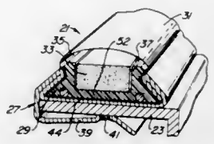
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4,820,885

MAGNETIC GASKET FOR SHIELDING AGAINST ELECTROMAGNETIC RADIATION

Tom E Lindsay, 1607 Hamilton Ave., Palo Alto, Calif. 94303

Filed Sep. 25, 1987, Ser. No. 100,930
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 GC **12 Claims**



1. A structure for shielding against electromagnetic energy penetration around edges of an enclosure opening when covered by a removeable or hinged panel, comprising:

an elongated, electrically conductive, rigid strip adapted to be held adjacent to an edge of the enclosure opening by one of said panel or said enclosure,

flexible, non-magnetic, electrically conductive sheet material carried by said strip along its length in a manner to provide an elongated enclosed space between them, and

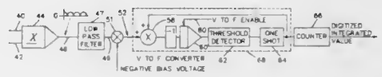
an elongated, flexible magnet contained in said enclosed space in a manner to be free floating therein and unattached to either the strip or the sheet material.

4,820,886

LOW-COST, HIGH-ACCURACY DIGITIZER SIGNAL ACQUISITION APPARATUS AND METHOD

James S. Watson, Phoenix, Ariz., assignor to Sanders Associates, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 26,217, Mar. 16, 1987, Pat. No. 4,734,546. This application Jan. 4, 1988, Ser. No. 140,648
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 **27 Claims**



1. In a digitizer having one or more conductors disposed across an area and an instrument moved across the area to selected positions to be digitized and producing an analog voltage signal having a DC component related to the position of the instrument, the improvement for producing a digital value from the signal dependent on the position of the instrument on the area comprising:

(a) voltage to frequency conversion means for receiving the analog voltage signal and for converting it to a pulsed signal at a frequency which is a monotonically increasing or decreasing function of the voltage level of the analog voltage signal; and,

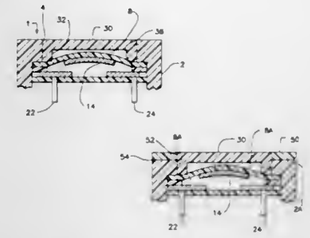
(b) counter means for receiving said pulsed signal from said voltage to frequency conversion means, for counting the pulses of said pulsed signal for an interval, and for producing at an output thereof a digital value proportional to the pulse count whereby said digital value is a monotonically increasing or decreasing function of the voltage level of the analog voltage signal.

4,820,887

MEMBRANE KEYBOARD BLOCKOUT APPARATUS

Robert Schmitz, Hatfield, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 2, 1988, Ser. No. 189,273
Int. Cl.[4] H01H *9/28, 13/70;* **B41J** *5/00;* **G06C** *7/00*
U.S. Cl. 200—43.18 **12 Claims**



1. A blockout apparatus for a membrane keyboard utilizing key members accessed for operation through respective keyboard surface frame apertures comprising

a cover means including a cover plate dimensioned to span a key member of the keyboard, to tightly fit within a respective one of the apertures providing access to the key member and to provide a substantially inflexible structure and

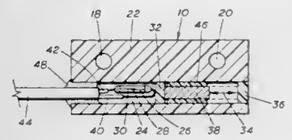
a plurality of support pedestals located on a common surface of said cover plate and arranged to contact adjacent peripheral areas of a key member upon a completed insertion of said cover plate in a respective one of the apertures to prevent further axial motion of said cover plate within the aperture whereby operation of the associated key member is precluded.

4,820,888

TILT SWITCH REPLACING MERCURY SWITCHES

Larry E. Shields, 8227 County Rd. 889, Manvel, Tex. 77578

Filed May 16, 1988, Ser. No. 194,095
Int. Cl.[4] H01H *35/02*
U.S. Cl. 200—61.45 M **2 Claims**



1. A tilt switch including in combination

an elongated housing having a cylindrical bore,

a reed switch positioned in said bore,

first and second wires connected to said reed switch and extending from one end of said bore,

a first plug positioned in said bore adjacent said reed switch,

a magnet positioned adjacent said first plug in said bore, and

a second plug positioned at the end of said bore whereby said magnet may move in said bore in response to movement of said housing upward and downward in an arc from an horizontal plane.

2. A tilt switch defined by claim **1** wherein said arc is in the range from about 22½° to about 45°.

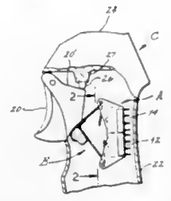
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4,820,889

TRIGGER SWITCH ASSEMBLY

Leland L. Seghetti, St. Louis, Mo., assignor to Essex Industries, Inc., St. Louis, Mo.

Filed Jan. 14, 1988, Ser. No. 143,679
Int. Cl.[4] H01H 9/06
U.S. Cl. 200—61.85 11 Claims



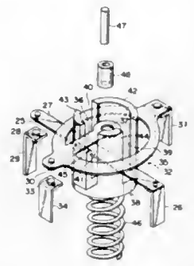
1. Apparatus in combination with at least first and second electrical switches for sequential actuation thereof, comprising first and second actuating elements each having a base portion and a resilient pressure-transferring arm extending from the base portion, means for pivotally mounting the respective first and second switches for actuation of the first and second switches upon pivoting movement of the respective first and second switch-actuating elements, and for presenting the pressure-transferring arms in mutually overlapping relation with a distal portion of a first one of the pressure-transferring arms in contact with a portion of a second one of the pressure-transferring arms such that the first and second pressure-transferring arms form between them an angle sufficient or providing an overcentered stable relationship, and means for connecting each base portion to respective ones of the switches whereby pressure received by a distal end of the second pressure-transferring arm will cause sequential collapsing movement from the over-centered relationship of the pressure-transferring arms for corresponding sequential actuation of the first and second switches.

4,820,890

THREE-FUNCTION PRESSURE SWITCH

Yuuichi Tamura, Yokohama, and Hirayoshi Suzuki, Hadano, both of Japan, assignors to Fuji Koki Mfg. Co. Ltd., Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,430
Int. Cl.[4] H01C 35/34
U.S. Cl. 200—81.4 9 Claims



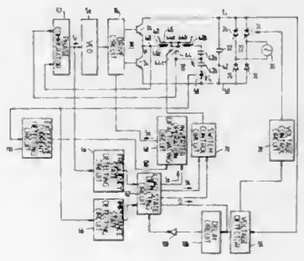
1. A three-function pressure switch comprising:
means for introducing fluid pressure;
means for responding to the flud pressure;
a casing;
a first switch means placed in said casing, said first switch means including a pair of first terminals facing each other, provided for in said casing, a first stationary contact for one of said first terminals, a first movable contact for touching said first stationary contact, and a lever member connected to another one of said first terminals at one end and provided with said first movable contact at another end such that said first movable contact is biased away from said first stationary contact by said lever member;
a second switch means placed adjacent to said first switch means in said casing, said second switch means including a pair of second terminals facing each other, provided for in said casing, a second stationary contact for one of said second terminals, a second movable contact corresponding to said second stationary contact, and a lever assembly which can work on said second movable contact to touch said second stationary contact, said second movable contact being biased away from said second stationary contact by said lever assembly, said lever assembly including a main lever and a sublever, said sublever having said second movable contact at one end and having a free end at another end, said main lever having one end connected to another end of said second terminals and having another end connected to a portion between said two ends of said sublever;
a first movable member provided in said casing between said first movable contact and said second switch means, and being capable of moving through the work of said means for responding to the fluid pressure;
a second movable member provided in said casing between said first movable member and said second switch means, and being capable of moving through the work of said means for responding to the fluid pressure with the help of said first movable member;
a first switch driving means for actuating said first switch means when the pressure of the fluid is between a first predetermined pressure value and a second predetermined pressure value;
a second switch driving means for pushing another side of the main lever of said second switch means due to the motion of said second movable member, thereby causing said second movable contact to touch said second stationary contact when the pressure exceeds a predetermined minimum pressure value;
a first switch operating means, supported on said first movable member, for operating the first switch means by acting on the lever member of said first switch means driven by said means for responding to the fluid pressure, wherein said first switch operating means causes said first movable contact to touch said first stationary contact when the pressure increases to the first predetermined pressure value, while causing said first movable contact to leave said first stationary contact when the pressure decreases to the second predetermined pressure value, where said second predetermined pressure value is lower than said first predetermined pressure value; and
a second switch operating means, supported on said second movable member and operated by said means for responding to the fluid pressure with the help of said first movable member, for operating the second switch means by rotating the sublever with respect to the main lever acting on a free end of the sublever of said second switch means, wherein said second switch operating means causes said second movable contact to touch said second stationary contact when the pressure increases to a third predetermined pressure value, causing said second movable contact to leave said second stationary contact when the pressure decreases to a fourth predetermined pressure value, where said fourth predetermined pressure value is lower than said third predetermined pressure value.

4,820,891

INDUCTION HEATED COOKING APPARATUS

Teruya Tanaka, Yokkaichi, and Katsuharu Matsuo, Nishikasugai, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1987, Ser. No. 127,927
Claims priority, application Japan, Nov. 29, 1986, 61-285037; Feb. 16, 1987, 62-33037; May 29, 1987, 62-136031
Int. Cl.[4] H05B 6/08
U.S. Cl. 219—10.77 7 Claims



1. An induction heating cooking apparatus for heating a removable cooling vessel comprising a material selected from a group consisting of materials having a high resistance and materials having a low resistance, said apparatus comprising:
power source means for supplying power;
induction heating means responsive to the power source means for inducing an eddy current in the cooking vessel, said induction means including means for generating a high frequency current for inducing a magnetic field and induction coil means for inducing the eddy current responsive to the magnetic field;
impedance state detection means for detecting the high frequency current;
frequency state detection means for detecting the frequency of the high frequency current; and
a control means for, in response to said impedance state detection means and said frequency state detection means, generating a first control signal to control said power source means and second and third control signals to control said induction heating means.

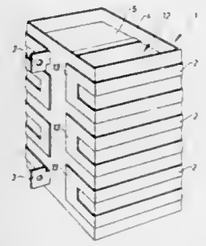
4,820,892

HEATING ARRANGEMENT FOR PACKING CONTAINERS HOLDING LIQUID CONTENTS

Gert Holmström, Lund, and Paul Mellbin, Bara, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Continuation of Ser. No. 893,203, Aug. 5, 1986, abandoned. This application Mar. 10, 1988, Ser. No. 169,140
Claims priority, application Sweden, Aug. 22, 1985, 8503912
Int. Cl.[4] H05B 6/12
U.S. Cl. 219—10.491 5 Claims

1. Apparatus for heating the liquid contents of packing containers,
said apparatus employing a high freuqency electromagnetic field and comprising:
an electrically insulating shell to receive packing containers therein, said insulating shell being arranged to allow displacement of a packing container along a predetermined path;
means for feeding a packing container of the type having a layer of metal foil and a joint extending along a region of overlap of the layer of metal foil into said electrically insulating shell with said region of overlap being substantially parallel with said path; and
an electromagnetic induction coil mounted on a portion of the exterior of said shell to produce an electromagnetic field in the interior of said shell along said path, said coil having coil segments spaced apart from each other along said shell to define a region extending parallel to said path and positioned to be aligned with the region of overlap of



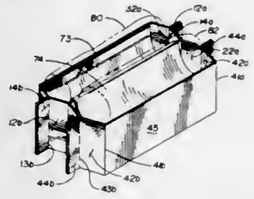
packing containers received in said electrically insulating shell;
whereby when a high frequency generator is connected to said induction coil any container in said shell will be heated without overheating the region of overlap.

4,820,893

TWO-CELLED EXPANDABLE MICROWAVE COOKING SLING

Duane R. Mode, Bloomington, Minn., assignor to Waldorf Corporation, St. Paal, Minn.

Filed May 2, 1988, Ser. No. 189,205
Int. Cl.[4] H05B 6/80; B65B 25/22
U.S. Cl. 219—10.55 E 6 Claims



1. A collapsible package for use in heating and browning food by microwave energy comprising:
a first sling enclosure comprising a pair of parallel, opposed substantially rectangular wall panels, the opposed ends of said wall panels being joined by collapsible bridge panels, movable between a collapsed position in which the wall panels lie against each other and an extended position in which the wall panels are held in spaced relation to each other;
a second sling enclosure comprising a pair of parallel, opposed substantially rectangular wall panels, the opposed ends of said wall panels being joined by collapsible bridge panels, movable between a collapsed position in which the wall panels lie against each other and an expanded position in which the wall panels are held in spaced relation to each other, said second sling enclosure being joined to said first sling enclosure at a center fold line between adjacent wall panels of said first and second sling enclosures; and
a generally rectangular strip of thin, flexible material capable of converting microwave energy into heat, one of two opposed edges of said strip being affixed to each of the two side walls of the first and second sling enclosures not connected at said center fold line, such that the portion of said flexible strip intermediate said affixed edges is draped over the two side walls joined at the common fold line to

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form a sling of said flexible material in each of said sling enclosures.

4,820,894

ELECTRO-EROSION MACHINE FOR AUTOMATIC MACHINING ACCORDING TO A CLOSED TRAJECTORY

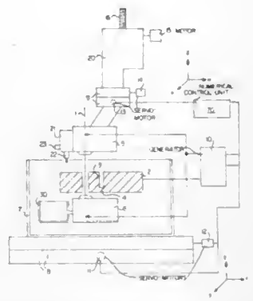
Corcelle Francois, Thoiry, France, and Lakatos Laszlo, Les Avanchets, Switzerland, assignors to Charmilles Technologies S.A., Geneve, Switzerland

Filed Nov. 2, 1987, Ser. No. 116,043

Claims priority, application Switzerland, Oct. 30, 1986, 4291/86

Int. Cl.[4] B23H *7/02*

U.S. Cl. 219—69.12 **20 Claims**



1. An electro-erosion machine for machining a workpiece and separating, at a certain predetermined time during a machining operation, a clipping formed in a workpiece and retained by a narrow bridge of material, said machine comprising:

an upper arm movably positioned over said workpiece;

means for selectively positioning said upper arm over said workpiece;

a machining head mounted to said upper arm;

an auxiliary ejection device mounted to said upper arm and operable in a vertical direction to rupture said bridge and separate said clipping from said workpiece so that said clipping falls downwardly from said workpiece; and

a numerical control device for controlling the operation of said machine.

4,820,895

ELECTRIC DISCHARGE MACHINE POSITION FINDING APPARATUS

Haruki Obara, Sagamihara, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP84/00601, § 371 Date Aug. 7, 1985, § 102(e) Date Aug. 7, 1985, PCT Pub. No. WO85/02800, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 18, 1984, Ser. No. 767,267

Claims priority, application Japan, Dec. 23, 1983, 58-243587

Int. Cl.[4] B23H *1/02*

U.S. Cl. 219—69.13 **5 Claims**

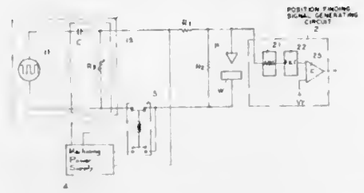
1. An electric discharge machining position finding apparatus for repeatedly impressing a pulse-shaped voltage of positive and negative polarity across a tool electrode and a workpiece, and for determining the relative positions of the tool electrode and the workpiece by sensing contact between the tool electrode and the workpiece, comprising:

a machining power supply unit for applying power for electric discharge machining across the tool electrode and the workpiece;

a pulse oscillator for generating a square wave of a prescribed period at output terminals;

a differentiating circuit, coupled to said pulse oscillator, for receiving the square wave generated by said pulse oscillator and for producing a differentiated waveform, said differentiating circuit comprising a capacitor and a resistor coupled in series with the output terminals of said pulse oscillator, said differentiating circuit having output terminals at the terminals of said resistor; and

a switching device, coupled to said differentiating circuit,



said machining power supply unit and the workpiece, for applying the power for electric discharge machining from said machining power supply unit across the tool electrode and the workpiece when machining is to be performed, and for applying the differentiated waveform produced by said differentiating circuit across the tool electrode and the workpiece when position finding is to be performed.

4,820,896

METHOD AND APPARATUS PRODUCING DRAWN COPPER WIRE FROM AN ELECTRICAL SEAM WELDER

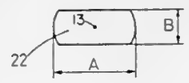
Wolfgang H. Weil, Heitersheim, Fed. Rep. of Germany, and Hanspeter Fankhauser, Irvington, N.Y., assignors to Elpatronic, AG, Switzerland

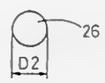
Filed Apr. 23, 1985, Ser. No. 726,095

Claims priority, application Switzerland, Apr. 24, 1984, 2029/84

Int. Cl.[4] B23K *35/00, 11/32*

U.S. Cl. 219—83 **13 Claims**





1. A method permitting multiple applications of a copper wire which is employed in a first use or application as a wire electrode for electrical resistance seam welding, particularly for tinned sheets, and for this purpose is deformed into a wire having a plurality of concentric peripheral regions about a longitudinal center with a cross-section different from a circular form, particularly into a substantially flat wire, before this first application and hardened in this form and which is contaminated during this first application in that region coming into contact with a weld by material originating from the weld and passing over to the wire during welding, characterized in that after the first application, the deformed and contaminated copper wire is passed to a wire-drawing device comprising a multiplicity of drawing stages and is drawn there in such a manner that the distances of the peripheral regions of the wire most distant from the center of the wire are reduced in all drawing stages and the distances of the peripheral regions of the wire nearest to the center of the wire are reduced in at least one part of the drawing stages and further that the distances of the peripheral regions most distant from the center of the wire are reduced successively in the drawing stages, at least to such an extent that said regions become smaller than the distances of the peripheral regions nearest to the center of the wire before drawing and that the distances of the peripheral regions nearest to the center of the wire are reduced in the said one part of the drawing stages to such an extent that after passing the last drawing stage they are as large as the distances of the peripheral regions of the wire having previously been most distant from the center of the wire, all of the drawing and reduction steps being carried out on the copper wire while retaining in the drawn wire material on the wire entering the drawing device so that a new round copper wire with circular cross-section and a smaller diameter than the smallest outside dimension of said deformed and contaminated copper wire is drawn from said deformed and contaminated copper wire in the wire-drawing device, and that this new round copper wire is supplied for a further application.

4,820,897

PROCESS FOR PRODUCING MINIATURE PIEZOELECTRIC DEVICES USING LASER MACHINING AND DEVICES OBTAINED BY THIS PROCESS

René Lefevre, 8 allée Van Gogh, 78160 Marly, France

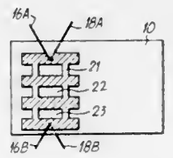
Continuation of Ser. No. 686,283, Dec. 26, 1984, abandoned. This application May 5, 1987, Ser. No. 51,263

Claims priority, application France, Dec. 28, 1983, 83 20963

The portion of the term of this patent subsequeot to Nov. 11, 2004, has been disclaimed.

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.67 **4 Claims**



1. A process for producing piezoelectrical devices, in which a piezoelectric material is cut to give it an appropriate shape, comprising the steps of choosing the piezoelectric material from the group including lithium tantalate and lithium niobate, cutting the said piezoelectric material with a laser beam, said laser beam having a wavelength chosen so that the piezoelectric material is substantially transparent to the laser beam, the laser beam operating in a pulse manner to effect the said cutting of the piezoelectric material.

4,820,898

ION BEAM APPARATUS FOR FINISHING PATTERNS

Hendrik N. Slingerland, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 14, 1987, Ser. No. 85,991

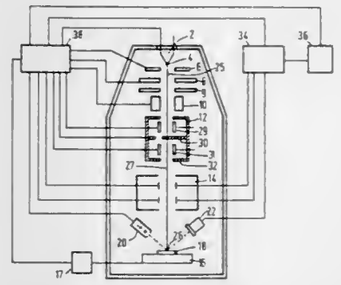
Claims priority, application Netherlands, Aug. 27, 1986, 8602176

Int. Cl.[4] B23K *15/00*

U.S. Cl. 219—121.12 **11 Claims**

1. An apparatus for both removing and replenishing material at a surface of a carrier comprising

a liquid metal ion source generating an ion beam onto the surface of the carrier,



means for adjusting ion beam current from a comparatively low value for material removal to a comparatively high value for material deposition.

4,820,899

LASER BEAM WORKING SYSTEM

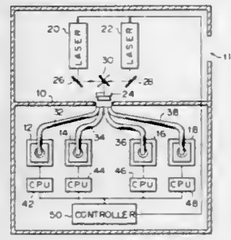
Ikuo Hikima, Kawasaki; Akira Miyaji, Tokyo; Saburo Kamiya, and Akikazu Tanimoto, both of Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 161,944

Claims priority, application Japan, Mar. 3, 1987, 62-46782; Jul. 20, 1987, 62-180479

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.76 **9 Claims**



1. A laser working system, comprising:

supplying means for supplying a laser beam;

a working unit including a stage for supporting a workpiece and means for exposing said workpiece to the laser beam;

a room unit, including wall means for surrounding said working unit, for accommodating said working unit to spatially isolate it from outside of said wall means, said supplying means being arranged outside said room unit and including first and second laser units each for generating said laser beam; and

beam guiding means for creating a first light path for optically communicating said first laser unit with said working unit through said wall means, and a second light path for optically communicating said second laser unit with said working unit through said wall means, respectively.

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VACUUM PLASMA SPRAY SYSTEM WITH SEALED MANIPULATOR

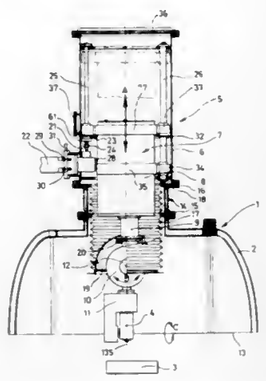
Hans-Michael Höhle, Ladenburg; Werner Pick, Bad Soden-Salmünster, and Michael Malakas, Linsengericht, all of Fed. Rep. of Germany, assignors to The Perkin-Elmer Corp., Norwalk, Conn.

Filed Sep. 1, 1987, Ser. No. 91,816

Claims priority, application European Pat. Off., Sep. 2, 1986, 86112122

Int. Cl.[4] B05B *7/20*

U.S. Cl. 219—121.47 15 Claims



1. A vacuum plasma spray system including a spray chamber (2) in which a workpiece (3) can be placed, means for producing a vacuum in the spray chamber, a motor-driven manipulator (5) including a drive mechanism and a respective control system, and a plasma gun (4) mounted on the manipulator (5) in the spray chamber such that the position of the plasma gun can be changed relative to the workpiece (3) in at least two axes by means of the manipulator (5), the drive mechanism and the control system being hermetically sealed against the spray chamber in housing parts (6,7) of manipulator (5) fastened to the spray chamber (2), the drive mechanism of the manipulator (5) comprising at least two drive groups of which a first drive group (21) facilitates upward and downward motion (A) of the gun (4) for adjusting the spray distance and a second drive group (44) facilitates a swiveling motion (B) of the gun (4) around a horizontal axis (12); wherein the manipulator (5) has a hermetically sealed outer housing (6) and a hermetically sealed inner housing (7) contained in the outer housing (6), the inner housing (7) contains the second drive group (44), protrudes into the spray chamber and carries the gun (4) situated in the spray chamber, and the first drive group (21) is arranged at least partially in the outer housing (6) to effect lifting or lowering of the inner housing (7) thereby adjusting spray distance.

4,820,901

QUICK RELEASABLE GROUND AND ROD CLAMP FOR WELDING

Thomas P. Peviani, 16550 Bushard St., Fountain Valley, Calif. 92708

Filed Feb. 8, 1988, Ser. No. 153,088

Int. Cl.[4] B23K *9/28, 9/32*

U.S. Cl. 219—138 20 Claims

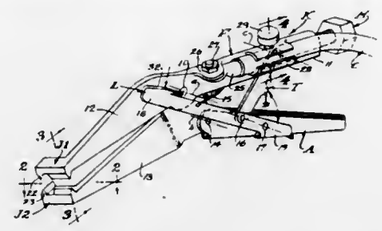
1. A quick releasable welder's clamp for mechanical engagement onto and electrical continuity into a work piece or rod, and including;

an elongated frame disposed about a transverse pivot and axis and comprised of a handle portion extending rearwardly and a lever arm extending forwardly,

an actuating lever carried by the pivot and extending rearwardly therefrom and complementary to and underlying the handle portion of the frame and from which a lever arm extends forwardly and complementry to and underlying the lever arm of the frame,

a toggle link adapted to be releasably set by adjustment means in an adjusted over-center position and operable between the handle portion of the frame and the actuating lever to force the two arms into spaced relationship,

a release lever carried by a pivot on the actuating lever and having a lever arm extending forwardly with a pad at the



exterior of the frame for manual depression and having a lever arm extending rearwardly and engageable beneath the toggle link to lift the same from said over-center position,

and opposed jaws carried by the complementary lever arms at the ends thereof remote from the pivot and axis for pressured engagement with opposite sides of a work piece or rod placed therebetween,

there being an anchor coupling means mechanically and electrically connecting an electric cable to the frame.

4,820,902

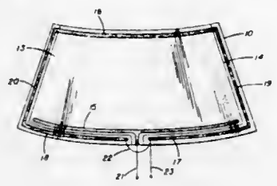
BUS BAR ARRANGEMENT FOR AN ELECTRICALLY HEATED TRANSPARENCY

F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 28, 1987, Ser. No. 138,008

Int. Cl.[4] H05B *3/26;* **E06B** *7/12;* **B60J** *1/20*

U.S. Cl. 219—203 11 Claims



1. An electrically heated transparency comprising: a transparent sheet, a transparent electroconductive coating on a major surface of the sheet, a first bus bar in contact with the coating along a first edge portion of the sheet, a second bus bar in contact with the coating along a second edge portion of the sheet opposite the first edge portion, an electroconductive extension extending from each end of the second bus bar to the first edge portion along third and fourth edge portions respectively, the extensions being electrically insulated from the coating.

4,820,903

CLOSED TYPE HEATING APPARATUS

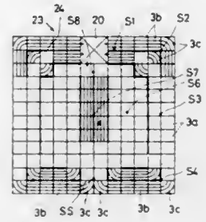
Goro Ishida, 865-7, Maekaizuka-cho, Funabashi-shi, Chiba-ken, Japan

Filed Feb. 5, 1988, Ser. No. 152,788

Claims priority, application Japan, Feb. 6, 1987, 62-25791; Feb. 6, 1987, 62-16385; Apr. 15, 1987, 62-92742; Jun. 19, 1987, 62-153849; Jun. 19, 1987, 153850; Jun. 19, 1987, 62-153851; Jun. 19, 1987, 62-153852; Jun. 19, 1987, 62-153853; Jun. 19, 1987, 62-95143; Jul. 29, 1987, 62-187650

Int. Cl.[4] A47C *21/04*

U.S. Cl. 219—213 17 Claims



1. A closed type heating apparatus comprising:

a base plate;

at least one space defining member including a top plate having a number of openings and a supporting means for supporting the top plate on the base plate, said base plate and said space defining member being coupled with each other to form a closed space;

means for heating air inside the closed space; and

means for circulating the air heated by said heating means within said closed space;

wherein said supporting means includes a pillar and a fin rotatably secured to said pillar.

4,820,904

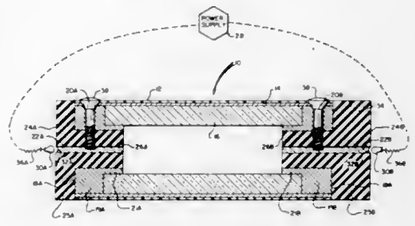
ELECTRICAL CONTACTING DEVICE FOR FUSING ROLLER

Carl T. Urban, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 2, 1987, Ser. No. 115,322

Int. Cl.[4] H05B *3/46*

U.S. Cl. 219—216 10 Claims



1. A fusing roller of the type having an inner base core with an insulative outer surface for supporting fusing roller layers including an outer protective layer and a resistive heating layer disposed between said insulative surface and said outer protective layer, said roller having an electrical contacting structure for providing electrical continuity between a power supply and the resistive heating layer, characterized in that said contacting structure includes:

a conductive annular element adjoining an end of said core to form a substantially continuous cylindrical surface with said insulative surface, which continuous cylindrical surface contacts and supports an inner surface of said resistive heating layer; and

means for electrically connecting said conductive annular element to the power supply.

4,820,905

CARBONIZING FURNACE

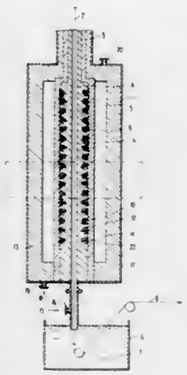
Yoshikazu Iwata; Makoto Sugiyama, and Motohisa Miyauchi, all of Shizuoka, Japan, assignors to Toho Rayon Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1987, Ser. No. 71,448

Claims priority, application Japan, Jul. 9, 1986, 61/159587

Int. Cl.[4] H05B *3/64*

U.S. Cl. 219—390 10 Claims



1. A carbonizing furnace comprising a heating chamber for carbonizing fibers, which comprises a wall having channels therein, a carbon heater in the channels, a heat insulator composed of carbon fiber felt and a ceramic fiber felt which covers the heating chamber such that the carbon fiber felt is in contact with the heating chamber and the ceramic fiber felt is separated by a space from the carbon fiber felt by a distance of at least about 5 cm, and a housing enclosing the heating chamber and the heat insulator, and a means for filling the insulator with an inert gas.

4,820,906

LONG ARC LAMP FOR SEMICONDUCTOR HEATING

Timothy J. Stultz, San Jose, Calif., assignor to Peak Systems, Inc., Fremont, Calif.

Filed Mar. 13, 1987, Ser. No. 25,306

Int. Cl.[4] H05B *31/24*

U.S. Cl. 219—405 4 Claims



1. A long arc lamp for heating a semiconductor wafer, comprising:

a pair of spaced electrodes;

a transparent casing enclosing said electrodes and the space between said electrodes; and

a volume of gas enclosed within said casing and having a peak light emission wavelength with an energy greater than an energy band gap of said semiconductor wafer;

said electrodes having first and second ends with the first

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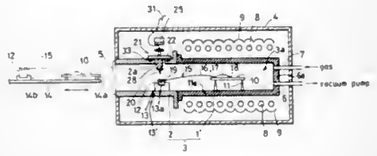
ends facing each other, said casing enclosing a pair of spaces adjacent respective second ends of said electrodes, said casing defining a gap between said casing and said electrodes to allow the passage of said gas between said pair of spaces and an area between said electrodes at low temperatures, said electrodes being expandable at high temperature to close said gap.

4,820,907

CONTROLLED FURNACE HEAT TREATMENT

Kenichi Terauchi, and Takeo Okamoto, both of Hazukashi, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 11, 1987, Ser. No. 131,634
Claims priority, applicatioo Japan, Dec. 11, 1986, 61-296131
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—494 **8 Claims**



1. A heat treatment apparatus for performing heat treatment of a substrate, comprising:
- a heating furnace having an inlet/outlet port means for transferring said substrate into and out of the furnace;
- a heat source for heating said heating furnace;
- (a) door means mounted on said inlet/outlet port means for opening and closing said heating furnace;
- a thermocouple including two types of metal wires having a common contact point formed by respectively connecting first ends of said two types of metal wires to said substrate;
- a terminal mount provided with fixed terminals in correspondence to said metal wires of said thermocouple, ends of said two types of metal wires of said thermocouple opposite said first ends being respectively connected to said fixed terminals;
- carrier means for introducing said substrate, said thermocouple and said terminal mount, being coupled with each other, into a prescribed position in said heating furnace through said inlet/outlet port means and discharging said substrate, said thermocouple and said terminal mount, being coupled with each other, from said prescribed position in said heating furnace; and
- a terminal driving mechanism provided with movable terminals in correspondence to said fixed terminals and mounted on a furnace wall portion of said heating furnace,

said terminal driving mechanism retaining said movable terminals in selective contact with said fixed terminals contained in said prescribed position of said heating furnace to thereby extract output signals of said thermocouple from said movable terminals.

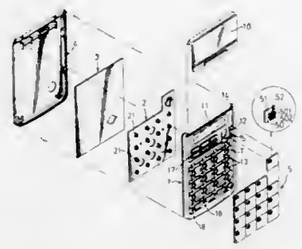
4,820,908

COMBINED CALCULATOR AND PUZZLE GAME DEVICE

Chih-Ming Wei, Taipei, Taiwan, assignor to Limax Electronics Co., Ltd., Taipei, Taiwan

Filed Jun. 21, 1988, Ser. No. 209,523
Int. Cl.[4] G06C *7/02*
U.S. Cl. 235—145 R **1 Claim**

1. A combined calculator and puzzle game device comprising:
- a base tray;
- a calculator printed circuit board mounted in said base tray;
- a rubber membrane placed on said calculator printed circuit board and having projecting keys;
- a cover board placed over said rubber membrane and connected to said base tray, said cover board having a panel which has a plurality of rows of holes allowing said projecting keys to extend through said panel, and plate-like guide pieces interspaced and lying in a plane above said panel, each of said guide pieces having a bottom neck support projecting from said panel, said guide pieces being arranged in rows which are interspaced so as to form grooves which intersect at locations in agreement with the alignment of said holes, said grooves being restricted between said guide pieces and broadened between said bottom neck supports, each of said guide pieces being marked with a numeral;



game pieces movably disposed on said guide pieces, each of said game pieces having a bottom projecting neck which has an end flange, said projecting necks of said game pieces movably extending into said grooves, said end flanges of said game pieces preventing said game pieces from being released from said cover board, each of said game pieces partially covering parts of four adjacent guide pieces and having an opening for exposing said numeral of one of said four adjacent guide pieces, said projecting necks of said game pieces pushing said projecting keys when said game pieces are depressed, said game pieces further having marks thereon which can be combined to form a particular pattern or a combination of characters upon rearranging said game pieces;
- said cover board further having a vacant recess capable of receiving one of said game pieces for allowing said game pieces to move for rearrangement.

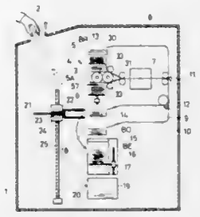
4,820,909

TRANSACTING DEVICE

Masataka Kawauchi, Ishioka; Mitsuyoshi Sato, Ibaraki; Tamio Innami, Tsuchiura, and Takeshi Katoh, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1987, Ser. No. 57,253
Claims priority, application Japan, Jun. 4, 1986, 61-127955; Jun. 4, 1986, 61-127953
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **27 Claims**

1. A transacting device adapted for use as a circular type cash dealing device in which deposit currencies are utilized as payment currencies, which comprises:
- a first accumulation unit for receiving and accumulating the deposit currencies;
- a second accumulation unit, disposed in such a way that said second accumulation unit is enterable in said first accumulation unit, for accumulating first payment currencies;
- a third accumulation unit, disposed in the vicinity of said second accumulation unit, for accumulating second payment currencies;
- a separating unit, provided in the proximity of said accumulation units, for separating and selectively transferring the paper currencies accumulated in each of said accumulation units;
- an identifying unit for identifying the separated and transferred currencies with respect to authenticity, monetary classification and the number of currencies;
- an accumulation unit for accumulating the paper currencies which have undergone the identifying process by dividing the currencies into at least payment currencies and non-payment currencies;
- an accumulation unit for accumulating unidentifiable currencies and the payment currencies;



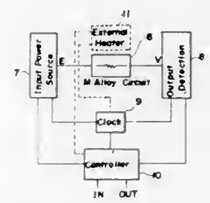
- carrying means for carrying the paper currencies from said identifying unit to said selected accumulation unit on the basis of the identifying results of the paper currencies which are given by said identifying unit;
- an enclosing unit for enclosing the deposit and payment currencies; and
- paper currency transferring means for transferring the paper currencies en bloc between said accumulation units, said enclosing unit and money receiving/paying port.

4,820,910

SECURITY SYSTEM AND LOCK

Yakichi Higo, Tokyo, and Hiroshi Morimoto, Himeji, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka and Yakichi Higo, Tokyo, both of, Japan

Filed Aug. 14, 1986, Ser. No. 896,666
Claims priority, application Japan, Aug. 30, 1985, 60-189868
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—439 **16 Claims**



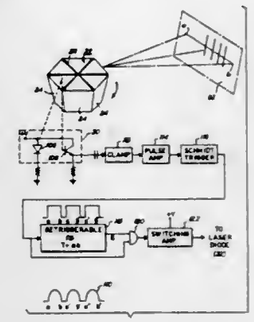
1. A security system, comprising:
- (a) a temperature-resistance conversion element having a hysteresis loop characteristic which exhibits a peak electrical resistance at a peak time after the temperature of the element has been raised and then lowered;
- (b) temperature changing means operative from a start time for raising and then lowering the temperature of the element to generate the peak electrical resistance;
- (c) means for detecting the generation of the peak electrical resistance;
- (d) timing means responsive to the detecting means, for measuring a time interval between the start time and the peak time; and
- (e) control means responsive to the timing means, for generating a security signal when the time interval lies within a predetermined range.

4,820,911

APPARATUS FOR SCANNING AND READING BAR CODES

Kevork Arackellian, Rochester; John A. Boles, Fishers, and Jay M. Eastman, Pittsford, all of N.Y., assignors to Photographic Sciences Corporation, Rochester, N.Y.

Filed Jul. 11, 1986, Ser. No. 884,683
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—467 **47 Claims**



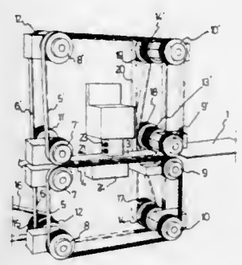
1. In a bar code scanning apparatus having a deflector which deflects an optical beam along a scan path in a nominal plane to intersect the bars of a bar code in said plane, the improvement comprising an anamorphic optical system having a plurality of optical elements for providing a first astigmatic focus in said plane and a second orthogonal astigmatic focus alignable generally paralleling the bars of said code and located far beyond said plane.

4,820,912

METHOD AND APPARATUS FOR CHECKING THE AUTHENTICITY OF DOCUMENTS

Johan Samyn, Roeselare, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Sep. 19, 1986, Ser. No. 910,153
Claims priority, application Netherlands, Sep. 19, 1985, 8502567
Int. Cl.[4] G01R *27/04*
U.S. Cl. 235—449 **11 Claims**



1. A method of checking the authenticity of documents, made of a non-conducting material and having a physical characteristic of which the value randomly changes over a number of sub-areas of a checking-area, and further comprising a digital mark which is characteristic of the distribution of said value over said sub-areas, the method comprising scanning said

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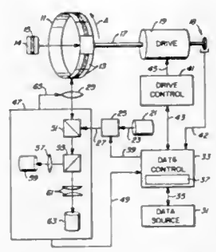
checking-area of such document for detecting the distribution of said value over said sub areas, producing a digital scanning signal which is characteristic of such distribution as scanned, reading said digital mark on said document and producing a digital mark-signal characteristic of the digital mark as read, and comparing said scanning signal with said mark signal, characterized by the use of documents comprising a number of particles with electromagnetic properties which are sensibly different from those of said non-conducting material and which are randomly distributed in at least said checking area, and that said scanning is conducted by means of a microwave bundle impinging on said checking-area and producing a response microwave bundle and by measuring said response bundle.

4,820,913

MULTIPLE CARD RECORDING SYSTEM

Richard Haddock, Redwood City, Calif., assignor to Drexler Technology Corporation, Moutain View, Calif.

Filed Dec. 2, 1986, Ser. No. 937,648
Int. Cl.[4] G06K *1/18, 13/08*
U.S. Cl. 235—487 **12 Claims**



1. A data card recording system comprising,

a rotatably mounted drum having means for gripping a plurality of data cards around the drum circumferential surface in a longitudinally skewed fashion to a direction of drum rotation, each card being offset from a next card by a distance dependent upon a desired track pitch, each of said plurality of data cards having a strip of laser recordable optical data storage material disposed thereon,

means in communication with a data source for storing a digital data segment,

a light source emitting a light beam, said beam being directed and focused along an optical path to said plurality of data cards, said beam having a size on said cards of at most five microns,

means for modulating said light beam in response to said data segment, said beam producing data spots corresponding to said data segment in one of a plurality of parallel tracks on each of said data cards in sequence, one card after another, said tracks being aligned in a direction of drum rotation, and

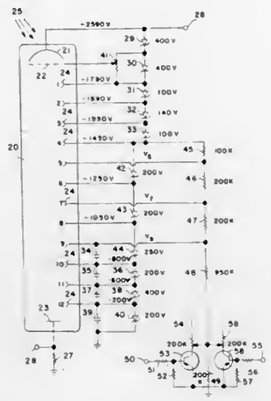
means for moving the relative transverse position between said beam and said plurality of data cards, additional data segments being recorded in others of said plurality of parallel tracks on each of said data cards, said means for moving being continuously operable.

4,820,914

GAIN CONTROL OF PHOTOMULTIPLIER TUBES USED IN DETECTING DIFFERENTIAL ABSORPTION LIDAR RETURNS

Robert J. Allen, Tabb, Va., assignor to Vigyan Research Associates, Inc., Hampton, Va.

Filed Jan. 20, 1988, Ser. No. 146,093
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—207 **16 Claims**



1. A gain control of a photomultiplier tube (PMT) used in detecting differential absorption LIDAR returns in which the potentials on the dynodes of the PMT are controlled by a network of electrical elements comprising:

means connected between a dynode numbered n and dynode n+2, between dynode n+2 and dynode n+4, and between dynode n+4 and dynode n+6 for maintaining the dynodes n+2, n+4 and n+6 at their normal operating potentials providing a fixed voltage reference;

a voltage divider means connected to the dynodes numbered n, n+1, n+3 and n+5 for maintaining the dynodes n+1, n+3 and n+5 at their normal operating potentials for maximum gain of the PMT; and

switching means for altering said voltage divider means to change the potentials to dynodes n+1, n+3 and n+5 to thereby reduce the gain of said PMT to different discrete levels.

4,820,915

COLOR SENSOR WITH AMORPHOUS PIN STRUCTURE

Yoshihiro Hamakawa, Kawanishi; Funio Koike, Yokohama, and Tetsuya Miyagishi, Kamakura, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

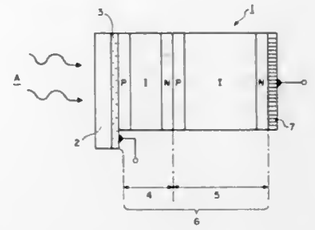
Filed Oct. 5, 1987, Ser. No. 105,440
Claims priority, application Japan, Oct. 8, 1986, 61-237879
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 J **8 Claims**

1. A color measuring apparatus comprising

a color sensor having a layered body obtained by stacking a first photoelectric sensor which is constituted by an amorphous semiconductor having a PIN structure and a spectral sensitivity which has a peak with respect to blue light and a second photoelectric sensor which is constituted by an amorphous semiconductor having a PIN structure and a spectral sensitivity which has a peak with respect to red light, so that a p-n junction is formed therebetween,

a pair of electrodes provided at both ends of said body, at least one of said pair of electrodes being transparent,

bias voltage applying means for applying at least three different bias voltages between said pair of electrodes using a first bias voltage V_a to obtain a first spectral sensitivity I_a, a second bias voltage V_b to obtain a second spectral sensitivity I_b and a third bias voltage V_c to obtain a third spectral sensitivity I_c with the sensitivities I_a, I_b and I_c being the three primary colors green, red and blue, respectively, with the spectral sensitivities being related by corresponding currents I_{Va}, I_{Vb} and I_{Vc} produced by the respective bias voltages V_a, V_b and V_c as $I_a=I_{Va}$, $I_b=I_{Vb}-I_{Va}$ and $I_c=I_{Vc}-I_{Vb}$,



photocurrent detecting means for detecting photocurrents I_{Va}, I_{Vb} and I_{Vc} corresponding to respective bias voltages, and

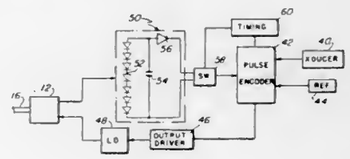
color discriminating means for discriminating a color of light incident on said color sensor on the basis of said photocurrent detecting means.

4,820,916

OPTICALLY POWERED SENSOR SYSTEM

Douglas R. Patriquin, Middlebury, Vt., assignor to Simmonds Precision Products, Tarrytown, N.Y.

Filed May 5, 1987, Ser. No. 46,075
Int. Cl.[4] H01J *5/16;* **G01D** *5/34*
U.S. Cl. 250—227 **17 Claims**



1. An optically powered sensor system comprising:

an optical energy source for transmitting optical energy;

an optical pathway for conveying the optical energy transmitted by said optical energy source;

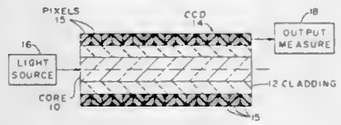
at least one sensor connected to said optical pathway for receiving optical energy from said optical energy source, said sensor including means for converting optical energy from said optical pathway to electricity and storing the electrical energy, a transducer responsive to a selected parameter and having an electrical characteristic that varies as a function of the selected parameter, a reference component having an electrical characteristic that is independent of the selected parameter, circuit means for providing electrical energy from said converting and storing means to said transducer and said reference component and producing a multi-pulse output having a first time attribute that is a function of the electrical characteristic of said transducer and a second time attribute that is a function of the electrical characteristic of said reference component.

4,820,917

STRESS AND TEMPERATURE MAPPING USING AN ARRAY OF OPTICAL FIBERS AND CHARGE COUPLED DEVICES

John T. Ioannou, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 18, 1987, Ser. No. 135,056
Int. Cl.[4] H01J *5/16;* **G01K** *11/00*
U.S. Cl. 250—227 **11 Claims**



1. An apparatus for measuring bending imposed on an optical fiber comprising:

means for passing light through the fiber,

a light sensing layer located on the surface and along the length of said fiber for sensing the magnitude of light escaping from the fiber as a function of the location of bending, and

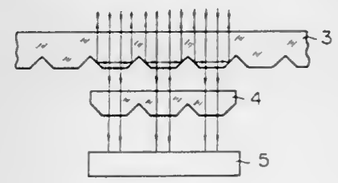
means for scanning the light sensing layer to determine the location of bending.

4,820,918

OPTICAL ENCODER INCLUDING TRANSPARENT SUBSTRATES HAVING FORMED INDICATORS THEREIN

Masahiko Igaki; Masahiro Rachi, both of Tokyo, and Tomohiro Maekawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,430
Claims priority, application Japan, Jun. 28, 1985, 60-143129; Jun. 28, 1985, 60-143130; Jul. 1, 1985, 60-144211; Jul. 1, 1985, 60-144212; Jul. 1, 1985, 60-144213; Jul. 1, 1985, 60-144214; Jul. 1, 1985, 60-144215
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **27 Claims**



1. An optical encoder comprising:

light projecting means;

an optical scale for modulating light projected from said light projecting means, said scale having a translucent part defining a surface and a mark-bearing area protruding from said surface, said scale further having a light-transmitting portion and a non-light-transmitting portion, said non-light-transmitting portion comprising a slanted face having an incident angle to light incident from said light projecting means which is larger than the critical angle, said light-transmitting and non-light-transmitting portions being alternately formed on said protruding mark-bearing area; and

photoelectric converting means for converting the light, modulated by said optical scale, into an electrical signal, wherein said protruding mark-bearing area has a trapezoidal cross-sectional shape, defining a face which corresponds to a sloped side of said trapezoidal shape and

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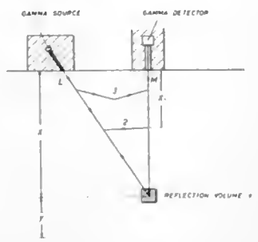
having an incident angle to light incident from said light projecting means which is larger than the critical angle.

4,820,919

METHOD OF DETERMINING THE DENSITY OF SUBSTRATA

Flemming Berg, Skovlunde; Povl L. Olgaard, Roskilde, and John L. Jorgensen, Kastrup, all of Denmark, assignors to Statens Vejlaboratorium, Denmark

Continuation of Ser. No. 863,705, May 15, 1986. This application Jun. 6, 1988, Ser. No. 205,610
Claims priority, application Denmark, May 28, 1985, 60-2377
Int. Cl.[4] G01N *9/24, 23/02;* **G01V** *5/12*
U.S. Cl. 250—269 **2 Claims**



1. A method of determining the density of substrata comprising:

(a) irradiating the substrate by means of a directional gamma-ray radiation source and detecting the quanta of gamma-ray radiation backscattered from the substrata by a directional detector and by changing the direction of radiation relative to the direction of detection and measuring the change of the detected signal, the direction of radiation and the direction of detection being always in substantially the same plane;

(b) counting the number of gamma rays received by the detector and providing a spectrum of counts versus energy of the detected gamma rays; and

(c) determining the variation of the density with the depth of irradiation by calculating the average density in two depth intervals based on the countings in two energy intervals by utilizing the quanta backscattered a plurality of times, in which, the quanta backscattered N times being backscattered on average from a depth greater than the quanta backscattered N+1 times and the quanta backscattered N times having on average a different energy than the quanta backscattered N+1 times.

4,820,920

METHOD AND APPARATUS FOR DETECTING DANGEROUS SUBSTANCES

John M. Bather, Prestbury, United Kingdom, assignor to Analytical Security Systems Limited, Manchester, United Kingdom

Filed Apr. 24, 1987, Ser. No. 43,905
Int. Cl.[4] B01D *59/44*
U.S. Cl. 250—282 **6 Claims**

1. A method of detecting a dangerous substance in an article in transit comprising the steps of:

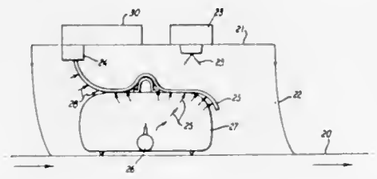
exposing the article to microwave or radiofrequency radiation to vaporize a component of said dangerous substance;

taking a sample of vapor from the vicinity of the article;

causing the sample to enter an ionization chamber of a mass spectrometer;

obtaining a mass spectrum of one or more constituents of the sample;

comparing the mass spectrum with one or more reference spectra; and



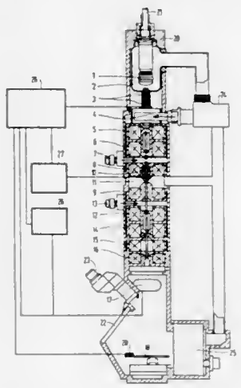
generating a signal indicative of any dangerous substance in the sample.

4,820,921

METHOD OF BEAM CENTERING

Johan G. Bakker, Eindhoven, and Karel D. Van Der Mast, Pijnacker, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 14, 1987, Ser. No. 85,992
Claims priority, application Netherlands, Aug. 27, 1986, 8602175
Int. Cl.[4] H01J *37/147*
U.S. Cl. 250—307 **13 Claims**



1. A method of centering a beam of charged particles in a charged particle beam apparatus comprising the steps of

forming a beam of charged particles by using a particle source, a system of lenses, a wobbler, an objective lens system, and a central control device,

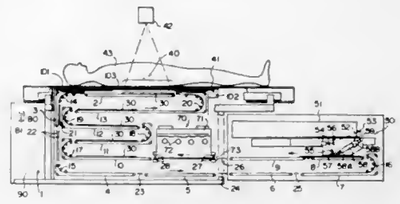
determining image displacements for two different wobbler adjustments with respect to an image located between said displaced images and corresponding to a third wobbler adjustment, and then readjusting the beam to make said different image displacements equal.

4,820,922

RADIATION IMAGE RECORDING AND READ-OUT APPARATUS WITH SECTORED IMAGE RECORDING CAPABILITY

Nobuyoshi Nakajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 18, 1985, Ser. No. 789,259
Claims priority, application Japan, Oct. 19, 1984, 59-220278
Int. Cl.[4] G01N *23/04*
U.S. Cl. 250—327.2 **6 Claims**



1. A radiation image recording and read-out apparatus comprising:

(i) a circulating and conveying means for conveying at least one stimulable phosphor sheet for recording a radiation image thereon along a predetermined endless circulation path,

(ii) an image recording section positioned on said circulation path for recording a radiation image of an object on said stimulable phosphor sheet by exposing said stimulable phosphor sheet to a radiation passing through said object,

(iii) an image read-out section positioned on said circulation path and provided with a stimulating ray source for emitting stimulating rays for scanning said stimulable phosphor sheet carrying said radiation image stored thereon at said image recording section, and a photoelectric read-out means for detecting light emitted by said stimulable phosphor sheet scanned by said stimulating rays to obtain an electric image signal,

(iv) an erasing section for, prior to the next image recording on said stimulable phosphor sheet for which the image read-out has been conducted at said image read-out section, releasing the radiation energy remaining on said stimulable phosphor sheet,

(v) a shutter provided above said stimulable phosphor sheet in said image recording section and movable between a shielding position in which it shields a part of said stimulable phosphor sheet from said radiation and a standby position in which it permits exposure of the whole stimulable phosphor sheet to said radiation,

(vi) a shutter operating means which moves said shutter between said shielding position and said standby position in accordance with instructions received from the exterior,

(vii) a sectored image recording operation control means for, upon receipt of a sectored image recording command, moving the shutter to the shielding position and controlling said circulation and conveyance means so as to convey the stimulable phosphor sheet in said image recording section by sectors, and

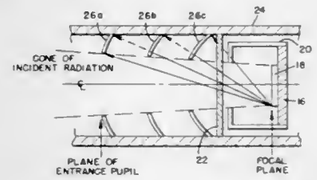
(viii) wherein said circulating and conveying means comprises means at each section for independently conveying said at least one stimulable phosphor sheet such that the movement of the stimulable phosphor sheet at the image recording section is independent of the movement of those other sections wherein, during sectored image recording on said sheet at the image recording section, images may be read out continuously from other sheets at the read-out section even during interruption of recording between respective sectors of said stimulable phosphor sheet at said image recording section.

4,820,923

UNCOOLED REFLECTIVE SHIELD FOR CRYOGENICALLY-COOLED RADIATION DETECTORS

William H. Wellman, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 19, 1986, Ser. No. 876,024
Int. Cl.[4] G01J *5/08, 5/06*
U.S. Cl. 250—352 **10 Claims**



1. An uncooled reflective shield for a cryogenically cooled detector comprising:

a reflector having a concave surface and reflective to radiation, said surface facing said detector;

said surface having a shape of a substantially toroidal segment as defined by the pivoting of a vector diagonally across a centerline axis of symmetry, the vector having a terminus substantially on or near a plane of said detector; and

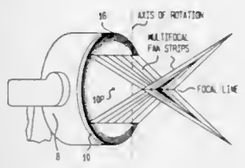
means for mounting said reflector relative to said detector such that a ray originating from a point upon said detector and impinging on said reflector is reflected back to a ring-like region surrounding said detector.

4,820,924

SCINTILLATION CAMERA AND THREE DIMENSIONAL MULTIFOCAL COLLIMATOR USED THEREWITH

Jiang Hsieh, Elk Grove Village, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 944,700, Dec. 19, 1986. This application Jun. 25, 1987, Ser. No. 67,059
Int. Cl.[4] G01T *1/166;* **G21K** *1/02*
U.S. Cl. 250—363.10 **13 Claims**



1. A rotational camera transaxial SPECT collimator having a plurality of focal points as viewed along a first direction and at least one focal point as viewed along a second direction which is perpendicular to said first direction.

4,820,925

ROOM AIR MONITOR FOR RADIOACTIVE AEROSOLS

David K. Balmer, Broomfield, and William H. Tyree, Boulder, both of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 23, 1987, Ser. No. 28,982
Int. Cl.[4] G01T *1/18*
U.S. Cl. 250—379 **23 Claims**

1. A housing assembly, for use in combination with a signal

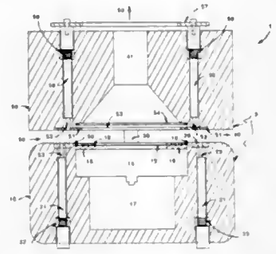
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processor/counter for detecting suspended particles, comprising:

a casing having opposed first and second ends and a central, longitudinal axis;

detector means, adjacent to said first end and having an active surface facing said second end, for providing electronic signals representative of radiation detected by said active surface;

a filter system, close coupled with said detector means and having a filter surface facing said active surface of said



detector means, for collecting particulates in room environment air;

an air flow system comprising an air inlet formed as an annular opening in said casing between said detector means and said filter system, said opening extending radially from said casing in communication with said filter surface, an air outlet adjacent to said second end of said housing assembly, and an aperture extending along said central, longitudinal axis of said casing from said air inlet to said air outlet.

4,820,926

RADIATION CONVERSION SCREEN

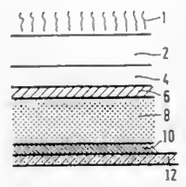
Theo J. A. Popma, Enschede, and Jacob A. Den Boer, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1986, Ser. No. 909,811

Claims priority, application Netherlands, Mar. 19, 1986, 8600696

Int. Cl.⁴ G01J *1/58*

U.S. Cl. 250—486.1 **13 Claims**



1. A radiation conversion screen for detecting a propagating incident radiation beam, comprising a luminescent layer which is sensitive to said radiation and is composed of sub-layers which succeed one another in an intended direction of propagation of said radiation beam; each of said sub-layers having mutually different radiation-conversion, radiation-optical and-/or technological properties wherein successive sub-layers of luminescent material have a luminescent radiation absorption which decreases in the intended propagation direction of the radiation beam; and

means which orient said screen so that said radiation beam propagates in the intended direction with respect to the screen.

4,820,927

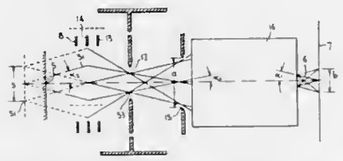
ELECTRON BEAM SOURCE EMPLOYING A PHOTO-EMITTER CATHODE

Guenther O. Langner, Westford, and Kenneth J. Harte, Carlisle, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Continuation of Ser. No. 750,102, Jun. 28, 1985, abandoned. This application Sep. 15, 1987, Ser. No. 97,408

Int. Cl.⁴ H01J *27/02*

U.S. Cl. 250—492.2 **11 Claims**



1. An electron beam system for exposing at least one target area in a target plane to a beam spot focused in the target plane, said system comprising:

diode gun emitter means for emitting a beam of electrons in parabolic trajectories, said diode gun emitter means comprising a source of light energy and a photocathode responsive to said light energy for emitting said electrons from an emitter surface of said photo-cathode;

an apertured anode through which the emitted electrons pass, the tangents to the parabolic trajectories at said anode intersecting in a virtual cathode plane from which the electrons appear to emerge as generally conical beam pencils having a first semi-angle α_1;

wherein said apertured anode includes a spot-shaping aperture through which the electrons pass in passing through said apertured anode;

focusing means for focusing said electrons passing through said spot-shaping aperture into a plurality of converging beam pencils converging at the target plane at a second semi-angle α_s within a beam spot area in said target plane, said beam spot area having a dimension b defined by said spot-shaping aperture and said focusing means;

area-defining means for selectively defining an electron-emitting area portion of said emitter surface such that electrons are emitted only from said electron-emitting area, said electron-emitting area having at least one selectable dimension s corresponding to the dimension b of said beam spot area and established equal to or greater than $t(b\alpha_1/p\alpha_s)$, wherein p is a truncation factor having a value less than one by which said beam pencils are truncated to define α_1, and t is a compensation factor greater than one accounting for imperfect imaging, beam jitter and noise;

whereby current density and uniformity of the combination of said electrons at said target plane, within said beam spot area, are maximized by reduced electron-to-electron interaction.

4,820,928

LITHOGRAPHY APPARATUS

Mitsuo Ooyama, Hachioji; Kimiaki Ando, Ome; Yoshio Kawamura, Kokubunji; Norio Saitou, Iruma; Takanori Simura, Kobe, and Hiroyuki Kohida, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 106,499

Claims priority, application Japan, Oct. 9, 1986, 61-239005

Int. Cl.⁴ H01J *37/302*

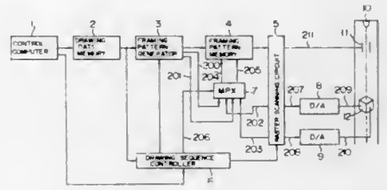
U.S. Cl. 250—492.2 **6 Claims**

1. A lithography apparatus in which a charged particle beam

is controlled to scan a desired region of a sample and thereby draw a pattern, comprising:

a framing pattern memory for storing therein closed framing lines of a pattern to be drawn in the form of dot images having a plurality of dots;

a framing pattern generator for writing said closed framing lines of the pattern to be drawn into said framing pattern memory in the form of dot images having a plurality of dots; and



a raster scanning generator including means for generating beam deflection addresses of the pattern to be drawn by scanning said closed framing lines of a pattern stored in said framing pattern memory, means for determining whether each dot in said framing pattern memory corresponding to a beam deflection address is within said closed framing lines and means for generating a beam blanking control signal which turn on the beam only when said dot is within said closed framing lines.

4,820,929

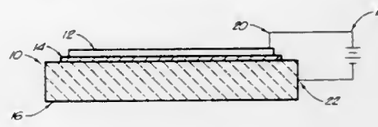
DYNAMIC INFRARED SIMULATION CELL

J. Everett Modisette, San Antonio, Tex., and R. Barry Johnson, Huntsville, Ala., assignors to Texas Medical Instruments, Inc., Schertz, Tex.

Filed Apr. 10, 1987, Ser. No. 37,223

Int. Cl.⁴ G21G *4/00;* **G01J** *1/00*

U.S. Cl. 250—504 R **28 Claims**



1. A device for transforming visible images into infrared images comprising:

a photoconductive layer;

a first conductive layer integrally affixed to one side of said photoconductive layer, said first conductive layer being transmissive with respect to radiation of known energy, said photoconductive layer being responsive to said radiation of known energy;

a second conductive layer integrally affixed to the other side of said photoconductive layer; and

an external energy source connected to said first conductive layer and said second conductive layer, said external energy source for passing a current across said layers, said photoconductive layer having a modulated resistivity in relation to said radiation of known energy.

4,820,930

PHOTOMASK POSITIONING DEVICE

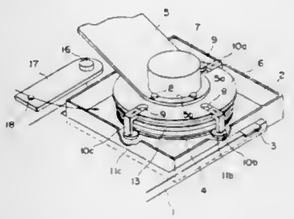
Shinji Tsutsui, Kawasaki, and Isamu Shimoda, Zama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 746,102, Jun. 18, 1985, abandoned. This application Sep. 4, 1987, Ser. No. 94,088

Claims priority, application Japan, Jun. 20, 1984, 59-126971; Jun. 20, 1984, 59-126972; May 27, 1985, 60-113909

Int. Cl.⁴ G01N *21/86*

U.S. Cl. 250—548 **26 Claims**



1. A positioning device for positioning an article, comprising:

means for holding the article;

means for positioning the article so that a center of the article is brought into alignment with a predetermined point on said holding means, said positioning means having a first engaging member movable toward the article to move toward and engage the article and to provide a positional reference for the article on the holder, and a second engaging member for acting on the article;

means for driving said first and second engaging members, said driving means having a first drive source for driving said first engaging member and a second drive source for driving said second engaging member, such that the article is brought into engagement with said first engaging member at said positional reference in response to operation of said first and second drive sources; and

means for controlling said first and second drive sources.

4,820,931

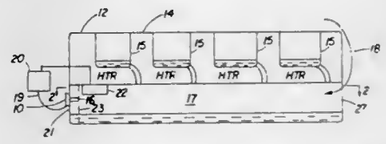
WET BENCH FLAME AND DROPLET DETECTOR

Robert A. Dunbar, Swampscott, Mass., assignor to Pyrotector, Inc., Marshfield, Mass.

Filed Mar. 1, 1988, Ser. No. 162,694

Int. Cl.⁴ G08B *17/12;* **G01V** *9/04*

U.S. Cl. 250—554 **25 Claims**



1. A system for detecting a flame or droplets of burning polypropylene in an area below an upper surface of a conventional wet bench used in semiconductor production, said flame having a predetermined characteristic flicker rate range and a predetermined characteristic radiation profile, said droplets occurring at a predetermined rate within said predetermined flicker rate range, comprising

at least one sensor for detecting radiation generated by activity in said area and for generating a sensor signal in response to said detected radiation,

a threshold detector for determining whether said activity has a cross-sectional area which exceeds a predetermined threshold area,

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a discriminator for determining whether said activity displays a flicker rate or a droplet rate that is within said predetermined flicker rate range,

a counter for determining whether a predetermined number of flickers or droplets has been detected within a predetermined time period, and

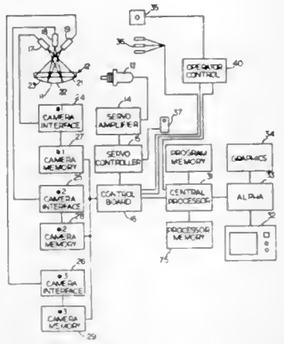
a latch for asserting a true output signal when said detected activity exceeds said predetermined threshold area, said flicker rate or said droplet rate is within said predetermined flicker rate range, and a said predetermined number of flickers or droplets have been detected within said predetermined time period.

4,820,932

METHOD OF AND APPARATUS FOR ELECTROOPTICAL INSPECTION OF ARTICLES

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois Television Products Inc., Toledo, Ohio

Filed Jun. 4, 1987, Ser. No. 58,207
Int. Cl.⁴ G01N *21/88*
U.S. Cl. 250—563 **29 Claims**



1. An apparatus for inspecting successive objects comprising:

a linear array of sensors for providing a plurality of signals each representing the magnitude of light received from a corresponding discrete area along a band of discrete areas on an object;

means to expose said linear array to a succession of bands of discrete areas on the object;

means to can said linear array in a plurality of sweeps;

means to identify and correlate each scan sweep with the exposure of a band of discrete areas on the object;

means to identify individual sensors as they are subject to scan sweeps;

signal utilization means for signals provided by said sensors;

signal gating means for selectively passing sensor signals to said signal utilization means; and

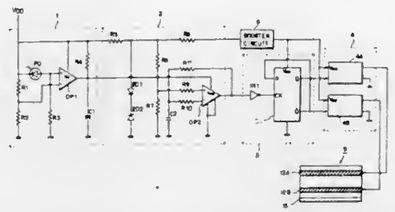
gate controlling means responsive to said means to identify sensors as predetermined individual sensors are identified and responsive to said means to identify scan sweeps as predetermined individual scan sweeps are identified to control said signal gating means for signals from different individual sensors during different individual scan sweeps.

4,820,933

CONTROL CIRCUIT FOR LIQUID CRYSTAL REAR-VISION MIRROR

Suk-Kwon Hong, Suwon; Ho-Yol Bang, Inchon, and Hyun-Jun Shin, Gwachon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon City, Rep. of Korea

Filed Dec. 30, 1987, Ser. No. 139,736
Claims priority, application Rep. of Korea, Dec. 31, 1986, 1986-11703
Int. Cl.⁴ G02F *1/133*
U.S. Cl. 307—10.1 **11 Claims**



1. A control circuit of a rear-vision mirror including a liquid crystal mirror for use in automobiles, for automatically operating the liquid crystal mirror which reduces incident light during application of a driving voltage to the liquid crystal mirror, the circuit comprising:

light sensing and comparing means for sensing incident light on a liquid crystal mirror, providing a sensor signal representing the amount of incident light, comparing the sensor signal with a predetermined reference signal to determine strength and weakness of the incident light, and providing a comparison signal indicating the amount of the incident light;

an Oscillator for receiving the comparison signal from said light sensing and comparing means and generating a square wave having a constant period;

pulse generating means for receiving the square wave from said oscillator and generating a pair of operating voltage driving pulses having amplitudes determined by a source voltage and having different phases; and

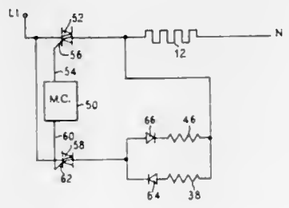
voltage driver means for buffering the driving pulses of said pulse generating means and providing the driving pulses to said liquid crystal rear-vision mirror.

4,820,934

DISPENSER CONTROL FOR DISHWASHERS

Roque Denis Marcade, Lincoln Township, Berrien County, Mich., and Daniel S. Query, Antioch, Tenn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 18, 1987, Ser. No. 134,994
Int. Cl.⁴ H01H *51/27;* **B01F** *3/00*
U.S. Cl. 307—41 **13 Claims**



1. In a dishwasher apparatus having an electric detergent dispenser operator, an electric wetting agent dispenser operator, and control means for cyclically operating the dishwasher through washing, rinsing and drying operations, improved circuit means operated by said control means for selectively electrically connecting said wetting agent dispenser operator and said detergent dispenser operator selectively to an alternating current power supply, said circuit means comprising:

said wetting agent dispenser operator and said detergent dispenser operator being connected in parallel, and

first means connected in series with said parallel connection of said operators for directing selected positive half cycles and alternatively selected negative half cycles of said alternating current to said parallel connection of said operators,

second means connected in series with a first one of said operators for passing positive half cycles of current through said first one of said operators while excluding passage of negative half cycles therethrough, and

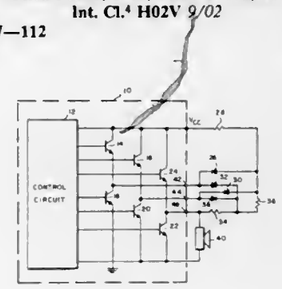
third means connected in series with a second one of said operators, for passing negative half cycles of current through said second operator while excluding passage of positive half cycles therethrough.

4,820,935

MULTIPLE FUNCTION DRIVER CIRCUIT

Walter S. Gontowski, Thompson, Conn., assignor to Cherry Semiconductor Corporation, East Greenwich, R.I.

Filed Feb. 5, 1988, Ser. No. 152,643
Int. Cl.⁴ H02V *9/02*
U.S. Cl. 307—112 **10 Claims**



1. A multi-function circuit comprising:

a first switching transistor and a second switching transistor connected in series;

a third switching transistor and a fourth switching transistor connected in series and said third and fourth switching transistors being connected in parallel with said first and second switching transistors;

a first one-way device connected in parallel with said first switching transistor and connected in series with said second switching transistor, such that said first one-way device turns on when said second switching transistor turns on;

a second one-way device connected in parallel with said third switching transistor and connected in series with said fourth switching transistor, such that said second one-way device turns on when said fourth switching transistor turns on;

a third one-way device connected in series with said first one-way device and in series with said first switching transistor;

a fourth one-way device connected in series with said third one-way device, in series with said third switching transistor and in parallel with said third one-way device; and

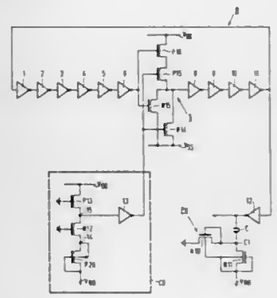
a fifth switching transistor connected in series with said third one-way device and in series with said fourth one-way device such that said third one-way device turns on when said first and fifth switching transistors are on and said second and fourth switching transistors are off and such that said fourth one-way device turns on when said third and fifth switching transistors are on and said second and fourth switching transistors are off.

4,820,936

INTEGRATED CMOS CIRCUIT COMPRISING A SUBSTRATE BIAS VOLTAGE GENERATOR

Hendrikus J. M. Veendrick; Cornelis G. L. M. Van Der Sanden, and Arie Slob, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,363
Claims priority, application Netherlands, May 29, 1987, 8701278
Int. Cl.⁴ H03K *17/16, 17/14, 17/06;* **H01L** *27/02*
U.S. Cl. 307—296.2 **5 Claims**



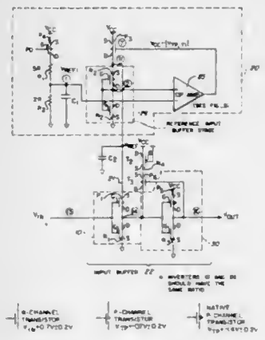
1. An integrated CMOS circuit comprising a first substrate bias voltage generator, which can be driven by an external clock generator, which also controls further circuits in the integrated circuit, and a second substrate bias voltage generator, characterized in that said second substrate bias voltage generator comprises a substrate bias voltage pump for generating a substrate bias voltage, an integrated oscillator for driving said substrate bias voltage pump, switching means for switching said oscillator on and off, and a comparator circuit for comparing the substrate bias voltage with a reference voltage and providing an output to drive said switching means.

4,820,937

TTL/CMOS COMPATIBLE INPUT BUFFER

Hung-Cheng Hsieh, San Jose, Calif., assignor to Xilinx, Incorporated, San Jose, Calif.

Filed Sep. 19, 1985, Ser. No. 778,344
Int. Cl.⁴ H03K *19/094, 19/092*
U.S. Cl. 307—475 **18 Claims**



1. A circuit for translating an input signal having a first range

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of voltages to an output signal having a second range of voltages, said circuit comprising:

a first inverter characterized by a trigger point at which said inverter switches states and having an input lead for receiving said input signal, an output lead for providing said output signal, a first power lead for connecting to a first power supply voltage, and a second power lead;

means for supplying a second power supply voltage to said second power lead of said first inverter;

means coupled to said first inverter for supplying a reference voltage to said second power lead of said first inverter; and

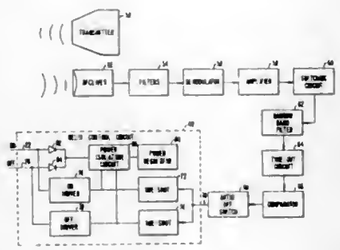
means for receiving control signals for operating said circuit in different modes, so that in a first mode of operation a trigger point of said inverter is forced to a selected voltage level by said reference voltage supplied at said second power lead, and in a second mode of operation, said means for supplying a reference voltage is disabled and said second power supply voltage is provided to said second power lead.

4,820,938

LOW VOLTAGE MOTION SENSOR FOR ACTIVATING A HIGH VOLTAGE LOAD

Jerome M. Mix, Redwood City, and Charles C. Hu, San Jose, both of Calif., assignors to The Watt Watcher, Inc., Santa Clara, Calif.

Filed Jun. 3, 1988, Ser. No. 202,179
Int. Cl.[4] G08B *13/16*
U.S. Cl. 307—117 **12 Claims**



1. In a motion sensor for detecting the presence or absence of motion and providing an activating signal, an improvement for providing ON and OFF signals on ON and OFF lines to a relay controlling power to a load, comprising:

a first pulse generator, having an input coupled to receive said activating signal and an output coupled to said ON line, for producing a pulse output to said ON line responsive to a first state of said activating signal;

a second pulse generator, having an input coupled to receive said activating signal and an output coupled to said OFF line, for producing a pulse on said OFF line responsive to a second state of said activating signal; and

means, coupled to said outputs of said first and second pulse generators for isolating a power supply for said motion sensor from said ON and OFF lines during said pulses.

4,820,939

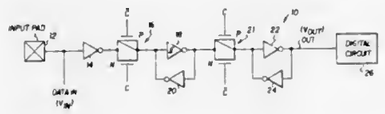
FINITE METASTABLE TIME SYNCHRONIZER

Richard G. Sowell, San Jose, and Robert Pieters, Eldorado, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 24, 1987, Ser. No. 124,875
Int. Cl.[4] H03K *5/13, 19/00*
U.S. Cl. 307—269 **5 Claims**

1. A finite metastable time synchronizer for synchronizing an input data signal provided to a digital receiving circuit with a clock frequency of the receiving circuit, the synchronizer comprising;

a master stage which receives the input data signal and is capable of providing two potential metastable points; and



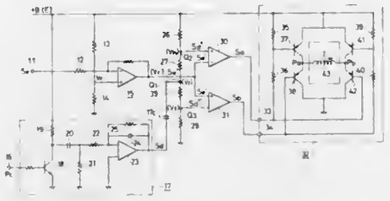
a slave stage capable of providing one potential metastable point and coupled to receive a master stage output via a data path which also serves as a feedforward/back path between the slave stage and the master stage to provide resolution of metastable conditions in the synchronizer.

4,820,940

CONTROL CIRCUITS OPERATING WITH PULSE-WIDTH MODULATED SIGNALS

Shigeaki Wachi; Akashi Ito, and Fumihiko Yoshii, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 803,062, Nov. 8, 1985, abandoned. This applicatinn Oct. 6, 1987, Ser. No. 105,989
Claims priority, application Japan, Mar. 12, 1984, 59-46710
Int. Cl.[4] H03K *5/153, 3/01*
U.S. Cl. 307—270 **4 Claims**



1. A control circuit operating with a power supply and a pulse-width modulated signal comprising;

biasing circuit means **(15)** connected to the power supply and having an input terminal receiving an analog control signal for providing said analog control signal with a first DC voltage level varying in proportion to variations in a power supply voltage from said power supply,

voltage generating circuit means **(26, 27, 28, 29)** connected to the power supply for producing a second DC voltage level higher than the first DC voltage level and varying in proportion to variations in the power supply voltage and a third DC voltage level varying in proportion to variations in the power supply voltage to be lower than the first DC voltage level by dividing the power supply voltage,

reference voltage producing means **(17)** connected to the power supply for generating a triangular or saw-toothed waveform reference voltage signal having an amplitude varying in proportion to variations in the power supply voltage,

first level comparing circuit means **(30)** connected to said biasing circuit means and said reference voltage producing means for comparing the analog control signal provided with the first DC voltage level with the voltage level of the reference voltage signal superposed on the second DC voltage level and for producing a first pulse-width modulated control signal resulting from the level comparison carried out therein,

second level comparing circuit means **(31)** connected to said biasing circuit means and said reference voltage producing means for comparing the voltage level of the reference voltage signal superposed on the third DC voltage level with the voltage level of the analog control signal provided with the first DC voltage and for producing a second pulse-width modulated control signal resulting from the level comparison carried out therein,

an electromagnetic coil, and

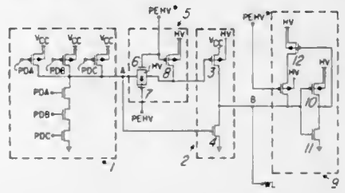
driving circuit means **(32)** having first and second switching elements connected to respective ends of said electromagnetic coil to be supplied with said first pulse-width modulated control signal for driving said electromagnetic coil, and third and fourth switching elements connected to respective ends of said electromagnetic coil to be supplied with said second pulse-width modulated control signal for driving said electromagnetic coil.

4,820,941

DECODER DRIVER CIRCUIT FOR PROGRAMMING HIGH-CAPACITANCE LINES

Debra J. Dolby, Missouri City; John F. Schreck, and Phat Truong, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 1, 1988, Ser. No. 150,863
Int. Cl.[4] H03K *17/10*
U.S. Cl. 307—449 **13 Claims**



1. A decoder driver circuit for reading and programming integrated-circuit logic arrays comprising:

a driver transistor pair with transistor source-drain paths connected in series between a supply voltage source and a reference potential,

a driver enabling means for enabling and disenabling one transistor of said driver transistor pair, and

a latching circuit means connected to a programming voltage source,

wherein the gate of said one transistor of said driver transistor pair is connected to the output of a decoder circuit through said driver enabling means,

wherein the gate of the other transistor of said driver transistor pair is connected to said output of said decoder circuit,

wherein said driver enabling means is connected to a source of enabling signals, and

wherein the output terminal of said driver transistor pair is connected to said latching circuit means and to the word-line of an integrated-circuit logic array.

4,820,942

HIGH-SPEED, HIGH-DRIVE OUTPUT BUFFER CIRCUITS WITH REDUCED GROUND BOUNCE

King W. Chan, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 27, 1988, Ser. No. 148,789
Int. Cl.[4] H03K *3/01, 21/10*
U.S. Cl. 307—542 **17 Claims**

1. A high-speed, high-drive output buffer circuit for producing an output signal at an output node with reduced ground bounce, comprising:

AC buffer means **(12)** responsive to a data input signal for generating quickly high-to-low and low-to-high transitions at the output node;

said AC buffer means **(12)** including a first pull-up transistor (Q1) and a first pull-down transistor (Q2) connected in series, said first pull-up transistor (Q1) having one of its main electrodes coupled to a first power supply terminal and its other main electrode coupled to the output node, said first pull-down transistor (Q2) having one of its main electrodes coupled to a second power supply terminal and its other main electrode coupled to the output node;

said AC buffer means **(12)** further including a first NAND logic gate (G2), a second NAND logic gate (G3), a first inverter (G1), a second inverter (G4), and a third inverter (G5);

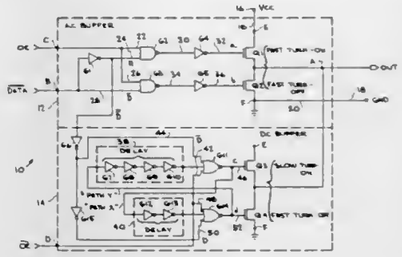
said first inverter (G1) having its input connected to the data input signal and its output connected to a first input of said first NAND gate (G2), said first NAND gate (G2) having a second input connected to a first enable signal, said first NAND gate (G2) having its output connected to the input of said second inverter (G4);

said second NAND gate (G3) having a first input connected to the data input signal and a second input connected to the first enable signal, said second NAND gate (G3) having its output connected to the input of said third inverter (G5);

said second inverter (G4) having its output connected to a control electrode of said first pull-up transistor (Q1) and said third inverter (G5) having its output connected to a control electrode of said first pull-down transistor (Q2);

DC buffer means **(14)** responsive to the data input signal for generating slowly high-to-low and low-to-high transitions at the output node;

said DC buffer means **(14)** including a second pull-up transistor (Q3) and a second pull-down transistor (Q4) connected in series, said second pull-up transistor (Q3) having one of its main electrodes coupled to the first power supply terminal and its other main electrode coupled to the output node, said second pull-down transistor (G4) having one of its main electrodes coupled to the second power supply terminal and its other main electrode coupled to the output node;



said DC buffer means **(14)** further including a first delay means **(38)** having an input and an output, a second delay means **(40)** having an input and an output, a first NOR logic gate (G11), a second NOR logic gate (G14), a fourth inverter (G6), and a fifth inverter (G15);

said first NOR logic gate (G11) having a first input connected to the output of said fourth inverter (G6), a second input connected to the output of said first delay means **(38)**, and a third input connected to a second enable signal;

said second NOR logic gate (G14) having a first input connected to the output of said fifth inverter (G15), a second input connected to the output of said second delay means **(40)**, and a third input connected to the second enable signal;

said fourth inverter (G6) having its input connected to the output of said first inverter (G1) in said AC buffer means **(12)** and said fifth inverter (G15) having its input connected to the output of said fourth inverter (G6); and

said first NOR gate (G11) having its output connected to the input of said second delay means **(40)** and to a control electrode of said second pull-up transistor (Q3), said second NOR gate (G14) having its output connected to the

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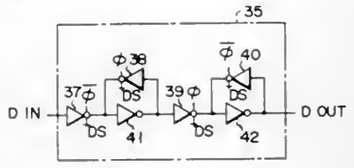
input of said first delay means (38) and to a control electrode of said second pull-down transistor (Q4).

4,820,943

DELAY CIRCUIT OF A VARIABLE DELAY TIME

Takashi Makino, Tokyo, and Shuji Asami, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 9, 1987, Ser. No. 23,611
Claims priority, application Japan, Mar. 27, 1986, 61-69230
Int. Cl.[4] H03K *17/28, 5/22, 19/096, 5/159*
U.S. Cl. 307—603 12 Claims



8. A delay circuit comprising:

a first inverter having an input for receiving an input signal and an output, the first clocked inverter including a first plurality of MOS FETs controlled by first clock signals;

a first inverter having an input and an output, the input being connected to the output of the first clocked inverter;

a second clocked inverter having an output connected to the input of the first converter and an input connected to the output of the first inverter, the second clocked inverter including a first plurality of MOS FETs controlled by second clock signals having a phase opposite to those of the first clock signals;

a third clocked inverter having an input connected to the output of the first inverter and an output, the third clocked inverter including a first plurality of MOS FETs controlled by the second clock signals;

a second inverter having an input and an output, the input being connected to the output of the third clocked inverter;

a fourth clocked inverter having an output connected to the input of the second inverter and an input connected to the output of the second inverter, the fourth clocked inverter including a first plurality of MOS FETs controlled by the first clock signals;

an output terminal connected to the output of the second inverter and the input of the fourth clocked inverter; and

each of the first, second, third, and fourth clocked inverters including a second plurality of MOS FETs operatively connected to the corresponding first plurality of MOS FETs responsive to a delay control signal for eliminating the clocked delay in the respective first, second, third, and fourth clocked inverters.

4,820,944

METHOD AND APPARATUS FOR DYNAMICALLY CONTROLLING THE TIMING OF SIGNALS IN AUTOMATIC TEST SYSTEMS

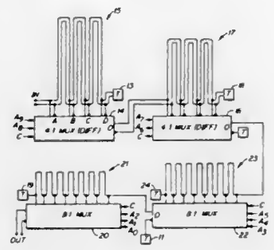
Richard F. Herlein, San Jose; Jeffrey A. Davis, Santa Clara, and E. James Cotriss, San Jose, all of Calif., assignors to Schlumberger Systems & Services, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 611,451, May 17, 1984, Pat. No. 4,675,562, which is a continuation-in-part of Ser. No. 518,499, Aug. 1, 1983, abandoned. This application Oct. 28, 1986, Ser. No. 924,073
The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.
Int. Cl.[4] H03K *3/86, 5/13*
U.S. Cl. 307—603 15 Claims

1. Apparatus connected between an input terminal and an output terminal for delaying an electrical signal supplied to the input terminal before supplying it to the output terminal, the apparatus comprising:

first means for delaying signals by a selected multiple of a first nominally predetermined delay interval, the first means connected to the input terminal to receive the electrical signal and delay it to provide a first delayed signal at a first node;

N delay elements, where N is an integer greater than one, each element providing a second nominally predetermined delay interval, which second nominally predetermined delay interval is greater than the first nominally predetermined delay interval divided by N; and



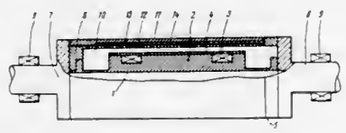
second means connected to the first node to receive the first delayed signal, connected to the output terminal, and connected to the N delay elements the second means being operable to pass the first delayed signal through a selected series of the N delay elements and delay the first delayed signal to provide a second delayed signal to the output terminal.

4,820,945

DYNAMOELECTRIC MACHINE ROTOR WITH SUPERCONDUCTING WINDING

Garri M. Khutoretsky; Vladimir M. Fridman; Galina A. Zagorodnaya; Leonid V. Maximov, and Jury G. Tjurin, all of Leningrad, U.S.S.R., assignors to Leningradskoe Proizvodstvennoe Elektromashinostroitelnoe Obiedinenie "Elektrolila", Leningrad, U.S.S.R.

Filed Nov. 5, 1987, Ser. No. 117,673
Int. Cl.[4] H02K *9/00*
U.S. Cl. 310—52 1 Claim



1. A dynamoelectric machine rotor with a superconducting winding, comprising:

an inner shaft including a superconducting winding supporting structure;

an outer shaft including a cylindric shell for hermetic encapsulating the rotor and two end extensions rigidly fixed to said shell at both ends thereof for supporting the rotor in bearings;

an electromagnetic shield including an inner cylinder made of a material with high electrical conductivity and an outer cylinder made of a material with high mechanical strength, said electromagnetic shield being fitted on said outer shaft with a radial interference such that said electromagnetic shield and said outer shaft have surface areas adjoining each other; and

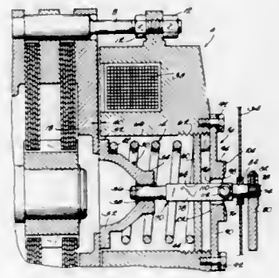
a layer of a solid lubricant interposed between said surface areas of said electromagnetic shield and said surface areas of said outer shaft, whereby a maximum magnitude of a torsional moment transmitted from said electromagnetic shield to said outer shaft under abnormal conditions of operation of a dynamoelectric machine is reduced and stabilized.

4,820,946

ELECTROMAGNETIC BRAKE

Kenneth J. Gutbrod, Lisbon, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed May 19, 1988, Ser. No. 195,929
Int. Cl.[4] H02K *7/102*
U.S. Cl. 310—77 12 Claims



5. In an electromagnetic brake having an axis, a brake spring positioned axially for supplying braking force when moved in an axial direction to a brake applied position, friction disc means having a friction surface facing axially, an axially positioned armature having a surface engageable with the disc means surface to effect a braking action in response to the braking force of the brake spring when the latter moves to said brake applied position, the engagement of the armature with the friction surface causing wearing of the friction disc and the reduction of the thickness of the friction disc means, electromagnetic means for applying magnetic force to the armature in a direction opposing the brake spring force to compress the spring to a brake released position and effect a brake release action, and a frame for supporting the brake spring, the armature, and the electromagnetic means, the combination comprising:

guide means supported by the frame and including a section having a side engaging the armature and an opposite side engaging the brake spring at one axial end of the latter for receiving and transmitting the braking force of the brake spring in an axial direction to the armature, the guide means being rotatably immovable when the brake spring is in the brake applied position;

the frame having an axially disposed threaded cylindrical portion;

a circular disc engaging the brake spring at the other axial end of the latter and having a central non-circular opening and an outer threaded periphery in rotatable threaded engagement with the threaded cylindrical portion of the frame, the disc when rotated being movable in an axial direction;

rod means having a length positioned axially and a non-circular cross-section portion similar in shape to and extending through the opening in the disc, the disc being free to move axially relative to the rod means, the rod means further including an end affixed to and rotatable relative to the guide means about the length of the rod means whereby rotation of the rod means relative to the immovable guide means rotates and threadably moves the disc in an axial direction to adjust the force of the brake spring on the guide means and armature; and

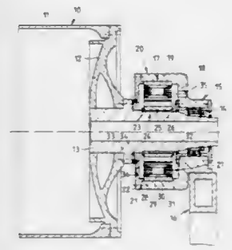
turning means for rotating the rod means.

4,820,947

BEARING AND RING-SHAPED DRIVE MOTOR ENCLOSED IN COMMON HOUSING

Diethelm Beisiegel, Gerstetten, and Erwin Binder, Heidenheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 1, 1987, Ser. No. 103,501
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 8703410
Int. Cl.[4] H02K *5/00, 9/00;* B23B *19/02*
U.S. Cl. 310—89 17 Claims



1. A drive system for rotating a workpiece such as a drying cylinder or the like, comprising:

a frame;

a bearing housing supported on the frame;

a bearing in the bearing housing;

a journal having a longitudinal axis, the journal having a first portion which is drivingly secured to the workpiece to be rotated, and a second portion remote from the workpiece which is supported in the bearing, and the bearing housing having an outer wall surrounding the bearing and the second portion of the journal;

a drive motor intermediate the first and second portions of the journal, and drivingly connected to the journal; wherein the drive motor is a permanent-magnet motor

whose rotor includes inner poles secured to a rotor ring which is circumferentially secured to the journal, wherein a heat-insulating layer is interposed between the journal and the rotor ring and

whose stator includes outer poles secured to the motor housing surrounding the inner poles wherein said inner and outer poles respectively form inner and outer rings concentrically surrounding the journal; and

a motor housing surrounding the drive motor, the motor housing having an outer wall which is joined to the outer wall of the bearing housing, to form a substantially continuous outer surface for the drive system.

4,820,948

ELECTRIC MOTOR

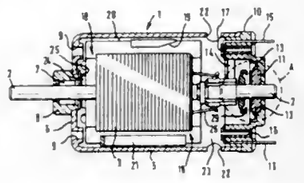
Dieter Rögelein, Stuttgart, Fed. Rep. of Germany, assignor to Johnson Electric Industrial Manufactory Limited, Chaiwan, Hong Kong

Filed Jun. 17, 1987, Ser. No. 63,020
Claims priority, application United Kingdom, Jun. 18, 1986, 8614834
Int. Cl.[4] H02K *5/16*
U.S. Cl. 310—90 11 Claims

1. An electric motor comprising a shaft carrying a commutator having electrically conducting segments, the shaft being mounted in a lubricated bearing, and an oil collector mounted on the shaft between the commuator and the bearing, wherein

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the oil collector comprises a disc portion mounted fast on the shaft, the disc portion extending radially away from the shaft and having a surface facing the bearing, and a U-shaped cross-section ring portion integral with an outer periphery of the disc portion and extending around the shaft, the U-shaped cross



section ring portion being concave in relation to a portion of the shaft between the commutator and the bearing, and forming collector means for collection of lubricant which migrates along the shaft from the bearing and spreads across the facing surface of the disc portion, the collector means being located at a radial distance from the shaft.

4,820,949

ELECTRICALLY POWERED APPARATUS

Shotaro Mizobochi; Toshiya Kanamori; Katsumi Sasaki; Katsutoshi Chiba, and Yoshikazu Kimura, all of Kanagawa, Japan, assignors to Ebara Research Co., Ltd., Tokyo, Japan

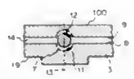
Filed Nov. 17, 1986, Ser. No. 931,064

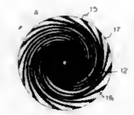
Claims priority, application Japan, Nov. 28, 1985, 60-268828; Dec. 25, 1985, 60-290685; Sep. 26, 1986, 61-227357

The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.

Int. Cl.[4] H02K *7/09*

U.S. Cl. 310—90 **5 Claims**





1. An electrically powered apparatus comprising:

a stator having a stator coil means and a stator end surface;

a rotor having a sliding end surface opposed to said stator end surface and mounted for coaxial rotation relative to said stator and having permanent magnet means with a plurality of poles in spaced opposed relation to said coil means of said stator with a magnetic gap therebetween, said stator end surface having a stator bearing surface as a part thereof, said rotor having said rotor sliding end surface in sliding engagement with said stator bearing surface, said rotor sliding surface and said stator bearing surface being of hard ceramic materials, one of said rotor sliding surface and said stator bearing surface being a smooth plane and the other of said surfaces having a plurality of grooves therein for generating fluid dynamic pressure upon rotation of said rotor, opposed recesses being provided in locations along the axis of rotation on said rotor sliding end surface and said stator bearing surface, and a hard material member is accommodated within the space defined by the two oppositely facing recesses provided respectively in said surfaces so as to prevent relative radial movement of said rotor sliding end surface and stator bearing surface while permitting relative rotation therebetween, whereby said rotor can be a driven member of said apparatus thereon driven in rotation relative to said stator.

4,820,950

FLUID BEARING

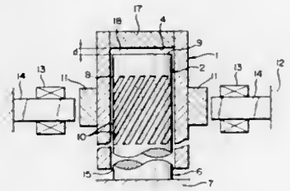
Toshinori Hijiya, and Katumi Saitou, both of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,774

Claims priority, application Japan, Mar. 3, 1987, 62-48298; Mar. 13, 1987, 62-36741[U]

Int. Cl.[4] F16C *39/06*

U.S. Cl. 310—90.5 **15 Claims**



1. A fluid bearing comprising:

a sleeve having a radial inner peripheral surface and an end portion with a thrust bottom face; and

a journal having a radial outer peripheral surface opposing said radial inner peripheral surface of the sleeve, and an end portion with a thrust end face opposing said thrust bottom face;

one of said sleeve and said journal being mounted to rotate relative to the other with a predetermined clearance between said radial outer peripheral surface and said inner peripheral surface;

a magnetic retaining force means for magnetically supporting said rotatable one of the sleeve and the journal forming a predetermined gap between said thrust bottom face of the sleeve and said thrust end face of the journal;

said end portion of one of the sleeve and the journal including a porous body having fluid permeability characteristics effective to discharge gas from the predetermined gap between said thrust bottom face and said thrust end face at a rate effective for preventing fluctuations between the sleeve and the journal during relative rotation.

4,820,951

MULTIPHASE SMALL SIZE BRUSHLESS DC MOTOR

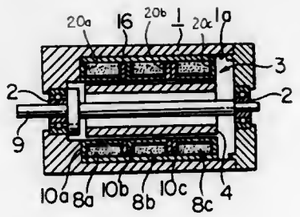
Tsuneo Sugiura, and Tomio Nakata, both of Iida, Japan, assignors to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,519

Claims priority, application Japan, Nov. 13, 1986, 61-268604

Int. Cl.[4] H02K *37/14, 3/34*

U.S. Cl. 310—257 **2 Claims**



1. A multi-phase small size brushless DC motor comprising in combination: a casing having a pair of end bearings in which is mounted a rotor axis supporting a rotor with a plurality of

circumferentially disposed alternating magnetic poles, at least three independent stator elements each formed from a pair of mating complementary stator pieces of magnetic material, said stator pieces each having a ring shaped radial flange portion from the radially inner periphery of which yoke pieces with radially outer faces extend axially toward the radial flange portion of the other stator piece of the respective pair of stator pieces, the yoke pieces from each stator piece of a respective pair of stator pieces being interdigitated with the yoke pieces from the other stator piece of the pair to form a spool-like structure, an insulating layer formed on the surface of said stator pieces, except for the outer periphery of said flange portions, for integral connection of the stator pieces of each pair of stator pieces and for insulating said stator pieces from respective drive coils, each of said spool-like structures having a corresponding drive coil disposed thereon wound directly about the insulated radially outer faces of said respective yoke pieces, a cylindrical magnetic sleeve holder for said spool-like structures mounted in said casing and having a radially inner cylindrical face, said plurality of independent spool-like structures with said drive coils thereon being mounted within said cylindrical holder with the outer peripheries of said stator piece flanges in electrical contact with said radially inner face of said cylindrical holder, and with said yoke pieces in angular correspondence with said plurality of rotor magnetic poles.

4,820,952

FILM SPEAKER USING A PIEZO-ELECTRIC ELEMENT

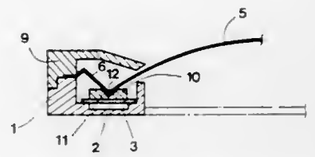
Kye S. Lee, Kyungki, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Kyungki, Rep. of Korea

Filed Sep. 16, 1987, Ser. No. 97,628

Claims priority, application Rep. of Korea, Sep. 16, 1986, 86-14341; Sep. 16, 1986, 86-14342; Sep. 30, 1986, 86-15012

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **4 Claims**



1. A film speaker for producing sound signals from electrical signals, comprising:

a film diaphragm having first and second edges for transducing mechanical vibrations into sound waves;

piezo-electric means for transducing electrical signals into mechanical vibrations; and

means for holding said film diaphragm in coupling with said piezo-electric means, said holding means having a pair of grooves along which said piezo-electric means are arranged and means for securing said first and second edges of said film diaphragm,

wherein said piezo-electric means comprise first and second pluralities of piezo-electric elements, said first plurality being arranged along one of said grooves and said second plurality being arranged along the other of said grooves, said film diaphragm is in contact with an upper surface of each piezo-electric element, and a plurality of holes are formed in said holding means for each piezo-electric element, each plurality of holes allowing vibrational waves produced by a corresponding one of said piezo-electric elements to propagate to the space external to said holding means.

4,820,953

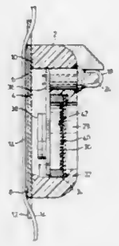
RATE OF ASCENT MONITOR USING PIEZOELECTRIC TRANSDUCER

Malcolm Saubolle, 2699 Battleford Rd., T.H. #13, Mississauga, Ontario, Canada L5N 3R9; Italo De Biasi, 5 Longford Ct., Whitby, Ontario, Canada L1R 1C5, and Stanley Livshitz, 38 Plum Tree Way, Willowdale, Ontario, Canada M2R 3J2

Filed Nov. 23, 1987, Ser. No. 124,050

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—338 **4 Claims**



1. A submersible rate of ascent monitor for divers, comprising a body defining a chamber, a diaphragm of a piezoelectric sound transducer closing an opening in said body so as hermetically to seal the chamber from the surrounding water, a piezoelectric ceramic wafer of the sound transducer being bonded to the inside surface of the diaphragm, a low pass filter electrically connected to the transducer output to exclude therefrom signals due to sounds, water movements and impacts, a threshold detector circuit within the chamber and receiving an output of the low pass filter, said threshold detector having a first threshold corresponding to a rate of decrease of ambient pressure indicative of an excessive rate of ascent, and indicator means driven by the threshold detector circuit to indicate an excessive rate of descent.

4,820,954

INDIRECTLY HEATED CATHODE STRUCTURE FOR ELECTRON TUBES

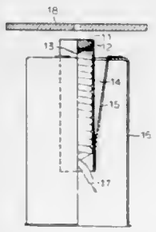
Sakae Kimura, Tokyo; Touru Yakabe, Yokosuka, and Mituo Kawai, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 18, 1987, Ser. No. 135,054

Claims priority, application Japan, Dec. 19, 1986, 61-301360

Int. Cl.[4] H01J *1/94*

U.S. Cl. 313—270 **16 Claims**



1. An indirectly heated cathode structure for an electron tube, comprising:

electron emission means for emitting electrons in response to heat;

heating means adjacent to the electron emission means for supplying heat to the emission means; and

niobium alloy cathode supporting sleeve means for support-

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ing the emission means and the heating means and increasing the vibration resistance of the cathode structure, wherein the sleeve means comprises an alloy containing at least 85 wt. % niobium and at least one metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, tantalum, molybdenum and tungsten.

4,820,955

TRAVELING WAVE TUBE COMPRISING PERIODIC PERMANENT MAGNETIC FOCUSING SYSTEM WITH GLASS/EPOXY RETAINING MEANS

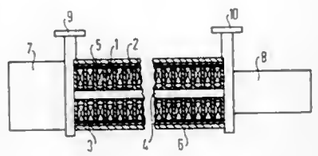
Gerit Boehme, Oberaudorf, and Hermann Turnwald, Obersuessbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,476

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, 364033

Int. Cl.⁴ H01J *29/86, 5/26*

U.S. Cl. 315—3.5 **6 Claims**



1. A traveling wave tube, comprising:
a cylindrical vacuum envelope surrounding a delay line;
said vacuum envelope being tightly surrounded by a permanent magnet system formed of annular pole discs and respective magnetic rings arranged between the pole discs which are oppositely polarized in alternating fashion along an axial direction of the tube;
said permanent magnet system being inserted into an outside envelope in form-fit fashion;
the permanent magnet system having a layer of glue at its outside periphery in direct contact with peripheral surfaces of the pole discs and magnetic rings adjacent an inside surface of the outside envelope; and
the glue being formed of a mixture of an epoxy resin having adhesive properties and glass fibers provided therein in an undirected attitude.

4,820,956

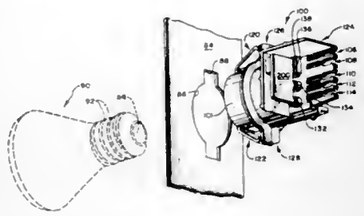
LIGHT MATRIX DISPLAY SYSTEM

Greg Slobodzian, Logan; Bill Kersey, Smithfield, and Brent Madsen, Providence, all of Utah, assignors to Integrated Systems Engineering, Inc., Logan, Utah

Filed Oct. 2, 1987, Ser. No. 104,118

Int. Cl.⁴ F21V *29/00;* **H04N** *3/16;* **G09F** *9/40;* **G08B** *5/38*

U.S. Cl. 315—51 **28 Claims**



1. A light matrix display system comprising:
a matrix support member and a plurality of lamps supported thereon in rows and columns so as to form an X-Y matrix, said lamps being individually electrically controllable within said matrix as to an on or off condition by selective application of high voltage power and low voltage control current;
first conductor means for supplying to said lamps said power;
second conductor means for supplying said low voltage control current;
base means for receiving one of said lamps;
first terminal means associated with said base means for electrically contacting said first conductor means so as to supply said power to said lamp;
second terminal means associated with said base means for electrically contacting said second conductor means so as to supply said low voltage control current to said base means; and
switching circuit means located at said base means and electrically interconnected between said first and second terminal means for electronically switching said lamp to the on or off condition by selective application of said power to said lamp in response to said low voltage control current supplied to said base means, said switching circuit means comprising means for removable connection to said first and second terminal means so that said switching circuit means may be removed and replaced at said base means independent of said lamp and said base means if said switching circuit means is found to be defective.

4,820,957

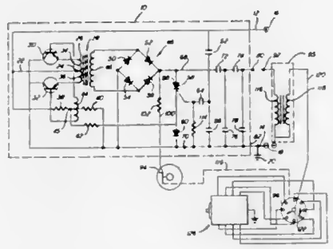
PROCESS FOR BURNING A CARBONACEOUS FUEL USING A HIGH ENERGY ALTERNATING CURRENT WAVE

Aleksandar Zivkovich, 7300 Cedar Post Rd., Liverpool, N.Y. 13088

Continuation-in-part of Ser. No. 829,972, Feb. 18, 1986, Pat. No. 4,710,681. This application Nov. 27, 1987, Ser. No. 126,308

Int. Cl.⁴ F02P *9/00*

U.S. Cl. 315—209 T **11 Claims**



1. An electronic ignition circuit for applying a high-frequency, high-voltage wave to a spark gap of a spark ignition device in a combustion chamber comprising an a.c. circuit providing an alternating-current, high-voltage high-frequency wave to a primary of an ignition coil whose secondary is connected to said spark gap, and a timing circuit connected to said a.c. circuit to control said wave so that the wave is provided during ignition intervals at a peak voltage sufficient to arc across said gap; wherein said wave provided to said spark gap has a peak voltage of from 25 KV to 200 KV and a frequency of about 8 KHz to 80 KHz, said a.c. circuit provides said wave at a continuous frequency, and said timing circuit is coupled to said a.c. circuit so as to provide said wave during ignition intervals at said peak voltage so that the wave voltage is sufficient to arc across said gap, and wherein during the intervals between successive said ignition intervals there is insufficient voltage to arc across said gap, said timing circuit including means to ensure that arcing will commence within substantially one cycle of the wave after the leading edge of each of said ignition intervals.

4,820,958

COLOR CATHODE RAY TUBE DEVICE

Taketoshi Shimoma, Isezaki, and Kumio Fukuda, Hyogo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

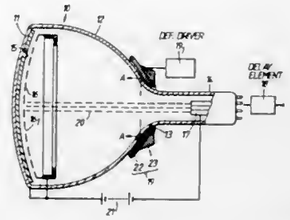
Filed May 21, 1986, Ser. No. 865,352

Claims priority, application Japan, May 21, 1985, 60-106957; Aug. 19, 1985, 60-180511

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.⁴ H01J *29/70, 29/50*

U.S. Cl. 315—368 **4 Claims**



1. In a color cathode ray tube device comprising:
an envelope including a face plate, a funnel sealed to said face plate and a neck connected to said funnel;
a phosphor screen formed on the inside of said face plate for emitting light in the three colors red, green, and blue;
in-line electron gun means in said neck for generating substantially parallel three electron beams in a direction toward said phosphor screen;
a shadow mask arranged in the vicinity of said phosphor screen, including a large number of apertures for selective impingement of said electron beams on said phosphor screen; and
deflection means for deflecting said electron beams from a substantially parallel orientation and for maintaining a parallel relation among said electron beams, the improvement comprising:
said deflection means including,
means for generating a horizontal deflection magnetic field having a substantially uniform magnetic field distribution,
means for generating a vertical deflection magnetic field having a barrel shaped magnetic field distribution, and said means for generating a horizontal deflection magnetic field comprising a deflection coil dimensioned so that a half-width of the magnetic flux density distribution of said horizontal deflection magnetic field, measured on the envelope axis, is in the range of about 0.1 to about 0.4 times the distance from the center of said flux density distribution to said phosphor screen; and
a time delay means for applying a time delay to the times at which the picture signals of the respective colors red, green and blue inputted to said electron gun means are controlled.

4,820,959

PROJECTION CRT PROTECTION CIRCUIT

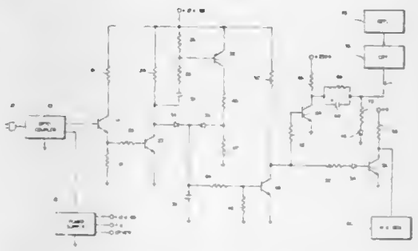
Donald E. Griffey, Skokie, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 22, 1988, Ser. No. 223,040

Int. Cl.⁴ H01J *29/52*

U.S. Cl. 315—384 **5 Claims**

1. In a projection cathode ray tube system of the type including separating high voltage generating means, high voltage shut down means for disabling the high voltage generating means, and optical coupler means for developing pulses of energy at power line frequency, the improvement comprising:
means responsive to the pulse output from the optical coupler means for quickly disabling the high voltage generating means in the event of interruption of AC input power to the optical coupler means for protecting the cathode ray tube from phosphor burn.



4,820,960

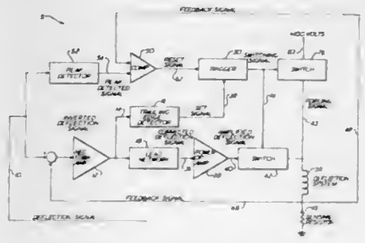
FAST RETRACE CIRCUIT FOR A DEFLECTION AMPLIFIER IN A CATHODE RAY TUBE

James A. Fazio, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 28, 1987, Ser. No. 101,513

Int. Cl.⁴ H01J *29/70, 29/72*

U.S. Cl. 315—397 **7 Claims**



1. A method for the retrace of a cathode ray tube (CRT) electron beam during a retrace period of a periodic deflection signal having alternating trace and retrace periods which signal is provided to a CRT's deflection system, comprising the steps of:
providing the periodic deflection signal to the CRT's deflection system after the retrace period so as to control the CRT electron beam so as to scan across the CRT's screen during the trace period; and
providing a forcing signal to the CRT's deflection system at the beginning of the retrace period so as to reverse the direction of current flow through the deflection system and allow for the CRT electron beam to slew to an initial position and settle before the beginning of the trace period.

4,820,961

LINEAR MOTION SCREENED INDUCTANCE SENSORS

Francis McMullin, Clare, Ireland, assignor to Kollmorgen Corporation, Simsbury, Conn.

Filed Apr. 29, 1988, Ser. No. 188,475

Claims priority, application Ireland, May 1, 1987, 1118/87

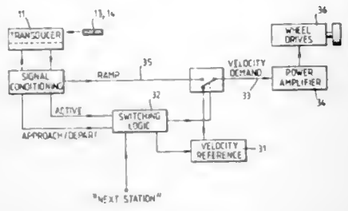
Int. Cl.⁴ G05D *1/00*

U.S. Cl. 318—587 **22 Claims**

1. A sensing system comprising a drive or exciting winding

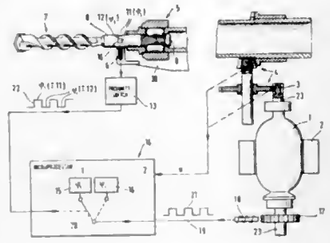
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for establishing a forward or drive field at least one secondary or sense winding in which a voltage may be induced in the presence of said forward or drive field, and at least one conductive screen within which eddy currents are generated in the presence of said forward or drive field to establish a counter-field opposing said forward or drive field, said drive or exciting winding and said at least one secondary or sense winding being accommodated in a displaceable sensor portion and said at least one conductive screen being fixedly located relative to said displaceable sensor portion, said secondary or sense winding being shaded to a varying extent by said at least one conductive screen when said displaceable sensor portion is in the vicinity of said at least one conductive screen to thereby vary the voltage induced in said at least one secondary or sense



winding and said at least one secondary or sense winding being oriented to provide a varying voltage output substantially indicative of the position of said displaceable sensor portion relative to said at least one conductive screen in a single direction of relative displacement of said displaceable sensor portion and said at least one conductive screen, said drive or exciting winding being configured so that in the absence of said at least one conductive screen said forward or drive field is substantially even over said at least one secondary or sense winding in said single direction of relative displacement of said displaceable sensor portion and said at least one conductive screen, said at least one secondary or sense winding being a two-terminal winding, and said at least one conductive screen defining a plane which is substantially parallel to a notional surface defined by said at least one secondary or sense winding.

4,820,962
ARRANGEMENT FOR AUTOMATIC WORKING DATA SET-UP FOR DRIVING IMPLEMENTS
Wolfgang Millauer, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft
Filed Oct. 28, 1987, Ser. No. 114,413
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637128
Int. Cl.⁴ G05B *19/29*
U.S. Cl. 318—602 **11 Claims**



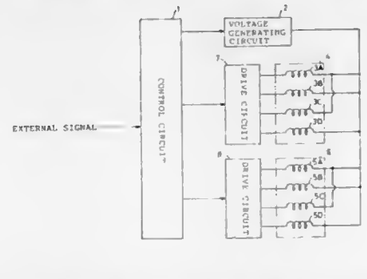
1. An arrangement for automatic working data set-up particular to each type of tool bit for driving implements adapted to various types of exchangeable tool bits, said arrangement comprising;

(A) data markings formed on said tool bits indicative of each type of tool bit, said data markings being arranged on a shank of each tool bit in the region serving for retention and actuating connection with the driving implement and distributed around a circumference of said tool bit;

(B) a marking read-out device built into a tool bit receptacle of the driving implement rigidly mounted to a housing of the implement, said read-out device being aligned with the data markings when the tool bit is inserted into the driving implement, said marking read-out device generating an electric signal corresponding to a sequence of the data markings on the circumference of the shank, when there, is relative motion between the tool bit and the housing; and

(C) an electronic evaluation arrangement for receiving the electric signal, said electronic evaluation arrangement generating appropriate adjustment orders for adjusting a drive unit of the driving implement for appropriate working parameters of the tool bit.

4,820,963
DRIVING DEVICE FOR STEP MOTOR
Norio Kobayashi, Nagoya, and Satoshi Yoshimoto, Komaki, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan
Filed Nov. 17, 1987, Ser. No. 122,855
Claims priority, application Japan, Nov. 19, 1986, 61-276253; Nov. 19, 1986, 61-276254
Int. Cl.⁴ H02I *8/00*
U.S. Cl. 318—696 **14 Claims**

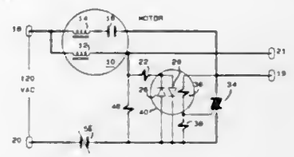


1. A driving device including a plurality of step motors:
a driver circuit connected to said respective motors,
a voltage generating circuit means connected to said respective step motors for providing power to said respective step motors in order to activate one or more of said step motors; and
control circuit means for activating said voltage generating circuit means in response to a drive signal or a stop signal, and for activating said driver circuits in response to a drive control signal so that: one or more step motors is rotated by sequential activation of respective coils of each said step motors; and any other step motors are stopped.

4,820,964
SOLID STATE MOTOR START CIRCUIT
Andrew S. Kadah, 5000 Henneberry Rd., Manlius, N.Y. 13104, and Kenneth G. Frazer, Clay, N.Y., assignors to Andrew S. Kadah, Manlius, N.Y.
Continuation-in-part of Ser. No. 899,018, Aug. 22, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 158,300
Int. Cl.⁴ H02P *1/42*
U.S. Cl. 318—786 **10 Claims**

1. Start circuit for a single-phase AC induction motor of the type having at least one run winding connected to a pair of AC inputs and a start winding connected with or without as start capacitor to said AC inputs during a start-up operation but which is cut out from said AC inputs when said motor has achieved running speed, the motor also having a thermal cut-out switch in series with the run winding that includes a heater resistor in series with said run winding developing a voltage thereacross that varies with the current through the run winding; the start circuit comprising

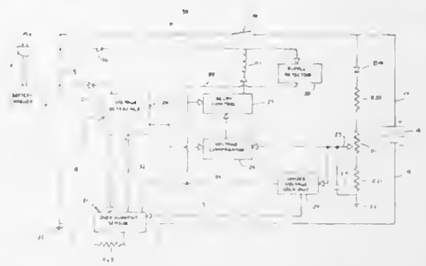
a light emitting diode connected to said heater resistor providing light output whose intensity depends on said voltage;



AC current switch means having a gate electrode and having current electrodes in series with said start winding;

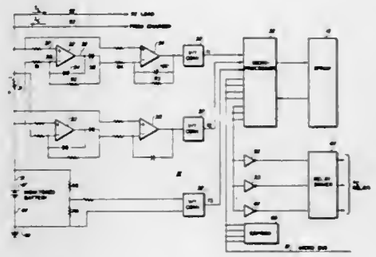
photosensitive circuit means including a photosensitive element and producing an output signal that depends on the intensity of light incident on the photosensitive element having an output supplying said output signal to the gate electrode of said AC current switch means; and light conduit means carrying said light output from said light emitting diode to said photosensitive element.

4,820,965
CONTROL CIRCUIT FOR BATTERY CHARGER
Dennis K. Siemer, Mankato, Minn., assignor to Maurice A. Sween and B. Marily Sween, both of Lake Crystal, Minn.
Filed Mar. 23, 1987, Ser. No. 29,264
Int. Cl.⁴ H02J *7/04*
U.S. Cl. 320—31 **12 Claims**



1. A control circuit for an AC operated battery charger having a direct current output and for connection to a battery for charging the battery, the control circuit comprising an electrical relay connected in series between a first electrical side of the output of said charger and a terminal of said battery of the same polarity as said first electrical side, voltage drop means interconnecting a second electrical side of the output of said charger with a terminal of said battery of the same polarity as said second electrical side of the output of said charger for generating a voltage drop, detection means in parallel with said battery for detecting the battery voltage level of said battery, voltage reference means for generating a voltage of predetermined voltage level, a voltage comparator means interconnecting said voltage reference means and said detection means for comparing the battery voltage with the predetermined voltage level, relay control means interconnecting said voltage comparator means and said relay to close said relay and apply power from said charger to said battery when the battery voltage level is below a predetermined voltage level and for opening said relay when the battery voltage level reaches said predetermined voltage level, overcurrent sensor means connected to said voltage drop means for detecting a high current flow and also connected to said relay control means to open said relay, under voltage means interconnecting said detection means and said relay control means for activating said relay control means when a predetermined low voltage is detected in said control circuit and ripple detector means interconnecting said battery charger and said relay control means to open said relay when no ripple voltage output is detected from said battery charger.

4,820,966
BATTERY MONITORING SYSTEM
Ron Fridman, 7540 E. Cochise, Scottsdale, Ariz. 85258
Filed Jun. 13, 1988, Ser. No. 205,633
Int. Cl.⁴ H02J *7/04*; G01N *27/46*
U.S. Cl. 320—32 **7 Claims**



1. A device for monitoring charging and discharging currents of a storage battery together with its controls, said device comprising:
a current sensing resistor (shunt) adapted to be connnected in series with a battery, the voltage and its polarity across said resistor being proportional to charging and discharging current through the battery and the direction of its flow,
a first amplifier means responsive only to signals across said resistor indicating discharge current flow through the battery for providing a first amplified voltage,
a second amplifier means responsive only to signals across said resistor indicating charging current flow through the battery for providing a second amplified voltage,
first and second voltage to frequency converters one for each of said first and said second amplifier means, each providing a train of pulses at a frequency proportional to the value of the first and second amplified voltage,
a microprocessor connected to receive the train of pulses from each of the first and second frequency converters and embodying a stored program for interpreting the first and second train of pulses and generating signals responsive thereto, and
relay means connected to said microprocessor for responding to said generated signals.

4. A device for monitoring charging and discharging currents of a storage battery together with its controls, said device comprising:
a current sensing resistor adapted to be connected in series with a battery, the voltage and its polarity across said resistor being proportional to charging and discharging current through the battery and the direction of its flow,
a first amplifier means responsive only to signals across said resistor indicating discharge current flow through the battery for providing a first amplified voltage,
a second amplifier means responsive only to signals across said resistor indicating charging current flow through the battery for providing a second amplified voltage,
first and second voltage to frequency converters one for each of said first and said second amplifier means, each

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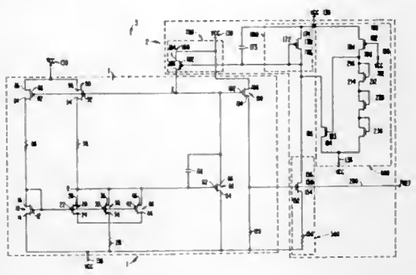
providing a train of pulses at a frequency proportional to the value of the first and the second amplified voltage,
a resistive divider for connection across the battery,
a third voltage to frequency converter responsive to battery voltage across said divider for providing a train of pulses at a frequency proportional to voltage across the battery,
a microprocessor connected to receive the train of pulses from each of the first, second and third frequency converters and embodying a stored program for interpreting the first, second and third train of pulses and generating signals responsive thereto,
relay means connected to said microprocessor for responding to said generated signals, and
display means for visually responding to said generated signals.

4,820,967

BICMOS VOLTAGE REFERENCE GENERATOR

Robert A. Kertis, and Douglas D. Smith, both of Puyallup, Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 2, 1988, Ser. No. 151,348
Int. Cl.[4] G05F *3/16*
U.S. Cl. 323—314 **10 Claims**



1. A reference voltage generator for generating a stable voltage over variations of source voltage and temperature of the type including an inner loop reference voltage generator connected to receive feedback current from a current mirror, comprising:
a inner loop reference voltage generator connected to receive a source voltage, including means for generating an inner loop reference voltage from said source voltage, means for generating a reference voltage form said inner loop reference voltage and a feedback current, and further including a feedback current receiving node for receiving said feedback current from a current mirror; and
a current mirror connected to receive said reference voltage for generating from said reference voltage a feedback current, said current mirror circuit connected to said feedback current receiving node for outputting to said inner loop reference voltage generator said feedback current.

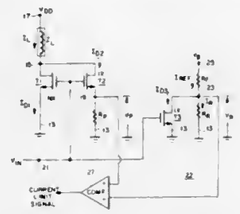
4,820,968

COMPENSATED CURRENT SENSING CIRCUIT

Robert S. Wrathall, Durham, N.C., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 27, 1988, Ser. No. 224,636
Int. Cl.[4] G05F *3/24*
U.S. Cl. 323—316 **6 Claims**

1. The combination comprising:
a. first and second power terminals for the application therebetween of an operating potential;
b. means for connecting a load between said first power terminal and a first node;
c. a first semiconductor switch having its main conduction path connected between said first node and said second power terminal for controlling the current flow through said load;
d. means for sensing the current flowing through said load and said first semiconductor switch comprising:
(i) a second semiconductor switch having its main conduction path connected between said first node and a second node; and
(ii) a first impedance means connected between said second node and said second power terminal; and



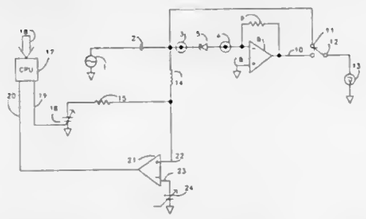
e. a reference circuit for producing a current which is proportional to the current flowing through said load comprising:
(i) a current reference generating circuit connected between point of operating potential and a third node;
(ii) a second impedance means connected between said third node and said second power terminal; and
(iii) a third semiconductor switch having its main conduction path connected in parallel with said second impedance means between said third node and said second power terminal.

4,820,969

POLARITY COMPENSATED APPARATUS FOR MEASURING THE IMPEDANCE OF A POLAR DEVICE

Takanori Yonekura, and Tomio Wakasugi, both of Hachioji, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 22, 1988, Ser. No. 185,602
Claims priority, application Japan, Apr. 23, 1987, 62-61872[U]
Int. Cl.[4] G01R *27/00, 27/14*
U.S. Cl. 324—57 R **1 Claim**



1. An apparatus for measuring a polar device having a first and second terminal comprising;
an AC signal source means for driving the first terminal of the polar device through AC coupling,
a variable DC supply means for driving the first terminal through an AC choke circuit,
a negative feedback amplifier means for virtually grounding the second terminal of the polar device and for generating output voltage proportional to current from the second terminal,

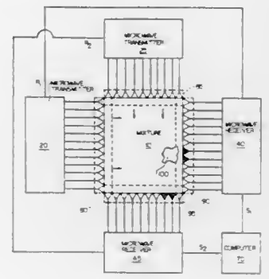
DC detector circuit for detecting a DC signal component impressed on the polar device through the AC choke circuit,
a control means for receiving the DC signal component and for comparing the DC signal component with a predetermined threshold and for selecting polarity of the output of the variable DC supply means in response to the comparison result, and
a vector ratio computing means for measuring impedance of the polar device from the AC voltage on the first terminal and from the output of the negative feedback amplifier means.

4,820,970

APPARATUS AND METHOD FOR USING MICROWAVE RADIATION TO MEASURE WATER CONTENT OF A FLUID

Clande V. Swanson, 1800 Old Meadow Rd., McLean, Va. 22101

Continuation-in-part of Ser. No. 906,952, Sep. 15, 1986. This application Jun. 3, 1987, Ser. No. 57,026
Int. Cl.[4] G01R *27/04, 27/26*
U.S. Cl. 324—58.5 A **17 Claims**



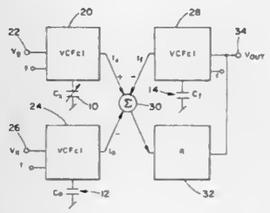
1. Apparatus for measuring a total volume of a first fluid having a first frequency dependent microwave energy absorption characteristic $\gamma(\omega)$ within a predetermined frequency range in a mixture of said first fluid and a second fluid, said second fluid having a second microwave energy absorption characteristic lower than said first microwave energy absorption characteristic in said predetermined frequency range, said mixture comprising volumes of said first fluid of various sizes, said apparatus comprising:
first means, arranged on one side of a volume of said mixture, for generating a microwave beam having an initial energy E_o and a frequency ω which varies within said predetermined range;
second means, arranged across said volume from said first means, for receiving said generated microwave beam after it has passed through the mixture, and for generating signals E_h indicative of attenuation of the initial energy of said microwave beam in said mixture as said frequency varies; and
third means, coupled to said second means and responsive to said signals E_h, for determining the total volume V_f of said first fluid in said mixture by summing all of the various size volumes of said first fluid in accordance with their spatial dimension r_i in a direction parallel to the direction of propagation of the microwave beam.

4,820,971

PRECISION IMPEDANCE VARIATION MEASUREMENT CIRCUIT

Wen-Hsiung Ko, 1356 Forest Hills Blvd., Cleveland Hts., Ohio 44118, and Gong-Jong Yeh, 2033 Cornell Rd., Cleveland, Ohio 44106

Filed May 29, 1986, Ser. No. 868,781
Int. Cl.[4] G01H *11/00*
U.S. Cl. 324—61 R **19 Claims**



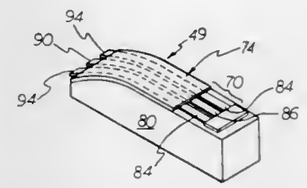
1. An impedance discrimination circuit for measuring a sensed condition related to impedance variation, the circuit comprising:
a condition sensing impedance means whose impedance varies in accordance with the sensed condition;
a reference impedance means having a fixed impedance which is unaffected by the sensed condition, the reference impedance means being connected in parallel with the condition sensing impedance means;
at least one electrical energy source operatively connected with the condition sensing and reference impedances for generating a sensed condition and reference impedance difference signal which varies in accordance with a difference between the condition sensing and reference impedances;
a feedback signal means for generating a feedback signal which varies in accordance with an output signal and a feedback impedance; and,
a converter means for converting a difference between the feedback signal and the sensed condition and reference impedance difference signal into said output signal such that the output signal is proportional to the feedback impedance.

4,820,972

WALL THICKNESS DETECTOR

Paul F. Scott, Hartford; Donald C. Button, Cheshire, both of Conn.; Charles B. Reeves, Salem, and Edward D. Howerter, Danvers, both of Mass., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Jul. 2, 1987, Ser. No. 69,457
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 P **5 Claims**



1. A capacitive circuit laminate for a capacitive probe in a wall thickness detector, said capacitive circuit laminate comprising:

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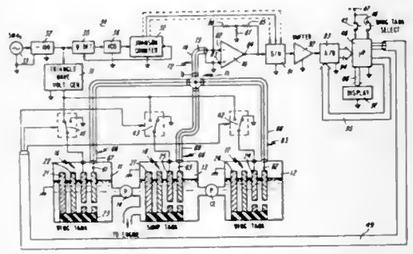
a middle layer including three elongated, equally spaced flexible metallic capacitive elements,
means for applying a non-zero voltage waveform to the central of said capacitive elements, and
means for shorting said other two outer capacitance elements to ground so that a capacitance field will be generated which is confined to a region approximately bounded by parallel planes through said outer capacitance elements and normal to said middle layer,
a rear layer including a thin metallic shield for shielding the rear surface of said middle layer, and
a front layer including a thin metallic shield for shielding the front surface of said middle layer and having a window for exposing a selected length of said capacitive elements of said middle layer whereby an electromagnetic field may emanate from said central one of said capacitive elements, pass outwardly through said window into the vicinity of a dielectric member, and return back through said window to said outer capacitive elements, and
means for driving the thin metallic shields of said rear and front layers with said non-zero voltage waveform.

4,820,973

IMPEDANCE MEASURING SYSTEM

Jose A. Alvarez, 917 Cross Ave., Elizabeth, N.J. 07208

Continuation of Ser. No. 934,181, Nov. 21, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 223,697
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 R **39 Claims**



1. A system for measuring the value of a capacitive impedance comprising a periodic non-sawtooth triangular voltage source that has a zero average value and changes linearly as a function of time adapted to be connected to the impedance, the capacitive impedance responding to said voltage source by deriving a current having a pair of constant amplitude components, and means for sampling the amplitude of the derived current for equal durations on opposite sides of zero crossings of the voltage applied to the impedance to provide an indication of the value of one of said constant amplitude components and a measure of the capacitive impedance.

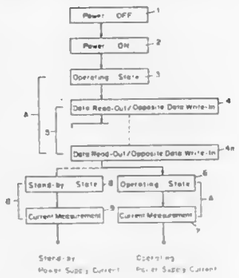
4,820,974

METHOD FOR MEASURING A CHARACTERISTIC OF SEMICONDUCTOR MEMORY DEVICE

Joji Katsura, Nishinomiya; Seiji Yamaguchi, Hirakata; Kazuhiko Tsuji, and Eisuke Ichinohe, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 11, 1986, Ser. No. 941,626
Claims priority, application Japan, Dec. 16, 1985, 60-283321
Int. Cl.[4] G01R *31/28, 31/26*
U.S. Cl. 324—73 R **15 Claims**

13. A method for measuring power supply current of a random access memory having memory cells comprising:
supplying a power supply voltage to a random access memory to be measured so that said random access memory enters into an operating state;
reading out data which is stored in one memory cell of said random access memory;
preparing opposite data which is opposite to the read-out data;



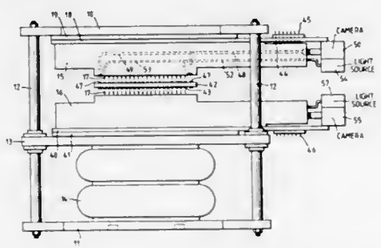
writing said opposite data in said memory cells;
repeating the steps of reading out, preparing opposite data and writing; and
measuring power supply current of said random access memory.

4,820,975

TEST APPARATUS FOR PRINTED CIRCUIT BOARDS

Brian Diggle, Stalybridge, England, assignor to International Computers Limited, London, England

Filed Dec. 29, 1987, Ser. No. 138,864
Claims priority, application United Kingdom, Jan. 14, 1987, 8700754
Int. Cl.[4] G01R *15/12*
U.S. Cl. 324—158 F **9 Claims**



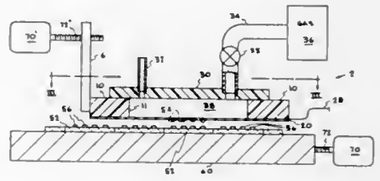
1. A method of testing a printed circuit board utilising test apparatus comprising at least one test head having an array of probes for contacting pads on the printed circuit board, the method comprising the steps of: providing at least two alignment marks at spaced-apart positions on the printed circuit board; simultaneously conveying images of the alignment marks along corresponding optical fibre image guides mounted in fixed relationship to the test head; and bringing both the conveyed images into alignment with associated fixed reference points.

4,820,976

TEST FIXTURE CAPABLE OF ELECTRICALLY TESTING AN INTEGRATED CIRCUIT DIE HAVING A PLANAR ARRAY OF CONTACTS

Candice H. Brown, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 24, 1987, Ser. No. 124,719
Int. Cl.[4] G01R *1/04, 1/073*
U.S. Cl. 324—158 F **13 Claims**



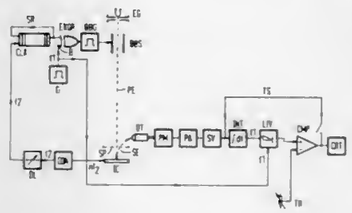
1. A test fixture apparatus for testing an integrated circuit die wherein a plurality of contacts arranged in a two dimensional array on said integrated circuit die may be simultaneously moved into a position of electrical and thermal communication with a corresponding array contacts on said test fixture comprising:
(a) an outer insulating support ring having an circular opening therein;
(b) a circular transparent flexible contact member having an outer diameter larger than the diameter of said circular opening on said support ring and which is bonded to one surface of said support ring, said flexibel contact member having a two dimensional array of metal contacts on one surface thereon which extend through said contact member to electrical connection means on the opposite surface thereof;
(c) a circular transparent cover member concentrically mounted in sealed relationship to one surface of said support ring to define, with said support ring and said flexible contact member, a chamber wherein said surface of said contact member having said contacts thereon forms an outer surface of said chamber;
(d) means to support said integrated circuit die in a plane parallel to the plane of said flexible contact member;
(e) means for providing laterally movement between said flexible contact member and said integrated circuit die in the plane defined by said contact member to permit said array of integrated circuit die contacts to be precisely aligned with said array of contacts on said contact board through said transparent cover member and said transparent contact member;
(f) means for admitting a cooling gas under pressure into said chamber to urge said flexible contact member toward an integrated circuit die positioned adjacent said test fixture to establish simultaneous electrical connections between contacts on said integrated circuit die and said contacts on said contact member to permit testing of said integrated circuit die; and
(g) means for releasing gas from said chamber at a lower rate than said admitting means to permit said chamber to be pressurized while allowing a moving flow of said cooling gas through said chamber whereby heat generated by said integrated circuit die during testing will be thermally transmitted into said chamber from said contacts on said die through said contacts on said contact member and dissipated in said flow of cooling gas through said chamber.

4,820,977

METHOD AND APPARATUS FOR IDENTIFYING POINTS ON A SPECIMEN HAVING A DEFINED TIME-DEPENDENT SIGNAL

Hans D. Brust, Dudweiler, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 15, 1986, Ser. No. 941,646
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 3544600
Int. Cl.[4] G01N *23/00;* **G01R** *31/26*
U.S. Cl. 324—158 R **30 Claims**



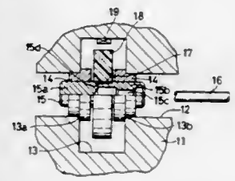
19. An apparatus for identifying points on a specimen having a defined time-dependent signal, the apparatus including a scanning microscope having a primary beam generator and means for deflecting and focusing the primary beam, said primary beam generating a secondary particle beam, a drive for supplying signals to the specimen, means for registering secondary particles in said secondary particle beam and means for generating a secondary electrical signal from the registered secondary particles, comprising:
means for modulating a selected one of said primary beam and said secondary particle beam and said secondary electrical signal;
means for driving said modulating means;
means for negating a signal appearing between said driving means and said modulating means;
means for switching said negating means between a negating and a non-negating operating mode; and
a first signal generator connected to said switching means.

4,820,978

MAGNETIC ROTATION SENSOR WHEREIN A MAGNETIC MEMBER IS ATTACHED TO A ROTATION SHAFT BY A HEAT RESISTANT ELASTIC MEMBER

Masaki Hirota, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

Filed May 29, 1987, Ser. No. 55,254
Claims priority, application Japan, May 30, 1986, 61-81169[U]
Int. Cl.[4] G01P *3/48;* **F16B** *4/00*
U.S. Cl. 324—166 **22 Claims**



1. A rotation sensor for a vehicle, comprising:
a drive shaft connected to a rotation shaft of the vehicle;
a ring-shaped magnetic member fixed to the drive shaft, the magnetic member being formed from a composition of heat resistant resin and magnetic materials;

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a heat resistant elastic member, which is disposed between the drive shaft and the magnetic member, for absorbing the stress of expansion or contraction of the drive shaft and the magnetic member; and

a detector for detecting changes of magnetic flux caused by rotation of the magnetic member mounted on said vehicle, wherein angular frequency or angular velocity can be determined from said changes in magnetic flux.

4,820,979

ELECTRONIC INSTRUMENT UNIT FOR USE ON A BICYCLE HAVING A SIGNAL RECEIVER ON BOTH SIDES OF THE UNIT

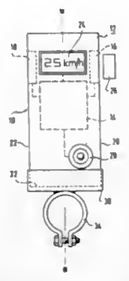
Hans J. Schwerdhöfer, Schweinfurt; Johannes Jäger, Gochsheim; Richard Gerstner, Dittelbrunn, and Günter Look, Bergrheinfeld, all of Fed. Rep. of Germany, assignors to Sachs-Huret S.A., Nanterre, France

Filed Nov. 13, 1987, Ser. No. 120,376

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 8631057[U]

Int. Cl.[4] G01P *3/487*

U.S. Cl. 324—171 **19 Claims**



1. An electronic instrument unit for use on a wheeled vehicle having a carrier unit and a wheel rotatably mounted about a wheel axis on the carrier unit, the wheel having a main plane perpendicular to the wheel axis, comprising: a frame unit having a middle plane; fastening means on said frame unit for fastening said frame unit to the carrier unit of the vehicle so that said middle plane is substantially parallel to the main plane when said frame unit is fastened to the carrier unit; electronic circuit means including signal-receiving means provided on said frame unit; and signal-inducing means provided on the wheel so as to pass by said frame unit during rotation of the wheel, said signal-receiving means cooperating with said signal-inducing means to cause signals to be delivered to said electronic circuit means, said signal-receiving means including at least one signal receiver on each side of said middle plane.

4,820,980

GAP, WEAR AND TRAM MEASUREMENT SYSTEM AND METHOD FOR GRINDING MACHINES

Darryl Dodson-Edgars, 10765 SW. Muirwood Dr., Portland, Oreg. 97225

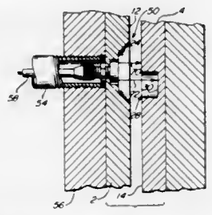
Filed May 4, 1987, Ser. No. 45,450

Int. Cl.[4] G01B *7/14, 7/10;* **B02C** *7/14;* **G01N** *27/72*

U.S. Cl. 324—207 **19 Claims**

1. In a refiner having a first and second grinding plate, opposed to each other, said second grinding plate having a recessed, non-wear surface area facing said first grinding plate, a dynamic measurement method for determining distances utilizable in calculating plate wear, said measurement method comprising the steps:

measuring during refiner operation a first distance from said first grinding plate to a grinding surface of said second grinding plate; and



measuring during refiner operation a second distance from said first grinding plate to said recessed non-wearing surface area of said second grinding plate.

4,820,981

METHOD AND APPARATUS FOR MEASURING MAGNETIC LOSSES IN FERROMAGNETIC MATERIALS BASED ON TEMPERATURE MODULATION MEASUREMENTS

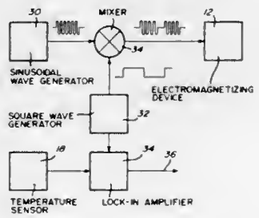
Jean F. Bussiere, St-Bruno; Martin Lord, Longueuil, and Jean-Pierre Monchalin, Montreal, all of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed Dec. 28, 1987, Ser. No. 137,933

Claims priority, application Canada, Dec. 29, 1986, 526373

Int. Cl.[4] G01R *33/14;* **G01N** *27/72;* **H04L** *27/10*

U.S. Cl. 324—222 **22 Claims**



11. An apparatus for measuring magnetic losses in a ferromagnetic material specimen, which comprises:

magnetizing means for generating an alternating magnetic field having a predetermined frequency and an amplitude which is modulated at a frequency lower than said predetermined frequency, and applying said magnetic field to the ferromagnetic material specimen to thereby cause in said specimen a modulation in temperature at the frequency of modulation of said magnetic field, and

temperature sensing means for measuring the temperature modulation at a surface of said specimen having the applied field, at the frequency of modulation of said magnetic field to obtain a measurement value which is substantially proportional to the magnitude of magnetic losses, whereby the magnitude of magnetic losses in the specimen is determined from said measurement value.

4,820,982

DEVICE FOR EXPLORING THE INNER VOLUME OF A CYLINDER AND AN INVESTIGATION SYSTEM EQUIPPED WITH THIS DEVICE

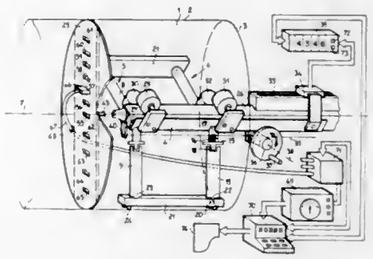
Guy Aubert, Grenoble, France, assignor to Thomson-CGR, Paris, France

Filed Mar. 30, 1987, Ser. No. 31,617

Claims priority, application France, Apr. 1, 1986, 86 04591

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—300 **18 Claims**



1. A device for exploring the inner volume of the cylinder, said device comprising:

(a) a framework;

(b) means for fixing and adjusting the position of said framework in the cylinder;

(c) a probe holder having housings for receiving at least one measuring probe;

(d) means for causing said probe holder to slide along the axis of the cylinder; and

(e) means for causing said probe holder to pivot about the axis of the cylinder,

(f) wherein said framework comprises two sets of three spacers, the spacers of each set being held in a plane perpendicular to the axis of the cylinder and being at least substantially 120° with respect to each other, one of the planes being situated substantially in line with one end of said framework.

4,820,983

METHOD AND APPARATUS FOR PERFORMING AN NMR EXPERIMENT

Max R. Bendall, 274 Ford Rd., Burbank, Queensland, Australia, and David T. Pegg, 7 Fanfare St., Eight Mile Plains, Queensland, Australia

PCT No. PCT/AU86/00353, § 371 Date Aug. 6, 1987, § 102(e) Date Aug. 6, 1987, PCT Pub. No. WO87/03370, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 20, 1986, Ser. No. 92,919

Claims priority, application United Kingdom, Nov. 20, 1985, 8528551

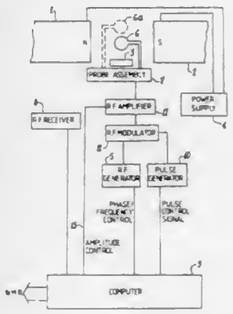
Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **25 Claims**

1. An NMR apparatus for the acquisition of magnetic resonance information from a sample comprising magnetic resonators by one or more pulses of Rf radiation comprising Rf magnetic field B_1, said resonators subject to an effective magnetic field B in a frame of reference rotating at Rf frequency ν_0 about an axis defined by an applied dc magnetic field the effective field B a vector comprising resonance offset ΔH and the Rf magnetic field B_1, said effective field B at an angle α with to said Rf magnetic field B_1, comprising modulation means for controlling both the amplitude and Rf frequency of said pulse to cause said pulse to exhibit a first time dependence in amplitude over the interval defined by said pulse and further to cause said pulse to exhibit a second time dependence in radio frequency over the interval of said pulse, said time dependencies satisfying the conditions wherein

(a) said effective field B is maintained substantially constant over the interval of said pulse,

(b) said angle α changes over the interval of said pulse in



accord with said modulation, said change comprising a rate $d\alpha/dt$ such that $d\alpha/dt$ is substantially constant over the interval of said pulse and that $d\alpha/dt$ is small compared to B.

4,820,984

MR TOMOGRAPHY METHOD AND MR TOMOGRAPHY APPARATUS FOR PERFORMING THE METHOD

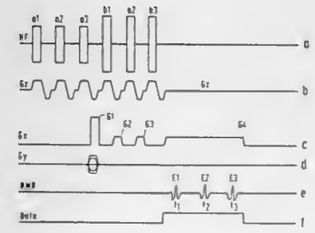
Michael H. Kuhn, Hamburg, and Graeme C. McKinnon, Ellerau, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 9, 1987, Ser. No. 94,568

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631039

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **7 Claims**



7. An MR tomography apparatus comprising:

a magnet for generating a uniform steady magnetic field;

an r-f coil system for generating an r-f magnetic field which extends perpendicular to said steady magnetic field;

a plurality of gradient coil systems for generating magnetic fields which extend in the direction of said steady magnetic field and which have gradients which extend in different directions;

an r-f generator for supplying said r-f coil system with r-f pulses having a presettable carrier frequency;

generators for supplying energizing signals to said gradient coil systems; and

control unit means for controlling said r-f generator and said generators for said gradient coil systems, said control unit means providing control signals to said r-f generator for supplying a sequence of first r-f pulses of different frequency spaced apart in time, and thereafter supplying a sequence of second r-f pulses spaced apart in time and having frequencies which vary from pulse to pulse in the same manner as said first r-f pulses and said control unit

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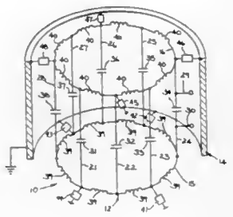
means further providing control signals to at least one of said gradient coil system generators for switching said one gradient coil generator on and off during intervals occurring before the first and between each two of said second r-f pulses and thereafter switching sid magnetic gradient field on during a detection interval to permit detection of spin echo signals relating to slices of a subject under investigation, said magnetic gradient field having amplitude and duration characteristics such that, with respect to each said slice, the time integral of said magnetic gradient field between first and second r-f pulses for said slice is substantially equal to the subsequent time integral of said magnetic gradient field between said second r-f pulse and the appearance of the spin echo signal corresponding to that slice.

4,820,985

APPARATUS FOR TUNING AN NMR FIELD COIL

Matthew G. Eash, Oconomowoc, Wis., assignor to General Electric Company, Milwankee, Wis.

Filed Apr. 6, 1988, Ser. No. 178,278
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **12 Claims**



1. A radio frequency NMR coil assembly intended to resonate at a desired frequency comprising:
a cylindrical field coil having a pair of conductive end loops disposed in a spaced-apart relation along a central axis, and a plurality of conductive segments electrically interconnecting the pair of conductive end loops at points around each of said end loops, and said conductive segments including reactive shunts which have values that cause said field coil to resonate at a given frequency;
a shield disposed about said field coil; and
a plurality of reactive shunts coupled between different locations about the periphery of the field coil and a common node, each of said reactive shunts being variable to increase or decrease the resonant frequency of the field coil.

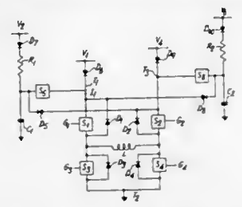
4,820,986

INDUCTIVE CIRCUIT ARRANGEMENTS

Peter Mansfield, Beeston, and Ronald J. Coxon, Wollaton, both of United Kingdom, assignors to National Research Development Corporation, London, United Kingdom

Filed Dec. 11, 1986, Ser. No. 940,609
Claims priority, application United Kingdom, Dec. 16, 1985, 8530930
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **13 Claims**

1. An inductive circuit arrangement comprising:
four switches connected to form four arms of a bridge configuration,
current supply terminals at opposite ends of the bridge,
inductive coil means connected across the bridge so that current can flow in either direction through the coil means depending on the setting of the switches,
a series connection of capacitor means and a series switch connected across the supply terminals, and
means for operating said four switches and said series switch so as to connect the capacitor means across the coil means at least for a sufficient period of time until the current flow through the coil reduces to zero by charging of the capacitor means and so as to isolate said capacitor means from the bridge configuration to enable current to continue to flow through the coil.

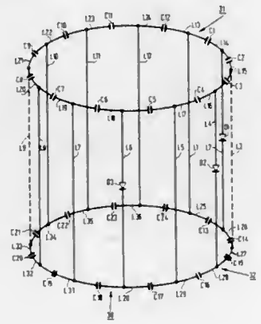


4,820,987

MAGNETIC RESONANCE IMAGING APPARATUS COMPRISING AN ACTIVATABLE BIRDCAGE RF COIL

Wilhelmus R. M. Mens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1987, Ser. No. 58,295
Claims priority, application Netherlands, Dec. 22, 1986, 8603251
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **8 Claims**



1. A magnetic resonance imaging apparatus comprising:
an RF coil having a substantially cylindrical shape and in which a substantially cosinusoidal current distribution can be generated around the circumference of said cylindrical shape,
a number of rod conductors which extend axially along a surface of said cylindrical shape,
wherein for the deactivation of said RF coil at least selected ones of said rod conductors are provided with switching means for interrupting the conductance in the rod conductors.

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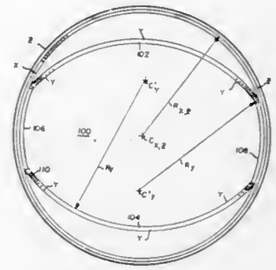
MAGNETIC GRADIENT COIL SET FOR NUC' EAR MAGNETIC RESONACE SYSTEM HAVING SUBSTANTIALLY DIFFERENT COIL-PATIENT SPACINGS

Lawrence E. Crooks, Richmond, and Joseph W. Carlson, San Francisco, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 7, 1987, Ser. No. 105,738
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **23 Claims**

1. An assembly of magnetic gradient coils for use in creating

controlled three-dimensional magnetic field gradients along mutually orthogonal x, y, z axes in a magnetic resonance system having a static magnetic field directed along the z-axis in which static field said gradients are created during passage of electrical current in said gradient coils, said assembly comprising:
x and z gradient coils having gradient-generating segments centered about said z-axis for generating magnetic gradients along respectively corresponding mutually orthogonal x and z axis directions within an enclosed patient access volume; and
a y gradient coil also encompassing said patient access volume but having gradient-generating segments centered about an axis that is offset from and parallel to said z-axis for generating a magnetic gradient along a y axis direction mutually orthogonal to said x and z axes.

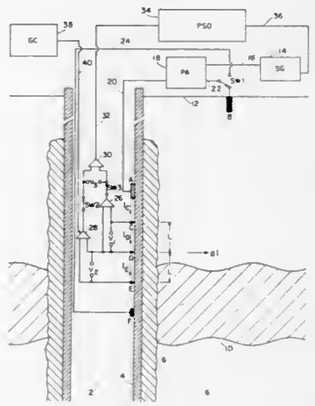


4,820,989

METHODS AND APPARATUS FOR MEASUREMENT OF THE RESISTIVITY OF GEOLOGICAL FORMATIONS FROM WITHIN CASED BOREHOLES

William B. Vail, III, Bothell, Wash., assignor to ParaMagnetic Logging, Inc., Woodinville, Wash.

Filed Nov. 4, 1986, Ser. No. 927,115
Int. Cl.[4] G01V *3/02*
U.S. Cl. 324—368 **22 Claims**



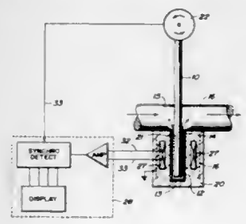
5. An apparatus for measuring the resistivity of particular formations adjacent to a borehole extending from the earth's surface into remote geological formations, the borehole having a metallic casing, said apparatus comprising:
(a) a first electrode disposed within and engaged in electrical contact with the interior of said metallic casing at a depth from the surface of the earth;
(b) an earth contacting electrode in electrical contact with the surface of the earth remote from said borehole;
(c) a plurality of at least three voltage measuring electrodes vertically disposed within said metallic casing, said voltage measuring electrodes being in electrical contact with said metallic casing adjacent to a particular formation of interest;
(d) means for generating an alternating current;
(e) conducting means for selectively applying said alternating current to said first electrode in a manner requiring a majority of the current to pass through the earth to said earth contacting electrode, thereby causing at least a portion of the current to pass through the particular formation of interest; and
(f) measuring means for simultaneously measuring the voltage differences between a plurality of discrete pairs of said voltage measuring electrodes and processing means for providing an output signal indicative of the electrical resistivity of the particular formation of interest based at least in part upon the simultaneous voltage differences detected by said measuring means.

4,820,990

ELECTRODE-LESS DETECTOR

Zach Moore, Lake Jackson, Tex., assignor to Zeta Management Ltd., Lake Jackson, Tex.

Filed Oct. 9, 1987, Ser. No. 107,290
Int. Cl.[4] G01R *5/28*
U.S. Cl. 324—445 **11 Claims**



1. An apparatus for sensing and quantifying without the addition of an externally induced potential the electrical charge condition in a flowable two phased liquid media containing electrical charge influencing species comprising a tubular flow path member, said flow path member having electrically insulating walls, an open end and a closed end, said flow path being so disposed that it may be substantially filled with said liquid, a reciprocating member whose outer wall is electrically insulating disposed within said flow path member for mechanically inducing the ions in said liquid to flow in more than one direction, said reciprocating member having a transverse cross-sectional configuration such that said reciprocating member fits adjacent but spaced from said electrically insulating walls of said flow path member and provides a controlled pressure drop, means for admitting predetermined amounts of flowable material to said flow path member, sensory means disposed on the non-wetted side of said flow path member for solely developing a signal proportional to a desired ion activity by electrostatic or inductive coupling, and means coupled to said sensory means for amplifying any electrical signal induced across said sensory means.

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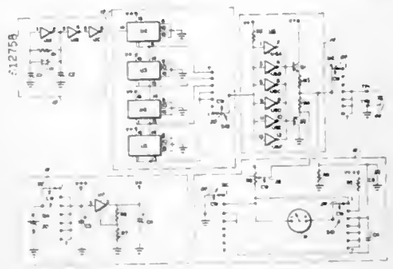
APPARATUS FOR DETERMINATION OF THE LOCATION OF A FAULT IN COMMUNICATIONS WIRES

Brian D. Clark, Mesa, Ariz., assignor to Progressive Electronics, Inc., Mesa, Ariz.

Continuation of Ser. No. 812,758, Dec. 23, 1985, abandoned. This application Sep. 30, 1988, Ser. No. 251,958

Int. Cl.[4] G01R *31/08, 11/52, 27/26*

U.S. Cl. 324—519 **8 Claims**



1. An open fault finding instrument having a pair of test leads for connection to a communications line to be tested, the fault finding instrument being provided with a power source, the instrument comprising in combination:

means for generating a test signal having a positive and a negative phase, one each of said positive phase and said negative phase comprising a cycle;

a single calibration capacitor;

means for charging said single calibration capacitor with electrical current, said charging means being driven by one of said phases of said test signal, said charging means having a first time constant;

means for discharging electrical current from said single calibration capacitor, said discharging means being driven by the other of said test signal phases, said discharging means having a second time constant, said second time constant being different from said first time constant;

means for measuring an integrated current value of one of said charging current and said discharging current; and

means for connecting a communications conductor having an open fault at an unknown location therein in parallel with said single calibration capacitor during a continuous time period comprising a plurality of said cycles of said positive phases and said negative phases.

4,820,992

CLOCK SIGNAL MULTIPLEXERS

Richard J. A. Avis, Sherfield Park, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 119,392

Claims priority, application United Kingdom, Nov. 20, 1986, 8627793

Int. Cl.[4] H04Q *3/00;* **H03K** *17/00, 1/17*

U.S. Cl. 328—137 **6 Claims**

1. A clock signal multiplexer for combining a plurality of input clock signals of the same frequency but differeing phases into a single channel, by selectively passing one of said input clock signals to an output of the multiplexer to the exclusion of all of the other input clock signals in response to a corresponding clock enable signal in a select condition, the multiplexer comprising:

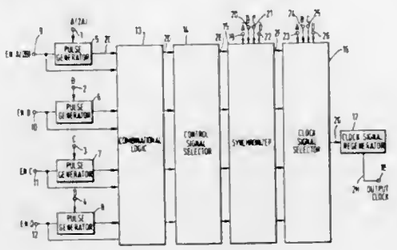
a plurality of input circuits each of which receives a respective one of said input clock signals and a corresponding one of a plurality of clock enable signals;

a signal synchronizer;

a logic circuit for coupling said input circuits to said signal synchronizer, and including means for enabling said signal synchronizer to pass the input clock signal corresponding to that one of said clock enable signals which is in a select condition and for disabling said signal synchronizer so as not to pass the selected input clock signal on return of said corresponding one of said clock enable signals to a non-select condition and transition of another of said clock enable signals to the select condition, and for enabling said signal synchronizer to pass the next selected input clock signal corresponding to said another clock enable signal;

a clock signal regenerator; and

a clock signal selector connected to receive said input clock signals and connected to said signal synchronizer, whereby the signal synchronizer enables said clock signal selector to pass the selected input clock signal to said clock signal regenerator;



said clock signal regenerator comprising first and second flip-flops and signal delay means, said second flip-flop having set and clock terminals and said first flip-flop being connected to receive said selected input clock signal and to supply a pulse in response thereto to said delay means and to one of said set and clock terminals of said second flip-flop, and said delay means producing an output supplied to the other of said set and clock terminals of said second flip-flop;

whereby said second flip-flop produces a signal which is supplied to said output of said multiplexer and has a mark/space ratio determined exclusively by said clock signal regenerator and not by said selected input clock signal.

4,820,993

DIGITAL PHASE LOCK LOOP

Earl T. Cohen, and John A. Swensen, both of Berkeley, Calif., assignors to Cyclotomics, Inc., Berkeley, Calif.

Filed Aug. 17, 1987, Ser. No. 85,682

Int. Cl.[4] H03K *5/13*

U.S. Cl. 328—155 **15 Claims**

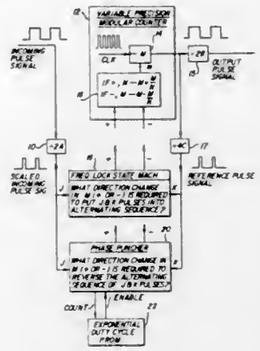
1. A digital phase lock loop which phase locks a train of reference pulses to a train of scaled incoming pulses, said digital phase lock loop comprising:

counter means for frequency-dividing a train of internal clock pulses by a modulus M to produce a counter output pulse signal from which said train of reference pulses may be derived;

first means for determining whether an increase or a decrease in said modulus M is necessary to put said trains of reference and scaled incoming pulses in alternating sequence;

second means active whenever said trains of reference and scaled incoming pulses are in alternating sequence for determining whether an increase or a decrease in said modulus M is necessary to reverse the order of said alternating sequence; and

means responsive to said first and second determining means for either increasing or decreasing said modulus M by an amount which is at least nearly proportional to the present value of said modulus M, whereby said modulus M may vary over a wide range with a minimum change in the effectiveness of each such increasing or decreasing of said modulus M, so that said digital phase lock loop may phase



lock said trains of reference and scaled incoming pulses over a wide range of incoming pulse frequencies.

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PHASE REGULATING CIRCUIT

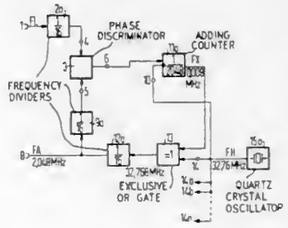
Fritz Sonntag, Munich, and Hermann Lang, Weilheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 105,670

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1986, 3635641

Int. Cl.[4] H03K *9/06, 5/13;* **H03L** *7/00*

U.S. Cl. 328—155 **5 Claims**



1. In a phase regulating circuit of the type which comprises a phase discriminator, a first frequency divider whose input serves as an input for a slot clock signal and whose output is connected to a first input of the phase discriminator, a regulator and oscillator component whose input is connected to the output of the phase discriminator and whose output serves to emit a regulated clock signal, and a second frequency divider whose input is connected to the output of the regulator and oscillator component and whose output is connected to a second input of the phase discriminator, the improvement wherein the regulator and oscillator component comprises:

an adding counter for mean value formation, said adding counter including a control input connected to the output of the phase discriminator, and an output;

a quartz crystal oscillator including an output;

an EXCLUSIVE OR gate including a first input connected to said output of said adding counter and a second input connected to said output of said quartz crystal oscillator, said adding counter including a clock input connected to said second input of said EXCLUSIVE OR gate and said EXCLUSIVE OR gate including an output; and

a third frequency divider including an input connected to said output of said EXCLUSIVE OR gate and an output forming the output of the regulating and oscillator component,

wherein said quartz oscillator provides an auxiliary frequency selected to be lower than the frequency of the regulated clock signal multiplied by the division factor of said third frequency divider.

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TEMPERATURE STABILIZED RF DETECTOR

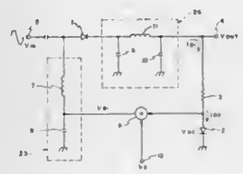
Yoshiharu Tamura, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 13, 1988, Ser. No. 193,835

Claims priority, application Japan, May 15, 1987, 62-116766

Int. Cl.[4] H03D *1/10*

U.S. Cl. 329—204 **12 Claims**



1. A temperature stabilized RF detector circuit comprising:

a detection diode for detecting an RF input signal;

a filter coupled to said diode for smoothing the output of said detecting diode;

a series connection of a compensating diode and a resistor which is connected between said filter and ground, said compensating diode being poled to have the same polarity as said detecting diode, said detecting and compensating diodes being disposed in a manner that their thermal environments are identical with each other; and

a bias circuit for supplying said detecting diode with a DC bias voltage, said bias circuit being coupled to said detecting and compensating diodes so that the current through said detecting diode is equal to the current through said compensating diode.

4,820,996

AMPLIFYING ARRANGEMENTS

Roy Heppinstall, Witham; Paul Eaton, Broadfield; George I. F. Tupper, High Wycombe, and Edmund K. Tunstall, Charlton on Otmoor, all of United Kingdom, assignors to English Electric Valve Company Limited, Chelmsford and British Broadcasting Corporation, London, both of, United Kingdom

Filed Jan. 29, 1987, Ser. No. 8,192

Claims priority, application United Kingdom, Jan. 30, 1986, 8602235

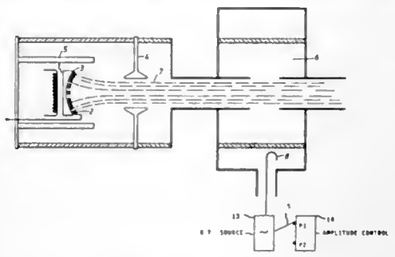
Int. Cl.[4] H03F *3/56*

U.S. Cl. 330—45 **4 Claims**

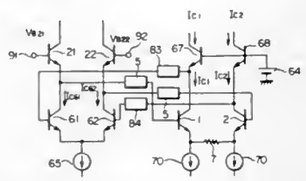
1. An amplifying arrangement including a klystron; means for applying a substantially constant amplitude high frequency carrier to an interaction cavity of the klystron; and means for modulating the electron beam current of the klystron while the carrier applied to the interaction cavity is at a substantially

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constant amplitude, whereby said high frequency carrier is maintained at said substantially constant amplitude and substantially all modulation desired on an amplified signal is provided by modulating said electron beam current.

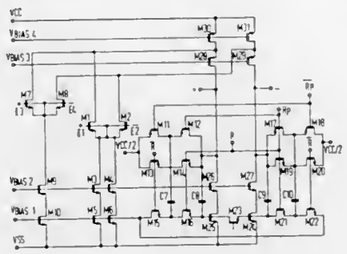


4,820,997
DIFFERENTIAL AMPLIFIER CIRCUIT
Yuji Sano, Yokohama; Michitaka Osawa, Fujisawa, and Masahide Kawai, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 2, 1987, Ser. No. 20,884
Claims priority, application Japan, Mar. 3, 1986, 61-43964
Int. Cl.⁴ H03F *1/32, 3/45*
U.S. Cl. 330—252 **4 Claims**



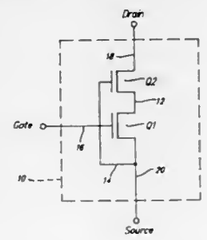
1. A differential amplifier arrangement comprising:
first and second input terminals between which a signal source is connected;
a differential amplifier circuit having first and second transistors, each having collector, base and emitter electrodes, said emitters of said first and second transistors being connected together, wherein an output voltage is derived from at least one of said collectors of said first and second transistors;
a third transistor having a base electrode connected to said first input terminal and an emitter electrode connected to said base electrode of said second transistor;
a fourth transistor having a base electrode connected to said second input terminal and an emitter electrode connected to said base electrode of said first transistor; and
current supply means having first and second current input terminals connected to said collector electrodes of said first and second transistors, respectively, and first and second current output terminals connected to said emitter electrodes of said third and fourth transistors, respectively, for producing output currents at said first and second current output terminals in response to in put currents at said first and second current input terminals so that a ratio of said output currents at said first and second current output terminals is equal to a ratio of said input currents at said first and second current input terminals.

4,820,998
OPERATIONAL AMPLIFIER
Bernward Roessler, and Eberhard Wolter, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Sep. 24, 1987, Ser. No. 100,692
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632802
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—258 **6 Claims**



1. An operational amplifier of the folded-cascode type, comprising:
push-pull output terminals;
differential-input transistors;
a load impedance in the form of a cascode current source coupled to said differential-input transistors; and
a switched capacitor common-mode negative feedback circuit; wherein:
a single transistor both operates as a current source transistor in said cascode current source and also is incorporated into said switched capacitor common-mode negative feedback circuit.

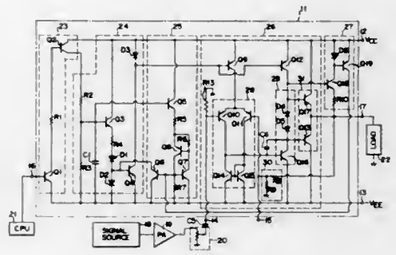
4,820,999
METHOD AND APPARATUS FOR AMPLIFYING SIGNALS
Geza Csanky, Manhattan Beach, Calif., assignor to The Aerospace Corporation, El Segundo, Calif.
Filed Sep. 11, 1987, Ser. No. 96,563
Int. Cl.⁴ H03F *3/16*
U.S. Cl. 330—277 **18 Claims**



1. An apparatus comprising: a first MOSFET having a drain, a source, and a gate;
means for connecting the tate of said first MOSFET to receive an input signal;
second MOSFET having a drain, a source and a gate, said second MOSFET being a depletion mode device and having a substantially greater drain saturation current than said first MOSFET;
means for electrically connecting the drain of said first MOSFET to the source of said second MOSFET;

means for electrically connecting the gate of said second MOSFET to the source of said first MOSFET; and
means for providing a sufficient biasing voltage to the drain of said second MOSFET to cause saturation of said first and second MOSFETs.

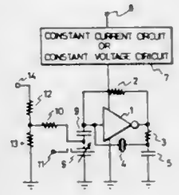
4,821,000
AUDIO OUTPUT AMPLIFIER
Kazuo Imanishi, Yokohama, Japan, assignor to Kabushiki Kaisha Tosbiba, Kawasaki, Japan
Filed Feb. 26, 1988, Ser. No. 160,838
Claims priority, application Japan, Feb. 27, 1987, 62-44542
Int. Cl.⁴ H03F *1/52*
U.S. Cl. 330—298 **14 Claims**



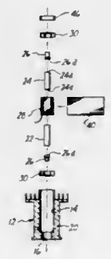
1. An audio output amplifier comprising:
a first power source terminal connected to be set at a power source potential;
a second power source terminal connected to be set at a power source potential lower than the power source potential of said first power source terminal;
a stand-by signal input terminal connected to receive a stand-by signal;
stand-by means having an input terminal connected to said stand-by signal input terminal and determining whether the operation condition is a normal operative mode or stand-by mode;
delay means for delaying an output signal of said stand-by means;
bias means controlled by an output signal from said delay means to generate a predetermined bias voltage;
an audio signal input terminal connected to receive an audio signal;
amplifier means for amplifying the audio signal supplied from said audio signal input terminal according to the bias voltage from said bias means;
a signal output terminal connected to the output terminal of said amplifier means;
overcurrent detection means for detecting an overcurrent flowing in said amplifier means; and
protection means controlled by an output signal from said delay means and connected to interrupt the supply of the bias voltage to said amplifier means from said bias means when an overcurrent is detected by said overcurrent detection means.

4,821,001
CIRCUIT OSCILLATOR
Yoshio Hattori, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan
Filed Apr. 9, 1987, Ser. No. 36,285
Claims priority, application Japan, Apr. 16, 1986, 61-87642
Int. Cl.⁴ H03B *5/32;* **H03L** *1/00*
U.S. Cl. 331—158 **12 Claims**

1. An oscillator circuit comprising: a piezo-electric resonator for oscillating at a frequency; a semiconductor variable capacitance element connected to the piezo-electric resonator for controlling the oscillating frequency thereof, the semiconductor variable capacitance element having a semiconductor substrate, an insulating film formed on the surface of the semiconductor substrate, a floaing electrode disposed on the semiconductor substrate and insulated from the outside, and a capacitor terminal electrode; means for injecting electric charge into the floating electrode to control the osillating frequency of the piezo-electric resonator; and biasing means for applying a bias voltage to the capacitor terminal electrode to control the oscillating frequency of the piezo-electric resonator.



4,821,002
KU BAND POLARIZER
Robert A. Luly, 560 W. 40th St., San Bernardino, Calif. 92407
Filed Apr. 7, 1988, Ser. No. 178,541
Int. Cl.⁴ H01P *1/175*
U.S. Cl. 333—21 A **13 Claims**



1. An electronic polarizer comprising:
a polarizer body defining a circular input waveguide and a rectangular output waveguide connected by a wavepath containing a magnetizable medium substantially transparent to microwave radiation interposed between impedance matching means;
a magnetic coil about said magnetizable medium for variably magnetizing said medium by means of an adjustable electric current through said coil; and
ferro-magnetic cap means at each end of said coil for holding said impedance matching means and said magnetizable medium in axially compressed relationship thereby to substantially eliminate air gaps therebetween.

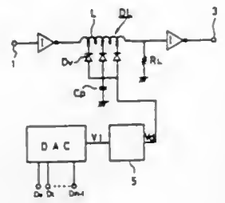
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4,821,003

ELECTROMAGNETIC VARIABLE DELAY LINE WITH LINEAR COMPENSATION

Kazuo Kameya, Tsurugashima, Japan, assignor to Elmec Corporation, Tsurugashima, Japan

Filed Dec. 30, 1987, Ser. No. 139,807
Claims priority, application Japan, Jan. 19, 1987, 62-10229; Feb. 20, 1987, 62-24675[U]
Int. Cl.[4] H03H 7/20, 11/26
U.S. Cl. 333—139 3 Claims



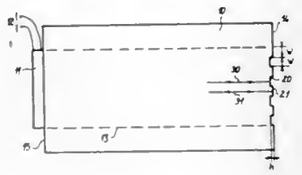
1. An electromagnetic variable delay line, comprising:
(a) a delay line, comprising an inductance device and at least one variable capacitance diode connected to the inductance device, said delay line having an operational property which is non-linear with respect to an output signal supplied to said at least one variable capacitance diode;
(b) means for sending an input signal;
(c) circuit means, interposed between said sending means and said at least one variable capacitance diode, for receiving the input signal from the sending means and sending the output signal to said at least one variable capacitance diode, said output signal being linearly related by a constant to said input signal over a plurality of discrete ranges, the constant over each of said ranges being different, so that a property of the output signal is approximately substantially complimentary and opposite to the non-linear operational property of the delay line.

4,821,004

METHOD FOR THE ELIMINATION OF SPURIOUS ECHOS IN ELECTRO-ACOUSTIC DELAY LINES USING BULK WAVES AND DELAY LINE APPLYING THIS METHOD

Philippe Defranould, Le Rouret, and Marc Verroust, Cagnes Sur Mer, both of France, assignors to Thomson-CSF, Paris, France

PCT No. PCT/FR87/00058, § 371 Date Jan. 14, 1988, § 102(e) Date Jan. 14, 1988, PCT Pub. No. WO87/06073, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 6, 1987, Ser. No. 133,048
Claims priority, application France, Mar. 25, 1986, 86 04284
Int. Cl.[4] H03H 9/36
U.S. Cl. 333—143 8 Claims



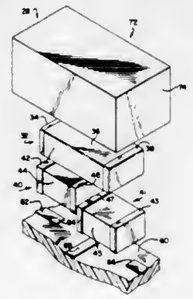
1. A method for the elimination of spurious echos in electro-acoustic delay lines having at least two sides using bulk waves, in which a spurious acoustic beam is propagated in a sound medium from one of said sides, said one side having only one transducer and is reflected on at least the other of said sides of this medium, and wherein this other side is prepared so as to divide this beam into two parts of the same intensity, having a difference in path such that the electrical signals induced in an output transducer by these parts cancel each other out; wherein these two parts are formed of two sets of beams, and wherein this side is prepared so that it presents an array formed of a set of a plurality of hollows having linear dimensions and a set of a plurality of peaks having linear dimensions corresponding respectively to the two sets of beams, the total area of the hollow being equal to the total area of the peaks, the linear dimensions of the hollows and peaks being greater than the acoustic wavelength of the waves of the beam so that there is no diffraction, the difference in the height between the hollows and the peaks determining the said path difference.

4,821,005

ELECTRICAL CIRCUIT COMPONENT ASSEMBLY FOR CIRCUIT BOARDS

John P. Kling, Mt. Joy, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1987, Ser. No. 136,675
Int. Cl.[4] H03H 7/01; H05K 1/18
U.S. Cl. 333—167 18 Claims



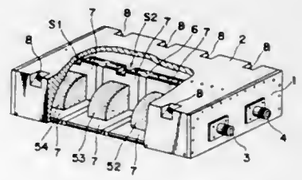
1. An electrical circuit component assembly for mounting to circuit boards comprising:
a first member having a first selected electrical circuit-modifying capability, said first member having first and second electrically conductive portion, at spaced locations therealong;
a second member having a second selected electrical circuit-modifying capability, said second member being proximate said first member, said second member having a first electrically conductive area exposed for electrical connection to one of said first member conductive portions and for electrical connection to one end of a discontinuous conductor on a circuit board and a second electrically conductive area spaced from said first area and exposed for electrical connection to a grounding means of the circuit board;
a third member having a third selected electrical circuit-modifying capability, said third member being proximate said first member, said third member having a first electrically conductive area exposed for electrical connection to the other of said first member conductive portions and for electrical connection to the other end of said discontinuous conductor on said circuit board and a second electrically conductive area spaced from said first area and exposed for electrical connection to a grounding means of the circuit board; and
said first member being secured to said second and third members, electrical connection means disposed at said first and second conductive portions of said first member electrically connecting respective portions with corresponding first conductive areas of said second and third members defining an assembly mountable to a circuit board with said second and third members adjacent thereto with said first conductive areas of said second and third members and their respective interconnected conductive portions electrically interconnectable with respective ends of said discontinuous conductor on said circuit board and said second conductive areas of said second and third members electrically connectable to said grounding means, whereby said first, second and third member circuit-modifying capabilities are selectable so that said defined assembly upon mounting completes the circuit path of said conductor w! . means for providing harmonic attenuation of a signal carried along said conductor.

4,821,006

DIELECTRIC RESONATOR APPARATUS

Youhei Ishikawa, Kyoto; Kikuo Tsunoda, Yawata; Toshiro Hiratsuka, and Hirotsugu Abe, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 14, 1988, Ser. No. 143,808
Claims priority, application Japan, Jan. 17, 1987, 62-8525; May 13, 1987, 62-116426
Int. Cl.[4] H01P 1/20, 1/207, 7/10
U.S. Cl. 333—202 30 Claims



1. A dielectric resonator apparatus, comprising a case member, at least two dielectric resonators accommodated within the case member, an input means for inputting electromagnetic wave energy into the case member, and an output means for outputting electromagnetic wave energy from the case member to the outside, each of the resonators having a flattened shape including a pair of outer planes each forming an electric wall and having first ends at which said outer planes are crossed at a given angle with each other, along a line which coincides with a central axis of the electromagnetic field distribution in the operating mode of the resonator, and another surface extending between second ends of said outer planes, and all of the resonators being arranged along an axis common to the central axis of each of the resonators so that they couple inductively with each other in the axial direction of the resonators.

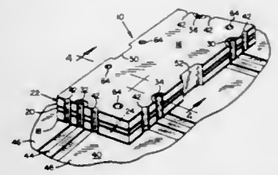
4,821,007

STRIP LINE CIRCUIT COMPONENT AND METHOD OF MANUFACTURE

Walter D. Fields, and Gary K. Larkins, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 6, 1987, Ser. No. 11,972
Int. Cl.[4] H01P 3/08
U.S. Cl. 333—238 9 Claims

1. A method for forming a low loss transition coupling on a strip line circuit component package having a planar conductor disposed between two insulating members in a laminar assembly with the outer surfaces of the insulating members being metallized, the steps comprising:
forming a first hole through the laminar assembly, said first hole being positioned so as to intersect the planar conductor;
forming an insulating region around said first hole by removing a portion of the metallization on the outer surfaces of the insulating members;
forming a second hole through the laminar assembly in close proximity to said first hole, said second bole not intersecting the planar conductor;
plating through said first hole and said second hole with a conducting material so that said conducting material in



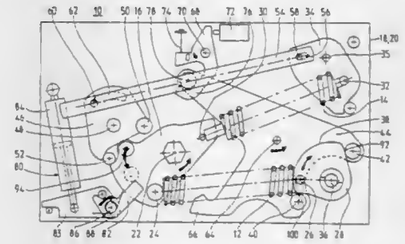
said first hole is in electrical contact with the planar conductor and said conducting material in said second hole is in contact with the outer metallized surfaces of the insulating members; and
cutting the laminar assembly along a line that bisects said first and second holes, exposing said conducting material within said holes to form a low loss transition coupling on the strip line circuit component package.

4,821,008

LATCHING OPERATING MECHANISM OF A THREE-POSITION CIRCUIT BREAKER

Robert Micoud, 7, rue des Peupliers, F 38120 Le Fontanil, and Michel Berne, 6, rue des Charmilles, F 38120 Saint-Egreve, both of France

Filed Jan. 20, 1988, Ser. No. 145,979
Claims priority, application France, Jan. 21, 1987, 87 00750
Int. Cl.[4] H01H 3/54
U.S. Cl. 335—189 7 Claims



1. An operating mechanism of an electrical switchgear device, especially a multipole circuit breaker or a fuse-switch, incorporated in an electrical distribution cubicle, connected by means of connecting cables, the movable assembly of the circuit breaker being able to occupy three distinct stable positions, namely a first position F in which the contacts are closed, a second intermediate position O in which the contacts are open, and a third earthed position T in which the outgoing cables are electrically earthed by means of the movable contacts of the corresponding phases, the kinematic transmission system of said mechanism (10) comprising:
an elastic energy storage system (12, 14), associated with a rotary transmission device (16) securedly united to the movable assembly,
operating means (28, 68, 72, 74, 34) operating in conjunction with the energy storage system (12, 14) to actuate the transmission device (16) in one of the three positions, earthing being accomplished from the second intermediate position O,

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blocking means (**46**, **50**, **52**) of the transmission device (**16**) in each of the three positions F, O, T, of the circuit breaker,

a first spring (**12**) of the energy storage system being arranged between a first drive pin (**24**) of the transmission device (**16**), and a crankshaft (**28**) wedged onto a shaft (**36**) extending parallel to the spindle (22) of the transmission device (**16**),

a second spring (**14**) of the energy storage system being fitted between a second drive pin (**30**) of the transmission device (**16**) and an earthing control crank (**34**) mechanically connected to said blocking means,

a pivoting retaining plate (**44**) cooperating on the one hand with an opening control lock (**68**) by means of a unidirectional locking (**76**, **78**, and on the other hand with the crankshaft (**28**) by means of a first and a second latching (**92**, **100**),

said first latching (**92**) being released during the opening travel by the expansion action of the first spring (**12**), subsequent to the lock (**68**) being released,

said second latching (**100**) being capable of occupying an active positive locking position of the transmission device (**16**) at the beginning of the closing travel of the crankshaft (**28**), and an inactive unlocking position of said device (**16**).

4,821,009

OVERCURRENT-PROTECTIVE SNAP SWITCH FOR HOUSEHOLD APPLIANCES

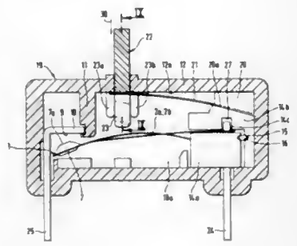
Rolf Pirdzuns, Wuppertal; Wolfgang Polligkeit, and Michael Schluckebier, both of Ennepetal, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

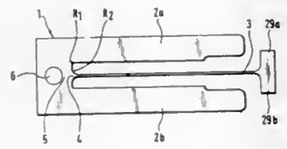
Filed Jan. 19, 1988, Ser. No. 145,269

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701275

Int. Cl.⁴ H01H *61/06, 71/18*

U.S. Cl. 337—130 **11 Claims**





1. An overcurrent-protective snap switch for household appliances such as a vacuum cleaner, the overcurrent-protective snap switch comprising:

a housing;

a first current terminal fixedly mounted in said housing;

a second current terminal fixedly mounted in said housing spaced from said first current terminal and defining a fixed contact surface;

a metal resilient U-shaped contact member having a base and two outer legs extending from said base, the contact member also having a center strip extending from said base and terminating in an outer end and being disposed between said outer legs;

said center strip being electrically and mechanically connected to said first current terminal at said outer end thereof;

said contact member having contact means mounted on said base and being movable between a first position wherein said outer legs are pretensioned to hold said contact means in contact engagement with said contact surface so as to define a closed current path between said current terminals and a second position wherein said contact means is separated from said contact surface and said current path is interrupted;

said center strip being configured as a resistance element which heats and expands in response to an overcurrent passing therethrough so as to cause said center strip to become stressed and snap said contact member into said second position;

said base of said U-shaped contact member having an inside edge from which said center strip extends and said outer legs having respective inside edges facing said center strip, each of said inside edges of said outer legs being joined with the inside edge of said base so as to define a first curved transition edge having a first radius of curvature R1;

said center strip having respective outside edges facing corresponding ones of said inside edges of said outer legs and said center strip extending from said inside edge of said base so as to cause each of said outer edges and said inside edge of said base to conjointly define a second curved transition edge having a second radius of curvature R2 greater than said first radius of curvature R1 thereby increasing the surface area of said base for accommodating said contact means thereon; and,

reset means for imparting a force to said outer legs to snap said contact member back into said first position after said center strip has cooled thereby again defining a closed current path between said current terminals.

4,821,010

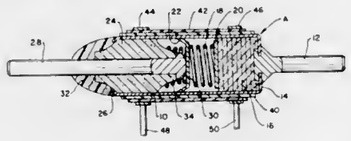
THERMAL CUTOFF HEATER

Emil R. Plasko, Lexington, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Dec. 30, 1987, Ser. No. 139,324

Int. Cl.⁴ H01H *37/76, 85/00*

U.S. Cl. 337—405 **14 Claims**



1. A thermal cutoff including a hollow electrically conductive housing containing thermal means responsive to a predetermined temperature for interrupting current flow through said housing, and an electrically conductive resistive coating bonded to said housing for transferring heat to said thermal means to raise the temperature of said thermal means.

4,821,011

PRESSURE SENSOR

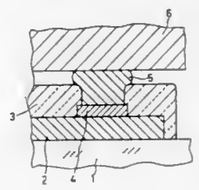
Mitsuko Kotaki, Chiryu; Ryohei Yabuno, and Masami Ishii, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 24, 1987, Ser. No. 29,646

Claims priority, application Japan, Mar. 24, 1986, 61-065464

Int. Cl.⁴ G01L *1/22*

U.S. Cl. 338—4 **3 Claims**



1. A pressure sensor, comprising:

a diaphragm;

an insulating film composed of silicon oxide and formed by a vacuum film forming method on said diaphragm;

an amorphous metal strain gauge formed on said insulating film by a vacuum film forming method;

electrodes formed on predetermined portions of said amorphous metal strain gauge by a vacuum film coating method; and

a protective film composed of silicon oxide formed on other portions of said amorphous metal strain gauge not covered by said electrodes.

4,821,012

MAGNETORESISTIVE ELEMENT

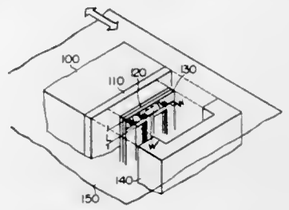
Yoshihisa Kamo, Kokubunji, and Kazuhiro Momata, Chigasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 14, 1987, Ser. No. 73,093

Claims priority, application Japan, Jul. 14, 1986, 61-163616

Int. Cl.⁴ H01L *43/00*

U.S. Cl. 338—32 R **6 Claims**



1. A magnetoresistive element comprising a sensor part including a magnetoresistive film and a conductor film formed on one side of said magnetoresistive film to make electrical contact therewith, said magnetoresistive film exhibiting a magnetoresistive effect by sensing an external magnetic field, and a first lead and a second lead extending from the both ends respectively of said sensor part to derive any change in the resistance of said sensor part as a corresponding voltage change, the width (W) of each of said leads in contact with said sensor part being selected relative to the width (L) of said sensor part to satisfy the relation $L \leqq W$ and to also satisfy the relation $W \leqq 2.5\ L$.

4,821,013

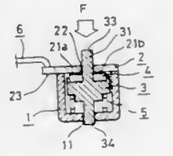
PRESSURE SENSING DEVICE

Hideo Iida, Inamachi, Japan, assignor to Kokoku Rubber Technologies Inc., Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 124,977

Int. Cl.⁴ H01C *10/10*

U.S. Cl. 338—114 **9 Claims**



1. A pressure sensing device consisting of at least one pair of electrodes, a high molecular pressure sensitive conductor provided between the electrodes and forming a resistance circuit therewith, said conductor being formed of resilient material and having a resistance variable in accordance with pressure applied thereto, first means for applying compressive force upon said pressure sensitive conductor to increase the conductivity thereof and second means for applying simultaneously to said first means a force opposing said compressive force whereby the resistance of said circuit will be a function of both said forces.

4,821,014

VARIABLE RESISTOR FOR MOUNTING ON SURFACE

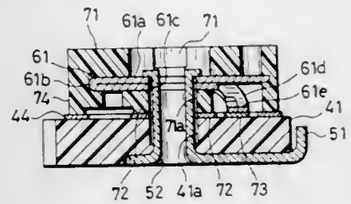
Fumitoshi Masuda, and Yukinori Ueda, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed May 16, 1988, Ser. No. 194,232

Claims priority, application Japan, May 15, 1987, 62-119683

Int. Cl.⁴ H01C *10/32*

U.S. Cl. 338—164 **7 Claims**



1. A variable resistor whose resistance is adjustable through a rotating operation, comprising

an insulating substrate including an arcuate resistive element,

a rotor formed of an insulating material and rotatably mounted on said insulating substrate, said rotor having a bottom surface opposed to said insulating substrate, said bottom surface including sealing means for defining a sealed space accommodating said resistive element, and

a metallic slider integrated with said rotor by insert molding, wherein said slider includes a base portion embedded in said rotor and arms extending from said base portion, said base portion being formed of at least two overlapping metal plates one of which closes an upper position of said sealed space accommodating said resistive element, said arms projecting toward said insulating substrate in said sealed space and having projecting ends thereof in contact with said resistive element.

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4,821,015

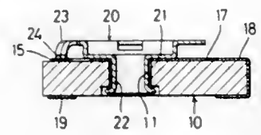
VARIABLE RESISTOR

Kenji Matsui; Toshi Numata; Yukinori Ueda; Tomohisa Ogawa, and Kiyoshi Ito, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Dec. 4, 1987, Ser. No. 128,913

Int. Cl.[4] H01C *10/34*

U.S. Cl. 338—175 **5 Claims**



1. A variable resistor of a type for mounting against the surface of a printed circuit substrate, said variable resistor comprising:

an insulating substrate having one surface for supporting a resistor and an opposite surface for being positioned against the surface of a printed circuit substrate;

a curved resistor on said one surface of said insulating substrate and having opposite ends;

a sliding member rotatably mounted on said insulating substrate and sliding on said resistor;

a plurality of outside electrodes on said insulating substrate, one for each end of said curved resistor, and extending from the corresponding end of the resistor along the one surface of said insulating substrate, along an edge of said insulating substrate, and along the opposite surface of said insulating substrate, each outside electrode having a three layer structure constituted by a lower layer against said insulating substrate, a middle layer and an outer layer, the lower layer being an electrically conductive material suitable for plating, the middle layer being a plating material having the capability to improve the heat resisting characteristics of solder by acting as a barrier to migration of the material of the lower layer into the outer layer, and the outer layer being a material having superior soldering characteristics.

4,821,016

STEERING WHEEL WITH AN ELECTRICAL LEAD TO A PROTECTIVE GAS BAG IMPACT INSTALLATION LOCATED IN THE STEERING BOWL OF AN AUTOMOTIVE VEHICLE

Gregor Zeller, Aschaffenburg, and Helmut Bonn, Haibach, both of Fed. Rep. of Germany, assignors to Petri AG, Fed. Rep. of Germany

Continuation of Ser. No. 842,949, Mar. 24, 1986, abandoned. This application Nov. 20, 1987, Ser. No. 124,376

Claims priority, application European Pat. Off., Mar. 23, 1985, 85103484.3

Int. Cl.[4] B60Q *9/00*

U.S. Cl. 307—10.1 **2 Claims**

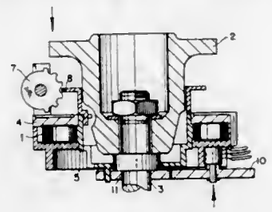
1. A steering wheel assembly comprising:

a fixed housing member;

a rotating steering unit surrounded by said fixed housing;

means for indicating a relative rotational relationship between said fixed housing member and said rotating steering unit, including an at least partially toothed disk mounted on said fixed housing with an axis of rotation transverse to said rotating steering unit; and

means for actuating said means for indicating including an annular flanged transport disk engaging said toothed disk and exhibiting a bevelled slot with an opening corresponding to a tooth division of said toothed disk mounted on said rotating steering unit.



4,821,017

PROTECTIVE SYSTEM FOR PROTECTING AGAINST ASSAULTS AND/OR INTRUSIONS

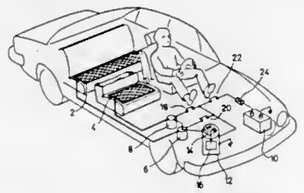
Yair Tanami, Ben Geven St. 6, and Yoav Madar, Shapira St. 54/19, both of Gedera, Israel

Filed Jan. 13, 1987, Ser. No. 3,038

Claims priority, application Israel, Jan. 22, 1986, 77679; Dec. 22, 1986, 81062

Int. Cl.[4] B60R *25/00*; **G08B** *15/00*

U.S. Cl. 340—430 **15 Claims**



1. A protective system for protecting a motor vehicle driver against an assault or threat of violence by a passenger, comprising:

a discharge electrode disposed on the vehicle seat to be occupied by such passenger, and exposed for contact by the passenger when sitting on the seat;

a high voltage generator connected to said electrode;

and electrical switch means actuated by the driver for energizing said discharge electrode.

4,821,018

DIRECTION INDICATOR AND HAZARD WARNING DEVICE FOR MOTOR VEHICLES

Raimund Leistenschneider, Sindelfingen; Klaus Neuffer, Böblingen, and Egon Frey, Starzach-Felidorf, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 92,883

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630448

Int. Cl.[4] B60Q *1/46*

U.S. Cl. 340—471 **6 Claims**

1. Direction indicator and hazard warning device for motor vehicles, comprising:

driving switch means for enabling operation of said motor vehicle;

lamp group means for displaying a direction signal and a hazard warning signal;

direction indicator switch means mechanically actuable for causing said lamp group means to display said direction signal;

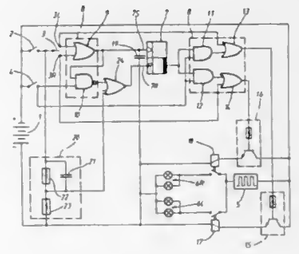
hazard warning switch means mechanically actuable independently from said direction indicator switch means for causing said lamp group means to display said hazard warning signal;

memory circuit means for storing and outputting logic signals;

logic circuit means connected to said direction indicator switch means and said hazard warning switch means for supplying said logic signals in response to open and closed positions of said direction indicator switch means and said hazard warning switch means, including connecting elements between each of said direction indicator switch means and said hazard warning switch means and inputs of said memory circuit means, and logic components connected to an output of said memory circuit means;

pulse generator means connectable to said lamp group means for generating said direction signal and said hazard warning signal in response to actuation of said direction indicator switch means and said hazard warning switch means, respectively;

switching elements for connecting said lamp group means to said pulse generator means;



said connecting elements and said memory circuit means forming time sequence control means for controlling said switching elements via said logic components and;

if said driving switch means is closed, connecting said pulse generator means to said lamp group means to correspondingly indicate hazard warning signals or direction signals in response to whichever of said direction indicator switch means or hazard warning switch means was last actuated, irrespective of a switch position of whichever of said direction indicator switch means or hazard warning switch means was not last actuated; and

if both said direction indicator switch means and said hazard warning switch means have been actuated, and subsequently one of said direction indicator switch means and said hazard warning switch means has been deactuated, connecting said lamp group means to said pulse generator means to indicate either direction signals or hazard warning signals to whichever of said direction indicator switch means or said hazard warning switch means remains actuated; and

suppression circuit means connected to said driving switch means for suppressing a control of said memory circuit means resulting from aid driving switch means being closed when both said direction indicator switch means and said hazard warning switch means are closed.

4,821,019

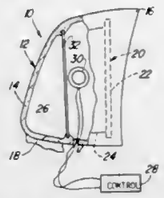
MIRROR ASSEMBLY INCLUDING AN IMAGE FORMING LAMP

Keith H. Taylor, 8140 Dubay, Detroit, Mich. 48234

Continuation of Ser. No. 1,575, Jan. 8, 1987, abandoned. This application Jun. 21, 1988, Ser. No. 211,082

Int. Cl.[4] B60Q *1/32*

U.S. Cl. 362—83.1 **7 Claims**



1. A mirror assembly (**10**) comprising: a translucent housing (**12**) including a plastic shell being substantially cup shaped and having an open end and a closed end and a wall extending from said closed end, said wall and said closed end and containing and concealing illuminating image forming means within said housing (**12**) and preventing incident light from passing therethrough while only revealing an illuminated image through at least one of said well and closed end projected from the illuminating image forming means; mirror means (**20**) retained by said housing (**12**) within and adjacent to said open end; and said illuminating image forming means (**26**) mounted within said housing (**12**) adjacent at least one of said closed end and wall and completely behind said mirror means (**20**) so as to be hidden from view from outside said housing (**12**) and said mirror means (**20**) for projecting only said illuminated image through at least one of said wall and closed end of said shell (**12**).

4,821,020

CYCLE STOP-LIGHT SWITCHES AND STOP-LIGHT EQUIPMENT

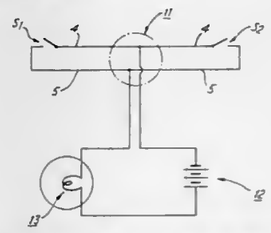
Karl M. Hargreaves, 60 Braemor Road, Calne, Wiltshire SN 11 9DU, United Kingdom

Filed Oct. 26, 1983, Ser. No. 545,443

Claims priority, application United Kingdom, Oct. 27, 1982, 8230912

Int. Cl.[4] B62J *3/00*

U.S. Cl. 340—432 **3 Claims**



1. A cycle stop-light apparatus including at least one electrical switch comprising a hollow sealed deformable member mounted on the outside of a hand-brake lever, said member having a general tubular shape so as to extend along a substantial part of the length of the lever, said member having opposed internal faces, a pair of electrically-conductive strips mounted one on each of said opposed internal faces and extending substantially the internal length of the member in the direction of the length of the hand-brake lever, said strips being spaced apart in the undeformed condition of the member out of engagement one with the other, the member being deformed upon squashing of the member between the hand of the operator and the hand-brake lever upon manual operation

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of the hand-brake lever in the process of operating the lever to apply the brakes to bring the strips into contact one with the other, and an electrical circuit including

a pair of electrical leads one connected to each of the electrical strips,

a stop-light, and

an electrical power source,

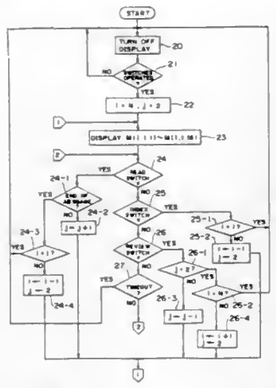
the switch, the stop-light and the electrical power source being connected in the electrical circuit via the electrical leads such that contacting one with the other of the electrical strips upon squashing of the electrical switch illuminates the stop-light.

4,821,021

SELECTIVE CALLING RADIO DISPLAY PAGER HAVING A MESSAGE RECALLING ALGORITHM WHICH SIMPLIFIES OPERATIONS

Motoki Ide, and Toshifumi Sato, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Dec. 31, 1987, Ser. No. 140,022
Claims priority, application Japan, Jan. 13, 1987, 62-4021
Int. Cl.[4] H04G *07/02*
U.S. Cl. 340—311.1 **6 Claims**



1. A selective calling radio pager having a display, comprising:

detector means for receiving a signal containing a message destined to said pager;

a memory for storing a plurality of said messages;

manually operated first, second and third command entry means for respectively generating first, second and third command signals; and

control means for (a) successively recalling portions of said messages from said memory in a first sequence in response to said first command signal and causing the recalled portions to be successively displayed in said display, (b) successively recalling starting portions of said messages from said memory in a second sequence in response to said second command signal and causing the recalled starting portions to be successively displayed in said display, and (c_1) successively recalling portions of one of said messages from said memory in a direction opposite to said first sequence in response to said third command signal if the portion being displayed at the moment said third command signal is generated is not a starting portion of a message and causing the recalled portions to be successively displayed in said display or (c_2) successively recalling the starting portions of said messages from said memory in a direction opposite to said second sequence in response to said third command signal if the portion being displayed at the moment said third command signal is generated is a starting portion of a message and causing the recalled starting portions to be successively displayed in said display.

4,821,022

FLOAT ASSEMBLY CHECKING SYSTEM

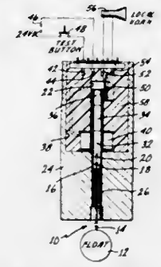
Louis J. Jannotta, 7940 Teton Rd., Orland Park, Ill. 60462

Filed Apr. 4, 1988, Ser. No. 177,093
Int. Cl.[4] G08B *29/00;* **G01F** *23/10*
U.S. Cl. 340—514 **19 Claims**

1. An apparatus for checking the workability of a float assembly used to determine the level of liquid in a vessel comprising:

extension means associated with the float of said float assembly and being movable when said float assembly is in working order in response to the movement of said float caused by changing the level of liquid in said vessel;

sensor means located in spaced relation to said extension means and acting to provide a signal when said extension means is in a predetermined position; and



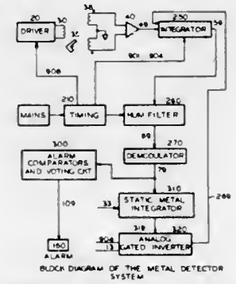
checking means capable of being activated to move said extension means into said predetermined position without regard to the level of liquid in said vessel when said float assembly is workable.

4,821,023

WALK-THROUGH METAL DETECTOR

Stephen I. Parks, Derwood, Md., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Jan. 7, 1988, Ser. No. 141,706
Int. Cl.[4] G08B *13/24, 13/14, 29/00*
U.S. Cl. 340—551 **17 Claims**



BLOCK DIAGRAM OF THE METAL DETECTOR SYSTEM

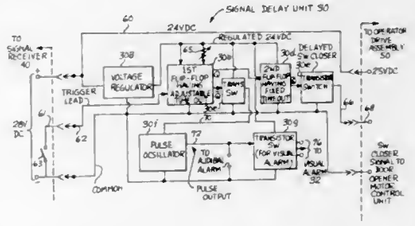
1. A pulsed-field metal detector system comprising a transmitting coil for transmitting pulses and a receive coil for receiving signals derived from said transmitted pulses, means for driving the transmitting coil responsive to current pulses recurring in cyclically alternating polarity, timing means coupled to synchronize measurement cycles at an odd half-multiple of an AC power main frequency, means for amplifying received signals derived from said transmitting pulses, means for subtracting from the amplified signals those components of said received signals which are due to periodic noise signals and static metal, means responsive to the subtracting means for limiting the absolute amplitude of residual signals remaining after said subtraction, means for demodulating and averaging the residual signals, means for detecting excursions of the averaged signal above or below preset threshold values, and means responsive to detection of said signals beyond said preset threshold values for giving an alarm when said threshold is exceeded for a majority of several successive process intervals.

4,821,024

DOOR OPERATOR PRE-WARNING SYSTEM

Allan T. Bayha, 2704 Soper Hill Rd., Everett, Wash. 98205

Filed Aug. 3, 1987, Ser. No. 80,434
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—545 **2 Claims**



1. An automatic electric door operator including an advance warning system, the door operator comprising:

a door operator assembly for moving an overhead door between an open and a closed position, said assembly including electrically operated power means responsive to an operating signal;

means responsive to a remotely generated command signal for producing the operating signal delayed from the command signal by a predetermined period of time including (i) a first monostable flip-fop means having a predetermined timeout period and being connected to receive the command signal for switching state after the predetermined timeout period as measured from the receipt of the command signal, (ii) a second monostable flip-flop means connected to the first monostable flip-flop means for producing a pulse of predetermined time width in response to a switch in the state of the first monostable flip-flop, and, (iii) a transistor switch means connected to the second monostable flip-flop means for producing the operating signal in response to the pulse of predetermined time width and,

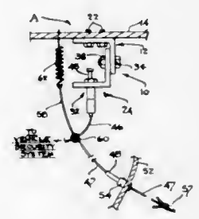
means also responsive to the command signal for emitting a warning a signal to indicate that movement of the door from either position is imminent.

4,821,025

VEHICLE COVER ALARM SYSTEM

Lawrence D. Ross, Sr., 4509 S. Honduras St., Los Angeles, Calif. 90011

Continuation-in-part of Ser. No. 907,571, Sep. 15, 1986, abandoned. This application Aug. 24, 1987, Ser. No. 90,562
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—568 **13 Claims**



1. A vehicle cover alarm apparatus for use on a vehicle equipped with a vehicle electronic security system, said alarm apparatus comprising:

(a) bracket means for securement to the vehicle,

(b) an electrical switch carried by said bracket means,

(c) means for electrically connecting said switch to the electronic security system equipped on the vehicle,

(d) a cable connected to said switch and extending from said switch outwardly of said vehicle and being adapted for connection to the vehicle cover and which creates a tension on said cable through said connection and opens said switch, and

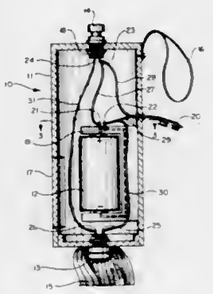
(e) biasing means biasing said cable against the tension created by connection to the vehicle cover and which enables said switch to be closed when the cover is disconnected from the cable thereby releasing the tension in the cable.

4,821,026

VISUAL AND AUDIBLE ALARM DEVICE

Larry T. Newsom, 10002 Old Providence Way, Apt. D, Cockeysville, Md. 21030

Filed Feb. 5, 1988, Ser. No. 152,851
Int. Cl.[4] G08B *7/00*
U.S. Cl. 340—574 **21 Claims**



1. A personal visual and audible alarm device for fires and other emergencies, comprising:

a substantially hollow alarm housing having an upper end and a lower end;

an internal electrical power supply source disposed in the alarm housing;

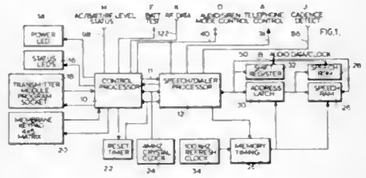
an audio alarm secured to the housing, said audio alarm being electrically connected to the internal power supply source, such that the internal power supply source provides power for activating the audio alarm;

an on/off switch secured to the housing and extending outwardly therefrom and providing manual access thereto, said on/off switch being electrically connected between the internal power supply source and the audio alarm for selectively, manually connecting and disconnecting the internal power supply source and the audio alarm, whereby the audio alarm is selectively, manually activated and deactivated; and

a plurality of streamers secured to the alarm housing and extending therefrom, whereby a visual alarm is provided.

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4,821,027
VOICE INTERACTIVE SECURITY SYSTEM
John Mallory; Thomas A. D. Burgmann, both of Mississanga, and Gary Lennartz, Rexdale, all of Canada, assignors to Dicon Systems Limited, Ontario, Canada
Filed Nov. 16, 1987, Ser. No. 121,417
Claims priority, application Canada, Sep. 14, 1987, 546816
Int. Cl.[4] G08B *19/00*; H04Q *7/00*
U.S. Cl. 340—521 6 Claims



1. A security system comprising a central monitor and a plurality of remote sensors for one or more of fire, smoke, intrusion, appliance operation and the like, each of said sensors having a transmitter for transmitting an electronic message when said sensor detects an alarm condition, said central monitor having a receiver to receive such electronic message, and an electronic microprocessor control system to decode the received electronic message and taking a necessary course of action in accordance with a programmable scheme retained in an electronic memory of said microprocessor system, said central monitor having a speech synthesizer responding to inputs from said microprocessor system, a keyboard being provided on said central monitor for allowing a user to interact with said security system, said microprocessor system being programmable via said keyboard thereby permitting a user to customize said programmable scheme by interaction with said security system through said keyboard to render thereby the scheme unique to such user, said microprocessor system actuating said speech synthesizer to synthesize predetermined messages in response to input from said keyboard and in accordance with said programmable scheme, said microprocessor system having means for checking data as it is entered by said keyboard against what is required by said programmable scheme, means for initiating said microprocessor system to actuate said speech synthesizer to synthesize a message relating to information input by said keyboard, said initiating means causing an error message to be synthesized when information entered via said keyboard is in error when said checking means verifies such information against what is required by said programmable scheme, and an internal speaker and an external speaker, said microprocessor system actuating said internal speaker to announce said error message, said microprocessor system actuating said external speaker to announce an alarm message produced by said speech synthesizer when said sensor detects an alarm condition, means for driving said external speaker to sound a siren alarm, said microprocessor system selectively actuating said siren driving means to sound said siren alarm on actuating said external speaker to announce an alarm message generated by said speech synthesizer.

4,821,028
FLOW CONTROL SYSTEM
Clinton Deckert, and Larry L. Wilson, both of Poway, Calif., assignors to Centaur Sciences, Inc., Stamford, Conn.
Division of Ser. No. 727,840, Apr. 26, 1985, Pat. No. 4,681,563.
This application Jul. 16, 1987, Ser. No. 73,984
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—606 9 Claims

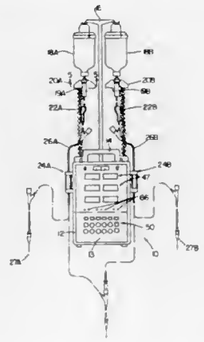
1. A flow control system for concurrently controlling the flow of fluid in two infusion units comprising:

keyboard means to input command and data signals indicative of a desired flow rate and fluid quantity for each of two infusion units;

first and second flow sensor means each adapted for mounting with an associated drop chamber of an infusion unit to generate a pulse corresponding to the occurrence of a falling drop in said chamber by sensing the interruption of a light path by said drop;

first and second flow controller means each associated with a respective infusion unit to variably control the flow of fluid passing therethrough by application of a variable compressive force;

first and second motor means associated with said first and



second flow controller means to drive said controller means;

processor means responsive to said input command and data signals and said pulses to compare actual and desired fluid flow rates and generate motor signals for transmittal to said motor means for concurrently independently regulating the fluid flow of each said infusion unit; and

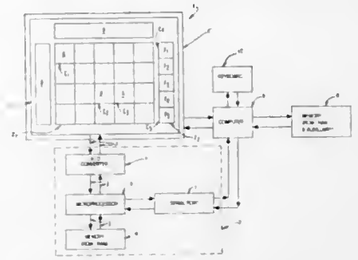
alarm means responsive to said processor means to activate an alarm in the event that the actual flow rate deviates from the desired flow rate for a pre-established time interval for at least one infusion unit and to generate a signal to a said motor means for activating said associated controller means to inhibit the flow of fluid of a said infusion unit.

4,821,029
TOUCH SCREEN COMPUTER-OPERATED VIDEO DISPLAY PROCESS AND APPARATUS
James D. Logan, Arlington, and Yury Litvin, Bedford, both of Mass., assignors to Microtouch Systems, Inc., Middlesex and The Academy of Applied Science, Boston, both of, Mass., a part interest
Filed Apr. 26, 1984, Ser. No. 604,319
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—712 10 Claims

1. In a touch-screen video display system provided with data processing means for storing and displaying

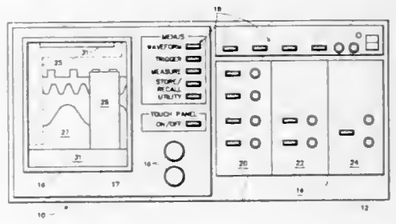
information upon a touch-screen display, a process that comprises, dividing the area of the touch-screen display into a plurality of sub-areas; displaying

information provided by the processing means in a predetermined sub-area, the provided information having a specific configuration; touching at least a point of the said predetermined sub-area of the touch screen display and then subsequently touching at least a point of a different sub-area to which it is desired to transfer said information displayed at the predetermined sub-area; controlling the processing means in response to the subsequent touching to transfer to, and display the same configuration of information displayed at the predetermined subarea at said different sub-area upon the said subsequent touching of



said different sub-area; and maintaining storage in said processing means of
the transferred information.

4,821,030
TOUCHSCREEN FEEDBACK SYSTEM
Brian Batson, and Brian D. Diehm, both of Lake Oswego, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Dec. 19, 1986, Ser. No. 944,290
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—712 9 Claims



1. For an instrument comprising a screen, means for generating output signals indicating when an object is proximate said screen and indicating a particular touch zone area of a plurality of touch zone areas of said screen to which said object is proximate, and control means responsive to said output signals for generating displays of images on said screen, a method for said control means for responding to said output signals, the method comprising the steps of:

monitoring said output signals to determine when an object is proximate said screen;

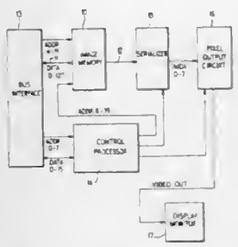
determining from said output signals the particular touch zone to which said object is proximate;

determining whether a portion of a particular image is displayed on said screen within boundaries of said particular touch zone;

generating a display of a first indicating image on said screen visually distinguishing said particular image displayed on said screen when any portion of said particular image is included within boundaries of said particular touch zone; and

generating a display of a second indicating image on said screen visually identifying said particular touch zone when no portion of any image displayed on said screen is included within boundaries of said particular touch zone.

4,821,031
IMAGE DISPLAY APPARATUS
Stephen J. Roberts, Herkimer, N.Y., assignor to International Computers Limited, London, England
Filed Jan. 20, 1988, Ser. No. 146,219
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—731 7 Claims



1. Image display apparatus for producing a raster-scanned display comprising interlaced odd and even frames, the apparatus comprising:

(a) an image store for holding image data,

(b) reading means for reading lines of image data from the image store, and displaying those lines to produce an image,

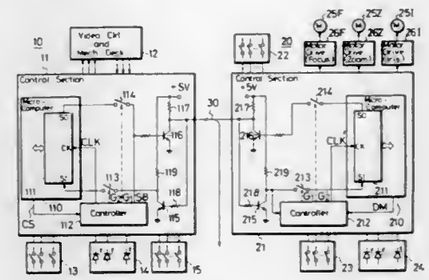
(c) first register means for holding line repeat count values for the odd frames,

(d) second register means for holding line repeat count values for the even frames,

(e) selection means operative in each odd frame, for selecting line repeat count values from the first register means, and operative in each even frame, for selecting line repeat count values from the second register means, and

(f) line repeat means, coupled to said reading means, for causing each line of image data to be repeated a number of times as indicated by the line repeat count value currently selected by the selection means, thereby producing a vertical magnification of the image.

4,821,032
COMMUNICATION SYSTEM FOR VIDEO INFORMATION APPARATUS
Keiichiro Shimada; Shinji Takada; Mitsugu Ishihara, all of Kanagawa, and Yukihiko Machida, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 23, 1985, Ser. No. 812,529
Claims priority, application Japan, Dec. 21, 1984, 59-270042; Dec. 28, 1984, 59-280077
Int. Cl.[4] H04Q *9/00*; H04J *3/02*; G05B *19/02*; H04N *5/24*
U.S. Cl. 340—825.210 6 Claims



1. A system for communicating between master video appa-

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ratus and a plurality of peripheral apparatus wherein video signals organized into vertical periods of successive fields are processed; said system comprising:

means for generating timing signals synchronously with said vertical periods;

means for establishing first communication intervals having a substantially constant phase relation with respect to said timing signals;

communication means for effecting communication between said master apparatus and said peripheral apparatus during said first communication intervals;

said first communication intervals being divided into separate transmission areas, a plurality of said transmission areas being reserved for transmission of communications by said peripheral apparatus, the number of said reserved areas being less than the number of said peripheral apparatus; and

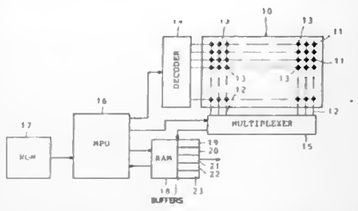
means independent of said master apparatus whereby one of said peripheral apparatus can preempt one of said reserved areas for transmission therein.

4,821,033

MATRIX SWITCHING APPARATUS FOR PREVENTING PSEUDO INPUT

Masaharu Mori, Anjo, and Sae Takenaka, Ichinomiya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 29, 1986, Ser. No. 947,917
Claims priority, application Japan, Jan. 8, 1986, 61-2585
Int. Cl.⁴ G06F *3/02*; H04Q *1/00*; G08C *25/00*
U.S. Cl. 340—825.790 **8 Claims**



1. A switching apparatus arranged in a matrix having a plurality of rows and columns comprising:

a plurality of switching means, each being arranged at an intersection of a row and a column;

detecting means for sequentially detecting an ON condition of said plurality of switching means by scanning said switching means;

counting means responsive to said detecting means for counting a first total number of said switching means in the ON condition in said matrix, a second total number of switching means in the ON condition in one of said rows and a third total number of said switching means in the ON condition in another of said columns in response to every detection of at least one of said switching means in the ON condition at an intersection of said one and another of said rows and columns;

storage means for storing with respect to each of said switching means one of a first status representative of said switching means being detected in an OFF condition during a previous and a present scanning cycle, a second status representative of said switching means being detected in the OFF condition during the previous scanning cycle and being detected in the ON condition during the present scanning cycle, a third status representative of said switching means being detected in the ON condition during the previous and present scanning cycles, detected in the ON condition during the previous scanning cycle and being detected in the OFF condition during the present scanning cycle; and

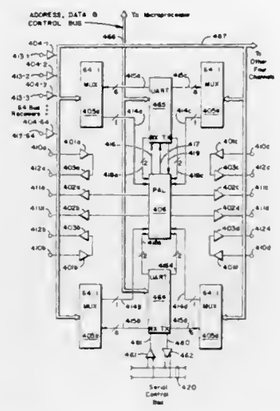
control means connected to said counting means and said storage means for changing a status of said switching means from said second status to said first status when said first total number is four or more and said second and third total number is two or more.

4,821,034

DIGITAL EXCHANGE SWITCH ELEMENT AND NETWORK

Terry M. Anderson, Minnetonka, and Robert S. Cornelius, Edina, both of Minn., assignors to Ancor Communications, Inc., Minneapolis, Minn.

Filed Feb. 6, 1987, Ser. No. 11,842
Int. Cl.⁴ H04Q *11/04, 1/00*; H04J *3/00*
U.S. Cl. 340—825.800 **20 Claims**



1. A single-stage multi-channel space-division switching network, comprising:

a plurality of I/O ports, each of which having inlet and outlet means adaptable for connecting to telecommunications equipment;

a bus having a plurality of channels, each of which being driven by a unique one of said inlet means of said I/O ports;

a plurality of selection means each having as inputs a plurality of said channels of said bus and each having an output which drives one of said outlet means of said I/O ports, said selection means controllable for causing one of said channels of said bus to be connected to said output of said selection means; and

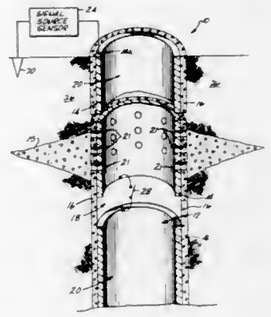
a control means connected to each of said selection means for sensing communications requests from a requesting one of said I/O ports for access to a requested one of said I/O ports and for causing in response thereto at least one of said selection means to connect the requesting I/O port to the requested I/O port.

4,821,035

METHOD AND APPARATUS USING A WELL CASING FOR TRANSMITTING DATA UP A WELL

Merle E. Hanson, Livermore, and Paul F. Titchener, Menlo Park, both of Calif., assignors to Comdisco Resources, Inc., San Francisco, Calif.

Filed May 1, 1984, Ser. No. 606,473
The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.
Int. Cl.⁴ E21B *47/022*; G01V *1/00*
U.S. Cl. 340—856 **44 Claims**



1. A data communication system for data in a well comprising:

electrically conductive and annular casing cemented in the well and comprising a ring-shaped high impedance separation, separating the casing into an upper casing portion and lower casing portion;

means for applying an alternating current signal between the upper casing portion and the surrounding earth causing a flow of current along the casing;

a tool insertable inside of the casing to the separation and comprising switch means, for sequentially changing electrical conductance for such flow of current across the separation between the upper and lower casing portions, for causing a changing signal at the upper case representative of the data; and

means coupled to the upper casing portion and responsive to the changing signal for forming a representation of the data.

4,821,036

METHOD OF AND APPARATUS FOR PRODUCING A DIGITAL INDICATION OF THE TIME-INTEGRAL OF AN ELECTRIC CURRENT

Patrick A. Daffarn, Crawley, England, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 889,440, Jul. 23, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 147,611
Claims priority, application United Kingdom, Jul. 26, 1985, 8518963
Int. Cl.⁴ H03M *1/38*
U.S. Cl. 341—172 **10 Claims**

1. An apparatus for producing a digital representation of the time integral of an electric current comprising:

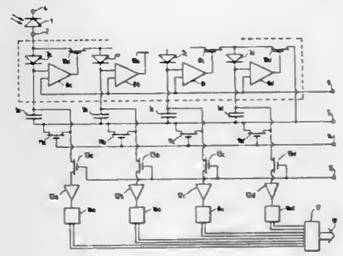
a plurality of capacitive elements forming a sequence of capacitive elements, each subsequent capacitive element having a capacitance which is B^{N-1} times the capacitance of a preceding element;

an input terminal for coupling said electric current to a first of said capacitive elements;

means for comparing the voltage across each capacitive element with a predetermined value of voltage;

coupling means for coupling each remaining capacitive element to said input terminal when a next capacitive element of said sequence receives a voltage equal to said predetermined voltage, whereby each capacitive element will be sequentially connected;

means for identifying the last of said capacitive elements to be connected to said input terminal and for providing a



digital code representation having N possible values of the voltage on said last capacitive element, which is a function of the logarithmic value to the base B of said last capacitive element voltage; and,

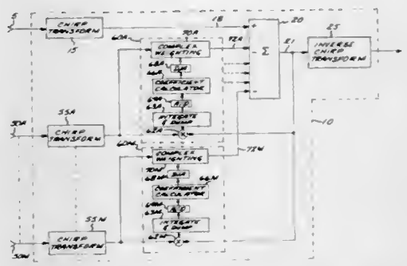
means for periodically discharging said capacitive elements.

4,821,037

WIDEBAND ADAPTIVE ARRAY USING THE CHIRP TRANSFORM

Thomas W. Miller, Yorba Linda, and Robert D. Kerwin, Rancho Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 10, 1986, Ser. No. 905,824
Int. Cl.⁴ G01S *03/86*
U.S. Cl. 342—383 **34 Claims**



1. An array processor for processing signals within a predetermined frequency bandwidth and suppressing interference received by an array of antennas including a main antenna and at least one auxiliary antenna, comprising:

means coupled to the main antenna for transforming the main antenna signal from the time domain into the frequency domain by a chirp transformation conducted over a time interval of duration T, wherein respective frequency components of the main antenna signal appear in time sequence;

means coupled to the auxiliary antenna for transforming the auxiliary antenna signal from the time domain into the frequency domain by a chirp transformation conducted over a time interval T in synchronism with said chirp transformation of the main antenna signal, wherein respective frequency components of the auxiliary antenna signal appear in time sequence;

means for weighting the transformed auxiliary antenna signal by a time variable coefficient in synchronism with said chirp transformation;

means for combining said transformed main antenna signal

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and said weighted, transformed auxiliary antenna signal to provide a combined transformed array signal; and

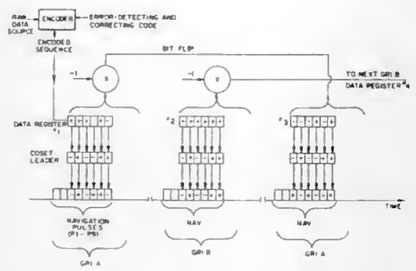
means for transforming the combined array signal to the time domain by an inverse chirp transformation to provide an array processor output.

4,821,038

METHOD OF AND APPARATUS FOR LORAN-C MESSAGE COMMUNICATION WITH REDUCED SKYWAVE NAVIGATION LOCATION ERRORS AND THE LIKE

Per Enge, Grafton, Mass., assignor to Megapulse Incorporated, Bedford, Mass.

Filed Nov. 3, 1987, Ser. No. 116,381
Int. Cl.[4] H01J *29/70, 29/72*
U.S. Cl. 342—390 **7 Claims**



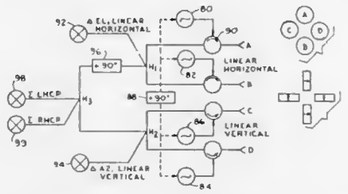
1. In a Loran-C navigation and message communication system in which a plurality of successive Loran-C pulses within successive groups of such pulses are pulse position modulated to communicate blocks of K raw data bit messages, a method of reducing errors in the reception of said pulses for navigation purposes in monitoring for a predetermined zero crossing within each successive pulse of each group, such errors being caused by skywave-introduced phase offsets and fluctuations, and regardless of the nature of the bit messages, said method comprising converting the successive blocks of K raw data bits into respective encoded data of N bit blocks, where N is greater than K, and containing an error-detecting code; applying the respective encoded data blocks to successive Loran-C pulse groups; logically multiplying the successive encoded sequences of the first and second Loran-C pulse groups by respective coset leader sequences to produce respective resulting data sequences that insure against strong imbalance in the plus and minus position modulations in any single group of pulses; pulse-position modulating certain of said plurality of pulses in the first and second groups of Loran-C pulses with the respective resulting data sequences; inverting the respective encoded sequences for the first and second Loran-C pulse groups and applying the same, respectively, as the encoded data for the third and fourth Loran-C pulse groups; logically multiplying the same with the said respective coset leader sequences to produce resulting data sequences in the third and fourth Loran-C groups, complementary to the respective resulting data sequences of the first and second Loran-C groups; pulse-position modulating certain of the plurality of pulses in the third and fourth groups of Loran-C pulses with the corresponding last-named resulting data sequences; and insuring that said coset leader sequences are excluded as a possible code for the converted raw data, whereby identical plus and minus position shifts will occur in the first and third Loran-C pulse groups and identical shifts in the second and fourth Loran-C pulse groups, each in perfect balance irrespective of the nature of the raw data and irrespective of skywave interference.

4,821,039

DUAL POLARIZED MONOPULSE ORTHOGONAL SUPERPOSITION

Patrick E. Crane, 7507 Summerbridge Dr., Tampa, Fla. 33614

Filed May 1, 1985, Ser. No. 729,433
Int. Cl.[4] G01S *13/44*
U.S. Cl. 342—153 **37 Claims**



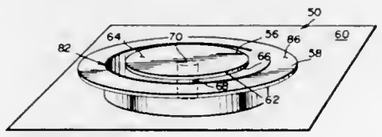
1. The method of detecting objects with radar signals which comprises providing dual polarized, two plane monopulse radar signals by superimposing two single plane monopulse patterns, wherein both single plane monopulse patterns are singly polarized and one of the patterns is orthogonally polarized with respect to the other pattern, and requiring only two sum/difference power dividers for full implementation of the monopulse comparator.

4,821,040

CIRCULAR MICROSTRIP VEHICULAR RF ANTENNA

Russell W. Johnson, and Robert E. Munson, both of Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Dec. 23, 1986, Ser. No. 945,613
Int. Cl.[4] H01Q *1/32, 9/04*
U.S. Cl. 343—700 MS **25 Claims**



1. A radio frequency antenna for installation in a vehicle, said antenna comprising:

a conductive reference surface;

a circularly shaped conductive radiator element of substantially less than one-half wavelength in diameter disposed above said reference surface by substantially less than one-fourth wavelength, said radiator element having an outer edge;

means for electrically shorting said circularly shaped element to said reference surface near the center of the circularly shaped element, said circularly shaped element and reference surface together defining a shorted annular cavity having a first circular radiating slot at said circularly shaped element outer edge;

a signal RF signal feed located between the reference surface and a matched impedance point on said circular radiator element, said point being spaced away from the periphery of said circular radiator element; and

at least one further continuous annular conductive radiator element spaced radially outwardly form said first circular radiating slot and also disposed above said reference surface by substantially less than one-fourth wavelength, said further radiator element having at least one edge, said further radiator element and said reference surface together defining at least one further circular radiating slot at one of said further radiator element edges,

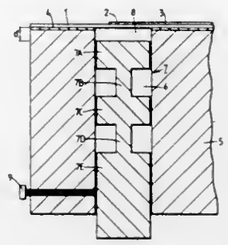
wherein said antenna has a substantially omnidirectional radiation pattern.

4,821,041

PATCH ANTENNA

David H. Evans, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,428
Claims priority, application United Kingdom, Dec. 22, 1986, 8630599
Int. Cl.[4] H01Q *00/00*
U.S. Cl. 343—700 MS **6 Claims**



1. A patch antenna comprising:

a. a dielectric substrate having first and second surfaces on opposite sides thereof;

b. a patch conductor and feeding means therefor disposed at the first surface;

c. a ground plane conductor disposed at the second surface and having an aperture therein juxtaposed to at least a substantial proportion of the patch conductor; and

d. a conductive element electrically connected to the ground plane and including a cavity therein having one end adjacent the ground plane aperture and having an opposite end defined by a conductive surface forming a short circuit termination of the cavity, said short circuit termination being spaced from the substrate by a distance d which effects operation of the cavity as a waveguide having an inductive impedance.

4,821,042

VEHICLE ANTENNA SYSTEM

Junzo Obe, Toyota, and Hiroshi Kondo, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

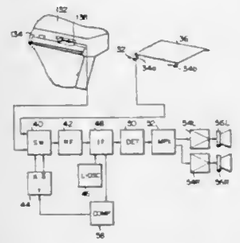
Filed Jun. 26, 1986, Ser. No. 878,778
Claims priority, application Japan, Jun. 28, 1985, 60-143090; Jun. 28, 1985, 60-143093
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—712 **8 Claims**

1. A diversity type vehicle antenna system for detecting broadcast waves, comprising:

first high frequency pickup means including a loop antenna mounted adjacent and in close proximity to a marginal edge portion of a vehicle roof of the vehicle body for electromagnetically detecting a magnetic flux formed by surface high-frequency currents flowing on the vehicle roof induced by the broadcast waves;

second high frequency pickup means including a loop antenna rigidly mounted on and along a trunk hinge of the vehicle body, said loop antenna being adapted to electromagnetically detect a magnetic flux formed by surface high-frequency currents flowing on the trunk hinge induced by the broadcast waves; and

pickup selection means for switchably selecting an output from any one of said first and second high-frequency pickup means, said pickup selection means comparing the selected output to a predetermined threshold limit and switching to the other output of said first and second high frequency pickup means when the selected output is lower than the predetermined threshold.

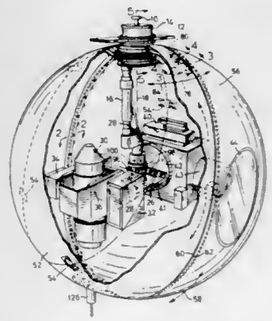


4,821,043

STEERABLE WINDOWED ENCLOSURES

John N. Leavitt, West Flamborough, Canada, assignor to Istec Inc., Hamilton, Canada

Filed Oct. 13, 1987, Ser. No. 107,438
Claims priority, application Canada, Oct. 23, 1986, 521276
Int. Cl.[4] H01Q *3/00*
U.S. Cl. 343—765 **12 Claims**



1. A steerable enclosure for a gyro-stabilized mechanism mounted within the enclosure, the enclosure having a window therein through which there is established a line-of-sight from the enclosure interior to the exterior, comprising:

mounting means for mounting the enclosure on a support therefor and including first rotating means for rotating the enclosure relative to the support about a first axis to steer the window for movement in a respective first plane;

the enclosure comprising a first enclosure part to which the mounting means are attached, and a second movable enclosure part including the window mounted for movement relative to the first part in a skew plane at an incline angle to said first axis and having a second skew axis perpendicular thereto;

second rotating means operatively connected between the two enclosure parts for rotating them relative to one another about the said second skew axis; and

means for controlling the said first and second rotating means such that rotation of the two enclosure parts about the second skew axis by the second rotating means is compensated as required by rotation of the enclosure by the first rotating means about the first axis to compensate for the said incline angle between the said first axis and the skew plane.

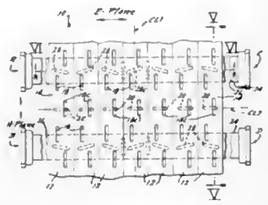
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4,821,044

WAVEGUIDE SLOT ARRAY TERMINATION AND ANTENNA SYSTEM

Louis A. Kurtz, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 14, 1987, Ser. No. 38,083
Int. Cl.[4] H01Q *13/10*
U.S. Cl. 343—771 **16 Claims**



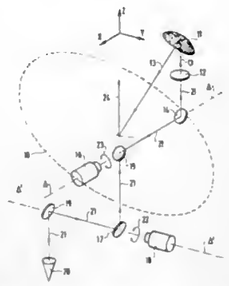
1. A slot array antenna having an improved difference radiation pattern comprising:
- a waveguide section having at least one pair of opposing broadwalls and having first and second ends for exciting with electromagnetic energy;
- said waveguide having an odd number of slot radiators including a center slot radiator at spaced intervals in one of said broadwalls;
- at least one termination means disposed behind said center slot radiator in the opposing broadwall opposite said one broadwall and centered about said center slot radiator;
- said termination means being inoperative when the ends of said waveguide are fed in a sum mode thereby permitting said center slot radiator to radiate energy, and being operative when the ends of said waveguide are fed in a difference mode thereby preventing said center slot radiator from radiation energy.

4,821,045

ANTENNA POINTING DEVICE CAPABLE OF SCANNING IN TWO ORTHOGONAL DIRECTIONS

Marc Capdepuy, Fontenilles; Régis Lenormand, Toulouse, and Daniel Renaud, Frouzins, all of France, assignors to Alcatel Espace, Courbevoie Cedex, France

Division of Ser. No. 806, Jan. 6, 1987, abandoned. This application Jun. 7, 1988, Ser. No. 204,949
Claims priority, application France, Jan. 9, 1986, 86 00223
Int. Cl.[4] H01Q *19/18, 3/12*
U.S. Cl. 343—781 R **7 Claims**



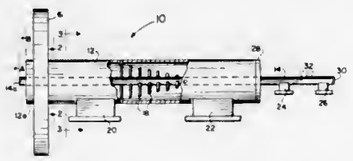
1. In an antenna pointing device operatively associated with a main offset reflector and a secondary offset reflector and being capable of scanning in two orthogonal directions, said device comprising a fixed source emitting a radio beam, the improvement comprising a set of at least three mirrors and first and second rotary drive mechanisms, said at least three mirrors including a first mirror which is aligned with said secondary reflector and a second and a third mirror which are fixed respectively to said first and second respective rotary drive mechanisms for providing rotary drive about two axes Δ and Δ', respectively extending in orthogonal directions, the direction of the mean axis of the parallel beam between said second and third mirrors being parallel to the axis Z of the beam radiated from the main reflector, said axes of rotation Δ and Δ' being perpendicular to said axis Z of the beam radiated from the main reflector near the zenith of the scanning zone of the antenna, the axis Δ' of rotation of the second mechanism being colinear with the mean axis of the parallel beam **21** from the source which is applied to the third mirror, and the secondary reflector and the first and second mirrors being mechanically interconnected and constituting a moving assembly, said second mechanism operatively driving the third mirror and said first mechanism operatively driving said moving assembly, whereby for aiming trajectories situated in a solid angle near the zenith, the rotations around the axes Δ and Δ' remain small with the antenna well fitted for tracking near that zenith.

4,821,046

DUAL BAND FEED SYSTEM

Brian J. Wilkes, P.O. Box 395, Leesburg, Fla. 32748

Continuation-in-part of Ser. No. 898,486, Aug. 21, 1986. This application Apr. 6, 1987, Ser. No. 34,710
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—786 **11 Claims**



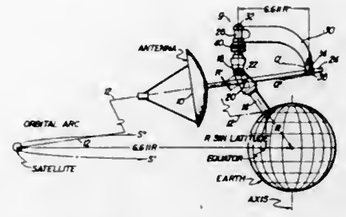
1. A dual frequency band microwave antenna feed for a parabolic reflector comprising:
- a first circular waveguide having a diameter for supporting first electromagnetic waves of a first microwave frequency range in the TE_{01} mode;
- a second circular waveguide disposed concentrically with said first circular waveguide for supporting second electromagnetic waves of a second microwave frequency range, higher in frequency than the first microwave frequency range, in the TE_{01} mode, a rearward portion of said second circular waveguide extending from a rearward end of said first waveguide;
- a first one of a first pair of in-line ports disposed in said first circular waveguide for output of a first one of a first pair of linearly cross-polarized electromagnetic waves;
- first polarization rotation means for rotating the planes of said first linearly cross-polarized electromagnetic waves rearward of said first port in said first waveguide;
- a first one of a second pair of in-line ports disposed in said second waveguide for output of a first one of a second pair of linearly cross-polarized electromagnetic waves; and
- second polarization rotation means for rotating the planes of said second linearly cross-polarized electromagnetic waves rearward of said first port in said second waveguide.

4,821,047

MOUNT FOR SATELLITE TRACKING DEVICES

Thomas H. Williams, Doraville, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Jan. 21, 1986, Ser. No. 820,655
Int. Cl.[4] H01Q *3/02*
U.S. Cl. 343—882 **13 Claims**



1. A mount for aiming a device at a body in orbit in the plane of the Earth's equator, comprising:
- (a) a support means for supporting;
  - (i) a pivot point; and
  - (ii) a reference point located at a predetermined distance away from the pivot point on a line containing the pivot point and substantially parallel to a line containing the center of the Earth and the pivot point;
- (b) a carrying member to which the device is to be attached and which is pivotally connected to the support means so that the device's axis pivots about the pivot point; and
- (c) an arc defining means rotatably connected to the support means and connected to the carrying member for constraining the axis of the device to pivot about the pivot point and intersect an arc:
  - (i) having the reference point as its center;
  - (ii) in a plane substantially parallel to the equatorial plane of the Earth; and
  - (iii) having a radius relative to the distance from the pivot point to the reference point substantially proportional to the ratio of the radius of the body's orbit to the Earth's radius.

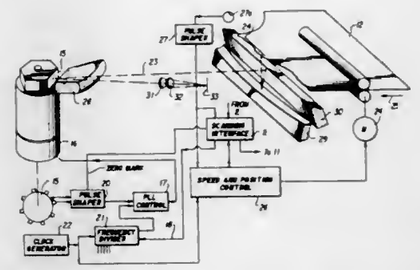
4,821,048

AREA EXPOSURE APPARATUS FOR EXPOSING AN AREA OF TEXT ON A RECORDING CARRIER AND METHOD FOR CONDUCTING THE AREA EXPOSURE

Klaus-Jurgen Hornig, Glashuettten, and Hans-Henning Thiessen, Kelkheim, both of Fed. Rep. of Germany, assignors to Linotype Aktiengesellschaft, Eschborn, Fed. Rep. of Germany

Continuation of Ser. No. 41,882, Apr. 23, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 228,855
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614645
Int. Cl.[4] G01D *9/42;* **G03G** *15/00*
U.S. Cl. 346—108 **10 Claims**

1. In an area exposure apparatus for exposing area of a text on a recoding carrier, an apparatus of the type comprising drive means for continuously moving said recording carrier in a forward move direction, a scanner for scanning said recording carrier at right angles relative to said forward move direction by means of a modulated scanner beam, the scanning movement of which is coupled to said drive means, and further comprising a receive module for receiving text data defining the identity, position, kind and size of the characters, said text data including end-of-line commands, an output data processing system connected to said receive module and an input device for receiving character-specific data defining the contour of the character, said output data processing system constructed for generating output data for controlling said scanner, and further comprising a converter connected to said output data processing system for converting said text data of text which is relatively narrow compared to a given typesetting width of said area exposure apparatus, the improvement wherein said output data processing system (**4**) comprises an X register (**42**) for storing X distance data of the postions of the characters in the X direction, and a Y register (**40**) for storing Y distance data of the positions of the scanning lines in the Y direction, for exposing the text in the normal position, a converter of the type for converting the X distance data of the characters of the text in rotation Y distance data as well as the Y distance data of the lines of text in rotation X distance data for rotating the text to be exposed onto said recording carrier about 90 degrees relative to a normal position of the text on said recording carrier, and at least one output (**39** or **41**) of said converter connected to said X register (**42**) and to said Y register (**40**).

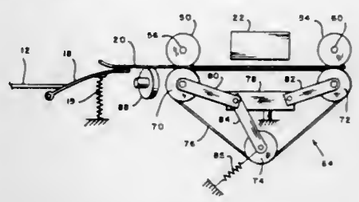


4,821,049

SUBSTRATE TRANSPORT APPARATUS, ESPECIALLY FOR MAIL HANDLING

John K. Eckl, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 2, 1987, Ser. No. 128,015
Int. Cl.[4] G01D *15/24*
U.S. Cl. 346—134 **22 Claims**



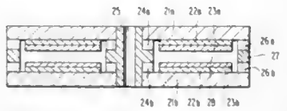
1. An envelope transport comprises:
- a fixed plate member;
- means for transporting envelopes along said plate member; and
- means for compliantly urging each of said envelopes against said plate member while being transported therealong, said means for compliantly urging said envelope including a plurality of independent envelope urging means, such that the effects of thickness variations of, and between, each said envelope are mitigated.

4,821,050

OPTICAL INFORMATION RECORDING MEDIUM

Masao Yabe, and Yonosuke Takahashi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 819,326, Jan. 16, 1986, abandoned. This application Jul. 17, 1987, Ser. No. 75,266
Claims priority, application Japan, Jan. 16, 1985, 60-5538
Int. Cl.[4] G01D *15/34;* **B32B** *7/12*
U.S. Cl. 346—137 **15 Claims**



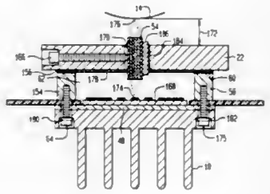
1. An optical information recording medium comprising two disc substrates, which are adhered directly or through a convex portion formed on at least one of the substrates or a spacer provided between the substrates by an adhesive layer, and a recording layer which is capable of recording and/or reading information by laser beam and which is provided on a surface of at least one of the substrates facing the other substrate, wherein the adhesive layer comprises an ultraviolet-curing epoxy adhesive composition comprising a light-initiator which produces a cationic polymerization initiator upon irradiation with ultraviolet rays and an epoxy compound having two or more epoxy groups per molecule.

4,821,051

OPTICAL PRINTHEAD HAVING THERMAL EXPANSION STRESS RELIEF

Edwin A. Hediger, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1988, Ser. No. 239,375
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—155 **15 Claims**



1. A printhead assembly for selectively exposing a moving photoconductive surface to provide a latent image, said printhead comprising:

a plurality of modular circuit assemblies each including a linear light emitting diode (LED) array and associated integrated circuit (IC) drivers;

a plurality of circuit assembly mounting tiles;

first means for securing the LED's and the IC drivers to said tiles;

means for focusing radiation from the LED's onto the photoconductive surface;

a backing plate dimensioned to support said plurality of mounting tiles;

second means for securing the tiles to the backing plate;

a heat dissipating structure; and

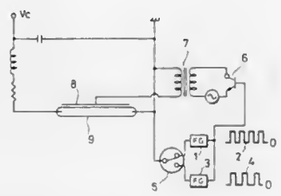
means for mounting the backing plate to the heat dissipating structure, said mounting means preventing stress buildup between the plate and structure due to differential thermal expansion.

4,821,052

FLASH FUSING APPARATUS FOR REDUCING OCCURRENCE OF SPOTS ON RECORDING PAPER

Teruaki Mitsuya, Hitachi; Takao Kumasaka, Takahagi; Shinichi Nishino; Masato Yamada, both of Katsuta, and Shigetaka Fujiwara, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 102,434
Claims priority, application Japan, Sep. 29, 1986, 61-228472; Oct. 9, 1986, 61-239333
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—14 FU **19 Claims**



1. A flash fusing apparatus comprising a recording paper, means for feeding said recording paper, a lamp receiving means disposed oppositely to said recording paper and including a flash lamp and a glass plate member, toner being developed on said recording paper, and means for heating said toner by a flash and for fusing said toner on said recording paper, wherein an overlapping portion formed between two adjacent fusing areas of said recording paper receives a first flash and a second flash from said heating and fusing means, characterized in that

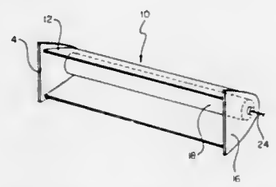
means for controlling said overlapping portion is provided so as to reduce an occurrence of spots on said recording paper by reducing an area of said overlapping portion on said recording paper.

4,821,053

PHOTOGRAPHIC FLASH DEVICE

David R. Dowe, Holley, and Paul L. Ruben, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1988, Ser. No. 191,458
Int. Cl.[4] G03B *15/03;* **F21V** *7/16*
U.S. Cl. 354—149.1 **6 Claims**



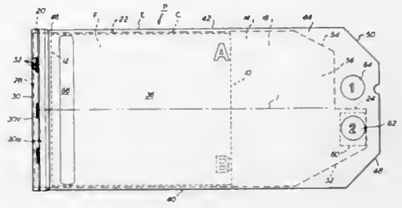
1. A device for producing a flash for illuminating a subject to be photographed by a camera having a zoom taking lens, including a reflector having a trough shape and a tubular device for creating light, the tubular device being disposed within and extending along the trough shape of the reflector, said reflector being formed of a laminate of a first sheet of piezoelectric material bonded to a second sheet of material, the trough-shape reflector being reflective at the side facing the tubular device, and means for applying an electric potential difference across the first sheet of material whereby a change in the potential difference changes the trough shape and the illumination pattern created by a flash from the tubular device changes to accommodate a change in the focal length of the zoom taking lens of the camera.

4,821,054

FILM PACKET

Randy E. Armbruster; Blanchard M. Brock; Timothy L. Bushnell, all of Rochester, and Guenter H. Loose, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1988, Ser. No. 200,474
Int. Cl.[4] G03B *17/26*
U.S. Cl. 354—282 **14 Claims**



1. A photographic film assemblage comprising:

a photosensitive film sheet having leading and trailing ends;

an elongate carrier sheet having first and second outward-facing surfaces, said carrier sheet including leading and trailing end sections and an intermediate section between said end sections, said film sheet being detachably attached to said first outward-facing surface of said intermediate section with said leading and trailing ends thereof oriented toward said leading and trailing end sections respectively, said leading end section extending longitudinally beyond said intermediate section and terminating in a tab, said trailing end section extending longitudinally beyond said intermediate section and having a transversely disposed element secured thereto; and

a light-shielding envelope removably enclosing said carrier sheet and said film sheet, said envelope having first and second inward-facing surfaces overlying said first and second outward-facing surfaces respectively, said envelope including longitudinally extending leading and trailing end portions overlying said leading and trailing end sections respectively, said leading end portion being sealed closed, said trailing end portion being closable by cooperative engagement with said transversely disposed element, said leading end portion including first and second graspable zones, said first graspable zone overlying said tab so that, when grasped, said first zone is pressed against said tab, said second graspable zone not overlying said tab so that, when grasped, said second zone is not pressed thereagainst;

wherein one of said tab and said first graspable zone has adhesive material thereon so that, when grasped, said first zone becomes adhered, via said adhesive material, to said tab, thereby to prevent unintended relative movement between said envelope and said carrier sheet.

4,821,055

FILM PACKET HOLDER

Guenter H. Loose, Webster, and Bradley S. Bush, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1988, Ser. No. 200,274
Int. Cl.[4] G03B *17/26*
U.S. Cl. 354—282 **8 Claims**

1. A holder for a photographic film assemblage of the type comprising:

a photosensitive film sheet having first and second ends;

means detachably attached to the film sheet for facilitating use thereof, the facilitating means including first and second sections thereof projecting longitudinally beyond the film sheet first and second ends, respectively, the facilitating means second section having a transverse edge along which is secured a transversely disposed light-locking element; and

a light-shielding envelope removably enclosing the film sheet and facilitating means, the envelope including a film-covering part and first and second parts extending longitudinally therefrom and covering the facilitating means first and second sections, respectively, the envelope first part having a closed end that is manually graspable, the envelope second part having an open end that is closable by cooperative engagement with the light-locking element, the envelope being removable from the film sheet and facilitating means by longitudinal relative movement therebetween in a direction separating the envelope second part end from the light-locking element, the envelope further including a movement-limiting element secured to an exterior surface thereof;

said holder comprising:

a substantially rectangular-shaped housing having parallel, spaced-apart front and rear walls, opposing sides, and oppositely disposed first and second end regions, said front wall including a frame portion defining a film-exposure window, said first end region including means defining an access opening configured to permit ingress and egress of the film assemblage along a movement path extending to and from, respectively, a seated position wherein the film sheet is aligned with said window and the light-locking element is in said second end region;

a substantially flat pressure-applying member movably disposed between and substantially parallel with said housing front and rear walls, said pressure-applying member being movable in directions transverse to said front wall and



normally urged by influence of biasing means thereon toward said movement path, to press the film assemblage, when in its seated position, against said front wall frame portion;

a first blocking member movably disposed in said housing second end region, said first blocking member being movable in directions transverse to said front wall and normally urged by influence of biasing means thereon toward said movement path, to engage the light-locking element, when in its seated position, and thereby block movement thereof toward said access opening;

a second blocking member movably disposed between said front wall frame portion and said access opening, said second blocking member being movable in directions transverse to said front wall and normally urged by influence of biasing means thereon toward said movement path, to engage the envelope movement-limiting element during movement thereof from its seated position toward said access opening, and thereby block further movement thereof toward said opening; and

a releasing member movably disposed between said pressure-applying member and said housing rear wall, said releasing member being movable in first and second opposing directions extending toward said housing first and second end regions respectively, said releasing member being normally urged by influence of biasing means thereon in said first direction to a rest position, said releasing member being adapted for manual movement in said second direction away from said rest position, said releasing member having means thereon operatively associated with said pressure-applying member and said blocking

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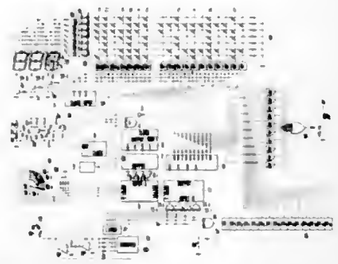
members, and responsive to said manual movement in said second direction, for negating said biasing means influences normally urging said pressure-applying and blocking members toward said movement path, to remove said members from said path and thereby release the film assemblage for unrestricted movement therealong from its seated position and through said access opening.

4,821,056

SHUTTER SPEED DISPLAY DEVICE FOR A CAMERA

Masqharu Kawamura, Kanagawa Nobuaki Sakurada, Kanagawa Hiroyasu Murakami, Tokyo Nobuhiko Shinoda, Tokyo Tadashi Ito, Kanagawa all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Continuation of Ser. No. 880,357, Feb. 23, 1978, abandoned.

This application Apr. 18, 1980, Ser. No. 141,490
Claims priority, application Japan, Mar. 8, 1977, 52-25223
Int. Cl.[4] G03B *17/18*
U.S. Cl. 354—289.1 3 Claims



1. A shutter speed value displaying device for a camera comprising:

(a) a shutter speed information signal forming circuit for producing a digital signal corresponding to a value of shutter speed;

(b) shutter speed displaying means for displaying a numerical indication of a shutter speed value, said displaying means including a plurality of display elements for said numerical indication;

(c) a decoder circuit connected to said signal forming circuit, said decoder circuit being provided with a plurality of output terminals which are arranged to produce an output signal from one of them in accordance with said digital signal, said arrangement of the output terminals of said decoder circuit consisting of output terminals which are divided into first and second groups of output terminals, said decoder circuit being arranged such that, when said digital signal corresponding to a shutter speed value corresponds to a shutter time shorter than a predetermined length of time, a specific output terminal in the first group of output terminals produces said output signal and, when said digital signal corresponds to a shutter time longer than said predetermined length of time, said output signal is produced from a specific output terminal in the second group of output terminals; and

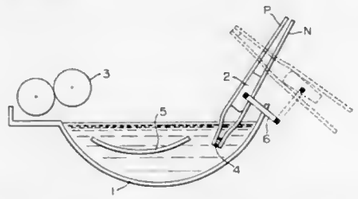
(d) a display signal forming circuit connected to the output terminals of said decoder circuit, said display signal forming circuit being arranged to form a display signal corresponding to a predetermined shutter speed value in response to the output signal from each output terminal of said decoder circuit and to transmit said display signal to said displaying means, said display signal forming circuit further being arranged to form a second mark signal for display in seconds in response to the output signal from said second group of output terminals and to transmit said second mark signal to a specific display element in said displaying means.

4,821,057

PROCESS FOR IMAGE TRANSFER AND EQUIPMENT THEREFOR

Yasuo Tsubai, and Shozi Oka, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 4, 1986, Ser. No. 892,369
Claims priority, application Japan, Aug. 6, 1985, 60-173754; Aug. 6, 1985, 60-173755; Aug. 6, 1985, 60-173756
Int. Cl.[4] G03D *9/00*
U.S. Cl. 354—301 8 Claims



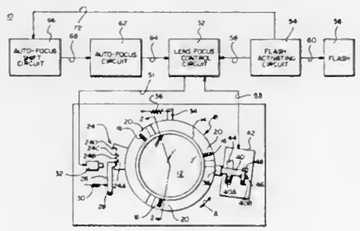
1. A processor for image transfer comprising a parting member, for parting an image donating sheet and an image receiving sheet, a processing solution tank and a pair of squeegee rolls wherein one side of the parting member is attached to the inner side wall of the processing solution tank and another side of the parting member is unattached to another inner side wall of the processing tank, wherein the processor can accommodate the image donating and image receiving sheet that are bonded along a side or front edge relative to a direction they are fed into the processor.

4,821,058

CAMERA WITH FLASH RESPONSIVE FOCUS SYSTEM

John H. Minnick, Rochester; John E. Spencer, Geneseo, and Peter S. Tisack, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 15, 1988, Ser. No. 144,839
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—400 9 Claims



1. In a camera including a lens adjustable to different focus distances, means for supplying a flash illumination, and a rangefinder for indicating the distance to a subject as one of at least two zones, said camera operable in a flash mode or a non-flash mode, apparatus comprising:

a ratchet defining at least three consecutive teeth connectible to said lens, each one of said ratchet teeth defining a focus setting for said lens, the focus settings ranging from a relatively near focus setting to a relatively distant focus setting;

a pawl for engaging a selected one of said ratchet teeth to fix the focus of said lens at the focus distance associated with the selected ratchet tooth; and

focusing means responsive to said rangefinder for operating said pawl to select one of the two ratchet teeth defining the relatively more distant focus settings when said flash illumination is not supplied and one of the two ratchet teeth defining the relatively nearer focus settings when said flash illumination is supplied;

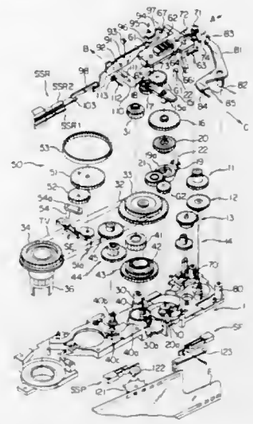
such that at least one of said ratchet teeth defining a focus setting is shared in both said flash and non-flash modes of operation.

4,821,059

ELECTRIC CAMERA

Kazuhiro Nakanishi, and Yasushi Hoshino, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 860,089, May 6, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 153,494
Claims priority, application Japan, May 10, 1985, 60-99941; May 10, 1985, 60-99942; May 10, 1985, 60-99943; May 10, 1985, 60-99944; May 10, 1985, 60-99945; May 10, 1985, 60-99946; May 10, 1985, 60-99947; Jun. 4, 1985, 60-122245
Int. Cl.[4] G03B *1/00, 3/00, 5/00, 15/02*
U.S. Cl. 354—400 17 Claims



1. A motor driven camera device comprising

a reversible motor capable of effecting a driving force in a first and second turning direction,

a winding means for performing a film winding in the first turning direction,

a rotation-reciprocation converting means for performing a reciprocative camera action in the second turning direction, p1 a switch means for starting said motor in the first turning direction in response to a first manual input designating film winding, or in the second turning direction in response to a second manual input designating the reciprocative camera action, and

a transmitting means for transmitting the driving force of said motor, said transmitting means comprising a transmitting direction change means for changing the transmitting direction of the driving force in response to the turning direction of said motor wherein transmitting means submits the driving force to said winding means in said first turning direction and transmits the driving force to said rotation-reciprocation converting means in said second turning direction, said camera device further comprising

a rewinding means for performing a film rewinding in said second turning direction, and

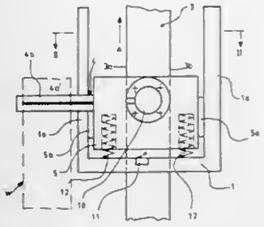
a mechanism change means for shifting a transmitting mechanism of said tranmitting means in response to a third manual input designating film rewinding, said switch means starting said motor in said second turning direction in response to said third manual input so that said shifted transmitting mechanism of said transmitting means transmits the driving force to said rewinding means in said second turning direction.

4,821,060

APPARATUS FOR ATTACHING CLIPS TO LEADER BELTS FOR PHOTOSENSITIVE WEBS

Siegfried Kurths, Taufkirchen, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 166,872
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709413
Int. Cl.[4] G03D *3/13;* B65H *20/16*
U.S. Cl. 354—321 23 Claims



1. Apparatus for transporting webs of photosensitive material in a processor, comprising an elongated driven transversely elastic band-like transporting element having a predetermined maximum width and being arranged to advance in a predetermined direction along a predetermined path; means for connecting a web of photosensitive material to said element including a first portion connectable with the web and a second portion connectable with said element, said second portion defining a channel having a second width less than said maximum width and an open side having a third width less than said second width; and means for attaching said second portion to said element, including a support adjacent a portion of said path and having means for locating said second portion in such orientation that the open side of said channel faces the element in said portion of said path, and means for deforming said element to an effective width equal to or less than said third width so that said element can enter the channel and can thereupon increase its effective width due to its elasticity so as to engage and entrain the second portion in said direction, said deforming means including at least one component which is movable with said element in said direction, at least during a portion of the interval of reduction and increase of the effective width of said element.

4,821,061

PHOTOFINISHING PACKAGING SYSTEM

Gunnar G. Gudmundson, Longmeadow; Martin E. Hebert, Williamsburg; Walter R. Hadank, Springfield; Raymond H. Crochetiere, Southampton, and Douglas A. Kenyon, Brimfield, all of Mass., assignors to Standard Manufacturing, Chicapee, Mass.

Filed Feb. 20, 1987, Ser. No. 18,097
Int. Cl.[4] G03B *27/32, 27/52;* B26D *5/34*
U.S. Cl. 355—40 10 Claims

1. A print encoding system for photofinishing apparatus comprising a printer for printing prints from developed film onto a roll of photographic print paper, the improvement comprising

means for applying identification indicia to each film in a roll of films,

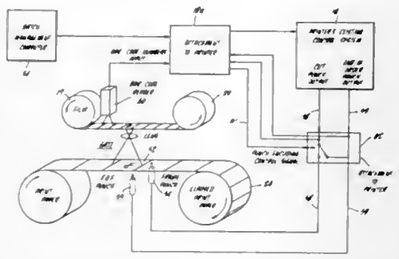
reader means for reading the identification indicia from a film of a roll of films,

punch means comprising first and second punches for

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punching holes in the roll of print paper for identifying (i) the end of a film order and (ii) a cut location between prints where the prints from the print roll are to be cut apart,

the printer including means for supplying signals to the first and second punches to normally make punch marks in print paper representing the end of a film order and to



provide print cut indicia between prints, the second punch normally providing the print cut indicia, and

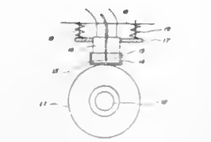
control means for controlling signals to said first and second punches to cause selective signals that normally would be applied to the second punch to be applied to the first punch to encode punch marks on the print paper specifically related to the identification indicia read by the reader means for the respective film.

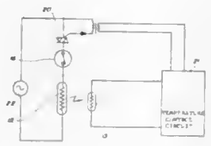
4,821,062

INTEGRATED ASSEMBLY OF THERMOSTAT AND THERMISTOR IN FIXING DEVICE OF IMAGE REPRODUCTION MACHINE

Itsuro Katoh; Akihiko Taniguchi, both of Nara, and Yoshitaka Honda, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 23, 1986, Ser. No. 888,411
Claims priority, application Japan, Jul. 23, 1985, 60-163398
Int. Cl.⁴ G03G *15/20*
U.S. Cl. 355—3 FU **4 Claims**





1. A heat fixing device for an image reproduction machine comprising:

a heat source for providing heat to said heat fixing device;

a power source for providing power to said heat source;

a temperature sensing thermistor for sensing the temperature of said heat fixing device;

silicon rubber formed around at least a portion of said thermistor for protecting said thermistor from the surrounding environment;

a temperature control circuit, responsive to said temperature sensing thermistor, for generating signals representative of changes in resistance of said thermistor, said signals corresponding to varying temperatures being sensed;

means for applying power to said heat source in response to said signals generated by said temperature control circuit when the temperature of said heat fixing device is below a predetermined temperature, said signals being applied to said power source of said heat source;

a thermostat, integrally combined with said temperature sensing thermistor, for detecting an abnormal increase in the temperature of said heat fixing device upon failure or malfunction of at least one of said power source, said temperature sensing thermistor, and said temperature control circuit, whereby said thermostat interrupts said means for applying power to said heat source, thereby preventing damage to said heat fixing device; and

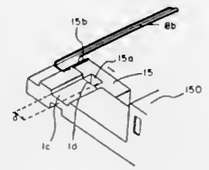
wherein heat is transferred to said thermostat through said silicon rubber around said thermistor.

4,821,063

IMAGE FORMING APPARATUS

Masatoshi Kaneshige, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1987, Ser. No. 49,397
Claims priority, application Japan, May 20, 1986, 61-117903
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 DD **5 Claims**



1. An image forming apparatus comprising:

a detachable image forming unit including an image carrier,

a detachable developing unit for developing an electrostatic latent image formed on said image carrier,

a guide groove formed on a frame portion of said image forming apparatus for receipt of said developing unit,

a guide means provided on said image forming unit for guiding said developing unit into said image forming apparatus, and

means for preventing said developing unit from being mounted prior to the mounting of said image forming unit, said means including a cut-away portion, which preventing means upon being engaged by said guide means upon mounting of said image forming unit is moved so as to align said cut-away portion with said guide groove of said frame.

4,821,064

CONFORMABLE PAD SKIVE

Borden H. Mills, Webster, and Lloyd E. Wade, Shortsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1987, Ser. No. 139,225
Int. Cl.⁴ G03G *21/00*; B65H *29/54*
U.S. Cl. 355—3 FU **2 Claims**



1. An apparatus in a copier or printer for stripping copy sheets from the surface of a fuser roller that is coated with a resilient material such as silicone rubber, the apparatus comprising:

(a) a solid, generally triangular stripping member having a base and a first stripping edge, said stripping member consisting of a hard material that, relative to the surface material of the fuser roller has a higher modulus of rigidity, said base having a radius of curvature substantially equal to the radius of curvature of the fuser roller and said base further having a groove therein;

(b) means for pivotably supporting and urging said stripping member against the surface of the fuser roller;

(c) a thick conformable pad positioned in said groove and having an outer surface for contacting the surface of the fuser roller, said pad having substantially the same dimensions as said groove including a bottom portion with a radius of curvature substantially equal to the radius of curvature of the fuser roller, and said pad further consisting of a soft material that, relative to the surface material of the fuser roller has an equal or lower modulus of rigidity; and

(d) a shim with a length and width substantially equal to that of said groove, the shim being positioned in said groove between said stripping member and said pad for causing said pad to protrude from said base of said stripping member by a distance substantially equivalent to said thickness of said shim, and for spacing said stripping edge from the surface of the fuser roller.

4,821,065

RECORDING APPARATUS HAVING CONTROLLABLE RECORDING BEAM STATES

Hiroaki Ishii, Tokyo; Yukio Sato; Yutaka Udagawa, both of Kawasaki, and Masafumi Watava, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 945,943
Claims priority, application Japan, Jan. 10, 1986, 61-2232; Jan. 10, 1986, 61-2233
Int. Cl.⁴ G03G *15/04*
U.S. Cl. 355—14 E **11 Claims**

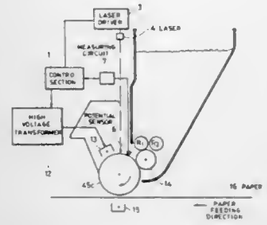
1. In a recording apparatus, the combination of:

first and second beam emitting means for emitting first and second beams for recording;

first detection means for detecting the power of said first beam emitted from said first beam emitting means;

control means for controlling, in accordance with the detection output from said detection means, the power of said second beam emitted from said second beam emitting means, wherein said control means includes setting means responsive to the output from said detection means which corresponds to a power of said first beam less than a predetermined level, to set the power of said second beam in accordance with said output; and

second detection means for detecting the power of said



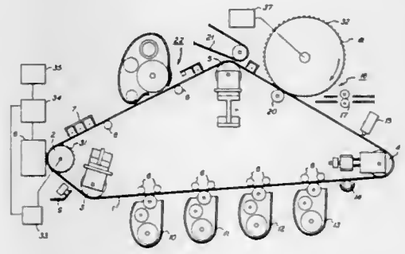
second beam from said second beam emitting means, said control means being connected to receive outputs from said first and second detection means and to control the power of said second beam to make it coincide with the power set by said setting means.

4,821,066

NONIMPACT PRINTER

James C. Foote, Jr., York; Frank Castrignano, Fairport, and Robert D. Huot, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,953
Int. Cl.⁴ G03G *15/01*
U.S. Cl. 355—14 R **18 Claims**



1. A nonimpact printer of the type having

an endless movable web entrained around a series of rollers,

a printhead positioned to form a series of electrostatic images on said web in response to electronic image information as said web passes said printhead,

means for controlling the printhead,

means for toning said electrostatic images to form a series of toner images, and

transfer means positioned to present a transfer surface repeatedly to said web to transfer and superpose said toner images in registration on the transfer surface; characterized in that

said web has a series of perforations along one edge,

said controlling means includes first sensing means for sensing the leading or trailing edge of each perforation as it passes a predetermined position associated with said printhead, and means for controlling actuation of said printhead in response to said sensing means, and

further characterized by means for controlling presentation of said transfer surface to the toner images, said means including second sensing means for sensing each perforation as it passes a predetermined position associated with

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said transfer means and means for positioning said transfer surface relative to the toner images in response to sensing of each perforation.

4,821,067

MICROFILM READER-PRINTER HAVING AN IMAGE FERMATION DEVICE

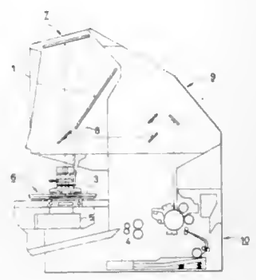
Hideshi Ouchiden, Kanagawa; Norio Imada, Setagaya, and Takeshi Sambayashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1986, Ser. No. 925,064

Claims priority, application Japan, Oct. 31, 1985, 60-245068; Oct. 31, 1985, 60-245067; May 12, 1986, 61-108318; May 13, 1986, 61-109193

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 E **9 Claims**



1. An image formation device for forming an electrostatic latent image on an image bearing member in accordance with a scanning light of an image information and for transferring the electrostatic latent image formed on the image bearing member to a recording medium, comprising:

means for detecting a size of the recording medium;

means, having on and off states, for charging the image bearing member;

means for exposing the image bearing member to the scanning light of the image information;

shutter means, having open and closed states, for shutting off the scanning light from said exposing means to the image bearing member; and

means for controlling said shutter means and said charging means in response to the size of the recording medium detected by said detecting means, so that in the case of inverted development said charging means remains on while the opening and the closing of said shutter means is controlled, and in the case of normal development said shutter means remains open while the on and off states of said charging means is controlled.

4,821,068

IMAGE FORMING APPARATUS

Toshio Honma, Tokyo; Hiroaki Takeda, Kawasaki, and Tadashi Suzuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 045,527, May 4, 1987, which is a continuation of Ser. No. 607,753, May 7, 1984, abandoned. This application Jun. 28, 1988, Ser. No. 213,514

Claims priority, application Japan, May 10, 1983, 58-81141; May 10, 1983, 58-81142; May 10, 1983, 58-81143

Int. Cl.⁴ G03G *15/00*

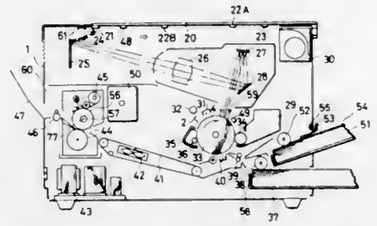
U.S. Cl. 355—14 E **10 Claims**

1. An image formation apparatus comprising:

image forming means for forming a copy image of an original image on a recording medium, said image forming means being capable of reproducing the original image with different selectable copy magnification;

detecting means for detecting a density of the original image; and

control means responsive to an output of said detecting means for controlling an operable condition of said image forming means so as to provide an adequate density of the copy image, said control means being operable to obtain control data in accordance with the output of said detect-



ing means, wherein a predetermined relation exists between the control data and the density of the original image, and to control the operable condition of said image forming means based on the thus obtained control data, wherein a relation between the density of the original image and the control data is varied in accordance with the copy magnification.

4,821,069

APPARATUS FOR CONTROLLING THE TEMPERATURE OF A HEAT ROLLER

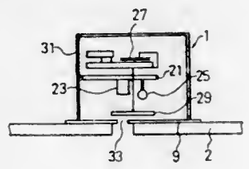
Koizi Kusumoto, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 16, 1986, Ser. No. 919,456

Claims priority, application Japan, Oct. 29, 1985, 60-242322

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 FU **8 Claims**



1. An apparatus for controlling the temperature of a heat roller comprising:

an infrared thermal sensor unit disposed in close vicinity to said heat roller and including a pyroelectric infrared thermal sensor, a chopper mechanism and a reference thermal sensor;

signal processing means for forming a composite signal from information signals produced by said pyroelectric thermal sensor and said reference thermal sensor;

setting signal generating means for producing an information signal having a value representative of a setting temperature of said heat roller;

comparing means for comparing the value of the setting signal produced by said setting signal generating means with the value of said composite signal formed by said signal processing means;

control means for controlling power supply to a heater of said heat roller in response to the output signal of said comparing means;

second comparing means for comparing the value of the output of said signal processing means or said reference

thermal sensor with the value of a signal representing a temperature lower than the setting temperature of said heat roller; and

setting signal shift means for shifting the value of the setting signal produced by said setting signal generating means during a period after power of said apparatus has been turned on until the output of said reference thermal sensor stabilizes in response to the output signal of said second comparing means.

4,821,070

DISPLAY FOR IMAGE FORMING APPARATUS

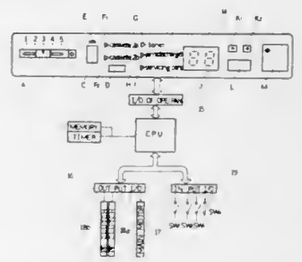
Toshiyuki Nakade, Settsu; Tsugio Nakanishi, Osaka; Toshinori Muraoka, Osaka; Noboru Fukuoka, Osaka; Tsuyoshi Nagao, Sakai; Hideki Endoo, Osaka; Kazuyoshi Yamamura, Sakai; Yoshio Sugishima, Osaka, and Katuhide Yamaguchi, Takatsuki, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 25, 1987, Ser. No. 125,200

Claims priority, application Japan, Nov. 29, 1986, 61-184538[U]; Nov. 29, 1986, 61-184539[U]

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 R **3 Claims**



1. A display for image processing apparatus so composed as to indicate number of processing sheets and disabled paper feeding on the paper supplying mechanism on one display separately by time-sharing in which said indication of disabled paper feeding and said indication of number of processing sheets are given alternatively while said indication of disabled paper feed is made.

4,821,071

ELECTROPHOTOGRAPHIC COPIERS

Tateki Oka, Toyokawa; Naoki Toyoshi; Hisashi Myochin, both of Toyohashi, and Tomoaki Yokoyama, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 7, 1987, Ser. No. 46,944

Claims priority, application Japan, May 9, 1986, 61-106923; Nov. 13, 1986, 61-270596; Nov. 13, 1986, 61-270597

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 CH **10 Claims**

1. An electrophotographic copier for copying in an image outline copying mode or a normal full image copying mode, said copier comprising:

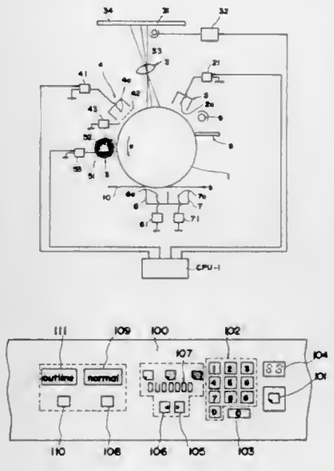
an electrostatic image bearing member;

a first charging means for charging said electrostatic image bearing member to a predetermined potential of a specific polarity;

an exposure means for exposing the charged electrostatic latent image bearing member to a positive image to thereby form a positive electrostatic latent image of said image bearing member;

a second charging means for recharging the electrostatic latent image bearing member on which the positive electrostatic latent image has been formed, said second charging means having a grid and means to supply said grid with a potential of the same polarity as that applied to said first charging means and which potential is substantially lower than the surface potential of the image portion of the latent image and which potential is further slightly higher than the surface potential of the imageless background portion of the electrostatic latent image, whereby an outline portion of the latent image is given a higher potential than the other portions thereof;

a developing means for developing the electrostatic latent image recharged by the second charging means or the electrostatic image formed on the latent image bearing member by exposure to said exposure means by using a potential slightly higher than the potential of said second



charging means and a toner charged to a polarity opposite to that applied to said first charging means;

an energizing means for causing said copier to operate through a cycle of a copying operation; and

an image outline copying mode designating means for, when copying only the outline portion of the positive image is desired, causes said second charging means to be operated during the copying operating cycle between the time of operation of said exposure means and the time of operation of said developing means; and

a normal full image copying mode designating means for, when normal copying is desired, causes said second charging means not to operate.

4,821,072

PRESSURIZING-TYPE IMAGE FORMING DEVICE

Akihiko Nagumo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1987, Ser. No. 108,857

Claims priority, application Japan, Sep. 11, 1986, 61-214792

Int. Cl.⁴ G03B *27/32, 27/52*

U.S. Cl. 355—27 **10 Claims**

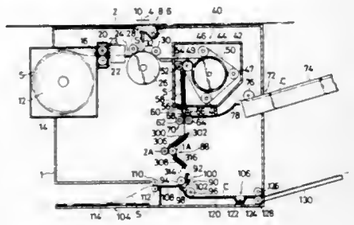
1. A pressurizing-type image forming device wherein a photosensitive member having a material capable of fixing an image formed thereon by exposure to an original image and a carrier carrying said material is first exposed to said original image and then pressurized so that the image formed on said photosensitive member is fixed, said device comprising:

a platen roller; and

a projection roller with an axis parallel to the axis of said platen roller, having a plurality of projections which extend widthwise on the surface thereof, and which is

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positioned at a location where only said projections are brought into contact with said platen roller, the circumferential speed V_2 at the surface of said projections on said



projection roller being set higher than the circumferential speed V_1 at the surface of said platen roller, whereby said photosensitive member which is being fed by way of said platen roller is struck by said projections.

4,821,073

METHOD AND APPARATUS FOR MEASURING CHARACTERISTICS OF PHOTOGRAPHIC NEGATIVES

Richard J. Backus, and Patrick A. Cosgrove, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 19, 1987, Ser. No. 122,996
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—68 **13 Claims**

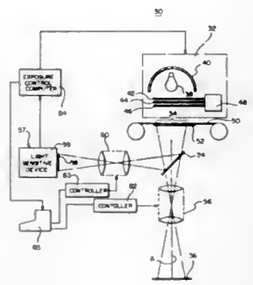




FIG. 3A



FIG. 3B



FIG. 3C

1. A method of determining the exposure of a photographic negative to be printed in a cropped format comprising the steps of:

defining a freely chosen, limited region of the negative to be printed;

measuring selected characteristics of the negative in an area substantially only in said region, which area is defined in response to defining said region; and

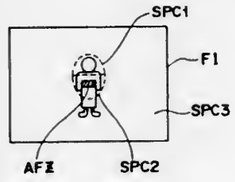
determining, using said selected characteristics, an exposure for said region.

4,821,074

EXPOSURE CONTROL DEVICE FOR A CAMERA

Masaaki Nakai, Kawachinagano; Shuji Izumi; Akihiko Fujino, both of Sakai; Nobuyuki Taniguchi, Nishinomiya; Toshio Yamaki, Osaka, and Hiromu Mukai, Kawachinagano, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1986, Ser. No. 905,267
Claims priority, application Japan, Sep. 9, 1985, 60-200277; Sep. 9, 1985, 60-200278; Sep. 9, 1985, 60-200279; Sep. 9, 1985, 60-200280; Sep. 10, 1985, 60-201126
Int. Cl.[4] G03B *3/00, 7/08*
U.S. Cl. 354—402 **6 Claims**



6. An exposure control device comprising

first means for measuring light from a first area of an object field;

second means for measuring light from a second area of an object field other than the first area;

means for detecting focus to at least a position within said first area;

means for adjusting focus in response to said detecting means to generate an in-focus signal when an in focus condition is established;

means for modifying a light measuring output from said first measuring means with a light measuring output from said second measuring means to generate a third light measuring signal;

means responsive to said first and second measuring means for examining whether or not an exposure control in accordance with only said first measuring means is appropriate; and

means for controlling exposure in accordance with the light measuring output from said first measuring means obtained upon the generation of the in-focus signal when said examining means decides appropriate, and in accordance with the third light measuring signal obtained upon the generation of the in-focus signal when said examining means decides inappropriate.

4,821,075

DEVELOPING DEVICE AND DEVELOPER SUPPLY DEVICE FOR THE SAME

Takeshi Saito, Tokyo, and Hiromitsu Takagaki, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 16, 1987, Ser. No. 97,168
Claims priority, application Japan, Sep. 20, 1986, 61-223216; Sep. 20, 1986, 61-223220; Sep. 20, 1986, 61-223221
Int. Cl.[4] G03G *15/00, 9/14*
U.S. Cl. 355—3 DD **10 Claims**

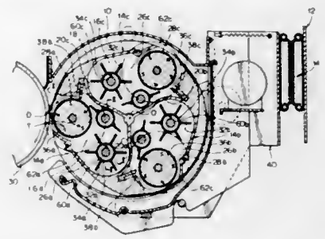
1. A dry process developing device for developing an electrostatic latent image provided on an image carrier of an image-forming apparatus by using a two-component developer which contains toner and carrier, comprising:

a developer chamber for accommodating the developer;

a developer conveying member located to face said image carrier for conveying the developer in said developer chamber to a predetermined developing station;

a developer separating member for separating the developer moved past the developing station from said developer conveying member at a predetermined separating position; and

a toner supply means located in the vicinity of the separating position for both introducing fresh toner from outside into



developer in said developer chamber which contains the carrier therein, and supplying a mixture of the fresh toner and the developer to said developer chamber, wherein said toner supplying means comprises a toner supply conduit for introducing the fresh toner from outside into said developer chamber, and a developer transport member disposed in said toner supply conduit for transporting the fresh toner in said toner supply conduit.

4,821,076

ELECTRO-STATIC PHOTO-COPIER MACHINE

Naoki Toyoshi, Toyohashi, and Takeki Oka, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 8, 1987, Ser. No. 71,261
Claims priority, application Japan, Jul. 15, 1986, 61-167340; Jul. 15, 1986, 61-167341
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **19 Claims**



1. A copying apparatus comprising:

first charging means for charging an electrostatic latent image bearing member to a predetermined potential;

exposing means for scanning an original document in a predetermined direction for exposing the document to the charged electrostatic latent image bearing member to form an electostatic latent image;

a screen member having a pattern of light blocking portions thereon and movable into and out of the light path between the exposing means and said image bearing member;

second charging means for recharging the electrostatic latent iamge formed on the electrostatic latent image bearing member, said second charging means having a grid;

developing means for developing the electrostatic latent image formed on the electrostatic latent image bearing member;

first mode designating means for designating a reversal image forming mode wherein a toner is deposited only onto a non-image portion of the latent image;

first control means to which said first mode designating means is connected and connected to said screen member for causing the screen member to move into the light path when the reversal image forming mode is designated by the first mode designating means; and

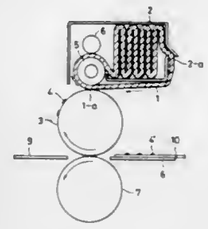
second control means to which said first mode designating means is connected and connected to said second charging means for operating the second charging means when the reversal image forming mode is designated by the first mode designating means.

4,821,077

CLEANER FOR TONER FIXING DEVICE

Mitsuaki Hayakawa; Hiroyoshi Tokoro, and Kiyoo Kawate, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,375
Claims priority, application Japan, Oct. 17, 1986, 61-248094
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—3 FU **4 Claims**



1. A cleaner for a fixing device of an electrophotographic machine or the like in which paper to which a toner image is transferred is moved through the nip of pair of fixing rollers to fix the image to said paper, comprising:

a housing provided near one of said fixing rollers;

an endless felt belt disposed in said housing; and

a drive roller and a pressure member provided in said housing at one end thereof, said pressure member facing said drive roller and said belt being pushed against said one of said fixing rollers by said drive roller while said belt is conveyed by said drive roller and said pressure member into said housing through one side thereof and is gradually pulled out of said housing through another side thereof, said belt having balanced elasticity and rigidity characteristics such that it naturally folds into a compact zigzag configuration within the housing.

4,821,078

APPARATUS FOR COMPOSING A PLURALITY OF ORIGINAL FILMS ON A BASE SHEET

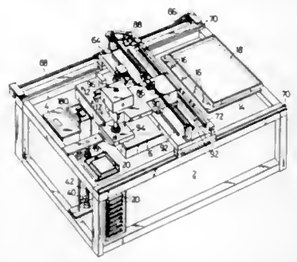
Fumihiko Nishida; Osami Taniuchi; Hideaki Yonetani, all of Kyoto; Toru Kawada, Otsu, and Tatsuo Yazaki, Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Feb. 27, 1987, Ser. No. 20,334
Claims priority, application Japan, Feb. 28, 1986, 61-41971; Feb. 28, 1986, 61-41972; Mar. 6, 1986, 61-472283; Mar. 7, 1986, 61-31822[U]; Mar. 7, 1986, 61-31823[U]; Apr. 16, 1986, 61-86024; Apr. 23, 1986, 61-92347
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 **5 Claims**

1. An apparatus for composing a plurality of original films

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which have register marks on desired positions of a base sheet by positioning and adhering thereon respectively, said apparatus having; a main frame, a positioning and composing table provided on said main frame on which a base sheet is installed, film cassettes for storing original films, a positioning detecting stage on which an original film is set prior to being composed at measuring positions of register marks provided therewith, an original film carrier for transporting one of said original films from said film cassette onto said stage, a working head for transporting said original film from said stage positioning and composing table to adhere said original film to said base sheet by pressing it at a desired position thereof, photoelectrical sensors provided on said working head for detecting register marks of said original film and measuring positions of said original film, a sliding frame which moves on said main frame



in one direction and a saddle provided with said sliding frame so as to be slidable in crossing direction with said sliding frame and supporting said original film carrier and said working head; wherein

said positioning detecting stage is a tape applicator comprising;

a polygonal rotor means supported on the uppermost part of a supporting board and moving vertically between a height at which it contacts with the bottom surface of the aligned working head and a position at which it separates from the surface;

a tape supplying means for supplying a both-faced type adhesive tape onto the circumference of said rotor means and pressing it thereto; and

a tape cutting means for cutting said supplied tape at each corner of said rotor means.

4,821,079

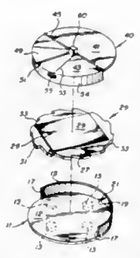
TEST PHOTOGRAPHIC IMAGE EASEL

Darrel K. Yoder, 502 S. Maple, Carlsbad, N. Mex. 88220

Filed Oct. 23, 1987, Ser. No. 111,666

Int. Cl.[4] G03B *27/58*

U.S. Cl. 355—74 **8 Claims**



1. A test photographic image easel comprising:

(a) a stationary base having a turntable rotatably mounted thereon about an axis of rotation;

(b) said turntable including frame means for releasably mounting a piece of photographic paper thereon;

(c) a mask mounted on said base in overlying relation to said turntable and including a slot selectively closable by a cover said slot having a radially inner terminus spaced from said axis;

(d) said easel being adapted to be placed in adjacency to an exposure mechanism with said base and mask being maintained in stationary relation to said exposure mechanism and with said turntable being selectively rotatable with respect to said base and mask to index different portions of said photographic paper into alignment with said slot; and

(e) a data imprinting device on said mask between said axis and said radially inner terminus of said slot and being programmable to print information on said photographic paper related to particular parameters of exposure of said photographic paper, whereby when each said different portion of said photographic paper is indexed into alignment with said slot, said data imprinting device may be activated to print thereon the particular parameters of the exposure thereof for later review and comparison.

4,821,080

MEASURING APPARATUS FOR ENZYME REACTION RATES

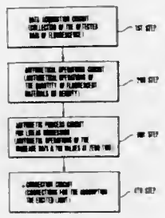
Hidechika Hayashi, Yokohama, Japan, assignor to Tosoh Corporation, Shinnanyo, Japan

Filed Feb. 4, 1988, Ser. No. 152,104

Claims priority, application Japan, Feb. 10, 1987, 62-29298

Int. Cl.[4] G01N *21/64*

U.S. Cl. 356—318 **2 Claims**



1. A measuring apparatus for enzyme reaction rates comprising:

optical detection means for detecting in time series the intensity of fluorescence derived from fluorescent materials obtained through enzyme reactions,

a first arithmetic circuit having time series signals of the intensity of the fluorescence detected by the optical detection means as an input for calculating apparent increasing rate of the fluorescent materials by utilizing a predetermined computation equation, and

a second arithmetic circuit having an apparent increasing rate of the fluorescent materials computed through the first arithmetic circuit as an input information for calculating a true increasing rate of the fluorescent materials by utilizing a predetermined correction equation, wherein enzyme contributing to the aforementioned reaction is obtained through enzyme immunoreaction.

4,821,081

LARGE PITCH CCD WITH HIGH CHARGE TRANSFER EFFICIENCY

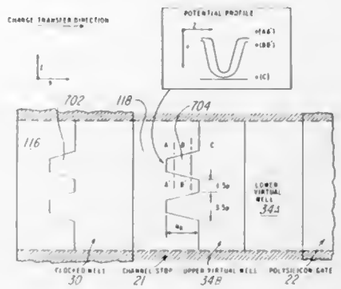
Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 770,321, Aug. 27, 1985, abandoned.

This application Jul. 6, 1987, Ser. No. 70,623

Int. Cl.[4] H01L *29/78*; G11C *19/28*

U.S. Cl. 357—24 **12 Claims**



1. A charge coupled device (CCD) comprising:

a semiconductor substrate having mobile charge carriers for moving under the influence of an electric field along adjoining regions of said substrate;

a first pair of elongated regions including an elongated first region and an elongated second region, each region having a distal end separated by the length of the regions and a proximate end adjoining the other region, said regions having different concentrations of immobile impurities of the same polarity;

a boundary defined by the proximate ends of said regions and characterized by said different concentrations of said immobile impurities on opposite sides of said boundary;

an electric field having a potential gradient across said boundary established by the different concentrations of impurities on opposite sides of said boundary, said electric field for attracting mobile charge carriers from the distal end of one region and accelerating the mobile charge carriers across said boundary to the other region;

said boundary further characterized by a protrusion of a portion of the proximate end of one region into the other region in a direction toward the distal end of said other region for altering the potential gradient of said electric field in the vicinity of said protrusion and reducing the distance between the electric field and a portion of the distal end of the other region.

4,821,082

HETEROJUNCTION BIPOLAR TRANSISTOR WITH SUBSTANTIALLY ALIGNED ENERGY LEVELS

David J. Frank, Tarrytown, and Ronald F. Marks, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 115,778

Int. Cl.[4] H01L *29/72*

U.S. Cl. 357—34 **38 Claims**

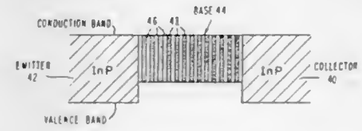
1. A heterojunction bipolar transistor comprising:

a collector layer of a first conductivity type;

a base layer of a second conductivity type forming a first junction with said collector layer; and

an emitter layer of the first conductivity type forming a second junction with said base layer;

at least one of the first and second junctions being between different semiconductor materials thereby forming at least one heterojunction, the semiconductor materials of each of said collector, base and emitter layers having conduction and valence band energy levels wherein the energy levels of one of said bands are substantially aligned at said



at least one heterojunction and an abrupt energy level offset occurs in the other of said bands at said at least one heterojunction.

4,821,083

THYRISTOR DRIVE SYSTEM

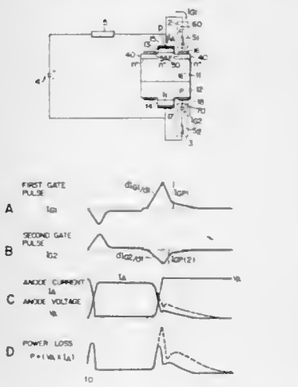
Tsuneo Ogura, Kamakura; Katsuhiko Takigami, Yokohama; Akio Nakagawa, Hiratsuka, and Tomokazu Domon, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1987, Ser. No. 101,790

Claims priority, application Japan, Sep. 30, 1986, 61-231769; Jan. 13, 1987, 62-3941; Feb. 26, 1987, 62-41315; Feb. 26, 1987, 62-41359

Int. Cl.[4] H21L *29/74*

U.S. Cl. 357—38 **19 Claims**



1. A thyristor drive system comprising:

a gate turn-off thyristor of the double gate structure, having a four-layer structure made up of an anode/emitter layer of a first conductivity type, a first base layer of a second conductivity type, a second base layer of the first conductivity type, and a cathode/emitter layer of the second conductivity type, said first base layer connected to a first gate electrode and said second base layer connected to a second gate electrode;

first means, connected between said first gate electrode and said anode/emitter layer, for applying to said first gate electrode a first turn-off pulse of a predetermined amplitude allowing said thyristor to be turned off; and

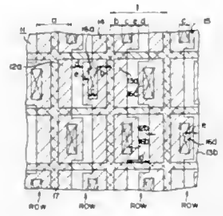
second means, connected between said second gate electrode and said cathode/emitter layer, for applying to said second gate electrode a second turn-off pulse whose amplitude is smaller in absolute value than that of said first turn-off pulse applied to said first gate electrode.

4,821,084

INSULATED GATE TYPE FIELD EFFECT TRANSISTOR

Masanori Kinugasa, Yokohama; Fuminari Tanaka, Tokyo; Hiroshi Shigehara, and Hirokata Ohta, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 21, 1987, Ser. No. 5,668
Claims priority, application Japan, Feb. 10, 1986, 61-27431
Int. Cl.[4] H01L 27/10
U.S. Cl. 357—45 5 Claims



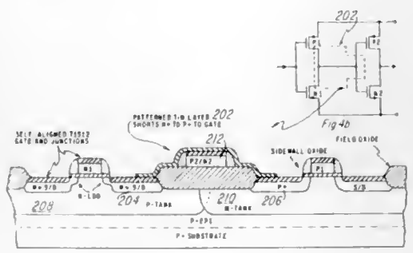
1. An insulated gate type field effect transistor having a gate electrode layer formed in a mesh pattern, comprising:
a semiconductor substrate;
a gate electrode layer formed in a mesh pattern on portions of a surface region of said substrate;
source regions and drain regions formed in said surface region portions of said substrate defined by the gate electrode layer formed in the mesh pattern, so that the source regions and drain regions are arrayed in a matrix pattern, said drain regions being positioned at four sides of any of said source regions and said source regions being positioned at four sides of any of said drain regions, so that said source and drain regions are alternately arranged to form an array comprising rows and columns of said source and drain regions;
a source electrode layer connected to said source regions; and
a drain electrode layer connected to said drain regions,
wherein extension directions of said source and drain electrode layers are parallel to one of said rows and columns of said alternately arranged source and drain regions.

4,821,085

VLSI LOCAL INTERCONNECT STRUCTURE

Roger A. Haken, Richardson, and Thomas C. Holloway, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 1, 1985, Ser. No. 729,318
Int. Cl.[4] H01L 29/78, 27/02, 23/48, 29/46
U.S. Cl. 357—67 12 Claims



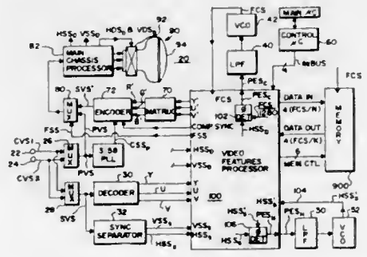
1. An integrated circuit comprising:
a substrate having a silicon upper portion;
device isolation regions defining predetermined active device areas;
a plurality of active devices in said active device areas,
portions of said active devices being formed from a conductive first thin film layer;
a local interconnect layer
distinct from said first thin film layer,
said local interconnect layer comprising lines predominantly comprising titanium nitride,
said lines of said local interconnect layer interconnecting predetermined portions of said active device regions over said device isolation regions.

4,821,086

TV RECEIVER HAVING IN-MEMORY SWITCHING SIGNAL

David L. McNeely, Indianapolis, and Russell T. Fling, Noblesville, both of Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Oct. 28, 1987, Ser. No. 113,779
Int. Cl.[4] H04N 9/74, 9/76
U.S. Cl. 358—22 12 Claims



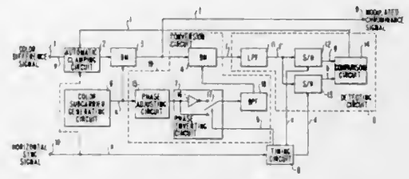
1. A television (TV) signal processing system comprising:
a source of a first video signal FVS;
a source of a second video signal SVS;
means including sampling means coupled to receive said second video signal and responsive to a clock signal FCS of frequency fcs for developing m-bit digital second video signal samples occurring synchronously with said clock signal, where m is a positive integer greater than one;
a source of an n-bit switching signal SS, where n is a positive integer greater than one;
means for concatenating bits of said n-bit switching signal with predetermined samples of said sampled second video signal to form a digital combined signal consisting of samples occurring synchronously with said clock signal;
means including memory means responsive to said clock signal for storing said combined sampled signal and for providing said combined sampled signal at an output terminal thereof synchronously with said clock signal;
means coupled to receive said combined sampled signal and responsive to said clock signal for reconstructing said second video signal and said n-bit switching signal;
a source of context code signal CCS;
decoding means coupled to receive said reconstructed switching signal (hereinafter, SS') and responsive to said context code signal CCS for generating a fast switching signal FSS in synchronism with said clock signal, said fast switching signal FSS having a first state when said reconstructed switching signal corresponds to said coantent code signal and a second state otherwise; and
switching means coupled to receive said first video signal FVS and said reconstructed second video signal SVS' when said fast switching signal FSS is respectively in said second state and said first state.

4,821,087

ENCODER CIRCUIT ELIMINATING CARRIER LEAK

Masahiro Honjo, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 20, 1987, Ser. No. 40,478
Claims priority, application Japan, Apr. 23, 1986, 61-93775; Apr. 23, 1986, 61-93781
Int. Cl.[4] H04N 9/535
U.S. Cl. 358—34 13 Claims



1. An encoder circuit comprising:
an automatic clamper for clamping an input signal to a predetermined level according to a control signal;
a balanced modulator for balanced-modulating a continuous wave signal in accordance with an output signal from said automatic clamper;
a conversion circuit receiving an output signal of said balanced modulator and said continuous wave signal for converting a carrier leak existing in a predetermined period in the output signal of said balanced modulator into changes of D.C. levels whose polarities are inverted at predetermined intervals with respect to a D.C. level appearing when no carrier leak exists;
a detection circuit to for detecting a difference between the D.C. levels from said conversion circuit changing at said predetermined intervals, said difference being applied as said control signal to said automatic clamper; and
a timing circuit for generating timing signals for controlling said conversion circuit and detection circuit,
whereby said automatic clamper controls its clamping level so that said difference between the D.C. levels is minimized, thereby eliminating said carrier leak.

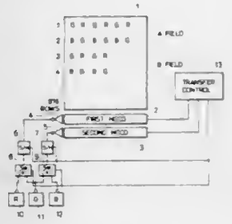
4,821,088

SOLID-STATE COLOR IMAGE PICKUP UNIT WITH MOSAIC COLOR FILTER AND TWO HORIZONTAL OUTPUT REGISTERS

Masatoshi Tabei, and Kazuhiro Kawajiri, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 27, 1987, Ser. No. 126,146
Claims priority, application Japan, Nov. 27, 1986, 61-280791; Dec. 4, 1986, 61-287600
Int. Cl.[4] H04N 9/077, 9/07
U.S. Cl. 358—48 6 Claims

1. A solid-state image pickup unit for a color image comprising:
a solid-state image sensor comprising a photosensing portion having picture elements arranged in horizontal lines for receiving light from an object, a charge transfer portion for vertically transferring signal charges produced in said photosensing portion and a transfer controlling portion for controlling the charge transfer portion;
a mosaic microfilter composed of color filters and arranged on said photosensing portion in correspondence with said picture elements;
two horizontal CCDs for receiving signal charges from said charge transfer portion, a first one of said two horizontal CCDs transferring a plurality of signal charges in parallel to a second one of said two horizontal CCDs, pairs of adjacent horizontal lines in said photosensing portion being assigned to respective ones of a plurality of scanning lines, said transfer controlling portion controlling said charge transfer portion to concurrently transfer signal charges from the pair of horizontal lines assigned to a selected one of said scanning lines to said two horizontal CCDs, said signal charges transferred to said two horizontal CCDs being concurrently read out from said two horizontal CCDs;
sample-and-hold circuits for receiving the signal charges read out from said two horizontal CCDs and for holding said received signal charges; and



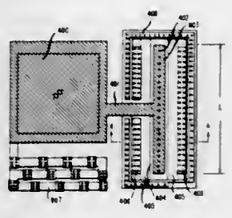
switching circuits for switching said signal charges held by said sample-and-hold circuits to a plurality of outputs each time one signal charge is read out from one of said horizontal CCDs to one of said sample-and-hold circuits;
wherein color filters of a first color and color filters of a second color are alternately arranged in correspondence with picture elements of a first line of each of said pairs of horizontal lines, and color filters of said first color and color filters of a third color are alternately arranged in correspondence with picture elements of a second line of each of said pairs of horizontal lines, said color filters of said first color in said first and second lines being shifted with respect to each other by a distance corresponding to one of said picture elements in the direction of said horizontal lines.

4,821,089

PROTECTION OF IGFET INTEGRATED CIRCUITS FROM ELECTROSTATIC DISCHARGE

Mark S. Strauss, Allentown, Pa., assignor to American Telephone and Telegraph Company, AT&T Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 787,764, Oct. 15, 1985, abandoned. This application Jun. 4, 1987, Ser. No. 59,194
Int. Cl.[4] H01L 23/48
U.S. Cl. 357—68 14 Claims



1. An integrated circuit including at least one conductive bondpad coupled to an input electrode of an insulated gate field effect transistor having source and drain regions of a given conductivity type, wherein the gate insulator of said

transistor breaks down at a breakdown voltage level, and wherein said bondpad has a periphery covered by a dielectric cap, and a central portion free of said cap,

CHARACTERIZED IN THAT

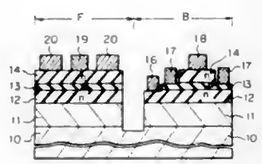
said integrated circuit comprises a first semiconductor region of a first conductivity type and a second semiconductor region having the opposite conductivity type, thereby forming a protective p-n junction that limits the voltage applied to said gate insulator to a value less than said breakdown voltage level for a voltage of a given polarity applied to said bondpad, wherein said first semiconductor region is located only under the insulator that covers said periphery, and is contacted by the periphery of said bondpad on a plurality of sides of said bondpad.

4,821,090

COMPOUND SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Naoki Yokoyama, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 676,828, Nov. 30, 1984, abandoned. This application Mar. 30, 1987, Ser. No. 31,228
Claims priority, application Japan, Dec. 5, 1983, 58-229431
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—43 **20 Claims**



1. A compound semiconductor integrated circuit device including a bipolar transistor and a field effect transistor (FET), comprising:

a semi-insulating substrate having first and second areas, said bipolar transistor being over the first area and said FET being over the second area;

means for electrically isolating said bipolar transistor over the first area, from said FET over the second area;

a first compound semiconductor layer of a first conductivity on said semi-insulating substrate;

a second compound semiconductor layer of a second conductivity on said first compound semiconductor layer; and

a third compound semiconductor layer of the first conductivity on said second compound semiconductor layer, at least one of said first and third compound semiconductor layers having a forbidden energy band gap larger than that of said second compound semiconductor layer;

an electrode formed over said first compound semiconductor layer;

said bipolar transistor comprising a base region of a part of said second compound semiconductor layer, an emitter region of a part of one of the at least one of said first and third compound semiconductor layers having a forbidden energy band gap larger than that of said second compound semiconductor layer, a collector region of a part of the other of the at least one of said first and third compound semiconductor layers, and said electrode over said first compound semiconductor layer;

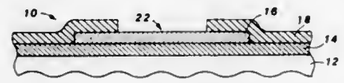
said FET comprising a channel region, a part of one of the first, second, and third compound semiconductor layers forming one of the channel region and a region for supplying electrons to the channel region.

4,821,091

POLYSILICON PHOTOCONDUCTOR FOR INTEGRATED CIRCUITS

Robert B. Hammond, Los Alamos, N. Mex., and Douglas R. Bowman, Estontown, N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 808,311, Jul. 22, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 147,130
Int. Cl.[4] H01L *27/14, 27/12, 29/04*
U.S. Cl. 357—30 **1 Claim**



1. A photoconductive element comprising:

a bulk silicon substrate having a defined surface area of silicon dioxide;

a layer of polycrystalline silicon serving as a photosensing element insulatively separated from said bulk silicon by said silicon dioxide; and

electrically conductive means contacting said polycrystalline silicon and defining an optical access gap above said polycrystalline silicon layer; where

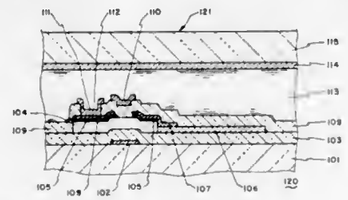
said polycrystalline silicon layer is (1) subjected to an anneal which is effective to increase output current of the photoconductive element, said anneal being carried out at a temperature in the range of from about 1000° to about 1200° C. for a time period of about one hour, and (2), following said anneal, is subjected to ion implantation which is effective to adjust response time of the photoconductive element, said response time being proportional to the damage caused to the polycrystalline silicon layer by said ion implantation.

4,821,092

THIN FILM TRANSISTOR ARRAY FOR LIQUID CRYSTAL DISPLAY PANEL

Kazuo Noguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 30, 1987, Ser. No. 126,578
Claims priority, application Japan, Nov. 27, 1986, 61-283320
Int. Cl.[4] H01L *27/12, 29/78, 23/48*
U.S. Cl. 357—4 **11 Claims**



1. A thin film transistor array comprising:

an insulator substrate;

a plurality of gate electrodes formed on said insulator substrate in form of a matrix of columns and rows;

a plurality of row connecting means formed on said insulator substrate for connecting said gate electrodes in the same rows in common;

a first insulator film covering at least said gate electrodes and said row connecting means;

a plurality o f semiconductor layers formed on said first insulator film at locations above said gate electrodes and peripheral portions thereof, each of said semiconductor layers having a source region, a drain region and a channel region locating therebetween;

a plurality of source electrodes connected to said source regions of said semiconductor layers, respectively;

a plurality of drain electrodes connected to said drain regions of said semiconductor layers, respectively;

a plurality of first column wiring layers connecting the drain electrodes in the same columns in common;

a second insulator film covering at least said channel region, said source electrodes, said drain electrodes and said first column wiring layers, said second insulator film having apertures elongating in the column direction along said first column wiring layers and exposing at least portions of said first column wiring layers; and

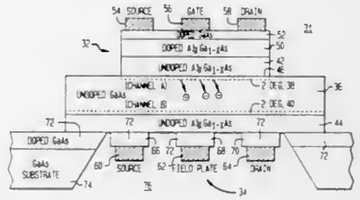
a plurality of second column wiring layers running along said first column wiring layers and formed in said apertures on the exposed portions of said first column wiring layers.

4,821,093

DUAL CHANNEL HIGH ELECTRON MOBILITY FIELD EFFECT TRANSISTOR

Gerald J. Iafrate, Toms River; Louis C. Poli, Hazlet; Thomas Aucoin, Ocean, and Linda S. Heath, W. Long Beach, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 900,128, Aug. 18, 1986, abandoned. This application Jul. 29, 1988, Ser. No. 228,795
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 **32 Claims**



1. A high electron mobility field effect semiconductor device, comprising, in combination:

a first body of undoped semiconductor material;

second and third bodies of semiconductor material located on opposite sides of said first body of undoped material, said second and third bodies of semiconductor material having respective energy bandgaps each greater than the energy bandgap of said first body of undoped material, and separated therefrom by respective first and second heterojunctions formed at the interfaces thereof, one of said second and third bodies of semiconductor material providing a source of charge carriers for diffusing charge carriers into said first body of material, a portion of said diffused carriers being confined at said first and second heterojunctions into respective first and second two dimensional electron gas (2 DEG) regions;

fourth and fifth bodies of semiconductor material, doped to facilitate Ohmic contact adjacent respectively said second and third bodies of semiconductor material, said fourth and fifth bodies forming respective outer layers of said device; and

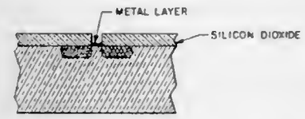
first and second sets of electrodes on the exterior of said device for modulating the flow of charge in respective first and second two dimensional electron gas regions underlying said sets of electrodes; said first set of electrodes having source, gate, and drain electrodes disposed upon said fourth body of semiconductor material, and said second set of electrodes having at least source and drain electrodes disposed on said fifth body of semiconductor material.

4,821,094

GATE ALIGNMENT PROCEDURE IN FABRICATING SEMICONDUCTOR DEVICES

Eldon Okazaki, Sunnyvale, and Howard L. Petersen, Saratoga, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 807,100, Nov. 8, 1985, abandoned. This application May 4, 1987, Ser. No. 45,738
Int. Cl.[4] H01L *29/78, 21/306;* **B44C** *1/22;* **C23F** *1/02*
U.S. Cl. 357—23.1 **11 Claims**



11. An electronic device comprising a semiconductor substrate having a source region and a drain region, said source and drain regions being separated from each other by a substantially homogeneous gate region, a surface of said substrate being substantially isoplanar over said source, drain and gate regions, an abrupt transition occurring within said substrate between said source region and said gate region and between said drain region and said gate region, said device further comprising a metal gate formed on a portion of said surface of said substrate over said gate region between said source region and said drain region, a first boundary of said metal gate being precisely aligned with a boundary of said source region on said portion of said surface of said substrate at said abrupt transition between said source region and said gate region, a second boundary of said metal gate being precisely aligned with a boundary of said drain region on said portion of said surface of said substrate at said abrupt transition between said drain region and said gate region, precise alignment of said first boundary of said metal gate with said boundary of said source region and of said second boundary of said metal gate with said boundary of said drain region substantially eliminating parasitic capacitances between said source region and said metal gate and between said drain region and said metal gate, said metal gate being formed on said portion of said surface of said substrate over said gate region without overlapping said source region and said drain region, said metal gate formed by the process of:

(a) forming a continuous oxide layer on said isoplanar substrate surface over said source and drain regions and over said gate region intervening between said source and drain region;

(b) coating a continuous layer of photoresist over said oxide layer;

(c) positioning a mask over said layer of photoresist so that dark fields of said mask are aligned with said source and drain regions, and so that an aperture on said mask is aligned with said gate region;

(d) exposing said mask to light of a wavelength to which said photoresist is photochemically sensitive, a portion of said layer of photoresist aligned with said gate region thereby becoming developed;

(e) removing said mask;

(f) removing said developed portion of said layer of photoresist, thereby exposing a portion of said oxide layer over said gate region while leaving undeveloped portions of said layer of photoresist on portions of said oxide layer over said source and drain regions;

(g) treating said undeveloped portions of said layer of photoresist to form a protective covering over said portions of said oxide layer over said source and drain regions;

(h) etching away said exposed portion of said oxide layer over said gate region, thereby exposing said portion of said surface of said substrate over said gate region while leaving edges of said portions of said oxide layer in alignment with boundaries of said gate region;

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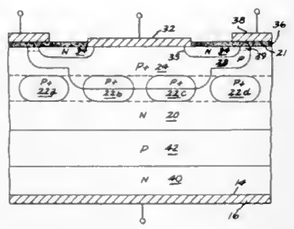
(i) stripping away said protective covering over said portions of said oxide layer over said source and drain regions;
(j) depositing a continuous layer of metal onto said portions of said oxide layer over said source and drain regions, including said edges of said portions of said oxide layer in alignment with said boundaries of said gate region, and onto said exposed portion of said surface of said substrate over said gate region;
(k) coating a continuous layer of photoresist over said layer of metal;
(l) directing a collimated beam of light of a wavelength to which said photoresist is photochemically sensitive at an oblique angle with respect to said isoplanar substrate surface, said collimated beam of light causing portions of said photoresist layer aligned with said source and drain regions to become developed, said oblique angle having a value such that at least one of said edges of said portions of said oxide layer in alignment with said boundaries of said gate region causes a shadow to be cast upon a portion of said layer of photoresist on a portion of said layer of metal on said portion of said surface of said substrate over said gate region, said shadow preventing said portion of said layer of photoresist on said portion of said layer of metal on said portion of said surface of said substrate over said gate region from becoming developed;
(m) removing said developed portions of said layer of photoresist aligned with said source and drain regions, thereby exposing portions of said layer of metal on said portions of said oxide layer over said source and drain regions while leaving an undeveloped portion of said layer of photoresist on said portion of said layer of metal on said portion of said surface of said substrate over said gate region;
(n) treating said undeveloped portion of said photoresist layer to form a protective covering over said portion of said layer of metal on said portion of said surface of said substrate over said gate region; and
(o) etching said portions of said layer of metal on said portions of said oxide layer over said source and drain regions.

4,821,095

INSULATED GATE SEMICONDUCTOR DEVICE WITH EXTRA SHORT GRID AND METHOD OF FABRICATION

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 12, 1987, Ser. No. 25,036
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.4 **16 Claims**



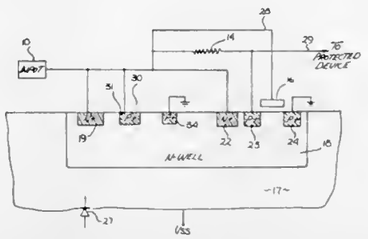
1. An insulated gate semiconductor device comprising:
a body of semiconductor material including:
a first layer of one type conductivity,
a second layer of opposite type conductivity disposed atop said first layer,
a first region of one type conductivity within said second layer,
a second region of opposite type conductivity disposed within said first region,
said body having a first surface to which said second layer, said first region and said second region extend, and
a heavily doped grid of one type conductivity disposed within said second layer and spaced from said first surface for establishing a current path for one type conductivity carriers, said grid comprising a plurality of segments of one type conductivity disposed in a substantially planar arrangement and a plurality of aperture therebetween each occupied at least in part by a portion of said opposite type conductivity second layer, at least one of said grid segments and at least one of said grid apertures in projection on said first surface extending into a projection of said first region on said first surface;
a first power electrode disposed in ohmic contact with said first layer;
a second power electrode disposed in ohmic contact with said first and second regions; and
an insulated gate electrode disposed on said first surface over a portion of said first region for, in response to an appropriate bias potential, establishing a channel through said first region between said second layer and said second region for facilitating the flow of opposite type conductivity carriers between said second layer and said second region;
said heavily doped grid being ohmically connected to said second power electrode.

4,821,096

EXCESS ENERGY PROTECTION DEVICE

Timothy J. Maloney, Palo Alto, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 23, 1985, Ser. No. 813,174
Int. Cl.[4] H01L *29/78, 27/02*
U.S. Cl. 357—23.13 **18 Claims**



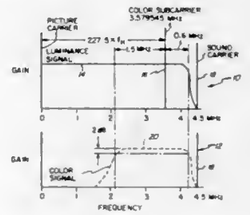
1. A protection device for protecting a semiconductor device from an excess event comprising:
a first pnp lateral transistor having a collector and an emitter region of a first conductivity type, said emitter region being coupled to an input of said device, said transistor having a base region of a second conductivity type coupled to said input of said device, said collector region being coupled to ground;
at least a second pnp lateral transistor having an emitter and a collector region of said first conductivity type, said emitter region being coupled through a resistor to said input, said transistor having a base region of second conductivity type, said collector region being coupled to ground;
whereby said transistors dissipate power during an excess energy event.

4,821,097

APPARATUS AND METHOD FOR PROVIDING DIGITAL AUDIO ON THE SOUND CARRIER OF A STANDARD TELEVISION SIGNAL

Clyde Robbins, Maple Glen, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Mar. 5, 1987, Ser. No. 22,380
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—143 **47 Claims**



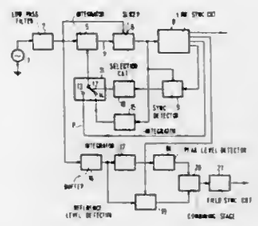
1. A method for providing a digital audio signal in a sound carrier portion of an approximately 6 MHz radio frequency channel of a television signal, said sound carrier portion located outside of an approximately 4.25 MHz band width video portion of said radio frequency channel, said method comprising the steps of:
generating a video signal having an approximately 4.25 MHz band width for inclusion in said channel,
generating a digitized audio signal associated with the video signal;
modulating the digitized audio signal using multi-phase modulation on a sound carrier for inclusion in said channel;
summing the modulated sound carrier and the video signal in an approximately 6 MHz band to produce a composite output signal, said sound carrier being located outside of the video band in said 6 MHz band; and
transmitting the sum in said 6 MHz radio frequency channel for receipt by a video appliance.

4,821,098

CIRCUIT FOR DERIVING A SYNCHRONIZING SIGNAL CONTAINED IN AN INCOMING VIDEO SIGNAL

Wouter Smeulers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 737,016, May 23, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 81,386
Claims priority, application Netherlands, Jun. 20, 1984, 8401955
Int. Cl.[4] H04N *5/10*
U.S. Cl. 358—153 **4 Claims**



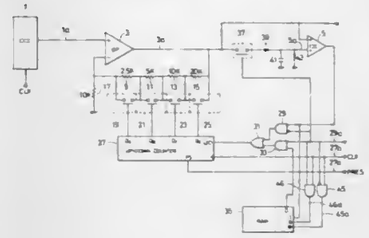
1. A recovering circuit for recovering a synchronizing signal contained in an incoming video signal and for applying to a line synchronizing circuit comprising a synchronization detector for detecting when the line synchronizing circuit is in a synchronized state, the recovered synchronizing signal, said synchronizing signal having at least line synchronizing pulses having amplitudes extending between a reference level and a peak level, said recovering circuit comprising, coupled to a video signal source for supplying said incoming video signal, a pulse generator for generating the recovered synchronizing signal using a threshold value level generated by a threshold value detector also coupled to the video signal source, said threshold value level corresponding to a level located between the peak and the reference levels, characterized in that said recovering circuit comprises means for deriving a first and a second keying pulse, and the threshold value detector comprises an integrator for integrating the incoming video signal during an occurrence of the first keying pulse, generated during an occurrence of each of said synchronizing pulses, and the second keying pulse, generated after the occurrence of each of said line synchronizing pulses, but before an end of a respective line blanking interval, and for storing the integrated incoming video signal in a storage element, in that said recovering circuit comprises a delay element for delaying pulses in the recovered synchronizing signal generated by the pulse generator and, when the synchronized state is not detected, the first and second keying pulses are derived from the delayed pulses, and in that said recovering circuit comprises a selection circuit controlled by the synchronization detector for applying either the output of the line synchronizing circuit or the output of the delay element to the means for deriving said first and second keying pulses.

4,821,099

IMAGE READING MEANS WITH CONTROLLABLE SHADING CORRECTION

Masahiro Sakamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 895,702
Claims priority, application Japan, Aug. 14, 1985, 60-177646; Aug. 14, 1985, 60-177647; Aug. 14, 1985, 60-177648
Int. Cl.[4] H04N *5/14, 5/228*
U.S. Cl. 358—163 **25 Claims**



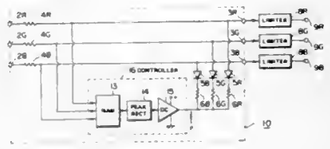
1. An image reading apparatus comprising:
means for photoelectrically reading an image line by line;
means for amplifying output signals of said reading means;
means for determining a control condition of said amplifying means in such a manner that each level of output signals representing a line of image of said amplifying means is substantially constant when a reference member is read by said reading means;
means for storing control data indicating the control condition determined by said determining means; and
control means for controlling said amplifying means, while an original image is read by said reading means, based on the control data read out from said storing means so as to remove shading distortion contained in output signals of said reading means.

4,821,100

IMAGE SIGNAL COMPRESSOR

Isamu Yamamoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 7, 1985, Ser. No. 763,416
Claims priority, application Japan, Aug. 10, 1984, 59-167604
Int. Cl.⁴ H04N *5/14*
U.S. Cl. 358—170 **10 Claims**



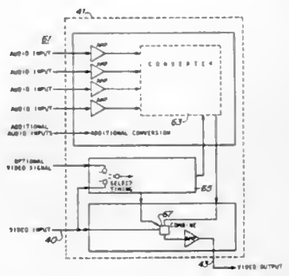
5. An image signal compressor which comprises:
(a) three first resistors, means for applying a respective one of three chrominance signals to be compressed to one end of each of said first resistors;
(b) three diodes respectively connected to said three first resistors, three compressed chrominance signals being derived from respective junction points between said first resistors and said three diodes;
(c) three second resistors respectively connected in series with said three diodes;
(d) control means responsive to each of the three chrominance signals to be compressed and connected to said three second resistors for controlling the compression start potential at which said three diodes are allowed to be conductive in such a way as to decrease said compression start potential with increasing highest peak voltage level of the three chrominance signals to be compressed or increase said compression start potential with decreasing highest peak voltage level of the three chrominance signals to be compressed, when said three diodes are conductive, the three chrominance signals to be compressed being compressed at respective compression ratios determined by said three first resistors and said three second resistors, each of said diodes being poled to be conductive when the respective chrominance signal to be compressed exceeds said compression start potential.

4,821,101

VIDEO SYSTEM, METHOD AND APPARATUS

Michael P. Short, San Jose, Calif., assignor to Isix, Inc., Foster City, Calif.

Filed Feb. 19, 1987, Ser. No. 16,671
Int. Cl.⁴ H04N *7/04, 5/262*
U.S. Cl. 358—181 **10 Claims**



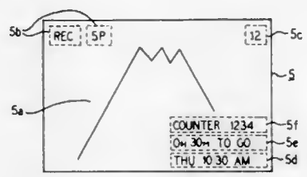
1. Apparatus for forming multi-program composite video display signals from the video display signals from at least three sources of displayable programs, the apparatus comprising:
switch means having an output and having inputs coupled to receive the video display signals from said at least three sources for displaying successive fields of the individual displayable programs, said switch means being operable in at least three operating states for selecting in each operating state a video display signal for displaying a field of the displayable program from one of said at least three sources;
control means coupled to control the operating state of the switch means for altering the operating state thereof to couple said output in selectable sequence to receive at a selected input the video display signal for displaying one field of a displayable program from the one of said at least three sources that is coupled to such selected input for producing at said output a composite video display signal which includes an arbitrary sequence of interleaved video display signals from separate ones of said at least three sources, each such video display signal for displaying one field of one displayable program.

4,821,102

VIDEO DISPLAY SYSTEM WITH SELECTIVE DISPLAY OF OPERATING CONDITIONS

Norihito Ichikawa; Osamu Oda, both of Tokyo; Toshio Amano, Kanagawa, and Ikuo Someya, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,152
Claims priority, application Japan, Jul. 29, 1986, 61-178171
Int. Cl.⁴ H04N *5/262, 5/272*
U.S. Cl. 358—183 **13 Claims**



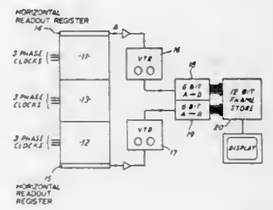
1. A video display system having a picture screen, adapted to display a picture corresponding to a video signal and system control means for controlling said system, said system control comprising, in combination:
(a) means for generating plural condition information signals, each corresponding to an operating condition of said system;
(b) superimposing means for sequentially superimposing up to N (N≧2) of said condition information signals upon said picture of said video signal displayed on said picture screen such that said N information signals are sequentially displayed so as to be simultaneously visable at predetermined positions of said picture screen in parallel relation to one another; and
(c) position control means connected to said system control means for altering the display positions of certain ones of said N condition information signals if the number of display information signals is smaller than N, whereby said certain ones of said N display information signals is displayed in the spaced immediately adjacent a corner of said picture screen.

4,821,103

SOLID STATE IMAGING APPARATUS AND METHOD WITH EXPANDED DYNAMIC RANGE

Peter W. Busby, Stevenage, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Apr. 17, 1987, Ser. No. 39,514
Claims priority, application United Kingdom, Apr. 29, 1986, 8610483
Int. Cl.⁴ H04N *3/14*
U.S. Cl. 358—213.26 **16 Claims**



1. Solid state imaging apparatus comprising:
a charge-coupled frame transfer image sensor including:
an image-sensitive integration region for forming a charge pattern representative of an incident image;
a first image storage region in charge transfer relationship with one end of said image integration region capable of receiving at least a major part of the charge pattern formed in said integration region and including first storage region signal read-out means,
and a second image storage region in charge transfer relationship with an opposed end of said image integration region capable of receiving at least a major part of the charge pattern formed in said integration region and including second storage region signal read-out means,
and charge transfer means for shifting the charge pattern formed on said integration region into a selected one of said image storage regions,
said imaging apparatus further comprising control means for setting a continuing series of field time periods and for defining in each field time period a long exposure period and a short exposure period and for controlling said charge transfer means to shift the charge pattern integrated during successive long and short exposure periods alternately into said first and second storage regions respectively and for controlling said first storage region signal read-out means and said second region signal read-out means to output data representing a series of long exposure shots and data representing a series of short exposure shots respectively, each series being output at the field rate defined by said field time period.

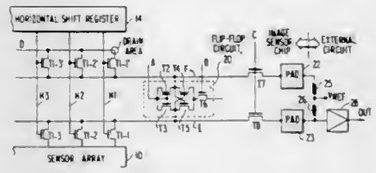
4,821,104

IMAGE SENSOR HAVING REDUCED FIXED-NOISE OUTPUT USING FLIP FLOP CIRCUIT

Ryuji Kondo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 29, 1987, Ser. No. 43,721
Int. Cl.⁴ H04N *5/335*
U.S. Cl. 358—213.18 **8 Claims**

1. An image sensor comprising:
an image-sensing pixel array;
means for sequentially reading image signal charges from said array onto an image output line;
means for providing a signal corresponding to a noise content of a signal produced on said image output line; and
producing means for producing an output signal on a sensor output line by cancelling said noise content of said signal produced on said image output line with said signal corresponding to said noise content, wherein said producing means comprises flip-flop circuit means having opposed inputs receiving said signal corresponding to said noise content and said signal produced on said image output line.

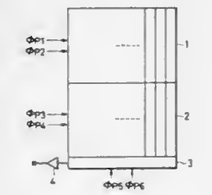


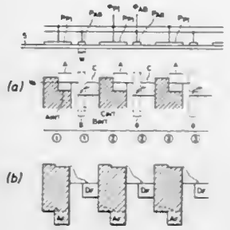
4,821,105

IMAGE PICKUP APPARATUS

Akira Suga; Takao Kinoshita, both of Tokyo; Shinji Sakai, and Akihiko Tojo, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 106,023, Oct. 8, 1987, abandoned, which is a continuation of Ser. No. 690,205, Jan. 10, 1985, abandoned, which is a continuation of Ser. No. 14,784, Feb. 13, 1987, abandoned, which is a continuation of Ser. No. 129,946, Nov. 25, 1987, abandoned. This application May 17, 1988, Ser. No. 196,853
Claims priority, application Japan, Jan. 18, 1984, 59-7772; Jan. 20, 1984, 59-8778; Jan. 23, 1984, 59-10509
Int. Cl.⁴ H04N *3/14*
U.S. Cl. 358—213.19 **55 Claims**





11. An image pickup apparatus comprising:
a light receiving part for converting an optical image to a charge signal, and for accumulating the charge signal;
recombining means for allowing a part of charges in said light receiving part to be recombined with a majority carrier; and
control means for producing signals to allow the charge signal in said light receiving part to be accumulated in a first period and transferred and for allowing said recombining means to perform the recombining operation during a predetermined second period shorter than said first

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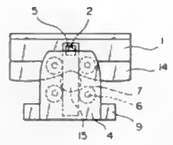
period immediately before at least said transfer of the charge signal.

4,821,106

APPARATUS FOR LOADING TELEVISION CAMERA OR THE LIKE

Iwao Fujita, Tokyo; Masahiro Maesuna, Kawasaki, and Tamiki Umemura, Yokohama, all of Japan, assignors to Shotoku Ltd., Japan

Filed Dec. 4, 1987, Ser. No. 128,647
Claims priority, application Japan, Dec. 12, 1986, 61-294748
Int. Cl.[4] H04N *5/232, 5/247*
U.S. Cl. 358—229 **2 Claims**



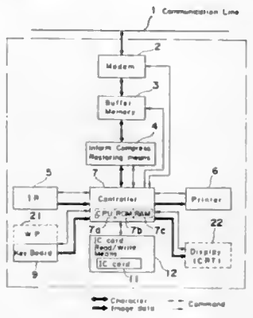
1. An apparatus for supporting a television camera or similar device, comprising:
a tilt stand, said tilt stand having a tilt axis;
tilt means for tilting said tilt stand about its tilt axis;
a turning stand for supporting the tilt stand;
pan means for turning said turning stand;
cam means for adjusting a weight balance on said tilt stand, cam means comprising a cam which cooperates with a cam roller; and
stop means for holding said tilt stand so that it cannot be tilted, said stop means comprising lifting means for lifting said cam from said cam roller when said stop means holds the tilt stand so that it cannot be tilted.

4,821,107

MULTI-FUNCTIONAL IMAGING APPARATUS

Yoshikazu Naito; Keiji Nakatani, and Kanji Wada, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 26, 1988, Ser. No. 148,635
Claims priority, application Japan, Jan. 26, 1987, 62-15571; Dec. 1, 1987, 62-305400
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—256 **18 Claims**



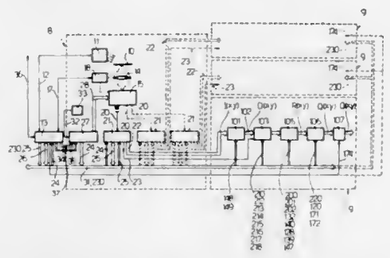
1. A multi-functional imaging apparatus having at least an image reading section, an image forming section and an external image data entering section and being able to function in either one of plural office automation modes which include a copy mode for forming a document image read by the image reading section on a paper in the image forming section and a print mode for forming an image on a paper in the image forming section based on data entered by the external image data entering section which is characterized in comprising:
plural card-like memory means each of which stores a program for controlling respective sections corresponding to one of the office automation modes,
means for accommodating either one of plural card-like memory means therein, said means having a reading means for reading a program stored in the card-like memory means when it is accommodated therein, and
control means for controlling respective sections so as to perform one of the office automation modes corresponding to the program stored in the card-like memory means when it is accommodated in the accommodating means and, when it is not accommodated therein, to perform a predetermined office automation mode.

4,821,108

FLEXIBLE IMAGE ACQUISITION AND PROCESSING SYSTEM

Giuseppe Barbagelata, and Ercole Giuliano, both of Genoa, Italy, assignors to Elettronica San Giorgio - ELSAG S.p.A., Genova-Sestri, Italy

Filed Nov. 26, 1986, Ser. No. 935,341
Claims priority, application Italy, Nov. 29, 1985, 68002 A/85
Int. Cl.[4] H04M *1/40*
U.S. Cl. 358—282 **28 Claims**



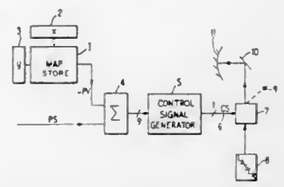
1. A flexible image acquisition and processing system comprising photosensor means supplying analogue output signals (20) for compensating, and digital conversion means (21) supplying digital output signals (22) representing said image; timing means (27) for controlling scanning of said photosensor means (15); means (105) for performing two-dimensional convolutions of data representing said image; and means (13) for controlling said system; characterized by the fact that said control means (13) comprise a processing unit (70) for calculating first compensating values (61) for standardizing to a given value the analogue output signals (20) for single photoelements (16) on said photosensor means (15) under dark conditions, and for calculating second compensating values (66) for standardizing the output signals (22) for said single photoelements (16) on said photosensor means (15) under normal lighting conditions of said images, the said first (61) and second (66) compensating values being stored in a non-volatile memory (80) on said control means (13); said control means (13) also being designed to select and modify operating coefficients employed by said convoluting means (105).

4,821,109

GENERATING HALF-TONE REPRESENTATIONS

Malcolm D. M. Roe, Herts, England, assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 17, 1987, Ser. No. 123,623
Claims priority, application United Kingdom, Nov. 26, 1986, 8628238
Int. Cl.[4] H04N *1/024, 1/23*
U.S. Cl. 358—253 **7 Claims**



5. Apparatus for generating a half-tone representation of an original picture, said apparatus comprising an exposing beam generator; a record medium support; means for causing an exposing beam generated by said beam generator to scan a record medium mounted on said support; exposing beam control means for generating a two state control signal to control the condition of said exposing beam, said control signal being generated in accordance with a picture signal representing colour component densities of said original picture and half-tone dot information defining for elemental areas within a dot cell corresponding values representative of colour densities whereby elemental areas of said record medium are exposed or not exposed according to said control signal taking up a first or second state respectively, the exposing beam control means including monitoring means for monitoring the position of said exposing beam relatively to said record medium and relative to a half-tone dot area within which said beam is positioned, half-tone dot cell value generating means responsive to the position of said exposing beam relative to a half-tone dot area to generate a half-tone dot cell value for the corresponding elemental area, comparison means for comparing a picture signal representing a colour component density at that position with the half-tone dot cell value generated to generate a difference signal; and control signal generating means for generating said control signal in one of its first and second states by determining from said difference signal and a predetermined probability function the probability that said control signal should take up its first or second state, said probability function being defined such that for a given picture signal the average proportion of a dot cell which is exposed over a region of said record medium having a plurality of half-tone dots generated in response to a picture signal will be substantially equal to the colour density represented by said picture signal expressed as a proportion of a maximum colour density.

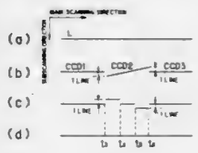
4,821,110

METHOD OF AND APPARATUS FOR CORRECTING A READ POSITION ERROR IN SUBSCANNING DIRECTION OF A LINE IMAGE SENSOR

Shigeo Murakami, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jan. 6, 1988, Ser. No. 141,149
Claims priority, application Japan, Jan. 8, 1987, 62-2070
Int. Cl.[4] H04N *1/04, 1/40*
U.S. Cl. 358—285 **10 Claims**

1. A method of correcting a read position error in subscanning direction in scanning and inputting of image data by a line image sensor provided in parallel with main scanning direction, said method comprising steps of:
finding an amount of said read position error in said subscanning direction with respect to each main scanning position of said line image sensor by a number of scanning lines; and
relatively delaying an output image signal from said line image sensor with respect to each said main scanning position on the basis of said number of scanning lines corresponding to said amount of the read position error in the subscanning direction thus found, to output the same.

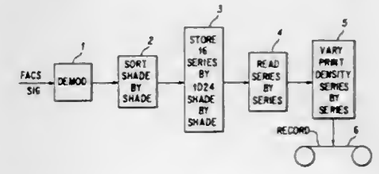


4,821,111

METHOD OF RECORDING FACSIMILE SIGNALS

Scott Nowell, Brookline, N.H., assignor to Alden Research Foundation, Brockton, Mass.

Filed Jan. 22, 1988, Ser. No. 146,980
Int. Cl.[4] H04N *1/21, 1/23*
U.S. Cl. 358—296 **6 Claims**



1. The method of recording facsimile signals of different shades, line by line with a printing head marking individual pixels along each line, comprising:
sorting out the signal pixels of each line according to shade and position along each line;
storing pixels of each line of the same shade in separate series according to their positions on the line;
successively and separately reading out of storage the respective series of pixels of different shades; and
separately marking all pixels of each series of one shade with the same density on the record, each line being recorded by a plurality of markings of different densities, so as to produce a recording with the different shades of the facsimile signal.

4,821,112

DETECTION CIRCUIT FOR DETECTING STANDARD TELEVISION SIGNALS AND NONSTANDARD TELEVISION SIGNALS

Toshiyuki Sakamoto, Fujisawa; Ikuya Arai, Yokohama; Toshiyuki Kurita, Yokohama; Toshinori Murata, Yokohama; Isao Nakagawa, Yokohama; Masahiko Achiha, Iruma, and Kazuo Ishikura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 63,477
Claims priority, application Japan, Jun. 20, 1986, 61-143019
Int. Cl.[4] H04N *9/44*
U.S. Cl. 358—17 **4 Claims**

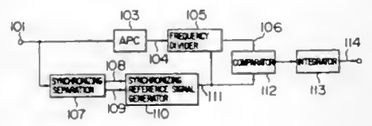
1. A detection circuit used in A TV receiver to detect whether the received TV signal is a standard TV signal to not, comprising:
(a) an automatic phase control circuit supplied with a color burst signal of frequency f_{SC} included in the TV signal,

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said automatic phase control circuit including means for generating a clock signal synchronized to said color burst signal, said clock signal having a frequency $m \times f_{SC}$, m being a constant;

(b) a synchronizing reference signal generating circuit supplied with a synchronizing signal included in the TV signal, said synchronizing reference signal generating circuit including means for generating a first reference signal, the period of said first reference signal being n times the period of said synchronizing signal, n being a constant;

(c) a frequency division circuit connected to said automatic phase control circuit and said synchronizing reference signal generating circuit and supplied with said clock signal from said automatic phase control circuit and said first reference signal from said synchronizing reference signal generating circuit, said first frequency division circuit being initialized by said first reference signal, said first frequency division circuit including means for generating a second reference signal by demultiplying the frequency of said clock signal with a ratio of $k \times m^{-1}n$, k being a constant;



(d) a comparator circuit connected to said first frequency division circuit and said synchronizing reference signal generating circuit and supplied with said first reference signal from said synchronizing reference signal generating circuit and said second reference signal from said first frequency division circuit, said comparator circuit including means for comparing the phase of said first reference signal with the phase of said second reference signal and for generating a coincidence signal upon coincidence between phases of said first and second reference signals and for generating of noncoincidence signal upon noncoincidence between phases of said first and second reference signals; and

(e) an integrator circuit connected to said comparator circuit to integrate said coincidence signal or said noncoincidence signal supplied from said comparator circuit;

wherein said integrator circuit comprises:

(e1) counters connected to said comparator circuit to count said coincidence signals and said non-coincidence signals supplied from said comparator circuit; and

(e2) a reset-set flip-flop connected to said counters so as to be reset or set by the output signals of said counters.

4,821,113

FULL COLOR, CONTINUOUS TONE LASER DIODE PHOTOGRAPHIC IMAGING APPARATUS AND METHOD USING THREE LASER DIODES AT PREDETERMINED FREQUENCIES

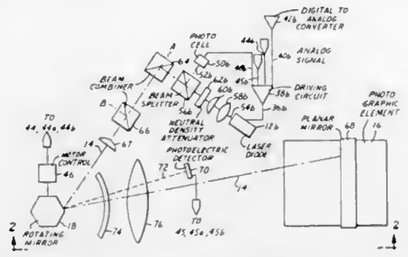
John M. McQuade, Woodbury, and Richard L. Paldosh, St. Anthony, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 22, 1985, Ser. No. 736,252
Int. Cl.⁴ H04N *1/23, 1/46*
U.S. Cl. 358—75 **5 Claims**

1. A laser diode imaging apparatus for producing multicolor, continous tone images on a photographic element upon exposure to laser diode radiation, the photographic element including a substrate and three superposed photosensitive layers on one side of the substrate, each photosensitive layer being associated with a different photographic coupler capable of forming a different color dye upon said exposure and development by reaction with an oxidized photographic developer, each photosensitive layer being sensitized to a different wavelength of the electromagnetic spectrum, the imaging apparatus comprising:

three laser diodes, each emitting radiation at a particular wavelength of the electromagnetic spectrum which is different from that of any of the other laser diodes and which corresponds to said wavelength at which one of said photosensitive layers is sensitized and wherein one of said laser diodes emits radiation at a wavelength of 780 nm, one of said laser diodes emits radiation at a wavelength of 830 nm and one of said laser diodes emits radiation at a wavelength of 880 nm;

means for modulating continously the intensity of said radiation emitted by said laser diodes to correspondingly modulate said exposure of said photosensitive layers and thereby the density of said color upon development;



means for directing said radiation emitted by said laser diodes to said photographic element, focusing said radiation to a spot and traversely scanning said radiation spot across the surface of said photographic element; and

means for advancing said photographic element relative to said scanned radiation in a direction having a component direction perpendicular to said direction of scanning so that all portions of said photosensitive layers are exposed to said radiation;

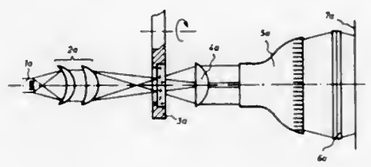
so that an image is produced by said exposure of said photosensitive layers to said laser diode radiation, so that said image is multi-colored in that any color within the color space defined by said color dyes may be produced and so that said color has a continuous tone in that the density of said color may be determined by modultion of all of said laser diodes and thereby said exposure of all of said photosensitive layers.

4,821,114

OPTO-ELECTRONIC SCANNING ARRANGEMENT

Axel Gebhardt, Mönkeberg, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed May 1, 1987, Ser. No. 44,609
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614888
Int. Cl.⁴ H04N *1/46, 1/028*
U.S. Cl. 358—75 **25 Claims**



1. In an opto-electronic arrangement for a line-by-line scan-

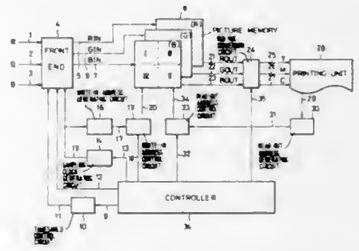
ning of color originals and reproduction technology by means of a line of photodiodes as an opto-electronic transducer, a light source means for creating a beam of light directed to the original and received by a photodetector, filters being arranged before the photodetectors for separating the light into a plurality of colors, and a shape converter of optical fibers being positioned between the original and the light source and having an input end for receiving the light beam from the source and an output end with the fibers being arranged to form a linear fiber arrangement to direct the light in a line at the line to be scanned the improvements comprising the light source means being a point shape white light source, a condenser system being arranged to receive the light beam from the light source and form the beam into a light bundle directed onto an input end of the shape converter, the input end of the converter being fashioned to have an entrance cross section adapted to the cross section of the light bundle from the condenser system, at least one cylindrical lens extending the full length of the linear fiber arrangement of the output end of the shape converter and being arranged in the output end of the converter to receive the light from the output end of the converter and to convert it into a line-shaped light strip directed at the colored original and optical means being provided for forming light from the original to impinge on the filter means.

4,821,115

COLOR HARD COPY APPARATUS HAVING SIMPLIFIED ANALOG-TO-DIGITAL CONVERSION WITH ADJUSTABLE THRESHOLD LEVELS

Kenichi Matsushima; Fumihiro Tanaka; Kazuo Yamaguchi; Yoshio Shimada, and Shinya Watanabe, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Sep. 30, 1986, Ser. No. 913,684
Claims priority, application Japan, Oct. 1, 1985, 60-218233
Int. Cl.⁴ H04N *1/46*
U.S. Cl. 358—75 **5 Claims**



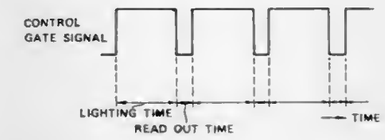
1. In a color hard copy apparatus which converts an analog video signal of a still picture frame displayed on a color graphic display into binary video data to obtain a multicolor gradation picture: analog-to-digital converting means for sampling an analog video signal having R(red), G(green) and B(blue) signal components representative of a desired picture frame displayed on a color graphic display and converting the analog video signal into corresponding binary video data, the analog-to-digital converting means comprising a single analog-to-digital converter having an adjustably settable threshold level, and means for adjustably setting the threshold level of the analog-to-digital converter to a plurality of different constant threshold levels such that the analog video signal of the entire picture frame is sampled at each different constant threshold level; means for writing the binary video data in a picture memory at predetermined write-in addresses according to a predetermined multicolor gradation picture program; and means for reading the binary video data out of the picture memory according to the predetermined multicolor gradation picture program to obtain binary picture data signals for use in printing a multicolor gradation picture corresponding to the desired picture frame displayed on the color graphic display.

4,821,116

ENDOSCOPE EQUIPMENT

Tatuso Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 656,375, Oct. 1, 1984, Pat. No. 4,653,478.
This application Mar. 18, 1987, Ser. No. 27,598
Claims priority, application Japan, Sep. 30, 1983, 58-183281; Oct. 3, 1983, 58-184683; Oct. 3, 1983, 58-184695
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 358—98 **5 Claims**



1. An endoscope, comprising:

an inserting member having an end component

a light source means for projecting light through said inserting member onto a subject;

a line transfer type solid state image sensing means disposed in said end component for receiving an optical image of the subject illuminated by said light source means, and for converting said received image into electrical signals;

a light control means for controlling the light incident on said solid state image sensing means so that a signal charge is accumulated in said solid state image sensing means during an incident period when reflected light is incident on said solid state image sensing means and light from said light source means is controlled in such a manner that it is not incident on said image sensing means when said signal charge is being read out from said image sensing means, said light control means including,

(a) a liquid crystal filter means positioned in the light path between said light source means and said solid-state image sensing means for interrupting the light from said light source means incident on said solid-state image sensing means, and

(b) a circuit means for electrically controlling said liquid crystal filter means such that said light from said light source means is not incident on said image sensing means when said signal charge is being read out from said image sensing means; and

a monitor means for displaying the subject image on the basis of the electrical signal read out from said solid-state image sensing means.

4,821,117

ENDOSCOPIC SYSTEM FOR PRODUCING FLUORESCENT AND VISIBLE IMAGES

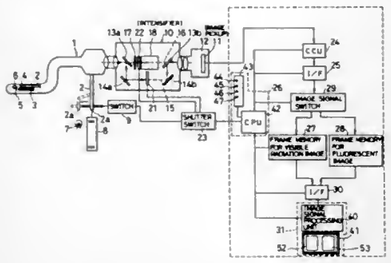
Tadashi Sekiguchi, Utsunomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 10, 1987, Ser. No. 119,905
Claims priority, application Japan, Nov. 12, 1986, 61-267798
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 358—98 **9 Claims**

1. An endoscopic system for simultaneously displaying a visible radiation image and a fluorescent image of an object to which has been applied, for inspection, a fluorescent material, comprising:

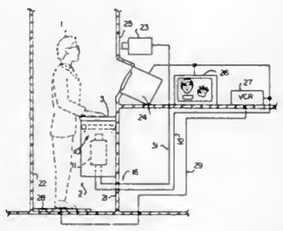
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first storing means for storing the visible radiation image of the object;
second storing means for storing the fluorescent image of the object;
means for irradiating the object with visible radiation and excitation radiation alternately to obtain a visible radiation image and a fluorescent image of the object;
means for supplying the visible radiation image and the fluorescent image to the first and second storing means, respectively;



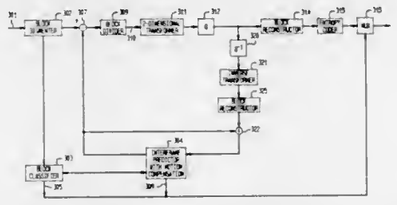
means for intensifying the fluorescent image to a predetermined level;
image displaying means for processing and displaying the images from the first and second storing means; and
controlling means for controlling the irradiating means, first and second storing means, and image displaying means such that the visible radiation image and the fluorescent image are simultaneously displayed on the image displaying means.

4,821,118
VIDEO IMAGE SYSTEM FOR PERSONAL IDENTIFICATION
Roger F. Lafreniere, Tewksbury, Mass., assignor to Advanced Identification Systems, Inc., Tewksbury, Mass.
Filed Oct. 9, 1986, Ser. No. 917,007
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—108 **27 Claims**



1. In a system for identifying a person who enters a designated place and presents an identification (ID) card containing information about himself, the improvement comprising in combination,
(a) a palm viewing window of transparent material having an outside surface and an inside surface oriented so that said person at said designated place can easily place the palm of his hand against said palm window outside surface,
(b) an ID card viewing window (ID card window) of transparent material having an outside surface and an inside surface oriented so that said person at said designated place can easily place his ID card against said ID card window outside surface,
(c) a video camera on said inside surface side of both said palm window and said ID card window,
(d) a source of illumination on said inside surface side of both said palm window and said ID card window,
(e) said palm window, said ID card window, said source of illumination and said video camera forming an optical system of which said palm against said palm window outside surface and said ID card against said ID card window outside surface is the object (palm and ID card object), said source of illumination illuminates said palm and ID card object and said camera intercepts the image of said palm and ID card object and produces a palm video image of said palm and ID card optical image and
(d) a video recorder for recording said palm and ID card video image.

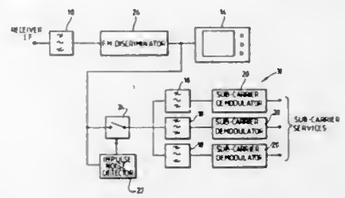
4,821,119
METHOD AND APPARATUS FOR LOW BIT-RATE INTERFRAME VIDEO CODING
Hamid Gharavi, Red Bank Borough, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.
Filed May 4, 1988, Ser. No. 190,251
Int. Cl.[4] H04N *7/133, 7/137*
U.S. Cl. 358—136 **17 Claims**



1. In an interframe video hybrid coder which comprises means for transforming blocks of differential video pel data into blocks of transform coefficients, means for quantizing the transform coefficients of each transformed block, and means for entropy coding the quantized transform coefficients of each transform block, apparatus comprising:
means for subdividing each block of differential pel data into smaller sub-blocks, said transforming means transforming each sub-block of each block and said quantizing means quantizing the transform coefficients of each transformed sub-block; and
means for reconstructing a block of quantized transform coefficients from the quantized transformed sub-blocks.

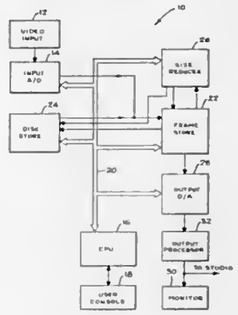
4,821,120
TELEVISION SUB-CARRIER TRANSMISSION
Martin Tomlinson, Totnes, England, assignor to Devon County Council, Devon, England, a part interest
Filed Jun. 12, 1986, Ser. No. 873,430
Claims priority, application United Kingdom, Jun. 13, 1985, 8515043; Nov. 20, 1985, 8528541
Int. Cl.[4] H04N *7/08*
U.S. Cl. 358—142 **21 Claims**

1. A receiver for receiving a television signal from an earth orbiting satellite, wherein the receiver comprises a first demodulator stage for extracting a video signal and at least one information-carrying sub-carrier signal from the received signal, at least one sub-carrier processing channel coupled to an output of the first demodulator stage and including a signal averaging circuit followed by a second demodulator stage for producing a respective demodulated information signal, and an impulse noise reduction circuit upstream of the signal averaging circuit, whereby said at least one sub-carrier signal can be satisfactorily



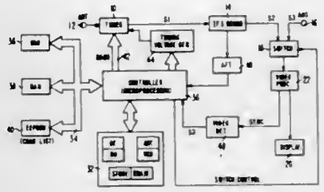
demodulated when the received signal strength is low such that said video signal is substantially unrecoverable.

4,821,121
ELECTRONIC STILL STORE WITH HIGH SPEED SORTING AND METHOD OF OPERATION
Daniel A. Beaulier, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Continuation of Ser. No. 740,297, May 31, 1985, abandoned, which is a continuation of Ser. No. 483,327, Apr. 8, 1983, abandoned. This application Feb. 24, 1987, Ser. No. 18,786
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—160 **15 Claims**



13. A method of storing video pixel data for access and display comprising:
providing data sets for a plurality of full size images at a first spatial resolution;
generating, from the data sets of the full size images, second data sets representing a corresponding plurality of reduced size reproduction images at a second lower spatial resolution;
storing both the data sets of the plurality of full size images and the data sets of the corresponding plurality of reduced size reproduction images in respective selected groups of storage location; and
selectively accessing from the storage locations a data, set representing one of the plurality of full size images, and a data set representing one of the corresponding plurality of the reduced size reproduction images, simultaneously.

4,821,122
TV RECEIVER WITH AUTOMATIC RF/BASEBAND SIGNAL
John F. Teskey, Greenfield, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.
Continuation of Ser. No. 5,795, Jan. 21, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 212,169
Int. Cl.[4] H04N *5/268;* **H04B** *1/06*
U.S. Cl. 358—181 **3 Claims**



1. A television receiver, comprising:
tuner means for providing a first video signal when tuned to an occupied television channel;
auxiliary input means for connection to an external source for providing a second video signal;
processing means for processing a video signal;
switch means having a tuner position for coupling said first video signal to said processing means and having an auxiliary position for coupling said second video signal to said processing means;
detector means coupled to an output of said switch means for detecting the presence of an active video components of said first video signal when said switch means is in said tuner position, for detecting the presence of said active video components of said second video signal when said switch means is in said auxiliary position and for providing an active video indicator signal;
keyboard means having plural keys;
control means having a first operating mode responsive to activation of a first one of said keys for placing said switch means in said tuner position;
said control means having a second operating mode responsive to activation of a second one of said keys for initially placing said switch means in said auxiliary position and subsequently being responsive to the absence of said active video indicator signal for placing said switch means in said tuner position, and further comprising:
tuning voltage generator means responsive to said control means for supplying tuning voltage to said tuner means, said control means being further responsive in said second mode of operation subsequent to having placed said switch means in said tuner position for supplying a control signal to said generator means for causing said tuner means to tune to a first predetermined channel.

4,821,123
MAGNETIC RECORDING OR REPRODUCTION APPARATUS WITH ERASING CAPABILITY
Tokihiko Ogura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 1986, Ser. No. 901,187
Claims priority, application Japan, Aug. 31, 1985, 60-192473
Int. Cl.[4] G11B *5/03*
U.S. Cl. 360—66 **10 Claims**

1. A magnetic recording or reproduction apparatus comprising:
(a) magnetic head means for recording or reproducing a first signal of a prescribed frequency band whose lower limit is f_{1L} on or from a magnetic recording medium,
said magnetic head means including an electromagnetic transducer element and transformer means for transform-

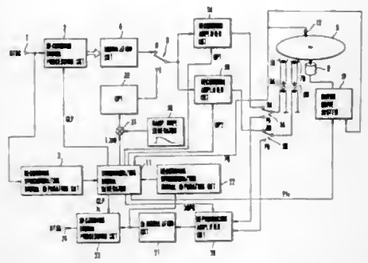
ing the input or output signal to or from said electro-magnetic transducer element, and said transformer means having a prescribed frequency characteristic whose lower limit pass frequency is f_L;

(b) drive means for displacing said magnetic recording medium and said magnetic head relative to each other;

(c) a reference clock signal source;

a first frequency dividing means for forming a signal of first frequency fv by dividing the frequency of the reference clock signal from said reference clock signal source;

(e) a second dividing means for forming a signal of second



frequency f_E by dividing the frequency of the reference clock signal from said clock signal source, said frequency satisfying the following conditions:

$f_E \neq k/2 \cdot fv$ (k is a positive integer)

$f_L < f_E < f_{VL}$; and

(f) control means for controlling said drive means periodically in accordance with said first frequency signal, and for supplying said second frequency signal to said electromagnetic transducer element through said transformer means.

4,821,124

DISC CASE HAVING REMOVABLE DISC AND SUB-TURNTABLE

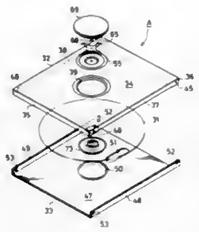
Takuya Tamaru, Hamakita, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 721,667, Apr. 10, 1985. This application Jul. 1, 1988, Ser. No. 214,818

Claims priority, application Japan, Apr. 12, 1984, 59-73584; Apr. 12, 1984, 59-73585; Apr. 12, 1984, 69-53970[U]

Int. Cl.[4] **G11B** *23/03, 5/012, 33/02;* **B65D** *85/30*

U.S. Cl. 360—133 **4 Claims**



1. A disc case for enclosing a disc on which data is recorded comprising a first case member and a second case member, said case members including means for allowing relative movement of said case members between open and closed positions to allow insertion and removal of a disc in an axial direction from a space defined by said case members when in said closed position, one of said case members having aperture means to permit a disc enclosed within said case members to be read by a reproducing apparatus,

a disc supporting means carried within said space so as to support a disc disposed in said space for rotation when said case members are in said closed position, said disc supporting means including a member engageable by a disc rotating member of the reproducing apparatus so that the disc is rotatable in said case by the disc rotating member, said second case member being provided with an opening through which the disc rotating member of the reproducing apparatus is insertable, and wherein, when said disc case with said disc contained is set in the reproducing apparatus, the disc rotating member of the reproducing apparatus will be inserted through said opening into said space and will support said disc rotatably in cooperation with said disc supporting means, said disc supporting means comprising a sub-turntable having a connecting part which can be connected to the disc rotating member of the reproducing apparatus and having a disc holding part for holding said disc, said disc supporting member further including a disc clamping plate which clamps said disc between said clamping plate and said sub-turntable in cooperation with said sub-turntable, said disc supporting member further comprising a thrust spring which acts on said clamping plate to impart a clamping force to clamp said disc between said clamping plate and said sub-turntable, wherein said disc supporting member further comprises:

a steel which supports said sub-turntable, said clamping plate and said thrust spring rotatably.

4,821,125

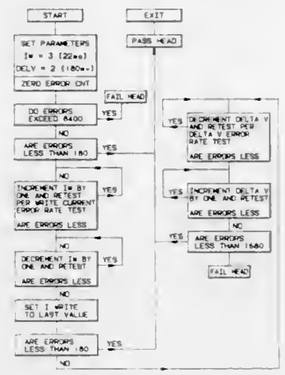
COMPENSATION OF WRITE CURRENT AND DELTA-V FOR RECORDING COMPONENT AND RADIAL POSITION

Thomas C. Christensen; Jonathan D. Coker; Earl A. Cunningham; Richard C. Jaworski; Gregory J. Kerwin; Dean C. Palmer, all of Rochester, and Jeffrey R. Roepke, Byron, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1986, Ser. No. 872,793

Int. Cl.[4] **G11B** *27/36, 5/09*

U.S. Cl. 360—31 **31 Claims**



1. In a rotating magnetic disk storage device which uses a magnetic transducer head to write data to and read data from a moving magnetic media surface having parallel data tracks thereon and has plural selectable values of write current, the method of enhancing transducer head read-write performance comprising:

writing a predetermined pattern of information on a selected track using an initial value of write current which comprises the steps of, writing old information on the selected track, writing new information on the selected track, and writing another information pattern on each track adjoining said selected track with each adjacent track information pattern offset toward said selected track;

reading the data on said selected track and recording the number of errors;

incrementing said write current within said plurality of selectable values, reading data on said selected track and recording the number of errors; and

if the number of errors is fewer than the number recorded after the next previous reading, repeating the prior step of incrementing the write current and reading the selected track and if the number of errors exceeds the next previous recorded error count, setting the write current at the next prior write current value.

4,821,126

MAGNETIC RECORDING METHOD INVOLVING CORE PIECES OF DIFFERENT THICKNESS

Takashi Matsumoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 22, 1986, Ser. No. 922,033

Claims priority, application Japan, Oct. 22, 1985, 60-234621; Mar. 5, 1986, 61-46398

Int. Cl.[4] **G11B** *5/187*

U.S. Cl. 360—66 **7 Claims**

1. A recording/erasing method using a magnetic head having a narrower core and a wider core opposing each other through a gap, wherein a moving direction of a magnetic recording medium relative to said magnetic head is from said wider core to said narrower core of said magnetic head for recording signals on said magnetic recording medium, and a moving direction of said magnetic recording medium relative to said magnetic head is from said narrower core to said wider core of said magnetic head for erasing signals recorded on said magnetic recording medium.

4,821,127

DEMAGNETIZING APPARATUS FOR ERASING SIGNALS RECORDED ON CONCENTRIC TRACKS

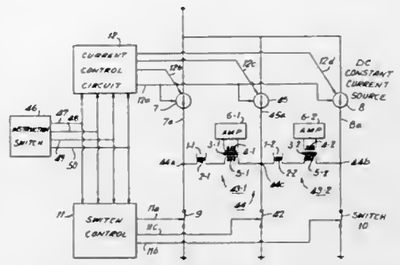
Takashi Soga, and Hitoshi Hirobe, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 20, 1986, Ser. No. 922,049

Claims priority, application Japan, Oct. 18, 1985, 60-231005; Dec. 20, 1985, 60-285699; Jan. 14, 1986, 61-4166; Feb. 7, 1986, 61-24047

Int. Cl.[4] **G11B** *5/24, 5/02*

U.S. Cl. 360—66 **4 Claims**



1. A demagnetizing apparatus comprising a plurality of recording or reproducing magnetic heads for separately scanning concentric tracks on a magnetic recording medium, a plurality of transformers having first coils connected to a recording or reproducing amplifier and second coils insulated regarding DC potentials from said first coils, a plurality of unit circuits, each consisting of each coil of said magnetic heads and each second coil of said transformers connected in series, a series circuit consisting of said plurality of unit circuits connected in series, a plurality of current-controllable, constant-current DC power supplies having the same polarity, with output terminals connected to both ends of said series circuit and any of connections between said unit circuits, a plurality of semiconductor switches connected to both ends of said series circuit and between a connection of said unit circuits and return paths of said DC power supplies, a switching control circuit for keeping ON all of said plurality of semiconductor switches during recording or reproduction operation of said apparatus, or in a first erasing mode, alternately switching ON and OFF said two semiconductor switches connected to both ends of said series circuit with a period of the same as or longer than that for scanning one turn of a track and keeping OFF the other semiconductor switch, or in a second erasing mode, alternately switching ON and OFF said semiconductor switch connected to the connection between said unit circuits connected with an output terminal of said DC power supply and another one of said semiconductor switches connected to another one of said DC power supplies with a period of the same as or longer than that for scanning one turn of a track and keeping OFF the other semiconductor switch, and a current control circuit for keeping current values of all said DC power supplies at zero during recording or reproduction operation of said apparatus, or varying current values of said two DC power supplies with output terminals connected to said two semiconductor switches to be ON/OFF controlled so as intensity of magnetic field of said magnetic head applied to a point on said track to be erased to decrease at every switching operation of said semiconductor switches and keeping current values of the other DC power supplies at zero during erasing operation of said apparatus.

4,821,128

APPARATUS FOR RECORDING AND/OR REPRODUCING A CONTROL SIGNAL

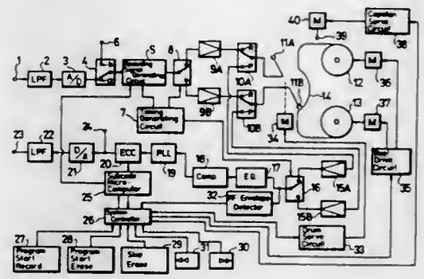
Yoshizumi Inazawa, Kanagawa, and Hisashi Asano, Tokyo, both of Japan, assignors to Sony Corporation, Japan

Filed Jun. 15, 1987, Ser. No. 62,867

Claims priority, application Japan, Jun. 17, 1986, 61-141139; Jun. 18, 1986, 61-142242

Int. Cl.[4] **G11B** *27/28*

U.S. Cl. 360—72.2 **8 Claims**



1. An apparatus for recording and/or reproducing a control signal comprising:

a recording medium, on which a main signal and an address is recorded in a main signal area and a control signal with respect to said main signal is recorded in a sub-signal area;

means for reproducing said address recorded in said main signal area; and

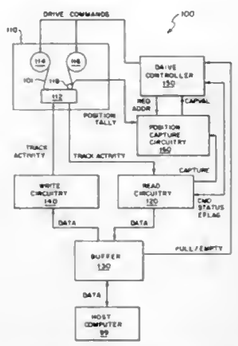
re-recording means for again recording the control signal in accordance with the reproduced address.

4,821,129

TAPE POSITIONING USING REVERSE BOUNDARY CAPTURE: TAPE DRIVE SYSTEM AND METHOD

Bradfred W. Culp, Greeley, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 21, 1986, Ser. No. 933,650
Int. Cl.[4] G11B *15/48*
U.S. Cl. 360—74.4 **19 Claims**



13. A tape drive system for reading information from a tape medium, said information being stored in a series of data blocks separated by interblock gaps, each block having an associated rear boundary, said interblock gaps having a predetermined nominal minimum length, said tape drive system comprising:

a read head;

drive means for transferring a tape across said read head, including means for transferring said tape in a forward direction and in a rearward direction, means for starting and stopping said tape, and means for increasing and decreasing the speed of said tape;

position indicator means for assigning position values reflecting changes in tape position relative to said head;

boundary capture means for capturing a boundary between a block and a gap, including means for capturing a boundary between a block and a gap while a tape is moving in a reverse direction;

controller means for controlling said drive means, said drive controller means being in communication with said position indicator and said boundary capture means so as to have access to current and stored position values;

capture inhibit means for being responsive to said drive controller means so that data blocks other than one being positioned around can be ignored while said tape is moving and not operable within a predetermined value of said captured boundary to prevent improper boundary capture during repositioning said tape relative to said rear head.

4,821,130

DISK EXTENDER BAFFLES

Frank Bernett, and Tave Fruge, both of Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 4, 1987, Ser. No. 93,195
Int. Cl.[4] G11B *17/32*
U.S. Cl. 360—78.04 **11 Claims**

1. A disk drive assembly comprising:

(a) a spindle having a longitudinal axis;

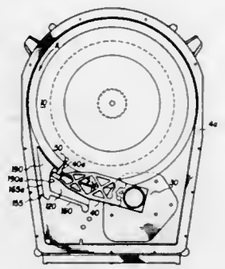
(b) means for rotating the spindle about its longitudinal, axis;

(c) a magnetic disk having an outer circumferential edge, said disk being mounted on said spindle at a predetermined axial position along said spindle to rotate therewith;

(d) an aerodynamically operable slider assembly including at least one transducer head capable of reading and writing information of said disk;

(e) means for positioning said slider assembly at various positions over concentric tracks located on said disk; and

(f) a baffle plate mounted in a first plane perpendicular to the longitudinal axis of the spindle and the confines of said baffle plate being adjacent to said positioning means, said baffle having a thickness substantially equal to the thickness of said disk and an edge spaced closely to a fractional



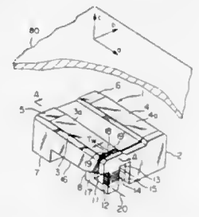
segment of the circumferential edge of said disk around said positioning means to form a clearance gap therebetween whereby air flow over said disk remains substantially laminar as it flows over said fractional segment of the outer circumferential edge around said positioning means to prevent vertical movement of said positioning means.

4,821,131

CORE ASSEMBLY FOR A FLYING MAGNETIC HEAD WITH MAGNETIC GAP ON AIR-BEARING SURFACE

Ryo Gotoh, Moka, Japan, assignor to Hitachi Metals, Ltd., Japan

Continuation of Ser. No. 906,039, Sep. 10, 1986, abandoned. This application Jul. 8, 1988, Ser. No. 217,059
Claims priority, application Japan, Sep. 13, 1985, 60-201630; Oct. 11, 1985, 60-224665; Oct. 11, 1985, 60-224666; Oct. 14, 1985, 60-226910; Apr. 21, 1986, 61-90000
Int. Cl.[4] G11B *5/60, 5/187, 5/127*
U.S. Cl. 360—103 **14 Claims**



1. A core assembly for a flying magnetic head for use with magnetic recording medium such as a magnetic disk, the medium being movable relative to the head and the direction of relative motion defining a longitudinal direction, the assembly comprising a first core and a second core having respective opposed longitudinal end surfaces, at least one of said end surfaces having a lateral groove formed therein and oriented to be parallel to the magnetic medium during use of the head, for partially defining a wire winding window, said opposed end surfaces being bonded to each other with glass,

a pair of slide rails formed in part by each of said bonded first and second cores and extending longitudinally on both lateral sides of the core assembly, at least one of said rails having a planar surface for opposing the magnetic recording medium, each of said first and second core members extending substantially the full lateral width of the core assembly;

a gap defined on said slide rail planar surface by said opposed end surfaces of said first core and said second core and extending laterally; and

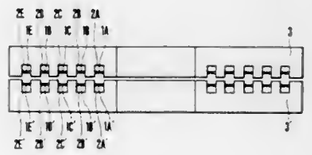
a pair of recesses filled with glass and located on both lateral sides of said gap and determining a track width of said gap.

4,821,132

ROTARY HEAD TYPE RECORDING APPARATUS USING ROTARY ERASING HEAD

Masahide Hasegawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1986, Ser. No. 921,623
Claims priority, application Japan, Oct. 31, 1985, 60-242894
Int. Cl.[4] G11B *5/02*
U.S. Cl. 360—108 **10 Claims**



1. A rotary head type recording apparatus, comprising:

(a) a rotary head member having four rotary heads and a rotary erasing head;

(b) a rotary transformer member having an erasing coil which is connected to said rotary erasing head and four recording coils which are respectively connected to said four rotary heads, said erasing coil and said four recording coils lying in a common surface of said rotary transformer member, and said erasing coil being so disposed that two of said four recording coils are on each side of said erasing coil;

(c) recording means for supplying recording signals to said four recording coils to record the recording signals on a recording medium by use of said four recording coils; and

(d) erasing means for supplying an erasing signal to said erasing coil to erase signals recorded on the recording medium by use of said erasing head, said erasing means not supplying said erasing signal to said erasing coil when said recording means is supplying recording signals to at least one of two recording coils arranged adjacent to and on opposite sides of said erasing coil.

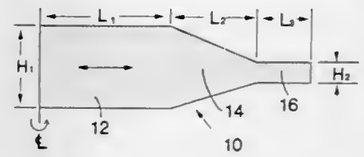
4,821,133

BOTTLENECK MAGNETORESISTIVE ELEMENT

Greogory S. Mowry, Burnsville; Terry B. Mitchell, Minneapolis; Charles H. Tolman, and Peter K. George, both of Bloomington, all of Minn., assignors to Magnetic Peripherals, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 15,203, Feb. 17, 1987. This application Feb. 5, 1988, Ser. No. 152,792
Int. Cl.[4] G11B *5/127, 5/33*
U.S. Cl. 360—113 **4 Claims**

1. A bottleneck magnetoresistive sensor element having a central wide portion with opposed substantially parallel sides and two ends, a narrowing transition portion connected to each end with at least one inclined side, and a bottleneck portion connected to each transition portion, the bottleneck portion having a width less than the central wide portion and being rectangular in shape with the sides of the rectangle's long



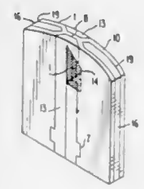
dimension being substantially parallel with the sides of said central region.

4,821,134

MAGNETIC ALLOY R/W HEAD WITH CENTRALLY PINCHED AND END SLOTTED CORE

Yoshikazu Niwa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 929,313
Claims priority, application Japan, Nov. 14, 1985, 60-255435
Int. Cl.[4] G11B *5/22*
U.S. Cl. 360—122 **7 Claims**



1. A magnetic head for recording and reproducing a signal on a magnetic tape, comprising:

(a) a thin composite core formed of magnetic alloy material and nonmagnetic reinforcing material, and having an elongate rectangular configuration when viewed from a tape facing surface thereof,

(b) the magnetic alloy material having a configuration, when viewed from said tape facing surface, defined by two generally U-shaped portions with slit openings (**19**) between parallel legs of the respective U-shaped portions, the slit openings of the U-shaped portions facing away from each other, and a central leg member having a width no greater than that of each of said slit openings of said U-shaped portions and equal to a tape track width for reducing eddy current loss adjacent said magnetic gap, and said leg member connects base portions of said U-shaped portions.

(c) the nonmagnetic reinforcing material (**16**) filling said slit openings, and nonmagnetic reinforcing material (**13**) filling both spaces flanking said central leg member and contiguous base portions of said U-shaped portions to complete said elongate rectangular configuration, and

(d) a signal recording/reproducing gap extending transversely across said central leg member.

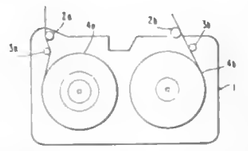
VOL 1101 ISS 2 AP 11 1989 UMI

4,821,135

THERMOSETTING RESIN STATIONARY TAPE GUIDES FOR MAGNETIC TAPE CASSETTES

Masaru Nakanishi; Arata Kitamura; Masashi Sakurai, and Masaaki Asanuma, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 26, 1986, Ser. No. 844,495
Claims priority, application Japan, Mar. 26, 1985, 60-62892
Int. Cl.[4] G11B *23/02, 15/60*
U.S. Cl. 360—132 14 Claims



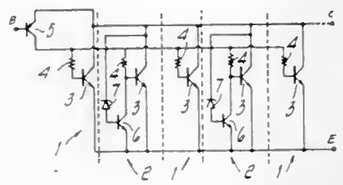
1. A stationary tape guide for magnetic tape cassettes comprising a thermosetting resin composition containing an inorganic filler in a proportion of from 60 to 75% by weight based on the total composition.

4,821,136

POWER TRANSISTOR WITH SELF-PROTECTION AGAINST DIRECT SECONDARY BREAKDOWN

Bruno Murari, Monza, and Flavio Villa, Milan, both of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Sep. 21, 1987, Ser. No. 99,356
Claims priority, application Italy, Sep. 30, 1986, 21855 A/86
Int. Cl.[4] H02H *9/02*
U.S. Cl. 361—58 10 Claims



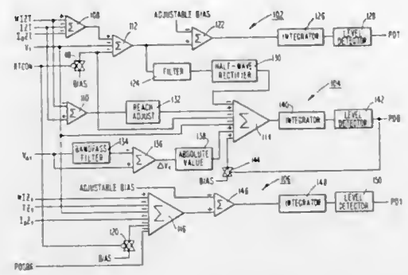
1. A power transistor with self-protection against direct secondary breakdown, comprising a first and a second plurality of elementary transistors having their emitter terminals mutually connected and forming a common emitter terminal, collector terminals mutually connected and forming a common collector terminal, and base terminals connected to at least one current source, and switch means selectively connected to said first plurality of elementary transistors for allowing operation of said first plurality of elementary transistor in a saturation operating region and switching off said first plurality of elementary transistors in a high-voltage operating region, while said second plurality of elementary transistors are active in both said saturation and high voltage operation regions, wherein said switch means comprise switching-off transistors having emitter collector terminals connected respectively to said base and emitter terminals of said first plurality of elementary transistors and base terminals connected to said common collector terminal by means of a respective Zener diode.

4,821,137

POSITIVE SEQUENCE DISTANCE RELAY FOR AC POWER TRANSMISSION LINE PROTECTION

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Nov. 12, 1987, Ser. No. 120,115
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—80 13 Claims



1. In a protective relay for detecting faults within a predetermined overreach zone of a three phase power transmission line of an electrical power distribution system, means for generating at least one relay output signal, said means comprising:

(a) means for receiving signals from the three phase power transmission line, which signals relate to the three phase voltages and current;

(b) means for utilizing said signals relating to the three phase voltages and currents for generating at least one operate signal having a first polarity and at least one restraint signal having second polarity opposite said first polarity, said means for generating said at least one operate signal and said at least one restraint signal comprising:

(i) means for generating a signal V_1 related to a positive sequence component of a phase voltage;

(ii) means for generating a polarizing signal V_{pol} related to said V_1 signal;

(iii) means for generating a signal I_1Z_1 comprising a signal I_1 related to a positive sequence component of a phase current multiplied by a quantity Z_1, which corresponds to a replica impedance of a first protective zone of said power transmission line; and

(iv) means for comparing coincidence of said V_{pol} and I_1Z_1 signals and generating at least a first operate signal MI_1ZT related to a first polarity of said I_1 signal multiplied by a quantity related to a replica impedance ZT of an overreach protected zone of said power transmission line, during coincidence of said V_{pol} and I_1Z_1 signals, and generating at least a first restraint signal I_1ZT related to said I_1 signal multiplied by said overreach replica impedance Zt, said first restraint signal having a second polarity opposite said first polarity when V_{pol} and I_1Z_1 are not coincident;

(c) at least a first summing circuit means for producing an output signal having a polarity and a magnitude which are related to the algebraic sum of the magnitude of said at least one operate signal and said at least one restraint signal coupled to the inputs of said summing circuit means, said at least one operate signal comprising said MI_1ZT signal and said at least one restraint signal comprising said I_1ZT signal and said V_1 signal;

(d) at least a first integrator circuit means comprising an operational amplifier having an input adapted to receive said output signal from said summing circuit means, an output, and a feedback circuit connected between said input and said output, said feedback circuit comprising resistance means and capacitance means electrically connected in parallel; and

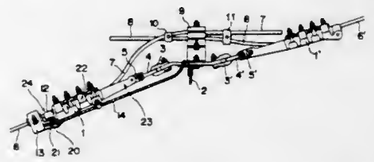
(e) at least a first level detector means for generating a relay output signal when an output signal from the output of said operational amplifier is of said first polarity and has a magnitude which exceeds a predetermined level, said relay output signal from said first level detector means comprising an overreach trip signal PDT indicating a fault has occurred in said predetermined overreach zone.

4,821,138

MONITORING DEVICE FOR OVERHEAD POWER TRANSMISSION SYSTEM

Tsuneo Nakano; Seika Nakamura, and Kiyomi Shimohashi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 21, 1987, Ser. No. 52,373
Claims priority, application Japan, May 23, 1986, 61-78498[U]
Int. Cl.[4] G01R *19/145*
U.S. Cl. 361—93 10 Claims



1. A monitoring device for an overhead power transmission system or power distribution system for use with a main overhead power transmission line or a main overhead ground wire suspended along a plurality of steel towers of an overhead power transmission system or power distribution system, comprising: anchoring means secured to the main overhead power transmission line or main ground wire for anchoring said overhead power transmission line or overhead ground wire at each of said steel towers, and sensing means for sensing a condition of the overhead power transmission system or power distribution system characterized in that said sensing means is so disposed as to allow said overhead power transmission line or overhead ground wire to pass through or disposed adjacent thereto and is secured to said anchoring means.

4,821,139

METHOD OF GROUNDING ELECTRICAL CURRENT SURGES

Masao Tomita, Nagoya, Japan, assignor to Kinki Denki Co., Ltd., Nagoya, Japan

Continuation-in-part of Ser. No. 526,631, Aug. 26, 1983, Pat. No. 4,648,794. This application Jul. 23, 1986, Ser. No. 889,095
Claims priority, application Japan, Apr. 4, 1983, 58-59085; Apr. 4, 1983, 58-59087
The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.
Int. Cl.[4] H02H *1/00*
U.S. Cl. 361—124 3 Claims

1. A method of directing an electrical current surge away from a structure, said method comprising:

(1) directing the current surge to a heat conducting inorganic fiber commingled with a highly hydrated mineral salt in a rocket;

(2) instantaneously using the heat created by the current surge in the inorganic fiber to heat the highly hydrated mineral salt to drive off its water of hydration in the form of steam;

(3) using the steam to propel the rocket and to create a vapor trail into which the resulting unhydrated mineral salts are entrained, and

(4) using the vapor trail as an electrical bridge through which the current surge is grounded.

2. A method of directing a lightning bolt away from an electrical power line, said method comprising:

(1) directing the lightning bolt to a heat conducting inorganic fiber commingled with a highly hydrated mineral salt in a rocket;

(2) using the heat created by the lightning bolt in the inorganic fiber to instantaneously heat the highly hydrated mineral salt to drive off its water of hydration in the form of steam;

(3) using the steam to propel the rocket and to create a vapor trail into which the resulting unhydrated mineral salts are entrained; and

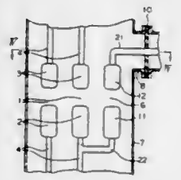
(4) using the vapor trail as an electrical bridge through which the lightning bolt is grounded.

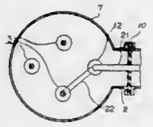
4,821,140

GAS INSULATED SWITCHGEAR DISCONNECTOR ARRANGEMENT

Hiroshi Takeuchi; Kiyokazu Torimi, and Keizo Takatsuka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 24, 1987, Ser. No. 100,620
Claims priority, application Japan, Sep. 29, 1986, 61-228349
Int. Cl.[4] H02B *1/20*; H01H *33/12*
U.S. Cl. 361—341 10 Claims





1. A gas insulated switchgear comprising:

a vessel,

main circuit disconnector units for three phases and a shunt circuit disconnector unit contained inside said vessel,

each main circuit disconnector unit and the shunt circuit disconnector unit having a movable side electrode and a stationary side electrode,

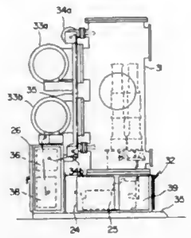
axes passing through said electrodes being arranged substantially parallel to each other,

the shunt circuit disconnector unit being provided inside said vessel in the vicinity of a side portion of said main circuit disconnector units, and

an electrical connection between one of said movable side electrodes and said stationary side electrode of the shunt circuit disconnector unit and one of said movable side electrode and said stationary side electrode of one of the main circuit disconnector units, whereby electrical paths can be lead out of the vessel through the shunt circuit disconnector unit.

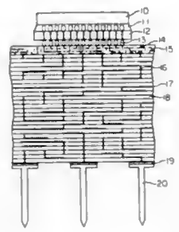
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4,821,141
GAS INSULATED SWITCHGEAR
Kiyokazu Torimi; Hiroshi Takeuchi, and Keizo Takatsuka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Sep. 24, 1987, Ser. No. 100,632
Claims priority, application Japan, Sep. 29, 1986, 61-228348
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—341 **3 Claims**



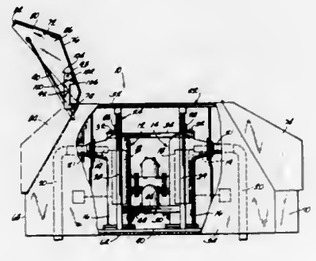
1. A gas insulated switchgear comprising:
a main unit housing an interrupter;
a plurality of bus bar units electrically connected to said interrupter of said main unit at a front face thereof, said bus bar units having disconnectors;
a pair of grounded switches respectively electrically connected to said interrupter and operable to disable said interrupter for inspection thereof; and
an operator unit having an interrupter operator connected to said interrupter, said operator unit being mounted on a base below said interrupter main unit, said operator unit having a monitor unit on a front face thereof, said bus bar units being located above said monitor unit, said monitor unit providing operators for said grounded switches and said disconnectors, said operators being positioned in the vicinity and at a same side of said interrupter main unit to allow operating maintenance and operating inspection of said operators and interrupter operator to be easily performed from the same side of said interrupter main unit.

4,821,142
CERAMIC MULTILAYER CIRCUIT BOARD AND SEMICONDUCTOR MODULE
Nobuyuki Ushifusa; Hiroichi Shinohara, both of Hitachi; Kousei Nagayama, Ibaraki; Satoru Ogihara, and Tasao Soga, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 4, 1987, Ser. No. 58,255
Claims priority, application Japan, Jun. 6, 1986, 61-130136
Int. Cl.[4] H05K *01/03*
U.S. Cl. 361—395 **9 Claims**



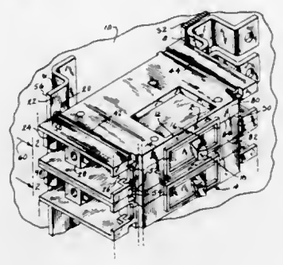
1. A ceramic multilayer circuit board comprising ceramic layers and wiring conductor layers laminated alternately, in which the ceramic layers are formed from a glass which consists essentially of 20 to 85% of SiO_2 and at least one member selected from 25% or less of Al_2O_3, 1 to 25% of MgO, 50% or less of B_2O_3, 15 to 25% of ZnO, 10 to 25% of CaO, 2 to 20% of Li_2O, 10% or less of K_2O, 50 to 60% $AlPO_4$, 25 to 35% Y_2O_3, 5% or less of P_2O_5, 5% or less of ZrO_2, 5% or less of CaF_2, 6% or less of AlN, 5% or less of Cs_2O, and 5% or less of V_2O_5, each by weight, and which softens at a temperature not higher than the melting point of the wiring conductor layer and wherein the ceramic layer has a thermal expansion coefficient lower than that of the wiring layer but not lower than one half that of the wiring layer.

4,821,143
SWITCHGEAR ENCLOSURE WITH IMPROVED SUPPORTING FRAME AND IMPROVED ACCESS DOOR
Nils V. Holmgren, Greendale; Donald R. Martin, and Hinhsomchay Phouybanhdyt, both of Wankesha, all of Wis., assignors to Cooper Power Systems, Inc., Houston, Tex.
Filed Oct. 30, 1987, Ser. No. 115,537
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—335 **13 Claims**



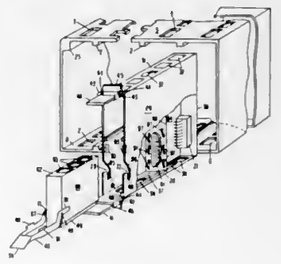
1. A switchgear apparatus comprising
a switch mechanism,
a conductor electrically connected to said mechanism,
a pressure vessel enclosing said mechanism and said conductor in a dielectric fluid,
an outer housing enclosing said pressure vessel, and
a frame which is adapted to be supported by the ground, which directly supports at least a portion of said outer housing above the ground, and which is rigidified by said pressure vessel by being attached thereto.

4,821,144
CIRCUIT BREAKER WITH MOUNTING CLIP
William E. Grass, Whitefish Bay, Wis., assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 2, 1987, Ser. No. 115,705
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—353 **15 Claims**



1. A circuit breaker mounted to support structure, comprising a housing having a frontside with a user-engageable operating handle extending therethrough, and having a backside, a mounting clip connected to said housing and moveable between a first position engaging said support structure and mounting said breaker thereto, and a second position out of the way of and noninterferring with said support structure, wherein said clip in said first position extends rearwardly beyond said backside, and wherein said clip in said second position is forward of said backside, said clip being connected to said housing in each of said first and second positions.

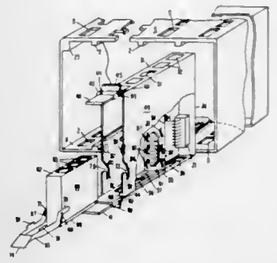
4,821,145
PLUGGABLE ASSEMBLY FOR PRINTED CIRCUIT CARDS
William D. Corfits; Claude J. Mosley; Jerry R. Rasmussen, and Stephen E. Wheeler, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 17, 1987, Ser. No. 121,436
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—383 **7 Claims**



1. A shielded enclosure assembly for connection of a circuit card to a system backplane, comprising:
a. a conductive housing having a top, a bottom, a back and a first connector positioned on said back for mating and connection with a system backplane;
b. a circuit card positioned within said housing and connected to a first connector;
c. a plurality of openings in the top and bottom of said housing for the flow of cooling air;
d. at least one grounding spring affixed to said top and bottom for engagement with a surface of said system backplane; and,
e. a solid conductive front portion and solid conductive side portions coacting with said back to constrain air flowing through said housing and providing electromagnetic shielding for said circuit card positioned within.

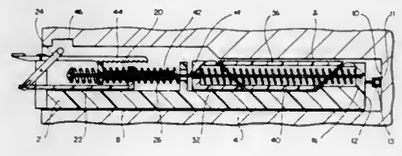
4,821,146
PLUGABLE INTERPOSER AND PRINTED CIRCUIT CARD CARRIER
Linda M. Behrens, Byron; Neil A. Blohm, Rochester; Raymond L. Cimijotti, Chatfield; William D. Corfits, and Jerry R. Rasmussen, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 17, 1987, Ser. No. 121,482
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—383 **14 Claims**

1. An interposer assembly, having a circuit card therein, for providing connection of an additional circuit card or cable to a system backplane, comprising:
a. a conductive housing having a top, a bottom, sides, a back and a first connector positioned on said back thereof for mating and connection with a system backplane;
b. a second connector affixed to a partition positioned within said housing, said partition connected to said housing and said second connector connected to said circuit card therein; and,



c. a plurality of openings in the top and bottom of said housing for the flow of cooling air.

4,821,147
MOUNTING ASSEMBLY COMPRISING AN ELECTRONIC MODULE AND A RACK RECEIVING THE MODULE
Brian Jacobs, Palo Alto; Thomas McGaffigan, Half Moon Bay, and Edward Cydzik, Foster City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Filed Oct. 5, 1987, Ser. No. 105,637
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 **19 Claims**



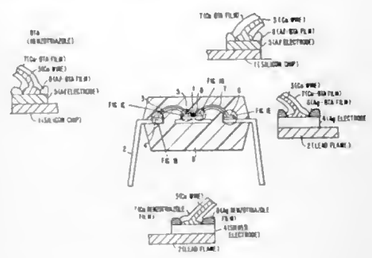
14. A mounting assembly which comprises:
(a) an electronic module;
(b) a rack, having an end stop, on which the module is received and can slide; and
(c) an actuator comprising a member on the module or the rack which, can operatively connect the module to the rack, and a shape memory alloy element which, on recovery, moves the member so as to cause the module to slide along the rack into engagement with the end stop.

4,821,148
RESIN PACKAGED SEMICONDUCTOR DEVICE HAVING A PROTECTIVE LAYER MADE OF A METAL-ORGANIC MATTER COMPOUND
Shiro Kobayashi; Masahiko Itoh, and Akira Minato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 4, 1986, Ser. No. 870,399
Claims priority, application Japan, Jun. 14, 1985, 60-128068
Int. Cl.[4] H01L *23/30, 21/56*
U.S. Cl. 361—392 **9 Claims**

1. A resin packaged semiconductor device having at least one protective layer formed on a semiconductor element mounted on a lead frame and metal surfaces of electric connecting metal parts and a resin package covering said at least one protective layer and said semiconductor element, said at least one protective layer being made of a metal-organic matter compound which is a reaction product between an organic matter and the metal surfaces of said electric connecting metal parts; said organic matter being a substance which reacts with

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said metal surfaces to give a compound which is difficultly soluble in water and being selected from the group consisting of a triazole, a sodium benzoate, an azelaic acid, a quinaldic acid, a rubeanic acid and a cupferron; said reaction product being formed by contact of the metal surfaces with a solution of the organic matter in a non-aqueous solvent; and said at least



one protective layer acting to protect said electric connecting parts from moisture and to prevent the penetration of moisture into said semiconductor element by adhesion between said electric connecting parts and said resin; said semiconductor device being immersed in a solution of said organic matter in alcohol to form said at least one protective layer.

4,821,149

SUBSTRATE MOUNTING DEVICE

Thomas D. Belanger, Jr., Clarendon Hills, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Sep. 28, 1987, Ser. No. 101,904
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—395 **7 Claims**

1. A substrate mounting device for mounting an electrical substrate to a carrier substrate comprising:

a first pair of tabs each extending from a major perimeter edge of said electrical substrate directly opposite each other;

a second pair of tabs located in a spaced relationship to said first pair of tabs and said second pair of tabs extending from a perimeter edge of said electrical substrate directly opposite each other;

first and second substrate guides located in a spaced and parallel relationship to each other and each including a lower shelf with each lower shelf having a top and a bottom surface, and each bottom surface mounted to said carrier substrate, each of said substrate guides further including a channel longitudinally oriented along a first side thereof, and each of said channels including an open end and a top guide, and each channel extends between said open end and said top guide, each channel further defined by a top surface and first and second drop guides, said first and second drop guides located on said lower shelf top surface directly opposite said channel top surface, said first and second drop guides further defining first and second tab receiving slots; and,

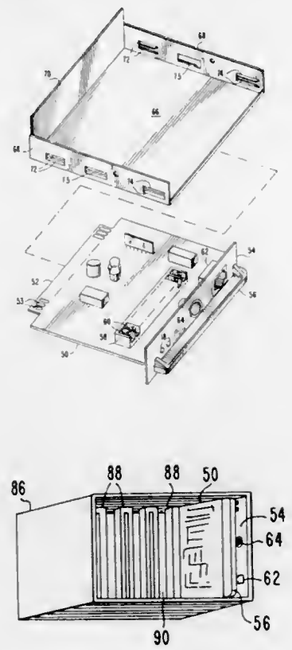
said electrical substrate and said first pair and said second pair of tabs are arranged to be manually inserted into respective first and second substrate guide channels at respective channel open ends and manually pushed along said channels riding between respective first and second drop guides and channel top surfaces until said substrate encounters a respective top guide, whereby, said first pair of tabs and said second pair of tabs fall within respective first and second tab receiving slots, resting said electrical substrate and said first and second pair of tabs on a respective first and second substrate guide lower shelf top surface.

4,821,150

PRINTED CIRCUIT BOARD MOUNTING FOR COMMUNICATION TERMINATION

George A. Duthie; Mark C. Frey, both of Chantilly; Wilfred L. Gleadall, Waterford, all of Va.; Ambroz C. Skrovanek, Bethesda, Md., and David O. Corp, Sterling, Va., assignors to Hubbell Incorporated, Orange, Conn.

Filed Mar. 31, 1988, Ser. No. 176,250
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—395 **6 Claims**



1. Communication termination apparatus comprising

a generally rectangular printed circuit board having electrical circuit means thereon for forming an interface between internal and external communication lines at a termination location;

means defining a first edge connector along a rear edge of said printed circuit board, said edge connector having a plurality of conductive members electrically connected to circuit components on said board, first and second groups of said conductive members being designated, respectively, for connection to internal and external communication lines;

a front panel attached to a front edge of said printed circuit board opposite said rear edge, said front panel being perpendicular to the plane containing said board;

means defining a second connector on said board for connection to said communication lines, said second connector having a plurality of terminals in third and fourth groups electrically connected to said first and second groups of conductive members, respectively; and

means defining a third connector on said front panel, said third connector having a plurality of terminals electrically connected to said first group of conductive members and connectable to said internal communication lines,

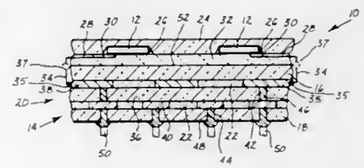
said board being selectively installable in one of a five-sided housing and a rack having edge connector receptacles, said board being connectable to said communication lines in said housing using said second and third connectors and in a rack using receptacles for said edge connector.

4,821,151

HERMETICALLY SEALED PACKAGE

Michael J. Pryor, Woodbridge; Narendra N. Singhdeo, New Haven, and Deepak Mahulikar, Meriden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 20, 1985, Ser. No. 811,911
Int. Cl.[4] H05K *7/10*
U.S. Cl. 361—403 **39 Claims**



1. A package adapted to house at least one semiconductor device, comprising:

a multi-layer circuit assembly comprising:

at least first, second and third ceramic substrates said third ceramic substrate disposed between said first and second ceramic substrates;

at least first, second and third layers of metal foil; said second and third layers of foil each having a conductive circuit pattern formed thereon and formed from a copper alloy selected from the group consisting of oxygen free copper alloy and deoxidized copper alloy, said second layer of foil being disposed between said first and third substrates and said third layer of foil being disposed between said second and third substrates; and

means bonding said first and third and said second and third ceramic substrates together with the conductive circuit patterns therebetween;

a ceramic cover having at least one cavity therein adapted for receiving said at least one semicondutor device;

the first layer of metal foil having electrical leads formed therein, said first layer of metal foil being disposed between said ceramic cover and said first ceramic substrate, said first layer of metal foil being adapted for electrical connection to the semiconductor device, and said first layer of metal foil having end portions extending outward of said package, said end portions being bonded to said conductive circuitry pattern means; and

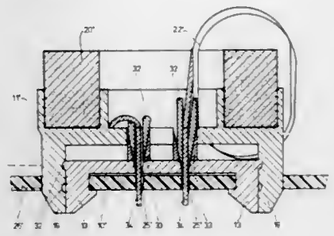
a sealing glass sealing said first substrate to said cover with said first layer of foil sealed therebetween whereby said package is adapted to hermetically seal said at least one semiconductor device within said at least one cavity.

4,821,152

METHOD AND DEVICE FOR MOUNTING ELECTRIC COMPONENTS ON A CIRCUIT BOARD

Klaus Lorenzen, Robert-Bosch-Str. 18, D-7160 Gaildorf 3, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,388
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636065
Int. Cl.[4] H05K *7/12*; H01R *13/00*
U.S. Cl. 361—403 **12 Claims**



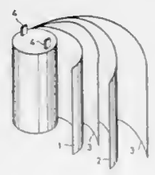
1. A device for mounting electric components on a printed circuit board having openings adapted to receive locking members therethrough, comprising a housing, said housing including a first and second section, a preselected plurality of legs depending from said first section and sized and positioned to extend through the respective openings in the circuit board, said legs including first locking means engageable with the board for locking said first section in position on the board; said second section having receiving means for receiving an electric component therein, second complimentary formed locking means on said first and second section engageable with each other for maintaining said second section in one of two positions with respect to said first section, wherein said second section is closer to the circuit board in the second position.

4,821,153

ELECTROLYTE FOR ELECTROLYTIC CAPACITORS AND ELECTROLYTIC CAPACITOR USING THE ELECTROLYTE

Yoshiteru Kuwae; Katsuji Shiono; Takaaki Kishi, all of Kyoto; Hideki Shimamoto, Osaka; Hisao Nagara, Kyoto; Keiji Mori, Kyoto, and Shingo Yoshida, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd and Sanyo Chemical Industries, Ltd., both of, Japan

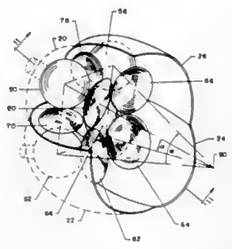
PCT No. PCT/JP87/00107, § 371 Date Oct. 21, 1987, § 102(e) Date Oct. 21, 1987, PCT Pub. No. WO87/05149, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 20, 1987, Ser. No. 127,298
Claims priority, application Japan, Feb. 21, 1986, 61-38029
Int. Cl.[4] H01G *9/02*
U.S. Cl. 361—505 **33 Claims**



1. An electrolyte for an electrolytic capacitor comprising an organic solvent solution of a tetraalkylammonium salt of a carboxylic acid selected from the group consisting of

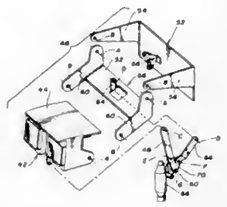
phthalic acid, tetrahydrophthalic acid, hexahydrophthalic acid and maleic acid, or
an alkyl or nitro-substituted compound of said carboxylic acid.

4,821,154
MULTI-BULB LIGHT SOURCE
Ireneusz J. Kotecki, and Slawomir Patocki, both of Nepean, Canada, assignors to Trio Engineering Inc., Nepean, Canada
Filed Sep. 28, 1987, Ser. No. 101,785
Int. Cl.[4] F21V *19/04*
U.S. Cl. 362—20 **14 Claims**



1. An optical device for directing the light rays from a plurality of light bulbs, for use in association with means for directing an electric current to each of said light bulbs, one at a time, and for switching said electric current from a light bulb when it burns out to another, operable one of said light bulbs, until all of said light bulbs are burnt out, said device comprising:
(a) a concave mirror comprising a plurality of wedges of ellipsoidal mirrors;
(b) means for holding said light bulbs within the concavity of said concave mirror; and
(c) means for focusing light rays from each of said light bulbs to produce a substantially identical pattern of light rays emitting from said device to a common focal area regardless of which one of said light bulbs is lit.

4,821,155
COMPACT ACTUATOR FOR A CONCEALED HEADLAMP ASSEMBLY
Thomas E. Harting, Alexandria, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 23, 1988, Ser. No. 210,541
Int. Cl.[4] B60Q *1/06*
U.S. Cl. 362—65 **2 Claims**



1. An actuator for a concealed headlamp assembly for a vehicle having a vehicle body with a front panel having a headlamp opening therein and a limited volume available below said opening to contain said actuator, comprising,
a headlamp housing sized to fit within said limited volume and having an upper cover sized to close said front panel opening when said actuator is in a retracted position,
a carrier bracket sized to fit within said limited volume and pivoted at one end to said headlamp housing and at the other end to said vehicle body,
a motor fixed to said vehicle within said limited volume and having a drive shaft to which a drive crank is fixed,
a first connecting link pivoted at a lower end to said drive crank and at an upper end to said carrier bracket,
a second connecting link pivoted at a lower end to said drive crank at a location spaced from said first link lower end and at an upper end to said headlamp housing,
whereby, when said motor drive shaft rotates said drive crank up from said retracted position, said first connecting link rotates said carrier bracket relative to said vehicle body as said second connecting link simultaneously rotates said headlamp housing relative to said carrier bracket, the net result of which is to raise said cover by rotating said headlamp housing about an imaginary pivot located outside of said limited volume, thereby allowing better control of the final raised position of said cover.

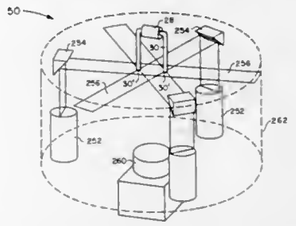
4,821,156
FLASHLIGHT WITH FOCUSING BEAM ASSEMBLY
Steven G. Siefert, Half Moon Bay, and Ralph F. Osterhout, San Francisco, both of Calif., assignors to Tekna, Redwood City, Calif.
Filed Apr. 14, 1988, Ser. No. 181,281
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—187 **11 Claims**



1. A flashlight comprising:
an elongate casing having an axial chamber capable of holding one or more batteries in series, said casing being open at a forward end and closed at a rearward end;
a battery spring disposed at the rearward closed end of the axial chamber for biasing the batteries in the forward direction;
a parabolic reflector mounted in the open forward end of the casing and capable of axial translation relative thereto;
a light bulb disposed within the parabolic reflector and contacting the batteries;
a reflector spring disposed at the forward open end of the casing for biasing the parabolic reflector in the forward direction relative to the batteries;
a lens cowl secured over the open forward end of the casing and engaging the parabolic reflector, said lens cowl being positionable in the axial direction whereby rearward motion of the cowl first moves the reflector, light bulb and batteries until contact is established energizing the light bulb and second moves the reflector rearward relative to the light bulb and batteries to change beam focus.

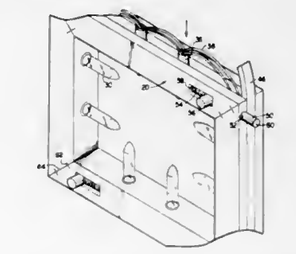
4,821,157
SYSTEM FOR SENSING AND FORMING OBJECTS SUCH AS LEADS OF ELECTRONIC COMPONENTS
John Birk, Los Altos; Heinz Breu, Mountain View; William Gong, Sunnyvale; Charles C. Morehouse, Cupertino, and Sidney Liebes, Jr., Atherton, all of Calif., assignors to Hewlett-Packard Co., Palo Alto, Calif.
Division of Ser. No. 832,481, Feb. 21, 1986, Pat. No. 4,705,081.
This application Aug. 26, 1987, Ser. No. 89,651
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—241 **5 Claims**

1. A device for illuminating a planar region comprising means for providing a thin sheet of light in substantially isotropic directions towards said planar region from locations substantially coplanar with the planar region so that only the portion of an object in or near the plane of the planar region



and the locations is illuminated without illuminating the remaining portion of the object and, wherein said light-providing means comprises three or more light sources, each providing a thin planar light beam.

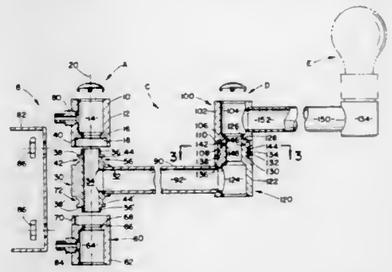
4,821,158
PRE-FRAMED LIGHTING SYSTEM FOR WINDOWS OR DOORS
James L. Mitten, 51 Beech Dr., Apt. A-2, Baltimore, Md. 21220
Filed Feb. 19, 1988, Ser. No. 157,586
Int. Cl.[4] F21V *21/00*
U.S. Cl. 362—249 **8 Claims**



1. In combination, a system having a rectangular frame for fitting in a window recess and for positioning a string of Christmas tree type lights inward facing in apertures in said frame for receiving respective sockets holding said lights, said string of lights including wiring connecting said sockets, said frame defining each said aperture as a hole through said frame from the outer side to the inner side and proportioned for passage of a said light therethrough, and a shoulder in each said hole proportioned for restraining a said socket from passing therethrough, and means for quick assembly of said string of lights to said frame by passing lights in sockets axially inward to an inward position from outside said frame, and means for retaining all said lights together at said inward position.

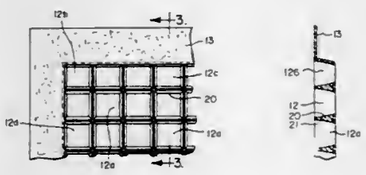
4,821,159
OVERLAPPED LAMP SWIVEL FOR AFTER ASSEMBLY FINISHING
Louis D. Pike, Moreland Hills, Ohio, assignor to Pike Machine Products Co., Cleveland, Ohio
Filed Jan. 29, 1988, Ser. No. 149,740
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—285 **17 Claims**

1. A swivel arm assembly comprising first and second swivel members that are interconnected for relative rotational movement about a swivel axis;
the swivel members having frictionally engaging first and second bearing surfaces, respectively disposed perpendicular to the swivel axis, the first swivel member having a skirt depending therefrom and extending beyond the engaging bearing surfaces, the skirt being displaced from the second swivel member to define an annular gap therebe-



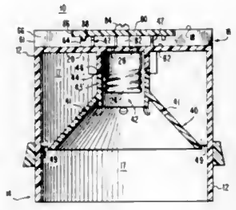
tween which is sufficiently large to inhibit bridging of the gap by coating materials;
a mounting means for mounting one of the first and second swivel members to a supporting structure; and,
an arm connected with the other swivel member.

4,821,160
FLANGED LOUVER CONSTRUCTION
Walter Glass, Northfield, Ill., assignor to American Louver Company, Skokie, Ill.
Filed Apr. 14, 1987, Ser. No. 38,623
Int. Cl.[4] F21V *11/06*
U.S. Cl. 362—354 **10 Claims**



1. A louver for a light box, or the like, comprising:
(a) a rectangular grid of cubes including a plurality of internal cubes and a row of perimeter cubes forming a border around said internal cubes;
(b) all of said internal cubes being square in external plan configuration and having first predetermined identical lengths and widths;
(c) all of said border row of cubes being other than square in plane configuration and having second predetermined lengths and widths, at least one of said second predetermined length and width in each border row cube differing from a corresponding one of said first predetermined length and width in an internal cube;
(d) said border row of cubes comprising end edge cubes, side edge cubes, and corner edge cubes;
(e) said end edge cubes having at least one of a length or width dimension different than any length or width dimension of said side edge cubes; and
(f) a flange formed unitarily with and around the periphery of said border row of cubes and protruding outwardly therefrom;
(g) said grid and said flange being molded in one piece.

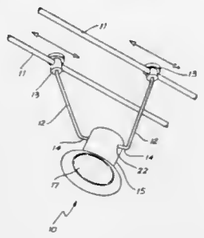
4,821,161
LIGHT FIXTURE
William D. Koontz, Jonesboro, Ark., assignor to Design Products, Co., Inc., Jones, Ark.
Filed Dec. 17, 1987, Ser. No. 134,062
Int. Cl.[4] F21S *1/06*
U.S. Cl. 362—364 **15 Claims**



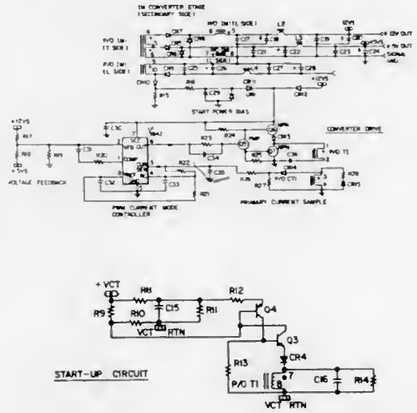
1. A light fixture, comprising:
a unipartite thermoplastic hollow annular receptacle having an open end and a closed end, said closed end having an inner and an outer surface;
a cylindrical screwshell centrally disposed in said receptacle on the inner surface thereof;
a plurality of spaced conductive contact means disposed in the screwshell, said contact means extending to the outer surface of the closed end;
a plurality of wire connectors connected to respective contact means on the outer surface of the closed end for connecting one end of a wire thereto;
a light reflector mounted in said receptacle, said reflector having a central opening adjacent to the closed end for receiving the screwshell, said reflector facing the open end of the receptacle;
a plurality of spaced axially extending cord guide means formed on the outer surface of the closed end adjacent to the wire connectors; and
cover means removably fastened to the outer surface of the closed end, said cover means having projecting means aligned with and spaced from the plurality of cord guide means for bending an electrical cord supported by the cord guide means into clamping engagement with the outer surface of the closed end for securing the cord against pull and strain forces on a respective wire connector.

4,821,162
LIGHTING ASSEMBLY
Peter J. Ellis, 5-7 Manning Street, Rozelle, New South Wales, Australia
Filed May 13, 1988, Ser. No. 193,777
Claims priority, application Australia, May 13, 1987, 72760/87
Int. Cl.[4] F21S *1/04*
U.S. Cl. 362—408 **6 Claims**

1. A lighting assembly for operation at no more than about 24 volts comprising a lamp holder, a pair of rigid electrically conductive arms, each arm having a lower end and an upper end, said lower ends being opposingly mounted on the lamp holder in electrical contact with a lamp socket disposed within the holder, in a manner such that the lamp mounted in said holder may be positioned axially about thereof, each upper end having means to permit independent movement along one of a pair of spaced apart elongate electrical conductors and to be fixed in place to form electrical contact therewith, each said conductor having means to connect to a source of electric current, and wherein movement of said alarms along said conductors permits a lamp mounted in said holder to be positioned transversely with respect to the axis lying through the lower ends and longitudinally with respect to the conductors.

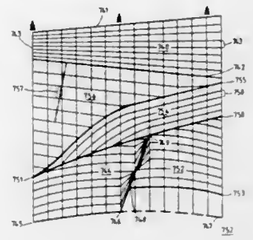


4,821,163
START-UP CIRCUIT FOR AN INTEGRATED-MAGNETIC POWER CONVERTER
Gordon E. Bloom, 115 Duran Dr., San Rafael, Calif. 94903
Filed Dec. 23, 1987, Ser. No. 137,494
Int. Cl.[4] H02M *7/5375*
U.S. Cl. 363—49 **24 Claims**



1. In a power converter having a switch which is operated in response to the flow of current through secondary winding means of a drive transformer and which when repeatedly closed causes power to be transferred through the converter, the drive transformer having primary winding means which is energized in response to the output of the converter, a circuit comprising: another winding on the drive transformer which is transformer coupled to the secondary winding means of the drive transformer; a capacitor which is charged to a predetermined level by the application of power to the input of the converter; and means, operated in response to the charging of said capacitor to said predetermined level, for passing a current pulse through said another winding and triggering the converter into operation and for using the flow of current through the primary winding of the drive transformer to prevent said capacitor from thereafter being charged to said predetermined level by discharging said capacitor prior to said predetermined level.

4,821,164
PROCESS FOR THREE-DIMENSIONAL MATHEMATICAL MODELING OF UNDERGROUND GEOLOGIC VOLUMES
Donald C. Swanson, Houston, Tex., assignor to Stratamodel, Inc., Houston, Tex.
Filed Jul. 25, 1986, Ser. No. 890,467
Int. Cl.[4] G01V *1/00*
U.S. Cl. 364—420 **16 Claims**

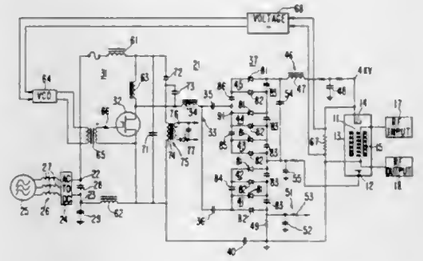


1. A process for modeling a geologic volume bounded by critical surfaces, the volume having a given geologic stratigraphic pattern, other than a volume having depositional layers parallel to mean sea level, the process comprising the steps of:
a. constructing a separate grid for each critical surface bounding said volume; and
b. constructing layers of cells within said volume according to said pattern.

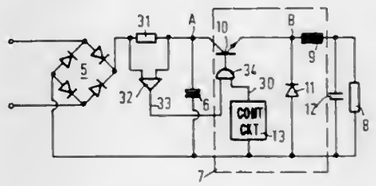
6. A process for modeling a geologic subvolume including an inclined originating surface, a limiting surface, and layers of sediments spanning an interval of geologic time occupying the space between said surfaces, which comprises:
(1) dividing said space into a plurality of cells by
(a) constructing a grid for said originating surface;
(b) constructing layers of laterally disposed cells from said grid, the cells in successive said layers aligned in vertical columns;
(2) assigning a set of coordinates to each said cell, whereby each said cell may be identified by its respective coordinates;
(3) reproducibly and systematically recording said sets of coordinates; and
(4) reproducibly recording a characteristic of a given cell in association with the coordinates of said given cell.

4,821,165
HIGH VOLTAGE DC POWER SUPPLY
Bradley R. Gunn, Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.
Filed Jun. 15, 1987, Ser. No. 62,806
Int. Cl.[4] H02M *3/18*
U.S. Cl. 363—60 **31 Claims**

1. A DC power supply responsive to a relatively low voltage DC power source and a high frequency switching source comprising capacitive and diode AC to DC converter means for deriving a DC output voltage, a switch controlled by the switching source to open and closed states, a flyback choke connected in series with the switch and the DC power source so current flows between terminals of the power source via the choke and switch while the switch is closed, resonant circuit means connected in circuit with the switch, the flyback choke and the AC to DC converter means so that each time the switch is closed (a) a half wave rectified current waveform at the resonant frequency of the resonant circuit flows in the resonant circuit means and (b) a ramping current having a first polarity direction flows in the choke, and while the switch is open a ramping current having a second polarity direction flows in the choke and the resonant circuit, the AC to DC converter means responding to each half wave rectified current waveform to derive the DC output voltage.



4,821,166
POWER-SUPPLY CIRCUIT
Manfred Albach, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.
Filed Mar. 4, 1988, Ser. No. 164,315
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722337
Int. Cl.[4] H02M *5/453*
U.S. Cl. 363—89 **15 Claims**



1. A power-supply circuit comprising: a power-storage means for storing power supplied by an a.c. voltage source, means for periodically connecting said power storage means to said a.c. voltage source during specific time intervals in order to feed power to said power storage means, switch means for taking power from the power storage means, and a control circuit for periodically actuating the switch means such that the control circuit actuates the switch means only outside said specific time intervals in which the a.c. voltage source is connected to the power-storage means.

4,821,167
METHOD AND APPARATUS FOR SEQUENTIAL CONTROL OF ANALOGUE SIGNALS
Harold D. Wiebe, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Mar. 2, 1987, Ser. No. 20,308
Int. Cl.[4] G06F *15/46*; G05B *21/02*
U.S. Cl. 364—138 **13 Claims**

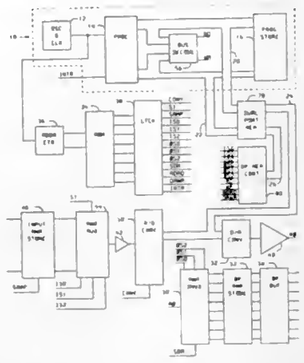
1. A method of process control wherein a continuous process is controlled by a digital control receiving sets of digital input signals and producing sets of digital output signals, the process being monitored and controlled by a plurality of analog process signals including analog input signals representing values of process parameters and analog output signals representing values of controllable process variables, the method comprising the steps of:
(a) repetitively producing, asynchronously with activity of

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the digital control, clock signal at a predetermined repetition rate;

(b) translating the plurality of analog process signals between the continuous process and the digital control in response to the clock signal by executing the steps of:

(i) periodically storing samples of a plurality of analog input signals;



(ii) periodically producing a set of digital input signals in response to a selected stored analog input signal sample; and

(iii) periodically storing an analog output signal in response to a set of digital output signals.

4,821,168

CONTROL SYSTEM WITH IMPROVED ROBUSTNESS TO DISTURBANCES

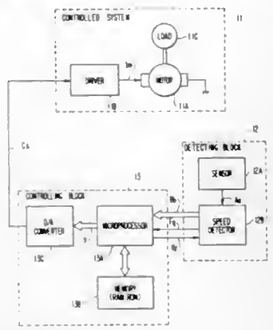
Makoto Goton, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 10, 1986, Ser. No. 917,498

Claims priority, application Japan, Oct. 15, 1985, 60-229141; Oct. 15, 1985, 60-229143; Oct. 15, 1985, 60-229144

Int. Cl.[4] G06F *15/00*

U.S. Cl. 364—183 **36 Claims**



1. A control system comprising:

a detecting means for producing a detected signal indicative of a controlled variable of a controlled system;

an error means for producing an error value from the detected signal;

a storage means for storing therein a plurality of stored values and for renewing the plurality of stored values sequentially and periodically at substantially constant renewing intervals each by a renewing value having information of a first mixed value obtained by a means for mixing the error value with at least a set of N stored values of said plurality of stored values, said set of N stored values having been renewed at intervals of L renewing cycles, where N and L are integers at least equal to 2; and

an output means for producing a control signal from a second mixed value obtained by a means for mixing the error value with one or more of said plurality of stored values, and for supplying said controlled system with the control signal so as to control the controlled variable of said controlled system.

4,821,169

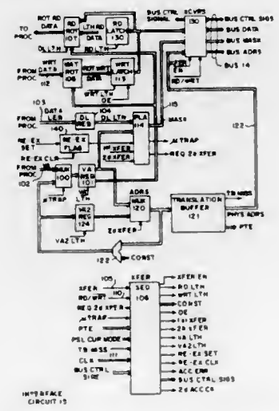
ACCESS VERIFICATION ARRANGEMENT FOR DIGITAL DATA PROCESSING SYSTEM WHICH HAS DEMAND-PAGED MEMORY WITH PAGE CROSSING DETECTION

Richard L. Sites, Boylston, and Stanley A. Lackey, Littleton both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 653,511, Sep. 21, 1984, abandoned. This application Feb. 11, 1987, Ser. No. 15,576

Int. Cl.[4] G06F *12/14;* **G11C** *7/00*

U.S. Cl. 364—200 **15 Claims**



1. In a processor, a bus interface unit for connection to a memory over a bus to form a digital data processing system, said processor including processing means for processing programs each having a selected one of a plurality of access rights modes, said memory including a plurality of addressable storage locations each including a like plurality of individually accessible byte locations, the storage locations being group into a plurality of pages each having a selected number of storage locations, with each page having an access right mode, said bus interface unit including:

a. transfer means for connection to said processing means and said bus and responsive to a single transfer request from said processing means for initiating a memory access over said bus to two adjacent addressable locations in said memory in two transfers over said bus;

b. access verification means connected to said transfer means and responsive to said transfer means initiating a memory access for enabling said transfer means to perform an access verification operation to determine whether the access right mode of said program corresponds to the access right mode of one of the addressable locations; and

c. trap means including:

i. page test means connected to said transfer means and responsive to said transfer means initiating a memory access to two adjacent locations in memory for determining whether the transfers are to separate pages;

ii. page cross verification enabling means connected to said page test means and said access verification means for enabling said access verification means to perform two access verification operations in response to said page test means determining that the transfers are to separate pages, each access verification operation being directed to one of the addressable locations in each of the pages, to determine whether the access mode right of said program corresponds to the access right modes of both of the addressable locations; and

iii. page cross transfer enabling means connected to said page test means, said access verification means and said transfer means for disabling said transfer means in response to said page test means determining that the transfers are to separate pages and to thereafter enable said transfer means to engage in the transfers in response to the determination by said access verification means that the access right mode of the program corresponds to the access right modes of both addressable locations whereby regardless of the number of transfer which have to be made to any two pages in response to one transfer request only two access verifications need be made.

4,821,170

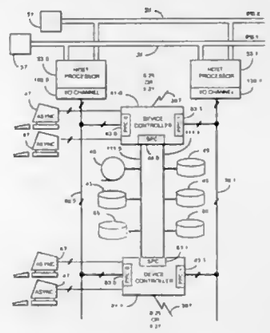
INPUT/OUTPUT SYSTEM FOR MULTIPROCESSORS

David L. Bernick, Felton; Kenneth K. Chan, San Jose; Wing M. Chan, Fremont; Yie-Fong Dan, San Jose; Duc M. Hoang, San Jose; Zubair Hussain, San Jose; Geoffrey I. Iswandhi, Sunnyvale; James E. Korpi, Santa Clara; Martin W. Sanner, Los Gatos; Jay A. Zwagerman, Saratoga; Steven G. Silverman, Santa Clara, and James E. Smith, Sunnyvale, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Apr. 17, 1987, Ser. No. 40,513

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **23 Claims**



1. For use in a digital computer system, a device controller comprising:

a first port-input/output controller coupled to a first input-/output channel bus; and

a second port-input/output controller coupled to a second input/output channel bus;

each of said first and second port-input/output controllers having:

a first ownership latch means for granting shared ownership of said device controller to a first host processor to provide a first data path on a first I/O channel through said first port I/O controller between said first host processor and any peripheral, and

at least a second ownership latch means operative independently of said first ownership latch means for granting shared ownership of said device controller to a second host processor independently of said first port input/output controller to provide a second data path on a second I/O channel through said second port I/O controller between said second host processor and any peripheral devices coupled to said device controller.

4,821,171

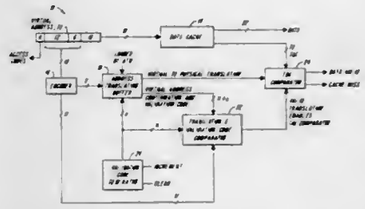
SYSTEM OF SELECTIVE PURGING OF ADDRESS TRANSLATION IN COMPUTER MEMORIES

Carroll A. Calamari, Fitchburg, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Continuation of Ser. No. 731,716, May 7, 1985, abandoned. This application Aug. 15, 1988, Ser. No. 233,884

Int. Cl.[4] G06F *12/10*

U.S. Cl. 364—200 **8 Claims**



1. An address translation system for use in a data processing system which employs virtual addressing for referencing a physical memory, said processing system comprising:

A. translation buffer means for storing a plurality of entries, which entries are accessed by virtual addresses to yield a translation word comprised of the physical memory location and a series of tag bits indicating the corresponding virtual memory address,

B. data cache means for storing data words that are used by the data processing system and outputting said word in response to the input of a virtual address from the data processing system, said data words comprising a series of tag bits for indicating the physical memory address of the data,

C. validation code generator means for generating a sequence of validation codes, each code being defined by a unique series of at least two validity bits, and for storing one of said codes in said translation buffer means in association with each entry,

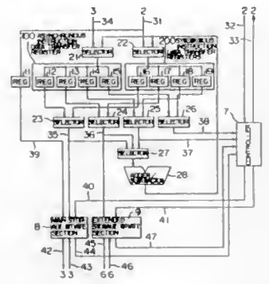
D. control means for activating said generator means when said data processing system requires invalidation of existing entries in said translation buffer means,

E. first comparator means having at least two input terminals and an output terminal and including separate conductor means for coupling from said translation buffer means and said validation code generator means, respectively, to said input terminals and for comparing the validation code of an entry in the translation buffer means with the code currently being generated by the validation code generator means to determine whether said entry is still valid, and outputting at said output terminal a valid translation signal if the codes match, and

F. second comparator means having at least three input terminals and an output terminal and including separate conductor means for respectively coupling from said first comparator output terminal to a first input terminal so as to be enabled by the output of said valid translation signal, coupled from said data cache means to a second input terminal, and translation buffer means to a third input terminal for comparing the tag bits from the data cache means with the tag bits from the translation buffer means and outputting a data "valid" signal if said tag bits match and a cache "miss" signal otherwise.

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4,821,172
APPARATUS FOR CONTROLLING DATA TRANSFER BETWEEN STORAGES
Sigeru Kaneko, and Yoshio Kiriu, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 10, 1987, Ser. No. 83,662
Claims priority, application Japan, Sep. 4, 1986, 61-208794
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **3 Claims**

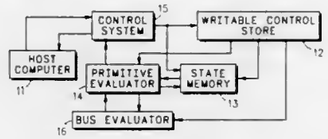


1. An apparatus for controlling a data transfer between storages having a main storage, an extended storage, a transmission path between said main storage and said extended storage for transmitting data therebetween, a data buffer provided on said transmission path, and a processor in which the data is transferred between the main storage and the extended storage by use of a synchronous instruction and an asynchronous instruction comprising:
- means for holding data transfer control information supplied from the processor in response to the synchronous instruction;
- means for holding data transfer control information supplied from the processor in response to the asynchronous instruction;
- select means for selecting data transfer information held in a one of said hold means; and
- control means for selecting, by means of said select means, the hold means associated with an instruction depending on whether the instruction is a synchronous instruction or an asynchronous instruction, for controlling the data transfer between said main storage and said extended storage based on a content of said selected hold means, and for updating the content of said selected hold means according to an amount of data to be transferred, wherein

said control means, when a request of a data transfer is issued by a synchronous instruction while a data transfer caused by an asynchronous instruction is being executed, controls to interrupt the data transfer of the asynchronous instruction and to select by use of said select means the information in said hold means holding data transfer control information of the synchronous instruction; and in response to a completion of the data transfer, said control means controls said select means to select the information in said hold means holding data transfer control information of the asynchronous instruction by means of said select means and to resume the data transfer of the asynchronous instruction interrupted,

wherein the data transfer between said main storage and said extended storage is effected in a unit of a block of data, the data transfer by the asynchronous instruction comprising transfer of a plurality of blocks, and when a data transfer is requested by a synchronous instruction during a data transfer caused by an asynchronous instruction, said select means are caused, in response to a completion of a transfer of a block of the data, to select the content of said hold means holding data transfer control information of the synchronous instruction, thereby achieving a data transfer of the synchronous instruction.

4,821,173
WIRED "OR" BUS EVALUATOR FOR LOGIC SIMULATION
Ronald J. Young, Mesa; Ronald S. Core, Glendale, and Joseph T. Marino, Jr., Fountain Hills, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation of Ser. No. 879,880, Jun. 30, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 168,577
Int. Cl.[4] G06F *15/20, 15/74, 7/544, 9/44*
U.S. Cl. 364—200 **7 Claims**



1. A wired "OR" bus evaluator for modeling a wired "OR" bus in a digital circuit comprising:
- writable control store means for storing a description of said digital circuit in terms of a list of primitives and interconnections between said primitives;
- state memory means for storing present and previous state data;
- said state memory means coupled to said writable control store means to receive at least one input state read addresses therefrom corresponding to a current primitive;
- primitive evaluator means coupled to said state memory means to receive at least one input state therefrom and to said writable control store means to receive a primitive type indicator therefrom;
- said primitive evaluator means for producing evaluator output states of each of said primitives;
- host computer means coupled to said state memory means through a control means to provide an initial state thereto;
- said control means coupled to said writable control store for providing a primitive number thereto and to said host computer for relaying a final evaluator output;
- bus evaluator means coupled to said primitive evaluator means, said bus evaluator means for comparing said evaluator outputs with a current bus primitive state to produce a new bus primitive state and for transmitting said new bus primitive state to said state memory means to update said state memory means.

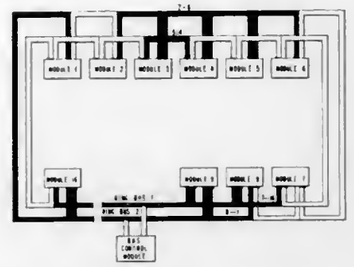
4,821,174
SIGNAL PROCESSING SYSTEM INCLUDING A BUS CONTROL MODULE
Richard F. Webb, Baltimore, Md., and Charles W. Brooks, Jr., Wayland, Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 591,361, Mar. 20, 1984, abandoned. This application Jun. 21, 1988, Ser. No. 211,126
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **8 Claims**

1. A signal processing system including a ring bus; a multiplicity of system modules coupled to said ring bus and operative to receive and transfer blocks of data words over said ring bus; and a bus control module coupled to said ring bus and operative to support simultaneous data transfers between specified pairs of system modules which are available adjacent modules along the ring bus or available modules separated by non-involved modules in accordance with concurrent execution of multiple programs of data transfer instructions, said bus control module comprising:

first memory means for storing a plurality of programs, each program including a sequence of data transfer instructions, each instruction specifying the pair of system modules corresponding to the instructed data transfer thereof;

second memory means for storing a predetermined number of data transfer instructions of each program of said first memory means, each stored instruction of said second memory preassigned an execution priority;

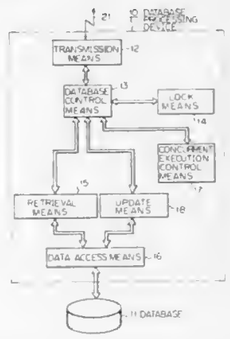
first control means operative to execute the data transfer instructions of said second memory means based on a



number of factors including the execution priority of the instruction, a transfer readiness of the pair of system modules specified by the instruction, and a bus activity between said specified module pair; and

second control means operative to replace data transfer instructions of said second memory means upon the execution thereof with data transfer instructions of said first memory means fetched from corresponding programs in accordance with the sequence of data transfer instructions thereof.

4,821,175
DATABASE PROCESSING DEVICE
Sadayuki Hikita; Suguru Kawakami; Hiromi Haniuda; Akifumi Sakamoto, and Hideki Yamamoto, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Dec. 24, 1985, Ser. No. 813,077
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—200 **4 Claims**



1. A database processing device for receiving data and for processing stored data; said received data including instruction information and record designation information; said received data being received from a plurality of independent terminal units; and said stored data being in a record in a database designated by said record designation information; said database processing device comprising:

(a) a transmission means for receiving or transmitting data from or to said terminal units;

(b) a database control means for receiving said received data from said transmission means, and for controlling execution of said processing in conformity with said instruction information included in said received data, and for delivering processed data resulting from said processing to said transmission means;

(c) a retrieval means for retrieving said stored data in said record designated by said record designation information included in said received data, and for delivering said stored data stored in said record including update control information stored in said record;

(d) an update means for changing said record designated by said record designation information included in said received data to a data value of said received data, and for updating said update control information of said record, and for delivering data including information indicative of completion of said changing and updating;

(e) wherein said database is accessed by said retrieval means and said update means and wherein said database includes a plurality of records each having data stored therein;

(f) a concurrent execution control means for receiving said update control information data included in said record subjected to said updating by said update means and designated by said record designation information included in said received data, and for receiving said update control information data received by said record update means, and for comparing each of said update control information, wherein said concurrent execution control means delivers data, after updating said update control information included in said record to be updated when said compared update control information match, said delivered data having the updated control information, and wherein said concurrent execution control means delivers data including information indicative of deletion of said update when said compared update control information do not match, and wherein said update means, upon receiving data including information indicative of said deletion of said update, executes said update deletion, and delivers data including information indicative of completion of said update deletion;

wherein said database control means transmits said data received from said tranmission means to said retrieval means when said instruction information included in said data is retrieval instruction infomration, and provides data received from said retrieval means as a processed result, and wherein said database control means delivers said data received from said transmission means to said retrieval means when said instruction information of said data is update instruction information and further delivers said data received from said retrieval means and said data received from said transmission means to said concurrent execution control means, and wherein said database control means transmits said data received from said concurrent execution control means to said update means and employs said data received from said update means a a processed data.

4,821,176
DATA PROCESSING ARRANGEMENT USING AN INTERCONNECTING NETWORK ON A SINGLE SEMICONDUCTOR CHIP
Christopher R. Ward; Stephen C. Hazon, and David L. Swift, all of Bishops Stortford, United Kingdom, assignors to STC PLC, London, England
Filed Dec. 15, 1986, Ser. No. 941,788
Claims priority, application United Kingdom, Mar. 18, 1986, 8606587
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **16 Claims**

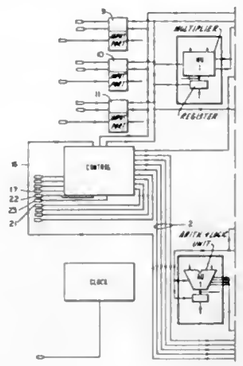
1. An electronic data processing arrangement implemented on a single semiconductor chip, which includes input units and

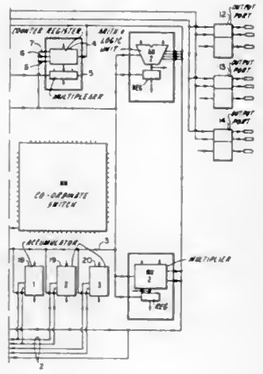
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output units, memory units, processing units and an interconnecting network which interconnects said units, said units and said interconnecting network being located on said chip, wherein:

the interconnecting network is an electronic co-ordinate matrix array on the chip, which matrix array is formed by electrical data paths including a first set of parallel data paths forming one co-ordinate of the array and a second set of parallel data paths forming a second co-ordinate of the array, the data paths of said first set intersecting the data paths of said second set;

semiconductor gates are provided at each intersection between a first co-ordinate data path and a second co-ordinate data path via which connections between said data paths can be set up by the operation of said gates;





said first and second co-ordinate data paths each consists of a plurality of conductors so that each said intersection between a first co-ordinate data path and a second co-ordinate data path is controlled by a set of said gates, the arrangement of the matrix being such that two or more connections can be simultaneously set up through the matrix array;

said input units, said output units, said memory units and said processing units are each connected to one of said electrical data paths, so that a unit connected to a first co-ordinate data path and a unit connected to a second coordinate data path can be interconnected by the operation of the appropriate one of said sets of gates;

at least one control unit is provided, which control unit is implemented on said chip and is connected via respective control conductors to said sets of gates, such that said control unit can, by the energization of respective ones of said control conductors cause the establishment of connectors between respective ones of said units via the appropriate ones of said sets of gates; and

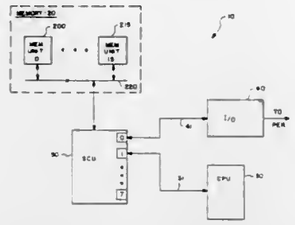
at least one of the memory units implemented on said chip contains program data which can be extracted from that memory unit and applied to said control unit to cause the establishment of connections between respective ones of said units via said co-ordinate matrix array.

4,821,177

APPARATUS FOR CONTROLLING SYSTEM ACCESSES HAVING MULTIPLE COMMAND LEVEL CONDITIONAL ROTATIONAL MULTIPLE PORT SERVICING PRIORITY HIERARCHY

Robert J. Koegel, Glendale, and Leonard Rabins, Scottsdale, both of Ariz., assignors to Honeywell Bull Inc., Waltham, Mass.

Filed Sep. 2, 1986, Ser. No. 902,545
Int. Cl.[4] G06F *13/14, 13/18*
U.S. Cl. 364—200 **12 Claims**



1. A data processing system comprising: memory subsystem means for executing memory activities; a system control unit (SCU) subsystem means having a plurality of ports;

a plurality of data handling units, each data handling unit being operatively connected to only one of said plurality of ports each data handling unit including means for producing and applying to its associated port a request signal set when the unit needs to access the memory subsystem means to request the memory subsystem means to execute a memory activity; each request signal set requesting access to the memory subsystem means includes a command portion specifying a memory activity to be executed and a command priority portion specifying a priority for each such command;

said SCU subsystem means being operatively connected to the memory means for granting a data handling unit access to the memory means in response to the data handling unit producing a request signal set requesting such access, each port of the SCU subsystem means having a port priority for each command priority;

port request control means for each port connected to a data handling unit responsive to receiving a request signal set for generating port request control signals, the port request control signals including a port request go signal if the memory subsystem means and SCU subsystem means are available to execute the command portion of the signal set received by the port from its associated data handling unit; and

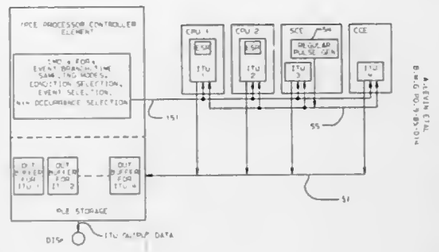
activity priority select means of the system controller operatively connected to each port of the system controller to receive said port request control signals generated by the port request control means of each port, said activity priority select means for producing and transmitting to a selected port a port request granted signal, the selected port being the port applying a port request go signal to said priority select means, and the command portion of the request signal set applied to the selected port having a higher command priority than that of any other port applying a port request go signal to the priority select means; and if two or more ports apply a port request go signal to said priority select means during the same time period having the same command priority, the port selected is the port having the highest port priority, the port request granted signal is transmitted to the selected port enabling the memory subsystem means to execute the memory activity specified by the command portion of the request signal set applied to the selected port.

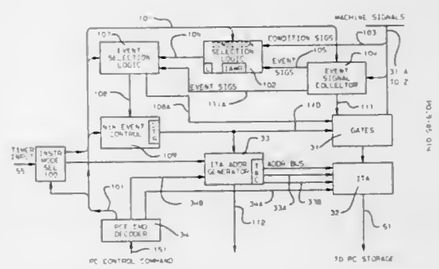
4,821,178

INTERNAL PERFORMANCE MONITORING BY EVENT SAMPLING

Arthur L. Levin, Pleasant Valley; Don W. Rain, and David J. Thomas, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1986, Ser. No. 896,994
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **14 Claims**





1. Internal processor instrumentation means for monitoring the software/hardware operations of a data processing system, which includes one or more processors, a system control console having displaying screens under control of a system operator; each processor having machine cycling circuits, and I/O controls; each processor having a plurality of internal lines for transferring internal signals including signals indicating processor condition states; an event-driven monitoring means comprising:

signal collection means for registering internal signals occurring during one or more machine cycles, the signal collection means being connected to and located in proximity to internal signal lines in a processor,

condition selection logic means having inputs connected to internal lines for receiving selected internal signals indicating condition states in the processor and determining the condition states to be used in the determination of monitoring events in event-driven monitoring operations for the processor,

event selection logic means having inputs connected to the signal collection means and to the condition selection logic means, the event selection logic means determining the occurrence of a monitoring event from selected inputs from the condition selection logic means and the event selection logic means, and the event selection logic means having an output for signalling the occurrence of a monitoring event to be used in a monitoring operation,

an internal instrumentation table unit (ITU) having an instrumentation table array (ITA) that includes a plurality of ITA entries and includes addressing means for selecting a current entry in the ITA,

gating means being associated with the signal collection means for selecting and transmitting registered internal signals from the collection means to the ITU, the gating means being enabled by the occurrence of the monitoring event determined by the event selection logic means, the gating means transmitting selected signals from the collector means to the current entry in the ITA when a monitoring event is determined to have occurred by the event selection logic means, and the ITU temporarily storing the internal signals transmitted by the gating means to the ITA, and

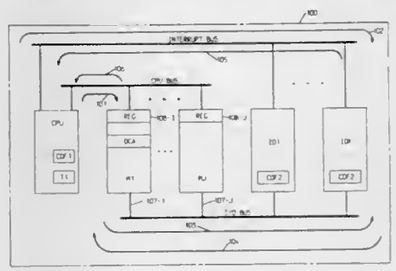
recording means being connected to the ITU for receiving the event monitored data temporarily stored in the ITA entries when the ITA is filled during an event-driven monitoring operation for the processor.

4,821,179

COMMUNICATION SYSTEM CONFIGURATION DETECTION APPARATUS AND METHOD

Craig W. Jensen, Aberdeen; Frederick R. Keller, Howell, both of N.J.; Joel I. Morrow, Brooklyn, N.Y., and Eric A. Roth, Boulder, Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems, Morristown, N.J.

Filed Aug. 8, 1985, Ser. No. 763,636
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **9 Claims**



1. In a data processing system including a processor connected over a CPU bus to a plurality of read/write memories, said memories connected over an I/O bus to an I/O interface and wherein said CPU bus connects to said I/O bus using said memories, a method of selecting one of said memories for enabling communication between said processor and said I/O interface comprising the steps of:

in said processor

selecting in response to a control signal one of said memories as a selected memory using a particular selection rule,

sending an initialize signal to said I/O interface,

checking said selected memory for a response from said I/O interface and

in said I/O interface

determining using said particular selection rule and in response to said initialize signal, which one of said memories is to store said response from said I/O interface.

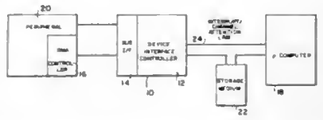
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4,821,180

DEVICE INTERFACE CONTROLLER FOR INTERCEPTING COMMUNICATION BETWEEN A MICROCOMPUTER AND PERIPHERAL DEVICES TO CONTROL DATA TRANSFERS

Eugene P. Gerety, Wolcott, and Jitender K. Vij, Trumbull, both of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,456
Int. Cl.[4] G06F *3/00, 9/22, 13/14, 13/36*
U.S. Cl. 364—200 **6 Claims**



1. Apparatus for use as an interface between a host microcomputer having input/output means and at least one peripheral device which is operated to receive data from and transmit data to said input/output means of said host microcomputer, said peripheral device being provided with a DMA controller having a control bus, an address bus, and a data bus and means for controlling the operation of said peripheral device; said apparatus comprising:

a bus interface having interface means which are separately interconnected to the control bus, the address bus and the data bus of the DMA controller;

a device interface controller coupled to said interface means of said bus interface, said device interface controller having means for monitoring data received via said bus interface and means for storing a general instruction program for controlling said DMA controller, said device interface controller being operative to examine the data received from said DMA controller via said bus interface and to control said DMA controller by means of said general instruction program based upon the examination of the data received therefrom;

data storage means directly coupled between said host microcomputer and said device interface controller for temporarily storing data transmitted between said host microcomputer and said peripheral device;

an interrupt signaling line coupled between said host microcomputer and said device interface controller for providing an interrupt signal to said host microcomputer to transmit and receive data to and from said data storage means, respectively;

wherein said host microcomputer communicates with said device interface controller only via interrupt signals provided on said interrupt signaling line for the transmitting and receiving of data to and from said peripheral device, whereby said microcomputer is less frequently required to respond to teh operation of said DMA controller of said peripheral device due to the interposed control of said DMA controller by said device interface controller.

4,821,181

METHOD FOR CONVERTING A SOURCE PROGRAM OF HIGH LEVEL LANGUAGE STATEMENT INTO AN OBJECT PROGRAM FOR A VECTOR PROCESSOR

Kyoko Iwasawa, Tokyo, and Yoshikazu Tanaka, Saitama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,520
Claims priority, application Japan, Jan. 8, 1986, 61-562
Int. Cl.[4] G06F *9/44*
U.S. Cl. 364—200 **4 Claims**

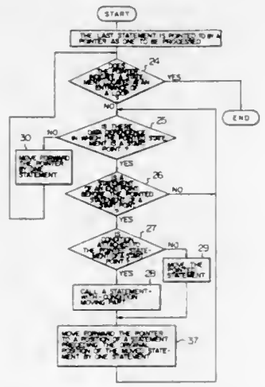
1. A method for computer-converting a loop comprising statements to be iteratively executed included in a source program written in a high-level language, to an object program including vector instructions to be executed by a vector processor, comprising:

(a) a first step of detecting a set of first to third statements

said first statement indicating execution of first data processing to refer to at least one element of array data comprising an ordered set of elements each having an element number;

said second statement being executed after said first statement and indicating whether or not branching is to be done, in accordance with a value of a certain condition expression included in the second statement;

said third statement being executed in a predetermined one of two cases, when branching is indicated by said second statement and when not, and indicating execution of second data processing to define a value of a larger-numbered element of the array data than the element number of the at least one element of the array data referred to in a same loop iteration by said first statement;



(b) a second step of generating, in response to the detection by the first step of the set of first to third statements, a set of vector instructions for executing first to third vector processing;

said first vector processing producing vector data comprised of vector elements, wherein an i-th vector element thereof has a value which the condition expression included in said second statement takes at an i-th iteration of the loop;

said second vector processing either executing or not executing said second data processing designated by said third statement for at least one element of the array data depending on a value of an element of the vector data having a same element number as said at least one element of the array data;

said third vector processing executing said first data processing to each element of the array data after said second vector processing.

4,821,182

MEMORY ADDRESS DECODING SYSTEM

Steven Leininger, Arlington, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Division of Ser. No. 525,167, Aug. 22, 1983, Pat. No. 4,563,676, which is a division of Ser. No. 342,069, Jan. 25, 1982, Pat. No. 4,500,956, which is a division of Ser. No. 261,976, May 8, 1981, Pat. No. 4,430,649, which is a continuation of Ser. No. 926,957, Jul. 21, 1978. This application Sep. 16, 1985, Ser. No. 776,490
Int. Cl.[4] G06F *13/00, 7/00*
U.S. Cl. 364—900 **3 Claims**

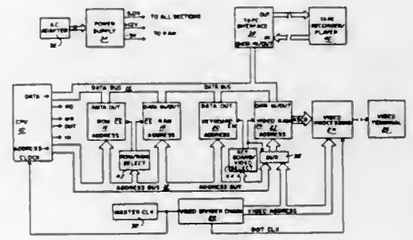
1. For a computer system having a central processing unit, a display means, and a plurality of system memory devices in-

cluding means for storing instructions, a random access memory and keyboard means,

address decoder means responsive to an address code from the central processing unit for providing separate outputs corresponding to different coded inputs representative of different capacity memory,

selection means coupled from the separate outputs of said address decoder means for selecting predetermined outputs from the address decoder means,

wherein the selection means includes a selective shunt means having input terminals coupling to the outputs of said address decoder and output terminals,



wherein said shunt means includes a plurality of shunts coupled between said input and output terminals, said random access memory being selectable in different capacities, said shunts are programmed so that the number of shunts correspond to the capacity of the random access memory,

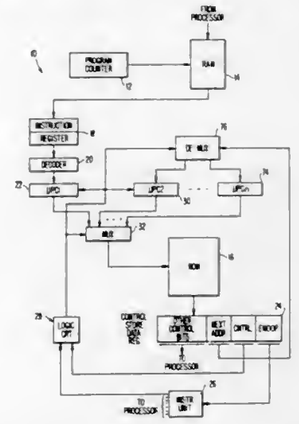
and gate means coupled to the output terminals of said shunt means for providing a plurality of separate enable signals for selection of one of the system memory devices available to the central processing unit.

4,821,183

A MICROSEQUENCER CIRCUIT WITH PLURAL MICROPROGROM INSTRUCTION COUNTERS

Jon F. Hauris, Manassas, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1986, Ser. No. 937,772
Int. Cl.[4] G06F *9/30*
U.S. Cl. 364—200 **3 Claims**



1. An improved microsequencer circuit including a microinstruction counter having a sequential numeric output which is applied to the address input of a microprogram control store memory containing a sequence of micro instructions to be executed, the microsequencer applying address information to said control store memory, the improvement containing:

a first microinstruction counter having an input coupled to an output of said microprogram instruction memory, for receiving an address value corresponding to the initial microinstruction of a primary microinstruction group in said control store memory;

an N-to-1 multiplexer having a first input connected to the output of said first microinstruction counter, having a control input, and having an output connected as the address input to said control store memory;

said control store memory having a primary microinstruction group which includes a plurality of microinstructions, at least one of which includes a destination address field and a subroutine calling field, said control store memory further including a first micro subroutine group consisting of a plurality of microinstructions with a first microinstruction which is addressed by said destination address field of said primary microinstruction group and which further has a subroutine completion field, said control store memory further including a next micro subroutine group whose first microinstruction is addressed by a destination address field in said first micro subroutine group and which further includes a subroutine completed field;

a control store data register having an input connected to the output of said control store memory for receiving destination address field information, subroutine calling field information and subroutine completed field information and having a first output for said subroutine call and said subroutine completion fields connected to said control input of said multiplexer;

a next microinstruction counter having an input connected to a second output of said control store data register for receiving the destination address field output from said control store memory, said next microinstruction counter having an output connected to a next input of said multiplexer;

a logic circuit connected between said first output of said control store data register and said control input of said multiplexer, for controlling, in response to said primary microinstruction group generating a subroutine in said subroutine call field, said multiplexer to disable the output of said first microinstruction counter and enable the output of said next microinstruction counter substantially concurrently with the outputting of a destination address from said primary microinstruction group over said second microinstruction counter, supplying the address for the first microinstruction in the first micro subroutine group stored in said control store memory;

whereby a branched-from microinstruction address is stored in said first microinstruction counter while said first micro subroutine group is being executed.

4,821,184

UNIVERSAL ADDRESSING SYSTEM FOR A DIGITAL DATA PROCESSING SYSTEM

Gerald F. Clancy, Saratoga, Calif.; Craig J. Mundie, Cary; Stephen I. Schleimer, Chapel Hill, both of N.C.; Steven J. Wallach, Saratoga, Calif., and Richard G. Bratt, Wayland, Mass., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 266,530, May 22, 1981, abandoned.
This application Sep. 4, 1984, Ser. No. 647,272
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **19 Claims**

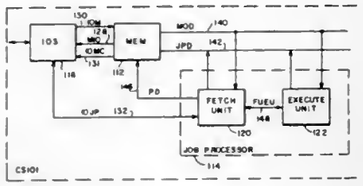
1. In a digital data processing system including at least one local digital data processing system, each said at least one local system including processor means for processing data items in response to instructions, a universal addressing system for addressing said data items comprising:

(1) universal logical memory means accessible to each said at

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least one local system for storing and providing said data items,

(2) memory organization means for organizing said universal memory means into objects uniquely and permanently identified by unique identifiers, each said data item being associated with a said object and addressable by means of a logical address specifying the unique identifier for said object with which said data item is associated and an offset specifying the locations of said data item in said associated object



(3) means in said processor means for providing memory operation specifiers in response to said instructions, said memory operation specifiers each including a logical address and a memory command specifying a memory operation, and

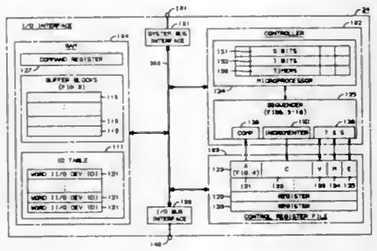
(4) memory operation means responsive to a memory operation specifier for accessing the data item and performing the memory operation specified by the memory command in said memory operation specifier on the data item specified by the logical address in said memory operation specifier.

4,821,185

I/O INTERFACE SYSTEM USING PLURAL BUFFERS SIZED SMALLER THAN NON-OVERLAPPING CONTIGUOUS COMPUTER MEMORY PORTIONS DEDICATED TO EACH BUFFER

Daniel Esposito, Lisle, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed May 19, 1986, Ser. No. 864,835
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 **35 Claims**



1. A processing system comprising:

a plurality of input and output devices;

a memory having a plurality of non-overlapping portions, each portion being contiguous and for storing information; and

an input and output interface connecting the plurality of devices to the memory, the interface including a plurality of buffers, each buffer fixedly mapped to at least one memory portion, the at least one memory portion which is mapped to a buffer being different from memory portions that are mapped to the other buffers, each buffer having a storage size smaller than the size of any memory portion mapped to the buffer, and each buffer for temporarily storing information being transferred between the devices and the at least one memory portion which is mapped to the buffer, the input and output interface including

a control arrangement coupled to the buffers, the control arrangement including

first means responsive to information received from a device seeking access to a destination memory portion, for storing the received information in the buffer mapped to the destination memory portion,

second means cooperative with the first means, for transferring the stored information to the destination memory portion,

third means responsive to a request for information received from a device seeking access to a source memory portion, for obtaining information requested by the requesting device from the source memory portion,

fourth means cooperative with the third means, for storing the requested information in the buffer mapped to the source memory portion, and

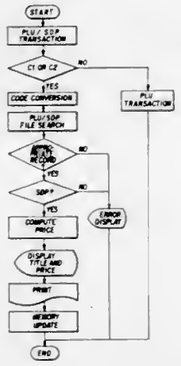
fifth means cooperative with the third means, for transferring the requested information to the requesting device.

4,821,186

BAR CODE READING ELECTRONIC CASH REGISTER HAVING AN AUTOMATIC DISCOUNT FUNCTION

Kazuhiko Munakata, Chiba, and Shigeki Kayama, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 6, 1987, Ser. No. 11,757
Claims priority, application Japan, Feb. 10, 1986, 61-27299
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—405 **6 Claims**



1. An electronic cash register for registering data concerning commodities having an associated source marking bar code including a department code, and commodities having an associated in-store marking bar code including a department code and unit price data, said register comprising:

bar code reading means for reading said source marking and in-store marking bar codes;

first means for storing unit price data corresponding to the department code for each of the commodities having a source marking bar code;

second means for storing discount data corresponding to the department code for at least some commodities having an in-store marking bar code; and

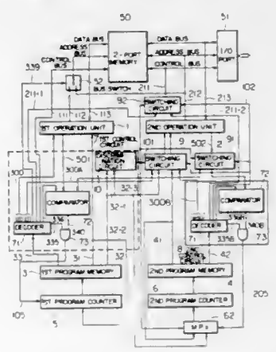
register processing means for: 1) reading from said first means, in accordance with a reading of said source marking bar code by said bar code reading means, unit price data corresponding to the department code contained in the source marking bar code and registering the read data, and 2) reading from said second means, in accordance with a reading of the in-store marking bar code by said bar code reading means, discount data corresponding to the department code contained in said in-store marking bar code, and registering a sum based on the unit price data contained in the in-store bar code as discounted in accordance with the read discount data.

4,821,187

PROCESSOR CAPABLE OF EXECUTING ONE OR MORE PROGRAMS BY A PLURALITY OF OPERATION UNITS

Hirotada Ueda, Kokubunji; Hitoshi Matsushima, Tachikawa; Yoshimune Hagiwara, Hachioji, and Kenji Kaneko, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1985, Ser. No. 794,449
Claims priority, application Japan, Nov. 2, 1984, 59-230247
Int. Cl.[4] G06F *9/28*
U.S. Cl. 364—200 **9 Claims**



1. A processor comprising:

first and second operation means for processing data;

first memory means for storing a first program including microinstructions which control only said first operation means and microinstructions which control both said first and said second operation means;

second memory means for storing a second program including microinstructions which control only said second operation means;

first control means connected to said first memory means for sequentially reading out the microinstructions in said first program, for decoding the read out microinstructions, for supplying first control signals to said first operation means to control said first operation means when the read out microinstructions are the microinstructions which control the first operation means, and for supplying second control signals to control both of said first and said second operation means when the read out microinstructions are the microinstructions which control both said first and said second operation means;

second control means connected to said second memory means for sequentially reading the microinstructions in said second program, for decoding the microinstructions and for supplying third control signals to control only said second operation means; and

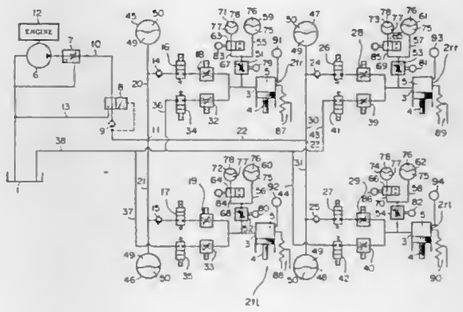
switching means connected to said first and second control means and responsive to a shift microinstruction for selecting said second or third control signals and for thereafter supplying the selected control signals only to said second operation means.

4,821,188

SYSTEM FOR VEHICLE HEIGHT ADJUSTMENT WITH STEERING ANGLE CHANGE RATE CORRECTION

Hiroyuki Ikemoto; Nobutaka Oowa; Yasuji Arai; Osamu Yasuike, all of Toyota, and Shunichi Doi, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Toyota Central Research and Development Laboratories, Inc., both of Aichi, Japan

Filed Oct. 22, 1986, Ser. No. 921,451
Claims priority, application Japan, Oct. 22, 1985, 60-235653
Int. Cl.[4] B60G *17/10*
U.S. Cl. 364—424.1 **3 Claims**



1. For a vehicle comprising a body and a plurality of wheels upon which said vehicle runs, a vehicle height adjustment system, comprising:

(a) a corresponding plurality of actuator assemblies, each corresponding to one of said vehicle wheels and resiliently suspending said one of said vehicle wheels from the vehicle body, each said actuator assembly comprising a pressure chamber and increasing and decreasing vehicle height at a location corresponding to each said vehicle wheel as a result of supply and discharge of working fluid to and from each said pressure chamber;

(b) a corresponding plurality of working fluid supplying and discharging means, each corresponding to one of said actuator assemblies, for supplying and discharging working fluid to and from each said pressure chamber;

(c) a corresponding plurality of vehicle height detection means, each corresponding to one of said vehicle wheels, for sensing each parameter representative of the height of the vehicle body over each corresponding one of said vehicle wheels;

(d) a means for detecting the rate of change of steering angle of the vehicle; and

(e) a computing and control means for controlling said working fluid supplying and discharging means so as to adjust each vehicle height to each standard vehicle height by obtaining each deviation of each actual vehicle height as detected by each said vehicle height detection means from each said standard vehicle height over each said vehicle wheel, performing a prediction calculation of fluctuations in said vehicle height at each wheel caused by vehicle rolling from the rate of change of steering angle as detected by said means for detecting said rate of change of steering angle and the vehicle speed as detected by said vehicle speed detecting means, and carrying out a correction to the adjustment control of each said working fluid supplying and discharging means based upon each said deviation of each said actual vehicle height from each said standard vehicle height by the calculation results.

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4,821,189

METHOD FOR THE DAMPING FORCE ADJUSTMENT OF MOTOR VEHICLES AS A FUNCTION OF OUTPUT SIGNALS OF A TRANSMITTER ARRANGED AT THE VEHICLE BODY

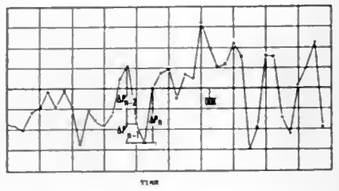
Dieter Hennecke, Reichertshausen; Eugen Herb, Munich; Udo Ochner, Munich, and Bernd Jordan, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 100,893

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1986, 3632920

Int. Cl.[4] B60G *11/26*

U.S. Cl. 364—424.05 9 Claims



1. A method for the damping force adjustment of motor vehicles in dependence on output signals of a transmitter arranged at a vehicle body, which are processed and initiate a signal for changing the damping force when exceeding/dropping below a predetermined threshold value, comprising the steps of adding the changes of the output signals of the transmitter measured in equal intervals with respect to time and determining the same over a measuring period which is considerably larger than the natural period of the vehicle wheels, and comparing the same with a threshold value that is dependent on the load.

4,821,190

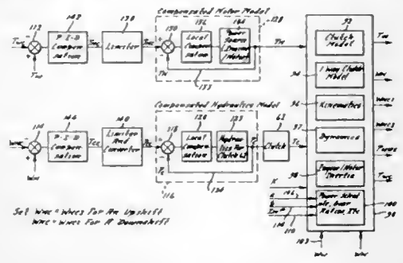
CLOSED LOOP COMPUTER CONTROL FOR AN AUTOMATIC TRANSMISSION

Prabhakar B. Patil, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 867,177, May 27, 1986, Pat. No. 4,799,158. This application Jan. 27, 1987, Ser. No. 6,838

Int. Cl.[4] B60K *41/08;* G06F *15/46*

U.S. Cl. 364—424.1 7 Claims



1. A method for controlling during a drive ratio change the operation of a power source and a transmission, which driveably connects the power source and the drive wheels of a motor vehicle, has a gearset capable of producing multiple drive ratios and a clutch engaged and disengaged to change the drive ratio produced by the transmission, the power source producing torque whose magnitude varies in accordance with a signal supplied to the power source control unit, comprising:

producing a commanded power source speed corresponding to the drive ratio to which the transmission will be shifted;

producing a commanding clutch pressure from the power source torque error derived from the difference between the commanded power source speed and the actual power source speed;

controlling the torque transmitted by the clutch by supplying pressure to the clutch in accordance with the clutch pressure error derived from the difference between the commanded clutch pressure and the actual clutch pressure;

producing a commanded drive wheel torque corresponding to the drive wheel speed demanded by the vehicle operator;

producing a commanded power source torque from the motor type error derived from the difference between the commanded drive wheel torque and the actual drive wheel torque; and

controlling the torque produced by the power source by supplying to the power source control unit a compensated commanded power source error signal derived from the difference between the commanded power source torque and the actual power source torque.

4,821,191

SYSTEM FOR VEHICLE HEIGHT ADJUSTMENT WITH LOADING DEVIATION CORRECTION

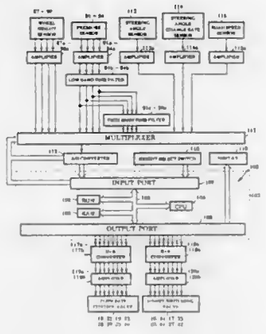
Hiroyuki Ikemoto; Yasuji Arai; Osamu Yasuike; Nobutaka Oowa, all of Toyota, and Shunichi Doi, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Toyota Central Research and Development Laboratories, Inc., both of Aichi, Japan

Filed Oct. 22, 1986, Ser. No. 921,450

Claims priority, application Japan, Oct. 22, 1985, 60-235652

Int. Cl.[4] G60G *17/10*

U.S. Cl. 364—424.1 13 Claims



1. For a vehicle comprising a body and a plurality of wheels upon which said vehicle runs, a vehicle height adjustment system, comprising:

(a) a corresponding plurality of actuator assemblies, each corresponding to one of said vehicle wheels and resiliently suspending said one of said vehicle wheels from the vehicle body, each said actuator assembly comprising a pressure chamber and increasing and decreasing vehicle height at a location corresponding to each said vehicle wheel as a result of supply and discharge of working fluid to and from each said pressure chamber;

(b) a corresponding plurality of working fluid supplying and discharging means, each corresponding to one of said actuator assemblies, for supplying and discharging working fluid to and from each pressure chamber;

(c) a corresponding plurality of loading detection means, each corresponding to one of said vehicle wheels, for sensing each parameter representative of the loading imposed by the vehicle body on each corresponding one of said vehicle wheels;

(d) a corresponding plurality of vehicle height detection means, each corresponding to one of said vehicle wheels, for sensing each parameter representative of the height of the vehicle body over each corresponding one of said vehicle wheels; and

(e) a computing and control means for controlling said working fluid supplying and discharging means based on each deviation of each actual vehicle height as detected by each said vehicle height detection means from a standard vehicle height at each said vehicle wheel, and carrying out each control adjustment of each said actual vehicle height to each said standard vehicle height, while also carrying out a correction to the adjustment control of each said working fluid supplying and discharging means, based upon each deviation of each said actual wheel loading as detected by each said loading detection means from a standard wheel loading for each said vehicle wheel, by an amount substantially sufficient to eliminate each said loading deviation.

4,821,193

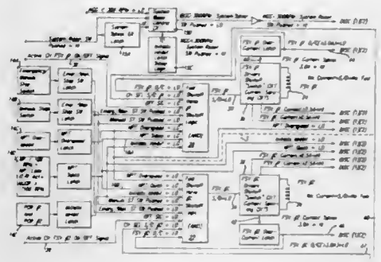
DIGITAL CONTROL FOR GAS TURBINE ENGINE

John H. Barber, West Chester; Curtis L. Brown, Cincinnati, both of Ohio; Vernon R. Duncan, Erlanger, Ky.; Carl E. Knox, Vestal, N.Y., and Roderick D. Owen, Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 26, 1985, Ser. No. 769,516

Int. Cl.[4] G06F *11/00;* G05D *7/06*

U.S. Cl. 364—431.02 6 Claims



1. A dual-change control for a gas turbine engine, comprising:

(a) first and second fuel shutoff valves (FSV's) through which fuel flows in series to the engine, either valve being capable of terminating fuel flow;

(b) first and second AND gate means for

(i) receiving signals indicative of selected engine operating conditions;

(ii) receiving signals indicative of the electric current drawn by each FSV;

(iii) terminating fuel flow through at least one FSV when any one of the signals of

(b)(i) or (b)(ii) attain a predetermined state.

4,821,192

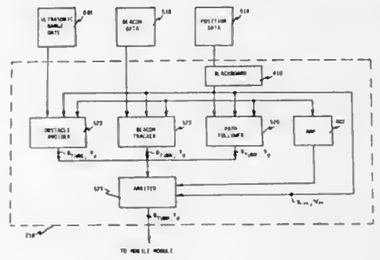
NODE MAP SYSTEM AND METHOD FOR VEHICLE

Amy L. Taivalkoski, Salem, N.H., and Mark B. Kadonoff, Cambridge, Mass., assignors to Denning Mobile Robotics, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 864,442, May 16, 1986. This application Nov. 28, 1986, Ser. No. 936,092

Int. Cl.[4] G06F *15/20;* B62D *1/02*

U.S. Cl. 364—424.02 48 Claims



29. A system for navigating a vehicle from node to node utilizing a map, stored in the vehicle, which defines a plurality of navigation nodes in relation to each other, comprising:

means for directing the vehicle to a first node recorded in the map;

means for referencing the map to identify the known initial direction of a path from said first node to a second node proximate a navigation beacon and to identify the known distance of said path;

detector means for sensing said navigation beacon and for resolving at least the azimuthal angle between a reference direction for the vehicle and the direction of the beacon relative to the vehicle; and

means, responsive to said means for referencing and said detector means, for commanding the vehicle to proceed in said initial direction and to navigate along said path to said second node for said known distance.

4,821,194

CYLINDER COMBUSTION MONITORING APPARATUS

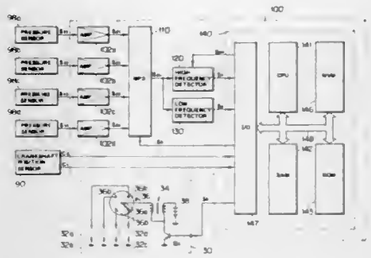
Yoshihisa Kawamura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 10, 1986, Ser. No. 917,893

Claims priority, application Japan, Oct. 22, 1985, 60-235811; Oct. 22, 1985, 60-235812; Oct. 22, 1985, 60-235813; Oct. 22, 1985, 60-235814

Int. Cl.[4] F02P *5/15, 11/00*

U.S. Cl. 364—431.08 12 Claims



1. An apparatus for monitoring cylinder combustion in an internal combustion engine having at least one cylinder to control said engine, comprising:

sensor means sensitive to combustion pressure in said cylinder for providing a sensor signal indicative of a sensed cylinder combustion pressure level;

means coupled through a signal line to said sensor means for

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extracting, from said sensor signal, a knock signal in a predetermined high frequency range and a cylinder combustion pressure signal in a predetermined low frequency range;

a circuit responsive to said high frequency knock signal and said low frequency cylinder combustion pressure signal for providing a failure indication of said sensor signal being unreliable for use in controlling said engine, said circuit including first decision means responsive to an abnormal condition of said high frequency knock signal for providing a first indication, second decision means responsive to an abnormal condition of said low frequency cylinder combustion pressure signal for providing a second indication, and means for providing said failure indication based upon said first and second indications; and

means responsive to said failure indication for controlling said engine independently of said sensor signal.

4,821,195

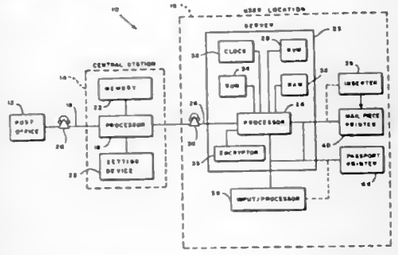
METHOD AND APPARATUS FOR SEQUENTIALLY NUMBERING MAIL PIECES

Patricia B. Baer, Pelham, N.Y.; Kevin D. Hunter, Stratford, Conn.; William G. Hart, Stamford, Conn.; Barry H. Axelrod, Newtown, Conn., and Ronald P. Sansone, Weston, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 813,445, Dec. 26, 1985. This application Dec. 10, 1986, Ser. No. 940,103

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—464.02 **8 Claims**



1. An apparatus for processing and authenticating a plurality of mail pieces, said apparatus including a postage accounting device having a serial number and a register for storing postage value, said apparatus comprising:

means for processing a plurality of mail pieces for mailing including determining the postage required to mail said plurality of mail pieces,

means for subtracting said postage required to mail said plurality of mail pieces form the value stored in said register;

first printing means for printing upon a statement sheet a number representative of postage value residing within said postage accounting device after completion of the processing of a plurality of mail pieces and the serial number of said postage accounting device and

second printing means for printing said number representative of postage value and said serial number as a combined number on said mail pieces, whereby the payment of postage for said mail pieces can be authenticated.

4,821,196

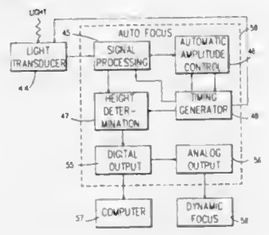
HIGH RESOLUTION AUTOMATIC FOCUS CORRECTION ELECTRONIC SUBSYSTEM FOR E-BEAM LITHOGRAPHY

Thomas K. Collopy, Hopewell Junction, and Donald F. Haire, Verbank, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 20, 1987, Ser. No. 17,114

Int. Cl.⁴ B23Q *15/12*; **G01B** *11/14*

U.S. Cl. 364—468 **7 Claims**



1. An electronic signal processing system for automatic focusing of an E-beam lithography tool with respect to the position of a measured surface comprising,

(a) a transducer having an output,

(b) optical means for providing a focused position image of a source aperture on said transducer, said image moving across said transducer in response to variations of said position of said measured surface,

(c) said transducer converting said position image into an electronic signal,

(d) signal processing means for producing multiple outputs from the electronic signal produced by said transducer having an input connected to said output of said transducer,

(e) said signal processing means including a charge-transfer current-to-voltage converter,

(f) height determination means for providing an analog correction output as a mathematical function of the measured position, and

(g) means for coupling said analog output to an output system connected to means for a focus correction subsystem of an E-beam tool.

4,821,197

APPARATUS AND METHOD FOR PARTS ASSEMBLY

Frank W. Kenik, Wadsworth; Ronald J. Jensen, Libertyville, both of Ill.; James J. Bayer, Kenosha, Wis.; David F. Allgeyer; Richard R. McCarthy, both of Antioch, Ill., and Thomas A. Miceli, Zion, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 22, 1987, Ser. No. 41,302

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—468 **27 Claims**

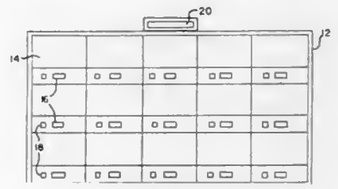
1. A system for assembling selected multiple component assemblies, comprising:

(a) at least one component selection cell having a plurality of component bins, each containing a quantity of components for use in constructing selected assemblies;

(b) numeric display means associated with each bin for display of component quantities required for the selected assembly model;

(c) means associated with each numeric display for clearing the respective numeric display and for generating a control signal in response to clearing of all numerical displays of a cell for a selected assembly model; and

(d) control means for controlling the numeric displays responsive to entry of a selected assembly model number and for entry of a schedule of selected assemblies to be successively assembled whereby the control means inhibits activation of the numeric displays for succeeding assemblies until the generation of the control signal.



4,821,198

APPARATUS FOR READING OUT WORK MACHINING DATA WRITTEN IN A MEMORY MODULE ATTACHED TO A PALLET WHEN THE PALLET IS MOVED TO A MACHINE TOOL

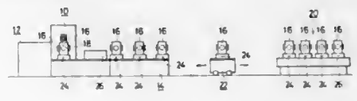
Kunihiko Takeuchi, Kawasaki, and Masao Oba, Yokohama, both of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Filed May 11, 1987, Ser. No. 48,632

Claims priority, application Japan, May 30, 1986, 61-125448

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—468 **8 Claims**



1. A data processing apparatus of a factory automation system comprising:

a memory module for storing machining data which is attached to a pallet having at least one workpiece which is automatically moved to a machine tool; and

a write/readout unit for writing machining data input from an NC storage medium into said memory module and for reading out said machining data stored in said memory module when said pallet is automatically moved to said machine tool and for setting the readout machining data into a controller of said machine tool; wherein said write/-readout unit comprises:

a control means for controlling the writing of said data into said memory module or the reading of said data from said memory module;

a frequency converting means for converting output data from said control means to said memory module into serial data and thereafter converting said serial data into a frequency multiplexed signal having two different frequencies in response to data bits and for outputting said frequency multiplexed signal;

an induction coupling transmitting means which is driven by said frequency multiplexed signal output from said frequency converting means;

an induction coupling receiving means for receiving said frequency multiplexed signal converted from said data from said memory module; and

a demodulating means for converting said frequency multiplexed signal obtained from said induction coupling receiving means into data and for outputting such data to said control means.

4,821,199

APPARATUS FOR ADJUSTING THE LENGTH AND THE MESH STRUCTURE OF KNITTED ARTICLES

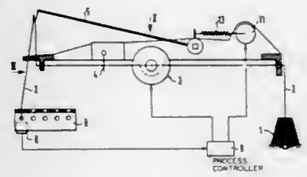
Gottfried Kühnert, Aalen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 29,292

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609719

Int. Cl.⁴ G06F *15/46*; **D04B** *15/48*

U.S. Cl. 364—470 **1 Claim**



1. An apparatus for adjusting the length and mesh structure of knitted articles produced on a flat bed knitting machine comprising yarn guide eyelet means, yarn supply means for supplying at least one yarn to said yarn guide eyelet means, spring biased yarn braking means and spring biased yarn retracting means adapted to engage said at least one yarn between said yarn supply means and said yarn guide eyelet means, each of said spring biased yarn braking means and said spring biased yarn retracting means having electrically controlled means connected thereto for controlling the respective spring force, yarn tension sensing means being disposed between said spring biased yarn retracting means and said yarn guide inlet means for measuring the actual yarn tension of said at least one yarn and providing an electrical signal indicative of said actual yarn tension, and microprocessor means having a value indicative of desired yarn tension stored therein connected to said electrical control means for each of said spring biased means and said yarn tension sensing means for controlling the spring force of at least one of said spring biased means in response to an electrical signal generated by said microprocessor in response to a comparison of actual yarn tension with desired yarn tension.

4,821,200

METHOD AND APPARATUS FOR MANUFACTURING A MODIFIED, THREE-DIMENSIONAL REPRODUCTION OF A SOFT, DEFORMABLE OBJECT

Kurt Öberg, Jönköping, Sweden, assignor to Jonkopings Lans Landsting, Jonkoping, Sweden

Filed Apr. 2, 1987, Ser. No. 34,228

Claims priority, application Sweden, Apr. 14, 1986, 8601671

Int. Cl.⁴ G06F *15/46*; **G06G** *7/64*

U.S. Cl. 364—474.24 **12 Claims**

1. Method of producing a modified, three-dimensional reproduction of a soft, elastically deformable object, characterized by the following measures:

(a) positioning the object in a predetermined position in respect of a rotatable framework on which a laser apparatus and a video camera are mounted to illuminate and receive, respectively, the image of a contour line of the object, via at least one mirror each, when the framework is rotated through one complete revolution;

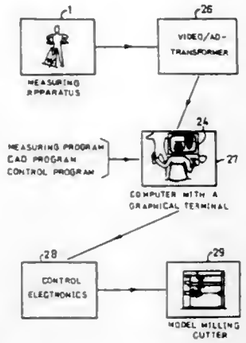
(b) intermittently rotating said framework stepwise to produce an analog signal based on the image recorded by said video camera for each step;

(c) converting the image of the contour line thus obtained at each step through a video/AD-converter into numerical information identifying coordinates of points on the contour line;

(d) supplying said numerical information together with

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measuring and control programs to a computer, preferably having a graphical terminal;
(e) modifying said numerical information supplied to the computer according to the measuring program as modified according to a CAD program in agreement with a calculated deformation of the object on account of a precalculated load;
(f) applying the output signals from the computer as input signals to a control electronic unit;
(g) controlling by said control electronic unit a model manufacturing machine having tool in such a way that said tool

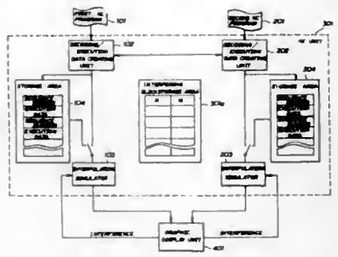


on a work-piece produces a contour line which conforms to the modified contour line of the object for each step;
(h) continuing said intermittent rotation of the framework including laser apparatus and video camera stepwise through a predetermined fraction of a revolution until the framework has been rotated through at least almost one complete revolution; and
(i) intermittently rotating the model workpiece stepwise in relation to the tool of the model manufacturing machine in the same way as the framework, is rotated in relation to the object, for producing a modified reproduction of the object.

4,821,201
METHOD OF REVISING NC PROGRAM FOR FOUR-AXIS LATHES

Hideaki Kawamura; Takao Sasaki, and Teruyuki Matsumura, all of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00624, § 371 Date Aug. 3, 1987, § 102(e) Date Aug. 3, 1987, PCT Pub. No. WO87/03524, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 10, 1986, Ser. No. 103,581
Claims priority, application Japan, Dec. 10, 1985, 60-277746
Int. Cl.[4] G06F *15/46;* G05B *19/42*
U.S. Cl. 364—474.2 **8 Claims**

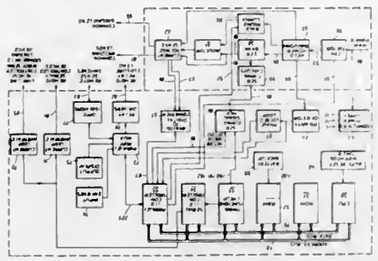


1. A method of revising NC programs for a four-axis lathe in which there are provided first and second NC programs corresponding to first and second tool rests, respectively, the first and second NC programs each having wait commands, wherein a workpiece is machined by controlling movement of the first and second tool rests independently in accordance with the first and second NC programs, respectively, while synchronization is achieved by the wait commands, said method comprising the steps of:
(a) executing interpolative simulations one block at a time in successive fashion based on the first and second NC programs when an interference check is made;
(b) checking whether tools on the first and second tool rests interfere with each other during said step (a);
(c) when it is determined in said step (b) that there is interference, halting the interpolative simulations and moving the two tool rests back to the beginning of blocks in which the interference occurred;
(d) holding the interpolative simulation according to one of the first and second NC programs in the halted state and executing the interpolative simulation according to the other of the first and second NC programs to move solely the corresponding tool rest along a path in the block in which the interference occurred while checking for interference;
(e) when no interference is found when moving solely the one tool rest in said step (d), storing sequence numbers of the first and second programs which prevailed when interference occurred; and
(f) automatically revising the NC programs after the interference check by inserting a wait command ahead of the sequence number of the NC program for which the interpolative simulation was halted in said step (d), and inserting a wait command after the sequence number of the NC program for which the interpolative simulation was executed in said step (d).

4,821,202
APPARATUS MICROPROCESSOR CONTROLLED WELDING

Clint A. Davis, League City, and Melvin P. Trail, Houston, both of Tex., assignors to Beckworth Davis International, Inc., Houston, Tex.

Continuation of Ser. No. 817,258, Jan. 8, 1986, abandoned, which is a continuation of Ser. No. 762,696, Aug. 5, 1985, abandoned, which is a continuation of Ser. No. 469,519, Feb. 24, 1983, Pat. No. 4,561,059. This application Jun. 27, 1986, Ser. No. 879,318
The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.
Int. Cl.[4] G06F *15/46;* B23K *9/10*
U.S. Cl. 364—477 **29 Claims**

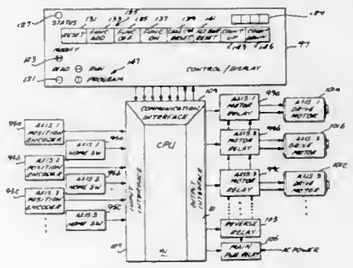


1. A microprocessor-controlled arc-welding apparatus, comprising:
a transformer coupled to a source of electrical energy;
a solid state control device coupled to the transformer for controlling the amount of electrical energy that is permitted to pass through the control device, the solid state control device being coupled to welding leads, the solid state control device being operable to produce a welding signal at the welding leads where the current or voltage of the welding signal is determined by the solid state control device, the solid state control device being responsive to a control signal to determine the current or voltage of the welding signal;
a control loop including:
(a) a sensor coupled to a welding lead for sensing the welding signal;
(b) a memory;
(c) a microprocessor coupled to the sensor and to the memory, the microprocessor being adapted to read signals representative of the welding signal sensed by the sensor, the microprocessor, in accordance with a program stored in the memory, being operable to compare the signals representative of the welding signal sensed by the sensor with control data in memory, the microprocessor being coupled in the control loop and operable to develop a control signal to signal the solid state control device to control the current or voltage of the welding signal produced by the solid state control device so that the welding signal has a current or voltage which is determined by the microprocessor in cooperation with the program stored in the memory; and,
whereby said control loop is operable to directly control the welding signal in accordance with the program stored in the memory.

4,821,203
COMPUTER ADJUSTABLE CASE HANDLING MACHINE

Bernard J. Carlton, Moxee, and David R. Downs, Yakima, both of Wash., assignors to Marq Packaging Systems, Inc., Yakima, Wash.

Filed May 12, 1987, Ser. No. 49,285
Int. Cl.[4] G06F *15/46;* B31B *3/02*
U.S. Cl. 364—478 **12 Claims**

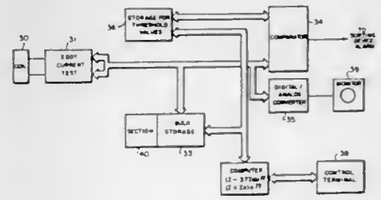


1. In a case handling machine having a plurality of elements each movable along linear axes, the positions of said movable elements along their respective linear axes being determined by the size of a case to be handled by the machine, the improvement comprising a programmable controller including:
(a) a plurality of electromechanical means, one of said electromechanical means coupled to each of said movable elements for moving said movable element along its linear axis;
(b) a plurality of sensing means, one of said sensing means directly coupled to each of said movable elements for directly sensing the position of said movable element along its linear axis, each of said plurality of sensing means including a wire encoder for directly sensing the position of a related movable element along its linear axis, said wire encoders including an encoder body attached to the structure of said case handling machine and a wire extending from said encoder body to the related movable element; and,
(c) a control system coupled to said plurality of sensing means for receiving movable element position data from said plurality of sensing means and coupled to said plurality of electromechanical means for controlling the position of said movable elements, said control system including a programmable central processing unit (CPU) and a control-display unit (CDU) for operator communication with the CPU, said programmable CPU including:
(1) a modify box parameters subroutine that allows an operator to use the CDU to input to the CPU the position of each movable element for each box size to be handled, said CPU storing said movable element position data based on a box number identifier for each box size; and
(2) a move to box position subroutine that uses the box number identifiers to access the movable element position data stored by the CPU for each box size and use the movable element position data to control the position of the movable elements.

4,821,204
METHOD AND DEVICE FOR TESTING FOR FLAWS WITH THE EDDY-CURRENT PRINCIPLE

Gerhard Hüschelrath, Laufach--Frohnhofen, Fed. Rep. of Germany, assignor to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,104
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3542159
Int. Cl.[4] G06F *15/20;* G01N *27/82*
U.S. Cl. 364—481 **13 Claims**



1. A method for determining faults in an electrically conductive testing material having an unknown fault structure comprising the steps of:
detecting a plurality of eddy-currents established in a fault-free test specimen;
converting said plurality of detected eddy-currents into digital values, each digital value representing a complex number in a complex plane;
determining a threshold envelope corresponding to said digital values, said threshold envelope determining step including the steps of:
determining an area in said complex plane in which said digital values occur,
calculating coordinates in said complex plane for a center of gravity corresponding to said digital values,
calculating a phase angle between one axis of said complex plane and a longitudinal axis of said area,
displacing said center of gravity to an origin of said complex plane,
rotating said longitudinal axis by said phase angle toward the one axis of said complex plane,
generating said threshold envelope which encloses said area, and
displacing said threshold envelope by said coordinate of said center of gravity and rotating said displaced threshold envelope by said phase angle;
detecting at least one eddy-current established in said testing material;

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converting said at least one detected eddy-current into a second digital value; and

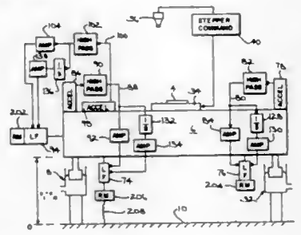
comparing said second digital value with said threshold envelope to determine if a fault exists in said testing material.

4,821,205

SEISMIC ISOLATION SYSTEM WITH REACTION MASS

Herman P. Schutten, Whitefish Bay, Wis., and Arnold Weiss, Minneapolis, Minn., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 30, 1986, Ser. No. 869,107
Int. Cl.[4] F16M *13/00*
U.S. Cl. 364—508 **18 Claims**



1. A seismic isolation system for isolating a body (**6**) of mass m from vibrations of a reference (**10**) comprising:

a first reaction mass (**206**) capable of movement different from those of both said body and said reference;

first force applying means (**74**) for applying a force between said first reaction mass and one of (a) said body and (b) said reference;

support means (**208**) for supporting said first reaction mass relative to the other one of (a) said body and (b) said reference;

accelerometer means (**86**) coupled to said body for sensing absolute inertial acceleration of said body and producing an acceleration signal accordingly:

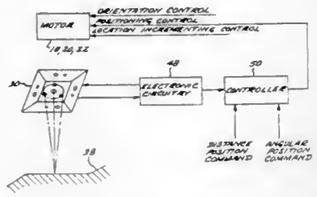
means receiving said acceleration signal for communicating it to said force applying means to control said force applying means to isolate said body by applying force against said acceleration.

4,821,206

ULTRASONIC APPARATUS FOR POSITIONING A ROBOT HAND

Arvind Arora, Moorpark, Calif., assignor to Photo Acoustic Technology, Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 675,424, Nov. 27, 1984, Pat. No. 4,718,023. This application Oct. 23, 1987, Ser. No. 111,879
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—513 **17 Claims**



1. Apparatus for precisely positioning a movable portion of a robot device with respect to a surface, comprising:

means for emitting an emitted signal toward the surface;

means for receiving a return signal originating at the surface as a result of the emitting signal striking the surface, said means for receiving being mounted on the movable portion of the robot device and including at least two signal receivers;

means for comparing the time of flight of the return signal received by two compared signal receivers to create a measured comparison signal proportional to the difference between the respective times of flight of the return signals for the two compared receivers; and

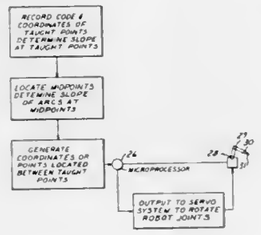
means for adjusting the movable portion of the robot device to maintain the measured comparison signal equal to a predetermined value of the comparison signal and for establishing the angular orientation of the movable portion of the robot device with respect to the surface.

4,821,207

AUTOMATED CURVILINEAR PATH INTERPOLATION FOR INDUSTRIAL ROBOTS

Loo Ming, Ann Arbor, and Veljko Milenkovic, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 28, 1987, Ser. No. 43,581
Int. Cl.[4] G06F *15/46*; G05B *19/415, 19/42*
U.S. Cl. 364—513 **13 Claims**



1. A method for generating a path in cartesian space from a sequence of points located on connected circular arcs to be traversed by the end effector of an industrial robot comprising:

recording the coordinates of a low number of taught points located on the path to be traversed, at perceived changes of curvature of the path;

determining at each taught point the slope u_i of a stroke connecting consecutive taught points;

determining the location of a set of midpoints M_i, each located in the plane that is midway between first and second consecutive taught points P_i and P_{i+1};

determining at each midpoint the common tangent of two circular arcs, the first arc passing through the first taught point and the midpoint and having its tangent at the first taught point coincident with the slope thereat, the second arc passing through the midpoint and the second taught point and having its tangent at the second taught point coincident with the slope thereat;

determining in accordance with the desired velocity of the end effector at a generated point the step distance between successive generated points;

determining the location of a relatively large set of next generated points G_{j+1}, each generated point being located on a circular arc passing through a current generated point G_j and a taught point P_i, whose slope is the corresponding unit direction vector u_i, such that the distance from G_j to G_{j+1} is substantially equal to or greater than the corresponding step distance;

repeating the step of determining the position of generated points until the distance from G_j to G_{j+1} is substantially equal to the step distance; and

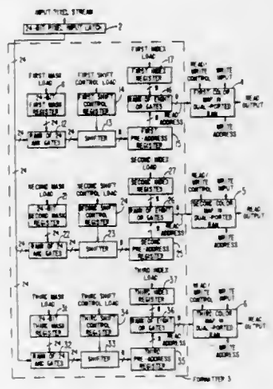
moving the angular position of the joints of the robot in accordance with the location of the generated points whereby the end effector traverses the path that connects the generated points.

4,821,208

DISPLAY PROCESSORS ACCOMMODATING THE DESCRIPTION OF COLOR PIXELS IN VARIABLE-LENGTH CODES

Lawrence D. Ryan, Princeton Junction, N.J.; James V. Sherrill, Andersonville, Tenn.; Robert D. Shedd, Swarthmore, Pa., and Gerald T. Caracciolo, Bordentown, N.J., assignors to Technology, Inc., Princeton, N.J.

Filed Oct. 14, 1986, Ser. No. 918,305
Claims priority, application United Kingdom, Jun. 18, 1986, 8614876
Int. Cl.[4] G06F *3/153*; G09G *1/28*
U.S. Cl. 364—518 **38 Claims**



1. A display processor for conditioning pixel data for use by a utilization means such as a kinescope, said processor comprising:

a first color map memory addressable by a first read address of p bits during its reading, p being a positive integer;

a first pre-address register for temporarily storing a p-bit first pre-address;

means for generating from said p-bit first pre-address said first read address;

a second color map memory addressable by a second read address of q bits during its reading, q being a positive integer;

a second pre-address register for temporarily storing a q-bit second address;

means for generating from said q-bit second pre-address said second read address;

a pixel input latch having a minimum width of (p+q) bits into which the data for respective pixels are serially loaded;

means for selecting from the contents of said pixel input latch a first number of bits from adjacent bit places, said first number being no larger than p;

means for applying the first number of bits in justified format to said first pre-address register as at least a portion of said first pre-address and applying ZEROs as any remaining portion of said first pre-address, to be temporarily stored in said first pre-address register;

means for programmably selecting from the contents of said pixel input latch second number of bits from adjacent bit places, said second number being no larger than q; said means for programmably selecting a second number of bits being of a type in which there is a choice of which bit places are to be included in said second number that is independent of which bit places are included in said first number;

means for applying the second number of bits in justified format to said second pre-address register as at least portion of said second pre-address and applying ZEROs as any remaining portion of said second pre-address, to be temporarily stored in said second pre-address register; and

means coupled to said first and second color maps memories for applying data read from said color map memories to said utilization means.

4,821,209

DATA TRANSFORMATION AND CLIPPING IN A GRAPHICS DISPLAY SYSTEM

Bruce C. Hempel, Tivoli, and Bob C. Liang, West Hurley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 21, 1986, Ser. No. 821,363
Int. Cl.[4] G06F *15/68, 15/72*
U.S. Cl. 364—518 **7 Claims**

1. A display processor for selectively providing transformation, clipping and mapping processes in a graphics display system comprising, in combination;

a plurality of registers for storing branch addresses relating to said transformation, clipping and mapping processes;

one of said registers being associated with each of said processes,

means for branching to the value of one of said registers in accordance with the process being performed;

means for determining the dimensions of a figure to be displayed;

means for determining whether said figure is to be transformed;

means for providing transformation of said figure;

means for determining whether said figure is to be clipped against a predetermined clipping enclosure;

means responsive to said last named determining means for clipping said figure against said predetermined clipping enclosure; and

means for drawing said figure as a series of vectors for display on a display device in said graphic display system whereby the control decision for selective transformation, clipping and mapping processes is performed only when the transformation, clipping and mapping parameters are modified.

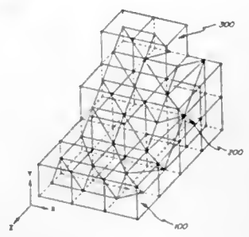
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4,821,210

FAST DISPLAY OF THREE-DIMENSIONAL IMAGES

James E. Rumbaugh, Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Apr. 2, 1987, Ser. No. 33,309
Int. Cl.[4] G06F 3/14
U.S. Cl. 364—518 6 Claims



1. In an object displaying method for displaying a three dimensional object located within a volume being examined on a two dimensional viewplane including the steps of representing said volume by a plurality of volumetric cells defined by a set of data values at the vertices of said cells; generating different representative polygonal surfaces within said cells to represent said object based on said set of values, said polygonal surfaces being located within their associated cells, and sequentially displaying said polygonal surfaces to form a three dimensional image of said object, an improved polygonal surface displaying method for sequentially displaying said polygonal surfaces so that each surface displayed is unobscured by any previously displayed surface with respect to said selected viewplane comprising the steps of:

organizing, prior to said polygonal generating step, said cells to conjointly represent said volume by arranging them contiguous to each other and forming a plurality of parallel, planar arrays;

scanning said cells, prior to said polygon generating step, to provide said cells in a predetermined scan sequence for performance of said polygon surface generating step, said cells with their associated polygonal surfaces being displayed in the predetermined scan sequence such that the step of sequentially displaying said polygonal surfaces comprises the substeps of:

sequentially displaying said cells by planar arrays starting with the array most distant from said viewplane and proceeding to the array closest to said viewplane;

within each said displayed array, displaying said cells by rows starting with the row most distant from said viewplane and proceeding to the row closest to said viewplane;

within each said row, displaying said cells in order of decreasing distance from said viewplane; and

for each cell, displaying the polygonal surfaces within said cell.

4,821,211

METHOD OF NAVIGATING AMONG PROGRAM MENUS USING A GRAPHICAL MENU TREE

Robert J. Torres, Colleyville, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 19, 1987, Ser. No. 122,861
Int. Cl.[4] G09G 1/14
U.S. Cl. 364—521 12 Claims

1. A method for the interactive visual presentation in graphical form of the menu hierarchy of one or more computer programs on one or more computer systems and navigation from one menu in the hierarchy to another comprising the steps of:

while displaying a menu in a currently active computer program, monitoring a user input requesting the display of a menu hierarchy, and in response to said input, displaying the menu hierarchy of said currently active computer program in a graphical tree structure;

highlighting in the graphical tree structure the menu displayed at the time the user requested the display of the menu hierarchy; and



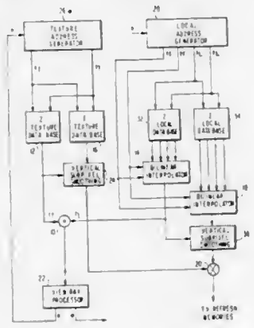
monitoring the position of a pointing device on said graphical tree structure and, in response to a selection by a user input, performing an operation on a menu in said hierarchy at the position of said pointing device.

4,821,212

THREE DIMENSIONAL TEXTURE GENERATOR FOR COMPUTED TERRAIN IMAGES

Robert A. Heartz, DeLand, Fla., assignor to General Electric Company, Syracuse, N.Y.

Filed Aug. 8, 1984, Ser. No. 638,707
Int. Cl.[4] G09B 9/08
U.S. Cl. 364—521 8 Claims



1. In combination in a system for the real-time computer generation and display of visual scenes:

(a) display means;

(b) first memory means for storing a grid data base of elevation posts at predetermined intervals for the visual scene to be generated;

(c) second memory means for storing a grid data base of display data for corresponding ones of said elevation posts;

(d) view ray generator means for defining a horizontal field of view as a predetermined number of sweeps perpendicular to a boresight at a view point, incrementing the change in range R from the view point and defining for each sweep the changes ΔX and ΔY in said elevation post data base, accumulating ΔX and ΔY to generate an X,Y data base address for reading from said first memory means the elevation data for that address, stepping a view ray down for each range increment ΔR by an increment of $\Delta R \text{Tan}\phi_m$ where ϕ_m is the view angle for the mth view ray, stepping the distance between sweeps by the increment $\Delta R \Delta \text{Tan}\phi$ for each range increment, ΔR, comparing

at each range increment the accumulated elevation value of the view ray with an elevation value input for said X,Y data base address, and if a view ray strikes an elevation post, reading display data for that post from said second memory means to said display means, otherwise reading the elevation data for the next elevation post from said elevation post data base and repeating said comparison;

(e) first and second interpolator means through which said elevation data and display data are respectively read to provide interpolated values of elevation and display data with interpolation levels varying inversely with range;

(f) third and fourth memory means respectively storing elevation data and display data values for a texture data base corresponding to a substantial part or all of said grid data base; and

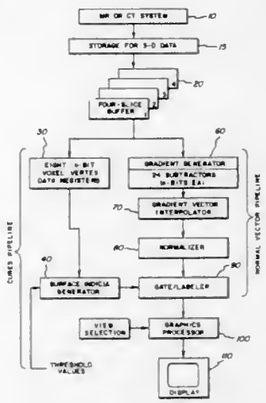
(g) means for reading from said texture data base delta values of elevation data and display data, adding the delta value and interpolated value of elevation data and applying the sum as the elevation value input for said X,Y data base address in said view ray generator, and multiplying the delta value and interpolated value of display data and applying the product as the display data input to said display means, thereby to add three-dimensional texture to the visual scene as represented on said display means.

4,821,213

SYSTEM FOR THE SIMULTANEOUS DISPLAY OF TWO OR MORE INTERNAL SURFACES WITHIN A SOLID OBJECT

Harvey E. Cline, Schenectady; Siegwalt Ludke, Scotia, and William E. Lorensen, Ballston Lake, all of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed Dec. 19, 1986, Ser. No. 943,359
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] G06F 3/14
U.S. Cl. 364—522 5 Claims



1. A system for displaying three-dimensional surface structures, said system comprising:

means for storing three-dimensional signal patterns representative of a value of at least one physical property of a three-dimensional body at each of regularly spaced parallelopiped grid locations each defining a volume element within said body;

means for retrieving signal pattern values associated with said parallelopiped volume elements;

means for comparing signal pattern values associated with a volume element with at least two threshold values, to generate an indicia of the relationship between each volume element and internal surface features of said body as defined by said threshold values;

means for generating a normal vector to one side at said surface at each of said grid locations;

means for associating a three-dimensional location of each of said grid locations with said normal vector generated for the surface at that grid location;

means for associating said volume element surface indicia with said normal vectors; and

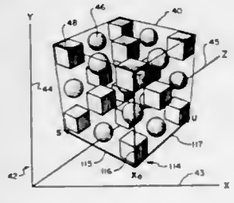
display processor means for receiving said locations and said normal vectors and providing a shaded image, said image representing at least one select surface.

4,821,214

COMPUTER GRAPHICS METHOD FOR CHANGING THE SHAPE OF A GEOMETRIC MODEL USING FREE-FORM DEFORMATION

Thomas W. Sederberg, Orem, Utah, assignor to Brigham Young University, Provo, Utah

Filed Apr. 17, 1986, Ser. No. 853,010
Int. Cl.[4] G06F 15/62
U.S. Cl. 364—522 17 Claims



1. A method of using a computer graphic system for changing the shape of a geometric model using a free-form deformation, said method comprising the steps of:

inputting to a CPU and storing geometric data defining an undeformed model in reference to a global coordinate system;

inputting to said CPU and storing a local coordinate system which defines a region of said model to be deformed;

said CPU defining in response to a user command a grid of control points for controlling deformation of that portion of said model within said region;

specifying at a user terminal a deformation to be applied to a portion of the model in said region by displacing one of said control points relative to one other control point of said grid;

said CPU retrieving said geometric data and transforming said retrieved data so that it is expressed in terms of said local coordinate system;

said CPU identifying which portion of said retrieved geometric data is within said region;

said CPU determining and storing a deformed position of the retrieved geometric data within said region by applying a deformation function to said transformed geometric data identified as within said region, where said deformation function is a trivariate vector rational polynomial for mapping said retrieved geometric data from said local coordinate system into said global coordinate system, and where each said displaced control point is a coefficient of said polynomial; and

said CPU displaying said model as changed according to the deformation specified by each said displaced control point.

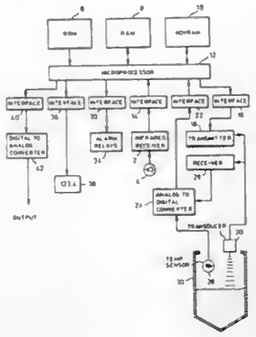
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4,821,215

MONITORING EQUIPMENT FOR ADVERSE ENVIRONMENTS

Steven J. Woodward, Port Hope, Canada, assignor to Canadian Corporate Management Company Limited, Peterborough, Canada

Filed Oct. 3, 1986, Ser. No. 916,013
Int. Cl.[4] G01S *15/46*; G06F *15/74*
U.S. Cl. 364—550 6 Claims



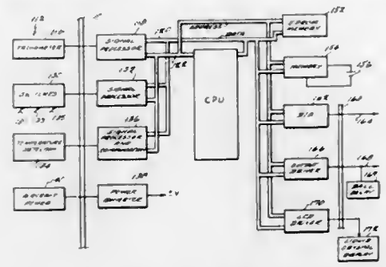
1. A unit providing at least one monitoring function for an industrial installation comprising an environmentally sealed casing, said casing having sealed window means providing the sole direct user interface to the unit, and containing a computer comprising a microprocessor, a read only memory accessible by the microprocessor and containing a stored program dedicating the microprocessor to at least one predetermined monitoring function, a human readable visual data display device within the casing and visible through said window means, a radiation transducer within the casing and responsive to data modulated radiation of a type to which at least part of the casing is transparent, at least one first peripheral interface element and second and third peripheral interface elements, said first, second and third peripheral interface elements interfacing the microprocessor respectively to connections for at least one monitoring transducer external of the casing and associated with said installation, to said data display device, and to said radiation transducer, a first random access memory accessible to the microprocessor and providing working memory and temporary data storage therefor, a second non-volatile random access memory accessible to the microprocessor and providing storage for data relating to normally constant parameters of said at least one monitoring function, said stored program consisting of a first normally active portion configuring the computer to carry out the at least one monitoring function of the unit, said portion accessing said second memory only for the reading of said normally constant parameters from defined locations therein, and a second normally inactive portion operative to decode signals received from the radiation transducer by the third peripheral interface unit to recover data representing said normally constant parameters, and to store said data in said defined locations in said second memory responsive to said signals, the third peripheral interface element including means responsive to receipt of signals from the radiation transducer to activate said second program portion; said unit further including a portable keypad comprising plural keys and means including a radiation source to generate data modulated radiation according to which of said plural keys is depressed, the casing including a dock to receive said unit with said radiation source in alignment with and adjacent said radiation transducer.

4,821,216

MULTIFUNCTION METER FOR USE IN AN AIRCRAFT

John S. Howell, and Robert L. Hartung, both of Fort Worth, Tex., assignors to Howell Instruments, Inc., Fort Worth, Tex.

Filed Apr. 10, 1987, Ser. No. 36,902
Int. Cl.[4] G08B *21/00*; G01C *23/00*
U.S. Cl. 364—551.01 43 Claims



1. An indicator assembly for an aircraft that has an engine, said induction assembly comprising:

selecting means for selecting one of a plurality of information values to be displayed, said plurality of information values including information values indicative of: (a) temperature of said engine, (b) revolution rate of said engine, and (c) temperature of said engine as a function of revolution rate of said engine;

processing means, coupled to signals indicative of a temperature and a revolution rate of said engine, for determining a current value of said one information value based on at least one of said temperature and said revolution rate of said engine, and producing a display signal indicative thereof; and

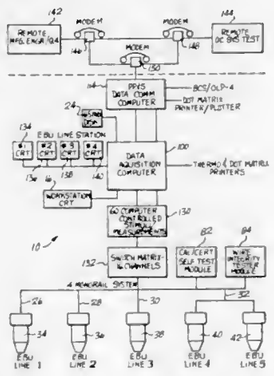
display means for producing a display output based on said display signal.

4,821,217

PROGRAMMABLE JET ENGINE TEST STATION

Brian K. Jackson, Lynnwood, and Joel D. Wilson, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 12, 1987, Ser. No. 2,413
Int. Cl.[4] G06F *15/20, 15/36*; G01M *15/00*
U.S. Cl. 364—551.01 6 Claims



1. For use in connection with a jet aircraft engine having certain electrical and pneumatic systems including oil and fuel pressure transducers, engine igniters, and EEC computer, air bleed valves, air-operated starter and thermo/anti-ice valves, and certain solenoids, a test station for automatically performing on-ground tests of such electrical and pneumatic systems when said engine is in a static, nonrunning condition, such station comprising:

a programmable data acquisition computer;

input means, controllable by said computer, and operable to provide a certain test stimulus to any one of said electrical and pneumatic systems;

output means, operatively connected to said computer, for sensing response of said any one of said systems to said test stimulus, in a manner so that computer may generate test data indicative of such response; and

wherein said computer includes programming means operable by a test station user for permitting said user to select said certain test stimulus and to cause said computer to control said input means in accordance with said selected stimulus, and further, said programming means being operable by said user to control generation of test data by said computer, such data indicating system response to said test stimulus.

4,821,218

METHOD AND APPARATUS FOR DETERMINING AT LEAST ONE CHARACTERISTIC VALUE OF MOVEMENT OF A BODY

Edmund R. Pötsch, Augsburgerstrasse 41, D-8901 Königsbrunn, Fed. Rep. of Germany

PCT No. PCT/EP85/00446, § 371 Date May 5, 1986, § 102(e) Date May 5, 1986, PCT Pub. No. WO86/01607, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 4, 1985, Ser. No. 867,188
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432596
Int. Cl.[4] G01P *15/08*; G01C *22/00*
U.S. Cl. 364—566 19 Claims

1. An apparatus for determining at least one characteristic value of movement (acceleration, velocity, distance covered) of a moving body comprising:

(a) a housing detachably mounted on said moving body independent of a vertical direction of attachment to said moving body;

(b) a sensor means arranged in said housing and including a pendulum suspended in said housing for free deflection about a horizontal axis in a direction opposite to a direction of movement of said moving body;

(c) a transducer means connected with said sensor means for generating electrical signals in response to any said deflection of said pendulum;

(d) a processing means for continuously receiving said electrical signals, for continuously solving a differential equation of oscillation of said pendulum based on said electrical signals and for continuously calculating said at least one characteristic value of movement; and

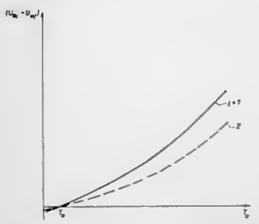
(e) a display means for displaying said at least one characteristic value of movement calculated by said processing means.

4,821,219

METHOD FOR THE CONTACTLESS MEASURING OF TEMPERATURE WITH A MULTI-CHANNEL PYROMETER

Ulrich Kienitz, and Christian Schiewe, both of Dresden, German Democratic Rep., assignors to VEB Messgeraetewerk "Erich Weinert" Magdeburg, Betrieb des Kombinates, Magdeburg, German Democratic Rep.

Filed Jun. 17, 1986, Ser. No. 875,124
Claims priority, application German Democratic Rep., Jul. 30, 1985, 2791180
Int. Cl.[4] G01K *13/06, 15/00*; G01N *25/72*
U.S. Cl. 364—571.03 1 Claim



1. In a method for the contactless measurement of the temperature of an object with a plurality of surface components a_i having i=1 to m differently emitting surface materials at the same temperature, including measuring the spectral signal voltages of a black body with a multi-channel pyrometer at j=1 to n spectral channels at a plurality of different temperatures to determine the characteristic curve of the relationship between the difference between the spectral signal voltages $U_{oj}-U_{uj}$ and the temperature of the black body at a plurality of various temperatures of the black body, and storing characteristic data corresponding to said curve, where

m and n are integers,

U_{oj} is the portion of the signal voltage difference $U_{oj}-U_{uj}$ which depends upon the temperature T_o of the black body, and

U_{uj} is the portion thereof which depends upon the known ambient temperature,

the improvement wherein said method further comprises:

calibrating the pyrometer by measuring the signal voltages U_{ij} of m known surface materials therewith at a known temperature, for each combinaion of i=1 to m surface materials and j=1 to n spectral channels, and calculating and storing the emissivities ϵ_{ij} specific to said known the surface materials in accordance with the equation:

$$\epsilon_{ij} = \frac{U_{ij}}{U_{oj} - U_{uj}}$$

using the measured values of U_{ij} and said stored calibration data corresponding to the black body at said known respective temperature for the difference signal $U_{oj}-U_{uj}$,

measuring signal voltages U_j from the object to be measured, in each of the j=1 to n spectral channels; and

determining the object temperature of the body by successively inserting into the equation:

$$U_j=(a_1\epsilon_{1j}+a_2\epsilon_{2j}+\ldots+a_m\epsilon_{mj})(U_{oj}-U_{uj})$$

the differences $U_{oj}-U_{uj}$ from the stored calibrated data at each of a plurality of temperatures, as well as the stored emissivities ϵ_{ij}, where the sum of all the surface components $a_i=1$ and U_j are the signal voltages measured from the object, whereby the temperature of the object to be measured is the temperature corresponding to the stored calibration data which results in a solution to the last mentioned equation.

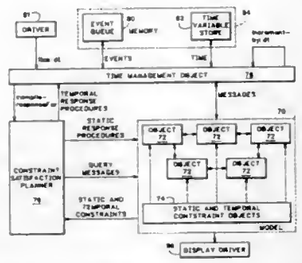
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4,821,220

SYSTEM FOR ANIMATING PROGRAM OPERATION AND DISPLAYING TIME-BASED RELATIONSHIPS

Robert A. Duisberg, Seattle, Wash., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 25, 1986, Ser. No. 891,071
Int. Cl.[4] G06F *3/153, 15/40*
U.S. Cl. 364—578 **16 Claims**



16. A method for animating the operation of an algorithm utilizing a model embodied within an object oriented computer programming system, wherein said model exhibits temporal behavior, the method being executed by a computer and comprising the steps of:

instantiating a time management object for executing procedures embodying the temporal behavior of said model, including adjusting the value of a time variable representing time and maintaining an event queue for storing events, wherein an event comprises a representation of a message and a time stamp indicating a time at which said message is to be sent, said time management object being adapted to send said message to said model when the time represented by said time variable rises at least to the time indicated by said time stamp;

instantiating a temporal constraint object comprising a description of a triggering message indicating performance of an action performed by said algorithm and a description of a temporal constraint on the behavior of said model in response to said triggering message;

compiling a response procedure to be executed by said time management object for storing a response event in said event queue, said response event comprising a time stamp indicating a future time and said response event future comprising a representation of a temporal constraint satisfaction message to said model for causing said model to satisfy said temporal constraint, said response procedure being compiled in response to said triggering message;

executing said response procedure whereby said time management object stores said response event in said queue and then sends said temporal constrain satisfaction message to said model when said time represented by said time variable rises at least to said future time; and

displaying an image on a screen of a computer terminal, the appearance of said image being controlled according to the temporal behavior of said model and representing said action performed by said algorithm.

4,821,221

COMPUTER TERMINAL DEVICE FOR PRODUCING DIFFERENT TYPES OF BUZZER SOUNDS

Masahiko Kaneko, Kawagoe, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

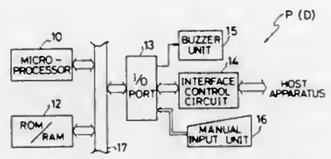
Filed May 31, 1985, Ser. No. 740,207
Claims priority, application Japan, Jun. 4, 1984, 59-113018
Int. Cl.[4] G06F *3/16;* **G10L** *5/02*
U.S. Cl. 364—710.13 **4 Claims**

1. A computer terminal printer device for generating different types of buzzer sounds indicating printer status information such as end of printing, interruption of printing, generation of errors, etc., in response to control signals from a remote host computer, said computer terminal printer device comprising:

buzzer sound data memory means for storing a plurality of buzzer sound data which are obtained by converting a plurality of intermittent buzzer sounds to numeric values;

interfacing means for interfacing control signals between said terminal printer device and said host computer, said interfacing means including:

(a) receiving means for receiving coded data from said host computer;



(b) data discriminating means for decoding the coded data received by said receiving means; and

(c) an index register for storing a decoding result of said data discriminating means;

buzzer sound readout means for reading out the buzzer sound data from said buzzer sound data memory means so as to correspond to the control signals transmitted by said host computer;

a buzzer unit for producing intermittent buzzer sounds corresponding to the readout buzzer sound data; and

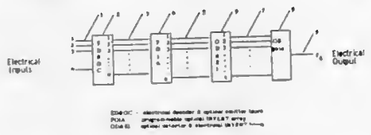
processor means at said terminal printer device for controlling said interfacing means.

4,821,222

METHOD AND APPARATUS FOR PROGRAMMABLE OPTICAL CROSSBAR LOGIC ARRAY WITH DECODERS

Raymond Arrathoon, 620 Miller St., Rochester, Mich. 48063

Filed Sep. 26, 1986, Ser. No. 912,353
Int. Cl.[4] G06F *7/56*
U.S. Cl. 364—713 **19 Claims**



1. A hybrid optical/electronic INVERT-OR-INVERT-OR logic array comprising:

means including one or more electrical decoders for converting n binary input electrical signals to m binary electrical output signals;

means for connecting said m binary output signals to m optical emitters providing m optical outputs;

means for effecting a factor of q fan-out of said m optical outputs;

means for effecting an optical INVERT of said m optical outputs, said means including a spatial light modulator having a standard optical crossbar geometry and pixels which are in a transparent state and pixels which are in an opaque state;

means for effecting a factor of m fan-in of said q optical signals from said spatial light modulator that provides q individual m-input optical OR operations to produce q optical signals;

means for detecting said q optical signals with q individual detectors to produce q outputs;

means for INVERTING each of said q outputs from said q individual detectors; and

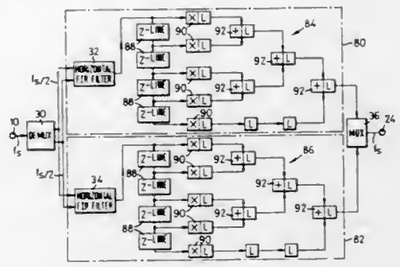
means for effecting a final single-output multiple-input OR operation on said q INVERTED detector outputs.

4,821,223

TWO-DIMENSIONAL FINITE IMPULSE RESPONSE FILTERS

Morgan W. A. David, Farnham, England, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1986, Ser. No. 910,523
Claims priority, application United Kingdom, Oct. 4, 1985, 8524533
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.05 **4 Claims**



1. A two-dimensional finite impulse response (FIR) filter comprising:

a demultiplexer for demultiplexing an input data signal comprising consecutive digital words into p slower data signals, where p is an integer greater than 1, such having a slower data rate equal to 1/p of said data rate of the input data signal and each comprising every p^{th} word of said input data signal;

p FIR filter portions each connected to receive all of said slower data signals, all of said p FIR filter portions being operative at said slower data rate simultaneously to effect horizontal filtration by periodically processing sets of consecutive words of said input data signal, said sets of consecutive words being processed at any one time by the respective filter portions being offset with respect to one another by one word in the horizontal direction; and

a multiplexer connected to receive output signals of said p FIR filter portions to form a filtered output data signal having a data rate equal to that of said input data signal;

wherein each of said p FIR filter portions comprises a vertical FIR filter and a horizontal FIR filter, said vertical FIR filter of said FIR filter portion has an input connected to said demultiplexer so as to receive directly only a respective one of said p slower data signals, and said horizontal FIR filter of each said FIR filter portion has p inputs of which one is connected to an output of said vertical FIR filter of the same FIR filter portion and the at least one other is connected to the output of the vertical filter of the at least one other FIR filter portion, whereby the at least one other of the p slower rate signals is received by the FIR filter portion indirectly, namely after vertical filtration in the at least one other FIR filter portion.

4,821,224

METHOD AND APPARATUS FOR PROCESSING MULTI-DIMENSIONAL DATA TO OBTAIN A FOURIER TRANSFORM

Wentai Liu, Cary; William T. Krakow, Chapel Hill, and Thomas A. Hughes Jr., Raleigh, all of N.C., assignors to Microelectronics Center of N.C., Research Triangle Park and N.C. State University, Raleigh, both of N.C.

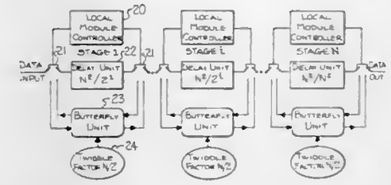
Filed Nov. 3, 1986, Ser. No. 926,436
Int. Cl.[4] G06F *15/332*
U.S. Cl. 364—726 **27 Claims**

1. A method of processing data to obtain a Fourier transform of data presented in a two dimensional format, the method comprising the steps of:

a) defining an N by N matrix of data;

b) rasterizing the data from one of all columns, or all rows of the defined matrix into a serial string of N^2 data elements;

c) performing a computational Fourier transform operation on the serial string of rasterized data to generate a first transformed data set; and



d) [rasterizing the data from all rows of the defined matrix into a second string of N^2 data elements; and]

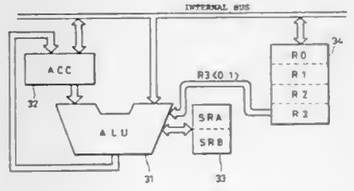
[e)] performing a computational Fourier transform operation directly on the first transformed data set to generate a second transformed data set in a one-dimensional serial string of data representing a form of the data presented in a two dimensional format.

4,821,225

ARITHMETIC AND LOGIC UNIT WITH PRIOR STATE DEPENDENT LOGIC OPERATIONS

Hideki Ando, and Hirohisa Machida, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1987, Ser. No. 42,532
Claims priority, application Japan, Apr. 30, 1986, 61-102792
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—736.5 **3 Claims**



1. An arithmetic and logic unit capable of selectively executing one of predetermined logical operations responsive to an operating condition signal generated by an earlier logical operation of said arithmetic logic unit, thereby minimizing the need for branch on condition operations, said arithmetic and logic unit comprising:

first storage means for storing a portion of said operating condition signal generated during an earlier operation of said arithmetic and logic unit, said first storage means capable of storing three states representing "positive", "negative" and "zero" conditions,

second storage means for storing a remaining portion of said operating condition signal, said second storage means capable of storing three states representing respectively said "positive", "negative" and "zero" conditions,

a control circuit for selectively outputting "addition", "subtraction" and "no operation" control signals in response to said states stored in said first and second storage means, and

an arithmetic and logic circuit for performing arithmetic operations responsive to said control signals output by

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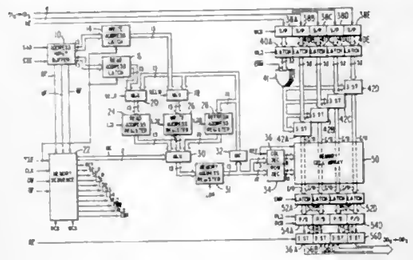
said control circuit and for generating a new operating condition signal.

4,821,226

DUAL PORT VIDEO MEMORY SYSTEM HAVING A BIT-SERIAL ADDRESS INPUT PORT

Todd J. Christopher, Indianapolis, Ind., and Shigeru Hirahata, Yokohama, Japan, assignors to RCA Licensing Corporatioo, Princeton, N.J. and Hitachi, Ltd., Japan

Filed Jan. 30, 1987, Ser. No. 8,730
Int. Cl.[4] G06F *12/00;* **G11C** *7/00*
U.S. Cl. 364—900 **8 Claims**



1. A digital memory system realized as a single integrated circuit comprising:

a block oriented data storage array wherein each block has a unique address value;

an address input terminal for applying a bit-serial signal including at least a bit-serial read address value and a bit-serial system control value;

address register means, coupled to said address input terminal, for storing said bit-serial read address value;

means, coupled to said address register means for incrementing said stored read address value;

a memory output port; and

control means, responsive to said control value, for selectively addressing the data storage array in succession with the stored read address value and the incremented stored read address value to condition said data storage array to provide the data held in the block having said stored read address value and the data held in the block having said incremented stored read address value sequentially at said memory output port.

4,821,227

PLESIOCHRONOUS MATCHING APPARATUS

Yushi Naito, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 767,192
Claims priority, application Japan, Aug. 18, 1984, 59-172031
Int. Cl.[4] G06F *13/00, 11/20*
U.S. Cl. 364—900 **12 Claims**

1. A plesiochronous apparatus for compensating for a difference between the data transmitting speeds of two digital signal systems at the time of communicating data between said two digital signal systems,

said plesiochronous apparatus having a redundant configuration including at least two equipments of the same structure, that is first equipment functioning as a on-line-equipment, an input signal from one of said two digital signal systems being applied to both said first and said second equipments simultaneously,

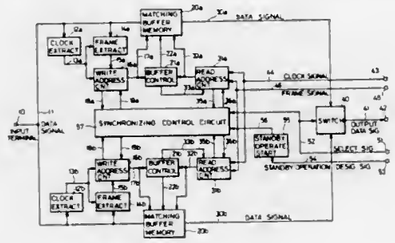
said first equipment and said second equipment each comprising:

buffer memory means for storing the data entered from said one of said two digital signal systems, for providing an elastic delay before putting out said data to the other of said two digital systems to ensure independent periodic frame-synchronized operations in each two digital signal systems,

write address counter means, operating in synchronism with write frame timing of one of said two digital signal systems from which said write frame timing is derived, for designating a write address of said buffer memory means wherein the input data from said one of said two digital signal systems is to be written, and for providing a write synchronizing output signal,

read address counter means, operating in synchronism with read frame timing of the other one of said two digital signal systems to which the said data is provided, for designating a read address from which the data of said buffer memory means is to be read, and for providing a read synchronizing output signal,

buffer control means for incrementing or decrementing said read address by a second predetermined number of addresses according to a signed difference between said write address and said read address when the absolute value of said difference attains a first predetermined number of addresses irrespective of the control of another said buffer control means of said redundant configuration,



said plesiochronous apparatus further comprising:

switching means connected in common to both of said first equipment and said second equipment, said switching means operable in response to a selection signal for making a selection between the data read from the buffer memory means of said first equipment and the data read from the buffer memory means of said second equipment, whereby said selected read data from sad on-line-equipment, whereby said selected read data from said on-line-equipment is provided to the other of said two digital signal systems, and

synchronizing control means for connecting in synchronism the write synchronizing output signal and the read synchronizing output signal of said on-line-equipment to the write address counter means and the read address counter means of said non-on-line equipment, respectively, at the time of bringing said non-on-line equipment into a standby state for said on-line-equipment, and for dissolving said connection thereafter to permit said write address counters and said read address counters of both said on-line-equipment and said non-on-line equipment to operate independently thereafter.

4,821,228

METHOD AND APPARATUS FOR COMPUTATION STACK RECOVERY IN A CALCULATOR

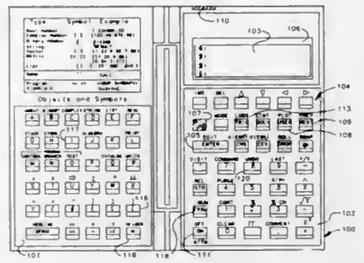
William C. Wickes, Corvallis, and Laurence W. Grodd, Portland, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 24, 1986, Ser. No. 946,543
Int. Cl.[4] G06F *15/06, 11/00*
U.S. Cl. 364—900 **9 Claims**

1. In a calculator having a data stack which contains first data

to be operated upon, an apparatus capable of performing error recovery comprising:

calculating means coupled to the data stack for performing calculations utilizing the first data to produce second data and for placing the second data on the data stack;



storage means coupled to the data stack for receiving and storing the first data before the first data is utilized by the calculating means in performing calculations; and,

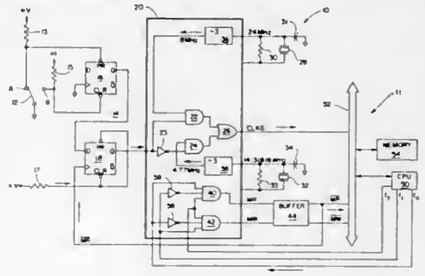
restoring means, coupled to the data stack and the storage means, for restoring the first data to the data stack.

4,821,229

DUAL OPERATING SPEED SWITCHOVER ARRANGEMENT FOR CPU

Luis H. Jauregui, St. Joseph, Mich., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 12, 1985, Ser. No. 808,394
Int. Cl.[4] G06F *1/00;* **G04G** *7/00*
U.S. Cl. 364—900 **7 Claims**



1. In a data processing system including a system bus and a CPU coupled thereto wherein the CPU is responsive to a clock signal provided from the system bus for establishing the operating speed of the CPU and the data processing system, an arrangement for selecting the operating speed of the data processing system comprising:

user responsive switch means for generating a first control signal when said switch means is in a first position and a second control signal when said switch means is in a second position;

logic means including first and second clock means coupled to the system bus and to said user responsive switch means and responsive to said first and second control signals for respectively providing a first clock signal from said first clock means to the CPU via the system bus upon receipt of said first control signal from said user responsive switch means whereupon the data processing system operates at a first speed or for providing a second clock signal from said second clock means to the CPU via the system bus upon receipt of said second control signal from said user responsive switch means whereupon the data processing system operates at a second speed, wherein said logic means is further coupled to the CPU and is responsive to status signals output therefrom for generating a third control signal;

feedback means coupling said logic means to said switch means for providing said third control signal thereto for synchronizing said first and second control signals with said third control signal; and

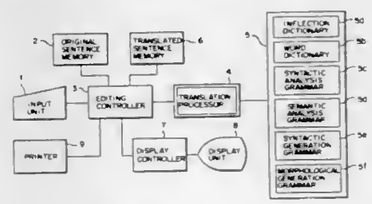
a system memory coupled to the system bus, wherein said third control signal is either a memory read signal or a memory write signal for synchronizing said first and second control signals and a change in data processing system operating speed associated therewith with a change in operation of said memory such that a change in data processing system operating speed occurs only after the completion of a memory read or write operation.

4,821,230

MACHINE TRANSLATION SYSTEM

Akira Kumano; Hiroyasu Nogami; Seiji Miike, and Shin-ya Amano, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 2, 1987, Ser. No. 133
Claims priority, application Japan, Jan. 14, 1986, 61-5570
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—900 **10 Claims**



1. A machine translation system comprising input means for inputting an original sentence, dictionary means for storing language information used in translation processing, translation processing means for translating the original sentence input through said input means with reference to the language information stored in said dictionary means, and output means for outputting a translated sentence obtained by said translation processing means,

said translation processing means including

analysis means for analyzing the original sentence syntactically and semantically using both a syntactic analysis grammar and a semantic analysis grammar,

translated sentence generation means for generating the translated sentence using both a syntactic generation grammar and a morphological grammar in accordance with an analysis result from said analysis means, and

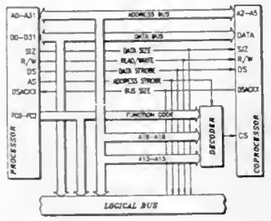
punctuation mark generation means for generating an appropriate punctuation mark based on at least one of the analyzed structure of the original sentence and the structure of the translated sentence substantially independently of a punctuation mark present in the original sentence during a translated sentence generation process of said translated sentence generation means, and inserting the generated punctuation mark in the translated sentence.

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4,821,231
METHOD AND APPARATUS FOR SELECTIVELY EVALUATING AN EFFECTIVE ADDRESS FOR A COPROCESSOR

Michael Cruess; David Mothersole; John Zolnowsky, and Douglas B. MacGregor, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 95,718, Sep. 14, 1987, Pat. No. 4,811,271, which is a division of Ser. No. 908,912, Sep. 18, 1986, Pat. No. 4,758,978, which is a continuation of Ser. No. 485,675, Apr. 18, 1983, abandoned. This application Dec. 21, 1987, Ser. No. 136,051
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **1 Claim**



PROCESSOR – COPROCESSOR SYSTEM BLOCK DIAGRAM



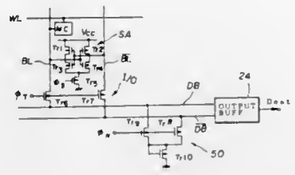
PROCESSOR TO COPROCESSOR TRANSFER

1. In a coprocessing data processing system, a method for selectively changing the flow of the instruction stream of a first data processor from a second data processor, comprising the steps of:
receiving a predetermined instruction for execution by the first data processor;
providing to the second data processor from the first data processor an indication that the predetermined instruction has been received for execution by the first data processor;
receiving from the second data processor a response to the indication provided by the first data processor, the response indicating how the flow of the instruction stream of the first data processor is to be changed; and
changing the flow of the instruction stream of the first data processor in accordance with the response received from the second data processor wherein the flow of the instruction stream of the first data processor is controlled by the value of a program counter; wherein the response received by the second data processor indicates a selected value to be loaded into the program counter; and wherein the step of changing the flow of the instruction stream of the first data processor is further characterized as loading into the program counter of the first data processor the value indicated by the response received from the second data processor.

4,821,232
SEMICONDUCTOR MEMORY DEVICE HAVING DATA BUS RESET CIRCUIT

Masao Nakano, Kasugai; Tsuyoshi Ohira; Hirohiko Mochizuki, both of Kawasaki; Yukinori Kodama, and Hidenori Nomura, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VLSI Limited, Kasugai, both of, Japan

Filed Sep. 16, 1987, Ser. No. 97,556
Claims priority, application Japan, Sep. 19, 1986, 61-221019
Int. Cl.[4] G11C *13/00, 11/40*
U.S. Cl. 365—189 **4 Claims**



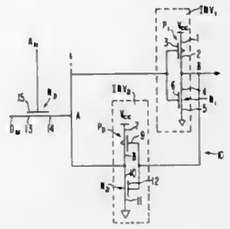
1. A semiconductor memory device comprising:
a memory cell array comprising a plurality of memory cells arranged in a matrix arrangement;
a sense amplifier, operatively connected to said memory cell array, amplifying a signal read out from one of said memory cells and having a pair of output terminals for outputting a complementary signal;
a pair of data buses for transferring the complementary signal;
a transfer gate for connecting said pair of output terminals to said pair of data buses responsive to a read operation;
a data output buffer connected to said pair of data buses for outputting an output signal; and
a reset circuit for resetting said pair of data buses to a predetermined voltage before each read operation responsive to a reset clock signal,
said reset circuit comprising a first circuit connected to said pair of data buses for connecting said pair of data buses to a common node responsive to said reset clock signal, and a second circuit connected between said common node and a ground voltage for shifting a potential at said common node to a voltage which is said predetermined voltage greater than said ground voltage.

4,821,233
5-TRANSISTOR MEMORY CELL WITH KNOWN STATE ON POWER-UP

Hung-Cheng Hsieh, Sunnyvale, Calif., assignor to Xilinx, Incorporated, San Jose, Calif.

Continuation-in-part of Ser. No. 777,670, Sep. 19, 1985, Pat. No. 4,750,155. This application Jun. 2, 1988, Ser. No. 201,509
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—203 **38 Claims**

1. A memory circuit comprising:
a first inverter having an input lead and an output lead;
a second inverter having an input lead connected to said output lead of said first inverter and having an output lead; and
one and only one pass transistor, said pass transistor having a first source/drain, a second source/drain, and a control gate, said second source/drain being connected to said input lead of said first inverter and to said output lead of said second inverter;
said first inverter comprising a first P channel enhancement mode transistor having a source and a drain, and a first N channel enhancement mode transistor having a source and a drain, said source of said first P channel transistor for connecting to a first voltage supply, said drain of said first P channel transistor being connected to said drain of said first N channel transistor, said source of said first N channel transistor for being connected to a second voltage supply having a voltage lower than said first voltage supply; and
said second inverter comprising a second P channel enhancement mode transistor having a source an a drain, and a second N channel enhancement mode transistor having a source and a drain, said source of said second P channel enhancement mode transistor for being connected to said first voltage supply, said drain of said second P channel

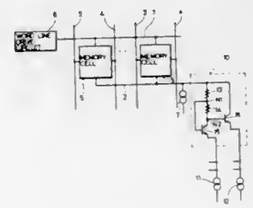


enhancement mode transistor being connected to said drain of said second N channel enhancement mode transistor, said source of said second N channel enhancement mode transistor for being connected to said second voltage supply; and
wherein a threshold voltage of said first P channel enhancement mode transistor is sufficiently higher than a threshold voltage of said second P channel transistor that upon power-up of said memory circuit said first P channel transistor remains in an off-state and said second P channel transistor assumes an on-state, thereby causing said memory circuit to provide a logical 1 at said output lead of said second inverter at completion of power-up.

4,821,234
SEMICONDUCTOR MEMORY DEVICE

Yasunobu Nakase, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1987, Ser. No. 46,788
Claims priority, application Japan, May 13, 1986, 61-111309
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—203 **3 Claims**

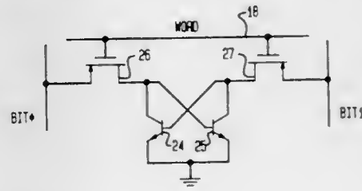


1. A semiconductor memory device having a plurality of pairs of word lines, each pair of said plurality of word lines including a positive word line and a negative word line; a plurality of pairs of bit lines, and a plurality of memory cells connected at intersections between respective pairs of said plurality of pairs of word lines and respective pairs of said plurality of pairs of bit lines, each of said pairs of word lines operable selectively in a selected state and in a non-selected state responsive to a select signal, a transition of said select signal from said selected state to said non-selected state defining a discharge period, said semiconductor memory device comprising:
a first discharging current source,
a second discharging current source, and
a plurality of word line discharging circuits, each of said plurality of word line discharging circuits connected to a corresponding negative word line of said plurality of pairs of word lines, and operable in response to a first voltage level on said negative word line to connect said corresponding negative word line to said first discharging current source for discharging said negative word line during a first portion of said discharge period, and operable in response to a second voltage level on said negative word line to connect said corresponding negative word line to said second current source during a remaining portion of said discharge period, each of said plurality of word line discharging circuits comprising:
first and second resistance means connected in series,
a first transistor having a collector connected to said corresponding negative word line through said first and second resistance means, a base connected to a point of connection between said first and second resistance means, and an emitter connected to said first discharging current source, and
a second transistor having a collector connected to said corresponding negative word line, a base connected to said collector of said first transistor, and an emitter connected to said second discharging current source.

4,821,235
TRANSLINEAR STATIC MEMORY CELL WITH BIPOLAR AND MOS DEVICES

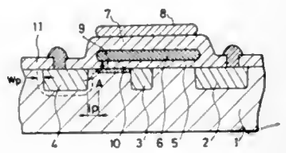
Raymond A. Heald, Los Altos, Calif., assignor to Fairchild Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 17, 1986, Ser. No. 853,297
Int. Cl.[4] G11C *11/34, 11/00;* **H01L** *27/02*
U.S. Cl. 365—177 **27 Claims**



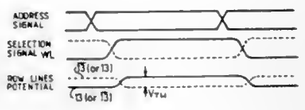
1. A translinear memory cell, comprising:
a first access line;
a pair of second access lines each connected to a source of power;
a pair of cross-coupled bipolar transistors wherein the base of each transistor is connected to the collector of the other transistor and the emitters of the two transistors are connected in common; and
a pair of field-effect transistors each having its gate connected to said first access line, one of its source and drain connected to a respective one of said second access lines and the other of its source and drain connected to the base of a respective one of said bipolar transistors to function as load devices for supplying power from said second access lines to said bipolar transistors and to conduct information between said bipolar transistors and said second access lines.

4,821,236
SEMICONDUCTOR NONVOLATILE MEMORY
Yutaka Hayashi, Ibarakiken; Yoshikazu Kojima, Tokyo; Masaaki Kamiya, Tokyo, and Kojiro Tanaka, Tokyo, all of Japan, assignors to Kogyo Gizyutsuin and Seiko Instruments & Electronics Ltd., both of Tokyo, Japan
Continuation of Ser. No. 587,265, Mar. 7, 1984, abandoned. This application Feb. 9, 1987, Ser. No. 13,192
Claims priority, application Japan, Mar. 7, 1983, 58-37172
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 **5 Claims**



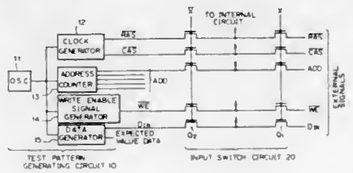
1. A semiconductor non-volatile memory comprising: a first semiconductor region; a carrier supply region formed on a surface portion of said first semiconductor region; an injection region formed on another surface portion of said first semiconductor region; a first insulation film in contact with said injection region; a control region for controlling the potential of said injection region, said control region being formed so as to make contact with said injection region; a floating gate electrode formed on said first insulation film; a first control gate electrode for controlling the potential of said floating gate electrode through a second insulation flim; said regions being effective when suitably biased to establish a space charge region in said first semiconductor region, between said carrier supply region and said injection region, said space charge region being established by the potential difference between said injection region and said carrier supply region so as to accelerate carriers from said carrier supply region into said space charge region by the potential of said injection region such that the carriers reach the surface of said first semiconductor region at a sufficiently high energy state to cause some of the carriers to exceed the energy barrier formed between said first insulation film and said injection region and be injected into said floating gate electrode.

4,821,237
SEMICONDUCTOR MEMORY DEVICE
Hiroshi Iwahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Dec. 18, 1986, Ser. No. 943,140
Claims priority, application Japan, Dec. 20, 1985, 60-286928
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **11 Claims**



1. A semiconductor memory device for reading and writing data comprising:
a pair of row lines, each having a corresponding electrical potential, the difference between the two potentials increasing during reading of data;
at least one static memory cell connected between the pair of row lines for storing data written into the memory cell;
switching means for connecting the static memory cell to the row lines in accordance with a selecting signal; and
voltage control means for limiting the increase in the potential difference between the row lines to perform the reading of the data from the memory cell at a predetermined restricted potential allowing fast access time during the reading operation.

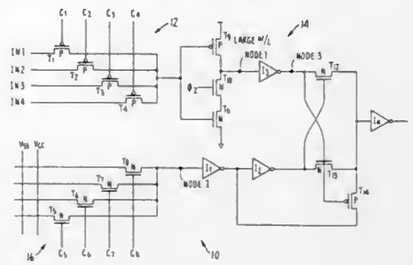
4,821,238
SEMICONDUCTOR MEMORY DEVICE HAVING TEST PATTERN GENERATING CIRCUIT
Takeo Tatematsu, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Filed Aug. 11, 1986, Ser. No. 895,091
Claims priority, application Japan, Aug. 14, 1985, 60-178961
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—201 **10 Claims**



1. A semiconductor memory device comprising:
an internal circuit including a memory circuit having a plurality of memory cells;
a test pattern generating circuit for generating output signals, said test pattern generating circuit including an address generating means, having an internal address counter, for generating address signals for accessing each memory cell in said memory circuit;
receiving means for receiving external signals including external address signals; and
an input switching circuit means, connected between said test pattern generating circuit and said receiving means, for switching said external signals, including said external address signals to the memory circuit of said internal circuit in a usual mode, and for switching said output signals, including said generated address signals from said test pattern generating circuit to the memory circuit of said internal circuit in a test mode, wherein the operation of the test mode and the usual mode are mutually exclusive one of another;
said test pattern generating circuit, said input switching circuit, and said internal circuit being provided on a same chip.

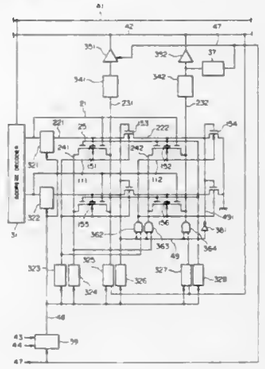
4,821,239
PROGRAMMABLE SENSE AMPLIFIER FOR READ ONLY MEMORY
Lavi A. Lev, Jerusalem, Israel, assignor to National Semiconductor Corp., Santa Clara, Calif.
Filed Aug. 25, 1987, Ser. No. 89,681
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—205 **2 Claims**

1. A programmable sense amplifier for a read only memory (ROM) comprising:
(a) an input multiplexer which receives a plurality of data input signals from a like plurality of column lines of the ROM and provides a selected one of the data input signals as a data output signal, the voltage level of the data output signal corresponding to the number of "1"s contained in the selected column line, the contents of the selected column line having been inverted if the number of "1"s contained in the data to be stored in the column line exceeds one-half the total number of ROM row lines;
(b) a sensing stage which amplifies the data output signal to provide a sensing stage output signal;



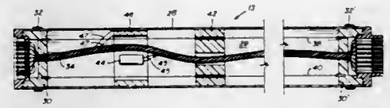
(c) inverter means for inverting the sensing stage output signal upon receipt of an invert signal; and
(d) programmable means selectively connected to a voltage source to provide the invert signal if the contents of the selected column line have been inverted.

4,821,240
SEMICONDUCTOR INTEGRATED CIRCUIT WITH NONVOLATILE MEMORY
Hideo Nakamura, Tokyo, and Terumi Sawase, Sayama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 854,889, Apr. 23, 1986, Pat. No. 4,744,062. This application Mar. 29, 1988, Ser. No. 174,975
Claims priority, application Japan, Apr. 23, 1985, 60-86797; Apr. 26, 1985, 60-90268; Jul. 3, 1985, 60-144719
Int. Cl.[4] G11C *11/40, 13/00*
U.S. Cl. 365—228 **7 Claims**



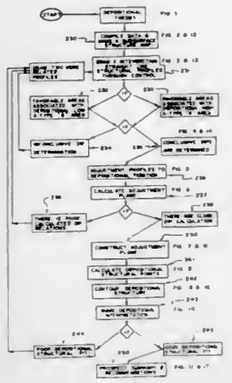
1. A card which incorporates a nonvolatile semiconductor memory integrated circuit, said nonvolatile semiconductor memory integrated circuit comprising:
a plurality of data memory elements arranged in a matrix;
a first means for accessing a selected one element within said plurality of data memory elements in accordance with an address signal specified with respect to said matrix;
a protecting data memory element for storing at least 1-bit protection data disposed within said matrix; and
a second means for reading out the content of said protecting data memory element, whereby whether a programming erasing or reading operation with respect to said selected one element is to be allowed or inhibited is determined in accordance with the content of said protecting data memory element, said content being read by said second means, wherein said data memory elements are respectively constituted by electrically erasable and programmable memory elements, and wherein said protecting data memory element is constituted by an electrically erasable and programmable memory element.

4,821,241
NOISE-CANCELLING STREAMER CABLE
Carl O. Berglund, Houston, Tex., assignor to Teledyne Exploration Co., Houston, Tex.
Filed May 23, 1988, Ser. No. 197,228
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—20 **13 Claims**



1. A seismic cable section for use in a body of water, the cable section including an elongated, flexible, tubular jacket that contains a volume of floatation fluid, comprising:
first means, mounted within said cable section, for generating electrical output signals in response to acoustic waves;
second means, mounted in said cable section adjacent said first means, for generating electrical output signals in response to mechanical stress induced in said flexible tubular jacket; and
third means for recombining the electrical output signals from said second means, in opposite polarity, with the electrical signals from said first means.

4,821,242
DEPOSITIONAL RECONSTRUCTION FOR PETROLEUM LOCATION
Willard M. Hennington, 507 Patchester, Houston, Tex. 77079
Continuation-in-part of Ser. No. 878,628, Jun. 26, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 103,716
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—53 **5 Claims**



1. A method of utilizing subsurface geological formation data for use in prospecting for subsurface hydrocarbon reservoir locations within a survey area where the survey area includes dry wells and hydrocarbon productive wells which penetrate earth formations, said method including the steps of:

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obtaining geological formation data descriptive of the physical characteristics of said earth formations from wells within the survey area for identifying a subsurface stratum containing hydrocarbon reservoir locations;

deriving a structural contour map of said subsurface stratum within said survey area from said geological formation data where the dry wells and the hydrocarbon productive wells are located relative to said contour map;

defining at least two straight control datum lines with respect to said structural contour map where said control datum lines intersect at an intersection point, said intersection point being located on said structural contour map where said intersection point is at a first known depth on the contour map and is an area of known porosity and hydrocarbon production characteristics relative to said dry wells and said productive wells and where said control datum lines respectively extend from said intersection point to different discrete locations on said contour map where said stratum has different vertical depths than said intersection point relative to sea level and where the earth formations at said different discrete locations have known porosity and hydrocarbon production characteristics;

plotting geological structural profiles of said subsurface stratum in vertical planes respectively extending through each of said control lines;

for each geological structural profile, constructing an apparent dip line for each geological structural profile of said subsurface stratum where the apparent dip line is at an angle which corresponds to the inclination in a vertical plane of the substratum structural profile between said intersection point and one of said different discrete locations and where the apparent dip line separates in said vertical profile the generally hydrocarbon productive reservoir areas of the earth formation subsurface stratum from reservoir areas of the earth formation subsurface stratum which are generally not hydrocarbon productive;

with respect to a first depositional plane defined by said apparent dip lines, determining dip and azimuth of said first depositional plane, utilizing said dip and azimuth determinations for adjusting depth data representing the depths of datum points on said structural contour map to obtain adjusted depth data where said adjusted depth data represent the depths of reconstructed datum points which define a reconstructed depositional structure contour map of said subsurface stratum for determining subsurface hydrocarbon reservoir locations.

4,821,243
LOW PRESSURE ACOUSTIC REFLECTOR FOR CONFORMAL ARRAYS
Samuel J. Caprette, Jr., Chagrin Falls, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio
Filed May 1, 1987, Ser. No. 44,917
Int. Cl.[4] H04R *17/00*
U.S. Cl. 367—153 **20 Claims**

1. An accoustic reflector comprising:

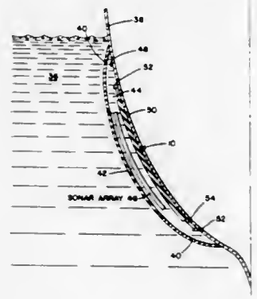
core ply of an elastomer reinforced fabric, the core ply having a pair of sheet-like surfaces;

a pair of pocket plies each having a surface bonded to one of the pair of core ply surfaces;

means for tensionably attaching the core ply to an object;

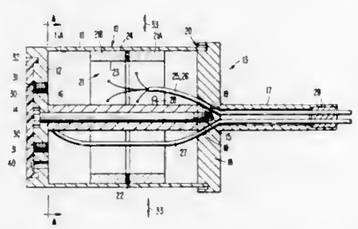
a plurality of substantially uniformly configured cell-like cavities embeddedly positioned within each of the pocket plies and separately defined from those within any other pocket ply, the cavities of each such pocket ply being of a size and configuration defining walls having a desired structural configuration separating adjacent cells and the cavities of at least one such pocket ply including a diagram over the cell generally integral with a surface of the pocket ply obverse to that surface of the pocket ply bounded to a core ply surface, the diaphragms having a desired thickness; and

the pocket ply being formed of an elastomer having desired static, dynamic, and acoustic properties for the acoustic



frequency and at the temperature it is desired the reflector function.

4,821,244
TUBULAR ACOUSTIC PROJECTOR
Frank Wood, Hornsea, United Kingdom, assignor to Ferranti International Signal, plc, Cheshire, England
PCT No. PCT/GB86/00729, § 371 Date Jul. 21, 1987, § 102(e) Date Jul. 21, 1987, PCT Pub. No. WO87/03448, PCT Pub. Date Jun. 4, 1987
PCT Filed Dec. 1, 1986, Ser. No. 94,723
Claims priority, application United Kingdom, Nov. 30, 1985, 8529543
Int. Cl.[4] H04B *13/00*
U.S. Cl. 367—159 **14 Claims**



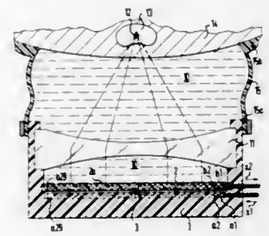
1. A tubular acoustic projector for underwater use comprising a tubular ceramic piezoelectric transducer having an outer cylindrical surface and a housing containing the transducer and interfacing with surrounding water, said housing including a side wall supporting the transducer in the housing by radially compressive engagement of an inner cylindrical surface of the side wall on the outer cylindrical surface of the transducer, said side wall being longer that the transducer and operable in operation to transmit vibrations of the transducer to the surrounding water and conduct heat generated by the transducer to the surrounding water across the interface between the housing and surrounding water.

4,821,245
ELECTROMAGNETIC TRANSDUCER
Ing. R. Riedlinger, Karlsruhe, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany
Filed Oct. 2, 1987, Ser. No. 104,343
Int. Cl.[4] H04R *9/00*
U.S. Cl. 367—175 **21 Claims**

1. An electromagnetic transducer for generating transient acoustic pulses of high amplitude comprising:

first conductor means mounted on a carrier of high sonic impedance and held against movement thereby, an acoustic emitter incorporating second conductor means, said second conductor means being located parallel to said first conductor means and movable relative thereto to cause pressure pulses to be generated by said emitter; and

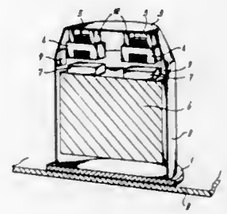
electrical supply means for supplying electric current pulses to said first and second conductor means, said supply means being operable as required to supply said pulses contradirectionally to said first and second conductor means to generate a repulsive force between them



whereby said acoustic emitter generates a positive pressure pulse, and co-directionally to generate an attractive force between them whereby said acoustic emitter generates a negative pressure pulse,

said carrier and said acoustic emitter being so mounted, and said first and second conductor means being so coupled electromagnetically, that said carrier and said acoustic emitter comprise means for generating said positive and negative pulses of magnitudes effective to disintegrate a concretion within living tissue and to destroy living tissue through cavitation, respectively.

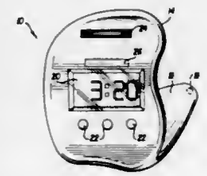
4,821,246
ELECTROMAGNETIC VIBRATOR FOR SEISMIC AND CIVIL-ENGINEERING APPLICATIONS
Willem A. Van Kampen, Voorschoten; Anne R. Ritsema, De Bilt, and Rudolf Unger, Houten, all of Netherlands, assignors to Stichting Voor De Technische Wetenschappen, Utrecht, Netherlands
Filed May 11, 1987, Ser. No. 48,223
Claims priority, application Netherlands, May 12, 1986, 8601195
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—189 **14 Claims**



1. Electromagnetic vibrator for seismic and civil engineering applications to transmit vibrations to the earth, which vibrator is provided with a supporting structure connected to a coupling element which transmits said vibrations to the earth, and a reaction mass, which is to be caused to vibrate, with an associated electromagnetic drive and provided at least with electromagnetic coils, characterized in that the reaction mass is magnetically suspended on the supporting structure by means of one or more magnets having pole surfaces and the associated electromagnetic coils and is at the same time caused to vibrate by the electromagnetic drive, the vibration force being exerted on the pole surface of the one or more magnets and the reaction mass being accelerated to at most the acceleration due to gravity.

4,821,247
EAR-MOUNTED ALARM CLOCK
Reginald M. Grooms, Rte. 6, Box 43, Conway, S.C. 29526
Filed Sep. 11, 1984, Ser. No. 649,591
Int. Cl.[4] G04B *21/08*
U.S. Cl. 368—63 **7 Claims**





1. An ear mounted alarm device adapted to alert a user to a preset time, said device comprising:

(1) an earpiece adapted to fit within said user's outer ear for delivering a personal alarm sound perceptible only to said user, said alarm sound being responsive to said preset time, said earpiece having a distal and proximal end, said distal and proximal ends having apertures communicating with each other for delivery of said alarm sound to the auditory canal of said user; and

(2) a clock connected to said earpiece, said clock comprising an alarm sounding means situated in close proximity with said proximal end of said earpiece, said alarm sounding means being responsive to a signal from said clock for sounding said alarm sound;

wherein said alarm sounding means directs said alarm sound toward said distal end of said earpiece.

4,821,248
WORLD TIMEPIECE
Masaharu Yamasaki, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan
Filed Jun. 22, 1987, Ser. No. 65,260
Claims priority, application Japan, Jun. 20, 1986, 61-144525
Int. Cl.[4] G04B *19/22*
U.S. Cl. 368—21 **8 Claims**

1. A world timepiece comprising:

an oscillation circuit including a quartz oscillator as a source of oscillation for producing an output signal having a given frequency;

a frequency-dividing circuit for dividing the frequency of the output signal of the oscillation circuit to produce divided signals;

means for generating timing clock signals in response to the divided output signals of the frequency-dividing circuit;

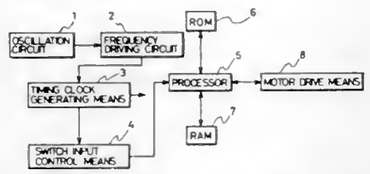
means for counting a fundamental time in response to the timing clock signals;

means for storing a plurality of regions having time differences in terms of a time-differential unit time and for storing the time differences;

means for counting a world time of a given region among the plurality of regions having time differences in response to the timing clock signals;

external operation means for inputting a correction amount of the fundamental time;

means for storing data representative of the correction amount of the fundamental time inputted by the external operation means;



counting means for counting the correction amount of the fundamental time to obtain a count value calculated by subtracting a multiple of the time-differential unit time from the correction amount of the fundamental time, said counting means including comparing means for generating a resetting signal for resetting the counting means each time the count value becomes the same as that of the time-differential unit time; and

means for correcting the world time in accordance with the count value.

4,821,249

TIMEPIECE MOVEMENT

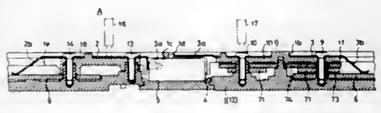
Susumu Ikuma, and Nobuhiro Tanaka, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,834

Claims priority, application Japan, Mar. 30, 1987, 62-47217[U]

Int. Cl.⁴ G04C *23/02, 3/00*

U.S. Cl. 368—88 **7 Claims**



1. A timepiece movement comprising:

a movement case containing therein a driving motor comprising a stator and a rotor, a gear train driven by said driving motor, a printed circuit board having a driving circuit for said driving motor, and a battery accommodating portion for accommodating a battery during use of the timepiece movement;

a pair of battery contacts for supplying energy from said battery to said printed circuit board and being provided on the outer surface of said case;

one end of each of said battery contacts being capable of elastically contacting said battery through a first opening in said case; and

the other end of each of said battery contacts being in elastic contact with said printed circuit board through a second opening in said case.

4,821,250

PROCESS AND APPARATUS FOR THE RECORDING OF AN INFORMATION SIGNAL

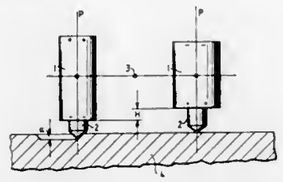
Horst Redlich, and Guenter Joschko, both of Berlin, Fed. Rep. of Germany, assignors to DMM Master Technik GmbH fur Informationstrager, Berlin, Fed. Rep. of Germany

Filed Jul. 9, 1986, Ser. No. 883,629

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527606

Int. Cl.⁴ G11B *11/16, 11/18*

U.S. Cl. 369—18 **24 Claims**



1. In a process for recording information signals onto a generally planar recording carrier surface in which the information signals are applied to the information carrier surface as individual indentations which can be read from the information carrier surface optically, the improvement comprising:

connecting the stylus to a positioning element which provides a common center of gravity which is substantially stable in position and which allows the stylus to ride in contact with the recording carrier surface; and

with a bearing force, driving the stylus, in its operating mode, substantially perpendicular to the recording carrier surface to describe a path of individual indentations generally parallel to the recording carrier surface, the path being defined by a lower vertex point which is indented beneath the undeformed surface of the recording carrier and an upper vertex point between successive indentations which lies on, or above, the surface of the recording carrier such that the depth of the thusly formed indentations is independent of the relative elevation of the carrier surface.

4,821,251

METHOD AND APPARATUS FOR RECORDING OR REPRODUCING INFORMATION IN OR FROM ONLY A SECTOR OF AN OPTICAL DISK TRACK WITHOUT ANY DEFECT BY SHIFTING A LIGHT BEAM TO AN ADJACENT TRACK BEFORE A DEFECTIVE SECTOR

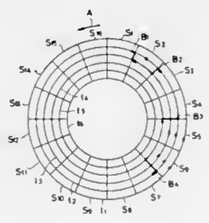
Hideki Hosoya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,880

Claims priority, application Japan, Nov. 18, 1983, 58-216052

Int. Cl.⁴ G11B *7/09*

U.S. Cl. 369—44 **9 Claims**



6. A method for recording or reproducing information only in a sector without any defect of an optical disc having a

recording surface obtained such that respective tracks are divided into a plurality of sectors, comprising:

scanning the optical disc with a light beam while carrying out tracking to detect a defective sector;

judging that the light beam has come immediately before the defective sector in accordance with position information of the detected defective sector; and

shifting the light beam from a position on a first track associated with the defective sector to a radially aligned position of another track after said judging step, and causing said light beam to scan a sector of said another track so that said light beam bypasses said defective sector.

4,821,252

INFORMATION RECORDING AND/OR REPRODUCING APPARATUS

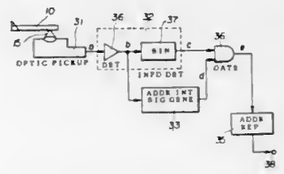
Masanobu Nishimiya, Yokohama, Japan, assignor to Ricob Company, Ltd., Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 122,043

Claims priority, application Japan, Nov. 20, 1986, 61-277735

Int. Cl.⁴ G11B *5/09, 20/12*

U.S. Cl. 369—48 **5 Claims**



1. An information recording and/or reproducing apparatus which reproduces a pre-recorded address information from a recording medium when recording and/or reproducing a main information signal on and/or from the recording medium, said address information being pre-recorded on substantially parallel tracks of the recording medium with a predetermined period, said information recording and/or reproducing apparatus comprising:

first means for detecting a signal recorded on one track of the recording medium and for converting the signal detected into a reproduced signal;

second means for generating an address interval signal having a predetermined level during a time corresponding to an interval in which the address information is prerecorded on the recording medium; and

third means for generating an output signal when both the reproduced signal from said first means and the address interval signal from said second means are received by said third means by passing the reproduced signal from said first means only during a time period in which the address interval signal has the predetermined level so as to obtain only the address information reproduced from said one track.

4,821,253

OPTICAL DISK AND OPTICAL DISK APPARATUS WITH ERROR CORRECTION

Makoto Usui, Suita; Katsumi Murai, Kyoto, and Isao Satoh, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 14, 1987, Ser. No. 132,279

Claims priority, application Japan, Dec. 19, 1986, 61-304274; Mar. 24, 1987, 62-69315

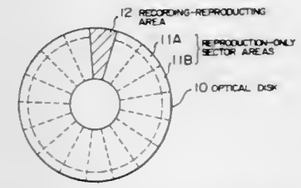
Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—54 **13 Claims**

1. An optical disk apparatus which uses an optical disk having a plurality of sectors,

said plurality of sectors consisting of reproduction-only information recording sectors and recording-reproduction sectors, with data and first error correcting codes for said data being recorded in advance in said reproduction-only sectors and second error correcting codes for said data or said data and first error correcting codes over plurality of said data being recorded in different reproduction-only sectors,

said optical disk apparatus further including means for reproducing reproduction-only sectors where said data and first error correcting codes or second error correcting codes are recorded; error correcting means; means of implementing error correction for data basing on said second error correcting codes by use of data in a reproduction-only sector if error correction for data by first



error correcting codes is infeasible; means of recording corrected data with said first error detecting and correcting code being appended thereto in a recording-reproduction sector; and means which, when reproducting again a sector uncorrectable by said first error correcting codes, reproduces said recorded recording-reproduction sector without using said second error correcting codes.

13. An optical disk having sectors consisting of information recorded sectors for reproduction-only and recording-reproduction sectors, data and first error correcting codes for said data being recorded in advance in said reproduction-only sectors, second error correcting codes for both said data and first error correcting codes or for only said data being recorded in advance in different reproduction-only sectors.

4,821,254

INFORMATION RECORDING AND REPRODUCING APPARATUS WHICH DETECTS DETERIORATION OF A MEDIUM IN EACH SECTOR BEFORE RECORDING

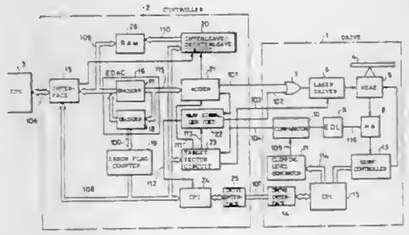
Isao Satoh, Neyagawa; Yoshihisa Fukushima, Osaka; Makoto Ichinose, Sakai; Yuzuru Kuroki, Toyonaka, and Yuji Takagi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 27, 1986, Ser. No. 866,954

Claims priority, application Japan, May 27, 1985, 60-113621

Int. Cl.⁴ G11B *7/00, 7/013*

U.S. Cl. 369—54 **8 Claims**



5. A method for recording and reproducing information on a reversible optical disk having a recording area formed with sectors and a directory sector which indicates an area in said recording area, comprising the steps of:

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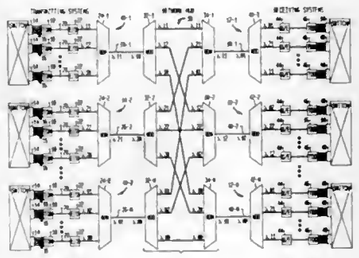
recording information including an error correction code;
receiving a signal indicative of said recorded information;
producing a strict clipping level which is a level stricter than a usual level that is recognized as a particular signal level;
comparing said signal indicative of said recorded information with said strict clipping level and producing an error signal based on said comparison;
counting a number of said error signals, and producing an error number signal indicative thereof;
checking a sector to determine if it is a bad sector when said error number signal indicates a number of errors over a predetermined number;
recording a mark signal on any bad sector;
verifying a target sector, before updating data, by comparing a signal indicative of recorded information with said strict clipping level; and
recording on only ones of said target sectors which are not detected to be bad.

4,821,255

CROSS-CONNECTION OF WAVELENGTH-DIVISION-MULTIPLEXED HIGH SPEED OPTICAL CHANNELS

Haim Kobrinski, Byram Township, Sussex County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed May 6, 1987, Ser. No. 46,911
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 11 Claims



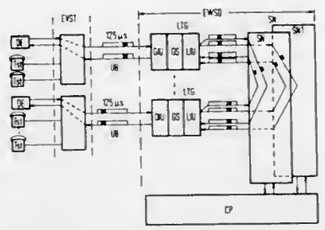
1. A wavelength division multiplexing structure for providing dedicated point-to-point connections between nodes in an optical telecommunications network, said structure comprising:
wavelength division demultiplexing means for receiving multiple wavelength radiation from each of said nodes and for separating said received radiation into constituent wavelengths so that said wavelengths are organized according to node of origin, each individual wavelength from each node being capable of carrying information destined for one specific destination node,
passive optical means for rearranging said wavelengths so that wavelengths having a common destination node are grouped together, and
wavelength division multiplexing means for multiplexing together wavelengths having the same destination node.

4,821,256

METHOD FOR MONITORING INFORMATION TRANSMISSION IN CONNECTED THROUGH FOUR-WIRE CONNECTING PATHS, MORE PARTICULARLY SEMIPERMANENTLY CONNECTED THROUGH CONNECTING PATHS IN DIGITAL TIME MULTIPLEX EXCHANGES

Lothar Schmidt, Fuerstenfeldbruck; Gerhard Schaich, and Wolfram Ernst, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 25, 1987, Ser. No. 67,065
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621531
Int. Cl.[4] H04L *11/08;* H04Q *1/20, 11/04*
U.S. Cl. 370—13 12 Claims



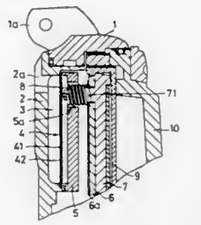
1. A method for monitoring information transmission in connected-through four-wire connecting paths, more particularly semipermanently connected-through connecting paths in digital time multiplex exchanges wherein line/trunk groups comprising a plurality of units and a double part switching network through which network each connection is formed twice in parallel form peripheral functional blocks under control of a coordination processor, said method comprising:
comparing bit for bit with one another first and second channel information streams coming from respective parts of said double part network to a line/trunk group and, with respect to one of said first and second channel information streams, to be further transmitted by way of said line/trunk group in a transmitting direction of transmission to a transmission circuit in a unit of said line/trunk group on the input side of said direction of transmission;
providing a parity bit to channel information streams coming in a receiving direction of transmission from said transmission circuit to said line/trunk group in a unit of said line/trunk group on the input side of said direction of transmission and subjecting said channel information streams coming in said receiving direction to a parity check after having traversed all units, including a last unit in a receiving direction of transmission wherein said comparing of said channel information streams coming from said switching network occurs;
providing a parity bit also to said channel information streams coming from said double part network in said last-named unit of said line/trunk group and subjecting said channel information streams, insofar as being transmitted to said transmission circuit, to a parity check in said unit of said line/trunk group on the input side of said receiving direction of transmission; and
insofar as said parity check indicates the presence of an error, inverting said parity bit provided said channel information streams coming from said transmission circuit in contradiction to actual parity such that the corresponding parity check in the last unit in said direction of transmission also indicates an error.

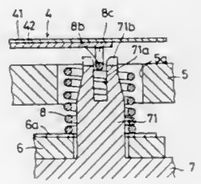
4,821,257

ELECTRICITY SUPPLY STRUCTURE FOR A PIEZOELECTRIC VIBRATOR

Nobuhiro Tanaka, and Takumi Matsuda, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,836
Claims priority, application Japan, Mar. 30, 1987, 62-47215 [U]; Mar. 30, 1987, 62-47216[U]
Int. Cl.[4] G04C *21/16*
U.S. Cl. 368—255 5 Claims





1. An electricity supply structure for a piezoelectric vibrator comprising:
a circuit board;
a coil spring having a center, one end positioned in contact with said circuit board, and another end having a portion extending toward the center and a rising contact portion which stands on said extending portion at a central portion of said coil spring and has a free end;
a piezoelectric vibrator in contact with the free end of said rising contact portion of said coil spring;
a base plate;
a positioning rod formed integraliy with the base plate for positioning said coil spring; and
wherein said positioning rod has a groove at a distal portion thereof in which said extending portion is insertable to prevent radial movement of said rising contact portion relative to said piezoelectric vibrator.

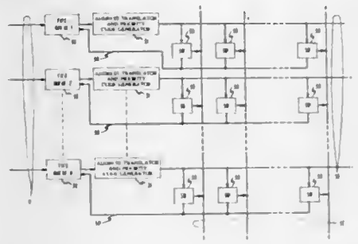
4,821,258

CROSSPOINT CIRCUITRY FOR DATA PACKET SPACE DIVISION SWITCHES

Alexander G. Fraser, Bernardsville, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 6, 1986, Ser. No. 893,602
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—60 12 Claims

1. A digital crosspoint switch for data packets including address headers, said switch comprising:
an array of input busses and output busses,
priority code generating means, and
a crosspoint circuit at each crosspoint between each of said input bus and each of said output buses,
each of said crosspoint circuits including
output address detecting means, and
means responsive to only one output address, and controlled



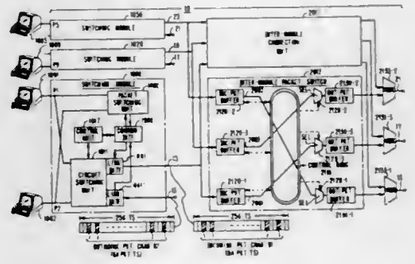
by a priority code, for connecting each one of said input busses to only the addressed one of said output busses for the duration of one of said data packets.

4,821,259

CONTROL INFORMATION COMMUNICATION ARRANGEMENT FOR A DISTRIBUTED CONTROL SWITCHING SYSTEM

Dennis L. DeBruler, Downers Grove; Edward H. Hafer, Winfield; Thomas L. Hiller; James M. Johnson, Jr., Both of Glen Ellyn; Douglas A. Kimber, St. Charles; Christopher G. McHarg, Arlington Heights; Scott W. Pector, Hinsdale, and David A. Pierce, Wheaton, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 5, 1986, Ser. No. 904,929
Int. Cl.[4] H04Q *11/02*
U.S. Cl. 370—60 28 Claims



1. A switching system comprising
a plurality of switching modules each having a plurality of access ports,
an inter-module packet switch,
an incoming packet channel from each of said switching modules to said inter-module packet switch, and
an outgoing packet channel from said inter-module packet switch to each of said switching modules,
wherein each of said switching modules comprises means for switching information to and from said access ports of said each switching module, control means for controlling said switching means and for generating inter-module control packets, and a communication interface comprising means for transmitting inter-module control packets generated by said control means on the incoming packet channel to said inter-module packet switch, and means for transmitting inter-module control packets received on the outgoing packet channel from said inter-module packet switch to said control means, and
wherein said inter-module packet switch comprises means

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for storing packets received on said incoming packet channels and means for concurrently packet switching inter-module control packets, received on a plurality of said incoming packet channels and stored by said storing means, via a plurality or independent paths to a plurality of said outgoing packet channels.

4,821,260

TRANSMISSION SYSTEM

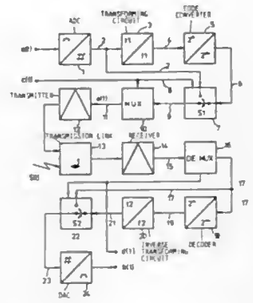
Otto Klank, Lehrte; Ernst Schröder, Hanover, and Walter Voessing, Wennigsen, all of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 135,511

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3642982

Int. Cl.⁴ H04J *3/00;* **H04L** *27/20*

U.S. Cl. 370—77 **12 Claims**



1. In a system for transmitting and receiving digitalized audio signals including a transmitting station having respective analog to digital converter means for converting respective analog audio signals to respective digital audio signals, means for multiplexing the respective digital audio signals to arrange the resulting data sequences in timely succession within frames, and transmitting means for transmitting the multiplexed signal, and a receiving station having receiving means for demodulating and for demultiplexing a received transmitted signal, and means for converting the received signals into corresponding analog audio signals; the improvement comprising: respective transforming and coding means, disposed in said transmitting station and each connected between the output of a respective one of said analog to digital converter means and said multiplexing means, for transforming a respective said digital audio signal at the output of a respective one of said analog to digital converter means to a respective transformed digital signal representing the momentary frequency spectrum of the audio signal and for coding the transformed digital audio signal such that portions of the transformed signal are given different weights on the basis of psychoacoustic laws with respect to the accuracy of their representation.

4,821,261

PACKET TRANSMISSION OF DIGITAL SIGNALS OVER A HIGH CAPACITY CHANNEL, PARTICULARLY OVER A SATELLITE BROADCASTING CHANNEL

Daniel Pommier, Breal-sous-Montfort, France, assignor to Etat Francais, Etablissement Public de Telediffusion, Montrouge, France

Filed Jul. 30, 1986, Ser. No. 890,475

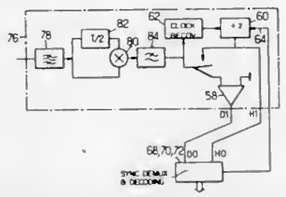
Claims priority, application France, Jul. 30, 1985, 85 11610

Int. Cl.⁴ H04J *3/02*

U.S. Cl. 370—77 **9 Claims**

1. For use in a satellite broadcasting system for transmission over a broadcasting channel having a predetermined frequency bandwidth sufficient for transmission of one TV program in the form of time division multiplexing of image signals in analog form a sound data signals in digital form, a method for full time broadcasting of digital signals in place of said TV program over said channel, comprising the steps of:

(a) forming two mutually independent multiplexed digital signals each consisting of a stream of bits and each requiring a bandwidth substantially half said predetermined frequency bandwidth, wherein both said multiplexed signals have the same bit rate,



(b) modulating a same transmitting carrier with said two multiplexed signals with bit-to-bit time interlacing,

(c) demodulating the multiplexed signals by phase demodulation, phase differential demodulation or phase coherent demodulation, and

(d) recovering only one of said multiplexed signals by physically separating the respective bits corresponding thereto out of said interlaced bits.

4,821,262

SYSTEM FOR TRANSMITTING AND RECEIVING DATA IN A TIME-DIVISION MULTIPLEX MODE APPLICABLE TO A VEHICLE

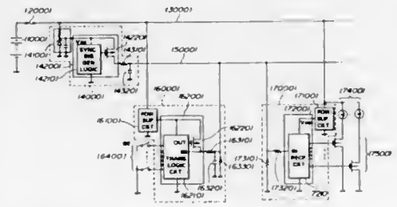
Toru Futami, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 17, 1987, Ser. No. 97,839

Claims priority, application Japan, Sep. 18, 1986, 61-218125

Int. Cl.⁴ H04J *3/02*

U.S. Cl. 370—85 **12 Claims**



1. A system for transmitting and receiving data in a time-division multiplexing mode, comprising:

(a) a signal transmission line;

(b) a power supply;

(c) first means for cyclically generating and transmitting a pulse train signal to the signal transmission line, the pulse train signal having a master synchronization interval defined by disconnecting the power supply from the signal transmission line for a first predetermined time width and having a plurality of communication channel intervals, each channel interval defined by connecting the power supply to the signal transmission line for a second predetermined time width followed by disconnecting the power supply from the signal transmission line for a third predetermined time width;

(d) second means for determining a specified channel interval from the plurality of channel intervals, detecting that the power supply is connected to the signal transmission line via the first means in the specified channel interval, and transmitting data represented by a pulse defined by connecting the power supply to the signal transmission line for a fourth predetermined time width, the fourth predetermined time width depending on an input state from an external apparatus of the second means; and

(e) third means for determining the specified channel interval from the plurality of channel intervals, detecting that the first means is connected to the signal transmission line in the specified channel interval, and receiving the data from the signal transmission line and outputting a signal to a load of the third means according to the time width of the data during the specified channel interval.

4,821,263

METHOD AND APPARATUS FOR TRANSMITTING INFORMATION VIA A BUS SYSTEM

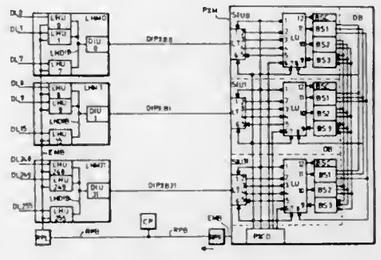
Peter C. B. Lundh, Skärholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Feb. 25, 1988, Ser. No. 160,255

Claims priority, application Sweden, Feb. 27, 1987, 8700840

Int. Cl.⁴ H04L *11/16*

U.S. Cl. 370—85 **21 Claims**



1. A method of transmitting message information between a plurality of transmission means by means of a bus system having a plurality of transmission channels, comprising the steps of:

dividing the transmission channels into data transmission channels and status transmission channels;

assigning each data transmission channel and each status transmission channel to a respective transmission means;

transmitting message information from a first transmission means to a second transmission means only over the data transmission channel assigned to said second transmission means; and

transmitting status information from said first transmission means to the other transmission means over the status transmission channel assigned to said second transmission means to indicate whether the data transmission channel assigned to said second transmission means is occupied.

4,821,264

ADAPTIVE CONCENTRATION COMMUNICATION NETWORK ISDN ACCESS

Noshik Kim, Middletown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Feb. 4, 1988, Ser. No. 152,347

Int. Cl.⁴ H04J *3/12, 3/24*

U.S. Cl. 370—110.1 **9 Claims**

1. In combination with a network for transporting ISDN B and D channel communications on a multiple-channel link between a remote terminal with B and D channel traffic and a central station, the link including communications channels and a maintenance channel, the system comprising:

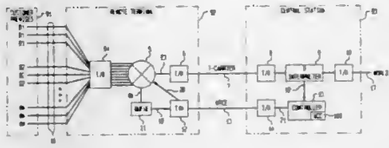
remote terminal means including

means for queuing incoming D channel traffic,

means for communicating the queue utilization of the queuing means to the central station over the maintenance channel, and

means for assigning B and D channel traffic to selected channels on the link in response to instructions received from the central station over the maintenance channel; and

central station means including



means for interpreting requests for B and D channel transport,

means for receiving the queue utilization over the maintenance channel,

means for applying pre-specified rules to the requests and queue utilization to determine the instructions, and

means for transmitting the instructions to the remote terminal over the maintenance channel.

4,821,265

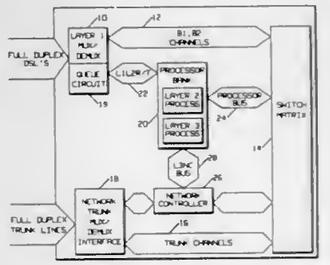
NODE ARCHITECTURE FOR COMMUNICATION NETWORKS

Nandakishore A. Albal, Sunrise, and Praduemn K. Goyal, Ft. Lauderdale, both of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.

Filed Apr. 6, 1987, Ser. No. 35,130

Int. Cl.⁴ H04J *3/12*

U.S. Cl. 370—110.1 **28 Claims**



1. A node for a communication system for processing a D-Channel ISDN message, comprising in combination:

interface means for receiving an ISDN signal from a transmission line;

demultiplexing means for demultiplexing said ISDN signal into a D-Channel message and for performing Physical Layer processes on said D-Channel message;

a processor bank including a plurality of processors which are interconnected by a bus for receiving said D-Channel message after said D-Channel message is processed by said demultiplexing means and for performing a Data Link Layer process on said D-Channel message; and

arbitration means for determining which of said plurality of processors is to perform said Data Link Layer process on said D-Channel message.

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4,821,266

TESTABLE ELECTRONIC DEVICE AND METHOD OF TESTING SUCH A DEVICE

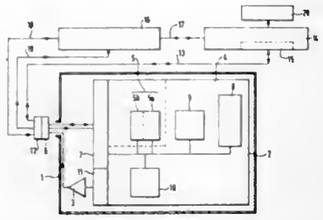
Heinz-Friedrich Ohm, Weiterstadt, and Wolfgang Reisch, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 9, 1987, Ser. No. 12,445

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, 3605431

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—16 **7 Claims**



1. An electronic device, in particular for throttle valve control in automotive vehicles, the electronic device having a microcomputer with a memory and an interface for connection to external test equipment, the electronic device being at testable device having a self-testing function provided by reference signals stored in the memory, the self-testing function being activated in response to signals applied by the test equipment via the interface to the testable device, wherein the test equipment applies input signals to the testable device and receives output signals from the testable device; said testable device comprising:

individual hardware units including a processor and said memory of the microcomputer, said individual hardware units being separately operable for testing via the interface; and wherein

said reference signals are normal output signals produced by respective ones of said hardware units; and

output signals produced by the hardware units are externally accessible via the interface for a comparison of actual output signals of the testable device with normal output signals of the testable device.

4,821,267

MONITORING APPARATUS FOR MONITORING THE OPERATING CONDITION OF TRANSMISSION FACILITIES OF COMMUNICATIONS TRANSMISSION TECHNOLOGY

Paul Druegh, and Volker Schmidt, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

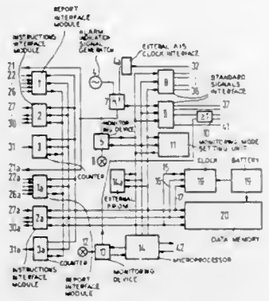
Filed Apr. 8, 1987, Ser. No. 36,667

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612275

Int. Cl.[4] G06F *11/30*

U.S. Cl. 371—22 **10 Claims**

1. In an in-service monitoring apparatus for monitoring the operational condition of transmission facilities of communications transmission technology which are composed of assemblies for transmitting and receiving signals, the monitoring apparatus having a monitoring device that acquires both trouble reports and measured values and that includes a monitoring information generator which is connectable, together with monitoring information generators of other monitoring devices, to signal receivers of a signal collecting apparatus for certain operations observations, and having an evaluation and memory device in said monitoring device in which the measured values are periodically acquired and edited, the improvement comprising:



means for registering said acquired and edited measured values with said memory device such that the memory contents are overwritten in a cyclic manner.

4,821,268

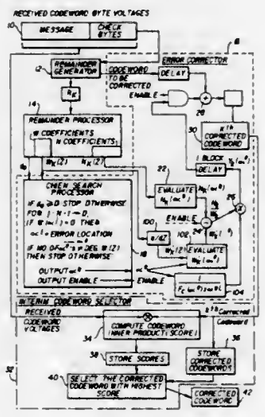
SOFT DECISION REED-SOLOMON DECODER

Elwyn R. Berlekamp, Berkeley, Calif., assignor to Cyclotomics, Inc., Berkeley, Calif.

Filed Oct. 26, 1987, Ser. No. 113,579

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—37 **14 Claims**



1. A Reed-Solomon soft decision decoder, comprising:

remainder generator means for generating a set of remainder coefficients from a received codeword;

remainder processor means for processing said remainder coefficients by executing one or more iterations of a recursive algorithm, whereby to generate one set of error descriptive coefficients upon each execution of one of said iterations; and

means for computing a candidate corrected codeword from each set of said error descriptive coefficients whereby to produce a plurality of candidate codewords

wherein said remainder generator means comprises:

means for receiving an analog N-byte m-bit-per-byte codeword in the form of a plurality of analog voltages representing a corresponding plurality of bits comprised within each byte of said analog codeword, said analog voltages not necessarily being restricted to a binary set of voltages;

means for determining the resemblance of each of the N-bytes of said analog codeword to each of a set of binary m-bit bytes, and, for each of said N-bytes of said analog codeword, selecting said one of the set of binary bytes having the greatest resemblance thereto;

means for forming a virtual codeword from the set of said binary bytes selected by said determining means, by rearranging said selected binary bytes in descending order of their resemblances; and

means for computing said set of remainder coefficients from said virtual codeword.

4,821,269

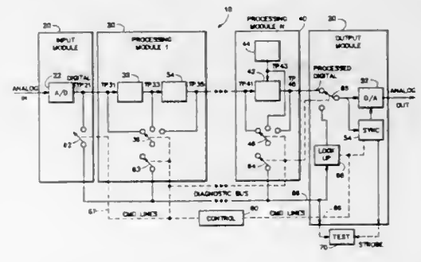
DIAGNOSTIC SYSTEM FOR A DIGITAL SIGNAL PROCESSOR

Richard A. Jackson, Nevada City; David E. Lake, Jr., Penn Valley; James E. Blecksmith, Nevada City; Ronnie D. Barnett, Nevada City, and John Abt, Nevada City, all of Calif., assignors to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Oct. 23, 1986, Ser. No. 922,367

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—16 **9 Claims**



1. A diagnostic system for a signal processor, the signal processor having an input module, an output module and a plurality of successive processing modules to form a path for processing an input signal, comprising:

a diagnostic bus;

means for selecting one of the modules and a test point within the selected module for connection to the diagnostic bus;

means for switching the input to the output module between the output of the diagnostic bus and the output of the last processing module; and

means for modifying the output of the diagnostic bus prior to input to the output module so that the output from the diagnostic bus is compatible with the input to the output module, the output from the output module representing the selected test point.

4,821,270

METHOD FOR DECODING DATA TRANSMITTED ALONG A DATA CHANNEL AND AN APPARATUS FOR EXECUTING THE METHOD

Jacques Mauge, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 3, 1986, Ser. No. 937,596

Claims priority, application France, Dec. 13, 1985, 85 18466

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—47 **14 Claims**

1. A method for decoding data transmitted along a data channel, said data being arranged in a sequence of groups, each group containing a fixed number of N sequential blocks, each block containing an information word of n1 bits, which by means of application of a linear error protection code has been extended to an error protected block of (n1+n2) bits, and wherein to each error protected block in a group a predetermined off-set word has been added by bitwise EXCLUSIVE ORING, which off-set word indicates the position of the error protected block in question within its group, wherein N, n1, and n2 are positive integers said method comprising the steps of:

(a) in an initialization phase:

(i) receiving a sequence of (n1+n2) data bits from said channel;

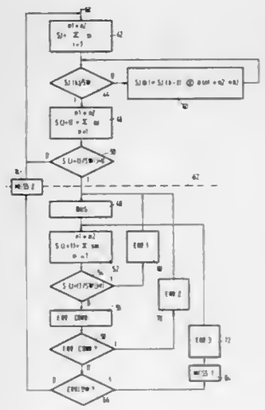
(ii) generating from the sequence of (n1+n2) data bits a first syndrome by means of incremental operations, each incremental operation taking into account exactly one most recently received data bit, whereby said first syndrome has a plurality of bits;

(iii) comparing said first syndrome to respective position-indicating standard syndromes, the latter corresponding to all possible off-set words;

(iv) in case of non-correspondence:

(A) omitting the least recently received data bit from said (n1+n2) data bits; and

(B) updating said first syndrome while accounting for a still more recently received data bit;



(v) repeating steps (iii) and (iv) until a correspondence occurs with a standard position-indicating syndrome corresponding to one of said predetermined off-set words, whereby synchronization is established;

(b) in a user phase following step (a):

(i) generating for each next block of (n1+n2) bits received over said data channel an associated syndrome;

(ii) comparing the associated syndrome with at least one appropriate position indicating standard syndrome, each next block having a presumed next following position in the sequence of groups;

(iii) in case of correspondence, outputting a first strategy controlling signal, while outputting the block's information word to a user;

(iv) in case of non-correspondence, executing an error correction operation on the error-protected block of n1+n2 bits without its associated off-set word, while outputting a second strategy controlling signal; and

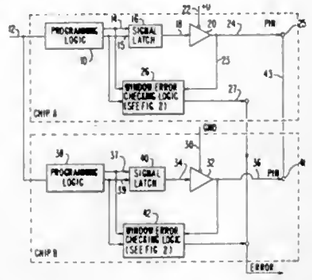
(c) restarting step a) upon occurrence of a predetermined time-sequence of said first and second strategy controlling signals, whereby the initialization phase is restarted when a number of errors becomes too high.

4,821,271

METHODS AND CIRCUITS FOR CHECKING INTEGRATED CIRCUIT CHIPS HAVING PROGRAMMABLE OUTPUTS

M. Vittal Kini; Mark S. Myers, both of Portland, and Sunil Shenoy, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 30, 1987, Ser. No. 79,444
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—68 **4 Claims**



1. The method of checking the output pin (**18**) of a first integrated circuit chip against the output pin (**41**) of a second substantially identical integrated-circuit chip, comprising the steps of:

Inputting data from substantially identical sources to programming logic (**10**) on said first chip and to programming logic (**38**) on said second chip;

Programming output data from said programming logic (**10**) on said first chip such that a set pulse (**14**) turns on output signal (**18**) on at a specific time and a reset pulse (**15**) turns said output signal off at a later time;

Programming output data from said programming logic (**38**) on said second chip the same as for said first chip such that a set pulse (**37**) turns an output signal (**34**) on at said specific time and a reset pulse (**39**) turns said output signal (**34**) off at said later time;

Generating a window having a rising edge (**42**) and a falling edge (**46**) in response to said set pulse (**14**);

Setting an error flip-flop (**50**) on said rising edge (**42**) of said window;

Utilizing a signal (**24**) asserted on said output pin (**25**) to reset said error flip-flop (**50**);

Signaling an error report (**54**) on the falling edge (**46**) of said window;

Inhibiting said output signal (**18**) of said first chip so that data on said output (**18**) does not reach the output pin (**25**) of said first chip;

Uninhibiting said output signal (**34**) of said second chip so that data on said output (**34**) does reach the output pin (**41**) of said second chip; and

Connecting said output pin (**41**) of said second chip to the output pin (**25**) of said first chip.

4,821,272

SINGLE MIRROR INTEGRAL RAMAN LASER

Hans W. Bruesselbach, Santa Monica, and Donald R. Dewhirst, Torrance, both of Calif., assignors to Hughes Aircraft Co., Los Angeles, Calif.

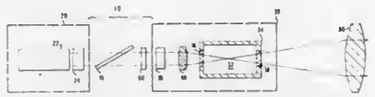
Continuation of Ser. No. 667,191, Nov. 1, 1984, abandoned. This application Oct. 31, 1986, Ser. No. 924,108
Int. Cl.[4] H01S *3/30*
U.S. Cl. 372—3 **15 Claims**

1. A Raman laser comprising:

a pump laser for producing radiation at a predetermined first wavelength comprising a lasing medium disposed in a resonant optical cavity having a reflector that is partially reflective of said pump laser radiation,

a Raman medium disposed along the optical path of said pump laser radiation, for converting the wavelength of said pump laser radiation to a predetermined second wavelength by Raman scattering processes, and

focusing means disposed between said pump laser and said Raman medium and positioned suitably adjacent to said Raman medium for focusing said pump laser radiation into



said Raman medium, without an isolator between said reflector and said focusing means,

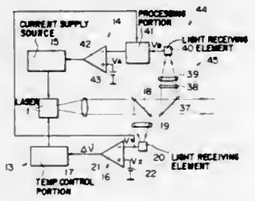
said reflector also being substantially 100% reflective of said second wavelength radiation and being positioned between said lasing medium and said focusing means, and aligned relative to said focusing means and said Raman medium so as to enhance wavelength conversion and substantially avoid feedback damage to said pump laser without an isolator.

4,821,273

WAVELENGTH/OUTPUT POWER STABILIZING APPARATUS OF SEMICONDUCTOR LASER

Nobuo Hori, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1987, Ser. No. 38,660
Claims priority, application Japan, Apr. 16, 1986, 61-87349
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—31 **8 Claims**



1. An apparatus for stabilizing the wavelength and output power of a semiconductor laser comprising:

an injection current supplying source for supplying an injection current to a single-mode semiconductor laser;

an output power fluctuation detecting means for detecting the fluctuation of said output power by receiving a part of the output power of said semiconductor laser;

a wavelength variation detecting means having a light receiving means for receiving a part of the output power of said semiconductor laser through an optical element whose spectral characteristics vary the wavelength bandwidth of said semiconductor laser, and a processing means for obtaining a variation of the wavelength of said semiconductor laser based on the output of said light receiving means and the output of said output power variation detecting means;

a heat value detecting means for detecting a heat value of said semiconductor laser;

an operating temperature stabilizing means which includes an operating temperature detecting means for detecting an operating temperature of said semiconductor laser;

a thermoelectric element means for forwarding and receiving heat to and from said semiconductor laser, and an operating temperature controlling means for controlling said thermoelectric element so as to bring the operating temperature in accordance with a specified temperature while maintaining the output power constant based on a reference signal corresponding to the specified temperature, an output of said heat value detecting means, and an output of said output power variation detecting means; and

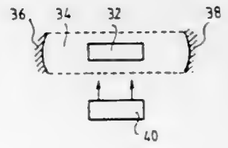
an injection current controlling means for controlling the injection current of said injection current source to maintain the wavelength constant based on an output of said wavelength variation detecting means.

4,821,274

ELECTRO-OPTICAL SEMICONDUCTOR DEVICE AND A METHOD OF EMITTING LIGHT

Claude Naud, Ezanville; Gérard Guillot, Lyons; Benoit Deveaud, Lannion, and Bernard Clerjaud, Montreuil, all of France, assignors to Centre National de la Recherche Scientifique, Paris and Etat Francais Represente Par Le Ministre Des Ptt, Issy Les Moulineaux, both of, France

PCT No. PCT/FR85/00311, § 371 Date Jun. 27, 1986, § 102(e) Date Jun. 27, 1986, PCT Pub. No. WO86/03059, PCT Pub. Date May 22, 1986
PCT Filed Nov. 5, 1985, Ser. No. 887,084
Claims priority, application France, Nov. 6, 1984, 84 16891
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—43 **18 Claims**



1. An electro-optical device for emitting light radiation, said device comprising:

a semi-conductor structure having an active layer of a semiconductor medium, said medium being a binary, ternary or quaternary III-V semiconductor alloy comprising at least one element from column III of the Periodic Table selected from the group consisting of gallium, indium and aluminum, and at least one element from column V of the Periodic Table selected from the group consisting of arsenic and phosphorous, and doped with vanadium, titanium or biobium as dopant, said medium being capable of two highly absorbent transitions; and

means for exciting the doped semiconductor alloy with a controlled energy greater than the threshold of one of said two highly absorbent transitions, whereby energy is transferred between the energy bands of the semiconductor alloy and the energy levels of the dopant, and light radiation is emitted.

4,821,275

LASER DIODE

Shinichi Nakatsuka, Kokubunji; Naoki Chinone, Hachioji; Kazuhisa Uomi, Kokubunji; Yuichi Ono, Nishitama, and Takashi Kajimura, Hishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 760,916, Jul. 31, 1985, abandoned. This application Jan. 4, 1988, Ser. No. 140,755
Claims priority, application Japan, Aug. 3, 1984, 59-162905
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **24 Claims**

1. A semiconductor laser diode comprising:

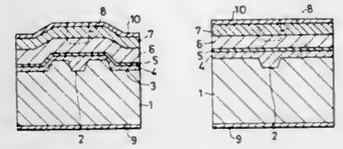
a semiconductor substrate having mirror edges;

a stripe groove formed in said substrate and running substantially perpendicular to said mirror edges, having end portions and a center portion between said end portions;

channel regions separated from said stripe groove and formed in said substrate adjacent said mirror edges and only at portions of said substrate corresponding to said end portions of said stripe groove;

multiple semiconductor layers including a first cladding layer formed on said substrate, and an active layer formed on said first cladding layer, such that said stripe groove and said channel regions are buried;

wherein said first cladding layer includes a first part adjacent said end portions of said stripe groove having a thickness



less than that of a second part adjacent said center portion of said stripe groove, and said active layer includes a first part adjacent said end portions of said stripe groove having a thickness less than that of a second part adjacent said center portion of said strip groove;

further wherein the distance between said stripe groove and said channel regions increases from a point at which said channel regions are closest to said mirror edges to a point at which said channel regions are most remote from said mirror edges; and

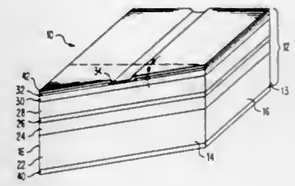
electrodes formed on a back surface of said substrate and on an uppermost semiconductor layer.

4,821,276

SUPER-LUMINESCENT DIODE

Gerard A. Alphonse, Princeton; Frank Z. Hawrylo, Trenton, and Maria Harvey, Princeton, all of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1987, Ser. No. 40,979
Int. Cl.[4] H01S *3/19;* **H01L** *33/00*
U.S. Cl. 372—45 **11 Claims**



1. In a super luminescent gain guided light emitting device which includes:

a semiconductor body having spaced first and second opposed end faces with an active regio extending therebetween, said end faces being spaced apart a given distance at said active region, said device comprising a crystal structure having a plurality of crystal planes wherein said active region is approximately parallel to one of said planes, said end faces normally lying in parallel first and second planes normal to said one plane, said device having a first current confining structure therein comprising a linear strip of material adjacent to a side of said active region, said structure being arranged to form an effective optical beam path between the end faces at said active region, said beam path having an optical axis of symmetry determined by and parallel to said current confining struc-

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ture, said path being oriented so that said axis of symmetry intersects said end faces, said path having a given width transverse said optical axis, wherein the improvement comprises:

at least one of said end faces being inclined at an angle non-parallel relative to said first and second planes, said linear strip and optical axis being perpendicular to said first and second planes, one of said at least one end faces emitting light from said beam path, the tangent of twice said angle being greater than or equal to the width of said effective optical beam path divided by said given distance;

said angle having a value such that light parallel to said axis incident on said at least one end face and reflected from that one end face toward said beam path is caused to e substantially refracted out of the beam path when incident on the boundary between the effective optical beam path and the adjacent semiconductor body outside the beam path;

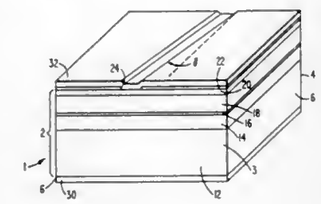
the values of said tangent and angle being such that together said values tend to minimize the spectral modulation within said path.

4,821,277

SUPER-LUMINESCENT DIODE

Gerard A. Alphonse, Princeton, N.J., and Dean B. Gilbert, Yardley, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1987, Ser. No. 40,977
Int. Cl.[4] A01S *3/19*
U.S. Cl. 372—45 **9 Claims**



1. In a super luminescent gain guided light emitting device which includes:

a semiconductor body having spaced first and second opposed end faces with an active region extending therebetween, said end faces being spaced apart a given distance at said active region, said device having a first current confining structure comprising a linear strip of material adjacent to a side of said active region, said structure being arranged to form an effective optical beam path between the end faces at said active region, said beam path having an optical axis of symmetry determined by and parallel to said current confining structure, said path being oriented so that said axis of symmetry intersects said end faces, said path having a given width transverse said optical axis, wherein the improvement comprises:

the optical axis of symmetry is inclined at an angle and non-parallel relative to a direction perpendicular to at lest one of said end faces, the tangent of said angle being greater than or equal to the width of said effective optical beam path divided by said given distance;

said angle has a value such that light parallel to said axis incident on said at least one end face and reflected from that one end face toward said beam path is caused to be substantially refracted out of the beam path when incident on the boundary between the effective optical beam path and the adjacent semiconductor body outside the beam path;

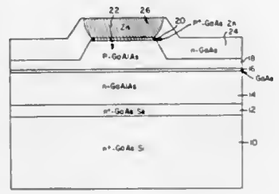
the values of said tangent and angle being such that together said values tend to minimize the spectral modulation within said path.

4,821,278

INVERTED CHANNEL SUBSTRATE PLANAR SEMICONDUCTOR LASER

Jane J. Yang, Los Angeles, Calif., and Chi-Shain Hong, Bellevue, Wash., assignors to TRW Inc., Redondo Beach, Calif.

Filed Apr. 2, 1987, Ser. No. 33,304
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 **14 Claims**



1. An inverted channel substrate planar semiconductor laser, comprising:

a planar substrate of semiconductor material of a selected conductivity type;

a planar first cladding layer of semiconductor material of the same conductivity type formed over the substrate;

a planar active layer of undoped semiconductor material formed over the first cladding layer;

a second cladding layer of semiconductor material of the opposite conductivity type formed over the active layer and having a mesa formed on it;

a semiconductor blocking layer formed over the second cladding layer and having a conductivity type the same as the substrate; and

a conductive contact region extending through the blocking layer to contact the mesa formed on the second cladding layer;

whereby the blocking layer laterally surrounds the mesa of the second cladding layer and functions both to confine the current to the region of the mesa and to laterally confine lasing to the same region.

4,821,279

GAS LASER

William E. Bell, Jerome, Ariz., assignor to Harry E. Aine, Philo, Calif. and Essenbee Inc., Jerome, Ariz., part interest to each

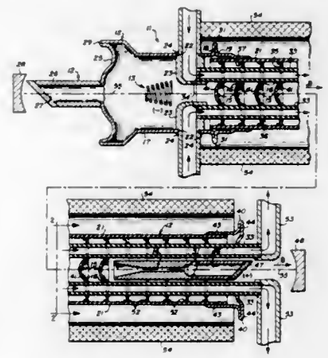
Filed Mar. 6, 1985, Ser. No. 708,953
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—61 **13 Claims**

1. In a method for producing laser radiation from an excited ionized gas at subatmospheric pressure, the steps of:

passing a first stream of thermionic electrons from a thermionic cathode emitter through an ionizable gas at subatmospheric pressure to an anode in said ionizable gas for ionizing the gas by collision therewith and for producing a column of positive gas ions within the first electron stream due to collisions therewith;

colliding a second electron stream emanating from a second-

ary electron emitter with said column of positive ions for populating an excited electronic state of said ions; and



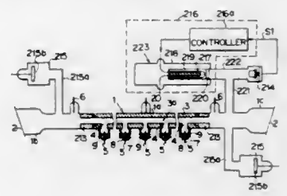
resonating optical laser radiation emanating from electronic transitions of the positive gas ions from said excited electronic state to a lower energy state.

4,821,280

HOLLOW-CATHODE TYPE METAL ION LASER

Hiromi Kawase, 2078-26, Masuo, Kashiwa-shi, Chiba-ken, Japan

Continuation of Ser. No. 781,558, Sep. 30, 1985, abandoned. This application Sep. 13, 1988, Ser. No. 244,592
Claims priority, application Japan, Oct. 12, 1984, 59-212667; Jan. 21, 1985, 60-7566
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 **28 Claims**



1. A hollow-cathode type metal ion laser, comprising:

a gas-filled tubular envelope;

a hollow cathode located within the tubular envelope, the hollow cathode having holes formed in a wall portion thereof and a bore therein;

a plurality of metal-containing reservoir means each containing a metal therein and having a discharge space near the envelope for vaporizing and diffusing said metal into the discharge space near each of the holes, each of the metal-containing reservoir means being disposed one next to each of the holes;

a plurality of main anodes disposed one within each of the metal-containing reservoir means, each of the main anodes being disposed near one of the holes;

a gauge for sensing the gas pressure within the tubular envelope;

means responsive to a loss of gas within the tubular envelope for supplying gas to the envelope until the sensed gas pressure is substantially equal to a predetermined desired pressure; and

a getter for absorbing impurity gas within the tubular envelope;

each of the reservoir means being connected via each of the holes into the bore;

a plurality of external heaters each surrounding each of the metal-containing reservoir means for heating the reservoir means;

each of the main anodes having an end portion positioned near each hole of the cathode such that each end portion of the main anodes is baked by the radiant heat of the cathode;

each of the metal-containing reservoir means including an open area having an axis substantially coaxial with the central axis of each hole at least near the envelope;

the diameter of each hole being smaller than that of each open area of the metal-containing reservoir means near the envelope;

the discharge space within the reservoir means being positioned only at one side of the envelope with respect to each hole of the cathode;

a sub-anode disposed within each end portion of the tubular envelope for confining the metal vapor within the cathode bore; and

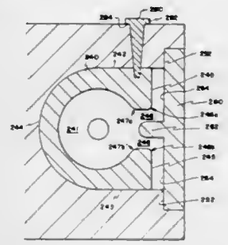
an insulator tube likewise disposed within each end portion of the tubular envelope.

4,821,281

HOLLOW CATHODE GLOW DISCHARGE RING LASER ANGULAR RATE SENSOR

Bruce J. Lind, Forest Lake, and Hendrik J. Oskam, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 15, 1986, Ser. No. 907,545
Int. Cl.[4] H01S *3/083*
U.S. Cl. 372—94 **6 Claims**



1. A ring laser comprising:

a gas impervious block containing at least three tunnels meeting to form, at least in part, a closed-loop gas containing cavity, said block constructed, in part, to provide a first electrode, said block including a tubular cavity axially aligned with a first one of said tunnels, said block including a slot aligned with said first tunnel and said tubular cavity, and said slot extending from an outside surface of said block to said tubular cavity;

electromagnetic wave reflecting surfaces, forming, in part, said cavity, for reflecting a pair of counter-propagating laser beams to propagate along said closed-loop cavity substantially defined by said tunnels;

a gas contained within said closed-loop cavity;

said tubular cavity having an electrically conductive surface to provide a first electrode adapted to be electrically connected to a negative supply voltage;

a second electrode fixed to said block, adapted to be electrically connected to a positive supply voltage relative to said negative supply voltage, said second electrode including an electrically conductive member aligned with said tubular cavity, said second electrode having a portion thereof fixed to said block to cover said slot, said second electrode including an electrically conductive member extending into said block and aligned with said tubular cavity and said slot, and in close proximity to said tubular cavity; and

said first and second electrodes positioned relative to each

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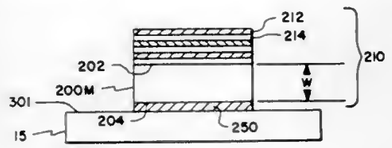
other to support a discharge current through said gas and establish a glow discharge region therebetween to induce a pair of counter-propagating laser beams to propagate through said glow discharge region in a direction transverse to the direction of said discharge current.

4,821,282

MIRROR ASSEMBLY FOR LASERS

Theodore J. Podgorski, Maplewood, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 27, 1985, Ser. No. 814,338
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—99 **12 Claims**



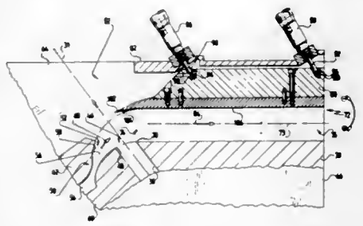
1. A ring laser angular rate sensor comprising:
a mechanically thermally stable block having a plurality of interconnecting tunnels; and
a two substrate mirror assembly including, a first substrate having a first polished surface having portions thereof fixed to portions of said block;
a second substrate having a first and a second oppositely disposed surfaces, said first surface bonded to said first surface of said first substrate; and
a mirror material deposited on said second surface of said second substrate, said mirror material being in communication with at least a pair of said interconnecting tunnels.

4,821,283

AERODYNAMIC WINDOW DEVICE

Eberhard Wildermuth, Fellbach, and Helmut Huegel, Sindelfingen, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt fuer Luft-und Raumfahrt e.V., Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 146,019
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701718
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—104 **12 Claims**



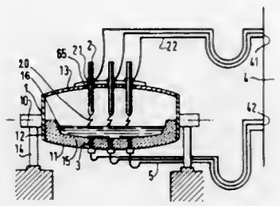
1. Aerodynamic window device for a laser for pressure isolation of the laser cavity, comprising: a jet nozzle and a diffuser arranged opposite said jet nozzle for generating a free jet extending from said jet nozzle to said diffuser and covering an exit aperture, characterized in that a side wall (**80**) of said diffuser (**72**) which faces away from said laser cavity (**34**) is adjustable, at least in sections thereof, relative to a free jet direction (**68**).

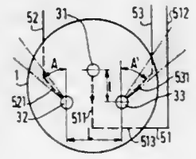
4,821,284

SCRAP-MELTING PROCESS AND ELECTRIC FURNACE FOR CARRYING OUT THE PROCESS

Robert A. Janiak, Saint-Genest-Malifaux, and Georges J. Davené , Marly Le Roi, both of France, assignors to Clecim, Courbevoie, France

Filed Jul. 30, 1987, Ser. No. 79,363
Claims priority, application France, Aug. 1, 1986, 86 11215
Int. Cl.[4] H05B *7/11*
U.S. Cl. 373—107 **5 Claims**





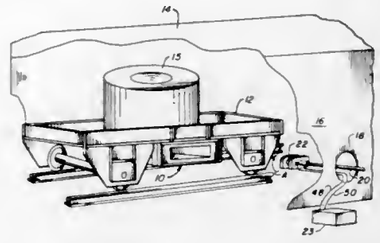
1. An electric direct-current metal melting furnace comprising
(a) a vessel (1) delimited by a bottom (**11**) covered by a refractory hearth (**15**), and a sidewall (**12**), and closed by a removable cover in the form of a vault (**13**);
(b) means for loading raw material into said vessel (**1**);
(c) means for melting said raw material to form a molten-metal bath, said means for melting comprising
(i) a plurality of consumable vault-electrodes mounted for vertical displacement through said vault (**13**) and generating an electric arc;
(ii) at least one fixed electrode (**3**) passing through said bottom (**11**) in a predetermined zone;
(iii) a direct-current source (**4**) having a negative pole (**41**) connected to said consumable vault-electrodes, respectively, by means of a plurality of feed conductors (**22**), and a positive pole (**42**) connected to said at least one hearth-electrode by means of at least two return conductors (**51, 52**);
(iv) said return conductors (**51, 52**) being arranged along an outer face (**11**) of said bottom of said vessel and each comprising a first part (**511, 521**) extending away from said zone of said electrodes (**3**) to a distance at which a magnetic field generated by a passage of current has a negligible influence on the electric arc, and a second part (**512, 522**) for connection to said current source (**4**); and
(v) said first parts (**511, 521**) of said conductors extending away in specific divergent directions, allowing for layout variations on the bottom of said vessel such that, for an ideal total length of a set of return conductors (**5**), magnetic fields generated by the passage of current in said conductors cause, by mutual compensation, an overall deflection effect which is such that, taking into account all the magnetic influences exerted on the arcs (**20**), the latter are directed towards a specific zone of said molten-metal bath.

4,821,285

THERMOCOUPLE SELECTION SWITCH

Robert H. Johns, Natrona Heights, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1987, Ser. No. 132,303
Int. Cl.[4] G01K *01/12, 13/00*
U.S. Cl. 374—152 **11 Claims**



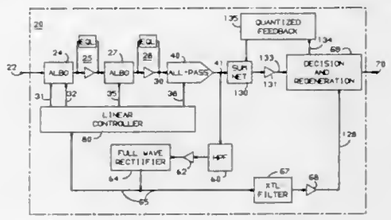
1. A thermocouple switch for monitoring thermocouples positioned within tunnel furnace cars, said thermocouple switch including:
longitudinally extending first contact rail means mounted to a tunnel furnace car, said first contact rail means being electrically coupled to first sides of thermocouples carried by said tunnel furnace car;
longitudinally extending second contact rail means positioned beneath said first contact rail means at a predetermined minimum spacing therefrom and in an aligned relationship therewith, said second contact rail means being electrically coupled to second sides of the thermocouples carried by said tunnel furnace car;
support and separating means for maintaining the first contact rail means at the predetermined minimum spacing from the first contact rail means; and
connecting means positioned at a tip portion thereof for establishing electrical contact with the first and the second contact rail means along the lengths thereof thereby allowing monitoring of one of said thermocouples externally of said tunnel furnace car.

4,821,286

QUATERNARY SIGNAL REGENERATOR

James F. Graczyk, Atkinson; John J. Ludwick, Hampton, and Edward S. Parsons, Londonderry, all of N.H., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 27, 1986, Ser. No. 867,218
Int. Cl.[4] H04L *25/60*
U.S. Cl. 375—4 **5 Claims**



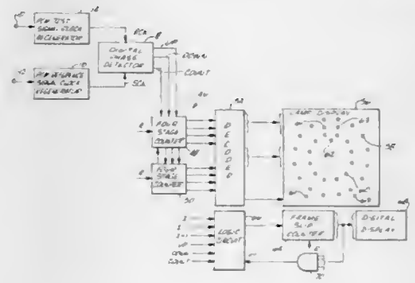
1. A digital signal regenerator comprising
means for receiving a four-level input signal;
a controlled shaping circuit means, responsive to the four-level input signal and plural control signals, for amplifying and reshaping the input signal into a reshaped four-level signal;
means for deriving the plural control signals from a maximum amplitude of the four-level input signal;
means, responsive to the reshaped four-level signal, for producing a recovered clock signal; and
means, responsive to the reshaped four-level signal and the recovered clock signal, for regenerating the reshaped four-level signal into a regenerated four-level output signal.

4,821,287

APPARATUS AND METHOD FOR DETECTING DIGITAL CARRIER SYNCHRONIZATION PROBLEMS

Francis P. Keiper, Jr., Sunnyvale, Calif., assignor to F. L. Jennings, Menlo Park, Calif.

Filed Oct. 21, 1987, Ser. No. 111,775
Int. Cl.[4] H04B *3/46*
U.S. Cl. 375—10 **20 Claims**



1. Apparatus for detecting digital carrier synchronization problems comprising:
means for recovering a test clock signal from a digital carrier signal;
a source of a reference clock signal operating at the same nominal frequency as the test clock signal;
means for generating from the test clock signal first and second binary signals at a frequency synchronized to the test clock signal, the second signal being shifted in phase from the first signal;
means responsive to the reference clock signal for repeatedly sampling the states of the first and second signals such that the sampled states are representative of the phase relationship between the clock signals;
means for storing successive samples of the states of the first and second signals;
means for comparing the stored successive samples to detect phase slippage between the digital carrier signals; and
means for accumulating unit interval clock phase shifts detected by the comparing means as successive samples are compared.

4,821,288

PARALLEL CHANNEL EQUALIZER ARCHITECTURE

Robert E. Peile, Pasadena, Calif., assignor to Cyclotomics, Inc., Berkeley, Calif.

Filed Dec. 21, 1987, Ser. No. 135,796
Int. Cl.[4] H03K *5/159*
U.S. Cl. 375—11 **12 Claims**

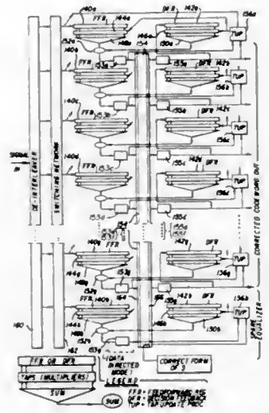
1. A processor which views through n time windows a serial stream of received symbols in an array of helically interleaved codewords of codeword length n symbols, wherein n is an integer, whereby each of said windows contains a given one of the n received symbols of ones of said codewords, said processor comprising:
error correction means for receiving a version of the n

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received symbols of each one of said codewords and providing therefrom n corrected symbols forming a corrected codeword corresponding thereto;

means associated with each of said n time windows for individually multiplying the symbols included in individual ones of said time windows with individual ones of said n sets of respective feedforward coefficients, and combining the resulting products to form n feedforward sums;

means associated with each of said n time windows for multiplying the currently available corrected symbol



corresponding to any one of the symbols included in a respective time window by respective sets of feedback coefficients and combining the resulting products to form a plurality of n feedback sums; and

means for combining said n feedforward sums and n feedback sums respectively to produce said versions of said n received symbols, and transmitting them to said error correction means, whereby said stream of received symbols moves through said n windows, while the n portions of said stream included within said n windows are separately equalized.

4,821,289

MULTIPLE PARALLEL CHANNEL EQUALIZATION ARCHITECTURE

Robert E. Peile, Pasadena, Calif., assignor to Cyclotomics, Inc., Berkeley, Calif.

Filed Dec. 21, 1987, Ser. No. 135,807
Int. Cl.[4] H04B *3/14*
U.S. Cl. 375—14 **8 Claims**

1. A multiple channel parallel equalizer system adapted to decode a codeword of length n whose n symbols have been transmitted and received on n separate channels, said equalizer system comprising:

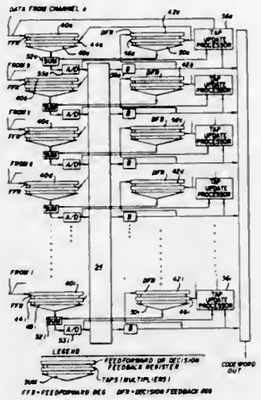
an error correction decoder having n inputs adapted to receive equalized versions of said n received codeword symbols and n decoder outputs adapted to transmit n corrected codeword symbols computed therefrom in accordance with a code generator polynomial;

n equalizers, each of said n equalizers comprising:

feedforward means providing a feedforward sum based on the combination of m ones of said codeword symbols received from the corresponding one of said n channels and a set of m feedforward multiplier coefficients;

feedback means for combining r ones of said corrected symbols received from a respective one of said n decoder outputs with a set of r feedback multiplier coefficients so as to provide a feedback sum of products therefrom,

means for combining said feedback and feedforward sums together to produce said equalized version of the last received codeword symbol of the corresponding one of



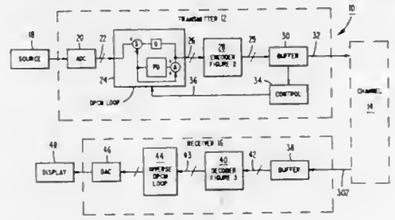
said n channels and transmitting said equalized version to the corresponding one of said n decoder inputs.

4,821,290

DECODER FOR DIGITAL SIGNAL CODES

Rajesh Hingorani, Plainsboro, and Nicola J. Fedele, Kingston, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 158,171, Feb. 9, 1988, abandoned. This application Aug. 26, 1988, Ser. No. 237,631
Int. Cl.[4] H04B *14/04*
U.S. Cl. 375—25 **15 Claims**



1. A decoder for decoding a plurality of codewords of an information signal having a representative codeword comprising N bits where N is an integer, said bits occurring in a given order, said codewords representing data, said decoder comprising:

memory means for assigning each bit of said representative codeword a memory location having an address based on the value and ordinal position of that bit in the codeword, said means for assigning including means for storing a partial address at each memory location for each of except for the last bit of said codeword, the partial address at each said memory location having a value such that for each except the last bit of the codeword when combined with the value of the bit in the next occurring ordinal position of the codeword forms a memory address to that memory location corresponding to the value of that next occurring bit, said means for assigning including means for storing data at that location whose address corresponds to the partial address in memory for the next to last bit combined with the value of the Nth received bit; and

means responsive to the addressing of said Nth bit memory

location for producing said data corresponding to the representative codeword at an output of said memory means;

each said memory location including a flag field for generating a flag signal of first and second values, one value indicative of the generation of data and a second value indicative of the receipt of an incomplete codeword; and

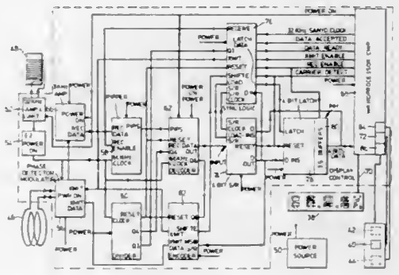
initial address generating means responsive to the generation of said flag signal of said first value indicative of the receipt of a codeword to form a partial initialization address which when combined with the next received codeword bit forms the address to a memory location for the first bit of that next occurring codeword.

4,821,291

IMPROVEMENTS IN OR RELATING TO SIGNAL COMMUNICATION SYSTEMS

John K. Stevens, Brampton, and Paul I. Waterhouse, Lynden, both of Canada

Filed Sep. 22, 1986, Ser. No. 909,548
Int. Cl.[4] H04L *27/00, 27/18*
U.S. Cl. 375—37 **26 Claims**



1. A signal broadcast system comprising a broadcast transmitter and at least one broadcast receiver, the system comprising:

means for generating at the transmitter a first carrier of a first reference frequency N and for broadcasting that first carrier;

means for generating at the transmitter a second carrier of second frequency N/n derived from the first reference carrier where the divisor n is greater than 1, for modulating the second carrier with a digital modulating signal in accordance with the digital information to be transmitted thereby, and for broadcasting the digitally modulated second carrier;

means at the receiver for receiving the first carrier and for dividing it by the divisor n to produce a corresponding demodulating signal of frequency N/n; and

a demodulator at the receiver receiving the second digitally modulated carrier and the demodulating signal and demodulating the second digitally modulated carrier with the second demodulating signal to generate a resulting digital information signal.

4,821,292

ADAPTIVE LIMITER/DETECTOR WHICH CHANGES TIME CONSTANT UPON DETECTION OF DOTTING PATTERN

Jeffrey S. Childress, Lynchburg, Va., assignor to General Electric Company, New York, N.Y.

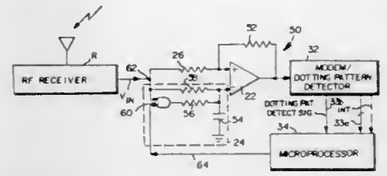
Filed Jun. 3, 1987, Ser. No. 56,924
Int. Cl.[4] H04L *25/06*
U.S. Cl. 375—76 **8 Claims**

1. A digital radio frequency communications receiver including:

integrating means, connected to receive an incoming signal including an alternating digital signal superimposed upon a DC level, for integrating said incoming signal over a predetermined time constant period;

signal comparing means for comparing said incoming signal with said integrated incoming signal and for producing an output signal responsive to the results of said comparison;

signal detecting means for detecting the occurrence of an alternating binary valued dotting pattern in said signal comparing means output signal, said dotting pattern maximizing the number of bit transitions over said time con-



stant period and having an average value over an even number of bit times equal to said DC level;

time constant selecting means connected to said integrating means for changing said predetermined time constant from a first value to a second value in response to detection by said detecting means of said dotting pattern; and

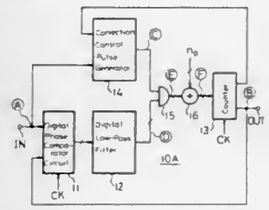
further signal detecting means for detecting the occurrence of a word synchronization bit pattern different from said dotting pattern in said signal comparing means output signal.

4,821,293

DIGITAL PHASE LOCKED LOOP CIRCUIT

Kazutoshi Shimizume, and Mutsumi Kimura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,653
Claims priority, application Japan, May 20, 1987, 62-123491
Int. Cl.[4] H03K *5/135*
U.S. Cl. 375—81 **13 Claims**



1. A digital phase locked loop (PLL) circuit comprising:

(a) input digital signal source means for generating an input digital signal having a pulse occurring at an integral multiple of a unit period;

(b) counter means for counting the number of a reference clock;

(c) digital phase comparator means for comparing phases of said input digital signal and the output of said counter means;

(d) digital low-pass filter means supplied with the output of said digital phase comparator means;

(e) correction control signal generating means for generating a correction control signal occurring at a following unit period of a unit period during which the pulse of said input digital signal occurs; and

(f) control means in response to said correction control signal for supplying the output of said digital low-pass

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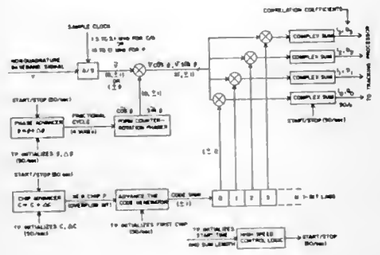
filter means to said counter means to control the dividing ratio of said counter means only in the unit period during which said correction control signal is obtained.

4,821,294

DIGITAL SIGNAL PROCESSOR AND PROCESSING METHOD FOR GPS RECEIVERS

Jess B. Thomas, Jr., La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jul. 8, 1987, Ser. No. 71,121
Int. Cl.[4] H04B *7/01*
U.S. Cl. 375—96 **26 Claims**



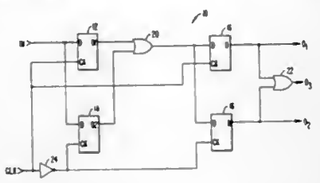
1. A digital signal processor for use in a Global Positioning System (GPS) receiver, the receiver of the type receiving a code-modulated signal, providing a digitized signal from said code-modulated signal, generating model delays, generating a model code sequence that is time offset by the model delays so that the resulting model code values are closely aligned in time with the received code sequence, and generating model carrier phases that are closely matched to received carrier phase, for accurately measuring the code group delay and carrier phase of the code-modulated signal; the processor comprising:
- means for generating counter-rotation sinusoids from model phases;
- means for counter-rotating the carrier phase of the digitized signal with said counter-rotation sinusoids;
- means for multiplying the counter-rotated signal with the model code values and accumulating the multiplication produces over respective selected time intervals;
- means for processing the accumulated products to obtain model phase and model delay; and
- means for modifying model carrier phase to obtain fast feedback models for code group delays.

4,821,295

TWO-STAGE SYNCHRONIZER

Martin W. Sanner, San Jose, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Nov. 30, 1987, Ser. No. 126,997
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—110 **5 Claims**



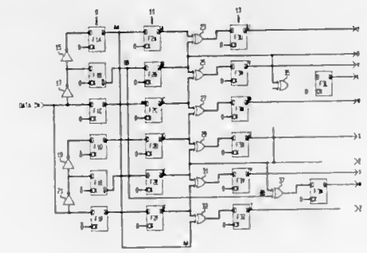
1. Apparatus for synchronizing transition between first and second states of an input signal to positive or negative transitions occurring in a periodic pulse train, the apparatus comprising:
- first storage means coupled to receive the input signal for sampling and storing the state of the input signal at each positive transition of the periodic pulse train;
- second storage means coupled to receive the input signal for sampling and storing the state of the input signal at each negative transition of the periodic pulse train;
- first circuit means operable to produce a first signal indicative of the state of the input signal stored in the first or the second storage means; and
- second circuit means operable in response to the first signal and the pulse train to produce a representation of the input signal with the first and second state transitions synchronized with the transitions of the pulse train, the second circuit means including third storage means coupled to sample and store the first signal at each positive transition of the periodic pulse train, and fourth storage means coupled to sample and store the first signal at each negative transition of the periodic pulse train.

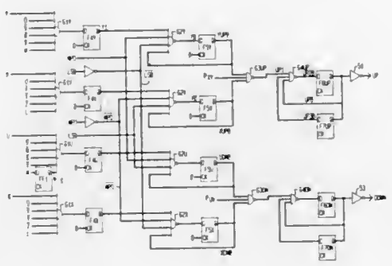
4,821,296

DIGITAL PHASE ALIGNER WITH OUTRIGGER SAMPLING

Robert R. Cordell, Tinton Falls, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 26, 1987, Ser. No. 89,609
Int. Cl.[4] H03D *3/24*
U.S. Cl. 375—119 **8 Claims**





1. A phase aligner circuit having an input and an output and comprising a sampler circuit comprising means to obtain samples of a phasevarying input data stream at a plurality of phases of a local clock and means for generating disagreement signals indicating the occurrences of transitions between any pair of said samples,
- first register means for storing a sequence of in-phase samples of said data stream,
- second register means for storing a sequence of anti-phase samples of said data stream,
- control means for analyzing said disagreement signals and

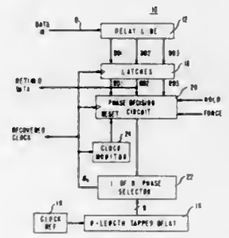
for causing samples stored in said first or said second register means to be connected to said output of said aligner circuit,
- and wherein said sampler circuit comprises means to obtain the said in-phase and anti-phase samples of said input data signal at the 0° and 180° phases of said local clock, respectively, and means to obtain two pairs of outrigger samples, each pair of which bracket one of said in-phase and anti-phase samples, the spacing between each of said outrigger samples and its associated in-phase or anti-phase sample being approximately the same and falling into the range of 1° to 89° in terms of the period of said local clock.

4,821,297

DIGITAL PHASE LOCKED LOOP CLOCK RECOVERY SCHEME

Ernest E. Bergmann, Fountain Hill Borough, and Sherre M. Staves, Telford Borough, both of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 19, 1987, Ser. No. 123,040
Int. Cl.[4] H03D *3/24*
U.S. Cl. 375—120 **18 Claims**



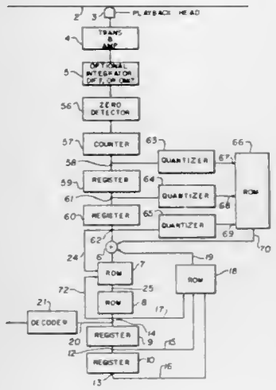
1. A clock recovery arrangement responsive to an incoming digital data stream for generating therefrom a retimed data output signal and a recovered clock output signal, said arrangement comprising
- a data input line for reception of the incoming data stream;
- data sampling means coupled to the data input line and responsive to the recovered clock output signal for producing as an output a plurality of M clocked samples (RD1, RD2, . . ., RDM) of each data bit from said incoming data stream, M being at least equal to three, one clocked sample located at the approximate midpoint of the data bit and defined as the retimed data output of said clock recovery arrangement, at least one clocked sample located before the midpoint, and at least one other clocked sample located after the midpoint;
- reference clock means for generating a clock output signal at a predetermined frequency;
- clock phase generating means responsive to said reference clock output signal for generating a plurality of N clock signals at said predetermined frequency, adjacent clock signals being separated in phase by the amount 360°/N, denoted as phase interval $\Delta\phi$; and
- clock phase determination and selection means responsive to both the plurality of M clocked data bit samples from the data sampling means and the plurality of N clock signals from the clock phase generating means for generating as an output the recovered clock signal, said clock phase determination and selection means capable of comparing the logic values of said plurality of M clocked data bit samples and adjusting the phase of the current recovered clock output signal if all do not agree in value, the adjustment being to decrement the phase if the at least one clocked sample after the midpoint is different in value from the others and alternatively to increment the phase if the at least one clocked sample before the midpoint is different in value from the others.

4,821,298

METHOD AND APPARATUS FOR REPRODUCING DIGITIZED SIGNALS

Roger Lagadec, Rumlang, and Julien Piot, Rolle, both of Switzerland, assignors to Willi Studer, AG, Regensdorf, Switzerland

Filed Dec. 19, 1984, Ser. No. 683,429
Claims priority, application Switzerland, Dec. 19, 1983, 6741/83; Jul. 3, 1984, 3196/84
Int. Cl.[4] H04B *1/66*
U.S. Cl. 375—122 **18 Claims**



1. A method for reproducing a digital signal, wherein said digital signal comprises a plurality of individual binary pulses arranged in groups of one or more such pulses whereby said pulses define run lengths, comprising steps of:
- (1) determining the deviation between each of said run lengths of the reproduced signal and the corresponding run length of said digital signal prior to reproduction of the digital signal,
- (2) storing said deviations,
- (3) producing a signal derived from said reproduced signal, and
- (4) processing said derived signal by combining run lengths of said derived signal with corresponding previously stored deviations.

4,821,299

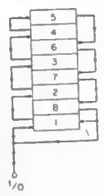
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING SHIFT REGISTER HAVING SUBSTANTIALLY EQUALIZED WIRING BETWEEN STAGES THEREOF

Hideki Kawai, Nara; Masaru Fujii, Takatsuki; Kiyoto Ohta, Takatsuki, and Masahiko Sakagami, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Feb. 17, 1987, Ser. No. 15,347
Claims priority, application Japan, Feb. 18, 1986, 61-34677
Int. Cl.[4] G11C *19/00*; **H03K** *23/54*
U.S. Cl. 377—69 **6 Claims**

1. A semiconductor integrated circuit device having a shift register which has a plurality of stages electrically connected in series, wherein a first stage of said shift register is located at a closest position to a data input terminal, and other succeeding stages are sequentially and straightly located in every other position leaving spaces therebetween, and the chain of said stages is folded at a particular stage, and further succeeding

stages are sequentially and straightly located in every other position so as to fill in the spaces between said every other stage, and wherein a last stage is located at a closest position to



a data output terminal, whereby the wiring between said stages is substantially equalized so as to substantially equalize time delays therebetween.

4,821,300

ROLLER COUNTER

Herbert Pollmann, Thumastrasse 9, A-3822 Karlstein/Thaya, Austria

PCT No. PCT/AT86/00058, § 371 Date May 20, 1987, § 102(e) Date May 20, 1987, PCT Pub. No. WO87/01843, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 17, 1986, Ser. No. 62,461
Claims priority, application Austria, Sep. 20, 1985, 2758/85
Int. Cl.[4] G06M *1/36*
U.S. Cl. 377—88 **17 Claims**



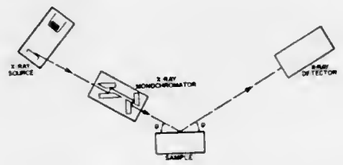
1. A roller counter, comprising:
an axle member;
at least two digit rollers rotatably supported by said axle member;
a teeth pair integral with each digit roller of said at least two digit rollers;
a plurality of stepping pinions, one of said plurality of stepping pinions respectively for each said at least two digit rollers, each of said plurality of stepping pinions being bearingly supported on said axle member, said plurality of stepping pinions engaging said teeth pair for driving one of s aid at least two digit rollers;
a plurality of bearing plates fixedly attached to said axle member, each of said bearing plates being located on said axle member between adjacent digit rollers of said at least two digit rollers, each of said plurality of hearing plates bearingly supporting respectively each of said plurality of stepping pinions;
at least one collar, said at least one collar being non-rotatably mounted between said at least two digit rollers and s aid axle member;
at least one ring bearingly supported by said at least one collar, said at least one ring having a toothed surface in gearing engagement with one of said plurality of stepping pinions of a respective digit roller, said at least one ring further having a center facing surface having a plurality of center facing recesses;
a lock pawl supported on each of said at least two digit roller, respectively, said lock pawl engaging one of said plurality of center facing recesses for orienting said at least one ring in a fixed direction relative to a respective digit roller; and
zero setting means for zero setting said at least two digit rollers, said zero setting means comprising:
a leaf spring having a bent portion forming two legs on either side thereof, said two legs having an inside surface generally facing each other, said two legs having an outside surface generally facing away from each other, one leg of said leaf spring biasing said lock pawl towards said plurality of center facing recesses;
at least two stop notches in said axle member, one of each of said at least two stop notches being located relative to one of each of said at least two digit rollers;
pestle means swivellably supported on said at least one ring, said pestle means being biased toward said axle member by the other leg of said two legs of said leaf spring; and
lateral protrusions on each of said at least two digit rollers for holding said leaf spring in a predetermined location, said lateral protrusions forming walls contacting said two legs, said lateral protrusions having an outer well contacting a portion of said outside surface of each said two legs of said leaf spring, said lateral protrusions further comprising a contiguous wall portion contacting said leaf spring along said bent portion, said lateral protrusions further comprising an inner wall contacting a portion of said inside surface of each said two legs of said leaf spring, said lateral protrusions further having protrusions extending beyond said leaf spring to permit pinching said protrusions over said leaf spring for holding said leaf spring to one of said at least two digit rollers.

4,821,301

X-RAY REFLECTION METHOD AND APPARATUS FOR CHEMICAL ANALYSIS OF THIN SURFACE LAYERS

Franklin H. Cocks, and Roland Gettliffe, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Feb. 28, 1986, Ser. No. 834,919
Int. Cl.[4] G01N *23/20*
U.S. Cl. 378—70 **9 Claims**



1. An X-ray reflection method for the analysis of the relative proportions of each element in a surface composed substantially of N known elements which comprises:
subjecting said surface to X-ray radiation from at least one substantially monochromatic X-ray beam of wavelength λ at a glancing angle θ between said beam and said surface from which the X-ray beam is reflected;
varying the glancing angle θ;
measuring the reflected X-ray intensities relative to incident X-ray intensity I_0 of said substantially monochromatic X-ray beam as a function of the glancing angle θ;
assuming any composition of said N known elements;
calculating the reflected X-ray intensities as a function of glancing angle θ and the assumed composition of said N known elements from an equation of the form

$$I/I_0 = f(\theta, \lambda, \delta, \beta)$$

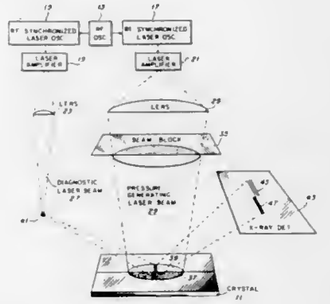
wherein I is the intensity of the reflected X-ray beam, I_0 is the intensity of the incident X-ray beam, f is the functional combination of θ the glancing angle, λ the wavelength of the incident X-ray beam, δ the value by which the real portion of the index of refraction of the element is less than unity for incident X-rays of wavelength λ, and β the absolute magnitude of the imaginary portion of the index of refraction of the element for incident X-rays of wavelength λ;
comparing the calculated and the measured X-ray intensities as a function of glancing angle θ; and
repeating the calculation of the reflected X-ray intensities as a function of glancing angle θ as a function of different assumed compositions of said N known elements until the measured X-ray intensity as a function of glancing angle θ is duplicated by the calculated X-ray intensity as a function of glancing angle θ.

4,821,302

METHOD AND APPARATUS FOR TRANSIENT UNIT CELL MEASUREMENT

Robert R. Whitlock, Bethesda, Md.; Justin S. Wark, Rochester, N.Y., and Allan Hauer, Los Alamos, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 29, 1988, Ser. No. 161,935
Int. Cl.[4] G01N *23/20*
U.S. Cl. 378—73 **20 Claims**



1. An apparatus for measuring the lattice parameters of a shocked single crystal, said apparatus comprising:
a target located at a preselected position in space with respect to said crystal;
means for transmitting a first laser beam pulse to said crystal to produce a transient shock wave in said crystal and for transmitting a second laser beam pulse to said target to cause said target to produce x-rays which are Bragg-diffracted from first atomic planes of said crystal as said crystal is undergoing the shock wave; and
detection means for recording the Bragg-diffracted x-rays to provide a first measurement of the lattice parameters of said crystal during compression by said shock wave.

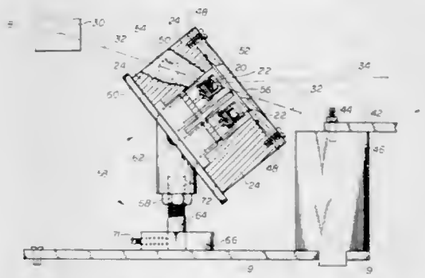
4,821,303

COMBINED THERMAL ANALYZER AND X-RAY DIFFRACTOMETER

Timothy G. Fawcett; William C. Harris, Jr.; Robert A. Newman; Lawrence F. Whiting, and Frank J. Knoll, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 938,682, Dec. 5, 1986. This application Oct. 6, 1987, Ser. No. 105,769
Int. Cl.[4] G01N *23/20*
U.S. Cl. 378—80 **9 Claims**

1. An instrument for studying structure of a sample material in a controlled environment and simultaneously studying energy changes in the sample material as a function of controlled temperature or atmospheric change, the instrument comprising:
a differential analyzer having means for determining energy changes in a sample material in comparison to a thermally heated reference contained in said analyzer and as a function of controlled temperature or atmospheric change, the analyzer having a sample holder assembly forming an enclosure relative to an external atmosphere which contains a thermally heated sample holder and which provides an environment in which the sample material is physically isolated from the external atmosphere so that a



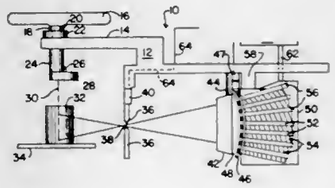
controlled temperature and atmospheric environment can exist about the sample material, a path defined through the sample holder assembly to and from the sample holder which is substantially transparent to X-rays to allow a beam of X-rays outside of the sample holder assembly to be impinged on the sample material within the sample holder assembly and to be diffracted effective for detecting the diffracted radiation, and
an X-ray diffractometer including a source of an X-ray beam to impinge on the sample material through said sample holder assembly, and a position sensitive detector arranged for receiving diffracted radiation from the sample material.

4,821,304

DETECTION METHODS AND APPARATUS FOR NON-DESTRUCTIVE INSPECTION OF MATERIALS WITH RADIATION

Michael Danos, 4820 Hutchins Pl., Washington, D.C. 20007

Filed Dec. 31, 1986, Ser. No. 948,043
Int. Cl.[4] G01N *23/201, 23/203*
U.S. Cl. 378—86 **11 Claims**



1. An apparatus for inspecting materials, comprising:
a penetrating radiation emission means for emitting radiation capable of penetrating a material of predefined thickness,
collimator means for configuring said penetrating radiation into a beam of a selected cross-sectional geometry and directing said beam toward the material in a manner where said beam penetrates a preselected volume of the material along a preselected cross-section thereof where said beam radiation is scattered by the material,

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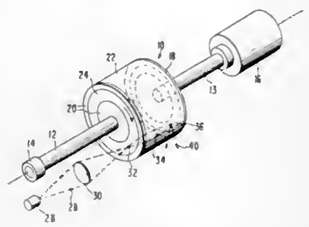
detector means for detecting said scattered radiation,
scattered radiation selection means for selecting a desired portion of said scattered radiation and allowing said desired portion to impinge upon said detector means, said selection means comprising remotely spaced vertical mask means with a horizontal slitted means for permitting only a first portion of the scattered radiation to pass through perpendicular to the direction of the beam, and vertical resolution mask means for permitting selection of a second portion of said first portion of radiation to pass through to the detector means, and
said slitted mask means being translatable to move between a first and second and third position and located between said specimen and said detector means and perpendicular to said detector means, said slitted mask means being composed of radiation impervious material and having a slot for passing scattered radiation through said mask means in a manner where only said first radiation portion passes through the mask.

4,821,305

PHOTOELECTRIC X-RAY TUBE

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 843,960, Mar. 25, 1986, abandoned.
This application Jun. 9, 1988, Ser. No. 207,005
Int. Cl.⁴ H01J *35/06*
U.S. Cl. 378—136 **13 Claims**



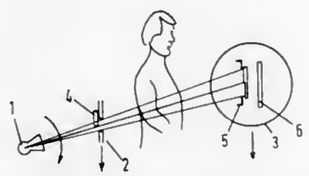
1. An X-ray generating device comprising:
a vacuum envelope, the entire envelope being rotatable as a sealed unit about an axis, said envelope comprising: a metallic anode electrode having an X-ray emitting surface symmetric with respect to said axis, a photocathode electrode symmetric with respect to said axis spaced from and facing said anode, a window of optically transparent material located in said vacuum envelope for coupling light from a stationary source outside said vacuum envelope to said photocathode, and an insulator being a portion of said vacuum envelope between said anode and said photocathode, said anode and said cathode being fixed with respect to said envelope;
means for cooling said anode from outside said vacuum envelope including a heat conduction path from an exterior face of said envelope to said X-ray emitting surface;
means for rotating said vacuum envelope about said axis comprising at least one axial bearing;
means for focusing a beam of light from the stationary source outside said vacuum envelope through said window onto a first stationary region through which said photocathode is rotatable as the envelope is rotated by said means for rotating; and
means for focusing a beam of photoelectrons from said first stationary region onto a second stationary region through which the X-ray emitting surface of said anode is rotatable as the envelope is rotated by said means for rotating.

4,821,306

SYSTEM FOR DETECTING TWO X-RAY ENERGIES

Hendrik Mulder, Delft, Netherlands, assignor to B.V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Jun. 13, 1985, Ser. No. 744,792
Claims priority, application Netherlands, Jun. 19, 1984, 8401946
Int. Cl.⁴ G21K *3/00*
U.S. Cl. 378—156 **11 Claims**



1. An apparatus for slit radiography, which comprises;
an X-ray source;
a slit diaphragm positioned between said X-ray source and a body to be radiographed for forming a substantially planar X-ray beam;
a filter disposed proximate said slit diaphragm along a longitudinally axis thereof for intercepting a portion of said substantially planar X-ray beam prior to irradiation of said body, said filter blocking relatively low level energy X-ray radiation;
an elongated X-ray detector tube for collecting radiation passing through said body to be radiographed and extending parallel to said longitudinal axis of said slit diaphragm, said elongated X-ray detector tube including a cathode and an anode extending along said longitudinal axis of said slit diaphragm, said cathode formed with an X-ray detection layer comprised of parallel strips of screening material, one strip of said screening material coinciding with said filter and another strip of said screening material coinciding with an unfiltered portion of said substantially planar X-ray beam; and
means for providing relative movement between said body to be radiographed and said slit diaphragm and elongated X-ray detector tube, said relative movement being substantially perpendicular to said longitudinal axis of said slit diaphragm.

4,821,307

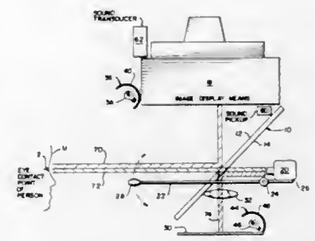
IMAGE SPLITTER FOR TWO-WAY IMAGING APPARATUS

Paul L. Flint, III, 1001B Daniel Ct., Arlington, Va. 22201

Filed Feb. 10, 1987, Ser. No. 13,084
Int. Cl.⁴ H04N *7/14*; **G02B** *1/10, 27/14*
U.S. Cl. 379—53 **7 Claims**

1. Apparatus for generating selectively a manifestation indicative of a first or second image, comprising:
(a) image sensing means to receive one of said first and second images to provide a corresponding manifestation thereof;
(b) means for illuminating selectively one of said first and second images, said illuminating means illuminating said second image with a greater intensity than said first image; and
(c) an image splitter disposed between said first and second images for selectively directing along a first path one of said first and second images depending upon which is illuminated by said illuminating means, said image splitter having a first surface for receiving via a second path incident therewith said first image an for transmitting said first image therethrough to be directed along said first path onto said image sensing means, and a second surface for receiving said second image along a third path incident therewith and for reflecting said second image along said first path onto said image sensing means, said image splitter having the property of a higher transmission of said first image therethrough than reflection of said second image.

5. Apparatus for generating selectively a manifestation indicative of a first or second image, comprising:
(a) an image splitter having first and second surfaces and disposed between said first and second images for receiving said first and second images via first and second paths respectively and for selective directing along a third path one of said first and second images depending upon the intensity of its illumination;
(b) image sensing means disposed in said third path to receive the selectively directed image to provide a corresponding manifestation;



(c) means for illuminating selectively one of said first and second images with an illumination of greater intensity whereby said selected one image is transmitted to said image sensing means; and
(d) display means for projecting a third image along a fourth path intersecting said first surface;
(e) said image splitter comprising a radiation transmissive layer defining said first and second surfaces, said first surface having a reflective coating thereon and said second surface having an antireflective coating thereon, said third image being incident via said fourth path upon said reflective coating to be reflected thereby via said first path, said second image being directed via said second path through said second surface and said transmissive layer to be incident upon said reflective coating to be reflected thereby via said first path onto said image sensing means, said antireflective coating preventing substantially the reflection of a double second image onto said image sensing means.

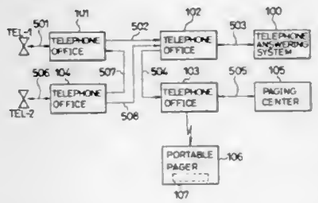
4,821,308

TELEPHONE ANSWERING SYSTEM WITH PAGING FUNCTION

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 841,097
Claims priority, application Japan, Mar. 19, 1985, 60-55225
Int. Cl.⁴ H04Q *7/04*
U.S. Cl. 379—57 **6 Claims**

1. For a telephone answering device having:
(a) means for establishing a closed loop of telephone lines, upon reception of an incoming telephone call;
(b) means for transmitting a prerecorded outgoing message to a caller; and
(c) means for recording a caller's voice message whereby the subscriber can obtain the caller's recorded voice message;
a means for providing at the telephone answering device a paging function, comprising:
means for receiving a signal representative of a caller's telephone number sent by the caller, before or after the message, and storing said signal;
means for automatically, temporarily releasing the closed loop after said signal is received and stored, and for reestablishing the closed loop of the telephone line;
means for dialing a paging center after reestablishment of the closed loop of the telephone lines; and
means for transmitting said stored signal representative of the caller's telephone number, to the paging center via



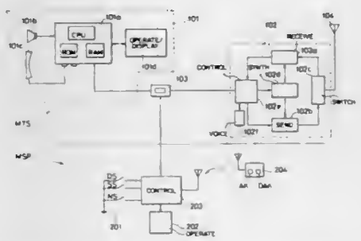
telephone lines, when the paging center answers and requests the telephone answering system to send said stored signal and; a portable receiver unit, adapted to be called by the paging center, with a display window for displaying a telephone number corresponding to said signal sent from the caller to the telephone answering device.

4,821,309

METHOD OF ALARM TO PREVENT VEHICLE THEFTS

Makoto Namekawa, Iwaki, Japan, assignor to Alpine Electronics Inc., Japan

Filed Jul. 2, 1986, Ser. No. 881,229
Claims priority, application Japan, Jul. 9, 1985, 60-150641
Int. Cl.⁴ H04Q *7/04*
U.S. Cl. 379—58 **2 Claims**



1. A method for notifying a notifiee of an abnormality occurring in a vehicle which is equipped with a vehicle telephone system and an anti-theft system for detecting abnormal conditions occurring at the vehicle, comprising:
providing an operative connection between the telephone system and the anti-theft system so that the anti-theft system can provide a power-on signal and an alarm signal to the telephone system;
placing the anti-theft system is an armed mode and the telephone system in a power-off mode when the vehicle owner leaves the vehicle;
operating the anti-theft system in the armed mode so that it provides the power-on signal and the alarm signal through the operative connection to the telephone system when the anti-theft system detects an abnormal condition;
operating the telephone system so that upon receipt of the power-on signal it switches to a power-on mode;
storing in advance in a memory of the telephone system a telephone number of a notifiee to be called in the event of an abnormal condition occurring at the vehicle;

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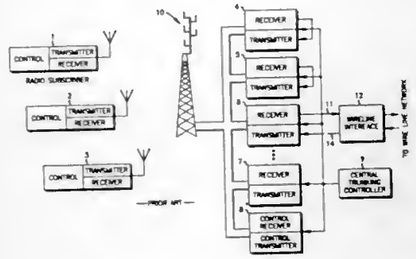
operating the telephone system so that upon receipt of the alarm signal from the anti-theft system and switching to the power-on state, the telephone number of the notifiee is recalled from memory, and the telephone number is dialed to establish a communication state with the notifiee.

4,821,310

TRANSMISSION TRUNKED RADIO SYSTEM WITH VOICE BUFFERING AND OFF-LINE DIALING

Charles N. Lynk, Jr., Bedford, and Eric R. Schorman, Beford, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1987, Ser. No. 136,601
Int. Cl.[4] H01Q *7/04*
U.S. Cl. 379—63 **10 Claims**



1. A method of communicating on a trunked radio system comprising the steps of:

requesting an assignment to an information channel on which to transmit and waiting to receive the assignment;

while waiting, recording a representation of information to be transmitted; and

receiving the assignment and, upon receiving the assignment, reproducing and transmitting on the information channel at least a part of the delayed version of the representation of the information.

4,821,311

AUTOMATIC TELEPHONE ANSWERING/RECORDING DEVICE OF DIGITAL TYPE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Jun. 3, 1987, Ser. No. 57,962
Claims priority, application Japan, Jun. 3, 1986, 61-128396
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—88 **6 Claims**

1. An automatic telephone answering/recording device, comprising:

means for converting an outgoing message recorded in a RAM (random access memory) in digital form into an analog signal for transmission thereof onto a telephone line;

means for recording messages from a number of unspecified callers in separate message channels, i.e., within different memory portions of said RAM having a common message storage capacity;

means for playing back messages from up to said number of the unspecified callers, channel by channel, in accordance with a first remote control signal sent by a user of said device from a remote place;

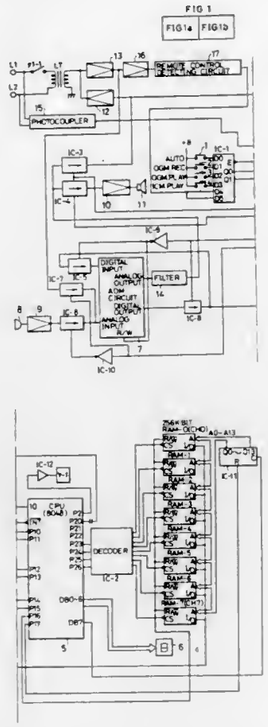
means for providing a blank portion between messages stored in said RAM each time playback of a channel for a message from the unspecified caller is completed;

means for permitting playback of a message from another unspecified caller upon elapse of the blank portion;

means for receiving a second remote control signal from the user when remote listening of a message is completed;

message number storage means for storing a message number corresponding to a message which needs to be stored in accordance with reception of the second remote control signal;

erase means for erasing a message which is not stored in said message number storage means and no longer needs to be stored upon restoration of said device to a standby mode thereof; and



transfer/storage means for successively transferring messages specified by message numbers stored in said message number storage means to a fill location at which a message erased by said erase means was stored.

4,821,312

VOICE/DATA SWITCH

Stephen W. Horton, Kirkland, and Dan M. Percival, Maple Valley, both of Wash., assignors to Rainier Technologies Corporation, Redmond, Wash.

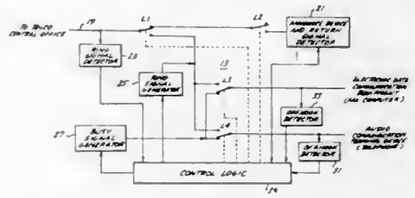
Filed Oct. 14, 1987, Ser. No. 109,260
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—102 **24 Claims**

1. A voice/data switch for selectively connecting a Telco line to either a piece of electronic data communication equipment, such as a FAX machine or a computer, or an audio communication device, such as a telephone, said voice/data switch comprising:

announcement and return signal means for producing an audible message requesting a return signal and detecting the receipt of said requested return signal; and,

switch means connected to said announcement and return signal means for receiving a signal when said announcement and return signal means receives said return signal and selectively controlling the connection of either a piece of electronic data communication equipment or an audio

communication terminal device to a Telco line such that said piece of electronic data communication equipment is connected to said Telco line if a return signal is not detected by said announcement and return signal means and said audio communication terminal device is connected to said Telco line if a return signal is detected by said announcement and return signal means.

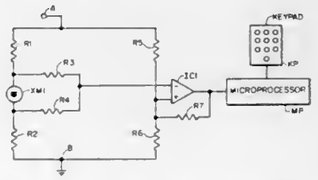


4,821,313

PAYSTATION TRANSMITTER GROUND DETECT CIRCUITRY

Gary Grantland, Hartselle, Ala., assignor to Palco Telecom Inc., Nashville, Tenn.

Filed Jul. 1, 1988, Ser. No. 214,430
Int. Cl.[4] H04M *17/00*
U.S. Cl. 379—145 **5 Claims**



1. A telephone paystation connected to a telephone central office via a telephone line, said paystation including a transmitter including first and second input terminals, a calling device, a microprocessor, a transmission network, an earth ground and a ground detect circuit, said ground detect circuit comprising:

a comparator circuit including first and second input terminals connected to said first and second transmitter input terminals, respectively, said comparator circuit further including an output terminal connected via said microprocessor to said calling device;

said comparator circuit operated in response to connection of said earth ground to one of said transmitter terminals to generate an output signal at said comparator output terminal whereby said microprocessor is operated to disable said calling device connected thereto.

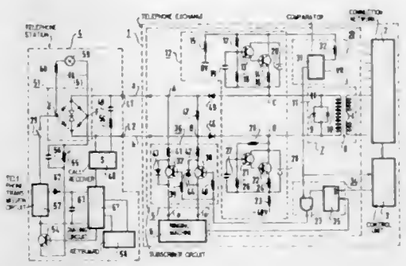
4,821,314

MESSAGE AND RINGING SIGNALING DEVICE FOR A TELEPHONE INSTALLATION

Roger Guyader, Guiparas, and Jean-Marie Ploet, Plougastel Daoulas, both of France, assignors to Telic Alcatel, S.A., Strasbourg Cedex, France

Filed Aug. 18, 1987, Ser. No. 86,579
Int. Cl.[4] H04M *1/00, 19/02*
U.S. Cl. 379—376 **3 Claims**

1. A signaling device for a telephone installation organized around a subscriber's line telephone exchange equipment (1) to which telephone stations (4) are connected by lines each comprising at least two wires, known as conversation wires (a,b) which, connected to a station, provide particularly the remote feeding of the station via a diode rectifier bridge (51), and the transmission of audiofrequency signals transiting in analog form by this station and the sending of rhythmic ring tones, alternating phases of silence with phases of transmission of a determined low frequency signal by a ringing generator (6, 36) of the telephone exchange equipment to a call receiver (48) of the station, said device being characterized in that it comprises, on the one hand, in each of stations (4) concerned, message signaling means which include, in parallel, on the other hand,



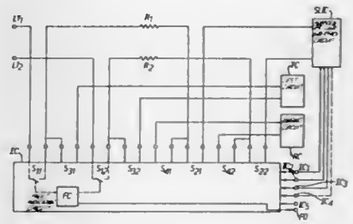
a lamp (59) in series with a resistor (60) and on the other hand, a capacitor (61) and which are connected to outputs (E,F) of the rectifier bridge (51), and, on the other hand, in the telephone exchange equipment, means to control, by the ringing generator, the sending of rhythmic signals whose cyclic transmission phase, shorter than that of the rhythmic ringing signals, is sufficient to light the lamp while being too short to actuate the call receiver.

4,821,315

ELECTRONIC CONTACTS AND ASSOCIATED DEVICES

Guido P. T. C. Remmerie, Ramst, and Luc J. L. Van den Bossche, Lebbeke, both of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

PCT No. PCT/EP84/00282, § 371 Date May 6, 1985, § 102(e) Date May 6, 1985, PCT Pub. No. WO85/01404, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 13, 1984, Ser. No. 732,789
Claims priority, application Belgium, Sep. 19, 1983, 2/60208; European Pat. Off., Aug. 22, 1984, 84201211
Int. Cl.[4] H04B *3/00;* **H03K** *17/00*
U.S. Cl. 379—412 **30 Claims**



25. Telecommunication system line circuit comprising a series impedance in each of two line conductors and contacts on each side of these two impedances enabling to selectively connect terminals of said impedances to an exchange or a line respectively, characterized in that said contacts comprise two pairs of electronic contacts, a first of said pairs connecting the line to the impedances and a second of said pairs connecting said impedances to the exchange, and that only said first pair of electronic contacts is provided with power limiting means.

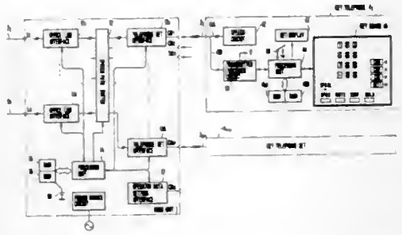
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4,821,316

KEY TELEPHONE SYSTEM

Senji Okumura, Chiba; Yasuo Kobayashi, Saitama; Ryuzo Sugiura, Tokyo, and Masatoshi Ikeda, Kanagawa, all of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Oct. 2, 1987, Ser. No. 104,763
Claims priority, application Japan, Oct. 3, 1986, 61-235880
Int. Cl.⁴ H04M *1/00*; H04Q *5/20*
U.S. Cl. 379—156 **18 Claims**



1. A key telephone system including a main unit having a speech path switch for selectively connecting at least one office line with a plurality of key telephone sets, an operating data memory for storing operating data required for operating said system, operation mode setting means for setting an operation mode of said system to either a call processing mode or a data setting mode, and control means for updating contents of said operating data memory in accordance with the operating data externally inputted during the data setting mode and for referring to said operating data memory to control said speech path switch during the call processing mode, said key telephone system comprising:

a temporary registration memory for temporarily storing the externally inputted operating data;

a final registration timing data memory for storing final registration timing data including a timing condition for transferring contents of said temporary registration memory to said operating data memory;

writing means for writing the operating data input and the final registration timing data in said temporary registration memory and said final registration timing data memory, respectively, from a data input unit connected to said main unit during the data setting mode;

discriminating means for discriminating establishment of the timing condition designated in accordance with the final registration timing data stored in said final registration timing data memory; and

transferring means for transferring the operating data stored in said temporary registration memory to said operating data memory in accordance with a timing condition establishment output from said discriminating means.

4,821,317

ELASTIC TELEPHONE HANDSET SUPPORT

Poon Wong, 43 Essex St., Apt. #2, New York, N.Y. 10002

Filed Sep. 11, 1987, Ser. No. 96,139
Int. Cl.⁴ H04M *1/05*
U.S. Cl. 379—430 **7 Claims**

1. A telephone handset in combination with a device for supporting the handset on the head of a person, comprising:

(a) the telephone handset enclosing an interior space and having an interior surface, an exterior surface, a transmitter end, a receiver end, and an elongated handle portion connecting both ends,

said telephone handset further having a first opening in the receiver end, and a second opening in the transmitter end;

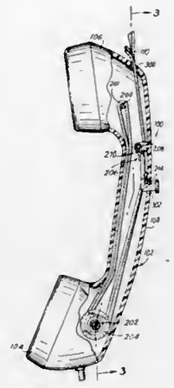
(b) an elastic loop for securing the receiver end of the telephone handset to the head of the person,

said elastic loop having a fixed end and a movable end,

said movable end being elastically extendable through the first opening in the telephone handset to a first position wherein the elastic loop is predominantly exterior to the telephone handset, and elastically retractable to a second position wherein the elastic loop is predominantly interior to the telephone handset;

(c) means interior to the telephone handset to secure the fixed end of the elastic loop therein;

(d) a resilient clip fixedly attached to the interior surface of the telephone handset,



said clip being resiliently held in a closed position frictionally engaging the elastic loop,

said clip being movable to an open position which disengages and releases the elastic loop;

(e) means responsive to pressure to move the resilient clip to the open position;

(f) a rod means for supporting the transmitter end of the telephone handset on the shoulder of the person;

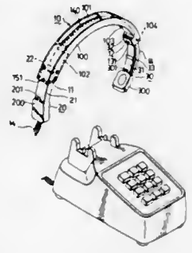
(g) a catch means for grasping the movable exterior end of the elastic loop.

4,821,318

CONVERTIBLE HANDSET DEVICE FOR TELEPHONE SETS

Chuan-Chi Wu, 4th Fl., No. 279, An-Ching St., Sanchung City, Taiwan

Filed Jun. 18, 1987, Ser. No. 63,489
Claims priority, application Taiwan, Apr. 17, 1987, 76203385
Int. Cl.⁴ H04M *1/05*
U.S. Cl. 379—430 **8 Claims**



1. A convertible handset device for telephone sets comprising:

a handset body integrally formed in an arch shape and

adapted to be placed over a switchhook of a telephone set, including a central handle portion having a cord groove located therein, a first internal trough with a trough mouth at one end, and a second internal trough with an end opening at another end, and an engaging recess formed at each side edge of said first and second internal troughs for making a detachable engagement therewith;

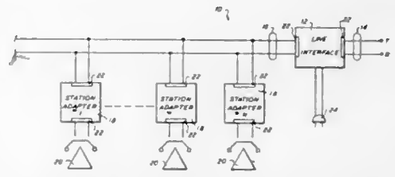
conductive means respectively installed in said cord groove and said first and second internal passages for being electrically connected to a telephone line of a telephone set; a receiving means having a receiver portion at one end with a receiver installed therein and electrically connected to said conductive means, and a flexible link at the other end being movably disposed in said first internal trough through said trough mouth for being movably operated in receiving telephone calls therewith; and a transmitting means having a transmitter portion at one end and a transmitter installed therein and an adjustable link at the other end being movably disposed in said second internal trough through said end opening for being movably operated in answering telephone calls, whereby, said handset device can be either held in one hand or worn over the head with said receiver portion and transmitter portion being pulled out when making and answering telephone calls.

4,821,319

SINGLE LINE TELEPHONE COMMUNICATION SYSTEM

Francisco A. Middleton, Newtown, and David A. Zeller, Jr., Brookfield, both of Conn., assignors to Alcatel USA Corp., New York, N.Y.

Continuation of Ser. No. 726,733, Apr. 25, 1985, abandoned. This application May 5, 1987, Ser. No. 47,586
Int. Cl.⁴ H04M *3/56*
U.S. Cl. 379—167 **6 Claims**



1. A communication system for use with a single pair of wires, said single pair of wires having an externally connected segment and an in-house segment, said in-house segment having a plurality of subsets interconnected therewith; said system comprising:

means for selectively providing connection between said externally connected segment and said in-house segment;

means, interconnected between each said subset and said in-house segment, for establishing direct communication between said subsets, said subset communication means including a plurality of station adapter modules, each said station adapter module being connected between one of said subsets and said in-house segment; and

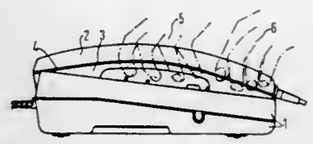
means, associated with each said station adapter module, for identifying said subset associated therewith, each said station adapter module also including means for enabling a call announcer in response to a signal from said subset identifying means, and means for introducing a time-delay before said call announcer is enabled, said delay being at least as long as the time required for all identifiers to be received by said subset identifying means.

4,821,320

DEVICE FOR PROTECTING ELECTRICAL APPARATUS AND THE OPERATOR WHEN THE OPERATOR CARRIES A HIGH ELECTROSTATIC CHARGE

Tomas J. Andert, Bocholt, and Stefan Pieper, Haltern, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 26, 1987, Ser. No. 53,996
Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617734
Int. Cl.⁴ H04M *1/03*
U.S. Cl. 379—437 **6 Claims**



1. Apparatus for protecting an operator who contacts a telephone apparatus handset arranged in an insulated housing including at least first and second housing components and for protecting electronic devices which comprise the telephone apparatus, in the event the operator carries a high electrostatic charge, comprising:

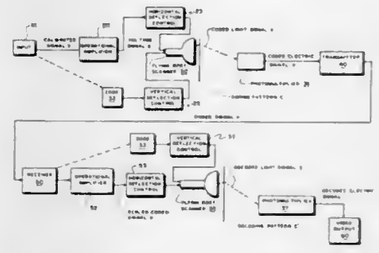
at least one resistive contact path having a relatively appreciable ohmic resistance (e.g., in the megohm range) and arranged proximate an outer part of said insulating housing which is touched by the operator, wherein a first end of said resistive contact path is arranged between said housing components and located in the region of said electronic devices and a second end of said resistive contact path terminates at a low potential point of the handset.

4,821,321

AUTOMATIC SECURE TRANSMISSION AND RECEPTION OF PICTORIAL INFORMATION

Jenny Bramley, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 31, 1981, Ser. No. 340,550
Int. Cl.⁴ H04N *7/167*
U.S. Cl. 380—54 **10 Claims**



1. A technique of real time secure coding for transmission and reception of pictorial two-dimensional information at television rates, comprising the steps of;

providing pictorial input information signal in the form of two-dimensional intensity distribution signals and limiting the maximum signal level of said input information signal to some predetermined maximum allowable signal level by toning down any extreme high contrast intensity values to fall below said maximum signal level;

simultaneously coding said input information distribution signals by use of a synchronized coding scheme in the

transmission and reception portions wherein each intensity value of said input information distribution signals is replaced by a different value specified by said coding scheme in said transmission portion and is returned to the original intensity value in said reception portion, wherein said coding step by use of a synchronized coding scheme is comprised of supplying a coding signal having the same continuously time-varying characteristic as said input information signal and is selected such that said maximum signal level of said coding signal will reach but not exceed said predetermined maximum allowable signal level and simultaneously feeding said input information signal and said coding signal into a linear operational amplifier for forming a resultant coded signal having each intensity value of said input information signal replaced by a different value specified by said coding signal in accordance with a predetermined code pattern and comparing said resultant coded signal with said predetermined maximum allowable signal level; and

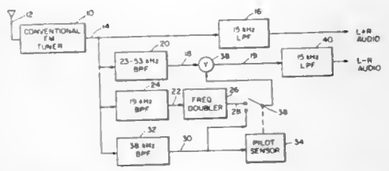
providing a secure display of said input information distribution signals at said reception portion.

4,821,322

FM MULTIPLEX DECODING

Amar G. Bose, Wayland, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Aug. 12, 1987, Ser. No. 90,051
Int. Cl.⁴ H04H *5/00*
U.S. Cl. 381—13 **8 Claims**



1. Apparatus for demodulating frequency-modulated information signals on a radio frequency signal carrying suppressed superaudio carrier signal, amplitude-modulated spectral components having an imparted random phase shift in a subcarrier channel frequency range above the audio frequency range and frequency modulated spectral components within the audio frequency range comprising,

demodulating means for demodulating the frequency-modulated information signals to provide detected audio signals having spectral components within said audio frequency range and detected superaudio signals having spectral components including those within said subcarrier channel frequency range above said audio frequency range characterized by said imparted random phase shift in response to modulated radiated radio frequency signals arriving at said apparatus over a plurality of paths of different lengths,

reference means responsive to said detected superaudio signals for providing a reference signal of the frequency of said suppressed carrier characterized by a phase shift substantially the same as said imparted random phase shift,

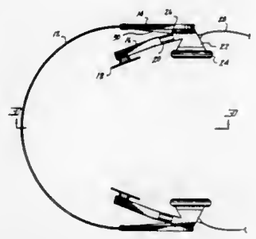
and means for combining said reference signal with the detected spectral components within said subcarrier channel frequency range to provide an audio signal.

4,821,323

STEREO HEADPHONE

Raymond S. Papiernik, 1441 Fairway Apt. 102, Naperville, Ill. 60540

Filed Feb. 19, 1988, Ser. No. 157,710
Int. Cl.⁴ H04R *5/02*
U.S. Cl. 381—25 **6 Claims**



1. A new and improved stereo headphone, comprising:

a generally "U"-shaped head band;

a pair of elongated hollow head band support rails;

opposite ends of said head band received for adjustable extension and retraction in said head band support rails;

a pair of speaker support frames, one of said speaker support frames secured to each of said head band support rails;

a pair of speakers, one of said speakers mounted on each of said speaker support frames;

each of said speaker support frames being inwardly inclined with respect to said head band support rails;

a pair of triangular transparent connecting braces, one of said connecting braces extending between each of said head band support rails and said speaker support frames;

a pair of vibrational audio output mounting bars, one of said mounting bars connected to each of said speaker support frames;

compound mounting means mounting each of said vibrational audio output mounting bars for compound adjustment with respect to said speaker support frame;

a pair of vibrational audio output discs, one of said vibrational audio output discs secured to each of said vibrational audio output mounting bars; and

switch means on said headphone for selectively actuating said speakers.

4,821,324

LOW BIT-RATE PATTERN ENCODING AND DECODING CAPABLE OF REDUCING AN INFORMATION TRANSMISSION RATE

Kazunori Ozawa, and Takashi Araseki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,167
Claims priority, application Japan, Dec. 24, 1984, 59-272435; Aug. 13, 1985, 60-178911
Int. Cl.⁴ G10L *9/04*
U.S. Cl. 381—31 **14 Claims**

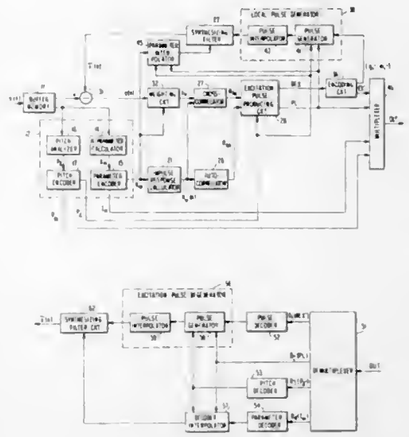
1. A method of encoding a discrete pattern signal into an output code sequence and of decoding said output code sequence into a reproduction of said discrete pattern signal, said discrete pattern signal being divisible into a succession of segments, said method comprising the steps of:

extracting a pitch parameter and a spectral parameter from each segment and from a spectral interval which is not shorter than the segment, respectively;

dividing said spectral interval into a succession of pitch intervals in consideration of the pitch parameters extracted from the respective segments, each pitch interval being shorter than the segments,

processing said discrete pattern signal with reference to said spectral parameter and the pitch parameters to produce representative excitation signals specifying the discrete pattern signal in each spectral interval;

coding amplitudes and locations of each of said representation excitation signals into said output code sequence;



separating, from said output code sequence, decoded excitation signals which correspond to said representative excitation signals; and

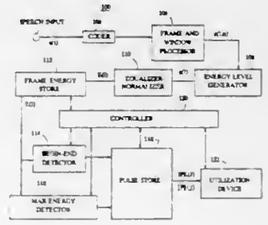
converting said decoded excitation signals into said reproduction of the discrete pattern signal.

4,821,325

ENDPOINT DETECTOR

Thomas B. Martin, Montville; Lawrence R. Rabiner, Berkeley Heights, and Jay G. Wilpon, Warren, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 8, 1984, Ser. No. 669,654
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 381—46 **14 Claims**



1. A method of identifying the endpoints of one or more utterances in an interval of speech comprising the steps of

(1a) dividing the interval into a succession of time frames, each frame having an identifying pointer,

(1b) selecting the frame over the interval which has the maximum speech energy level,

(1c) defining the first frame preceding the selected energy frame which has an energy level below a first threshold as the beginning frame of an energy pulse,

(1d) defining the first frame following the selected energy frame which has an energy level below a second threshold as the ending frame of the energy pulse,

(1e) saving the pointers of the beginning and ending frame and the level of the selected energy frame of the energy pulse if the number of frames between the beginning and ending frame is greater than a predetermined number and the level of the selected energy frame is greater than a third threshold,

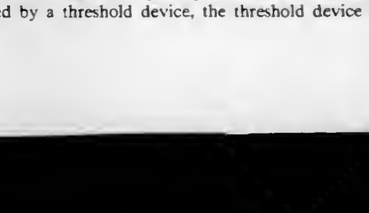
(1f) repeating steps (1b)–(1e), examining only those frames which are not constituents of the current or prior energy pulses until no further energy pulses are found, whereby the saved pointers correspond to the end points of the utterances in the interval, whereby the endpoint determinations are likely to be more effective in the presence of varying background noise than in the prior art.

4,821,326

NON-AUDIBLE SPEECH GENERATION METHOD AND APPARATUS

Norman MacLeod, Sunnyvale, Calif., assignor to Macrowave Technology Corporation, San Jose, Calif.

Filed Nov. 16, 1987, Ser. No. 121,659
Int. Cl.⁴ G10L *7/02*
U.S. Cl. 381—51 **26 Claims**



1. An artificial speech generation device, comprising:

transmitting means for producing an ultrasonic signal and introducing said ultrasonic signal into the vocal track of a speaker for modulation of said ultrasonic signal by said speaker into ultrasonic words;

detector means for receiving said ultrasonic words and generating an ultrasonic word signal corresponding to said ultrasonic words; and

converter means for receiving said ultrasonic word signal and shifting said ultrasonic word signal into a corresponding artificial speech signal which can be utilized to create an audio signal corresponding to said speaker's ultrasonic words.

4,821,327

ACOUSTICAL STETHOSCOPE WITH ELECTRICAL FILTER

Erik G. Furugard, 21 CH de la Source, CH-1296 Coppet, Switzerland, and Charles Caron, Chable beaument, Haute Savoie, France

PCT No. PCT/CH86/00140, § 371 Date Jun. 9, 1987, § 102(e) Date Jun. 9, 1987, PCT Pub. No. WO87/02233, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 8, 1986, Ser. No. 80,539
Int. Cl.⁴ A61B *7/04*
U.S. Cl. 381—67 **6 Claims**

1. A stethoscope comprising an acoustic membrane pick-up for receiving sounds connected directly to acoustic earpieces by an acoustic conduit, an electrical pick-up mounted to respond to said sounds, an amplifier responsive to said electrical pick-up, an electro - acoustic emitter responsive to said amplifier for transmitting rhythmic sounds to said earpieces simultaneously with sounds from said acoustic membrane pick-up, further characterized in that said electro-acoustic emitter is connected to the electrical pick-up by way of a bandpass filter, followed by a threshold device, the threshold device being

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connected to an audible frequency generator which causes said acoustic emitter to emit said rhythmic sounds as soon as the



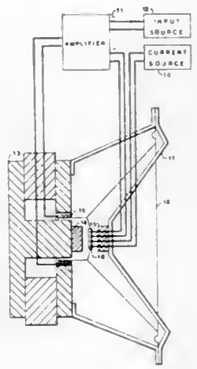
level of sounds perceived by the electrical pick-up lying in the passband of the filter exceeds a well-determined threshold.

4,821,328

SOUND REPRODUCING SYSTEM WITH HALL EFFECT MOTIONAL FEEDBACK

Stanislaw Drozdowski, 3220 Stream Side Rd., Apt. 16, Raleigh, N.C. 27613

Filed Oct. 24, 1986, Ser. No. 922,851
Int. Cl.[4] H04R *3/00*
U.S. Cl. 381—96 **2 Claims**



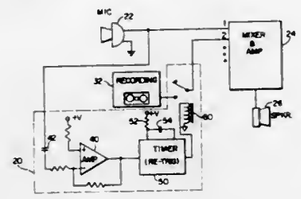
1. Means for sensing the motion of sound generating member of a sound reproducing system, wherein said means comprise:
at least one Hall generator, linked to and mechanically driven by said sound generating member;
a reference magnet structure, comprising two magnets, wherein said magnets form single gap between their homonymous poles, and wherein spatial relation of said reference magnet structure to said Hall generator results in said Hall generator reciprocating along the axis connecting said homonymous poles of said reference magnet structure;
a current source energizing said Hall generator; and
an amplifier jointly responsive to an input signal and a feedback signal, derived from said Hall generator.

4,821,329

AUDIO SWITCH DEVICE WITH TIMED INSERTION OF SUBSTITUTE SIGNAL

Gary Straub, 1002 Folsom Ave., Mays Landing, N.J. 08330

Filed Jul. 7, 1987, Ser. No. 70,423
Int. Cl.[4] H04R *27/00*
U.S. Cl. 381—119 **18 Claims**



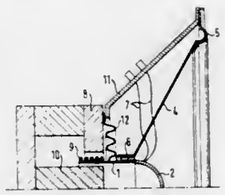
1. An audio system, comprising:
an audio mixer having at least two inputs and an output, the audio mixer summing signals on said at least two inputs;
a primary signal source producing a primary audio signal having periods of activity and period of inactivity, the primary signal source being directly connected to one of said at least two inputs of the audio mixer;
a secondary signal source producing a secondary audio signal;
a retriggerable timer responsive to activity in the primary audio signal, the retriggerable timer timing out and producing an output at a predetermined time after cessation of activity in the primary audio signal; and,
a switching means responsive to the output of the retriggerable timer, the switching means connecting the secondary audio signal to another of said at least two inputs to the audio mixer upon timing out of the retriggerable timer due to absence of the primary audio signal, whereby the secondary audio signal appears in place of the primary audio signal and the primary signal source remains connected.

4,821,330

WIDE-BAND LOUDSPEAKER HAVING A DIAPHRAGM AREA DIVIDED INTO SUB-AREAS FOR VARIOUS FREQUENCY RANGES

Peter Pfleiderer, Erhardstrabe 9, D-8000 München 5, Fed. Rep. of Germany, assignor to Peter Pfleiderer, Munich, Fed. Rep. of Germany

Filed Jan. 22, 1987, Ser. No. 6,014
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1986, 3603537
Int. Cl.[4] H04R *1/24, 7/16*
U.S. Cl. 381—184 **9 Claims**



1. A wide-band loudspeaker comprising:
a diaphragm area divided into at least two sub-areas, including an inner diaphragm sub-area and an outer diaphragm sub-area, each of said diaphragm sub-areas being optimized for the production of a different portion of an audio frequency range;
wherein said inner diaphragm sub-area includes a moving-coil cover connected to a moving-coil support;

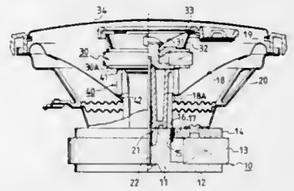
wherein said outer diaphragm sub-area is coupled to an inner diaphragm sub-area by a connection means which has a frequency dependent modulus of elasticity so that said outer diaphragm sub-area remains substantially at rest when said loudspeaker is generating high frequency audio signals and so that said outer diaphragm sub-area moves substantially in unison with said inner diaphragm sub-area when said loudspeaker is generating low frequency audio signals;
wherein when said loudspeaker is generating intermediate frequency audio signals, movement of said outer diaphragm sub-area is partially responsive to movement of said inner diaphragm sub-area via said connection means, said connection means dissipating, by internal friction, a portion of the mechanical energy received from said inner diaphragm sub-area,
wherein said outer diaphragm sub-area is constructed in a form selected from a group consisting of a cone diaphragm, a NAWI diaphragm, a shaped body, and a molded body;
wherein said selected form is planar at the front and rear boundary thereof; and
wherein said outer diaphragm sub-area is of a sufficient height that said selected form is stressed by a force normal thereto, but is substantially unstressed by flexing or tilting forces.

4,821,331

COAXIAL SPEAKER UNIT

Fumio Murayama, and Mitsuyoshi Matsuda, both of Yamagata, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 208,534
Claims priority, application Japan, Jun. 30, 1987, 62-100764[U]
Int. Cl.[4] H04R *9/06, 1/24, 9/02*
U.S. Cl. 381—192 **5 Claims**



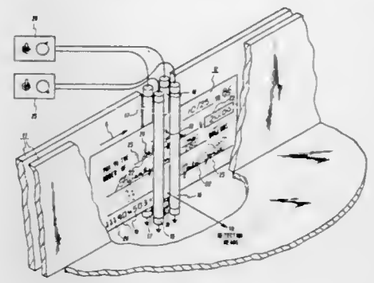
1. A coaxial speaker unit comprising:
a low-frequency band magnetic circuit;
a high-medium frequency band magnetic circuit attached at a central portion of said low-frequency band magnetic circuit through a mount;
a low-frequency band diaphragm driven by said low-frequency band magnetic circuit;
support step means formed along a portion of said low-frequency band diaphragm, said step means being planar and extending in a radial direction of said low-frequency band diaphragm; and
a dust-proof member fixed between said support step means and a bottom surface of said high-medium frequency band magnetic circuit.

4,821,332

METHOD AND APPARATUS FOR IMAGE CAPTURE OF INFORMATION ON DOCUMENTS

Thomas J. Durham, Garland, Tex., assignor to BancTec Inc., Dallas, Tex.

Filed Feb. 20, 1987, Ser. No. 17,093
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—7 **8 Claims**



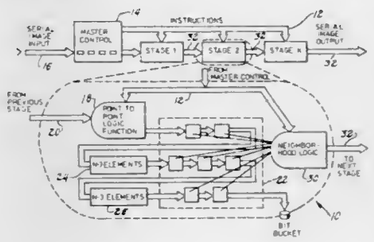
1. In a method for the image capture of data from the face of documents having background patterns or illustrations of lesser opacity than the opacity of the medium of which the data is formed, the step of:
directing a first light at a back side of a document of intensity sufficient to travel through said document and render said patterns or illustrations substantially invisible to image capture, thereby to enhance the image capture of said data;
concomitantly directing a second light at the front side of said document; and
capturing the image data on said document from only one of said sides.

4,821,333

MACHINE LEARNING PROCEDURES FOR GENERATING IMAGE DOMAIN FEATURE DETECTOR STRUCTURING ELEMENTS

Andrew M. Gillies, Ann Arbor, Mich., assignor to Environmental Research Inst. of Michigan, Ann Arbor, Mich.

Filed Aug. 22, 1986, Ser. No. 899,518
Int. Cl.[4] G06K *9/54*
U.S. Cl. 382—49 **41 Claims**



1. A method for generating a set of structuring elements for use in an image processing program in a computer, the image processing program being operative to apply feature detectors to an input image comprising an input digital matrix of points having digital values to generate a corresponding transformed digital matrix of points having digital values, each point of said transformed digital matrix having a digital value which is a function of the digital value of a corresponding point in said input digital matrix and/or the digital values of points immedi-

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ately neighboring said corresponding point in said input digital matrix, the transformed digital matrix containing either no points having nonzero values or at least one point having a nonzero value, each featuare detector consisting of a program form including a predetermined series of morphological operations applied to the input digital matrix and a spatial constant component comprising a set structuring elements, the method comprising the steps of:

(a) selecting a plurality of sets of structuring elements;

(b) representing each set of structuring elements in a single binary code word chromosome in accordance with a predetermined encoding technique, thereby producing a plurality of said chromosomes;

(c) applying a plurality of featuare detectors equal in number to the number of said plurality of chromosomes to a first set of images known to belong to a predetermined class to and a second set of images known not to belong to said predetermined class, each feature detector consisting of said program form and a unique one of said plurality of chromosomes, each feature detector thereby producing a transformed digital matrix containing either no points having nonzero values or at least one point having a nonzero value;

(d) associating a score with each feature detector based upon the number of input images from said first set of input images in which said feature detector produces a transformed digital matrix containing at least one point having a nonzero value and the number of input images from said second set of input images in which said feature detector produces a transformed digital matrix containing no point having a nonzero value;

(e) determining whether the score for any of said plurality of feature detectors meets a predetermined criterion;

(f) if the score of at least one of said plurality of feature detectors meets said predetermined criterion, identifying the set of structuring elements represented by the single binary code word chromosome for one such feature detector having a score meeting said predetermined criterion said identified set of structuring elements being the set of structuring elements generated by the method;

(g) if the score of none of said plurality of feature detectors meets said predetermined criterion

(1) producing a succeeding plurality of chromosomes representing a succeeding plurality of sets of structural elements by randomly selecting a subset of said plurality of chromosomes where the probability of selection of any chromosome of said plurality of chromosomes is proportional to the score associated with the feature detector employing that chromosome, and augmenting said subset of chromosomes with chromosomes corresponding to modifications and/or combinations of chromosomes of said subset of chromosomes,

(2) repeating said step of applying a plurality of feature detectors to said first set of images known to belong to said predetermined class and to said second set of images known not to belong to said predetermined class employing said succeeding plurality of chromosomes,

(3) repeating said step of associating a score with each feature detector, and

(4) repeating said step of determining whether the score for any of said plurality of feature detectors meets said predetermined criterion,

until the score of at least one of said plurality of feature detectors meets said predetermined criterion.

4,821,334

IMAGE PROCESSING APPARATUS

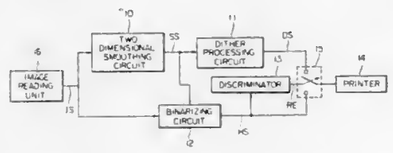
Yoshitaka Ogino, Kawasaki, and Hiroshi Tanioka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,308

Claims priority, application Japan, Dec. 28, 1984, 59-276474; Dec. 28, 1984, 59-276475; Dec. 28, 1984, 59-276494

Int. Cl.[4] G06K *9/38*

U.S. Cl. 382—50 **24 Claims**



1. An image processing apparatus comprising:

means for inputting pixel data; and

means for processing the pixel data inputted by means of said input means,

wherein said processing means has means for discriminating an image tone of the pixel data for each pixel, and said discriminating means discriminates both spatial frequency characteristics of pixel data of interest and a linearity of the pixel data of interest with respect to adjacent pixel data thereto, in connection with a plurality of directions, on the basis of the pixel data of interest and the adjacent pixel data, and discriminates the image tone of the pixel data of interest.

4,821,335

ELECTRONIC BLACKBOARD

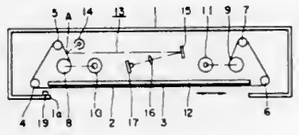
Shuichi Yamazaki, Tokyo, and Tatsuo Ishii, Ohmiya, both of Japan, assignors to Ricoh Company, Limited, Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,689

Claims priority, application Japan, Apr. 5, 1985, 60-72060; Apr. 9, 1985, 60-75184; Apr. 9, 1985, 60-75185; May 21, 1985, 60-108535; May 21, 1985, 60-108536

Int. Cl.[4] G06K *9/00*; **H04N** *1/00*

U.S. Cl. 382—53 **16 Claims**



1. An electronic blackboard comprising:

a writing sheet in the form of a web movable along a predetermined path which includes a window through which information may be manually written on said writing sheet, and said writing sheet having a plurality of writing sections and a standard concentration pattern comprising a first concentration pattern section, and a second concentration pattern section which differs in concentration level from said first concentration pattern section, said standard concentration pattern being located on said writing sheet so as not to be exposed through said window;

driving means for driving said writing sheet along said predetermined path back and forth relative to said window;

reading means for reading said writing sheet to produce image data;

processing means for processing said image data produced by said reading means, said processing means including converting means for converting said image data into binary image data using a variably set threshold level and adjusting means for adjusting said threshold level to be between density levels corresponding to said first and second concentration pattern sections determined by reading said concentration pattern sections of said standard concentration pattern by said reading means; and

recording means responsive to said processing means for recording desired image on said writing sheet read by said reading means on a sheet of copy paper.

4,821,336

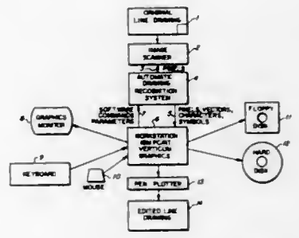
METHOD AND APPARATUS FOR SIMPLIFYING RUNLENGTH DATA FROM SCANNING OF IMAGES

John M. Roye, Tempe, Ariz., assignor to GTX Corporation, Phoenix, Ariz.

Filed Feb. 19, 1987, Ser. No. 16,662

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—56 **34 Claims**



1. A method of compiling serial pixel data reduced by scanning consecutive rows of an image, the method comprising the steps of:

(a) encoding the serial pixel data to produce runlength data including a plurality of slices each including a plurality of consecutive connected pixels;

(b) forming a first open list including a plurality of slices of a first row of the image;

(c) determining if a first portion of a first slice in the first open list overlaps a first portion of a second slice from a second row of the image;

(d) if the first portion of the first slice overlaps the first portion of the second slice and it a second portion of the first slice does not overlap a portion of another slice, attaching the second slice to a growing column of the first open list by attaching the second slice to the first slice;

(e) if the first portion of the first slice overlaps the first portion of the second slice, and it the second portion of the first slice overlaps a portion of another slice, creating another column of the first open list and putting the second slice in that column, wherein each slice has a left end coordinate and a right end coordinate and wherein each object corresponds to an open list and the image includes at least one object, the object having the property that it includes a plurality of dark connected pixels which are surrounded entirely by transparent pixels, wherein step (c) includes determining if the left coordinate of the first slice is less than the left coordinate of the second slice; and

(f) if the left coordinate of the first slice is less than the left coordinate of the second slice, determining it the right coordinate of the first slice is less than the left coordinate of the second slice, and it is, determining that the first slice does not overlap the second slice.

4,821,337

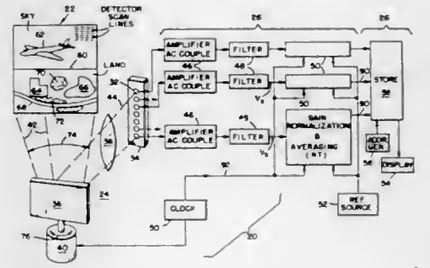
RADIATION SCANNER UNIFORMITY SYSTEM

Ake W. Alm, 2145 Toscanini Dr., Rancho Palos Verdes, Calif. 90732

Filed Oct. 30, 1985, Ser. No. 792,715

Int. Cl.[4] G06K *7/00*

U.S. Cl. 382—58 **10 Claims**



1. An imaging system comprising:

an array of radiation detectors arranged along the vertical dimension of a scanning pattern;

means for directing radiation from an object, distant from said system, toward said array of detectors to permit a viewing of said object by said system, said directing means including means for scanning said radiation along a horizontal dimension of said scanning pattern with a scan interval of predetermined duration to provide a two-dimensional raster scan of a scene including said object, each of said detectors providing a signal in response to radiation incident upon the detector;

means for processing data carried by signals of respective ones of said detectors, said data processing means including means for displaying the data to present a scene containing said object;

signal processing means interconnecting said data processing means with said array of detectors, said signal processing means including gain normalizing means for amplifying individual ones of said detector signals with a gain varying inversely to average signal strength; and wherein

said normalizing means comprises means for averaging the signals of individual ones of said detectors over an averaging interval of time several times larger than the duration of said scan interval to enhance the uniformity of a data display by said processing means with respect to regions of said scene extending horizontally along the raster and having substantially uniform temperature;

said normalizing means includes a gain control circuit having a feedback loop with a forward branch and a feedback branch for processing the signals of each of said detectors independently of the signals of the other ones of said detectors, there being multiplying means in said forward branch for applying said gain to individual ones of said detector signals, said averaging means being located in said feedback branch; and

said normalizing means further comprises a source of reference signal and differential means for comparing an output signal of said averaging means with said reference signal to output a loop error signal to a terminal of said multiplier means to establish a value of said gain.

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4,821,338

OPTICAL SIGNAL RECEIVING APPARATUS WITH COMPENSATION FOR PERIPHERAL LIGHT

Kazuhiko Naruse, Nabari; Akira Kataoka, Sennan; Masayasu Hirano, Nishinomiya, and Naoya Takata, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1986, Ser. No. 893,404

Claims priority, application Japan, Aug. 7, 1985, 60-173818; Nov. 1, 1985, 60-246749; Nov. 1, 1985, 60-246750; Nov. 1, 1985, 60-246751; Nov. 1, 1985, 60-246752; Nov. 1, 1985, 60-246753; Nov. 1, 1985, 60-246754

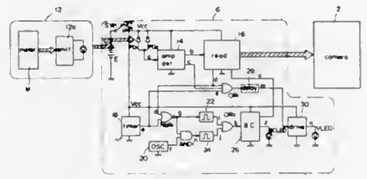
Int. Cl.[4] H04B 9/00

U.S. Cl. 455—617 **27 Claims**

1. An optical signal receiving apparatus for optical communication, comprising:

means for measuring intensity of peripheral light corresponding to the brightness of the periphery of the optical signal receiving apparatus, including means for receiving light incident on the optical signal receiving apparatus to produce a photoelectric signal corresponding to the intensity of light received, and means, connected in series to the receiving means, for transmitting a noise component having a frequency lower than a predetermined frequency in the photoelectric signal;

means for discriminating whether the measured intensity of the peripheral light is over a predetermined intensity level, and



means for displaying an indication when the measured intensity is discriminated to be over the predetermined intensity level.

DESIGNS

APRIL 11, 1989

300,580

PROTECTOR FOR SHOE HEEL

Darryl D. Stewart, 611 E. Kelso St., No. 26, Inglewood, Calif. 90301

Filed Jan. 21, 1987, Ser. No. 5,875

Term of patent 14 years

U.S. Cl. D2—277





300,581

BELTING FOR SAFETY BELT

Johann Berger, Obere Schloss-Strasse 114, D-7071 Alfdorf, and Josef Berger, Hainstrasse 11, D-7070 Schwaebisch Gmnend-Grossdeinbach, both of Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 737,666

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1984, 3079

Term of patent 14 years

U.S. Cl. D2—635



300,582

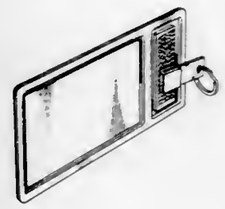
COMBINED KEY RING AND FRAME SUPPORT

Allan M. Hodge, 5852 Lomond Dr., San Diego, Calif. 92120

Filed Jun. 11, 1985, Ser. No. 743,576

Term of patent 14 years

U.S. Cl. D3—62



300,583

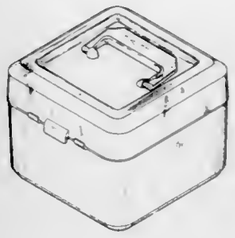
STORAGE CASE

E. W. Smith, Burleson, Tex., assignor to Doskocil Manufacturing Co., Inc., Arlington, Tex.

Filed Jul. 1, 1985, Ser. No. 750,256

Term of patent 14 years

U.S. Cl. D3—72



300,584

BROOM

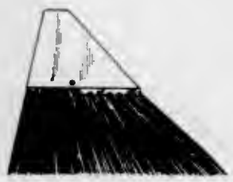
Francesco Sartori, Bologna, Italy

Filed Dec. 10, 1985, Ser. No. 807,269

Claims priority, application Italy, Jun. 21, 1985, 4933/85[U]

Term of patent 14 years

U.S. Cl. D4—132



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300,585
CHAIR
Claus K. Uredat, Lindern/Oldenburg, Fed. Rep. of Germany, assignor to Cirkel B.V., Ak Zwanenburg, Netherlands
Filed Dec. 24, 1985, Ser. No. 813,084
Claims priority, application Benelux, Jun. 26, 1985, 60163
The portion of the term of this patent subsequent to May 31, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—366



300,586
CHAIR
George C. Mulhauser, Paramus, N.J., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Jun. 30, 1986, Ser. No. 880,666
Term of patent 14 years
U.S. Cl. D6—372



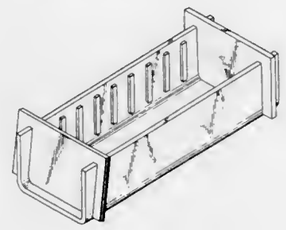
300,587
CHAIR
Claus K. Uredat, Lindern/Oldenburg, Fed. Rep. of Germany, assignor to Cirkel B.V., Ak Zwanenburg, Netherlands
Filed Dec. 24, 1985, Ser. No. 813,085
Claims priority, application Benelux, Jun. 26, 1985, 60163
The portion of the term of this patent subsequent to May 31, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—379



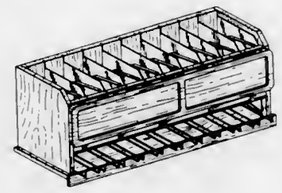
300,588
CHAIR
Winsor White, Chicago, Ill., assignor to Vecta Contract Division of Steelcase Inc., Grand Prairie, Tex.
Filed Aug. 21, 1986, Ser. No. 898,627
Term of patent 14 years
U.S. Cl. D6—379



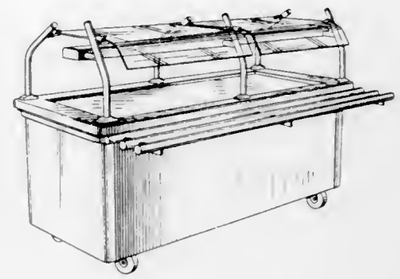
300,589
CASSETTE CADDIE
Douglas W. Cross, 129 Padelford St., Berkley, Mass. 02702, and Randy Houghtaling, 4040 Auburn Way #5, Auburn, Wash. 98002
Filed Apr. 28, 1986, Ser. No. 857,825
Term of patent 14 years
U.S. Cl. D6—407



300,590
MERCHANDISING STAND
Lynn E. Everett, New Philadelphia, Ohio, assignor to Tusco Manufacturing Company, Gnadenhutten, Ohio
Filed Jun. 23, 1986, Ser. No. 877,671
Term of patent 14 years
U.S. Cl. D6—408



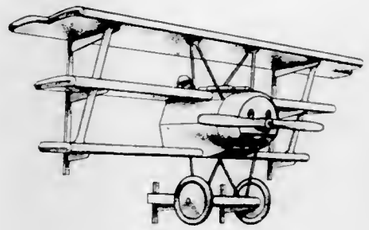
300,591
FOOD SERVING COUNTER
Jean-Claude Marchais, L'Hay Les Roses, France, assignor to OFECO, S.A., Paris, France
Filed Apr. 23, 1986, Ser. No. 857,555
Claims priority, application France, Oct. 23, 1985, 854992
Term of patent 14 years
U.S. Cl. D6—481



300,592
END STANDARD FOR A STORAGE SHELF
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Aug. 1, 1986, Ser. No. 892,697
Term of patent 14 years
U.S. Cl. D6—491



300,593
SHELVING UNIT
Charles R. Eldridge, 1102 Tarragon Ct., Virginia Beach, Va. 23462
Filed Jul. 15, 1987, Ser. No. 32,393
Term of patent 14 years
U.S. Cl. D6—569



300,594
BEVERAGE CONTAINER HOLDER
Gregory J. Wenkman, Middleton; Ferdinand F. Salzmann, Prairie du Sac, and Harold E. Blossom, Madison, all of Wis., assignors to Uniek Plastics, Inc., Madison, Wis.
Filed Mar. 21, 1986, Ser. No. 845,436
Term of patent 14 years
U.S. Cl. D7—70

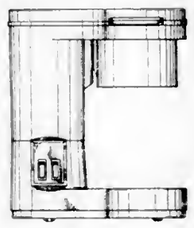


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300,595
BEVERAGE DISPENSER
Stanley S. Boxall, P.O. Box 80383, Atlanta, Ga. 30366
Filed Jul. 21, 1986, Ser. No. 887,893
Term of patent 14 years
U.S. Cl. D7—307



300,596
COFFEE MACHINE
Arthur Eugster, Romanshorn, Switzerland, assignor to Arthur Eugster Elektro-Haushaltgerate, Switzerland
Filed May 6, 1986, Ser. No. 860,753
Term of patent 14 years
U.S. Cl. D7—309



300,597
ESPRESSO MACHINE
Alberto Pandolfi, Milan, Italy, assignor to Brevetti Gaggia S.p.A., Milan, Italy
Filed Jun. 19, 1986, Ser. No. 876,334
Claims priority, application Italy, Dec. 20, 1985, 54266/85[U]
Term of patent 14 years
U.S. Cl. D7—309

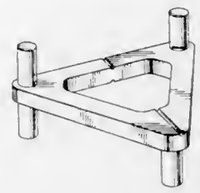




300,598
RICE COOKER
Yoshiaki Ueda, Osaka; Hiroshi Toyoda, Nara; Kazunori Mano, Hyogo; Toshiaki Tsuruha, and Akinobu Kanza, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 4, 1986, Ser. No. 841,714
Claims priority, application Japan, Sep. 20, 1985, 60-39791
Term of patent 14 years
U.S. Cl. D7—360



300,599
MASONRY GUIDE LINE HOLDER
Richard A. Ledenican, Alamosa, Colo., assignor to Goldblatt Tool Co., Kansas City, Kans.
Filed Feb. 7, 1986, Ser. No. 827,360
Term of patent 14 years
U.S. Cl. D8—71



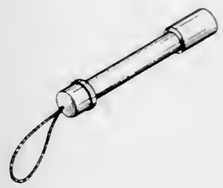
300,600
TOOL HANDLE FOR REPLACEABLE KNIFE BLADES
Bradley S. High, 4727 Pierce St., Wheatridge, Colo. 80033
Filed Apr. 28, 1986, Ser. No. 858,238
Term of patent 14 years
U.S. Cl. D8—98



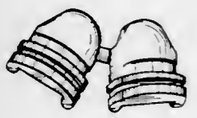
300,601
HANDLE FOR A KNIFE
Hans Himbert; Sven-Eric Juhlin, and Eva Jäderberg, all of Bromma, Sweden, assignors to AB Bahco Verktyg, Enkoping, Sweden
Filed Oct. 22, 1986, Ser. No. 922,131
Term of patent 14 years
U.S. Cl. D8—107

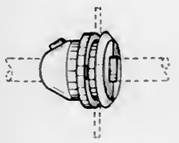


300,602
COMBINED HANDLE AND HOLDER FOR CHEMILUMINESCENT SIGNAL
Jacob O. Smith, Sr., 601 Armenia Dr., Pensacola, Fla. 32505
Filed Feb. 18, 1986, Ser. No. 833,752
Term of patent 14 years
U.S. Cl. D8—303



300,603
STRAIN RELIEF BUSHING FOR AN ELECTRIC CABLE
Royce W. Hill, Flippin, and Danny M. Nelson, Mountain Home, both of Ark., assignors to Micro Plastics, Inc., Flippin, Ark.
Filed Jun. 23, 1986, Ser. No. 877,668
Term of patent 14 years
U.S. Cl. D8—356



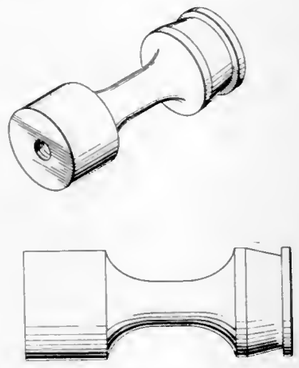


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300,604
SUSPENDING HOOK
Masazo Nakamura, 10-12, Shimanouchi 1-chome, Minami-ku, Osaka, Japan
Filed Jun. 18, 1987, Ser. No. 63,224
Term of patent 14 years
U.S. Cl. D8—367



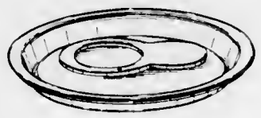
300,605
MOUNTING BRACKET FOR A HANDGUN OR SIMILAR ARTICLE
Arvo Ojala, P.O. Box 98, North Hollywood, Calif. 91603
Filed Mar. 10, 1986, Ser. No. 842,428
Term of patent 14 years
U.S. Cl. D8—380



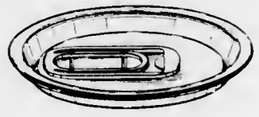
300,606
BUTANE CONTAINER
William Schwabel, and Thaddeus Zaborowski, both of Cambridge, Mass., assignors to The Schawbel Corporation, Cambridge, Mass.
Filed Sep. 27, 1985, Ser. No. 781,264
Term of patent 14 years
U.S. Cl. D9—369



300,607
CONTAINER CLOSURE
Martin F. Ball, Wantage, England, assignor to MB Group plc, Reading, England
Filed Mar. 17, 1986, Ser. No. 845,044
Claims priority, application United Kingdom, Sep. 20, 1985, 1029369
Term of patent 14 years
U.S. Cl. D9—438



300,608
CONTAINER CLOSURE
Joseph S. Taylor, Long Wittenham, and Andrew P. Pavely, Blunsdon, both of England, assignors to MB Group plc, Reading, England
Filed Mar. 17, 1986, Ser. No. 845,045
Claims priority, application United Kingdom, Sep. 20, 1985, 1029370
Term of patent 14 years
U.S. Cl. D9—438



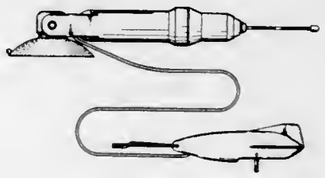
300,609
THERMOMETER SHEATH
Patrick A. Leverty, 806 MacBeth Cir., Lakeville, Minn. 55044
Filed Feb. 18, 1986, Ser. No. 833,789
Term of patent 14 years
U.S. Cl. D10—60



300,610
REMOTE DISPLAY FOR A SAILBOARD SPEEDOMETER
Kouji Machida, Shibukawa, Japan, assignor to Nihon Seimitsu Sokki Co., Ltd., Gunma, Japan
Filed Jun. 23, 1986, Ser. No. 877,652
Term of patent 14 years
U.S. Cl. D10—98



300,611
SAILBOARD SPEEDOMETER
Kouji Machida, Shibukawa, Japan, assignor to Nihon Seimitsu Sokki Co., Ltd., Gunma, Japan
Filed Jun. 23, 1986, Ser. No. 877,640
Term of patent 14 years
U.S. Cl. D10—98



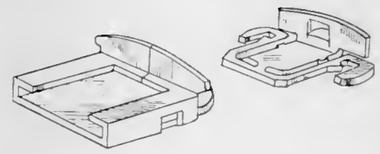
300,612
COMBINED PENDANT AND PIN OR SIMILAR ARTICLE
Joseph K. Lau, Westmont, Ill., assignor to Imperial World, Inc., Oakbrook Terrace, Ill.
Filed Nov. 6, 1986, Ser. No. 928,113
Term of patent 14 years
U.S. Cl. D11—44



300,613
JEWELRY PIN
Bernard Jacques, Geneva, Switzerland, assignor to Jean-Philippe Schmid, Switzerland
Filed Dec. 20, 1985, Ser. No. 811,384
Term of patent 14 years
U.S. Cl. D11—75

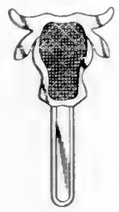


300,614
JEWELRY CLASP
Simon Geldwerth, Brooklyn, N.Y., assignor to Do-All Jewelry Mfg. Co., Inc., Springfield, N.J.
Filed Jul. 8, 1986, Ser. No. 883,484
The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—87

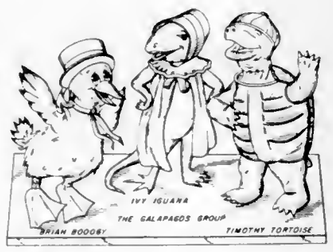


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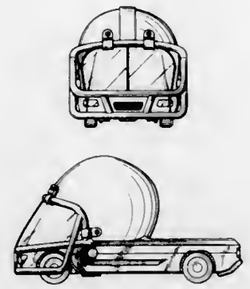
300,615
NOVELTY CONVERSATION FILTER OR SIMILAR ARTICLE
Wayne K. Pfaff, 2601 Texas Dr., Irving, Tex. 75062
Filed Jul. 3, 1986, Ser. No. 881,673
Term of patent 14 years
U.S. Cl. D11—158



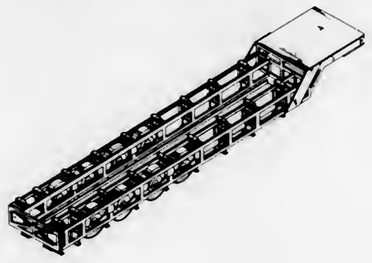
300,616
STATUETTE
Connie Chang, 2900 Lakeridge Dr., Los Angeles, Calif. 90068, and Carol Schild, 11142 Dona Pegita Dr., Studio City, Calif. 91604
Filed Jun. 26, 1986, Ser. No. 879,163
Term of patent 14 years
U.S. Cl. D11—158



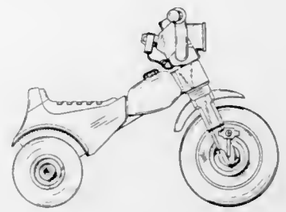
300,617
VEHICLE OR THE LIKE
Joseph M. Baker, 12301 Wilshire Blvd. Suite #208, Los Angeles, Calif. 90025
Filed Sep. 15, 1986, Ser. No. 907,532
Term of patent 14 years
U.S. Cl. D12—83



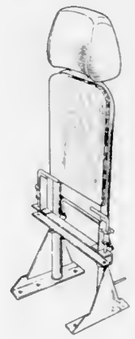
300,618
TRAILER
William B. O'Neill, P.O. Box 1144, Fort Morgan, Colo. 80701
Filed Apr. 3, 1985, Ser. No. 719,448
Term of patent 14 years
U.S. Cl. D12—97



300,619
TRICYCLE
Raymond C. Phinney, and David E. Moomaw, both of East Aurora, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 17, 1986, Ser. No. 920,869
The portion of the term of this patent subsequent to Dec. 17, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—112



300,620
WHEELCHAIR LOCKING UNIT FOR USE IN A VEHICLE
Leslie D. Cousens, Victoria, Australia, assignor to Spastic Society of Victoria Limited, St. Kilda, Australia
Filed Apr. 1, 1986, Ser. No. 847,930
Term of patent 14 years
U.S. Cl. D12—133



300,621
VEHICLE TIRE
Tokimi Hamada, and Hisashi Shintomi, both of Osaka, Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Nov. 19, 1986, Ser. No. 932,538
Claims priority, application Japan, Jun. 28, 1986, 61-25291
Term of patent 14 years
U.S. Cl. D12—149

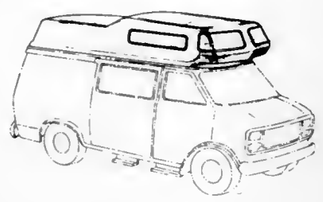


300,622
VEHICLE TIRE
Toshinori Furusawa, Osaka, and Kohtaroh Tsutsumi, Tokyo, both of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Nov. 19, 1986, Ser. No. 932,537
Claims priority, application Japan, May 30, 1986, 61-21022
Term of patent 14 years
U.S. Cl. D12—149

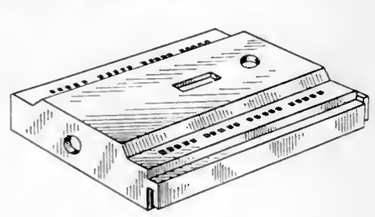


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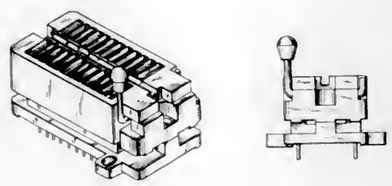
300,623
VAN TOP
Kermit W. Fisher, Elkhart, Ind., assignor to International Vehicles Corp., Bristol, Ind.
Filed Apr. 1, 1985, Ser. No. 718,646
The portion of the term of this patent subsequent to Apr. 29, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—156



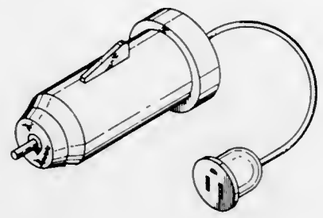
300,624
ELECTRONIC HOUSING FOR BREADBOARDING BLOCKS
Arthur Seymour, 1245 Rosewood Ave., Deerfield, Ill. 60015
Filed Jan. 16, 1986, Ser. No. 819,350
Term of patent 14 years
U.S. Cl. D13—11



300,625
ELECTRICAL TEST CONNECTOR FOR A PRINTED CIRCUIT BOARD
William Y. Sinclair, Stockton, and Steven Miller, Asbury, both of N.J., assignors to Aries Electronics, Inc., Frenchtown, N.J.
Filed Jul. 14, 1986, Ser. No. 885,266
Term of patent 14 years
U.S. Cl. D13—24



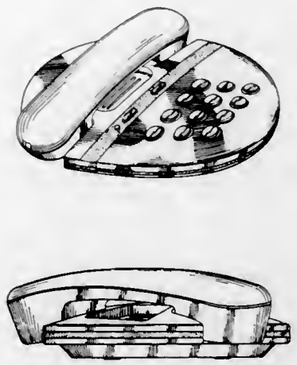
300,626
ADAPTER PLUG FOR A VEHICLE CIGARETTE LIGHTER
Carol A. Crutcher, 16-C Belle Meadows Dr., Trotwood, Ohio 45426, and Ladon Williams, 1743 Academy Pl., Dayton, Ohio 45406
Filed Oct. 15, 1986, Ser. No. 918,905
Term of patent 14 years
U.S. Cl. D13—28



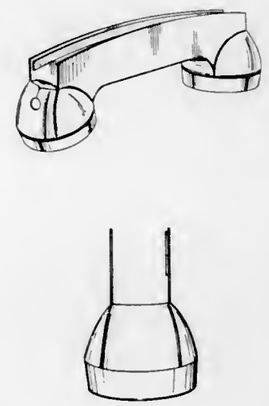
300,627
HEADSET
Ng H. Kwong, Flat "Q", 8th Floor, Hopewell House, 175 Hip Wo Street, Kwun Tong, Kowloon, Hong Kong
Filed Sep. 10, 1985, Ser. No. 774,532
Claims priority, application United Kingdom, Mar. 18, 1985, 1025601
The portion of the term of this patent subsequent to Jan. 17, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—205



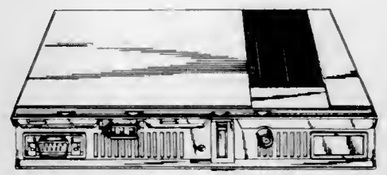
300,628
TELEPHONE SET
Richard Wu, 12th Fl., 126, Nanking E. Rd., Sec. 4, Taipei, Taiwan
Filed Mar. 14, 1988, Ser. No. 167,469
Term of patent 14 years
U.S. Cl. D14—151



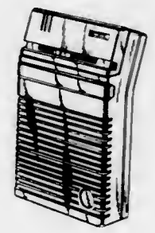
300,629
PROTECTIVE SHIELD FOR TELEPHONE HANDSET
Keith R. Martens, 246 S. Weaver, Hesston, Kans. 67062
Filed Aug. 10, 1987, Ser. No. 83,093
Term of patent 14 years
U.S. Cl. D14—250



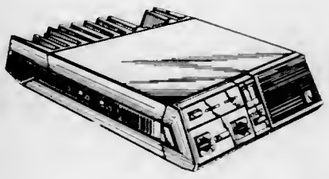
300,630
CELLULAR MOBILE TRANSCEIVER
Richard Culbertson, Lynchburg; Tye C. Drinkard, Forest, and Arthur E. Douglas, Lynchburg, all of Va., assignors to General Electric Company, Lynchburg, Va.
Filed Aug. 25, 1986, Ser. No. 900,035
Term of patent 14 years
U.S. Cl. D14—138



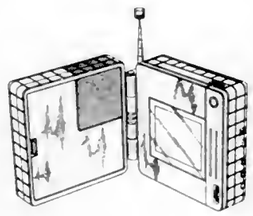
300,631
MOBILE RADIO CONTROL UNIT
Richard Culbertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Sep. 9, 1986, Ser. No. 905,993
Term of patent 14 years
U.S. Cl. D14—137



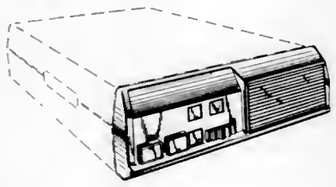
300,632
TWO-WAY MOBILE RADIO
Richard Culbertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Jun. 2, 1986, Ser. No. 869,962
Term of patent 14 years
U.S. Cl. D14—137



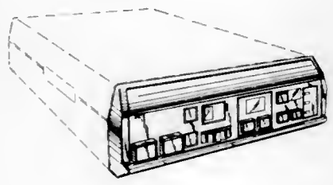
300,633
COMBINED RADIO AND TELEVISION RECEIVER
Katsuhiko Makino, Hirakata; Tsugio Akita, Osaka; Mitsunari Fujii; Hiroaki Nishiyori, both of Takatsuki; Toyoyuki Uematsu, Suita; Yoshiaki Kawata, Kawanishi, and Hiroshi Yasuno, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 14, 1986, Ser. No. 917,931
Claims priority, application Japan, Apr. 14, 1986, 61-13734
Term of patent 14 years
U.S. Cl. D14—131



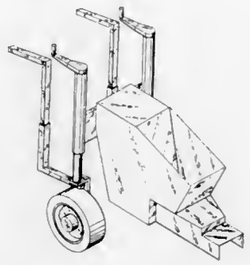
300,634
FRONT PANEL FOR A TWO-WAY MOBILE RADIO
Douglas M. Dickson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed May 1, 1986, Ser. No. 858,499
Term of patent 14 years
U.S. Cl. D14—257



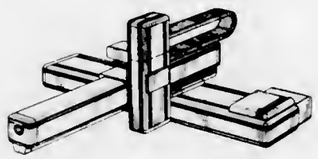
300,635
FRONT PANEL FOR A TWO-WAY MOBILE RADIO
Douglas M. Dickson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed May 1, 1986, Ser. No. 858,509
Term of patent 14 years
U.S. Cl. D14—257



300,636
MACHINE FOR FORMING CONCRETE
William H. Howard, and Patrick W. Kincaid, both of Costa Mesa, Calif., assignors to Creatuve Curb, Inc., Tustin, Calif.
Filed Sep. 3, 1985, Ser. No. 771,830
Term of patent 14 years
U.S. Cl. D15—10



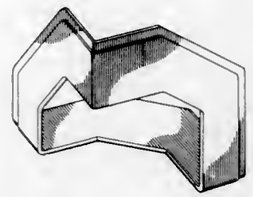
300,637
CARTESIAN COORDINATES TYPE ROBOT
Katsuji Kagayama, Nara; Benito Mishiro, and Ikuo Nishimura, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 8, 1986, Ser. No. 905,109
Claims priority, application Japan, Apr. 22, 1986, 61-15007
Term of patent 14 years
U.S. Cl. D15—199



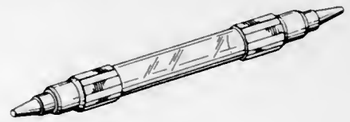
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GUITAR HEAD
Ronald S. Carriveau, 2029 W. Elm St., Phoenix, Ariz. 85015
Filed Feb. 10, 1986, Ser. No. 827,521
Term of patent 14 years
U.S. Cl. D17—20



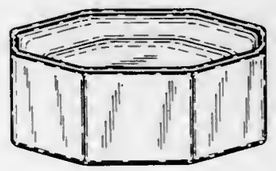
300,639
BOOK END OR THE LIKE
Gerald J. Klodt, Madison, Wis., assignor to W. T. Rogers Company, Madison, Wis.
Filed Oct. 1, 1985, Ser. No. 782,374
Term of patent 14 years
U.S. Cl. D19—34.1



300,640
COLORING INSTRUMENT
Ralph Coletta, 1434 Sackett Hills Dr., Akron, Ohio 44313, and Joseph M. LaGuardia, 2345 Hudson-Aurora Rd., Hudson, Ohio 44236
Filed Jan. 13, 1986, Ser. No. 818,209
Term of patent 14 years
U.S. Cl. D19—51

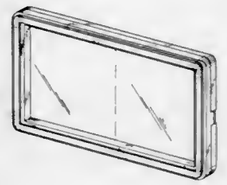


300,641
OCTAGONAL HOLDER FOR SMALL METALLIC OBJECTS
Feather W. King, 165 Reiten Dr., Ashland, Oreg. 97520
Continuation-in-part of Ser. No. 442,156, Nov. 16, 1982, Pat. No. D. 282,380, which is a continuation-in-part of Ser. No. 133,434, Mar. 24, 1980, Pat. No. D. 266,934. This application Nov. 18, 1985, Ser. No. 805,461
Term of patent 14 years
U.S. Cl. D19—75

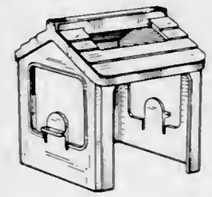




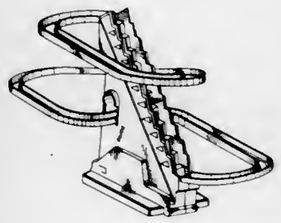
300,642
DISPLAY SIGN
James P. Pawlik, 5592 Lory Dr., Greendale, Wis. 53129, and Margaret A. Erdell, 225 Fairway Dr., Brookfield, Wis. 53005
Filed Feb. 6, 1986, Ser. No. 826,736
Term of patent 14 years
U.S. Cl. D20—10



300,643
TOY CABIN OR THE LIKE
Rino Conti, Stoughton, Mass., and Lawrence O. Freese, Providence, R.I., assignors to Dart Industries Inc., Deerfield, Ill.
Filed Jul. 16, 1986, Ser. No. 887,011
Term of patent 14 years
U.S. Cl. D21—114



300,644
TOY TRACKWAY
Yoshio Udagawa, Mama-Ichikawa, Japan, assignor to Dah Yan Toy Industrial Co., Ltd., Taiwan and Toplay (T.P.S.) Ltd., Japan
Continuation-in-part of Ser. No. 539,526, Oct. 6, 1983, Pat. No. D. 284,492. This application Feb. 3, 1986, Ser. No. 825,325
Claims priority, application Japan, Apr. 11, 1983, 58-014924
Term of patent 14 years
U.S. Cl. D21—143



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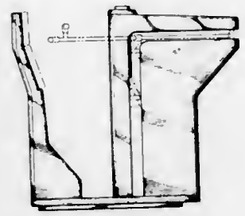
300,645
GENERIC ANIMAL FIGURE
Emily D. Bowden, 4818 W. Northview Ave., Glendale, Ariz. 85301
Filed Dec. 26, 1985, Ser. No. 813,427
Term of patent 14 years
U.S. Cl. D21—159



300,646
ICE SKATING DOLL
Karen Robinson, 1505 Danube La., Plano, Tex. 75075
Filed Mar. 5, 1986, Ser. No. 841,746
Term of patent 14 years
U.S. Cl. D21—173



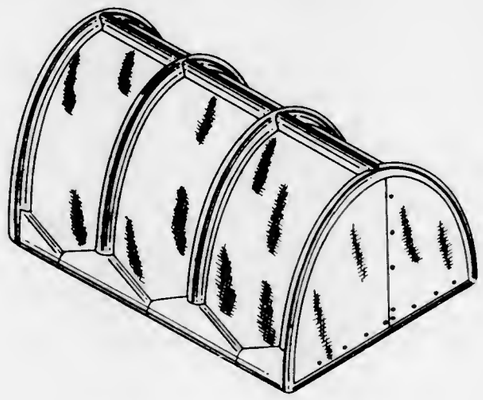
300,647
WEIGHT LIFTING PHYSICAL EXERCISER
John Griffin, Salt Lake City, Utah, assignor to Hoggan Health Industries, Inc., Salt Lake City, Utah
Filed Oct. 16, 1986, Ser. No. 919,865
Term of patent 14 years
U.S. Cl. D21—191



300,648
BICYCLE EXERCISER
Dyke DeWitt, Chicago Park, Calif., assignor to Apparent, Inc., Chicago Park, Calif.
Filed Jul. 30, 1987, Ser. No. 79,813
Term of patent 14 years
U.S. Cl. D21—194



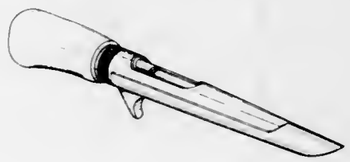
300,649
INFLATABLE TENT
Lyle A. Tauer, 6820 - 32nd Ave. North, Crystal, Minn. 55427
Filed Jun. 29, 1987, Ser. No. 67,685
Term of patent 14 years
U.S. Cl. D21—253



300,650
LINE ANCHOR FOR SECURING FISHING LINE OR THE LIKE
Robert O. Thomas, 1022 Alamo St., San Marcos, Tex. 78666
Filed May 1, 1986, Ser. No. 858,310
Term of patent 14 years
U.S. Cl. D22—134



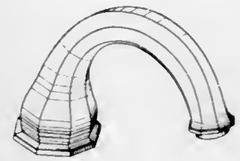
300,651
FISHING ROD HANDLE
Kari-Gunnar Lassi, Karlshamn, Sweden, assignor to Abu AB, Karlshamn, Sweden
Continuation of Ser. No. 804,904, Dec. 5, 1985, abandoned. This application Apr. 4, 1988, Ser. No. 178,894
Term of patent 14 years
U.S. Cl. D22—142



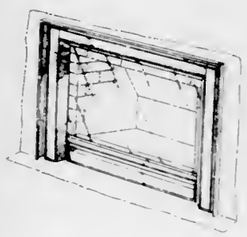
300,652
FAUCET HANDLE OR THE LIKE
Herbert V. Kohler, Jr., Kohler, Wis., and Paul P. Kolada, Bexley, Ohio, assignors to Kohler Co., Kohler, Wis.
Filed Jan. 16, 1986, Ser. No. 820,201
Term of patent 14 years
U.S. Cl. D23—250



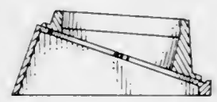
300,653
SPOUT
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Mar. 24, 1987, Ser. No. 29,852
Term of patent 14 years
U.S. Cl. D23—255



300,654
FIREPLACE FRONT
James A. Watt, Providence, R.I., assignor to Vermont Castings, Inc., Randolph, Vt.
Filed Mar. 13, 1987, Ser. No. 25,827
Term of patent 14 years
U.S. Cl. D23—345

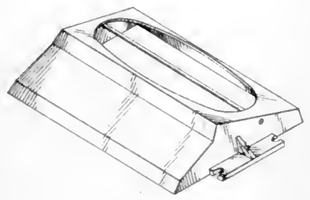


300,655
FIREPLACE INSERT SMOKE PIPE CONNECTOR
Thomas E. Buehler, 3010 18th Ave. W., Bradenton, Fla. 33505
Filed Feb. 3, 1986, Ser. No. 825,419
Term of patent 14 years
U.S. Cl. D23—403

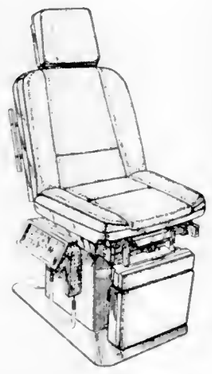


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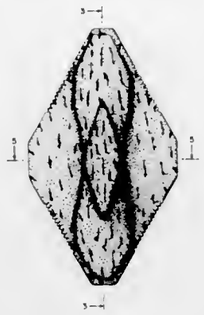
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FIREPLACE INSERT SMOKE PIPE CONNECTOR
Thomas E. Buehler, 3010 18th Ave. W., Bradenton, Fla. 33505
Filed Feb. 3, 1986, Ser. No. 825,106
Term of patent 14 years
U.S. Cl. D23—403



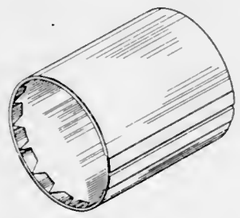
300,657
EXAMINATION TABLE
Terry J. Simpkins, Snowmass Village, Colo., and Richard L. Turner, Coldwater, Ohio, assignors to Midmark Corporation, Versailles, Ohio
Filed Oct. 9, 1986, Ser. No. 917,322
Term of patent 14 years
U.S. Cl. D24—3



300,658
PANTY PAD
Vincent R. Sneider, 3422 Hallcrest Dr., NE., Atlanta, Ga. 30319
Filed Nov. 4, 1987, Ser. No. 116,675
Term of patent 14 years
U.S. Cl. D24—51



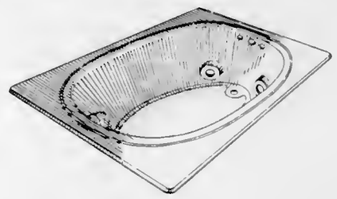
300,659
TEST SPECIMEN HOLDER
Donald G. Needham, Rte. 1, Box 300, Ramona, Okla. 74061
Filed Jul. 20, 1987, Ser. No. 75,861
Term of patent 14 years
U.S. Cl. D24—32



300,660
SINGLE PORT COUPLER FOR RESONANCE SPLITTING IN HEARING AID
Mas Harada, 3217 Flag Ave., Minneapolis, Minn. 55426
Filed Aug. 25, 1986, Ser. No. 899,943
Term of patent 14 years
U.S. Cl. D24—35



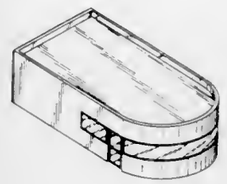
300,661
WHIRLPOOL BATHTUB
Kent A. Dowse, Coon Rapids, Minn., assignor to Pearl Baths Inc., Minnespolis, Minn.
Filed Jun. 16, 1986, Ser. No. 875,379
Term of patent 14 years
U.S. Cl. D24—38







300,662
SERVICE STATION
Saul Bass, Los Angeles, Calif., assignor to The Standard Oil Company, Cleveland, Ohio
Filed Aug. 27, 1986, Ser. No. 901,169
Term of patent 14 years
U.S. Cl. D25—33



300,663
FASTENING STRIP FOR GLASS PANEL
Chung-Nan Liao, 516, Ta Li Road, Ta Li Hsiang, Taichung Hsien, Taiwan
Filed Dec. 12, 1986, Ser. No. 941,925
Term of patent 14 years
U.S. Cl. D25—119

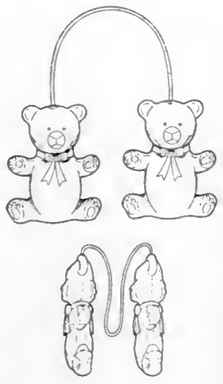


300,664
WINDOW FRAME EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to P.H. Tech. Inc., Levis, Canada
Filed Mar. 18, 1987, Ser. No. 27,352
Claims priority, application United Kingdom, Sep. 18, 1986, 1,036,789
Term of patent 14 years
U.S. Cl. D25—124

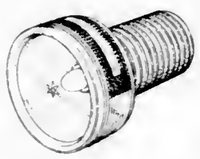


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300,665
PAIR OF LINKED CANDLES
Michael C. B. Lam, Ground Floor, Kwai Bo Industrial Building, 40 Wong Chuk Hang Road, Aberdeen, Hong Kong
Filed Aug. 28, 1986, Ser. No. 901,543
Term of patent 14 years
U.S. Cl. D26—7

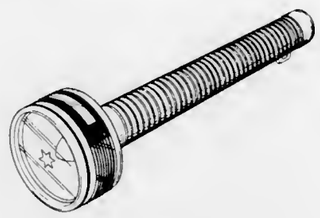


300,666
PORTABLE LIGHT
Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co. Ltd., Shizuoka, Japan
Filed May 7, 1985, Ser. No. 731,407
The portion of the term of this patent subsequeot to Apr. 11, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—49



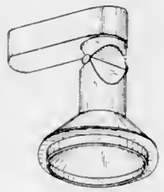


300,667
PORTABLE LIGHT
Kelichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co. Ltd., Shizuoka, Japan
Filed May 7, 1985, Ser. No. 731,408
The portioo of the term of this patent subsequent to Apr. 11, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—49

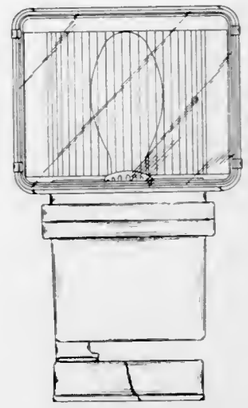




300,668
LIGHTING FIXTURE
Bernard Monfort, Lamotte-Beuvron, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 6, 1986, Ser. No. 916,088
Claims priority, application France, Apr. 4, 1986, 861741
Term of patent 14 years
U.S. Cl. D26—63



300,669
ADJUSTABLE LIGHT FIXTURE WITH HIGH INTENSITY REFLECTOR
Thomas Russello, Howell, and Richard Sangiamo, Linden, both of N.J., assignors to Keene Corporation, Union, N.J.
Filed Dec. 3, 1986, Ser. No. 937,527
Term of patent 14 years
U.S. Cl. D26—63



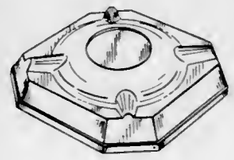
300,670
LUMINAIRE
Robert L. Ewing; Douglas S. Hammond, and Mark L. Roush, all of Newark, Ohio, assignors to Manville Corporation, Denver, Colo.
Filed Nov. 28, 1986, Ser. No. 935,674
The portion of the term of this patent subsequent to Apr. 11, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—67



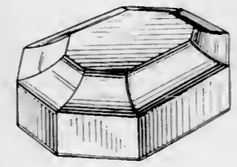
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LUMINAIRE
Robert L. Ewing; Douglas S. Hammond, both of Newark; James L. Leary, Granville; David G. Meredith, Westerville, and Mark L. Roush, Newark, all of Ohio, assignors to Manville Corporation, Denver, Colo.
Filed Nov. 28, 1986, Ser. No. 936,401
The portion of the term of this patent subsequent to Apr. 11, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—67



300,672
NON-SMOKER'S ASHTRAY
Philip M. Seymour, late of Ann Arbor, Mich., and Clara P. Seymour, 1920 Mershon Dr., Ann Arbor, Mich. 48103
Filed Mar. 27, 1986, Ser. No. 847,024
Term of patent 14 years
U.S. Cl. D27—102

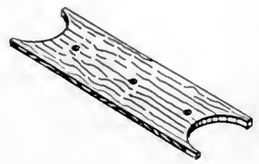


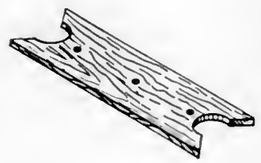
300,673
PHARMACEUTICAL TABLET
Gregory A. Rhoa, Collegeville, and Pravinchandra B. Shah, Warminster, both of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Nov. 9, 1987, Ser. No. 118,838
Term of patent 14 years
U.S. Cl. D28—2



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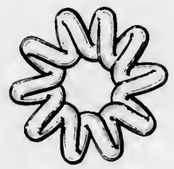
300,674
PERMANENT WAVE HAIR CURLER
Debrah E. Johnson, P.O. Box 82604, Kenmore, Wash. 98028
Filed Jun. 12, 1987, Ser. No. 61,988
Term of patent 14 years
U.S. Cl. D28—35

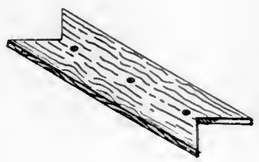




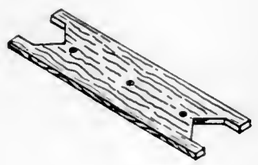
300,675
HAIR HOLDER
Stephen Sacher, Lincolnwood, Ill., assignor to UPI Corporation, Whippany, N.J.
Filed Apr. 14, 1986, Ser. No. 851,695
Term of patent 14 years
U.S. Cl. D28—41



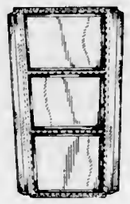




300,676
FOREARM PROTECTOR
Alfred R. Pierce, Jr., 25 Argyle Ave., Blackwood, N.J. 08012
Continuation-in-part of Ser. No. 687,746, Dec. 31, 1984, Pat. No. Des. 290,766. This application Apr. 25, 1986, Ser. No. 857,582
Term of patent 14 years
U.S. Cl. D29—20



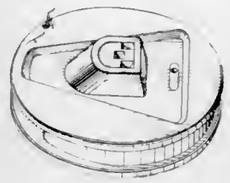




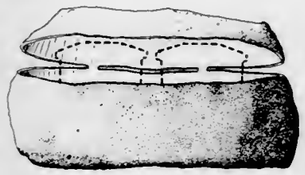
300,677
ULTRASONIC CLEANER
Michael Van Hoye, Anaheim Hills, Calif., assignor to Identechs Corporation, Dallas, Tex.
Filed Dec. 15, 1986, Ser. No. 942,613
Term of patent 14 years
U.S. Cl. D32—1



300,678
RE-CHARGING STAND FOR A CORDLESS ELECTRIC IRON
Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France
Filed Dec. 1, 1987, Ser. No. 127,284
Claims priority, application France, Jun. 11, 1987, 873465
Term of patent 14 years
U.S. Cl. D32—73



300,679
STORAGE CONTAINER FOR TRASH CANS
A. Allen Draper, 3860 S. Midland, Roy, Utah 84067
Filed Apr. 3, 1986, Ser. No. 847,846
Term of patent 14 years
U.S. Cl. D34—4



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF APRIL, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Manufacturing Company: *See—*
Lang, John W., 4,819,521, Cl. 81-63.000.

A KAD Co.: *See—*
Foldes, David A., 4,819,580, Cl. 119-1.000.

A/S Modulex: *See—*
Korteqaard, Per, 4,820,171, Cl. 439-75.000.

Aaronson, Stuart A .: *See—*
Lacal, Juan C.; and Aaronson, Stuart A ., 4,820,631, Cl. 435-6.000.

Aarthun, Nils I.: *See—*
Lofgren, Peter; and Aarthun, Nils I., 4,819,691, Cl. 137-556.000.

Abbazia, Leonard P.: *See—*
Barcelon, Shirley A.; Hussein, Mamoun M.; Abbazia, Leonard P.; and Graff, Allan H., 4,820,544, Cl. 426-660.000.

Abbott, Adrian, to Plessey Overseas Limited. Method of and system for controlling a fluidic valve. 4,819,431, Cl. 60-204.000.

Abe, Akihiro; Kamata, Akinori; Yoshino, Satoshi; and Terada, Hirotomo, to Fujitsu Limited. Shuttle printer which stops shuttle for paper feed. 4,819,556, Cl. 101-93.040.

Abe, Hirotsugu: *See—*
Ishikawa, Youhei; Tsunoda, Kikuo; Hiratsuka, Toshiro; and Abe, Hirotsugu, 4,821,006, Cl. 333-202.000.

Abe, Masao: *See—*
Tahara, Tetsuya; Moriwaki, Minoru; Abe, Masao; and Yuasa, Shuji, 4,820,703, Cl. 514-220.000.

Abe, Mitsuji, to Tannan Co., Ltd. Pipe joint. 4,819,968, Cl. 285-81.000.

Abe, Mitsunobu: *See—*
Shingu, Hideo; Abe, Mitsunobu; Sato, Takashi; and Yamada, Toshio, 4,820,141, Cl. 419-8.000.

Absi-Halabi, Ma'mun: *See—*
Lahalih, Shawqui; and Absi-Halabi, Ma'mun, 4,820,766, Cl. 524-843.000.

Abt, John: *See—*
Jackson, Richard A.; Lake, David E., Jr.; Blecksmith, James E.; Barnett, Ronnie D.; and Abt, John, 4,821,269, Cl. 371-16.000.

Academy of Applied Science, The: *See—*
Logan, James D.; and Litvin, Yury, 4,821,029, Cl. 340-712.000.

Achiha, Masahiko: *See—*
Sakamoto, Toshiyuki; Arai, Ikuya; Kurita, Toshiyuki; Murata, Toshinori; Nakagawa, Isao; Achiha, Masahiko; and Ishikura, Kazuo, 4,821,112, Cl. 358-17.000.

Achterholt, Rainer. Pressure drop indicating valve cap for pneumatic tires. 4,819,686, Cl. 137-229.000.

Acme General Corportion: *See—*
Jacobs, Kenneth; and Jerila, Torsti T. T., 4,819,297, Cl. 16-87.00R.

Adams, Allan J.: *See—*
Alexander, Michael P.; and Adams, Allan J., 4,819,983, Cl. 296-121.000.

Adamski, Maximilian, Jr.: *See—*
Kosrow, Robert L.; Prochut, Richard; and Adamski, Maximilian, Jr., 4,819,926, Cl. 270-45.000.

Adcock, Jimmy L., to M. L. Eakes Co. Leakproof endless belt conveyor. 4,819,790, Cl. 198-811.000.

Adeka Argus Chemical Co., Ltd.: *See—*
Kagiya, Tsutomu; Minagawa, Motonobu; Nakahara, Yutaka; Kimura, Ryoji; Tsubakimoto, Tsuneo; Oshiumi, Ryoichi; and Sakano, Koichi, 4,820,844, Cl. 548-266.000.

ADIR Et Cie: *See—*
Lavielle, Gilbert; and Poignant, Jean C., 4,820,707, Cl. 514-252.000.

Advanced Identification Systems, Inc.: *See—*
Lafreniere, Roger F., 4,821,118, Cl. 358-108.000.

Advanced Micro Devices, Inc.: *See—*
Arnold, William H., III; Farnaam, Mohammad; and Sliwa, Jack, 4,820,611, Cl. 430-271.000.
Brown, Candice H., 4,820,976, Cl. 324-158.00F.
Chan, King W., 4,820,942, Cl. 307-542.000.

Advanced Underwater Techology: *See—*
Dahlback, Gunnar, 4,820,084, Cl. 405-186.000.

AEG Olympia AG: *See—*
Keiter, Alfred; and Sauer, Manfred, 4,820,125, Cl. 400-249.000.

Aerospace Corporation, The: *See—*
Csanky, Geza, 4,820,999, Cl. 330-277.000.

Aerospatiale Societe Nationale Industrielle: *See—*
Chareire, Jean-Louis; and Lapeyre, Didier, 4,820,301, Cl. 623-3.000.

Aesculap-Werke AG: *See—*
Taschner, Wolfgang, 4,820,499, Cl. 422-310.000.

Agency of Industrial Science & Technology: *See—*
Hirotsu, Toshihiro; and Nakajima, Shigeru, 4,820,418, Cl. 210-640.000.
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,819,717, Cl. 165-104.120.

Agency of Industrial Science & Technology and Kurimoto Ltd.: *See—*
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguichi, Keizo, 4,819,718, Cl. 165-104.120.

AGFA-Gevaert AG: *See—*
Bauer, Walter; Schmidt, Manfred; Plaschke, Herbert; and Butz, Otto, 4,819,317, Cl. 29-407.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Kurths, Siegfried, 4,821,060, Cl. 354-321.000.
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Cordell, Robert R., to Bell Communications Research, Inc. Digital phase aligner with outrigger sampling. 4,821,296, Cl. 375-119.000.

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Hoffmann, Gerhart; Irlweck, Karl; and Cordes, Rudolf, 4,820,862, Cl. 560-77.000.

Core, Ronald S.: *See—*
Young, Ronald J.; Core, Ronald S.; and Marino, Joseph T., Jr., 4,821,173, Cl. 364-200.000.

Corfits, William D.; Mosley, Claude J.; Rasmussen, Jerry R.; and Wheeler, Stephen E., to International Business Machines Corporation. Pluggable assembly for printed circuit cards. 4,821,145, Cl. 361-383.000.

Corfits, William D.: *See—*
Behrens, Linda M.; Blohm, Neil A.; Cimijotti, Raymond L.; Corfits, William D.; and Rasmussen, Jerry R., 4,821,146, Cl. 361-383.000.

Cornelius, Robert S.: *See—*
Anderson, Terry M.; and Cornelius, Robert S., 4,821,034, Cl. 340-825.800.

Corp, David O.: *See—*
Duthie, George A.; Frey, Mark C.; Gleadall, Wilfred L.; Skrovanek, Ambroz C.; and Corp, David O., 4,821,150, Cl. 361-395.000.

Corsetti, Carmine: *See—*
Alberico, Joseph S.; Corsetti, Carmine; and Brandolino, Fiore, 4,819,687, Cl. 137-367.000

Cosgrove, Patrick A.: *See—*
Backus, Richard J.; and Cosgrove, Patrick A , 4,821,073, Cl. 355-68.000.

Cotriss, E. James: *See—*
Herlein, Richard F.; Davis, Jeffrey A.; and Cotriss. E. James, 4,820,944, Cl. 307-603.000.

Cottrell, John S.: *See—*
Caprioli, Richard M.; and Cottrell, John S., 4,820,648, Cl. 436-89.000.

Counard, Cletus J., to Pamarco Incorporated. High efficiency fluid metering roll. 4,819,558, Cl. 101-348.000.

Courduvelis, Constantine I.; and DelGobbo, Anthony R., to Enthone, Incorporated. Three step process for treating plastics with alkaline permanganate solutions. 4,820,548, Cl. 427-98.000.

Coury, Frank; Frank, Margaret A.; and Sivilich, Daniel M., to E. R. Squibb & Sons, Inc. Male external catheter. 4,820,289, Cl. 604-349.000.

Cova, Dario R.; and Thorman, John M., to Monsanto Company. Purification of alkyl glyoxylate in a continuous column by azeotropic distillation. 4,820,385, Cl. 203-2.000.

Cox, Donald G Compact dust collector. 4,820,320, Cl. 55-302.000.

Cox, Helen M.: *See—*
Rogers, Peter H.; and Cox, Helen M., 4,819,649, Cl. 128-660.020.

Coxon, Ronald J.: *See—*
Mansfield, Peter; and Coxon, Ronald J., 4,820,986, Cl. 324-322.000.

CPI Sales, Inc.: *See—*
Lilie, Kenneth R., 4,820,407, Cl. 209-397.000.

Cracraft, Larry A.: *See—*
Redmond, John P.; Sheak, Ray N.; Shirk, Albert; and Cracraft, Larry A., 4,820,170, Cl. 439-66.000.

Crane, Patrick E. Dual polarized monopulse orthogonal superposition. 4,821,039, Cl. 342-153.000.

Creber, Dave K.; and Gesing, Adam J., to Lanxide Technology Company, LP. Production of ceramic articles incorporating porous filler material. 4,820,461, Cl 264-57.000.

Crighton, James S.; and Malcolme-Lawes, David J., to British Petroleum Company p.l.c., The. Transport detector system. 4,820,044, Cl. 356-315.000.

Crisp, Harold A.; Clayton, John C.; Elliott, Leonard G.; and Wilson, Edward M., to Glaxo Group Limited. Preparation of a highly pure, substantially amorphous form of cefuroxime axetil. 4,820,833, Cl. 540-220.000.

Crochetiere, Raymond H.: *See—*
Gudmundson, Gunnar G.; Hebert, Martin E.; Hadank, Walter R.; Crochetiere, Raymond H.; and Kenyon, Douglas A., 4,821,061, Cl. 355-40.000.

Cromar, Stephen A.: *See—*
Calder, Ian D.; and Cromar, Stephen A., 4,819,967, Cl. 285-18.000.

Crooks, Evon L.: *See—*
Roberts, Donald L.; Morrison, Carl C.; Brooks, Johnny L.; Crooks, Evon L.; and Ingebrethsen, Bradley J., 4,819,665, Cl. 131-195.000.

Crooks, Lawrence E.; and Carlson, Joseph W., to University of California, The Regents of the. Magnetic gradient coil set for nuclear magnetic resonace system having substantially different coil-patient spacings. 4,820,988, Cl. 324-318.000.

Cross, Jack A.; and Jackson, Cletis M., to Technical Manufacturing Systems, Inc. Method of forming electro-discharge machining electrode. 4,819,325, Cl. 29-825.000.

Crucil, Guy A.; and Blaser, Laura J., to Nalco Chemical Company. Branched alkyl acrylamide types of polymer-zinc corrosion inhibitor. 4,820,423, Cl. 210-697.000.

Cruess, Michael; Mothersole, David; Zolnowsky, John; and MacGregor, Douglas B., to Motorola, Inc. Method and apparatus for selectively evaluating an effective address for a coprocessor. 4,821,231, Cl. 364-900.000.

Cruise, Thomas E. Insulated concrete masonry unit with low density heat bridges. 4,819,396, Cl. 52-405.000.

Crum, Gerald W.: *See—*
Sharpless, John; Knobbe, Alan J.; White, Kenneth A.; and Crum, Gerald W., 4,819,879, Cl. 239-691.000.

Cruse, John W.: *See—*
O'Callaghan, William; and Cruse, John W., 4,820,380, Cl. 162-135.000.

Csanky, Geza, to Aerospace Corporation, The. Method and apparatus for amplifying signals. 4,820,999, Cl. 330-277.000.

Culp, Bradfred W., to Hewlett-Packard Company. Tape positioning using reverse boundary capture: tape drive system and method. 4,821,129, Cl. 360-74.400.

Cummins, Joseph M., to Texas A&M University System. Low dosage of interferon to enhance vaccine efficiency. 4,820,514, Cl. 424-85.400.

Cummins, Joseph M., to Texas A&M University System. Method of using interferon in low dosage to regulate appetite and efficiency of food utilization. 4,820,515, Cl. 424-85.700.

Cunningham, Earl A.: *See—*
Christensen, Thomas C.; Coker, Jonathan D.; Cunningham, Earl A.; Jaworski, Richard C.; Kerwin, Gregory J.; Palmer, Dean C.; and Roepke, Jeffrey R., 4,821,125, Cl. 360-31.000.

CUNO, Incorporated: *See—*
Repetti, Ronald V.; Yaeger, Scott P.; and Chu, Chaokang, 4,820,460, Cl. 264-41.000.

Curiel Contreras, Jorge H.: *See—*
Thompson, Marvin W.; Jennings, Timothy C.; Scott, James A.; Phenicie, Ronald W.; Murphy, Margaret H.; Nakash, Gabriel D.; Biggers, James R.; Boudreau, Lynnlee M.; and Curiel Contreras, Jorge H., 4,819,567, Cl. 108-38.000.

Curti, Carlo; and Cattani, Luciano, to Sauer S.p.A. Closed loop system for making ice confections having a holding stick embedded therein. 4,819,449, Cl. 62-345.000.

Curtis, Ernest S.: *See—*
Murphy, John H.; Curtis, Ernest S.; and Horton, Donald D., 4,820,518, Cl. 424-401.000.

Custom Controls Co., Inc.: *See—*
Emplit, Raymond H.; and Daily, Donald Y., 4,819,483, Cl. 73-304.00C.

Cuzin, Daniel. to Atochem. Bonding method employing polyamide oligomer-epoxy polymer adhesives. 4,820,367, Cl. 156-283.000.

Cyclotomics, Inc.: *See—*
Berlekamp, Elwyn R., 4,821,268, Cl. 371-37.000.
Cohen, Earl T.; and Swensen, John A., 4,820,993, Cl. 328-155.000.
Peile, Robert E., 4,821,288, Cl. 375-11.000.
Peile, Robert E., 4,821,289, Cl. 375-14.000.

Cydzik, Edward: *See—*
Jacobs, Brian; McGaffigan, Thomas; and Cydzik, Edward, 4,821,147, Cl. 361-388.000.

Cyprus Minerals Company: *See—*
Weber, Kenneth E., 4,820,347, Cl. 106-469.000.

Czarnecki, Kenneth R.: *See—*
Amelio, William J.; Czarnecki, Kenneth R.; Lemon, Gary K.; Markovich, Voya; Sambucetti, Carlos J.; and Zarr, Richard S., 4,820,643, Cl. 436-37.000.

Czich, Erhard; Endler, Wolfgang; and Wagner, Juergen, to Alfred Teves GmbH. Actuating device for a disc brake for automotive vehicles. 4,819,768, Cl. 188-196.00D.

Dadhich, Ghanshyam M., to Westinghouse Electric Corp. Method of salvaging stationary blades of a steam turbine. 4,819,313, Cl. 29-156.80R.

Daffarn, Patrick A., to U.S. Philips Corp. Method of and apparatus for producing a digital indication of the time-integral of an electric current. 4,821,036, Cl. 341-172.000.

Dahlback, Gunnar, to Advanced Underwater Techology. Device for heat-insulated diving suits for work at great depths under water. 4,820,084, Cl. 405-186.000.

Dahlgren, Richard M.: *See—*
Medcalf, Ralph F., Jr.; Visscher, Martha O.; Knochel, John R.; and Dahlgren, Richard M., 4,820,447, Cl. 252-117.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,820,686, Cl. 503-227.000.
Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,820,687, Cl. 503-227.000.

Daicel Chemical Industries, Ltd.: *See—*
Higo, Yakichi; and Morimoto, Hiroshi, 4,820,910, Cl. 235-439.000.

Daily, Donald Y.: *See—*
Emplit, Raymond H.; and Daily, Donald Y., 4,819,483, Cl. 73-304.00C.

Daimler-Benz AG: *See—*
Britze, Manfred, 4,819,771, Cl. 188-299.000.

Scarpatetti, Diether V.; and Sahm, Dietrich, 4,820,168, Cl. 439-33.000.

Daimler-Benz Aktiengesellschaft: *See—*
Leistenschneider, Raimund; Neuffer, Klaus; and Frey, Egon, 4,821,018, Cl. 340-471.000.

Dainihon Glass Industry Company Ltd.: *See—*
Sugita, Minoru; Nakatsuji, Teruyuki; Fujisaki, Tadashi; Hiraga, Hisao; Nishimoto, Takashi; and Futagawa, Minoru, 4,819,395, Cl. 52-309.160.

Dainippon Ink and Chemicals, Inc.: *See—*
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,820,878, Cl. 568-659.000.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Murakami, Shigeo, 4,821,110, Cl. 358-285.000.
Nishida, Fumihiko; Taniuchi, Osami; Yonetani, Hideaki; Kawada, Toru; and Yazaki, Tatsuo, 4,821,078, Cl. 355-75.000.
Terauchi, Kenichi, and Okamoto. Takeo, 4,820,907, Cl. 219-494.000.

Daka, Joseph N.: *See—*
Chang, Thomas M. S.; and Daka, Joseph N., 4,820,416, Cl. 210-632.000.

Dakss, Mark L.: *See—*
Melman, Paul; and Dakss, Mark L., 4,820,018, Cl. 350-96.330.

Dal-Tex Specialty & Mfg. Co.: *See—*
Knight, Michael R., 4,820,096, Cl. 411-169.000.

Dalmadi, Gyula: *See—*
Szabo, Tibor; Vidra nee Sandor, Ildiko ; Dalmadi, Gyula; Kaczmarek nee Sebestyen, Judit; and Ori, Janos, 4,820,852, Cl. 549-539.000.

Daly, Raymond A., to Johnson Filtration Systems, Inc. Metal well screen assembly with plastic end fitting and method of attaching same. 4,819,722, Cl. 166-231.000.

Dameron, Joseph T. Improved roof panel apparatus and panel locking method. 4,819,398, Cl. 52-529.000.

Damino A/S: *See—*
Christensen, Borge H.; and Storm, Ebbe, 4,820,527, Cl. 426-2.000.

Dan, Yie-Fong: *See—*
Bernick, David L.; Chan, Kenneth K.; Chan, Wing M.; Dan, Yie-Fong; Hoang, Duc M.; Hussain, Zubair; Iswandhi, Geoffrey I.; Korpi, James E.; Sanner, Martin W.; Zwagerman, Jay A.; Silverman, Steven G.; and Smith, James E., 4,821,170, Cl. 364-200.000.

Dana Corporation: *See—*
Davison, Kent E.; and Rickert, Ervin M., 4,820,357, Cl. 148-12.400.

Danforth, Richard L.; and Gilmore, Dennis W., to Shell Oil Company. Polyketone roofing membranes. 4,820,578, Cl. 428-291.000.

Danish Hyperthermia Foundation, The: *See—*
Andersen, Jorgen B.; and Raskmark, Povl, 4,819,642, Cl. 128-419.00R.

D'Annessa, Anthony T.: *See—*
Baumgart, Jerry W.; D'Annessa, Anthony T.; Geyling, Franz T.; Flegal, William M.; and Miller, Thomas J., 4,820,322, Cl. 65-3.110.

Danos, Michael. Detection methods and apparatus for non-destructive inspection of materials with radiation. 4,821,304, Cl. 378-86.000.

Darlington, William B., to PPG Industries, Inc. Method for deinking wastepaper with a halogenated polyethylene oxide and a polymeric material. 4,820,379, Cl. 162-5.000.

Darnell, William R.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Process for preparing polyketone in the presence of perfluoroalkyl sulfonic acid and oxide of phosphorus. 4,820,794, Cl. 528-271.000.

Data General Corporation: *See—*
Clancy, Gerald F.; Mundie, Craig J.; Schleimer, Stephen I.; Wallach, steven J.; and Bratt, Richard G., 4,821,184, Cl. 364-200.000.

Data Motion, Inc.: *See—*
Seitz, Karl G., 4,819,849, Cl. 226-74.000.

Datascope Corp.: *See—*
Zelin, Michael P., 4,819,752, Cl. 128-633.000.

Daudi, Anwar R., to Motor Wheel Corporation. Method of wheel manufacture for correcting rotational non-uniformity of a pneumatic tire and wheel assembly. 4,819,472, Cl. 72-335.000.

Davene , Georges J.: *See—*
Janiak, Robert A.; and Davene , Georges J., 4,821,284, Cl. 373-107.000.

Davern, John W.; and Mazurik, Frank T., to Gemcor Engineering Corp. Method and apparatus for inserting fasteners. 4,819,856, Cl. 227-119.000.

David, Constant V., to Phillips Petroleum Company. Flexible conformable vanes made of carbonaceous materials. 4,820,480, Cl. 418-153.000.

David, Morgan W. A., to Sony Corporation. Two-dimensional finite impulse response filters. 4,821,223, Cl. 364-724.050.

Davidson, Richard W.; and Fletcher, John W., to Agtek Development Co., Inc. Position sensing system for surveying and grading. 4,820,041, Cl. 356-1.000.

Davies, David H. Retrolasing catheter and method. 4,819,632, Cl. 128-303.100.

Davis, Cecil J.; Matthews, Robert T.; Jucha, Rhett B.; and Loewenstein, Lee M., to Texas Instruments Incorporated. Method for cleanup processing chamber and vacuum process module. 4,820,377, Cl. 156-643.000.

Davis, Clint A.; and Trail, Melvin P., to Beckworth Davis International, Inc. Apparatus microprocessor controlled welding. 4,821,202, Cl. 364-477.000.

Davis, Eddie L. Golf stance training aid. 4,819,940, Cl. 273-187.00B.

Davis, Jeffrey A.: *See—*
Herlein, Richard F.; Davis, Jeffrey A.; and Cotriss, E. James, 4,820,944, Cl. 307-603.000.

Davis, Mark W.: *See—*
Policastro, Peter P.; Hernandez, Pamela K.; and Davis, Mark W., 4,820,781, Cl. 525-431.000.

Davison, Kent E.; and Rickert, Ervin M., to Dana Corporation. Low grade material axle shaft. 4,820,357, Cl. 148-12.400.

Day, Donal F.; and Koenig, David W., to Louisiana State University and Agriculture and Mechanical College. Method of producing dextranase. 4,820,640, Cl. 435-211.000.

Day, Robert L. Metal frame system. 4,819,392, Cl. 52-211.000.

Day, Shenq T. Visor cap with a detachable eye shield. 4,819,274, Cl. 2-10.000.

Dayan, Abraham. Method of converting thermal energy to work. 4,819,437, Cl. 60-673.000.

Dayco Products, Inc.: *See—*
Allen, Michael E., 4,820,246, Cl. 474-174.000.

DE-KO-WE Schurholz Teppichfabrik GmbH: *See—*
Schurholz, Heinrich, 4,819,372, Cl. 47-9.000.

DeBernardi, Carlo; and Modone, Eros, to Centro Studi e Laboratori Telecomunicazioni Spa. Method of fabricating optical waveguides for the midinfrared portion of the spectrum. 4,820,323, Cl. 65-3.120.

De Blasi, Italo: *See—*
Saubolle, Malcolm; De Blasi, Italo; and Livshitz, Stanley, 4,820,953, Cl. 310-338.000.

DeBolt, Charles H. Ditch forming machine. 4,819,348, Cl. 37-81.000.

Debono, Manuel; Kirst, Herbert A.; and Leeds, James P., to Eli Lilly and Company. Modifications of 3-O-demethylmycinose in macrocin and lactenocin. 4,820,694, Cl. 514-30.000.

Debono, Manuel; and Kirst, Herbert A., to Eli Lilly and Company. C-20-dihydro-deoxy-(cyclic amino)-derivatives of macrolide antibiotics. 4,820,695, Cl. 514-30.000.

DeBruler, Dennis L.; Hafer, Edward H.; Hiller, Thomas L.; Johnson, James M., Jr.; Kimber, Douglas A.; McHarg, Christopher G.; Pector, Scott W.; and Pierce, David A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Control information communication arrangement for a distributed control switching system. 4,821,259, Cl. 370-60.000.

Deckert, Clinton; and Wilson, Larry L., to Centaur Sciences, Inc. Flow control system. 4,821,028, Cl. 340-606.000.

Dedo, Richard G. Article and method for prepping a patient prior to surgery. 4,820,279, Cl. 604-290.000.

Deere & Company: *See—*
Engelstad, Jonathan L.; and Best, William A., 4,819,415, Cl. 56-41.000.
Fleischer, Dennis G.; Smola, Robert J.; and Draeger, James H., 4,819,554, Cl. 100-224.000.
Smemo, Alfred S.; Paisley, Daniel J.; and Baskerville, Gary L., 4,819,755, Cl. 180-70.100.

DeForrest, Allen L., to United States of America, Air Force. Compact focal plane precision positioning device and method. 4,819,340, Cl. 33-613.000.

Defosse, Gerard: *See—*
Manoury, Philippe; Binet, Jean; and Defosse, Gerard, 4,820,710, Cl. 514-272.000.

Defrance, Alain, to Delachaux SA. Process for the production of chromium-aluminum balls for adding chromium into molten aluminum baths. 4,820,483, Cl. 419-23.000.

Defranould, Philippe; and Verroust, Marc, to Thomson-CSF. Method for the elimination of spurious echos in electro-acoustic delay lines using bulk waves and delay line applying this method. 4,821,004, Cl. 333-143.000.

Degawa, Toru: *See—*
Ototani, Tohei; Degawa, Toru; Kusumoto, Kenichi; and Ebata, Makoto, 4,820,485, Cl. 420-78.000.

Degenhardt, Charles R.; and Charbonneau, Duane L., to Procter & Gamble Company, The. Antimicrobial agents and process for their manufacture. 4,820,698, Cl. 514-102.000.

Degner, Dieter; Gramlich, Walter; Lanzendoerfer, Franz; and Siegel, Hardo, to BASF Aktiengesellschaft. Novel benzaldehyde dialkyl acetals and preparation and use thereof. 4,820,389, Cl. 204-78.000.

DeHart, Anthony G., to Laser Photonics, Inc. Flexible light transmissive apparatus and method. 4,819,630, Cl. 128-303.100.

Deike, Horst, to WABCO Westinghouse Fahrzeugbremsen GmbH. Activation apparatus for a differential pawl with an actuator. 4,819,511, Cl. 74-711.000.

De Jong, Johannes: *See—*
Winkler, Hugo; and De Jong, Johannes, 4,819,765, Cl. 187-88.000.

Del Norte Technology, Inc.: *See—*
Parks, Stephen I., 4,821,023, Cl. 340-551.000.

Delachaux SA: *See—*
Defrance, Alain, 4,820,483, Cl. 419-23.000.

DelGiorno, Daniel; Pellicano, Russell A.; and Medina, Henry, to Myo-Tech Corp. Muscle testing apparatus. 4,819,485, Cl. 73-379.000.

DelGobbo, Anthony R.: *See—*
Courduvelis, Constantine I.; and DelGobbo, Anthony R., 4,820,548, Cl. 427-98.000.

Dell, George: *See—*
Simkus, John J.; and Dell, George, 4,819,818, Cl. 273-138.00A.

Dellen, Franz: *See—*
Mitzner, Horst; and Dellen, Franz, 4,819,918, Cl. 266-207.000.

Delpla, Claude A.; Limet, Henri D.; and Janicaud, Francois P., to Compagnie Internationale Des Produits Sanitaires "CIPS". Thermostatic mixing valve. 4,819,867, Cl. 236-12.160.

Delta Dredge and Pump Corporation: *See—*
Merrifield, G. David, deceased, 4,819,948, Cl. 277-3.000.

DeMarco, Thomas M. Vacuum loader and process for removing asbestos and other particulate material. 4,820,315, Cl. 55-1.000.

Demarest, Russell G., Jr. Self-contained portable hanging clothes dryer. 4,819,812, Cl. 211-1.300.

Demarne, Henri: *See—*
Mosse, Madeleine; Demarne, Henri; and Proietto, Vincenzo, 4,820,717, Cl. 514-317.000.

de Masi, Amerigo. Rack or transport tool for the manufacturing of printed wired boards. 4,820,396, Cl. 204-297.00W.

de Mathan, Olivier, to France Luzerne Complexe Agricole du Mont-Bernard. Process for drying vegetable matter using high-pressure steam. 4,820,542, Cl. 426-636.000.

Demers, James P.; Murray, William V.; and Sulsky, Richard B., to Ortho Pharmaceutical Corporation. Cinnamohydroxamic acids. 4,820,828, Cl. 549-362.000.

Demura, Hiroshi; Hayashi, Kazumi; Oyama, Yasuo; Kokubu, Sadao; Takizawa, Kouji; and Iguchi, Shigeru, to Toyota Jidosha Kabushiki Kaisha; and Kahushiki Kaisha Tokai Rika Denki Seisakusho. Liquid crystal antidazzle mirror. 4,820,022, Cl. 350-331.00R.

Demuth, Robert; and Wuest, Anton, to Maschinenfabrik Rieter AG. Device for cleaning at least one sensor roller and method of cleaning such sensor roller. 4,820,350, Cl. 134-6.000.

Den Boer, Jacob A.: *See—*
Popma, Theo J. A.; and Den Boer, Jacob A., 4,820,926, Cl. 250-486.100.

Denkmann, W. John; Drexler, Leonard H.; Guelden, Ronald H.; and Spitz, William T., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Connecting block construction. 4,820,192, Cl. 439-404.000.

Denning Mobile Robotics, Inc.: *See—*
Taivalkoski, Amy L.; and Kadonoff, Mark B., 4,821,192, Cl. 364-424.020.

Dennis, Mahlon D., to Diamant Boart-Stratabit (USA) Inc. Method of forming a cutting element having a V-shaped diamond cutting face. 4,819,516, Cl. 76-101.00R.

Dentsply Research & Development Corp.: *See—*
Warrin, George E.; Perdreaux, Rene J.; Paschke, Richard H.; Constantinescu, Teodor E.; and McGill, Robert, 4,820,152, Cl. 433-86.000.

Depel, William A.; and Weinberg, Bernd, to Bivona, Inc.; and Purdue Research Foundation. Speech prosthesis device. 4,820,304, Cl. 623-9.000.

Derrick, James W., to Derrick Manufacturing Corporation. Reinforced polyurethane vibratory screen. 4,819,809, Cl. 209-275.000.

Derrick Manufacturing Corporation: *See—*
Derrick, James W., 4,819,809, Cl. 209-275.000.

DeSatnick, Allen H.; Marcus, Herbert D.; and Merte, Kenneth E., to Minnesota Mining and Manufacturing Company. Tubing set. 4,820,265, Cl. 604-30.000.

Descroix, Jean-Pierre; and Leben, Yannick, to SAFT, S.A. Activatable battery using the $Li/SOCl_2$ or Li/SO_2Cl_2 couples. 4,820,598, Cl. 429-62.000.

Design Products, Co., Inc.: *See—*
Koontz, William D., 4,821,161, Cl. 362-364.000.

Despres, Dominique; and Paquin, Jacques, to Valeo. Torsional damper device for torque transmission systems. 4,820,239, Cl. 464-68.000.

Detonix Close Corporation: *See—*
Patz, Vivian E.; and Smithies, Stafford A., 4,819,560, Cl. 102-202.500.

Deutsch, Larry-Stuart. Guiding catheter system. 4,820,271, Cl. 604-99.000.

Deutsche Forschungs-und Versuchsanstalt fuer Luft-und Raumfahrt e.V.: *See—*
Wildermuth, Eberhard; and Huegel, Helmut, 4,821,283, Cl. 372-104.000.

Deutsche Thomson-Brandt GmbH: *See—*
Klank, Otto; Schroder, Ernst; and Voessing, Walter, 4,821,260, Cl. 370-77.000.

Deveaud, Benoit: *See—*
Naud, Claude; Guillot, Gerard; Deveaud, Benoit; and Clerjaud, Bernard, 4,821,274, Cl. 372-43.000.

Devernoe, Alan L.: *See—*
Andres, Uri T.; Devernoe, Alan L.; and Walker, Michael S., 4,819,808, Cl. 209-1.000.

Devlin, Paul V.: *See—*
Williford, Frank B.; Luke, James M.; and Devlin, Paul V., 4,819,730, Cl. 166-355.000.

Devon County Council: *See—*
Tomlinson, Martin, 4,821,120, Cl. 358-142.000.

Dewhirst, Donald R.: *See—*
Bruesselbach, Hans W.; and Dewhirst, Donald R., 4,821,272, Cl. 372-3.000.

Dhein, Rolf: *See—*
Mussig, Bernhard; Meyer, Rolf-Volker; Brassat, Bert; and Dhein, Rolf, 4,820,771, Cl. 525-183.000.

Dholakia, Anil R.; and Trager, Louis, to General Electric Company. Method of making a semiconductor device assembly. 4,820,659, Cl. 437-209.000.

Dial Manufacturing, Inc.: *See—*
Sandig, Bruce D., 4,820,408, Cl. 210-98.000.

Diamant Boart-Stratabit (USA) Inc.: *See—*
Dennis, Mahlon D., 4,819,516, Cl. 76-101.00R.

Diaz, Zaida; and Miller, James H., to Shell Oil Company. Process for reducing corrosive impurities in sulfolane used for extracting aromatic hydrocarbons. 4,820,849, Cl. 549-87.000.

Dick, Roderick A. Tubular loudspeaker system. 4,819,761, Cl. 181-145.000.

Dicon Systems Limited: *See—*
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Kobayashi, Masahiro: *See—*
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Kurtz, Louis A., to Hughes Aircraft Company. Waveguide slot array termination and antenna system. 4,821,044, Cl. 343-771.000.

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Kurze, Werner; and Klos, Klaus-Peter, to Raschig AG; and Elektro-Brite GmbH & Co. KG, a part interest. Polyalkylene glycol naphthyl-3-sulfopropyl diether compounds and their salts, process for preparing same and electroplating baths containing same. 4,820,388, Cl. 204-44.200.

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Kuwae, Yoshiteru; Shiono, Katsuji; Kishi, Takaaki; Shimamoto, Hideki; Nagara, Hisao; Mori, Keiji; and Yoshida, Shingo, to Matsushita Electric Industrial Co., Ltd; and Sanyo Chemical Industries, Ltd. Electrolyte for electrolytic capacitors and electrolytic capacitor using the electrolyte. 4,821,153, Cl. 361-505.000.

Kuwajima, Teruaki; Umeda, Shinichiro; and Okuda, Hidefumi, to Nippon Paint Co., Ltd. Metallic/clear coat system. 4,820,555, Cl. 427-407.100.

Kuzuno, Katsutoshi; Ishizuka, Shigeo; Sakurai, Kazuaki; and Watanabe, Hiroshi, to Yazaki Corporation. Watertight connector. 4,820,181, Cl. 439-272.000.

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Kwauka, Gerd-Georg, to Mohndruck Graphische Betriebe GmbH. Device for the stacking and/or palleting of, in particular, thin products of a printing press operation. 4,820,104, Cl. 414-791.000.

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Matre, Rita. Sitting patient leg restraint. 4,819,663, Cl. 128-876.000.
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Matsuda, Takumi: *See*—
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Matsufuji, Akihiro: *See*—
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Matsumoto, Takashi, to Fuji Photo Film Co., Ltd. Magnetic recording method involving core pieces of different thickness. 4,821,126, Cl. 360-66.000.
Matsumura, Teruyuki: *See*—
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Matsuo, Katsuharu: *See*—
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Matsuo Kogyo Kabushiki Kaisha: *See*—
Ueno, Tadashi, 4,819,893, Cl. 242-220.000.
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Gotou, Makoto, 4,821,168, Cl. 364-183.000.
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Katsura, Joji; Yamaguchi, Seiji; Tsuji, Kazuhiko; and Ichinohe, Eisuke, 4,820,974, Cl. 324-73.00R.
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Maunand, Jean, to Fournier Innovation et Synergie. Dosage calendar. 4,819,352, Cl. 40-107.000.
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Chapas, Richard B.; and Mavinkurve, Pramod, 4,820,295, Cl. 604-385.100.
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May, Donald M. Tamper-proof electrical receptacle. 4,820,187, Cl. 439-359.000.
Mayers, Joseph B.; Gjertsen, Robert K.; and Wilson, John F., to Westinghouse Electric Corp. Burnable absorber rod push out attachment joint. 4,820,475, Cl. 376-327.000.
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Inoue, Hitoshi; Kondo, Toshiro; Takata, Naoto; and Edahiro, Takeshi, 4,819,959, Cl. 280-660.000.
Ioka, Tadashi, 4,819,550, Cl. 98-2.170.
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Kawano, Hiroto, 4,819,606, Cl. 123-502.000.
Takubo, Hiroichi; Isayama, Kazuo; and Yamashita, Syoji, 4,819,505, Cl. 74-603.000.
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McArthur, James; and Bentz, Herbert W., to Med-Ex Diagnostics of Canada Inc. Tilting mechanism for use with infant bassinette. 4,819,282, Cl. 5-62.000.
McCain, Conrad L. Trolling motor mount for pleasure boats. 4,819,905, Cl. 248-642.000.
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Kenik, Frank W.; Jensen, Ronald J.; Bayer, James J.; Allgeyer, David F.; McCarthy, Richard R.; and Miceli, Thomas A., 4,821,197, Cl. 364-468.000.
McCarty, Lorraine C. Artist's aid. 4,820,163, Cl. 434-81.000.
McClain, Dorothee M., to National Distillers and Chemical Corporation. Process for recovering ethylene-vinyl acetate copolymers from an aqueous dispersion. 4,820,803, Cl. 528-487.000.
McCoy, Randall E.: *See*—
Nelson, Jordan R.; Green, Gilbert L., Sr.; McCoy, Randall E.; and Williams, Richard, 4,819,489, Cl. 73-854.000.
McCready, John W.: *See*—
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McCullagh, Keith G.: *See*—
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McCullough, Doris E.: *See*—
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McDaniel, Max P.; Klendworth, Douglas; Norwood, Donald D.; Hsieh, Eric T.; and Boggs, Elizabeth A., to Phillips Petroleum Company. In situ comonomer generation in olefin polymerization. 4,820,785, Cl. 526-105.000.
McDonald, Brian A.; and Baldwin, Kaye. Inlet vents for fireplaces. 4,819,613, Cl. 126-515.000.
McDonald, John H., III: *See*—
Cook, Gwendolyn K.; and McDonald, John H., III, 4,820,832, Cl. 540-205.000.
McDonald, Paul M., to P. X. Industries, Inc. Metal shelf lock. 4,819,901, Cl. 248-250.000.
McDonnell Douglas Corporation: *See*—
Grote, Michael G.; Stark, John A.; and Tefft, Edward C., III, 4,819,719, Cl. 165-104.260.
Howard, Robert W., 4,819,720, Cl. 165-104.340.
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McGaffigan, Thomas: *See*—
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McGarry, Dennis L.: *See*—
Gaul, David J.; and McGarry, Dennis L., 4,820,324, Cl. 65-8.000.
McGeehan, John K., to EM Diagnostic Systems, Inc. Method of preparing particles suitable for tabletting into diagnostic reagents. 4,820,627, Cl. 435-4.000.
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Warrin, George E.; Perdreaux, Rene J.; Paschke, Richard H.; Constantinescu, Teodor E.; and McGill, Robert, 4,820,152, Cl. 433-86.000.
McHarg, Christopher G.: *See*—
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McIntyre, Daniel K.: *See*—
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McKann, H. Smith; and Haney, Wendel W., to General Products Company, Inc. Door system with interlocking panels. 4,819,383, Cl. 49-501.000.

McKean, John A., to Titan Tool Company. Automatic stud driver having thread relief for high torque applications. 4,819,519, Cl. 81-53.200.

McKenzie, Lee F.; and Lawrence, Lawrence D., to IRECO Incorporated. Emulsion explosive containing organic microspheres. 4,820,361, Cl. 149-2.000.

McKiernan, Edward: *See—*
Sigler, James; Sprang, Richard W.; Bailey, Ronald J.; and McKiernan, Edward, 4,819,279, Cl. 4-300.000.

McKinnon, Graeme C.: *See—*
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McLennan, John M.; Brunt, Keith D.; and Guthrie, Walter G., to Oilfield Speciality Products Manufacturing Ltd., of Canada; and Boots Company, plc, of England, The, a part interest. Antimicrobial compositions and methods. 4,820,428, Cl. 252-8.551.

McMullen, Thomas J., Jr. Nail clipper. 4,819,673, Cl. 132-75.500.

McMullin, Francis, to Kollmorgen Corporation. Linear motion screened inductance sensors. 4,820,961, Cl. 318-587.000.

McMurtry, David R., to Renishaw plc. Position-determining apparatus. 4,819,491, Cl. 73-865.800.

McNally, Lillian. Method and apparatus for providing a non-radioactive coolant for a nuclear reactor. 4,820,477, Cl. 376-310.000.

McNamara, Francis J. Jewelry setting. 4,819,453, Cl. 63-28.000.

McNeely, David L.; and Fling, Russell T., to RCA Licensing Corporation. TV receiver having in-memory switching signal. 4,821,086, Cl. 358-22.000.

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Radebaugh, Galen W.; Murtha, John L.; and Glinecke, Robert, 4,820,522, Cl. 424-468.000.

McQuade, John M.; and Paidosh, Richard L., to Minnesota Mining and Manufacturing Company. Full color, continuous tone laser diode photographic imaging apparatus and method using three laser diodes at predetermined frequencies. 4,821,113, Cl. 358-75.000.

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Fisher, William H.; Stott, William R.; Thomson, Bruce A.; and Weisz-Margulescu, Adam, 4,819,477, Cl. 73-23.000.

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Medcalf, Ralph F., Jr.; Visscher, Martha O.; Knochel, John R.; and Dahlgren, Richard M., to Proctor & Gamble Company, The. Mild skin cleansing soap bar with hydrated cationic polymer skin conditioner. 4,820,447, Cl. 252-117.000.

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Megapulse Incorporated: *See—*
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Menke, Ronald; Holdt, Bernd-Dieter; and Praus, Gerd, to Henkel Kommanditgesellschaft auf Aktien. Cleaning block for flush toilet tanks. 4,820,449, Cl. 252-544.000.

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Verhoeven, Thomas R.; and Askin, David, 4,820,850, Cl. 549-292.000.
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Merz, Heinz-Otto; Kerkhoff, Alois-Bernhard; and Storbeck, Wolfgang, to Felix Schoeller, Jr. GmbH & Co. KG. Waterproof photographic paper support. 4,820,582, Cl. 428-328.000.

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Rossini, Robert S.; and Steinhauser, Walter J., 4,819,316, Cl. 29-160.600.

Robbins, Clyde, to General Instrument Corporation. Apparatus and method for providing digital audio on the sound carrier of a standard television signal. 4,821,097, Cl. 358-143.000.

Robert Bosch GmbH: *See*—
Goebels, Hermann-Josef; and Emig, Reiner, 4,819,998, Cl. 303-118.000.
Rubel, Erich, 4,819,772, Cl. 188-299.000.

Roberts, David; and Stuart, Johnson H., to King Taudevin & Gregson (Holdings) Limited. Vitrification of asbestos waste. 4,820,328, Cl. 65-134.000.

Roberts, Donald L.; Morrison, Carl C.; Brooks, Johnny L.; Crooks, Evon L.; and Ingebrethsen, Bradley J., to R. J. Reynolds Tobacco Company. Aerosol delivery article. 4,819,665, Cl. 131-195.000.

Roberts, Robert M., to Boeing Company, The. Nutplate installation tool. 4,819,324, Cl. 29-771.000.

Roberts, Stephen J., to International Computers Limited. Image display apparatus. 4,821,031, Cl. 340-731.000.

Robertshaw Controls Company: *See*—
Sepso, Roger P.; and Everett, Charles J., 4,819,442, Cl. 62-187.000.

Robertson, Bertram D., Jr. Tamper-evident closure. 4,819,819, Cl. 215-230.000.

Roby Teknik AB: *See*—
Ignell, Rolf, 4,819,710, Cl. 164-423.000.

Rockwell International Corporation: *See*—
Bampton, Clifford C., 4,820,355, Cl. 148-11.50A.
Randa, James; and Ucker, John L., 4,819,697, Cl. 138-30.000.

Rodder, Jerome A. Fast operating bistable valve. 4,819,693, Cl. 137-625.400.

Rodgers, Colin: *See*—
Vershure, Roy W., Jr.; Rodgers, Colin; and Shekleton, Jack R., 4,819,423, Cl. 60-39.020.

Rodriguez, Augusto: *See*—
Morman, Michael T.; Greene, Sharon L.; Pazos, Jose F.; and Rodriguez, Augusto, 4,820,577, Cl. 428-228.000.

Roe, Anthony M.; Coates, William J.; Slater, Robert A.; and Breukelman, Stephen P., to Smith Kline & French Laboratories Limited. 5-phenyl-3[2H]-pyridazinone derivatives. 4,820,819, Cl. 544-239.000.

Roe, Malcolm D. M., to Wisconsin Alumni Research Foundation. Generating half-tone representations. 4,821,109, Cl. 358-253.000.

Roepke, Jeffrey R.: *See*—
Christensen, Thomas C.; Coker, Jonathan D.; Cunningham, Earl A.; Jaworski, Richard C.; Kerwin, Gregory J.; Palmer, Dean C.; and Roepke, Jeffrey R., 4,821,125, Cl. 360-31.000.

Roessler, Bernward; and Wolter, Eberhard, to Siemens Aktiengesellschaft. Operational amplifier. 4,820,998, Cl. 330-258.000.

Rogalla, Lyle H.: *See*—
Brumm, Curtis; Ernst, Randi; and Rogalla, Lyle H., 4,820,365, Cl. 156-109.000.

Rogelein, Dieter, to Johnson Electric Industrial Manufactory Limited. Electric motor. 4,820,948, Cl. 310-90.000.

Rogers, Peter H.; and Cox, Helen M., to Georgia Tech Research Corporation. Noninvasive vibration measurement system and method for measuring amplitude of vibration of tissue in an object being investigated. 4,819,649, Cl. 128-660.020.

Rohm, Gunter H. Power chuck retainer for rotating spindle. 4,819,319, Cl. 29-568.000.

Rohne, Elmar; and Ruetz, Gottfried, to J. M. Voith GmbH. Hydrodynamic-mechanical transmission. 4,819,509, Cl. 74-688.000.

Rokach, Joshua: *See*—
Belanger, Patrice; Fortin, Rejean; Guindon, Yvan; Yoakim, Christiane; and Rokach, Joshua, 4,820,867, Cl. 562-478.000.

Rolls-Royce: *See*—
Holroyd, Trevor J., 4,819,994, Cl. 303-100.000.

Rolph-Clark-Stone Packaging Corp.: *See*—
Capuano, Frank G., 4,819,864, Cl. 229-135.000.

Romano, Antonio, to Campagnolo S.P.A. Fast opening arrangement for shoes of bicycle brakes. 4,819,497, Cl. 74-489.000.

Romhild, Ludwig; Hartmann, Erwin; and Reinhard, Peter, to Romhild, Ludwig; and Reinhard, Peter. Process and apparatus for cleaning a tooth. 4,820,153, Cl. 433-118.000.

Romhild, Ludwig; Hartmann, Erwin; and Reinhard, Peter, to Romhild, Ludwig; and Reinhard, Peter. Dental instrument with a tool for treating the teeth. 4,820,154, Cl. 433-128.000.

Rommerskirchen, Hans-Josef: *See*—
Piorr, Robert; Rommerskirchen, Hans-Josef; Ritterbex, Horst; and Jost, Frantisek, 4,820,451, Cl. 260-400.000.

Rorer Pharmaceutical Corporation: *See*—
Orlowski, Ronald C.; Seyler, Jay K.; Geever, James E.; and Flanigan, Everett, 4,820,804, Cl. 530-307.000.
Youssefyeh, Raymond D.; Skiles, Jerry W.; Suh, John T.; and Jones, Howard, 4,820,729, Cl. 514-542.000.

Rose, Alan D., to Texas Instruments Incorporated. Apertured ring for exhausting plasma reactor gases. 4,820,371, Cl. 156-345.000.

Roselle, Paul J.; and Benkusky, Richard T., to Unisys Corporation. Sealing of contact openings for conformally coated connectors for printed circuit board assemblies. 4,820,196, Cl. 439-519.000.

Rosenberg, Gerson: *See*—
Pierce, William S.; and Rosenberg, Gerson, 4,820,300, Cl. 623-3.000.

Rosenberg, Peretz. Liquid dispensing device and water sprinkler including same. 4,819,872, Cl. 239-119.000.

Rosenfeld, Warner D.: *See*—
Gerch, Edward L.; and Rosenfeld, Warner D., 4,819,796, Cl. 206-291.000.

Ross, Lawrence D., Sr. Vehicle cover alarm system. 4,821,025, Cl. 340-568.000.

Ross, Robert. Joystick control accessory for computerized aircraft flight simulation program. 4,820,162, Cl. 434-45.000.

Ross, Robert R.; and Vedejs, Ilona, to American Telephone and Telegraph Company AT&T Bell Laboratories. Cable closure and methods of assembling. 4,820,007, Cl. 350-96.200.

Ross, Stanley E., to Ross Systems Corporation. Trephine dental drill. 4,820,156, Cl. 433-165.000.

Ross Systems Corporation: *See*—
Ross, Stanley E., 4,820,156, Cl. 433-165.000.

Rossigno, Louis P., to Allied-Signal Inc. Staked stud torque retention ribs. 4,820,076, Cl. 403-284.000.

Rossini, Robert S.; and Steinhauser, Walter J., to RMO, Inc. Method of making a pre-adjusted orthodontic bracket assembly. 4,819,316, Cl. 29-160.600.

Rosten, David B.; Perchak, William C.; Foos, Douglas E.; Partlow, Richard L., Jr.; and Buhrke, Gary G., to Plastofilm Industries, Inc. Closure for pourable materials container. 4,819,829, Cl. 220-346.000.

Roth, Eric A.: *See*—
Jensen, Craig W.; Keller, Frederick R.; Morrow, Joel I.; and Roth, Eric A., 4,821,179, Cl. 364-200.000.

Rothacker, Eugen O.: *See*—
Kraus, James R.; and Rothacker, Eugen O., 4,819,501, Cl. 74-538.000.

Rothe, Anselm; Knappe, Wolfgang-Reinhold; and Trasch, Heinz-Friedrich, to Boehringer Mannheim GmbH. Test strips and a process for the production thereof. 4,820,489, Cl. 422-56.000.

Rousselot, Andre J.; and Charnay, Georges, to Somfy. Electromechanical operating device for a slidingly movable door. 4,819,743, Cl. 74-89.150.

Roy, Wolfgang: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kirsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; and Schmidt, Robert R., 4,820,337, Cl. 71-93.000.

Royal Institution for the Advancement for Learning (McGill University), The: *See*—
Chang, Thomas M. S.; and Daka, Joseph N., 4,820,416, Cl. 210-632.000.

Roye, John M., to GTX Corporation. Method and apparatus for simplifying runlength data from scanning of images. 4,821,336, Cl. 382-56.000.

Royer, Russell J.: *See*—
Greene, H. Jack; Royer, Russell J.; Smidl, Robert L., Jr.; and Renkes, Scott D., 4,819,758, Cl. 180-168.000.

Rozumek, Dennis. Erectable bird feeder. 4,819,584, Cl. 119-51.00R.

Rubel, Erich, to Robert Bosch GmbH. Motion-damping apparatus for a vehicle. 4,819,772, Cl. 188-299.000.

Ruben, Paul L.: *See*—
Dowe, David R.; and Ruben, Paul L., 4,821,053, Cl. 354-149.100.

Rubin, Mae K., to Mobil Oil Corporation. Synthetic crystalline silicate. 4,820,502, Cl. 423-328.000.

Ruetz, Gottfried: *See*—
Rohne, Elmar; and Ruetz, Gottfried, 4,819,509, Cl. 74-688.000.

Rumbaugh, James E., to General Electric Co. Fast display of three-dimensional images. 4,821,210, Cl. 364-518.000.

Rumo, Bernhard: *See*—
Arnold, Vladimir; and Rumo, Bernhard, 4,820,807, Cl. 534-565.000.

Russell, Anthony W., to NL Sperry-Sun, Inc. Method of determining the orientation of a surveying instrument in a borehole. 4,819,336, Cl. 33-304.000.

Russell, Joseph W.; and Russell, Toni M. Sanitary baby pacifier. 4,819,641, Cl. 128-360.000.

Russell, Toni M.: *See*—
Russell, Joseph W.; and Russell, Toni M., 4,819,641, Cl. 128-360.000.

Rust, Ray D.: *See*—
Lambert, William R.; Lu, Neng-Hsing; and Rust, Ray D., 4,820,376, Cl. 156-643.000.

Rutges, Antonius A.: *See*—
Claeys, Daniel A.; Timmerman, Daniel M.; Rutges, Antonius A.; Michiels, Eddy A.; Vanmaele, Luc J.; and Kok, Piet, 4,820,608, Cl. 430-213.000.

Rutter, William J.: *See*—
Edman, Jeffrey C.; Rutter, William J.; Hallewell, Robert A.; Valenzuela, Pablo D. T.; and Goodman, Howard M., 4,820,642, Cl. 435-252.330.

Rutzen, Horst: *See*—
Klueppel, Hans-Juergen; Ploeger, Walter; Rutzen, Horst; and Lehmann, Rudolf, 4,820,507, Cl. 424-54.000.

Ryan, Douglas G.; Trust, Donald B.; and Savory, Rudolph R., to Exxon Research and Engineering Company. Process for removing haze from dewaxed hydrocarbon oil mixture boiling in the lubricating oil range (OF-3379). 4,820,400, Cl. 208-38.000.

Ryan, Lawrence D.; Sherrill, James V.; Shedd, Robert D.; and Caracciolo, Gerald T., to Technology, Inc. Display processors accommodating the description of color pixels in variable-length codes. 4,821,208, Cl. 364-518.000.

Ryba-Romanowski, Witold: *See*—
Piekarczyk, Wladyslaw; Berkowski, Marek; Jasiolek, Gabriel; Ryba-Romanowski, Witold; and Chabiera, Mieczyslaw, 4,820,445, Cl. 252-301.40R.

Ryukawa, Eiji: *See*—
Hashimoto, Hitoshi; Fujita, Tsutomu; Ryukawa, Eiji; and Kodachi, Hideo, 4,819,311, Cl. 29-40.000.

Ryynanen, Seppo I., to Nobar Ky. Method of sequentially separating a medium into different components. 4,820,427, Cl. 210-788.000.

S.C. Johnson & Son, Inc.: *See*—
Tsaur, Sheng-Liang, 4,820,762, Cl. 524-460.000.

S. Franzen Sohne (GmbH & Co.): *See*—
Werner, Hans U., 4,819,466, Cl. 70-70.000.

Saab, Mark A., to C. R. Bard, Inc. Dilatation catheter with collapsible outer diameter. 4,820,349, Cl. 128-344.000.

Sabin, Cullen M., to Geoscience, Ltd. Means and techniques useful in detecting ice on aircraft surfaces. 4,819,480, Cl. 73-170.00R.

Sable, Lewis E.: *See*—
Benoit, Gordon L.; Sable, Lewis E.; and Wenzel, Richard A., 4,819,898, Cl. 248-97.000.

Sachs-Huret S.A.: *See*—
Schwerdhofer, Hans J.; Jager, Johannes; Gerstner, Richard; and Look, Gunter, 4,820,979, Cl. 324-171.000.

Sachse, Burkhard: *See*—
Maier, Thomas; Schmierer, Roland; Bauer, Klaus; Bieringer, Hermann; Burstell, Helmut; and Sachse, Burkhard, 4,820,335, Cl. 71-92.000.

Sadatoshi, Hajime: *See*—
Shiga, Akinobu; Kakugo, Masahiro; Sadatoshi, Hajime; Kora, Hiroyuki; Sasaki, Toshio; Kojima, Junpei; Wakamatsu, Kazuki; and Kawamata, Syozo, 4,820,775, Cl. 525-247.000.

Sadler, Loren G.: *See*—
Linde, Gilbert W.; and Sadler, Loren G., 4,819,880, Cl. 239-662.000.

Saeki, Keiso: *See*—
Sano, Shojiro; and Saeki, Keiso, 4,820,684, Cl. 503-212.000.

Saeki, Naomi; Inoue, Nobuaki; Ukai, Toshinao; and Mihara, Yuji, to Fuji Photo Film Co., Ltd. Direct positive silver halide photographic material. 4,820,625, Cl. 430-596.000.

Saferstein, Albert; Spector, Gilbert; and Tsuyuki, Larry. Flexible lice comb. 4,819,670, Cl. 132-156.000.

SAFT, S.A.: *See*—
Descroix, Jean-Pierre; and Leben, Yannick, 4,820,598, Cl. 429-62.000.

Sahm, Dietrich: *See*—
Scarpatetti, Diether V.; and Sahm, Dietrich, 4,820,168, Cl. 439-33.000.

Saijo, Yoshihiro, to Nippon Acchakutanshi Seizo Kabushiki kaisha. Multi-contact electrical connector. 4,820,179, Cl. 439-224.000.

Saint-Gobain Vitrage: *See*—
Letemps, Bernard; and Gonzalez-Blasquez, Ignacio, 4,820,327, Cl. 65-104.000.

Saito, Chuichi; and Hanano, Masamitsu, to Hitachi, Ltd.; and Hitachi Elevator Engineering Co., Ltd. Passenger conveyor with unitary balustrade panel support members. 4,819,781, Cl. 198-335.000.

Saito, Masanori: *See—*
Ito, Yoshikazu; Akada, Masanori; Kutsukake, Masaki; Yamauchi, Mineo; Saito, Masanori; Takano, Atsushi; Takeda, Hideichiro; and Arita, Hitoshi, 4,820,686, Cl. 503-227.000.

Saito, Shinichi: *See—*
Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saito, Shinichi, 4,820,444, Cl. 252-299.650.

Saito, Shinji; Ogawa, Hiroshi; Matsufuji, Akihiro; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,820,581, Cl. 428-323.000.

Saito, Takaharu, to Mitsubishi Denki Kabushiki Kaisha. Group supervising system for outdoor observatory elevator. 4,819,766, Cl. 187-124.000.

Saito, Takeshi; and Takagaki, Hiromitsu, to Ricoh Company, Ltd. Developing device and developer supply device for the same. 4,821,075, Cl. 355-3.0DD.

Saito, Teruo; Hayashida, Haruo; and Hieda, Kazuo, to Sumitomo Chemical Company, Limited. Aromatic polysulfone resin composition. 4,820,761, Cl. 524-456.000.

Saito, Toshihiko: *See—*
Furukawa, Nobuhiro; Saito, Toshihiko; Nakane, Ikuro; and Watanabe, Hiroshi, 4,820,599, Cl. 429-194.000.

Saito, Yutaka: *See—*
Kono, Motomichi; Kasai, Masaji; Saito, Yutaka; Morimoto, Makoto; and Ashizawa, Tadashi, 4,820,824, Cl. 548-422.000.

Saitou, Katumi: *See—*
Hijiya, Toshinori; and Saitou, Katumi, 4,820,950, Cl. 310-90.500.

Saitou, Norio: *See—*
Ooyama, Mitsuo; Ando, Kimiaki; Kawamura, Yoshio; Saitou, Norio; Simura, Takanori; and Kohida, Hiroyuki, 4,820,928, Cl. 250-492.20B.

Sakabe, Yukio: *See—*
Sano, Harunobu; Ichikawa, Hiroaki; Nishioka, Goro; and Sakabe, Yukio, 4,820,670, Cl. 501-136.000.

Sakagami, Masahiko: *See—*
Kawai, Hideki; Fujii, Masaru; Ohta, Kiyoto; and Sakagami, Masahiko, 4,821,299, Cl. 377-69.000.

Sakaguchi, Keizo: *See—*
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,819,717, Cl. 165-104.120.

Sakaguchi, Seiichiro: *See—*
Sugita, Shigehisa; Koyama, Kazuhito; Shiina, Koji; Sakaguchi, Seiichiro; Kuroda, Michio; and Noguchi, Yoshiki, 4,820,594, Cl. 429-17.000.

Sakaguichi, Keizo: *See—*
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguichi, Keizo, 4,819,718, Cl. 165-104.120.

Sakai, Shinji: *See—*
Suga, Akira; Kinoshita, Takao; Sakai, Shinji; and Tojo, Akihiko, 4,821,105, Cl. 358-213.190.

Sakakura, Toshiyasu: *See—*
Tanaka, Masato; Kobayashi, Toshiaki; and Sakakura, Toshiyasu, 4,820,823, Cl. 548-200.000.

Sakama, Mitsunori: *See—*
Mase, Akira; Konuma, Toshimitsu; Sakama, Mitsunori; Inushima, Takashi; and Yamazaki, Shunpei, 4,820,612, Cl. 430-315.000.

Sakamoto, Akifumi: *See—*
Hikita, Sadayuki; Kawakami, Suguru; Haniuda, Hiromi; Sakamoto, Akifumi; and Yamamoto, Hideki, 4,821,175, Cl. 364-200.000.

Sakamoto, Masahiro, to Canon Kabushiki Kaisha. Image reading means with controllable shading correction. 4,821,099, Cl. 358-163.000.

Sakamoto, Shizuo: *See—*
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,819,717, Cl. 165-104.120.
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguichi, Keizo, 4,819,718, Cl. 165-104.120.

Sakamoto, Toshiyuki; Arai, Ikuya; Kurita, Toshiyuki; Murata, Toshinori; Nakagawa, Isao; Achiha, Masahiko; and Ishikura, Kazuo, to Hitachi, Ltd. Detection circuit for detecting standard television signals and nonstandard television signals. 4,821,112, Cl. 358-17.000.

Sakano, Koichi: *See—*
Kagiya, Tsutomu; Minagawa, Motonobu; Nakahara, Yutaka; Kimura, Ryoji; Tsubakimoto, Tsuneo; Oshiumi, Ryoichi; and Sakano, Koichi, 4,820,844, Cl. 548-266.000.

Sakashita, Kiichiro, to Canon Kabushiki Kaisha. Magnetic toner. 4,820,603, Cl. 430-106.600.

Sakata, Tetshin; Kuzuu, Kazuto; Ito, Hideo; and Oouchi, Akira, to Nissan Motor Company, Ltd. Body mounting arrangement for truck. 4,819,980, Cl. 296-35.100.

Sakito, Yoji: *See—*
Suzukamo, Gohfu; Sakito, Yoji; and Fukao, Masami, 4,820,864, Cl. 560-124.000.

Sakuma, Tetsuro: *See—*
Kubota, Takao; Sakuma, Tetsuro; and Nakazato, Ryoji, 4,820,744, Cl. 522-13.000.

Sakurai, Kazuaki: *See—*
Kuzuno, Katsutoshi; Ishizuka, Shigeo; Sakurai, Kazuaki; and Watanabe, Hiroshi, 4,820,181, Cl. 439-272.000.

Sakurai, Masashi: *See—*
Nakanishi, Masaru; Kitamura, Arata; Sakurai, Masashi; and Asanuma, Masaaki, 4,821,135, Cl. 360-132.000.

Salam, Hassan P. A. Information display devices. 4,819,357, Cl. 40-449.000.

Salco Products Incorporated: *See—*
Schultz, Francis R., 4,819,830, Cl. 220-371.000.

Saleeb, Fouad Z.; and Pickup, John G., to General Foods Corporation. Fixation of volatiles in extruded glass substrates. 4,820,534, Cl. 426-96.000.

Sallmann, Alfred: *See—*
Beck, Andreas; Sallmann, Alfred; Lang, Robert W.; and Wenk, Paul, 4,820,726, Cl. 514-476.000.

Salnajs, Gunars: *See—*
Konzal, Daryl; and Salnajs, Gunars, 4,819,411, Cl. 53-439.000.

Salvo, Christopher A. Dental bridge. 4,820,157, Cl. 433-180.000.

Samaritan Industries, Inc.: *See—*
Mikitka, Nancy L.; Purkapile, Emerson J.; and Picht, Duane R., 4,820,231, Cl. 446-73.000.

Sambayashi, Takeshi: *See—*
Oushiden, Hideshi; Imada, Norio; and Sambayashi, Takeshi, 4,821,067, Cl. 355-14.00E.

Sambucetti, Carlos J.: *See—*
Amelio, William J.; Czarnecki, Kenneth R.; Lemon, Gary K.; Markovich, Voya; Sambucetti, Carlos J.; and Zarr, Richard S., 4,820,643, Cl. 436-37.000.

Sampson, Eric A., to Sampson Sports, Inc. Self contained braking system for bicycle pedals. 4,819,504, Cl. 74-594.400.

Sampson Sports, Inc.: *See—*
Sampson, Eric A., 4,819,504, Cl. 74-594.400.

Samson, Ilan. Baby calmer. 4,819,616, Cl. 600-28.000.

Samsung Electro-Mechanics Co., Ltd.: *See—*
Lee, Kye S., 4,820,952, Cl. 310-334.000.

Samsung Electronics Co., Ltd.: *See—*
Hong, Suk-Kwon; Bang, Ho-Yol; and Shin, Hyun-Jun, 4,820,933, Cl. 307-10.100.

Samyn, Johan, to N. V. Bekaert S.A. Method and apparatus for checking the anthenticity of documents. 4,820,912, Cl. 235-449.000.

Sanada, Shinichi; and Miyamura, Masataka, to Kabushiki Kaisha Toshiba. Photosensitive resin composition and method of manufacturing color filter using the same. 4,820,619, Cl. 430-197.000.

Sanchez, Frades. Removable knives for punching cardboard slots. 4,819,534, Cl. 83-671.000.

Sanden Corporation: *See—*
Shirai, Isamu; Ujiie, Susumu; and Koitabashi, Takeshi, 4,819,778, Cl. 192-84.00T.

Sanders Associates, Inc.: *See—*
Watson, James S., 4,820,886, Cl. 178-19.000.

Sanders, Harold F.; Cheng, Yu-Ling; Enscore, David J.; and Libicki, Shari B., to ALZA Corporation. Transdermal drug composition with dual permeation enhancers. 4,820,720, Cl. 514-356.000.

Sanders, Josef, to Bayer Aktiengesellschaft. Process for the production of diisocyanates, selected diisocyanates produced thereby and the production of polyurethane plastics therefrom. 4,820,866, Cl. 560-347.000.

Sanders, Martin E.; Joiner, Keith A.; Frank, Michael M.; and Hammer, Carl H., to United States of America, Health and Human Services. Kit for assaying activation of terminal complement cascade. 4,820,635, Cl. 435-7.000.

Sanders, Robert N.: *See—*
Laurent, Sebastian M.; and Sanders, Robert N., 4,820,526, Cl. 426-2.000.

Sandig, Bruce D., to Dial Manufacturing, Inc. Double valve apparatus. 4,820,408, Cl. 210-98.000.

Sandoz, Ltd.: *See—*
Baumann, Werner; Diest, Joseph V.; Eichenberger, Herbert; and Oppliger, Max, 4,820,806, Cl. 534-605.000.
Brenneisen, Kurt; and Lehr, Friedrich, 4,820,808, Cl. 534-624.000.
Holliger, Herbert, 4,820,309, Cl. 8-437.000.
Stevenson, Walter R.; and Kelman, Arthur, 4,820,699, Cl. 514-147.000.

Sandoz Pharm. Corp.: *See—*
Tomesch, John C., 4,820,718, Cl. 514-336.000.

Sanford Redmond Inc.: *See—*
Redmond, Sanford, 4,819,406, Cl. 53-51.000.

Sankyo Company, Limited: *See—*
Terahara, Akira; and Tanaka, Minoru, 4,820,865, Cl. 560-256.000.

Sankyo Manufacturing Company, Ltd.: *See—*
Kato, Heizaburo, 4,819,850, Cl. 226-162.000.

Sanner, Martin W., to Tandem Computers Incorporated. Two-stage synchronizer. 4,821,295, Cl. 375-110.000.

Sanner, Martin W.: *See—*
Bernick, David L.; Chan, Kenneth K.; Chan, Wing M.; Dan, Yie-Fong; Hoang, Duc M.; Hussain, Zubair; Iswandhi, Geoffrey I.; Korpi, James E.; Sanner, Martin W.; Zwagerman, Jay A.; Silverman, Steven G.; and Smith, James E., 4,821,170, Cl. 364-200.000.

Sano, Harunobu; Ichikawa, Hiroaki; Nishioka, Goro; and Sakabe, Yukio, to Murata Manufacturing Co., Ltd. Dielectric ceramic composition. 4,820,670, Cl. 501-136.000.

Sano, Kinji: *See—*
Mohri, Yoshio; and Sano, Kinji, 4,820,660, Cl. 501-8.000.

Sano, Shojiro; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Pressure-sensitive recording sheet. 4,820,684, Cl. 503-212.000.

Sano, Yuji; Osawa, Michitaka; and Kawai, Masahide, to Hitachi, Ltd. Differential amplifier circuit. 4,820,997, Cl. 330-252.000.

Sanofi: *See—*
Mosse, Madeleine; Demarne, Henri; and Proietto, Vincenzo, 4,820,717, Cl. 514-317.000.

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Saito, Teruo; Hayashida, Haruo; and Hieda, Kazuo, 4,820,761, Cl. 524-456.000.
Shiga, Akinobu; Kakugo, Masahiro; Sadatoshi, Hajime; Kora, Hiroyuki; Sasaki, Toshio; Kojima, Junpei; Wakamatsu, Kazuki; and Kawamata, Syozo, 4,820,775, Cl. 525-247.000.
Suzukamo, Gohfu; Sakito, Yoji; and Fukao, Masami, 4,820,864, Cl. 560-124.000.
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Sumitomo Electric Industries, Ltd.: *See—*
Mogi, Masaharu, 4,820,015, Cl. 350-96.240.
Nakano, Tsuneo; Nakamura, Seika; and Shimohashi, Kiyomi, 4,821,138, Cl. 361-93.000.
Nishimura, Akira; and Suzuki, Shuzo, 4,820,014, Cl. 350-96.230.
Ueno, Keiji, 4,820,782, Cl. 525-454.000.
Sunagawa, Tomoji: *See—*
Okamoto, Toshiaki; Sunagawa, Tomoji; and Sato, Sbun'ichi, 4,819,612, Cl. 126-263.000.
Sunbeam Corporation: *See—*
Carnevale, Francesco L., 4,819,750, Cl. 177-256.000.
Sundberg, Bo S. Disposable cleaning article. 4,820,558, Cl. 428-34.300.
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Sung, Eric: *See—*
Andree, Hans; Baumann, Horst; Biermann, Manfred; Jost, Frantisek; Krause, Horst-Juergen; Lange, Fritz; Leiter, Herbert; Meffert, Alfred; Ploog, Uwe; Schnegelberger, Harald; Smulders, Eduard; Sung, Eric; Syldatk, Andreas; Uphues, Guenter; and Vogt, Guenther, 4,820,436, Cl. 252-544.000.

Sung, Rodney L.: *See*—
Kapuscinski, Maria M.; Grina, Larry D.; Jones, Ronald E.; and Sung, Rodney L., 4,820,776, Cl. 525-279.000.

Suntory Limited: *See*—
Nakanishi, Toshihiro; Fukuda, Yoshiaki; Miura, Kenju; and Nakazato, Hiroshi, 4,820,641, Cl. 435-240.270.
Tazawa, Toshiaki; Yotsumoto, Masahiro; Tanahashi, Hiroshi; and Wakabayashi, Yuzuru, 4,819,552, Cl. 99-277.200.

Surface Technology, Inc.: *See*—
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Surgical Systems & Instruments: *See*—
Shiber, Samuel, 4,819,634, Cl. 128-305.000.

Surti, Tyrone N. Ribbon cartridge. 4,820,067, Cl. 400-208.000.

Suzukamo, Gohfu; Sakito, Yoji; and Fukao, Masami, to Sumitomo Chemical Company, Limited. Method for racemization of optically active chrysanthemic acid or its ester. 4,820,864, Cl. 560-124.000.

Suzuki, Hirayoshi: *See*—
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Suzuki, Hiroshi: *See*—
Ishikawa, Hiroshi; Oguro, Keisnke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguchi, Keizo, 4,819,717, Cl. 165-104.120.
Ishikawa, Hiroshi; Oguro, Keisuke; Suzuki, Hiroshi; Kato, Akihiko; Okada, Teruya; Sakamoto, Shizuo; Nishimura, Iwao; and Sakaguichi, Keizo, 4,819,718, Cl. 165-104.120.

Suzuki, Masatoshi: *See*—
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Suzuki, Ryoichi: *See*—
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Suzuki, Satoshi; and Shigeki, Kiyoshi, to Toyoda Gosei Co., Ltd. Weather strip for automobile. 4,819,382, Cl. 49-497.000.

Suzuki, Shuzo: *See*—
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Suzuki, Tadashi: *See*—
Honma, Toshio; Takeda, Hiroaki; and Suzuki, Tadashi, 4,821,068, Cl. 355-14.00E.

Suzuki, Yoshio; Nakamura, Mikihiko; and Aoshima, Atsushi, to Asahi Kasei Kogyo Kabushiki Kaisha. Transparent polyamide elastomer from carboxy polycaprolactam and poly(tetramethylene oxy)glycol. 4,820,796, Cl. 528-292.000.

Swaney, John W. Package for footwear. 4,819,795, Cl. 206-278.000.

Swanson, Claude V. Apparatus and method for using microwave radiation to measure water content of a fluid. 4,820,970, Cl. 324-58.50A.

Swanson, Donald C., to Stratamodel, Inc. Process for three-dimensional mathematical modeling of underground geologic volumes. 4,821,164, Cl. 364-420.000.

Sween, B. Marily: *See*—
Siemer, Dennis K., 4,820,965, Cl. 320-31.000.

Sween, Maurice A.: *See*—
Siemer, Dennis K., 4,820,965, Cl. 320-31.000.

Sweeny, Peter J.: *See*—
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Swengel, Robert C., Jr.: *See*—
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Swensen, John A.: *See*—
Cohen, Earl T.; and Swensen, John A., 4,820,993, Cl. 328-155.000.

Swenson, Gleo: *See*—
Moe, Gilmore L.; and Swenson, Gleo, 4,819,981, Cl. 296-100.000.

Swetly, Peter; Dworkin-Rastl, Eva; and Meindl, Peter, to Dr. Karl Thomae GmbH. Novel alpha interferon species produced by recombinant means. 4,820,638, Cl. 435-68.000.

Swift, David L.: *See*—
Ward, Christopher R.; Hazon, Stephen C.; and Swift, David L., 4,821,176, Cl. 364-200.000.

Swinglite, Inc.: *See*—
Lee, Sung Y.; and Nakama, Lloyd, 4,819,942, Cl. 273-186.00A.

Swiokla, Joyce L.: *See*—
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Switchcraft, Inc.: *See*—
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Syldatk, Andreas: *See*—
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Synthelabo: *See*—
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Szabo, Tibor; Vidra nee Sandor, Ildiko ; Dalmadi, Gyula; Kaczmarek nee Sebestyen, Judit; and Ori, Janos, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara. Process for the preparation of diacyl-dianhydro hexitols. 4,820,852, Cl. 549-539.000.

Szarka, Sandor, to Precision Screen Machines, Inc. Pallet assembly for improved printing operation. 4,819,559, Cl. 101-474.000.

Szczepanski, Harry. Putting practice device and method. 4,819,943, Cl. 273-186.00C.

T. A. Pelsue Company: *See*—
Beavers, Allan E., 4,819,680, Cl. 135-104.000.

TA Triumph-Adler Aktiengesellschaft: *See*—
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Tab Products Company: *See*—
Lechner, Lloyd; and Thomas, Kent, 4,820,002, Cl. 312-221.000.
Thomas, Kent; Bullis, Daniel R., Jr.; and Bottelson, Thomas J., 4,820,073, Cl. 402-68.000.
Thomas, Kent; Bullis, Daniel R., Jr.; and Bottelson, Thomas J., 4,820,074, Cl. 402-75.000.

Tabei, Masatoshi; and Kawajiri, Kazuhiro, to Fuji Photo Film Co., Ltd. Solid-state color image pickup unit with mosaic color filter and two horizontal output registers. 4,821,088, Cl. 358-48.000.

Tachikawa, Hiroshi: *See*—
Shinozaki, Takashi; and Tachikawa, Hiroshi, 4,820,237, Cl. 453-61.000.

Taddei, Silvio, to Silvelox S.p.A. Driving and guiding apparatus for a horizontally pivoted wing. 4,819,376, Cl. 49-200.000.

Tagai, Hideo; Kobayashi, Masahiro; Niwa, Shigeo; Takeuchi, Hiroyasu; and Ono, Mikiya, to Mitsubishi Mining and Cement Co., Ltd. Fiber glass mainly composed of calcium phosphate. 4,820,573, Cl. 428-228.000.

Tagland New Zealand Limited: *See*—
Gardner, Michael S., 4,819,639, Cl. 128-330.000.

Tahara, Tetsuya; Moriwaki, Minoru; Abe, Masao; and Yuasa, Shuji, to Yoshitomi Pharmaceutical Industries Ltd. PAF-antagonistic thienotriazolodiazepine compounds and pharmaceutical uses thereof. 4,820,703, Cl. 514-220.000.

Taivalkoski, Amy L.; and Kadonoff, Mark B., to Denning Mobile Robotics, Inc. Node map system and method for vehicle. 4,821,192, Cl. 364-424.020.

Tajima, Hiroki: *See*—
Hashimoto, Yoshio; and Tajima, Hiroki, 4,820,005, Cl. 350-6.800.

Takada, Shinji: *See*—
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Takada, Shun; Murai, Kazuhiro; and Onodera, Kaoru, to Konica Corporation. Silver halide photographic light-sensitive material suitable for rapid processing. 4,820,614, Cl. 430-505.000.

Takagaki, Hiromitsu: *See*—
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Takahashi, Hajime; and Maeda, Eiichi, to Iwaya Corporation. Voice making device for moving animal toy and moving animal toy using the voice making device. 4,820,232, Cl. 446-178.000.

Takahashi, Masahiko, to Fuji Jukogyo Kabushiki Kaisha. Pressure control valve. 4,819,690, Cl. 137-514.000.

Takahashi, Shiro, to Man Design Co., Ltd. Vice. 4,819,921, Cl. 269-32.000.

Takahashi, Yonosuke: *See*—
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Takai, Hiromitsu, to Ori-Pro Company, Limited. Notebook provided with pages containing a window-like aperture. 4,819,962, Cl. 281-15.100.

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Takao, Hiroyoshi; Tanimoto, Yoshio; Ikeda, Kiyosi; and Fukuyama, Masahiro, to Sumitomo Chemical Company, Limited. Elastomer composition. 4,820,774, Cl. 525-208.000.

Takaoka, Michio: *See*—
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Takata, Naoto: *See*—
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Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, to Dainippon Ink and Chemicals, Inc. Tolan-type nematic liquid crystalline compounds. 4,820,878, Cl. 568-659.000.

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Takeuchi, Hiroshi: *See*—
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Takeuchi, Hiroyasu: *See*—
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Takiguchi, Haruhisa: *See*—
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Takikawa, Kazunori; and Suzuki, Ryoichi, to Usui Kokusai Sangyo Kabushiki Kaisha. Slide type exhaust brake system. 4,819,696, Cl. 137-630.120.

Takimae, Toyosaku. Curly hair correcting iron. 4,819,674, Cl. 132-224.000.

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Talleres Daumar, SA: *See*—
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Tamaru, Takuya, to Yamaha Corporation. Disc case having removable disc and sub-turntable. 4,821,124, Cl. 360-133.000.

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Tamura, Yuuichi; and Suzuki, Hirayoshi, to Fuji Koki Mfg. Co. Ltd. Three-function pressure switch. 4,820,890, Cl. 200-81.400.

Tanahashi, Hiroshi: *See*—
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Tanaka, Fumihiro: *See*—
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Tanaka, Fuminari: *See*—
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Tanaka, Kojiro: *See*—
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Tanaka Manufacturing Co., Ltd.: *See*—
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Tanaka, Masato; Kobayashi, Toshiaki; and Sakakura, Toshiyasu, to Director-General of Agency of Industrial Science and Technology. Process of producing α-keto acids. 4,820,823, Cl. 548-200.000.

Tanaka, Minoru: *See*—
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Tanaka, Muneo: *See*—
Yamazaki, Kazunori; Soyama, Yoshikazu; Tanaka, Muneo; and Kitamura, Chigusa, 4,820,509, Cl. 424-61.000.

Tanaka, Nobuhiro; and Matsuda, Takumi, to Seikosha Co., Ltd. Electricity supply structure for a piezoelectric vibrator. 4,821,257, Cl. 368-255.000.

Tanaka, Nobuhiro: *See*—
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Tanaka, Shunichiro; Sayano, Akio; and Kameda, Tsuneji, to Kabushiki Kaisha Toshiba. Metallizing composition for sintered ceramic article. 4,820,562, Cl. 428-34.600.

Tanaka, Teruya; and Matsuo, Katsuharu, to Kabushiki Kaisha Toshiba. Induction heated cooking apparatus. 4,820,891, Cl. 219-10.770.

Tanaka, Toshihiro; and Yamashita, Hiateru, to Kabushiki Kaisha Komatsu Seisakusho. Work indexing apparatus with a height adjustment for a pair of transfer bars. 4,819,786, Cl. 198-621.000.

Tanaka, Toshinori: *See*—
Morishita, Akira; and Tanaka, Toshinori, 4,819,975, Cl. 290-48.000.

Tanaka, Yasuyuki: *See*—
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Tanaka, Yoshihisa, to Tanaka Manufacturing Co., Ltd. Device for determining swing speed of rotatable implements. 4,819,941, Cl. 293-186.00A.

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Sanner, Martin W., 4,821,295, Cl. 375-110.000.

Tandy Corporation: *See*—
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Taniguchi, Akihiko: *See*—
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Taniguchi, Nobuyuki: *See*—
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Tanimoto, Yoshio: *See*—
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Tanioka, Hiroshi: *See*—
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Taniuchi, Kazuman: *See*—
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Taniuchi, Osami: *See*—
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Tanka, Hatsuyuki; Sato, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, to Tokyo Ohka Kogyo Co., Ltd. Developer solution for positive-working photoresist compositions comprising a base and a non-ionic surfactant. 4,820,621, Cl. 430-331.000.

Tannan Co., Ltd.: *See*—
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Tao, Eddie V. P.: *See*—
Beck, James R.; Aikins, James A.; and Tao, Eddie V. P., 4,820,845, Cl. 548-378.000.

Tarlow, Kenneth A.; and Arner, Barbara D., to Arner, Barbara D. Container display stand and containers therefore. 4,819,815, Cl. 211-74.000.

Tasaki, Takaharu, to Yoshino Kogyosho Co., Ltd. Trigger type liquid dispenser. 4,819,835, Cl. 222-383.000.

Taschner, Wolfgang, to Aesculap-Werke AG. Closure for a sterilizing container. 4,820,499, Cl. 422-310.000.

Tassin, Larry D.; and Ayer, John W. Stair bracket. 4,819,391, Cl. 52-182.000.

Tatematsu, Takeo, to Fujitsu Limited. Semiconductor memory device having test pattern generating circuit. 4,821,238, Cl. 365-201.000.

Tatsuoka, Syuuzi; Sekiyama, Hiroshi; and Ishige, Kanji, to Hitachi, Ltd. Soldering method for printed circuit board. 4,819,327, Cl. 29-840.000.

Taub, Floyd, to Digene Diagnostics, Incorporated. Assay for nucleic acid sequences, particularly genetic lesions, using interactive labels. 4,820,630, Cl. 435-5.000.

Taubert, Hubert; and Webendorfer, Rudolf, to Friedr. Boesner GmbH. Screw. 4,820,098, Cl. 411-411.000.

Tavs, Peter; Laas, Harald; Schauer, Horst; and Arnold, Lothar, to BASF Aktiengesellschaft. Increasing the yield of 2.5.6-trimethylcyclohex-2-en-1-one. 4,820,874, Cl. 568-350.000.

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Taylor, Donglas P., to Tayco Developments, Inc. Boot seal for liquid spring used in corrosive environments. 4,819,919, Cl. 267-64.130.
Taylor, James W., to Union Carbide Corporation. Surface active polycarbodiimides. 4,820,863, Cl. 560-115.000.
Taylor, Keith H. Mirror assembly including an image forming lamp. 4,821,019, Cl. 362-83.100.
Taylor, Natalee E.; and Bonica, John P. Orthopedic cervical support collar and method of making the same. 4,819,622, Cl. 128-75.000.
Taylor, Richard D.: *See—*
Stumpff, Phillip W.; and Taylor, Richard D., 4,820,197, Cl. 439-535.000.
Tazawa, Toshiaki; Yotsumoto, Masahiro; Tanahashi, Hiroshi; and Wakabayashi, Yuzuru, to Suntory Limited; and Kansai Chemical Engineering Co., Ltd. Apparatus for continuous tartar separation. 4,819,552, Cl. 99-277.200.
TCS Containers Pty. Ltd.: *See—*
Weiner, Ronald, 4,819,820, Cl. 220-1.500.
TDK Corporation: *See—*
Satoh, Takateru, 4,819,889, Cl. 242-199.000.
Tech Spray, Inc.: *See—*
Goforth, Melvin L., 4,819,837, Cl. 222-402.100.
Technical Manufacturing Systems, Inc.: *See—*
Cross, Jack A.; and Jackson, Cletis M., 4,819,325, Cl. 29-825.000.
Technology, Inc.: *See—*
Ryan, Lawrence D.; Sherrill, James V.; Shedd, Robert D.; and Caracciolo, Gerald T., 4,821,208, Cl. 364-518.000.
Tedesco, Raffaele; Bocus, Socrate; and Signoretti, Luigi, to Montefibre S.p.A. Acrylic fibers having improved dispersability in viscous organic or inorganic matrices. 4,820,585, Cl. 428-360.000.
Tefft, Edward C., III: *See—*
Grote, Michael G.; Stark, John A.; and Tefft, Edward C., III, 4,819,719, Cl. 165-104.260.
Teh Yor Industrial Co., Ltd.: *See—*
Huang, Chung-Chen, 4,819,530, Cl. 83-39.000.
Teijin Limited: *See—*
Kawaguchi, Takeyuki; and Shiro, Takashi, 4,820,649, Cl. 436-501.000.
Tekna: *See—*
Siefert, Steven G.; and Osterhout, Ralph F., 4,821,156, Cl. 362-187.000.
Tektronix, Inc.: *See—*
Batson, Brian; and Diehm, Brian D., 4,821,030, Cl. 340-712.000.
Duisberg, Robert A., 4,821,220, Cl. 364-578.000.
Fields, Walter D.; and Larkins, Gary K., 4,821,007, Cl. 333-238.000.
Teledyne Exploration Co.: *See—*
Berglund, Carl O., 4,821,241, Cl. 367-20.000.
Telefonaktiebolaget L M Ericsson: *See—*
Lundh, Peter C. B., 4,821,263, Cl. 370-85.000.
Telfer, Alexander, to Shell Oil Company. Liquid sensor for robotic filtration station. 4,820,425, Cl. 210-746.000.
Telic Alcatel, S.A.: *See—*
Guyader, Roger; and Ploet, Jean-Marie, 4,821,314, Cl. 379-376.000.
Tempel, Ernst, to Ciba-Geigy Corporation. Solid formulation of anionic dyes containing an ethoxylated stearyl diphenyloxyethyl diethylene-triamine. 4,820,311, Cl. 8-524.000.
Temple, Victor A. K., to General Electric Company. Insulated gate semiconductor device with extra short grid and method of fabrication. 4,821,095, Cl. 357-23.400.
Tendapak Holdings PTY. Limited: *See—*
Gibson, Royce G., 4,820,535, Cl. 426-272.000.
Tendick, Clyde C.: *See—*
Osborn, Paul V.; and Tendick, Clyde C., 4,819,928, Cl. 271-276.000.
Teng, Lin-nar L., to Research Corporation. Amine reacted therapeutic agents. 4,820,811, Cl. 536-21.000.
Tennant Company: *See—*
Blehert, Michael L.; and Weidner, Archie A., 4,819,676, Cl. 134-21.000.
Ten Napel, Jamie M.: *See—*
Choksi, Pradip V.; and Ten Napel, Jamie M., 4,820,274, Cl. 604-174.000.
Teppo, Maynard: *See—*
Alexander, William; and Teppo, Maynard, 4,820,742, Cl. 521-131.000.
Terada, Hirotomo: *See—*
Abe, Akihiro; Kamata, Akinori; Yoshino, Satoshi; and Terada, Hirotomo, 4,819,556, Cl. 101-93.040.
Terahara, Akira; and Tanaka, Minoru, to Sankyo Company, Limited. MB-530B derivatives containing them. 4,820,865, Cl. 560-256.000.
Terashima, Kanetsugu: *See—*
Inukai, Takashi; Furukawa, Kenji; Terashima, Kanetsugu; and Saito, Shinichi, 4,820,444, Cl. 252-299.650.
Terauchi, Kenichi; and Okamoto, Takeo, to Dainippon Screen Mfg. Co., Ltd. Controlled furnace heat treatment. 4,820,907, Cl. 219-494.000.
Terauchi, Ryugo; and Fukushima, Kyoshi, to Nippon Medical Supply Corporation. Urinary applicance. 4,820,291, Cl. 604-349.000.
Terayama, Hideo; and Inoue, Jun, to Senju Pharmaceutical Co., Ltd. 1-hydroxy-oxo-5H-pyrido(3,2-a)phenoxazine-3-carboxylic acid esters. 4,820,837, Cl. 544-99.000.
Terrell, Charles T.: *See—*
Nobles, Anthony A.; Nobles, Verne H.; Fleming, Jon H.; Terrell, Charles T.; and Lai, Alexander K., 4,820,167, Cl. 434-336.000.
Terrill, Frank E. Passive daylighting system. 4,820,020, Cl. 350-259.000.
Terskov, Alexei D.; Plavskikh, Vladimir D.; Kostylev, Alexandr D.; Nazarov, Nikolai G.; Chepurnoi, Nikolai P.; Cherednikov, Evgeny N.; and Karavaev, Andron T. Reversiele percussion device. 4,819,741, Cl. 173-91.000.
Terumo Kabushiki Kaisha: *See—*
Isono, Keinosuke, 4,820,288, Cl. 604-280.000.
Tesch, Gunter, to Tesch, Gunter. Filling material for cushions and covers. 4,820,574, Cl. 428-234.000.
Teschendorf, Hans-Juergen: *See—*
Kropp, Rudolf; Thyes, Marco; Schlecker, Rainer; Franke, Albrecht; Reicheneder, Franz; Reicheneder, Dora I.; Amann, August; Teschendorf, Hans-Juergen; Kretzschmar, Rolf; Traut, Martin; and Gries, Josef, 4,820,821, Cl. 544-224.000.
Teskey, John F., to RCA Licensing Corporation. TV receiver with automatic RF/baseband signal. 4,821,122, Cl. 358-181.000.
Tetra Pak International AB: *See—*
Carlsson, Lars; Martensson, Kjell; and Melle, Hans-Georg, 4,819,839, Cl. 222-541.000.
Holmstrom, Gert; and Mellbin, Paul, 4,820,892, Cl. 219-10.491.
Texaco Inc.: *See—*
Bou-Mikael, Sami; Alston, Robert B.; and Hoyt, Donald L., 4,819,724, Cl. 166-263.000.
Kapuscinski, Maria M.; Grina, Larry D.; Jones, Ronald E.; and Sung, Rodney L., 4,820,776, Cl. 525-279.000.
Mims, Donald S.; and Hoyt, Donald L., 4,819,725, Cl. 166-271.000.
Texas A&M University System: *See—*
Cummins, Joseph M., 4,820,514, Cl. 424-85.400.
Cummins, Joseph M., 4,820,515, Cl. 424-85.700.
Texas Instruments Incorporated: *See—*
Anderson, Ron, 4,819,847, Cl. 224-252.000.
Davis, Cecil J.; Matthews, Robert T.; Jucha, Rhett B.; and Loewenstein, Lee M., 4,820,377, Cl. 156-643.000.
Dolby, Debra J.; Schreck, John F.; and Truong, Phat, 4,820,941, Cl. 307-449.000.
Haken, Roger A.; and Holloway, Thomas C., 4,821,085, Cl. 357-67.000.
Hynecek, Jaroslav, 4,821,081, Cl. 357-24.000.
Loewenstein, Lee M., 4,820,378, Cl. 156-643.000.
Mitcham, Larry D., 4,820,068, Cl. 400-216.100.
Rose, Alan D., 4,820,371, Cl. 156-345.000.
Texas Medical Instruments, Inc.: *See—*
Modisette, J. Everett; and Johnson, R. Barry, 4,820,929, Cl. 250-504.00R.
Texma Textilmaschinen und Armaturen Gesellschaft m.b.H.: *See—*
Engel, Harald, 4,819,350, Cl. 38-30.000.
Tezuka, Kazuo: *See—*
Nakajima, Toshio; Kumatani, Hiroshi; Miyazaki, Masayuki; and Tezuka, Kazuo, 4,819,502, Cl. 74-572.000.
Thalen, Bror A.: *See—*
Brattsand, Ralph L.; and Thalen, Bror A., 4,820,700, Cl. 514-174.000.
Thaniyavarn, Suwat, to TRW Inc. Electrooptical switch and modulator. 4,820,009, Cl. 350-96.130.
Tharp, Gene E.: *See—*
Heine, Richard F.; and Tharp, Gene E., 4,820,566, Cl. 428-88.000.
Thaxton, Inc.: *See—*
Leslie, Bruce E.; Shadle, Paul N.; and Wolf, Herman C., 4,820,474, Cl. 376-203.000.
Thayer, Edward B., to United Technologies Corporation. Divergent flap actuation system for a two-dimensional exhaust nozzle. 4,819,876, Cl. 239-265.390.
Theiling, Louis F., Jr.: *See—*
Knopf, Robert J.; and Theiling, Louis F., Jr., 4,820,673, Cl. 502-167.000.
Theiss, Edmund: *See—*
Ehrler, Ernst; Eichlseder, Martin; and Theiss, Edmund, 4,820,467, Cl. 264-161.000.
Therm-O-Disc, Incorporated: *See—*
Plasko, Emil R., 4,821,010, Cl. 337-405.000.
Thermo King Corporation: *See—*
Hanson, Jay L., 4,819,441, Cl. 62-160.000.
Thiel, Charles G., to Minnesota Mining and Manufacturing Company. Apparatus and methods for delivering a predetermined amount of a pressurized fluid. 4,819,834, Cl. 222-355.000.
Thiessen, Hans-Henning: *See—*
Hornig, Klaus-Jurgen; and Thiessen, Hans-Henning, 4,821,048, Cl. 346-108.000.
Thom, Guenter; and Neuber, Georg, to Siemens Aktiengesellschaft. Plug connector strip comprising contact springs arranged in at least two parallel rows. 4,820,173, Cl. 439-79.000.
Thomas & Betts Corporation: *See—*
Collier, William H.; Fadule, Matthew J.; and Dunn, James S., 4,820,188, Cl. 439-395.000.
Noorily, Peter, 4,820,193, Cl. 439-488.000.
Thomas, Carroll M. Glass cutting apparatus. 4,819,535, Cl. 83-880.000.
Thomas, David J.: *See—*
Levin, Arthur L.; Rain, Don W.; and Thomas, David J., 4,821,178, Cl. 364-200.000.
Thomas Industries, Inc.: *See—*
Calvert, Peter W., 4,819,294, Cl. 15-209.00R.
Thomas Jefferson University: *See—*
Williams, Stuart K.; and Jarrell, Bruce E., 4,820,626, Cl. 435-1.000.
Thomas, Jess B., Jr., to California Institute of Technology. Digital signal processor and processing method for GPS receivers. 4,821,294, Cl. 375-96.000.
Thomas, Kent; Bullis, Daniel R., Jr.; and Bottelson, Thomas J., to Tab Products Company. Document cartridge. 4,820,073, Cl. 402-68.000.

Thomas, Kent; Bullis, Daniel R., Jr.; and Bottelson, Thomas J., to Tab Products Company. Universal center hook. 4,820,074, Cl. 402-75.000.
Thomas, Kent: *See—*
Lechner, Lloyd; and Thomas, Kent, 4,820,002, Cl. 312-221.000.
Thomas, Larry. Bowfishing arrowhead. 4,819,360, Cl. 43-6.000.
Thompson, John R.: *See—*
Cairns, Royston H.; and Thompson, John R., 4,819,320, Cl. 29-568.000.
Thompson, Mark E., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,820,332, Cl. 71-90.000.
Thompson, Marvin W.; Jennings, Timothy C.; Scott, James A.; Phenicie, Ronald W.; Murphy, Margaret H.; Nakash, Gabriel D.; Biggers, James R.; Boudreau, Lynnlee M.; and Curiel Contreras, Jorge H., to Anvil Cases, Inc. Method and apparatus for forming a desk. 4,819,567, Cl. 108-38.000.
Thompson, Peter F.: *See—*
Otsuka, Nobuo; Thompson, Peter F.; and Wada, Seiji, 4,819,714, Cl. 165-12.000.
Thompson, Robert W., Jr. Automated angulating mirror. 4,820,032, Cl. 350-605.000.
Thompson-Russell, Kathryn C.; and Black, Roger A., to U.S. Philips Corporation. Method of sealing a pump stem to a cathode ray tube envelope part. 4,820,225, Cl. 445-43.000.
Thomson, Bruce A.: *See—*
Fisher, William H.; Stott, William R.; Thomson, Bruce A.; and Weisz-Margulescu, Adam, 4,819,477, Cl. 73-23.000.
Thomson-CGR: *See—*
Aubert, Guy, 4,820,982, Cl. 324-300.000.
Thomson-CSF: *See—*
Defranould, Philippe; and Verroust, Marc, 4,821,004, Cl. 333-143.000.
Thorman, John M.: *See—*
Cova, Dario R.; and Thorman, John M., 4,820,385, Cl. 203-2.000.
Thornton, C. J. Portable particulate material bagging machine. 4,819,701, Cl. 141-231.000.
Thurber, Gerald A.: *See—*
Ewing, Richard C.; Kuczewski, Walter V.; and Thurber, Gerald A., 4,819,811, Cl. 209-699.000.
Thyes, Marco: *See—*
Kropp, Rudolf; Thyes, Marco; Schlecker, Rainer; Franke, Albrecht; Reicheneder, Franz; Reicheneder, Dora I.; Amann, August; Teschendorf, Hans-Juergen; Kretzschmar, Rolf; Traut, Martin; and Gries, Josef, 4,820,821, Cl. 544-224.000.
Thyssen Stahl Aktiengesellschaft: *See—*
Lax, Hermann; and Kohler, Karl-Ulrich, 4,819,840, Cl. 222-606.000.
Tighe, Charles E.: *See—*
Walker, Alvin M.; and Tighe, Charles E., 4,819,672, Cl. 132-75.000.
Till, Edwin: *See—*
Kronberger, Maximilian; and Till, Edwin, 4,819,871, Cl. 239-533.300.
Tillotson Limited: *See—*
Scott, William A.; and Dull, Carl, 4,820,454, Cl. 261-64.400.
Timken Company: *See—*
Otto, Dennis L., 4,819,949, Cl. 277-29.000.
Timmerman, Daniel M.: *See—*
Claeys, Daniel A.; Timmerman, Daniel M.; Rutges, Antonius A.; Michiels, Eddy A.; Vanmaele, Luc J.; and Kok, Piet, 4,820,608, Cl. 430-213.000.
Vermeersch, Joan T.; Vandenabeele, Hubert; Vervecken, Jacques L.; and Timmerman, Daniel M., 4,820,613, Cl. 430-496.000.
Tinoco, Hernan: *See—*
Ekander, Hans; Ericson, Clas; Tallback, Gote; Tinoco, Hernan; and Ostrom, Staffan, 4,820,342, Cl. 75-10.650.
Tioxide Group PLC: *See—*
Egerton, Terence A.; Lawson, Edmund J.; and Frost, Peter W., 4,820,593, Cl. 428-698.000.
Tippmann, Dennis J. Automatic feed marking pellet gun. 4,819,609, Cl. 124-72.000.
Tisack, Peter S.: *See—*
Minnick, John H.; Spencer, John E.; and Tisack, Peter S., 4,821,058, Cl. 354-400.000.
Titan Tool Company: *See—*
McKean, John A., 4,819,519, Cl. 81-53.200.
Titchener, Paul F.: *See—*
Hanson, Merle E.; and Titchener, Paul F., 4,821,035, Cl. 340-856.000.
Tjurin, Jury G.: *See—*
Khutoretsky, Garri M.; Fridman, Vladimir M.; Zagorodnaya, Galina A.; Maximov, Leonid V.; and Tjurin, Jury G., 4,820,945, Cl. 310-52.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Shiozawa, Kouji; Okumura, Yoshiharu; Imai, Chihiro; and Okamoto, Nobukazu, 4,820,674, Cl. 502-169.000.
Tobita, Hiroshi: *See—*
Goto, Chikado; and Tobita, Hiroshi, 4,819,931, Cl. 271-287.000.
Tocker, Stanley, to Du Pont de Nemours, E. I., and Company. Herbicidal spray mixtures. 4,820,336, Cl. 71-93.000.
Toho Rayon Co., Ltd.: *See—*
Iwata, Yoshikazu; Sugiyama, Makoto; and Miyauchi, Motohisa, 4,820,905, Cl. 219-390.000.
Tohoku Ricoh Co., Ltd.: *See—*
Hashimoto, Yoshio; and Tajima, Hiroki, 4,820,005, Cl. 350-6.800.
Tojo, Akihiko: *See—*
Suga, Akira; Kinoshita, Takao; Sakai, Shinji; and Tojo, Akihiko, 4,821,105, Cl. 358-213.190.
Tokar, Joseph C.: *See—*
Gillingham, Gary R.; and Tokar, Joseph C., 4,819,549, Cl. 98-1.000.
Tokita, Akihiko: *See—*
Akasaki, Yutaka; Tokita, Akihiko; Torikoshi, Kaoru; Imai, Akira; and Ishii, Touru, 4,820,600, Cl. 430-58.000.
Tokoro, Hiroyoshi: *See—*
Hayakawa, Mitsuaki; Tokoro, Hiroyoshi; and Kawate, Kiyoo, 4,821,077, Cl. 355-3.0FU.
Tokuda, Masahide: *See—*
Mizuishi, Kenichi; Tokuda, Masahide; and Chiba, Katuaki, 4,819,857, Cl. 228-121.000.
Tokyo Keiki Company, Ltd.: *See—*
Takeuchi, Kunihiko; and Oba, Masao, 4,821,198, Cl. 364-468.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Hori, Nobuo, 4,821,273, Cl. 372-31.000.
Matsui, Mizuo; Ohtomo, Fumio; Sato, Koji; and Takahashi, Yoshihiro, 4,820,264, Cl. 604-21.000.
Tokyo Ohka Kogyo Co., Ltd.: *See—*
Tanka, Hatsuyuki; Sato, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,820,621, Cl. 430-331.000.
Tokyo Pigeon Co., Ltd.: *See—*
Kamijo, Masao, 4,819,891, Cl. 242-201.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Watanabe, Fumio, 4,820,634, Cl. 435-7.000.
Tolino, Ralph W., to Westinghouse Electric Corp. Screw installation plate for use in a fuel assembly repair and reconstitution system. 4,819,524, Cl. 81-488.000.
Tolman, Charles H.: *See—*
Mowry, Greogory S.; Mitchell, Terry B.; Tolman, Charles H.; and George, Peter K., 4,821,133, Cl. 360-113.000.
Tomes, Nancy J., to Pioneer Hi-Bred International. Bacterial treatment to preserve hay quality by addition of microorganisms of the genus bacillus. 4,820,531, Cl. 426-52.000.
Tomesch, John C., to Sandoz Pharm. Corp. N-alkyl-(2- or 5-substituted-2-methoxycarbonyl aminoalkyl furanyl)-substituted cyclimmonium salts and use thereof in PAF inhibition. 4,820,718, Cl. 514-336.000.
Tomita, Masao, to Kinki Denki Co., Ltd. Method of grounding electrical current surges. 4,821,139, Cl. 361-124.000.
Tomlinson, Martin, to Devon County Council, a part interest. Television sub-carrier transmission. 4,821,120, Cl. 358-142.000.
Tomosada, Tsuyoshi: *See—*
Ishikawa, Isao; and Tomosada, Tsuyoshi, 4,820,743, Cl. 521-137.000.
Toop, Gerald W.: *See—*
Richards, Gregory G.; Cockcroft, Steven L.; Brimacombe, James K.; and Toop, Gerald W., 4,820,340, Cl. 75-24.000.
Topworks, Inc.: *See—*
Leinen, Chris M., 4,819,543, Cl. 91-363.00R.
Torchia, Nicholas: *See—*
Lowsky, John; Trierwiler, Scott; and Torchia, Nicholas, 4,820,409, Cl. 210-130.000.
Torii & Co., Ltd.: *See—*
Fujii, Setsurou; Okutome, Toshiyuki; Nakayama, Toyoo; Nunomura, Shigeki; Sudo, Kimio; Watanabe, Shinichi; Kurumi, Masateru; and Aoyama, Takuo, 4,820,730, Cl. 514-510.000.
Torii, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Sheet-feeding apparatus with selectable unit feed and coefficient therefor. 4,820,069, Cl. 400-568.000.
Torii, Yasushi: *See—*
Shimogori, Kazutoshi; Fujiwara, Kazuo; Sugie, Kiyoshi; Morita, Kikuo; Nakayama, Takenori; Miyakawa, Mutsuhiro; and Torii, Yasushi, 4,820,486, Cl. 420-108.000.
Torikoshi, Kaoru: *See—*
Akasaki, Yutaka; Tokita, Akihiko; Torikoshi, Kaoru; Imai, Akira; and Ishii, Touru, 4,820,600, Cl. 430-58.000.
Torimi, Kiyokazu; Takeuchi, Hiroshi; and Takatsuka, Keizo, to Mitsubishi Denki Kabushiki Kaisha. Gas insulated switchgear. 4,821,141, Cl. 361-341.000.
Torimi, Kiyokazu: *See—*
Takeuchi, Hiroshi; Torimi, Kiyokazu; and Takatsuka, Keizo, 4,821,140, Cl. 361-341.000.
Torremans, Joseph L. G.: *See—*
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., 4,820,822, Cl. 546-118.000.
Torres, Robert J., to International Business Machines Corp. Method of navigating among program menus using a graphical menu tree. 4,821,211, Cl. 364-521.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Sasaki, Yoshinari; Oda, Etsuji; Nagata, Hirozumi; Kurita, Naoki; and Maehara, Hiroyuki, 4,820,464, Cl. 264-40.100.
Toso Kabushiki Kaisha (Toso Company Limited): *See—*
Onosato, Hiroshi; Horikoshi, Hiroshi; and Hirahara, Masahiro, 4,819,708, Cl. 160-331.000.
Tosoh Corporation: *See—*
Hayashi, Hidechika, 4,821,080, Cl. 356-318.000.
Inoue, Hiroshi; Kato, Toshikazu; Otsuru, Masaaki; and Emura, Noriaki, 4,820,801, Cl. 528-388.000.
Nakatani, Masaki, 4,820,501, Cl. 423-321.00R.
Tosoh SMD, Inc.: *See—*
Brat, Teodoro E.; and Wickersham, Charles E., 4,820,393, Cl. 204-192.150.
Fielder, Kenneth B.; Belli, Robert L.; and Fuchs, Conrad E., 4,820,397, Cl. 204-298.000.

Toto Ltd.: *See*—
Tsutsui, Osamu; Kawaguchi, Hideki; Hayashi, Keiji; Kayano, Masahiro; Tanaka, Shingo; Kobayashi, Hiroshi; Nakamura, Hisashi; and Makita, Atsuo, 4,819,587, Cl. 122-488.00R.

Towle, Ian D. H., to Raychem Limited. Preparation of aromatic polyketones using a strong acid catalyst with a weaker acid solvent. 4,820,792, Cl. 528-126.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Hirata, Sadao; and Watanabe, Yoshihiko, 4,820,795, Cl. 528-272.000.

Toyoda Gosei Co., Ltd.: *See*—
Suzuki, Satoshi; and Shigeki, Kiyoshi, 4,819,382, Cl. 49-497.000.

Toyoda, Noriyuki: *See*—
Ikuzawa, Masanori; Oguchi, Yoshiharu; Matsunaga, Kenichi; Toyoda, Noriyuki; Furusho, Takao; Fujii, Takayoshi; and Yoshikumi, Chikao, 4,820,689, Cl. 514-8.000.

Toyoshi, Naoki; and Oka, Takeki, to Minolta Camera Kabushiki Kaisha. Electro-static photo-copier machine. 4,821,076, Cl. 355-3.00R.

Toyoshi, Naoki: *See*—
Oka, Tateki; Toyoshi, Naoki; Myochin, Hisashi; and Yokoyama, Tomoaki, 4,821,071, Cl. 355-14.0CH.

Toyota Central Research and Development Laboratories, Inc.: *See*—
Ikemoto, Hiroyuki; Oowa, Nobutaka; Arai, Yasuji; Yasuike, Osamu; and Doi, Shunichi, 4,821,188, Cl. 364-424.100.
Ikemoto, Hiroyuki; Arai, Yasuji; Yasuike, Osamu; Oowa, Nobutaka; and Doi, Shunichi, 4,821,191, Cl. 364-424.100.

Toyota Jidosha Kabushiki Kaisha: *See*—
Azuma, Hitoshi; and Mizutani, Hitoshi, 4,819,512, Cl. 74-713.000.
Demura, Hiroshi; Hayashi, Kazumi; Oyama, Yasuo; Kokubu, Sadao; Takizawa, Kouji; and Iguchi, Shigeru, 4,820,022, Cl. 350-331.00R.
Harada, Kenichi; Uchitani, Nobuki; Kamohara, Tatuyoshi; Satoya, Koichi; and Kato, Takashi, 4,819,601, Cl. 123-438.000.
Ikemoto, Hiroyuki; Oowa, Nobutaka; Arai, Yasuji; Yasuike, Osamu; and Doi, Shunichi, 4,821,188, Cl. 364-424.100.
Ikemoto, Hiroyuki; Arai, Yasuji; Yasuike, Osamu; Oowa, Nobutaka; and Doi, Shunichi, 4,821,191, Cl. 364-424.100.
Isobe, Toshiaki; and Oba, Hidehiro, 4,819,490, Cl. 73-861.220.
Nagai, Toshinari; Masui, Takatoshi; and Katsuno, Toshiyasu, 4,819,427, Cl. 60-274.000.
Ohe, Junzo; and Kondo, Hiroshi, 4,821,042, Cl. 343-712.000.
Yasue, Hideki; and Fukumura, Kagenori, 4,819,777, Cl. 192-0.062.

Toyota, Sumio, to Yoshida Kogyo K. K. Automatic fastener assembling apparatus. 4,819,852, Cl. 227-8.000.

Tradewinds Technologies, Inc.: *See*—
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Wheeler, Jack L. Method of coastal erosion control using massive sea block system. 4,820,079, Cl. 405-23.000.

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Whitney, G. Ward, Jr. Wire anchor for metal stud/brick veneer wall construction. 4,819,401, Cl. 52-713.000.
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Wilco Enterprises: *See—*
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Wile, Raymond G.; and Middien, Ismail F., to E and R Investments. Composition for precipitating dirt and other contaminants from wash water and method of cleaning. 4,820,450, Cl. 252-545.000.
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Wilkinson, Edward L.; and Sayles, David C., to United States of America, Army. Chemical removal of dental plaque. 4,819,675, Cl. 132-321.000.
Wilkinson, Stanley B., to General Electric Company. Positive sequence distance relay for AC power transmission line protection. 4,821,137, Cl. 361-80.000.
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Wilson, John F.; Cerni, Samuel; and Gjertsen, Robert K., to Westinghouse Electric Corp. Control rod end plug with a stabilizing configuration. 4,820,058, Cl. 376-327.000.
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Winslow, Denis M. W. Mechanical seal. 4,819,950, Cl. 277-93.0SD.
Winslow, Paul A.; and Matzner, Markus, to Amoco Corporation. Chain-extended poly(aryl ether ketones). 4,820,790, Cl. 528-125.000.
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Witt, William F., to Ampex Corporation. Bidirectional transfer mechanism. 4,820,109, Cl. 414-282.000.
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Wojdylo, Henry K. Emergency V-belt. 4,820,247, Cl. 474-255.000.
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Wolff, Merle; Nuss, Mark A.; Fetcenko, Michael A.; and Lijoi, Andrea L., to Energy Conversion Devices, Inc. Method for the continuous fabrication of hydrogen storage allov negative electrodes. 4,820,481, Cl. 419-3.000.
Wolkewitz, Klaus; Scheck, Alfons; and Seeberger, Kurt, to Blaupunkt-Werke GmbH. Composite electrical connector for apparatus installed in a vehicle. 4,820,172, Cl. 439-76.000.
Wollermann, Kenneth; Gudmestad, Ragnar; Kroening, Terry R.; and Conrardy, John E., to Artos Engineering Company. Wire processing apparatus having pushbar and conveyor mechanisms. 4,819,533, Cl. 83-154.000.
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Wong, Don M. Stirring mechanism. 4,820,054, Cl. 366-287.000.
Wong, Poon. Elastic telephone handset support. 4,821,317, Cl. 379-430.000.
Wood, Frank, to Ferranti International Signal, plc. Tubular acoustic projector. 4,821,244, Cl. 367-159.000.
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Woodroof, E. Aubrey, to Sterling Drug Inc. Bio compatible and blood compatible materials and methods. 4,820,302, Cl. 623-8.000.

Woodruff, James L. Flying insect eliminator. 4,819,370, Cl. 43-113.000.
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Wu, Chuan-Chi. Convertible handset device for telephone sets. 4,821,318, Cl. 379-430.000.
Wu, Tse C., to Allied-Signal Inc. Process for the production of poly(vinyl acetate) and poly(vinyl alcohol). 4,820,767, Cl. 525-62.000.
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Wurst, Dieter; and Nissle, Gerhard, to H. Stoll GmbH & Co. Yarn guide element for textile machines. 4,819,457, Cl. 66-146.000.
Wylie, Bruce B. Automobile doormat. 4,819,984, Cl. 296-152.000.
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Xu, Jinghang, to Beijing Polytechnic University; and China National Petroleum & Chemical Equipment Engineering. Method for preparing rare earth metal catalysts with honeycomb-like alloy supports and catalysts obtained thereby. 4,820,678, Cl. 502-303.000.
Yabe, Masao; and Takahashi, Yonosuke, to Fuji Photo Film Co., Ltd. Optical information recording medium. 4,821,050, Cl. 346-137.000.
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Yamamori, Naoki; and Kanda, Kazunori, to Nippon Paint Co., Ltd. Antifouling coating composition. 4,820,748, Cl. 523-122.000.
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Yamamuro, Sigeaki; and Kumura, Haruyoshi, to Nissan Motor Co., Ltd. Pulley actuating hydraulic pressure control for continuously variable transmission. 4,819,514, Cl. 74-868.000.
Yamaoka, Kojiro; and Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg. Co., Ltd. Transmission system for working vehicles. 4,819,508, Cl. 74-665.0GC.
Yamasaki, Masaharu, to Seiko Instruments Inc. World timepiece. 4,821,248, Cl. 368-21.000.
Yamashita, Atsushi; and Kyotani, Ikuo, to G-C Dental Industrial Corp. Method and apparatus for making the inner crowns of composite-layered crowns for restoring crowns. 4,820,387, Cl. 204-4.000.
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Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,820,687, Cl. 503-227.000.
Yamazaki, Kazunori; Soyama, Yoshikazu; Tanaka, Muneo; and Kitamura, Chigusa, to Shiseido Company Ltd. Nail cosmetic composition. 4,820,509, Cl. 424-61.000.
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Yamazaki, Shuichi; and Ishii, Tatsuo, to Ricoh Company, Limited. Electronic blackboard. 4,821,335, Cl. 382-53.000.
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Yanagisawa, Masahiro; and Motomura, Yoshihiro, to NEC Corporation. Apparatus for determining microhardness. 4,820,051, Cl. 356-378.000.
Yang, Jane J.; and Hong, Chi-Shain, to TRW Inc. Inverted channel substrate planar semiconductor laser. 4,821,278, Cl. 372-46.000.
Yang, Tai-Her. Heavy duty vise. 4,819,924, Cl. 269-241.000.
Yang, Wei-Yeih, to B. F. Goodrich Company, The. Poly(vinyl chloride) polyblend containing a crystalline polyester with limited miscibility and reinforced composites thereof. 4,820,763, Cl. 524-505.000.
Yano, Shunji; and Hayama, Masato, to Honda Giken Kogyo Kabushiki Kaisha. Variable-displacement turbine. 4,820,118, Cl. 415-161.000.

Yasuda, Koichi, to Hitachi, Ltd. Sealing apparatus for picture tube. 4,820,228, Cl. 445-67.000.
Yasue, Hideki; and Fukumura, Kagenori, to Toyota Jidosha Kabushiki Kaisha. System for integrally controlling an engine and an automatic transmission having a device for determining engagement of the lockup clutch when a certain time duration elapses after output of an engagement signal. 4,819,777, Cl. 192-0.062.
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Yokoyama, Naoki, to Fujitsu Limited. Compound semiconductor integrated circuit device. 4,821,090, Cl. 357-43.000.
Yokoyama, Takashi; Hide, Ichiro; Sawaya, Keiji; and Matsuyama, Takeshi, to Hoxan Corporation. Polycrystalline silicon wafer tray. 4,820,145, Cl. 425-425.000.
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Young, Rosa; and Mytilineou, Eugenia, to Energy Conversion Devices, Inc. Phase changeable material. 4,820,394, Cl. 204-192.210.
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TO WHOM

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Braungart, Martin, Re. 32,903, Cl. 301-37.0AT.
Braungart, Martin, to BBS Kraftfahrzeugtechnik, GmbH and Co. KG. Motor vehicle wheel center including an anti-theft feature. Re. 32,903, Cl. 301-37.0AT.
Equatorial Communications Company: *See—*
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James River Norwalk, Inc.: *See—*
Kuchenbecker, Morris W., Re. 32,902, Cl. 206-613.000.
Kuchenbecker, Morris W., to James River Norwalk, Inc. Carton with improved opening structure. Re. 32,902, Cl. 206-613.000.
Pacholok, David R. Power supply for gas discharge devices. Re. 32,904, Cl. 363-131.000.

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Baisch, Herbert: *See—*
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 300,592, Cl. D6-491.000.
Baker, Joseph M. Vehicle or the like. 300,617, 4-11-89, Cl. D12-83.000.
Ball, Martin F., to MB Group plc. Container closure. 300,607, 4-11-89, Cl. D9-438.000.
Barrault, Jean-Louis, to Moulinex, Societe Anonyme. Re-charging stand for a cordless electric iron. 300,678, 4-11-89, Cl. D32-73.000.
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Buehler, Thomas E. Fireplace insert smoke pipe connector. 300,655, 4-11-89, Cl. D23-403.000.
Buehler, Thomas E. Fireplace insert smoke pipe connector. 300,656, 4-11-89, Cl. D23-403.000.
Carriveau, Ronald S. Guitar head. 300,638, 4-11-89, Cl. D17-20.000.
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Coletta, Ralph; and LaGuardia, Joseph M. Coloring instrument. 300,640, 4-11-89, Cl. D19-51.000.
Conti, Rino; and Freese, Lawrence O., to Dart Industries Inc. Toy cabin or the like. 300,643, 4-11-89, Cl. D21-114.000.
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Crutcher, Carol A.; and Williams, Ladon. Adapter plug for a vehicle cigarette lighter. 300,626, 4-11-89, Cl. D13-28.000.
Culbertson, Richard; Drinkard, Tye C.; and Douglas, Arthur E., to General Electric Company. Cellular mobile transceiver. 300,630, 4-11-89, Cl. D14-138.000.
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Furusawa, Toshinori; and Tsutsumi, Kohtaroh, to Ohtsu Tire & Rubber Co., Ltd., The. Vehicle tire. 300,622, 4-11-89, Cl. D12-149.000.
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437 4,819,338
503 4,819,339
613 4,819,340

CLASS 34
86 4,819,341
95 4,819,342
187 4,819,343

CLASS 36
17 R 4,819,345
35 A 4,819,344

CLASS 37
66 4,819,346
78 4,819,347
81 4,819,348
117.5 4,819,349

CLASS 38
30 4,819,350

CLASS 40
107 4,819,352
152.2 4,819,353
154 4,819,354
209 4,819,355
449 4,819,357
618 4,819,356
642 4,819,351

CLASS 42
65 4,819,358
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CLASS 43
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17.6 4,819,361
42.2 4,819,362
42.4 4,819,363
42.47 4,819,365
43.1 4,819,364
44.81 4,819,366
55 4,819,367
61 4,819,368
102 4,819,369
113 4,819,370
131 4,819,371

CLASS 44
622 4,820,313

CLASS 47
9 4,819,372
58 4,819,373
4,819,374
80 4,819,375

CLASS 48
94 4,820,314

CLASS 49
200 4,819,376
221 4,819,377
225 4,819,378
280 4,819,379
374 4,819,380
493 4,819,381
497 4,819,382
501 4,819,383

CLASS 51
218 R 4,819,384
241 B 4,819,385
281 R 4,819,386
283 R 4,819,387
411 4,819,388

CLASS 52
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182 4,819,391
211 4,819,392
223 L 4,819,393
252 4,819,394
309.16 4,819,395
405 4,819,396
406 4,819,397
529 4,819,398
646 4,819,399
693 4,819,400
713 4,819,401
726 4,819,402
741 4,819,403
749 4,819,404
810 4,819,405

CLASS 53
51 4,819,406
202 4,819,407
211 4,819,408
282 4,819,409
413 4,819,410
439 4,819,411
471 4,819,412
478 4,819,413
551 4,819,414

CLASS 55
1 4,820,315
18 4,820,316
21 4,820,317
68 4,820,318
213 4,520,319
302 4,820,320

CLASS 56
12.7 4,819,416
41 4,819,415
202 4,819,417
341 4,819,418

CLASS 57
261 4,819,419
263 4,819,420
264 4,819,421
328 4,819,422

CLASS 60
39.02 4,819,423
39.183 4,819,424
204 4,819,431
226.1 4,819,425
250 4,819,426
274 4,819,427
323 4,819,428
414 4,819,429
421 4,819,430
525 4,819,432
547.1 4,819,433
646 4,819,435
653 4,819,434
657 4,819,436
673 4,819,437
730 4,819,438

CLASS 62
6 4,819,439
52 4,819,454
133 4,819,440
160 4,819,441
187 4,819,442
225 4,819,443
238.3 4,819,445
4,819,446
238.6 4,819,444
271 4,819,447
304 4,819,448
345 4,819,449
514 JT 4,819,451
514 R 4,819,450

CLASS 63
15 4,819,452
28 4,819,453

CLASS 65
2 4,820,321
3.11 4,820,322
3.12 4,820,323
8 4,820,324
27 4,820,325
30.11 4,820,326
104 4,820,327
134 4,820,328
4,820,329

CLASS 66
75.1 4,819,455
135 4,819,456
146 4,819,457
202 4,819,458

CLASS 68
3 R 4,819,459
23.7 4,819,460

CLASS 70
14 4,819,461
4,819,462
4,819,463
18 4,819,464
56 4,819,465
70 4,819,466
277 4,820,330

CLASS 71
88 4,820,331
90 4,820,332
4,820,333
92 4,820,334
4,820,335
93 4,820,336
4,820,337

CLASS 72
8 4,819,467
71 4,819,468
89 4,819,469
161 4,819,470
214 4,819,471
335 4,819,472
382 4,819,473
441 4,819,474
447 4,819,475
456 4,819,476

CLASS 73
23 4,819,477
61.1 C 4,819,478
170 R 4,819,480
201 4,819,482
304 C 4,819,483
321 4,819,484
379 4,819,485
382 R 4,819,486
726 4,819,487
845 4,819,488
854 4,819,489
861.22 4,819,490
865.8 4,819,491

CLASS 74
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89.15 4,819,743
89.17 4,819,493
190 4,819,494
424.6 4,819,495
479 4,819,496
489 4,819,497
493 4,819,498
498 4,819,499
513 4,819,500
538 4,819,501
572 4,819,502
574 4,819,503
594.4 4,819,504
603 4,819,505
665 GA 4,819,507
665 GC 4,819,508
665 T 4,819,506
688 4,819,509
4,819,510
711 4,819,511
713 4,819,512
866 4,819,513
868 4,819,514

CLASS 75
0.5 BB 4,820,339
10.61 4,820,341
10.65 4,820,342
24 4,820,340
101 BE 4,820,343
233 4,820,338

CLASS 76
41 4,819,515
101 R 4,819,516
108 A 4,819,517

CLASS 81
53.2 4,819,519
57.39 4,819,520
63 4,819,521
113 4,819,522
177.2 4,819,523
488 4,819,524

CLASS 82
1.11 4,819,525
113 4,819,526
165 4,819,527

CLASS 83
13 4,819,528
32 4,819,529
39 4,819,530
56 4,819,531
100 4,819,532
154 4,819,533
671 4,819,534
880 4,819,535

CLASS 84
1.01 4,819,536
1.11 4,819,537
384 4,819,538
476 4,819,539

CLASS 89
37.05 4,819,540
46 4,819,518

CLASS 91
6 4,819,541
172 4,819,542
363 R 4,819,543
369.4 4,819,544
371 4,819,545

CLASS 92
5 R 4,819,546
261 4,819,547

CLASS 98
1 4,819,548
4,819,549
2.17 4,819,550
42.04 4,819,551

CLASS 99
277.2 4,819,552
305 4,819,553

CLASS 100
224 4,819,554
257 4,819,555

CLASS 101
93.04 4,819,556
228 4,819,557
348 4,819,558
474 4,819,559

CLASS 102
202.5 4,819,560
213 4,819,561
281 4,819,562
501 4,819,563

CLASS 104
292 4,819,564

CLASS 105
11 4,819,565
168 4,819,566

CLASS 106
14.13 4,820,344
18.12 4,820,345
22 4,820,346
469 4,820,347

CLASS 108
38 4,819,567
43 4,819,568
113 4,819,569

CLASS 109
23 4,819,570

CLASS 110
346 4,819,571

CLASS 112
121.15 4,819,572
454 4,819,573

CLASS 114
39.1 4,819,574
248 4,819,576
270 4,819,575

CLASS 116
264 4,819,577

CLASS 118
652 4,819,578
728 4,819,579

CLASS 119
1 4,819,580
3 4,819,581
17 4,819,582
29 4,819,583
51 R 4,819,584
72.5 4,819,585

CLASS 122
235 C 4,819,586
488 R 4,819,587

CLASS 123
52 M 4,819,588
4,819,589
65 P 4,819,590
90.44 4,819,591
192 B 4,819,592
4,819,593
201 4,819,594
272 4,819,595
339 4,819,596
399 4,819,597
4,819,598
425 4,819,599
4,819,600
438 4,819,601
479 4,819,602
492 4,819,604
4,819,605
502 4,819,606
519 4,819,607

CLASS 124
23 R 4,819,608
72 4,819,609
75 4,819,610
87 4,819,611

CLASS 126
36 4,819,614
263 4,819,612
515 4,819,613

CLASS 127
9 4,819,615
46.2 4,820,348

CLASS 128
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24 A 4,819,621
75 4,819,622
87 A 4,819,623
200.18 4,819,625
200.26 4,819,619
201.28 4,819,626
203.11 4,819,627
4,819,628
203.22 4,819,629
207.15 4,819,664
303 R 4,819,631
303.1 4,819,630
4,819,632
303.17 4,819,633
305 4,819,634
4,819,635
318 4,819,636
325 4,819,637
328 4,819,638
330 4,819,639
334 R 4,819,640
344 4,819,751
4,820,349
360 4,819,641
419 P 4,819,643
419 R 4,819,642
596 4,819,644
632 4,819,645
633 4,819,646
4,819,752
642 4,819,647
653 4,819,648
660.02 4,819,649
661.01 4,819,650
661.09 4,819,652

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662.03 4,819,651
673 4,819,653
680 4,819,654
713 4,819,655
736 4,819,656
4,819,657
4,819,658
4,819,659
764 4,819,753
773 4,819,660
774 4,819,661
786 4,819,662
866 4,819,624
876 4,819,663
897 4,819,617

CLASS 131

175 4,819,666
195 4,819,665
310 4,819,667
371 4,819,668

CLASS 132

54 4,819,671
75 4,819,672
75.5 4,819,673
156 4,819,670
200 4,819,669
224 4,819,674
321 4,819,675

CLASS 134

6 4,820,350
21 4,819,676
4,820,351
30 4,820,352
104.2 4,819,677
186 4,819,678

CLASS 135

19.5 4,819,679
104 4,819,680

CLASS 137

1 4,819,681
4,819,682
71 4,819,683
112 4,819,684
223 4,819,685
229 4,819,686
367 4,819,687
493.6 4,819,688
512.1 4,819,689
514 4,819,690
556 4,819,691
614.03 4,819,692
625.4 4,819,693
625.47 4,819,694
625.65 4,819,695
630.12 4,819,696

CLASS 138

30 4,819,697
31 4,819,698

CLASS 140

105 4,819,699

CLASS 141

1 4,819,700
231 4,819,701
232 4,819,702

CLASS 144

230 4,819,703

CLASS 148

2 4,820,353
4,820,354
11.5 A 4,820,355
12.4 4,820,357
12.7 N 4,820,356
13 4,820,358
127 4,820,359
133 4,820,360

CLASS 149

2 4,820,361
4,820,362

CLASS 152

209 R 4,819,704
527 4,819,705

CLASS 156

69 4,820,364
109 4,820,365
166 4,820,366
283 4,820,367
307.3 4,820,368
344 4,820,369
345 4,820,370
4,820,371
356 4,820,372
405.1 4,820,373
494 4,820,363
538 4,820,374
566 4,820,375
643 4,820,376
4,820,377
4,820,378

CLASS 160

67 4,819,706
4,819,707
331 4,819,708

CLASS 162

5 4,820,379
135 4,820,380
261 4,820,381

CLASS 164

134 4,819,709
423 4,819,710
456 4,819,711
463 4,819,712

CLASS 165

1 4,819,713
12 4,819,714
16 4,819,715
21 4,819,716
104.12 4,819,717
4,819,718
104.26 4,819,719
104.34 4,819,720

CLASS 166

55 4,819,721
231 4,819,722
248 4,819,723
263 4,819,724
271 4,819,725
291 4,819,726
292 4,819,727
298 4,819,728
305.1 4,819,729
355 4,819,730

CLASS 168

4 4,819,731

CLASS 169

61 4,819,732
4,819,733

CLASS 172

22 4,819,734
4,819,735
25 4,819,736
156 4,819,737
292 4,819,738

CLASS 173

17 4,819,739
49 4,819,740
91 4,819,741
162.2 4,819,742

CLASS 174

35 GC 4,820,885

CLASS 175

18 4,819,744
IGT 4,819,745
296 4,819,746
385 4,819,747
410 4,819,748

CLASS 177

25.18 4,819,749
256 4,819,750

CLASS 178

19 4,820,886

CLASS 180

9.1 4,819,754
70.1 4,819,755
73.3 4,819,756
79 4,819,757
168 4,819,758

CLASS 181

102 4,819,760
121 4,819,759
145 4,819,761

CLASS 182

153 4,819,762
187 4,819,763

CLASS 184

36 4,819,764

CLASS 187

88 4,819,765
124 4,819,766

CLASS 188

2 D 4,819,767
196 D 4,819,768
218 XL 4,819,769
284 4,819,770
299 4,819,771
4,819,772
322.15 4,819,773

CLASS 192

0.062 4,819,777
4 A 4,819,774
41 A 4,819,775
45 4,819,776
84 T 4,819,778
105 BA 4,819,779

CLASS 194

317 4,819,780

CLASS 198

335 4,819,781
372 4,819,782
395 4,819,783
4,819,784
404 4,819,785
621 4,819,786
781 4,819,787
4,819,788
803.8 4,819,789
811 4,819,790
818 4,819,791

CLASS 200

43.18 4,820,887
61.45 M 4,820,888
61.85 4,820,889
81.4 4,820,890

CLASS 201

32 4,820,382

CLASS 202

245 4,820,384

CLASS 203

2 4,820,385

CLASS 204

1 T 4,820,386
4 4,820,387
44.2 4,820,388
78 4,820,389
129.5 4,820,390
182.4 4,820,391
192.11 4,820,392
192.15 4,820,393
192.21 4,820,394
207 4,820,395
297 W 4,820,396
298 4,820,397
299 R 4,820,398
403 4,820,399

CLASS 206

45.25 4,819,792
162 4,819,793
225 4,819,794
278 4,819,795
291 4,819,796
309 4,819,797
4,819,798
310 4,819,799
323 4,819,800
387 4,819,801
4,819,802
423 4,819,803
456 4,819,804
457 4,819,805
554 4,819,806
610 4,819,807
613 Re.32,902

CLASS 208

38 4,820,400
40 4,820,401
111 4,820,402
4,820,403
159 4,820,404
423 4,820,405

CLASS 209

1 4,819,808
166 4,820,406
275 4,819,809
315 4,819,810
397 4,820,407
699 4,819,811

CLASS 210

98 4,820,408
130 4,820,409
169 4,820,410
4,820,411
220 4,820,412
321.83 4,820,413
512.1 4,820,414
616 4,820,415
632 4,820,416
638 4,820,417
640 4,820,418
651 4,820,419
669 4,820,420
670 4,820,421
696 4,820,422
697 4,820,423
716 4,820,424
746 4,820,425
779 4,820,426
788 4,820,427

CLASS 211

1.3 4,819,812
41 4,819,813
50 4,819,814
74 4,819,815
189 4,819,816
205 4,819,817

CLASS 215

230 4,819,819

CLASS 219

10.491 4,820,892
10.55 E 4,820,893
10.77 4,820,891
69.12 4,820,894
69.13 4,820,895
83 4,820,896
121.12 4,820,898
121.47 4,820,900
121.67 4,820,897
121.76 4,820,899
138 4,820,901
203 4,820,902
213 4,820,903
216 4,820,904
390 4,820,905
405 4,820,906
494 4,820,907

CLASS 220

1.5 4,819,820
5 A 4,819,821
6 4,820,383
72 4,819,822
89 A 4,819,823
266 4,819,824
273 4,819,826
276 4,819,825
318 4,819,827
338 4,819,828
346 4,819,829
371 4,819,830

CLASS 222

153 4,819,832
155 4,819,833
355 4,819,834
383 4,819,835
386 4,819,836
402.1 4,819,837
420 4,819,831
538 4,819,838
541 4,819,839
606 4,819,840
607 4,819,841
642 4,819,842

CLASS 224

42.45 R 4,819,843
150 4,819,844
204 4,819,845
240 4,819,846
252 4,819,847

CLASS 225

96 4,819,848

CLASS 226

74 4,819,849
162 4,819,850
194 4,819,851

CLASS 227

8 4,819,852
19 4,819,853
67 4,819,855
119 4,819,856

CLASS 228

121 4,819,857
173.7 4,819,858
190 4,819,859
668 4,819,860

CLASS 229

16 R 4,819,861
125.27 4,819,862
125.35 4,819,863
135 4,819,864
137 4,819,865

CLASS 232

43.3 4,819,866

CLASS 235

145 R 4,820,908
379 4,820,909
439 4,820,910
449 4,820,912
467 4,820,911
487 4,820,913

CLASS 236

12.16 4,819,867
49.5 4,819,868

CLASS 238

298 4,819,869
351 4,819,870

CLASS 239

8 4,819,873
23 4,819,874
97 4,819,875
119 4,819,872
265.39 4,819,876
266 4,819,877
427 4,819,878
533.3 4,819,871
662 4,819,880
691 4,819,879

CLASS 241

39 4,819,884
4,819,885
88.1 4,819,881
92 4,819,882
99 4,819,883
186.1 4,819,886

CLASS 242

18 PW 4,819,892
56 R 4,819,887
77.2 4,819,888
199 4,819,889
4,819,890
201 4,819,891
220 4,819,893

CLASS 244

137.4 4,819,894
234 4,819,896

CLASS 248

68.1 4,819,897
97 4,819,898
4,819,899
244 4,819,900
250 4,819,901
460 4,819,902
538 4,819,903
545 4,819,904
642 4,819,905

CLASS 249

67 4,819,906

CLASS 250

207 4,820,914
211 J 4,820,915
227 4,820,916
4,820,917
231 SE 4,820,918
269 4,820,919
282 4,820,920
307 4,820,921
327.2 4,820,922
352 4,820,923
363.10 4,820,924
379 4,820,925
486.1 4,820,926
492.2 4,820,927
492.2 B 4,820,928
504 R 4,820,929
548 4,820,930
554 4,820,931
563 4,820,932

CLASS 251

48 4,819,909
96 4,319,907
149.6 4,819,908

CLASS 252

8.551 4,820,428
8.554 4,820,429
48.6 4,820,430
51.5 A 4,820,432
56 R 4,820,431
62.57 4,820,433
75 4,820,434
90 4,820,435
102 4,820,437
108 4,820,438
117 4,820,447
135 4,820,439
4,820,440
174.18 4,820,441
188.28 4,820,442
299.63 4,820,443
299.65 4,820,444
301.4 R 4,820,445
511 4,820,446
533 4,820,448
544 4,820,436
4,820,449
545 4,820,450

CLASS 254

88 4,819,910
134.3 FT 4,819,911
266 4,819,912
350 4,819,913

CLASS 256

10 4,819,914
12.5 4,819,915
13.1 4,819,916

CLASS 260

400 4,820,451
510 4,820,452

CLASS 261

64.4 4,820,454
96 4,820,455
111 4,820,456
120 4,820,457

CLASS 264

34 4,820,458
40.1 4,820,464
40.3 4,820,459
41 4,820,460
57 4,820,461
63 4,820,462
68 4,820,463
119 4,820,465
4,820,466
161 4,820,467
163 4,820,468
506 4,820,469
555 4,820,470
564 4,820,471

CLASS 266

51 4,819,917
207 4,819,918

CLASS 267

64.13 4,819,919
90 4,819,920

CLASS 269

32 4,819,921
45 4,819,922
63 4,819,923
241 4,819,924
327 4,819,925

CLASS 270

45 4,819,926

CLASS 271

34 4,819,927
177 4,819,929
209 4,819,930
276 4,819,928
287 4,819,931

CLASS 272

3 4,819,932
4,819,933
76 4,819,934
116 4,819,951
124 4,819,935
126 4,819,936

CLASS 273

26 R 4,819,937
32.5 4,819,938
81 R 4,819,939
138 A 4,819,818
186 A 4,819,942
186 C 4,819,943
187 B 4,819,940
193 A 4,819,944
272 4,819,945
404 4,819,946
412 4,819,947

CLASS 277

3 4,819,948
29 4,819,949
47 4,819,854
93 SD 4,819,950
165 4,819,952
235 B 4,819,953
4,819,954

CLASS 280

203 4,819,956
293 4,819,957
644 4,819,958
660 4,819,959
734 4,819,960
775 4,819,961
837 4,819,955

CLASS 281

15.1 4,819,962
4,819,963
35 4,819,964

CLASS 285

14 4,819,965
18 4,819,966

4,819,967
81 4,819,968
131 4,819,971
177 4,819,969
227 4,819,970
331 4,819,972
332.3 4,819,973
373 4,819,974

CLASS 290

48 4,819,975

CLASS 292

4,819,976

CLASS 293

186 A 4,819,941

CLASS 294

1.4 4,819,977
119.1 4,819,978

CLASS 296

35.1 4,819,980
77.1 4,819,979
100 4,819,981
107 4,819,982
121 4,819,983
152 4,819,984
218 4,819,985

CLASS 297

325 4,819,986
434 4,819,987
467 4,819,988

CLASS 299

43 4,819,989
80 4,819,990

CLASS 301

37 AT Re.32,903
37 SS 4,819,991

CLASS 303

20 4,819,992
38 4,819,993
100 4,819,994
110 4,819,995
114 4,819,996
115 4,819,997
118 4,819,998

CLASS 305

11 4,819,999

CLASS 307

10.1 4,820,933
4,821,016
41 4,820,934
112 4,820,935
117 4,820,938
269 4,820,939
270 4,820,940
296.2 4,820,936
449 4,820,941
475 4,820,937
542 4,820,942
603 4,820,943
4,820,944

CLASS 310

52 4,820,945
77 4,820,946
89 4,820,947
90 4,820,948
4,820,949
90.5 4,820,950
257 4,820,951
334 4,820,952
338 4,820,953

CLASS 312

1 4,820,000
183 4,820,001
221 4,820,002
234 4,820,003

CLASS 313

270 4,820,954

CLASS 315

3.5 4,820,955
51 4,820,956
209 T 4,820,957
368 4,820,958
384 4,820,959
397 4,820,960

CLASS 318

587 4,820,961
602 4,820,962
696 4,820,963
786 4,820,964

CLASS 320

31 4,820,965
32 4,820,966

CLASS 323

314 4,820,967
316 4,820,968

CLASS 324

57 R 4,820,969
58.5 A 4,820,970
61 P 4,820,972
61 R 4,820,971
4,820,973
73 R 4,820,974
158 F 4,820,975
4,820,976
158 R 4,820,977
166 4,820,978
171 4,820,979
207 4,820,980
222 4,820,981
300 4,820,982
307 4,820,983
309 4,820,984
318 4,820,985
4,820,987
4,820,988
322 4,820,986
368 4,820,989
445 4,820,990
519 4,820,991

CLASS 328

137 4,820,992
155 4,820,993
4,820,994

CLASS 329

204 4,820,995

CLASS 330

45 4,820,996
252 4,820,997
258 4,820,998
277 4,820,999
298 4,821,000

CLASS 331

158 4,821,001

CLASS 333

21 A 4,821,002
139 4,821,003
143 4,821,004
167 4,821,005
202 4,821,006
238 4,821,007

CLASS 335

189 4,821,008

CLASS 337

130 4,821,009
405 4,821,010

CLASS 338

4 4,821,011
32 R 4,821,012
114 4,821,013
164 4,821,014
175 4,821,015

CLASS 340

311.1 4,821,021
430 4,821,017
432 4,821,020
471 4,821,018
514 4,821,022
521 4,821,027
545 4,821,024
551 4,821,023
568 4,821,025
574 4,821,026
606 4,821,028
712 4,821,029
4,821,030
731 4,821,031
825.210 4,821,032
825.790 4,821,033
825.800 4,821,034
856 4,821,035

CLASS 341

172 4,821,036

CLASS 342

153 4,821,039
383 4,821,037
390 4,821,038

CLASS 343

700 MS 4,821,040
4,821,041
712 4,821,042
765 4,821,043
771 4,821,044
781 R 4,821,045
786 4,821,046
882 4,821,047

CLASS 346

108 4,821,048
134 4,821,049
137 4,821,050
155 4,821,051

CLASS 350

3.85 4,820,006
4.1 4,820,004
6.8 4,820,005
96.10 4,820,008
96.13 4,820,009
96.15 4,820,010
96.19 4,820,011
96.20 4,820,007
96.23 4,820,012
4,820,014
96.24 4,820,015
96.27 4,820,013
96.29 4,820,016
96.30 4,820,017
96.33 4,820,018
163 4,820,019
259 4,820,020
276 R 4,820,021
331 R 4,820,022
4,820,023
333 4,820,024
334 4,820,025
341 4,820,026
347 E 4,820,027
423 4,820,028
432 4,820,029
434 4,820,030
538 4,820,031
605 4,820,032
613 4,820,033

CLASS 351

123 4,820,034
153 4,820,035
156 4,820,036
160 H 4,820,038
211 4,820,037
212 4,820,039
234 4,820,040

CLASS 354

149.1 4,821,053
282 4,821,054
4,821,055
289.1 4,821,056
301 4,821,057
321 4,821,060
400 4,821,058
4,821,059
402 4,821,074

CLASS 355

3 DD 4,821,063
4,821,075
3 FU 4,821,062
4,821,064
4,821,077
3 R 4,821,076
14 CH 4,821,071
14 E 4,821,065
4,821,067
4,821,068
14 FU 4,821,052
4,821,069
14 R 4,821,066
4,821,070
27 4,821,072
40 4,821,061
68 4,821,073
74 4,821,079
75 4,821,078

CLASS 356

1 4,820,041
153 4,820,042
241 4,820,043
315 4,820,044
318 4,821,080
319 4,820,045
328 4,820,046
4,820,048
349 4,820,047
360 4,820,049
375 4,820,050
378 4,820,051
401 4,820,055

CLASS 357

4 4,821,092
22 4,821,093
23.1 4,821,094
23.13 4,821,096
23.4 4,821,095
24 4,821,081
30 4,821,091
34 4,821,082
38 4,821,083
43 4,821,090
45 4,821,084
67 4,821,085
68 4,821,089

CLASS 358

17 4,821,112
22 4,821,086
34 4,821,087
48 4,821,088
75 4,821,113
4,821,114
4,821,115
98 4,821,116
4,821,117
108 4,821,118
136 4,821,119
142 4,821,120
143 4,821,097
153 4,821,098
160 4,821,121
163 4,821,099
170 4,821,100
181 4,821,101
4,821,122
183 4,821,102
213.18 4,821,104
213.19 4,821,105
213.26 4,821,103
229 4,821,106
253 4,821,109
256 4,821,107
282 4,821,108
285 4,821,110
296 4,821,111

CLASS 360

31 4,821,125
66 4,821,123
4,821,126
4,821,127
72.2 4,821,128
74.4 4,821,129
78.04 4,821,130
103 4,821,131
108 4,821,132
113 4,821,133
122 4,821,134
132 4,821,135
133 4,821,124

CLASS 361

58 4,821,136
80 4,821,137
93 4,821,138
124 4,821,139
335 4,821,143
341 4,821,140
4,821,141
353 4,821,144
383 4,821,145
4,821,146
388 4,821,147
392 4,821,148
395 4,821,142
4,821,149
4,821,150
403 4,821,151
4,821,152
505 4,821,153

CLASS 362

20 4,821,154
65 4,821,155
83.1 4,821,019
187 4,821,156
241 4,821,157
249 4,821,158
285 4,821,159
354 4,821,160
364 4,821,161
408 4,821,162

CLASS 363

49 4,821,163
60 4,821,165
89 4,821,166
131 Re.32,904

CLASS 364

138 4,821,167
183 4,821,168
200 4,821,169
4,821,170
4,821,171
4,821,172
4,821,173
4,821,174
4,821,175
4,821,176
4,821,177
4,821,178
4,821,179
4,821,180
4,821,181
4,821,183
4,821,184
4,821,185
4,821,187
405 4,821,186
420 4,821,164
424.02 4,821,192
424.05 4,821,189
424.1 4,821,188
4,821,190
4,821,191
431.02 4,821,193
431.08 4,821,194
464.02 4,821,195
468 4,821,196
4,821,197
4,821,198
470 4,821,199
474.2 4,821,201
474.24 4,821,200
477 4,821,202
478 4,821,203
481 4,821,204
508 4,821,205
513 4,821,206
4,821,207
518 4,821,208
4,821,209
4,821,210
521 4,821,211
4,821,212
522 4,821,213
4,821,214
550 4,821,215
551.01 4,821,216
4,821,217
566 4,821,218
571.03 4,821,219
578 4,821,220
710.13 4,821,221
713 4,821,222
724.05 4,821,223
726 4,821,224
736.5 4,821,225
900 4,821,182
4,821,226
4,821,227
4,821,228
4,821,229
4,821,230
4,821,231

CLASS 365

177 4,821,235
185 4,821,236
189 4,821,232
4,821,237
201 4,821,238
203 4,821,233
4,821,234
205 4,821,239
228 4,821,240

CLASS 366

101 4,820,052
4,820,056
137 4,820,053
287 4,820,054

CLASS 367

20 4,821,241
53 4,821,242
153 4,821,243
159 4,821,244
175 4,821,245
189 4,821,246

CLASS 368

21 4,821,248
63 4,821,247
88 4,821,249
255 4,821,257

CLASS 369

18 4,821,250
44 4,821,251
48 4,821,252
54 4,821,253
4,821,254

CLASS 370

3 4,821,255
13 4,821,256
60 4,821,258
4,821,259
77 4,821,260
4,821,261
85 4,821,262
4,821,263
104 Re.32,905
110.1 4,821,264
4,821,265

CLASS 371

16 4,821,266
4,821,269
22 4,821,267
37 4,821,268
47 4,821,270
68 4,821,271

CLASS 372

3 4,821,272
31 4,821,273
43 4,821,274
45 4,821,275
4,821,276
4,821,277
46 4,821,278
61 4,821,279
87 4,821,280
94 4,821,281
99 4,821,282
104 4,821,283

CLASS 373

107 4,821,284

CLASS 374

141 4,820,057
152 4,821,285

CLASS 375

4 4,821,286
10 4,821,287
11 4,821,288
14 4,821,289
25 4,821,290
37 4,821,291
76 4,821,292
81 4,821,293
96 4,821,294
110 4,821,295
119 4,821,296
120 4,821,297
122 4,821,298

CLASS 376

203 4,820,474
4,820,476
272 4,820,472
305 4,820,473
310 4,820,477
327 4,820,058
4,820,475
333 4,820,478
446 4,820,479

CLASS 377

69 4,821,299
88 4,821,300

CLASS 378

70 4,821,301
73 4,821,302
80 4,821,303
86 4,821,304
136 4,821,305
156 4,821,306

CLASS 379

53 4,821,307
57 4,821,308
58 4,821,309
63 4,821,310
88 4,821,311
102 4,821,312
145 4,821,313
156 4,821,316
167 4,821,319
376 4,821,314
412 4,821,315
430 4,821,317
4,821,318
437 4,821,320

CLASS 380

54 4,821,321

CLASS 381

13 4,821,322
25 4,821,323
31 4,821,324
43 4,820,059
46 4,821,325
51 4,821,326
67 4,821,327
96 4,821,328
119 4,821,329
184 4,821,330
192 4,821,331

CLASS 382

7 4,821,332
49 4,821,333
50 4,821,334
53 4,821,335
56 4,821,336
58 4,821,337

CLASS 384

447 4,820,060
462 4,820,061
486 4,820,062

CLASS 400

76 4,820,063
120 4,820,064

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124 4,820,065
144.2 4,820,066
208 4,820,067
216.1 4,820,068
249 4,820,125
568 4,820,069

CLASS 401

87 4,820,070

CLASS 402

4 4,820,071
64 4,820,072
68 4,820,073
75 4,820,074
79 4,820,075

CLASS 403

284 4,820,076
402 4,820,077

CLASS 404

92 4,820,078

CLASS 405

23 4,820,079
45 4,820,080
132 4,820,081
168 4,820,082
169 4,820,083
186 4,820,084
288 4,820,085

CLASS 406

112 4,820,086

CLASS 408

9 4,820,087
17 4,820,088
111 4,820,089
241 R 4,820,090

CLASS 409

132 4,820,091
133 4,820,092

CLASS 410

107 4,820,093
4,820,094

CLASS 411

82 4,820,095
169 4,820,096
188 4,820,235
366 4,820,097
411 4,820,098

CLASS 412

37 4,820,099

CLASS 413

6 4,820,100

CLASS 414

21 4,820,101
200 4,820,105
217 4,820,106
261 4,820,107
282 4,820,109
301 4,820,108
458 4,820,110
534 4,820,111
704 4,820,112
736 4,820,113
751 4,820,114
788.9 4,820,102
790 4,820,103
791 4,820,104

CLASS 415

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115 4,820,116
142 4,820,117
161 4,820,118
172 A 4,820,119
189 4,820,120
202 4,820,121

CLASS 416

97 R 4,820,122
4,820,123
191 4,820,124
221 4,820,126
4,820,127
241 B 4,820,128

CLASS 417

18 4,820,129
32 4,820,130
83 4,820,131
222 4,820,132
269 4,820,133
336 4,820,134
391 4,820,135
397 4,820,136
566 4,820,137

CLASS 418

71 4,820,138
135 4,820,139
152 4,820,140
153 4,820,480

CLASS 419

3 4,820,481
8 4,820,141
15 4,820,482
23 4,820,483
49 4,820,484

CLASS 420

78 4,820,485
108 4,820,486
512 4,820,487
529 4,820,488

CLASS 422

56 4,820,489
58 4,820,490
63 4,820,491
4,820,497
111 4,820,492
143 4,820,493
145 4,820,494
148 4,820,495
197 4,820,496
310 4,820,499

CLASS 423

132 4,820,498
210 4,820,500
321 R 4,820,501
328 4,820,502
362 4,820,503

CLASS 424

3 4,820,504
9 4,820,505
40 4,820,506
54 4,820,507
59 4,820,508
61 4,820,509
63 4,820,510
70 4,820,511
4,820,512
84 4,820,513
85.4 4,820,514
85.7 4,820,515
94.62 4,820,516
195.1 4,820,517
401 4,820,518
412 4,820,519
439 4,820,520
458 4,820,521
468 4,820,522
469 4,820,523
474 4,820,524
486 4,820,525

CLASS 425

12 4,820,148
66 4,820,142
122 4,820,143
183 4,820,144
425 4,820,145
461 4,820,146
549 4,820,147
555 4,820,149

CLASS 426

2 4,820,526
4,820,527
3 4,820,528
7 4,820,529
40 4,820,530
52 4,820,531
74 4,820,532
76 4,820,533
96 4,820,534
272 4,820,535
412 4,820,536
481 4,820,537
533 4,820,538
581 4,820,539
582 4,820,540
586 4,820,541
636 4,820,542
650 4,820,543
660 4,820,544

CLASS 427

2 4,820,545
38 4,820,546
97 4,820,547
98 4,820,548
4,820,549
146 4,820,551
150 4,820,550
216 4,820,552
304 4,820,553
391 4,820,554
407.1 4,820,555

CLASS 428

7 4,820,556
34.3 4,820,558
34.5 4,820,561
34.6 4,820,562
34.9 4,820,557
35.1 4,820,560
35.8 4,820,563
36.1 4,820,559
63 4,820,564
64 4,820,565
88 4,820,566
105 4,820,567
113 4,820,568
124 4,820,569
140 4,820,570
225 4,820,571
227 4,820,572
228 4,820,573
4,820,577
234 4,820,574
240 4,820,575
246 4,820,576
291 4,820,578
304.4 4,820,579
314.4 4,820,580
323 4,820,581
328 4,820,582
333 4,820,583
336 4,820,584
360 4,820,585
403 4,820,587
421 4,820,586
422 4,820,588
4,820,589
516 4,820,590
628 4,820,591
692 4,820,592
698 4,820,593

CLASS 429

17 4,820,594
27 4,820,595
50 4,820,596
4,820,597
62 4,820,598
194 4,820,599

CLASS 430

45 4,820,618
58 4,820,600
4,820,601
72 4,820,602
84 4,820,620
106.6 4,820,603
110 4,820,604
115 4,820,605
139 4,820,606
190 4,820,607
197 4,820,619
213 4,820,608
270 4,820,609
4,820,610
271 4,820,611
315 4,820,612
331 4,820,621
351 4,820,622
376 4,820,623
496 4,820,613
505 4,820,614
531 4,820,615
543 4,820,616
567 4,820,624
570 4,820,617
596 4,820,625

CLASS 432

121 4,820,150

CLASS 433

17 4,820,151
86 4,820,152
118 4,820,153
128 4,820,154
136 4,820,155
165 4,820,156
180 4,820,157
182 4,820,158
225 4,820,159
229 4,820,160

CLASS 434

16 4,820,161
45 4,820,162
81 4,820,163
238 4,820,164
276 4,820,165
336 4,820,167
376 4,820,166

CLASS 435

1 4,820,626
4 4,820,627
4,820,628
5 4,820,629
4,820,630
4,820,631
6 4,820,632
7 4,820,633
4,820,634
4,820,635
14 4,820,636
29 4,820,637
32 4,820,292
68 4,820,638
4,820,639
211 4,820,640
240.27 4,820,641
252.33 4,820,642

CLASS 436

37 4,820,643
55 4,820,645
66 4,820,646
79 4,820,647
89 4,820,648
501 4,820,649
518 4,820,644

CLASS 437

10 4,820,650
22 4,820,651
52 4,820,652
62 4,820,653
067 4,820,654
129 4,820,655
169 4,820,656
172 4,820,657
209 4,820,658
4,820,659

CLASS 439

33 4,820,168
65 4,820,169
66 4,820,170
75 4,820,171
76 4,820,172
79 4,820,173
95 4,820,174
98 4,820,175
152 4,820,176
207 4,820,177
212 4,820,178
224 4,820,179
248 4,820,180
272 4,820,181
290 4,820,182
310 4,820,183
321 4,820,184
4,820,185
326 4,820,186
359 4,820,187
395 4,820,188
4,820,189
4,820,190
402 4,820,191
404 4,820,192
488 4,820,193
510 4,820,194
4,820,195
519 4,820,196
535 4,820,197
595 4,820,198
599 4,820,199
607 4,820,200
610 4,820,201
620 4,820,202
4,820,203
681 4,820,204
733 4,820,205
782 4,820,206
825 4,820,207

CLASS 440

7 4,820,208
74 4,820,209
75 4,820,210
83 4,820,211
88 4,820,212
4,820,213
4,820,214
4,820,215
101 4,820,216

CLASS 441

5 4,820,217
64 4,820,218
66 4,820,219
74 4,820,220
106 4,820,221

CLASS 445

3 4,820,222
6 4,820,223
23 4,820,224
43 4,820,225
55 4,820,226
66 4,820,227
67 4,820,228

CLASS 446

26 4,820,229
48 4,820,230
73 4,820,231
178 4,820,232
303 4,820,233
321 4,820,234
369 4,820,236

CLASS 453

61 4,820,237

CLASS 455

617 4,821,338

CLASS 464

15 4,820,238
68 4,820,239
145 4,820,240
183 4,820,241

CLASS 474

8 4,820,242
43 4,820,243
56 4,820,244
140 4,820,245
174 4,820,246
255 4,820,247
268 4,820,248

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59 4,820,253
192 4,820,249
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414 4,820,250
440 4,820,252
451 4,820,255

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73 4,820,662
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95 4,820,664
97 4,820,665
104 4,820,666
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134 4,820,668
4,820,669
136 4,820,670

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53 4,820,671
115 4,820,672
167 4,820,673
169 4,820,674
216 4,820,675
220 4,820,676
4,820,677
303 4,820,678
314 4,820,679
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418 4,820,681

CLASS 503

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212 4,820,684
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4,820,687

CLASS 505

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12 4,820,690
19 4,820,691
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4,820,695
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212 4,820,702
220 4,820,703
232.8 4,820,708
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654 4,820,737
656 4,820,738
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83 4,820,772
88 4,820,755
93 4,820,757
289 4,820,756
413 4,820,759
423 4,820,760
456 4,820,761
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505 4,820,763
512 4,820,764
606 4,820,765
843 4,820,766

CLASS 525

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92 4,820,768
113 4,820,769
133 4,820,770
183 4,820,771
208 4,820,774
247 4,820,775
274 4,820,773
279 4,820,776
291 4,820,777
329.9 4,820,778
351 4,820,780
431 4,820,781
454 4,820,782
474 4,820,783
481 4,820,784
533 4,820,779

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105 4,820,785
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125 4,820,790
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363 4,820,799
388 4,820,800
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307 4,820,804
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565 4,820,807
605 4,820,806
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765 4,820,809

CLASS 536

4.1 4,820,810

21 4,820,811
27 4,820,812
84 4,820,813
127 4,820,814

CLASS 540

200 4,820,815
205 4,820,816
4,820,832
220 4,820,833
350 4,820,817
504 4,820,834
577 4,820,835
586 4,820,818

CLASS 544

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224 4,820,821
239 4,820,819
268 4,820,838
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118 4,820,822
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252 4,820,843
266 4,820,844
362 4,820,847
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420 4,820,846
422 4,820,824
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87 4,820,849
214 4,820,758
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167 4,820,855
249 4,820,856
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483 4,820,859

CLASS 560

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124 4,820,864
158 4,820,830
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347 4,820,866

CLASS 562

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55 4,820,871
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CLASS 568

33 4,820,831
350 4,820,874
360 4,820,875
494 4,820,876
659 4,820,878
697 4,820,877
715 4,820,882
851 4,820,879
861 4,820,880
947 4,820,881

CLASS 570

153 4,820,883
156 4,820,884

CLASS 600

1 4,820,258
7 4,819,618
28 4,819,616

CLASS 604

2 4,820,259
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385.1 4,820,295
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409 4,820,297

CLASS 623

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2 4,820,299
3 4,820,300
4,820,301
8 4,820,302
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9 4,820,304
16 4,820,305
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635 300,581
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72 300,583
D4— 132 300,584
D6— 366 300,585
372 300,586
379 300,587
300,588
407 300,589
408 300,590
481 300,591
491 300,592
569 300,593
D7— 70 300,594
307 300,595
309 300,596
300,597
360 300,598
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98 300,600
107 300,601
303 300,602
356 300,603
367 300,604
380 300,605
D9— 369 300,606
438 300,607
300,608
D10— 60 300,609
98 300,610
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D11— 44 300,612
75 300,613
87 300,614
158 300,615
300,616
D12— 83 300,617
97 300,618
112 300,619
133 300,620
149 300,621
300,622
156 300,623
D13— 11 300,624
24 300,625
28 300,626
D14— 131 300,630
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138 300,630
151 300,628
205 300,627
250 300,629
257 300,634
300,635
D15— 10 300,636
199 300,637
D17— 20 300,638
D19— 34.1 300,639
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D20— 10 300,642
D21— 114 300,643
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173 300,646
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194 300,648
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D26— 7 300,665
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D27— 102 300,672
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D29— 20 300,676
D32— 1 300,677
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P.— 18 6,725
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Robert A. Mosbacher, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changes effective Apr. 17, 1989 and were announced in the Official Gazette at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	660.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

Mar. 29, 1989.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on April 15, 1986 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,581,771 through 4,583,245
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 13, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,324,003 through 4,325,147
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and 7 years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant . . . $ 495.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 245.00
By other than a small entity . . . . . $ 490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 495.00
By other than a small entity . . . . . $ 990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 60.00
By other than a small entity . . . . . $ 120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JANUARY 29, 1989, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,495,659	06/547,754	1/29/85
4,495,660	06/484,898	1/29/85
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4,495,702	06/411,431	1/29/85
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Patent Number	Serial Number	Issue Date	4,496,462	06/541,965	1/29/85
			4,496,463	06/559,556	1/29/85
4,496,019	06/389,954	1/29/85	4,496,465	06/604,463	1/29/85
4,496,021	06/467,736	1/29/85	4,496,466	06/604,464	1/29/85
4,496,022	06/468,850	1/29/85	4,496,497	06/496,183	1/29/85
4,496,025	06/495,145	1/29/85	4,496,503	06/527,911	1/29/85
4,496,028	06/581,737	1/29/85	4,496,509	06/488,722	1/29/85
4,496,033	06/334,707	1/29/85	4,496,510	06/550,576	1/29/85
4,496,039	06/552,018	1/29/85	4,496,518	06/300,151	1/29/85
4,496,041	06/384,688	1/29/85	4,496,519	06/241,597	1/29/85
4,496,043	06/414,375	1/29/85	4,496,520	06/380,321	1/29/85
4,496,047	06/601,114	1/29/85	4,496,522	06/482,314	1/29/85
4,496,053	06/427,557	1/29/85	4,496,528	06/480,037	1/29/85
4,496,054	06/601,724	1/29/85	4,496,529	06/622,365	1/29/85
4,496,058	06/499,993	1/29/85	4,496,530	06/448,581	1/29/85
4,496,059	06/253,613	1/29/85	4,496,531	06/448,883	1/29/85
4,496,075	06/431,347	1/29/85	4,496,533	06/438,814	1/29/85
4,496,083	06/378,439	1/29/85	4,496,539	06/344,497	1/29/85
4,496,086	06/375,228	1/29/85	4,496,547	06/451,396	1/29/85
4,496,088	06/543,827	1/29/85	4,496,557	06/408,451	1/29/85
4,496,090	06/356,813	1/29/85	4,496,559	06/298,679	1/29/85
4,496,091	06/425,394	1/29/85	4,496,560	06/408,676	1/29/85
4,496,092	06/380,678	1/29/85	4,496,575	06/501,034	1/29/85
4,496,093	06/501,122	1/29/85	4,496,576	06/531,064	1/29/85
4,496,096	06/427,366	1/29/85	4,496,577	06/539,197	1/29/85
4,496,104	06/380,992	1/29/85	4,496,587	06/488,528	1/29/85
4,496,116	06/525,308	1/29/85	4,496,590	06/485,936	1/29/85
4,496,120	06/330,980	1/29/85	4,496,602	06/547,894	1/29/85
4,496,127	06/397,030	1/29/85	4,496,613	06/457,551	1/29/85
4,496,131	06/498,021	1/29/85	4,496,615	06/550,132	1/29/85
4,496,137	06/396,805	1/29/85	4,496,621	06/498,735	1/29/85
4,496,139	06/508,340	1/29/85	4,496,655	06/454,060	1/29/85
4,496,143	06/384,064	1/29/85	4,496,672	06/413,145	1/29/85
4,496,148	06/329,140	1/29/85	4,496,678	06/612,278	1/29/85
4,496,149	06/440,544	1/29/85	4,496,700	06/521,452	1/29/85
4,496,150	06/398,597	1/29/85	4,496,710	06/583,229	1/29/85
4,496,151	06/440,781	1/29/85	4,496,723	06/506,731	1/29/85
4,496,154	06/406,811	1/29/85	4,496,728	06/419,842	1/29/85
4,496,155	06/415,923	1/29/85	4,496,735	06/469,475	1/29/85
4,496,163	06/289,346	1/29/85	4,496,737	06/432,219	1/29/85
4,496,164	06/324,436	1/29/85	4,496,738	06/389,935	1/29/85
4,496,171	06/426,610	1/29/85	4,496,748	06/404,984	1/29/85
4,496,182	06/433,884	1/29/85	4,496,753	06/535,903	1/29/85
4,496,188	06/457,725	1/29/85	4,496,770	06/479,475	1/29/85
4,496,199	06/541,045	1/29/85	4,496,777	06/549,891	1/29/85
4,496,212	06/466,742	1/29/85	4,496,778	06/538,190	1/29/85
4,496,213	06/437,738	1/29/85	4,496,796	06/514,822	1/29/85
4,496,218	06/391,817	1/29/85	4,496,798	06/523,544	1/29/85
4,496,228	06/426,262	1/29/85	4,496,801	06/433,720	1/29/85
4,496,229	06/517,283	1/29/85	4,496,803	06/491,454	1/29/85
4,496,253	06/486,696	1/29/85	4,496,804	06/521,697	1/29/85
4,496,270	06/422,456	1/29/85	4,496,816	06/491,361	1/29/85
4,496,272	06/491,084	1/29/85	4,496,818	06/570,194	1/29/85
4,496,285	06/527,738	1/29/85	4,496,826	06/466,216	1/29/85
4,496,289	06/427,265	1/29/85	4,496,874	06/376,807	1/29/85
4,496,290	06/424,960	1/29/85	4,496,894	06/590,507	1/29/85
4,496,291	06/321,089	1/29/85	4,496,901	06/379,101	1/29/85
4,496,300	06/486,885	1/29/85	4,496,909	06/470,522	1/29/85
4,496,305	06/522,522	1/29/85	4,496,917	06/422,430	1/29/85
4,496,313	06/423,247	1/29/85	4,496,925	06/419,395	1/29/85
4,496,320	06/525,447	1/29/85	4,496,930	06/499,347	1/29/85
4,496,329	06/489,710	1/29/85	4,496,938	06/326,392	1/29/85
4,496,331	06/342,414	1/29/85	4,496,946	06/424,870	1/29/85
4,496,332	06/352,307	1/29/85	4,496,948	06/382,125	1/29/85
4,496,337	06/511,188	1/29/85	4,496,959	06/417,897	1/29/85
4,496,351	06/502,585	1/29/85	4,496,971	06/393,880	1/29/85
4,496,389	06/609,263	1/29/85	4,496,992	06/341,635	1/29/85
4,496,390	06/398,337	1/29/85	4,496,994	06/392,303	1/29/85
4,496,393	06/459,539	1/29/85	4,496,999	06/416,568	1/29/85
4,496,394	06/514,023	1/29/85	4,497,011	06/459,601	1/29/85
4,496,396	06/531,275	1/29/85	4,497,012	06/551,575	1/29/85
4,496,408	06/479,624	1/29/85	4,497,016	06/554,636	1/29/85
4,496,421	06/511,986	1/29/85	4,497,025	06/367,087	1/29/85
4,496,431	06/410,586	1/29/85	4,497,030	06/255,621	1/29/85
4,496,447	06/451,673	1/29/85	4,497,045	06/255,378	1/29/85
4,496,450	06/594,828	1/29/85	4,497,049	06/467,938	1/29/85
4,496,457	06/422,848	1/29/85	4,497,053	06/366,832	1/29/85

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,390,704	06/281,042	6/28/83	7/7/81	3/8/89
4,432,078	06/226,891	2/14/84	1/21/81	3/8/89
4,434,751	06/333,801	3/6/84	12/23/81	3/8/89
4,436,487	06/393,511	3/13/84	6/29/82	3/8/89
4,448,255	06/408,764	5/15/84	8/17/82	3/8/89
4,451,049	06/375,397	5/29/84	5/6/82	3/8/89
4,452,995	06/364,590	6/5/84	4/2/82	3/8/89
4,454,642	06/362,203	6/19/84	3/26/82	3/8/89
4,484,543	06/499,344	11/27/84	5/31/83	3/8/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,641,720, Re. S.N. 307,790, Filed Feb. 7, 1989, Cl. 180/6.24, MOTORIZED WHEEL CHAIR, Alva L. Young, Owner of Record: *Sinties Corp., Tulsa, Okla.*, Attorney or Agent: Bill D. McCorthy, Ex. Gp.: 316

4,642,047, Re. S.N. 306,816, Filed Feb. 3, 1989, Cl. 432/013, METHOD AND APPARATUS FOR FLAME GENERATION AND UTILIZATION OF THE COMBUSTION PRODUCT FOR HEATING, MELTING AND REFINING, Grigory M. Gitman, Owner of Record: *American Combustion Inc., Norcross, Ga.*, Attorney or Agent: Sumner C. Rosenberg, Ex. Gp.: 344

4,646,754, Re. S.N. 319,340, Filed Mar. 3, 1989, Cl. 128/774, NON-INVASIVE DETERMINATION OF MECHANICAL CHARACTERISTICS IN THE BODY, Joseph B. Seale, Owner of Record: *Inventor,* Attorney or Agent: Peter J. Devlin, Ex. Gp.: 335

4,646,771, Re. S.N. 317,933, Filed Mar. 2, 1989, Cl. 137/013, ONE-STEP SYSTEM FOR TRANSFORMING A WATER-IN-OIL EMULSION INTO AN OIL-IN-WATER EMULSION, R. Srinivas Prasad, et al., Owner of Record: *Occidental Petroleum Corp., Los Angeles, Calif.*, Attorney or Agent: John P. Grinnell, Ex. Gp.: 347

4,648,530, Re. S.N. 318,173, Filed Feb. 28, 1989, Cl. 221/034, AUTOMATIC DISPENSER OF PRE-CUT AND Z-WRAPPED OR FOLDED WEB MATERIALS, Maurice Granger, Owner of Record: *Inventor,* Attorney or Agent: Eric P. Schellin, Ex. Gp.: 311

4,696,565, Re. S.N. 311,285, Filed Feb. 15, 1989, Cl. 355/15, CLEANING DEVICE FOR A MONOCHROMATIC COPY MACHINE, Yoshiaki Imanaka, Owner of Record: *Matsushita Electric Industrial Co., Osaka, Japan,* Attorney or Agent: Terrell C. Brich, Ex. Gp.: 215

4,705,038, Re. S.N. 312,878, Filed Feb. 17, 1989, Cl. 128/305, SURGICAL SYSTEM FOR POWERED INSTRUMENTS, Douglas D. Sjostrom, et al., Owner of Record: *Dyonics Inc., Andover, Mass.*, Attorney or Agent: Robert E. Hillman, Ex. Gp.: 336

4,721,412, Re. S.N. 316,310, Filed Feb. 24, 1989, Cl. 405/195, OFFSHORE SAFETY ESCAPE PLATFORM, Steve Jennings, et al., Owner of Record: *Robert D. King, Houston, Tex.*, Attorney or Agent: Guy E. Matthews, Ex. Gp.: 351

4,741,983, Re. S.N. 311,283, Filed Feb. 16, 1989, Cl. 430/93, DUAL DYE SENSITIZED ELECTROPHOTOGRAPHIC ZINC OXIDE, Leonard Skuby, Owner of Record: *AM International Inc., Chicago, Ill.*, Attorney or Agent: James P. Zeller, Ex. Gp.: 156

4,744,737, Re. S.N. 312,197, Filed Feb. 14, 1989, Cl. 418/055, ELECTRICALLY DRIVEN COMPRESSOR WITH A PERIPHERAL HOUSING WELD, Michio Yamamura, et al., Owner of Record: *Matsushita Electric Industrial, Osaka, Japan,* Attorney or Agent: Michael Stone, Ex. Gp.: 343

4,747,691, Re. S.N. 310,215, Filed Feb. 14, 1989, Cl. 366/160, METHOD AND APPARATUS FOR DILUTING AND ACTIVATING POLYMER, Robert O. Hofland, Owner of Record: *Inventar,* Attorney or Agent: Richard L. Moseley, Ex. Gp.: 242

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 290,339, Reexam. No. 90/001,725, Requested: Mar. 2, 1989, Cl. D8/354, WIRE ROPE SOCKET, Archie J. Lowery, Owner of Record: *Inventar, Marrero, La.*, Attorney or Agent: O'Brien & Jacobson, Ex. Gp.: 290, Requester: J. S. Egbert, Houston, Tex.

4,163,482, Reexam. No. 90/001,723, Requested: Feb. 28, 1989, Cl. 188/24, CENTER-PULL CALLIPER BRAKES FOR BICYCLES AND THE LIKE, Rene Lauzier, Owner of Record: *Angenieux CLB S.A., Loire, France,* Attorney or Agent: Browdy & Niemark, Ex. Gp.: 310, Requester: Stevens, Davis, et al., Alexandria, Va.

4,194,509, Reexam. No. 90/001,721, Requested: Feb. 24, 1989, Cl. 128/350, PRECONNECTED CATHETER DRAINAGE SYSTEM, Keldon S. Pickering, et al., Owner of Record: *C. R. Bard Inc., Murray Hills, N.J.*, Attorney or Agent: Dennison, Dennison, et al., Ex. Gp.: 330, Requester: The Kendall Co., Boston, Mass.

4,626,895, Reexam. No. 90/001,724, Requested: Mar. 1, 1989, Cl. 358/31, SAMPLED DATA VIDEO SIG-

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NAL CHROMINANCE/LUMINANCE SEPARATION SYSTEM, Glen Reitmeir, Owner of Record: *RCA Licensing Corp., Princeton, N.J.*, Attorney or Agent: Eugene Whitcarce, Ex. Gp.: 260, Requester: John R. Inge, Washington, D.C.,

4,664,913, Reexam. No. 90/001,722, Requested: Feb. 27, 1989, Cl. 424/101, METHOD FOR TREATING PLASMA FOR TRANSFUSION, Harold Mielke, et al., Owner of Record: *Xoma Corp., San Francisco, Calif.*, Attorney or Agent: A. Hillman, Ex. Gp.: 180, Requester: Chembiomed Ltd., Edmonton, Alberta, Canada,

4,770,368, Reexam. No. 90/001,726, Requested: Mar 3, 1989, Cl. 244/1, TURBINE AIR VENT REELING MACHINE, John S. Yates, Owner of Record: *Southwest Aerospace Corp., Santa Ana, Calif.*, Attorney or Agent: Stetina & Brunda, Ex. Gp.: 310, Requester Teledyne Brown Engineering, Ind., Huntsville, Ala.,

Errata

"All reference to Patent No. 4,808,945 to Fred D. Waldhauer, et al. of CA. for VARIOLOSSER appearing in the Official Gazette of Feb. 28, 1989 should be deleted since no patent was granted."

"All reference to Patent No. 4, 810,323 to Kent S. Tarbutton, et al. of Minn for EPOXY RESIN COMPOSITION appearing in the Official Gazette of Mar. 7, 1989 should be deleted since no patent was granted."

Patent Terms Extended Under 35 USC 156

Certificates extending the terms of the following patents were issued on Mar. 27, 1989.

Patent No. 4,375,547, granted Mar. 1, 1983, to Richard P. Poich, Owner of Record: Eli Lilly and Co., Title:N-METHYL-N''-2-([2-DIMETHYLAMINOMETHYL)-4-THIAZOLYL] METHYLTHIO)ETHYL 2-NITRO-1, 1-ETHENEDIAMINE Classification: 548-205, Product Trade Name: Axid, Term Extended: 2 years

Patent No. 4,146,029, granted Mar. 27, 1979, to Everett H. Elling wood, Jr., Owner of Record: Biomedical Systems Institute, Inc., Title: SELF-POWERED IMPLANTED PROGRAM MABLE MEDICATION SYSTEM AND METHOD, Classification: 604-891.1, Product Trade Name: Synchromed Infu sion Pump, Term Extended: 2 years

An interim extension under 35 U.S.C. §156(e)(2) of the term of U.S. Patent 3,652,762 has been granted for a period of one year from the original expiration date of the patent. The drug product approved by the Food and Drug Administration is VOLTAREN (diclofenec sodium).

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representitives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Omega Precision Hand tools, Inc., New Hyde Park, N.Y., Reg. No. 1,036,106, for the mark "OMEGA", Canc. No. 17,278.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks

Patent Attorney
Office of the Solicitor

The Office of the Solicitor, U.S. Patent and Trademark Office, has several attorney openings, GS 11-15 ($28,852-74,303). Stimulating work includes representing the Commissioner before the U.S. Court of Appeals for the Federal Circuit and other federal courts. Minimum of three years patent examining and/or equivalent prosecution experience is required and candidate must also be admitted to practice before the highest court of any state or D.C. Send resume or form SF 171 with two legal writing samples to: Solicitor, U.S. Patent and Trademark Office, Box 8, Washington, D.C. 20231.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 18, 1989

PP. 6,548	4,755,996	4,775,502	4,782,433
Re. 32,751	4,756,710	4,775,824	4,782,519
D. 298,626	4,756,780	4,775,877	4,782,807
4,300,090	4,757,036	4,775,908	4,782,870
4,524,405	4,757,878	4,776,591	4,783,414
4,577,567	4,758,673	4,776,615	4,783,784
4,614,708	4,759,965	4,776,662	4,783,807
4,642,425	4,760,633	4,777,169	4,783,812
4,678,235	4,762,793	4,777,311	4,784,052
4,690,938	4,763,050	4,777,336	4,784,146
4,691,171	4,763,799	4,777,546	4,784,298
4,697,244	4,764,296	4,777,771	4,784,409
4,699,012	4,764,518	4,777,877	4,784,562
4,701,746	4,765,793	4,777,935	4,785,338
4,703,659	4,765,874	4,777,942	4,785,365
4,704,501	4,766,108	4,778,325	4,785,806
4,709,209	4,766,135	4,778,525	4,785,963
4,712,183	4,766,377	4,778,549	4,786,115
4,721,693	4,767,467	4,778,552	4,786,178
4,722,818	4,767,858	4,778,598	4,786,187
4,724,204	4,768,066	4,778,966	4,786,268
4,724,385	4,768,739	4,778,969	4,786,532
4,728,528	4,769 352	4,779,024	4,787,227
4,731,679	4,769,931	4,779,087	4,787,495
4,732,134	4,770,034	4,779,155	4,787,500
4,735,154	4,770,138	4,779,156	4,787,817
4,736,391	4,770,815	4,779,207	4,787,850
4,737,034	4,771,037	4,779,256	4,787,982
4,738,061	4,771,630	4,779,340	4,788,217
4,738,908	4,771,763	4,779,384	4,788,574
4,740,046	4,772,591	4,779,413	4,788,584
4,741,583	4,774,129	4,780,092	4,788,652
4,743,942	4,774,136	4,780,432	4,788,869
4,744,314	4,774,376	4,780,537	4,789,271
4,746,497	4,774,380	4,781,213	4,790,552
4,748,620	4,774,728	4,781,446	4,791,090
4,749,718	4,774,852	4,782,004	4,791,474
4,752,745	4,774,966	4,782,193	4,794,504
4,754,823	4,775,445	4,782,263	4,801,559

Disclaimers

3,873,303.—*Robert J. Theissen*, Westfield, N.J. HERBICIDAL USE AND COMPOSITION OF HALOPHENOXY BENZAMIDES. Patent dated Mar. 25, 1975. Disclaimer filed Oct. 17, 1988, by the assignee, *Rhone-Poulenc Agrochimie.*

Hereby enters this disclaimer to claims 1, 2, 3, 5, 6, 8, 9, 10, 12, and 13 of said patent.

4,388,935.—*Andrew N. Napolitane*, New York, N.Y. HINGELESS COMPACT. Patent dated June 21, 1983. Disclaimer filed Nov. 23, 1988, by the *inventor.*

The term of this patent subsequent to Apr. 12, 1997, has been disclaimed.

4,575,575.—*Charles A. Drake*; *Robert E. Reusser*, both of Bartlesville, Okla. CATALYSTS AND PROCESS FOR OLEFIN CONVERSION. Patent dated Mar. 11, 1986. Disclaimer filed Jan. 30, 1989, by the assignee, *Phillips Petroleum Co.*

Hereby enters this disclaimer to all claims of said patent.

4,708,095.—*Garry M. Luterek*, Waterloo, Iowa. COMBINED ENGINE COOLING AND LUBE SYSTEM. Patent dated Nov. 24, 1987. Disclaimer filed Feb. 16, 1989, by the assignee, *Deere & Co.*

Hereby enters this disclaimer to claim 1 of said patent.

4,773,382.—*Richard W. Smith, Jr.*; *Michael E. Smith*, both of Wooster, Ohio. HEAD FOR HIGH PERFORMANCE INTERNAL COMBUSTION ENGINE. Patent dated Sept. 27, 1988. Disclaimer filed Feb. 24, 1989, by the assignee, *TFS, Inc.*

The term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Dedication

4,710,663.—*Stephen R. Reid*, Winter Springs, Fla. DYNAMOELECTRIC MACHINE COIL SLOT WEDGE MOUNTING ARRANGEMENT. Patent dated Dec. 1, 1987. Dedication filed Feb. 3, 1989, by the assignee, *Westinghouse Electric Corp.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

Re. 32,774.—*James M. Duff*, Sequim, Wash. AXLE ALIGNMENT BUSHING. Patent dated Nov. 1, 1988. Disclaimer and Dedication filed Feb. 21, 1989, by the *inventor.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

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PATENT APPLICATION	New patent application and associated papers and fees.
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North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 11, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	8-21-86
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	11-24-86
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	12-18-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	7-7-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	8-12-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during February 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,638,239 to 3,646,613, inclusive

Plant Patents . . . . . None

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REEXAMINATIONS

APRIL 18, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 30,759 (1032nd)
METHOD AND APPARATUS FOR PRODUCING AND TRANSPORTING SINGLE AND MULTILAYER CHIPBOARDS
Wolfgang Burkner, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany
Reexamination Request No. 90/001,098, Sep. 24, 1986.
Reexamination Certificate for Reissue Patent Re. 30,759, issued Oct. 6, 1981, Ser. No. 115,117, Jan. 24, 1980.
Original No. 3,542,629, dated Nov. 24, 1970, Ser. No. 719,924, Claims priority, application Fed. Rep. of Germany, Apr. 11, 1967, 40517
Int. Cl.[4] B27N *3/16;* **B30B** *7/02, 15/30, 15/34*
U.S. Cl. 264—118



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

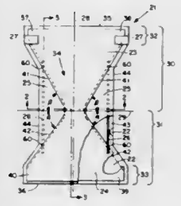
The patentability of claims **10–12** and **14–16** is confirmed.

Claims **1–9** and **13** were previously cancelled.

15. Method of producing and transporting chipboards of material consisting primarily of wood particles, chips, fibers or the like and a binding agent which comprises conveying a plurality of elongated cauls each of which has a main body portion of screen-like metal cloth construction and a ledge at the leading edge thereof extending beyond the main body portion, end to end sequentially past a material dispensing station with the ledge of one caul overlapping the trailing edge of the immediately preceeding caul in the conveying direction, continuously spreading material dispensed from the device over the cauls so as to form a continuous mat of the material thereon, transversely severing the mat to form lengths thereof on the respective cauls corresponding substantially to the ultimate length of the chipboard to be formed, feeding the severed mat portions together with the respective cauls into a multitier heating press, subjecting the mat portions and cauls to pressure and heat in the heating press to form the mat portions into chipboards, withdrawing the chipboards and respective cauls together from the heating press, separating the chipboards from the cauls and continuously reconveying the cauls in closed circuit past the material dispensing device.

16. Apparatus for producing and transporting chipboards of material consisting primarily of wood particles, chips, fibers or the like and a binding agent, comprising a material-dispensing device, a plurality of elongated cauls, each of which has a main body portion of screen-like metal cloth construction and a ledge at the leading edge thereof extending laterally beyond said main body portion, main conveyor means for conveying said cauls end-to-end sequentially past said material-dispensing device so that material is continuously spread from said device over said cauls to form a continuous mat of the material thereon, severing means located adjacent said main conveyor means downstream from said material-dispensing device for transversely severing the mat into lengths thereof on the respective cauls corresponding substantially to the ultimate length of the chipboard to be formed, a multitier heating press located downstream from said severing means for receiving said mat portions and respective cauls therein and subjecting them to heat and pressure to form the mat portions into chipboards, a multitier supply cage for feeding said mat portions and respective cauls to said heating press, means for withdrawing the chipboards and respective cauls together from said heating press, means for separating the chipboards from the respective cauls, and conveyor means for reconveying said cauls in a closed cycle past said material-dispensing device.

B1 3,860,003 (1033rd)
CONTRACTABLE SIDE PORTIONS FOR DISPOSABLE DIAPER
Kenneth B. Buell, Cincinnati, Ohio, assignor to The Proctor & Gamble Co., Cincinnati, Ohio
Reexamination Request No. 90/001,349, Oct. 13, 1987.
Reexamination Certificate for Patent No. 3,860,003, issued Jan. 14, 1975, Ser. No. 418,147, Nov. 21, 1973.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

1. In an integral disposable diaper having a backsheet and a semi-rigid absorbent body superposed on and associated with the backsheet, an improvement, comprising:

a. a flexible side flap extending outwardly from and along each lateral edge of the absorbent body, the side flap being in the crotch area of the diaper,

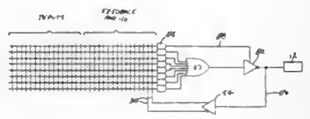
b. an elastic member secured to the side flap in an elastically contractable condition, the elastic member being effective to gather the side flap thereby providing an elasticized contractable line through the side flap;

c. the portion of the elasticized contractable line in the crotch area being spaced outwardly from the lateral edge of the semi-rigid absorbent body at least ¾ inch;

whereby effective elastic side flaps are formed on the integral diaper and the side flaps being compliant and forming effective seals about an infant's leg.

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B2 4,124,899 (1034th)
PROGRAMMABLE ARRAY LOGIC CIRCUIT
John M. Birkner, Santa Clara, and Hua-Thye Chua, Cupertino, both of Calif., assignors to Monolithic Memories, Inc., Sunnyvale, Calif.
Reexamination Request No. 90/001,527, Jun. 16, 1988.
Reexamination Certificate for Patent No. 4,124,899, issued Nov. 7, 1978, Ser. No. 799,509, May 23, 1977.
Reexamination Certificate B1 4,124,899, issued Apr. 28, 1987.
Int. Cl.[4] H03K *19/20*
U.S. Cl. 364—716



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4–6**, **10–12** and **15–21** is confirmed.

Claims **1–3**, **7–9**, **13** and **14** were previously cancelled.

16. A programmable integrated logic circuit array comprising:
(a) a plurality of logical AND gates, each AND gate having a plurality of inputs and an output;
(b) a matrix comprising the inputs to said logical AND gates and a plurality of input lines;
(c) means for selectively connecting desired input lines with desired logical AND gate inputs;
(d) a plurality of logical OR gates;
(e) means for connecting outputs from said logical AND gates to inputs to said OR gates;
(f) gating means connected to the output of at least one of said OR gates;
(g) feedback means for connecting the output of each of the gating means to selected ones of said input lines; and
(h) means for gating each of said gating means to either disable or enable said OR gate; said feedback means being operable as an input line when said OR gate is disabled.

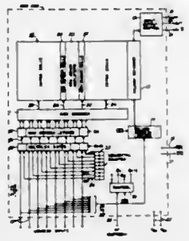
B1 4,207,618 (1035th)
ON-CHIP REFRESH FOR DYNAMIC MEMORY
Lionel S. White, Jr., and G. R. Mohan Rao, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Reexamination Request No. 90/001,563, Jul. 21, 1988.
Reexamination Certificate for Patent No. 4,207,618, issued Jun. 10, 1980, Ser. No. 918,891, Jun. 26, 1978.
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—222

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

New claims **11–22** are added and determined to be patentable.

1. A semiconductor memory device comprising an array of memory cells in a single integrated circuit formed in a semiconductor body, the memory device having a refresh address counter included within said body along with means for incrementing the counter and addressing means for alternatively



receiving an address from inputs to the device or from the counter and for accessing the array using said address.

B1 4,394,956 (1036th)
ELECTRIC STOCK PROD
James S. Andrews, Westminster, and Leonard L. Hierath, Denver, both of Colo., assignors to The Magrath Company, McCook, Nebr.
Reexamination Request No. 90/001,470, Mar. 14, 1988.
Reexamination Certificate for Patent No. 4,394,956, issued Jul. 26, 1983, Ser. No. 62,450, Jul. 30, 1979.
Continuation of Ser. No. 754,341, Dec. 27, 1976, abandoned.
Int. Cl.[4] B68B *11/00;* **F41B** *15/04*
U.S. Cl. 231—7



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **10–15** and **20–23** is confirmed.

Claims **1**, **4** and **16** are determined to be patentable as amended.

Claims **2**, **3**, **5–9** and **17–19**, dependent on an amended claim, are determined to be patentable.

New claims **24–28** are added and determined to be patentable.

1. A head for an electric animal prod or the like comprising a body of insulating material having a width substantially greater than its thickness and having a shaft attaching means at its rear end adapted to receive a shaft extending rearwardly thereof, *in fixed relationship thereto, said attaching means holding said head and shaft substantially rigid with respect to one another,* a pair of spaced electric contact tips secured to and projecting forwardly from the front end of said body, the front end of said body having a configuration between said tips providing a long insulated path between said tips having a length substantially greater than the spacing between said tips, said body being adapted to be placed laterally against an animal *in substantial facial engagement,* with said tips in position for simultaneous electrical contact with the animal.

B1 4,426,860 (1037th)
LOCK AND KEY SYSTEM OF THE PLUNGER TYPE
James Swisher, Box 248, Southport, Conn. 06490
Reexamination Request No. 90/001,422, Jan. 19, 1988.
Reexamination Certificate for Patent No. 4,426,860, issued Jan. 24, 1984, Ser. No. 281,701, Jul. 9, 1981.
Int. Cl.[4] E05B *19/18, 35/06*
U.S. Cl. 70—34



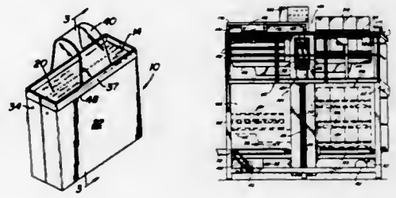
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4** and **8** is confirmed.

Claims **1–3**, **5–7** and **9** are cancelled.

4. A system as set out in claim **3** in which means is provided on the forward end of the key capable of forward adjustment to decrease the effective amount of projection of the spacing member and to thereby close the gap between the head of the key and the head of the lock when a key with a spaced of a predetermined length is inserted into a lock with a recess having a depth less than the length of the spacer.

B1 4,573,203 (1038th)
REUSABLE PLASTIC BAG WITH LOOP HANDLE
Harry R. Peppiatt, Doylestown, Pa., assignor to Paramount Packaging Corp., Chalfont, Pa.
Reexamination Request No. 90/001,501, Apr. 29, 1988.
Reexamination Certificate for Patent No. 4,573,203, issued Feb. 25, 1986, Ser. No. 388,381, Jun. 14, 1982.
Int. Cl.[4] B65D *33/10*
U.S. Cl. 383—29



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–13** is confirmed.

1. A bag comprising a unitary piece of flexible thermoplastic material including generally rectangular front and rear panels of flexible thermoplastic material overlying one another and a gusset integral in one piece with said panels and extending between the edges of said panels along one end of said panels to form a closed end of the bag, said gusset being flexible and having a fold line located between said panels and defining the inner boundary of said gusset, each panel having a fold line at said one end defining the outer boundary portion of said gusset, the other end of said panels being open to facilitate introducing goods into the bag, the side edges of said panels and said gusset being connected together in a manner so that the bag when filled can approximate the shape of a hexahedron with said gusset being flattened to form a substantially planar closed end of the bag, a flexible handle defined by a loop of thermoplastic material collapsible on itself, each end of said loop being welded to a separate one of said panels outside and adjacent the outer boundary portion of said gusset by a weld zone at the loop end, said gusset including frangible means integral therewith to facilitate access to goods in the bag and thereafter permit reuse of the bag, said frangible means facilitating provision of an elongated opening in the gusset substantially perpendicular to the length of the handle, and said loop being longer than the transverse width of the gusset so that a person's arm may extend through the loop for the purpose of supporting the bag when said gusset is flattened.

9. A bag comprising a unitary piece of flexible plastic material including generally rectangular front and rear flexible plastic panels overlying one another and a gusset integral with and extending between the edges of said panels along one end of said panels, said gusset being flexible and having a fold line located between said panels and defining the inner boundary of said gusset, each panel having a fold line at said one end defining the outer boundary portion of said gusset, the other end of said panels being open to facilitate introducing goods into the bag, the side edges of said gusset and panels being connected together in a manner so that the bag when filled can approximate the shape of a hexahedron with said gusset being flattened to form a substantially planar closed end of the bag, a handle defined by a loop of flexible plastic material collapsible on itself and having a flange at each end, each flange having a length substantially equal to the width of said panels, each flange being welded to a separate one of said panels outside and adjacent the outer boundary portion of said gusset by a weld zone extending across the handle flange in a direction substantially parallel to said gusset outer boundary, said gusset having a line of perforations substantially perpendicular to the length of the loop to facilitate access to the goods in the bag and thereafter permit reuse of the bag, said loop being longer than the transverse width of the gusset so that a person's arm may extend through the loop for the purpose of supporting the bag when said gusset is flattened.

12. A bag comprising a unitary piece of flexible plastic material including generally rectangular front and rear flexible plastic panels overlying one another and a gusset integral with and extending between the edges of said panels along one end of said panels, the other end of said panels being open to facilitate introducing goods into the bag, the side edges of said gusset and panels being connected together in a manner so that the bag when filled can approximate the shape of a hexahedron with said gusset being flattened to form a substantially planar closed end of the bag, and a handle defined by a loop of flexible plastic material collapsible on itself, each loop end being welded to a separate one of said panels outside said gusset and along said one end of said panels by a weld zone at the loop end, said gusset being flexible and having perforations substantially perpendicular to the length of the loop to facilitate access to goods in the bag and thereafter permit reuse of the bag, said loop being longer than the transverse width of said gusset so that a person's arm may extend through the loop for the purpose of supporting the bag when said gusset is flattened.

B1 4,592,353 (1039th)
MEDICAL AND SURGICAL LASER PROBE
Norio Daikuzono, Ichikawa, Japan, assignor to Surgical Laser Technologies Ohio, Inc., Cincinnati, Ohio
Reexamination Request No. 90/001,247, May 19, 1987.
Reexamination Certificate for Patent No. 4,592,353, issued Jun. 3, 1986, Ser. No. 612,674, May 22, 1984.
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

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The patentability of claims **6–9** is confirmed.

Claim **1** is determined to be patentable as amended.

Claims **2–5**, dependent on an amended claim, are determined to be patentable.

New claims **10–13** are added and determined to be patentable.

1. A medical and surgical contact laser probe for irradiating human tissue or the like, the laser probe having a forward end and defining a predetermined laser energy radiation area immediately adjacent the laser probe forward end whereby tissue

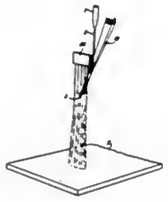


subtended by said area may be irradiated, the laser probe including *a tip means and means for transmitting laser energy from a source of laser energy to the tip means, said tip means to be positioned to perform a surgical procedure on or within a patient, said transmitting means including a laser optical fiber adapted for insertion through an endoscope, the laser optical fiber having a first end adapted for connection to the source of laser energy,* [an optical fiber adapted for connection optically to a source of laser energy at a first end of the optical fiber and], *the* probe tip means consisting of laser transmissive material disposed in front of the second end of the optical fiber and means for securing the transmissive material in said front [positions] *position*, the transmissive material extending from the securing means whereby the securing means remains clear of tissue when the transmissive material of the tip means is brought into contact with said tissue.

B1 4,647,471 (1040th)
METHOD OF DISTRIBUTING LIQUID ONTO A SUBSTRATE

Walter N. Jenkins, West Glamorgan, Wales, assignor to National Research Development Corporation, London, England

Reexamination Request No. 90/001,456, Mar. 2, 1988.
Reexamination Certificate for Patent No. 4,647,471, issued Mar. 3, 1987, Ser. No. 829,172, Feb. 14, 1986.
Claims priority, application United Kingdom, Feb. 18, 1985, 8504047; May 17, 1985, 8512502
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—37



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **5** and **6** are cancelled.

Claims **1**, **7**, **8**, **12**, **14–16**, **18** and **19** are determined to be patentable as amended.

Claims **2–4**, **9–11**, **13** and **17**, dependent on an amended claim, are determined to be patentable.

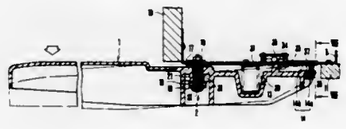
New claims **20–23** are added and determined to be patentable.

1. A method of distributing liquid onto a substrate comprising:
deflecting the liquid in two stages wherein,
in the first, an unsupported supply of the liquid is allowed to fall into a chute, the chute not being solid but being comprised by a stream of gas, trough-shaped in cross-section, directed downhill; and,
in the second, the liquid meets a vertical or near-vertical plane containing [: a gas-knife directed towards the substrate; and/or] a plurality of sequentially repetitiously fired gas-knives, the directions of flow from which intersect at a point [vertically above] *on a vertical line including the centreline of the chute, subtending an angle of up to* 80° at that point, below which is the substrate.

B1 4,653,378 (1041st)
PEDAL KEYBOARD FOR ELECTRONIC MUSICAL INSTRUMENT

Keisuke Watanabe, and Toshiyuki Iwamoto, both of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Reexamination Request No. 90/001,357, Oct. 22, 1987.
Reexamination Certificate for Patent No. 4,653,378, issued Mar. 31, 1987, Ser. No. 734,952, May 16, 1985.
Claims priority, application Japan, May 25, 1984, 59-75874[U]; May 25, 1984, 59-75875[U]; Jan. 9, 1985, 60-494[U]; Feb. 14, 1985, 60-18365[U]
Int. Cl.[4] G10C *3/12*
U.S. Cl. 84—423 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2** and **5** are cancelled.

Claims **3**, **4**, **6**, **8**, **9**, **13**, **14**, **19**, **23** and **25** are determined to be patentable as amended.

Claims **7**, **10–12**, **15–18**, **20–22**, **24**, **26** and **27**, dependent on an amended claim, are determined to be patentable.

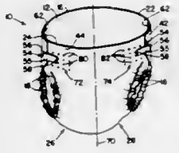
New claim **28** is added and determined to be patentable.

[**1.** A pedal keyboard for an electronic musical instrument, comprising:
a pedal key means including a pivot mechanism and pedal key member having a front end portion and a rear end portion for generating a musical tone, said pedal key member being vertically pivotal about said pivot mechanism and mounted on a frame which is fixed to a body of the musical instrument;
a spring for biasing said pedal key member so as to cause said pedal key member to return to an initial position; and
a stopper for limiting pivotal movement of said pedal key member,
said pivot mechanism being disposed adjacent to said front end portion of said pedal key member, said stopper being disposed distally to said pedal key member and said spring being disposed between said pivot mechanism and said stopper.]

B1 4,662,875 (1043rd)
ABSORBENT ARTICLE

Dennis O. Hirotsu, Cincinnati, Ohio, and Anthony J. Robertson, Madison, Wis., assignors to The Procter & Gamble Company, Cincinnati, Ohio

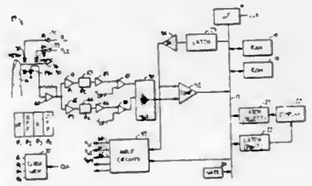
Reexamination Request Nos. 90/001,309, Aug. 17, 1987 and 90/001,346, Oct. 8, 1987.
Reexamination Certificate for Patent No. 4,662,875, issued May 5, 1987, Ser. No. 802,803, Nov. 27, 1985.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—389



B1 4,653,498 (1042nd)
PULSE OXIMETER MONITOR

William New, Jr., Woodside, and James E. Corenman, Alameda, both of Calif., assignors to Nellcor Incorporated, Haywood, Calif.

Reexamination Request No. 90/001,452, Mar. 1, 1988.
Reexamination Certificate for Patent No. 4,653,498, issued Mar. 31, 1987, Ser. No. 867,005, May 20, 1986.
Continuation of Ser. No. 417,312, Sep. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 414,175, Sep. 2, 1982, abandoned.
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—633



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2** and **3**, dependent on an amended claim, are determined to be patentable.

1. An oximeter apparatus for use in measuring pulse rate and oxygen saturation of blood by means of absorption of optical radiation through living tissue comprising:
first and second light sources for emitting light at a first and second wavelength, respectively;
a light sensor;
said light sources and light sensor being adapted to be addressed to said tissue to define a light path through said tissue between said light sources and said light sensor;
means for detecting signals corresponding to light received by said light sensor at each of said first and second wavelengths and for deriving from said signals a pulsatile signal corresponding to a pulsatile characteristic of arterial blood flow and generating a signal corresponding to oxygen saturation of the blood; and
means for generating an audible intermittent tone signal, said tone signal generating means further comprising:
means responsive to said pulsatile signal for controlling the occurrence of said audible tone signal, and
means responsive to said oxygen saturation signal for *continuously* varying the tonal frequency of said audible tone signal with oxygen saturation.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **5–7** are cancelled.

Claims **1**, **2**, **8**, **11**, **12**, **14**, **17** and **18** are determined to be patentable as amended.

Claims **3**, **4**, **9**, **10**, **13**, **15** and **16**, dependent on an amended claim, are determined to be patentable.

New claim **19** is added and determined to be patentable.

1. An absorbent article having a liquid pervious topsheet, a liquid impervious backsheet attached to said topsheet, and an absorbent medium disposed between said topsheet and said backsheet, said article comprising:
a. a first region having *a* first laterally spaced portion and a second laterally spaced portion;
b. a second region connected to said first region;
c. fastening means for fastening said first laterally spaced portion of said first region to said second region at a first attachment area;
d. fastening means for fastening said second laterally spaced portion of said first region to said second region at a second attachment area;
e. indicia means *comprising a plurality of discrete markings* coextensive with at least a part of said first attachment area; [and]
f. indicia means *comprising a plurality of discrete markings* coextensive with at least a part of said second attachment area; *and*
g. a longitudinal centerline extending from said first region to said second region;
wherein said indicia means described in (e) *and* (f) *comprise a plurality of horizontally arranged rows of discrete markings that are substantially symmetrically disposed about said longitudinal centerline,* said indicia means providing guidance *for horizontal and vertical positioning* in fitting said article to a wearer.

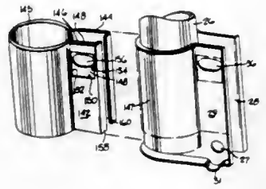
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B1 4,733,884 (1044th)

CAMBER ADJUSTMENT DEVICE

Craig R. Pettibone, Lafayette, and Jimmy D. Berry, Longmont, both of Colo., assignors to Specialty Products Company, Longmont, Colo.

Reexamination Request No. 90/001,487, Mar. 28, 1988.
Reexamination Certificate for Patent No. 4,733,884, issued Mar. 29, 1988, Ser. No. 65,725, Jul. 2, 1987.
Continuation-in-part of Ser. No. 893,153, Sep. 15, 1986, which is a continuation-in-part of Ser. No. 692,825, Jan. 18, 1985, Pat. No. 4,615,845.
Int. Cl.[4] B62D *17/00*
U.S. Cl. 280—661



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **10** and **11** is confirmed.

Claims 1-9 are cancelled.

[1. A camber adjustment assembly for adjusting the camber of a wheel in a vehicle suspension system of the type ordinarily including a generally vertically extending strut assembly having an upper end attached to a vehicle frame assembly and having a pair of strut flanges positioned in parallel relationship with one another and projecting laterally outwardly from a lower end portion of the strut assembly; a wheel knuckle assembly mounted on the strut assembly and having a mounting portion positioned between the two strut flanges with a first hole therein adapted to closely, axially slidingly receive a first bolt therein which also passes through a first pair of coaxially aligned holes in the strut flanges in close axially sliding relationship and with a second hole therein adapted to closely, axially slidingly receive a second bolt which also passes through a second pair of coaxially aligned holes in the strut flanges in close axially sliding relationship, the first and second holes in the wheel knuckle mounting portion being vertically spaced apart, the first and second bolt holes in the wheel knuckle mounting portion and the first and second pair of holes in the strut flanges having axes positioned in substantially perpendicular relationship with the axis of rotation of a wheel supported on the wheel knuckle assembly, the camber adjustment assembly comprising:

(a) parallel laterally extending slot means provided in said pair of strut flanges by lateral extension of said first pair of holes therein;

(b) cam bolt means having a central longitudinal axis for providing adjustable pivotal movement of said wheel knuckle about said axis of said second hole in said wheel knuckle mounting portion, said cam bolt means being received in said parallel slot means in said strut flanges and in said first hole in said wheel knuckle with said central longitudinal axis thereof positioned coaxially with said axis of said first hole in said wheel knuckle assembly and being adjustably laterally movable in said parallel slot means in a first relatively loosened state of said cam bolt means and being relatively fixed with respect to said parallel slot means in a second relatively tightened state of said cam bolt means;

(c) cam plate means mounted on at least one of said strut flanges and adapted to coact with said strut flange and said cam bolt for causing said relative lateral displacement of said cam bolt in said strut flange parallel slot means during rotational movement of said cam bolt means about said cam bolt means central longitudinal axis in said first relatively loosened state;

(d) whereby the camber of a wheel mounted on said wheel knuckle assembly is adjustable through rotation of said cam bolt means about said cam bolt means central longitudinal axis.]

[4. The invention of claim 1 wherein said cam bolt means comprises:

an elongate threaded shaft portion having a central shaft longitudinal axis, a first end and a second end and being adapted to be closely slidingly accepted in said first hole of said wheel knuckle mounting portion and adapted to be laterally displaceable and vertically nondisplaceable in said parallel lateral slot means;

a cylindrical cam portion having a cylindirical axis positioned in parallel offset relationship with said shaft central longitudinal axis and positioned at said first end of said shaft portion;

a bolt torquing portion positioned at a terminal portion of said first end of said shaft portion;

a nut threadingly mounted on said second end of said threaded shaft portion.]

[5. The invention of claim 4 wherein said cam plate means comprises:

parallel cam engagement surfaces extending perpendicular to the direction of extension of said parallel laterally extending slot means and spaced apart by a distance slightly larger than the diameter of said cylindrical cam portion of said cam bolt and adapted to receive said cylindrical cam portion of said cam bolt means therebetween in axially rotatable, laterally nondisplaceable relationship therein in said loosened state and in totally nondisplaceable relationship therein in said tightened state;

cam plate slot means extending laterally between said cam engagement surfaces and adapted to receive said shaft portion of said cam bolt means therethrough in axially rotatable, laterally displaceable, vertically nondisplaceable relationship therein in said loosened state and in totally nondisplaceable, relationship therein in said tightened state;

whereby axial rotation of said shaft portion through torquing of said torquing portion produces adjustably controllable oscillating lateral displacement of said shaft portion;

whereby said wheel knuckle is pivotally movable about said axis of said second bolt by said torquing of said cam bolt means during said loosened state thereof.]

[6. The invention of claim 5 wherein said cam plate means further comprises:

stabilizing means for preventing movement thereof relative said at least one strut flange on which it is mounted.]

10. The invention of claim 6 wherein said cam plate stabilizing means comprises:

a first attachment portion adapted to be attached to one of said strut flanges;

a second attachment portion adapted to be attached to the other of said strut flanges; and

flexible encompassing means attached to said first and second attachment portions and adapted to engage a peripheral portion of said strut assembly positioned between said strut flanges.

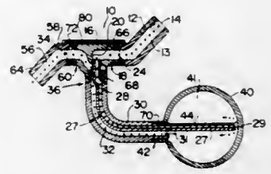
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,906

SHOWER MIRROR APPARATUS

Thomas L. Jones, 11 Yorkshire St., Asheville, N.C. 28803

Original No. 4,557,003, dated Dec. 10, 1985, Ser. No. 725,829, Apr. 22, 1985. Application for reissue Dec. 3, 1987, Ser. No. 128,400
Int. Cl.[4] A47K *3/22*
U.S. Cl. 4—605 10 Claims



5. A shower apparatus comprising:

a shower water supply means for providing a flow of water;

mirror means for receiving at least a portion of the flow of water comprising:

(i) a housing having a back wall and a front wall forming a plenum for receiving the portion of the flow of water;

(ii) a mirror mounted in said housing adjacent said front wall and having a front reflective surface and a back surface in contact with said front wall of said housing, thereby forming a heat exchange relationship between the plenum for receiving the portion of the flow of water and said reflective surface; and

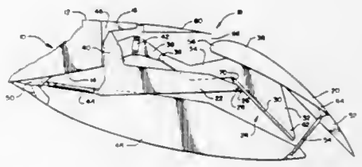
means for diverting at least a portion of the flow of water to said mirror means, said means for diverting comprising a plurality of adjustable and rotatable rigid pipe-like means connected together and supporting said mirror means, said pipe-like means acting to carry the portion of the flow of the water from said shower water supply means to said mirror means to prevent fogging on said reflective surface of said mirror, whereby said plurality of rigid pipe-like means allow said mirror means to be moved to different positions with respect to said shower water supply means and said rigid pipe-like means act to retain said mirror means in said different positions.

Re. 32,907

AIRFOIL FLAP ASSEMBLY WITH FLAP TRACK MEMBER

Peter K. C. Rudolph, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Original No. 4,434,959, dated Mar. 6, 1984, Ser. No. 306,743, Sep. 28, 1981. Application for reissue Mar. 6, 1986, Ser. No. 837,703
Int. Cl.[4] B64C *3/50, 9/20*
U.S. Cl. 244—215 30 Claims



1. A flap assembly for an airfoil having a forward end, a rear end, a longitudinal axis and a transverse axis, said flap assembly comprising:

(a) a mounting structure located at the rear end of the airfoil, said mounting structure having a track mounting portion at a track mounting location,

(b) a first flap member having a stowed first position at the rear end of the airfoil, and movable rearwardly through an intermediate second position to a fully extended third position,

(c) said flap member having mounted thereto a substantially longitudinally aligned track member operatively connected to said track mounting portion for longitudinal and rotational movement relative thereto, said track member having a forward end and a rear end, said track member being characterized in that with the flap member in the first position, the rear end of the track member is at the track mounting location, and with the flap member in its third position, the forward end of the track member is at the track mounting [position] *location*,

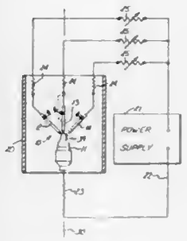
(d) actuating means operatively connected to said flap member at a connecting location spaced forwardly of the forward end of the track member and having a fixed location relative to the flap member, said actuating means being arranged to move said connecting location substantially longitudinally along a first path [component] *portion* generally aligned with [the] *a* lengthwise axis of the track *member* to move said flap *member* between the stowed position and the intermediate position so as to cause substantial Fowler motion of the flap *member* with relatively little rotation of the lengthwise axis of the track member relative to the mounting structure at the track mounting location, and to move the connecting location along a second path portion, having a substantial upward path component to move the flap *member* between the intermediate position and the third position so as to cause relatively less Fowler motion with relatively greater rotation of the legthwise axis of the track member relative to the mounting structure at the track mounting location.

Re. 32,908

METHOD OF UTILIZING A PLASMA COLUMN

Emil Pfender, West St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Original No. 4,725,447, dated Feb. 16, 1988, Ser. No. 817,759, Jan. 6, 1986. Continuation of Ser. No. 655,340, Sep. 27, 1984, abandoned. Application for reissue Apr. 1, 1988, Ser. No. 176,615
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—37 7 Claims



5. A method of using a plasma column directed in a first direction comprising the steps of:

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forming a plasma column moving in the first direction toward a surface along an axis using a plurality of cathodes spaced laterally from the axis and from each other, orienting the cathodes relative to an anode spaced from the cathodes in the first direction and energizing the cathodes to simultaneously form an individual arc from each cathode, which individual arcs coalesce to form such plasma column;

injecting a flow of gas along the axis in the first direction through a nozzle spaced along the axis from the cathodes such that the nozzle is in a region where the plasma arcs forming the plasma column have not coalesced; [and]

regulating the flow of gas from said nozzle to form a stable core in the plasma column that is formed after the arcs have coalesced;

providing the gas at sufficient gas volume and pressure so that the size and stability of the plasma column is controlled primarily by the regulated flow of gas; and

injecting particles into the *regulated* gas flow to move *with the regulated gas flow* in the first direction axially along and in the center portions of the plasma column, said particles being injected into the gas flow in a region where the arcs have not coalesced *and being carried into the central core of the plasma column with the regulated gas flow.*

Re. 32,909

METAL OXYCARBOXYLATES AND METHOD OF MAKING SAME

Joseph E. Lionelle, and Jeffrey A. Staffa, both of Salida, Colo., assignors to BioSystems Research Inc., Salida, Colo.

Original No. 4,404,146, dated Sep. 13, 1983, Ser. No. 304,305, Sep. 21, 1981. Continuation-in-part of Ser. No. 217,119, Dec. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 194,849, Oct. 7, 1980, abandoned. Application for reissue Jun. 18, 1984, Ser. No. 621,859

Int. Cl.[4] C07F *3/06*

U.S. Cl. 556—131 **17 Claims**

1. A method of preparing a metal oxycarboxylate which comprises reacting, in an aqueous reaction mixture at a temperature of below about 130° C., a metal, a carboxylic acid, and hydrogen peroxide to form said metal oxycarboxylate said hydrogen peroxide being utilized in said reaction mixture as a dilute aqueous solution of up to 10% H_2O, precipitating said metal oxycarboxylate and separating the precipitated metal oxycarboxylate.

PLANT PATENTS

GRANTED APRIL 18, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,738

CHRYSANTHEMUM PLANT NAMED BYRON

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 123,905

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Byron, as described and illustrated, and parts thereof.

6,739

CHRYSANTHEMUM PLANT NAMED TOPPER

Jacques C. M. Van der Knapp, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 123,906

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Topper, as described and illustrated, and parts thereof.

6,740

CHRYSANTHEMUM PLANT NAMED GOLDEN IMPALA

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 124,480

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Golden Impala, as described and illustrated, and parts thereof.

6,741

CHRYSANTHEMUM PLANT NAMED BRIDESMAID

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 124,545

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Bridesmaid, as illustrated and described, and parts thereof.

6,742

CHRYSANTHEMUM PLANT NAMED GUILDERLAND

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 124,546

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Guilderland, as illustrated and described, and parts thereof.

6,743

CHRYSANTHEMUM PLANT NAMED CREAM IMPALA

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 124,760

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Cream Impala, as described and illustrated, and parts thereof.

6,744

CHRYSANTHEMUM PLANT NAMED RHINO

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 124,991

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Rhino, as described and illustrated, and parts thereof.

6,745

LITTLELEAF LINDEN NAMED 'NORBERT'

Willet N. Wandell, Rte. #1, Box 286, Oquawka, Ill. 16469

Filed Nov. 13, 1987, Ser. No. 120,494

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new variety of the parts thereof, of *Tilia cordata* named 'Norbert', as described and shown herein, that differs from other varieties by the unique combination of: (1) a tight, dense pyramidal crown with a straight single leader and maintaining this neat appearance with age; (2) strongly ascending branches, not two-ranked but forming a symmetrical limb scaffold laterally around the trunk; (3) bright green, shiny, leathery leaves that are moderately resistant to aphid colonization; (4) the close spacing of the leaves and buds on the lateral branches; and (5) rapid rate of growth with the trunk diameter increasing nearly twice as much as the species or other observed cultivars on young plants propagated by budding.

6,746

ENGLISH OAK NAMED 'WANDELL'

Willet N. Wandell, Rte. #1, Box 286, Oquawka, Ill. 61469

Filed Nov. 19, 1987, Ser. No. 123,060

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinctive variety and the parts thereof, of *Quercus robur* named 'Wandell' as described herein, that differs from all other varieties by the unique combination of: (1) a narrow, strongly fastigiate crown that is symmetrical, tight and neat with a naturally occurring well groomed appearance; (2) this type of crown is formed on young plants, continues to mature trees, and is consistantly maintained when the plants are vegetatively propagated; and (3) the plants are resistant to powdery mildew.

6,747

PEACH TREE "JUNE PRIDE"

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Dec. 7, 1987, Ser. No. 129,784

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by its large size, vigorous, upright in growth and a regular and productive bearer of large, firm, yellow flesh, freestone fruit, with a high degree of attractive red skin color and good eating, storage and shipping quality; the new variety is further characterized in comparison to June Lady Peach (U.S. Plant Pat. No. 3,022) by having fruit maturing in the same maturity season but having the ability to produce a greater number of larger, uniform sized fruit, with a higher degree of attractive red skin color.

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ROSE PLANT/KINSCHOON

Gene King, 3711 Caddo St., Monroe, La. 71203

Filed Nov. 2, 1987, Ser. No. 116,279
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, spreading, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a generally apricot yellow color, being of a shade generally near Empire Yellow 603/1 but modified by red coloring to give an apricoty effect; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with an abundance of small to medium size matt foliage and an abundance of flowers borne usually singly but sometimes in clusters or spray.

PATENTS

GRANTED APR. 18, 1989

ERRATA

For CLASS	See PATENT NO.
054-023	4,821,380
123-498	4,821,726
242-071	4,821,876
065-002	4,822,388
065-002	4,822,389
065-016	4,822,392
376-257	4,822,552
420-059	4,822,556
422-263	4,822,579
424-480	4,822,629
426-003	4,822,635
528-028	4,822,850
528-125	4,822,853
252-174	4,822,854
540-492	4,822,880
540-603	4,822,881
375-015	4,823,172
369-014	4,823,205
369-013	4,823,220
371-008	4,823,252
250-372	4,823,368

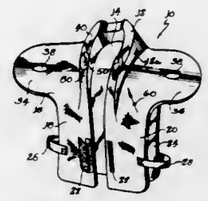
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PATENTS

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GENERAL AND MECHANICAL

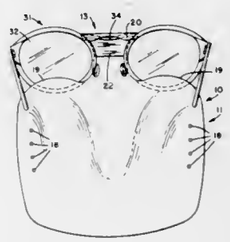
4,821,339
PROTECTIVE VEST HAVING A CERVICAL COLLAR
Jeffrey D. Fair, 4801 N. Britton, Stillwater, Okla. 74075
Filed Jun. 23, 1987, Ser. No. 65,859
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **13 Claims**



1. A protective device for use with helmets of the type worn by players in contact sports, comprising:

a flexible body of resilient material having shoulder, chest and back portions covering substantial portions of the shoulders, chest and back of a player respectively, and having a raised resilient collar immediately adjacent a central portion of the device defining an opening for the head of a wearer of the device, said raised resilient collar integrally formed with and continuously joined to said chest and said back portions so as to transmit thereto forces applied to an upper surface of said raised collar by the bottom of a helmet worn by the wearer, said body having an inner surface for frictionally engaging the body of a wearer so as to maintain said device in a preselected position about the body of a wearer so that displacement of said raised resilient collar portion is resisted with a resilient bias force which maintains said collar portion in said preselected position about the body of a wearer.

4,821,340
FACE SHIELD
April E. Johnson, 121 Pleasant St., Marlboro, Mass. 01752
Filed Feb. 8, 1988, Ser. No. 153,150
Int. Cl.[4] A61F *9/04*
U.S. Cl. 2—9 **10 Claims**





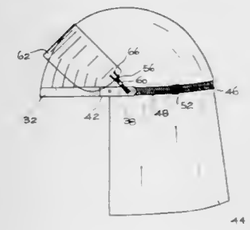
1. A face shield to protect an individual against inhaling germs and other foreign bodies, comprising:

(a) a sheet of substantially rigid material having a lower portion which has a width which is substantially equal to the width of a conventional pair of eyeglasses and an upper edge and a tab which extends upwardly from a mid-point of said upper edge, said tab being substantially narrower than said lower portion,

(b) a clip having a rearwardly extending hook-shaped flange for removably mounting the clip on the nosepiece of a pair of eyeglasses, said clip having a downwardly extending flange which extends in front of said nosepiece, and

(c) mounting means for removably attaching said tab to said downwardly extending flange so that said sheet lies in front of the nose and mouth of the individual and substantially below at least a major portion of the lenses of the eyeglasses and said tab is substantially between the lenses of the eyeglasses.

4,821,341
SUN-VISOR AND HEADPIECE COMBINATION AND PACKAGE THEREFOR
Trevor I. Baptiste, 383 Grand Ave., Brooklyn, N.Y. 11238
Filed May 13, 1987, Ser. No. 49,342
Int. Cl.[4] A42B *1/06*
U.S. Cl. 2—10 **15 Claims**



1. A size adjustable sun-visor and headpiece combination adapted to be worn on the head of a wearer, comprising:

a headpiece having a single piece construction to cover the head of the wearer, said headpiece including a front portion to run across the forehead of the wearer and a rear portion extending downwardly at an angle of approximately 90° relative to said front portion to cover the backneck of the wearer;

a headband including a frontal portion, a rightside portion and a leftside portion connected together to provide an elongated headband;

said frontal portion of said headband being secured to said front portion of said headpiece with a highly absorbent sweatband sandwiched therebetween;

said rightside and leftside portions of said headband being secured respectively to opposite sides of said rear portion of said headpiece;

button means provided on each of said rightside and leftside portions of said headband to secure a sun-visor to said headband;

a first elastic back portion connected to said rightside portion of said headband, and a second elastic back portion connected to said leftside portion of said headband;

adjustable buckle means connecting said first and second elastic back portions together across said rear portion of said headpiece to adjust said headpiece to the head size of the wearer;

said adjustable buckle means including a first buckle attached permanently to said second elastic back portion, and a second buckle attached to said first elastic back

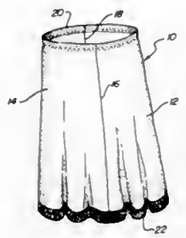
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portion in a horizontally movable connection therewith to permit adjustability of the length of said first elastic back portion; and

said sun-visor including loop means for attaching and detaching said sun-visor from said headpiece, said loop means including two elastic straps secured on opposite sides of said sun-visor;

each of said two elastic straps having its ends secured so as to provide dual loops, each of said dual loops including an end loop, each said end loop being sufficiently small to accommodate said button means on said rightside and leftside portions of said headband to connect said sun-visor to said headband.

4,821,342
UNDERGARMENT
Jane D. Troyer, 23811 Wilmarth, Farmington, Mich. 48024
Filed Dec. 14, 1987, Ser. No. 132,583
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—82 **10 Claims**



1. A garment intended to be worn principally on the lower body comprising:

a front panel;

a rear panel; and

means joining said front and rear panels to form an undergarment which is essentially circumferentially continuous;

the front panel being formed at least in part of a smooth, essentially non-absorbent fabric, and the rear panel being formed as a laminate of outside and inside fabric layers, the outside layer being formed of a smooth essentially non-absorbent fabric and having an organic waterproofing material applied to an inside surface thereof, the inside layer being formed of an absorbent fabric.

4,821,343
UPPER TORSO WEARING APPAREL
Judith F. Quealy, 1444 Harbor Dr., Sarasota, Fla. 34236
Filed Jua. 3, 1988, Ser. No. 201,837
Int. Cl.[4] A41D *1/04;* **A41B** *9/02*
U.S. Cl. 2—102 **4 Claims**

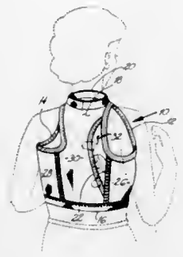
1. Novelty upper torso wearing apparel comprising:

an inverted man's underwear having a body portion including a front fly covering a frontal opening, leg openings and a waist opening including a waistband;

said inverted underwear also including a neck aperture between the leg openings disposed in the crotch of said underwear and opposingly spaced at the opposite end from the waistband of said underwear;

said neck aperture adapted to receive the wearer's head and neck passing therethrough when said inverted underwear is worn by placing arms through said leg openings and said waistband is pulled downwardly toward the wearer's waist.

4. A novelty shirt adapted to be worn tightly fit by women comprising:



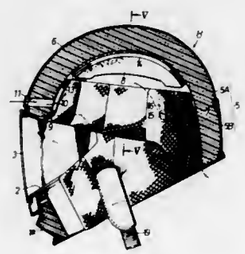
a body portion fabricated of flexible somewhat stretchable fabric structured to fit snuggly over a wearer's upper torso;

said body portion having diagonally disposed sleeveless arm holes separated by an upper panel having a neck aperture;

said body portion extending downwardly to an elastic waistband forming its lower margin; and

a flyfront disposed in said body portion whereby said shirt is structured and oriented to resemble men's inverted briefs.

4,821,344
HELMET
Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kako Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 25, 1987, Ser. No. 18,642
Claims priority, application Japan, Jan. 19, 1987, 62-5724[U]
Int. Cl.[4] A42B *3/02;* **A42C** *5/04*
U.S. Cl. 2—414 **8 Claims**

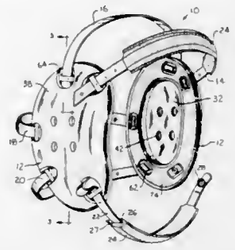


1. A helmet comprising:

a cap body, said cap body including a shell and a buffer liner mounted on an inner surface of said shell, a flexible top pad being disposed on a ceiling portion of an inner peripheral surface of said buffer liner, a flexible fitted pad being disposed on the inner peripheral surface of said buffer liner excluding said ceiling portion, and an air intake hole being made in a front wall of said cap body to penetrate the front wall, wherein a vertically extending elongated hole being provided in the fitted pad as a through hole communicated to said air intake hole, and a ventilation

groove being provided in said top pad along an extension of said elongated hole.

4,821,345
ATHLETIC EAR GUARD ASSEMBLY
John L. Marchello, Ann Arbor, Mich., assignor to Danmar Products, Inc., Ann Arbor, Mich.
Filed Oct. 29, 1987, Ser. No. 114,568
Int. Cl.[4] A63B *71/10*
U.S. Cl. 2—425 **5 Claims**



1. An athletic ear guard assembly for covering and protecting a user's ears comprising:

a reinforcement plate having a cup shaped center section forming a convex outer surface and a concave inner surface, and forming a peripheral edge flange, said edge flange having a plurality of strap attaching means,

a plurality of retention straps connected to said attaching means and enabling said ear guard assembly to be held in position on a user's head,

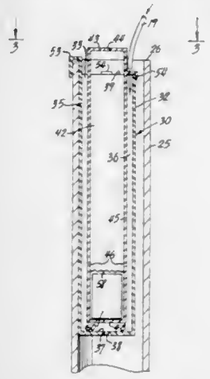
an outer foam pad having a shape complementary to said plate and covering said convex outersurface of said plate, said outer foam pad having cut-out areas overlying said strap attaching means,

an inner foam pad covering said edge flange on said plate inner surface, and

a molded outer skin cover covering said foam pads, said cover having apertures overlying said outer foam pad cut-outs and said strap attaching means and forming reinforcing flanges surrounding said cut-outs which cover the edges of said outer foam pad defining said cut-out areas, said outerskin cover further forming internal ribs around the periphery of said cover engaging the outer edge of said plate, said ribs engaging said plate outer edge to inhibit tearing of said outer cover by said plate edge.

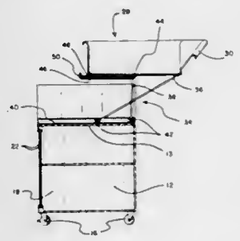
4,821,346
TOILET BOWL CLEANING COMPOSITION DISPENSER
Gregory R. Jones, 4302 Greenlee Ave., Cincinnati, Ohio 45217
Filed Jan. 15, 1987, Ser. No. 4,351
Int. Cl.[4] E03D *9/02*
U.S. Cl. 4—226 **17 Claims**

1. A toilet bowl cleaning composition dispenser adapted for placement substantially within an overflow tube connecting a toilet tank with a toilet bowl and operative to dispense a dosage amount of an aqueous solution of a cleaning composition subsequent to the cessation of toilet bowl refill water flow through the overflow tube, the dispenser comprising an exterior tubular housing having a top with an opening therein for toilet bowl refill water to enter and said housing having an aperture proximate its bottom for drainage of said water therefrom; a tubular cleaning composition solution chamber within the housing for containing a solid cleaning composition vehicle and said chamber having a top vented to the atmosphere and a bottom; a pathway formed between the housing and the chamber providing fluid communication between the housing opening and the housing aperture, said chamber having an aperture providing fluid communication between the chamber and the



pathway, and means to retain the dispenser within the overflow tube.

4,821,347
EXTENSIBLE SHAMPOO BOWL DESIGNED FOR INDIVIDUAL CONFINED TO A WHEELCHAIR
Lavonne Nash, 5936 Market St., Lot 13, Wilmington, N.C. 28405
Filed Jan. 27, 1988, Ser. No. 149,006
Int. Cl.[4] A45D *19/04*
U.S. Cl. 4—516 **6 Claims**



1. An extensible and laterally shiftable shampoo bowl and cabinet assembly adapted for use in conjunction with a person confined to a wheelchair comprising: a movable lower cabinet having an internal storage area and access doors that enable one to gain access to the storage area; the cabinet having a shampoo bowl seat formed about an upper portion thereof and wherein the cabinet includes side shoulder portions that extend upwardly over the shampoo bowl seat so as to define an area therebetween for receiving a shampoo bowl; a mobile shampoo bowl disposed over the bowl seat of the cabinet; mounting means interposed between the shampoo bowl and the cabinet for movably mounting the shampoo bowl for both vertical and lateral movement relative to the cabinet; the mounting means including vertical, extensible means connected to the shampoo bowl for raising and lowering the bowl between a lower position with the shampoo bowl lying adjacent the bowl seat to an upper position with a shampoo bowl spaced upwardly above the bowl seat; the mounting means further including means for moving the shampoo bowl laterally from a position over the cabinet to a lateral extended position where the shampoo bowl assumes an offset position with respect to the cabinet and wherein there is provided a track structure associated with the

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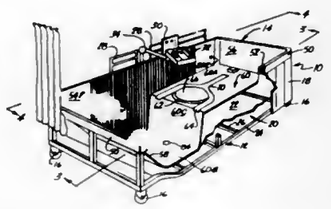
cabinet and wherein the mounting means is movably contained within the track structure and movable back and forth therein; and wherein the mounting means includes a scissor-type linkage disposed about opposite sides of the shampoo bowl with the scissor-type linkage interconnected between the cabinet and the bowl and including a pair of linkages pivotally connected together about an intermediate point and movable between a closed position where the shampoo bowl overlies the bowl seat to an open expanded position where the bowl assumes a position spaced above the cabinet structure and outwardly to one side thereof.

4,821,348

CONVERTABLE BED AND BATHROOM COMBINATION

Kenneth Pauna, Cloquet, Minn., assignor to Richard Paterson, Brampton, Canada

Filed Feb. 22, 1988, Ser. No. 158,661
Int. Cl.[4] A61H *33/02*; A61G *7/02*
U.S. Cl. 4—547 **36 Claims**



1. A patient care apparatus comprising:
a tub;
a plurality of inflatable cushions positioned in the tub for supporting a patient; and
means for selectively inflating and deflating the cushions for moving the patient between a plurality of positions.

4,821,349

FABRIC COVERED KNOCK-DOWN HEADBOARD FOR BEDS

Elaine S. Cohen, 222 E. 81st St., New York, N.Y. 10028, assignor to Elaine S. Cohen, N.Y. and Dale F. Beckman, N.C.

Continuation-in-part of Ser. No. 18,738, Feb. 20, 1987, abandoned, which is a continuation of Ser. No. 749,732, Jun. 28, 1985, abandoned. This application Jan. 18, 1988, Ser. No. 145,527
Int. Cl.[4] A47C *17/00, 19/04*
U.S. Cl. 5—53 R **6 Claims**



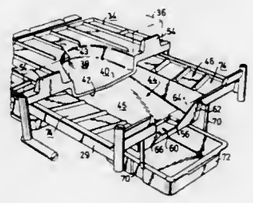
1. A decorative, knock-down headboard comprising:
(a) a knock-down frame including a pair of opposed side members, each side member having an upright tubular post with an upper and a lower tubular arm extending horizontally therefrom towards the corresponding upper and lower arms of the other side member, said upper arms of the opposed side members being connected, when assembled, by a first separable center section and said intermediate arms of the opposed side members being connected by a second separable center section;
(b) a cover member including a pair of opposed fabric panels having top, bottom, and end edges and a front surface, the top and end edges of said fabric panels being seamed and the bottom edges being initially open, and releasable attaching means adjacent the bottom edges of the fabric panels on either side of said open bottom for selective closure thereof;
(c) said cover member being assembled over the upper tubular arms of said frame, and said releasable attaching means being connected together around said lower tubular arms to secure the cover member thereto; and
(d) the size and dimensions of said cover being such that, when assembled as set forth in subparagraph (c), said cover is tightly stretched over said frame members to retain them in assembled relation.

4,821,350

CHILD DELIVERY BED

Mats Feldt, Liatorp, Sweden, assignor to Landstingens Inkopscentral, Lic, Ekonomisk Forening, Solna, Sweden

Filed Mar. 5, 1987, Ser. No. 22,202
Claims priority, application Sweden, Mar. 5, 1986, 8601007
Int. Cl.[4] A61H *7/02*
U.S. Cl. 5—60 **7 Claims**



1. A child delivery bed comprising a raisable backrest section located at one end of a centre section, and a leg support section which is located at the other end of the centre section and which can be displaced axially to different positions beneath said centre section, characterized in that the upper side of the centre section has provided thereon a sunken recess which is open in the vicinity of a rear edge of the centre section, so as to facilitate drainage of, e.g., blood at one edge of the sunken recess; in that the upper side of the leg support section has provided thereon a longitudinally extending channel which lies below the rear edge of the sunken recess and has a length such as to lie at a lower level than said edge of the sunken recess in all positions of the leg support section; in that the channel slopes down towards and extends to adjacent an outer end part of the leg support section, and the bottom of said channel terminates at a drainage edge; and in that the leg support section is provided with means for detachably supporting a collecting vessel in a position beneath the drainage edge, the channel being sunk between two longitudinally extending side parts of the upper side of the leg support section and the recess nesting within the channel between said side parts.

4,821,351

BED AND/OR CHAIR DEVICE

Henning Bergenwall, Sollentuna, Sweden, assignor to Molnlycke AB, Molnlycke, Sweden

Filed Aug. 24, 1987, Ser. No. 88,822
Claims priority, application Sweden, Aug. 27, 1986, 8603607
Int. Cl.[4] A61G *7/06*
U.S. Cl. 5—67 **13 Claims**

1. A bed and/or chair device comprising a stand (1) and a support surface arrangement (2, 3, 4) which is divided in at least two mutually movable parts, viz a back support (2) and a thigh supporting and possibly also seat supporting part (3), the back support (2) and the thigh supporting part (3) being pivotably connected to the stand (1), power means (11) being arranged to cause a pivoting movement of the back support between different inclination positions with respect to the stand, characterized in that a transmission arrangement is arranged to make the movements of the back support and the thigh supporting part dependent on each other, s that in pivoting the back support (2) upwardly from a substantially horizontal position, the thigh supporting part (3) is initially pivoted upwardly with respect to the stand (1), until a maximally raised position is reached, after which a continued pivoting upwardly of the back support causes the thigh supporting part to pivot



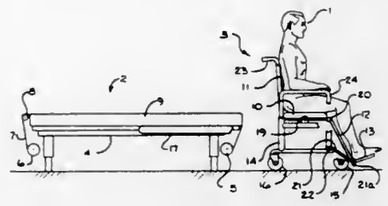
downwardly toward its initial position, a shank supporting part (4) being pivotably connected to the thigh supporting part (4), the pivot between the latter parts being positioned so as to correspond with the knee-joint of the person resting in the device, characterized in that an elongated support member (22) is at its one end pivotably connected to the shank supporting part (4), that the other end (24) of the support member is designed to be able to rest undisplaceably in a stopping member arranged on the stand, so that a pivoting upwardly of the thigh supporting part (3) with respect to the stand (1) causes the entire shank supporting part (4) to be lifted to a position in which the latter part preferably is extending close to a horizontal plane and in any case does not point with its end opposed to the back support (2) in an upward direction making a greater angle with the stand (1) than the thigh supporting part (3) does.

4,821,352

INVALID TRANSFER ARRANGEMENT

Paul DiMatteo, Dix Hills; Charles F. Chubb, Brookville, and Robert Segnini, Stony Brook, all of N.Y., assignors to Nova Technologies, Inc., Hauppauge, N.Y.

Division of Ser. No. 937,015, Dec. 2, 1986, which is a continuation-in-part of Ser. No. 731,533, May 7, 1985, Pat. No. 4,776,047. This application Oct. 9, 1987, Ser. No. 107,366
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 R **11 Claims**



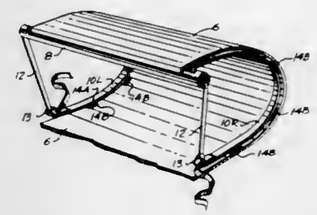
5. A method of transferring a person to a sitting position on a seat from a reclined position on a first surface comprising the steps of: positioning said seat in vicinity of an end of said first surface; positioning a second surface over said seat; moving said person with feet first toward and partly onto said second surface by moving said first surface at a velocity horizontally toward said second surface and vertically down in vicinity of said second surface, so that the person's feet and calves move off said first surface and slide onto said second surface; moving and raising the person's knees and thighs over said seat by rotating and moving said second surface horizontally at a velocity substantially equal to the velocity of the first surface until the person's buttocks move onto said seat; raising said person to a sitting position on said seat by rotating a part of said first surface to raise the person's back and head to a substantially vertical position, and rotating and lowering said second surface to extend downward from said seat to support said person's legs and feet.

4,821,353

BEACH MAT WITH ADJUSTABLE SUN SHADE

James Neri, 429 ½ Westbourne, La Jolla, Calif. 92037

Filed Jun. 17, 1988, Ser. No. 208,171
Int. Cl.[4] A47G *9/06*
U.S. Cl. 5—418 **2 Claims**



1. A rectangular beach mat with integral sun shade comprising:
a boom of tube stock, two bows of resilient material, and a bowstring,
said boom having a slot cut along its length and attached to a top end of a short side of said mat,
said bows attached by pivot means in the ends of said boom,
mating means and complimentary mating means, where said mating means is attached to said bows at an unpivoted end and at a multiplicity of other positions along the length of said bows, and complimentary mating means attached to said mat in a pattern which tapers slightly inward from each long edge from the top of said mat and positioned to adhere to said mating means on said bow,
a multiplicity of loops on said bowstring, one loop on an end, and others along the length of said bowstring, said end loop engaging said unpivoted end of one of said bows and threading through the length of the boom and exiting therefrom;
so that said bows may be mated to said mat with said mating means and complimentary mating means, said bowstring tensioning said bows into arcs thereby creating a canopy of the upper portion of said mat, maintaining said canopy by attaching said loops to said unpivoted ends of said bows and thereby providing a sun shade;
and by releasing said tension in said bowstrings and unadhering said mating means and complementary mating means, one may jack-knife said bows into said boom and roll said mat to create a compact portable unit.

4,821,354

PORTABLE COOLING POOL, BEACH OR CAR SEAT MAT

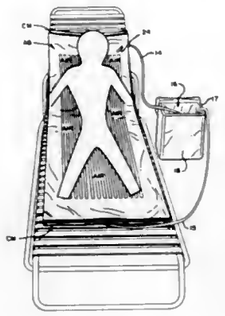
Donald E. Little, 520 Ioaa St., Metairie, Calif.

Filed Mar. 21, 1988, Ser. No. 171,111
Int. Cl.[4] A47C *21/04, 27/08*
U.S. Cl. 5—422 **3 Claims**

1. A mat for cooling a person lying or sitting on the mat comprising two sheets sealed together to form a cooling bladder, a reservoir containing ice water to be recirculated through said cooling bladder, two tubes connected to said bladder for conveying said ice water from said reservoir and back to said reservoir, one tube being connected at one end of the bladder

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and the other of said two tubes being connected at the opposite end of said cooling bladder, said two sheets being further sealed together to form parallel channels that are spaced from sealed sides of said cooling bladder and spaced from sealed ends of said cooling bladder thereby to provide flow of said ice water from said one end to said end of said cooling bladder, and extruded strips inserted in said parallel channels to prevent



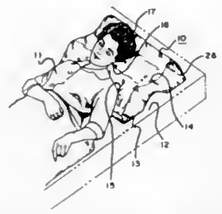
the two sheets from collapsing against each other due to pressure exerted by said person, said strips being extruded with a cross section which will assure a passage of said ice water through said parallel channels even while said person is lying or sitting on said mat, and further including an air bladder connected to one surface of said cooling bladder for insulation of said cooling bladder on said one surface while said person is lying or sitting on said mat.

4,821,355

SELF-ADJUSTING ORTHOPEDIC CERVICAL PILLOW

George J. Burkhardt, 116D Cherry Park Condominiums, Park Blvd., Cherry Hill, N.J. 08002

Filed Nov. 19, 1987, Ser. No. 123,530
Int. Cl.[4] A47C *20/02*
U.S. Cl. 5—434 **4 Claims**



1. In an orthopedic cervical pillow formed of resilient form maintaining cellular material of the type having an undersurface and an uppersurface contoured from front to rear to form a in depth back engaging portion transitioning into a convex neck engaging portion further transitioning into a head engaging portion, the improvement providing for self-adjusting lift of the back and neck engaging portions proportionally responsive to the user's head pressure upon the head engaging portion comprising:

a relieved section within the undersurface of the pillow generally beneath the head engaging portion extending from underneath the head engaging portion in a direction toward the rear of the pillow to end at a point under and no more than approximately half the depth of the head engaging portion toward the rear of the pillow and furthe extending in a forward direction to a region beneath the neck engaging portion of the pillow whereby, upon a user's head applying pressure upon the head engaging portion, such pressure will proportionately compress the recess downwardly providing adjustment upwardly of the neck and back engaging portions of the pillow.

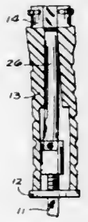
4,821,356

MILITARY BAYONET AND SCABBARD

Charles A. Finn, Oceanside, Calif., assignor to Phrobis III, Ltd., Carlsbad, Calif.

Filed Mar. 13, 1987, Ser. No. 25,334
Int. Cl.[4] B25F *1/04*
U.S. Cl. 7—134 **31 Claims**





1. A bayonet comprising:

a blade;

a tang having an inner end secured to said blade; said tang having a modulus of elasticity lesser than the modulus of elasticity of said blade whereby said tang exhibits greater deformation under loading than said blade;

a handle securable to said blade and means securing said handle to said blade and to the outer end of said tang with clearance between said handle and said tang; and

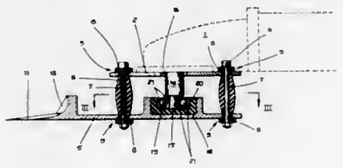
means for attaching said bayonet to the muzzle region of a firearm barrel.

4,821,357

SCRAPER ADAPTOR FOR ROTARY BUFFER

Edgar Millette, 171 Chemin St Ours, Sorel (Québec) J3P 2L4, Canada

Filed Feb. 23, 1988, Ser. No. 159,131
Int. Cl.[4] A47L *11/12*
U.S. Cl. 15—93 R **22 Claims**



1. A removable tool-bearing adaptor for a powered rotary implement providing rotation of a shaft which forms part of said implement, said adaptor comprising:

an upper plate;

securing means for securing said upper plate to said implement;

said tool being borne by a lower plate substantially parallel to said upper plate;

cam means, disposed in a central area between said plates, for converting rotation of the shaft of said implement to low amplitude circular vibration of said lower plate;

a plurality of flexible attachment means disposed substantially perpendicularly between said plates, each said attachment comprising:

(a) a rigid, two-ended fastening device;

(b) a two-ended flexible bushing surrounding said device and press-fitted at each end thereof into means defining holes in said plates;

(c) a pair of securing means, each securing means being securable to each end of said fastening device projecting from said bushing; and

(d) a pair of flexible washers, each washer being disposed between said securing means and said plate and being sized to prevent passage of said securing means through said means defining holes;

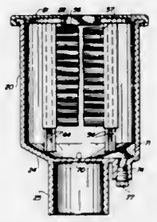
whereby said plates are fixedly held in spaced relation while allowing low amplitude circular vibration of said lower plate relative to said upper plate.

4,821,358

GOLF CLUB WASHER

Charles R. Wyckoff, Fountain Hills; Ralph J. Lener, Scottsdale, both of Ariz., and William L. Samuelson, Minneapolis, Minn., assignors to C.R.W. Manufacturing, Phoenix, Ariz.

Filed Jan. 4, 1988, Ser. No. 140,752
Int. Cl.[4] B08B *1/00*
U.S. Cl. 15—104.92 **18 Claims**



1. A golf club head washing device including in combination:

a cylindrical housing for holding cleaning fluid, said housing having an open top and with the bottom thereof tapering inwardly toward a drain therein;

first and second rectangular cleaning members having cleaning elements extending from one surface thereof, each of said first and second cleaning members having first and second opposite edges with corresponding first and second extensions thereon;

cleaning member support guide rails attached to the interior of said housing and extending substantially parallel to the central axis thereof for releasably supporting and holding in place, through a wedging engagement of said extensions, said first and second cleaning members as an opposed pair of cleaning members, with the cleaning elements thereon extending substantially across the space between said cleaning members, said cleaning members being supported a predetermined distance above the bottom of said housing and releasably wedged and held in place by the engagement of said guide rails with said extensions on the opposite edges of said first and second cleaning members; and

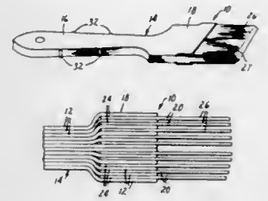
a removable cover releasably attached to said housing to close the open top thereof, said cover having an elongated slot therein located above the space between said cleaning members.

4,821,359

BRUSH AND ITS MANUFACTURING METHOD

Edward W. Deziel, West St. Paul; John T. Rueb, St. Paul; Mark D. Sorlien, White Bear Lake; Jack A. Dahlstrom, and David W. Erismann, both of Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 8, 1987, Ser. No. 57,214
Int. Cl.[4] A46B *3/06*
U.S. Cl. 15—159 R **5 Claims**



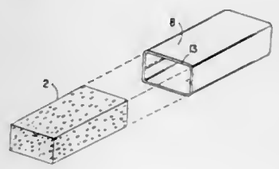
1. A brush comprising a plurality of similarly shaped plies adhered together in face to face relationship to form a laminate, said laminate having a handle end portion adapted for manual engagement, and an opposite head end portion; and a plurality of rows of bristles, each row having a base end portion adhered between a different pair of adjacent plies in the head end portion of said laminate and having distal end portions projecting outwardly from said head end portion, the distal end portions of said rows of bristles extending generally in the same direction, and the bristles in each of said rows of bristles being of polymeric material oriented longitudinally of said bristles and being a unitary film in said base end portion, while being separated in said distal end portion.

4,821,360

POLISHING PAD

Michael A. Giallourakis, Tarpon Springs, Fla., assignor to Sponge Fishing Co, Inc., Tarpon Springs, Fla.

Continuation of Ser. No. 48,554, May 11, 1987, which is a division of Ser. No. 676,949, Nov. 30, 1984, Pat. No. 4,670,962.
This application Jan. 19, 1988, Ser. No. 147,620
Int. Cl.[4] A47K *7/03*
U.S. Cl. 15—244.3 **8 Claims**



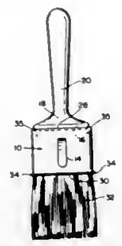
1. A polishing pad comprising:

a sponge core enveloped by a covering made from a double layer of soft, loosely knitted material wherein the covering is provided with an elastic band that defines an expandable opening, whereby the sponge core is insertable through the expandable opening and the covering is reversible, whereby, as polishing materials builds up in the

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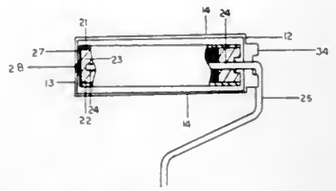
outer surface of the covering, the sponge core can be removed and the covering reversed inside out to provide a clean polishing surface.

4,821,361
PAINT BRUSH FERRULE COVER
Angelo Meimeteas, 68 Warren St., Lynn, Mass. 01905
Continuation-in-part of Ser. No. 85,362, Aug. 14, 1987, Pat. No. 4,751,762. This application Dec. 2, 1987, Ser. No. 127,467
Int. Cl.[4] A46B *17/00*
U.S. Cl. 15—246 **2 Claims**



1. A hollow flexible rubber cover for a paint brush having a handle section, a bristle mounting section attached to said handle section, a ferrule having an upper edge adjacent the handle section and a lower edge adjacent the bristle section. said ferrule surrounding said bristle mounting section and a bristle brush secured between said bristle mounting section and said ferrule which comprises a flexible cover being shaped to make a tight contact fit with the entire ferrule, said cover having a constant size opening from its upper edge to its lower edge, said opening being of a size to permit insertion of a paint brush into said cover so that the upper edge of the cover is positioned over the upper edge of the ferrule adjacent the handle to prevent leakage of paint or thinner form the interior of the brush onto the handle, and the lower edge of the cover extends down until its lower edge conicides with the lower edge of the ferrule in order to seal the interior of said cover against the ferrule to prevent liquid from entering said interior and a hook formed integrally with said cover, said hook extending in a direction toward said opening.

4,821,362
SPLATTER SHIELD FOR CONVENTIONAL PAINT ROLLER
Kenneth W. Kolb, 3611 Airline Hwy., Metairie, La. 70001
Continuation-in-part of Ser. No. 724,260, Apr. 17, 1985, abandoned. This application Feb. 5, 1987, Ser. No. 10,970
Int. Cl.[4] B05C *17/02;* **B44D** *3/28*
U.S. Cl. 15—248 A **4 Claims**



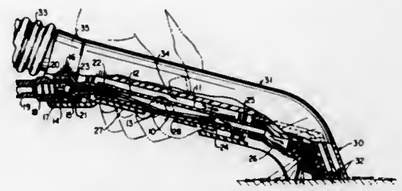
3. A splatter shield for a conventional paint roller having a roller arm integrally connected to a roller shaft, comprising an inner end wall; an outer end wall; and two side walls, all connected so as to have substantially parallel lower edges which define a first plane; a top wall connected to the upper edges of said end walls and side walls so as to define a second plane substantially parallel to said first plane, said inner end wall having an opening therein, said opening communicating with the lower edge of said inner end wall by means of a cut between said opening and said lower edge of said inner wall, said cut intersecting said opening to form a restriction having a width less than the diameter of said opening, said outer end wall having an aperture alignable with an offset roller shaft; and an annular shoulder member, integrally formed with said inner end wall and concentric with said opening, said shoulder member having a slot, communicating with said cut, and a plurality of flexible adjustment tabs, radially spaced about said shoulder member, the space between any two said adjustment tabs being approximately equal to the diameter of a roller arm, said adjustment tabs extending to a height so as to prevent free radial movement of said
shield when said shield is in place on a roller shaft, allowing forced radial adjustment of a roller arm about said opening
such that any adjacent pair of said tabs will bracket a roller arm
and whereby the shield can be attached to the roller arm by sliding a portion of said arm through the slot and cut and into the opening where it is maintained in position by the said restriction at the point where the slot meets the opening.

4,821,363
DEVICE FOR WASHING AND DEFROSTING AUTOMOBILE WINDSHIELDS
René Delluc, 74 bis Bld Gambetta, Nice, France
Filed Sep. 15, 1987, Ser. No. 97,158
Claims priority, application France, Sep. 29, 1986, 86 13654
Int. Cl.[4] B60S *1/46*
U.S. Cl. 15—250.05 **10 Claims**



1. A device for defrosting automobile vehicle windshields, comprising:
defrosting control means,
at least one windshield wiper consisting of a blade holder (71) and a blade (73), said blade holder (71) being mounted at one end on a shaft (24) adapted to be given, by a motor, reciprocating pivoting movement, and said blade (73) being equipped with a scraper carrying a pair of tongues (4, 5) of an elastomer material, which tongues, together with their support (7), form the U-shaped walls of a duct (6) open in the direction of the windshield,
an air supply unit comprising a turbine (13) drawing in air from at least one extraction point, and a tube (1) which leads out between the pair of tongues (4, 5) near that end of said blade (73) which sweeps through the longer arc,
mechanical raising means (27) adapted to move said tongues away from said windshield by axial thrust on the pivot shaft (24) of said blade holder (71), said shaft (24) thus being displaceable between a lowered position in which said tongues (4, 5) rest on a windshield, and a raised position in which said tongues (4, 5) are moved away from the windshield while retaining their orientation substantially parallel to said windshield, and
actuating means, under control of said defrosting control means, and causing automatically, upon switching said defrosting control means on, the bringing of the turbine (13) of the air supply unit into communication with said at least one extraction point (17), the operation of said turbine (13), the operation of the raising means moving said tongues away from said windshield and the starting of the motor effecting the reciprocating pivoting movement of the blade holder, said tongues being maintained in their raised position by said axial thrust as long as said defrosting control means are not switched off.

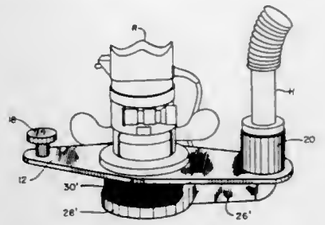
4,821,364
FLUID CONTROL VALVE
Tom A. McAllister, Mississauga; John S. McAllister, Pickering, and William R. Bounar, Whitby, all of Canada, assignors to American Home Products Corporation, New York, N.Y.
Filed Apr. 28, 1988, Ser. No. 187,371
Claims priority, application Canada, May 5, 1987, 536382
Int. Cl.[4] A47L *7/00*
U.S. Cl. 15—322 **8 Claims**



6. A cleaning device for a vacuum, spray-type cleaning apparatus comprising:
a hose for providing a vacuum;
means for supply a source of liquid;
a valve for controlling the flow of liquid from said liquid supply means, said valve including:
a deformable conduit for liquid;
a valve control port connected to said conduit at a liquid entry point of said conduit, said port including means biased to keep said port closed to liquid in an unactuated valve state;
a support element disposed within said conduit downstream of said valve control port, said support element also permitting liquid flow therethrough;
a trigger mechanism disposed within said conduit between said valve control port and said support element, said mechanism including an elongated bar having a deformable irregularity, said bar extending from said support element to said port closing means, the end of said bar contacting said port closing means with a low level of force in an unactuated state of said valve;
said irregularity subject to being deformed by external pressure applied through said conduit for actuating said valve by causing the length of said bar to increase so as to apply sufficient force to said port closing means to overcome the applied bias in order to open said port to liquid; and
a nozzle connected to said hose and valve for supplying a liquid and a vacuum to an item to be cleaned.

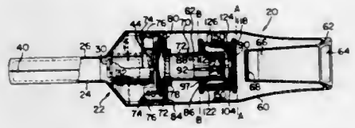
4,821,365
DUST REMOVAL ATTACHMENT
William E. Charters, 41034 Cornac Ter., Fremont, Calif. 94539
Filed Aug. 19, 1987, Ser. No. 86,779
Int. Cl.[4] B27B *11/02*
U.S. Cl. 15—339 **12 Claims**

1. A dust removal attachment for a router, comprising:
base plate means having top and bottom surfaces;
aperture means extending through said base plate means;
means for mounting a router on said base plate means so that a spindle of the router extends through said aperture means;
vacuum passage means formed through said base plate means;
vacuum connection means on said top surface of said base plate means for connecting said vacuum passage means with a source of vacuum;
brush means mounted on said bottom surface of said base plate means;
said brush means having an elongated concave body portion forming a chamber connected with said vacuum passage means;
a planar surface, which extends parallel to, and spaced from, said bottom surface of said base plate means, connected to one end of said elongated concave body portion;



a plurality of bristles, arranged in a partial circular arc around said aperture means, extending upwardly from said planar surface; and
a gap formed intermediate said bristles creating a passage through said bristles whereby dust and chips formed by a router bit extending through said aperture means in said base plate means are drawn through said gap and out said vacuum connection means.

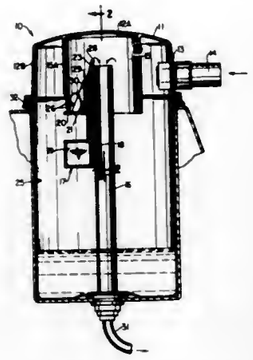
4,821,366
WET-DRY VACUUM CLEANER
Morris M. Levine, Scarsdale, N.Y., assignor to CIC Int'l. Corp., New York, N.Y.
Filed May 3, 1988, Ser. No. 189,810
Int. Cl.[4] A47L *5/24*
U.S. Cl. 15—344 **10 Claims**



1. A wet-dry vacuum cleaner comprising a bousing assembly providing a cavity, a motor within said cavity, an impeller driven by said motor to produce a vacuum, a canister having an intake nozzle for reception of dirt, liquid and air drawn into said nozzle by said vacuum, said nozzle having an air intake port and an air exit port within said canister, and a filter assembly largely within said canister and providing an air flow path from said canister to said impeller, said filter assembly including a tubular filter holder having a large diameter rear end sealingly engaging an end of said canister remote from said nozzle and a front end spaced a substantial distance forwardly from said rear-end, a tubular filter intake element within said canister and having an opening from end to end thereof in communication with said air flow path of said filter holder, and means positioned in the vicinity of said air exit port of said nozzle for deflecting the dirt and liquid drawn into said nozzle away from said opening of said intake element.

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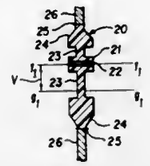
4,821,367
RECOVERY CHAMBER FOR SPRAY-TYPE VACUUM CLEANING APPARATUS
Tom A. McAllister, Mississauga; John S. McAllister, Pickering, and William R. Boanar, Whitby, all of Canada, assignors to American Home Products Corporation, New York, N.Y.
Filed Apr. 28, 1988, Ser. No. 187,316
Claims priority, application Canada, May 5, 1987, 536387
Int. Cl.[4] A47L *7/00*
U.S. Cl. 15—353 11 Claims



1. In a spray-type vacuum cleaning apparatus having a container for collection of dirt-laden fluid, a vacuum source located at the bottom of the container and an open-ended riser tube centrally mounted in the container and connected in fluid-tight fashion to the vacuum source, the improvement comprising a recovery chamber, said recovery chamber including:
an outer housing including a roof portion and a side portion, said housing adapted to cover and be seated on the container;
an inner chamber having a peripheral wall affixed at its top portion to the underside of the roof portion of said outer housing;
a fluid entry port mounted in the side portion of said outer housing, said port facing the peripheral wall of the inner chamber, said port for connection to a hose and nozzle for dirt and fluid intake;
a float mechanism mounted on a lower portion of said inner chamber wall and alongside said riser tube, said float mechanism including a float portion which extends into the container and is adapted to rise upon a rise in liquid level in said container; and
vacuum cut-off means attached to said float mechanism for covering said riser tube when said float mechanism rises an amount corresponding to a predetermined level of liquid in the container to prevent further vacuum action through said riser tube which, in turn, prevents further fluid from entering the container.

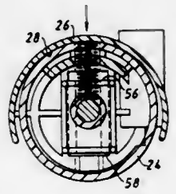
4,821,368
ECCENTRIC SHOCK ISOLATION GROMMET
Larry Albrecht, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Sep. 4, 1987, Ser. No. 93,189
Int. Cl.[4] B65D *55/00*
U.S. Cl. 16—2 12 Claims

1. An eccentric isolation grommet assembly comprising:
(a) a stiff inner portion having a first axis defining the centerline of said inner portion;
(b) a stiff outer portion having a second axis defining the centerline of said outer portion, said outer portion surrounding the inner portion;(and)
(c) an intermediate portion, having a substantially smaller cross sectional width than the cross sectional width of said outer portion, resiliently supporting said inner portion within the outer portion with said first axis being off-set from said second axis; and
(d) a structure having a sway space coupled to said outer portion for supporting said inner, outer and intermediate



portions and a component, said component being supported in three dimensional vibratory isolation coupled to said inner portion, said component further having a weight imposing a load upon said grommet assembly that second axes coincide to center said components in the sway space allowing maximum freedom of motion under dynamic loads.

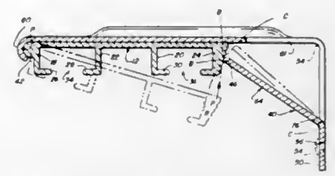
4,821,369
CASTORS BRAKED EITHER IN RESPONSE TO A LOAD OR TO THE ABSENCE OF A LOAD
Raymond R. J. Daniels, Norfolk, England, assignor to Guy-Raymond Engineering Company Ltd., Norfolk, England
Filed Jun. 23, 1987, Ser. No. 65,369
Claims priority, application United Kingdom, Sep. 16, 1986, 8622236
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—35 R 12 Claims



1. A castor having a castor body, a castor wheel mounted on the body, and braking means by which the castor wheel can be selectively braked without manual actuation of said braking means either in response to the application of a load applied to the castor or in response to the absence of such a load.

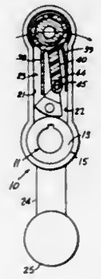
4,821,370
COMBINATION DRAPERY TRACK AND SIDE WALL MOUNTING BRACKET
John T. Magdars, Northbrook, and Burton L. Siegal, Skokie, both of Ill., assignors to Coral Industrial Sales, Inc., Chicago, Ill.
Filed Mar. 20, 1987, Ser. No. 28,348
Int. Cl.[4] A47H *1/04, 1/14*
U.S. Cl. 16—94 D 14 Claims

1. A drapery track and mounting bracket therefor;
(a) said track comprising an elongated member of generally rectangular cross-sectional configuration and having at least one channel formation extending the length thereof, said channel having means for slidably receiving drapery carrier members therein including first and second, spaced outer side walls,
a first outer side wall including a bead on the outer face thereof, and a second side wall including at least one longitudinal notch formation on the outer face thereof; and
(b) a mounting bracket for said track comprising, a generally L-shaped body having a first segment adapted to be attached to a vertical support surface and a second segment adapted to overlie said track,



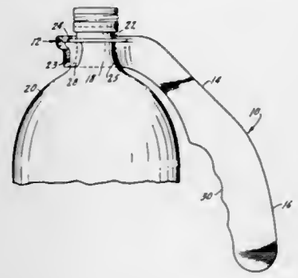
said first segment including track retention means comprising a resilient tongue extending upwardly from said first segment toward said track for selectively engaging said notch formation in said track in a snap fit connection,
said second segment having a free end including a curl formation engageable with said bead.

4,821,371
SAFETY HANDLE
Louis J. Finkle, Bellflower, Calif., assignor to Larry K. Goodman, Cerritos, Calif.
Filed Jul. 13, 1987, Ser. No. 72,537
Int. Cl.[4] G05G *1/08*
U.S. Cl. 16—112 8 Claims



1. A safety handle for releasably driving a shaft which is also otherwise powered, said shaft having an axis of rotation and a peripheral engagement band, and said safety handle comprising:
a frame including a bearing aperture receiving said shaft so as to be freely rotatable on and relative to the shaft, a lever arm extending away from said bearing aperture, and pivot means laterally spaced from said aperture;
a drive handle bi-directionally rotatably mounted to said pivot means, said handle having a handle axis of rotation extending parallel to the axis of said shaft;
engagement means pivotal mounted to said frame and rotatable by said drive handle, said engagement means thereby being bi-directionally rotatable and having an engagement surface conformed to stand away from said engagement band when substantially rotated in either direction from said centralized position; and
centering means resiliently bi-directionally biasing said drive handle and engagement means toward said centralized position, whereby when said drive handle is grasped and twisted around said handle axis, said engagement means is pivoted to engage said engagement band, enabling torque exerted on said drive handle relative to said shaft axis to turn said shaft, but when said twisting effort is released, said centering means returns said handle and said engagement means to said centralized position, thereby to release said engagement means from said engagement band and freeing said safety handle for free rotation around and relative to said shaft,
said centering means comprises a pair of springingly resiliently flexible arms on said drive handle, each opposed to a respective wall of said frame, rotation of said handle in either direction around its axis being resisted by a respective one of said flexible arms.

4,821,372
REUSABLE CONTAINER HANDLE
Nicholas Casiello, 1449 Briergate Dr., Naperville, Ill. 60540
Filed Dec. 4, 1986, Ser. No. 937,947
Int. Cl.[4] B65D *23/10*
U.S. Cl. 16—114 R 4 Claims



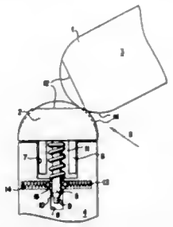
1. A reusable container handle for releasably securing a container having a flanged neck portion, said handle comprising:
a substantially horizontal curved top end portion;
said top end portion further defining an upward horizontal boundary, a middle horizontal groove portion, and a lower horizontal boundary, wherein said lower boundry of said substantially horizontal curved top end portion extends further in a circular pattern than the upper boundry portion of said substantially horizontal curved top end portion;
said groove portion having a sufficient size and curvature to receive a portion of peripheral boundary of said neck flange of said container;
said handle further comprising a downwardly and rearwardly protruding middle portion;
said handle further comprising a bottom end portion.

4,821,373
RESILIENT HINGE HAVING S-SHAPED MEMBERS AND A RELEASABLE CATCH
Robert A. M. Maidment, Suffolk, and Michael T. Smith, Kent, both of England, assignors to Courier Products Limited, England
Filed Sep. 9, 1987, Ser. No. 94,669
Claims priority, application United Kingdom, Sep. 17, 1986, 8622324; Sep. 7, 1987, 8721011
Int. Cl.[4] E05D *1/04;* E05F *1/08*
U.S. Cl. 16—227 8 Claims

1. A hinged structure comprising two supports and at least one hinge hinging the supports together so that they are parallel and closely adjacent, each said at least one hinge comprising two hinge members, each hinge member being made of resilient strip material, each said hinge member being S-shaped, passing partially round each support and together with the other hinge member forming a letter χ configuration as seen in direction along the supports, wherein a releasable catch is

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provided for holding the supports in a predetermined relative angular position, the catch comprising two cam members, each associated with a respective support and the two being resiliently urged into engagement and so shaped and arranged that rotation away from the said predetermined relative angular position of the supports urges the cam members apart against the resilient urging, the cam members having mating surface portions that seat one on to another at the predetermined



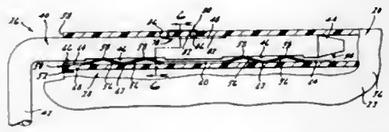
angular position, said mating surface portions are flats, and one cam member is fixed relative to its respective support and the other cam member is slidably mounted relative to its support and urged outwards by resilient means, wherein the resilient means is a spring wound round a spindle attached to the cam member, the end of the spindle remote from the other cam member itself being cammed and acted upon by springs mounted in bores formed in the support at right angles to the spindle.

4,821,374

HINGE ASSEMBLY FOR VEHICLE VISOR AND OTHER VEHICLE ACCESSORIES

James A. Gavagan, Center Line, Mich., assignor to Irvin Industries, Inc., Rochester Hills, Mich.

Filed Mar. 26, 1987, Ser. No. 30,390
Int. Cl.[4] E05D *11/08*
U.S. Cl. 16—321 **18 Claims**



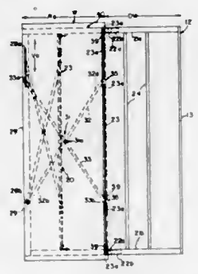
1. A hinge assembly for pivotally interconnecting a first member with a second member, said hinge assembly comprising: an elongated rod member interconnected with the first member; a generally hollow elongated sleeve member having an interior surface and being interconnected with the second member for receiving said rod member for relative rotation therewithin; and resilient biasing means including a longitudinally-extending leaf spring in said sleeve member for resiliently biasing said rod member generally laterally against said interior surface of said sleeve member in order to provide a frictional relative rotational engagement between said rod member and said interior surface of said sleeve member, said leaf spring including at least one generally laterally protruding discontinuity thereon, said discontinuity being generally laterally and resiliently compressed between said rod member and said interior surface of said sleeve member in order to bias said rod member in a generally lateral direction against said interior surface of said sleeve member, said rod member including at least one generally first flat rod portion thereon, said first flat rod portion being generally aligned longitudinally with said discontinuity on said leaf spring and being resiliently engaged by said discontinuity when said rod member is in a predetermined relative rotational orientation in said sleeve member, said rod member having a second generally flat rod portion thereon, said sleeve member including a generally flat sleeve portion disposed on said interior surface and being separate from said leaf spring, said second flat rod portion being generally aligned longitudinally with said flat sleeve portion for mutual engagement with one another when said rod member is in a predetermined relative rotational orientation in said sleeve member, said resilient engagement of said leaf spring with said first flat rod portion and said mutual engagement of said flat sleeve portion with said second flat rod portion defining [a] at least one detent in the relative rotation of said rod member in said sleeve member [at said predetermined relative rotational orientation].

4,821,375

RECESSING HINGE MECHANISM

Anthony R. Kozon, Burbank, Ill., assignor to Viking Metal Cabinet Co., Inc., Chicago, Ill.

Filed Jan. 29, 1988, Ser. No. 150,059
Int. Cl.[4] A47B *88/00*
U.S. Cl. 16—360 **15 Claims**



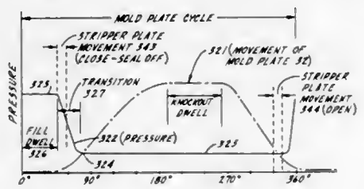
1. A recessing hinge mechanism for doors and the like, comprising:
an elongated anchor member having opposing ends and being attachable to a support means;
a scissors-like stabilizer device moveable between an expanded open position and a contracted closed position, said device having two cooperative arms pivotably joined to one another about their respective midpoints and being arranged so that in said closed position said arms are substantially superimposed relative one to another, with an upper end of one of said arms and a lower end of the other of said arms being slidably/pivotably attached to said anchor member; and
an elongated support rod slidably/pivotably attached to opposing ends of each of said arms, opposite the ends thereof attached to said anchor member for pivotably carrying a door means on opposite ends of said rod.

4,821,376

SEAL-OFF FOR FOOD PATTY MOLDING MACHINE WITH MULTI-ORIFICE FILL PASSAGE AND STRIPPER PLATE

Glenn A. Sandberg, Lockport, Ill., assignor to Formax, Inc., Mokena, Ill.

Filed Jun. 2, 1988, Ser. No. 202,129
Int. Cl.[4] A22C *7/00*
U.S. Cl. 17—32 **4 Claims**



1. In a food patty molding machine comprising:

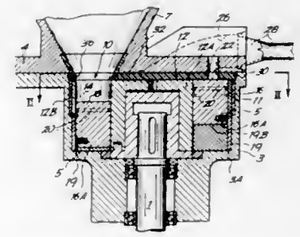
a mold plate having at least one mold cavity therein;
mold plate drive means for driving the mold plate along a given path, in a repetitive cycle, between a fill position and a discharge position;
food pump means for pumping a moldable food product;
a fill passage connecting the food pump to the mold cavity when the mold plate is in its fill position;
a fill plate, interposed in the fill passage immediately adjacent the mold plate, having a multiplicity of fill orifices distributed in a predetermined pattern throughout an area aligned with the mold cavity when the mold plate is in its fill position;
a stripper plate interposed in the fill passage immediately adjacent the side of the fill plate opposite the mold plate, and movable along a path transverse to the mold plate path between a fill location and a discharge location, the stripper plate having a multiplicity of fill openings aligned one-for-one with the fill orifices as extensions thereof when the stripper plate is in its fill location;
and stripper plate drive means, synchronized with the mold plate drive means, for moving the stripper plate between its fill location and its discharge location;
the improvement in which:
the spacings between fill openings in the stripper plate, in the direction of the stripper plate path, are such that movement of the stripper plate to its discharge location seals off the fill openings;
the stripper plate drive means moves the stripper plate to its discharge location, in each mold cycle, before the mold cavity moves appreciably away from its fill position toward its discharge position; and
the stripper plate drive means maintains the stripper plate in its discharge location while the mold plate moves toward its discharge position at least until the mold cavity is displaced beyond the fill orifices.

4,821,377

SAUSAGE-MAKING MACHINE (SAUSAGE-FILLER) FOR SAUSAGES AND OTHER SIMILAR PRODUCTS

Bruno Valiani, Siena, Italy, assignor to Omet S.m.c. di Volentieri & Co., Italy

Filed Mar. 18, 1988, Ser. No. 175,928
Claims priority, application Italy, Mar. 19, 1987, 11588/87[U]
Int. Cl.[4] A22C *11/04*
U.S. Cl. 17—37 **4 Claims**



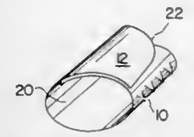
1. A sausage-making machine for pushing a mixture for sausages and other similar products, also produced with relatively fluid filling, comprising: a casing with a lid forming a hopper with a feeder; a rotor having through cavities; pistons located around the rotor axis and movable parallel to the axis of said rotor within said through cavities provided in said rotor; between the rotor and said lid, a sealing liner made of self-lubricating synthetic resin, which is retained against rotation and is removable; and cam profiles for the lifting and the lowering of the pistons inside the relevant cavities.

4,821,378

FISH HOLDER THIMBLE

Stanley Streit, and Mary Streit, both of R.R. #1, Box 94, Avon, Minn. 56310

Filed Oct. 19, 1987, Ser. No. 87,808
Int. Cl.[4] A22C *25/08*
U.S. Cl. 17—66 **1 Claim**



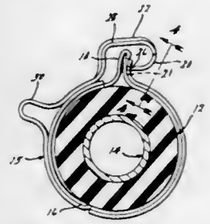
1. A fish gripper made from a flat strip of material having an inner surface and an outer surface, a plurality of teeth projecting from said outer surface, said strip being rolled so as to define a substantially frusto-conical member, open at both ends and with said inner surface adapted to fit about a person's thumb, wherein downward pressure by the thumb forces said teeth into the fish to secure same during processing.

4,821,379

SELF-ALIGNING SPRING CLAMP

George E. Spaulding, Hinsdale, Ill., assignor to Wittek Industries, Inc., Broadview, Ill.

Filed Mar. 31, 1988, Ser. No. 176,208
Int. Cl.[4] B65D *63/02*
U.S. Cl. 24—20 TT **1 Claim**



1. A circular spring clamp comprising:
a spring steel band having a latch hook at one end and a latch at the other end,
said latch hook comprising a radially outwardly extending portion, a circumferentially extending portion, and a radially inwardly reentrantly folded portion having a terminal edge engageable with said latch,
said latch having a concave latching surface thereon for the acceptance of the terminal edge of said latch hook,
a pair of radially outwardly extending flanges on opposite edges of the latching surface of said latch,
the reentrantly folded portion of said latch hook being substantially equal to the spacing between said flanges so as to the acceptable therebetween for positively positioning said latch hook.

4,821,380

QUICK CINCH

Eddie G. Crosby, 1609 E. 46th Pl., Tulsa, Okla. 74105

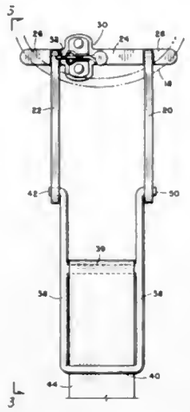
Filed Sep. 28, 1987, Ser. No. 102,004
Int. Cl.[4] B68C *1/00*
U.S. Cl. 54—23 **7 Claims**

7. A quick cinch for use with a leather strap and a saddle with a saddle ring attached thereto in which a girth with a ring thereon is used with the saddle for holding the saddle to a horse which comprises:
a first rigid saddle ring connecting U-shaped member having two spaced apart essentially parallel arms, one end of each arm having a lateral extension means essentially perpen-

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dicular to its arm and an end member which is rigidly attached to said lateral extensions means and extends beyond each such extension means for forming a connector with said saddle ring;

a second rigid U-shaped lever member having two spaced apart essentially. parallel arms, a second end member



across the two arms and a strap member between said two arm members intermediate the ends thereof;

pivot means connecting the ends of said arms of one U-shaped member with the arms of the second U-shaped member.

4,821,381

FASTENER MADE OF SYNTHETIC RESIN

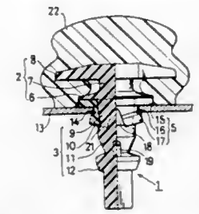
Yoshio Kaneko; Kunihiro Fukuhara, and Koji Watanabe, all of Yokohama, Japan, assignors to Nifco, Inc., Yokohama, Japan

Filed Jan. 28, 1988, Ser. No. 149,306

Claims priority, application Japan, Jan. 30, 1987, 62-11460[U]

Int. Cl.⁴ F16B *13/04*

U.S. Cl. 24—297 **13 Claims**



1. A fastener, comprising:

a molded insertion pin made of a first synthetic resin material integrally provided with a head portion and a leg portion depending from said head portion; and

a molded bush made of a second synthetic resin material, which is softer than said first synthetic resin material comprising said insertion pin, integrally provided with a cylindrical portion disposed upon an outer peripheral portion of said leg portion of said insertion pin and having an outer diameter which permits said bush to be disposed within an aperture defined within a support panel within which said fastener is to be secured, a flange portion, having a diameter larger than the diameter of said aperture and disposed at an upper end of said cylindrical portion for seating upon an upper surface of said support panel, and first engagement means defined upon a lower end portion thereof,

wherein said leg portion of said insertion pin is provided midway along the axial length thereof with second engagement means for engaging said first engaging means of said bush so as to axially fix said insertion pin at a first axial assembled position and prevent forward and backward axial movement thereof relative to and within said bush when said bush and insertion pin are initially deposite within said aperture of said support panel; a wide diameter portion for radially expanding said cylindrical portion of said bush, when said insertion pin is moved axially relative to said bush from said first axial assembled position toward a second axial assembled position, axially spaced from said first axial assembled position, so as to fixedly retain said bush within said support panel; and third engaging means, defined upon said insertion pin at a position axially spaced from said second engaging means, for engaging said first engaging means of said bush so as to fix said insertion pin at said second axial assembled position and prevent forward and backward axial movement thereof relative to and within said bush when said insertion pin is disposed at said second axial assembled position.

4,821,382

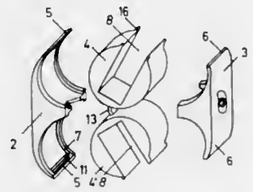
FASTENING ELEMENT FOR THE CONNECTION TOGETHER OF TWO SHEET MEMBERS

Theodor Puschkarski, Aubofstrasse 170, A-1130 Wien, Austria

Filed Mar. 29, 1988, Ser. No. 174,946

Int. Cl.⁴ A44B *21/00*

U.S. Cl. 24—298 **9 Claims**



1. A fastening element for the connection together of two sheets at a selectable angle in relation to each other along an abutting edge, comprising gripping jaws formed with wings of different length, a screw to connect such jaws with each other, such jaws forming bearing sockets, rotatable cylindrical gripping rollers mounted in such sockets, said gripping rollers being made of elastic material and each having an axial gripping groove, said gripping jaws including a gripping jaw half forming such socket and having a longer wing with an inner surface with an axially extending locking rib formed thereon, a plurality of differently spaced locking grooves arranged at the peripheral surface of the gripping rollers, such ribs being able to be selectively engaged in one of said plurality of differently spaced locking grooves, the two gripping rollers each being united by means of a flexible connecting lug with each other.

4,821,383

TERMINAL CRIMPING APPARATUS HAVING MEANS FOR PREVENTING MISFEEDING OF THE TERMINAL STRIP

John R. Grosklos, York, and Dallas E. Schlegel, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 16, 1988, Ser. No. 155,198

Int. Cl.⁴ B23P *23/00*

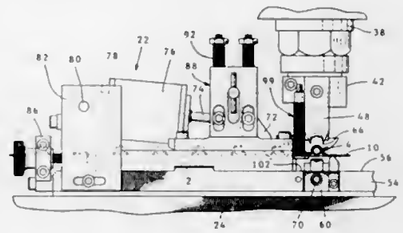
U.S. Cl. 29—33 M **13 Claims**

1. Apparatus for crimping electrical terminals onto wires, the terminals being in the form of a continuous strip comprising carrier strip means and individual terminals which are connected to the carrier strip means at spaced apart intervals, the apparatus comprising a crimping zone having a crimping anvil and a crimping die therein, the crimping anvil having a terminal supporting surface on which the terminal is supported during crimping, the crimping die being mounted on a ram

which is movable along a path of reciprocation towards and away from the anvil between an open position, in which the die is spaced from the anvil, and a closed position, in which the die is proximate to the anvil, and strip feeding means for feeding the strip along a strip feed path which extends to the crimping zone and normally of the path of reciprocation of the ram so that the leading terminal of the strip is positioned between the die and the terminal supporting surface of the anvil, the apparatus being characterized in that:

a strip lifter is provided for lifting the strip away from the anvil thereby to ensure feeding of the strip and delivery of the leading terminal on the strip to a position between the die and the terminal supporting surface of the anvil,

the strip lifter comprising a lifting foot which is beside the anvil and coupled to the crimping die on the upstream side thereof relative to the direction of strip feed, the lifting



foot extending transversely of the strip feed path, the lifting foot being coupled to the ram by a foot coupling and being reciprocal with the ram normally of the strip feed path,

the terminal supporting surface being between the lifting foot and the ram when the die is in its closed position, the lifting foot being between the terminal supporting surface and the ram when the die is in its open position whereby, after the leading terminal of the strip has been crimped onto a wire, the die moves from its closed position to its open position, and the lifting foot is moved by the foot coupling towards and past the strip so that the lifting foot lifts the carrier strip means away from the terminal supporting surface, and the strip can then be fed over and past the terminal supporting surface thereby to position the next adjacent terminal of the strip in the crimping zone.

4,821,384

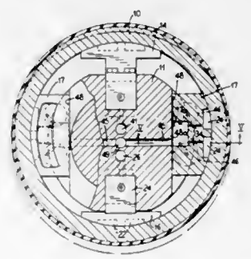
SELF-LOADING CONTROLLED DEFLECTION ROLL

Ronnie A. Arav, Netania, Israel, assignor to Beloit Corporation, Beloit, Wis.

Filed Nov. 5, 1987, Ser. No. 117,052

Int. Cl.⁴ B21B *31/32*

U.S. Cl. 29—113.2 **9 Claims**



1. A controlled deflection press roll structure for coacting with an opposed member to form a press nip comprising in combination:

a rotatable roll shell having a portion for receiving an axial force, a cylindrical inner surface and an outer surface for forming a press nip;

a stationary support shaft extending axially through the shell;

force means between the shaft and shell applying a controlled supporting force to the inner surface of the shell to obtain a predetermined pressure at the nip, said force means including pressure shoe means between the shell and shaft; and

an axially facing hydraulic means between the support shaft and roll shell, said hydraulic means including a pair substantially radially opposed lateral shoes, each lateral shoe having a face surface for contacting the roll shell inner surface and an axially facing surface for exerting pressure against the portion for receiving the axial force on the roll shell, and an axially facing pad interposed between each lateral shoe and the support shaft, said lateral shoe and pads being hydraulically actuated to support and stabilize the roll shell against radial and axial movement relative to the support shaft.

4,821,385

METHOD OF MAKING A BEARING

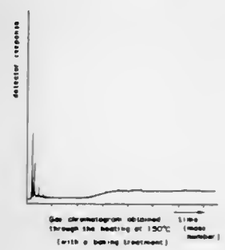
Hiroshi Ueno; Tomoaki Satomi, and Teruo Yoshida, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jul. 27, 1987, Ser. No. 78,120

Claims priority, application Japan, Jul. 29, 1986, 61-117399[U]; Jun. 24, 1987, 62-156784

Int. Cl.⁴ B21D *53/10*

U.S. Cl. 29—148.4 A **4 Claims**



1. A method of producing a bearing comprising:

assembling two rings formed of a metal, a plurality of rolling elements of calcined carbon having higher hardness than the metal, and a cage for retaining the plurality of carbon rolling elements into a bearing; and

baking the bearing at a temperature higher than that at which the bearing is to be actually used.

4,821,386

METHOD OF PRODUCING A ROLLING BEARING RACE

Michael Simon, Herzogenaurach, and Werner Kreiss, Erlangen, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Mar. 25, 1987, Ser. No. 30,695

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614246

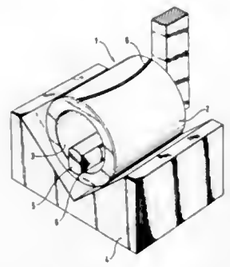
Int. Cl.⁴ B21D *53/10*

U.S. Cl. 29—149.5 C **6 Claims**

1. A method of producing a rolling bearing race provided with a continuous rupture seam along at least one area of its periphery and having a seating surface and a raceway surface for rolling elements, the seating surface being exposed before rupture along at least a portion of the intended course of the

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rupture seam to high-energy radiation within confined limits transverse to the intended course of the rupture seam and during rupture the surface area exposed to radiation is subjected to tensile stress by an external force, characterized in



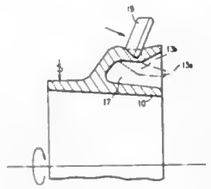
that the seating surface (2,8) of the bearing (1,7) is exposed to the radiation and the only external force exerted to rupture the roller bearing race is a pressure force exerted onto the raceway surface (3,9) along an area directly opposed to the area (6,10) of the seating surface (2,8) exposed to radiation.

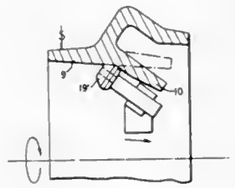
4,821,387

METHOD OF MANUFACTURING COOLING FILM DEVICES FOR COMBUSTION CHAMBERS OF TURBOMACHINES

Pierre A. P. Bouillot, Yerres, and Claude A. L. Genet, Vigneux, both of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.", Paris, France

Filed Sep. 25, 1987, Ser. No. 101,014
Claims priority, application France, Sep. 25, 1986, 86 13370
Int. Cl.[4] B21K *29/00*; B23P *15/26*
U.S. Cl. 29—157 C **7 Claims**





1. A method of manufacturing a cooling film device of short length for a large diameter combustion chamber of an aircraft turbo-engine, said cooling film device comprising an upstream wall of substantially cylindrical shape, a downstream wall, a tongue extending downstream from said upstream wall, said downstream wall and said tongue defining therebetween an annular chamber and a downstream annular outlet slit from said chamber for communication with the inside of said combustion chamber, and means defining a plurality of air inlet holes to said annular chamber, said method including the steps of:

(a) making an annular blank on a lathe, said blank having an upstream part of generally cylindrical shape and an enlarged downstream part of generally cylindro-frusto-conical shape;

(b) machining in said downstream part a frusto-conical recess opening in the downstream direction, thereby providing said downstream part with an inner portion having an axis which merges with that of said blank, a radial portion, and an outer portion with double curvature bounding said recess, said inner and outer portions defining inner and outer downstream wings;

(c) deforming at least one of the said inner and outer downstream wings to form on the one hand said downstream wall of said cooling film device, and on the other hand said inner tongue, thereby defining said annular chamber and said outlet slit therefrom;

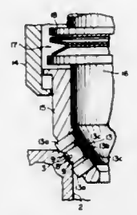
(d) drilling rows of holes in said radial portion separating said tongue and said downstream wall.

4,821,388

METHOD FOR PROCESSING A NUT SEAT ON A WHEEL

Tsunemasa Okumura, Aichi, and Shunji Kobayashi, Okazaki, both of Japan, assignors to Topy Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 184,800
Claims priority, application Japan, Apr. 24, 1987, 62-99993
Int. Cl.[4] B21H *1/02*
U.S. Cl. 29—159.01 **10 Claims**



1. A method for processing a nut seat on a wheel, said nut seat being formed around a bolthole opened through said wheel, said method comprising the steps of:

drilling said nut seat and said bolthole on said wheel substantially simultaneously with a step drill; and

performing a roller burnishing on at least the edge portions of said nut seat, including rolling at least one roller on said nut seat in a circumferential direction of said nut seat while said at least one roller is pressed onto said nut seat, said at least edge portions of said nut seat being finished to a specular grade by said roller burnishing.

4,821,389

METHOD OF MAKING A PIN FIN HEAT EXCHANGER

Richard D. Nelson, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

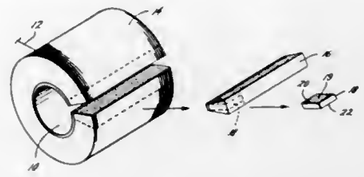
Filed Dec. 1, 1987, Ser. No. 126,648
Claims priority, application United Kingdom, Dec. 3, 1986, 8628967
Int. Cl.[4] B21D *53/02*
U.S. Cl. 29—157.3 R **12 Claims**

1. The method of making a pin fin heat exchanger comprising,

wrapping a thermally conductive wire having a coating around a mandrel forming a multilayered coil,

fusing the coating together for holding the wires together,

cutting a section out of the coil providing a plurality of generally parallel wires having first and second ends, and



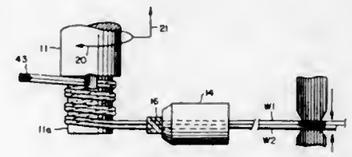
placing the cut section between an object and a wall for transferring heat therebetween with the first ends engaging the object and the second ends engaging the wall.

4,821,390

MULTIPLE-STRAND TORSION SPRING AND METHOD OF FORMING THE SAME

Peter G. Seyler, Franklin Park, Ill., assignor to Perfection Spring & Stamping Corp., Mt. Prospect, Ill.

Filed Mar. 15, 1988, Ser. No. 168,377
Int. Cl.[4] B21F *35/00*
U.S. Cl. 29—173 **7 Claims**



1. A method of forming helical springs composed of a plurality of parallel, coiled strands of spring wire with such strands being unconnected along most of their length but being joined together at least at one end of said spring,, comprising the steps of

(a) arranging a plurality of wires in substantially parallel, contiguous relation; each of said wires including first, second, and third integral sections of equal length with said first sections having leading end portions welded together in a first zone of connection; said wires also being welded together in a second zone of connection spaced from said first zone and located along a stretch of wire that includes trailing end portions of said first sections and leading end portions of said second sections;

(b) winding said first sections, starting at a point adjacent the leading end portions thereof, about a mandrel to coil said parallel first sections into a plural-strand helix while simultaneously longitudinally advancing said second and third sections;

(c) and thereafter transversely severing said wires along said stretch and welding said wires together in a third zone of connection spaced behind said second zone a distance equal to the distance between said first and second zones or a multiple thereof.

4,821,391

MACHINE FOR FORMING AUTOMOTIVE MUFFLER MECHANICAL LOCK JOINT

Robert J. Paterick, Knoxville, Tenn., assignor to Maremont Corporation, Carol Stream, Ill.

Filed Jun. 13, 1986, Ser. No. 873,799
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—253 **11 Claims**

1. Apparatus comprising:

a base;

first ways on the base defining an axial direction, the first ways extending axially;

a die and first workpiece component holder movably mounted on the first ways and movable between an operative position and a retracted position;

a die on the die and first workpiece component holder;

a punch holder on the base including an axially extending barrel;

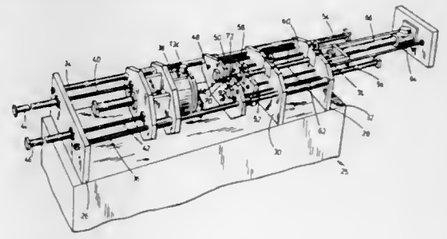
a drive rod extending axially within the barrel;

a wedge on the drive rod, the wedge extending from the barrel toward the and first workpiece component holder;

a plurality of punch segments circumferentially spaced about the wedge having guided members,

means for positioning a workpiece, said means for positioning being movably mounted about said punch holder whereby a workpiece may be positioned to engage said punch segments;

automatic drive means on the base for axially reciprocating the drive rod and wedge between a punch engaging position and a non-engaging position, the wedge in the punch



engaging position driving the punch segments radially outward;

means on the base for automatically reciprocating the die and first workpiece component holder in coordination with the drive means, the die and first workpiece component holder in the operative position locating the die and first workpiece component for the punch segments to engage the first workpiece component against the die,

whereby a first workpiece component loaded in the die and first workpiece component holder is held, reciprocated into operative position with the die while the punch segment are driven radially outward to engage the first workpiece component against the die, the first workpiece component thereby being deformed by the punch segments and die said apparatus further comprising, on the barrel adjacent the punch segments, a second workpiece component holder and means to locate said second workpiece component holder relative to said first component holder, whereby a second workpiece component is deformed with the first workpiece component.

4,821,392

COUPLING SEPARATOR

Donald L. Layland, Jr., Yucaipa, Calif., assignor to Romalayland Enterprises, Bellflower, Calif.

Filed Dec. 30, 1987, Ser. No. 139,724
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—267 **7 Claims**

1. A coupling separator tool for use with a two-piece coupling to dislodge one piece from the other, said coupling being composed of a receptacle permanently mounted on an adjacent surface and a removable plug portion engagable with said receptacle, said removable plug portion including at least one ear projection which may be used for leverage removal of said plug, said separator tool including:

an elongated handle means including a handle base portion having a longitudinal axis and a handle extension portion

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projecting outwardly of said base portion at an angle offset from said longitudinal axis wherein said handle base portion is spaced farther from said surface when said tool is in a working position, said handle extension portion having a longitudinal axis;

a yoke plug biasing means fixedly extending from said handle extension portion including a pair of spaced apart plug engaging-biasing fingers adapted to straddle said plug and having end portions adapted to engage said surface and



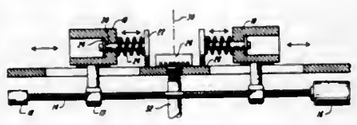
act as pivot points for said tool and said fingers having intermediate portions between said handle and said end portions lying in a plane offset from said handle extension portion longitudinal axis at least one of which is adapted to engage said plug ear projection whereby when outward hand pressure is exerted on said handle means said plug biasing means will leverage said tool against said surface and bias against at least one of said ears to disengage said removable plug portion in the same general initial direction as the applied force.

4,821,393

COMPONENT CENTERING TOOL

Donald J. Spigarelli, Carlisle, Mass., assignor to Srtechnologies, Inc., Concord, Mass.

Filed May 28, 1987, Ser. No. 55,031
Int. Cl.[4] B23Q *3/00;* **H05K** *3/30*
U.S. Cl. 29—283 **13 Claims**



1. Apparatus for centering a component on a surface comprising:

first and second jaws disposed in close proximity to the surface and each having an element for engaging a side of a component, and resilient coupling means for biasing the element in a normally extended position;

means coupled to the jaws and operative to selectively move the jaws in unison toward each other and away from each other;

the jaws being operative during movement toward each other to engage a component disposed on the surface between the jaws and to slide the component along the surface into alignment on a center line between the jaws;

the jaws being driven beyond the point of engagement between the elements and the component against the urging of the resilient coupling means, and

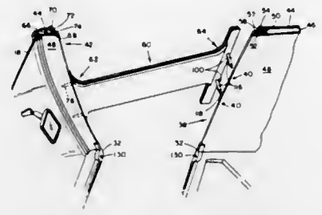
means separate from the jaws for retaining the component at its aligned position on the surface after centering by said jaws.

4,821,394

METHOD AND APPARATUS FOR CONVERSION OF A STANDARD AUTOMOBILE TOP TO A DETACHED ROOF AND/OR T-TOP MODEL

Raben Martinez-Vera, 1819 Babcock Rd. #107, San Antonio, Tex. 78229

Filed Oct. 14, 1983, Ser. No. 542,178
Int. Cl.[4] B60J *7/11*
U.S. Cl. 29—401.1 **6 Claims**



1. Apparatus for readily converting a detached roof style vehicle to a T-top style vehicle, comprising:

an H-shaped spanning member having a first end having detachable fasteners for readily removably securing said first end to a modified front windshield header on said detached roof style vehicle for mating engagement therewith and a second end having detachable fasteners for readily removably securing said second end to a modified rear roof portion on said detached roof style vehicle for mating engagement therewith, said spanning member extending longitudinally from said front windshield header to said rear roof portion at generally the center line of said detached roof style vehicle, said spanning member further comprising sealing means on said first end of said spanning member adapted to align with sealing means on said modified front windshield header and sealing means on said second end of said spanning member adapted to align with sealing means on said modified rear roof portion; and

a flange member connected to the center portion of said spanning member between said first end and said second end to permit removable attachment of two separate roof panels to said detached roof style vehicle when said first end of said spanning member is secured to said modified front windshield header and said second end of said spanning member is secured to said modified rear roof portion, thereby converting said detached roof style vehicle to said T-top style vehicle.

4,821,395

METHOD AND APPARATUS FOR ADJUSTING THE BACKLASH ON A DIFFERENTIAL

Michael S. Cook, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 23, 1988, Ser. No. 172,153
Int. Cl.[4] F16H *55/20*
U.S. Cl. 29—407 **3 Claims**

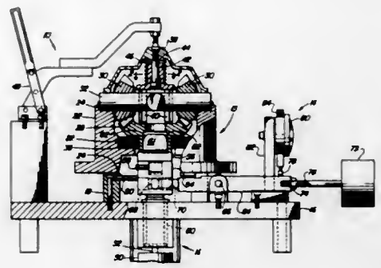
1. A method for adjusting the backlash between the bevel gears and pinion gears of a bevel-type differential , comprising:

assembling the pinion gears and one bevel gear into one half of the differential housing;

pressing said bevel gear towards said pinion gears while holding said pinion gears firmly in position in said differential housing half;

measuring the distance travelled by said bevel gear;

preparing a shim pack having a thickness approximately equal to the difference between the measured bevel gear travel distance and a pre-determined desired bevel gear travel distance; and



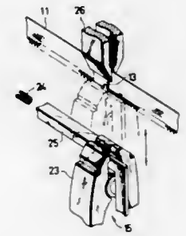
placing said shim pack in said differential half between said bevel gear and said housing.

4,821,396

METHOD OF MANUFACTURING SEPARABLE SLIDE FASTENERS

Keiichi Yoshieda, Kurobe; Yuusei Sassa, Namerikawa; Toshiaki Sodeno, Toyama, and Kunio Miyazaki, Uozu, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,591
Claims priority, application Japan, Oct. 9, 1984, 59-211932
Int. Cl.[4] B21D *53/50;* **A41H** *37/06*
U.S. Cl. 29—410 **4 Claims**



1. A method of automatically manufacturing separable slide fasteners from an elongate side fastener chain composed of a pair of slide fastener stringers having rows of coupling elements alternating with element-free portions having substantially U-shaped recesses in inner edges thereof, said method comprising the steps of:

(a) feeding the elongate slide fastener chain under tension along a longitudinal path;

(b) separating the pair of slide fastener stringers from each other;

(c) twisting the separated slide fastener stringers independently through an angle of substantially 90° in said longitudinal path so that the inner edges of the slide fastener stringers are directed downwardly;

(d) attaching an insertion pin to the downwardly directed inner edge of one of said element-free portions of one of the twisted slide fastener stringers by moving the insertion pin perpendicularly to the inner edge to fit the pin transversely over the inner edge and then clinching the pin thereon;

(e) attaching a box pin to the downwardly directed inner edge of a corresponding element-free portion of the other twisted slide fastener stringer by moving the box pin perpendicularly to the other inner edge to fit the box pin transversely over the other inner edge and then clinching the box pin thereon;

(f) retwisting the twisted slide fastener stringers independently through an angle of substantially 90° in said longitudinal path so that the inner edges of the slide fastener stringers face each other;

(g) threading said insertion pin and said box pin through a slider until certain coupling elements of the slide fastener stringers are interengaged; and

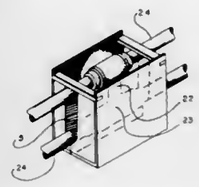
(h) finally, attaching a box to said box pin with said insertion pin inserted into said box.

4,821,397

METHOD FOR WET REMOVAL OF ASBESTOS INSULATION

William G. Lyons, Riverview Rd., Rexford, N.Y. 12148

Filed Jul. 6, 1987, Ser. No. 70,251
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—426.4 **6 Claims**



1. A method for complete wet removal of asbestos insulation covering and like hazardous materials from a structure of a pipe, joint or valve, comprising:

(a) positioning a length of trough around an asbestos covered structure by placing support bars through openings in upper wall portions of said trough to hold said trough in place around said structure;

(b) securing side walls of said trough to said structure;

(c) placing upper and lower end walls having semi-circular recesses in saddling relationship around said structure and into grooves in the side walls of said trough;

(d) sealing any spaces between said recesses and said covered structure;

(e) pouring water into said trough through the top until said structure is completely immersed in water;

(f) allowing the water to remain until said insulated covering is completely wetted and softened;

(g) removing water from around said structure through a drain cock in said trough;

(h) slitting a softened length of covering with a cutting tool and substantially removing said softened covering from said structure; and

(i) wiping the uncovered structure with a cloth saturated with an aqueous solution or oil to insure that no friable remnants of asbestos or like hazardous materials are left intact on said structure.

4,821,398

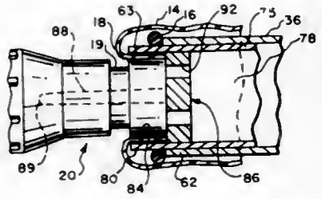
METHOD OF ATTACHING A STERILE SLEEVE TO A CONNECTOR

Richard A. Hillstead, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Mar. 3, 1988, Ser. No. 163,746
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—450 **6 Claims**

1. A method for forming a sterile sleeve/connector assembly including a joint between a sterile sleeve and a connector, such as a distal fitting, for the sleeve using a single barrel member having a lumen, a distal end and a proximal end, comprising the steps of:

(a) pushing an O-ring onto an outer surface of the distal end of said barrel member;
(b) sliding a sterile sleeve over the barrel member;
(c) inverting one end portion of the sleeve into the lumen of the barrel member at the distal end of the barrel member;
(d) sliding a hub of a connector into the inverted end portion of the sleeve within the lumen at the distal end of the barrel member;



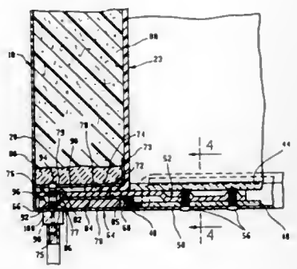
(e) forcing the O-ring off the distal end of the barrel member, into a bight of the inverted end portion of the sleeve and into an annular groove in the hub of the connector and,
(f) removing said connector from within said barrel member and pulling on the connector until the entire sleeve is removed from over the barrel member.

4,821,399

METHOD OF ASSEMBLING A REFRIGERATOR

Joseph P. Markley, and William D. Irish, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Feb. 18, 1988, Ser. No. 156,976
Int. Cl.[4] B23P *25/00;* **B29C** *67/22*
U.S. Cl. 29—458 **5 Claims**



1. Method of assembling a refrigerator having a fresh food compartment and a freezer compartment separated by a mullion partition, said refrigerator having an outer metal casing with side walls, an inner liner and foamed-in-place thermal insulation between the metal casing and liner comprising:
forming the metal casing having a vertical front face perpendicular to the side walls of the metal casing, said front face being formed to have a right angle bend relative to the side wall and a first U-shaped portion which includes a first outer wall perpendicular to the side wall and extending from the right angle bend to the first U-shaped portion, a second inner wall spaced from the first outer wall, the second inner wall being reversely bent to from a third wall and provide a second U-shaped portion formed between the second inner wall and the third wall, said first, second and third walls being in spaced parallel planes and having aligned screw receiving apertures therethrough adjacent the mullion partition,
vacuum forming the liner from plastic material, said liner having an outwardly directed peripheral flange,
placing a foam stop strip of gas permeable material over the screw receiving aperture on the surface of the third wall of the front face opposite from the second wall and adjacent the mullion partition,
placing the liner inside the metal casing in spaced relationship so that the flange is received between the second and third wall of the front face and spaced from the second U-shaped portion thereby forming a void cavity adjacent the mullion partition,
foaming the space between the outer metal casing and the liner other than the void cavity,
placing a reinforcing nut strip having a screw receiving aperture between the second wall of the front face and the liner in alignment with the front face screw receiving apertures,
inserting a nozzle with conduit means and having a side wall and end wall through the aligned apertures into the insulation void cavity, said nozzle having a slightly smaller diameter than the screw receiving apertures to provide a snug fit between the nozzle and the apertures,
forcing a foamable hot melt material through the nozzle conduit means into the insulation void cavity,
retaining the nozzle in the void cavity until the cavity is filled with foamable hot melt material,
withdrawing the nozzle from the aligned apertures, and
securing a fastener through the aligned apertures to secure the reinforcing nut strip to the front face.

4,821,400

METHOD OF MAKING BRAKE SHOE STOCK

Gilbert B. Burkhart, III, Washington; Don Casper, Meadowlands, and David E. Rosenberg, Pittsburgh, all of Pa., assignors to Pittsburgh Coil Technology, Washington, Pa.

Filed Apr. 4, 1988, Ser. No. 177,379
Int. Cl.[4] B23P *15/18*
U.S. Cl. 29—527.4 **8 Claims**

1. Method of making brake shoe stock from a coil of steel strip of a thickness at least 0.123 inch comprising:
a. continuously feeding strip steel from said coil
b. preparing a surface of said strip by abrading it to make an anchor pattern thereon,
c. cleaning said surface with a heated cleaning solution,
d. rinsing said surface with a hot water rinse, to achieve a heated surface temperature of at least 100° F.,
e. spraying on said heated surface phosphoric acid in a concentration from about 1% to about 20%, whereby said phosphoric acid is flash dried,
f. spraying onto said surface a partially cured phenol-formaldehyde resin having a Brookfield viscosity less than 80 cps, and
g. curing said phenol-formaldehyde resin under heat.

4,821,401

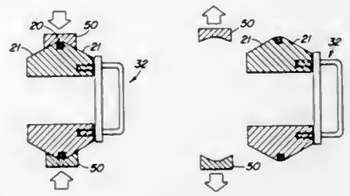
QUICK CHANGE COLLET AND REMOVAL TOOL

Brian D. Williams, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 33,447, Apr. 1, 1987, Pat. No. 4,768,269.
This application May 25, 1988, Ser. No. 198,413
Int. Cl.[4] B23P *19/04;* **B25B** *13/48;* **B23Q** *3/15*
U.S. Cl. 29—568 **5 Claims**

1. A method of rapidly changing a work holding collet in a machine wherein the collet is provided with a plurality of segments defining a work engaging surface, the segments are resiliently held together by a resilient means, each segment is provided with at least one aperture for receiving an outwardly extending finger of a collet removal tool, the method comprising the following sequential steps:

first, compressing the collet held in the machine by the machine compressing the collet;



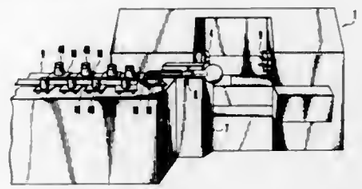
second, inserting the fingers of a collet removal tool into the tool receiving apertures in the collet;
third, removing the collet with the tool from the machine.

4,821,402

NC LATHE WITH ROBOT FOR AUTOMATICALLY EXCHANGING WORK AND CHUCK CLAW

Akira Kosho; Hideaki Matsuki; Hidefumi Shiratori; Shosaku Sawada, and Yoshitaka Kondo, all of Abiko, Japan, assignors to Hitachi Seiki Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,947
Claims priority, application Japan, Mar. 24, 1984, 59-056689
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 29—568 **7 Claims**



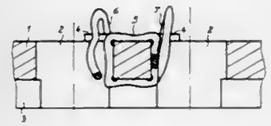
1. A numerical control lathe assembly for performing operations on workpieces comprising:
a rotatable chuck;
a plurality of means for holding a workpiece, each said workpiece having a holding knob having a first diameter; and
a plurality of magazines which carry a plurality of jaws for said chuck, each said magazine having a knob with the same diameter as said first diameter of said holding knobs;
means for storing said plurality of workpiece holding means and said plurality of magazines on one surface thereof and having a predetermined robot access area defined thereon and for selectively indexing a particular one of said plurality of workpieces or magazines to said robot access area in response to an applied signal commanding said particular one of said workpieces or magazines;
robot means, having a single robot arm that is located to have at least two positions, one adjacent said rotatable chuck and an other which picks up items from said robot access area on said storing means, and movable between said two positions responsive to an applied command, for exchanging one of said workpieces or chuck jaws between said robot access area of said storing device and said rotatable chuck, responsive to an applied command; and
control means, connected to control said robot means and said storing means, for storing a prestored sequence of workpieces and chuck jaws and sequentially executing said sequence by:
(1) commanding said storing means to move a magazine to said robot access area,
(2) commanding said robot arm to move said magazine to said rotatable chuck,
(3) commanding said storing means to move one of said workpiece holding means to said robot access area, and
(4) commanding said robot arm to move said workpiece to said rotatable chuck.

4,821,403

METHOD FOR MAKING A FLAT MAGNETIC STRUCTURE FOR READ/WRITE MAGNETIC HEADS

Jean-Luc Rolland; Paul L. Meunier, both of Paris, and Jean-Claude Mage, Levallois Perret, all of France, assignors to Compagnie Europeene de Composants Electroniques LCC, Courbevoie, France

Filed Oct. 28, 1987, Ser. No. 113,481
Claims priority, application France, Oct. 28, 1986, 86 14975
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **16 Claims**



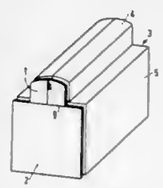
1. A method of making a flat magnetic structure having coils thereon, said structure including magnetic read/write heads using a flat substrate that has at least one side made of a magnetic material, said method comprising the steps of:
(a) initial machining of the magnetic side of the substrate to form supporting means for conducting wires, which forms said coils, and to demarcate future magnetic poles of said magnetic read/write heads; then
(b) depositing, on either side or both sides of the substrate, connecting pins at a rate of two pins per said coil; then
(c) positioning the conducting wires on said supporting means to form the coils, then
(d) connecting the ends of the conducting wires of each coil to the corresponding connecting pins; then
(e) coating the machined magnetic side with an insulating material; and then
(f) machining and polishing the coated side until the magnetic poles are exposed.

4,821,404

METHOD OF CONNECTING A MAGNETIC HEAD CORE WITH A MOUNTING PLATE

Horst Gukkenberger, Weiherhofer-Haupstr. 81, D-8502 Zirndorf; Karl Eberle, Blütenstr. 15, D-8501 Cadolzburg, and Klaus J. Köpnick, Königsbergerstr. 42, D-8510 Fürth, all of Fed. Rep. of Germany

Filed Aug. 3, 1987, Ser. No. 82,885
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626274
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **8 Claims**



1. A method of connecting a magnetic head core having a

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tape contact face to a mounting plate to form a video magnetic head unit, comprising the following steps

providing a ferrite core block from which the individual head cores are to be separated, said core block having a connecting face opposite the tape contact face,

providing a bonding layer on the connecting face,

connecting the core block to a metal block from which the mounting plates are to be separated by means of solder provided between the bonding layer and the metal block, and

jointly separating a magnetic core and a mounting plate as a single piece from the overall block formed by the core block and the metal block.

4,821,405

METHOD OF SECURING A VIDEO MAGNETIC HEAD

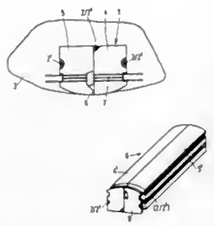
Horst Gukkenberger, Weiherhofer Hauptstr.81, D-8502 Zirndorf; Karl Eberle, Blütenstr. 15, D-8501 Cadolzburg, and Klaus J. Köpnick, Königsbergerstr.42, D-8510 Fürth, all of Fed. Rep. of Germany

Filed Jul. 31, 1987, Ser. No. 80,049

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626307

Int. Cl.⁴ G11B *5/127*

U.S. Cl. 29—603 **11 Claims**



1. A method of manufacturing a video magnetic tape apparatus comprising a head disc having a video magnetic head secured thereto, said method comprising the following steps:

connecting two core block halves to form a core block having a non-magnetic gap between said halves,

providing said core block with an elongate recess in each respective core block half, each recess facing away from the core block half of the other recess, said recesses lying on opposite sides of said block, said recesses paralleling said gap,

filling said recesses with solder,

separating an individual head from the block,

placing the head in a predetermined position on the disc, and

soldering the head to the disc by melting the solder in the recesses.

4,821,406

PROCESS FOR PRODUCING A MAGNETIC HEAD

Hiroyuki Ota, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

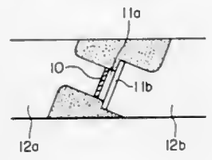
Filed Feb. 26, 1988, Ser. No. 160,969

Claims priority, application Japan, Feb. 27, 1987, 62-43153

Int. Cl.⁴ G11B *5/412*

U.S. Cl. 29—603 **7 Claims**

1. A process for producing a magnetic head, comprising the steps of: forming a magnetic-gap-forming nonmagnetic thin film on a first substrate made of a magnetic oxide material, forming a thin magnetic metal film on said nonmagnetic thin film, forming a plurality of recording/reproducing track width controlling grooves in a surface of said first substrate having said nonmagnetic thin film coating so as to produce a first core half, forming a thin magnetic metal film on a second substrate made of a magnetic oxide material so as to produce a second core half, and joining the two magnetic thin metal film coatings together on said first and second core halves to form a



head block having a magnetic gap defined by said nonmagnetic thin film.

4,821,407

METHOD OF MANUFACTURING A DEFLECTION UNIT FOR A CATHODE RAY TUBE

Jacobus J. M. Van de Meerakker, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

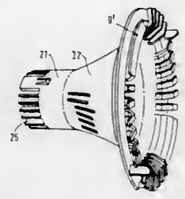
Filed Sep. 22, 1987, Ser. No. 99,885

Claims priority, application Netherlands, Sep. 22, 1986, 8602377

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.⁴ H01F *41/06*

U.S. Cl. 29—605 **5 Claims**



1. A method of manufacturing an electromagnetic deflection unit for a cathode ray tube, which unit comprises a field deflection coil consisting of two parts, a line deflection coil consisting of two parts and an annular core of a magnetizable material surrounding the two coils; such method comprising: winding the two parts of the field deflection coil on the inside of a hollow, funnel-shaped field coil support; passing a hollow, funnel-shaped line coil support having an annular flange at its wide end into the field coil support to such an extent that its narrow end projects outside the field coil support; and subsequently winding the two parts of the line deflection coil on the inside of the line coil support.

4,821,408

PROGRAMMABLE FIXTURE AND ASSEMBLY CELL

Thomas H. Speller, Sr., Buffalo, and Jeffrey P. Weaver, Tonawanda, both of N.Y., assignors to Gemcor Engineering Corp., Buffalo, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,732

Int. Cl.⁴ B23P *21/00;* **B25B** *27/14*

U.S. Cl. 29—701 **36 Claims**

1. A flexible fixture for holding a plurality of details comprising an assembly during assembly processes thereon comprising:

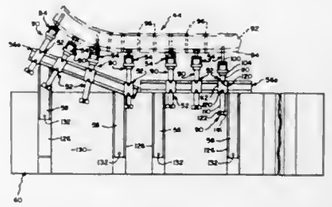
(a) an elongated base;

(b) means for supporting said base in a predetermined position;

(c) a plurality of movable positioning means located at spaced locations along said base, each of said positioning means having holding means adapted to engage said details, said positioning means being located to allow access

to said details from two directions of movement of tools of assembly apparatus moving with respect to the assembly during assembly processes thereon;

(d) mechanical means separate from said base for engaging said positioning means for moving said positioning means relative to said base to enable said holding means to accept



various members of a family of details which all have substantially the same configuration and differ by increments in size and for holding the details together as an assembly and in the proper detail location and assembly position for assembling; and

(e) means for moving said holding means into and out of engagement with said details.

4,821,409

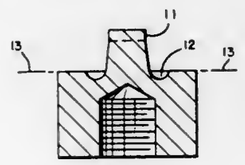
ELECTRICAL CONNECTION APPARATUS FOR FLAT CONDUCTOR CABLES AND SIMILAR ARTICLES

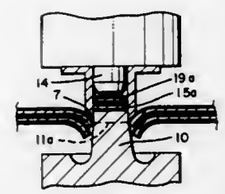
Urs F. Nager, Jr., Bethel, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Continuation of Ser. No. 314,965, Oct. 26, 1981, abandoned. This application Dec. 21, 1984, Ser. No. 684,974

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—747 **8 Claims**





1. Apparatus for quickly and rapidly producing a strong electro-mechanical connection on a flat conductive article, which comprises:

a. an electrically-conductive compressible rivet connector, having a flange with a circular opening and a hollow cylindrical post circumferentially-joined to the flange at said opening, the top of said post being tapered outward toward said flange;

b. anvil means comprising a base, a vertical circular post attached thereto, and a curved, circular well immediately surrounding said post at the anvil base, wherein the post is cylindrical at the top and is thereafter uniformly tapered out toward the anvil base; where the inner diameter of the hollow rivet post is greater than the diameter of the top cylindrical portion of the anvil post but less than the diameter of the tapered portion thereof;

c. compression means for positioning and registering said rivet connector opposite said anvil means in post-to-post concentric facing relationship, wherein said compression means forcibly thrusts said rivet post through a flat conductive article placed between the rivet connector and the anvil, to produce a cut out portion from said flat conductive article, and over said anvil post whereby said rivet post is formed into an eyelet which clamps said flat conductive article between the eyelet and said rivet flange so as to electro-mechanically secure the rivet connector to said flat conductive article.

4,821,410

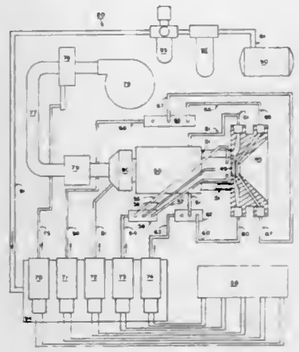
ELECTRICAL CORD FILLER REMOVAL APPARATUS AND METHOD

James W. Pierpoint, 4610 Yuma Ct., Winston-Salem, N.C. 27107

Filed Aug. 7, 1987, Ser. No. 82,747

Int. Cl.⁴ H01R *43/00*

U.S. Cl. 29—825 **25 Claims**



1. A cord receptacle for containing a cord while removing filler therefrom comprising: a cord nozzle, said nozzle having

(a) a cord channel and

(b) a fluid passageway, said fluid passageway encircling and communicating with said cord channel whereby fluid passing through said passageway will enter said cord channel and will contact a cord therein.

21. A method of removing filler from electrical cords comprising: stripping the outer jacket from an electrical cord to expose the filler, inserting the stripped cord into a nozzle channel and thereafter causing degradation to the filler by directing conditional fluid against the filler while the cord is in said channel.

4,821,411

METHOD OF MANUFACTURING ELECTRICAL CONTACT PINS

Hirokatsu Yaegashi, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 945,036, Dec. 22, 1986, abandoned, which is a division of Ser. No. 857,948, May 1, 1986, abandoned. This application Mar. 10, 1988, Ser. No. 166,426

Claims priority, application Japan, Jun. 13, 1985, 60-128444

Int. Cl.⁴ H01R *43/16*

U.S. Cl. 29—874 **1 Claim**

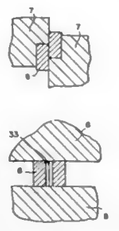
1. A method of manufacturing an electrical contact pin having a compliant part to be fitted into a small plated through

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hole of a diameter of no more than 0.93 mm (0.037"), which comprises the steps of:

stamping a sheet of metal to form an elongated portion with a rectangular cross section in such a manner that the diagonal length of said elongated portion is less than said diameter;

shearing said elongated portion in its axial direction to form two elongated legs which are offset to a predetermined extent along a single vertical shear plane and have a length at least twice a width of said compliant part;



pressing said offset elongated legs between a pair of flat die surfaces to flatten so that they return to a single horizontal plane

said predetermined extent being such that when flattened, said elongated legs automatically expand outwardly to form a thin slot with a pair of short shear ends at its opposite ends; and

coining said shear ends for fine adjustment of the width of said thin slot so that said compliant part resiliently fits into said small plated through hole.

4,821,412

METHOD OF PRODUCTING AN ELECTRIC CONTACT

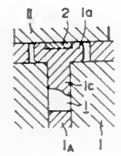
Tatsuhiro Tani; Masaaki Ishiguri; Rokuro Kikuchi, and Akio Ohyama, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation at Ser. No. 347,247, Feb. 9, 1982, abandoned. This application Jun. 28, 1985, Ser. No. 749,763

Claims priority, application Japan, Mar. 4, 1981, 56-29906

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—882 **8 Claims**



1. A method of producing an electric contact, the method comprising the steps of:

providing a contact base member of one metal, which base member has an axially extending blind hole;

providing a contact member of another metal of hardness lower than a hardness of the contact base member which contact member has a columnar shaped portion insertable into the blind hole and a height greater than a depth of the blind hole;

inserting the contact member into the blind hole of said contact base member;

applying axial pressure to the contact member to fill the blind hole with the contact member, an intimate contact interface area being formed between the contact member and a whole portion of the blind hole; and

applying axial pressure subsequent to the filling of the blind hole of the contact base member with the contact member, plastically axially compression-deforming both the contact member and the contact base member simultaneously, increasing, by the simultaneous plastic compression deformation of both said contact member and said contact base member, said initial intimate contact interface area into a final contact interface area larger than said initial contact interface area while changing an axial sectional shape of the interface defined between a wall of the blind hole and the contact member into a trapezoidal shape with the smallest side of the shape being the side adjoining said contact member, wherein an electrically superior contact state as well as a firm mechanical engagement between the contact member and the contact base member is achieved.

4,821,413

METHOD OF MAKING ELECTRIC COMPONENT

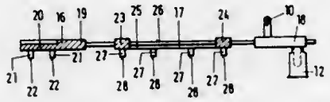
Herbert Schmitt; Dietrich Krause, and Helmut Winkler, all of Bad Neustadt, Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany

Filed Apr. 7, 1987, Ser. No. 35,520

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1986, 3612576

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—883 **4 Claims**



1. A method of making a component characterized by forming a terminal frame having conductive connections with terminal ends and connecting bars connecting the conductive connections in a predetermined spaced relation,

moulding a plastic carrier around at least a first portion of the conductive connections out of the range of the connecting bars to fix the predetermined spacing,

then cutting the connecting bars to electrically separate the conductive connections, and

then moulding a plastic sheath around at least a second portion of the conductive connections and the plastic carrier while maintaining said predetermined spaced relation.

4,821,414

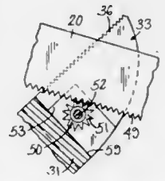
SWING SAW FOR CUTTING METAL CONDUIT

Lucien C. Ducret, 9 Tod's Driftway, Old Greenwich, Conn. 06870

Filed May 18, 1987, Ser. No. 52,238

Int. Cl.[4] B25D *9/00*

U.S. Cl. 30—90.2 **12 Claims**



1. A tool for cutting a workpiece comprising

a tool body;

means on said tool body for securing said workpiece;

a saw blade movably supported on said body for cutting the secured workpiece, said saw blade having a plurality of cutting teeth movable in a sawing direction and a feeding direction in a cutting plane extending through said workpiece; and

a bushing on said tool body rotatable about an axis normal to said cutting plane, said bushing being engagable on its periphery by said saw blade teeth and rotatable thereby, after cutting of said workpiece, to prevent further movement of said saw blade in said feeding direction while permitting movement of said saw blade in said sawing direction wherein said bushing includes a plurality of teeth on said periphery to mesh with said saw blade teeth for rotating said bushing and cleaning said saw blade teeth.

4,821,415

CONVERSION SET FOR A PORTABLE CIRCULAR SAW

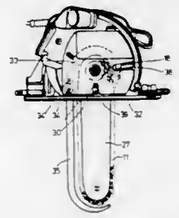
Willy Kress, Bisingen, Fed. Rep. of Germany, assignor to Kress-elektrik GmbH & Co., Bisingen, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,124

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805041

Int. Cl.[4] B25F *3/00*

U.S. Cl. 30—122 **13 Claims**



1. Conversion set for a portable circular saw including a housing, an electric drive motor mounted within the housing, a saw blade output mounting shafl in driving connection with the motor and having an end extending from said housing, the improvement comprising a chain-saw adaptor attachment adapted to be connected to said portable circular saw, the said adaptor attachment having a self-supporting main bearing plate non-rotatably attached to said portable circular saw and being oriented in a plane vertical to said output mounting shaft, and a pinion seated in the said main bearing plate for driving a saw chain connected thereto and connected with said output mounting shaft, said main bearing plate (**21**) comprising a bore (**22**) having bearing therein (ball bearing **23**) and ,receiving a mounting spindle in said bearing (**24'**), said spindle being connected to the said pinion (**24**), the said mounting spindle (**24'**) being fitted on the said output mounting shaft of the said basic unit (**10**) of the portable circular saw for rotationally entraining the said pinion (**24**).

4,821,416

SKINNING KNIFE

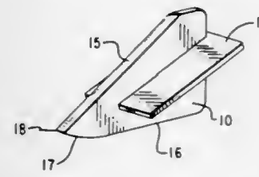
Emil J. Dullinger, 35274 County Road 4, St. Joseph, Minn. 56374

Filed Aug. 7, 1987, Ser. No. 82,870

Int. Cl.[4] B26B *29/00*

U.S. Cl. 30—294 **3 Claims**

1. For use in skinning an animal, a knife comprising a flat blade piece having one sharpened edge and a non-cutting end and a flat vane piece, said pieces being formed with co-relative slots, each of said pieces being engaged in said slot in the opposite piece so that said vane piece extends on opposite sides of said blade piece and only slightly beyond said end of said blade piece, said pieces being readily disengageable from said slots to separate said pieces, both of said pieces being flat



whereby the pieces can be placed side by side and readily carried as a flat package.

4,821,417

DEVICE FOR FACILITATING USE BY HANDICAPPED OF TOOLS AND UTENSILS

Anthony H. Levine, 5000 Brewster Dr., Tarzana, Calif. 91356

Filed Apr. 9, 1987, Ser. No. 40,907

Int. Cl.[4] A47J *43/28*

U.S. Cl. 30—298 **9 Claims**



1. A device for use by the manually disabled for carrying an eating utensil such as a spoon or a fork, comprising:

means for wrapping about and thereby attaching to the extremity of a manually disabled person, said means comprising an elongated semi-rigid handle element having first and second ends, and of length sufficient for wrapping entirely about a hand at least once, said semi-rigid handle being sufficiently rigid so that once it is bent it will retain its configuration until rebent, said first end being free for said wrapping; and

coupling means at said second end of said handle for the attachment thereto of said utensil;

said handle element including a flexible sheathing along substantially its entire length and an internal semi-rigid supporting element which is non-elastic.

4,821,418

BLADE HOLDER

Alfred Windhager, 352 Ellamar Rd., West Palm Beach, Fla. 33405

Filed Nov. 15, 1984, Ser. No. 671,514

Int. Cl.[4] B26B *1/00*

U.S. Cl. 30—329 **1 Claim**

1. A blade holder comprising a handle, a shaft attached to said handle and a clamp attached to said shaft, said shaft being bent to an angle sufficient to assure that the centerline of the portion of the shaft attached to said handle does not align with the centerline of the portion of the shaft that is attached to said clamp, and said clamp comprising a member that defines a channel whose sides are substantially parallel and whose width is approximately the same as the width of a two-edged blade to be held by said clamp, said clamp being made of a strong material so that the substantially parallel inner sides of the

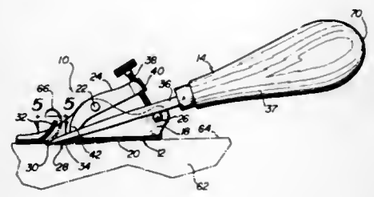
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member securely grip and hold the two-edged blade by friction in a position that exposes both edges of the two-edged blade at



the same time and allows cutting by either edge of said two-edged blade during use of the blade.

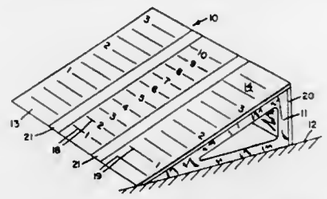
4,821,419
BLIND NAILER
Leonard G. Lee, Ottawa, Canada, assignor to Lee Valley Tools Ltd., Ottawa, Canada
Filed Aug. 28, 1987, Ser. No. 90,946
Int. Cl.[4] B27G *17/02*
U.S. Cl. 30—493 **3 Claims**



1. A woodworking chisel for use in a plane body, comprising a metal shaft fixed to a handle on one end and having at the other end a cutting edge having a substantially straight central portion and curved ends defined by:
a. a first bevel extending entirely across the shaft, and
b. on the side of the shaft opposite the first bevel:
(i) a second, centered bevel which intersects the central portion of the first bevel at the cutting edge, and
(ii) a contour symmetrical about the longitudinal axis of the shaft and curved transverse to that axis so that the contour intersects the first bevel on both sides of the second bevel.

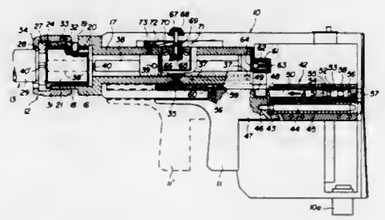
4,821,420
MEASUREMENT OF PERIPHERAL STRENGTH
William A. Maykel, 36 Stark Rd., Worcester, Mass. 01602
Continuation of Ser. No. 21,631, Mar. 4, 1987, Pat. No. 4,741,110, which is a continuation of Ser. No. 772,877, Sep. 5, 1985, abandoned, which is a division of Ser. No. 612,346, May 21, 1985, Pat. No. 4,539,756. This application Dec. 31, 1987, Ser. No. 139,983
Int. Cl.[4] A61F *3/00*
U.S. Cl. 33—512 **4 Claims**

1. Gage to measure the point of heel elevation at which peripheral strength is lost, comprising:
(a) a support structure adapted to rest on a flat horizontal first surface,
(b) a plate connected to the support structure and having a second surface, which surface is inclined at a selected angle to the first surface, so that a patient to be tested can be placed in a standing position with the balls of both feet on the said first surface and with the heels of both feet on the second surface, the foot angle between the first surface (on the one hand) and the plane of the balls and heels (on the other hand) being changed in successive steps while measuring peripheral strength at each step to observe the step at which peripheral strength begins to decrease, and



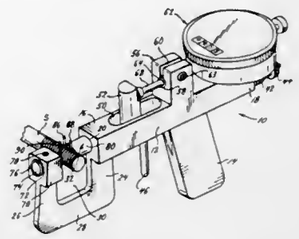
(c) markings including horizontal lines to indicate the foot angle at the successive steps, wherein an adjustable brace extends between the support structure and the plate to change the angle between them, the balls and heels remaining in fixed positions on the two surfaces, while the angle of the second surface is adjusted, the markings being located on a protractor extending between the support structure and the plate.

4,821,421
MICROMETER FOR MEASURING OUTER DIMENSIONS INNER DIMENSIONS OF A CAVITY OR DEPTH OF A CAVITY
Jean-Pierre Girardier, and Raymond Girardier, Both of 1411, Vaugondry, Switzerland
PCT No. PCT/CH86/00131, § 371 Date May 14, 1987, § 102(e) Date May 14, 1987, PCT Pub. No. WO87/01797, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 18, 1986, Ser. No. 57,925
Claims priority, application France, Sep. 19, 1985, 85 14038
Int. Cl.[4] G01B *5/12*
U.S. Cl. 33—819 **12 Claims**



1. Micrometer including a body containing means for displaying the results of measurements, said body being equipped with a cylindrical head, a measuring piece detachably mounted on said head and adapted for the measurement of either the outer dimensions of a surface, or of the inner dimensions of a cavity or of depths, and means attached to said head for effecting measurements in natural size and for displaying a value corresponding to the real dimension of the measured object, wherein said means for effecting measurements comprise a surface plate secured to said head and serving as a reference surface designed to constitute a fixed support for said measuring piece, said head being solid with said body, said surface plate having two series of serrations respectively parallel to two mutually perpendicular diameters of said head.

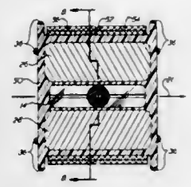
4,821,422
MAGNETIC WIRE HOLDING DEVICE
Robert D. Porter, Florissant, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Jan. 11, 1988, Ser. No. 146,606
Int. Cl.[4] G01B *5/16*
U.S. Cl. 33—199 R **20 Claims**



1. An improved, hand-held measuring device for determining both the major and pitch diameters of screw threads, gears, splines and the like, and comprising:
an elongated body having a passageway extending along a longitudinal axis thereof;
said passageway having a front-end portion and a rear-end portion aligned with one another and with said longitudinal axis of said elongated body;
a spindle slidably disposed within said passageway, with said spindle having a forward end portion extending through and beyond the forward-end portion of said passageway;
a hollow adjustment screw encircling said spindle and threadedly attached to a portion of said elongated body forming said rear-end portion of said passageway;
a support assembly comprising a plurality of attached leg portions including a first leg portion attached to said elongated body and a second leg portion having a surface intersecting the longitudinal axis of said body and confronting said forward end of said spindle, forming an opening of sufficient size to position a screw thread therebetween;
adjustable biasing means disposed within said passageway between said hollow adjustment screw and said forward end portion of said spindle for biasing said spindle through said passageway toward said second leg portion of said support assembly;
at least one of said confronting surfaces of said second leg portion and said forward end of said spindle including attractable magnetic means having a magnetically attractable end surface facing said opening for attracting and magnetically retaining gauging wires as required for determining the pitch diameter of a screw thread positioned in the opening formed by said confronting surfaces.

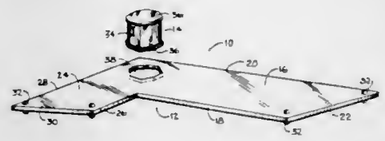
4,821,423
INSTRUMENT PRODUCING ELECTRICAL SIGNALS IN RESPONSE TO ACCELERATION FORCES
Eric M. Adams, 4740 NE. 29th Ave., Fort Lauderdale, Fla. 33308-4827
Continuation-in-part of Ser. No. 934,894, Nov. 25, 1986, Pat. No. 4,790,076. This application Aug. 25, 1987, Ser. No. 89,105
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[4] G01D *15/08*
U.S. Cl. 33—366 **10 Claims**

1. An instrument responsive to acceleration forces, comprising in combination:
a. a supporting structure having an outer perimeter and cavity therein;
b. means for providing a magnetic field in said cavity;
c. a body of magnetic material supported by a spindle;
d. channel means cooperating with said spindle to support said body magnetic material such that said body of magnetic material changes position in a predetermined manner along a path determined by said channel means within said cavity in response to acceleration forces; and



e. electrical sensor means responsive to the position of said body of magnetic material for producing an electrical signal having a predetermined relationship to the position of said body of magnetic material.

4,821,424
DRAFTING INSTRUMENT
C. Jim Loggins, Sheboygan, Wis., assignor to Mayline Company, Inc., Sheboygan, Wis.
Filed Aug. 1, 1988, Ser. No. 226,854
Int. Cl.[4] G01B *3/00*
U.S. Cl. 33—474 **16 Claims**



1. A drafting instrument comprising
an integrally formed planar body having a first, long leg and a second, short leg of equal widths, said legs intersecting at their proximal ends at a right angle and each having an inner edge and an outer edge, with the distal end of each leg inclined at a 45 degree angle relative to the outer edge of such leg, and with the lengths of said first and second legs proportioned such that a 30 degree angle is formed between the inner edge of said first, long leg and a straight line mutually tangent to the distal ends of both said first and second legs and a 60 degree angle is formed between the outer edge of said second, short leg and a straight line mutually tangent to the distal ends of both said first and second legs;
a plurality of glide points extending outwardly from each planar face of said planar body a short distance so as to contact a planar surface upon which the drafting instrument is positioned with the planar body of the drafting instrument parallel to said planar surface, and suspend said planar body above said planar surface;
an aperture penetrating said planar body near the intersection of said first leg and said second leg of said body; and
a handle having a shaft to be received through said aperture and having a pair of end caps each interconnected to a different end of said shaft, each of said end caps having a thickness less than the distance of extension of each of said glide points from each face of said planar body.

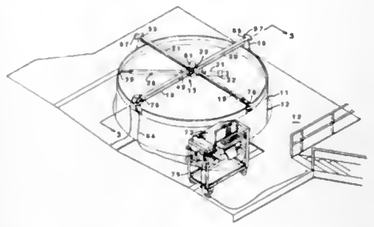
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4,821,425

CYLINDRICAL SURFACE PROFILE AND DIAMETER MEASURING TOOL AND METHOD

James R. Currie; Ralph R. Kissel; Charles E. Oliver; Earnest C. Smith; John W. Redmon; Charles C. Wallace, and Charles P. Swanson, all of Huntsville, Ala., assignors to United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 18, 1987, Ser. No. 122,740
Int. Cl.[4] G01B *7/28*
U.S. Cl. 33—520 **13 Claims**



1. A cylindrical surface profile measuring tool comprising:
a radius arm adapted to rotate about an offset center from the true radius center of an cylindrical surface,
means to rotate said radius arm about said offset center, said means including a two crossing beams structure adapted to be fixed to the open end of said cylindrical surface,
said radius arm having means to detect a surface of the cylindrical surface to be measured and a means to provide a first electrical signal indicative of said surface radius from the center of rotation of the radius arm,
resolving means for determining the angle of rotation of said radius arm at any interval and providing a second electrical signal indicative of its angle position,
computer means for receiving said first and second electrical signals and computing therefrom the continuous circumference profile of said surface of said cylindrical surface and the true radius center of said surface.

4,821,426

HIGHWAY PROFILE MEASURING DEVICE

Richard D. Angove, 200 Rockwell, Ames, Iowa 50010

Continuation-in-part of Ser. No. 7,523, Jan. 29, 1987, Pat. No. 4,697,352. This application Oct. 2, 1987, Ser. No. 104,116
Int. Cl.[4] G01B *5/28;* **B61K** *9/00*
U.S. Cl. 33—523 **9 Claims**



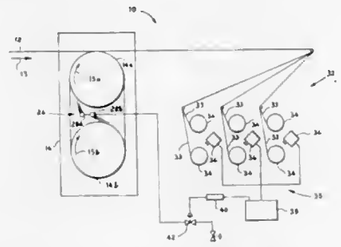
1. A surface profile measuring device, comprising:
an elongated first frame member having opposite forward and rearward ends;
an elongated second frame member having opposite forward and rearward ends;
hinge means pivotally connecting the frame members in an end-to-end relation;
front wheel means on the forward end of said first frame member for rollably supporting the front end of the first frame member on the surface;
rear wheel means on the rearward end of said second frame member for rollably supporting the rearward end of the second frame member on the surface;
the points engagement between the surface and the front and rear wheel means defining a reference plane extending through such points of engagement;
mid-wheel means adjacent the hinge means for rollably supporting the rearward end of the first frame member and the forward end of the second frame member on the surface and for pivoting said first and second frame members relative to one another when said mid-wheel means engages a surface elevation varying from the reference plane;
recording means for continuously recording the vertical displacement of said mid-wheel means; and
said recording means including marking means mechanically connected to said mid-wheel means, tensioning means for urging said marking means to a first position corresponding to said reference plane, and a writing surface, whereby vertical displacement of said mid-wheel means moves said marking means across said writing surface a distance corresponding to the vertical displacement of said mid-wheel means.

4,821,427

METHOD AND APPARATUS FOR REDUCING THE MOISTURE CONTENT OF WET YARNS

Terry S. Chern, Richmond, Va., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Apr. 18, 1988, Ser. No. 182,826
Int. Cl.[4] F26B *3/32*
U.S. Cl. 34—41 **16 Claims**



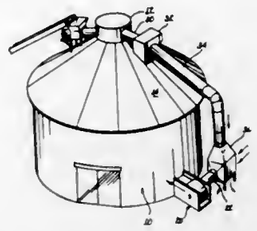
1. A method for reducing the moisture content of wet yarn comprising:
supplying said wet yarn to and discharging said yarn from a pair of spaced-apart, internally heated drier rolls each having an exterior yarn contact surface with a contact area and a non-contact area facing the other roll, said contact areas of said contact surfaces contacting and spirally advancing said yarn along said rolls to progressively reduce the moisture content of said yarn;
providing heat to said drier rolls at a rate in excess of that necessary to heat said yarn contact surfaces to reduce the moisture content of said yarn to a predetermined level;
spraying cooling fluid on said non-contact area of at least one of said drier roll yarn contact surfaces to cool said contact surface;
measuring the moisture content of said yarn subsequently to discharge from said rolls and producing a signal corresponding to the moisture content; and
controlling the spraying of cooling fluid in response to the signal produced by measuring the moisture content so that the moisture content of said yarn discharged from said rolls approaches said predetermined level.

4,821,428

HEAT EXCHANGER FOR GRAIN ELEVATORS OR BINS

Harold M. Good, 5633 N. 17th St., Phoenix, Ariz. 85016

Continuation of Ser. No. 8,463, Jan. 29, 1987, abandoned, which is a continuation of Ser. No. 701,775, Feb. 14, 1985, Pat. No. 4,676,007. This application Oct. 23, 1987, Ser. No. 115,584
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—86 **4 Claims**



1. Apparatus for recovering heat energy generated to remove moisture from, and thereby dry, an agricultural product contained in a bin and using air as a medium for the heat exchange without changing its gaseous state, said apparatus including:
(a) heating and blowing means for introducing heated fresh air into the bin to aid in evaporating the moisture in the agricultural products and in removing at least some of the moisture from the agricultural products;
(b) a conduit means for conveying the heated fresh air into the bin, said conduit means including means for forcing air flow in and about the agricultural products within the bin;
(c) exhaust means for drawing out and exhausting the heated moisture laden air from within the bin which air has flowed in and about at least some of the agricultural products in the bin, said exhaust means being operable independently of said heating and blowing means;
(d) further conduit means for conveying the exhausted air from said exhaust means to a remote location;
(e) heat exchange means located at the remote location for receiving and venting to the atmosphere the air flowing through said further conduit means; and
(f) means for directing a flow of fresh air through said heat exchange means to said heating and blowing means to preheat the fresh air flowing into said heating and blowing means;
whereby, a quantity of the generated heat energy is recovered from the exhaust air to preheat the fresh air flowing into the bin.

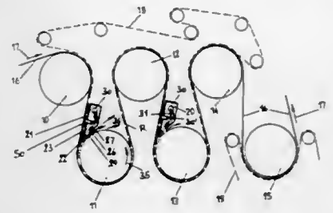
4,821,429

AIR GUIDE BOX FOR STABILIZING THE RUN OF A WEB, FOR INSTANCE A PAPER WEB

Ralf Sieberth, Appleton, Wis., assignor to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,863
Int. Cl.[4] F26B *5/00*
U.S. Cl. 34—114 **14 Claims**

1. An air guide box connected to a blowing air supply, for stabilizing the run of a web, for instance a paper web, specifically for the drying section of a paper machine where the web runs from a first roll or drying cylinder onto a second roll or drying cylinder having a cylinder surface
and where the air guide box is arranged transverse to the web and has the following characteristics:
a first wall, viewed in cross section, extends along the web, forming a first gap therewith,
a second wall, extends along the cylinder surface of the second roll or drying cylinder forming a second gap therewith,
characterized in that in the first wall there is provided a removal opening extending
across the length of the air guide box and serving to remove the air from the first gap into the interior of the air guide box, in that the removal opening is connected with an intake line of the blowing air supply, and in that in the



first wall there is provided at least one blowing slot which is connected with a pressure line of the blowing air supply and which, relative to the running direction of the web, is arranged before the removal opening, the blowing slot having a blowing direction coinciding essentially with the web running direction.

4,821,430

HEEL COUNTER FOR ATHLETIC SHOE AND FOOTWEAR INCORPORATING SAME

Udo Flemming, Erlangen, and Willi Bauer, Herzogenaurach, both of Fed. Rep. of Germany, assignors to PUMA AG Rudolf Dassler Sport, Herzogenaurach, Fed. Rep. of Germany

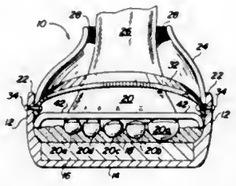
Filed Aug. 28, 1987, Ser. No. 90,581
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629264
Int. Cl.[4] A43B *23/08*
U.S. Cl. 36—69 **16 Claims**



1. Footwear, particularly an athletic shoe designed for medium and long distance running, including a shoe upper, a heel counter of a relatively stiff resilient material that is disposed below and supporting the heel area of the shoe upper, a cushioning midsole, and an outer sole, the midsole and the outer sole being connected to the shoe upper, wherein said counter is disposed on the cushioning midsole and includes a generally U-shaped wall which is shaped to extend about a heel portion of the shoe upper, and which has two sidewall portions that extend forwardly from the heel area to a point at least under the medial and lateral malleoli of a wearer's foot, wherein a flexibly yielding pressure distribution membrane of 0.6 to 1.5 mm is connected to a substantially thicker reinforced lower arcuate edge area of said U-shaped wall and extends from one of the sidewall portions to the other of the sidewall portions as a means for distributing heel impact forces to the sidewall portions by arching downward to receive the heel bone of a wearer under heel pressure applied by the foot of a wearer during walking or running, thereby causing an upper edge area of the sidewall portions of the U-shaped wall to be drawn inwardly to hold the heel with greater force.

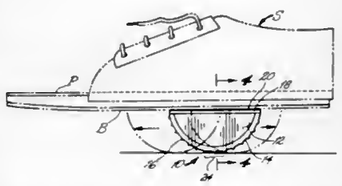
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4,821,431
SANDAL WITH CONTAINED GRANULAR MATERIAL TO PROVIDE A PAD FOR A PERSON'S FOOT
Donald W. Rieffel, 3402 E. Seneca, Tucson, Ariz. 85716
Filed May 10, 1988, Ser. No. 192,165
Int. Cl.[4] A43B *11/00, 1/00*
U.S. Cl. 36—88 14 Claims



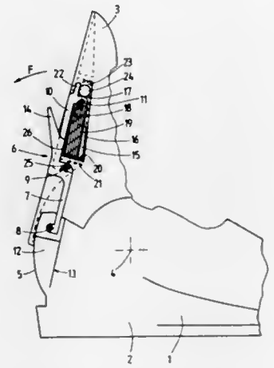
1. Footwear providing a natural environment walking surface for the bottom of a person's foot comprising:
a lower shell adapted to receive the person's foot;
a plurality of foot straps operably attached to said lower shell, said plurality of foot straps adapted to contain the person's foot; and
granular material held within said lower shell interposed said lower shell and the bottom of the person's foot whereby the bottom of the person's foot contacts the granular material which provides the natural environment walking surface for the foot while the foot is contained within the lower shell.

4,821,432
WALKING ADAPTER FOR POSTSURGICAL SHOES
M. Andrew Reiber, 16050 Bay Point Boulevard, N.E. 301, N., Ft. Myers, Fla. 33917
Filed Mar. 25, 1988, Ser. No. 173,570
Int. Cl.[4] A43B *13/00;* A61F *05/04*
U.S. Cl. 36—110 14 Claims



1. A walking adapter for attachment to postsurgical sandals having a ground-engaging surface, comprising:
a rigid support having an upper generally flat surface, a lower arcuate surface and generally flat sides;
said upper surface sized to fit a central portion of the postsurgical sandal and having an adhesive thereon for securing said walking adapter in unlimited position as desired to the central portion of the ground-engaging surface of the postsurgical sandal;
said lower arcuate surface having a textured central portion extending across said walking adapter between said sides.

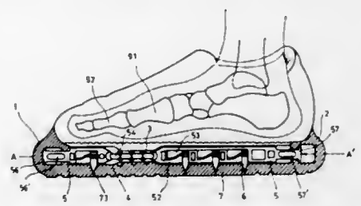
4,821,433
SKI BOOT
Herbert Marxer, Schaan, Liechtenstein, assignor to Lange International S.A., Fribourg, Switzerland
Filed Feb. 24, 1987, Ser. No. 18,054
Claims priority, application Switzerland, Apr. 18, 1986, 1577/86
Int. Cl.[4] A43B *5/04;* A43C *11/00*
U.S. Cl. 36—121 4 Claims



1. Ski boot made of at least semi-rigid material and comprising a shell (1) comprising the sole, said shell surrounding the foot and the heel and said ski boot comprising an upper which is hinged with the shell about a transverse pin (4) and at least one part (3) of which can be pivoted backwards on the shell, and said ski boot comprising moreover, at its rear, a mechanism (6) connecting the shell and the upper, consisting of a lever (7) passing through the pivotable part of the upper and hinged, at its bottom end (8), with the shell and connected via a link (10) to the said part of the upper which can be pivoted, the lever (7) and the link (10) forming a knuckle joint, wherein the elastic body (24) is accommodated in a cavity formed between the upper and one of the ends of the connecting mechanism (6) hinged with the upper, this recess being limited on the outside by an extended portion (22) of the said end, which extended portion is oriented substantially parallel to the axis of the connecting mechanism (6) and extends beyond the point (11) where the latter is hinged with the boot, such that this elastic body is compressed when the connecting mechanism is opened.

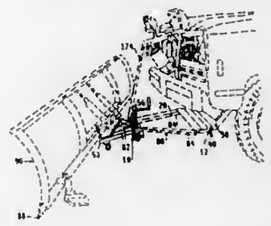
4,821,434
SHOE STRUCTURE WITH NAILS TO EXTEND OUT OR RETRACT IN BY KICKING FORWARDS OR BACKWARDS
Chung-Min Chein, No. 69, Kou Jung Rd., I-Lan City, Taiwan
Filed Feb. 19, 1988, Ser. No. 157,886
Int. Cl.[4] A43C *15/02, 15/00*
U.S. Cl. 36—134 9 Claims

1. A shoe for traversing various surfaces, said shoe comprising, in combination:
a sole, said sole having a top and a bottom defining a front edge, a central portion, and a rear edge, said sole having a brake formation near said front edge, a hollow formation in said central portion, a brake formation near said rear edge, a narrowed part generally located between the metatarsus and the phalanx of the foot of a respective user of said shoe, and lateral grooves at said bottom of the sole, said bottom of said sole further including a plurality of nail holes with a diameter slightly less than the diameter of respective driven nails;
a front cover, said front cover including a flexible member sealingly secured at the front edge of said sole, and including vent formations which are in communication with said central portion;
a rear cover, said rear cover including a flexible member sealingly secured at the rear edge of said sole, and including vent formations which are in communication with said central portion;
an upper pad plate arranged above a respective driving member and connected to said sole at the top thereof;
a lower pad plate arranged under a respective driving member and connected to said sole at the bottom thereof;
a driving member, said driving member including a front top member, a dual sliding rail, a single sliding rail, a chain link assembly and a rear top member, said driving member being sandwiched between said upper pad and said lower pad plate;



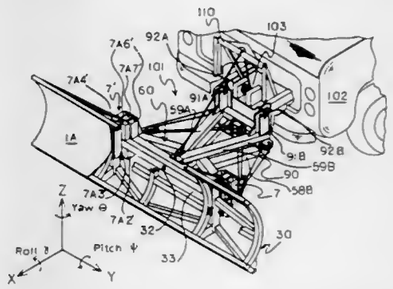
a plurality of driven nails, each of which has a sharp lower point and a central groove formation at the top thereof for engagement with a respective element of said driving member;
said driving member being able to move backwards upon said front cover being kicked, whereby said single sliding rail forces said driven nails to extend downwardly; and said driving member being able to move forward upon said rear cover being kicked so as to cause said driven nails to be retracted into said sole.

4,821,435
SNOW PLOW ALIGNMENT AND STORAGE SYSTEM
William D. Pester, 2113 Cornelia St., Omaha, Nebr. 68147
Filed Sep. 21, 1987, Ser. No. 98,983
Int. Cl.[4] E01H *5/04*
U.S. Cl. 37—231 16 Claims



1. A snow plow alignment and storage carrier for aligning the mounting apertures of a snow plow support module with cooperative apertures of a truck-mounted attachment module, said carrier comprising: a frame having wheels thereunder, a plow blade lower edge engaging means at the forward end of said frame and capable of engaging and supporting the lower edge of a plow blade when such blade is in a carrying position on said carrier, an elevating means supported by a rearward end of said carrier frame, said elevating means having a portion elevatable with respect to said carrier frame, snow plow support module engaging means attached to said elevatable portion and capable of engaging and supporting the underside of said snow plow support module while a snowplow blade is in said carrying position whereby as said elevatable portion is raised with respect to said carrier frame said support module will be raised so that said carrier with said snowplow thereon can be moved across a supporting surface thereunder so as to assist alignment of said apertures of said plow support module with said apertures of said attachment module whereby pivot pin means can be inserted through said apertures to pivotally mount said plow support module on said truck-mounted attachment module.

4,821,436
BLOW SYSTEM
Alexander H. Slocum, 550 Memorial Dr., Apt. 23B, Cambridge, Mass. 02139
Filed Nov. 14, 1983, Ser. No. 551,192
Int. Cl.[4] E01H *5/04*
U.S. Cl. 37—235 19 Claims



1. A plow to effect plowing action of a material at a surface, that comprises:
a blade having an arcuate-shell face region and bottom plate means that interfaces with the material at the surface being plowed, said bottom plate means being secured to and extending along the lower edge of the arcuate-shell face region and being disposed at an angle ϕ to the portion of the face region of the blade to which it is secured, said bottom plate means being wide enough to place the upper portion thereof above rigid obstacles usually encountered in the course of plowing, wherein the angle ϕ is the external angle formed between the face region of the plow blade and the bottom plate means at the junction of the two structures and is an angle greater than 180° and less than 360° and said bottom plate makes an angle α with the surface to be plowed of not less than 0° and not more than 90°;
a frame for attaching the blade to a vehicle, said frame being geometrically configured to counteract, in the course of said plowing action, dynamic lift forces exerted upon the bottom plate means; and
a blade connecting mechanism to attach the blade to the frame, the face region, when plowing is being achieved, being disposed to have a substantial vertical component, the bottom plate means comprising a plate whose bottom edge in contact with the material is a rider plate disposed at an angle to the first named plate, which rider plate is disposed essentially parallel to the surface during plowing, which surface serves as a bearing therefor, said material, in the course of plowing, providing dynamic lift to decrease wear of the rider plate that would otherwise occur, said frame being an L-shaped A-frame wherein the short leg of the L pivotally connects the plow at the vehicle attachment end of the plow to the vehicle to serve as a pivot attachment end of the frame to the vehicle and the long leg of the L is connected through the blade connec-

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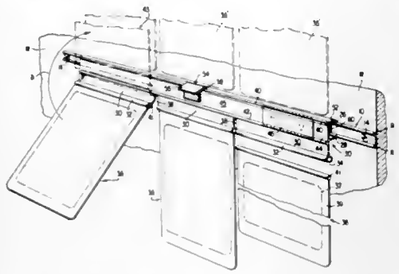
tion mechanism, to the blade, the dimensions of the short leg of the L, and hence the pivotal attachment location of the frame to the blade, being chosen to give an attachment location such that, when a force is applied to the blade at the lower edge thereof in the course of plowing, a moment is created about the pivot at the pivot attachment end of the frame to the vehicle, which moment produces a net downward force upon said rider plate to keep the rider plate in contact with said surface.

4,821,437

MERCHANDISE INFORMATION SYSTEM

Patrick B. Abramson, 304-365 Kennedy Rd., S., Brampton, Ontario, Canada L6W 3H3, and Willem J. Bake, P.O. Box 6464, Mississauga, Ontario, Canada L4W 9Z9

Filed Apr. 4, 1985, Ser. No. 719,963
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—642 **31 Claims**



1. A merchandise identification system comprising a plurality of display items at a first location sufficiently remote from a second location having available merchandise so that a customer at the first location does not have access to the merchandise at the second location, each item being provided on opposite sides thereof with information concerning corresponding available merchandise, and support means for holding said items in closely spaced high density concentration relative to one another so as to be individually visible while allowing each and every item to be manipulated by a customer to provide ready visual access to all the information on opposite sides of the item, said support means comprising an elongate support and a plurality of individual flexible members integral with said support means and cumulatively providing a length commensurate with that of said support means.

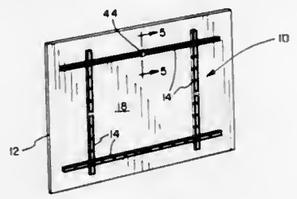
4,821,438

UNIVERSAL PICTURE SUPPORT ASSEMBLY HAVING GLASS RETAINING CLIPS

Marc A. Lansky, and Philip M. Clemens, both of Fort Wayne, Ind., assignors to Albert L. Jeffers and John F. Huffman, both of Fort Wayne, Ind., part interest to each

Continuation-in-part of Ser. No. 4,665, Jan. 20, 1987, Pat. No. 4,761,902. This application Oct. 13, 1987, Ser. No. 107,547
Int. Cl.[4] A47G *1/06*
U.S. Cl. 40—156 **16 Claims**

1. A universal picture support assembly, comprising:
a plurality of relatively rigid elongate grid members;
first means defined at a first plurality of spaced locations along each of said grid members for facilitating the breaking off of an end portion thereof to provide said grid member matched in length to a dimension of a picture to be mounted by said assembly;
second means defined at a second plurality of spaced locations along each of said grid members for facilitating interfitting of said grid members together in a gridwork pattern;
attaching means on one of a pair of opposite sides of said grid members for securing to the back of the picture said grid members when interfitted in said gridwork pattern, and



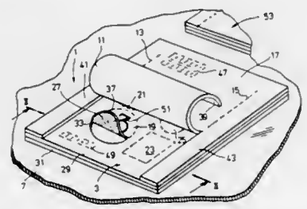
clip means adapted to be releaseably connected to ends of said grid members for clamping a sheet of glass or the like to the front of the picture.

4,821,439

COMPOSITE LABEL

Karl H. Wilck, Hamburg, Fed. Rep. of Germany, assignor to Chalcographi Druck U. Papierverarbeitung Reingold & Wilck KG (GmbH), Hamburg, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 117,678
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 8629843[U]
Int. Cl.[4] G09F *3/10*
U.S. Cl. 40—638 **10 Claims**



1. A composite label comprising a base layer having a contact adhesive at its rear surface enabling the separation of the base layer from a storing means and the adhesion to a useful carrier means and a cover sheet adapted to be connected to the base sheet by a separable attachment means and fixedly connected to the base sheet along a connecting portion, the cover sheet being adapted to be removed from the base sheet after the separation of the separable attachment means, the stock carrier means allowing an easy removal of the base sheet, characterized in that the base sheet includes a number of removable labels provided with a contact adhesive at their rear surface.

4,821,440

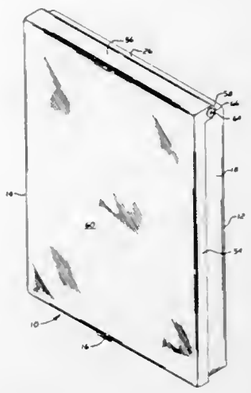
WEATHERIZED CONSTRUCTION SITE INSPECTION BOARD ASSEMBLY

Gary D. Dunn, 2080 Sandpiper Dr., Palm Harbor, Fla. 34683

Continuation-in-part of Ser. No. 920,532, Oct. 20, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 125,958
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—642 **12 Claims**

1. A weatherized display device comprising:
(a) a back frame enclosure having two side members, a top member and a bottom member, all integral at an interior edge with a back member, each side member having an outwardly projecting curl at an exterior edge, the top member having an upwardly projecting curl at an exterior edge, the bottom member having a downwardly projecting curl at an exterior edge;

(b) a tack board mounted on an interior surface of the back member;
(c) a pocket plate mounted perpendicular to the bottom member and engaged to at least a portion of each side member;
(d) a four-sided cover hinged on an exterior upper surface of



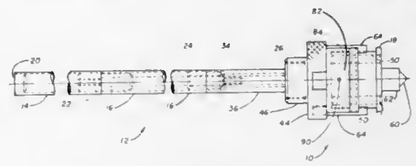
each back frame side member, the cover pressing against the bottom of each curl on the top member and side members of the back frame;
(e) means for displaying an identifying sign on an exterior surface of the cover; and
(f) means for mounting the display device on a display surface for ease of access.

4,821,441

MULTISHOT UNDERWATER SURVIVAL GUN

Manuel Castro, Jr., 7736 Textile Rd., Ypsilanti, Mich. 48197, and Bruce Bush, 598 Lambkins, Saline, Mich. 48176

Filed Jan. 27, 1988, Ser. No. 148,853
Int. Cl.[4] F41C *9/06*
U.S. Cl. 42--1.14 **18 Claims**



1. An underwater gun comprising a head and handle attached to the head, a cylinder in the head, said cylinder including a plurality of chambers, a plurality of arms engageable with said cylinder to retain the cylinder in the head, means to retain said arms in engagement with the cylinder and means to cause release of said arms from the cylinder, and said handle including a first handle portion and a second handle portion rotatable relative to the first handle portion , said first handle portion connected to said cylinder for rotation therewith.

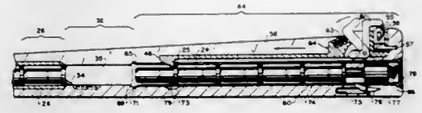
4,821,442

CENTER FEED MAGAZINE FOR FIREARMS

Robert T. Bock, Rd6 Drovers La., Brewster, N.Y. 10509

Filed Oct. 19, 1987, Ser. No. 109,992
Int. Cl.[4] F41C *25/06*
U.S. Cl. 42—17 **6 Claims**

1. A tubular shotgun magazine having a longitudinally central area for feeding cartridges into a shotgun receiver comprising:
a main magazine section means providing storage means for a single or a plurality of said cartridges and a feeding means of said cartridges into said shotgun receiver;
a auxiliary magazine section means providing storage means for said cartridges and having means to transfer said cartridges into said main magazine section;
a connecting member means to substantially coaxially align and securely attach the magazine sections to each other and to said shotgun receiver.
5. A cartridge clip comprising:



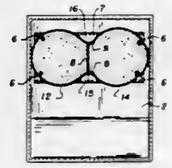
a flexible wall means defining a column space for receiving a single or a plurality of cartridges oriented axially in an end to end position;
a cartridge propelling means enclosed entirely within said flexible wall means, urging said cartridges toward a cartridge exit end of said clip;
a slot means formed in said flexible walls allowing access to said cartridges by a firearm cartridge feeding mechanism;
a cartridge retaining means formed into said flexible walls resisting the forces generated by said cartridge propelling means and retaining said cartridges within said clip; allowing passage of cartridges only when relieving forces applied on said cartridge retaining means by a firearm mechanism.

4,821,443

RECOIL ABSORBER

Rodolfo Bianco, 560 West 21st Avenue, Vancouver, British Columbia, Canada V5Z 1Y7

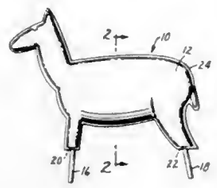
Filed Jul. 11, 1988, Ser. No. 217,589
Int. Cl.[4] F41C *29/00*
U.S. Cl. 42—94 **4 Claims**



1. A recoil absorber for use with a rifle comprising:
a base compartment; and
an upstanding compartment mounted to said base compartment, each of said compartments having flexible walls to define an interior that is substantially filled with particulate material of high density, the flexible walls of said upstanding compartment being connected by a central upstanding internal baffle extending therebetween, said baffle forming said upstanding compartment into two lobes separated by a narrowed portion defining a channel for accepting a butt of a rifle, said lobes communicating with each other about said baffle.

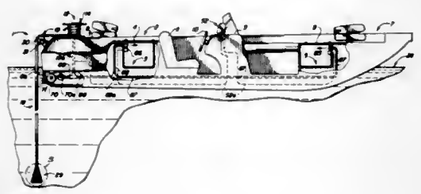
VOL 1101 ISS 3 APR 18 1989 UMI

4,821,444
HUNTING DECOY
David R. Remus, P.O. Box 33427, St. Paul, Minn. 55144-1000
Filed Nov. 30, 1987, Ser. No. 126,747
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—2 3 Claims



1. A figure particularly useful in hunting to simulate and lure game to the proximity of the figure comprising:
at least two silhouette portions formed of flexible, thermoformable, closed-cell expanded foam which when joined simulate substantially the complete exterior shape of said figure; and
a planar rib projecting from each of said portions and around the periphery of said portions for connection of one portion to another and stiffness of said portions.

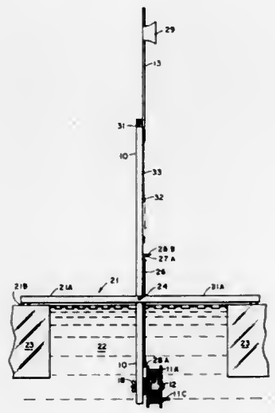
4,821,445
WATER DELIVERY SYSTEM AND METHOD
Robert E. Bass, P.O. Box 93, Vivian, La. 71082
Filed Dec. 29, 1986, Ser. No. 946,791
Int. Cl.[4] A01K *69/00*
U.S. Cl. 43—4.5 26 Claims



1. A water distribution system for mounting on a structure positioned over a water body and pumping water from a selected depth in the water body to a container for containing marine life, comprising a water pick-up cone; at least one first sensor provided in said water pick-up cone for analyzing at least one selected condition of the water at said selected depth and a monitor provided in electrical connection with said first sensor for indicating said selected condition of the water at said selected depth; a hose having one end secured to said water pick-up cone and the opposite end provided in fluid communication with the container; a reel mounted on the structure, said reel receiving the opposite end of said hose, wherein said reel is adapted to selectively wind and unwind said hose and deploy said water pick-up cone at said selected depth; and pump means provided in fluid delivery association with said hose for delivering water from said selected depth through said hose to the container.

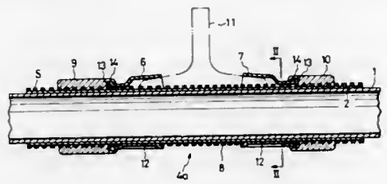
4,821,446
WIND RESISTANT ICE FISHING SIGNAL DEVICES
Joseph R. Beaulieu, Jr., Box 1294, Bucksport, Me. 04416
Filed Sep. 21, 1987, Ser. No. 99,303
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 3 Claims

1. An ice fishing device including a post having at least one side which is flat, a support dimensioned to straddle a hole in the ice and pivotally connected to the post between the ends thereof and positionable to hold the post vertically with one end portion extending downwardly, a flanged reel rotatably connected to said one end portion at said one side, a rigid signal arm of a substantial width one end of which is pivotally connected to the post adjacent the other end thereof to swing in a plane parallel to said one side between a depending inoperative position overlying a lengthwise portion thereof and an operative vertical position in alignment with the post, resilient means operable to swing said arm from its operative position and including a coil spring one end of which is anchored to said



one side between said upper post end and said support and a line connected to the other spring end and trained about the pivoted arm end and connected to the arm adjacent thereto, said line dimensioned to hold the spring tensioned in any position of the arm, said other spring end at all times below the pivoted arm end, and latch means extending lengthwise of said one side and rotatable between first position and second positions, in the first position the latch releasable held by the reel and the free end of the arm held if in its operative position and in the second latch position, the latch turned by the reel and the free arm end released.

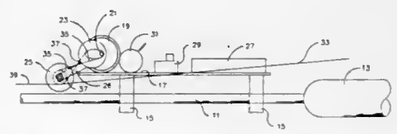
4,821,447
FISHING ROD AND METHOD OF MANUFACTURING SAME
Yoji Nakayama, and Akira Yasui, both of Fuchu, Japan, assignors to Ryobi Ltd., Japan
Filed May 10, 1988, Ser. No. 192,361
Claims priority, application Japan, May 11, 1987, 62-115443
Int. Cl.[4] A01K *87/06, 87/00;* B23P *19/04;* B32B *31/04*
U.S. Cl. 43—18.1 13 Claims



1. A fishing rod having a reel leg mounting portion on which a leg portion of a fishing reel is mounted, said reel leg mounting portion comprising:

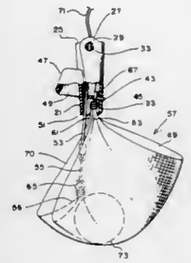
a prepreg sheet or woven fabric layer formed in such a manner that a prepreg sheet or woven fabric prepared by impregnating thermosetting resin into high tension or strength fibers is rolled up as a cylindrical tube for constituting a base of a fishing rod;
a glass fiber reinforced sheet layer formed in such a manner that a glass fiber reinforced sheet prepared by impregnating thermosetting resin into glass fibers is rolled up around a portion of the rolled cylindrical tube of the first mentioned prepreg sheet;
a carbon fiber reinforced sheet layer formed in such a manner that a carbon fiber reinforced sheet having carbon fibers extending in a single orientation and prepared by impregnating thermosetting resin into carbon fibers is rolled up around the second mentioned glass fiber reinforced sheet so that the carbon fibers in the carbon fiber reinforced sheet extend in a direction perpendicular to an axial length of a rod so as to form a thickened portion together with said two layers;
screw threads formed on the carbon fiber reinforced sheet layer of the thickened portion throughout an entire axial length thereof;
two nut-members each provided with a threaded inner surface which is engageable with the screw threads of the thickened portion to be axially movable;
two movable hood members to be mounted on said thickened portion to be engageable with said nut members respectively in an axially opposing relation to be axially movable but not rotatable with respect to the nut-members, the leg portion of the reel being mounted between said two movable hood members in a movable manner; and
a groove formed across said screw threads, said groove engaging with a portion of each of two movable hood members for preventing the movable hood members from being rotated.

4,821,448
LURE ACTION ATTACHMENT FOR FISHING RODS
Harold Lindaberry, Mansfield, Pa., assignor to Harlind and Sandlind Development Company, Mansfield, Pa.
Filed Jul. 11, 1988, Ser. No. 217,340
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—19.2 5 Claims



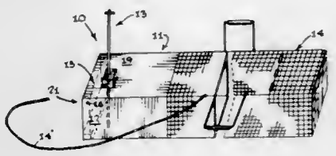
3. In combination, a fishing rod and a fishing lure activator device affixed to said rod, said devices comprising a housing for a battery operated motor having an eccentric pulley wheel turned by said motor and an idler pulley wheel mounted in front of and in alignment with said eccentric wheel whereby, when a fishing line from a reel on said rod is taken under said idler wheel, then wound under the bottom and over the top of said eccentric wheel and then taken back under the idler wheel and then leading said line to the tip of said rod to a weighted lure in the water to maintain said line taut, said motor, when energized, will activate said line to impart a swimming motion to said lure.

4,821,449
SINKER DROP
Harry Hafer, 3313 Onyx Rd., Miramar, Fla. 33025
Filed Feb. 22, 1988, Ser. No. 158,831
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—41.2 11 Claims



1. A sinker drop for use in a fishing rig comprising, in combination, a sling made of net-like material, non-releasable for holding one end of said sling, releasable means for holding the opposite end of said sling, means for releasing said opposite end of said sling, and initiating means for actuating said releasing means, said initiating means being responsive to contact with water when said rig is cast.

4,821,450
NO SPRAY LIVE SKUNK TRAP APPARATUS
Walter D. Kenison, Carefree Living, Apartment 1, Pioche, Nev. 89043
Filed Aug. 16, 1988, Ser. No. 233,176
Int. Cl.[4] A01M *23/02*
U.S. Cl. 43—61 8 Claims



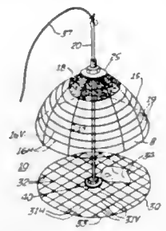
1. A live skunk trapping apparatus for minimizing the possibility that the trapper will be sprayed by a captured skunk wherein the trapping apparatus comprises:
a telescoping housing unit including a generally rectangular covered housing section and a generally rectangular open framework housing section wherein one of said housing sections is dimensioned to slide over the outside of the other of said housing sections; and,
a mechanical trap unit operatively connected within said telescoping trap housing unit and including a trap door member pivotally suspended within said trap housing unit.

4,821,451
SHELLFISH TRAP
Boris R. Matson, 2110 NE. First Ave., Boynton Beach, Fla. 33435
Filed Aug. 3, 1987, Ser. No. 80,909
Int. Cl.[4] A01K *69/06*
U.S. Cl. 43—102 8 Claims

1. A trap for submersion in waters containing shellfish comprising:
an elongated shaft;
a first and a second member, each having means for mount-

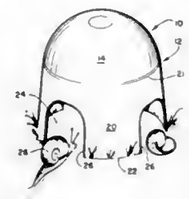
VOL 1101 ISS 3 APR 18 1989 UMI

ing that member on said shaft, said members being shaped for forming an enclosure having a hollow chamber for confining and entrapping a shellfish therein;
at least one of said first and second members permitting the passage of water therethrough;
at least one of said mounting means being so constructed for permitting movement of one of said members on said shaft relative to the other of said members;
at least one of said members including flotation means for maintaining said members in spaced apart relationship while the members are submerged in the water prior to confining or entrapping a shellfish; and
said flotation means being shaped to effect movement of said member including said flotation means into engagement with said other member for forming said hollow chamber during upward movement of said trap;



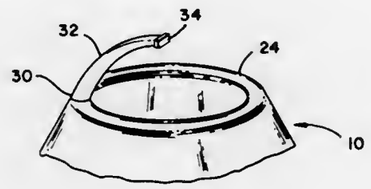
wherein said members are formed of a material having a specific gravity greater than the water and said flotation means includes a material having a specific gravity less than water;
wherein said one member including said flotation means is positioned above said other member and said flotation means is confined within said on member;
wherein other member is constructed for being positioned on an ocean bed;
wherein said member including said flotation means is hemispherically shaped with an open end and an apex;
wherein said other member is flat; and
wherein said open end faces said other member, whereby the other member serves as a closure for said open end; and
wherein said flotation means is confined in the apex area of said hemispherically-shaped member.

4,821,452
SNAIL TRAP
Kenneth E. Beckley, 2251 Casa Alta, Spring Valley, Calif. 92078
Filed Dec. 14, 1987, Ser. No. 132,601
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 **4 Claims**



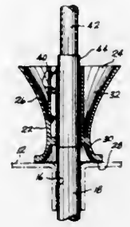
1. A snail trap comprising:
a housing having a top wall and side walls that form a chamber therewithin, said top wall having a top surface and a bottom surface, said side walls having an inside surface, a top edge and a bottom edge;
a plurality of snail entry archways formed ins aid side walls, said entry archways having an inverted U-shape to them, and the bottom edge of said archways coincide with the bottom edge of said side walls;
a plurality of legs extending downwardly from said side walls for anchoring said snail trap by insertion into the ground, said legs having side edges, an inside surface and being V-shaped, said side edges having top ends that join the bottom edges of said respective entry archways, the inside surface of said legs having a concave configuration in its horizontal plane; and
said housing and legs being integrally formed of plastic material.

4,821,453
PLANT PROTECTING AND GROWTH ENHANCING DEVICE
James B. Morehead, 485 Sonoma Mountain Rd., Petaluma, Calif. 94952
Filed Feb. 17, 1987, Ser. No. 15,789
Int. Cl.[4] A01G *13/00*
U.S. Cl. 47—2 **6 Claims**



1. A plant protecting and growth enhancing device comprising:
(a) a first truncated, hollow, rigid, self-supporting conical member having a top and a bottom end with said top end having a smaller diameter than said bottom end,
(b) a second truncated, hollow, rigid, self-supporting conical member having a top and a bottom end with said top end having a smaller diameter than said bottom end,
(c) said top end and said bottom end diameters of said second conical member being smaller that the respective diameters of said first conical member,
(d) said first and second conical members being joined by a continuous rigid bottom closure member between said bottom ends of said first and second conical members leaving an open base for said device,
(e) said first and second conical members being joined by a continuous rigid top closure member between said top ends of said first and second conical members leaving an open top for said device,
(f) said first and second conical members when joined by said top and bottom closure members forming a hollow, double walled, truncated conical tubular device having an open base and open top adapted to enclose a plant and a height adapted to accomodate said plant during its growth,
(g) and an opening formed in said top closure member,
(h) a spout formed at said opening in said closure member, said spout including a portion extending inwardly from said top closure member toward the axis of formation of said first and second conical members, said spout being rigid and functioning as a handle for moving said device,
(i) whereby said device when formed as above establishes an enclosed self-supporting fluid tight, conical tubular device that may be filled with a fluid at said opening in said top closure member and may be placed over a plant to provide protection and to enhance growth of said plant.

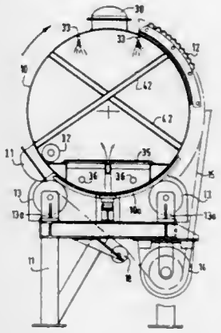
4,821,454
FLORAL ARRANGEMENT CONTAINER FOR UMBRELLA TABLE
Brian E. Wilds, 13502 - 37th Ave. S., Seattle, Wash. 98168
Continuation-in-part of Ser. No. 902,747, Sep. 2, 1986, abandoned. This application Nov. 5, 1987, Ser. No. 117,477
Int. Cl.[4] A01G *5/00*
U.S. Cl. 47—41 R **13 Claims**



1. For use with a table having a central opening and an umbrella pole extending through said opening and vertically upwardly from the table, a centerpiece container, comprising:
inner wall means defining a vertically elongated, tubular center section having a circular pole space sized to receive said pole;
outer wall means surrounding said inner wall means and defining therewith a receiving space radially between said inner wall means and said outer wall means for a floral arrangement or other object;
said outer wall means including a supporting bottom which in use makes supporting contact with a table;
said container extending upwardly from said supporting bottom and having an open top spaced from said supporting bottom; and
said inner wall means defining a vertically elongated channel on one side of said pole space, said channel opening laterally into said pole space throughout its full length, for receiving and accommodating a push button which may extend laterally outwardly from a pole positioned in said pole space, said channel having an open upper end through which a push button on a pole may move into and move out from the channel by axial movement of the pole into and out from the pole space.

4,821,455
INDUSTRIAL METHOD AND DEVICE FOR GERMINATING CEREALS AND/OR LEGUMINOUS PLANTS
Pedro Omente, Evin Malmaison, France, assignor to Societe Francaise D'Entretin et Montages Industriels Sofremi Zone Industrielle, Courcelles-Les-Lens, France
Filed Aug. 3, 1987, Ser. No. 80,959
Claims priority, application France, Aug. 13, 1986, 86 11707
Int. Cl.[4] A01L *1/02;* **A01G** *31/02*
U.S. Cl. 47—61 **6 Claims**

1. Industrial device for germinating at least one member of the group consisting of cereals and leguminous plants comprising:
an elongate cylindrical drum (**10**) capable of rotating about its axis,
means (**12,15,14**) for rotating said drum,
means (**31,32**) for introducing the seeds to be germinated into the drum (**10**) and distributing them therein,
means (**33**) for sprinkling the seeds to be treated with an appropriate fluid and over the entire length of the drum (**10**)
means (**16,17**) for blowing hot air into the drum (**10**), and
means for draining the fluid introduced into the drum, the said means for introducing and distributing the seeds comprises a trap (**31**) arranged in the wall of the drum (**10**) facing a screw assembly comprising right and left hand helical portions proceeding from a central point located at



the trap to evenly distribute the seeds over the length of the drum.

4,821,456
LINEAR MECHANICAL DRIVE WITH PRECISE END-OF-TRAVEL LOAD POSITIONING
Hisami Nogaki, 6465 E. Camino Grande, Anaheim Hills, Calif. 92807
Filed May 2, 1988, Ser. No. 189,102
Int. Cl.[4] E05F *11/34*
U.S. Cl. 49—362 **20 Claims**

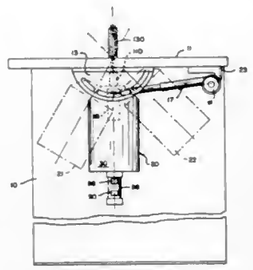
1. A linear mechanical drive with precise end-of-travel load positioning comprising:
a drive shaft having a threaded portion intermediate two non-threaded portions;
motor drive means for reversibly turning said drive shaft;
a threaded load carrier including load connecting means axially displaceable on said shaft from one to another of said non-threaded portions responsive to rotation of said shaft, said carrier disengaging from said threaded portion at said non-threaded portions to thereby precisely determine the end-of-travel positions of the carrier irrespective of drive shaft rotation;
first means for bringing said carrier into reengagement with said threaded shaft portion at each of said non-threaded portions; and
second means for adjusting at least one of the end-of-travel positions of said load connecting means in relation to the shaft axis.

4,821,457
VERTICAL OSCILLATING SPINDLE SANDERS
Joseph N. Ianuzzi, 3233 Knapp Rd., Vestal, N.Y. 13850
Filed Mar. 21, 1988, Ser. No. 170,931
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—34 H **4 Claims**

1. In an oscillating vertical spindle sander or the like, the combination comprising a substantially hollow stand having a

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tabletop and base member, said tabletop having an elongated opening therein, a hydraulic motor with variable speed control in said hollow stand, a tilting spindle assembly connected to said hydraulic motor and including a rotatable spindle, a spindle housing and an outer housing suspended from arcuate slots on said hollow stand, said spindle housing, outer housing and hydraulic motor each positioned below said tabletop, tilting means connected to said spindle assemble whereby said spindle



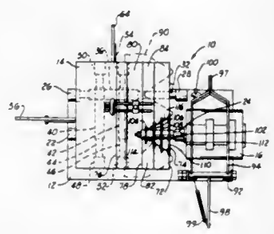
assembly and hydraulic motor are adjustably tilted on said slots, said tilting means including bracket means on said stand, said working element slidable with said spindle within the spindle housing for relative axial movement, a connection from said hydraulic motor to said spindle whereby said spindle is rotated and connection means between said spindle housing and said outer housing whereby said spindle housing oscillates axially relative to the outer housing by a hydraulic cylinder.

4,821,458

COMBINE BLADE SHARPENING APPARATUS

Randy J. Henson, Rte. 1, Box 195, Wheeler, Tex. 79096

Filed Jul. 23, 1987, Ser. No. 76,769
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—98 BS **19 Claims**



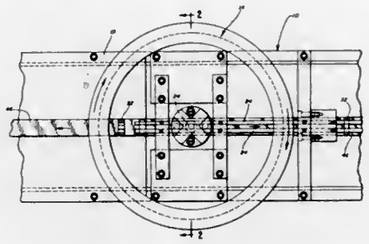
1. A blade sharpening apparatus for combine blades having cutting edges which are angularly disposed to the direction of motion of a combine, said apparatus comprising:
   a table having a surface for receiving a plurality of blades thereon to be sharpened;
   a plurality of spaced cutting wheels of progressively larger size movable between a cutting position in which said wheels substantially simultaneously cuttingly engage opposite cutting edges of a pair of adjacent blades on said table such that transverse slots are cut in said blades and a free position spaced from said blades; and
   a prime mover for driving said cutting wheels.

4,821,459

MULTILEVEL GRINDING APPARATUS AND METHOD

James V. Keefe, Park Ridge, Ill., assignor to Speedfam Corporation, Des Plaines, Ill.

Division of Ser. No. 923,669, Oct. 27, 1986. This application Mar. 11, 1988, Ser. No. 167,295
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—109 R **7 Claims**



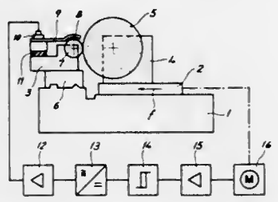
1. A method for grinding a workpiece which comprises carrying said workpiece across a first grinding wheel to grind a surface of said workpiece, and thereafter moving said workpiece inwardly to a second grinding wheel carried in coaxial relation with said first grinding wheel, and having a grinding surface which occupies a different plane from that of said first grinding wheel, and presenting a portion of said workpiece for grinding to said second grinding wheel, whereby said portion is ground by said second wheel to a different plane from other workpiece portions ground by said first grinding wheel, said workpiece passing across said first and second grinding wheels in a diametric or chordal path.

4,821,460

ARRANGEMENT FOR CONTROLLING THE SPEED OF ADVANCE OF A TOOL TOWARD A WORKPIECE

Heinz Wegmann, Rümlang, Switzerland, assignor to Meseltron S.A., Corcelles, Switzerland

Filed Jun. 2, 1987, Ser. No. 56,829
Claims priority, application France, Jun. 11, 1986, 86 08534
Int. Cl.[4] B24B *49/00*
U.S. Cl. 51—165.92 **6 Claims**



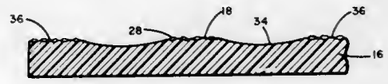
1. An arrangement for controlling the speed of advance of the tool part of a machine tool during its approach phase toward a workpiece and for reducing said speed as soon as the tool part has come into contact with the workpiece, said contact of said tool with said workpiece causing generation of a signal, said arrangement comprising an acoustic sensor adapted to detect said signal emitted at the instant of said contact, an electronic circuit for processing said signal and a motor responding to the circuit so as to regulate the speed of advance of said tool part, said sensor being fastened to a feeler mounted on the machine framework by means of elastic shock absorbing elements disposed between said feeler and said machine framework, said feeler being arranged to be in contact with the workpiece or the carrier of said workpiece.

4,821,461

TEXTURED LAPPING PLATE AND PROCESS FOR ITS MANUFACTURE

Allan L. Holmstrand, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Nov. 23, 1987, Ser. No. 123,954
Int. Cl.[4] B24D *17/00*
U.S. Cl. 51—209 DL **6 Claims**



1. An abrading tool comprising a lapping body having a substantially horizontal lapping surface, said lapping surface adapted for surface engagement with a workpiece and further for supporting an abrasive slurry, said lapping body being movable horizontally with respect to said workpiece for lapping a surface of the workpiece through the abrasive action of said first abrasive particles and of a plurality of second abrasive particles suspended in said abrasive slurry, wherein the improvement comprises:
   a plurality of generally spherical depressions in said lapping surface, spaced apart from one another, generally uniformly distributed over the lapping surface, and together comprising from twenty-five percent to sixty-five percent of the surface area of said lapping surface, said depressions having diameters in the range of from two to twenty thousandths of an inch, with the depth of each depression being less than one-fourth of its diameter.

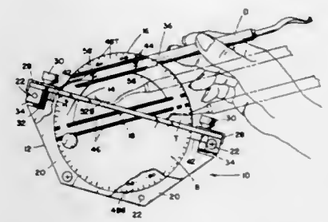
4,821,462

DENTAL INSTRUMENT SHARPENING HONE

Steven B. Moore, 7846 S. Logan St., Littleton, Colo. 80122

Filed Aug. 31, 1987, Ser. No. 91,415
Int. Cl.[4] B24D *15/06*
U.S. Cl. 51—214 **10 Claims**

1. A hone for reconditioning dental instruments of the type having a handle terminating at an end thereof in a blade sharpenable to produce a flat surface bordered by at least one knife edge which comprises: a horizontally-disposed substantially planar base adapted to support the hand holding the instrument for slidable movement therealong while its handle is rotated, means for sharpening the blade including a pair of abrasive surfaces arranged in side-by-side relation atop the base and cooperating with one another to define a slot therebetween, angle-measurement means including a protractor-like element mounted for rotation within the slot between the abrasive surfaces in substantially right-angular relation thereto, handle-orienting indicia carried by said protractor-like element of the angle-measurement means comprising means defining at least



one straight line movable therewith through a plurality of angular relationships relative to said planar abrasive surfaces, and angle-indicating indicia on said portractor-like element consisting of a plurality of discrete markings each cooperating with the handle-orienting indicia to define a predetermined angular relationship that a handle of a particular dental instrument held in parallel relation to said handle-orienting indicia must bear to one of said pair of abrasive surfaces while being drawn therealong and simultaneously twisted in order to restore the flat and sharpened surfaces of its blade.

4,821,463

DRILL BIT SHARPENING APPARATUS

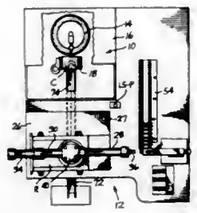
Robert L. Fuller, Jr., Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 822,198, Jan. 24, 1986, Pat. No. 4,787,176. This application Dec. 10, 1987, Ser. No. 132,570
Int. Cl.[4] B24B *3/26*
U.S. Cl. 51—215 H **9 Claims**

1. Mechanism for feeding drill bits one at a time into a drill bit holder of a drill bit sharpener which includes a grinding wheel, said holder serving to position the drill bit against the grinding wheel during grinding, said mechanism comprising:
   a drill bit carrier swingable between a drill bit receiving position and a drill bit inserting position, said carrier including a collet for receiving the shank end of a drill bit when the carrier is in its drill bit receiving position;
   means for inserting a drill bit into the collet when the drill bit carrier is in its drill bit receiving position and closing the collet to grip said drill bit;
   means for then swinging the carrier from its drill bit receiving position into its drill bit inserting position, said drill bit being aligned with the drill bit holder when the carrier is in its drill bit inserting position;
   means for extending the collet endwise an amount sufficient to insert the drill bit into the drill bit holder, and then opening the collet to release the drill bit from the collet

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when the drill bit is in the drill bit holder, and then refracting the collet endwise; and



means for moving the carrier back into its drill bit receiving position, for receiving another drill bit.

4,821,464
APPARATUS FOR MACHINING AN EARTH GRADER BLADE SUPPORT

Daniel L. Hummel, Longmont, Colo., assignor to Flatiron Service Company, Boulder, Colo.

Continuation of Ser. No. 33,225, Apr. 2, 1987, Pat. No. 4,768,313. This application May 18, 1988, Ser. No. 195,141
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—241 S 5 Claims

1. An apparatus for machining a circular workpiece having an open, interior portion, comprising, in combination:

frame means:

support means for securing the workpiece to the frame means so that the workpiece defines a substantially horizontal plane;

center tube means rotatably supported by the frame means so as to extend into the interior of the circular workpiece at substantially the center thereof, a central axis defined by the center tube means being substantially perpendicular to the plane defined by the workpiece;

first and second spindle arms extending radially outwardly from the center tube means toward the workpiece and having radially outer ends;

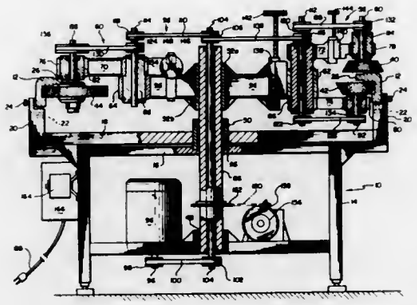
first and second rotatable grinding wheels mounted to the first spindle arm at its outer end so that the grinding surfaces of the grinding wheels define planes substantially parallel to the plane defined by the workpiece;

first adjustment means associated with the first spindle arm for moving the first and second grinding wheels in unison in a direction perpendicular to the plane defined by the workpiece;

a third rotatable grinding wheel mounted to the second spindle arm at its outer end so that its grinding surface defines a plane substantially perpendicular to the plane defined by the workpiece;

adjustment means associated with the second spindle arm for adjusting the radial position of the third grinding wheel;

means for rotating the first, second and third grinding wheels with respect to their respective spindle arms; and



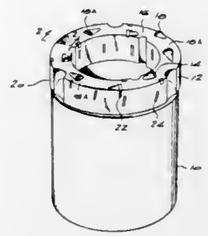
means for rotating the center tube means so as to move the grinding wheels about the circumference of the workpiece.

4,821,465
ABRASIVE TOOL

Peter N. Tomlinson, 315 Enford Road, Mondeoe, Johannesburg, Transvaal; Richard P. Burnand, 39 Constantia Avenue, Alan Manor, Johannesburg, Transvaal, and Klaus Tank, 9 Warbleton Road, Essexwold, Johannesburg, Transvaal, all of South Africa

Filed Jun. 16, 1986, Ser. No. 874,501
Claims priority, application South Africa, Jun. 18, 1985, 85/4589
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—283 R 3 Claims

1. A method of abrading a medium to soft rock having an unconfined compressive strength of less than 240 MPa, including the step of contacting a surface of the rock in an abrading manner with a working portion of an abrasive tool having a plurality of hexagonal shaped thermally stable abrasive compacts mounted in the working portion, wherein some of said hexagonal compacts are located around at least one circumferenial edge face of the working portion and are oriented such that an exposed flat edge of each of these compacts acts as a gauge stone for the working portion of said tool, the remaining hexagonal compacts each being located remote from said at least one edge face, said remaining hexagonal compacts being

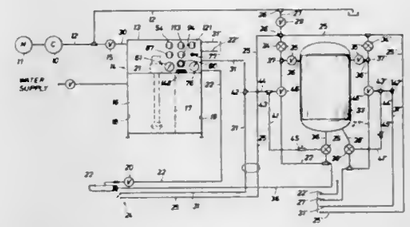


oriented such that each presents an exposed elongate cutting edge between points of the hexagon.

4,821,467
CONTROL SYSTEM FOR LIQUID PROPELLED ABRASIVE CLEANING

Jerry P. Woodson; R. Craig Martin, both of Houston, and Bryce T. Baker, Bellaire, all of Tex., assignors to Whitemetal Inc., Houston, Tex.

Filed Jun. 6, 1986, Ser. No. 872,095
Int. Cl.[4] B24C *7/00*
U.S. Cl. 51—436 26 Claims

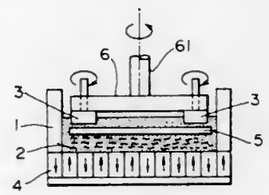


19. Liquid-propelled abrasive cleaning apparatus comprising: a housing having a compartment for holding a supply of water; pneumatically operable pump means for taking water from said compartment and supplying it under high pressure; first conduit means for supplying air under pressure to said pump means to operate the same; normally closed air valve means in said first conduit means for shutting off the supply of air to said pump means, said valve means being opened in response to an air pressure signal; second conduit means connected to said first conduit means upstream of said valve means and through which said air pressure signal is supplied to said valve means; means for preventing application of said air pressure signal to said air valve means unless water in said compartment is above a predetermined level; first supply means including a first normally closed water valve for supplying water at high pressure from said pump to a first blast nozzle; second supply means including a second normally closed water valve means for supplying water at high pressure to a second blast nozzle; each of said nozzles having a deadman control disposed in proximity with each of said nozzles for providing air signals to said water valves to open the same only when said deadman controls are activated.

4,821,466
METHOD FOR GRINDING USING A MAGNETIC FLUID AND AN APPARATUS THEREOF

Koji Kato, 3-16-8 Yagiyamaminami, Sendai City, Miyagi Prefecture; Noritsugu Umehara, Sendai; Shigeru Adachi, Izumi, and Shin Sato, Natori, all of Japan, assignors to Koji Kato, Sendai and JGC Corporation, Tokyo, both of, Japan

Filed Feb. 5, 1988, Ser. No. 152,937
Claims priority, application Japan, Feb. 9, 1987, 62-26443; Nov. 16, 1987, 62-287439
Int. Cl.[4] B24B *1/00*; B24C *1/00*
U.S. Cl. 51—317 9 Claims



1. A method for grinding a work immersed in a magnetic fluid containing abrasive grains filled in a container, said magnetic fluid being given a magnetic field from the outside of the container with magnets, which comprises immersing a floating pad in said magnetic fluid at a position adjacent to the work, said floating pad being given a buoyant force by said magnetic field whereby the abrasive grains existing between the floating pad and the work are pushed onto the work and a mutual motion is given between the work and the magnetic fluid containing abrasive grains.

4,821,468
DOCK SEAL

David W. Moore, Ajax, Canada, assignor to Super Seal Mfg. Ltd., Ontario, Canada

Filed May 5, 1987, Ser. No. 46,273
Int. Cl.[4] E06B *7/22*
U.S. Cl. 52—2 9 Claims

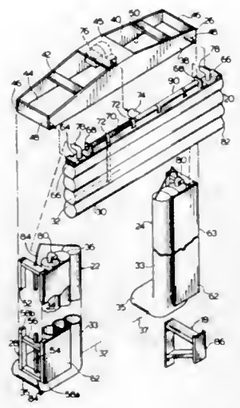
1. A dock seal device for positioning about an opening in a wall face, which opening has a phantom axis of entry extending through the opening generally perpendicularly of the wall face, said device comprising:

an inflatable seal comprising an upper horizontal inflatable member adapted to be disposed adjacent an upper end of

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the opening, and a pair of vertical inflatable members adapted to be disposed adjacent opposed sides of the opening,

each of said vertical members being of generally L-shaped configuration having an upright, elongate, inflatable leg portion and a horizontal, short, inflatable foot portion extending generally perpendicularly from a lower end of said leg portion,



each of said leg and foot portions being inflatable laterally of the opening along a phantom axial line of inflation generally perpendicular to the phantom axis of entry, and

further including an upper support member for supporting said upper inflatable member, and side supports for supporting said vertical members about the opening, said side supports each having a rear edge adapted to engage the wall and a front edge to be spaced from the wall.

4,821,469

LIBRARY STRUCTURE FOR VIDEO LIBRARY OF REAL ESTATE PROPERTIES

Gary Bayless, 1761 N.W. 9th Ave., Homestead, Fla. 33030

Filed Jan. 14, 1988, Ser. No. 144,304
Int. Cl.⁴ E04H *3/04*
U.S. Cl. 52—33 **3 Claims**

1. A video tape library comprising:

a front wall having a pair of opposite ends and spanning a distance of about at least 30 feet;

a first side wall extending away from one of said opposite ends to a rear end and a second wall extending away from the other of said opposite ends to a rear end;

a rear wall spanning the rear ends of said first and second side walls;

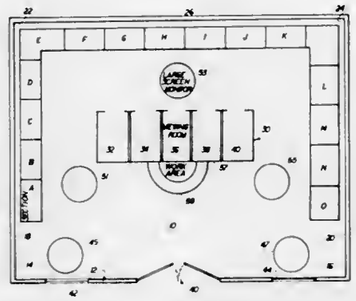
said walls defining a peripheral zone adjacent said walls, a central zone, and an intermediate zone between said peripheral and central zones;

an entrance opening in said front wall between said opposite ends including door means to close and to open said opening; said front wall including a transparent portion between each of said ends and said opening;

structure in said central zone defining a qroup of video tape viewing rooms, each of said rooms having an entrance facing away from said front wall;

a pair of monitor means in the peripheral zone adjacent said front wall to display slide pictures cyclically, one of said monitor means being adjacent and confronting each of said transparent portions for viewing by persons outside of said library.

video storage means along said side and rear walls displaying a plurality of organized and cataloged video tape containers, said containers containing video tapes of real estate;



a live screen monitor means in the intermediate zone between the central zone and the rear wall and each of said side walls; and

said structure in said central zone including work station means facing said opening between said live screen monitor means and including catalogs to identify and locate said video tape containers in said cataloged video storage means, so that persons entering the opening face the work station means and can optionally, view said large screen monitor means and can obtain information about the location in the storage means of specific tape containers to be selected and viewed in one of said rooms.

4,821,470

HEAD WALL FOR HOSPITAL BED

Timothy A. Kappers, Cincinnati, Ohio; Steven R. Westerfeld, Batesville, Ind., and Dennis J. Gallant, Harrison, Ohio, assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Jun. 17, 1988, Ser. No. 208,380
Int. Cl.⁴ H02G *3/10;* **A61G** *12/00;* **E06B** *9/14*
U.S. Cl. 52—36 **7 Claims**

1. A head wall adapted to be mounted above a patient's bed in a hospital patient's room comprising,

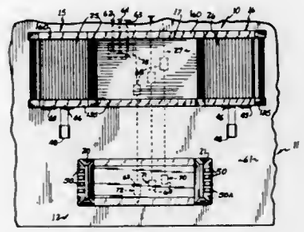
two modules that are horizontally spaced by at least about four feet,

each module containing a plurality of service outlets,

said modules projecting outwardly from a patient's wall, and creating a recess between said modules that provides a substantially unobstructed path for a bed to rise between said modules,

a tambour door mounted across each module and movable between an open position in which said service outlets are accessible and a closed position in which said service outlets are concealed,

a removable panel mounted between said modules across said recess,



horizontal upper and lower molding across the top and bottom of said recess, said molding extending across said modules,

tracks for said tambour doors mounted behind said upper and lower molding, said tambour doors being slidable in said tracks, said tracks running behind said panel to conceal said doors when said doors have been slid behind said panel to said open position.

4,821,471

BUILDING PANEL

Norman M. Stephens, Aldergrove, and John B. McRae, Coquitlam, both of Canada, assignors to 501 Diamond Arch Systems Canada Inc., Port Coquitlam, Canada

Filed Jun. 12, 1987, Ser. No. 60,925
Int. Cl.⁴ E04B *1/32*
U.S. Cl. 52—81 **15 Claims**

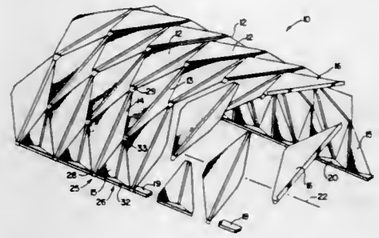
11. A fiber reinforced cement composition building panel having:

(a) an inner edge portion having a generally straight edge flange extending therealong, the edge flange having two outer end portions,

(b) two generally straight side edges extending symmetrically from the outer end portions of the edge flange at equal edge angles thereto to intersect at an intermediate corner to define a generally triangular-shaped periphery,

(c) margin portions extending along each side edge, at least one of the margin portions being adapted to cooperate with, and to be secured to, an adjacent building panel,

(d) at least one crowned central portion displaced laterally from a nominal plane containing the margin portions of the side edges and the edge portion, the said at least one



crowned central portion being bowed smoothly outwardly from the nominal plane,

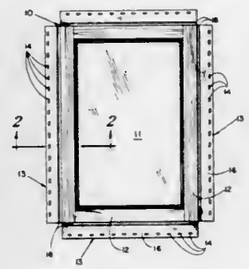
(e) all panel portions having relatively thin wall sections.

4,821,472

HINGED NAILING FIN FOR WINDOW INSTALLATION

James P. Tix, Hastings, Minn., assignor to Plastic Profiles, Inc., Cannon Falls, Minn.

Filed Dec. 28, 1987, Ser. No. 138,057
Int. Cl.⁴ E06B *1/04*
U.S. Cl. 52—213 **18 Claims**



1. For use with a window assembly having a window glazing enclosed by a surrounding frame, a foldable nailing fin, comprising:

a first flat elongated thin strip of generally stiff material containing nail holes for attaching said first strip to a support structure;

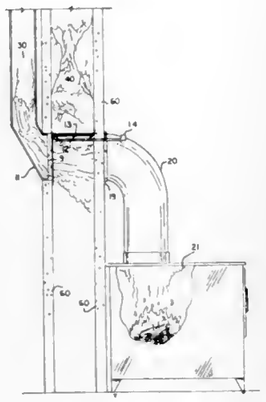
a second elongated strip of generally stiff material with an elongated edge parallel to and adjoining an elongated edge of said first strip;

means for attaching said second strip lengthwise to a side of the frame of a window assembly; and

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flexible means hingedly attaching said strips along said adjoining edges for releasably folding said strips.

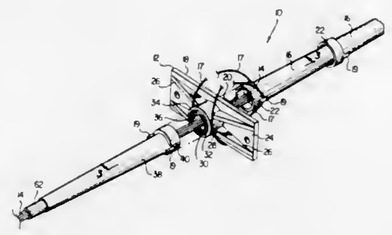
4,821,473
CHIMNEY BY-PASS
Ernest E. Cowell, 921 Saltrising Rd., Bolivar, N.Y. 14715
Continuation-in-part of Ser. No. 059,757, Jun. 8, 1987, abandoned, which is a continuation-in-part of Ser. No. 025,189, Mar. 12, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 176,322
Int. Cl.[4] E04H *12/28*
U.S. Cl. 52—218 7 Claims



1. A chimney by-pass for use with a main chimney to reduce chimney fires and handle smoke, comprising;
an auxiliary chimney;
a movable damper;
means for moving said movable damper, thereby closing said main chimney and opening said auxiliary chimney.

4,821,474
POST-TENSIONING ANCHOR
Alan Rodriguez, 3025 Montego, Plano, Tex. 75023
Filed Aug. 24, 1987, Ser. No. 88,795
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—223 L 14 Claims

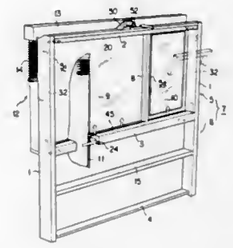
1. An improved post-tensioning anchor plate assembly of the type constructed for securement in a concrete structure, defined by pour forms and the receipt of a tensioning tendon therethrough, having means for securing said tensioning tendon therein in taut engagement, wherein said improvement comprises:
an anchor plate housing having first and second faces, said first face being adapted for facing inwardly toward said concrete with said second oppositely disposed face adapted for facing outwardly therefrom;
said anchor plate housing further being constructed with a central aperture formed therethrough, said aperture having a first collar region formed on said first face and a second collar region formed on said second face, said first and second collar regions being concentrically aligned one with the other;
a tubular member adapted for engagement with said first anchor plate face for extension outwardly therefrom into said concrete with said tendon extending therethrough;
said first collar region having a first tubular engaging surface



with an outside diameter substantially equivalent to an inside diameter of said tubular member and adapted for the press fit engagement thereof for the sealing of said tendon therein; and
said second collar region having a second tubular member engaging surface of substantially equivalent diameter to said first tubular member engaging surface for permitting securement of a second member thereon.

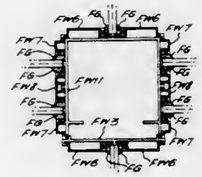
4,821,475
DUCT MOUNTING STRUCTURE FOR PREFABRICATED CURTAIN WALL WITH AIR CONDITIONING SYSTEM
Hiroshi Kondo; Toshimasa Kusunoki, both of Funabashi, and Ryo Kameda, Chiba, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan
Filed Sep. 4, 1987, Ser. No. 93,044
Claims priority, application Japan, Sep. 8, 1986, 61-136692[U]
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—235 5 Claims

1. A duct mounting structure for a prefabricated curtain wall with an air conditioning system, characterized in that the duct mounting structure comprises a frame body for a curtain wall unit formed by left and right hollow vertical members, one length of hollow upper horizontal member and one length of lower horizontal member, all of which are constituted of metallic extruded section members and which are framed with one another in a rectangular shape, and one length of hollow horizontal muntin constituted of a metallic extruded section member extending transversely between the left and right hollow vertical members and connected thereto. to, respective hollow inside portions of said left and right vertical members, said upper horizontal member and said horizontal muntin being arranged to intercommunicate; an outlet adapted to blow out the conditioned air and formed continuously in said horizontal muntin in the longitudinal direction thereof so as to communication with the hollow inside of the horizontal muntin; and only one air duct for each frame body which is connected on one side of a longitudinally central part of said hollow upper horizontal member to supply the air to be conditioned thereto,



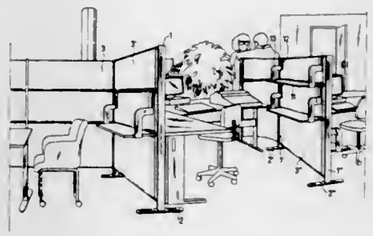
and which is connected on the other side thereof through a piping with the air conditioning system.

4,821,476
DEMOUNTALE PARTITIONING SYSTEM
John G. Thoburn, March, and Keith G. Longhurst, Peterborough, both of England, assignors to Phoenix Interiors Limited, Cheam Surrey, England
Filed Sep. 2, 1983, Ser. No. 528,924
Claims priority, application United Kingdom, Sep. 7, 1982, 8225442
Int. Cl.[4] E04B *2/58*
U.S. Cl. 52—238.1 30 Claims



1. A universal section for a demountable partitioning system, said universal section comprising an elongate channel-shaped member (FW1; FW11) of constant generally rectangular cross-section throughout its length such as to have only one open side, a side wall (1) opposed thereto and two other wide walls (2) generally perpendicular to the first-mentioned side wall (1), said member having formations (4, 5; 12, 5) associated with at least that one (1) of its three side walls which is opposed to said open side, said formations being such as to enable another elongate member (FW3; FW4; FW5) having complementary formations (8; 10) to be engaged with said at least one side wall in a snap-fit manner and furthermore being such as to enable glazing to be effected to such side wall by means of elongate glazing elements (FW6; FW7; FW8) and associated glazing beads (FG), said formations (4, 5; 12, 5) comprising a glazing stool (5) provided between the longitudinal edges of the respective side wall (1; 1, 1) and spaced-apart formations (4; 12) provided at the longitudinal edges of the respective side wall (1; 1, 2), said glazing stool (5) defining a seating for a glazing pane and furthermore defining with said spaced-apart formations (4), 12) opposed abutments for locating a glazing element (FW6) and associated glazing head (FG) on each side of a glazing pane seated at said glazing stool (5), the said member further having formations (3; 12) provided at the longitudinal edges of the open side of the channel-shaped member (FW1; FW11) which are at least functionally the same as those provided at the longitudinal edges of the side wall (1) opposite thereto for enabling enother elongate member (FW3; FW4; FW5) as aforesaid to be engaged also with said open side in a snap-fit manner, the arrangement thereby being such that another elongate member (FW3, FW4, FW5) as aforesaid may be engaged with at least one of said open side of the elongate channel-shaped member (FW1; FW11) and the side wall (1) thereof which is opposed to said open side.

4,821,477
PARTITION PANEL SYSTEM
Sune S. L. Rydqvist, Hagmarksvägen 10, Hallsberg, Sweden (S-694 00)
Continuation of Ser. No. 913,650, Sep. 4, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,279
Claims priority, application Sweden, Jan. 22, 1985, 8500271
Int. Cl.[4] E04H *1/00*; E04B *1/99, 2/74*
U.S. Cl. 52—239 14 Claims



1. Partition panel system including at least two relatively longitudinally spaced and substantially vertically extending supporting sections supported at the lower ends thereof by supporting members adapted to set on a floor surface, comprising:
at least two wall surface units supported by and between said at least two supporting sections, each wall surface unit comprising,
a frame-shaped member formed by longitudinally extending upper and lower attachment members and two longitudinally extending side members,
at least one plate-shaped member supported by and between said attachment members and side members,
upwardly and downwardly facing convexly curved outer

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edge surfaces on said upper and lower attachment members, respectively, and

a longitudinally extending groove in substantially the central portion of each convexly curved outer edge surface;

the at least two supporting sections each having at least one side facing said at least two wall surface units;

a longitudinally extending side groove in said at least one side;

groove-restricting elements extending toward each other on each supporting section to partially close said side groove and having internal surfaces thereon; and

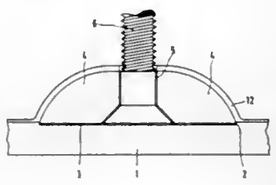
attachment means engageable against said internal surfaces and removably engageable with one of said wall surface units for supporting said wall surface units.

4,821,478

LARGE-FORMAT CERAMIC TILE WITH HOLDING ELEMENTS PROVIDED ON THE SIDE FACING AWAY FROM ITS VISIBLE SIDE

Gottfried Cremer, Cologne, and Martin Bard, Amberg, both of Fed. Rep. of Germany, assignors to Buchtal Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 56,644
Int. Cl.[4] E04F *13/08*
U.S. Cl. 52—384 **19 Claims**



1. A large-format ceramic tile with holding elements provided on its side facing away from a visible side thereof, characterized by the attachment of the holding elements **(4, 24)** to the tile at joining points determined according to static requirements by means of a ceramic glaze **(3)** whose thermal expansion coefficient is at least approximately equal to that of the ceramic tile **(1)**.

4,821,479

FINISHING TILE

John M. Lucak, 3445 Little St., Redding, Calif. 96003

Filed Aug. 2, 1984, Ser. No. 637,262
Int. Cl.[4] E04B *5/04;* **E04C** *2/04*
U.S. Cl. 52—603 **1 Claim**

1. A finishing tile especially for use with identical adjacent tile in a planar area around a substantially circular opening having a center axis comprising a discrete body having substantially parallel, planar upper and lower surfaces, a pair of side edge surfaces, a smooth inner edge surface substantially arcuate about said center axis, a smooth outer edge surface substantially arcuate about said center axis, said side edge surfaces meeting said inner and outer edge surfaces and lying in different radial planes that contain said center axis, a first pair of lugs both extending the same predetermined lateral distance from one of said side edge surfaces and each of said first pair of lugs having a first planar face extending perpendicular to said one of said side edge surfaces parallel to and facing toward the other first planar face a predetermined radial distance therefrom, and a second pair of lugs both extending said same predetermined lateral distance from the other one of said side edge



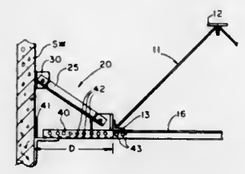
surfaces and each of said second pair of lugs having a second planar face extending perpendicular to the other one of said side edge surfaces parallel to and facing away from the other second planar face substantially said predetermined radial distance therefrom and in position to abut one of the first planar faces of an adajcent identical tile.

4,821,480

ADJUSTABLE SIDEWALL CONNECTION FOR ROOF PANEL SUPPORT JOISTS

James L. Silvey, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Jun. 1, 1988, Ser. No. 201,016
Int. Cl.[4] E04G *25/00*
U.S. Cl. 52—632 **7 Claims**



1. In a joist structure for spanning the distance between spaced walls of a building, wherein the joist has upper and lower chords and diagonally extending webs interconnecting the chords, the improvement comprising:

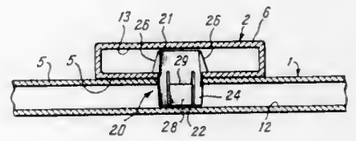
adjustable means for connecting the joist and a sidewall of the building, said adjustable means including at least two elongate brace members connected at one of their ends to substantially the same location on said joist and diverging outwardly therefrom at their other ends to spaced points of attachment to the sidewall, thereby bracing the joist against movement parallel to the plane of the sidewall and providing support to the sidewall in a direction perpendicular to the plane of the sidewall.

4,821,481

LATTICE AND METHOD OF MAKING SAME

Richard C. Woodman, 2186 Ellwyn Dr., Atlanta, Ga. 30341

Filed Mar. 30, 1988, Ser. No. 175,142
Int. Cl.[4] E04C *2/42*
U.S. Cl. 52—664 **14 Claims**



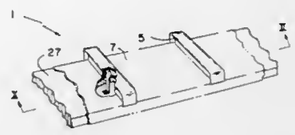
1. A lattice comprising a plurality of tubular strips fastened together at designated crossings that have openings formed in the surface of each strip that faces and is overlayed by another strip and with the opposite surface of each strip that faces away from the other strip being closed at said crossings, and wherein said tubular strips are fastened together by fasteners that are concealed from view and which are snapped into said tubular strip openings at said crossings.

4,821,482

CLIP FASTENER

Fred W. Miller, 47 Nottingham La., Inglis, Fla. 32649

Filed Jun. 9, 1987, Ser. No. 65,046
Int. Cl.[4] E04B *1/40*
U.S. Cl. 52—714 **13 Claims**



1. A removable, self-tightening and self-locking clip fastener of integral construction for attachment to installed roofing including metal structural roof panels having pairs of vertically extending juxtaposed risers between adjacent ones of a plurality of roof panels, for use in attaching and supporting insulated ceilings, light fixtures, paddle fans, simulated beams and the like, comprising:

a substantially horizontally disposed short leg joined to a substantially vertically disposed long leg terminating in an uppermost distal tip, said distal tip disposed in the plane of the longitudinal axis of said long leg,

camming means on said long leg including a radially twisted portion of said long leg adjacent said distal tip,

stop means on said long leg intermediate said twisted portion and said short leg, and

the vertical extent between said stop means and said distal tip being no greater than the vertical extent of said risers, whereby

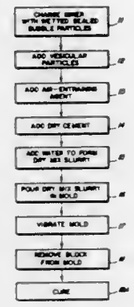
said clip long leg is insertable between a pair of said juxtaposed risers with said stop means engageable with said panels to limit the insertion of said long leg as said twisted portion laterally deflects a portion of said juxtaposed risers to form a pocket therebetween and retain said clip in its inserted position.

4,821,483

METHOD FOR MANUFACTURING CONCRETE BLOCKS AND CONSTRUCTING FENCE

Raymond R. Adams, 117 W. Forest Grove, Phoenix, Ariz. 85051

Filed Jul. 5, 1988, Ser. No. 215,401
Int. Cl.[4] B28B *3/00*
U.S. Cl. 52—747 **2 Claims**



1. A method of manufacturing a concrete structure, comprising the steps of:

(a) charging a mixer with a volume of wetted irregularly shaped vesicular glass particles having a weight in the range of 25 to 45 lbs/ft^3, the interstices of which are filled with cavities and pierced with a system of canals and capillaries,

(i) the canals and capillaries opening on the surface of the particles, and

(ii) the cavities being shaped and dimensioned to absorb water by amounts of air therein when immersed in water,

said vesicular particles being 45.0% to 78.0% SiO_2 and including

(iii) Fe_2O_3,

(iv) at least one chemical component from the group consisting of K_2O and CaO, and

(v) at least one chemical component from the group consisting of CaO and Al_2O_3,

(vi) at least thirty-five percent by weight of said vesicular aggregate particles being larger than thirty mesh and equal to or less than one-half inch in size, the remaining particles having a size of 16 mesh or less;

(b) adding to the mixer a volume of wetted sealed-bubble glass particles,

(i) the interstices of which are primarily filled with bubbles sealed therein, and

(ii) having hollows formed on the surface thereof,

said sealed-bubbled particles being 68.0% to 78.0% SiO_2 and including

(iii) Fe_2O_3,

(iv) at least one chemical component from the group consisting of K_2O and CaO, and

(v) at least one chemical component from the group consisting of CaO and Al_2O_3, at least seventy percent by weight of said sealed-bubble particles being 100 mesh or less in size;

(c) adding an air entraining agent to the mixer;

(d) adding cement to the mixer, the ratio of the combined volume of vesicular particles and sealed-bubble particles to the volume of cement being in the range of 6:1 to 8:1;

(e) adding water to the mixer to form a slurry, said air entraining agent forming in said slurry small well-dispersed generally noncoalescing spheriods of air having diameters ranging from 0.003 to 0.05 inches;

(f) pouring said slurry into a mold;

(g) introducing vibrations into the slurry container in said mold; and,

(h) curing said slurry to form a hollow concrete block, air and water retained in said vesicular particles gradually bleeding from said vesicular particles through said capillaries and channels into surrounding cement to facilitate curing of said blocks.

4,821,484

DOUBLE FLOOR CONSTRUCTION

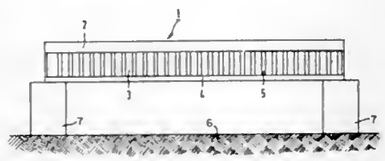
Gottfried Cremer, Cologne, and Martin Bard, Amberg, both of Fed. Rep. of Germany, assignors to Buchtal Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Feb. 3, 1987, Ser. No. 10,203

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1986, 3603232

Int. Cl.[4] E04C *2/34*

U.S. Cl. 52—806 **13 Claims**



1. A tile-like floor element for use in double floor construction of the type having supports set up at predetermined intervals on a stable substructure and a plurality of the tile-like floor elements bedded directly or indirectly on said supports, with each of the tile-like floor elements formed by a composite construction of a plurality of superposed layers of different materials, characterized in that the composite construction is composed of a cover tile made of ceramic material, a core layer made of rigid material with low volume weight, and a bottom layer thinner than the cover tile and with high tensile strength properties, and wherein the superposed layers are bonded together.

4,821,485

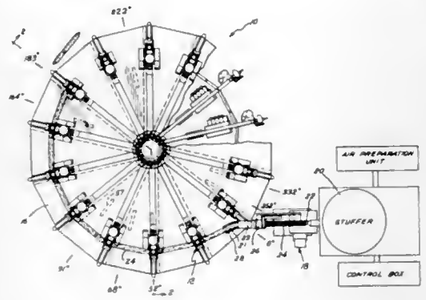
CONTINUOUSLY ROTATING PLATFORM WITH MULTIPLE MOUNTED DOUBLE CLIPPERS FOR CONTINUOUSLY FORMING LINK PRODUCT

Alfred J. Evans, Raleigh; Grant K. Chen, Cary; Dennis J. May, Pittsboro, and Edward P. Brinson, Raleigh, all of N.C., assignors to Delaware Capital Formation, Inc., Apex, N.C.

Filed Oct. 7, 1987, Ser. No. 105,665

Int. Cl.[4] B65B *9/15, 51/05*

U.S. Cl. 53—138 A **19 Claims**



1. An improved packaging device for filling flexible casing and sealing discrete lengths of filled casing comprising, in combination:

a clipper mounting assembly including a floor mounted frame and a platform supported by the frame, said platform rotatable in a horizontal plane relative to the frame;

a plurality of clippers mounted on the platform, each clipper spaced radially from a vertical axis through the platform, each clipper including means for attaching a clip about filled casing by gathering said casing and subsequently forming a U-shaped clip about the gathered casing with cooperative punch and die means, each of said clippers extending radially outwardly from its axis on the platform;

means for continuously rotating the platform and clippers mounted thereon about said axis in a uniform direction;

means positioned at one side of the platform for feeding continuously filled casing sequentially into each clipper as each one of said clippers moves, by platform rotation, past the means for feeding; and

means for sequentially operating the clippers as the platform is rotated whereby as each clipper is in position to receive filled casing as it moves past the means for feeding, said clipper operates to subsequently gather the casing, to form a U-shaped metal clip about the casing, to separates separate links of casing, to release the casing link and discharges the filled link from the platform.

4,821,486

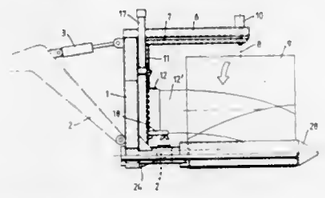
DEVICE FOR WRAPPING CYLINDRICAL OBJECTS

Jens Oiestad, Vestre Oiestad, N-4880 Rykene, Norway

Filed Jan. 13, 1988, Ser. No. 144,017

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—170 **17 Claims**



1. A wrapping device for wrapping cylindrical objects having a central axis, such as bales of straw or hay, comprising at least a first rotatable roller and a second rotatable roller, drive means, lifting means adapted to vary the height of said rollers, and carrier means adapted to support a roll of stretchable self-adhesive film, said rollers each comprising a prong having a first end attached to said lifting means and an unattached free end spaced from said lifting means, said rollers extending in use of the device substantially horizontally and being spaced apart by a distance less than diameter of the cylindrical object to be wrapped whereby said object can be supported by said rollers with its central axis extending substantially horizontally, at least one of said rollers being rotationally driven by said drive means whereby to rotate said cylindrical object about its central axis, said roll of film being supported by said carrier means with the axis of said roll at right angles to a plane containing said central axis of said object and being movable by said support means in an orbit around said cylindrical object with said roll intersecting said plane, rotation of said cylindrical object combined with orbiting of said roll wrapping said object in film from said roll, and wherein said lifting means is adapted to vary the height of said rollers between a raised position in which said object is supported by said rollers and a lowered position in which said free ends of said rollers may be inserted under said object prior to lifting said object off a surface upon which said object rests.

4,821,487

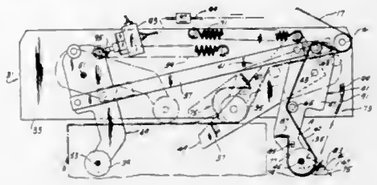
EASY-OPEN CASE TAPING

Robert C. James, Sheboygan, Wis., and Richard J. Pederson, Richfield, Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Division of Ser. No. 876,848, Jun. 20, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 109,748

Int. Cl.[4] B65B *61/18*

U.S. Cl. 53—412 **19 Claims**



1. The method of taping a case having a closure comprising two folded-over flaps having adjoining edges, said method comprising pressing a strip of tape having adhesive on one face thereof against the margins of said flaps along said adjoining edges to adhere the tape to said margins, and wherein, prior to pressing the tape against said flaps, an integral end portion of the tape is folded back on said face of the tape and adhered thereto to form a tab which is unadhered to the case for being grasped and pulled to peel the tape away from the case, and wherein the case is fed forward in a predetermined path with said adjoining edges extending in the direction of feed, a continuous length of tape is guided from a supply thereof toward said path for pressing of the tape against the case to adhere it to said margins as the case is fed forward in said path, the tape being pulled from the supply by the case, and the tape is severed transversely following its adherence to said margins to provide a length thereof for adherence to said margins along said adjoining edges, said integral end portion of the tape being at least partially folded back on said face of the tape prior to the pressing of the tape against the case adjacent said integral end portion of the tape.

4,821,488

ASEPTIC PACKAGING

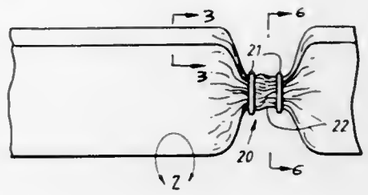
Robert A. Donald, 328 Hammond Road, Landenong, Victoria 3175, Australia

Filed Oct. 1, 1986, Ser. No. 914,067

Claims priority, application Australia, Oct. 2, 1985, PH2718/85

Int. Cl.[4] B65B *9/08, 51/02, 51/05, 51.08*

U.S. Cl. 53—417 **1 Claim**



1. A method of continuously forming and filling aseptic packages from a film which has outer layers of a flexible plastic material having sandwiched therebetween a material that is impervious to microorganisms, said method comprising forming a continuous substantially cylindrical package from the film with adjacent edges thereof being in contact to form a cylinder, heat sealing said adjacent edges of the film with the plastic materials of the adjacent edges which are sealed together being the same, filling the cylinder, after formation thereof and heat sealing of the adjacent edges thereof, to form a filled cylinder, locating an adhesive in the cylinder at positions where the cylinder is to be divided into individual packages, compressing the filled cylinder at the positions of the adhesive, placing two clips about the positions of the adhesive after compression thereof and tightening the clips such that as the clips are tightened the adhesive flows to occupy any interstices in the film which are formed during the compression to thereby provide a plug between the clips, and separating the cylinder between the clips into individual packages.

4,821,489

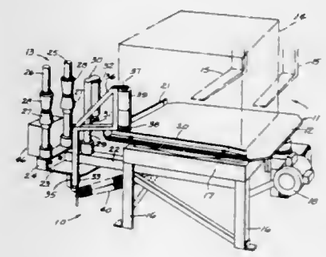
METHOD AND APPARATUS FOR SEALING A FLEXIBLE BAG TO A PALLET

Richard F. MacLeod, and Kevin J. Bolejack, both of Salinas, Calif., assignors to TransFRESH Corporation, Salinas, Calif.

Filed Sep. 29, 1982, Ser. No. 428,087

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—419 **6 Claims**



1. A method of sealing an open plastic bag to a plastic sheet integrally related to a pallet base to provide a gastight container for respiring foodstuffs, which comprises the steps of:

locating the plastic sheet under the pallet base with sheet edge margins extending beyond the pallet base peripheral edges and upwardly;

positioning the open bag above the pallet base with the bag open edge margins extending downwardly and lying laterally opposite the plastic sheet upwardly extending edge margins;

unrolling two continuous strips of tape each having adhesive on one major surface;

passing the two strips over an idler roller with the said tape strips in edge overlapping relation to form a single composite tape strip;

adhering an end portion of the composite strip to adjacent edge margins of the plastic sheet and plastic bag about the peripheral edge of the pallet;

locating a second roller in continuous pressure exerting contact with the adhered end portion of the composite strip; and

rotating the pallet, plastic bag and plastic sheet as a unit in such a plane as to apply a continuous strip of the composite tape about the bag and sheet edge margins and peripheral edge of the pallet to effect sealing

while maintaining continuous pressure contact of the second roller across the full width of the composite tape.

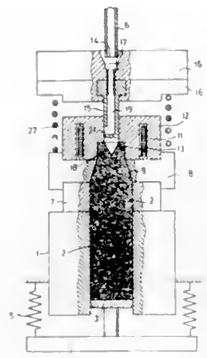
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4,821,490

METHOD OF AND APPARATUS FOR CLOSING THE END OF A PAILLETTE

Robert Cassou, Rue Clemenceau, 61300 L'Aigle; Bertrand Cassou, Saint Symphorien des Bruyeres, and Maurice Cassou, Rue Clemenceau, 51300 L'Aigle, all of France

Filed Jan. 5, 1987, Ser. No. 515
Claims priority, application France, Jan. 10, 1986, 86 00273
Int. Cl.[4] A61M *37/02;* **A61D** *7/02;* **B29C** *57/10;* **B65B** *7/28*
U.S. Cl. 53—423 **3 Claims**



1. A method of closing an open end of a paillette, said paillette being formed as tube containing a biological substance and being suitable for the low temperature storage of such substances, said method comprising the steps of:
providing a paillette comprising a tube of polyvinyl chloride having an open end;
heating a dose of thermo-plastic material to a flowable condition, said thermo-plastic material comprising a solid mixture of ethylene-vinyl-acetate copolymer and a polyolefine;
injecting the dose under pressure into the open end of the paillette; and
allowing the material to solidify and adhere to the wall of the paillette to form a stable hermetic plug closing the end of the paillette.

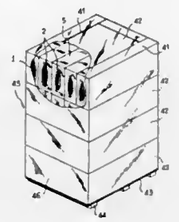
4,821,491

PROCESS FOR PACKAGING PANELS OF A COMPRESSIBLE MATERIAL AND THE PACKAGES PRODUCED BY THIS PROCESS

Jean-Claude Rias, Villennes Sur Seine, France, assignor to Isover Saint-Gobain, Paris La Défense, France

Continuation of Ser. No. 403,598, Jul. 30, 1982. This application Jul. 11, 1988, Ser. No. 217,768
Claims priority, application France, Jul. 31, 1981, 81 14970
Int. Cl.[4] B65B *27/12, 53/02*
U.S. Cl. 53—438 **4 Claims**

1. A process for packaging compressible glass fiber blankets characterized by the following operations:
superimposing a plurality of glass fiber blanket components in face-to-face relation in each of a plurality of groups thereby forming a plurality of piles of said fiber blanket components;
applying separate enclosures of shrinkable plastic sheet material to each of said piles;
subjecting the enclosed piles to at least two successive stages of compression each of which is applied in a direction perpendicular to the planes of the fiber blanket components and each of which effects substantial reduction in the cross-sectional area of the compressed pile, the total reduction in thickness of each pile effected by said successive stages of compression being at least one-half of the thickness of the pile before compression;
effecting shrinkage of the plastic material applied to each of said piles in two successive stages one of which is effected after the first of said two stages of compression;
after effecting the first stage of shrinkage, assembling a



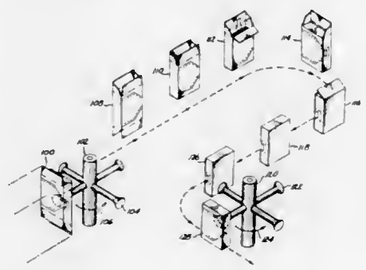
plurality of piles having preshrunk enclosures with side faces in superimposed relation to form a stack;
effecting the second of said two successive stages of compression by applying compression force to the stack of piles; and
after compressing the stack, effecting the second stage of shrinkage of the plastic sheet material.

4,821,492

METHOD OF MAKING END FILL MICROWAVABLE AND/OR OVENABLE CONTAINER

Donald R. Prater, Beaverton, Oreg., assignor to Ridgway Packaging Corp., Redmond, Wash.

Division of Ser. No. 40,255, Apr. 20, 1987, Pat. No. 4,746,019. This application Feb. 16, 1988, Ser. No. 156,405
Int. Cl.[4] B65B *43/26, 7/20*
U.S. Cl. 53—458 **17 Claims**



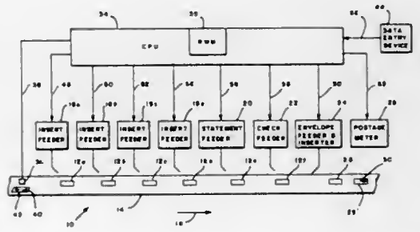
1. A method for assembling from a pre-cut blank, a container, which is filled with a product through an open end and which is made with a waterproof material suitable for holding the product while it is heated in an oven, the pre-cut blank including a tray portion on which scored fold lines define a first panel, a front sidewall, a first and a second end wall, and four gusseted corners; and a cover portion connected to the tray portion by a rear sidewall defined by scored fold lines, also defining on the cover portion a front flap, and a first and a second end flap, the cover portion including a tear-open access flap, the method comprising the steps of:
folding the blank along one of the fold lines that define the rear sidewall, so that the tray portion at least partially overlies the cover portion;
folding one of the front sidewall and the front flap over the other thereof and adherently securing and sealing it thereto;
orienting the blank so that the first panel, the cover portion, the rear sidewall, and the front flap are all substantially vertical, the end walls and the end flaps being disposed at the top and the bottom of the blank;
folding the blank along the fold lines so that it assumes a generally box-like shape having two open ends, and four sides;
folding one of the first end flap and first end wall over one of the open ends;
folding the other of the first end flap and first end wall over the one and adherently securing and sealing it thereto, thereby closing one end;
after the container is filled through the other end that is open, folding one of the second end flap and second end wall over the other; and
folding the other of the second end flap and the second end wall over the one thereof, adherently securing and sealing it thereto.

4,821,493

METHOD FOR COMPUTERIZED POSTAGE DETERMINATION

David A. Pintsov, West Hartford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 29, 1988, Ser. No. 161,708
Int. Cl.[4] G01G *23/28;* **B65B** *35/50*
U.S. Cl. 53—502 **3 Claims**



1. In an inserting machine for collating inserts and placing a collation of said inserts into an envelope, a method of determining the amount of postage to be applied to said envelope into which said collation of inserts have been inserted, said inserting machine having a feed deck and a plurality of feed stations adapted to selectively feed said inserts onto said feed deck, said method comprising:
A. feeding along said feed deck a control document having code thereon;
B. reading said code on said control document;
C. storing in data processing memory means a set of predetermined threshold values of a measurable, cumulative attribute of said inserts, said threshold values corresponding to the amounts of postage for different postage categories;
D. repeatedly calculating a current attribute value difference (CAVD) between a first threshold value and the attribute values of the inserts being fed onto said feed deck pursuant to said code or other means governing the feeding of inserts onto said feed deck as long as the CAVD remains non-negative until the last desired insert is fed onto said feed deck; and
E. if the CAVD becomes negative, superseding said negative CAVD with a replacement CAVD which is equal to the next higher threshold value less the absolute value of said negative CAVD and repeating step (D),
whereby the last desired insert is fed onto said feed deck without exceeding the amount of postage for one of said different postage categories, said amount of postage being the postage required for said envelope and said collation.

4,821,494

CROP HARVESTER HAVING CONDITIONING ZONE PROVIDED WITH ENLARGED END REGIONS

Michael L. O'Halloran, Hesston, and Cecil L. Case, Newton, both of Kans., assignors to Hay & Forage Industries, Hesston, Kans.

Continuation of Ser. No. 804,776, Dec. 5, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 148,142
Int. Cl.[4] A01D *82/00*
U.S. Cl. 56—1 **14 Claims**



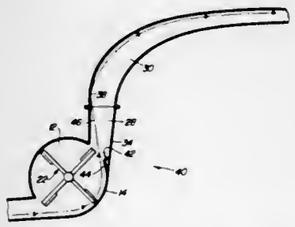
1. A crop conditioning roll for use in conditioning harvested crops, said roll comprising:
an elongated body having a generally cylindrical periphery and a pair of opposite ends;
means attached to said opposite ends of said body adapting the body to be mounted for rotational movement about the longitudinal axis thereof; and
a plurality of crop conditioning elements on said periphery of said body between said opposite ends thereof, said body have axially extending opposite end portions which become progressively smaller in diameter as said opposite ends are approached,
said elements comprising generally axially extending, elongated ribs spaced circumferentially about said periphery of the body,
each of said ribs in the end portions of the body having a radially innermost base of constant width as the ends of the body are approached and a radially outermost surface of progressively decreasing width as the ends of the body are approached.

4,821,495

BLOWER AND DISCHARGE SPOUT ASSEMBLY

Harold E. De Buhr, and Raymond S. Wilkes, Both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 23, 1987, Ser. No. 29,109
Int. Cl.[4] A01D *87/10*
U.S. Cl. 56—13.3 **2 Claims**



1. In an ensilage harvester blower and discharge spout assembly including a blower housing having a cylindrical wall, a blower blade assembly rotatably mounted in the housing and having blades with radially outer ends disposed in close proximity to the wall, the housing including, as viewed from an end thereof, an inlet opening formed in a lower quadrant thereof and an outlet opening formed in an upper quadrant thereof spaced approximately one hundred eighty degrees from the inlet opening, and a discharge spout coupled to the housing for receiving crop material discharged from the housing through said outlet opening and having a first spout section extending upwardly from the housing and coupled to an arcuately curved second spout section having inner and outer arcuate wall sur-

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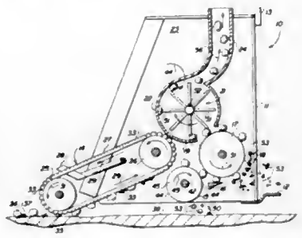
faces with a first wall portion of the first spout section extending substantially tangentially to the housing and inner arcuate wall surface, the improvement comprising: said blower housing having a deflector mounted transversely thereacross and being joined to the first wall portion tangentially to and including an arcuate surface forming a continuation of the cylindrical wall of the housing and located for directing crop material discharged through said outlet opening along a path which intersects a surface area of the outer arcuate wall surface of the second spout section at a small angle.

4,821,496

COTTON HARVESTING APPARATUS

Ronald L. Kysar, Box 740, Chino Valley, Ariz. 86323

Filed Jun. 5, 1987, Ser. No. 58,385
Int. Cl.[4] A01D *46/08*
U.S. Cl. 56—28 **1 Claim**



1. Apparatus for removing dirt and debris from clumps of cotton, said apparatus including

(a) ground engaging frame means;

(b) saw tooth drum means mounted on said frame means for rotation about a first axis;

(c) doffing means rotatably positioned on said frame means for removing clumps of cotton from the saw teeth of said drum means;

(d) means for transferring cleaned clumps of cotton from said doffing means into a cotton removal conduit;

(e) belt means mounted on said frame means for carrying cotton clumps upwardly from the ground, said belt means having an upper end and a lower end;

(f) transfer means mounted on said frame for rotation about a second axis and for carrying cotton clumps from said belt means to said saw tooth drum means and including

(i) an axle rotating about said second axis, and

(ii) a plurality of spaced apart laterally resilient disks carried on said axle for rotation therewith, each disk having a peripheral generally cylindrical outer surface spaced apart from and beneath said upper end of said belt means;

said first and second axes and said belt means being positioned with respect to one another to define a free space intermediate said belt means and saw tooth drum means substantially spanned by said peripheral generally cylindrical outer surfaces of said transfer means such that

(g) cotton clumps from said belt means are released onto and carried across said free space to said drum means on said peripheral outer surfaces of said disks, said clumps being pressed against said peripheral outer surfaces by the force of gravity;

(h) dirt and debris from said belt means travel between said disks toward said axle; and,

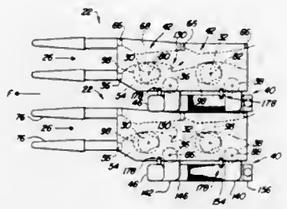
(i) debris and rocks of a selected size wedge between and outwardly displace an opposed pair of said resilient disks laterally away from one another, said debris and rock being thrown free of said disks pair and transfer means when said disk pair rotates toward the ground.

4,821,497

COTTON HARVESTER AND TANDEM ROW UNIT THEREFOR

Timothy A. Deutsch, Newton, and Arthur L. Hubbard, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 935,460, Nov. 26, 1986, abandoned. This application Aug. 11, 1988, Ser. No. 233,880
Int. Cl.[4] A01D *46/08*
U.S. Cl. 56—41 **35 Claims**



1. A narrow row unit for a cotton harvester, comprising:

a fore-and-aft extending unit frame including a fore-and-aft row-receiving area for receiving a single row of cotton plants therein;

harvesting means located on one side only of the row-receiving area, said harvesting means including a first forwardly located upright harvesting drum rotatably supported by the unit frame adjacent said one side of the row-receiving area and including spindle means projecting into the row-receiving area for removing cotton from the plant and a second harvesting drum rotatably supported by the unit frame rearwardly adjacent of, and on the same side of the row-receiving area as the first drum, said second drum including additional spindle means projecting into the row-receiving area rearwardly of the first-mentioned spindle means for removing cotton left on the plants by the first-mentioned spindle means;

pressure means located on the side of the row-receiving area opposite the harvesting means for urging the cotton plants toward the first and second drums whereby cotton is removed substantially exclusively by the harvesting means; and

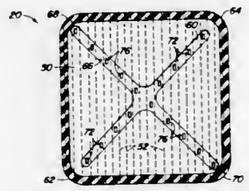
means for conveying the removed cotton from the first and second drums.

4,821,498

MOISTENER PAD FOR A COTTON HARVESTER

Timothy A. Deutsch, Newton, and Russell D. Copley, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 26, 1986, Ser. No. 935,459
Int. Cl.[4] A01D *46/16*
U.S. Cl. 56—50 **8 Claims**



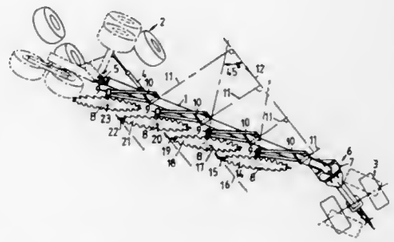
1. A cotton picker spindle moistener pad having a generally rectangular base with a top and a bottom, flexible fins extending downwardly from the bottom of the base, the top of the base including a fluid receiving area for receiving moistener fluid and distributing the fluid downwardly between the fins, a first channel area located in the top of the base and extending diagonally generally from one corner of the base to the opposite corner, said channel area including apertures extending through the base and opening between the fins, and a second channel area extending diagonally generally from one of the remaining corners to the opposite remaining corner and forming a generally X-shaped pattern in the top of the base, said second channel area including apertures extending through the base and opening between the fins.

4,821,499

ROTARY RAKES

Darrell C. Symonds, 13 Linkwater Street, Shelley, Australia 6155

Continuation of Ser. No. 849,706, Apr. 9, 1986, abandoned. This application May 31, 1988, Ser. No. 201,331
Claims priority, application Australia, Apr. 9, 1985, PH00062
Int. Cl.[4] A01D *78/14*
U.S. Cl. 56—377 **3 Claims**



1. A rotary rake for raking large pieces of timber and associated debris resulting from forest-clearing operations and disposed on a ground plane, laterally to one side in relation to a longitudinally forward direction of travel of the rake along a towing path, for rolling the large timber pieces and associated debris in a longitudinally continuous windrow extending along said side of said path,

said rake comprising:

an elongated, generally horizontal main frame; said main frame being obliquely oriented as seen in top plan view so as to have a forward end, and a rearward end displaced laterally towards said side in relation to said longitudinally forward direction;

said main frame having a forward end, and ground-supported front bogey wheel means supporting said forward end;

said main frame further having a rear end, and ground-supporting rear bogey wheel means supporting said rear end;

tow bar means operatively connecting with said forward end of said main frame for towing said rotary rake in said longitudinally forward direction along said towing path;

a plurality of rake wheels, each including a generally planar hub portion having a plurality of circumferentially-spaced, radially outwardly-extending rake fingers provided thereon and extending on an outer periphery thereof;

each rake wheel including an axle means extending axially, centrally from said hub portion thereof, each axle means having a longitudinal axis extending transversally to the respective said generally planar hub portion and defining an axis of rotation for the respective said rake wheel;

a plurality of cantilever-type rake wheel support arms, corresponding in number to said plurality of rake wheels;

each rake wheel support arm including a leading end and a trailing end;

each rake wheel support arm trailing end being provided with a hub which journals a respective said rake wheel axle means for rotation about a respective said axle means longitudinal axis;

each rake wheel support arm leading end being provided with pivot means pivotally securing the respective support arm to said main frame for pivotal movement about a respective pivot axis;

support means provided on said main frame for supportingly engaging each said rake wheel support arm and thereby providing a lower limit to downward pivoting of the respective rake wheel support arm, in which position the respective rake wheel is cantilevered from the main frame by the respective pivot means and has respective ones of said rake fingers below the respective rake wheel hub portion disposed to intersect said ground plane, but permitting the respective said support arm temporarily to pivot upwards, away from said support means, when, in use, the respective rake wheel encounters obstacles located above said ground plane;

said rake wheels being thereby arranged in a series in an echelon arrangement in which, as seen looking longitudinally backwards along said towing path, each further forward said rake wheel overlaps each respectively adjacent but further rearward said rake wheel nearly to axially centrally of the latter, and each said respectively adjacent but further rearward rake wheel extends further laterally to said one side of said towing path than the respectively adjacent further forward said rake wheel;

each said axle means longitudinal axis being oriented to extend at an angle of 41 to 49 degrees, as seen in top plan view to said pivot axis, of the respective said support arm;

each said axle means longitudinal axis being oriented to extend at an angle of 7 to 13 degrees, as seen in front elevational view, above said ground plane, when the respective said support arms are supported on said support means; and

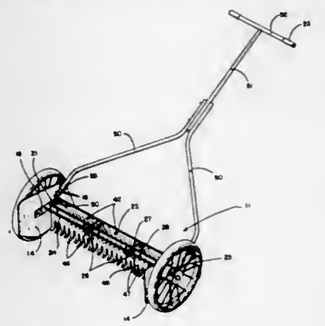
each said pivot axis being generally horizontal and oriented to extend at substantially a right angle, as seen in top plan view, to said longitudinally forward direction.

4,821,500

RAKING MEANS

Robert G. MacIvergan, 422 Long Leaf Acres Dr., Wilmington, N.C. 28405

Continuation-in-part of Ser. No. 909,787, Nov. 17, 1986, abandoned. This application Nov. 19, 1987, Ser. No. 123,050
Int. Cl.[4] A01O *7/00*
U.S. Cl. 56—400.14 **8 Claims**



1. A lawn rake comprising: a frame; a pair of wheels supporting the frame; a handle extending generally upwardly from the frame; a plurality of broad, resilient gathering tines laterally spaced between the wheels so as to form a substantially continuous row, said gathering tines having an upper end portion secured to the frame and a raking end engaged with the ground for collecting debris, said gathering tines further having a concave profile forming an elongated pocket on the front side of the gathering tines where debris collected by the gathering

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tines is accumulated; a plurality of laterally spaced pusher tines secured to the frame and disposed forward of the gathering tines, said pusher tines being normally disposed in a substantially vertical position; means for allowing said pusher tines to pivot forward when the rake is pulled backward to permit the debris accumulated by the gathering tines to pass thereunder and return to its normal substantially vertical position when the rake is pushed forward so that the previously accumulated debris is pushed ahead of gathering tines by the pusher tines.

4,821,501

SUSPENSION CABLE CASING SYSTEM

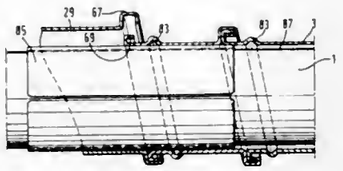
Xaver Lipp, Hohenstaufenstrasse 30, 7090 Ellwangen, Fed. Rep. of Germany

Filed Jul. 23, 1987, Ser. No. 76,722

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626886

Int. Cl.[4] B21C *37/12;* **B21D** *39/02;* **D07B** *1/16*

U.S. Cl. 57—210 **24 Claims**



1. A suspension cable assembly, comprising:

a cable; and

a casing surrounding said cable, said casing being a metallic tubular member formed by at least one metal strip helically wound about said cable with adjacent windings thereof connected along longitudinal edges of said strip by a tight fold, said casing having a deformable area extending longitudinally along said strip.

4,821,502

METHOD OF AND APPARATUS FOR CONTROLLING THE YARN SPINNING-IN IN THE OPEN-END SPINNING PROCESS

Frantisek Bur sek, 315 Dukla; Jirí Sloupensk , 1345 Na pláni; Miroslav Boucek, 319 Dukla; Frantisek Hortlík, 382 Dukla; Jirí Bace, 323 Dukla, all of Ústí nad Orlicí ; Zdeněk Silar, 1043 Na bílé , and Jiri Kutlvasr, 678 Erbenova, both of Chocen, all of Czechoslovakia

Continuation-in-part of Ser. No. 777,836, Sep. 19, 1985, abandoned. This application May 12, 1987, Ser. No. 49,762

Claims priority, application Czechoslovakia, Sep. 26, 1984, 7261-84

Int. Cl.[4] D01H *7/885, 15/02*

U.S. Cl. 57—263 **8 Claims**

1. A method for controlling a yarn spinning-in process in spinning units of open-end rotor spinning machines by means of a service device provided with a unit for controlling the fiber supply and the return of yarn into the spinning rotor for being spun-in, comprising

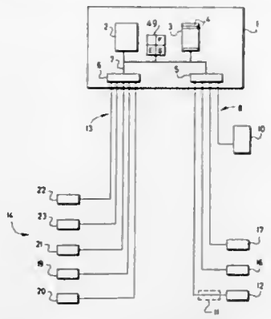
spinning-in yarn according to a spinning-in cycle of the controlling unit;

measuring yarn spinning-in parameters of yarn return length and timing of initiating supply of fibers form a sliver;

automatically adjusting said parameters according to successive verifying measurements of the spinning-in parameters performed by the service device, the spinning-in parameters being automatically adjusted partly according to the successive measurements to ascertain a suitable yarn length to be returned by reversing means, and partly according to successive measurements to determine a suitable time point to initiate the supply of fiber to the spinning rotor by a feeding device;

the spinning-in parameters being chosen initially form a group of stored parameters;

returning the yarn from an initial position of yarn end into a collecting groove of the spinning rotor and deposited within a deposit yarn length onto a fibrous ribbon in said groove;



ascertaining a fundamental yarn length as the backward path of the yarn end from its entry point into the collecting groove to a point in which the yarn is first exposed to tension;

calculating said deposit yarn length in dependence on a yarn count to be produced and being added to said fundamental yarn length.

4,821,503

METHOD AND APPARATUS FOR MONITORING A PREDETERMINED YARN QUALITY AT A TEXTILE MACHINE, ESPECIALLY AT A FALSE-TWIST JET SPINNING APPARATUS

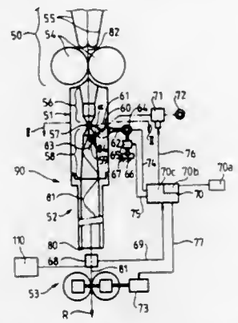
Herbert Stalder, Kollbrunn; Peter Egloff, Aadorf; Rolf Binder, Schottikon, and Josef Baumgartner, Sirnach, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Apr. 25, 1988, Ser. No. 185,688

Claims priority, application Switzerland, Apr. 27, 1987, 01601/87

Int. Cl.[4] D01H *13/10;* **D02G** *1/16*

U.S. Cl. 57—264 **25 Claims**



1. A method for monitoring a predeterminate yarn quality of a yarn spun by a false-twist jet spinning apparatus, comprising the steps of:

forming a spun yarn at the false-twist jet spinning apparatus;

delivering the spun yarn as a running yarn from the false-twist jet spinning apparatus;

measuring the mechanical tension of the running yarn to obtain a measured value of such measured mechanical tension in order to determine the quality of the spun yarn; and

upon a predeterminate deviation of the determined quality of the spun yarn controlling operation of the false-twist jet spinning apparatus so as to establish a predeterminate desired tension of the running yarn.

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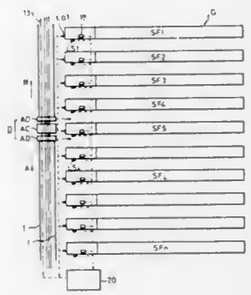
SYSTEM FOR CONTROLLING DISPLACEMENT OF CARRIAGE WORKING MACHINES

Kunio Shinkai, Handa; Yutaka Tanaka, Gifu, and Hachiro Yokoyama, Nishikasugai, all of Japan, assignors to Howa Machinery, Ltd., Aichi, Japan

Continuation of Ser. No. 67,261, Jun. 25, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 236,342

Int. Cl.[4] D01H *9/10, 9/14;* **B65H** *67/00*

U.S. Cl. 57—276 **13 Claims**



1. A system for controlling the displacement of a working machine along a track arranged along ends of a plurality of spinning machines installed in parallel, said working machine comprising a carriage and automatic apparatus mounted on said carriage, said automatic apparatus performing an operation on said spinning frames, comprising:

means for outputting a forecast signal requesting the displacement of said working machine which is disposed on each spinning machine,

means for indicating a present position of said working machine on said track, which position is adjacent to a spinning machine where the operation of said automatic apparatus is being carried out, said means for indicating said present position being disposed on either each spinning machine or said working machine,

a main control apparatus comprising means for selecting a particular spinning machine at which said operation of said automatic apparatus should be carried out next with priority based upon a signal output from said means for outputting a forecast signal, means for deciding a travel direction of said working machine based upon a signal indicating a frame number of a spinning machine, in relation to said corresponding position from said present position of said working machine, which is issued from said means for indicating a present position of said working machine and a signal indicating a frame number of said particular spinning machine, which is issued from said means for selecting a particular spinning machine, and a transmitter for transmitting a signal instructing said working machine as to its travel direction,

a control box disposed on said working machine, said control box being provided with a receiver for receiving said instruction signal issued from said transmitter of said main control apparatus so that said working machine is displaced toward said particular spinning machine upon receiving said instruction signal at said receiver,

whereby said working machine can be displaced toward said particular spinning machine direct from said present position of said working machine.

4,821,505

METHOD AND APPARATUS FOR SPINNING YARN

Alan N. Jacobsen, 14 Raheen Drive, Kew, Victoria, Australia

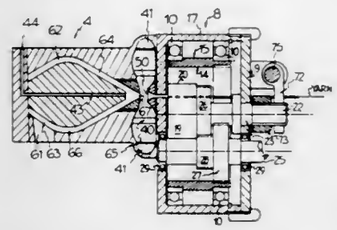
PCT No. PCT/AU86/00165, § 371 Date Jan. 20, 1987, § 102(e) Date Jan. 20, 1987, PCT Pub. No. WO86/07392, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 6, 1986, Ser. No. 23,866

Claims priority, application Australia, Jun. 7, 1985, PH0954

Int. Cl.[4] D01H *7/898, 1/135*

U.S. Cl. 57—401 **18 Claims**



1. A method of preparing fibres for spinning to form a yarn comprising, maintaining an airstream in a converging passage of annular cross-section travelling towards the smaller end thereof, said passage being concentric to a longitudinal axis and having a coaxial assembly zone at the smaller end, entraining fibres in said airstream to form a substantially uniform seriate fibre distribution within said annular passage to pass therealong to the assembly zone and so accelerate and straighten the individual fibres, withdrawing air from said assembly zone in the axial direction opposite to the direction of convergence, and withdrawing an assembly of fibres from the assembly zone in the axial direction of convergence, the seriately distributed fibres entering the assembly zone as a converging curtain to initially adhere at there leading end with the fibre assembly and be drawn to a generally longitudinal disposition to axially build on the fibre assembly as the latter is withdrawn from the assembly zone in a continuous form.

4,821,506

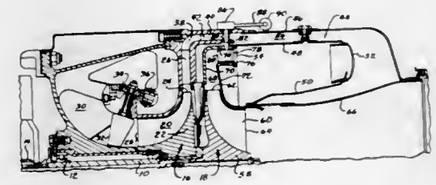
RADIAL TURBINE WITH VARIABLE AXIAL NOZZLE

Colin Rodgers, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 8, 1987, Ser. No. 105,866

Int. Cl.[4] F02C *9/22*

U.S. Cl. 60—39.2 **11 Claims**



1. A gas turbine power plant having in combination:

a radial outflow compressor means and a radial inflow turbine means coupled for simultaneous rotation about an axis of rotation;

means to deliver combustion gas from a combustor to said

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radial inflow turbine along an axial combustion gas path concentric to said axis of rotation;

means to deliver compressed gas from said radial outflow compressor means to said combustor along with a compressed gas path parrallel to said axial combustion gas path; and

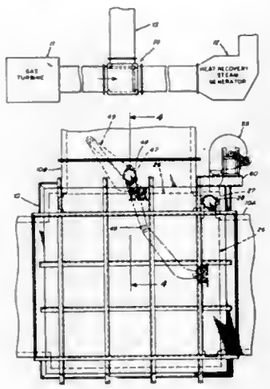
rotatably mounted guide vane means positioned in said axial combustion gas path and having integrally secured thereto rotatable guide vane control element means extending through said compressed gas path, said guide vane control element means being cooled by passage of said compressed gas.

4,821,507

GAS FLOW DIVERTER

Lothar Bachmann, Auburn, and William F. Koch, Lewiston, both of Me., assignors to Bachmann Industries, Inc., Lewiston, Me.

Filed May 29, 1987, Ser. No. 55,594
Int. Cl.[4] F02C *6/00*; F16K *1/16*
U.S. Cl. 60—39.182 **18 Claims**



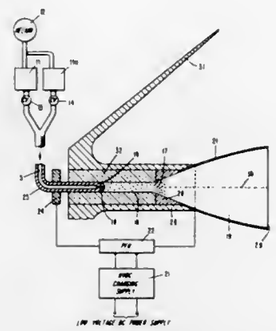
1. A gas flow diverter for use as the junction between the exhaust of a gas turbine, a stack and the inlet of a heat recovery steam generator, said diverter including a chamber having an inlet port connectable to the exhaust of the turbine, an aligned outlet port connectable to the intake of the generator and an upwardly opening outlet port connectable to the stack, insulation secured to the interior surfaces of the chamber, a blade within the chamber and provided with a pivot shaft rotatably supported by the chamber with its axis equidistant from the outlet ports, said blade shaped and dimensioned to swing between positions in which either outlet port is closed thereby and the other is opened, said blade including a frame both sides of which constitute first ledges and a central projection both sides of which constitute second ledges, sealing frames, one surrounding each outlet port and U-shaped in cross section with one side wall longer than the other and secured to the interior of the chamber with the open ends of the sealing frames opening into the chamber in the same plane, first and second seals carried by said longer and other walls, respectively, and spaced and dimensioned to be engaged by the first and second ledges, respectively, on the appropriate side of the blade frame when the blade is in a port closing position, actuating means connected to said blade and operable to swing said blade to bring the ledges thereof into and out of engagement with the seals of either sealing frame, and means to deliver sealing air into the space within either sealing frame when the seals thereof are engaged by first and second ledges of the frame of the blade.

4,821,508

PULSED ELECTROTHERMAL THRUSTER

Rodney L. Burton, Fairfax Station, Va.; Yeshayahu S. A. Goldstein, Gaithersburg; Derek A. Tidman, Silver Spring, both of Md., and Niels K. Winsor, Alexandria, Va., assignors to GT-Devices, Alexandria, Va.

Filed Jun. 10, 1985, Ser. No. 743,150
Int. Cl.[4] F03H *1/00*
U.S. Cl. 60—203.1 **90 Claims**



1. An electrothermal thruster adapted to be mounted on a mass to be propelled comprising means for forming a capillary passage having a plasma confining elongated surface and an open end, electric means for forming a plasma discharge in the capillary passage so the surface is an outer boundary for the plasma in the passage, the capillary passage being arranged so that the plasma is ejected from the capillary passage only out of the open end, the ejected plasma being a thruster source for the mass, the means for forming the plasma including means for supplying a propellant liquid to the passage so that the propellant liquid forms plasma in the plasma discharge, the propellant liquid being applied to the passage confining surface to cool the passage confining surface so as to prevent excessive heating of the surface by the plasma discharge that would otherwise have a tendency to occur and cause damage to the surface.

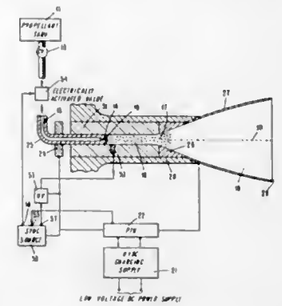
4,821,509

PULSED ELECTROTHERMAL THRUSTER

Rodney L. Burton, Fairfax Station, Va.; Yeshayahu S. A. Goldstein, Gaithersburg; Derek A. Tidman, Silver Spring, both of Md., and Niels K. Winsor, Alexandria, Va., assignors to GT-Devices, Alexandria, Va.

Division of Ser. No. 743,150, Jun. 10, 1985. This application Dec. 7, 1987, Ser. No. 133,154
Int. Cl.[4] F03H *1/00*
U.S. Cl. 60—203.1 **9 Claims**

1. An electrothermal thruster adapted to be mounted on a mass to be propelled comprising means for forming a capillary passage having an elongated plasma confining surface that is an outer boundary for plasma in the passage, the passage having an open end, electric means for forming a plasma discharge in the capillary passage, the capillary passage being arranged so that the plasma is ejected from the capillary passage only out of the open end, the ejected plasma being a thrust source for the mass, the plasma in the capillary passage having a very high pressure on the order of 1000 atmospheres, the capillary being constructed so plasma flowing out of the open end has a tendency to be highly ionized and dissociated, and a supersonic, equilibrium flow nozzle having an inlet positioned to be responsive to the plasma ejected from the open end, the nozzle having a high outlet to inlet area ratio and a high Reynolds number for achieving substantially adiabatic and equilibrium directed kinetic energy and relatively low ionization, dissociation and thermal energies.



4,821,510

MULTIPLE-STAGE ROCKET MOTOR NOZZLE THROAT

Warren L. Graser, Elkton, Md., and Robert H. McCafferty, Wilmington, Del., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Apr. 22, 1987, Ser. No. 41,264
Int. Cl.[4] F02K *9/97*
U.S. Cl. 60—242 **12 Claims**

1. A rocket motor nozzle employing multiple-stage operation for improving the pressure versus time history of rocket motors utilizing a solid propellant grain having a longitudinally extending center perforation contained within an elongated cylindrical case comprising,

a nozzle body,

first and second stage nozzle throats positioned within said nozzle body and attachable thereby to the end of the elongated cylindrical case in spaced axial alignment with the perforation in the propellant grain with said second nozzle throat positioned between the end of the propellant grain and said first nozzle throat,

said first stage nozzle throat, when so positioned on the end of the elongated cylindrical case, providing a restricted passage in axial alignment with the perforation in the propellant grain, said first stage nozzle throat being made of a material which during burning of the propellant grain erodes at a rate such that the area of the throat increases at a rate that approximately matches the increase in the burning surface area of the propellant grain so that the ratio of the burning surface area of the propellant grain divided by the throat area of said first stage nozzle throat remains virtually constant and the pressure in the perforation of said propellant grain similarly remains nearly constant during the majority of the burn of the propellant grain, and

said second stage nozzle throat being made of a non-eroding material and providing a restricted passage in axial alignment with the perforation in the propellant grain after the erosion of said first stage nozzle throat, the area of said second stage nozzle throat being greater than the initial area of said first stage nozzle throat,

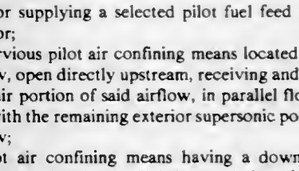
whereby upon erosion of said first stage nozzle throat near the end of the burn of said propellant grain said second stage nozzle throat becomes the controlling throat.

4,821,511

LINER FOR A SOLID PROPELLANT ROCKET MOTOR

Bernard R. Felix, Saratoga, and Stephen E. Slosarik, Los Gatos, both of Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 31, 1986, Ser. No. 925,645
Int. Cl.[4] F02K *9/00*
U.S. Cl. 60—255 **7 Claims**



1. A curable liner for a solid propellant rocket motor, said liner comprising a curable mixture of components formulated to bond a propellant to an insulator disposed within the motor, the improvement characterized by:

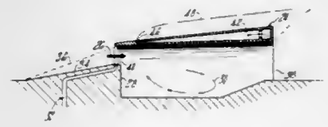
a radiopaque material, uniformly blended with the uncured liner component formulation, said material added in an amount sufficient to block the passage of x-rays through the propellant-liner-insulation interface, thereby enhancing the definition of flaws during non-destructive x-ray testing, without detrimentally affecting the bonding or burning properties of the cured liner.

4,821,512

PILOTING IGNITER FOR SUPERSONIC COMBUSTOR

Roy N. Guile, Wethersfield, and William T. Peschke, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 5, 1987, Ser. No. 46,072
Int. Cl.[4] F02K *7/10*; F02C *7/264*
U.S. Cl. 60—270.1 **16 Claims**



1. A piloting fuel injector assembly for a supersonic ramjet engine, located within a supersonic airflow delivered directly from a supersonic inlet confined by a combustor wall, comprising:

means for supplying a selected pilot fuel feed rate to said injector;

an impervious pilot air confining means located within said airflow, open directly upstream, receiving and confining a pilot air portion of said airflow, in parallel flow relationship with the remaining exterior supersonic portion of said airflow;

said pilot air confining means having a downstream discharge opening in parallel flow relationship with said remaining exterior supersonic portion of said airflow;

a downstream facing flow disturbing means located within

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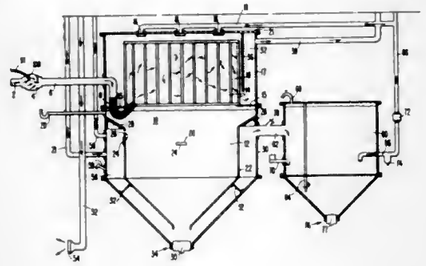
the confined flow of said pilot air confining means, whereby a flow recirculation zone is formed;
means for introducing said pilot fuel at a location upstream of at least a portion of said recirculation zone;
means for supplying a second main fuel flow into said supersonic airflow at a location upstream of said discharge opening;
a fuel flow path through said pilot air confining means;
means for supplying said second main fuel to one end of said fuel flow path; and
a plurality of outlets at the other end of said fuel path whereby fuel heated in passing through said fuel flow path is discharged into said exterior supersonic airflow portion.

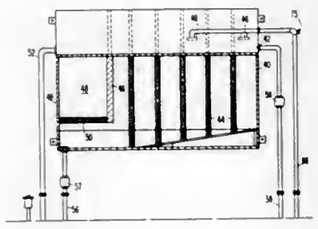
4,821,513

AUTOMOBILE EXHAUST GAS CLEANER

John J. Pickering, 102 Barrett Ave., North Providence, R.I. 02904

Filed Jun. 12, 1987, Ser. No. 62,072
Int. Cl.[4] F01N *3/04*
U.S. Cl. 60—283 **12 Claims**





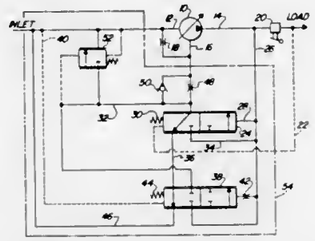
1. A cleaner for exhaust gas comprising:
first and second perforated baffle means supported in respective first and second perforated baffle means supported in respective first and second housings, said first housing having an exhaust gas inlet, said second housing having an exhaust gas outlet, and said first housing being situated below said second housing and connected thereto to permit the flow of exhaust gas upwardly from said first housing to said second housing,
first spray means for spraying cleaning liquid onto said first perforated baffle means and for permitting the gas to permeate therethrough and then to flow downwardly around means for deflecting the gas before moving upwardly to said second housing, said sprayed liquid falling downwardly into sump means for receiving said sprayed liquid,
second spray means for spraying cleaning liquid onto said second perforated baffle means and for permitting the gas to permeate therethrough, said sprayed liquid falling downwardly into said sump means,
filtered separator box means adjacent said second baffle means for filtering pollutants from said exhaust gas,
wherein said exhaust gas is conducted through said first perforated baffle mans while being sprayed with cleaning liquid from said first spray means then conducted upwardly, next conducted through said second perforated baffle means while being sprayed with cleaning liquid from said second spray means, and immediately conducted through said filtered separator box, and out into the atmosphere,
whereby pollutants are removed from said exhaust gas.

4,821,514

PRESSURE FLOW COMPENSATING CONTROL CIRCUIT

Randy P. Schmidt; Steven G. Brandau, James A. Miller, all of Cedar Falls, Iowa, and Dwight B. Stephenson, Savage, Minn., assignors to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 060,150, Jun. 9, 1987. This application Sep. 11, 1987, Ser. No. 96,418
Int. Cl.[4] F04B *49/00*
U.S. Cl. 60—452 **20 Claims**



1. A control circuit for a variable displacement pump having an inlet, an outlet connected to a load and a control line, said circuit comprising:
a load sense valve having a first port connected to the pump control line, a second port connectible to the pump inlet and a third port connected to the pump outlet, said load sense valve having one position connecting said first port to said second port and another position connecting said first port to said third port;
a load sense line having a pressure therein representative of the pressure supplied to the load;
means for controlling the position of said load sense valve based on the pressure differential between said pump outlet and said load sense line;
a pressure-compensator valve having a first port connected to said load sense valve second port, a second port connected to said load sense valve first port, a third port connected to said pump inlet and a fourth port connected to said pump outlet, said pressure-compensator valve having one position connecting its first and third ports while blocking communication between its second and fourth ports, and having another position blocking communication between its first and third ports while connecting its second and fourth ports;
means for controlling the position of said pressure-compensator valve based on the pressure differential between said pump inlet and outlet;
flow limiting orifice means connecting said pump control line and said load sense valve first port;
check means connected in parallel to said orifice means, said check means allowing flow therethrough from said pump control line towards said load sense valve first port, while blocking flow therethrough from said load sense valve first port towards said pump control line; and
a relief valve for connecting said load sense valve first port

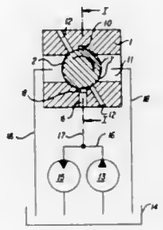
to said pump inlet when the pressure differential therebetween exceeds a predetermined maximum.

4,821,515

CONTROL DEVICE FOR LIQUID OR GASEOUS MEDIUM

Günter Steln, Waihengeyerstr. 1, D 8882 Lauingen, Fed. Rep. of Germany

Continuation of Ser. No. 915,861, Oct. 6, 1986, abandoned, which is a continuation of Ser. No. 600,667, Mar. 29, 1984, abandoned. This application Mar. 7, 1988, Ser. No. 165,186
Int. Cl.[4] G01F *11/22;* **F15B** *15/18*
U.S. Cl. 60—494 **17 Claims**



1. Control arrangement for controlling parts of volume of a liquid medium, a gaseons medium or an emulsion medium under pressure, said control arrangement comprising:
a housing, including an inlet and an outlet for said medium;
a cylindrical volume control slide mounted in said housing, and drivable rotatably in said housing with a predetermined rpm, said control slide having a control surface;
at least one opening means provided in said control surface, said at least one opening means being connectable during rotation of said control slide in said housing alternately with said inlet and said outlet for receiving medium at said inlet and for ejecting medium at said outlet;
a pumping means connected to a medium actuated means by a connection line for pumping said medium to said medium actuated means;
a branch line connecting said connection line with said inlet of said housing;
said cylindrical volume control slide and said housing being pressure tight so that, in use of said arrangement, medium entering said inlet from said branch line undergoes a pressure drop between said inlet and said outlet, said medium compressing gaseous parts in said at least one opening means, said medium being ejected from said opening means at said outlet under the effect of centrifugal force.

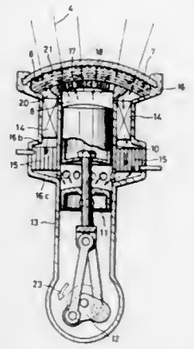
4,821,516

STIRLING CYCLE ENGINE

Naotsugu Isshiki, Tokyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 26, 1988, Ser. No. 224,303
Claims priority, application Japan, Jul. 31, 1987, 62-190147
Int. Cl.[4] F02G *1/04;* **F03G** *7/06*
U.S. Cl. 60—517 **7 Claims**

1. A stirling cycle engine including cylinder means having cylinder head means and piston means disposed in said cylinder means to define working chamber means in said cylinder means, fluid passage means for passing working fluid into and out of said working chamber means, said fluid passage means being provided with cooling means for cooling said working fluid, heat accumulating means and heating means for heating said fluid passage means, said heating means including transparent wall means provided in said fluid passage means and fluid permeable heat receiving means provided in said passage



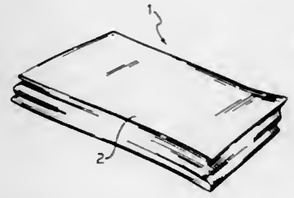
means to receive heat radiation which has passed through said transparent wall means.

4,821,517

ACTUATOR FOR PRODUCING A DISPLACEMENT MOVEMENT ON A SET TEMPERATURE BEING REACHED

Claudio Zarotti, Via Marco Polo, 7, 20124 Milano, Italy

Filed May 7, 1987, Ser. No. 46,639
Claims priority, application Italy, May 12, 1986, 20401 A/86
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—531 **11 Claims**



1. An actuator of a type effective to produce a displacement movement on a preset cut-in temperature being reached, said actuator comprising an impervious deformable bladder formed from a multilayered laminate material, said material comprising
a polyester layer, a nylon layer, an aluminum layer, and a polyethylene layer, said bladder containing a fluid having a boiling temperature equal to the set cut-in temperature.

4,821,518

CLUTCH BOOSTER WITH OVERCENTER MEANS

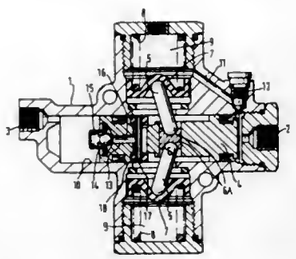
Ralph Copland, and Cdm M.P. Keegan, both of Lincoln, United Kingdom, assignors to Clayton Dewandre Co. Ltd., Lincoln, United Kingdom

Filed Nov. 5, 1987, Ser. No. 116,985
Claims priority, application United Kingdom, Nov. 5, 1986, 8626480
Int. Cl.[4] F15B *3/00;* **F01B** *31/00*
U.S. Cl. 60—579 **8 Claims**

1. A booster device comprising, a hydraulic cylinder, a piston movable in the cylinder and wherein movement of the piston in opposite directions beyond a predetermined point is assisted by an overcenter means acting on the piston intermediate its ends, the overcenter means acts under the influence of

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biasing means acting in different radial directions spaced around the piston axis to provide substantially balanced radial forces, and the overcenter means bears upon a radially floating



element which is carried by the piston and acts under the influence of the biasing means which provide the balanced radial forces.

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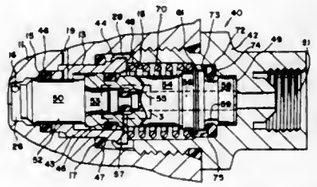
PRIMARY PRESSURE-BALANCED PROPORTIONING VALVE

Robert F. Gaiser, Stevensville, Mich.; John E. Steer, South Bend, and Donald A. Crumb, Granger, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 29, 1987, Ser. No. 67,514

Int. Cl.[4] B60T *8/26*

U.S. Cl. 60—591 **20 Claims**



1. A proportioning valve in combination with a master cylinder, the master cylinder comprising a primary pressure chamber and a secondary pressure chamber, communication means for communicating fluid pressure from the respective pressure chambers to a transverse bore having said proportioning valve disposed therein, the bore having at one end a primary pressure receiving chamber located radially inwardly relative to the master cylinder and at the other end a secondary pressure receiving chamber located radially outwardly, the secondary pressure receiving chamber having an outlet opening, a differential area piston disposed within said bore and having a primary end received in the primary pressure receiving chamber and a secondary end received in the secondary pressure receiving chamber, the primary end having at least one seal thereat in order to define a part of the primary pressure receiving chamber, the secondary end having sealing means disposed thereat, resilient means disposed between said piston and a shoulder in said bore, the differential area piston comprising a first piston part and a second piston part, the first piston part having an extension received at a through opening of the second piston part, the extension having a seal member thereabout, and the seal member adjacent a radial opening in the second piston part and engaging sealingly a part of the second piston part, and a stepped, stationary sleeve located in said bore and disposed about said first and second piston parts in order to define a portion of a vented intermediate chamber, so that failure of pressure in the primary chamber causes the first piston part to be displaced and the seal member to move from sealing engagement to permit fluid pressure in the second pressure receiving chamber to be communicated through the radial opening and the through opening in the second part.

4,821,520

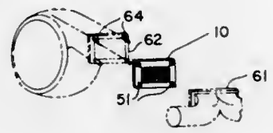
TURBOCHARGER PROTECTOR SCREEN

Michael A. Rumfield, Rte. 2, Box 3121, Cleveland, Tex. 77327

Filed Jul. 22, 1988, Ser. No. 222,743

Int. Cl.[4] F02C *7/055;* **B01D** *39/12;* **F02G** *3/02*

U.S. Cl. 60—614 **5 Claims**



1. A screen assembly for use with an internal combustion engine, adapted to cover an exhaust gas driven turbine having an inlet port for exhaust gases, said screen assembly adapted to protect said gas driven turbine from debris or particulate matter, comprising;

a housing portion mounted across said turbine inlet port, said housing portion defining an exhaust gas flow aperture therethrough;

a screen member disposed within said housing portion, said screen member spanning said exhaust gas flow aperture; and

a gasket member between said housing portion and said screen member, said gasket member permitting thermal expansion of said screen member within said housing portion.

4,821,521

POSITIONING DRIVE FOR A MOTOR VEHICLE DOOR CLOSING DEVICE

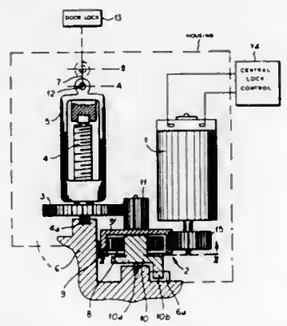
Rolf Schüler, Heiligenhaus, Fed. Rep. of Germany, assignor to Kiekert GmbH & Co. Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,625

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1986, 8621592[U]

Int. Cl.[4] E05C *3/06;* **E05B** *37/20*

U.S. Cl. 60—716 **5 Claims**



1. A positioning drive for a motor vehicle door closing device, particularly for a motor vehicle central locking mechanism, comprising:

a housing;

an electric motor mounted in said housing;

a transmission including a gear shaped like a cup and a coil spring mounted in said gear with one end attached to said gear and braced with the other end on said housing and being stressable by rotation, said transmission being mounted in said housing and connected to and driven by said electric motor;

a gear/spindle unit engaged with said transmission and mounted in said housing; and

a positioning element mounted in said housing extendible and retractable by alternating action of said spindle so that said coil spring is stressable by rotation by said electric motor with the extension and retraction of said positioning element and said positioning element is returnable by said coil spring after shutting off said electric motor.

4,821,522

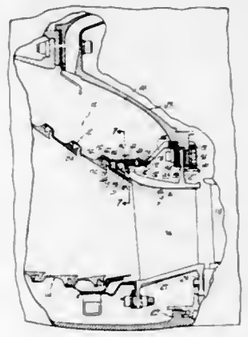
SEALING AND COOLING ARRANGEMENT FOR COMBUSTOR VANE INTERFACE

John A. Matthews, Melrose; Melvin H. Zeisser, Marlborough, and Robert E. Coburn, Mansfield Center, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 2, 1987, Ser. No. 68,870

Int. Cl.[4] F02C *1/00*

U.S. Cl. 60—757 **6 Claims**



1. In an axial flow gas turbine engine including a combustor, inner structural means and outer engine casing means, and a stage of circumferentially spaced apart turbine inlet guide vanes downstream of said combustor and disposed between said inner structural means and outer casing means, each of said vanes having a platform and a leading edge, an annular seal assembly connected to said platforms, said platforms including a gas path defining annular surface having an upstream end, wherein during operation a circumferentially extending sinusoidal-like pressure distribution exists in the gas path immediately upstream of said vanes with a higher pressure region substantially circumferentially aligned with each vane leading edge and lower pressure regions therebetween, the improvement comprising:

said seal assembly including an annular sheet metal liner member secured to said cumbustor and including a conical portion having downstream end and a first substantially conical gas path defining surface terminating at said downstream end, said conical surface being adapted to have a film of coolant flowing downstream thereover and being oriented and disposed at a first axial location selected to direct said coolant flow downstream adjacent and substantially parallel to said gas path surface of said platform;

said conical platform having a second substantially conical surface facing away from the gas path and terminating at said downstream end, wherein said downstream end is closedly axially spaced from said platforms to define a small annular gap therebetween;

a structural member connected to said platforms and having a conical support surface at its upstream end radially spaced from said conical portion downstream end;

said seal assembly including an annular sheet metal wall member external of the gas path, fixed axially relative to said liner member and spaced radially from said conical portion;

said seal assembly including annular baffle means disposed within the space between said conical portion and said wall member, fixed axially relative to said conical portion and wall member and having a generally conical, wave-shaped portion mating with said second conical, surface of said liner member at alternate wave peaks to form a plurality of circumferentially spaced apart open-ended axially extending channels;

said seal assembly including means defining a first annular compartment upstream of and in fluid communication with said open-ended channels, including first coolant passages through said wall member for introducing coolant air into said first cavity, said open-ended channels being the same in number as the number of vanes in said stage of vanes, each open-ended channel being aligned with a respective one of said vanes for directing coolant from said first compartment through said open-ended channels, across said gap, and at the leading edge of each vane, each of said open-ended channels being constructed to direct coolant fluid at a respective higher pressure region immediately upstream of each vane leading edge;

wherein said seal assembly includes a cylindrical surface which mates with said cylindrical surface of said support member and is fixedly secured thereto to locate said liner member conical gas path surface at said selected first axial location.

4,821,523

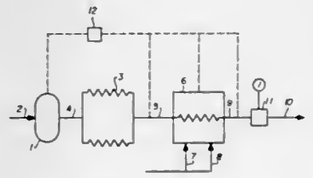
METHOD AND APPARATUS FOR RELIABLE GAS SUPPLY

John P. Borcuch, Williamsville, and David R. Thompson, Grand Island, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1988, Ser. No. 176,220

Int. Cl.[4] F17C *7/02*

U.S. Cl. 62—52 **17 Claims**



1. A method for supplying gas to a receiving point at a flowrate at least equal to a design gas usage rate comprising:

(A) passing liquid from a liquid reservoir into an atmospheric vaporizer having a rated capacity at least equal to said design gas usage rate;

(B) passing the liquid through the atmospheric vaporizer while heating the liquid by indirect heat exchange with ambient air to produce heated fluid;

(C) passing substantially all of the heated fluid from the atmospheric vaporizer into a powered heat exchanger having a rated capacity at least equal to said design gas usage rate;

(D) passing the heated fluid through the powered heat exchanger while heating the heated fluid by indirect heat exchange with hot fluid to produce product gas: and

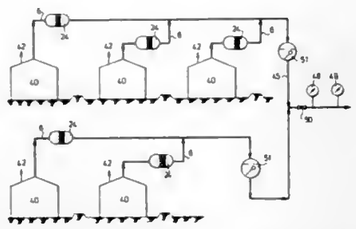
(E) passing product gas to the receiving point at a flowrate at least equal to the design gas usage rate.

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4,821,524
METHOD AND APPARATUS FOR REDUCING EVAPORATION OF STORAGE TANKS

Ferenc Kostyál; György B. Mika, Both of Budapest; Miklós Petruska, and István Sokorai, Százhalombatta, all of Hungary, assignors to Olajipari Fovállalkozó és Tervezo Vállalat, Budapest, Hungary

Continuation of Ser. No. 892,025, Jul. 30, 1986, abandoned. This application May 10, 1988, Ser. No. 195,382
Claims priority, application Hungary, Jul. 30, 1985, 2920/85
Int. Cl.[4] F17C *13/00*
U.S. Cl. 62—54 **4 Claims**

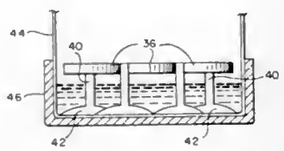


1. Apparatus for the recovery of a volatile liquid from a gaseous phase without any mechanical compression or suction, which comprises a plurality of tanks each having a vapour outlet at or near its top, some or all of said tanks containing a volatile liquid, each of said tanks having a breathing valve for admitting gas from the exterior of said tank when the pressure within a tank falls below the pressure of said gas, a header tube connecting parallel to each other the vapor outlets of a plurality of tanks for recovering mixture of vapors of said volatile liquid and the gas in the space in a tank above the volatile liquid and for continuously conveying away said mixture from each tank in which the pressure of said liquid is greater than in said header tube, said greater pressure in a tank being due to the introduction of additional volatile liquid into a tank, or an increase of the temperature therein, or both, a countercurrent flow condenser connected from said header tube for condensing and recovering volatile liquid from gases introduced from a tank into the header tube, and means for preventing volatile liquid condensed within said condenser from reentering said header tube.

4,821,525
COOLING DEVICE FOR BEVERAGE CONTAINERS

Charles S. Drummond, III, 8 Berkshire Dr.; Thomas B. Milan, 500 Welwyn Rd., both of Richmood, Va. 23229, and Brian E. Moon, 2900 E. Brigstock Rd., Midlothian, Va. 23113

Continuation-in-part of Ser. No. 92,178, Aug. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 11,199, Feb. 5, 1987, abandoned. This application Apr. 25, 1988, Ser. No. 186,066
Int. Cl.[4] F25D *17/00*
U.S. Cl. 62—56 **7 Claims**

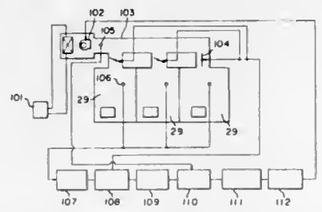


1. A method for providing a cooling receptacle for holding and cooling plural packaged beverage containers, said method comprising the steps of:
disposing the bottom of a bag in a mold;
inserting into said bag a holding device comprising a plurality of beverage container gripping loops supported by support means;
adding water to the bag to such a level such that the gripping loops of said holding device extend above the water level while at least a portion of the support means lies below the water level;
freezing the water within the bag so as to form a slab of ice within the bag with at least a portion of said support means encapsulated therein; and
separating said bag from the mold.

4,821,526
AIR CONDITIONING APPARATUS

Nobuo Otsuka; Hideo Igarashi, and Peter Thompson, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 899,327, Aug. 22, 1986, Pat. No. 4,754,919. This application Feb. 10, 1988, Ser. No. 154,233
Claims priority, application Japan, Aug. 22, 1985, 60-186242; Sep. 11, 1985, 60-201001; Sep. 11, 1985, 60-201002; Sep. 18, 1985, 60-208001; Sep. 18, 1985, 60-208002; Oct. 7, 1985, 60-225051; Oct. 7, 1985, 60-225052; Oct. 7, 1985, 60-225054; Oct. 7, 1985, 60-225055
Int. Cl.[4] F25D *17/00*
U.S. Cl. 62—180 **10 Claims**

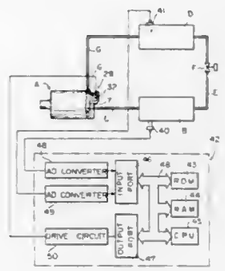


1. An air conditioning apparatus comprising a heat source apparatus for producing warm air or cool air, an air blower and an air duct for distributing the warm air or the cool air from said heat source apparatus to each of rooms, air quantity adjusting dampers, each being disposed in a branched duct connected to said air duct for each room, and a room thermostat disposed in each of said rooms, comprising:
a heat load measuring means which receives signals corresponding to an established room temperature determined by said room thermostat and an actual room temperature detected by said room thermostat, and measures a heat load for each of said rooms based on the difference between the established temperature and the detected temperature,
a damper control means for controlling the degree of opening of said dampers on the basis of an output of said heat load measuring means,
at least one of an established temperature determining means for determining the value of the established temperature for the air passing in said air duct and an established pressure determining means for determining the value of the established pressure for the air in said air duct based on the value of the heat load of each of said rooms measured by said heat load measuring means, wherein at least one of said air blower and said heat source apparatus is controlled by using an output from said established pressure determining means, wherein said heat source apparatus is of a capacity changeable type, said air blower is adapted to feed the air heated or cooled by said heat source apparatus at a substantially constant pressure, and said established temperature determining means is adapted to determine the value of an established temperature for the air in said air duct based on the greatest value among the heat loads in each of said rooms measured by said heat load measuring means, and which further comprises a temperature measuring means which receives and processes a detection signal from a temperature detector disposed in said air duct, a capacity determining means for determining the capacity of said heat source apparatus based on an output from said temperature detector and an output from said established temperature determining means, and a capacity control means for controlling said heat source apparatus based on an output from said capacity determining means,
wherein said established temperature determining means comprise means to determine the value of an established temperature in said air duct to be at a limit value of the lower limit temperature for room-warming operation and the upper limit temperature for a room-cooling operation, which allows the operation of said heat source apparatus when the greatest value for heat load is not greater than zero; to determine said value to be a limit value at the upper limit temperature for room-warming operation and the lower limit temperature for room-cooling operation when the greatest value for heat load is the same as or higher than the established value; and to determine said value to be a temperature in proportion to the greatest value for heat load when the greatest value is in the range from zero to said established value.

4,821,527
COOLING DEVICE EQUIPPED WITH A VARIABLE DISPLACEMENT TYPE COMPRESSOR

Shinichi Suzuki; Jun Hasegawa, and Kenji Takenaka, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jul. 8, 1987, Ser. No. 70,927
Claims priority, application Japan, Jul. 17, 1986, 61-168828
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—209 **11 Claims**

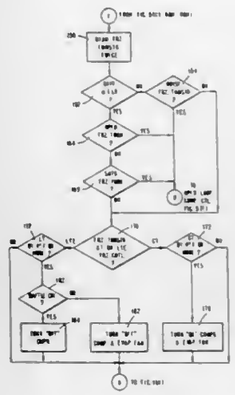


1. A cooling device having a variable displacement type compressor, a condenser, an expansion valve and an evaporator, said device comprising:
first means for detecting a condensing temperature of refrigerant in the condenser;
second means for detecting an actual evaporation temperature of refrigerant in the evaporator;
valve means controlling the displacement of the compressor;
control means controlling said valve means in response to output signals of said first means and said second means to cause the actual evaporation temperature to approach a predetermined desired evaporation temperature, which temperature is determined by the condensing temperature and becomes low as the condensing temperature becomes high whereby the compressor displacement is increased as the condensing temperature is increased, at low compressor loads, and lubrication of the compressor can be insured.

4,821,528
FAULT TOLERANT CONTROL FOR A REFRIGERATOR

Andrew T. Tershak, Center Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 946,914, Dec. 22, 1986, Pat. No. 4,741,170. This application Feb. 10, 1988, Ser. No. 154,575
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—228.1 **8 Claims**



1. In a refrigerator having a cabinet defining a first, below freezing compartment and a second, above freezing compartment, a compressor for cooling said first compartment, a wall having an opening between said compartments, a baffle for selectively closing said opening, first and second temperature sensing means for sensing respectively the temperatures in said first and second compartments, first and second temperature setting means for setting the temperatures respectively of said first and second compartments to user selected first and second temperatures:
memory means for storing plural open loop compressor control parameters; and
microprocessor means programmed to be responsive to said first and second temperature sensing means and to said first and second temperature setting means to control selectively said compressor and said baffle to maintain said first and second compartments at said first and second user selected temperatures;
said microprocessor means being further programmed to detect faults in both said first temperature sensing means and said baffle and, in response, to control said compressor using a predetermined one of said plural open loop compressor control parameters stored in said memory means.

4,821,529
REFRIGERATION SYSTEM FOR MOTOR CARS

Eliaho Maier, Patah-Tiqua, Israel, assignor to Loran & Co., Mobile Post Galil Elyon, Israel

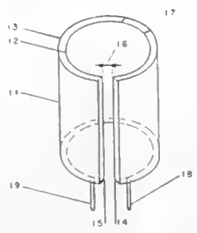
Filed Nov. 25, 1987, Ser. No. 125,386
Claims priority, application Israel, Nov. 28, 1986, 80805
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—239 **5 Claims**

1. A refrigeration system for the rapid cooling of a beverage container, at least part of which defines a cylindrical surface, for use in conjunction with an existing motor-car air-conditioning system, said refrigeration system comprising:

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a cooling mantle for selectable engaging in heat conductive contact substantially the entire cylindrical surface of the container, said cooling mantle comprising fluid entry and exit conduits and defining therebetween a fluid path for a refrigerant fluid associated with the motor car air-conditioning system;

refrigerant fluid expansion means associated with said fluid entry conduit; and



selectable valve means associated with the motor car air-conditioning system operable in a first mode to permit flow therethrough of said refrigerant fluid such that it bypasses said refrigeration system, said valve means being further operable in a second mode to prevent flow therethrough of said refrigerant fluid such that it flows through said cooling mantle, thereby causing said mantle to close around the surface of the beverage container so as to cause rapid cooling of the beverage contained thereby.

4,821,530

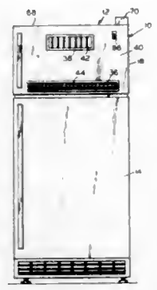
AIR-CONDITIONING REFRIGERATOR

Ricky G. Ledbetter, 503 Maple St., Medford, Oreg. 97501

Filed May 13, 1988, Ser. No. 193,933

Int. Cl.[4] F25B *25/00*

U.S. Cl. 62—332 **10 Claims**



1. An air-conditioning refrigerator which, in combination with a conventional refrigerator having separate freezer and refrigeration compartments, with separate freezer compartment and refrigeration compartment doors, comprises the following:

an air-conditioning cooling coil unit;

a blower and motor unit;

an enclosing housing attached to the inside of the freezer compartment door within which the air conditioning cooling coil unit and the blower and motor unit are located;

the freezer compartment door having a first opening for entry of air and a second opening for the exit of cooler air;

the blower and motor unit being positioned as to draw air in through the first opening in the freezer compartment door, past the air-conditioning cooling coil unit, and out through the second opening in the freezer compartment door;

an air-conditioning motor-compressor unit;

freon lines interconnecting said motor-compressor unit and said cooling coil unit;

freon condensing means located between said motorcompressor unit and said cooling coil unit.

4,821,531

REFRIGERANT EVAPORATOR

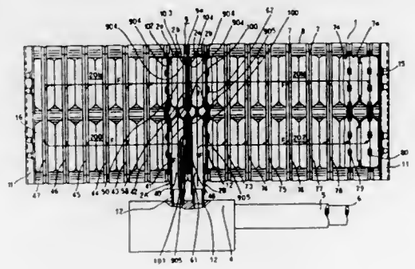
Yoshiyuki Yamauchi, Chita; Toshio Ohhara, Kariya; Shinji Ogawa, Aichi; Isao Kuroyanagi; Haruhiko Otsuka, both of Anjo; Toshio Takahashi, Oobu, and Osamu Kasebe, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 9, 1987, Ser. No. 130,542

Claims priority, application Japan, Dec. 11, 1986, 61-295398; Oct. 9, 1987, 62-255250

Int. Cl.[4] F25B *39/02*

U.S. Cl. 62—515 **20 Claims**



1. An evaporator comprising:

a first portion having an inlet port adapted to receive a gas-liquid phase refrigerant;

a plurality of tubes each having first and second ends, said first end being connected to said first tank portion so that the refrigerant is distributed thereinto and the refrigerant is evaporated therein while the refrigerant passes therethrough, said plurality of tubes being arranged in such a manner that said first ends form a line along a direction of refrigerant flow within said first tank portion; and

a second tank portion having an outlet port through which refrigerant exits said evaporator said second end of said tube being connected to said second tank portion so that refrigerant passed through said tubes flows into said second tank portion, wherein for each tube, a flow passage is defined by that tube, at least a portion of said first tank, at least a portion of said second tank, said inlet port and said outlet port, the length of each such flow passage having greater far successive tubes along said line.

4,821,532

BRACELET COMPRISING A FLEXIBLE CORE

Bernard Jaques, Bienne, and Francis Chatelain, La Chaux-de-Fonds, both of Switzerland, assignors to Montres Rado, S.A., Lengnau, Switzerland

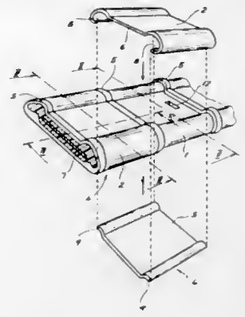
Filed Mar. 22, 1988, Ser. No. 171,583

Claims priority, application France, Mar. 23, 1987, 87 04041

Int. Cl.[4] A44C *5/00*

U.S. Cl. 63—3 **10 Claims**

1. A bracelet including a flexible core (1) formed of a material which renders such core non-extensible in the longitudinal direction and a plurality of covering elements (4) surrounding said core each comprising an upper part (2) and a lower part (3) assembled to one another, raised beads (5) integrally formed with the core and extending between edges (6, 10) of two adjacent covering elements, said beads providing regular gaps between said covering elements the upper part and the lower part forming each covering element being formed of elastic material and snap fastened to one another, said upper and



lower parts conforming in a manner to be assembled or separated without there resulting therefrom a permanent deformation of said parts.

4,821,534

APPARATUS FOR CONTROLLING THE CARRIAGE DRIVE MOTOR OF A FLAT BED KNITTING MACHINE

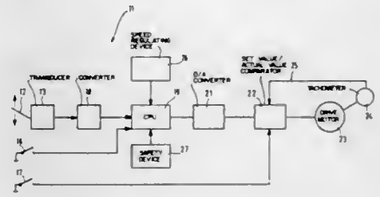
Ernest Goller, Reutlingen; Jürgen Ploppa, Pfullingen, and Adam Müller, Reutlingen, all of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Reutlingen, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 156,872

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705125

Int. Cl.[4] D04B *7/00*

U.S. Cl. 66—60 R **17 Claims**



1. An apparatus for activating, accelerating and turning off the carriage drive motor of a flat-bed knitting machine, the drive motor having at least one manually operable handlebar which extends substantially along a longitudinal section of the machine and is mechanically connected to said apparatus, said apparatus comprising: an electrical transducer connected to and continuously adjustable by said handlebar, the output of said transducer being a measure of the relative change of the preset working speed of the drive motor.

4,821,535

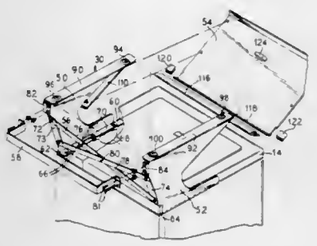
COUPLING DEVICE FOR WASHER AND DRYER

Chester W. Wassilak, St. Joseph, and Richard J. Conrad, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 29, 1987, Ser. No. 139,003

Int. Cl.[4] D06F *39/00*

U.S. Cl. 68—3 R **19 Claims**



11. A coupling device to provide for vertical mounting of a top appliance having a horizontal base wall with upwardly directed depressions formed therein and a bottom appliance having a removable top panel and vertical side walls with inwardly turned horizontal flanges at a top edge of said side walls positioned below said top panel, said coupling device comprising two support members, each having:

a lower flange having a bottom side which defines a lower mounting surface to engage said horizontal side wall flanges independent of said top panel;

an upper flange having a top side which defines an upper mounting surface to engage said base of said top appliance; and

supporting means joining said upper flange to said lower

4,821,533

METHOD OF SETTING PRECIOUS STONES, AS WELL AS JEWELRY MADE BY THIS METHOD

Alain Bonnefoy, Eaubonne, France, assignor to Cartier International B.V., Amsterdam, Netherlands

Filed Jan. 15, 1988, Ser. No. 144,157

Claims priority, application France, Jan. 19, 1987, 87 00513

Int. Cl.[4] A44C *5/00*

U.S. Cl. 63—3 **8 Claims**

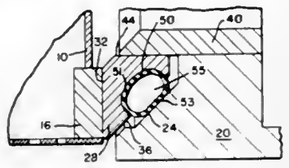


1. A method for setting precious stones for making pieces of jewelry, in particular rings or bracelets of the type set with precious stones, comprising the steps of providing a metal support element having a U-shaped cross section and including two lateral bands separated by a central band with the bands defining a channel corresponding in width (a) to the width of the stones to be set; providing in each lateral band holes separated on each band by a distance (b) corresponding to the dimensions of the stones; placing the stones side by side in the channel; passing a metal wire in the holes in the lateral bands proceeding from one band to the other across the channel to hold the stones therein.

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flange in a spaced parallel relationship and being capable of supporting said top appliance;
including a front panel extending at an angle from vertical between said two support members; and
said bottom appliance has a door on said top panel openable towards said front panel, and including a latch member carried on said front panel engageable with said door of said bottom appliance to hold it in an open position against said front panel.

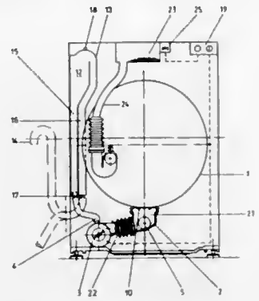
4,821,536
ROTATING DRUM END SEAL
Donald E. Bardsley, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Jun. 22, 1988, Ser. No. 209,597
Int. Cl.[4] D06B *23/18;* **B01D** *33/10;* **F16J** *15/48*
U.S. Cl. 68—158 **1 Claim**



1. In combination:
a vat; a rotatable drum mounted in the vat; a circumferential, inflatable tube retainer at each end of the rotatable drum extending at least partially around the circumference of the rotatable drum and located between the end of the rotatable drum and the inside surface of the vat; each circumferential, inflatable tube retainer having an inside surface extending at an acute angle with respect to the axis of the rotatable drum; a circumferential wear shoe with a generally triangular cross-section at each end of the drum in sealing contact with the drum along a first side of the wear shoe, a second side of the wear shoe facing and parallel to said inside surface of the circumferential, inflatable tube retainer, said second side having a generally semi-cylindrical groove extending along the length of the wear shoe; an inflatable tube located in each wear shoe generally semi-cylindrical groove and in contact with said inflatable tube retainer inside surface; and a wear shoe retainer having a surface in contact with the third side of the wear shoe.

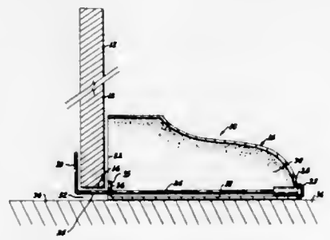
4,821,537
WASHING MACHINE OR WASHING DRYING MACHINE WITH DEVICES TO AVOID LOSSES OF WASHING AGENT
Peter Zinkann, Gütersloh; Wilfried Hüttemann, Bielefeld; Hans Fey; Friedrich W. Stork, both of Gütersloh; Rudolf Herden, Herzebrock, and Wilfried Schultz, Gütersloh, all of Fed. Rep. of Germany, assignors to Miele & Cie. GmbH & Co., Gütersloh, Fed. Rep. of Germany
PCT No. PCT/DE86/00400, § 371 Date Jun. 3, 1987, § 102(e) Date Jun. 3, 1987, PCT Pub. No. WO87/02078, PCT Pub. Date Apr. 9, 1987
PCT Filed Oct. 2, 1986, Ser. No. 66,417
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535326; Nov. 16, 1985, 3540741; Jan. 25, 1986, 3602232; Jan. 25, 1986, 3602217; Mar. 14, 1986, 3608579
Int. Cl.[4] D06F *39/08*
U.S. Cl. 68—208 **16 Claims**

1. A washing machine, comprising:
a wash tub for receiving water and articles to be washed;
a drain connected to said wash tub;
a float disposed within said drain;
drain water reservoir means for receiving and storing water removed from said wash tub through said drain and for providing back pressure on said float;
said drain water reservoir means comprising a storage reservoir having a cross sectional area which is substantially greater than the cross sectional area of said drain;



said storage reservoir extending to at least an upper portion of said wash tub; and
pump means for pumping water from said wash tub, through said drain, and into said drain water reservoir means.

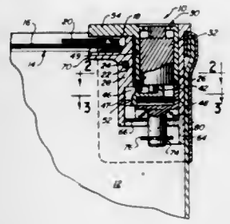
4,821,538
SECURITY-PROVIDING CONTAINER DEVICE
Eric A. Gray, 1505 Richmond Dr., Zionsville, Ind. 46077
Filed Sep. 4, 1987, Ser. No. 93,788
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **19 Claims**



1. A security-providing container device, for co-operation with a door having an open and a closed condition, the base portion of the door being slightly above the floor, the device comprising, in combination:
a container,
the container having a base, a hollow interior, and an access opening which opens to the container's interior,
a slender retainer means,
the container having support means which support the retainer means for rotation about its axis, and with a portion of the retainer means extending from the container,
lock means manually accessible from a portion of the container removed from the portion of the container from which the retainer means extends,
the lock means permitting the retainer means to be rotated when manipulated,
the retainer means provided with an abutment spaced from the axis of the retainer means, the abutment being carried by the said extending portion of the retainer means extending from the container,
the support means supporting the retainer means closely adjacent the container's base, such that the portion of the retainer means which extends from the container can lie, and be moved past the plane of the door, between the base portion of the door and the floor,
the arrangement providing for operativity as follows, assuming the door is then in open condition:
(a) when a patron desires to leave an article of the patron outwardly of the door, such as for servicing and subsequent return by an attendant, the patron deposits the article through the container's access opening and into its interior, and
(b) the patron places the container onto the floor outwardly of but adjacent the door, and adjacent the free side edge of the door, with the base of the container lying on the floor, and
(c) while the door is still in open condition, the patron pushes the extending portion of the retainer means in the space between the floor and the base portion of the door, to a position inwardly of the free side edge of the door, and
(d) the patron closes the door, and
(e) the patron may rotate the extending portion of the retainer means so that, if not already above, the abutment is rotated to be above the base of the door, thus providing an abutting condition of the abutment and door, with the abutment being engageable with the interior face of the door to block the container from being moved outwardly of the door, unless the retainer means is rotated to bring the abutment to a non-abutting condition in which the abutment is lower than the base of the door and thus free of abutment with the door, and
(f) an attendant, who has the means to unlock the lock means, can then unlock the lock means and achieve a rotation of retainer means to free its abutment from abutting engagement with the door, by rotating it from abutting condition to non-abutting condition, and
(g) the attendant can then pull the container outwardly, fully free from adjacency to the door, during which movement the extending portion of the retainer means, including its abutment, pass between the base of the door and the floor, and becomes entirely free of the door, and
(h) when the attendant subsequently returns the patron's article and the container to adjacency to the closed door, the container base lying on the floor, the attendant rotates the retainer means to its position in which the abutment is not in abutting condition, unless it is already in non-abutting condition, and
(i) the attendant pushes the container to a position closely adjacent the door such that the abutment may be rotated to abutting condition inwardly of the door when positioned inwardly of the door, and
(j) an attendant then pushes the abutment and the extending portion of the retainer means through the space between the base of the door and the floor, and
(k) the attendant then rotates retainer means to cause the abutment to be moved into abutting condition, and
(l) the attendant locks the lock means to block the retainer means from being rotated to change the abutment from its abutting condition to a non-abutting condition.

4,821,539
KEEPER LOCK FOR SLIDE FASTENER
Robert Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Company, Chicago, Ill.
Filed May 26, 1988, Ser. No. 199,149
Int. Cl.[4] E05B *67/38*
U.S. Cl. 70—68 **9 Claims**

1. In a keeper lock for a zipper-type slide fastener the lock including a barrel assembly of a tubular barrel and an anvil fixed to and projecting radially from the barrel, the anvil adapted to receive the slide fastener when the fastener is moved to its closed position, a key operated lock assembly telescopically and rotatably received in the barrel for limited acial sliding movement therein and a keeper arm fixed to and projecting radially from the lock assembly adjacent to a proximal end thereof, the lock assembly and keeper arm being capable of both angular rotation and axial movement so that it may assume a fully telescoped locked position wherein the keeper arm closely overlies the anvil for confining the slide fastener between the keeper arm and the anvil, an intermediate partially telescoped and unlocked position wherein the keeper arm overlies the anvil and is spaced apart therefrom, and a partially telescoped and unlocked position wherein the keeper arm is swung to one side so that it assumes a laterally removed position with respect to the anvil so that the slide fastener is accessible for manipulation, a locking bolt carried by the lock assembly and adapted for locking engagement with the barrel when the lock assembly assumes the fully telescoped locked position to maintain the lock assembly in the locked position, a lock cylinder in the lock assembly and movable between locked and unlocked positions, and a key and tumbler mechanism for controlling the operation of the cylinder, the lock cylinder,



when in its unlocked position, serving to withdraw the locking bolt from its locking engagement with the barrel, the improvement comprising: alignment means for positioning the keeper arm over the anvil when the keeper arm is in the intermediate partially telescoped and unlocked position so that the keeper arm can assume the fully telescoped and locked position by pushing the keeper arm axially towards the anvil,
said alignment means comprising a protruding finger carried by the lock assembly and a receiving groove portion in the barrel, the receiving groove portion adapted to receive in locking relationship the protruding finger when the keeper arm is rotated to a position overlying the anvil,
said protruding finger being engaged by spring means for pushing the finger radially outward against the barrel, the finger operatively connected to the key operated lock assembly so that operation of the key and tumbler mechanism causes withdrawal of the finger from engagement with the groove portion in the barrel.

4,821,540
LOCK MECHANISM OPERABLE FROM ONE SIDE OF A STRUCTURE BY A PHYSICAL IDENTIFIABLE COMBINATION MECHANISM
James E. Huston, 101 Linden Dr., Galion, Ohio 44833
Filed Feb. 20, 1987, Ser. No. 16,800
Int. Cl.[4] E05B *13/10*
U.S. Cl. 70—213 **7 Claims**



1. A lock mechanism for a closure utilizing a combination locking, comprising a combination pod, operable from one side

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of said closure by a physical identifiable combination mechanism having a tongue that protrudes upon attaining a predetermined setting thereof,

a locking lever positioned adjacent said combination pod and related to the position of the tongue,

said locking lever further comprises a right angle member and a horizontal member and means for pivoting said lever and horizontal member,

a lug retaining recess formed on the underside of said horizontal member,

a locking lug fixedly positioned relative to said lug recess,

a resilient member for maintaining said locking lever and said lug retaining recess in an engaging position, to thereby prevent said lock from being operational; and

a rotational spindle on said combination pod for actuation of said combination pod to a predetermined setting,

a cam follower means in said combination pod operative to actuate said tongue upon said spindle attaining a predetermined setting,

said tongue upon actuation protrudes to engage said right angle member and thereby pivotally moving said locking lever and thereby disengaging said locking lever retaining recess and said locking lug;

and wherein said rotational spindle further comprises a two portion member rotational from one side of said closure upon said spindle attaining a predetermined setting, and operational from the other side of said closure irrespective of the setting of said spindle.

4,821,541

TIME LOCK

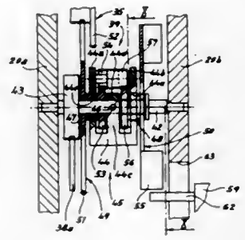
Willy Richard, Convers, and Francois Jolidon, La Chaux-de-Fonds, both of Switzerland, assignors to Relbor S.A., La Chaux-de-Fonds, Switzerland

Filed Nov. 16, 1987, Ser. No. 121,252

Claims priority, application Switzerland, Nov. 17, 1986, 04585/86

Int. Cl.⁴ E05B *43/00*

U.S. Cl. 70—272 **10 Claims**



1. A time lock comprising a blocking member able to prevent manual actuation of the lock during a time interval fixed by at least one mechanical timing device, this timing device being driven by a spring coupled via a wheel-train to a regulating device, characterized in that the timing device comprises a second regulating device and switching means able to selectively connect to said wheel-train either the first regulating device or the second regulating device to adjust the speed of running of the timing device.

4,821,542

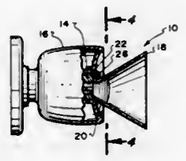
KEY POSITIONING APPARATUS

J. Scott Rosenthal, 2113 Curtis Ave., Redondo Beach, Calif. 90278

Filed Jul. 18, 1988, Ser. No. 220,600

Int. Cl.⁴ E05B *15/08*

U.S. Cl. 70—454 **4 Claims**



1. An apparatus for positioning a key at the keyhole of a lock, comprising:

a hollow, funnel-shaped element having a wide end and a narrow end, said wide end defining a wide opening, said wide opening being sufficiently large and said funnel-shaped element being sufficiently deep to permit the partial introduction of the index finger and thumb of the user holding the key into said funnel-shaped element, said narrow end defining a narrow opening; and

means for securing said funnel-shaped element in a position adjacent said keyhole so that said narrow end is located adjacent the periphery of the keyhole during use, said narrow opening being wider than the keyhole but sufficiently narrow to enable the user to accurately locate the keyhole,

said means for securing said funnel-shaped element including,

at least one flange extending from said narrow end in a direction substantially parallel to an outer surface of a core of the lock, said core defining said keyhole, and

means for rigidly attaching said flange to said core.

4,821,543

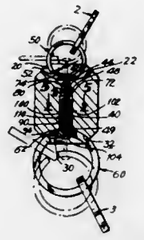
DOUBLE ENDED KEY RING

Robert Scungio, W. Warwich, R.I., assignor to G. Pruefer Mfg. Co., Johnston, R.I.

Filed Jun. 20, 1988, Ser. No. 208,470

Int. Cl.⁴ A44B *15/00*

U.S. Cl. 70—456 R **10 Claims**



1. A double ended key ring comprising;

a pair of opposed, spaced key holders, each of which comprises retaining means, configured to pass through the retaining holes of keys, for retaining the keys, said retaining means having a gap for removing the keys from and for mounting the keys on said retaining means;

a central housing including,

a pair of opposed seats, located at the ends of said housing, having a pair of opposed, spaced abutment surfaces configured to contact said key holders and keeper means, connected to said abutment surfaces, for preventing the keys from being removed through said gaps of said retaining means when said key holders are in contact with said abutment surfaces, and

a central passageway, communicating between said abutment surfaces, said passageway including, at one end, a shoulder having an inner facing surface, and a primary bore communicating between one of said abutment surfaces and said inner facing surface;

said key holders being located at the ends of said housing and being operable for independent outward and inward movement between a retracted position, against said abutment surfaces and an extended position, spaced from said abutment surfaces, in which said gaps are exposed to permit the keys to be mounted on and to be removed from said retaining means;

a cartridge-like bushing, located within the other end of said passageway, said bushing including a tubular sidewall and an endwall connected to said sidewall, said endwall having an opening;

bushing attachment means for attaching said bushing to said housing;

biasing means, locateed within said passageway, for biasing said key holders in their said retracted position; and

connection means, configured to slidably extend through said primary bore and said opening of said endwall, for connecting said key holders to said biasing means for movement between their said extended and retracted positions.

4,821,544

METHOD AND APPARATUS FOR ROLL GAP MEASUREMENT AND CONTROL

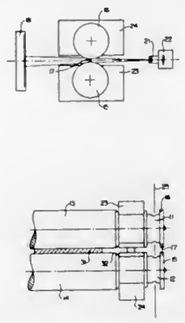
Horst Tamler, Witten; Wilhelm Tappe, Dortmund, and Hermann-Josef Kopineck, Dortmund, all of Fed. Rep. of Germany, assignors to Hoesch Stahl Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Jun. 5, 1987, Ser. No. 59,607

Claims priority, applicatioo Fed. Rep. of Germany, Jun. 10, 1986, 3619412

Int. Cl.⁴ B21B *31/34, 37/08;* G01B *11/14*

U.S. Cl. 72—16 **7 Claims**



1. An apparatus for measuring and controlling the roll gap formed between a pair of rolls mounted in bearing pedestals of a roll stand for a mill comprising:

a neck formed at one end of each roll;

a reference disk mounted at one end of each roll adjacent said neck and rotatable therewith wherein said disks are coaxial and aligned vertically;

a gap formed between each of the reference disks;

means for illuminating said gap;

a camera having an objective lens and mounted to receive light rays representing the thickness of said gap;

photosensitive sensors in said camera adapted to respond to receipt of light rays representing the thickness of said gap;

electronic drive means for periodically interrogating said photosensitive sensors to derive a length signal representative of the thickness of said gap; and

means for outputting a length signal representing said thickness of said gap.

4,821,545

INSTALLATION FOR THE DETENSIONING OF EXPANDED TUBES, PARTICULARLY IN A HEAT EXCHANGER

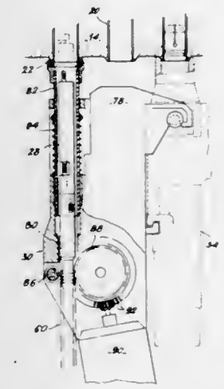
Philippe Druelle, Gournay Sur Marne; Pierre Vidal, Montigny Sur Loing; Robert Saglio, Antony, and Jean-Louis Tocci, Paris, all of France, assignors to Intercontrole S. A. and Electricite De France Service, both of Paris, France

Filed May 28, 1987, Ser. No. 55,454

Int. Cl.⁴ B21D *7/06*

U.S. Cl. 72—53 **13 Claims**



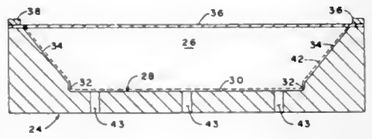


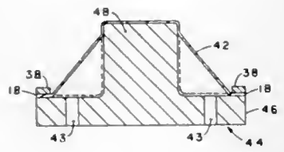
1. An installation for detensioning of expanded tubes comprising a tool constituted by a cylindrical cage having a given axis, a shaft mounted in a rotary manner within said cage about a parallel axis and displaced with respect to the cage axis and at least one flexible plate fixed to said shaft facing an open window in part of the cage close to the shaft axis, said plate carrying at least one row of shot at is end, peening control

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means for rotating said shaft about its axis and sweeping control means for driving the cage in rotation and in translation within a tube to be treated and having an axis parallel to the axes of the cage and the shaft, wherein the seeping control means move the cage along a helical trajectory centered on the axis of the tube to be treated, the sweep control means comprising a threaded rod integral in rotation and translation with said cage, a nut mounted in a support member and which can be immobilized with respect to the tube, said nut being screwed onto the threaded rod, and rotation control means for rotating the threaded rod.

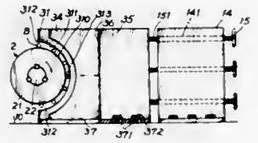
4,821,546
TWO-STEP SUPERPLASTIC FORMING METHOD
James M. Story, Plum Borough, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Mar. 18, 1988, Ser. No. 169,994
Int. Cl.[4] B21D *22/00, 26/02*
U.S. Cl. 72—60 **5 Claims**

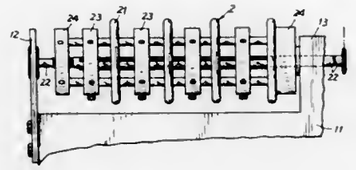




1. A method of forming a metallic object comprising:
providing a preform mold having a central cavity which includes a bottom surface having side edges and side surfaces extending upwardly and outwardly therefrom to a top surface;
providing a blank of superplastic metallic material having a central portion and a peripheral flange portion thereabout in a condition for superplastic forming;
clamping the flange portion to the top surface of the preform mold with the central portion covering the central cavity;
applying a fluid pressure to the surface of the blank outward of the mold cavity at a rate to cause the central portion to superplastically deform and contact the mold cavity surfaces and thereby form a preform having a bottom portion, side portions, and a flange projecting outward from the side portions;
providing an object forming mold having forming surfaces and which includes a base and a central portion projecting upwardly therefrom which has a top forming surface portion conforming to the inside of the bottom portion of the preform;
heating the preform to a temperature sufficient to establish a state suitable for superplastic forming and clamping the preform to the object forming mold with the inside surface of the bottom portion positioned against the top surface of the central portion; and
applying a fluid pressure against the surface of the preform outward of the object forming mold at a rate which is suitable to superplastically deform the side portions of the preform and thereby cause the preform to contact the forming surfaces of the mold.

4,821,547
WHEEL-DRIVING STRAIGHTENER FOR STRAIGHTENING LONGITUDINAL CYLINDRICAL MEMBER
Suei-Tien Hsiao, P.O. Box 10160, Taipei, Taiwan
Filed Dec. 29, 1987, Ser. No. 138,967
Int. Cl.[4] B21D *3/00*
U.S. Cl. 72—93 **1 Claim**

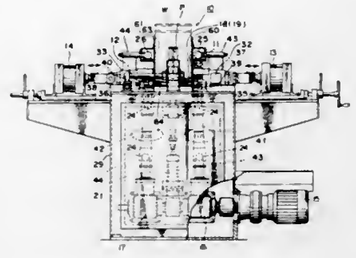




1. A wheel-driving straightener for straightening longitudinal cylindrical member comprising:
a machine body having a base portion, a left frame having two side brackets formed on a left portion on said base portion, and a right frame having plural adjusting bolts formed through said right frame formed on a right portion on said base portion;
a driving wheel unit having a plurality of annular wheel members juxtaposedly mounted on a driving shaft rotatably mounted on said two side brackets of said left frame, and having plural wheel-space adjusting means mounted on said driving shaft each wheel-space adjusting means partitioned between every two neighboring wheel members, said driving shaft driven by a driving motor means mounted on said machine body; and
an idle plate assembly having a plurality of idle plates each idle plate having a semi-circular recess formed on a front portion of said idle plate generally shaped as rectangular, said idle plates juxtaposedly retained on a block adjustably mounted on said base portion and adjusted toward and away from said driving wheel unit by said adjusting bolts formed on said right frame, said idle plates being axially offset from and facing said plural wheel members and operatively defining an arcuate slit between the driving wheel unit and the idle plate assembly for the transverse insertion of a cylindrical member to be straigtened into said arcuate slit, every two said idle plates partitioned by a plate-space adjusting means and fastened on said block for retaining said idle plates in said block, whereby upon the rotation of the wheel members as driven by said driving motor means, a cylindrical member being straightened is operatively bitten between the wheel members and the idle plates and arcuately moving downwardly for its straightening;
said plurality of annular wheel members being formed with three axially extending grooves on the inner periphery thereof engageable with triple longitudinal extensions radially formed on said driving shaft;
the improvement which comprises:

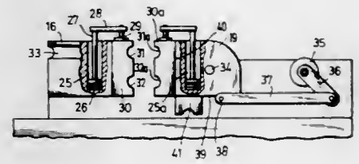
said wheel-space adjusting means including an inner annular disk having three axially extending grooves on its inner periphery slidingly engaged with the triple extensions in said driving shaft, plural spacing bars mounted on plural notches circumferentially formed on the inner disk, and a fastening collar securing said spacing bars on said inner disk and having a radially extending opening larger than a diameter of the spacing bars for selectively coinciding with said bars for replacement with other bars of different length through said collar opening.

4,821,548
APPARATUS FOR CHAMFERING EDGES OF A RIM ELEMENT
Yusaku Shinozawa, Tokyo, and Shin Sugiura, Toyokawa, both of Japan, assignors to Topy Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 3, 1987, Ser. No. 92,528
Int. Cl.[4] B21H *1/10*
U.S. Cl. 72—107 **9 Claims**



1. An apparatus for chamfering through press forming edges of a rim element for a wheel of a vehicle, wherein the chamfering apparatus is located upstream of a flaring machine on a wheel rim manufacturing line so that rim element has an axially straight extending wall and a generally circular cross section when the rim element is conveyed into the apparatus, said apparatus comprising:
means for supporting thereon a rim element conveyed into the apparatus rotatively around an axis of the rim element, said rim element supporting means including two freely rotatable rollers arranged to extend in a horizontal direction and spaced from and parallel to each other so that a rim element conveyed toward the apparatus with an axis of the rim element maintained in a horizontal direction is supplied into the apparatus maintaining the direction of the axis of the rim element in the horizontal direction and said two rollers defining a rim element chamfering position in a vertical direction above said two rollers;
a pair of edge rolls provided on both sides of said rim element chamfering position in an axial direction of a rim element conveyed to said rim element chamfering position and provided between said two rollers of said rim element supporting means, said edge rolls having respective vertically extending axes and being adapted so as to rotate around the respective axes thereof, said edge rolls being formed with circumferentially extending groove means formed therein at portions axially opposing a lowermost portion of a wall of a rim element when the rim element is positioned at said rim element chamfering position;
edge roll supporting means, provided on both sides of said rim element chamfering position in an axial direction of a rim element when the rim element is conveyed to said rim element chamfering position, for supporting said edge rolls rotatively around the respective axes thereof, said edge rolls supporting means being arranged to be movable toward and away from said rim element chamfering position in the horizontal direction and in the axial direction of the rim element conveyed to said rim element chamfering position;
drive means, connected to said edge roll supporting means, for driving said edge roll supporting means toward and away from said rim element chamfering position in an axial direction of a rim element when the rim element is conveyed to said rim element chamfering position, said driving means driving said edge roll supporting means toward said chamfering position so that an axially straight extending wall of a rim element conveyed to said rim element chamfering position is axially compressed, at one portion of the rim element in a circumferential direction of the rim element, between said pair of edge rolls to be chamfered at said circumferentially one portion of the rim element through press forming while maintaining a high rigidity in the axial direction of the rim element due to the straight extension of the wall of the rim element; and
means, coupled to said edge rolls, for rotating said edge rolls urged toward said rim element chamfering position by said edge roll driving means such that said edge rolls rotate opposite to each other around their respective axes to thereby rotate a rim element around an axis of the rim element and to chamfer entire peripherals of end portions of the axially straight extending wall of the rim element.

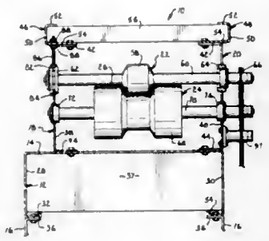
4,821,549
TUBE BENDING MACHINE
Rigobert Schwarze, Olpener Str. 460-474, 5000 Köln 91, Fed. Rep. of Germany
Continuation of Ser. No. 862,309, May 8, 1986, abandoned. This application Jan. 13, 1988, Ser. No. 143,617
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516923
Int. Cl.[4] B21D *7/04*
U.S. Cl. 72—157 **6 Claims**



1. In a tube bending machine comprising a bending table pivotable about a first vertical axis and including a bending template, a clamping jaw displaceable relative to the bending template for clamping a tube between the clamping jaw and bending template to bend said tube about said bending template, and a displaceable feeding carriage having a rotatable clamping sleeve for clamping a tube being bent and for feeding and rotating said tube through said clamping jaw and bending template, whereby the bending template and the clamping jaw have, respectively, clamping elements each having at least two clamping faces which have different shapes, are positioned one under the other and adjusted to straight and bend portions of a tube being bent, said clamping faces of said bending template and clamping jaw being spaced from each other and bringable into an operation position relative to each other, two hydraulic drives each of which vertically moves the respective clamping element and has a cylinder and a movable piston with a piston rod, the improvement comprising that a respective cylinder of the hydraulic drive of at least one clamping element is arranged in the interior of and integrated within a body of at least the bending template or the clamping jaw, and a respective piston rod of the hydraulic drive of said at least one clamping element is connected with said at least one clamping element so that said at least one clamping element is moved by and moves with the respective piston rod.

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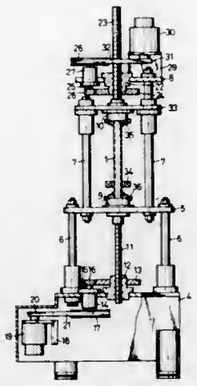
4,821,550
ROLL FORMING APPARATUS
Frank J. DeBarea, Sr., 7150 S. 135th St., West, Clearwater, Kans. 67026
Filed Oct. 29, 1987, Ser. No. 114,196
Int. Cl.[4] B21D *5/08*
U.S. Cl. 72—181 4 Claims



1. A roll forming machine comprising:
a unitary platform formed into a generally U-shaped configuration with opposed vertical side walls and a generally flat upper surface extending between upper edges of said side walls, said flat upper surface extending generally horizontally;
a pair of unitary housing members mounted on said platform upper surface in spaced apart and parallel relationship;
a plurality of pairs of vertically aligned upper and lower rollers coupled with and extending between said pair of housing members, each of said rollers comprising a tooling element mounted on a rotatable shaft for progressively bending sheet material fed therethrough;
means coupling said upper rollers with said housing members to allow variable vertical positioning of said upper rollers for adjusting the spacing between each paired upper and lower roller;
a plurality of support braces extending between said unitary housing members thereby providing additional structural support to prevent warping and bowing of said unitary housing members;
at least one side rolling tool mounted on at least one of said support braces;
drive means coupled with said rollers for effecting rotation of said upper rollers in one direction and said lower rollers in the opposite direction;
a separate unitary, elongated adjusting brace extending along a top portion of each housing member, each unitary, elongated brace spanning said plurality of pairs of said vertically aligned upper and lower rollers; and
bracing members coupled with and extending between said adjusting braces.

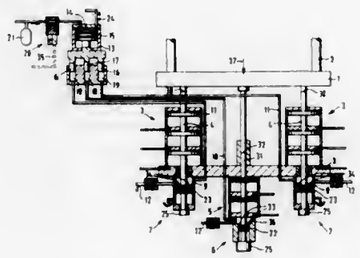
4,821,551
METHOD OF MANUFACTURING CORRUGATE TUBE AND MOLDING APPARATUS THEREOF
Mineo Ogino, Aichi, and Masazumi Ohnishi, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Nov. 24, 1987, Ser. No. 124,961
Claims priority, application Japan, Nov. 25, 1986, 61-180732[U]; Feb. 19, 1987, 62-36181; Feb. 19, 1987, 62-36183
Int. Cl.[4] B21D *15/06*
U.S. Cl. 72—302 19 Claims

1. A method of manufacturing a corrugate tube, comprising the steps of:
(a) locally heating a primary tube by use of a high frequency coil in the peripheral direction;
(b) applying an axial load from both ends of said primary tube to bulge a heated portion;
(c) stopping application of said load almost concurrently with termination of the heating step;
(d) cooling said bulged heated portion with the cooling liquid; and



(e) repeating steps (a)–(d) at a predetermined pitch in the axial direction of said primary tube.

4,821,552
DRAWING MECHANISM FOR A PRESS
Siegfried Baur; Rudi Brandstetter, both of Goeppingen, and Gerhard Roos, Ebersbach-Bünzwangen, all of Fed. Rep. of Germany, assignors to L. Schuler, GmbH, Goeppingen, Fed. Rep. of Germany
Filed Nov. 30, 1987, Ser. No. 125,924
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640787
Int. Cl.[4] B21D *45/04, 22/00*
U.S. Cl. 72—351 6 Claims

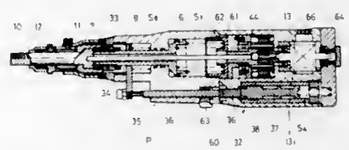


1. A drawing installation for a press, comprising mechanically actuated drawing ram means, sheet metal holder means including pressure cylinder means for the sheet metal retention during the drawing operation and at least one pressure cylinder means for the ejection of the workpiece, pressure plate means movable in a press table by piston rods of the pressure cylinder means and the at least one pressure cylinder means, respectively and transmitting the movement and forces of the pressure cylinder means and the at least one pressure cylinder means by way of pressure rods onto the sheet metal holder means and for the ejection of the workpiece, each piston rod including a pressure piston having an operating surface adapted to be acted upon in a drawing direction, a pre-acceleration cylinder means having pressure quantity spaces, a pressure space, and a pressure piston separating the pressure quantity spaces from the pressure space, each pressure quantity space being in fluid communication with and coordinated to one of the operating surfaces and with control means operating in dependence on the ram travel for pressure-actuating the pressure space of said pre-acceleration cylinder means by way of a throttling directional control valve means so that prior to contact of the drawing ram means on the sheet metal holder means, the latter is operable to be pre-accelerated in the drawing direction by actuation of the operating surfaces with hydraulic liquid from the pressure quantity spaces.

4,821,554
PRESS FORGING OF MOLYBDENUM OR MOLYBDENUM ALLOY PARTS
Ricky D. Morgan, Ulster, and Vito P. Sylvester, Athens, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.
Filed Feb. 2, 1987, Ser. No. 9,433
Int. Cl.[4] B21J *1/02*
U.S. Cl. 72—377 3 Claims

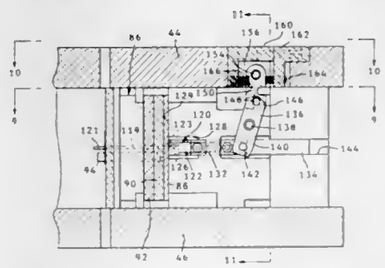
1. A method for deforming a molybdenum based part from a billet to a press forged part which can easily be machined to a desired size, said method consisting essentially of press forging a part made of material selected from the group consisting of molybdenum metal and molybdenum metal alloys, at a temperature of from about 1700° F. to about 2300° F. at an average strain rate of from about 5 inches per minute to about 20 inches per minute, said press forging being done in one step.

4,821,555
HYDROPNEUMATIC GUN FOR SETTING BLIND-RIVET NUTS
Akira Kamata, Ikoma; Yoshiyuki Kubo; Yasuo Umemura, both of Osaka, and Hirohumi Tsuyuguchi, Higashiosaka, all of Japan, assignors to Lobster Tool Co., Ltd., Osaka, Japan
Filed Jan. 25, 1988, Ser. No. 147,383
Int. Cl.[4] B21D *31/00*
U.S. Cl. 72—391 3 Claims



1. In a hydropneumatic gun for setting blind-rivet nuts, including a gun body having oil therein, an air cylinder coupled to the gun body, an oil piston in said gun body, a screw mandrel attached to a tip of said oil piston for threadedly receiving a sleeve of a nut, a compressed air supply port in said gun body, an air piston movably fitted in the air cylinder for pressurizing said oil in the gun body upon movement of said air piston, said oil piston being mounted to be retracted by said pressurizing of said oil to retract said screw mandrel to the inner part of the gun body and exert a deforming force on said sleeve of said nut threadedly,
the improvement wherein said hydropneumatic gun for setting blind-rivet nuts comprises:
an air motor mounted to be rotated in said gun body by compressed air from said port;
an air motor driving air guide passage between said air motor and said compressed air supply port;
an air motor forward/reverse rotation direction changeover mechanism in said motor driving air guide passage for switching the rotation direction of said air motor;
a power transmission mechanism coupled between said air motor and said screw mandrel for transmitting forward and reverse rotation driving forces from said air motor;
an air guide hole in said air cylinder at the air piston moving side, and an air piston moving air guide passage between said compressed air supply port and said air guide hole;
a communication hole communicating with said air piston moving air guide passage, and a spool slidably fitted in a said communication hole for opening and closing said air piston moving air guide passage;
a spool controlling air guide chamber between said communication hole and said compressed air supply port for moving said spool in said communication hole by compressed air from said port in such direction as to close said air piston moving air guide passage; and
a discharge passage between said air guide chamber and a compressed air discharge port in the vicinity of said power transmission mechanism in said gun body for discharging compressed air guided in said air guide chamber;
said power transmission mechanism having a clutch disposed in said discharge passage, whereby said clutch also serves as a member for opening and closing said discharge passage and said discharge passage is opened when said clutch is rotated to a predetermined angular position by a predetermined turning torque from said air motor.

4,821,556
STAMPING AND FORMING MACHINE HAVING IMPROVED PILOT PINS
Johannes C. W. Bakermans, Harrisburg, and John R. Studer, Hummelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 21, 1988, Ser. No. 184,238
Int. Cl.[4] B21D *28/04*
U.S. Cl. 72—420 16 Claims



1. Apparatus for performing stamping and forming operations on strip material, the apparatus comprising first and second tooling assemblies which are movable towards and away from each other between open and closed positions along a tooling assembly path of reciprocation, tooling assembly actuating means for moving the tooling assemblies between their open and closed positions, the tooling assemblies having leading ends which are proximate to each other when the tooling assemblies are in their closed positions and are spaced apart when the tooling assemblies are in their open positions, strip feeding means for feeding the strip material along a strip feed path which extends transversely of the tooling assembly path and between the leading ends of the tooling assemblies whereby operations are performed on the strip material when the tooling assemblies move to their closed positions, the apparatus having pilot pin means which are movable with, and extend parallel to, the first tooling assembly, the pilot pin means having free end portions which enter pilot holes in the strip material prior to arrival of the first tooling assembly at its closed position thereby precisely to position the strip material between the tooling assemblies prior to engagement of the tooling assemblies with the strip material, the apparatus being characterized in that:
the pilot pin means is movable, relative to the first tooling assembly, parallel to the tooling assembly path of reciprocation between a retracted position and an extended position, the free end portions of the pilot pin means being proximate to the leading end of the first tooling assembly when the pilot pin means is in its retracted positions and being located forwardly of, and beyond, the leading end

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of the first tooling assembly when the pilot pin means is in its extended positions, and

pilot pin actuating means are provided for moving the pilot pin means from its retracted position to its extended position during movement of the first tooling assembly from its open position to its closed position, and for moving the pilot pin means from its extended position to its retracted position during movement of the first tooling assembly from its closed position to its open position whereby,

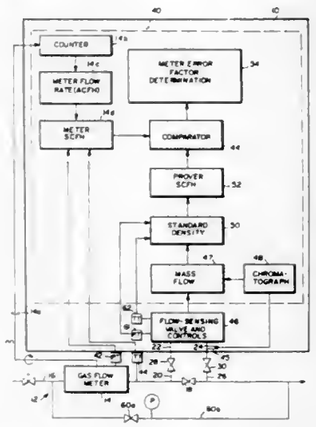
when the first and second tooling assemblies are in their open positions, the space between the leading ends of the first and second tooling assemblies is not obstructed by the face end portions of the pilot pin means.

4,821,557

METHOD AND APPARATUS FOR DETERMINING THE ACCURACY OF A GAS FLOW METER

James S. Beeson, III, Shreveport, La., assignor to Arkla, Inc., Shreveport, La.

Filed Mar. 8, 1988, Ser. No. 165,469
Int. Cl.[4] G01F *25/00*
U.S. Cl. 73—3 **19 Claims**



14. A mobile gas meter proving system comprising:

a vehicle; and

means housed within said vehicle for proving accuracy of a gas meter, said means for proving accuracy including,

(i) a flow determining valve;

(ii) means adapted to being connected operatively with a gas flow line in which the gas flow meter is located so as to allow the gas to flow simultaneously through the meter and said flow determining valve;

(iii) means for deriving flow data from said meter and said flow determining valve; and

(iv) means for comparing said derived data to obtain a variance factor for said gas flow meter, wherein

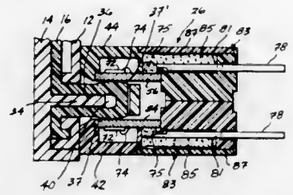
(v) said means for deriving flow data from said determining valve includes means for determining the relative quantities of gas constituents in said gas flow and then deriving said flow data based upon said gas constituents quantities.

4,821,558

ULTRASONIC DETECTOR

John Pastrone, Los Gatos; George H. Fellingham, San Jose, and Michael Lawless, Boulder Creek, all of Calif., assignors to Abbott Laboratories, North Chicago, Ill.

Filed May 1, 1987, Ser. No. 45,951
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—19 **4 Claims**



1. An air-in-line detector assembly, comprising:

a supporting structure for the air-in-line detector;

an elastomeric member that cooperates with the supporting structure to define a fluid passageway, said elastomeric member having a pair of resilient lobes extending in opposite directions about the fluid passageway;

an ultrasonic sound generator comprising a first transducer, said first transducer being disposed in contact with one lobe of the elastomeric member and

an ultrasonic sound receiver comprising a second transducer, said second transducer being disposed in contact with the other lobe of the elastomeric member, spacedly positioned apart from and facing said sound generator,

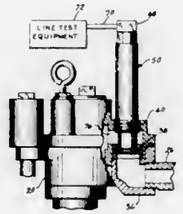
said elastomeric member being positioned between said sound generator and receiver, and said sound generator and receiver being so spaced such that said lobes are compressed inwardly of said elastomeric member to insure that each lobe maintains close direct contact with one of said first and second transducers.

4,821,559

LINE TEST ISOLATION PLUG

William J. Purpora, 5541 North Kent Ave., Whitefish Bay, Wis. 53217

Filed Oct. 26, 1987, Ser. No. 112,470
Int. Cl.[4] G01M *3/28*
U.S. Cl. 73—40.5 R **12 Claims**



1. An isolation plug suitable for leakage testing of a liquid conduit by means of line test apparatus capable of pressurizing the liquid conduit, said liquid conduit being connected to the outlet of a fitting having a sleeve through which the liquid discharged from the fitting passes, said fitting having a threaded hole axially aligned with the sleeve, said isolation plug comprising:

an elongated body having an exterior surface surrounding and defining the body in a direction parallel to its elongation, said surface extending between ends of said body;

sealing means on said exterior surface adjacent one end of said body, said sealing means surrounding said body and being adapted to mate with the sleeve in the fitting when said plug is inserted in the fitting through the threaded hole to seal off the outlet of the fitting from the remaining portions of the fitting; and

thread means on said exterior surface of said body intermediate the ends of said body, said thread means mating with the threaded hole in the fitting when the plug is inserted in the fitting for retaining the plug in the fitting;

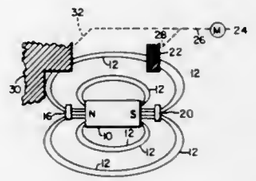
said body having a passage extending therethrough, one end of said passage opening into the outlet of the fitting downstream of the seal formed between said sealing means and the sleeve, the other end of said passage opening on said body exteriorly of the fitting, the other end of said passage having means adapted to mate with the line test apparatus to permit pressurizing of the liquid conduit for testing purposes.

4,821,560

DUAL OUTPUT MAGNETIC SENSOR

Ronald G. Kohlbauer, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 1, 1988, Ser. No. 200,844
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.3 **20 Claims**



1. Dual magnetic sensing apparatus comprising:

a magnet having first and second poles;

a first magnetic sensor mounted proximate the first pole a first distance therefrom;

a second magnetic sensor mounted proximate the second pole a second distance therefrom;

a first magnetic field shunting member mounted for motion past the first pole at a distance greater than the first distance to increase the field strength sensed by the first sensor; and

a second magnetic field shunting member mounted for motion past the second pole at a distance less than the second distance to decrease the field strength sensed by the second sensor.

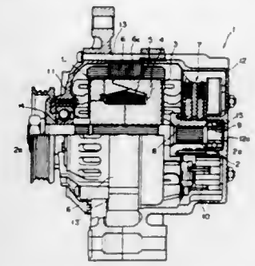
4,821,561

METHOD OF METERING AN AIR-GAP IN AN ELECTRIC ROTATING MACHINE

Keiji Takahashi, Kiryu, and Mamoru Zennyoji, Ashikaga, both of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Japan

Filed Nov. 13, 1987, Ser. No. 120,618
Claims priority, application Japan, Nov. 14, 1986, 61-271619
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.1 **7 Claims**

1. A method of metering an air-gap in a electric rotating machine comprising a rotor core provided integrally on a rotary shaft and a stator core arranged coaxially with the rotor core around the outer periphery thereof, which method comprises measuring the width of the stator core in the radial direction prior to assembling the stator core and the rotor core, also measuring the position of an outer periphery of the stator core from the axis of the rotor core after the assembling, calculating the position of an inner periphery of the stator core from the axis of the rotor core based on the difference between the result of measurement of the width of the stator core in the radial direction measured prior to the assembling and the result of measurement of the position of the outer periphery of the stator core from the axis of the rotor core after the assembling,



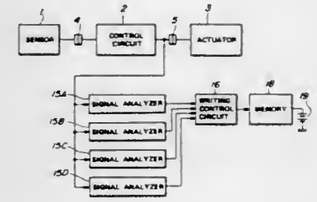
and further calculating the difference between the position of the inner periphery of the stator core and the position of the outer periphery of the rotor core based on the results of the measurements, the thus-obtained difference being defined as an air-gap between the stator core and the rotor core.

4,821,562

SIGNAL MONITORING APPARATUS

Hiroshi Inoue, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 30, 1987, Ser. No. 30,911
Claims priority, application Japan, Apr. 3, 1986, 61-75507
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—119 A **7 Claims**



1. An apparatus for monitoring at least one drive signal used to drive an actuator, comprising:

a memory;

an analyzer circuit for extracting a plurality of components corresponding to respective portions of the drive signal, the components representing different actuator operating characteristics; and

means connected between the analyzer circuit and the memory for storing the respective components into the memory at time intervals predetermined for the respective components.

4,821,563

APPARATUS FOR MEASURING WEIGHT, TORQUE AND SIDE FORCE ON A DRILL BIT

Robert Maron, Cromwell, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Jan. 15, 1988, Ser. No. 144,471
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—151 **24 Claims**

1. Apparatus for measuring at least one load applied to a drill bit during the drilling of a well, including:

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drill string sub means adapted to be connected in a drill string above the drill bit;
hole means for defining a pair of diametrically opposite through-hole means in the wall of said sub;
plug means in each of said hole means, said plug means cooperating with said through hole means to define an atmospheric chamber means in each of said through hole means;
ring means in the centerbore of said drillstring sub;
fastener means for connecting said plug means to said annular ring means;



weight sensor means in each of said through hole means for generating an output in response to at least the parameter of weight on the drill bit; and
said weight sensor means including first weight sensor means positioned at a first predetermined position and in a first predetermined orientation in each through hole means to sense the effects of weight; and second weight sensor means in each through hole means positioned at a second predetermined position relative to the first sensor means and in a second orientation relative to the orientation of said first sensor means to cancel the effects of pressure differential across said drill string sub.

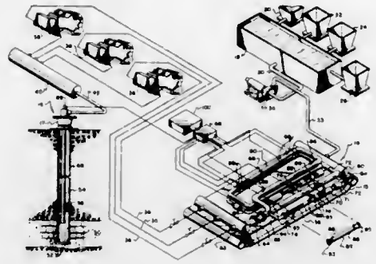
4,821,564

METHOD AND SYSTEM FOR DETERMINING FLUID PRESSURES IN WELLBORES AND TUBULAR CONDUITS

C. M. Pearson; Fevzi Zeren, and Ahmed S. Abou-Sayed, all of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 829,381, Feb. 13, 1986, Pat. No. 4,726,219. This application Oct. 26, 1987, Ser. No. 113,782
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—155 **13 Claims**

1. In an operation for stimulating a subterranean formation to produce recoverable minerals, a method for determining friction pressure losses in a well flow conduit through which a non-Newtonian or generalized Newtonian stimulation fluid is being pumped, at a predetermined rate comprising the steps of:
providing high pressure pump means in communication with a source of said fluid;
providing viscometer apparatus interposed between said high pressure pump means and said source, said viscometer apparatus including conduit means of known length and diameter and a pipe viscometer section having a surface roughness similar to the surface roughness of said flow conduit;
pumping at least a sample of said fluid through said conduit means on said viscometer apparatus at plural known velocities and measuring the pressure differential due to friction over said known length;
calculating the generalized shear stress and shear rate for said plural velocities and pressure differentials due to friction losses;
determining the consistency index (K') and the Power Law Index (n') for said fluid from the respective sets of values of shear stress and shear rate;
determining the Reynolds number of the fluid flowing through said flow conduit and conducting at least a sample of said fluid through said viscometer section under the same conditions of Reynolds number;



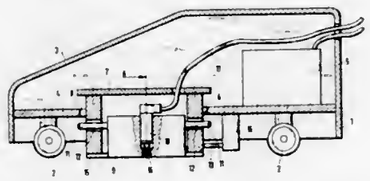
measuring the friction pressure loss, the fluid density, and the velocity of fluid flow through said viscometer section;
calculating the value of the Fanning Friction factor (f) based on the measured values of friction pressure loss, fluid density, fluid velocity and the effective diameter and length of said viscometer section; and
determining the friction pressure loss through said flow conduit by measuring the effective diameter of said flow conduit, the effective length of said flow conduit, the velocity of fluid flow through said flow conduit and using said friction factor and said measured value of fluid density.

4,821,565

DEVICE FOR MEASURING SMALL CHANGES IN THE THICKNESS PROFILE OF BAND-SHAPED MATERIAL PARTICULARLY PHOTOGRAPHIC BASE PAPER

Waldemar Voosbeck, Mettingen, and Hans-Dieter Bode, Bohmte, both of Fed. Rep. of Germany, assignors to Felix Schoeller Jr. GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 157,728
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705201
Int. Cl.[4] G01B *5/06*
U.S. Cl. 73—159 **3 Claims**



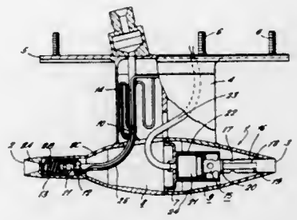
2. A device for measuring relatively small changes in the thickness profile of web material wound on a reel, comprising in combination a block, a measuring sensor positioned in said block in an adjustable manner, said sensor being in contact with the surface of the web material, said block being positioned within a casing in a moveable and weight-relieved manner, said casing being in contact with the surface of the material to be measured on both sides of the measuring sensor, said casing being supported by a carrier which can be moved in relation to the reel, wherein the casing (7) has a rectangular section and a rectangular base plane, and recesses (12) that are formed in the frontal walls opposing one another, into which recesses the pegs (11) of the block (9) engage such that the block and measuring sensor are mounted within the casing.

4,821,566

AIR DATA MEASUREMENT APPARATUS

James S. Johnston; David W. Pownall, and Melvyn S. White, all of West Sussex, England, assignors to Rosemount Limited, United Kingdom

Filed Mar. 16, 1988, Ser. No. 168,866
Claims priority, application United Kingdom, Mar. 25, 1987, 8707093
Int. Cl.[4] G01C *21/00*; G01L *7/00*
U.S. Cl. 73—178 R **10 Claims**



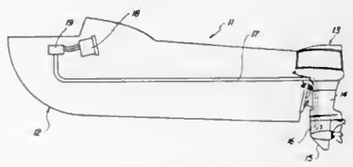
1. Air data measurement apparatus comprising an elongated housing open at its opposite ends and adapted to be mounted on an aircraft with one end leading in the direction of flight of the aircraft; a transverse wall in the housing dividing the housing into leading and trailing end chambers; a number of suction vents in the wall of the housing providing communication between the trailing end chamber and the exterior of the housing; a total pressure sensor in the leading end chamber; and a total temperature sensing element assembly in the trailing end chamber.

4,821,567

RUNNING SPEED DETECTING DEVICE FOR MARINE VESSELS

Tomoji Nakamura; Ryoji Sawada, both of Iwata, and Kazuhiro Nakamura, Hamamatsu, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha and Yamaha Hatsudoki Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 1, 1988, Ser. No. 162,734
Claims priority, application Japan, Mar. 2, 1987, 62-45364
Int. Cl.[4] G01C *21/10*
U.S. Cl. 73—182 **6 Claims**



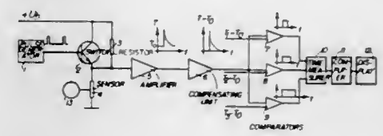
1. A running speed detector for a watercraft comprising a hull, means carried by said hull and defining an opening to receive water pressure generated by the movement of said hull through the water, conduit means for transmitting the water pressure from said opening to a remote position at which a combined sensor, indicator element is located, said combined sensor, indicator element being comprised of first means providing an output signal in proportion to pressure at a first predetermined relationship and second means for providing an output signal in proportion to pressure in a second predetermined relationship, and processing means for selecting a respective one of said signals in a first range and the other one of said signals in another range to provide a signal indicative of speed from the sensed pressure.

4,821,568

METHOD AND APPARATUS FOR DETERMINING A MEASURABLE VARIABLE

Siegfried Kiske, Gross Grönau, Fed. Rep. of Germany, assignor to Draegerwerk, AG, Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 116,364
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639666
Int. Cl.[4] G08B *21/00*; G01F *1/68*
U.S. Cl. 73—204.17 **3 Claims**



3. A method for detecting a no flow condition of a medium having a flow condition and a no flow condition, comprising the steps of:
during a measurement period, heating a sensor by imparting a heating pulse and allowing the sensor to cool, the sensor cooling in an exponential manner during a flow condition and cooling in a non-exponential manner during a no flow condition;
choosing temperature T_1, T_2 and T_3 during a flow condition such that the time period for the sensor to cool from T_1 to T_2 is equal to the time period for the sensor to cool from T_2 to T_3;
repeating the heating and cooling of the sensor to provide successive measurement periods;
determining the ratio of the time period for the sensor to cool from T_1 to T_2 to the time period for the sensor to cool from T_2 to T_3 during the successive measurement periods;
detecting the ratio of the time period for the sensor to cool from T_1 to T_2 to the time period for the sensor to cool from T_2 to T_3 approaching a limit value;
establishing a no flow condition when said approaching is detected.

4,821,569

PARASITIC ECHO PULSE REJECTOR FOR ULTRASONIC LIQUID LEVEL METER

Daniel J. Soltz, Norristown, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

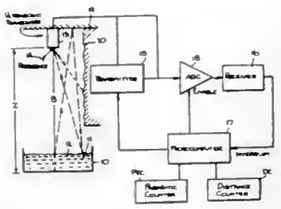
Filed Oct. 30, 1987, Ser. No. 114,857
Int. Cl.[4] G01F *23/28*; G01S *15/08*
U.S. Cl. 73—290 V **9 Claims**

1. An ultrasonic echo-ranging system to measure within a predetermined time span the level of liquid in an open channel or tank, said system comprising:
A an ultrasonic transducer disposed on an ultrasonically-reflective surface at a fixed raised position above the surface of the liquid;
B means to excite the transducer to emit periodic pulses of ultrasonic energy which are propagated in a gaseous medium between the transducer and the liquid and are directed toward the surface of the liquid and reflected from this target to produce main echo pulses which return to the transducer and are detected thereby, said trans-

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ducer also detecting parasitic echo pulses originating from said ultrasonically-reflective surface;

C means including a programmed microcomputer and a distance counter responsive to pulses detected by the transducer to measure the round trip transit time of the pulse energy in the gaseous medium to provide a reading of liquid level; and



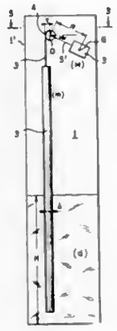
D a parasitic echo rejector operatively coupled to said microcomputer acting to discriminate between said main echo pulses and said parasitic pulses received within said span to render said system non-responsive to said parasitic pulses to provide an accurate reading of liquid level.

4,821,570

APPARATUS FOR MEASURING THE LEVEL OF A LIQUID, IN PARTICULAR A FLAMMABLE LIQUID

Danny J. Khoi, Asnieres, France, assignor to Materiel et Auxiliaire de Signalization et de Controle Pour L'Automation - Auxitrol, Asnieres, France

Filed Nov. 2, 1987, Ser. No. 116,365
Int. Cl.[4] G01F *23/62*
U.S. Cl. 73—309 **5 Claims**



1. Apparatus for measuring the level of a flammable liquid, in particular a cryogenic liquid, contained in a closed receptacle, the apparatus comprising:

a vertical elongate plunger freely suspended at its top end from a thread so as to be partially immersed in the liquid;

a housing mounted at the top of the receptacle and containing a pulley which is rotatable through no more than one-fourth of a turn, the pulley serving to wind the plunger suspension thread and being connected to a counterweight in such a manner that the pulley-counterweight assembly serves to compensate for the weight of the plunger as reduced by the Archimedes displacement thrust exerted on the plunger by the liquid, with the angular position of the pulley-counterweight assembly varying as a function of the depth to which the plunger is immersed, and consequently as a function of the depth of the liquid in the receptacle; and

means for measuring and digitizing the angular position of the pulley, said means comprising a binary encoded disk mounted outside the housing in which the pulley-counterweight assembly is housed, together with light-emitting means and light-receiving means between which the disk moves, and a magnetic coupling for transmitting motion from the pulley to the disk through the housing,

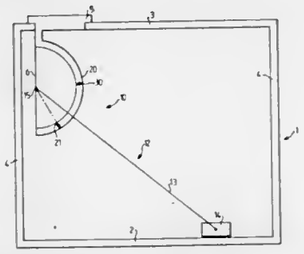
wherein the interval between successive sectors constituting the binary coding on the disk decrease as a function of the angle of rotation, in accordance with a mathematical law which is selected so that the said interval varies in such a manner as to compensate for the non-linearity due to the inclination of the counterweight as it moves, such that the digitized data available at the output from the light-receiving means varies linearly with the level of the liquid in the receptacle.

4,821,571

DAMPING DEVICE AND A DEVICE FOR MEASURING THE LEVEL OF FUEL IN A MOTOR VEHICLE FUEL TANK INCLUDING SUCH A DAMPING DEVICE

Philippe Reymond, Yerres, France, assignor to Jaeger, Levallois Perret, France

Filed Feb. 24, 1986, Ser. No. 17,447
Claims priority, application France, Feb. 21, 1986, 86 02420
Int. Cl.[4] G01D *11/12*; G01F *23/32*
U.S. Cl. 73—317 **6 Claims**



1. A damping device comprising:

a housing defining a sealed chamber in the form of a semicylindrical sector having a series of concentric semicylindrical main fins, which are centered about a main axis,

a shaft passing through a wall of the housing, said shaft being centered on said main axis and being free to pivot about said main axis,

a blade pivotally mounted in the chamber, said blade including:

a plane sheet in the form of a sector of a disk having an angle of less than 180° between its edges, said plane sheet extending perpendicularly to said main axis and being linked with said shaft, and

a series of concentric semicylindrical secondary fins linked with said plane sheet, said secondary fins being centered about said main axis and inserted between the main fins,

a viscous damping fluid in said sealed chamber, and

sealing means having four ring lips in an X-configuration provided around the periphery of the shaft to prevent the viscous damping fluid from leaving the housing and to prevent fluid outside the housing from penetrating therein,

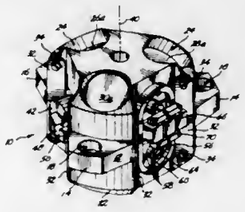
such that relative displacement of the blade and the housing is braked firstly by controlled flow of the fluid from one side of the blade to the other, via interstices between the blade and the housing, and secondly by viscous friction between the interleaved main and secondary fins, wherein the sealing means are received in a sleeve which extends from said wall and wherein said wall of the housing includes a bore defining a first bearing for the shaft and wherein a bearing element defining a second bearing for the shaft is inserted in the sleeve outside of the sealing means.

4,821,572

MULTI AXIS ANGULAR RATE SENSOR HAVING A SINGLE DITHER AXIS

Rand H. Hulsing, II, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Nov. 25, 1987, Ser. No. 125,220
Int. Cl.[4] G01P *9/04*
U.S. Cl. 73—505 **47 Claims**



1. Apparatus for producing an output signal indicative of the angular rate of rotation of a body about a prime axis, comprising:

(a) a first accelerometer and a second accelerometer, each having an acceleration sensitive axis and operative to produce a signal proportional to an acceleration directed along said axis, the first and second accelerometers being mounted on opposed support members that are pivotally connected to the body, the acceleration sensitive axes of the first and second accelerometers being generally aligned in parallel;

(b) a motor connected to counter-rotate the opposed support members about a common pivot axis, rotation of the body about the prime axis subjecting the counter-rotating accelerometers to a Coriolis acceleration that is a function of said angular rate of rotation and causing the accelerometers to produce a signal proportional to a component of the Coriolis acceleration that is aligned with their acceleration sensitive axes; and

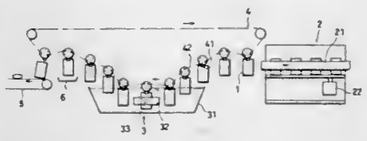
(c) means for combining the signals produced by the first and the second accelerometers to produce the output signal indicative of said angular rate of rotation of the body about the prime axis.

4,821,573

ULTRASONIC METHOD OF INSPECTING CONTENTS OF A PACKAGE AND APPARATUS THEREOF

Masanori Nagata; Tsugio Kaneoka; Shigeki Imano, and Hitoshi Matumoto, all of Tokyo, Japan, assignors to Fujimori Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,846
Claims priority, application Japan, Oct. 15, 1986, 61-245115; Jan. 13, 1987, 62-5528; Jan. 28, 1987, 62-18035
Int. Cl.[4] G01M *3/00*
U.S. Cl. 73—597 **6 Claims**



1. An ultrasonic method of inspecting contents of a package comprising:

shaking said package so as to disperse head space into contents of said package;

immersing the package in water after shaking;

disposing an ultrasonic transmitter-receiver system on at least one side of said package and applying pressure to the package to squeeze it to a certain depth, while keeping the body thickness of the package constant;

transmitting an ultrasonic wave selected from a wavelength region of approximately 0.5 MHz to approximately 20 MHz;

receiving the ultrasonic wave to obtain output data; and

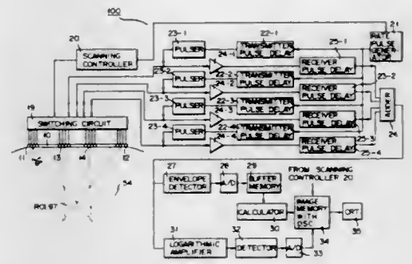
evaluating an occurrence or degree of degradation of the contents based upon said output data.

4,821,574

METHOD AND APPARATUS FOR MEASURING ULTRASONIC VELOCITY BY CROSSED BEAM

Kinya Takamizawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 20, 1987, Ser. No. 75,603
Claims priority, application Japan, Jul. 22, 1986, 61-170831; Sep. 11, 1986, 61-212670
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—602 **18 Claims**



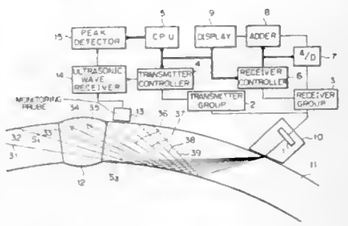
1. An apparatus for measuring an ultrasonic velocity in a region of interest (ROI) within a medium by utilizing plural ultrasonic beams, comprising:

transducer means including a plurality of transducer elements arranged in an array form, which are subdivided into at least first and second transmitter sections and first and second receiver sections, said first and second receiver sections being located, at predetermined intervals, between said first and second transmitter sections along a

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longitudinal direction of the array of said transducer elements;
driving means for driving said first and second transmitter sections to transmit first and second ultrasonic beams to said ROI;
receiving means coupled to said first and second receiver sections, for receiving echo signals, which are produced from said first and second receiver sections and correspond to ultrasonic echoes of the first and second ultrasonic beams which are reflected from said ROI; and,
processor means for processing said echo signals to calculate times of propagation of said ultrasonic beams in said ROI, said processor means calculating an ultrasonic velocity within said ROI based upon said calculated propagation times.

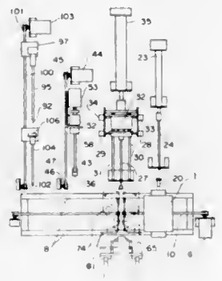
4,821,575
ULTRASONIC FLAW DETECTING METHOD AND APPARATUS
Yoichi Fujikake, Kawasaki; Takao Sugimoto, Kimitsu; Kiyohide Tamaki, Fuchu, and Yoshio Udagawa, Higashiosaka, all of Japan, assignors to Nippon Steel Corporation, Chiyoda, Japan
Filed Oct. 5, 1987, Ser. No. 105,118
Claims priority, application Japan, Oct. 6, 1986, 61-237722
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—626 **10 Claims**



1. An ultrasonic flaw detecting method for ultrasonically detecting flaws in a portion of a subject to be tested by using an ultrasonic wave phased array probe having an array of a plurality of transducers for emitting and receiving ultrasonic wave beams in a sector scanning fashion in which the beams are scanned substantially in the form of a sector, and wherein at least one monitoring probe is located in the vicinity of the portion of the subject that is to be tested to receive the ultrasonic wave beams, comprising
detecting peak values of the ultrasonic wave beams within a predetermined gate,
determining a maximum peak value of the detected peak values to determine a pilot beam having the maximum peak value,
determining from the determined pilot beam effective beams which reach the portion of the subject to be tested, so that the detection of the flaws can be effected by using only the effective beams.

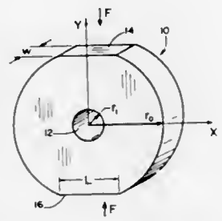
4,821,576
AUTOMATIC CLEANING DEVICE FOR USE IN THE THERMOPLASTICS EXTRUSION PLASTOMETER
Yasuhiro Miura, Chiba, and Hiromu Iwata, Kisarazu, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Feb. 10, 1988, Ser. No. 154,582
Claims priority, application Japan, Feb. 10, 1987, 62-027360; Feb. 10, 1987, 62-027361; Feb. 10, 1987, 62-027362; Feb. 10, 1987, 62-027363
Int. Cl.[4] G01N *11/00*
U.S. Cl. 73—788 **34 Claims**

1. An automatic cleaning device for use in the thermoplastics extrusion plastometer in which thermoplastics is fed into a vertically disposed cylinder to be heat melted, and the melted thermoplastics is extruded through a die formed at the bottom of the cylinder by a piston disposed at a plasticity testing position so that the plasticity of the thermoplastics is tested, said device comprising:
a piston cleaning unit for cleaning the surface of said piston removed from said cylinder at said plasticity testing position;



a conveying unit for moving said cylinder from said plasticity testing position sequentially to a given cylinder cleaning position and to a die cleaning position;
a cylinder cleaning unit for cleaning the interior surface of said cylinder conveyed from said plasticity testing position to said cylinder cleaning position; and
a die cleaning unit for cleaning the interior surface of said die conveyed from said cylinder cleaning position to said die cleaning position, without removing said die from said cylinder.

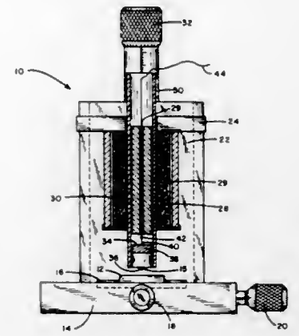
4,821,577
MODIFIED RING TEST
Marc Thiercelin, Cambridge, England, and Jean C. Roegiers, Tulsa, Okla., assignors to Dowell Schlumberger Incorported, Tulsa, Okla.
Filed Jun. 22, 1987, Ser. No. 65,317
Int. Cl.[4] G01N *19/08*
U.S. Cl. 73—799 **2 Claims**



1. A method of determining the fracture toughness, K_{Ic}, comprising the steps of:
(a) preparing a cylindrical specimen having a longitudinal axis and a cylindrical outer surface, wherein said cylindrical specimen is characterized by the presence of a cylindrical opening therethrough having a common axis with said longitudinal axis, and two diametrically opposed flat surfaces of the same length on said cylindrical outer surface of said cylindrical specimen;
(b) applying a compressive displacement at a constant rate on said two diametrically opposed flat surfaces;
(c) monitoring the load applied to said specimen resulting from said compressive displacement of step (b) as a function of displacement;
(d) measuring the value of the critical load, F_c, corresponding to the minimum value of the load applied as a function of the displacement in step (c), at critical crack length; and
(e) Multiplying the value of the stress intensity factor per unit load for this critical crack length, K_f, times the value of the critical load, F_c, from step (d) to establish the fracture toughness, K_{Ic}, according to the formula:

$$K_{Ic}=K_f \times F_c.$$

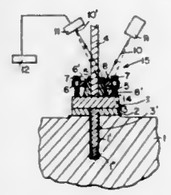
4,821,578
APPARATUS AND METHODS FOR TESTING SURFACE PROPERTIES OF A MATERIAL
Amarjit S. Brar, Edina; Jagdish P. Sherma, Bloomington, and Suryanarayana Kaja, Eden Prairie, all of Minn., assignors to Magnetic Peripheals Inc., Minneapolis, Minn.
Division of Ser. No. 96,185, Sep. 11, 1987, Pat. No. 4,776,202.
This application Jun. 28, 1988, Ser. No. 212,441
Int. Cl.[4] G01B *21/00*
U.S. Cl. 73—827 **3 Claims**



1. A method for testing the adhesion strength of a layered material on a sample comprising the steps of:
dropping an indentor onto the surface of the sample from a known distance above the sample; and
applying a uniform force substantially perpendicular to the surface of the sample and to the area adjacent the indentation to determine if the area adjacent the indentation will lift off from the surface of the sample in the presence of the uniform force.

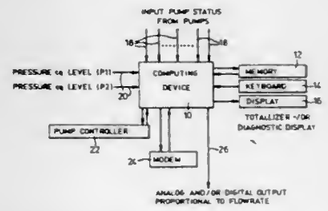
4,821,579
APPARATUS FOR CLAMPING A TEST SAMPLE IN A TESTING MACHINE
Peter Gernhart, Klingenberg; Gerhart Hintz, Rossdorf; Guenter Keller, Modautal, and Andreas Pohl, Klein Umstadt, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany
Filed Jnn. 16, 1988, Ser. No. 207,758
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720303
Int. Cl.[4] G01N *3/06*
U.S. Cl. 73—856 **5 Claims**

1. A clamping apparatus for a test sample in a testing machine especially for carrying out fast tensile rupture tests, comprising a clamping chuck, force sensor means for measuring a force, a base plate comprising a first side for mounting said clamping chuck and a second side for mounting said force sensor means, said base plate comprising means for securing said force sensor means to counter support means of said testing machine, said clamping arrangement further comprising reflector means, a light source emitting a light beam, a photo-position detector, and electronic signal evaluating circuit means connected to said photo-position detector, said reflector means being arranged to reflect said light beam toward and



onto said photo-position detector for providing a displacement representing signal to said electronic evaluating circuit means to evaluate said displacement representing signal and determine a measurement of a deformation of said test sample.

4,821,580
METHOD AND APPARATUS FOR CALCULATING FLOW RATES THROUGH A PUMPING STATION
Johannes N. Jorritsma, 37 Yonge Street N., Aurora, Ontario, Canada L4G 1N6
Filed Jan. 27, 1988, Ser. No. 148,875
Int. Cl.[4] G01F *1/34*
U.S. Cl. 73—861 **18 Claims**



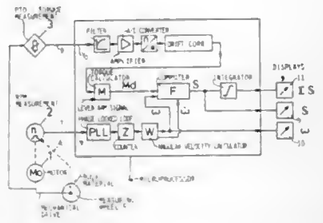
1. A method of calculating the flow rate through a pumping station having a pump, comprising the steps:
(a) storing in a memory means a table correlating pumping rate for the pump with the pressure differential across the pump,
(b) detecting data from which the differential pressure across the pump can be computed,
(c) utilizing a computing means to accomplish the following at sequential points of time:
(i) compute the differential across the pump on the basis of said data,
(ii) access said table in the memory means in order to determine the pumping rate corresponding with the computed pressure differential,
(iii) calculate the volume pumped during the time interval between the current time point and the immediately preceding time point by multiplying the determined pumping rate by the length of the time interval, and
(iv) update a totalizer in the memory means by adding in the calculated volume pumped during the respective interval.

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4,821,581
METHOD AND APPARATUS FOR THE CONTINUOUS MEASURING OF BULK MATERIAL PASSING OVER A MEASURING WHEEL

Gerhard Jost, Muehltal, Fed. Rep. of Germany, assignor to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed Sep. 9, 1987, Ser. No. 94,816
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633694
Int. Cl.⁴ G01F *1/80*
U.S. Cl. 73—861.36 **12 Claims**

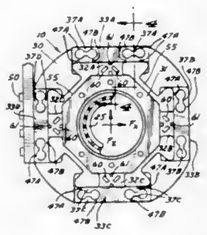


1. A method for continuously measuring of the quantity of bulk material passing through a measuring station, comprising the following steps:
(a) driving a measuring wheel by means of a motor,
(b) passing bulk material over said measuring wheel,
(c) measuring a load r.p.m. to provide a load r.p.m. representing first signal,
(d) measuring the power output torque of said motor to provide a power output torque representing second signal,
(e) forming an inverse or reciprocal value of said first signal,
(f) calculating said inverse or reciprocal value with said second signal to produce a bulk material quantity representing value, and
(g) ascertaining any variation in said load r.p.m. by measuring the respective angular acceleration (ω) to provide a load r.p.m. variation value, ascertaining the inertia moment of any rotating components to provide an inertia moment value, forming a correction value from said inertia moment value and from said load r.p.m. variation value, and using said correction value in said calculating step for producing said quantity representing value.

4,821,582
LOAD TRANSDUCER

Richard A. Meyer, Carver, and Douglas J. Olson, Plymouth, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Dec. 2, 1987, Ser. No. 127,641
Int. Cl.⁴ G01L *5/16*
U.S. Cl. 73—862.04 **9 Claims**

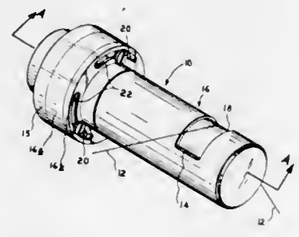


1. A load transducer for measuring loads in a plurality of axes including:
an outer housing;
an inner housing;
a plurality of load sensitive shear beams connecting said inner and outer housings, said shear beams being separated and extending generally radially from the inner housing toward the outer housing, the shear beams being aligned in a plane generally perpendicular to a reference axis of the inner housing; and
flexure links for connecting the radial outer ends of said, shear beams to said outer housing, said flexure links each having a longitudinal axis lying in a common plane perpendicular to the reference axis of the inner housing, and a pair of strap means at each end of each of the flexure links, said strap means being integral parts of the respective flexure link and spaced apart in a direction lying parallel to a radial line at each end of the respective flexure link, each strap means being fixed to the outer housing.

4,821,583
TENSION MEASURING APPARATUS

Brian D. Richards, Columbus, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 14, 1987, Ser. No. 73,098
Int. Cl.⁴ G01L *5/10*
U.S. Cl. 73—862.48 **3 Claims**



1. In a yarn direction-changing tension measuring apparatus that includes a direction-changing guide and means for mounting said guide to a fixed base, said means including a pair of spaced parallel longitudinal beams connected at one end to said guide and at their other to said base, each of said beams having a width greater than their thickness with the width of said beams being oriented to detect forces perpendicular thereto and one or more strain transducers mounted to the beams, the improvement comprising: said direction changing guide having an even surface over which said yarn travels, and said beams having successive lengths of varying thickness decreasing to a minimum then increasing to a maximum thickness from each end, there being two strain transducers mounted at each end of each beam at a location of said minimum thickness connected in a bridge circuit to provide an output signal proportional to the flexure of the beams and independent of the location of the yarn on said even surface.

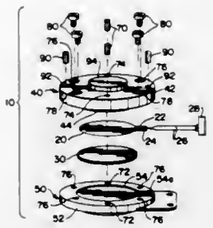
4,821,584
PIEZOELECTRIC FILM LOAD CELL ROBOT COLLISION DETECTOR

John R. Lembke, Overland Park, Kans., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 15, 1988, Ser. No. 168,367
Int. Cl.⁴ G01L *1/16*
U.S. Cl. 73—862.68 **10 Claims**

1. A robot collision detector comprising:
piezoelectric film force sensing means for generating an output voltage signal in response to compressive stresses thereon;

support means for resiliently supporting said force sensing means;
first and second plate means for compressively clamping

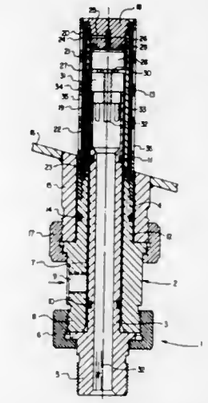


therebetween said force sensing means and said support means; and
means for mounting said first and second plate means between a robot arm wrist and end effector.

4,821,585
PROBE MEANS FOR SAMPLING VOLATILE COMPONENTS FROM LIQUIDS OR GASES

Eberhard Kempe, 2112 Hetzmannsdorf Nr. 8, Austria

Filed Dec. 12, 1985, Ser. No. 809,231
Claims priority, application European Pat. Off., Dec. 12, 1984, 84-890240-9
Int. Cl.⁴ G01N *1/22*
U.S. Cl. 73—863.23 **9 Claims**

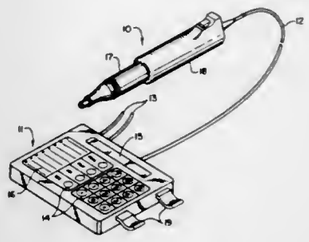


1. Probe means for sampling volatile components from liquids or gases comprising a probe body consisting of two essentially tubular, coaxial parts, an inner part and an external part, the former being inserted into the latter, a permeation passage means extending on the outside of the body, a tublar permeation membrane covering said permeation passage means, a carrier-medium feed canal communicating with the permeation passage means and provided between the inner and external tublar parts, a carrier-medium return line extending from the permeation passage means inside the probe body, the external part having a front end closed by a plug-like closing member, the permeation passage means being provided on an exterior surface of a front zone adjacent to the front end of the external part, and the said permeation passage means being connected respectively to the carrier-medium feed canal by a rear cross hole in the external part and to the carrier-medium return line by a front cross hole in the external part near its front end and wherein said closing member has a cross bore aligned with the said cross hole in the external part and an axial blind hole communicating with said cross bore for the return of the carrier-medium.

4,821,586
PROGRAMMABLE PIPETTE

Richard E. Scordato, Mount Kisco, and George Fried, Tarrytown, both of N.Y., assignors to Medical Laboratory Automation, Inc., Pleasantville, N.Y.

Filed Feb. 25, 1988, Ser. No. 160,391
Int. Cl.⁴ B01L *3/02*; **G01N** *1/14*; **G01F** *25/00*
U.S. Cl. 73—864.18 **17 Claims**



1. A programmable pipette comprising: a pipette assembly including piston means movable between a home position wherein it is ready to intake a volume of liquid and a discharge position wherein it is ready to dispense a volume of liquid previously aspirated into said assembly; a motor drive assembly connectable to said pipette assembly and including motor means for moving said piston means between the home and the discharge positions, and switch means connected to a control unit for controlling actuation of said motor means; and a programmable control unit including microprocessor means preprogrammed for controlling said motor means to move said piston means between said home and said discharge positions in a plurality of modes of pipette operation, said microprocessor means also being programmed to display individual pipetting steps to enable a new program to be written to define a new pipette operating mode, keyboard means for keying information into said microprocessor means, and display means for displaying information stored in said microprocessor means requiring the input of information from said keyboard means to select one of said pre-programmed modes of pipette operations and information keyboarded into said microprocessor means to enable said microprocessor means to control said motor means to perform in response to actuation of said switch means according to a pre-programmed mode of pipette operation, said display means also displaying the individual pipetting steps requiring the input of information from said keyboard means to enable a new program defining a mode of pipette operation to be written and stored in said microprocessor means.

4,821,587
DEPTH GAUGE-ANALYZER

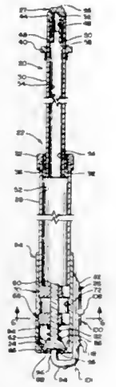
M. Maurice Rogers, Route 1, Box 214, Downsville, La. 71234

Filed Feb. 24, 1987, Ser. No. 17,737
Int. Cl.⁴ G01N *1/12*; **G01F** *23/04*
U.S. Cl. 73—864.63 **19 Claims**

1. A device for measuring the depth of a body of liquid and for collecting a sample of said liquid, said device comprising: an elongated barrel having an upper end and a lower end in its operative orientation; an aperture valve seat forming a closure at the lower end of said barrel; a valve member; means biasing said valve member toward said valve seat to prevent the flow of liquid through said aperture; an actuator engageable with a surface at the bottom of said body of liquid and thereafter effective upon downward movement of said barrel to displace said valve member away from said valve seat and allow liquid

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to flow from said body into said barrel through said aperture; and means operable upon rotation of said actuator by the operator of said device about an axis paralleling the axis of



elongation of said barrel to latch said actuator in a position in which it holds said valve member away from said valve seat, whereby liquid can flow into said barrel through said aperture as said device is lowered through said body of liquid.

4,821,588

STARTER MOTOR

Yoshifumi Akae, and Tatuo Yabe, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

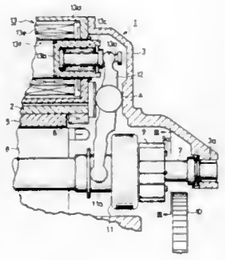
PCT No. PCT/JP87/00496, § 371 Date Jan. 26, 1988, § 102(e) Date Jan. 26, 1988

PCT Filed Jul. 11, 1987, Ser. No. 168,124

Claims priority, application Japan, Jul. 15, 1986, 61-109023

Int. Cl.⁴ F02N *15/06*

U.S. Cl. 74—7 A **4 Claims**



1. A starter motor, comprising: a rotary shaft (7) rotatably supported by a casing (1), an armature (8) for rotationally driving said shaft, a pinion (9) slidably mounted on said shaft and axially movable thereon to transmit rotation of said shaft to an engine by meshing with an engine starting gear (10), an electromagnetic switch (13) for axially sliding said pinion to mesh with said engine starting gear and for simultaneously supplying electric current to said armature to rotate said shaft and pinion, and means for removing any foreign material, such as ice, mud or packed snow, blocking a path of axial travel of the rotating pinion into meshed engagement with the starting gear, said removing means comprising a plurality of protrusions formed on an end face of said pinion, facing said starting gear, and extending axially outwardly from said end face.

4,821,589

DRIVE UNIT FOR WIRE-TYPE WINDOW

Ryoichi Fukumoto, 83, Soae 1-chome, Midori-ku, Nagoya city, Aichi pref.; Daiichi Shiraishi, 81-24, Hatano-cho, Seto city, Aichi pref., and Eiji Iwasaki, 10-4, Misato 1-chome, Toyota city, Aichi pref., all of Japan

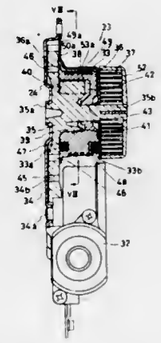
Continuation of Ser. No. 82,987, Aug. 5, 1987, abandoned, which is a continuation of Ser. No. 741,479, Jun. 5, 1985, abandoned.

This application Mar. 18, 1988, Ser. No. 177,830

Claims priority, application Japan, Jun. 6, 1984, 59-084818; Jun. 6, 1984, 59-084819

Int. Cl.⁴ E05F *11/78;* **F16D** *3/68;* **F16H** *7/00*

U.S. Cl. 74—89.22 **4 Claims**



1. A driver unit for use in a window regulator, comprising:
(a) a base;
(b) a gear rotatably mounted on said base and having first and second shafts coaxial with each other, said first and second shafts being formed integrally with said gear and fixed to said gear, said first and second shafts projecting from opposite sides of said gear, said first shaft being rotatably supported on said base, said gear having a support surface coaxial with said first and second shafts and having a plurality of angularly spaced convex arms projecting radially outward from said support surface;
(c) a drum rotatably mounted on said second shaft, said drum having a plurality of angularly spaced cavities opening radially toward said support surface of said gear and a plurality of bearing surfaces supported on said support surface;
(d) a plurality of integrally joined dampers disposed as pairs in each of said cavities, one of said arms being disposed between said dampers in each pair;
(e) a wire wound around said drum and adapted to be coupled to a panel of window glass; and
(f) driving means mounted on said base for rotating said gear to rotate said drum through said arms and said dampers.

4,821,590

ELECTRONIC CONTROL SYSTEM FOR CONTROL OF ELECTRONIC ELECTRIC SHIFT APPARATUS FOR MANUAL TRANSMISSION

Edward L. Tury, 9732 Rosemary La., Brighton, Mich. 48116, and Gregg A. Thoe, 36091 Grand River, Apartment 201, Farmington, Mich. 48024

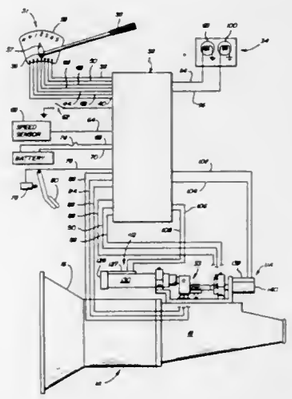
Continuation-in-part of Ser. No. 64,099, Jun. 18, 1987. This application Oct. 15, 1987, Ser. No. 108,810

Int. Cl.⁴ B60K *20/10;* **F16H** *5/42*

U.S. Cl. 74—335 **14 Claims**

1. An electrical control apparatus for control of a manual transmission apparatus in a motor vehicle having a plurality of transmission states selected by the position of a shift select lever, said electrical control apparatus comprising:
a first electric motor;

means drive by said first electric motor and operative in response to energization of said first electric motor to move said shift select lever laterally between left, center, and right locations;
a second electric motor;
means driven by said second electric motor and operative in response to energization of said second electric motor to move said shift select lever longitudinally between forward, neutral, and rearward locations;
operator input means operative to generate a desired transmission state signal corresponding to manual operator input;
a first transmission state sensing means for indicating the left, center or right location of the shift select lever;
a second transmission state sensing means for indicating the forward, neutral or rearward location of the shift select lever;
a logic control unit connected to said operator input means and said first and second transmission state sensing means for generation of a sequence of motor drive signals corresponding to the sequence of motions required for move-



ment of the shift select lever from the present transmission state to the desired transmission state when said desired transmission state differs from said present transmission state, said motor drive signals including a clockwise motor drive signal, a counter-clockwise motor drive signal, a shift up motor drive signal and a shift down motor drive signal; and
a motor drive means connected to said logic control unit and adapted for connection to the first and second electric motors for
controlling the first electric motor for movement of said shift select lever in one lateral direction in response to said clockwise motor drive signal,
controlling the first electric motor for movement of said shift select lever in the opposite lateral direction in response to said counter-clockwise motor drive signal,
controlling the second electric motor for movement of said shift select lever in one longitudinal direction in response to said shift up motor drive signal, and
controlling the second electric motor for movement of said shift select lever in the opposite longitudinal direction in response to said shift down motor drive signal.

4,821,591

AUXILIARY GEARBOX FOR MOTOR VEHICLES

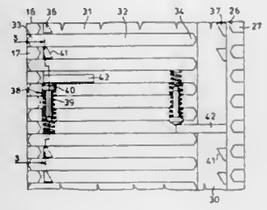
Horst F. Adler, Södertälje, Sweden, assignor to Saab-Scania Aktiebolag, Södertälje, Sweden

Filed Mar. 23, 1987, Ser. No. 28,765

Claims priority, application Sweden, Mar. 26, 1986, 8601399

Int. Cl.⁴ F16H *3/38, 3/44, 11/00, 13/00*

U.S. Cl. 74—339 **2 Claims**



1. Gearbox intended to be inserted between a main gearbox and a transmission to the driving wheels in a motor vehicle, and including a gearbox housing accommodating an input shaft from the main gearbox, an output shaft to the transmission, a planetary gear system arranged between the input shaft and the output shaft, said planetary gear comprising a sun wheel rigidly fixed to the input shaft, a plurality of planet wheels meshing with said sun wheel and rotatably mounted on a planet wheel carrier non-rotatably mounted on the output shaft, and a ring gear surrounding and meshing with the planet wheels, the gearbox housing also accommodating a clutch ring non-rotatably attached to the gearbox housing and a clutch ring non-rotatably attached to the input shaft, said clutch rings being arranged axially on either side of the planet wheels, and between the ring gear and the respective clutch ring, there being arranged synchronizing rings, characterized in that the synchronizing rings have axial external cogs meshing with angular play between the engagement teeth of the ring gear and characterized in that the ring gear, at its axial ends, is formed with engagement teeth that are integrated with its internal teeth, which internal teeth mesh with the planet wheels, and that the ring gear is axially displaceable to enable its engagement teeth to be engaged with either of the clutch rings.

4,821,592

BALL CAGE FOR A WORM-AND-NUT TYPE DRIVE UNIT

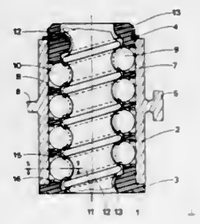
André J. Rousselot, Scionzier, France, assignor to Somfy, Cluses, France

Filed Apr. 11, 1988, Ser. No. 180,357

Claims priority, application France, Apr. 21, 1987, 87 05593

Int. Cl.⁴ F16H *25/22*

U.S. Cl. 74—424.8 NA **3 Claims**

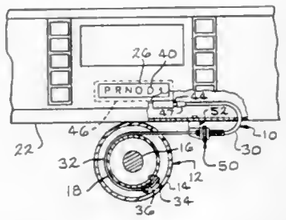


1. A ball cage for a ball nut in a worm-and-nut type drive unit, comprising a cylindrical sleeve (1) provided with ball

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seats formed by radial cylindrical perforations (7, 8) whose diameter is substantially equal to the diameter of the balls (9, 10) and which are distributed over at least one helix corresponding to the helicoidal groove or grooves of the worm, each perforation being intended to receive a ball (9, 10) freely rotatable in its seat for cooperation with the helicoidal groove or grooves of the worm in order to secure the nut and the worm to one another, wherein the inner surface of the cage (1) has a bead-like portion (13) of increased thickness of material extending over the perforations (7, 8), along each helix on which said perforations are disposed, and wherein the cylindrical surface of the perforations has a narrowed portion (14) at its intersection with said bead and is provided at its outer end with projections (15 to 18), in such a manner that once the ball has been forced into its seat it is retained in the latter by said narrowed portion and by said projections.

4,821,593
GEAR SELECTOR INDICATOR ADJUSTMENT MECHANISM
Lawrence P. Kobylarz, Howell, Mich., assignor to May & Scofield, Inc., Howell, Mich.
Filed May 12, 1988, Ser. No. 193,035
Int. Cl.[4] B60K *20/00*
U.S. Cl. 74—475 **7 Claims**



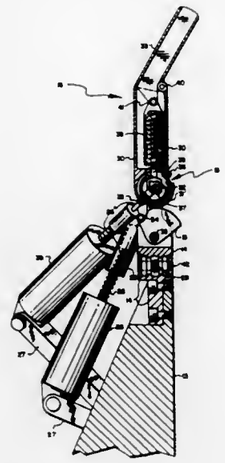
1. A motor vehicle automatic transmission gear selector indicator assembly which indicates the position of a gear shifter and permits the indicated gear position to be adjusted comprising:

a display having gear selector designations and movable means for indicating one of said gear selector designations, and compliant means urging said movable means in one direction,

a cable assembly having an outer sheath with first and second mounting means for mounting the opposite ends of said sheath, said cable assembly further having a cable core sliding within said sheath with a first end connected to said display movable means and a second end connected to said gear shifter, wherein tension on said core urges said indicator movable means to move against said compliant means, and

an adjustment mechanism including a hollow externally threaded tube with said sheath fixed to said tube with said core passing through said tube, an adjustment wheel having a threaded bore meshing with said external threads of said tube, and a bracket which traps said adjustment wheel, said tube and said bracket including anti-rotation means for preventing rotation of said tube, and said adjustment mechanism further having detent means which restrains said adjustment wheel from rotation until it is forcibly rotated through an external force, whereby, rotation of said wheel caused longitudinal movement of said tube and changes the indicated position of said gear selector display.

4,821,594
ROBOT JOINTS
Mark E. Rosheim, 1565 St. Paul Ave., St. Paul, Minn. 55116, and Hans W. Trechsel, Rockford, Mian., assignors to Mark E. Rosheim, St. Paul, Minn.
Filed Jun. 10, 1988, Ser. No. 205,443
Int. Cl.[4] G05G *11/00*
U.S. Cl. 79—479 **39 Claims**



1. A controlled relative motion system permitting a controlled motion member, joined to another base member, to selectively move with respect to that base member, said system comprising:

a first joint mean comprising:

a first joint support means;

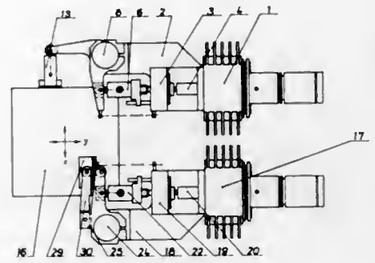
a first joint ball means with a generally spherical shape affixed to said first joint support means;

a first joint equatorial plane capture means having a rotation location in which said first joint ball means is positioned such that said first joint equatorial plane capture means can rotate in multiple directions about said first joint ball means;

a plurality of first joint force imparting means mechanically connected to said first joint equatorial plane capture means, including a first joint first force imparting means and a first joint second force imparting means each of which permits force to selectively be imparted to said first joint equatorial plane capture means; and

a plurality of first joint connection means, including a first joint first connection means and a first joint second connection means, with said first joint first connection means rotatably connecting said first joint first force imparting means to said first joint equatorial plane capture means and said second joint second connection means rotatably connecting said first joint second force imparting means to said first joint equatorial plane capture means and with said first joint first and second connection means being fixed with respect to one another at that connection of each in said first joint equatorial plane capture means, said first joint first force imparting means being capable of approaching and receding from said first joint second force imparting means during selected rotation of said first joint equatorial plane capture means about said first joint ball means.

4,821,595
POSITIONING DEVICE FOR THE PRODUCTION OF SEMICONDUCTOR COMPONENTS
Horst Podeschwa; Joachim Gérard, and Wolfgang Schoepe, all of Dresden, German Democratic Rep., assignors to VEB Elektromat Dresden, Dresden, German Democratic Rep.
Filed Dec. 8, 1987, Ser. No. 130,057
Claims priority, application German Democratic Rep., Mar. 13, 1987, 3007563
Int. Cl.[4] G05G *11/00*
U.S. Cl. 74—479 **3 Claims**



1. A positioning device for the production of semiconductor components, comprising:

(a) a cross table including a guide rail;

(b) a first support plate;

(c) an x-direction drive unit flange-mounted on one side of said first support plate, said x-direction drive unit including:

(i) a first drive motor;

(ii) a first drive spindle;

(iii) first bearing means mounted on the first support plate for carrying said first drive spindle;

(iv) a first drive nut positioned on the first drive spindle;

(v) first guide rod means for preventing rotation of sid first drive nut;

(vi) a first adjustable lever;

(vii) first rolling bearing means positioned on said first adjustable lever for engaging an end face of said first drive nut;

(viii) a second adjustable lever oriented approximately 90° to said first adjustable lever;

(ix) x-direction guide means including a connecting piece;

(x) second rolling bearing means positioned on an end of said second adjustable lever for interaction with said connecting piece;

(xi) first vertical bearing means mounted on the first support plate for holding said first and second adjustable levers;

(xii) first spring means for force-lockingly interconnecting said first drive nut and said first adjustable lever;

(xiii) second spring means for force-lockingly interconnecting the connecting piece of the x-direction guide means and the second adjustable lever;

(d) a second support plate;

(e) a y-direction drive unit flange-mounted on one side of said second support plate and and separate from said x-direction drive unit, said y-direction drive unit being disposed in a parallel orientation with respect to said x-direction drive unit, said y-direction drive unit including:

(i) a second drive motor;

(ii) a second drive spindle;

(iii) second bearing means mounted on the second support plate for carrying said second drive spindle;

(iv) a second drive nut positioned on the second drive spindle;

(v) second guide rod means for preventing rotation of said second drive nut;

(vi) a double lever including a main lever and a secondary lever which is pivotally mounted on the main lever;

(vii) second vertical bearing means mounted on the second support plate for holding said double lever;

(viii) third rolling bearing means positioned on said main lever for engaging an end face of said second drive nut;

(ix) a pair of rolling bearing means positioned on an end of the main lever for engaging the guide rail on the cross table and extending substantially parallel to the x-direction of the cross table;

(x) third spring means for force-lockingly interconnecting said second drive nut and said main lever;

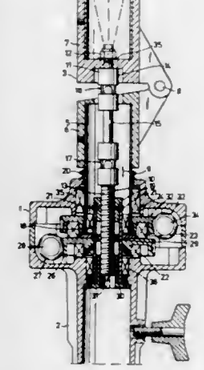
(xi) a tensioning bolt;

(xii) an adjusting bolt;

(xiii) fourth spring means for force-lockingly interconnecting the secondary lever of the double lever and the main lever of the double lever, with the aid of said tensioning bolt and adjusting bolt; and

(xiv) fourth rolling bearing means on an end of said secondary lever of said double lever for engaging the guide rail on the cross table.

4,821,596
ROTATOR
Erik Eklund, Klövervägen 15, 161 36 Bromma, Sweden
Filed Feb. 9, 1988, Ser. No. 154,149
Claims priority, application Sweden, Feb. 25, 1987, 8700804
Int. Cl.[4] G05G *11/00;* **H01Q** *3/08;* **F16H** *25/24*
U.S. Cl. 74—479 **5 Claims**



1. A rotator comprising a gear housing which has a lower attachment for fitting the housing to the top of a mast, and which has extending therefrom a tube which can be rotated about its longitudinal axis relative to the gear housing by means of a gear therein, said tube being intended to carry a top sleeve, which in turn is intended to carry an aerial, characterized in that an upper attachment (3) is mounted on the outer end of the tube (5); in that the upper attachment (3) includes a lower part (6) which is connected firmly to the tube (5) and an upper part (7) which is hinged to the lower part (6); in that the tube (5) has located therewithin a rod (10) or like element which can be moved in the direction of the tube axis and is fixed against rotation with respect to said gear housing and the upper end of which rod (10) is attached to the upper part (7) of the upper attachment (3), such that when the rod (10) is moved axially the angle defined by the two attachment parts (6,7) with said longitudinal axis is changed; and in that the gear housing has provided therein activating means (18,19,26, 27) for displacing the rod (10) axially relative to the gear housing (1), therewith

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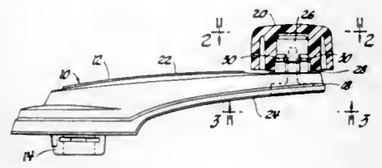
enabling a top sleeve (4) attached to the upper part (7) of the upper attachment (3) to be brought to a pre-determined angle with the tube (5) and enabling this angle to be maintained during rotation of the tube about its longitudinal axis, in that a drive shaft (28) for displacing said rod (10) and a drive shaft (34) for rotating said tube (5) are located in, and are stationary relative to, said gear housing and in that said gear housing is located stationary in relation to said mast.

4,821,597

OPERATING CRANK FOR VEHICLES

George Z. Marciniak, St. Clair Shores, and William M. Selkirk, Burton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1982, Ser. No. 378,641
Int. Cl.[4] G05G *1/00*
U.S. Cl. 74—545 **2 Claims**



1. An operating crank for a window regulator drive mechanism or the like, comprising,

a one-piece, integrally molded handle having a first end adapted for attachment to the drive mechanism and a second end adapted for attachment to a knob, the handle including an outer side and an inner side,

an axial shank extending from the outer side of the second end,

a plurality of circumferentially spaced knob retention ribs extending radially outwardly from the shank in axially spaced relationship to the outer side of the second end,

the second end of the handle including a plurality of access slots equal in number to the ribs and extending from the inner side of the second end of the handle through the outer side and along the shank to the knob retention ribs, each slot being of sufficient size to allow unencumbered access for a mold insert receivable therein from the inner side of the handle, whereby the shank and the knob retention ribs may be integrally molded in a mold which parts between the outer and inner sides of the handle, the material of the shank intermediate the slots providing an integral connection of the shank to the second end of the handle,

and a knob mounted on the knob retention ribs.

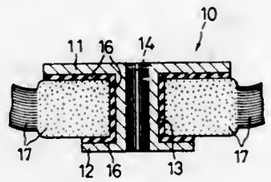
4,821,598

STEERING WHEEL CORE MATERIAL

Yasushi Yamazawa; Katsumi Kondo, Both of Shizuoka; Yasuhiro Tsuchiya, Aichi; Shinji Koike, and Masaki Terada, Both of Shizuoka, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 3, 1987, Ser. No. 116,245
Claims priority, application Japan, Nov. 5, 1986, 61-263074; Apr. 13, 1987, 62-90176; May 26, 1987, 62-79703
Int. Cl.[4] B62D *1/04;* D06C *11/00;* B32B *5/12*
U.S. Cl. 74—552 **8 Claims**

1. A laminated FRP steering wheel core material formed by winding resin-impregnated continuous filaments in layer around the ring- and spoke-forming mold and the body of the boss metal fitting positioned at the center of the ring, characterized in that an elastic material is interposed between the body of the boss metal fitting and the resin-impregnated con-



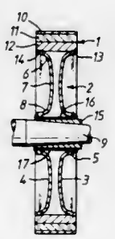
tinuous filaments wound around the body of the boss metal fitting.

4,821,599

ENERGY STORAGE FLYWHEEL

Philip A. C. Medlicott, Pryford, England, assignor to British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 662,073, Oct. 18, 1984, abandoned.
This application Sep. 14, 1987, Ser. No. 97,310
Claims priority, application United Kingdom, Oct. 22, 1983, 8328295
Int. Cl.[4] F16F *15/30*
U.S. Cl. 74—572 **16 Claims**



1. A flywheel comprising a rim which is a substantially circular ring mounted on a central portion, the central portion comprising at least one substantially circular solid disc which is imperforate except for a central hole and which comprises three integrally formed annular portions, two of the portions being curved and being positioned on each side of the third annular portion, the radii of the curved portions being such that the diameter of the solid disc tends to increase with increasing rotational speed and the specific modulus of the solid disc being less than the specific modulus of the rim.

4,821,600

LINEAR ACTUATOR TAKE-OFF AND RELEASE APPARATUS

Edward E. Griffiths, 3200 Polaris St., Suite 23, Las Vegas, Nev. 89102

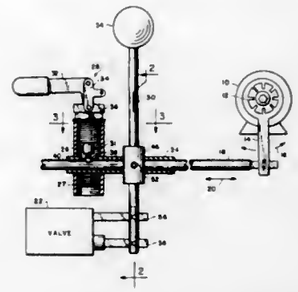
Filed Jan. 29, 1985, Ser. No. 696,120
Int. Cl.[4] F16K *31/05;* G05G *9/00, 5/06*
U.S. Cl. 74—625 **4 Claims**

1. A mechanism for effecting the coupling and release of control apparatus from a linearly moveable actuator shaft, said mechanism comprising:

a tubular shaft housing slidably supported on the external surface of the linearly moveable actuator shaft;

actuator take-off means adjustable along said shaft housing, said take-off means being attachable to the control apparatus for actuating said apparatus in accordance with the movement of said actuator shaft;

locking means connected to said shaft housing for securing said housing to and releasing said housing from a precise predetermined point along said moveable actuator shaft, said locking means including a tubular member having a threaded bore and a diametric hole for accommodating said shaft housing, said housing being locked into a predetermined position in said tubular member by a set screw



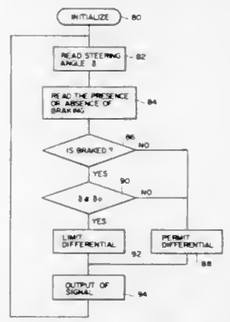
threaded into the bore of the first end of said member, the second end of said member supporting locking mechanism having a shaft axially extendible in the bore of said member and through an opening in the surface of said shaft housing to foreceably contact sad predetermined point on said actuator shaft.

4,821,601

DIFFERENTIAL CONTROLLING DEVICE FOR DIFFERENTIAL GEAR

Mitsuyuki Ouchi, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 5, 1987, Ser. No. 81,727
Claims priority, application Japan, Aug. 5, 1986, 119409[U]
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—71 **7 Claims**



1. A differential controlling device for controlling a rotational speed differential generated to shafts respectively connected to a pair of side gears in cooperation with a differential case, a plurality of pinions and the pair of side gears respectively disposed in said differential case, in a differential gear capable of being limited with limiting means, comprising:

means for operating said limiting means;

a sensor for detecting a braking condition of a vehicle;

a sensor for detecting the steering angle; and

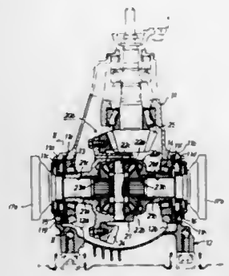
a controller for receiving signals from both sensors and controlling said operating means to limit the rotational speed differential generated from said differential speed differential generated from said differential gear when the vehicle is braked and turned with a steering angle exceeding a predetermined value.

4,821,602

SUPPORT STRUCTURE OF DIFFERENTIAL GEAR UNIT

Yasuyoshi Yasui, and Tatsuji Suganuma, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 3, 1987, Ser. No. 116,176
Claims priority, application Japan, Nov. 4, 1986, 61-169300[U]
Int. Cl.[4] F16H *1/40*
U.S. Cl. 74—713 **5 Claims**



1. A support structure of a differential gear unit assembled in a trans-axle casing having a pair of axially spaced carrier portions and an open end closed by a removable cover member secured thereto, an outer case of said gear unit having a pair of side journals rotatable supported by a pair of tapered roller bearings which are removably coupled within respective cylindrical bores in the carrier portions of said trans-axle casing,

wherein the cylindrical bores in said carrier portions each are formed with an annular groove which is located in a predetermined position where an outer race of each of said bearings extends axially to interfere with said grooves, said carrier portions each being formed therein with a radial slit which extends inwardly from an upright seating face of said trans-axle casing and opens into said annular groove, and wherein a shim plate of substantially rectangular shape is inserted into each of said carrier portions through said radial slit and engaged at a semi-circular inner end thereof with said annular groove to retain each of said bearings in place by engagement therewith, said shim plate being formed at a central portion thereof with an opening which is arranged coaxially with the outer race of said bearing and being formed in a predetermined length to be retained in place by engagement with said cover member at an outer end thereof when it has been fully engaged at the inner end thereof with said annular groove.

4,821,603

TORQUE-APPORTIONING DIFFERENTIAL MECHANISM FOR MOTOR VEHICLES

Peter J. Russell, Lichfield, England, assignor to Knight-Mechadyne Limited, Kirtlington, England

PCT No. PCT/GB86/00462, § 371 Date May 6, 1987, § 102(e) Date May 6, 1987, PCT Pub. No. WO87/00900, PCT Pub. Date Feb. 12, 1987
PCT Filed Jul. 31, 1986, Ser. No. 71,227
Claims priority, application United Kingdom, Jul. 31, 1985, 8519286
Int. Cl.[4] F16H *1/38*
U.S. Cl. 74—715 **3 Claims**

1. A limited slip differential mechanism for apportioning input torque applied to the mechanism between first and sec-

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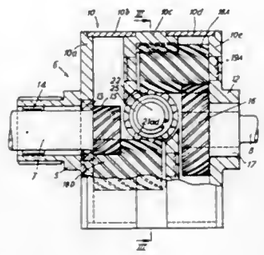
ond output gears, said mechanism comprising a gear carrier mountable for rotation about an axis of the carrier;

a pair of diametrically opposed first worm members mounted for rotation relative to the carrier with their axes parallel to the carrier axis;

a pair of diametrically opposed second worm members mounted for rotation relative to the carrier with their axes parallel to the carrier axis;

a first output gear wheel coaxial with said carrier axis and meshing with said first worm members;

a second output gear wheel coaxial with said carrier and meshing with said second worm members;



a pair of idler worm wheels each mounted for rotation relative to the carrier about an axis extending substantially perpendicular to the carrier axis;

each of said first worm members being individually coupled to a single one of said second worm members by a respective one of said idler worm wheels thereby establishing a drive path from one output gear to said other output gear, the pitch circle diameters of the mesh between said output gears and respective ones of said first and second worm members being unequal and the axes of said idler worm wheels being parallel to but offset from each other.

4,821,604

FOUR-WHEEL DRIVE SYSTEM

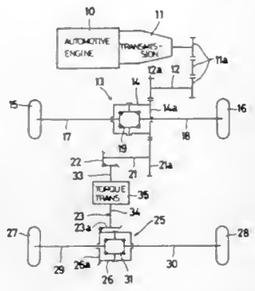
Hiroaki Asano, Okazaki, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 5, 1987, Ser. No. 58,868

Claims priority, application Japan, Jun. 6, 1986, 61-132201

Int. Cl.[4] F16H *47/00, 1/44*

U.S. Cl. 74—718 **6 Claims**



1. A four-wheel drive system having a torque transmission device between front wheels and rear wheels of a vehicle, said torque transmission device comprising:

a stationary casing secured to a frame of said vehicle;

an oil pump positioned in said casing and mechanically connected to be actuated by the relative rotations of a first rotating shaft connected to the front wheels and a second rotating shaft connected to the rear wheels for discharging pressure oil;

a hydraulic clutch mounted in said casing, interposed between said first and second rotating shafts and having a cylinder chamber communicating with a discharge passage of said oil pump for selectively transmitting rotational power from one of said first and second rotating shafts to the other rotating shaft, the transmitted rotational power depending on the pressure of oil admitted in said cylinder chamber;

an electromagnetic throttle valve fluidically connected to said discharge passage and having a solenoid for varying a throttle opening thereof in response to an electric current applied to said solenoid so as to control the pressure of oil admitted in said cylinder chamber;

a speed sensor for detecting a traveling speed of said vehicle;

a steering angle sensor for detecting a rotational angle of a steering wheel of said vehicle; and

control means electrically connected to said speed sensor, said steering angle sensor and said solenoid of said electromagnetic throttle valve for applying to said solenoid an electric current depending on signals from said speed sensor and said steering angle sensor so as to vary the throttle opening of said electromagnetic throttle valve wherein said oil pump and said hydraulic clutch are mounted on facing end portions of said first and second rotating shafts, respectively, in tandem fashion.

4,821,605

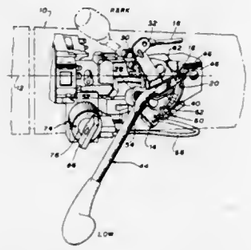
TRANSMISSION SHIFT CONTROL ASSEMBLY

Donald L. Dzioba, Midland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 3, 1988, Ser. No. 189,856

Int. Cl.[4] E05B *65/12*

U.S. Cl. 74—850 **3 Claims**



1. A transmission shift control assembly mounted on a steering column having a longitudinal axis comprising: bracket means secured to said steering column; transmission shift cable means having a portion secured to said bracket means and a portion linearly movable relative to said secured portion; mounting means on said bracket cable drive arm means having an axis and being rotatably mounted on said rotary axis on said mounting means oblique to said longitudinal axis and including a cable connecting portion secured to said movable portion of said cable means and lever mounting means adjacent said mounting means; operator control means including lever means, pin means for pivotally mounting said lever means on said lever mounting means on an axis substantially perpendicular to said rotary axis and positioning arm means formed on said lever means and extending from said pin means; detent gate means disposed on said bracket means in position to abut said positioning arm means for limiting the extent of pivotal movement of said lever means, said detent gate means including a gear select detent plate means for engaging said positioning arm means at one pivotal extent for establishing operating positions in a transmission; and spring means for urging said positioning arm into said detent gate means, said lever means being disposed for manipulation by an operator for pivoting said operator control means on said pin means and for rotating said operator control means and said cable drive arm means for selectively positioning said shift cable means to control the transmission at the operating position established by said detent plate means.

4,821,606

ARRANGEMENT FOR AUTOMATICALLY SHIFTING VEHICLE AGGREGATES OF A MOTOR VEHICLE

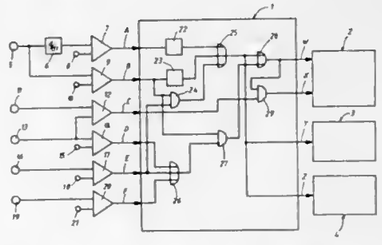
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,432

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627549

Int. Cl.[4] B60K *43/00*

U.S. Cl. 74—866 **17 Claims**



1. An arrangement for the automatic shifting of vehicle aggregates for the adaptation to different driving manners of drivers of motor vehicles, including a wheel slip control means for selecting permissible wheel slip settings between "select low" and "select high", and between different slippage thresholds, wherein a logic circuit means includes input means for receiving the following input signals:

signal A, indicating that a given value of an actuating velocity of a vehicle drive pedal was exceeded;

signal B, indicating that a full load position of the vehicle drive pedal was reached;

signal C, indicating that a value of a vehicle cross-acceleration calculated from a vehicle steering angle and driving speed is higher than a measured value;

signal E, indicating that a given value of the steering angle has been exceeded; and

wherein said logic circuit means generates from at least one of these input signals, at least one of the following output signals:

signal W, for the shifting of the wheel slip control system from the "select low" to the "select high" operation;

signal X, for the shifting of the wheel slip control system from a lower to a higher slippage threshold; and

wherein said logic control means generates signal W whenever either signal A or signal B exceeds an integrated value, or when signals B and E both appear, and wherein said logic control means generates signal X when signal W and signal C appear at the same time.

4,821,607

SHIFT ACTUATOR IN AUTOMATIC SHIFT MECHANISM OF GEARED TRANSMISSIONS

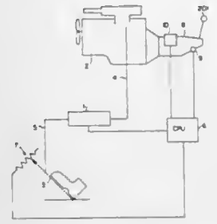
Shunichi Kawai, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 17, 1987, Ser. No. 134,192

Claims priority, application Japan, Dec. 18, 1986, 61-300157

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—866 **29 Claims**



1. A shift actuator in an automatic shift mechanism of a geared transmission for an automotive vehicle, comprising:

a casing;

a shift member including a shift rod arranged in the casing so as to slide freely in opposite axially directions and being connected with a distal end of a lever coupled to a fork shaft for actuating the fork shaft by sliding in either of the opposite axial direction, thereby effecting a gear shift, the lever having a distal end portion pivotally supported on a head provided on said shift rod and a base portion fixed to one end of a shaft arranged to be rockable about its axis in the casing, a further lever engaged with the fork shaft being attached to the other end of said shaft;

actuating means connected to said shift member for urging said shift member in either of said directions by fluid pressure; and

control means for switching the fluid pressure.

4,821,608

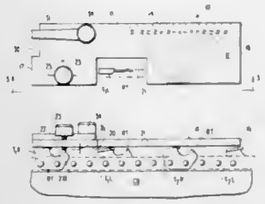
CHAIN SAW SHARPENING GUIDE

Garrett W. Reed, 18 Quick Rd., Elkview, W. Va. 25071

Filed Apr. 4, 1988, Ser. No. 176,978

Int. Cl.[4] B23D *63/16*

U.S. Cl. 76—36 **4 Claims**



1. A chain saw sharpening gauge for chains having cutting teeth preceeded by gauge teeth, and alternating on each side of the chain, comprising,

an elongated flat metal plate body member having a thickness of about $\frac{1}{8}$" to about $\frac{1}{4}$",

said elongated flat metal plate body member having a length sufficient to span the distance between at least three consecutive saw teeth on a chain saw,

said elongated flat metal plate body member having a notch formed on one side thereof to permit said elongated flat metal plate body member to engage on two consecutive

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teeth on the same side of said chain saw and the intervening tooth on the opposite side to project upwardly into said notch, and

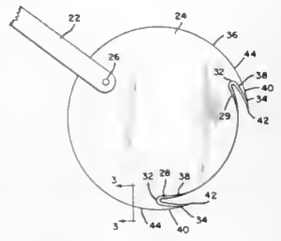
a calibrated screw threadably engaged in a threaded bore passing through said plate, said calibrated screw passing through said plate to engage said gauge tooth, calibration markings uniformly dispersed around said threaded bore on said upper surface to provide an indication, of the distance said calibrated screw projects below the lower surface of said flat metal plate body member and into engagement with said raker tooth with said flat metal plate body member engaged with said two consecutive teeth on the same side of said chain.

4,821,609

SHINGLE CUTTING TOOL

Stanley E. Rushbrook, Germantown, and Tommy M. Scott, Adamstown, both of Md., assignors to Stanley E. Rushbrook, Gaithersburg, Md.

Filed Aug. 20, 1987, Ser. No. 87,222
Int. Cl.[4] B25B *00/00*
U.S. Cl. 81—45 **11 Claims**



1. A shingle cutting tool comprising:

(a) cutting body means including convexly curved guide surface means for permitting rocking movements of the cutting tool relative to a roof surface to pry up roof shingles while the guide surface means is in contact with a roof surface, the guide surface means adapted to slide along the surface of a shingled roof, the cutting body means including at least one V-shaped cutting notch having an apex extending inwardly of the body means and positioned adjacent to the guide surface means to define with the guide surface means a substantially V-shaped lifting lip the lifting lip including a convexly curved outer edge; and

(b) handle means defining a handle axis and connected to and extending from the body means to define an acute angle with the guide surface means and to permit movement of the cutting body means along the surface of a shingled roof while the user is in an upright position to sever portions of the shingles from a roof by causing the shingles to enter the cutting notch.

4,821,610

SELF-LOCKING CLAMPING TOOL WITH SWIVEL JAWS

John W. Redmon, Jr., Huntsville, Ala., and Fred Jankowski, Titusville, Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 20, 1987, Ser. No. 87,370
Int. Cl.[4] B25B *7/14*
U.S. Cl. 81—322 **8 Claims**

1. A clamping tool comprising:

a first member having a rear handle portion and a forward jaw portion;

a second member having a rear handle portion and a forward jaw portion;

said first and second members being pivotally connected to each other intermediate their ends whereby the handle portion of said first member is above the handle portion of said second member and the jaw portion of said second member is above the jaw portion of said first member so as to have a plier action;

a pair of opposing swivel jaw members;

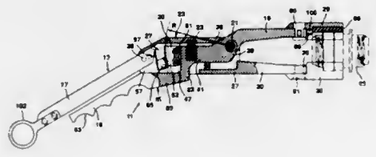
one of said swivel jaw members rotatively mounted to the end of the jaw portion of said first member, and the other of said swivel members rotatably mounted to the end of the jaw portion of said second member whereby pivoting the handle portions away from each other will pivotally open the opposing swivel jaw members for grasping an object and whereby pivoting the handle portions toward each other will close the opposing jaw members to grasp an object;

said first and second members may rotate relative to said opposing swivel jaw members along an arc to best position said first and second members for operation by an user;

a locking means that permits said first and second members to pivotally close its jaw members as desired on an object to be grasped and locks said jaws members so as not to release an object grasped;

said first member having a housing structure between its handle portion sand its jaw portion;

said housing structure having a two opposing side plates, an upper plate, and a lower plate that extends to form the jaw portion;



said housing structure forming a tunnel through which said second member extends;

said second member having a short angled portion joining its jaw portion and extending within said housing and joined to said angled portion;

said short member extending within said housing having a drop extension which joins with a rear extending member orientated singularly to the short member but at a lower level from which the handle portion of said second member extends;

said first member having a fastener extending between the opposing side plates and through the short angled portion of said second member to permit said first and second members to pivot in a plier action;

said locking means including a ratchet gear secured to the short member of said second member and a pawl pick secured to a shaft extending between said two opposing plates of said first member, said pawl pack selectively engaging the teeth of said ratchet gear as said first and second members are pivotally closed members in the opposite direction;

a spring means biasing said pawl pick into engagement with said ratchet gear;

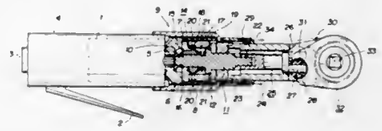
a release means for rotating said shaft extending between said two opposing plates so as to cause the pawl pick to rotate against said spring means and to disengage from said ratchet gear thereby permitting said first and second members to pivotally open from a closed position.

4,821,611

TIGHTENING DEVICE

Osamu Izumisawa, Nagano, Japan, assignor to Sbinano Pneumatic Industries Inc., Nagano, Japan

Filed Apr. 15, 1987, Ser. No. 38,674
Claims priority, application Japan, Apr. 16, 1986, 61-85986
Int. Cl.[4] B25B *19/00*
U.S. Cl. 81—464 **20 Claims**



1. A tool for tightening or loosening structural members, such as, for example, bolts, nuts, and the like, comprising:

rotatable means operatively connectable to one of said structural members for rotatably tightening or loosening said one of said structural members;

oscillating ratchet means operatively connected to said rotatable means for causing rotatable movement of said rotatable means in a predetermined rotational direction;

rotatable impact drive means for driving said oscillating ratchet means;

means interconnecting said rotatable impact drive means and said oscillating ratchet means for converting rotatable drive movement of said rotatable impact drive means into oscillating drive movement for said oscillating ratchet means;

a casing for housing a first proximal end of said impact drive means;

an air motor operatively connected to said first proximal end of said impact drive means;

a housing for enclosing a second distal end of said impact drive means;

a connecting member interconnecting said casing and said housing;

a first exhaust passage defined within said casing for exhausting exhaust air from said air motor toward said connecting member and said housing; and

a second exhaust passage defined within said connecting member for exhausting said exhaust air from said first exhaust passage toward said means interconnecting said rotatable impact drive means and said oscillating ratchet means for cooling said means interconnecting said rotatable impact drive means and said oscillating means within which frictional heat is generated as a result of operative movement thereof during conversion of said rotatable drive movement of said rotatable impact drive means into said oscillating drive movement of said oscillating ratchet means.

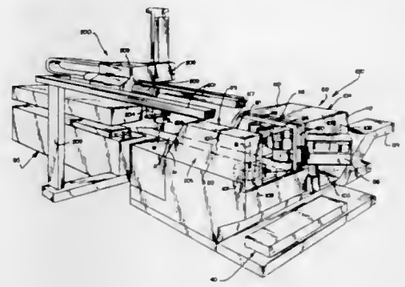
4,821,612

METHOD FOR MACHINING WORKPIECES

Carl J. Myers, Mentor, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Division of Ser. No. 927,758, Nov. 6, 1986, Pat. No. 4,741,232.
This application Jan. 25, 1988, Ser. No. 147,736
Int. Cl.[4] B23B *1/00, 7/16, 15/00*
U.S. Cl. 82—1.11 **3 Claims**

1. A method of machining workpieces, said method comprising the steps of moving a workpiece (W) from a first location (**30**) disposed on a first side of a machine tool (**100**) to a chuck (**101**) disposed in the machine tool, said step of moving the workpiece to the chuck including gripping the workpiece with a transfer structure (**204**) and moving the workpiece along a straight path (A), said method further including gripping the workpiece with the chuck, machining the workpiece while it is gripped by the chuck, thereafter, moving the workpiece (W) from the chuck (**101**) to a second location (**40**) disposed on a second side of the machine tool opposite from the first side, said step of moving the workpiece from the chuck to the second location includes gripping the workpiece with the transfer structure and continuing the movement of the workpiece along the straight path, said method being characterized by said steps of moving the workpiece (W) to the chuck (**101**) and moving the workpiece from the chuck further including opening a door (**116**) to unblock an opening (**117**) which extends across the top (**106**, **107**) and down opposite sides (**108**, **109** and **110**, **111**) of a housing (**102**) which encloses the chuck, moving the transfer structure (**204**) along the straight path (A) from the first location (**30**) through the portion of the opening (**117**) which extends down the one side (**108**,**109**) of the housing, through the portion of the opening which extends across the top (**106**, **107**) of the housing, and through the portion of the opening (**117**) which extends down the opposite side (**108**, **109**) of the housing to the second location (**40**).

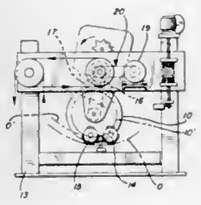


4,821,613

METHOD AND APPARATUS FOR LOG SAW BLADE SHARPENING

James E. Hertel, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jun. 19, 1987, Ser. No. 64,136
Int. Cl.[4] B26D *7/12*
U.S. Cl. 83—13 **4 Claims**



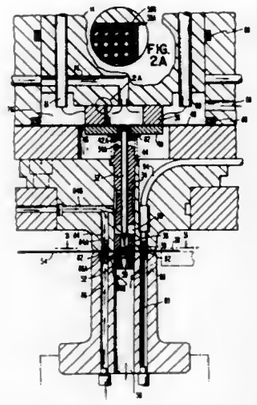
1. In a method of operating an orbiting, rotating disc blade for sawing logs of wound web material, the steps of engaging said blade with a sharpening stone at one portion of an orbit and changing the speed of rotation of said blade to avoid sharpening at the natural frequency of vibration of said blade.

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4,821,614
PROGRAMMABLE MAGNETIC REPULSION PUNCHING APPARATUS

Russell W. Fleet, Walden; David C. Long; Karl F. Stroms, both of Wappingers Falls, and Gerhard Weiss, LaGrangeville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 837,933, Mar. 10, 1986, abandoned. This application Jan. 6, 1988, Ser. No. 140,971
Int. Cl.[4] B26D *7/18, 5/08*
U.S. Cl. 83—100 28 Claims



1. A programmable punch apparatus for punching hole patterns in thin sheet material including a frame, and a punch element mounted on said frame for rectilinear movement, comprising:

a punch element;

a collar element directly mounted on said punch element;

a substantially planar element of highly conductive material directly mounted on said collar element normal to the direction of movement, wherein the diameter of said planar element is substantially greater than the diameter of said collar;

a planar coil fixedly mounted on said frame of said punch apparatus coaxially with said punch element and adjacent to said planar element,

carriage means for positioning a thin sheet of material to be punched in the path of said punch element, and moving said sheet material in directions transverse to the axis of said punch element,

means for energizing said coil with a pulse of electrical energy for generating flux linking said conductive planar element to repel said planar element from said coil,

a means to rebound said punch element, at least a part of which is affixed to said punch element,

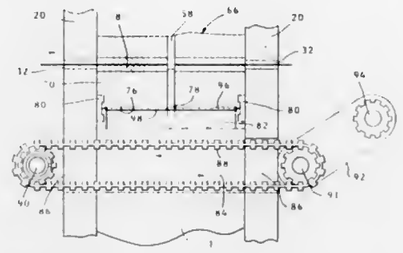
programmable means to selectively move said carriage means to specifically locate said sheet relative to said punch element, and activate said means for energizing said coil to thereby produce a predetermined punched hole pattern in said sheet.

4,821,615
SLUG RETAINER FOR THE DIE ASSEMBLY OF A STAMPING AND FORMING MACHINE

Johannes C. W. Bakermans, Harrisburg, and Abdollah Owzar, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 24, 1988, Ser. No. 160,060
Int. Cl.[4] B26D *5/20, 7/06;* B26F *1/14*
U.S. Cl. 83—147 17 Claims

1. A stamping machine having a punch assembly and a die assembly, the punch assembly and die assembly being in horizontal opposed confronting relationship and being reciprocable relatively towards and away from each other, strip feeding means for intermittently feeding strip material, which is in a vertical plane, along a strip feed path which extends between the punch assembly and the die assembly, the die assembly having a die opening therein which receives a punch carried by the punch assembly whereby, during each operating cycle, a slug is punched from the material and is pushed by the punch into the die opening, the die assembly having a slug receiving cavity therein which is spaced from the die opening and having a slug passageway extending from the die opening to a slug outlet which communicates with the slug receiving cavity so that slugs produced during continuous operation of the machine are stacked in, and pushed through, the passageway and into the slug receiving cavity, the die assembly comprising a removable portion and a fixed portion, the die opening and the



passageway being in the removable portion, the slug receiving cavity being in the fixed portion, the stamping machine being characterized in that:

a primary slug retaining means is provided at the slug outlet for preventing spillage of slugs from the slug passageway, the primary retaining means being on the removable portion of the die assembly adjacent to the slug outlet and extending partially across the slug outlet, the primary retaining means being resiliently deformable during movement of the stack of slugs through the slug passageway thereby to permit the endmost slug of the stack to pass from the slug outlet, the primary retaining means being effective to retain the endmost slug in the stack during periods of non-operation of the machine whereby,

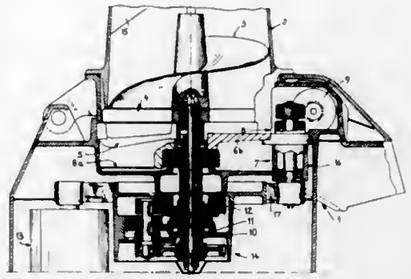
the removable portion of the die assembly can be removed from the machine without spillage of slugs.

4,821,616
MACHINE FOR CUTTING FOOD PRODUCTS SUCH AS IN PARTICULAR VEGETABLES

Marcel Mayeux, Felletin; Christian Lallier, and Joel Musseau, both of Aubusson, all of France, assignors to DITO - SAMA, Aubusson, France

Filed Oct. 13, 1987, Ser. No. 107,641
Claims priority, application France, Oct. 15, 1986, 86 14325
Int. Cl.[4] B26D *5/22, 7/06*
U.S. Cl. 83—355 14 Claims

1. A machine for cutting food products such as in particular vegetables, comprising a frame, a hopper for charging the products carried by the frame, a cutting plate, an ejection plate for ejecting the cut products and disposed below the cutting plate, and driving means for driving in rotation the cutting plate and the ejection plate, said ejection plate being driven in

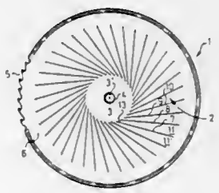


rotation in a direction opposed to the direction of rotation of the cutting plate.

4,821,617
CUTTING OR RIPPING BLADE

Frans G. W. Fjelkner, and Bo W. Fjelkner, both of Stierncornas väg 11, 161 53 Bromma, Sweden

Continuation of Ser. No. 829,136, Dec. 31, 1985, abandoned. This application Aug. 27, 1987, Ser. No. 91,296
Claims priority, application Sweden, May 3, 1984, 8402383
Int. Cl.[4] B27B *33/08*
U.S. Cl. 83—835 5 Claims



1. A cutting blade comprising a disc for rotation and having attachment means arranged in a center of rotation and provided around its periphery with teeth or like elements, said disc has provided therein slots arranged so as to form between mutually adjacent slots disc-material sections wherein;

(a) the slots extend from a point located substantially adjacent a peripheral edge of the disc in a direction toward the center of the disc said slots being oriented substantially tangentially to a zone defined concentrically to said center;

(b) the respective disc-material sections located between said slots converge toward the center of the disc and define said zone concentrically adjacent said center, said material section absorbing substantially all of tensile and compressive forces generated during high load operation;

(c) said zone provided, upon occurrence of said high load, to take-up elastically substantially all changes in shape occurring primarily in the peripheral edge of the disc substantially without permanent shape deformation;

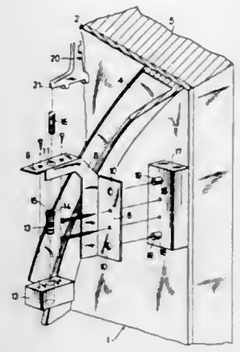
(d) the disc material section separated from an adjacent material section by said slot having a width substantially in the range of 0.2–0.4 mm; and

(e) each of the zones, one for each material section defines a portion of a circle concentric with respect to the center of the disc.

4,821,618
ACTION-SUPPORTING ARRANGEMENT IN PIANO

Shinsaku Koizumi, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Continuation-in-part of Ser. No. 920,504, Oct. 17, 1986, abandoned, Continuation of Ser. No. 635,296, Jul. 27, 1984, abandoned. This application Oct. 23, 1987, Ser. No. 112,724
Int. Cl.[4] G01C *3/18*
U.S. Cl. 84—250 3 Claims



1. In an action supporting arrangement for a piano, said piano having a back structure including laterally spaced vertically arranged backposts formed from a sound absorbent material, a sound board supported by the back structure, a string supporting metal frame secured to and carried by said back structure, strings carried by said metal frame, and a bridge interposed between said strings and said sound board for transmitting vibrations of said strings to said sound board, the improvement comprising:

a support bracket attached to a front surface of each of said back posts in a position spaced laterally from said metal frame;

an action mechanism including hammers carried directly by said support brackets; and

adjustment means interposed between said brackets and said action mechanism for effecting accurately controllable positioning of said action mechanism relative to said strings;

whereby said action mechanism is effectively isolated from said metal frame and said strings by the interposed back posts of said piano, and vibrations produced in said action mechanism are absorbed in said back posts.

4,821,619
KEY SIGNATURE ACTUATOR FOR A MUSICAL KEYBOARD

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806

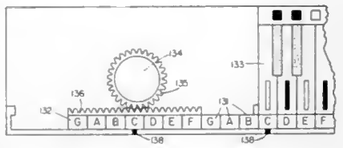
Continuation-in-part of Ser. No. 921,407, Oct. 22, 1986, Pat. No. 4,750,399, which is a continuation-in-part of Ser. No. 736,701, May 22, 1985, Pat. No. 4,640,173. This application Mar. 10, 1988, Ser. No. 166,464
Int. Cl.[4] G09B *15/02;* G10B *3/20;* G10G *1/04*
U.S. Cl. 84—448 6 Claims

2. An improved keyboard display for orienting a player on a musical keyboard, the keyboard having at least fourteen front digitals and at least ten back digitals arranged in a single sequence, any twelve consecutive digitals of the sequence occupying a constant distance of an octave span along the keyboard, each octave span containing exactly seven front digitals and exactly five back digitals, the improvement comprising:

a display of seven different letter labels arranged in a line along the front of the keyboard, one of the labels aligned

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with each of seven consecutive front digital of the keyboard,



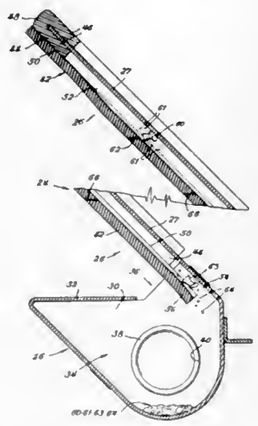
means for bodily moving the display of letter labels to a succession of seven discrete positions along the keyboard, the distance between any two consecutive positions of the succession being equal to one seventh of an octave span.

4,821,620

BULLET TRAP WITH ANTI-SPLATTER SAFETY SCREEN

Larry A. Cartee, and Harry A. Barot, both of Schaumburg, Ill., assignors to Detroit Armor Corporation, Schaumburg, Ill.

Filed Jan. 14, 1988, Ser. No. 144,320
Int. Cl.[4] F41J *1/00*; F41H *5/04*
U.S. Cl. 89—36.02 **15 Claims**



1. An anti-splatter safety screen apparatus for installation on a bullet trap for trapping deformable bullets which strike one face of a deflector plate and fragments and particulate caused by the impact of bullets with the plate, comprising;

(a) a screen of a rubber-like material adapted for self-closing when penetrated by bullets,

(b) means for securing said screen in spaced relation to said one face of the deflector plate to provide a confined space between the screen and the face sufficient to allow bullets to completely penetrate the screen, whereby all spent bullets which strike said face, and all fragments and particulate from spent bullets, are contained within the space and move through the space without restriction,

(c) a bullet trap well associated with said deflector plate and arranged to catch and retain all spent bullets, fragments and particulate from said space, and

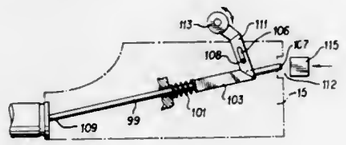
(d) means for removing spent bullets, fragments and particulate from said bullet trap well.

4,821,621

MULTIPURPOSE REPEATING FIREARM HAVING ALTERNATE FIRING MECHANISMS

Carmelo Lorenzo, Bronx, N.Y., assignor to Car-Lin Inc., Bronx, N.Y.

Filed Nov. 20, 1986, Ser. No. 932,564
Int. Cl.[4] F41D *11/02*
U.S. Cl. 89—143 **41 Claims**



1. A firearm comprising:

a reciprocal sliding bolt;

a housing comprising an interior open area, a firing chamber for holding a bullet for firing and positioned at one end of said open area, said open area having a portion thereof configured to guide a reciprocal path of movement of said sliding bolt forward towards said firing chamber and rearwardly away from said firing chamber, said sliding bolt loading a bullet into said firing chamber during said forward movement;

a firing mechanism comprising a firing pin, first means for normally retractably biasing said firing pin within said sliding bolt during rearward and at least a substantial position of forward movement of said sliding bolt, and means for extending said firing pin from said housing to strike a rear of a bullet within said firing chamber, said means for extending comprising:

a first member carried on said sliding bolt which is coupled to move said firing pin, a member supported by said housing and engaging with said first member at the termination of forward movement of said sliding bolt such that upon such engagement said first member moves to cause said firing pin to extend to fire a bullet, means for selectively moving said member supported by said housing to a first position where it is engageable with said first member and to a second position where it is not engageable with said first member, and a pivotal hammer having a rotation shaft fixed to a portion of said housing, said hammer being rotatable to a position for striking an end of said firing pin projecting from a rear side of said sliding bolt when said sliding bolt is at the termination of its forward movement to cause said firing pin to extend from said sliding bolt, whereby a bullet can be fired either by the engagement of said first member with said selectively movable member supported to said housing or by said hammer striking said end of said firing pin; and,

second biasing means for biasing said sliding bolt forward toward said forward chamber.

4,821,622

EXTENSION AND RETRACTION SEQUENCING CIRCUIT

Ronnie F. Burk, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Dec. 22, 1986, Ser. No. 945,279
Int. Cl.[4] F15B *13/04*
U.S. Cl. 91—29 **8 Claims**

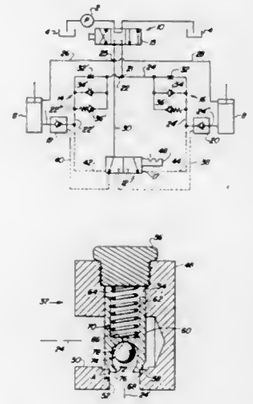
1. A multifunction valve comprising:

a valve body having first and second intersecting bores, said first bore being closed at one end, said second bore being a stepped bore closed at the end of the large diameter section, the step portion providing a valve seat about the periphery of the small diameter section;

a valve spool slidably disposed within and engaging the walls of said large diameter bore section, having a valve face for sealingly contacting said valve seat;

means for biasing said spool toward said valve seat;

a flow limiting orifice passage communicating said first bore with the large diameter section of said second bore;



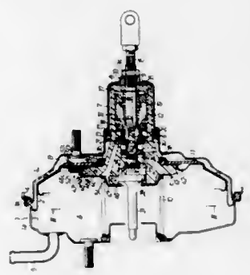
a check valve passage communicating both sections of said stepped bore on opposite sides of said spool, said check valve passage having a check element for blocking fluid flow from said small section to said large section.

4,821,623

VACUUM TYPE BOOSTER

Takayoshi Shinohara, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Dec. 22, 1987, Ser. No. 137,297
Claims priority, application Japan, Jan. 6, 1987, 62-516[U]; Jan. 6, 1987, 62-520[U]
Int. Cl.[4] F15B *9/10*; F01B *29/00*
U.S. Cl. 91—376 R **19 Claims**





1. A vacuum type booster comprising

a booster shell,

a booster piston accommodated in an interior of said booster shell so as to be reciprocatively movable forwardly and rearwardly and dividing the interior of the booster shell into a first working chamber leading to a vacuum source and a second working chamber adapted to be selectively communicated with said first working chamber and the atmosphere via a control valve,

a valve sleeve for said control valve, said valve sleeve being fitted into a valve sleeve fitting hole provided in a central area of the booster piston and having a disengagement preventive flange which is superposed on a fore surface of the booster piston facing said first working chamber, and

a clamp plate placed in resilient engagement with a plurality of engagement pawls which are formed by cutting portions of the booster piston and bending said portions for clamping said disengagement preventive flange in cooperation with the booster piston, the engagement of the clamp plate with the pawls being obtained by turning the clamp plate around a center line of the disengagement preventive flange,

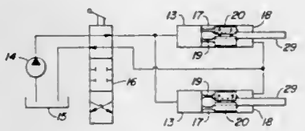
wherein the booster piston is provided with pairs of reinforcement ribs extending so as to cross the turning direction of the clamp plate, said reinforcement ribs in respective pairs being located to sandwich therebetween a cut-out hole which is provided in the booster piston as a result of cutting and bending formation of each of the engagement pawls, one pair of the reinforcement ribs being located on a rear side of the booster piston in the turning direction of the clamp plate and serving to permit the clamp plate to be turned in such a direction that the plate comes in engagement with the engagement pawls and prevent the clamp plate, after completion of such engagement, from being turned in a direction that the plate disengages from the pawls.

4,821,624

STROKE LIMITER FOR HYDRAULIC CYLINDER

James R. Smith, LaMotte, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 29, 1988, Ser. No. 161,868
Int. Cl.[4] F15B *15/22*
U.S. Cl. 91—401 **15 Claims**



1. A stroke limiter for limiting the piston stroke of a hydraulic cylinder comprising:

a first sleeve portion having a first engaging surface for engaging a piston rod, the first sleeve portion is provided with a first mounting assembly;

a second sleeve portion having a second engaging surface for engaging a piston rod, the second sleeve portion is provided with a second mounting assembly; and

at least one joining member for joining the first and second mounting assemblies for coupling the first and second sleeve portions to one another, whereby at least one of the sleeve portions is provided with a channel into which is slidably received a contacting means for contacting a poppet valve located on a piston.

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4,821,625

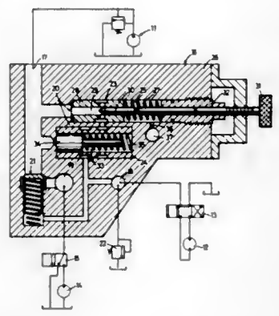
VALVE DEVICE FOR CONTROLLING THE DELIVERY OF PRESSURIZED LIQUID TO TWO SEPARATE HYDROSTATIC MOTORS

Jonas Sundberg, Fruängsgatan 49, S-126 65 Hägersten, Sweden

Continuation of Ser. No. 15,505, Feb. 9, 1987, abandoned, which is a continuation of Ser. No. 688,887, Jan. 4, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 145,748

Int. Cl.[4] **F15B** *13/06*

U.S. Cl. 91—516 **5 Claims**



1. A valve device for controlling the delivery of pressurized liquid to two separate hydrostatic motors from a common source of pressurized liquid which is variable in respect of pressure, comprising: an inlet port for connection to the source of pressurized liquid, two outlet ports for connection to respective ones of the motors, means defining flow paths between said inlet port and each of said outlet ports, and control valve means in said flow paths, said control valve means in said flow path between said inlet port and one of said motor connection ports including a volume flow regulator controlled by pressure to change volume flow rate in inverse proportion to the controlling pressure and having a control input which has a substantially zero pressure drop connection with the other of said motor connection ports, said volume flow regulator being biased by a spring balancing the pressure-control force up to a predetermined control pressure, said volume flow regulator comprising a first restrictor valve connected to said inlet port and controlled by the pressure therein, and a second restrictor valve connected to an outlet of said first restrictor valve and controlled by the pressure differential across said first restrictor valve, said first restrictor valve including a mechanically positionable first valve element and a second valve element displaceable relative to said first valve element by the control pressure against the action of a spring force.

4,821,626

PRESSOSTAT FOR PRESSURE SENSITIVE ACTIVATION

Guglielmo Rossi; Mario Gemma, both of Linkenheim, and Hans Bösing, Oftersheim, all of Fed. Rep. of Germany, assignors to Ranco Incorporated of Delaware, Dublin, Ohio

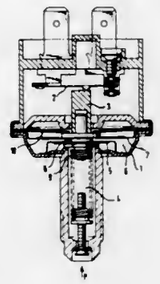
Filed Oct. 20, 1983, Ser. No. 543,925

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240231

Int. Cl.[4] **F01B** *19/00*; **F16J** *3/00*

U.S. Cl. 92—48 **5 Claims**

1. A pressostat comprising: a housing; an operating membrane connected to said housing to define, with said housing, an operating pressure chamber communicating with a source of operating pressure to be monitored, said operating membrane including a pressure surface acted upon by pressure in said operating chamber; a protective membrane connected to said housing to define, with said housing and said operating membrane, a protective chamber disposed adjacent said operating chamber with said protective membrane defining a second pressure surface acted upon by pressure in said protective chamber, said protective chamber sealed against communication with ambient atmospheric pressure and pressure in said operating chamber; a switch supported in fixed relation to said housing; an output member between said protective membrane and said switch for actuating said switch in response to limit pressure in said operating pressure chamber; an intermediate member between said membranes, said intermediate member fixedly connect ed to one of said pressure surfaces and abutting said other pressure surface for transmitting pressure forces from said operating chamber to said output member via said protective membrane while freely enabling movement of said membranes away from each other; first spring means for resil-



iently opposing movement of said output member by pressure force applied to either of said membranes; and second spring means for resiliently resisting movement of said operating membrane in response to operating pressure applied thereto in said operating chamber, said second spring means normally effective to resiliently resist operation of said switch by said operating membrane in response to pressure in said operating chamber and rendered ineffective to resiliently resist operation of said switch upon a failure of said pressostat resulting in fluid communication between said operating pressure chamber and said protective chamber so that said switch is actuated by fluid pressure force applied to said protective membrane in said protective chamber by a predetermined fluid pressure substantially less than said limit pressure when such failure occurs.

4,821,627

PISTON AND CYLINDER ASSEMBLY

Keith V. Leigh-Monstevens, 5622 Larkins Dr., Troy, Mich. 48098

Continuation-in-part of Ser. No. 58,781, Jun. 5, 1987. This application Oct. 23, 1987, Ser. No. 111,924

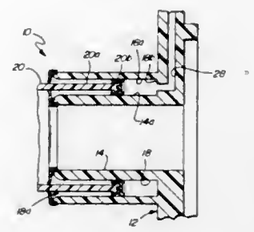
Int. Cl.[4] **F01B** *31/00*

U.S. Cl. 92—107 **15 Claims**

8. A piston and seal assembly comprising:

(A) an annular piston having an annular main body portion and a radially enlarged end portion presenting an enlarged annular end edge; and

(B) an annular elastomeric seal moldingly bonded to and moldingly encapsulating said enlarged annular end portion with the elastomeric material of the seal intimately conforming to and intimately moldingly bonded to said





enlarged annular end portion over the entire interface between said seal and said piston.

4,821,628

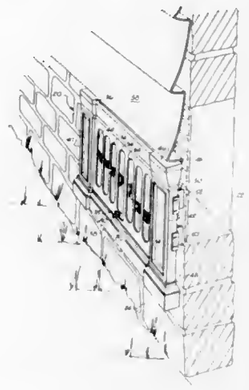
SHALLOW-PROFILE FOUNDATION VENTILATOR

Paul M. Sarazen, Jr., 214 Fairview Dr., and Dennis A. Beam, Jr., 410 Westfield Dr., both of Shelby, N.C. 28150

Filed Jan. 19, 1988, Ser. No. 145,627

Int. Cl.[4] **F24F** *7/00*

U.S. Cl. 98—29 **13 Claims**



1. A shallow-profile foundation ventilator for being installed into the installation opening of a foundation, the installation opening being defined by an installation opening surface, the ventilator comprising:

(a) a body;

(b) said body defining a front surface, a back surface, and further defining at least one vent opening extending therethrough;

(c) means for screening matter larger than a predetermined size from passing through each said vent opening;

(d) means for defining a depth dimension of said body, said depth dimension definition means being connected to said back surface of said body and extending generally normally from said back surface;

(e) means for securing the ventilator to the installation opening, said installation securing means having at least one installation member for extending into the installation opening, each said installation member extending beyond said depth dimension definition means and extending generally normally from said body;

(f) means for covering each said vent opening, said covering means including a flat cover plate dimensioned for covering each said vent opening;

(g) said cover plate defining a plurality of tear-drop shaped openings therethrough and disposed near the outer edge thereof;

(h) said body having a plurality of attachment pegs extending normally from said back surface of said body and disposed generally surrounding the portion of said body defining all of said vent openings, each said peg being disposed to coincide with one of said tear-drop openings of said cover plate; and

(i) said tear-drop openings of said cover plate engaging respective coincident ones of said attachment pegs to secure said cover plate to said body and against said back surface of said body and covering all of said vent openings.

4,821,629

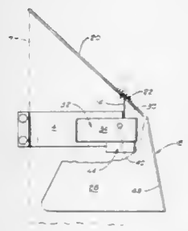
DYNAMICALLY BALANCED EXHAUST PIPE CAP

Jerom G. Davison, 3361 Stoneybrook, Oklahoma City, Okla. 73120, and Gerald E. Hollingshead, 7609 Northwest 34th St., Bethany, Okla. 73008

Filed May 4, 1988, Ser. No. 190,248

Int. Cl.[4] **F23L** *17/02*

U.S. Cl. 98—59 **6 Claims**



1. A protective closure cap for an exhaust pipe comprising:

an annular clamping band for extending around, and mounting the cap upon, an exhaust pipe;

hook means connected to the clamping band and projecting therefrom for hooking over the upper edge of an exhaust pipe around which the clamping band extends; and

a closure flap assembly pivotally connected to said annular clamping band for pivotation about a horizontal axis, said closure flap assembly comprising:

a closure plate of a size to fit across, and close by covering, the upper end of said exhaust pipe, said closure plate defining a carbon-relief indentation at a location aligned with said hook and adapted to bridge across the upper edge of said exhaust pipe when said clamping band is placed therearound and said hook is engaged with said upper edge of the exhaust pipe whereby exhaust gas from the exhaust pipe can bleed through said carbon-relief indentation sufficiently to avoid carbon build up on the upper edge of said exhaust pipe;

a pair of balancing plates connected to opposite sides of

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the closure plate and projecting downwardly on opposite sides of said clamping band;

a metallic stop element extending between said balancing plates;

axle means pivotally supporting the balancing plate on the clamping band for pivotation about a horizontal axis;

damping means dynamically and yieldingly cooperating with said closure flap assembly, and yieldingly resisting the pivotal movement of said balancing plates and closure plate about said horizontal axis to slow the opening and closing movement of said closure plate, and reduce the noise level of contact of the closure plate with the upper edge of the exhaust pipe upon closing; and

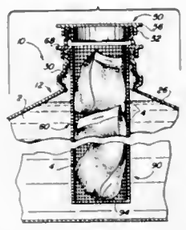
means arresting the upward pivoting movement of said closure plate.

4,821,630

SUN TEA ADAPTER FOR PLASTIC CARTONS

Robert E. Roberts, 2033 N. Sunset Dr., Apache Junction, Ariz. 85219

Filed Apr. 18, 1988, Ser. No. 182,410
Int. Cl.[4] A47J *31/18, 31/00*
U.S. Cl. 99—323 **11 Claims**



1. Sun tea apparatus, comprising, in combination:

container means for holding a quantity of water, and including a mouth portion of a first predetermined size; and

insert means extending into the container means and into the quantity of water through the mouth opening, including

cylinder means for containing a quantity of tea and having a plurality of apertures to allow for contact between the water and the tea and dimensioned to correspond to the first predetermined size to provide a self-wiping action as the insert means is removed from the container means, and

means for securing the cylinder means to the container means.

4,821,631

COOKING FOOD DEVICE

Henry Wong, and Pen Weichou, both of 3704 Emily St., Kensington, Md. 20895

Filed Apr. 20, 1988, Ser. No. 183,935
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—327 **18 Claims**

1. A food cooking device for cooking Oriental dishes, comprising:

(a) a base;

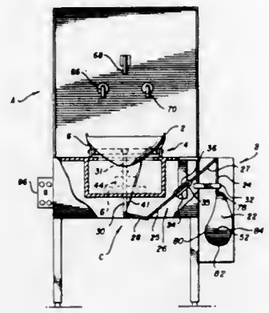
(b) cooking pan support means having front and rear portions;

(c) means for securing said support means to said base;

(d) means for securing the pan to said support means;

(e) acceleration and deceleration means for rapidly accelerating upwardly from a starting position at least said rear portion of said support means at an initial high velocity followed by a subsequent rapid upward deceleration to said rear portion of said support means;

(f) whereby when the cooking pan is positioned on said support means, it will move upwardly with said support means and propel food placed therein into the air upon rapid upward deceleration of said support means, thereby



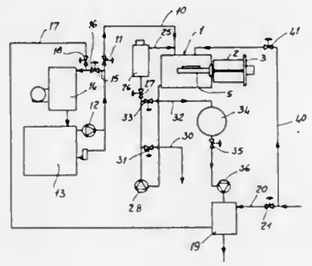
causing the food to be turned for uniform heating of different portions of the food.

4,821,632

APPARATUS FOR AUTOMATICALLY COOKING ALIMENTARY PASTA

Otello Bolzani, Via Mantova, 79, and Alcide Iotti, Via Torreggiani, 5, both of 43100 Parma, Italy

Filed Sep. 8, 1987, Ser. No. 94,340
Claims priority, application Italy, Sep. 10, 1986, 21664 A/86
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—330 **1 Claim**



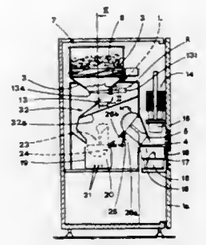
1. An apparatus for automatically cooking pasta, comprising a basin in which a pasta basket is removably housed, said pasta basket being rotatably supported by a cover adapted to be tightly engaged on a side of said basin, a duct for introducing hot water into said basin, said hot water introducing duct being controlled by a first valve arranged on a delivery side of a first pump drawing water from a boiler, a water recirculation duct connected to said delivery side of said first pump and controlled by a second valve for recirculating water between a kettle and said boiler, a further duct connected to said kettle and controlled by a third valve for supplying preheated water from a heat exchanger to said kettle and said boiler, an accumulating tank for introducing the water existing the basin into the heat exchanger, and a basin recirculating circuit consisting of a second pump and a further heat exchanger.

4,821,633

PERFECTED UNIT FOR THE PREPARATION OF A PORTION OF FRIED FOOD, AND FOR THE IMMEDIATE DISTRIBUTION OF THIS FOOD

Gilberto Ripatonda, via Quasimodo, 3/A Suzzara, Italy

Filed Sep. 25, 1987, Ser. No. 101,147
Claims priority, application Italy, Feb. 3, 1987, 3336 A/87; Jul. 1, 1987, 4909[U]
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—357 **3 Claims**



1. A perfected unit for the preparation of a portion of fried food, and for the immediate distribution of this portion comprising a parallelepiped-shaped housing, with at least one vertical panel that is hinged so as to turn in relation to a vertical axis, said housing supporting within it, respectively: a metal inner casing featuring an opening in its top part, and a window in a side with a door; a deep pan, located at the bottom of said inner casing, containing a mixture of oils that is kept at a preset temperature by means of a heat source; a first magazine for raw food, positioned above said inner casing, and fitted with a hopper below, that is located so as to close off said opening; positioned within said inner casing is; a diaphragm located above said deep pan and below said hopper to screen said hopper from greasy fumes given off by said mixture of heated oils; connected to said diaphragm is a means for guiding said raw food from said hopper to said deep pan; a second magazine for containers, located outside said inner casing, said containers being designed to be moved from said second magazine to a station located by a side of said opening accessible from outside said unit; second feed means for feeding a portion of said raw food from said first magazine to said deep pan; a mesh drainer able to receive said portion of food to be fried and subsequently to empty the fried food into said container located in said station; a purifier including an electrical heating element for burning said greasy fumes said purifier being located outside said inner casing, to which it is connected by ducting; and a suction means, having a suction mouth which is connected to said purifier, and having an outlet which passes outside said housing; said purifier and suction means preventing the greasy fumes from contaminating portion of the housing outside of the inner casing.

4,821,634

IN-LINE DOUGH LAMINATOR

Peter E. Swanson, Cloquet, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Mar. 16, 1988, Ser. No. 168,827
Int. Cl.[4] A21C *9/04*
U.S. Cl. 99—450.2 **3 Claims**



1. An in-line dough laminator for forming a dough web into a laminated dough web by lapping the dough web on itself, said laminator comprising:

a. frame means;

b. a first conveyer means having a feed end which is reciprocably mounted on said frame means, said conveyer means having a first movable belt with a longitudinal axis direction of belt movement;

c. a second conveyer means having a second movable belt with a longitudinal axis of belt movement generally parallel to said first belt direction of movement, said second belt having an upper belt run positioned under said feed end for a distance at least the length of said reciprocating movement, said upper belt run of said second conveyer means being at an angle A in the range of between about 10° and about 20° of the plane of movement of said feed end of said first conveyer means;

d. drive means operably connected to said first conveyer means and operable for reciprocating said feed end of said first conveyer means at a first extending speed and a second retracting speed; and

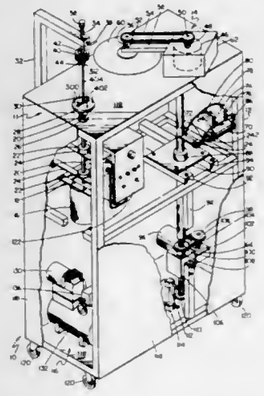
e. means for maintaining tension in said first belt during reciprocating motion of said feed end.

4,821,635

MEAT SLICING APPARATUS

James P. Logan, Jr., Rte. 4, Box 94D, Richmond, Tex. 77469

Continuation-in-part of Ser. No. 912,533, Sep. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 784,658, Oct. 5, 1985, abandoned. This application Oct. 9, 1987, Ser. No. 107,256
Int. Cl.[4] A23N *7/00;* **A47J** *17/00*
U.S. Cl. 99—538 **8 Claims**



1. An apparatus for spirally slicing meat, comprising:

(a) a meat holding means adapted to hold a ham or other cut of meat to be sliced, said holding means being adapted for rotating said meat, thereby defining a first rotational axis;

(b) a rotary means for rotating said meat holding means about said first rotational axis, said rotary means having a variable rotational rate and being capable of rotating in either a clockwise or counter-clockwise direction;

(c) a rotary slicing means for slicing said meat when in cutting engagement therewith;

(d) an electro-mechanical linear indexing means, interconnected to said rotary slicing means, for moving said rotary slicing means along a path substantially parallel to said first rotational axis, thereby defining a linear indexing axis, said linear indexing means being capable of rotation about said linear indexing axis, thereby pivoting said rotary slicing means selectively toward or away from said first

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rotational axis, the rate of movement of said linear indexing means being variable and independent of the rotational rate of said rotary means, thereby effecting a continuous spiral slice of selectable thickness through said meat when said rotary means is rotating said meat holder and said linear indexing means rotates to bring said rotary slicing means in cutting engagement with said meat, the independent variability of movement of said rotary means and said linear indexing means being such that a wide range slice thickness may be attained, while maintaining uniform slicing quality over range of different meats having different consistencies;

(e) a variable, pneumatic lateral indexing means, interconnected to said linear indexing means, for selectively rotating said linear indexing means, thereby pivoting said rotary slicing means into and out of cutting engagement with said meat, said lateral indexing means being independent of said linear indexing means and said rotary means, said lateral indexing means being designed such that rotational force exerted by said lateral indexing means upon said linear indexing means and thereby said rotary slicing means is selectively variable and uniform throughout the movement of said lateral indexing means, said rotational force exerted by said lateral indexing means being sufficient to bring said rotary slicing means into cutting engagement with said meat and readily permit said rotary slicing means to move reciprocally into and away from said first rotational axis in response to the position of bones within said meat, while maintaining cutting engagement with said meat, thereby decreasing meat spoilage due to bone chipping during slicing operations and facilitating the slicing operations by decreasing the amount of operator intervention necessary to overcome said rotational force exerted by said pneumatic lateral indexing means, thereby preventing chipping of bones within said meat and ensuring uniform slicing quality throughout the slicing process.

4,821,636

APPARATUS FOR LIFTING A BUNDLE OF CONDUCTORS OFF A SURFACE

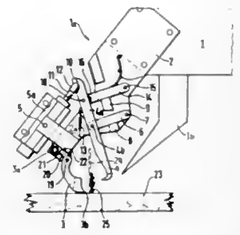
Siegfried Kraemer, Hamburg, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 21, 1987, Ser. No. 99,313

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1986, 3632239

Int. Cl.[4] H01R *43/00*; B65B *13/06*

U.S. Cl. 100—19 R 7 Claims



1. An apparatus for lifting a bundle of conductors off a surface and presenting the bundle to means for applying a cable binder to said lifted bundle of conductors, comprising a robot arm, a program controllable bundle lifting tool means supported by said robot arm for lifting and presenting said lifted bundle to a bundle binding tool for a binding operation, said apparatus further comprising frame means for attachment to said robot arm, said bundle lifting tool means comprising a first claw journalled to said frame means in an initial position for tilting in response to contacting a firm surface, first spring means for biasing said first claw into said initial position, a second claw, means for mounting said second claw on said frame means for a first rotational claw closing movement relative to said first claw and for a second linear bundle lifting movement following said claw closing movement, and power drive means arranged for operating said second claw to sequentially perform said first and second movements for lifting said bundle off said firm surface and presenting said bundle to said bundle binding tool.

4,821,637

SUPPORT ASSEMBLY ATTACHED TO A LARGE ROUND BALER FOR FORMING A BALE DISCHARGE RAMP

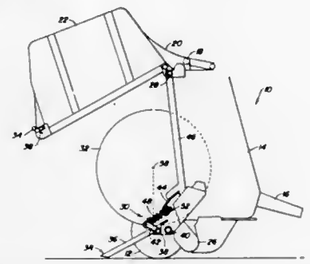
Jean Viaud, Sarrequemines, France, assignor to Deere & Comapny, Moline, Ill.

Filed Apr. 25, 1988, Ser. No. 185,652

Claims priority, application United Kingdom, Apr. 27, 1987, 8709927

Int. Cl.[4] B30B *5/06*

U.S. Cl. 100—88 4 Claims



1. In a baling machine for forming cylindrical bales of crop including a bale chamber defined in part by a bale discharge gate pivotable about an upper front location thereof between a lowered closed position wherein it closes the chamber and a raised open position wherein it allows a completed bale to exit the chamber, a support extending beneath the bale discharge gate and being vertically pivotally mounted for movement between an elevated non-discharge position and a lowered discharge position where it forms a ramp for the bale to roll down, the improvement comprising: biasing means loaded against the support and urging the support towards its discharge position and abutment means carried by a lower front portion of the gate and being engaged with the support for holding the latter in its non-discharge position when the gate is in its closed position; and the abutment means being so located relative to the support than when the gate moves towards its open position, the abutment means will move away from the support so as to permit the biasing means to move the support to its discharge position and that when the gate moves towards its closed position the abutment means will re-engage the support and return it to its non-discharge position.

4,821,638

APPARATUS FOR SUPPORTING AND PRINTING CYLINDRICAL OBJECTS

Pieter G. Ulthoven, Gorssel, Netherlands, assignor to Thomassen & Drijver-Verblifa NV, Netherlands

Filed Jul. 6, 1987, Ser. No. 70,246

Claims priority, application Netherlands, Jul. 4, 1986, 8601754

Int. Cl.[4] B41F *17/22*

U.S. Cl. 101—40 19 Claims

1. Apparatus for successive printing of the peripheral surfaces of cylindrical objects open at one end, for example metal beakers or cans, which apparatus comprises:

a carrying wheel which can be driven for rotation at a preselected rotational speed about a first axis;

a number of spindles on the periphery of that carrying wheel and freely rotating around their longitudinal axes parallel to the axis of rotation of said carrying wheel for carrying said objects, which spindles have a form such that the objects to be printed fit onto them precisely;

a printing station placed in radial direction alongside the path of said spindles for successive printing of said objects carried by said spindles;

detection means for detecting the possible absence on a spindle of an object for printing, which detection means are connected to control means; and

deflection means controlled by these control means for temporary deflection of the path of such a spindle such that it is held out of contact with said printing station,

each spindle being carried by a carriage which can move in radial direction relative to the carrying wheel and which is guided by a first guide member engaged with the carrying wheel, on which carriage is also arranged a pair of second guide members which co--operate with guide

4,821,639

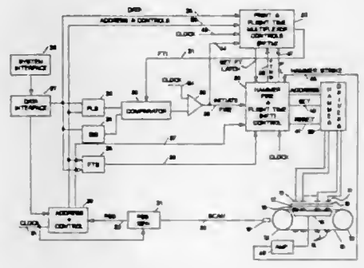
CONTROL FOR ENABLING FLIGHT TIMING OF HAMMERS DURING PRINTING

James E. Carrington, Vestal, and Gerald R. Westcott, Newark Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1987, Ser. No. 84,359

Int. Cl.[4] B41J *1/20*

U.S. Cl. 101—93.14 12 Claims



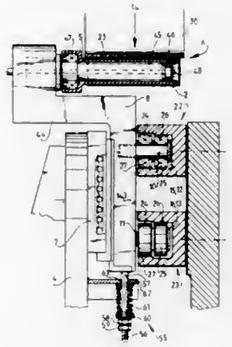
1. In a printer control apparatus for a printer wherein said printer comprises a row of print hammers electrically operable for recording data at

a plurality of print positions of a print line, a moving type carrier for continuously presenting type characters at said print positions of said print line, and print control means including hammer selection means for providing selection signals for operating said print hammers to impact said type carrier to effect printing, said selection print including means for repeatedly addressing said print hammers in synchronizaiton with said moving type carrier, said print control means including a hammer flight time control means comprising:

means for indicating a specific address of a hammer to be flight timed,

means for comparing addresses generated by said means for addressing said print hammers with said specific address during a print operation, and

means responsive to a selection signal generated by said selection means to effect operation of said specific hammer and to a signal from said means for comparing addresses for supplying a signal to said selection means for preventing selection signals for a predetermined interval related to the flight time of the said specific print hammer.



grooves centered on the first axis for determining the path of said spindle carried by said carriage;

fixed guide means defining the guide grooves and disposed in spaced opposed relation to the carrying wheel whereby each carriage is sandwiched between the carrying wheel and the fixed guide means, the guide grooves receiving the second guide members of each carriage for guiding each carriage radially from a first position in which its spindle leaves a printing station to a second position in which such spindle approaches its printing station;

the first guide member of each carriage engaging the carrying wheel on one side of the carriage and the second guide members of each carriage engaging the fixed guide means on its other side so that each spindle is carried such that the pressure force applied thereto during printing of an object can substantially be absorbed without moment by the first and second guide members; and

that said deflection means are formed such that a deflection-guide groove part of said guide grooves at the location of said printing station can move between two extreme positions, respectively an active printing position and an inactive deflecting position and that said printing position is one that is stable in relation to the pressure force applied.

4,821,640

PRINTING MACHINE REGISTER ADJUSTMENT SYSTEM

Josef Hajek, Friedberg, and Hans Mamberer, Königsbrunn, both of Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 13, 1988, Ser. No. 181,310

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 3712702

Int. Cl.[4] B41F *5/18, 5/22*

U.S. Cl. 101—177 19 Claims

1. Printing machine having three printing couples (1, 2, 3) for printing on a substrate (69),

each printing couple having

a blanket cylinder (4, 6, 8) and a plate cylinder (5, 7, 9), all of said printing cylinders being axially shiftable;

spiral gears (22–29) positioned on shafts of the respective cylinders for selected meshing engagement,

said spiral gears including two double gears (23, 24; 28, 29) coupled respectively to two (4, 8) of the blanket cylinders, in which the individual gears of each double gear have oppositely directed spiral angles, and one (24, 29) of the

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individual gears of each of the double gears is in engagement with a spiral gear (25) coupled to the remaining blanket cylinder (6);

a drive pinion (68) coupled to one of said spiral gears,

and comprising, in accordance with the invention,

a printing machine register adjustment system including

axial position sensing means (30, 40, 62; 33, 43) operatively associated with the three plate cylinders (5, 7, 9) and with those of the two blanket cylinders (4, 8) which are coupled to said double gears (23, 24; 28, 29);

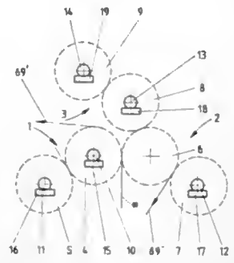
blanket cylinder axial position adjustment means (15; 34; 18, 44; 50) coupled to the respective two blanket cylinders (4, 8) for effecting axial shifting thereof;

plate cylinder positioning means (16, 17, 19) coupled to the respective plate cylinders (5, 7, 9) for effecting axial shifting thereof,

said blanket cylinder axial positioning means effecting axial positioning and adjustment of the respective ones of said two blanket cylinders (4, 8) upon at least one of:

(a) axial shifting of at least one of the plate cylinders (5, 7, 9) by a respective plate cylinder axial positioning means;

(b) circumferential register positioning or adjustment of one of said plate cylinders (5, 7, 9).

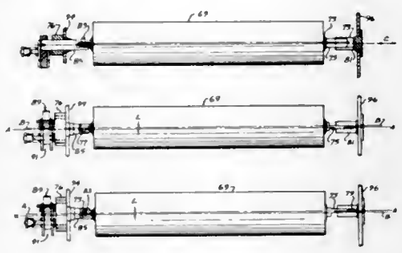


4,821,641

DAMPENING AND BRIDGING APPARATUS FOR A DUPLICATING MACHINE

Matthew F. Kowalik, Wheeling, and Chester S. Rempala, Chicago, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Feb. 5, 1988, Ser. No. 152,663
Int. Cl.[4] B41L *25/14*
U.S. Cl. 101—148 4 Claims



1. A bridging system for use with an offset printer of the type having a frame with opposed sidewalls supporting a master cylinder, a dampening system for transferring repellant solution to the master cylinder, an inking system for also transferring ink to the master cylinder, and a bridging roller rotatably supported by a shaft and movable between the dampening system and inking system, comprising:

a two-position bridging roller support for positively maintaining the bridging roller in either a first position in which the bridging roller cooperatively contacts a roller of the inking system and a roller of the dampening system to transfer ink and repellant solution therebetween or a second position in which the bridging roller remains in contact with the inking system roller but is spaced from the dampening system roller such that ink and repellant solution are not transferred therebetween, said bridging roller support including:

a mounting means for mounting the bridging roller shaft to the printer frame, said mounting means including a stub shaft at one end of the bridging roller shaft and the other end of the bridging roller shaft defining an aperture, the center of the aperture and the center of the stub shaft being located along a line offset a predetermined distance from the axis of rotation of said bridging roller, said bridging roller shaft being movable between a first orientation and a second orientation, and

engaging means located on the opposed sidewalls for engaging said mounting means and supporting said bridging roller in either of said orientations;

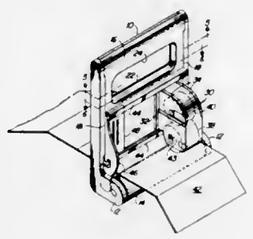
whereby when said mounting means is in said first orientation said bridging roller is in said first position and when said mounting means is in said second orientation said bridging roller is in said second position.

4,821,642

HAND OPERATED TICKET PRINTER

Christopher E. Schafer, R.R. 2, Adair, Iowa 50002

Filed Feb. 1, 1988, Ser. No. 150,970
Int. Cl.[4] B41K *3/12*
U.S. Cl. 101—219 3 Claims



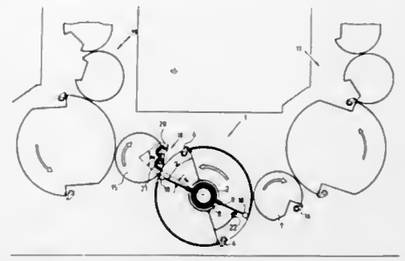
1. A ticket printer comprising an upright rectangular frame having a transverse top, a transverse bottom and opposite upright sides, support means fixedly carried at the bottom of the frame and including a pair of support legs projecting respectively outwardly from and spaced laterally apart according to the opposite sides of the frame, a platen spanning and journalled by the legs, upright tracks respectively on the legs above the level of the platen, a carrier vertically slidably mounted in the tracks for movement up and down relative to the platen, an inking and printing head carried by the carrier and including a printing wheel cooperative with the platen and cooperative finger grip elements respectively on the carrier and frame at proximate top portions thereof for effecting sliding of the carrier and frame relative to each other between a ticket-receiving mode in which the printing wheel and platen are spaced apart to receive tickets therebetween and a ticket-printing mode in which the printing wheel and platen are pressed toward each other to print received tickets.

4,821,643

SWITCHABLE SHEET FED ROTARY PRINTING PRESS

Erich G. Wieland, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,348
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734493; Nov. 13, 1987, 3738674
Int. Cl.[4] B41F *21/04, 21/10*
U.S. Cl. 101—230 1 Claim



1. A sheet fed rotary printing press switchable between recto printing and recto and verso printing, said printing press having a sheet transfer drum which is disposed between first and second printers and having a drum body that is supported in hollow journals and having sheet grippers to grip the front edge of the sheets, said sheet transfer drum also having gripping means for gripping the rear edges of sheets, said gripping means being carried on a shaft supported in said hollow journals, said sheet transfer drum having identical gear wheels positioned generally parallel to each other, one of said gear wheels being carried on one of said hollow journals and the other of said gear wheels being carried on an end of said shaft; one of said gear wheels engaging a gear wheel of a transfer cylinder and the other of said gear wheels engaging a gear wheel of a reversing drum which is placed downstream in the direction of sheet transport and which has a gripper system for selectively gripping the front and rear edges of the sheets, said sheet transfer drum having a disengagable clutch which connects said two gear wheels in various angled positions for gripping the front and rear edges of sheets on the transfer cylinder, characterized in that in the recto printing position an arc distance between said sheet grippers and said sheet gripping means for gripping the front and rear edges of the sheets on said sheet transfer drum corresponds to an arc distance on the reversing drum which is the distance between grippers of said gripper system on the reversing drum for gripping the front and rear edges of the sheets and of a distance resulting from the displacement of the rear edge of the sheet during reversing plus the required paper edge for gripping the respective sheet at its front or rear edge, and in that the recto printing position can be set by means of cooperating stops on said sheet grippers and gripping means for gripping the front and rear edges of the sheets on said sheet transfer drum or on their cooperating gear wheels which can be coupled with each other.

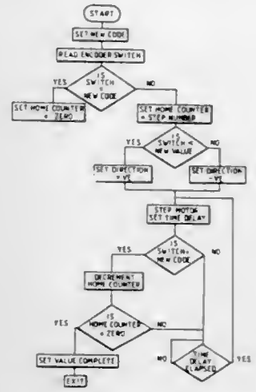
4,821,644

METHOD AND APPARATUS FOR POSITIONING A MEMBER

David A. Gawler, Brentwood, England, assignor to Alcatel Business Systems Limited, Essex, England

Filed Mar. 23, 1987, Ser. No. 28,755
Claims priority, application United Kingdom, Mar. 25, 1986, 8607367
Int. Cl.[4] B41L *1/02*
U.S. Cl. 101—486 10 Claims

10. A method of setting a print element of a franking machine to position a selected one of a plurality of type characters in a precise printing position comprising the steps of deriving a current type character code signal from a position encoder mechanically coupled to said print element representing that type character currently in said printing position; generating a new code signal representing a selected type character to be moved into the printing position; comparing the code signal derived from the position encoder with the new code signal;



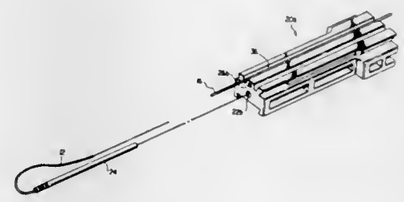
moving said print element until said comparison indicates that the current type character code signal corresponds to the new code signal and that the selected type character is in the printing position; and subsequently moving said print element through a predetermined distance in which the current type character code signal and said new code signal continue to correspond such that the selected type character represented by the new code signal is located at a precise determined position within said printing position.

4,821,645

MULTI-DIRECTIONAL SIGNAL TRANSMISSION IN A BLAST INITIATION SYSTEM

Peter F. Reiss, Sugarloaf, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed Jal. 13, 1987, Ser. No. 72,544
Int. Cl.[4] F42B *3/10*; C06C *5/00*
U.S. Cl. 102—275.7 17 Claims



10. A transmitter useful in transmitting a blast signal comprising:

two or more connectors joined together, each said connector comprising:

(a) a body of high density plastic defining a well for receiving a blasting cap;

(b) two or more channels for receiving transmission lines formed in said connector being no more than ¼ inch from

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said well for a length substantially equal to the length of said well; and

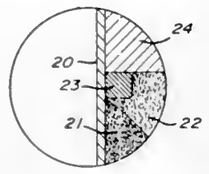
(c) means disposed on each said connector for firmly joining each said connector to other connectors, such that the wells for receiving blasting caps lay adjacent to one another.

4,821,646

DELAY INITIATOR FOR BLASTING

Donald C. True, and Raymond Carrière, both of Brownsburg, Canada, assignors to CXA Ltd./CXA Ltee, Montreal, Canada

Filed Nov. 4, 1987, Ser. No. 116,707
Claims priority, application Canada, Jun. 29, 1987, 540857
Int. Cl.[4] F42B *3/00*
U.S. Cl. 102—322 **5 Claims**



1. An improved time-delay blasting initiator of the type comprising a tubular metal shell, a base charge of explosive in the shell, a priming charge adjacent the base charge, a delay train above said priming charge and an ignition means above said delay train, the improvement comprising an annular collar of resilient material interposed between the said delay train and the said priming charge, the said collar being in tight-fitting contact with an inner wall of the said tubular metal shell.

4,821,647

DOWNHILL TUBULAR GUIDEWAY HAVING AN AIR SUSPENSION SYSTEM FOR PASSENGER CAR

Tyrone E. Powell, 1048 W. International Airport Rd., Anchorage, Ak. 99518, and George Ladyman, 302 Tradd St., Mauldin, S.C. 29662

Filed Mar. 16, 1988, Ser. No. 168,971
Int. Cl.[4] A63G *31/00*; B61B *13/10*; B61L *1/00*
U.S. Cl. 104—23.2 **13 Claims**

1. In an amusement ride for at least one car a combination comprising;

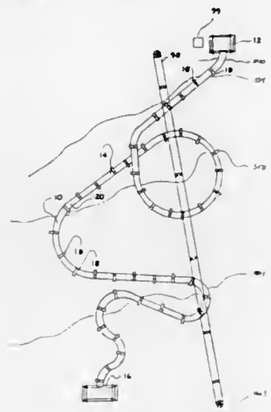
means for guiding said at least one car comprising a ramp, and at least one flume with a concave surface arranged in said ramp;

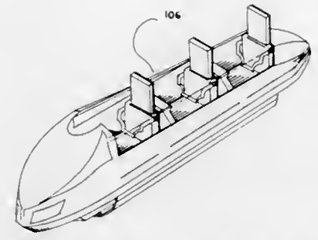
said ramp having a top portion and a bottom portion;

means for housing said at least one flume in said ramp including a superstructure above and a base structure below holding the superstructure;

means for supporting said means for housing including sequential stanchions;

said means for housing being in modular form including a plurality of sections with two ends; each of said sections has a part of the superstructure with its corresponding part of the base structure;





and means in said flume for supporting said at least one car separated from the concave surface of the flume on a stream of air fed to the flume under pressure.

4,821,648

HOPPER CAR COVER

Dan E. Bramhall, and Ken L. Kneebone, both of Neodesha, Kans., assignors to Fiberglass Engineering Incorporated, Neodesha, Kans.

Filed Dec. 10, 1987, Ser. No. 130,649
Int. Cl.[4] B61D *39/00*
U.S. Cl. 105—377 **7 Claims**



1. A cover for closing the opening of a railroad hopper car and adapted to be hingedly coupled to the car, said cover comprising:

a member having an overall arcuate configuration presenting a vertical side wall section extending around the periphery of that portion of said car presenting said opening and a top wall integral with said side wall and extending over said opening,

said arcuate configuration of said member being generally concave with respect to a line passing through a horizontal plane at a first angle of curvature; and

a section of said top wall having an arcuate configuration and located at the side opposite the hinged coupling.

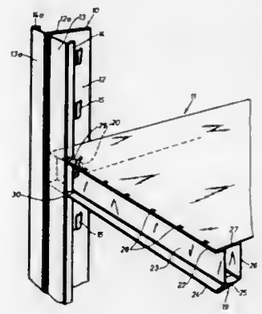
said arcuate configuration of said section being generally concave with respect to a line passing through a horizontal plane at an angle of curvature that is greater than said first angle of curvature, said line of curvature of said section presenting a catenary curve.

4,821,649

SHEET METAL SHELVING

Olof I. Andersson, Säffle, Sweden, assignor to Electrolux Constructor Aktiebolag, Säffle, Sweden

Filed Sep. 10, 1987, Ser. No. 95,124
Claims priority, application Sweden, Sep. 23, 1986, 8603998
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—107 **4 Claims**



1. A shelving assembly comprising a plurality of upright posts and at least one shelf extending substantially perpendicular to said posts, each of said posts having a first upright flange and a vertically extending second flange perpendicular thereto and being provided with a waist section extending substantially perpendicular to said first flange and parallel with and extending in the same direction as the second flange having at least one lug thereon for latching said shelf to said upright posts, said shelf having a first edge part extending downward from the shelf and having recesses therein adjacent to the corners of said shelf, a second edge part positioned perpendicular to the first edge part and having a box-like profile in which the edge is bent to form an outwardly extending upper edge flange, a vertical part and an outwardly extending lower edge flange parallel to the upper edge flange, vertically aligned notches in said upper and lower edge flanges adjacent to the corner of said shelf, and when the shelf is mounted on said posts a portion of said first edge part engages said waist section and said lugs are inserted in respective recesses in said first edge part, the corners of said shelf being so shaped that when said shelf is mounted on said posts said upper and lower edge flanges abut said first flange of said post and at the same time the second flange of said post is inserted in said notches whereby the shelf and the posts supporting the shelf are rigidly connected together.

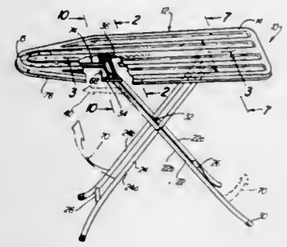
4,821,650

IRONING BOARD

Danny Simpson, Seymour, Ind., assignor to Lear Seymour Seymour Corporation, Seymour, Ind.

Division of Ser. No. 944,957, Dec. 22, 1986, Pat. No. 4,759,296.
This application Jan. 4, 1988, Ser. No. 140,718
The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.
Int. Cl.[4] A47B *9/16*
U.S. Cl. 108—120 **16 Claims**

1. An adjustable ironing table (10) comprising: a top board (12); first and second legs (22,24) moveable between a collapsed position adjacent said top board (12) and an open position extending from said top board (12); an elongated control element (36) connected to said first leg (22) and slideably connected to said board (10); locking means (44) for allowing passive movement of said control element (36) in a direction towards said second leg (24) and locking said control element (36) at a fixed position against movement away from said second leg (24); biasing means (42) for biasing said locking means (44) to engage said control element (36); and characterized by housing means (46) having a vertical wall (48) extending perpendicularly relative to said top board (12) and including a distal end relative to said top board (12) and a horizontal wall (50) parallel relative to and spaced form said top board (12) and extending from said distal end of said vertical wall (48) towards said first leg (22), said vertical wall (48) including guide means (52) for guiding said control element (36) through said housing means (46), said horizontal wall (50) including a slot (54) and said locking means (44) including an independent plate member (44) including a trapped portion extending through said slot (54) and retained thereby to pivot relative thereto and a free portion (58), said biasing means (42) being retained by said control element (36) between said vertical wall



(48) and said plate member (44) and between said horizontal wall (50) and said top board (12) as said biasing means (42) pivots said plate member (44) relative to said slot (54) to engage said control (36), said vertical wall (48) including an edge proximate to said top board (12) and fixedly connected thereto to form a nondeflectable wall engaged by said biasing means (42), release means (34) for moving said plate member (44) our of engagement with said control element (36) to allow said control element (36) and said first leg (22) to move away from said second leg (24) and said housing means (46), said release means (34) including a handle (62), a body portion (61) enclosed between said housing means (46) and said top board (12) for rotational movement and an end portion (66) engaging one side of said plate member (44), said spring (42) engaging the opposite side of said plate member (44), said housing means (46) including a recessed portion (72) defining a channel, said body portion (64) of said release means (34) being contained within said channel.

4,821,651

TABLE WITH CHANGEABLE TABLE SHEET

Jung-Chang Peng, No. 773-10, Chung Shan Rd., Wu-Jih Hsiang Taichung, Taiwan

Filed Jun. 5, 1987, Ser. No. 58,757
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—157 **7 Claims**

1. A table with a changeable table sheet comprising:

a base;

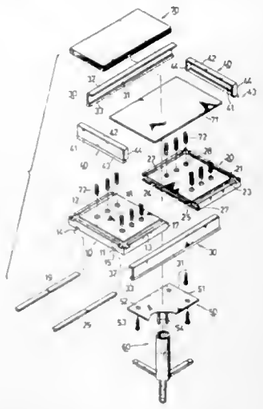
a plurality of edge members inserted onto an upper surface of said base, each edge member having a vertical first plate and a second plate extending substantially perpendicularly from an upper side of said first plate, and all edge members merging into one another at respective ends to form a retaining seat;

a table sheet formed by a plurality of separable layers of soft membranes movably positioned on the retaining seat and engaged by the second plates of each edge member;

a supporting board having a size generally equal to the size of the table sheet and positioned thereunder;

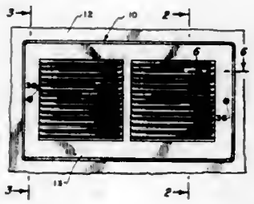
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a plurality of spring members disposed on the retaining seat between said supporting board and said base;
a plurality of legs connected onto an undersurface of said base to stably support the retaining seat; and
a pair of longitudinal grooves and a pair of transverse



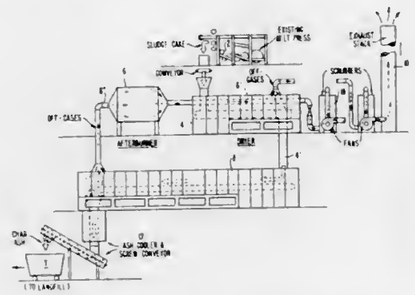
grooves provided on the upper surface of the base, the first plate of each edge member having a rectangular shape, and each edge member further having a convexity situated on an underside of the first plate adapted to be inserted into one of the longitudinal and transverse grooves, respectively.

4,821,652
WALL SAFE SIMULATING AN AIR VENT
Steven H. Hoffman, 26005 Corriente La., Mission Viejo, Calif. 92691
Filed Sep. 21, 1987, Ser. No. 98,559
Int. Cl.[4] E05G *3/00*
U.S. Cl. 109—23 **19 Claims**



1. An apparatus for storing and hiding valuables within the wall of a building, comprising:
a removable assembly, including
a unitary receptacle for containing said valuables said receptacle having at least a major portion thereof being adapted to fit within an opening formed in said wall, said unitary receptacle including a substantially rectangular parallelepiped body defined by a front wall, two side walls, a rear wall and a bottom wall,
a top wall for said parallelepiped body being at least partially removable from said parallelepiped body, and
a metal front panel simulating a conventional air vent being securely attached to a front end of said unitary receptacle said panel being larger than said opening, said front panel being substantially parallel to said front wall; and
adhesive attachment means being adapted to directly attach said removable assembly to a section of said wall adjacent the periphery of said opening when said major portion of said unitary receptacle is emplaced within said opening and thereby providing the appearance of a conventional air vent, said adhesive attachment means further being adapted to allow manual detachment of said removable assembly from said wall for the removal or addition of valuables.

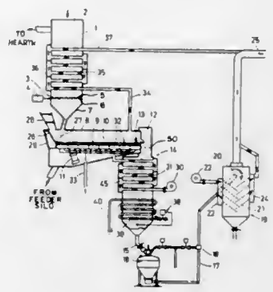
4,821,653
PROCESS AND APPARATUS FOR FIXING, ENCAPSULATING, STABILIZING AND DETOXIFYING HEAVY METALS AND THE LIKE IN METAL-CONTAINING SLUDGES, SOILS, ASH AND SIMILAR MATERIALS
Bradford H. Jones, 85 Portsmouth Ave., P.O. Box 219, Stratham, N.H. 03885
Division of Ser. No. 831,409, Feb. 20, 1986, Pat. No. 4,781,944.
This application Aug. 30, 1988, Ser. No. 238,606
Int. Cl.[4] F23G *5/12*
U.S. Cl. 110—229 **4 Claims**



1. Apparatus for fixing and stabilizing heavy metals in a metal-containing sludge, soil, or ash feed material and the like, having, in combination, pyrolyzer means operable with a substantially oxygen-free internal environment; means for feeding the metal-containing material containing intimately contacting carbon-containing material to the pyrolyzer means; means for adjusting the pyrolyzer means to heat said metal-containing material in said substantially oxygen-free environment to a temperature sufficient to drive off volatile organics and solvents but below the temperatures for complete volatilization of most heavy metals and while inhibiting the formation of oxides of nitrogen and sulfur; means for continuing said heating for a period of time sufficient to produce a char residue with carbon bonded to the metal, until the weight of the residue expressed as a percentage of the weight of the metal-containing material is a minimum, and until substantially all volatile organics and solvents are driven off; means for cooling the said char residue in the absence of air to a temperature low enough to ensure that the residue will no longer combust if exposed to air; and means for thereafter enabling cooling the residue further to ambient temperature to provide a non-leachable residue.

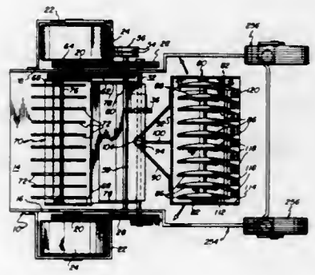
4,821,654
REGENERATION OF BULK MATERIALS
Norbert Becker, Freudenberg, and Michael Gross, Betzdorf-Dauersberg, both of Fed. Rep. of Germany, assignors to Forder-und Anlagetechnik GmbH, Niederfischbach, Fed. Rep. of Germany
Filed Oct. 23, 1987, Ser. No. 112,960
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1986, 3636479
Int. Cl.[4] F23D *14/00*
U.S. Cl. 110—236 **19 Claims**
1. Method for the thermo-mechanical regeneration of bulk

materials fed from a feeding silo, especially of foundry black sand, wherein the heating-up of the black sand that is to be regenerated is effected during its transport, through a furnace characterized by the fact that:
(a) material is heated to a temperature exceeding 500° C. in a fluidized bed furnace equipped with a forced throughput mechanism,
(b) gases intended for heating as well as combustion air and/or a gas-air mixture are introduced into the fluidized bed furnace through a bottom which is porous or provided with passage openings,
(c) at least the bottom of the fluidize bed furnace is made to



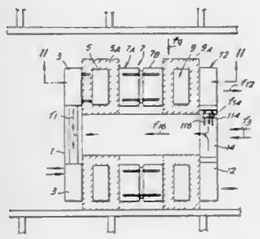
vibrate by means of one or several vibrators into oscillations so that the material is both loosened up and guided through the furnace, in a layer of predetermined height sufficient to cause rubbing of grains against one another for mechanical cleaning,
(d) the material is conducted through the heating chamber of the fluidized bed furnace by means of a forced conveying mechanism, and
(e) by means of heat exchangers the flue gases of the fluidized bed furnace preheat the material that is to be fed, that the outgoing regenerated sand heats the combustion air, and that vapors arising in the feeder silo are conducted to a hearth of the fluidized bed furnace.

4,821,655
LAWN SEEDING MACHINE
Salvatore J. Rizzo, 78 Arlington St., Meriden, Conn. 06450
Filed Apr. 30, 1987, Ser. No. 44,594
Int. Cl.[4] A01C *7/08*
U.S. Cl. 111—8 **17 Claims**



1. A power-operated lawn seeding machine comprising, in combination:
a chassis;
laterally spaced ground engaging wheels disposed adjacent opposite sides of said chassis and rotatably mounted thereon;
an engine disposed on said chassis in substantial vertical alignment over said wheels;
first connecting means for operatively connecting said engine for driving said wheels;
a multiplicity of rotary slicing blades arranged as a bank in side-by-side spaced relationship for rotation on a common axis and operatively connected to said engine for driven rotation;
second connecting means for operatively connecting said engine for driving said bank of blades;
means mounting said bank of blades on said chassis, with said axis thereof in parallel alignment with the axis between said wheels, said mounting means enabling movement of said bank of blades, relative to said chassis, between an elevated position with said blades substantially above ground level, and a lowered position for cutting thereinto, said blade bank axis being in substantial vertical alignment under said wheel axis in said lowered position of said mounting means, so as to impose, in coaction with said wheels, a minimum amount of resistance to turning of said machine;
means for selectively adjusting the elevation of said blade mounting means;
handle structure disposed on said chassis rearwardly of said wheels and in an elevated position; and
seed delivery means mounted on said chassis rearwardly of said wheels, said delivery means and said chassis having cooperating means for operatively connecting said delivery means to said chassis for free pivotal movement about a generally vertical axis, said delivery means comprising a bank of discs mounted in side-by-side, spaced relationship for rotation on a common axis, the number and spacing of said discs being the same as the number and spacing of said blades, such pivotable mounting adapting said delivery means to enable ground-contacting and automatic tracking engagement of said discs in grooves cut by said blades.

4,821,656
APPARATUS FOR THE SEMIAUTOMATIC FORMATION OF SHEATHS THAT IS, COVERS FOR MATTRESSES AND THE LIKE
GianMaria Dordi, Frosinone, and Gianfranco Fiorini, Latina, both of Italy, assignors to Permaflex, S.p.A., Italy
Filed Jul. 22, 1987, Ser. No. 76,539
Claims priority, application Italy, Jul. 24, 1986, 9446 A/86
Int. Cl.[4] D05B *11/00*
U.S. Cl. 112—2.1 **9 Claims**



1. An apparatus for the semi-automatic manufacture of sheath-form covers for mattresses including a first series of work stations arranged sequentially to provide a first workpiece feed path having workpiece entry and exit ends comprising:
a first loading bench at the entry end for receiving a mattress template and the workpiece, comprising an annular band for the formation of the side of the cover and one of two main fronts of the cover;

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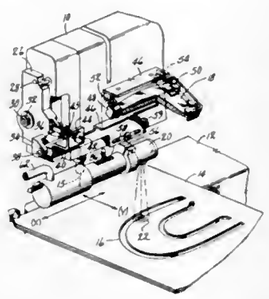
a first beader adjacent said loading bench, for beading said annular band to said one main front of the cover along perimetrical edges thereof;
first transfer means operable to extend between the first loading bench and the first beader for transferring said template from said loading bench to said first beader;
a first unloading bench and a second loading bench adjacent the first unloading bench;
an overturning device connected between said first unloading bench and said second loading bench, said overturning device having two sets of arms operable to engage respective opposite sides of the template and to remove the template from said first unloading bench overturn and deposit the template in overturned condition on said second loading bench;
second transfer means operable to extend between the first beader and the first unloading bench for transferring said template from said first beader to said first unloading bench;
a second beader adjacent said second loading bench;
third transfer means operable to extend between the second loading bench and the second beader for transferring said template from said second loading bench to said second beader;
a second unloading bench at the exit end of the feed path including means for withdrawing the template from the cover formed thereon; and,
fourth transfer means operable to extend between the second unloading bench and the second beader for transferring said template from said second beader to said second unloading bench.

4,821,657

VIEWING APPARATUS FOR ENTERING COORDINATE DATA IN AN AUTOMATIC SEWING MACHINE

Donald F. Herdeg, South Hamilton, and John F. Martin, Essex, both of Mass., assignors to British United Shoe Machinery Ltd., Leicester, England

Filed Dec. 3, 1982, Ser. No. 445,591
Int. Cl.[4] D05B *3/14, 79/00*
U.S. Cl. 112—121.12 12 Claims



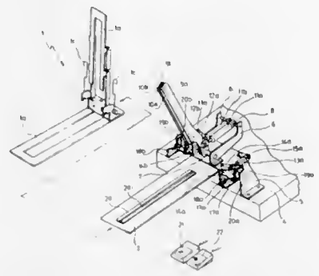
1. Apparatus for optically projecting a predefined image onto the surface of a stitch pattern reference being held within a workholding device of an automatic sewing machine, said apparatus comprising:
means, attached to the sewing head, for defining the image that is to be projected;
means for projecting a high intensity light beam through said means for defining the image, said means for projecting a high intensity light beam comprising a halogen light source, and a fiber optic cable connected to said halogen light source for transmitting the light to said means for horizontally projecting a high intensity light beam; and
means for orienting the projected light beam downwardly onto the surface of the stitch pattern reference after the light beam has been projected through said means for defining the image, whereby the predefined image is projected onto the surface of said stitch pattern reference at a predetermined offset distance from a reciprocating sewing needle associated with said automatic sewing machine.

4,821,658

APPARATUS FOR SETTING A WORKPIECE CORRECTLY ON A SKIRT-ZIPPER SEWING MACHINE

Tooru Hiramatsu, and Shigeru Tobita, both of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Nov. 5, 1987, Ser. No. 117,236
Claims priority, application Japan, Nov. 8, 1986, 61-266259
Int. Cl.[4] D05B *3/12*
U.S. Cl. 112—114 7 Claims



1. An apparatus for setting a workpiece correctly on a skirt-zipper sewing machine comprising:
a cassette having an upper frame and a lower frame for clamping the workpiece to a zipper;
pressing plates positioned within the cassette frames for aligning the workpiece with the zipper and for pressing and stretching the workpiece; and
means for controllably moving the upper frame, the lower frame, and the pressing plates so that the plates and the frame clamp the zipper to the workpiece to prevent the formation of shrink marks in the workpiece prior to and during the sewing of the zipper to the workpiece.

4,821,659

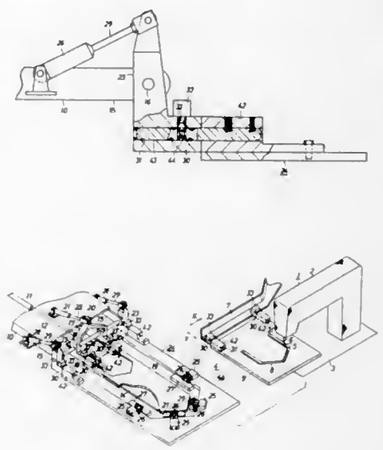
WORKPIECE HOLDING DEVICE FOR A SEWING MACHINE

Satoshi Moril, Nagoya; Kunihiko Murata, Tsushima, and Hiroyuki Mitsui, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 125,325, Nov. 25, 1987. This application Apr. 26, 1988, Ser. No. 188,174
Claims priority, application Japan, Dec. 1, 1986, 61-185292
Int. Cl.[4] D05B *21/00, 35/00*
U.S. Cl. 112—121.15 4 Claims

1. A workpiece holding device for a sewing machine comprising a table, a supporting member movably supported on the table in upward and downward movements, actuating means for actuating the supporting member, a workpiece holding plate and connecting mechanism for detachably connecting the workpiece holding plate with the supporting member, characterized in that said connecting mechanism comprises;
at least one connecting rod provided on either one of said supporting member or said holding plate;
at least one hole formed in the other of said supporting member or said holding plate for slidably receiving the connecting rod along an axis thereof;
a latch means for latching said connecting rod at an inserted position, said latch means including an engaging portion

formed on said connecting rod, an engaging member for engaging with the engaging portion, and an actuating



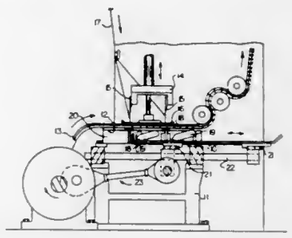
means for actuating said engaging member to engage with said engaging portion.

4,821,660

MULTINEEDLE AUTOMATIC SEWING MACHINE

Dirk Klimpke, Am Johannisbach 35, 4800 Bielefeld 1, Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,381
Int. Cl.[4] D05B *1/08, 69/36*
U.S. Cl. 112—164 7 Claims



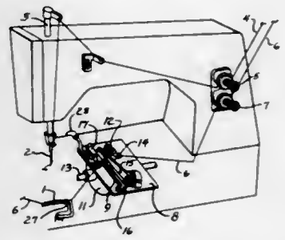
1. Textile machine which is designed as a sewing machine in the form of a multineedle automatic stitching device, with a needle holder vertically movable above a needle plate, whose needles are supplied with upper threads unwinding from spools, and, with shuttles, which contain spools with lower threads, arranged on horizontally displaceable shuttle holders below the needle plate, characterized by that the machine is equipped with electrical control means which for each shuttle (19) contains a particular electrical circuit, in which the shuttle (19) together with an associated contact plate (29) arranged on the lower side of the needle plate (12) functions as an electric switch, wherein the machine is switched off in the case of breaking of one single lower thread.

4,821,661

CHAIN STITCH SEWING MACHINE

ALfred W. T. Brownlee, Hoddeson, England, assignor to Union Special GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,843
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710231
Int. Cl.[4] D05B *49/04*
U.S. Cl. 112—248 6 Claims



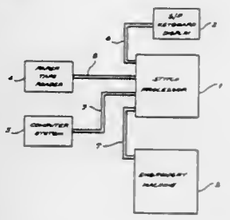
1. A thread control device for the looper thread of a chain stitch sewing machine comprises a rotating thread take-up disc, a cover plate having a slot through which the thread take-up disc protrudes and moves between thread guiding elements into the path of the thread, and a looper having a thread eye, the thread guiding elements including a tube disposed between the thread take-up disc and the thread eye on the looper, so that the looper thread passes through the tubes means being provided for passing a pressure medium through the tube to impart tension to the looper thread to at least compensate for the frictional force of the looper thread on the thread take-up disc.

4,821,662

METHOD OF EMBROIDERY AND STITCH PROCESSOR THEREFOR

Robert G. Pongrass, and William B. Wilson, both of Chippendale, Australia, assignors to Wilcom Proprietary Limited, Australia

PCT No. PCT/AU86/00104, § 371 Date Dec. 5, 1986, § 102(e) Date Dec. 5, 1986, PCT Pub. No. WO86/06423, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 18, 1986, Ser. No. 3,406
Claims priority, application Australia, Apr. 19, 1985, PH00206
Int. Cl.[4] D05C *5/02, 5/04*
U.S. Cl. 112—266.1 20 Claims



1. A method of producing an embroidery pattern, comprising the steps of:
(a) reading a stitch-by-stitch definition of the embroidery pattern in tape data format incorporating fixed, step-by-step successive stitch commands, each command defining an individual stitch movement to form an individual stitch, successive commands defining successive individ-

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ual stitch movements to form sequences of individual stitches which together constitute the embroidery pattern, each sequence being characterized by at least one stitch type, by a geometric area within the pattern, by stitches having lengths, and by stitches located at spacings relative to one another;

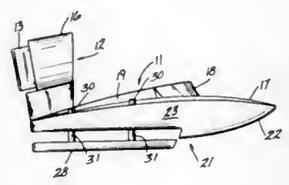
(b) analyzing each sequence of individual stitches throughout the embroidery pattern, and determining what stitch type, what area, what stitch lengths, and what stitch spacings characterize the respective sequence; and

(c) automatically generating modified stitch commands in accordance with the determination of the stitch type, the area, the stitch lengths and the stitch spacings.

4,821,663
BOAT HULL

Robert D. Schad, 110 Bloor St. West, Suite 2104, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 759,764, Jul. 29, 1985, Pat. No. 4,669,408. This application May 20, 1987, Ser. No. 51,763
Int. Cl.[4] B62B *15/00*
U.S. Cl. 114—43 **5 Claims**



1. A hull structure for a highly maneuverable amphibious craft useful for transportation over hull support surfaces such as rotten ice, slush, snow, swamps, short spans of lowland, rough seas, ships wakes, ocean growlers and the like comprising:

a hull body having an exterior working surface, said working surface having bilges defining a junction between a hull bottom portion and a hull side portion, each said bilge further defining a movable hull section normally disposed substantially flush with said exterior working surface and recessed therein, said movable hull section being co-extensive with that portion of the hull body which normally contacts said hull support surfaces and spring means for projecting said bilges beyond the hull body to reduce the effective area of said working surface, said spring means being of sufficient size and area so as to be operable in the projected condition to support the craft when stationary or at rest, as well as when the craft is underway.

4,821,664
FURLING STAY COVER

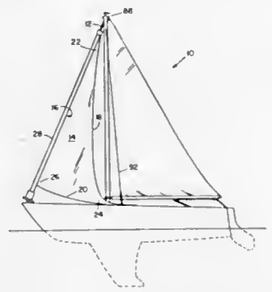
Joseph E. Dahmen, Concord, Mass., assignor to Cruising Design, Inc., Peabody, Mass.

Filed Jun. 12, 1987, Ser. No. 62,555
Int. Cl.[4] B63H *9/08*
U.S. Cl. 114—107 **42 Claims**

1. A furling stay cover comprising:

an elongated member having a first groove for carrying a luff edge of a staysail and an area for loosely retaining a stay; and

swivel means connected to a bottom end of the elongated member for rotating said elongated member about the stay positioned within the retaining area so as to furl the staysail about the elongated member, the elongated member being sufficiently stiff to furl the staysail yet sufficiently flexible and elastic such that the swivel means rotates the bottom end relative to an opposite end of the elongated member at least one revolution to make a full twist, the elongated member twisting during furling at least five

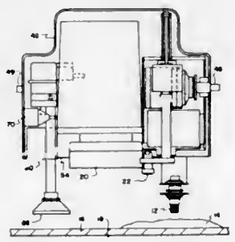


revolutions along its length without reaching its elastic limit and without damage.

4,821,665
SUBMERSIBLE ROV FOR CLEANING AND INSPECTING METAL

Brian P. Matthias; Richard C. Mursinna, and Felixberto A. Galasan, all of San Diego, Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 840,115, Mar. 13, 1986, abandoned. This application Feb. 26, 1988, Ser. No. 163,171
Int. Cl.[4] B63B *59/08*
U.S. Cl. 114—222 **5 Claims**



1. A submersible, remotely operated device for cleaning and inspecting metal, said metal being underwater and said device being controlled from a surface location, comprising:

means for removing extraneous material attached to a site on the surface of said metal;

means for viewing said metallic surface, said viewing means being positioned so that said site can be viewed;

means for measuring the thickness of said metal at said site, wherein said measuring means directs ultrasonic energy into said metal and makes physical contact with said metal in order to measure said thickness;

carriage means for supporting said removing means, said viewing means and said thickness measuring means;

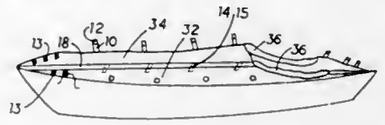
means for releasably securing said carriage to said metallic surface; and

means for moving said carriage in water, said means for moving including propellers.

4,821,666
FOLDING KAYAK

Robert T. Ingram, SS 1 Site 7 Comp 19, Penetang, Ontario, Canada (L0K 1P0)

Filed Dec. 7, 1987, Ser. No. 129,584
Claims priority, application Canada, Jul. 3, 1987, 541193
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—347 **2 Claims**



1. A collapsible Kayak having a cover having access to a storage area in the interior of the assembled Kayak along the entire deck by means of fasteners which stretch the cover longitudinally and transversely over the frame, including:

(a) two sets of fasteners attached to the cover comprising lengths of material

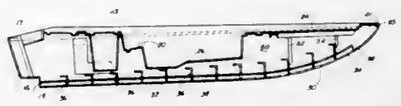
(b) a non-expanding frame including a deck ridge,

(c) a flexible gasket attached to one edge of the cover which lies on the deck ridge the full length of the kayak and which is sandwiched between overlapping parts of the cover, whereby a first set of fasteners connect the one edge of the cover having a gasket on the deck ridge, the cover is then wrapped around the frame such that a portion of the cover is overlapped over the gasket, compressing it, to make a watertight seal, the second set of fasteners secure the overlapping part of the cover while permitting access to the storage area by release thereof.

4,821,667
COMPOSITE FIBERGLASS AND METAL BOAT

Dan Hargett, Sr., P.O. Box 51282, Lafayette, La. 70505

Filed Feb. 16, 1988, Ser. No. 156,445
Int. Cl.[4] B63B *3/09, 3/16*
U.S. Cl. 114—355 **11 Claims**



1. A composite fiberglass and metal boat, comprising:

a. a metal hull portion, the hull portion including a continuous sloping sidewall terminating at an upper perimeter edge;

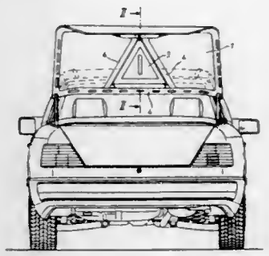
b. a fiberglass cap portion, positionable onto the hull, and providing a corresponding exterior cap perimeter edge and a lateral surface extending laterally away from the cap perimeter edge along a substantial portion of the metal hull, so that the edge of the hull fits in mating engagement with the perimeter edge of the cap portion to define a longitudinally extending void space between the cap and the metal hull sidewall; and

c. attachment means for securing the cap of the boat to the hull portion along the corresponding perimeter edges.

4,821,668
REAR COVER INCLUDING WARNING DEVICE FOR A MOTOR VEHICLE

Harald Leschke; Heinz Baumert, and Rudi Kneib, all of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,219
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1986, 3627100
Int. Cl.[4] B60R *01/06;* **G02B** *05/12*
U.S. Cl. 116—28 R **8 Claims**

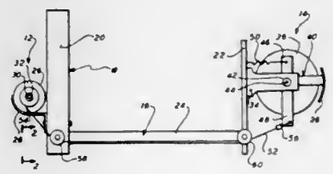


1. A rear cover for a motor vehicle including: extractable warning means which is provided in a preselected position so as to be visible to the following traffic when the cover is open; and further, solidly attached warning means on the cover which is visible when said extractable warning means is removed from the cover and said cover is open.

4,821,669
FLIGHT INSTRUMENT FLAG ANNUNCIATOR

Joe T. Hoffman, Phoenix, Ariz., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 30, 1987, Ser. No. 126,311
Int. Cl.[4] G01D *13/00*
U.S. Cl. 116—45 **2 Claims**



1. A flight instrument flag annunciator comprising:

a motor having a stator and a rotor rotatable relative to the stator about a motor axis;

a drive pulley driven by and coaxial with the rotor;

a slack stretchable cord having a first end portion fixedly connected to the drive pulley and having a second end portion;

guide means for guiding the slack stretchable cord;

a flag mechanism having a flag shutter rotatable relative to a display drum and a base member about a flag mechanism axis, said flag shutter having a first arm connected to the slack cord second end portion and having a second arm; and

a spring having a first end portion connected to the second flag shutter arm and having a second end portion connected to the flag mechanism base member; wherein

said flag mechanism axis is substantially parallel to said motor axis; and wherein

said slack stretchable cord is disposed adjacent to a plane,

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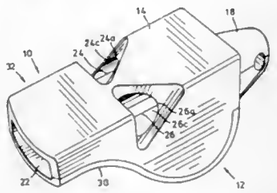
said plane being normal to said motor axis and said flag mechanism axis for applying a tension force of gradually increasing amount through the cord while slack is being taken up in the cord by the drive pulley whereby a shock load on the shutter and on the cord is avoided by a slack takeup and a shock load on the shutter when stopped is avoided by a cord stretching.

4,821,670

WHISTLE

Ronald L. Foxcroft, Burlington, and Charles G. Shepherd, Oakville, both of Canada, assignors to Fortron Inc., Hamilton, Canada

Filed Aug. 7, 1987, Ser. No. 82,708
Int. Cl.[4] G01K *5/00*
U.S. Cl. 116—137 R **36 Claims**



1. A whistle of the type comprising at least three fipple-type whistle elements in a single whistle body, each whistle element having a chamber providing a respective vibratable air column and a respective vibration-producing edge at its entrance, at least two of the air columns being of different lengths, the whistle comprising:

first and second whistle elements disposed side-by-side as seen in plan with the third whistle element disposed between the other two elements, the third whistle element being displaced laterally from the first and second elements as seen in side elevation; and

a common mouthpiece for the three elements disposed in front of the elements;

wherein the whistle body is of "mandolin" shape in side elevation, as defined herein, with the mouthpiece constituting the neck of the mandolin shape and the three whistle elements provided in the bulbous body of the mandolin shape.

4,821,671

CAPTIVE VOLUME DEVICE AS A SAFE LIFE MONITOR

Frank G. Borgardt, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 27, 1985, Ser. No. 749,335
Int. Cl.[4] G01L *19/12*
U.S. Cl. 116—270 **3 Claims**

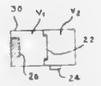
1. A captive volume apparatus for use as a safe life monitor comprising in combination:

a means for enclosing a volume, said volume enclosing means having a first and second end, said volume enclosing means containing at said first end thereof an expendable material,

a means for detecting gas, said detecting means being contained within said second end of said volume enclosing means, said detecting means monitoring a state of said expendable material, said detecting means providing a visual indication when said expendable material has reached the end of its useful life, said detecting means comprises a differential pressure sensing means, and,

a means for viewing, said viewing means being mounted on said second end of said volume enclosing means to provide viewing access to said visible indication of said detecting means.



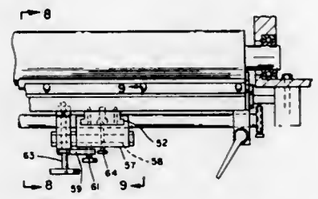


4,821,672

DOCTOR BLADE ASSEMBLY WITH ROTARY END SEALS AND INTERCHANGEABLE HEADS

Nick Bruno, 574 Marina Blvd., San Leandro, Calif. 94577

Filed Jun. 22, 1987, Ser. No. 64,676
Int. Cl.[4] B05C *1/08*
U.S. Cl. 118—261 **15 Claims**



1. A doctor blade assembly adapted for applying a liquid uniformly to a rotating transfer roller, comprising;

a longitudinally extending doctor blade head having a channel-like cavity formed therein and oriented parallel to the transfer roller, a pair of doctor blades disposed on opposed sides of said cavity and extending the length thereof and adapted to impinge on the transfer roller,

said pair of doctor blades extending parallel to the transfer roller and converging as they extend from said opposed sides of said cavity toward the transfer roller,

a pair of end seal assemblies secured to said doctor blade head and disposed at opposite ends of said cavity, each end seal assembly including means for establishing a high pressure liquid seal with a rotating peripheral surface portion of the transfer roller at a respective end of the transfer roller, and

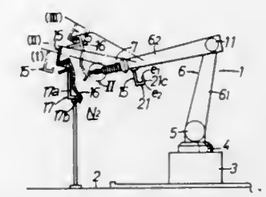
means for supporting said doctor blade head and removably positioning said doctor blade head so that said doctor blades may be moved into and out of engagement with the transfer roller.

4,821,673

APPLICATOR ROBOT AND APPARATUS HAVING MEMBER FOR PICKING UP AND TRANSPORTING WORKPIECE

Misoru Kirigakubo, Sakado; Hitoshi Nakazawa, Sayama, and Kyuya Yamazaki, Hidaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1986, Ser. No. 920,549
Claims priority, application Japan, Oct. 21, 1985, 60-234697; Oct. 21, 1985, 60-234699; Nov. 8, 1985, 60-250016
Int. Cl.[4] B05B *13/02*
U.S. Cl. 118—319 **14 Claims**



1. An applying robot comprising:

a movable arm having an applying gun and reciprocatingly movable at least between a work carry-in position and an applying position;

a work transporting hanger member mounted on said movable arm for picking up a work at said work carry-in position, transporting said work to said applying position and releasing said work at said applying position; and

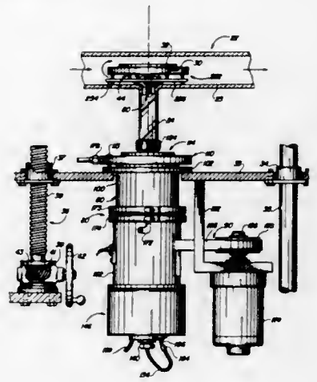
an urging member mounted on said movable arm for clamping said work in cooperation with said hanger member during transporting the work by said hanger member.

4,821,674

ROTATABLE SUBSTRATE SUPPORTING MECHANISM WITH TEMPERATURE SENSING DEVICE FOR USE IN CHEMICAL VAPOR DEPOSITION EQUIPMENT

Wiebe B. deBoer, Kromme Molenweg 10, 5521 GB Eersel, Netherlands, and Albert E. Ozias, 7515 Poet Rd., S.E., Aumsville, Oreg. 97325

Filed Mar. 31, 1987, Ser. No. 32,474
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—666 **31 Claims**



1. A chemical vapor deposition comprising:

(a) a reaction chamber defining a reactant gas flow path therethrough and having a bottom surface with a tubular shaft depending therefrom;

(b) drive shaft means defining a rotational axis, said drive shaft means having a top end disposed in said reaction chamber and depending in spaced coaxial relationship through the tubular shaft thereof to provide an intermediate portion and a lower portion which extends below the tubular shaft of said reaction chamber;

(c) a support plate in downwardly spaced relationship with said reaction chamber and defining an opening which is coaxial with said drive shaft means;

(d) mounting means on said support plate and attached to the tubular shaft of said reaction chamber, said mounting means defining an axial opening which is coaxial with the opening of said support plate and through which said drive means axially extends;

(e) bearing means dependingly attached to said mounting means in circumscribing engagement with the intermediate portion of said drive shaft means for supporting and rotatable journaling of said drive shaft means;

(f) drive means coupled to the lower end of said drive shaft means for rotational driving thereof;

(g) spider means on the top end of said drive shaft means for rotation therewith; and

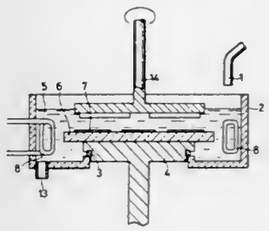
(h) a susceptor defining a top surface for demountably receiving a substrate for deposition purposes in a position wherein the center of the substrate is in a substantially aligned overlaying relationship with the center of said susceptor, said susceptor being mounted on said spider means for rotation therewith and being supported thereby in a position wherein the rotational axis off said drive means is normal with respect to the center of said susceptor.

4,821,675

COLOR FILTER DYEING APPARATUS

Masahiko Ikeno, and Hideo Saeki, both of Itami, all of Japan, assignors to Maeda & Associates, Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,042
Claims priority, application Japan, Dec. 16, 1985, 60-282576
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—667 **10 Claims**



1. A color filter dyeing apparatus for dyeing a color filter formed on a substrate, comprising

a chuck for holding the substrate on which the color filter is mounted,

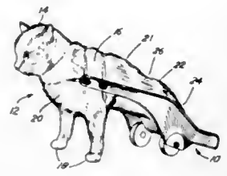
a dyeing solution receptacle in intimate engagement with a sealing member disposed to be in engagement with the lower surface of the substrate, and forming a container for containing the color filter therein,

an inlet for supplying the dyeing solution into the container, and

means for discharging the dyeing solution from the container.

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4,821,676
CART ASSEMBLY FOR A PARTIALLY-IMMOBILIZED ANIMAL
Harold D. Hulterstrum, 1155 College Ave., Baraboo, Wis. 53913
Filed Feb. 5, 1988, Ser. No. 152,658
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **3 Claims**



1. A cart assembly for a partially-immobilized animal, said animal having a head, front portion, shoulder region, front legs, middle portion, hind portion, and hind legs, comprising, in combination:

an integrally formed cradle, said cradle including an animal support portion adapted to receive and support in an extended and prone position said middle portion, hind portion and hind legs of said partially-immobilized animal, a support member extending forwardly from each of two opposing sides of said animal support portion and terminating at opposing sides of said shoulder region of said partially-immobilized animal, and a flange portion extending downwardly from each of said two opposing sides of said animal support portion of said integrally formed cradle wherein said animal support portion of said integrally formed cradle includes a contoured mid-support section and a channeled hind-support section for providing support for said middle portion, hind portion, and hind legs of said partially immobilized animal, said channeled hind-section including a first part extending downwardly from said mid-support section and a second part substantially parallel to said mid-support section;

a harness to be worn by said partially-immobilized animal, said harness being secured about said head, extending along said front portion, and terminating in said shoulder region;

fastener means for securing said harness to said support members; and

a wheel rotably secured to an inner side of each of said flange portions.

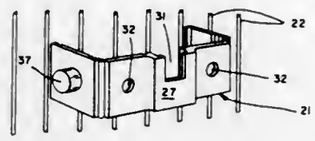
4,821,677
METHOD OF MAKING ANIMAL LITTER HAVING IMPROVED ABSORBENT AND DEODORIZING QUALITIES
Robert E. Harrison, Culpeper, Va., assignor to Virginia Mills, Inc., Culpeper, Va.
Filed Oct. 27, 1987, Ser. No. 114,310
Int. Cl.[4] A01K *1/015*
U.S. Cl. 119—1 **12 Claims**

8. An improved animal litter product which comprises:

(a) a mixture of ground organic materials including peanut hulls and peanut skins added thereto to provide a substantial oil content to said mixture; and

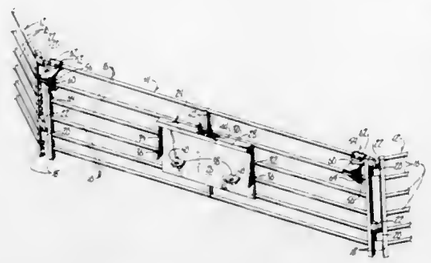
(b) hydrated silicate of aluminum having an approximate weight ratio of 1:10 of said mixture.

4,821,678
AVIAN WATER BOTTLE ASSEMBLY
Frank W. Atchley, P.O. Box 2580, Napa, Calif. 94558
Filed Jun. 16, 1987, Ser. No. 62,571
Int. Cl.[4] A01K *31/00*
U.S. Cl. 119—18 **17 Claims**



1. A watering system for a bird or like animal maintained in a cage, including a water bottle, a mounting bracket adapted to be secured to a wall of the cage, a mounting member extending from said bottle, means on said mounting bracket for releasably engaging said mounting means, said mounting bracket including a medial portion and at least one arm portion extending from an end of said medial portion, hinge means extending between said medial portion and said arm portion to permit rotation of said arm portion into confronting opposition with said medial portion with portions of the wall of the cage engaged therebetween, a screw hole extending through said medial portion, and a tapped hole extending in said arm portion, said screw hole and said tapped hole being disposed to be aligned in operative relationship when said arm portion is rotated into said confronting opposition to said medial portion.

4,821,679
PORTABLE CORRAL ASSEMBLY AND METHOD FOR TRANSPORTING SAME
Kenneth Hackert, Rte. 1, Sully, Iowa 50251
Filed Nov. 23, 1987, Ser. No. 123,768
Int. Cl.[4] A01K *3/00*
U.S. Cl. 119—20 **6 Claims**



1. A portable corral assembly comprising:

a plurality of elongated corral members detachably secured together in end-to-end relation with one another to form an enclosed corral, one of said corral members forming a gate member;

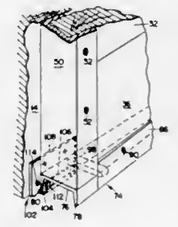
said gate member having an upper edge, a lower edge, opposite end edges, a front face, and a rear face;

connecting means on said opposite ends of said gate member for connection to two adjacent ones of said portable corral members;

a carrying bracket assembly mounted on said front face of said gate member, said bracket assembly comprising a vertical flat plate attached to said front face of said gate member, a horizontal flange attached to said vertical plate and extending horizontally away from said gate member,

and a lip flange extending downwardly from said horizontal flange in spaced relation to said vertical plate member; said carrying bracket assembly having a pair of horizontally spaced apart lug members attached to said vertical plate in spaced relation below said horizontal flange, said lug members each having vertical pin receiving holes extending downwardly therethrough.

4,821,680
SLIDING DOOR HARDWARE
Richard H. Smith, 264 Gale Ave., and Douglas N. Smith, 14 Belvedere Ave., both of Pittsfield, Mass. 01201
Filed Oct. 28, 1987, Ser. No. 113,751
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—27 **1 Claim**



1. In a rail system for cooperating with a door associated with an animal stall having a door opening therein and first and second end walls at opposite sides of the opening and with the opening being spannable by the door, the door being slidable between stall-opened and stall-closed positions, the improvement comprising:

upright U-shaped door channels enclosing and fixed to the opposite vertical edges of the door,

a horizontally-disposed track fixed to the stall,

hangers extending upwardly from the upper horizontal edge of the door and having rollers being rotatably mounted thereon and rideable in the track, the hangers and rollers suspending the door from the track,

an inverted U-shaped rail having a horizontal planar wall and spaced depending front and rear walls at opposite sides of the planar wall,

the planar wall of the rail being stationarily secured to the bottom of the door,

an upright extension plate on the rail front wall fixed to the front of the door,

the planar wall and rear wall of the inverted U-shaped rail having a tonguelike extremity extending outboard of a side edge of the door,

a pair of U-shaped door guides, one disposed adjacent each stall end wall,

each door guide having a horizontal planar wall and spaced upstanding front and rear walls at opposite sides of the planar wall defining an operating groove,

the rear wall of each door guide being stationarily secured to one of the end walls of the stall,

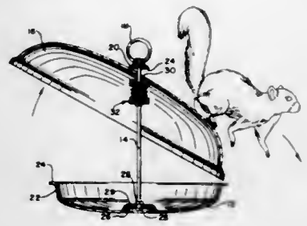
and the front wall of each door guide being offset and bent outwardly to provide easy access to the operating groove,

all adapted and arranged whereby, as the door is slid between stall-closed and stall-opened positions, one of the depending walls of the rail is receivable in the operating groove of the door guide,

a stop on the inverted U-shaped rail extending transversely between the front and rear walls thereof for limiting the range of sliding movement of the door upon contact with one of the walls of one of the door guides, and

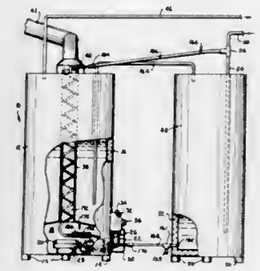
a latch on the door releasably engageable with one of the stall end walls, the latch comprising a pin slidably and releasably receivable in aligned angularly disposed openings in the door and end wall.

4,821,681
SQUIRREL-PROOF BIRDFEEDER
James E. Tucker, Batavia, Ill., assignor to Weber-Stephen Products Co., Palatine, Ill.
Filed Jul. 14, 1987, Ser. No. 72,873
Int. Cl.[4] A01K *39/01*
U.S. Cl. 119—51 R **5 Claims**



1. A hanging birdfeeder comprising a lower feed tray having a center support post affixed thereto and extending upwardly with means at an upper end of said post for suspending said tray and a cover supported on said post and spaced above said tray and being larger than said tray for diverting rain and unwanted species from access to said tray, and biasing means between said cover and post normally maintaining said cover in parallel upright relation to said tray, said biasing means including a coil spring below said cover with said post having a projection spaced from said cover and a circular cup engaging said projection and receiving said coil springs, said biasing means facilitating tilting pivotal movement of said cover on said post upon the application of a downward force to said cover remote from said post to eject unwanted species, such as squirrels, from said cover.

4,821,682
METHOD AND APPARATUS FOR UTILIZING WASTE HEAT IN HOT WATER HEATERS
Larry G. Waters, 1943 Oakley, Topeka, Kans. 66604
Division of Ser. No. 860,877, May 8, 1986, Pat. No. 4,699,091.
This application Jul. 24, 1987, Ser. No. 77,635
The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.
Int. Cl.[4] F22B *30/00*
U.S. Cl. 122—20 A **6 Claims**



1. In a hot water heating system having a main tank, a cold water inlet pipe connected with a supply of cold water to be heated, a fuel fired main burner for heating water in the main tank, a fuel fired pilot burner for igniting the main burner, and a flue in the main tank for discharging combustion gases, the improvement comprising:

a storage tank for holding water which is to be preheated

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prior to transfer to the main tank, said cold wate rinlet pipe discharging into said storage tank to deliver thereto incoming cold water to be heated;

a conduit loop having an inlet end communicating with said storage tank to receive water therefrom and an outlet end communicating with said storage tank to return preheated water thereto, said conduit loop having an intermediate portion thereof extending in said flue in a generally spiral configuration to extract heat from the flue for preheating of water circulating in the conduit loop; and

a transfer conduit extending from said storage tank to said main tank to deliver preheated water from the storage tank to the main tank to replace hot water drawn out of the main tank.

4,821,683

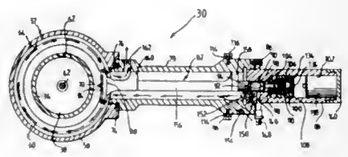
PORTABLE POWER TOOL WITH IMPROVED COMBUSTION CHAMBER CHARGING MEANS

Alphoasus G. Veldman, Heatherlea West Road, R.D. 5, Levin, New Zealand

Continuation of Ser. No. 922,763, Oct. 24, 1986, abandoned, which is a continuation of Ser. No. 601,400, Apr. 17, 1984, abandoned. This application Oct. 23, 1987, Ser. No. 111,647

Int. Cl.[4] F02B *71/00;* **F02D** *31/10*

U.S. Cl. 123—46 SC **23 Claims**



1. A portable power tool comprising:

a body defining a cylindrical bore;

a piston, slidably and sealingly housed within said cylindrical bore, for a movement in one direction from a first position through a power stroke into a second position and in an opposite direction through a return stroke;

a combustion chamber, formed in said body, associated with and arranged for communication with said cylindrical bore at an end remote from said second position of said piston, said combustion chamber being receivable of a gaseous fuel mixture for ignition and combustion;

at least one double function opening means, provided in said body and communicating with said combustion chamber, for admission of said fuel mixture to said combustion chamber and emission of a residual gas therefrom;

valve means, mounted within said body, for movement between an open condition and a closed condition relative to said double function opening means;

fuel supply means for supplying said fuel mixture to said double function opening means;

exhaust means for removing said residual gas from said double function opening means;

said valve means, said double function opening means, said combustion chamber, said fuel supply means and said exhaust means cooperating so that when said valve means is in said open condition and said piston at its first position, said fuel mixture is directed into and around said combustion chamber in a manner scouring the combustion chamber of residual gases from a preceding cycle of operation of the tool and sweeping said residual gases out through said double function opening means prior to movement of the valve means to its closed condition;

ignition means for igniting said fuel mixture in said combustion chamber with said valve means in said closed condition;

whereby subsequent combustion of said fuel mixture creates an elevated pressure condition within said combustion chamber and such elevated pressure can be passed to said cylindrical bore land said piston therein to cause rapid movement under power of said piston, through said power stroke towards said second position, said piston being arranged to effect a required power assisted operation.

4,821,684

V-TYPE ENGINE

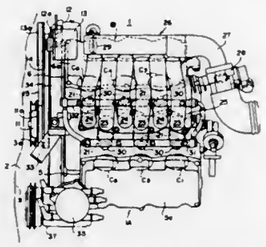
Keisyo Tasaka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 10, 1987, Ser. No. 94,873

Claims priority, application Japan, Sep. 10, 1986, 61-213576

Int. Cl.[4] F02M *35/10*

U.S. Cl. 123—52 MV **11 Claims**



1. A V-type engine mounted in an engine compartment of a vehicle body such that an engine output shaft extends substantially in the transverse direction of said vehicle body, said engine compartment being provided at the front of said vehicle body and having a top wall defined by a cover member generally inclined downward from the rear of said engine compartment in the longitudinal direction of said vehicle body to the front of said vehicle body, at least above said engine, comprising:

front and rear cylinder banks, each of said banks having a plurality of cylinders, said cylinder banks being disposed substantially in parallel with said engine output shaft,

a surge tank located directly atop said rear cylinder bank, said surge tank being connected to said cylinders of each said cylinder bank by a plurality of intake passages; and

at least a first auxiliary mechanism, said first auxiliary mechanism disposed directly atop said rear cylinder bank in spaced relationship with said surge tank in the direction of the longitudinal axis of said engine output shaft, said first auxiliary mechanism being driven from an end of said engine output shaft via a driving force transmission means.

4,821,685

SUCTION DEVICE OF ENGINE

Atsushi Matsushima, Hamakita, and Hideaki Ueda, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 13, 1987, Ser. No. 25,408

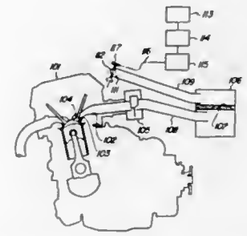
Claims priority, application Japan, Mar. 14, 1986, 61-55060

Int. Cl.[4] F02M *35/10*

U.S. Cl. 123—52 MF **9 Claims**

1. In an induction system for an internal combustion engine having an inlet port for admitting a charge to a variable volume chamber of said engine, a first conduit extending from said inlet port to a plenum chamber, means for sequential opening and closing said inlet port for generating pulses in said first conduit means, a second conduit extending from said plenum chamber and providing the sole atmospheric air inlet to said plenum chamber and reflective means adapted to extend across

a portion of said atmospheric air inlet for reflecting pulses emanating from the opening and closing of said inlet port back



into said induction system for reducing pulsations in said induction system.

4,821,686

TWO-STROKE INTERNAL COMBUSTION ENGINE WITH CYLINDER HEAD VALVES

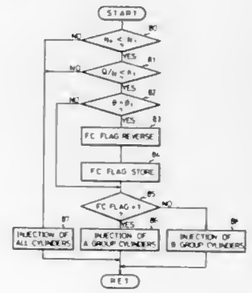
Toyokazu Baika, Susono; Norihiko Nakamura, Mishima; Hirosi Noguchi, Gotenba; Tosio Tanahasi, and Katsuhiko Hirose, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 16, 1988, Ser. No. 155,965

Claims priority, application Japan, Feb. 18, 1987, 62-33445

Int. Cl.[4] F02B *75/02*

U.S. Cl. 123—65 VD **9 Claims**



1. A two-stroke internal combustion engine comprising:

a cylinder block and a cylinder head mounted thereon to form a plurality of combustion chambers therein, the cylinder head having at least one intake port and at least one exhaust port formed therein for each of said combustion chambers, an intake valve and an exhaust valve being arranged in said at least one intake port and said at least one exhaust port, respectively, and operating in synchronization with the engine to open and close the respective port;

a fresh air intake means having an air charging means arranged therein for delivering fresh air under pressure in said at least one intake port;

means for generating a swirl about an axis of said combustion chamber by a portion of exhaust gas caused to flow back from said at least one exhaust port into said combustion chamber after being once exhausted through said at least one exhaust port when said exhaust valve opens; and

a fuel supply means capable of supplying fuel into said combustion chamber at every cycle of the engine when the engine is under a high load and supplying fuel into said combustion chambers at alternating cycles of the engine when the engine is under a low load.

4,821,687

TWO-STROKE ENGINE

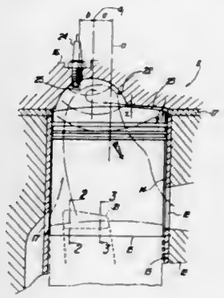
Tomio Iwai, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 31, 1987, Ser. No. 80,951

Claims priority, application Japan, Aug. 1, 1986, 61-180015

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—65 P **12 Claims**



1. In a combustion chamber for a two-cycle crankcase compression internal combustion engine having a cylinder, a cylindrical piston reciprocating in said cylinder, a cylinder head closing said cylinder and defining with said piston and said cylinder a combustion chamber, said combustion chamber being comprised of a large recessed area at one side of said cylinder and a surrounding squish area when said piston is at its top dead center, exhaust port means opening into said cylinder at a side thereof opposite said one side for receiving and discharging exhaust gases from said combustion chamber, and transfer port meand disposed on said one side of said cylinder and extending circumferentially therearound to a position contiguous to said exhaust port means for admitting a charge to said cylinder the improvement comprising said transfer port means being configured relative to said piston to introduce the charge into the cylinder initially at the area directly on said one side and upon subsequent motion of the piston progressively circumferentially around said cylinder toward said opposite side.

4,821,688

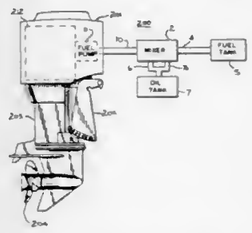
AUTOMATIC OIL-FUEL MIXER WITH AUXILIARY CHAMBER

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 12, 1988, Ser. No. 218,310

Int. Cl.[4] F04B *43/06*

U.S. Cl. 123—73 AD **6 Claims**



1. A marine propulsion system comprising an outboard two cycle internal combustion engine, a fuel tank, an oil tank, an oil-fuel mixer having a fuel inlet receiving fuel from said fuel

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tank, an oil inlet receiving oil from said oil tank, and an oil-fuel outlet delivering an oil-fuel mixture to said engine, said mixer comprising:

a valve housing;

a working chamber in said valve housing;

a moveable diaphragm in said working chamber and moved by fuel pressure differential thereacross;

an oil pump in said valve housing driven by movement of said diaphragm;

wherein fuel fills to a given level in said working chamber;

an auxiliary chamber having a fuel inlet receiving fuel from said working chamber below said given level, a vapor inlet receiving fuel vapor from said working chamber above said given level, and a vapor outlet exhausting said fuel vapor.

4,821,689

VALVE DRIVE WITH A HYDRAULIC TRANSMISSION AND A CHARACTERISTIC VARIABLE BY MEANS OF A LINK CONTROL

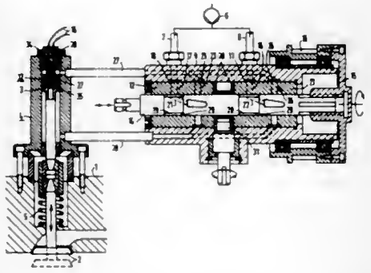
Gabriel Tittizer, Roesrath, and Ewald Junghans, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,794

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 3704071

Int. Cl.⁴ F01L *9/02*

U.S. Cl. 123—90.12 **12 Claims**



1. Valve drive assembly for an internal combustion engine having a crankshaft, comprising:

(a) a given number of pistons, control valves each being connected to a respective one of said pistons and independently movable by hydraulic fluid acting upon said pistons, a housing, at least one rotatable link disposed in said housing for aiding in shutting off and releasing a supply of hydraulic fluid to said pistons at regular intervals, an auxiliary shaft supported in said at least one rotatable link and driven by the crankshaft;

(b) first and second conduits for each valve communicating with said pistons: a hydraulic pump; first and second supply lines for hydraulic fluid leading from said hydraulic pump to first and second annular grooves formed in said housing: said at least one rotatable link having said given number of radial third and fourth conduits formed therein communicating with said first and second annular grooves: said auxiliary shaft having fifth and sixth annular grooves formed therein communicating with said third and fourth conduits; fifth and sixth conduits communicating with said fifth and sixth annular grooves; seventh and eighth conduits for each valve communicating with said fifth and sixth conduits; third and fourth annular grooves leading respectively, from said seventh and eighth conduits to said first and second conduits: and

(c) ribs dividing said fifth and sixth annular grooves into a number of sectors equivalent to said given number.

4,821,690

ENERGIZATION CONTROL APPARATUS FOR GLOW PLUG

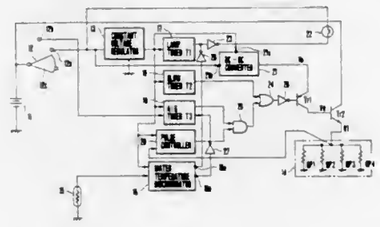
Minoru Masaki, Saitama, Japan, assignor to Jidosha Kiki Co., LTD., Tokyo, Japan

Filed May 19, 1988, Ser. No. 196,143

Claims priority, application Japan, May 20, 1987, 62-121386

Int. Cl.⁴ F02N *17/00;* **F02P** *19/02*

U.S. Cl. 123—179 H **4 Claims**



1. An energization control apparatus for a glow plug connected between ground and an emitter of an npn transistor and turning on/off said npn transistor to control an amount of power to be supplied to the glow plug, comprising:

control signal generating means (20) for generating a control signal for turning on/off said npn transistor; and

base voltage boosting means, arranged between said control signal generating means and a base of said npn transistor, for boosting a base voltage such that said npn transistor is operated in a saturation region regardless of load variations.

4,821,691

PORTABLE ENGINE UNIT

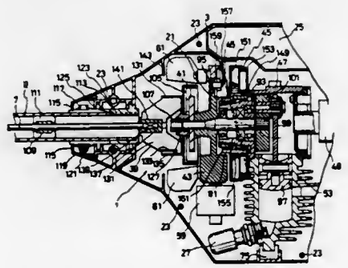
Tetsuo Ueno, Tokyo, and Katsumi Kiyooka, Saitama, both of Japan, assignors to Komatsu Zenoah Company, Machida, Japan

Division of Ser. No. 844,539, Mar. 26, 1986, Pat. No. 4,727,828. This application Dec. 11, 1987, Ser. No. 131,558

Claims priority, application Japan, Mar. 29, 1985, 60-44951; Mar. 29, 1985, 60-63814; Mar. 29, 1985, 60-63815; Apr. 19, 1985, 60-57412; Apr. 19, 1985, 60-57413; Apr. 26, 1985, 60-61845; Apr. 26, 1985, 60-61846; Apr. 26, 1985, 60-61849

Int. Cl.⁴ F02N *1/00*

U.S. Cl. 123—185 B **10 Claims**



1. A portable engine unit, comprising an engine including a centrifugal clutch, a crank case enclosing a crank shaft, an engine having a piston and a piston rod, a carburetor, an air filter, a recoil starter, a muffler, a transmission shaft rotated by said engine, and a vibration isolator removably attached to a vibration isolator joint, wherein said vibrator isolator joint is attached to a side surface of said clutch drum, wherein said clutch is fixedly attached to one end of said crank shaft, and said clutch comprises a clutch drum which is rotatably provided coaxially to the axial line of said crank shaft, and wherein one end of said transmission shaft is removably connected to the central portion of said vibration isolator.

4,821,692

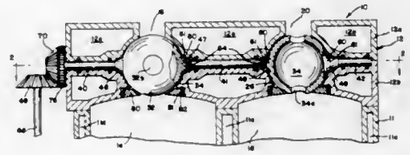
ROTARY VALVE MECHANISM FOR INTERNAL COMBUSTION ENGINE

Daniel F. Browne, 1840 Highland Ave., Northbrook, Ill. 60062

Filed Jan. 25, 1988, Ser. No. 147,975

Int. Cl.⁴ F01L *7/10*

U.S. Cl. 123—190 A **9 Claims**



1. In an internal combustion engine having a cylinder encasement formed with a plurality of cylinders and an intake port and an exhaust port for each cylinder, an improved rotary valve system for said engine comprising an enlarged chamber disposed between and in fluid communication with an associated cylinder and an associated port, a rotary valve member for said chamber having a through-channel and mounted for rotation within said chamber about a first axis of movement transverse to said valve member through-channel to permit fluid flow through said chamber and between the associated port and cylinder when said through-channel is aligned with the associated port, said valve member being movable within said chamber along a predetermined second axis of movement transverse to said first axis of movement and transverse to said valve member through-channel as said valve member is being rotated about said first axis, valve member drive means connected to said valve member for rotating said valve member about said first axis while permitting transverse movement of said valve member along said second axis, whereby said valve member may move transversely outwardly in said chamber to sealingly engage the portions of said chamber surrounding the juncture with the associated port as said valve member is being rotated between the positions of alignement of said valve member through-channel and the associated port.

4,821,693

CAMSHAFT FOR AN INTERNAL COMBUSTION ENGINE

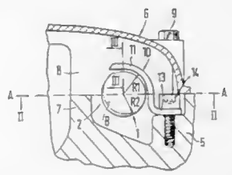
Gerhard Koller, Ditzingen, Fed. Rep. of Germany, assignor to Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,502

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643673

Int. Cl.⁴ F01L *1/04*

U.S. Cl. 123—193 H **12 Claims**



1. A camshaft mounting for an internal combustion engine which serves for the actuation of valves; cooperating bearing means; said camshaft being arranged in said cooperating bearing means which are formed by a cylinder head bearing housing means and a camshaft bearing housing means; the camshaft forming together with one of the bearing housing means a structural unit preassembled independently of the other bearing housing means; and at least one holder means for connecting the camshaft with the one bearing housing means.

4,821,694

HYPEREUTECTIC ALUMINUM-SILICON CASTING ALLOY

William G. Hesterberg; Raymond J. Donahue, and Benjamin L. Sheaffer, all of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 723,058, Apr. 15, 1985, Pat. No. 4,603,665. This application May 13, 1986, Ser. No. 867,401

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.⁴ C22C *21/02;* **F02F** *7/00*

U.S. Cl. 123—195 R **7 Claims**

1. A component for an internal combustion engine, comprising a casting composed of a hypereutectic aluminum silicon alloy, said alloy consisting essentially of 16% to 19% by weight of silicon, 0.4% to 0.7% by weight of magnesium, up to 1.4% by weight of iron, up to 0.3% by weight of manganese, up to 0.37% by weight of copper, and the balance aluminum, said alloy having excellent fluidity, and a solidification range of less than 150° F.

6. A method of casting an engine block, comprising the steps of forming a mold having a plurality of non-metallic cores constructed and arranged to form cylinder bores in the cast engine block, preparing a hypereutectic aluminum-silicon alloy consisting essentially by weight of 16% to 19% of silicon, 0.4% to 0.7% of magnesium, up to 1.4% iron, up to 0.3% of manganese, up to 0.37% copper, and the balance aluminum, a solidification range of less than 150° F., casting said alloy into the mold and into contact with said cores, and cooling the cast alloy to produce a solidified cast engine block having precipitated silicon crystals substantially uniformly distributed throughout said cast block.

4,821,695

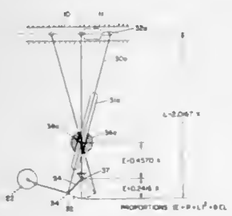
SWING BEAM INTERNAL COMBUSTION ENGINES

Ferdinand Freudenstein, Bronx, N.Y., assignor to The Trustees of Columbia University in the City of New York, Morningside Heights, N.Y.

Continuation of Ser. No. 870,507, Jun. 4, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 210,212

Int. Cl.⁴ F02B *75/32*

U.S. Cl. 123—197 AC **28 Claims**



1. In an internal combustion engine having a cylinder, a piston displaceable in the cylinder for executing at least two strokes over an engine cycle, namely, a compression stroke and a power stroke, a crankshaft, and a swing beam;

first coupling means between one end of the swing beam and the piston;

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second coupling means between the crankshaft and swing beam;

pivot-establishing means engaging the swing beam for causing the swing beam to rotate about a pivot point; and

control means responsive to the piston stroke for varying the pivot point, relative to the cylinder, between each compression stroke and each power stroke.

4,821,696

DEVICE FOR INJECTING FUEL INTO A COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Bernhard Kaczynski, Waiblingen; Alfred Schmitt, Ditzingen; Ewald Eblen, Stuttgart, and Iwan Komaroff, Regensburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

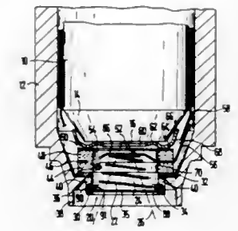
PCT No. PCT/DE87/00012, § 371 Date Jan. 7, 1988, § 102(e) Date Jan. 7, 1988, PCT Pub. No. WO87/06978, PCT Pub. Date Nov. 19, 1987

PCT Filed Jan. 14, 1987, Ser. No. 159,521

Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615636

Int. Cl.⁴ F02M *53/06, 57/00*

U.S. Cl. 123—298 **11 Claims**



1. A device for injecting fuel into a combustion chamber of an internal combustion engine, having an injection nozzle and a glow element arranged opposite the outlet side of the nozzle and embodied as a helix, which forms a passageway for the fuel injection streams and is surrounded with radial play be a sleeve, comprising a radially inwardly directed collar formed at the end of said sleeve remote from the nozzle and surrounding an insertion opening for said glow element, the inside diameter of said insertion opening being smaller than the outside diameter of one end turn of said glow element facing the combustion chamber, and the outside diameters of all the remaining turns of the glow element being equal or less than the inside diameter of the insertion opening; said collar having an annular shoulder facing the combustion chamber, said one end turn of the glow element being secured on and making an electrical contact with said annular shoulder; a contact ring washer secured in an insulated manner on the other end of said sleeve facing the nozzle, said contact ring washer having an inner ring rim which firmly retains and electrically contact the other end turn of said glow element.

4,821,697

FUEL OCTANE EVALUATION SYSTEM

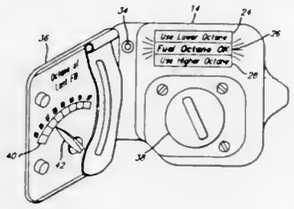
John A. McDougal, 14388 Harbor Island, Detroit, Mich. 48215

Filed Aug. 14, 1987, Ser. No. 85,476

Int. Cl.⁴ F02P *5/145*

U.S. Cl. 123—425 **31 Claims**

1. For a motor vehicle, computational and display means for indicating to the vehicle operator the propriety of the grade of fuel which has been consumed by the vehicle in a recent time interval, said computational means including means for providing a comparative evaluation as to whether a grade of fuel



should be used which is different from the grade of fuel which has been consumed in said recent time interval.

4,821,698

FUEL INJECTION SYSTEM

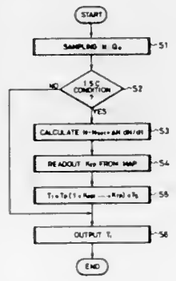
Takeshi Atago; Yasunori Mouri, and Toshio Manaka, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1986, Ser. No. 895,217

Claims priority, application Japan, Aug. 27, 1985, 60-186639

Int. Cl.⁴ F02B *3/02*

U.S. Cl. 123—478 **5 Claims**



1. A fuel injection system including valve opening time determining means for determining the opening time of a fuel injection valve in accordance with engine operation parameters which include intake air flow rate, engine speed and engine temperature, said fuel injection system comprising:

speed change detecting means for detecting variation in the number of revolutions of the engine per unit time;

correction component generating means for generating a correction component for correcting the opening time of said injection valve in accordance with the output of said speed change detecting means, including means for storing a map of correction component values which may be accessed by addresses based at least on said values of variation in the number of revolutions of the engine per unit time detected by said speed-change detecting means; and

means for supplying said correction component to said valve opening time determining means as one of the engine operation parameters.

4,821,699

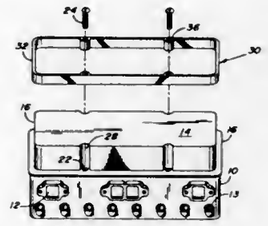
PRESSURE DISTRIBUTION DEVICE FOR VALVE COVER

Alan Mackin, 11375 Redhill Rd., Moreno Valley, Calif. 92387

Filed Feb. 8, 1988, Ser. No. 152,983

Int. Cl.⁴ F01L *1/46*

U.S. Cl. 123—90.38 **3 Claims**



2. A device for evenly distributing clamping pressure over a valve cover for an internal combustion engine, said valve cover having an attachment flange extending thereabout, said attachment flange being provided with openings which correspond to threaded openings in a block of an internal combustion engine through which extend bolts by which said valve cover is attached to said block, said device comprising;

an annular, substantially rigid body defining an upper surface and a planer lower surface, said planer lower surface disposed about said valve cover and overlaying said attachment flange of said valve cover, said body including bolt passages extending therethrough and opening at said upper and said lower surfaces, said bolt passages corresponding in position and number to said openings on said attachment flange of said valve cover, said body cross section at said bolt passages being thickened with respect to the body cross section intermediate said bolt passages;

whereby said planer lower surface of said annular body acts against said attachment flange of said valve cover responsive to the down torquing of said bolts to evenly distribute clamping pressure about said attachment flange.

4,821,700

DEVICE FOR DETERMINING MASS FLOW AND DIRECTION OF FLOW

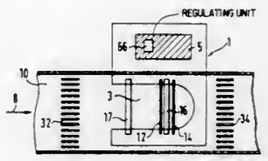
Wolfgang Weibler, Hofheim a. T., and Wolfgang Porth, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 107,654, Oct. 9, 1987, Pat. No. 4,774,833. This application Jul. 15, 1988, Ser. No. 219,312

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637541

Int. Cl.⁴ F02D *41/18*

U.S. Cl. 123—494 **10 Claims**



1. In a device for determining the mass flow and direction of flow of a fluid of substantially unidirectional flow with known mass flow, the device having a mass-flow measuring unit provided with a thermoelectric mass-flow sensor and a temperature sensor, the improvement wherein the device comprises

two temperature-measuring elements arranged adjacent the mass-flow sensor;

one of said temperature-measuring elements being located, depending on the direction of flow, in a feed stream; and

the other of said temperature-measuring elements being located in the discharge stream of the mass-flow sensor; and

fuel-metering means operatively coupled to said temperature-measuring elements for controlling fuel injection, in an engine, as a function of the mass flow of the air drawn in; and wherein

fuel is fed by said controlling means as a function of the signals given off by the temperature-measuring elements.

4,821,701

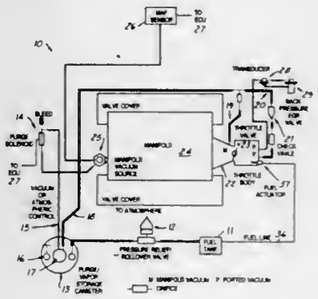
PURGE CORRUPTION DETECTION

Robert J. Nankee, II, Canton; Douglas C. Frantz, Lake Orion; James R. Tamm, Ypsilanti, and Terry R. Gutermuth, St. Clair Shores, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jun. 30, 1988, Ser. No. 213,667

Int. Cl.⁴ F00M *39/00*

U.S. Cl. 123—520 **3 Claims**



1. In an internal combustion engine having a throttle means, and a manifold; a fuel control system with evaporative emission controls (purge system) comprising a fuel tank, a pressure relief valve, a vapor storage canister, a purge solenoid, a purge valve, and a check valve, for the internal combustion engine, the fuel control system working in conjunction with an engine control unit (ECU) with a memory, microprocessing unit, and an input/output (I/O) module; a fuel actuator; a manifold absolute pressure (MAP) sensor, and exhaust gas oxygen sensor; an adaptive memory cell update method for the detection and correction of a possible purge corruption of the adaptive memory portion of the memory in the ECU, the adaptive memory portion having purge free cells and normal cells, the method comprising:

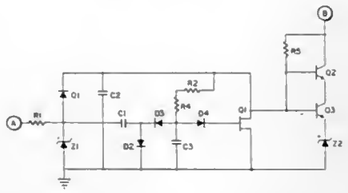
determining the adaptive memory cells to be used during the adaptive memory cell update by determining if the engine conditions are right to turn the purge system off;

if the conditions are right to turn the purge system off, turning the purge system off and using the purge free cells in the adaptive memory cell update;

if the conditions are not right to turn the purge system off, turning the purge system on and using the normal cells in the adaptive memory cell update.

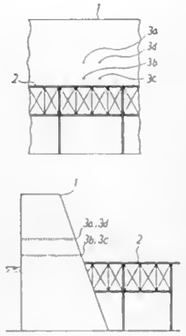
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4,821,702
ENGINE SPARK CONTROL APPARATUS
Floyd M. Minks, 2700 Partin Settlement Rd., Kissimmee, Fla. 32743
Continuation of Ser. No. 112,100, Oct. 22, 1987, Pat. No. 4,774,924. This application Jul. 29, 1988, Ser. No. 226,298
Int. Cl.[4] F02P 5/155
U.S. Cl. 123—618 6 Claims



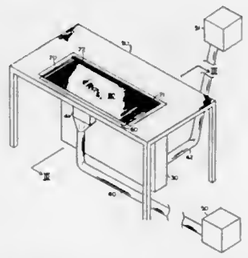
1. A system for controlling the firing of a semiconductor switching assembly, said assembly having an input terminal, an output terminal and a common input output terminal, said system containing a source of current for said common input output terminal and a solid state amplifying device connected to divert current from said input terminal to said common input output terminal in response to an input signal.

4,821,703
OPENING METHOD FOR REINFORCED CONCRETE WALL
Setsuo Kabo, Kyoto, Japan, assignor to Kabushiki Kaisha Dymosha, Kyoto, Japan
Filed Jul. 29, 1987, Ser. No. 78,884
Claims priority, application Japan, Aug. 31, 1986, 61-204851
Int. Cl.[4] B28D 1/00
U.S. Cl. 125—1 2 Claims



2. A method for creating an opening through a reinforced concrete wall, said opening being shaped as a rectangle having two vertical legs and two horizontal legs, comprising:
drilling cable penetrations through the concrete wall at each vertice of said rectangle;
placing a cutting cable through the pair of cable penetrations, for each pair of cable penetrations located at adjacent vertices of the rectangle;
circulating said endless cutting cable so as to cut along said vertical and said horizontal legs between the cable penetrations, to thereby separate a rectangular-shaped core;
guiding said cutting cable by two vertically-disposed tension pulleys attached to a cable drive device when cutting along said vertical legs;
guiding said cutting cable by two horizontally-disposed tension pulleys attached to a cable drive device when cutting along said horizontal legs;
injecting water against the cutting cable while circulating said cutting cable; and
breaking up and removing said core so as to leave said opening in the concrete wall.

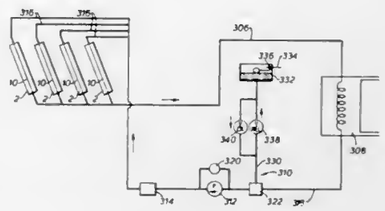
4,821,704
COOKING APPARATUS VENTILATION SYSTEM
James L. Tucker, 5363 110th St., Jacksonville, Fla. 32244; Takatoshi Yano, 2040 Deer Run Trail, Jacksonville, Fla. 32216, and Roy L. Turknett, Rt. 1, Keystone Heights, Fla. 32656
Filed Jan. 14, 1988, Ser. No. 143,667
Int. Cl.[4] F24C 15/20
U.S. Cl. 126—299 D 8 Claims



1. A cooking apparatus ventilation system, mounted on a table or other horizontal surface, comprising:
(A) a cooking surface situated below the surface of the table or other horizontal surface;
(B) evacuation means comprising one or more venting channels adjacent to one or more sides of the cooking surface, said venting channels situated below or even with the surface of the table or other horizontal surface, to downwardly remove a quantity of air from the region directly above the cooking surface and exhaust this air away from the device, where the evacuation means further comprises an evacuation chamber and outlet conduit, where such chamber and conduit are situated below the surface of the table or other horizontal surface and where said venting channels are situated to support the cooking surface around its perimeter; and
(C) forced air means directing a quantity of air horizontally or downwardly across the cooking surface in the direction of the evacuation means, such as that all of the air from the forced means is removed by the evacuation means.

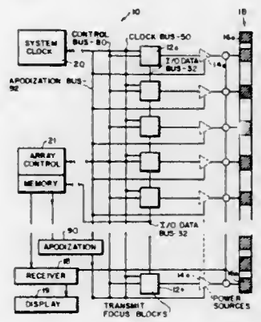
4,821,705
SOLAR TRACKING SYSTEM
John M. Tribey, Ringwood, Australia, assignor to Vulcan Australia Limited, Victoria, Australia
Division of Ser. No. 698,893, Feb. 6, 1985, Pat. No. 4,649,900. This application Jan. 13, 1987, Ser. No. 2,999
Claims priority, application Australia, Feb. 8, 1984, PG3512; Aug. 24, 1984, PG6763
Int. Cl.[4] F21J 3/02
U.S. Cl. 126—434 3 Claims

1. A solar energy utilization system comprising a plurality of solar energy collecting devices each having a heat transfer conduit for a heat transfer fluid and solar energy concentrating means for concentrating solar energy on said conduit so as to heat the heat transfer fluid sufficiently to cause vaporization of the fluid to a mixed liquid and vapor phase, heat utilization means which, in use, condenses heat transfer fluid supplied thereto in the vapor phase, a heat transfer fluid circulating system for circulating heat transfer fluid from the devices to the heat utilization means, wherein said circulating system includes a first line including a pump for supplying the heat transfer fluid in liquid form at a predetermined pressure to said devices, a second line for conveying heat transfer fluid in said mixed liquid and vapor phase from said devices to the heat utilization means, said heat transfer conduits being connected in parallel between said first and second lines, flow control means for each of said devices, said flow control means being connected in series with said heat transfer conduits for controlling flow of the heat transfer fluid so as to render the flow through respective heat transfer conduits substantially independent of one another;



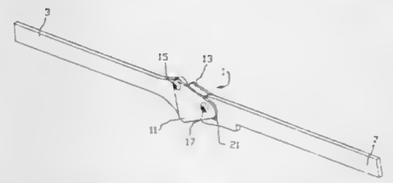
each flow control means comprising a flow element operative, in use, to cause a relatively large pressure drop across it so as to substantially eliminate the effects of variations in pressure drop across the various collectors or variations in pressure caused by vaporization of the heat transfer fluid in the collectors;
the flow element comprising capillary tubing.

4,821,706
HIGH VOLTAGE PULSE POWER DRIVE
Israel D. Schleicher, Costa Mesa, and Robert H. Russell, Manhattan Beach, both of Calif., assignors to North American Philips Corporation, New York, N.Y.
Filed Oct. 15, 1987, Ser. No. 108,522
Int. Cl.[4] A61B 10/00
U.S. Cl. 128—660.01 8 Claims



1. A high voltage pulse power driver to provide controlled amplitude current pulses to a load comprising:
a high voltage power source;
a variable control voltage source;
input means which receive a burst of constant amplitude voltage pulses;
means which clamp the voltage of said burst of pulses at the voltage level of said control voltage source;
current amplifying means which generate and amplify an electrical current which is proportional to the clamped voltage of said burst of pulses;
driver means connected to said current amplifying means which control a current drawn from said high voltage power source through said load such that the amplitude of said low voltage power source controls the amplitude of the current from said high voltage source through the load.

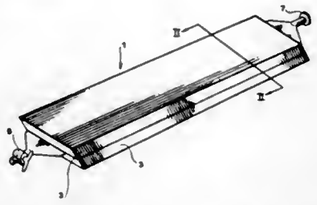
4,821,707
MECHANICAL ARTICULATED JOINT FOR KNEE BRACES
André Audette, 172, Avenue Breton, Laval-des-Rapides, (Quebec), Canada H7N 3L1
Filed Dec. 28, 1987, Ser. No. 138,075
Int. Cl.[4] A61F 5/01, 5/04
U.S. Cl. 128—80 F 20 Claims



1. An articulated mechanical joint for a knee apparatus applied to a human wearer and selected from the group consisting of a knee brace allowing extension and flexion of the wearer's knee to which said brace is applied, an artificial articulated knee of a leg prosthesis, said joint comprising:
a femoral link having a pivot end and a tibial link also having a pivot end, said pivot ends adjoining one another and lying in a common plane generally perpendicular to the rotation axis of the knee;
a first plate and a second plate; said plates lying flatly over said links in overlapping relation with said adjoining pivot ends, each plate being located on one side of said links;
first means pivotally mounting said first plate to the pivot end of said femoral link; second means pivotally mounting said first plate to the pivot end of said tibial link; third means pivotally mounting said second plate to the pivot end of said femoral link; and fourth means pivotally mounting said second plate to the pivot end of said tibial link; and
extension stop means preventing extension of said femoral and tibial links beyond a predetermined extension limit;
wherein, in full extension of the knee, (a) said first pivot means has a first pivot axis perpendicular to said common plane and intersecting a first, straight line located in said common plane posteriorly to a second line parallel to said first line and said second line being defined in said common plane by a medial-lateral transversal plane intersecting both centrally of the femoral head and tibial malleolus of the wearer, (b) said second pivot means has a second pivot axis both perpendicular to said common plane and anterior to said first line, (c) said third pivot means has a third pivot axis both perpendicular to said common plane and posterior to said first line, and (d) said fourth pivot means has a fourth pivot axis both perpendicular to said common plane and posterior to said first line.

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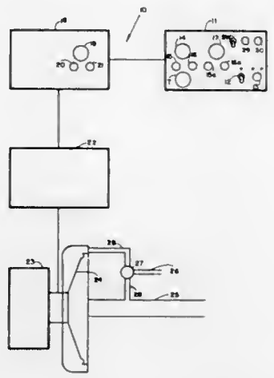
4,821,708
THERMOFORMABLE ORTHOPEDIC BANDAGE AND USE THEREOF
Claude Guignard, Le Vezely/Serby Gare, Saint-Genis-Pouilly, France; Tony Giglio, 15, route des Pilotis, 1246 Corsier-Port, and Abdelkader Benmiloud, 55, avenue de Vaudagne, 1217 Meyrin, both of Switzerland
Division of Ser. No. 734,314, May 14, 1985, Pat. No. 4,685,453. This application Mar. 3, 1987, Ser. No. 21,238
Claims priority, application Switzerland, May 14, 1984, 2368/84
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—82.1 **13 Claims**



1. A method of forming an orthopaedic bandage, comprising the steps of providing a thermoformable element comprising two adjacent layers of polymers of which at least one comprises elastically compressible foam, and at least one layer is made of a thermoplastic polymer, which two layers are united at the edges of the layers so as to define between the layers an enclosed space, and in which at least two openings are provided for connecting the said space to the exterior of the elements, one of which openings comprises an inlet for a fluid for heating the said thermoplastic polymer to its thermoforming temperature and the other of which openings comprises an outlet for this fluid, filling the said space with a heating fluid, heating the element by said fluid to soften at least one layer of said element, applying said softened element to a patient and causing it to adopt a desired shape, and cooling the said element in said desired shape.

4,821,709
HIGH FREQUENCY VENTILATOR AND METHOD
Robert L. Jensen, San Antonio, Tex., assignor to SensorMedics Corporation, Anaheim, Calif.
Continuation of Ser. No. 16,470, Feb. 17, 1987, abandoned, which is a continuation of Ser. No. 728,146, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 519,387, Aug. 1, 1983, abandoned, which is a continuation-in-part of Ser. No. 485,900, Apr. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 358,648, Mar. 16, 1982, abandoned. This application Mar. 8, 1988, Ser. No. 168,618
Int. Cl.[4] A61H *31/00;* **A61M** *16/00*
U.S. Cl. 128—204.21 **56 Claims**

1. An apparatus for supporting full ventilation in an air breathing animal comprising:
- means for supplying a respirating gas to an animal at elevated pressure,
- a linear motor,
- a diaphragm driven by said linear motor, and
- circuit means for producing a high frequency, variable frequency, variable amplitude signal for driving said linear motor to drive said diaphragm to generate a pressure wave in said gas which is polar relative to the static pressure in an airway of said animal, said pressure wave having a positively sloped portion forcing gas into said airway



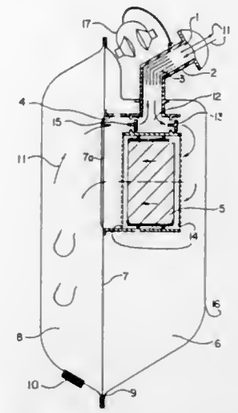
and a negatively sloped portion drawing gas out of said airway.

4,821,710
ADAPTOR TO ENDOTRACHEAL TUBE
Theodor Greunwald, 68 Horeb Str., and Yeshayahu Katz, 38 Hashomer Str., both of Haifa, Israel
Filed Jul. 9, 1987, Ser. No. 72,085
Claims priority, application Israel, Jul. 30, 1986, 79566
Int. Cl.[4] A62B *27/00*
U.S. Cl. 128—207.14 **12 Claims**

1. A transparent adaptor suitable to be attached at one end to an endotracheal tube and at the other end to a mechanical respirator, the adaptor containing a solid support impregnated with a solution of at least two chemical compounds; (a) organic amine and (b) an indicator with a pK in the range of 8.0 to 10.5 having a concentration of at least 0.05% (weight by volume) of the impregnation solution.

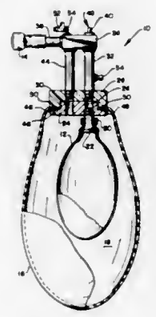
4,821,711
PROTECTIVE BREATHING DEVICE
Wolfgang Eckstein, Friedrich-Ebert-Ring, and Wolfgang Drews, Bahrenhof, both of Fed. Rep. of Germany, assignors to Dragerwerk AG, Fed. Rep. of Germany
Filed Jan. 7, 1988, Ser. No. 142,461
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 3300458
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—202.26 **6 Claims**

1. A protective breathing device comprising an air impermeable bag, a partition wall extending completely through said bag having an exhalation opening therethrough, said partition wall dividing said bag into an exhalation chamber on one side and an inhalation chamber on the opposite side, a breathing housing assembly mounted in said bag exhalation chamber portion on said partition wall and having a breathing air regeneration cartridge in said exhalation chamber portion and a breathing tube connection extending out of said bag and having an offset portion terminating in a mouthpiece which forms a part of said housing and including a plurality of spaced parallel cooling fins located in said breathing tube passage, said breathing tube connection and said housing defining a valved inhalation passage extending from the interior of said inhalation chamber through said partition wall exhalation opening and through said valve passage to the exterior and also defining a valved exhalation passage extending from the exterior of said bag through said valved exhalation passage into said inhalation chamber, said housing including a two-way passage below said breathing tubes located in said exhalation chamber having respective inhalation and exhalation passages that are at opposite ends, said exhalation passage communicating with a passage adjecent said partition wall opening for feeding inhaled air



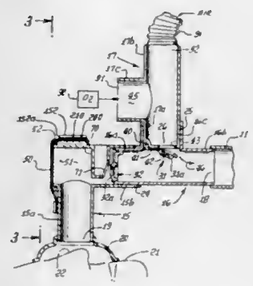
backwardly from said inhalation chamber through said breathing passage wherein, the opposite end of said passage includes an exhalation valve opening into said exhalation chamber of said bag.

4,821,712
BREATHING APPARATUS
Allen D. Gossett, 2202 Harrison #321, Wichita Falls, Tex. 76308
Filed Mar. 29, 1988, Ser. No. 174,768
Int. Cl.[4] A62B *7/00, 9/00*
U.S. Cl. 128—205.15 **10 Claims**



1. Portable emergency breathing apparatus adapted to be supportable solely by the mouth of the user, said apparatus comprising an expandable bladder adapted to receive, store and release a breathable oxygen-containing gas;
- a first normally closed valve means adapted to permit the introduction of said oxygen-containing gas into said bladder from an external source at a pressure greater than atmospheric pressure;
- a mouthpiece adapted to be inserted into and maintained in the mouth of the user during use;
- conduit means providing gaseous fluid communication between said bladder and said mouthpiece;
- and a second valve means adapted to selectively control the release of said oxygen-containing gas from said bladder to said mouthpiece through said conduit means;
- a bag disposed around said bladder so as to define a confined space therebetween, and a second conduit means producing gaseous fluid communication between said confined space and said mouthpiece.

4,821,713
RESUSCITATOR
Jack Bauman, 1677 San Onofre Dr., Pacific Palisades, Calif. 90272
Continuation of Ser. No. 912,568, Sep. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 882,773, Jul. 7, 1986, abandoned. This application Jul. 31, 1987, Ser. No. 80,388
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—205.13 **19 Claims**



1. A resuscitator for ventilating a patient comprising:
- a ventilator mask means for sealingly surrounding the patient's mouth and nose;
- a gas flow manifold having first, second, and third gas flow passage means for delivering ventilating gas from a source of ventilating gas to said mask means;
- means for operatively coupling said third gas flow passage means to said mask means;
- a manually collapsible gas receptacle;
- means for operatively coupling said manually collapsible gas receptacle to said first gas flow passage means;
- said second gas flow passage means being in flow communication with a source of ventilating gas;
- said first gas flow passage means being operatively coupled to said third gas flow passage means and said second gas flow passage means being operatively coupled to said first gas flow passage means;
- first one-way flow valve means mounted intermediate said second and first gas flow passage means for preventing flow from said first gas flow passage means to said second gas flow passage means and allowoing flow from said second gas flow passage means to said first gas flow passage means;
- second one-way flow valve means mounted intermediate said first and third gas flow passage means for preventing flow from said third gas flow passage means to said first gas flow passage means and allowing flow from said first gas flow passage means to said third gas flow passage means;
- said first one-way flow valve means and said second one-way flow valve means being mounted so that when said manually collapsible gas receptacle is collapsed, said first one-way flow valve means prevents flow from said first gas flow passage means to said second gas flow passage means and said second one-way flow valve means allows from said first gas flow passage means to said third gas flow passage means and, when said manually collapsible gas receptacle expands, said first one-way flow valve means allows flow from said second gas flow passage

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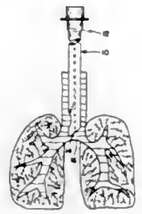
means to said first gas flow passage means and said second one-way flow valve means prevents flow from said third gas flow passage means to said first gas flow passage means;

said third gas flow passage means including gas outlet means and means for closing said gas outlet means when said second one-way flow valve means allows flow from said first to said third gas flow passage means;

said gas flow manifold further including means for detecting air pressure within said third gas flow passage means and for defining a portion of a wall of said third gas flow passage means; and

a wall of said third gas flow passage means having means for indicating the pressure detected by said air pressure detecting means.

4,821,714
PHARMACEUTICAL ENDOTRACHEAL TUBE
Danny N. Smelser, 205 Lincoln St., Florence, Ala. 35630
Filed Dec. 4, 1986, Ser. No. 937,679
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.14 **15 Claims**



1. An endotracheal device coupleable to a syringe with a hypodermic needle comprising:

a generally elongated, flexible, tubular member enclosing a main passageway and extending along the length thereof, said tubular member having a distal end positionable at the point where the trachea of a patient divides to form a passageway to each lung and having an opposite end configured for the introduction of a breathable gas;

discrete tube means having a termination end adjacent the distal end of said tubular member, said discrete tube means extending along said tubular member for a discrete distance and then separating from said tubular member and ending in a second opening end;

puncturable closure means secured to said second end of said discrete tube means; and

said discrete tube means being of smaller diameter than said tubular member;

whereby, while applying a breathable gas through said opposite end of said tubular member, puncturing said puncturable closure means with the needle end of said hypodermic syringe having a pharmaceutical fluid therein and effecting a pumping action on said syringe, said pharmaceutical is positively forced through said discrete tube means and out said termination end into the lungs of a patient and therefrom absorbed through the walls of the lungs of a patient into the bloodstream of a patient.

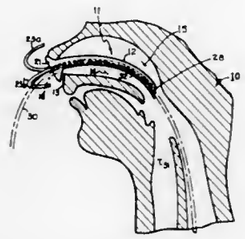
4,821,715
NASOPHARYNGEAL AIRWAY
Michael V. Downing, 3520 Myrtle Ave., Covington, Ky. 41015
Filed Feb. 16, 1988, Ser. No. 155,912
Int. Cl.[4] A61M *15/08;* **A62B** *9/04, 7/02*
U.S. Cl. 128—207.18 **9 Claims**

1. An improved nasopharyngeal airway comprising:

a tube having a predetermined length from end to end which extends from the tip of the nares to the oropharynx of a patient and in all cases short of the trachea and the esophagus of said patient when inserted completely into a nasal passage, said tube defining an airway passage having an open end located proximate a distal end of said tube;

at least one unobstructed lumen completely enclosed in a wall of said tube and extending the length of said tube adjacent said airway passage, said lumen having an open end proximate the distal end of said tube;

means for operably connecting said lumen to a source of oxygen;



wherein said airway passage is unobstructed and provides a channel for insertion of medical apparatus for patient treatment while oxygen is simultaneously delivered to the oropharynx of a patient through said at least one lumen, and said airway defining a medical apparatus guide for preventing tissue damage which may otherwise result from frequent insertion and withdrawal of such other medical apparatus.

4,821,716
METHOD AND APPARATUS FOR PERPENDICULAR PERFORATION OF THE CRANIUM
Jamshid B. G. Ghajar; Robert J. Hariri, and Fathali G. Ghadjar, all of New York, N.Y., assignors to Neurodynamics, Inc., New York, N.Y.
Filed Sep. 4, 1987, Ser. No. 93,426
Int. Cl.[4] A61B *17/16, 19/00*
U.S. Cl. 128—303 B **19 Claims**



1. An apparatus for drilling an orifice in a human cranium at an angle of substantially 90° to a plane defined by a tangent to a surface portion thereof, said apparatus comprising:

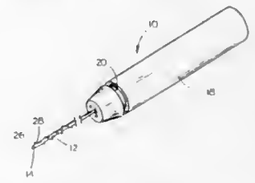
(a) hand-held means for guiding drill means upon said cranium at an angle of substantially 90° to a plane defined by a tangent to said cranium during the perforation thereof, said drill guiding means adapted for resting unsecured upon any portion of said cranium;

(b) means insertable within an open bore portion of said drill guiding means for drilling an orifice in said cranium;

(c) means for guiding a fluid transport member having a bore portion with a reduced diameter in relation to said bore of said drill guiding means and insertable within said open bore portion of said drill guiding means upon removal of said drilling means so as to effectively reduce the diameter of said open portion; and

(d) means for preventing penetration of said drilling means beyond a predetermined distance into said cranium.

4,821,717
BARBED ELECTROLYSIS AND THERMOLYSIS NEEDLE
Janet M. M. Wehrli, 12820 Drexel St., Omaha, Nebr. 68137
Filed Mar. 28, 1988, Ser. No. 174,211
Int. Cl.[4] A61B *17/41*
U.S. Cl. 128—303.18 **20 Claims**



1. An electrolysis needle, adapted for use in an electrolysis needle holder, said needle comprising,

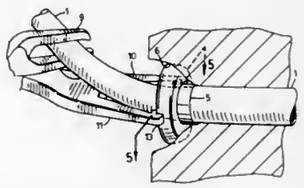
an elongated blade having a tip at one end and an opposite end,

said blade having a diameter of between 0.002 and 0.010 inches over a substantial portion of the length thereof,

an elongated electrolysis shank aligned with said blade and secured to the opposite end thereof, said shank having a diameter substantially greater than said blade for insertion within an electrolysis needle holder, and

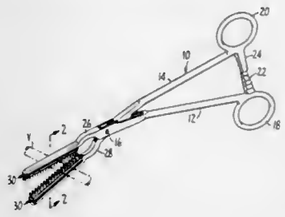
said blade including a plurality of axially and circumferentially spaced apart barbs protruding therefrom.

4,821,718
SURGICAL INSTRUMENT FOR PROSTHETIC GRAFT REMOVAL
P. Robert Uldall, 11 Birchwood Avenue, Willowdale, Ontario, Canada M2L 1M2
Filed Oct. 19, 1987, Ser. No. 109,516
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 **12 Claims**



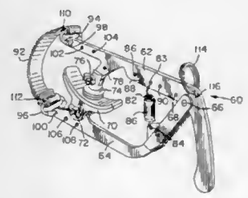
10. A cutting head for an instrument for removal of a prosthetic graft from surrounding tissue, said cutting head comprising a cylindrical knife having a sharp circular front edge, a rear portion of said knife being connected in and secured to an annular guide concentric with said cylindrical knife and of external diameter greater than the diameter of said sharp circular front edge, the front surface of said guide extending continuously rearwardly from the external surface of said knife and merging arcuately smoothly with the side surface of the knife, whereby tissue may slide freely over said front surface and the freed end of the prosthetic graft can be withdrawn rearwardly through the central opening in said annular guide and knife, the diameter of the opening in the annular guide being less than the internal diameter of the cylindrical knife, the internal surface of the opening extending smoothly continuously rearwardly from the internal portion of the knife, whereby the freed portion of the prosthetic graft may slide freely over said internal surface, and said guide comprising a cylindrical side surface having therein a pair of diametrically opposed recesses, each recess extending radially inwardly from said side surface, for receiving and engaging a projection on said instrument to be inserted radially inwards into each recess.

4,821,719
COHESIVE-ADHESIVE ATRAUMATIC CLAMP
Thomas J. Fogarty, 770 Welch Rd., Suite 216, Palo Alto, Calif. 94304
Continuation-in-part of Ser. No. 677,561, Dec. 3, 1984, Pat. No. 4,611,593. This application Aug. 20, 1986, Ser. No. 898,313
The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—325 **13 Claims**



1. A vessel occluding instrument for facilitating the treatment of an anatomical vessel, said instrument comprising: an elongated generally rigid body member having top and bottom surfaces; resilient pad means secured to the bottom surface of said body member, said resilient pad means comprising a cohesive-adhesive covering sheet for releasably and atraumatically securing said pad means to said vessel, whereby said sheet and said vessel collectively produce an adherence relationship therebetween; and clamp means secured to said body member in apposition to the bottom surface thereof to selectively draw said vessel into adherence relationship to the covering sheet of said resilient pad means.

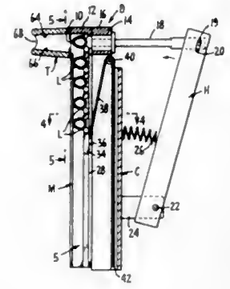
4,821,720
MEDICAL FASTENING AND CLAMP SYSTEM
James D. Hajduch, 1703 Caroline Ave., Whiting, Ind. 46394
Division of Ser. No. 637,019, Aug. 2, 1984. This application Nov. 2, 1987, Ser. No. 115,405
Int. Cl.[4] A61B *17/12, 17/00*
U.S. Cl. 128—325 **11 Claims**



1. A clamp for applying pressure to a member comprising: a first frame having length; a second frame means movable secured to said first frame means; cradle means secured to said second frame means and being capable of acting to hold said member on which pressure is to be applied; and head means capable of being secured to said first frame means at different positions along the length of said first frame means and being capable of acting to contact said member being held by said cradle means whereby the desired pressure is applied to said member.

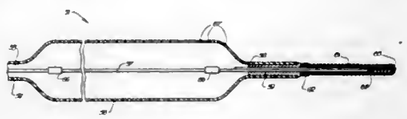
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4,821,721
APPARATUS AND METHOD FOR APPLYING HEMOSTATIC SCALP CLIPS
Albert K. Chin, Palo Alto, and Robert K. Goldman, Menlo Park, both of Calif., assignors to Thomas J. Fogarty, Palo Alto, Calif.
Continuation-in-part of Ser. No. 691,416, Jan. 14, 1985, Pat. No. 4,671,278. This application Jun. 4, 1987, Ser. No. 58,263
Int. Cl.[4] A61B 17/10
U.S. Cl. 128—334 R 7 Claims



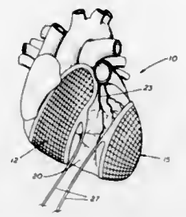
5. An improved method for hemostatically closing an incision in a flesh member, said method comprising:
providing a guide tunnel having an open distal end and tapered internal cam surfaces which converge to said distal end;
spanning the incision with the open distal end of the guide tunnel;
directing a clip having a normally engaged spring biased jaws through the tunnel to engage protrusions on the jaws with the cam surfaces to force the jaws apart as the clips pass through the tunnel toward the open distal end thereof; and
discharging said clip from the distal end of the tunnel to release the jaws for closure and engage the flesh member to either side of the incision between the jaws.

4,821,722
SELF-VENTING BALLOON DILATATION CATHETER AND METHOD
Gary H. Miller, Milpitas, and Wilfred J. Samson, Saratoga, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.
Filed Jan. 6, 1987, Ser. No. 651
Int. Cl.[4] A61M 29/02
U.S. Cl. 128—344 12 Claims



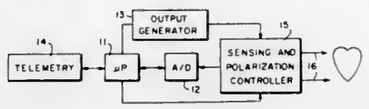
1. A self-venting balloon dilation catheter comprising an elongate flexible tubular member with an inflatable balloon on the distal portion thereof, the tubular member having at least one lumen extending longitudinally therein to at least the interior of the balloon and in fluid communication therewith for inflating the balloon with a liquid inflation medium and the balloon having a wall portion adjacent an end thereof with a plurality of small micromachined holes therein having diameters from about 0.000015 to about 0.001 inch in fluid communication with the interior of the balloon permitting air to escape from the interior of the balloon but inhibiting the passage of the liquid inflation medium when the balloon is inflated thereby.

4,821,723
BIPHASIC WAVEFORMS FOR DEFIBRILLATION
Ross G. Baker, Jr., Houston; Stephen J. Whistler, Lake Jackson, both of Tex.; Raymond E. Ideker, Durham, N.C.; Richard V. Calfee, Houston, and Edward A. Haluska, Angleton, both of Tex., assignors to Intermedics Inc., Angleton, Tex.
Filed Feb. 27, 1987, Ser. No. 19,705
Int. Cl.[4] A61N 1/00; H05G 00/00
U.S. Cl. 128—419 D 16 Claims



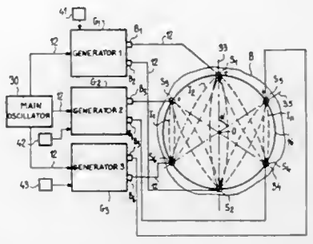
1. A method of defibrillating a heart in fibrillation, comprising the steps of:
detecting the onset of fibrillation of the heart, and
applying to the fibrillating heart a biphasic waveform having only a first phase and a second phase, each phase of the waveform being characterized by a predetermined time duration and by a predetermined polarity and magnitude of voltage, in which the duration of the first phase of the applied waveform is greater than the duration of the second phase.

4,821,724
PACING PULSE COMPENSATION
Robert H. Whigham, Aurora, and Tibor A. Nappholz, Englewood, both of Colo., assignors to Telectronics N.V., Curacao, Netherlands Antilles
Filed Aug. 1, 1986, Ser. No. 891,479
Int. Cl.[4] A61N 1/00; H05G 00/00
U.S. Cl. 128—419 P 28 Claims



1. A pacemaker stimulus-generating circuit comprising an electrode, a coupling capacitor, and means for controlling an isolated stimulus cycle including means for causing a negative stimulating current to flow to said electrode through said capacitor, and means driven by the capacitor voltage for applying a subsequent positive current to said electrode through said capacitor until the capacitor voltage returns to its value prior to the start of the isolated stimulus cycle, said positive current applying means operating to apply a current which is a function of said capacitor voltage but which is substantially independent of the body load impedance to which said electrode is coupled.

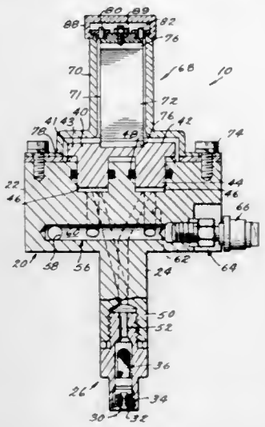
4,821,725
DEVICE FOR TREATMENT THROUGH HYPERTHERMIA
Guy Azam, La Celia St. Cloud; Guy Convert; Jean M. Cosset, both of Vincennes; Jacques Dufour, Orsay, and Jean P. Mabire, Sur Yvette, all of France, assignors to C.G.R. MeV, Buc, France
Filed Jun. 6, 1986, Ser. No. 871,288
Claims priority, application France, Jun. 7, 1985, 85 08641
Int. Cl.[4] A61N 1/32
U.S. Cl. 128—420 A 3 Claims



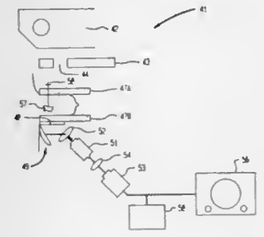
1. A treatment device using hyperthermia, comprising:
a first generator supplying an alternating electrical energy;
two unipolar implantable probes connected to the output of said generator to receive said alternating electrical energy and to apply said electrical energy, according to an electric field, to an area of a patient to be treated;
at least one second generator synchronized in frequency with said first generator;
a third and fourth unipolar probe connected to receive the output of said at least one second generator and cooperating with said first two unipolar probes in order to heat said area of said patient; and
means for modifying the distribution forms of said electrical field from said first and said at least one second generator including means for inverting the plus, minus polarity of said electrical energy applied to at least to said two unipolar probes which are connected to said first generator.

4,821,726
ELECTRONIC FUEL INJECTION DEVICE
Hiroshi Tamura, Oobu; Shunichiro Hiromasa, Okazaki, and Toshio Kondo, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Nov. 9, 1987, Ser. No. 118,675
Claims priority, application Japan, Nov. 7, 1986, 61-263971
Int. Cl.[4] F02M 51/04
U.S. Cl. 123—498 22 Claims

1. An electronic fuel injection device for feeding fuel to an internal combustion engine comprising:
(a) a main body having at least two bores therein;
(b) a pumping member which has at least two pistons, each piston being adapted to be fitted into a respective bore, and a base on which said pistons are formed, each bore and its associated piston forming a pump chamber;
(c) means for driving said pump member;
(d) a fuel supply passage for supplying fuel into said pump chambers;
(e) injection nozzles adapted to be secured to a suction pipe of said internal combustion engine in order to supply fuel thereto when a predetermined pressure of fuel is provided thereto;
(f) fuel injection passages connecting said injection nozzles to said pump chambers respectively; and
(g) a spring member, provided between said main body and said base of said pumping member, for biasing said pumping member in a direction opposite to that in which said pumping member is moved by said driving means.



4,821,727
MAMMOGRAPHIC BIOPSY NEEDLE HOLDER SYSTEM
Simha Levene, Tiberias, and Dan Inbar, Haifa, both of Israel, assignors to Elscint Ltd., Haifa, Israel
Filed Oct. 30, 1986, Ser. No. 924,628
Int. Cl.[4] A61B 6/00
U.S. Cl. 128—653 6 Claims



1. A mammographic biopsy needle holder positioning system for locating a needle holder in a breast to identify a lesion therein that is to undergo biopsy, said system comprising:
a biopsy needle holder adapted to be inserted into the breast,
x-ray tube means for generating x-ray beams, said x-ray tube means being positioned to direct said x-ray beams so that they pass through the breast of the patient,
breast compression means for compressing the breast to reduce the distance through the breast traversed by the x-ray beams, said breast compression means comprising first and second compression plates and means for moving said compression plates relative to each other to compress said breast therebetween,
x-ray receptor means for receiving x-rays, said x-ray receptor means being located opposite the x-ray tube means for receiving the x-ray beams after they have traversed the breast and for obtaining a view thereof,
C-arm means for holding said x-ray tube means and said x-ray receptor means aligned and spaced apart,
a relatively immobile base means for supporting said breast compression means,

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means for mounting said breast compression means to said base means while enabling said breast compression means to move laterally and transversely on said base means relative to said C-arm means, and

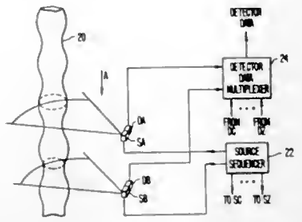
pivot means for mounting said C-arm means to said base means for supporting said C-arm means while enabling said C-arm means to pivot around said base means and said compression means for obtaining displays on said receptor means of different views of the biopsy needle holder inserted into the breast in accordance with the angular position of said C-arm means on said base means.

4,821,728

THREE-DIMENSIONAL IMAGING SYSTEM

Robert S. Ledley, Silver Spring, Md., assignor to National Biomedical Research Foundation, Washington, D.C.

Continuation of Ser. No. 594,277, Mar. 28, 1984, Pat. No. 4,747,411. This application Jan. 29, 1988, Ser. No. 150,268
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—661.01 **16 Claims**



1. A three-dimensional imaging system for obtaining a three-dimensional image of a three-dimensional object, comprising:

source means displaced from the three-dimensional object for transmitting ultrasonic energy toward the three-dimensional object in successive directions in a first scanning plane, each successive direction having an angular orientation, with respect to a reference direction in the first scanning plane, which is greater than the angular orientation with respect to the reference direction of any preceding direction, and for repeating the transmission of ultrasonic energy toward the three-dimensional object in successive directions in successive scanning planes parallel to said first scanning plane;

detector means for receiving reflected energy reflected from material of the three-dimensional object as a result of scanning of said three-dimensional object by said source means in said first and said successive scanning planes, and for converting said reflected energy to electrical signals;

processing means connected to said detector means for receiving said electrical signals, and for processing said electrical signals to develop reconstructed image data of the three-dimensional object, said reconstructed image data developed by said processing means corresponding to forward projections of the three-dimensional object into a left image plane to form a first image and into a right image plane to form a second image, said first and second images forming a stereo pair, and

display means connected to said processing means and responsive to said reconstructed image data developed by said processing means for displaying said first and second images compositely, thereby displaying said three-dimensional image of the three-dimensional object;

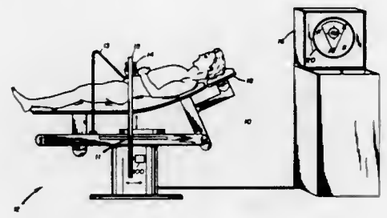
wherein each of said electrical signals received by said processing means represents a reflection profile for the energy reflected from the material of the three-dimensional object as a result of scanning in a respective one of said successive directions, said processing means comprising means for performing a differentiation operation to identify reflective peaks in the reflection profile.

4,821,729

MEANS AND METHOD FOR THE NONINVASIVE FRAGMENTATION OF BODY CONCRETIONS HAVING MEANS FOR ACCURATELY LOCATING A CONCRETION

Robert A. Makofski, Catonsville; Joe T. Massey, Bethesda; F. Fausten Mark, Silver Spring; Francis B. Weiskopf, Jr., Catonsville; William H. Guier, Pasadena; Patrick C. Walsh, Hunt Valley, and Fray F. Marshall, Ruxton, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 608,114, May 8, 1984, Pat. No. 4,610,249. This application Sep. 9, 1986, Ser. No. 905,218
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—660.03 **4 Claims**



1. A device for the noninvasive fragmentation of a concretion within a body of a patient, comprising:

patient support means;

a first ultrasonic transducer mounted on said patient support means, said first ultrasonic transducer being used to locate said concretion;

a second ultrasonic transducer for locating said concretion;

a reflector comprising a portion of an ellipsoid of revolution with an open end and a closed end, said second ultrasonic transducer being attached to said closed end, said reflector having a first focus and a second focus, said second ultrasonic transducer being positioned so that an axis of the second ultrasonic transducer is coincident with the straight line extending through the first and second foci;

relative positioning means for determining the relative position of said reflector to the location of said concretion as determined by said first ultrasonic transducer and providing a relative position signal indicative of the relative position of said reflector;

reflector positioning means for positioning said reflector at the location of said concretion in response to said relative position signal from said relative positioning means and wherein said concretion is located at the second focus of said reflector using said second ultrasonic transducer;

shockwave generating means for generating a shockwave at said first focus; and

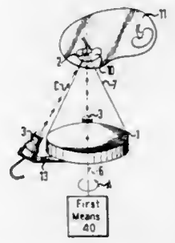
acoustical coupling means for acoustically coupling said shockwave from said first focus through a portion of said body to said second focus whereby said shockwave is concentrated at said concretion.

4,821,730

ULTRASONIC SCANNER AND SHOCK WAVE GENERATOR

Helmut Wurster, Oberderdingen, and Werner Krauss, Maulbronn, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Division of Ser. No. 940,445, Dec. 11, 1986, Pat. No. 4,771,787.
This application Sep. 14, 1988, Ser. No. 244,747
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543867
Int. Cl.[4] A61B *8/00*
U.S. Cl. 128—660.03 **8 Claims**



1. A device for spatial location and destruction of a concretion in a bodily cavity of a patient, comprising:

focussing shock wave transducer means for producing ultrasonic waves and having an axis of symmetry and a focus alignment with the concretion to be destroyed;

a B-scanner arranged to generate a B-section image of bodily tissue of the patient traversed by the ultrasonic waves from said transducer means;

support means for mounting the B-scanner within a perimeter defined by the transducer means to move with the transducer means, said support means comprising means for rotating the B-scanner relative to the transducer means about a rotational axis which passes through the B-scanner to rotate the orientation of the sectioning plane of the B-scanner with respect to the transducer means;

monitor means for displaying said image;

means for defining at least one target mark on said monitor means indicating the position of the transducer focus; and

means for effecting relative movement between the patient and the device to bring the concretion depicted in said image into coincidence with said target mark, said shock wave transducer means adapted to generate ultrasonic shock waves in a pulsed manner to destroy the concretion at said focus.

4,821,731

ACOUSTIC IMAGE SYSTEM AND METHOD

Michael A. Martinelli, Winchester, and Peter von Thuna, Lexington, both of Mass., assignors to Intra-Sonix, Inc., Burlington, Mass.

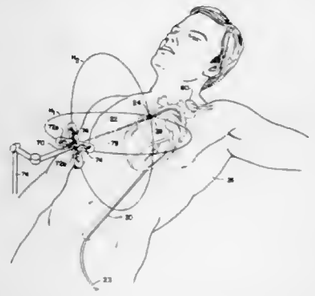
Continuation-in-part of Ser. No. 856,621, Apr. 25, 1986, abandoned. This application Dec. 8, 1987, Ser. No. 129,830
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—662.06 **48 Claims**

1. Apparatus for sensing imaging information of the internal features of a living body at a preselected site, said apparatus comprising:

a catheter having a longitudinal axis, a proximal end and a distal end such that said catheter is adapted to be partially inserted into said living body so that said distal end is positioned relative to said preselected site so that said imaging information of said internal features can be acoustically sensed at said distal end;

image data sensing means, coupled to said catheter at said distal end, for acoustically sensing said imaging information of said body in the general direction of an image data sensing axis transverse to the longitudinal axis of said catheter at said distal end so that rotation of said catheter about said longitudinal axis rotates said image data sensing axis about said longitudinal axis; and

position sensing means for determining the spatial position of said image data sensing means within said body and the angular orientation of said image data sensing axis about



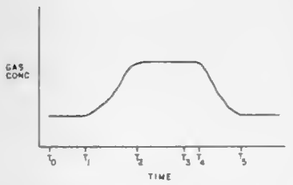
said longitudinal axis with respect to said spatial position so that imaging information of said body sensed by said image data sensing means at each such spatial position and angular orientation can be related to a specific cylindrical coordinate position, and imaging information of said body for a plurality of said cylindrical coordinate positions can be spatially cross correlated.

4,821,732

METHOD FOR MONITORING FETAL-MATERIAL CIRCULATION TIME

Jack Lippes, 100 Lincoln Pkwy., Buffalo, N.Y. 14222

Filed Apr. 23, 1987, Ser. No. 41,470
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—632 **19 Claims**



1. A method for determining distress in a fetus comprising the steps of:

A. Administering a predetermined concentration of gas to the mother;

B. detecting transdermal diffusion of said gas at a location on the maternal skin;

C. detecting transdermal diffusion of said gas at a location on the fetal skin;

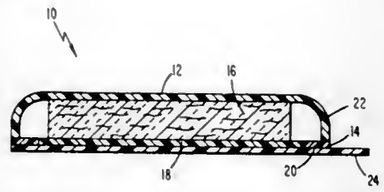
D. determining the time period from first administration of said gas to first detection of said gas transdermally diffused through the maternal skin;

E. determining the time period from first administration of said gas to first detection of said gas transdermally diffused through the fetal skin; and

F. Comparing said time periods to standard time period values.

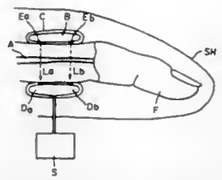
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4,821,733
TRANSDERMAL DETECTION SYSTEM
Carl C. Peck, Rockville, Md., assignor to Dermal Systems International, Rockville, Md.
Filed Aug. 18, 1987, Ser. No. 87,699
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—636 **26 Claims**



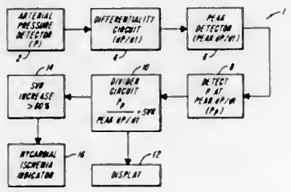
1. An apparatus for the detection of a target substance which migrates to the surface of the skin of a subject by diffusion, comprising
detector means including (a) at least one detector chemical contained in solution and capable of chemically reacting with the target substance as the target substance migrates to the surface of the skin of the subject to produce a detectable signal and (b) a barrier means for substantially preventing said detector chemical from migrating into the skin of the subject; and
attachment means for maintaining the detector means adjacent the surface of the skin of the subject.

4,821,734
SPHYGMOMANOMETER
Shinji Koshino, Shibukawa, Japan, assignor to Nihon Seimitsu Sokki Co., Ltd., Shibukawa, Japan
Filed Jul. 16, 1987, Ser. No. 74,204
Claims priority, application Japan, Apr. 21, 1987, 62-98390; Apr. 21, 1987, 62-98391
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—680 **4 Claims**



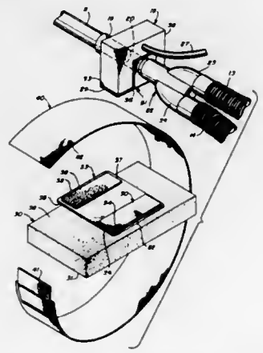
1. A non-invasive manometer comprising:
pressure means attached to an appendage for applying a pressure thereto;
pressure changing means for changing the pressure applied to said appendage;
optical means for sensing a change in a blood vessel of the appendage due to the applied pressure of the pressure means and internal pressure of the blood vessel caused by beating of a heart, the optical means including a light emitting unit and a photosensitive unit, the units including at least first and second pairs of light emitting elements and photosensitive elements;
shielding means for shielding the optical means from light external to the optical means;
clock means for operating the light emitting and photosensitive units alternately in a time-divisional manner;
said first pair of light emitting element and photosensitive element being disposed on said appendage closer to said heart than said second pair of light emitting element and photosensitive element, said second pair of light emitting element and photosensitive element, which is disposed on a peripheral side, for determining a systolic blood pressure; and
comparison means for comprising outputs from two or more pairs of elements of the optical means, which are disposed closer to said heart and disposed on the peripheral side, to determine a diastolic pressure when said outputs coincide.

4,821,735
METHOD AND APPARATUS FOR DETECTING MYOCARDIAL ISCHEMIA
Daniel Goor, Rehov David Hemelech 47, Tel Aviv, and Raphael Mohr, Rehov Hameshorer 10, Kiryat Krinitzi, Ramat Gan, both of Israel
Continuation of Ser. No. 856,489, Apr. 25, 1986, abandoned. This application Feb. 11, 1988, Ser. No. 153,498
Claims priority, application Israel, Jan. 22, 1986, 77677
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—713 **6 Claims**



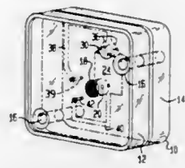
1. A method for detecting myocardial ischemia in a subject comprising the steps of:
monitoring the systemic vascular resistance of the subject; and
detecting the presence of myocardial ischemia in a subject when the monitored systemic vascular resistance of the subject increases by at least 60%, thereby indicating the presence of myocardial ischemia.

4,821,736
HEAD-MOUNTED DEVICE FOR SUPPORTING BREATHING CIRCUIT TUBES AND SENSOR
Charles B. Watson, Easton, Conn., assignor to Dale Medical Products, Inc., Plainville, Mass.
Filed Mar. 22, 1988, Ser. No. 171,896
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—719 **8 Claims**



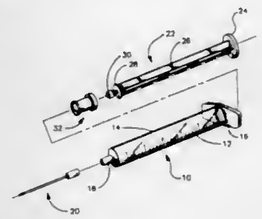
1. In a system for monitoring the concentration of fluids such as CO_2 in a breathing circuit of the type including an endotracheal tube positionable in a patient's nose or mouth, a fluid sensor having an airway passage means connected to the endotracheal tube and having means for measuring the concentration of a fluid which passes through the airway passage means, a pair of breathing tubes connected to the airway passage means, and a breathing machine providing a source of inhalation fluids to one of the breathing tubes and an exit for exhalation fluids from the other breathing tube, a device for supporting the breathing tubes and sensor comprising:
a cushion positionable across the forehead;
a plate positionable over the cushion and having first and second plate portions, said plate being substantially rigid and providing a thermal insulating barrier;
a band stretchable in the lengthwise direction and adapted to be wrapped snugly over the cushion and the first plate portion and around the back of the head, the band having adjustable and releasable attaching means for securing the band in said wrapped position;
the second plate portion extending above the band; and
connecting means on the second plate portion and on the sensor for attaching the sensor to the second plate portion;
wherein the plate acts as a thermal barrier reducing heat transfer from the sensor to the patient and counterbalances the weight of the sensor so that the sensor is supported in a substantially fixed position on the plate adjacent the centerline of the patient s forehead and the circuit tubes are positioned up over the patient's head.

4,821,737
WATER SEPARATOR
Peter E. Nelson, Englewood, Colo., assignor to The BOC Group, Inc., Montvale, N.J.
Filed Aug. 25, 1986, Ser. No. 900,030
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—730 **9 Claims**



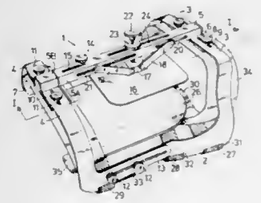
1. A water separator for use with a breath gas analyzer, for analyzing the breath of a patient, said separator comprising; a housing having an inlet for receiving gas/liquid removed as a sample from the patient's breath and an outlet for discharging gas from said water separator to the analyzer, first and second chambers formed in said housing means intermediate said inlet and said outlet, said first chamber adapted to receive said gas/liquid from said inlet and having a pair of substantially closely aligned wall surfaces of predetermined narrow distance from each other, said aligned surfaces sufficiently close to remove liquid from said gas/liquid stream passing from said inlet to said outlet by surface tension with said liquid adapted to adhere to said aligned surfaces, said second chamber adapted to receive said gas stream from said first chamber, said second chamber having wall surfaces spaced apart a wider distance than said wall surfaces of said first chamber to break the surface tension effect, said outlet communicating with said second chamber for removal of the gas, a liquid reservoir formed ins aid first chamber and a liquid drain outlet communicating with said first chamber at a point remote from said second chamber and oppositely disposed from said second chamber with respect to said inlet, said liquid drain outlet communicating liquid from said first chamber to said liquid reservoir.

4,821,738
ARTERIAL BLOOD GAS SYRINGE
Dean H. Iwasaki, Denver, and Michael D. Iliff, Conifer, both of Colo., assignors to Marquest Medical Products, Inc., Englewood, Colo.
Filed Nov. 19, 1987, Ser. No. 122,892
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—765 **10 Claims**



1. A syringe, comprising:
a syringe barrel including a tapered end and an open and and having an inner wall surface;
a plunger rod having a tip;
a sealing plug connected to said plunger rod tip for preventing the flow of blood past said open end of said syringe barrel, said sealing plug having an upper surface and a hollow interior with an inner hollow section being defined in said hollow interior, said upper surface of said sealing plug having a plurality of channels extending laterally across said upper surface, said channels being of a size wherein blood tends to fill a blood receiving space defined between said upper surface and said tapered end of said syringe barrel before the blood moves along said channels; and
filter means held in said inner hollow section for use in permitting the passage of air from said blood receiving space while preventing the passage of blood from said blood receiving space, said channels providing a passageway for air from said blood receiving space to said filter means.

4,821,739
DEVICE AND METHOD FOR TESTING FOR A CORSET OR SPINAL ORTHOSE
Stig Willner, Malmö , and Gert Karlsson, Helsingborg, both of Sweden, assignors to Camp Scandinavia AB, Helsingborg, Sweden
PCT No. PCT/SE86/00535, § 371 Date Sep. 4, 1987, § 102(e) Date Sep. 4, 1987, PCT Pub. No. WO87/03191, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 24, 1986, Ser. No. 133,126
Claims priority, application Sweden, Nov. 25, 1985, 8505547
Int. Cl.[4] A61B 5/10
U.S. Cl. 128—774 **7 Claims**



1. A device for testing a patient for a spinal orthose or corset,

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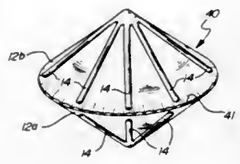
the device comprising: a frame (1) for surrounding the back of a patient, the frame being width and height adjustable; an adjustable back beam (5) attached to the frame; a back plate (16) movably attached to the back beam (5); and an abdominal plate (26) attached to the frame (1) for distribution of pressure against the abdomen of the patient; in combination with a measurement rod (36) for transferring values set thereon by the frame (1), back beam (5) and back plate (16) to a corset blank; the frame (1) comprising two lower clamps (3) and two upper clamps (4), the clamps being adjustable in relation to each other for the width and height adjustment of the frame, the lower clamps (3) being attached to each other with screws (8) inserted in grooves (9) in the lower clamps, the upper clamps (4) being attached to each other with screws (10) inserted in grooves (11) in the upper clamps, and both the lower and upper clamps (3, 4) being attached to the adjustable back beam (5).

4,821,740
ENDERMIC APPLICATION KITS FOR EXTERNAL MEDICINES
Shunro Tachibana, Fukuoka, and Uichi Shibata, Tokyo, both of Japan, assignors to Shunro Tachibana and Meiji Seika Kaisha, Ltd., both of Tokyo, Japan
Filed Nov. 13, 1987, Ser. No. 120,555
Claims priority, application Japan, Nov. 26, 1986, 61-282703
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—798 **1 Claim**



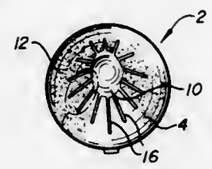
1. An endermic application kit for external medicines, comprising:
- a disc-like ceramic ultrasonic oscillator having a terminal at one end adapted to be connected to an external oscillator device;
- a drug-containing layer situated below the disc-like ceramic ultrasonic oscillator,
- a drug-permeable adhesive layer laminated below the drug-containing layer so that when the ultrasonic oscillator is actuated, the drug contained in the drug-containing layer is applied to a skin of a patient through the drug-permeable layer, drug concentration in blood being rapidly carried out by controlling release rate of the drug in the kit, and
- a protective cover covering the disc-like ceramic ultrasonic oscillator and the drug-containing layer.

4,821,741
BARRIER CONTRACEPTIVE
Reza S. Mohajer, 1275 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013
Continuation-in-part of Ser. No. 37,212, Apr. 10, 1987. This application Oct. 5, 1987, Ser. No. 104,428
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—837 **1 Claim**



1. An intravaginal barrier type contraceptive device comprising two flexible, continuous, impermeable, generally conical barrier members each having a circular perimeter and an apex, said members joined at a plurality of points along said circular perimeters, with the apices oriented in opposite directions; each barrier member including a plurality of radially disposed, resilient stiffener members associated therewith, said stiffening members adapted to bias the barrier members into a generally conical configuration to uniformly contact the vaginal wall and form a tight barrier seal therewith, and having sufficient flexibility to allow said device to be folded into a generally fusiform shape for insertion and removal.

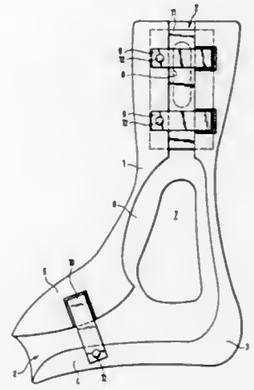
4,821,742
CONTRACEPTIVE DEVICE
John Y. Phelps, III, 1530 N. Key Blvd., Unit 202, Georgetown Univ., Rosslin, Va. 22209
Filed Dec. 17, 1987, Ser. No. 134,122
Int. Cl.[4] A61F *5/42*
U.S. Cl. 128—842 **6 Claims**



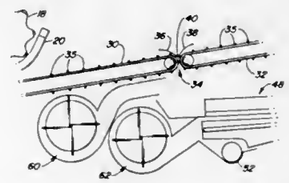
1. A condom for adhesive attachment to the glans penis of a male sex organ, said condom comprising a semispherical shaped body for substantially covering said glans penis and leaving the corona surrounding said glans penis exposed, said condom forming a fluid enclosure over the opening of the glans penis and the area therearound, said condom on the surface thereof to be applied to be surface of the glans penis having a pressure sensitive adhesive coating, said adhesive coating being continuous around the peripheral area of said surface for forming a fluid tight seal with said glans penis, said surface to be applied having an adhesive free area surrounded by said adhesive coating for positioning over said glans penis opening for forming a fluid reservoir between said glans penis and said condom, said adhesive free area including adhesive free strips radiating outward from said adhesive free area, said strips opening at their adhesive free area end into said adhesive free area and being closed at their opposite end by the continuous adhesive coating around said peripheral area.

4,821,743
REMOVABLE IN-SHOE ANKLE BRACE
Hans-Henning Wetz, Im Schwiesdahl 46, D-5880 Lüdenscheid, Fed. Rep. of Germany
Filed Aug. 19, 1987, Ser. No. 87,059
Int. Cl.[4] A61F *5/30*
U.S. Cl. 128—893 **6 Claims**

1. An ankle-joint brace formed as a tube of a heat-shapable synthetic resin formed internally complementarily to a shape corresponding to the external surface of the lower region of a human leg terminating in a foot and formed along its full length on one side of the foot portion of the shape with a throughgoing entry slot, the tube being sufficiently deformable that the slot can be spread widely enough to accommodate a patient's ankle region, the tube being formed with
- an upwardly and inwardly concave heel seat complementary to the heel portion of the shape and a sole part extending forward from the heel seat and forming a flat support surface complementary to the distal surface of the foot portion of the shape, and
- a downwardly and inwardly concave instep part complementary to the proximal surface of the foot portion of the shape, bounding part of the slot, and joined on the side of the foot portion of the shape opposite the slot to the sole part, the tube being substantially closed over the top of the foot portion of the shape and at the front of the ankle portion of the shape.

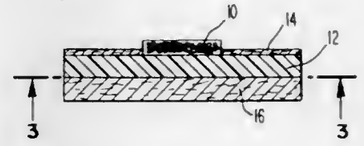


4,821,744
BELTED GRAIN ACCELERATOR FOR A THRESHING MACHINE
Reed J. Turner, East Moline, and Bruce Coers, Silvis, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed Jun. 30, 1987, Ser. No. 68,072
Int. Cl.[4] A01F *12/48*
U.S. Cl. 130—27 HF **12 Claims**



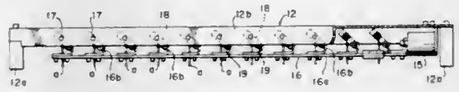
1. In a grain thresher having a threshing cylinder and an associated concave, and a separation means for separating straw from grain, the combination comprising:
- a pair of belted endless conveyors extending beneath the concave and separator means for receiving grain and chaff falling from the concave and separator means:
- power means for driving the conveyors in opposite directions whereby the grain and chaff deposited on the conveyors from the separator means and concave are directed to an opening between the conveyors through which the chaff and grain is accelerated in a substantially downwardly direction;
- a gull wing shaped diverter located above the opening wherein each wing of the diverter extends above one of the conveyors and the vertex of the diverter extends into the opening between the two conveyors; and
- a blower means directing a substantially horizontal flow of air through the accelerated chaff and grain to blow the falling chaff away from the falling grain.

4,821,745
APPARATUS AND METHOD FOR OVERCOMING THE HABIT OF TOBACCO SMOKING
David I. Rosen, and William E. Rosen, both of 2055 Wisteria La., Lafayette Hill, Pa. 19444
Continuation-in-part of Ser. No. 797,938, Nov. 14, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 31,909
Int. Cl.[4] A24F *47/00*
U.S. Cl. 131—270 **22 Claims**



1. Apparatus for enabling a smoker to reduce the smoking habit, comprising a patch of tobacco, the patch being adapted to be laid over an area of the skin of the user, a wetting agent, and a covering means, the wetting agent being disposed between the skin and the patch.

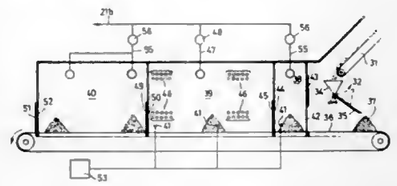
4,821,746
BAR-LIKE ARTICLE SUPPLYING APPARATUS IN HOPPER
Katsuhiko Kumata; Isao Endo, both of Chiba, and Taro Nishikimoto, Tokyo, all of Japan, assignors to Tokyo Automatic Machinery Works, Ltd. and Japan Tobacco, Inc., both of Tokyo, Japan
Filed Mar. 25, 1987, Ser. No. 29,997
Claims priority, application Japan, Mar. 31, 1986, 61-73166
Int. Cl.[4] A24C *5/32, 5/33*
U.S. Cl. 131—282 **8 Claims**



1. Apparatus for supplying bar-like articles to a hopper, comprising:
- a receptacle pivotally mounted to said hopper for receiving bar-like articles from a source of supply in a first position and for dispensing said bar-like articles in a second position;
- said receptacle including a plurality of bottom lid elements movable between respective open and closed positions respectively corresponding to said second and first positions of said receptacle; and
- means for moving said plurality of bottom lid elements and including a like plurality of rotatable shafts each connected to a respective bottom lid element and means for rotating said rotatable shafts to move said bottom lid elements to said open position.

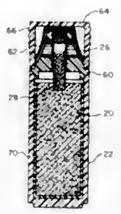
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4,821,747
PROCESS FOR TREATING TOBACCO AND SIMILAR ORGANIC MATERIALS
Oskar Stuhl, Düsseldorf, and Klaus-Dieter Wenzel, Konz, both of Fed. Rep. of Germany, assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Mar. 27, 1987, Ser. No. 30,800
Int. Cl.[4] A24B *3/18, 15/22*
U.S. Cl. 131—299 3 Claims



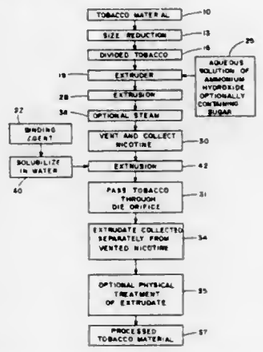
1. Apparatus for treating tobacco and similar organic materials which previously have been impregnated with an inert organic liquid and heated above the boiling point of the inert organic liquid with a hot gas to produce expanded organic materials containing residual amounts of inert organic liquid, said apparatus comprising
(a) a microwave chamber provided with a suction line for removing vaporized inert organic liquid from the chamber,
(b) sluice means associated with the microwave chamber for introducing into and withdrawing from the microwave chamber the expanded organic materials, said sluice means including gate openings and pairs of cooperating gates adapted to be operated in an alternating fashion to close the gate openings at controlled intervals,
(c) a conveyor belt provided with drive means for moving the belt through the microwave chamber and the gate openings of the sluice means,
(d) feed means for depositing discrete heaps of expanded organic materials onto said conveyor belt for transport through the microwave chamber and sluice means associated therewith and
(e) a source of microwave radiation for directing microwave energy into the microwave chamber to evaporate residual inert organic liquid contained in the expanded organic materials for subsequent removal by said suction line.

4,821,748
HAND-HELD CIGARETTE-COLORING DEVICE
John H. Reas, 18125 Constitution Ave., Monte Sereno, Calif. 95030
Filed Feb. 26, 1987, Ser. No. 19,348
Int. Cl.[4] A24C *5/60*; A24F *47/00*
U.S. Cl. 131—329 9 Claims



1. A hand-held cigarette-coloring device, comprising:
(a) an reservoir adapted to contain inking fluids; and
(b) an apertured porous ink-absorbent inking element for drawing ink from said reservoir and wherein said aperture is dimensioned to receive a cigarette whereby ink from said inking element is transferred onto the external surface of a cigarette caused to be passed through the aperture in the ink-absorbent inking element.

4,821,749
EXTRUDED TOBACCO MATERIALS
Howard C. Toft, Clemmons; Kenneth W. Smith, and Carolyn R. Carpenter, both of Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Jan. 22, 1988, Ser. No. 147,626
Int. Cl.[4] A24B *3/14*
U.S. Cl. 131—575 31 Claims



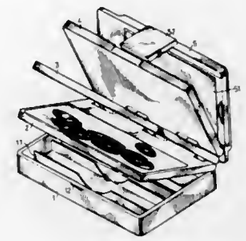
1. A process for providing smokable extrudate, the process comprising:
(a) providing filler material, at least a portion of which is tobacco material;
(b) providing an agent capable of displacing selected component(s) from the tobacco material;
(c) subjecting the filler material and the aforementioned agent to extrusion conditions using extrusion means, the extrusion conditions being sufficient to provide for displacement of selected component(s) from the tobacco material; and
(d) separately (i) removing from the extrusion means, during extrusion, component(s) displaced from the tobacco material, and (ii) providing extrudate.

4,821,750
CIGARETTE FILTERS
Colin L. Browne, Clover, S.C., assignor to Celanese Corporation, New York, N.Y.
Division of Ser. No. 739,946, May 31, 1985, Pat. No. 4,744,932.
This application Nov. 16, 1987, Ser. No. 121,816
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—345 3 Claims



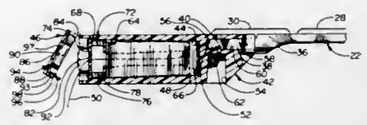
1. A cigarette filter formed of a bundle of skinless cellulose acetate hollow fibers, said fibers having a cellular interior structure, striations on at least one of the inner and outer surfaces and a specific surface area of at least about 0.8 square meters/gram.

4,821,751
COSMETIC CASE WITH DETACHABLE PLATES
James S. K. Chen, 3F., No. 189, Sec. 4, Hsin-I Rd., Taipei, Taiwan
Filed Oct. 9, 1987, Ser. No. 106,458
Int. Cl.[4] A45D *33/00*
U.S. Cl. 132—295 10 Claims



1. A cosmetic case with detachable plates comprising:
(a) a substantially rectangular base plate having a plurality of partitions therein, a fastening hook being provided at a first edge of said base plate and, at a second edge parallel to said first edge being an axle running along said second edge thereof;
(b) a plurality of substantially rectangular plates having a pair of arch-shape collars formed at one edge thereof for each said plate, said plurality of plates being provided with different cosmetics and colors of cosmetics;
(c) a substantially rectangular lid including an inner surface, said lid having a mirror being mounted at the inner surface thereof, and at an edge thereof being provided with a fastening means, such that said fastening means can be engaged with said fastening hook of said base plate, and a second edge of said lid being provided with a pair of collars, such that the collar thereof can be pivotally engaged with said axle of said base plate; and
(d) each of said collars extend in a direction, at least one pair of said collars formed on one of the edges extending in a direction different than the direction in which at least one other pair of collars extends.

4,821,752
ORAL HYGIENE APPARATUS HAVING REPLACEABLE TOOTH ENGAGING CLEANING ELEMENT AND INTERNAL DENTAL FILAMENT DISPENSER
Jane Widlak, 4503 Branchview Dr., Arlington, Tex. 76017
Filed Jun. 29, 1987, Ser. No. 67,921
Int. Cl.[4] A45D *44/18*
U.S. Cl. 132—309 1 Claim



1. A combination toothbrush and dispenser for dental filament wound into a dental filament bobbin, said bobbin defining a bobbin external diameter, comprising:
a generally tubular, hand graspable base member having generally opposed ends along a base member axis and defining an internal chamber for receiving said bobbin, said internal chamber presenting an opening at one of said ends and a chamber end wall opposite said opening, said internal chamber defining a chamber axis generally along said base member axis, and having a chamber depth measured along said chamber axis, and a chamber diameter decreasing in size along said chamber axis in a direction from said opening to said end wall from a size larger than said bobbin external diameter to a size smaller than said bobbin diameter whereby said filament bobbin is received within said internal chamber in a force fit;
means for retaining said bobbin within said internal chamber, including a generally annular retaining member removably received within said internal chamber in confining engagement with said bobbin, a generally annular cover member spaced apart from said retaining member along said chamber axis, said cover member being snapably, detachably positioned within said internal chamber, and a removable spacer member interposed between said retaining member and said cover member, said spacer member having an axial length such that the position of said retaining member within said internal chamber is determined by said axial length of said spacer member, whereby filament bobbins of different sizes can be retained within said internal chamber by the use of spacer members having different axial length, said retaining member and said spacer member each having structure defining generally centered apertures such that said filament can be dispensed from said internal chamber through said apertures;
a tooth engaging cleaning element comprising a brush having an elastomeric bristle base having a bristle receiving surface and an opposed bristle base top surface, and a plurality of bristles operably carried by said bristle base bristle receiving surface; and
means operably coupling said tooth engaging element to said base member including a rigid elongated neck portion having a first end operably coupled to said base member and an opposed bristle base receiving end including structure defining a bristle base receiving channel and a receiving end top surface opposed to said receiving channel, said bristle base top surface including first and second opposed upwardly projecting retention ribs, said elongated neck portion including an outer margin and structure defining a rib receiving aperture extending through said bristle base receiving end from said receiving end top surface to said receiving channel, said rib receiving aperture presenting opposed, front and rear aperture walls, and said rib receiving aperture being spaced inwardly from said outer margin, said first retention rib snapably receivable within said rib receiving aperture and said second retention rib abutably engageable with said outer margin whereby said bristle base is detachably retained by said neck portion, said first retention rib including a sloped face engageable with said rib receiving front wall, said rib receiving aperture providing access to said first retention rib for urging said sloped face against said rib receiving front wall to facilitate removal of said bristle base from said neck portion.

4,821,753
APPARATUS FOR CLEANING OF COUPLER ELEMENTS
Hideo Nakamura; Toshiharu Miura, both of Ichihara, and Kazuhiro Kikkawa, Manazuru, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka; Sumitomo Chemical Engineering Co., Ltd. and Nippon Valqua Kogyo Kabushiki Kaisha, both of Tokyo, all of, Japan
Filed Sep. 30, 1987, Ser. No. 102,640
Claims priority, application Japan, Oct. 2, 1986, 61-235303; Oct. 24, 1986, 61-253491
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—59 16 Claims

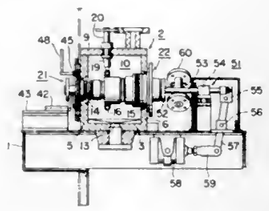
1. An apparatus for cleaning a coupler of the type having a male coupler element and a female coupler element, the male and female elements each having mating surfaces and each being capable of being coupled together especially at the mating surfaces thereof, said apparatus comprising:

a cleaning box having a pair of spaced opposed side walls for defining a cleaning chamber;

a pair of spaced opposed coupler element insertion openings, one each of said pair of openings being in one of said pair of side walls of said clenaing box for allowing one each of the male and female copuler elements to be introduced into said cleaning chamber therethrough;

means for attaching one of the male and female coupler elements to said cleaning box and in one of said pair of insertion openings for positioning the mating surfaces of the one of the male and female couplers within said cleaning chamber;

means for holding the other one of the male nad female coupler elements and for inserting the other one of the male and female coupler elements through the other one of said coupler element insertion openings for bringing the other one of the male and female coupler elements directly adjacent and spaced from the one of the male and female coupler elements attached to said cleaning box for defining an idle gap bewteen the mating surfaces of the male and female coupler elements;



an annular cleaning means in said cleaning chamber for coaxially encircling the mating surfaces of the male nad female coupler elements and the idle gap between the mating surfaces ;

a plurality of nozzle openings in said annular cleaning means for directing a fluid substantially towards the radial center of said annular cleaning means for cleaning the adjacent and spaced apart mating surfaces of the male and female coupler elements;

means for feeding pressurized water to said plurality of nozzle openings for forming a nubmer of water jets for washing the adjacent and spaced apart mating surfaces of both the coupler elements; and

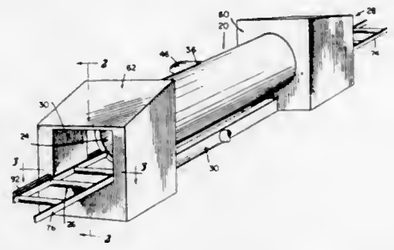
pressure means for advancing further inwardly the other one of the male and female coupler elements held by said holding means towards the one of the coupler elements held by said attaching means until both coupler elements are brought into a mutually and tightly mating and coupled position.

4,821,754
FLITCH WASHER

George Weil, Mississauga, Canada, assignor to David R. Webb Co., Inc., Edinburg, Ind.

Continuation-in-part of Ser. No. 562,460, Dec. 16, 1983. This application May 24, 1984, Ser. No. 613,276
Int. Cl.[4] B08B *1/02*
U.S. Cl. 134—64 R **15 Claims**

1. A washer for a flitch or the like comprising means defining a passageway open at an entry end and an exit end, means for conveying a flitch through the passageway from the entry end to the exit end, means defining a plurality of openings along the walls of the passageway for discharging a washing fluid into the passageway, means for supplying washing fluid to the openings, means for recycling said washing fluid, means including a filter that permits drainage of said washing fluid into said means for recycling said washing fluid for trapping



debris beneath the means for conveying a flitch, and means for conveying the trapped debris away from the washer.

4,821,755
CONTINUOUS-FLOW TYPE DISHWASHING APPARATUS

Tamar Hen, and Yochai Kimchi, both of En-Harod, Israel, assignors to Palbam, a registered partnership, En-Harod, Israel

Filed Mar. 29, 1988, Ser. No. 174,736
Claims priority, application Israel, Feb. 3, 1988, 85380
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—72 **20 Claims**



1. Dishwashing apparatus, comprising: a washing compartment containing washing devices for washing the dishes and other utensils passing therethrough; a closed loop conveyor disposed laterally of the washing compartment and including a forward stretch extending adjacent one side of the washing compartment, and a return stretch extending on the side of said forward stretch opposite to that of the washing compartment; a plurality of racks for receiving the dishes and other utensils to be washed; coupling means pivotably coupling the racks to said conveyor; and supporting means supporting the racks in a substantially horizontally position as they are moved by said forward stretch of the conveyor through the washing compartment, and for supporting the racks in a substantially vertical position as they are moved by said return stretch of the conveyor back to the washing compartment.

4,821,756
COLLAPSIBLE DIPOSABLE UMBRELLA

Daniel L. England, Irving, Tex., assignor to Rainstix R & D Partners Ltd., Irving, Tex.

Filed Mar. 15, 1988, Ser. No. 168,250
Int. Cl.[4] A45B *19/00*
U.S. Cl. 135—19.5 **15 Claims**

1. A collapsible umbrella comprising:

a hollow tube having an upper end and a lower end;

a shaft having a top end and a bottom end reciprocally received in said tube;

a piston secured to said bottom end and movable from said lower end of said tube to the upper end of said tube;

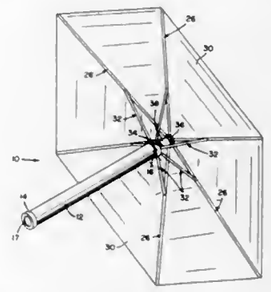
an upper hub fixedly secured to said top end;

a lower hub slidably received on said shaft and extending upwardly from said piston;

means to affix said upper hub to said lower hub;

a plurality of ribs hingedly connected to said upper hub and each rib having a first position parallel to the axis of said shaft and a second position extending radially outwardly from said shaft;

a plurality of bracing struts for each of said ribs, said struts having inner ends hingedly connected to said lower hub



and outer ends hingedly connected to intermediate points on said ribs and said struts having first positions parallel to the axis of said shaft and second positions extending outwardly from said lower hub;

said second positions of said ribs and said struts occurring when said means affixes said upper hub to said lower hub.

4,821,757
BIOEMULSIFIER STABILIZED HYDROCARBOSOLS

Michael E. Hayes, Fernandina Beach; Kevin R. Hrebenar, Jacksonville; Patricia L. Murphy, Amelia Island; Laurence E. Futch Jr., Fernandina Beach; James F. Deal III, Amelia Island, and Paul L. Bolden Jr., Fernandina Beach, all of Fla., assignors to Petroleum Fermentations N. V., Antilles, Netherlands

Continuation of Ser. No. 780,779, Sep. 27, 1985, abandoned, which is a division of Ser. No. 653,808, Sep. 24, 1984, Pat. No. 4,684,372, which is a continuation-in-part of Ser. No. 547,892, Nov. 2, 1983, Pat. No. 4,618,348. This application Jun. 23, 1987, Ser. No. 65,124
Int. Cl.[4] F17D *1/17*
U.S. Cl. 137—13 **21 Claims**

1. An improved method for post recovery transporting viscous hydrocarbons, wherein the improvement comprises (A) forming a hydrocarbosol of said viscous hydrocarbons using a surfactant package in a proportion from about 1:500 to about 1:20,000 by weight based on hydrocarbon, said surfactant package comprising:

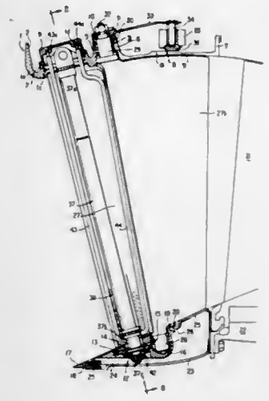
(1) at least one water-soluble surfactant selected from the group consisting of anionic surfactants, nonionic surfactants and mixtures thereof, an effective amount of which surfactant promotes emulsification of a hydrocarbon with API gravity of about 20°API or less, viscosity of about 100 centipoise or greater at 150° F., paraffin content of about 50% by weight or less and aromatic content of about 15% by weight or greater into an aqueous phase to form a hydrocarbon-in-water emulsion, the viscosity of which emulsion is reduced by at least a factor of about 10 compared to the viscosity of the hydrocarbon; and

(2) α-emulsan, an effective amount of which α-emulsan stabilizes a hydrocarbon-in-water emulsion formed with a hydrocarbon as in (1) by maintaining viscosity reduced by at least a factor of about 10 for a period of at least about a day under static conditions, said hydrocarbosol (a) comprising a hydrocarbon with API gravity of about 20°API or less, viscosity of about 100 centipoise or greater at 150° F., paraffin content of about 50% by weight or less and aromatic content of about 15% by weight or greater, and (b) having a hydrocarbon:water ratio from about 65:35 to about 75:25 by volume; and (B) transporting the hydrocarbosol.

4,821,758
TURBINE PLANT INTAKE HOUSING

Jean-Pierre Ruis, Le Chatelet en Brie, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M A.", Paris, France

Filed Nov. 24, 1987, Ser. No. 124,604
Claims priority, application France, Nov. 26, 1986, 86 16449
Int. Cl.[4] F02C *7/04*
U.S. Cl. 137—15.1 **5 Claims**



1. A twin-flow turbine plant having an air intake housing of the type mounted in cantilever fashion, comprising:

an inner hub,

an outer shell surrounding and radially spaced from said inner hub, and

a plurality of arms extending radially between said inner hub and said outer shell, each of said arms comprising

a fixed part,

an associated adjustable flap,

wherein each of said arms includes

a metal tie rod forming a central core and disposed between said inner hub and said outer shell, and

a nut fixing said tie rod to said inner hub whereby said tie rod is prestressed by the tightening of said nut wherein said inner hub is of a floating type; being supported by said tie rods, and comprises superimposed layers of coiled filaments of composite material, and a plurality of metal inserts embedded in said superimposed composite filament layers, each of said tie rods co-operating with one of said inserts.

4,821,759
EARTHQUAKE RELIEF VALVE

Harvey E. Diamond, 12953 Woodbridge St., Studio City, Calif. 91604

Filed Feb. 12, 1988, Ser. No. 155,515
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—45 **14 Claims**

1. A shock actuated shut-off valve comprising:

a valve, having an open position and a closed position, rotatably mounted within a valve body;

a valve stem connected to the valve;

an elongated handle having a valve stem engagement end and a ball detent engagement end, the valve stem engagement end connected to the valve stem;

means for urging said valve to rotate into the closed position;

means for stopping further rotation of the valve when the valve is in the closed position;

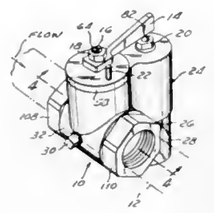
a ball detent having,

a ball detent housing;

a first ball disposed within the ball detent housing;

a separation spring disposed within the ball detent;

a second ball disposed within the ball detent housing such that the separation spring urges the first ball and the



second ball apart; the first ball positioned to engage the ball detent engagement end of said elongate handle, thereby restraining said valve in the open position; and

a pendulum having a ball detent engagement end and a plumb end, the ball detent engagement end supporting the second ball, said pendulum responding to a shock by freeing the second ball, thereby freeing the elongate handle and allowing the valve to move to the closed position.

4,821,760

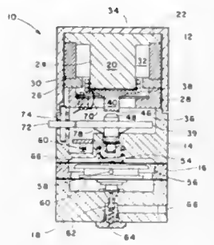
VOICE COIL ASSEMBLY FOR AN ELECTROPNEUMATIC CONVERTER

Christine B. Barnes, Wickliffe; Thomas E. Martin, Chesterland, and Frank E. Nardis, Painesville, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 28, 1984, Ser. No. 655,409

Int. Cl.[4] G05D *16/00*

U.S. Cl. 137—82 **4 Claims**



1. In an electropneumatic converter, the combination comprising a nozzle connected to a source of air under pressure, an electromagnet including a coil and a vane directly connected to the coil in proximity to the outlet of the nozzle, a fixed support member, a spring means conencted to the fixed support for resiliently supporting the vane and coil, means for energizing the electromagnet to move the coil and vane toward the outlet of the nozzle to vary the outflow of air under pressure from the outlet of the nozzle, and electrical means for adjusting the current of said electromagnet to adjust the range of the converter.

4,821,761

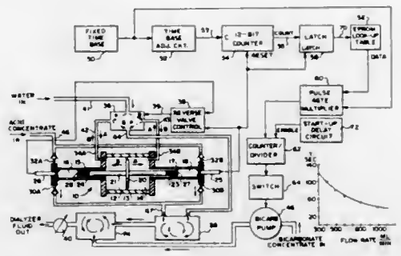
CLOSED LOOP PUMP CONTROL SYSTEM

James D. Aid, St. Petersburg; Shahid Q. Din, Clearwater, and Andrew D. Hopping, Largo, all of Fla., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 15, 1987, Ser. No. 50,915

Int. Cl.[4] G05D *11/13*

U.S. Cl. 137—101.21 **14 Claims**



1. In a fluid mixing system having a first proportioning pump that pumps a fixed volume of a first fluid on each stroke thereof and a second electrically operated pump having a flow rate of a second fluid that is directly proportional to the comprising:

an electrical limit switch operatively connected to said first pump and actuated at each stroke thereof;

a mixing chamber connected to said first pump for receiving said first fluid, and connected to said second pump for receiving said second fluid to thereby effect mixing of said first and second fluids;

electrical timing means connected to said limit switch for producing first electrical data directly proportional to the time between successive actuations of said limit switch; and

nonlinear conversion means connected to said timing means for converting said first electrical time data therefrom to second electrical data directly proportional to the rate of flow of said first fluid during each successive stroke of said first pump;

electrical control means connected to control the rate of flow of said second fluid from said second pump, said control means connected to said conversion means for receiving said second electrical flow rate data;

whereby a fixed ratio of said first fluid to said second fluid is maintained in said mixing chamber.

4,821,762

FREEZELESS WALL FAUCET HAVING REMOVABLE CARTRIDGE

Warren R. Breneman, Colorado Springs, Colo., assignor to Woodford Industries, Inc., Colorado Springs, Colo.

Filed Apr. 25, 1988, Ser. No. 185,994

Int. Cl.[4] F16K *1/02*

U.S. Cl. 137—218 **11 Claims**

1. A freezeless wall faucet comprising:

an elongated faucet housing having an elongated bore extending therethrough, said bore having an inner end adapted to be connected to a pressurized source of fluid and an outer end, said housing having an outlet nozzle in communication with said bore adjacent said outer end of said bore for permitting fluid to exit from said bore;

a valve cartridge removably inserted within said bore and comprising sealing means, valve means, an elongated tube assembly having a tube bore extending therethrough and having an outer cylindrical surface, said tube assembly having a first end connected to said sealing means and a second end connected to said valve means, a handle connected to said sealing means, an elongated operating rod extending through said tube bore and being longitudinally

movable therein, said rod having a first rod end engaging said handle and a second rod end engaging said valve means;

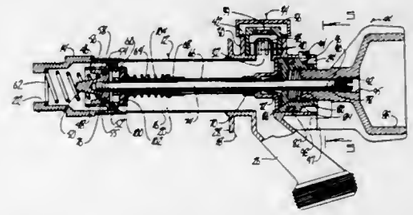
said cartridge being removable from an inserted position within said bore wherein said sealing means sealingly engages the wall of said bore adjacent said outer end thereof and said valve means is positioned within said bore adjacent said inner end thereof to a removed position wherein said entire cartridge is removed from said bore through said outer end thereof;

locking means on said housing and movable from a locked position wherein said locking means engages said cartridge to prevent removal of said cartridge from said inserted to said removed positions to an unlocked position wherein said locking means permits removal of said cartridge from said inserted to said removed positions;

said nozzle being between said valve means and said sealing means when said cartridge is in said inserted position;

said valve means comprising valve sealing means sealingly engaging said wall of said bore when said cartridge is in said inserted position;

said valve means being movable from a closed position preventing fluid flow from said inner end of said bore to said nozzle to an open position permitting fluid flow from



said inner end of said bore through said bore to said nozzle and outwardly through said nozzle;

said handle being movable from an off position to an on position for causing longitudinal movement of said rod within said tube assembly so as to cause movement of said valve means from said closed position to said open position;

backflow preventor means movably mounted on said outer cylindrical surface of said tube assembly adjacent said valve means for longitudinal sliding movement to said tube assembly between a forward flow position wherein fluid is free to pass from said valve means to said nozzle to a backflow position wherein said backflow preventor means blocks the reverse flow of fluid from said nozzle through said valve means to said inner end of said bore, spring means yieldably holding said backflow preventor means in said backflow position and being yieldable to permit movement of said backflow preventor means to said forward flow position in response to fluid flow from said inner end of said bore through said valve means toward said nozzle;

said backflow preventor means being carried by said cartridge when said cartridge is moved from said inserted to said removed position.

4,821,763

TAMPERPROOF COUPLING

Rand H. Ackroyd, Methuen, and Mark T. Corcoran, Dracut, both of Mass., assignors to Watts Regulator Company, North Andover, Mass.

Filed Apr. 13, 1988, Ser. No. 181,225

Int. Cl.[4] F16K *24/02, 35/00*

U.S. Cl. 137—218 **4 Claims**

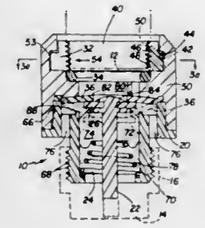
1. A coupling device for a liquid conduit system comprising:

a body defining a liquid flow passage and having an orifice defined by a generally cylindrical surface about an axis,

said surface further defining a shoulder surface disposed generally parallel to said axis of said orifice, and

disposed within said orifice, an insert means having a threaded inner surface, and sized for rotation relative to the cylindrical surface of said orifice in a first direction about the axis of said orifice, and defining an engagement surface adapted to engage upon the shoulder surface of said orifice to restrict rotation of said insert means relative to the cylindrical surface of said orifice in a second, opposite direction,

said insert means comprising a split ring and said engagement surface being defined by a radially aligned surface of the split ring,



whereby, for assembling said coupling device with a male threaded element, said body is rotated in the first direction, with said engagement surface of said insert means engaged upon the shoulder surface of said orifice, to rotate said insert means to interengage the threads of said insert means and said male thread element, and when said body is rotated in the second direction, the cylindrical surface of the orifice rotates about the insert means, and the threads of the insert means do not disengage from threads of the male threaded member, said threaded inner surface of said split ring having a diameter that is undersized relative to said male threaded element.

4,821,764

DISPENSING COCK FOR LIQUID, NOTABLY FOR BEER

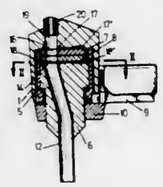
Simon Brenez, Tienen, Belgium, assignor to Ateliers de Construction E. Molinet, Tienin, Belgium

Continuation of Ser. No. 782,583, Oct. 1, 1985, abandoned. This application Nov. 5, 1987, Ser. No. 117,628

Claims priority, application Belgium, Oct. 10, 1984, 0/213808

Int. Cl.[4] F16K *11/08, 23/00*

U.S. Cl. 137—238 **21 Claims**

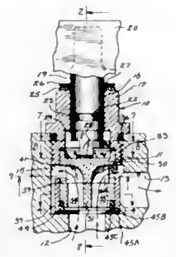


1. Liquid-dispensing cock or tap, which comprises a cock body of generally cylinder shape, wherein a feed line opens and which serves moreover as housing on the one hand for a rotating part wherein a dispensing line is located, and on the other hand for a pair of plates which are each pierced by two openings, which parts are arranged inside the cock body, between the feed line and the dispensing line, that plate nearest the feed line being fixed relative to the cock body and arranged with the one opening thereof in the extension of the feed line, while the other plate fixed relative to said rotating part, may be

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rotated by means of a handle about the geometrical axis of the cock body to have the dispensing line communicate alternately with the feed line and an opening running through the cock body along an axis wherewith the top portion of the dispensing line axis may coincide, to allow after moving away a plug, cleaning said dispensing line through said cock body.

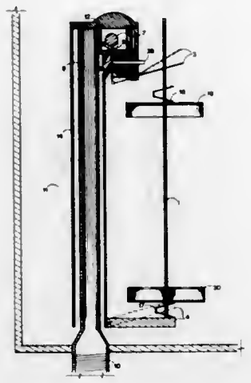
4,821,765
VALVE FOR FAUCET OR THE LIKE
Muhammad Iqbal, Sheboygan, and Dana F. Buccicone, Kohler, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jun. 10, 1988, Ser. No. 205,284
Int. Cl.[4] F16K *3/02*
U.S. Cl. 137—270 **13 Claims**



1. A removable cartridge type valve for use in a faucet housing or the like, the housing having an inlet in its bottom and an outlet, the cartridge type valve comprising:
- a valve body having an axial bore and an open lower end for fluid communication with the inlet in the bottom of the housing and at least one outlet in the valve body for fluid communication with the outlet in the housing;
- a stationary valve element and a movable valve element both positioned in the valve body for regulating fluid flow through the valve in response to rotation of the movable element over the stationary element;
- a rotatable spindle sealed within an upper end of the axial bore of the valve body, the spindle having one end extending outside the valve body and the other end connected to a drive member, the spindle also having a radially extending projection positionable in the valve body;
- a groove structure formed on an upper side of the movable valve element, the groove structure being capable of receiving the drive member in two positions which are more than 10° but less than 170° rotationally disposed with respect to each other; and
- a stop wall formed on the valve body to limit the rotation of the spindle by contact with the spindle projection;
- the valve being constructed and arranged so that contact between the drive member and the movable valve element in response to rotation of the spindle rotates the movable valve element over the stationary valve element, and changing the relative positions of the groove structure and drive member between the first and second receiving positions causes a conversion of the valve from a right hand valve to a left hand valve or vice versa.

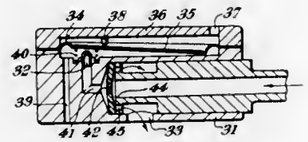
4,821,766
TOILET TANK FILL VALVE
Norman R. Preston, 14 Linton Place, Kitchener, Ontario, Canada N2B 2J9
Continuation of Ser. No. 910,467, Sep. 3, 1986, abandoned. This application Mar. 4, 1988, Ser. No. 166,831
Int. Cl.[4] F16K *31/18*
U.S. Cl. 137—421 **8 Claims**

1. A toilet tank fill valve for controlling the flow of water from a pressurized inlet line into the tank, comprising:
- a cage connected to said inlet line and having an opening leading to said tank, a free-floating ball contained within said cage and adapted to seat in said opening to block the flow of water from said inlet line to said tank;
- a substantially vertical rod;
- a lever connected to said rod;
- a plunger activated by said lever to unseat said ball in response to downward movement of said rod, and to retract from said opening in response to upward movement of said rod; and



float/weight means acting on adjustable upper and lower stops positioned on said rod at positions corresponding to upper and lower water levels respectively in said tank to move said rod upwardly and downwardly respectively to close and open said valve respectively; and wherein said cage is connected to said inlet line by virtue of at least a portion of said cage being of a porous filter material and by virtue of said inlet line having a line-pressurized chamber around said porous filter material portion.

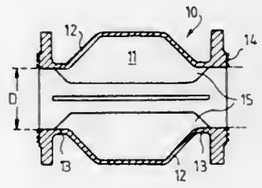
4,821,767
PRESSURE REGULATOR
Peter J. Jackson, 3 Queensmead, Franklyn Road, Durrington, Worthing, West Sussex BN13 2PG, England
Continuation of Ser. No. 44,338, Apr. 30, 1987, abandoned. This application Mar. 10, 1988, Ser. No. 166,434
Claims priority, application United Kingdom, May 7, 1986, 8611113; Dec. 5, 1986, 8629099
Int. Cl.[4] G05D *6/06*
U.S. Cl. 137—491 **9 Claims**



1. A pressure regulator having an inlet for high pressure gas and an outlet, the regulator comprising a housing defining first and second chambers separated by a movable partition, the first chamber being vented to a reference pressure and the housing including fulcrum means to define an eccentric pivot axis for a rigid central part of the partition, the second chamber including a pilot jet facing the partition and closeable thereby at a position on the side of the pivot axis remote from the centroid of the rigid portion of the partition and a vent leading from the second chamber for fluid communication with the outlet of the pressure regulator, the housing further defining a

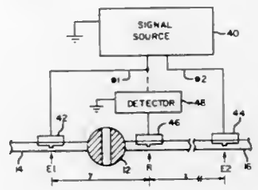
third chamber communicating with the pilot jet and partially defined by a valve member adapted for movement between an open position and a closed position, to respectively allow or deny access from a high pressure supply port to the outlet of the pressure regulator, the high pressure being supplied to the third chamber via an orifice such that while a predetermined back pressure is applied to the outlet the rigid portion of the partition is held in a position to close the pilot jet and the valve member is held in its closed position by the pressure in the third chamber, and that when the back pressure is reduced to below a predetermined value the pilot jet is opened, the pressure in the third chamber reduces, and the valve member moves toward its open position.

4,821,768
TRANQUILLIZER DEVICE FOR REQULATING THE FLOW PROFILE OF FLUID
Roland Lett, Yerres, France, assignor to Schlumberger Industries, S.A., Montrouge, France
Filed Mar. 13, 1984, Ser. No. 589,261
Claims priority, application France, Mar. 15, 1983, 83 04197
Int. Cl.[4] F15D *1/02*
U.S. Cl. 137—551 **8 Claims**



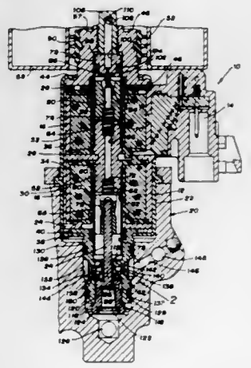
1. Fluid flow profile regulating apparatus for mounting coaxially in a cylindrical conduit, comprising:
- a cylindrical chamber of a radius greater than that of the conduit and having a longitudinal axis, the chamber having internally a set of longitudinal ribs oriented in planes parallel to the longitudinal axis of the chamber, said planes being evenly angularly spaced around said axis, each rib having a radial length less than the radius of the chamber extending radially inward from the chamber wall and leaving a cylindrical passage of a radius less than that of the conduit open for fluid to flow uninterrupted along the axis of the chamber.

4,821,769
VALVE MONITOR AND METHOD
Gary N. Mills, Gladstone; Bruce A. Peterson, Milwaukie, and William G. Preston, Jr., Portland, all of Oreg., assignors to CD Medical Inc., Miami Lakes, Fla.
Filed Nov. 12, 1986, Ser. No. 929,981
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—554 **18 Claims**



7. An apparatus for monitoring the occlusion of a fluid path linking first and second conduits in a hydraulic system, comprising:
- signal source means for provided an electrical excitation signal;
- excitation coupling means for coupling the electrical excitation signal from the signal source means to the fluid at a first location in the first conduit;
- resultant coupling means for coupling a resultant electrical signal from the fluid at a second location in the second conduit;
- electrical reference means for providing an electrical reference signal; and
- detector means coupled to the resultant coupling means and to the electrical reference means for comparing the phase of the resultant signal to the phase of the reference signal, said comparison being indicative of the occlusion of said fluid path.

4,821,770
SOLENOID VALVE ASSEMBLY
Richard M. Parrott, Anderson; Yachi P. Peng, Noblesville, both of Ind., and William J. Ricketts, Fond du Lac, Wis., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 28, 1987, Ser. No. 138,179
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—596.17 **5 Claims**



1. A solenoid valve assembly having a housing, a pressure inlet, a pressure outlet, and an exhaust port, said assembly comprising:
- a first solenoid having a first solenoid actuatable plunger;
- a second solenoid having a second solenoid actuatable plunger in axial alignment with said first solenoid and plunger;
- a plunger stop and guide member comprising a stop element positioned axially intermediate said plungers and first and second tubular guides secured to and extending from said stop element with said first plunger and said second plunger being respectively reciprocably received therein, said stop element having an axially extending bore therethrough and oppositely extending first and second plunger springs respectively urging said first and second plungers axially away from said stop element;
- a first valve housing having normally open first valve means, axially spaced from said first solenoid, therein fluidly intermediate said pressure inlet and said pressure outlet and having a valve closing member secured to said first plunger and movable therewith when said first solenoid is energized to close said first valve means;
- passage means in said first valve housing in axial alignment with said first plunger and maintaining continuous fluid communication between said pressure outlet and said axial

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passage in said stop element through said first tubular guide;

normally closed second valve means including a valve seat in said second tubular guide in axially spaced relation to said stop element with said second plunger positioned axially therebetween, a valve element formed on said second plunger and normally seated on said valve seat to close said second valve means and axially movable when said second solenoid is energized to open said second valve means, said second plunger having a passage therethrough providing fluid communication with said stop element axial passage to said valve element, and a restrictive orifice passageway extending through said valve seat and in fluid communication with said release port;

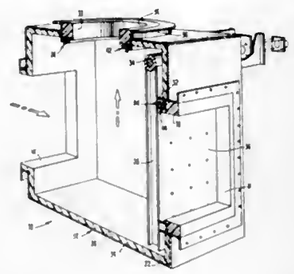
said solenoids being selectively energizable and deenergizable to selectively open and close said first and second valve means and thereby control the fluid pressure in said outlet in pressure apply, pressure hold, pressure release, and air bleed modes.

4,821,771

DIVERTER VALVE WITH BELLOWS SEAL

Ronald K. Maxwell, Irving, Tex., assignor to Pathway Bellows, Inc., El Cajon, Calif.

Filed Feb. 6, 1987, Ser. No. 11,643
Int. Cl.[4] F16K *11/02, 25/00*
U.S. Cl. 137—625.44 **9 Claims**



1. A diverter valve for directing the flow of gas to selected paths comprising:

a valve body;

an inlet and a plurality of outlets in said valve body;

a valve element in said valve body, said valve element being mounted for movement between a first position in which said valve element closes a first of said outlets and a second position in which said valve element closes a second of said outlets;

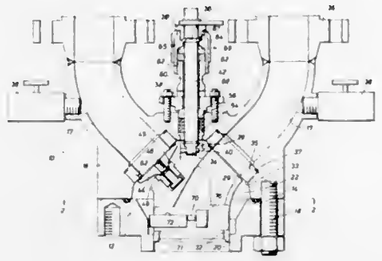
a seal surrounding each of said first and second outlets, each seal defining a resilient bellows having at least one convolution, wherein each convolution includes a curved end portion and a flat sidewall uninterrupted around its respective outlet and having a predetermined width, said flat sidewall of the seal surrounding the outlet closed by said valve element and being in continuous contact with said valve element over substantially said width in order to prevent the flow of gas past said valve element.

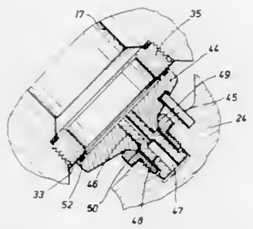
4,821,772

DUAL ACTIVE SELECTOR VALVE

William L. Anderson, Jr., and Larry A. Sample, both of Houston, Tex., assignors to Anderson Greenwood & Co., Bellaire, Tex.

Continuation-in-part of Ser. No. 667,762, Nov. 2, 1984, abandoned. This application Apr. 2, 1985, Ser. No. 719,072
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—625.46 **27 Claims**





1. A selector valve comprising:

(a) an external manifold body;

(b) an inlet opening into said body adapted to connect to a pressure vessel to deliver fluid flow into said body through said inlet opening;

(c) joinder means around said inlet opening for attaching said body to the pressure vessel;

(d) said body including at least two spaced outlet passages;

(e) an internally located conduit having branched flow passages therethrough;

(f) closure means supported by said conduit for selectively closing said outlet passages;

(g) support means for supporting said conduit in alignment with said inlet opening; and

(h) bypass valve means selectively operable to equalize pressure across said closure means, said bypass valve means including a mounting plug connecting an axially hollow mounting pin to said conduit, said axially hollow mounting pin extending through said mounting plug and having an end connected to said closure means, said mounting plug including a sealing surface for engaging said closure means and forming a seal therewith.

20. A selector valve comprising:

(a) an external manifold body;

(b) an inlet opening into said body adapted to connect to a pressure vessel to deliver fluid pressure into said body through said inlet opening;

(c) joinder means around said inlet opening for attaching said body to the pressure vessel;

(d) said body further incorporating a hollow upstanding external housing member closed over by a fixed upper housing member;

(e) a pair of spaced outlet passages in said fixed upper housing member;

(f) an internally located, rotatably mounted conduit having branched flow passages therethrough;

(g) closure means supported by and rotatably jointly with said conduit, said closure means including a closure disk facing said outlet passages for sealing engagement with seat means defining inlet ends of said outlet passages, and further including means loosely mounting said closure disk to said conduit for movement toward and away from said seat means, said mounting means permitting said closure disk to wobble to accommodate for slight misalignment of said closure disk with said inlet ends of said outlet passages;

(h) support means supporting said conduit for rotation about an axis aligned with said inlet opening during rotation of said conduit;

(i) said closure means further including bypass valve means selectively operable to equalize pressure across said closure disk, said bypass valve means including seal means forming a seal between said closure disk and said conduit wherein downward movement of said conduit disengages said seal means establishing fluid communication past said mounting means along a passage extending through said closure disk to said outlet passages;

(j) means for moving said conduit axially within said manifold body enabling release of said closure means from said seat means; and

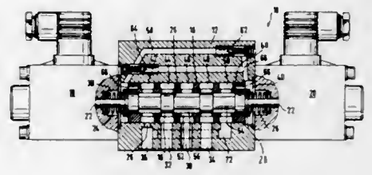
(k) wherein said branched flow passages and said outlet passages upon alignment define smoothly curving fluid flow passages for minimizing fluid pressure drop between said inlet opening and said outlet passages.

4,821,773

DIRECTIONAL CONTROL VALVE

Erich Herion, Stuttgart, and Helmut Motzer, Leinfelden-Echterdingen, both of Fed. Rep. of Germany, assignors to Herion-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Mar. 7, 1988, Ser. No. 164,562
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708248
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **10 Claims**



1. A directional control valve for liquid and gaseous fluid, comprising:

a housing having fluid inlet means, fluid outlet means and tank means;

valve means accommodated in said housing for selectively regulating the fluid flow, said valve means including a reciprocating valve piston and magnetic means acting upon said valve piston at each end face thereof;

throttle means for creating a dynamic pressure within a chamber in front of said end faces to act upon the latter in direction of actuation of said magnetic means;

fluid-carrying passageway means within said housing for connecting said chamber at said one end face of said valve piston with said chamber at said other end face of said valve piston; and

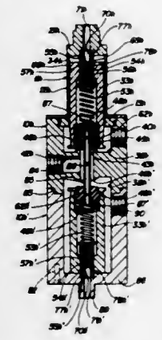
pressure relief valve means provided in said passageways means for limiting the pressure in said chambers.

4,821,774

SOLENOID OPERATED VALVE WITH BALANCING MEANS

William J. Chorkey, 34300 Lyncroft, Farmington, Mich. 48024

Filed Apr. 4, 1988, Ser. No. 176,870
Int. Cl.[4] F16K *31/06;* **F15B** *13/044*
U.S. Cl. 137—625.65 **17 Claims**



1. A balanced solenoid operated valve characterized in that it comprises:

(a) a valve body, having a transfer chamber formed in one end thereof and extending longitudinally inward from said one end of the valve body, and having an axial hole formed therein which communicates with and extends inward in the valve body from the transfer chamber;

(b) a solenoid operatively mounted on said one end of said valve body, and having an armature guide tube which is enclosed at the upper end thereof by a solenoid pole piece and open at the lower end thereof, and having an armature with an upper end and a lower end, and being movable axially in said guide tube between a balanced de-energized position and a balanced energized position, and said armature being disposed with said lower end extending out of the open lower end of the guide tube and into the transfer chamber in the valve body;

(c) said axial hole in the valve body having a poppet valve seat formed therearound at the end thereof which communicates with said transfer chamber;

(d) said armature having a poppet valve seal mounted in the lower end thereof;

(e) means for normally biasing said armature in a direction outward of the open end of the guide tube when the solenoid is de-energized to move the poppet valve seal on the lower end of the armature into seating engagement with said poppet valve seat formed around said axial hole;

(f) a pressurized fluid inlet port formed in said valve body which communicates with said axial hole;

(g) a transfer port formed in said valve body which communicates with said transfer chamber, and which communicates with the inlet port when the armature is energized, and which is blocked from communication with the inlet port when the armature is de-energized;

(h) an axial balancing hole formed in the upper end of the armature, and having the upper end thereof open to the guide tube, and being formed to a cross section area equal to the cross section area of the axial hole in the valve body;

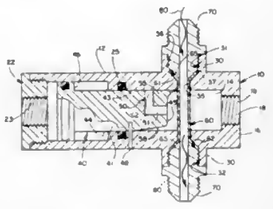
(i) a sealed balancing plug means operatively mounted in said balancing hole in the armature; and,

(j) fluid passage means formed through the armature and poppet valve seal and interconnecting the axial hole in the valve body with the axial balancing hole in the armature to convey pressurized fluid from the inlet port into the axial balancing hole in the upper end of the armature and into balancing engagement with the balancing plug means

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to balance the armature when it is in a de-energized position.

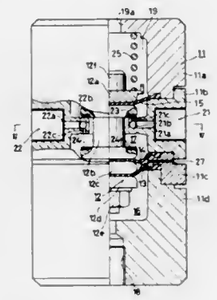
4,821,775
ONE SHOT VALVE
George E. Cooksey, 1522 Autumn Ave., Ridgecrest, Calif. 93555
Filed Oct. 3, 1988, Ser. No. 252,963
Int. Cl.[4] F16K *13/00*
U.S. Cl. 137—68.2 10 Claims



6. A one-shot valve comprising:
a tubular wall defining therein a valve chamber having opposite ends and defining a pair of bores opening through the wall into the chamber and disposed transversely oppositely thereof;
means for closing each of the ends;
a flexible tube extended through the bores and across the chamber, the tube having opposite end portions individually disposed in the bores;
connector means individual to each of said end portions for connecting thereto a conduit for pressurized fluid;
means individual to each of said end portions for fixing the end portion to the wall within the corresponding bore in pressure sealed relation to the wall;
a ram slidably received in the chamber for movement in a predetermined direction between said ends from an unactuated position wherein the ram is disposed between one of said ends and the tube and an actuated position wherein the ram is disposed between the bores, the ram having an operating end portion adjacent to the tube when the ram is in the unactuated position and the operating end portion bearing
cutting means adjacent to one of said bores for severing the tube thereat as the ram moves initially from the unactuated position toward the actuated position so that a portion of the tube extends from the other of the bores toward said one bore, said tube portion remaining connected to the corresponding conduit for pressurized fluid, and
crimping means adjacent to the other of said bores for bending and collapsing said tube portion against the wall to seal off said corresponding conduit and for wedging said tube portion between the crimping portion and the wall to retain the ram in the actuated position.

4,821,776
AIR PILOT OPERATED DIRECTIONAL CONTROL VALVE
Rozo Ariizumi, Urawa, and Masakuni Kainuma, Ohmiya, both of Japan, assignors to Fujikura Rubber Ltd, Tokyo, Japan
Filed Jan. 27, 1987, Ser. No. 6,842
Claims priority, application Japan, Jan. 31, 1986, 61-19258
Int. Cl.[4] F16K *11/048*
U.S. Cl. 137—625.4 13 Claims

1. A snap acting air pilot operated directional control valve for controlling a fluid connection between one normally open port and two selection ports, comprising a casing, a plunger which is arranged in the casing to move in the axial directions thereof in the casing and which moves in response to a pilot pressure, elastically deformable means for enabling the plunger to axially move, said elastically deformable means being connected to the casing and the plunger and being arranged to define a control chamber in the casing, said open port and the selection ports being connected to the control chamber to open into the control chamber, said selection ports having axial open ends which face in opposite axial directions with respect to the control chamber, said plunger being provided with valve seats to selectively close the axial open ends of the selection ports in accordance with the axial displacement of the plunger, each of said valve seats being rigidly attached to the plunger and being positioned in direct alignment with its corresponding selection

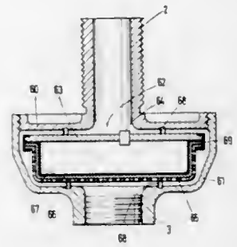


port to receive energy of ejected air and cause quick axial movement of the plunger in the event that air is ejected from the respective selection port, and spring means for biasing the plunger in a direction opposite to a direction of the movement of the plunger by the pilot pressure, whereby the plunger moves in a snap action when the pilot pressure exceeds a predetermined valve, said elastically deformable means comprising three diaphragms consisting of two end diaphragms and one intermediate diaphragm between the end diaphragms, said three diaphragms being connected to the plunger so as to axially move together therewith, said control chamber being defined between and by one of the end diaphragms and the intermediate diaphragm.

4,821,777
DEVICE FOR DAMPING PRESSURE SURGES IN PIPELINES, ESPECIALLY SANITARY INSTALLATIONS
Kurt Martin, Sissach, Switzerland, assignor to R. Nussbaum AG., Olten, Switzerland
Filed Jun. 3, 1987, Ser. No. 56,969
Claims priority, application Switzerland, Jun. 11, 1986, 02362/86
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 8 Claims

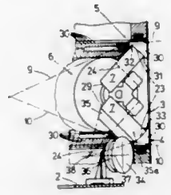
1. A device for damping pressure surges in pipelines for liquid, comprising
a housing composed of two parts (2, 60, 3, 61) and surrounding a cup-shaped space having a diametrical dimension greater than the axial dimension thereof,
each of said housing parts having a pipe connection member (2, 3) communicating with said cup-shaped space at opposite sides thereof and a housing wall part (60, 61) projecting radially past said pipe connection members (2, 3),
a box or capsule (62) adapted to and inserted in said cup-shaped space between the two housing parts (60, 61),
said box or capsule having a rigid outer wall (63, 65) composed of a lid portion (63) and a mating capshaped portion (65), said cap-shaped portion (65) having a brim portion and having openings, a cap-shaped flexible or elastic member (66, 67) juxtapositioned inside said cap-shaped portion, said cap-shaped flexible or elastic members (66, 67) having a brim portion tightly connected between the brim portion

of said cap-shaped portion (65) and said lid portion (63), said rigid outer wall (63, 65) and said cap-shaped flexible or elastic member (66, 67) surrounding a sealed chamber filled with a pressurized gas,
said box or capsule (62) having an axial dimension and a diametrical dimension greater than the axial dimension and being positioned coaxial in the cup-shaped space within the housing wall part (60, 61) between said pipe connection members (2, 3) and projecting radially past the latter, and spacer elements (68) maintaining said box or



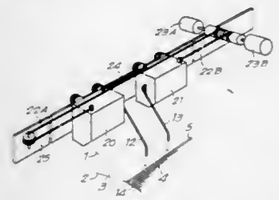
capsule at a spacing from the housing wall part (60, 61), so that liquid may flow around the whole box or capsule, said housing wall part (60, 61) comprising a pair of mating housing wall parts surrounding the cup-shaped space, each of said housing wall parts (60, 61) of said pair having a rim portion having a thread for releasably and tightly threading together the pair of housing parts (60, 61) in the axial direction, said box or capsule (62) is brought into a contact pressure connection via said spacer elements (68) with said housing parts (60, 61) and can be easily exchanged by threading said pair of housing parts (60, 61).

4,821,778
CIRCULAR LOOM
Franz Zacek, Vöcklabruck, Austria, assignor to Lenzing Aktiengesellschaft, Austria
Filed Jul. 9, 1987, Ser. No. 71,398
Claims priority, application Austria, Jul. 14, 1986, 1904/86
Int. Cl.[4] D03D *37/00*
U.S. Cl. 139—13 R 6 Claims



1. A circular loom having a middle axis and comprising a machine frame, a rotor, a lower and an upper circular running race arranged in said machine frame, and a shuttle guided by said lower and said upper circular running races,
said lower and upper running races having lower and upper guiding surfaces, respectively, which are inwardly inclined so as to diverge towards said middle axis of said loom,
said shuttle having lower and upper running rollers with frustoconical running surfaces which contact and ride on said lower and upper guiding surfaces, respectively, of said lower and upper circular running races,
means associated with at least one of said running races for preventing sliding of the rollers in a direction perpendicular to the middle axis;
said lower and upper running rollers being disposed at an angle with respect to said middle axis such that a line extending along the rotational axis of said running rollers forms an imaginary truncated cone with a tip disposed on said middle axis of said loom, and lines extending from the frustoconical running surfaces of said lower and upper running rollers from respective imaginary having cones having tips disposed at the middle axis of the circular loom, the tips of the imaginary cones formed by extending lines from the frustoconical running surfaces of the lower running rollers coinciding with the top of the imaginary cone formed by extending a line along the rotational axis of the lower rollers, and the tips of the imaginary cones formed by extending lines from the frustoconical running surfaces of the upper running rollers coinciding with the tip of the imaginary cone formed by extending a line along the rotational axis of the upper rollers.

4,821,779
METHOD AND APPARATUS FOR RELEASING DEFECTIVELY INSERTED WEFT THREADS IN WEAVING MACHINES
Henry Shaw, Vleteren, Belgium, assignor to Picanol N.V., Belgium
Filed Oct. 27, 1987, Ser. No. 113,077
Claims priority, application Netherlands, Nov. 7, 1986, 8602827
Int. Cl.[4] D03D *49/00*
U.S. Cl. 139—116 14 Claims



1. A method of removing a defectively inserted weft thread from a beat-up position in a fabric fell of a weaving loom which has been automatically stopped on detection of the defectively inserted weft thread and reversed through its operative cycle until the shed into which the weft thread is defectively inserted is re-formed, the method including:
inserting a releasing element between the weft thread and the fabric fell at a predetermined position along the fell of the fabric;
moving the releasing element away from the fabric fell toward the area of the shed, thereby releasing a portion of the weft thread from the fabric fell;
moving the releasing element out of the area of the shed after the portin of the weft thread has been released from the fabric fell; and
performing the inserting and moving operations of the releasing element in a step-wise manner at a plurality of predetermined positions across the entire length of the fell, thereby removing the defectively inserted weft thread from its beat-up position in the fabric fell.

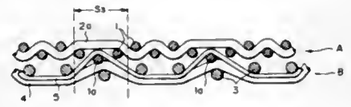
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4,821,780

MULTI-LAYER FABRIC FOR PAPER-MAKING

Takuo Tate, Hachioji, Japan, assignor to Nippon Filcon Co. Ltd., Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,395
Claims priority, application Japan, Dec. 2, 1986, 61-285963
Int. Cl.[4] D21F 7/10
U.S. Cl. 139—383 A 2 Claims



1. Multi-layer fabric for paper-making, said fabric comprising:

an upper fabric layer and a lower fabric layer,

respective warps and wefts interwoven with each other to form each of said upper and lower fabric layers, said upper layer being formed by warps and wefts woven as a plain weave except at binding portions thereof and being adapted to support a paper slurry thereon, said lower layer positioned below said upper layer and being formed by warps and wefts each having larger diameters than said warps and wefts forming said upper layer,

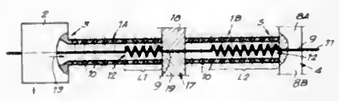
binder threads interlaced with some of the warps of said upper layer and with some of the warps of said lower layer, respectively, to bind said upper layer and said lower layer together, said binder threads being separate from the warps and wefts which form said upper layer and said lower layer, so that at said binding portions, a warp of said upper layer is interlaced with said binder thread and extends under three successive wefts of said upper layer, a weft of said upper layer extends above three successive warps of said upper layer, each said binder thread, at said binding portions, passes upwardly between a first warp and a second warp of said three successive warps of said upper layer, above said second warp, and downwardly between said second warp and a third warp of said three successive warps of said upper layer, and said binder thread is positioned at the binding portion under said weft of said upper layer, formation of a recess in which said paper slurry can accumulate thereby being prevented.

4,821,781

WEFT ACCUMULATING METHOD AND ASSEMBLY FOR WEAVING MACHINES

Philippe van Bogaert, Schaerbeek; Frank Ampe, Leffinge-Middelkerke; Jozef Verhulst, Zillebeke; Luc Weymeels, Ronse, and Hugo Markey, Langemark, all of Belgium, assignors to Picanol N.V., Ieper, Belgium

Filed Oct. 27, 1987, Ser. No. 113,060
Claims priority, application Netherlands, Oct. 31, 1986, 8602741
Int. Cl.[4] D03D 47/30, 47/36
U.S. Cl. 139—435 18 Claims



1. A weft accumulator assembly for accumulating a predetermined length of weft thread to be inserted into a shed of a weaving loom, the accumulator assembly comprising:

a weft thread supply;

a drawing off of means arranged to draw off a predetermined length of weft thread from said thread supply;

at least one perforated cylindrical tube;

a fluid blowing means operatively connected to a first end of said tube and arranged to receive said predetermined length of weft thread drawn off of said thread supply and blow said length of thread into said tube; and

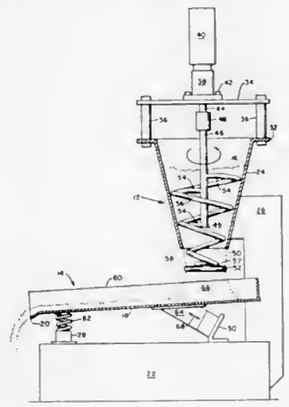
a thread clamping means operatively connected to a second end of said tube and arranged to operate in a first condition closing the second end of said tube to prevent the insertion of said predetermined length of weft thread into the shed, and a second condition opening the second end of said tube to permit the insertion of said predetermined length of weft thread into the shed.

4,821,782

POWDER FEEDER

Frank S. Hyer, Duxbury, Mass., assignor to Hyer Industries, Inc., Pembroke, Mass.

Filed Jan. 29, 1987, Ser. No. 8,611
Int. Cl.[4] H65B 1/34
U.S. Cl. 141—83 9 Claims



1. Apparatus for continuously feeding cohesive powder at a controlled rate comprising, in combination,

a hopper for storing the powder having a wall terminating at an outlet opening, said wall having a wall portion of circular horizontal cross section which decreases in diameter toward said opening,

an elongate agitator having a dilating portion formed of convolutions spiraling upwardly from said opening and radially outwardly in close proximity and conforming to said wall portion over a substantial portion of its axial length, said opening being otherwise unobstructed,

drive means for rotating the agitator as the powder is discharged from said opening, the direction of rotation tending to lift the powder in contact with said dilating portion, the speed of rotation being sufficient only to dilate and decompress the powder and to prevent the formation of stable arches thereof in the hopper, and

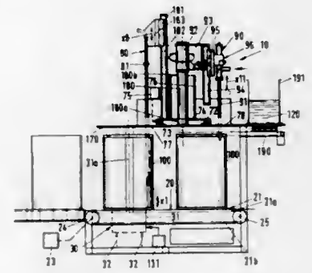
a vibratory pan feeder having a pan adapted to receive the powder, said hopper and agitator being formed and driven to produce a column of powder ascending from the pan up to the agitator, said column forming a head load of constant mass beneath said opening, said feeder being adapted to convey the powder from said column at a predetermined rate, whereby the rate of powder discharge from the hopper to the feeder is limited to said predetermined rate and is sufficient only to replace the powder conveyed from said column.

4,821,783

APPARATUS FOR FILLING CONTAINERS TO BE SEALED WITH PLUGS

Gerhard Arnemann, D-2083 Halstenbek, Am Krönrey 11, Fed. Rep. of Germany

Filed Jun. 19, 1987, Ser. No. 64,845
Claims priority, application European Pat. Off., Mar. 13, 1987, 87103657
Int. Cl.[4] B65B 43/42
U.S. Cl. 141—165 7 Claims



1. Apparatus for filling containers each having an opening for receiving a screw plug and each having an outer periphery and a vertical axis as well as a given maximum horizontal dimension and as a maximum height, comprising:

(a) a horizontal conveyor belt for moving the containers and having a length at least twice the maximum horizontal dimension of a container, said conveyor belt including two spaced endless chainbelts, having upper sides to guide the containers,

(b) means for raising the individual containers from the chainbelts between the upper sides of the two chainbelts, said means including:

(b1) a powered raisable and lowerable lifting frame for engaging the individual containers in the region between the two chainbelts,

(b2) at least three container supporting and centreing pulleys raisable and lowerable with the lifting frame between the upper sides of the two chainbelts along a circular line with a center and a diameter at least corresponding to the maximum horizontal dimension of the container said centering pulleys having bearing axes extending radially relative to a vertical axis and substantially radial to the vertical container axes, the supporting and centreing pulleys being freely displaceable on their bearing axes in the longitudinal direction of said bearing axes and being automatically centreing towards the centre of the circular line, so that a container standing on the supporting and centreing pulleys is horizontally displaceable in all directions and

(b3) three alignment pulleys with vertical bearing axes in the region of the periphery of the container when the container is standing on the supporting and centreing pulleys and engageable on the container periphery, means for rotating at least one of said alignment pulleys one of said pulleys forming a fixed lateral boundary stop for the container, the two other alignment pulleys facing said first alignment pulley and having bearing spindles, and means to permit swinging all three alignment pulleys into and out of engagement with the outer periphery of the container,

(c) A work station having screwdriving means for screw plugs and a level measuring probe as well as a filling device, the work station comprising

(c1) a horizontal mounting plate above the conveyor belts a distance greater than the height of the container, a scanning mechanism below said plate for detecting the screw plugs of an empty container and for controlling the alignment pulleys to center each empty container on the lifting frame above the container feed belt,

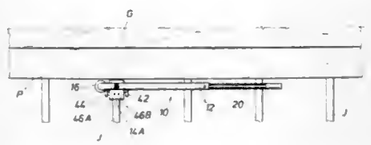
(c2) a rotary disc, a drive mechanism for rotating the rotary disc about a vertical axis on the mounting plate, said rotary disc having a central opening a vertical support connection running upwards from the plate along the opening, a plurality of vertically displaceably guides mounted on the rotary disc one of said guides having a first laterally projecting arm for carrying said screwdriving means and another of said guides having a second laterally projecting arm, a device for fitting safety caps mounted on said second arm, the mounting plate having two facing openings arranged centrally with respect to the feed path for the passage of said devices, and

(c3) a supporting column passing through the interior of the support connection and through the opening in the rotary disc, said supporting column having a longitudinal axis and a bottom end fixed to the mounting plate, a swivel rotatable about the supporting column along the longitudinal axis of the supporting column and having a third laterally projecting arm, a vertical guide with a vertically displaceable guide slide on said third arm, a filling device coupled to said guide slide and having a filling connection, a swivel on the filling device coupled with a forward or return movement of the rotary disc or the screwdriving means to make the filling device lead during an advance of the rotary disc or screwdriving means in a counterclockwise direction and to make the filling device trail behind during return movement of the rotary disc or the screwdriving means, the screwdriving means being arranged near the container opening in an initial position for facing the filling device while the device for fitting safety caps and the level measuring probe are positioned between the screwdriving means and the filling device in an angular range of 45° or 90° eminating from the means, and

said station being arranged for aligning an empty, screw plug-equipped container which has entered the station with the screwdriving means in a position to unscrew the screw plug, lowering said screwdriving means onto the screw plug and unscrew it and raise it from the container opening, then rotate the rotary disc until the level measuring probe is aligned with the container opening, lowering the measuring probe into the container to simultaneously bring about coincidence between the filling device and the filling opening of the empty container, feeding the filling material into said container with said filling device, then moving the filling device away from the opening and rotating the rotary disc so the screwdriving means is aligned with the opening of the filled container and screws a plug onto the filled container, further moving of the rotary disc, following a screw plug being screwed into the opening of the filled container, to move the rotating means moves out of the position at which the screw plug is screwed in, moving the device for fitting a safety caps into the vicinity of the screwed in screw plug of the filled container and fitting a safety cap onto the screw plug of the filled container, moving filled and sealed container out of the station and an empty container into the station to a rearward filling position with simultaneous rotation of the rotary disc in the clockwise direction, so that the screwdriving means is moved into the screw plug unscrewing position and a new empty container with its screw plug is moved into the vicinity of the screwdriving means and aligned therewith.

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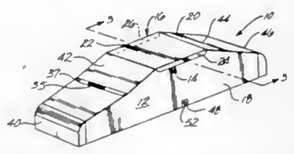
4,821,784
TOOL FOR REMOVING LATERAL DEFLECTION IN A WOOD PLANK
Michael P. Cone, 714 Worthshire, Houston, Tex.
Filed Sep. 30, 1987, Ser. No. 103,054
Int. Cl.[4] B27H 1/00
U.S. Cl. 144—381 12 Claims



1. Apparatus adapted for removing lateral deflection from a wood plank, comprising
a first elongated member having a first end and a second end and having a connector position intermediate its ends.
a fastener means having an upper surface for positioning said elongated member adjacent the wood plank,
means for pivotally connecting said elongated member at said connector position with said upper surface of said fastener means, said first end of said elongated member pivoting about said connector position relative to said fastener means between a nonloading position and a loading position to remove lateral deflection in the wood plank, and
cylindrical means rotatable relative to and disposed on said first end for reducing friction between said elongated member and the wood plank.

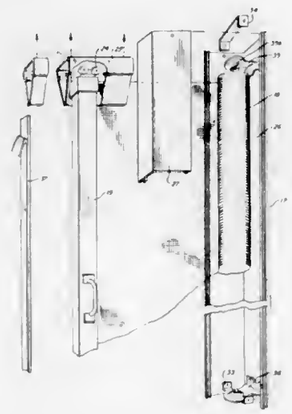
12. A method for removing lateral deflection in a wood plank during its installation, comprising the steps of:
providing an elongated member having a first end and a second end being pivotally connected to an upper surface of a fastener means,
positioning the fastener means adjacent the wood plank to operably enable rotation of the elongated member relative to said fastener means to allow the first end of said elongated member to apply a load to the wood plank to remove lateral deflection in the wood plank, and
reducing friction between said elongated member and the wood plank when applying the load to the wood plank with a cylindrical member rotatable relative to said elongated member.

4,821,785
PROTECTIVE COVER
Rolan, 2019 Red Rose Way, #1, Santa Barbara, Calif. 93109
Division of Ser. No. 82,511, Aug. 7, 1987. This application May 2, 1988, Ser. No. 188,960
Int. Cl.[4] B60J 11/00
U.S. Cl. 150—166 13 Claims



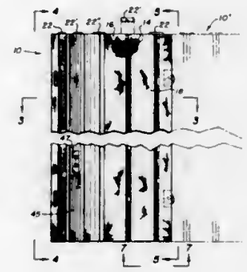
1. A lightweight, protective cover for a shaped object comprising:
a plurality of panels formed from a sheet of lightweight material, said sheet having an outer reflective surface and a smooth inner surface; and a plurality of vent openings formed in the panels; and
in which the sheet material is a laminate including top and bottom layers of synthetic resins and an intermediate layer of reflective metal.

4,821,786
REELABLE DOOR CLOSURE
Bernard A. Johnston, 3026 Fairfield Ave., Downers Grove, Ill. 60515
Filed Sep. 4, 1987, Ser. No. 92,949
Int. Cl.[4] E06B 9/08, 9/20
U.S. Cl. 160—23.1 1 Claim



1. The reelable door closure comprising a door frame having spaced apart, vertically extending jambs having inner and outer edges and a cross member top interconnecting said jambs,
a vertically elongated box secured to one of said jambs and equipped with upper and lower spool supports,
a spool of door closure material reelably mounted in said supports,
said box including a first angle element having first and second arm portions, said first arm portion being secured to said one jamb and said second arm portion extending toward the other of said jambs from adjacent the outer edge of said one jamb,
said first arm portion having a free edge equipped with rib means defining a slot, said box including a second angle element having third and fourth arm portions cooperating with said first and second arm portions in defining said box, said third arm portion being having a free edge equipped with rib means engaging said slot, said second and fourth arm portions having free ends each equipped with rib means arranged in spaced apart relation to provide a passage for said closure material when being unreeled toward the other of said jambs,
a locking and stabilizing member attached to the free end of said closure material and having means cooperable with said other of said jambs for releasable magnetic locking engagement, said locking and stabilizing member being equipped with four wheels at the upper end thereof,
a track hanger secured to said cross member top and having opposed internal guide means suspendingly mounting said wheels, said track hanger being equipped with depending tongue portions for engaging said closure material and providing an elongated opening for said closure material to pass whereby said track hanger spool and locking and stabilizing member cooperate to provide a taut, readily operable closure.

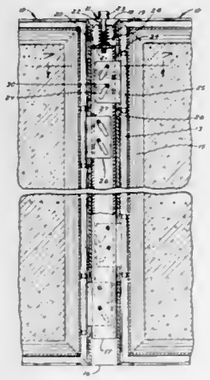
4,821,787
FLEX PANEL SYSTEM
Wesley W. Swanson, Glastonbury, Conn., assignor to Harold Post, West Hartford, Conn.
Continuation of Ser. No. 921,314, Oct. 21, 1986, abandoned. This application Feb. 23, 1988, Ser. No. 161,411
Int. Cl.[4] A47G 5/00
U.S. Cl. 160—135 19 Claims



1. A flexible panel comprising:
a plurality of adjacent longitudinal members, each member including a core having top and bottom portions, said cores having a flexible outer covering thereon, said outer covering interconnecting at least two of said adjacent longitudinal members to define a flexible hinge between said two adjacent members;
a groove in at least one of said top and bottom portions of said cores defining at least a pair of grooves, said grooves having a preselected width and being respectively aligned in said two adjacent longitudinal members to define a continuous uninterrupted groove between said two adjacent longitudinal members;
means for locking said flexibly connected adjacent members in a preselected angular configuration, said means for locking comprising a rigid flattened insert which is insertable in said continuous uninterrupted groove of said two adjacent longitudinal members to thereby lock said members in said preselected angular configuration, said rigid insert having a preselected angle corresponding to the preselected configuration desired between said two adjacent members, said preselected groove width adapted for receiving said rigid insert; and
said rigid flattened insert having a thickness dimension which is small relative to the width and length dimensions thereof, said thickness dimension of said insert forming a friction fit with said preselected width of said grooves to thereby lock said adjacent longitudinal members.

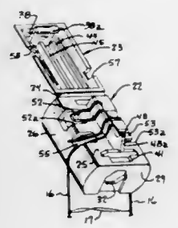
4,821,788
LOCKING SYSTEM FOR DISPLAY PANELS
LeRoy O. Nelson, Minnetonka, Minn., assignor to Media/-Graphics, Inc., Minneapolis, Minn.
Filed Apr. 18, 1988, Ser. No. 182,888
Int. Cl.[4] A47G 5/00
U.S. Cl. 160—135 16 Claims

1. A locking system for rigidly joining together display panels having elongated longitudinal undercut retainer channels along their adjacent edges, said system comprising:
(A) a first elongated outer tubular member adapted to fit between adjacent panels,
(B) a second elongated inner tubular member telescopically fit within the first tubular member with a sliding fit,
(C) means connecting said tubular members at one end thereof for limited reciprocal movement of the inner tubular member within the outer tubular member, said means comprising:
(1) an end plate secured to one end of said inner tubular member,
(2) a central threaded openig in said end plate,
(3) an end plate secured to the same end of said outer tubular member,
(4) a central opening in the end plate of said outer tubular member in longitudinal alignment with said threaded opening, and
(5) a bolt extending through said central opening in the end plate of the outer tubular member and in engagement with said threaded opening,
(D) a plurality of longitudinally spaced apart locking members carried by said inner tubular member,



(1) said locking members projecting outwardly from at least two sides of said inner tubular member, the outer edge of said locking members being engageable with the retainer channels of the panels to be joined, and
(2) longitudinal slots in said inner and outer tubular members adjacent to said locking members for passage of said locking members, and
(E) means associated with said locking members for causing simultaneous limited inward or outward reciprocal movement relative to said slots of all of the locking members upon reciprocation of the inner tubular member relative to the outer tubular member.

4,821,789
VENETIAN BLIND WITH IMPROVED LADDER TILT DRUM
Mark R. Van Rens, Middleton, Wis., assignor to Graber Industries, Inc., Middleton, Wis.
Filed Dec. 21, 1987, Ser. No. 135,241
Int. Cl.[4] E06B 9/38
U.S. Cl. 160—176.1 8 Claims



1. In a venetian blind having a tilt rod, slat support ladder

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means, and a tape drum for securing the ladder means to the tilt rod for operation thereby, the ladder means including a pair of flexible side cords joined by cross rungs, the improvement wherein the tape drum comprises a one-piece body of synthetic resin material including a drum section and a cover section integrally connected by a flexible hinge portion to the drum section, the drum section having a tilt axis and passage means on the tilt axis adapted to receive the tilt rod, the drum section having top wall means overlying the tilt axis and two sides spaced generally equidistant from the tilt axis and two ends extending transverse to the tilt axis, the flexible hinge portion extending transverse to the tilt axis adjacent one end of the drum section and being sufficiently flexible to allow the cover section to be swung from an open position space from the top wall means to a closed position overlying the top wall means, latch means integral with the drum and cover sections at a location spaced from the hinge portion for latching the cover section to the drum section in a closed position with the lower face of the cover section opposed to an upper face of the top wall means, the two side cords having upper end portions extending from relatively opposite sides of the drum section and across the top wall means, and ridge means on the opposed faces of the drum section and cover section extending generally longitudinally of the tilt axis and intermediate the sides of the drum section for gripping the end portions of the side cords therebetween when the cover section is in its closed position.

4,821,790

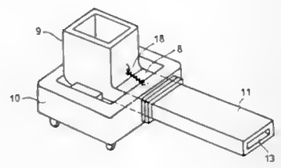
APPARATUS FOR POURING MOLTEN METAL

Yutaka Tsuchida, Yokosuka; Shuzo Takahashi, Yokohama; Shiro Osada, Yokohama; Hisashi Sato, Yokohama; Akichika Ozeki, Tokyo, and Nobuhisa Hasebe, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of, Japan

Filed Jan. 21, 1988, Ser. No. 146,717

Int. Cl.[4] B22D *11/10*

U.S. Cl. 164—430 **6 Claims**



1. An apparatus for pouring molten metal in a moving-mold type continuous casting machine, comprising a tundish nozzle, a tundish car having a stationary portion, means for securing said tundish nozzle to said stationary portion by which said tundish nozzle is supported, and a tundish for supplying molten metal into said tundish nozzle mounted on said tundish car and having a molten-metal pouring outlet portion, said molten-metal pouring outlet being resiliently urged toward an end of said tundish nozzle.

4,821,791

MELTING FURNACE FOR PRODUCING STRAND-CAST INGOTS IN A PROTECTIVE GAS ATMOSPHERE

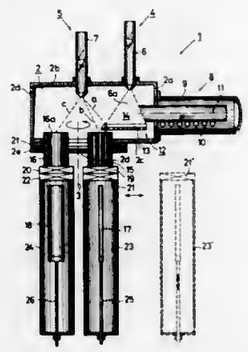
Hans Aichert, Hanau am Main; Herbert Stephan, Bruchköbel; Hermann Stumpp, Alzenau; Walter Dietrich, Hanau am Main, and Michael Kiessling, Langenselbold, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,910

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1987, 3740530

Int. Cl.[4] B22D *11/04, 11/10, 27/15*

U.S. Cl. 164—506 **16 Claims**



1. Melting furnace for producing strand-cast ingots in a protective gas atmosphere comprising:

a charging system for feeding starting material into a melting area within a melting chamber provided with a chamber floor;

at least one energy source for melting the starting material;

a first strand-casting mold for the conversion of the melt to an ingot;

an ingot offbearing apparatus disposed underneath the strand-casting mold and having an offbearing chamber enveloping the ingot and the offbearing apparatus and associated with the strand-casting mold;

at least one additional strand-casting mold, the first strand-casting mold together with said at least one additional strand-casting mold being disposed in the chamber floor such that each of the strand-casting molds can be brought by a movement relative to the melting area into the drop path of the melt;

an offbearing chamber which can be coupled gas-tight to each strand-casting mold and which has an offbearing apparatus for the ingot; and

at least one vacuum valve between each strand-casting mold and the offbearing chamber associated with it.

4,821,792

HEATING AND COOLING SYSTEM FOR MOTOR VEHICLES

Henryk Bednarek, Landsberg, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

Filed Feb. 27, 1987, Ser. No. 20,101

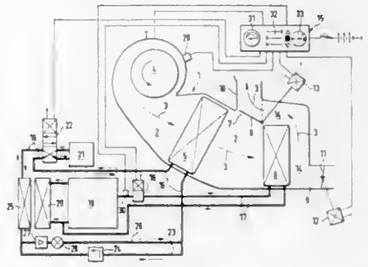
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606591

Int. Cl.[4] B60H *3/00;* **F25B** *29/00*

U.S. Cl. 165—17 **5 Claims**

1. A heating and cooling installation for motor vehicles, comprising operating elements means for the selective adjustment of at least the functions of cooling, heating, defrosting and ventilating, reversible refrigerant circulatory means for

reversibly circulating refrigerant through an air/refrigerant heat exchanger communicating with a compartment of the motor vehicle to cool and heat air for cooling and heating selections, respectively, cooling-medium circulatory means of an internal combustion engine for circulating cooling medium through an air/cooling medium heat exchanger communicating with said compartment for heating selection, and control



means operatively connected with the operating elements means and operable for heating and defrosting selections for automatically heating by engaging said reversible refrigerant circulatory means only at an outside temperature of less than about 10° C., and upon reaching a predetermined temperature of the cooling-medium, for automatically shifting to heating exclusively by engaging said cooling-medium circulatory means.

4,821,793

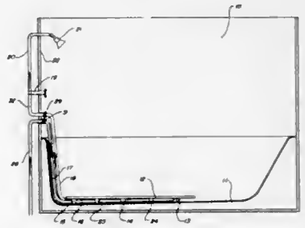
TUB AND SHOWER FLOOR HEAT EXCHANGER

Robert D. Sheffield, 4105 Oak St., Dunsmuir, Calif. 96025

Filed Aug. 6, 1987, Ser. No. 82,279

Int. Cl.[4] A47K *3/22;* **F24J** *3/04*

U.S. Cl. 165—47 **5 Claims**



1. A heat exchanger for use in extracting heat from spent bathing water and transferring said heat to water in a domestic water supply, comprising:

a heat exchanger tube extendng over a tortuous path and having an inlet and an outlet;

first connecting means for connecting said inlet of said heat exchanger tube to a domestic water supply line;

second connecting means for connecting said outlet of said heat exchanger tube to a water delivery line, and

a heat exchanger cover constructed of a sheet of substantially imperforate material having a top surface and a bottom surface and legs attached to and extending downward from said bottomsurface, said sheet of material from which said heat exchanger cover is constructed being substantially imperforate so that, when said heat exchanger tube is positioned on the floor of a bathing stall and said heat exchanger cover is positioned above said heat exchanger tube, said legs of said heat exchanger cover hold said sheet of substantially imperforate material above said heat exchanger tube.

whereby said spent water contacting said top surface of said sheet of substantially imperforate material is forced to flow around the edges of said sheet of substantially imperforate material and over a path defined by said bathing stall, said legs of said heat exchanger cover and said bottom surface of said sheet of substantially imperforate material, contacting said heat exchanger tube, thereby transferring heat from said spent bathing water to water inside of said heat exchanger tube.

4,821,794

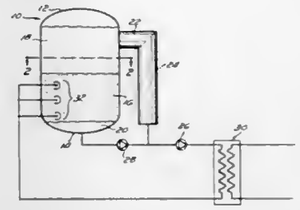
CLATHRATE THERMAL STORAGE SYSTEM

Albert G. Tsai; John F. Westerman, and Victor J. Ott, all of San Diego, Calif., assignors to Thermal Energy Storage, Inc., San Diego, Calif.

Filed Apr. 4, 1988, Ser. No. 176,934

Int. Cl.[4] F28D *20/00*

U.S. Cl. 165—104.17 **26 Claims**



18. A method of latent and sensible heat storage and transfer, comprising the steps of:

providing a container having a storage medium therein, said storage medium comprising water and a hydrate agent capable of forming a clathrate with said water, said medium separating into an aqueous phase and a liquid hydrate agent phase;

continuously removing water from said aqueous phase;

continuously removing hydrate agent from said hydrate agent phase;

combining said removed water and removed hydrate agent to form an emulsion;

cooling said emulsion to a temperature at or below the temperature of formation of said clathrate; and

injecting said cooled emulsion into said storage medium through nozzles under pressure to mix said storage medium and to form clathrate crystals.

4,821,795

UNDULATED HEAT EXCHANGER FIN

James W. B. Lu, W. Bloomfield, Mich., assignor to McCord Heat Transfer Corporation, Walled Lake, Mich.

Filed Oct. 22, 1987, Ser. No. 111,263

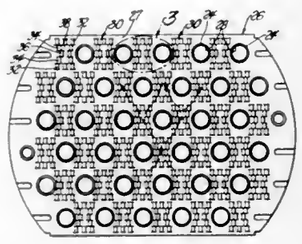
Int. Cl.[4] F28D *1/04*

U.S. Cl. 165—151 **17 Claims**

1. A heat exchanger assembly (**10**) of the tube-fin type comprising: a housing (**12**); a plurality of fins (**26**) having a plurality of holes (**28**) therethrough, a plurality of tubes (**24**) adapted for disposition within said housing (**12**) and extending through said holes (**28**); said assembly (**10**) characterized by said fins (**26**) including a plurality of undulations (**30**) arranged in rows (**32, 34, 36**) between adjacent of said holes (**28**) and spaced from one another along said rows (**32, 34, 36**) with the spacing between

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adjacent undulations (30) varying from one of said rows (32, 34, 36) to the next of said rows (32, 34, 36) and each of said



rows (32, 34, 36) including a flat portion (38) of said fin between said undulations (30).

4,821,796

DEVICE FOR HEATING COMPARTMENTS

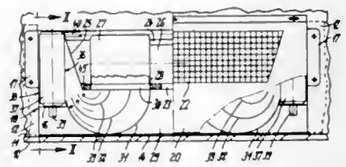
Joachim Schulz, Amorbach, Fed. Rep. of Germany, assignor to Aurora Konrad G. Schulz GmbH & Co., Mudau/Odenwald, Fed. Rep. of Germany

Continuation of Ser. No. 811,494, Dec. 20, 1985, abandoned. This application Jun. 9, 1988, Ser. No. 206,956

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501451

Int. Cl.[4] F24H *3/06*

U.S. Cl. 165—122 **18 Claims**



18. A device for installation to heat a vehicular passenger compartment in vehicles including particularly buses having a duct along a side wall directly above a floor thereof for distribution of air and having an improvement in combination therewith comprising:

a housing for receiving a heat exchanger means having a width and a fan means having a main longitudinal axis as well as having air inlet opening means and air outlet opening means; said fan means and the air outlet opening means extending longitudinally of said housing relative to which said fan means is installed in a space-saving manner; said housing further including an air guide means arranged between an air outlet opening of said fan means and an air inlet side of said heat exchanger means; said air guide means including several air guide elements for changing flow of air emerging from said fan means so that said flow of air has an approximately rectangular flow profile and a width corresponding to the width of said heat exchanger means;

said fan means being a radial-flow fan means including end faces and including an extension of the air outlet opening thereof parallel to the main longitudinal axis of said fan means; said heat exchanger means having a plane of the air inlet side thereof disposed at a fixed position with respect to the main longitudinal axis of said fan means, said fixed position thereof forming an angle to said main longitudinal axis of said fan means; said fan means receiving air from said air inlet opening means;

delivery conduit means connected to said fan means, downstream of said air inlet opening means, for receiving air from said fan means; said delivery conduit means having an air outlet opening located in a plane extending parallel to said main longitudinal axis of said fan means;

heat exchanger means installed transversely as accommodated in said housing and having an air inlet side thereof for receiving air from said air outlet opening of said delivery conduit means through said heat exchanger means, said air outlet opening of said conduit means being offset relative to said air inlet side of said heat exchanger means; said heat exchanger means being disposed in the vicinity of at least one of said end faces of said fan means, with said air inlet side of said heat exchanger means being disposed at an angle to said main longitudinal axis of said fan means; said heat exchanger means also having an air outlet side, with said air outlet opening means of said housing receiving air from said air outlet side of said heat exchanger means; and

means for separation of air flow including said several air-guiding elements of said air-guiding means extending over the entire width of said housing as disposed between said air outlet opening of said delivery conduit means, and said air inlet side of said heat exchanger means; said several air-guiding elements guide and change the flow of air emerging from said air outlet opening of said delivery conduit means in such a way that said air flow has an approximately rectangular flow profile, has a width corresponding to the width of said heat exchanger means, and strikes said air inlet side of said heat exchanger means at an angle, said several air-guiding elements having different sides therewith and having air flowing on both sides thereof as well as having a tapered area therewith arranged downstream of said several air-guiding elements and upstream of said air inlet side of said heat exchanger means, for supplying air to said heat exchanger means in a downstream expanding and increasing manner substantially free of any intermixing thus avoiding turbulence of air flow therethrough due to reduction of flow resistance so that air flow occurs substantially free of losses and free of noise in spite of deflection and deformation of the air flow; said heat exchanger means having air flow therethrough passing generally perpendicularly to the air inlet side thereof;

said air outlet opening of said delivery conduit means also having short sides; a first one of said several air-guiding elements being curved and being connected to that one of said short sides of said air outlet opening that is remote from said heat exchanger means; and

further ones of said several air-guiding elements being disposed in the region between said first one of said several air-guiding elements and said heat exchanger means.

4,821,797

FLUID COOLER

Hans Allgäuer, Gisingen; Harald Kremnitz, Bludenz, and Martin Obersberger, Thüringen, all of Austria, assignors to Norsk Hydro a.s., Oslo, Norway

Division of Ser. No. 907,682, Sep. 15, 1986, Pat. No. 4,778,002. This application Mar. 28, 1988, Ser. No. 175,408

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532930; Feb. 19, 1986, 3605244

Int. Cl.[4] F28D *7/10*

U.S. Cl. 165—141 **6 Claims**

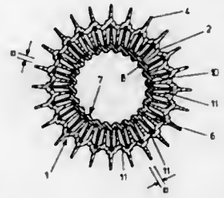
1. A fluid cooler comprising:

an extruded inner tube including an inner circumferentially closed shell having formed therein axially extending, circumferentially spaced corrugations defining inward and outward alternate projections and recesses, and axially extending heat exchange fins integral with and projecting radially outwardly from said outward projections;

an extruded outer tube including an outer shell having formed therein axially extending circumferentially spaced corrugations of the same pattern as said corrugations in said inner shell and defining inward and outward alternate projections and recesses, and axially extending heat exchange fins integral with and projecting radially inwardly from said inward projections of said outer shell;

said heat exchange fins of said inner and outer shells having radial heights substantially equal to half the difference between the inner diameter of said outer shell and the outer diameter of said inner shell;

said inner tube being mounted concentrically within said outer tube to define therebetween a circumferential passageway, with said outwardly extending heat exchange fins of said inner shell extending across and dividing said



passageway and fitting into respective of said inward recesses of said outer shell, and with said inwardly extending heat exchange fins of said outer shell extending across and dividing said passageway and fitting into respective of said outward recesses of said inner shell; and

said outwardly extending heat exchange fins of said inner shell being removed from an end area of said inner tube, and the end of said inner shell at said end area being widened outwardly and joined to the adjacent end of said outer tube.

4,821,798

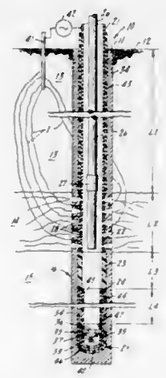
HEATING SYSTEM FOR RATHOLE OIL WELL

Jack E. Bridges, Park Ridge, Ill., and Vincent Young, Tulsa, Okla., assignors to ORS Development Corporation, Tulsa, Okla.

Filed Jun. 9, 1987, Ser. No. 59,956

Int. Cl.[4] E21B *43/24*

U.S. Cl. 166—60 **19 Claims**



1. In a oil well of the kind comprising:

a well bore extending downwardly from the surface of the earth through one or more overburden formations and through an oil producing formation, and further into an underburden formation below the producing formation to afford a rathole of substantial depth;

an electrically conductive first casing section extending from the surface of the earth down into the well bore to a depth adjacent the top of the oil producing formation

an electrically conductive second casing section extending downwardly from the first casing section through the oil producing formation;

and a third casing section extending downwardly from the second casing section into the rathole;

an electrical heating system for heating a portion of the oil producing formation, comprising:

at least one portion of the second casing section having an uninsulated surface to afford a primary heating electrode within the oil producing formation;

a secondary electrode positioned within one of the overburden and oil producing formations;

and an electrical power supply connected to the primary and secondary electrodes to energize those electrodes for conduction heating of a portion of the oil producing formation adjacent the well;

in which the third casing section constitutes an electrical insulator casing having a length at least equal to three times the diameter of the well bore, electrically isolating the rathole from the first and second casing sections;

and in which the third casing section is formed essentially entirely of electrical insulator material.

4,821,799

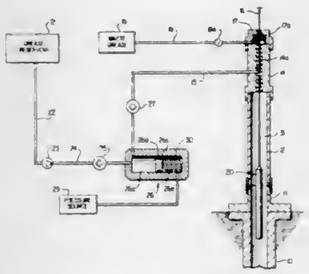
GREASE INJECTION CONTROL SYSTEM

Kwok-Ping Wong, The Colony, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 10, 1988, Ser. No. 192,670

Int. Cl.[4] E21B *33/072*; F16J *15/40*

U.S. Cl. 166—84 **17 Claims**



1. A system for sealing around a flexible line lowered into or raised from a well having a wellhead comprising:

(a) a grease control head mounted on the wellhead; and

(b) a control system for grease injected into said control head, said control system including a pump for pumping grease and a pressurizing accumulator for continuously maintaining a constant pressure on said grease.

4,821,800

FILTERING MEDIA FOR CONTROLLING THE FLOW OF SAND DURING OIL WELL OPERATIONS

Leslie A. Scott, and Maurice L. Dubois, both of Edmonton, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Dec. 1, 1987, Ser. No. 126,797

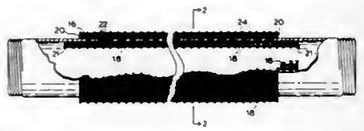
Claims priority, application United Kingdom, Dec. 10, 1986, 8629574

Int. Cl.[4] E21B *43/08*

U.S. Cl. 166—228 **10 Claims**

1. A method of filtering sand from an oil flow from a sand-containing oil producing formation or interval of an oil well comprising passing the oil flow with entrained sand through a filter assembly containing filtering media comprising a body of juxtaposed composite particles, each composite particle having an iron-containing core surrounded by a continuous chromium cladding, said composite particles having a size to permit

passage of the oil flow through the body of the composite particles while substantially preventing flow of sand therethrough, said composite particles being substantially spherical with a diameter in the range of from about 250 to about 2000



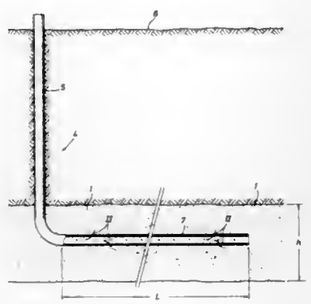
micrometers, the chromium cladding of each composite particle having a thickness in the range of from about 4 to about 30 micrometers, and said iron-containing core of each composite particle containing from about 0.8 to about 1.2% by weight carbon.

4,821,801

PRODUCING ASPHALTIC CRUDE OIL

Hermanus G. Van Laar, Calgary, Canada, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1987, Ser. No. 68,378
Claims priority, application Canada, Jun. 30, 1986, 512753
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—250 **5 Claims**



1. A method of producing asphaltic crude oil from a subterranean reservoir formation in which the reservoir pressure at the exterior boundary of the reservoir is above the asphalt saturation pressure, the method comprising:

determining the asphalt saturation pressure at the reservoir temperature of the crude oil to be produced;

completing a well system into said formation, said well system comprising a substantially vertical well section extending from the reservoir formation to the surface and a substantially horizontal drainhole section traversing the reservoir formation along a predetermined length, said length being sized in conjunction with a desired crude oil production rate and the difference ΔP between the reservoir pressure and said asphalt saturation pressure to prevent asphalt precipitation;

establishing crude oil production via the well system at said desired production rate.

4,821,802

AQUEOUS SULFOMETHYLATED MELAMINE GEL-FORMING COMPOSITIONS AND METHODS OF USE

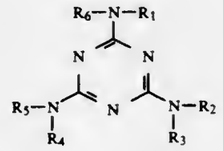
Clifford N. Meltz; Gordon D. Gruetzmacher, both of Gales Ferry, and Ping W. Chang, Waterford, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 746,821, Jun. 20, 1985, Pat. No. 4,772,641.
This application Sep. 1, 1988, Ser. No. 239,062
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—270 **5 Claims**

1. A method for the selective modification of the permeability of the strata of a subterranean bydrocarbon-containing reservoir which comprises:

(A) introducing into a well in communication with said reservoir; an aqueous gel-forming composition, comprising a 1.0–60.0 weight percent sulfomethylated melamine polymer solution prepared by reacting:

(A) 1.0 molar equivalent of a melamine of the formula:



wherein R_1 through R_6 are selected from the group consisting of hydrogen; carboxymethyl; hydroxyethyl; 2, 3-dihydroxypropyl and 2, 3-epoxypropyl with the proviso that at least 2 of R_1 through R_6 be hydrogen and the remainder of R_1 through R_6 be identical;

(B) 3.0–6.7 molar equivalents of formaldehyde or a 2–6 carbon atom containing dialdehyde;

(C) 0.25–1.25 molar equivalents of an alkali metal or ammonium salt of sulfurous acid;

(D) 0.01–1.5 molar equivalents of a gel-modifying agent, said gel-modifying agent functioning to lower the gel-forming amounts of components (A), (B) and (C) necessary to form a gel-forming composition, said gel-modifying agent selected from the group consisting of

(1) a ring-substituted primary aniline or primary naphthylamine where the substituent is electron-withdrawing;

(2) poly (vinyl alcohol) of MW range 3,000–78,000;

(3) poly (acrylamide) of MW range 10,000–100,000;

(4) glycerol;

(5) a poly (oxyethylene) or poly (oxypropylene) primary amine or a poly (oxyethylene) or poly (oxypropylene) secondary di- or tri- amine of MW 300–2,000; and

(6) formaldoxime;

for 1–10 hour at 50–95° C. in an aqueous medium; followed by;

(E) 0–5.0 molar equivalents of a water-soluble, acid-generating, gelation-time-regulating agent, said water-soluble acid-generating, gelation-time-regulating agent selected from the group consisting of alkali metal and ammonium salts of fluoroboric acid and persulfurous acid, formaldehyde, glutaraldehyde, glyoxal, dimethyl maleate, dimethyl itaconate, triethyl citrate, ethyl acetate, sodium hexametaphosphate and sodum mono, di- or tribasic phosphate; said composition introduced at a pH of 5–11; and

(B) shutting-in the well and allowing said composition to gel in the reservoir for 1 hour to 30 days.

4,821,803

HIGH SALINITY POLYMER DRIVE FOR SURFACTANT FLOODING SYSTEMS

Francis E. Debons, Richmond, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 29, 1987, Ser. No. 67,070
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 **23 Claims**

1. A method of recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

injecting into the formation through an injection well about 0.05 to about 0.5 pore volumes of an aqueous surfactant slug having a concentration of about 0.1% to about 6.0% active component;

injecting into the formation at least 0.15 pore volumes of an aqueous drive fluid comprising about 0.01% to about 0.5% of polysaccharide by weight and about 0.1% to about 3.0% of drive fluid additive by weight,

said drive fluid additive having the structure

$$R(C_2H_4O)_nH_y(SO_3M)_x$$

where R is the product of reduction of lignin in the presence of carbon monoxide or hydrogen at a temperature greater than about 200°°C. and a pressure greater than about 100 psi, n has an average value of about 5 to about 30, x is 0 or 1, y is 1 if x is O, y is O if x is 1, and M is an alkali metal or ammonium ion; and

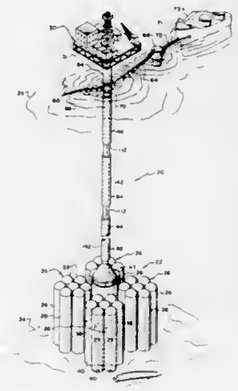
recovering hydrocarbons and other fluids from the formation through a production well.

4,821,804

COMPOSITE SUPPORT COLUMN ASSEMBLY FOR OFFSHORE DRILLING AND PRODUCTION PLATFORMS

Robert H. Pierce, Box 590694, Houston, Tex. 77259-0694

Continuation of Ser. No. 716,576, Mar. 27, 1985, abandoned.
This application Apr. 26, 1988, Ser. No. 186,752
Int. Cl.[4] E21B *7/12*
U.S. Cl. 166—367 **12 Claims**



1. A support column assembly for an offshore drilling and/or production comprising:

anchor means for anchoring said column assembly on the seabed;

an elongated cylindrical support column including at least one generally cylindrical column member having a cylindrical wall formed of a composite of elongated filaments of at least one of carbon and boron bonded in a resin matrix, said support column including a plurality of said column members coupled end to end by coupling means at opposite ends of said column members, said coupling means including a plurality of radially project pins for coupling said composite wall to a coupling member interposed between said column members, respectively;

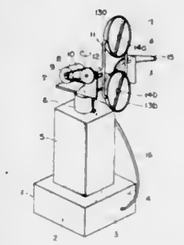
and means for connecting said column to a platform for transmitting platform loads between said platform and said anchor means.

4,821,805

AUTOMATIC FIRE EXTINGUISHING SYSTEM

Yoshifusa Saito; Hiroshi Nakayama, both of Sagamihara; Hisao Fukui, Yokohama, and Naoya Matsuoka, Yokohama, all of Japan, assignors to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1983, Ser. No. 508,657
Claims priority, application Japan, Jun. 28, 1982, 57-111316; Jun. 28, 1982, 57-111317
Int. Cl.[4] A62C *35/00*
U.S. Cl. 169—5 **6 Claims**



1. An automatic fire extinguishing system comprising:

at least two fire detecting sensors disposed at a distance from each other, each being rotatably directable in the horizontal and vertical directions to scan a region to be protected;

driving means for controllably directing the scan of said fire detecting sensors in the horizontal and vertical directions;

first angular determining means operating to determine the vertical angle of a detected fire source as the lowermost angle at which the boundary of said fire source is detected by said sensors in the vertical scan thereof;

second angular determining means operating to determine the horizontal angle of a detected fire source as the average of the boundary of said fire source detected by said sensors in the horizontal scan thereof;

at least one discharge nozzle for fire extinguishing fluid rotatably directable in the horizontal and vertical directions;

computing means arranged to compute the horizontal distance from said discharge nozzle to said fire source based upon said vertical angle and said horizontal angle as determined by said first and second angular determining means;

driving means for controllably directing said discharge nozzle in the horizontal and vertical directions; and

control means for directing said nozzle driving means in the horizontal and vertical directions and operable under control of said computing means to direct said fire extinguishing fluid from said nozzle at said detected fire source in accordance with said vertical and horizontal angles thereof and said distance thereto.

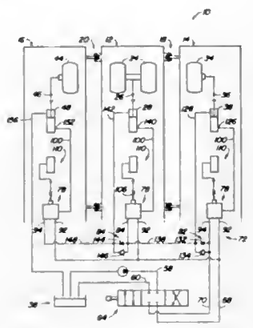
VOL 1101 ISS 3 AP 18 1989 UMI

4,821,806

IMPLEMENT HAVING PARALLEL CYLINDER DEPTH CONTROL AND SERIES CYLINDER LIFT

David C. Winter, Johnston, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 5, 1986, Ser. No. 904,575
Int. Cl.[4] A01B *63/111*
U.S. Cl. 172—4 **17 Claims**



1. In an argricultural implement having a transversely extending frame supporting earthworking tools, and at least first and second cylinders connected to lift structures for raising and lowering the frame between ground-working and transport positions and for controlling soil penetration of the tools when the frame is in the ground-working position, a cylinder control system comprising:

automatic depth control means for operating the cylinders in an automatic depth control mode when the frame is in the ground-working position;

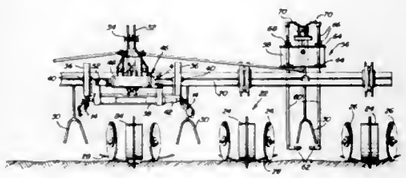
flow control means connected to the cylinders for constraining the cylinders to operate substantially in series as the frame is raised toward the transport position so that the frame raises uniformly across its width and permitting the cylinders to operate substantially in parallel in the automatic depth control mode, said flow control means including pressure responsive check valve means connected between the automatic depth control means and the first cylinder for automatically directing fluid flow from the first cylinder to the second cylinder as the frame is raised toward the transport position, and from the first cylinder away from the second cylinder when operating in the depth control mode.

4,821,807

ROW CROP TILLAGE AND PLANTING UNIT GUIDANCE SYSTEM

Eldon E. Trumm, Box 151, Worthington, Iowa 52078

Filed Jun. 12, 1986, Ser. No. 873,769
Int. Cl.[4] A01B *69/06*
U.S. Cl. 172—6 **9 Claims**



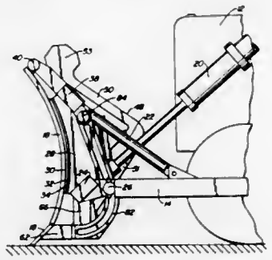
3. In combination with a tractor including a longitudinal center line and a lift hitch incorporating a pair of laterally spaced rearwardly projecting lower hitch arms, an elongated transverse mounting bar extending between and having its opposite ends journaled from the rear ends of said lower hitch arms, a guide assembly mounted from said mounting bar for sliding movement therealong and for rotation therewith relative to said lower hitch arms, a horizontal transverse tool bar including a longitudinal mid-portion and opposite end portions and disposed rearward of and generally paralleling said mounting bar, portions of said tool bar spaced longitudinally to either side of said longitudinal mid-portion of said tool bar including mounting structures rigidly mounting said tool bar from said guide assembly, an upstanding attachment arm mounted on said tool bar longitudinal mid-portion between said longitudinally spaced portions, said tractor including a central rearwardly projecting upper lift arm, means pivotally attaching the rear end of said lift arm directly to an upper portion of said attachment arm for angular displacement relative thereto about a horizontal transverse axis, thrust means operatively connected between said mounting bar and said guide assembly for variably adjustably shifting said guide assembly, and thus said tool bar, along said mounting bar, a depending tillage unit supported from said tool bar, said tillage unit including sensing means for sensing lateral displacement of a crop row to either side of a predetermined path paralleling the longitudinal center line of said tractor and control means operatively associated with said crop row sensing means and said thrust means operative to actuate said thrust means to displace said guide assembly along said mounting bar in the direction in which said crop row sensing means senses lateral displacement of said crop row laterally of said predetermined path.

4,821,808

RESONANTLY DRIVEN EARTH MOVING BLADE

Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Company, Reno, Nev.

Filed Feb. 4, 1988, Ser. No. 152,286
Int. Cl.[4] E02F *3/815*
U.S. Cl. 172—40 **28 Claims**



10. A mold board assembly for a bulldozer tractor or like machine adapted to move earth and other material, said assembly comprising:

a frame coupled to the tractor and including at least one vertical rib and pivotal support means superimposed over the vertical rib;

a mold board having means proximate its upper edge for linking the mold board to the pivotal support means of the frame so that the mold board is pivotably supported at its upper edge by the frame with the back side of the mold board in close abutment with the rib to limit the pivotal movement of the mold board in the aft direction;

a resonant beam having a central juncture and a pair of legs emanating from the juncture;

means for vibrating the resonant beam at near its resonant frequency to generate reciprocating forces at the central juncture; and

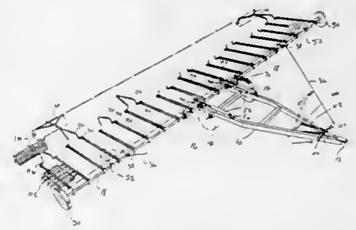
means for connecting the central juncture of the resonant beam to the aft side of the mold board so that the reciprocating forces are transmitted to the mold board to agitate the material in contact with the mold board.

4,821,809

MULTIPLE SECTION DRAWBAR

Terry Summach; Glen S. Pask, both of Saskatoon; Dennis Summach, Asquith, and William Newton, Aberdeen, all of Canada, assignors to Flexi-Coil Limited, Saskatoon, Canada

Continuation of Ser. No. 531,624, Sep. 12, 1983, abandoned, which is a continuation of Ser. No. 351,175, Feb. 22, 1982, abandoned, which is a continuation of Ser. No. 174,167, Aug. 18, 1980. This application Jul. 20, 1984, Ser. No. 632,279
Claims priority, application Canada, Aug. 17, 1979, 334034
Int. Cl.[4] A01B *49/02, 73/06*
U.S. Cl. 172—179 **58 Claims**



56. A drawbar adapted to be drawn across the ground comprising:

(a) a boom having at least two sections pivotally connected together at adjacent ends thereof, said boom sections being transverse to the direction of travel of the drawbar when they are in working position,

(b) ground engagable wheel means for supporting said boom sections of contact with the ground,

(c) first coupling means for coupling a central portion of the boom to an associated tractor,

(d) releasable second coupling means to couple the outer ends of the boom to the first coupling means and to retain the boom transverse to the direction of travel of the drawbar when in the working position,

(e) a plurality of frame members attached to each of said sections and directed generally rearwardly of said sections when in the working position, each said frame member being capable of drawing and supporting an associated first soil working device which is attachable to a said section by means of said frame member and adapted to be in contact with the ground when in the working position, to provide substantially complete coverage of the ground,

(f) a plurality of connecting means each including

(i) a rigid connecting member freely pivotally connected at its forward end to a respective one of said frame members rearwardly thereof to pivot about a first horizontal axis transverse to the direction of travel of the drawbar in working position, and

(ii) a further free pivotal connection about an axis at the rearward end of each said connecting means which axis is vertical when the frame member is in working position, said connecting means each being adapted to draw an associated second soil working device across the ground in contact therewith for substantially complete coverage of the ground in working position and support it out of contact with the ground in non-working position, said frame members and corresponding connecting means adjacent the pivotally connected boom sections being of diffrent lengths so that adjacent ones of any said second soil working devices attached thereto are trailed at different distances behind the boom in working position and do not interfere one with the other upon folding of the boom sections,

(g) means for pivoting said boom sections about a horizontal boom axis, generally parallel to their length and forward of said frame members in working position, to move said frame members between

(i) the working position, in which any said first soil working devices attached thereto are adapted to be in contact with the ground, and

(ii) a non-working position in which any said first soil working devices are adapted to be in a raised substantially upright position out of contact with the ground and generally in the same position relative to each other and the frame members,

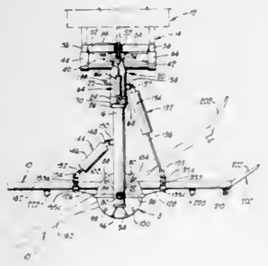
said connecting means freely pivoting about said first horizontal axes at the connections with their respective frame members, to be lifted thereby and to raise any said second soil working devices from the ground to hang rearwardly of any said first soil working devices in said non-working position, said pivotal connections at adjacent ends of said sections including at least one axis which is generally upright when in the non-working position so that the outer ends of said sections may pivot about said axes upon release of said releasable second coupling means from a position transverse to the direction of travel of the drawbar in the non-working position to a position generally parallel to the direction of travel of the drawbar for transport.

4,821,810

AGRICULTURAL AND CONSTRUCTION UTILITY BLADE

Vernon R. Buchanan, R.R. #3, Box 145, Pawnee, Okla. 74058

Filed May 12, 1988, Ser. No. 193,388
Int. Cl.[4] E02F *3/815*
U.S. Cl. 172—197 **24 Claims**



1. A utility blade assembly comprising:

a three-point hitch connection for connection of an earth moving blade to a tractor, and including:

a central, upper one point connecting structure; and

a pair of outer, lower connecting structures;

an elongated, generally horizontally extending boom having a forward end and a rear end;

a sleeve rotatably receiving the forward end portion of said boom for rotation of the boom about its longitudinal axis within said sleeve, said sleeve having a forward end and a rear end;

a pair of aligned, horizontally extending transverse pivot arms secured to, and extending from, opposite sides of said sleeve;

means for connecting said pivot arms to the two outer, lower connecting structures of said three-point hitch connection for pivotation of the pivot arms about a horizontal axis extending normal to the longitudinal axis of said boom;

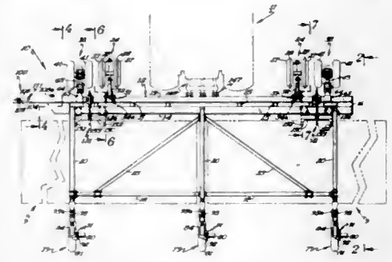
a boom lifting piston and cylinder subassembly connected between the rear end of said sleeve and said central upper connecting structure of said three-point hitch connection for elevating the sleeve and boom when said boom lifting piston and cylinder subassembly is actuated;

means for selectively rotating said boom within said sleeve and about the longitudinal axis of the boom;

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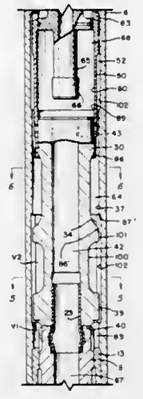
a turntable subassembly carried on the rear end of said elongated boom and including an upper plate fixed to said boom and a lower plate rotatable relative to said upper plate;
an elongated utility blade secured to said lower plate and rotatable with said lower plate relative to said upper plate; and
means connected between said boom and said utility blade to pivot said blade and said lower plate about the axis of rotation of said lower plate on said upper plate.

4,821,811
MOBILE SUPPORT FRAME
Kenneth C. Swenson, Crookston, Minn., assignor to Gust Swenson & Sons, Inc., Crookston, Minn.
Filed Mar. 28, 1988, Ser. No. 174,363
Int. Cl.[4] A01B *73/00*
U.S. Cl. 172—248 **6 Claims**



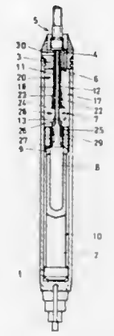
1. A mobile support frame for use in attaching and supporting a pair of towed multi-row implements, such as planters, cultivators, or the like, to a tractor, comprising:
a front frame structure,
an elongate transversely extending rigid rear frame structure,
a plurality of transversely spaced apart longitudinal frame members rigidly interconnecting the front and rear frame structures,
a pair of transversely spaced apart hitch mechanisms, each being mounted on said front frame structure adjacent one end of the latter, said hitch mechanisms being disposed in side-by-side relation and each being releasably connectable to a cooperating centrally located hitch mechanism on one of a pair of multi-row implements whereby a pair of implements may be mounted on a frame in side-by-side relation,
a pair of transversely spaced apart field wheel assemblies mounted on said front, frame structure and positioned forwardly thereof, and each including a pair of ground-engaging wheels, means for vertically adjusting said field wheel assemblies,
a pair of transversely spaced apart front transport wheel assemblies, linkage means interconnecting said front transport wheel assemblies with said front frame structure to permit relative vertical shifting between the frame and said transport wheel assemblies, each transport wheel assembly being disposed adjacent one of said field wheel assemblies, each hitch mechanism on said front frame, assembly being positioned directly rearwardly of a field wheel assembly and a front transport wheel assembly, and
a plurality of rear wheel assemblies, linkage means connecting said rear wheel assembly with said rear frame structure, each of a pair of said rear wheel assemblies being disposed in general alignment with one of said field wheel assemblies, power means interconnecting on said front and rear frame structures, respectively, with the linkage means for the rear wheel assemblies and the front transport wheel assemblies, respectively, and being operable to shift the frame and implements mounted thereon between transport and field positions.

4,821,812
DOWN HOLE DRILL IMPROVEMENT
Joseph R. Ditzig, Portland, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Continuation of Ser. No. 75,185, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 811,778, Dec. 20, 1985, abandoned. This application Sep. 8, 1988, Ser. No. 243,167
Int. Cl.[4] E21B *1/06*
U.S. Cl. 173—17 **7 Claims**



1. An improved percussive drill apparatus of the valveless type adapted for downhole drilling comprising:
a casing;
a backhead disposed at the back end of said casing adapted to connect the drill apparatus to a drill string and a source of pressure fluid;
a distributor disposed within said casing towards said back end of said casing;
a percussive member disposed at the front end of said casing to form a chamber having a back end disposed towards said distributor and a front end disposed towards said percussive member between said distributor and said percussive member within said casing;
a cylinder sleeve disposed in said chamber toward said back end of said chamber;
a first pressure fluid passage formed between said casing and said cylinder sleeve to connect the pressure fluid source to said chamber;
a piston disposed in said chamber to reciprocate axially therein and impart a blow on said percussive member; said piston being in sliding contact with said cylinder sleeve adjacent said back end of said chamber and in sliding contact with said casing adjacent said front end of said chamber;
a means for continuously applying pressure fluid to a selected portion of said back end of said piston to thereby provide a continued driving force on said piston towards said front end of the chamber;
a means for alternately supplying and exhausting pressure fluid to a selected portion of one side of said piston disposed towards said back end of said chamber and to a selected portion of the other side of said piston disposed towards said front end of said chamber to thereby reciprocate said piston;
said means for alternately supplying and exhausting pressure fluid to said back side of said piston includes a second pressure fluid passage extending from said first pressure fluid passage along the interior of said sleeve and the exterior of said piston.
the improvement comprising:
a nonporting means on the piston in constant communication with said front end of said piston during operation for accumulating additional pressure fluid; and
a means for selectively communicating said means for accumulating additional pressure fluid with said first pressure fluid passage.

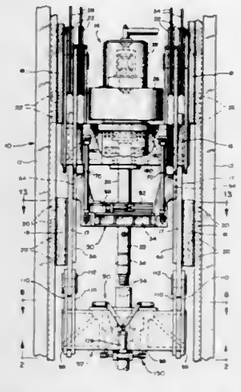
4,821,813
PERCUSSION DRILLING APPARATUS
Gustav Jenne, Essen-Kettwig, Fed. Rep. of Germany, and Dietmar Jenne, Strengelbach, Switzerland, assignors to Terre AG fur Tiefbautechnik, Strengelbach, Switzerland
Filed Mar. 24, 1987, Ser. No. 36,410
Claims priority, application Switzerland, May 7, 1986, 1863/86
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—135 **12 Claims**



1. A percussion drilling apparatus comprising:
a housing and a piston axially movable within said housing by a medium flowing under pressure;
a displacement reversing unit for controlling reversal by said flowing medium between advance and return displacement of the drilling apparatus, said unit being of a rotary slide type with control slide elements rotatably arranged one inside another,
said piston and said displacement reversing unit including interacting lateral control ports therein for passage therethrough of said flowing medium,
a piston controlling unit, coaxially connected with said displacement reversing unit and axially displaced therefrom, said piston controlling unit including two control sleeves each of said sleeves having a front controlling edge, each of said sleeves controlling one of the two directions of displacement of said apparatus, said sleeves being connected coaxially in succession in the axial direction and separately from each other, such that said controlling edges of one sleeve are positioned at a distance from said controlling edges of said other sleeve.

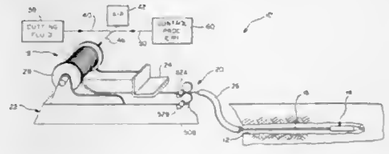
4,821,814
TOP HEAD DRIVE ASSEMBLY FOR EARTH DRILLING MACHINE AND COMPONENTS THEREOF
Clyde A. Willis, and Keith M. Haney, both of Wichita Falls, Tex., assignors to 501 W-N Apache Corporation, Wichita Falls, Tex.
Filed Apr. 2, 1987, Ser. No. 35,021
Int. Cl.[4] E21B *19/16*
U.S. Cl. 173—164 **27 Claims**

1. An apparatus for supporting a down hole tubular beneath a top head drive assembly of an earth drilling machine, said apparatus comprising:
a support beam having first and second ends and an opening passing through the beam intermediate the ends;
an insert retainer positioned in the opening and secured to the support beam, said insert retainer defining an inner surface which forms a larger diameter in an upper region and a smaller diameter in a lower region;
at least a pair of inserts shaped to fit within the retainer and to engage an upper shoulder on a down hole tubular and thereby support the down hole tubular;
remotely actuated means for moving the inserts between an upper position, in which the inserts are positioned to allow



the down hole tubular to be inserted in and removed from the retainer opening, and a lower position, in which the inserts are positioned in the retainer opening to support the down hole tubular; and
means for rigidly supporting the ends of the support beam on the top head drive assembly such that the opening is held in alignment with a drilling axis defined by the top head drive assembly;
said supporting means comprising means for pivotably supporting the support beam from the top head drive assembly, means for pivoting the support beam between an upper, storage position offset to one side from the drilling axis and a lower, operative position in alignment with the drilling axis.

4,821,815
TECHNIQUE FOR PROVIDING AN UNDERGROUND TUNNEL UTILIZING A POWERED BORING DEVICE
Glen Baker, Kent; Albert W. Chau, Redmond; James A. Fikse, Kirkland, and John E. Mercer, Kent, all of Wash., assignors to FlowMole Corporation, Kent, Wash.
Filed May 22, 1986, Ser. No. 866,240
Int. Cl.[4] E21B *7/18, 7/26, 44/00*
U.S. Cl. 175—26 **12 Claims**



1. An apparatus for providing a continuous underground tunnel between first and second spaced-apart points, comprising:

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(a) a boring device including means for boring through soil; and

(b) means for driving said boring device through the soil from said first point to said second point as said device bores through the soil whereby to form a tunnel between said points, said driving means including

(i) a thrust conduit which extends in a continuous, uninterrupted manner from one end thereof to an opposite end and which is connected at said one end with said boring device, and means acting directly on the conduit behind said boring device at said first point for thrusting the conduit forward along its axis in the direction of said boring device as the latter bores through the soil whereby to push the boring device therethrough, said conduit being sufficiently rigid to push said boring device forward through the soil and yet sufficiently flexible to allow the device to move from said first point to said second point in a non-linear manner if necessary or desired, said thrusting means including rotatable means engaging said conduit, motor means for rotating said rotatable means, and means for maintaining the torque on said motor means constant regardless of the degree of compactness of the soil through which the boring device is being pushed.

4,821,816

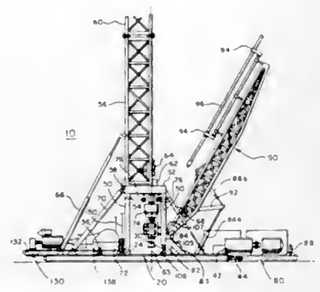
METHOD OF ASSEMBLING A MODULAR DRILLING MACHINE

Clyde A. Willis, Wichita Falls, Tex., assignor to W-N Apache Corporation, Wichita Falls, Tex.

Division of Ser. No. 31,982, Mar. 27, 1987, Pat. No. 4,759,414, which is a continuation-in-part of Ser. No. 856,293, Apr. 25, 1986, abandoned. This application May 10, 1988, Ser. No. 191,584

Int. Cl.[4] E21B *7/02*

U.S. Cl. 175—57 **2 Claims**



1. A method for assembling an earth drilling machine comprising the following steps:

(a) providing a modular earth drilling machine comprising a drilling substructure skid, a draw works skid, and a pipe boom skid, said drilling structure skid comprising a collapsible drilling substructure platform and means for receiving the draw works skid and the pipe boom skid, said draw works skid comprising a draw works winch, and said pipe boom skid comprising:

a pipe boom pivotably mounted to the pipe boom skid for rotation about a pivot axis;

at least one hydraulic cylinder coupled between the pipe boom and the pipe boom skid to rotate the pipe boom about the pivot axis;

a hydraulic pump mounted to the pipe boom skid and coupled to the hydraulic cylinder by a closed hydraulic fluid circuit; and

a pipe boom skid winch;

said pipe boom skid, pipe boom, hydraulic cylinder and hydraulic pump forming a modular unit which is transportable as a single unit without any disconnection of the closed hydraulic fluid circuit;

(b) positioning the substructure skid at a desired drilling position;

(c) utilizing the pipe boom skid winch to pull the pipe boom skid into position with respect to the substructure skid;

(d) utilizing the pipe boom skid winch to pull the draw works skid into position with respect to the substructure skid

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4,821,817

ACTUATOR FOR AN APPLIANCE ASSOCIATED WITH A DUCTED BODY, ESPECIALLY A DRILL ROD

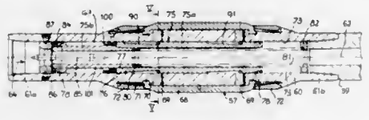
André Cendre, Cosne-sur-Loire, and Jean Boulet, Paris, both of France, assignors to SMF International, Cosne-sur-Loire, France

Filed Jan. 3, 1986, Ser. No. 816,042

Claims priority, application France, Jan. 7, 1985, 85 00142; Apr. 2, 1985, 85 04996

Int. Cl.[4] E21B *17/10, 21/10*

U.S. Cl. 175—269 **8 Claims**



8. A drill rod stabilizer comprising:

a tubular body having a first end and a second end and having a bore extending longitudinally therethrough from said first end to said second end;

at least one bearing blade so mounted on an outer periphery of said body as to be radially movable in relation thereto;

a piston movably mounted in said bore of said body and actuated by a flow of working fluid through said body bore, said piston being tubular in shape and having a bore extending longitudinally therethrough which piston bore is coaxial with said body bore, said piston bore including an orifice portion said piston also having on its outer surface a plurality of longitudinal grooves whose bottom surfaces are inclined in a radial direction relative to a longitudinal axis of said body and are connected to one another so as to form a continuous actuating surface for a step by step rotary movement of said piston;

a flow restrictor element secured in said body bore and disposed coaxially with said piston, said element having a tapered external surface which has a maximum outer diameter and a minimum outer diameter, said tapered external surface being adapted to cooperate with said piston bore to limit a flow of fluid therethrough, wherein the maximum outer diameter of said flow restrictor element is sufficiently smaller than a minimum internal diameter of said piston bore so as to leave an annular space through which working fluid continues to flow at all positions of said piston;

a biasing means for biasing said piston in one direction; and,

at least one actuating finger slidably mounted in lateral holes in said tubular body so as to be radially movable in said body as said at least one finger interacts with said bearing blade and said piston, said holes in said body being located radially inwardly of said at least one bearing blade and radially outwardly of said piston.

4,821,818

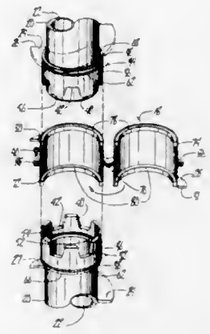
TUBE AUGER SECTIONS

Roy J. Mefferd, Laurens, Iowa, assignor to Micro Specialties Co., Inc., Laurens, Iowa

Filed Feb. 1, 1988, Ser. No. 151,025

Int. Cl.[4] E21B *17/22*

U.S. Cl. 175—323 **13 Claims**



1. In combination:

a first auger section having an upper end and a lower end, said lower end of said first auger section having a first collar means thereon including an annular upwardly facing shoulder and an annular end edge facing axially downward, said end edge of said first collar means having at least one indentation and at least on projection therein;

a second auger section having an upper end adjacent said lower end of said first auger section, said upper end of said second auger section having a second collar means with an annular downwardly facing shoulder and an annular end edge facing axially upwardly, said end edge of said second collar means having at least one indentation and at least one projection matingly interlocked with said indentation and projection of said lower end of said first auger section so as to hold said first and second auger sections against rotation about a vertical axis with respect to one another;

said lower end of said first auger section comprising a tube member having a lower end extending axially below said annular end edge of said first collar means and protruding axially within said second collar means;

said upper end of said second auger section comprising a tube member having an upper end which is recessed axially below said annular end edge of said second collar means and which abuts said lower end of said tube member of said first auger section so as to form a continuous tube from said tube members of said first and second auger sections, said continuous tube having a longitudinal bore extending therethrough;

a detachable coupling member surrounding said interlocked first and second collar means and holding said first and second collar means against axial movement away from one another;

said coupling member having a downwardly facing flange engaging said upwardly facing shoulder of said first collar means and an upwardly facing flange engaging said downwardly facing shoulder of said second collar means for limiting axial movement of said interlocked first and second collar means away from one another.

4,821,819

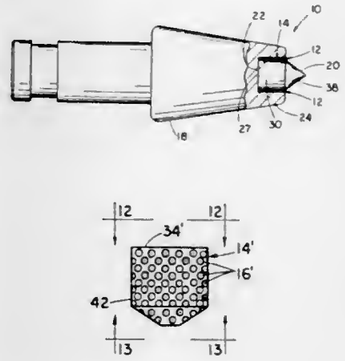
ANNULAR SHIM FOR CONSTRUCTION BIT HAVING MULTIPLE PERFORATIONS FOR STRESS RELIEF

Hubert H. Whysong, Imler, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Aug. 11, 1987, Ser. No. 84,607

Int. Cl.[4] E21B *10/52*

U.S. Cl. 175—410 **6 Claims**



1. A shim for facilitating formation of a double sandwich braze joint, said shim comprising:

(a) a cylindrical basket having an annular sidewall with opposite forward and rearward ends and a bottom wall extending across and connecting said sidewall at said rearward end thereof, said bottom wall being frusto-conical in shape and protruding away from said rearward end of said sidewall, said sidewall being open at said forward end for receiving an insert tip; and

(b) means defining a multiplicity of perforations in spaced apart relation through said sidewall and bottom wall of said basket, said perforations being distributed about said sidewall and endwall.

4,821,820

METHOD AND APPARATUS FOR LINEAR COMBINATION WEIGHING

Robert B. Edwards, Stone Mountain; Bruce H. Dalrymple, Loganville; Lawrence H. Long, Stone Mountain; Paul Meisner, Dunwoody; Forrest C. Bacon; Dale E. Pribbernow, both of Conyers, and William L. Warner, Grayson, all of Ga., assignors to Kliklok Corporation, Decatur, Ga.

Filed Nov. 30, 1987, Ser. No. 126,915

Int. Cl.[4] G01G *13/00*

U.S. Cl. 177—25.18 **29 Claims**

1. An apparatus for combination weighing to provide a target weight of product onto/into a receptacle from a selection of produce charges, comprising:

a plurality of product charge transfer conveyors providing a series of product feed lanes arranged side-by-side;

a plurality of volumetric cups on each transfer conveyor for receiving and holding similar product charges;

a plurality of weighing scales each having a weighing hopper mounted thereon, one weighing hopper aligned with a discharge end of each transfer conveyor, for receiving individual product charges from said transfer conveyors;

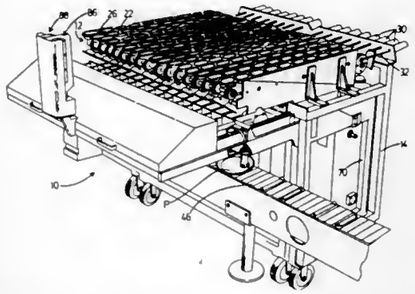
said product charges having a weight determined by the filled volume of said cups;

conveyor means for supporting a series of in-line receptacles running across said transfer conveyors;

control means for stepped operation of said transfer convey-

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ors in time with said receptacle and for selecting the combination of scales having a total weight of product within an acceptable range of target weight; and



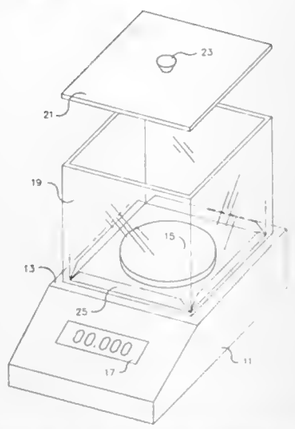
means for dumping product charges in sequence from the combination of weighing hoppers associated with the selected scales onto the selected receptacle traveling on said conveyor in response to said control means.

4,821,821

ELECTROSTATICALLY SHIELDED LABORATORY BALANCE

Louis E. Kelley, Wyncote, Pa., assignor to Instruments for Research and Industry I²R, Inc., Cheltenham, Pa.

Filed Sep. 12, 1988, Ser. No. 242,627
Int. Cl.⁴ G01G *23/18, 21/28*
U.S. Cl. 177—181 **7 Claims**



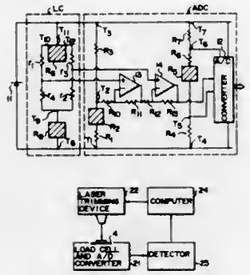
1. In combination, a top loading microbalance and an electrostatic shield therefor comprising an electronic balance having a balance pan adapted for top, side or front loading and a shield surrounding said balance pan, said shield comprised of structurally stable glass or plastic having an electrically conducting coating on the surfaces of said shield, said coating being in contact with an electrically conducting part of said balance and wherein said glass or plastic is essentially transparent or has means to visually view said balance pan and its contents.

4,821,822

METHOD AND APPARATUS FOR ADJUSTING RESISTORS IN LOAD-CELL SCALE

Tohru Kitagawa, Mishima, and Yoshihisa Nishiyama, Shizuoka, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,397
Claims priority, application Japan, Mar. 25, 1986, 61-66310
Int. Cl.⁴ G01G *3/14;* G01L *1/22*
U.S. Cl. 177—211 **10 Claims**



1. A resistor-adjusting apparatus used for a load-cell scale, comprising:

a load cell including a frame and having a resistor bridge circuit including exposed temperature characteristic adjustable thin film resistor means mounted on said frame, for generating an analog electrical signal corresponding to a load weight applied to said frame;

an A/D converting section mounted on said frame for converting the analog electrical signal supplied from said bridge circuit into a digital signal corresponding to the load weight;

resistor-trimming means for removing part of the exposed adjustable thin film resistor means of said bridge circuit of said load cell scale in response to a control signal and adjusting a resistance of said thin film resistor means; and

control means for supplying, to said resistor-trimming means, a control signal functionally related to digital signals generated by said A/D converting section in response to a predetermined load at selected ones of different temperatures, and for causing said resistor-trimming means to remove said part of said exposed thin film resistor means to thereby adjust the resistance of said thin film resistor means according to said control signal.

4,821,823

TORQUE SUSPENSION WEIGHING SCALE

Robert E. Skibinski, Tompkinsville, Ky., assignor to Mid-America Scale, Inc., Tompkinsville, Ky.

Filed May 23, 1988, Ser. No. 200,523
Int. Cl.⁴ G01G *21/08*
U.S. Cl. 177—256 **7 Claims**

1. A torque suspension weighing scale comprising:

a subframe;

C-shaped uprights positioned on said subframe;

a weighing platform;

inverted C-shaped legs depending from said platform;

torque suspension members supporting said weighing platform in a spaced-apart relation from said subframe;

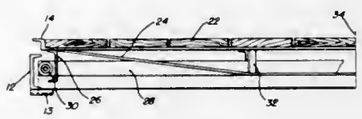
means for connecting said torque suspension members to both said subframe and said weighing platform;

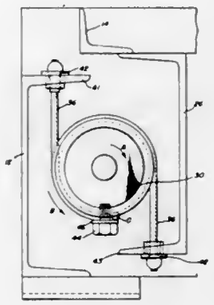
a positive displacement scale;

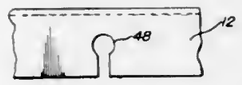
means for connecting said torque suspension members to said positive displacement scale, said means for connecting including lever arms fixed to first opposing ends of parallel torque suspension members, a keyhole slot formed

in the free ends of adjacent lever arms, a cable aligning said lever arms, a cable aligning said lever arms in an upper and lower relationship, and a ball and seat retention assembly surrounding said cable at a lower side of each said upper and lower lever arms, said ball and seat retention assembly being fitted into respective ones of said keyhole slots to provide positive lateral positioning of said retention assemblies with respect to said lever arms; and

means for transmitting torque applied to said torque suspension members to said positive displacement scale.







4,821,824

AUXILIARY TRACTION SYSTEM

Lloyd Gilbert, 4865 S. Ravenna Rd., Ravenna, Mich. 49451

Filed Feb. 4, 1988, Ser. No. 152,334
Int. Cl.⁴ B62D *55/02*
U.S. Cl. 180—9.28 **4 Claims**

1. In combination with a vehicle having a chassis and one drive wheel mounted each side of said chassis on a transverse axis, an endless track unit comprising:

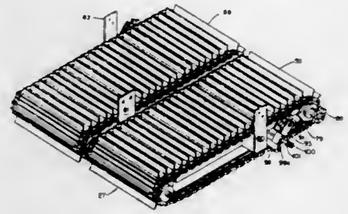
a frame formed by substantially continuous upper and lower plates interconnected by web plates, and having telescoping sections biased to increased overall length of said frame to maintain tension on said tracks, and means normally securing said frame to said chassis;

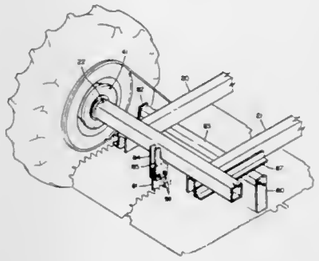
a pair of laterally spaced endless tracks each forming a loop surrounding said frame;

track-locating means establishing turns in each said loop on horizontally spaced axes parallel to said drive wheel axis, said track-locating means including a pair of rollers rotatably mounted on said frame;

a pair of first sprocket, said first sprockets being each normally secured to said drive wheel;

a second sprocket, said second sprocket being secured to a respective roller, each of said first and second sprockets having pitch diameters proportioned to induce a track





velocity corresponding to the peripheral velocity of said drive wheel; and

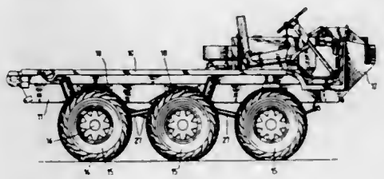
drive chain means engaging said first and second sprockets.

4,821,825

ALL-TERRAIN VEHICLE

Michael Somerton-Rayner, Ladgershall, Nr. Andover, Great Britain, assignor to Escaro Limited, Great Britain

Filed May 4, 1987, Ser. No. 45,566
Claims priority, application United Kingdom, Feb. 11, 1987, 8703167
Int. Cl.⁴ B60K *17/36*
U.S. Cl. 180—22 **8 Claims**



1. An all terrain vehicle, comprising:

a chassis,

an engine,

a gearbox for controlling the actuating output of the engine,

first and second transfer boxes mechanically connected to said gearbox to be capable of providing common actuating outputs therefrom,

first and second axles floating mounted to said chassis and being spaced apart at a first selected distance and a third axle being spaced apart from said second axle by a second selected distance,

first, second and third inclined propeller shafts having a length less than the selected distances including universal joints at both ends of each shaft where said shafts are connected through the universal joints respectively to said

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first, second and third axles and said first and third shafts are connected to said first transfer box and said second shaft is connected to said second transfer box, and

swing axle radius rods, each connected to one of said axles and to said chassis to provide independent vertical movement of each of said axles relative to said chassis.

4,821,826

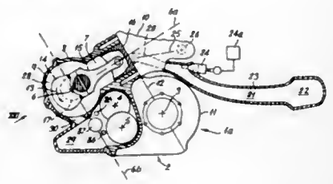
COMPONENTS IN OR FOR SELF-POWERED VEHICLES

Geoffrey P. Lings, Bourne, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 24,080, Mar. 10, 1987. This application Mar. 23, 1988, Ser. No. 172,330

Int. Cl.[4] B60K *5/04*

U.S. Cl. 180—58 **15 Claims**



1. A power unit for a self-powered vehicle, comprising:

a casing structure for said power unit;

a reciprocating piston internal combustion engine comprising a plurality of pistons working in a plurality of cylinders disposed in line, whereby the axes of said cylinders are parallel and lie in a common first plane, cylinder head structures for and adjacent to said cylinders, a crankcase, and a crankshaft rotatable within said crankcase about an axis and driven by said pistons;

a multi-ratio transmission system comprising a plurality of gear-carrying shafts including an input shaft, and two coaxial output shafts adapted respectively to drive two wheels located on opposite sides of said power unit, said axes of said output shafts being substantially parallel to said crankshaft axis, and said input shaft being in driving communication with said crankshaft;

a second plane lying at right angles to said common first plane and including said crankshaft axis and a third plane parallel to said second plane and passing through a boundary between said cylinders and their said adjacent cylinder head structures;

said transmission system being arranged alongside side cylinders and so that said axes of said output shafts substantially coincide with said third plane and the remainder of said plurality of the said gear-carrying shafts of said multi-ratio ratio transmission system all lie between said parallel second and third planes.

4,821,827

ENGINE MOUNT FOR GOLF CART

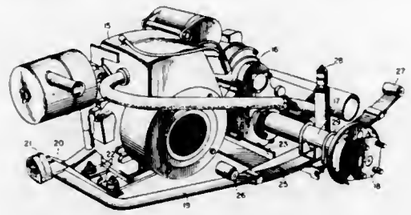
Terry L. Reese, Appling, Ga., assignor to Club Car, Inc., Augusta, Ga.

Continuation of Ser. No. 609,013, May 10, 1984, abandoned. This application Apr. 22, 1988, Ser. No. 186,768

Int. Cl.[4] B60K *9/00*

U.S. Cl. 180—61 **8 Claims**

1. An internal combustion engine powered golf cart, or the like, comprising in combination, a main frame for the cart having a transverse member laterally across the middle of the cart for providing a front engine mount position, the main frame defining a rear end frame portion for suspending engine and wheels therebeneath, an engine assembly attached to an axle-wheel assembly and cantilevered therefrom forwardly of the axle, and frame connecting means extending from the engine assembly for permitting freedom of movement of the engine assembly and rear wheels attached thereto relative to said frame comprising, a single front engine mount substantially centered in said transverse member by means of a finger-like projection from the engine assembly friction fit into a surrounding flexible yielding member fit into a frame retainer cage located midway in said transverse member to permit yielding lateral and vertical movement of the projection within



a limited zone by deflection of the yielding member and rotation of the axle wheel assembly relative to the main frame, and a pair of spring members coupled between each end of the axle to the main frame, thereby providing a flexible rear suspension for permitting pivoting of the axle wheel assembly about said front engine mount thereby delivering a smooth ride with minimal wheel impact transmitted to the frame.

4,821,828

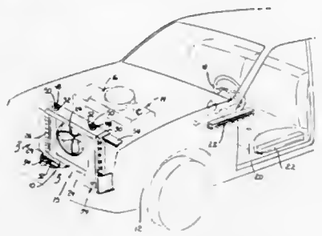
DYNAMIC ABSORBER FOR MOTOR VEHICLE

Dennis D. Schwerzler, Troy, and George C. Foltz, East Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1987, Ser. No. 59,015

Int. Cl.[4] B60K *11/04*

U.S. Cl. 180—68.4 **3 Claims**



1. A dynamic absorber for a motor vehicle having a vehicle body with an inherent first beaming mode and an accompanying anti-node location, an engine cooled with a radiator over which air is circulated by a fan and an air conditioning system including a condenser characterized by module means comprising at least the radiator and condenser, elastomeric mount means firmly supportively mounting said module means on the vehicle body with the center of gravity of said module means located approximately at said anti-node location, said module means having a natural frequency made substantially equal to said first beaming mode, and said engine having an idle speed set substantially equal in a frequency sense to said first beaming mode.

4,821,829

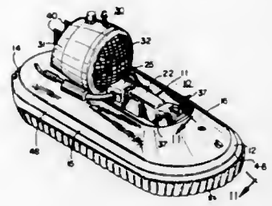
AIR CUSHION VEHICLE

Ronald C. Gilbert, and Robert R. Henvest, both of Southampton, England, assignors to H. S. I. Products, Inc., Eddystone, Pa.

Filed Jul. 31, 1987, Ser. No. 80,744

Int. Cl.[4] B60V *1/16*

U.S. Cl. 180—127 **8 Claims**



1. In an air cushion vehicle having a composite hull including an inflatable for buoyancy and a hard structure for containing the occupants, at least one ducted fan unit to provide air for vehicle movement and for a supporting air cushion, the improvement which comprises

a self contained inflated tubular member attached to and extending around the perimeter of said hull;

said hull having openings therethrough in communication with said air from said ducted fan unit;

a plurality of skirt segment means attached to said perimeter of said hull above said tubular member supported by, and in contact with said tubular member;

said tubular member continuously urging said skirt segment means outwardly and upwardly;

said skirt segment means each including at least one outer wall extending around and under said tubular member towards the center of said hull; and

at least one opening in said hull adjacent each of said skirt segment means whereby air under pressure is expelled downwardly to engage said outer wall and to form an air cushion for vehicle support.

4,821,830

AUTOMOTIVE FOUR WHEEL STEERING SYSTEM

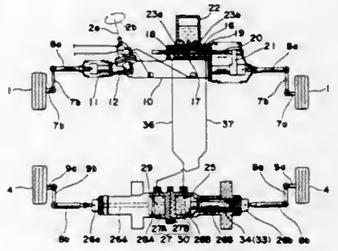
Atsuo Tomoda; Takao Kijima; Muneharu Yamada, and Takaaki Itoh, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 30, 1987, Ser. No. 103,070

Claims priority, application Japan, Oct. 1, 1986, 61-235038; Oct. 3, 1986, 61-236612

Int. Cl.[4] B62D *6/02*

U.S. Cl. 180—140 **16 Claims**



1. In an automotive vehicle having front and rear wheel pairs and a steering wheel drivingly coupled with the front wheel pair for steering the vehicle with respect to the direction of run of the vehicle, said steering wheel being rotatable in any one of the opposite directions from a neutral position at which the vehicle can run straightforward, an automotive four wheel steering system which comprises:

a right-hand wheel turning means for turning the right-hand rear wheel in a direction in which toe-in takes place;

a left-hand rear wheel turning means for turning the left-hand rear wheel in a direction in which toe-in takes place;

a right-hand rear wheel toe-out stopper means for mechanically preventing the right-hand rear wheel from turning in a direction in which toe-out takes place;

a left-hand rear wheel toe-out stopper means for mechanically preventing the left-hand rear wheel from turning in a direction in which toe-out takes place, said right-hand rear wheel toe-out stopper means and said left-hand rear wheel toe-out stopper means being spaced from each other in a direction perpendicular to the direction of run of the automotive vehicle so as to act independently of each other; and a rear wheel operating means for operating either one of the right-hand and left-hand rear wheel turning means in response to running conditions of the vehicle.

4,821,831

THROTTLE CONTROL DEVICE

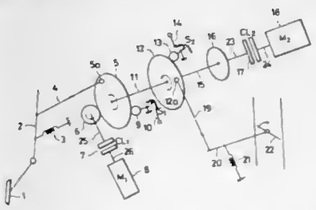
Masayoshi Onishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 164,748

Claims priority, application Japan, Mar. 12, 1987, 62-59147

Int. Cl.[4] B60K *31/02*

U.S. Cl. 180—178 **1 Claim**



1. A throttle control device, comprising: a first gear (**5**) operably coupled to an accelerator pedal (**1**) of a vehicle engine for rotation corresponding to the amount of depression of said pedal, a first motor (**8**) engageable through a first clutch (**7**) with a second gear (**6**) meshed with said first gear, said first motor being actuated upon a traction slip detection to rotate said first gear through said second gear to correct a rotation angle of said first gear, a third gear (**12**) ganged with said first gear to rotate therewith, a throttle link (**20**) coupled to said third gear by a throttle wire (**19**) for controlling an opening angle of a throttle valve (**22**) of said engine corresponding to a rotation angle of said third gear, and a second motor (**18**) for driving said third gear through a second clutch (**17**) to control the rotation angle of the third gear and attendantly the opening angle of said throttle valve during a constant speed running mode of the vehicle.

4,821,832

MOTOR SCOOTER HAVING A FOLDABLE HANDLE AND FRICTION DRIVE

Steven J. Patmont, P.O. Box 0097, Pleasanton, Calif. 94566

Filed Jul. 9, 1987, Ser. No. 71,364

Int. Cl.[4] B62K *11/10, 15/00;* **B62M** *13/00*

U.S. Cl. 180—208 **4 Claims**

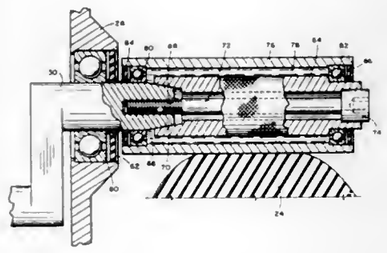
4. An improved light weight motor scooter comprising:

an elongated, generally horizontal, frame member having a forward end and a rearward end and having a plane extending longitudinal of the frame member;

a rear drive wheel secured to said frame member rearward

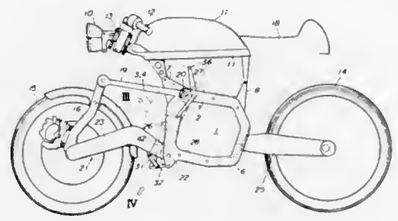
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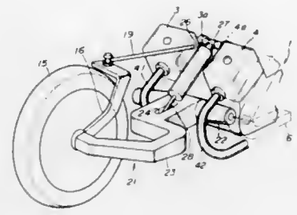
end and mounted for rotation about an axis normal to the vertical plane of said frame member;
a general vertical tubular support member secured to said frame member forward end and in the longitudinal plane of said frame member;
a general vertical relatively short strut member rotatably received in said tubular support member and having an upper end and a lower end and having a yoke member on the lower end thereof below said tubular support member, the upper end thereof being above said tubular support member;
a front wheel rotatably affixed to said yoke member;
a generally horizontal platform means received on said frame member between said front and rear wheels;
an engine secured to said frame member adjacent said rearward end thereof, the engine having a drive shaft extending therefrom;
a three position elongated handle member having a lower end and an upper end, the lower end being pivotally affixed to the upper end of said strut member for pivotation in a vertical plane relative to said strut member, the handle member having a horizontal handle bar affixed to the upper end thereof;



means to releaseably lock said handle member to said strut member whereby in the first locked position the handle member is axially aligned with said strut member and in an unlocked position said handle member may be pivoted to a second forward position to permit said motor scooter to be pulled by a user or pivoted rearwardly to a third position overlying said frame member;
means to releaseably retain said handle member in a rearward position overlying said frame member to permit said motor scooter to be carried by said handle member;
an elongated cylindrical drive spindle affixed concentrically to and extending from said engine drive shaft;
a tubular driven spindle having an internal diameter greater than the external diameter of said drive spindle, the drive spindle being concentrically received within said driven spindle;
bearings within each end of said driven spindle rotatably supporting said driven spindle to said drive spindle;
seal means at the inner ends of said driven spindle closing the ends thereof and forming a closed annular area between the exterior of the drive spindle and the interior of the driven spindle; and
hydraulic fluid filling said closed area between said drive spindle and said driven spindle.

4,821,833
MOTORCYCLE WITH SWING-ARM FRONT SUSPENSION
Ken Yamaguchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 3, 1987, Ser. No. 57,503
Claims priority, application Japan, Jun. 4, 1986, 61-129846
Int. Cl.[4] B62K *25/04, 25/16*
U.S. Cl. 180—219 **6 Claims**



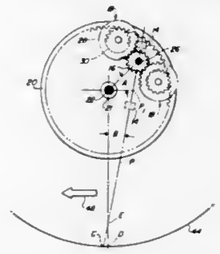


1. A motorcycle comprising:
a frame assembly;
a front wheel;
an engine supported on said frame assembly and having at least two cylinders transversely juxtaposed to one another with a space therebetween; and
a front suspension system including an upper swing arm having one end connected for swinging motion to said frame assembly, a lower swing arm having one end connected for swinging motion to said frame assembly, and a knuckle having an upper end connected for steering motion to an opposite end of said upper swing arm and a lower end connected for steering motion to an opposite end of said lower swing arm, said front wheel being journalled in said lower end of the knuckle;
said front suspension system further including a damper, said damper extending through said space between the cylinders and having an upper end pivotally connected to a shaft supported between said cylinders and a lower end pivotally connected through a link mechanism to said frame assembly.

4,821,834
MOUNTING OF A STEERABLE WHEEL
Volker Hueckler, Radolfzell, and Ulrich Eckhardt, Altrip, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.
Filed Nov. 25, 1987, Ser. No. 125,311
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640931
Int. Cl.[4] B60K *17/30*
U.S. Cl. 180—255 **2 Claims**

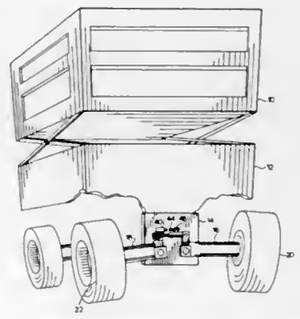
1. A mounting for a steerable wheel of an agricultural tractor, the mounting comprising:
a housing rotatably supporting the wheel;

lug means for pivotally connecting the housing to an axle body, the mounting lugs forming a pivot axis which intersects a horizontal plane containing an axis of wheel rotation at a point which is displaced horizontally rearwardly from the wheel rotation axis, the pivot axis being inclined with respect to a vertical axis and the pivot axis intersecting a plane upon which the wheel rests at a point which is spaced forwardly of the lowermost point of the wheel by



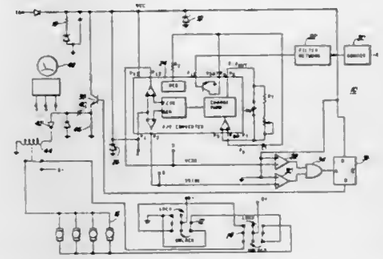
a distance which remains constant despite changes in tractor weight or loading due to braking;
a differential;
an input wheel drivingly coupled to the wheel; and
a drive shaft connecting the differential to the input wheel, the input wheel being non-rotatably fixed concentrically on an end of the drive shaft, and the drive shaft having an axis which is offset from the axis of the wheel.

4,821,835
WHEEL SUSPENSION SENSING SYSTEM
Evaldas J. Latvys, Itasca, and Ronald W. Barnhart, Elmhurst, both of Ill., assignors to Economy Engineering Company, Bensenville, Ill.
Continuation of Ser. No. 915,996, Oct. 6, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 221,262
Int. Cl.[4] B60R *21/02*
U.S. Cl. 180—282 **11 Claims**



1. A wheel suspension sensing system for a vehicle having a chassis, a first axle assembly including first and second wheel support members pivotally mounted to said chassis for mounting a first pair of wheels on said chassis and a second axle assembly mounted to said chassis for mounting a second pair of wheels on said chassis, at least one pair of said wheels constituting drive wheels for driving said vehicle, said sensing system comprising:
an electrical limit switch affixed to said first wheel support member and arranged to move therewith, said limit switch having a trip button arranged to extend toward said second wheel support member; and
a position sensing arm mounted to said second wheel support member for reciprocal motion and arranged to protrude toward said limit switch, and further comprising means urging said position sensing arm toward its full extension, whereby said position sensing arm maintains contact with said limit switch trip button during a first range of angular difference between said wheel support members but loses contact during a second range of angular difference so that a first electrical signal is caused during said first range of angular separation permitting said vehicle to be moved by said drive wheels and a second electrical signal is caused during said second range of angular separation, said second signal preventing said drive wheels from driving said vehicle.

4,821,836
VEHICLE INTEGRAL SPEEDOMETER AND AUTOMATIC DOOR LOCK SYSTEM
John L. Evans, Huntsville, Ala., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Continuation-in-part of Ser. No. 47,090, May 8, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 222,395
Int. Cl.[4] B60R *21/00;* **B60K** *28/12*
U.S. Cl. 180—289 **4 Claims**

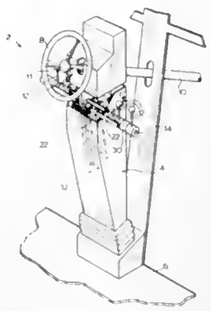


1. A method of automatically activating a door lock motor in a vehicle integral speedometer and monitoring vehicle speed and power door lock system of the type wherein a distance sensor transducer provides a pulse-train signal of a frequency proportional to the speed of a vehicle, wherein the speed of the vehicle is monitored by a conventional speedometer, wherein an activating logic voltage is applied t a relay energizing transistor when the vehicle reaches a predetermined speed, and wherein the relay energizing transistor activates a relay which provides power to the door lock motor, which method comprises:
(a) converting the pulse-train signal into a linear voltage ranging from a minimum voltage when no pulses are provided to a maximum voltage when the pulse-repetition rate of the pulse train is maximum;
(b) generating complementary sine and cosine output voltage waveform signals about a chosen reference voltage from the linear voltages derived from the pulse train;
(c) providing the complementary sine and cosine voltage signals and the reference voltage to the speedometer;
(d) establishing a plurality of trip points for the complementary sine and cosine voltage waveform signals in order to establish magnitudes and directions of the waveform signals with respect to the linear voltages derived from the pulse train when the pulse train signal varies from the minimum to the maximum pulse repetition rate;
(e) translating one of said plurality of trip points into a reference point from which, when exceeded, a chosen magnitude and direction of both the sine and cosine waveform signals are indicative of the vehicle traveling at a predetermined speed;
(f) applying the activating logic voltage to the relay energizing transistor to activate the relay which applies power to the door lock motor when the vehicle travels at the prede-

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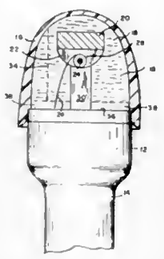
termined speed that causes the magnitude and direction of the sine and cosine waveform signals to cross over said selected one of said plurality of trip points, said selected trip point being used as the reference point which is indicative of the vehicle traveling at a predetermined speed said door lock motors locking the doors even when one or more doors are open.

4,821,837
PEDESTAL CONTROL CONSOLE FOR VEHICLES
Jerry R. Fifer, Chapin, S.C., assignor to Champion Road Machinery Limited, Goderich, Canada
Filed Nov. 16, 1987, Ser. No. 120,929
Int. Cl.[4] B62D *1/18*
U.S. Cl. 180—334 **30 Claims**



1. In a vehicle control having at least four control levers each connected to separate bearings journalled on a common shaft and independently movable through a limited angle of rotation about said shaft, each bearing being divided into a first bearing portion having a control lever connected thereto and which cooperates with and is connected by a rigid bridge member to a spaced slave bearing portion carried by said common shaft, the space intermediate said slave bearing portion and said first bearing portion of each bearing accommodating at least one bearing portion of a separate bearing.

4,821,836
ACOUSTIC DAMPER
James N. C. Chen, Chelmsford, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 30, 1987, Ser. No. 115,216
Int. Cl.[4] H04R *7/00*
U.S. Cl. 181—175 **22 Claims**

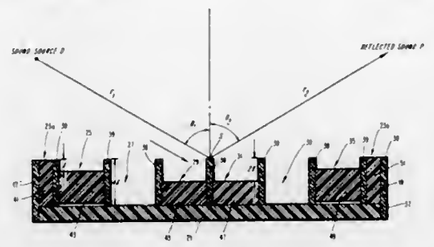


1. An acoustic damper for substantially reducing reverberation echoes at a junction between an acoustic signal propagating fluid and a mismatched material having an acoustic impedance substantially different from that of the fluid, said damper comprising:

at least one piece of foam plastic material of predetermined thickness, said foam plastic material having a sufficiently high firmness to be acoustically stable; and

means for securing said foam plastic material to at least selected portions of the mismatched material such that the foam material is positioned between the fluid and such selected portions of the mismatched material.

4,821,839
SOUND ABSORBING DIFFUSOR
Peter D'Antonio, Largo, Md., and John H. Konnert, Reston, Va., assignors to RPG Diffusor Systems, Inc., Largo, Md.
Filed Apr. 10, 1987, Ser. No. 37,244
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—198 **7 Claims**



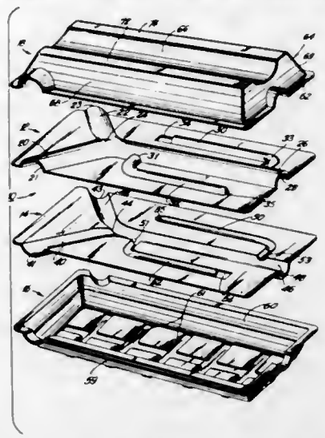
1. An improved sound absorbing diffusor comprising:
(a) a housing; and
(b) an irregular sound absorbing surface on said housing;
(c) said surface comprising a plurality of wells of differing depths;
(d) said wells being of particular depths with respect to one another as determined by use of a quadratic residue number theory sequence wherein each consecutive well is given a number from 0 to n where n equals one less than a total number of wells, and wherein a depth of any particular well is determined by squaring said number for said particular well and dividing said squared number by a chosen modulus number resulting in a remainder, the remainder after said dividing being multiplied by a chosen constant to arrive at said depth of said particular well.

4,821,840
STAMP FORMED EXHAUST MUFFLER WITH CONFORMAL OUTER SHELL
Jon W. Harwood, and Walter G. Moring, III, both of Toledo, Ohio, assignors to AP Parts Manufacturing Company, Toledo, Ohio
Filed Jan. 20, 1988, Ser. No. 146,832
Int. Cl.[4] F01N *1/02, 7/18*
U.S. Cl. 181—282 **7 Claims**

1. An exhaust muffler for mounting on an underside of a vehicle, said underside of said vehicle comprising at least one area of convex shape and a plurality of areas of concave shape, said convex and concave areas of said underside of said vehicle being in proximity to one another to define an area for receiving the muffler, said muffler comprising:

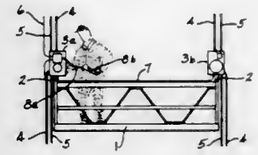
first and second plates secured in face-to-face relationship and formed to define at least one inlet and at least one outlet and at least one tube extending therebetween, said first plate having aperture means extending therethrough for permitting communication of exhaust gas with locations external of said tube; and

an external shell secured to at least said first plate and defining at least one chamber in communication with said tube through the aperture means in said first plate, said external shell comprising a plurality of convex portions generally conforming to the shape of the concave areas on the underside of the vehicle, said external shell further comprising at least one concave portion generally conforming to the shape of the convex area on the underside of the



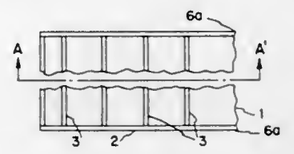
vehicle, the convex and concave portions of said external shell being disposed in selected proximity to one another such that said muffler can be mounted in nested relationship to said convex and concave areas defining the area for receiving the muffler on the underside of said vehicle.

4,821,842
SECURITY UNIT FOR A HANGING STAGE SCAFFOLDING
Michel Cavalieri, 64 rue Massue, Vincennes, France
Filed Jul. 14, 1988, Ser. No. 219,023
Claims priority, application France, Jul. 21, 1987, 87 10276
Int. Cl.[4] E04G *3/10*; B66D *1/58*
U.S. Cl. 182—19 **8 Claims**



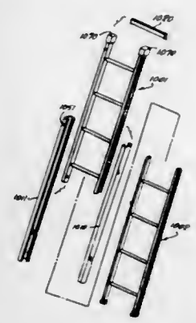
1. A security unit for a hanging stage scaffolding motorized by two electric winches of which each is supplied through a control circuit, said stage having a platform or gondola directly or indirectly suspended by two lugs pivotally mounted of each of said winches, respectively, characterized in that each lug carries a pin adapted to penetrate a slit in a slide to move towards the left or right said slide according to the default of the gondola to the horizontal, the displacement of said slide being adapted to bring it in contact with a switch included in said control circuit and to cause the opening thereof.

4,821,841
SOUND ABSORBING STRUCTURES
Bruce Woodward; Daniel W. Martin, and William Miller, all of 912 Baxter Ave., Louisville, Ky. 40204
Filed Jun. 16, 1987, Ser. No. 62,846
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—286 **18 Claims**



1. A sound absorbing structure comprising a plurality of adjacent, elongated, substantially solid panels each attached to a support strip for supporting the panels in lengthwise and parallel but separate relationship wherein the distance between adjacent panel edges of adjacent panels defines a slot which is between about 1/16 and about ¼ inch and wherein said support strips are attached to a substantially solid bottom member such that the adjacent panels together with the support strips and the bottom member form first acoustical resonator cavities in communication with the slots which provide substantial sound absorption at a frequency of less than about 1000 Hz, and second closed cavities between adjacent first cavities for reducing acoustical coupling between adjacent first cavities.

4,821,843
FOLDING LADDER
Paul O. Planchon, 2580 Melody Lane, Reno, Nev. 89512
Filed Mar. 17, 1988, Ser. No. 169,579
Int. Cl.[4] E06C *1/10, 1/383*
U.S. Cl. 182—178 **3 Claims**



1. An extension provision for a ladder comprising in cooperative combination a first ladder segment having feet, two side rails, and a multiplicity of rungs; a second ladder section so designed as to rest upon the top of the first ladder segment on its side rails and a sliding locking device suitable to slide over the side rails of both ladder sections to hold them in position together as a unit and wherein a stop device has been provided upon the first ladder section to stop the sliding side rails when they come into contact with such stop device.

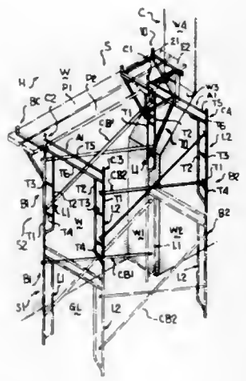
VOL 1101 ISS 3 APR 18 1989 UMI

4,821,844

OUTRIGGER FOR SCAFFOLDING

Cary A. Huffman, 5005 Montgomery St., and Emory L. Thompson, 4813 Montgomery St., both of Annandale, Va. 22003

Filed Apr. 11, 1988, Ser. No. 179,776
Int. Cl.[4] E04G *1/15*
U.S. Cl. 182—179 44 Claims



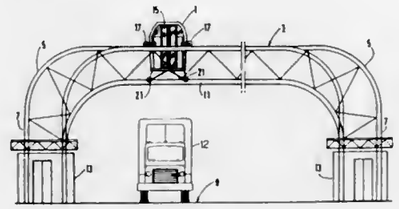
1. In combination with a scaffold which includes at least four generally vertical members each establishing a respective corner of said scaffold, first and second generally parallel horizontal members, said first generally horizontal member spanning and being connected to first and second of said generally vertical members, said second generally horizontal member spanning and being connected to third and fourth of said generally vertical members, said scaffold being of a generally polygonal configuration as viewed in plan with said polygonal configuration being defined by four vertical planes spanning said first and second corners, said second and fourth corners, said third and fourth corners and said first and third corners, and at least one generally horizontal plank spanning and supported by said generally horizontal members, the improvement comprising means for supporting a second generally horizontal plank positioned in generally side-by-side relationship to said one plank at an end portion of said second generally horizontal plank appreciably outboard of said polygonal configuration in the direction of the length of said second horizontal plank, said second plank supporting means including first and second generally parallel horizontal arms, a first of said arms having means at one end thereof for removably connecting said first arm to one of said vertical members and underlyingly supporting said second horizontal plank, said first arm lying generally parallel to the most adjacent of said four planes which is normal to the direction of the length of said second plank, said second arm being appreciably spaced from said first arm and in underlying supporting relationship to said second plank at a point most adjacent a free edge of said second plank, and cantilever arm means for cantilever-supporting said second arm from said first arm appreciably outboard of said most adjacent plane in a direction normal thereto.

4,821,845

TRAVERSING ELEVATOR

Guy DeViaris, Neuilly, France, assignor to Otis Elevator Company, Farmington, Conn.

PCT No. PCT/US86/00255, § 371 Date May 23, 1986, § 102(e) Date May 23, 1986, PCT Pub. No. WO86/04569, PCT Pub. Date Aug. 14, 1986
PCT Filed Feb. 5, 1986, Ser. No. 132,549
Claims priority, application France, Feb. 5, 1985, 85 01567
Int. Cl.[4] B66B *9/06*
U.S. Cl. 187—12 17 Claims



1. A traversing elevator for ferrying pedestrians over town streets (9), railroads, water ways, work sites, or other obstacles, of the type shuttling over an arc-shaped support structure (3) astride said obstacle (12) comprising at least one cabin (1) and two stations (13) accessible to the pedestrians, the movement of the cabin being provided by a traction cable (43) with electric motor propulsion, whereiu the cabin is vertically and horizontally supported on tracks that maintain the cabin in a fixed orientation throughout its movement across the obstacle and also guide the cabin vertically and horizontally above and over the obstacle characterized by:

four roller trolleys (17) situated substantially at the ends of the edges of the cabin (1) in a substantially median horizontal plane thereof, these trolleys (17) being pivotably mounted to the cabin with their pivoting axes (18) merged two-by-two;

two lower roller assemblies (21) situated under the cabin and disposed substantially in the two vertical planes of the pivoting axes (19) of said trolleys (17), these roller assemblies (21) being secured to the cabin by fixing triangles (23);

take-up rollers (27) fixed to the cabin,

a fixing point (45) for the traction cable (43), situated under the cabin and on its vertical axis, said cable (43) running on pulleys (41) and forming a looped circuit closed at the fixing point (45) of the cabin by two shackles (49) pivoting on the same pin;

an element for guiding the roller trolleys (17) when running fixed to the supporting structure (3) formed on one side of the structure by an outer rail (33) receiving the downstream roller trolleys and an inner rail (31) integral with a check rail (35) receiving the upstream roller trolleys, these rails comprising successively a vertical rising part extending from side station (13) and a curved transitional part, the outer rail (33) being connected by its upper end (37) to the check rail (35) and the inner rail (31) being extended as far as the second station (13);

at least one running rail (39) for said upstream lower rollers (21) of the cabin comprising a vertical rising part followed by a curved transitional part; and

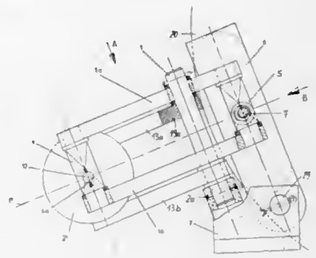
at least one take-up cam (53) disposed at the level of the bottom of the beam of the supporting structure (3) and projecting over a small length outwardly of the arc of the beam, said cam (53) being adapted for receiving said take-up rollers (27) in running relation, so as to support the cabin (1) when the downstream roller trolleys (17) leave the upper end (37) of the outer rail (33).

4,821,846

ACTUATING DEVICE FOR A DISK BRAKE

Kurt Adleff, Crailsheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed May 7, 1987, Ser. No. 47,895
Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615589
Int. Cl.[4] F16D *55/26, 55/18*
U.S. Cl. 188—72.6 13 Claims



1. An actuating device for a disk brake, wherein the brake comprises:

a brake disk and means for supporting the disk for rotation around a disk axis, the disk having opposite sides; a respective brake shoe at each opposite side of the disk, the brake shoes being supported for movement generally along the direction of the disk axis into engagement with and disengagement from the disk for braking the rotation of the disk;

an actuator for the brake shoes, spaced from the brake shoes and from the disk, and operative for moving the brake shoes to engage the disk; the actuator having an axis oriented so that the axis of the actuator and the axis of the disk are generally in and define a central plane of the brake;

the actuating device comprising;

the actuator;

two substantially identical but mirror image arranged brake caliper halves, one brake caliper half being connected to one of the brake shoes at one side of the brake disk and the other brake caliper half being connected to the other brake shoe at the other side of the brake disk; each brake caliper half having a first section away from the disk which is coupled to the actuator for being moved by the actuator and having a second section toward the disk which is coupled to a respective brake shoe, such that operation of the common actuator along the actuator axis operates through the respective brake caliper half to operate the respective brake shoe;

a common mounting pin disposed between the disk and the actuator and extending in a direction generally transverse to the axis of the disk;

each brake caliper half comprising two substantially identically shaped, substantially parallel brake levers spaced apart along the common mounting pin, each brake lever being generally a flat plate lying in a plane parallel to the central plane of the brake; each brake lever including a mounting lug which receives the common mounting pin, and the common mounting pin serves as a common pivot axis for each of the levers;

for each brake caliper half, a first connector comprising a connecting pin between the levers of each brake caliper half for connecting the levers of the respective brake caliper half to the respective brake shoe at one respective side of the disk;

a second connector between the levers of each brake caliper half, the second connector comprising a second connecting pin for connecting the levers of the respective brake caliper half to the actuator;

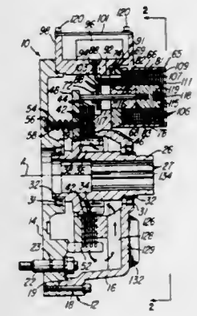
each brake caliper half, viewed as a whole, being arranged displaced along the common mounting pin from the central plane of the brake and one of the two levers of each brake caliper half is disposed between the two levers of the other brake caliper half along the direction of the mounting pin.

4,821,847

LIQUID COOLED BRAKE UNIT

David W. Langdon, Hamilton, Ohio, and Michael J. Sharratt, Utica, Mich., assignors to Force Control Industries, Inc., Fairfield, Ohio

Filed Dec. 29, 1987, Ser. No. 138,935
Int. Cl.[4] B60T *13/04;* F16D *65/14, 65/78*
U.S. Cl. 188—171 7 Claims

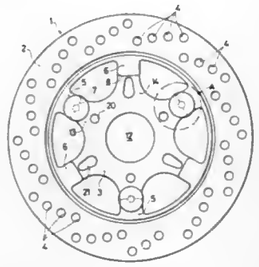


7. Apparatus for braking the speed of a shaft projecting from a motor or other machine, comprising a hub member having a center bore for receiving the shaft for rotation therewith, a plurality of annular brake discs mounted on said support portion of said hub member for rotation therewith and for axial movement relative to said hub member, means defining circumferentially spaced passages around said support portion of said hub member, a non-rotatable housing surrounding said hub member and including an annular base section adapted to be mounted on the machine, a closure section coupled to said base section, a liquid coolant within said housing, a plurality of non-rotatable annular brake plates disposed between said brake discs in interfitting relation and connected to said housing, said coolant being forced outwardly through said passages and between said brake discs and plates in response to rotation of said hub member and said brake discs, means within said housing for directing the coolant from said brake discs and plates to said passages, an annular non-rotatable thrust plate supported by said base section of said housing generally concentrically with said hub member and for axial movement relative to said hub member, a plurality of electrically actuated solenoids mounted on said closure section of said housing in circumferentially spaced relation and projecting outwardly from said housing for exposure to air flowing around said housing, each of said solenoids including an armature rod projecting axially into said housing and past said interfitting annular brake discs and plates to said non-rotatable thrust plate, spring means supported by said base section of said housing for moving said thrust plate axially towards said closure section to effect axial compression of said brake discs and plates for braking the shaft, said thrust plate being movable towards said base section to release said brake discs and plates and the shaft in response to energizing said solenoids and axial movement of the corresponding said armature rods further into said housing, wherein each of said solenoids includes a metal shell surrounding an annular wire coil, one of said armature rods disposed within each of said coils and projecting axially through a hole within

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said closure section of said housing, and said hole within said closure section for each of said armature rods provides for the flow of said liquid coolant within said housing into said shell for cooling said solenoids and dampening the movement of said armature members.

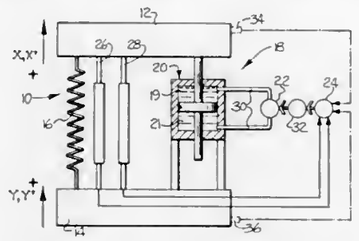
4,821,848
BRAKE DISK
Zenzo Izumine, Hamamatsu, Japan, assignor to Yutaka Giken Co., Ltd., Shizuoka, Japan
Filed Apr. 14, 1988, Ser. No. 181,633
Claims priority, application Japan, Apr. 15, 1987, 57-90668
Int. Cl.[4] F16D *65/12*
U.S. Cl. 188—218 XL **8 Claims**



1. A brake disk comprising:
a ring-shaped braking section having plural inner circumferential spokes provided on its inner circumferential surface;
a hub section connected to an axle provided with plural outer circumferential spokes;
a dish-shaped spring placed on the same surfaces of paired two inner and outer circumferential spokes as to be in pressure contact commonly therewith, and
a connecting pin used together with said dish-shaped spring to connect said paired two spokes is disposed as to allow both of said paired two spokes to move relatively slightly with respect to each other, wherein one spoke of the pair is provided on a surface of the end portion thereof facing a surface of the end portion of the other spoke with a peripheral groove and the other spoke of the pair is provided on said surface of the end portion thereof with a peripheral ridge, and said end portions of both spokes are each provided with a concave recess, said concave recesses being arranged to face each other and cooperate to hold in place said connecting pin linked with said dish-shaped spring when said brake disk is in an assembled state, and wherein said groove and said ridge extend circumferentially, said groove being shaped to receive said ridge with small play in the axial direction when said brake disk is in said assembled state, and wherein one of said concave recesses forms a discontinuity in said ridge and the other of said concave recesses intersects said groove.

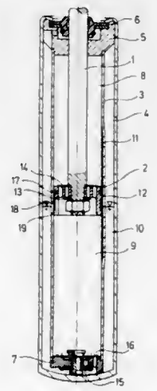
4,821,849
CONTROL METHOD AND MEANS FOR VIBRATION ATTENUATING DAMPER
Lane R. Miller, Cary, N.C., assignor to Lord Corporation, Erie, Pa.
Filed Sep. 29, 1986, Ser. No. 913,067
Int. Cl.[4] F16F *9/18*
U.S. Cl. 188—280 **16 Claims**

1. In a system for attenuating the transmission of vibratory forces and the like between first and second members spaced from and movable relative to each other, said system including a semi-active damper assembly interconnecting said members and normally generating damper forces in response to relative movement therebetween, the improvement comprising:



control means for causing the magnitude of said damper forces to be relatively small whenever the product of the relative displacement of said members and the relative velocity of said members is greater than zero.

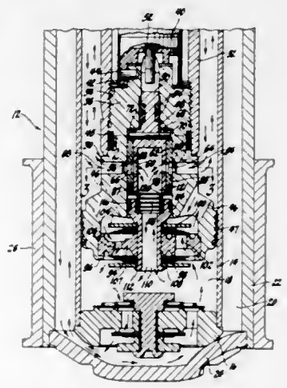
4,821,850
DOUBLE-TUBE VIBRATION DAMPER
Wolfgang Geiling, Schonungen-Hausen, and Felix Wössner, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany
Filed Mar. 27, 1987, Ser. No. 31,987
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611288
Int. Cl.[4] F16F *9/06, 9/36*
U.S. Cl. 188—315 **13 Claims**



1. A double-tube vibration damper, comprising: a tubular, damping-fluid filled axially extending cylinder defined at one end by a bottom part and at the other end by a sealing part, a piston, displaceable in the cylinder located on a piston rod extending in sealed manner out of the cylinder through the sealing part, said piston dividing the cylinder into a first working chamber containing the piston rod and a second working chamber remote from the piston rod,
a container laterally surrounding the cylinder with radial spacing and forming a compensating chamber filled with damaping fluid and gas, the compensating chamber of the container being in communication by way of a valve arrangement in the bottom part with the second working chamber,
a damping device on the piston, rendering possible the passage of damping fluid through the piston, said piston having an axially and circumferentially extending outer

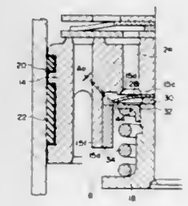
surface facing and adjacent to the internal surface of the cylinder,
a substantially rigid sealing ring seated in a first circumferential groove in the outer surface of the piston and sealing the piston against the internal surface of the cylinder,
a substantially axially extending groove in the internal surface of the cylinder extending between the first and second working chambers, which groove together with the sealing ring forming a by-pass passage around said piston for stroke-dependently varying the damping force,
a guide ring arranged in a second circumferential groove in the outer surface of the piston spaced axially from said first circumferential groove and located closer to the second working chamber than said first circumferential groove, said guide ring guiding the piston radially on the cylinder, said guide ring being formed of a flexible elastic plastics material means for low-friction sliding of said piston in said cylinder, and at least one generally axially extending pressure relief passage which connects at least one of the second circumferential groove and an annular space, positioned axially between the first and second circumferential grooves and defined by the internal surface of the cylinder and the outer surface of the piston, with the second working chamber remote from the piston rod.

4,821,851
DAMPER WITH OPTIMIZED ADJUSTABLE VALVING FOR VEHICLE RIDE CONTROL
William C. Kruckemeier, Xenia; Gustavus P. Bock, Bellbook, and Wayne V. Fannin, Xenia, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 21, 1987, Ser. No. 87,876
Int. Cl.[4] F16F *9/34*
U.S. Cl. 188—319 **3 Claims**



1. A double-acting damper for controlling the jounce and rebound action of a vehicle suspension spring comprising an outer tube, a cylinder tube mounted within said outer tube and cooperating therewith to form a reservoir for damper fluid contained within said tubes, base valve means operatively mounted at one end of said cylinder tube for controlling the flow between said cylinder tube and said reservoir, a piston rod operatively mounted for reciprocating movement in said cylinder tube extending through the upper end of said damper, a piston secured to the inner end of said piston rod, first valve means in said piston establishing a restricted flow through said piston in jounce and rebound movement thereof, the improvement comprising:
second valve means establishing a second restricted flow through said piston in parallel with said first valve means, said second valve means having first and second valve elements operatively mounted for rotation within said piston and rotatable in one direction as a unit to a predetermined number of distinct steps defining one revolution of said second valve means to provide a different fluid flow rate through said second valve means for each of said steps and being relatively rotatable one adjacent step in an opposite direction from any of said distinct steps to block the flow through said second valve means,
said second valve means comprising a dual barrel valve assembly with said first and second vlave elements concentrically mounted within said piston, and a lost device operatively connecting said first and second valve elements providing for relative rotation of said valve elements in one direction from any one of said steps,
said first valve element comprising a cylindrical driver and said second valve element comprising a cylindrical selector having a lost motion slot therein, said lost motion device being formed by cross pin means extending through said driver into said slots of said selector.

4,821,852
SHOCK ABSORBER
Yuji Yokoya, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jun. 2, 1987, Ser. No. 56,760
Claims priority, application Japan, Jul. 25, 1986, 61-175232
Int. Cl.[4] F16F *9/52*
U.S. Cl. 188—322.15 **6 Claims**



1. A shock absorber comprising:
partition means for partitioning the interior of a cylinder into two liquid chambers while affording communication between both liquid chambers through at least one port, the partition means having ring means; and
a valve body biased toward said partition means for opening and closing said at least one port, wherein said partition means forms a first path in cooperation with said valve body for regulating the amount of liquid flowing from said at least one port around a peripheral edge of said valve body and has a second path extending from said first path defined by a bore of said ring means, and wherein the effective areas of said at least one port and said second path are respectively larger than the maximum effective area of said first path.

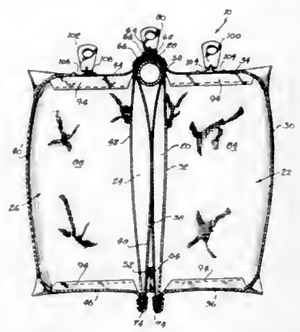
4,821,853
TRAVEL BAG WITH MULTIPLE COMPARTMENTS
Raymond W. Young, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.
Filed Jun. 10, 1987, Ser. No. 60,723
Int. Cl.[4] A45C *3/00, 13/10, 13/36*
U.S. Cl. 190—111 **2 Claims**

1. A travel bag comprising:
an inner compartment having two opposed ends and foldable along an axis of the bag intermediate the two ends to bring the two ends in overlying relationship;
a pair of generally parallelepiped outer compartments having upper walls adjacent the bag axis on opposite sides thereof and lower walls, each disposed adjacent one of the

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opposed ends of the inner compartment, the upper and lower walls having preselected widths outwardly extending from said inner compartment;

slide fastener closures extending along interior portions of each upper wall generally parallel to said bag axis, said slide fastener closures having a width substantially less than the width of said upper walls;



spacing means in said upper and said lower walls of said outer compartments for maintaining the generally parallelepiped configurations thereof, said spacing means extending from said inner compartment in generally outward directions; and

a slide fastener closure for said inner compartment intermediate and generally parellel to the slide fastener closures for said outer compartments.

4,821,854

BRAKE FORCE RETAINING CONTROL APPARATUS

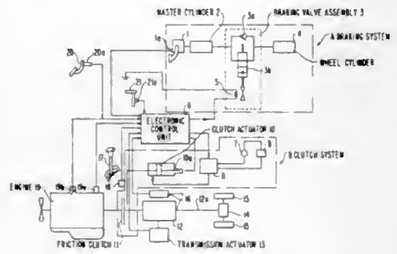
Toshifumi Koshizawa, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 60,419

Claims priority, application Japan, Jun. 12, 1986, 61-136469

Int. Cl.[4] B60K *41/28*

U.S. Cl. 192—0.072 **6 Claims**



1. A brake force retaining control apparatus in a motor vehicle having a transmission, a friction clutch and an accelerator pedal, for controlling the release of a retained braking force within the motor vehicle, said brake force retaining control apparatus comprising:

first detecting means for detecting an amount of the accelerator pedal depression;

second detecting means for detecting an amount of clutch engagement;

third detecting means for detecting a gear position in the transmission;

fourth detecting means for detecting a travelling speed of the motor vehicle;

storing means for storing data corresponding to clutch positions for releasing the retained braking force dependent upon the detected amount of accelerator pedal depression;

determining means for determining a clutch engaging position in which to release the retained braking force, dependent upon the data stored in said storing means and the detected amount of accelerator pedal depression; and

releasing means for releasing the retained braking force when the detected gear position is a running gear position, the detected travelling speed is less than a predetermined value and the detected amount of clutch engagement reaches the determined clutch engaging position.

4,821,855

TORQUE TRANSMITTING ASSEMBLY

Johann Jäckel, Bühl, Fed. Rep. of Germany, assignor to Lu Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 061,298, Jun. 10, 1987, Pat. No. 4,785,924. This application Jul. 13, 1987, Ser. No. 72,820

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623433; Sep. 13, 1986, 3631274

Int. Cl.[4] F16H *45/02*; F16D *3/66, 13/46*

U.S. Cl. 192—3.29 **12 Claims**



1. A hydrodynamic torque converter and lock-up clutch assembly, particularly for motor vehicles, comprising a rotary housing; a clutch apply member in said housing; two walls flanking and being rotatable relative to said clutch apply member; an input element affixed to and rotatable with said walls; energy storing means interposed between said walls on the one hand and said clutch apply member on the other hand and arranged to yieldably oppose rotation of said walls and said clutch apply member relative to each other; a first friction disc non-rotatably and axially movably on one of said walls; a second friction disc between said first friction disc and said input element, said housing and said second disc respectively having cooperating first and second torque transmitting portions and said torque transmitting portions being movable into engagement with each other axially of said rotary housing in predetermined angular positions relative to each other.

4,821,856

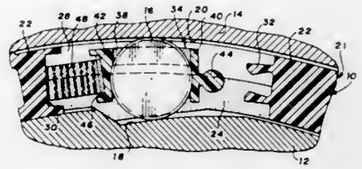
OVERRUNNING ROLLER CLUTCH WITH ROLLER CONTROL CARS

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1987, Ser. No. 121,079

Int. Cl.[4] F16D *41/06*

U.S. Cl. 192—45 **4 Claims**



1. A roller clutch of the type in which a plurality of cylindrical rollers is located between a pair of substantially coaxial clutch races and in which the upper and lower surface of each of said rollers is selectively engageable between a cylindrical pathway on one race and a respective confronting sloped cam ramp formed on the other race, and in which said rollers must move significantly in the circumferential direction between said races during clutch operation, said roller clutch comprising,

a cage adapted to be installed between said races so as to maintain a substantially fixed orientation relative to the axis of said races,

a plurality of roller cars, one for each said roller, which leaves the upper and lower surfaces of said roller exposed to said races while enclosing and confining a sufficient portion of said roller such that said roller is maintained in a substantially fixed orientation relative to said car so that said roller carries said car with it as it moves circumferentially between said races during clutch operation, and,

roller car control means operable between said cage and said roller cars to confine said cars relative to said cage, and thereby indirectly control said rollers with said cage, said control means allowing said cars to move substantially freely in the circumferential direction relative to said cage during clutch operation so that said rollers can also move substantially freely between said races during clutch operation.

4,821,857

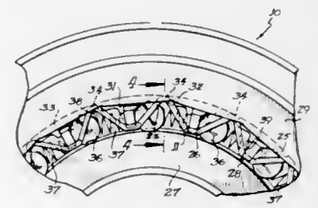
STAMPED ROLLER CLUTCH CAGE WITH INTEGRAL SNAP RING

David M. Groh, Hanover Park, Ill., assignor to Borg-Warner Transmission and Engine Components Corporation, Ithaca, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,276

Int. Cl.[4] F16D *41/07*

U.S. Cl. 192—45 **7 Claims**



1. In an overrunning clutch having inner and outer concentric races receiving a cage housing rollers and folding springs therefor, wherein said cage includes an annular side plate and a spaced parallel side disc joined by a plurality of crossbars extending parallel to the cage axis, the side disc having a wavy form with crests and valleys adjacent the outer race and the inner race, respectively, the improvement comprising one of said races having an annular groove, and means on said cage cooperating with said groove to retain the cage axially between said races.

4,821,858

RELEASE MECHANISM FOR A CLUTCH

Yoshiaki Kabayama, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

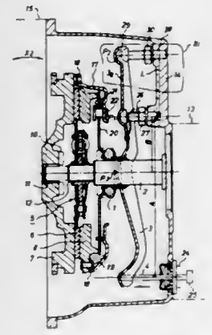
PCT No. PCT/JP87/00473, § 371 Date Feb. 2, 1988, § 102(e) Date Feb. 2, 1988, PCT Pub. No. WO88/00660, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 6, 1987, Ser. No. 168,126

Claims priority, application Japan, Jul. 10, 1986, 61-162846

Int. Cl.[4] F16D *23/12*

U.S. Cl. 192—91 R **3 Claims**



1. A release mechanism of a clutch comprising a release bearing (1) supported by a support shaft, a clutch lever (3) perpendicular to said shaft and provided at an intermediate portion with a pressing point (P3) axially engageable with said release bearing (1), an operation rod (4) engaging an end of said lever (3) for axially applying a release force to the lever, and a first stationary fulcrum (P1) supporting a portion of said lever opposite to said operation rod with said support shaft therebetween;

characterized in that;

said clutch lever having an extension (3*a*) extending beyond said first fulcrum (P1), said extension (3*a*) including an end remote from said rod and said shaft, which is adapted to be supported by a second stationary fulcrum (P2), and said end of said extension (3*a*) adapted to be spaced from the second fulcrum (P2) before the clutch reaches a predetermined released condition in a releasing operation and to engage the second fulcrum (P2) after the clutch reaches said predetermined condition.

4,821,859

SELF ADJUSTING ROTOR FOR A CENTRIFUGAL CLUTCH

Lakhbir S. Suchdev, Charlotte, N.C., and Jack E. Campbell, Fort Mill, S.C., assignors to Textron Inc., Providence, R.I.

Filed May 11, 1987, Ser. No. 48,595

Int. Cl.[4] F16D *43/18, 13/75*

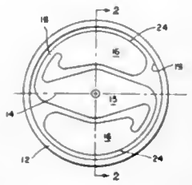
U.S. Cl. 192—105 CD **3 Claims**

1. A method of reducing the clearance between a rotor and a driven member of a centrifugal clutch where the rotor's

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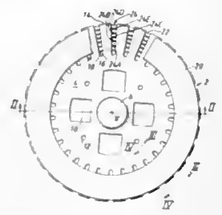
diameter expands as its speed is increased comprising the step of raising the speed of the rotor above a predetermined speed to enlarge the rotor diameter so as to exceed the elastic limit of the rotor material to induce a permanent set in the material at an enlarged diameter thereby reducing said clearance.

2. A self-regulating rotor for a centrifugal clutch wherein the rotor increases in diameter to engage and rotate a driven member of the clutch as the speed of rotation of the rotor increases, said rotor comprising:



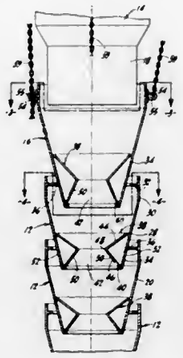
means for allowing the rotor to expand elastically at a design engagement speed to maintain a design clearance between the rotor and the driven member said means further allowing the rotor to expand sufficiently at a speed above the design engagement speed when the clearance exceeds the design clearance to induce a permanent set in said rotor to permanently enlarge the rotor to return the clearance toward the design clearance.

4,821,860
FRICTION FACING MATERIAL AND CARRIER ASSEMBLY
Peter F. Crawford, Bubbenhall; Ian C. Maycock, Leamington Spa, and Graham R. Bicknell, Harbury, all of England, assignors to Automotive Products plc, Leamington Spa, England
Filed Jun. 19, 1987, Ser. No. 64,078
Claims priority, application United Kingdom, Jun. 28, 1986, 8615874
Int. Cl.[4] F16D *11/00, 13/60*
U.S. Cl. 192—107 C **14 Claims**



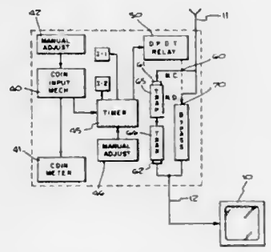
1. A friction facing material and carrier assembly for a dry clutch driven plate, wherein said carrier assembly is sinuously flexible in a circumferential direction under a specified axial clamp load of the clutch, said friction facing material being disposed in an annular array around an being adhesively bonded to and flexible with said carrier, and said friction facing material and/or said bonding material and/or said carrier are/is so resiliently deformable that, under the specified axial clamp load, the overall thickness of said carrier and friction facing material between the clamping surfaces is reduced by between 0.05 mm and 2.00 mm inclusive.

4,821,861
BULK MATERIAL CHUTE SYSTEM
Robert Shanahan, 15034 Shoreline Dr., Weed, Calif. 96094
Filed May 31, 1988, Ser. No. 200,355
Int. Cl.[4] B65G *11/16*
U.S. Cl. 193—25 E **10 Claims**



1. A dust-preventing, verticle chute system comprising:
a plurality of interconnected buckets each having a wall of generally truncated conical configuration with an open top and a smaller diameter open bottom, with first means for interconnecting the buckets to an auxiliary bulk material dispensing device, and second means for interconnecting the buckets in a vertical stack with the bottom of each upper bucket partially nestled in the top of the next lower bucket, wherein the arrangement provides an air space between the nestled bottom of each upper bucket and the top of the next lower bucket; and,
a venturi member situated in the bottom of each upper bucket the venturi member having a constricted section with an air passage means below the constricted section communicating with the air space between buckets for drawing atmospheric air into the chute system when bulk material passes through the chute system.

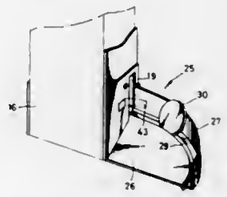
4,821,862
COIN-OPERATED TIMER FOR PAY TV
William W. Nelson, Long Beach, Calif., assignor to Coinview Corporation, Ventura, Calif.
Filed May 21, 1987, Ser. No. 53,265
Int. Cl.[4] G07F *17/00*; H04N *7/16*
U.S. Cl. 194—241 **19 Claims**



6. An apparatus adapted to be used in conjunction with a television receiver for requiring payment in order to view programs on any of certain selected frequency channels while

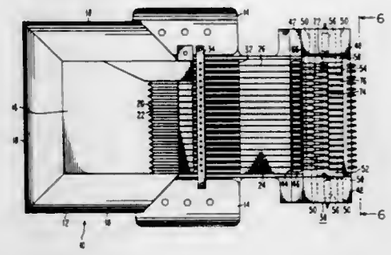
permitting the unpaid viewing of programs on other frequency channels, comprising:
a signal input line adapted to be coupled to a source of programs;
a signal output line adapted to be coupled to the television receiver;
a plurality of frequency traps, whose frequencies correspond to respective ones of said selected frequency channels, connected in a series configuration between said signal input line and said signal output line so that programs on all of said selected frequency channels are normally prevented from passing to said signal output line;
a bypass circuit selectively connectable between said signal input line and said signal output line in parallel with said series of frequency traps for permitting a program received on any frequency channel to pass to said signal output line;
relay means controlling said selective connection of said bypass circuit; and
timing means controlling the operation of said relay means.

4,821,863
TOKEN FEED APPARATUS FOR SLOT MACHINES
Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Oyama, Japan
Continuation of Ser. No. 886,096, Jul. 16, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 119,216
Claims priority, application Japan, Jul. 16, 1985, 60-107563
Int. Cl.[4] G07F *1/04*
U.S. Cl. 194—344 **4 Claims**



1. In a slot machine comprising a main body, a front door attached to a front part of the main body, the front door having a token inlet port into which tokens are inserted edgewise parallel to said front door and on its rear surface a token discharge port adapted to discharge a token inserted into the token inlet port prior to the start of a game, a token collection bucket in said main body for collecting tokens discharged from said token discharge port, and a token pay-out device connected to said token collection bucket, the improvement comprising:
a token feed apparatus attached to said token discharge port remote from said token collection bucket, said token feed apparatus having a bottom plate extending downwardly at an incline from said token discharge port, said bottom plate terminating in a free end directed rearwardly of said machine toward a rear portion of said token collection bucket and adapted to support the outer periphery of a token discharged from said token discharge portion, a side plate projecting upwardly from one side of said bottom plate and curved about the periphery thereof rearwardly away from said front door so that a token sliding down along said side plate will be reoriented from a position parallel to said front door to a position substantially perpendicular to said front door, said side plate and bottom plate supporting the token upright and allowing the token to roll down on its outer periphery into said token collection bucket and be propelled by its own momentum edgewise rearwardly toward said rear portion of said bucket, and means for regulating the shape of the rolling path of the token along said bottom plate, said regulating means including a groove formed in said bottom plate.

4,821,864
PIN FEEDING APPARATUS
Brian E. Lock, Princeton, and John G. Aceti, Princeton Jct., both of N.J., assignors to General Electric Company, Schenectady, N.Y.
Filed Feb. 1, 1988, Ser. No. 151,292
Int. Cl.[4] B65G *47/10*
U.S. Cl. 198—368 **14 Claims**



1. An apparatus for feeding headed pins comprising:
a hopper including a substantially horizontal base and side walls extending upwardly from around a portion of the base so that the hopper has an open portion;
a ramp extending from the base of the hopper at the open portion of the hopper, said ramp having a plurality of spaced, parallel slots therein extending to the end of the ramp away from the hopper, said slots being of a depth and width substantially equal to the length and diameter of the pins but narrower than the diameter of the heads of the pins so that the pins can fit into the slots with the heads of the pins seated on the surface of the ramp;
a chute extending vertically downwardly from the said end of the ramp, said chute having a plurality of vertical passages therethrough with the upper end of each passage being adjacent but offset from the end of a separate slot in the ramp and being of a size at least as large as the diameter of the heads of the pins so that the pins can slide down the passages;
a single shuttle plate mounted across the end of the ramp and across all of the slots;
a plurality of gates mounted on said shuttle plate, each of said gates having a notch in its end facing the ramp for receiving a pin;
means for moving said shuttle plate between a position in which the gates are aligned with the slots and a position in which the gates are over the passages in the chute; and
means for selectively sliding the gates away from the ramp to selectively drop a pin down a passage in the chute.

4,821,865
WORK DELIVERING APPARATUS
Hisao Hirata, Hiratsuka; Shojiro Yokomizo, Yokohama; Hirokazu Mitsuhori, Kanagawa, and Tadao Murano, Zama, all of Japan, assignors to Topy Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 12, 1987, Ser. No. 48,941
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—368 **7 Claims**

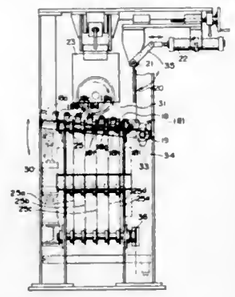
1. A delivering apparatus, disposed on a disk wheel production line between an insertion station where a disk is inserted into a wheel rim and a plurality of welding stations where said wheel rim and said disk are welded to each other, for selectively delivering a work comprising a combination of said wheel rim and said disk inserted into said wheel rim to be conveyed from one inlet path connected to said insertion station to one of three exit paths connected to said welding stations, said exit paths comprising a first exit path which extends opposite to said inlet path from an intersection of said inlet path

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and said exit paths, a second exit path which extends to the right from said intersection and a third exit path which extends to the left from said intersection, said delivering apparatus being located at said intersection, said delivering apparatus comprising:

a series of free rollers for flowing said work from said inlet path to said first exit path, said series of free rollers being selectively movable between an upper position and a lower position positioned lower than said upper position, each free roller of said series of free rollers extending in a direction which is at a right angle with respect to the direction in which said inlet path and said first exit path extend;

a bracket for supporting said series of free rollers and a fixed framework for pivotally supporting said bracket, each roller of said series of free rollers being supported by said bracket so as to freely rotate around an axis of said each roller, said bracket having a first end portion nearer to said first exit path and a second end portion nearer to said inlet path, said first end portion of said bracket being pivotally connected to said framework and said second end portion of said bracket being supported so as to move substantially



in a vertical direction such that when said series of free rollers take said upper position by upwardly moving said second end portion of said bracket to rotate said bracket around its pivot axis, said series of free rollers rotatably supported by said bracket incline obliquely downward in a direction away from said inlet path;

a first stopper provided between said series of free rollers and said first exit path, said first stopper being selectively moved between an opening position and a closing position; and

a series of chains for selectively conveying said work to one of said second and third exit paths, each chain of said series of chains being disposed between adjacent free rollers of said series of free rollers and being selectively driven in either a normal or a reverse direction, an uppermost portion of said series of chains being disposed between said upper position and said lower position between which said series of free rollers is moved, said uppermost portion of said series of chains extending horizontally between said second exit path and said third exit path and being fixed in position in the vertical direction, said series of chains being operable independently of said second and third exit paths.

4,821,866

CONVEYOR FOR A CLEAN ROOM

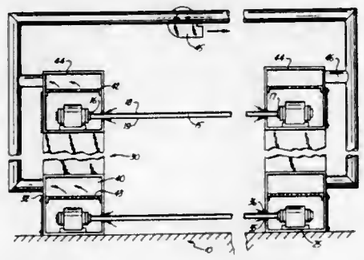
Hans L. Melgaard, Minneapolis, Minn., assignor to Despatch Industries, Inc., Minneapolis, Minn.

Filed Dec. 24, 1987, Ser. No. 138,285

Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—494 **18 Claims**

1. A conveyor for conveying articles along a given path comprising a plurality of spaced, parallel conveying members elongated in a direction normal to said path; carriage means for supporting respective ends of the conveying members; track means parallel to and at either side of the path for receiving and guiding the carriage means; housing means housing the track and carriage means, a plenum extending along the housing means and in air communication therewith; air restriction means between the housing means and plenum for restricting air flow therebetween; means for creating a partial vacuum



within the plenum to thus create a lesser vacuum within the housing means, a slot carried by the housing means to permit passage of the conveying members therethrough, the housing means, plenum, flow restriction means and means for creating a vacuum in the plenum being so constructed and arranged and so balanced with respect to one another as to create an air flow through the slots into the housing having an average velocity of not less than about one hundred feet per minute.

4,821,867

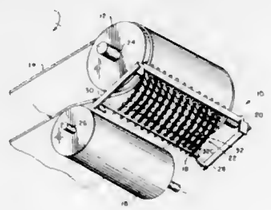
CONTROLLED DEFLECTION OF FLEXIBLE SCRAPER STRANDS

Willem D. Veenhof, 4501 Soundside Dr., Gulf Breeze, Fla. 32561

Division of Ser. No. 41,777, Apr. 23, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 202,949

Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—499 **6 Claims**



1. A belt scraper assembly for use in combination with a conveyor belt of the type driven by a pulley drum, said belt scraper assembly including first and second crossbar members adapted to be mounted in operative positions about the overhang region of the pulley drum, respectively; an array of elongated, flexible scraping members supported between said first and second crossbar members for engaging the curved surface of a conveyor belt in the overhang region of a pulley drum, each scraping member having one end portion coupled to one of said crossbar members and an opposite end portion coupled to the other of said crossbars; bias means coupled to said scraping member for maintaining each scraping member in yieldable, thrusting engagement with the curved surface of a conveyor belt in the pulley drum overhang region; each scraping member including an elongated flexible tension member having a leading end portion and a trailing end portion; a plurality of scraper elements mounted onto said tension member, each scraper element including a spacing portion having a scraper edge for engaging a conveyor belt, each spacing portion having a spacing dimension as measured between its scraper edge and said tension member, and two of said scraper elements having unequal spacing dimensions for establishing unequal static deflection distances of said tension member relative to the surface of a conveyor belt in response to static engagement of said belt by said scraper elements.

4,821,868

DRIVE/FRAME ASSEMBLY FOR A RECIPROCATING FLOOR

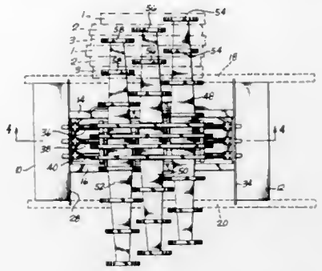
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Sep. 8, 1986, Ser. No. 905,370

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[4] B65G *25/04*; F01B *15/00*

U.S. Cl. 198—750 **16 Claims**



1. A linear hydraulic motor, comprising:

a fixed first piston rod having inner and outer ends;

a fixed second piston rod having inner and outer ends;

a first piston head at the inner end of said first piston rod;

a second piston head at the inner end of said second piston rod;

said first and second piston heads being spaced apart when in use;

a cylinder housing mounted to travel on said first and second piston head;

said cylinder housing having first and second end members;

said first end member including a central opening through which the first piston rod extends;

said second end member including a central opening through which the second piston rod extends;

said cylinder housing including a divider wall between its ends;

wherein a first fluid chamber is formed within said cylinder housing between said first end member and said first piston head;

wherein a second fluid chamber is formed within said cylinder housing between said first piston head and the divider wall;

wherein a third fluid chamber is formed within said cylinder housing between said divider wall and said second piston head;

wherein a fourth fluid chamber is formed within said cylinder housing between said second piston head and said second end member;

said divider wall including a first passageway having an inner end communicating with said third fluid chamber, and an outer end;

said divider wall also including a second passageway having an inner end communicating with said second fluid chamber, and an outer end;

first conduit means extending through said first piston rod and having an inner end in communication with said second fluid chamber, and an outer end;

second conduit means interconnected between said first fluid chamber and said third fluid chamber and including said first passageway in said divider wall;

third conduit means interconnected between said second fluid chamber and the fourth fluid chamber and including said second passageway in the divider wall; and

fourth conduit means extending through said second piston rod and having an inner end in communication with said third fluid chamber, and an outer end.

12. A linear hydraulic motor, comprising:

a fixed first piston rod having inner and outer ends;

a fixed second piston rod having inner and outer ends;

a first piston head at the inner end of said first piston rod;

a second piston head at the inner end of said second piston rod;

said first and second piston heads being spaced apart when in use;

a cylinder housing mounted to travel on said first and second piston head;

said cylinder housing having first and second end members;

said first end member including a central opening through which the first piston rod extends;

said second end member including a central opening through which the second piston rod extends;

said cylinder housing including a divider wall between its ends;

wherein a first fluid chamber is formed within said cylinder housing between said first end member and said first piston head;

wherein a second fluid chamber is formed within said cylinder housing between said first piston head and the divider wall;

wherein a third fluid chamber is formed within said cylinder housing between said divider wall and said second piston head;

wherein a fourth fluid chamber is formed within said cylinder housing between said second piston head and said second end member;

first conduit means extending through said first piston rod and having an inner end in communication with said second fluid chamber, at an outer end;

second conduit means interconnected between said first fluid chamber and said third fluid chamber;

third conduit means interconnected between said second fluid chamber and said fourth fluid chamber; and

fourth conduit means extending through said second piston rod and having an inner end in communication with said third fluid chamber and an outer end.

4,821,869

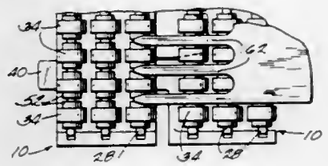
LOW BACKLINE PRESSURE CHAIN FOR USE WITH TRANSFER PLATE

William G. Hodlewsky, Greendale, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Nov. 23, 1987, Ser. No. 123,782

Int. Cl.[4] B65G *17/24*

U.S. Cl. 198—779 **4 Claims**



1. A conveyor assembly comprising:

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a chain link conveyor including a plurality of chain links joined together to form a continuous chain, each chain link including

a base portion having top and bottom surfaces,

first and second shaft support members extending upwardly from the top surface of the base portion, each shaft support member including means for supporting a shaft,

at least one shaft extending between the first and second shaft support members, and supported by the shaft support members,

a plurality of rollers mounted for rotation on the shaft, each of said rollers including a first cylindrical portion having a first diameter and a second cylindrical portion having a second diameter less than the first diameter of the first cylindrical portion, and the first cylindrical portions of the rollers defining an article support surface, and the second diameter portions of the plurality of rollers defining grooves between the first diameter portions and adapted to house fingers of a fingered transfer plate,

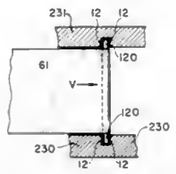
a transfer plate for removing articles from the chain link conveyor, the transfer plate including a generally planar upper surface generally coplanar with the article supporting surface defined by the first cylindrical portions of the rollers, and a plurality of spaced apart parallel fingers extending between the first cylindrical portions of the rollers and housed in the grooves defined by the second diameter portions of the plurality of rollers.

4,821,870

AUTOMATIC DIRECT SOFT COOKIE LOADING APPARATUS

William J. Simelunas, Glen Rock; Henry N. Shoiket, Rutherford, and Celso Espejo, Chatham, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 682,244, Dec. 17, 1984, Pat. No. 4,662,152. This application Sep. 30, 1986, Ser. No. 913,381
Int. Cl.[4] B65G *15/60*
U.S. Cl. 198—812 **3 Claims**



1. A conveyor for handling articles, comprising:

(a) an endless belt movable about rollers having an upstream end and a downstream end;

(b) a fixed pivot roller located at the upstream end, whereby the conveyor is pivotable upwardly and downwardly about said pivot roller;

(c) a first movable roller located at the downstream end, said movable roller being capable of moving upwardly, downwardly and horizontally;

(d) an intermediate roller located between the fixed pivot roller and the first movable roller for directing the belt downwardly towards the first movable roller, whereby a downward sloped nose is formed on the conveyor;

(e) a second movable roller receiving the belt from said first movable roller, said second movable roller being spring biased for tensioning the belt; and

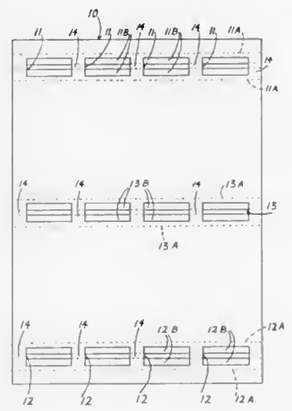
(f) a housing within which rollers other than the first and second movable rollers are rotatably mounted, said housing comprising a slot adapted to receive the second movable roller and adapted to constrain movement of the second movable roller.

4,821,871

IDLER PULLEY SURFACING

Harold L. Herren, 802 Main St., Platteville, Colo. 80651

Filed Jan. 13, 1988, Ser. No. 144,018
Int. Cl.[4] B65G *39/10*
U.S. Cl. 198—843 **10 Claims**



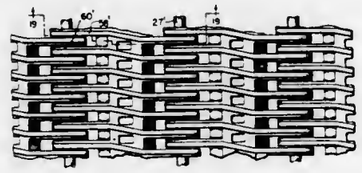
1. A flexible rubber strip having first and second ends, wherein said first end includes a row of openings therealong and said second end includes a row of openings therealong, wherein a pair of spaced-apart metal strips are secured to each said end of said rubber strip, wherein a portion of each said metal strip is exposed in said openings; wherein when said rubber strip is wrapped around a pulley, said portion of each said metal strip can be welded to said pulley to secure said rubber strip to said pulley.

4,821,872

LIGHTWEIGHT MODULAR CONVEYOR BELT

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 750,896, Jul. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 457,482, Jan. 12, 1983, Pat. No. 4,556,142. This application Apr. 17, 1987, Ser. No. 39,759
The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.
Int. Cl.[4] B65G *17/06*
U.S. Cl. 198—853 **6 Claims**



4. A conveyor belt configured to be driven by a plurality of sprocket wheels having teeth, comprising:

a plurality of identical modules of integral molded construction linked together end-to-end to form said conveyor belt, each module including

a plurality of link elements of equal length disposed in laterally spaced relation, each of said plurality of link elements having an upper surface, a lower surface and first and second flat sides, each module having a length equal to said length of said individual link elements, and wherein each module has a width determined by said plurality of link elements in laterally spaced relation,

each of said plurality of link elements terminating in first and second link ends, respectively, said length of each individual link element being defined as the longitudinal distance between corresponding first and second link ends, and wherein

said corresponding first and second link ends of each individual link element are laterally offset with respect to one another and further wherein said corresponding first and second link ends of each individual link element are parallel with respect to one another,

each of said plurality of first and second link ends having an opening formed therethrough, said openings of each said module defining pivot axes therefor,

a rib integrally formed with and extending upwardly from said upper surface of each of said plurality of link elements, each rib extending from said first link end to said second link end of said corresponding link element, each rib having a width less than said first and second link ends of said corresponding link element to form a stepped configuration with said upper surfaces of transversely extending portions of said corresponding first and second link ends, and wherein

said transversely extending end portions of said first and second link ends of each corresponding link element extend transversely in opposite directions with respect to said corresponding rib thereof,

first and second cross members integrally formed intermediate said first and second link ends to extend transversely between said first and second flat sides of adjacent link elements of the laterally spaced relation, said first and second cross members being angularly disposed with respect to said adjacent link elements to have upper and lower surfaces substantially parallel with said corresponding upper and lower surfaces of said adjacent link elements,

said first and second cross members further including outwardly sloping surfaces and confronting sloping surfaces, respectively, said confronting surfaces defining sprocket recesses configured for intermittent mating with the teeth of the plurality of sprocket wheels to cause longitudinal movement of said module; and

a plurality of pivot rods inserted in said openings of said link elements of adjacent modules to link said plurality of identical modules together end-to-end to form said conveyor belt, and wherein said transversely extending end portions of adjacent modules are dispoto-end to form said conveyor belt, and wherein said transversely extending end portions of adjacent

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4,821,873

BRAKE SYSTEM

Carroll Crane, Shawneetown, Ill., assignor to Peabody Coal Company, St. Louis, Mo.

Filed Apr. 13, 1987, Ser. No. 37,468
Int. Cl.[4] B65G *23/00*
U.S. Cl. 198—856 **10 Claims**

1. A brake system for braking a shaft of an apparatus subject to runaway to stop runaway, said system comprising:

a brake drum on the shaft;

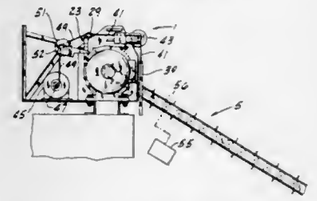
brake shoe means engageable with and disengageable from the drum;

a control member connected to the brake shoe means movable in one direction to a first position for applying the brake shoe means and in the opposite direction to a second position for releasing the brake shoe means;

means biasing the control member in said one direction to its said first position for applying the brake shoe means;

a torque motor connected to said control member for moving the control member on energization of the torque motor to said second position and holding it there for release of the brake shoe means;

means responsive to runaway of the apparatus for de-energizing the torque motor, the control member being released on de-energization of the torque motor for applying the brake shoe means to its drum; and



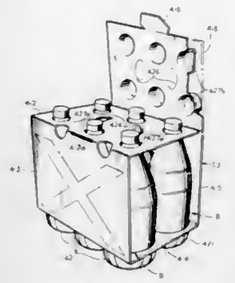
a drive motor for driving said shaft and a limit switch for controlling operation of the drive motor, said control member being engageable with the limit switch when the control member is in its said second position to energize the drive motor to drive the shaft, and said control member being disengageable from said limit switch as it moves toward its said first position to deenergize the drive motor prior to application of the brake shoes to the brake drum.

4,821,874

REUSABLE WRAP-TYPE MULTI-PACK CARRIER

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Dec. 13, 1984, Ser. No. 681,393
Int. Cl.[4] B65D *71/06*
U.S. Cl. 206—140 **3 Claims**



1. In combination with a plurality of like containers, a reusable one-piece wrap-type carrier for carrying said containers and comprising, in combination: a bottom panel; means formed in said carrier for engaging the bottoms of said containers in spaced apart configuration; first and second generally vertically extending panels formed integrally with said bottom panel and folded with respect thereto; generally horizontally extending panel means formed integrally with one of said first and second generally vertically extending panels, said generally horizontally extending panel means extending across the tops of said containers; and releasable and reclosable locking means securing said generally horizontally extending panel means to the other of said generally vertically extending panels, said locking means comprising a tab extending outwardly from an edge of said carrier for receiving said tab, said carrier being provided with a finger width vertical slot disposed on one side of and adjacent said horizontally extending slot to help to remove said tab from said horizontally extending slot.

3. In combination with a plurality of like beverage containers, a reusable one-piece wrap-type carrier for carrying said beverage containers and comprising, in combination: a bottom

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panel; means formed in said carrier for engaging the bottoms of said beverage containers in spaced-apart configuration; first and second generally vertically extending panels formed integrally with said bottom panel and folded with respect thereto; generally horizontally extending panel means formed integrally with one of said first and second generally vertically extending panels, said generally horizontally extending panel means extending across the tops of said containers; said generally horizontally extending panel means comprising a first horizontal panel which is formed integrally with one of said first and second generally vertically extending panels and a second horizontal panel which is formed integrally with the other of said first and second generally vertically extending panels, said first and second horizontal panels lying in substantial surface to surface contact with one another to form a double thickness layer of material at the top of said carrier; means for engaging the top of said beverage containers comprising a series of spaced-apart holes in said first horizontal panel, each of said holes having the top of one of said beverage containers protruding therethrough, and a series of spaced-apart pockets in said second horizontal panel, each of said pockets having the top of one of said containers protruding thereinto; and

releasable and recloseable locking means securing said generally horizontally extending panel means to the other of said generally vertically extending panels.

4,821,875

SYSTEM FOR INTRODUCING ADDITIVE INTO A CONTAINER

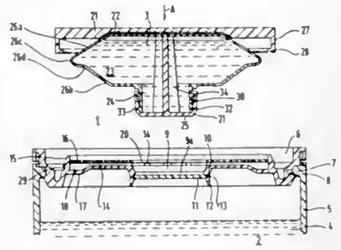
Michael H. Groves; Digby R. Redshaw, and Michael R. Cane, all of Warwick, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 61,423, Jun. 12, 1987. This application Feb. 12, 1988, Ser. No. 155,610

Claims priority, application United Kingdom, Feb. 12, 1987, 8703205

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—219 **21 Claims**



1. A system for introducing flowable additive to paint, varnish, woodstain or the like contained in a closed container wherein the system comprises

(a) a closed container containing paint, varnish, woodstain or the like, the container being provided with an inlet which is closed by an inlet closure but which is openable by a force exerted on the inlet closure,

(b) a closed capsule separate from the closed container which capsule comprises a chamber having a shape in the form of two opposed adjacent dished shapes joined around their perimeters which chamber defines a volume which contains the flowable additive, which chamber can be opened to create an opening in the chamber which opening can communicate with the inlet into the container after the inlet has been opened, and which chamber is compressible whereby the volume defined by the chamber can be contracted to expel positively additive from the chamber through the opening and

(c) co-operable locating means provided on the container and capsule which can at least assist in locating the opening created in the chamber in communication with the inlet into the container.

4,821,876

MAGAZINE FOR LIGHT-SENSITIVE MATERIAL HAVING A CONTOURED FOLDED PORTION ADJACENT A MATERIAL DISPENSING OPENING OF THE MAGAZINE

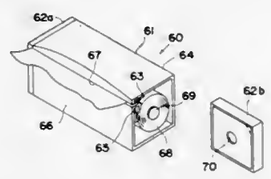
Hideo Naito; Tsukasa Matsuda, and Katsuhiko Uchiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 28, 1988, Ser. No. 149,562

Claims priority, application Japan, Jan. 28, 1987, 62-18082; Jan. 28, 1987, 62-18083

Int. Cl.[4] B65D *85/67*

U.S. Cl. 242—71.1 **7 Claims**



1. A magazine for dispensing light-sensitive materials comprising a tubular body having two side portions and side plates covering each of said two side portions of said tubular body; said tubular body being formed by bending a sheet material having folded portions at both ends thereof so as to form a slit between said both ends and having an upper part of the magazine formed by a portion of the bent material in a region adjacent one of said both ends, a front wall part of the magazine formed of a portion of the bent material in a region adjacent the other of said both ends, wherein a forehead portion having a upper edge and a lower edge is formed by the bent material in an area between said upper part and one of said folded portions positioned at said one of said both ends of the upper part, said forehead portion having a plane essentially parallel to said front wall part and a central portion of one of said upper edge and said lower edge thereof being bulged outwardly in a direction parallel to said plane so as to form an arc extending lengthwise of the slit.

5. A magazine for dispensing light-sensitive materials comprising a tubular body having two side portions and side plates covering each of said two side portions of said tubular body; said tubular body being formed by bending a sheet material having folded portions at both ends thereof so as to form a slit between said both ends and having an upper part of the magazine formed by a portion of the bent material in a region adjacent one of said both ends, a front wall part of the magazine formed of a portion of the bent material in a region adjacent the other of said both ends, wherein a space is provided between one of the folded portions at one of said both ends and another of the folded portions at said one of said both ends, a cured resin material substantially filling said space.

4,821,877

SCREW MAGAZINE FOR AN APPARATUS FOR INSERTING AND REMOVING SCREWS

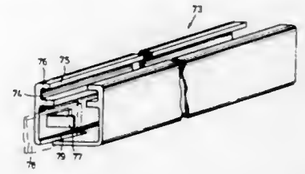
Hans W. Aab, Waiblingen, and Arnd Kniese, Bad Laasphe, both of Fed. Rep. of Germany, assignors to EJOT Eberhard Jaeger GmbH & Co. KG, Fed. Rep. of Germany

Division of Ser. No. 851,283, Apr. 10, 1986, Pat. No. 4,674,367, which is a continuation of Ser. No. 627,645, Jul. 3, 1984, abandoned. This application Apr. 3, 1987, Ser. No. 35,626

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325565

Int. Cl.[4] B65D *85/24*

U.S. Cl. 206—338 **7 Claims**



1. A screw magazine for an apparatus for inserting and removing screws, each screw having a head, a laterally protruding flange and an at least partly threaded shaft, the magazine comprising:

an elongated housing extending linearly along a line of extension and having a bottom wall and opposing side walls defining an elongated compartment in which the heads of a plurality of screws can be aligned one behind the other, with their shafts at right angles to the line of extension of the housing,

the elongated compartment including a guide compartment and a head compartment adjacent to the guide compartment, the guide compartment bearing against the flanges of the screws and having an inner shelf and a free leg portion on each opposing side wall of the guide compartment extending laterally therefrom, said inner shelves and free leg portions partly enclosing around the flanges and guiding the screws by said flanges on a path of movement of the screws along a length of the housing,

the head of the screws compartment containing the heads and comprising a clamping lug cut out of the housing and bent into the head compartment, thereby extending into the path of movement of the screws,

the clamping lug being engagable by a release mechanism of the apparatus upon inserting the magazine into the apparatus, whereby the lug is bent out of the path of movement.

4,821,878

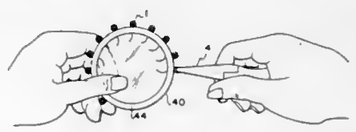
ROUND DISPENSER FOR SUTURES

J. Paul Jones, Chester Springs, Pa., assignor to PRD Corporation, Exton, Pa.

Division of Ser. No. 916,896, Oct. 6, 1986, Pat. No. 4,732,151. This application Feb. 29, 1988, Ser. No. 162,236

Int. Cl.[4] B65D *85/24*

U.S. Cl. 206—370 **4 Claims**



1. The combination of a dispenser and a plurality of needle sutures comprising:

a plurality of combined needle sutures and anchors, the anchor of each suture being on one end thereof;

a pair of flat spaced apart, round covers extending parallel to each other, the covers being made of weldable plastic material;

a ring of elastomer material disposed between the outer edges of said covers, the elastomer material being of a structure to be penetrable by said needle sutures and being made of weldable material, the outer edges and the elastomer material being welded together so that said covers and the elastomer material form a sealed chamber; and

each needle suture extending into and through said elastomer material with the anchor thereof engaging the outer periphery of the elastomer material and each needle suture extending into said sealed chamber.

4,821,879

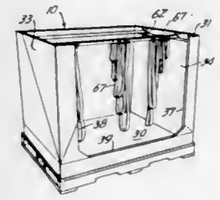
CRADLE TYPE SHIPPING CONTAINER

Julius B. Kupersmit, 299 W. 12th St., New York, N.Y. 10014

Filed Feb. 29, 1988, Ser. No. 163,247

Int. Cl.[4] B65D *19/00*

U.S. Cl. 206—386 **5 Claims**



1. An improved shipping container comprising: a generally rectangular box element including a bottom wall, a pair of oppositely disposed vertical side walls, a vertical rear wall and a vertical front wall defining an opening therein, said side walls having upper horizontal edges, plural channel-forming members engaged upon said upper edges of said side walls, and at least one load-supporting element including an elongated rigid bar having first and second ends engaging said channel forming members for lateral sliding movement of said bar upon said channel-forming members; said bar having plural load-supporting means in pendant relation thereon, each of said means detachably engaging a plurality of supported objects in generally vertically stacked relation for serial removal, as said objects are moved adjacent said opening.

4,821,880

PALLETIZED STRUCTURE CONTAINING SPOOLS

Louis G. Ditton, Fort Wayne, Ind., assignor to Essex Group, Inc., Ft. Wayne, Ind.

Continuation of Ser. No. 78,727, Jul. 27, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 230,727

Int. Cl.[4] B65D *19/00*

U.S. Cl. 206—386 **6 Claims**

1. A palletized structure for containing a plurality of cylindrical objects, each of said cylindrical objects having two ends and a body therebetween comprising:

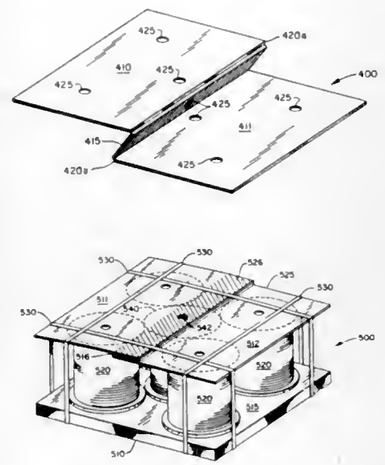
a pallet having a generally planar surface;

a plurality of cylindrical objects each having a first end generally parallel to be generally planar surface of said pallet;

a cap structure of corrugated cardboard which is generally parallel with and abutting each second end of said cylindrical objects characterized by at least one centrally located integral beam structure; and

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said integral beam structure formed of a multiple thickness fold of said cardboard having a length extending to the



edges of said cap structure and a width of less than one third of the width of said cap structure.

4,821,881

FOLDUP PAPER CONTAINER

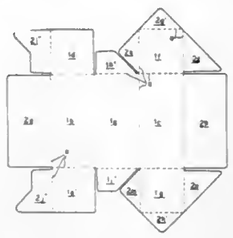
Yoshiharu Yabe, 25-banchi, 4-ban, 1-chome, Doshin, Kita-ku, Osaka-shi, Osaka-fu, Japan

Division of Ser. No. 765,350, Aug. 13, 1985, Pat. No. 4,688,673. This application Jul. 2, 1987, Ser. No. 69,195

Claims priority, application Japan, Feb. 15, 1985, 60-5709; Feb. 18, 1985, 60-21475; Feb. 22, 1985, 60-6925; Jun. 18, 1985, 60-25638; Jun. 18, 1985, 60-25639

Int. Cl.[4] B65D *85/672*

U.S. Cl. 206—387 **10 Claims**



1. A foldup container formed from a single sheet comprising:

a first rectangular bend part having a pair of long sides and a pair of short sides;

first and second rectangular outer bend parts each having a pair of long sides, one each of which adjoins a respective one of the first bend part, and each having a pair of short sides;

first and second inner foldback parts each having a long side adjoining the other long side of said first and second outer bend parts respectively, said inner foldback parts each having a width not greater than the short sides of said outer bend parts and a length substantially equal to the long sides of said outer bend parts;

first and second upper bend parts, each having a length, a width and four sides, at least a pair of said sides being parallel, one each of which adjoins a respective one of said first and second outer bend parts along a short said thereof;

third and fourth lower bend parts, each having a length, a width and four sides, at least a pair of said sides being parallel, one each of which adjoins a respective one of said first and second outer bend parts along the other short side thereof;

at least one first and at least one second upper foldback parts, each having a side adjoining another side of said first and second upper bend parts respectively, said another side of said upper bend parts being adjacent said parallel sides, and said upper foldback parts each having a length and width not greater than the length and width of the respective upper bend part which it adjoins;

at least one third and at least one fourth lower foldback parts, each having a side adjoining another side of said third and fourth lower bend parts respectively, said another side of said lower bend parts being adjacent said parallel sides and said lower foldback parts each having a length and width not greater than the length and width of the respective lower bend part which it adjoins; and

at least one of said upper and lower foldback parts being triangular;

wherein said foldup container includes a back end wall comprising said first bend part; a pair of opposed two layer sidewalls each comprising one of said inner foldback parts folded back onto a respective one of said outer bend parts along the long side on which they adjoin; a four layer upper side wall comprising said first and second upper foldback parts folded back onto said first and second upper bend parts respectively which, in turn, overlap one another; a four layer lower side wall comprising said third and fourth lower foldback parts folded back onto said third and fourth lower bend parts respectively which, in turn, overlap one another; and an opening opposite said back end wall defined by the folded edges of said two layer side walls and said upper and lower side walls.

4,821,882

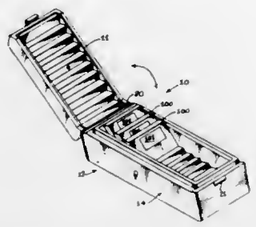
INSULATED RECEPTACLE DEVICE FOR CASSETTES

Eugene C. Messina, Rte. 1, Box 217 K5, Comfort, Tex. 78013

Filed Apr. 5, 1988, Ser. No. 177,753

Int. Cl.[4] B65D *85/672*

U.S. Cl. 206—387 **3 Claims**



1. An insulated receptacle device in combination with a plurality of cassette cartridges wherein the insulated receptacle device consists of:

an insulation unit including an upper insulation member and a lower insulation member wherein both insulation members are provided with a central recess which cooperate to define an enlarged contoured cavity that is dimensioned to receive said plurality of cassette cartridges in a staggered disposition; wherein, said upper and lower insulation members are fabricated from a thermal insulation material; the central recesses in said upper and lower insulation members are provided with a sawtooth configuration defined by a plurality of teeth; wherein, each tooth of said sawtoothed configuration has an upwardly angled tooth surface and a rearwardly angled tooth surface whereby said rearwardly angled tooth surfaces are disposed parallel to one another and the upwardly and rearwardly angled tooth surfaces are arranged in an alternating contacting sequential fashion wherein said sawtooth configuration supports said plurality of cassette cartridges; and,

a housing unit including an upper housing member and a lower housing member which are hingedly connected on one end and provided with a cooperating latch mechanism on their other end; wherein, the housing members cooperate with one another to provide a closed receptacle that encompasses said insulation unit and said plurality of cassette cartridges.

4,821,883

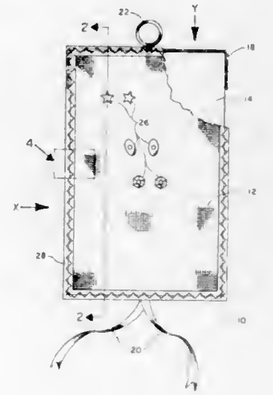
JEWELRY HOLDER

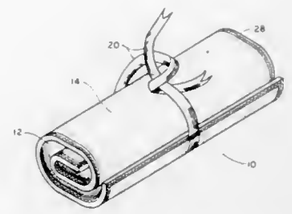
Kathern M. Miller, 4222 Meadow La., Lorain, Ohio 44055

Filed Jan. 7, 1988, Ser. No. 141,543

Int. Cl.[4] B65D *73/00*

U.S. Cl. 206—495 **1 Claim**





1. A device, having an X and Y longitudinal axes, for the display and storing of jewelry articles having a post-type configuration at one end thereof;

a first sheet of mesh cloth, said mesh cloth provided with a plurality of apertures, a second sheet of craft foam bonded to said first sheet of mesh cloth;

said device provided with loop means at one end thereof and strings means at another end thereof and being further provided with wire means at the same end in which said loop means is provided, said wire means preventing said device from folding along the X axis but permitting said device to be folded along the Y axis, and

said bonded sheets of mesh cloth and craft foam adapted to receive and engage the post of said jewelry such that the ornamental portion of said jewelry is visible to the user.

4,821,884

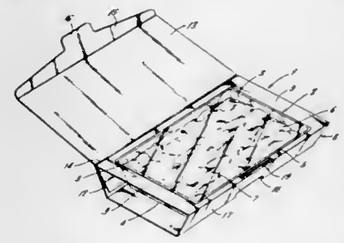
SECONDARY PACKAGING

Christopher Griffin, London, and Peter Kay, Shefield, both of United Kingdom, assignors to General Foods Limited, Banbury, England

Filed Nov. 12, 1987, Ser. No. 119,944

Int. Cl.[4] B65D *1/34*

U.S. Cl. 206—557 **15 Claims**



1. A heat resistant container suitable for a ready prepared meal, which comprises a tray having a bottom, side walls, and a rim, said tray being located in a recess provided in a secondary package, at least a substantial portion of the rim thereby being supported by the portion of the secondary package surrounding said recess, said secondary package provided with a hinged lid which encloses the top surface of said tray, and said secondary package also having a plurality of flanges depending from the recess opening which bear upon the side wall of said tray.

4,821,885

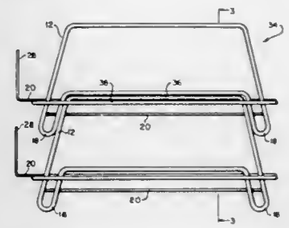
STACKABLE AND NESTABLE BASKET DEVICE

V. John Ondrasik, 11215 S. Wilmington, Los Angeles, Calif. 90059

Filed Dec. 1, 1986, Ser. No. 937,079

Int. Cl.[4] B65D *21/04, 21/02, 6/08*

U.S. Cl. 206—513 **10 Claims**



1. A basket suitable for stacking and nesting with like baskets comprising a bottom, defined by a frame and first wire means extending from front to back across said frame and affixed thereto; arch members, each arch member consisting of continuous wire members having an extreme upper portion, an intermediate center portion and two feet, said arch members affixed to the frame at opposite edges of said frame in parallel orientation with said first wire means, such that both said upper and center portions of said arch members extend above said frame and said two feet extend below said frame, said first wire means being spaced inwardly from said arch members to provide respective inner openings at both edges of said frame whereby

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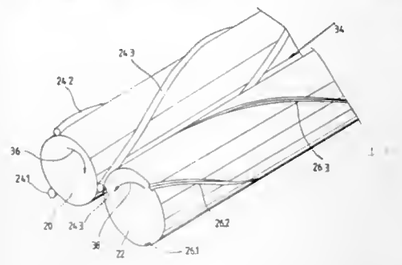
an upper like basket would nest within said basket longitudinally offset, the feet of one of said arch member of said upper basket being accommodated by the opening at one edge of said basket, the opening at the opposite inner edge of said upper basket accommodating the upper portion of said arch member of said basket; and means for stacking said basket with said upper basket whereby said center portions of said arch members of said upper basket rest upon and are in superior register with the upper portions of said arch members of said basket.

4,821,886

CLEANING DEVICE FOR AGRICULTURAL PRODUCTS

Hermann F. Roethig, 11 Sluysken Street, Welgemoed, 7530, South Africa

Filed Mar. 21, 1988, Ser. No. 171,393
Int. Cl.[4] B07B *13/00*
U.S. Cl. 209—618 **4 Claims**



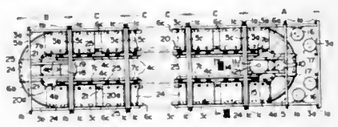
1. A cleaning device for agricultural products, which includes a support structure having an upper side and a lower side; at least one pair of rotatable elongated members arranged adjacent and substantially parallel to each other; rotating means for rotating each of the elongated members about its respective longitudinal axis so that in each pair the elongated members are rotated in opposite directions towards each other and towards the lower side of the support structure; at least one spiral ridge provided on one elongated member in each pair; a complementary associated spiral groove for each spiral ridge provided on an adjacent associated elongated member of each pair of elongated members, so that on rotation of the elongated members projecting parts of agricultural products to be cleaned and placed on the elongated members are gripped between associated spiral ridges and spiral grooves for removal from such products; and a strip made of resilient material being located in each spiral groove against which strip the complementary spiral ridge is adapted to abut.

4,821,887

ROTATABLE STOCK CLOSET

Takusuke Iemura; Takeshi Gotoh, and Hiroshi Komaki, all of Yokohama, Japan, assignors to Okamura Corporation, Japan

Continuation-in-part of Ser. No. 203,449, Nov. 3, 1980, Pat. No. 4,379,602. This application Feb. 22, 1982, Ser. No. 350,640
Claims priority, application Japan, Aug. 11, 1981, 56-118289[U]
Int. Cl.[4] A47F *3/08*
U.S. Cl. 211—1.5 **11 Claims**



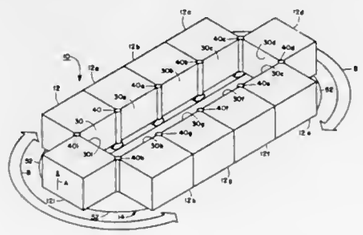
1. A rotatable stock closet comprising a frame and a plurality of container conveying units arranged vertically one above another on the frame, each conveying unit comprising:
first and second vertical shafts on the frame and spaced apart from each other;
first and second rotatable members on the first and the second vertical shafts, respectively;
a traction means on the first and second rotatable members, the traction means extending between and being adapted to be moved between the first and second rotatable members;
a plurality of container means for containing stock items, each connected to the traction means;
the first vertical shaft being movable in a direction away from the second vertical shaft for adjusting the distance between the first and the second vertical shafts to absorb slack in the traction means;
means for rotating the first rotatable member for driving the traction means, comprising:
a driving means mount having a free end and a base end, the free end being adjustably mounted to the frame, the base end rotatably contacting the first vertical shaft;
a drive on the driving means mount; and connecting means for connecting the first rotatable member and the driver for rotating the first rotatable member; the driving means mount being for holding the driver at a predetermined distance from the first vertical shaft and for receiving forces caused by the driver.

4,821,888

CAROUSEL MATERIAL HANDLING APPARATUS

William P. Hankes, 4363 Wilshire Blvd. #301A, Mound, Minn. 55364

Filed Oct. 29, 1987, Ser. No. 114,576
Int. Cl.[4] A47F *3/08*
U.S. Cl. 211—1.5 **7 Claims**



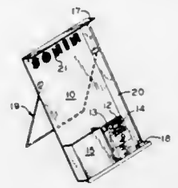
1. A carousel material handling apparatus comprising:
a plurality of storage bins;
a first and second generally linear spaced apart pathway segment each extending between first and second ends, first and second arcuate pathway segments, said first arcuate pathway segment joining first ends of said linear pathway segments and said second arcuate pathway segment joining second ends of said linear pathway segments, said first and second linear pathway segments and said first and second arcuate pathway segments cooperating to define a continuous pathway;
bin support means for supporting each of said bins to move about said continuous pathway with said bins disposed in side-by-side relation to define contiguous bins;
connecting means for hingedly connecting contiguous bins to define a continuous chain of hingedly connected bins disposed on said pathway;
drive means associated with a plurality of said bins to independently urge each one of said plurality of bins to move in a predetermined common direction around said continuous pathway; and
drive engagement means for operating said drive means of any one of said plurality of bins to urge said any one of said plurality of bins to move in said predetermined common direction when said any one of said plurality of bins is disposed on one of said linear pathway segments and said drive engagement means further selected for said drive means not to be urging said any one of said plurality of bins to move in said predetermined common direction when said any one of plurality of bins is disposed on one of said arcuate pathway segments.

4,821,889

DISPLAY STAND FOR ADVERTISING DISTANCE MEASURING DEVICES

Herbert Cohen, Rosslyn Heights, N.Y., assignor to Sonin, Inc., Scarsdale, N.Y.

Filed Apr. 26, 1988, Ser. No. 186,407
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **4 Claims**



1. A display stand for demonstrating a distance measuring device of the type which emits an acoustic wave and receives a reflection from a distant surface comprising:
a planar surface having a front side for supporting a rear surface of said distance measuring device between two integral fixed flanges which terminate opposite vertically disposed ends of said planar surface, said distance measuring device having one end abutting one of said flanges, and an opposite acoustic wave emitting and receiving end facing the remaining of said flanges, said measuring device being operable to measure the distance between said fixed flanges and display said measured distance;
a supporting leg connected to a rear side of said planar surface supporting said surface in a sufficiently vertical position to permit viewing of said planar surface front side; and
a measuring indicia disposed on said front side adjacent said distance measuring distance which displays the fixed distance between said flanges which can be visually observed and compared to a measured distance displayed on said distance measuring device; and a rectangular enclosure supported on said planar surface open at one end for supporting sales literature adjacent said distance measuring device.

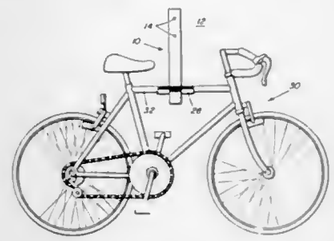
4,821,890

BICYCLE SUPPORT RACK

Geoffrey O. Hills, Piscataqua Rd., Durham, N.H. 03824

Filed Aug. 14, 1987, Ser. No. 85,891
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—18 **13 Claims**

1. A bicycle support apparatus comprising:
an elongate vertically disposed bracket adapted to be flushly affixed to an independent load bearing means;
a deformable arm means integrally connected to said bracket means, said arm means comprising a first section, adjacent said bracket means, disposed at an angle of between 30° and 60° with said bracket means, a substantially horizontal second section adjacent said first section, and a third section, comprising the terminal end of the arm means adjacent said second section, disposed at an angle substantially equal to that of said first section;



a bicycle engaging means secured to the terminal end of said arm means for engaging a cross bar of a bicycle to support said bicycle.

4,821,891

SHAPE SAVING HAT RACK

Kenneth A. Williams, Spring, Tex., assignor to Utopia International, Missouri City, Tex.

Filed Feb. 10, 1988, Ser. No. 154,363
Int. Cl.[4] A47F *7/06*
U.S. Cl. 211—31 **3 Claims**



1. In a holder for securing a hat adjacent a substantially flat surface, wherein said holder comprises a mounting bracket adapted for attachment to said flat surface; a frame comprising a single length of substantially rigid material, with opposed facing ends, said frame including a hat-crown receiving portion of substantially rectangular configuration with outwardly bowed segments opposite one another and intermediately located along the long sides of said rectangularly configured portion; and a hinge connected to said mounting bracket, said hinge rotatably receiving said frame's ends, said hinge including a torsionally stressed spring connected at one end to said mounting bracket and at the other end to said frame whereby said frame is biased toward said flat surface; the improvement comprising:
said crown receiving portion's long sides defining a plane; and
means for displacing said plane substantially equidistant from said flat surface throughout the area defining said crown receiving portion for the purpose of providing support to said hat along the greater extent of each of said frame portions long sides.

4,821,892

SHELVING SYSTEM

Harold M. Randall, Fullerton, Calif., assignor to Newell Co., Freeport, Ill.

Continuation of Ser. No. 1,341, Jan. 8, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 228,197
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—90 **2 Claims**

1. A friction gripping and shear locking shelf bracket for use with a cantileverly supported shelf which provides increasing

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shear locking forces with increasing cantilever loading on the shelf, said friction gripping and shear locking shelf bracket including

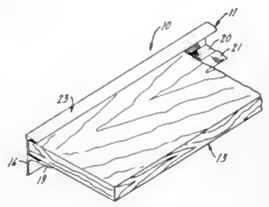
a base member adapted to be secured to a support structure such as a wall,

a combined resiliently bendable friction gripping and shear locking arm extending outwardly from the base member,

a shelf support ledge extending outwardly from the base member a greater distance than the friction gripping and shear locking arm at a location below the gripping and shear locking arm,

said support ledge and gripping and shear locking arm forming an opening therebetween for the reception of the rear edge portion of a shelf to be supported from the bracket,

the vertical distance between (a) the distal end portion of the gripping and locking arm and (b) the support ledge being less than the thickness of the rear edge portion of a shelf to be supported,



said gripping and shear locking am being bendable upwardly to a position in which the vertical distance between the distal end portion of the gripping and shear locking arm, and the support ledge, is at least equal to the thickness of the rear edge portion of a shelf to be received in the opening and supported to thereby exert a gripping force on a shelf which is adapted to be inserted in said opening,

a knife edge structure projecting downwardly from the gripping and locking arm between the distal and proximate ends of the gripper arm, said knife edge structure projecting downwardly to a location beneath the upper surface of an unloaded shelf which has been inserted in the opening between the gripping and shear locking arm and the support ledge, and

a fulcrum on the support ledge located distally outwardly from the knife edge structure,

whereby imposition of a load on the front end portion of a cantileverly supported shelf will increase the shear locking force between the knife edge structure and the shelf.

4,821,893

DISPLAY STAND

Roger M. Wyatt, Cape Town, South Africa, assignor to Truworths Limited, Cape Town, South Africa

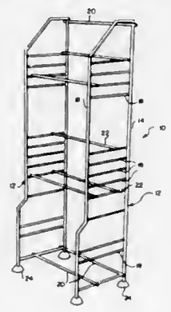
Filed Jul. 21, 1987, Ser. No. 76,117

Claims priority, application South Africa, Jul. 21, 1986, 86/5423

Int. Cl.[4] A47H *1/00*

U.S. Cl. 211—123 **5 Claims**

1. In a display stand a joint structure which enables one rail of the display stand to be adjustably mounted atop a further rail of the display stand which is transverse thereto, said one rail being tubular with a plug pushed into its end, the plug being of a resilient material and having a part cylindrical downwardly open transverse groove in the underside of the cylindrical outer face thereof, said further rail entering said groove from below when said one rail is pressed down onto said further rail, said plug resiliently gripping said further rail to inhibit relative



sliding movement of said one rail with respect to said further rail.

4,821,894

RETURN SPRING DEVICE FOR DOUBLE PINS OF DISPLAY UNITS

Jean-Pierre Dechirot, Sedan, France, assignor to Societe Vynex S.A., Flize, France

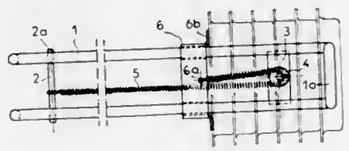
PCT No. PCT/FR87/00007, § 371 Date Sep. 25, 1987, § 102(e) Date Sep. 25, 1987, PCT Pub. No. WO87/04328, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 12, 1987, Ser. No. 112,833

Claims priority, application France, Jan. 27, 1986, 86 01203

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—59.3 **6 Claims**



1. A spring-loaded device for display of articles of the type having means for slidably supporting the article on slide rail means, said device comprising slide rail means having a first end and an opposite, second end with said second end being adapted for attachment to a support, a thrust plate slidably supported on said slide rail means, a return stud carried by said slide rail means at a position adjacent said first end thereof, a cross-piece carried by said slide rail means adjacent said second end thereof, a spring member having a first end attached to said thrust plate and a second end attached to said cross-piece with said spring member extending from said thrust plate, around said return stud to said cross-piece and being attached at its ends to said thrust plate and to said cross-piece, respectively, said slide rail means comprising two arms extending substantially in the same plane, said return stud being disposed between said two arms, said thrust plate comprising a U-shaped metal sheet including a pair of lugs extending outwardly to engage an article supported on said slide rail means to thereby exert thrust loading on the articles tending to move the articles toward said first end.

4,821,895

NURSING BOTTLE ACCESSORY HAVING MEANS FOR THE INTRODUCTION OF A SEPARATE SUBSTANCE

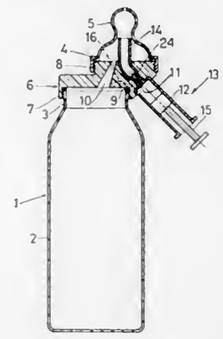
Stephen Roskilly, 32 Rayden Drive, Borrowdale, Harare, Zimbabwe

Filed Jan. 8, 1987, Ser. No. 1,483

Claims priority, application Zimbabwe, Jan. 8, 1986, 3/86

Int. Cl.[4] A61J *9/00*

U.S. Cl. 215—11.1 **8 Claims**



1. A feeding bottle accessory comprising a teat holder and bottle closure, said accessory including an exterior mounting structure for receiving means for introducing secondary material into the teat separately from the primary material contained with said bottle, a first end shaped for co-operation with the neck of the bottle and a second end shaped for cooperation with a teat retaining cap, the accessory further having means defining at least two internal passages, a first internal passage providing communication between the bottle and the interior of the teat, and a second internal passage providing communication between the teat and the outside of the bottle through said exterior mounting structure.

4,821,896

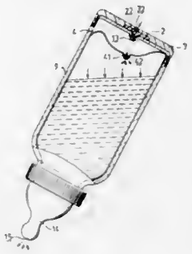
NURSING BOTTLE WITH A LINER AND VENT

Ping N. Cheng, No. 45, Huo I Road, Keelung City, Taiwan

Filed Mar. 24, 1988, Ser. No. 172,456

Int. Cl.[4] A61J *9/00, 9/04*

U.S. Cl. 215—11.3 **1 Claim**



1. A nursing bottle comprising:

a bottle having a nipple attached to an upper end thereof, threads formed on an outer surface at a lower portion of said bottle, a hollow protrusion formed on a base of said bottle protruding inwardly toward an interior of the bottle with an opening formed in a top portion of said hollow protrusion;

a silicon rubber layer attached to the exterior of said base having an elastic protrusion formed on a central portion of said rubber layer and received in the hollow protrusion of said bottle, with a vertical slit formed in a top portion of said elastic protrusion;

a cylindrical base casing having threads formed on an inner surface thereof engageable with said threads of said bottle and having a minute vent formed therein; and

a disposable liner bag disposed inside said bottle for filling a drinking liquid therein,

the improvement which comprises:

(a) said cylindrical base casing having a disc-shaped recess formed in a central portion thereof for receiving said silicon rubber layer therein; and

(b) said disposable liner bag including a reinforced wall made of silicon rubber formed on a central portion of said bag bottom, and a cut formed in a central portion of said reinforced wall, said cut of said bag being axially aligned with said opening of said hollow protrusion, said slit of said elastic protrusion of said rubber layer, and said minute vent of said base casing, whereby upon suction on the nipple by a baby, exterior air passes from the exterior of the bottle into the interior of the bag, allowing a smooth drinking of the liquid.

4,821,897

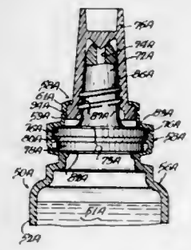
CONTAINER WITH INSERT HAVING A FULLY OR PARTIALLY ENCAPSULATING SEAL WITH A FRANGIBLE WEB FORMED AGAINST SAID INSERT

Gerhard H. Weiler, South Barrington, Ill., assignor to Automatic Liquid Packaging, Inc., Woodstock, Ill.

Division of Ser. No. 845,199, Mar. 28, 1986, Pat. No. 4,699,748, which is a division of Ser. No. 402,982, Aug. 3, 1982, Pat. No. 4,596,110, which is a continuation-in-part of Ser. No. 296,368, Aug. 26, 1981, Pat. No. 4,707,966. This application Jul. 6, 1987, Ser. No. 69,851

Int. Cl.[4] B65D *1/00, 41/62, 47/10*

U.S. Cl. 215—32 **6 Claims**



1. A container formed from thermoplastic material comprising:

a body defining an opening at one end;

an insert article positioned at said body opening; and

a closure structure unitary with said body and encapsulating at least a portion of said insert article to seal closed the container; said closure structure including a wall having first and second portions joined together with a frangible web; said frangible web abutting said insert article; in which container said insert article is a nozzle assembly comprising a nozzle and a removable cap mounted on said nozzle; in which container said closure structure wall includes a peripheral wall around said nozzle assembly wherein said wall first portion is a lower portion of said peripheral wall and wherein said wall second portion is an upper portion of said peripheral wall; and in which container said frangible web abuts a peripheral surface of said cap.

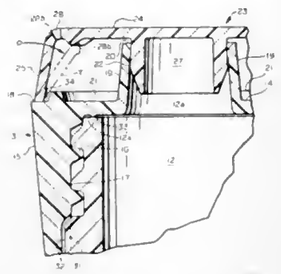
VOL 1101 ISS 3 APR 18 1989 UMI

4,821,898

CHILD RESISTANT HINGE TOP CLOSURE

Ned J. Smalley, Perrysburg, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Jan. 10, 1988, Ser. No. 206,163
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—216 **24 Claims**



1. A hinged dispensing closure comprising

a main closure comprising a top wall and skirt, and adapted to interengage with the open neck of a container,

a cover cap,

said cover cap having a top wall and integral peripheral deformable skirt joined together peripherally at a radius,

a hinge portion interconnecting the main closure and cover cap near their periphery for pivoting the cover cap between an open position and a closed position over the main closure,

an orifice in the top of said main closure for dispensing product therethrough, the improvement therein comprising

the cover cap and main closure having cooperating locking means disposed opposite said hinge portion for holding the cover cap in closed position,

means in the skirt of said cover cap disposed opposite said hinge portion defining a radially inwardly deflectable tab portion which is manually deflectable for opening the cover cap,

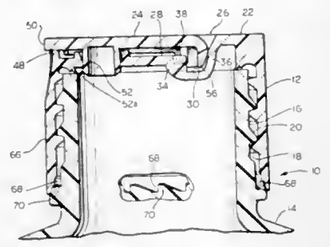
said manual deflection and opening of the cover cap being adapted for one handed opening manipulation.

4,821,899

DISPENSING CLOSURE

Joseph D. Nycz, Haskins, and Mark J. Schoenlein, Perrysburg, both of Ohio, assignors to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Jun. 24, 1988, Ser. No. 211,186
Int. Cl.[4] B65D *47/00*
U.S. Cl. 215—235 **29 Claims**



1. A dispensing closure for a bottle that contains a flowable product, the bottle having an annular closure receiving finish, said closure comprising;

a cup-shaped base cap member having an annular skirt with bottle finish engaging means, said annular skirt being adapted to surround and engage the finish of the bottle, said base cap member further having an interrupted generally planar top positioned within an annulus defined by said annular skirt, a recessed wall portion in an interruption in said generally planar top, said recessed wall portion extending inwardly from an edge of said top past a center thereof to an end, said recessed wall portion having a depressed socket portion at said end thereof and a dispensing opening which is away from said depressed socket portion and which extends through said base cap member, whereby the flowable product can be dispensed from the bottle through said dispensing opening; and

a closing member having a generally planar portion with a first end, a second end, and a flange extending generally normally to said generally planar portion from one of said first end and said second end, said flange having a free edge, said closing member further having spaced apart first and second side surfaces extending normally from said flange partly toward the other of said first end and said second end and a plug which extends from said generally planar portion and which is spaced between said first end and said second end, said one of said first end and said second end of said closing member being received in said depressed socket portion of said base cap member, said closing member being pivotable with respect to said base cap member about a pivot axis between a first position in which said closing member is engaged in said recessed wall portion of said base cap member with said plug being received in said dispensing opening in said base cap member to prevent the flowable product from being dispensed through said dispensing opening and a second position in which said closing member extends away from said base cap member and said plug is away from said dispensing opening to permit the flowable product in the bottle be dispensed through said dispensing opening;

one of said base cap member and said closing member being provided with projection means, the other of said base cap member and said closing member being provided with recess means, said recess means frictionally engaging said projection means along said pivot axis, said pivot axis extending through said projection means and said recess means;

said flange of said closing member further having thickened portion means extending from said generally planar portion partly to said free end, and further extending from at least one of said first surface and said second surface, said thickened portion means stiffening said one of said first end and said second end of said closing member to prevent said closing member from being disengaged from said base cap member as said closing member is being pivoted about said pivot axis from said second portion to said first position.

4,821,900

PROCESS FOR IMPREGNATING CORKS

Otto Berker, Riedgasse 29, Innsbruck, Austria

Continuation of Ser. No. 857,128, Apr. 29, 1986, abandoned.
This application Mar. 21, 1988, Ser. No. 170,034
Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516633
Int. Cl.[4] B05D *3/06, 3/00*; B65D *39/00*
U.S. Cl. 215—355 **32 Claims**

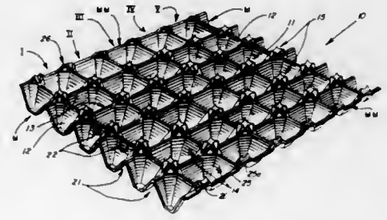
1. A process for impregnating a cork for a bottle containing an alcoholic drink to improve the long term sealing effect of said cork with said bottle, said process comprising spacing a generally uniform sealing surface of said cork a predetermined distance of up to 150mm from a corona discharge electrode; exposing said sealing surface of said cork to a corona discharge of predetermined voltage having a maximum of 500 KV for a period up to 30 seconds; and impregnating said cork to a predetermined depth of between 1mm and 4mm by contact with at least one aqueous solution repelling substance compatible with said alcoholic drink in said bottle selected from the group consisting of saturated and unsaturated fatty acids which occur naturally in cork, primary alcohols having 20 to 26 carbon atoms, alkanes having 16 to 34 carbon atoms, and fats and oils with a melting point not more than 90° C. and a kinematic viscosity of up to 30,000 mm^2/sec at impregnation step temperature; said impregnating step occuring prior to the cork returning to its non-impregnable condition and said contact with said aqueous solution repelling substance occuring for a length of time of between 2 and 60 seconds.

4,821,901

FILLER FLAT CONSTRUCTION

Kenneth D. Bixler, Lake Forest, Ill., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Mar. 2, 1988, Ser. No. 163,266
Int. Cl.[4] B65Q *85/32*
U.S. Cl. 217—18 **8 Claims**



1. A molded filler flat construction for accommodating a plurality of fragile articles, said construction comprising a plurality of article-accommodating cells arranged in side by side relation and forming a plurality of parallel rows; adjacent cells in a row being separated by upright first shoulders; corresponding cells in adjoining rows being separated by upright second shoulders; the first and second shoulders of a cell being angularly disposed relative to one another and being interconnected by upstanding hollow corner posts, each post having an upper portion projecting upwardly above upper extremities of the interconnected shoulders, said post upper portion having open side walls facing adjacent cells, upper extremities of the open side walls being interconnected by a cap section; each cell having a base section substantially delimited by wall segments extending divergently upward therefrom, said wall segments forming portions of the shoulders circumjacent a cell; adjacent open side walls of predetermined corner posts being interconnected by gusset segments which coact to form an upright indented intervening wall section, the latter being in substantially endwise alignment with an upper extremity of a shoulder.

4,821,902

WASTE CONTAINER

Robert A. May, Beeville, Tex., assignor to May Fabricating Co., Inc., Beeville, Tex.

Filed Apr. 1, 1988, Ser. No. 176,678
Int. Cl.[4] B65D *43/20*
U.S. Cl. 220—1 T **9 Claims**

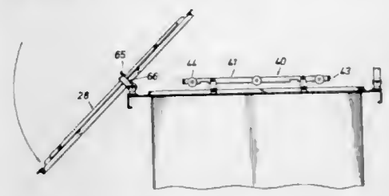
1. A waste container, comprising

a metal body having longitudinally extending side walls, laterally extending end walls, a bottom wall, and a top wall having a large unobstructed access opening therein which is surrounded by an upstanding rim,

a lid of fiberglass reinforced plastic or other relatively light weight material having a downwardly extending lip for disposal about the rim when the lid is over the opening to close same, and

means by which the lid may be moved between its closed position and a generally upright, suspended position adjacent either side of the container, including

means for raising and lowering the lid between its closed position and a raised position in which its lip is above the rim, and supporting the lid, when so raised, for guided, lateral movement toward and away from a position overhanging either side of the body, and



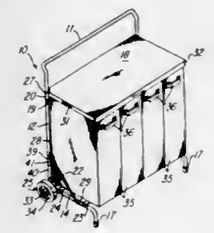
means for engaging the lid, as it is moved into overhanging position, to permit it to be swung into its upright, suspended position, and then to be swung back into its overhanging position for guided lateral movement to a position above the opening, from which it may be lowered to closed position.

4,821,903

TRASH BIN CART AND BIN ASSEMBLY

James K. Hayes, 325 Cottage St., Rahway, N.J. 07065

Filed Apr. 21, 1988, Ser. No. 184,266
Int. Cl.[4] B65D *90/00*
U.S. Cl. 220—1 T **7 Claims**



1. A trash bin cart comprising a tubular metal handlebar portion; central vertical tubular metal portions whose lower ends are adapted for fitting into lower tubular metal floor portions; lower tubular metal floor portions having upper and lower elbow bends with an intermediate horizontal portion; a rear pivoting common lid secured to upper end portions of said central vertical portions wherein said common lid has a rear flange, side flanges and a front flange wherein said front flange is longer than said rear and side flanges; circular rod side braces attached to the upper portions of said central vertical tubular portions and said lower tubular floor portions; front and rear tubular metal floor members attached to lower tubular floor portions at locations near said elbow bends joining said lower tubular floor portions with said central vertical tubular metal portions; one or more circular rod rear cross braces attached to said central vertical portions and said lower tubular floor portions; means to secure the upper and lower portions of said side braces to the vertical tubular metal portions and said horizontal lower tubular metal portions; an axle passing through the proximal portions of the horizontal portion of the lower tubular metal floor portions and wheels mounted on said axle.

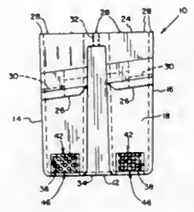
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4,821,904

ELECTRICAL OUTLET BOX WITH IMPROVED CABLE ENTRY APERTURE KNOCKOUT PANEL

N. Norm Bhargava, and Jayanta L. Barua, both of Fort Wayne, Ind., assignors to Bhar, Inc., Fort Wayne, Ind.

Filed Aug. 17, 1987, Ser. No. 85,737
Int. Cl.[4] H02G 2/00
U.S. Cl. 220—3.2 17 Claims



1. An electrical outlet box having wall means defining the interior of said box and at last one cable entry aperture defined in said box by a portion of said wall means for facilitating insertion of an electrical cable from the exterior of said box into said interior of said box, and comprising:

a knockout panel having a periphery; and

rupturable means interconnecting said panel at more than two locations spaced about its periphery to said wall means portion so as to dispose said panel in a closed relation across said aperture and to support said panel in a substantially balanced relation from said wall means portion such that a knockout force applied to said panel will be directed within a region of said panel bounded by said interconnecting means so as to effectuate detachment of said panel from said walls means portion; and

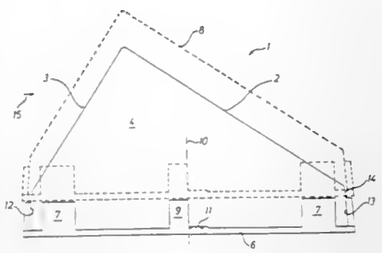
a multiplicity of protrusions on a side of said panel facing toward the exterior of said box, said protrusions defining a non-skid surface on said panel side which substantially prevents a knockout force delivering end of an instrument from slipping upon impact with said side of said panel.

4,821,905

PROTECTIVE HOUSING MADE OF A SYNTHETIC MATERIAL TO HOLD MEASURING, CONTROL, MONITORING AND SIMILAR DEVICES IN REPEATED USE UNDER TIGHTLY SEALED CONDITIONS

Joachim Hess, D-8070 Schroeplerstrasse 35, Ingolstadt, Fed. Rep. of Germany

Filed Feb. 4, 1988, Ser. No. 152,049
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 3704015
Int. Cl.[4] B65D 6/00
U.S. Cl. 220—4 B 19 Claims



1. A protective housing made of a synthetic material to hold measuring, control, monitoring and similar devices in repeated use under tightly sealed conditions, consisting of two housing elements having a plurality of sides, a juxtaposition rim carried around each of said sides, each said housing element including two generally parallel lateral surfaces and two central roof surfaces at an angle of approximately 90° to each other; and said two housing elements being joined together to form a protective housing generally in the shape of a parallelepiped in such manner that a juxtaposition surface is defined by the juxtaposition rim diagonally across the lateral surfaces of the housing, wherein the improvement comprises:

said central roof surfaces including two band-like wall segments inclined towards said juxtaposition rim;

each said band-like wall segment being disposed generally perpendicularly to the juxtaposition surface at a slightly conical pitch towards said central roof surfaces;

a plurality of wall reinforcement elements disposed adjacent said juxtaposition rim carried by the band-like wall segments generally at the same height, said wall reinforcement elements also being disposed on said lateral surfaces to serve as stacking support points and to receive hardware; and

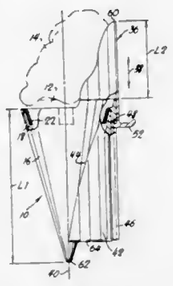
said lateral surfaces being inclined towards each other at a slightly conical pitch.

4,821,906

ICE CREAM CONE GUARD AND THE LIKE

Christopher Clark, 273 Hancock St., Brooklyn, N.Y. 11216

Filed Jan. 29, 1988, Ser. No. 150,137
Int. Cl.[4] B65D 3/06
U.S. Cl. 220—4 A 13 Claims



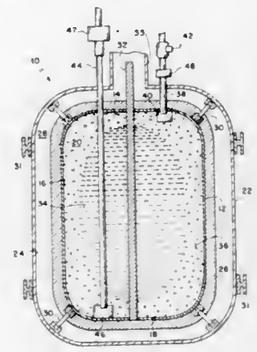
1. A device for receiving and enhancing conditions for the devouring of a foodstuff accommodated in and protruding from a receptacle, said device comprising first means for internally accommodating said receptacle, said first means being portable and adapted for being grasped in a hand of a user, and second means on said first means and extending from the same to encompass at least partially the protruding foodstuff to shield and protect the same and to limit the possibilities of displacement of the protruding foodstuff from said receptacle, the second means being displaceable on said first means to vary the extension of the second means therefrom, and third means fixed on said first means and configured to facilitate grasping by the hand of the user, the third means being configured as part of a cylinder.

4,821,907

SURFACE TENSION CONFINED LIQUID CRYOGEN COOLER

Stephen H. Castles, College Park, and Michael E. Schein, Crofton, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 13, 1988, Ser. No. 205,771
Int. Cl.[4] F17C 11/00
U.S. Cl. 220—5 A 22 Claims



1. A cryogenic cooler for use in craft such as launch, orbital and space vehicles subject to changes in orientation and conditions of vibration and weightlessness comprising:

an insulated tank;

a porous open celled sponge-like material disposed substantially throughout the contained volume of said insulated tank;

a cryogenic fluid disposed within said sponge-like material;

a cooling finger immersed in said cryogenic fluid, said finger extending from inside said insulated tank externally to an outside source such as an instrument detector for the purpose of transmitting heat from said outside source into said cryogenic fluid;

means for filling said insulated tank with cryogenic fluid; and

means for venting vaporized cryogenic fluid from said insulated tank;

wherein said sponge-like material is of such pore size that the surface tension of said cryogenic fluid is effective to maintain said liquid cryogenic fluid suspended within said sponge-like material during conditions of vibration, changes in said cooler orientation and zero gravity environments, and

wherein heat entering said cooling dewar through said cooling finger is conducted at a precise temperature through said cooling finger and therefrom into said cryogenic fluid contained within said tank, said heat being dissipated by vaporization and expulsion of cryogen through said vent means.

4,821,908

ON-BOARD REFUELING VAPOR RECOVERY SYSTEM

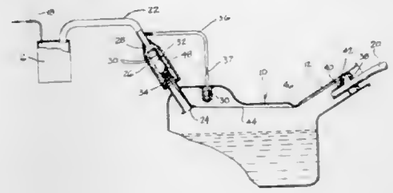
John V. Yost, Trenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1987, Ser. No. 92,873
Int. Cl.[4] F16K 24/00
U.S. Cl. 220—86 R 1 Claim

1. In a vehicle fuel system having a fuel tank with a filler pipe at one end thereof that receives an inserted filler nozzle through its open end during fuel fill and a vapor canister mounted at the opposite end of said tank for storing fuel vapors produced in said tank, an improved, compact means for venting said vapors to said canister, comprising,

a tank venting line running directly from said opposite end of said tank to said storage canister, said venting line having a cross sectional area sufficient to allow fuel vapors displaced from said tank during fuel fill to flow quickly therethrough to said canister,

a selectively openable valve located within said venting line between said tank and canister which is normally biased to a closed position so as to block vapor flow therethrough,



a seal in said filler pipe engageable with said filler nozzle when it is inserted so as to substantially block the flow of fuel vapors from said tank out said filler pipe open end,

lever means located within said filler pipe and rotatable by the insertion of said fuel nozzle so as to open said valve only during fuel fill, and,

a cable running from said lever through the inside of said tank and to said valve,

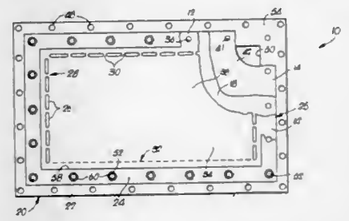
whereby, during fuel fill, said lever means and cable will pull said valve open to allow the quick venting of fuel vapors from said tank to said canister through said tank venting line.

4,821,909

HYGIENIC PRESSURE RELIEF PANEL UNIT

Donald R. Hibler, Bates City, and Eddie R. Malcolm, Independence, both of Mo., assignors to Fike Corporation, Blue Springs, Mo.

Filed Mar. 10, 1988, Ser. No. 166,266
Int. Cl.[4] B65D 51/16
U.S. Cl. 220—207 10 Claims



1. A hygienic pressure relief panel unit for use with a pressure relief assembly for protecting a structure such as a vessel, building, or the like defining an enclosed interior from buildup of a predetermined amount of pressure within the structure interior, the structure presenting a vent opening communicating the structure interior with the structure exterior, the assembly including means for placing said panel unit in a covering relationship with the vent opening, said panel unit comprising:

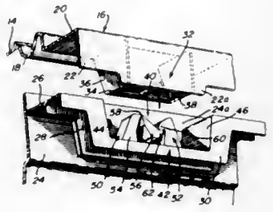
a panel having means defining at least one line of weakness for separation therealong in the event said panel is exposed to a predetermined amount of pressure, said panel presenting a forward side and a rearward side;

an imperforate sheet of material selected from the group including PTFE and FEP, said sheet presenting an inner

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face and an outer face, said sheet rupturing in the event of exposure to a predetermined amount of pressure;
means defined on said inner face for presenting a bonding surface for allowing adhesive bonding therewith; and
adhesive means adhering said bonding surface with said rearward side thereby coupling said sheet with said panel, said inner face substantially covering said apertures,
whereby said panel unit, when placed in a covering relationship with the vent opening, being adapted for presenting said outer face of said sheet toward the structure interior, and preventing media passage therethrough until buildup of a predetermined amount of pressure within the structure interior whereupon said at least one line of weakness separates and said sheet ruptures to relieve the pressure.

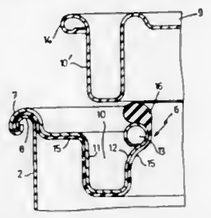
4,821,910
CLOSURE AND CONTAINER HAVING TAMPER PROOF MEANS
Charles Poirier, St-Damien, Canada, assignor to IPL Inc, Quebec, Canada
Filed Jun. 29, 1988, Ser. No. 212,866
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—266 **6 Claims**



1. In combination, a closure and a container;
said closure having a top wall and a peripheral depending skirt portion; and at least one frangible element on the interior side of said skirt portion;
said container having a side wall and an upper flange outwardly projecting from said side wall; said flange displaying a recessed area adapted to receive said frangible element therein;
locking means in said area including a hingeable portion adapted to be downwardly displaced by said frangible element, as said closure is positioned onto said container, and to thereafter upwardly return to block said element from retraction from said recessed area;
said frangible element being brakeable upon forcible removal of said closure from said container to thereby provide a visual indication of removal of the closure, whether authorized or unauthorized.

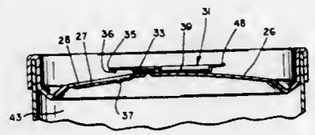
4,821,911
CLOSING COVER FOR A METAL CONTAINER
Roger O. Lefrant, Casteau, Belgium, assignor to Manufacture de Bldons et Boltes Metalliques M. Kouperman S.A., Brussels, Belgium
Filed Sep. 2, 1987, Ser. No. 92,098
Claims priority, application Belgium, Sep. 2, 1986, 0/217.110
Int. Cl.[4] B65D *3/00*
U.S. Cl. 220—67 **5 Claims**

1. A closure for a metal container (1) composed of a body (2) and a closing base (4) crimped onto a lower edge (5) of said body (2), said closure comprising: an interior ring (7) covered on its lower interior surface with a preformed resilient sheath (15) of synthetic material and crimped onto an upper edge (8) of the body (2), the upper exterior surface of the ring being stamped so as to have a downwardly extending circumferential groove (10) with an interior wing which is reinforced by a rim (13) which is folded back in its extension; and a round cover (9) having both a downwardly extending marginal rib which has a convex annular profile (10') with a complementary shape to that of said groove 10, so as to be tightly retained in said groove, and also a peripheral rim (14); said preformed resilient sheath (15) of synthetic material being ratched on the interior



surface of the ring (7), being provided with an internal peripheral shoulder (16) surrounding said folded back rim (13), and being fixed at its exterior periphery by crimping the ring (7) onto the upper edge (18) of the body (2) of the metal container (1).

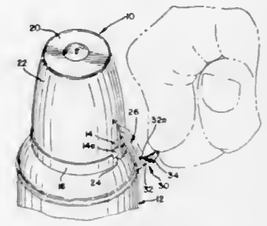
4,821,912
RECLOSABLE SELF-OPENING CAN END
Robert A. Wells, 13 Fairway Dr., Kennesaw, Ga. 30144
Division of Ser. No. 410,422, Aug. 25, 1982, Pat. No. 4,673,099.
This application Jun. 2, 1987, Ser. No. 57,222
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—231 **7 Claims**



1. A selectably reclosable easy-opening container apparatus comprising:
a container wall having an outer surface and an inner surface;
an openable panel member defined in said wall by a selectively separable region of predetermined weakness;
a raised flange on said wall surrounding said separable region;
a unitarily constructed opening and reclosure tab member secured to said wall by first and second attachment means;
said first means located outside said openable panel member to secure the tab member to the wall;
said second means located in said openable panel member and across said region of weakness from said first attachment means to secure the panel member to the tab member;
said opening and reclosure tab member having a closure engaging means selectively operable to engage said raised flange, wherein said raised flange on said wall and said flange engaging means on said tab member form a seal over said openable panel member prior to opening and separation of said openable panel member from said container wall;
said tab member having means confronting said wall in the vicinity of said region of weakness and operative to separate the region of weakness when the tab is first pressed downwardly to separate and displace said openable panel member and is then lifted up a limited distance to pivot said connected tab member and said panel member across said wall; and

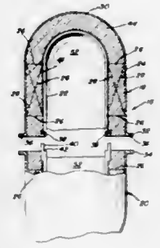
said tab and said opened panel member are thereby pivotable across said end wall around said first attachment means while the second attachment means moves with the tab member and the opened panel member, so as to provide a pour opening in the container wall.

4,821,913
TAMPER EVIDENT COVER
Daniel P. Hidding, Rte. 2, Ridgecroft La., Barrington Hills, Ill. 60010
Filed Apr. 8, 1988, Ser. No. 179,394
Int. Cl.[4] B65D *41/48*
U.S. Cl. 220—270 **3 Claims**



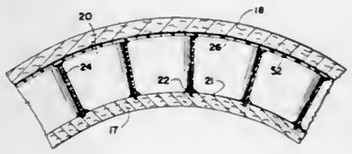
1. For use with a can having a top closure with a surrounding outwardly extending bead and a nozzle extending upwardly through the closure for discharging the contents of the can therethrough, a hollow cap for covering the closure and accommodating the nozzle therewithin, said cap having an open generally circular base portion, a top portion spaced from said base and a sidewall portion extending between said base portion and said top portion, said base portion being adapted to surround the spray can top closure bead and having an inwardly extending flange for engaging the closure bead and holding the cap onto the top closure, and an elongated removable pull-tab formed in said base and sidewall portions and extending from said base portion toward said top along frangible lines defining the sides of said pull-tab portion, said cap sidewall portion being tapered from said base portion to said top portion and being continuous and without discontinuities along the frangible side lines of said removable pull-tab, said pull-tab having an integral grip member at said base portion, the frangible lines defining the sides of said pull-tab angling toward each other and substantially intersecting at the end of the pull tab remote from said base portion and from said grip member, said pull-tab grip member having a leg portion extending outwardly from said pull-tab intermediate said frangible lines and extending axially along said pull-tab for a sufficient distance to provide a fulcrum permitting outward pulling and initial tearing of said pull-tab along said frangible lines when the outer end of said leg portion is moved upwardly, and said grip member having a substantially flat tip portion integral with and extending transversely to the outer end of said leg portion to facilitate manual upward movement of the outer end of said leg portion, whereby said pull-tab may be easily removed and said base portion and adjacent sidewall portion may be spread to permit removal of said inwardly extending base portion flange from the closure bead.

4,821,914
LOW TEMPERATURE STORAGE CONTAINER FOR TRANSPORTING PERISHABLES TO SPACE STATION
James W. Owen, and William G. Dean, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Apr. 1, 1988, Ser. No. 176,545
Int. Cl.[4] B65D *25/18*
U.S. Cl. 220—421 **17 Claims**



1. A container for storing frozen products for long durations, said container comprising two units adopted for connecting together, each of said units comprising an elongated outer shell having an open end and a closed end, an elongated inner shell having an open end and a closed end, said inner shell being disposed within and spaced from said outer shell with the respective closed ends and inner ends in juxtaposition, said inner shell defining a storage chamber for said products, support means for connecting said shells together in spaced apart relationship to provide a hollow between said shells, a multilayer insulation disposed in said hollow, said insulation comprising plastic sheet material having metallic film surfaces for limiting heat transfer by conduction and by radiation between said shells, getter material disposed in said hollow, means for connecting said open ends of the shells of one unit to the open ends of the other unit while communicating the hollow of one unit with the hollow of the other unit, and closeable port means attached to the outer shell of at least one unit and communicating with the hollow therein for evacuating air from the hollow of both units when said units are connected together for providing a vacuum in said hollow.

4,821,915
TWIN WALL FIBERGLASS TANK AND METHOD OF PRODUCING THE SAME
John M. Mayer, Strongsville, Ohio, assignor to Corespan, Inc., Geneva, Ohio
Filed Mar. 9, 1987, Ser. No. 23,475
Int. Cl.[4] B65D *25/18*
U.S. Cl. 220—441 **22 Claims**



1. A multiple wall fiberglass tank structure, comprising
an inner fiberglass wall,
an outer fiberglass wall,

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a preformed core separating said inner wall and said outer wall,

said core including plural elongate, fluted, strip-like, relatively rigid fiberglass members having opposite lateral edges and a flexible, permeable fabric-like mounting means initially attached to a lateral edge of a plurality of said members for effecting generally parallel relative spacing of said plurality of strip-like members,

said members being bonded to said inner wall and to said outer wall, said mounting means comprising permeable material for permitting penetration of resin therethrough during formation of said outer wall to bond said outer wall to said members, and

said mounting means being impregnated with resin to form at least a portion of said outer wall.

4,821,916

DEVICE FOR DISPENSING AND VENDING FLEXIBLE SUPPORTS

Renee Dewaele, 17, rue de la Scierie, 67115 Plobsheim, France

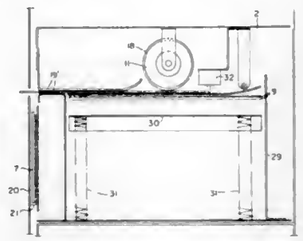
PCT No. PCT/FR86/00266, § 371 Date May 20, 1987, § 102(e) Date May 20, 1987, PCT Pub. No. WO87/00664, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 25, 1986, Ser. No. 44,027

Claims priority, application France, Jul. 26, 1985, 85/11580

Int. Cl.⁴ G07F *11/14*; B65H *1/16*

U.S. Cl. 221—13 **4 Claims**



1. Device for dispensing flexible supports, comprising a juxtaposition and superposition of compartments each enclosing a stack of flexible supports (9), means for the dispensing of individual supports by an assembly (3) for selection of and payment for flexible supports, and a closure (4) for said compartments, said closure having at an upper portion of each compartment (2), a dispensing opening (5), and below this opening (5) a housing (6) for the reception and display of a sample of the flexible supports (7) contained within the corresponding compartment (2), each compartment (2) having a drawer (29) introduced through a rear face of the device (1), the supports (9) being supported within the drawer on a movable base (30) against the action of springs (31), a drive roller (11) with a motor fixed against an upper wall of the compartment (2) and a micro-contact (32) controlling stoppage of the said motor, this micro-contact being disposed behind the roller (11) in the direction of the opening (5).

4,821,917

STORAGE AND DISPENSING MEANS

Leonard C. Brown, Warner Beach, South Africa, assignor to Cornelis Dirk Ferguson, Umkomaas, South Africa

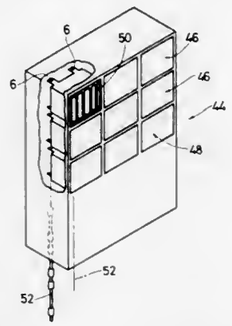
Filed May 28, 1987, Ser. No. 55,167

Claims priority, application South Africa, May 30, 1986, 86/4044

Int. Cl.⁴ A47B *81/00*; A47F *1/00*

U.S. Cl. 221—69 **14 Claims**

1. Storage and dispensing device for a plurality of tape cassettes in a tape cassette dispensing machine comprising a housing; at least one bin (1) having a plurality of sliding compartments (11) arranged to receive tape cassettes side by side therein with one tape cassette in each sliding compartment, the compartments being arranged to be slidable in their own planes between a closed position within the bin in which the compartment interior is inaccessible for removal of a cassette, and a position extended from a side of the bin in which the compartments are accessible for removal and inserting of a cassette; bin mounting formations including two tongues extending from each of the upper and lower bin sides and extending rearwardly from the upper and lower bin sides, to form two pairs



of tongues operatively one above the other, each tongue having an opening therein with a slot extending from the opening through the rear edge, a locking rod for each pair having two spaced apart thickened portions and being arranged to be transversely insertable into the openings of a pair through the slots and being slidable to have the thickened portions within the openings in which position the slots are too narrow to allow transverse withdrawal through the slots, said bin mounting formations and said locking rod cooperating so as to mount said bin in said housing.

4,821,918

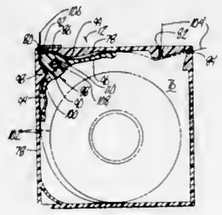
LABEL DISPENSER AND HOLDER

Paul F. Turner, Earlham, Iowa, assignor to Net Associates, Inc., Des Moines, Iowa

Filed May 4, 1987, Ser. No. 45,531

Int. Cl.⁴ B65H *5/28*

U.S. Cl. 221—70 **13 Claims**



9. A label dispenser comprising:

a dispenser box having a pair of opposite side walls positioned parallel and spaced apart with respect to one another, and a continuous edge wall extending between said opposite side walls so as to define an enclosed compartment within said box;

said edge wall having first and second spaced apart elongated slots therein extending perpendicularly to said opposite side walls;

guide means attached within said compartment of said box, said guide means comprising a central portion positioned adjacent and in close spaced relation to said first slot and a pair of leaf portions attached to and extending away from said central portion, said leaf portions being in close spaced relation to said edge wall on opposite sides of said first slot, said pair of leaf portions extending at approximate right angles to one another;

a pair of inwardly extending wall nodes provided on said edge wall on opposite sides of said first slot, said wall nodes extending inwardly from said edge wall toward said leaf portions of said guide means.

4,821,919

APPARATUS FOR STACKING CONICAL OBJECTS

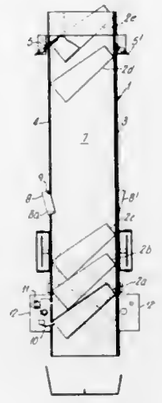
Alan Smith, Accrington, England, assignor to Hollingsworth (UK) Ltd., Accrington, England

Filed Apr. 16, 1987, Ser. No. 39,146

Claims priority, application United Kingdom, May 23, 1986, 8612636

Int. Cl.⁴ B65G *59/06*, *11/20*

U.S. Cl. 221—131 **18 Claims**



1. In combination:

a device for stacking conical objects said device comprising:

column means for stacking said conical objects defining at least one column with a longitudinal axis and having a tapering cross-section defined by a narrower end and a wider end when said cross-section is viewed in plan;

a plurality of generally superposed conical objects each having a wider diameter first end, and a second end and a length, to be stacked in single stacks in said column means, said at least one column having a single said narrower end to accommodate said second ends of the objects in a single stack and a single said wider end to accommodate the wider ends of said objects in said single stack;

said length of said conical objects being greater than a distance between said narrower end and said wider end of said column means; and

first retaining means disposed adjacent said wider end of said column means for engaging said wider diameter end of said conical objects stacked generally superposed in said column means wherein said at least one column is adapted to be disposed adjacent at least one other column to form a row of said columns, each said column in said row being oriented such that its said wider end is adjacent said narrower end of said adjacent column, and its said narrower end is adjacent said wider end of said adjacent column.

4,821,920

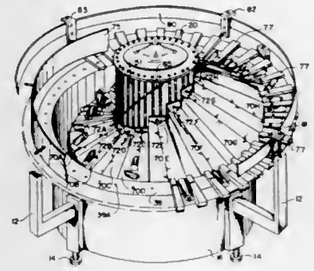
METHOD AND APPARATUS FOR LOADING ARTICLES ONTO FEEDER BY ELEVATING RAMP SEGMENTS

James G. Lin, Springfield, and Werner H. Schmitt, Falls Church, both of Va., assignors to Hoppmann Corporation, Chantilly, Va.

Filed Aug. 28, 1987, Ser. No. 90,685

Int. Cl.⁴ B65H *9/00*

U.S. Cl. 221—167 **28 Claims**



1. An article feeding apparatus for supplying articles comprising:

a base member;

a side wall member having a first surface and a second surface, said first surface being secured to said base member;

a rim member being secured to said second surface of said side wall member;

an elevating turret centrally disposed relative to said base member;

a plurality of inclined ramp segments operatively connected to said elevating turret and extending from said centrally disposed elevating turret towards said side wall member for forming a reservoir area into which articles may be supplied;

means for rotating said base member, side wall member, rim and elevating turret at a predetermined speed; and

elevating means operatively positioned within said elevating turret and operatively connected to said plurality of ramp segments for sequentially elevating predetermined ramp segments while maintaining a constant slope and angle of the ramp segments to permit articles deposited within the reservoir section to be transported by a vertical movement upwardly and to fall by means of gravity outwardly onto the rim.

4,821,921

LIQUID DISPENSING APPARATUS

Garry E. Cartwright, 28 Hathaway Gardens, Waterlooville, Hants, and Paul Palmer, 8 St. Matthews Road, Cosham, Hants, both of England

Continuation-in-part of Ser. No. 635,912, Jul. 30, 1984, abandoned. This application Dec. 19, 1986, Ser. No. 943,411

Claims priority, application United Kingdom, Aug. 1, 1983, 8320655

Int. Cl.⁴ B67D *5/08*

U.S. Cl. 222—65 **11 Claims**

1. Liquid dispensing apparatus comprising:

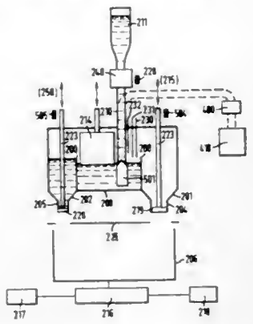
a first stationary liquid dispensing chamber defining therein a volume measure and having an outlet, first valve means for opening and closing the outlet, a prefill chamber, and filling means for filling the first dispensing chamber with liquid from the prefill chamber;

a second stationary liquid dispensing chamber defining therein a volume measure and having an outlet, second valve means for opening and closing the outlet of the second dispensing chamber, said filling means filling the

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second dispensing chamber with liquid from the prefill chamber; and

control means for independently operating the first and second valve means of each dispensing chamber, and for independently operating said filling means from the operation of said first and second valve means such that said control means selectively reciprocates said filling means relative to said first and second stationary liquid dispensing chambers to displace liquid from said prefill chamber into said dispensing chambers, and, selectively dispense



contents from the respective outlet of either or both dispensing chambers by opening said valve means;

said control means being coupled to a sensing means which disables said valve means in the event the filling means fails to displace a sufficient amount of liquid into said dispensing chambers during a cycle;

the first and second dispensing chambers being in communication with the prefill chamber in such a way that liquid in excess of the measure overflows back to the prefill chamber.

4,821,922

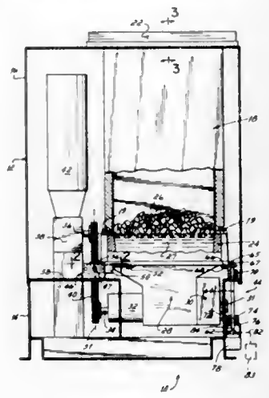
THERMOPLASTIC MELTING APPARATUS WITH A LEVEL INDICATOR

Scott R. Miller, Roswell, and Robert A. Dunn, Marietta, both of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 29, 1987, Ser. No. 114,437

Int. Cl.[4] G01G *13/00, 17/04*

U.S. Cl. 222—77 **10 Claims**



1. Apparatus for converting solid thermoplastic material to molten thermoplastic material, comprising:

a tank for receiving solid thermoplastic material;

melting means connected to said tank for melting the solid thermoplastic material to form molten thermoplastic material;

pump means mounted upon said tank for pumping molten thermoplastic material out of said tank;

drive means mounted independently of said tank;

linkage means drivingly connected between said pump means and said drive means, said linkage means transmitting a drive force from said drive means for operating said pump means;

pivot means connected to one side of said tank for permitting pivotal motion of said tank;

a load cell connected to said tank and being spaced from said pivot means, said load cell being effective to sense said pivotal motion of said tank and provide a corresponding measurement of the quantity of thermoplastic material carried within said tank; and

said pivot means being positioned relative to said linkage means so as to isolate said load cell from forces operating said pump means.

4,821,923

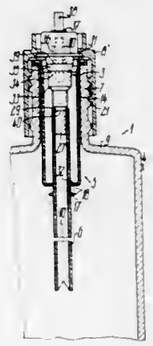
MANUALLY OPERABLE DISPENSER FOR MEDIA WITH MULTIPLE COMPONENTS

Thomas Skorka, Radolfzell, Fed. Rep. of Germany, assignor to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 105,884

Int. Cl.[4] B67B *7/24*

U.S. Cl. 222—80 **29 Claims**



1. A dispenser for media to be mixed from at least two components, comprising:

a main chamber (4) and at least one admixing chamber (5) closed with respect to the main chamber (4);

a closure means (17) associated with said admixing chamber (5) for opening and transferring a component contained in the admixing chamber (5) into the main chamber (4), said closure means (17) providing a closure position, wherein the closure means (17) of at least one of said at least one admixing chambers (5) is provided in a duct connection directly connecting the main chamber (4) to the admixing chamber (5), the closure means (17) being separable from the closure position by means of a predetermined breaking zone (18), the main chamber (4) having a mount (7) for a manually operable discharge means (3) for discharging said media from the main chamber (4);

said discharge means (3) having an inlet and having a riser duct (6), said closure means (17) forming a common construction component with said riser duct (6), the riser duct forming a riser tube, the closure means (17) being provided in collar-like manner on an outer circumference of the riser duct (6).

4,821,924

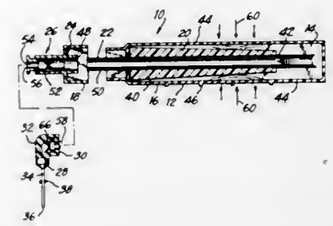
FLEXIBLE CONTAINER HAVING A COMPRESSION LIMITING DEVICE

George Kozam, 234 Clinton Ave., Tenafly, N.J. 07670

Filed Jun. 23, 1986, Ser. No. 877,105

Int. Cl.[4] B65D *1/32*

U.S. Cl. 222—211 **16 Claims**



1. Portable dispensing apparatus for dispensing a first material contained within said apparatus, said apparatus comprising:

a compressible body member having a lower portion;

varying stop means disposed within said body member for limiting the extent to which the container can be compressed;

exit means disposed at an outer surface of said body member for dispensing material; and

a conduit for carrying said material from said body to said exit means.

4,821,925

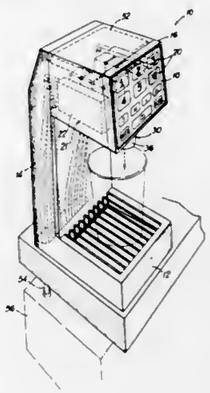
NARROW, MULTIFLAVOR BEVERAGE DISPENSER VALVE ASSEMBLY AND TOWER

Ronald L. Wiley, Marietta; Kathryn M. Chase, Atlanta; Annie T. Ellis, Smyrna, and Roger C. Whigham, Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed May 14, 1987, Ser. No. 50,850

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—129.4 **1 Claim**



1. A multiflavor beverage dispensing valve assembly comprising:

(a) a valve assembly including a flow block having a water conduit and a plurality of syrup conduits therethrough;

(b) said valve assembly having a single nozzle assembly for dispensing any one of a plurality of different beverages therefrom;

(c) said flow block including a flow meter and a flow control means in each of said conduits and wherein each of said flow meter and said flow control means for a particular conduit are combined in a single flow control module;

(d) each of said conduits having a distal end at said nozzle assembly;

(e) said valve assembly including a selection panel having a plurality of beverage selection buttons thereon including one button for each of said syrup conduits; and

(f) said valve assembly including control means for controlling the dispensing of beverages from said valve assembly and for controlling the syrup to water ratio for beverages to be dispensed, said control means being connected to each of said flow meters, each of said flow control means and each of said buttons, said control means including a control board having a microprocessor for controlling the syrup to water ratio, and including only a single interface board having a microprocessor for monitoring all of said selection buttons and for connecting the correct flow meter and flow control means to said control board, said control means also including memory means containing data on a plurality of syrups corresponding to said plurality of syrup conduits including mixture ratio, syrup viscosity and whether carbonated or non-carbonated water is to be used.

4,821,926

DISPENSER OF PASTE-LIKE PRODUCTS, IN PARTICULAR TOOTHPASTE

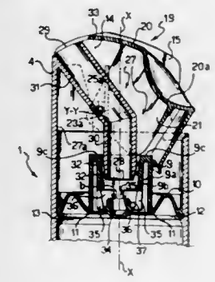
Piero Battegazzore, Alessandria, Italy, assignor to Guala S.p.A., Italy

Filed Apr. 4, 1988, Ser. No. 176,855

Claims priority, application Italy, Apr. 10, 1987, 21386/[U]

Int. Cl.[4] B67D *5/42;* **G01F** *11/00*

U.S. Cl. 222—209 **9 Claims**



1. A dispenser of paste-like products, in particular toothpaste, comprising a cylindrical container having a vertical longitudinal axis, a head located at the container upper end, a bottom wall mounted for tight sliding movement inside the container in one direction toward the head, a pumping member mounted on the container close against the head, a sleeve-like element having a free end and an opposed end associated with the pumping member, an actuating lever for moving the pumping member, trunnions protruding from the lever along a perpendicular pivot axis to the container longitudinal axis, said pivot axis being fixed relatively to the container, said lever being movable angularly about said pivot axis from a home position to a paste delivery position, trunnion bearing seats formed in the head for accomodating said trunnions, a tubular delivery conduit having an inlet mouth and an outlet mouth and being stationarily fixed relative to the head, said tubular delivery conduit being connected to said sleeve-like element at its inlet mouth, a covering eave formed integrally with said actuating lever and extending to cover the outlet mouth when the lever is at its home position, said actuating lever being provided with a cam shaped portion for engagement with said

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free end of the sleeve-like element for sliding the sleeve-like element in an axial direction along the inlet mount upon movement of the actuating lever to its paste delivery position, said pumping member comprising a flexible annular membrane having an outward edge held axially to the cylindrical container and an inward edge connected to said sleeve-like element, and a shutter connected to said sleeve like member for closing the inlet mouth of said delivery conduit when the actuating lever is at said home position and to open it when said actuating lever is moved from said home position to said paste delivery position.

4,821,927

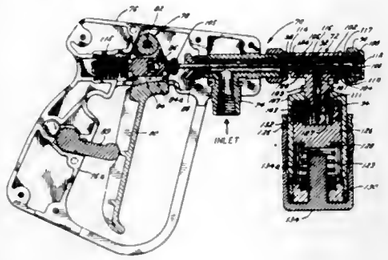
LIQUID DISPENSING GUN

Gary Paulsen, Geneva; Lawrence E. Thomas, Carol Stream; Stephen C. Reif, Naperville, and Wade R. Brown, St. Charles, all of Ill., assignors to Spraying Systems Co., Wheaton, Ill.

Continuation-in-part of Ser. No. 594,654, Apr. 4, 1984, Pat. No. 4,650,099. This application Mar. 16, 1987, Ser. No. 26,085

Int. Cl.[4] G01F *11/06*

U.S. Cl. 222—263 **5 Claims**



1. A gun for repeatedly dispensing precisely metered quantities of liquid from a pressurized source, comprising, in combination:

(a) a hollow body having has a substantially horizontal portion;

(b) said horizontal body portion having a valve chamber with inlet and outlet ports at opposite ends thereof;

(c) means defining a metering chamber disposed in depending relation to said horizontal body portion so that said horizontal body portion and metering chamber defining means form a substantially T-configuration;

(d) said body having a passage communicating between said valve and metering chamber;

(e) a handle coupled to said horizontal body portion and extending in depending relation thereto;

(f) an actuating trigger pivotably mounted adjacent said handle for movement between first and second positions,

(g) said body having a pressurized liquid inlet passage located between s aid handle and valve chamber inlet port and communicating with said inlet port;

(h) an axially slidable valve spool in said valve chamber;

(i) first and second blocking means disposed on said spool for regulating the flow of liquid through said valve chamber inlet and outlet ports;

(j) lost-motion means for permitting relative motion of said first and second blocking means in response to movement of said valve spool;

(k) resilient biasing means for normally urging said valve spool in a direction that causes said first blocking means to engage said outlet ports while said second blocking means is maintained in disengaged relation to said inlet port for permitting the flow of pressurized liquid into said metering chamber; and

(l) means responsive to pivotable movement of said axially moving said spool so as to cause said second blocking means to close said inlet port while said outlet port is closed by said first blocking means thereby isolating a metered quantity of liquid in said metering chamber, and then to move said first blocking means away from said outlet port so as to permit the discharge of said meter quantity of liquid from said metering chamber through said outlet port.

4,821,928

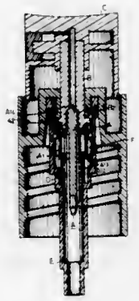
MOVEABLE VALVE STRUCTURE FOR PERFUME ATOMIZERS

Cheng Y. Su, No. 1106, Tung Ta Road, Hsinchu, Taiwan

Filed Sep. 25, 1987, Ser. No. 101,869

Int. Cl.[4] B67D *5/42*

U.S. Cl. 222—321 **3 Claims**



1. A movable valve assembly for a liquid atomizer, comprising:

a piston body which includes a lip portion;

a cylindrical housing receiving a portion of said piston body; and

a movable valve body received by a portion of said cylindrical housing and enclosed thereby, said valve body moved by said piston body within said housing, said movable valve body including a sleeve portion enclosed by said cylindrical housing, said sleeve portion including,

a flattened shoulder receiving said lip portion of said piston assembly and forming a path for liquid flow therebetween, and

a projection extending outwardly from said sleeve portion toward said cylindrical housing, said outward projection forming a sliding contact with said housing; wherein said flattened shoulder further includes a plurality of recesses or protruding ribs.

4,821,929

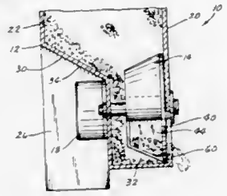
DISPENSER

Chalirmkiert Srisathapat, 8701 Vine Valley Dr., Sun Valley, Calif. 91352

Filed Feb. 19, 1988, Ser. No. 157,556

Int. Cl.[4] G01F *11/10*

U.S. Cl. 222—367 **2 Claims**



1. A dispenser comprising: a container for containing granular or like material and having a bottom and upright front and rear panels and said front panel having a material discharge outlet, a valve disposed within the container for rotation on an axis normal to the panels and above the container bottom for at least partial immersion in the container material, said valve having a circular front wall closely behind the front panel and a rim in the form of the section of a truncated cone coaxial with the valve axis and having its base affixed to the valve front wall and tapering rearwardly to a reduced portion proximate to the rear panel, said rim being interrupted to form an opening heading to the interior of the valve and the valve further having integral therewith a radial wall cooperating with the rim opening and the aforesaid front wall of the valve to form a first pocket for receiving material from the container via said rim opening, the aforesaid front wall having an opening therein which, during part of the rotation of the valve, registers with the outlet to dispense material and during another part of said rotation is blanked off by the front panel while the valve front wall trailing the front wall opening blanks off the outlet, the valve having a second pocket identical to and spaced angularly from the first-named pocket, the valve front wall has a second wall opening like the first-named front wall opening and leading out of the second pocket.

4,821,930

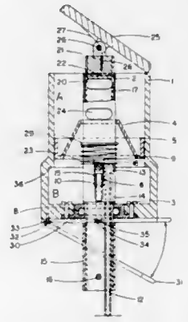
BOTTLE MOUNTED ADJUSTABLE LIQUOR DISPENSING DEVICE

George J. Luine, and John L. Luine, both of 2641 N. Vermont, Los Angeles, Calif. 90027

Filed Apr. 29, 1988, Ser. No. 188,486

Int. Cl.[4] G01F *11/26, 11/28*

U.S. Cl. 222—454 **10 Claims**



1. A bottle mounted liquor dispensing device which comprises: a moveable outer circular housing having a longitudinal axis and a base; a slideable shutoff sleeve with a flange at one end, said shutoff sleeve affixed by its flanged end to an outer face of said base, said axis of said housing coaxial with a longitudinal axis of said sleeve and said base having an opening centrally located; a stationary filling member with an insertion flange member at its lower end thereof; said filling member extending upwardly through said centrally formed opening in said base and through said shutoff sleeve to a releasing cap member at upper end of said outer housing; an outer diameter of said filling member slideably and sealably compatible with an inner diameter of said shutoff sleeve as a slip-fit and further sealably reinforced by an O-ring at lower end of said shutoff sleeve; said filling member having two opposing filling openings one-hundred-and eighty degrees apart at an upper end thereof, said shutoff sleeve forming two opposing filling openings which align with said filling openings in said filling member to form a liquid passage from the bottle through said filling member and said shutoff sleeve when said device is in a rest position; a rearward movement of said housing and said shutoff sleeve mis-aligning said filling openings in said filling member and said shutoff sleeve to close said liquid passage; an air passage member affixed to an inner wall of said filling member and extending downwardly towards said bottle with an opening at the upper end of said air passage member affixed to a formed opening in said filling member at a juncture of said filling member with said base within said housing, said shutoff sleeve having a formed opening at its flanged end, said formed opening in said shutoff sleeve coinciding with said formed opening in said filling member allowing a flow of air from within said outer housing into said air passage member when device is at said rest position; said releasing member attached at its center by a hinge pin member to a filling cap member which closes a terminal end of said filling member, said filling cap member affixed to said filling member by a cap retaining pin through said upper end of said filling member which remains stationary, said releasing member activated by an elbow spring around said hinge pin, one end of said spring being anchored in a form opening in said filling cap member, the other end of said spring acting against the lower half of an inner face of said releasing cap member, said other end of said elbow spring pushing lower periphery of said releasing member outwardly as said outer housing is moved from a closed to an open dispensing position; in the closed position said releasing member being biased towards the upper end of said housing by a biasing spring having upper and lower ends, and positioned around said shutoff sleeve, the upper end of said biasing spring pressing against an upper spring retaining flange around said shutoff sleeve, the lower end of said biasing spring pressing against spring retaining screws anchored in said filling member at the juncture of the inner face of said base of said outer housing and said shutoff sleeve and positioned perpendicular to the longitudinal axis of said filling member placed at equidistant intervals around the perimeter of said said filling member, said screws extending outwardly through elongated openings in said shutoff sleeve which are parallel to the longitudinal axis of said sleeve extending upwardly from inner face of said base of said outer housing to said spring retaining flange and allowing therefore free movement of said shutoff sleeve axially along said retaining screws; the length of said elongated openings being determined by the length of movement of said shutoff sleeve to said filling member between said aligned and said misaligned positions of said filling openings, the width of said elongated openings being determined by diameter size of said spring retaining screws so as to allow a smooth passage of said shutoff sleeve along said retaining screws, said screws further preventing rotation of said outer housing around said filling member.

4,821,931

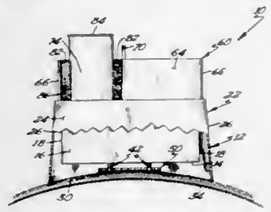
MULTIPURPOSE ARTICLE HOLDING TRAY

Richard E. Johnson, 3304 39th Ave., NE., Minneapolis, Minn. 55421

Filed Jun. 12, 1987, Ser. No. 61,216

Int. Cl.[4] B60R *7/00*

U.S. Cl. 224—42.42 **15 Claims**



2. Multipurpose article holding tray for use in an automobile body comprising, in combination: a traylike receptacle for holding articles, with the traylike receptacle including a bottom wall having a top surface and a bottom surface; and means for removably holding the traylike receptacle to the automo-

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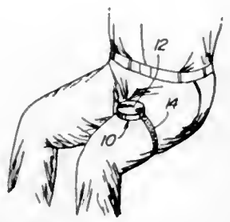
bile body against displacement by forces caused by movement and jarring of the automobile body, with the removably holding means comprising, in combination: at least a first stud integrally formed with the bottom wall of the traylike receptacle and extending generally perpendicularly to the bottom surface, with the stud comprising, in combination: a generally cylindrical portion and a generally spherical portion, with the generally cylindrical portion having a first end, a second end, and a diameter, with the first end of the generally cylindrical portion being integrally formed with the bottom wall of the traylike receptacle, with the generally spherical portion connected to the second end of the generally cylindrical portion, with the generally spherical portion having a diameter larger than the diameter of the generally cylindrical portion; a gripping element; and at least a first aperture formed in the gripping element and having a first portion and a second portion, with the first portion of the aperture having a generally cylindrical shape including a constant diameter slightly larger than the diameter of the generally cylindrical portion of the stud, with the second portion of the aperture interconnected to the first portion and having a frusto-conical shape including a major base with a diameter larger than the diameter of the first portion and a minor base with a diameter generally equal to the diameter of the first portion, with the first portion of the aperture interconnected to the second portion of the aperture at the minor base; and means for securing the gripping element to the automobile body.

4,821,932

HOLDER FOR SHOE POLISH CANS

Jon E. Petryshyn, 512 Sixth Ave. West, Lyndon, Ill. 61261

Filed Apr. 18, 1988, Ser. No. 182,640
Int. Cl.⁴ A45C *13/30*
U.S. Cl. 224—222 **2 Claims**



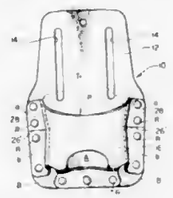
1. A user-supported holder for a can of shoe polish of the type having upper and lower halves separable by an opener key on the lower half, comprising a first cup formed of relatively rigid material and having a circular bottom and a first peripheral wall rigid with and rising from the bottom to a uniform height and terminating in a top rim to define, with the bottom, a first circular cavity dimensioned to relatively tightly receive the lower half of the can of shoe polish, the wall being of such height that the can projects above the rim, a portion of the wall and rim being interrupted to afford a notch for accommodating the opener key of the lower half of the can, a second peripheral wall rigid with and depending from the bottom and providing a second cup substantially duplicative of the first-mentioned cup but of a different diameter for receiving the lower half of a different-sized shoe polish can, the second wall likewise having notch for accommodating the opener-key of the second-mentioned can, and means connected to the holder for attaching the holder to a limb of the user.

4,821,933

LEATHER TAPE RULE HOLDER

Brett P. Seber, Laguna Niguel, Calif., assignor to McGuire-Nicholas Company, Inc., City of Commerce, Calif.

Filed Apr. 18, 1988, Ser. No. 182,859
Int. Cl.⁴ B25B *29/100*
U.S. Cl. 224—248 **4 Claims**



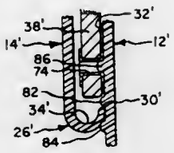
1. In a leather tape rule holder of the type that consists of a back leather piece including means adapted for mounting on the belt of the user of a tape rule to be carried by said holder and a front leather piece forming a tape rule pocket comprising a front wall, side walls and a bottom wall areas of said with peripheral side wall and bottom wall projecting laterally to overlap said back piece and being riveted to the lower peripheral side edge and bottom edge areas, respectively, of said back piece, the improvement comprising the provision of a "v" notch extending across each of the peripheral side wall areas of said front piece at approximately the midpoint thereof with the "v" notch of each peripheral side wall area closed upon the riveting of said front piece to said back piece whereby there is formed on the inner side walls of said pocket pressure detent ridges which together grip a tape rule inserted into said pocket and maintain same therein against accidental dislodgement.

4,821,934

PLASTIC SUPPORT CLIP HAVING A RETAINING HOOK FOR RELEASABLY RETAINING AN ARTICLE WITHIN THE CLIP

Louis F. Alessi, Amherst, and Charles E. Ritchie, Jr., Kenmore, both of N.Y., assignors to Alessi Holsters, Inc., Tonawanda, N.Y.

Filed May 15, 1987, Ser. No. 49,965
Int. Cl.⁴ A44B *13/02, 21/00*
U.S. Cl. 224—252 **9 Claims**



1. A support clip for removably connecting a first article to a second article, said clip comprising:

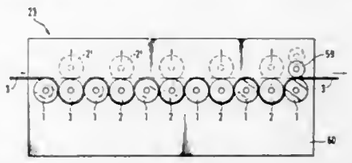
an integrally formed molded plastic body having first and second leg portions arranged in a facing relationship and having first and second ends and facing inner surfaces, a connecting portion joining said first ends and possessing resiliently deformable spring properties for establishing a bias tending to move said second ends of said leg portions towards one another, said first leg portion includes means for attaching said clip to said first article, and a retaining hook carried by said second leg portion to project towards said first leg portion, said hook having a concave surface facing towards said connecting portion and a free end positioned immediately adjacent said inner surface of said first leg portion, said second leg portion defining release means manually engageable by a user to move said retaining hook away from said first leg portion against said bias to permit removable insertion of said second article lengthwise of said first and second leg portions past said retaining hook into a position intermediate said retaining hook and said connecting portion, said first end of said first leg portion includes a projecting portion projecting beyond said connecting portion in a direction away from said second end of said first leg portion and said means for attaching said clip includes at least one mounting aperture extending through said projecting portion.

4,821,935

THREADING APPARATUS FOR FILMS

Hellmut Caroselli, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,533
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1985, 3539591
Int. Cl.⁴ B29D *7/01;* **B65H** *59/10, 59/20*
U.S. Cl. 226—92 **4 Claims**



1. An improved forward stretching machine for the manufacture of oriented thermoplastic films comprising a plurality of individually driven, rotably mounted rolls in cooperating relationship, such that each alternate roll is a stationary roll and every other roll is a lift roll capable of being raised a distance slightly less than the diameter of a cylindrical film threading apparatus, with the proviso that each stationary and lift roll has a groove located on an intake plate of the roll adapted to receive said cylindrical film threading apparatus, such that the grooves of adjacent stationary and raised lift rolls form a channel through which said cylindrical film threading apparatus can pass when the lift rolls are in the raised position, said film threading apparatus being flexible and having a length more than twice the distance between two neighboring rolls so that it is gripped by three rolls and bent between said rolls at the same time as it is transported through said channel, said forward stretching machine further comprising means for inserting said cylindrical film threading apparatus into said channel formed by the stationary and raised lift rolls of the forward stretching machine.

4,821,936

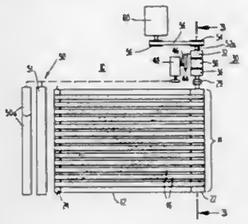
HYDRAULIC INDEX DRIVE SYSTEM

Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 21, 1987, Ser. No. 99,276
Int. Cl.⁴ B65H *20/10;* **F16H** *27/04, 39/04, 39/46*
U.S. Cl. 226—170 **16 Claims**

1. An hydraulic index drive system for indexing a drive roll through a predetermined cycle having dwell and index portions comprising a variable displacement hydraulic pump having a swash plate, a fixed displacement hydraulic motor and an adaptor positioned between said motor and said pump coupling said pump to said hydraulic motor to feed hydraulic fluid to and return hydraulic fluid from said hydraulic motor, a lever on said pump for controlling the position for said swash plate to determine pump displacement, cam means operably connected to said lever for positioning said lever, means for rotating said cam means through one revolution per cycle, said cam means being shaped to include a dwell portion and an index portion, said dwell portion of said cam means corresponding to the dwell portion of the cycle so that there is no pump output during the dwell portion of the cycle and said index portion of said cam means corresponding to the index portion of the cycle so that the output of the pump rises to a set maximum during the index portion of the cycle, whereby the pressure supplied to the motor brings the motor up to maximum speed during the index portion of the cycle and the pressure returned from the motor decelerates the speed of the motor to zero during the dwell portion of the cycle.

9. In a system for intermittently moving a web of material through a machine including conveyor means for receiving the web material and a drive roll for advancing the web material on the conveyor means during a predetermined cycle, each cycle including an index portion and a dwell portion, the improvement comprising an hydraulic index drive system connected to the drive roll, said hydraulic index drive system comprising a variable displacement hydraulic pump having a swash plate, a fixed displacement hydraulic motor and an adaptor positioned between said motor and said pump coupling said pump to said hydraulic motor to feed hydraulic fluid to and return hydraulic fluid from said hydraulic motor, a lever on said pump for controlling the position for said swash plate to determine pump displacement, cam means operably connected to said lever for positioning said lever, means for rotating said cam means through one revolution per cycle, said cam means being shaped to include a dwell portion and an index portion, said dwell portion of said cam means corresponding to less than 50% of the cycle so that there is no pump output during the dwell portion for the cycle and said index portion of said cam means corresponding to more than 50% of the cycle so that the output of the pump rises to a set maximum during the index portion of the cycle, whereby the pressure supplied to the motor brings the conveyor means up to maximum speed during the index portion and the pressure returned from the motor decelerates the speed of the conveyor means to zero during the dwell portion, and a variable speed motor for driving said hydraulic pump at the same speed as the delivery of the web material to the conveyor means.



4,821,937

GUIDE FOR FASTENER DRIVING TOOL

John P. Rafferty, Vancouver, Wash., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Filed Sep. 14, 1987, Ser. No. 96,974
Int. Cl.⁴ B27F *7/02*
U.S. Cl. 227—8 **11 Claims**

1. A fastener driving tool comprising;

a housing having a nose defining a drive track and having a driver element for driving fasteners in a given direction along said drive track into a workpiece;

a safety member carried by said housing for movement relative to said housing in said given direction between a workpiece responsive position extending beyond said nose and an operating position;

safety biasing means operatively connected between said housing and said safety member for urging said safety member toward the workpiece responsive position; and

a workpiece responsive guide assembly for positioning the

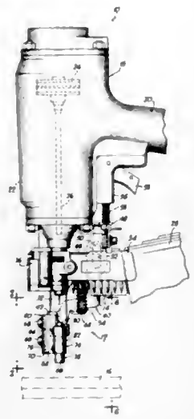
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tool relative to a workpiece, said guide assembly characterized by:

a guide member;

adjustable mounting means supporting said guide member on said safety member adjacent said nose for adjustably mounting said guide member in a selected one of a range of positions arrayed in said given direction for limiting the depth to which a fastener is driven into a workpiece;

an arm extending from said nose in a direction transverse to said given direction;



an edge guide carried by said arm and extending in said given direction beyond said safety member for locating said nose a predetermined distance from an edge of the workpiece;

said edge guide being movably mounted on said arm and retractable in said given direction from a normal position to a retracted position to permit said nose to be located farther than said given direction from the edge of a workpiece; and

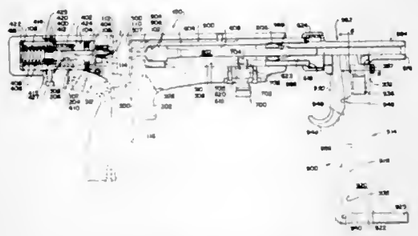
guide biasing means operatively connected between said arm and said edge guide for biasing said edge guide to said normal position.

4,821,938

POWDER-ACTUATED FASTENER DRIVING TOOL

Harry M. Haytayan, 32 Indian Rock Rd., Nashua, N.H. 03063

Filed Nov. 25, 1987, Ser. No. 125,392
Int. Cl.[4] B25C *1/14*
U.S. Cl. 227—10 **11 Claims**



1. In a powder-actuated fastener-driving tool of the type comprising:

(a) a housing having a first opening therein;

(b) a barrel and cylinder assembly comprising a cylinder having a front end, a rear end, and a longitudinally-extending slot and a barrel having a back end and a muzzle end, with said back end of said barrel being secured to said front end of said cylinder so that said barrel and cylinder are coaxially aligned, said assembly being slidably disposed in said first opening and adapted for reciprocal movement in said housing between a rearward position and a forward position;

(c) a piston driver assembly disposed within said hollow barrel and cylinder member and adapted for reciprocal movement therein between a rear position and a forward position;

(d) a cylinder stop assembly mounted to said housing and comprising a yieldable stop means that projects into said slot so as to limit the longitudinal and rotational travel of said barrel and cylinder assembly relative to said housing;

(e) a breech block assembly mounted in said housing adjacent said barrel and cylinder assembly, said breech block assembly comprising a breech block having a central chamber and a longitudinally-extending bore that intersects said central chamber;

(f) firing means for firing a cartridge, said firing means comprising a firing actuator, movable means slidably supporting said actuator, spring means biasing said actuator and said movable means toward said breech block, latch means releasably locking said actuator to said movable means, and a push rod coupled to said movable means and extending through said breech block bore, said push rod being sized so that when the letter is driven rearwardly a selected distance it will cause said movable means to move away from said breech block to a first ready-fire position so as to store energy in said spring means, whereby said spring means can act to drive said actuator forward to fire a cartridge in said breech block when said actuator is released from said latch means;

(g) trigger means for operating said latch means so as to release said firing actuator from said movable means when the latter is in said first ready-fire position so as to permit said spring biasing means to bias said firing actuator toward said breech block; and

(h) a cartridge advancing mechanism for advancing a strip of cartridges as said cylinder member is reciprocated so as to position a cartridge in firing position adjacent said cylinder member and said firing actuator;

the improvement wherein:

said fastener driver tool further comprises force-transmitting means movably disposed in said barrel and cylinder assembly for moving said push rod, said force-transmitting means being reciprocatable relative to said assembly and said housing between a first position in which a front portion of said force-transmitting means extends forwardly of said muzzle end of said barrel and a second position in which said front portion of said force-transmitting means is substantially flush with said muzzle end, said force-transmitting means being constructed and disposed so that (a) it moves said push rod rearwardly said selected distance only when (1) said barrel and cylinder assembly is in said rearward position and (2) said force-transmitting means is in said second position, and (b) movement of said force-transmitting means from said first position to said second position does not cause said barrel and cylinder assembly to move from said forward position toward said rearward position.

4,821,939

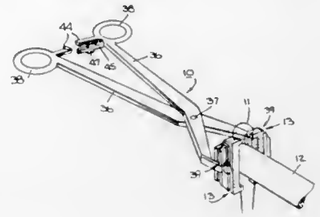
STAPLE CARTRIDGE AND AN ANVILLESS SURGICAL STAPLER

David T. Green, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Sep. 2, 1987, Ser. No. 92,076
Int. Cl.[4] B31B *1/00*
U.S. Cl. 227—19 **40 Claims**

1. A staple cartridge comprising

a housing having a pair of opposed walls defining an internal opening therebetween, each said wall having a first slot extending longitudinally of said opening to receive one side of a staple therein, a second slot of greater width coaxially of said first slot and an inwardly directed lip at one end of said first slot to define an outlet of less width than said opening and a staple in said opening;



a pusher slidingly received in said second slot of each wall and extending across and between said walls for expelling a staple disposed in said slots of said walls through said outlet; and

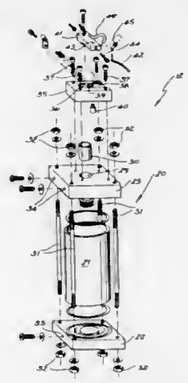
means for moving said pusher from a rest position in said housing to an actuated position adjacent said outlet.

4,821,940

T-NUT INSERTION MACHINE

Alan C. Rotherham, Girraween, Australia, assignor to Tee-Sert Pty. Ltd., Girraween, Australia

Filed Feb. 27, 1987, Ser. No. 20,117
Claims priority, application Australia, Feb. 28, 1986, PH4826
Int. Cl.[4] B23P *19/00*
U.S. Cl. 227—107 **13 Claims**



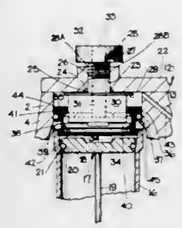
1. A machine to insert "T-nuts" into an object provided with a passage for receiving a portion of a "T-nut" to be fixed to the object, said machine comprising a body; "T-nut" supply means mounted on the body and adapted to locate the "T-nuts", at least one at a time, at a predetermined location; an insertion assembly mounted on said body and positioned to receive the "T-nuts" from said supply means and to fix the "T-nut" to the object so as to project into said passage, said insertion assembly including transfer means mounted on said body adjacent said predetermined location for transferring a "T-nut" from said predetermined location to an insertion location adjacent said predetermined location, and motor means mounted on said body adjacent said insertion location for engaging the "T-nut" at said insertion location so as to apply a force thereto to fix the "T-nut" to said object, wherein said predetermined location is defined by a step terminating a slot against which the "T-nut" is abutted to be located at said predetermined location, and wherein said transfer means includes a nozzle for directing an air jet at the "T-nut", which air jet moves the "T-nut" from said predetermined location to said insertion location, and means for raising the "T-nut" above said step so that said nozzle can move the "T-nut" to said insertion location.

4,821,941

POWER REGULATOR FOR A PNEUMATIC FASTENER DRIVING TOOL

Gilbert A. Cotta, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Aug. 18, 1987, Ser. No. 85,715
Int. Cl.[4] B25C *1/04*
U.S. Cl. 227—130 **22 Claims**



1. A regulator for adjusting the amount of power generated by a pneumatic fastener driving tool of the type having a body connected to a source of air under pressure, a cylinder within said body having an open upper end, a piston/driver assembly in said cylinder, a main valve within said body located above said upper end of said cylinder and shiftable axially of said cylinder between a closed position engaging said upper end of said cylinder and sealing said cylinder from said air under pressure and an open position spaced from said upper end of said cylinder defining an annular opening between said main valve and said upper end of said cylinder allowing said air under pressure to enter said cylinder and shift said piston/driver assembly through a work stroke, and means to shift said main valve between said open and closed positions, said regulator comprising a stop means mounted within said body above said main valve and abuttable by said main valve to determine said open position of said main valve, means to shift said stop means toward and away from said upper cylinder end to adjust said open position of said main valve to thereby adjust the size of said annular opening and said power of said tool, a portion of said shifting means extending through said body, manual actuating means attached to said shifting means exteriorly of said body.

4,821,942

DRIVER FOR SURGICAL MICROSTAPLER

William D. Richards, Medway; Richard A. Clark, Holliston, and John C. Meade, Walpole, all of Mass., assignors to Ophthalmic Ventures Limited Partnership, Norwood, Mass.

Continuation of Ser. No. 906,150, Sep. 11, 1986, abandoned. This application Jul. 11, 1988, Ser. No. 217,554
Int. Cl.[4] B25C *5/00*
U.S. Cl. 227—132 **14 Claims**

1. In combination with a stapler head that has a reciprocally movable staple ram plate for separating a staple from a supply thereof and driving said staple into a selected workpiece,

a stapler driver comprising:

(a) reciprocally movable striker for engaging said staple ram plate and driving said staple ram plate in a first direction,

(b) selectively operable means for causing said striker to move from a first retracted position to a second extended

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position so as to drive said staple ram plate in said first direction, and

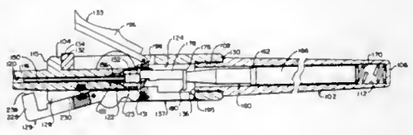
(c) return means for returning said striker from said second extended position to said first retracted position,

said selectively operable means comprising:

(a) an elongated ram having a longitudinal axis,

biasing means for urging said ram from a first retracted position to a second extended position, and

trigger means for (a) moving said ram from said second extended position to said first position and thereafter



maintaining said ram in said first retracted position when said trigger means in actuated a first time, and (b) moving at least a portion of said ram substantially perpendicularly to be longitudinal axis thereof so as to release said ram when said trigger means is actuated a second time so that said biasing means will move said ram from said first retracted position to said second extended position, whereby said ram will engage said striker and move it from its said first retracted position to its said second extended position.

4,821,943

DEVICE FOR WELDING INSIDE A TUBE OF SMALL DIAMETER

Jean-Paul Gaudin, Chassieu, and Jean P. Peyrot, Chilly-Mazarin, both of France, assignors to Framatome, Courbevoie, France

Filed Jul. 7, 1988, Ser. No. 215,972
Claims priority, application France, Jul. 10, 1987, 87 09872
Int. Cl.[4] B23K *37/00, 9/225;* F16L *55/18*
U.S. Cl. 228—45 12 Claims



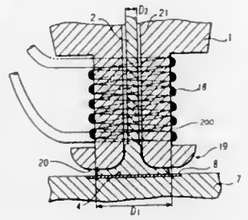
1. Device for rotary welding inside a tube (3) of small diameter, in particular inside a steam generator tube crimped at one of its ends into a tube plate (2) of great thickness, comprising a welding head with a diameter smaller than the internal diameter of the tube comprising a carrier (25) to which a guiding component (29) and a radially directed electrode (30) are fastened, which is fastened to the end of a flexible tubing (16) and by means for moving (18, 21, 19, 57) the welding head in axial translation in the tube (3) and in rotation about the tube axis, wherein the driving means (57) for driving the welding head in rotation is arranged in a motor casing (18) inserted between a first section (16*a*) and a second section (16*b*) of the flexible tubing (16), said second section (16*b*) connecting the casing to a bush (26) in which the carrier (25) of the welding head is rotatably mounted and comprising a flexible member (35) for transmitting rotational motion between the driving means (57) and the carrier (25) of the welding head, and said first section (16*a*) being connected at one of its ends to the motor casing (18) and in engagement with a puller-pusher device (21) for moving the flexible tubing (16) and thereby the welding head (17) and the motor casing (18).

4,821,944

METHOD FOR BONDING A WIRE AND BONDING APPARATUS

Kiyoaki Tsumura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 9, 1988, Ser. No. 229,997
Claims priority, application Japan, Feb. 8, 1988, 63-25687
Int. Cl.[4] B23K *20/10*
U.S. Cl. 228—10 27 Claims



1. A method for bonding a wire comprising the steps of:

a. positioning a metal ball formed at an end of a wire over a material to be bonded;

b. pressing said metal ball against said material to be bonded and plastically deforming said ball on said material to be bonded; and

c. generating heat energy by inducing an eddy current in a portion of said wire above said deformed metal ball,

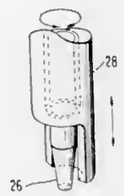
whereby elements of said metal ball and said material to be bonded are mutually diffused by means of said heat energy and said pressing force.

4,821,945

SINGLE LEAD AUTOMATIC CLAMPING AND BONDING SYSTEM

Judith A. Chase, Franklin; Douglas W. Phelps, Jr., Burlington; Robert J. Redmond, and Stephen G. Starr, both of Essex Junction, all of Vt., assignors to International Business Machines, Armonk, N.Y.

Filed Jul. 1, 1987, Ser. No. 68,679
Int. Cl.[4] B23K *31/02, 5/22, 37/00*
U.S. Cl. 228—179 15 Claims



1. Apparatus for bonding a fine wire lead to a terminal comprising an assembly of;

a bonder having a capillary for dispensing a fine wire and bonding it to a terminal, and

a selectively rotated clamp mounted around said capillary bonder, said clamp having leg portion means for clamping said terminal, said clamp movable vertically with respect to said capillary and selectively rotatable around said capillary bonder to position said leg portion means on said terminal.

7. A method of bonding a fine wire to a terminal comprising the steps of:

positioning a single lead clamp over a region where a wire bond is to be made,

lowering said single lead clamp to clamp a terminal,

lowering a capillary of wire bonder adjacent to said single lead clamp and completing said wire bond to said terminal,

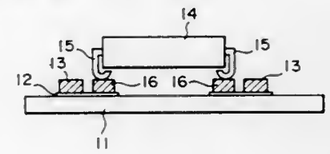
raising said capillary and then said single lead clamp.

4,821,946

SOLDERING METHOD

Seiichi Abe; Kenji Fujita, both of Odawara, and Toshiyuki Nakao, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,201
Claims priority, application Japan, Feb. 19, 1987, 62-34620
Int. Cl.[4] B23K *1/02*
U.S. Cl. 228—180.2 8 Claims



1. A soldering method for connecting by soldering a plurality of lead terminals of an electronic component to conductive terminal connecting portions disposed corresponding to the lead terminals of a substrate, comprising the steps of:

coating each of said terminal connecting portions with connecting paste-like solders corresponding to the lead terminals,

holding each of the lead terminals from each electronic component at positions separated from the corresponding paste-like solders, and

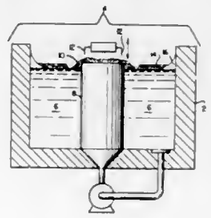
thereafter moving said substrate into a heating atmosphere and melting the paste-like solders, thereby causing the melted paste-like solders to flow from the separate positions on the terminal connecting portions toward the corresponding lead terminals for contacting with the corresponding lead terminals to form a solder fillet between each of the lead terminals and the corresponding terminal connecting portions.

4,821,947

FLUXLESS APPLICATION OF A METAL-COMPRISING COATING

Mark S. Nowotarski, Ossining, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 8, 1988, Ser. No. 154,081
Int. Cl.[4] B23K *1/06, 35/38;* H05K *3/34*
U.S. Cl. 228—219 30 Claims



1. A method of bonding together at least two metal-comprising surfaces, comprising the steps of:

(a) providing at least two essentially flux-free, metal-comprising surfaces to be bonded, wherein said metal-comprising surface is a wettable surface or a surface which becomes wettable upon contact with a metal-comprising bath;

(b) providing a bath which comprises a metal-comprising coating capable of forming at least one compound detrimental to wetting of said wettable surface, wherein at least a portion of said bath is protected from the formation of said at least one compound using an environment which is inert with respect to at least the metal-comprising coating material during the time period of its application; and,

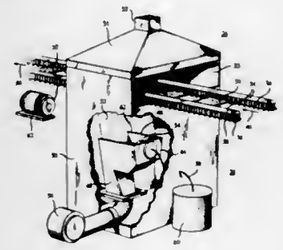
(c) contacting said metal-comprising surface to be bonded with said bath at a location within said bath which is essentially flux-free and which is protected by s aid inert environment, and wherein said environment temperature is sufficiently low that no damage is done to said metal-comprising surfaces and no damage is done to other materials adjacent to said metal-comprising surfaces.

4,821,948

METHOD AND APPARATUS FOR APPLYING FLUX TO A SUBSTRATE

John R. Fisher, Langhorne; Leslie A. Guth, Holland, both of Pa., and James A. Mahler, East Windsor, N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Apr. 6, 1988, Ser. No. 178,114
Int. Cl.[4] B23K *1/20*
U.S. Cl. 228—223 7 Claims



1. A method for fabricating a circuit assembly comprising the steps of:

applying soldering flux to a major surface of a substrate to coat at least one metallized area thereon with flux; and

soldering at least one lead to said metallized area, characterized in that the flux is applied by:

(a) directing a quantity of liquid flux through means for disintegrating the liquid flux into a fog of minute droplets;

(b) injecting the fog of droplets into a laminar gas stream to create a laminar flux spray;

(c) directing the flux spray at the major surface of the substrate to deposit flux thereon; while

(d) simultaneously regulating the concentration of flux solids on the major surface of the substrate to achieve a uniform coating that does not exceed a predetermined concentration.

4,821,949

LOCKING CARTON BOTTOM

Vernard Booth, Americas, Ga., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Feb. 24, 1988, Ser. No. 159,746
Int. Cl.[4] B65D *5/10*
U.S. Cl. 229—157 12 Claims

1. A carton with a self-locking bottom closure comprising:

a pair of opposed sidewalls;

a pair of opposed end walls, said end walls being generally normal to said sidewalls;

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a major closure flap hingedly connected to each of said sidewalls;

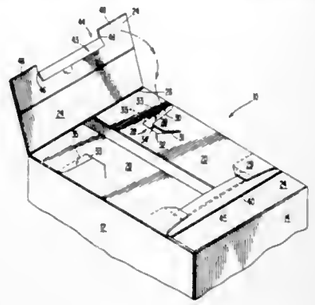
a hinge line at the connection of each of said sidewalls and said major closure flaps thereby hingedly connecting said sidewalls to said major closure flaps;

a minor closure flap hingedly connected to each of said end walls, said minor closure flaps having an outer end portion and an inner end portion, said inner end portion of said minor closure flaps serving to hingedly connected said minor closure flaps to said end walls;

a flap locking segment formed centrally along the outer end portion of each of said minor flaps, said flap locking segments hingedly connected to said minor flaps so that said flap locking segments may be folded inwardly thereby defining openings having spaced locking edges at opposite ends of said openings and projecting tabs on end portions of said minor flaps, said projecting tabs, disposed laterally of said ends of said openings;

a flap locking slit formed in each of said major flaps, each of said flap locking slits having a first portion extending partially across said major flaps and terminating adjacent said hinge line connecting the major flaps to the sidewalls of said carton body;

each of said flap locking slits having a second portion, said second portions providing locking edges extending generally parallel to said hinge lines connecting the major flaps to the sidewalls of said carton body;



a flap retaining segment formed in each of said major closure flaps by the intersection of said first portion and said second portion of each of said flap locking slits for retaining said minor closure flaps in their associated position when inserted into said flap locking slits;

said second portions of said flap locking slits having flexibility means for providing flexibility to said flap retaining segments, said flexibility means comprising an angular slit angularly disposed with respect to said second portion of said flap locking slits;

a single transverse fold line extending the full length of each of said minor flaps to divide each of said minor flaps into outer and inner sections with each inner section being hingedly connected to one of said end walls and said tabs carried by said outer section;

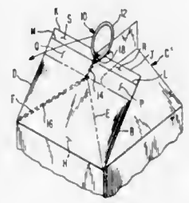
said major and minor closure flaps being folded generally perpendicular to said side and end walls of said carton body, respectively, to form a carton bottom closure with said minor flaps each being folded along said fold line to have said tabs on said outer section inserted through said slits of said major flaps so that said locking edges of said opening in said minor flaps are lockingly engaged with said locking edges of said flap locking slits in said major flaps.

4,821,950

LIQUID CONTAINER OPENING DEVICE

Aracelia Sanchez, and Don O. Cord, both of 800 Hudson Ave., Sarasota, Fla. 34236

Filed Jun. 20, 1988, Ser. No. 208,652
Int. Cl.[4] B65D *5/42*
U.S. Cl. 229—160.2 **5 Claims**



1. In a conventional rectangularly shaped liquid container for milk, juice and the like, having four upstanding sides sealed along their mating upper margins to form a container top, said container formed of folded, thin sheet paper or plastic and having a four sided pour spout formed when said container top is opened for use, with two of said four sides of said pour spout formed by folding in an upper portion of one of the four upstanding sides to form an inner triangular panel having an inside surface and attached to said one side along a fold line, the improvement comprising:

a container opening device having a first portion adhesively connected to said inside surface of said inner triangular panel and extending to said pour spout and a second portion integral with said first portion and extending freely from a juncture between said two sides of said pour spout structured to be hand-grasped and pulled;

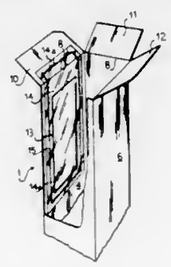
said first portion adapted, when said second portion is pulled laterally away from said pour spout, to forceably separate said sealed, mating upper margins of said container top.

4,821,951

CASE FOR AUTOMATICALLY PACKAGING ELONGATE PASTA PRODUCTS THEREIN

Arnaldo Franzoni, V.le Riccardo Barilla, 3/A, 43100 Parma, Italy

Filed Mar. 11, 1987, Ser. No. 24,135
Int. Cl.[4] B65D *5/42*
U.S. Cl. 229—162 **1 Claim**



1. A case for automatically packaging elongate pasta products therein, of a type which comprises:

a die cutting wherein there are defined, as by fold lines, sidewalls for said case and closure flaps therefor extending from opposed sides of said sidewalls,

a window formed in a first one of said sidewalls,

a clear sheet attached to only said first sidewall and to only one adjacent closure flap which extends from said first sidewall,

a cement bead laid on said sidewall in proximity of said window and on said flap forming a continuous rectangular pattern crossed by a fold line extending between said sidewall and said flap,

said clear sheet having dimensions exceeding said pattern thereby forming an unrestrained peripheral skirt,

wherein said flap can be outwardly splayed relative to said sidewall when said case is assembled to prevent said clear sheet and said unrestrained peripheral skirt from interfering with operations for filling said case,

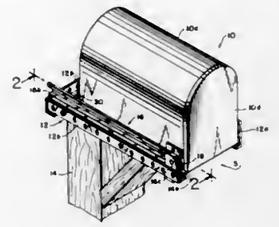
wherein said fold lines are positioned so as to form an elongated rectangular box having a window on one sidewall when said die cutting is folded along said fold lines.

4,821,952

AUTOMATICALLY RETRACTABLE RURAL MAIL BOX

Laura Deciutiis, Woodside Dr., Dover Plains, N.Y. 12522

Filed Jan. 29, 1988, Ser. No. 150,036
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—17 **12 Claims**



1. A rural mailbox comprising a housing having a bottom panel, a rear panel and a roof portion defining an enclosure for receiving mail through an opening at an end of said housing opposite to said rear panel, and door member pivotally mounted at said opening for movement between a closed position to close said opening and an open position permitting access to said enclosure through said opening; a generally fixed frame; means for movably mounting said housing on said fixed frame for movement between a normally retracted position substantially coextensive with said frame and an extended position substantially displaced from said frame to facilitate the placing of mail into said enclosure by a letter carrier making delivery by vehicles when displacement is in the direction of the road; biasing means acting between said fixed frame and said housing for urging said housing to revert to said retracted position, locking means for locking said housing in said extended position against the action of said biasing means; and unlocking means responsive to closure of said door member for unlocking said locking means to thereby cause said housing to revert to said retracted position due to the action of said biasing means, whereby said housing can be extended to facilitate insertion of mail from a rural road and thereafter automatically returned to its normal retracted position subsequent to insertion of the mail into the mailbox and closure of said door member.

4,821,953

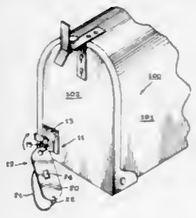
MAILBOX GRAVITY SIGNALLING APPARATUS

John Poloha, 7839 Manor Dr., West Chester, Ohio 45069

Filed Sep. 28, 1988, Ser. No. 250,050
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—35 **6 Claims**

1. A mailbox signalling apparatus for use with mailboxes having both upwardly and outwardly swinging hinged closure members and downwardly and outwardly swinging hinged closure members wherein the apparatus comprises:

a suspension unit including a generally flat suspension member adapted to be secured to the hinged closure member of a mailbox, wherein, the suspension member is provided with a support arm that is disposed at an angle to the face



of the suspension member and at least one elongated contoured slot disposed proximate the support arm; and,

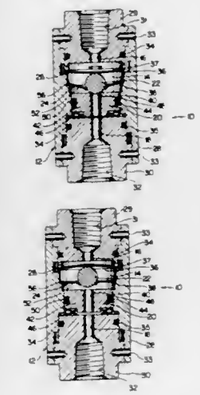
a signal unit operatively attached to the suspension unit and including an attachment ring that is dimensioned to be selectively received over the support arm and within the at least one elongated slot.

4,821,954

THERMALLY ACTIVATED SNAP-ACTION VALVE

Thomas H. Bowder, Coventry, R.I., assignor to Elmwood Sensors, Inc., Pawtucket, R.I.

Filed May 31, 1988, Ser. No. 200,046
Int. Cl.[4] G05D *23/10*
U.S. Cl. 236—48 R **7 Claims**



1. A thermally activated snap-action valve comprising a valve body having an interior cavity therein and inlet and outlet passages which communicate with said cavity, a valve seat adjacent the inner end of said outlet passage, a ball element in said cavity positionable in a closed position wherein it is received in said valve seat for obstructing the flow of a fluid through said valve seat and outwardly through said outlet passage, resilient positioning means in said cavity positioning said ball element so that it is normally disposed in an open position wherein it is spaced inwardly from said valve seat but so that it is resilient movable to said closed position, and a bimetallic disc operative with a snap action in response to a predetermined temperature condition, said valve body having a disc shoulder formed therein, said bimetallic disc being received on said shoulder and communicating with said ball

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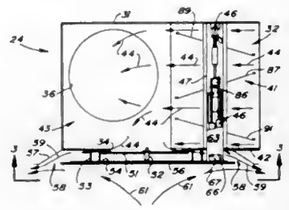
element for moving same from the open position thereof to the closed position thereof in response to said temperature condition, said valve body also having a plurality of fluid passages formed therein at spaced location around the perimeter of said disc, fluid passing through said fluid passages as it passes through said cavity from said inlet passage to said outlet passage, said fluid passages cooperating to maintain the fluid pressures on opposite sides of said disc substantially equal.

4,821,955

THERMALLY-POWERED ACTIVE MASTER AND PASSIVE SATELLITE AIR DIFFUSER SYSTEM

James R. Kline, Moraga, and Robert S. Hunka, Berkeley, both of Calif., assignors to Acutherm, Ltd., Emeryville, Calif.

Filed Jan. 29, 1988, Ser. No. 149,704
Int. Cl.[4] F24F *13/14*
U.S. Cl. 236—49.3 **17 Claims**



1. A thermally-powered, master diffuser comprising:
a diffuser housing having an air supply inlet for receipt of supply air, into said housing, an air discharge master outlet for the discharge of air from said housing into a space outside said housing, and an air discharge auxiliary outlet for discharge of air from said housing to a slave diffuser to be coupled to said auxiliary outlet;
a damper assembly movably mounted in said housing at a position between said supply inlet and both of said master outlet and said auxiliary outlet for simultaneous control of the flow of air from said supply inlet into said housing and out of said housing through said master outlet and said auxiliary outlet;
thermal sensor-actuator means mounted proximate said master outlet and said damper assembly and responsive to sensed air temperature to move said damper assembly to simultaneously modulate the air flow discharged from said master outlet and said auxiliary outlet; and
air induction means positioned proximate said sensor-actuator means and inducing the flow of air from said space to said sensor-actuator means for control of the position of said damper assembly by sensing the temperature of air from said space.

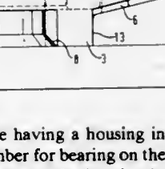
4,821,956

METHOD FOR ADJUSTING THE TEMPERATURE IN A VEHICLE AND VEHICLE PROVIDED WITH SUCH A TEMPERATURE ADJUSTMENT

Rubertus J. P. van Kuik, Bachlaan 43, 5707 RN Helmond, Netherlands

Continuation of Ser. No. 797,850, Nov. 14, 1985, abandoned.
This application Sep. 29, 1987, Ser. No. 102,169
Claims priority, application Netherlands, Nov. 17, 1984, 8403512
Int. Cl.[4] B60H *1/26*
U.S. Cl. 237—12.3 A **28 Claims**

1. A heating system for an enclosed vehicle having an engine, said vehicle including a roof, a floor opposite said roof, longitudinal side walls joining said floors and said roof, a front driver's section between said longitudinal side walls and said roof and said floor, and a rear enclosure opposite said front driver section and between said longitudinal side walls, said roof and said floor, said heating system comprising:
air supply ducts extending within said vehicle;
heating devices located generally rearwardly of said vehicle and in the vicinity of said floor and said longitudinal side walls, said heating devices being operable with said ducts such that air passing through said ducts is heated by said heating devices;
a suction pipe extending transverse of said side walls and near said floor, said suction pipe communicating with air outside of said vehicle;



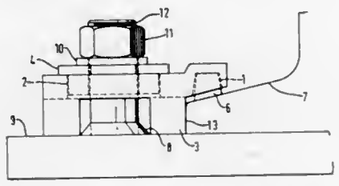
fans connected between said suction pipe and said air ducts and between the inside of said vehicle and said air ducts, said fans being located near said floor and acting to suck air from said suction pipe and the inside of said vehicle and blow it into said air ducts past said heating devices;
temperature sensors distributed about the inside of the vehicle, said sensors being operable to reduce or increase the blowing capabilities of a respective one of said fans to control the amount of air being blown into said ducts.

4,821,957

RESILIENT MATERIAL HOUSING IN THE NOSE OF A RAIL ANCHORAGE

Godfrey M. O. Molyneux, "Burway", Rudford, Gloucester, England GL2 8DY

Filed Oct. 9, 1987, Ser. No. 107,385
Claims priority, application United Kingdom, Oct. 13, 1986, 8624468
Int. Cl.[4] E01B *9/00*
U.S. Cl. 238—317 **9 Claims**



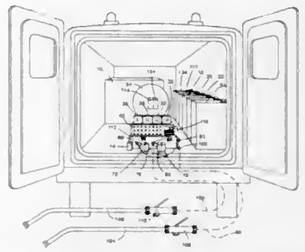
1. A rail anchorage having a housing in which there is received a resilient member for bearing on the flange of a rail that the anchorage is to secure, the housing being formed with a pocket portion having sides which receives said resilient member, said resilient member having sides which are adjacent said sides of said pocket portion, said sides of one of said resilient member and said pocket portion being inclined whereby there is produced a wedging action on the resilient member during use of the rail anchorage when the member bears on the rail flange.

4,821,958

MOBILE PRESSURE CLEANING UNIT

Detmer B. Shaffer, Garrettsville, Ohio, assignor to Sparkle Wash, Inc., Bedford Heights, Ohio

Filed Sep. 3, 1987, Ser. No. 92,617
Int. Cl.[4] B05B *1/24;* **E01H** *3/02*
U.S. Cl. 239—131 **18 Claims**



18. A washing and treating unit comprising a water source; a plurality of liquid additive tanks; a water and additive mixing means connected to the water source; an additive selection means, wherein said selection means communicates sequentially with the additive tanks in a known repeating sequence, said selection means also communicating with the mixing means; a main pump communicating with the mixing means, whereby liquid is drawn from the water source and one of said additive tanks; a main pump unloader valve communicating with the main pump output, said valve causing the output of the main pump to recirculate to the main pump input when the output pressure of the main pump exceeds a known value; a spraying means communicating with the unloader valve, whereby liquid under pressure from the main pump may be sprayed; a pressure sensing means operably connected to the unloader valve and the selection means, said pressure sensing means being an integral portion of said unloader valve, wherein a pressure change in the output of the main pump causes the selection means to advance to the next position in the sequence; a rinse pump connected between the water source and an additional spraying means, whereby rinse water under pressure from the rinse pump may be sprayed; and a liquid heating means insertable between the water source and the spraying means, said heating means comprising a combustion air blower, a fuel pump, and a heating fuel ignition means having an electrical oscillator powered by low voltage direct current, a step-up transformer operably connected to the output of the oscillator, and a spark gap means operably connected to the output of the transformer, whereby a high voltage spark is supplied to ignite heating fuel, wherein said main pump, rinse pump, blower, and fuel pump share a single driving means which is operably connected thereto.

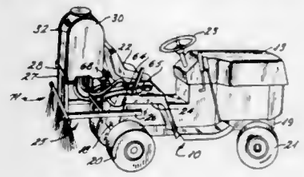
4,821,959

PUMP AND SPRAYER ATTACHMENTS FOR LAWN MOWERS

Henry A. Browing, Rt. 1, P.O. Box 90, Quitman, Ga. 31643

Filed Jul. 30, 1987, Ser. No. 79,424
Int. Cl.[4] A01D *34/00;* **F04B** *17/00*
U.S. Cl. 239—121 **22 Claims**

1. A combination lawn mower and pump apparatus comprising a lawn mower having a chassis and an engine mounted to said chassis, a crank shaft mounted within said engine and having an outer end portion extending vertically upwardly with respect to said engine, a connector means having first and second end portions, said first end portion of said connector means being mounted to said outer end of said crank shaft so as to be in axial alignment therewith, a pump means supported by said engine, said pump means having a housing having an inlet and discharge port and a drive shaft having a driven end portion, said driven end portion of said drive shaft being connected to said second end portion of said connector means,



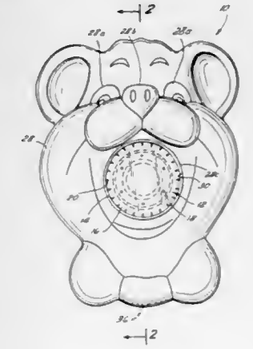
whereby said drive shaft of said pump means is powered by being directly driven by said crank shaft of said lawn mower.

4,821,960

SHOWER HEAD AND DECORATIVE COVERING THEREFOR

Budd S. Goldman, 43 Stanford Ct., Wantagh, N.Y. 11793

Filed Apr. 7, 1988, Ser. No. 178,494
Int. Cl.[4] B05B *15/00*
U.S. Cl. 239—211 **30 Claims**



1. A covering for a shower head, comprising:
a hollow body;
a through hole extending through said hollow body, said through hole having dimensions to permit receipt of said shower head therein;
first bearing means formed in said hollow body for contactingly engaging the shower head, said first bearing means defining a portion of said through hole; and
second bearing means formed in said hollow body in spaced relation to said first bearing means for contactingly engaging the shower head, said second bearing means defining another portion of said through hole;
said hollow body having a hollow portion between said first and second bearing means which is spaced from and out of contact with said shower head, said hollow portion surrounding at least a portion of the length of said shower head;
wherein said first and second bearing means stably support said covering on said shower head.

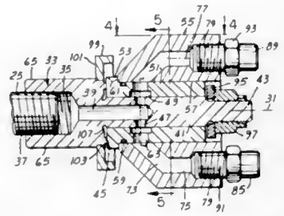
VOL 1101 ISS 3 AP 18 1989 UMI

4,821,961

SELF-ROTATING NOZZLE

Forrest A. Shook, Fenton, Mich., assignor to NLB Corp., Wixom, Mich.

Filed Mar. 31, 1988, Ser. No. 175,805
Int. Cl.[4] B05B *3/06, 7/02*
U.S. Cl. 239—253 **16 Claims**



16. A self-rotating nozzle comprising a hollow shaft adapted for connection to a source of pressurized fluid;

a body having an axial bore upon a central axis secured over one end of said shaft, and having a counterbore;

a shank extending from said body in which said counterbore extends;

said counterbore terminating in at least one inner radial port;

an end portion on one end of the shank;

a head bearing against said body and journaled upon said shank for rotation upon the central axis;

fastener means upon said shank end portion retaining said head against axial movement in one direction relative to said body;

at least one jet flow orifice mounted upon outer portions of said head extending generally parallel to said central axis inclined at a small acute angle to axes parallel to said central axis to provide a rotational reactive power torque to said head;

at least one fluid passage in said head at one end communicating with said radial port and at the other end communicating with said orifice, said orifice adapted to provide high-velocity streams of pressurized fluid upon a surface to be cleanede;

an annular flange projecting radially from said body and secured thereto, said annular flange operably engaging said bead at the second axial direction relative to said body;

pressure fluids from said inner radial ports escaping axially along said shank and head for lubricating the head;

said annular flange with said head defining a pressure chamber acting upon one end of said head to bias the head towards said shank end portion.

4,821,962

PROPELLER NOZZLES THEREBY REDUCING LATERAL FORCES

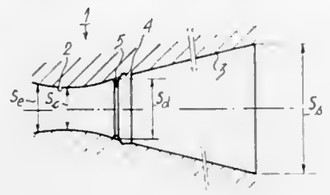
Anne Venables, Boissy l'Aillerie; Dominique Regard, Bourg la Reine, and Gérard Laruelle, Le Plessis Robinson, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales ONERA Chatilloo, France

Filed Jul. 29, 1987, Ser. No. 79,016
Claims priority, application France, Aug. 4, 1986, 86 11269
Int. Cl.[4] B64D *33/04;* **B63H** *11/10*
U.S. Cl. 239—265.15 **7 Claims**

1. An expanded propeller nozzle, comprising

(a) a revolution pipe through which a gaseous fluid flows including a throat portion having a minimum cross-section and a divergent portion having an outlet of maximum cross-section the configuration of said pipe throat and divergent portions producing dissymmetric fluid separation relative to the longitudinal axis of said pipe at an area of said divergent portion downstream of said throat portion during a primary phase of gaseous fluid flow through said pipe of a duration less than 50 ms; and

(b) annular stabilizing means arranged about the inner surface of said divergent portion at a distance from said throat portion between 0.5 and 0.7 times the inner diameter of said throat section and extending into the path of flow of the gaseous fluid, said stabilizing means having an inner diameter greater than that of said throat section for rendering said fluid separation stable, symmetrical, and coaxial with respect to the longitudinal axis.

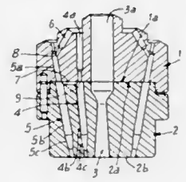


4,821,963

STEELWORKS CUTTING NOZZLE WITH A DOUBLE HEATING RING

Michel Arnout, Franconville; Patrick Fonteneau, Eaubonne, and Didier Lasnier, Cergy, all of France, assignors to L'Air Liquide, Paris, France

Filed Jul. 30, 1987, Ser. No. 79,494
Claims priority, application France, Jul. 30, 1986, 86 11008
Int. Cl.[4] F23D *13/32*
U.S. Cl. 239—419.3 **6 Claims**



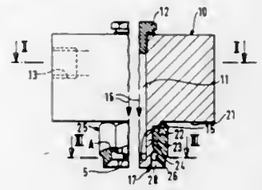
1. A steelworks cutting nozzle providing a cutting jet and double heating rings, namely an oxidizing outer heating ring for receiving oxygen and a carburizing inner heating ring for receiving fuel, said rings surrounding the cutting jet, said nozzle having a longitudinal axis and comprising two parts respectively forming a unit of injectors and a cutting unit in adjoining relation to each other in a transverse joint plane, said units defining a central cutting passageway for producing said cutting jet and, disposed around said central cutting passageway, two arrangements of passageways spaced apart around said axis of the nozzle, namely a first arrangement of outer passageways for producing said oxidizing outer heating ring and a second arrangement of inner passageways for producing said carburizing inner heating ring the nozzle further comprising fuel gas supply conduits in the injector unit for supplying fuel to the outer passageways, and means for establishing communication between the outer passageways and the inner passageways so as to supply to the inner passageways a small quantity of oxygen from the outer passageways by way of an oxy-fuel mixture supply groove.

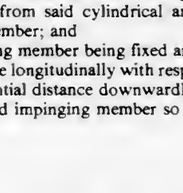
4,821,964

TWO-MATERIAL ATOMIZING NOZZLE TO PRODUCE A SOLID-CONE JET

Sepp Mezger, Eningen, and Werner Raissle, Metzingen, both of Fed. Rep. of Germany, assignors to Lechler GmbH & Co. KG, Fellbach, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,018
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706694
Int. Cl.[4] B05B *7/04*
U.S. Cl. 239—432 **11 Claims**





1. A binary atomizing nozzle, comprising:

(a) a housing;

(b) said housing having a passageway having an upper portion and a lower portion and a longitudinal axis;

(c) a gas inlet and a liquid inlet connected to said housing and opening into said passageway upper portion for mixing said gas and liquid;

(d) said lower portion of said passageway having mounted thereon a movable outer sleeve surrounding said passageway lower portion and having a retracted and an extended position relative to said housing;

(e) said passageway including at said lower portion a mixture impinging member at the bottom of said passageway and having means for projecting said mixture radially outwardly and generally transversely to said passageway longitudinal axis and beyond said impinging member and said projecting means;

(f) said outer sleeve including a cylindrical annular inside wall having an upper and lower end, spaced outwardly from said impinging member and said projecting means a substantial distance and extending parallel to said longitudinal axis;

(g) said outer sleeve including a frusto-conical annular inside wall connected to said lower end of said cylindrical annular inside wall and flaring outwardly and downwardly from said cylindrical annular inside wall and having a bottom edge;

(h) said impinging member having a bottom outer surface and a cylindrical annular wall extending upwardly from said bottom surface;

(i) said frusto-conical annular wall being spaced outwardly and radially from said cylindrical annular wall of said impinging member; and

(j) said impinging member being fixed and said outer sleeve being movable longitudinally with respect to said passageway a substantial distance downwardly from said bottom surface of said impinging member so as to extend below said bottom surface when in its greatest extended position and having its bottom edge substantially even with said bottom surface of said impinging member when in its uppermost retracted position.

4,821,965

SELF-LEVELING DROPPED WHEEL-LINE IRRIGATION APPARATUS

Ann J. Smith, HC 79 Box 2175, Oreana, Id. 83650

Filed Apr. 18, 1988, Ser. No. 182,636
Int. Cl.[4] A01G *25/09;* **B05B** *3/04, 3/18, 15/06*
U.S. Cl. 239—741 **14 Claims**



9. Self leveling dropped line irrigation apparatus comprising:

a plurality of laterally spaced wheels;

an elongated pipeline suspended by and between said wheels, said pipeline defining a plurality of adjacent main line sections each having a substantially horizontal longitudinal axis, and a plurality of dropped line sections, each dropped line section extending between and below said adjacent main line sections to define a substantially U-shaped cradle;

a plurality of trunk lines, each trunk line in fluid communication with and mounted upon said pipeline by first bearing means having an axis substantially coaxial with the longitudinal axis of said main line sections for free rotation of said trunk line and each trunk line extending below said adjacent main line sections and above each respective dropped line section; and

a plurality of sprinklers, each of said sprinklers rotatably mounted about a vertical axis on the top surface of one of said trunk line; the center of gravity of each sprinkler and its respective trunk line being such as to hold said sprinkler in an erect, upright position within its respective cradle, and each of said sprinklers including at least one nozzle, each nozzle having an inlet port and a discharge port, the inlet port of each nozzle being located at or below the horizontal axis of said first bearing means by which it is supported.

4,821,966

GRINDING MACHINE

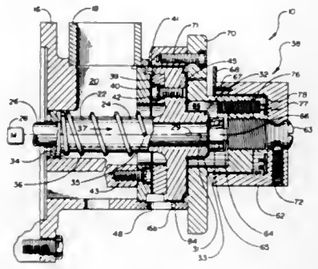
Daniel R. Ephraim, Glencoe, and Philip C. Ephraim, Evanston, both of Ill., assignors to Grinders, Inc., Chicago, Ill.

Filed Oct. 8, 1987, Ser. No. 105,823
Int. Cl.[4] B02C *7/14*
U.S. Cl. 241—55 **1 Claim**

1. A grinder comprising a housing having an inlet and an outlet, a first grinding burr fixedly mounted on said housing and defining a first grinding face, an axially adjustable rotor assembly having two main faces and including a second grinding burr disposed on one face of the rotor assembly and defining a second grinding face facing said first grinding face, means for moving the position of said rotor assembly to adjust the spacing between said first and second grinding faces to adjust the coarseness of the grind to be produced by the grinding burrs, including a spring means having one end secured to said rotor assembly and its other end contacting said housing for bearing said rotor assembly away from said first grinding face and further includes an adjusting mechanism for determining the movement of said rotor assembly in response to said spring means to adjust the coarseness of the grind to be produced by

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the grinding burrs, the other face of the rotor assembly facing a housing cavity containing bearings and adjustable mechanisms and defining a plurality of generally spirally disposed vanes, each projecting in a generally outward direction outwardly of the second grinding burr secured to said rotor assembly and terminating in a peripheral edge closely confronting a surface defining the housing cavity, the forward faces of



the vanes closely confronting a surface of the housing defining the cavity, and deep cavities in the rotor face between the vanes, the bases of which are distant from the surface of the housing defining the cavity, whereby the vaned rotor prevents the collection of finely ground material in the housing cavity to prevent fouling of the bearings and adjustable mechanisms disposed therein and promotes discharge of the ground material through the housing outlet.

4,821,967

PAPER SHREDDER PAPER FEEDING SYSTEM

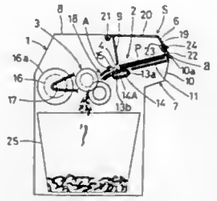
Hiroshi Moriyama, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1987, Ser. No. 103,300

Claims priority, application Japan, Oct. 3, 1986, 61-152798[U]

Int. Cl.⁴ B02C *18/22*

U.S. Cl. 241—37.5 **2 Claims**



1. A paper shredding system comprising:

a shredder main body;

a paper shredding cutter;

a paper set block provided in said shredder main body;

a paper feed opening formed within said paper set block on the shredding cutter side of said main body;

paper transport means for sending paper automatically through said paper feed opening to said paper shredding cutter;

a rotatably mounted cover for opening and closing said paper set block for enclosing and shielding said paper set block and said paper feed opening, said cover having a front section for covering a front side of said paper set block when said cover is closed;

locking means for locking said cover in a closed position; and

a paper insertion opening provided in said cover for inserting paper into said paper set block without opening said cover, said paper insertion opening being formed in an upper part of a front section of said cover such that paper to be shredded may be inserted into said paper set block during a paper shredding operation through said paper insertion opening while said cover is locked in said closed position, said inserted papers being placed on top of the papers already present and remaining in said set block.

4,821,968

HOPPER FOR INSERTING FOODSTUFFS INTO A FOOD PROCESSOR

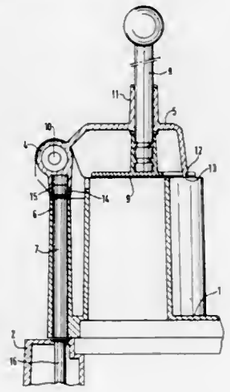
Michel Fleche, Blanzy, France, assignor to Robot Coupe S.A., Montceau Les Mines, France

Filed Jun. 23, 1987, Ser. No. 65,484

Claims priority, application France, Jul. 16, 1986, 86 10323

Int. Cl.⁴ B02C *25/00*

U.S. Cl. 241—37.5 **5 Claims**



1. A hopper for inserting foodstuffs into a food processor apparatus comprising a base which includes an electric motor whose shaft projects through the surface of the base, a bowl removably mounted on said base, and a cover capable of being locked onto the bowl, the cover having an opening surrounded by a chute, and a pusher capable of being inserted into the chute in order to press against food, the hopper including the improvement whereby a pusher support is pivotally mounted at the top of the chute, said support slidably receiving a pusher rod and said pusher rod being terminated by a blade whose section is substantially equal to the inside section of the chute, said blade being capable of being engaged in said chute such that the edges of said blade are completely within said chute only when said pusher rod is in a raised position and said hopper having a means such that said motor is capable of operating only when said pusher support is in a lowered position.

4,821,969

ALUMINUM CAN CRUSHER

Vernon J. Fox, and Darrell G. Fox, both of Langdon, N. Dak., assignors to Richard W. Fox, Grand Forks, N. Dak., a part interest

Filed Jun. 3, 1988, Ser. No. 202,228

Int. Cl.⁴ B02L *1/04*

U.S. Cl. 241—99 **6 Claims**

1. A crusher for elongate cans having frangible side walls, said crusher including:

(a) a main frame;

(b) a semicylindrical compaction chamber integrally mounted to said frame, said chamber being open upwardly and having a first open inner end, a second outer end and a first longitudinally extending axis, the inner diameter of said chamber about said axis being at least as large as the outer diameter of the thickest can to be crushed;

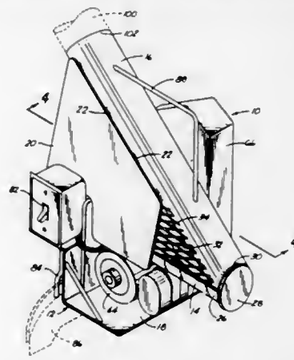
(c) an anvil plate rigidly mounted to the frame in transverse aligned relation to the second outer end of the chamber;

(d) a ram mounted to slide in said chamber between a first position spaced from the anvil plate by a distance at least sufficient to permit the longest can to be crushed to enter the chamber lengthwise and a second position spaced from the anvil at a distance no greater than the final axial dimension of the bulkiest can to be crushed;

(e) said chamber being provided with a bottom opening adjacent the anvil plate, said opening being of size and configuration to allow a crushed can to move by gravity from the chamber after it has been crushed and as said ram begins to move from said second toward said first position;

(f) means for driving the ram between its first and second positions, said means including a ram rod extending integrally from the ram in direction away from the anvil plate;

(g) a cylindrical can holding feed tube for receiving, end to end, a plurality of cans to be crushed, said feed tube having a second longitudinal axis, the feed tube being supported on said frame so that its second longitudinal axis lies in the same vertical plane and above the first longitudi-



nal axis of the compaction chamber, said tube opening into the compaction chamber in position so that a can to be crushed can pass by gravity down the feed tube and into the chamber to position adjacent the anvil plate, the second longitudinal tube axis lying at an acute angle with respect to the horizontal and at an acute angle with respect to and above the first longitudinal compaction chamber axis, said feed tube being provided with a skewer receiving opening therein;

(h) said means for driving the ram including:

(1) a motor mounted on said frame and having a motor driven shaft lying in normal relation to a vertical plane defined by said first and second axes,

(2) a motor pinion on the motor driven shaft,

(3) a crankshaft rotatably mounted on frame in parallel relation to the motor driven shaft,

(4) a crankshaft drive sprocket on said crankshaft,

(5) a drive belt operably connecting the motor pinion and the drive sprocket, and

(6) a ram rod crank arm extending radially outwardly from the crankshaft and pivotally connected at its outer end portion to the end of the ram rod opposite the ram;

(i) wherein said ram rod is provided with a can restraining camming surface flush with an uppermost end of the ram and extending back toward the ram rod crank arm to lie in can restraining position to prevent a can from taking position on a side of said ram opposite said anvil plate;

(J) means for feeding one can at a time from the feed tube into the compaction chamber each time a can is crushed and dropped from the chamber, said feed means including:

(1) a skewer crank arm extending effectively radially outwardly with respect to the crankshaft to lie in fixed angular relation to the ram rod crank arm about said crankshaft,

(2) a pointed skewer pivotally mounted with respect to the skewer crank arm in spaced relation to the axis of the crankshaft and extending outwardly from the skewer crank arm in alignment with the skewer receiving opening of the feed tube, and

(3) a skewer retaining sleeve extending integrally outwardly from the feed tube in encompassing relation to the feed tube skewer receiving opening and in encompassing relation to an outer end portion of the skewer; and

(k) wherein the angle between the skewer crank arm and the ram rod crank arm is such that when the ram is in its second position the skewer is clear of the interior surface of the feed tube to allow the bottom uncrushed can in the tube to move into contact with the can restraining camming surface of the ram rod, and is such that before that bottom can slides over the camming surface of the ram rod and the ram to move into the compaction chamber, the next-to-the bottom uncrushed can has been impaled by the skewer.

4,821,970

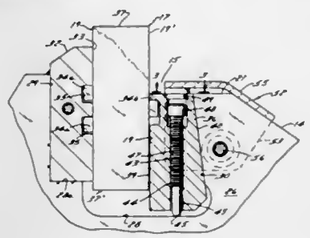
IMPACT CRUSHER

Ronald G. Puetz, New Berlin, Wis., assignor to Telsmith, Inc., Mequon, Wis.

Filed May 13, 1988, Ser. No. 194,047

Int. Cl.⁴ B02C *13/28*

U.S. Cl. 241—192 **8 Claims**



1. A rotor assembly for an impact crusher comprising: a shaft mounted for rotation in one direction about a rotor axis; at least one disc fixed to the shaft for rotation therewith and which has a peripheral surface, opposite side surfaces normal to said axis and a slot opening substantially radially outwardly to said peripheral surface and defining on the disc a radially outwardly facing bottom surface and opposing front and rear confining surfaces that extend substantially radially outward from said bottom surface; a reversible and radially adjustable elongated hammer bar received in said slot and extending lengthwise parallel to said axis, said hammer bar having a front surface facing substantially in said direction which projects radially outwardly beyond the peripheral surface of the disc to provide a material impacting surface and relative to which the front confining surface on the disc is in obliquely opposing and radially outwardly convergent relationship; first cooperating key means on the disc at the rear confining surface of the slot and on the rear of the hammer bar providing radially oppositely facing abutments opposingly engageable to confine the hammer bar against radially outward displacement relative to the disc; a radially outwardly tapering wedge in said slot which is confined between said front surface of the hammer bar and said front confining surface on the disc; second cooper-

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ating key means on the front of the hammer bar and on a side of the wedge facing the front of the hammer bar providing radially oppositely facing abutments opposingly engageable to further confine the hammer bar against radially outward displacement relative to the disc; said wedge cooperating with said first and second key means to releasably lock the hammer bar to the disc; and

a screw extending lengthwise substantially radially to said rotor axis, said screw

(a) having one end rotatably engaging said bottom surface on the disc to react against the same and

(b) having a threaded connection with said wedge whereby rotation of the screw in one direction drives the wedge radially outwardly in the slot and thus into confining engagement with the hammer bar whereas its rotation in the opposite direction provides for release of the hammer bar for removal thereof from the slot.

4,821,971

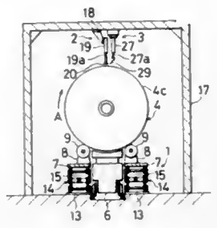
DEVICE FOR PEELING AND CUTTING OFF SURFACE PORTIONS OF PAPER ROLLS

Takemi Watanabe, Osaka, and Noriyuki Shiba, Tokyo, both of Japan, assignors to Kabushiki Kaisha Kaneda Kikai Seisakusho, Osaka and Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, both of, Japan

Filed Mar. 17, 1988, Ser. No. 169,264

Int. Cl.[4] B65H *16/00;* **B26D** *1/10*

U.S. Cl. 242—55 **10 Claims**



1. A device for transversely cutting an outer layer of a paper roll comprising:

a rotary support which rotatably supports said paper roll, whose leading end is fastened to the rest of said roll, and rotates said paper roll on its axis;

a cutter guide device including a cutter-guide means for moving into a position for contacting a surface of said paper roll and being inserted under said leading end of said paper roll at a lateral portion thereof, said cutter guide means including a clearance forming means for forming a clearance under said outer layer;

a cutting device including a cutter means for reciprocating in a direction parallel to an axis of said paper roll, moving into said clearance formed on said paper roll, and cutting an entire width of the outer layer of said paper roll.

4,821,972

SYSTEM AND METHOD FOR USE IN HANDLING AND DELAMINATING BOBBINS OF PAPER MATERIAL

Everett C. Grollimund, Midlothian; Donald L. Brookman, and Steven F. Spiers, both of Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 21, 1986, Ser. No. 820,665

Int. Cl.[4] B65H *19/10;* **B66C** *1/00;* **B25J** *11/00*

U.S. Cl. 242—56 R **53 Claims**

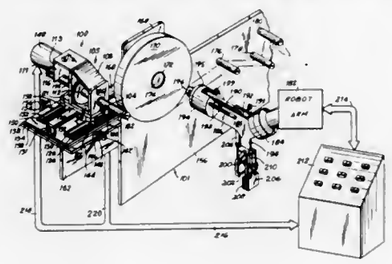
22. A system for handling and delaminating bobbins of paper material or the like used in a processing machine comprising:

(a) a delaminator apparatus for removing at least one lamination thickness of material disposed on said bobbin;

(b) a robotic arm assembly having a robotic hand attached thereto for handling the bobbin of material and the material carried on said bobbin, with the robotic hand further comprising,

(1) a bobbin core-engaging means for inserting into a bobbin core of a bobbin of material to hold said bobbin fast to said bobbin core-engaging means,

(2) a bobbin transfer means for transferring said bobbin of material from said bobbin core-engaging means,



(3) clamping means for clamping at least one lamination of thickness of material from the bobbin therebetween,

(4) and bobbin core removal means for removing a bobbin core from said machine after the material of the bobbin has been removed therefrom; and

(c) a control means for controlling operation of the delaminator apparatus, and the robotic arm assembly including the robotic hand.

4,821,973

APPARATUS AND METHOD FOR ACTIVATING A DEVICE FOR OPERATING ON A MOVING WORKPIECE

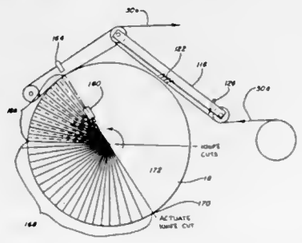
Leonard I. Tafel, Mount Prospect, and Leonard W. Kosoglad, Lincolnwood, both of Ill., assignors to Webquip Corporation, Wheeling, Ill.

Division of Ser. No. 918,481, Oct. 14, 1986, Pat. No. 4,729,519.

This application Oct. 26, 1987, Ser. No. 112,276

Int. Cl.[4] B65H *19/18, 19/20*

U.S. Cl. 242—57 **4 Claims**



1. Apparatus for activating a device for operating on a moving workpiece, which comprises:

means for sensing a selected position of the workpiece;

means for indexing the travel of the workpiece;

means for detecting said indexing means;

counting means, coupled to said detecting means, for counting the index means;

means, for operating said counting means to count the index means in a first count mode for a predetermined time after said sensing means senses said selected position;

means for operating said counting means to count the index means in a second count mode after said predetermined time;

means for providing an activation signal when a predetermined number of counts has occurred;

said predetermined time being substantially equal to the inherent time delay between said activation signal and the time required for the device to operate on the moving workpiece, and the first count mode being a multiple of the number of counts for each count of the second count mode.

4,821,974

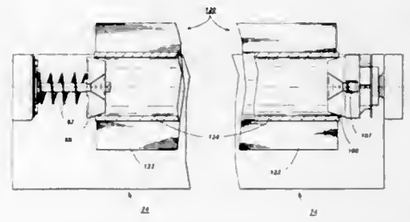
ROLL MEDIA SUPPLY MOUNTING SYSTEM

Raymond E. Poehlein, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1987, Ser. No. 111,399

Int. Cl.[4] B65H *16/06, 18/04*

U.S. Cl. 242—68.4 **2 Claims**



1. A roll media supply mounting system comprising, in combination, a first end mount assembly including a rotatable spindle shaft about which is mounted a first compression spring, and a first hub assembly mounted on the inner end of said spindle shaft; a second end mount assembly including a second spindle shaft axially aligned with said first spindle shaft, said second mount assembly further including a second compression spring, having a compressive force unequal to the compressive force of said first compression spring, encircling said second spindle shaft and a second hub member mounted on the inner end of said second spindle shaft in opposed, axial alignment with said first hub member, said first and second hub members being adapted to resiliently accomodate an installation of a media roll and subsequently to maintain the media roll in a fixed axial position due to the unequal compressive forces of the two compression springs.

4,821,975

BACKLASH PREVENTION ADJUSTMENT MECHANISM FOR A FISHING REEL

Haruo Uetsuki; Takehiro Kobayashi, and Kounoshin Makino, all of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Feb. 9, 1988, Ser. No. 153,925

Claims priority, application Japan, Feb. 11, 1987, 62-19299[U]; Mar. 4, 1987, 62-32445[U]

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.52 B **3 Claims**

1. A backlash prevention adjustment mechanism for a backlash prevention device comprising:

a rotatable spool shaft;

a spool mounted on said spool shaft;

first magnetic means;

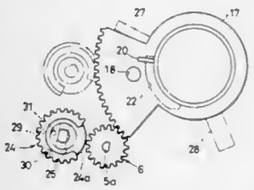
second magnetic means;

a nonmagnetic electroconductive member provided between said first magnetic means and said second magnetic means and being rotatable with said rotatable spool shaft for inducing an eddy current in said nonmagnetic electroconductive member to brake the rotation of said spool to prevent backlash of a fishline wound on said spool;

a first gear mechanism for moving said first magnetic means with respect to said second magnetic means to change the level of eddy current induced in said nonmagnetic electroconductive member;

a motor;

a motor shaft gear rotated by said motor and engaged with said first gear mechanism to rotate said first gear mechanism to move said first magnetic means; and



a manual eddy current adjustment means rotatable to a first position disengaged from said motor shaft gear and second position engaged with said motor shaft gear for rotating said first gear mechanism to move said first magnetic means.

4,821,976

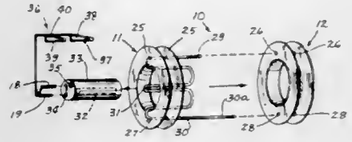
DUAL REEL STRING WINDING AND UNWINDING APPARATUS FOR USE WITH STUNT KITES

Hiroshi Nakashima, 1503 N. Hayden Island Dr., #20, Portland, Oreg. 97217

Filed May 10, 1988, Ser. No. 192,152

Int. Cl.[4] B65H *75/40*

U.S. Cl. 242—96 **3 Claims**



1. Dual reel string winding and unwinding apparatus for use with stunt kites, said apparatus comprising:

a first spool adapted to be rotated about a rotational axis, said first spool including a first base member for holding string and a first pair of spaced apart flanges attached to opposite edges of said first base member and extending radially outwardly from said first base member, said first base member being disposed radially outwardly from said rotational axis;

a second spool adapted to be rotated about said rotational axis, said first spool including a second base member for holding string and a second pair of spaced apart flanges attached to opposite edges of said second base member and extending radially outwardly from said second base member, said second base member being disposed radially outwardly from said rotational axis;

a first pair of aligned holes extending through said first pair of flanges;

a second pair of aligned holes extending through said first pair of flanges;

a third pair of aligned holes extending through said second pair of flanges;

a fourth pair of aligned holes extending through said second pair of flanges;

a first post extending through said first and third pairs of aligned holes for causing said first and second spools to rotate together;

a second post extending through said second and fourth pair

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of aligned holes for causing said first and second spools to rotate together, said second post having a crank handle portion thereon extending a substantial distance beyond said fourth pair of aligned openings;

a handle having a central opening therein; and

connection means disposed inside of said first and second base members and connected to one end of said first and second posts for rotatably receiving said handle thereon, said connection means extending into the central opening of said handle.

4,821,977

FISHING REEL WITH TRIGGER ACTUATED BRAKE AND CLUTCH

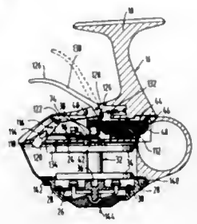
Reinhold Schuster, Peter-Rosegger-Stasse 49, D-8039 Puchheim/Bahnhof, Fed. Rep. of Germany

Filed Feb. 1, 1988, Ser. No. 150,545

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 8701557[U]

Int. Cl.[4] A01K *89/015, 89/02*

U.S. Cl. 242—220 **8 Claims**



1. A fishing reel comprising: a support frame, a line spool having a shaft and two flanges spaced from one another along the length of said shaft, said flanges each having an inward face facing the other of said flanges and each having an outward face facing away from the other of said flanges, means engaging and supporting said spool shaft outwardly of the outer face of each of said flanges for rotation relative to said support frame, a hand crank rotatably carried by said support frame, a hand lever pivotally carried by said support frame, a drive mechanism for drivingly connecting said hand crank to said spool, and a coupling mechanism associated with said drive mechanism and including a release mechanism operable by said hand lever for selectively breaking the driving connection provided by said drive mechanism between said hand crank and said line spool, said support frame having a T-shaped foot for fastening the reel to a rod, said hand lever being arranged near said T-shaped foot so as to be operable by the same hand of a user as holds the rod to which said reel is fastened, and a brake mechanism operable through said hand lever for selectively braking said line spool after the breaking of said driving connection between said line spool and said hand crank, said coupling mechanism including a coupling element arranged coaxially with said spool shaft, which coupling element is connected with a drive pinion and is axially shiftable between a drive position and a free running position, said coupling mechanism also including a slide with a ramp which ramp is cooperable with a surface connected with said coupling element for axially shifting said coupling element, and a two-armed operating lever supported on said support frame for pivotal movement, said operating lever having a first arm linked to said hand lever and a second arm linked to said slide, said second arm of said operating lever also carrying a bow shaped brake element as part of said brake mechanism and designed to engage one of said flanges of said spool, said hand lever being a two-armed lever with a longer arm and a shorter arm, said longer arm being a grip portion which extends out of said support frame near said T-shaped foot and said shorter arm being connected with a return spring and also being connected through a link with said operating lever.

4,821,978

TWIN-BEARING TYPE FISHING REEL

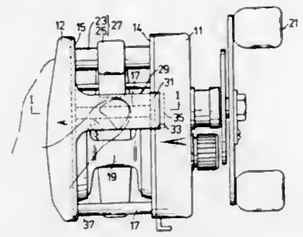
Kyoichi Kaneko, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Jan. 23, 1987, Ser. No. 6,722

Claims priority, application Japan, Jan. 31, 1986, 61-12582[U]; Jun. 19, 1986, 61-93885[U]; Jun. 19, 1986, 61-93886[U]

Int. Cl.[4] A01K *89/00*

U.S. Cl. 242—84.1 R **9 Claims**



1. A twin-bearing type fishing reel comprising: a reel frame including a handle-side inner plate and an opposite-side inner plate, said plates being arranged in confronting relationship with a predetermined spacing therebetween; a spool borne rotatably in said reel frame; a handle-side outer plate with said handle-side inner plate, a handle for rotating said spool engaged to said handle-side outer plate; and a finger rest fixed between said handle-side and opposite-side inner plates and above said spool, an opposite-side outer plate, means attaching said opposite-side outer plate, and in covering relationship, to said opposite-side inner plate, said opposite-side outer plate being molded of a soft material capable of conforming to the user's hand, and a rest cover overlying said finger rest, the rest cover being formed of the same material as said opposite side outer plate and being integral therewith.

4,821,979

VARIABLE AREA EXHAUST NOZZLE FOR A GAS TURBINE ENGINE

Ralph M. Denning; John M. Hall, both of Bristol, and Terence Jordan, Gloucestershire, all of England, assignors to Rolls-Royce PLC, England

Filed Aug. 17, 1987, Ser. No. 86,398

Claims priority, application United Kingdom, Aug. 29, 1986, 8620879

Int. Cl.[4] B64C *15/02*

U.S. Cl. 244—23 D **8 Claims**

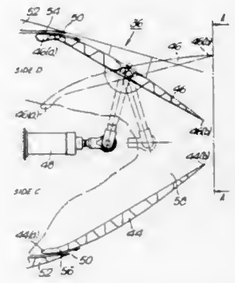
1. A variable area exhaust nozzle for a gas turbine engine comprising:

an exhaust duct having a trailing edge on a first and a second side of said nozzle;

a first fixed portion fixed relative to the exhaust duct on the first side of said nozzle and being provided with a trailing edge;

a second movable portion on the second side of said nozzle and being provided with a leading edge and a trailing edge;

the second movable portion being pivotable about an axis which is positioned between its leading edge and its trailing edge, between a first position in which an exit of the nozzle is defined between the trailing edge of the first fixed portion and the trailing edge of the second movable portion, and a second position in which the exit of the nozzle is defined between the trailing edge of the first



fixed portion and the trailing edge of the exhaust duct on the second side of the nozzle.

4,821,980

VIBRATION ISOLATING ENGINE MOUNT

Charles C. Clausen, Seattle; Ronald C. Johnson, Fall City; Wan T. Chee, Bellevue, all of Wash., and Warren E. Schmidt, Erie, Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1987, Ser. No. 102,045

Int. Cl.[4] B64D *27/26*

U.S. Cl. 244—54 **23 Claims**

1. Apparatus for mounting an engine assembly to an aircraft comprising:

a beam extending adjacent the engine assembly, generally parallel to a longitudinal axis thereof;

a first spar, connected at one end to a structural framework of the aircraft, the other end extending outwardly therefrom toward the beam;

a second spar, connected at one end to the structural framework of the aircraft, the other end extending outwardly therefrom to pivotally connect to the beam about an axis that is substantially parallel to the longitudinal axis of the engine assembly;

a vibration isolation arm, pivotally connected to the beam about an axis that is substantially orthogonal to the longitudinal axis of the engine assembly, the vibration isolation arm extending generally parallel to the first spar and resiliently attached thereto at a plurality of spaced apart points; and

an enclosing skin covering the first and second spars and the vibration isolation arm, and extending between the structural framework of the aircraft and the engine assembly, to define a generally streamlined strut.

4,821,981

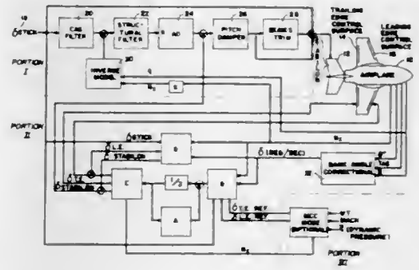
MANEUVER ENCHANCEMENT AND GUST ALLEVIATION SYSTEM

Dagfinn Gangsaas, Bellevue, and Daniel C. Norman, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 785,389, Oct. 8, 1985, abandoned. This application Jan. 25, 1988, Ser. No. 147,066

Int. Cl.[4] B64C *13/16*

U.S. Cl. 244—76 C **12 Claims**



1. A system for providing precise normal acceleration maneuver response of an aircraft based on input commands while simultaneously reducing any deviations from a precise commanded normal acceleration response due to gusts, the aircraft having a flight status and at least two control surfaces that produce pitching moments and lift and which may be adversely coupled, the control surfaces being responsive to control surface commands that are functions of the input commands and the gusts, the control surface commands being integrated such that for all frequencies of response the response to gusts does not oppose the response to the input commands and the response to the input commands does not oppose the response to the gusts, comprising:

(a) means for generating a signal representative of a derived commanded normal acceleration (Nz_c) of the aircraft from the input commands;

(b) means for generating a signal representative of the actual normal acceleration response (Nz) of the aircraft;

(c) means for taking the difference between the derived commanded normal acceleration signals to the actual aircraft normal acceleration signals; and

(d) means for generating the control surface commands to alter the positions of two or more of the control surfaces to reduce any differences between the derived commanded normal acceleration signals and the actual aircraft normal acceleration signals in response to the differences, between the desired normal acceleration of the aircraft and the actual normal acceleration and other input signals representative of the aircraft flight status, regardless of the frequency of response of the desired commanded normal acceleration and the frequency of response of the actual aircraft normal acceleration due to the gusts.

4,821,982

BRAIN O_2 RESERVE LIMITER FOR HIGH PERFORMANCE AIRCRAFT

Robert E. Van Patten, Bellbrook, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 7, 1987, Ser. No. 35,425

Int. Cl.[4] B64C *13/16*

U.S. Cl. 244—76 R **4 Claims**

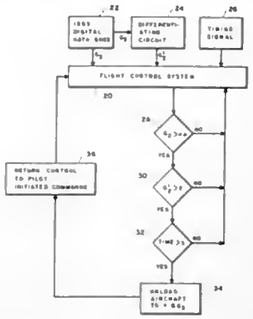
1. A method of protecting a pilot from G-induced unconsciousness while piloting an aircraft, comprising the steps of:

(a) providing previously determined data defining a state

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space comprising acceleration, rate of change of acceleration and duration of acceleration of the aircraft, the state space having previously been determined to be acceptable boundaries of G tolerance for the pilot;

(b) continuously monitoring over time the acceleration and rate of change of acceleration of the aircraft; and,



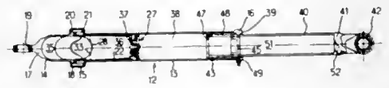
(c) comparing the monitored values of acceleration and rate of change of acceleration to said state space and, whenever the boundaries of said state space are exceeded directing the aircraft to perform a maneuver unloading the aircraft to reduce the monitored acceleration and rate of change of acceleration to values within said boundaries.

4,821,983

SHOCK ABSORBING JACK, A STAY COMPRISING IT AND LANDING GEAR EQUIPPED WITH SUCH A STAY

Jacques A. Aubry, Cabries, and Daniel A. Mauduit, Marignane, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 9, 1987, Ser. No. 130,816
Claims priority, application France, Dec. 12, 1986, 86 17401
Int. Cl.[4] B64C *25/60*
U.S. Cl. 244—104 FP **23 Claims**



1. In a shock absorbing jack, for equipping the landing gear of aircraft, and of the type loaded under compression comprising:

a cylindrical body, an axial end of which is open,

a hollow cylindrical rod, an axial end of which is open and whose other axial end is closed by a bottom, intended to be connected to an unsuspended member of the landing gear, this rod being engaged by its open axial end portion in the open axial end of the body, and mounted for sealingly sliding therein,

an annular piston, mounted for sealingly sliding inside the cylindrical body and moving therein with the rod portion internal to the body, while defining between the body and the rod an annular retraction chamber, which the annular piston isolates from a hydraulic fluid chamber contained in the body, the pressurized hydraulic fluid supply of the annular retraction chamber controlling retraction of the rod into the body, whereas emptying thereof causes extension of the rod from the body,

a separator piston, mounted for sealingly sliding and between two stops inside the rod in which is defined an extension chamber which the separator piston isolates from the hydraulic fluid contained in the body, and which, when it is supplied with pressurized hydraulic fluid, controls the extension of the rod out of the body, whereas empty thereof causes the rod to retract into the body,

a low pressure gas chamber, compressed by an adjacent volume of hydraulic fluid when the hydraulic fluid contained in the body is compressed by the annular piston and the separator piston, under the effect of compression loads exerted on the shock absorbing jack and causing the rod to retract into the body,

a throttling device, housed in the body and braking the movements of the rod by throttling the hydraulic fluid contained therein, and

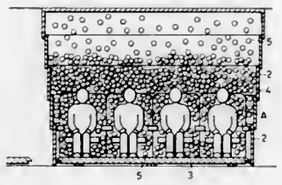
a high pressure gas chamber, also housed in the body in which it is defined between a fixed wall of the body and a separator member which isolates it from the hydraulic fluid and from the low pressure gas chamber, and which is compressed as soon as the shock absorbing jack is subjected to a compression force greater than a threshold corresponding to a pressure of the gas in the low pressure chamber equal to the inflation pressure of the high pressure gas chamber, wherein said low pressure gas chamber is housed in the body, between the throttling device and the high pressure gas chamber, from which it is only separated by the separator member, comprising a flexible membrane which bears, as long as the pressure of the gas in the low pressure chamber is not greater than the inflation pressure of the high pressure hamber, against a rigid and perforated support, fixed to the cylinder, and allowing the transmission of pressure from the low pressure chamber to the high pressure chamber through the membrane, while completely limiting the deformation of the membrane towards the low pressure chamber and the throttling device.

4,821,984

SAFETY CHAMBER FOR AN AIRPLANE

Tokuichiro Yoshida, 13-14,Ise-cho, Kawasaki-shi, Japan

Filed Mar. 25, 1988, Ser. No. 174,416
Claims priority, application Japan, Mar. 27, 1987, 62-75662
Int. Cl.[4] B64D *25/00, 25/08*
U.S. Cl. 244—141 **5 Claims**



1. A safety chamber of the telescopic type usable for an airplane comprising:

a plurality of wall segments adapted to be telescopically displaced relative to one another to assume a contracted state when the safety chamber is not in use and an expanded state when the safety chamber is in use, said wall segments constituting a chamber in the expanded state in which a single seat assembly is completely incased together with passengers sitting thereon in the event of an emergency, the lowermost wall segment having the same dimensions as those of the bottom of the seat assembly;

a large number of granular cushioning materials for protecting the passengers on the seat assembly from the influence of shock caused when such seat assembly lands on the ground or sea surface, said cushioning materials being stored in a compressed state in the contracted wall segments on the ceiling of the airplane when the safety chamber is not in use, said cushioning material falling down from the ceiling and expanding by themselves in the event of an emergency so that the hollow space in the expanded safety chamber surrounding all passengers being filled; and

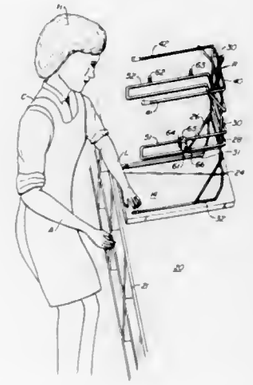
a parachute stored in a parachute box on the uppermost wall segment.

4,821,985

RACK FOR PLASTIC T-SHIRT GROCERY BAGS

Robert B. DeMatteis, San Jose, Calif., and Wayne A. Pflueger, Salt Lake City, Utah, assignors to Cupples Paper Bag Company, LaMirada, Calif.

Filed Apr. 26, 1988, Ser. No. 185,634
Int. Cl.[4] A63B *55/04*
U.S. Cl. 248—97 **3 Claims**



1. A rack for holding T-shirt grocery bags of the bag type formed from an endless tube having "W" folded sides, said bags being held overlying a loading surface,

a closed seal bottom,

a closed seal top, cut away to provide a central opening with paired handles on either side of said central opening,

the handles each being provided with apertures for threaded mounting to a dispensing rack,

the dispensing rack for said T-shirt bag comprising:

a first horizontally disposed U-shaped rack having first and second outwardly extending arms, said horizontally disposed outwardly extending arms defining the end of the U and being threaded through apertures in the handles of said T-shirt bags for supporting said bag during loading of said bag on a rack;

at least one vertical member supported from said loading surface and joined to the back of said first horizontally disposed U-shaped rack at the upper end between said outwardly extending arms for holding said first horizontally disposed U-shaped member at an elevation to support the bottom of said T-shirt bag on said loading surface whereby packing of said bag with said sealed bottom resting on said loading surface can occur;

a second horizontally disposed U-shaped rack underlying said first horizontally disposed U-shaped rack, said second horizontally disposed U-shaped rack having two outwardly extending arms, each parallel to and underlying the two outwardly extending arms of said first horizontally disposed U-shaped rack,

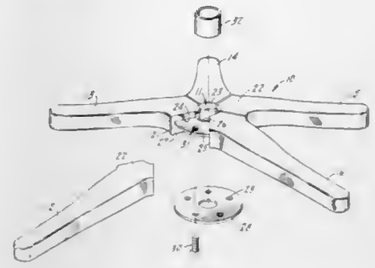
said two outwardly extending arms of said second horizontally disposed U-shaped rack protruding outwardly beyond the arms of said first horizontally disposed U-shaped member whereby said arms limit the horizontal expansion of a T-shirt bag being loaded on said rack and inhibit arm movement in the interstitial area between said first horizontally disposed U-shaped rack at the top and said loading surface at the bottom.

4,821,986

MULTIPLE LEG FURNITURE BASE

Winsor White, Chicago, Ill., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Feb. 3, 1988, Ser. No. 151,918
Int. Cl.[4] A47B *13/00*
U.S. Cl. 248—188.7 **9 Claims**



1. A base for a piece of furniture comprising:

(a) a plurality of elongated leg members extending radially from a central point of conversion,

(b) each of said leg members providing at its converging end a flaired enlargement presenting a concaved edge, with said edge of each leg member cooperating to form a central hub when said legs are in their base forming assemblage,

(c) means carried by said concaved edges for positioning said legs in alignment with each other and in a hub forming relation,

(d) receiving means on each of said legs for receiving said positioning means, each said receiving means is a radially extending arcuate slot extending between said concaved edge of each leg and an internal concave edge of the slot that is within each leg and that is radially spaced from said concaved edge of each said leg, each said slot has a pair of radially extending edges between said leg concaved edge and said internal concave edge of the slot, and said positioning means projects into each of said slots, whereby said concaved edges of the legs, said radially extending arcuate slots and said positioning means cooperate to define the central hub for said base when said legs are in their base forming assemblage, and said positioning means is enclosed within said leg members,

(e) means connecting said converging ends of said legs together and for attaching said positioning means to each of said legs when said positioning means is received in said receiving means, and

(f) means within said formed hub for receiving a perpendicular extending pedestal for a piece of furniture to be supported by said base.

4,821,987

RECREATIONAL VEHICLE AWNING SUPPORT TRUSS AND SYSTEM

Charles Haman, P.O. Box 294, Homosassa Springs, Fla. 32647

Filed Feb. 29, 1988, Ser. No. 161,913
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—200 **25 Claims**

1. On a recreational vehicle having a chassis frame and an awning, which provides shelter during various weather conditions, a truss arm for securing an awning support strut or the like, the truss arm comprising:

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an inner bearing plate for rigidly mounting the truss arm on the chassis frame of the recreational vehicle;

a truss structure having a proximal end and a distal end and being rigidly connected at the proximal end to said inner bearing plate and extending outwardly therefrom, said truss structure including:

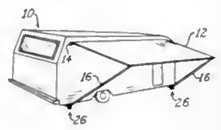
an upper truss arm rigidly connected to said inner bearing plate and extending laterally in an outward direction;

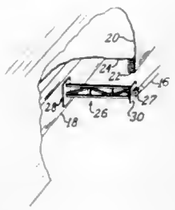
a lower truss arm rigidly connected to said inner bearing plate and extending laterally in an outward direction;

a first vertical member disposed outwardly of said inner bearing plate and rigidly connected to and disposed between said upper truss arm and said lower truss arm;

a first diagonal member rigidly connected to said inner bearing plate proximate said lower truss arm and extending upwardly therefrom in an outward direction and rigidly connected to said first vertical member proximate said upper truss arm;

a second vertical member disposed outwardly from said first vertical member and rigidly connected to and disposed between said upper truss arm and said lower truss arm, said first and said second vertical members supporting said upper and said lower truss arms and distributing static and dynamic loads imposed by the awning;





a second diagonal member rigidly connected to said first vertical member proximate said upper truss arm and extending downwardly therefrom in an outward direction and rigidly connected to said second vertical member proximate said lower truss arm;

a third diagonal member rigidly connected to said second vertical member proximate said lower truss arm and extending upwardly therefrom in an outward direction to a point proximate the outermost end of said upper truss arm, said diagonal members supporting said upper and said lower truss arms and said vertical members in a fixed spacial relationship with each other; and

a bracing member rigidly connected to said lower truss arm proximate the outermost end thereof and extending upwardly and inwardly from said lower truss arm and rigidly connected to said third diagonal member mediate between said second vertical member and the outermost end of said upper truss arm; and

an outer bearing plate for receiving and mounting the awning strut thereupon, said outer bearing plate being disposed in spaced apposition to said inner bearing plate and rigidly connected at the distal end of said truss arm to the outermost ends of said upper and said lower truss arms and said third diagonal member.

4,821,988

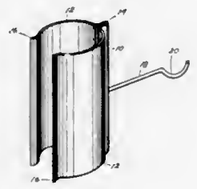
CATHETER BAG HOLDER

Louis M. Jimenez, P.O. Box 1916, Oroville, Calif. 95965-1916

Filed Oct. 5, 1987, Ser. No. 104,509

Int. Cl.[4] A47G *29/00*

U.S. Cl. 248—227 **6 Claims**



1. A catheter bag holder, comprising:

in a metallic embodiment, an elongated tubular member opened longitudinally along one side with the edges thereof flanged outwardly providing a clamp structured for removable snap-on attachment to a bed rail, a wheelchair frame, and the like;

a hook rod support, said hook rod support being a narrow ridge diametrically rounded formed by a longitudinal wall continuation of said clamp aligned full length therein oppositely said opened side of said clamp;

a hook rod, said hook rod being affixed to said hook rod support ridge right angled outwardly from said clamp oppositely said opened side, said hook rod formed at the free end with an opened hook, said opened hook sized for attachment as a holder to the support cord of said catheter bag and said hook rod of minimal length required to support said catheter bag usefully.

4,821,989

SEAT SLIDE DEVICE

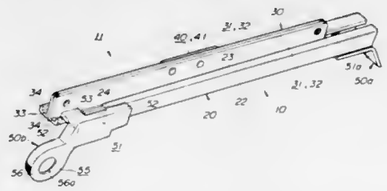
Kiyohiko Munakata, Yokohama; Yuji Tanaka, and Isamu Chinomi, both of Kanagawa, all of Japan, assignors to Ikeda Bussan Co., Ltd., Ayase and Ohi Seisakusho Co., Ltd., Yokohama, both of, Japan

Filed Jun. 27, 1988, Ser. No. 211,701

Claims priority, application Japan, Aug. 17, 1987, 62-125063[U]

Int. Cl.[4] F16N *13/00*

U.S. Cl. 248—430 **11 Claims**



1. A seat slide device comprising:

a stationary rail securedly mounted on a fixed member;

a movable rail slidable on and along said stationary rail while keeping an interlocking engagement with said stationary rail, said movable rail mounting thereon a seat and slidable to a given position wherein a longitudinal end portion of said movable rail is projected considerably from a corresponding end of the stationary rail;

a leg member having one end secured to said corresponding end of said stationary rail and the other end secured to the fixed member; and

a structure defined by said leg member, said structure having a projected portion which is placed above said longitudinal end portion of said movable rail when said movable rail comes to said given position.

4,821,990

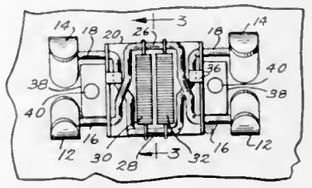
FLASHLIGHT HOLDER

Toney L. Porter, and Floyce M. Porter, both of P.O. Box 1896, Eldorado, Ark. 71730

Filed Dec. 11, 1987, Ser. No. 132,163

Int. Cl.[4] F16M *11/00*

U.S. Cl. 248—316.5 **3 Claims**



1. A device for holding an article comprising;

a base;

two support plates, each of said support plates including; two holes, and

a first and second rotatable connecting rods, each having two ends, formed so that said ends of each of said connecting rods are parallel and displaced along the same line and each rod having a u-shaped middle portion with legs and a bite portion, said bite portion being parallel to ends but are not along the same lnie as their respective ends, said ends of said first and second connecting rods being placed in said holes of said support plates with said middle portion of said first connecting rod overlaps said middle portion of said second connecting rod so that said first connecting rod rotates a greater amount than said second connecting rod;

a spring having an end connected to each of said middle portions of said connecting rods that allows said first connecting rod to rotate more easily than said second connecting rod;

a curved clasp attached to each end of said first and second connecting rods, said clasps attached so that when rotated from an open position to a closed position said article can be held and when rotated from said closed position to said open position said article can be removed.

4,821,991

SEAT SLIDE DEVICE

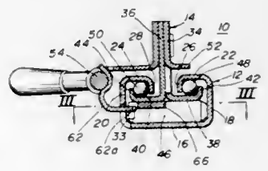
Tsutomu Aihara, Yokohama, and Masakazu Muraishi, Isehara, both of Japan, assignors to Nissan Motor Co., Ltd. and Ohi Seisakusho Co., Ltd., both of Yokohama, Japan

Filed Apr. 7, 1987, Ser. No. 35,428

Claims priority, application Japan, Apr. 7, 1986, 61-78224

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—430 **3 Claims**



1. A seat slide device for sliding a seat relative to a floor, comprising:

a stationary rail including an elongate flat base portion adapted to be mounted on the floor, side wall portions extending upwardly from opposed sides of the base portion, upper flat wall portions extending toward each other from the upper ends of the side wall portions, and hanging down portions extending downwardly from the inward ends of the upper flat wall portions leaving therebetween an axially extending clearance;

a movable rail including an elongate base portion, lower flat wall portions each extending outwardly from the lower end of said elongate base portion and raised up portions extending upwardly from the outward ends of the lower flat wall portions, said movable rail being coupled with said stationary rail in such a manner that the lower flat wall portions are received in said stationary rail having the elongate base portion extending upwardly through said axially extending clearance of the stationary rail, said movable rail including two elements of generally L-shaped cross section which are secured to each other in back-to-back manner, one of said two elements being formed with a plurality of raised up portions which are arranged along a longitudinal axis of the movable rail leaving a given space between each raised up portion and one of said upper flat wall portions of the stationary rail;

a plurality of rollers rotatably received in said stationary rail and putting thereon said lower flat wall portions of the movable rail; and

a plurality of ball bearings rotatably received in two parallel elongate spaces of generally rectangular cross section each being defined by one of the upper wall portions and one of the hanging down portions of the stationary rail and one of the lower flat wall portions and one of the raised up portions of the movable rail,

said seat slide device further comprising a latch mechanism which comprises:

means defining a plurality of notches in the stationary rail, said notches being arranged along the axis of the stationary rail at evenly spaced intervals;

a control shaft supported by said movable rail in a manner to be rotatable about the axis thereof;

a latching plate secured to said control rod to rotate therewith, said latching plate having pawls which are engageable with some of said notches to latch said movable rail to said stationary rail;

biasing means for biasing said control shaft in a direction to engage the pawls of the latching plate with the notches of the stationary rail; and

a reinforcing plate which is secured to said movable rail in the vicinity of said latching plate, said reinforcing plate being formed with notches with which leading ends of the pawls of the latching plate are engaged when said pawls are engaged with the notches of the stationary rail.

4,821,992

PICTURE HOOK WITH SAFETY CLOSURE

Dennis M. Johnson, 1125 S. 2nd St., Alhambra, Calif. 91803

Filed May 9, 1988, Ser. No. 191,869

Int. Cl.[4] A47G *1/16*

U.S. Cl. 248—493 **4 Claims**

1. A picture hook which includes a frame portion, a hook portion extending from said frame portion at one end thereof and a resilient locking portion extending from the remaining end of said frame portion;

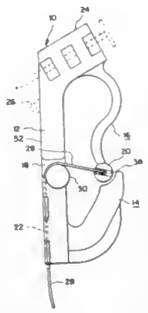
said resilient locking portion being positioned in opposition to said hook portion and, in normal operation, in close proximity thereto;

a journal portion carried by said frame portion; and,

a cord connected to said resilient locking portion, passing over said journal portion, through said frame portion and extending therefrom for manual operation of said resilient locking portion to move said resilient locking portion

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away from proximity with said hook portion, said frame portion carrying, at one end thereof, a nail receiving



portion for securing said picture hook to a support member.

4,821,993

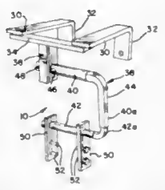
RETAINING BRACKET FOR DETACHABLE PUMP

Steven D. Warner, Naperville; William C. Swick, Downers Grove, and David M. Anderson, Clarendon Hills, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 4, 1988, Ser. No. 140,496

Int. Cl.[4] F16M *1/04*

U.S. Cl. 248—674 **6 Claims**



4. A retaining bracket for a pump having a pump shaft adaptable to the power take-off shaft of a tractor comprising: a framework rigidly secured to the pump and having a member positioned rearwardly of the pump; said framework including a cross bar positioned behind the pump, and said member comprising a torque bar depending centrally from said cross bar, said torque bar having a connector opening therein, said torque bar being in substantial alignment with the longitudinal axis of the pump shaft; and support means comprising a channel-shaped connector having an upper leg, a lower leg and a vertical interconnecting web, said upper leg being slidably received in said opening; a pair of mounting bars carried by the lower leg and spaced to accommodate a drawbar of the tractor therebetween; and vertically spaced mounting pins on each of said mounting bars adapted to slidingly engage the tractor drawbar therebetween and providing a torque restraint which resists bending of the pump shaft during operation thereof.

4,821,994

MOLDING FOR THE RETENTION OF A TIE IN THE CONCRETING OF A PRECAST CONCRETE PART

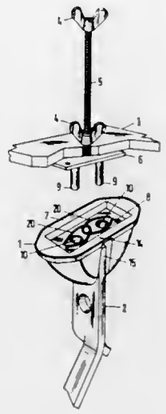
Siegfried Fricker, Wurmberger Strasse 30-34, 7135 Wiernsheim, Fed. Rep. of Germany

Filed Sep. 1, 1987, Ser. No. 92,314

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629772

Int. Cl.[4] E04G *15/04*

U.S. Cl. 249—91 **12 Claims**



1. An apparatus for positioning a tie having an orifice within a precast concrete part while the precast concrete part is being formed, comprising:

a molding removeably securable to the tie, the molding comprising:

a top surface adapted to face outward from the precast concrete part when the tie is positioned within the precast concrete part;

a slot for receiving the tie, the slot having a bottom lying along an axis;

lug means insertable into the orifice of the tie when the tie is inserted into the slot, the lug means being moveable out of engagement with the tie upon outward flexing of the molding about the axis, and

lifting out means foldable below the top surface of the molding but adapted to project outwardly beyond the top surface of the molding for removal of the molding from a cast concrete part, whereby the molding flexes outwardly in response to a force applied to the lifting out means so as to move the lug means out of engagement with the tie.

4,821,995

CLIP FOR FLANGES OF FORMS IN FORMWORKS

Josef Merkel, Steinach, Fed. Rep. of Germany, assignor to Josef Maier, Steinach, Fed. Rep. of Germany

Filed Jul. 28, 1988, Ser. No. 225,730

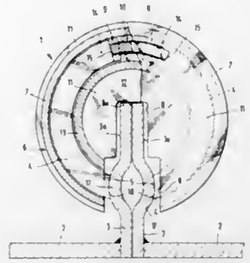
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724872

Int. Cl.[4] E04G *17/04*

U.S. Cl. 249—219.1 **29 Claims**

1. A clip for separably coupling to each other two substantially plate-like components, said clip comprising a housing having an inlet for the components; a pair of arcuate clamping elements installed in said housing at opposite sides of said inlet and having first end portions adjacent said inlet and confronting second end portions, said housing defining arcuate paths for sliding movement of said elements in directions to increase the mutual spacing of said first end portions while reducing the

mutual spacing of said second end portions and vice versa; and means for moving the second end portions of said elements



apart so as to urge said first end portions into clamping engagement with the components in said inlet.

4,821,996

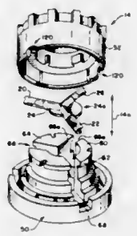
FLUID FLOW CONTROL VALVE AND TRANSFER SET

Marc Bellotti; William J. Schnell, both of Libertyville; John F. Love, Prairie View, all of Ill.; Randy K. Murphey, Kenosha, Wis.; Larry C. Taylor, McHenry, Ill., and Franco Peluso, Leuven, Belgium, assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 28, 1987, Ser. No. 8,012

Int. Cl.[4] F16K *7/06*

U.S. Cl. 251—9 **47 Claims**



1. A multi-position mechanical apparatus for controlling fluid flow within a fluid transfer device having multiple, interconnected flexible, conduits normally open for fluid flow therethrough, the apparatus comprising:

a base member for receiving a plurality of the interconnected fluid flow conduits; and

selecting means, including a rotatable member rotatable in only one direction, said selecting means removably affixable to said base member and supported movably by said base member for selectively blocking fluid flow through at least one of the members of the plurality of flexible fluid flow conduits, said selecting means being affixable to said base member only at a single rotational insertion/removal position.

4,821,997

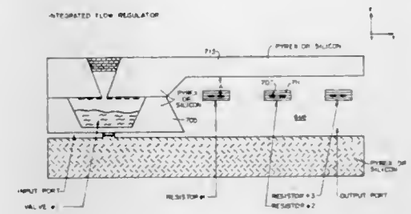
INTEGRATED, MICROMINIATURE ELECTRIC-TO-FLUIDIC VALVE AND PRESSURE/FLOW REGULATOR

Mark Zdeblick, Los Altos Hills, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 911,242, Sep. 24, 1986. This application Sep. 16, 1987, Ser. No. 97,494

Int. Cl.[4] F16K *7/12*

U.S. Cl. 251—11 **2 Claims**



1. An integrated flow regulator comprising:

a first wafer having first and second surfaces, said second surface of said first wafer having a first resistive pattern formed thereon at a first location and having terminal means coupled to said resistive pattern for coupling said resistor pattern to a source of electrical power;

a second wafer having first and second surfaces, said first surface of said second wafer having a trench formed therein having a depth sufficient to form a flexible diaphragm between the bottom of said trench and said second surface of said second wafer, said first surface of said second wafer being bonded to said first wafer so that said trench forms a sealed cavity which contains said first resistor pattern;

a material trapped in said cavity which has a boiling point above any ambient temperature that will be experienced but low enough that heating caused by passing of electrical current to said first resistor pattern will cause said material to boil and raise the vapor pressure in said cavity sufficiently to expand said diaphragm;

a third wafer having first and second surface, said first surface of said third wafer having an input channel and an output channel formed therein and having a valve seat formed therein in the form of a wall separating said input channel from said output channel, said valve seat formed in a location such that said diaphragm, when expanded, contacts said valve seat to control the flow from said input channel to said output channel, said first surface of said third wafer being bonded to said second wafer at predetermined points not including the points of contact between said valve seat and said diaphragm, said output channel being located so as to be in fluid communication with a flow channel formed between said first and said second wafers; and

resistor means formed in said flow channel for supplying heat to any fluid flowing said flow channel when current is passed through said resistor;

first and temperature sensing means formed in said flow channel at first and second locations, respectively, such that heat diffusing through any fluid flowing in said flow channel must diffuse in a direction which is upstream to reach said first temperature sensing means, and must diffuse in a direction which is downstream to reach said second temperature sensing means.

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4,821,998

MECHANISM FOR OPERATING A METERING VALVE

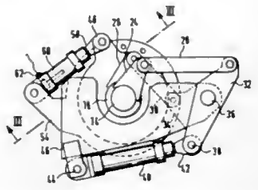
Edouard Legille, Luxembourg, and Emile Lonardi, L-Bascharage, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Nov. 19, 1987, Ser. No. 122,956

Claims priority, application Luxembourg, Nov. 21, 1986, 86680

Int. Cl.[4] F16K *31/122*

U.S. Cl. 251—58 **16 Claims**



1. An apparatus for operating a metering valve comprising two rotary registers provided with cutouts which are symmetrical with respect to a vertical axis of a central opening defined by the movement of the registers and cutouts, the registers being fastened respectively to first and second drive shafts disposed coaxially in relation to one another and received in bearings of a flow tube such that by pivoting about their common axis, each of the registers operates synchronously and in opposite directions, and further comprising:

first arm means provided to said first drive shaft;

second arm means provided to said second drive shaft;

first connecting rod means pivotably connected to a first rocking lever means, said first rocking lever means being pivotably mounted on a pivot axis, said pivot axis being parallel to the common axis of said first and second drive shafts, said first arm means being articulated to said first connecting rod means;

second connecting rod means pivotally connected to a second rocking lever means, said second rocking lever means being pivotably mounted on a pivot axis, said pivot axis being parallel to the common axis of said first and second drive shafts, said second arm means being articulated to said second connecting rod means;

drive means, said first and second rocking lever means being pivotably connected to said drive means wherein said drive means pivots said first and second rocking lever means about said pivot axis;

wherein the connection between said first rocking lever means and said first connecting rod means is angularly offset about said pivot axis in relation to the connection between said second rocking lever means and said second connecting rod means; and

moving means forming the entire apparatus as a whole about the pivot axis of the two rotary registers for modifying the orientation of said registers with respect to said vertical axis in order to maintain a symmetrical flow to said vertical axis.

4,821,999

VALVE ELEMENT AND PROCESS OF PRODUCING THE SAME

Yoshimitsu Obtaka, Mishima, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1988, Ser. No. 146,782

Claims priority, application Japan, Jan. 22, 1987, 62-13066; Mar. 13, 1987, 62-58507

Int. Cl.[4] F16K *31/02*

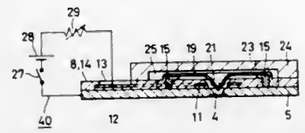
U.S. Cl. 251—129.02 **30 Claims**

1. A valve element, comprising:

a nozzle plate having formed therein a nozzle through which fluid can pass;

an insulator layer covering said nozzle plate except at a location corresponding to said nozzle;

an electrode plate covered by said insulator layer; and



a valve beam made of a conductive substance and spaced by a predetermined distance from said nozzle plate, said valve beam defining at an integral portion thereof facing said nozzle a yieldable portion forming valve means opening and closing said nozzle.

4,822,000

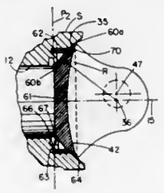
ECCENTRIC SEGMENTED BALL VALVES

John W. Bramblet, Houston, Tex., assignor to Rockford Controls Corporation, Houston, Tex.

Filed Aug. 24, 1987, Ser. No. 88,576

Int. Cl.[4] F16K *1/16*

U.S. Cl. 251—298 **11 Claims**



1. A segmented ball valve comprising

a hollow ball valve body member having inlet and outlet bores disposed along a central axis and a hollow interior defining a passageway along said central axis,

means in said body member for journalling upper and lower shaft members along a journal axis transverse to said central axis and offset from said central axis,

valve seat means forming an annular valve seat about said central axis in one of said bores,

valve element means having upper and lower shaft members journalled in said body member for rotation of said valve element means about said journal axis to a 90° position in engagement with said valve seat means for closing said passageway and to a 0° position where said passageway is open, said valve element means including a spherically shaped sealing surface portion which has a spherical configuration with respect to a locus point on the central axis for said passageway in a 90° position of the valve element means, and

said annular valve seat having a generally spherical configuration including an inner annular metal right section, an intermediate non-metal annular contact section and an outer annular metal ring section, said sections being constructed and arranged for selective sealing engagement with said spherically shaped sealing surface on said valve element means during rotation to a 90° position of said valve element means where said intermediate non-metal contact section first provides a pressure seal, said inner metal ring section next provides a metal-to-metal flexture seal, and said outer ring section next provides a metal-to-metal compression seal.

4,822,001

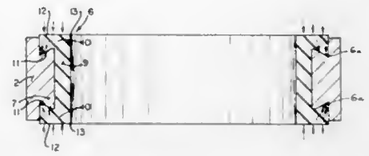
POSITIVE FLUID SEAL BUTTERFLY VALVE

David E. Sisk, R.R. 1, Box 340, Bonne Terre, Mo. 63628

Filed Jan. 13, 1988, Ser. No. 143,198

Int. Cl.[4] F16K *1/22*

U.S. Cl. 251—306 **6 Claims**



1. In a butterfly valve for insertion between a pair of spaced flanges in a fluid flow passageway, and wherein said valve attains flush alignment with said flanges to maintain contiguity and uninterrupted flow of fluid material therethrough, said valve including a tubular body having a fluid flow chamber therethrough for communication with the fluid flow passageway, said valve including a disc element pivotally mounted within said tubular body to open and close the fluid flow chamber in said tubular body for open and closed communication with the fluid flow passageway, a resilient seal surrounding the fluid flow chamber of said tubular body and including an inner wall integrally connected to spaced and opposed outer walls, the inner wall of said resilient seal being configured and dimensioned to engage and seal the disc element along its outer periphery when the disc element closes the fluid flow chamber in said tubular body, said spaced and opposed outer walls of said resilient seal having inner wall surfaces directed towards each other and disposed for complimentary engagement and retention by a dovetail extension projecting from an inner portion of said tubular body, said dovetail extension forming re-entrant angles for reception of said inner wall surface of the seal, said inner wall surfaces of the opposed outer walls of said resilient seal also each spaced from the dovetail extension within its re-entrant angles to define inner recess areas on opposite sides of said dovetail extension, said spaced and opposed outer walls of said resilient seal further each having an outer wall surface which extends beyond the tubular body of said valve for engagement with said one spaced pair of flanges, and said spaced and opposed outer walls and said inner wall of the resilient seal being joined along generally right angled corner areas, whereby upon compression engagement of the outer wall surfaces of said resilient seal by said spaced pair of flanges, said resilient seal will be compressed and will flow at least partially into said re-entrant angles of the inner recess areas and also allow the inner wall thereof to be deflected inwardly for a tighter seal with said disc element, while maintaining said generally right angled corner areas for contact engagement with said spaced pair of flanges about the fluid flow passageway.

4,822,002

MOVABLE SLEEVE TYPE VALVE

Hans D. Baumann, 32 Pine St., Rye, N.H. 03870

Filed Oct. 28, 1988, Ser. No. 263,813

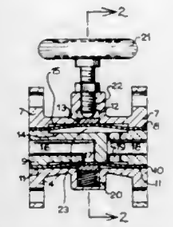
Int. Cl.[4] F16K *7/06*

U.S. Cl. 251—331 **3 Claims**

1. (a) Movable sleeve type valve comprising a valve housing having a central horizontal bore and a central enlarged radial cavity;

(b) a circular insert having a central access port terminating in a radially extending vertical orifice and having a second opposite access port located along the same horizontal axis communicating with at least one more vertical port to the exterior of said cylindrical insert, said cylindrical insert having a reduced exterior diameter portion encompassing the area where the orifice and at least one additional vertical port are located;

(c) a tubular seal extending and surrounding the entire length of said cylindrical insert and having their outer extremities retained within said cylindrical bore of the valve housing;



(d) a sleeve slidingly engaged within the radial recess of said housing, the inner bore being in close contact with the outside diameter of said tubular seal;

(e) actuating means attached to said valve housing and capable of radial displacement of said sleeve and thereby the central portion of the tubular seal in order to cover or uncover said vertical orifice in the cylindrical insert.

4,822,003

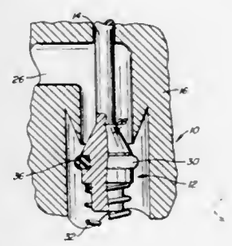
VALVE FOR FIRE EXTINGUISHER

Freddy Self, 933 Parkside Dr., Richmond, Calif. 94803

Filed Jun. 1, 1987, Ser. No. 56,421

Int. Cl.[4] A62C *13/24, 23/00, 39/00*; F16K *25/00*

U.S. Cl. 251—332 **2 Claims**



1. A valve including a movable stem within a passageway comprising:

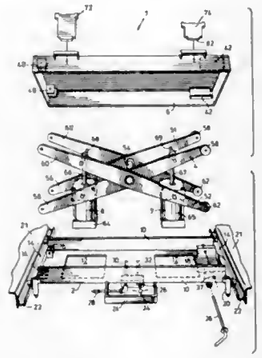
a. a bead connected to said stem, said head including a relatively hard member having a hard outer surface fitting snugly within the passageway, said head further including a deformable portion adjacent said relatively hard surface of said relatively hard member, said deformable portion including a slot having an internal wall portion terminating in first and second edges at a mouth, said first and second edges of said slot lying against one another;

b. a seat, said seat positioned in the passageway, said seat including an edge portion formed by first and second converging walls, said seat edge portion having an edge capable of entering said slot of said deformable portion of said head and separating said first and second edges of said slot, said first edge of said slot being capable of contacting and scraping said edge portion of said seat with movement of the stem within the passageway during said separation of said first and second slot edges, said relatively hard outer surface of said hard portion of said head being capable of contacting and scraping said second wall of said seat, said first and second walls being scraped simultaneously by said first edge of said slot and said relatively

VOL 1101 ISS 3 AP 18 1989 UMI

hard outer surface of said hard portion of said head, respectively.

4,822,004
JACK
John G. M. Van Lierop, Mississauga, Canada, assignor to 554072 Ontario Inc., Mississauga, Canada
Division of Ser. No. 704,696, Feb. 25, 1985, Pat. No. 4,659,066.
This application Sep. 17, 1986, Ser. No. 908,470
The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—122 **8 Claims**



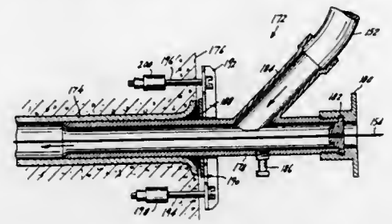
1. A jack, for use with a lifting device including two parallel support platforms, the jack being adapted for horizontal movement between the support platform and comprising: a base element; a bearing means mounted on the base element and enabling the jack to travel freely along two such support platforms; a top element; a scissor mechanism between the base and top elements, which comprises a pair of first arms and a pair of second arms, which arms extend transversely so as to be perpendicular to the support platforms in use and which are pivotally connected at mid points thereof, with one ends of the first levers engaging the base element, one ends of the second levers and the other ends of the first levers engaging the top element, and the other ends of second levers engaging the base element; and two air piston and cylinder assemblies which are disposed vertically, and each of which is pivotally connected to the first and second arms on a respective side of the scissor mechanism, with the upper ends of the piston and cylinder assemblies pivotally connected to the one ends of the first arms and the other ends of the second arms; wherein the base element includes opening means through which the cylinders extend when the jack is in a collapsed configuration.

4,822,005
CABLE PULLING SYSTEM AND ADAPTOR
Ronald E. Aleshire, Miami, Fla., assignor to FPL Qualtec, Inc., Palm Beach Gardens, Fla.
Continuation of Ser. No. 10,230, Feb. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 787,988, Oct. 16, 1985, abandoned. This application Jun. 8, 1988, Ser. No. 205,630
Int. Cl.[4] B65H *59/00*
U.S. Cl. 254—134.4 **16 Claims**

1. Apparatus for providing cable and pressurized fluid to a hollow conduit defining an interior region comprising:

(A) a plug shaped to conform to the interior region of the conduit, said plug having an internal face which is placed wholly with the conduit and an external face which remains outside the conduit, said plug including means for expanding the size of said plug so as to secure it in place within the conduit;

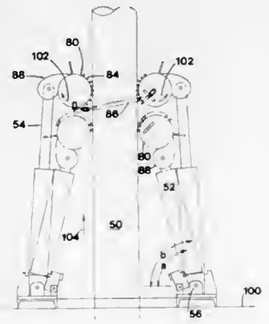
(B) sealing means, adjacent the internal face of said plug for providing a fluid seal between said plug and the interior region of the conduit, including a gasket means disposed between an exterior portion of said plug and an open end portion of the conduit, and support means to position and maintain said gasket means in sealing engagement with the open end portion of the conduit;



(C) an air duct extending through said plug from the external face to the internal face and through said sealing means to permit the supply of pressurized fluid to the interior region of the conduit; and

(D) a cable groove extending through said plug from the external face to the internal face and through said sealing means to permit the supply of cable to the interior region of the conduit.

4,822,006
POLE PULLING APPARATUS AND METHOD
Gary L. McIntire, 12 Honeybee La., Idaho Falls, Id. 83402
Filed Jul. 31, 1987, Ser. No. 80,346
Int. Cl.[4] B66F *1/02*
U.S. Cl. 254—228 **6 Claims**



1. Apparatus for extracting poles from a fixed, embedded upright position, comprising:

a. a base member adapted to straddle the pole;

b. at least two elongate piston members rotatably affixed to the base member and spaced equally about said pole to permit rotation from a first upright position to a second engaged position against said pole, the piston being displaceable along a longitudinal axis;

c. an adjustable, cylindrical head member affixed to each of said piston members at a pivot point, and having a longitudinal axis through the cylindrical head member aligned perpendicular to the longitudinal axis of the piston member;

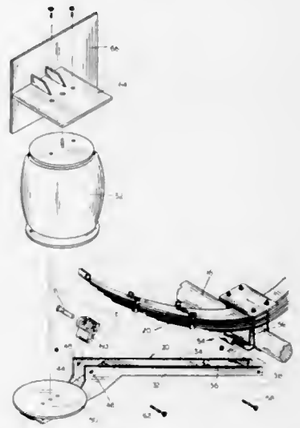
d. said cylindrical head member provided with a plurality of gripping means aligned about the longitudinal axis of the head member across a surface of the cylindrical head member;

e. a flange member positioned between the cylindrical head member and the pivot point to provide eccentric rotation of said head member about the pivot point;

f. actuating means to actuate the piston members; and

g. stop members mounted to the base member for releasably locking the elongate piston members in their first upright position.

4,822,007
SUSPENSION SYSTEM FOR A TRUCK OR THE LIKE
Ralph R. Rogers, 733 W. 21st, So. Sioux City, Nebr. 68776
Filed Jan. 17, 1986, Ser. No. 819,591
Int. Cl.[4] B60G *11/34*
U.S. Cl. 267—32 **2 Claims**



1. A suspension system for wheeled vehicles including a pair of spaced-apart longitudinally extending frame members having rearward and forward ends, a transversely extending axle housing positioned beneath said frame members forwardly of the rearward end thereof, comprising,

a leaf spring means having rearward and forward ends positioned outwardly of each of said frame members and having its forward end secured to the associated frame member forwardly of said axle housing, said leaf spring means being rigidly secured, intermediate its ends, to said axle housing, the rearward end of said leaf spring means being positioned rearwardly of the associated axle housing,

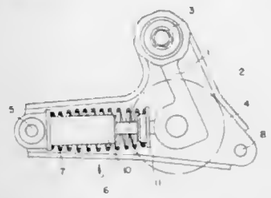
a rigid elongated support means having rearward and forward ends, the forward end of said support means being operatively secured to said axle housing, said support means being secured, forwardly of its rearward end, to the rearward end of said leaf spring means,

an upstanding air spring means having upper and lower ends, the lower end of said air spring means being mounted on the rearward end of said support means,

means rigidly operatively connecting the upper end of said air spring means to the associated frame member whereby said air spring means yieldably resists the upward movement of said axle housing and the rearward end of said leaf spring means towards said frame member and yieldably resists the downward movement of said frame member towards said axle housing, and

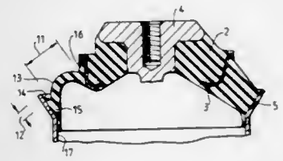
a bracket secured to said axle housing, said forward end of said support member being pivotally secured to said bracket.

4,822,008
VIBRATION-DAMPED SPRING
Otmar Winkler, Schweinfurt; Manfred Brandenstein, Eussenheim, and Rudiger Hans, Niederwerrn, all of Fed. Rep. of Germany, assignors to SFK GmbH, Fed. Rep. of Germany
Filed Dec. 4, 1987, Ser. No. 128,728
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 8633068[U]
Int. Cl.[4] F16F *13/00, 1/06*
U.S. Cl. 267—74 **1 Claim**



1. Dynamic tension assembly comprising a support element (1), including a pivot bearing (3), a tension roller (2), a linear action vibration damper (6) adapted to provide a damping effect upon pivoting motion of tension roller (2) relative to a pivot bearing (3), a helical spring (7) closely surrounding said vibration damper (6) and having a middle section with turns of a larger diameter (D), and starting from the middle section, a continuous transition is provided toward the two ends with turns of a smaller diameter (D_e), the diameter D at the middle section being about between 5–10% greater than the diameter (D_e) at the terminal ends so that when the spring is tensioned, the axial distance between adjacent turns is small and each turn is opposed by a relatively high radial spring force component whereby each turn has a stable radial position and contact of spring with tubular member is avoided.

4,822,009
HYDRAULIC BEARING MOUNT WITH THIN-WALLED ELASTIC BELLOWS
Arnold Hirchenhain, Beverungen, and Karl-Heinz Pepping, Mechernich, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Feb. 2, 1988, Ser. No. 151,416
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707445
Int. Cl.[4] F16F *15/04*; F16M *13/00*
U.S. Cl. 267—140.1 **3 Claims**



1. Hydraulic bearing mount including a rubber-elastic, conical support member; a metal anchor and a housing having a bottom and a cylindrical side wall vulcanized to said support member, said support member having kidney-shaped regions with a thinner material thickness in proximity to said housing, said regions being located opposite each other and symmetrical relative to a transverse axis of said bearing mount, said regions being constituted of thin-walled, outwardly curved rolling bellows extending above said cylindrical side wall of said housing.

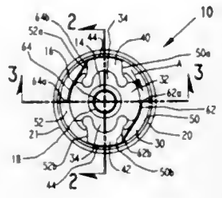
VOL 1101 ISS 3 APR 18 1989 UMI

4,822,010

FLUID FILLED RESILIENT BUSHING

Richard P. Thorn, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Sep. 30, 1987, Ser. No. 102,947
Int. Cl.[4] F16F *9/34*
U.S. Cl. 267—140.1 14 Claims



1. A fluid filled resilient bushing assembly for vibration control comprising

an elongate inner rigid member;

an elongate outer rigid sleeve member concentrically disposed about and radially spaced from said inner member to define an annular space therebetween;

a resilient wall means interconnecting and sealing said inner and outer members to each other adjacent opposite ends thereof;

a resilient impact absorbing means circumferentially disposed about said inner member between said inner and outer members and partially filling the annular space therebetween;

said absorbing means together with said inner and outer members and resilient wall means defining at least two spaced chambers interconnected by at least two restricted passageways;

an incompressible fluid filling said spaced chambers and restricted passageways; and

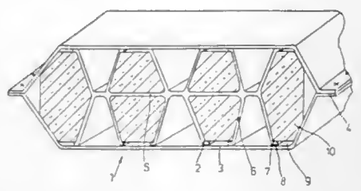
unidirectional flapper valves in each of said restricted passageways which cooperate to permit flow through said passageways circumferentially about said inner member between said chambers.

4,822,011

ELASTICALLY DEFORMABLE SYNTHETIC ABSORBER FOR BUMPERS

Hubert Goldbach, Ratingen, and Roderich Kammerer, Bad Hoanef, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 112,281
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637751
Int. Cl.[4] B60R *19/18*
U.S. Cl. 267—201 10 Claims



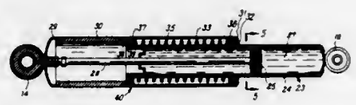
1. A shock absorber for bumpers providing damage-free absorption of shock energy during vehicle crashes for placement between a vehicle bumper and a vehicle body, the shock absorber consisting of at least one elastically deformable element and a support body, the elastically deformable element and the support body each having mutually engaging flat sliding surfaces which form an angle with respect to the direction of movement of the element, upon impact elastic body means between portions of the elastically deformable element and the support body adapted to influence the deformation and movement of the elastically deformable element during impact.

4,822,012

SINGLE SPRING SAFETY STABILIZER FOR VEHICLE STEERING LINKAGE

James L. Sketo, Stockbridge, Ga., assignor to Sexton Enterprises, Inc., Atlanta, Ga.

Filed Jan. 29, 1988, Ser. No. 149,846
Int. Cl.[4] B60G *11/56;* F16F *1/00;* B25G *3/02*
U.S. Cl. 267—221 13 Claims



1. A stabilizer for a vehicle steering linkage for connection between a fixed portion of a vehicle and a movable portion of the vehicle steering linkage comprising:

an elongated outer member;

an elongated inner member projecting longitudinally through an end of said outer member and being movable relative thereto;

said inner member including a pair of spaced apart stops projecting outwardly therefrom and said outer member including a pair of spaced apart stops projecting inwardly therefrom, the spacing between said outer member stops being substantially the same as the spacing between said inner member stops, with said inner member stops being configured to be movable past said outer member stops as said inner member moves longitudinally relative to said outer member;

a compression spring mounted within said outer member about said inner member, said compression spring being longitudinally captured between said inner member stops and said outer member stops;

a first annular thrust washer means slidably mounted about said inner member between one end of said compression spring and the adjacent inner member and outer member stops and a second annular thrust washer means slidably mounted about said inner member between the opposite end of said compression spring and the adjacent inner member and outer member stops;

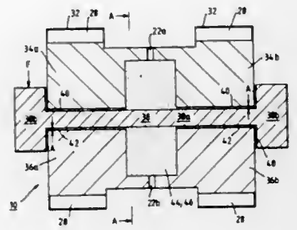
whereby said compression spring normally urges said annular thrust washer means toward engagement with said inner and outer stops and relative movement of said inner and outer members in either longitudinal direction causes longitudinally opposing inner member and outer member stops to move the thrust washers closer together compressing the spring so that the spring resists the relative movement of the inner member and outer member.

4,822,013

APPARATUS FOR SECURING A COMPONENT

Thomas K. Johnson, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed Dec. 2, 1987, Ser. No. 127,474
Claims priority, application United Kingdom, Dec. 11, 1986, 8629596
Int. Cl.[4] B25B *1/00*
U.S. Cl. 269—7 7 Claims



1. An apparatus for securing a component for machining, comprising:

a casing, having two portions, each portion being provided with an end wall having an interior end face, said end wall extending towards the component such that said end faces confront said component but are spaced therefrom by a predetermined amount thereby to define a first gap, at least one of said portions being provided with a cavity which communicates with said first gap and further being provided with a reference feature, the apparatus being provided with an exterior end portion which is profiled to match the profile of an end portion of the component and is spaced therefrom by a predetermined amount thereby to define a second gap; and

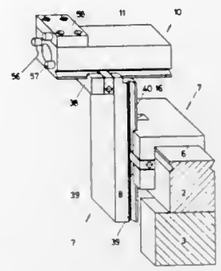
a support material which at least partially fills said cavity and the gap.

4,822,014

APPARATUS FOR HOLDING AN OBJECT IN A DESIRED POSITION IN SPACE

René Buchler, Sonnental, Switzerland, assignor to Buchler B-Set AG, Flawil, Switzerland

Continuation of Ser. No. 912,164, Sep. 26, 1986, abandoned, which is a continuation of Ser. No. 684,146, Dec. 20, 1984, abandoned. This application Aug. 13, 1987, Ser. No. 85,293
Claims priority, application Switzerland, Dec. 20, 1983, 6799/83; Jan. 26, 1984, 346/84
Int. Cl.[4] B23Q *1/04*
U.S. Cl. 269—71 6 Claims



1. An apparatus for holding an object in a desired position in space, comprising:

a horizontal beam affixed to a machine table by legs, said horizontal beam having an upper surface and two side surfaces, said side surfaces having mutually opposed angled grooves formed therein;

a first L-shaped second component having a first horizontal body portion and a first depending vertical leg portion, the first horizontal body portion having an elongated recess formed therein which defines a bottom wall and two lateral walls, wherein the bottom wall rests on the upper surface of the horizontal beam, one lateral wall is angled with respect to the bottom wall so as to engage one groove of the beam, and the other lateral wall is essentially perpendicular to the bottom wall, said first horizontal body portion further having a depression and a pawl located therein, the pawl having a nose which projects from the other lateral wall to engage the other groove of the beam, the first vertical leg portion having an elongated recess formed therein which defines a second bottom wall and two second lateral walls, one second lateral wall being inclined with respect to the second bottom wall and the other second lateral wall being essentially perpendicular thereto, the first vertical leg portion further having a second depression and a second pawl located therein, the second pawl having a second nose which projects from the other second lateral wall of the first vertical leg portion;

a second L-shaped second component having a second horizontal body portion and a second depending vertical leg portion, the second vertical leg portion having two side surfaces with mutually opposed grooves formed therein, one groove being engageable with the inclined second lateral wall and the other groove being engageable with the second nose, the second horizontal body portion having an elongated recess formed therein which defines a third bottom wall and two third lateral walls, one third lateral wall being inclined with respect to the third bottom wall and the other third lateral wall being essentially perpendicular thereto, the second horizontal body portion further having a third depression and a third pawl located therein, the third pawl having a third nose which projects from the other third lateral wall of the second horizontal body portion; and

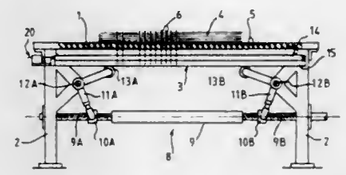
a first component for supporting the object, comprising a carriage having two side walls, said side walls having mutually opposed grooves formed therein, one groove being engageable with the third inclined wall and the other groove being engageable with the third nose.

4,822,015

PINNING TABLE FOR FABRIC STACKS

Léon Glasman, 64, rue Charles Laffitte, 92200 Neuilly-Sur-Seine, and Jean Omer M. Prioux, 16 Villa de L'Alliance, 95110 Sannois, both of France

Filed Nov. 30, 1987, Ser. No. 126,589
Claims priority, application France, Dec. 19, 1986, 86 17874
Int. Cl.[4] B23Q *1/00*
U.S. Cl. 269—54.1 7 Claims



1. A pinning table for fabric stacks comprising:

an upper fixed platen provided with holes, and intended to receive said fabric stack;

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a lower movable platen, substantially parallel to said upper platen;

a plurality of removable pins supported by said lower platen and adapted to be introduced into said holes in the upper platen;

means for imparting a translational movement to said lower platen with respect to said fixed upper platen, in a direction perpendicular to said platens; and

locking means for locking said pins in said lower platen, said locking means comprising at least first and second superimposed plates forming said lower platen, each of said first and second plates having a plurality of orifices arranged identically and corresponding to the holes in said upper platen, and in which said pins can be introduced,

at least one of said plates being slidable, with respect to the other plate, through actuating means between two end positions, a first position in which said pins are free in said orifices and a second position in which said pins are locked in said orifices by jamming between said plates.

4,822,016

SHEET SORTER HAVING PIVOTAL SHEET GUIDE AND DISCHARGE LINKAGE MECHANISM

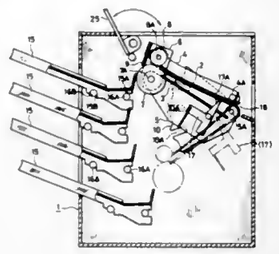
Toshio Sakuuchi, Ibaraki, and Kuniaki Kimura, Mito, both of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,422

Claims priority, application Japan, Sep. 9, 1986, 61-210673; Sep. 9, 1986, 61-210674

Int. Cl.⁴ B65H *39/02*

U.S. Cl. 270—58 **8 Claims**



1. A sheet sorter comprising:

(a) a frame;

(b) a sheet inlet;

(c) a sheet guide and discharge linkage mechanism having a first end, a second end, and four parallel pivotal axes including a first pivotal axis which is positionally fixed, and a second pivotal axis which is also positionally fixed, a third pivotal axis and a fourth pivotal axis, said linkage mechanism being pivotally mounted on said frame in said first end on said first and second pivotal axes in the proximity of said sheet inlet whereby said linkage mechanism can be pivotally moved up or down, said linkage mechanism comprising:

a pair of first parallel linkage members extending from said first end to said second end, and being pivotable about said first pivotal axis;

a connecting member disposed between said pair of first parallel linkage members rigidly connecting said first parallel linkage members thereby;

a pair of second parallel linkage members extending from said first end to said second end, and being pivotable about said second pivotal axis; and

a coupling member disposed in said second end and pivotally connected to said first linkage members on said third pivotal axis and to said second linkage members on said fourth pivotal axis;

(d) a sheet discharge roller rotatably mounted on said linkage mechanism in said second end in such a manner that said sheet discharge roller rotates about said third pivotal axis, whereby an axis of said sheet discharge roller makes substantially a circular-arc movement about said first pivotal axis as said linkage mechanism pivotally moves up or down;

(e) a plurality of sheet receiving trays mounted in a spaced array on said frame, said trays having respective front edges which are disposed substantially along the locus of the circular-arc movement of the axis of said sheet discharge roller;

(f) means for driving said sheet discharge roller;

(g) means for driving said linkage mechanism intermittently so that said linkage mechanism may be pivotally moved up or down and said sheet discharge roller may be consecutively aligned with each of said trays; and

(h) a pinch roller rotatably mounted on said linkage mechanism in said second end in such a manner that said pinch roller rotates about said fourth pivotal axis, said pinch roller being in contact with said sheet discharge roller.

4,822,017

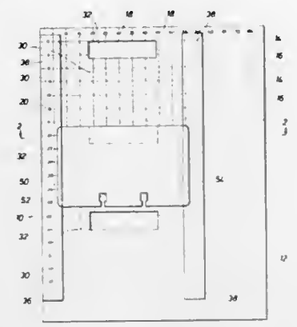
CARRIER FOR RELATIVELY SMALL SHEETS OF PAPER OR THE LIKE

Barbara A. Griesmyer, 11922 Coral Reef, Houston, Tex. 77044

Filed Nov. 8, 1985, Ser. No. 796,112

Int. Cl.⁴ B65H *5/00*

U.S. Cl. 271—2 **7 Claims**



1. A carrier for advancing one or more relatively small items such as envelopes, address cards, checks and the like through a computer printer or word processor printer having a single sheet feed mechanism controlled remotely by the computer or word processor, comprising a carrier sheet of a size that the feed mechanism of the printer is designed to handle, a plurality of strips of non-setting, non-drying, pressure sensitive, tacky adhesive attached to the carrier sheet to which the items can be attached and carried through the printer with the carrier sheet and thereafter removed from the carrier sheet, and grid means on the sheet to allow the computer or word processor to be programmed to print the desired information at the proper location on the items as the sheet is fed through the printer.

4,822,018

SHEET HANDLING APPARATUS

David A. Hain, Monifieth, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 27, 1987, Ser. No. 129,568

Claims priority, application United Kingdom, Sep. 10, 1987, 8721261

Int. Cl.⁴ B65H *5/22*

U.S. Cl. 271—3 **3 Claims**

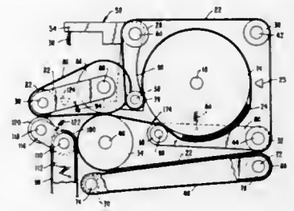
1. A sheet handling apparatus comprising:

rotatable cylindrical means;

endless belt means arranged to be in cooperative relationship with said cylindrical means over a major part of the periphery of said cylindrical means;

feeding means for feeding both single and multiple sheets from sheet supply means into an entry throat between said belt means and the periphery of said cylindrical means;

drive means, operable in a first mode or a second mode, for driving said belt means and said cylindrical means so that the parts of said belt means and said cylindrical means which are in cooperative relationship with each other move in the same direction, whereby either a single or multiple sheet fed into said entry throat when said drive means is operating in said first mode is carried around the axis of said cylindrical means while held between said belt means and said cylindrical means, the operation of said feeding means being synchronized with the rotation of said cylindrical means so that each successive single or



multiple sheet fed into said entry throat while said drive means is operating in said first mode is brought into a superposed relationship with the sheet or sheets already held between said belt means and said cylindrical means so as to form a stack of sheets between said belt means and said cylindrical means;

control means for changing the mode of operation of said drive means, whereby, when said drive means changes from said first mode to said second mode of operation, the movement of said belt means and said cylindrical means is reversed so as to drive said stack out of said entry throat; and

movable guide means associated with said feeding means and being arranged to diver alternate sheets fed from said sheet supply means around a diversion path whereby said alternate sheets are delayed by an amount corresponding to half the time taken for said cylindrical means to complete one revolution.

4,822,019

ELECTRONIC EQUIPMENT UTILIZING FORWARD/REVERSE ROTATION OF MOTOR

Keiji Nagira, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 706,130, Feb. 26, 1985, abandoned. This application Jul. 2, 1987, Ser. No. 68,792

Claims priority, application Japan, Mar. 2, 1984, 59-38701

Int. Cl.⁴ B65H *3/44*; **H02P** *8/00*

U.S. Cl. 271—9 **6 Claims**

1. An electronic apparatus comprising:

a first operation system;

a second operation system;

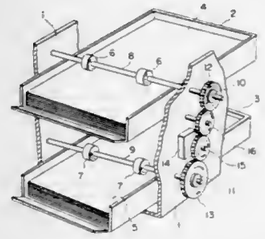
a pulse motor having multiple excitation phases and being repeatedly rotatable through the multiple excitation phases in forward and reverse directions selectively in response to the sequential application of drive pulses to the excitation phase;

transmission means for transmitting forward rotation of said pulse motor to said first operation system and reverse rotation of said pulse motor to said second operation system;

first memory means for storing a predetermined excitation phase of said pulse motor;

second memory means responsive to the drive pulses for storing a current excitation phase of said pulse motor; and

control means for sequentially applying the drive pulses to the excitation phases of said pulse motor, beginning with the predetermined excitation phase, to cause said pulse motor to rotate in a desired direction and for comparing



the contents of said first and second memory means at the cessation of the application of the drive pulses to said pulse motor, wherein if the contents of said first and second memory means fail to coincide, said control means applies additional drive pulses to said pulse motor to cause further rotation of said pulse motor in the desired direction until the contents of said first and second memory means coincide.

4,822,020

ADVANCED APPARATUS FOR GRIPPING FLEXIBLE, AND IN PARTICULAR TEXTILE, LAYERS

Alain Rouleau, 3 Rue Espinasse; Patrick Rouleau, 52 Boulevard Carnot, both of 31000 Toulouse, and Jean-Pierre Touret, Route de Meauville, Bretx, 31530 Levignac, all of France

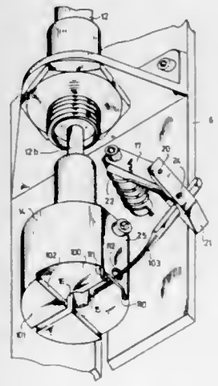
Filed Feb. 24, 1987, Ser. No. 17,479

Claims priority, application France, Feb. 24, 1986, 86 02951

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.⁴ B65H *3/22*

U.S. Cl. 271—18.3 **12 Claims**



1. An apparatus for gripping flexible material comprising at least one head (**14**) having a contact surface, a clearance (**16**) in said contact surface, a needle (**103**) associated with said head and movable with respect to said head from an initial position in which the tip of the needle is located on one side of the clearance to a final position, a thin groove (**15**) provided in said

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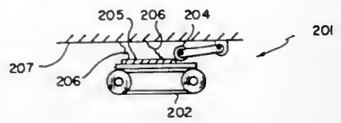
head and having a thickness greater than the thickness of said needle and crossing said clearance in the head, kinematic guides for the needle (103) with respect to the head (14), for guiding the tip of the needle along a path lying in said groove (15) and directed at least in said final position toward the contact surface, said contact surface including a step (102) for dividing said contact surface into a recessed area (100) slightly recessed with respect to an opposite protruding area (101) for ensuring different pressures on the layer of flexible material at the two areas, said kinematic guides comprising a hinge link (21) for bearing said needle (103), a hinge spindle (20) for said link and carried by a support (17), translation guiding means (12) for allowing a relative translational movement between said support (17) and said head (14), and a guide plate (25) connected to said head (14) and provided with an aperture (112) penetrated by said needle (103).

4,822,021

SHEET SEPARATING DEVICE

John Giannetti, Penfield, and Jerry F. Sleve, Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1987, Ser. No. 137,683
Int. Cl.[4] B65H *3/04*
U.S. Cl. 271—35 **9 Claims**



1. A sheet separation device including:
feed means for engaging and frictionally feeding the outside sheet from a stack;
retard means movably mounted to provide a nip with said feed means through which said outermost sheet is conveyed; and
a flat sheet-like insert movably attached to a portion of a housing associated with a receiving means for the stack and positioned to engage the end of the stack opposite the feed means, the insert being so positioned and mounted that it is frictionally moved by the last sheet to be fed into engagement with the retard means to provide a lifting force to the retard means to reduce the frictional retard force of the retard means on the last sheet.

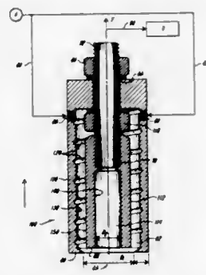
4,822,022

APPARATUS FOR LIFTING A FLEXIBLE SHEET

Ann T. Attenasio, Revere, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 21, 1988, Ser. No. 171,264
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—97 **24 Claims**

1. A device for lifting a flexible sheet member, said device comprising:
(a) a first tubular sleeve member enclosing an elongated interior region extending along a reference axis and having a first substantially planar, aperture-defining rim disposed about and coaxial with said reference axis at the distal end of said interior region, said sleeve member including means for coupling the proximal end of said interior region to a relatively low pressure region; and
(b) means for defining a composite airflow path from a relatively high pressure region, through said first rim and said interior region to said low pressure region, and including means for establishing an airflow vortex in said



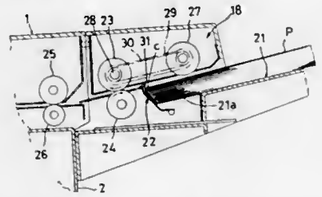
composite airflow path substantially at said first rim and disposed about said reference axis.

4,822,023

PAPER-FEEDING DEVICE

Yoshitake Miyoshi, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 868,049, May 29, 1986, abandoned. This application Oct. 27, 1987, Ser. No. 113,378
Claims priority, application Japan, Jul. 29, 1985, 60-116760
Int. Cl.[4] B65H *3/06*
U.S. Cl. 271—118 **4 Claims**



1. In a paper feeding device for supplying sheets one at a time from a stack of paper sheets, said device including a paper receiving member for housing therein a plurality of paper sheets in a stack, paper supply roller means for feeding an uppermost paper sheet of the stack in a feed direction along a feed path, a pair of paper feed rollers positioned downstream of said supply roller means for receiving therefrom the uppermost paper sheet and for conveying such uppermost paper sheet in said feed direction, position controlling means for controlling the positions of leading ends of the paper sheets of the stack in said paper receiving member, said position controlling means comprising a member mounted adjacent a forward end of said paper receiving member for pivotal movement, during each operation of feeding by said paper supply roller means of an uppermost paper sheet from the stack, between a blocking first position, whereat said member blocks the leading ends of the paper sheets of the stack, and a release second position, whereat said member is spaced away from the leading ends of the paper sheets of the stack, said member having an upper end pivoting generally downstream with respect to said feed direction during movement of said member from said first position thereof to said second position thereof and pivoting generally upstream with respect to said feed direction during movement of said member from said second position thereof to said first position thereof, separating means positioned between said supply roller means and said pair of feed rollers for separating from the uppermost paper sheet any paper sheets therebeneath and supplied therewith by said supply roller means and thereby for preventing the simultaneous supply of plural paper sheets

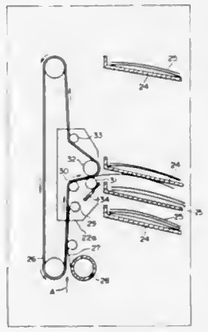
to said pair of paper feed rollers, said separating means comprising an upper feeding roller rotated in said feed direction and a lower separating roller rotation in a direction opposite to said feed direction, said upper feeding roller and said lower separating roller being positioned toward each other to nip therebetween the uppermost paper sheet and any paper sheets therebeneath and supplied from said supply roller means such that rotation of said separating roller in said opposite direction prevents feeding to said pair of feed rollers of any paper sheets other than the uppermost paper sheet, and said upper feeding roller and said lower separating roller being spaced from each other in a separated position to not nip therebetween the uppermost paper sheet and any paper sheets therebeneath upon the uppermost sheet being supplied to said pair of feed rollers, the improvement comprising auxiliary separating means for preventing the simultaneous supply of plural paper sheets when said upper feeding roller and said lower separating roller are spaced from each other in said separated position, said auxiliary separating means comprising:
friction means mounted on said upper end of said member of said position controlling means and pivotal therewith for, upon said member pivoting from said second position thereof to said first position thereof, engaging the lower side of any paper sheet beneath the uppermost paper sheet and fed by said paper supply roller means and preventing any further advance thereof in said feed direction.

4,822,024

SORTER FOR UPWARDLY CURVING COPY SHEETS

Koji Takahashi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 25, 1983, Ser. No. 497,973
Claims priority, application Japan, May 31, 1982, 57-92412
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—296 **8 Claims**



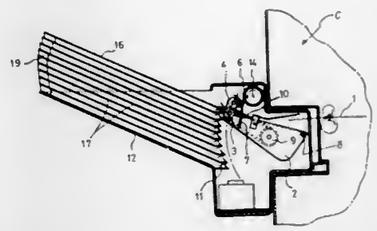
1. A sorter for sorting copy sheets made from an original by a copying machine, comprising:
a plurality of trays vertically arranged in multiple stages at predetermined intervals; and
means for conveying copy sheets into said plurality of trays and upwardly curving said sheets so that ends of said upwardly curved copy sheets curve downwardly with respect to a bottom surface of said trays, said means for conveying comprising a first roller and a web for conveying said paper past said first roller, said web passing over said first roller to change direction while conveying said paper between said web and said first roller, an angle of curvature of said copy sheets being a function of the a diameter of said first roller.

4,822,025

DEVICE FOR SORTING COPIED PAPERS

Jae Heon Chung, Eujungbu, Rep. of Korea, assignor to Sindo Ricoh Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 000,828, Jan. 6, 1987, abandoned. This application Jul. 13, 1988, Ser. No. 219,906
Claims priority, application Rep. of Korea, Jul. 28, 1986, 1986-6141
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—296 **2 Claims**



1. A device for sorting copied papers discharged from a copy machine according to page numbers thereof comprising:
a casing having an attachment adapted to removably attach the device to the paper outlet of said copy machine;
a guide plate pivotably mounted on a pivot pin fixed to said casing at its one end adjacent said paper outlet of the copy machine;
a feed motor mounted on said pivotably mounted guide plate;
a first paper-feed roller mounted on the other end of said pivotably mounted guide plate and driven by said feed motor via a belt, said first paper-feed roller being located at a distance from said pivot pin which is greater than the distance from said pivot pin at which said feed motor is located;
a second paper-feed roller disposed to contact with and follow said first paper-feed roller;
a lift motor adapted to pivot said guide plate in a stepwise manner via a pulley fixed to a shaft of said lift motor and a wire fixed at its one end to said guide plate and its other end to said pulley; and
a plurality of trays each provided at its one end adjacent said guide plate with a stacker for arranging copied papers and at its other end with a rib adapted to adjust a space between adjacent trays,
wherein during pivoting of said guide plate, said feed motor and said paper-feed rollers rotate along respective arcs relative to said pivot pin.

4,822,026

PLAYING SURFACES

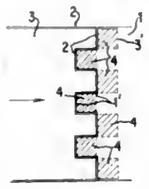
Harald Schobermayr, Heipelweg 9/4, and Erwin Krumboeck, Judendorferstrasse 33, both of A-8706 Leoben, Austria

Filed Mar. 7, 1983, Ser. No. 472,666
Claims priority, application European Pat. Off., Mar. 8, 1982, 82-890036.5
Int. Cl.[4] E01C *13/00*
U.S. Cl. 272—3 **10 Claims**

1. a substantially planar horizontal athletic field comprising

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a firm substrate provided with a top coating or finish of loosely poured particles of an elastic plastic in the form of flat plates or



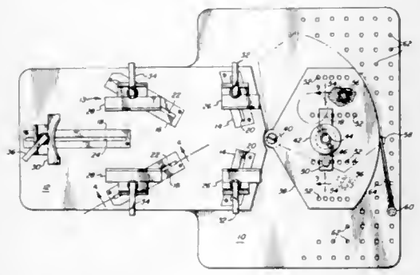
scales whose length is at least 7.5 times the thickness of the plate or scale.

4,822,027

THERAPEUTIC HAND AND ARM EXERCISE DEVICE

Thomas R. Kascak, 50 Parkway Dr., Trumbull, Conn. 06611

Filed Sep. 15, 1988, Ser. No. 244,322
Int. Cl.[4] A63B *5/00, 21/22*
U.S. Cl. 272—67 **12 Claims**



1. A therapeutic range of motion hand, wrist, and forearm exercising device comprising:
a baseboard;
restraint means, attached to said baseboard, for securely holding a patient's forearm;
a hand board pivotally attached at one end to said baseboard providing movement in a plane parallel to said baseboard;
a handle adjustably attached to said hand board said pivoted end being disposed between said handle and said restraint means;
adjustment means, associated with said hand board, for adjusting the position of said handle in relation to said hand board; and
adjustable elastic means, attached between said baseboard and a second end of said hand board, for providing adjustable force between said baseboard and said hand board.

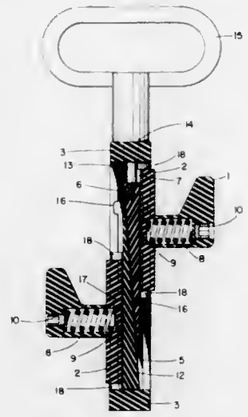
4,822,028

PORTABLE EXERCISE DEVICE

James N. McLellan, 911 Murfreesboro Rd., Franklin, Tenn. 37064, and Lawrence J. Morgan, 317 Willard Dr., Nashville, Tenn. 37211

Filed Jul. 5, 1988, Ser. No. 215,367
Int. Cl.[4] A63B *5/00, 21/00*
U.S. Cl. 272—67 **4 Claims**

1. A portable exercise device comprising:
(a) frame means including linear slide channels;
(b) first and second plate means adapted for sliding linearly within said slide channels in said frame means;
(c) grips attached to said plate means, said grips adapted for operative engagement by the user of said portable exercise device;
(d) first and second spring means for resisting inwardly directed efforts of the user of said exercise device, said effort and resistance being directed perpendicular to the direction of travel of said plate means in said linear slide channels;
(e) first and second opposed and abutting flexible wedge means attached to and within said frame means, said first wedge means adapted for slidable linear movement within said frame means and generally parallel with the movement of said plate means, said first and second wedge means having their respective outside surfaces in slidable



engagement with friction means attached to said spring means, whereby linear movement of said first wedge means will vary the perpendicular resistance offered by each of said spring means;
(f) actuator means for varying the linear position of said first wedge means, whereby adjustment of said actuator means will vary the resistance of each of said grips to inward force applied by the user of said portable exercise device;
(g) said first and second plate means adapted for slidable engagement by said friction means with said first and second wedge means to provide resistance in a linear direction; and
(h) whereby said device provides resistance to both linear and inward movement of said grips.

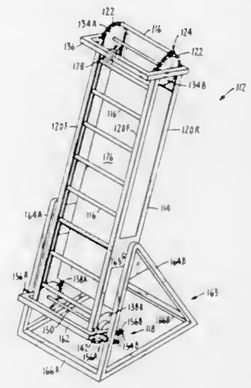
4,822,029

EXERCISER SIMULATOR HAVING A FRAME ROTATABLY MOUNTED ON A FULCRUM POINT

Gregory G. Sarno, 19070 Mayberry Dr., Castro Valley, Calif. 94546; Robert J. Williams, 626 Polk St., Apt. 505, San Francisco, Calif. 94102, and Michael E. Hohmeyer, 2627 Ashby St., Berkeley, Calif. 94708

Division of Ser. No. 810,181, Dec. 18, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 106,720
Int. Cl.[4] A63B *23/06*
U.S. Cl. 272—69 **6 Claims**

1. An exerciser simulator, comprising:
a base having fulcrum point;
at least two generally concave members defining a frame, each of said concave members having a first end and a second end, said frame being rotatably mounted on the base at the fulcrum point;
a rotatable member positioned adjacent to each of said first and second ends of each of said concave members;
a unidirectional, closed-looped transporting chain travelling adjacent to each of said concave members, said transporting chain being rotatably received by said first end rotatable member and said second end rotatable member for travelling towards a direction defined by one of said first and second ends of each of said concave members;
a plurality of exercise bars each of which is fixably mounted to both said transporting chains, said exercise bars being mounted generally normal to said transporting chains at a preselected positions of said transporting chains and each of said exercise bars having two mounting means for securely mounting each of said exercise bars to said transporting chains; and



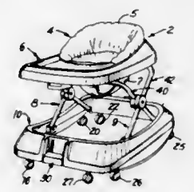
speed regulation means mounted between the base and the frame for controlling the speed of travel of said transporting chains, whereby
the weight of a user initially causes engagement of the speed regulation means to prevent movement of said transporting chains, and as the user advances on said exercise bars beyond said fulcrum point towards a direction opposite to said defined direction the speed regulation means becomes disengaged causing said transporting chains and said attached exercise bars to travel towards said defined direction, thereby simulating a climbing exercise.

4,822,030

JUVENILE WALKER

Richard E. Cone, Dayton, Ohio, assignor to R/D/ & D, Inc., Dayton, Ohio

Filed Dec. 28, 1987, Ser. No. 138,720
Int. Cl.[4] A63B *25/00;* **B62B** *9/12;* **A47D** *13/04*
U.S. Cl. 272—70.3 **20 Claims**



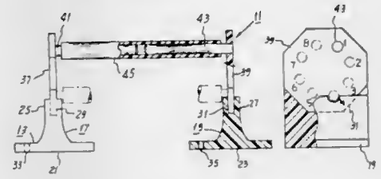
1. A juvenile walker comprising
a seat portion,
a support structure operatively connected to said seat portion;
said support structure being operatively connected to a base frame which is substantially rectangular and has a hollow U shaped cross section, the arms of the U shaped cross section being downwardly depending;
two U shaped support bars oppositely directed and each having its terminal ends centrally directed and pivotally. connected to the underside of said base frame,
said U shaped support bars being of such a size that they are adapted to nest inside of said base frame,
a plurality of casters or wheels being attached to each of said U shaped support bars.
and latches associated with both the U shaped support bars and base frame for biasing and retaining said U shaped support bars for engaging or disengaging the castors or wheels with a support surface.

4,822,031

POOL EXERCISE DEVICE

Horst A. Olschewski, 10011 Sandpiper Rd., East, Bradenton, Fla. 34209

Filed Nov. 13, 1987, Ser. No. 120,141
Int. Cl.[4] A63B *1/00;* **B25G** *3/28*
U.S. Cl. 272—71 **4 Claims**



1. A pool exercise device for use by a person in water in a swimming pool comprising:
a pair of end supports, each support having a base and an upright portion;
a slot or groove in each upright portion that is shaped to removably receive an end member;
a rod secured to and projecting outwardly from each end member;
means for positioning said supports and the coacting end members adjacent an edge of said pool in such a way that said rods are disposed colinearly toward each other;
means for positioning each end member by removing said end member from its slot, selectively rotating said end member, and returning said end member to said slot so that said end member is slottingly secured therein thereby allowing the height of said rods to be adjusted up or down relative to the level of water in said pool, said means including a pair of multi-sided members and a pair of member-receiving slots;
a sleeve surrounding said colinear rods;
said sleeve being able to be grasped with one or more hands for exercising.

4,822,032

EXERCISE MACHINE

Henry B. Whitmore, Rte. 5, Box 369, San Antonio, Tex. 78211, and Thomas P. Moore, Senate Blvd., Indianapolis, Ind. 46206

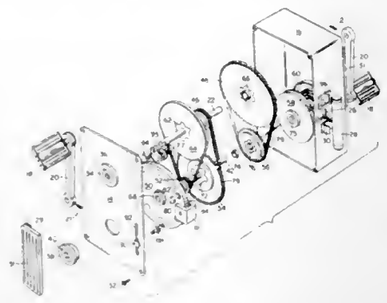
Filed Apr. 23, 1987, Ser. No. 42,211
Int. Cl.[4] A63B *69/06, 23/04, 21/22*
U.S. Cl. 272—73 **11 Claims**

1. An exercise machine for providing rope pull/rowing exercise and bicycling exercise comprising:
a housing;
shaft means extending through said housing and being rotatably carried by said housing;
bicycle pedal means rigidly attached to said shaft means external to said housing;
rope pulling means rotatably connecting to said shaft means, said rope pulling means extending external to said housing;
resistance means mounted in said housing and operatively

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connected to said shaft means to resist rotation of said shaft means;

clutch means for rotatably connecting said shaft means to provide for said rope pulling/rowing exercise from said rope pulling means and said bicycling exercise from said bicycle pedal means; and



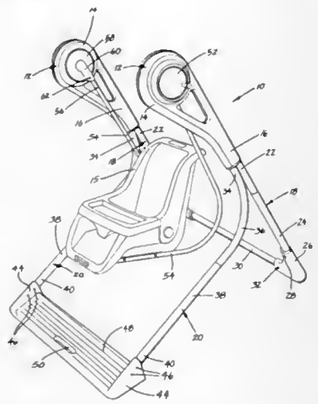
gear reduction means connected to said shaft means linking said rope pulling means and said bicycle pedal means with said resistance means and including at least one pair of rotating components having unequal diameters, said gear reduction means allowing said resistance means to apply appropriate force for proper exercise by said rope pull/-rowing exercise and said bicycling exercise when in use.

4,822,033

BABY SWING SUPPORT ASSEMBLY

Louis M. Kohus; John V. Mariol, and David W. Rice, all of Cincinnati, Ohio, assignors to James F. Mariol, Cincinnati, Ohio

Filed Nov. 3, 1987, Ser. No. 116,462
Int. Cl.[4] A63G *9/16*
U.S. Cl. 272—86 13 Claims



1. A baby swing support structure for providing enhanced stability and improved access to a baby seat comprising:

a pair of spaced apart upper hubs,

a pair of spaced apart support legs, each having an upper end, and each said leg extending downwardly and rearwardly from one of said hubs and having a lowermost end which is spaced rearwardly of the hub,

a pair of spaced apart support posts, each having an upper end, each said post secured to and extending downwardly from its upper end from one of said hubs, each said post having a lowermost end which is spaced substantially forwardly of the hub to provide, with said support legs, a stable support for the hubs, and wherein one of said posts is generally aligned in front elevation with one of said legs and the other of said posts is generally aligned in front elevation with the other of said legs,

a baby seat suspended from said hubs,

wherein said posts are concave in side elevation to provide ready access to said seat without interference by said posts,

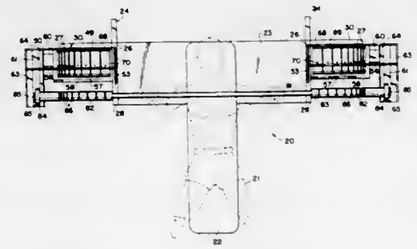
and wherein said structure has a top and is open at the top, and between said hubs, to provide ready access to said seat by a person reaching forwardly to place a baby into said seat or to remove a baby from said seat.

4,822,034

BARBELL SYSTEM

William D. Shields, 3031 Dalehurst Dr. W., Jacksooville, Fla. 32211

Filed Jun. 17, 1988, Ser. No. 208,173
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 33 Claims



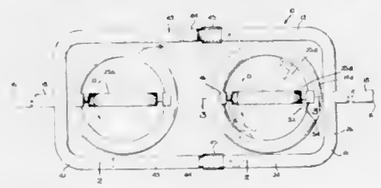
1. In a barbell weight lifting apparatus comprising an elongated lifting bar, a plurality of planar weights adapted to be selectively attached to said bar, support means to position said weights upstanding in a horizontal row, selective means for detachably securing said weights to said bar, each said weight having an identically positioned horizontally disposed lateral slot therein extending from a generally upright edge of said weight to generally medially thereof, said bar being positionable through each said slot at respective said weights and being selectively secured to selective said weights.

4,822,035

ADJUSTABLE BARBELL BAR WITH ROTATING HANDLES

Homer F. Jennings, Olney, Ill., and Ozzie Martisez, Aptos, Calif., assignors to Welder Health & Fitness, Woodland Hills, Calif.

Filed Jul. 25, 1986, Ser. No. 890,405
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 10 Claims



1. A barbell comprising:

two generally U-shaped member forming a generally elongated rectangular telescoping frame having two ends and two parallel bars, said frame comprising a telescoping means disposed between said U-shaped members for continuously adjusting the distance between the ends of said frame;

a pair of substantially circular handle tracks, each handle track being secured to each of said parallel bars and an adjacent end;

an end weight support bar disposed on each end of said frame and adapted to support weight plates thereon; and

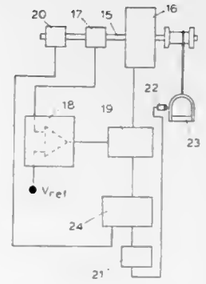
a handle disposed along the diameter of each of said handle tracks, said handle being rotationally movable through an axis transverse to the plane defined by said handle track, and having a locking means for reversibly securing said handle in a desired rotationally angle in said handle track.

4,822,036

ISOKINETIC PHYSICAL EXERCISE APPARATUS WITH CONTROLLABLE MINIMUM RESISTANCE

Chi H. Dang, 3897 Birchwood Dr., Boulder, Colo. 80304

Filed Apr. 25, 1988, Ser. No. 185,392
Int. Cl.[4] A63B *21/24*
U.S. Cl. 272—129 3 Claims



2. A physical exercise apparatus having a resistance generator for generating physical exercise resistance comprising:

a magnetic particle brake having the electromagnet windings for generating resistance for said physical exercise apparatus;

a power supply means for supplying variable electrical current output to said electromagnet windings;

a speed detecting means for detecting a motion speed generated by said magnetic particle brake and outputting a detected motion speed signal;

an isokinetic controlling means connected to said power supply means for controlling sais electrical current; said isokinetic controlling means including means for comparing said detected motion speed signal with a preselected isokinetic speed setting and causing said power supply means (a) to generate no electrical current output when said motion speed is below said isokinetic speed setting or (b) to generate an electrical current output that increasing said motion speed when said detected motion speed exceeds said isokinetic speed setting;

a position detecting means for detecting a motion position generated by said magnetic particle brake and outputting a detected motion position signal;

a counter mens for counting a number of repetition being completed by a user from said physical exercise apparatus and outputting a count signal;

an isotonic controlling means connected to said power supply means for controlling said electrical current output; said isotonic controlling means including a programable microprocessor for processing said detected motion position signal and said count signal and generating a controlling signal to said power supply means to control said electrical current output; said isotonic controlling means causes said magnetic particle brake to generate an isotonic resistance that follows an optimum strength curve for each specific exercise motion; the magnitude of said strength curve depends on a maximum strength of said user and said number of repetition being completed by said user; and

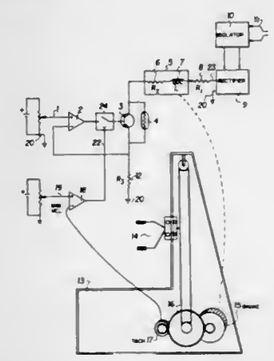
wherein a total output resistance is the sum of said resistances caused by said isokinetic controlling means and said isotonic controlling means.

4,822,037

RESISTANCE CONTROL SYSTEM FOR MUSCLE THERAPY/EXERCISE/TRAINING AND STRENGTH MEASUREMENT

Terek Makansi, Los Gatos, and Robert E. Hora, San Ramon, both of Calif., assignors to Digital Kinetics Corporation, Danville, Calif.

Filed Jun. 5, 1987, Ser. No. 58,895
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—129 27 Claims



1. A machine including a resistance control system for use by an individual comprising:

first means disposed for engagement by at least one limb of said individual;

electric brake of one of the hysteresis and friction types having a rotor and stator, said brake generates a resistance torque to rotary motion of the rotor proportional to an electrical current flowing in the stator;

second means for converting motion imparted to the first means by said individual to cause a rotary motion of the rotor of the brake;

third means disposed for receiving a signal proportional to the desired resistance torque of the brake to oppose the motion of the individual;

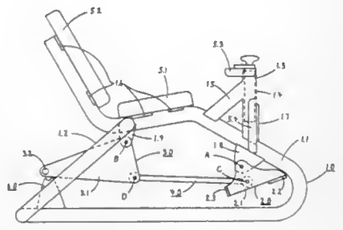
fourth means for measuring the torque exerted by the individual;

fifth means for increasing the stator current when the desired torque exceeds the measured torque exerted by the individual by applying a voltage to the stator of the brake that is greater than the voltage necessary to maintain the measured torque in the steady state; and

sixth means for removing inductive energy from the stator when the measured torque exerted by the individual exceeds the desired torque by maintaining a reverse voltage thereacross that is greater than the voltage necessary to achieve the measured torque in the steady state.

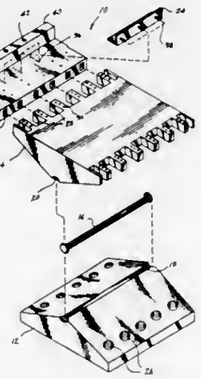
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4,822,038
CALF ISOLATING EXERCISE MACHINE
Henry Maag, 5332 Clark Cir., Westminster, Calif. 92683
Continuation of Ser. No. 862,975, May 14, 1986, abandoned. This application Oct. 28, 1987, Ser. No. 117,366
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **5 Claims**



1. A calf exercising machine, comprising:
a rigid frame which includes means for supporting an operator in a seated position of operation;
a rigid rotating foot-engaging assembly which is journaled in said frame an axis which is approximately common with the axes of rotation of said operator's ankle joints while said operator is supported in said machine's frame in the operating position;
said rigid rotating foot-engaging assembly includes ball-of-the-foot-engaging surfaces which, through body-machine contact, apply resistive force to the balls of the operator's feet through circular exercise movement paths about the rotational axes of the operator's ankle joints;
said rigid frame includes means for fixing the positions of both the operator's lower legs and ankle joints while performing the exercise movement, as by means of providing body-machine contact surfaces which apply constraining forces to the operator's body which balance the forces acting at the ball-of-the-foot-engaging surfaces which would tend to displace the operator's ankle joints and/or lower legs relative to the axis of rotation of said rigid rotating foot-engaging assembly;
a rigid rotating weight arm which is journaled in said machine's frame on an axis which is both parallel with and separated by a specific distance from the axis of rotation of said rigid rotating foot-engaging assembly;
said rigid rotating weight arm includes means for loading weights onto at a point offset from its axis of rotation;
said rigid rotating foot-engaging assembly and said rigid rotating weight arm are mechanically linked to each other, at axes which are both parallel with and offset by specific distances from their respective axes of rotation, by a rigid connecting link which has a specific length between its centers of connection;
said rigid rotating foot-engaging assembly, said rigid rotating weight arm, said link mechanically joining said rigid rotating foot-engaging assembly and said rigid rotating weight arm, and said frame of said calf exercising machine join together to form a four-bar linkage which, when acting in conjunction with the sinusoidally changing values of force applied by the machine's rotating weight arm as the weights swing through a circular path through the gravitational field, applies a predetermined variably resistive force at the ball-of-the-foot-engaging surfaces on said rigid rotating foot-engaging assembly, which varies as a function of the degrees of rotation of the operator's ankle joints and which is characteristic of the relationships in length and orientation of the four rigid members forming the four-bar linkage and the orientation of the rotating weight arm to the gravitational field throughout the range of the exercise movement;
said specific distance between the axis of rotation of said rigid rotating foot-engaging assembly and the axis of rotation of said rigid rotating weight arm, said specific distance between the axis of rotation of said rigid rotating foot-engaging assembly and the axis of connection of said connecting link on said rigid rotating foot-engaging assembly, said specific distance between the axis of rotation of said rigid rotating weight arm and the axis of connection of said connecting link on said rigid rotating weight arm, and said specific distance between the centers of connection on said connecting link all have a definite non-changing relationship to each other, which relationship, along with their orientations to each other, is determined through kinematic analysis of the moving parts of the four-bar linkage/rotating weight arm force-varying mechanism and is dependent on said predetermined variably resistive force which said four-bar linkage/rotating weight arm force-varying mechanism is designed to put out throughout the exercise movement.

4,822,039
PIVOTING LEG AND ARM EXERCISE DEVICE
Charles B. Gonzales, and Benjamin C. Gonzales, both of 101 E. Wilson, Gallup, N. Mex. 87301
Filed Feb. 5, 1988, Ser. No. 152,675
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—146 **1 Claim**



1. A new and improved exercise device, comprising:
a base block having a generally rectangular flat bottom surface and a generally triangular transverse cross sectional shape;
an elongated semi-cylindrical pivot axle recess formed at a central apex of said base block;
a plurality of lower cylindrical recesses spaced along opposite side edges of said base block;
said lower cylindrical recesses disposed on opposite sides of said pivot axle recess;
a pivot block having a generally rectangular flat top surface and a generally triangular transverse cross sectional shape;
an elongated semi-cylindrical pivot bearing recess formed at a central apex of said pivot block;
a plurality of upper cylindrical recesses spaced along opposite side edges of said pivot block, said upper cylindrical recesses disposed on opposite sides of said pivot bearing recess;
a pivot axle received between said base block and said pivot block, said pivot axle received in said pivot axle and pivot bearing recesses and supporting said pivot block on said base block;
at least one coil spring connecting said base and pivot blocks on each side of said pivot axle, each of said coil springs

having opposite ends secured in one of said upper cylindrical recesses and one of said lower cylindrical recesses;
a plurality of outwardly extending mounting rails spaced along opposite side edges of said pivot block, each of said rails provided with a plurality of spaced adjustment apertures;
a pair of generally "L"-shaped adjustable mounting blocks secured on opposite side edges of said pivot block, each of said adjustable mounting blocks having a plurality of spaced rail receiving recesses dimensioned for reception of said mounting rails;
a plurality of retaining pin receiving apertures communicating with each of said rail recesses;
a plurality of retaining pins adjustably securing said mounting rails in said rail recesses;
a pair of foot supports adjustably secured on said adjustable mounting block;
a pair of hand grips; and
at least one elongated coil spring securing each of said hand grips to one of said adjustable mounting blocks.

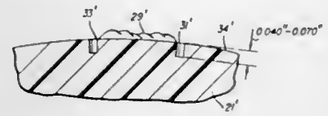
4,822,040
BOWLING TRAINING PROCESS AND DEVICE
Thomas F. Raditic, 95 Ashland Ave., Buffalo, N.Y. 14222
Filed Apr. 11, 1988, Ser. No. 179,971
Int. Cl.[4] A63D *5/00*
U.S. Cl. 273—54 D **10 Claims**





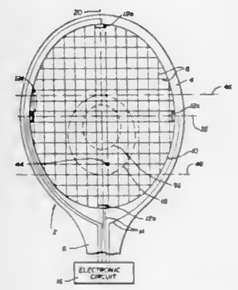
5. A process for improving the accuracy skills of a bowler which comprises placing a pressure-sensitive target on a lane of a bowling alley, fixing said target in place on said alley, providing on said target visible markup for comparing the trajectory of a bowling ball rolled thereover, rolling a bowling ball down the alloy in such a manner that it passes over said pressure-sensitive target thereby substantially permanently recording on said target the ball trajectory, locating the proper visible trajectory image for maximum score, and comparing that same trajectory with the next ball and series of balls thrown.

4,822,041
GAME BALL
Robert P. Molitor, Niles, Mich., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Division of Ser. No. 876,506, Jun. 20, 1986, Pat. No. 4,729,566. This application Dec. 18, 1987, Ser. No. 135,173
Int. Cl.[4] A63B *37/12*
U.S. Cl. 273—60 B **1 Claim**



1. A molded ball comprising
a unitary substantially spherical body;
simulated stitching having protrusions and indentations integral with said body; and
a plurality of simulated stitch holes adjacent the outer edges of said stitching, said simulated stitch holes extending into said body a distance of between 0.040 inches and 0.070 inches simulate the depth of the stitching holes of a standard stitched leather covered ball.

4,822,042
ELECTRONIC ATHLETIC EQUIPMENT
Steve Landsman, Randallstown, Md., assignor to Richard N. Conrey, Cockeysville and Phillip T. McQuaid, Marriottsville, both of, Md.
Filed Aug. 27, 1987, Ser. No. 90,057
Int. Cl.[4] A63B *61/00*
U.S. Cl. 273—73 R **30 Claims**



1. An athletic instrument comprising:
a surface including a predetermined area for striking a movable game element to impart motion thereto, the predetermined area being deemed as the intended location on the surface for striking the game element;
a multiple number of sensing means located at the periphery of the surface for detecting shock waves, caused when the game element strikes the surface, propagating along the surface;
means for differentiating respective moments at which the shock waves are initially detected by the respective sensing means;
means for signaling that the predetermined area has been struck if the respective moments at which the shock waves are initially detected by the respective sensing means fall within a reference time frame.

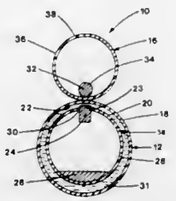
VOL 1101 ISS 3 AP 18 1989 UMI

4,822,043
BASEBALL CARD GAME
Lewis S. Carter, No. 3, The Tower, Chapel Hill, N.C. 27514
Filed Mar. 25, 1987, Ser. No. 30,710
Int. Cl.[4] A63F *1/04*
U.S. Cl. 273—93 C 18 Claims



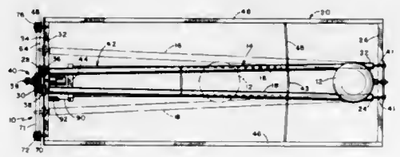
1. A baseball game, comprising:
(a) a random character generator, said random character generator utilized to generate a two-digit character by independently generating each digit of the two-digit character;
(b) a park card containing:
(i) a series of characters generatable by said random character generator, and
(ii) a series of corresponding play events;
(c) a set of play action cards, each having on a first side thereof:
a listing of all player positions;
a numerical range of fielding rations for each of said player positions; and
a play event for each of the said fielding rations for each said player position; and on a second side thereof:
a series of category events; and
a corresponding series of play events;
(d) a set of player cards, including batter/fielder and pitcher cards, each of said batter/fielder cards containing a designation of a specific player and playing position for said player, a fielding rating for said player at said position, and said player's performance as a batter against each of the pitching categories of right-handed and left-handed pitching, each said pitching category being so designated and having associated therewith:
(i) a series of two-digit characters generatable by said random character generator, and
(ii) a series of corresponding play events, some of which designate outcome play events on one of said park cards and said play action cards; and
each of said pitcher cards containing a designation of a specific player and indicia of his pitching performance in each of the pitching situation categories of pitching with bases empty, and pitching with runner(s) on base, each of said playing situation categories being so designated and having associated therewith:
(i) a series of two-digit characters generatable by said random character generator, and
(ii) a series of corresponding play events, some of which designate outcome play events on one of said park cards and said play action cards.

4,822,044
MOVING SURFACE MAGNETIC GAME
Jerzy Perkitny, 28115 Osborn Rd., Bay Village, Ohio 44140
Filed Oct. 26, 1987, Ser. No. 113,106
Int. Cl.[4] A63B *37/00, 39/00, 67/14*
U.S. Cl. 273—109 13 Claims



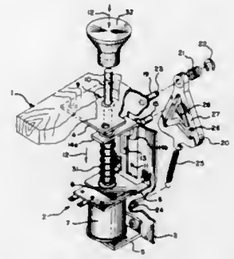
1. A game comprising:
(a) a hand manipulatable housing having a wall which presents a curved external playing surface;
(b) an operating member having a magnetic portion and a weighted portion;
(c) means mounting said operating member for movement within said housing so that said weighted portion maintains said magnetic portion uppermost near an inner surface of said wall as said housing is turned;
(d) an object member separate from said housing, said object member at least in part being of a ferromagnetic material and having a curved surface;
(e) said object member being engageable with said curved playing surface of said housing, whereby said magnetic portion will attract said object member to maintain it in tracking engagement with said housing when it is turned.

4,822,045
ROLLING BALL GAME
Stephen P. Shoemaker, Jr., 123 International Boardwalk, Redondo Beach, Calif. 90277
Filed Aug. 10, 1987, Ser. No. 83,377
Int. Cl.[4] A63B *67/14;* A63D *3/02*
U.S. Cl. 273—110 13 Claims



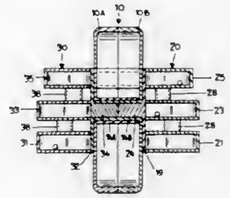
1. An amusement apparatus, comprising:
a pair of spaced apart, elongate members defining a generally horizontal track spaced above the ground, the members having opposite first and second ends defining opposite first and second ends of the track, respectively, the first ends being spaced a fixed distance apart;
a rolling member seated on the track and moveable between opposite ends of the track;
a mounting assembly for guiding the second ends of the elongate members for movement towards and away from each other in a horizontal direction transverse to the track;
non-manual drive means for moving the second ends of the members towards and away from each other; and
control means remote from the drive means for controlling operation of the drive means to adjust the separation of the second ends of the members to control rolling of the rolling member along the track, the control means including a player-controlled device for allowing at least partial control by the player of the drive means controlling movement of the second ends of the elongate members.

4,822,046
TWO AND FOUR POSITION TARGET ASSEMBLY
Mark S. Kim, Chicago, and Gary L. Berge, Crystal Lake, both of Ill., assignors to Williams Electronics, Chicago, Ill.
Filed Feb. 25, 1987, Ser. No. 18,480
Int. Cl.[4] A63F *7/00*
U.S. Cl. 273—127 R 8 Claims



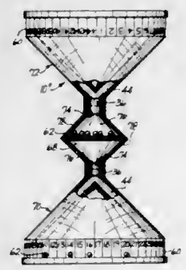
1. In a flipper-type pinball game machine of the type having an inclined playfield which supports a rolling ball and one or more play features, the improved play feature comprising:
(1) a ball target means;
(2) a positioning means for movably positioning said ball target means comprising a solenoid having a plunger-shaft arranged perpendicular to and extensible above the playfield to carry said ball target means, a camming pin carried by said plunger-shaft, and a cam means having a cam track into which said camming pin extends to control movement of said plunger shaft;
(3) a sensing means for sensing the position of said camming pin and plunger shaft for registering a score based on the position; and
(4) an activating means for activating said positioning means.

4,822,047
COMBINATION OF A GAME APPARATUS AND EDUCATIONAL DEVICE
Yuri P. Treer, 1320 S. 27 Pl., Birmingham, Ala. 35205
Continuation-in-part of Ser. No. 848,810, Jul. 21, 1986, abandoned. This application Sep. 3, 1987, Ser. No. 93,176
Int. Cl.[4] A63B *67/14;* A63F *9/06*
U.S. Cl. 273—113 7 Claims



1. A game apparatus comprising a central housing, a left housing and a right housing; said central housing comprising one or more substantially identical generally disk shaped members with one or more tubular members attached perpendicularly to said central housing, each said disk shaped member having a plurality of channels spaced about an axis, and, in the case of multiple said disk shaped members, said channels on all said disk shaped members being alignable with the channels of all other said disk shaped members; each of said right and left housings having movable elements therein and comprising two or more vertically separated levels of enclosed communicating maze members and a means for communicating between each level, said maze members being attached to a planar sheet member, said sheet members having at least one aperture in communication with each of said levels, said sheet members further having means for pivotally engaging said tubular members of said central housing; said at least one apeture being alignable with at least one of said channels in said central housing such that said movable elememts can move between said right and left housings through said central housing channels.

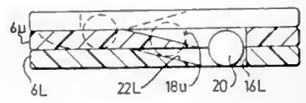
4,822,048
MIX AND DISPLAY CHANCE DEVICE
Austin H. Axup, 1065 - 108th Ave. Bellevue #4, Bellevue, Wash. 98007
Filed Jul. 14, 1987, Ser. No. 72,862
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—144 B 15 Claims



1. A mix and display type chance device, comprising:
wall means defining a plurality of ball catch regions spaced about an axis, each said ball catch region including a closed end and an open end;
a ball passageway which surrounds said axis, said ball passageway having a small end and a large end, said large end being positioned adjacent the open ends of the ball catch regions;
said ball passageway being defined between inner and outer conical walls, said inner wall converging to a closed top and said outer wall converging to form said small end, such that said ball passageway is axially tubular at said small end and is annular at said large end;
a ball mixing chamber axially spaced from and in communication with the small end of said ball passageway;
an identifying indicia associated with each said ball catch region; and
a predetermined number of balls movable into and out from the ball catch regions, and through said ball passageway, in response to an inversion of the device,
wherein the device can be positioned with the closed end of said ball catch regions directed upwardly, and the open ends of the ball catch regions directed downwardly, to position the balls by gravity in the ball mixing chamber, and then the device can be inverted to cause the balls to gravitate through the ball passageway, striking the inner wall and mixing as they move, and each into a said ball catch region.

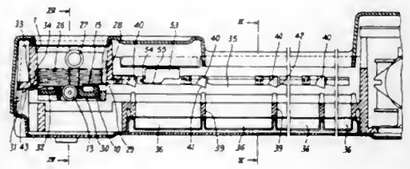
VOL 1101 ISS 3 AP 18 1989 UMI

4,822,049
PUZZLE-TYPE AMUSEMENT DEVICE
Tuvia Biber, Dror Street 58, Rishon Lezion, Israel
Filed Mar. 14, 1988, Ser. No. 167,820
Claims priority, application Israel, May 25, 1987, 82650
Int. Cl.[4] A63B *67/14*; A63F *9/08*
U.S. Cl. 273—110 **20 Claims**



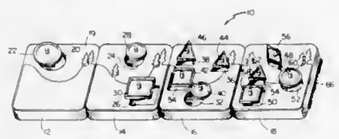
1. A puzzle-type amusement device comprising: a stack of discs including a bottom disc at one end, a top disc at the opposite end, and a plurality of intermediate discs, each rotatably mounted with respect to the others; each of said intermediate and top discs being formed with at least two openings adapted to be aligned with each other; and a ball of a diameter equal to or smaller than that of said openings so as to be receivable through one of the openings in the top disc and to pass through the openings aligned therewith in the intermediate discs to rest against the bottom disc; one of said openings in each intermediate disc being bounded at one side by a tapered surface curved about the axis of rotation of said intermediate disc so as to constitute an inclined track permitting the ball, when received in such opening, to be rolled along said inclined track out of the respective opening in the direction towards said top disc; the other of said openings in each intermediate disc being bounded on all its sides by an untapered surface such that said other opening constitutes a trap preventing the ball, when received in the said other opening, from being rolled out of said other opening in the direction towards said top disc.

4,822,050
DEVICE FOR READING AND DISTRIBUTING CARDS, IN PARTICULAR PLAYING CARDS
Gérard Normand, Besancon, and Michel Persuy, Le Vesinet, both of France, assignors to Acticiel S.A., France
Filed Mar. 6, 1987, Ser. No. 23,078
Claims priority, application France, Mar. 6, 1986, 86 03161
Int. Cl.[4] A63F *1/14*
U.S. Cl. 273—149 P **12 Claims**



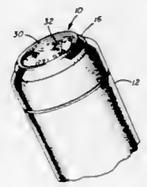
1. A device for reading and dealing cards, in particular playing cards which comprises:
(a) a container adapted to receive a pack of stacked cards,
(b) a movable bottom for said container, said bottom comprising a carriage adapted to perform a translation movement along a path according to an outgoing travel and a return travel under the action of motor means,
(c) friction means carried by said carriage and adapted to engage a face of the lower card of said pack,
(d) receiving boxes for cards to be dealt which are aligned at a lower level parallel to the path along which the carriage is caused to move,
(e) means for reading information carried by the lower card,
(f) selection means for separating said lower card from the other cards of the pack at the beginning of the outgoing travel of the carriage,
(g) means for guiding the face of the lower card opposite to the face engaged by said friction means during the outgoing travel of the carriage so that said lower card moves together with said carriage,
(h) means comparing said information read on the lower card with basic information relating to the deal to be distributed and controlling a stop of the outoing travel of the carriage above a chosen receiving box, and
(i) means preventing said lower card from moving together with said carriage when said carriage performs its return travel, said lower card then falling by gravity into said chosen receiving box.

4,822,051
PICTURE PUZZLE OF MULTIPLE PANELS WITH PROGRESSIVE DIFFICULTY
Ralph M. Nowak, Marblehead, Mass.; Harold Ashton, Providence, R.I., and Earlene Hornbostel, Brighton, Mass., assignors to Kiddie Products, Inc., Avon, Mass.
Filed Mar. 28, 1988, Ser. No. 174,193
Int. Cl.[4] A63F *9/10*
U.S. Cl. 273—157 R **10 Claims**



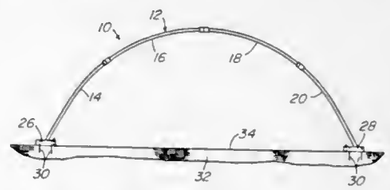
1. A child's toy in the form of a puzzle comprising:
a plurality of discrete puzzle panels, each said puzzle panel bearing, on a first surface, a segment of a pictorial representation, said puzzle panels adapted for assembly into a unit for joining of said segments into a contiguous pictorial display, said puzzle panels being adapted for random assembly into said contiguous pictorial display, and
each said puzzle panel defining, in said first surface, at least one cavity of predetermined size and shape, and said puzzle further comprising a puzzle piece of corresponding size and shape sized and adapted to be received snugly into said cavity.

4,822,052
GOLF CLUB GRIP ATTACHMENT FOR IDENTIFICATION AND BALL POSITION MARKING
Gary S. Dimmick, 667 4th St., Oakmont, Pa. 15139, and Scott G. Lockerman, 930 Nevin Ave., Sewickley, Pa. 15143
Filed Dec. 7, 1987, Ser. No. 129,718
Int. Cl.[4] A63B *53/14*
U.S. Cl. 273—162 D **15 Claims**



6. A one piece golf club identification marker comprising,
a circular disc-like body with a top surface and a bottom surface,
an anchor member formed on said body bottom surface and adapted to permanently connect said marker to the end of a golf club grip,
an upstanding annular protective collar formed on said body top surface near the outer periphery of said body top surface and defining a protected portion of said body top surface within the confines of said protective collar, and
identification indicia engraved directly on said body top surface protected portion whereby said identification indicia becomes a permanent part of said golf club grip when said marker is connected to the end of a golf club grip.

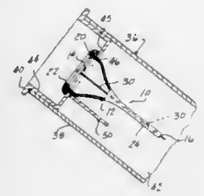
4,822,053
GAME BARRIER DEVICE
Eleanor L. Flaherty, 6050 Oak Hill La., Centerville, Ohio 45459
Continuation-in-part of Ser. No. 745,270, Jun. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 526,043, Aug. 24, 1983, abandoned. This application Aug. 7, 1986, Ser. No. 894,268
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—411 **16 Claims**



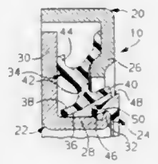
1. A game barrier device for forming an arch-shaped barrier of adjustable height comprising:
a pair of support members;
each of said support members having a socket;
each of said support members being constructed to lie on the ground or other generally horizontal playing surface with its said socket facing upwardly at an angle so that the center axes of said sockets intersect one another above said playing surface;
an elongate substantially free-standing rod having a self-supporting shape, capable of being bent into an arch shape, and being formed from plural, releasably interconnected rod sections each having a length convenient to be transported about by one person, said rod having an unbent length of approximately 15 feet or more and having end portions sized to be received within said sockets so that said end portions may be inserted into said sockets in alignment with said center axes by bending said rod into an arch shape; and
means for holding said support members at adjustably fixed relative spacings on the playing surface so that arches of different heights may be formed by spacing said support members at different spacings with said rod received in said sockets.

4,822,054
VAPOR/FUEL SEAL FOR FUEL TANK FILLER TUBE
Susan A. Christner; Elaine R. Janda, Both of Wyandotte, and Mark Sidebottom, Fenton, all of Mich., assignors to Janchris Corporation, Wyandotte, Mich.
Filed Jan. 15, 1988, Ser. No. 144,911
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—12 **5 Claims**

1. A vapor/fuel seal for a fuel tank filler tube having inlet and outlet ends comprising:
a seal member having an inlet end and an outlet end;
means, formed adjacent to the inlet of the seal member, for sealingly attaching the inlet end of the seal member to the open end of the fuel filler tube;
a normally closed fluid flow passage formed between the inlet and outlet ends of the seal member, the fluid flow passage being formed from an expansible material to enable the fuel flow passage to closingly receive a fuel dispensing nozzle; wherein the expansible material, in its normal position, seals the passage from a point medial to the inlet and the outlet to the outlet end of the seal member;
a biasing member having a lateral portion and at least two prong members extending outward therefrom, the lateral member securely positioned at the inlet end of the seal member, the prong members extending within the fluid flow passage.



4,822,055
UNITIZED BEARING SEAL ASSEMBLY
Martin J. Hogan, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed May 17, 1988, Ser. No. 194,773
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—27 **3 Claims**

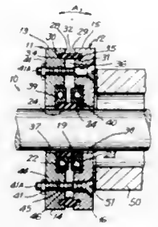


1. A unitized seal assembly for use in the annular space formed between a stationary bearing member and a rotating bearing member extending coaxially through said core, with a supply of lubricant being located on one axial side of said annular space and ambient on the on the other axial side of said annular space, said seal assembly comprising,
a first casing sized so as to fit within the bore of said stationary bearing member,
a second casing having a sleeve sized so as to fit over said rotating bearing member,
an elastomer seal bonded to said first casing with a radially inner sealing lip that sealingly engages said second casing sleeve, and,
a generally annular retention ring sized to fit tightly to said second casing, said ring further having an outwardly facing conical surface that extends axially toward said lubricant space and radially outwardly sufficiently far to radially overlap said elastomer seal,
whereby said seal assembly may be assembled by axially aligning said first and second casings and then fitting said retention ring to said second casing, after which the radial overlap of said retention ring conical surface and said seal prevents said casings from being pulled apart, said retention ring conical surface also acting, after said casings have been installed, to throw any lubricant moving axially toward ambient radially outwardly and axially back into

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said lubricant supply as said second casing rotates with said rotating bearing member.

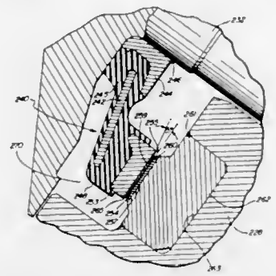
4,822,056
ADJUSTABLE ROTARY SHAFT SEAL
David Bowers, Bath, Me., assignor to Woodex Bearing Company, Inc., Georgetown, Me.
Continuation-in-part of Ser. No. 124,087, Dec. 23, 1987. This application Oct. 26, 1988, Ser. No. 262,740
Int. Cl.[4] F16J *15/38*
U.S. Cl. 277—83 **6 Claims**



1. A compensating rotary shaft seal assembly comprising in combination, an elongate, axially expansible, high friction elastomeric sleeve adapted to be mounted in sealing and encompassing relation over a shaft, first and second spaced washers engaging the distal ends of said sleeve, first and second spaced end plates having clearance apertures for the passage therethrough of said shaft, said end plates including annular wear surfaces surrounding said clearance apertures, said wear surfaces being in sliding engagement with the respective surfaces of said washers remote from said sleeve, a tubular elastomeric band member interposed between said end plates in encompassing relation of said sleeve and washers and surrounding said clearance apertures, the end surfaces of said band member being disposed in sealing contact with the respective opposed faces of said end plates to define with said end plates a chamber, and a plurality of threaded adjustment means extending between said end plates at angularly offset positions surrounding said wear surfaces for compressing said band member to vary the spacing between and the angular orientation of said end plates and biasing said wear surfaces against said washers.

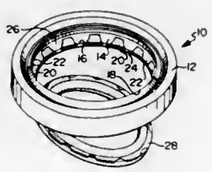
4,822,057
MECHANICAL FACE SEAL FOR ROCK BITS
Weng-Kwen R. Chia, Irvine, and George F. Anderson, Buena Park, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.
Filed Mar. 31, 1988, Ser. No. 176,072
Int. Cl.[4] F16J *15/38*
U.S. Cl. 277—84 **20 Claims**

1. A metal-to-metal Belleville seal for a rotary cone rock bit, said seal is positioned in a seal cavity formed between a leg of said rock bit, and a rotatable cone mounted on a journal bearing extending from said leg of said bit, said seal comprising:
- a first metal ring, positioned adjacent a resilient material forming an outer peripheral end of said Belleville seal, said ring forming a diameter that will fit within said seal cavity, a first radially disposed sealing surface formed from a metallic material of said metal ring, said metal ring subsequently serves as part of said metal-to-metal Belleville seal; and
- a second metal, radially disposed sealing surface formed in said cone is positioned adjacent said first radially disposed sealing surface of said metal ring, said second metal sealing surface is formed from a metallic material in said cone, said metallic material forming said first sealing surface is softer than said metallic material forming said second sealing surface in said cone, said first and second sealing surfaces being pre-lapped to substantially perfect a seal



between sealing surfaces prior to insertion of said first metal ring into said seal cavity formed between said leg and said cone of said rotary cone rock bit.

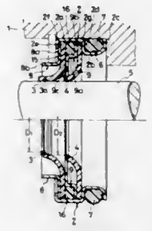
4,822,058
RADIAL LIP SEAL
John D. Butler, Van Wert, Ohio, and Jon A. Chandler, Brighton, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.
Filed Oct. 1, 1987, Ser. No. 103,151
Int. Cl.[4] F16J *15/32*; B29C *17/10*
U.S. Cl. 277—152 **18 Claims**



1. A rotational contact seal comprising:
- an annular sealing member having a lip for contacting a relatively rotatable shaft;
- said lip formed of a first material and a second material, said first and second materials having different material properties and defining a continuous circumferentially extending contact band having alternating first and second separate regions formed of the first and second materials respectively.

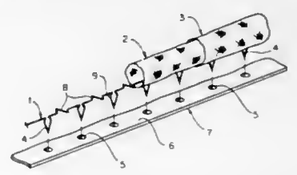
4,822,059
DUAL LIP SEAL DEVICE
Keiichi Shimasaki; Hiroshi Kanayama; Hiroshi Kanemitsu; Makoto Shibata; Satoshi Asahi, and Akira Takenaka, all of Aichi, Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan
Filed May 20, 1988, Ser. No. 196,700
Claims priority, application Japan, Jul. 24, 1987, 62-184966
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—152 **23 Claims**

1. A lip seal device for sealing the gap between a housing and a rotary shaft, comprising:
- a case surrounding said rotary shaft;
- a plurality of lip seals fitted inside said case and including at least two lip seals which are a first and a second lip seals;
- support means for holding said lip seals on at least the outer circumferential portions thereof;
- and seal means located on the outside circumferential surface of said case, wherein said first lip seal is located nearer a sealed fluid than said second lip seal, the inner circumferential portions of said first and second lip seals being curved toward said sealed fluid and having sealing



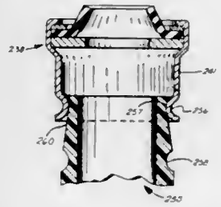
surfaces in sliding contact with the outside circumferential surface of said rotary shaft, and wherein the contact pressure of said second lip seal on said rotary shaft is set to be lower than that of said first lip seal on said rotary shaft.

4,822,060
WOVEN TUBULAR GASKET WITH CONTINUOUS INTEGRAL ATTACHMENT MEANS
James D. Moyer, Downingtown; John K. Neuhauser, West Chester, both of Pa.; Thomas B. Conaghan, Rock Hall, Md., and J. Sellers Kite, Gleamore, Pa., assignors to The Bentley-Harris Manufacturing Company, Lionville, Pa.
Continuation-in-part of Ser. No. 703,836, Feb. 21, 1985, abandoned. This application Jul. 30, 1985, Ser. No. 760,716
Int. Cl.[4] F06B *7/16*; F16J *15/02*
U.S. Cl. 277—166 **8 Claims**



1. A gasket for sealing a space between two surfaces, one of said surfaces having a series of spaced openings therethrough, said series being arranged in the pattern desired for the gasket, said gasket comprising:
- (a) at least one woven tubular member having a bollow interior and comprising woven strands; and
- (b) an integral continuous attachment means positioned inside the tubular member, being adapted to hold the tubular member in said pattern when assembled on said one of said surfaces, said attachment means comprising a flexible metal wire extending generally axially inside the hollow interior of said woven tubular member, said flexible metal wire being of diameter representing only a minor fractional percentage of the hollow interior diameter of the surrounding woven tubular member to provide freedom for limited relative lateral flexing of the flexible metal wire within the surrounding woven tubular member, said flexible metal wire having a lateral portion to provide stability for the attachment means inside the tubular member while permitting said limited flexing by being engageable with the interior of the woven tubular member to thereby limit the extent of said flexing, said flexible metal wire further having protrusions protruding from bases and which protrusions have shoulder means for engaging said openings in said one surface and which protrusions extend outwardly through the weave of the tubular member and thus form apertures in the weave without breaking or cutting a significant number of the woven strands and substantially without permanently interfering with the strands of the tubular member, with the result that said apertures in the weave around the bases of the protrusions are smaller than the shoulder means of the protrusions and which protrusions are adapted to engage said openings in said one surface to thereby connect the attachment means to said one surface.

4,822,061
VALVE SEAL RETAINER
James A. Kammerzad, Holland, Mich., assignor to K-Line Industries, Inc., Holland, Mich.
Filed Oct. 2, 1987, Ser. No. 103,956
Int. Cl.[4] F16J *15/00*; F16K *41/00*
U.S. Cl. 277—181 **23 Claims**



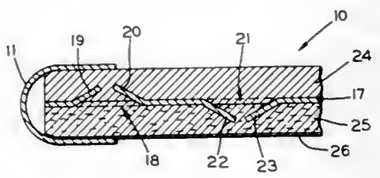
1. A valve seal retainer for retaining a resilient seal element to an internal combustion engine valve, said valve including a valve stem and a valve guide, said valve guide having a wall defining a generally cylindrical outer surface and edge means defining an axially oriented bore therein, said valve stem reciprocatably disposed in said bore, said seal element surrounding said valve stem, said valve seal retainer comprising:
- a polymeric sleeve generally surrounding said valve guide wall and including means defining an inner surface having a diameter generally greater than that of said wall;
- first retention means for retaining said sleeve to an outer surface of said valve guide wall including a portion of said inner surface configured as an inwardly directed reduced diameter deformable portion that is adapted to be rolled in response to installation of said sleeve on said valve guide in the direction opposite of installation;
- a generally tubular shell;
- second retention means for retaining a seal element within said shell; and
- third retention means for retaining said shell to said sleeve.

4,822,062
TWO MATERIAL NON-ASBESTOS GASKET AND METHOD OF MAKING THE SAME
Paul E. Gallo, Berwyn; James H. Larsen, Brookfield, and Mary K. Jurczyk, Berwyn, all of Ill., assignors to Dana Corporation, Toledo, Ohio
Filed Dec. 23, 1987, Ser. No. 136,985
Int. Cl.[4] F16J *15/12*
U.S. Cl. 277—235 B **17 Claims**

1. An improved gasket structure comprising:
- a first facing layer formed from a material having a relatively high degree of thermal conductivity;
- a second facing layer formed from a relatively compressible material; and

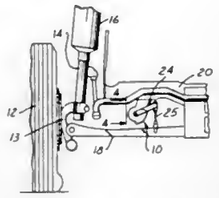
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a core having a plurality of retaining means formed thereon, said first and second facing layers being mechanically



retained to opposite surfaces of said core by said retaining means.

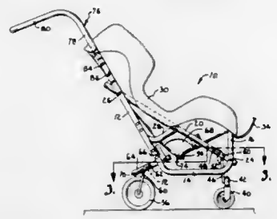
4,822,063
AUTOMOTIVE SUSPENSION CONTROL SYSTEM INCLUDING SUSPENSION POSITION SENSOR
W. Trent Yopp, Canton, and John A. Glab, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Nov. 27, 1987, Ser. No. 126,082
Int. Cl.[4] B62D *37/00*
U.S. Cl. 280—840 **20 Claims**



1. A sensor for determining the operational position of an automotive suspension including two suspension members relatively movable with respect to one another, comprising:
an assembly including a first sensor component movable with respect to a second sensor component;
means for attaching said first sensor component to one of said relatively movable suspension members and said second sensor component to the other of said relatively movable suspension members such that said first and second sensor components will be caused to move with respect to one another when said suspension members move with respect to one another;
signal generation means associated with said first and second sensor components for sequentially generating a plurality of position signals including both unique and non-unique signals as said suspension moves from either the jounce or rebound position to the other position.

4,822,064
COMBINATION CHILD VEHICLE SEAT AND STROLLER
Everett E. Hunter, Rt. 1, Box 21, Pomona, Kans. 66076
Filed Jan. 25, 1988, Ser. No. 147,509
Int. Cl.[4] B62B *7/12*
U.S. Cl. 280—30 **10 Claims**

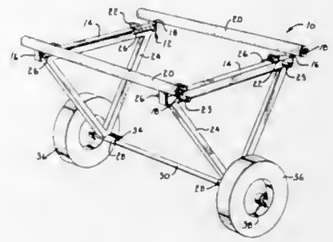
1. A combination child vehicle seat and stroller, comprising:
a rigid frame having a base portion adapted to rest on a vehicle passenger seat;
a seat on said frame having a size and shape to receive a child therein;
belt means for retaining the child in said seat;
a front wheel assembly including a pair of front swivel wheels and bracket means connecting said front wheels with said frame in a manner permitting said front wheels to move between an extended position wherein said front wheels extend below said base portion of the frame and a retracted position wherein said front wheels are located beneath the seat and above said base portion of the frame;
said bracket means for the front wheel assembly comprising a rigid bracket carrying said front wheels thereon and having opposite end portions and means for mounting said bracket on the frame for pivotal movement to carry the front wheels between the extended and retracted positions thereof;
releaseable means for locking said front wheels in the extended position;
said releaseable locking means comprising a fixed stop on the frame engageable with one end portion of said bracket to prevent the bracket from pivoting beyond said extended position of the front wheels and a removable pin applicable to the frame at a location to engage the other end portion of said bracket in a manner preventing the bracket from moving in a direction to carry the wheels from the extended position toward the retracted position, said pin being removable from the frame to release said bracket for movement of the wheels to the retracted position;



a rear wheel assembly including a pair of rear wheels and bracket means connecting said rear wheels with said frame in a manner permitting said rear wheels to move between an extended position wherein said rear wheels extend below said base portion of the frame behind the front wheels and a retracted position wherein said rear wheels are located beneath the seat and above said base portion of the frame;
releaseable means for locking said rear wheels in the extended position; and
a handle connected with said frame in a manner permitting the handle to move between an extended position wherein the handle extends above the frame at a location to serve as a stroller handle and a retracted position wherein the handle extends to a lesser height than in the extended position, whereby said frame and seat can be placed on a vehicle seat for service as a child seat in the retracted positions of the front and rear wheels and handle and can be rolled on said front and rear wheels for service as a stroller in the extended positions of the front and rear wheels and handle.

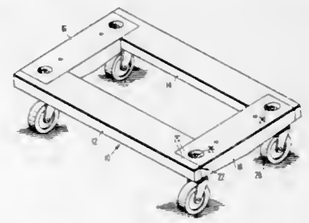
4,822,065
COLLAPSIBLE CARGO CARRIER
Irvin D. Enders, 11511 W. 99th St., Overland Park, Kans. 66214
Filed Aug. 3, 1987, Ser. No. 80,885
Int. Cl.[4] B62B *1/12*
U.S. Cl. 280—47.331 **4 Claims**

1. A collapsible cargo carrier comprising:
a framework for supporting said cargo in a raised position relative to a surface;
first and second generally triangular brace members hingedly coupled with said framework on opposite sides thereof and movable from a folded position generally parallel with said framework to a cargo carrying position generally perpendicular to said framework;
a removable axle extending between and connecting said brace members for supporting said framework and said brace members in said cargo carrying position;
means for releasably locking said brace members to said axle in said cargo carrying position;
means on said framework for securing said cargo to the framework;



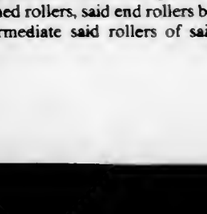
first and second wheels adapted to be releasably coupled with said axle means for accommodating rolling movement of said cargo over said surface; and
means on said framework for mounting said axle when removed from said brace members to accommodate rolling movement of said cargo carrier on said wheels when said triangular brace members are in the folded position.

4,822,066
STRENGHTENED PLASTIC DOLLY
Houston Rehrig, Pasadena, Calif., assignor to Rehrig International, Inc., Richmond, Va.
Continuation-in-part of Ser. No. 858,671, May 2, 1986, Pat. No. 4,720,115. This application Oct. 13, 1987, Ser. No. 107,305
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—79.11 **30 Claims**



1. A plastic dolly comprising:
a pair of longitudinal side members having end portions, said end portions having an opening for receiving a caster bolt;
a pair of transverse end members having end portions, said end portions having an opening for receiving a caster bolt;
said end portions of both said longitudinal side members and said transverse end members interfitting to forma a lap joint coupling said longitudinal side members and said transverse end members to form a frame, said lap joint being formed by overlapping substantially the entire said end portions of respective said longitudinal side members and and said transverse end members and by mating an upper longitudinal recess of said longitudinal side member and a lower transverse recess of said transverse end member, said lap joints being securely fastened together at the corners of said frame; and
said end portions of both said longitudinal side members and said transverse end members are rabbeted and each said end portion of said longitudinal side members is formed having a longitudinal cutout portion and a longitudinal projecting portion which form a space in which a complementary transverse projecting portion of each said end portion of said transverse end members can extend to its full depth for strengthening said lap joint, said longitudinal cutout portion being a portion along the entire depth of each end of said longitudinal side member that is totally removed, wherein said upper longitudinal recess of said longitudinal side members encompasses substantially the entire area of said end portions of said longitudinal side members except for said longitudinal projecting portion, and said lower transverse recess of said transverse end members encompasses substantially the entire area of said end portions of said transverse end members except for said transverse projecting portion.

4,822,067
FRONT FENDER FOR VEHICLE
Yoshihiro Matsuo, Tokorozawa, and Yukihiro Yamazaki, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 688,121, Dec. 31, 1984, abandoned. This application Jun. 12, 1986, Ser. No. 873,869
Claims priority, application Japan, Dec. 29, 1983, 58-203234
Int. Cl.[4] B60K *11/06*
U.S. Cl. 280—152.1 **9 Claims**



1. A front fender mounted between a pair of right and left front forks for a vehicle having a frame, a front wheel, at least one rear wheel, and an engine mounted therebetween, comprising:
a fender main body mounted above a front wheel and directly supported by left and right front forks, said fender main body having an arcuately curved upper surface extending longitudinally along an outer peripheral portion of said front wheel, said fender main body being curved longitudinally forwardly and rearwardly and also laterally to respective lateral edges thereof;
a pair of guide walls projecting upwardly from each of said respective lateral edges of said upper surface of said fender main body and longitudinally therealong, said fender main body and said guide walls defining a channel having a substantially U-shaped transverse cross-section, being open along the top portion thereof; and
a pair of said edge portions each projecting downwardly from a respective one of said guide walls and longitudinally therealong, such that said front fender, guide walls and side edge portions define a substantially H-shaped configuration in transverse cross-section.

4,822,068
VEHICLE TOY
Vernal M. Tyler, 101 Fleet Dr., Port Ludlow, Wash. 98365
Filed Mar. 7, 1988, Ser. No. 164,581
Int. Cl.[4] B62M *1/00*
U.S. Cl. 280—211 **12 Claims**

12. A vehicle toy comprising
a duality of spaced end rollers,
a central roller means between said end rollers,
said central roller means including a duality of spaced, axially aligned rollers, said end rollers being continuous,
a platform intermediate said rollers of said central roller

means and remote from said end rollers so that the full widths of said end rollers are exposed, and

means for connecting said end rollers, said central roller means and said platform together to form an assembly in which the lower part of said central roller means is lower than the lower parts of said end roller means and the axes of all of said roller means are parallel,



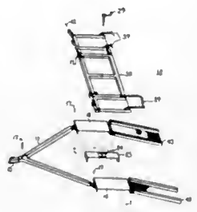
whereby said central roller means will engage a supporting surface and either of said end roller means may be selectively and individually caused to engage said surface, and said vehicle may be caused to move by manipulation of said rollers by the feet of an operator.

4,822,069

COLLAPSIBLE VEHICULAR TRAILER

David Burgess, 5994 SE. 11th Ave., Caldwell, Id. 83605

Filed Mar. 21, 1988, Ser. No. 171,016
Int. Cl.[4] B60P *3/07*
U.S. Cl. 280—402 **1 Claim**



1. A collapsible vehicular trailer, for use with a standard towing dolly having two axles, comprising:

a pair of base platforms, each having a retaining pin for detachably engaging a towing dolly when the base platforms are positioned transversely across the axles of the towing dolly, each base platform further having means for rigidly and detachably connecting to a trailer tongue and a ramp retaining lip for detachably connecting a ramp to each base platform;

a V-shaped collapsible tongue having a hitch-ball coupler removably attached to the base platforms;

a pair of ramps generally defined by rectangular planes having a perpendicular segment at one end for detachably engaging the retaining lips of the base platforms;

a pivot support platform having a retaining pin receiving means for detachably engaging the towing dolly, also having a dolly retaining lip for detachable engaging the towing dolly;

a pivot frame generally rectangular in shape for receiving and supporting the tires of a towed vehicle for pivotal attachment to the pivot support platform;

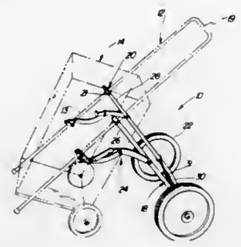
a pivot bolt for pivotally connecting the pivot frame to the pivot support platform.

4,822,070

AUXILIARY WHEEL ASSEMBLY

Stanley J. Korona, and Sue M. Korona, both of 4745 Cecil, Detroit, Mich.

Filed Jun. 25, 1987, Ser. No. 66,869
Int. Cl.[4] B62B *5/00*
U.S. Cl. 280—47.2 **4 Claims**



1. An auxiliary wheel assembly for manually propelled wheeled vehicles comprising:

a U-shaped frame having a pair of free extending legs and a base;

means coupled with said U-shaped frame base for expanding and contracting said frame for enabling said frame to be coupled with different manually propelled wheeled vehicles;

a pair of friction clips on the free extending legs of said frame for removably attaching said frame to a manually propelled wheeled vehicle, said friction clips enabling quick connection and disconnection of the U-shaped frame from the manually propelled wheeled vehicle to enable said U-shaped frame to quickly connect and disconnect to other manually propelled wheeled vehicles;

a pair of wheels coupled with said U-shaped frame; and

a pair of scissor type brackets each having two ends, one end of each scissor type bracket coupled with one of said legs of said U-shaped frame, the other end of each scissor type bracket including a frictional fastener for securing said pair of scissor type brackets to said manually propelled wheeled vehicle, said friction fasteners enabling quick connection and disconnection of the scissor type brackets from the manually propelled wheeled vehicle to enable said pair of scissor type brackets to quickly connect and disconnect to other manually propelled wheeled vehicles, said pair of scissor type brackets enabling said auxiliary wheel assembly to be moved from a first extended use position wherein said wheels are in contact with a surface along with the wheels of said manually propelled wheeled vehicle to provide additional stability and to distribute load from said manually propelled wheeled vehicle to a second collapsed non-use position wherein said scissor type bracket substantially folds upon itself and said wheels are positioned out of contact with said surface.

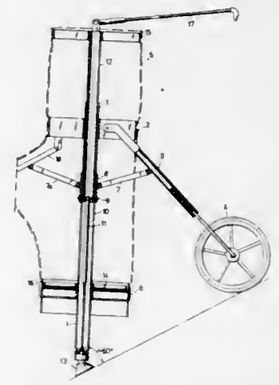
4,822,071

GOLF BAG UNIT HAVING EXTENDABLE AND RETRACTABLE TRAVELLING WHEELS

John C. Widegren, S-114 31 Stockholm, Stockholm, Sweden

PCT No. PCT/SE87/00451, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO88/02643, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 7, 1987, Ser. No. 201,140
Claims priority, application Sweden, Oct. 8, 1986, 8604277
Int. Cl.[4] B62B *1/12;* **A63B** *35/08*
U.S. Cl. 280—646 **4 Claims**

1. A golf bag unit having extendable and retractable travelling wheels and comprising a tubular body (1), which extends centrally in longitudinal direction of a bag and which adjacent its upper end carries a mounting device (2), a pair of support legs (3), pivotally attached to said mounting device (2) and at their free ends each carrying a travelling wheel (4), a bag (5) of flexible material, which surrounds the tubular body (1) in substantially coaxial and radially spaced relationship and n the bottom of which is mounted a support plate (6), upon which golf clubs standing in the bag can rest, a pair of link arms (7), each being pivotally connected at one end with one of the support legs (3) at an intermediate position thereof and at its other end pivotally connected with an actuation sleeve member (8), which is slidably movable on the tubular body, a compression spring (11), which is mounted within the tubular body (1) and through at least one entrainment device (9), which is slidably guided in an elongated slot in the wall of the tubular body (1), is connected at one end with said actuation sleeve member (8) and at its other end with the lower portion of the tubular body (1), a tubular control rod (12), which is concentrically and slidably arranged within the tubular body (1) and at



one end connected with the upper end of said compression spring (11) and with its opposite end extending beyond the end of the tubular body (1) in order to provide for a manual compression of the compression spring (11) during simultaneous retraction of the wheel-carrying support legs (3) towards the tubular body and a subsequent automatic extension of said legs (3) to the travelling position under the utilization of the energy thus stored in the compression spring (11), the bag (5) furthermore being supported from the control rod (12) at its upper end by means of a support ring (15) attached to said rod, while the tubular body (1) at its lowermost end is provided with a ground support foot (13), the support plate (6) of the bag (5) is being arranged freely slidably movable on the tubular body between a position of rest adjacent the ground support foot (13) and a position of use spaced above said foot (13) a distance corresponding to the extension movement of the control rod (12) and hence of the bag support ring (15) when extending the support legs (3).

4,822,072

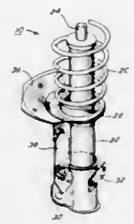
SPRING GUARD FOR A VEHICLE SUSPENSION STRUT

Alan J. Preslicka, Naperville, Ill.; Guillermo Martinez, Jr., Lambertville, Mich., and James Sommerio, Carol Stream, Ill., assignors to Maremont Corporation, Carol Stream, Ill.

Filed May 12, 1987, Ser. No. 49,126
Int. Cl.[4] B60G *15/00*
U.S. Cl. 280—668 **8 Claims**

1. A structure for protecting against damage from a broken automobile suspension spring of the kind adapted for use with a MacPherson strut having a strut body and mounted in the vicinity of an automobile tire, with the structure further adapted to be secured about the strut on a spring seat attached to the strut, the structure comprising:

a guard flange attached to the spring seat and disposed to shield the tire from contact with a broken spring and



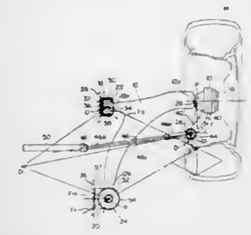
further comprising a bracket supporting the guard flange and attaching the guard flange to the strut body.

4,822,073

FRONT SUSPENSION FOR A VEHICLE

Haruhiko Tanahashi, Toyota, Japan, and Noritoshi Arai, Brussels, Belgium, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 18, 1988, Ser. No. 169,986
Claims priority, application Japan, Mar. 24, 1987, 62-070015
Int. Cl.[4] B62D *7/16*
U.S. Cl. 280—673 **10 Claims**



1. A front suspension for a vehicle, including a vehicle wheel support member (10) supporting rotatably a vehicle wheel (14), a control arm (12) connected with a vehicle body at two inboard end portions (12*a*, 12*b*) thereof spaced apart substantially in a longitudinal direction of the vehicle to be vertically pivotable therearound relative to the vehicle body and connected with said wheel support member at an outboard end portion thereof to be horizontally pivotable therearound relative to said wheel support member, a front and a rear elastic linkage bearing (18, 24) incorporated in the connecting portions between said two inboard end portions of said control arm and said vehicle body, a knuckle arm (42) integrally connected at one end thereof with said vehicle wheel support member and extending rearwardly of the vehicle therefrom to a free end portion thereof, and a tie rod (46) pivotally connected at one end thereof with said free end portion of said knuckle arm, characterized in that said rear elastic linkage bearing (24) has non-linear spring characteristics such as to exhibit a first spring constant with respect to force acting thereto in a vehicle lateral direction at a value not exceeding a certain value (f1) and a second spring constant which is lower than said first spring constant with respect to the force exceeding said certain value, and in that said first spring constant of said rear elastic linkage bearing (24) and the spring constant of said front elastic linkage bearing (18) with respect to force acting thereto in the vehicle lateral direction are set such that the instantaneous center of pivoting (O1) of said vehicle wheel support member and said control arm together in the vehicle longitudinal direction is positioned to the rear of the axis (46*c*) of said tie rod (46).

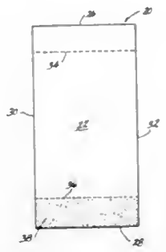
VOL 1101 ISS 3 APR 18 1989 UMI

4,822,074

RECORD KEEPING PAD AND PAGE THEREFOR

Jennifer R. Hueffman, 48 Winding Rd., Madison, Conn. 06443, and Paul M. Boczar, 23 Nicoll St., New Haven, Conn. 06511

Filed Mar. 21, 1988, Ser. No. 170,864
Int. Cl.[4] B42D 5/00, 1/00; B41L 1/20; B42B 5/00
U.S. Cl. 281—15.1 11 Claims



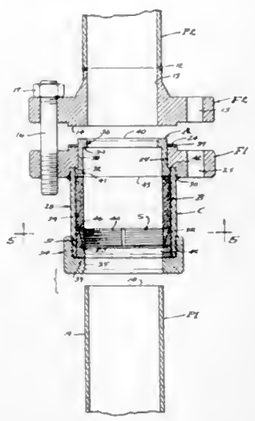
1. A composite page for use as a component of a pad including a stack of like composite pages, said composite page comprising a paper sheet having a top surface, a bottom surface, a bindable end, a free end, sides joining said ends, a first perforation line spaced from said bindable end and joining said sides, and a second perforation line between said first perforation line and said free end, a first layer of pressure sensitive adhesive material on said top surface and localized on the portion thereof between said free end and said second perforation line, a second layer of pressure sensitive adhesive material on said bottom surface and covering at least partly the portion thereof between said first and second perforation lines, a first removable piece of release paper covering said first layer of adhesive material and a second removable piece of release paper covering said second layer of adhesive material.

4,822,075

FLANGED REPAIR COUPLING FOR PIPE LINE SERVICE

James R. Reaux, P.O. Box 2700, LaFayette, La. 70502

Filed Jun. 1, 1987, Ser. No. 55,910
Int. Cl.[4] F16L 35/00
U.S. Cl. 285—3 19 Claims



1. A repair coupling for connecting a first open ended pipe section to a flange having a sealing face at the open end of a second pipe section, and including;

a coupling flange having a sealing face engageable with the sealing face of the flange at the open end of the second pipe section, the coupling flange being radially inwardly stepped to present a shoulder and a bore through said flange,

a cylindrical body extending concentrically from the coupling flange and shoulder thereof and on an axis coincidental with the axis of the first open ended pipe section to be received therein, the cylindrical body having an inner diameter bore greater in diameter than the outside diameter of the first open ended pipe section to be received therein with an annulus therebetween and carrying a radially inwardly stepped wall remote from the coupling flange and with a bore in said wall to slidably engage over and pass the first open ended pipe section,

piston means slidable axially within the annulus and with a head portion extending from the coupling flange to be depressed by the flange at the open end of the second pipe section and having a shoulder to engage the shoulder of the coupling flange to limit extension of the head portion of the piston means,

slip means and packing means within the annulus to engage over and constrict onto the first open ended pipe section received therein and carried between the radially inwardly stepped shoulder of the coupling flange and the radially inwardly stepped wall of the cylinder body remote from the coupling flange and to be compressed axially be the piston means for constriction thereof into anchored and sealed engagement with the outside diameter of the first open ended pipe section inserted within said slip means and said packing means,

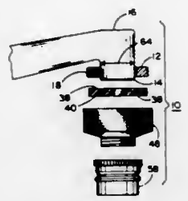
and means to draw the two flanges together and axially depress the head portion of the piston means to constrict said slip means and said packing means.

4,822,076

UNIVERSAL COUPLING FOR A FAUCET

James M. Padilla, Covina Heights, Calif., assignor to Cuno, Incorporated, Meriden, Conn.

Filed Nov. 27, 1987, Ser. No. 126,235
Int. Cl.[4] F16C 21/00
U.S. Cl. 285—8 20 Claims



1. An universal coupling operable for quick attachment to the outlet of a variety of faucets, said universal coupling comprising:

a collar having upper and lower surfaces, an outside cylindrical surface having external threads extending from said upper surface to said lower surface, a first bore extending centrally from said upper surface to said lower surface, wherein said first bore is operable for slipping over an outlet of a variety of faucets, and at least one internally threaded bore and screw therefor spaced between and away from said upper surface and said lower surface and extending from said outside cylindrical surface to said first bore, wherein, when said collar is slipped over such outlet, said screw for said at least one internally threaded bore is operable for screwing in said at least one internally threaded bore and thence against such outlet to rigidly fasten said collar to such outlet;

an adapter having top and and bottom outer surfaces, an outside surface therebetween, a recess in said top outer surface having a cylindrical side and a bottom, said cylindrical side having internal threads beginning at said top outer surface and an axis, said internal threads being operable for screwing onto said external threads of said collar, said bottom of said recess being an internal flat surface perpendicular to said axis of said cylindrical side of said recess, a passageway from said internal flat surface of said recess to said bottom outer surface of said adapter, a threaded part having threads beginning at said bottom outer surface, said threaded part being operable for screwing to a corresponding threaded part of a quick-disconnect fitting; and

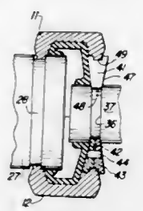
sealing means having substantially flat upper and lower surfaces and a central aperture therebetween and operable for seating over said internal flat surface of said recess of said adapter with said passageway thereof in communication with said central aperture of said sealing means, said sealing means for effecting a sealed fluid communication between the outlet of such variety of faucets and said passageway of said adapter by fastening said collar with said screw for said at least one internally threaded bore of said collar to the outlet of such variety of faucets, seating said sealing means in said bottom of said recess over said internal flat surface of said adapter, and screwing said internal threads of said adapter onto said external threads of said collar until said upper and lower surfaces of said sealing means are sufficiently compressed against the outlet of such variety of faucets and said internal flat surface of said recess of said adapter, respectively, to effect said sealed fluid communication.

4,822,077

PIPE COUPLING REDUCING INSERT

Thomas R. Hendrickson, Pontiac, Mich., assignor to Urdan Industries (USA) Inc., Southfield, Mich.

Filed Sep. 26, 1988, Ser. No. 248,914
Int. Cl.[4] F16L 25/00
U.S. Cl. 285—12 11 Claims



1. A pipe coupling reducing insert for a standard pipe coupling formed of two semi-circular segments that are normally fastened together to provide a circular casing which surrounds the adjacent, axially aligned, end portions of a pair of pipes which are of substantially equal, predetermined size diameters, with the casing being U-shaped in cross-section to form a radially inwardly opening, annular channel having an exterior base and radially inwardly directed legs of substantially equal length, and whose inner, free peripheral edges form continuous, annular tenons that normally fit into and interlock with continuous grooves formed on the exterior surfaces of the adjacent pipe end portions, said insert comprising:

a circular ring formed of separable segments and having an outer peripheral edge which is provided with an exterior, continuous groove shaped to receive the tenon of one of the casing legs, and an inner peripheral edge portion which forms an annular ring tenon similar to such casing leg tenon;

said ring being normally located in coplanar relationship with said one casing leg for encircling a pipe of a smaller diameter than the predetermined size pipe, and with its tenon being substantially coplanar with the surrounding tenon of said casing leg;

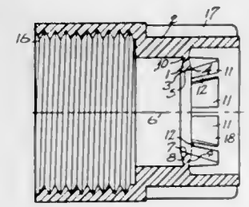
and with the ring inner diameter being pre-selected to correspond to the diameter of a particular, pre-selected, smaller diameter pipe to be coupled to a larger diameter pipe which is interlocked with the opposite casing leg, so that a predetermined size, standard casing may be used to couple a particular size, large diameter pipe for which that casing is intended, to a variety of smaller size diameter pipes by pre-selecting an insert which matches the size of that smaller diameter pipe.

4,822,078

HOSE COUPLING

Peter J. Snelling, Adelaide, Australia, assignor to Vinidex Tubemakers Pty. Limited, Australia

PCT No. PCT/AU86/00125, § 371 Date Jan. 5, 1987, § 102(e) Date Jan. 5, 1987, PCT Pub. No. WO86/06814, PCT Pub. Date Nov. 20, 1986
PCT Filed May 6, 1986, Ser. No. 10,130
Claims priority, application Australia, May 6, 1985, PH00444
Int. Cl.[4] F16L 17/02
U.S. Cl. 285—110 15 Claims



1. An annular fitting facilitating a sealing connection with a tube to provide a liquid seal, the fitting having an aperture to receive a tube therein, the fitting being comprised of a plastic material and having a circumferentially continuous inwardly extending lip integral with a housing of the fitting, the lip having an inner end and being attached to the housing by a portion between the inner end of the lip and the housing of reduced thickness as compared to the thickness of the lip further toward the outer end of the lip and adapted thereby and by the position of such reduced thickness portion to be pivotal about such portion of reduced thickness.

4,822,079

GROMMET FOR WINDSHIELD WASHER HOSE

Carl W. Schulte, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 6, 1988, Ser. No. 192,053
Int. Cl.[4] F16L 3/04
U.S. Cl. 285—162 1 Claim

1. For use in conjunction with an automotive panel having a thickness measured between its two surfaces that may vary between a maximum and a minimum thickness, said panel also having a generally cylindrical passage therethrough that may vary between a maximum and a minimum diameter, a washer hose and a grommet body for installing said washer hose through said passage while sealing said passage, said grommet body comprising,

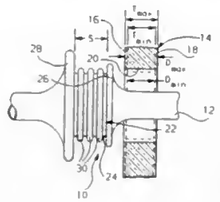
a generally cylindrical body molded coaxially to said hose with an outer surface having a diameter less than the minimum diameter of said passage,

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a first stop flange having a diameter greater than said maximum diameter of said passage at one end of said body molded of a flexible material and sufficiently small and flexible to be drawn through said passage,

a second stop flange having a diameter at least as great as that of said first stop flange at the other end of said body substantially parallel to the first stop flange and spaced therefrom by at least said maximum thickness, and

at least one compressible rib molded to the outer surface of said body and having an outer diameter greater than said maximum diameter,



whereby, said grommet body and hose can be installed by drawing said grommet body and first stop flange through said passage for any possible thickness of panel between said minimum and maximum thickness, with said first and second flanges thereafter facing said panel surfaces to prevent said grommet body from being withdrawn, and with said rib compressed against said passage for any passage diameter between said minimum and maximum diameter to seal said passage.

4,822,080

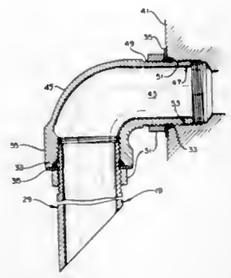
ROTATABLY ADJUSTABLE PIPE JOINT/COUPLING SEAL

Joseph J. Darish, R.D. No. 1, Country Hill Rd., Lebanon, N.J. 08833

Filed Apr. 2, 1987, Ser. No. 34,064

Int. Cl.[4] F16L *43/00*

U.S. Cl. 285—179 **16 Claims**



1. A pipe joint assembly for mating a pipe to a standard female S.A.E. "O"-ring port of a component comprising:

an elbow having a standard female S.A.E. "O"-ring port at one end, and at its other end a male innermost S.A.E. threaded portion, and outermost male S.A.E. threaded portion, annular groove between said innermost and outermost threaded portions;

a first nut threaded onto said innermost threaded portion of said elbow;

a first backup washer captively mounted on said annular groove of said elbow;

a first "O"-ring mounted on said annular groove between said first backup washer and said outermost threaded portion of said elbow;

a straight pipe having at one end a male innermost S.A.E. threaded portion, a male outermost S.A.E. threaded portion, and an annular groove between said innermost and outermost threaded portions, the other end of said pipe being cut at an angle relative to its longitudinal axis for directing fluid flow;

a second nut threaded onto said innermost threaded portion of said pipe;

a second backup washer captively mounted on said annular groove of said pipe; and

a second "O"-ring mounted on said annular groove between said second backup washer and said outermost threaded portion of said pipe;

the outermost threaded portion of said elbow being threaded into said port of said component and aligned, followed by turning the first nut toward said port to push said first backup washer against said first "O"-ring and a face of said port, thereby locking said elbow in position and effecting a fluid seal via compression of said first "O"-ring;

the outermost threaded portion of said pipe being threaded into the port of said elbow and aligned, followed by turning the second nut toward said elbow to push said second backup washer against said second "O"-ring and a face of the port of said elbow, thereby locking said pipe in position and effecting a fluid seal via compression of said second "O"-ring, the inside diameter of said elbow at said port of said component being substantially the same as the inside diameter of said pipe.

4,822,081

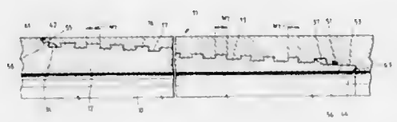
DRIVEABLE THREADED TUBULAR CONNECTION

Thomas L. Blose, Houston, Tex., assignor to XL Systems, Beaumont, Tex.

Filed Mar. 23, 1987, Ser. No. 29,687

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—334 **20 Claims**



1. In a flush pipe joint, including integral pin and box members having a common axis,

mating shoulders and end faces on said members;

mating threads on said members, the threaded portion extending between the shoulder and end face of each member, the thread on each member having progressively changing axial width with the axial thread width of the pin member progressively decreasing toward the end face of the pin member over the length of the thread;

said threads of the pin member being trapped by the threads of the box member in the fully made-up condition;

said threads having crests and roots, the crests making contact with the roots prior to reaching the fully made-up condition; and

the area of contact between the shoulders and end faces configured to increase when axial compressive force is applied to the joint.

4,822,082

TUBE CONNECTOR

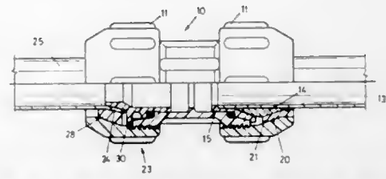
Malcolm W. Phillipps, Stirling, Australia, assignor to Philmac Pty. Ltd., North Plympton, Australia

Filed Jul. 23, 1987, Ser. No. 76,595

Claims priority, application Australia, Jul. 24, 1986, PH7109

Int. Cl.[4] F16L *19/04*

U.S. Cl. 285—334.1 **2 Claims**



1. A tube connector fitting which is useful for connecting end to end a copper tube having a flared end with a second tube of one of copper, polyethylene, lead or steel, comprising

a body having an external thread at each respective end, walls defining a passage extending through the body, the passage having a central portion and two identical outer portions, one at each end of the central portion, there being an annular shoulder between the central portion and each respective said end portion,

a pair of hollow inserts each having a relatively smaller diameter tail freely insertable within said body central portion, a relatively larger diameter portion freely insertable within a said body outer portion, and a respective resilient sealing ring surrounding each said tail effecting a seal between tat insert and the body, the outer surface of at least one of the inserts being tapered and converging in an axially outward direction, an outstanding flange on each of said insert abutting a respective end of said body,

a pair of backing sleeves each having inner and outer tapered surfaces also converging in an axially outward direction,

and a pair of hollow nuts each having an internal thread co-operable with a respective one of said body external threads, the inner surface of each nut including an axially outwardly converging portion adjacent the axially outward end of the nut thread,

said flared end of the copper tube being located between the outer tapered surface of the respective insert and the inner tapered surface of the respective backing sleeve, and clamped by the converging portion of the respective nut bearing against the outer tapered surface of said respective backing sleeve.

4,822,083

BUTT JOINT BETWEEN TWO THIN-WALLED ROUND SHEET METAL PIPE SECTIONS

Manfred Meinig, Rietheim-Weilheim, Fed. Rep. of Germany, assignor to Metu-System Meinig KG, Rietheim-Weilheim, Fed. Rep. of Germany

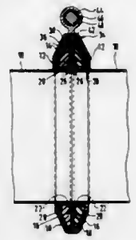
Filed Apr. 11, 1988, Ser. No. 179,868

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1987, 3713461

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—367 **4 Claims**

1. Butt joint between two round pipe sections each having an annular edge projecting radially at the pipe end, whereby the pipe sections are formed as thin-walled sheet metal pipe sections, one flange ring each is mounted onto the outside of each sheet metal pipe section, which is adapted to abut against the matching annular edge, and each flange ring, extending substantially around the circumference of the pipe ends, has an essentially closed hollow section with a right triangular cross-section being defined by two leg portions and a hypotenuse, the hypotenuse side of the hollow section, lying diagonally to the respective annular edge, points away from the annular edge and the pipe section, and whereby the two flange rings are held together by a clamping ring which can be tightened and is mounted from the outside, characterized in that the wall of each flange ring, which forms one of the leg portions which is parallel to the annular edge, has a free edge at its radially



inner surface and the other leg portion terminates short of said free edge defining a slit therebetween and the matching annular edge is inserted into the slit defined between the edge and an adjoining wall which forms the other leg portion of the flange ring.

4,822,084

SLIDING DOOR LOCK ASSEMBLY

Brian Fox, 7970 Mentor Ave., #D1, Mentor, Ohio 44060

Filed Apr. 20, 1987, Ser. No. 39,956

Int. Cl.[4] E05C *21/02*

U.S. Cl. 292—270 **11 Claims**



1. An apparatus for use with sliding doors, windows or the like for securing such a slidable door or the like in a closed position comprising a slidable door member and a stationary door member mounted in a support frame, an elongated bar member adapted to be attached at one end to said support frame so as to hold said slidable door member in a closed position relative to said stationary door member, a bracket member attached to said slidable door member and having a guide-like passageway to slidably receive therethrough said bar member upon sliding movement of said slidable door member relative to said stationary door member, latching means pivotally connected on and adjacent the end of said bar member remote from said support frame and including manual actuator having an integral latch portion adapted for pivotal movement into and out of engagement with a confronting side edge of said slidable door member for holding said slidable door member in said closed position, biasing means mounted on said manual actuator for biasing engagement with said latch portion and with a confronting surface of said bar member for biasing said latch portion into engagement with the said edge surface of said a slidable door member in the closed position thereof, the bar member including a channel member having a top section, a side section and a bottom section with said latching means being pivotally supported by said top and bottom sections, a sliding lock member mounted on said channel member adapted to move between a first position wherein said latch portion pivots under action of said biasing means into engagement with said slidable door member, and a second position wherein said sliding lock member engages the latch portion of said latching means to hold said latch portion out of engagement with said sling door member to allow said channel member, said latching means and said sliding lock member to pass

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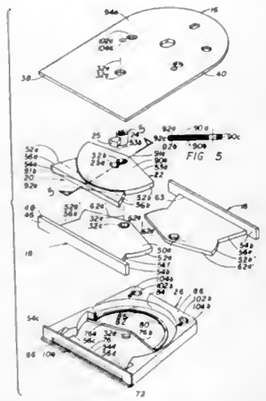
through the passageway in said bracket member upon sliding movement of said slidable door member relative to said stationary door member, and said bracket member including a hollow housing having rollers mounted thereon that engage the top and bottom sections of said channel member as the slidable door member opens and closed to reduce frictional engagement between the slidable door member and said bar member.

4,822,085

ADJUSTABLE MAGNETIC DOOR LATCH SYSTEM

Hossein F. Guity-Mehr, Long Beach, Calif., assignor to Texim International, Irvine, Calif.

Filed Dec. 22, 1986, Ser. No. 944,175
Int. Cl.[4] E05C *17/56, 19/16*
U.S. Cl. 292—251.5 **4 Claims**



3. a rotatably adjustable multi-magnet system, comprising:

a first planar thin ferro magnetic cover flux plate and a second generally planar thin L-shaped cross-section ferro magnetic angle flux plate having opposite polarity to the first plate, the plates arranged so as to generate a magnetic force perpendicular to the magnetic surfaces contacting the flux plates;

wherein the multi-magnet system comprises a rotatable convex thin magnet coupled to a fixed concave thin magnet coupled between the two flux plates and capable when rotated of changing the volume of an air gap between the convex and concave magnets thereby rotatably adjusting magnetic flux.

4,822,086

SECURITY GUARD DEVICE FOR DOORS

N. Keith Brown, Apt. 288, Hidden Lake Apartments, 15 Villa Rd., Greenville, S.C. 29615

Filed Jun. 1, 1987, Ser. No. 56,432
Int. Cl.[4] F05C *17/16*
U.S. Cl. 292—338 **7 Claims**

1. A security guard device for a door having a doorknob comprising:

(a) a bracket adapted for being secured to said door adjacent said doorknob having a base affixed to the door and two spaced arms extending outwardly from said base;

(b) a first elongated member pivotally mounted at a fixed pivot which is fixed in a location between said arms;

(c) a second elongated member adjustably connected to said first elongated member for relative longitudinal movement with said first elongated members;

(d) a foot carried by said second elongated member for contacting the floor spaced from said door;

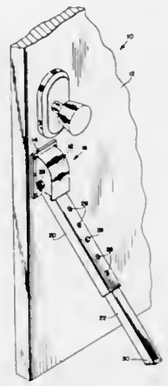
(e) said first and second elongated members sliding longitudinally with respect to each other and having an adjustable length extending generally from said doorknob to said floor;

(f) biasing means carried by said bracket for pivotally urging said first and second elongated members about said fixed pivot towards said door;

(g) said first and second elongated members having a deactivated position in which the total effective length of said first and second elongated members is less than the distance from said pivot to said floor;

(h) said biasing means directly biasing said first and second elongated members about said fixed pivot against said door to hold said guard device securely against said door in said deactivated position so that said door may be opened and closed freely;

(i) said first and second elongated members having an activated position in which the total length of said first and second elongated members is greater than the distance



from said pivot to said floor for bracing said door in a secure, locked position;

(j) said biasing means biasing said elongated members about said fixed pivot for urging said foot against said floor tightly wedging said foot against said floor when said first and second elongated members are in said activated position so that said door is securely braced against opening; and

(k) said biasing means including a compression spring urged against a face of said first elongated element near said fixed pivot generally within said bracket, said compression spring being compressed when said first and second elongated members are in said activated position to urge said second elongated member against said floor with a compressive force, and said compression spring urging against said face of said first elongated member in compression to hold said first elongated member against said door in said deactivated position.

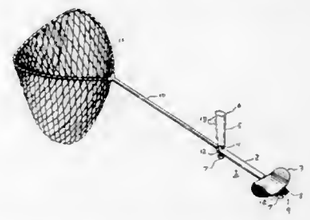
4,822,087

LIFT IMPROVEMENT DEVICE

Tony J. DeCarlo, 2225 Grand Ave., Niagara Falls, N.Y. 14301

Filed Dec. 14, 1987, Ser. No. 132,784
Int. Cl.[4] A01K *75/00;* **B25G** *3/26*
U.S. Cl. 294—1.1 **11 Claims**

1. A lift improvement device comprising an elongated, tubular, hollow main member having an internal configuration suitable for completely sliding said hollow member over an elongated handle, said member having means at each end thereof for engaging said handle and fixing said member to said handle, said member having integrally attached at one end thereof a forearm support means and having integrally attached at a point along the member, from about seven to about eighteen inches from said support means, a handle gripping means, said forearm support means and said handle gripping means being positioned on said elongated main member such that upon a hand gripping said handle gripping means, with the



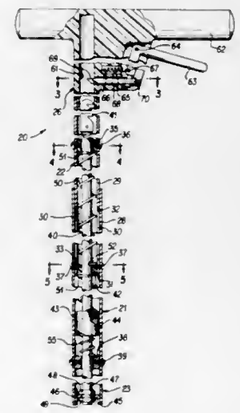
wrist in a relaxed, unrotated position, the forearm support means contacts the backside of the forearm and the elongated member generally follows the backside of the forearm in a straight line from the wrist to the elbow.

4,822,088

WEED PULLER

Chester Price, 300 Chelsea St. (P.O. Box 279), Forked River, N.J. 08731

Filed Jun. 24, 1988, Ser. No. 210,925
Int. Cl.[4] A01B *1/16*
U.S. Cl. 294—50.7 **8 Claims**



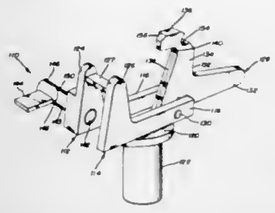
1. A weed puller comprising a first tube having one end engageable with a ground surface, a second tube having one end telescoping into the other end of said first tube and terminating short of the ground engageable end of said first tube a handle on the other end of said second tube, an elongate member extending longitudinally within said telescopic tubes between the distal ends thereof, releasable interfitting holding means on said elongate member and handle, first resilient means urging said first tube to extend said one end thereof outwardly to a limiting position away from said second tube, second resilient means urging said elongate member toward an intermediate position of its movement relative to said first tube, whereby ground pressure applied to said one end of said first tube telescopes said tubes to compress said first resilient means and compress said second resilient means to shift said holding means into a releasable interfitting engagement, removal of ground pressure enabling extension of said first tube beyond said second tube, release of said holding means relative to said elongate member under the influence of said second resilient means expelling contents from said ground engageable first tube end.

4,822,089

TRUCK AXLE GRASPING ATTACHMENT FOR TOWING VEHICLES

Vernon S. Moore, Ringgold, Ga., and Reed K. Hamman, Newbern, Tenn., assignors to Holmes International Inc., Chattanooga, Tenn.

Filed Feb. 23, 1988, Ser. No. 159,784
Int. Cl.[4] B66C *1/28*
U.S. Cl. 294—82.34 **15 Claims**



1. An axle grasping attachment for use in conjunction with a cross-bar of a towing vehicle so that a low lying front axle of a disabled truck or the like may be supported on a pair of attachments at respective sides of the truck for lifting and towing the truck, said attachment comprising a cradle having a base upon which said axle may be supported and a pair of tangs upstanding from the base at least when said axle is supported on the base and spaced apart transversely to the axle to define a front tang and a rear tang relative to said truck, said front tank being secured to said base, and means for movably mounting said rear tang relative to said base and said front tang for movement from said upstanding relationship to open the cradle for permitting said base to be disposed readily beneath the axle with the front tang juxtaposed adjacent the front of the axle without interference by the rear tang with the axle, said means for movably mounting said rear tang further permitting said rear tang to be moved into upstanding relationship with the base to close the cradle so that the front and rear tangs may straddle said axle, and a support member fixed to and depending downwardly from said base and adopted to be carried by said cross-bar.

4,822,090

SHOVEL FOR PLACER MINING

Kwang-Shick Kim, #551, Dockpoong-7Ri, Kongbu-up, Kwangju-gun, Kyungki-do, Rep. of Korea

Filed Jul. 27, 1988, Ser. No. 224,670
Claims priority, application Rep. of Korea, Jul. 29, 1987, 8252/1987
Int. Cl.[4] B07B *1/02*
U.S. Cl. 294—49 **1 Claim**

1. A shovel for placer mining for use in the riverbed, characterized by

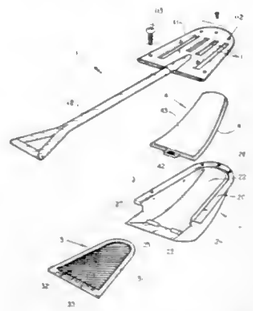
(a) a shovel handle,

(b) a shovel blade, fixedly attached to the shovel handle, having four elongated rectangular openings on its surface aligned parallel to said shovel handle,

(c) a shovel scoop detachably screwed beneath the shovel blade, said scoop comprising of a concave bottom piece capable of bearing wear with sand or gravel, two side plates attached to the side end of the bottom piece, a rear plate of flat trapezoid, two elongated hexahedral projections on both ends of a junction line between the bottom piece and the rear plate, a U-shaped flange screwed beneath the shovel blade, and a stepped portion formed on the inner side of the U-shaped flange,

(d) a mesh screen placed beneath said shovel blade on the top part of said shovel scoop, tightly insertable to the stepped portion of said shovel scoop and forming a flat net enclosed by a U-shaped frame, and

(e) a bottom lining being the upper surface of a bottom piece of said scoop, having the same curvature and size as the



bottom piece so as to adhere tightly to said scoop, while at the edge of said bottom lining the two elongated hexahedral projections sandwiches a lining handle of said bottom lining onto said shovel scoop, thus enabling a mining portion of said bottom lining to mine minerals, namely placer gold.

4,822,091

GRIPPING DEVICE

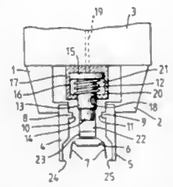
Adrianus J. P. M. Vermeer, and Johannes T. A. Van de Ven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1988, Ser. No. 171,043

Claims priority, application United Kingdom, Apr. 6, 1987, 8708154

Int. Cl.[4] B65G *47/91*; H05K *3/30*

U.S. Cl. 294—86.4 **9 Claims**



1. A gripping device for an apparatus for placing electrical components on a substrate, the device comprising a pair of grippers, each of which comprises a gripper jaw and which are movable towards and away from one another to close and open the jaws for gripping and releasing a component, each said jaw having a surface, characterized in that a stop member is provided in the gripping device for abutment on two opposite sides by the surfaces of the two grippers to limit the movement of the grippers in the closing direction, said stop member having two portions and being adjustable to bring either of said two portions thereof selectively into an operative position between said surfaces of the grippers for engagement by said surfaces, said different portions of the stop member having different widths measured between the two opposite sides of each portion which are engageable by said surfaces of the grippers in said operative position whereby said grippers can be stopped by abutment in two different gripping positions.

4,822,092

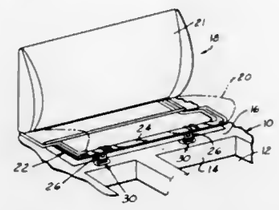
COMPOSITE ANCHOR ATTACHING ARRANGEMENT FOR VEHICLE SEAT

Michael J. Sweers, Williamston, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Mar. 28, 1988, Ser. No. 174,047

Int. Cl.[4] B60N *1/00*

U.S. Cl. 296—63 **2 Claims**



1. In combination with a vehicle floor panel, a composite anchor assembly for securing a seat cushion frame to the vehicle floor panel, a U-shaped striker depending vertically downwardly from said frame and terminating in a transverse bight portion, said floor panel having an oval-shaped aperture therethrough defined by a downturned rolled edge bounding said aperture for receiving said anchor member, said anchor member in the form of an improved composite two-part anchor assembly comprising:

a lower shell part molded of synthetic resin flexible plastic formed with an open upper end and a closed lower end, said socket portion normally being elongated oval-shaped in horizontal section defining parallel planar opposed side wall portions interconnected by arcuate end wall portions, said shell part formed symmetrical about a vertically disposed longitudinally extending plane of symmetry,

said shell part further comprising an integral flexible inverted U-section arcuate collar portion extending continuously around said socket portion open upper end, said collar portion terminating in an outer V-section spring flange having an upwardly directed continuous outer terminal flange portion positioned vertically below the apex of said collar portion;

a molded rubber sealing part having a right-angle section extending around the periphery of said floor panel aperture, said right-angle section comprising a horizontal resilient lip flange portion having its downwardly facing surface in sealing contact with the upper surface said floor panel;

said right-angle section further comprising a vertical neck portion having its outer surface formed with an outwardly diverging resilient shoulder lockingly engaging said aperture rolled edge, said neck portion terminating in an integral thin film portion confirming with and bonded to the upper surface of said V-section spring flange and said inverted U-section collar portion;

said thin film portion molded with a transverse U-shaped loop portion bonded to shell part socket portion associated side walls and bottom wall contiguous inner surfaces, said U-shaped loop portion molded with vertically disposed wedge-shaped ribs having transversely opposed ramp faces that slope downwardly providing a lead-in V-shaped notch defining a longitudinally extending gap having a predetermined transverse dimension normally preventing the passage of said striker bight portion therethrough, each said rib having its undersurface sloped upwardly toward said gap defining a shallow inverted V-shaped locking catch adapted to capture said bight portion;

whereby upon said striker bight portion being received in said lead-in V-shaped notch and being forcefully pushed downwardly resulting in a wedging action cauding said socket portion sidewalls to deform outwardly from said plane of symmetry by virtue of their associated collar portions flexing outwardly about their associated collar portions flexing outwardly about their respective spring flanges, such that said gap allows said bight portion to snappingly pass therethrough so as to be captured in said inverted V-shaped locking catch.

4,822,093

VEHICLE SEAT WITH ROTATABLE BACKREST

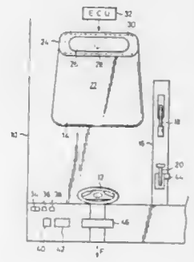
Naoki Kawai, Nishio; Toshiaki Shimogawa, Okazaki; Satosi Kuwakado, Nukata; Koji Imai, Nukata; Toshikazu Ina, Nagoya, and Akira Kuno, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Jun. 26, 1987, Ser. No. 66,540

Claims priority, application Japan, Jun. 27, 1986, 61-149711; May 18, 1987, 62-118981

Int. Cl.[4] B60N *1/04, 1/06*

U.S. Cl. 296—65.1 **32 Claims**



1. A seat mounted in a vehicle having an operational state indicative of at least one of an operating condition of said vehicle and a condition of said vehicle relative to a surrounding environment, comprising:

a seat cushion for seating a person in said vehicle,

a support shaft projecting upward with respect to said seat cushion and having an axis,

a backrest secured on said support shaft for rotation with respect to said seat cushion about said axis,

means for regulating the rotational movement of said backrest,

means for detecting at least one of the operating condition of said vehicle and the condition of said vehicle relative to the surrounding environment, and

control means for controlling said regulating means in response to said at least one detected condition of said vehicle.

4,822,094

TRACTOR SEAT SUSPENSION MECHANISM WITH AUTOMATIC SEAT STOP

Raymond L. Oldfather, Woodridge, and Robert J. Oliver, Westmont, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 12, 1988, Ser. No. 142,935

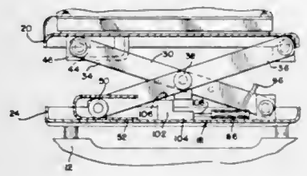
Int. Cl.[4] B60N *1/02*

U.S. Cl. 296—65.1 **7 Claims**

1. A seat assembly for an agricultural tractor comprising:

a fluid activated seat suspension mechanism movable along a predetermined path for providing a vertical range of cushioned travel to a seat when said suspension mechanism is pressurized; and

a seat stop having a stopping surface which is movable into the predetermined path of said suspension mechanism for automatically preventing the seat from traveling beneath a predetermined height level in the event the pressure of



said suspension mechanism falls below a predetermined level.

4,822,095

VEHICLE VISOR AND A METHOD FOR ITS MANUFACTURE

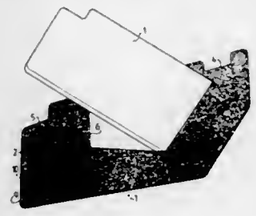
E. Gunnar Svensson, Malung, Sweden, assignor to Autopart Sweden AB, Malung, Sweden

Filed Apr. 12, 1988, Ser. No. 180,826

Claims priority, application Sweden, Apr. 27, 1987, 8701723

Int. Cl.[4] B60J *3/00*

U.S. Cl. 296—97.1 **3 Claims**



1. A motor-vehicle visor comprising an elongated core and a cover which embraces the core and which is made of a non-weldable material, preferably a textile material, and which comprises two panels which are sewn together around the edges of the elongated core, characterized in that the end edges (10) of all the sewn sides of the cover are located on the inside of the cover; in that at least one cover panel (1 or 2) is made of a stretchable material; and in that the cover has formed therein an opening (6) through which the elongated core (7) can be inserted into the cover upon completion of the edge seams therearound.

4,822,096

FRONT FRAME STRUCTURE FOR VEHICLE

Yoshio Fujii, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 3, 1987, Ser. No. 92,595

Claims priority, application Japan, Sep. 4, 1986, 61-209364

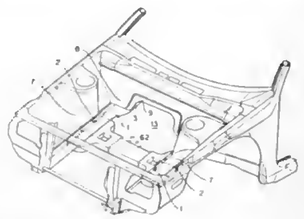
Int. Cl.[4] B62D *25/08*

U.S. Cl. 296—194 **8 Claims**

1. A front frame structure for a vehicle having a front side frame comprising a side frame portion which has a closed cross-section and is mounted on the side wall of the engine compartment on the front side of a dashboard panel to extend in the longitudinal direction of the vehicle body and a floor frame portion which has a channel-shaped cross-section open upward including an angled segment extending downward and rearward at a predetermined angle in a vertical plane from the rear end of the said frame portion wherein the floor frame portion is mounted on the lower surface of a floor panel to extend in the longitudinal direction of the vehicle body, a front reinforcement provided in the side frame portion, a rear rein-

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forcement provided in the floor frame portion and connected to the front reinforcement at a junction generally corresponding to the intersection of the side frame portion and the angled



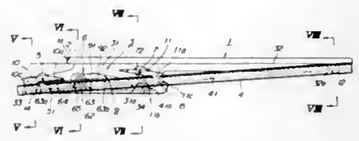
segment of the floor frame portion, and a gusset fixed near the junction of the front reinforcement and the rear reinforcement to partition the front side frame in the longitudinal direction thereof.

4,822,097

VEHICLE ROOF STRUCTURE HAVING SLIDING ROOF LID

Satoshi Ishizuka, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1987, Ser. No. 94,613
Claims priority, application Japan, Sep. 9, 1986, 61-212369
Int. Cl.[4] B60J *7/047, 7/19*
U.S. Cl. 296—216 **15 Claims**



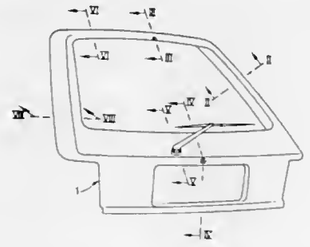
1. A vehicle sliding roof structure comprising:
a roof having an opening;
a sliding roof lid for closing said opening in a closed position and opening said opening in an open position;
a rail member adapted to be fixed to said roof;
a support member supporting said lid and slidably mounted on said rail member so that said lid can be tilted up into a tilted posture in which a rear end of said roof lid is lifted up from said closed position and slid in said tilted posture along said rail member to said open position;
drive slider means slidably mounted on said rail member for tilting and sliding said lid; and
cam means comprising a cam slot formed in said support member, and translating means formed in said drive slider and slidably received in said cam slot for causing said support member to tilt with respect to said rail member by sliding along said cam slot when said translating means is moved along said rail member with said drive slider, wherein said rail member has a first rail groove extending along said rail member and a recess depressed below said first rail groove, and wherein said support member has a front main portion which supports an underside of a front portion of said lid and formed with said cam slot and a rear extension extending from said front main portion to a rear end of said support member, said front main portion of said support member having a front sliding portion slidably received in said first rail groove of said rail member, and a rear sliding portion slidably received in said first rail groove when said support member slides along said rail member, said rear sliding portion being sunk in said recess and said rear end of said support member being received in said first rail groove when said support member is in said closed position.

4,822,098

DOUBLE-WALLED STRUCTURAL BODY PANEL FOR MOTOR VEHICLE

Hans Vogt, Overath, Fed. Rep. of Germany; Malcom H. Russell, Upminster, Great Britain; Richard C. McKechnie, Hoourheide, Netherlands, and Derek F. Gentle, Birmingham, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 4, 1987, Ser. No. 117,714
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637622
Int. Cl.[4] B62D *25/12*
U.S. Cl. 296—901 **10 Claims**



1. A double-walled, plastic, structural body panel for a motor vehicle, comprising an outer member and an inner member, an outer edge area of the outer member comprising a first flat joining area, an outer edge area of the inner member comprising a second flat joining area corresponding to said first flat joining area, an inner edge area of the outer member comprising a third flat joining area, and an inner edge area of the inner member comprising a fourth flat joining area corresponding to said third flat joining area, aid outer member and said inner member being joined together at said outer edge areas by an adhesion joint formed by and between said first flat joining area and said second flat joining area, and at said inner edge areas by a second adhesion joint formed by and between said third flat joining area and said fourth flat joining area, wherein the outer edge area of one of said outer member and inner member further comprises a web extending approximately at right angles to said flat joining area thereof and substantially parallel to and proximate an inner surface of the other one of said outer member and inner member, and wherein the inner edge area of one of said outer member and said inner member further comprises a second web extending approximately at right angles to said flat joining area thereof and substantially parallel to and proximate an inner surface of the other one of said outer member and inner member.

4,822,099

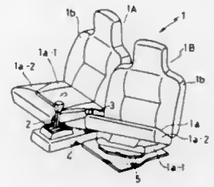
ROTARY SEAT

Yoshitaka Negi, and Hiroshi Matsuura, both of Kosai, Japan, assignors to Fujikiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,326
Claims priority, application Japan, Mar. 31, 1987, 62-78377; Mar. 31, 1987, 62-78378; Mar. 31, 1987, 62-78379
Int. Cl.[4] A47C *15/00*
U.S. Cl. 297—349 **6 Claims**

1. A rotary seat for mounting on a floor, comprising:
(a) a base frame;
(b) turntable means for rotation relative to the base frame;
(c) thigh support frame means pivotally supported on both sides of said turntable means for pivoting up and down about a pivotal axis;
(d) hip support cushion means, disposed on said turntable means, for constituting a substantially middle seat cushion;

(e) thigh support cushion means, disposed on said thigh support frame means for constituting substantially front and side portions of the seat cushion, when said thigh support frame means is pivoted down, said hip and thigh support cushion means being combined into a single complete seat cushion, and when said thigh support frame means is pivoted up, said thigh support cushion means being separated upward away from said hip support cushion means for seat rotation,



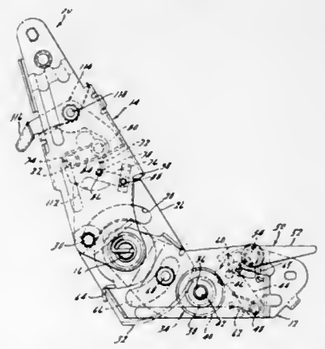
(f) latch means for latching said turntable means to the base frame when said thigh support frame means is pivoted down, with at least two predetermined latch positions after seat rotation; and
(g) release means for releasing said latch means for seat rotation simultaneously when said thigh support frame means is pivoted up.

4,822,100

QUICK RELEASE MECHANISM FOR GEAR OPERATED SEAT RECLINER

Robert L. Bell, Oxford, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Continuation of Ser. No. 632,597, Jul. 19, 1984, Pat. No. 4,684,174, which is a continuation-in-part of Ser. No. 602,370, Apr. 20, 1984, abandoned. This application Jan. 23, 1987, Ser. No. 6,115
The portion of the term of this patent subsequent to Ang. 4, 2004, has been disclaimed.
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—367 **7 Claims**



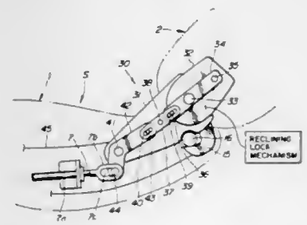
1. A seat recliner mechanism for supporting a seat back and seat bottom which permits the angle therebetween to be controllably varied comprising:
a lower recliner structure,
an upper recliner structure,
first pivot means for rotatably attaching said lower recliner structure to said upper recliner structure,
a toothed rack operatively connected to one of said upper or lower recliner structures,
second pivot means carried by the other of said upper or loer recliner structures,
gear means mounted to said second pivot means for rotation thereabout, said toothed rack meshing with said gear means,
pawl means for engaging said gear means to control rotation of said gear means,
third pivot means connected to said other of said upper or lower recliner structures,
a recliner actuator rotatable about said third pivot means between a normal position and a released position,
a quick release cam rotatable about said third pivot means, said quick release cam coupled to said recliner actuator, said quick release cam having an engagement portion which cooperates with said pawl means such that when said recliner actuator is in said normal position, said engagement portion engages said pawl means to maintain said pawl means in a position to control rotation of said gear means, and when said recliner actuator is moved toward said released position, said quick release cam is rotated to a released position such that said engagement portion disengages said pawl means and said pawl means disengages said gear means, thereby permitting rotation of said gear means, said quick release cam engaging portion including a notched surface engaging said pawl means in said engaged position and abruptly disengaging said pawl means upon rotation to said released position causing abrupt disengagement of said pawl means from said gear means as said recliner actuator is moved from said normal position to said released position, and
a camplate rotatable with said recliner actuator, said camplate having a cam surface which cooperates with said pawl means to urge said pawl means into engagement with said gear means when said recliner actuator is moved from said released toward said normal position.

4,822,101

WALK-IN MECHANISM IN SEAT ASSEMBLY

Takashi Hosoe, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 13, 1988, Ser. No. 205,939
Claims priority, application Japan, Sep. 30, 1987, 62-150122[U]
Int. Cl.[4] B60N *1/04*
U.S. Cl. 297—379 **9 Claims**



1. In a seat assembly including a seat cushion, a seatback pivotally connected to the seat cushion, a stationary rail stationarily mounted on a floor, a movable rail slidably disposed on said stationary rail and mounting thereon said seat cushion, a fore-and-aft position lock mechanism having a pivotal latch pawl member which locks said movable rail to said stationary rail when pivoted in a first direction and releases said movable rail from said stationary rail when pivoted in a second direction, and a reclining mechanism including a first pivot shaft about which said seatback is pivotal to determine an angular position of said seatback relative to said seat cushion and means for locking said seatback at said angular position,
a walk-in mechanism comprising:
a base plate having first and second portions which are pivotally connected to said seatback and said seat cushion

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respectively through said first pivot shaft and a second pivot shaft, so that said base plate is pivotal about said second pivot shaft together with said seatback;

a latch means for latching said base plate to said seat cushion;

a first link member secured to said seatback to move therewith;

a second link member pivotally connected to said base plate, said second link member having axially opposed first and second end portions, said first end portion being connected to said first link member through a first lost-motion device;

a third link member pivotally connected to said base plate, said third link member having first and second wing portions, said first wing portion being connected to said second end portion of the second link member through a second lost-motion device; and

a transmission wire having one end fixed to said latch pawl member and the other end which is connected to the second wing portion of the third link member through a third lost-motion device.

4,822,102

FOLDABLE HEADREST FOR A VEHICLE SEAT, ESPECIALLY FOR THE REAR SEAT OF A PASSENGER CAR

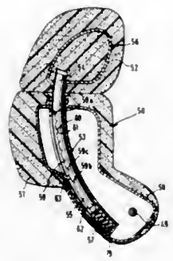
Manfred Duvenkamp, Trebur, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 23, 1987, Ser. No. 65,490

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621278

Int. Cl.[4] A47C 7/36

U.S. Cl. 297—403 **6 Claims**



1. A foldable headrest for a rear vehicle seat, said headrest having a lateral surface, said headrest being mounted for pivoting movement on a seat backrest of said rear vehicle seat, said rear vehicle seat backrest having bushings with aligned bores and at least one of said bushing having recesses in an arc, said headrest in combination comprising:

a lower headrest member mounted by pivot pins into said aligned bores of said backrest and said lower headrest member having a dead end bore parallel with said aligned bores of said backrest and said lower headrest having a lateral opening intersecting said dead end bore;

a spring arranged in said dead end bore; and

a latch pin adapted for axial displacement in said dead end bore, said latch pin having an actuating device extending through said lateral opening and said actuating device at a free end having a push key accessible by way of said lateral surface of said lower headrest member, and said latch pin in said dead end bore has one end facing said spring and said latch pin end facing away from said spring extends in a rest position past the lateral surface of said lower headrest member into one of said recesses in an arc whereby manually pressing against said push key allows said actuating device to be moved against the biasing of said spring to remove said latch pin out of one of said recesses so that said headrest can be pivotally stepwise adjusted into another position.

4,822,103

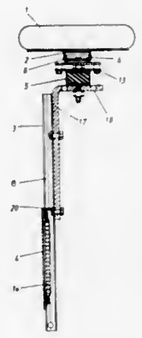
ARM REST DEVICE

Kurt Stenvall, Blåvägen, Stensele, Sweden S-920 53

Filed May 13, 1988, Ser. No. 193,540

Int. Cl.[4] A47C 7/54

U.S. Cl. 297—411 **4 Claims**



1. An arm device for relieving load on parts of the human body, when performing work by hand and wrist movements, comprising an attachment member for mounting the arm rest onto a chair or the like; an upper support for supporting the forearm and work being performed by hand and wrist movements; an adjustable horizontal guide rail attached to said upper support and movably disposed in longitudinal direction to provide a corresponding adjustment of said support due to the influence of a force generated when the hand is move forwards or backwards; an adjustable vertical guide rail which is movable in its longitudinal direction to provide a corresponding adjustment of said support due to the influence of a force generated by the weight of the forearm and by external forces exerted on the forearm; and a joint of elastic material arranged between said horizontal guide rail and said vertical guide rail, said elastic joint carrying said horizontal guide rail and said support, said elastic joint allowing said horizontal guide rail to tilt about the elastic joint in order to provide corresponding adjustment of said support due to the action of forces applied on said support in front of or behind said joint via the forearm, said horizontal guide rail, said vertical guide rail and said joint being arranged to return to their initial positions when said forces have ceased.

4,822,104

SEAT BELT BUCKLE FOR CHILD RESTRAINT

Edward J. Plesniarski, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1988, Ser. No. 155,954

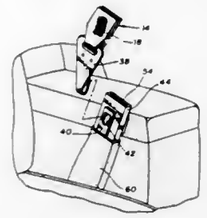
Int. Cl.[4] A47C 31/00

U.S. Cl. 297—468 **2 Claims**

1. In a motor vehicle occupant restraint system of the type wherein a belt is mounted on the vehicle on one side of an occupant seat and carries a latch plate, a buckle is mounted on the vehicle on the other side of the occupant seat by an anchor belt extending through a slot in the buckle housing and is engageable by the latch plate to restrain the occupant in the vehicle seat, and a child seat is adapted to sit on the occupant seat and a child restraint belt is connected to the vehicle on the one side of the occupant seat, the improvement comprising:

a hook attached to the child restraint belt;

and an anchor plate independent of the buckle and having a slot receiving the anchor belt passing through the slot of the buckle housing whereby the anchor plate is effectively coupled to the buckle by the anchor belt, and said anchor plate having an aperture therein for receiving the hook of



the child restraint belt to connect the child restraint belt with the vehicle and thereby restrain the child seat on the occupant seat.

4,822,105

DOUBLE ENDED RANGING DRUM SHEARER AND METHOD OF CONTROLLING WORKING HEIGHT IN MINING FACE IN USE OF THE SAME

Ryuji Yamada, and Shoji Igata, both of Oomuta, Japan, assignors to Mitsui Miike Machinery Company, Limited, Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,474

Claims priority, application Japan, Sep. 26, 1986, 61-227697

Int. Cl.[4] E21C 35/08, 35/24

U.S. Cl. 299—1 **5 Claims**

1. A double ended ranging drum shearer capable of controlling a working height of a mining face in a pit, comprising:

a shearer body;

a drum disposed at each of a front and rear end portion of said shearer body, each said drum being movable upwardly and downwardly;

a respective arm member operatively connected to each of said drums for adjusting the height of said drums;

controlling means attached to said shearer body and operatively connected to control said arm members to thereby adjust the height of said drums;

a potentiometer operatively connected to a said arm member and to said controlling means for detecting the height of one of said drums;

means operatively connected to said controlling means for detecting an inclination of said shearer body; and,

means operatively connected to said controlling means for detecting a traveling position of said shearer body;

said controlling means operating during a teaching mode in which an operator manually controls the height of said one drum to store data representing the drum heights necessary for maintaining the working height of said mining face constant in accordance with output signals generated from said drum height detecting means, said inclination detecting means, and said traveling position detecting means, at least one of said arm members being operated during a playback mode to automatically adjust the height of at least one of said drums in response to an output signal from said controlling means representing the drum height needed to maintain said working height constant.

2. A method of controlling a working height of a mining face in a pit by using a shearer which repeatedly traverses between a main gate and a tail gate and which includes a shearer body and a pair of drums disposed at front and rear end portions of the shearer body to be movable upwardly and downwardly through respective drum height adjusting means, comprising the steps of:

(a) in a first half-cycle operation in which an operator manually controls the height of one of said drums and in which the shearer body is moved in one direction between the main gate and the tail gate along the mining face,

(i) detecting and storing a number of traveling positions, spaced apart along the mining face, of the shearer body;

(ii) detecting and storing a height of said one drum at each of said detected traveling positions of the shearer body;

(iii) detecting and storing the inclination of the shearer body at each of said detected traveling positions; and

(iv) controlling mathematically a height of the other drum necessary for maintaining a working height constant in accordance with the stored data representing the detected traveling positions, the height of said one drum and the inclination of the shearer body; and,

(b) in a second half-cycle operation in which the shearer body is moved in the other direction between the tail gate and the main gate,

(i) controlling the height of at least one of said drums in accordance with data stored in the first half-cycle operation.

4,822,106

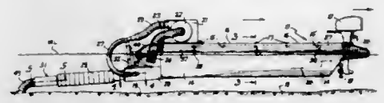
GOLF BALL DREDGE

Steven M. Wilson, 284 Oak Ct., and Richard D. Mason, 330 N. Putney Way, both of Severna Park, Md. 21146

Filed Dec. 9, 1987, Ser. No. 130,609

Int. Cl.[4] E02F 7/06, 3/88

U.S. Cl. 299—9 **20 Claims**



1. A golf ball dredge comprising a relatively lightweight shallow draft buoyant vessel;

a relatively high pressure water pump supported on the vessel having a suction intake located below the water level and a high pressure outlet discharge;

educator tube means having an inlet end supplied from the high pressure outlet discharge of the high pressure water pump and having a discharge end;

a suction intake piping system having an inlet with the inlet end submerged below the surface of the water to a suitable depth for lightly contacting the bottom of the water;

said educator tube means having its discharge end connected to the suction intake piping system near the inlet end thereof for producing a suction action that draws water and any entrained solids therein into the suction intake piping system and discharges it out the discharge end thereof under increased pressure due to educator action produced by the high pressure liquid discharge supplied from the pump;

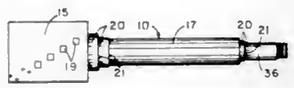
automatically operable golf ball separator means supported on the vessel and having the discharge end of the suction intake piping system connected thereto for automatically separating out golf balls from the liquid and other entrained solids contained in the suction intake pipe discharge without the need for human intervention in the separating procedure;

said golf ball separator means comprising golf ball passageway means for increasing or at least maintaining the velocity of golf balls sucked up from the bottom by the suction

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intake piping system and discharged into the automatically operable golf ball separator means;
golf ball differentiating means coacting with said golf ball passageway means for separating out golf balls from other entrained solids; and
golf ball collection and containing means coupled to the output from the golf ball differentiating means for collecting and containing golf balls separated out from other entrained solids by said golf ball differentiating means.

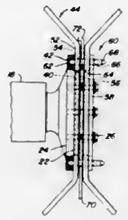
4,822,107
CUTTER AND METHOD TO REMOVE SURFACE COATINGS
Patrick J. Connacher, E. 13726 Mission Ave., Spokane, Wash. 99216
Filed Sep. 8, 1987, Ser. No. 93,643
Int. Cl.⁴ E21C *25/10*
U.S. Cl. 299—10 **4 Claims**



1. An implement for removing an adherent, semi-thermal plastic coating from a rigid underlying supporting surface without removing any substantial portion of that underlying surface when the implement be moved over that underlying surface in a direction perpendicular to the axis of a cutter comprising, in combination:
an elongate first cutter shaft;
a first cutter cylinder irrotatably carried at a first end portion of said cutter shaft;
a plurality of cutter teeth carried in spaced array by said first cutter cylinder to define a cylindrical cutting surface concentric about said first cutting cylinder and at a spaced distance radially outwardly therefrom, said cutter teeth having similar configuration, and being fixedly carried by the cutter cylinder, in axial adjacency and radially spaced relationship about the surface of the cutter cylinder,
defining cutting edges oriented parallel to the cutter cylinder axis, and
being arrayed spirally on the cutter cylinder with only one cutter tooth always in contact with a surface coating being cut;
mounting structure journaling said first cutter shaft for rotary motion about a horizontal axis;
a first housing carried by the mounting structure, defining a chamber for rotation of the first cutter cylinder and covering a substantial portion of the periphery of said first cutter cylinder with an opening allowing access of that cylinder to an underlying surface to be operated upon; and
means for powering said first cutter shaft for rotation and means for adjustably positioning said first cutter cylinder over a surface to be removed and of lineally moving said cylinder over that surface; and
a second auxiliary cutter structure pivotally mounted at one lateral end of the first housing for selective, substantially vertical orientation immediately laterally of the first housing to allow horizontal motion of the second auxiliary cutting structure along a vertical surface laterally adjacent a course of travel of the first housing.

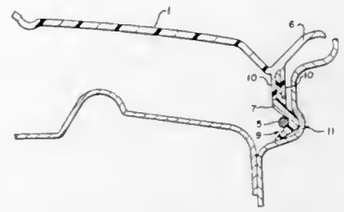
2. A process for removing a coating from an underlying rigid supporting surface comprising the steps of:
forming a cutter cylinder having a plurality of axially adjacent and radially spaced cutter teeth with lineal cutting edges defining a cylindrical cutting surface coincident with and at a spaced distance radially outwardly from said cutter cylinder, said cutter teeth rotating said cutter cylinder at speeds up to 500 revolutions per minute;
locomoting said cutter cylinder over a surface to be removed in a direction perpendicular to the axis of said cutter cylinder, at speeds up to 2 miles per hour and at a spaced distance above said surface with the cylindrical cutting surface of said cutter cylinder extending into the surface to be removed.

4,822,108
ROW STRADDLING DUAL WHEELS FOR A HARVESTER
Michael D. Benhart, Moline, Ill., assignor to Deere & Company, Moline, Ill.
Filed May 14, 1984, Ser. No. 610,286
Int. Cl.⁴ B60B *11/00*
U.S. Cl. 301—36 R **7 Claims**



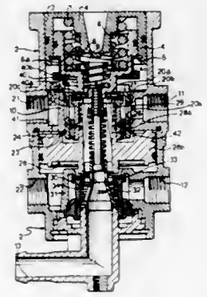
1. A method of mounting a pair of dual wheels on the outwardly facing drive axle flange of a self-propelled harvester, the axle flange having a set of threaded concentric mounting holes and both wheels having offset central mounting flanges with matching concentric sets of mounting holes, the respective offsets in the wheels making it possible to bring the central mounting flanges into contact with each other to establish a predetermined axial spacing of the wheel rims, comprising the steps of:
threading a first elongated pilot stud inwardly into a first hole of the axle flange, said stud having a generally transverse bearing surface intermediate its ends;
manipulating a first wheel with the rim offset inwards over the axle so that the holes of the wheel central mounting flange are brought into approximate register with the holes of the axle flange and so that the pilot stud enters one of the holes in the central mounting flange and so that said flange is brought up against the axle mounting flange and the transverse bearing surface of the stud is disposed outwardly of the central mounting flange;
disposing an elongated retaining rod across the outwardly facing surface of the central mounting flange and entering said rod into engagement with the transverse bearing surface so that said rod restrains the wheel with the central mounting flange closely adjacent the wheel axle flange;
manipulating the second wheel with the rim offset outwards so that the pilot stud enters one of the holes of the central mounting flange and so that the mounting holes of the flanges are brought into register and so that the central mounting flange of the second wheel is disposed axially adjacent the retaining rod;
threading at least one wheel stud through one set of aligned wheel mounting holes into a threaded hole of the axle flange and tightening said wheel stud into the axle flange until the stud tends to clamp the two wheels against the axle mounting flange;
disengaging the retaining rod from the pilot stud; and
threading at least a second wheel stud through the wheel mounting holes and into a threaded hole of the axle flange and tightening said first and second wheel studs to secure the attachment of the wheels to the axle flange.

4,822,109
VEHICLE WHEEL RETENTION CAP
Juan M. Feria, Diadema S. Paulo, Brazil, assignor to Autometal S/A, S. Paulo, Brazil
Filed Jan. 20, 1987, Ser. No. 5,260
Int. Cl.⁴ B60B *7/06*
U.S. Cl. 301—37 P **6 Claims**



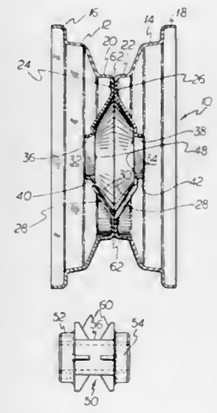
1. A retention cap for a wheel of a vehicle, the cap comprising a body made of plastic and having an internal face; a plurality of projections formed on said internal face and of the same plastic as said body, said projections being circumferentially spaced from each other and extending normally to said internal face towards a center of said body, said projections having grooves; a metallic ring; and a plurality of clamps injection molded onto said internal face between said projections and extending towards the center of said body, said clamps being engageable in a wheel and formed of a heat-resistant plastic and having extensions forming recesses in said clamps, said metallic ring being received in said grooves and said recesses, said plastic of said body and said projections being different from said heat-resistant plastic of said clamps.

4,822,110
PNEUMATIC VALVE, PARTICULARLY A DUPLEX-TYPE DISTRIBUTOR FOR A BRAKING SYSTEM, INCLUDING A DEVICE FOR LIMITING THE MAXIMUM DISTRIBUTABLE PRESSURE
Domenico Angelillo, Sesto S.Giovanni, Italy, assignor to Industrie Magneti Marelli S.r.L., Milan, Italy
Filed Dec. 28, 1987, Ser. No. 138,126
Claims priority, application Italy, Dec. 30, 1986, 67996 A/86
Int. Cl.⁴ B60T *15/06*
U.S. Cl. 303—56 **1 Claim**



1. A pneumatic valve, particularly for braking systems, comprising a body with an inlet connector and an outlet connector intended to be connected to a pressure source and a pneumatic circuit respectively, and having a valve comprising a seat and an obturator for controlling communication between the said connectors, a control device including a piston sealingly slidably mounted in a guide portion of the body and able to cause a controlled displacement of the obturator away from the seat in its working travel, so as to cause controlled opening of the valve, and means for limiting the maximum pressure deliverable to the outlet connector; wherein the seat is formed in a member mounted in the body for translation in the direction of displacement of the obturator, and the limiting means comprise control means operatively associated with the piston and arranged to cause a displacement of the seat relative to the body together with and in contact with the obturator when the piston passes beyond a predetermined position relative to the body in its working travel.

4,822,111
WHEEL ASSEMBLY AND METHOD OF FORMING SUCH ASSEMBLY
Barry R. Albert, Dillsburg, Pa., assignor to Emhart Industries, Inc., Farmington, Conn.
Filed Mar. 11, 1988, Ser. No. 166,864
Int. Cl.⁴ B60B *1/06*
U.S. Cl. 301—63 DD **2 Claims**



1. A wheel assembly comprising:
a first wheel half having an outer annular rim with a valley portion and having an integral wall with external and internal surfaces and shaped at its center to form an opening extending through said wall, the wall defining said opening including a flange like portion extending in a direction normal to the plane of the external surface of said integral wall and functioning as an annular bearing seat;
a second wheel half having an outer annular rim with a valley portion and having an integral wall with external and internal surfaces and shaped at its center to form an opening extending through said wall, the wall defining said opening including a flange like portion extending in a direction normal to the plane of the external surface of said integral wall and functioning as an annular bearing seat;
bearing means having a pair of spaced generally cylindrical flanges of a first diameter joined by a generally cylindrical intermediate portion of a diameter somewhat smaller than the first diameter, said cylindrical flanges of said bearing means being supported by said wall defining opening of each wheel; and first antirotation means affixed to said bearing means and second antirotation means affixed to said first and second wheel halves and cooperating with said first antirotation means for substantially preventing rotation of said bearing means relative to said walls defining said openings;
said second antirotation means includes a plurality of spaced

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dimples extending from the internal surface of each wheel half for engaging said first antirotation means, said dimples being disposed about the openings defined by said walls of said first and second wheel halves, with the position of the dimples about the opening defined by said wall of said first wheel half being circumferentially displaced relative to the position of the dimples about the opening defined by the said wall of said second wheel half; and

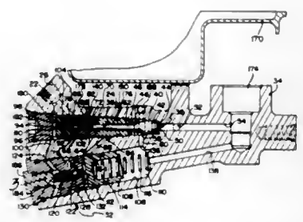
means for joining said first and second wheel halves to form a complete wheel assembly.

4,822,112

MODULATOR WITH TWO-STAGE ORIFICED MASTER CYLINDER BYPASS VALVE

David F. Reuter, Beavercreek; Dewey F. Mort, Dayton, and Donald M. Flory, Arcanum, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 28, 1987, Ser. No. 138,178
Int. Cl.[4] B60T *8/88, 8/46, 8/42*
U.S. Cl. 303—92 **3 Claims**



1. In a vehicle wheel lock control system having a master cylinder having a pressure output, a wheel brake, an isolation valve, a displacement cylinder, a pressure source, and control means selectively controlling said system for normal service braking operation wherein said wheel brake is actuated by pressure from said master cylinder and for wheel lock control operation wherein pressure to said wheel brake for actuation, modulation and release is operatively supplied from said pressure source, said isolation valve having a first position for normal service braking in which said master cylinder is connected therethrough to said wheel brake for wheel brake operation, said isolation valve having a second position for wheel brake control operation in which said wheel brake is isolated against receiving pressure from said master cylinder, said displacement cylinder including a displacement piston defining therewith an output pressure chamber, said displacement piston being responsive to pressure from said pressure source to pressurize brake fluid in said output pressure chamber and have same delivered through said isolation valve to said wheel brake when said isolation valve is in said second position, said pressure from said pressure source acting on said displacement piston in accordance with said control means to apply, hold, and release brake actuating pressure delivered to said wheel brake, passage means arranged to communicate with said output pressure chamber and with said master cylinder output, the improvement wherein:

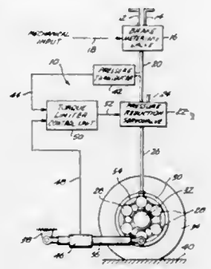
said passage means has a normally closed two-stage check valve therein including a first valve and a second valve in axially aligned series with a light spring therebetween and a heavier spring acting on said second valve and continually urging said second valve toward said first valve, said second valve having a restrictive flow orifice therethrough, said displacement piston having a valve opening member engageable with and then opening said first check valve when said displacement piston has moved adjacent to but spaced from its substantially full pressurizing position, the opening of said first check valve permitting master cylinder pressure from said master cylinder output to flow to said wheel brake through said passage means and said second check valve orifice and said first check valve and said output pressure chamber and said isolation valve in its second position, said displacement piston when moved further axially so as to be at its substantially full pressurizing position acting through said first check valve to move said second valve to its open position and allow substantially full flow of master cylinder pressure to said wheel brake.

4,822,113

BRAKING TORQUE CONTROL SYSTEM

Robert L. Amberg, Seattle, and Andrew M. Valaas, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 13, 1987, Ser. No. 84,857
Int. Cl.[4] B60T *8/58*
U.S. Cl. 303—100 **35 Claims**



1. A system for controlling a torque developed by a fluid pressure activated brake as it slows a rolling wheel, comprising:

(a) means for producing a signal indicative of the magnitude of a force applied to actuate the brake;

(b) means for sensing the torque developed by the brake as it slows the rolling wheel and for producing a signal indicative of that torque;

(c) means for reducing the pressure of the fluid actuating the brake independently of the wheel's rolling speed and in response to a control signal, the pressure reducing means being disposed so as not to affect the means for producing a signal indicative of the magnitude of the force applied to actuate the brake; and

(d) control means, connected to receive the signal indicative of the magnitude of the force applied to actuate the brake and the signal indicative of the torque developed by the brake, for producing the control signal to reduce the fluid pressure actuating the brake if the torque developed by the brake exceeds a value determined as a function of the magnitude of the force applied to actuate the brake.

4,822,114

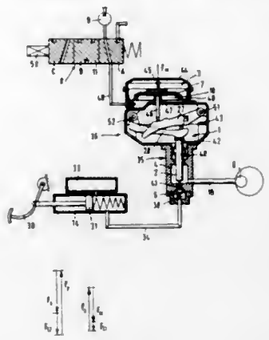
BRAKING PRESSURE MODULATOR

Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,072
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718973; Jun. 5, 1987, 3718955
Int. Cl.[4] B60T *8/32, 8/42, 13/66*
U.S. Cl. 303—115 **31 Claims**

1. A braking pressure modulator comprising a volume-receiving unit including a displacement member in a working chamber, said volume receiving unit hydraulically interposed between a master brake cylinder and a wheel brake cylinder of a brake system, said volume receiving unit adapted to be uncoupled form the master brake cylinder by a separating valve

coupled to said volume-receiving unit which separating valve closes automatically when the displacement member moves from one end position in said working chamber where at said displacement member modulates the pressure in the working chamber and wheel brake cylinder, an actuator including an adjusting member that is coupled to the displacement member by a gear unit having a transmission characteristic driven by a piston and diaphragm assembly operatively connected thereto, said piston and diaphragm assembly responsive to a pressure difference across said piston and diaphragm to generate an adjusting force that is dependent on the difference in pressure wherein the transmission of the gear unit varies in such a



manner that a defined adjusting force of the actuator will be generated by a predetermined value of said differential pressure and said gear unit urges the displacement member in the direction of its one end position to modulate said pressure, said gear unit adapted to provided that forces acting on the displacement member or urging the displacement member in a direction toward an end position opposite said one end position remain substantially in a condition of balance with the adjusting force irrespective of the position of the displacement member when the displacement member leaves its one end position and begins movement in the opposite direction upon a predetermined maximum pressure being attained in the working chamber with the separating valve closed.

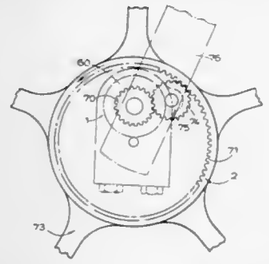
4,822,115

VEHICLE ANTI-SKID BRAKING SYSTEMS

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries public limited company, England

Division of Ser. No. 936,352, Dec. 1, 1986. This application Mar. 21, 1988, Ser. No. 170,866
Claims priority, application United Kingdom, Dec. 3, 1985, 8529777
Int. Cl.[4] B60T *8/40, 13/70*
U.S. Cl. 303—116 **5 Claims**

1. A vehicle anti-skid hydraulic braking system comprising a brake on a wheel, a master cylinder for supplying operating fluid to said brake to apply said brake, speed sensing means for sensing the speed of said wheel and for emitting skid signals, a modulator assembly for modulating the supply of operating fluid to said brake from said master cylinder, and an hydraulic pump for controlling re-application of said brake at the termination of a respective one of said skid signals, said hydraulic pump incorporating a bore, and at least one plunger working in said bore controls brake re-application following skid correction, wherein said vehicle comprises a motor cycle, said wheel has a hub, and said modulator assembly and said pump are incorporated in a unit, and wherein said unit is installed within



said hub, and said hub is provided with an internal ring gear, and a drive gear drives said pump from said ring gear.

4,822,116

BACK-TO-BACK DRAWER ASSEMBLY WITH STAGGERED BYPASSING SLIDES

Christopher M. Relyea, and Michael S. Relyea, both of Grove City, Ohio, assignors to Drustar Inc., Grove City, Ohio

Continuation of Ser. No. 35,073, Apr. 6, 1987, abandoned. This application Feb. 18, 1988, Ser. No. 159,445
Int. Cl.[4] A47B *81/00*
U.S. Cl. 312—209 **16 Claims**



1. A drawer assembly for use in a unit having a transverse opening therethrough to accommodate two sets of drawers in back-to-back relationship and openable from opposite sides of the unit, said assembly comprising a plurality of drawer guides and two sets of drawers, said drawer guides being horizontal, rectilinear and arranged in equal numbers at both sides of said opening in parallel, equally spaced relationship, the upper surfaces of corresponding drawer guides at each side of said opening being coplanar, said drawer guides extending substantially the horizontal length of said opening, said sets of drawers being arranged in back-to-back relationship, the total vertical dimension of each set substantially equaling the vertical dimension of said opening, first and second mirror image slides for each of said drawers, said slides being rectilinear and of a length slightly less than the length of said guides, each slide having a bottom surface adapted to cooperate with said upper surfaces of said guides, said first and second slides being affixed to and indentically positioned on each drawer in horizontal, parallel, vertically staggered relationship, the vertical distance between the bottom surfaces of said slides of a drawer being substantially equal to the vertical distance between said upper surfaces of two adjacent guides, the slides of each drawer having portions extending rearwardly of said drawer, all of the slides of the drawers of said sets engaging different guides, each drawer and its slides being shiftable along its respective guides between open and closed positions, the rearwardly extending portions of the slides of each drawer of each set bypassing and extending alongside a drawer of the other set when said drawers are in said closed position.

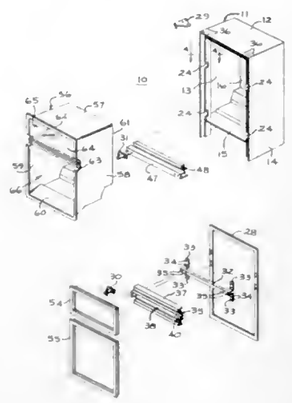
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4,822,117

REFRIGERATOR CASE/LINER INTERFACE AND RELATED COMPONENTS FOR AUTOMATED ASSEMBLY

Ray W. Boston, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 12, 1987, Ser. No. 61,153
Int. Cl.[4] F25D *11/00*
U.S. Cl. 312—214 8 Claims



1. A refrigerator cabinet comprising:
a casing including substantially parallel spaced apart side walls and a connecting top wall;
a front face extending along said top and side walls and including a peripheral groove open to the front of said cabinet, said groove having spaced apart lateral walls and a bottom wall,
reinforcing means physically connected to said bottom wall and extending longitudinally of said groove;
an elongated brace extending between and physically connected to said casing side walls, said brace being spaced below said casing top wall to divide said casing into upper and lower sections;
said brace having feet physically attached to said bottom wall of said peripheral groove;
a first cross-member extending between said casing side walls and including a central portion overlying said brace; and
a second cross-member extending between said casing side wall and spaced below said brace and first cross-members.

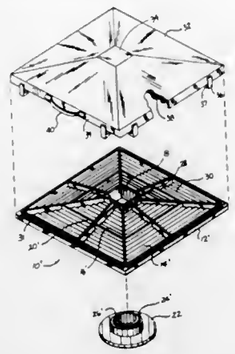
4,822,118

ROTATING PASTEL STORAGE TABOURET

James A. Watkins, 27 Brier Springs, Conway, Ark. 72032

Filed Feb. 5, 1988, Ser. No. 152,560
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—244 2 Claims

1. A new and improved rotating pastel storage tabouret, comprising:
a circular base having a flat bottom end and upper surface with a raised central cylindrical hub;
a caged ball bearing on an upper end of said cylindrical hub;
a pyramidal storage tray having a flat bottom surface with a central circular recess;
said cylindrical hub received in said circular recess and mounting said storage tray for rotation;
said storage tray having a square central storage compartment with a flat level floor;
said storage tray having four planar sides slanted outwardly downwardly at a three to five degree angle with said flat level floor;
each of said planar sides having a plurality of inclined upstanding dividers forming four compartments;
a pyramidal cover having a flat level square central surface and four outwardly downwardly inclined sides terminating in a vertical peripheral rim;



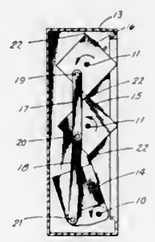
a plurality of "L"-shaped latches formed from a resilient plastic material spaced around said vertical peripheral rim;
a sponge rubber lining on an inner surface of said pyramidal cover; and
a handle on said vertical peripheral rim.

4,822,119

LATERAL FILING CABINET WITH ROTARY DRAWERS

Arthur M. Compton, 33 Library St. NE, Grand Rapids, Mich. 49503

Filed Nov. 12, 1987, Ser. No. 119,545
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—328 4 Claims



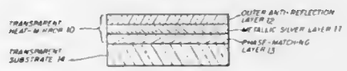
1. A lateral file construction comprising:
a stationary case having a bottom wall, a top wall, a rear wall, a pair of opposed side walls, and a substantially open front, said case further forming a generally rectangular parallelopiped having a height, a width from side wall to side wall, and a depth from front to rear;
a plurality of drawers, each in the form of an elongated rectangular parallelopiped having an open top, a pair of opposed end walls, a bottom wall, a front wall, and a rear wall, each of said drawers further having a height, a length, and a depth;
means for pivotally supporting each of said drawers between each of said opposed end walls and the respectively adjacent opposed side walls of said case such that said plurality of drawers are disposed in a generally vertical spaced array, the length of each drawer extending within the width of the case, at least one of said means for pivotally supporting said drawers being mechanized by a pair of coaxial pivot shafts respectively journalled between the opposed end walls of said drawer and the respectively adjacent one of said opposed side walls of said case, said at least one pair of pivot axes being substantially displaced from a centroid of said opposed end walls of said rectangular parallelopiped forming said drawer;
means for limiting said pivoting of each of said drawers to an arc between a first or closed position, whereat said open top of each drawer forms an imaginary plane oriented to be downwardly sloping toward said rear wall of said case, and a second or open position, whereat each said imaginary plane is sloping generally downwardly toward said substantially open front of said case, said slopes of said imaginary planes associated with the open tops of the respective drawers, when in said second positions, being at respectively differing angles each sufficient to provide clear access to and view of the contents of each drawer from a single vantage position and elevation of a user in front of said case; and
means for coupling the pivoting motions of said drawers such that all drawers may be concurrently pivoted from their respective closed positions to their respective open positions, and vice versa, by manually pivoting any one of the drawers between said positions.

4,822,120

TRANSPARENT HEAT-MIRROR

John C. C. Fan, Chestnut Hill, and Frank J. Bachner, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 804,664, Dec. 2, 1985, Pat. No. 4,721,349, which is a continuation of Ser. No. 365,533, Apr. 5, 1982, Pat. No. 4,556,277, which is a continuation of Ser. No. 690,696, May 27, 1976, Pat. No. 4,337,990, which is a continuation-in-part of Ser. No. 498,169, Aug. 16, 1974, abandoned. This application Jan. 15, 1988, Ser. No. 144,270
Int. Cl.[4] G02B *5/28, 5/24*
U.S. Cl. 350—1.7 10 Claims



1. A composite film comprising a continuous, discrete metallic layer sandwiched between two continuous, discrete, transparent layers each having a thickness of greater than about 150 Å, said metallic layer substantially comprised of silver, said metallic and transparent layers having thicknesses that cooperate to provide said composite film with significantly higher solar energy transmission compared to the metallic layer alone and with high infrared reflectivity.

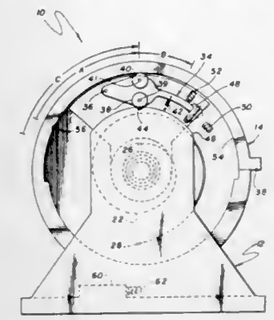
4,822,121

ANGULAR SCAN DRIVE SYSTEM HAVING MEANS FOR SELECTIVELY EXTENDING THE RANGE THEREOF

Frank R. Malinowski, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Oct. 31, 1987, Ser. No. 107,214
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.6 18 Claims

1. An angular scan drive system comprising:
a main frame;
a mass pivotally attached to said frame; and
spring means for applying an angle limiting restoring force between said frame and said mass, said spring means including coupling means for selectively coupling and decoupling said mass and said frame, during the scanning motion of said scan drive system, through said spring means, whereby the range of motion of said mass is selectively extended thereby.



4,822,122

OPTICAL TRANSMISSION MEDIUM AND PROCESS FOR PRODUCING THE SAME BASED ON VINYLIDENE FLOURIDE POLYMERS AND METHARYLATE POLYMERS

Takashi Yamamoto; Yoshihiko Mishina, and Masaaki Oda, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 873,595
Int. Cl.[4] G02B *6/00, 1/00;* C08L *51/06, 27/16*
U.S. Cl. 350—96.31 3 Claims

1. An optical transmission fiber medium comprising:
a mixture of polymers resulting in said fiber medium having a distribution of the refractive index n corresponding nearly to the equation, $n=n_0(1-\alpha r^2)$, in which r is a distance from the central axis of the fiber toward the radius direction, n_0 is the refractive index at the central axis and α is a positive constant;
said mixture of polymers including the number of N of polymers Pn, in which N is two or more, n=1, 2, . . . N, the polymers having different refractive indices from each other, the proportion of mixing of the polymers Pn varying in the optical transmission medium from the interior toward the surface thereof so that the index distribution of the optical transmission medium is formed, and the relationship between the attenuations Ln (dB/m) of the polymers Pn and the attenuation L_F (dB/m) of the optical transmission medium being represented by the following inequality (I):

$$L_F < \sum_{n=1}^{N} Wn \cdot Ln \quad \text{(I)}$$

wherein Wn are the respective proportions by weight of mixing of the polymers Pn to the whole of the mixture of the polymers Pn, and

$$\sum_{n=1}^{N}$$

Wn is equal to one; and
said polymers Pn including a copolymer having an attenuation of 100 dB/m or more and including 60–95% by mole of vinylidene fluoride unit and 40–5% by mole of tetrafluoroethylene, and a polymer having an attenuation of 30 dB/m or less and selected from the group consisting of polymethyl methacrylate and a copolymer containing methyl methacrylate, as a chief monomeric unit, said

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mixture of polymers being obtained by polymerising a monomer selected from methyl methacrylate and a monomer mixture containing methyl methacrylate as a chief component in the presence of a mixture of said copolymer of vinylidene fluoride and tetrafluoroethylene and a polymer selected from polymethyl methacrylate and a copolymer containing methyl methacrylate as a chief monomeric unit.

4,822,123

OPTICAL RADIATOR

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 396,823, Jul. 9, 1982, abandoned. This application Oct. 17, 1984, Ser. No. 661,872

Claims priority, application Japan, Jul. 13, 1981, 56-109108

Int. Cl.[4] G02B *5/14*

U.S. Cl. 350—96.10 **5 Claims**



1. An optical radiator for diffusingly radiating sunlight emitted from an optical-conductor cable for the purpose of illumination of a region, said optical-conductor cable transmitting light from an upstream direction toward a downstream direction and including a core made of optical fiber and a cladding layer covering the outer surface of said core, the improvement comprising: at least one end portion of said cladding layer located in said region is excised and the outer surface of the thus exposed core of the optical-conductor cable being topically covered with a plurality of fine grain adhesive elements each having an adhering area, said elements with a refractive index equal to or greater than that of said core, and the adhering area of each of said elements being smaller on said elements affixed upstream and larger on said elements affixed downstream of said exposed core.

2. An optical radiator for diffusingly radiating sunlight emitted from an optical-conductor cable for the purpose of illumination of a region, said optical-conductor cable transmitting light from an upstream direction toward a downstream direction and including a core made of optical fiber and cladding layer covering the outer surface of said core, the improvement comprising: at least one end portion of said cladding layer located in said region is excised and the outer surface of the thus exposed core of the optical conductor cable being topically covered with a plurality of light-scattering elements adhered to said core with an adhesive with a refractive index equal to or greater than that of said core, and said light-scattering elements being thinly distributed on the upstream portion and densely distributed on the downstream portion of the exposed core.

4,822,124

OPTICAL MATRIX SWITCH

Syuji Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,679

Claims priority, application Japan, Feb. 10, 1987, 62-30180

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.11 **4 Claims**

1. An optical matrix switch comprising,

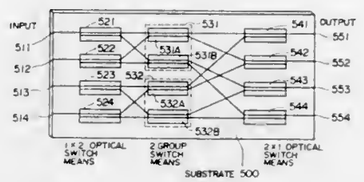
inputs of N in number where N is an integer,

outputs of M in number where M is an integer,

1×M/2 optical switch means of N in number each including a predetermined number of optical switch elements and having a single input connected to a corresponding one of said inputs of N, and having output of M/2 in number,

optical switch groups of N/2 in number, each of said optical switch groups including optical switch elements of M/2 in number, each of said optical switch elements being of a 2×2 optical switch element having two inputs and two outputs, wherein each of said 2×2 optical switch elements is operable to have a "BAR" state, in which a first of said two inputs is connectable to a first of said two outputs and a second of said inputs is connectable to a second of said two outputs and a "CROSS" state, in which said first of said two inputs is connectable to said second of said two outputs and said second of said two inputs is connectable to said first of said two outputs, and

N/2×1 optical switch means of M in number each including a predetermined number of optical switch elements and having a single output connected to a corresponding one



of said outputs of M, and having inputs of N/2 in number, and

wherein said outputs of M/2 in each of said 1×M/2 optical switch means of N are respectively connected to said optical switch elements of M/2 of a corresponding group among said optical switch groups of N/2, and said inputs of N/2 in each of said N/2×1 optical switch means of M are respectively connected to optical switch elements each selected from each of said optical switch groups of N/2 whereby an optical signal supplied to any one of said inputs of N is switched to be appeared at a predetermined one of said output of M by selecting a predetermined one of optical signal transmitting paths formed through said optical switch groups of N/2 between said 1×M/2 optical switch means of N and said N/2×1 optical switch means of M in accordance with "BAR" and/or "CROSS" states of corresponding optical switch elements therein.

4,822,125

OPTICAL FIBER TAP

Penny L. Beals, Redwood City; Phyllis M. Simon, Fremont, and Bruce D. Campbell, Portola Valley, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Continuation of Ser. No. 769,817, Aug. 26, 1985, abandoned, which is a continuation of Ser. No. 437,054, Oct. 27, 1982, Pat. No. 4,557,550. This application Feb. 27, 1987, Ser. No. 19,895

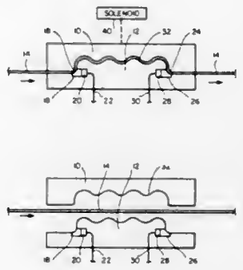
Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—96.15 **18 Claims**

1. A method of tapping an optical fiber carrying a first optical signal therein, comprising the steps of:

withdrawing a first part of the first optical signal from the fiber at a first location;

attenuating a second part of the first optical signal from the fiber at a second position located downstream from the first position; and



injecting a second optical signal into the fiber at a third position downstream from the first and second positions.

4,822,126

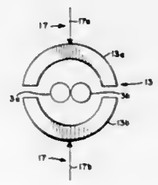
WAVELENGTH INDEPENDENT COUPLER AND METHOD OF MANUFACTURE THEREOF

Kevin L. Sweeny; Michael Corke, both of Wheaton, and Kevin M. Schmidt, Schiller, all of Ill., assignors to Amphenol Corporation, Wallingford, Conn.

Filed May 21, 1987, Ser. No. 53,292

Int. Cl.[4] G02B *6/26, 6/02*

U.S. Cl. 350—96.15 **18 Claims**



1. In a single mode coupler of type wherein two single mode fibers are fused together to form a coupler which permits substantially uniform coupling of light over a predetermined wavelength range of light between the two fibers, the improvement wherein said fibers are selected to have cores with respective indexes of refraction one different from the other, with the difference being sufficient such that when said fibers are fused together as a coupler, said substantially uniform coupling of light over a predetermined wavelength range, between the two fibers is achieved.

4,822,127

MULTI-CHANNEL OPTICAL TRANSMISSION SYSTEM

Tadao Kamiya, Anaheim, and Matthew J. Leader, Long Beach, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.

Filed Jun. 16, 1986, Ser. No. 874,919

Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—96.15 **22 Claims**

1. A multi-channel electromagnetic radiation transmission system comprising a plurality of first cladded optical fibers each having a proximal end and a distal end, said proximal end being adapted to receive radiation from a source and said distal end having an exposed tip which touches but is not integrally joined to an exposed intermediate portion of a second cladded optical fiber having a proximal end and a distal end, the touch contact between said tip and the exposed portion of said second optical fiber forming a highly directional radiation-transmissible junction which is encased in an opaque, radiation reflective jacket, said second cladded optical fiber being either a single fiber having a plurality of said junctions corresponding to the number of first optical fibers located sequentially along its length or one of a plurality of fibers each having at least one of said junctions, wherein the total number of said junctions corresponds to the number of first optical fibers, the proximal end of said single second optical fiber or of each of said plurality of second optical fibers being adapted to be attached to a



radiation measuring, transducing, recording or retransmitting component and the distal end thereof being attached to a radiation sensitive component, whereby the output radiation from said radiation sensitive component passes substantially unattenuated along said second optical fiber and through its associated junction toward the proximal end of said second optical fiber for determination by said radiation measuring, transducing, recording or retransmitting component.

4,822,128

OPTICAL FIBER STAR COUPLER AND METHOD OF MANUFACTURING THE SAME

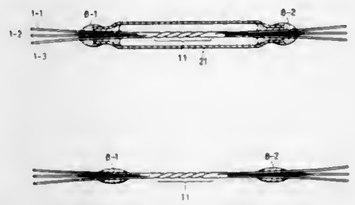
Katsuyuki Imoto, Sayama, and Hirohisa Sano, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,635

Claims priority, application Japan, Oct. 16, 1985, 60-228685; Feb. 5, 1986, 61-21920; Mar. 12, 1986, 61-52437

Int. Cl.[4] G02B *6/28*

U.S. Cl. 350—96.16 **11 Claims**



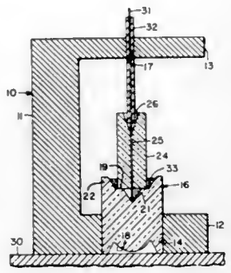
1. A method of manufacturing a plastic optical fiber star coupler comprising the steps of twisting and pulling a bundle of plastic optical fibers while heating the vicinity of a middle part of the fiber bundle, thereby to form a biconically tapered portion; and blowing a gas against an outer peripheral surface of said biconically tapered portion when a desired shape has been attained, thereby to cool said biconically tapered portion.

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4,822,129
METHOD OF MOUNTING FERRULE TO EXPANDED BEAM LENS

Thomas W. Webb, Horseheads, N.Y., assignor to Corning Glass Workr, Corning, N.Y.

Filed Jan. 4, 1988, Ser. No. 140,573
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.18 18 Claims



1. A method of attaching an optical fiber alignment ferrule to a connector body comprising

providing a connector body having an optical device at a first end thereof and a second end opposite said first end, an indented region in the second end of said body, said indented region being centered on the optical axis of said optical device, the remainder of said body other than said first and second ends having a predetermined shape,

mounting said body in a predetermined position,

mounting a rigid alignment rod in a slidable mounting means so that said rod is capable of only longitudinal movement along its axis, said slidable mounting means being so located that that portion of said rod within said slidable mounting means is coaxial with the optical axis of said optical device,

providing an elongated ferrule having a hole extending longitudinally therethrough, the inside diameter of said hole being sufficiently large for said rod to pass therethrough,

inserting one end of said rod through the hole in said ferrule,

advancing said rod toward said connector body until said rod contacts the bottom of said indented region,

positioning said ferrule so that one end thereof is in contact with said second end, and

bonding said ferrule to said second end.

4,822,130
FIBER OPTIC HERMETIC FEEDTHROUGH

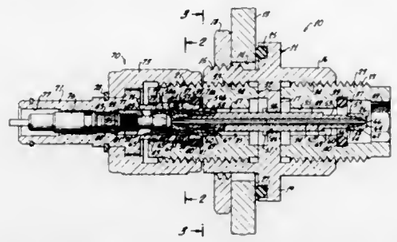
Jack J. Maranto, Capistrano Beach, and Gregory B. Noll, Corona, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 21, 1987, Ser. No. 87,832
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 17 Claims

1. A fiber optic feedthrough connector assembly comprising:

a. a housing having a wall disposed therein, and

b. elongated fiber optic contact means extending through said wall and terminating at each of its opposite ends in a



light coupling surface, said light coupling surfaces being on opposite sides of said wall.

4,822,131
FIBER OPTIC FERRULE CRIMP

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 542,006, Oct. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 268,462, May 29, 1981, abandoned. This application Dec. 6, 1985, Ser. No. 806,125
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 3 Claims



1. A hermaphroditic housing for a fiber optic splice, the housing comprising a pair of substantially identical mating sections each having a generally tubular contour and characterized by:

a tubular primary portion having an orifice at one end for the insertion of an optical fiber,

a tubular locking portion having a diameter greater than the diameter of the primary portion,

a tapered portion disposed between and joining the primary portion and the locking portion and

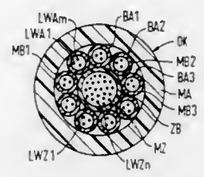
a trisectional, substantially cylindrical interior cavity comprising a first section having a diameter appropriate for the insertion of a ferrule crimp, a second section having a diameter greater than the diameter of the first section and appropriate for the insertion of an elastomeric splice, and an intermediate section disposed between the first section and the second section and having a diameter greater than the diameter of the first section but less than the diameter of the second section.

4,822,132
OPTICAL COMMUNICATIONS CABLE

Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 110,878
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706677
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 11 Claims

10. In an optical communications cable comprising a plurality of separate bundles, each containing light waveguides loosely enveloped within a protective covering having a wall thickness, said bundles including a centrally disposed bundle with the remaining bundles being stranded on said centrally disposed bundle, and all of the bundles being received in a common outer sheath, the improvement comprising the centrally disposed bundle having a greater number of light waveguides than each of the outwardly disposed remaining bundles and the protective covering of the centrally disposed bundle having a diameter greater than the diameter of the protective

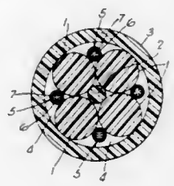


covering of each of the outwardly disposed remaining bundles, said centrally disposed bundles having a first ratio between the wall thickness and diameter of the protective covering, each of the outwardly disposed remaining bundles having a second ratio between the wall thicknesses and diameters of the protective covering and said first and second ratios being substantially the same.

4,822,133
OPTICAL CABLES

Alan J. Peacock, Essex, England, assignor to Telephone Cables Limited, England

Filed Jul. 30, 1987, Ser. No. 80,439
Claims priority, application United Kingdom, Aug. 7, 1986, 8619308
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 14 Claims



1. An optical cable, comprising:

a cylindrical outer sheath having an inner and an outer surface;

at least three longitudinally extending cylindrical strength members accommodated within and forming interstitial spaces with said outer sheath, each strength member having a radius and bearing against only two other strength members and against said inner surface of said outer sheath; and

at least one package having a radius and including a plurality of optical fibres accommodated in at least one interstitial space between said strength members, the radius of said package being substantially smaller than the radius of a respective one of said strength members, and said package being spaced from the inner surface of said outer sheath.

4,822,134
OPTICAL FIBER CABLE MARKER

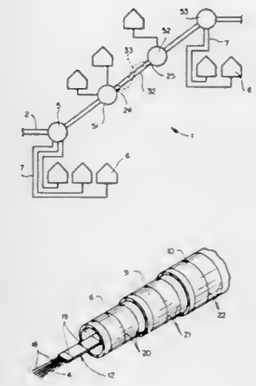
Bruce D. Campbell, Portola Valley, Calif., assignor to Raychem Corp., Menlo Park, Calif.

Filed Oct. 14, 1986, Ser. No. 918,746
Int. Cl.[4] G02B 6/44; B65H 59/00
U.S. Cl. 350—96.23 12 Claims

1. A method of installing an optical fiber cable having at least one optical fiber loosely contained within the cable, comprising the steps of:

disposing the optical fiber cable over a geographical area so as to extend past first and second points, the optical fiber being loosely contained within the cable and being capable of moving linearly relative to the cable;

noting a first value of a fiber length marker indicative of a linear length of the optical fiber between first and second points;



noting a second value of a cable length marker indicative of a linear length of the optical fiber cable between the first and second points;

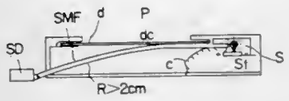
comparing the first and second values to determine if the first value is at least a predetermined percent larger than the second value; and

fixing the optical fiber in place at the first and second points when the first value is at least the predetermined percent larger than the second value.

4,822,135
OPTICAL WAVE GUIDE BAND EDGE SENSOR AND METHOD

George Seaver, 19 Mystery La., Cataumet, Bourne, Mass. 02534

Filed Aug. 7, 1987, Ser. No. 83,691
Int. Cl.[4] G01N 21/17
U.S. Cl. 350—96.29 18 Claims



10. A sensor apparatus for the determination of selected parameters, which apparatus comprises:

(a) an optical wave guide means which comprises a single mode optical fiber having an inlet and an outlet to provide a guided optical path for radiant energy and having a known guiding interface and wherein one part of said optical fiber and said interface is physically deformable relative to another part;

(b) a broad-band radiant energy means to provide radiant energy to the inlet of the optical wave guide means;

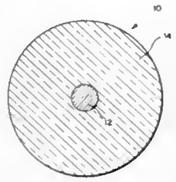
(c) moveable means to deform physically the optical wave guide, the movement of said means related to a selected parameter to be measured; and

(d) detecting means to detect continuously from the output of the optical wave guide means the change in the critical wavelength of the radiant energy through the change in

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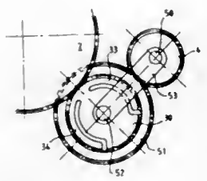
physical deformation of the optical wave guide means and thereby to measure the selected parameter to be measured.

4,822,136
SINGLE MODE OPTICAL FIBER
John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Jun. 15, 1984, Ser. No. 621,152
Int. Cl.⁴ G02B *6/10*
U.S. Cl. 350—96.34 **4 Claims**



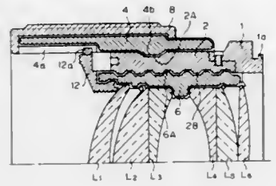
1. A single mode, all glass, optical fiber comprising a core consisting essentially of pure fused silica and fluorine uniformly distributed throughout said core in a given concentration and a cladding consisting essentially of pure fused silica and fluorine uniformly distributed throughout said cladding in a concentration higher than that of said concentration of fluorine in said core.

4,822,137
MEANS FOR ADJUSTING THE FOCAL LENGTH OF A LENS IN RELATION TO ITS DISPLACEMENT
Jozef L. L. Goertz, Belfeld, and Bernardus W. de Jong, Venlo, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands
Filed Dec. 16, 1987, Ser. No. 133,747
Claims priority, application Netherlands, Dec. 22, 1986, 8603254
Int. Cl.⁴ G02B *7/02*
U.S. Cl. 350—255 **4 Claims**



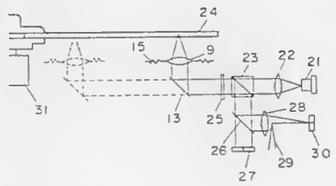
1. In a copying machine having:
an optical system with a variable imaging ratio and a fixed distance between the image plane and the object plane;
a lens mounted upon a moveable carriage, the focal length of which can be adjusted to a selected imaging ratio by rotation of a toothed ring coupled thereto;
a drive means for displacing the carriage; and
a system comprising at least two cooperating gear wheels for converting the displacement of the carriage into a rotation of said toothed ring thereon,
the improvement in combination therewith comprising:
at least one toothed ring segment on one cooperating gearwheel substantially near the circumference of said gearwheel, said segment being pivotable about an axis which extends axially of said gear wheel, and pivot means for causing said toothed ring segment to pivot about said axis and enable it to be fixed in any position.

4,822,138
LENS TUBE UNIT AND METHOD FOR PRODUCING THE SAME
Hironori Takase, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Japan
Filed Nov. 26, 1986, Ser. No. 935,383
Claims priority, application Japan, Nov. 27, 1986, 60-266781; Nov. 27, 1986, 60-266782
Int. Cl.⁴ G02B *7/02*
U.S. Cl. 350—252 **3 Claims**



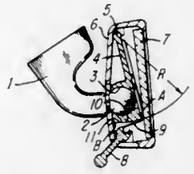
1. A lens tube unit comprising:
an intermediate tube having inner and outer elongate surfaces and provided with at least one helicoid on at least one of said surfaces:
an outer tube member and an inner tube member, said outer and inner tube members each including a central portion including a core layer and an outer peripheral layer;
said core layer being formed from a glass fiber reinforced material;
said outer peripheral layer being formed from a superficial skin layer material of polycarbonate; and
saidf intermediate tube being positioned such that at least a portion of said inner and outer elongate surfaces engage with at least a portion of said outer peripheral layers of said inner and outer tube members respectively.

4,822,139
OPTICAL HEAD APPARATUS FOR OPTICAL DISC PLAYER
Keiichi Yoshizumi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
PCT No. PCT/JP85/00264, § 371 Date Dec. 9, 1985, § 102(e) Date Dec. 9, 1985, PCT Pub. No. WO85/05487, PCT Pub. Date Dec. 5, 1985
PCT Filed May 10, 1985, Ser. No. 815,703
Claims priority, application Japan, May 15, 1984, 59/96880
Int. Cl.⁴ G02B *7/02;* **G11B** *7/00*
U.S. Cl. 350—257 **3 Claims**



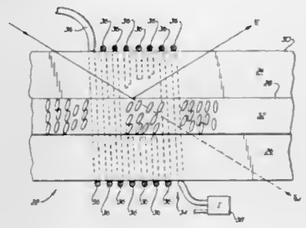
1. An optical head apparatus for an optical disc player, comprising:
a stand which is movable in the radial direction of a disc type recording media;
a light source spaced from said stand for directing substantially parallel light beams in the direction of movement of said stand;
a light reflecting means fixed to said stand for receiving said light beams and reflecting said light beams in a direction substantially perpendicular to the surface of the disc type recording media;
a condenser lens for receiving and converging the reflected light from said light reflecting means onto the surface of the disc type recording media;
a flexible support means having one end fixed to said condenser lens and the other end fixed to said stand for supporting said condenser lens for movement in said perpendicular direction;
a first coil means integrally affixed to said condenser lens and wound for applying a driving force to said condenser lens to move it in said perpendicular direction;
a second coil means integrally affixed to said condenser lens and wound for applying a driving force directly to said condenser lens to move it in said radial direction for both tracking and accessing; and
a magnetic circuit having a gap extending in said radial direction and in which a part of each of said first and second coil means are positioned for driving said lens in said directions.

4,822,140
REAR-VIEW MIRROR FOR MOTOR VEHICLES
Bernhard Mittelhäuser, Am Krähenberg, D-3002 Wedemark 2, Fed. Rep. of Germany
Filed Oct. 27, 1987, Ser. No. 113,786
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1986, 3636495
Int. Cl.⁴ G02B *17/00*
U.S. Cl. 350—279 **7 Claims**



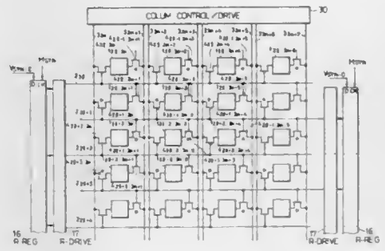
1. In a rear-view mirror for motor vehicles, especially an internal mirror, including a holder that is adjustably disposed on a ball-and-socket joint, and a dish-shaped housing that is provided with a mirror body, mounted in an aperture of said housing, and that is pivotably mounted to said holder about a horizontal axis in the region of the upper edge of said holder, with said housing being pivotable, by means of a pivot lever, into two end positions, namely a normal position and an anti-glare position, the improvement wherein:
additional support surface means are associated with said housing and said holder at least for supplementing said two end positions thereof to provide rigid abutment in radial direction, with said support surface means being located and curved in conformity with a pivot radius determined by said horizontal axis, said additional surface means assuring a secure adjustment so that undesired vibrations of the mirror are avoided during vehicle operation and assuring that radial forces applied to the rear-view mirror from end to end thereof are taken up safely via the rigid abutment in radial direction when manual adjustment of the rear-view mirror occurs other than at the location where the rear-view mirror is pivotably mounted.

4,822,141
LIQUID CRYSTAL BEAM SPLITTER
Richard L. McAdams, New Haven, Conn., assignor to ITT Defense Communications, a division of ITT Corporation, Nutley, N.J.
Filed Aug. 13, 1986, Ser. No. 896,359
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—330 **11 Claims**



1. A liquid crystal beam splitter comprising:
first and second transparent members each having an inner and an outer surface;
a liquid crystal material disposed between said inner surfaces;
an electrically conductive coil wrapped in contact with said transparent members;
means for providing an electric current to said coil to establish a magnetic field within the liquid crystal material.

4,822,142
PLANAR DISPLAY DEVICE
Masaru Yasui, Yao, Japan, assignor to Hosiden Electronics Co. Ltd., Osaka, Japan
Filed Dec. 23, 1986, Ser. No. 945,701
Int. Cl.⁴ G02F *1/133;* **G09G** *3/36*
U.S. Cl. 350—332 **6 Claims**



1. A planar display device comprising:
a plurality of display elements respectively defined by display electrodes arrayed in rows and columns to form a matrix array of said display elements;
a plurality of first thin film transistors each having a drain source, drain and gate formed adjacent a corresponding one of said display electrodes, each of said first transistors having its drain connected to a corresponding one of said display electrodes;
a plurality of first row drive lines each provided for and extending between every two adjacent rows of said display electrodes, said first transistors connected to corresponding ones of said display electrodes on the opposite sides of each said first row drive line having their respective gates commonly connected to said first row drive line;

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a plurality of column drive lines provided in pairs for respective columns of said display electrodes, said column drive lines in each pair extending along opposite sides of a corresponding column of said display electrodes, said first transistors connected to respective said display electrodes in said corresponding column having their respective sources connected alternately to one and the other of said pair of column drive lines;

a plurality of second row drive lines each provided for and extending between every two adjacent rows of said display electrodes between adjacent ones of said first row drive lines;

a plurality of second thin film transistors each having a source, drain and gate formed adjacent corresponding ones of said display electrodes each of said second transistors having its drain connected to a corresponding one of said display electrodes, said second transistors connected to said corresponding ones of said display electrodes on the opposite sides of each said second row drive line having their respective gates commonly connected to said second row drive line, and each of said second transistors having its source connected to one of a corresponding pair of said column drive lines other than the one to which the source of a corresponding one of said first transistors is connected;

row drive means connected to said first and second row drive lines for driving said plurality of first row drive lines one after another in synchronism with the horizontal scanning cycle of a video signal for each odd scanning field, and for driving said plurality of second row drive lines one after another in synchronism with the horizontal scanning cycle of the video signal for each even scanning field; and

column drive means supplied with said video signal for each scanning line and having a plurality of drive stages equal in number to said plurality of column drive lines and connected thereto, respectively, for driving said column drive lines according to the outputs of corresponding said stages.

4,822,143

PICTURE-REPRODUCING ARRANGEMENT USING A PICTURE TUBE, AND METHOD OF MANUFACTURING SAME

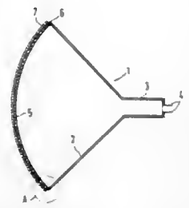
Rolf Zondler, Stuttgart, Fed. Rep. of Germany, assignor to Nokia Graetz GmbH, Pforzheim, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 111,693

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636059

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—337 **9 Claims**



7. An arrangement for reproducing pictures, comprising:

a picture tube having a faceplate;

a polarizer;

a liquid crystal cell provided with transparent electrode areas on both sides, said liquid crystal cell and said polarizer having juxtaposed surfaces joined together, said joined polarizer and liquid crystal cell being disposed directly on the faceplate of the picture tube; and

a layer of adhesive joining said faceplate to said joined polarizer and liquid crystal cell, said adhesive layer being constituted by transparent portion and a conductive portion.

4,822,144

ELECTRO-OPTIC COLOR DISPLAY INCLUDING LUMINESCENT LAYER AND INTERFERENCE FILTER

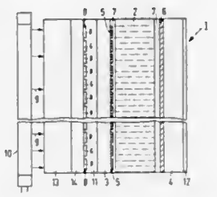
Leendert Vriens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,432

Claims priority, application Netherlands, Dec. 24, 1986, 8603298

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—339 F **10 Claims**



1. A color display device comprising: an electro-optical medium; two parallel transparent substrates flanking the medium and having drive means to influence the transmission state of the medium; a pattern of at least two luminescent materials on one of the substrates; and a radiation source suitable for emitting sufficiently short-wave radiation to excite the luminescent materials,

characterized in that an interference filter is arranged between the radiation source and the luminescent materials, which filter is substantially coplanar and coextensive with the radiation source and the luminescent materials, and substantially completely passes the short-wave radiation and substantially completely reflects radiation generated in the luminescent materials.

4,822,145

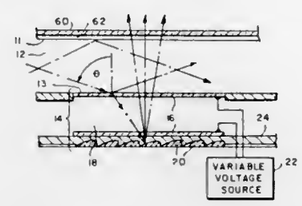
METHOD AND APPARATUS UTILIZING WAVEGUIDE AND POLARIZED LIGHT FOR DISPLAY OF DYNAMIC IMAGES

David H. Staelin, Wellesley, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 14, 1986, Ser. No. 863,122

Int. Cl.⁴ G02F *1/13*; F21V *7/04*

U.S. Cl. 350—345 **31 Claims**



12. A visual display device comprising:

a light waveguide having a front face and a rear face;

an array of liquid crystal cells overlying the front face of said waveguide, each cell including a dielectric layer and a pair of transparent electrodes on opposite faces of said layer, said dielectric layer having a dielectric constant to define a critical angle relative to the normal to said front face, said critical angle being the angle above which light will remain trapped within said waveguide;

means for changing the voltage level across any of said pairs of electrodes to change said critical angle so that previously trapped light may escape said light waveguide through the liquid crystal layer between said pair of electrodes; and

a grooved surface overlying said array of liquid crystal cells for directing said escaped light, said grooved surface having a plurality of transparent surfaces facing in one direction alternately positioned with a plurality or mirror surfaces facing in a second direction.

19. A method for illuminating a visual display device comprising the steps of;

providing a light waveguide and an array of liquid crystal cells adjacent said waveguide;

directing polarized light through said waveguide at an angle such that said polarized light remains trapped within said light waveguide; and

changing the voltage level across a pair of electrodes in at least one of said liquid crystal cells to change the dielectric constant of said at least one liquid crystal cells so as to release polarized light from said light waveguide so that it is visible through said at least one liquid crystal cells.

4,822,146

OPTICAL MODULATION ELEMENT

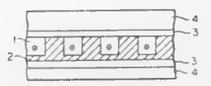
Masato Yamanobe, Machida; Yasuyuki Watanabe, Chigasaki, and Yukitoshi Ohkubo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 33,192

Claims priority, application Japan, Apr. 7, 1986, 61-080608; Apr. 7, 1986, 61-080609

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—348 **7 Claims**



1. An optical modulation device comprising:

a first substrate;

a second substrate disposed opposingly to said first substrate;

a liquid crystal layer and optical member alternately arranged between said first and second substrates and substantially in a plane extending parallel to the planes defined by said both substrates, said liquid crystal layer including liquid crystal molecules whose refractive index changes between maximum refractive index Nmax and minimum refractive index Nmin in accordance with their orientation an said optical member having refractive index Ng about equal to refractive index N_θ where $Nmax > N_\theta > Nmin$; and

control means for controlling the orientation of said liquid crystal molecules to change the refractive index of said liquid crystal layer.

4,822,147

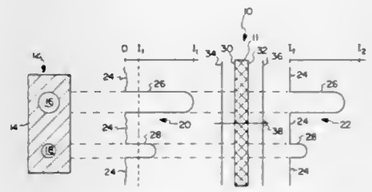
CONTRAST ENHANCEMENT OF OPTICAL IMAGES WITH NONLINEAR MEDIA

Yong K. Park, Vadnais Heights, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 538,401, Oct. 3, 1983, abandoned. This application Nov. 27, 1985, Ser. No. 802,948

Int. Cl.⁴ G02F *1/17*

U.S. Cl. 350—354 **9 Claims**



1. A device for enhancing contrast in a two dimensional optical image, said device comprising:

means for producing said image, wherein said image includes selected wavelengths of light and a plurality of features;

a nonlinear optical medium which will absorb light of said selected wavelengths incident thereupon having an intensity less than a threshold intensity and transmit light incident thereupon having an intensity above said threshold, and wherein the intensity of at least one of said features is less than said threshold intensity; and

first and second means for partially transmitting and partially reflecting light, positioned in spaced relationship with respect to each other, with said nonlinear medium placed, at least in part, therebetween, and wherein said first and second means for partially transmitting and partially reflecting light and said nonlinear optical medium are adapted to only transmit light of said selected wavelengths which is incident upon said first means for partially transmitting and partially reflecting light.

8. A method of enhancing contrast in a two dimensional optical image, said image including selected wavelengths of light and having a plurality of features, said method comprising:

irradiating a saturable absorptive nonliinear medium with said image;

absorbing light of said selected wavelengths having an intensity less than a threshold intensity, wherein the intensity of at least some of said features is less than said threshold intensity; and

transmitting light of said selected wavelengths having an intensity above said threshold.

4,822,148

MULTICOLOR LIGHT VALVE IMAGING APPARATUS HAVING ELECTRODE CONSTRUCTIONS FOR UNIFORM TRANSMISSION

John A. Agostinelli, Rochester, and José M. Mir, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 23, 1987, Ser. No. 100,058

Int. Cl.⁴ G02F *1/03, 1/01*

U.S. Cl. 350—356 **6 Claims**

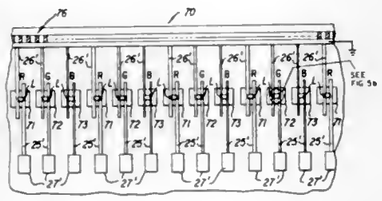
1. In multicolor light valve imaging apparatus of the type including (i) an isotropic-birefringent modulator panel with sandwiching polarizer and analyzer elements, (ii) electrode means dividing said panel into an array comprising a plurality of selectively addressable pixel portions, (iii) a plurality of different color filter elements arranged in light filtering association with respective pixel portions, (iv) light source means for directing multicolor light through said modulator and polar-

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izer, analyzer and filter elements and (v) means for addressing said electrodes to selectively apply voltage across said pixel portions, the improvement wherein:

(a) said array comprises a plurality of predeterminedly different electrode constructions, respectively for each different color of filter elements, said electrode constructions differing so that the half-wave voltage for each pixel portion and filter combination is substantially equal and

(b) said addressing means is constructed to apply such substantially equal half-wave voltage across all pixel portions of said panel.



4,822,149

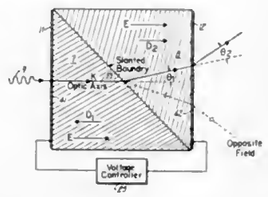
PRISMATIC FERROELECTRIC BEAM STEERER

Frederick W. Kubick, White Plains, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 2, 1984, Ser. No. 585,760

Int. Cl.⁴ G02F *1/29*

U.S. Cl. 350—389 **9 Claims**



1. A device for continuously steering a beam of millimeter wavelength radiation, comprising:

adjacent first and second material media sharing a common slanted boundary, each of said media having the form of a prism, said media being ferroelectric and having coincident optic axes of opposing domains, said axes being disposed in the direction of propagation of said beam of millimeter wavelength radiation;

a pair of flat electrodes straddlingly adjacent said material media, said electrodes being orthogonal to said optic axes; and

electric means for providing a voltage between said pair of electrodes to establish a variable electric field across said media for controllably directing the steerage of said beam of millimeter wavelength radiation.

5. A method of continuously steering a beam of millimeter wavelength radiation, comprising the steps of:

directing a beam of radiation having millimeter wavelength characteristics at adjacent first and second material media including a respectively a pair of prisms, said media being ferroelectric and having coincident optic axes with opposing domains, said axes being disposed in the direction of propagation of said beam of millimeter wavelength radiation;

disposing a pair of electrodes straddlingly adjacent said material media, each of said electrodes being orthogonal to said coincident optic axes; and

applying a voltage between a pair of electrodes straddlingly adjacent said media.

4,822,150

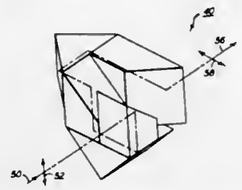
OPTICAL DEVICE FOR ROTATING THE POLARIZATION OF A LIGHT BEAM

Francisco J. Duarte, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1987, Ser. No. 50,809

Int. Cl.⁴ G02B *5/04*

U.S. Cl. 350—394 **2 Claims**



1. An optical device for rotating the polarization of a linearly-polarized input beam of radiation, said device comprising:

prism means having first means for receiving said input beam and rotating the polarization thereof through a first angle and second means for receiving said beam from said first means and for producing an output beam which is collinear with said input beam, said prism means including a body of light-transmitting material having a plurality of internally-reflecting prismatic surfaces thereon which are disposed to interact in succession with said input beam, said first means including two of said prismatic surfaces, said two surfaces being arranged along an optical axis and being at the same angle relative to said axis, one of said two surfaces being rotated 90° about said axis relative to the other of said two surfaces, and said second means including the remainder of said prismatic surfaces.

4,822,151

OPTICAL DEVICE WITH PHASE-LOCKED DIODELASER ARRAY

Kimio Tatsuno, Tokyo, Japan; Jan Opschoor, Eindhoven, Netherlands; Carolus J. van der Poel, Eindhoven, Netherlands, and Ronald R. Drenten, Eindhoven, Netherlands, assignors to Hitachi Ltd., Tokyo, Japan and U.S. Philips Corporation, New York, N.Y.

Filed Mar. 2, 1988, Ser. No. 162,920

Claims priority, application European Pat. Off., Oct. 19, 1987, 87201996.3

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 350—401 **14 Claims**



1. Optical device for delivering a single radiation beam comprising in this order

a phase locked diode laser array having a p-n junction layer with a plurality of emitters defining a lateral plane and an axis of symmetry, said array being constructed so that said emitters radiate in a highest order supermode in which the radiation of each emitter is π radians out of phase with the radiation of the adjacent emitters and the far field radiation pattern exhibits two central lobes in the lateral plane,

a collimator lens arranged in the path of the radiation from the emitters to collimate the radiation in the lateral plane, whereby the two radiation lobes in the lateral plane are collimated into two parallel collimated subbeams,

a polarization rotator in the path of one of the subbeams,

a polarization sensitive beam combiner in the path of both of said subbeams.

4,822,152

COMPACT HIGH-VARI-FOCAL RATIO ZOOM LENS SYSTEM

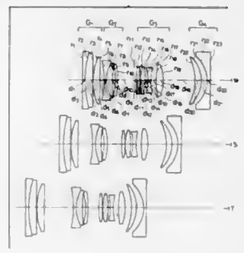
Takanori Yamanashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 670,840

Claims priority, application Japan, Aug. 11, 1986, 61-186727; Dec. 22, 1986, 61-303876

Int. Cl.⁴ G02B *15/14, 9/64*

U.S. Cl. 350—427 **17 Claims**



1. A compact high vari-focal ratio zoom lens system comprising a first lens group having positive refractive power, a second lens group having negative refractive power, a third lens group having positive refractive power, and a fourth lens group having negative refractive power, in the order from the object side, and arranged to move said first, second, third and fourth lens groups respectively toward the object side along the optical axis at the time of zooming from the wide position to the teleposition, said compact high-vari-focal ratio zoom lens system being arranged to fulfill the conditions (1), (2) and (3) shown below:

$$0.03 < \frac{\beta_{4T}}{\beta_{4W}} \cdot \phi_W < 0.07 \quad (1)$$

$$0.3 < \beta_{2T} \cdot \beta_{3T} < 1.0 \quad (2)$$

$$5 < \frac{1 - \beta_{4W}}{\phi_4} < 20 \quad (3)$$

where, reference symbol β_{2T} represents the lateral magnification of the second lens group in the teleposition, reference symbol β_{3T} represents the lateral magnification of the third lens group in the teleposition, reference symbol β_{4T} represents the lateral magnification of the fourth lens group in the teleposition, reference symbol β_{4W} represents the lateral magnification of the fourth lens group in the wide position, reference symbol ϕ_W represents the refractive power of the lens system as a whole in the wide position, and reference symbol ϕ_4 represents the refractive power of the fourth lens group.

4,822,153

ONE-HAND ZOOM LENS BARREL

Yasumasa Tomori, and Tetsuo Sekiguchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1986, Ser. No. 936,700

Claims priority, application Japan, Dec. 2, 1985, 60-271161

Int. Cl.⁴ G02B *15/14, 7/02*

U.S. Cl. 350—429 **7 Claims**

1. A lens barrel adapted to be used in a zoom lens system of the two-group type which achieves zooming by moving front and rear lens units in the direction of an optical axis of said lens units and which achieves focusing by displacing the front lens unit in the direction of the optical axis, said barrel comprising:

(a) a front lens unit frame (**1**) for holding a front lens unit;

(b) a front lens unit moving frame (**4**) onto which said front lens unit frame is threaded;

(c) a rear lens unit frame (**2**) for holding a rear lens unit;

(d) a single operating sleeve (**6**) that can be rotated or displaced in the direction of the optical axis and which is coupled to said front lens unit frame, whereby turning said operating sleeve causes said front lens unit frame to rotate;

(e) a sliding ring (**5**) that is movable en masse with said single operating sleeve in the direction of the optical axis;

(f) a cam sleeve (**3**) that has a first cam groove (**3***a*) to permit said sleeve to rotate in operative association with the linear movement of said sliding ring;

(g) a second cam groove (**4***a*) for said front lens unit that allows said front lens unit moving frame to be displaced in



the direction of the optical axis as a result of the rotation of said cam sleeve; and

(h) a third cam groove (**3***b*) for said rear lens unit that allows said rear lens frame to be displaced in the direction of the optical axis as a result of the rotation of said cam sleeve, wherein said first, second and third cam grooves are shaped to satisfy the following relation over an entire zoom range of the lens system:

$$\tan \theta_F + \tan \theta_R + \tan \theta_Z = K,$$

where θ_Z is the angle, with respect to the optical axis, of the first cam groove for a small change in focal length of the lens system;

θ_F is the angle, with respect to the optical axis, of the second cam groove for a small change in the focal length;

θ_R is the angle, with respect to the optical axis, of the third cam groove for a small change in the focal length;

K is a constant.

4,822,154

IMPROVEMENTS IN OR RELATING TO BORESCOPES

Colin G. Oxford, Canvey Island; George C. Parker, Westcliff-on-Sea, and Roger L. Gray, Shoeburyness, all of United Kingdom, assignors to Keymed (Medical and Industrial Equipment Limited), Southend-on-Sea, England

Filed Oct. 30, 1987, Ser. No. 114,997

Claims priority, application United Kingdom, Nov. 13, 1986, 8627109

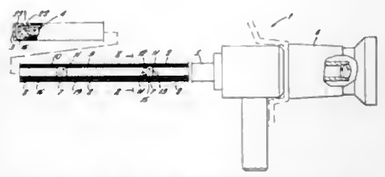
Int. Cl.⁴ G02B *23/24*

U.S. Cl. 350—572 **9 Claims**

4. A borescope for use in through-bore inspection of inaccessible objects comprising a tubular shaft having a first end for insertion in use into a bore, objective means at the first end of the shaft for viewing an object, imaging means at the second end of the shaft, and optical relay means for relaying light from the objective means to the imaging means such that the object may be imaged by the imaging means wherein the relay means comprises an optical assembly in which a plurality of optical elements are spaced apart by tubular spacers through which the optical path extends, said spacers including formations for connecting adjacent spacers and for housing the optical elements such that the spacers and optical elements form a self-supporting assembly, said formations comprising male and female portions of each spacer, which portions

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interfit with cooperating portions of adjacent spacers, and wherein each optical element includes a cylindrical surface



which is a sliding fit in axial alignment within a respective female portion.

4,822,155

MIRROR ASSEMBLY WITH FLEXIBLE MEMBRANE

Peter Waddell, East Kilbride, Scotland, assignor to University of Strathclyde, Glasgow, Scotland

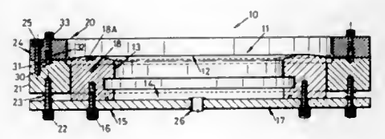
PCT No. PCT/GB87/00622, § 371 Date Apr. 28, 1988, § 102(e) Date Apr. 28, 1988, PCT Pub. No. WO88/02126, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 4, 1987, Ser. No. 192,788

Claims priority, application United Kingdom, Sep. 18, 1986, 8622515

Int. Cl.⁴ G02B *7/18, 5/10, 5/08*

U.S. Cl. 350—608 **5 Claims**



1. A mirror assembly comprising a rigid circular structure (15) defining a hollow chamber (14) having a circular aperture (13), a flexible membrane (12) disposed across said circular aperture (13) and in contact with the periphery (18) of the circular aperture (13), said flexible membrane (12) having a reflective coating (11) adherent to the membrane face which is distal to said circular aperture (13), circularly-extending secural means (20) peripherally engaging said membrane (12) radially outwardly of said circular aperture (13) and capable of rendering flat that portion of the membrane (12) covering said circular aperture (13), pneumatic means (26) connected to said chamber (14) for varying the differential pneumatic pressure across the membrane (12) to thereby apply a pneumatic membrane deformation force to the membrane (12), said reflective coating (11) being rendered variable in focal length according to the magnitude of the applied deformation force, characterised in that said secural means (20) provides peripherally continuous clamping of the membrane (12) between opposed circularly-extending clamp surfaces (21, 24) at least one of which is mounted for movement axially of said circular structure (15) in order to effect rendering said membrane portion flat in the absence of any deformation force applied by said pneumatic means (26), and in that said secural means (20) also provides peripherally-discontinuous adjustment means (30–33) for adjusting tension in individual peripheral regions of said membrane portion, and stress control means (18A) are provided located at the interface between the circular structure (15) and the reflective coating (11) for controlling the stress distribution in the membrane (12) around the periphery of the circular aperture (13) when deformation force is applied by said pneumatic means (26).

4,822,156

REFLECTING TELESCOPE

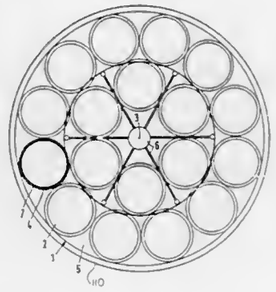
Hermann Hügenell, Maxdorfer Str. 47, D-6715 Lamb sheim, Fed. Rep. of Germany

Filed Oct. 22, 1986, Ser. No. 922,180

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1985, 3538208

Int. Cl.⁴ G02B *17/06, 7/18, 23/06, 23/16*

U.S. Cl. 350—613 **1 Claim**



1. A reflecting telescope comprising: a cylindrical tube having a inlet end and a primary mirror end, the tube having a central axis; a plurality of mirror segments cooperating to form a single mirror, said mirror segments forming a single paraboloid-shaped surface by grinding the mirror segments altogether in a single grinding process, said primary mirror of paraboloid shape being positioned at said primary mirror end of said tube, each of plurality of mirror segments having a circular disk shape and being arranged in circular tracks, each circular track being defined by an inner circle and an outer circle, each of said inner and outer circles being concentric to the tube central axis, areas free of mirror segments lying between said mirror segments of circular disk shape and an innermost area free of mirror segments lying within an innermost circular track, said mirror segments being mounted at said primary mirror end for individual adjustment; bearings positioned about each of said mirror segments at said areas free of mirror segments lying between said mirror segments, said bearings being adapted to adjust each of said mirror segments; a system of mounting bars positioned in said tube between said inlet end and said primary mirror end, said mounting bars being connected to said primary mirror end at said areas free of mirror segments, such that light entering said inlet end causes shadows to be cast by said system of mounting bars on said areas free of mirror segments; and, a plurality of observation cages, each of said plurality of observation cages being positioned in the innermost area free of mirror segments, each of said plurality of observation cages being positionable between said tube primary mirror end and said inlet end to provide different modes of observation, each of said observation cages including at least one deviating mirror for reflecting light which has been directed to it.

4,822,157

ELONGATE, ARCUATE MIRROR WITH LIGHTWEIGHT, AERODYNAMIC BACK SUPPORT

Thomas R. Stout, Lambertville, Mich., assignor to Safety Cross Mirror Co., Inc., Lambertville, Mich.

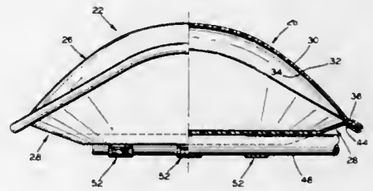
Filed Sep. 30, 1987, Ser. No. 102,619

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.⁴ B60R *1/08, 1/06;* **G02B** *7/18*

U.S. Cl. 350—629 **12 Claims**

1. A mirror assembly including an elongate, convex mirror comprising a transparent elongate sheet with a generally convex surface and a generally concave surface, said sheet having a reflective layer on the concave surface, said sheet having a substantially constant longitudinal radius of predetermined value throughout a central portion of said mirror, said sheet having a substantially constant transverse radius of a value exceeding the value of said longitudinal radius throughout the same central portion of said mirror, end portions of said sheet beyond said central portion to the ends thereof having generally segmental spherical shapes, said transparent sheet having a rim around the entire periphery thereof, said rim, as viewed from the top of the sheet, being arcuate with a constant radius substantially throughout the central portion of said sheet, said rim, as viewed from the top of the sheet, being straight at both end portions of said sheet with said rim at each end portion



lying in a common plane, an elongate back support for said transparent sheet having a backing rim around the entire periphery thereof, said backing rim conforming in size and shape to said sheet rim, being arcuate throughout a central portion of said back support and having end portions, as viewed from the top of the back support, which are straight, with each end portion of said support rim lying in a common plane, means affixing said backing rim to said sheet rim, said back support having a generally convex side and a generally concave side, said concave side facing toward said concave surface of said transparent sheet, said convex side of said back support having means for receiving a mounting support for supporting said mirror.

4,822,158

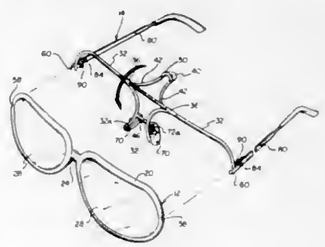
EYEGLASSES WITH REMOVABLE LENS ASSEMBLY

Ferdinand A. Porsche, St. Georgen, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.

Filed Jun. 30, 1987, Ser. No. 68,639

Int. Cl.⁴ G02C *7/08*

U.S. Cl. 351—57 **8 Claims**



1. Eyeglasses of a type having two mating assemblies which permit an exchange of lenses, comprising:

a lens assembly including a pair of lenses mounted in a frame defining two lens-receiving portions connected together by a single bridge member forming an open recess between upper sections of the two lens-receiving portions;

a backing support located behind said lens assembly for support thereof, said backing support including a central portion having a lower mounting bar and an upper mounting bar above said lower mounting bar and an upper mounting bar above said lower mounting bar for pivotally mounting a retaining clip at an upper end thereof for movement between open and closed positions; and

said retaining clip having an upper end pivotally mounted to said upper mounting bar and movable between said open position which permits installation and removal of said lens assembly with respect to said backing support and said closed position adapted to engage said bridge member for mounting of said frame assembly to said backing support and for positioning said bridge member immediately adjacent said lower mounting bar, remote from the upper mounting bar, and said clip having detent locking means at a lower end thereof for releasable locking engagement with said lower mounting bar to maintain said retaining clip in said closed position.

4,822,159

SADDLE-SHAPED SPECTACLE BRIDGE

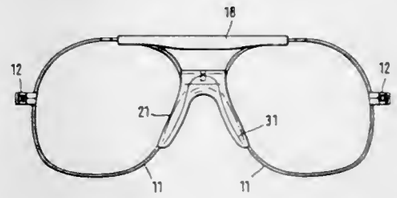
Hans Gaiser, Thuring Strasse 19, 7410 Reutlingen 24, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,781

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1982, 3212686

Int. Cl.⁴ G02C *5/02*

U.S. Cl. 351—124 **14 Claims**



1. In a saddle-shaped spectacle bridge made of silicone of a Shore-D hardness of 10–30 having:

two wings,

a cross member connecting the wings

a spectacle rim groove in the frontal external longitudinal zone of each wing, the groove having a bottom surface and a rear surface which is approximately vertical thereto, and

a fastening hole in the cross member in the front thereof, the improvement comprising:

(a) a metal spring extending in the shape of a bell having a cross piece embedded in the cross member and two legs which have a curvature towards the outside, each leg extends in a wing as a ridge,

(b) the untensioned position of the spring having a greater dimension of expansion than corresponds to the position of use of the saddle-shaped bridge,

(c) the spring being located behind the grooves, and

(d) a blind hole that passes from the top of the cross member to the bottom through the silicone material and coaxially through the cross piece of the spring, the blind hole forming, below the cross piece, the lowermost part of the fastening hole, into which a fastening part of the spectacles is received.

4,822,160

FLASHING SPECTACLES

James Tsai, Fl. 11, No. 40, Chang Chun Road, Taipei, Taiwan

Filed Jun. 8, 1988, Ser. No. 204,000

Int. Cl.⁴ G02C *1/00*

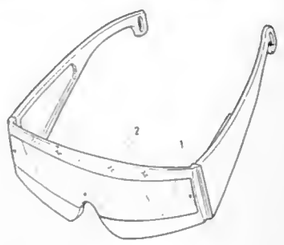
U.S. Cl. 351—158 **1 Claim**

1. A pair of flashing spectacles comprising:

a pair of spectacles; and

an electrical device including an oscillator for producing square waves, an external resistor connected in parallel

with the oscillator for controlling frequency of the square waves produced by the oscillator, said oscillator having an output connected to a counter, an on/off latch having an input connected with one end of a rest switch and an output connected with the oscillator and the counter, a decoder controller connected to output of the counter, an open drain driver connected with the decoder controller,



a plurality of light emitting diodes connected with output of the open drain driver and a battery connected between output of the light emitting diodes and the other end of the reset switch;

whereby the light emitting diodes will emit light when the reset switch is pressed once but will extinguish when the reset switch is further pressed.

4,822,161

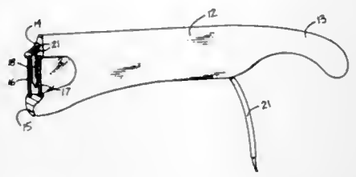
ILLUMINATING SPECTACLE APPARATUS

Michael F. Jimmy, P.O. Box 2183, Barrhead, Alberta, Canada

Filed Jan. 19, 1988, Ser. No. 145,148

Int. Cl.[4] G02C *1/00*

U.S. Cl. 351—158 **1 Claim**



1. A spectacle apparatus for forming a novel illumination effect, comprising,

a spectacle framework means for securement and alignment with an individual's eyes wherein said framework means is formed in a continuous "U" shaped configuration defined by a forward portion and extending integral legs secured to said forward portion, and

a plurality of lenses securable to said spectacle framework at said forward portion wherein said lenses are spaced to accommodate a plurality of illuminating elements therebetween, and

a remote power supply means for selectively supplying power to said illuminating elements for sequentially illuminating said elements, and

wherein said forward portion is defined by an upper and lower frame portion spaced a distance from one another along the extend of said forward portion wherein said upper and lower frame portions merge with one another in each of said legs, and

wherein said lenses are continuous and are secured between said upper and lower frame portions and said lenses are each generally of a "U" shaped configuration defining an enclosed space therebetween, and

wherein said illuminating elements comprise a plurality of individual lights electrically communicating with one another and with said remote power supply means, and

wherein said remote power supply means includes a cover hingedly securable to a base portion wherein said cover and base portion are padded for comfort to the individual, and

wherein said remote power supply means further includes a battery source for supplying power to said illuminating elements and switching means for selectively supplying said power, and a sequencing means for sequencing the plurality of illuminating elements to sequentially illuminate the illuminating elements, and

wherein said remote power supply means includes a plurality of elongate flexible electrically conducting wires to conduct electrical energy from said remote power supply means to said individual lights, and said wires being of sufficient length to remotely position said remote power supply means to said spectacle framework.

4,822,162

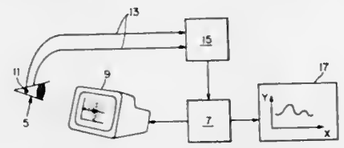
METHOD AND DEVICE FOR MEASURING RETINAL RESPONSE AS A FUNCTION OF POSITION OF THE RETINA

Robert W. Richardson, 305 E. 24th St., New York, N.Y. 10010, and Barbara M. Feldman, 43 Barnes St., Providence, R.I. 02906

Filed Aug. 27, 1987, Ser. No. 90,004

Int. Cl.[4] A61B *3/02*

U.S. Cl. 351—243 **36 Claims**



18. A device for measuring retinal response of an eye comprising:

means for presenting to the eye a series of patterns spatially varying in intensity, the variation being chosen from a family of orthogonal functions;

means for measuring, for each pattern, response of the eye, said means providing signals indicative of the responses of the eye; and

calculation means responsive to the signals in a manner which relates the signal indicated responses to the corresponding patterns, so as to provide a set of coefficients of a transform associated with the chosen orthogonal function, and subsequently compute an inverse transform of the transform associated with the chosen orthogonal function to provide a spatial retinal response of the eye as a function of position over the retina.

4,822,163

TRACKING VISION SENSOR

Richard Schmidt, Huntington, N.Y., assignor to Robotic Vision Systems, Inc., Hauppauge, N.Y.

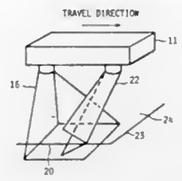
Filed Jun. 26, 1986, Ser. No. 879,203

Int. Cl.[4] G01C *3/00, 5/00, 3/08*

U.S. Cl. 356—1 **8 Claims**

1. A method for carrying out non-coplanar 3-D measurements of surface points, comprising the steps of: forming light from a light source into a plane of light; reshaping said plane of light into a non-planar beam; projecting from a projection

source said non-planar beam upon a surface to be measured and forming an intersection of said beam with said surface; imaging at an imaging site light reflected from said intersection from an angle different than said projected beam; and generating coor-



dinates of said surface intersection points illuminated by said projected beam based on a known angle of projection, known angle of imaging and distance between projection source and imaging site.

4,822,164

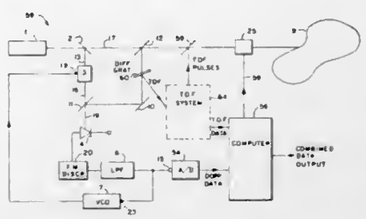
OPTICAL INSPECTION DEVICE AND METHOD

Michael T. Breen, Garden City, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1987, Ser. No. 103,088

Int. Cl.[4] G01P *3/36*

U.S. Cl. 356—28.5 **18 Claims**



1. A closed loop optical gauge comprising:

laser means for producing a first beam;

means for directing at least a portion of said first beam toward a target from which a beam is reflected;

means for providing a reference beam having the frequency of said first beam;

frequency shift means receiving said reference beam and receiving a modulation input signal, for providing a shifted reference beam whose frequency is shifted from that of the reference beam in accordance with the modulation input signal;

means for producing interference of said shifted reference beam and said reflected beam to produce a beat frequency signal;

negative feedback means for utilizing said beat frequency signal to control the frequency of said modulation input signal;

whereby the frequency of said shifted reference beam tracks the reference of said reflected beam and has a known relationship to the radial component of velocity of said target.

4,822,165

DEVICE FOR ILLUMINATING COMPONENTS OF TRANSPARENT MATERIAL IN TESTING FOR IRREGULARITIES

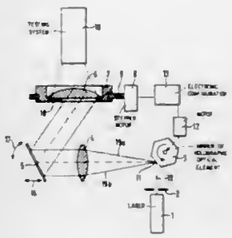
Harald Schmalfuss, Rodgau; Friedel Sinsel, Frankfurt am Main, and Reinhold Bolz, Floersheim, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 62,182

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620108

Int. Cl.[4] G01N *21/88*

U.S. Cl. 356—239 **9 Claims**



1. A device for illuminating components of transparent material by dot-scanning so that the the components may be tested for surface irregularities and occlusions, comprising:

means for rotatably mounting the component so that the component may be rotated on its axis at a predetermined speed;

means for generating a parallel light beam for illuminating the component;

means for periodically linearly deflecting the light beam at a frequency greater than said predetermined rotational speed of the component, said periodically linearly deflecting means being disposed in the path of the light beam between said parallel light beam generating means and the component;

a focusing lens for focusing the light beam in a testing plane, said focusing lens being disposed between said periodically linearly deflecting means and the component at a location so that the focal point of said focusing lens is at the surface of said periodically linearly deflecting means, said focusing lens having a diameter which is larger than the extreme positions of said light beam produced when deflected by said periodically linearly deflecting means; and

an adjustable tilting mirror disposed between said focusing lens and the component for deflecting the light beam onto the component, whereby the dot-scanning light beam can then be detected by a testing device.

4,822,166

FLOW-THROUGH CELLS FOR SPECTROSCOPY

Valentine J. Rossiter, 16 Rathmore Ave., Kilmacud, Stillorgan, Dublin, Ireland

Continuation of Ser. No. 807,219, Dec. 12, 1985, which is a continuation-in-part of Ser. No. 729,076, Apr. 30, 1985, abandoned, which is a continuation of Ser. No. 419,275, Sep. 17, 1982, abandoned. This application Dec. 16, 1987, Ser. No. 134,555

The portion of the term of this patent subsequent to Jan. 18, 2004, has been disclaimed.

Int. Cl.[4] G01N *21/05*

U.S. Cl. 356—246 **10 Claims**

1. A flow-through optical cell for infrared spectroscopy of gas of time-varying composition and eluting from a chromatograph, comprising:

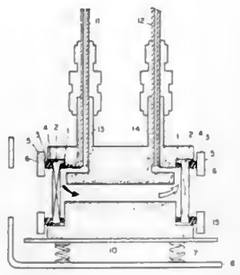
a body having an optical cavity between 0.4 mm to 6 mm in

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diameter and between 1 cm and 15 cm in length to be traversed by an analyzing beam;

a gas inlet being a raised port integral with said body and having a bore communicating with the optical cavity adjacent one end of the cavity;

a gas outlet being a raised port integral with said body and having a bore communicating with the optical cavity adjacent the opposite end of the cavity; and



an infrared radiation-transmitting window at or adjacent each end of the optical cavity, a gas-sealing gasket between the window and the body, and at least one gas-sealing gasket on the opposite side of the window;

an operating range of said cell being from between 20° C. and 270° C. and over a pressure range from between vacuum and 15 PSIG.

4,822,167

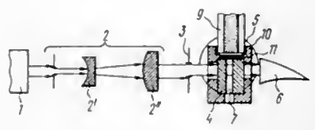
LASER FLUOROMETRIC DETECTOR FOR MICROCOLUMN CHROMATOGRAPHY

Alexandr F. Lobazov; Vasily A. Mostovnikov; Sergei V. Nechaev, all of Minsk, and Boris G. Belenky, Leningrad, all of U.S.S.R., assignors to Institute Fiziki AN BSSR, Minsk, U.S.S.R.

Filed Sep. 5, 1986, Ser. No. 903,650

Int. Cl.[4] G01J *3/30*

U.S. Cl. 356—317 **1 Claim**



1. A laser fluorometric detector for microcolumn chromatography, comprising:

a laser producing a laser beam having a round cross-section;

a unit for shaping laser emission, placed in the path of said laser beam, which comprises a cylindrical telescope, said cylindrical telescope transforming said laser beam having a round cross-section into a substantially flat beam defining a first plane;

a diaphragm defining a second plane for adjusting the detected sample volume, having the shape of a rectangular trapezium, located in the path of said flat laser beam so that the bases of said trapezium are parallel to said first plane into which said laser beam is flattened, said diaphragm being adapted to travel in said second plane and in a direction perpendicular to said first plane;

a flow-through cell being shaped as a rectangular parallelepiped, having a lateral face which is an inlet face for said laser beam, an outlet face located opposite said inlet face, and two butt faces;

a through-going channel in said cell, having a square cross-section, the longitudinal axis of said channel being parallel to the edges of said flow-through cell, the inlet of said channel being located on one butt face and the outlet on the other butt face of said cell, said flow-through cell being placed so that the inlet face thereof is perpendicular to said plane of the laser beam, the longitudinal axis of said channel intersecting said laser beam, when the latter passes through said flow-through cell, said butt face of the flow-through cell, where the inlet of the channel is located, being adapted for communication with said chromatographic column for feeding the sample liquid into said through channel;

a laser radiation trap located opposite said outlet face of said flow-through cell; and

a receiver of fluorescence emission, having an objective adapted to receive radiation from the lateral face of said cell, which is perpendicular to the said inlet and outlet faces.

4,822,168

SPECTROSCOPIC PHOTOMETER FOR FLOW THROUGH SAMPLE ABSORPTION

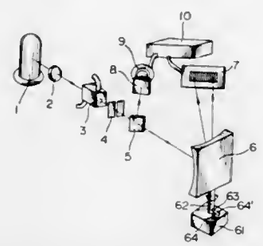
Taro Nogami; Tetsuyuki Miwa, both of Katsuta, and Kenitiro Takahasi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 897,789

Claims priority, application Japan, Aug. 30, 1985, 60-189621

Int. Cl.[4] G01J *3/42, 3/427*

U.S. Cl. 356—319 **14 Claims**



1. An analyzing apparatus provided with a spectroscope photometer comprising:

a deuterium lamp for providing light;

a flow cell, through which a sample flows and light from said deuterium lamp passes;

means for spectroscopically dispersing light passing through said flow cell;

detector means for sample measurement being disposed for receiving light dispersed by said dispersing means;

detector means for monitoring being disposed for receiving light passed through said flow cell within a predetermined wavelength region of a plurality of wavelengths longer than a wavelength region essentially absorbed by said sample so as to obtain a total light energy sufficient to reduce effects of noise in a monitoring signal; and

operation means comparing the output signal of said detector means for sample measurement with that of said detector for monitoring.

4,822,169

MEASURING ASSEMBLY FOR ANALYZING ELECTROMAGNETIC RADIATION

Richard Distl, Edlingerstrasse 7, D-8000 München 90, and Ulrich Schmidt, Kasinostrasse 54, D-5100 Aachen, both of Fed. Rep. of Germany

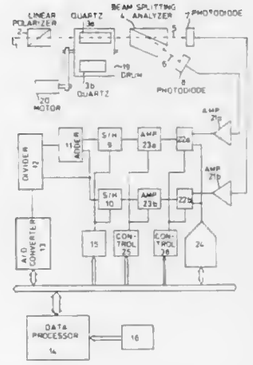
PCT No. PCT/EP85/00498, § 371 Date Jul. 22, 1986, § 102(e) Date Jul. 22, 1986, PCT Pub. No. WO86/02159, PCT Pub. Date Apr. 10, 1986

PCT Filed Sep. 25, 1985, Ser. No. 878,877

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435189; Jan. 7, 1985, 3500307

Int. Cl.[4] G01J *4/04;* **G01N** *22/21*

U.S. Cl. 356—364 **13 Claims**



1. A measuring assembly for analyzing a beam of electromagnetic radiation across a measuring range to determine the wavelength center of gravity thereof, comprising:

(a) a linear polarizer interposed in the path of said beam, said polarizer having a first predetermined polarization direction;

(b) at least two optically active elements interposed in the path of said beam, each of said elements having a different and known optical activity; one of said optically active elements having a rotary value, with respect to the polarized radiation, not exceeding 90 degrees across the measuring range; another of said optically active elements having a rotary value, with respect to the polarized radiation, exceeding 90 degrees across the measuring range;

(c) an optical analyzer having a second predetermined polarization direction with respect to said first predetermined polarization direction, said analyzer being interposed in the path of said beam after said beam has passed through said linear polarizer and at least one of said optically active elements, said analyzer having an exit side for passing said beam;

(d) a first photosensitive sensor interposed in the path of said beam after said beam has passed through said analyzer;

(e) means for obtaining a reference beam, said means located before the exit side of said analyzer;

(f) a second photosensitive sensor positioned to receive said reference beam; and

(g) a measuring circuit comprising:

(i) a divider circuit having inputs respectively connected to said first and second photosensitive sensors;

(ii) an analog-to-digital converter connected to said divider circuit; and

(iii) a digital data processor connected to said analog converter, said data processor having a memory means for prestoring optical rotation dispersion data relating to said optically active elements, and means for calculating the wavelength center of gravity of said beam of electromagnetic radiation.

4,822,170

SENSOR FOR THE CONTACTLESS LINEAR MEASUREMENT OF THE DISTANCE OF A TARGET BY BACKSCATTERED RADIATION

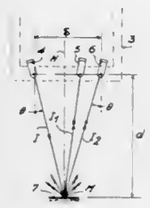
Jean-Louis Bonnefoy, and Jean-Paul Prulhiere, both of Bordeaux, France, assignors to Commissariat A l'Energie Atomique, Paris, France

Filed Apr. 24, 1987, Ser. No. 42,237

Claims priority, application France, Apr. 30, 1986, 8606265

Int. Cl.[4] G01B *11/14*

U.S. Cl. 356—375 **4 Claims**



1. A sensor for the contactless linear measurement by backscattered radiation of the distance (d) between a sensor and a target comprising a light emitter applying a light beam to the target at a non-zero incidence angle relative to a normal to the target, first and second light receivers spaced from the light emitter, each light receiver operable to receive light reflected from the light beam striking the target with an intensity curve $I=F(d)$ having a first substantially linear part, a second substantially quadratic part in the vicinity of a maximum intensity corresponding to a privileged reflection direction forming a reflection angle relative to said normal with said reflection angle being equal to said incidence angle, and a third substantially decreasing parabolic part, and wherein the second substantially quadratic parts of the intensity curves are outside one another such that a random distance can always be read on at least one of the first and third parts of the intensity curves, and further comprising a circuit connected to receive first and second signals respectively from said first and second receivers, each of said first and second signals being proportional to the intensity of light received by the corresponding one of said first and second receivers, said circuit supplying an output signal proportional to the value of the distance, said output signal derived only from the first and third parts of the intensity curves.

4,822,171

METHOD AND APPARATUS FOR MEASURING THE WALL THICKNESS OF TRANSPARENT OBJECTS

Bernhard Brand, Niederwerrn, and Bruno Richter, Stegaurach, both of Fed. Rep. of Germany, assignors to Dipl.-Ing.Bruno Richter GmbH & Co., Fed. Rep. of Germany

Filed Jan. 30, 1986, Ser. No. 824,158

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3503086

Int. Cl.[4] G01B *11/06*

U.S. Cl. 356—382 **17 Claims**

1. A method of measuring the wall thickness of a transparent object comprising the steps of:

projecting a narrow beam of light from a light source onto an outer surface of a transparent object at an angle other than 90°, said transparent objecting having a first boundary surface adjacent said outer surface and having a second boundary surface which is spaced from the first boundary surface by the distance to be measured;

focusing the beams reflected by said first and second boundary surfaces of the object onto the image plane of receiver means;

providing a movable deflecting element in the optical path

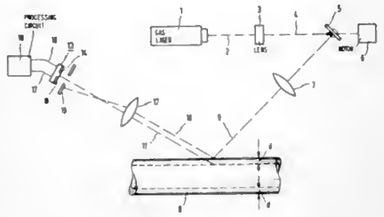
VOL 1101 ISS 3 APR 18 1989 UMI

between the light source and the image plane of said receiver means;

moving the lines of intersection between the beam of light and the first and second surfaces of the object to be measured by said deflecting element in the direction in which the first and second surfaces are spaced apart wherein the lines of intersection are represented by beams of light on the image plane of said receiver means;

generating signals from said receiver means in response to the appearance of a pair of light beams at a predetermined location on the image plane of said receiver means;

measuring the interval of time between said signals to determine the wall thickness whereby two measuring surfaces are provided in the image plane of said receiver means, said measuring surfaces adjoining along a boundary line, said boundary line being at right angles to the direction of movement of the two beams of light;



separately measuring the light fluxes which are incident on the respective measuring surfaces, wherein during the movement of the two beams of light over the image plane of said receiver means, the first beam of light delivers equal light fluxes to both measuring surfaces at a first time and the second beam of light delivers equal light fluxes to both measuring surfaces at a second time;

determining the wall thickness of the transparent object from the interval of time between output signals generated by said receiver means and indicated by the first and second times; and

wherein said two reflected beams of light have curved cross-sections and including the further step of;

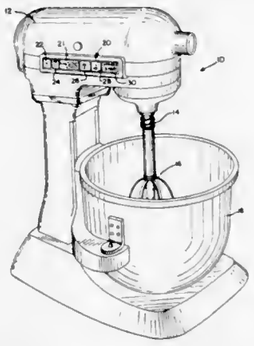
providing a boundary line between the measuring surfaces wherein said boundary line has the same curvature as the images of the beams of light on the image plane of the receiver means.

4,822,172
ELECTRIC FOOD MIXER
Richard L. Stottmann, Louisville, Ky., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 23, 1987, Ser. No. 137,422
Int. Cl.[4] B01F *7/16*
U.S. Cl. 366—142 **39 Claims**

1. An electric food mixer having a motor operable at a plurality of mixing speeds comprising:

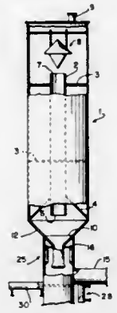
means actuable by a user for starting said motor; and

means responsive to the actuation of said starting means for automatically controlling said motor to start at a start-up speed less than the slowest of said mixing speeds and to



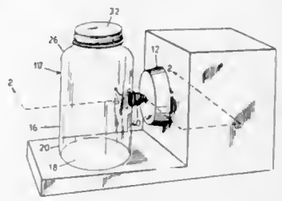
run at said start-up speed for a predetermined period of time.

4,822,173
WITHDRAWAL SYSTEM FOR VESSEL
Kermit D. Paul, Bethlehem, Pa., assignor to Fuller Company, Bethlehem, Pa.
Filed Jul. 13, 1987, Ser. No. 72,836
Int. Cl.[4] B01F *13/02, 15/02*
U.S. Cl. 366—101 **6 Claims**



1. In a vessel for particulate material having a material outlet in the bottom thereof for discharging material from the vessel and means for supplying gaseous fluid under pressure to the vessel through the material outlet, an improved material withdrawal apparatus comprising a conduit mounted on the bottom of the vessel at the material outlet; means defining a gaseous fluid inlet nozzle mounted in said conduit and operatively associated with the material outlet; and means for adjusting the position of the inlet nozzle for controlling the effective size of the material outlet by moving the inlet nozzle between a first position to increase the effective size of the material outlet during material withdrawal and a second position to reduce the effective size of the material outlet when gaseous fluid under pressure is supplied to the vessel.

4,822,174
BLENDING VESSEL FOR MICROBIOLOGICAL ANALYSES
Robert H. Deibel, 845 E. Johnson St., Madison, Wis. 53703
Continuation-in-part of Ser. No. 937,407, Dec. 3, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 169,006
Int. Cl.[4] B01F *7/06*
U.S. Cl. 366—279 **10 Claims**



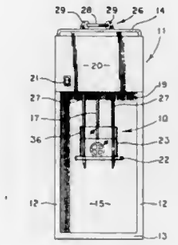
1. A culture blending vessel for use with a blender motor having a substantially horizontal drive shaft, and adapted for preparing and containing samples, and also the culturing of same, for microbiological analysis comprising:

a vessel body formed of an autoclavable material having an essentially flat bottom wall, a substantially cylindrical, vertical side wall formed integrally with said bottom wall and extending upwardly therefrom, a mouth opening at the top of said side wall through which material can be deposited in and removed from said body, and a rotor port formed in said side wall a selected distance above said bottom wall;

a lid closing said mouth opening in selectively removable, fluid-tight relation; and

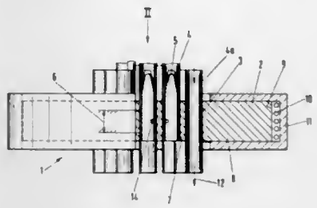
a rotor assembly mounted in said rotor port and having a substantially horizontal rotor shaft mounted for rotation and extending from the outside to the inside of said vessel body, blending blades attached to the inside end of said rotor shaft for rotation therewith, a coupling on the outside end of said rotor shaft which is adapted to removably and drivingly engage the drive shaft of a blending motor, and means for effecting a fluid tight seal about said rotor shaft for making said vessel fluid-tight at said rotor port.

4,822,175
SPLASH GUARD FOR A FOOD MIXER
John K. Barnard, Bay Village; Richard D. Boozer, Columbia Station, and Sreenivasan Sankar, Middleburg Heights, all of Ohio, assignors to Vita-Mix Corporation, Cleveland, Ohio
Filed Sep. 12, 1988, Ser. No. 243,262
Int. Cl.[4] B01F *15/00*
U.S. Cl. 366—347 **8 Claims**



1. A splash guard for a food mixer, the food mixer having a housing with an agitator extending downwardly therefrom, the splash guard comprising a base plate having an opening therein through which the lower end of the agitator may pass, a ring member positioned above said base plate and surounding the agitator, and means carrying said base plate and said ring member, said means being slidably attached to the housing so that said base plate and said ring member may be vertically moved with respect to the housing.

4,822,176
METHOD AND APPARATUS FOR SIMULATION OF THE OPERATIONAL DEMANDS ACTING ON EXPANDED TUBE JOINTS
Dieter Daum, Heppenheim, Fed. Rep. of Germany, assignor to Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany
Filed May 12, 1988, Ser. No. 192,954
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717032
Int. Cl.[4] G01N *3/06*
U.S. Cl. 374—57 **8 Claims**



1. Method for simulating operational demands on a connection between components, which comprises penetrating a central inner region of a circular disc of a test body with a plurality of hollow cylinders, connecting sleeves or hollow plugs to the hollow cylinders in the vicinity of the disc, and creating a stress condition in the inner region corresponding to the operational demands by applying a force in an outer region of the disc through a uniform introduction of heat in the outer region while cooling the inner region.

5. Apparatus for simulating operational demands on a connection between components, comprising a test body including a circular disc having a central inner region and an outer region, a plurality of inner hollow cylinders penetrating said central inner region, sleeves or hollow plugs connected to said inner hollow cylinders in the vicinity of said disc, outer hollow cylinders serving as cooling passages and forming a boundary between said inner region and said outer region, thermal insulation associated with said outer region, and an electric resistance heater associated with said outer region for applying a force in said outer region and creating a stress condition in said inner region corresponding to the operational demands.

4,822,177
CARRYING BAG, PARTICULARLY BATHING BAG
Arnold Arend, Mainzerlandstrasse 782, 6000 Frankfurt 80, Fed. Rep. of Germany
Filed Aug. 3, 1988, Ser. No. 227,750
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 8711072; Jan. 4, 1988, 8800021
Int. Cl.[4] B65D *30/00*
U.S. Cl. 383—4 **26 Claims**

1. A carrying bag comprising a substantially rectangular flexible sheet article folded about a folding line that notionally divides the sheet article into two portions each having an inner side and plural outer edges, such that said two portions are arranged in overlapping relation with their inner sides facing each other and are secured to each other along at least two of said outer edges,

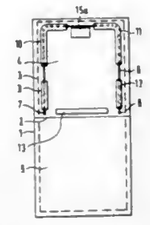
wherein the improvement comprises

(a) releasable closure means mounted on the inner sides of

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said two portions along outer edges thereof for securing said portions to each other as aforesaid;

(b) plural guiding elements, mounted on one of said portions,



for movably holding a cord extending substantially along the outer edges thereof; and

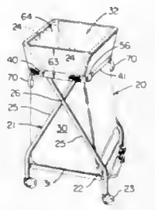
(c) a cord movably held by said guiding elements and having opposed ends secured adjacent said folding line.

4,822,178

BAG WITH DUAL PURPOSE HOOK AND LOOP FASTENER STRIPS AND METHOD OF MAKING SAME

Jeffrey L. Taylor, Cincinnati, Ohio, assignor to Standard Textile Company, Inc., Cincinnati, Ohio

Filed Jul. 24, 1984, Ser. No. 633,907
Int. Cl.[4] B65D *33/24*
U.S. Cl. 383—33 **15 Claims**



1. In a bag for containing articles and comprising a body portion having an access of a particular peripheral outline and a device for closing and opening said access, said device comprising a hook, and loop fastener for closing the entire extent of said peripheral outline, said fastener being adapted to be closed solely by urging a pair of cooperating portions thereof in pressure contact and being adapted to be opened by pulling said cooperating portions out of said contact, said cooperating portions of said fastener comprising a pair of cooperating substantially rectangular strips of substantially equal length each fastened to said body portion and extending along onehalf of said outline, one of said strips comprising a fastening mat having loop means and the other of said strips comprising a plurality of hook members which are adapted to engage and hook said loop means, the improvement comprising at least one tab attached to said body portion roughly midway along its length, said tab having cooperating hook members or loop means adapted to engage at least a portion of said loop means or hook members respectively of an associated strip so that with an outer end part of said body portion folded over a part of said body portion adjacent said outer end part said hook members or loop means of said tab are adapted to engage said portion of said loop means or hook members respectively of said associated strip and hold said outer end part of said body portion thus folded, said loop means or hook members of said associated strip thus being usable for the dual purpose of holding said access closed when cooperating with its cooperating strip and holding said outer end part in its folded over position when cooperating with hook members or loop means respectively of said tab.

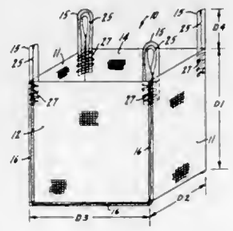
8. In a hamper bag for containing soiled clothing articles and comprising a body portion which has a closed end and an access for said articles, said access having a particular peripheral outline and having a device for closing and opening same; said bag being adapted to be supported on a hamper stand which has a shelf for supporting said closed end thereon and also has means for holding said access open; said device comprising a hook and loop fastener for closing the entire extent of said peripheral outline, said fastener being adapted to be closed solely by urging a pair of cooperating portions thereof in pressure contact and being adapted to be opened by pulling said cooperating portions out of said contact, said cooperating portions of said fastener comprising a pair of cooperating substantially rectangular strips of substantially equal length each fastened to said body portion and extending along one-half of said outline, one of said strips comprising a fastening mat having loop means and the other of said strips comprising a plurality of hook members which are adapted to engage and hook said loop means, the improvement comprising at least one tab attached to said body portion roughly midway along its length, said tab having cooperating hook members or loop means adapted to engage at least a portion of said loop means or hook members respectively of an associated strip so that with an outer end part of said body portion folded over a part of said body portion adjacent said outer end part said hook members or loop means of said tab are adapted to engage said portion of said loop means or hook members respectively of said associated strip and hold said outer end part of said body portion thus folded, said loop means or hook members of said associated strip thus being usable for the dual purpose of holding said access closed when cooperating with its cooperating strip and holding said outer end part in its folded over position when cooperating with hook members or loop means respectively of said tab.

4,822,179

SEMI-BULK TRANSPORT BAGS WITH LIFTING MEMBERS OF BAG MATERIAL

Peter J. Nattrass, Barrington Hills, Ill., assignor to Bulk Lift International Incorporated, Carpentersville, Ill.

Continuation-in-part of Ser. No. 631,455, Jul. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 542,587, Oct. 17, 1983, abandoned. This application Jan. 22, 1987, Ser. No. 6,625
Int. Cl.[4] B65D *33/02, 33/10, 33/14, 88/22*
U.S. Cl. 383—17 **6 Claims**



1. A semi-bulk transport bag having a volumetric capacity of the order of at least twenty cubic feet and a weight capacity of the order of at least about two thousand pounds, comprising a bottom panel and four side panels with the side panels joined at their edges to the bottom panel and to each other, the bag having four lifting members each anchored to the top of a respective corner of the bag and engageable by the fork of a fork-lift truck, each of the side panels and the bottom panel being formed of a uniform plainwoven panel fabric of high tensile strength, in which:

each lifting member comprises a stiff elongated strip of at least three superimposed layers of the same type of woven fabric as the panel fabric, stitched longitudinally to form a stiff lifting member having a width W of at least about three inches;

and each lifting member has two end portions, each end portion having a height H of at least about six inches;

each lifting member end portion being secured to a top portion of a different side panel of the bag by anchor stitching extending throughout the surface area of the lifting member end portion to distribute the transfer of lifting stress from the lifting member to an area of the side panel of approximately W×H;

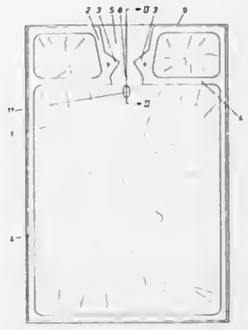
and the edges of the end portions of each lifting member being overlapped at the bag corner by an overlap width much smaller than W.

4,822,180

FOIL BAG

Lars Gjelstrup, Kolding, and Flemming Hansen, Bjert, both of Denmark, assignors to Lindknud Plast A/S, Denmark

PCT No. PCT/DK87/00044, § 371 Date Dec. 16, 1987, § 102(e) Date Dec. 16, 1987, PCT Pub. No. WO87/06558, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 15, 1987, Ser. No. 138,093
Claims priority, application Denmark, Apr. 22, 1986, 1857/86
Int. Cl.[4] B65D *30/24*
U.S. Cl. 383—57 **2 Claims**



1. A foil bag for storing liquid and pasty substances, the bag formed from two welded-together layers of foil having a channel defined by first welding seams, the channel extending from a rim of the bag to an interior thereof, the bag including a valve having two valve flaps disposed in the channel, the valve flaps being formed by folding the foil layers towards the interior of the bag and being closed by the first welding seams defining the channel for forming pockets which are open towards the interior of the bag, the foil bag characterized in that the pockets extend substantially the entire length of the channel, with the channel in cross-section having a shape of an hour glass produced by a narrowing in an area around a center of the channel.

4,822,181

HYDROSTATIC SUPPORT DEVICE AND METHOD

Werner H. Egli, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

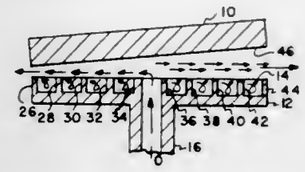
Filed Apr. 2, 1984, Ser. No. 595,804
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—12 **7 Claims**

1. A device for hydrostatically supporting an object with a fluid, comprising:

a support member having a support surface;

means for directing the flow of said fluid to and across the surface of said object, and to and across said support surface; and

wherein at least a part of either said supporting surface or of said object surface is in contact with said fluid and includes a plurality of ridges, each of said ridges comprising



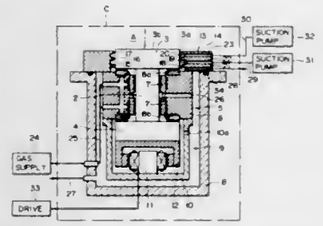
a raised portion which extends beyond adjacent portions of said support surface or said object surface, and wherein said ridges are positioned so that said fluid will cross a plurality of said ridges in any direction that said fluid flows.

4,822,182

ROTARY MOTION DRIVING APPARATUS

Koichi Matsushita, Chiba, and Hiroyuki Suzuki, Ushiku, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 143,111, Jan. 12, 1988, abandoned. This application Jul. 20, 1988, Ser. No. 222,333
Claims priority, application Japan, Jan. 14, 1987, 62-004996
Int. Cl.[4] F16C *33/72*
U.S. Cl. 384—107 **2 Claims**



1. A rotary motion driving apparatus, comprising:

a rotatable shaft having a shaft portion extending in an axial direction and two flange-like portions formed on opposite ends of said shaft portion;

a gas bearing assembly actable on said shaft portion and said flange-like portions so as to support said rotatable shaft with respect to said axial direction and a rotational direction about said axial direction;

a driving motor operable to rotate said rotatable shaft, said driving motor having a rotor, a stator and a cover, wherein said rotor is fixed, as a unit, to said rotatable shaft via one of said flange-like portions of said rotable shaft and wherein said stator is maintained out of contact with said rotor and is fixed, as a unit, to said gas bearing assembly via said cover;

a casing for accommodating at least said gas bearing assembly and said driving motor; and

sealing means cooperable with said casing so as to place at least said gas bearing assembly and said driving motor in a substantially closed space, said sealing means having a plurality of partitions each being formed so as to surround the other of said flange-like portions of said rotatable shaft with a minute clearance maintained therebetween.

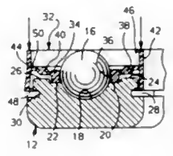
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4,822,183

THRUST BALL BEARING WITH IMPROVED SEALING

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 6, 1988, Ser. No. 240,183
Int. Cl.[4] F16C *33/38, 33/78*
U.S. Cl. 384—607 **3 Claims**



1. In a bearing of the type in which an array of pockets in a separator is fitted over a complement of bearing elements prior to a pair of generally annular races being moved coaxially together to an assembled position to capture said bearing elements, thereby spacing apart a pair of axialy opposed seal lands on said races by a predetermined distance, the improvement comprising,

at least one generally annular seal adjacent said pocket array, said seal having an axial thickness substantially equal to said predetermined distance and being frangibly joined to said separator at a location axialy offset from the assembled position of said seal lands,

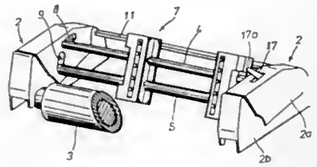
whereby, after said bearing elements have been placed in one race and said separator has been fitted to said bearing elements, a force may be applied to push said seals toward said one race, thereby breaking said seals away from said separator, after which the other race may be assembled to capture said seals between said lands to seal said bearing elements independently of said separator.

4,822,184

PAPER FEEDER FOR A PRINTER

Norio Kawashima, 17-17 Hirado 2chome, Totsuka-ku, and Hidemi Haga, Mori-so, 19-9 Nakahama-cho, Isogo-ku, both of Yokohama-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 915,155, Oct. 2, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 171,133
Claims priority, application Japan, Oct. 3, 1985, 60-220966
Int. Cl.[4] B41J *11/30, 11/32*
U.S. Cl. 400—616.1 **6 Claims**



1. A paper feeder for a printer comprising:

a frame;

a platen mounted on said frame and having a peripheral paper guiding surface for guiding a moving continuous sheet of paper which is wrapped around at least a portion of said paper feeding surface whereby said sheet forms first and second runs of paper which respectively move toward and away from said platen;

a tractor feeder supported on said frame between first and second runs of a moving sheet of paper, said tractor feeder having first and second surface and first and second paper feeders respectively located on said first and second surfaces, said tractor feeder being adjustably supported for selective positioning into first and second paper feeding positions; and

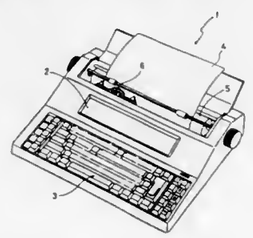
means for selectively placing said tractor feeder into said first position wherein said first surface is tangential to said paper guiding surface, whereby said first paper feeder feeds paper toward said platen and into said second position wherein said second surface is tangential to said paper guiding surface whereby said second paper feeder feeds paper away from said platen.

4,822,185

DRIVING METHOD OF A PRINTING APPARATUS EMPLOYING A NON-STABILIZED POWER SOURCE

Tatsuji Imai, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 19, 1987, Ser. No. 51,401
Claims priority, application Japan, May 20, 1986, 61-115887
Int. Cl.[4] B41J *29/38*
U.S. Cl. 400—54 **6 Claims**



1. A driving method of a printing apparatus employing a non-stabilized power source comprising:

connecting plural electric actuators of a printing apparatus, the said non-stabilized power source,

providing drive means for driving said plural electric actuators respectively, and control means for controlling said driving means,

whenever driving a carriage driving motor during a non-printing operation without actuation of the printing hammer drive solenoid, continuously driving through said control means and driving means a type-wheel drive motor in a mode not generating its rotation in order to stabilize the current and voltage supplied to said carriage drive motor during said non-printing operation.

4,822,186

CARRIAGE MECHANISM FOR THERMAL PRINTER

Seiji Hanaoka; Masahiro Misawa, both of Suwa; Masataka Okamura, Kounosu; Masao Masumura, Kumagaya; Tooru Iwasa; Noboru Watanabe, Kumagaya; Shoichi Mitsugi, Kumagaya, and Norimichi Miyazawa, Nagano, all of Japan, assignors to Seiko Epson Corporation, Tokyo and Jeco Company Limited, Gyoda, both of, Japan

Continuation of Ser. No. 914,807, Oct. 3, 1986, abandoned. This application May 26, 1988, Ser. No. 203,545
Claims priority, application Japan, Oct. 21, 1985, 60-234981
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 **3 Claims**

1. A carriage mechanism for a thermal printer which comprises a platen and a guide member, said carriage mechanism comprising:

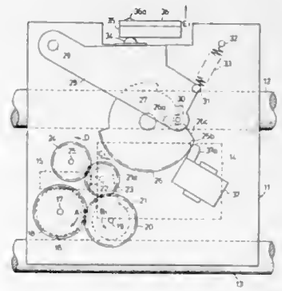
ink ribbon take-up means for taking up an ink ribbon which is coated with ink;

a movable carriage guided by said guide member, for carrying a thermal head and said ink ribbon take-up means;

head moving means mounted on said carriage for holding the thermal head at a printing postion so as to push the thermal head against a recording paper on the platen through the ink ribbon while a printing operation is carried out, and for holding the thermal head stationary at a non-printing position while the printing operation is not being carried out, the thermal head in the non-printing position being spaced from the platen, said head moving means

comprising spring means for constantly urging said thermal head toward the printing position; and

driving means mounted on said carriage, said driving means comprising a single motor rotatable in both of forward and reverse directions and rotation transmitting means for selectively transmitting a rotation of said motor to one of said ink ribbon take-up means and said head moving means depending on a rotational direction of said motor, said motor constituting a driving source for driving said ink ribbon take-up means to take up a used part of the ink ribbon while the thermal head is in the printing position,



said used part of the ink ribbon having been used for the printing operation during a displacement of said carriage, and said motor further constituting a driving source for driving said head moving means to move the thermal head between said printing position and said non-printing position,

said rotation transmitting means comprising a rotary member supported on a pivot shaft, a first gear which is rotatably supported coaxially to the pivot shaft on

said rotary member and is rotated by said motor, and a second gear which is rotatably supported on a free end of said rotary member and is in mesh with said first gear, said rotary member pivoting to a first position so that said second gear drives said head moving means to move said thermal head toward the non-printing position against a force of said spring means when said motor rotates in one of the forward and reverse directions and pivoting to a second position so that said second gear drives said ink ribbon take-up means when said motor rotates in the other of the forward and reverse directions.

4,822,187

PREVENTING ARMATURE REBOUNDING IN MATRIX PRINT HEADS

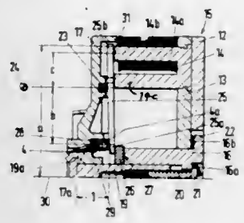
Bernd Gugel, Ulm-Eissingen, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 932,174
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540761
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **1 Claim**

1. In a matrix print head having a plurality of print needles, a plurality of circularly electromagnetic drives respectively associated with the needles of the plurality and each including an armature pivotally operated by the respective energizing portion of the drive and having a radial inner end operatively connected to the rear end of the needle, a tip of each needle being provided for printing a dot there being a plurality of such armatures arranged accordingly and in a star pattern around a center, there being in addition a central sleeve being concentric in relation to and part of the mounting structures of the electromagnetic energizing portion of the circularly arranged drives, the improvement comprising:

said sleeve is made of Al or Al alloy;

an annular element provided as a stop for the radial inner



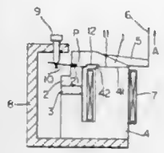
ends of the armatures and against which the armatures are moved for abutment upon retraction of the print needles said annular element being made of fluoro-rubber material to absorb any vibrations the armature may tend to undergo and having a hardness between 60 shore A and 90 shore A, and being adhesively bonded to said sleeve by means of an adhesive bonding agent that can withstand at least 100 degrees C, said adhesive is a two component adhesive having an epoxy resin as binder and a modified amide as curing agent.

4,822,188

PRINTING MECHANISM

Tetsuji Shimojo; Mineo Harada, both of Owariasahi; Hideyo Tanaka, Seto, and Kaname Furuya, Kasugai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 700,129, Feb. 11, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,873
Claims priority, application Japan, Feb. 22, 1984, 59-30218
Int. Cl.[4] B41J *3/04*
U.S. Cl. 400—124 **18 Claims**



1. A wire matrix printing mechanism, comprising:

a magnetic member having a cantilevered unitary body with a distal end supporting a stylus and an opposite end having resilient means for storing potential energy, a first member exterior surface coextensive with said distal end, a second member exterior surface, and a third member exterior surface coplanar with said first member surface, said third member surface providing a predetermined fulcrum, and said second member surface forming a recess into the unitary body distinct from said first and third member surfaces, said second member surface extending across the width of said magnetic member and separating said first member surface from said third member surface, said magnetic member being rotatable about said fulcrum;

first magnetic means including a yoke providing an exposed surface engaging said third member surface, for generat-

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ing a force for rotating said magnetic member to store potential energy in said resilient means;

second magnetic means including a core having a first magnetic surface coplanar with said exposed surface and directly facing said first member surface, and a coil around an arm of the core providing said first magnetic surface, for rotating said magnetic member by cancelling the force generated by said first magnetic means and releasing stored energy in said resilient means, said core further having a corner at an end portion of said first magnetic surface most proximate said fulcrum;

said magnetic member having a cross-sectional area taken transversely to the plane of said first member surface at a junction between said first and said second member surfaces that is greater in area than the area of said first member surface; and

said first member surface engaging the first magnetic surface of the core when said magnetic member is in a first operational state wherein the potential energy is stored in said resilient means, and said second member surface facing and directly overlying but not touching the coil, the corner and a corner area of the first magnetic surface of the core adjoining the corner such that during a return rotation of the magnetic member about said fulcrum to said first operational state from a printing operation, engagement between said corner, said corner area and said magnetic member is prevented.

4,822,189

DRIVE ARRANGEMENT FOR A RIBBON CASSETTE

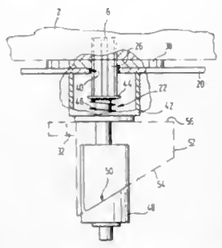
Wilfried Dobring, and Peter Güll, both of Berlin, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,367

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1986, 3638344

Int. Cl.[4] B41J *32/00*

U.S. Cl. 400—208 **9 Claims**



1. A drive arrangement for use in a printer or typewriter, said arrangement comprising:

a ribbon cassette,

a transport roll arranged inside of said cassette for rotation relative thereto about a transport roll axis,

a device having a cassette receiving compartment, cooperating guide means on said cassette and on said device for guiding said cassette as it is moved into and out of said receiving compartment with said cassette during such movement being constrained by said guide means to movement in a direction perpendicular to said transport roll axis,

a drive shaft carried by said device for rotation relative thereto about a drive shaft axis and having a coupling end,

said cassette having a forward end which is the first part of said cassette which moves into said receiving compartment as the whole of said cassette is moved into said receiving compartment,

said transport roll being mechanically drivingly coupleable in a form locking manner with said coupling end of said drive shaft which is arranged to be coaxial with said transport roll when said cassette is fully inserted in said receiving compartment,

said drive shaft being axially shiftable between a coupling position and a decoupled position at which said coupling end of said drive shaft is backwardly spaced relative to the coupling position against the force of a spring means,

said cassette having upper and lower face surfaces and having a cam surface formed said forward end thereof slopping toward one of said upper and lower surfaces which cam surface as a result of the insertion of said cassette into said receiving compartment runs against said drive shaft and shifts it into its decoupled position, and

additional actuating means associated with said drive shaft for moving said drive shaft to its decoupled position.

4,822,190

COMBINATION OF A PRINTER AND CONTINUOUS FEEDER

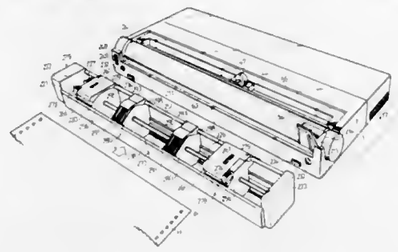
Takeshi Yokoi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 799,753, Nov. 19, 1985, abandoned. This application Oct. 21, 1987, Ser. No. 112,196

Claims priority, application Japan, Nov. 20, 1984, 59-175818; Feb. 5, 1985, 60-014887; May 2, 1985, 60-066064

Int. Cl.[4] B41J *15/04*

U.S. Cl. 400—613.3 **15 Claims**



1. In printer having:

a printer frame;

a platen having a circular cross-section and rotatably supported in said printer frame;

a paper guide member disposed under said platen provided in said printer frame in the vicinity of said platen and having a concave arc surface facing said platen at a predetermined distance and a rear end facing away from and extending rearwardly of said platen;

a paper feeder having a driving member for transferring continuous printing paper to said platen, said paper having first and second opposite surfaces, said driving member comprising first and second sprocket wheels engaging a plurality of perforations formed along opposite side edges of said continuous printing paper, the improvement wherein

said paper feeder has a pair of first feed guide blocks each including a first guide surface adapted to face said first surface of said paper and extending position adjacent to said separate ones of surface of said paper guide member, said first guide surfaces extending slantingly toward the end of the concave arc surface under the platen form a position adjacent the upper portion of the first sprocket wheel, said first feed guide blocks each having a second guide surface formed substantially along part of the outer circumference of the respective sprocket wheel, said second guide surfaces extending toward said concave arc surface;

said paper feeder further comprises a second guide block intermediate said first feed guide blocks and slidable with respect thereto and having a third guide surface which faces said second surface of said paper, one end portion of said second guide block extending substantially parallel to said concave arc surface of said paper guide member, whereby the front end of said continuous printing paper transferred from said feeder towards said platen by means of said driving member is introduced into an area between said platen and said paper guide member, said second guide block being arranged to prevent the front end of said continuous printing paper from flotation, said third guide surface having a concave arc surface and a slant surface corresponding to said first and second guide surfaces.

4,822,191

GUIDE BLOCK FOR A PRINTER FOR GUIDING CONTINUOUS PAPER

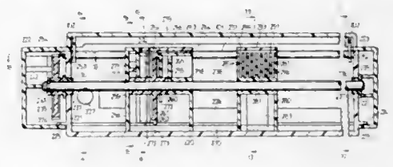
Takeshi Yokoi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 799,753, Nov. 19, 1985, abandoned. This application Oct. 21, 1987, Ser. No. 112,194

Claims priority, application Japan, Nov. 20, 1984, 59-175818; Feb. 5, 1985, 60-14887; May 2, 1985, 60-66064

Int. Cl.[4] B41J *11/32*

U.S. Cl. 400—616.1 **8 Claims**



1. In a feeder for feeding continuous printing paper, having a plurality of perforations formed along both side edges thereof, to a printer,

said feeder comprising:

a frame;

a rotating shaft mounted in said frame;

a pair of guide blocks provided in said frame, said guide blocks being slidable in the axial direction of said rotating shaft; and

a respective sprocket wheel mounted in each said guide block with part of each said sprocket wheel exposed to the upper sides of the respective said guide block, said sprocket wheels being unitedly rotatably with said rotating shaft and slidable in the axial direction thereof, the improvement wherein:

each of said guide blocks is in the form of a box having an opened bottom toward the bottom surface of said frame and being provided with an upper wall plate having a partially curved upper surface extending generally along part of the outer circumference of the respective said sprocket wheel, each guide block having first and second side wall plates with holes through which said rotating shaft extends, said first and second side wall plates being on opposite sides of the respective guide block along the axial direction of said rotating shaft;

each of said guide blocks is provided with a slit formed in said upper wall plate and connected with a space between said first and second side wall plates in each said guide block,

said pace between said first and second side wall plates being downwardly open through said opened bottoms and having a dimension larger than a diameter of said sprocket wheel,

each said sprocket wheel being positioned in said space between said side wall plates with a part of the circumference of said sprocket wheel being exposed through said slit, each of said guide blocks being provided with a reinforcement plate between said side wall plates, said reinforcement plate having a downwardly open channel axially aligned with said holes of said first and second side wall plates;

each of said sprocket wheels having a boss sleeve portion fitted to said rotating shaft and extending in the axial direction thereof, said boss sleeve portion received by an supported in said channel, the opposite ends of said boss sleeve portion respectively facing the inner sides of said first and second side wall plates of said guide block.

4,822,192

DOCUMENT FEED DEVICE WITH PIN TRACTOR ASSEMBLY

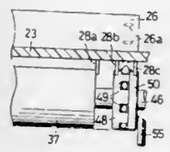
Toshiki Morita, Toyoake, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 814,126, Dec. 27, 1985, Pat. No. 4,729,682. This application Oct. 29, 1987, Ser. No. 113,984

Claims priority, application Japan, Dec. 28, 1984, 59-199595; Dec. 29, 1984, 59-199955; Dec. 29, 1984, 59-199956

Int. Cl.[4] B41J *11/78*

U.S. Cl. 400—616.3 **7 Claims**



1. A document feed device for a printing apparatus having a platen, said document feed device feeding a sheet of material with longitudinally spaced perforations, comprising:

a frame member having a top opening;

cover means mounted on the frame member so as to be upwardly removable from a closed position where the cover means closes the top opening of the frame member;

a feed shaft rotatably mounted on the frame member and supporting the platen;

a pair of pin tractor assemblies individually slidable along the feed shaft within adjustment ranges predetermined on both sides of the platen,

each of the pair of pin tractor assemblies including a pin tractor member having a cylindrical surface and rotatable around an axis of rotation of the feed shaft, and a number of feed pins radially distributed around the axis of rotation so as to individually engage the perforations of the sheet of material; and

two groups of rib means fixedly attached to the cover means so as to be individually placed within the adjustment ranges when the cover means is in the closed position,

each of the groups of rib means including at least three rib members located side by side at such intervals that the feed pins of each of the pin tractor assemblies can be located between the adjacent rib members when the cover means is in the closed position, said rib members acting as a means to retain the sheet on said tractor members,

at least one of the three rib members having an arcuate guide surface which faces the cylindrical surface of the tractor member when the cover means is in the closed position,

said guide surface of the rib member and said cylindrical surface of the tractor member defining therebetween a narrow path through which the sheet of material is passed when the cover means is in the closed position, thereby preventing the feed pins from being disengaged from the perforations of the sheet of material.

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4,822,193

INK RESERVOIR HAVING CONTINUOUS RANDOM SLIVER WITH STRETCH YARN

Richard M. Berger, Midlothiam, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 852,241, Apr. 15, 1986, Pat. No. 4,729,808. This application Nov. 3, 1987, Ser. No. 116,441

Int. Cl.[4] B43K *15/00*

U.S. Cl. 401—198 **1 Claim**



1. An ink pen comprising:

a pen body;

an ink reservoir provided in the pen body for holding ink, the ink reservoir including a fibrous body composed of a gathered bundle of a plurality of unbonded continuous false twist stretch yarn fibers each having twist and curl and oriented generally parallel to one another, the plurality of continuous false twist stretch yarn fibers entangling one another and being sufficiently randomly oriented with one another such as to form a strong tangled fibrous mass having high capillarity; and

a pen tip provided on the pen body for drawing ink from the ink reservoir and adapted for applying ink.

4,822,194

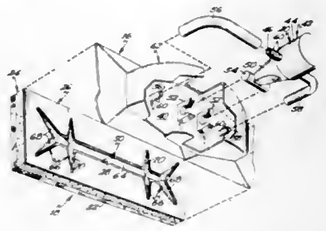
APPLICATOR HEAD

Dallas W. Simonette, Stacy, Minn., assignor to Power Flo Products Corp., Minneapolis, Minn.

Filed Feb. 27, 1987, Ser. No. 19,770

Int. Cl.[4] A47L *1/08;* **B05C** *17/00*

U.S. Cl. 401—207 **20 Claims**



1. An applicator head for applying fluid to a surface comprising, in combination: a pad having a top surface and a bottom surface for evenly distributing fluid onto the surface; a manifold base having a bottom surface and a top surface, with the top surface of the pad being secured adjacent to the bottom surface of the manifold base; a fluid inlet comprising a tee fitting having a conduit and first and second tee stems extending generally perpendicular from the conduit; means for pivotally mounting the fluid inlet to the manifold base about a pivot axis generally perpendicular to the fluid inlet; and means for providing fluid communication between the fluid inlet and the pad and for placing a torsional spring action between the manifold base and the fluid inlet to bias the bottom surface of the manifold base generally perpendicular to the fluid inlet comprising, in combination: a first hose having a first end and a second end; a second hose having a first end and a second end; and first and second nipples extending from the top surface of the manifold base generally perpendicular to the bottom surface of the manifold base and intersecting the pivot axis; means for preventing rotation of the first end of the first hose with respect to the first tee stem of the fluid inlet; means for preventing rotation of the second end of the first hose with respect to the first nipple of the manifold base; means for preventing rotation of the first end of the second hose with respect to the second tee stem of the fluid inlet; and means for preventing rotation of the second end of the second hose with respect to the second nipple of the manifold base, with the first hose being in fluid communication between the first tee stem and the first nipple and with the second hose being in fluid communication between the second tee stem and the second nipple, with the hoses being formed of flexible material and extending in a tight manner between the tee stem and the nipples requiring the hoses to be stretched and kinked from their free state when the manifold base and the fluid inlet are pivoted about the pivot axis.

4,822,195

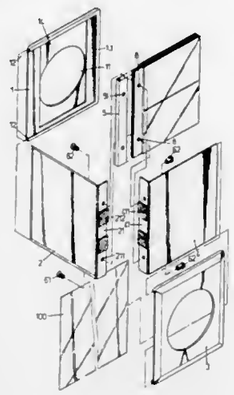
MULTI-PURPOSE ALBUM

Tsann T. Lu, No. 49, Hsin Le Road, An Ping Industrial Distrial, Tainan, Taiwan

Filed Jun. 4, 1987, Ser. No. 58,948

Int. Cl.[4] BA42 *3/02, 13/00;* **A47G** *1/06;* **G09F** *1/12*

U.S. Cl. 402—53 **3 Claims**



1. A multi-purpose album comprising:

a front cover;

a back cover; and

a plurality of pages, characterized in that said front cover and said back cover each includes a flap and a slide plate, said flap having three raised edges and a rectangular recess at a central portion for receiving a transparent plastic sheet, said slide plate being insertable into said flap and having a hinged portion which may overlap thereon, said hinged portion having two holes and two self-attaching pads, said pages each having two correspondingly disposed holes for receiving two sets of screws and nuts for binding the pages, the front cover and the back cover together.

4,822,196

BINDING POST REPAIR KIT

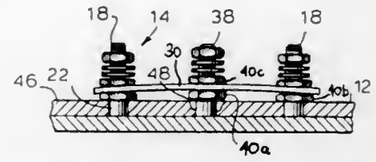
Douglas J. Miller, 1319 Pulaski St., Riverhead, N.Y. 11901

Divislon of Ser. No. 53,099, May 22, 1987. This application Jul. 12, 1988, Ser. No. 218,083

Int. Cl.[4] F16D *1/00*

U.S. Cl. 403—11 **5 Claims**

1. Apparatus for repairing damaged binding posts in a telephone wire connecting panel having a mounting board in which a plurality of spatially aligned binding posts are normally integrally imbedded and wherein said damaged binding post is removed therefrom, comprising a replacement binding post loosely held in a hole in said mounting panel in lieu of said damaged binding post, a bridging plate having a plurality of holes therein, each hole adapted to receive therethrough a binding post, said bridging plate being located over the replacement binding post and at least each one of the next adjacent binding posts in the array, at least one retaining spacer



applied over the replacement binding post beneath said bridge plate and above said mounting panel, said at least one spacer having a cumulative height sufficient to raise said bridging plate above said mounting panel, and a locking nut applied to at least each of the next adjacent binding posts in the array above said bridging plate, said fastening nuts acting to flex said plate to apply a downward holding bias on the retaining nut on the replacement binding post.

4,822,197

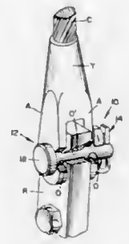
QUICK CONNECT/DISCONNECT ASSEMBLY

John D. DeMartino, 17 Bittersweet La., Wilbraham, Mass. 01095, and Wayne J. Yee, 86 Monticello Ave., Springfield, Mass. 01109

Filed Feb. 18, 1987, Ser. No. 15,915

Int. Cl.[4] F16B *19/00*

U.S. Cl. 403—154 **1 Claim**



1. A two-part fastener for interjoining first and second workpieces having a pair of aligned openings transversely extending therethrough comprising:

an elongated primary post having opposite outboard and inboard extremities with an enlarged head at the inboard extremity and a bifurcated head at the outboard extremity defining a pair of spaced legs,

a pivot pin connected to each of the spaced legs of the primary post extending between and transversely of the legs in bridging relationship with the bifurcation at its approximate midsection.

an elongated secondary post having opposite outboard and inboard extremities and defined by a pair of first and second resilient jaws interjoined at the inboard extremity and having respective first and second confronting faces separated by an expandable pin-accommodating slot extending inwardly from the outboard extremity,

an inner radius defining a slot bottom in the area of the joinder of the jaws,

a transversely-extending pivot pin-receiving recess extending inwardly from the first confronting face of the first jaw at the approximate midsection of the pin-accommodating slot,

the first confronting face of the first jaw extending in substantial parallelism with the second confronting face of the second jaw from the outboard extremity of the secondary post to the pivot pin-receiving recess and extending at an acute angle relative to the second confronting face of the second jaw from the pivot pin-receiving recess to the slot bottom in defining an inner ever-widening wedge-shaped throat portion of the pin-accommodating slot,

the secondary post being primarily positionable relative to the primary post between a first preparatory mode upon insertion of the secondary post along a first axis through the bifurcation of the primary post for seating the pivot pin of the primary post in abutment with the slot bottom of the secondary post and a second preparatory mode upon rotation of the secondary post relative to the pivot pin of the primary post for bringing the primary and secondary posts into coaxial-alignment,

the coaxially-aligned primary and secondary posts being insertable through the aligned openings of the first and second workpieces with the enlarged head of the inboard extremity of the primary post abutting the first workpiece and with the outboard extremity of the primary post projecting outboard of the second workpiece,

the secondary post being secondarily positionable relative to the primary post between a first operating mode upon pivot of the secondary post along a second axis right angular to the first axis and a second operating mode upon the sliding of the secondary post relative to the primary post with the contact of the pivot pin by the first and second confronting faces of the first and second jaws in the area of the wedge-shaped throat of the pin-accommodating slot camming the jaws into a spreading relationship for allowing seating of the pivot pin in the pin-receiving recess for function as a T head crosspiece in locking the primary and secondary posts against withdrawal relative to the workpieces.

4,822,198

JOINT CONNECTION FOR FRAME STRUCTURES

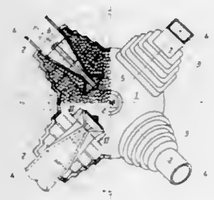
Erich Frantl; Peter Hofstätter; Willibald Zemler; Albert P. Raunicher, and Werner Frantl, all of Vienna, Austria, assignors to Dipl. -Ing. Manfred Beer, Mödling, Austria

Filed Jan. 13, 1987, Ser. No. 2,900

Claims priority, application Austria, Jan. 14, 1986, 68/86

Int. Cl.[4] F16B *7/04*

U.S. Cl. 403—170 **3 Claims**



1. A joint for frame structures, said joint comprising at least three tubular members and a metal casing having apertures therein for receiving an end portion of each of said tubular members wherein:

said received end portion of each of said tubular members terminates in a necked-down portion having a first tapering inner wall portion in opposing spaced-apart relation to a second tapering inner wall portion therein;

said metal casing is adapted to be filled with a hardenable grout;

a pair of elements having tapering sections are positioned in

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spaced-apart relation within said necked-down portion of each of tubular members with their tapering sections facing in opposition; and

prestressing means are located in each of said necked-down portions for urging one of said elements against said first tapering inner wall portion and the other of said elements against said second tapering inner wall portion in flatwise, abutting engagement therewith to prestress said necked-down end portion;

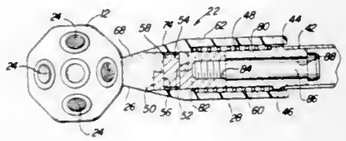
each of said prestressing means including adjustable means for urging said opposing elements toward each other in each of said necked-down portions, said adjustable means being aligned with the longitudinal axis of each tubular member.

4,822,199

MODULAR FRAME STRUCTURE

Charles O. Nehls, Allen Park, Mich., assignor to Unistrut International Corp., Wayne, Mich.

Filed Aug. 10, 1987, Ser. No. 83,252
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—171 **13 Claims**



1. A modular frame structure comprising, in combination:

a pair of nodes having a generally spherical configuration with a plurality of radially extending threaded apertures arranged in a predetermined pattern;

a strut designed to extend between adjacent nodes in forming said frame structure;

a pair of mode couplings each having one end threaded for engagement with a threaded node aperture and each having an elongated tang at its other end;

a pair of strut couplings, one coupling having at one end means for permanent fixed attachment to one end of said strut, and the other coupling having at one end means for permanent attachment to the other end of said strut allowing rotational movement between said other coupling and said strut; and both strut couplings having elongated tangs at their other ends arranged for positioning in overlapping complementary relation to said node coupling tangs; and

complementary lock elements on each of said node coupling and strut coupling tangs engageable with each other when said tangs are in said overlapping position to hold said node couplings and strut couplings in fixed longitudinal alignment.

4,822,200

OVERLOAD PROTECTOR FOR A ROBOT

Klaus Berner, Reilingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

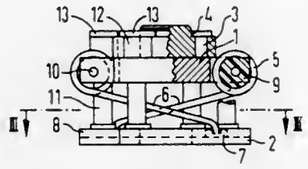
Filed Dec. 2, 1987, Ser. No. 127,853
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3641919
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—229 **6 Claims**

1. An overload protector for connection between a robot arm and a tool holder, comprising:

first and second elements, of which a one is securable to a robot arm and of which another one is securable to a tool holder;

means for securing the first and second elements together in such a manner that the first element is restricted to axially directed movement towards and away from the second element; and

at least one transversely extending torsion spring attached to one of said elements and having



a first free end which is also attached to said one of said elements and

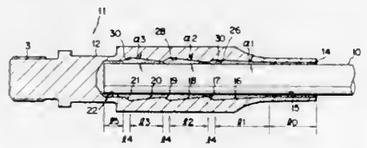
a second free end which is formed as an elongated pressure arm and which bears resiliently against another one of said elements.

4,822,201

COUPLING PIN FOR SUCKER ROD MADE OF FIBER-REINFORCED PLASTIC MATERIAL

Toshio Iwasaki; Akihiko Katoh; Atsuhiko Murao; Masakazu Tsukada; Takashi Nakano, and Masaru Nasu, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 62,765
Claims priority, application Japan, Jul. 4, 1986, 61-156215
Int. Cl.[4] F16B *11/00*
U.S. Cl. 403—268 **14 Claims**



1. A coupling pin for use with a sucker rod, and which is made from fiber-reinforced plastics material, comprising:

an elongated hole in said coupling pin, one end of which is closed, and the other end of which is open for the insertion of a sucker rod in said elongated hole; and

a plurality of annular depressions in the inner wall of said elongated hole, said annular depressions being arranged in a series from the open end to the closed end of said elongated hole, and, as viewed crosswise, said annular depressions each including a first tapered, substantially straight, surface portion having a given angle of inclination, the angle of inclination of said tapered portions of each of said annular depressions being such that the diameter of the respective annular depression increases toward said closed end of said elongated hole;

at least one of said first tapered surface portions being longer in length than a preceding first tapered surface portion, said preceding tapered surface portion being located more toward said closed end of said elongated hole than said at least one first tapered surface portion; and

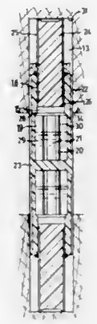
said first tapered surface portions progressively increasing in angle of inclination as their location varies from said open end to said closed end of said elongated hole.

4,822,202

LOAD ABSORBING GLUE JOINTING PLUG, PREFERABLY FOR JOINING TOGETHER FURNITURE COMPONENTS

Bror Gustafsson, Gislaved, Sweden, assignor to Sedaplast AB, Gislaved, Sweden

Filed Jan. 29, 1987, Ser. No. 9,040
Claims priority, application Sweden, Feb. 12, 1986, 8600619
Int. Cl.[4] F16B *12/24, 13/04*
U.S. Cl. 403—268 **6 Claims**



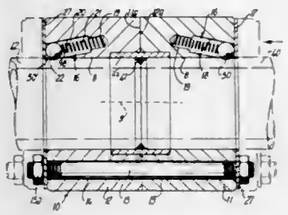
1. A load absorbing jointing plug intended to be inserted into and glued in a cylindrical attachment hole located in a structural member, such as a wooden structure member, particularly when joining pieces of furniture together, characterized in that the plug has provided therein an axially extending bore which opens out at an insertion end of the plug; in that the bore contains a given quantity of liquid glue which is enclosed in the bore by means of a plunger which is partially inserted into the bore to a starting position and which seals in said bore; and in that the bore and the plunger are so constructed in relation to one another that forcible insertion of the plunger into the bore from a starting position causes glue present in a glue chamber located between a bottom of the bore and an inner end of the plunger to be forced beyond the plunger and out at the insertion end of the plunger, the plunger having an inner end forming a piston which seals in the bore, in a starting position of the plunger, and the plunger having a plurality of axially extending glue channels which extend from the piston to an outer end of the plunger, the plug and plunger providing an arrangement such that when the plunger is urged through a given distance from said sealing starting position, the glue channels provided on said plunger are brought into communication with the glue chamber so that glue is gradually forced through the glue channels on the plunger and out at the end of the plug as the plunger is pressed to its bottom position, an inner part of the bore situated axially inwardly of a location at which the piston seals against the bore in a plunger-starting position having, at least at certain locations, a larger diameter than the piston, so as to provide free passageways for glue to pass beyond the piston when the plunger has moved through a given distance from its starting position and the piston is located in the inner part of the bore, said inner part of the bore having thereon a number of axially extending lands having radially inner surfaces which lie on a geometric cylinder in an extension of a cylindrical outer part of the bore, wherewith channels defined between the lands communicate with the glue channels on the plunger when the plunger has been pressed into the glue chamber.

4,822,203

CLAMPS AND CONNECTORS

Owen Walmsley, Chorley, England, assignor to Robert Emmett, Lancaster, England

Filed Mar. 27, 1987, Ser. No. 30,581
Claims priority, application United Kingdom, Apr. 2, 1986, 8608073
Int. Cl.[4] F16B *2/02*
U.S. Cl. 403—314 **11 Claims**



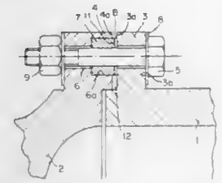
1. A clamp comprising two parts each having an axis, at least one of the parts having a plurality of inclined recesses such that each recess provides a surface inclined to the axis at an acute angle, a plurality of movable elements respectively received in the plurality of recesses and engaging the respectively inclined surfaces for engaging an elongate member, respective biassing means for the movable elements operative to bias the respective movable elements towards an axial end of the respective recess and hence along said inclined surface, and means for moving the two parts relative to each other to cause the movable elements to engage th elongate member more firmly, each movable element being movable axially and radially in the respective recess to accommodate any surface nonuniformity of the elongate member in the area of one movable element relative to the other movable elements.

4,822,204

FLANGE COUPLING

Hans Lindenthal, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 100,992
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 8625580[U]
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—337 **7 Claims**



1. A coupling for rigidly connecting a pair of coaxial machine parts, comprising:

a pair of tubular coupling sections each having radially extending flanges with each flange provided with a front face adapted to about said front face of said other flange;

an axially tensioned connecting element extending through said front faces to connect said front faces and thus said pair of coupling sections; and

a layer of granular material is positioned between said contacting front faces in the area of said axially tensioned connecting element, wherein one of said front faces has a recess for receiving said layer of granular material, and

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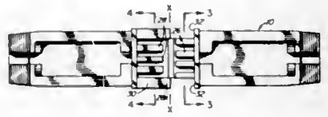
wherein said layer of granular material increases the friction force between said front faces.

4,822,205

FOLD-UP CORNER PIECE FOR SPACER TUBE ASSEMBLY

Gunter Berdan, Weston, Canada, assignor to Indal Limited, Ontario, Canada

Filed Apr. 24, 1987, Ser. No. 42,035
Claims priority, application Canada, Jan. 21, 1987, 527784
Int. Cl.[4] B25G *3/36*
U.S. Cl. 403—402 **10 Claims**



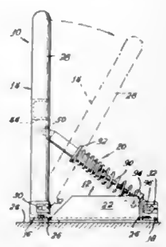
1. A corner piece for use in a spacer tube assembly comprising:
(a) a pair of arms each adapted to enter into and engage within an end portion of a respective spacer tube;
(b) hinge means defining a hinge axis ad permitting said arms to be pivoted into a predetermined angular relationship with each other;
(c) friction means on each of said arms adapted to come into close contacting relation with each other as said arms are pivoted toward said predetermined angular relationship to frictionally retain said arms in said predetermined angular relationship;
(d) said friction means comprising fin means on each of said arms which extend generally normal to said hinge axis, the fin means on one said arm being arranged to come into tight interdigitating or interleaved relation with the fin means on the other said arm as said arms are pivoted toward said predetermined angular relationship;
(e) said fin means being in the form of multiple, spaced, generally parallel fins on each of said arms, the fins having generally planar walls which are substantially devoid of interengaging catches or recesses so that substantially pure frictional engagement takes place between the tightly interleaved fins of said arms.

4,822,206

PARKING BARRIER

Xavier Roussel, Versailles, France, and Elaine Silets, 34 E. Bellevue Pl., Chicago, Ill. 60611, assignors to Elaine G. Silets, Chicago, Ill.

Filed May 21, 1987, Ser. No. 52,276
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **19 Claims**



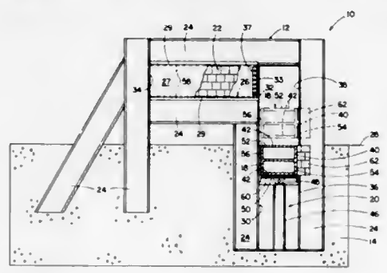
1. A collapsible, cushioned barricade comprising
a. a fixed, generally horizontal support,
b. an elongated barrier member,
c. hinge means pivotally securing said barrier member to said fixed support so that said barrier member may be positioned in one of two orientations, a first orientation where said barrier member is essentially prone and a second orientation where said barrier member is essentially upright, and
d. a brace extending between said barrier member and said support, said brace being slidably secured to said barrier member and pivotally secured to said support such that when said barrier member is in said second orientation said brace is inclined relative to said barrier member, and said brace including resilient means permitting temporary displacement of said barrier member by compression of said brace when said barrier member is in said second orientation, said resilient means further returning said barrier member to said second orientation after such temporary displacement.

4,822,207

ANTI-TERRORIST VEHICLE CRASH IMPACT ENERGY ABSORBING BARRIER

David J. Swahlan, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 17, 1988, Ser. No. 207,849
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **27 Claims**



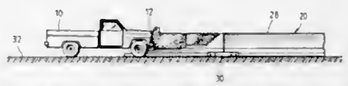
1. A vehicle crash impact energy absorbing barrier, comprising:
(a) a pair of side support structures stationarily-mountable at opposite sides of an entrance to a facility, each support structure defining a generally horizontal guideway displaced above a vehicular traffic-bearing surface and having a forward end and closed aft end;
(b) an elongated substantially impact-resistant beam having a pair of opposite ends, a forward impact-receiving side and an opposite rearward side, said impact beam being adapted to extend between said side support structures and at said opposite ends of said beam extend in transverse relation through said horizontal guideways of said side support structures for providing an obstruction to vehicular traffic between said side support structures through the facility entrance, said impact beam being slidably movable along said horizontal guideways toward said aft ends thereof upon being impacted at its forward side by an incoming vehicle; and
(c) a pair of members being disposed in said horizontal guideways of said side support structures between a rearward side of said impact beam and said closed aft ends of said horizontal guideways, said members being adapted to absorb at least a significant portion of the kinetic energy produced by impact of the incoming vehicle against said forward side of said impact beam such that said beam and members are capable of coacting to disable and stop the incoming vehicle without causing structural damage to said support structures.

4,822,208

ADVANCED DYNAMIC IMPACT EXTENSION MODULE

Don L. Ivey, Bryan, Tex., assignor to The Texas A&M University System, College Station, Tex.

Filed Nov. 23, 1987, Ser. No. 124,499
Int. Cl.[4] E01F *13/00, 15/00*
U.S. Cl. 404—6 **15 Claims**



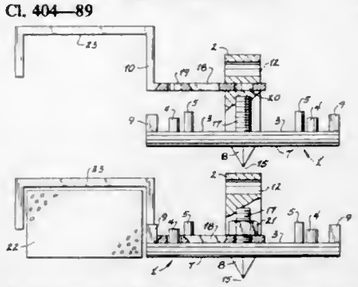
1. A roadside barrier, adapted to prevent vehicles from impacting obstacles, including other vehicles, comprising:
a plurality of linearly arrayed barrier wall sections, each said section having a substantially identical cross-sectional exterior configuration;
a first said section being a composite section comprised of reinforced concrete and a lower density, crushable material; and wherein said lower density, crushable material is positioned above said reinforced concrete and comprises at least half of the cross-sectional volume of said first section; and
a plurality of intermediate said sections, said intermediate sections being composite sections wherein a lower portion of each said section is comprised of reinforced concrete and an upper portion of each said section is comprised of a lower density, crushable material; each said intermediate section being further characterized in that the said sections located nearer said first section are comprised of a greater volume of lower density, crushable material than the said sections positioned further away from said first section.

4,822,209

ELONGATED CONCRETE GROOVER

Nicholas Dragich, 17 Fairway, Orchard Park, N.Y. 14127

Filed Feb. 22, 1988, Ser. No. 158,926
Int. Cl.[4] E01C *23/02*
U.S. Cl. 404—89 **9 Claims**



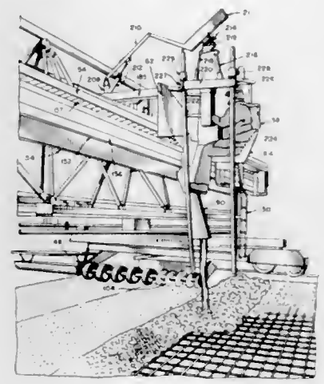
1. A groover tool for use in grooving wet cement which comprises a main elongated body having a substantially flat upper and lower surface, said lower surface containing in its center portion and substantially coextensive therewith a grooving rib having a substantially V-shaped configuration, said grooving rib extending slightly beyond terminal end portions of said lower surface, the terminal ends of said rib tapered in a downward manner, said upper surface having at substantially its center portion a flange for connection to a movable handle means, said flange containing means for allowing said movable handle freedom of movement therein, said upper surface having upwardly projecting housings for retaining weights therein, said upper surface also having guide bar means for attachment thereto of a guide bar, said guide bar having an inverted U-shaped configuration with a tail section extending therefrom, and said guide bar means adapted to attach to said tail of said guide bar wherein said guide bar tail is fixed at substantially a right angle to a length portion of said groover tool.

4,822,210

CONCRETE FINISHING MACHINE

Robert F. Oury, Gilberts, and Charles J. Arndt, Bloomingdale, both of Ill., assignors to Rotec Industries, Elmhurst, Ill.

Continuation of Ser. No. 917,406, Oct. 10, 1986, abandoned. This application May 6, 1988, Ser. No. 190,900
Int. Cl.[4] E01C *19/12*
U.S. Cl. 404—106 **26 Claims**



1. A concrete finishing machine comprising, in combination:
a framework mounted transversely over a paving area to be paved with concrete and defining an axis substantially perpendicular to the direction of framework travel, the framework having track engaging end sections to support the framework and means for moving the framework;
a carriage movably attached to the framework for movement along the axis defined by the framework, means for moving the carriage along the length of the framework;
at least one auger unit rotatably mounted on the carriage, the auger unit having leading and trailing ends and defining an axis substantially aligned with the direction of framework travel, means on the carriage for driving the auger unit to plow excess concrete forward in the direction of framework travel;
a finishing member attached to the carriage and having a substantially horizontal surface for engaging and finishing the concrete surface at a desired grade, the finishing member positioned adjacent to the trailing end of the auger unit in a following relationship relative to the direction of frame travel; and
means for conveying concrete mounted on the framework and substantially aligned with the axis defined by the framework, the conveying having a side discharge station movably mounted thereon for directing concrete from the conveying means to the paving area along the length of the conveying means, the side discharge station having an operator platform for carrying an operator of the concrete finishing machine, a plow for directing the concrete from the conveying means, a discharge chute for receiving the concrete direct by the plow and guiding the concrete onto the paving area, said discharge chute being mounted on a gimbal secured to said side discharge station for controlling the position of said discharge chute from said operator platform, and means moving the side discharge station along the length of the conveying means.

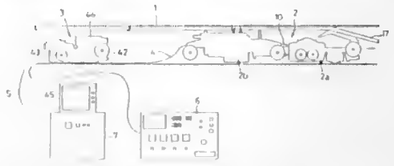
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4,822,211

METHOD AND APPARATUS FOR LAYING CABLE IN A PIPE

Yasuhiro Shinoda, Kashiwa; Yoshifumi Takahashi, Tokyo; Tsuneto Takaso, Tokyo; Akira Hagiwara, Tokyo, and Yoshiaki Ishii, Tokyo, all of Japan, assignors to Nippon Hume Pipe Co., Ltd., Japan

Filed Jun. 24, 1987, Ser. No. 66,141
Claims priority, application Japan, Jun. 25, 1986, 61-148964
Int. Cl.⁴ F16L *1/02*
U.S. Cl. 405—154 **3 Claims**



1. An apparatus for laying a cable in a pipe of the kind that fixes a cable already introduced into the pipe to the inner wall of the pipe, said apparatus comprising:

(a) a wagon adapted to move forward along the pipe interior;

(b) an arm disposed at a forward part of said wagon for raising and thrusting the cable against the inner wall of the pipe at predetermined positions:

(c) fixing means disposed at the rear part of said wagon for fixing the raised cable onto the inner wall of the pipe;

(d) means for controlling all functions of said wagon from the outside of the pipe;

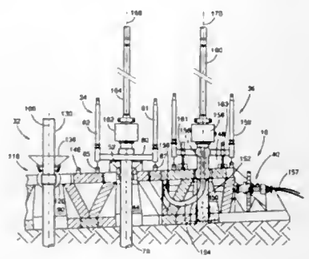
said wagon having propelling means on either side thereof, and said propelling means being constructed for engagement with the inner wall of the pipe at positions higher than a bottom of said pipe so as to prevent said wagon from rolling about the pipe axis.

4,822,212

SUBSEA TEMPLATE AND METHOD FOR USING THE SAME

Johnce E. Hall, Kingwood, and Samuel L. Penny, Houston, both of Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 28, 1987, Ser. No. 115,080
Int. Cl.⁴ E21B *7/128, 43/013;* **E02D** *5/54;* **E02B** *17/00*
U.S. Cl. 405—227 **16 Claims**



1. A method for installing a well casing in a formation beneath a body of water comprising the steps of:

lowering a template to the floor of the body of water;

pivotally coupling a pile to the template;

inserting the pile into the formation;

pivotally coupling a well casing to the template in a manner which permits well casing movement along the longitudinal axis of the well casing while permitting well casing pivoting in all directions; and

inserting the well casing into the formation.

7. A template for installing a well casing in a formation beneath a body of water comprising:

a frame for resting on the floor of the body of water;

means for pivotally coupling a pile to said frame, said pile coupling means permitting pile movement along the longitudinal axis thereof while said pile is so coupled; and

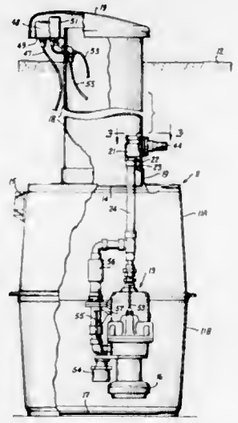
means for pivotally coupling a well casing to said frame, said well casing coupling means permitting well casing movement along the longitudinal axis thereof while said well casing is so coupled.

4,822,213

NARROW ACCESSWAY SEWAGE COLLECTION TANK ASSEMBLY, REMOTE OPERATED QUICK CONNECT-DISCONNECT COUPLING AND SYSTEM USING THE SAME

Richard C. Grace, Carlisle; Jack L. Cooley, Clifton Park, and Eric F. Cabahug, Schenectady, all of N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,833
Int. Cl.⁴ E02D *29/12;* **B02C** *23/36, 13/18*
U.S. Cl. 405—303 **32 Claims**



1. A narrow accessway grinder pump system for outdoor installation below normal ground level at a sewage collection facility with minimum cost and impact on the environment while maintaining proper operating conditions, good scouring of the collection tank bottom and facilitating below ground installation and subsequent maintenance and servicing from the surface; said system comprising:

an enlarged sewage collection tank to be planted below level in the ground near a facility to be serviced and connected to suitable gravity drain conduit means interconnected between the facility to be serviced and the collection tank for collecting raw sewage therein;

sewage pump means physically supported within the enlarged collection tank and having the suction intake thereof disposed at a level below a normal low level of raw sewage content within the tank and displaced upwardly from the bottom of the collection tank a distance sufficient to assure ready flow of raw liquid sewage and entrained solids into the suction intake and proper scouring of the bottom of the tank to avoid build-up of solids thereon;

a narrow-access passageway enclosure physically supported on the top of the collection tank and providing access to the interior of the tank, said narrow-access passageway being of sufficient cross sectional dimension to allow free passageway for the sewage pump means but being insufficient in cross-section to accommodate passage of human beings or a guide rail system of conventional construction;

coupling means having a movable portion and a fixed portion for slidably receiving and supporting the movable portion, said fixed portion being secured within the collection tank for physically supporting the sewage pump by means of the movable portion thereof within the collection tank properly positioned relative to the bottom to assure proper operation of the pump means; and

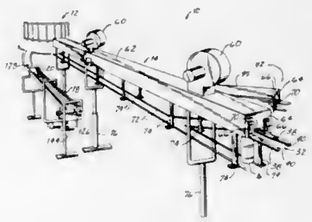
pressure sewage discharge outlet conduit means secured to the discharge outlet of the sewage pump means via the coupling means for transport of liquid sewage supplied under pressure from the discharge outlet of the sewage pump away from the sewage collection tank.

4,822,214

AIR CONVEYOR

Samuel S. Aidlin; Stephen H. Aidlin, and Larry Kincaid, all of Sarasota, Fla., assignors to Aidlin Automation Corp., Bradenton, Fla.

Filed Jun. 12, 1987, Ser. No. 62,171
Int. Cl.⁴ B65G *51/00*
U.S. Cl. 406—86 **12 Claims**



1. A pneumatic conveying apparatus for container bodies comprising:

a pair of laterally spaced neck tracks defining an elongated slot therebetween for slidingly supporting a container body by its neck;

an inverted, U-shaped, interior channel member extending upwardly from the neck tracks spanning the slot and extending longitudinally substantially the length of the slot and having a cross sectional area sufficient to receive the portion of a container body above its neck, the interior channel member having a top wall and side walls with air directing louvers formed in the top wall and side walls, the louvers of the top wall being shaped to direct a flow of air into a container body located in operative proximity therewith to thereby provide a driving force within the container body in addition to the driving force outside the container body created by the side louvers;

an inverted, U-shaped, exterior channel member extending upwardly from the neck tracks enclosing the interior channel member and extending longitudinally substantially the length of the slot, the cross sectional area of the exterior channel member being between about five and fifteen times larger than the cross sectional area of the interior channel member; and

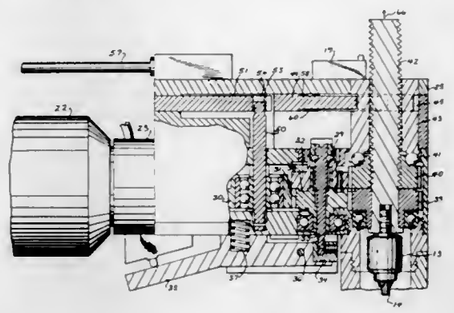
pneumatic means to introduce air under pressure to the space between the exterior and interior channel members whereby such space may constitute a plenum chamber and direct a flow of air within the interior chamber in a direction dictated by the angle of the louvers for conveying container bodies supported by their necks on the neck tracks in the direction of the air flow.

4,822,215

THRUST AND TORQUE SENSITIVE DRILL

Robert H. Alexander, Columbia, S.C., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed May 26, 1988, Ser. No. 199,066
Int. Cl.⁴ B23B *41/00*
U.S. Cl. 408—9 **15 Claims**



1. A thrust sensitive drill for rotationally driving a bit into a workpiece comprising:

a spindle for mounting the bit;

drive gear means operatively connected to said spindle to rotate said spindle and move said spindle in a linear manner;

bearing race means operatively connected to said drive gear means and in a manner so as to move in linear manner with respect thereto;

a restraining lever connected at one end to a drill housing and at another end to said bearing race means; and

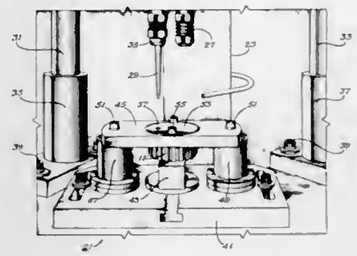
sensing means operatively associated with said restraining lever to sense movement of said lever and thereby detect the thrust of the drill.

4,822,216

PARTIAL HOLE THREADING SYSTEM

Billy G. Howard, Arlington, Tex., assignor to Martin Sprocket & Gear, Inc., Fort Worth, Tex.

Filed Jun. 7, 1988, Ser. No. 203,276
Int. Cl.⁴ B23G *1/48*
U.S. Cl. 408—54 **3 Claims**



1. Apparatus for threading with a tap a longitudinally divided partial hole in a peripheral surface of a machine component, comprising:

a frame for mounting the apparatus;

a tap driving spindle reciprocally carried by the frame;

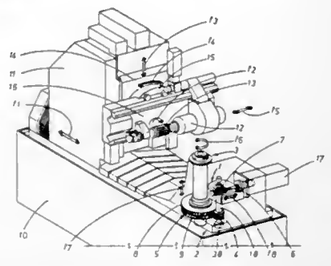
a base plate supported by the frame beneath the tap driving spindle;

means for positioning and holding said component in a predetermined relationship with the frame;

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locater means for accurately aligning said component with the tap driving spindle;
a movable guide shoe operable in combination with the locater means to oppose the partial hole to be threaded and form temporarily an opposed partial hole to accurately guide the tap.

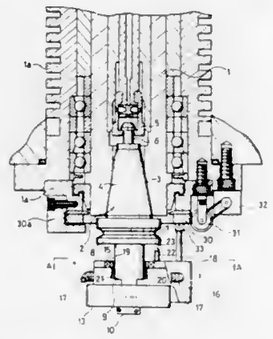
4,822,217
ASSEMBLAGE OF COMPONENTS FOR THE DRIVE SYSTEM OF THE WORKTABLE IN AN AUTOMATIC GEAR CUTTING MACHINE
Alessandro Lunazzi, Bologna, Italy, assignor to C.I.M.A. Costruzioni Italiane Macchine Attrezzi S.p.A., Bologna, Italy
Filed Feb. 9, 1988, Ser. No. 153,972
Claims priority, application Italy, Feb. 17, 1987, 3351 A/87
Int. Cl.⁴ B23F *5/00*
U.S. Cl. 409—11 **7 Claims**



1. Assemblage of components for a drive system of a worktable in an automatic gear cutting machine, comprising:
a first speed reduction unit with shafts disposed at right angles, consisting of a driving worm and a driven worm wheel;
a second speed reduction unit with parallel shafts, driven by the worm wheel and driving the worktable, consisting of a pair of cylindrical gears dissimilar in diameter, one of which is backlash-compensating and split into two coaxial sections;
a worktable, to which the larger of said cylindrical gears is coaxially and rigidly attached.

4,822,218
FLUID DELIVERY DEVICE FOR A MACHINING CENTER, AND A MACHINING CENTER
Yoshikazu Satoh, 204, Kifune 1-chome, Meito-ku, Nagoya City, Aichi 465, Japan
Filed Aug. 31, 1987, Ser. No. 90,887
Int. Cl.⁴ B23Q *11/10*
U.S. Cl. 409—136 **2 Claims**

1. A machining center fluid delivery system comprising a body block to be mounted on a tool holder mounted on a machining center and a driving source block to be mounted on a body of the machining center for rotating said body block; said driving source block including a ring gear to be rotatably, circumferentially mounted at a lower end opening of an outer cylinder of a spindle of the machining center, a fluid delivery pipe coupling means fixed to a lower surface of said ring gear, and a fluid delivery passageway communicating at one end thereof to a fluid delivery source outside of the machining center and at the other end thereof to said fluid delivery pipe coupling means; said body block comprising a cover-shaped body member mountable relatively rotatable on a toll coupling shaft of the tool holder and including an upper portion and a lower circumferential axially extending portion, at least one fluid delivery nozzle extending from said lower portion, and a fluid delivery pipe extending upwardly from said upper portion and having one end thereof communicating with a base end of said at least one fluid delivery nozzle and an upper tip end thereof engaged with said fluid delivery pipe coupling means on said ring gear; whereby when said ring gear is



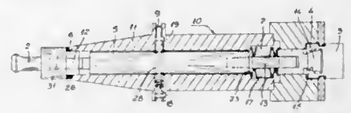
turned, said body member is also turned about an axis of the spindle to direct fluid flow from said at least one fluid delivery nozzle to a desired position.

4,822,219
HOLDDOWN AND CHIP REMOVAL MEANS FOR A CUTTING MACHINE
Kenneth O. Wood, Ellington, and Wolfgang M. Strobel, Southington, both of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.
Filed May 31, 1988, Ser. No. 201,069
Int. Cl.⁴ B23Q *11/02*
U.S. Cl. 409—137 **19 Claims**

1. A vacuum shroud for use with a cutting machine having a rotary cutting tool said shroud comprising:
a body portion partially defining a chamber for receiving at least part of a rotary cutting tool;
said body portion having a top surface and a first opening providing communication between said top surface and said chamber;
at least one duct portion extending generally laterally outwardly from said body portion and communicating with said chamber;
a base portion connected with said body portion and having a lower surface;
a resilient layer having an upper and a lower surface, said resilient layer upper surface underlying and facing said lower surface of said base portion;
a contact element formed from a low friction material and having an upper surface and a lower sliding surface, said contact element upper surface underlies and faces said resilient layer lower surface and defining said portion of said chamber;
attachment means connecting said contact element and said resilient layer to said base portion;

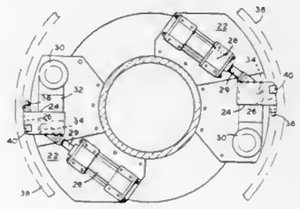
a second opening formed in said contact element to provide communication between said lower surface of said contact element and said chamber, said first and said second openings being concentric with one another, and said resilient layer having means providing communication between said second opening and said chamber; and
a connecting flange extending upwardly from said body portion and having connecting means formed thereon for attaching said vacuum shroud to a support.

4,822,220
DEVICE FOR SECURING TOOLS IN METAL WORKING MACHINE
Sven-Arne Danielsson, and Agneta Danielsson, both of Flattinge, S-340 15 Vittaryd, Sweden
PCT No. PCT/SE86/00234, § 371 Date Jan. 16, 1987, § 102(e) Date Jan. 16, 1987, PCT Pub. No. WO86/06992, PCT Pub. Date Dec. 4, 1986
PCT Filed May 19, 1986, Ser. No. 14,066
Claims priority, application Sweden, May 20, 1985, 8502465
Int. Cl.⁴ B23C *5/26*; B23B *31/06*
U.S. Cl. 409—233 **10 Claims**



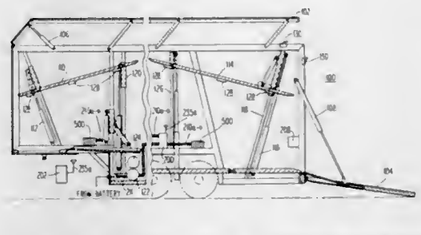
1. A machining device arranged for a machine (**20**) having a spindle (**21**) and a spindle draw-bar (**22**), comprising:
a bar (**10**) including a body (**11**) and a displaceable draw-bar pin (**2**) formed to enter into engagement with the spindle draw-bar (**22**), and in communication with a tool element (**4**) of the bar (**10**), the tool element being formed to hold a tool whereby the draw-bar force of the spindle draw-bar can be utilized to hold the tool to the bar, said bar (**10**) further including a fixing device (**9**) arranged to fix selectively the tool element (**4**) against displacement in relation to the body (**11**) in an axial direction from the machine (**20**).

4,822,221
INTERNAL FLASH REMOVAL UNIT
Jan Iliakowicz, New Orleans, La., assignor to McDermott Incorporated, New Orleans, La.
Filed Jun. 15, 1987, Ser. No. 61,614
Int. Cl.⁴ B23D *3/02*
U.S. Cl. 409—309 **10 Claims**



1. An internal flash removal unit for removing hot flash, comprising:
a. a housing;
b. a drive motor mounted in said housing;
c. a gearbox in operative engagement with said drive motor;
d. a tooling plate rotatably mounted to and coaxially with said housing;
e. a cutting assembly pivotally mounted to said tooling plate and radially movable between a first retracted position and a second extended cutting position;
f. a carbide shoe mounted on said cutting assembly;
g. means between said gearbox and said tooling plate for rotatably driving said tooling plate;
h. means for moving said cutting assembly between said first and second positions, comprising a hydraulic cylinder and piston connected to said tooling plate and said cutting assembly; and
i. a hydraulic fluid accumulator mounted in said housing and in fluid communication with said hydraulic cylinder for maintaining even pressure on said cutting assembly while in the cutting position.

4,822,222
ELECTROHYDRAULIC SYSTEM FOR AN ENCLOSED AUTOMOBILE CARRIER
Kenneth W. Zeuner, New Hope; Thomas A. Zeuner, Holland; Donald C. Broschard, Langhorne, and William A. Babacz, Newtown, all of Pa., assignors to Integrated Technologies and Systems, Inc., Newtown, Pa.
Filed Feb. 24, 1987, Ser. No. 18,376
Int. Cl.⁴ B60P *3/08*
U.S. Cl. 410—29.1 **22 Claims**



1. In a car-carrying trailer having cylinders and ramps and at least one proximity sensor coupled to a ramp wherein the cylinders control the position of the ramps, comprising:
a single moveable manually activated unit for providing a source of data for controlling substantially all of the cylinders;
a single transmission link coupled to the unit for receiving the data and transmitting the data from the unit;
means for receiving and processing the transmitted data and determining ramp position control signals in accordance with the data;
hydraulic means coupled to the processing means for moving ramps in accordance with the ramp position control signals;
means coupled to the proximity sensor for determining the distance between the ramp and a vehicle and for providing a proximity sensor signal when a vehicle is within a predetermined distance of the ramp.

4,822,223
WOOD INSERT
William L. Williams, HCR 06, Box 1571, Wetmore, Tex. 78163
Filed Sep. 23, 1987, Ser. No. 100,252
Int. Cl.⁴ F16B *39/02*
U.S. Cl. 411—82 **8 Claims**

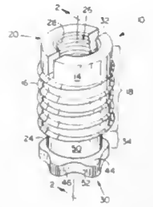
1. An insert for securing coupling means in a recipient material comprising:
a body having a first end, a second end, and an exterior annular surface therebetween;
a first portion of said body near said first end being formed into a recess for accommodating a first part of an adhesive placed in a hole in said recipient material with said insert and thereby allowing said first part to form a protrusion adhered to said recipient material adjacent to said recess at the inner surface of said hole and extending into said

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recess which protrusion, after said adhesive hardens, acts as a barrier resisting removal of said insert from said hole;

a second portion of said surface extending from said second end to a point on said surface coextensive with the edge of said recess closest to said second end having first penetrating means for engaging said recipient material at said inner surface, said engaging means axially securing said insert in said hole;

a third portion of said surface having a plurality of indentations, said indentations being sized and shaped whereby said third portion takes a wave-like shape, said shape of said periphery for interfacing with a second portion of



said adhesive in which said third portion is embedded when said insert is installed in said hole having said adhesive placed therein, said indentations being sized such that there are six wave crests and six wave troughs on said periphery for providing an effective interface with said second portion of said adhesive, said wave crests and said wave troughs having a relative wave height of either substantially core nor substantially less than one eighth of said body's maximum diameter;

said cylindrical body further having an axially-oriented columnar cavity at said first end, said cavity having second engaging means for engaging with said coupling means.

4,822,224

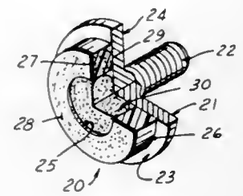
HARNESS RETAINER STUD

Richard M. Carl, Rochester, and Ventzel J. Potochnik, Grosse Pointe Woods, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 5, 1987, Ser. No. 116,938

Int. Cl.⁴ F16B *39/02*

U.S. Cl. 411—82 **4 Claims**



1. A removable backing wafer for use with a harness retainer stud in an automatic assembly process, the stud having a circular flat plate having a shaft face and a seal face, the faces parallel to one another, a shaft disposed upon the shaft face of the plate having clip engaging means for communicating with the wire harness retainer clip, a resilient annular seal having plate surface and an adhesive surface, the surfaces parallel to one another, the plate surface attached to the seal face of the plate, the annular seal having a central cavity, a contact adhesive coating on the adhesive surface of the seal for mounting the stud on the body panel, and an uncured adhesive in the central cavity of the seal which when cured will bond the stud to the body panel the wafer comprising:

a solid disc;

a ring disc having a central opening, and;

means for attaching the discs to one another in a coplanar relationship;

the solid and ring discs having a diameter greater than the diameter of the plate of the stud, the central opening of the ring disc exposing the interior surface of the solid disc and capable of receiving the seal, allowing contact of the seal with the interior surface of the solid disc, the wafer retained onto the seal by the contact adhesive.

4,822,225

SCREW FOR EASILY ENGAGING THE INTERNAL THREAD OF A TAPPED HOLE

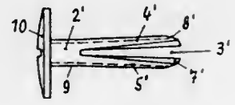
Walter Haberle, Gronauer Weg 16, 6368 Bad Vilbel, Fed. Rep. of Germany

Filed Apr. 25, 1988, Ser. No. 185,900

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 8709664[U]

Int. Cl.⁴ F16B *39/284*

U.S. Cl. 411—306 **4 Claims**



1. A screw comprising:

a screwed shank divided into two halves by a slot running centrally in longitudinal direction, and

two chamfers running vertically to the slot and along both halves of the screwed shank, wherein the chamfers are arranged at acute angles to each other.

4,822,226

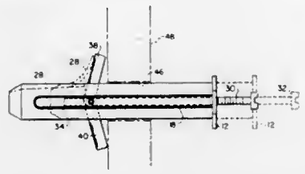
WING NUT RETAINER AND EXTRACTOR

Arvest G. Kennedy, 13421 Brian Park La., Poway, Calif. 92064

Continuation of Ser. No. 521,143, Aug. 8, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,793

Int. Cl.⁴ F16B *21/00*

U.S. Cl. 411—342 **18 Claims**



1. A wing nut holder and retractor for holding and retracting wing nuts through an aperture from behind a wall panel, comprising:

a face plate having an aperture for passage of a wing nut therethrough when said wing nut is in either a tilted or folded position,

a pair of elongated opposed spaced apart guide and support rails each having an outer end and an inner end and secured at said inner end to and extending outward in parallel relation from one side of said face plate for extending through an aperture in a wall panel for holding a wing nut therebetween for passage therealong behind said panel and through said aperture, and

tipping finger means carried by said rails at the outer end thereof and normally biased to a position extending generally parallel to said rails and toward said face plate for engaging and extending outward along the back of one wing of a wing nut positioned against said panel upon movement of the holder outward from the wall panel, and for simultaneously biasing said one wing and tipping both wings of a wing nut in a common direction around the pivot axis thereof to a position extending in opposite directions generally parallel to said rail upon movement of said holder inward toward said wall panel.

4,822,227

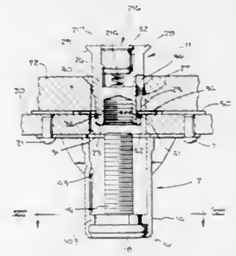
FLUSH MOUNTED BOLT

John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.

Filed Jnl. 14, 1987, Ser. No. 72,885

Int. Cl.⁴ F16B *23/00*

U.S. Cl. 411—373 **7 Claims**



1. In a fastener assembly for joining a panel to a sub-panel comprising a receptacle assembly having a threaded portion secured to the undersurface of the sub-panel, a bolt having an enlarged flush head at one end and a nose at the other end, said nose being adapted to extend through a countersunk opening in said panel coaxially aligned with an opening in said sub-panel with the threaded portion of said receptacle assembly coaxially aligned with both of said openings, said bolt being threaded for threaded engagement to the threaded portion of said receptacle assembly, said head having a socket therein configured to a tool adapted to be inserted into said socket to rotate said bolt, the improvement which comprises:

a plug mounted in said socket and configured similarly thereto having an outer surface flush with the portion of the head of said bolt surrounding said socket; and

plug displacement and flush return means associated with said plug and said socket for moving said plug from a first position wherein the outer surface thereof is flush with the portion of the head of said bolt surrounding said socket to a second position wherein the outer surface of said plug is disposed internally of said socket upon insertion of a tool into said socket thereby permitting rotation of said bolt,

said plug displacement and flush return means including a flange having an annular groove therein at the upper end of said plug, the outer diameter of said flange being substantially the same as the inner diameter of said socket and similarly configured in cross-section to provide a seal between said plug and said socket.

4,822,228

QUICK-ACTION CONNECTION FOR RETAINING AN INSERTION PART IN AN ORIFICE OF A CARRIER

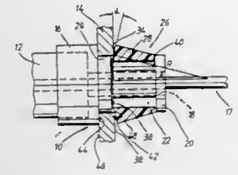
Ernst Senft, Möglingen; Herbert Klemmer, Nürtingen, and Nikolaus Schefscik, Schwaikheim, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 25, 1986, Ser. No. 934,868

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1985, 3541931

Int. Cl.⁴ F16B *21/18*

U.S. Cl. 411—519 **16 Claims**



1. Quick-action connection for retaining an insertion part in an orifice of a carrier wall, such as for a Bowden cable sleeve at a vehicle wall, comprising:

an extension piece having an annular peripheral groove bounded on one end hy a radially protruding tenon part, and a retaining ring carried in the annular groove with a first end face facing the tenon part and a second oppositely facing end face, said retaining ring being resiliently flexible in the radial direction to accommodate insertion thereof through a carrier wall orifice and subsequent radial expansion, to a clamping position, with said second end face abutting the carrier wall adjacent the orifice and the first end face abutting the tenon part,

wherein the retaining ring is a slotted meander-shaped ring with slot-like recesses extending axially from both axial ends of the retaining ring, said slot-like recesses and the wall thickness of the retaining ring being configured to provide different radial restoring forces at respective different axial locations of the retaining ring,

wherein said retaining ring is conically tapered from a maximum diameter at its end facing the carrier wall when in an inserted position, and

wherein the slot-like recesses at the end adjacent the maximum diameter of the retaining ring are axially shorter than are the slot-like recesses at the opposite end of the retaining ring.

4,822,229

INSTALLATION FOR CHARGING A SHAFT FURNACE

Edouard Legille, L-Luxembourg; Emile Lonardi, L-Bascharage, and Germain Schilz, L-Esch sur Alzette, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Mar. 4, 1987, Ser. No. 21,824

Claims priority, application Luxembourg, Mar. 4, 1986, 86335

Int. Cl.⁴ B65G *69/00*; **F23K** *3/06*

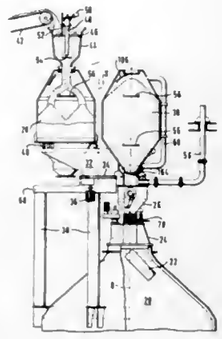
U.S. Cl. 414—21 **12 Claims**

1. An installation for charging a shaft furnace having a spout for distributing charge material inside the furnace, comprising at least two containers for storing the charge material, a sluicing system for introducing the charge material onto the distribution spout and a valve cage which is mounted on a mouth of the furnace and has a flow duct controlled by a metering valve and a sealing valve, and further comprising:

said at least two containers being positioned adjacent each other and each being displaceable horizontally between a first position aligned on the central vertical axis of the furnace wherein the charge material is unloaded from said containers onto the distribution spout, and a second position parallel to, but laterally offset from the central verti-

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cal axis of the furnace wherein said containers are filled with charge material; and



a rotating platform, said containers being mounted on said rotating platform, said rotation platform capable of revolving about a vertical axis parallel with the vertical axis of the furnace.

4,822,230

PIPE HANDLING APPARATUS

Per Slettedal, Ovrebo, Norway, assignor to Maritime Hydraulics A.S., Kristiansand, Norway

Filed Oct. 20, 1987, Ser. No. 110,432
Claims priority, application Norway, Oct. 22, 1986, 864219
Int. Cl.[4] E21B *19/14*
U.S. Cl. 414—22.54 **6 Claims**

rick for connecting with or disconnecting from a drill pipe or stand;

a pipe-supporting strongback comprising means for releasably holding a drill pipe or a stand of drill pipes, said strongback having one end rotatably connected with said drilling device for pivotal movement about said first axis as said drilling device moves up and down relative to said derrick;

a brace unit having a lower end and an upper end;

means pivotally mounting said brace unit to said strongback above said lower end of said brace unit, for angular movement about a second, horizontal axis which is parallel to but transversally displaced from said first axis;

means pivotally supporting said lower end of said brace unit, for angular movement about a third, horizontal axis which is parallel to but transversally displaced from said first and second axes, whereby

as said drilling device is raised and lowered, said strongback is angularly moved about said first and second axes and said brace unit is angularly moved about said second and third axes and consequently a drill pipe or stand, when held by said releasable holding means, is moved between said initial and final substantially horizontal positions, and said approximately vertical drill center position;

said releasable holding means comprising at least two arms mounted to said strongback at respective sites spaced longitudinally therealong, each arm having an openable, closable clamp mounted thereto for releasably holding a drill pipe or stand at respective sites spaced longitudinally along the drill pipe or stand, and means for operating said clamps to open and close them about said drill pipe or stand.



1. A pipe-handling apparatus adapted for automatic drilling operations in which a plurality of drill pipes is manipulated in succession between a substantially horizontal initial or final position, and an approximately vertical drill center position, respectively, as a drill string is made-up and broken-down,

said pipe handling device comprising:

an upright, fixed derrick;

a top-mounted drilling device;

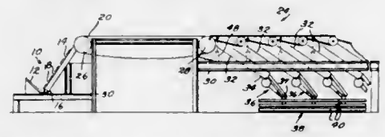
means mounting said drilling device to said derrick for moving up and down, and for rotating said drilling device through a right angle about a first, horizontal axis between a first orientation in which said drilling device projects vertically downwards, for turning a drill pipe, stand or drilling string, and a second orientation in which said drilling device projects horizontally away from the der-

4,822,231

SPACING MEMBER PLACEMENT APPARATUS

Harvey R. Morris, Jr., 6772 Celeste Rd., Saraland, Ala. 36571

Filed Dec. 3, 1986, Ser. No. 937,636
Int. Cl.[4] B65G *57/26*
U.S. Cl. 414—789.5 **19 Claims**



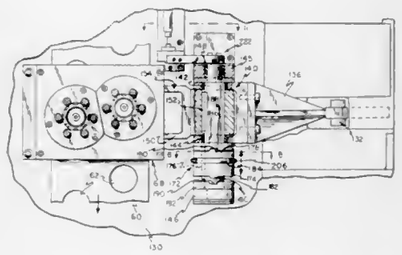
1. Means for delivering a member from magazine means containing a plurality of said members to a depository location comprising a pair of cooperating guide means, each guide means having a first end and an opposite, second end, said first end of one of said guide means having means for moving said first end thereof between a loading position where said first ends of said guide means are spaced apart a predetermined distance and another position wherein said first ends are farther apart from one another than said predetermined distance so that, when said first end of said one of said guide means is moved from said loading position a said member will be moved from the magazine means to be guided by said guide means and along said guide means from a point adjacent a said first end toward said depository location and, when said first ends of said guide means move toward said another position, a said member will be moved in substantial contact with at least one of said guide means toward said second ends of said guide means for discharge from said guide means.

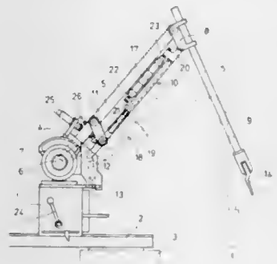
4,822,232

UPSTACKING DEVICE FOR A SHELL CONVERSION PRESS

Vernon C. Gantz, Dayton, and Robert H. Elliott, Vandalia, both of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Filed Jun. 27, 1987, Ser. No. 66,590
Int. Cl.[4] B65G *57/30*
U.S. Cl. 414—795.3 **14 Claims**





1. A device for upstacking generally flat metal ends for cans from an end transport means including an intermittently advancing conveyor means, said upstacking device comprising:

drive means for providing driving power;

input means coupled to said drive means for producing reciprocating rotational motion;

a support frame;

a drive shaft mounted for rotation to said frame along a horizontal axis;

a stacking arm fixedly connected to said drive shaft and having a distal end, whereby reciprocating rotation of said shaft produces rising and falling motion of said distal end between raised and lowered positions;

stack piston means pivotally connected to said distal end of said stacking arm and having a can end engaging surface;

said drive shaft, said stacking arm and said piston means being mounted to said supporting frame such that (a) whenever said stacking arm is in said lowered position, said can end engaging surface is positioned below said conveyor means, and (b) said piston means is aligned with openings in said conveyor means for movement therethrough; and

clutch means for selectively (1) engaging said input means with said drive shaft for reciprocating driving of said stacking arm and said piston means for stacking of said can ends, and alternately, (2) engaging said drive shaft with said frame for locking of said stacking arm and said piston means into said lowered positions.

4,822,233

APPARATUS FOR REMOVING SPRUE SLUGS FROM AN INJECTION MOLDING MACHINE

Mathias Hänsel, Kandern, Fed. Rep. of Germany, assignor to A. Raymond, Lorrach, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 95,261
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1986, 3631314
Int. Cl.[4] B65H *29/02*
U.S. Cl. 414—225 **3 Claims**

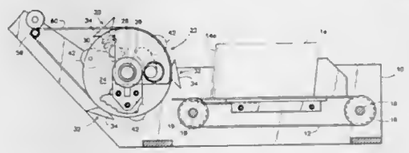
1. Apparatus for removing plastic sprue slugs protuding from a mold half of an injection molding machine, comprising a housing, a swivel arm rotatably mounted at one end in the housing about a horizontal axis, means for rotating the arm between an upper waiting position and a lower gripping position, a gripping arm pivotally mounted at its upper end to the opposite end of the swivel arm, a pair of fingers for gripping the slugs located at the lower end of the gripping arm, means for operating the fingers, a steering rod running parallel to the swivel arm and being pivotally connected between the swivel arm and the gripping arm to form a hinged parallelogram, said steering rod comprising a tube and a rod longitudinally displaceably therein and including a hydraulic cylinder connected between the tube and the rod for altering the length of the steering rod to thereby pivot the gripping arm about the swivel arm without rotation of the swivel arm and cam means for controlling movement of the hinged parallelogram and pivotal movement of the gripping arm upon rotation of the swivel arm, said cam means comprising a roller at the end of the steering rod nearest the housing and two mutually parallel cam surfaces mounted in the housing for guiding the roller, which surfaces upon rotation of the swivel arm from its upper position to its lower position cause the fingers on the gripping arm to first trace a circular path and then a path substantially vertically downward until they reach a protruding sprue slug.

4,822,234

PLATE FEED APPARATUS

Peter E. Johnson; David A. Johnson, both of Corvallis, and George W. Kahl, Albany, all of Oreg., assignors to Tekmax Inc., Tangent, Oreg.

Filed Nov. 16, 1987, Ser. No. 121,422
Int. Cl.[4] B65H *3/08*
U.S. Cl. 414—798.9 **6 Claims**



1. A vacuum supply system for a plate feed apparatus having a plurality of gripping heads with gripping surfaces for engaging a plate, comprising:

(a) a pair of spaced-apart carrier plates;

(b) axle means for rotating said carrier plates as a unit about a central axis;

(c) a plurality of mounting blocks, one associated with each of said gripping heads, spanning between said carrier plates intermediate their centers and their peripheries, said mounting blocks having passageways defined therein which are fluidly interconnected with the gripping surface of the gripping head which is associated with said mounting block;

(d) means for attaching one of said gripping heads centrally on each of said mounting blocks;

(e) one of said carrier plates having a plurality of openings passing therethrough with one of said openings being aligned with each of said passageways;

(f) a first sector plate journaled on said axle means but not rotatable therewith, said first sector plate having an annu-

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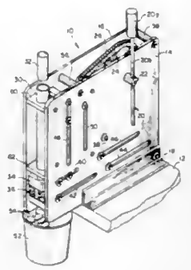
lar slot passing therethrough which has a width approximately equal to the diameter of said opening and is centered on the same radius, relative to said axle means, that said openings are centered on; and

(g) means for connecting said slot to a vacuum source.

4,822,235
DEVICE FOR BREAKING AND STRIPPING COINS FROM A COIN ROLL

David R. Hipp, Box 398B, R.D. #1, Coatesville, Pa. 19320, and Carl D. Hipp, 1632 Pulaski Dr., West Chester, Pa. 19382

Filed Feb. 24, 1987, Ser. No. 18,374
Int. Cl.[4] B65G *65/30*
U.S. Cl. 414—4 11 **17 Claims**



1. A device for breaking a coin roll comprising:

a pair of elements, each element having a channel adapted for receiving a portion of a coin roll;

support means adapted for supporting the pair of elements in a first orientation adjoining one another with the channels of the two elements substantially coaxially aligned to simultaneously receive a coin roll and in a second orientation with the channels of the pair of elements laterally displaced with respect to one another and during a translational movement of at least one of the pair of elements in the first orientation to laterally displace at least one of the aligned channels from the other to provide the second orientation whereby the coin roll simultaneously received in the aligned channels of the pair of elements in the first orientation is broken during the translational movement when the channels of the pair of elements are laterally displaced with respect to one another; and

stripper means for passing through the channel of a first one of the pair of elements.

4,822,236
APPARATUS FOR BOOKING AN ELASTOMER ARTICLE

Seizaburo Inoue, and Glenn D. Ryans, both of Nashville, Tenn., assignors to Bridgestone Corporation, Tokyo, Japan and Bridgestone (U.S.A.), Inc., La Vergne, Tenn.

Filed Mar. 11, 1986, Ser. No. 838,730
Int. Cl.[4] B65G *47/34*
U.S. Cl. 414—591 **9 Claims**

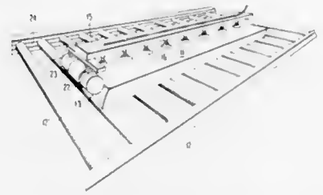
1. An apparatus for booking an elastomer article on a flatcar, comprising;

(a) a conveyor having a multiplicity of rollers connected with a drive means,

(b) means for stopping said elastomer article on said conveyor by contacting said elastomer article on the front portion,

(c) means for grasping said stopped elastomer article having a plurality of vacuum beads,

(d) a spring interposed between said means for stopping and said means for grasping;

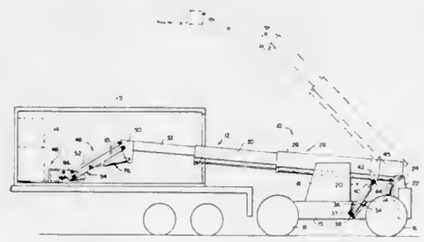


(e) means for transferring said grasped elastomer article to the flatcar, and said stop means fixed on said grasp means.

4,822,237
EXTENDED REACH MATERIALS HANDLING APPARATUS

Joseph A. Meyer, and John H. Frank, both of New Philadelphia, Ohio, assignors to The Gradall Company, New Philadelphia, Ohio

Filed Nov. 21, 1985, Ser. No. 800,577
Int. Cl.[4] B66E *9/065*
U.S. Cl. 414—708 **14 Claims**



1. An extended-reach lifting apparatus adapted for mounting on a supporting frame comprising:

a. a boom means comprising:

(i) a base boom section vertically pivotally supported at one end thereof by said supporting frame;

(ii) at least one telescoping boom section supported by and extendible from and retractable into said base boom section, the end of said at least one telescoping boom section remote from said base boom section when said telescoping boom section is extended comprising the free end of said boom means; and

(iii) means for extending and retracting said at least one telescoping boom section relative to said base boom section;

b. means for vertically pivoting said boom means relative to said supporting frame;

c. a work implement means;

d. an extended tilt head assembly vertically pivotally attached to said free end, said tilt head assembly comprising:

(i) a tilt head support bracket affixed to said free end;

(ii) an upper link member vertically pivotally attached at one end thereof to said tilt head support bracket at a first point thereon;

(iii) a lower link member vertically pivotally attached at one end thereof to said tilt head support bracket at a second point thereon; and

(iv) a second bracket vertically pivotally attached to the other end of said upper link member and to the other end of said lower link member, said second bracket vertically pivotally supporting said work implement means;

e. means for vertically pivoting said upper link member, said lower link member and said second bracket relative to said boom means, said tilt head assembly being effective upon the vertical pivoting of said upper and said lower link members and said second bracket about said boom means to maintain said work implement means in a predetermined vertical orientation; and

f. control means connected to said work implement means for maintaining said work implement means in, alternatively, either a predetermined horizontally level or non-level orientation upon the vertical pivoting of said boom means relative to said supporting frame.

4,822,238
ROBOTIC ARM

Horst Kwech, Lake Bluff, Ill., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 876,018, Jun. 19, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,264
Int. Cl.[4] B25J *21/00, 9/06*
U.S. Cl. 414—730 **20 Claims**

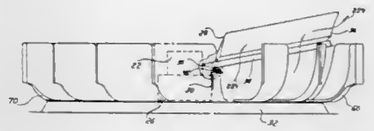


1. A robotic system comprising a robotic arm for work access to the interior of a nuclear vessel and having an operating end for holding an end effector to perform a desired operation within the nuclear vessel and a control end positionable externally of the nuclear vessel comprising, a housing attachable to the nuclear vessel, a mounting frame rotatable on the housing externally of the nuclear vessel, a plurality of arm sections positioned generally in end-to-end relation including a first arm section extending through said housing and having a length to extend from within the nuclear vessel to said control end and having longitudinal movement lengthwise of said housing, said first arm section being connected to said mounting frame for rotation therewith, means on an arm section at the operating end of the robotic arm for holding an end effector, means mounting said arm sections to enable six axes of motion of the operating end of the robotic arm including said longitudinal movement of the first arm section with a plurality of said axes of motion being between arm sections disposed in the nuclear vessel during operation of the robotic arm, means between arm sections operable to effect said plurality of axes of motion, a plurality of motors at the control end of the robotic arm for positioning outside of the nuclear vessel for providing power to said means between arm sections for moving said arm sections to achieve said six axes of motion, means mounting at least one of said motors for said longitudinal movement with said first arm section, and drive trains between certain of said motors and said means between arm sections to cause movement about said plurality of axes of motion.

4,822,239
VERTICAL AXIS WINDMILL

Michael E. Tsipov, 120 Ruth Ellen, Richmond Heights, Ohio 44143

Filed May 13, 1988, Ser. No. 194,088
Int. Cl.[4] F03D *3/04*
U.S. Cl. 415—2 R **12 Claims**



1. A windmill comprising:

a power transfer shaft defining a vertical axis of rotation for the windmill with respect to the Earth's surface;

a plurality of blades, the blades being power transferringly attached to the power transfer shaft and configured to pivot between a power delivery position and a recovery position about an axis generally perpendicular to the vertical axis as defined by the power transfer shaft;

a non-rotating central housing configured to establish an outer pheriphery surrounding the power transfer shaft and blades, thereby defining a plenum;

a plurality of airgates, the airgates being configured and attached to the central housing in a manner permitting pivoting action between a closed position whereby negligible airflow is admitted through the airgate to the central housing and an open position whereby non-negligible air flow is admitted to the central housing, the airgates further including an air dam portion configured to facilitate movement of the airgates from the closed to the open position under the impetus of a desired airflow;

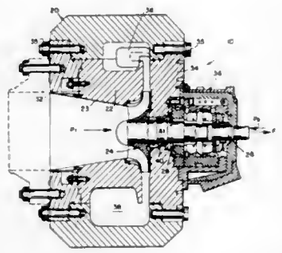
the blades each having an upper and a lower portion with respect to the Earth's gravitation field, the upper blade portion being larger than the lower blade portion;

the blades being of a configuration whereby while the blade is positioned in the power delivery position, the lower blade portion thereof is configured and positioned to collect air flow entering the central housing through the airgates and to channel the airflow towards the axis upon which the blade pivots, the upper blade portion thereof being configured and positioned to collect air flow both entering the central housing through the airgates and passing over the windmill outside the central housing, and to channel the air flow so collected generally parallel to the axis upon which the blade pivots, the blade while in the power delivery position thereby defining and presenting a generally concave surface to air flow passing through the airgates and over the central housing;

the blades further being of a configuration whereby while the blade is positioned in the recovery position, the blade is configured to present a generally convex surface to air flow which may be present both within the central housing and flowing thereover, the upper and lower portions configured and positioned to conduct airflow generally away from the axis along which the blade pivots.

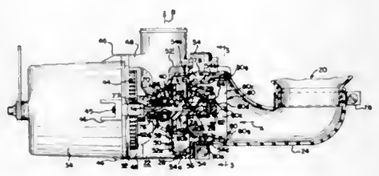
VOL 1101 ISS 3 APR 18 1989 UMI

4,822,240
COMPRESSOR THRUST BALANCER
Dale F. Marshall, Ashburnham, Mass., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 11, 1988, Ser. No. 167,080
Int. Cl.[4] F01D 3/04
U.S. Cl. 415—105 12 Claims



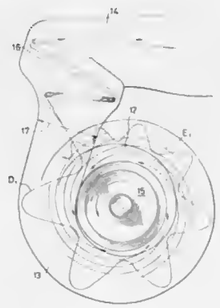
1. A system for balancing thrust in a compressor including a compressor casing having a rotor supported therein; an impeller mounted on one end of the rotor and rotatable therewith; a thrust collar mounted on the rotor and rotatable with the rotor and at least one stationary thrust bearing ring axially adjacent the thrust collar for limiting the axial movement of the rotor; and wherein the thrust balancing system comprises:
- a bearing housing surrounding the thrust collar and the thrust bearing ring;
- an axially slidable sealing ring disposed within one side of the bearing housing and around the outer circumference of the thrust bearing ring;
- means for moving the axially slidable sealing ring into sealing contact with the thrust collar during periods of low compressor rotor speed; and,
- means for pressurizing the bearing housing on the side including the axially slidable sealing ring.

4,822,241
AUTOMATIC DISHWASHER WITH A PUMP HAVING A SELECTIVELY ADJUSTABLE IMPELLER CLEARANCE
Wilbur W. Jarvis, St. Joseph Township, Berrien County, and John I. Smith, Coloma Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Aug. 3, 1987, Ser. No. 80,607
Int. Cl.[4] F01D 5/12
U.S. Cl. 415—132 17 Claims



1. An automatic dishwasher comprising
- an interior washing chamber,
- a pump assembly for pumping liquids into and out of said washing chamber,
- said pump assembly including a motor having a rotatable motor shaft and a pump having both a pump housing and a rotatable impeller disposed in said housing,
- said motor shaft extending into said pump housing and said impeller being disposed along and axially movable along the length of said motor shaft and being configured to be engaged and rotatably driven by said motor shaft, and
- wall means removably securely engaging said pump housing at an inlet end of said pump housing for providing a radially outwardly extending wall surface spaced from said impeller to provide a desired amount of clearance therebetween, the amount of said clearance being determined by the engagement of said pump housing and said wall means.

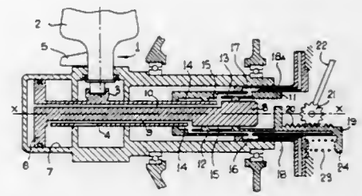
4,822,242
VARIABLE CAPACITY TURBO SUPERCHARGER
Yoichi Yamazaki, No. 6-7, Akebara 3-chome, Kashiwa-shi, Chiba-ken, Japan
Filed Jun. 3, 1988, Ser. No. 201,750
Claims priority, application Japan, Jun. 9, 1987, 61-142203
Int. Cl.[4] F01D 1/08
U.S. Cl. 415—205 2 Claims



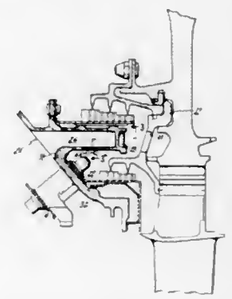
1. In a variable capacity turbo supercharger having a turbine rotor and a nozzle for the turbine rotor which is a vaneless nozzle, the improvement comprising a scroll chamber having a substantially circular sectional profile flow path, said scroll chamber being disposed sidewise of said nozzle, an exhaust gas inlet passage for introducing exhaust gas into said scroll chamber, a fixed swirling generation means for imparting to the exhaust gas passing through said scroll chamber a screw-like swirling of the exhaust gas whose rotational direction is such that the rotation of said gas moves away from said turbine rotor in the neighborhood of the outlet of said scroll chamber into said nozzle.

4,822,243
BLADED ROTOR ASSEMBLIES AND CONTROL MEANS THEREFOR
Michael Poucher, Charlton Kings, England, assignor to Dowty Rotol Limited, England
Filed Apr. 14, 1987, Ser. No. 38,027
Claims priority, application United Kingdom, Apr. 18, 1986, 8609554
Int. Cl.[4] B64C 11/40
U.S. Cl. 416—49 8 Claims

1. A bladed rotor assembly and a control means therefor, which comprises a bladed rotor, a fluid-pressure operable actuator for effecting a change of blade pitch, a first valve member connected to, and movable with, the actuator and having first and second passageways therein for supplying fluid to the actuator for reducing and increasing the pitch of the rotor blade, respectively, and a second valve member co-operable with the first valve member, the second valve member having first and second passageways therein for supplying fluid to the first and second passageways, respectively, of the first valve member, at least when the rotor blades are within a normal operating range of pitch, and mechanical override means being provided to control the position of the second valve member relative to the first valve member, wherein safety means associated with the actuator automatically effects increased blade pitch whenever there is a failure of the mechanical override means.



4,822,244
TOBI
Mark S. Maier, North Palm Beach, and Jesse Eng, Jupiter, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Oct. 15, 1987, Ser. No. 108,528
Int. Cl.[4] F01D 5/08
U.S. Cl. 416—95 3 Claims



1. For a gas turbine engine having a turbine and a source of cooling air for cooling said turbine, TOBI means for directing said cooling air tangentially relative to said turbine, said TOBI means including an housing having an annular passageway, a plurality of circumferentially spaced nozzles in said housing at one end of said passageway and adjacent said turbine, an inlet in said passageway for leading cooling air from said source through said passageway to said nozzles for flowing cooling air into a cavity defined by said turbine and said housing, sealing means between said turbine and said housing for preventing the leakage of air from said cavity, said sealing means having a continuous amount of leakage from said cavity, means for reducing the size of the plume of the cooling air stream ejected from said nozzles and optimize the cooling of said cooling air, said means including a plurality of apertures formed in said housing for communicating with said annular passageway for bypassing a portion of said cooling air and directing it adjacent said sealing means and said plurality of apertures being oriented relative to said housing to impart a tangential velocity to the cooling air discharging therefrom to equal in magnitude and direction the tangential velocity of the cooling air discharging from said nozzles in said TOBI.

4,822,245
TORSIBLE, FLEXIBLE LINKING ARM WITH INTEGRATED FLEXION DAMPING, IN PARTICULAR FOR LINKING A ROTOR BLADE TO ITS HUB, AND ROTOR AND HUB EQUIPPED WITH SUCH ARMS
Jacques A. Aubry, Cabries, and Jean J. E. Azeau, Gardanne, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France
Filed Jun. 2, 1988, Ser. No. 201,160
Claims priority, application France, Jun. 4, 1987, 8707778
Int. Cl.[4] B64C 27/38
U.S. Cl. 416—134 A 22 Claims



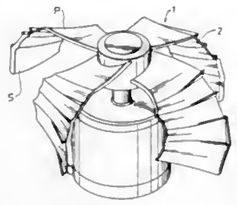
1. Linking arm designed to connect two relatively rigid bodies, such as a rotor blade and a hub (1), permitting limited relative displacements of these bodies equivalent to rotations about at least one axis and, preferably, about three axes orthogonal two by two, and comprising, between two rigid end portions (2,5), each designed to be attached to, or at least partially, integrated with one of the bodies, an elongated central portion (4), flexible in flexion and torsion, ensuring with damping elastic bias towards a mean rest position of the two bodies, and which includes a longitudinal composite bundle (6) of rods (8) that are substantially unidirectional, of high mechanical strength, in particular tensile strength, each of which has a certain elasticity and is formed by the agglomeration of a large number of mineral or synthetic fibres and/or filaments by a polymerised synthetic impregnation resin, each rod (8) being individually encapsulated by a flexible vulcanised elastomer (9), having a relatively low shearing factor and considerable deformation remanence, which agglomerates the said rods (8) forming the said composite bundle (6), characterised in that the elongated portion (4) also includes a longitudinal damping core (7) comprising at least one longitudinal, tight chamber, internal to the bundle (6) and filled with a damping fluid (12), and at least one longitudinal shearing member (13) extending into each chamber and integral by only one of its longitudinal ends with a rigid end portion (2) of the arm (3), so that any deformation of the elongated portion (4) in at least one direction leads to damping complementary to that provided by the encapsulating elastomer (9), and obtained by the shearing of the fluid (12) between the shearing member or members (13) and the composite bundle (6) that surrounds them.

4,822,246
FAN FOR MOVING FLUID AXIALLY AND RADIALLY
Yan-Tung Hsu, No. 9, Floor 2, Alley 2, Lane 437, Nei-Hu Rd., Sec. 1, Nei-Hu Dist., Taipei, Taiwan
Filed Jul. 19, 1988, Ser. No. 221,049
Int. Cl.[4] F04D 29/28
U.S. Cl. 416—175 6 Claims

1. A fan including a motor shaft, and a plurality of circumferentially spaced first blades fixed on a first axial position of an end of said motor shaft, characterized in that each of said first blades includes a series of radially interconnected oblique planes which are all inclined circumferentially of said motor shaft in a direction which allows them to press or suck fluid when said motor shaft rotates, outer one of any adjacent two of said oblique planes extending radially outwardly from said inner adjacent plane toward the other end of said motor shaft at an angle of less than 90 degrees so that said first blades are

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generally L-shaped, outermost one of said oblique planes of each of said first blades being generally parallel to said motor



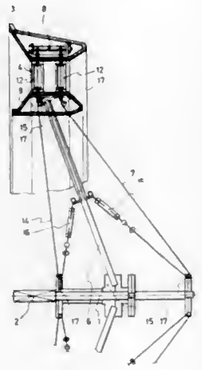
shaft, whereby, fluid can be pressed or sucked axially and radially of said motor shaft.

4,822,247

ROTOR FOR A WIND-DRIVEN GENERATOR

Alberto K. Heinz, Calle 77 A, No. 11 - 92, Bogota, Colombia

Filed Aug. 8, 1986, Ser. No. 894,559
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528672
Int. Cl.[4] F03D 1/06
U.S. Cl. 416—189 5 Claims



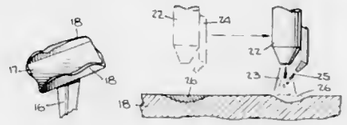
1. A rotor for a wind driven generator comprising:
(a) a carrier member;
(b) an axial bearing means disposed on the carrier member;
(c) a hub disposed on the carrier member adjacent to and rotatably supported by the bearing means;
(d) the hub includes:
i. a first flange disposed at or near the end of the hub nearest the bearing means;
ii. a second flange disposed at or near the other end of the hub; and
iii. a third flange disposed between the first and second flanges;
(e) a plurality of pressure elements mounted to and extending outwardly from the third flange and angled towards the bearing means;
(f) an inner ring comprising a plurality of first arcuate sections disposed in essentially the same rotational plane as the bearing means and supported by and mounted to the pressure elements;
(g) an outer ring comprising a plurality of second arcuate sections disposed in essentially the same rotational plane as the bearing means and outside of the inner ring where one second arcuate section corresponds to each first arcuate section;
(h) a plurality of blades disposed where one blade is disposed between each first arcuate section and corresponding second arcuate section;
(i) a plurality of first deflectors where one first deflector is disposed inside each first arcuate section perpendicular to the longitudinal axis of the carrier;
(j) a plurality of second deflectors where one second deflector is disposed in each second arcuate section substantially parallel to the longitudinal axis of the carrier;
(k) a plurality of third deflectors where one third deflector is disposed in each first arcuate parallel to the first deflector disposed in the same first arcuate section;
(l) a plurality of flexible first tension elements where each first tension element:
i. is connected at one end to a pressure element;
ii. disposed in sliding relation in the second flange;
iii. disposed against a first deflector means in sliding relation;
iv. disposed against a second deflector means in sliding relation;
v. connected at the other end to a second deflector means disposed in an adjacent second arcuate section
(m) a plurality of second tension elements where each second tension element means is:
i. connected at one end to a pressure element;
ii. disposed in sliding relation in the first flange;
iii. disposed against a third deflector in sliding relation;
iv. disposed against a second deflector in sliding relation;
v. connected at the other end to a second deflector disposed in an adjacent second arcuate section to circumferentially support the outer ring.

4,822,248

REBUILT SHROUDED TURBINE BLADE AND METHOD OF REBUILDING THE SAME

Timothy A. Wertz, Manahawkin; Gilbert A. Saltzman, Howell, and Ira L. Friedman, Rumson, all of N.J., assignors to Metallurgical Industries, Inc., Tinton Falls, N.J.

Filed Apr. 15, 1987, Ser. No. 38,855
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] F01D 5/12, 5/14, 5/20
U.S. Cl. 416—192 18 Claims



1. A shrouded turbine engine blade comprising
a blade root;
an airfoil extending form said blade root;
a shroud on said airfoil opposite said blade root, said shroud having a notch at each of two opposite ends and a projection on said opposite ends; and
a metallurgically bonded wear resistant surface made from powdered metal and applied on at least one of said notches and said projections by a plasma transferred arc generated at a low amperage sufficient to melt and cast the powdered metal while holding the heat imparted to said shroud to a minimum and holding the dilution of the wear resistant surface by the base material of said shroud to a minimum.

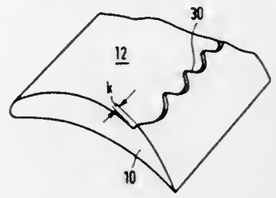
13. A method of rebuilding a shroud of an airfoil having at least one outwardly extending rib defining a seal, said method comprising the steps of
creating a transferred plasma arc between an electrode and the rib; and
feeding powdered metal particles into the arc for depositing a series of overlapping weld deposits on the rib to form a wear resistant layer thereon, said layer being metallurgically bonded to the rib and maintaining the transferred plasma arc at a low amperage sufficient to melt and cast the powdered metal while holding the heat imparted to the rib to a minimum and holding the dilution of the wear resistant layer by the base material of the rib to a minimum.

4,822,249

AXIAL FLOW BLADE WHEEL OF A GAS OR STEAM DRIVEN TURBINE

Dietrich Eckardt, Munich, and Arthur Schäffler, Vierkirchen, both of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union Munich GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 629,265, Jul. 10, 1984, abandoned. This application Dec. 23, 1986, Ser. No. 946,449
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325663
Int. Cl.[4] F01D 5/14
U.S. Cl. 416—235 19 Claims



1. An axial blade wheel of a gas or steam driven turbine comprising a plurality of spaced blades defining passages for fluid flow therebetween, each blade being of streamline shape and having a transverse cross-section with an upper suction surface of convex shape and a lower pressure surface so that fluid flowing in said passages is accelerated to a region of maximum velocity and decelerated downstream thereof, and means providing a continuous spoiler edge at said upper suction surfaces of said blades at a location downstream of said maximum velocity region for minimizing development of large separation bubbles at said suction surface due to transition of flow of a boundary layer from laminar to turbulent conditions for fluid flow in said passages, said continuous spoiler edge facing upstream at said suction surface and extending substantially the length of the respective blade, said spoiler edge being of saw tooth profile in a plane tangential to the upper surface of the blade, said upstream facing spoiler edge projecting a distance k from the profile of said upper suction surface which distance k is given by the relation

$$1.5 < \frac{k}{\delta_2} < 3.5,$$

for Reynolds numbers Re_k between 50 and 200
wherein:
δ_2 is the impulse loss of the boundary layer on the suction surface at a location directly upstream of said spoiler edge and is expressed by the relation

$$\delta_2 = \frac{1}{U^2} \int_0^\infty u(U-u)dy$$

y=the distance measured along the coordinate extending in the direction of projection of the spoiler edge relative to the profile of the upper suction surface;
u=f (y), velocity component tangential to the profile surface;
U=velocity of the fluid flow undisturbed by friction;

$$Re_k = \frac{U_k \cdot k}{\nu_k};$$

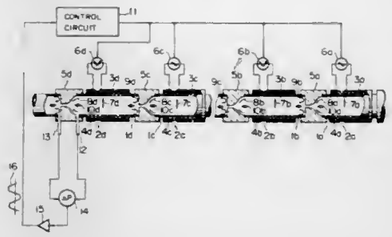
ν_k=kinematic viscosity of the fluid at the spoiler edge.

4,822,250

APPARATUS FOR TRANSFERRING SMALL AMOUNT OF FLUID

Kuniyoshi Tsubouchi, Mito; Shohei Yoshida, Hitachi; Kiyoshi Namura, Ibaraki; Tsutomu Okusawa, Hitachi, and Akira Arai, Tsukuba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 29,095, Mar. 23, 1987. This application May 25, 1988, Ser. No. 198,223
Claims priority, application Japan, Mar. 24, 1986, 61-64092; May 29, 1987, 62-131406
Int. Cl.[4] F04B 49/06
U.S. Cl. 417—45 7 Claims



1. In an apparatus for transferring a small amount of fluid, including:
at least one row of a plurality of vibration pump units connected in series, each pump unit including a fluid transfer pipe having fluid inlet and outlet ends, a vibrator surrounding said fluid transfer pipe to cause the same to make respiring vibration, an inner peripheral electrode disposed between said fluid transfer pipe and said vibrator, an outer peripheral electrode disposed on an outer periphery of said vibrator, and a high-frequency voltage applying means for applying a high frequency voltage across said inner and outer peripheral electrodes:
an orifice means disposed between each adjacent pair of pump units for allowing a fluid to flow easily from one of the pair of pump units into the other pump unit and exhibiting a resistance to a reversing flow of the fluid whereby the fluid is transferred from said one pump unit into the other pump unit; and
an additional orifice means connected to the fluid outlet end of the most downstream pump unit;
the high-frequency voltage applying means of respective pump units being controlled such that the vibrators of respective pump units are operated with a predetermined phase difference maintained between each adjacent pair of pump units to minimize pulsation of the fluid pressure at the fluid outlet end of the most downstream pump unit of the apparatus,
the improvement which comprises:
means for detecting a pressure differential across at least one of all of said orifice means to produce a differential pressure signal; and
means for controlling said high-frequency voltage applying means to control the fluid transferring rate of the apparatus based on said differential pressure signal.

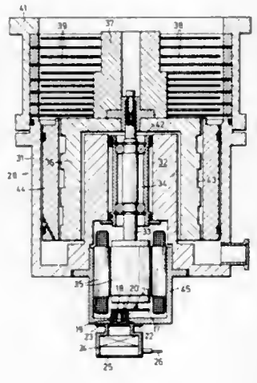
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4,822,251

VACUUM PUMP HAVING AN RPM-MEASURING DEVICE

Hans Amrath, Viersen, and Zoltan Szöcs, Bonn, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 162,222
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1987, 8703108[U]
Int. Cl.[4] F04B *39/00*; F01D *25/00*
U.S. Cl. 417—63 10 Claims



1. In a vacuum pump having a housing, a pump shaft having a terminal shaft portion, a bearing member mounted in the housing and supporting said pump shaft, a rotor affixed to the pump shaft; said housing having a housing wall forming, with said bearing member, a side chamber, said terminal shaft portion projecting through said bearing member into said side chamber; and a device for measuring the rpm of the rotor; the improvement wherein said device comprises

(a) an inductive sensor held in said housing wall;

(b) a ferromagnetic member mounted on said terminal shaft portion for rotation in unison therewith; said ferromagnetic member including pulse inducing means for inducing in said inductive sensor electric pulses at a rate proportionate to the rpm of the rotor;

(c) output means operatively connected to said inductive sensor for rendering said electric pulses accessible.

(d) an aperture provided in said housing wall;

(e) a bowl-shaped receptacle held in the housing wall and projecting through said aperture into said side chamber; said inductive sensor being accommodated in said bowl-shaped receptacle; said bowl-shaped receptacle having a base wall oriented towards said ferromagnetic member and being situated within said side chamber beyond said aperture in said housing wall; said base wall constituting a nonmagnetic partition separating said inductive sensor from said side chamber; and

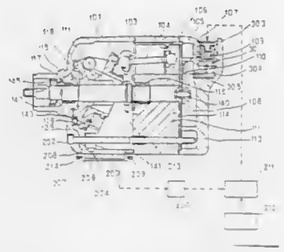
(f) an additional receptacle adjoining said bowlshaped receptacle; said additional receptacle being arranged for receiving electronic components.

4,822,252

VARIABLE CAPACITY COMPRESSOR

Hiroshi Ishikawa, Nagoya, and Hidetaka Shingai, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 16, 1987, Ser. No. 74,063
Claims priority, application Japan, Jul. 28, 1986, 61-177104; May 20, 1987, 62-124138
Int. Cl.[4] F04B *1/26*
U.S. Cl. 417—222 16 Claims



1. A variable capacity compressor comprising of:

a cylinder housing having a plurality of cylinders each of which is parallel with each other,

a cover housing connected to said cylinder housing having inner surfaces that form a pressure chamber between said cover housing and said cylinder housing,

a shaft rotatably provided beneath said cover housing,

a rotating member connected to said shaft so that said rotting member and said shaft rotate in synchronism,

a rotating plate swingably connected with said rotating member so that said rotating plate wobbles within said pressure chamber when the rotation of said shaft is transferred to said rotating plate,

a wobble plate rotatably supported on said rotating plate so that said wobble plate wobbles within said pressure chamber without rotation,

a piston slidably provided within said cylinder,

a rod connecting said piston to said wobble plate,

a through member provided within said pressure chamber in such a manner said through member is parallel with said shaft,

a slider slidably connected with said through member and rotatably connected with said wobble plate so that said slider reciprocates along with said through member when said wobble plate wobbles,

a magnet connected to an end portion of said slider that a direction of flux connecting N pole and S pole of said magnet is the same as a direction of reciprocating movement of said slider, and

a plurality of magnetic sensors facing said magnet.

4,822,253

MACHINE INSTALLATION FOR A HEAT PUMPING PLANT

Roland Nuber, Lindau, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Sep. 17, 1986, Ser. No. 908,337
Int. Cl.[4] F04B *35/00, 39/06*
U.S. Cl. 417—364 10 Claims

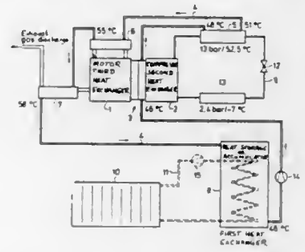
1. A machine installation including a Wankel-type drive motor and a refrigeration compressor, a refrigerant circuit, twin cooling chambers for the motor and the compressor and a cooling water circuit that flows through a compressor cooling chamber, a refrigerant heat exchanger, a motor cooling chamber and a motor exhaust in that order, said Wankel-type drive motor being of trochoidal type of construction with a common housing consisting of a central middle part with two-arc trochoidal-shaped mantle raceway and two side parts, which have an eccentric continuous shaft in common passing

at right angles therethrough, upon an eccentric of the eccentric shaft there being a triangular piston rotating thereon and a compressor of the same type of construction as well as including a primary circuit therewith, comprising:

an intermediate part provided between said motor and said compressor, said intermediate part having two parallel annular chambers arranged axially adjacent to each other, of which one annular chamber is located toward the motor;

a first heat exchanger located in a cooling water circuit between an inlet and an outlet for flow-through of the primary circuit; and

second and third heat exchangers operatively connected and



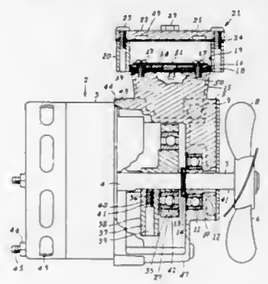
associated therewith so that the annular chamber located toward the compressor is located in the primary circuit between an output of the first heat exchanger and an input of the second heat exchanger of the working medium of the compressor and furthermore that the outlet passage of the the compressor and furthermore that the outlet passage of the motor leads to a third heat exchanger for the motor exhaust gases, which third heat exchanger has flow therethrough from the primary circuit after passage through the second heat exchanger for the working medium of the compressor and then via a further head exchanger for the cooling water of the motor, whereby the outlet of this third heat exchanger for the primary circuit leads to an inlet of the first mentioned first heat exchanger.

4,822,254

OSCILLATING CYLINDER PUMPING ARRANGEMENT

Walter F. Prien, Dyer, Tenn.; Meredith W. Meece, and John H. Bolthouse, II, both of Ouachita, La., assignors to TI Pneumotive, Inc., Louisville, Ky.

Continuation of Ser. No. 717,979, Mar. 29, 1985, abandoned.
This application Sep. 28, 1987, Ser. No. 101,735
Int. Cl.[4] F01B *15/00*; F04B *35/04*
U.S. Cl. 417—368 6 Claims



1. A pumping arrangement comprising:

a motor having a stator with an open ended axial flow path therethrough and at least one output shaft centered on a longitudinal axis and including at least one shaft portion projecting axially out of said stator;

at least one crankcase stationary with respect to said stator and arranged around said shaft portion;

at least one piston component rigid with and extending outwardly of said crankcase along a reciprocation axis extending substantially normal to said longitudinal axis;

at least one cylinder component arranged around said piston component and cooperating with said piston component to define a pumping chamber;

means for sealing the interface between said piston and cylinder components;

means for admitting a fluid being pumped into and for discharging such fluid from said pumping chamber;

valve means operative for controlling the flow of the fluid being pumped through said admitting and discharging means;

eccentric means mounted on said shaft portion and centered on an eccentric axis substantially parallel to and transversely offset from said longitudinal axis and orbiting said longitudinal axis during the rotation of said shaft portion with attendant eccentric movement of said eccentric means about said longitudinal axis;

said eccentric means having a pair of laterally projecting diametrically opposite ears;,

a pair of elongated bolts straddling said crankcase and removably secured in said ears connecting said eccentric means with said cylinder component to cause said cylinder component to share in said eccentric movement of said eccentric means and thus to conduct a reciprocating and tilting oscillating movement with respect to said piston component; and

blower means mounted on said shaft portion for joint rotation therewith, said blower means causing ambient air to flow at least around the exterior of said at least one crankcase and through said axial flow path of the stator, thereby effecting cooling of said at least one cylinder and said at least one piston.

4,822,255

PUMP FOR PRESSURES EXCEEDING ONE THOUSAND ATMOSPHERES BY THE PROVISION OF A HALF-PRESSURE CHAMBER AROUND A HIGH PRESSURE CHAMBER BETWEEN CONED RING ELEMENTS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 788,174, Oct. 16, 1965, Pat. No. 4,701,113, which is a continuation-in-part of Ser. No. 282,990, Jul. 14, 1981, Pat. No. 4,557,347, and a continuation-in-part of Ser. No. 387,567, Jun. 11, 1982, Pat. No. 4,569,630. This application Apr. 8, 1987, Ser. No. 37,910
Int. Cl.[4] F04R *43/10*
U.S. Cl. 417—401 4 Claims

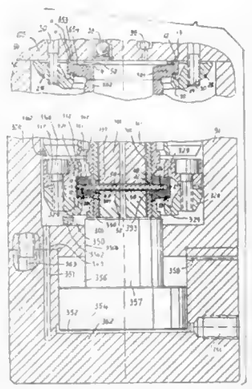
1. A pump including a fluid containing inner chamber (**50**) formed between at least two hollow coned ring elements (**1,11** or **301**) and at least one closing wall portion, formed by a piston (**357**), subjected to periodic axial movement with axial compression and expansion of said coned ring elements by said piston (**357**) which is reciprocably provided in a cylinder (**356**) and a housing (**91,306**) surrounding and coned elements for forming an outer chamber (**350**) around said elements with fluid under pressure passed into said outer chamber at times when fluid is compressed in said inner chamber when said coned rings are compressed, with an improvements whichincludes that said piston is a differential piston of a small diameter and a big diameter portion with said small diameter portion forming said closing wall portionand said big diameter portion provided axially moveably and sealingly fitting in said cylinder,

wherein a passage is provided from said cylinder to said outer chamber,

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wherein said big diameter portion has a cross sectional area substantially twice the cross sectional area of said small diameter portion

whereby at thrusting movement of said piston against said coned ring the pressure in said outer chamber is due to the relation of said sectional areas substantially one half of the pressure in said inner chamber, and;



wherein clamping rings are provided around said coned ring elements to keep pairs of oppositionally directed elements of said coned ring elements closely and sealingly together with said clamping rings filling at least a major portion of said outer chamber to prevent excessive compressible fluid in said outer chamber.

4,822,256

BEARING SUPPORT FOR SPHERICAL PUMPS

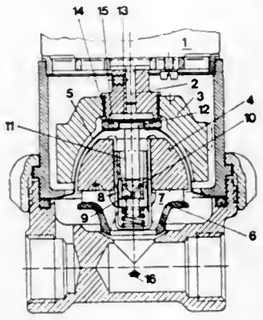
Karsten Laing, 1253 La Jolla Rancho Rd., La Jolla, Calif. 92037

Filed Jun. 9, 1986, Ser. No. 871,829

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1985, 3520596

Int. Cl.⁴ F04D *13/02;* **H02K** *49/10;* **F16C** *17/10*

U.S. Cl. 417—420 **1 Claim**



1. Spherical bearing consisting of a rotating bearing cap (9) and a stationary spherical bearing member (10), said spherical bearing member being mounted on a strut (11) for a pump which forms a unit with an electric motor, the pump having an impeller (6,7) which forms a unit with a driven annular rotor (4) with a spherical surfaces, said rotor (4) being separated from a driving portion of the motor by a thin-walled, spherical, magnetically permeable separation wall (5) consisting of a corrosion resistant metal, characterized in that the strut (11) of the spherical bearing member (10) consists of a metal having the same eletro-chemical potential as the separation wall (5) and that the strut (11) has a foot portion (12), said foot portion being situated inside of a protrusion (13) at the nadir of the separation wall (5) the protrusion having a cylindrical wall portion which is surrounded by a metal ring (14) said metal ring being elastically expanded producing centripetally oriented forces on said cylindrical wall portion of the protrusion (13) so that the foot portion (12) is clamped by friction forces.

4,822,257

PUMP ARRANGEMENT, PARTICULARLY FOR PUMPING WATER FROM DEEP WELLS

Björn Olofsson, Mångatan 44, S-195 00 Märsta, Sweden

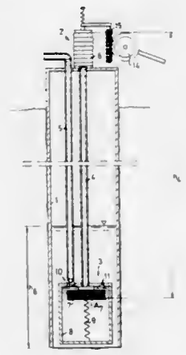
PCT No. PCT/SE87/00013, § 371 Date Aug. 31, 1987, § 102(e) Date Aug. 31, 1987, PCT Pub. No. WO87/04498, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 15, 1987, Ser. No. 101,297

Claims priority, application Sweden, Jan. 16, 1986, 8600190; May 16, 1986, 86002244

Int. Cl.⁴ F04B *43/10, 47/04*

U.S. Cl. 417—389 **6 Claims**



1. In a pump arrangement for pumping water from deep wells including a feed pump unit (2) located at ground level which transits power and motion to a delivery pump unit (3) to raise water through a delivery pipe (5) connected to the delivery pump unit via a pressure valve (10) during a working stroke and to draw water into the delivery pump unit through a well-water inlet pipe via a suction valve (11) during a return stroke, the improvement which comprises

(a) a closed hydraulic system connecting said feed pump unit with said delivery pump unit, comprising

(1) a first compressible and expandable chamber (6) arranged in said feed pump unit;

(2) a second compressible and expandable chamber (7) arranged in said delivery pump unit; and

(3) a hydraulic line (4) hydraulically connected said first and second chambers; and

(b) return spring means (9) for supporting compression of said second chamber during the return stroke, said return spring means including

(1) a housing (901) open at its upper end, said upper housing end being connected in sealed relation with the bottom of said second chamber;

(2) a longitudinal member (903) connected with the bottom of said second chamber and vertically displaceable within said housing upon compression and expansion of said second chamber;

(3) a plurality of belleville washers (906) arranged in stacked relation within said housing and supporting the bottom of said longitudinal member, said stack of washers providing a pretensioning force to said second chamber via said longitudinal member in accordance with the number of washers in said stack, said sealed

housing preventing contaminants from contacting said longitudinal member and said washers to ensure smooth operation and a long life of said pump.

4,822,258

IN-TANK FUEL PUMP

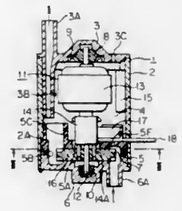
Takashi Matsuda; Ryozo Suzuki; Shingo Iwai, and Ryoji Ikeda, all of Hiroshima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 27, 1988, Ser. No. 148,915

Claims priority, application Japan, Jan. 30, 1987, 62-13199

Int. Cl.⁴ F04B *17/00, 39/00*

U.S. Cl. 417—423.3 **1 Claim**



1. An in-tank type fuel pump having a body including a fuel inlet, a pump chamber and a fuel chamber, an impeller disposed in said pump chamber, a motor for rotating said impeller, said motor being disposed in said fuel chamber, wherein said fuel chamber includes, adjacent said pump chamber, an annular channel in communication with said pump chamber and a through hole opening into said channel, said fuel inlet, and said fuel chamber, to establish communication therebetween, whereby liquid fuel may flow from said fuel chamber into said pump chamber.

4,822,259

SYSTEM OF COMPRESSING MISCIBLE FLUIDS

Narcizo O. Basseggio, Av. FCha̲ul, 376/401-Cristal, CPE 90650, Porte Alegre, R.S., Brazil

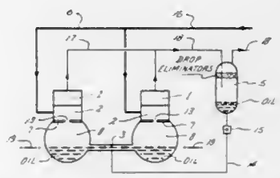
PCT No. PCT/BR86/00009, § 371 Date Apr. 14, 1987, § 102(e) Date Apr. 14, 1987, PCT Pub. No. WO86/07415, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 11, 1986, Ser. No. 44,363

Claims priority, application Brazil, Jun. 14, 1985, P18502912

Int. Cl.⁴ F01M *11/06;* **F04B** *39/02*

U.S. Cl. 417—426 **5 Claims**



1. A system of parallel compressors for compressing fluids miscible with oil, comprising:

a plurality of compressors connected in parallel;

means for internally separating each compressor into a discharge chamber, a suction chamber, and a crankcase chamber, the chambers of each compressor being independent of one another;

conduit means for connecting the crankcase chambers in oil and gas flow communication with one another;

a suction manifold connected to the suction chambers;

means for equalizing the pressure of each crankcase chamber with the pressure of the suction manifold comprising a capillary tube connecting each crankcase chamber in gas flow communication with the suction manifold at a common point on said suction manifold;

a discharge manifold connected to the discharge chambers;

means connected to the discharge manifold for separating oil from compressed fluids leaving the discharge chambers; and

means for returning the oil from the oil separating means to the crankcase chambers.

4,822,260

DEVICE FOR CONTROLLING FLUID SUPPLY TO A ROTARY PISTON MACHINE

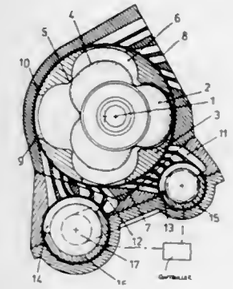
Hans Baumgartner, Viersen; Ulrich Henke, Übach-Palenberg; Manfred Brandstädter, Düsseldorf; Klaus Heikrodt, and Herbert Schneider, both of Krefeld, all of Fed. Rep. of Germany, assignors to Pierburg GmbH, Fed. Rep. of Germany

Filed Sep. 17, 1987, Ser. No. 97,941

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631574; Feb. 12, 1987, 3704336

Int. Cl.⁴ F04B *49/00;* **F04C** *2/04*

U.S. Cl. 417—440 **10 Claims**



1. A device for controlling a rotating-piston machine having inner and outer rotors rotating at unequal speeds of rotation and provided with profiled teeth which form gaps to define working chambers which move, with change of volume, from an inlet region to an outlet region, said device comprising a body having a feed channel for a working fluid, a plurality of supply channels which open into said inlet region and two rotary slide valve means for controlling communications between the feed channel and the supply channels to fill the working chambers during development of suction therein upon rotation of said rotors, said body having two round cutouts, said two rotary slide valve means comprising respective rotary slide valves each in a respective one of said cutouts, said supply channels being arranged in two groups one for each rotary slide valve so that one slide valve controls supply of fluid at the beginning of development of suction in each working chamber while the other slide valve controls supply of fluid at the end of development of suction in each working chamber, each cutout being connected to said feed channel, and to respective associated pluralities of supply channels and means coupled to said slide valves for rotating the same to control supply of fluid to the supply channels in the respective two groups and thereby control the respective supply of fluid at the beginning and end of suction development in each working chamber.

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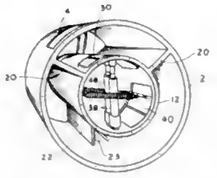
LOW HEAD, HIGH VOLUME PUMP APPARATUS

Don E. Avery, 45-437 Akimala St., Honolulu, Hi. 96744, and Bryan F. Young, 66-489 Pikai St., Honolulu, Hi. 96712

Continuation-in-part of Ser. No. 802,289, Nov. 27, 1985, Pat. No. 4,699,574. This application Oct. 13, 1987, Ser. No. 106,810

Int. Cl.[4] F04B *39/08, 11/00*

U.S. Cl. 417—540 **21 Claims**



1. A low head, high volume pump comprising an inner cylinder and a substantially larger outer cylinder joined as two vertical concentric cylinders, vertical partitions between the cylinders dividing a space between the cylinders into an inlet chamber and an outler chamber which is substantially larger in volume than the inner cylinder to form an air chamber to reduce pump pulsations, upper and lower inlet ports between the inlet chamber and the inner cylinder and upper and lower outlet ports between the outlet chamber and the inner cylinder, spring loaded valves in the ports for permitting flow from the inlet chamber to the cylinder and for permitting flow from the cylinder to the outlet chamber, a piston in the inner cylinder, upper and lower end covers on the inner cylinder, a piston rod connected to the piston and extending through one of the end covers, an inlet connected to the inlet chamber, an outlet connected to the outlet chamber, wherein the springs on the valves at the inlet ports are tension springs and extend through the outer cylinder, and the springs on the valves at the outlet ports are tension springs and extend through the inner cylinder.

4,822,262

ROTARY ENGINE HAVING ROLLERS FOR THE APEX SEAL

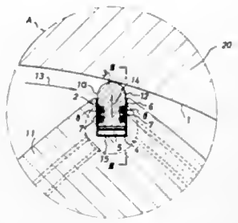
Yoshihiro Bando, Tokushima, Japan, assignor to Bando Kiko Co., Ltd., Tokushima, Japan

Continuation of Ser. No. 931,795, Nov. 18, 1986, abandoned. This application Sep. 1, 1988, Ser. No. 240,434

Claims priority, application Japan, Nov. 19, 1985, 60-260449; Jun. 23, 1986, 61-147281; Aug. 2, 1986, 61-182546

Int. Cl.[4] F01C *19/04, 19/08, 21/00*

U.S. Cl. 418—120 **1 Claim**



1. A rotary engine having two side housings opposed to each other, a rotor housing and a rotor rotatably mounted in said rotor housing which has a plurality of apex portions and first and second recesses formed in the respective ends of each of said apex portions, said rotary engine comprising:

a seal groove formed on each of said apex portions and extending in parallel with a rotary axis of the rotor, said seal groove having an inner wall surface;

an apex seal having first and second side surfaces and first and second ends, said apex seal being disposed within said seal groove wherein said apex seal can be displaced radially outwardly from said rotary axis;

at least one recessed groove formed on said inner wall surface of said seal groove;

a plurality of elongate rollers each having first and second ends and being disposed within said recessed groove whereby said inner wall surface of said seal groove is in rolling contact with said first side surface of said apex seal when said second side surface of said apex seal receives a pressure of combustion operation; and

first and second corner seals respectively arranged in said first and second recesses so as to be able to contact said side housing airtightly, each of said corner seals having a first hollow portion for receiving an end of said apex seal and opened toward said side housing, and a second hollow portion for receiving said end of said apex seal and an end of each of said rollers, said second hollow portion being extended continuously from said recessed groove.

4,822,263

SLIDING-VANE ROTARY COMPRESSOR

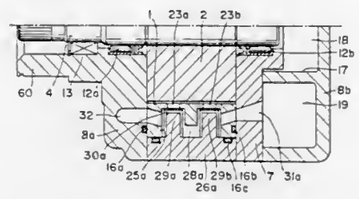
Nobuyuki Nakajima; Kenichi Inomata, and Shigeru Okada, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 107,364

Claims priority, application Japan, Oct. 27, 1986, 61-255234

Int. Cl.[4] F04C *18/344*

U.S. Cl. 418—133 **4 Claims**



1. A sliding-vane rotary compressor for compressing a lubricating oil containing gas, said compressor comprising:

(a) a cylinder having an intake hole and a discharge hole, said discharge hole having first and second ends, a rotor rotatably disposed in said cylinder for defining therebetween an operating compartment, said rotor carrying thereon a plurality of substantially radially movable sliding vanes, and there being defined between said cylinder, said rotor and said vanes a plurality of compression chambers which vary in volume with each revolution of said rotor for compressing a gas sucked therein through said intake hole and for thereafter discharging the compressed gas therefrom through said discharge hole;

(b) a first head closing one of opposite open ends of said cylinder;

(c) a side block closing the other open end of said cylinder;

(d) a second head secured to said side block;

(e) said side block and said second head defining therebetween a low pressure chamber communicating with said intake hole and defining therebetween a high pressure chamber communicating with said discharge hole;

(f) a recess defined in an outer surface of said cylinder, said first end of said discharge hole opening to said operating compartment and said second end of said discharge hole opening to said recess for fluidly communicating said operating compartment and said recess;

(g) a cover secured to said cylinder and extending over said recess for closing the latter, there being defined between said cylinder and said cover a valve receiving chamber;

(h) a tubular discharge valve disposed in said valve receiving chamber for opening and closing said discharge hole;

(i) a discharge connecting hole defined in said first head, said cylinder and said side block, said discharge connecting hole extending between said recess and said high pressure chamber, and said discharge connecting hole having means for separating a lubricating oil from a lubricating oil containing gas for collecting in said high pressure chamber; and

(j) an intake port and a discharge port in one of said first and second heads, said intake port communicating with said low pressure chamber, and said discharge port communicating with said high pressure chamber.

4,822,264

REVERSIBLE TWIN-CHAMBERED COMPRESSED-AIR MOTOR

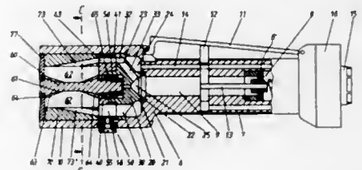
Konrad K. Kettner, Aalen-Hofherrnweiler, Fed. Rep. of Germany, assignor to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 823,549, Jan. 29, 1986, abandoned. This application Apr. 10, 1987, Ser. No. 37,270

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1986, 3503032

Int. Cl.[4] F01C *1/344, 13/02, 21/12*

U.S. Cl. 418—150 **18 Claims**



1. A reversible twin-chambered compressed-air motor comprising:

a cylinder having at least a substantially elliptical internal contour;

a rotor constructed and arranged to fit within said cylinder so that a chamber is formed on either side of said rotor;

a plurality of radially sliding vanes uniformly distributed about the peripbery of said rotor, said radially sliding vanes extending over the entire length of said cylinder and being fitted in axial slots in said rotor;

said cylinder having a closing cover and a rotor cover fitted on either end of said rotor to form with said cylinder; said rotor and two of said vanes a pair of chambers for compressed air;

said rotor cover being rotatably sealed for alternately connecting said cylinder to a compressed-air inlet and an air outlet;

said air outlet constructed and arranged to lie in a rotating direction of said rotor behind the large semi-axis of said substantially elliptical internal contour of said cylinder during both clockwise and anti-clockwise operation.

4,822,265

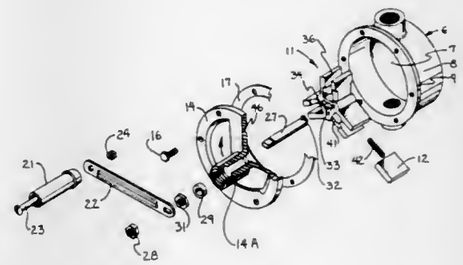
PUMP ROTOR

Paul R. Johnson, Kentwood, and Kevin M. Wheeler, Plainfield Township, Kent County, both of Mich., assignors to Dover Resources, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 894,605, Aug. 8, 1986, abandoned. This application Apr. 5, 1988, Ser. No. 180,608

Int. Cl.[4] F04C *2/344, 15/00*

U.S. Cl. 418—182 **5 Claims**



1. A rotary, sliding-vane pump, comprising:

a pump cylinder having an inner circumferential wall defining a chamber, means defining an inlet and an outlet communicating with said chamber at circumferentially spaced-apart locations and first and second transverse parallel end walls closing the opposite axial ends of said pump cylinder;

a rotor having an axis of rotation, said rotor being disposed in said chamber and having parallel opposite axial end walls slidably engaging said end walls of said cylinder so that said rotor can only rotate and move radially in said chamber, said rotor having a central core and at least three pairs of parallel, vane-guiding walls defining slots, which walls and slots extend substantially radially outwardly from said central core of said rotor, said slots being circumferentially spaced apart equal distances, the spaces between said pairs of walls being open and unobstructed, said central core having a blind-ended, centrally located socket coaxially with the axis of rotation of said rotor and which opens through one axial end wall of said rotor, said socket having a groove extending radially outwardly therefrom partway to the perimeter of said central core, the axial ends of said rotor being free from support by said pump cylinder so that said rotor is free to rotate and move radially relative to said pump cylinder;

a plurality of vanes corresponding in number to the number of said pairs of vane-guiding walls, each vane being disposed between the walls of one of said pairs of vane-guiding walls and supported for radially sliding movement relative to said rotor so that the radially outer ends of said vanes constantly contact said inner wall of said pump cylinder;

a rotatable shaft having an axis of rotation and extending through one of said end walls of said pump cylinder and extending into and terminating within said blind-ended socket of said rotor said blind-ended socket having a larger diameter than the diameter of the portion of said shaft that is received therewithin so that said rotor is free to move radially inwardly and outwardly with respect to said shaft to a limited extent, the portion of said shaft that is received within said socket having a single drive pin extending radially outwardly therefrom into said groove to drivingly interconnect said shaft and said rotor so that rotation of said shaft will rotate said rotor and said rotor will be free to move radially to a limited extent with respect to said shaft;

the axes of said rotor and said shaft being eccentric with respect to said pump chamber so that when said shaft is rotated, said rotor, said vanes and said pump cylinder form movable, expansible and contractible pumping chambers to pump liquid from said inlet to said outlet;

and drive means connected to said shaft and adapted for rotating said shaft and thereby rotating said rotor with respect to said pump cylinder.

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4,822,266

SLIDE FALLING PREVENTION DEVICE IN A TIRE VULCANIZER

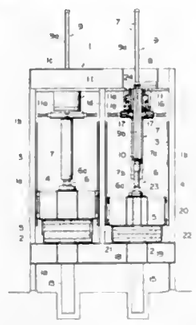
Itaru Amano, Kobe; Yasuhiko Fujieda, Akashi, and Kashiro Ureshino, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 5, 1988, Ser. No. 177,950

Claims priority, application Japan, Apr. 15, 1987, 62-58111[U]

Int. Cl.⁴ B29C *33/20, 35/00*

U.S. Cl. 425—34.1 **3 Claims**



1. A device for preventing a slide from falling in a tire vulcanizer, including a vulcanizer frame, a fixed lower die fixedly located on said vulcanizer frame, a slide adapted to be lifted and lowered along said frame, a movable upper die retained to said slide and adapted to be vertically opened and closed relative to said lower die, a vertically moving member provided at a central position of said slide for opening and closing said upper die, a hollow pressure member provided at the central position of said slide for applying pressure to said upper die, said hollow pressure member being located diametrically outside said vertically moving member in such a manner as to be concentric with and separate from said vertically moving member, a pressure device mounted to said vulcanizer frame in such a manner as to surround said hollow pressure member, an upper die height adjusting mechanism for connecting said slide with said hollow pressure member; and a movable pressure member provided in said pressure device and a locking member disengageably mounted to said movable pressure member in such a manner as to surround said hollow pressure member, said locking member being disengaged from the hollow pressure member, when the hollow pressure member is lifted to raise the upper die and is engaged with the hollow pressure member at a position intermediate thereof when the hollow pressure member is in a die clamping position.

4,822,267

APPARATUS FOR PRODUCING SUPERFINE POWDER IN SPHERICAL FORM

Alfred Walz, Am Kurzarm 7, D-7830 Emmendingen, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,018

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3533964

Int. Cl.⁴ B29B *9/00*

U.S. Cl. 425—7 **13 Claims**

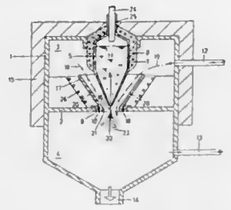
1. Apparatus for producing superfine spherical powder of diameter of about 5–30 pm from molten multifilaments formed from a molten stream of a metal or ceramic material, comprising

a container including an upper gas space, a gas feed inlet, a material inlet, and an outlet for gas and molten material;

an axially elongated propellant gas feeder funnel of substantial length extending within said upper gas space to said outlet, said funnel tapering to a zone of most narrow cross-section and defining a rotationally symmetrical Laval nozzle at said outlet, said funnel being formed of a heat conductive refractory material;

gas feeding means for feeding a gas, which is nonreactive with the molten material, through said funnel and through said Laval nozzle in a laminar flow exceeding a supersonic rate downstream of said zone of most narrow cross-section;

molten material feeding means for feeding a stream of molten material through at least a lower part of said funnel to said Laval nozzle which stream then separates into molten multifilaments downstream of said zone of most narrow



cross-section, said molten material feeding means comprising a molten material reservoir having a sidewall tapering to an outlet through which the molten material passes as a stream, said molten material outlet being within and spaced from at least a lower part of said funnel and being spaced above the level of said Laval nozzle; and

means for superheating the molten material stream as it passes through at least said lower part of said funnel and said Laval nozzle from the side opposite the molten material reservoir and radiating heat from said funnel and said nozzle to said molten stream prior to stream separation into molten multi-filaments.

4,822,268

CONVEYING AND TREATMENT APPARATUS FOR MOULDS FILLABLE WITH A CASTABLE, SOLIDIFYING BODY, SUCH AS CHOCOLATE MASS

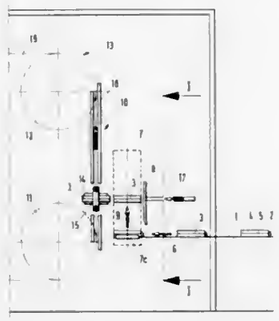
Uwe Bindler, Bergneustadt, and Theo Schürholz, Reichshof-Eckenhagen, both of Fed. Rep. of Germany, assignors to Gebr. Bindler GmbH & Co, KG, Bergneustadt, Fed. Rep. of Germany

Filed Feb. 12, 1988, Ser. No. 155,190

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704761

Int. Cl.⁴ B29C *32/36, 39/04*

U.S. Cl. 425—454 **9 Claims**



1. In a conveying apparatus having moulds comprising one or two superimposed plates defining mould cavities for a castable, solidifying material, the apparatus having a circulating endless conveyor which has supporting and retaining elements for receiving and turning the moulds, that improvement wherein a horizontally extending conveying means for the moulds is disposed in front of a vertically ascending portion of said endless conveyor, and disposed between the vertically ascending portion of said endless conveyor and the conveying means is a transfer device from which the moulds taken over from the conveying means are transferable in synchronism by means of pushing device to the supporting and retaining elements of said endless conveyor.

4,822,269

VENT TYPE INJECTION MOLDING MACHINES

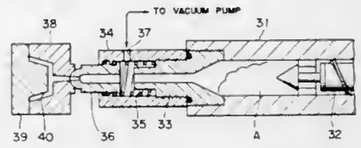
Takashi Kamiyama, and Shigeru Fujita, both of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1987, Ser. No. 87,203

Claims priority, application Japan, Aug. 20, 1986, 61-194496; Aug. 27, 1986, 61-200892

Int. Cl.⁴ B29C *45/22, 45/34*

U.S. Cl. 425—203 **3 Claims**



1. In a vent type injection molding machine of the type comprising a heating cylinder, injection nozzle means having a vent port and connected to a front end of said heating cylinder, and a rotatable and reciprocatable screw acting as resin metering means and contained in said heating cylinder, the improvement wherein:

said injection nozzle means comprises a first injection nozzle connected to the front end of said heating cylinder, a second injection nozzle coaxial with said first injection nozzle, spring means interposed between said first and second injection nozzles for urging the second injection nozzle against a stationary metal mold and a housing surrounding said first and second injection nozzles and connected to said heating cylinder or said first injection nozzle;

said vent port being provided through said housing at a point communicated with a space in said housing axially between said first and second injection nozzles; and further comprising

means for closing said vent port during an injection stroke of said machine.

4,822,270

DEVICE FOR FORMING OF THERMOPLASTIC PRODUCTS EQUIPPED WITH UNDERCUTS

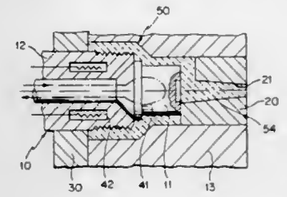
Giancarlo Bonissone, and Piero Mulas, both of Genoa, Italy, assignors to F. I. P. Formatura Iniezione Polimeri S.p.A., Genoa, Italy

Filed Jun. 6, 1987, Ser. No. 47,199

Int. Cl.⁴ B29C *39/38, 39/34, 41/40*

U.S. Cl. 425—289 **8 Claims**

1. Apparatus for molding a thermoplastic bushing comprising, a mold shell open at opposite ends, a mold core made of two parts comprising a core pin having a forward major diameter portion and a rear minor diameter portion, said core comprising an externally threaded core sleeve disposed in use circumferentially of the minor diameter portion of the core pin slidable axially relatively thereto and having an outer diameter greater than the diameter of the major diameter portion of the core pin, said mold core being disposed in use internally of the mold shell jointly defining therewith a mold cavity corresponding in shape to a shape of the thermoplastic bushing being molded and having a thermoplastic major diameter portion internally threaded and and integral thermoplastic truncated portion of lesser diameter, a feeder bushing defining one end of the mold cavity and having an open feeder opening eccentrically in communication with the cavity for delivery of thermoplastic material into the mold cavity, a plate through which said core sleeve extends disposed closing an opposite end of the mold cavity, said feeder bushing being rotatable for shearing off a thermoplastic sprue after the thermoplastic



bushing has been molded and movable axially out of the mold shell, the mold sleeve being axially movable relative to the molded bushing to expose it on the mold core, said plate being movable toward the molded bushing when exposed to apply compression to the molded bushing while in a plastic state to cause the major diameter portion of the molded bushing to swell outwardly and release the externally threaded core sleeve for permitting the core to be moved axially partially out of the molded bushing thereby to release the molded bushing from the apparatus mold for removal from the core in a completely molded state.

4,822,271

MACHINE FOR THE MANUFACTURE OF SHORT CUT PASTA, IN PARTICULAR ORECCHIETTE, CAVATELLI ETC.

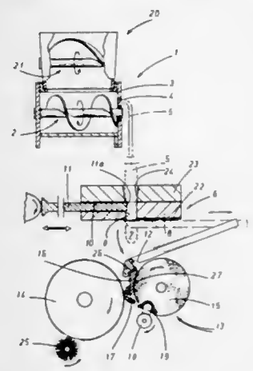
Franco Annicchiarico, and Adima Pilari, Both of Via Roma, 12, 40065 Pianoro (Bologna), Italy

Filed May 16, 1988, Ser. No. 194,487

Claims priority, application Italy, May 29, 1987, 3499 A/87

Int. Cl.⁴ B29C *47/08*

U.S. Cl. 425—296 **12 Claims**



1. An improved machine for manufacturing short cut pasta, comprising:

an infeed unit for receiving pasta mix, comprising a first screw feeder, the end of which is associated with a plate having at least one hole from which a continuous stick of pasta is extruded and allowed to fall;

a cutting unit, into which the pasta stick descends and is

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severed into discrete cylindrical pellets, said cutting unit being located downstream of the infeed unit and comprising a first plate having a first hole for each stick of pasta through which the stick is made to pass, said first plate being provided with a first seat one end of which emerges into the first hole and serves as a guide for a rod able to reciprocate between a retracted position, and an extended position, said rod having a butt end projecting beyond an end of the seat and into the first hole in order to separate the pasta stick from the wall of the hole; and a blade positioned against an underside of the first plate, said blade being capable of movement through a looped path comprising a first stretch in which said blade strokes horizontally, parallel and against the first plate, and moving between a retracted position and an extended position to a point where a cutting edge of said blade passes through and severs the pasta stick into a cut cylindrical pellet, and a second stretch in which said blade rotates downward, said cut cylindrical pellet accompanying said blade in its descent;

a gathering and shaping unit by which the cut cylindrical pasta pellet is gathered and shaped, said gathering and shaping unit being located downstream of the cutting unit and comprising a first roller of a rigid material, and a second roller of a soft material, said rollers being positioned on either side of a vertically disposed forming plate, said forming plate having a bead at a bottom edge thereof directed toward and interacting with the first roller so that said pellet wraps around the bead while one of its surfaces remains in direct contact with said first roller; a third roller, positioned beneath the forming plate on the same side as that occupied by the second roller, which rotates in the opposite direction to that of the second roller in the same direction of said first roller, said third roller being provided with a projection that sinks into the second roller during rotation of said third roller, in such a way that the pasta pellet will be impinged upon and shaped into a cup; and means, located beneath said first roller serving to clean an outer surface of the first roller.

9. An improved machine for manufacturing short cut pasta, comprising:

an infeed unit for receiving pasta mix, comprising a first screw feeder the end of which is associated with a plate having at least one hole from which a continuous stick of pasta is extruded and allowed to fall;

a cutting unit, into which the pasta stick descends and is severed into discrete cylindrical pellets, said cutting unit being located downstream of the infeed unit and comprising a first plate having a first hole for each stick of pasta through which the stick is made to pass, said first plate being provided with a first seat, one end of which emerges into the first hole and serves as a guide for a rod able to reciprocate between a retracted position and an extended position said rod having a butt end projecting beyond an end of the seat and into the first hole in order to separate the pasta stick from the wall of the hole; and a blade positioned against an underside of the first plate, said blade being capable of movement through a looped path comprising a first stretch in which said blade strokes horizontally, parallel and against the first plate, moving between a retracted position and an extended position to a point where a cutting edge of said blade passes through and severs the pasta stick into a cut, cylindrical pellet, and a second stretch in which said blade rotates downward, said cut cylindrical pellet accompanying said blade in its descent;

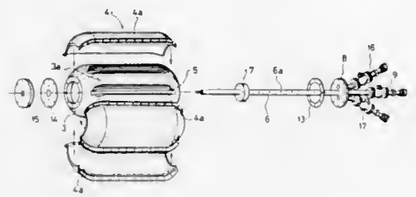
a gathering and shaping unit by which the cut cylindrical pasta pellet is gathered and shaped, located downstream of the cutting unit and comprising a first and a second roller both fashioned of a rigid material, which rotate in opposite directions about parallel axes, flanking one another and distanced apart such that the gap between them will be less than the diameter of the first hole in the first plate through which the pasta stick is made to pass and the descending pellet can be taken up between their outer surfaces and flattened; a first vertically disposed forming plate, located substantially between the first and second rollers, the bottom edge of which affords a bead directed toward and interacting with the first roller so that said pellet wraps around the bead while one of its surfaces remains in direct contact with said first roller; a second forming plate, positioned beneath the first forming plate and extending downward therefrom, said second forming plate exhibiting at least one hole, located near the bead, affording passage of a finger having transverse dimensions less than the diameter of said at least one hole and capable of movement between a retracted and a distanced position from the at least one hole, said finger standing by while the flattened pellet of pasta moves into position over the hole; and extended, such that an end of the finger passes through the hole, contacting the flattened pellet of pasta and shaping it into a cup with the assistance of the hole itself; and means by and from which the finger is carried and derives its movement.

4,822,272

MANDREL FOR USE IN A MANUFACTURE OF AN ARTICLE MADE OF COMPOSITE MATERIAL

Motoaki Yanase, and Tatsuya Yamamoto, both of Kakamigahara, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 15, 1987, Ser. No. 108,697
Claims priority, application Japan, Oct. 17, 1986, 61-245362
Int. Cl.[4] A01J *21/00*
U.S. Cl. 425—328 **5 Claims**



1. Apparatus comprising a flexible mandrel having an outer forming surface and a mould adapted to be disposed about the mandrel for forming an article of a composite fiber reinforced thermosetting resin by applying heat and pressure to the resin in the mould, the mandrel comprising a hollow body formed of an alloy which becomes super plastic at a predetermined temperature at which the resin cures, the body having port means for introducing into the body a heating and pressurizing medium for heating the body to said predetermined temperature and for deforming the body to press the fiber reinforced resin against the mould to cure the resin and form said article.

4,822,273

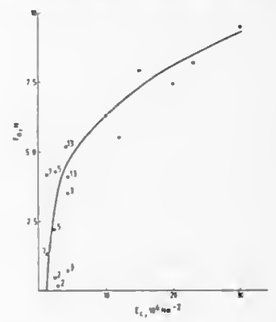
APPARATUS FOR STAMPING A DETERGENT BAR

Michael J. Adams, and Brian Edmondson, both of Cheshire, England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 147,397, Jan. 25, 1987, Pat. No. 4,793,959.
This application Sep. 9, 1988, Ser. No. 242,754
Claims priority, application United Kingdom, Jan. 26, 1987, 8701635
Int. Cl.[4] B29C *59/02*
U.S. Cl. 425—385 **8 Claims**

1. In an apparatus for stamping a detergent bar comprising means for locating a detergent bar, at least one die member,

and drive means for moving said at least one die member relatively towards said bar to stamp said bar,



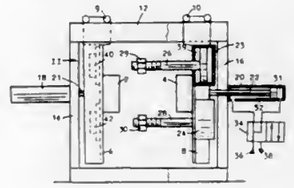
the improvement wherein said at least one die member has a total modulus of elasticity within the range 10^5 to 5×10^7 Nm^{-2}.

4,822,274

HYDRAULIC CLAMPING UNIT FOR A MOLDING APPARATUS

Harry Chan, 89 Larkin Ave., Markham, Ontario, Canada L3P 4R1, and Basilio Yi, 35 Hoover Dr., Thornhill, Ontario, Canada L3T 5M6

Filed Jan. 20, 1988, Ser. No. 146,265
Int. Cl.[4] B29C *45/67, 49/56*
U.S. Cl. 425—450.1 **4 Claims**



1. A hydraulic clamping unit for a molding apparatus, the unit including:

a pair of opposed complimentary mold halves attached accordingly to a pair of opposed platens, at least one of which is moveable toward another into engagement of the mold halves to form a mold cavity which surrounds a molded article of a thermoplastic material;

at least one clamp hydraulic cylinder having two ends each of which is connected to the different platens for exerting pressure on the latter to keep the mold halves closed during formation of the article, the cylinder being of a pull type, having a piston rod chamber pressurized to exert said pressure on the platens;

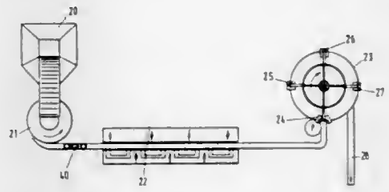
at least one rapid traverse kicker cylinder connected to said moveable platen by means of a locking mechanism operating at the end of the stroke of said kicker cylinder and including a pair of opposite complimentary locking plates attached to said moveable platen, at least one of the plates being moveable toward another plate into engagement with the clamp cylinder by means of at least one locking cylinder.

4,822,275

APPARATUS FOR OPENING AND CLOSING MOLD HALVES

Hermann Voss, Seevetal, and Manfred Mank, Hamburg, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,532
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729451
Int. Cl.[4] B29C *49/56*
U.S. Cl. 425—539 **2 Claims**



1. An apparatus for opening and closing a blow mold, said blow mold comprising first and second mold halves and common pivot means for said mold halves, said apparatus comprising first rocker arm means operatively connected to each said mold half, said first rocker arm means comprising a guide arm member mounted on said mold half;

second rocker arm means operatively connected to said first rocker arm means, said second rocker arm means comprising a coupling member, said coupling member having first and second opposed end regions, first pivot means mounted in said first end region for pivotally connecting said coupling member to said guide arm member, second pivot means mounted in said second end region of said coupling member and guide means pivotally connected to said second end region of said coupling member by said second pivot means; and

drive means operatively connected to said second rocker arm means, said drive means comprising cylinder means fixedly mounting said guide means of said second rocker arm means, said cylinder means including an external curved surface, said curved surface defining cam track means, cam roller means engaging in said cam track means and sliding cam controller means mounting said cam roller means whereby actuation of said drive means causes pivotal movement of said first and second rocker arm means causing said mold halves to pivot about an axis, said axis conciding with said common pivot means.

4,822,276

CHILD-PROOF CIGARETTE LIGHTER

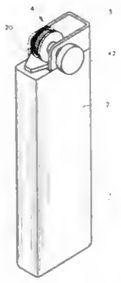
Jerry L. Bisbee, 38153 Erie Rd. #20B, Willoughby, Ohio 44094

Filed Jun. 13, 1988, Ser. No. 206,089
Int. Cl.[4] F23D *11/36*
U.S. Cl. 431—153 **10 Claims**

1. A pyrophoric igniter, of the type commonly used in cigarette lighters, comprising a pyrophoric material held against a friction wheel that is rotatable about an axle, which axle is supported on each end thereof by axle support means, the rotating of said friction wheel abrades said pyrophoric material, thereby generating sparks that ignite a fuel; the improve-

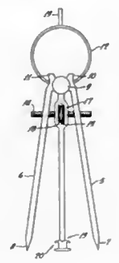
VOL 1101 ISS 3 AP 18 1989 UMI

ment in said igniter consists of a mechanically biased clutch means capable of preventing the rotation of said friction wheel



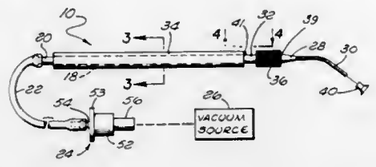
while said mechanical biasing clutch means is engaged, said clutch means may be selectively engaged or disengaged.

4,822,277
ORTHODONTIC TRIVIDER
Vincent J. Nevell, 164 Edinburgh Street, Coffs Harbour Jetty, N.S.W., Australia
Filed Dec. 15, 1987, Ser. No. 132,966
Claims priority, application Australia, Dec. 22, 1986, PH9618; May 11, 1987, PI1844; Sep. 18, 1987, PI4436
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—3 **11 Claims**



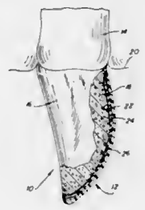
1. Orthodontic apparatus comprising:
a pair of arms co-extending from a hinge at one end thereof,
a screw member spaced from said hinge and threadingly connecting said arms,
a manually rotatable wheel fixed to the mid-portion of said screw member for rotation thereof,
said screw member having oppositely-handed threads on each side of said wheel such that rotation thereof causes said arms to move inward or outward with respect to each other,
a further arm, attached to said hinge and extending between said pair of arms, coupled to said wheel so as to maintain a fixed position relative to the positions of each of said pair of arms,
said further arm being provided with bracket retaining means at its end remote from said hinge.

4,822,278
DENTAL VENEER INSTRUMENT
Richard A. Oliva, Los Angeles; Leland M. Perkins, Thousand Oaks, and Charles W. Westrick, Huntington Park, all of Calif., assignors to The Wilkinson Dental Manufacturing Company, Inc., Westlake Village, Calif.
Filed Oct. 16, 1987, Ser. No. 109,995
Int. Cl.[4] A61C *17/04*
U.S. Cl. 433—91 **27 Claims**



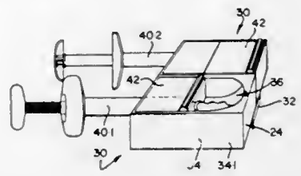
1. A dental instrument for use in supporting and handling a dental veneer or the like, said instrument comprising:
an elongated handpiece having front and rear ends and defining an internal passage extending therebetween, said rear end being adapted for connection to a vacuum source; and
a substantially transparent tip mounted generally at said front end of said handpiece, said tip being formed from a resilient elastomer and defining an outwardly opening and generally cup-shaped base for engaging a dental veneer, the interior of said generally cup-shaped base being in communication with said handpiece internal passage whereby the dental veneer is vacuum-supported against said base when said handpiece internal passage is coupled to the vacuum source.

4,822,279
ARTICLE FOR COSMETIC RESTORATION OF ANTERIOR TEETH
Thomas S. Greggs, Wheaton, Ill., assignor to Denneer Corporation, Armonk, N.Y.
Continuation of Ser. No. 620,439, Jun. 14, 1984, abandoned, which is a division of Ser. No. 485,281, Apr. 15, 1983, Pat. No. 4,473,353. This application Dec. 4, 1986, Ser. No. 938,370
Int. Cl.[4] A01C *13/08*
U.S. Cl. 433—202.1 **10 Claims**



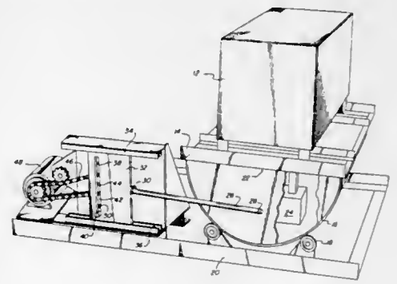
1. A custom-made homogenous porcelain labial veneer adapted to be bonded to the labial enamel surface of a cosmetically defective tooth, said labial veneer comprising:
a thin rigid porcelain coating of substantially uniform thickness, said veneer being custom fabricated to conform to said tooth so as to define a posterior concave bonding surface, fitted to conform to the labial bonding surface of such tooth and to extend to the proximal and incisal margins of said labial bonding surface, and an anterior veneer surface custom fabricated to be of such color, shade and shape as to cosmetically conform to the patient's other teeth.

4,822,280
DISPENSER FOR LIGHT CURABLE SUBSTANCES
John D. M. Rider, 410 Compen Building, 146 Commercial Road, Pietermaritzburg, 3220, South Africa
Filed May 15, 1987, Ser. No. 51,135
Claims priority, application South Africa, May 19, 1986, 86/3721
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—229 **8 Claims**



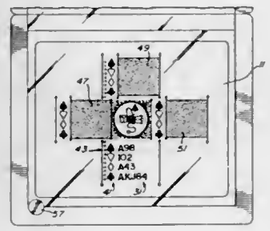
1. A dispenser for dispensing light curable substances, which includes:
a body in the form of a box;
at least one dispensing formation into which a light curable substance can be charged from a storage container for dispensing purposes, said dispensing formation being in the form of a recess within said box, said recess being at least partially dish-shaped to facilitate dispensing of said light curable substance therefrom for dental applications by a dentist;
closure means for closing off said dispensing formation and isolating any light curable substance therein from light; and
means for locating and holding said storage container within said body during and subsequent to charging, said locating and holding means including a charging opening in the box through which said light curable substance can be charged into said recess from said storage container, said storage container being a storage syringe, with said charging opening being adapted to receive, locate and hold said syringe body therein, with the end through which said substance can be dispensed from the syringe being in communication with said recess.

4,822,281
SHIPBOARD TRANSPORTATION SIMULATOR
Gayle T. Zajicek, Savanna, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Division of Ser. No. 410,777, Aug. 23, 1982, abandoned. This application Apr. 2, 1986, Ser. No. 848,104
Int. Cl.[4] G09B *9/06*
U.S. Cl. 434—29 **4 Claims**



1. A shipboard transportation simulator consisting of

4,822,282
ASSEMBLY TO DEMONSTRATE AND TEACH THE GAME OF BRIDGE
Leonard Weinstein, Montreal, Canada, assignor to IKN Communications Inc., Montreal, Canada
Filed Sep. 9, 1986, Ser. No. 905,137
Int. Cl.[4] G09B *19/22*
U.S. Cl. 434—129 **21 Claims**



1. An assembly for teaching a game of bridge by sequentially revealing four hands of bridge from a dealer's hand to and including right side opponent's hand and representing the sequentially revealed hands on an image reproducing surface, thereby enabling learners or students to discuss and analyze bidding with a bridge teacher and suggest a play for each hand until suggestions made indicate how to reach a contract, said assembly comprising
a sheet capable of being represented on said image reproducing surface, said sheet displaying four pre-determined bridge hands, including a dealer's hand, left side opponent's hand, dealer's parter's hand and right side opponent's hand, said hands being arranged in a cross wise manner in the above-mentioned sequence,
means overlying said sheet to individually conceal said four bridge hands,
means associated with said overlying means for revealing, on said image reproducing surface, said four bridge hands including said dealer's hand to said right side opponent's hands, one full hand being revealed at a time, and
means enabling the teacher to sequentially reveal hands on said image reproducing surface.

4,822,283
SEMANTIC MAPPING DEVICE FOR TEACHING LANGUAGE SKILLS
Lois M. Roberts, W 1952 Roosevelt Rd., Oconomowoc, Wis. 53066
Filed Feb. 8, 1988, Ser. No. 153,421
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—171 **4 Claims**

1. A teaching aid comprising a plurality of sets of pieces of

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progressively smaller size ranging from largest to large to small to smallest,

one piece being common to a plurality of sets and being the largest piece in each such set,

each piece having a surface treated to accept legends which may be removed,

each of said pieces including connecting means on the periphery thereof limiting connection of each such piece in



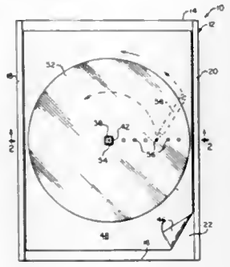
each said set to being placed in contact only with a next larger or a next smaller piece whereby information is mapped semantically with the main idea or concept represented by said largest piece common to a plurality of sets and each progressively more detailed concept is represented by a progressively smaller piece in a set while other sets representing additional detailed concepts are connected to said common piece.

4,822,284

EDUCATIONAL APPLIANCE FOR TEACHING HANDWRITING SKILLS

Martha G. Cohen, 18 W. Valley Brook Rd., Long Valley, N.J. 07853

Filed Jul. 25, 1988, Ser. No. 223,644
Int. Cl.[4] G09B *11/00*
U.S. Cl. 434—162 **20 Claims**



1. An educational appliance for teaching handwriting skills comprising:

a planar tablet having an inscribable surface;

an overrunning clutch mounted to said tablet, said clutch oriented to permit rotation in a counterclockwise direction;

a rotatable member having an axis of rotation and at least one aperture spaced radially outward from said axis of rotation, said aperture configured to receive a writing implement operable to inscribe a circle beneath said member as it rotates about said axis of rotation; and

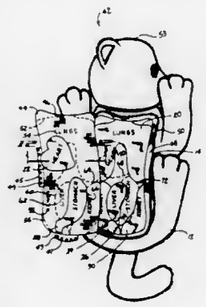
means for removably connecting said rotatable member to said clutch so that said member rotates only in a counterclockwise direction, thereby causing the writing implement which is received in said aperture to inscribe a circle on said inscribable surface of said tablet during rotation of said member by manual manipulation of the writing implement, and thereby instilling a habit in a user of drawing circles in a counterclockwise direction.

4,822,285

ANATOMICALLY STUFFED TOY ANIMAL

Stephan W. Summerville, 7149 Mariposa Ave., Citrus Heights, Sacramento, Calif.

Filed Feb. 10, 1988, Ser. No. 154,589
Int. Cl.[4] G09B *23/34*; **A63H** *3/02*
U.S. Cl. 434—272 **8 Claims**



1. A new and improved anatomically stuffed toy animal, comprising:

an animal shaped body portion formed from a fabric covering filled with a stuffing material;

a hollow abdominal cavity in said body portion;

a flap for selectively closing said hollow abdominal cavity;

fastening means for securing said flap in a closed position;

a plurality of stuffed fabric internal organs removably received in said abdominal cavity;

first fastening means on a back surface of each of said internal organs;

an inner wall of said abdominal cavity provided with cooperating second fastening means for securing said internal organs in anatomically correct locations; and

imprinted outlines and indicia on said inner wall of said abdominal cavity indicating anatomically correct locations of said internal organs.

4,822,286

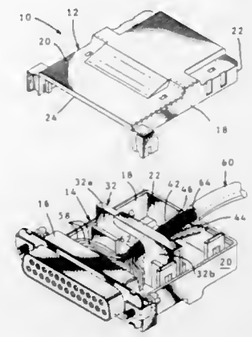
HOOD HAVING AN INTEGRAL STRAIN RELIEF FOR USE WITH ELECTRICAL CONNECTORS

Giuseppe Bianca, Stouffville, Canada, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 12, 1988, Ser. No. 193,010
Int. Cl.[4] H01R *13/58, 13/658*
U.S. Cl. 439—610 **2 Claims**

1. A protective hood for use with an electrical connector of the type having several wires extending away therefrom, said hood comprising:

two mateable halves formed frorm a suitable plastics material, each having side and end walls with a groove in said end wall and an inwardly projecting cantilever shell attached to said end wall in alignment with said groove, said halves, upon being mated together, provides a cavity for receiving the electrical connector, an opening through said end walls and a tapered strain relief member formed by cooperation of said shells, said strain relief member projecting into said cavity and having a passage in alignment with said opening for receiving and closely encircling wires extending from the electrical connector which



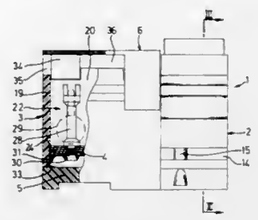
may be in said cavity, said strain relief member being capable of accepting a range of wire or cable sizes.

4,822,287

ELECTRICAL CONNECTOR MODULE INCORPORATING COMPONENTS

Lucien Blanchet, Le Vesinet, France, assignor to Air LB, Colombes, France

Filed Jun. 2, 1988, Ser. No. 201,214
Claims priority, application France, Jun. 10, 1987, 87 08088
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—76 **8 Claims**



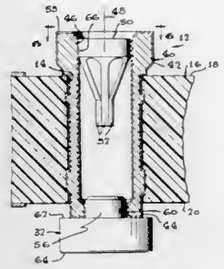
1. Electrical connector module comprising an insulative material connector body open at the bottom, a plurality of female contacts in said connector body, holes in an upper part of said connector body, male contacts adapted to be attached to the ends of electrical conductors and to be received by said female contacts through said holes, means for establishing electrical connections between said female contacts, at least one component housing open at the bottom thereof and adjacent at least one side wall of said connector body and formed in one piece with said connector body, a common wall dividing said connector body from said component housing, exterior walls of said connector body and said component housing, said common wall extending a lesser distance in the downward direction than said exterior walls, a printed circuit board carrying said female contacts and having components thereon, on said printed circuit board being inserted into said connector body and said component housing from said bottom so that the part thereof carrying said female contacts is in said connector body and the remainder thereof carrying said components is in said component housing, and a selectively attachable base adapted to close off the bottom of said connector body and the bottom of said component housing below said printed circuit board.

4,822,288

PIN PANEL CIRCUIT BOARD ASSEMBLY

Larry Conley, 11146 Blue Allium, Fountain Valley, Calif. 92708

Filed Sep. 14, 1987, Ser. No. 96,680
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—84 **4 Claims**



1. A pin system for installation in a circuit board that has upper and lower opposite surfaces and a plurality of board holes, comprising:

a main shaft having upper and lower ends, said shaft formed so its lower end can pass through said upper board surface and substantially through one of said board holes so said shaft lies in said board hole, said shaft being rigid and including an exterior surface for preassembled force fit in said board hole, and said shaft having a hole in its lower end;

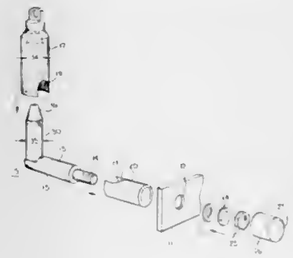
a plurality of wire termination devices each having an upper end that can fit into and anchor itself in said hole in said lower end of said shaft, each termination device also having a lower end forming a means for bolding onto and making electrical connection with a wire conductor.

4,822,289

EASILY REMOVABLE HIGH VOLTAGE GROUND STUD INSULATOR

John DeLeo, 107 Sun Valley Dr., Southington, Conn. 06489

Filed Oct. 2, 1987, Ser. No. 104,800
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—92 **8 Claims**



1. An insulated ground stud for electrical equipment comprising:

an angled metal bar having a threaded end and a tapered end;

a hollow cylindrical insulative cover arranged over said tapered end;

a hollow cylindrical insulative cap attached to said threaded end; and

a hollow cylindrical insulative sleeve arranged on said metal

bar intermediate said tapered end and said threaded end to electrically insulate said metal bar and to prevent said metal bar from forming a corona discharge when said threaded end is attached to a voltage source.

4,822,290

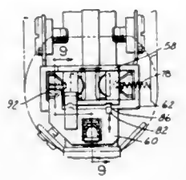
ELECTRIC RECEPTACLE

William J. Cauley, 60483 Apache La., Washington, Mich. 48094, and Cheatham T. Dudley, 1533 Walton, Rochester, Mich. 48063

Continuation-in-part of Ser. No. 96,764, Sep. 11, 1987, Pat. No. 4,749,360, which is a continuation of Ser. No. 868,949, May 30, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 203,278

Int. Cl.[4] H01R *13/453*

U.S. Cl. 439—137 **20 Claims**



1. An electrical receptacle for receiving electrical plugs having two polarized conductive blades or two conductive blades and a ground prong, said electrical receptacle comprising:

a body having a longitudinal axis and an internal cavity covered by a face plate, said face plate provided with a ground prong aperture and first and second blade apertures sized to receive the blades of a polarized plug, said longitudinal axis extending between first and second blade apertures and aligned with the ground prong aperture, said apertures extending into said internal cavity;

an aperture shield located in the internal cavity of the body formed of a non-conductive material, shiftable transversely relative to the longitudinal axis between an open and closed position, said aperture shield provided with a first and second cross member for cooperating with the conductive blades of the electrical plug, in the closed position the electrically conductive blades engage the first and second cross member preventing further blade insertion and at least one of which having an inclined surface for urging the aperture shield to the open position;

locking means for normally retaining the aperture shield in the closed position and for releasing the aperture shield upon the partial insertion of a polarized plug or a plug having a ground prong, thereby enabling the aperture shield to shift to the open position in response to engagement with the electrically conductive blades of the plug;

means for resiliently biasing the aperture shield to the closed position; and

wherein said electrical receptacle will selectively exclude non-polarized ungrounded electrical plugs.

4,822,291

GAS OPERATED ELECTRICAL CONNECTOR

Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Corporation, Chicago, Ill.

Continuation of Ser. No. 841,844, Mar. 20, 1986, abandoned. This application Dec. 17, 1987, Ser. No. 136,440

Int. Cl.[4] H01R *13/52*

U.S. Cl. 439—187 **6 Claims**

1. A separable insulated connector module for electrical connection to another component of an electrical distribution system and to an incoming probe of a mating elbow module comprising

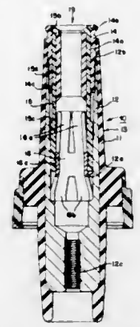
an elongated housing having a bore,

an elongated conductive connector having first and second extremities,

means for making said electrical connection to said other component,

an elongated dielectric tube adapted for movement along said bore upon the occurrence of a fault current arc formed within said tube,

said first extremity of said elongated connector being disposed within said dielectric tube and being adapted for making a conductive connection to said probe,



said second extremity of said elongated connector comprising means for connecting to said electrical connection making means,

said elongated connector including an elongated continuous portion of metal comprising a first elongated finger portion of said first extremity and a second elongated finger portion of said connecting means of said second extremity, said second finger portion being disposed in abutting contact with said electrical connection making means.

4,822,292

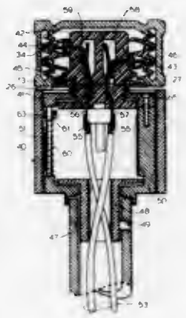
MULTIPLE LINE CIRCUIT TRACK LIGHTING SYSTEM AND FIXTURE MOUNTING ADAPTERS THEREFORE

George F. Thayer, 2503 Greenbrier, Anahiem, Calif. 92801, and Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Continuation of Ser. No. 688,256, Jan. 2, 1985, abandoned. This application Jan. 21, 1987, Ser. No. 5,919

Int. Cl.[4] H01R *25/14*

U.S. Cl. 439—207 **13 Claims**



1. A multiple circuit track lighting system comprising:

an elongated track including a bottom opening and a pair of partial bottom walls at opposite sides of the track defining a pair of edge recesses;

insulating members within said edge recesses;

said insulating members each having a plurality of vertically separating recesses oppositely disposed with respect to those of the other insulating member;

an electrical conductor in each of said recesses with a portion of the surface of each conductor exposed to electrical contact within said track;

means for electrically connecting together one oppositely disposed pair of said conductors;

means for effecting separating electrical connections to each conductor of another oppositely disposed pair of said conductors;

connector means mechanically engageable with said track to be supported thereby and for supporting an electrical fixture to be powered by said track lighting system;

said connector means including vertically separated electrical contacts on opposite sides of said connector means;

said separated electrical contacts being positioned in said connector means so that one contact engages one conductor on one side of said track and the other contact engages a separated conductor on the opposite side of said track when said connector means is fully engaged with said track;

the orientation of said electrical contacts being such that when the connector means is reversed and engaged with the track, the contacts engage vertically separated conductors on opposite sides of the track;

whereby any fixture supported by said connector means may be transferred from one circuit to a different circuit in said track lighting system by a simple reversal of said connector means; and

means for releasably latching said connector means in a position in which said electrical contacts are in engagement with said electrical conductors including a member carried by said connector means, spring urged into engagement with facing edges of the bottom opening of said track.

4,822,293

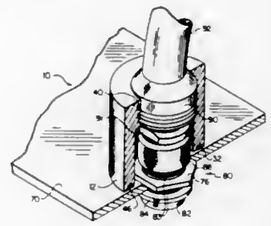
BELL HOUSING SEALING ASSEMBLY FOR MOUNTED CONNECTOR

Michael H. Robson, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Nov. 20, 1987, Ser. No. 123,416

Int. Cl.[4] H01R *13/73, 13/52*

U.S. Cl. 439—271 **18 Claims**



1. A sealing bell housing for enclosing part of an electrical connector mounted on a mounting plate and projecting through an opening in the mounting plate, said housing comprising:

a tubular member having a bottom end and a top end; the bottom end having an end face directed axially away from the tubular member, said member having a predetermined inside diameter and length for surrounding part of an electrical connector projecting through an opening in a mounting plate to which the connector is mounted;

attaching means for attaching said tubular member to the surrounded connector;

top sealing means for sealing between said top end of said tubular member and the end of a surrounded connector;

said tubular member having a predetermined axial length between said top sealing means and said bottom end no greater than the length of the projecting part of said electrical connector; and

bottom sealing means on said bottom end face for sealing between said bottom end face of said tubular member and the opposing outer face of a mounting plate to which a surrounded connector is mounted.

4,822,294

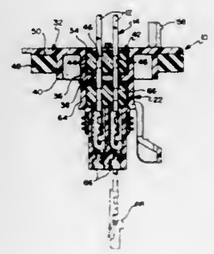
SEALING GROMMET ASSEMBLY FOR WIRING HARNESS

Lisa J. McClearn, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1987, Ser. No. 14,572

Int. Cl.[4] H01R *13/52*

U.S. Cl. 439—274 **9 Claims**



1. A sealing grommet assembly for passing a plurality of electrical conductors or the like through a hole in a panel and sealing off the hole through the panel comprising:

a support plate for attaching the sealing grommet assembly to a panel having a hole extending through the panel,

said support plate having a seal well which includes a peripheral wall projecting from the support plate and a base ledge at the end of the peripheral wall spaced from the support plate,

said support plate further including a pilot wall which projects from the support plate and surrounds the seal well in a spaced relationship, said pilot wall being sized to pass through the hole which extends through a panel to which the support plate is to be attached,

an elastomeric cable seal disposed in the seal well, said elastomeric seal block having a peripheral lip sealingly engaging an inside surface of the seal well and a plurality of apertures extending through the lastomeric cable seal for slidably and sealingly engaging individual electrical conductors, or the like, of a wiring harness, or the like, which is to be passed through the hole in the panel,

a gasket surrounding the pilot wall of the support plate to provide a face seal between a surface of the support plate outwardly of the pilot wall and a surface of the panel surrounding the hole when the support plate is attached to the panel, and

a cover which is attached to the support plate on the opposite side of the seal well,

said cover having a channel portion which covers the seal well and which extends to an edge of the cover to direct the electrical conductors extending through the cable seal in a direction generally parallel to the support plate.

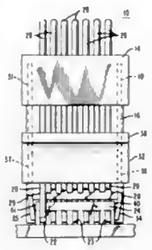
VOL 1101 ISS 3 APR 18 1989 UMI

4,822,295

SMALL OUTLINE SMT TEST CONNECTOR

Warren W. Porter, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 17, 1987, Ser. No. 136,178
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—330 1 Claim



1. A test connector for use with an S-type small outline surface mount package mounted on a circuit board and having a plurality of leads arranged in two rows located at opposite ends of said package, and having two opposing ends of the package without leads where a respective single, planar end wall is located, said test connector comprising:
an insulative body having a plurality of finger-like members therein spaced so that one member is located between each of the plurality of leads;
a plurality of conductors, each mounted between respective ones of the plurality of finger-like members;
each of the conductors having a first portion located at a first end of the insulative body for electrical contact with a respective one of the plurality of leads, and a second portion projecting beyond the insulative body at a second end located at a distance from the first end of the insulative body for forming a respective test terminal, said test terminals being arranged with a spacing greater than that of the plurality of leads in order to facilitate connections;
gripper means connected to the insulative body for gripping the small outline surface mount package by the end walls alone, located between the opposing rows of leads; and
means for providing a gripping force to the gripper means comprising a hollow slide means slidably surrounding gripper means for converting a sliding force into the gripping force upon the ends walls of the small outline surface mount package.

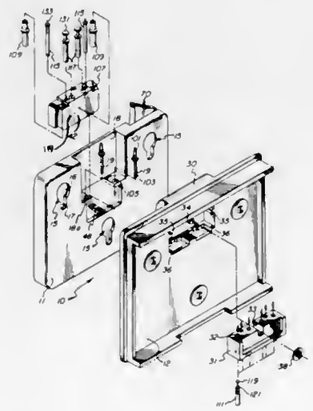
4,822,296

ELECTRICAL CONNECTION FOR BATTERY CHARGING APPARATUS OR THE LIKE

Anton Wilson, Shelton, Conn., assignor to Anton/Bauer, Inc., Shelton, Conn.

Filed Jun. 19, 1987, Ser. No. 64,233
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—343 10 Claims

1. An electrical connection comprising
a relatively flat male plate, and
a relatively flat female plate,
said plates being adapted to be releasably locked together in connected condition,
said female plate including
an open top recess being adapted to contain a plurality of elongated electrical terminals,
a connector block being adapted to be releasably received in and locked to said open top recess, said connector block containing
a plurality of depending slots formed therein, and
a plurality of elongated electrical terminals being elongated in the same direction as said slots;
said male plate including
a housing having an opening extending outwardly from said male plate, said housing being adapted to contain a plurality of elongated mating electrical terminals,
a terminal block being adapted to be releasably received in and locked to said opening in the male plate,
a plurality of spaced headed projections with there being one for each slot and with each projection having head and leg portions, and
elongated mating electrical terminals, at least some of which correspond in location to the electrical terminals on said connector block when said plates are releasably locked together, and
said male plate being positioned abutting the female plate with a leg of each of the projections being located in an associated slot and with the elongated electrical terminals on said connector block in contact with the mating electrical terminals on said terminal block, and



said elongated electrical terminals on said connector block including:
(1) a pair of terminals having a fixed head in the direction of said depending slots located in individual recesses in said connector block, and
(2) at least one terminal having a movable head in the direction of said depending slots to allow depression even in the absence of a corresponding terminal on the male plate; and
the corresponding mating electrical terminals on said terminal block either receiving the fixed heads on said terminals on said connector block or being in contact with said movable head on the other terminal on said connector block to depress the same in the direction of said slots when said plates are locked together, to establish an electrical connection.

4,822,297

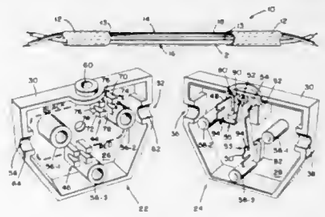
JUNCTION BLOCK

Thomas F. Prince, Milton; Julian J. Bishop, Belmont, both of Mass., and William B. Walkup, Amherst, N.H., assignors to Ark-Les Corporation, Watertown, Mass.

Filed Apr. 22, 1983, Ser. No. 487,618
Int. Cl.[4] H01R *4/24, 13/506*
U.S. Cl. 439—395 4 Claims

1. For providing tap-in electrical connection to an unsevered non-terminal portion of two-conductor wire comprising an insulating sheath and two conductors, each conductor being separately enclosed in an insulation layer and carried within the sheath,

a junction block comprising a conductor-positioning part and a tap-in part,
said conductor-positioning part comprising
first and second connection locating structures, each defining
a retaining channel for positioning and retaining a medial length of an unsevered insulated conductor of a non-terminal length of two-conductor wire extending beyond said block in two directions, and
a blade support channel transversely crossing said retaining channel,
said retaining channel and said blade support channel comprising a pair of medially crossing mutually transverse channels,
said tap-in part providing first and second slicing and gripping connectors for making electrical connection with a conductor enclosed in an insulation layer and retained by a corresponding said retaining channel, each said slicing and gripping connector comprising
a bifurcated blade providing a wedging edge comprising opposed interior conductor-engaging slicing edges and an interior concave edge coplanar with and connecting said opposed edges,
said blade further providing opposed lead-in edges each adjacent and coplanar with a said conductor-engaging slicing edge and at an angle thereto and spaced from said concave edge,
said conductor-positioning part and said tap-in part providing cooperating prepositioning structure sized and dimensioned for preliminary mutually aligning engagement in



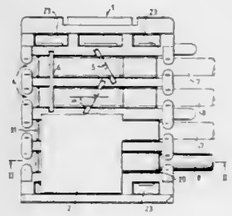
the absence of engagement of either said slicing and gripping connector with the insulation layer of a corresponding retained conductor,
said prepositioning structure in said preliminary engagement preventing further relative travel of said conductor-positioning part and said tap-in part other than in that orientation in which each said slicing and gripping connector blade is aligned for entry into a corresponding said blade support channel,
during said further relative travel, said lead-in edges of a said slicing and gripping connector blade entering said blade support channel and tangentially engaging the insulating layer of a conductor retained by the corresponding said retaining channel, for initial slicing of circumferential portions of the insulating layer,
each said slicing and gripping connector blade being positioned in said tap-in part for wedging a circumferential portion of a corresponding retained conductor against said blade wedging edge,
said conductor-positioning part, said tap-in part, said pairs of medially crossing mutually transverse channels, and said slicing and gripping connector blades being sized and dimensioned with respect to each other and with respect to the conductor to be tapped into to terminate said further relative travel of said parts at an assembled engagement position in which said block is closed and each said wedging edge electrically engages and positively grips the corresponding retained conductor through its insulating layer to provide a gas-tight connection, and such that retention of conductors by said retaining channels, and engagement of the retained conductors by said corresponding wedging edges, is effective to hold said conductor-positioning part and said tap-in part in assembled engagement without other means for holding.

4,822,298

WIRE CONNECTION FOR CABLE WIRES

Dieter Gerke; Manfred Müller, and Lutz Biederstedt, all of Berlin, Fed. Rep. of Germany, assignors to Krone Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 177,496
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711675
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—402 20 Claims



1. A wire connector for cable wires, comprising: a lower housing part with at least two guide channels for receiving cable wires; at least one upper housing part including snap-in means for forming a snap-in connection between said upper housing part and said lower housing part, said upper housing part forming a snap-in connection with said lower housing part in a first snap-in position with respect to said lower housing part and in a second snap-in position with respect to said lower housing part; at least two cutting/clamping contacts each inserted into respective corresponding said at least two guide channels of said lower housing part, each cutting/clamping contact being provided with contact slots adapted to make contact with a cable wire, said cutting/clamping contacts of the respective corresponding guide channels being each electrically connected to an adjacent one of said cutting/clamping contacts; said upper housing part having an underside with at least two press-in pieces formed at the underside of said upper housing, each of said press-in pieces cooperating with a respective cutting/clamping contact slot to urge one of the cable wires into electrical contact with said cutting/clamping contacts when said upper housing part is connected to said lower housing part in said first snap-in position and said second snap-in position; at least two separating knives each inserted in a respective corresponding one of said at least two guide channels for separating a corresponding one of the cable wires; and, separating means positioned at the underside portion of said upper housing part for urging a cable wire into a separating knife when said upper housing part is in said first snap-in position and maintaining a cable wire out of contact with a separating knife when said upper housing part is in said second snap-in position.

4,822,299

INSULATOR HOUSING HAVING OPERATING MEMBER

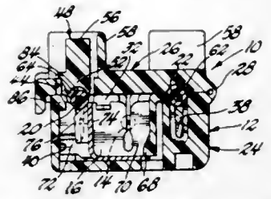
Frederick H. Rider, Jr., Youngstown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1984, Ser. No. 671,453
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—402 6 Claims

1. An insulator housing for an insulation displacement terminal comprising:

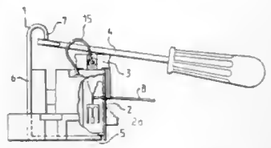
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a body and a cover integrally hinged to the body for movement between an open and a closed position,
a terminating chamber in the body which is adapted to receive an insulation displacement portion of a terminal,
said cover having an aperture which extends through the cover and which aligns with the terminating chamber of the body when the cover is in a closed position,
an operating member having one end initially disposed in the aperture of the cover and connected to the cover by frangible webs and an opposite end initially disposed outwardly of an outer surface of the cover,



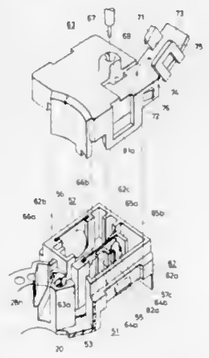
said operating member being displaceable into the terminating chamber when the cover is closed and the frangible webs are fractured for forcing an insulated conductor positioned between the cover and the insulation displacement portion of the terminal into the terminating chamber and into cooperative engagement with an insulation displacement portion of the terminal disposed therein,
said operating member being separate from said cover after said frangible webs are fractured and having means cooperating with said body to retain the operating member in the terminating chamber after separation from the cover, and
a sufficient spacing existing between the opposite end of the operating member and the aperture of the cover so that the cover may be opened when the operating member is retained in the terminating chamber.

4,822,300
CABLE WIRE CONNECTOR AND METHOD OF MAKING RAPID CABLE CONNECTIONS
Dieter Gerke; Lutz Biederstedt, and Eberhard Klaiber, all of Berlin, Fed. Rep. of Germany, assignors to Krone Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 3, 1987, Ser. No. 128,430
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641366; Dec. 3, 1986, 3641367
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—417 **7 Claims**



1. A device for connecting dropwise cables, comprising:
a dropwise connector bank body defining a plurality of insertion slot chambers;
a plurality of cutting/clamping contacts, each of said plurality of cutting/clamping contacts being positioned within one of said plurality of insertion slot chambers;
a press-in tool including an application body, a press-in piece extending downwardly from said application body, said press-in piece being adapted to urge a dropwire cable into said cutting/clamping contact as said press-in tool is inserted into one of said plurality of insertion slot chambers;
a wall portion having a support edge, said wall portion being connected to said dropwire connector bank body;
and guide groove means connected to said press-in tool application body, said guide groove means for guidingly receiving a lever tool and for positioning the lever tool relative to said support edge to bear the lever tool against the support edge to facilitate pressing the press-in tool application body and to press the press-in piece into one of said plurality of insertion slots.

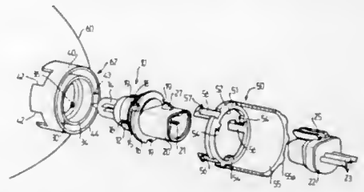
4,822,301
CRT SOCKET
Hirobumi Inaba, and Yasunori Nishikawa, both of Yao, Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan
Filed Nov. 2, 1987, Ser. No. 115,736
Claims priority, application Japan, Nov. 21, 1986, 61-179185
Int. Cl.[4] H01N *4/24*
U.S. Cl. 439—436 **12 Claims**



8. A CRT socket comprising;
a socket part for receiving terminal pins of a CRT;
a high-voltage chamber provided adjacent a side of said socket part;
a pair of high-voltage discharge electrodes disposed in said high-voltage chamber in opposing relation to each other to define a high-voltage discharge gap therebetween, one of said pair of electrodes being a high-voltage side electrode and the other being a ground side electrode, the high-voltage side electrode having a flange part;
a contact plate disposed near said flange part in obliquely opposing relation thereto;
a lead insertion hole bored through said high-voltage chamber, for introducing therethrough a high-voltage lead from the outside to a place between said contact plate and said flange part; and
an urging member movable into a position for resiliently pressing said contact plate against said flange part;
said contact plate being formed by bending an arm plate extending integrally from an edge of said flange part.

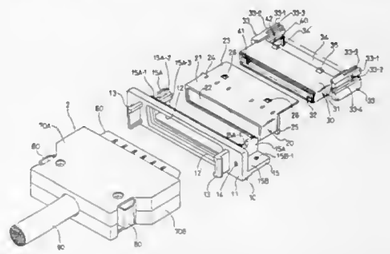
4,822,302
FASTENING MEANS FOR A MOTOR VEHICLE LAMP
Guy Dorleans, Boulogne, France, assignor to Cibie Projecteurs, Bobigny, France
Filed Sep. 17, 1987, Ser. No. 97,949
Claims priority, application France, Sep. 18, 1986, 86 13087
Int. Cl.[4] H01R *13/74*
U.S. Cl. 439—544 **7 Claims**

1. A device for locking a lamp in the socket of a motor vehicle headlight, the lamp including a flange suitable for bearing against a annular surface of the socket for predetermined axial positioning of the lamp, the lamp and the socket including first complementary fittings for predetermined angular positioning of the lamp whereat the lamp is fixed against rotation, said device comprising a ring, assembly means enabling the ring to be permanently assembled to the socket in such a manner as to allow it to rotate relative to the socket through a predetermined angle, the ring including a circular inside passage having a diameter equal to or slightly greater than the outside diameter of the lamp's flange, and second complementary fittings being provided radially at the periph-



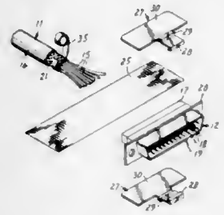
ery of said flange and in said passage in such a manner that, in a first angular position of the ring, the lamp may be inserted there through up to the predetermined axial and angular positiion, and that, in a second angular position, the lamp is held in said position by said second complementary fittings.

4,822,303
ELECTRICAL CONNECTOR
Masaru Nakamura, and Masao Yamaguchi, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Apr. 25, 1988, Ser. No. 186,111
Claims priority, application Japan, May 18, 1987, 62-74160; May 18, 1987, 62-74161; Aug. 5, 1987, 62-119936; Aug. 5, 1987, 62-119937
Int. Cl.[4] H01R *13/648, 13/73*
U.S. Cl. 439—607 **11 Claims**



1. An electrical receptacle connector for a printed circuit board, which comprises:
a one-piece detachable insulating housing for holding a plurality of contacts each having a contact portion for engagement with a mating contact and a substantially L-shaped rear portion extending rearwardly from a rear end of said contact portion;
said insulating housing having a front contact enclosure for enclosing said contact portions of said contacts and a rear base plate extending rearwardly from a lower rear end of said front contact enclosure, with free ends of said L-shaped rear portions passing through said rear base plate;
a shielding shell having a front enclosure for enclosing said front contact enclosure of said insulating housing and a rear cover extending rearwardly from an upper rear end of said front enclosure to cover at least upper part of said rear portions of said contacts;
a mounting frame having a central opening through which said mating plug connector engages said contacts of said insulating housing completely enclosed by said shielding shell;
a pair of first releasable latch means extending rearwardly from a backside of said mounting frame on opposite sides of said central opening;
a first elongated guide member provided on an inside of said first latch means and extending in a direction that said insulating housing is detachable from said mounting frame;
a pair of mounting means each extending rearwardly from said backside of said mounting frame and outwardly from said first latch means;
a pair of second releasable latch means provided on opposite sides of said insulating housing for engagement with said first releasable latch means to lock said detachable insulating housing to said mounting frame; and
a second elongated guide member provided on an outside of said second latch means for slidable engagement with said first elongated guide member.

4,822,304
EMI SHIELDED ELECTRICAL CONNECTOR AND CABLE ASSEMBLY
Robert C. Herron, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 24, 1987, Ser. No. 100,747
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—610 **6 Claims**



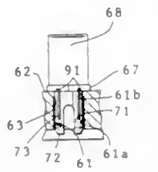
1. An EMI/ESD shielded connector and cable assembly comprising
a length of cable comprising a plurality of conductors, a shield and outer insulating sheath,
a connector comprising individual contacts connected to said conductors and having a conductive metal shroud having a peripheral flange,
said conductors extending from said sheath and said shield extending from said insulating sheath,
a length of conductive wire mesh wrapped about said conductors and contacting said shroud along one edge and the other edge being wrapped about said exposed shield,
a shield plate having a plate portion conductively coupled to said mesh and being formed to cover a portion of said flange and extend along said connector, and
a cover extending over said mesh from said cable sheath to said connector flange.

4,822,305
PROGRAMMABLE KEYING SYSTEM
Mark H. Waters, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Aug. 31, 1987, Ser. No. 90,291
Int. Cl.[4] H01R *13/64*
U.S. Cl. 439—681 **13 Claims**

1. A programmable keying system for electrical connectors, comprising:
a connector having at least one key-receiving passageway therein;
a key adapted to extend into and be received within each at least one key-receiving passageway, each key including a keying portion rotatable to any one of a plurality of orientations;

first retention means for relatively loosely retaining the key in a programmable first position partially inserted into its respective passageway while permitting said key to be rotated to orient said keying portion to a selected one of said plurality of orientations;

second retention means for retaining said key in a locked second position fully inserted into its respective passage-



way for locking said keying portion in said selected orientation; and

third means for resisting unintentional insertion of said key into said passageway from said programmable first position to said locked second position while permitting intentional insertion of said key to said locked second position for locking said keying portion in said selected orientation.

4,822,306

CONNECTOR BANK FOR TELECOMMUNICATION DEVICES

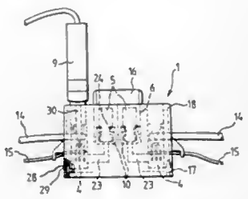
Eberhard Klaiber, Berlin, Fed. Rep. of Germany, assignor to Krone Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 132,988

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3644349

Int. Cl.⁴ H01R *9/24*

U.S. Cl. 439—709 **7 Claims**



1. A connector bank for telecommunication devices comprising: a plastic housing; a series of connection contacts for cable wires positioned in connection chambers defined by said housing; a series of overvoltage suppressor contact elements positioned in overvoltage plug sockets defined in said housing, said overvoltage plug sockets and said overvoltage suppressor contact elements adapted to receive an overvoltage suppressor at an overvoltage suppressor space; and, a series of test plug sockets, each test plug socket being positioned between two adjacent connection chambers associated with said series of connection contacts, each plug socket being provided with pickup contact elements adapted to engage a test plug received by the test plug socket said pickup contact elements being connected with a connection contact of said series of connection contacts, each of said test plug sockets of said series of test plug sockets being positioned between two adjacent connection contacts such that one pickup contact of each of the two adjacent connection contacts enters into a single test plug socket of said series of test plug sockets.

4,822,307

WARNING DEVICE FOR A WATERCRAFT PROVIDED WITH A PLURALITY OF MARINE PROPULSION ENGINES

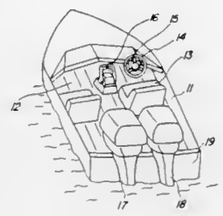
Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 8, 1987, Ser. No. 36,019

Claims priority, application Japan, Apr. 8, 1986, 61-80870

Int. Cl.⁴ F01B *21/00*

U.S. Cl. 440—1 **23 Claims**



1. In a marine propulsion device for a watercraft having a first engine driving first propulsion means, a second engine driving a second propulsion means, sensing means for sensing an abnormal condition of either of said engines independently of the other engine condition tending to cause a substantial deviation in the course of said watercraft, and means responsive to the sensing of such an abnormal condition for initiating the operation of means for preventing course deviations due to said abnormal condition.

4,822,308

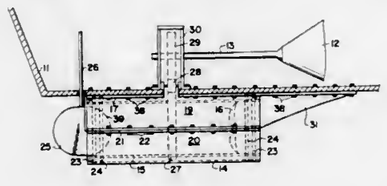
MARINE STEERING AND PROPULSION SYSTEM

Willard G. Rochester, 12062 Normandy Blvd., Jacksonville, Fla. 32221

Filed Sep. 21, 1987, Ser. No. 98,912

Int. Cl.⁴ B63H *1/16*

U.S. Cl. 440—66 **9 Claims**



1. In a marine steering and propulsion system for a boat having a propeller inside a cylindrical tube open at both ends and with the tips of said propeller attached to said tube which is peripherally driven through a ring gear rack on the outside of said tube, the improvement which comprises a stationary housing spaced concentrically outwardly from said tube and rigidly affixed to said boat, a ring bearing at each end of said tube adapted to permit said tube to rotate inside of said housing, a seal longitudinally external to each said bearing to prevent water from entering between said housing and said tube, means to maintain a supply of lubricating oil in the space between said housing and said tube; and a pivotable rudder partially within said housing aft of said propeller and partially outside of said housing and aft thereof.

4,822,309

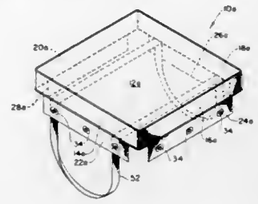
COMBINED LIFE PRESERVER CUSHION AND TOTE BAG

John A. Vandenberg, 3186 Petaluma Ave., Long Beach, Calif. 90808

Continuation-in-part of Ser. No. 832,037, Feb. 21, 1986, abandoned. This application Jun. 8, 1987, Ser. No. 59,324

Int. Cl.⁴ A45C *9/00*

U.S. Cl. 441—35 **11 Claims**



9. An aquatic safety device comprising a plurality of rectangular buoyant cushions, each cushion comprising a rectangular top surface and a generally planar rectangular bottom surface, said top and bottom surfaces on each cushion connected together by four side surfaces, four separate rectangular skirts on each cushion, each rectangular skirt connected to an edge of the bottom surface of the cushion and substantially in the plane of the bottom surface of the cushion and extending out beyond the edge of said bottom surface of the cushion, means on each skirt on one cushion for attachment to another skirt on another cushion, the width of each skirt long enough so if the cushions are close enough together and the skirts extend toward each other in the plane of the bottom surface of the cushion, the skirts overlap each other sufficiently so the skirts can be attached together to hold the cushions in side by side relationship whereby the cushions form a raft formed from any number of cushions, so persons holding on to the raft will not drift apart.

4,822,310

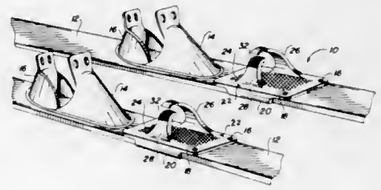
REMOVABLE STIRRUP FOR WATER SKIS

Timothy A. Parker, 352 N. Banff, Tucson, Ariz. 85748, and Colleen A. Jones, 3630 S. Logan, Tucson, Ariz. 85730

Filed Dec. 28, 1987, Ser. No. 138,144

Int. Cl.⁴ A63C *15/06*

U.S. Cl. 441—70 **12 Claims**



1. A removable stirrup for attachment to a water ski to receive and secure a skier's foot comprising:

a removable base having a top surface adapted to receive the skier's foot;

means to removably secure said base to the associated ski defining means to clamp said base to the ski, said clamp means including a first rolled over cupped lip attached to said base, said cupped lip adapted to extend over the ski to receive a portion of the ski within said cupped lip; and

means to removably secure the skier's foot to said base whereby the skier is secured to the ski by the skier's foot secured to the base and the base secured to the ski in order that the skier may utilize the water ski.

4,822,311

FREE FALL SUBMERSIBLE LIFE SAVING DEVICE FOR OFFSHORE STRUCTURES

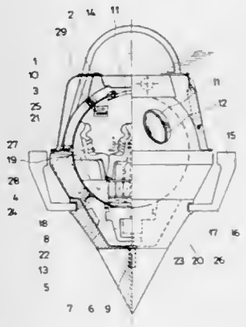
Jerzy W. Doerffer, Sopot; Lech Rowi ski, Wocławy; Andrzej Niepieklo, Gda sk; Ján Klopocki, Gda sk, and Boguslaw Siwek, Gda sk, all of Poland, assignors to Politechnika Gdanska, Sdansk, Poland

Continuation of Ser. No. 770,389, Aug. 28, 1985, abandoned. This application Dec. 15, 1987, Ser. No. 133,202

Claims priority, application Poland, Sep. 5, 1984, 249475

Int. Cl.⁴ B63B *23/28*

U.S. Cl. 441—87 **16 Claims**



1. A free fall, submersible life saving device for an offshore structure, the device comprising:

a spherical pressure-shell capsule for survivors, the pressure shell having at least one manhole with a closing cover in an upper part and glands for cables, piping and a windlass mechanical drive in a lower part,

an outer casing about the pressure-shell capsule, the outer casing having a lower part;

a windlass with an anchor rope in the lower part of the casing, the windlass having the windlass mechanical drive through one of the glands into the pressure shell and automatic control means for controlling the force in the anchor rope;

a ballast and mechanical-grip means for detachably connecting the ballast to the lower part of the casing; and

an anchor connected to the anchor rope and holder means for detachably fastening the anchor to the ballast.

4,822,312

ELECTRODE FOR HIGH INTENSITY DISCHARGE LAMPS

Edmund M. Passmore, Gloucester, Mass., assignor to GTE Products Corporation, Danvers, Mass.

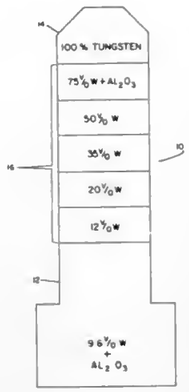
Filed Dec. 5, 1983, Ser. No. 557,813

Int. Cl.⁴ H01J *9/12*

U.S. Cl. 445—49 **3 Claims**

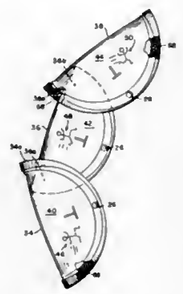
1. A method of making a combination sealing disc and electrode for a high intensity discharge lamp composed of a mixture of a refractory oxide and a metal, said combination having first and second ends separated by an intermediate body, comprising the steps of: providing a first substantially homogeneous mixture of from about 9 to 10 volume percent of said metal and about 90 to 91 volume percent of said oxide; loading said first mixture into a die and lightly compacting same to form a layer; providing, in turn, a plurality of subsequent layers of said oxide and said metal, each successive layer containing a greater amount of said metal than the preceding layer and again lightly

compacting same; adding a final layer comprised of substantially 100 percent of said metal; cold pressing all of said layers under a pressure of from 10,000 to 20,000 psi to form a green part; removing said green part from said die and firing said



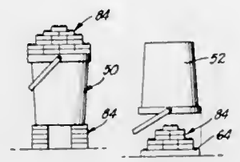
green part in wet hydrogen for about 2 hours at about 1050° to form a sub-finished part; and firing said sub-finished part in a vacuum or dry hydrogen for about 4 hours at about 1850° C.–1900° C. to form said combination.

4,822,313
TOY ASSEMBLY DEVICE
Douglas P. Yasika, 12 Colby Rd., Danville, N.H. 03819
Filed Feb. 9, 1987, Ser. No. 12,553
Int. Cl.[4] A63H *33/06*
U.S. Cl. 446—69 **17 Claims**



1. A toy assembly device comprising:
a substantially flat member formed of a resilient flexible material having upper and lower surfaces and a peripheral edge;
said flat member being sufficiently folded upon itself whereby said lower surface forms upper and lower inner opposing surface members having corresponding upper and lower opposing peripheral edges extending from a common fold area; and
means for attaching said opposing upper and lower surfaces together at a point adjacent the peripheral edges whereby said opposing surface members and edges define an opening therebetween extending the length of said fold area and terminating in a pair of lateral openings;
said lateral openings tapering from said fold area to an area of contact of said opposing upper and lower surface members adjacent said attaching means;
the peripheral edges forming said lateral openings being sufficiently resilient and means disposed adjacent said opposing peripheral edges for releasably holding the end of another toy assembly device inserted in said openings to thereby form an assemblage thereof.

4,822,314
INTERLOCKING CONTAINER AND TOY BLOCK SETS
Edward D. O'Brian, 19702 Shorecliff La., Huntington Beach, Calif. 92648, and William M. Plachy, 346 Camino Redondo, San Marcos, Calif. 92069
Filed Jun. 23, 1987, Ser. No. 65,587
Int. Cl.[4] A63H *33/04, 33/08*
U.S. Cl. 446—75 **12 Claims**

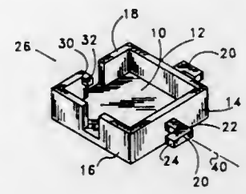


1. In the combination of a pail and a lid, and a set of toy blocks, each of the blocks of said set being constructed so as to include a plurality of identical cylinders extending from a top thereof and an open interior in the bottom thereof capable of frictionally holding the cylinders on other of said blocks, said pail having a bottom a peripheral wall extending upwardly from said bottom, said peripheral wall having a top, said lid being capable of fitting against said top of said peripheral wall so as to close off the interior of said pail, the improvement which comprises:
said lid including a plurality of upwardly extending cylinders, each of said cylinders on said lid being identical to said cylinders on said blocks of said set, said cylinders on said lid being spaced from the periphery of said lid being located in a pattern such that said blocks can be assembled on said lid with the interior of the bottom of each block so held being in frictional engagement with said cylinders on said lid and with the cylinders on the top of each block so held projecting upwardly from said lid, whereby when blocks are assembled on said lid other blocks can be assembled on the blocks assembled on said lid so as to create an assembly of said blocks which is supported by said lid and whereby said assembly of said blocks can be created when said lid is removed from said pail and said pail can be inverted to cover said assembly on said lid and all of said cylinders on said lid.

4,822,315
TOY CONSTRUCTION APPARATUS
Ofer Ben-Gal, Simtat Avivim 6, Kfar Saba, and Nissim Sabatov, Alterman 11, Tel Aviv, both of Israel
Filed Oct. 13, 1987, Ser. No. 108,416
Int. Cl.[4] A63H *33/04*
U.S. Cl. 446—102 **8 Claims**

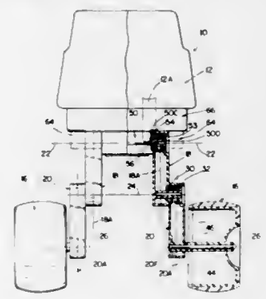
1. An assembly toy comprising a flexible generally planar array of removably interconnectable tile elements, each interconnectable tile element having a generally planar wall and a plurality of upstanding side walls arranged at the periphery of said generally planar wall and extending generally perpendicular thereto to an edge, said plurality of upstanding side walls having a first thickness and comprising:
at least one upstanding side wall having formed thereon an engagement socket defined by a slot formed in the upstanding side wall which extends to said edge thereof; and

a retaining protrusion arranged adjacent the slot, said retaining protrusion extending beyond said wall with a second thickness; and
at least one upstanding side wall having formed thereon an engagement element including an axial portion extending outwardly from said side wall and a lateral portion extending laterally from said axial portion at a location spaced from said side wall by a first distance;
said engagement socket and said engagement element being configured such that upon engagement of said engagement element with said engagement socket, said axial portion extends through the slot and said lateral portion lies beyond the retaining protrusion;



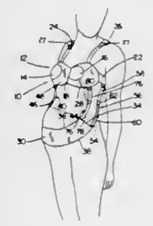
said engagement socket and said engagement element being configured such that said first distance is approximately equal to the sum of the first and second thicknesses, whereby engagement and disengagement of the engagement socket and engagement element on separate tile elements may be achieved by relative motion of the tile elements parallel to their respective side walls and parallel to said slot when the side walls are in touching relationship and whereby once the tile elements are engaged the interconnection therebetween permits relative pitch, roll and yaw rotation therebetween without producing disengagement.

4,822,316
TOY VEHICLE
Ralph E. Shaffer, Columbia Station; Edward G. Chanter, Lakewood; Randy j. Randleman, Cleveland, and Robert H. Yeager, Parma Heights, all of Ohio, assignors to Those Characters From Cleveland, Inc., Independence, Ohio
Filed Jun. 8, 1987, Ser. No. 59,633
Int. Cl.[4] A63H *17/26, 17/267*
U.S. Cl. 446—466 **8 Claims**



1. A toy vehicle comprising a chassis and at least three wheels connected with said chassis and adapted to support said chassis for rolling movement along a surface; a separate joint structure connecting each of said three wheels with said chassis; the joint structure associated with each wheel comprising a wheel joint means for rotatably supporting the wheel and a chassis joint means for connecting said wheel joint means with said chassis; said chassis joint means including at least one chassis joint member supported for pivotal movement to discrete angular positions relative to the chassis; first detent means for adjustably retaining and indexing the chassis joint member in the discrete angular positions; said wheel joint means including at least one wheel joint member being supported for pivotal movement to discrete angular positions relative to the chassis joint means; second detent means for adjustably retaining and indexing the wheel joint member in the discrete angular positions, support means on the chassis separate from the joint structures adapted to engage each joint structure in at least two angular orientations to limit the range of pivotal movement of the chassis joint member associated with the joint structure and to stabilize the chassis joint member in those angular orientations in such a manner as to allow the wheel associated with the chassis joint member to roll along a surface with the chassis joint member oriented in either of said two angular orientations defined by the support means, the first detent means associated with each of the chassis joint members being disposed to adjustably retain the chassis joint member in at least two discrete additional angular orientations disposed between the limits of pivotal movement defined for the chassis joint members by the support means, said chassis extending from a first end to a second end; the separate joint structures supporting their associated wheels for independent adjustment relative to said chassis and relative to each other; the separate joint structures enabling the chassis to be adjustably retained and placed in a plurality of discrete stable angular orientations including discrete angular orientations in which the chassis is tilted toward the first end, the second end, and in opposite directions transverse to the first and second ends; the joint structure enabling the wheels to roll along the surface with the chassis adjustably retained in each of its discrete stable angular orientations.

4,822,317
UNDERGARMENT HAVING BRASSIERE AND ABDOMINAL SUPPORT SECTIONS
Shirley A. Wimmer, 501 E. Lanier, Kirbyville, Tex. 75956
Filed Dec. 14, 1987, Ser. No. 132,126
Int. Cl.[4] A41C *3/08*
U.S. Cl. 450—14 **2 Claims**



1. A maternity undergarment for use by a pregnant woman having a protruding abdomen comprising;
a brassiere frontal portion for supporting the breasts of the woman, said frontal portion including a bottom edge, and a brassiere end portion extending from the opposite ends of the frontal portion, and forming the rearward portion
an abdominal support portion positioned in a supporting position relative to the protruding abdomen, said abdominal support portion including a generally rectangular-shaped flexible member having four corners; and
means for detachably connecting the abdominal support portion to the brassiere portion, said connecting means including an adjustable strap connected to and extending from each one of said corners, the distal end of each strap having a connector secured thereto, a plurality of corresponding brassiere connectors attached to said brassiere

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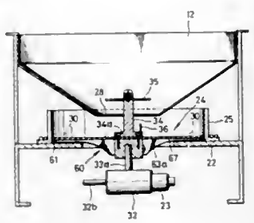
whereby each strap is detachably connected to said brassiere at one of said brassiere connectors, a pair of said brassiere connectors attached to the bottom edge of said brassiere frontal portion, and another one of said brassiere connectors attached at each brassiere end portion whereby the weight of the protruding abdomen is supported by the frontal and rearward portions of the brassiere.

4,822,318

COIN DISPENSER

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Nov. 18, 1986, Ser. No. 931,868
Claims priority, application Japan, Nov. 18, 1985, 60-256759
Int. Cl.[4] G07D *1/00*
U.S. Cl. 453—57 **5 Claims**



1. A coin dispenser comprising:
- a bucket for storing a number of coins therein which has an opening at its bottom;
- a rotary disk driven by a motor for receiving thereon coins supplied from said bucket through said opening, said rotary disk being adapted to rotate in a substantially horizontal plane and causing said coins placed thereon to slide outwardly under centrifugal force; and
- a guide wall adapted to guide the coins along the periphery of said rotary disk and formed with an opening for discharging the coins;

said rotary disk comprising: a rotary pedestal including a hub fixed to an output shaft of said motor and a plurality of ribs projecting in the radial direction from said hub, said hub comprising a peripheral array of axially extending bores; a thin disk fixed to said rotary pedestal and supported by said ribs and adapted to bear the coins thereon, said thin disk comprising a plurality of holes aligned with said bores of said hub; a control shaft having a radially outwardly extending flange formed on one end thereof, said flange comprising a plurality of holes aligned with said bores of said hub; and a screw passing through each said hole of said flange and said thin disk, each said screw having a shank fixed in a said bore of said hub and a head bearing on said flange of said control shaft, said control shaft comprising a second end remote from said one end thereof and disposed above said opening in said bucket, said second end bearing a control disk rotatable relative to said control shaft.

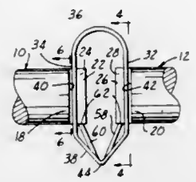
4,822,319

INSTRUMENT DRIVE COUPLER

Alfred H. Glover, Decatur, and Joseph T. Betterton, Arab, both of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 21, 1987, Ser. No. 135,895
Int. Cl.[4] F16D *3/50*
U.S. Cl. 464—101 **1 Claim**

1. A coupler for installation between the spaced apart ends of two fixed and axially aligned shafts by simple insertion of the coupler over the spaced shaft ends in the shaft's radial direction, each shaft end being configured with parallel flats to define a non-circular cross section with parallel opposite surfaces, one parallel surface of each shaft being coplaner with a corresponding surface of the other shaft, the coupler comprising: a generally tubular base portion having a non-circular cross-sectional shape including a pair of substantially parallel and shaped opposite side walls and first and second ends walls which connect the side walls, the side walls being spaced a greater distance than the space between the shaft ends; each side wall defining an elongated slot partially extending into the first end wall with the slot width being just sufficient to receive a corresponding flat configured shaft end as the coupler is radially inserted over the shaft end, the slots extending parallel to one another whereby opposite side edge portions of a side wall defining the elongated slot engage the parallel surface to form a driving connection between each shaft and t he coupler;



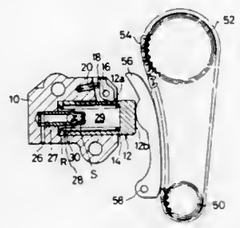
an elongated catch-tab formed integrally with the one end wall and extending both toward the other end wall and outward toward one of the side walls when is an unstressed condition, the catch-tab terminating at a free end unattached to adjacent portions of the side wall and thus independently movable with respect the side wall portions forming the slot and thus capable of movement under stress in a direction generally normal to the plane of the side wall as is caused by interaction with a shaft end portion as the coupler is inserted in a radial direct ion over the shaft end whereafter the free end of the catch-tab returns to its unstressed position by the movement of the shaft end past the free end which allows the free end to move outward toward the side wall and engage the shaft thereby securing the coupler to the shaft and preventing unintended disassembly of the coupler from the shaft.

4,822,320

RATCHET-TYPE TENSIONER WITH POSITIVE BACKLASH

Tadasu Suzuki, Kawagoe, Japan, assignor to Tsubakimoto Chain Co., Japan

Filed Jun. 29, 1988, Ser. No. 212,938
Claims priority, application Japan, Jul. 7, 1987, 62-167890
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—111 **7 Claims**



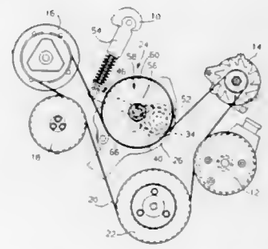
1. A ratchet-type tensioner for controlling positive backlash in a power transmission device wrapped around rotating members comprising, in combination:
- a housing;
- plunger means slidably protruding from said housing and having a rack formed along the length thereof;
- force exerting means urging said plunger means against the device and thereby applying tension between the members; and
- ratchet means pivotally connected to said housing for engaging said rack, the location of the center of rotation of said ratchet means being a function of the selected backlash B, a distance x parallel to the length of said rack between the center of rotation and its tip in the fully retracted position, a distance y normal to the length of said rack between the center of rotation and its tip in the fully retracted position, and the pitch P and the angle θ of said rack, the distance x being dependent upon a selected amount of the distance y, or the distance y being dependent upon a selected amount of the distance x.

4,822,321

COMBINATION WATER PUMP AND BELT TENSIONER

Donald L. Webb, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1988, Ser. No. 220,286
Int. Cl.[4] F16H *7/14*
U.S. Cl. 474—117 **3 Claims**



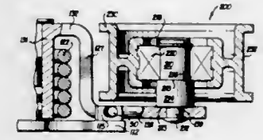
1. A combination vehicle engine coolant pump and engine fan belt tensioner, comprising,
- a pump housing having a bearing portion on the outside thereof,
- a pump shaft rotatably supported inside said pump housing coaxial to said pump housing bearing portion with an impeller mounted to the inner end of said pump shaft and with the outer end of said pump shaft extending out of said housing,
- a driven pulley on said pump shaft outer end,
- an arm attached at one end to said housing bearing portion so as to swing about the coaxis of said housing bearing portion and pump shaft,
- tension means connected to bias said arm to swing in one direction,
- a drive pulley rotatably supported on said arm at a location intermediate its two ends so as to spin about an axis that is parallel to said pump housing bearing portion-pump shaft coaxis and which swings about said coaxis as said arm swings, said drive pulley having an outer surface adapted to engage a run of said fan belt so as to keep said fan belt under continual tension as said arm swings and so as to be spun by said fan belt, said drive pulley also having an inner surface coaxial to said outer surface that spins therewith, and,
- a flexible drive means operatively connected between said drive pulley inner surface and said driven pulley so that said drive pulley and driven pulley turn one to one,
- whereby, said pump shaft will be driven by said fan belt, with the fan belt loads on said drive pulley and arm being transferred to said pump housing bearing portion and pump housing, thereby isolating said pump shaft from said fan belt loads while said flexible drive means compensates for said drive pulley and driven pulley axes swinging relative to one another as said arm swings with a change in fan belt length.

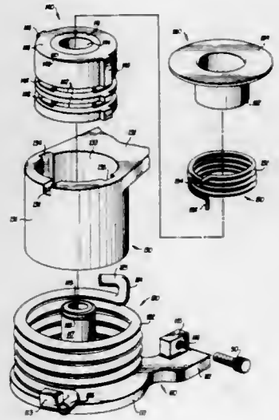
4,822,322

TENSIONING DEVICE FOR TIMING BELT OR CHAIN IN AUTOMOTIVE ENGINE APPLICATIONS

Kelly D. Martin, Lawndale, N.C., assignor to INA Bearing Co., Inc., Fort Mill, S.C.

Filed Jul. 25, 1988, Ser. No. 223,362
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—135 **9 Claims**



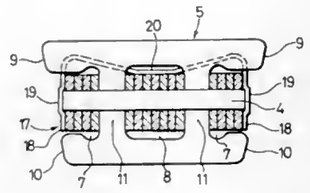


1. Apparatus for maintaining a predetermined optimum tension on an endless power transmission member, comprising:
- a first cylindrical housing including a radially extending arm member,
- pulley means carried by said arm member at an end thereof remote from said first housing,
- pivot means for said first housing, said pivot means defining a pivot axis, and including a second cylindrical housing and one-way clutch means permitting pivoting of said second housing in one direction only, said second housing being disposed within said first housing,
- means, coupled between said pivot means and said first housing, for rotatably driving said first housing about said pivot means in a first direction to move said pulley means into tensioning engagement with said endless power transmission member,
- interfitting radially extending means, carried by each of said first and second housings, for permitting rotation of said first housing relative to said second housing in second reversed direction, each of said interfitting radially extending means including means for limiting the amount of pivoting of said first housing means in said second direction such that said pulley means continuously maintains

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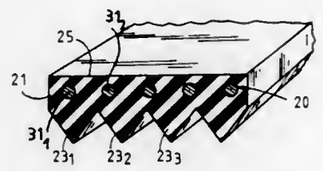
said optimum tension on said endless transmission member.

4,822,323
ENDLESS TRANSMISSION BELT
Yoshinori Miyaishi, Okazaki, and Shiro Sakakibara, Anjo, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan
Filed Oct. 28, 1987, Ser. No. 113,775
Claims priority, application Japan, Nov. 4, 1986, 61-260706
Int. Cl.[4] F16G *1/24*
U.S. Cl. 474—242 19 Claims



1. In an endless transmission belt for transmitting torque between a pair of pulleys each having a contact surface formed of the surfaces of two coaxial and opposite circular cones, the improvement comprising:
a plurality of pairs of facing first and second blocks having opposing side edges, each block being formed in the shape of a trapezoidal plate and having inclined contact surfaces respectively formed in the opposing side edges thereof, at least one through hole having a predetermined lateral size and recesses formed in the opposing side edges in alignment with the through hole, and bored in the direction of thickness of each block, pillar-like portions formed between the through hole and recesses and a groove formed on the surfaces of the pillar-like portions located in the facing surface of the first and second blocks in the direction of width of the block;
an endless belt comprising a parallel arrangement of at least three longitudinally-extending strands of thin link plates, each of said strands being formed by arranging the link plates having the same length side by side in a direction of thickness in a zigzag arrangement, said three strands of link plates being pivotally interconnected with predetermined intervals therebetween with articulating pins each penetrating through the respective component link plates of the strands; and
retaining members for holding said pins against axial displacement by attaching to the opposite ends of each pin at the opposite sides of said endless belt;
each of said strands of link plates having widths conforming to the respective sizes of the corresponding recesses and through hole of said first and second metallic blocks, respectively, and passing through the corresponding recesses and through hole of said first and second metallic blocks to the direction of the thickness of the blocks and a pair of the first and second metallic blocks being retained between the adjacent articulating pins by contacting with each other so as to be able to turn relative to each other at one surface thereof and receiving said pin in the groove formed in the surfaces of the pillar-like portions of each pair of the first and second metallic blocks at the other surface thereof.

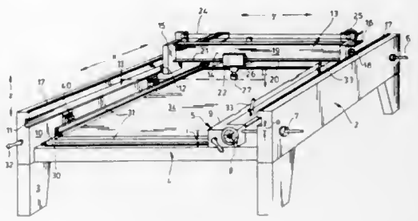
4,822,324
ENDLESS POWER TRANSMISSION BELT
Pierre Georget, Chambray Les Tours, France, assignor to Hutchinson, Paris, France
Filed Jan. 21, 1988, Ser. No. 146,480
Claims priority, application France, Jan. 28, 1987, 87 00982
Int. Cl.[4] F16G *1/10*
U.S. Cl. 474—268 18 Claims

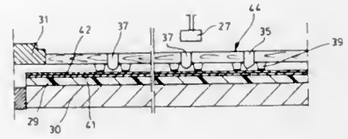


1. An endless power transmission belt comprising:
(a) a matrix made from an elastomeric material and
(b) a longitudinal reinforcement embedded in said matrix, said longitudinal reinforcement having an overall extension modulus:
(i) that is sufficiently low so that, in use, it is possible to fit the endless power transmission belt over fixed pulleys by exerting a tractive force on the endless power transmission belt and
(ii) that is sufficiently high so that, after the endless power transmission belt has been fitted over the pulleys, the endless power transmission belt maintains a minimum appropriate tension.

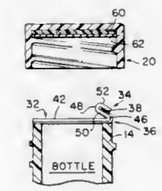
4,822,325
SHEET IMPRINTING APPARATUS
Franz Vossen, Radolfzell, Fed. Rep. of Germany, assignor to Meurer Nonfood Product GmbH, Radolfzell, Fed. Rep. of Germany
Continuation of Ser. No. 747,456, Jun. 21, 1985, Pat. No. 4,710,156, which is a continuation of Ser. No. 426,904, Sep. 29, 1982, Pat. No. 4,544,367. This application Jun. 12, 1987, Ser. No. 62,110
Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3216593
The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.
Int. Cl.[4] B31B *1/00*
U.S. Cl. 493—1 19 Claims

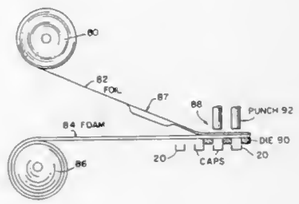
1. Apparatus for processing a sheet of material such as sheets of cardboard for the manufacture of folding boxes or the like comprising:
a table plate;
a stamping plate fixed to said table plate;
said stamping plate carrying a hard cardboard plate on an upper surface;
a chase structure movable relative to said stamping plate;
means for defining a folding box pattern including cut lines and bend lines located above said hard cardboard plate;
said pattern defining means being surrounded by said chase structure and carrying at least one member for forming said bend lines and at least one tool for forming said cut lines;
a beam member extending over the table plate at a spacing therefrom and disposed movably thereabove;
a carriage movable in a direction transverse with respect to the direction of movement of said beam member;
at least one vertically movable pressure member carried on said carriage; and
each said pressure member comprising a ram head operatively directed towards said cardboard plate for selectively applying pressure onto discrete areas of said pattern defining means for producing imprints on said cardboard plate.





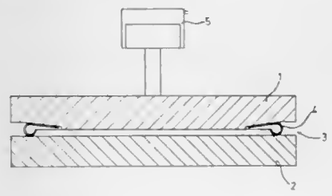
4,822,326
METHOD OF FORMING A TAMPER EVIDENT SEALING LINER
Myron E. Ullman, Canfield, and Milton Kessler, Youngstown, both of Ohio, assignors to Boardman Molded Products, Inc., Youngstown, Ohio
Division of Ser. No. 87,191, Aug. 20, 1987, Pat. No. 4,754,890. This application May 27, 1988, Ser. No. 180,948
Int. Cl.[4] B31B *1/60;* B21D *51/46*
U.S. Cl. 493—77 6 Claims





1. A method for forming a sealing liner for a plastic bottle cap, said liner being convertible to an improved tamper evident safety seal for a bottle, said method comprising
providing a tape of a polymer coated metal foil laminated to paper;
passing said tape of said flexible laminate of polymer coated metal foil and paper to a folding station;
double folding said laminate tape into a S- or Z-shape configuration;
passing said double folded laminate tape to a stamping and assembly station and between a matching punch and a die such that said folded laminate tape has a folded flat edge lying within the periphery of the matching punch and die;
passing bottle caps beneath said die in sequence with said laminate tap; and
punching a sealing liner from said folded tape and simultaneously forcing same into a cap disposed beneath said die.

4,822,327
JACKET FOR A FLEXIBLE MAGNETIC DISK AND PRODUCTION OF THE JACKET
Bernhard Lenz, Rheinmuenster; Kurt Zwintzscher, Willstaedt; Dietrich Gruehn, Appenweier; Hubert Fehrenbach, Kehl, and Norbert Holl, Battenberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Continuation of Ser. No. 870,906, Jun. 5, 1986, abandoned. This application Mar. 22, 1988, Ser. No. 170,032
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520114
Int. Cl.[4] B31B *1/64*
U.S. Cl. 493—190 4 Claims



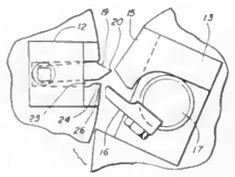
1. A process for the production of a jacket for the protection of a flexible magnetic disk, including the steps of
punching blanks out from a web of film material,
covering the surfaces of the blanks which are intended to be the inner surfaces of the jacket with a nonwoven fabric,
then folding the blanks together with the nonwoven fabric to form the jacket, and
causing the parts of the blank which are overlapped to be sealed together by means of folded-over tabs,
wherein, subsequent to the folding of the individual blanks, including the tabs, said process also includes the step of heating, by the application of substantially uniform amounts of heat directly over the entire surface area of the formed jacket, and then cooling, the formed jacket as a whole so that stresses set up in the jacket material during the earlier production steps are substantially eliminated.

4,822,328
FOLDING APPARATUS AND METHOD
Robert Bertolini, Green Bay, and Bernard A. Arveson, Denmark, both of Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.
Filed Dec. 21, 1987, Ser. No. 136,109
Int. Cl.[4] B31F *1/08*
U.S. Cl. 493—425 4 Claims

1. An apparatus for folding webs having a pair of rolls each equipped with tuckers and grippers and arranged for a tucker of one roll to enter into a gripper of the other roll, an improved tucker construction comprising an elongated member having a gripper-entering tip at one end and a pivot mounting at the other end, pivot means on each roll for mounting said elongated member in unbiased, free floating condition, and abut-

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ment means on each roll radially outward of said pivot means for limiting the amount of member free float to a predeter-



mined value and for immobilizing said member for initial timing of said rolls.

4,822,329

COMBINATION FOLDING AND CROSS-PERFORATING SYSTEM

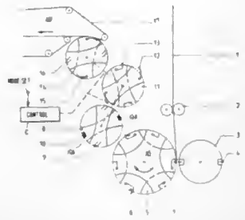
Eckhard Schneider, Stadtbergen, Fed. Rep. of Germany, assignor to MAN Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 20, 1987, Ser. No. 111,012

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636246

Int. Cl.⁴ B65H *35/08, 45/16, 45/28*

U.S. Cl. 493—359 **6 Claims**



1. A combination folding and cross perforating system for crosswise, or transversely pre-perforating a product at a location where a folded back or crease in a folded product is to be produced,

comprising

a folding blade cylinder (**5**) equipped with needles (**6**) and folding blades (**7**), for receiving products;

a first folding flap cylinder (**8**) having folding flaps (**9**) for receiving products from said folding blade cylinder (**5**), and at least one axially extending perforating groove (**10**);

a folding and perforating blade cylinder (**11**) associated with said first folding flap cylinder (**8**), said folding and perforating blade cylinder having

grippers **12** for receiving the folded products thereon from said first folding flap cylinder (**8**) and

a combination perforating and folding blade (**13**), said combination perforating and folding blade being controllable to engage a folded product held on the folding and perforating blade cylinder (**11**) when said folded product moves above the perforating groove (**10**) of the first folding flap cylinder (**8**) to form transverse perforations in the folded products;

a second folding flap cylinder (**14**) having folding flaps (**16**) thereon, said second folding flap cylinder (**14**) being associated with the folding and perforating blade cylinder (**11**) and receiving products from said folding and perforating blade cylinder (**11**), said combination perforating and folding blade (**13**) being controllable to engage said products when the products move over the folding flaps (**16**) of the second folding flap cylinder (**14**) to form a second transverse fold in the perforated products,

said second folding flap cylinder (**14**) delivering the products to a delivery transport system (**17**).

4,822,330

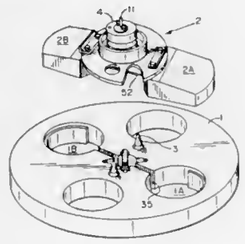
ROTOR WITH STRESS RELIEF

Harry A. Penhasi, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 30, 1987, Ser. No. 115,480

Int. Cl.⁴ B04B *5/02*

U.S. Cl. 494—16 **8 Claims**



1. A rotor for a centrifuge comprising in combination:

a disk having flat bottom surfaces,

hub means for attaching said disk to the spindle of a centrifuge, said hub having a mated and correspondingly flat top surface,

said flat bottom surface of said disk being positioned next to said flat top surface of said hub to form an interface for relative movement between said hub and disk upon loading due to centrifugation,

bolt means passing through said disk into said hub, said bolt means having an elastic portion and threads at the end thereof and said hub means has bolt holes which dispose at least one end of said bolt at a substantial distance from the interface for relative movement between said hub and disk, whereby said bolt means act as springs allowing said disk to move radially with respect to said hub at said interface, said bolt means maintaining pressure between said top surface of said hub and said bottom surface of said disk in a direction perpendicular to the flat top surface of said hub but allowing radial motion of said disk surface relative to the surface of said hub,

whereby said surface of said disk can move radially relative to said surface of said hub during dynamic loading due to centrifugation.

4,822,331

CENTRIFUGE

David C. Taylor, 45 Warren Dr., Patterson, N.Y. 12563

Filed Nov. 9, 1987, Ser. No. 118,570

Int. Cl.⁴ B04B *5/02*

U.S. Cl. 494—16 **27 Claims**

1. A centrifuge comprising:

a baseplate;

a motor assembly with an upper end and a lower end pivotably mounted in a vertical position on the baseplate and including a motor having an upper shaft at the upper end and a lower shaft at the lower end, the lower shaft extending through the baseplate, said motor assembly further including a reverse detection arm;

a spindle assembly vertically mounted in the baseplate and having a lower end and an upper end, the lower end of the spindle assembly extending through the baseplate;

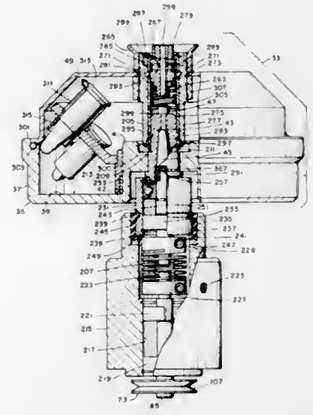
a rotor including a rotor base with a flat base portion and a cylindrical portion and a rotor cover, said rotor cover being removable from said rotor base, said rotor being mounted on the upper end of said spindle assembly;

a drive pulley mounted on the lower shaft of the motor assembly and a driven pulley mounted on the lower end of the spindle assembly, the drive pulley having a diameter substantially larger than the diameter of the driven pulley;

a drive belt mounted on and connecting the drive pulley and the driven pulley;

a tube carrier removably mounted in the rotor base and including a plurality of tube holders;

an enclosure mounted on the baseplate enclosing the motor assembly and the spindle assembly and the rotor, the enclosure having an access door above the rotor;



a locking mechanism mounted on the enclosure at the access door to prevent opening of the access door during operation of the rotor;

a stop switch located at the upper end of the motor assembly adjacent the reverse detection arm to deactivate the motor when the reverse detection arm strikes the stop switch; and

an electrical circuit means including the locking mechanism and the stop switch and further including means to activate the motor with a starting torque, said electrical circuit further including means to reverse the motor torque to a braking torque opposite from the starting torque and to increase substantially the starting and braking torque of the motor.

4,822,332

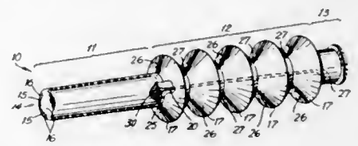
DEVICE FOR DELIVERING AN OBJECT TO A CAVITY

Richard E. Kajander, Ware, Mass., assignor to Tambrands Inc., Lake Success, N.Y.

Filed Mar. 31, 1988, Ser. No. 176,371

Int. Cl.⁴ A61F *13/20*

U.S. Cl. 604—16 **18 Claims**



1. A unitary device for delivering an object to a cavity, said device comprising:

a substantially rigid first tubular section for containing said object to be inserted, said tubular section having an exit end through which said object is inserted into said cavity;

a second tubular section abutting said first tubular section, said second section being collapsible and extensible; and

a pusher member mounted at a first end thereof to an inner wall of said device at an end remote from said exit end and extending through said second section into said first section, a second end of said pusher member being biased away from said inner wall, said pusher member having a length such that when said second section is collapsed, said second end reaches at least to said exit end, and when said second section is extended, said second end reaches at most to a point at which said first and second tubular sections abut one another; wherein:

when said object is in said device prior to insertion into said cavity, said second section is collapsed and said pusher member lies in a first position relative to said inner wall, between said inner wall and said object, in said first section; and

when said object is to be inserted, said second section is extended by grasping said first section and said remote end and moving them away from one another, whereby said pusher member is withdrawn from between said inner wall and said object and, as a result of said bias, said second end thereof assumes a second position further from said inner wall than said first position and adjacent said object, thereby arming said device; such that

when said exit end of said armed device is inserted in said cavity and said second section is collapsed by grasping said first section and said remote end and moving them toward one another, said pusher member pushes said object out of said exit end into said cavity.

4,822,333

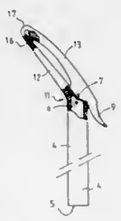
URETHRAL ENDOPROSTHESIS

Vincent A. Lavarenne, 13 Av Bolviller, 91800 Brunoy, France

Filed Sep. 2, 1987, Ser. No. 92,384

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 600—30 **7 Claims**



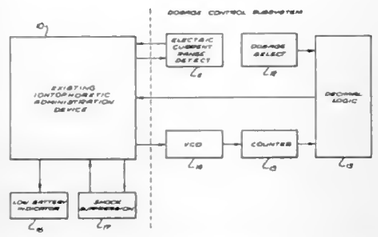
1. A urethral endoprosthesis comprising a tubular body forming a urinary catheter in the urethra and having a first end which is open and intended to be located at the tip of the penis without protruding therefrom,

valving means integral with said tubular body intended to be positioned within the bladder, at the second end of said tubular body, said valving means being elastically urged into a closed position;

a flexible and elastic portion of said valving means being applied against the internal wall of the bladder whereby to close said valving means in the rest position and to open it when the tubular body is pulled by squeezing the penis.

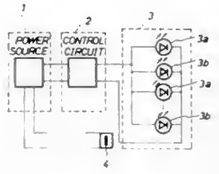
VOL 1101 ISS 3 AP 18 1989 UMI

4,822,334
ELECTRICAL DOSIMETRY CONTROL SYSTEM
Robert Tapper, 1935 Armacost Ave., Los Angeles, Calif. 90025
Filed Dec. 4, 1986, Ser. No. 937,910
Int. Cl.[4] A61N *1/40*
U.S. Cl. 604—20 5 Claims



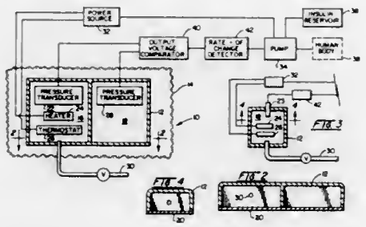
1. In an electronic control system for iontophoretic delivery of electrical current over time to a biological subject, the combination comprising:
means for determining the magnitude of said electrical current delivered to the biological subject;
means for controlling the time period over which electrical current is supplied to the biological subject;
adjustable means for selecting the dosage to be delivered to the biological subject;
means for electrically measuring the actual dosage applied to the biological subject as a function of the produce of said electrical current and time; and
means for terminating said electrical current delivered to the biological subject when said electrical current-time product equals said desired total dosage to be administered as established by said adjustable means.

4,822,335
APPARATUS FOR TREATMENT OF CANCER WITH PHOTODIODE
Yoshio Kawai, Musashino; Kazue Endo, and Makoto Yoshimura, both of Kawasaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 8, 1987, Ser. No. 94,111
Claims priority, application Japan, Oct. 29, 1986, 61-257345
Int. Cl.[4] A61F *2/38*; A61B *17/36*
U.S. Cl. 604—20 23 Claims



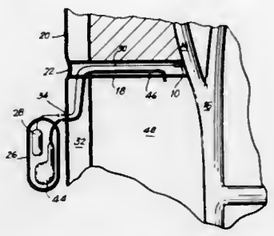
1. Apparatus for treatment of a cancerous lesion part with a light energy which is irradiated from a light source to said cancerous lesion part having absorbed and accumulated in advance therein a photosensitive substance with an affinity for tumors, wherein said light source comprises a first photodiode adapted to excite said photosensitive substance from the ground state thereof to a singlet state of a higher energy level and a second photodiode adapted to excite an energy level of said photosensitive substance which has transited from said singlet state to a triplet state to a still higher energy level, wherein a plurality of pairs of first and second photodiodes are disposed on a curved surface of a spherical-segment shaped support member along the bottom periphery of said support member and projected radially outwardly from said curved surface, any two randomly selected adjacent photodiodes constituting a pair of a first photodiode and a second photodiode.

4,822,336
BLOOD GLUCOSE LEVEL SENSING
John DiTraglia, 3317 Orchard Dr., Portsmouth, Ohio 45662
Filed Mar. 4, 1988, Ser. No. 164,473
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—50 16 Claims



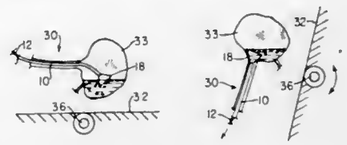
1. In a method of sensing blood glucose levels within a body of live tissue having peritoneal fluid therein for the control of insulin infusion into the body, the steps of:
(a) passing glucose from the peritoneal fluid through a semipermeable membrane and into a closed chamber;
(b) reacting the glucose passed into said closed chamber with a yeast suspension within the chamber to produce a level of carbon dioxide in said closed chamber;
(c) detecting the level of carbon dioxide in said closed chamber; and
(d) controlling insulin infusion into blood as a consequence of the detected carbon dioxide level.

4,822,337
INSULIN DELIVERY METHOD AND APPARATUS
Stanley Newhouse, 206 Juniper Cir. North, Lawrence, N.Y. 11559; Robert Lerner, 315 E. 65th St., New York, N.Y. 10021, and Roy Martin, 3312 182nd Pl., NE., Redmond, Wash. 98452
Filed Jun. 22, 1987, Ser. No. 64,355
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—50 16 Claims



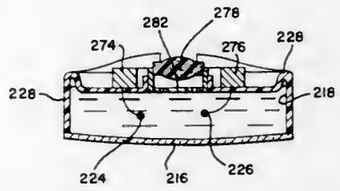
1. A method for providing for the insulin needs of a diabetic individual, comprising: mounting a blood flow sensor on the individual such that digestive tract blood flow may be monitored; monitoring said digestive tract blood flow and forming an electrical data signal relating thereto; computing the individual insulin needs based upon said electrical data signal; and delivering an amount of insulin responsive to said determined need to the individual.

4,822,338
METHOD OF REMOVING MATERIAL FROM THE STOMACH USING A COLLAPSIBLE FUNNEL
Wayne D. Longmore, 40 Remsen St., Apt. 4, Brooklyn, N.Y. 11201, and Peter J. Acker, 49 Barton Pl., Port Chester, N.Y. 10573
Filed Sep. 3, 1987, Ser. No. 92,741
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—54 6 Claims



1. A method of removing material from the stomach of a patient comprising the steps of:
inserting a catheter with a collapsible funnel into the stomach of a patient,
erecting the funnel,
administrating a lavage liquid through the catheter to the patient's stomach, and
turning the patient to a position where his head is lower than his feet to permit the material to be removed to flow from the stomach into the open end of the funnel and out of the patient through the catheter.

4,822,339
THERAPEUTIC AGENT DELIVERY SYSTEM AND METHOD
Loi H. Tran, Wheaton, Ill., assignor to Controlled Release Technologies, Inc., Batavia, Ill.
Continuation-in-part of Ser. No. 679,128, Dec. 6, 1984, Pat. No. 4,715,850. This application Jun. 16, 1987, Ser. No. 62,959
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—82 26 Claims



1. A therapeutic agent delivery system comprising:
(a) a first housing;
(b) a second housing mounted on the first housing, and having an inlet and an outlet;
(c) a semipermeable membrane captured between the first housing and the second housing, the membrane and first housing defining a donor chamber adapted to receive a therapeutic agent and the membrane and the second housing defining a receiving chamber in fluid communication with the inlet and the outlet and being adapted to receive therapeutic agent from the donor chamber through the membrane;
(d) a first electrode exposed within the donor chamber; and
(e) a second electrode exposed within the receiving chamber such that the therapeutic agent remains in the donor chamber until an electromotive force of a sufficient amount is applied between the electrodes whereby at least a portion of the therapeutic agent passes from the donor chamber to the receiving chamber and when the electromotive force is no longer applied no further therapeutic agent is delivered to the receiving chamber.

4,822,340
AUTOMATIC INJECTOR
Paulus R. Kamstra, Olst, Netherlands, assignor to Duphar International Research B.V., Weesp, Netherlands
Filed Oct. 9, 1986, Ser. No. 917,143
Claims priority, application Netherlands, Oct. 11, 1985, 8502777
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—135 31 Claims



1. An automatic injector for injecting one or more injection liquids, comprising:
a combination of a substantially cylindrical means containing a discharge mechanism and a plurality of cartridge elements, said cartridge elements comprising:
a piston that is movable in said substantially cylindrical means and seals same;
a sealing stopper that is movable in said substantially cylindrical means, whose circumference adjoins the inner wall of said cylindrical means in a sealing manner, and that, prior to use of the injector, seals the foremost injection liquid from the front end of said substantially cylindrical means;
a number of separating stoppers equal to one less than the number of said liquids, said separating stoppers being movable in said substantially cylindrical means and having circumferences that adjoin the inner wall of said cylindrical means in a sealing manner, thereby keeping said liquids separated from each other prior to use of said injector;
a needle holder comprising a neck for sealingly gripping a needle, and a needle holder stopper that is movable in the substantially cylindrical means, that at its rear end adjoins the front face of said sealing stopper, that at its front end adjoins said neck, that comprises a longitudinal bore that at the front end of said needle holder stopper communicates with the duct of said neck, and that comprises a by-pass means through which said one or more liquids behind said sealing stopper can reach said bore; and
a needle sealingly gripped by said neck;
said substantially cylindrical means comprising:
a nose portion that tapers inwardly in the forward direction and terminates at its front end with an aperture to allow passage of said needle during operation of the injector and at its rear end comprises an abutment for said needle holder stopper in its ultimate forward position; and
by-pass means in front of said sealing stopper for permitting said one or more liquids behind said sealing stopper to reach said needle holder by-pass means when during operation of the injector the sealing stopper and said

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number of separating stoppers are moved forward, said cylindrical means by-pass means extending in the longitudinal direction over a length that is substantially shorter than the combined lengths of said sealing stopper and said needle holder stopper;

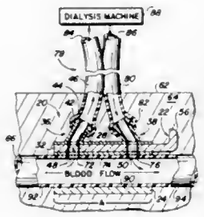
wherein said substantially cylindrical means and said cartridge elements are so proportioned that when, during operation of said injector, said needle holder stopper has been moved forward, said needle holder stopper circumferentially adjoins in a sealing manner the inner wall of said substantially cylindrical means in front of said cylindrical means by-pass means, and that the distance between the rear end of said cylindrical means by-pass means and said abutment for said needle holder stopper is slightly greater than the combined lengths of said needle holder stopper, said sealing stopper, and said number of separating stoppers, so that when all of said stoppers are in their ultimate forward positions, they do not cover the rear end of said cylindrical means by-pass means.

4,822,341

VASCULAR ACCESS FISTULA

William M. Colone, Phoenix, Ariz., assignor to Impra, Inc., Tempe, Ariz.

Filed Nov. 20, 1987, Ser. No. 123,339
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—175 **22 Claims**



1. An access device for implantation in a living body to facilitate access to a fluid path within the living body, said access device comprising in combination:

a. a hard sintered unexpanded PTFE tube section having first and second opposing ends and having a tubular wall;

b. at least one access port hole formed in the tubular wall of said hard sintered unexpanded PTFE tube section for permitting access to the interior thereof;

c. first and second expanded PTFE tube sections each having first and second opposing ends, the first end of said first expanded PTFE tube section being integrally joined with the first end of said hard sintered unexpanded PTFE tube section, and the first end of said second expanded PTFE tube section being integrally joined with the second end of said hard sintered unexpanded PTFE tube section;

d. said first and second expanded PTFE tube sections and said hard sintered unexpanded PTFE tube section collectively providing a PTFE tube having a smooth continuous lumen; and

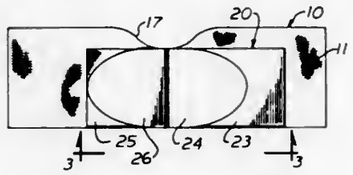
e. access means coupled to said hard sintered unexpanded PTFE tube section for establishing a fluid path between the at least one access port hole and a point external to the living body.

4,822,342

PREPARED TAPE FOR BODY INSERTED TUBE

Johnny A. Brawner, 5291 W. 229th St., Fairview Park, Ohio 44126

Filed Nov. 18, 1982, Ser. No. 442,631
Int. Cl.[4] A61M *25/02*
U.S. Cl. 604—180 **13 Claims**



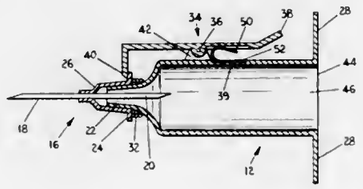
1. A prepared tape for securing to a patient's skin or to a support a medical device such as an intravenous needle, a catheter, tubing or the like comprising a length of a flexible base tape and a length of a flexible anchoring tape, each having a pair of lateral edges parallel to its length and opposite adhesive and non-adhesive surfaces, the non-adhesive surface of the base tape being joined to the non-adhesive surface of the anchoring tape in a linear area intermediate of and substantially parallel to the lateral edges of both tapes, whereby, when the base tape is adhered to a supporting surface, a medical device overlying said linear area may be restrained from movement with respect to said supporting surface by adhesion to the surface of segments of the anchoring tape wrapped over said device.

4,822,343

BLOOD COLLECTION DEVICE WITH EJECTABLE TIPS

Louise Beiser, 18585 W. Spring Lake Rd., Spring Lake, Mich. 49456

Filed Sep. 21, 1987, Ser. No. 98,989
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—187 **7 Claims**



1. In a blood collecting device for use in collecting blood samples wherein the collecting device comprises a tubular holder with an open end and a needle mount end and a needle assembly having a hub fitting and a double ended needle extending therethrough, the needle assembly being mounted on the tubular holder by inserting one end of the needle through an opening in the needle mount end and sliding the needle longitudinally inward until there is engagement between the hub fitting and the needle mount end, the tubular holder compatibly receiving a blood collection tube through the open end of said holder so as to engage the inwardly extending end of the needle, the improvement wherein the needle mount end and hub fitting comprise mating inwardly tapered surfaces that provide a sealed engagement therebetween when the hub fitting is seated on the needle mount end, the sealing engagement being broken as soon as the hub fitting is moved away from its seated position on the needle mount end, the device comprising manually releasable latch means for affirmatively

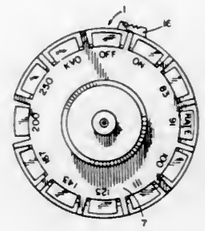
retaining the hub fitting of the needle assembly seated on the needle mount end, the needle assembly being slidably longitudinally out of engagement with the needle mount end when the latch means is released, the device further comprising automatic, non-manual ejection means for dislodging the needle assembly longitudinally from the needle mount when the latching means is disengaged, the needle assembly moving freely off the end of the needle mount end as soon as the hub fitting is dislodged from its seated position, due to the tapered shape of the needle mount end and the hub fitting.

4,822,344

APPARATUS FOR CONTROLLING FLUID FLOW RATE

Matthew O'Boyle, Houston, Tex., assignor to Sta-Set Corp., Houston, Tex.

Filed Dec. 5, 1986, Ser. No. 938,620
Int. Cl.[4] A61M *5/005*
U.S. Cl. 604—248 **16 Claims**



16. A combination for variable infusion of liquid parenterally to a patient comprising a container containing a liquid to be administered parenterally to a patient, a needle set through which liquid from said container can be administered to a patient when a needle of said needle set is inserted into the patient, and means defining a flow path for conveying liquid from said container to said needle set, said means defining a flow path including a device for controlling a flow rate of a liquid from said container to be infused paraenterally to a patient via said needle set, said device comprising a metering member having a flat surface with a groove formed therein radially outward of an axis of rotation of said device, a baffle member having a surface overlying the groove of the metering member to form a passage with said groove and said metering member through which a liquid can be flowed, said baffle member being secured against movement relative to said metering member, at least one of the metering member and the baffle member having a plurality of spaced openings extending therethrough in a direction transverse to said flat surface of said metering member and communicating with respective portions along the length of said passage, said plurality of spaced openings being located radially outward of said axis of rotation of said device, and a shunt rotatable about said axis of rotation relative to said metering member and baffle member for selectively communicating with respective ones of said plurality of spaced openings for bypassing liquid about at least a portion of the passage.

4,822,345

CONTROLLABLE FLEXIBILITY CATHETER

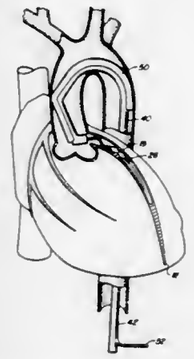
John W. Danforth, 875 25th Ave., San Francisco, Calif. 94105

Continuation of Ser. No. 896,471, Aug. 14, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 170,596
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—282 **23 Claims**

1. A catheter comprising:

an elongate housing having an opening extending from a proximal end to a distal end of its length, the housing adapted to be inserted into a vessel wherein said housing, when inserted in the vessel, has a first substantially curved portion and a second substantially straight portion, said first portion being more proximate to the distal end than said second portion; and

controllable stiffening means coupled to said first portion of the length of the elongated housing to provide at least a first higher flexibility of said first portion of the elongated housing and a second lower flexibility of said first portion



of the elongated housing as selected by a user of the catheter,

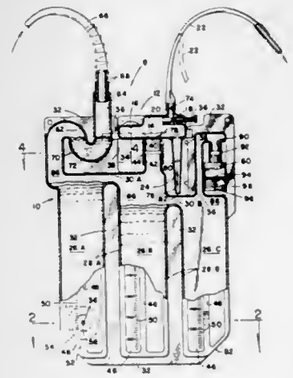
wherein the flexibility of said second portion of said elongate housing is substantially unchanged by said user-selected change in flexibility of said first portion of said elongated housing, and wherein the curvature of said curved portion is not substantially decreased when said housing has said second lower flexibility.

4,822,346

CHEST DRAINAGE APPARATUS

Donald P. Elliott, Denver, Colo., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 909,779, Sep. 19, 1986, Ser. No. 553,992, Nov. 21, 1983, Ser. No. 341,877, Jan. 22, 1982, Ser. No. 156,920, Jun. 6, 1980, said Ser. No. 341,877, is a division of Ser. No. 156,920,. This application Apr. 13, 1988, Ser. No. 181,189
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—319 **15 Claims**



1. A non-waterseal thoracic drainage apparatus comprising:

means defining a fluid collection chamber having an air space at its upper end;

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an inlet tube in communication with the fluid collection chamber, the inlet tube being connectable to receive fluids and air from a patient's a chest cavity.

one-way waterless valve means associated with the fluid collection chamber and being operative, unaided by underwater seals, to permit air to flow out of the air space while preventing reverse flow back into the collection chamber;

means defining a flow path between the inlet tube and said one-way waterless valve means;

air leak indicator means along said flow path for entrapping a volume of liquid through which air may bubble;

said air leak indicator means being constructed to provide a visual indication of air passing therethrough; and

said one-way waterless valve means being openable in response to a low pressure differential.

4,822,347

FEMALE INCONTINENCE DEVICE

Morag M. MacDougall, London, England, assignor to E. R. Squibb and Sons, Inc., Princeton, N.J.

Filed Dec. 31, 1981, Ser. No. 336,244

Claims priority, application United Kingdom, Jan. 14, 1981, 8101033

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—329 **3 Claims**



1. An incontinence device for females consisting of an adhesive pad having an upper adhesive layer that in use contacts the body and a lower non-adhesive side, said upper adhesive layer of said pad comprising a homogeneous blend of one or more water soluble or swellable hydrocolloids in a viscous elastic binder and said lower non-adhesive side of said pad is a film of polymeric material, said pad is dimensioned so that it can be stuck to the skin of the wearer in the region immediately surrounding the urethral orifice, said pad having a centrally located aperture through said adhesive layer and said non-adhesive side, and a tubular sheath having an upper end that is strengthened by beading and a lower end that is integral with a funnel that empties into a urine-conducting pipe, said tubular sheath including a cylindrical chamber intermediate to said upper and lower ends, wherein the upper end of said sheath has a narrower diameter then said cylindrical chamber and passes through the aperture in said adhesive pad and said beading is adhesively secured to the adhesive layer of said pad.

4,822,348

SURGICAL CLIPS

Donn Casey, 141 Newmarket Rd., Cambridge, England CB5 8HA

Filed May 13, 1987, Ser. No. 49,613

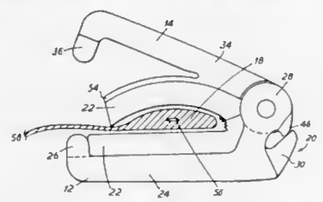
Int. Cl.[4] A61B *17/12*

U.S. Cl. 604—346 **18 Claims**

1. A surgical clip for performing sexual sterilization, comprising:

two jaws hinged together to form a mouth for receiving a bodily duct to be occluded by closing the jaws; and

an elongated trapping member of resilient material extending from a first end relatively remote from the said mouth substantially along the length of the said one jaw to a



second free end relatively closer to the said mouth, the trapping member in its unstressed condition curving away form the said one jaw towards the other jaw, the trapping member acting to restrict the mouth formed by the jaws, whereby the trapping member and the said other jaw trap a duct within the mouth before the jaws are fully closed.

4,822,349

METHOD OF TREATING WOUNDS

Francis X. Hursey, 27 Keeney Ave., W. Hartford, Conn. 06107, and Fernand J. Dechene, 2931, New Britain, Conn. 06051

Filed Apr. 25, 1984, Ser. No. 603,884

Int. Cl.[4] A61L *15/00*

U.S. Cl. 604—367 **3 Claims**

1. A method in the medical treatment of warm blooded mammals for reducing the flow of blood from an external wound or other opening in the heart, vein, artery or other internal organ,

(a) providing dehydrated zeolite molecular sieve material in a sterilized form suitable for use in or on a person to be treated,

(b) applying said zeolite molecular sieve material directly to the wound or other opening from which blood is emanating so as to completely cover the wound or opening in order that zeolite molecular sieve material absorb water from the blood to achieve a coagulation effect, and heat the tissue adjacent the wound where the moist blood comes into contact with the zeolite molecular sieve material to cauterize such tissue as a result of exothermic action from the zeolite molecular sieve material.

4,822,350

ABSORBENT ARTICLE

Osamu Ito, Utsunomiya, and Hiroshi Mizutani, Yachiyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jan. 28, 1986, Ser. No. 823,469

Claims priority, application Japan, Jan. 30, 1985, 60-15754; Oct. 25, 1985, 60-239122

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—372 **9 Claims**

1. An absorbent article comprising a liquid-impermeable, leakproof sheet; a liquid-permeable sheet; and an absorbent layer provided between said leakproof sheet and said surface sheet, wherein said leakproof sheet is a monoaxially or biaxially stretched porous film of a polyolefin resin composition comprising 100 parts by weight of a polyolefin, 25 to 400 parts by wight of a filler, 1 to 100 parts by weight of a liquid or wax hydrocarbon polymer and 3 to 70 parts by weight of an epoxy group containing organic compound said film having a pore size of 0.05 to 5 microns, a pore volume of not smaller than 0.1 cm^3/cm^3, a water vapor permeability of not smaller than 500 g/m^2 for 24 hours and a bending resistance in the longitudinal and transversal direction which satisfies the following formula:

$$\text{bending resistance} \leqq 0.193 \times \text{film thickness} + 35$$

wherein bending resistance is in mm, and film thickness is in μ.

4,822,351

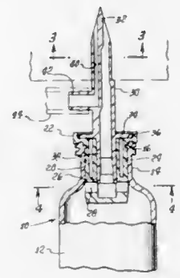
POWDER SPIKE HOLDER

Bradford P. Purcell, Alta Loma, Calif., assignor to IMS Limited, South El Monte, Calif.

Filed Mar. 25, 1987, Ser. No. 30,441

Int. Cl.[4] A61B *19/00*

U.S. Cl. 604—411 **7 Claims**



1. The novel container and closure combination comprising:

a container having a cylindrical neck of reduced cross-section with respect to the main body of the container and terminating in an open end, said neck having a projection on its inner surface in proximity to said open end, and

a closure for said open end having a skirt portion received in said open end and a shoulder at its outer end adapted to move into abutting relationship with the end of said cylindrical neck, said skirt portion having a cut out adapted for receiving said projection on the inner surface of said neck to hold said shoulder in non-abutting relationship with the end of said neck, said closure including a central fluid passage and a transverse fluid passage in communication therewith, the ends of said transverse fluid passage being sealed by the inner surface of said neck when said closure is held in the non-abutting position by the engagement of said projection in said cut out, said engagement being adapted to be overcome by force applied to the end of said closure whereby said shoulder is brought into abutting relationship with the end of said neck and the transverse passage is moved out of said neck and into fluid communication with the interior of said container, whereby a fluid pathway is provided from the interior of said container through said closure to the exterior.

4,822,352

MEDICAL TUBES WITH POROUS TEXTURED WALLS

Yasushi Joh, and Noriaki Kaneko, both of Yokohama, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jun. 25, 1987, Ser. No. 66,849

Claims priority, application Japan, Aug. 8, 1986, 61-185165

Int. Cl.[4] A61F *2/06*

U.S. Cl. 623—1 **3 Claims**

1. A medical tube comprising a mono-layer medical tube having inner and outer wall faces and comprised of a high molecular weight compound, wherein an inner texture of a tube wall constituting said tube is porous and no skin layer is present on the inner face of said tube wall;

the porous inner texture of the tube wall having a microscopically spongy structure wherein the pores are 0.01 to 30 microns, said inner structure defining a great number of cell or void walls forming cells or voids; said cells or voids continuously connected over the whole area of the inner texture by said pores,

the size of said cells or voids being such that a diameter (1) of a cell or void corresponding to the maximum diameter taken at an arbitrary cross-section, relative to a thickness of the tube wall (d) is $0.005d \leqq 1 \leqq 0.9d$, and the size distribution within the tube being such that the size of the cells or voids are smaller near the outer wall of the tube thereby to minimize blood leakage;



said inner face further defining concavities open to the inside of the tube and open to said cells or voids; and

wherein said medical tube shows no leakage of water when kept under a positive pressure of 120 mmHg.

4,822,353

HEART VALVE

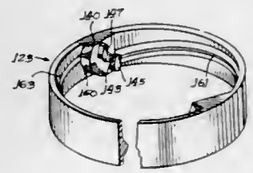
Jack C. Bokros, Austin, Tex., assignor to Carbomedics, Inc., Austin, Tex.

Division of Ser. No. 806,032, Dec. 6, 1985, Pat. No. 4,692,165, and a continuation-in-part of Ser. No. 653,960, Sep. 24, 1984, abandoned. This application May 4, 1987, Ser. No. 45,397

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[4] A61F *2/24*

U.S. Cl. 623—2 **12 Claims**



1. A heart valve prosthesis comprising

a generally annular body which has an interior surface that defines a central passageway for blood flow therethrough,

occluder means supported on said body for alternately blocking and then allowing the flow of blood through said passageway in a predetermined direction,

said occluder means being formed with means at opposite locations in the periphery thereof that cooperate with complementary means interior of said annular body, and

a pair of opposed seat means provided on said interior surface of said annular body, each of said seat means having an abutment surface engageable with a portion of the periphery of said occluder means, which abutment surface is generally that of a portion of a frustum of a cone so that when the periphery of said occluder means engages said pair of seat means in the closed position a good seal is achieved therealong.

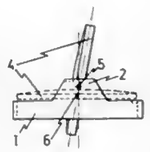
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4,822,354

MECHANICAL VALVULAR PROTHESIS FOR USE IN CARDIAC SURGERY

Ignacio M. Elosegui, Ronda de Tejares, 19 - Portal 4 6º, 14008 Cordoba, Spain

Filed Aug. 28, 1987, Ser. No. 90,609
Claims priority, application Spain, Sep. 2, 1986, 8600413
Int. Cl.⁴ A61F *00/00*
U.S. Cl. 623—2 **6 Claims**



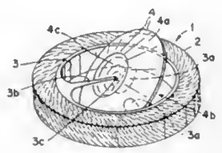
1. A mechanical valvular prothesis comprising:
- a ring having an interior surface, an exterior surface, an upper downstream rim surface, a lower upstream rim surface, and an upper and lower opening formed by the interior surface;
- at least one butt, essentially flush with the upper downstream rim surface, inwardly extending from the interior surface of the ring;
- at least two flanges upwardly extending from the upper downstream rim, said flanges having at least one inclined slot thereon;
- at least one tab inwardly extending from an upper portion of the flanges; and
- a disc, having a top side, a bottom side, a peripheral rim, and at least two pivots extending from the disc in a nondiametrical manner, said disc is positioned between the flanges so that the pivots can extend into the slots and permit the disc to have both translational and rotational movement, wherein the disc moves from a closed first position, in which the disc covers the upper opening and rests on the butt so that the bottom side of said disc is slightly spaced above and parallel to the upper rim surface, to an open second position in which the disc rests against the tabs so as to form approximately equal passages on either side of the disc.

4,822,355

HEART VALVE ASSEMBLY

G. S. Bhuvaneshwar, Trivendrum, India, assignor to Sree Chitra Tirunal Inst. for Medical Science & Technology, Kerala, India

Continuation of Ser. No. 928,095, Nov. 7, 1986, abandoned. This application Jun. 21, 1988, Ser. No. 210,165
Claims priority, application India, Aug. 21, 1986, 671186
Int. Cl.⁴ A61F *2/24*
U.S. Cl. 623—2 **2 Claims**



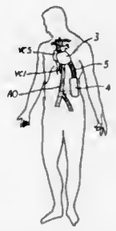
1. An improved heart valve assembly comprising a sewing ring component, a valve housing component and a disc occluder, said disc occluder being held tiltably on supports within the enclosed space of the valve housing component, said valve housing component having a grooved ring portion externally and having said sewing ring component accommodated on same and fabricated from knitted or woven fabrics of carbon or knitted or woven fabrics of polyester, polytetrafluoroethylene, which said polyester or polytetrafluoroethylene fabric may be coated with carbon, said valve housing being a fabricated housing of cobalt-chromium-tungsten alloy having a surface coating of Titanium Nitride, said disc occluder being made of material selected from the group consisting of synthetic sapphire wherein the disc occluder is provided with a substantially flat surface on its one side and a substantially convex surface on the opposite side thereof, said convex side being also provided with a centrally depressed portion for engaging it on a suitable support means of the valve housing, said substantially flat surface having a centrally depressed portion being not as prominent as the depressed portion on the other side of the disc, and wherein the valve housing is provided with a plurality of support means for the disc occluder from both sides of the housing, the said support means being solid or strut members extending to a distance substantially to the center of the housing, one support means provided from one side of the housing and having a hooked end portion curved towards the opposite side of the housing adapted to engage the depressed portion on the convex surface of the disc component, two other support means provided on the side of the housing opposite to that which is provided with said one support means, the said two support means extending substantially radially to the center of the housing and being substantially flat members adapted to support the substantially flat surface of the disc occluder such that the disc occluder is mounted tiltably on the said three support means provided in the housing component.

4,822,356

EXTRA-PERICARDIAL MODULE FOR TOTAL CARDIAL PROSTHESIS MODULES ASSOCIATED IN A FUNCTIONALLY INDISSOCIABLE UNIT

Jean-Louis Chareire, Levallois, and Didier Lapeyre, Pacy-sur-Eure, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 15, 1986, Ser. No. 942,074
Claims priority, application France, Dec. 13, 1985, 85 18514
The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.
Int. Cl.⁴ A61F *2/22*
U.S. Cl. 623—3 **10 Claims**



1. Extra-pericardial module for a total cardial prosthesis comprising two pumps, respectively representative of the right heart and the left heart and comprising the indissociable functional unit constituted of:
- a pericardial module adapted to be housed in the cavity of the natural heart to be replaced and enclosed in a tight envelope comprising at least three orifices for connection, adapted respectively to be connected to the right atrium, to the pulmonary artery, and to the left atrium, said orifices for connection to the right atrium and to the pulmonary artery being provided with valves in order to serve respectively as input orifice and as output orifice for a first pump housed in said envelope and adapted to perform the function of the right heart of the natural heart to be replaced;
- an extra-pericardial module, adapted to be housed in a physiologically neutral space in the recipient patient and to perform the function of the left heart of the natural heart to be replaced, said extra-pericardial module comprising a second pump of the type with diaphragm and thrust plate enclosed in a tight envelope, provided with an input orifice and an output orifice, each equipped with a valve;
- a functional link between said modules comprising at least:
- a first duct passing through said envelope of said pericardial module and connecting the orifice thereof corresponding to the left atrium and the input orifice of the second pump incorporated in said extra-pericardial module;
- a second duct establishing a gaseous communication between the sides of said first and second pumps opposite the blood passing therethrough; passages being provided inside of said envelope so that the parts of the envelope containing the mechanisms can communicate with the inside of said second duct,

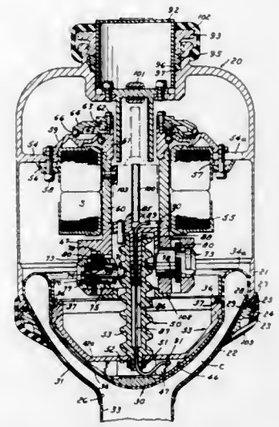
said first and second pumps being actuated in opposition, wherein said second pump comprises in its envelope, a tight enclosure which communicates with said input orifice and said output orifice of said second pump, and which is at least partly defined by two supple diaphragms, placed in facing relationship, and two thrust plates also in facing relationship, placed on either side of said tight enclosure in contact with a diaphragm and imparted with reciprocating back and forth movements, under the action of mechanisms disposed respectively on the side of the corresponding thrust plate opposite said tight enclosure.

4,822,357

AUXILIARY ARTIFICIAL HEART

David A. Forster, Drayton Plains, and W. Kenneth Crowder, Davison, both of Mich., assignors to Articor Limited, Flint, Mich.

Filed Apr. 29, 1987, Ser. No. 43,870
Int. Cl.⁴ A61F *2/22*
U.S. Cl. 623—3 **12 Claims**



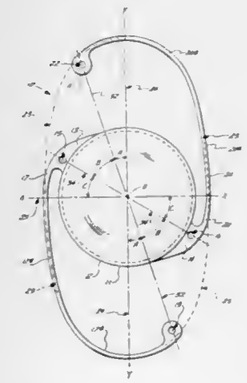
1. An auxiliary artificial heart comprising a housing having an opening adapted to be connected to a blood vessel,
- a diaphragm mounted in said housing for movement toward and away from the opening,
- an electric motor mounted within said housing;
- said motor including a stator and an armature, said armature being hollow,
- a screw connected to one side of said diaphragm and having an external thread thereon,
- said armature supporting a plurality of circumferentially spaced roller pins extending radially inwardly with, the ends having surfaces complementary to the surface of the thread on the screw,
- each said roller pin being supported by bearings in said armature such that when the motor is energized to rotate the armature in one direction, the screw and, in turn, the diaphragm are moved toward the opening in the housing and when the motor is energized to rotate the armature in the opposite direction, the screw is moved and, in turn, the diaphragm are moved away from the opening.

4,822,358

INTRAOCULAR LENS

Norman S. Jaffe, N. Miami Beach, Fla., assignor to Cilco, Inc., Bellevue, Wash.

Continuation of Ser. No. 8,056, Jan. 16, 1987, abandoned, which is a continuation of Ser. No. 744,137, Jun. 12, 1985, abandoned. This application Feb. 1, 1988, Ser. No. 150,460
Int. Cl.⁴ A61F *2/16*
U.S. Cl. 623—6 **7 Claims**



1. An intraocular lens comprising:
- (a) an optic having a periphery;
- (b) first and second haptics of substantially similar geometry, each connected to and projecting from the periphery of the optic on substantially diametrically opposite sides from each other;
- (c) the haptics being curved to define generally an ellipse, such that the haptics and the defined ellipse encircle the optic with narrower ellipse sides along an X axis and wider ellipse sides along a Y-axis, the X and Y ellipse axes traversing respectively the narrowest and widest portions of the ellipse, defining four ellipse quadrants;
- (d) each haptic including a first gusset segment extending radially outwardly from said optic periphery and a relatively long, thin, loop portion projecting from the gusset segment, at a beginning position;
- (e) each loop portion including a second segment extending from the first gusset segment and spaced outwardly from the periphery of the optic, the second segment including a first portion extending from the gusset segment and generally parallel to the periphery of the optic for a distance the second segment further including at least one second portion with a substantially greater curvature than the optic periphery extending from the first portion and through at least one-half of an ellipse quadrant, so that the second loop segment projects away from the optic to a point that is substantially farther from the optic than the beginning position, the second segment forming at least a portion of one of the narrower sides of the ellipse;
- (f) each haptic further including a third segment extending

from the second segment and having a significantly smaller radius of curvature than the second portion and forming at least a major portion of one of the narrower sides of the ellipse;

(g) the third segment of each haptic terminating at a free end lying outward of the optic portion along a line extending radially from the optic portion that is positioned relative to the beginning of the second segment of the other haptic so that the free end of one haptic approaches but does not overlap the second segment of the other haptic when the haptics are in an uncompressed state; and

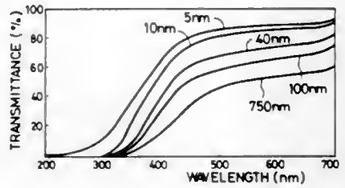
(h) wherein the first segment of the haptics are relatively stiff and the other segments being more flexible.

4,822,359

INTRAOCULAR LENS WITH COATED DIAMOND-LIKE CARBON FILM

Yasuo Tano; Hisashi Hosotani; Naoji Fujimori, and Keizo Harada, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 18, 1988, Ser. No. 156,752
Claims priority, application Japan, Feb. 19, 1987, 62-36681
Int. Cl.[4] A61F 2/16; A01N 1/02
U.S. Cl. 623—6 **2 Claims**



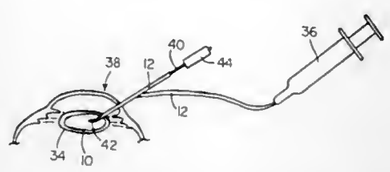
1. An intraocular lens comprising an artificial crystalline lens, and a diamond-like carbon film coated on the surface of said artificial crystalline lens said film having a thickness in the range of approximately 10–100 nm.

4,822,360

INFLATABLE, INTRAOCULAR LENS AND METHOD OF IMPLANTING THE LENS IN THE CAPSULE OF AN EYE

Jim Deacon, Capistrano Beach, Calif., assignor to University of Utah, Salt Lake City, Utah

Filed Mar. 16, 1988, Ser. No. 169,231
Int. Cl.[4] A61F 2/16; A61B 17/00
U.S. Cl. 623—6 **12 Claims**



1. An inflatable, intraocular lens for implantation within the lens capsule of an eye following removal of the biological contents of the lens capsule, said lens comprising

a thin-walled lens skin forming a substantially enclosed, collapsible sac, said lens skin being made of a clear, flexible polymeric material and having a wall thickness no greater than about 0.15 millimeter, said lens skin further having an exterior shape when inflated which is substantially the same as the shape of the biological content of the lens capsule of a normal eye; and

a pair of longitudinal, flexible tubes extending from said lens skin, with the lumen of each tube communicating with the inside of said sac formed by said lens skin,

wherein said lens skin, when in a collapsed, folded condition, can be inserted into the lens capsule of an eye through a relatively small incision in the eye, with said lens skin being adapted to be inflated through the pair of tubes after said lens skin has been inserted into said lens capsule of the eye to substantially the shape of the biological content of the lens capsule prior to the removal of such biological content from said lens capsule.

4,822,361

TUBULAR PROSTHESIS HAVING A COMPOSITE STRUCTURE

Koichi Okita; Shigeru Asako; Katsuya Yamada; Kazuhiro Okabe, and Tohru Kashiwagi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 24, 1986, Ser. No. 945,971
Claims priority, application Japan, Dec. 24, 1985, 60-296491; Dec. 24, 1985, 60-296492
Int. Cl.[4] A61F 2/04, 2/06
U.S. Cl. 623—12 **10 Claims**

1. A tubular prosthesis having a composite structure comprising

(i) tubular polytetrafluoroethylene having a microfibrous structure comprising small nodes interconnected with fibrils and

(ii) materials which can be absorbed by a living body

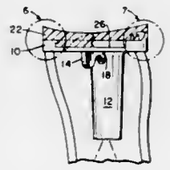
wherein (a) said polytetrafluoroethylene has a greater average fibril length on the outer surface than on the inner surface, and the fibrous structure of said polytetrafluoroethylene varies continuously across the thickness of the tube wall wherein said inner surface has said fibrous structure being predominantly oriented along the axial direction and said outer surface has said fibrous structure being predominantly oriented along the concentric direction; and (b) said materials which can be absorbed by a living body are collagen, at least one of albumin and chitosan, and heparin, and are distributed in such a manner that collagen is present only in the portion of the tube wall which is closest to the outer surface thereof or the outer surface of the tube wall while at least one of albumin and chitosan is present only in the portion of the tube wall which is closest to the inner surface thereof or the inner surface of the tube wall, and heparin is present only in the inner surface of the tube wall.

4,822,362

PROCESS AND APPARATUS FOR TIBIAL PLATEAU COMPENENT

Peter S. Walker, 15 Hallett Hill Rd., and Frederick C. Ewald, 4 Black Oak Rd., both of Weston, Mass. 02193

Filed May 19, 1987, Ser. No. 52,033
Int. Cl.[4] A61F 2/38, 5/04; F24C 15/20
U.S. Cl. 623—20 **8 Claims**



1. Apparatus for preparing a tibial plateau of a human knee joint for mounting a plate-like tibial prosthetic component thereon, which component comprises:

a plate having an upper and an under surface, said plate having substantially the same size and shape as the tibial plateau on which it is to be mounted with gap along its posterior edge to accomodate the passage of the posterior cruciate ligament of said joint;

means mounted on the upper surface of said plate adapted to recive and support condylar portions of said joint;

means on the under surface of said plate for fixing said plate against lateral shifting on said plateau comprising a pin located substantially on the line of the intramedullary canal of said tibia and dimensioned to occupy and extend into only the least dense area of the cancellous bone of said plateau to a depth at least near to the upper end of said canal; and

means of the under surface of said plate for fixing said plate against rotation relative to said plateau comprising a projection located in each of the areas of said plateau where the cancellous bone is most dense, said projections dimensioned to occupy only a minor portion of said most dense areas,

said apparatus comprising:

a template having an upper and a lower surface and having the same size and shape as said plate;

a hollow guide tube mounted on the upper surface of said template at a location corresponding to the location of the pin on the under surface of said plate, said guide tube having an inside diameter substantially the same as the outside diameter of said pin;

walls forming slots in said guide tube longitudinally thereof set at the same angle from the axis of said tube as said projections are set from the axis of said pin on the under surface of said plate;

walls forming slots in said template corresponding in size, shape and location to said projections on the under surface of said plate; and

means for use in conjunction with said template and guide tube for excising portions of the cancellous bone of said plateau coaxially with said guide tube and laterally thereof on the lines of said slots.

2. In a knee joint prosthesis, a tibial component for mounting on a tibial plateau which has been appropriately resected and trimmed in a manner removing as little bone as possible to provide:

a substantially flat upper surface defining a plateau on a plane normal to the axis of the intramedullary canal of said tibia to expose the cancellous bone centrally of said plateau, and to expose the upper rim of the relatively hard peripheral cortical wall;

a narrow cylindrical opening in the cancellous bone extending from said upper surface substantially down into the tibia on the axis of the intramedullary canal of the tibia; and,

two lateral slots in said upper surface extending down into the cancellous bone of said tibia, said slots being in communication with and extending radially outwardly from said cylindrical opening into the areas of maximum hardness of the cancellous bone of said tibia in planes disposed at an angle of between about ten degrees and thirty degrees to the transverse plane of the joint which passes through the axis of said intramedullary canal respectively;

said tibial component comprising:

(a) a base plate having a thickness, and being contoured and shaped to approximate the size and shape of said plateau; said base plate further having posterior, left, right, and anterior edges; a top surface; and an under surface; said under surface being contoured so as to substantially match the contour of said plateau, and said top surface defining recessed areas adjacent the right and left edges of the base plate separated by an upwardly projecting area extending between said posterior and anterior edges of said base plate substantially centrally thereof, and flanked by upwardly projecting portions adjacent the posterior and anterior edges of the base plate, said base plate futher defining walls in its posterior edge forming an opening which provides an unobstructed path for the posterior cruciate ligament of said joint to pass upwardly for attachment to the anterior portion of the femur of said joint;

(b) means having a first and second surface and substantially the same peripheral contour as said base plate mounted on the top surface of said base plate such that said first surface is adapted to receive and support condylar portions of said joint, and said second surface defines a contour which substantially directly abuts the top surface of said base plate;

(c) a fixation pin on the under surface of said base plate aligned (relative to the contour of said base plate) with said cylindrical opening in said plateau, and dimensioned to fit therein, when said base plate is mounted on, and in abutment with, said trimmed and prepared plateau;

(d) means on the under surface of said base plate for anchoring said base plate against both shear and rotational forces relative to said plateau comprising a pair of elements dimensioned to fit into, and substantially fill, the cross sectional area of said slots, each element having a proximal end, a distal end, a top edge, a bottom edge, a proximal portion adjacent said proximal end, and a distal portion adjacent its distal end, said elements being respectively affixed along their top edges to the underside of the base plate and along their proximal ends to said fixation pin so as to extend radially outwardly from the fixation pin under the recessed areas of said base plate at angles corresponding to the angles at which said slots extend from said cylindrical opening in said plateau so that said elements fit within said slots when said base plate is mounted on, and in abutment with, said trimmed and prepared plateau, the maximum height of the proximal portion between the top edge and the bottom edge of each said element being substantially smaller than the maximum height of the distal portion between the top edge and the bottom edge of each said element,

whereby an extremely stable and strong tibial component is provided having a minimum vertical height, but maximum strength and wear characteristics.

4,822,363

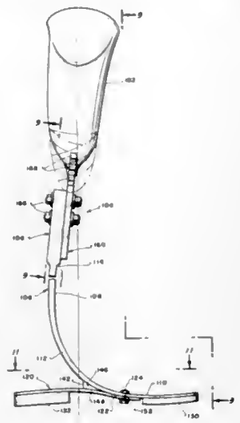
MODULAR COMPOSITE PROSTHETIC FOOT AND LEG

Van L. Phillips, P.O. Box 1873, Rancho Santa Fe, Calif. 92067

Continuation-in-part of Ser. No. 761,481, Aug. 1, 1985, abandoned. This application Mar. 26, 1987, Ser. No. 29,947
Int. Cl.[4] A61F 1/00, 3/00
U.S. Cl. 623—27 **18 Claims**

16. A lower leg prosthesis comprising: a generally vertically oriented pylon fabricated from resin-impregnated, high-strength filamentary materials, said pylon including an upper extremity, an intermediate shin portion and a forwardly oriented foot portion, a rearwardly extending heel portion formed from: resin-impregnated filamentary material, said heel portion being secured to the underside of said foot portion, said underside and the upper surface of said heel portion adjacent said

securement of said heel portion to said foot portion defining a space, and lever arm length-determining means interposed



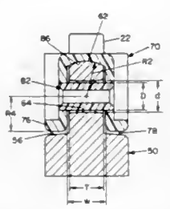
between said foot and heel portions in said space to determine the length of the lever arm of said heel portion.

4,822,364

ELBOW JOINT PROSTHESIS

Allan E. Inglis, Rye, N.Y.; Chitranjan S. Ranawat, Alpine, N.J., and Albert H. Burstein, Stamford, Conn., assignors to New York Society for the Relief of the Ruptured and Crippled, Maintaining the Hospital for Special Surgery, New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 136,149
Int. Cl.[4] A61F *2/38*
U.S. Cl. 623—20 **7 Claims**



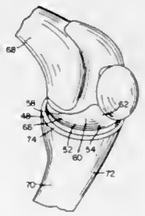
1. An elbow joint prosthesis comprising a metal humeral component that includes a stem portion adapted to be received in the medullary canal of a distal humeral shaft and a head portion adapted to be received in a resected portion of a distal humerus intermediate the internal and external humeral condyles and including a lateral flange and a medial flange defining between them a recess opening distally, anteriorly and posteriorly; a metal ulnar component that includes a stem portion adapted to be received in the medullary canal of the proximal ulnar shaft, a head portion adapted to be received in a resected portion of the olecranon of an ulna and a boss portion extending generally anteriorly from the head portion and adapted to be received in the recess of the humeral component; a plastic humeral insert component nested in the recess and including a base portion and a pair of leg portions selectively engageable between the boss of the ulnar component and the head portion of the humeral component throughout the range of motion of the prosthesis, the flanges of the humeral component, the legs of the insert component and the boss portion of the ulnar component having aligned axle holes extending latero-medially, a metal axle extending through the holes and connecting the humeral and ulnar components for articulation, a plastic sleeve interposed between the portions of the axle within the holes of the insert component legs and the ulnar component boss, the boss of the ulnar component being in lateral clearance from the walls of the insert component legs and the sleeve being in clearance with the hole in the ulnar component boss so as to provide laxity under pronation, supination and varus-valgus angulation of the arm the boss of the ulnar component having a convex spherical articular surface along its superior, anterior and inferior aspects, and the base portion of the insert component bearing against an inferior surface of the head portion of the humeral component and having a concave spherical inferior articular surface throughout the range of motion of the prosthesis for transfer of compressive loads.

4,822,365

METHOD OF DESIGN OF HUMAN JOINT PROSTHESIS

Peter S. Walker, 15 Hallette Hill Rd., and Frederick C. Ewald, 4 Black Oak Rd., both of Weston, Mass. 02193

Continuation-in-part of Ser. No. 868,609, May 30, 1986, abandoned. This application Sep. 11, 1987, Ser. No. 97,286
Int. Cl.[4] A61F *2/38*; B23Q *15/14*
U.S. Cl. 623—20 **3 Claims**



1. A method of making a prosthesis for the replacement of the male and female articular surfaces of a human joint having a male articular surface bearing portion and a female articular surface bearing portion respectively adapted to be affixed to the anatomical bone structure adjacent said joint subsequent to the surgical resection of said bone structure for the removal of the anatomical male and female articular surfaces thereof such that the male and female articular surfaces of said prosthesis are disposed in pressure receiving relation to each other and adapted for articulating movement through a path between extreme positions of extension and flexion, said method comprising:

generating and storing in a computer a mathematical model of a male articular surface contour, said model contour representing an average of a preselected number of actual anatomical male articular surface contours of said joint derived from mathematical analogues of empirical measurements of the anatomical surface geometries of said preselected number of actual anatomical male articular surface contours;

generating a first set of computer numerical control signals corresponding to said model male articular surface contour;

machining said model male articular surface contour onto a first workpiece in direct response to said first set of computer numerical control signals;

forming said male articular surface bearing portion of said prosthesis utilizing said first machined workpiece;

generating and storing in a computer a model female articular surface contour for receiving said model male articular surface contour in articulating relation, said model female articular surface contour corresponding to the surface described by sweeping said model male articular surface contour through the average motion path of said joint;

superimposing laxity parameters upon said model female articular surface contour in said computer to account for the partially restrained motion in a specified direction before substantial ligamentious restraint takes place at the extremes of motion in a normal anatomical human joint of the type to be replaced by the prosthesis, thereby creating a resultant model female articular surface contour in said computer;

generating a second set of computer numerical control signals corresponding to said resultant model female articular surface contour;

machining said resultant female articular surface onto a second workpiece in direct response to said second set of computer numerical control signals; and

forming said female articular surface bearing portion of said prosthesis utilizing said second machined workpiece.

4,822,366

MODULAR KNEE PROSTHESIS

Richard C. Bolesky, Warsaw, Ind., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Oct. 16, 1986, Ser. No. 919,365
Int. Cl.[4] A61F *2/38*
U.S. Cl. 623—20 **14 Claims**

1. A modular knee prosthesis assembly for the replacement of an end portion of a leg bone contiguous to the knee joint, the assembly comprising:

a first component having obverse and reverse surfaces and a central aperture connecting the two surfaces, the obverse surface being shaped to cooperate with a confronting portion of an adjacent bone or the like forming a knee joint, the obverse surface including a fastener-engaging portion adjacent the central aperture,

a second component having an obverse surface engaging the reverse surface of the first component, an axial bore extending in line with the aperture of the first component, and a contact surface surrounding a reverse end of the axial bore,

a third component having a surface contacting the contact surface of the second component and a coupling means for coupling the third component to a fastener component, and

a fastener component inserted into the central aperture of the first component, engaged to the fastener-engaging portion of the first component, and coupled to the coupling means of the third component in direct mechanical interlock to secure the components in compressively assembled condition.

4,822,367

ENDOPROSTHESIS FOR A HIP JOINT SOCKET

Karl-Gerhart Stuhmer, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 4, 1987, Ser. No. 11,070
Claims priority, application Switzerland, Feb. 18, 1986, 651/86
Int. Cl.[4] A61F *2/34*
U.S. Cl. 623—22 **11 Claims**



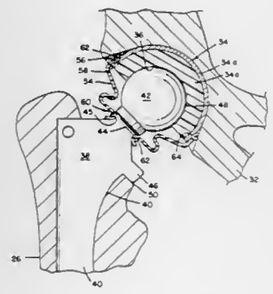
1. An endoprosthesis for a hip joint socket having a metallic hemispherical outer shell having an equator and a polor region and a screw thread on said shell having a constant pitch and spaced apart notches therein extending along meridian lines of said shell, said screw thread being of decreasing length from the equator towards the polar region of said shell and having a plurality of turns with each turn having a length (L) of from 4 millimeters to 12 millimeters, a base width (A) of from 0.15L to 0.2L and a crest width (a) of from 0.025L to 0.05 L.

4,822,368

SUGICAL METHOD OF ATTACHING ENCLOSURE MEMBER FOR PROSTHETIC JOINT

John P. Collier, Hanover, N.H., assignor to Boehringer Mannheim Corporation, Indianapolis, Ind.

Division of Ser. No. 869,592, Jun. 2, 1986, Pat. No. 4,731,088. This application Jan. 13, 1988, Ser. No. 144,263
Int. Cl.[4] A61F *2/32*
U.S. Cl. 623—22 **10 Claims**



1. A method of providing an artificial joint for a patient comprising the steps of:

(a) separating the head of a patient's femur from the patient's pelvic acetabulum;

(b) providing an artificial acetabular component having a hemispheric shaped inner surface terminating at a rim thereby defining a socket;

(c) reshaping the acetabulum of the patient to form a recess to fittingly receive said acetabular component;

(d) mounting said acetabular component within the recess of said acetabulum;

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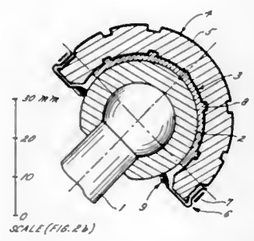
(e) surgically removing the head of the patient's femur from the shaft of the femur;
(f) providing an artificial femoral component having a shank carrying a ball member slightly smaller than the socket of the acetabular component, a neck region joining the ball member and the shank having a cross section smaller than either the ball member or the shank;
(g) anchoring the shank in the femoral shaft with the femoral ball member projecting from the end of the femoral component;
(h) fitting the ball member into the socket of the acetabular component so as to be rotatable therein;
(i) isolating the interengaging surfaces of the ball member and the socket from the reminder of the patient's body, including the steps of:
(j) providing a generally tubular flexible sheath having first and second ends;
(k) receiving the sheath over the femoral ball member;
(l) sealingly affixing the first end of the sheath to the neck region; and
(m) sealingly affixing the second end of the sheath of the rim of the acetabular component.

4,822,369

BONE JOINT PROSTHESIS

Gerard Oueveau, Amik-Farm, Les Boulaies, Le Pin 79140, Cerizay, and Jacques Moulin, 43, Avenue Edouard Vaillant, 181 Vierzon, both of France

Filed Jun. 10, 1986, Ser. No. 872,539
Int. Cl.[4] A61F *3/34*
U.S. Cl. 623—22 **14 Claims**



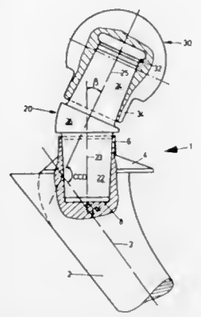
1. A hip or shoulder prosthesis for connecting a thigh bone to a pelvis or a humerus to a scapula comprising a shaft to penetrate the thigh bone or humerus; a substantially spherical head having an outer hemispherical surface with a maximum diameter fastened to the shaft; a cotyle adapted to be fastened to the pelvis or scapula with an adhesive, the cotyle comprising an inner, substantially hemispherical, rigid shell having a substantially hemispherical cavity to receive the head, the cavity having an inner surface being formed of an abrasion resistant, low friction material, an outer, substantially hemispherical rigid shell, the inner shell sized relative to the outer shell to provide a space therebetween, a resilient shock absorption layer between the inner and outer shells and in intimate contact therewith, the resilient shock absorption layer being thicker than the internal and external shells; at least one of the shells having a plurality of ridges formed therein to enhance the rigidity of said shell, each of the ridges being generally convex on one side of the shell and generally concave on the other side of the shell; and a retainer fixed to the cotyle, the retainer comprising a retaining lip having an inside diameter less than the maximum diameter of the head to prevent dislocation of the head from the cotyle cavity.

4,822,370

HIP JOINT FEMORAL PROSTHESIS

Klaus-Dieter Schelhas, Bremem, Fed. Rep. of Germany, assignor to Orthoplant Endoprothetik, Bremen, Fed. Rep. of Germany

Continuation of Ser. No. 115, Jan. 2, 1987, abandoned. This application Jun. 20, 1988, Ser. No. 210,200
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600804
Int. Cl.[4] A61F *2/36*
U.S. Cl. 623—23 **5 Claims**



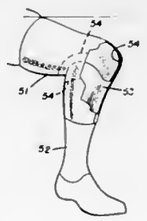
1. Hip joint femoral prosthesis comprising a shaft, a spherical head and a connecting part between the shaft and the head, with a conical boring at the proximal end of the shaft and a corresponding first socket cone on the shaft end of the connection part, and wherein the connecting part displays on the head end a second socket cone, wherein said first socket cone is capable of being inserted into and anchored in a conical boring in the shaft at any angular position relative to said shaft, and that the longitudinal axis of the first socket cone and the longitudinal axis of the second socket cone intersect at a predetermined angle $0° \leqq \beta \leqq 50°$ (zero is less than or equal to beta and beta is less than or equal to 50°) so that from the shaft through the connecting part to the head may undergo two angular deflections.

4,822,371

REINFORCED ELASTIC SLEEVE FOR USE WITH A LIMB PROSTHETIC DEVICE

David F. Jolly, 2250 Holly Hall, Apt. #292, Houston, Tex. 77054, and Michael T. Wilson, 3131 Villa La., Missouri City, Tex. 77459

Filed Jan. 23, 1987, Ser. No. 6,682
Int. Cl.[4] A61F *2/78*
U.S. Cl. 623—32 **2 Claims**



1. An improved integral elastic tubular suspension sleeve means for holding a prosthetic device under airtight conditions securely on the end of the limb of a human being having a below the knee amputation of a leg or a below the elbow amputation of the arm, which suspension sleeve means comprises:

an elastic substantially tubular suspension sleeve defining a non-linear axis having first and second substantially circular open ends, the first end for receiving and securely gripping the adjacent surface of the amputated limb of the human being and the second substantially circular open end for receiving and gripping securely the outer upper surface of the complementary socket portion of a prosthetic device wherein the first and second open ends of the sleeve have a preflexed angle between about 5° and 45° from a straight tube, said integral elastic sleeve itself formed of:
(i) an X-shaped blank outer laminate of a flexible cellular polymeric material of neoprene rubber having the tradename NS1 having an inner surface with a high coefficient of friction and an outer surface of the sleeve adhered to a surface facing fabric of LYCRA ® having a lower coefficient of friction covering substantially all of the outer surface of the sleeve having adjacent edges which are glued and blind stitched together to form an airtight seam; and
(ii) a substantially rectangular inner panel means to reduce deterioration of the interior surface of the sleeve consisting essentially of a smaller sized laminate itself consisting essentially of a cellular polymeric sheet material of neoprene rubber having the tradename NS1 which is adhered to the inner surface of the suspension sleeve having an outer surface fabric of LYCRA ® facing having a lower coefficient of friction, which inner panel is positioned on the interior of the outer laminate to contact the outer intersection line of the outer surface of the prosthetic device and the outer surface of the flesh of the extremity of the human being, wherein the outer laminate and inner laminate are glued together and the outer laminate is formed from an X-shaped blank wherein the top front and the bottom front of the suspension sleeve each have a longitudinal seam formed by tightly joining the complementary inner upper edges and lower inner edges of the X-shaped blank, the middle of the front of the sleeve is seamless, and the top rear to bottom rear of the sleeve has a continuous seam therebetween formed by joining the complementary outer upper and outer lower edges of the X-shaped blank, the overall suspension sleeve produces an essentially air tight seal between the inner surface of the suspension sleeve, the outer surface of the residual limb, and the outer surface of the upper socket of the prosthetic device, and the angle of the knee or elbow is coincident with the angle of the sleeve, wherein the finished sleeve means does not have any external patches of material on its outer surface, and
wherein the finished sleeve means minimize the gathering of material that takes place in the back of the knee.

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4,822,372

PROCESSING FOR TANNING LEATHER

Frank Förster, Offenbach; Karlfried Keller, Frankfurt; Hermann Becker, Rodgau, and Werner Lotz, Niedernhausen, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 95,136

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632587

Int. Cl.[4] C14C *3/18*

U.S. Cl. 8—94.24 8 Claims

1. In an improved process for tanning leather by treating animal skins with a water-soluble melamine-formaldehyde resin in the presence of an acid catalyst, the improvement comprises said melamine-formaldehyde resin having a molar ratio of melamine: formaldehyde of 1:2 to 1:7 and being at least partially etherified with a glycol ether, C_1–C_4 alkyl glycol ether or a mixture of both.

4,822,373

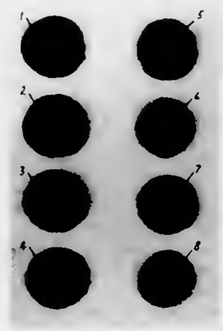
PROCESS FOR PROVIDING POLYAMIDE MATERIALS WITH STAIN RESISTANCE WITH SULFONATED NOVOLAK RESIN AND POLYMETHACRYLIC ACD

Maynard H. Olson, North St. Paul; John C. Chang, New Brighton, and Imelda A. Muggli, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1988, Ser. No. 167,041

Int. Cl.[4] C14C *9/00;* B32B *7/00*

U.S. Cl. 8—115.6 16 Claims



1. A treated fibrous polyamide substrate having resistance to staining by acid colorants comprising a fibrous polyamide substrate having applied thereto (a) a partially sulfonated novolak resin and (b) polymethacrylic acid, copolymers of methacrylic acid, or combinations of said polymethacrylic acid and said copolymers of methacrylic acid.

4,822,374

PROCESS FOR THE AFTERTREATMENT OF DYED CELLULOSE FIBERS

Rosemarie Töpfl, Dornach, and Jörg Binz, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

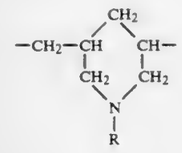
Filed Jun. 10, 1987, Ser. No. 60,288

Claims priority, application Switzerland, Jun. 17, 1986, 2437/86

Int. Cl.[4] C09B *67/00*

U.S. Cl. 8—554 10 Claims

1. A process for the aftertreatment of dyed cellulosic fibers, which consists of treating said fibers with an aqueous liquor consisting essentially of a polyquaternary ammonium compound obtained by reacting an epihalohydrin with a linear polymer containing repeating units of the formula



wherein R is C_1–C_6-alkyl.

4,822,375

DYEING COMPOSITIONS FOR KERATINOUS FIBRES BASED ON INDOLE DERIVATIVES, AND NEW COMPOUNDS

Gérard Lang, Saint-Gratien; Hervé Richard; Madeleine Leduc, both of Paris, and Alex Junino, Livry-Gargan, all of France, assignors to L'Oreal, Paris, France

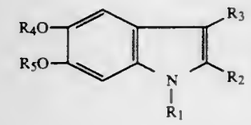
Filed Mar. 5, 1987, Ser. No. 21,932

Claims priority, application Luxembourg, Mar. 6, 1986, 86346

Int. Cl.[4] A61K *7/13;* C07D *209/30;* C07F *9/12*

U.S. Cl. 8—423 25 Claims

1. A dye composition for keratinous fibers comprises, in a cosmetically acceptable medium and in an amount ranging from 0.01 to 5 percent by weight based on the total weight of said composition, at least one dye having the formula



(I)

wherein

R_1 represents hydrogen, lower alkyl or $—SiR_9R_{10}R_{11}$,

R_2 and R_3, each independently, represent hydrogen, lower alkyl, lower alkoxy carbonyl or $—COOSiR_9R_{10}R_{11}$,

R_4 and R_5, each independently, represent a member selected from the group consisting of linear or branched C_1–C_{20} alkyl, formyl, linear or branched C_2–C_{20} acyl, linear or branched C_3–C_{20} alkenoyl, $—SiR_9R_{10}R_{11}$, $—P(O)(OR_6)_2$ and $R_6OSO_2—$, or one of R_4 and R_5 is hydrogen and the other has the meaning given above, with the proviso that R_4 and R_5 are not simultaneously acetyl,

or R_4 and R_5 together with the oxygen atoms to which they are attached form a ring containing a carbonyl group, a thiocarbonyl group, a $>P(O)OR_6$ group or a $>CR_7R_8$ group,

R_6 represents hydrogen or lower akyl,

R_7 represents hydrogen or lower alkyl,

R_8 represents lower alkoxy, monoalkylamino or dialkylamino,

R_9, R_{10} and R_{11}, each independently, represent linear or branched lower alkyl, and

the cosmetically acceptable alkali metal, alkaline earth metal, ammonia or amine salts of the dye of formula I,

said dye composition also including an effective amount of at least one of a surfactant, an anionic polymer, a nonionic polymer a cationic polymer, an amphoteric polymer, a thickening agent, a penetrating agent, a swelling agent, a sequestering agent, an antioxidant, a buffer, an electrolyte and a perfume.

4,822,376

PRINTED BLEEDING MADRAS

Raymond J. Tocci, 347 Saly Rd., Yardley, Pa. 19067

Filed Oct. 14, 1987, Ser. No. 108,485

Int. Cl.[4] D06P *5/00*

U.S. Cl. 8—478 17 Claims

1. A printed bleeding madras effect made using a print paste

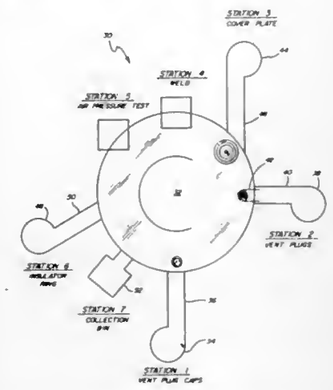
comprising: a non-water soluble pigment for producing a printed color pattern on a piece of fabric; a dye for bleeding which thereby colors a portion of the fabric not forming part of the printed pattern; a binder for holding the print paste to the fabric wherein the binder comprises from about 4% to less than 20% of the print paste by weight; and a viscosity agent for thickening the print paste; the dye, the pigment, the binder and the viscosity agent adapted for use on the fabric.

4,822,377

METHOD FOR SEALING AN ELECTROCHEMICAL CELL EMPLOYING AN IMPROVED REINFORCED COVER ASSEMBLY

Merle Wolff, Rochester, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Feb. 18, 1988, Ser. No. 157,190
Int. Cl.[4] H01M *2/12, 10/38*
U.S. Cl. 29—623.2 **5 Claims**



1. A method of sealing a cylindrical, ventable electrochemical cell, said cell including a positive electrode, a metal hydride, hydrogen storage negative electrode, a separator means operatively disposed between said electrodes, an electrolyte, an insulated, reinforced cover assembly and a cylindrical cell can, said method comprising the steps of:

assembling said electrodes and separator means in a rolled configuration so that said metal hydride, hydrogen storage negative electrode forms the outermost layer thereof;

disposing said electrode roll and said electrolyte in said cell can, so that only said negative electrode contacts said cell can;

bendably deforming the cylindrical wall portion of said cell can at a level above the electrode roll so as to form a stiffened sealing lip;

disposing a reinforced cover assembly atop said sealing lip and in contact with said positive electrode, said reinforced cover assembly including a circular, reinforced cover plate having an axial stiffening rib and a vent perforation formed therethrough; a compressible, electrically insulating ring formed of a polysulfone, which insulating ring is sealably affixed along the circumference of said cover plate, and an elastic vent plug disposed top said vent perforation, said vent plug being compressibly deformable in response to cell pressures in the range of 200 to 500 psi, and a nickel plated steel vent plug cap disposed atop said vent plug and operatively affixed by metallurgical means to said cover plate;

folding an area of said wall portions above said sealing lip inward for a first angle, said angle being less than 90 degrees from said wall portions original position;

pressing said folded area over to assume an approximately 90 degree orientation to said cell walls;

curling said folded area over upon said insulated cover assembly to seal said electrolytic cell; and

radially compressing said wall portions upon said cover assembly to affect an air tight seal.

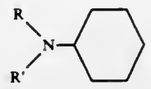
4,822,378

PROCESS AND COMPOSITION FOR COLOR STABILIZED DISTILLATE FUEL OILS

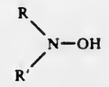
Dwight K. Reid, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 25, 1987, Ser. No. 18,887
Int. Cl.[4] C10L *1/22, 1/18*
U.S. Cl. 44—53 **15 Claims**

1. A process for inhibiting color deterioration of distillate fuel oil which comprises adding to said fuel oil an effective inhibiting amount of a mixture of (a) a tertiary amine having the formula



wherein R and R′ are the same or different alkyl groups having one to about six carbon atoms, and (b) a hydroxylamine having the formula



wherein R and R′ are the same or different and are hydrogen, alkyl, alkaryl or aralkyl groups, wherein the weight ratio of (a):(b) is from about 1:1 to about 99.7:0.3.

4,822,379

SOLID FUEL COMPOSITION FROM WASTE PRODUCTS

Jeffery Thompson, 3059 Old Stone Dr., Birmingham, Ala. 35243

Continuation-in-part of Ser. No. 873,170, Jun. 10, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,800
Int. Cl.[4] C10L *5/06, 5/00*
U.S. Cl. 44—589 **9 Claims**

1. A method of selectively capturing nuisance chemical components within the residual ash of a combusted mixture of waste compounds, said method comprising the steps of:

(a) forming a combustible mixture from:

(i) a nuisance waste component, which nuisance waste contains a material including at least one of the group consisting of lead, chromium, manganese, cadmium, beryllium, barium, selenium, arsenic, vanadium, antimony, bismuth, strontium, zirzonium, germanium, copper, nickel, zinc, aluminum, sulfur, hydrocarbons, biological wastes and mixtures thereof;

(ii) a heating value component; and

(iii) a neutralizing component consisting of the oxides, hydroxides and carbonates of calcium, magnesium, and sodium, and at least one of SiO_2, Al_2O_3, Fe_2O_3, ZnO and mixtures thereof;

(b) pressing said combustible mixture at a pressure sufficient to form a structurally stable solid having a net heating value of at least 200 btu/lb of said solid; and

(c) converting said nuisance waste components to compounds resistant to water extraction by burning said combustible mixture, said neutralizing component being selected to cause said nuisance components to form said compounds resistant to water extraction.

4,822,380

COATED CARBONACEOUS MATERIAL

C. B. Fehrler Young, P.O. Box 796, Douglasville, Ga. 30133

Filed Mar. 3, 1987, Ser. No. 20,967
Int. Cl.[4] C10L *5/32*
U.S. Cl. 44—544 **16 Claims**

1. A coated fuel product comprising a piece of charcoal, and a glossy coating of paraffin completely enclosing said piece of charcoal, said charcoal further including a flammable liquid therein, said flammable liquid consisting of a light kerosene product and being sealed within said charcoal by said coating, saod coating of paraffin consisting of from about 3 percent to about 7 percent by weight of said fuel product, and said flammable liquid consisting of from about 7 percent to 12 percent by weight of said fuel product.

4. A coated fuel product as claimed in claim 1, and further including an additive for increasing the gloss of said coating, said additive being selected from the group consisting of polyethylene, stearic amide and monocrystalline wax.

4,822,381

ELECTROPRECIPITATOR WITH SUPPRESSION OF RAPPING REENTRAINMENT

Ronald B. Mosley, Chapel Hill; Leslie E. Sparks, Durham, and Norman Plaks, Raleigh, all of N.C., assignors to Government of the United States as represented by Administrator Environmental Protection Agency, Washington, D.C.

Filed May 9, 1988, Ser. No. 191,469
Int. Cl.[4] B03C *3/00*
U.S. Cl. 55—2 **9 Claims**



1. A method of reducing rapping reentrainment from an electrostatic precipitator comprising, in series, at least one main electrical section comprising a plurality of positively charged main collection plates, said main collection plates being evenly spaced to define a plurality of gas flow lanes therebetween, and a linear array of main corona discharge wires within each of said main gas flow lanes; said method comprising:

attaching to said electrostatic precipitator, as the last stage thereof, a reeintrainment suppressor comprising: a precharger, downstream of said main electrical section, having a single tubular anode aligned with each of said main collection plates and at least one precharger corona discharge wire aligned with each of said linear arrays of main corona discharge wires; and a reentrainment collector downstream of said precharger and having a plurality of secondary collector plates, each of said secondary collector plates being aligned with one of said main collection plates, thereby extending said gas flow lanes, and being substantially shorter than said main collection plates in the direction of the gas flow and at least one collector corona discharge wire in each of said gas flow lanes between said secondary collector plates; and

passing a gas stream containing particulate solids successively through said one main electrical section, said precharger and said reentrainment collector.

4,822,382

COMPOSITE MEMBRANES, THEIR MANUFACTURE AND THEIR USE

Joyce K. Nelson, Lexington, Mass., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 2, 1987, Ser. No. 115,913
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **48 Claims**

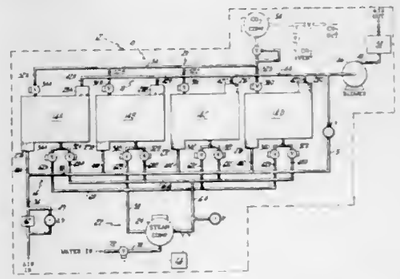
1. A method for separating a gas in a gaseous mixture from at least one other gas in said gaseous mixture by selective permeation and providing a permeated product containing at least one permeating gas, comprising: contacting the gaseous mixture with one surface of a composite membrane, which, with respect to at least one pair of gases of said gaseous mixture, the composite membrane exhibits selective permeation of one gas of said pair of gases over that of the remaining gas of said pair of gases, and which composite membrane comprises a porous support layer having substantially no separation characteristics with respect to said fluid mixture and a separation layer positioned on the support layer comprised of at least one or more poly(tetramethy) bisphenol A phthalates; permeating said at least one permeating gas into and through the composite membrane; and removing from the vicinity of the opposite surface of the composite membrane a permeated product having a different proportion of said at least one gas of said gaseous mixture to said at least one other gas of said gaseous mixture than the proportion in the gaseous mixture of said at least one gas to said at least one other gas.

4,822,383

METHOD AND APPARATUS FOR REMOVING CARBON DIOXIDE FROM AIR

Harlan F. Brose, East Hartland, and Alfred O. Brouillet, Somers, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 30, 1987, Ser. No. 44,091
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—33 **10 Claims**



1. A method for removing a gaseous component from air utilizing a plurality of beds, each bed having three states, a first state wherein said bed adsorbs said gaseous component from said air, a second state wherein a regenerative gas desorbs said gaseous component from said bed, said regenerative gas forming a condensate on said bed therewith and a third state wherein said condensate is removed from said bed, said method characterized by:

simultaneously lowering the pressure within a bed in said third state to vaporize said condensation and moving said vaporized condensate into a bed in said second state to desorb said gaseous component from said bed; and

moving air through a bed in said first state to remove said gaseous component from said air.

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4,822,384

OXYGEN ENRICHING APPARATUS WITH MEANS FOR REGULATING OXYGEN CONCENTRATION OF OXYGEN ENRICHED GAS

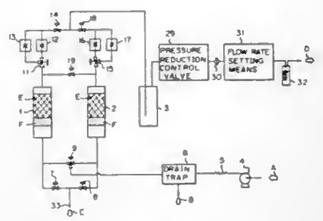
Akira Kato; Terukuni Ikuta, both of Iwakuni, and Masamichi Tamada, Kobe, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sep. 21, 1987, Ser. No. 99,343

Claims priority, application Japan, Sep. 22, 1986, 61-222055; Sep. 22, 1986, 61-222056; Dec. 25, 1986, 61-307885; Dec. 26, 1986, 61-308516

Int. Cl.[4] B01D *53/22, 53/04*

U.S. Cl. 55—158 **31 Claims**



1. An apparatus for producing an oxygen enriched gas from air comprising:

an air source means comprising a compressor for supplying air under pressure to be enriched with oxygen;

a means for producing a gas enriched with oxygen from said air supplied from said air source comprising at least one bed of adsorbent capable of adsorbing nitrogen more readily than oxygen;

a first gas conduit means for fluid connection between said air source means and an inlet for said means for producing a gas enriched with oxygen through which air is introduced and an outlet thereof through which said oxygen enriched gas is discharged;

a gas storage means for reserving a given amount of said oxygen enriched gas produced by said means for producing a gas enriched with oxygen;

a second gas conduit means for fluid connection between said outlet of said means for producing a gas enriched with oxygen and said gas storage means;

a third gas conduit for delivering said oxygen enriched gas from said gas storage means toward an outlet of said apparatus;

a flow rate setting means for setting a flow rate of said oxygen enriched gas delivered from said gas storage means to said outlet of said apparatus via said third gas conduit means, said flow rate setting means being arranged in said third conduit means;

a concentration regulating means for adjustably regulating an oxygen concentration of said oxygen enriched gas delivered from said outlet to said apparatus in response to a change in a requirement for an oxygen concentration in said oxygen enriched gas, and said apparatus further comprising a fourth gas conduit means for providing a fluid communication between said compressor and said gas storage means;

a flow control means arranged in said fourth gas conduit means for adjustably regulating said fluid communication between said compressor and said gas storage means, thereby controlling a flow rate of said air from said compressor to said gas storage means in response to a change in a requirement for an oxygen concentration of said oxygen enriched gas.

4,822,385

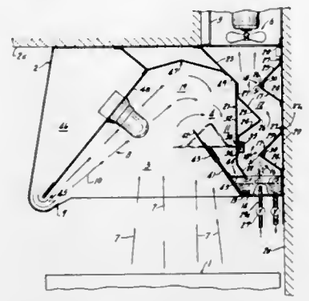
EXHAUST CLEANSING APPARATUS

Gary L. Strege, Watertown; Gerd W. Renno, Cottage Grove, both of Minn.; Kirk A. Nelson, Hudson, Wis., and Stephen K. Melink, Madeira, Ohio, assignors to Maysteel Corporation, Mayville, Wis.

Filed Jul. 14, 1987, Ser. No. 72,902

Int. Cl.[4] B21D *47/02*

U.S. Cl. 55—248 **16 Claims**



1. An exhaust hood having a bottom opening for introducing fluid having foreign material to be removed, comprising a vertical collection chamber means having a top wall, and a front wall, a back wall and spaced sidewalls and having a a bottom end including a bottom opening and defining a collection chamber extending vertically upwardly from said bottom openings, a vertical exhaust cleansing chamber means mounted to the back wall of said collection chamber means and having a bottom inlet opening and an upper outlet opening defining a vertical cleansing passageway, an inlet passageway means connecting said collection chamber with said inlet opening, said inlet passageway means including a first inclined wall extending from the bottom end of the collection chamber means upwardly and inwardly into said collection chamber and a second wall spaced from said first inclined wall toward the exhaust cleansing chamber means and extending downwardly from the top wall of said collection chamber into downwardly overlapping relation to said first inclined wall to define an inlet passageway having a discharge end at the inlet opening to the exhaust cleansing chamber means, said inlet passageway having a vertically directed top open end, said collection chamber extending substantially upwardly above said top open end and upwardly above said first inclined wall and inwardly to s aid second wall, said second wall being substantially vertical and located substantially inwardly of said first inclined wall, and a curved wall connected to said second wall and extended over said top open end and defining an enlarged capture pocket having a horizontal opening substantially larger than said top open end and said pocket extending upwardly above the top open end of said inlet passageway, said inlet passageway forming a continuation of said capture pocket with a decreasing cross-section to said exhaust cleansing chamber means.

4,822,386

FILTER REPLACEMENT MECHANISM

Jerome G. Duchesneau, Andover, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 27, 1987, Ser. No. 125,844

Int. Cl.[4] B01D *27/08, 46/02*

U.S. Cl. 55—274 **7 Claims**

1. Apparatus for replacing a nuclear and biological filter which has an inlet portion and an outlet portion and is disposed for use within a mobile field howitzer characterized by;

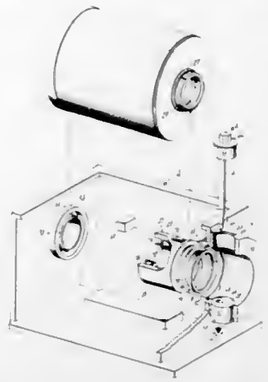
a housing disposed within said howitzer for holding said filter, said housing comprising;

an inlet means for directing air from ambient to said filter,

an outlet means for directing air from said filter to an interior portion of said howitzer, and

a removable cover for sealingly enclosing said housing and said filter from said ambient; and,

means for changing said filter under adverse environmental conditions, said means being disposed in either of said inlet means or said outlet means said means comprising;



a camming means for providing a loading or unloading force,

a spring means for transferring said loading force from said camming means to said filter such that said force does not damage said filter and such that said filter is properly sealed, and

a piston means for transferring said loading force from said spring means to said filter and for transferring said unloading force from said camming means to said filter, such that said filter is loaded or unloaded to or from said inlet means and said outlet means.

4,822,387

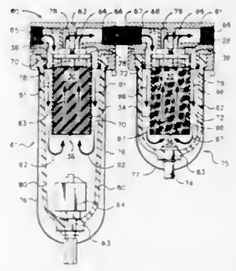
INVERSE FLOW DEPTH FILTER ASSEMBLY

Keith L. Daniels, Birdsboro, Pa., assignor to Reading Technologies, Inc., Reading, Pa.

Filed Oct. 22, 1987, Ser. No. 112,256

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—323 **10 Claims**



9. In an inverse flow depth filter assembly having an elongated, generally elliptical housing with a top and a bottom, gas inlet means and gas egress means at the top, and drain means at the bottom, the improvement comprising:

a filter cartridge, said filter cartridge having a generally hollow gas impermeable tube with an open bottom, the tube being of lesser circumference than an internal cross-section of the housing and the tube having an open cartridge bottom and a cartridge top leading to the gas egress means of the housing, the tube and the housing having means to suspend said cartridge from an underside of the top of the housing, so that an annular channel is created between said housing and said cartridge, the filter cartridge having a coalescent non-absorptive fibrous material therein, the housing and the filter cartridge together defining a downward annular passage for gas from the top of the housing to the bottom of the housing, and an upward passage for the gas through the filter cartridge through the bottom of the housing to the gas egress means, condensates collected by the filter material moving downwardly through the filter material to the bottom of the housing, opposite gas flowing upwardly through the filter material.

4,822,388

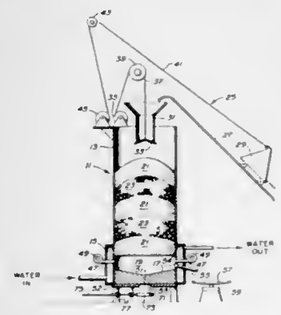
METHOD OF OPERATING MINERAL WOOL CUPOLAS AND USING SPENT ELECTROLYTIC ALUMINUM POT LINING

Kenneth H. Gee, R.D. #7, Black River Rd., Bethlehem, Pa. 18015

Continuation-in-part of Ser. No. 19,639, Feb. 27, 1987, abandoned. This application Feb. 24, 1988, Ser. No. 159,789

Int. Cl.[4] C03B *40/00, 37/00, 5/04;* **C10L** *5/40*

U.S. Cl. 65—2 **28 Claims**



1. A method of operating a mineral wool cupola comprising charging to such cupola up to approximately 80% of the amount of carbonaceous fuel charged to said cupola along with meltables, of a relatively dense solid carbonaceous particulate material having a relatively low ignitability and low solution loss compared to the usual fuel as the result of at least a partial coating on some of the particulates and an impregnation in pores within substantially all of said carbonaceous particulates of a cryolytic material.

4,822,389

CAPILLARY SPLICE METHOD

George E. Berkey, Pine City, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 7, 1987, Ser. No. 82,680

Int. Cl.[4] C03B *37/023*

U.S. Cl. 65—2 **21 Claims**

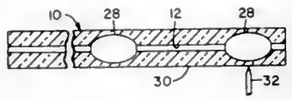
1. A method of forming an optical fiber splice comprising the steps of

providing a hollow cylindrical member formed of glass, said member having a bore along the longitudinal axis thereof,

providing fluid to said member bore at a pressure in excess of ambient pressure,

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heating a portion of said member to the softening point of said glass,



forming a bubble within said member bore in said heated portion of said member under the influence of said fluid pressure and said heating, and

severing said member at the location of said bubble.

4,822,390

CLOSED CYCLE GAS REFRIGERATOR

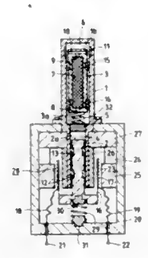
Yoshio Kazumoto; Takuya Suganami; Yoshiro Furuishi, and Kazuo Kashiwamura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,858

Claims priority, application Japan, Jul. 2, 1987, 62-165712

Int. Cl.⁴ F25B *9/00*

U.S. Cl. 62—6 **5 Claims**



1. A regrigerator having a working space including a compression space held at a relatively high temperature during operation and having a volume varied according to a displacement of a piston arranged adjacent said compression space or displacements of said piston and a displacer, an expansion space held at a relatively low temperature during operation and having a volume varied according to said displacement of said displacer arranged adjacent said expansion space, a cooler, a regenerator and a freezer disposed between said compression space and said expansion space to communicate therebetween and a working gas filling said working space and performing a thermodynamic cycle by movements of said piston and said displacer in different phase to generate a cold production therein, comprising a linear motor including an armature coil and a closed magnetic circuit for driving said piston, a support spring for supporting said piston in a constant position in a stationary condition and a power source for driving said armature coil, wherein an angular resonance frequency ω of a reciprocation portion including said piston and a portion of said linear motor is defined by the following equation:

$$\omega = \sqrt{\frac{1}{m}\left(\frac{2 \cdot Sp \cdot Pa \cdot \cos\alpha}{S} + Ks\right)}$$

where

m=total mass of said reciprocation portion

SP=area of a working surface of said piston

Pa=amplitude of pressure variation of said working gas in said compression space

α=phase difference between a displacement of said piston and pressure variation of said working gas in said compression space

S=stroke of said piston

Ks=spring constant of said support spring and wherein an angular frequency of said power source ω_o is substantially equal to said angular resonance frequency ω with an acceptable error therebetween being $\pm 10\%$.

4,822,391

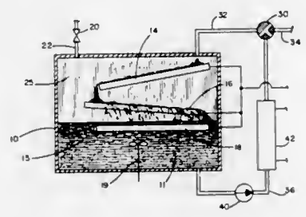
METHOD AND APPARATUS FOR TRANSFERRING ENERGY AND MASS

Uwe Rockenfeller, 1453 Rawhide Rd., Boulder City, Nev. 89005

Filed Nov. 2, 1987, Ser. No. 115,820

Int. Cl.⁴ F25J *5/00*

U.S. Cl. 62—12 **14 Claims**



1. Apparatus in which mass and heat are transferred between a mixture of a liquid and particulate solid comprising

a container having a cavity for receiving said mixture,

a plurality of heat exchange surfaces in said cavity having means for transferring heat therefrom to and from said liquid and particulate solid in contact therewith, each said surface disposed at a different elevation from the other of said surfaces and tilted with respect to horizontal for gravitationally feeding said mixture successively along said surfaces from the uppermost surface, and

first pump and conduit means for pumping said mixture from the bottom of said cavity to the uppermost of said heat exchange surfaces.

4,822,392

APPARATUS FOR PRODUCING FIBRES FROM SILICATE RAW MATERIALS SUCH AS BASALT BY BLAST DRAWING

Gaston Fachat, Ladenburg; Klaus Sistermann, Neustadt, and Heinz-Jürgen Ungerer, Viernheim, all of Fed. Rep. of Germany, assignors to Grunswelg & Hartmann and Glasfaser AG, Fed. Rep. of Germany

Continuation of Ser. No. 840,751, Mar. 13, 1986, abandoned.

This application Oct. 22, 1987, Ser. No. 111,125

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, 3509424

Int. Cl.⁴ C03B *37/06;* **C03C** *25/02*

U.S. Cl. 65—16 **9 Claims**

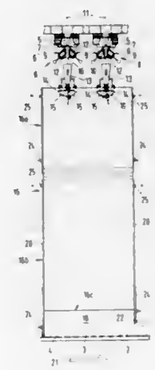
1. Apparatus for producing fibres by blast drawing, comprising:

(a) a melting tank and at least one distributor tank fed therefrom, said distributor tank having exit orifices for passing primary filaments of melt to a blast nozzle unit;

(b) a blast nozzle unit arranged underneath said exit orifices at a distance therefrom and symmetrical relative to the plumb line of the primary filaments and having an exit side;

(c) a chute arranged underneath said blast nozzle unit and having an entry zone;

(d) at least one guide cell positioned between the exit side of said blast nozzle unit and the entry zone of said chute, said guide cell having an upper entry orifice for receiving a flow bundle from said blast nozzle unit, a lower exit orifice for discharging the flow bundle therefrom and a downwardly converging passageway connecting said orifices; said upper entry orifice having a cross-section larger than the cross-section of said flow bundle from said blast nozzle unit to provide a lateral distance therebetween; and



(e) a conveyor belt arranged at the lower end of said chute and on which the mineral fibres produced are laid and transported away in the form of a continuous web.

4,822,393

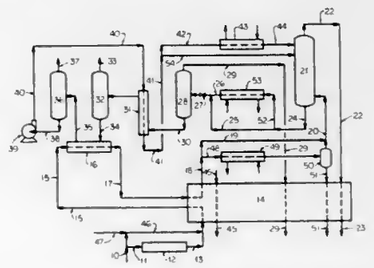
NATURAL GAS PRETREATMENT PRIOR TO LIQUEFACTION

Stephen J. Markbreiter, Edison, N.J., and Irving Weiss, Merrick, N.Y., assignors to Kryos Energy Inc., New York, N.Y.

Filed Jun. 30, 1988, Ser. No. 212,870

Int. Cl.⁴ F25J *3/00*

U.S. Cl. 62—17 **11 Claims**



1. The pretreatment of natural gas having an elevated pressure and containing moisture and about 1.5% to 3.5% by volume of CO_2 prior to liquefaction of said natural gas which comprises the steps of:

(a) dehydrating said natural gas;

(b) partially cooling said natural gas by heat exchange with countercurrent streams of pretreated natural gas and separated CO_2, both said streams being hereinafter identified;

(c) further cooling said partially cooled natural gas from step (b) by heat exchange with a countercurrent stream of methanol withdrawn from a second flashing separation, hereinafter identified;

(d) still further cooling said further cooled natural gas from step (c) by heat exchange with said countercurrent streams of pretreated natural gas and separated CO_2;

(e) scrubbing said still further cooled natural gas from step (d) at a pressure of at least 150 psia with cold recycled methanol supplied at a temperature in the range of about $-30°$ F. to $-80°$ F. and containing not more than about 0.7% on a molar basis of absorbed CO_2 at the start of said scrubbing;

(f) passing the scrubbed gas containing not more than about 1.0% by volume of CO_2 as the aforesaid countercurrent stream of pretreated natural gas in steps (b) and (d);

(g) passing methanol withdrawn from said scrubbing of step (e) through a pressure-reducing valve to effect a substantial pressure drop and a first flashing separation of absorbed CO_2 from said methanol;

(h) passing said first flash-separated CO_2 as the aforesaid countercurrent stream of separated CO_2 in steps (b) and (d);

(i) heating methanol withdrawn from said first flashing separation of step (g) by heat exchange with a countercurrent stream of methanol withdrawn from a third flashing separation, hereinafter identified;

(j) effecting a second flashing separation of absorbed CO_2 from said heated methanol from said first flashing separation of step (g);

(k) warming methanol withdrawn from said second flashing separation of step (j) by passage as the aforesaid countercurrent stream in step (c) to effect said third flashing separation of absorbed CO_2 to yield the aforesaid countercurrent stream of methanol from said third flashing separation with a residual CO_2 content of not more than about 0.7% on a molar basis;

(l) recycling to said scrubbing of step (e) the aforesaid countercurrent stream of methanol from said third flashing separation of step (k) after being chilled by said heat exchange of step (i) with methanol from said first flashing separation of step (g); and

(m) applying external refrigeration to methanol withdrawn from or supplied to said scrubbing of step (e) to maintain the temperature of said recycled methanol supplied to said scrubbing in said range of about $-30°$ F. to $-80°$ F.

4,822,394

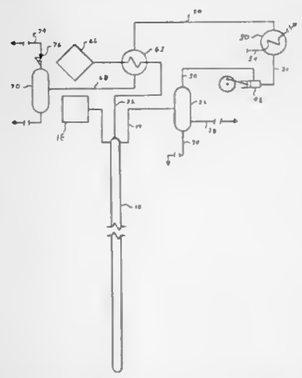
METHOD AND APPARATUS FOR THE PRODUCTION AND LIQUEFACTION OF GASES

Joseph E. Zeigler, Westminster, and Hermann W. Peterscheck, Longmont, both of Colo., assignors to VerTech Treatment Systems, Inc., Denver, Colo.

Filed Sep. 14, 1987, Ser. No. 95,987

Int. Cl.⁴ F25J *3/00*

U.S. Cl. 62—17 **20 Claims**



15. An apparatus which produces and liquifies gases, comprising:

a reaction apparatus for oxidizing organic matter in an aqueous medium at high temperature and pressure to substan-

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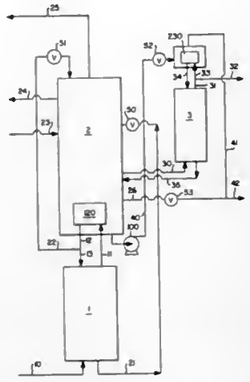
tially oxidize said organic matter producing an effluent which includes an ash, water and off-gases;
a separator for receiving said effluent and for separating said off-gases from said effluent;
means for flowing said effluent from said reaction apparatus to said separator;
a compressor for receiving said off-gases from said separator and for compressing said off-gases to produce a gas pressure greater than the pressure at which said off-gases reside in said separator;
means for flowing said off-gases from said separator to said compressor;
a cooler for receiving said pressurized off-gases from said compressor and for cooling said pressurized off-gases to a temperature less than the temperature of said off-gases in said compressor;
means for flowing said pressurized off-gases from said compressor to said cooler;
supply means for containing a supply of liquid oxygen;
a heat-exchanger for receiving said pressurized off-gases from said cooler and for receiving said liquid oxygen contemporaneous with said pressurized off-gases, said heat exchanger having means for allowing the separate flow of said pressurized off-gases and said liquid oxygen therethrough such that heat is transferred from said off-gases to said liquid oxygen at a rate which liquefies said off-gases to form a liquid product and gasifies said liquid oxygen;
means for flowing said gaseous oxygen to said reaction apparatus for use in oxidizing said organic matter; and
means for flowing said liquid product from said heat-exchanger.

4,822,395

AIR SEPARATION PROCESS AND APPARATUS FOR HIGH ARGON RECOVERY AND MODERATE PRESSURE NITROGEN RECOVERY

Harry Cheung, Buffalo, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 2, 1988, Ser. No. 203,264
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 **20 Claims**



1. An air separation process comprising:
(A) introducing feed air into a first column operating at a pressure within the range of from 60 to 300 psia and separating the feed within said first column into nitrogen-richer and oxygen-richer components;
(B) passing oxygen-richer and nitrogen-richer component from the first column into a second column operating at a pressure less than that of the first column and within the range of from 20 to 90 psia, for separation into nitrogen-rich and oxygen-rich components;
(C) recovering nitrogen-rich component as moderate pressure nitrogen product;
(D) passing argon containing fluid from an intermediate point of the second column into a third column and separating the argon-containing fluid within the third column into argon-richer vapor and oxygen-richer liquid;
(E) recovering a first portion of the argon-richer vapor as crude argon product; and
(F) condensing a second portion of the argon-richer vapor by indirect heat exchange with oxygen-rich component and passing resulting liquid down the third column as reflux liquid.

4,822,396

METHOD OF SHAPING A COATED GLASS SHEET ON A SHAPING DIE

Barry P. Reinherz, Lawrence, and Robert M. Sullivan, Washington, both of Pa., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 120,460, Nov. 13, 1987, abandoned.
This application Jul. 14, 1988, Ser. No. 220,334
Int. Cl.[4] C03B *23/02*
U.S. Cl. 65—60.7 **2 Claims**

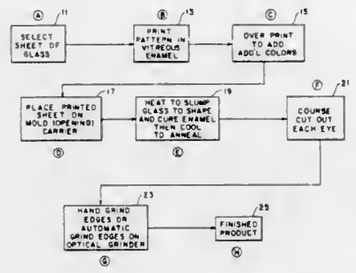
1. In the method for forming a glass enamel coated glass sheet, the glass enamel composition comprising a glass frit system and a vehicle therefor, wherein the glass enamel composition is coated onto the glass sheet, the coated glass sheet is heated to soften the sheet, to remove the volatiles in said enamel and to bond the remainder of the enamel to the sheet, the softened glass sheet is contacted with a fibrous material covered forming die, the forming die is removed and the glass sheet cooled; the improvement comprising incorporating into the enamel composition from about 5–80%, by weight, of a metal sulfide or sulfate selected from the group consisting of iron sulfide, iron sulfate, aluminum sulfide, aluminum sulfate, zinc sulfide, zine sulfate, tin sulfide, tin sulfate and mixtures thereof.

4,822,397

METHOD FOR MAKING TAXIDERMIC EYES

John W. Crossley, Box 434, Geigel Hill Rd., Upper Black Eddy, Pa. 18972

Filed Mar. 30, 1987, Ser. No. 32,024
Int. Cl.[4] C03B *23/025*
U.S. Cl. 65—107 **47 Claims**



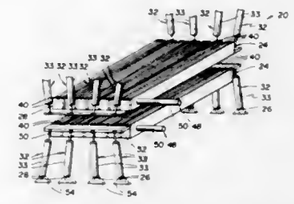
1. A method of manufacturing glass eyes comprising the following steps:
selecting a sheet of glass of a thickness appropriate for approximate wall thickness of the manufactured eye;
depositing a graphic pattern on one side of said sheet, said pattern being the graphics for the eye;
placing said patterned sheet of glass on a pallet containing an opening, said opening determining the base curvature for the eye;
heating said patterned sheet of glass on said pallet into the plastic state to cause said to slump through said pallet opening;
further heating said slumped patterned sheet of glass above the initial plastic state to cause said glas to flow internally thereby forming a free-form generally parabolic outer shaped eye;
allowing the formed eye to cool; and
trimming any excess glass material away from the formed eye.

4,822,398

GLASS BENDING AND TEMPERING APPARATUS

Harold A. McMaster, 707 Riverside Dr., Woodville, Ohio 43469; Norman C. Nitschke, 29737 E. River Rd.; Dexter H. McMaster, 1070 Elm St., both of Perrysburg, Ohio 43551, and Ronald A. McMaster, 420 Water St., Woodville, Ohio 43469

Filed Aug. 7, 1987, Ser. No. 83,675
Int. Cl.[4] C03B *23/03, 27/04*
U.S. Cl. 65—273 **11 Claims**



1. A glass bending the tempering apparatus comprising: a deformable platen for receiving a heated glass sheet to be bent; said deformable platen including an actuator for deforming the platen from a planar shape to a bent shape to bend the heated glass sheet; said deformable platen including quench openings throughout the extent thereof; said quench openings of the deformable platen moving therewith during the deformation of the platen to the bent shape; another platen that has quench openings throughout the extent thereof and opposes the bent deformable platen with the bent glass sheet therebetween; and quenching gas being supplied to the quench openings of both platens and thereby to both sides of the glass sheet to temper the bent glass sheet between the platens.

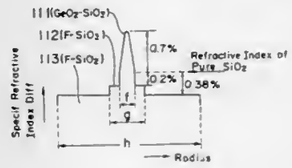
4,822,399

GLASS PREFORM FOR DISPERSION SHIFTED SINGLE MODE OPTICAL FIBER AND METHOD FOR THE PRODUCTION OF THE SAME

Hiroo Kanamori; Hiroshi Yokota; Gotaro Tanaka; Yoichi Ishiguro; Masahiro Takagi; Hiroshi Suganuma, and Masayuki Shigematsu, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 10, 1987, Ser. No. 60,176
Claims priority, application Japan, Jun. 11, 1986, 61-133762; Mar. 6, 1987, 62-50276; Mar. 9, 1987, 62-52089
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.12 **3 Claims**

1. A method for producing a glass preform for use in the fabrication of a dispersion shifted single mode optical fiber comprising steps of:
preparing a core member by flame hydrolyzing glass forming raw materials to produce glass soot particles of SiO_2 containing GeO_2, depositing glass soot particles on a starting member to form an inner core part, flame hydrolyzing glass raw materials to produce glass soot particles of SiO_2, depositing the glass soot particles on the inner core part to form a soot core member consisting of the inner core part and an outer core part, dehydrating and sintering the soot core member to form a vitrified core member, and drawing the vitrified core member in an atmosphere not containing hydrogen atoms to produce an elongated core member,
preparing a cladding member by flame hydrolysing glass forming raw material to produce glass soot particles of SiO_2, depositing them on a starting member to form a soot glass rod, dehydrating the soot glass rod, heating it in an atmosphere containing a fluorine-containing compound, sintering the soot glass rod to form a vitrified glass rod, and boring a center part of the vitrified glass rod along its axis to form a tube shape cladding member,



inserting the elongated core member consisting of the inner core part made of a germania-added quartz glass and the outer core part made of the quartz glass having a refractive index smaller than that of the inner core part in the tube shape cladding member made of the fluorine-added quartz glass having a refractive index smaller than that of the outer core part, and
heating the core member and the tube shape cladding member to collapse the tube shape cladding member and fuse them together to produce a glass preform.

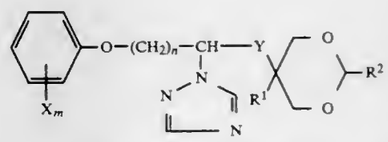
4,822,400

1,3-DIOXAN-5-YLALKYLTRIAZOLES, THEIR USE FOR REGULATING PLANT GROWTH, AND AGENTS FOR THIS PURPOSE

Costin Rentzea, Heidelberg; Hubert Sauter, Mannheim; Wolfgang Tuerk, Ludwigshafen; Bernd Wenderoth, Lampertheim; Winfried Richarz, Stockstadt; Johann Jung, and Wilhelm Rademacher, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 25, 1986, Ser. No. 855,598
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515309
Int. Cl.[4] A01N *43/653*; C07D *405/06*
U.S. Cl. 71—76 **5 Claims**

1. A compound of the formula I



where R^1 and R^2 are identical or different and are each hydrogen or alkyl of 1 to 5 carbon atoms, X is an identical or different substituent selected from the group consisting of halogen, cyano, trifluoromethyl, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, unsubstituted phenyl or hydrogen, m is from zero to 5, n is an integer from 2 to 6 and Y is —CO— or —CH(OH)—.

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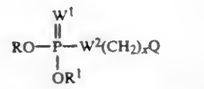
4,822,401

SAFENING OF HERBICIDAL CLOMAZONE APPLICATIONS WITH ORGANOPHOSPHORUS COMPOUNDS

John M. Tymonko, Hamilton Square, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 5, 1988, Ser. No. 141,016
Int. Cl.[4] A01N *57/04, 43/80*
U.S. Cl. 71—87 **33 Claims**

1. A method of controlling undesirable vegetation in the locus of a crop, which comprises applying to the locus thereof in the presence of an agriculturally acceptable carrier a herbicidally effective amount of clomazone and, as an antidote to clomazone, a safening amount of at least one organophosphorus compound of the formula



wherein W^1 and W^2 independently are oxygen or sulfur, x is an integer of from 1 to 4, Q is SR^2 or and R, R^1, R^2 and R^3 are alkyl(C_1-C_{13}), provided that both W^1 and W^2 are not oxygen.

4,822,402

THIOPHENESULFONAMIDE COMPOUNDS, AND HERBICIDAL COMPOSITIONS CONTAINING THEM

Fumio Kimura, Otsu; Takahiro Haga, Kusatsu; Kazuyuki Maeda, Hikone; Koji Hayashi; Masahiko Ikeguchi, both of Moriyama, and Tsunezo Yoshida, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osakr, Japan

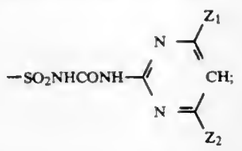
Filed May 21, 1986, Ser. No. 865,467
Claims priority, application Japan, Jun. 7, 1985, 60-123901; Sep. 20, 1985, 60-207830
Int. Cl.[4] C07D *409/12;* **A01N** *43/54*
U.S. Cl. 71—90 **13 Claims**

1. A thiophenesulfonamide compound having the formula:

(I)



wherein X is a halogenalkoxyalkyl group having from 1 to 6 halogen atoms, the alkoxy moiety contains from 1 to 6 carbon atoms, and the alkyl group has 1 to 2 carbon atoms; Y is



and each of Z_1 and Z_2 is a methyl group or a methoxy group; and its salt.

10. A herbicidal composition comprising a herbicidally effective amount of the thiophenesulfonamide compound of the formula I as defined in claim 1 or its salt, and an agricultural adjuvant.

4,822,403

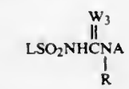
HERBICIDAL SULFONAMIDES

James V. Hay, Newark; Barry A. Wexler, Wilmington, both of Del., and Donna T. Zimmerman, Landenberg, Pa., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

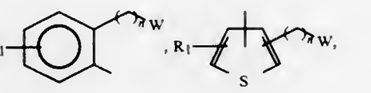
Continuation-in-part of Ser. No. 768,158, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 680,549, Dec. 11, 1984, abandoned. This application Oct. 10, 1986, Ser. No. 917,928
Int. Cl.[4] C07D *239/69, 401/12, 409/12;* **A01N** *43/54*
U.S. Cl. 71—90 **32 Claims**

1. A compound of the formula

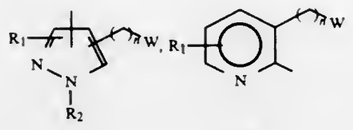
I



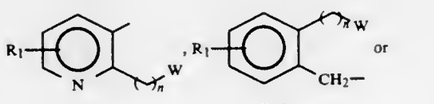
wherein L is R1



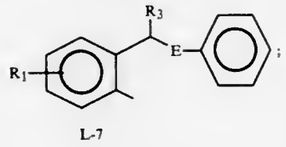
L-1 L-2



L-3 L-4



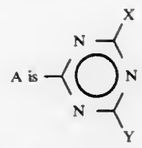
L-5 L-6



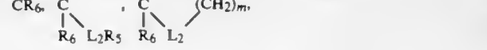
L-7

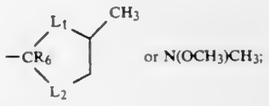
R is H or CH_3;
W_3 is O or S;
n is 0 or 1;
E is $S(O)_p$ or Se;
p is 0, 1 or 2;
R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro, CH_2CN, CH_2OCH_3, CH_2SCH_3, CN, C_1–C_3 alkoxy, $SO_2NR^IR^{II}$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl or CO_2R^{III};
R^I is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;
R^{II} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or
R^I and R^{II} may be taken together as —$(CH_2)_3$—, —$(CH_2)_4$—, —$(CH_2)_5$— or —$CH_2CH_2OCH_2CH_2$—;
R^{III} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_4 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;
R_2 is C_1–C_3 alkyl;
W is W_1 or W_2;
W_1 is C_2–C_8 alkenyl or C_4–C_7 cycloalkenyl either of which may be optionally substituted with 1–3 atoms of F, Cl or Br, OH, CN, NO_2, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, amino, C_2–C_4 alkenyl, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, (C_1–C_3 alkylamino)sulfamoyl, di(C_1–C_3 alkylamino)sulfamoyl, OC(O)C_1–C_3 alkyl, C(O)C_1–C_3 alkoxy, OC(O)C_1–$_3$ alkoxy, OSO_2C_1–C_3 alkyl, $OSO_2C_6H_5$, OSO_2—4—CH_3— C_6H_4, phenyl or phenyl substituted with halogen, CH_3, OCH_3, SCH_3 or NO_2;
W_2 is C_2 alkynyl which may be substituted with phenyl or phenyl substituted with halogen, CH_3, OCH_3, SCH_3 or NO_2 or W_2 is C_3–C_8 alkynyl which may be optionally substituted with 1–3 atoms of F, Cl or Br, OH, CN, NO_2, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, (C_1–C_3 alkylamino)sulfamoyl, di(C_1–C_3 alkylamino)sulfamoyl, OC(O)C_1–C_3 alkyl, OC(O)C_1–C_3 alkoxy, OSO_2C_1–C_3 alkyl, $OSO_2C_6H_5$, OSO_2—4—CH_3—C_6H_4, phenyl or phenyl substituted with halogen, CH_3, OCH_3, SCH_3 or NO_2;
R_3 is H or C_1–C_4 alkyl;

A-1



X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_6 alkoxy, C_1–C_6 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl,





or $N(OCH_3)CH_3$;

m is 2 or 3;
L_1 and L_2 are independently O or S;
R_4 and R_5 are independently C_1–C_2 alkyl;
R_6 is H or CH_3;
Z is CH; and their agriculturally suitable salts;
provided that
(a) when X is Cl, F, Br or I, then Y is OCH_3, OC_2H_5, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;
(b) when L is L-2 or L-3, then the W substituent and the sulfonylurea bridge are on adjacent carbon atoms;
(c) when W_1 is C_3 alkenyl, then L is L-3, L-4, L-5 or L-6;
(d) when L is L-1, then n is 1 and W is W_2;
(e) when L is L-1 and W_2 is C_2 or C_3 alkynyl, said group must be substituted;
(f) when W_1 is C_3–C_8 alkenyl or C_4–C_7 cycloalkenyl substituted with OH, then the OH substituent is not bonded directly to the oelfinic group;
(g) when L is L-3, then the sulfonylurea bridge is bonded at the 3- or 5-position;
(h) when W_3 is S, then R is H and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$ or $CH(OCH_3)_2$;
(i) when the total number of carbon atoms of X and Y is greater than four, then the number of carbons of R_1 must be less than or equal to two and the number of carbons of W must be less than or equal to four; and
(j) when L is L-2, L-3, L-4 or L-5, then W_1 is other than C_2–C_8 alkenyl substituted with 1–3 atoms of F, Cl or Br.

27. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

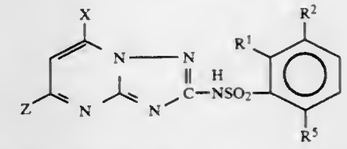
4,822,404

SULFONAMIDES DERIVED FROM SUBSTITUTED 2-AMINO-1,2,4-TRIAZOLO (1,5-A) PYRIMIDINES AND COMPOSITIONS AND METHODS OF CONTROLLING UNDESIRED VEGETATION

William A. Kleschick, Martinez, Calif., assignor to The Dow Chemical Company, Midland, Mich.

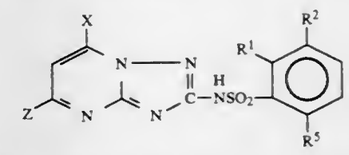
Continuation of Ser. No. 773,406, Sep. 6, 1985, abandoned. This application Oct. 20, 1987, Ser. No. 111,003
Int. Cl.[4] A01N *43/90;* **C07D** *487/04*
U.S. Cl. 71—92 **9 Claims**

1. A compound having the formula



wherein R^1 represents halo, —NO_2, —CF_3, —CN or —$COOR^7$, R^2 represents H, halo or C_1–C_4 alkyl, R^5 represents H, C_1–C_4 alkoxy or halo, R^7 represents H or C_1–C_4 alkyl and X and Z represent H, CH_3 or C_1–C_2 alkoxy groups with the proviso that X and Z cannot both be H.

7. Method of controlling undesired vegetation which comprises the application of a herbicidally effective amount of a compound having the formula



wherein R^1 represents halo, —NO_2, —CF_3, —CN or —$COOR^7$, R^2 represents H, halo or C_1–C_4 alkyl, R^5 represents H, C_1–C_4 alkoxy or halo, R^7 represents H or C_1–C_4 alkyl and X and Z represent H, CH_3 or C_1–C_2 alkoxy groups with the proviso that X and Z cannot both be H.

4,822,405

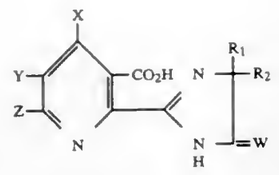
HERBICIDAL OIL IN WATER COMBINATION COMPOSITIONS OF IMIDAZOLINONE HERBICIDES

Craig A. Martin, Pennington, and Jerry L. Johnson, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

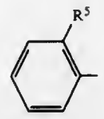
Filed Jan. 27, 1987, Ser. No. 7,068
Int. Cl.[4] A01N *43/50, 33/06*
U.S. Cl. 71—92 **10 Claims**

1. Herbicidal concentrated oil in water emulsion composition comprising on a weight basis about 0.5% to 10% of a water soluble salt of an imidazolinyl acid represented by formula (I) below

VOL
1101
ISS
3
AP
18
1989
UMI



(I)



wherein

W is oxygen or sulfur; X is H, halogen, methyl or hydroxyl;

Y and Z are each hydrogen, halogen, C_1–C_6 alkyl, hydroxyloweralkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, nitro, cyano, C_1–C_4 alkylamino, diloweralkylamino or C_1–C_4 alkylsulfonyl group or phenyl optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; difluoromethoxy, trifluoromethoxy, 1,1,2,2-tetrafluoroethoxy, C_3–C_8 straight or branched alkenyloxy optionally substituted with one to three halogens, or C_3–C_8 straight or branched alkynyloxy optionally substituted with one to three halogens;

or, when taken together Y and Z may form a ring in which YZ or ZY are represented by $-(CH_2)_n-$, $-(CH)_n-$, where n is an integer of 3 or 4, with the proviso that X is hydrogen;

R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionallly substituted with methyl;

5% to 45% of pendimethalin;

5% to 40% of a water immiscible solvent;

0.5% to 5.0% of an alkylphenol polyethylene oxide condensate;

0.5% to 5.0% of a ethylene oxide/propylene oxide block copolymer;

0% to 5.0% of an anionic dispersant; and sufficient water to total 100%.

4,822,406

O-ARYL-N'-(TRIAZIN-2-YL)-ISOUREA HERBICIDES

Christa Fest; Hans-Jochem Riebel, both of Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Robert H. Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

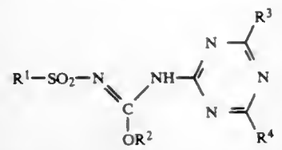
Filed Oct. 7, 1987, Ser. No. 105,852

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1986, 3634928

Int. Cl.⁴ A01N *43/66, 43/68;* **C07D** *251/46, 251/52*

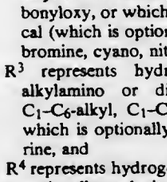
U.S. Cl. 71—93 **6 Claims**

1. An O-aryl-N'-(triazin-2-yl)-isourea of the formula



in which

R^1 represents the radical



wherein

R^5 represents trifluromethoxy, difluoromethoxy, phenyl, phenoxy, trifluoromethylthio, difluoromethylthio, di-(C_1–C_4-alkyl)-aminocarbonyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkoxyaminosulphonyl, N-(C_1–C_4-alkoxy)-N-(C_1–C_4-alkyl)aminosulphonyl, C_1–C_4-alkylaminosulphonyl or di-(C_1–C_4-alkyl)-aminosulphonyl,

or wherein

R^1 represents the radical

wherein

R^6 represents hydrogen or C_1–C_4-alkyl and

R^7 and R^8 are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylsulphonyl or di-(C_1–C_4-alkyl)-aminosulphonyl;

R^2 represents a phenyl radical which is optionally substituted by one or more radicals from the series comprising halogen, cyano, nitro, hydroxyl, carboxyl, C_1–C_6-alkyl (which is optionally substituted by fluorine, chlorine, bromine, nitro, cyano, hydroxyl, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or phenyl), C_3–C_6-cycloalkyl, C_1–C_4-alkoxy (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or C_1–C_4-alkoxycarbonyl), C_1–C_4-alkylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy-carbonyl), amino, C_1–C_4-alkyl-amino and di-(C_1–C_4-alkyl)-amino (which are optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl), C_1–C_4-alkyl-carbonyl-amino, C_1–C_4-alkoxycarbonylamino, (di)-C_1–C_4-alkylamino-carbonylamino, formyl, C_1–C_4-alkyl-carbonyl, benzoyl, C_1–C_4-alkoxy-carbonyl, phenoxy-carbonyl, benzyloxycarbonyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, hydroxyl or methyl), phenoxy, phenylthio, phenylsulphonyl, phenylamino or phenylazo (which are optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl), pyridoxy and pyrimidoxy (which are optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl), C_1–C_4-alkyl-carbonyloxy, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkyl-amino-carbonyloxy and di-(C_1–C_4-alkyl)-amino-carbonyloxy, or which is optionally fused with a benzo radical (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl,

R^3 represents hydrogen, halogen, hydroxyl, C_1–C_6-alkylamino or di-(C_1–C_6-alkyl-amino, or represents C_1–C_6-alkyl, C_1–C_6-alkoxy or C_1–C_6-alkylthio each of which is optionally substituted by fluorine and/or chlorine, and

R^4 represents hydrogen, halogen or hydroxyl, or represents optionally substituted C_1–C_6-alkyl, C_1–C_6-alkoxy or

C_1–C_6-alkylthio, or represents C_1–C_6-alkylamino or di-(C_1–C_6-alkyl)-amino.

6. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1.

4,822,407

DILUTANT FOR NON-AGRICULTURAL INDUSTRIAL HERBICIDES

James E. Esposito, Chalfont, Pa., assignor to Asplundh Tree Expert Co., Willow Grove, Pa.

Continuation of Ser. No. 697,952, Feb. 4, 1985, abandoned. This application May 6, 1987, Ser. No. 49,036

Int. Cl.⁴ A01N *25/02*

U.S. Cl. 71—94 **9 Claims**

1. A non-agricultural dilutant and carrier for low volume basal bark application of herbicides, fungicides, insecticides and plant growth regulators to woody plants comprising

20% to 80% by weight of a hydrocarbon filler,

10% to 40% by weight of lecithin, and

10% to 40% by weight of a mixture of emulsifiers, pine oils or terpenes, and mineral oils.

4,822,408

ALKYL-, ALKENYL- AND ALKYNYLNITROGUANIDINES AS CYTOKININ PLANT GROWTH REGULANTS

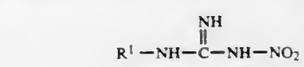
Albert W. Lutz, Princeton, N.J., and Shirley J. Rodaway, Newtown, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 759,705, Jul. 29, 1985, Pat. No. 4,677,226. This application Mar. 9, 1987, Ser. No. 23,348

Int. Cl.⁴ H01N *33/02*

U.S. Cl. 71—121 **9 Claims**

1. A method for inducing a cytokinin response in growing plants which comprises applying to the foilage of said plants or to the soil containing seeds or other propagating organs thereof, a cytokinin-response-inducing amount of a nitroguanidine compound having the structural formula



wherein R^1 is C_1–C_6 alkyl, optionally substituted with one to three OH, halogen or C_1–C_3 alkoxy groups; C_2–C_6 alkenyl, optionally substituted with one to three OH, halogen or C_1–C_3 alkoxy groups or C_2–C_6 alkynyl, optionally substituted with from one to three OH, halogen or C_1–C_3 alkoxy groups; or the salts, geometric isomers, optical isomers or tautomers thereof.

4,822,409

METHOD FOR THE MANUFACTURE OF A THERMOSTABLE AMORPHOUS FERROMAGNETIC POWDER

Dimiter T. Butchkov; Yovka D. Dragieva; Zvetan K. Nikolov; Georgi G. Georgiev; Mina S. Slavtcheva-Staikova, and Ivanka S. Grozdanova, all of Sofia, Bulgaria, assignors to VMEI Lenin, Quartal Darvenitza, Sofia, Bulgaria

Division of Ser. No. 913,786, Sep. 30, 1986. This application Mar. 23, 1988, Ser. No. 171,989

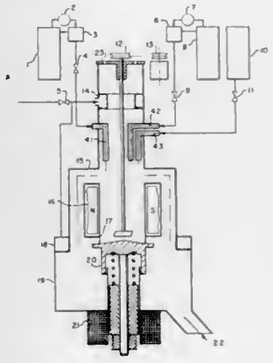
Int. Cl.⁴ B22F *9/24*

U.S. Cl. 75—0.5 AA **2 Claims**

1. A method for the manufacture of thermostable amorphous ferromagnetic powder comprising the steps of

preparing a first solution containing salts of iron, cobalt, nickel and chrome, lithium and magnesium, and complex-forming agents, as well as polyvalent alcohols,

adding to said first solution, consisting in the form of salt lithium and magnesium in amounts of 0.01 to 2.0% by weight of the powder, an organic hydrophobic substance -xylene- in amounts 0.2 to 25% by volume of the powder particles,



reducing said second solution by means of sodium borohydride as reductant in the presence of sodium hydroxide, at ambient temperature for a time period of 5 seconds to 10 minutes in the presence of a magnetic field.

4,822,410

RECLAMATION OF METALS BY FLASH DIRECT REDUCTION

Edwin Matovich, Dana Point, Calif., assignor to MKR, Inc., Costa Mesa, Calif.

Filed Mar. 14, 1988, Ser. No. 167,326

Int. Cl.⁴ B22F *9/20*

U.S. Cl. 75—0.5 B **14 Claims**

1. A high-temperature chemical reaction process for the reclamation of metals which comprises: intimately mixing finely-divided solid metal compounds with a finely-divided solid oxygenated carbonaceous reductant, placing said mixture into gaseous entrained flow, and subjecting said gas-entrained mixture to electromagnetic radiation of sufficiently high intensity and for a sufficient exposure time to raise the temperature of said solid oxygenated carbonaceous reductant sufficiently high to decompose said solid oxygenated carbonaceous reductant into reducing gases and at the same time to raise the temperature of the solid metal compounds sufficiently high to cause them to react with said reducing gases, producing the parent metals.

4,822,411

INTEGRATED STEEL MILL ARRANGEMENT

Gerhard Standler; Siegfried Zeller, both of Linz; Konstantin Milionis, Graz, and Rudolf Zeller, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Apr. 8, 1987, Ser. No. 35,988

Claims priority, application European Pat. Off., May 7, 1986, 86890130

Int. Cl.⁴ C21B *13/14*

U.S. Cl. 75—35 **5 Claims**

1. A process for operating an integrated mill comprising a coking plant, a blast furnace arrangement, a converter steelworks including at least one converter, and a direct reduction plant, said process comprising:

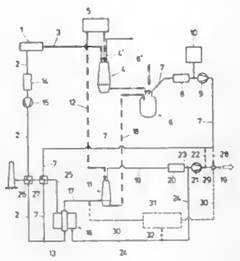
conducting exhaust gas consisting essentially of CO and CO_2 from said at least one converter via first duct means to a reformer,

conducting coke oven gas consisting essentially of H_2 and CH_4 from said coking plant via a second duct means to said reformer,

forming a reducing gas containing substantially CO and H_2 in said reformer from said exhaust gas and said coke oven

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gas without additional supply of oxygen or carbonaceous material,



conducting said reducing gas to said direct reduction plant to convert iron ore in said reduction plant to sponge iron, and feeding said sponge iron to said at least one converter

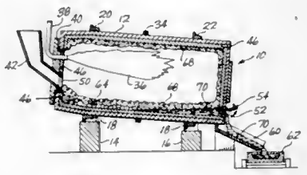
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4,822,412

METHOD OF REMOVING LITHIUM FROM ALUMINUM-LITHIUM ALLOYS

Douglas V. Badger, Federal Way; Billy L. Small, Seattle, and Philip K. Stanfeld, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 17, 1986, Ser. No. 932,177
Int. Cl.[4] C22B *21/06*
U.S. Cl. 75—63 **14 Claims**



1. A method of removing lithium from aluminum-lithium alloys, in which the alloys contain an amount of lithium sufficient ot significantly lighten the alloys but not enough to weaken the alloys for a practical use, comprising:

providing a rotary furnance having a first end, a second end, and a refractory lining;

feeding solid aluminum-lithium alloy and solid metal halide flux into the first end of the rotary furnace;

maintaining the temperature of the first end of the furnace above that of the melting point of the flux and approximately at or below the melting point of the alloy;

melting the flux in the first end of the furnace to form a molten flux;

coating the solid alloy with the molten flux to prevent the alloy from oxidizing;

coating the refractory lining with flux to prevent contact between the refractory lining and molten alloy until lithium has been removed from the alloy;

rotating the furnace to move the alloy and molten flux toward the second end of the furnace;

heating the furnace sufficiently to melt the alloy adjacent the second end; and

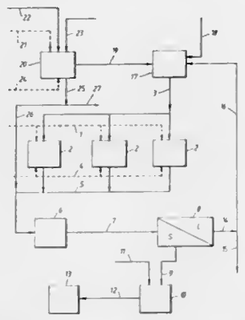
removing the lithium from the alloy and chemically absorbing the lithium with the flux.

4,822,413

EXTRACTION OF METAL VALUES FROM ORES OR CONCENTRATES

Frederick D. Pooley, Cardiff, Wales, and Martin T. Errington, Cleveland, England, assignors to Davy McKee (Stockton) Limited, Cleveland, England

Continuation-in-part of Ser. No. 839,094, Mar. 13, 1986, abandoned. This application Jun. 4, 1987, Ser. No. 58,607
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—118 R **9 Claims**



1. A process for recovery of gold from a gold-bearing arsenopyritic material selected from a gold-bearing arsenopyritic ore and a gold-bearing arsenopyritic concentrate in which an aqueous liquor is circulated between a leach stage and a solids separation stage, which process comprises:

(i) supplying a pyritic material, sulphuric acid, nutrients, and an oxygen-containing gas to a generator vessel containing a colony of *Thiobacillus ferro-oxidans*, said pyritic material having a content of arsenic producing an arsenic content in the liquor in the generator vessel which is less than the arsenic content of a recycle stream leaching the gold-bearing arsenopyritic material, thereby to generate an aqueous acidic ferric sulphate solution containing bacterially generated ferric ions;

(ii) admixing resulting aqueous acidic ferric sulphate solution with an arsenic-containing aqueous recycle stream containing ferrous ions;

(iii) leaching the gold-bearing arsenopyritic material in the form of a pulp in the leach stage by admixture with the feric sulphate and arsenic-containing aqueous liquor from step (ii);

(iv) separating resultant leached solids in the solids separation stage from the arsenic-containing aqueous leach liquor containing ferrous ions;

(v) subjecting recovered solids of step (iv) to a cyanide leach step;

(vi) discarding a part of the arsenic-containing leach liquor of step (iv) in excess of the volume required to form the arsenic-containing aqueous stream of step (ii); and

(vii) recycling the remainder of the arsenic-containing aqueous leach liquor of step (iv) as the arsenic-containing aqueous recycle stream of step (ii).

4,822,414

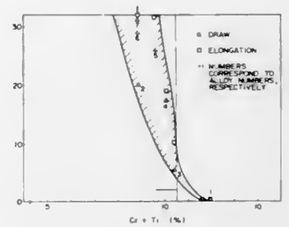
AL-BASED ALLOY COMPRISING CR AND TI

Katsuyuki Yoshikawa; Hidetoshi Inoue; Tsukasa Shiomi; Shojiro Oie, and Mutsumi Abe, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 18, 1987, Ser. No. 50,462
Claims priority, application Japan, May 19, 1986, 61-114306
Int. Cl.[4] C22C *21/00*
U.S. Cl. 75—249 **6 Claims**

1. An Al-based alloy obtained by powder metallurgy and having a high heat resistance, good workability and good toughness, which consists essentially of from 5 to 10% by weight of Cr, from 0.5 to 3% by weight of Ti and the balance of Al and inevitable impurities,

wherein the total amount of Cr+1.2 Ti is not less than 8% by weight of the alloy,



the total amount of Cr+Ti is not larger than 10.5% by weight of the alloy, and

the total amount of Cr+0.6 Ti is not larger than 10% by weight of the alloy.

4,822,415

THERMAL SPRAY IRON ALLOY POWDER CONTAINING MOLYBDENUM, COPPER AND BORON

Mitchell R. Dorfman, Smithtown; Subramaniam Rangaswamy, Port Jefferson Station, and Joseph D. Reardon, Happauge, all of N.Y., assignors to Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 22, 1985, Ser. No. 801,035
Int. Cl.[4] C22C *38/20*
U.S. Cl. 75—251 **3 Claims**

1. A thermal spray powder characterized by ability to produce coatings having high resistance to wear and corrosion, comprising a homogeneous alloy consisting essentially of, in weight percent:

10 to 30% chromium,
10 to 30% molybdenum,
1 to 5% copper,
3 to 4% boron,
0 to 4% silicon,
0.01 to 1% carbon, and
balance incidental impurities and at least 50% iron.

4,822,416

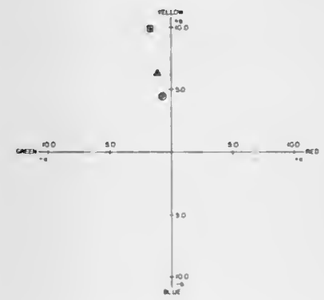
HIGH SOLIDS CONTENT CB COATING

George O. Langlais; Pat Y. H. Wang, and Joseph S. Chaplick, all of Nashua, N.H., assignors to Nashua Corporation, Nashua, N.H.

Continuation of Ser. No. 743,756, Jun. 12, 1985, abandoned. This application Sep. 8, 1987, Ser. No. 96,204
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—21 **9 Claims**

1. An aqueous, high solids content coatable formulation for application to a substrate to produce a pressure-releaseable color-former, said formulation comprising the following materials in the following parts by weight:

Material	Parts by Weight
Carboxymethylcellulose	100
a salt of a polyvalent metal	4.4–12.2
a wall-forming carboxylated alkyl acrylic copolymer acrylic resin	50–200
an organic cross-linker reactive with carboxymethylcellulose and said acrylic resin	10–150
spacer particles, and	100–500
a color-forming dye dissolved in oil solvent,	300–1,000



said composition having a total non-aqueous content of at least 30% by weight and a Brookfield viscosity at 78° F. of from about 50 to about 5,000 cps.

4,822,417

MARKING INK COMPOSITION

Yuichi Kobayashi, Mito, and Satoshi Saito, Inashiki, both of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,625
Int. Cl.[4] C09D *11/16, 11/06*
U.S. Cl. 106—23 **3 Claims**

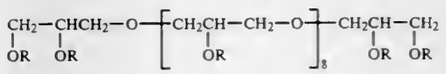
1. A marking ink composition comprising, based on the total weight of the ink composition:

(1) 1 to 20% by weight of a pigment, an organic solvent-soluble dye, or a mixture thereof;

(2) 55 to 90% by weight of an organic solvent;

(3) 1 to 30% by weight of a resin soluble in said organic solvent and being selected from the group consisting of polyvinyl butyral, vinyl chloride-vinyl acetate copolymer, rosin resins and cellulose resins; and

(4) 0.05 to 5% by weight of a decaglycerol stearate ester represented by the formula



wherein R is a stearoyl group or a hydrogen atom.

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4,822,418
DROP ON DEMAND INK JET INK COMPRISING DUBUTYL SEBECATE
An-Chung R. Lin, New Town; Theodore M. Cooke, and Alfred R. Merritt, both of Danbury, all of Conn., assignors to Dataproducts Corporation, Woodland Hills, Calif.
Continuation of Ser. No. 801,015, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 610,627, May 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 507,918, Jun. 27, 1983, Pat. No. 4,484,948, which is a continuation of Ser. No. 331,604, Dec. 17, 1981, Pat. No. 4,390,369, and a continuation-in-part of Ser. No. 668,095, Nov. 5, 1984, abandoned, and a continuation-in-part of Ser. No. 644,542, Aug. 27, 1984, Pat. No. 4,659,383, which is a continuation of Ser. No. 248,551, Mar. 27, 1981, Pat. No. 4,659,843, and a continuation-in-part of Ser. No. 565,124, Dec. 23, 1983, abandoned, which is a continuation of Ser. No. 394,154, Jul. 1, 1982, abandoned, and a continuation-in-part of Ser. No. 672,587, Nov. 16, 1984, abandoned, and a continuation-in-part of Ser. No. 522,837, Aug. 12, 1983, Pat. No. 4,531,976, which is a continuation of Ser. No. 327,994, Dec. 7, 1981, Pat. No. 4,400,215, and a continuation-in-part of Ser. No. 501,074, Jun. 6, 1983, Pat. No. 4,531,976, which is a continuation of Ser. No. 331,603, Dec. 26, 1981, Pat. No. 4,386,961. This application Jan. 27, 1988, Ser. No. 149,959
The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—27 13 Claims

1. An ink jet ink composition for use in drop on demand ink jet printers, consisting essentially of:
(a) 85–99 weight percent of a vehicle consisting essentially of:
(i) 30 to 80 weight percent dibutyl sebacate and
(ii) 20 to 70 weight percent oleic acid; and
(b) 1–15 weight percent colorant.

4,822,419
LITHOGRAPHIC INK COMPOSITION AND PROCESS FOR MAKING SAME
Louis J. Pepoy; Thomas E. Foye, both of Holland, Mich., and Sherwin P. Malchick, Sparta, N.J., assignors to BASF Corporation, Parsippany, N.J.
Filed Nov. 9, 1987, Ser. No. 118,263
Int. Cl.[4] C09D *11/06*
U.S. Cl. 106—27 11 Claims

1. An improved ink composition comprising at least 0.1 percent based on weight of ink composition of a substantially oil-soluble buffer, wherein the buffer is a reaction product of a primary, secondary, or tertiary monoamine and a polybasic organic acid.

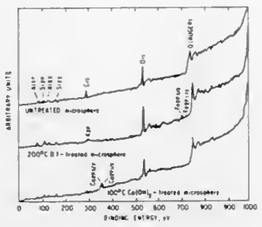
4,822,420
SEALING COMPOSITION FOR SOIL BARRIERS
Rudolf Burkhardt, Vettelschoss; Hansjürgen Hass; Reiner Hitze, both of Troisdorf, and Günther Zoche, Bonn, all of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Cologne, Fed. Rep. of Germany
Filed Feb. 25, 1987, Ser. No. 18,684
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606313
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] C04B *35/16;* C09K *3/00*
U.S. Cl. 106—74 11 Claims

1. A sealing composition for soil barriers comprising: a solids mixture of clay minerals and silicatic fillers having a clay mineral content of 5 to 90% by weight of the solids mixture, said solids mixture amounting to 50 to 95 wt.-% of the total composition; a binding agent, said binding agent being a mixture of an aqueous solution of alkali water glass with a trialkoxysilane of the general formula R—Si(OR')$_3$ in which R is an aliphatic moiety of 1 to 6 carbon atoms, and R' represents identical or different alkyl moieties of 1 to 4 carbon atoms; and water.

4,822,421
THIXOTROPIC CEMENT COMPOSITIONS
Clarence R. Crabb, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Mar. 4, 1988, Ser. No. 164,156
Int. Cl.[4] C04B *7/02*
U.S. Cl. 106—89 13 Claims

1. A thixotropic cement composition comprising a hydraulic cement and an effective amount of an additive to thicken and impart thixotropic properties to said cement composition upon the addition of water, the additive consisting essentially of a mixed metal layered hydroxide wherein the crystals of the hydroxide are essentially monolayer.

4,822,422
CA(OH)$_2$-TREATED CERAMIC MICROSPHERE
Toshifumi Sugama, Mastic Beach, N.Y., assignor to Associated Universities, Inc., Washington, D.C.
Filed Oct. 9, 1987, Ser. No. 106,269
Int. Cl.[4] C04B *7/00, 14/00*
U.S. Cl. 106—97 1 Claim



1. A lightweight cement slurry composed of:

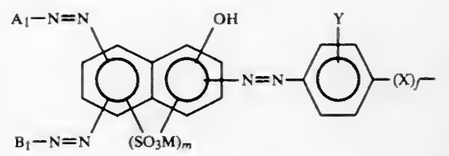
	Weight percent
Class H Cement (C)	30
Silica flour (S)	10
Water	35
Pressure resistant sillimanite-based microspheres treated before inclusion in the slurry by washing and exposing to a solution of an alkali earth metal hydroxide at an elevated temperature for a period up to twenty hours	25

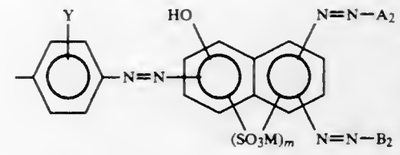
4,822,423
NAIL COSMETIC COMPOSITION
Yoshikazu Soyama; Kazunori Yamazaki, and Chigusa Kitamura, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan
Continuation of Ser. No. 775,194, Sep. 12, 1985. This application Jul. 30, 1987, Ser. No. 79,722
Claims priority, application Japan, Mar. 15, 1985, 60-51941
Int. Cl.[4] C09G *1/16*
U.S. Cl. 106—5 1 Claim

1. A nail cosmetic consisting essentially of 3% to 15% by weight of nitrocellulose, 3% to 15% by weight of a resin, 2% to 8% by weight of a plasticizer, 60% to 85% by weight of at least one solvent selected from the group consisting of esters, alcohols, are aromatic hydrocarbons, 1% to 10% by weight of, as a matting agent, silica having an average particle size of 0.01 to to 30 μm, and 0.1% to 2.5% by weight of mica in the form of a leaf having a thickness of 0.05 to 1.5 μm and a particle size of 1 to 30 μm.

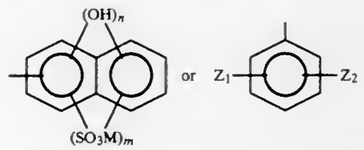
4,822,424
HEXAKISAZO DYES-CONTAINING AQUEOUS COMPOSITIONS
Hisashi Senshu; Sadahiko Matsubara, and Tamotsu Naito, all of Osaka, Japan, assignors to Orient Chemical Industries Ltd., Japan
Division of Ser. No. 891,571, Jul. 29, 1986, Pat. No. 4,758,659. This application Dec. 30, 1987, Ser. No. 140,148
Claims priority, application Japan, Aug. 1, 1985, 60-170390
Int. Cl.[4] C09B *31/30, 33/18, 35/64;* C09D *11/00*
U.S. Cl. 106—22 6 Claims

2. Aqueous ink composition comprising a hexakisazo dye represented by the formula

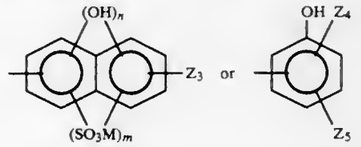




wherein
X is —CH=CH—, —CONH—, —CRH— (wherein R is phenyl which is unsubstituted or substituted by a sulfonic acid group), —SO$_2$— or —O—;
Y is H, CH$_3$, OCH$_3$, Cl or SO$_3$M;
A$_1$ and A$_2$ are each



(wherein Z$_1$ is H, Cl, CH$_3$, OH, OCH$_3$, OC$_2$H$_5$ or SO$_3$M, and Z$_2$ is H, CH$_3$, NO$_2$ or COOM);
B$_1$ and B$_2$ are each



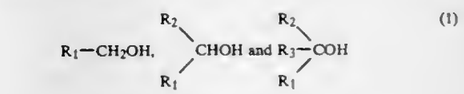
wherein Z$_3$ is H, OH, NH$_2$, Cl or COOM, Z$_4$ is H, Cl, CH$_3$, OH, OCH$_3$, NH$_2$, COOM or SO$_3$M, and Z$_5$ is H, C$_1$–C$_4$ alkyl or OH);
M is H, Na, K, Li or NH$_4$; and
f is 0 or 1; m is 0, 1 or 2; and n is 0, 1 or 2; water, and a water soluble organic solvent.

4,822,425
AGGREGATE STABILIZATION
Richard M. Burch, 11908 Berwick La., Knoxville, Tenn. 37922
Filed Mar. 19, 1987, Ser. No. 27,646
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—273.1 22 Claims

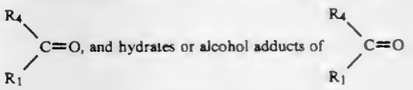
1. A mixture for use as the dispersed phase in a stable, water dilutable, non-flammable, non-corrosive, dispersable, aggregate stabilizing emulsion consisting essentially of pine tar pitch from about 70 to about 90 weight percent based on the total weight of the mixture and rosin from about 1.0 to about 30 weight percent based on the total weight of the mixture wherein said mixture when emulsified with an emulsifying agent and water sufficiently to reduce the particle size of both the pine tar pitch and rosin to a maximum particle size of from about 5 to about 10 microns forms said aggregate stabilizing emulsion.

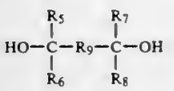
4,822,426
PRIMER COMPOSITION USEFUL FOR APPLICATION TO NON-POLAR ON HIGHLY CRYSTALLINE RESIN SUBSTRATES
Kenji Ito, and Kaoru Kimura, both of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan
Filed Nov. 12, 1986, Ser. No. 930,506
Claims priority, application Japan, Nov. 14, 1985, 60-253701; Jan. 14, 1986, 61-4255; Mar. 28, 1986, 61-68628
Int. Cl.[4] C09D *3/48;* C08J *5/12, 7/06;* C08K *5/56*
U.S. Cl. 106—189 18 Claims

1. A primer composition comprising a solvent and a mixture consisting essentially of (a) at least one member selected from the group consisting of organometallic compounds, natural resins and synthetic resins and (b) at least one fluorine-containing compound selected from the group consisting of compounds of the following formulae (1) through (4):



R$_1$—CHO, and hydrates or alcohol adducts of R$_1$—CHO (2)





in which each R$_1$ represents a fluorinated alkyl group having from 1 to 12 carbon atoms or a fluorinated aryl group, R$_2$ and R$_3$ independently represent a fluorinated or non-fluorinated alkyl group having from 1 to 12 carbon atoms or a fluorinated or non-fluorinated aryl group, R$_4$ represents a fluorinated or non-fluorinated alkyl group having from 1 to 12 carbon atoms or an acetonyl group, R$_5$, R$_6$, R$_7$ and R$_8$ are the same or different from each other and independently represent a fluorinated alkyl group having from 1 to 4 carbon atoms, and R$_9$ represents a phenylene group, methylphenylene group, dimmthylphenylene group, hydroxyphenylene group or naphthylene group, said fluorine-containing compound possessing a polar group and in which all or part of the hydrogen atoms are substituted with fluorine atoms.

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4,822,427

OPEN-GRADE ASPHALT EMULSION MIXES

Peter E. Graf, Orinda; Steven J. Agazzi, Walnut Creek, and Eugene J. Vanderzanden, Piedmont, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1986, Ser. No. 926,035
Int. Cl.[4] C09D *3/387, 3/24*
U.S. Cl. 106—502 3 Claims

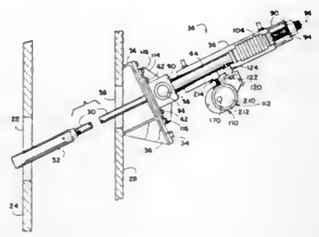
1. A paving composition consisting of about 80 to 97% by weight of an open-graded aggregate and 3 to 20% by weight of a cationic bituminous emulsion, said emulsion comprising, relative to the emulsion, about 60 to 70% by weight asphalt, 0.4–2% by weight of a cationic emulsifier, 0.2–0.4% by weight of a water-soluble thickening agent, the presence of a low-boiling hydrocarbon in amounts of less than 2% by weight of low-boiling hydrocarbon, and water as a continuous phase of said emulsion to make up 100% by weight.

4,822,428

APPARATUS FOR CLEANING AIR PORTS OF A CHEMICAL RECOVERY FURNACE

Byron L. Goodspeed, 1111 Holcomb Rd., Kelso, Wash. 98626

Filed Apr. 29, 1987, Ser. No. 43,947
Int. Cl.[4] B08B *9/00*
U.S. Cl. 134—6 30 Claims



1. Apparatus for cleaning an opening in a furnace, said apparatus comprising:
a rod provided with a cleaning tip adapted for insertion into the opening;
means for translating said rod in a first direction primarily longitudinal of said rod to insert said cleaning tip into the opening to dislodge residual buildup therefrom and including means for subsequently retracting said cleaning tip from the opening;
means for indexing said cleaning tip to control a point of insertion of said cleaning tip into said opening; and
means for alternate actuation of said translating means and said indexing means whereby said cleaning tip is indexed between successive insertions by a predetermined amount to provide controlled spacing between successive points of insertion of said cleaning tip into said opening.

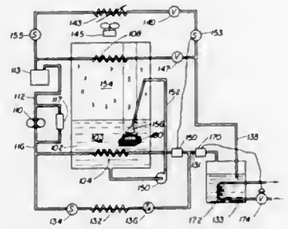
28. Apparatus for cleaning an opening in a furnace, said apparatus comprising:
a rod provided with a cleaning tip adapted for insertion into the opening;
means for translating said rod in a first direction primarily longitudinal of said rod to insert said cleaning tip into the opening to dislodge residual buildup therefrom and including means for subsequently retracting said cleaning tip from the opening; and
means for indexing said cleaning tip to control a point of insertion of said cleaning tip into said opening, said indexing means comprising a clutch operated by said retracting means and attached through an eccentric to said rod, whereby said rod is moved to index said cleaning tip.

4,822,429

LIQUID CIRCULATING MEANS FOR A VAPOR GENERATING AND RECOVERY APPARATUS

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

Filed Jul. 7, 1986, Ser. No. 882,822
Int. Cl.[4] B08B *7/04*
U.S. Cl. 134—12 7 Claims



1. In a vapor generating and recovering apparatus for vaporizing a liquid and condensing vapor, including a housing having at least one compartment therein, said compartment having a liquid and a vapor therein, the improvement comprising:
first heating means in a liquid zone in said compartment;
first cooling means in a vapor zone in the compartment; and,
liquid circulating agitation means to remove liquid from the liquid zone and return said liquid back into the liquid zone in said compartment beneath the top surface of the liquid whereby agitation of the liquid is sufficient to create treating action on objects which have been placed in the liquid.

4,822,430

METHOD AND APPARATUS FOR CLEANING BOILER BURNERS

Victor V. Carberry, N55 W21404 Logan Dr., Menomonee Falls, Wis. 53051

Filed Aug. 22, 1985, Ser. No. 768,128
Int. Cl.[4] B08B *5/04*
U.S. Cl. 134—21 32 Claims



1. Apparatus for use in cleaning soot and combustion residue from an elongated tube of a boiler, the elongated tube having opposite ends, the apparatus comprising:
a frame,
a housing supported by the frame, the housing including a first chamber portion, a second chamber portion below said first chamber portion and means for separating said first chamber portion from said second chamber portion, said means for separating including a generally horizontal wall having a plurality of apertures, said apertures providing for airflow from said second chamber portion to said first chamber portion,
means for generating a vacuum in said first chamber portion,
means for filtering air flowing through said apertures from said second chamber portion to said first chamber portion,

said means for filtering including at least one filter bag housed in said first chamber portion,
means for connecting a vacuum hose to said second chamber portion;
a trough positioned at the bottom of said second chamber portion and adapted to receive particulate material cleaned from the elongated tube, and
means for selectively discharging the particulate material from said trough, said means for discharging including an auger housed in said trough and means for selectively driving said auger.

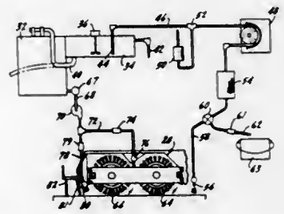
21. Apparatus for use in cleaning particulate material, the apparatus comprising:
a frame,
a housing supported by the frame, the housing including an upper chamber portion, a lower chamber portion beneath the upper chamber portion and means for separating said upper chamber portion from said lower chamber portion, said means for separating including a wall having a plurality of apertures, said apertures providing for airflow from said lower chamber portion to said upper chamber portion,
means for generating a vacuum in said upper chamber portion,
means for filtering air flowing through said apertures from said lower chamber portion to said upper chamber portion, said means for filtering including at least one filter bag suspended in said upper chamber portion, said filter bag including an open lower end adjacent one of said apertures whereby air flowing from said lower chamber portion to said upper chamber portion through said one of said apertures will flow through said filter bag,
a vacuum hose having opposite ends, one of said opposite ends being connected to said lower chamber portion whereby air is drawn through said vacuum hose, and an opposite end adapted to be positioned to receive the particulate material,
a trough positioned at the bottom of said lower chamber portion and adapted to contain the particulate material, said trough including a discharge opening in one end, and
means for selectively discharging the particulate material from said trough through said discharge opening, said means for discharging including an auger housed in said trough, and means for selectively driving said auger.

4,822,431

MACHINE AND METHOD FOR PREPARING A CONCRETE SURFACE FOR COATING

Charles W. Bricher, St. Paul, and Mark E. Snetting, Eden Prairie, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Division of Ser. No. 688,578, Jan. 3, 1985, Pat. No. 4,586,213.
This application Feb. 10, 1986, Ser. No. 827,956
Int. Cl.[4] B08B *30/00*
U.S. Cl. 134—28 11 Claims



1. A method of removing a membrane adhering to a concrete surface, such as a floor, and at the same time etching the surface to prepare the surface for the application of a coating, including the steps of applying a mixture to the surface which includes a solvent effective to soften and loosen the membrane and an inactive acid, thereafter mechanically agitating the mixture and, at the same time, abrading the membrane with the mixture thereon to rapidly loosen and disintegrate the membrane so as to expose the concrete, thereafter applying sufficient water to the thus abraded and disintegrated membrane and the mixture so as to activate the acid, immediately thereafter further agitating and abrading the surface so that the activated acid will quickly etch the exposed concrete, thereafter applying sufficient additional water to flood the surface, and immediately thereafter removing the mixture and water so that the etched exposed concrete is ready for a new surface coating after a relatively short drying period.

10. In a disc brush adapted to be rotated about a generally upright axis, a disc-like backing annulus with an opening in the center thereof, bristles projecting from the lower surface of the annulus with an opening in the center conforming generally to the center opening in the annulus, a flexible sleeve in the center opening of the annulus, the sleeve being in sealing relationship to the backing annulus and extending slightly beyond the ends of the bristles in a free state so that the sleeve will be in contact with and will form a fluid duct to the surface being worked upon when in use.

4,822,432

METHOD TO PRODUCE TITANIUM METAL MATRIX COPOSITES WITH IMPROVED FRACTURE AND CREEP RESISTANCE

Daniel Eylon, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 1, 1988, Ser. No. 150,677
Int. Cl.[4] C22C *1/09*; C22F *1/02, 1/18*
U.S. Cl. 148—127 4 Claims

1. A method for improving the microstructure of a consolidated titanium alloy metal matrix composite consisting of a plurality of alternating layers of titanium alloy and reinforcing fibers which comprises the steps of:
(a) heating the composite to a temperature in the range of 800° to 2000° F., said temperature being below the temperature at which interfacial reactions occur between the metal matrix and the fiber, and diffusing hydrogen into the composite to achieve a hydrogen level of about 0.50 to 1.50 weight percent;
(b) altering the temperature of said composite to a transformation temperature approximately equal to the temperature of transformation of (HCP) alpha in the hydrogenated composite to (BCC) beta;
(c) cooling the composite to room temperature;
(d) heating the thus-cooled composite to a temperature below said transformation temperature, and diffusing hydrogen out from said composite; and
(e) cooling said composite to room temperature.

4,822,433

EMULSION EXPLOSIVE COMPOSITION

John Cooper, Ayrshire, Scotland, and Alan S. Baker, Berkshire, England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 818,401, Jan. 13, 1986, abandoned, which is a continuation of Ser. No. 711,485, Mar. 13, 1985, abandoned. This application Jun. 5, 1987, Ser. No. 59,225
Claims priority, application United Kingdom, Mar. 21, 1984, 8407302; Jun. 14, 1984, 8415205
Int. Cl.[4] C06G *45/00*
U.S. Cl. 149—2 17 Claims

1. An emulsion explosive composition comprising a discontinuous phase containing an oxygen-supplying component and an organic medium forming a continuous phase characterised in that the oxygen-supplying component and organic medium are capable of forming an emulsion which, in the absence of a supplementary adjuvant, exhibits an electrical conductivity,

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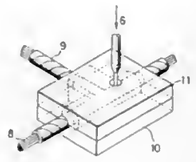
measured at a temperature of 60° C., not exceeding 60,000 picomhos/meter.

4,822,434

METHOD FOR FORMING COVER LAYER OVER WIRE JOINT

Atsushi Sawaki; Mamoru Ono; Toshio Okazaki, and Koji Naruse, all of Aichi, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,391
Int. Cl.⁴ H01B *13/06, 13/08*
U.S. Cl. 156—48 **6 Claims**



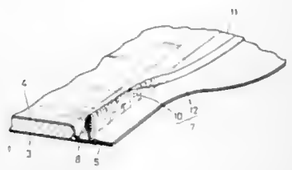
5. A method for forming a cover layer over a joint of electrical wires, comprising the steps of:
assembling a plurality of electrical wires to form a joint;
wrapping said joint with an insulating electrical tape;
placing said joint in a transparent mold;
filling said mold with a photosetting resin; and
applying radiation through said mold to harden said resin.

4,822,435

METHOD FOR MAKING WEARABLE ARTICLES

Takamitsu Igaue, and Hiroyuki Tanji, both of Kawanoe, Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Oct. 26, 1987, Ser. No. 112,361
Claims priority, application Japan, Oct. 27, 1986, 61-254892; Jan. 28, 1987, 62-19338
Int. Cl.⁴ B32B *31/08*
U.S. Cl. 156—164 **3 Claims**



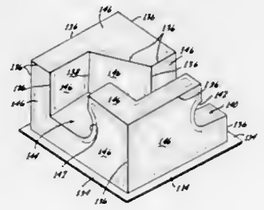
1. A method of making wearable absorbent articles which comprises the steps of
(a) forming a main body (6) comprising an elongated absorbent core (3) mounted between a topsheet (4) and a backsheet (3), said topsheet (4) and said backsheet (3) being joined together so as to extend laterally outwardly from the sides of said absorbent core (3) to form first side flaps (5) on each lateral side of said absorbent core (3),
(b) providing second side flaps by
(1) forming elongated strips (7) of water-impervious material that have an upper surface and a lower surface,
(2) folding over on itself a portion (10) of each elongated strip (7) adjacent a longitudinal edge thereof and incorporating in said folded over position (10) an elongated elastic member (8), leaving a not-folded portion (12) in each side flap (7),
(3) rotating said folded portion (10) through an angle of about 180° with respect to said unfolded portion (12), and
(4) joining longitudinally opposite ends of said folded over portions (10) to the top surface of the adjacent non-folded portion (12), and
(c) joining the bottom surface of the non-folded portion of said second side flaps (7) to the upper surface of said first side flaps (5) so that a portion of the folded portions (10) extend vertically upwards from the topsheet portion (4) of said side flaps (5) and the remainder of said folded portions extend in a direction away from said absorbent core (3).

4,822,436

APPARATUS FOR DEBULKING AND AUTOCLAVING LAMINATES OF COMPLEX SHAPES

Richard A. Callis, Thousand Oaks, and Darryl G. James, Camarillo, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Continuation-in-part of Ser. No. 837,616, Mar. 7, 1986, abandoned. This application May 19, 1987, Ser. No. 52,670
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—211 **17 Claims**



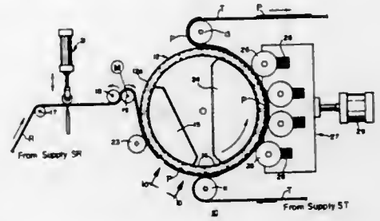
1. In a method for manufacturing a molded bag for use in vacuum debulking and autoclaving operations on composite parts formed on a tool including a shaped mold on which the part is formed, said mold having first portions of relatively low curvature and second portions of high curvature, said second portions having much smaller surface extent than said first portions, the steps of:
providing a plurality of cured, preshrunk, and stabilized panels of silicone rubber,
covering said tool over said first portions and extending over all of said tool except said second portions to form a partial bag structure which form the major segments of a bag while leaving gaps or removing portions to form gaps at tight inside radiuses and recesses in the tool configuration,
providing strips of uncured sheet silicone rubber, laying said strips over said second portions to bridge the panels across the second portions and the gaps and to interconnect said panels into a unitary, complete bag structure for completely covering the mold to complete a total enclosed bag structure,
vacuum bagging an autoclaving the completed bag at elevated temperature and pressure,
stabilizing the total bag structure so formed against shrinkage by postcuring the total bag structure in an oven at elevated temperature greater than the autoclave temperature to thereby form a molded blanket of silicone rubber formed about said mold to form said molded bag, said molded bag being of dimensions to fully cover said mold and to fully conform to said mold shape and dimensions throughout said first and second portions without stretching and further being fully preshrunk throughout.

4,822,437

METHOD AND APPARATUS FOR MAKING NON-ROPING THERMOPLASTIC DRAW TAPE FOR THERMOPLASTIC BAGS

David A. Bryniarski, Rochester, and Edward G. Groaz, Sodus Point, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 19, 1988, Ser. No. 157,751
Int. Cl.⁴ B30B *15/34*; B32B *31/18, 31/20*
U.S. Cl. 156—252 **6 Claims**



1. In a system for the manufacture of thermoplastic draw tape bags, apparatus for the continuous application of reinforcing patches of predetermined length to thermoplastic draw tape of predetermined length to produce non-roping draw tape for the bags comprising:
(a) a cylindrical drum supported for rotation at a predetermined speed adjacent a heat sealing station in the system, said cylindrical drum having a plurality of chambers extending around the circumference thereof, the cylindrical peripheral surface of said drum being heated and having perforations therein;
(b) a vacuum manifold communicating with a fractional number of said chambers to supply a vacuum to the perforations in said peripheral surface at a vacuum station spaced from the heat sealing station in the system,
(c) means for supplying thermoplastic draw tape from a supply roll to the cylindrical surface of said drum at the heat sealing station for rotation therewith at the predetermined speed;
(d) means for supplying reinforcing patch material from a supply roll;
(e) nip roll means for unwinding the reinforcing patch material from the supply roll at a predetermined speed slower than the draw tape speed on the surface of said drum by the direct ratio of the reinforcing patch length to the draw tape length;
(f) means positioned between the supply roll of reinforcing patch material and said nip roll means for perforating the reinforcing patch material, once per bag, at predetermined locations corresponding to the predetermined length of the reinforcing patches;
(g) separator nip roll means at the vacuum station for forcing the perforated reinforcing patch material against the peripheral surface of said drum for rotation therewith at draw tape speed to separate a patch from the roll of reinforcing patch material at the perforations;
(h) means for directing the draw tape over the patches on the peripheral surface of said drum between the vacuum station and the heat sealing station;
(i) compression applying means at the heat sealing station for applying pressure against the draw tape to force the draw tape against the reinforcing patches and the reinforcing patches against the heated drum to cause the reinforcing patches to soften and adhere to the draw tape as each reinforcing patch passes the heat sealing station; and
(j) means for lowering the temperature of the reinforcing patch below the softening point and directing the draw tape with heat sealed reinforcing patches away from the heat sealing station for subsequent assembly of the reinforced draw tape with a thermoplastic bag.

6. In a process for manufacturing thermoplastic draw tape bags, the method for the continuous application of reinforcing patches of predetermined length to thermoplastic draw tape of predetermined length per bag to produce non-roping draw tape for the bags comprising the steps of:
unwinding draw tape from a supply roll at a predetermined speed and passing the draw tape over a heated drum adjacent a heat sealing station;
unwinding reinforcing patch material from a supply roll at a predetermined speed slower than the draw tape speed on the surface of the drum by the direct ratio of the reinforcing patch length to the draw tape length;
perforating the reinforcing patch material, once per bag, at predetermined locations corresponding to the predetermined length of the reinforcing patches, the distance between perforations determining the patch length;
directing the perforated reinforcing patch material against the peripheral surface of the drum prior to the point where the draw tape comes in contact with the drum;
applying a vacuum through the surface of the drum to the perforated reinforcing patch material to hold the reinforcing patch material in contact with the surface of the drum at a vacuum station spaced from the heat sealing station, the peripheral surface of the drum traveling at a faster speed than the speed of the reinforcing patch material which slips on the peripheral surface of the drum and continues to move at the unwind speed;
forcing the perforated reinforcing patch material against the surface of the drum at the vacuum station for rotation therewith at draw tape speed to cause the reinforcing patch material to stretch and break at the perforations whereby the separated patch continues to rotate with the drum, the upstream portion of the reinforcing patch material, due to the vacuum, remaining in contact with the surface of the drum and continuing to slip and feed for the next bag;
directing the draw tape over the patches on the peripheral surface of the drum between the vacuum station and the heat sealing station, the draw tape and the patches thereafter rotating together at the same speed;
applying pressure at the heat sealing station against the draw tape to force the draw tape against the reinforcing patches and the reinforcing patches against the heated drum to cause the reinforcing patches to soften and adhere to the draw tape as each reinforcing patch passes the heat sealing station; and
thereafter lowering the temperature of the reinforcing patch below the softening point and directing the draw tape with the heat sealed reinforcing patches away from the heat sealing station for subsequent assembly of the reinforced draw tape with a thermoplastic bag.

4,822,438

METHOD FOR HEAT INSULATING A ROTATIONAL CASTING MOLD

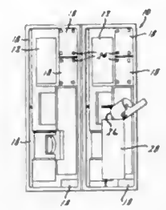
Nelson E. Williams, Jr., Hamilton, Ill., and Forrest F. Baum, Keokuk, Iowa, assignors to Sheller-Globe Corporation, Toledo, Ohio

Filed Oct. 8, 1987, Ser. No. 106,181
Int. Cl.⁴ B28B *1/14*; B29C *33/40, 33/42*; B32B *31/12*
U.S. Cl. 156—265 **7 Claims**

1. A method for shielding a mold having first and second mold surfaces respectively defining critical and non-critical portions of said mold, said mold being for use in a rotational casting process whereby a fascia part having a substantially even thickness is produced, said method comprising the steps of:
(a) cutting a plurality of sections from heat insulating material, said sections corresponding to discreet portions of said second mold surfaces defining said non-critical portions of said mold for assembly onto said non-critical portions;

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(b) coating said second surfaces with a layer of heat resistant bonding material;
(c) then assembling said plurality of sections onto their corresponding locations on said second surfaces of said mold; and
(d) allowing the heat resistant bonding material to cure



thereby bonding said sections onto said second mold surfaces of said mold whereby the sections insulate the non-critical portions of the mold to provide a temperature barrier on the non-critical portions such that these non-critical portions remain below the melting point temperature of a preselected plastic material to prevent melting of plastic on said non-critical portions.

4,822,439

PROCESS FOR FORMING THICK BALLISTIC RESISTANT MATERIALS

James V. Gauchel; Edward L. Wilson, both of Newark; Edward J. Kerle, Granville, and Terry R. Beaver, Nashport, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 24, 1987, Ser. No. 88,637
Int. Cl.[4] B29C *45/00*
U.S. Cl. 156—285 **14 Claims**

10. A process for forming a prepreg material which is adapted to be vacuum bag molded into thick ballistic resistant composites, the process comprising: combining (i) calcium hydroxide, and (ii) 2,5-dimethyl-2,5-bis-(2-ethylhexanoyl-peroxy) hexane initiator (ii), and, optionally tertiary butyl perbenzoate and (iv) water or glycerin or mixtures of water and glycerin (v), and optionally alphamethyl styrene, with (vi) a solution of an isophthalic-maleic-propylene glycol polyester in a solvent of styrene or a solvent mixture of styrene and diallyl phthalate to thereby form a viscosity controlled impregnating composition, said polyester having an acid number of less than about 12.5; while on a plastic film, impregnating a magnesia aluminosilicate fiber glass woven roving with said viscosity controlled impregnating composition to thereby form a prepreg; collecting said prepreg on a roll; the amount of calcium hydroxide and water or glycerin or mixture of water and glycerin which is combined with said polyester solution being between about 0.5% to about 4% by weight calcium hydroxide and about 0.02% to about 1% of water or glycerin or mixtures of water and glycerin, said amounts being sufficient such that the impregnating composition will have (i) a viscosity in excess of about 500 and up to about 4,000 cps during said impregnating, and (ii) a viscosity of in excess of about 15,000 cps within no more than about 10 minutes after impregnating, and (iii) a viscosity of in excess of between about 50,000 and up to about 500,000 cps after the elapse of about no more than about one day after said roll is collected, and (iv) a viscosity of about 3,000 to about 10,000 cps when heated for molding to between about 140° F. to about 150° F.; the total amount of total initiators present in the impregnating solution being at least about 0.05% by weight up to about 1.0% by weight; the amount of impregnating composition employed being sufficient upon final curing of the polyester to produce a composite containing about 60 to about 75% by weight of glass, said impregnated roving having a cross linking initiation temperature of about 165° F. and said impregnated roving when vacuum bag molded being capable of flowing and conforming to the mold in the temperature range of about 140°–150° F.

4,822,440

CROSSBAND AND CROSSBANDING

Ten-hu Hsu; Watson F. Brown, and Jerry J. Saimre, all of Wilmington, Del., assignors to NVF Company, Yorklyn, Del.

Filed Nov. 4, 1987, Ser. No. 116,578
Int. Cl.[4] C09J *5/02*
U.S. Cl. 156—307.5 **10 Claims**



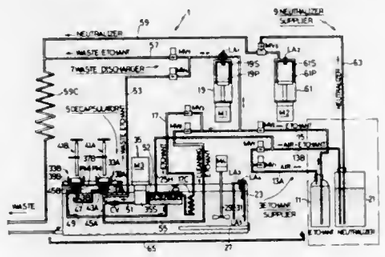
1. In the process of hot pressing layers of natural or reconstituted wood together with a crossband sheet that reduces telegraphing, sand-through, checking and splitting of the face, the improvement according to which before the hot pressing the crossband sheet is a vulcanized fiber sheet both surfaces of which adherently carry dried adhesive.

4,822,441

PLASTIC MOLD DECAPSULING APPARATUS

Hiroyuki Ohta; Naoki Yoshida, and Hideo Goto, all of Tokyo, Japan, assignors to Nippon Scientific Co., Ltd. and Kusumoto Chemicals Co., Ltd., both of, Japan

Filed May 25, 1988, Ser. No. 198,230
Claims priority, application Japan, May 26, 1987, 62-78238[U]; May 26, 1987, 62-127172; May 26, 1987, 62-127173; May 28, 1987, 62-129869
Int. Cl.[4] B44C *1/22;* **B29C** *37/00;* **C03C** *15/00, 25/06*
U.S. Cl. 156—345 **9 Claims**



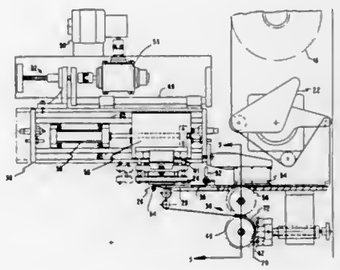
1. A plastic mold decapsuling apparatus comprising:
(a) an etchant bottle for containing an etchant to decapsule a capsuled plastic mold;
(b) a heat tank for containing a heating medium kept at a constant temperature;
(c) an etchant reservoir, disposed within said heat tank, for containing a predetermined amount of the heated etchant;
(d) at least one decapsuling plastic mold holder for holding a plastic mold to be decapsuled;
(e) first etchant feeding means for selectively feeding a predetermined amount of the etchant from said etchant bottle to said etchant reservoir and waste etchant from said decapsuling plastic mold holder to outside; and
(f) second etchant feeding means, disposed within said heat tank, for circulating the etchant in said etchant reservoir through said decapsuling plastic mold holder.

4,822,442

FLEXIBLE ARTICLE APPLICATION APPARATUS

Glinden R. Ashcraft, Lawrenceburg, Ky.; Richard E. Gorman, Lantana, Fla.; Edward J. Kozol, Ft. Lauderdale, Fla., and Robert J. Paul, Lighthouse Point, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1987, Ser. No. 32,138
Int. Cl.[4] B65C *9/14, 9/18, 9/42*
U.S. Cl. 156—361 **5 Claims**



1. Apparatus for handling flexible gummed rings and placing them in predetermined positions for use comprising:
a backing web carrying the gummed rings stuck thereto in spaced sequence extending along a predetermined path in said apparatus;
said backing web having round openings concentric with and having the same diameter as the inner diameter of said gummed rings;
a vacuum holding head for holding a gummed ring thereon by suction;
a hand operated plug over which a gummed ring on said backing is located to reference said rings carried by said backing web in said apparatus;
a sharp edge stripping plate for aiding in the stripping of said gummed rings from said backing web;
means for lowering said vacuum holding head into contact with said gummed ring located thereunder;
a first transport means for moving said vacuum head horizontally;
a gear rack connected to and movable with said first transport means;
an index drive connected to and driven by said gear rack for linearly moving the backing web synchronously with said vacuum head carried by said first transport means so that said backing web goes around said sharp edge stripping plate and said gummed ring held by said vacuum holding head is stripped from said backing web;
a second transport means carried by said first transport means for moving said vacuum head horizontally to the predetermined position for placing said gummed rings carried thereby and;
vertical motion means for moving said vacuum head downward to place said gummed ring into position.

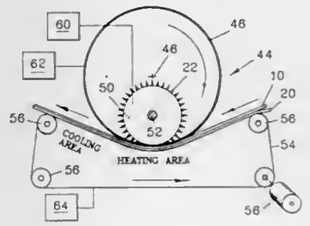
4,822,443

APPARATUS FOR ATTACHING TOUCH FASTENERS WITH SELF-HEATING ATTACHMENT ADHESIVE

John M. Dubowik, Nashua, N.H., assignor to Velcro Industries B.V., Amsterdam, Netherlands

Filed Dec. 8, 1986, Ser. No. 939,364
Int. Cl.[4] B32B *21/04*
U.S. Cl. 156—379.7 **19 Claims**

1. Apparatus for attaching touch fastener material to a surface, said apparatus comprising:
(a) touch fastener material having
(1) a backing material with front and rear surfaces and having one portion of a touch fastening system on the front surface thereof,
(2) a layer of thermoplastic/thermosetting adhesive bonded to the rear surface, and
(3) an electrically conductive/resistive material incorporated into the layer of adhesive capable of producing sufficient heat in the adhesive when a low voltage and high current electrical source is applied therethrough to cause the adhesive to adhere to the surface of an article with which it is in contact;
(b) support means for supporting the article with the surface thereof exposed and the touch fastener material disposed thereon;



(c) compression means for releasably bearing against the front surface of the touch fastener material to hold it and its adhesive against the surface of the article;
(d) a pluraltiy of contact means for releasably making direct electrical contact with the electrically conductive/resistive material in the adhesive when said compression means is bearing against the front surface of the touch fastener material; and
(e) electrical means for applying low voltage electrical current to flow through the electrically conductive/resistive material in the adhesive between respective ones of said contacts to heat the adhesive to its point of melting and adhesion.

4,822,444

FILAMENT WINDING MECHANISM FOR FORMING AND WINDING A SHINGLED GAP FREE BAND

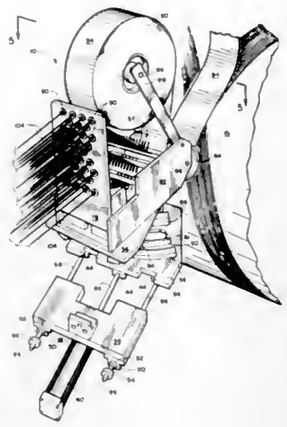
Oscar Weingart, Riverside; Gerald A. Lunde, Norco, and Clark D. Taylor, Riverside, all of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 855,638, Apr. 25, 1986, abandoned.
This application Oct. 27, 1987, Ser. No. 113,403
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—441 **18 Claims**

1. A payoff unit for a filament winding machine for gap free application of filament strands arranged into a band and impregnated with a bonding medium onto a rotating mandrel of varying horizontal contour comprising:
means for flattening and positioning a plurality of non-flattened impregnated filament strands prior to their gathering into said band such that a gap free band of partially overlapped contacting shingled flattened strands will be formed after subsequent gatherings;
means for gathering the flattened impregnated filament strands into said gap free band of partially overlapped contacting shingled flattened strands;
a payoff head for applying the plurality of flattened impregnated strands arranged in a prearranged partially overlapped contacting shingled relationship to form a gap-free band directly onto said mandrel;
a cross-arm of a filament winding machine; and
a biasing translatable member fixedly connected to said cross-feed arm and pivotally connected to said payoff head to allow positioning of said payoff head along the varying horizontal contour of said rotating mandrel rela-

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tive to the position of said cross-feed arm for applying a uniform pressure between said mandrel regardless of



mandrel horizontal contour for maintaining said plurality of impregnated strands in their mandrel applied flattened partially overlapped contacting shingled state.

4,822,445

APPARATUS FOR PROCESSING DOUBLE FACE ADHESIVE TAPE

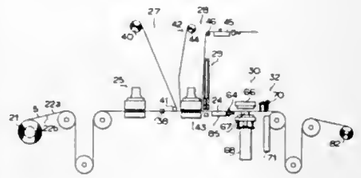
Akira Yamaguchi, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 9, 1987, Ser. No. 118,721

Claims priority, application Japan, Nov. 21, 1986, 61-276671; Nov. 21, 1986, 61-276672; Mar. 11, 1987, 62-54195

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—510 **6 Claims**



1. In an apparatus for processing a double face adhesive tape whereby at least one face of a member is attached thereto, comprising a roll of the double face adhesive tape having release papers attached to both faces, a drawing out means of the double face adhesive tape from said roll, a separating means to separate the release paper from one of said faces of said tape, an attaching means to attach at least one member on the exposed adhesive face of the double face adhesive tape where the release paper has been removed, the improvement which comprises incorporating a cutting means to cut the remaining release paper and the double face adhesive tape in a size being smaller than the attached face of said member and a detaching means to detach the member and the cut release paper and the cut double face adhesive tape from the double face adhesive tape.

4,822,446

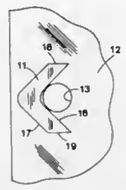
APPARATUS FOR REINFORCING BINDING HOLES

Robert S. Hansen, P.O. Box 2238, Rohnert Park, Calif. 94928

Filed Oct. 23, 1986, Ser. No. 922,406

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—513 **8 Claims**



1. Apparatus for reinforcing binding holes in paper, comprising a sheet of reinforcing material, a punch having a pair of substantially identical V-shaped cutting edges which are spaced apart and parallel to each other for cutting the reinforcing material along V-shaped lines to form a chevron shaped reinforcement having concave and convex edges of substantially identical length and contour on opposite sides thereof, and means forming a part of the punch for applying the chevron shaped reinforcement to the paper with the concave edge adjacent to a binding hole.

4,822,447

HIGH-FREQUENCY WELDING INSTALLATION

Hans Obermeier, Breslauer Str. 43, D-8228 Freilassing, Fed. Rep. of Germany

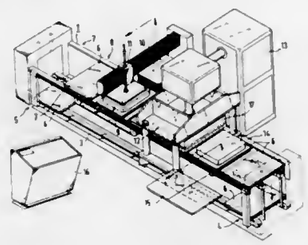
PCT No. PCT/DE86/00432, § 371 Date Aug. 3, 1987, § 102(e) Date Aug. 3, 1987, PCT Pub. No. WO87/02607, PCT Pub. Date May 7, 1987

PCT Filed Oct. 27, 1986, Ser. No. 72,270

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538149

Int. Cl.⁴ B30B *15/30;* **B65G** *37/00*

U.S. Cl. 156—538 **4 Claims**



1. High-frequency welding installation for welding plastic parts including:

at least one work station and one feed station and an initial station arranged in linear succession,

trays on which work pieces are conducted through the stations by means of a transport system in a single direction and are returned into the initial station in the opposite direction outside of the stations in an essentially vertically offset plane, wherein the trays have working sides and and are arranged during the transport in both directions always with the working side facing upwardly

the improvement which comprises that

at least two work stations are arranged in linear succession, four essentially straight-line transport units are provided, the first unit is a feed unit, the third unit is a return unit, and

the second and fourth unit are each a vertical elevator, wherein the return unit is arranged essentially parallel to the feed unit and at least the return unit is capable of operating at a higher transport speed than the feed unit.

4,822,448

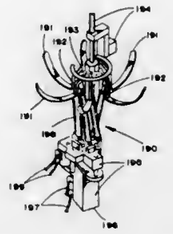
FABRIC BAND MAKING AND LABEL APPLYING MACHINE

Kenneth J. Thompson, Rte. 3, Box 268, Lexington, N.C. 27292; Wayne G. Foster, 101 Forest Dr., Advance, N.C. 27006; Joel C. Rosenquist, 9430 Morton Dr., Kernersville, N.C. 27284, and David S. Ketner, 3212 Dillon Rd., Jamestown, N.C. 27282

Filed Apr. 29, 1987, Ser. No. 44,063

Int. Cl.⁴ B65G *57/16*

U.S. Cl. 156—538 **21 Claims**



1. An apparatus for use with a device having a work station for forming endless bands from strips of material by joining the ends thereof to form a closed loop or band; said apparatus comprising support means adjacent the loop forming work station; transfer means on said support for removing the formed loop or band from the work station and transferring the loop or band to a label application station for applying a label thereto; said transfer means including a reciprocation band gripping mechanism for extending into the loop forming work station, grasping the formed loop, and retracting the same to remove it from the forming station; said gripping mechanism including loop engaging jaws having means to open and close same in sequential timed relation; said transfer means including reciprocating means, said band gripping mechanism further having means to move the formed loop to a labeling station remote from the loop forming work station and placing the same on a label application device.

4,822,449

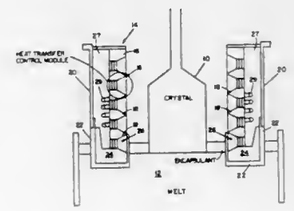
HEAT TRANSFER CONTROL DURING CRYSTAL GROWTH

Shahryar Motakef, Newton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 10, 1987, Ser. No. 61,117

Int. Cl.⁴ C30B *15/34*

U.S. Cl. 156—601 **5 Claims**



1. Method for growing a crystal from a melt comprising controlling the heat flux from the crystal surface so that the thermal stress levels are maintained below the critical resolved shear stress value of the crystal matrix by monitoring radial heat flux from the crystal and, responsive to the monitored heat flux, by controlling the as-monitored radial heat flux in the growing crystal, and by simultaneously monitoring and controlling the temperature to which the top of the growing crystal radiates.

4,822,450

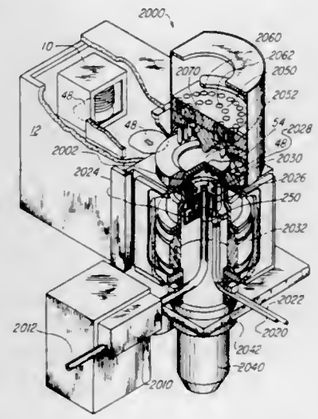
PROCESSING APPARATUS AND METHOD

Cecil J. Davis, Greenville; Lee M. Loewenstein, Plano; Rhett B. Jucha, Celeste; Robert T. Matthews, Plano; Randall C. Hildenbrand, Richardson; Dean W. Freeman, Garland, and John I. Jones, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 74,398, Jul. 16, 1987, abandoned. This application May 18, 1988, Ser. No. 198,632

Int. Cl.⁴ B44C *1/22;* **H01L** *21/306;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **30 Claims**



18. A method of processing wafers comprising;

(a) transferring a wafer into a process chamber;

(b) applying a pressure to said chamber less than ambient to maintain said chamber at less than ambient;

(c) providing a first gas to a plasma generating module separated from said chamber and producing a remote plasma;

(d) to said remote plasma;

(e) illuminating the wafer with ultraviolet energy from an ultraviolet energy source within said vacuum chamber separate from the wafer;

(f) illuminating the backside of the wafer with a source of radiant energy;

(g) supplying an additional process gas; and

(h) flowing the remote plasma and the additional process gas over said wafer disposed within said chamber.

4,822,451

PROCESS FOR THE SURFACE MODIFICATION OF SEMICRYSTALLINE POLYMERS

Andrew J. Ouderkirk; Douglas S. Dunn, and Robert W. Warner, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 27, 1988, Ser. No. 187,019

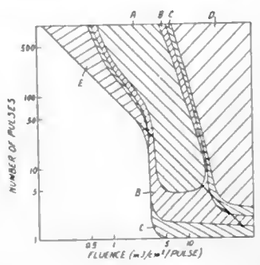
Int. Cl.⁴ B44C *1/22;* **B29C** *37/00;* **B05D** *3/06;* **G21K** *5/00*

U.S. Cl. 156—643 **40 Claims**

1. A process for modifying the surface of a semicrystalline polymer which process comprises irradiating at least one surface of a semicrystalline polymer composition with radiation

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which is absorbed by said composition, controlling the intensity and fluence of said radiation exposure so that semicrystalline polymer on said surface is melted and there is ablation or volatilization of less than 1% by weight of the total weight of



the polymer within regions of said polymer which are melted, and allowing said melted polymer to cool at a rate which will form a quasi-amorphous polymeric area on said at least one surface.

4,822,452

MANUFACTURE OF WET LAID NONWOVEN WEBS

Stephen H. Tse, Midlothian, Va.; David H. Hollenberg, Neenah, Wis.; Richard L. Martin, Menasha, Wis., and James H. Manning, Appleton, Wis., assignors to James River Corporation of Virginia, Richmond, Va.

Continuation-in-part of Ser. No. 35,059, Apr. 6, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 219,909
Int. Cl.⁴ D21H *5/12*
U.S. Cl. 162—146 **13 Claims**

1. A method for the preparation of a fibrous web comprising textile length fibers which comprises forming a fiber furnish by dispersion of said fibers in an unfoamed carrier medium consisting essentially of water and an associative thickener selected from the group consisting of ethylene oxide based urethane block copolymers and hydroxyethyl cellulose ethers have a C_{10} to C_{24} alkyl side chain in an amount within the range of from about 1 to about 150 pounds thickener per ton of dry fiber, and supplying unfoamed fiber furnish at a consistency in the range of 0.01 to 0.5 weight percent fibers to the wire of a papermaking machine forming a fibrous web.

4,822,453

ABSORBENT STRUCTURE CONTAINING INDIVIDUALIZED, CROSSLINKED FIBERS

Walter L. Dean, Memphis; Danny R. Moore, Germantown; James W. Owens, and Howard L. Schoggen, both of Memphis, all of Tenn., assignors to The Procter & Gamble Cellulose Company, Memphis, Tenn.

Filed Jun. 27, 1986, Ser. No. 879,708
Int. Cl.⁴ D21H *5/12*
U.S. Cl. 162—157.6 **32 Claims**

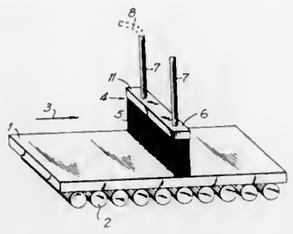
1. An absorbent structure comprising individualized, twisted and curled, crosslinked cellulosic fibers having between about 0.5 mole % and about 3.5 mole % crosslinking agent, calculated on a cellulosic anhydroglucose molar basis, reacted with said fibers in an intrafiber crosslink bond form, wherein said crosslinking agent is selected from the group consisting of C_2–C_8 dialdehydes, C_2–C_8 dialdehyde acid analogues having at least one aldehyde group, and oligomers of said aldehyde and dialdehyde acid analogues, said fibers having been maintained in substantially individual form during drying and crosslinking, said fibers having a WRV of from about 25 to about 60, and said fibers having the property of enabling said absorbent structure to have a wet equilibrium density less than its dry density, said wet equilibrium density being calculated on a dry fiber basis.

4,822,454

ENHANCED SOIL REMOVAL FROM PAPER MACHINE FORMING FABRICS

Randy E. Melrowitz, Medford, and Charles E. Kramer, Walpole, both of Mass., assignors to Albany International Corp., Dedham, Mass.

Filed Dec. 24, 1986, Ser. No. 946,448
Int. Cl.⁴ D21F *1/32*
U.S. Cl. 162—199 **20 Claims**



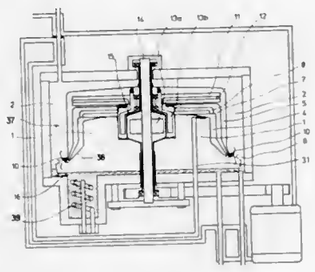
1. A combination of a forming fabric and a forming fabric contaminant removal apparatus, said apparatus comprising a set of bristles having upper and lower ends and arranged above the forming fabric, the lower ends of said bristles being in contact with an upper surface of the forming fabric and the upper ends of said bristles being engaged by a bristle holder, the bristle holder being supported by a support means and said bristles being comprised of a lower surface energy material oleophilic relative to said forming fabric at a water and oil interface, the material being selected from the group consisting of polyolefins, fluoropolymers, and copolymers thereof with polyethylene terephthalate.

4,822,455

DISTILLING AND DESALINATION APPARATUS

Henrik-Gerner Olrik, Humlebaek, Denmark, assignor to Chas. Hude, Copenhagen, Denmark

Filed Jan. 7, 1987, Ser. No. 1,160
Claims priority, application Denmark, Jan. 8, 1986, 78/86
Int. Cl.⁴ B01D *1/22*
U.S. Cl. 202—236 **7 Claims**



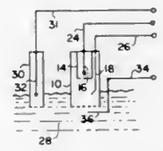
1. A distilling apparatus comprising:
(a) an evaporation chamber;
(b) a condensing chamber;
(c) means for feeding fluid to be evaporated to said evaporation chamber;
(d) heating means disposed within said evaporation chamber whereby evaporated fluid is heated;
(e) cooling circuit means rotatably mounted between said evaporation chamber and said condensing chamber, and in heat exchange communication with each of said chambers, said cooling circuit means comprising a first and a second surface means;
(f) a coolant condensing means disposed between said first and second surface means;
(g) a coolant evaporation means disposed between said first and second surface means adjacent said coolant condensing means;
(h) a conduit means for conveying evaporated coolant from said coolant evaporation means to said coolant condensing means;
(i) a heat conducting pot covering said evaporation chamber;
(j) thermal insulating means for keeping said heat conducting pot thermally insulated from the remainder of said cooling circuit, said thermal insulating means including channels for establishing a pressure difference between said coolant condensing and evaporation means;
(k) a fluid seal provided along the edge of said heat conducting pot for serving as a barrier between the coolant condensing means and the evaporation means; and
(l) means for depositing a thin film of fluid on said first surface means;
whereby when said cooling circuit means is rotated, unevaporated fluid is urged away from said first surface means by centrifugal force and condensed fluid is urged away from said second surface means by centrifugal force.

4,822,456

ION MEASURING APPARATUS AND MONITORING SYSTEM

Avron I. Bryan, 26 Country Club Rd., Cocoa Beach, Fla. 32931

Filed Jun. 5, 1987, Ser. No. 58,866
Int. Cl.⁴ G01N *27/30*
U.S. Cl. 204—1 T **20 Claims**



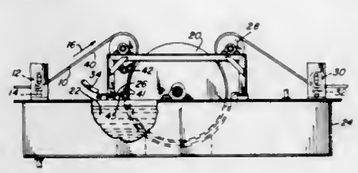
18. The method of monitoring the physical condition of a reference electrode and an ion electrode in a system having a reference electrode cell and an ion electrode for continuous measurement of an ion concentration of a solution where the method comprises:
a. disposing a solution ground electrode adjacent the reference electrode cell;
b. driving the solution ground electrode against a common ground with a first time varying signal from a first source thereby producing a first signal component of a common ground current;
c. driving the ion electrode against the common ground with a second time varying signal from a second source in which the second signal is uncorrelated and orthogonal to the first signal thereby producing a second signal component of the common ground current;
d. cross-correlating the common ground current with said first time varying signal to produce a first output proportional to the impedance of the reference electrode cell; and
e. cross-correlating the common ground current with said second time varying signal to produce a second output proportional to the impedance of the ion electrode.

4,822,457

METHOD OF ELIMINATING A FERN-LIKE PATTERN DURING ELECTROPLATING OF METAL STRIP

Herbert E. Biber, Murrysville Township, Westmoreland County; Chang D. Kim, Boro of Fox Chapel, and Larry E. Pfister, Ross Township, Allegheny County, all of Pa., assignors to USX Corporation, Pittsburgh, Pa.

Filed Jan. 25, 1988, Ser. No. 147,479
Int. Cl.⁴ C25D *7/06*
U.S. Cl. 204—28 **9 Claims**



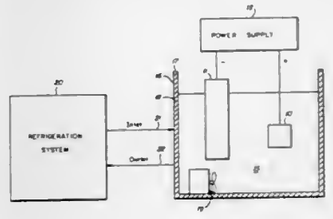
1. A method for electroplating steel strip with zinc or zinc-alloy coatings, said method comprising:
passing the strip in sequence through a series of electrolytic cells for electroplating a surface of the strip therein,
providing an electrolyte solution in each of said cells for conducting electrical current between at least one anode contained in said cell and the surface of the strip to be plated therein, said to be plated surface of the strip being contacted by at least one roll prior to entry into at least one of the cells in said series, and
contacting said surface to be plated in the next adjacent cell with sufficient electrolyte solution to substantially eliminate non-uniformity of the electrolyte film carried thereon from a prior treatment, said additional electrolyte for a solution being in contact with said surface for a time of at least 0.1 seconds immediately prior to and continuing in contact therewith until arrival of said surface at a point directly facing the adjacent entry edge of a first electrically energized anode within said cell.

4,822,458

ANODIC COATING WITH ENHANCED THERMAL CONDUCTIVITY

Thomas R. Ogden, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1988, Ser. No. 188,774
Int. Cl.⁴ C25D *11/10*
U.S. Cl. 204—58 **2 Claims**



1. A method of anodizing to provide corrosion and abrasion resistance for an aluminum part that has improved thermal conductivity of about 1.3 Watt/meter/° C. comprising:
coupling the aluminum part to a positive terminal and a lead mass to a negative terminal of a power supply;
immersing the aluminum part and lead mass into an aqueous solution of carboxylic acid;
cooling the aqueous solution to a temperature of between 0° to 5° C.;

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varying the potential of the power supply from 100 volts to 300 volts and

continuing the varying of the potential for a period of about 90 minutes to provide a corrosion and abrasion resistant coating of about 30 to 40 micrometers.

4,822,459

LEAD OXIDE-COATED ELECTRODE FOR USE IN ELECTROLYSIS AND PROCESS FOR PRODUCING THE SAME

Minoru Ueda; Akio Watanabe, both of Ibaraki, and Takayuki Shimamune, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology (MITI), Tokyo and Permelec Lectrode Ltd., Kanagawa, both of, Japan

Filed Aug. 31, 1987, Ser. No. 91,148

Claims priority, application Japan, Aug. 29, 1986, 61-201287; Aug. 29, 1986, 61-201288

Int. Cl.⁴ C25D *5/00*

U.S. Cl. 204—38.1 **14 Claims**

7. A process for producing a lead oxide-coated electrode for use in electrolysis, which comprises successively forming, on a substrate comprising a corrosion resistant metal, (1) a primary layer comprising platinum, palladium oxide, or mixtures thereof, (2) an intermediate layer comprising α-PbO_2, and (3) a coating layer comprising β-PbO_2 electrolytically formed from an acidic bath containing lead ions and having dispersed therein a corrosion resistant and electrochemically inactive granular material, fibrous material or mixtures thereof.

4,822,460

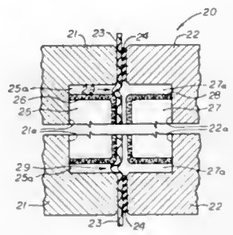
ELECTROLYTIC CELL AND METHOD OF OPERATION

Richard N. Beaver, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 667,949, Nov. 5, 1984, abandoned. This application Jul. 16, 1986, Ser. No. 886,770

Int. Cl.⁴ C25B *1/14, 13/00*

U.S. Cl. 204—98 **25 Claims**



15. A method of electrolyzing an alkali metal salt comprising

providing an electrolytic cell with an anode compartment containing a generally planar anode, a cathode compartment containing a generally planar cathode, a membrane having slack separating the anode compartment from the cathode compartment, and at least one means defining a space other than perforations on the surface of the anode or cathode for receiving said slack during operation of the cell, said space provided in at least one electrode compartment,

creating a higher pressure in at least one electrode compartment than in the other electrode compartment containing the membrane receiving space such that the membrane is pressed against the anode or cathode whereby membrane slack is pressed into the membrane receiving space to retain the membrane taut, and

passing a current through the anode and cathode to electrolyze the alkali metal salt.

4,822,461

ELECTROLYTIC CELL

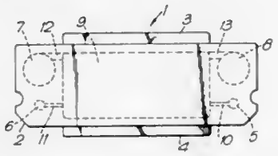
Keith Brattan, Gt Boughton; Stephen J. Horuby, Widnes, and Govinder S. Sehmi, Knutsford, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 16, 1987, Ser. No. 62,689

Claims priority, application United Kingdom, Jun. 17, 1986, 8614706

Int. Cl.⁴ C25B *1/14*

U.S. Cl. 204—98 **25 Claims**



1. An electrolytic cell which comprises at least one anode and at least one cathode, an inlet through which liquor may be charged to the electrolytic cell and an outlet through which liquor may be removed from the electrolytic cell, and means for recirculating liquor to the electrolytic cell, in which said recirculating means comprises a unit formed of a plurality of stacked shaped sheets which together form at least one channel inside of said unit, said channel connecting the inlet and outlet of the electrolytic cell.

4,822,463

PROCESS FOR THE ELECTROPHORETIC FORMATION OF SELFCLEANING ENAMEL FREE FROM ALUMINUM ON STEEL SHEET PARTS

Hans Hoffmann, Leichlingen, and Bruno Hees, Langenfeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 16, 1987, Ser. No. 74,385

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 3626424

Int. Cl.⁴ C25D *13/02*

U.S. Cl. 204—181.1 **3 Claims**

1. A process for the electrophoretic application of self-cleaning enamel systems free from aluminium on a sheet steel by a two layered/single stoving process, comprising applying a base layer in a thickness of 80 to 120 μm to a steel substrate, and then applying a top coat to said base coat, said top coat comprising an enamel suspension having a specific conductivity adjusted to a value below 2000 $\mu S.cm^{-1}$.

4,822,464

WATER-COMPATIBLE COATING RESIN

Alphonsus V. Pocius, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 12, 1986, Ser. No. 906,830

Int. Cl.⁴ C25D *13/06*

U.S. Cl. 204—181.7 **2 Claims**

1. A process for coating a metallic substrate with a cathodic electrophoretically depositable structural adhesive bonding primer, comprising the steps of:

(A) placing said substrate in fluid contact with an anode and a coating composition comprising

(i) water-compatible resin having a substantially linear structure of the formula:

$$A^- \ ^+C—E—(L—E)_y—C^+ \ A^-$$

wherein:

each E is independently a residue of a diepoxide;

each L is independently a residue of an aryl or cycloalkyl linking compound having an average of two epoxide-reactive groups and bulky structure that is sufficiently T_g-enhancing to raise by more than 20° C. the T_g of a first cured epoxy resin that has been (a) made from the reaction product obtained by combining DGEBA and said linking compound at a 2.1:1 ratio of moles of said DGEBA to moles of said linking compound, (b) cured using piperidine at a 9.08:1 ratio of moles of epoxy groups in said reaction product to moles of said piperidine, and (c) analyzed using dynamic mechanical analysis, when compared to the T_g of a second cured epoxy resin made and cured similarly but using bisphenol A in place of said linking compound;

each C is independently a cationic water-compatible ammonium, sulfonium or phosphonium group;

each A is independently the conjugate base of a water-soluble acid HA having a pK_a for use under cathodic electrodeposition conditions; and

y has an average value of about 1 to about 20;

(ii) crosslinking agent;

(iii) water; and

(v) resin solvent or coalescing solvent;

(B) passing electrical current between said substrata and said anode for a time period sufficiently long to attain a continuous coating of said primer on said substrate;

(C) removing excess primer from said substrate; and

(D) heating said primer at a curing temperature and for a curing time sufficient to crosslink said primer to a solvent-resistant state.

4,822,465

HYDROGEN SULPHIDE SENSOR

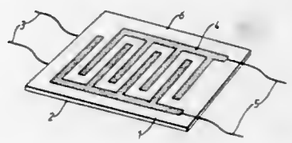
Eric Jones, Chelmsford, and Alan M. Doncaster, Maldon, all of United Kingdom, assignors to English Electric Valve Company Limited, Essex, United Kingdom

Filed Jun. 30, 1987, Ser. No. 69,542

Claims priority, application United Kingdom, Jul. 7, 1986, 8616506

Int. Cl.⁴ C23C *14/00*; G01N *31/00*

U.S. Cl. 204—192.1 **11 Claims**



1. A hydrogen sulphide sensor including a sensing element comprising an ordered lattice containing only molybdenum, tungsten and oxygen ions; and electrical means for passing electric current through the element.

4,822,466

CHEMICALLY BONDED DIAMOND FILMS AND METHOD FOR PRODUCING SAME

John W. Rabalais, and Srinandan R. Kasi, both of Houston, Tex., assignors to University of Houston - University Park, Houston, Tex.

Filed Jun. 25, 1987, Ser. No. 67,298

Int. Cl.⁴ C23D *14/00*

U.S. Cl. 204—192.15 **7 Claims**

1. A method for depositing a chemically bonded carbon based film having a diamond structure on a substrate, comprising the steps of:

positioning an electrically grounded substrate within a deposition chamber;

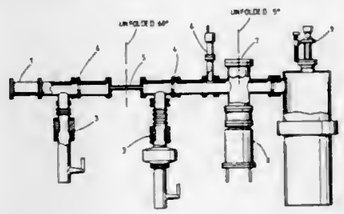
preparing the substrate to have an atomically clean surface and maintaining said surface in an atomically clean state during deposition by maintaining the pressure within the deposition chamber at or below 1×10^{-9} torr;

generating from a carbon containing material a source of gaseous ions in an ionization region maintained at 1-30-0eV above the grounded substrate;

directing ions from the ionization region into electromagnetic mass analyser;

selecting $^{12}C^+$ ions to exit from the mass analyser;

directing said $^{12}C^+$ ion beam through a bend by passing said beam through a parallel plate condenser to eliminate line-of-sight neutral particles from said ion beam;



directing said $^{12}C^+$ ion beam through a decelerator lens immediately in front of said substrate;

impinging said ion beam on the atomically clean substrate surface at a beam energy sufficient to form a carbon layer bound to said substrate surface by carbide bonding; and

impinging said ion beam on said carbide bound carbon layer at a beam energy of at least about 10 eV for a time sufficient to overlay said carbide bound carbon layer with a diamond layer of the thickness desired, said diamond layer being substantially free from included hydrogen or oxygen.

4,822,467

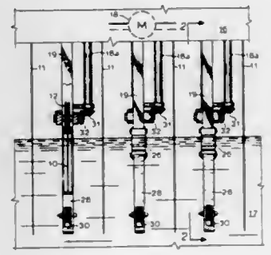
DISK PLATING SYSTEM

David Young, Mesa; Richard Lamoure, Pheonix; William Bratt, Tempe, all of Ariz.; Vincent Ruscello, Sidney, Ohio, and John E. Wilson, Colorado Spring, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 27, 1987, Ser. No. 113,872

Int. Cl.⁴ C25D *17/00*

U.S. Cl. 204—212 **36 Claims**



1. An apparatus for use in electroplating storage disks, comprising:

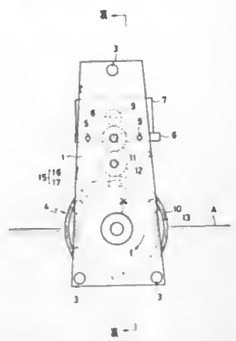
means for supporting a disk in a plating solution, whereby the disk is partially submerged in the plating solution;

means for electrically contacting the disk at a point out of the plating solution;

means for rotating the electrically contacted disk in the plating solution so that successive portions of the disk emerge from the solution, contact the contacting means and then re-enter the solution.

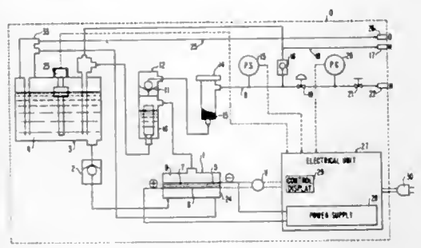
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4,822,468
BARREL PLATING APPARATUS
Takashi Kanehiro, 121-Banchi, Shiki-cho, Minami, 4-chome, Yao-shi, Osaka, Japan
Filed Jun. 13, 1988, Ser. No. 205,742
Claims priority, application Japan, Dec. 1, 1987, 62-304916
Int. Cl.[4] C25D *17/20*
U.S. Cl. 204—213 8 Claims



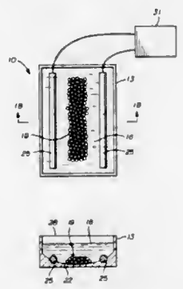
1. A barrel plating apparatus comprising
a pair of vertical plates spaced apart from each other;
a hollow barrel having two ends and an axis and supported at the two ends by said vertical plates;
means for rotating said barrel; and
agitating means for agitating articles under plating treatment within said barrel, said agitating means being fixedly disposed within said hollow barrel and comprising a central electrode disposed at said axis of said barrel, a plurality of conductive rods connected to said central electrode and extending radially therefrom, and a plurality of agitating ball-like bodies attached to the unconnected ends of respective said rods, wherein
said rods are of progressively varying lengths with the rods closest the two ends of said barrel being the longest and the rod closed to the middle of said barrel being the shortest.

4,822,469
ELECTRICAL POWER SUPPLY FOR AN ELECTROLYTIC GAS GENERATOR
Mitsuzo Shimomura, and Yoshiro Torii, both of Minami, Japan, assignors to Stec Inc., Kyoto, Japan
Filed Feb. 12, 1988, Ser. No. 155,534
Claims priority, application Japan, Mar. 8, 1987, 62-33736[U]
Int. Cl.[4] C25B *15/02, 9/04*
U.S. Cl. 204—230 1 Claim



1. In an electrolytic gas generator comprising: an electrolytic cell having a predetermined electrolyte passing therethrough and provided with an electrode for electrolyzing the electrolyte so as to generate the desired gas therein and having a gas passage communicatingly connected therewith for outputting said generated gas, the improvement consisting of an electrical power supply for supplying the electrode in said electrolytic cell with electrical power for use in an electrolysis, said electrical power supply comprising:
an input network provided with a first rectifying flattening means for generating a D.C. voltage from an A.C. power source voltage input thereto;
an output network provided with a switching means for generating a pulse voltage having a predetermined frequency from said D.C. voltage supplied from said input network and a second rectifying-flattening means for transforming said pulse voltage generated by said switching means into said D.C. voltage and for supplying said D.C. voltage generated by said second rectifying-flattening means to said electrode in said electrolytic cell as the voltage for use in electrolysis;
a voltage-adjusting means having a comparison means for generating an error signal corresponding to a difference between a feedback signal for any one of a signal corresponding to the output voltage from said output network and a signal corresponding to a detected pressure of said gas generated and a standard signal corresponding to a design pressure of said gas generated so as to maintain the output value of said output network or the pressure of said gas generated at a predetermined design value; and
a frequency-fixed pulse-width modulation means for generating a pulse signal having a predetermined frequency modulated to a pulse-width corresponding to the error signal supplied from said comparison means and a driving means for generating a drive pulse for controlling the switching of said switching means in said output network in accordance with said modulated pulse signal supplied from the frequency-fixed pulse-width modulation means.

4,822,470
METHOD OF AND APPARATUS FOR CELL PORATION AND CELL FUSION USING RADIOFREQUENCY ELECTRICAL PULSES
Donald C. Chang, Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.
Filed Oct. 9, 1987, Ser. No. 106,282
Int. Cl.[4] C12N *5/00;* B01D *57/02*
U.S. Cl. 204—299 R 24 Claims



22. A method for fusing biological particles, comprising the steps of:
placing a plurality of biological particles in solution between electrodes, wherein said biological particles are selected from the group consisting of biological cells, vesicles, erythrocyte ghosts and liposomes;
providing a low amplitude alternating electrical field across said electrodes for bringing said particles into close proximity by dielectrophoresis, wherein said electrical field has a frequency range of about 60 Hz to about 10 mega Hz and a field strength of about 100 to 400 V/cm.;
applying a pulsed multifrequency radiofrequency oscillating electrical field across said electrodes for porating said particles, wherein said radiofrequency oscillating electrical field includes a frequency range of about 50 KHz to 500 KHz; a pulse width range of about 1 μsec to 10 msec, and a pulse amplitude range of about 1 KV/cm to 15 KV/cm; and
providing an alternating electrical field across said electrodes for bringing said particles into close proximity for fusion, wherein said electrical field has a frequency range of about 60 Hz to about 10 mega Hz and a field strength of about 100 V/cm to 400 V/cm.

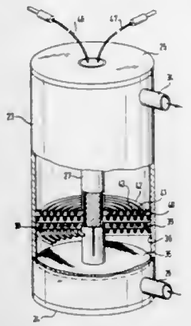
4,822,471
ACID EFFICIENT MEMBRANE FOR USE IN ELECTRODIALYSIS FOR RECOVERY OF ACID
Russell J. MacDonald, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.
Filed Apr. 5, 1988, Ser. No. 177,727
Int. Cl.[4] C25B *13/08;* C25C *7/04;* C08D *2/02*
U.S. Cl. 204—301 2 Claims

1. The process for preparing a aliphatic, weak base anion exchange polymeric membrane of low void volume, high ion exchange capacity and low electrical resistance having a woven or non-woven cloth reinforcing structure, the polymer of said membrane prepared by the process comprising copolymerizing in the absence of non-polymerizable solvents about 50 to 90 mol percent of at least one multiple-ethylenic cross-linking monomer compound selected from the group consisting of ethylene glycol dimethacrylate, polyethylene glycol dimethacrylate, tri methylol propane trimethacrylate, methylene bismethacrylamide, neopentyl glycole dimethacrylate, bis-phenol A dimethacrylate, pentaerythritol trimethacrylate and penta erythritol tetra methacrylate with about 50 to about 1 mol percent respectively of a methacrylate ester salt monomer compound of the formula:

Where R is an ion exchange moeity of a non-quarternized ammonium group selected from primary, secondary and tertiary amines, said resulting solvent free polymer having substantially no inherent voids due to the absence of non-polymerized solvents in the monomers during manufacture.

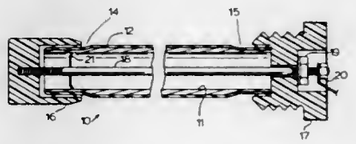
4,822,472
ELECTROLYTIC CELL FOR A DISINFECTION DEVICE
August K. Reis, Faistenbergerstr. 1, 8000 München 90; Norbert L. Kirmaier, Aschheim, and Meinolf H. A. Schöberl, Prien, all of Fed. Rep. of Germany, assignors to August K. Reis, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 122,561, Feb. 19, 1980, abandoned. This application May 20, 1982, Ser. No. 380,238
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—302 6 Claims

1. Apparatus for treating fluids comprising an electrolytic cell, inlet and outlet openings at the bottom and top of the cell, respectively, in communication with the interior of the cell through which the fluid flows, a centrally-located, vertically-positioned, non-conductive support within the cell, a plurality of arrays of annular electrodes supported about the support in vertically-spaced planes transversely of the cell in non-conductive relation to each other, each array occupying substantially the entire cross-sectional area of the cell such that said arrays collectively compel the fluid to flow in a tortuous path as it passes through from the bottom of the cell to the top thereof to thus effect complete exposure of the fluid to the electrolytic action, each array embodying a plurality of radially-spaced in



one plane concentric annular electrodes and conductors connecting the electrodes in the arrays vertically of the support.

4,822,473
ELECTRODE FOR GENERATING AN ELECTROSTATIC FIELD
Tore C. Arnesen, 158 Rexway Dr., Georgetown, Ontario, Canada L7G 1S1
Continuation of Ser. No. 905,466, Sep. 10, 1986, abandoned. This application May 2, 1988, Ser. No. 189,111
Int. Cl.[4] C25B *11/00*
U.S. Cl. 204—302 4 Claims



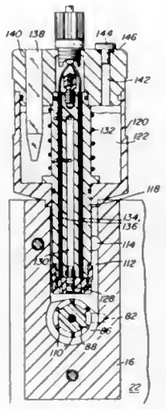
1. An electrode adapted for use in generating a high voltage electrostatic field for use within a vessel containing a liquid medium to be acted thereupon, said electrode having an electrically conductive tube, and a liquid impervious dielectric sealing layer extending in protective, insulative, sealing relation over a major portion of the outer surface of said tube, the improvement comprising:
an electrically insulative end cap enclosing each end of said conductive tube and extending in sealing relation over said sealing layer, said end caps having unitary tension rod means extending in mechanically securing relation therebetween, one said end cap having attachment means for securing said end cap in aligned sealing relation within a through passage in a wall of said vessel to position said tube, in use, in immersed relation in said liquid within said vessel, and electrical connection means in said end cap connected in conducting relation with the interior of said tube, for the application of a high direct current voltage potential thereto.

4,822,474
RESIDUAL ANALYZER ASSEMBLY
Daniel R. Corrado, Berkeley Heights, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed Apr. 30, 1987, Ser. No. 44,876
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—402 20 Claims

1. A probe for residual analyzation of working fluid, the probe comprising: three electrodes including a first electrode having a double spiral configuration, a second electrode form-

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ing an outer ring closely adjacent the first electrode, the first and second electrodes adapted for direct contact with the working fluid and a third electrode positioned within an elec-



trolytic solution within an internal chamber in a probe body and a membrane immediately adjacent the first electrode, the membrane in communication with the third electrode through the electrolytic solution.

4,822,475

METHOD FOR DETERMINING THE FOULING TENDENCY OF CRUDE PETROLEUM OILS

Cato R. McDaniel; W. John Delaney, both of The Woodlands, and Bruce E. Wright, Spring, all of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 8, 1988, Ser. No. 165,653

Int. Cl.[4] C10G *9/12, 9/16;* **G01N** *33/24*

U.S. Cl. 208—48 AA **24 Claims**

13. In the process of refining a crude petroleum oil feed, containing varying amounts of fouling-inducing contaminants, the improvements comprising:

(a) mixing a selected volume of crude petroleum oil sample with a selected volume of solvent medium;

(b) agitating the resulting mixture to solublize fouling-determining materials in the solvent medium;

(e) removing a sample of the resulting solvent medium;

(d) determining the absorbance of the resulting solvent medium at 230–270 nm and subtracting from the absorbance that of control solvent medium to obtain corrected absorbance for the resulting solvent medium;

(e) determining the fouling tendency of the crude petroleum oil sample by correlating the corrected absorbance of the resulting solvent medium with calibration data specific for the solvent medium used, the ratio of oil sample to solvent medium and the wavelength at which absorbance is determined;

(f) adding to the feed sufficient antifouling agent to compensate for the fouling tendency, determined in step (e); and

(g) refining the thus-treated feed.

4,822,476

PROCESS FOR HYDRODEWAXING HYDROCRACKED LUBE OIL BASE STOCKS

James N. Ziemer, Hercules, and Paul M. Spindler, Novato, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 27, 1986, Ser. No. 900,943

Int. Cl.[4] C10G *67/04, 69/10*

U.S. Cl. 208—59 **4 Claims**

1. A process for hydrodewaxing and hydrofinishing a hydrocracked, solvent dewaxed lube oil base stock which comprises:

passing said stock, in the presence of hydrogen, through a multilayer single stage catalyst system, said catalyst system comprising:

(a) a first catalyst layer comprising a fixed bed of catalyst particles having dewaxing activity said catalyst comprising a crystalline aluminosilicate having a constraint index ranging from about 0.4 to about 15;

(b) a second catalyst layer in contact with said first layer comprising a fixed bed of catalyst particles having hydrogenation activity under hydrofinishing conditions wherein said second catalyst comprises at least one Group VIIIA noble metal supported on an alumina or siliceous matrix, under dewaxing and hydrofinishing conditions, and obtaining a product having a Nephelometric Turbidity Units (NTU) Index of 24 or less wherein said NTU Index is a measure of wax remaining in the oil after solvent dewaxing.

4,822,477

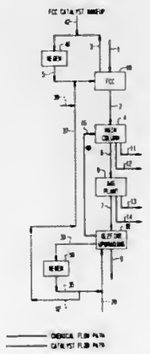
INTEGRATED PROCESS FOR GASOLINE PRODUCTION

Amos A. Avidan, Mantua, and Tai-Sheng Chou, Sewell, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 60,541, Jun. 11, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 220,358

Int. Cl.[4] C10G *63/04*

U.S. Cl. 208—70 **12 Claims**



5. A continuous multi-stage process for producing liquid hydrocarbons from crackable petroleum feedstock comprising:

contacting the feedstock in a primary fluidized catalyst reaction stage with a mixed catalyst system which comprises finely divided particles of a first large pore cracking catalyst component and finely divided particles of a second medium pore siliceous zeolite catalyst component under cracking conditions to obtain a product comprising intermediate gasoline and distillate range hydrocarbons, and a gas rich in olefins;

separating the olefinic gas and contacting said olefins with particulate catalyst solids consisting essentially of medium pore siliceous zeolite catalyst in a secondary fluidized bed reaction stage under reaction severity conditions effective

to upgrade said olefins to mostly C_5^+ hydrocarbons, thereby depositing carbonaceous material onto the particulate zeolite catalyst to obtain an equilibrium catalyst;

withdrawing a portion of partially deactivated equilibrium particulate zeolite catalyst from the secondary reaction stage and regenerating the equilibrium catalyst; and

adding a portion of the regenerated zeolite catalyst to the primary fluidized reaction stage for conversion of crackable petroleum feedstock, whereby catalyst makeup of a primary stage fluidized catalytic cracking unit and a secondary stage olefins conversion unit is balanced; wherein catalyst flow rates per day are adjusted so that about 1 to 3 percent by weight of fresh large pore cracking catalyst based on total amount of catalyst present in the primary fluidized bed reaction stage is added to the primary reaction stage; about 0.5 to 2.0 percent by weight fresh medium pore zeolite catalyst based on total amount of catalyst present in the secondary fluidized bed reaction stage is added to the secondary reaction stage; and about 0.5–2.0 percent by weight of regenerated zeolite catalyst based on total amount of catalyst present in the secondary reaction stage is withdrawn from the secondary reaction stage and added to the primary fluidized bed reaction stage to increase octane by 0.2–1 Research Octane Number.

4,822,478

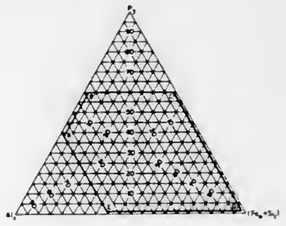
IRON-ALUMINUM-PHOSPHORUS-SILICON-OXIDE MOLECULAR SIEVES

Brent M. T. Lok, New City; Lawrence D. Vail, New Rochelle, and Edith M. Flanigen, White Plains, all of N.Y., assignors to UOP, DesPlains, Ill.

Division of Ser. No. 600,173, Apr. 13, 1984, Pat. No. 4,683,217. This application May 6, 1987, Ser. No. 46,453

Int. Cl.[4] C10G *11/04, 47/04*

U.S. Cl. 208—111 **4 Claims**



1. Process for cracking a hydrocarbon which comprises contacting said hydrocarbon under hydrocarbon cracking conditions with a crystalline molecular sieve having an intracrystalline pore system characterized by framework structures of FeO_2, AlO_2, PO_2 and SiO_2 tetrahedral units and having a unit empirical formula:

$$mR:(Fe_wAl_xP_ySi_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system: "m" represents the molar amount of "R" present per mole of $(Fe_wAl_xP_ySi_z)O_2$ and has a value of zero to about 0.3: and "w", "x", "y" and "z" represent the mole fractions of iron, aluminum, phosphorus and silicon respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of FIG. 1.

4,822,479

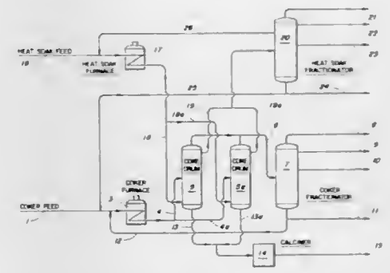
METHOD FOR IMPROVING THE PROPERTIES OF PREMIUM COKE

Ta-Wei Fu, and Bruce A. Newman, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 933,419, Nov. 21, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 125,967

Int. Cl.[4] C10G *9/14*

U.S. Cl. 208—131 **6 Claims**



1. In a delayed premium coking process in which an aromatic mineral oil feedstock is heated to elevated temperature and introduced continuously to a coking drum under delayed coking conditions wherein the heated feedstock soaks in its contained heat to convert the feedstock to cracked vapors and premium coke at lower than normal coking temperatures and in which the introduction of feedstock to the coking drum is discontinued after the coking drum is filled to the desired level, the improvement which comprises (1) determining the percentage of carbon atoms in the aromatic form as f_a, (2) determining the minimum soaking time for the aromatic oil feedstock having f_a as determined in (1) by the equation $TS_{SOAK} \geqq TS_M$, where $TS_M = \exp(0.050 \times f_a - 42.8)$ (3) subjecting the contents of the coking drum to a heat soak at substantially the same temperature as the temperature at which the coke was formed to obtain premium coke, and then (4) heat soaking the coke drum contents for at least the soaking time as determined by step (2).

4,822,480

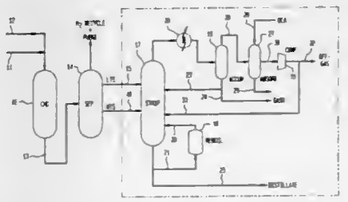
HYDROCARBON PRODUCT STRIPPING

Mohsen N. Harandi, Sewell; Hartley Owen, Belle Mead, both of N.J., and Michael T. Sinta, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1987, Ser. No. 137,113

Int. Cl.[4] C10G *7/00*

U.S. Cl. 208—212 **10 Claims**



1. A method for stripping light gasiform components from the liquid effluent of a catalytic hydrodesulfurization process, which comprises:

(i) separating the liquid effluent containing relatively low boiling hydrocarbon components, relatively high boiling hydrocarbon components, hydrogen and hydrogen sulfide

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in a stripping/fractionation zone to form an overhead fraction comprising low boiling components, hydrogen and hydrogen sulfide and a bottoms fraction comprising high boiling components,

(ii) heating a portion of the bottoms fraction and returning the heated fraction to the stripping fractionation zone,

(iii) separating relatively low boiling hydrocarbons from the overhead fraction to form a gaseous stream containing hydrogen sulfide,

(iv) removing hydrogen sulfide from the gaseous stream,

(v) passing a portion of the gaseous stream from which the hydrogen sulfide has been removed to the stripping zone,

(vi) stripping the effluent with the portion of the gaseous stream passed to the stripping zone to strip relatively low boiling hydrocrbon components and hydrogen sulfide from the effluent.

4,822,481

RECOVERY OF HEAVY OIL

Alistair S. Taylor, Camberley, England, assignor to The British Petroleum Company p.l.c., London, United Kingdom

Filed Aug. 13, 1987, Ser. No. 84,800

Claims priority, application United Kingdom, Aug. 27, 1986, 8620706

Int. Cl.⁴ C10G *1/04*

U.S. Cl. 208—390 **7 Claims**

1. A method for the recovery of heavy crude oil from tar sands, which method comprises treating said tar sands with an emulsion of a solvent in water, adding an alkali to the resulting mixture to give a pH in the range of 10 to 12 and recovering the heavy crude oil characterized by the fact that the emulsion contains 0.5 to 15% by volume of the solvent said solvent being a chlorinated and/or fluorinated derivative of methane or ethane.

4,822,482

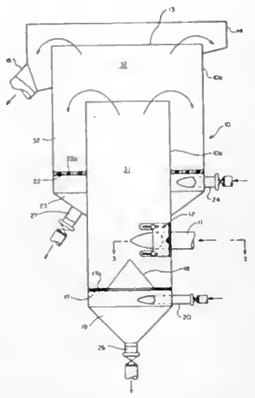
HYDRAULIC SEPARATING APPARATUS AND METHOD

Clinton A. Hollingsworth, Lakeland, Fla., assignor to C-H Development and Sales, Inc., Lakeland, Fla.

Continuation-in-part of Ser. No. 820,675, Jan. 21, 1986, abandoned. This application Apr. 11, 1987, Ser. No. 48,363

Int. Cl.⁴ B03B *5/62*

U.S. Cl. 209—158 **11 Claims**



1. Apparatus for processing aqueous slurries to produce separate fractions containing solids differing in settling velocities, comprising:

(a) an upright tank structure that is circular in horizontal section, the structure including aligned first and second tank parts, the second tank part having a diameter substantially greater than the first tank part, the upper end of the first tank part being freely open to the interior of the second tank part at a level intermediate the upper and lower portions of the second tank part, the interiors of the first and second tank parts forming first and second processing chambers respectively;

(b) means for introducing aqueous feed slurry tangentially into the first processing chamber whereby material in the first chamber is caused to swirl about the vertical axis of the first processing chamber;

(c) a first barrier plate interposed between upper and lower portions of the first tank part chamber and below said means for tangentially introducing feed slurry, said first barrier having holes thererthrough;

(d) a second annular barrier plate having holes therethrough and disposed between the sidewalls of the first and second tank parts at a level below the upper end of the first tank part and interposed between upper and lower portions of the second tank part at a level above said first barrier;

(e) means for introducing water into the spaces below each of the first and second barrier plates to cause water to flow upwardly through the holes of both barrier plates and to form jets of water extending above the holes, the upper end of the second tank part forming an overflow weir for discharge of slurry having solids of relatively low settling velocity;

(f) means for removing a middling slurry fraction from the lower portions of the second tank part; and

(g) means for removing an underflow slurry of solids of greater settling velocity from the lower portion of the first tank part;

(h) the upper open end of the first tank part forming means for unobstructed swirling flow from the first tank part into the second tank part, thereby inducing swirling in the second tank part.

4,822,483

COLLECTOR COMPOSITIONS FOR THE FROTH FLOTATION OF MINERAL VALUES

Richard R. Klimpel, and Robert D. Hansen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 856,728, Apr. 28, 1986, Pat. No. 4,684,459, which is a continuation-in-part of Ser. No. 803,026, Nov. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 787,199, Oct. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 649,890, Sep. 13, 1984, abandoned. This application Mar. 23, 1987, Ser. No. 28,855

Int. Cl.⁴ B03D *1/02*

U.S. Cl. 209—167 **25 Claims**

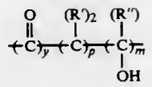
1. A composition comprising

(a) a compound corresponding to the formula:

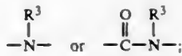
$$[R^1—X—R—_nQ]$$

$$R^1—X—R—_nN(R^2)_2$$

wherein $—R—_n$ is



each R′ and R″ is independently hydrogen, methyl or ethyl; $y+p+m=n$; n is an integer from 1 to 6; y and m are independently 0 or 1; and $y+m=0$ or 1; p is an integer from 1 to 6 and each moiety can occur in random sequence; R^1 is a $C_{1\text{-}22}$ hydrocarbyl or a $C_{1\text{-}22}$ substituted hydrocarbyl; each R^2 is independently hydrogen, a $C_{1\text{-}22}$ hydrocarbyl or $C_{1\text{-}22}$ substituted hydrocarbyl; and —X— is



R^3 is hydrogen, a $C_{1\text{-}22}$ hydrocarbyl or a $C_{1\text{-}22}$ substituted hydrocarbyl; and

(b) a thiol compound selected from the group consisting of a thiocarbonate, thionocarbamate, thiocarbanilide, thiophosphate, thiophosphinates, mercaptan, xanthogen formate, a xanthic ester and mixtures thereof.

4,822,484

TREATMENT OF MULTIPHASE MIXTURES

Gavan J. J. Prendergast, Mount Waverley, and David A. Webb, Northcote, both of Australia, assignors to Noel Carroll, Victoria, Australia

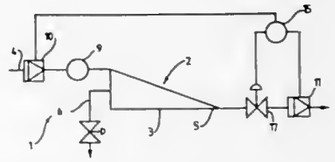
PCT No. PCT/AU86/00288, § 371 Date Jul. 31, 1987, § 102(e) Date Jul. 31, 1987, PCT Pub. No. WO87/01968, PCT Pub. Date Apr. 9, 1987

PCT Filed Oct. 2, 1986, Ser. No. 86,144

Claims priority, application Australia, Oct. 2, 1985, PH2705/85

Int. Cl.⁴ B01D *17/038, 21/26*

U.S. Cl. 210—96.1 **13 Claims**



1. A multi-phase mixture treatment system for the treatment of the mixture discharged from an oil well, the system including:

(a) means for minimizing the weight of the system including at least one cyclone separator comprising elements designed, sized and arranged for separating a more dense liquid component from a less dense liquid component thereof, said separator comprising a separating chamber having a feed inlet at one end, an overflow outlet at said one end and an underflow outlet at the other end;

(b) an infeed flow line for delivering the multi-phase mixture from the oil well to the feed inlet of tbe cyclone separator;

(c) at least two outflow lines from which the separated or partially separated phases are discharged from the overflow and underflow outlets of the cyclone separator; and

(d) means for controlling the separation of the mixture through the cyclone separator, said means including analyzing means for analyzing the mixture before and/or after entry to or discharge from the cyclone separator and a central control means responsive to information received from said analyzing means for controlling the flow rate from one or more of said flow lines.

4,822,485

RECIRCULATING SAND FILTER VALVE

Robert B. Mayer, 9029 Longstreet Dr., Manassas, Va. 22110

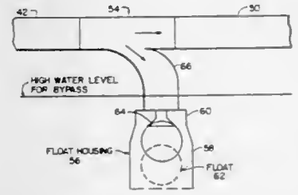
Division of Ser. No. 85,171, Aug. 14, 1987. This application Jul. 29, 1988, Ser. No. 226,201

Int. Cl.⁴ B01D *35/00*

U.S. Cl. 210—123 **2 Claims**

1. A recirculating valve for use in a recirculating sand filter system, said recirculating valve being adapted to being located in a recirculating pump tank connected between a return line entering said recirculating pump tank and a discharge line exiting said recirculating pump tank, said recirculating valve comprising:

a T-pipe consisting of a horizontal straight section and a downwardly directed branching arm having a large radius curvature allowing for smooth, nonturbulent flow of water into either said recirculating pump tank of water discharge line; and



a float valve connected to said branching arm for blocking the flow of water into said recirculating pump tank when a level of water in the tank exceeds a predetermined maximum level thereby diverting water into said discharge line.

4,822,486

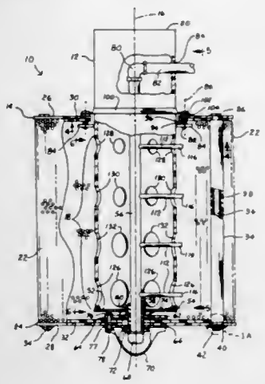
ROTARY SELF-CLEANING STRAINER

Thomas R. Wilkins; Charles A. Wilkins, and James O. Stoneburner, all of Ann Arbor, Mich., assignors to Perfection Sprinkler Co., Ann Arbor, Mich.

Filed Oct. 23, 1987, Ser. No. 117,064

Int. Cl.⁴ B01D *33/06*

U.S. Cl. 210—170 **20 Claims**



1. A self-cleaning strainer for connection to a pump and immersion in debris-containing liquid to prevent debris in the liquid from being sucked along with the liquid into the pump, said strainer comprising a main cylindrical pipe having an intake and a discharge at spaced locations along its length, said discharge serving to communicate the pipe to the pump and said intake serving to communicate the pipe to the liquid, a cylindrical screen for straining the debris from the liquid, means for supporting and journaling said screen on and for coaxial rotation about said main pipe in a manner that disposes said screen in outwardly spaced relation to said main pipe and in surrounding relation to said intake for causing liquid entering the intake to have been strained by said screen, a supply pipe extending coaxially through said main pipe to protrude beyond an end thereof, one or more apertures through the sidewall of said main pipe, one or more pipe structures tapped

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into said supply pipe, extending through said one or more apertures and terminating in nozzles directed toward said screen for both cleaning and rotating the screen by fluid that is fed through said supply pipe and said pipe structures and emitted at said nozzles, and said means for supporting and journaling said screen on and for coaxial rotation about said main pipe comprises a journal structure that acts on said main pipe between the intake and discharge thereof and a further journal structure that acts on said supply pipe where said supply pipe protudes beyond an end of said main pipe.

4,822,487

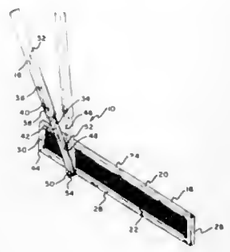
POOL SKIMMER

Joseph Soich, 2705 Riverton Rd., Cinnaminson, N.J. 08077

Filed Nov. 27, 1987, Ser. No. 126,062

Int. Cl.[4] E04H *3/20*

U.S. Cl. 210—238 **11 Claims**



1. A skimming device for a swimming pool comprising:

a substantially rectangularly shaped elongated frame means, said frame means having a major axis and a minor axis and including upper and lower substantially horizontal spaced apart elongated frame members and substantially vertically arranged side frame members extending between and connecting the ends of said upper and lower members, said frame means defining and substantially lying within a single plane;

screen means connected to each of said frame members and extending throughout the area surrounded by said frame members, said screen means being relatively taut and substantially lying within the same plane as said frame means;

elongated substantially rigid handle means extending from said frame means, said handle means being connected to said frame means and lying substantially in the same plane as said frame means, and

means for adjusting the angle of said handle means relative to the major axis of said frame means with said handle means always lying substantially within said plane.

4,822,488

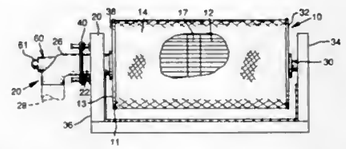
VACUUM DISCHARGE ASSEMBLY FOR ROTARY DRUM FILTERS

Lawrence A. Shatuck, Portland, Oreg., assignor to LaValley Industries, Inc., Vancouver, Wash.

Filed Oct. 19, 1988, Ser. No. 259,970

Int. Cl.[4] B01D *33/06*

U.S. Cl. 210—404 **20 Claims**



1. In a rotary drum filter system of the type having a discharge valve housing at the discharge end of the rotary drum, an axially self-adjusting discharge system which comprises:

a discharge system including a discharge valve member, a discharge elbow, and a discharge valve mounting means, respectively, said discharge valve member and said discharge valve housing together defining a gap therebetween; and

means joining said discharge system to said filter drum for maintaining said discharge system in a fixed axial position with respect to said filter drum and thereby fixing the clearance of said gap;

said discharge valve member including a valve closure segment at an inlet end thereof for insertion in said discharge valve housing, and further including valve connecting means at a discharge end thereof;

said discharge elbow defining a flow passage therethrough and including elbow inlet and outlet ends, said elbow inlet end including elbow connecting means; and

said discharge valve mounting means connected to said respective discharge valve member and said elbow connecting means, respectively, said valve mounting means being self-adjustable during use for axial movement in response to the axial movement of said discharge system due to the axial movement of said rotary drum filter, comprising means for maintaining said gap clearance during use at a substantially fixed, constant size.

4,822,489

AROMATIC POLYSULFONE TYPE RESIN HOLLOW FIBER MEMBRANE AND A PROCESS FOR PRODUCING THE SAME

Takashi Nohmi, Fuji, and Yasuo Hashino, Kashiwa, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

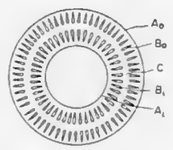
PCT No. PCT/JP82/00329, § 371 Date Apr. 20, 1983, § 102(e) Date Apr. 20, 1983, PCT Pub. No. WO83/00705, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 23, 1982, Ser. No. 491,340

Claims priority, application Japan, Aug. 22, 1981, 56-131904; Sep. 22, 1981, 56-150234; Jan. 29, 1982, 57-12863

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—500.23 **5 Claims**



1. An aromatic polysulfone type resin hollow fiber membrane having a thickness of 100 to 600 μm and a five-layer structure of an outer surface layer, an outer void layer, an intermediate layer, an inner void layer and an inner surface layer and wherein said inner and outer void layers are present in a thickness ratio of the inner void layer to the outer void layer of 1.5 to 0.6, and said intermediate layer has a thickness of 5 to 70 μm and an average pore diameter of 0.1 to 9 μm, said hollow fiber membrane having a cut-off molecular weight of 13,000 or less.

4,822,490

BACTERIAL COMPOSITON AND METHOD FOR RECOVERY OF OIL-POLLUTED WATER AND SOIL

Vladimir N. Dyadechko; Ivan I. Nesterov; Lidia E. Tolstokorova, and Svetlana V. Platonova, all of Tjumen, U.S.S.R., assignors to Zapakno-Sibirsky Nauchno-Issledovatelsky Geologorazvedochny neftyanoi Institut (Zapsibnigni), Tjumen, U.S.S.R.

PCT No. PCT/SU86/00053, § 371 Date Jan. 15, 1988, § 102(e) Date Jan. 15, 1988, PCT Pub. No. WO87/07316, PCT Pub. Date Dec. 3, 1987

PCT Filed May 29, 1986, Ser. No. 174,797

Int. Cl.[4] C02F *3/34;* **E02B** *15/04*

U.S. Cl. 210—611 **13 Claims**

1. A bacterial composition for cleaning water and soil from oil pollution comprising the bacteria *Pseudomonas putida*-36 as an active biocomponent, deposited under No. B-2443, and a mineral component comprising a mixture of mineral salts, having a percent by weight of the mixture of from 34.26–37.12% KNO_3; 28.66–31.28% NH_4Cl; 26.42–28.71% $NH_4H_2PO_4$ and 11.66–2.89% NH_4NO_3, wherein the ratio of the biocomponent to the mineral component being from 1.26 to 1:32.

7. A method of cleaning water and soil from oil pollution, which comprises contacting the water or soil with a composition comprising a bacteria *Pseudomonas putida*-36 deposited under No. B-2443 as an active biocomponent and a mineral component comprising a mixture of salts in a percent by weight of 34.26–37.12% KNO_3; 28.66–31.28% NH_4Cl; 26.42–28.71% $NH_4H_2PO_4$ and 11.66–2.89% NH_4NO_3, the weight ratio of the biocomponent to the mineral component being 1:26 to 1:32.

4,822,491

PROCESS FOR TRANSPORTING METAL IONS BY MEANS OF MICROPOROUS MEMBRANES

Karl Ostertag, Erlenbach, Fed. Rep. of Germany, assignor to Akzo NV, Netherlands

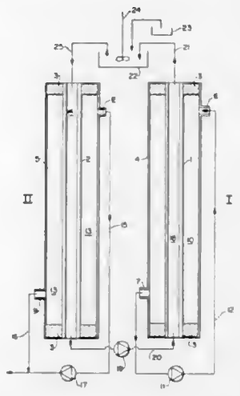
Filed Oct. 24, 1985, Ser. No. 790,967

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439079

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] B01D *11/03, 13/01*

U.S. Cl. 210—638 **38 Claims**



1. A process for the transport of metal ions from a first aqueous liquid to a nonaqueous liquid and from the nonaqueous liquid to a second aqueous liquid, wherein the nonaqueous liquid is substantially immiscible with said first and second aqueous liquids and comprises at least one metal complexing agent for forming complexed metal ions when said metal ions contact said metal complexing agent, and further acts as a solvent for the complexed metal ions, comprising:

keeping the nonaqueous liquid separate from said first aqueous liquid by at least one microporous hydrophobic first membrane comprising pores containing a portion of the nonaqueous liquid;

transferring metal ions from said first aqueous liquid to the nonaqueous liquid in a first transport zone;

mechanically mixing in a second transport zone the metal containing nonaqueous liquid from the first transport zone and said second aqueous liquid to form a mixture comprising an aqueous phase, thereby transferring the metal ions contained in the nonaqueous liquid to said second aqueous liquid;

continuously circulating the nonaqueous liquid through said first and second transport zones; and

separating aqueous phase in the second transport zone from the mixture by at least one second membrane separation.

4,822,492

LATEX POLYMER BONDED CRYSTALLINE MOLECULAR SIEVES

Chien C. Chao, Millwood; John D. Sherman, Chappaqua, both of N.Y., and Craig H. Barkhausen, Denville, N.J., assignors to UOP, Des Plains, Ill.

Filed Sep. 28, 1984, Ser. No. 655,583

Int. Cl.[4] B01D *15/00;* **C08J** *9/32*

U.S. Cl. 210—679 **40 Claims**

1. An aqueous composition for the preparation of an adsorbent composition for the separation of polar components from aqueous solutions, said aqueous composition comprising a weight ratio of latex polymer, based on the weight of the polymer in the latex, to crystalline molecular sieve between about 1:100 to about 1:1.

4,822,493

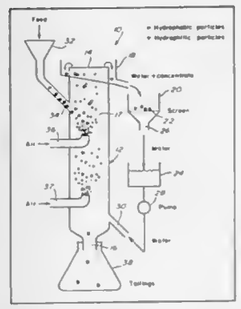
METHOD FOR SEPARATION OF COARSE PARTICULES

Gilles Barbery; Ahmed Bouajila, and Heriban Soto, all of Quebec, Canada, assignors to Universite Laval, Cite Universitaire, Quebec, Canada

Filed Nov. 27, 1987, Ser. No. 125,709

Int. Cl.[4] B03D *1/12*

U.S. Cl. 210—703 **6 Claims**



1. A method for the separation of particles in a liquid suspension, said method comprising the steps of:

injecting gas bubbles into said liquid suspension under conditions which avoid the formation of a froth phase to form particle-bubble aggregates including aggregates heavier than water;

introducing an upward flow of liquid through said suspension under conditions of low turbulence so that said liquid and said gas bubbles ascend countercurrent to settling

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particles without disrupting said bubble-particle aggregates; and

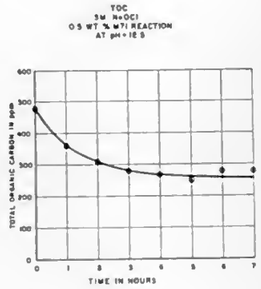
elutriating particle-bubble aggregates heavier than water by upwards flow of liquid and bubbles.

4,822,494

CHEMICAL REMOVAL OF THIOUREA FROM HYDROCHLORIC ACID

Stanley B. McConnell, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jul. 1, 1987, Ser. No. 69,375
Int. Cl.[4] C02F *1/76*
U.S. Cl. 210—721 **16 Claims**



1. A method of removing thiourea from a thiourea containing acid solution comprising the steps of:

(a) adding an effective amount of a Group Ia hydroxide, Group IIa hydroxide or a mixture thereof to adjust the pH to not less than about 12, thus precipitating any alkaline insoluble metal hydroxides present in said acid solution and producing an alkaline thiourea containing solution and separating said metal hydroxides from said alkaline thiourea containing solution;

(b) adding an effective amount of hydrogen peroxide to the separated alkaline thiourea containing solution produced in step (a), thus oxidizing the thiourea to urea according to the reaction,

$$H_2N-\overset{\overset{S}{\|}}{C}-NH_2 + 4H_2O_2 + 2OH^- \longrightarrow H_2N-\overset{\overset{O}{\|}}{C}-NH_2 + SO_4^{=} + 5H_2O;$$

;and

(c) adding an effective amount of a hypohalite salt MOX where M is a Group Ia or Group IIa element and X is a halogen, to the alkaline urea containing solution produced in step (b) to oxidize said urea according to the reaction,

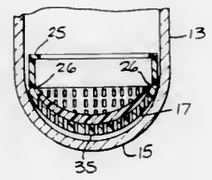
$$H_2N-\overset{\overset{O}{\|}}{C}-NH_2 + 3MOX + 2OH^- \longrightarrow N_2 + 3M^+ + CO_3^{=} + 3X^- + 3H_2O.$$

4,822,495

CELL BLOCK COLLECTION METHOD AND APPARATUS

Ruth Y. Michels, Clifton, Colo., assignor to St. Mary's Hospital and Medical Center, Grand Junction, Colo.

Filed Jul. 7, 1987, Ser. No. 70,410
Int. Cl.[4] B01D *45/12*; B65D *39/00*
U.S. Cl. 210—781 **10 Claims**



1. A method of collecting particles from fluids comprising, placing in the bottom of a fluid container a foraminous member, placing contiguous to the interior surface of the member a mucilaginous substance, placing in the container interiorly of the mucilaginous substance a fluid including the particles, applying a centrifugal force in a direction toward the mucilaginous substance, said mucilaginous substance remaining attached to said foraminous member and being situated in the bottom of the fluid container, and collecting particles from the fluid onto the surface of the substance.

4,822,496

PROCESS FOR THE TREATMENT OF EFFLUENT CONTAINING CYANIDE AND TOXIC METALS, USING HYDROGEN PEROXIDE AND TRIMERCAPTOTRIAZINE

Andrew Griffiths, Ridgewood, N.J.; Roy Norcross, Norwalk, Conn.; Gerhard Scherer, Montvale, N.J.; Friedrich W. Merz, Nierstein, and Stephen Gos, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 18, 1988, Ser. No. 233,576
Int. Cl.[4] C02F *1/62*
U.S. Cl. 210—721 **12 Claims**

1. A process for the treatment of aqueous effluent containing cyanide and toxic or heavy metals, comprising contacting said effluent with a sufficient amount of hydrogen peroxide to oxidize at least a substantial portion of the cyanide in the effluent in the presence of sufficient trimercaptotriazine to react with a substantial portion of the metal present in said effluent, and precipitating said metal component.

4,822,497

METHOD FOR SOLIDS SEPARATION IN A WET OXIDATION TYPE PROCESS

Glenn T. Hong, Tewksbury; William R. Killilea, West Chelmsford, both of Mass., and Terry B. Thomason, Houston, Tex., assignors to Modar, Inc., Houston, Tex.

Filed Sep. 22, 1987, Ser. No. 99,773
Int. Cl.[4] C02F *1/72*
U.S. Cl. 210—721 **10 Claims**

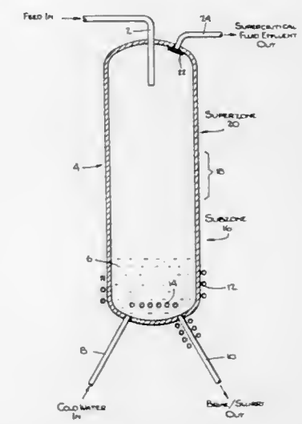
1. A method for the separation of precipitates and other solids from a fluid comprising the steps of:

(a) introducing a pressurized feed material including water, organics, inorganics, and oxygen into a super zone of a pressurized vessel comprised of said supercritical temperature super zone and a lower temperature sub zone thereby forming a supercritical temperature fluid phase;

(b) providing a liquid phase in the sub zone of the vessel;

(c) allowing the supercritical temperature fluid phase to oxidize under supercritical temperature conditions in the super zone and to form an oxidized super fluid phase and precipitates therein;

(d) transferring the precipitates and other solids from the oxidized supercritical temperature fluid phase in the super zone to the liquid phase provided in the sub zone, to produce a solution or slurry;



(e) removing the oxidized super fluid phase from the super zone of the vessel; and

(f) removing the solution or slurry from the sub zone of the vessel.

4,822,498

FIRE-EXTINGUISHING COMPOSITION

Sachio Otoshi, Yokohama, and Hideaki Hatayama, late of Tokyo, both of Japan (by Selichi Hatayama, legal representative), assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 5, 1987, Ser. No. 81,729
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1986, 61-183337
Int. Cl.[4] A62D *1/00*; A62C *1/12*
U.S. Cl. 252—2 **5 Claims**

1. An aqueous fire-extinguishing composition comprising a fluorine-containing surfactant of the formula:

$$R_fXCH_2\underset{\underset{OH}{|}}{CH}CH_2N(\underset{\underset{R^1}{|}}{R})-Y \quad (I)$$

wherein R_f is a polyfluoroalkyl group having from 3 to 20 carbon atoms, X is a bivalent connecting group containing an ether-type oxygen atom, R is an alkylene group, Y is

$$-\overset{\overset{R^3}{|}}{\overset{\oplus}{N}}(\overset{\overset{R^2}{|}}{Z^{\ominus}}) \text{ or } -\overset{\overset{R^3}{|}}{N}(\overset{\overset{R^2}{|}}{\rightarrow O})$$

wherein $Z^{\ominus}$ is an anionic group-containing alkyl group, R^1 is a hydrogen atom, an alkyl group or a hydroxyalkyl group, or forms together with R^2 an alkylene group, R^2 is a hydrogen atom, an alkyl group or a hydroxyalkyl group, or forms together with R^1 an alkylene group, and R^3 is a hydrogen atom, an alkyl group or a hydroxyalkyl group.

4,822,499

LIQUID FABRIC SOFTENER WITH STABLE NON-STAINING PINK COLOR

Errol H. Wahl, and Aivars I. Vimba, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 86,117, Aug. 17, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 213,660
Int. Cl.[4] D06M *13/34, 13/40*
U.S. Cl. 252—8.8 **10 Claims**

1. A fabric softening composition in the form of an aqueous dispersion comprising from about 3% to about 35% by weight of fabric softener and from about 1 ppm to about 1,000 ppm of a dye system which comprises a dye selected from the group consisting of FD&C Red #4; FD&C Red #40; D&C Red #33;C.I. Acid Red #1; C.I. Acid Red #18; C.I. Acid Red #395; C.I. Acid Violet #9; and mixtures thereof, the pH of a 10% solution of the composition being less than about 7.

4,822,500

SATURATED BRINE WELL TREATING FLUIDS AND ADDITIVES THEREFORE

James W. Dobson, Jr.; Alan T. Moudshine, and Thomas C. Moudshine, all of Houston, Tex., assignors to Texas United Chemical Corporation, Houston, Tex.

Filed Feb. 29, 1988, Ser. No. 161,765
Int. Cl.[4] C09K *7/02*; E21B *43/00*
U.S. Cl. 252—8.551 **11 Claims**

1. A well treating fluid comprising a saturated aqueous saline solution, a water soluble particulate salt which is insoluble in the saturated aqueous saline solution, a xanthomonas gum, and an epicholorhydrin crosslinked hydroxypropyl starch wherein the concentration of the xanthomonas gum is from about 0.5 kg/m^3 to about 5.7 kg/m^3 of the well treating fluid and the concentration of the epichlorohydrin crosslinked hyroxypropyl starch is from about 0.7 kg/m^3 to about 42 kg/m^3 of the well treating fluid.

4,822,501

USE OF LIGNIN/AMINE/SURFACTANT BLENDS IN ENHANCED OIL RECOVERY

Francis E. Debons, 2435 Wren Meadow, Richmond, Tex. 77469; Larry D. Pedersen, 6875 Farley Rd., Pinckney, Mich. 48169, and Lawrence E. Whittington, 25902 Hunter La., Katy, Tex. 77450

Continuation-in-part of Ser. No. 727,098, Apr. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 481,950, Apr. 4, 1983, abandoned. This application Jun. 5, 1987, Ser. No. 59,561
Int. Cl.[4] E21B *43/22*
U.S. Cl. 252—8.554 **15 Claims**

1. A method for the enhanced recovery of oil from a subterranean formation containing oil and having at least one production well and at least one injection well comprising:

injecting into said formation a surfactant system comprising

a surfactant blend comprising an oil soluble primary alkyl amine having from 8 to 22 carbon atoms, a lignin selected from the group consisting of lignosulfonates and sulfonated alkali and soda lignins and a water soluble anionic surfactant selected from the group consisting of petroleum sulfonates and alkylaryl surfonates, said blend having from about 1 to about 20% of said oil soluble amine, from about 5% to about 70% of said lignin, and from about 10 to about 99% of said water soluble anionic surfactant; and

water, wherein the equilibrated interfacial tension between said oil and said surfactant system is less than about 100 millidynes/cm;

driving said surfactant system through said formation; and

producing the oil mobilized by said surfactant system through said production well.

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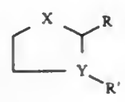
4,822,502

IMIDAZOLINE PROMOTER OVERBASED CALCIUM SULFONATES

Ronald J. Muir, West Hill, Canada, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 1, 1987, Ser. No. 32,564
Int. Cl.[4] C10M *133/38*
U.S. Cl. 252—33.4 **17 Claims**

1. A promoter for and with an overbased calcium sulfonate comprising; a cyclic compound present in an amount of up to 1.0% of the overbased calcium sulfonate, and having the formula:



(I)

where

Y=0, N or S;

R=H or, C_1 TO C_{50}; and

R'=H, CH_2CH_2OH, or $CH_2CH_2NH_2$ when Y is N, and zero when Y is O or S.

4,822,503

METHOD OF MANUFACTURING AN IMPROVED MULTI-GRADE LUBRICATING GREASE

James H. Norton, Corunna; William Nyweaing, Wyoming; Philip W. Brewster, Camlachie, and A. Gordon Alexander, Sarnia, all of Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 850,516, Apr. 11, 1986, abandoned. This application Apr. 13, 1987, Ser. No. 37,440
Int. Cl.[4] C10M *129/26, 129/92*
U.S. Cl. 252—33.6 **18 Claims**

1. A method for manufacturing a NLGI #0 grade grease having the high temperature stay-in-place properties of a NLGI #2 grade grease which comprises:

A. reacting a pyrrolidone compound with a fatty amine in a base oil; and,

B. adding a metal compound selected from the group consisting of hydroxides, carbonates, alkoxides and mixtures thereof to the reaction when the unreacted fatty amine content ranges between about 33 and about 66 wt. % of the fatty amine originally added.

4,822,504

LUBRICANT COMPOSITIONS CONTAINING OXIDIZED SULFURIZED ISOBUTYLENE

Costandi A. Audeh, and Andrew Jackson, both of Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 15, 1987, Ser. No. 108,597
Int. Cl.[4] C10M *143/06*
U.S. Cl. 252—46.3 **8 Claims**

1. A lubricant composition comprising an oil of lubricating viscosity or grease and between about 0.5 and about 7.5 percent by weight of an oxidized sulfurized butylene product prepared by reacting liquid sulfurized isobutylene with a mild oxidizing agent in a mole ratio of oxidizing agent to sulfurized olefin of between about 0.5 and about 2.5 at a temperature between about 20° C. and about 95° C. and recovering a liquid oxidized sulfurized isobutylene product soluble in said lubricating composition.

4,822,505

LOAD-CARRYING GREASE

A. Gordon Alexander, Sarnia, Ontario, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 31, 1987, Ser. No. 80,454
Int. Cl.[4] C10M *105/32*
U.S. Cl. 252—32.7 E **43 Claims**

1. A grease composition having improved load-carrying capability which comprises:

(a) a lubricating oil,

(b) a thickener,

(c) a polyhydric alcohol having at least three hydroxy groups, and

(d) at least two metal hydrocarbylthiophosphate compounds in which the metal is different in at least two compounds.

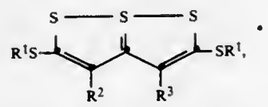
4,822,506

LUBRICANT ADDITIVES CONTAINING SULFUR

Henri Dubas, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 4, 1987, Ser. No. 116,931
Claims priority, application Switzerland, Nov. 12, 1986, 4521/86
Int. Cl.[4] C10M *135/34*
U.S. Cl. 252—45 **14 Claims**

1. A composition containing a lubricant or a hydraulic fluid and at least one compound of the formula I



(I)

in which both R^1, independently of one another, are a hydrogen atom, a metal cation, $NH_4^{\oplus}$, primary, secondary, tertiary or quaternary ammonium, linear or branched C_1–C_{24}-alkyl, unsubstituted or C_1–C_{18}-alkyl-substituted cycloalkyl or cycloalkylalkyl having 3 to 7 ring C atoms, C_7–C_{16}-aralkyl or C_8–C_{40}-alkaralkyl, where C_1–C_{24}-alkyl may be substituted by $-NR^4R^5$, $-N^{\oplus}R^4R^5R^6$, $-OR^7$, $-SR^7$, $-(C_mH_mO)_nR^8$, $-C(O)OR^9$ or C_1–C_{20}-acyloxy, in which R^4, R^5 and R^6, independently of one another, are a hydrogen atom or unsubstituted or —OH-substituted C_1–C_{20}-alkyl, or R^4 and R^5 together are tetramethylene, pentamethylene or 3-oxapentylene, R^7 is a hydrogen atom, linear or branched C_1–C_{18}-alkyl, unsubstituted or C_1–C_{12}-alkyl-substituted cyclohexyl, phenyl or benzyl, R^8 is a hydrogen atom, C_1–C_{18}-alkyl or C_1–C_{20}-acyl, and R^9 is a hydrogen atom, C_1 to C_{20} alkyl, a metal cation, $NH_4^{\oplus}$ or primary, secondary, tertiary or quaternary ammonium, m is an integer from 1 to 6, and n is a number from 1 to 20, R^2 and R^3, independently of one another, are a hydrogen atom or linear or branched C_1–C_{20}-alkyl, or R^2 and R^3 together are $-C_pH_{2p}-$ in which p is an integer from 2 to 9.

4,822,507

LUBRICATING OIL COMPOSITION SERVING AS SLIDING SURFACE OIL AND METAL WORKING OIL, AND METHOD OF LUBRICATING WORKING MACHINERY USING SAID OIL COMPOSITION

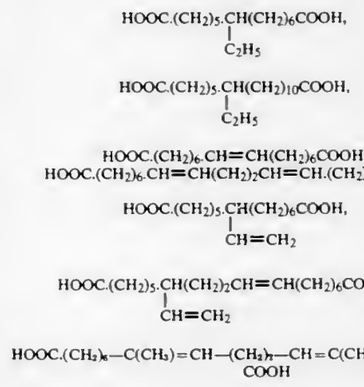
Hideo Kanamori, and Katsumi Hashimoto, both of Ichihara, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 35,203, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 805,274, Dec. 5, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 105,488
Claims priority, application Japan, Dec. 14, 1984, 59-262920
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] C10M *173/00*
U.S. Cl. 252—49.5 **11 Claims**

1. A method of lubricating a metal working machine which has (i) at least one sliding machine surface requiring lubrication and (ii) a metal working section wherein metal is worked in contact with a metal working fluid, and, wherein the operation of said machine causes the sliding machine surface lubrication to mix with the metal working liquid, said method comprising applying a lubricating oil composition to said at least one sliding surface and using as said metal working fluid an aqueous working fluid composition comprising said lubricating oil composition diluted with water, the ratio of water to said lubricating oil composition being at least 3 to 1, said lubricating oil composition comprising:

(A) 5 to 88% by weight of at least one oil selected from the group consisting of a mineral oil and synthetic oil,

(B) 2 to 50% by weight of a reaction product of a long chain dibasic acid of the formula



and a C_2–C_4 alkanolamine present in a molar ratio of 1:0.5 to 5,

(C) 5 to 30% by weight of at least one extreme pressure additive selected from the group consisting of sulfurized fat and oil, a phosphate, a phosphite, and an amine salt of phosphate or phosphite, and

(D) 5 to 30% by weight of an emulsifying agent selected from the group consisting of an anionic surface active agent, a cationic surface active agent, a nonionic surface active agent and a phosphorus-containing surface active agent.

4,822,508

SHEAR STABLE MULTIRANGE OILS HAVING AN IMPROVED VISCOSITY INDEX

Horst Pennewiss, Darmstadt; Heinz Jost, Modautal, and Helmut Knoell, Lautertal, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 937,199, Dec. 2, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 248,233
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544061
Int. Cl.[4] C10M *145/14*
U.S. Cl. 252—56 R **3 Claims**

1. A multirange lubricating oil having high shear stability comprising 40–80 percent, by weight, paraffinic based oils and the balance being an additive improving the viscosity index, said additive being a mixture of from 10 to 20 percent each, by weight of said oil, of at least two different polymer species, each of said species comprising monomers selected from the group consisting of

(a) esters of methacrylic acid and acrylic acid with linear alcohols having from 6 to 15 carbon atoms,

(b) esters of methacrylic acid and acrylic acid with linear alcohols having from 16 to 30 carbon atoms,

(c) esters of methacrylic acid and acrylic acid with branched alcohols having from 6 to 40 carbon atoms,

(d) esters of methacrylic acid and acrylic acid with alcohols having from 1 to 5 carbon atoms, and

(e) other monomers, different from (a)–(d), capable of free radical copolymerization and having the formula $H_2C=C(R_1)—B_z$, wherein R_1 is hydrogen or methyl and B_z is an inert heterocyclic five- or six-membered ring or is $—C(O)—Z—Q—NR_2R_3$, wherein Z is oxygen or $—NR_4$, Q is a linear or branched aliphatic hydrocarbon bridge having from 2 to 10 carbon atoms, R_2 and R_3 taken alone are each alkyl having from 1 to 6 carbon atoms or, taken together with the nitrogen atom and inclusive of other possible hetero atoms, form a heterocyclic five- or six-membered ring, and R_4 is hydrogen or alkyl having from 1 to 6 carbon atoms.

4,822,509

HIGHLY MAGNETIC IRON OXIDE POWDER

Jeries I. Bishara, Mentor; Anthony J. Vaccaro, Madison, and Eric J. Rudd, Painesville, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Nov. 6, 1986, Ser. No. 928,230
Int. Cl.[4] C01G *49/06*
U.S. Cl. 252—62.56 **5 Claims**

1. A highly magnetic isotropic iron oxide powder of cubic-shaped, multi-axial particles, said powder having an at least substantially uniform particle size distribution and particle size in the range from 0.005 to 0.2 micrometer characterized in that the iron oxide is a mixed iron oxide exhibiting gamma (Fe_2O_3) and ferrite (Fe_3O_4) structure, having the empirical formula $Fe_{72-x}O_{96}$, where x has a value between 2 to 7, an aspect ratio of not substantially above about 1.5:1 and a temperature coefficient of coercivity of less than −0.7% per degree Celcius.

4,822,510

STABLY SUSPENDED 4,4'-SULFONYLBISPEROXYBENZOIC ACID BLEACH IN AN AQUEOUS LIQUID

Stephen A. Madison; Leonora M. Ilardi; Patricia Liberati, all of Valley Cottage, and Joshua Schwarz, Brooklyn, all of N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 25, 1988, Ser. No. 173,328
Int. Cl.[4] C11D *3/395*
U.S. Cl. 252—95 **1 Claim**

1. An aqueous liquid bleaching composition having a pH from 4 to 4.5 consisting essentially of:

(i) 7% of sodium alkylbenzene sulfonate;

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(ii) 3% of C_{14}–C_{15} primary alcohol condensed with 7 moles ethylene oxide;
(iii) 7% of sodium sulfate;
(iv) 5.8% of 4,4'-sulfonylbisperoxybenzoic acid;
(v) 0.04% of hydroxyethylidenediphosphonic acid;
(vi) 0.2% of fluorescer; and
wherein said 4,4'-sulfonylbisperoxybenzoic acid has a particle size ranging from 30 to 250 microns.

4,822,511

PRESERVATIVE COMPOSITIONS COMPRISING A SYNERGISTIC MIXTURE OF ISOTHIAGOLONES

Andrew B. Law, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 6, 1988, Ser. No. 190,864
Int. Cl.⁴ C11D *3/48*
U.S. Cl. 252—106 **7 Claims**

1. A composition comprising a mixture of 75% 5-chloro-2-methyl-4-isothiazolin-3-one and 25% 2-methyl-4-isothiazolin-3-one (Component 1) and 2-n-octyl isothiazolin-3-one (Component 2) in a ratio of Component 1 to Component 2 of between about 1:10 and about 10:1.

4,822,512

BIOCIDAL, PARTICULARLY VIRUCIDAL, COMPOSITIONS

Thomas R. Auchincloss, The Grange, Stanningfield, Bury St. Edmunds, Suffolk, England

PCT No. PCT/GB87/00145, § 371 Date Oct. 16, 1987, § 102(e) Date Oct. 16, 1987, PCT Pub. No. WO87/05187, PCT Pub. Date Sep. 11, 1987
PCT Filed Mar. 2, 1987, Ser. No. 116,711
Claims priority, application United Kingdom, Mar. 1, 1986, 8605129
Int. Cl.⁴ C11D *3/48*
U.S. Cl. 252—106 **10 Claims**

1. A dry, water-soluble biocidal composition comprising:
(a) 0.01 to 5 parts by weight of water-soluble inorganic halide,
(b) 25 to 60 parts by weight of an oxidizing agent which, in aqueous solution, reacts with the halide to generate hypohalite ions,
(c) 3 to 8 parts by weight of sulfamic acid,
(d) 0 to 20 parts by weight of a non-reducing organic acid,
(e) 10 to 30 parts by weight of an anhydrous alkali metal phosphate,
the parts by weight of the composition totaling 100,
the pH of a 1% by weight aqueous solution of the composition being between 1.2 and 5.5, and
said composition being characterized by lack of evolution of halogen at a pH less than 3.0 and a biocidal activity substantially greater than that produced by like compositions having inorganic halide concentrations greater than about 20%.

4,822,513

CLEANING/DISINFECTING PROCESS AND COMPOSITION

Michael P. Corby, Ravenshead, England, assignor to Diversey Corporation, Ontario, Canada

Filed Nov. 12, 1985, Ser. No. 796,849
Claims priority, application United Kingdom, Nov. 12, 1984, 8428564
Int. Cl.⁴ C11D *3/43*
U.S. Cl. 252—106 **13 Claims**

1. A cleaning and disinfecting composition comprising (a) an effective amount of at least one interhalogen selected from the group consisting of iodine chloride, iodide trichloride, iodine bromide, bromine chloride or mixtures thereof and (b) an amount of at least one acid which is not appreciably oxidized by the interhalogen selected from the group consisting of nitric acid, phosphoric acid, hydrochloric acid, sulphamic acid, sulphuric acid or mixtures thereof, effective to achieve cleaning and disinfecting, the interhalogen being present in an amount ranging from about 2 percent to about 25 percent, by weight, and the acid being present in an amount ranging from about 75 percent to about 95 percent, by weight.

4,822,514

COMPOSITIONS AND METHODS FOR CLEANING SURFACES WHILE SELECTIVELY IMPARTING GLOSS OR SHINE THERETO

Brian D. Becker, Northfield, Ohio, assignor to Murphy-Phoenix Company, Cleveland, Ohio

Filed Jan. 14, 1987, Ser. No. 3,191
Int. Cl.⁴ C11D *9/00*
U.S. Cl. 252—108 **22 Claims**

1. A dilutable concentrate cleaning composition consisting essentially of:
a. from about 5 to about 25 wt % of at least one alkaline metal sale of a fatty acid;
b. from about 5 to about 25 wt % of at least one alkanolamine salt of a fatty acid;
c. from about 5 to about 25 wt % of a component selected from the group consisting of a fatty acid alkanolamide, having an acid amine ratio of from about 1:1 to about 2:1; an ethoxylated linear alcohol; having from about 7 to about 12 moles ethylene oxide and an average linear chain portion length of from about 10 to about 18 carbon atoms, and mixtures thereof;
d. from about 25 to about 60 wt % of a substituted ether selected from the group consisting of tripropylene glycol methyl ether; tripropylene glycol ethyl ether; tripropylene glycol butyl ether; diethylene glycol methyl ether; diethylene glycol ethyl ether; diethylene glycol butyl ether; dipropylene glycol methyl ether; dipropylene glycol ethyl ether; dipropylene glycol propyl ether, and mixtures thereof;
e. from about 5 to about 25 wt % of a compound selected from the group consisting of polyalkoxylated alkyloalkane comprising ethoxy and propoxy groups and derivatives thereof; and
f. from about 0.2 to about 2.0 wt % of a compound selected from the group consisting of the sodium salts of EDTA, HEDTA, and mixtures thereof.

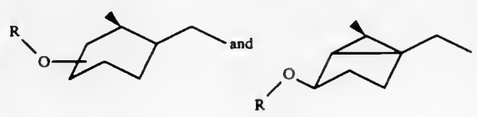
4,822,515

ETHYL NORBORNYL ALKYL ETHERS, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

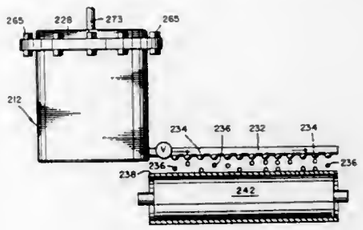
Mark A. Sprecker, Sea Bright; Margo Androulakis, Palisades Park, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 149,676, Jan. 28, 1988, Pat. No. 4,772,411. This application Jun. 30, 1988, Ser. No. 213,318
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.
Int. Cl.⁴ C11D *7/18*
U.S. Cl. 252—174.11 **16 Claims**

1. A mixture of compounds defined according to the structures:



wherein R is C_2, C_4 or C_6 straight chain lower alkyl.

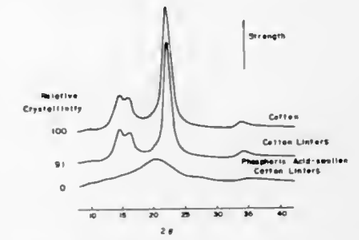


4,822,516

DETERGENT COMPOSITION FOR CLOTHING INCORPORATING A CELLULASE

Akira Suzuki; Susumu Ito, both of Utsunomiya; Kikuhiko Okamoto, Koshigaya; Eiichi Hoshino; Michio Yokosuka, both of Utsunomiya, and Moriyasu Murata, Chiba, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,418
Claims priority, application Japan, Dec. 8, 1986, 61-292158
Int. Cl.⁴ C11D *7/42, 3/386*
U.S. Cl. 252—174.12 **1 Claim**



1. A detergent composition for clothing which comprises at least one surface active agent and an amount of from 50 to 20,000 units, per kg of the detergent composition, in terms of an enzymatic activity determined when carboxymethyl cellulose (CMC) is used as a substrate of a cellulase
selected from the group consisting of alkaline cellulase K, alkaline cellulase K-344, alkaline cellulase K-534, alkaline cellulase K-539, alkaline cellulase K577, alkaline cellulase K-425, alkaline cellulase K-521, alkaline cellulase K-580, alkaline cellulase K-588, alkaline cellulase K-597, alkaline cellulase K-522, CMCase I, CMCase II, alkaline cellulase E-Ii and alkaline cellulase E-III.

4,822,517

NOVEL POLYISOCYANATE MIXTURE

James R. Jasenak, Sewickley, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jun. 16, 1987, Ser. No. 62,933
Int. Cl.⁴ C09K *3/00*; H05B *33/00*
U.S. Cl. 252—182.21 **4 Claims**

1. A polyisocyanate mixture comprising
(a) from 73 to 77% by weight of methylene bis(-phenylisocyanate), said methylene bis(phenylisocyanate) having an isomer content as follows:
(i) from about 30 to about 34% by weight of the 2,4' isomer,
(ii) from about 60 to about 66% by weight of the 4,4'-isomer, and
(iii) from about 3 to about 7% by weight, the 2,2' isomer, the percent of said isomers totaling 100%,
(b) from 23 to 27% by weight of higher functional methylene-bridged polyphenyl polyisocyanates, the percents of components (a) and (b) totaling 100%, and wherein said polyisocyanate mixture has an isocyanate group content of from about 30 to about 33.5 percent by weight.

4,822,518

CONVENIENT SYNTHESIS OF POLYAMIDE POLYOL/URETHANE DIOL BLENDS

Anil B. Goel, Worthington, and Harvey J. Richards, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 11, 1987, Ser. No. 131,982
Int. Cl.⁴ C08G *69/44, 71/04*
U.S. Cl. 252—182.26 **6 Claims**

1. A method of forming a polyamide polyol and urethane diol blend comprising reacting a polyalkyl ester of a polybasic acid with a molar excess of alkanolamine to form a solution including the polyamide polyol, alkanol and excess alkanolamine and reacting a carbonate selected from the group consisting of ethylene carbonate and propylene carbonate and ethyl and methyl substituted derivatives thereof with said excess alkanolamine in the presence of said formed polyamide polyol to form a said blend of polyamide polyol with said urethane diol.

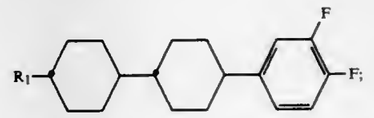
4,822,519

NEMATIC LIQUID CRYSTAL COMPOSITION

Hideo Saito; Shinichi Sewada, both of Yokohamashi, and Kenji Furukawa, Yokosukashi, all of Japan, assignors to Chisso Corporation, Japan

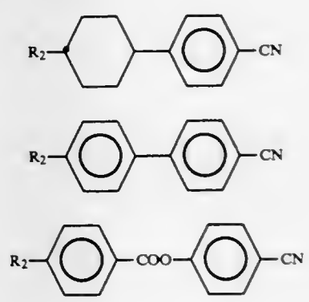
Filed Aug. 27, 1987, Ser. No. 89,773
Claims priority, application Japan, Sep. 1, 1986, 61-205643
Int. Cl.⁴ G02F *1/13*; C09K *19/54, 19/34, 19/30*
U.S. Cl. 252—299.61 **4 Claims**

1. A nematic liquid crystal composition comprising, by weight, 10 to 80% of at least one compound of a component having the formula



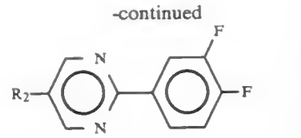
(A1)

5 to 50% of a component (B) comprising at least one member of the group consisting of the compounds expressed by the formulas (B1) to (B7)

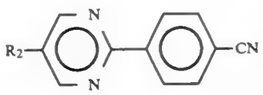


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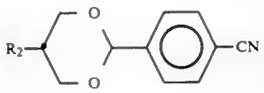
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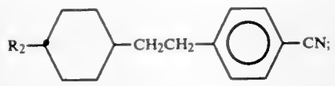
(B4)



(B5)



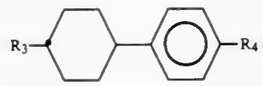
(B6)



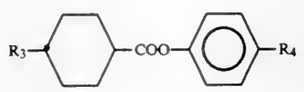
(B7)

5 to 50% of a component (C) comprising at least one member of the group consisting of the compounds expressed by the formulas (C1) to (C11)

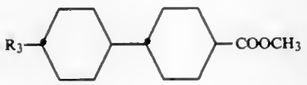
(C1)



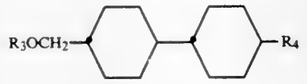
(C2)



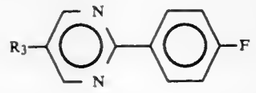
(C3)



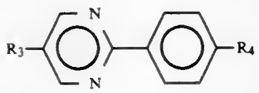
(C4)



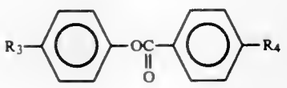
(C5)



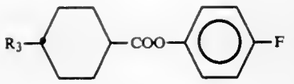
(C6)



(C7)

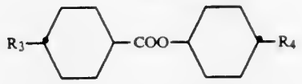


(C8)

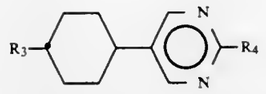


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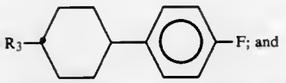
(C9)



(C10)

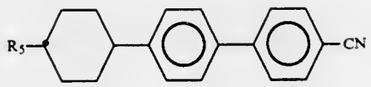


(C11)

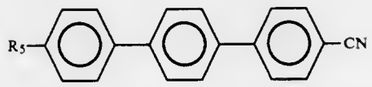


5 to 50% of a component (D) comprising at least one member of the group consisting of the compounds expressed by the formulas (D1) to (D10)

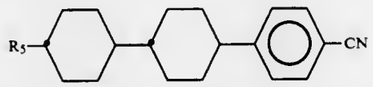
(D1)



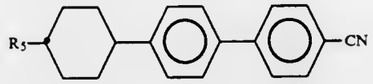
(D2)



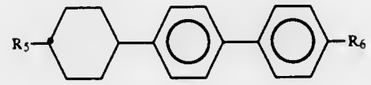
(D3)



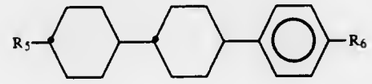
(D4)



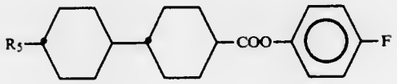
(D5)



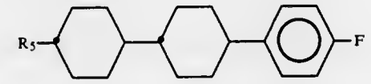
(D6)



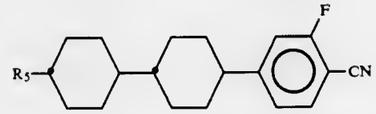
(D7)



(D8)

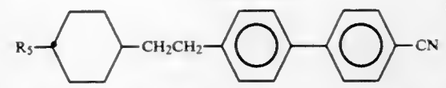


(D9)



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(D10)



wherein R_1 and R_4 each independently represents an alkyl group or an alkoxy group of 1 to 10 carbon atoms and R_2, R_3, R_5, and R_6 each independently represents an alkyl group or an alkoxy group of 1 to 8 carbon atoms.

4,822,520

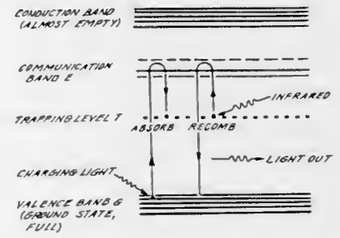
PHOTOLUMINESCENT MATERIALS FOR OUTPUTTING BLUE-GREEN LIGHT

Joseph Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.

Continuation of Ser. No. 870,809, Jun. 6, 1986, which is a continuation-in-part of Ser. No. 786,095, Oct. 10, 1985, Pat. No. 4,705,952. This application Apr. 3, 1987, Ser. No. 34,333

Int. Cl.[4] **B05D** *5/06;* **C09K** *11/08*

U.S. Cl. 252—301.4 S **14 Claims**



1. An electron trapping photoluminescent material, comprising:

a base material comprising subtantially strontium sulfide;

a first dopant of samarium provided in a quantity of between 70 to 300 parts per million by weight; and

a second dopant of cerium oxide provided in a quantity of between 600 to 1500 parts per million by weight.

4,822,521

INTEGRATED PROCESS AND APPARATUS FOR THE PRIMARY AND SECONDARY CATALYTIC STEAM REFORMING OF HYDROCARBONS

Andrija Fuderer, Antwerp, Belgium, assignor to UOP, Des Plains, Ill.

Division of Ser. No. 502,580, Jun. 9, 1983, Pat. No. 4,650,651. This application Nov. 17, 1986, Ser. No. 931,121

Int. Cl.[4] **C01B** *1/13*

U.S. Cl. 252—376 **20 Claims**

1. An integrated, essentially autothermal, catalytic process for the primary and secondary reforming of fluid hydrocarbons comprising:

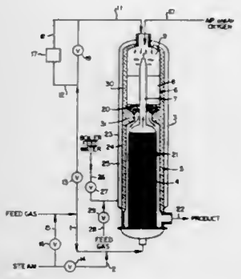
(a) catalytically reacting a fluid hydrocarbon feed stream with steam in catalyst-containing reformer tubes positioned within a lower primary reforming zone of an integrated primary-secondary reformer, said primary reforming zone being maintained at an elevated temperature by the passage of hot product effluent from the secondary reforming zone of said reformer on the shell side of said primary reforming zone;

(b) passing the partly reformed product effluent from said lower primary reforming zone upwardly in conduit means extending through the catalyst bed of the secondary reforming zone to the catalyst zone to the catalyst-free reaction space positioned in the secondary reforming zone above said catalyst bed;

(c) introducing an oxygen-containing gas to said catalyst-free reaction space in the secondary reforming zone of said integrated reformer, exothermic reaction of said oxygen with unconverted fluid hydrogen feed and hydrogen causing the temperature of the reaction mixture in said reaction space to rise;

(d) passing the reaction mixture from said reaction space to the secondary reforming catalyst bed, unconverted hydrocarbon feed present in said reaction mixture reacting with steam in an endothermic reaction during the passage of the reaction mixture through said catalyst bed so as to reduce the temperature of the reaction mixture from the temperature reached in said catalyst-free reaction space to a lower-elevated temperature;

(e) introducing the secondary reforming product effluent gas passing from the discharge end of the secondary reforming catalyst bed to the shell side of the primary reforming zone to supply heat to maintain said elevated temperature for the endothermic steam reforming reaction taking place within the catalyst-filled reactor tubes of said primary reforming zone such that essentially all of the heat required in the primary reforming zone is supplied by the product effluent of the secondary reforming zone; and



(f) discharging cooled effluent from the shell side of said primary reforming zone as the product effluent of said integrated primary-secondary reformer. whereby the desired overall primary and secondary reforming of the fluid hydrocarbon feed is accomplished without the need for an external fuel-fired primary reformer and/or for the burning of a portion of the hydrocarbon feed for fuel purposes.

4,822,522

HINDERED PHENOL AMIDES

Kenji Tajima, Kuwana; Takao Nishina, Kitamoto, and Kazunori Nishikawa, Matsudo, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

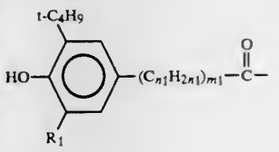
Continuation-in-part of Ser. No. 18,878, Feb. 25, 1987, abandoned. This application Aug. 26, 1987, Ser. No. 89,463

Claims priority, application Japan, Feb. 26, 1986, 61-41107

Int. Cl.[4] **C09K** *15/32;* **C08K** *5/15;* **C07D** *319/08*

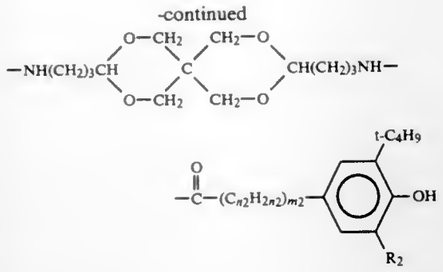
U.S. Cl. 252—400.24 **21 Claims**

1. Hindered phenol amides having the formula:



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wherein:
R_1 and R_2 are hydrogen or lower alkyl having from one to four carbon atoms;
m_1 and m_2 are 0 or 1; and
n_1 and n_2 are selected from 1, 2 and 3.

4,822,523
ELECTRICALLY CONDUCTIVE, POTENTIALLY ADHESIVE COMPOSITION
Christian Prud'Homme, Lyons, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Oct. 16, 1987, Ser. No. 109,668
Claims priority, application France, Oct. 20, 1986, 86 14851
Int. Cl.⁴ H01B *1/06*
U.S. Cl. 252—511 **16 Claims**

1. An electrically conductive, potentially adhesive composition which comprises
(a) a thermoplastic polyblock organopolysiloxane copolymer having elastomeric properties and consisting of a plurality of repeat units corresponding to formula I, formula II or a mixture thereof

$$+Y-[SiR_2(XSiR_2)_aYSiR_2ZSiR_2Y]_pSiR_2(XSiR_2)_aYSiR_2-(OSiR_2)_n+ \quad (I)$$

$$+Y-[SiR_2ZSiR_2YSiR_2(XSiR_2)_aY]_pSiR_2ZSiR_2YSiR_2(OSiR_2-)_n+ \quad (II)$$

wherein
Y, which are identical or different, denote linear or branched alkylene radicals containing 2 to 6 carbon atoms;
R, which are identical or different, denote alkyl and haloalkyl radicals containing 1 to 4 carbon atoms, cycloalkyl radicals containing 3 to 8 carbon atoms, and aryl and haloaryl radicals containing 6 to 8 carbon atoms;
X, which are identical, denote a linear or branched alkylene radical containing 1 to 8 carbon atoms, a divalent radical corresponding to formula III

$$-(CH_2)_x-Q-T-Q-(CH_2)_x- \quad (III)$$

in which
Q, which are identical, denote one of the groups —O— or —OCO— (—OCO— being linked to T via the radical —CO—);
T denotes a monocyclic divalent hydrocarbon radical containing 6 to 8 carbon atoms or a divalent organic radical containing 10 to 22 carbon atoms consisting of 2 hydrocarbon rings fused to each other or linked by a valency bond or by one of the groups of formulae —O—, $—CH_2—$, $—C(CH_3)_2—$ or $—Si(R')_2—$, (R' being an alkyl radical containing 1 to 3 carbon atoms), and
x, which are identical, denote 1, 2 or 3, or a divalent hydrocarbon radical corresponding to formula IV

$$-(CH_2)_b-T-(CH_2)_b- \quad (IV)$$

in which
T has the meaning given in formula III, and
b, which are identical, denote 0, 1 or 2;
Z, which are identical, have the meaning given for X, but cannot correspond to formula III,
a denotes 0 or 1,
p denotes any number from 1 to 120, and
n denotes any number from 1 to 1000, and
(b) an effective amount, sufficient to afford electrical conductivity to the composition, of particles with at least the surface of said particles being electrically conductive.

4,822,524
XANTHAN GUM ENHANCED FIRE-RETARDANT COMPOSITIONS
Bruce G. Strickland, Phoenix, Ariz., assignor to Chemonics Industries, Inc., Phoenix, Ariz.
Filed Apr. 1, 1988, Ser. No. 177,474
Int. Cl.⁴ C09K *21/00;* **C09D** *5/16, 5/18;* **A62D** *1/00*
U.S. Cl. 252—603 **1 Claim**

1. In a fire-retardant composition, specially adapted for aerial application, to suppress the spread of wildfires, said compositions consisting essentially of
a fire-suppressing salt selected from the class consisting of ammonium phosphate, ammonium polyphosphate and ammonium sulfate,
a guar gum thickener, and
an aqueous liquid carrier,
the improvement for increasing the long-term stability and adhesion characteristics of said compositions, comprising
the addition of xanthan gum, in a minor amount effective to improve said characteristics.

4,822,525
PROCESS FOR PREPARING A CARTRIDGE FOR DISPOSAL OF A RADIOACTIVE WASTE LIQUID
Noboru Endo; Yutaka Kikuchi, both of Tokyo; Kiichi Yamatsuta, and Shoji Goto, both of Kanagawa, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan and Asahi Fiber Glass Company Limited, both of Tokyo, Japan
Filed Mar. 16, 1987, Ser. No. 26,197
Claims priority, application Japan, Mar. 25, 1986, 61-066318
Int. Cl.⁴ G21F *9/16;* **C03C** *25/02;* **C03B** *19/09, 20/00*
U.S. Cl. 252—629 **8 Claims**



1. A process for preparing a cartridge for disposal of a radioactive waste liquid, which comprises filling glass fibers in a mold, heat-treating the fibers for partial fusion and molding them into a molded product of a predetermined shape, wherein at least one member selected from the group consisting of boric acid, silicic acid, lithium borate, lithium silicate, zinc borate, zinc silicate, an organic silane, a silica sol, an oil emulsion, and an alumina sol, is applied to the glass fibers or to the molded product.

4,822,526
PROCESS FOR PREPARING LIQUID ROSIN ESTER WITH ANTHRAQUINONE AND ALKALI METAL IODIDE
Seiichi Tsuchida, and Tsukasa Ishimoto, both of Sakai, Japan, assignors to Arakawa Chemical Industries, Ltd., Osaka, Japan
PCT No. PCT/JP86/00423, § 371 Date Mar. 23, 1988, § 102(e) Date Mar. 23, 1988
PCT Filed Aug. 18, 1986, Ser. No. 184,448
Int. Cl.⁴ C09F *1/04, 7/00*
U.S. Cl. 260—103 **2 Claims**

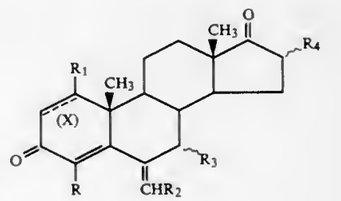
1. A process for preparing a liquid rosin ester which is light-colored and highly stable, which comprises subjecting to thermal reaction a rosin and an alcohol in the presence of anthraquinone and at least one alkali metal iodide selected from sodium iodide or potassium iodide.

4,822,527
PROCESS FOR PREPARATION OF ANTHRAQUINONES AND FLUORENONES
David E. James, Batavia, and Neal R. Nowicki, St. Charles, both of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Dec. 14, 1987, Ser. No. 134,839
Int. Cl.⁴ C07C *50/18, 45/00*
U.S. Cl. 260—369 **5 Claims**

1. A process for producing cyclized aromatic compounds comprising anthraquinones and fluorenones and carboxy derivatives of said aromatic compounds which process comprises liuqid-phase air oxidation of a feedstock selected from the group consisting of 2-methyl-diphenylmethane, 2-methylbiphenyl and derivatives of said 2-methyldiphenylmethane and said 2-methylbiphenyl to said anthraquinones and fluorenones in a mother liquor comprising an acetic acid medium wherein weight ratio of said feedstock to acetic acid is in the range of from about 1:1 to about 1:20, in the presence of a coblat-managanese-bromine catalyst wherein the mole ratio of cobalt to managanese is about 1.0:0.1 to about 1.0:10.0, and mole ratio of bromine to total metals of said catlayst is from 3.0:1.0 to about 10.0:1.0, the process comprising oxidation of said feedstock at a temperature within the range of from about 75° C. to about 250° C. at a pressure of from about 1 to about 100 atmospheres.

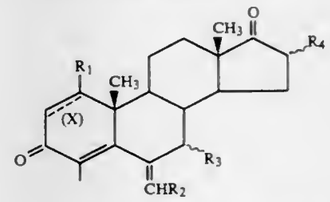
4,822,528
4-SUBSTITUTED 6-ALKYLIDENANDROSTEINE-3,17-DIONE DERIVATIVES AND PROCESS FOR THEIR PREPARATION
Maristella Colombo, Cesano Boscone; Franco Buzzetti, Monza; Enrico di Salle, and Paolo Lombardi, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba S.R.L., Milan, Italy
Filed Aug. 18, 1987, Ser. No. 86,608
Claims priority, application United Kingdom, Sep. 17, 1986, 8622330
Int. Cl.⁴ C07J *1/00;* **C07C** *117/00*
U.S. Cl. 260—397.3 **5 Claims**

1. A compound of formula (I)

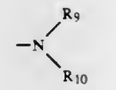


(I)

wherein each of R_1, R_2 and R_3, independently, is hydrogen or C_1–C_6 alkyl; R_4 is hydrogen or fluorine;
the symbol _____ indicates that (x) may be either a single bond or a double bond;
R is
(1) a group $—OR_5$ wherein R_5 is
(a) hydrogen;
(b) C_1–C_6 alkyl;
(c) a phenyl or benzyl group, each unsubstituted or ring-substituted by one or more substituents chosen from C_1–C_4 alkyl, halogne, trifluoromethyl, nitro, amino, hydroxy and C_1–C_4 alkoxy;
(d) a group $—COR_6$ wherein R_6 is
(i) a C_1–C_{22} saturated or C_2–C_{22} unsaturated aliphatic hydrocarbon radical;
(ii) a C_4–C_7 monocycloalkyl group; or
(iii) a phenyl or benzyl group, each unsubstituted or ring substituted as reported above; or
(e) a hydroxy protecting group;
(2) a group $—SR_7$ wherein R_7 either has one of the meanings (a) to (d) indicated above for R_5 or is a group $—SR_8$ wherein R_8 is
(iv) C_1–C_6 alkyl;
(v) a phenyl or benzyl group, each unsubstituted or ring-substituted as reported above; or
(vi) a steroidic residue of formula



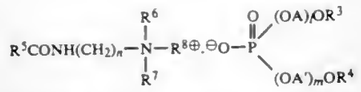
wherein R_1, R_2, R_3, R_4 and (x) are as defined above
(3) the group $—N_3$; or
(4) a group



wherein each of R_9 and R_{10}, independently, is hydrogen or C_1–C_6 alkyl;
and the pharmaceutically acceptable salts thereof.

4,822,529
ANTISTATIC AGENTS FOR SYNTHETIC FIBERS AND METHODS OF PRODUCING SAME
Masatsugu Saiki, Okazaki; Yoshio Imai, and Makoto Takagi, both of Gamagori, all of Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan
Division of Ser. No. 836,691, Mar. 6, 1986, Pat. No. 4,727,177.
This application Sep. 10, 1987, Ser. No. 95,330
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.⁴ C07F *9/09*
U.S. Cl. 260—403 **2 Claims**

1. In an antistatic agent for synthetic fibers comprising quaternary ammonium alkyl phosphate which is shown by the formula (I) below as principal constituent and by-product alkali metal halides;



(I)

where R^3 is alkyl group or alkenyl group with 8–18 carbon atoms, R^6, R^7 and R^8 are each alkyl group with 1–3 carbon atoms, R^4 is hydrogen or alkyl group or alkenyl group with 8–18 carbon atoms, R^5 is alkyl group or alkenyl group with 7–17 carbon atoms, OA and OA' are single oxyethylene or oxypropylene group or block or random connected mixture thereof, l and m are 0 or integers in the range of 1–20 such that l+m=0–20, and n is 2 or 3, the improvement wherein said by-product alkali metal halides are contained by 1 weight percent or less with respect to said quaternary ammonium alkali phosphate.

4,822,530

PREPARATION OF POLYFUNCTIONAL INITIATORS FOR ANIONIC POLYMERIZATION, OLIGOMERIC POLYFUNCTIONAL INITIATORS, USE OF THE RESULTING POLYMERS FOR THE PREPARATION OF UNFUNCTIONALIZED OR FUNCTIONALIZED POLYMERS AND AS PREPOLYMERS FOR OTHER RESINS

Klaus Bronstert, Carisberg, and Siegbert Bohnet, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,680

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711920

Int. Cl.[4] C07F *1/02*

U.S. Cl. 260—665 R **2 Claims**

1. A process for the preparation of an oligomeric polyfunctional initiator for anionic polymerization of dienes and/or alkenylaromatics and/or other ionically polymerizable monomers to give homo-, co- and block copolymers having molecular weights of from 2,000 to 200,000 under inert conditions, wherein a mixture of dialkenylaromatics and alkenylaromatits in a molar ratio of from 1:4 to 1:100, if necessary dissolved in an inert solvent, is run in the course of from 3 to 300 minutes at from 25° to 100° C., continuously, or quasi-continuously in small portions, with thorough mixing, into an initially taken mixture which contains from 1.2 to 3.0 molar equivalents, based on the dialkenylaromatics, of one or more organolithium compounds mixed with an inert solvent, and is polymerized completely.

4,822,531

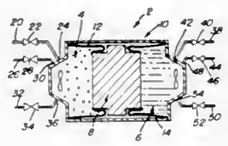
NON-VENTING MICROGRAVITY CARBONATOR AND METHOD

Arthur G. Rudick, Marietta, and Hugh Y. Torrance, Roswell, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jun. 23, 1988, Ser. No. 210,501

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—25 **31 Claims**



1. A method for carbonating water comprising the steps of: providing a carbonator having a movable piston which separates said carbonator into a first chamber and a second chamber, said first chamber initially being filled with carbonated water and said second chamber initially being filled with one of carbon dioxide and water;

introducing one of carbon dioxide, water and a combination of carbon dioxide and water into said second chamber whereby said second chamber will be filled with both carbon dioxide and water;

moving said piston to reduce volume of said first chamber in response to said introducing into said second chamber;

dispensing said carbonated water initially filling said first chamber, said dispensing being in response to moving said piston and said dispensing avoiding release of carbon dioxide from said carbonator;

mixing said carbon dioxide and water in said second chamber; and

forming carbonated water in said second chamber in response to at least said mixing.

4,822,532

CARBURETOR

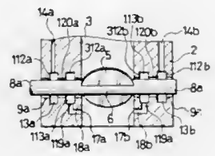
Koichi Suda, Aichi, and Fumio Sugi, Handa, both of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Continuation of Ser. No. 714,042, Mar. 19, 1985, abandoned, which is a contiauation of Ser. No. 509,233, Jun. 28, 1983, abandoned. This application Dec. 15, 1987, Ser. No. 133,379

Claims priority, application Japan, Sep. 1, 1982, 57-151891

Int. Cl.[4] F02M *19/00*

U.S. Cl. 261—65 **2 Claims**



1. In a carburetor including a body, a suction passage formed in said body and designed to be connected at one end thereof to a discharge port of a supercharger and at the other end thereof to an intake port of an internal combustion engine, a venturi section formed within said suction passage, a main fuel nozzle opening into the venturi section and a trottle valve disposed within the suction passage at a position downstream of the venturi section and held by a throttle shaft which is supported pivotally at least at one end thereof in a through hole formed in said body, said carburetor comprising;

means to support said throttle shaft and to prevent leakage of air-fuel mixture, said means to support and prevent consisting of said through hole and at least two pressure chambers for receiving any air-fuel mixture passing outwardly along said through hole away from said suction passage and for retaining said air-fuel mixture during a pulsative variation in pressure occurring during the operating cycle of said engine, said pressure chambers surrounding said trottle shaft on one side of said throttle valve and located between said throttle shaft and a wall of said through hole, a first passage extending between a first of said pressure chambers and a first location in said suction passage upstream of said venturi for applying a pressure at said first location to said first pressure chamber and a second passage extending between a second location in said suction passage downstream of said throttle valve and a second of said pressure chambers between said first pressure chamber and said suction passage for applying a pressure at said second location to said second of said pressure chambers,

said first pressure chamber being arranged remotely from said suction passage axially along said throttle shaft, said second pressure chamber being arranged between said first pressure chamber and said suction passage axially along said throttle shaft, said first and second pressure chambers being formed in the inside walls of said through holes and opening toward a respective cylindrical outer wall of said throttle shaft, the width of each of said first and second pressure chambers along said throttle shaft being greater than the width of a respective one of said first and second passages along said throttle shaft.

4,822,533

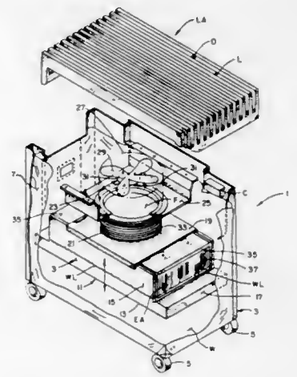
HUMIDIFIER WITH FLOATING WICK ASSEMBLY AND REPLACEABLE WICK ELEMENTS

Robert E. Steiner, and Terrence L. Stanek, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 940,444, Dec. 11, 1986, abandoned. This application Feb. 17, 1988, Ser. No. 156,598

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—72.1 **9 Claims**



1. A humidifier comprising a water reservoir tank for holding a supply of water, an evaporator floatable on said water, said evaporator having a horizontally disposed wick element extending across at least two opposite areas of said water reservoir and being freely and independently floatable in operative association with the water, said wick element having an evaporative surface extending above the level of the water, said wick element being constructed such that said evaporative surface extends a substantially uniform and predetermined amount above said water level as said water level in said tank rises and falls to provide a constant evaporative area for said wicking element, said humidifier further comprising a fan in fixed position with respect to an upper end of said reservoir tank, said fan being operated to draw air downwardly into contact with said wick element, an extensible and collapsible closed flow path means between said wick element and said fixedly mounted fan enabling said fan to also draw air upwardly through said closed flow path means from over substantially the entire evaporative surface and constant evaporative area of said wick element so as to discharge air from said humidifier with increased relative humidity while accommodating downward and upward movement of said freely and independently floatable wick element with the fall and rise of the water level within said reservoir tank, and said wick element having a core of sheet wicking material, said core comprising a plurality of spaced, parallel plates and a plurality of inclined ribs extending between said parallel plates, with said plates and said ribs defining air passageways extending through said core, said plates and said ribs being of a one-piece folded web, said plates extending substantially vertically when said wick element is installed in said evaporator, with the lower portion of said plates and said ribs being at least in part immersed within said water, and with the portion of said core extending above said water constituting the constant evaporative area of said wick element.

4,822,534

METHOD OF PRODUCING MICROSPHERES

Robert W. J. Lencki, 1650 Lincoln Ave., Apt. 1101, Montreal, Quebec, Canada H3H 1H1; Ronald J. Newfeld, 110 Westbank Ave., Pointe Claire, Quebec, Canada H9R 2X6, and Trevor Spinney, 3739 St. Dominique, Montreal, Quebec, Canada H2X 2Y6

Filed Mar. 11, 1987, Ser. No. 24,554

Int. Cl.[4] B01J *13/02*

U.S. Cl. 264—4.3 **28 Claims**

1. Method for the production of microspheres which comprises

a) providing a water slurry containing an immobilizing agent and a substance effective to cause gelation of said immobilizing agent,

b) contacting said water slurry with a hydrophobic liquid under conditions leading to formation of droplets of said water slurry in said hydrophobic liquid, and

c) adding an oil soluble organic acid to mixture obtained in step b to convert said droplets into solid microspheres.

9. Method according to claim 1, which comprises adding a pH adjusting compound to said water slurry.

11. Method according to claim 9, wherein said pH adjusting compound is selected from the group consisting of sodium citrate, disodium phosphate and potassium citrate.

12. Method according to claim 11, which comprises storing microspheres obtained in step c in a microsphere storage solution to maintain solid microspheres.

4,822,535

METHOD FOR PRODUCING SMALL, SPHERICAL POLYMER PARTICLES

Bo Ekman, Malmö , and Åke Lindahl, Skurup, both of Sweden, assignors to Norsk Hydro A.S., Oslo, Norway

Filed Jun. 26, 1986, Ser. No. 878,700

Claims priority, application Sweden, Dec. 7, 1985, 8503459

Int. Cl.[4] B01J *19/06*

U.S. Cl. 264—4.3 **10 Claims**

1. A method of producing small spherical polymer particles from a system containing two mutually immiscible aqueous liquid phases, the one phase of which contains one or more dissolved polymer substances and is dispersed in the form of small droplets in the other phase to form an emulsion, whereafter the droplets are caused to solidify to form said particles, and wherein said two mutually immiscible aqueous liquid phases both contain dissolved substances which will cause the formation of dispersed droplets when the two phases are brought together.

4,822,536

METHOD OF ENCAPSULATING AN ELECTRONIC COMPONENT WITH A SYNTHETIC RESIN

Sylvie Voinis, St . Germain-en-Laye, and Sjoerd Nijboer, Carrieres-sur-Seine, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1986, Ser. No. 944,289

Claims priority, application France, Dec. 20, 1985, 85 18922

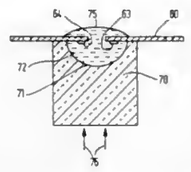
Int. Cl.[4] B29C *35/08, 43/28*

U.S. Cl. 264—22 **6 Claims**

1. A method of encapsulating an electronic component comprising an active device connected to metallic electrical conductors, said method comprising coating said component with an ultraviolet radiation polymerizable coating composition comprising an ethoxy bisphenol A dimethacrylate and about 0.2%–3% by weight of a photo-initiator compound, capable of producing radicals by photo-scission or by intermo-

VOL 1101 ISS 3 AP 18 1989 UMI

lecular abstraction of hydrogen, in a manner so as to allow each of said conductors to be partially uncoated, and exposing



the thus coated component to ultraviolet radiation to thereby polymerize said coating.

4,822,537

PRODUCTION OF FOAMED POLYMER STRUCTURES

Carroll W. Lanier, Baker; H. Eugene Broemmelsiek, Baton Rouge, both of La., and Raymond Lee, Elk Grove Village, Ill., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 20, 1988, Ser. No. 209,018
Int. Cl.[4] C08J 9/04; B29C 35/12
U.S. Cl. 264—26 **35 Claims**

1. In a method of producing a foamed polymer structure in which a body of polyimide precursor is exposed to microwave radiation of intensity sufficient to cause the development of a foamed polymer structure through tne generation and evolution of gaseous material within the body of the precursor, the improvement which comprises:

(a) maintaining the body of polyimide precursor and of the foam structure as it is developing therefrom under a substantially vapor-impermeable microwave-compatible shroud that does not substantially restrict or impede development of the foam structure; and

(b) directing the microwave radiation upon the top, sides and ends of said body of polyimide precursor and of the foam structure as it is developing therefrom, but curtailing the extent to which such radiation impinges upwardly into the bottom of said body and said foam structure.

4,822,538

PROCESS FOR PRODUCING A CARBONACEOUS THIN PLATE

Akio Yoshida; Shigetoshi Ajima; Masaru Hiruta, and Hatsuo Saito, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,333
Claims priority, application Japan, Aug. 23, 1985, 60-185340
Int. Cl.[4] B29C 43/02
U.S. Cl. 264—29.4 **5 Claims**

1. A process for producing a carbonaceous, thin and dense plate comprising:

(1) disposing a composite material comprising:

(A) a carbonaceous raw material which is carbonized and solidifies after being softened by heating; and

(B) paper-like substances which are carbonized without melting

between the pressing surfaces of a heating press, so as to sandwich said carbonaceous raw material between said paper-like substances and to contact said paper-like substances with each of the pressing-surfaces of said heating press,

said carbonaceous raw material being (i) a pitch or a mixture of a pitch and a pulverized carbonaceous material or (ii) a sheet-like carbonaceous raw material obtained by preparing a slurry or a solution of powdery carbonaceous raw material, impregnating or applying the thus prepared slurry or solution to a carbonizable supporting body, and evaporating the solvent from the thus treated carbonizable supporting body, said carbonizable supporting body being a paper-like material manufactured from organic fibers, carbon fibers or a mixture thereof; and

each of said paper-like substances having a thickness of not more than 100 micrometers and being (i) a sheet of paper manufactured from vegetable fibers or (ii) a sheet of paper manufactured mainly from vegetable fibers with not more than 30% by weight of synthetic fibers based on the total weight of the raw material for the sheet of paper;

(2) press-molding the thus disposed composite material under the conditions of a temperature of 150° to 450° C., a pressure of not more than 100 kg/cm^2 G. and a pressure-retaining time of 10 to 120 min.;

(3) continuously heating the thus press-molded composite material to a temperature of about 600° to 650° C. under a pressure of 0.1 to 100 kg/cm^{2}G, thereby carbonizing the thus press-molded composite material;

(4) taking out the thus obtained carbonized thin plate from the press; and

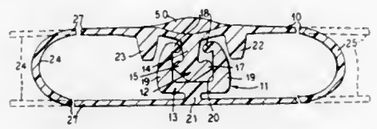
(5) interposing the carbonized thin plate between two pieces of flat and smooth graphite plate and further, calcining or graphitizing the interposed plate under a reduced pressure or in an inert gas to obtain said carbonaceous, thin and dense plate.

4,822,539

METHOD OF AND APPARATUS FOR EXTRUDING BAG MAKING MATERIAL HAVING FASTENER PROFILES AND ALIGNMENT RIBS, WITH REINFORCING AND STABILIZING BEAM EFFECT RIDGE MEANS

Paul A. Tilman, New City; Zdenek Machacek, Nanuet, and Richmond Scott, Pleasantville, all of N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Filed Sep. 14, 1987, Ser. No. 95,835
Int. Cl.[4] B29C 47/06, 47/30, 47/92
U.S. Cl. 264—40.4 **39 Claims**



1. A method of controlled coextrusion of plastic bag making film with a male zipper profile thereon and an adjacent alignment rib, comprising:

extruding plastic extrudate in predetermined volume into a film;

extruding plastic extrudate into a male zipper profile and joining the freshly extruded profile into union with the freshly extruded film;

extruding a separate plastic extrudate into at least one alignment rib and joining the freshly extruded rib with the freshly extruded film in adjacent spaced parallel relation to said male profile;

controlling the volume of said separate extrudate in the rib relative to the volume of extrudate in the film; and

extruding a reinforcing ridge and joining said ridge to the opposite side of the film from that to which said profile is joined and along and in alignment with the back of the base of said male profile.

16. Apparatus for controlled coextrusion of plastic bag making film and zipper profile wherein an interlocking male zipper profile includes an adjacent alignment rib, comprising:

means for extruding plastic extrudate in predetermined volume into a film;

means for extruding plastic extrudate into a male zipper profile and directing the freshly extruded profile into union with the freshly extruded film;

means for extruding a separate plastic extrudate into at least one alignment rib and joining the freshly extruded rib with the freshly extruded film in adjacent spaced parallel relation to said male profile;

means for controlling the volume of said separate extrudate in the rib relative to the volume of extrudate in the film; and

a means for extruding a reinforcing ridge and for joining said ridge to the opposite side of the film from that to which said profile is joined and along and in alignment with the back of the base of said male profile.

4,822,540

PROCESS FOR THE PREPARATION OF A POROUS REGENERATED CELLULOSE HOLLOW FIBER

Seiichi Manabe, Ibaraki; Michitaka Iwata, Osaka, and Mamoru Inoue, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 604,512, Apr. 27, 1984, Pat. No. 4,604,326. This application May 27, 1986, Ser. No. 867,228
Claims priority, application Japan, May 2, 1983, 58-76305; May 2, 1983, 58-76306
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] D01F 2/04; D01D 5/247
U.S. Cl. 264—41 **13 Claims**



1. A process for the preparation of a porous regenerated cellulose hollow fiber having a hollow portion extending continuously along the entire fiber length and a screen filter structure, comprising the steps of extruding a cuprammonium solution of a cellulose from an annular spinning orifice and coagulating, regenerating and water-washing the extrudate, said spinning solution being extruded from an outer annular spinning orifice and liquid that is composed of at least one organic solvent free of hydroxyl groups, having a solubility of at least 10% by weight in a 28% aqueous solution of ammonia, which does not swell a cellulose and having a composition causing micro-phase-separation in the cuprammonium solution of a cellulose, being extruded from a central spinning orifice, to cause micro-phase-separation to occur before the coagulation of said fiber.

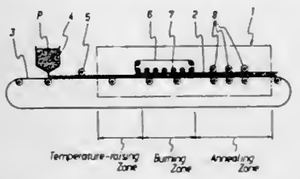
4,822,541

METHOD OF PRODUCING A POROUS CERAMIC PANEL

Satoru Nagai, Toki; Kazuo Imahashi, Chofu; Yoshio Nagaya, Toki; Shigeo Yoshida, Shiga; Satoshi Kitagawa, Shiga, and Takatoshi Miyazawa, Shiga, all of Japan, assignors to National House Industrial Co., Ltd., Osaka; Takasago Industry Co., Ltd., Gifu and Intelhearts Co., Ltd., Tokyo, all of, Japan

Filed Oct. 13, 1987, Ser. No. 107,070
Claims priority, application Japan, May 22, 1987, 62-126778; Aug. 4, 1987, 62-194840
Int. Cl.[4] B29C 43/26, 43/46, 67/20, 71/02
U.S. Cl. 264—42 **18 Claims**

1. In a method of producing a porous ceramic panel of superior dimensional accuracy and surface smoothness, wherein formable inorganic raw materials are heated and pressed in a kiln to produce the porous ceramic panel; the improvement wherein a foaming body of the inorganic raw materials is first-pressed in the kiln during a foaming step to ensure rough dimensional accuracy in a direction of the thickness of the panel, and after the foaming step the first-pressed foamed body is second-pressed in the kiln by pressing and cooling rolls disposed in an annealing zone of the kiln to obtain the desired dimensional accuracy and surface smoothness of the porous ceramic panel, which rolls directly contact a top



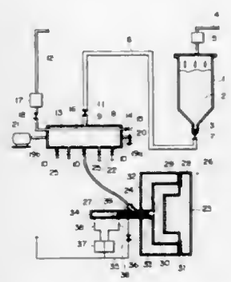
surface and a bottom surface of the first-pressed foamed body to quench the foamed body in the kiln, and wherein the surface temperature of the quenched foamed body is raised again in an atmosphere of the annealing zone of the kiln to relax the thermal strain stress of the quenched foamed body thereby forming the porous ceramic panel of the desired dimensional accuracy and surface smoothness.

4,822,542

METHOD OF PRODUCTION OF EXPANSION-MOLDED ARTICLE, FROM FOAMABLE THERMOPLASTIC RESIN PARTICLES AND APPARATUS THEREFOR

Hedeki Kuwabara, Hadano; Atusi Kitagawa, Fujisawa, and Masato Kanbe, Hiratsuka, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 703,301, Feb. 21, 1985, abandoned. This application Jul. 23, 1987, Ser. No. 76,753
Int. Cl.[4] C08J 9/22; B29C 67/22
U.S. Cl. 264—50 **18 Claims**



1. A method for producing an expansion-molded article from internally pressurized pre-foamed particles of a thermoplastic resin which comprises:

maintaining a supply of said internally pressurized pre-foamed particles under pressure in a pressurizing tank;

transferring a suitable portion of said pre-foamed particles, under pressure, to a pressurizing hopper and holding the transferred particles under pressure in said pressurizing hopper;

feeding under pressure into a mold a predetermined amount of the pre-foamed particles from the pressurizing hopper; and

heating the thus-filled pre-foamed particles within the mold so as to cause the pre-foamed particles to foam and expand, thereby fusion-bonding the resulting expanded particles to obtain the expansion-molded article.

4,822,543

METHOD FOR FORMING PLASTIC CONTAINERS

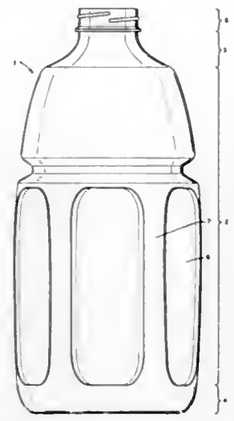
Takao Iizuka, Matsudo, and Akibo Ota, Funabashi, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 137,948, Dec. 28, 1987, which is a continuation of Ser. No. 934,789, Nov. 25, 1986, abandoned, which is a division of Ser. No. 760,548, Jul. 30, 1985, abandoned. This application Apr. 11, 1988, Ser. No. 180,235

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[4] B29C *35/02, 49/20, 71/02, 49/62*

U.S. Cl. 264—521 **9 Claims**



1. A method for producing a blow-molded heat set container, including at least one large panel in a side wall of said container, said method comprising:

blowing-molding a parison of thermoplastic material to form said container in a mold comprising a mold cavity which defines a final shape of said container, said mold cavity having an inner wall and having at least one mold wall panel portion corresponding to said large panel to be formed in said side wall of said container; and

applying heat to said mold to heat set said container, an inner surface of said mold wall panel portion being heated to a temperature sufficiently different from a temperature to which adjacent portions of said inner wall of said mold are heated to heat set said large panel at a temperature sufficiently different than remaining sections of said container to prevent distortion of said large panel when said container is removed from said mold.

4,822,544

DRY PROCESS FOR FABRICATING A UNITARY MEMBRANE-ELECTRODE STRUCTURE

Thomas G. Coker, Lexington; Anthony R. Fragala, North Andover; Anthony B. LaConti, Lynnfield, and John F. Austin, Hamilton, all of Mass., assignors to Unitd Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 874,001, Jun. 13, 1985, abandoned, which is a continuation of Ser. No. 603,481, Apr. 24, 1984, abandoned. This application Aug. 28, 1987, Ser. No. 90,719

Int. Cl.[4] C04B *35/00;* **C25B** *13/00*

U.S. Cl. 264—104 **9 Claims**

1. In a process for attaching an electrode to an ion transporting permselective membrane, consisting essentially of the steps of

(a) providing a permselective membrane, with ion transporting functional groups having a water content of less than 0.01 grams of water per gram of dry membrane, whereby the functional groups are in a non-dissociated state,

(b) depositing an electrode on at least one surface of said membrane,

(c) attaching the electrode to the dry membrane by the application of heat and pressure,

(d) hydrating the membrane to increase the water content and convert the functional groups to a dissociated, ion transporting state and produce 3–15% dimensional growth of said membrane with the electrode attached thereto.

4,822,545

METHOD FOR MAKING FREE-FLOWING COATED RUBBER PELLETS

Edward N. Kresge, Watchung, and Donald R. Hazelton, Chatham Township, Morris County, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 696,726, Jan. 31, 1985, Pat. No. 4,622,193, which is a continuation-in-part of Ser. No. 621,179, Jun. 15, 1984, abandoned. This application Nov. 10, 1986, Ser. No. 929,550

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] B29B *9/06*

U.S. Cl. 264—141 **1 Claim**

1. A process for preparing a free flowing polymer pellet which comprises:

(a) intimately mixing an elastomeric butyl rubber polymer or a mixture of butyl rubber and ethylene-propylene rubber, ethylene, propylene and a non-conjugated diene, natural rubber, polyisobutylene, halobutyl rubber or styrene butadiene rubber, having a glass transition temperature (Tg) of less than 0° C. with a plastic polymer having a semicrystalline or crystalline melting point of at least 10° C. higher than the softening point of the elastomer; said plastic polymer and elastomeric polymer being insoluble in one another in the melt state;

(b) extruding the elastomer/plastic polymer mixture at an extrusion melt temperature above the melting point of the plastic, through a die having a die inlet and a die face said die face being the die outlet; maintaining a temperature gradient across the die from the die inlet to the die outlet, said temperature gradient being such that the polymer mixture has a melt temperature at the die outlet which is less than the extrusion melt temperature; and

(c) forming pellets of the extrudate, thereby forming a pellet having a skin comprising the plastic polymer.

4,822,546

DIE DESIGN FOR UNDERWATER PELLETIZATION OF HIGH FLOW RATE POLYMERS

Dwight T. Lohkamp, Baytown, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Aug. 6, 1987, Ser. No. 82,755

Int. Cl.[4] B29B *11/10;* **B29C** *47/12*

U.S. Cl. 264—143 **24 Claims**

1. A method for extruding a high melt flow rate polymer underwater, comprising the steps of:

feeding the polymer to an extruder;

melting the polymer in the extruder;

discharging the polymer into water through a die having a plurality of orifices therein, each die orifice having a first portion defining a narrow preland followed by a second portion defining a wider final hole; and

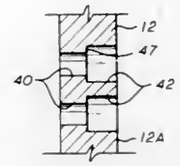
cutting the polymer strands into pellets as the strand exits the die.

11. An apparatus for extruding a high melt flow rate polymer underwater, comprising:

means for feeding the polymer to an extruder;

means for melting the polymer in the extruder;

a die having a plurality of orifices therein, each orifice having a first portion defining a narrow preland followed by a second portion defining a wider final hole;



means for discharging the polymer into water through the die; and

means for cutting the polymer strands into pellets as the strands exit the die.

4,822,547

PROCESS FOR THE EXTRUSION OF COMPOSITIONS COMPRISING POLYPROPYLENE, POLYVINYL ALCOHOL AND A POLYPROPYLENE-POLYVINYL ALCOHOL ADHESIVE

Wayne E. Derrick, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 6, 1987, Ser. No. 34,373

Int. Cl.[4] B29B *11/10, 11/14*

U.S. Cl. 264—169 **7 Claims**

1. In the process of extruding a composition comprising polyvinyl alcohol, a polypropylene-polyvinyl alcohol adhesive and a polypropylene prepared with a high activity polymerization catalyst, the improvement which comprises utilizing polypropylene having from about 50 to about 5000 ppm by weight of hydrotalcite incorporated therein to substantially eliminate gel formation.

4,822,548

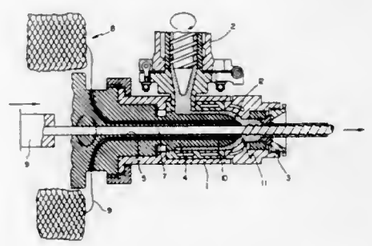
METHOD AND APPARATUS FOR MANUFACTURING A THREAD-REINFORCED RUBBER HOSE

Jürgen Hempel, Weinheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim Bergstrasse, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,913

Int. Cl.[4] B29C *47/24*

U.S. Cl. 264—209.2 **6 Claims**



1. A method for the production of a thread-reinforced hose of rubber comprising:

feeding a starting mixture in the moldable state continuously progressively into a shear head for shaping the mixture into a hose by means of a mold core passing through a shear mandrel;

winding a reinforcing thread passing through at least one orifice interrupting an end face of the shear mandrel about the mold core;

solidifying the mixture by heating to vulcanization temperature within the shear head and at the same time placing the thread in the wall of the hose;

heating the starting mixture to vulcanization temperature in the shear head, and performing the heating such that, at the moment of the placement of the reinforcing thread in the wall of the hose, a transient lowering of the viscosity of the starting mixture takes place; and

then removing the mold core.

2. A shear head for the production of a thread-reinforced, polymeric hose comprising:

a casing for fastening in front of the discharge opening of an extruder;

a hose-type nozzle disposed in the casing;

a shear mandrel coaxially associated with the hose-type nozzle and rotatable about its axis and having an end face facing the hose-type nozzle, the shear mandrel having a coaxial central passage;

a mold core fed through the central passage and having a rotary speed including zero different from that of the shear mandrel;

means for continuously displacing the mold core fed through the central passage toward the hose-type nozzle and for providing relative rotation between the mold core and the shear mandrel for winding the mold core with at least one reinforcing thread for placement into the wall of the hose, the means including a thread guide and the thread guide passing through the shear mandrel and having at least one orifice which interrupts the end face of the shear mandrel facing the hose-type nozzle.

4,822,549

METHOD FOR PREPARING A SHAPED LAYER BY GUN SPRAYING

Jacques Verwilst, and Lucien Jourquin, both of Wetteren, Belgium, assignors to "Gechem", Brussels, Belgium

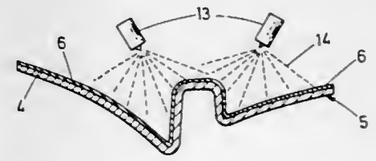
PCT No. PCT/BE86/00021, § 371 Date Mar. 16, 1987, § 102(e) Date Mar. 16, 1987, PCT Pub. No. WO87/00482, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 8, 1986, Ser. No. 26,330

Claims priority, application Luxembourg, Jul. 15, 1985, 86007

Int. Cl.[4] B29C *41/08, 41/42, 63/22*

U.S. Cl. 264—250 **16 Claims**



1. A method for preparing a shaped part of a plastic material by gun-spraying, which part is flexible or can be made flexible, from a particular pattern, comprising successively:

(a) forming by gun-spraying a layer of plastic material over a shaping surface of a first mould which does not lengthen as it is distorted, said surface corresponding to the impression of the visible surface from the pattern deformed along substantially continuous lines without any elongation, in such a way that substantially all the surface portions from said mould be easily accessed for gun spraying;

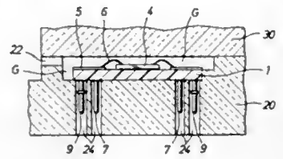
(b) then stripping said layer plastic material from the first mould surface;

(c) laying said layer plastic material in a second mould, the shaping surface of which substantially coincides with the visible shape of said pattern; and

(d) filling the cavity resulting from the layer plastic material shaped inside said second mould with a padding.

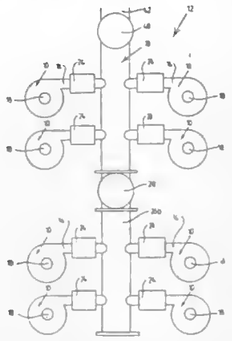
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4,822,550
METHOD OF MOLDING A PROTECTIVE COVER ON A PIN GRID ARRAY
Kathuzi Komathu, Kawagoe, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Apr. 13, 1987, Ser. No. 37,745
Claims priority, application Japan, Apr. 17, 1986, 61-087081
Int. Cl.[4] B29C *45/02, 45/16*
U.S. Cl. 264—263 **10 Claims**



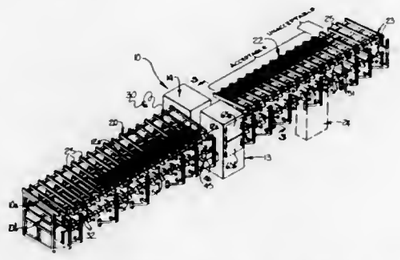
1. A method of forming a protective cover of a pin grid array in which a semiconductor chip is mounted on an upper surface of a resinuous printed circuit board having a plurality of contact pins on a lower surface thereof, comprising the steps of:
inserting the pin grid array in a recess of a lower mold so as to position at a lower level than the upper surface of the lower mold and to leave a space therearound, the lower mold having the recess for receiving the resinuous printed circuit board, grooves formed on the bottom of the recess for receiving the contact pins, and projections formed on the peripheral portion of the recess for abutting against part of side surfaces of the resinuous printed circuit board;
positioning an upper mold onto the upper surface of the lower mold; and
injecting a thermosetting resin into a gap defined between the upper and lower molds, thereby performing transfer molding.

4,822,551
FLUID FLOW APPARATUS
Gavan J. J. Prendergast, Mount Waverley, Australia, assignor to Noel Carroll, Victoria, Australia
Division of Ser. No. 852,666, Mar. 19, 1986, Pat. No. 4,737,287.
This application Jan. 12, 1988, Ser. No. 142,920
Claims priority, application Australia, Jul. 19, 1984, PG6098; Aug. 2, 1984, PG6356
Int. Cl.[4] B01D *17/038*
U.S. Cl. 264—275 **3 Claims**



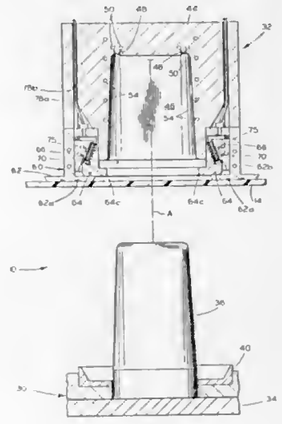
1. A method comprising: forming a cyclone separator having a separating chamber defined as an elongate axially extending surface of revolution having a larger diameter and a smaller diameter end and having an axial overflow outlet at the larger diameter end and an axial underflow outlet at the smaller diameter end and a tangential inlet located towards the larger diameter end, by, forming a mould insert having an outer profile corresponding to the required profile of the separating chamber, forming a hollow cylindrical casing, forming an inlet pipe and an opening in the side wall of said casing and inserting the inlet pipe through the opening so as to extend inwardly of the interior of the casing in a disposition which is tangential to the intended separating chamber to be formed, inserting said mould profile into the separating chamber so as to extend lengthwise thereof, whilst having its outer surface spaced from the inner surface of the casing, and with the inlet pipe abutting in tangential relationship to the outer surface of the mould insert towards its larger diameter end, injecting molten plastics material into the space between the outer surface of the mould insert and in the inner surface of the cavity and around the portion of the inlet pipe within the casing while preventing egress of said material from the opposite ends of the casing sufficient to form, when the material is set, a molded body within the casing the inner surface of which defines the surface of said separating chamber, removing said mould insert from said casing and closing at least the larger diameter end of said separating chamber by an end plate extending across an end of said casing, sufficient for providing said end plate with an opening therein defining said overflow outlet, and for forming of said underflow outlet at the other end of the body.

4,822,552
METHOD AND APPARATUS FOR PASSIVELY GAMMA SCANNING A NUCLEAR FUEL ROD
Hassan J. Ahmed, and James L. Fogg, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 25, 1987, Ser. No. 18,900
Int. Cl.[4] G21C *17/06*
U.S. Cl. 376—257 **12 Claims**



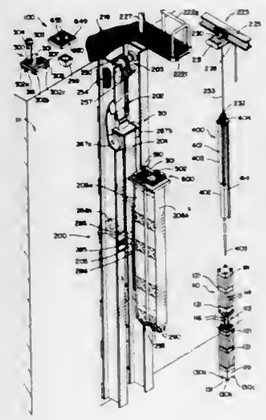
1. A method for passively scanning the gamma radiation emission count of nuclear fuel contained within a fuel rod to determine enrichment uniformity comprising the steps of:
(a) advancing a fuel rod along a linear path of travel;
(b) repeatedly detecting the natural gamma radiation emission count of the advancing rod at each of a plurality of regularly spaced apart discrete segments along the length of the advancing rod; and
(c) summing the output of each of the detecting steps for each segment to obtain a total gamma radiation emission count for each segment.

4,822,553
APPARATUS AND METHOD FOR THERMOFORMING A PLASTIC ARTICLE HAVING AN UNDERCUT
Floyd M. Marshall, Rte. 2, County Hwy. 134, Nevada, Ohio 44849
Filed Nov. 6, 1986, Ser. No. 927,365
Int. Cl.[4] B29C *49/30, 49/70*
U.S. Cl. 264—292 **4 Claims**
1. A method of forming a plastic article from a sheet of plastic material heated to a predetermined forming temperature, comprising the steps of:
(a) providing a first mold section having forming surfaces defining a forming cavity, the first mold section including at least one undercut forming element movable between an advanced position wherein the forming element projects into the forming cavity to form an undercut portion in the plastic article and a retracted position wherein the forming element is withdrawn from the forming cavity to enable the formed plastic article to be removed from the forming cavity;
(b) moving a second mold section along a forming axis in one direction to urge at least a portion of the heated plastic sheet into the forming cavity of the first mold section to form the plastic article while the undercut forming element is in the advanced position;
(c) moving a stripper plate a first predetermined distance along the forming axis in an opposite direction for partially removing the formed plastic article from the forming cavity by moving the formed plastic article a first predetermined distance in an opposite direction along the forming axis relative to the forming cavity;



(d) simultaneously with step (c), operating a retracting mechanism to move the undercut forming element to the retracted position as the formed plastic article is moved the first predetrmined distance, the undercut forming element moving with the stripper plate in an opposite direction along the forming axis as the stripper plate travels a first predetermined distance such that the stripper plate, the undercut forming element, and the plastic article are all simultaneously moved in an opposite direction along the forming axis for the first predetermined distance; and
(e) subsequent to steps (c) and (d), moving the second mold section with the plastic article a second predetermined distance away from the first mold section along the forming axis in an opposite direction relative to both the forming cavity and the undercut forming element to remove the formed plastic article from the forming cavity.

4,822,554
RECONSTITUTION AND REPAIR SYSTEM FOR NUCLEAR FUEL ROD ASSEMBLIES
John D. Wood, Hempfield Township, Westmoreland County; Alan Savinell, Penn Hills; Charles H. Roth, Jr., N. Huntingdon; Frederick J. Ellingson, Murrysville Boro, and George F. Dailey, Plum Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 8, 1986, Ser. No. 916,682
Int. Cl.[4] G21C *19/10, 19/32*
U.S. Cl. 376—261 **7 Claims**



7. A system for repairing and reconstituting fuel assemblies submerged within a spent fuel pool, wherein each assembly includes a square array of fuel rods disposed between a top and a bottom nozzle fuel assembly, comprising:
(a) an elevator and carriage means having a pair of adjacent baskets for containing and supporting a pair of fuel assemblies in side-by-side relationship so that the bottom ends of the fuel assemblies are mutually adjacent, a carriage means for lifting and lowering the baskets within the pool, and a basket inverting means including means for rotatably mounting the baskets to the carriage means for selectively inverting the baskets;
(b) a rod handling tool having a length adjustable housing that includes a gripper means on its distal end and a lift motor means on its proximal end for gripping, lifting, lowering and ungripping a fuel rod, and a linkage for connecting said lift motor means with said gripper means which automatically adjusts its length to accommodate adjustments in the length of the housing, and
(c) a tool positioner detachably mountable over the adjacent bottom ends of the fuel assemblies, said positioner having a tool guide for receiving and guiding the gripper means of the rod handling tool, first and second remotely operable slave carriages for moving the tool guide in different directions across the ends of the fuel assemblies, and a master carriage linked to the first and second slave carriages by at least one loop of cable for remotely moving the first and second slave carriages.

4,822,555
CONTAINER FOR PLATE-LIKE OBJECTS
Hiroaki Kawabata, Tsuruga, Japan, assignor to Nuclear Services Company, Tokyo, Japan
Filed Jun. 18, 1987, Ser. No. 63,657
Int. Cl.[4] G21C *19/32*
U.S. Cl. 376—272 **3 Claims**
2. In combination, a water pool and an upwardly opening container in said water pool for storing substantially L-shaped

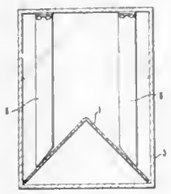
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cut halves of spent atomic fuel channel boxes, said upwardly opening container comprising:

at least two spaced opposed walls; and

at least one pair of spaced opposed leaf springs, each one of said at least one pair of leaf springs having first and second ends, each said first end of each said pair of leaf springs being attached to the inside surface of one of said at least two spaced opposed walls, each one of said leaf springs





extending downwardly inside said container toward the other one of said at least two spaced opposed walls, each said second end of said leaf springs being free and having an oblique end, each pair of said oblique ends of each pair of said at least one pair of spaced opposed leaf springs defining an L-shape for contacting an L-shaped object for retaining an L-shaped object upright when an L-shaped object is inserted into said upwardly opening container.

4,822,556

AUSTENITIC STAINLESS STEEL COMBINING STRENGTH AND RESISTANCE TO INTERGRANULAR CORROSION

James N. Cordea, Monroe; Joseph C. Jasper, Middletown, both of Ohio, and Harshad V. Sheth, Rancho Palos Verdes, Calif., assignors to Baltimore Specialty Steels Corporation, Baltimore, Md.

Filed Feb. 26, 1987, Ser. No. 19,448

Int. Cl.[4] C22C *38/58*

U.S. Cl. 420—59 **13 Claims**

1. An austenitic stainless steel having a 0.2% yield strength of at least 100 ksi (689 N/mm^2), a magnetic permeability not greater than 1.004 at 500 oersteds, intergranular corrosion resistance of at least 24 hours measured by ASTM A-262 Practice E and a grain size number of ASTM 6 or finer, said steel consisting essentially of, in weight percent, from greater than 0.05% to about 0.10% carbon, greater than 14% to about 18% manganese, about 15% to about 20% chromium, about 1% to about 3.5% nickel, about 0.3% to about 0.55% nitrogen, about 0.1% to about 0.5% vanadium, about 1% maximum copper, about 1% maximum molybdenum, about 1% maximum silicon, about 0.04% maximum phosphorus, about 0.03% maximum sulfur and balance essentially iron.

4,822,557

EMERGENCY REACTOR CORE COOLING STRUCTURE

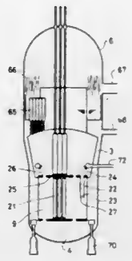
Hiroaki Suzuki, Hitachi; Michio Murase, Mito; Shigeo Hatamiya, Hitachi; Masanori Naitoh, Hitachi, and Kenji Tominaga, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,600

Claims priority, application Japan, Feb. 28, 1986, 61-41788

Int. Cl.[4] G21C *15/02*

U.S. Cl. 376—282 **13 Claims**



1. In a nuclear reactor having a pressure vessel, a core region disposed in said pressure vessel and containing therein a plurality of fuel assemblies, an upper plenum over said core region, an upper core plate having therein a plurality of holes and defining said upper plenum and said core region, a fluid passage for cooling water through said core region and said upper plenum, and an emergency core cooling system, said emergency core cooling system comprising a plurality of flow passages mounted on said upper core plate and extending downwardly into said core region for allowing the cooling water on said upper core plate prevented from falling down from said upper core plate by rising steam generated by said fuel assemblies when a level of the cooling water in said core region is lowered at a cooling water loss accident to fall down into said core region thereby cooling said fuel assemblies with the cooling water disposed on said upper core plate, said flow passages each having an upper end open to said upper plenum containing the cooling water and a lower end reduced in flow passage area and open to one of an upper and middle region of said core region.

4,822,558

THIMBLE GUIDE EXTENDER FOR A NUCLEAR POWER PLANT

Daniel Merkovsky, Monroeville, and Edward J. Rusnica, Greensburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1987, Ser. No. 79,859

Int. Cl.[4] G21C *17/00*

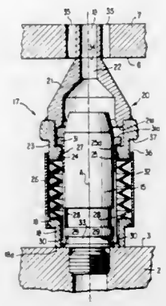
U.S. Cl. 376—347 **27 Claims**

1. An extender in combination with a thimble guide, and a lower core plate of a nuclear reactor; said extender having a longitudinal axis and being installed on and coaxially with said thimble guide mounted on said lower core plate of a nuclear reactor vessel and projecting toward and terminating at a distance from an underface of a bottom nozzle forming part of a fuel assembly and supported on a top face of said lower core plate, comprising

(a) a lower fitting surrounding said thimble guide at a bottom length portion thereof adjacent said top face of said lower core plate;

(b) an upper fitting being axially displaceable relative to the lower fitting and surrounding said thimble guide at a top length portion thereof; said upper fitting having an axial passage and a terminal opening defined by an outer annular radial face adapted to be in a face-to-face engagement with said underside of said bottom nozzle;

(c) an axially compressible, generally cylindrical resilient bellows arranged between said lower and upper fittings generally in axial alignment therewith and being sealingly secured thereto; said bellows being compressed to a greater or lesser degree by said lower and upper fittings dependent upon axial distances therebetween; in an in-



stalled state of said fuel assembly said bellows being compressed and urging said annular radial face of said upper fitting into a sealing contact with said underside of said bottom nozzle; and

(d) circumferential sealing means provided at said lower fitting and sealingly surrounding the thimble guide.

4,822,559

NUCLEAR FUEL ELEMENT

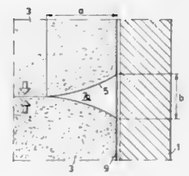
Hilding Mogard, Lidingo, Sweden, assignor to Studsvik Energiteknik AB, Sweden

Filed Sep. 10, 1987, Ser. No. 95,095

Claims priority, application Sweden, Sep. 15, 1986, 8603873

Int. Cl.[4] G21C *3/00*

U.S. Cl. 376—415 **19 Claims**



1. A nuclear fuel element for use in power-producing nuclear reactors, comprising a circular metal cladding tube containing sintered cylindrical oxide fuel pellets and an inert filler gas, the tube being formed internally with a substantially cylindrical inner surface having a plurality of longitudinal ribs forming axially extending channels and axial channel space volumes, the fuel pellets having chamfered endfaces creating toroidal space volumes at the adjoining ends of the fuel pellets, the ratio of the axial channel space volumes to toroidal space volumes including any dish volumes at the pellet end faces being substantially equal to or less than one (1).

4,822,560

COPPER ALLOY AND METHOD OF MANUFACTURING THE SAME

Yoshimasa Oyama; Masato Asai; Toru Tanigawa; Shigeo Shinozaki, all of Nikko, and Shoji Shiga, Utsunomiya, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1986, Ser. No. 916,694

Claims priority, applicatioo Japan, Oct. 10, 1985, 60-225559; Oct. 10, 1985, 60-225561; Oct. 10, 1985, 60-225560; Nov. 29, 1985, 60-268753; Apr. 10, 1986, 61-82746; Apr. 10, 1986, 61-82747; Apr. 10, 1986, 61-82745; Jun. 17, 1986, 61-141076

Int. Cl.[4] C22C *9/02*

U.S. Cl. 420—470 **26 Claims**

1. An alloy consisting essentially of 0.09 to 0.4 wt.% of Cr, 0.01 to 8 wt.% of Sn, 0.001 to 5 wt.% in total of at least one of 0.001 to 5 wt.% of Zn, 0.001 to 0.5 wt.% of Mn and 0.001 to 0.2 wt.% of Mg and the balance being Cu, and wherein the content of O_2 in said alloy is not more than 0.005 wt.%.

4,822,561

ALUMINUM BEARING ALLOY

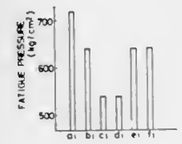
Soji Kamiya; Yuji Yokota; Tatsuhiko Fukuoka, and Yoshio Kumada, all of Aichi, Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Division of Ser. No. 908,433, Sep. 16, 1986, abandoned. This application Oct. 8, 1987, Ser. No. 105,645

Claims priority, application Japan, Sep. 17, 1985, 60-204679

Int. Cl.[4] C22C *21/00*

U.S. Cl. 420—530 **6 Claims**



1. An aluminum bearing alloy consisting essentially, by percentage by weight, of 3 to 20% of Sn, 0.1 to 1.2% of Mn, 0.2 to 2% of Cu, and the balance Al.

4,822,562

COPPER ALLOY EXCELLENT IN MIGRATION RESISTANCE

Motohisa Miyafuji, and Isao Hosokawa, both of Yamaguchi, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 13, 1986, Ser. No. 930,114

Claims priority, applicatioo Japan, Nov. 13, 1985, 60-254358; Dec. 9, 1985, 60-276233

Int. Cl.[4] C22C *9/04*

U.S. Cl. 420—472 **2 Claims**

1. A copper alloy excellent in migration resistance and spring limit property consisting essentially of from 0.05 to 0.15% by weight of Fe, from 0.02 to 0.05% by weight of P, from 1.1 to 4.5% by weight of Zn, from 1.0 to 2.5% by weight of Sn and the substantial balance of Cu and impurities.

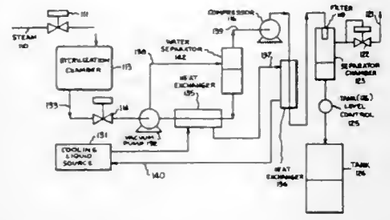
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4,822,563

METHOD FOR THE RECOVERY OF STERILANTS

Larry Joslyn, Macedon, N.Y., assignor to Joslyn Value Corporation, Macedon, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,333
The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
Int. Cl.[4] A61L 2/20
U.S. Cl. 422—31 10 Claims



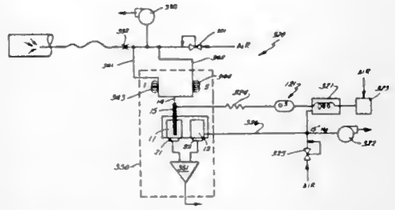
8. A method of recovering a chemical sterilant gas from a sterilizing chamber which comprises flushing the chamber with a substantially condensable, insert dilutent gas and selectively condensing the effluent dilutent gas to separate the sterilant gas from the dilutent.

4,822,564

CHEMILUMINESCENT GAS ANALYZER FOR MEASURING THE OXIDES OF NITROGEN

Charles P. Howard, Ann Arbor, Mich., assignor to Sensors, Inc., Saline, Mich.

Continuation-in-part of Ser. No. 751,215, Jul. 2, 1985, Pat. No. 4,657,744. This application Feb. 6, 1987, Ser. No. 12,077
Int. Cl.[4] G01N 21/76
U.S. Cl. 422—52 45 Claims



1. A gas analyzer for determining the concentration of an oxide of nitrogen in a sample gas comprising:
- a sample chamber;
- means for delivering a sample gas to said sample chamber, said sample gas containing an oxide of nitrogen;
- means for delivering ozone to said sample chamber for reading with said oxide of nitrogen and producing a chemiluminiscence;
- a sample photodiode mounted to receive light from said sample chamber and providing a sample signal representative of the concentration of said oxide of nitrogen in said sample gas; and
- means for holding said sample chamber and said sample photodiode at a constant temperature wherein a source of hot sample gas is analyzed and a sample gas line heat exchanger is provided comprising a pair of inner and outer concentric flexible lines extending from said source of hot sample gas to said analyzer, said sample gas passing through said inner line and effluent from said reference chamber passing through said outer line.

4,822,565

CARRIER DEVICE FOR IMMUNOLOGICAL ASSAY

Dora Köhler, Kreutzer Weg 11, D-1000 Berlin 45, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 710,123
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1984, 3416933
Int. Cl.[4] B01L 9/00; G01N 33/543, 33/548
U.S. Cl. 422—57 2 Claims



1. A device adapted for use with a multi-well plate with individual wells for performing immunological assays, said device comprising
- (a) a holding member,
- (b) a flexible carrier and
- (c) a plastic reinforcing structure; said flexible carrier and said plastic reinforcing structure being attached to said holding member;

said flexible carrier comprising a plurality of strips formed of nitrocellulose or nitrocellulose-like material having the absorption characteristics of nitrocellulose; said strips being arranged in comb-like, spaced fashion and being coated with antigens or antibodies and being capable of being immersed into individual wells of a multi-well plate;

said plastic reinforcing structure comprising a plurality of strips arranged in a comb-like, spaced fashion and being capable of being immersed into individual wells of a multi-well plate;

wherein each one of the plurality of flexible carrier strips is in a juxtaposed position relative to a plastic reinforcing strip but not completely bound thereto, so that both sides of the carrier strip will be contacted by the material in the wells and the plastic reinforcing strips will serve as a mechanical support.

4,822,566

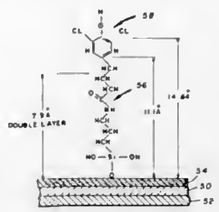
OPTIMIZED CAPACITIVE SENSOR FOR CHEMICAL ANALYSIS AND MEASUREMENT

Arnold L. Newman, Kensington, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 799,761, Nov. 19, 1985. This application May 18, 1987, Ser. No. 50,367
Int. Cl.[4] G01N 27/22
U.S. Cl. 422—68 16 Claims

1. A device for detecting the presence of an analyte in a fluid having an aqueous solvent, said device comprising:
- a sensing capacitor including:
  - a substrate having a first conductor and a second conductor spaced a distance from said first conductor,
  - an electrically insulating layer covering said first and second conductors, said electrically insulating layer defining a surface,
  - a binding agent selected from the group consisting of antigens, haptens, bioreceptors and antibodies capable of biospecifically binding with the analyte,
  - a linking molecule adapted for and covalently bonding said binding agent to said surface and extending said binding agent a distance from said surface to minimize

steric hindrance between the analyte and the surface; and,



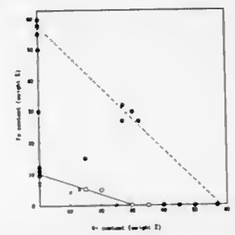
a circuit means, electrically coupled to said sensing capacitor, responsive to changes in capacitance between said first and second conductors.

4,822,567

ANTIBIOTIC ALLOYS

Isamu Kato, Toyonaka; Sadayuki Yuhda, Suita; Naoki Oda, Nishinomiya, and Masahiro Suganuma, Suita, all of Japan, assignors to Sankin Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1987, Ser. No. 113,908
Claims priority, application Japan, Nov. 7, 1986, 61-266438
Int. Cl.[4] C22C 38/10, 19/00, 30/00
U.S. Cl. 420—95 9 Claims



1. An antibiotic alloy adapted for orthodontic fittings and sanitary articles whose antibacterial properties result from the leaching of cobalt from the alloy, consisting essentially of: cobalt, iron and nickel in amounts within the confines of the relationships expressed below, and from 1.5 to 5% of Cr, from 2% to 5% of Cu, or combinations thereof, and the unavoidable impurities

$30\% \leqq 3.0Fe+Ni$

$Fe+Ni \leqq 58\%$

$Co \geqq 42\%$.

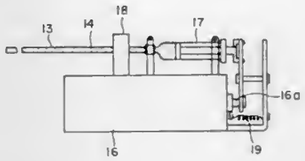
4,822,568

APPARATUS FOR MEASURING AGGREGATION RATE OF WHOLE BLOOD RED BLOOD CELLS

Minoru Tomita, 26 Minamisakamachi, Motojukucho, Okazaki City, Aichi Prefecture, Japan

Filed Jun. 16, 1986, Ser. No. 874,558
Claims priority, application Japan, Mar. 28, 1986, 61-070404
Int. Cl.[4] G01N 15/05
U.S. Cl. 422—73 6 Claims

1. An apparatus for measuring the aggregation rate of whole blood red blood cells, comprising:
- a tube through which blood can flow;
- means for varying flow rate of the blood in said tube;
- means, at one side of said tube, for transmitting light through the tube and the blood therein;
- means for detecting light from said light transmitting means after the light has been transmitted through the blood in the tube, and for producing signals representative of changes in optical density of the light so detected at different flow rates of the blood;
- means for receiving said signals to determine said aggregation rate;



said tube comprising a cubital vein in an extracorporeal circulatory system;

said detecting means comprising a light detector of a densitometer; and

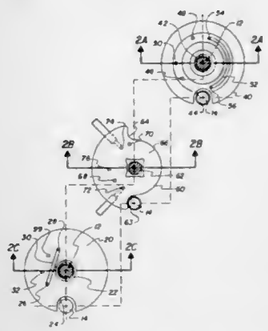
said densitometer being connected to a voltage comparator switch of a warning device.

4,822,569

ROTARY SHEAR VALVE WITH CLEANING FEATURE AND METHOD OF USING SAME

Ernest N. Pellegrino, Bridgeport, Conn., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Jun. 9, 1986, Ser. No. 872,336
Int. Cl.[4] G01N 1/00; B67D 5/00
U.S. Cl. 422—103 9 Claims



1. A rotary shear valve comprising a substantially disc-shaped front stator, a substantially disc-shaped rear stator and a rotor between and parallel to the front and rear stators, forming in a first rotary position a specimen pathway including a first normal passage through the rotor, and forming in a second rotary position a sample dispensing pathway including the first normal passage through the rotor, means for introducing specimens into the specimen pathway with the rotor in the first rotary position, and means for flushing fluid through the sample dispensing pathway when the rotor is in the second rotary position to withdraw an aliquot of specimen which is within the first normal passage;

wherein the rotary shear valve further comprises a first circumferentially-extending concave arced groove formed in the rear face of the front stator and a second circumferentially-extending concave arced groove formed in the front face of the rear stator, and the rotary shear valve further comprising means for introducing cleaning solution into the first and second circumferentially-extending concave arced grooves with the rotor in a third rotary position.

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each circumferentially-extending concave arced groove communicating in the third rotary position with a circumferentially-extending portion of a face of the rotor adjacent to the first normal passage, and

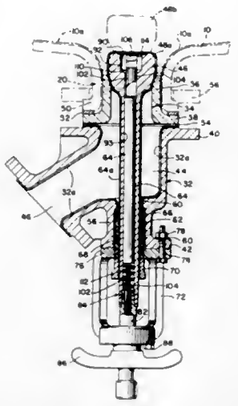
each circumferentially-extending concave arced groove being distal from the first normal passage in the first and second rotary positions.

4,822,570

THERMAL SENSING APPARATUS IN OUTLET NOZZLE

Michael J. Lerman, Edison, N.J., and Jean M. Hamert, Hoenheim, France, assignors to De Dietrich (USA), Inc., Union, N.J.

Filed Dec. 1, 1986, Ser. No. 936,557
Int. Cl.[4] G01N *25/00*
U.S. Cl. 422—119 7 Claims



1. A valve for disposition within an outlet nozzle disposed in a lowermost portion of a reaction vessel, comprising:

a valve seat adapted to be mounted in an outlet nozzle;

a metallic valve member, comprising a valve head and a valve stem;

means for moving said valve member generally vertically with respect to said valve seat, to open and close said valve;

a disc of metallic heat conductive material not more than about 2 mm thick assembled to and forming an outer surface of the valve head;

a socket for receiving a temperature sensing element formed within said valve head and sealed from the interior of the vessel by said disc,

said valve head and said disc having a coating comprising a glass material, and

a sensing element disposed in said socket and in efficient thermally conductive relation with an inside surface of said disc.

4,822,571

METERING MECHANISM FOR A SWIMMING POOL CHEMICAL DISPENSER

Donald Nicholson, Canoga Park, and Robert Nordmyer, Woodland Hills, both of Calif., assignors to Aquaity, Inc., Chatsworth, Calif.

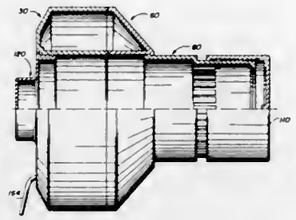
Filed Oct. 5, 1987, Ser. No. 104,287
Int. Cl.[4] B01D *12/00*
U.S. Cl. 422—119 17 Claims

1. A floating swimming pool chemical dispenser having an improved metering mechanism for selecting and controlling the rate at which a chemical is dispensed into the swimming pool, comprising:

a float assembly containing therein a sealed, waterproof compartment for providing buoyancy to support said dispenser in a swimming pool;

an essentially cylindrical metering valve body supported by said float assembly, said metering valve body having a plurality of longitudinally extending apertures located around at least a portion of the circumference thereof the walls defining said apertures each defining a first camming surface, said metering valve body having a threaded portion thereof;

a metering valve cap haivng a threaded portion for engagement with the threaded portion of said metering valve body to said metering cap when rotated with respect to said metering valve body moving longitudinally on said metering valve body to selectively open or close said



longitudinally extending apertures on said metering valve body; and

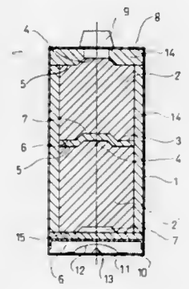
means for preventing unintentional rotational movement of said metering valve cap with respect to said metering valve body, said preventing means comprising a plurality of radially extending tabs located on said metering valve cap at the top thereof the surface of said tabs each defining a second camming surface thereon, said tabs being arranged and configured to fit into said longitudinally extending apertures when the top of said metering valve cap partially or completely closes said longitudinally extending apertures, said first and second camming surfaces providing a resistance to rotational motion of said metering valve cap with respect to said metering valve body requiring a minimal force to overcome said resistance.

4,822,572

CHEMICAL OXYGEN GENERATOR

Carl E. van der Smissen, Lubeck; Rainer Ernst, Curau, and Wolfgang Eckstein, Sereetz, all of Fed. Rep. of Germany, assignors to Draegerwerk AG, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,606
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422021; Dec. 20, 1984, 3446550
Int. Cl.[4] C01B *13/02*
U.S. Cl. 422—126 10 Claims



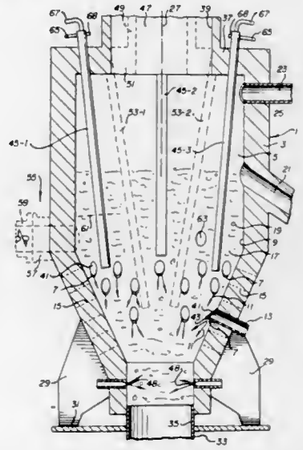
1. A chemical oxygen generator, comprising a canister having a hollow interior, a plurality of adjacent oxygen releasing single candles disposed in said hollow interior in succession, an incandescence element positioned between and abutting against adjacent candles for transmitting burning from one candle to another and for holding said candles in a shockproof manner, said incandescence element substantially covering the adjacent end faces of adjacent ones of said candles, ignition means adjacent an end of said plurality of adjacent oxygen releasing single candles for igniting and burning the first one of said candles and thereafter its adjacent incandescence element, successive candles being ignited by an associated one of said incancescent elements, and an outlet connected to said hollow interior for the discharge of the generated oxygen.

4,822,573

FLUIDIZED-BED REACTOR

Hinrich Timmann, Hamburg, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 33,392
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1985, 3523653
Int. Cl.[4] F27B *15/10*
U.S. Cl. 422—143 9 Claims



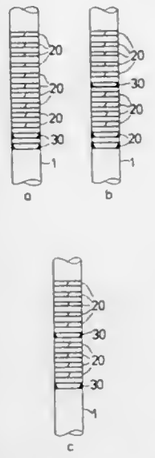
1. Fluidized-bed reactor for the pyrolytic treatment of wastes containing hydrocarbons and high content of polymeric organic substances, comprising a circumferential wall (3) having an inner surface (9) and an interior (5) with a conical lower section and an expanded cylindrical upper section, a side feed device (55) for laterally feeding starting material, and a lower discharge branch (33) for discharging non-pyrolyzable large pieces of residual consitiuents, fluidizing-gas feed pipes (13) having ends with lower circumferential sections (43) protruding directly from said inner surface (9) of said circumferential wall (3) into said conical lower section, covering walls (41) covering said ends of said fluidizing-gas feed pipes (13) and extending obliquely downwardly and inwardly, blow orifices (7) each being disposed at a respective one of said lower circumferential sections (43) and having an obliquely downward and inward blow direction (11) for blowing fluidizing-gas into a fluidized-bed material (19) in said interior (5), and heating pipes (45-1, 45-2, 45-3, 53-1, 53-2) for heating with heating gas dipping vertically from above through said expanded cylindrical upper section of said interior (5), said heating pipes (45-1, 45-2, 45-3, 53-1, 53-2,) having connections (65, 67, 68) for heating gas, combustion air and exhaust gas.

4,822,574

GAS SUSPENSION REACTOR

Jorn Tonborg, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Copenhagen, Denmark

Continuation of Ser. No. 879,159, Jun. 26, 1986, abandoned.
This application Oct. 29, 1987, Ser. No. 115,570
Claims priority, application United Kingdom, Jul. 9, 1985, 8517335
Int. Cl.[4] B01J *8/08;* F27B *15/00*
U.S. Cl. 422—228 6 Claims



1. A gas suspension reactor comprising a substantially cylindrical vessel having substantially cylindrical side walls defining an inner diameter and mounted with the longitudinal axis thereof substantially vertical, said reactor having at least one predetermined section within the cylindrical vessel defined by the side walls and only a port of the vertical length of the side walls of the vessel, a downwardly and inwardly sloping bottom wall, means for introducing granular material to be treated and fuel into said vessel adjacent to said bottom wall, means for introducing a gas into said vessel centrally up through said bottom wall for reaction with said material, for burning out said fuel and for suspension of said material, and means for withdrawing said gas and said material from an upper portion of the reactor; wherein interspersed at invervals along the vertical length of said vessel there are first means mounted on and projecting inwardly from the vessel side walls for making said gas rotate about said longitudinal axis whereby said gas follows an upward helical path and at least a portion of the material entrained in said gas is passed radially outwardly toward the side walls and thereafter down along the side walls, and second means mounted on and projecting inwardly from the vessel side walls in said at least one predetermined section for causing material falling down along the side walls of said vessel to be displaced inwardly towards said longitudinal axis, said first means being so positioned as to cause at least a portion of said material to be passed radially outwardly toward the side walls of said vessel about said at least one predetermined section and thereafter down along said side walls to said second means, and said section means being so positioned as to cause the material falling down said side walls to be displaced inwardly so as to be entrained in said gas whereby concentration and retention time of the material within the reactor is varied in a controlled manner throughout the vertical length of the vessel by increasing the material concentration and retention time within said at least one predetermined section as compared to the concentration and retention time in other portions of the reactor not having the second means mounted therein.

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4,822,575

PROCESS FOR THE PURIFICATION OF ZIRCONIUM COMPOUNDS

Kian F. Ngian, Lower Templestowe; Angus J. Hartshorn, Pasoo-eVale, and David H. Jenkins, East Bentleigh, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

PCT No. PCT/AU86/00109, § 371 Date Jan. 2, 1987, § 102(e) Date Jan. 2, 1987, PCT Pub. No. WO86/06362, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 22, 1986, Ser. No. 10,190
Claims priority, application Australia, May 2, 1985, PH0405
Int. Cl.[4] C01G *25/00, 25/06*
U.S. Cl. 423—82 10 Claims

1. A process for the preparation of zirconium compositions which on calcination form zirconia, which process comprises:
preparing an aqueous zirconium sulphate solution of pH not greater than zero;
adding an ammonia source to said zirconium sulphate solution until the pH of said solution is in the range of from 0.1 to 2.5 whereby crystalline ammonium zirconium sulfate is precipitated; and
collecting the thus precipitated crystalline ammonium zirconium sulfate, by separating the same from the remaining solution, said separated sulfate being suitable for calcining to provide zirconia.

4,822,576

REMOVAL OF HYDROGEN SULFIDE FROM A CARBON DIOXIDE CONTAINING GAS MIXTURE

Humbert H. Chu, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 27, 1987, Ser. No. 114,165
Int. Cl.[4] B01D *53/14*
U.S. Cl. 423—228 7 Claims

1. A process for the removal of hydrogen sulfide from a gas mixture comprising at least 80% v of carbon dioxide which comprises (a) contacting the gas mixture with an aliphatic tertiary amine or an aqueous solution thereof as an absorbent for hydrogen sulfide: (b) regenerating the loaded absorbent to remove substantially all of the hydrogen sulfide and most of the carbon dioxide to provide a lean absorbent containing carbon dioxide in an amount of from 0.2% w to 2% w; and (c) recycling the lean absorbent to the contacting step (a).

4,822,577

METHOD FOR THE REDUCTION OF SULFUR TRIOXIDE IN AN EFFLUENT

William R. Epperly, New Canaan; James C. Sullivan, Norwalk, and Barry N. Sprague, West Haven, all of Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Filed Jul. 14, 1988, Ser. No. 219,297
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—243 15 Claims

1. A method for the selective reduction of sulfur trioxide in the effluent from the combustion of a carbonaceous fuel, the method comprising introducing a treatment agent comprising hydrogen peroxide or an oxygenated hydrocarbon having at least two carbon atoms into the effluent at an effluent temperature of between about 1000° F. and about 1450° F.

4,822,578

REMOVAL OF HYDROCARBON IMPURITIES FROM NATURAL GAS-DERIVED METHANE AND/OR ETHANE

Paul J. Busse, and Douglas B. Taggart, both of Omaha, Nebr., assignors to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Dec. 17, 1984, Ser. No. 682,557
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—245.3 2 Claims

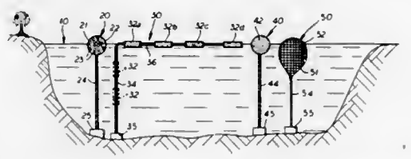
1. A method for the purification of methane, ethane and mixtures thereof which comprises:
(a) first oxidizing the C_{3+} hydrocarbon impurities in the gas with oxygen at 175° C. to 375° C. in the presence of a catalyst which contains silver as the active component, and
(b) then oxidizing the ethane in the gas with oxygen at 175° C. to 375° C. in the presence of a catalyst which contains silver as the active component.

4,822,579

DEVICE FOR THE DEACIDIFICATION OF WATER

Herbert H. Wagner, Augsburg, Fed. Rep. of Germany, assignor to Deutsche Perlite GmbH, Dortmund, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,333
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1986, 3630538
Int. Cl.[4] C02F *1/66*
U.S. Cl. 422—263 13 Claims



1. A solid body for the deacidification of water by neutralizing the water with an agent which is alkali-reactive in aqueous medium, said solid body having a specific gravity enabling it to float autonomously in the water and consisting essentially of water glass which has been made floatable by the formation of said water glass into a porous solid body to achieve a specific gravity of the body of 1 or less and has been made to dissolve slowly in said water to deacidfy said water.

4,822,580

PRODUCTION OF STANNOUS SALTS

Jean-Yves Chane-Ching, and Jean-Yves Dumoussean, both of Paris, France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevole, France

Continuation of Ser. No. 884,915, Jul. 14, 1986, abandoned. This application Apr. 5, 1988, Ser. No. 178,891
Claims priority, application France, Jul. 12, 1985, 85 10709
Int. Cl.[4] C01B *35/06, 17/96*
U.S. Cl. 423—293 20 Claims

1. A process for the preparation of a stannous salt of a non-oxidizing anionic acid, comprising reacting metallic tin with a solution of a non-oxidizing anionic acid in the presence of a plurality of catalyst particles which increase the reaction rate compared to a non-catalyzed reaction, said catalyst particles providing hydrogen release at low overvoltage, wherein the anion formed by said anionic acid comprises a halogen ion, fluoborate ion or sulfate ion, and wherein said catalyst particles comprise platinum, palladium or ruthenium.

4,822,581

CATENATED PHOSPHORUS MATERIALS AND THEIR PREPARATION

Christian G. Michel, Ossining; Rozalie Schachter, New York, both of N.Y.; Mark A. Kuck, Upper Montclair, N.J.; John A. Baumann, Dobbs Ferry, N.Y., and Paul M. Raccah, Chicago, Ill., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 442,208, Nov. 16, 1982, Pat. No. 4,508,931, which is a continuation-in-part of Ser. No. 335,706, Dec. 30, 1981, abandoned, and a continuation-in-part of Ser. No. 419,537, Sep. 17, 1982, Pat. No. 4,620,968. This application Dec. 4, 1984, Ser. No. 677,845
Int. Cl.[4] C01B *25/08*
U.S. Cl. 423—302 27 Claims

1. A phosphorus material formed as the deposition product of vapor transport from separated heated sources of phosphorus vapor and the vapor of one or more metals, each of said sources held at a high temperature, said product being deposited in a deposition zone located between said sources, said deposition zone being held at a substantially lower temperature than said sources, and the atomic ratio of phosphrous to metal in said product being greater than 15.

4,822,582

PROCESS FOR THE REMOVAL OF HEAVY METALS FROM ACID, PHOSPHATE-CONTAINING, AQUEOUS MEDIA

Cornelis A. M. Weterings, Stein, and Johannes A. Janssen, Schinveld, both of Netherlands, assignors to Stamicarbon B.V., Netherlands

Filed Jul. 2, 1987, Ser. No. 69,512
Claims priority, application Netherlands, Jul. 15, 1986, 8601846
Int. Cl.[4] C01B *25/16*
U.S. Cl. 423—321 R 8 Claims

1. A process for the removal of heavy metals from an acid, phosphate-containing, liquid medium, in which process a precipitate containing heavy metals is formed and is subsequently separated, which comprises adding at least one of the following additives (a) sulphate ions and (b) calcium ions to the phosphate-containing, liquid medium under such conditions that a calcium sulphate anhydride-containing precipitate containing heavy metals is formed, wherein the amount of calcium or sulphate ions to be added and the temperature during precipitation are chosen such as to result in conditions corresponding to area II or III of FIG. 1.

4,822,583

PHOSPHATE FEED MATERIAL FOR PHOSPHORUS ELECTRIC FURNACES AND PRODUCTION OF SAME

Joseph H. Finley, Metuchen, N.J.; Lewis L. Hammermeister, Pocatello, Id., and Jared S. Sproul, Belle Mead, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Aug. 17, 1987, Ser. No. 86,014
Int. Cl.[4] C01B *25/01*
U.S. Cl. 423—322 7 Claims

1. In the production of elemental phosphorus wherein a feed stream of suitably sized calcined phosphate ore from a calcining zone is charged into a phosphorus reduction furnace and calcined phosphate ore fines recovered from the calcining zone, the improvement of utilizing the recovered calcined fines as an added source of phosphorus comprising the steps:
1. forming a homogeneous mixture of the fines with phosphoric acid binder;
2. compacting the mixture into green shaped articles,
3. curing the green shaped articles to increase their crush strength, and
4. introducing the cured shaped articles into the furnace for reduction to elemental phosphorus.

4,822,584

PROCESS FOR OBTAINING PHOSPHORUS FROM AQUEOUS SUSPENSION OF PHOSPHORUS SLIME

Murat Z. Zhurinov; Kappas Kusaiynov, both of Karaganda; Tlenbai M. Alzhanov, Alma-Ata; Zhanaly S. Bekturganov, Karaganda; Abduali Baeshov, Karaganda; Asyk-At Z. Zhagufarov, Karaganda; Kanat S. Ibishev, Karaganda; Mukan D. Atabaev, and Klim A. Kim, both of Dzhambul, all of U.S.S.R., assignors to Institute Organitcheskogo Sinteza I Uglekhimii An Kaz SSR, Karaganda, U.S.S.R.

Continuation of Ser. No. 944,932, Dec. 22, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 153,496
Int. Cl.[4] C01B *25/01, 25/04*
U.S. Cl. 423—322 5 Claims

1. A process for recovering phosphorus from an aqueous phosphorus slime which comprises:
providing phosphorus slime in a treating zone at a temperature above the melting point of phosphorus; passing at least one direct current electric discharge through the phosphorus slime, to provide 20 to 180 Joules of energy per Kilogram of slime whereby phosphorus is separated from the slime; and recovering the separated phosphorus

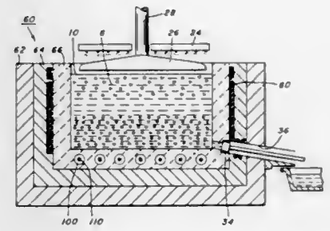
4. A process for recovering phosphorus from an aqueous phosphorus slime which comprises:
providing phosphorus slime in a treating zone at a temperature above the melting point of phosphorus; applying an alternating current electric field of from 85 to 250 watts to the phosphorus slime in the treating zone, whereby the phosphorus separates from the slime; and recovering the separated phosphorus.

4,822,585

SILICON PURIFICATION METHOD USING COPPER OR COPPER-ALUMINUM SOLVENT METAL

Robert K. Dawless, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 5, 1982, Ser. No. 374,931
Int. Cl.[4] B01D *9/00*
U.S. Cl. 423—348 15 Claims

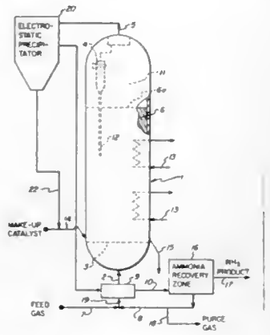


1. A method for providing a bed of purified silicon crystals wherein silicon is crystallized from a solvent metal and the amount of solvent metal remaining in the crystal bed is reduced to a low level, the method comprising the steps of:
(a) providing a molten body containing silicon and a metal selected from the group of copper and aluminum-copper, the silicon being present in an amount greater than the eutectic point of the silicon-metal combination, the metal adapted to act as a solvent for the silicon;
(b) extracting heat from the body to provide a solid phase containing silicon in crystal form and to concentrate impurities in a molten phase;
(c) thereafter, removing a substantial part of the molten phase from the solid phase containing said silicon crystals;
(d) subjecting the solid phase to a melting action to melt at least a fraction of the solid phase for purposes of removing a substantial amount of metal-silicon combination adhering to said crystals; and

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(c) separating at least a fraction of the melted material from said cryttals of silicon.

4,822,586
AMMONIA SYNTHESIS METHOD
Cornelius E. Shannahan, 1 Hilltop Clr., Chappaqua, N.Y. 10514
Continuation-in-part of Ser. No. 8,776, Jan. 30, 1987, which is a continuation-in-part of Ser. No. 866,203, May 21, 1986. This application Aug. 9, 1988, Ser. No. 230,312
Int. Cl.[4] C01C *1/04*
U.S. Cl. 423—359 19 Claims



1. A process for producing ammonia, comprising:
(a) contacting a synthesis gas mixture comprising hydrogen and nitrogen with a mass of solid, particulate ammonia synthesis catalyst under conditions to fluidize the mass of catalyst, and maintaining the catalyst mass in a fluidized state by a fluidization step consisting essentially of controlling the volumetric hourly flow rate of gas through the fluidized mass, and the pressure within the reaction zone;
(b) passing the synthesis gas through a reaction zone in contact with the fluidized catalyst mass;
(c) maintaining the reaction zone at an elevated temperature and at a pressure of from about 20 to 100 atmospheres to therein react hydrogen with nitrogen to form ammonia and provide a reacted synthesis gas stream; and
(d) flowing the reacted synthesis gas stream from the reaction zone to an ammonia recovery zone and therein recovering from the reacted synthesis gas stream ammonia produced in the reaction zone to provide an ammonia product and an ammonia-depleted gas.

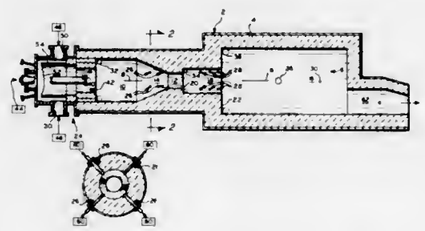
4,822,587
HIGH MODULUS PITCH-BASED CARBON FIBER AND METHOD FOR PREPARING SAME
Takashi Hino, Tokorozawa; Tsutomu Naito, Saitama; Hiroyuki Kuroda, Omiya; Eiki Tsushima, Saitama, and Tomio Nomura, Higashimatsuyama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 1, 1987, Ser. No. 45,835
Claims priority, application Japan, May 2, 1986, 61-101098; Sep. 24, 1986, 61-223789
Int. Cl.[4] D01F *9/12*
U.S. Cl. 423—447.1 19 Claims

1. A pitch-based carbon fiber having a Young's modulus of at least 700GPa in which the fiber is made from a carbonaceous pitch composed of more than 90% of optically anisotropic components and comprises an inner portion and an outer layer portion thereof, the inner portion of the fiber having an average size of crystallites at least 10% larger than that of the outer



layer portion, the thickness of the outer portion of the fiber being in the range of 1–3 μm.

4,822,588
PROCESS FOR PRODUCING CARBON BLACK
Mark L. Gravley, and E. Webb Henderson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jul. 26, 1985, Ser. No. 759,376
Int. Cl.[4] C01B *31/02*; C09C *1/48*
U.S. Cl. 423—450 10 Claims

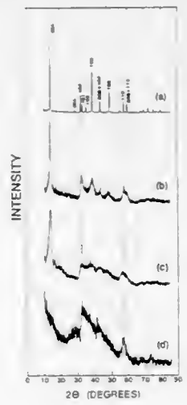


1. A process for producing carbon black in a reaction flow passage having an upstream end, a converging zone, a reactor throat, a reaction zone, a quench zone, and a downstream end, said process comprising:
(a) combusting a hydrocarbon fuel with excess amounts of oxygen-containing gas to form a mass of hot combustion gases containing free oxygen and flowing generally axially from the upstream end toward the downstream end of the reaction flow passage;
(b) flowing the mass of hot combustion gases through the converging zone;
(c) introducing a carbonaceous feedstock generally radially inwardly into the hot combustion gases at a position from the periphery of the converging zone to form a first reaction mixture;
(d) flowing the first reaction mixture through the reactor throat, wherein the reactor throat has a radius and a diameter of two times the radius, past a first abrupt expansion in the reaction flow passage at a downstream end of the reactor throat, and into an upstream end of the reaction zone, said first abrupt expansion connecting the reactor throat with the reaction zone;
(e) introducing additional carbonaceous feedstock generally radially inwardly into the reaction mixture at a position from the periphery of the reaction zone to form a second reaction mixture; and
(f) flowing the second reaction mixture past a second abrupt expansion in the reaction flow passage at a downstream end of the reaction zone and into a quench zone having a sufficiently large diameter and length to provide for the formation of carbon black.

4,822,589
MANUFACTURING PROCESS OF CHLORINE
Tadamitsu Kiyoura, Kawasaki; Yasuo Kogure, Yokosuka; Tokio Nagayama, Yokohama, and Kazuo Kanaya, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
PCT No. PCT/JP87/00418, § 371 Date Jan. 26, 1988, § 102(e) Date Jan. 26, 1988, PCT Pub. No. WO88/00171, PCT Pub. Date Jan. 14, 1988
PCT Filed Jun. 25, 1987, Ser. No. 148,508
Claims priority, application Japan, Jun. 26, 1986, 61-148055
Int. Cl.[4] C01B *7/04*
U.S. Cl. 423—502 7 Claims

1. A manufacturing process of chlorine which comprises oxidizing hydrogen chloride with molecular oxygen in the presence of a chromic oxide catalyst, which has a microcrystal size of from 200 to 500 Å, and which is obtained by supporting chromic oxide in an amount of from 20 to 90 wt. % as chromia on a silicon oxide carrier having a pore volume in the range of from 0.3 to 1.8 cc/g and conducting a heat treatment at a temperature of from 450° to 700° C.

4,822,590
FORMS OF TRANSITION METAL DICHALCOGENIDES
S. Roy Morrison, Burnaby; Robert F. Frindt, Vancouver; Per Joensen, Coquitlam; Michael A. Gee, Vancouver, and Bijan K. Miremadi, Coquitlam, all of Canada, assignors to Simon Fraser University, Burnaby, Canada
Filed Apr. 23, 1986, Ser. No. 855,517
Int. Cl.[4] C10B *17/20*; C01G *35/00, 39/06, 41/00*
U.S. Cl. 423—561.1 19 Claims

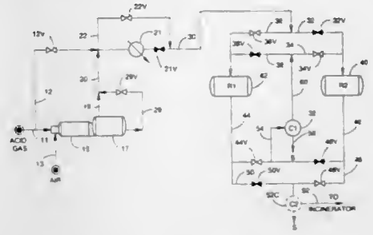


1. An exfoliation process for preparing a single layer substance of the form

MX_2

wherein MX_2 is a layer type transition metal dichalcogenide selected from the group consisting of MoS_2, TaS_2, WS_2, which comprises:
(a) intercalating multi-layer MX_2 with an alkali metal in a dry environment for sufficient time to enable the alkali metal to substantially intercalate the layers of the MX_2; and
(b) immersing the alkali metal intercalated MX_2 in a liquid that generates a gas upon reaction with the alkali metal to thereby with suitable agitation cause the layers of MX_2 to separate.

4,822,591
TWO-REACTOR, HIGH-RECOVERY SULFUR PLANT AND PROCESS
Robert L. Reed, Houston, Tex., and John W. Palm, Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.
Filed Sep. 7, 1984, Ser. No. 648,545
Int. Cl.[4] C01B *17/04*
U.S. Cl. 423—574 R 17 Claims



1. Process for the recovery of sulfur
wherein an acid gas feedstream comprising hydrogen sulfide is processed for the recovery of sulfur in a Claus process sulfur recovery plant comprising a Claus thermal reaction zone and two and only two Claus catalytic reaction zones, the acid gas being passed successively through the Claus thermal reaction zone, a first position Claus catalytic reaction zone, and a second position Claus catalytic reaction zone, the first position Claus catalytic zone being maintained in the range of from above about the sulfur condensation point to about 700° F., except for preconditioning as hereinafter set forth, and the second Claus catalytic reaction zone being maintained under conditions effective for forming and depositing a preponderance of the thus formed elemental sulfur on the catalyst therein, the process comprising:
(a) passing the acid gas feedstream successively through the thermal reaction zone, the first position Claus catalytic reaction zone, and the second position Claus catalytic reaction zone for the recovery of sulfur;
(b) preconditioning the first position Claus catalytic reaction zone by introducing thereinto a cold stream having an inlet temperature effective for condensing sulfur on at least a portion of the catalyst and passing the resulting stream through a remaining substantial portion of the catalyst, the cold stream thus used for preconditioning being produced by cooling acid gas feedstream effluent from the thermal reaction zone to the first position catalytic reaction zone to said temperature; and
(c) switching the thus preconditioned Claus catalytic reaction zone in the first position into the second position and continuing cooling the thus preconditioned freshly regenerated reactor in the second position concurrently with forming and depositing sulfur on catalyst therein, and switching the Claus catalytic reaction zone in the second position into the first position and continuing the process according to (a), (b), and (c).

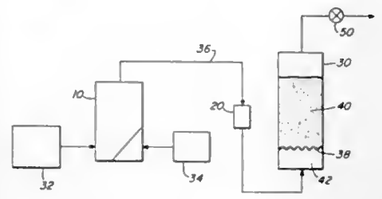
4,822,592
PRODUCING ALPHA ALUMINA PARTICLES WITH PRESSURIZED ACIDIC STEAM
Chanakya Misra, Plum Borough, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 11,247, Feb. 5, 1987, abandoned. This application Feb. 8, 1988, Ser. No. 153,419
Int. Cl.[4] C01F *7/02*
U.S. Cl. 423—627 18 Claims

1. A process for producing alpha alumina particles having crystallite size below about 1 micron, said process comprising:
(a) providing particles of alumina having less than about 25

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wt % alpha alumina content and an average particle size of about 1–20 microns,

(b) fluidizing the alumina particles in a reactor with a fluidizing gas comprising principally steam having a pH of about 3–6, and



(c) maintaining the alumina particles in said reactor at a temperature of about 380°–600° C. and a steam pressure of at least about 1000 psig for a sufficient time to obtain particles comprising predominantly alpha alumina and having an average crystallite size of less than about 1 micron.

4,822,593

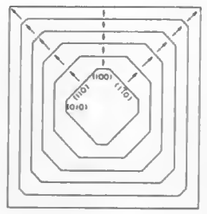
CONTROL OF FORM OF CRYSTAL PRECIPITATION OF ALUMINUM HYDROXIDE USING COSOLVENTS AND VARYING CAUSTIC CONCENTRATION

Richard B. Wilhelmy, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 940,354, Dec. 11, 1986. This application Mar. 6, 1987, Ser. No. 22,735

Int. Cl.⁴ C01F *7/02*

U.S. Cl. 423—629 **25 Claims**



1. Generally spherical aluminum hydroxide particles, each of said particles comprised of a plurality of aluminum hydroxide crystals extending radially outwardly from a central core region of said particle, each of said crystals having a shape selected from the class consisting of lamellar and acicular.

4,822,594

CONTRAST ENHANCING AGENTS FOR MAGNETIC RESONANCE IMAGES

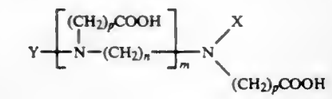
Wendell A. Gibby, 7025 N. Via Assisi, Tucson, Ariz. 85704

Filed Jan. 27, 1987, Ser. No. 7,289

Int. Cl.⁴ A61K *49/00;* **A61B** *6/00;* **C08B** *37/02*

U.S. Cl. 424—9 **12 Claims**

1. A chelating agent represented by the formula:



where

m is 1, 2, or 3;

n is an interger between 1 and 4;

p can be independently varied and is an integer between 0 and 2; and

X and Y can be $-(CH_2)_pCOOH$ or X is $(CH_2)_n$ and joined to Y;

at least one saccharide is bound to said chelating agent through an ester linkages of one of said (COOH) groups and (OH) groups of the saccharide.

4,822,595

HOOF LOTION

Lyal S. Corliss, and James W. Nielsen, both of P.O. Box 6669, Brookings, Oreg. 97415

Filed Aug. 19, 1986, Ser. No. 897,995

Int. Cl.⁴ A61K *7/04, 33/40, 33/34, 33/18*

U.S. Cl. 424—61 **1 Claim**

1. A composition exhibiting optimum effectiveness as a preventive or healing agent for animals with ungulates comprising on a weight basis linseed oil as a dispersing agent at 0.5585 percent; lanolin as a moisturizer at 0.0332 percent; turpentine as a drying agent at 0.2695 per cent; tincture of iodine at 0.0332 percent; pine tar as a sticking agent at 0.0703 per cent; hydrogen peroxide as an antibacterial agent at 0.03 percent and copper sulphate as a fungicidal agent at 0.0053 percent; 100 pound quantity of the composition is produced by heating 0.5585 pounds of linseed oil in a container to a temperature of 200° F. and combining 0.0332 pounds of lanolin; when the temperature drops to 150° F., 0.0703 pounds of pine tar, 0.0332 pounds of iodine and 0.2695 pounds of turpentine are combined, 0.030 pounds of hydrogen peroxide is combined when the temperature falls to 120° F. and 0.0053 pounds of copper sulphate is combined and when the temperature falls to 95° F., the said composition is ready to be added to a spray bottle to spray on and into ungulates.

4,822,596

SKIN COMPOSITION

Martin Callingham; Dwaipayan Chaudhuri, both of London; Kenneth V. Curry, Camberley; Barry G. Pike, Wokingham, and Michael B. Taylor, Old Headington, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 288,084, Jul. 29, 1981, Pat. No. 4,743,440, which is a continuation of Ser. No. 33,581, Apr. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 930,780, Aug. 2, 1978, abandoned, which is a continuation of Ser. No. 842,769, Oct. 17, 1977, abandoned, which is a continuation of Ser. No. 520,124, Nov. 1, 1974, abandoned. This application Nov. 6, 1985, Ser. No. 795,582

Claims priority, application United Kingdom, Nov. 8, 1973, 51815/73

The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.

Int. Cl.⁴ A61K *7/32, 7/34, 7/38, 9/12*

U.S. Cl. 424—46 **18 Claims**

1. A substantially non-aqueous fluid antiperspirant composition consisting essentially of a solid phase and a non-aqueous liquid phase for dispensing as a spray onto the human skin to provide a non-toxic, nonirritant, dry-to-the-touch, non-sticky deposit,

the solid phase of the composition comprising from about 1% to about 95% by weight of a moisture-absorbent organic polymer in particulate form, and

the non-aqueous liquid phase of the composition comprising

(a) from 1% to about 99% by weight of a liquefied propellant to produce an aerosol spray; and

(b) from 0% to about 99% by weight of a carrier, other than a propellant, for the organic polymer,

the organic polymer being characterized by its capacity for absorbing an amount of moisture at least equal to about 10 times its own weight after deposition of the composition onto the skin, and the amount of said polymer ranging from 1% to about 95% by weight of the total antiperspirant composition.

4,822,597

ANESTHETIC-CONTAINING CHEWING GUM COMPOSITIONS

Steven M. Faust, Stanhope, and Subraman R. Cherukuri, Towaco, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 13, 1987, Ser. No. 72,304

Int. Cl.⁴ A61K *9/68;* **A23G** *3/30*

U.S. Cl. 424—48 **11 Claims**

1. A palatable chewing gum composition capable of providing an anesthetic effect to the mouth and throat areas through the simultaneous release of a local anesthetic and a sweetener, said composition by weight of total composition, consisting essentially of:

(a) about 16 to about 30% gum base;

(b) about 0.5% to about 3% flavor; and

(c) a premixture of sweetener and anesthetic, said premixture comprising about 50 to about 80% sweetener admixed with an anesthetic in an amount of from about 0.05 to about 0.5% by weight of the total gum composition which is sufficient to produce an anesthetic effect in the mouth and throat areas upon chewing of the composition.

4,822,598

COSMETIC AGENT ON THE BASIS OF QUATERNARY CHITOSAN DERIVATIVES, NOVEL QUATERNARY CHITOSAN DERIVATIVES AS WELL AS PROCESSES FOR MAKING SAME

Günther Lang, Reinheim; Harald Wendel, Ober-Ramstadt, and Eugen Konrad, Darmstadt, all of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP83/00287, § 371 Date Jul. 20, 1984, § 102(e) Date Jul. 20, 1984, PCT Pub. No. WO84/02343, PCT Pub. Date Jun. 21, 1984

PCT Filed Nov. 3, 1983, Ser. No. 634,100

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245784

The portion of the term of this patent subsequent to Nov. 14, 2005, has been disclaimed.

Int. Cl.⁴ A61K *7/06, 7/09, 7/13;* **C08B** *37/08*

U.S. Cl. 424—47 **15 Claims**

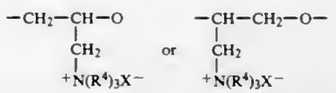
1. A cosmetic composition for the treatment of hair or skin, characterized in that the active ingredient is a quaternary macromolecular polymer compound derived from chitosan having the formula

$$HO[C_6H_{11-m}NO_4(R^1)_m(R^2)_n(R^3)_q]_pH,$$

wherein m denotes any given numerical value from 0 to 0.5, n denotes any given numerical value from 0 to 6, q is a given numerical value from 0.005 to 3.0, p denotes a whole number from 10 to 50,000, R′ is an acetyl residue, R^2 represents a bivalent residue of the formula $-CH_2CH(OH)-CH_2-O-$,



and R^3 is a bivalent residue of the formula



wherein $R^4 = C_1$ to C_4 alkyl and X = Cl, Br, I or CH_3SO_4, in a cosmetic carrier selected from the group consisting of water, an alcohol, an aqueous-alcoholic solution, a cream, a gel and an emulsion.

4,822,599

ORAL COMPOSITIONS

Sekhar Mitra, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 26, 1987, Ser. No. 89,379

Int. Cl.⁴ A61K *7/18, 7/16*

U.S. Cl. 424—52 **7 Claims**

1. A method for reducing natural stain on teeth comprising brushing the teeth with a toothpaste comprising:

(a) from about 10% to about 70% by weight of a dental abrasive compatible with pyrophosphate ions and fluoride ions;

(b) an amount of a fluoride ion source sufficient to supply from about 50 ppm to about 3,500 ppm of fluoride ions;

(c) an amount of at least one soluble pyrophosphate source sufficient to provide at least about 1.0% $(P_2O_7)^{-4}$; and

(d) from about 10% to about 95% water; wherein the pH of said composition is from about 6.0 to about 10.0.

4,822,600

INFRARED BLOCKER

Mitchell S. Wortzman, Los Angeles, Calif., assignor to Neutrogena Corporation, Los Angeles, Calif.

Filed May 27, 1987, Ser. No. 54,438

Int. Cl.⁴ A61K *7/40, 7/42, 7/44*

U.S. Cl. 424—59 **8 Claims**

1. A method of protecting mammalian skin from infrared radiation having a wavelength of between 700 and 2600 nanometers comprising applying to such skin in need thereof a small but effective amount of a composition consisting of from about 1 to about 10 percent by weight of fumed silica and a non-toxic, non-irritating cosmetically acceptable carrier.

4,822,601

COSMETIC BASE COMPOSITION WITH THERAPEUTIC PROPERTIES

Stephen T. Goode, Woodstock; Robert R. Linton, Crystal Lake, both of Ill., and Fred Baiocchi, Prairie Village, Kans., assignors to R.I.T.A. Corporation, Crystal Lake, Ill.

Filed Mar. 13, 1987, Ser. No. 25,569

Int. Cl.⁴ A61K *7/00*

U.S. Cl. 424—59 **25 Claims**

1. A composition for use as a therapeutic agent comprising about 1% to about 15% by weight sucrose fatty acid ester, about 3% to about 45% by weight acyl fatty acid lactylate ester or alkali metal salt thereof, and a solvent.

4,822,602

COSMETIC STICKS

Anthony D. Sabatelli, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 29, 1987, Ser. No. 43,909

Int. Cl.⁴ A61K *7/32, 7/34, 7/36, 7/38*

U.S. Cl. 424—65 **17 Claims**

1. A cosmetic stick composition comprising:

(a) from about 0.1% to about 50% of at least one water-soluble active selected from the group consisting of deodorant actives, antiperspirant actives, and mixtures thereof;

(b) from about 5% to about 25% of at least one dimethicone copolyol;

(c) from about 1% to about 25% of at least one volatile silicone oil selected from the group consisting of cyclic and linear polydimethylsiloxanes containing from about 3 to about 9 silicon atoms;

(d) from about 5% to about 20% of propylene glycol;

(e) from about 1% to about 15% of at least one C_2–C_4 monohydric alcohol selected from the group consisting of ethanol, n-propanol, iso-propanol, and mixtures thereof;

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(f) from about 10% to about 50% water;
(g) from about 1% to about 25% of at least one solidifying agent; and
(h) from about 1% to about 30% of at least one coupling agent selected from the group consisting of C_6–C_{22} fatty alcohols, ethoxylated derivatives of C_4–C_{22} fatty alcohols, propoxylated derivatives of C_4–C_{22} fatty alcohols, and mixtures thereof, having an HLB value within the range of from about 5 to about 18.

4,822,603

ANTIPERSPIRANT STICK COMPOSITION AND PROCESS FOR PREPARING THE SAME

Richard D. Farris, Cincinnati, Ohio; John P. Luebbe, Lawrenceburg, Ind., and Gerald J. Quinlivan, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 875,901, Jun. 18, 1986, abandoned. This application May 28, 1987, Ser. No. 55,488
Int. Cl.[4] A61K *7/32, 7/34, 7/36, 7/38*
U.S. Cl. 424—66 **16 Claims**

1. An antiperspirant stick composition comprising:
(a) from about 35% to about 60% of a volatile silicone oil;
(b) from about 1% to about 5% of a non-volatile emollient;
(c) from about 2.5% to about 4% of a high-melting point wax;
(d) from about 10% to about 15% of a low melting point wax;
(e) from about 0.2% to about 1.5% of a colloidal silica material;
(f) from about 0.5% to about 4% of an inert spherical particulate material selected from the group consisting of polyolefins, nylon, insoluble cross-linked starches, and mixtures thereof, which is comprised of essentially spherical particulates having a mean diameter of at least about 10 microns;
(g) from about 2% to about 9% of a talcum material; and
(h) from about 20% to about 33% of a particulate antiperspirant material;
wherein the total level of said talcum material and said antiperspirant material is from about 25% to about 35%.

4,822,604

LOCAL TREATMENT OF DANDRUFF, SEBORRHEIC DERMATITIS, AND PSORIASIS

Donald W. Knoll, Waukesha; David L. Shelton, and Thomas J. Szymczak, both of Racine County, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 20, 1985, Ser. No. 736,011
Int. Cl.[4] A61K *7/06*
U.S. Cl. 424—70 **12 Claims**

1. A clear therapeutic hair care composition having low pH for use in local treatment of dandruff, seborrheic dermatitis, and psoriasis of the scalp which resists oxidative decomposition, comprising:
(a) a detergent shampoo base;
(b) about 1.8 to 3.0% by weight of the composition of salicylate compound keratolytic agents selected from the group consisting of salicylic acid, acetyl salicylic acid, magnesium salicylate, sodium salicylate, and mixtures thereof; and
(c) about 0.25 to 20% by weight of the composition of a tertiary amine keratolytic stabilizing agent selected from the group consisting of N,N,N',N'-tetrakis(2-hydroxypropyl)ethylenediamine, triethanolamine, tripropanolamine, tributanolamine, and mixtures thereof wherein said keratolytic stabilizing agents are present in an amount sufficient to stabilize the keratolytic agents against oxidative decoloration decomposition catalyzed by ultraviolet radiation exposure.

4,822,605

COMPOSITIONS AND METHODS EMPLOYING THE SAME FOR THE TREATMENT OF VIRAL AND CANCEROUS SKIN LESIONS AND THE LIKE

Maxwell M. Powell, Great Neck, N.Y., assignor to Exovir, Inc., Great Neck, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,662
Int. Cl.[4] A61K *45/05, 45/02*
U.S. Cl. 424—85.2 **22 Claims**

1. A composition comprising an effective antiviral amount of an antiviral surfactant, an effective antitumor amount of an antitumor agent selected from the group consisiting of lymphotoxin, tumor necrosis factor, interleukin, target cell lysis factor and carcino-breaking factor; an effective amount of human interferon and a physiologically acceptable carrier.

20. A method for treating viral or cancerous skin disorders and skin manifestations thereof which comprises topically administering to the affected skin area an effective amount of a composition in accordance with claim 1.

4,822,606

IMMUNOSUPPRESSIVE SYNTHETIC PEPTIDES AND ANALOGS THEREOF BASED ON RETROVIRAL ENVELOPE SEQUENCES

Ralph D. Snyderman, and George J. Cianciolo, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Apr. 7, 1986, Ser. No. 848,469
Int. Cl.[4] A61K *39/12;* **C07K** *7/08, 7/10*
U.S. Cl. 424—88 **35 Claims**

1. A peptide having immunosuppressive or immunoregulatory activity, comprising the formula (I):

A-Gln-B-Arg-C-D-E-F-G-H-I-J-K-L-M-N-O

wherein:
A is Leu, Ala or Tyr;
B is Asn or Ala;
C is Arg, Leu or Ile;
D is Gly, Ala or Leu;
E is Leu or Ala;
F is Asp or Val;
G is Leu, Tyr, Glu or Ile;
H is Leu or Arg;
I is Phe, Leu, Tyr or Thr;
J is Leu, Trp or Ala;
K is Lys, Glu, Gln or Ala;
L is Glu, Gln or Asp;
M is Gly or Gln;
N is Gly or Gln; and
O is Leu, Val or Ile.

4,822,607

ANTI-TUMOR AGENT AND METHOD

Leslie L. Balassa, Blomming Grove, and John F. Prudden, Upper Nyack, both of N.Y., assignors to Lescarden Ltd., New York, N.Y.

Continuation of Ser. No. 821,221, Jan. 21, 1986, abandoned, which is a continuation of Ser. No. 741,199, Jun. 4, 1985, abandoned, which is a continuation of Ser. No. 553,877, Nov. 21, 1983, abandoned, which is a continuation of Ser. No. 321,789, Nov. 16, 1981, abandoned, which is a continuation of Ser. No. 167,775, Jul. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 736,770, Oct. 29, 1976, Pat. No. 4,212,857. This application Dec. 4, 1986, Ser. No. 938,331
Int. Cl.[4] A61K *35/32, 35/60*
U.S. Cl. 424—95 **20 Claims**

1. A method of treating conditions selected from the group consisting of carcinomas of the breast, ovary, prostate gland, and colo-rectal area, which comprises subcutaneously administering in a distensible area of the body to a patient afflicted with said carcinoma an effective amount for treating said carcinoma of an aqueous solution consisting essentially of the aqueous soluble portion of essentially pure granulated cartilage materials substantially free from adhering tissue, said cartilage being derived from a cartilage bearing animal, fish or reptile.

4,822,608

METHODS AND COMPOSITIONS FOR THE TREATMENT OF MAMMALIAN INFECTIONS EMPLOYING MEDICAMENTS COMPRISING HYMENOPTERA VENOM OR PROTEINACEOUS OR POLYPEPTIDE COMPONENTS THEREOF

Allen W. Benton, Bozman, Md., and Lorraine Mulfinger, Belefonte, Pa., assignors to Vespa Laboratories, Inc., Spring Mills, Pa.

Filed Sep. 14, 1987, Ser. No. 96,628
Int. Cl.[4] A61K *35/64, 37/02*
U.S. Cl. 424—98 **22 Claims**

1. A method for the treatment of an infection in a mammal which comprises:
administering an effective dosage of a medicament comprising:
an antibiotic agent having activity against said infection; and
a second agent selected from the group consisting of
at least one Hymenoptera venom,
at least one active protein component of a Hymenoptera venom,
at least one polypeptide component of a Hymenoptera venom, and
mixtures thereof:
the proportions of said antibiotic agent and said second agent being such that said second agent enhances the activity of said antibiotic agent.

4,822,609

TREATMENT OF OSTEOPOROSIS

Lawrence Flora, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 684,542, Dec. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 605,541, Apr. 30, 1984, abandoned. This application Sep. 12, 1986, Ser. No. 906,725
Int. Cl.[4] A61K *31/66, 35/55*
U.S. Cl. 424—112 **16 Claims**

1. A method for treating or preventing osteoporosis in humans comprising administering to a subject afflicted with or at risk to osteoporosis a bone cell activating compound and a bone resorption inhibiting polyphosphonate according to a regimen consisting of two or more cylces, whereby each cycle consists of: (a) a bone activating period of from about 1 day to about 5 days during which a bone activating amount of a bone cell activating compound is administered daily to said subject; followed by (b) a bone resorption inhibition period of from about 10 days to about 20 days during which ethane-1-hydroxy-1,1-diphosphonic acid, or a pharmaceutically-acceptable salt or ester thereof, is administered daily to said subject in an amount of from about 0.25 mgP/kg/day to about 3.3 mgP/kg/day; followed by (c) a rest period of from about 30 days to about 60 days during which the subject receives neither a bone cell activating compound nor a bone resorption inhibiting polyphosphonate.

4,822,610

METHOD FOR THE TREATMENT OF UROLOGIC DISORDERS

Irving M. Bush, Box 365, Burlington, Ill. 60109

Continuation-in-part of Ser. No. 928,313, Nov. 7, 1986, abandoned. This application Aug. 26, 1987, Ser. No. 89,539
Int. Cl.[4] A61K *33/30, 31/075*
U.S. Cl. 424—145 **7 Claims**

1. A method for the treatment of the urologic conditions selected from the group consisting of prostatitis, seminal vesiculitis, benign prostatic hypertrophy, prostatic abscess, bladder neck hypertrophy, urinary tract infection including urethritis and decreased liquification of semen, which comprises administering orally to the patient in need of said treatment a pharmaceutically acceptable dosage of 50–1200mg of guaifenesin.

4,822,611

ORAL HYPOSENSITIZATION IN THE TREATMENT OF ALLERGIES

Jack C. Booren, Denver, Colo., assignor to Immunotec, Inc., San Diego, Calif.

Filed Dec. 9, 1986, Ser. No. 939,949
Int. Cl.[4] A61K *35/78, 31/70*
U.S. Cl. 424—195.1 **4 Claims**

1. A method of treating allergy in humans by hyposensitization to allergens to which the patient has been found to be sensitive comprising sequentially scheduled oral administration of titrated amounts of allergenic extracts in a prepared liquid vehicle comprising defined proportions of a selected hexose monosaccharide and ethyl alcohol in water until a level providing satisfactory symptomatic response is achieved, and continued administration of this dosage for the duration of treatment.

4,822,612

ANTICANCER AGENT

Kunihiro Shinpo, Nagareyama, Japan, assignor to Chlorella Industry Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1986, Ser. No. 882,301
Claims priority, application Japan, Jul. 16, 1985, 60-156517
Int. Cl.[4] A61K *35/80, 37/10*
U.S. Cl. 424—195.1 **5 Claims**

1. An anticancer agent which is a glycoprotein extraced and isolated from Chlorella, which has an average molecular weight of 4.5×10^4, of which protein moiety consists of α-helix and random coil, of which sugar moiety consists of β-pollysaccharide, and of wich circular dichroism spectrum has a positive peak at 275 nm.

4,822,613

WATER-SOLUBLE FOAMABLE INSECTICIDALLY-ACTIVE COMPOSITIONS

Alejandro Rodero, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 15, 1986, Ser. No. 941,326
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—405 **8 Claims**

1. A water-soluble, foamable, insecticidally-active composition comprising:
an aqueous phase comprising water;
an aqueous phase-dispersible and insecticidally-active toxicant; and
an effective amount of a foam-causing ingredient which is also capable of causing the insecticidally-active toxicant to be dispersed throughout the aqueous phase so as to produce a toxicant-in-water dispersion, for causing the toxicant-in-water dispersion to form a water-soluble and insecticidally-active foam,
wherein the composition is characterized as an insecticidally-active, water-soluble foam wherein the foam-causing ingredient is characterized as a two-component system comprising a saponifiable fatty acid, and an alkali selected from the group consisting of triethanol amine, sodium hydroxide, potassium hydroxide, and morpholine.

4,822,614

BIOACTIVE FILM-FORMING COMPOSITION FOR CONTROL OF CRAWLING INSECTS AND THE LIKE

Alejandro Rodero, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 19, 1986, Ser. No. 943,405
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—405 **10 Claims**

1. An evaporable bioactive composition, characterized as

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being able to form a bioactive film on a surface of control of crawling insects and the like, comprising:

a water-in-oil emulsion;

a bioactive ingredient dispersed throughout the emulsion, wherein the bioactive ingredient is selected from the group consisting of an insecticidally-active ingredient, an insect-repellent ingredient, and combinations thereof, wherein the insecticidally-active ingredient is selected from the group consisting of synthetic pyrethroids, natural pyrethrum, and organo phosphates, and wherein the insect-repellent ingredient is selected from the group consisting of synthetic pyrethroids having intrinsic repellancy, N,N-diethyl-meta-toluamide, BHA, BHT, Neem extract and Sembury extract; and

a lubricating agent also dispersed throughout the emulsion, wherein the lubricating agent is present in an amount of about 1 to about 20 weight percent based upon the weight of the bioactive composition, wherein the lubricating agent is selected from the group consisting of silicones, mineral oils, petrolatum and polybutenes, and blends of each of these,

wherein the water-in-oil emulsion comprises a continuous phase, an aqueous discontinuous phase, and an effective amount of an emulsifier system for dispersing the discontinuous phase throughout the continuous phase,

wherein the bioactive composition is characterized in that after particles of the bioactive composition have been applied to a surface, a substantial portion of the continuous and discontinuous phases will evaporate over time, thereby leaving a bioactive film on the surface, and

wherein the film is characterized as comprising the emulsifier system, the bioactive ingredient, and the lubricating agent,

whereby the film effectively and substantially adheres to the surface for an extended period of time while retaining a high degree of residuality, thereby providing a substantial and effective positive barrier for control of crawling insects and the like.

4,822,615

ANTITHROMBIC RESIN COMPOSITION

Kouichi Iwata; Hideo Takahashi, both of Hyogo, and Akihiko Isomura, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 657,437, Oct. 3, 1984, abandoned. This application Sep. 9, 1986, Ser. No. 904,833

Claims priority, application Japan, Oct. 3, 1983, 58-185599

Int. Cl.[4] A61F *2/00;* **A61K** *9/14, 31/715*

U.S. Cl. 424—423 **8 Claims**

1. An antithrombic resin composition comprising a synthetic resin which is insoluble in glycerol and has a molding temperature of not more than 140° C. as a mother material having uniformly dispersed therein by melt-kneading (1) a solution obtained by dissolving an anticoagulant which is heparin or a salt thereof in glycerol, and (2) a carrier retaining said solution selected from the group consisting of (i) an inorganic porous powder pulverized to an average particle diameter of not more than 0.1 mm, (ii) said inorganic porous powder admixed with a water-absorbing resin powder, and (iii) said inorganic porous powder admixed with water-absorbing resin fibers.

4,822,616

VAGINAL RING

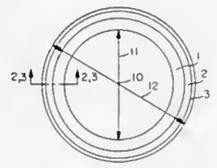
Ingfried Zimmermann; Fred Windt, and Hans-Jürgen Reck, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 316,011, Oct. 28, 1981, abandoned. This application Feb. 13, 1987, Ser. No. 14,316

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040978

Int. Cl.[4] A61M *7/00*

U.S. Cl. 424—432 **13 Claims**



1. A vaginal ring spaced from an axis of revolution, the ring having an inside diameter and an outside diameter, a radial thickness with respect to the axis and an axial thickness in the direction of the axis, the ring having first and second exposed radial surfaces and the ring further comprising:

a supporting ring made of a pharmacologically acceptable material and being essentially free of medicament;

the supporting ring having a first annular surface between inner and outer circumferential peripheries extending in a radial direction and generally facing in a first axial direction, the supporting ring having a second annular surface extending in a radial direction with respect to the axis and facing in an axial direction opposite that of the first annular surface, the second annular surface being completely exposed;

a first annular layer made of a pharmacologically acceptable material and containing a pharmacologically active agent, the first annular layer extending in the axial direction and overlying radially the first annular surface of the supporting ring between the inner and outer circumferential peripheries thereof; and

a second pharmacologically acceptable layer overlying the first annular layer in the axial direction; said second layer being essentially medicament free and being permeable to the active agent in the first layer; said second layer being thinner than the first layer in a ratio of 5–50:1, and also being in contact with the supporting layer at the inner and outer circumferential peripheries of the supporting layer, the second pharmacologically acceptable layer controlling the rate of migration of the activation from the first layer into the vagina.

4,822,617

DRUG DELIVERY DEVICE

Donald E. Panoz, Athlone, Ireland, assignor to Elan Corporation P.L.C., Athlone, Ireland

Continuation of Ser. No. 827,190, Feb. 6, 1986, abandoned, which is a continuation of Ser. No. 568,693, Jan. 6, 1984, abandoned. This application Apr. 10, 1987, Ser. No. 37,108

Claims priority, application Ireland, Jan. 18, 1983, 94/83

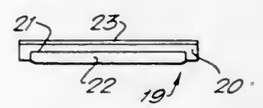
Int. Cl.[4] A61F *13/02*

U.S. Cl. 424—449 **13 Claims**

1. A bilaminarly-structured device for the transdermal administration of a drug to a patient comprising:

a drug-receiving and retaining means accessible to a user of the device, said means being provided on a first laminar member having a first face and a second face, said first laminar member having on said first face a predetermined amount of a drug in an ointment, cream or jelly-like carrier, said ointment, cream or jelly-like carrier, which includes said drug, being contained in a recess and projecting outwardly from said recess beyond the first face so that said drug in said ointment, cream or jelly-like carrier can be placed in direct contact with the user's skin and the carrier serves to secure the device to the skin; and

means effectively restricting the dispersion of the drug from said first laminar member to the direction of the skin



whereby an effective amount of said drug is delivered to the user's skin, in use, said restricting means comprising a second and drug impervious, laminar member affixed to said first laminar member to form a bi-laminar structure which covers said second face of said first laminar member and said restricting means further including a peripheral wall on said first laminar member defining said recess.

4,822,618

CAPSULES

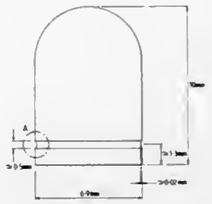
Bernard Schweiger, Fegersheim, and Alfred Wagner, Gerstheim, both of France, assignors to Lilly Industries Limited, Basingstoke, England

Filed May 13, 1987, Ser. No. 49,640

Claims priority, application United Kingdom, May 15, 1986, 8611905

Int. Cl.[4] A61J *1/04*

U.S. Cl. 424—453 **20 Claims**



1. A capsule shell of the sort commonly employed to contain pharmaceutical preparations selected from a generally cylindrical capsule body portion, or a capsule cap portion which is adapted to fit telescopically onto the capsule body portion, wherein the said capsule body or cap portion contains an annular groove of from about 0.01 mm to about 0.05 mm deep in the region of the open end to reduce ovality in the open end of the capsule body or cap portion.

4,822,619

CONTROLLED RELEASE PHARMACEUTICAL PREPARATION CONTAINING A GASTROINTESTINAL IRRITANT DRUG

Herman J. Eichel, and Brent D. Massman, both of Columbus, Ohio, assignors to Ionor, Inc., Dayton, Ohio

Filed Feb. 18, 1987, Ser. No. 16,134

Int. Cl.[4] A61K *9/16*

U.S. Cl. 424—492 **11 Claims**

1. A pharmaceutical preparation comprising microparticles of an admixture of micronized gastrointestinal irritant drug having an average particle size of less than 10 microns in a non-toxic, protective balm which is readily dispersible throughout the disgestive tract whereby said micronized gastrointestinal irritant drug is embedded in said balm and coated by it and is dissolvable in a controlled manner by the digestive fluids upon dispersion of said balm, said nucroparticles having an average diameter of between about 100 and 1000 microns.

4,822,620

SILAGE PRODUCTION

Peter Chamberlain, Shipley, and Simon Couldwell, Batley, both of England, assignors to Allied Colloids Limited, Bradford, England

Filed Mar. 18, 1987, Ser. No. 27,533

Claims priority, application United Kingdom, Mar. 19, 1986, 8606805

Int. Cl.[4] A23K *3/02*

U.S. Cl. 426—2 **35 Claims**

1. A method for retaining silage effluent in silage comprising adding water-absorbent substantially dry, water insoluble, water-swellable particles comprising wholly synthetic polymer formed from water-soluble ethylenically unsaturated monomer or monomers including acrylic monomer, the polymer being ionic and cross-linked and able to absorb silage effluent in an amount of at least 10 times its own weight, the particle shaving sizes in the range of 10 microns to 3 mm and being added to silage-making matter in an amount in the range of 0.005 to 0.5% by weight dry polymer based on the total weight of silage-making matter.

4,822,621

METHOD AND PRODUCT FOR INCREASED ASPARTAME STABILITY IN CHEWING GUM

Michael Glass, Fairlawn; Joseph Hoholick, Hopatcong, both of N.J.; Eva K. Malinowski, Franklin Square, N.Y.; Zdravko Dokuzovic, Mississauga, and Zoltan Bodor, Pickering, both of Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 30, 1987, Ser. No. 79,849

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—5 **37 Claims**

1. A stabilized chewing gum product containing an L-aspartic acid derived sweetener which comprises:

a first portion chewing gum composition comprising about 5% to about 50% weight of the final chewing gum product of a gum base and about 0.01% to about 2.0% by weight of the final chewing gum product of an L-aspartic acid derived sweetener in free form, wherein there is an absence of aldehyde-based flavoring in said first portion and the pH is not above 4.5; and

at least a second portion chewing gum composition comprising about 5% to about 50% by weight of the final chewing gum product of a gum base, and at least one flavoring agent wherein the flavorings are in amounts of about 0.005% to about 5% by weight of the final chewing gum composition;

said first and second portion being formed into said product in a surface-to-surface relationship whereby said L-aspartic acid derived sweetener of said first portion substantially out of contact with the flavoring agent of said second portion, thereby increasing the stability of said L-aspartic acid derived sweetener in such chewing gum product.

4,822,622

STABILIZED CHEWING GUM PRODUCT AND METHOD OF MAKING SAME

Zdravko Dokuzovic, Mississauga, and Zoltan Bodor, Pickering, both of Canada, assignors to Warner-Lambert Co., Morris Plains, N.J.

Filed Jul. 30, 1987, Ser. No. 79,861

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—5 **33 Claims**

1. A stabilized chewing gum product containing an L-aspartic acid derived sweetener which comprises:

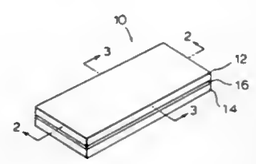
a first portion substantially anhydrous chewing gum compo-

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sition comprising from about 5% to about 50% by weight of the final chewing gum product of a gum base and from about 0.01% to about 2.0% by weight of the final chewing gum product of an L-aspartic acid derived sweetener, wherein there is an absence of aldehyde-based flavoring agents in said first portion;

at least a second portion chewing gum composition comprising from about 5% to about 50% by weight of the final chewing gum product of a gum base and an amount of about 0.005% to about 5% by weight of the final chewing gum composition of at least one flavoring agent, said second portion having less than about 5% by weight, based on the weight of said second portion, of water; and

a protective barrier film in amounts effective to provide a barrier between said first portion and said second portion,



said protective barrier film being fabricated from a material selected from the group consisting of: Gelatin, Acacia Gum; Agar; algin and Derivatives; Carrageenan and salts thereof; Arabinogalactan; Baker Yeast Glycan; Carboxymethylcellulose; Carob Bean Gum; Cellulose Gum; Furcellaran and salts thereof; Guar Gum; Gum Arabic; Hydroxypropyl Cellulose; Hydroxypropyl Methyl Cellulose; Irish Moss Gelose; Karaya Gum; Locust Bean Gum; Methylcellulose; Methylethyl Cellulose; Peptin; Propylene Glycol Alginate; Propylene Glycol Ether of Methyl Cellulose; Sodium Carboxy Methyl Cellulose; Tragacanth Gum; Xanthan Gum; shellac; and mixtures thereof, whereby said L-aspartic acid derived sweetener of said first portion is substantially out of contact with the flavoring agent, thereby increasing the stability of said L-aspartic acid derived sweetener in said chewing gum product.

4,822,623

PROCESS OF USING RENNET CASEIN FOR PRODUCING IMITATION CHEESE

Jerry L. Middleton, Wapakoneta, Ohio, assignor to Universal Foods Corporation, Milwaukee, Wis.

Continuation of Ser. No. 299,429, Sep. 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 71,150, Aug. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 907,437, May 19, 1978, Pat. No. 4,197,322, which is a continuation-in-part of Ser. No. 794,808, May 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 525,549, Nov. 20, 1974, abandoned. This application Nov. 21, 1983, Ser. No. 553,733

The portion of the term of this patent subsequent to Apr. 8, 1997, has been disclaimed.

Int. Cl.⁴ A23C *19/04, 19/055, 19/06, 20/00*

U.S. Cl. 426—39 **24 Claims**

21. A process for producing an imitation cheese which comprises admixing a hydrated casein curd produced by the action of a milk coagulating enzyme on a calcium salt of a milk casein with an edible oil and an emulsifying agent with heating at elevated temperatures to form a homogeneous mixture.

4,822,624

PRESERVATIVE FOR HARVESTED CROPS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 568,067, Jan. 4, 1984, abandoned, which is a division of Ser. No. 272,687, Jun. 11, 1981, Pat. No. 4,426,396. This application Jul. 30, 1987, Ser. No. 79,347

Int. Cl.⁴ A23K *1/22*

U.S. Cl. 426—53 **6 Claims**

1. A stable, aqueous solution for preserving harvested crops which consists essentially of comprises urea, urease enzyme, and at least about 10 weight percent free ammonia sufficient to prevent the uncontrolled enzymatic decomposition of said urea by said urease enzyme said urease enzyme being added in an amount effective for converting said urea to ammonia at a rate sufficient to preserve said harvested crops.

4,822,625

PROCESS FOR HONEY-ROASTING NUTS

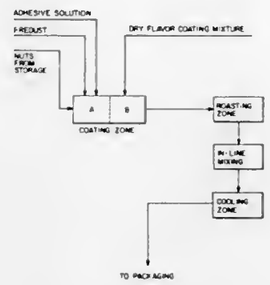
Peter M. Gannis, Stamford; Howard Wilkins, Brookfield, both of Conn., and Oris E. Holloway, Jr., Sparta, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 797,914, Nov. 14, 1986, Pat. No. 4,692,342. This application Mar. 18, 1987, Ser. No. 27,426

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.⁴ A23L *1/36*

U.S. Cl. 426—93 **1 Claim**



1. A honey-roasted nut comprising a nut having successive coatings which comprise, from the nut outward based on 100 parts by weight of nuts:

(a) no greater than about 1 part by weight of a dry adhesive;

(b) the dried residue of about 1 to about 10 parts by weight of an adhesive solution comprising about 15 to about 25 percent by weight on a dry basis of honey, about 15 to about 25 percent by weight of an adhesive film-forming material, and at least about 50 percent by weight of water; and

(c) about 4 to about 12 parts by weight of a dry flavor coating mixture comprising about 20 to about 25 percent by weight of honey, about 60 to about 70 percent by weight of sugar, and about 8 to about 10 percent by weight of salt, wherein the ratio of said dry adhesive to said adhesive film-forming material is about 1:10 to about 1:2.

4,822,626

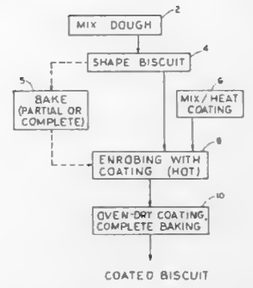
COATED CANINE BISCUITS

Henry C. Spanier, West Milford, N.J.; Patrick Mulligan, Thiels; Albert Spiel, Yonkers, both of N.Y., and Lorna C. Staples, Teaneck, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jan. 5, 1987, Ser. No. 430

Int. Cl.⁴ A23L *1/10;* **A23K** *1/10, 1/18*

U.S. Cl. 426—94 **51 Claims**



1. Process of producing a biscuit with a baked-on proteinaceous coating, comprising steps of:

(a) preparing a dough piece from a dough comprising flour, meal, fat and water;

(b) enrobing said dough piece with a viscous coating formulation comprising from about 10 to about 30 weight percent of a dextrin carrier, from about 10 to about 50 weight percent of meat, from about 10 to about 30 weight percent of a glazing agent, from about 1 to about 5 weight percent of at least one polysaccharide gum, from about 5 to about 15 weight percent of a monosaccharide sugar, from about 5 to about 15 weight percent of a disaccharide sugar, and water, wherein said weight percentages are based upon total solids content and total 100 weight percent; and

(c) baking the coated dough piece to form a dry biscuit with a baked-on coating.

4,822,627

FROZEN CONFECTION SUITABLE FOR DEEP FRYING

Melodee L. Clegg and Terry R. Clegg, both of Salt Lake City Utah, assignors to International Fried Ice Cream, Salt Lake City, Utah

Filed Oct. 3, 1985, Ser. No. 783,784

Int. Cl.⁴ A23G *3/00*

U.S. Cl. 426—101 **25 Claims**

1. A frozen composite confectionery food product comprising:

an inner core of frozen confectionery substance;

a first frozen matrix coating surrounding and being physically bonded at the inner face thereof to the frozen core, said first coating being selected from the group consisting of (i) the inner core confectionery substance liquid form, (ii) a frozen dessert composition other than the inner core, in liquid form and (iii) vegetable oils;

a second coating made of dry food crumbs or particles which are partially embedded in the first coating surrounding the frozen core; and

a third coating comprising a frozen, uncooked batter totally enclosing the first and second coatings to form an outer matrix coating which is physically bonded at the inner surface thereof to an exposed exterior surface of the first and second coatings and which can be rapidly deep fat fried to form a hot, crisp exterior covering which is retained around the enclosed, frozen dessert.

4,822,628

PROCESS FOR MANUFACTURING A PRODUCT BASED ON HARD-BOILED EGG

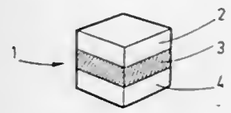
Christian Huc, Arras, France, assignor to Or'Action SA, Lievin, France

Filed Jan. 27, 1988, Ser. No. 148,975

Claims priority, application France, Jan. 30, 1987, 87 01234

Int. Cl.⁴ A23L *1/32*

U.S. Cl. 426—274 **17 Claims**



1. A process for manufacturing a product based on egg, constituted by a plurality of superposed, fast-joined layers, one layer composed essentially of yolk alternating with a layer composed essentially of white, cross-sections of all of said layers being rectangles of the same width (**1**), said process comprising the following steps of:

(a) supplying fresh runny egg white in n_1 moulds, and fresh runny egg yolk in n_2 moulds, the sum $n_1 + n_2$ being at least equal to two and n_1 being equal to n_2 or different from n_2 by one unit;

(b) pre-cooking each runny liquid up to coagulation to form a layer;

(c) removing each coagulated layer from its moulds;

(d) superposing the coagulated layers, a layer of yolk being adjacent a layer of white;

(e) cooking the superposed layers, under slight pressure, up to hardening.

4,822,629

AZUMOLENE DOSAGE FORM

Schwe F. Pong, Norwich, N.Y., assignor to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Dec. 12, 1986, Ser. No. 940,815

Int. Cl.⁴ A61K *9/32, 9/36, 9/58, 9/62*

U.S. Cl. 424—480 **19 Claims**

1. A method of achieving systemic absorption of azumolene from the gastrointestinal tract of a human or lower mammal comprising orally delivering a safe and effect amount of azumolene to the intestines of said human or lower mammal without exposure of said azumolene in the stomach of said human or lower mammal.

4,822,630

PROCESSED EGG PRODUCT

Michael B. Timmons, 126 Sunset Dr., Ithaca, N.Y. 14850, and Neal B. Kreher, 11066 Main St., Clarence, N.Y. 14031

Filed Apr. 13, 1987, Ser. No. 37,893

Int. Cl.⁴ A23L *1/32;* **A23B** *5/00*

U.S. Cl. 426—614 **11 Claims**

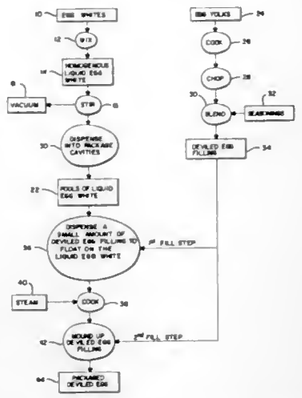
1. A method for the production of an egg product which comprises the steps of:

(a) dispensing liquid egg white into a mold;

(b) dispensing a predetermined amount of filling comprising cooked particulate egg yolk to float partially submerged in a substantially stationary position in said liquid egg white;

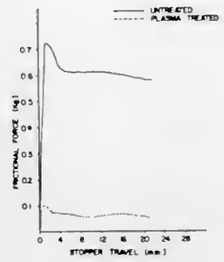
(c) cooking the egg white until solidified; thereby forming an

egg product having a central yolk portion with its submerged portion surrounded by the cooked egg white



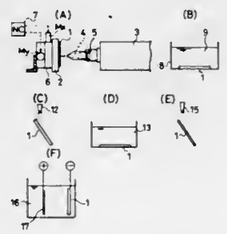
portion while its exposed upper portion resembles a deviled egg filling.

4,822,632
IONIZING PLASMA LUBRICANT METHOD
Joel L. Williams, Cary; David A. Martin, Raleigh, and David B. Montgomery, Cary, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Division of Ser. No. 734,438, May 16, 1985, abandoned. This application May 4, 1988, Ser. No. 190,028
Int. Cl.[4] B05D *1/08*
U.S. Cl. 427—34 **10 Claims**



1. A method for reducing breakout and sustaining forces of a surface adapted for slidable engagement with another surface comprising applying silicone oil to a surface and treating said surface and said silicone oil thereon with an ionizing plasma.

4,822,633
AUTO-SELECTIVE METAL DEPOSITION ON DIELECTRIC SURFACES
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue Japax Research Incorporated, Yokohama, Japan
Continuation of Ser. No. 691,877, Jan. 16, 1985, Pat. No. 4,639,378. This application Jul. 7, 1986, Ser. No. 882,498
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—43.1 **3 Claims**

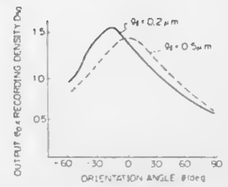


1. A method of plating a pattern of metal on a dielectric surface, comprisng the steps of:
(a) in a priming stage, thermo-mechanically delineating a pattern masklessly on the dielectric surface, contacting the surface with a priming solution and imparting ultrasonic vibrations to the priming solution in contact with the thermo-mechanically delineated pattern on the surface of the dielectric to render the surface selectively activated along delineated areas thereof forming the pattern; and
(b) after the priming stage, masklessly contacting the dielectric surface with an electroless plating solution to allow metal therefrom to auto-reductively deposit selectively at said areas, thereby forming the pattern of metal desired on the dielectric surface.

4,822,631
PROCESS ELECTROSTATIC IMAGING AND DEVELOPING
Leo A. Beaudet, Milford, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Continuation-in-part of Ser. No. 643,334, Aug. 22, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,307
Int. Cl.[4] B05D *1/06*
U.S. Cl. 427—14.1 **16 Claims**

1. An imaging method comprising the steps, in sequence, of:
(a) creating a latent electrostatic image on the surface of an imaging member, said imaging member having a hard porous oxide surface layer the pores of which are impregnated with a sealant having a melting temperature above the melting temperature of a toner, said sealant further having good dielectric properties at elevated temperatures below its melting temperature;
(b) delivering a quantity of said toner to the imaging member's surface to create a visible toner image corresponding to said latent electrostatic image;
(c) heating said toner to melt or soften the visible toner image; and
(d) transferring said toner image to a receptor.

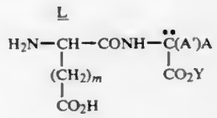
4,822,634
LONGITUDINAL MAGNETIC COATED RECORDING MEDIUM
Jun Takahashi, Zama; Shigeru Fukushima, Tokyo; Toshikatu Narumi, Kawasaki; Ken-ich Itoh, Yamato, and Seiya Ogawa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Division of Ser. No. 863,039, May 14, 1986, Pat. No. 4,746,569. This application Apr. 17, 1987, Ser. No. 39,226
Claims priority, application Japan, May 20, 1985, 60-107635; Sep. 3, 1985, 60-194076; Apr. 7, 1986, 61-78159; Apr. 7, 1986, 61-78160; Apr. 8, 1986, 61-79170; Apr. 9, 1986, 61-80064; Apr. 9, 1986, 61-80065
Int. Cl.[4] G11B *5/70*
U.S. Cl. 427—48 **10 Claims**



1. A process for producing a longitudinal magnetic coated recording medium, which includes a magnetic film moving relative to a magnetic head, said magnetic film having an orientation angle of −30° to +30° between the surface of said magnetic film and an easy axis of magnetization of said magnetic film, said orientation angle being determined by an angle where the ratio of residual magnetization to saturation magnetization MR/MS is largest, comprising the steps of:
(1) preparing a magnetic paint having planar magnetic particles, each particle having an easy magnetization axis perpendicular to a planar surface thereof dispersed therein;
(2) coating a nonmagnetic substrate with said magnetic paint, and forming a magnetic film having a surface;
(3) alternately applying a first magnetic field approximately perpendicular to the surface of said magnetic film and a second magnetic field parallel to the surface of said magnetic film, and orienting the easy magnetization axis of said planar magnetic particles dispersed in said magnetic film; and
(4) drying said magnetic paint, while applying said first magnetic field.

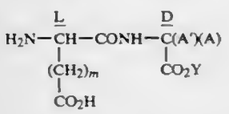
4,822,635
SWEETENING WITH L-AMINODICARBOXYLIC ACID ESTERS
Paul R. Zanno, Nanuet, N.Y.; Ronald E. Barnett, Barrington, and Glenn M. Roy, Streamwood, both of Ill., assignors to General Foods Corporation, White Plains, N.Y.
Division of Ser. No. 145,786, Jan. 19, 1988, Pat. No. 4,788,332, which is a continuation of Ser. No. 82,246, Aug. 5, 1987, Pat. No. 4,781,927, which is a continuation-in-part of Ser. No. 898,063, Aug. 19, 1986, Pat. No. 4,766,246, which is a continuation-in-part of Ser. No. 723,603, Apr. 15, 1985, abandoned. This application Jul. 22, 1988, Ser. No. 223,472
Int. Cl.[4] A23L *1/236*
U.S. Cl. 426—3 **114 Claims**

1. A composition comprising an edible composition and a compound represented by the Formula:

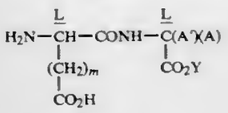


and food-acceptable salts thereof, wherein
A is hydrogen, and alkyl containing 1–3 carbon atoms,
A′ is hydrogen or alkyl containing 1–3 carbon atoms; alternatively
A and A′ taken together with the carbon atom to which they are attached form cycloalkyl containing 3–4 carbon atoms;
Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;
R_1 is a β,β-dialkyl cycloalkyl, a β,β′-dialkyl cycloalkyl, a β,β,β′-trialkyl cycloalkyl, β,β,β′,β′-tetralkyl cycloalkyl on which the alpha substituent is hydrogen and wherein the cycloalkyl ring contains up to 6 ring carbon atoms and a total of 12 carbon atoms; with the proviso that when the double asterisked carbon is an asymmetric or chiral center, the configuration around said carbon is in the D form.

113. A sweetening composition comprising a sweetening effective amount of a mixture comprising:

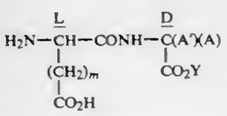


and

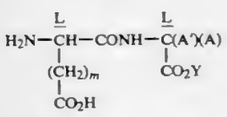


and food-acceptable salts thereof, a mixture of food acceptable salts of N-L-aspartyl-D-alanine ester; wherein
A is hydrogen and alkyl containing 1–3 carbon atoms,
A′ is hydrogen or alkyl containing 1–3 carbon atoms; alternatively
A and A′ taken together with the carbon atom to which they are attached form cycloalkyl containing 3–4 carbon atoms;
Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;
R_1 is a β,β-dialkyl cycloalkyl, a β,β′-dialkyl cycloalkyl, a β,β,β′-trialkyl cycloalkyl, β,β,β′,β′-tetralkyl cycloalkyl in which the alpha substituent is hydrogen and wherein the cycloalkyl ring contains up to 6 ring carbon atoms and a total of 12 carbon atoms;
R_2 is H or alkyl containing 1–4 carbon atoms;
R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;
n=0 or 1; and
m=0 or 1.

114. A sweetening composition comprising a sweetening effective amount of a mixture comprising:



and



and food-acceptable salts thereof, wherein
A is hydroxyalkyl containing 1–3 carbon atoms or alkoxymethyl wherein the alkoxy contains 1–3 carbon atoms;

A' is hydrogen or alkyl containing 1–3 carbon atoms; alternatively

A and A' taken together with the carbon atom to which they are attached form cycloalkyl containing 3–4 carbon atoms;

Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;

R_1 is an alkyl-substituted cycloalkyl, cycloalkenyl bicycloalkyl or bicycloalkenyl wherein at least one alkyl is in the β-position of the cycloalkyl, cycloalkenyl, bicycloalkyl or bicycloalkenyl ring, containing up to 7 ring carbon atoms and a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0 or 1; and

m=0 or 1.

4,822,636

METHOD FOR FORMING DEPOSITED FILM

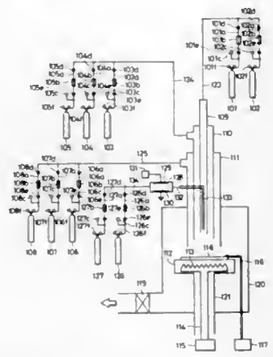
Keishi Saitoh, Nabari; Masaaki Hirooka, Toride; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,214

Claims priority, application Japan, Dec. 25, 1985, 60-295302

Int. Cl.⁴ B05D *5/06, 5/12*

U.S. Cl. 427—69 **24 Claims**



1. A method for forming a deposited film on a substrate by introducing into a reaction space a non-activated gaseous starting material for formation of the deposited film and a non-activated gaseous halogenic oxidizing agent selected from the group consisting of F_2, Cl_2, Br_2, and I_2 having the property of oxidation action on said non-activated gaseous starting material to form a deposited film by a direct chemical reaction between said non-activated gaseous starting material and said non-activated gaseous halogenic oxidizing agent, comprising:

(a) activating a gaseous substance (D) which includes a component to act as a valence electron controller in an activation space separate from said reaction space to form an activated species; and

(b) introducing said activated species into the reaction space so as to form a mixture with said non-activated gaseous starting material and said non-activated gaseous halogenic oxidizing agent and form a deposited film controlled in valence electron on said substrate without the use of external discharge energy in the reaction space.

4,822,637

FABRICATION OF MAGNETIC RECORDING MEDIUM WITH LUBRICANT

Fred Chi-Tat Chung, Palo Alto, and Ross P. Clark, San Jose, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Continuation of Ser. No. 681,727, Dec. 14, 1984, abandoned, which is a division of Ser. No. 661,983, Oct. 17, 1984, Pat. No. 4,659,627. This application Nov. 7, 1986, Ser. No. 928,677

The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.

Int. Cl.⁴ G11B *5/71*

U.S. Cl. 427—128 **14 Claims**

1. A method of providing a coating for magnetic records, this method including preparing a binder to include a lubricant system comprising a fluoro-silicone oil and a fatty acid ester combined therewith; wherein

the ratio of fatty acid ester to fluoro-silicone oil is from about 3/1 to about 12/1;

the fluoro-silicone oil constitutes from three-tenths to ten wt.% of the dry coating solids;

the fluoro-silicone-ester system having a viscosity, concentration, and molecular weight selected to enhance migration of the lubricant; and

dispersing one or more abrasive pigment constituents in the binder.

4,822,638

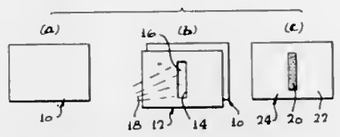
ELECTRONIC DEVICE FABRICATION ON NON-CONDUCTIVE POLYMER SUBSTRATE

Stuart I. Yaniger, Palmdale, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Feb. 11, 1987, Ser. No. 13,306

Int. Cl.⁴ B05D *5/12*; H01B *1/00*; B32B *3/00*

U.S. Cl. 427—79 **18 Claims**



1. A process for producing an electronic device on a non-conductive polymer substrate which comprises applying a covalent doping agent to a preselected portion of a base-type non-conductive polymer substrate containing carbon-nitrogen linkages, said agent being capable of covalently binding to the nitrogens of said polymer, said covalent doping agent being an R^+ donor compound containing an organic cation group, the R^+ donor compound being selected from the group consisting of RX, R_3OX, R_2SO_4, $R'SO_2Cl$, and R''_3SiCl, where R, R' and R'' are each selected from the group consisting of alkyl and aryl, and X is selected from the group consisting of halogen, PF_6^-, $SbCl_6^-$ and benzene sulfonate, and wherein the base-type non-conductive polymer substrate is selected from the group consisting of polyaniline, its naphthyl and biphenyl derivatives, and alkyl and aryl substituted polyaniline and its alkyl and aryl substituted naphthyl and biphenyl derivatives, and converting said preselected portion of said polymer substrate to an electrically conduotive polymer portion in which such cation groups are covalently linked to the nitrogen atoms of said preselected polymer portion.

4,822,639

SPIN COATING METHOD AND DEVICE

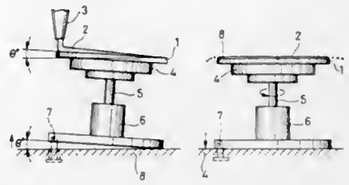
Itsuo Fujii; Toshikazu Sato, and Kazuharu Kawashima, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 21, 1987, Ser. No. 88,052

Claims priority, application Japan, Aug. 25, 1986, 61-197417

Int. Cl.⁴ B05D *3/12*; B05C *13/00*

U.S. Cl. 427—240 **6 Claims**



1. A spin coating method, comprising the steps of:

supplying a coating solution to a periphary of substrate tilted with respect to a horizontal place, whereby said coating solution flows across said substrate and then;

holding said substrate, including said flowed coating solution, parallel to said horizontal plane; and then

rotating said substrate, while parallel to said horizontal plane, about a vertical axis perpendicular to said horizontal plane for distributing said coating solution over said substrate.

3. A spin coating device, comprising:

a turntable for supporting a substrate coated with a coating solution;

means for moving between a first position in which the turntable is in a horizontal plane and a second position in which the turntable is tilted at an angle to the horizontal plane; and

a vertical rotary shaft for rotating said turntable and

means for coating a substrate comprising a single nozzle disposed above a periphery of the turntable while it is in the second position on the turntable with a coating solution by the action of gravity.

4,822,640

COATER

Raimo Tuhkanen, Helsinki; Markku Grasten, and Sivert Westergard, both of Järvenpää, all of Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

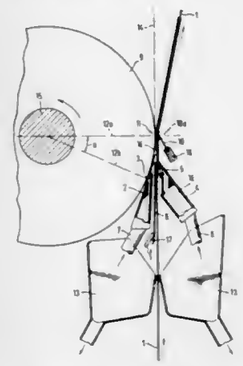
Filed Sep. 14, 1984, Ser. No. 650,798

Claims priority, application Finland, Sep. 16, 1983, 833306

Int. Cl.⁴ B05D *1/26, 3/12*; B05C *11/02, 11/03*

U.S. Cl. 427—211 **20 Claims**

18. A method of coating running lengths of web material, for instance webs of paper or cardboard, using an appliance comprising a rotatable back-up roll, a levelling member which cooperates with the roll to define a smoothing nip, and a coating substance applicator positioned below the smoothing nip and spaced apart therefrom along a predetermined path of movement, the applicator being located between the back-up roll and said path of movement and being adjustable between a first condition in which it is disposed for applying coating substance to the moving surface of the back-up roll and a second condition in which it is disposed for applying coating substance to a length of web material being advanced along said path of movement, said method comprising advancing a first length of web material upwardly along said path of movement while said coating substance applicator is in said first condition, delivering coating substance to the coating substance applicator, whereby coating substance is applied to the moving surface of the back-up roll and is transferred to the first length of web material, adjusting the coating substance applicator to its second condition, advancing a second length of web material upwardly along said path of movement, and



delivering coating substance to the coating substance applicator, whereby coating substance is applied directly to the web.

4,822,641

METHOD OF MANUFACTURING A CONTACT CONSTRUCTION MATERIAL STRUCTURE

Günter Weik, Birkenfeld, Fed. Rep. of Germany, assignor to Inovan GmbH & Co. KG, Birkenfeld, Fed. Rep. of Germany

Continuation of Ser. No. 729,060, Apr. 30, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 123,957

Int. Cl.⁴ C23C *16/06*

U.S. Cl. 427—250 **4 Claims**

1. A method of manufacturing a contact construction material structure comprising the steps of applying to a metal base a corrosion resistant contact layer of at least one metal of the group comprising silver, palladium and alloys thereof, applying by molecular deposition a thin gold coating of 0.1μ to 1.0μ to said corrosion resistant contact layer, and finally heating the contact construction material with the gold coating disposed on its contact layer surface to 350° to 650° C. for a period of 10 to 1000 seconds to cause diffusion of said gold coating into said corrosion resistant contact layer.

4,822,642

METHOD OF PRODUCING SILICON DIFFUSION COATINGS ON METAL ARTICLES

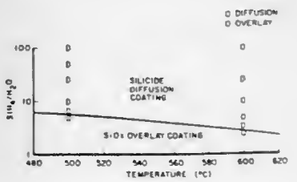
Alejandro L. Cabrera, Fogelsville; John F. Kirner, Orefield; Robert A. Miller, Allentown; Ronald Pierantozzi, and John N. Armor, both of Orefield, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 807,890, Dec. 11, 1985, Pat. No. 4,714,632. This application Nov. 12, 1987, Ser. No. 119,593

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.⁴ C23C *16/24*

U.S. Cl. 427—255.1 **35 Claims**



1. A method of forming a silicon diffusion coating on the

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surface of a non-ferrous metal, said non-ferrous metal subject to formation of a surface oxide that can be reduced by a furnace treatment under controlled atmosphere, the steps comprising:

(a) pretreating said non-ferrous metal by heating said non-ferrous metal under conditions of, temperature less than 1200° C. under a controlled atmosphere reducing to elemental constituents of said non-ferrous metal to reduce or prevent formation of a barrier coating on exposed surfaces of said non-ferrous metal; and

(b) treating said non-ferrous metal under conditions where said non-ferrous metal article can be maintained at a temperature of less than 1200° C. under a controlled atmosphere consisting of silane at least 1 part per million by volume, balance hydrogen or hydrogen and inert gas mixture wherein said atmosphere contains silane to oxygen in a molar ratio greater than 2.5 and oxygen to hydrogen in a molar ratio less than 2×10^{-4} whereby silicon is diffused into the surface of said non-ferrous metal article.

4,822,643

THERMAL TRANSFER IMAGING SYSTEM

Hsin-Hsin Chou; Mohamed A. Elmasry, both of Woodbury; Jeffrey C. Chang, North Oaks, and Kevin M. Kidnie, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 30, 1987, Ser. No. 68,648

Int. Cl.[4] B41M *5/26*

U.S. Cl. 427—256 **18 Claims**

1. A process for the thermal transferring of images comprising the steps of:

(a) providing a thermal transfer donor sheet comprising a substrate having a front transfer surface and a back surface, said front surface comprising a layer of a dispersion of particles having average diameters of less than one micron, said particles being colored polymeric particles having a weight ratio of colorant to binder in said particles of between 10:1 and 1:10, said particles displaying an effective T_g of less than or equal to 55° C., and said substrate having a thickness of less than 12 microns,

(b) contacting said front surface with a receptor sheet,

(c) applying an imagewise distribution of heat to the back surface of said sheet sufficient to locally soften said dispersion of particles and transfer said particles to said receptor sheet, and

(d) separating said receptor sheet with an image thereon from said donor sheet.

4,822,644

PROJECTING GUN AND NOZZLE, AND METHOD OF USE

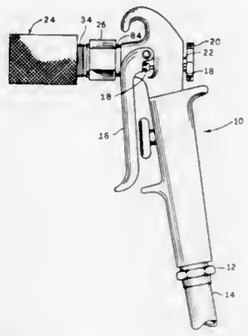
Michael J. Krueger, 812 Cleveland Ave., Kaukauna, Wis. 54130

Division of Ser. No. 62,682, Jun. 16, 1987. This application Apr. 25, 1988, Ser. No. 184,772

Int. Cl.[4] B05D *5/00*

U.S. Cl. 427—280 **2 Claims**

1. A method of applying a patterning splatter coating of drywall coating material to drywall, said method comprising projecting said material through an airless spray gun, having a nozzle thereon, in short bursts of less than 2 seconds, simultaneously moving said gun so as to project particles of said material along a path of aim, and including adjusting said



nozzle to thereby control the range of the size of particles projected from said gun.

4,822,645

METALLIZING PASTE AND A PROCESS FOR METALLIZING CERAMIC ARTICLES BY USING SUCH A METALLIZING PASTE

Isao Oda; Minoru Matsui, both of Nagoya, and Nobuo Tsuno, Kasugai, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Oct. 7, 1987, Ser. No. 105,225

Claims priority, application Japan, Oct. 21, 1986, 61-248342

Int. Cl.[4] B05D *5/02;* **B22F** *1/00*

U.S. Cl. 427—376.3 **11 Claims**

1. A metallizing paste containing, as inorganic materials, 15 to 50% by weight of a component to form a glass phase consisting essentially of 5 to 25% by weight of Al_2O_3, 35 to 55% by weight of SiO_2, and 30 to 55% by weight of MnO, and 50 to 85% by weight of metallic molybdenum having a purity of not less than 99.5% by weight and an average particle size of 0.65 ± 0.1 μm.

4,822,646

SOLID FILM LUBRICANT COMPOSITIONS AND METHODS OF USING SAME

Robert N. Clark, Sylvania, and Paul W. L. Graham, Toledo, both of Ohio, assignors to Owens-Illinois Glass Container Inc., Toledo, Ohio

Division of Ser. No. 797,267, Nov. 12, 1985. This application Oct. 23, 1987, Ser. No. 111,945

Int. Cl.[4] B05D *3/02;* **C03C** *39/00*

U.S. Cl. 427—387 **9 Claims**

1. A process for coating hot glass-contacting surfaces of forming and handling equipment for making glass articles, the process comprising: (a) forming a hot glass-contacting layer on the glass-contacting surface, the layer comprising graphite dispersed in a thermoset organopolysiloxane binder thereon, said layer having a thickness of about 1½ to about 3 mils, and formed by:

(1) applying unto the hot glass-contacting surface a non-aqueous composition consisting essentially of finely divided graphite dispersed in an organic solvent solution of a solvent-soluble, thermosettable, further-curable, non-gelled, organopolysiloxane and less then about 15% by weight, based on the organopolysiloxane, of NaOH to make the solution alkaline, said graphite having a particle size of about ½ to 150 microns and at least 90% having a particle size of 44 microns or less, and the weight ratio of said graphite to said organopolysiloxane being between 1/1 to about 2/1, and

(2) curing said organopolysiloxane, without gelling, at a temperature as low as room temperature to a cured condition so as to provide a cured coating on the hot glass-contacting surface.

4,822,647

COATING AGENT TO COATING ROBOT, INCLUDING A METHOD AND ARRANGEMENT FOR PROTECTING THE APPARATUS FROM DAMAGE DUE TO IMPROPER PRESSURES IN A SUPPLY LINE

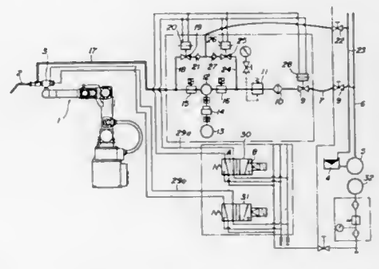
Hiroyoshi Nozaki; Zenichi Aida, both of Saitama; Hirofumi Hara, Tokyo; Toshihiko Satake, Saitama; Hiroshi Mitsuyoshi, Saitama; Masayasu Arakawa, Saitama, and Koji Hatanaka, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1987, Ser. No. 41,849

Claims priority, applicatioo Japan, Apr. 23, 1986, 61-93949; May 9, 1986, 61-106041

Int. Cl.[4] B05D *1/02*

U.S. Cl. 427—421 **15 Claims**



10. A method of supplying a coating agent to a coating robot, comprising the steps of:

detecting pressures in a supply pipe downstream and upstream of a coating agent supply pump on a coating agent supply line extending from a supply source of a coating agent to a coating robot;

releasing the pressure from said supply pipe through branch lines extending from the supply line downstream and upstream of said coating agent supply pump when the pressure in the supply pipe downstream or upstream of said coating agent supply pump falls outside of a prescribed pressure range; and

stopping operating of said coating agent supply pump.

4,822,648

DECORATIVE BOW ASSEMBLY AND METHOD OF MAKING SAME

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Oct. 1, 1987, Ser. No. 103,353

Int. Cl.[4] D04D *7/10*

U.S. Cl. 428—4 **11 Claims**

1. A decorative bow assembly, comprising:

(A) a pair of elongated bow members of sheet material movable relative to each other from a bow-unformed position in which the bow members are in a collapsed, face-to-face state, to a bow-formed position in which the bow members form a three-dimensional, looped state,

(i) said bow members extending along a longitudinal direction and having a common end,

(ii) each bow member having at least one bow section having opposite outer edges and a plurality of slits extending between the outer edges and forming a plurality of loop-forming, longitudinally-extending elements one each bow section;

(B) connector means engaging the bow members at a location spaced longitudinally away from the common end, for restraining movement of the bow memebers toward and apart of each other at said location.

(i) said connector means having an aperture extending in a transverse direction of the bow members; and

(C) limited travel actuator means for moving the bow members from the bow-unformed to the bow-fromed position, including an elongated drawstring having one end connected to the common end extending in the longitudinal direction between the bow members and freely through the aperture,



(i) said drawstring being displaceable in the longitudinal direction along a limited travel path for folding the plurality of loop-forming elements of each slit bow section to form a decorative bow having multiple loops arranged in an annulus at the end of said path.

4,822,649

MULTIPLE GLAZING, METHOD FOR OBTAINING SAME AND DEVICE FOR USING SAID METHOD

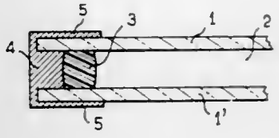
Michel Canaud, Paris, and Philippe Dewitte, Thourotte, both of France, assignors to Saint-Gobain Vitrage, Aubervilliers, France

Filed Feb. 20, 1987, Ser. No. 17,218

Claims priority, application France, Feb. 20, 1986, 86 02344; Dec. 24, 1986, 88 18184

Int. Cl.[4] E06B *3/24, 7/12;* **B32B** *27/36, 27/00*

U.S. Cl. 428—34 **18 Claims**



1. A multiple glazing, comprising:

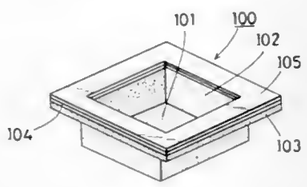
at least two sheets of glass separated by an interposed gas space;

means for maintaining said glass sheets mutually substantially parallel, wherein said means for maintaining comprises a cross-braced frame, said frame comprising a rigid metal profile having a glass contact surface and covered on said glass contact surface with a butyl rubber or isobutylene-based joint, and a peripheral joint and wherein said

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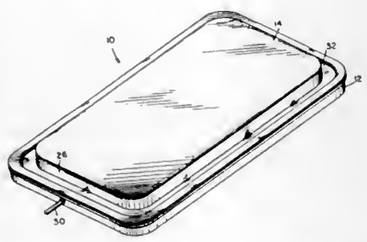
peripheral joint comprises a plastic adhering in a cohesive manner to said cross-braced frame.

4,822,650
MASKING MEMBER
Seinosuke Horiki, Midori, and Reiji Makino, Minami, both of Japan, assignors to Nagoya Oilchemical Co., Ltd., Nagoya, Japan
Filed Sep. 24, 1987, Ser. No. 100,524
Claims priority, application Japan, Sep. 30, 1986, 61-149583[U]; Sep. 30, 1986, 61-149585[U]; Feb. 20, 1987, 62-024313[U]
Int. Cl.[4] B32B *1/02, 3/26*
U.S. Cl. 428—34.2 22 Claims



1. A thermoplastic foam vessel shape masking member comprising a bottom, a wall extending upwardly from the perimeter of said bottom, a flange extending outwardly from the upper edge of said wall and an adhesive layer formed on the upper surface of said flange.

4,822,651
VACUUM DIAPHRAGM DEVICE
Cosby M. Newsom, 15517 S. Seaforth Ave., Norwalk, Calif. 90650
Division of Ser. No. 900,141, Aug. 25, 1986, Pat. No. 4,732,639, which is a continuation-in-part of Ser. No. 771,520, Aug. 30, 1985, abandoned. This application Sep. 28, 1987, Ser. No. 103,122
Int. Cl.[4] B25B *11/00*
U.S. Cl. 428—36.8 8 Claims



1. In a diaphragm in conjunction with a base for vacuum bagging, wherein base has a top surface and wherein said diaphragm placed on top of said base together define a chamber space, said base being provided with means for evacuating said chamber space of ambient atmosphere, said diaphragm comprising a top member and a downwardly depending side wall, wherein the improvement comprises providing said base with an outer peripheral vacuum manifold which terminates in said top surface and further providing said diaphragm with a solid, conformable seal adapted to seal said vacuum manifold.

4,822,652
SANITARY WARES OF ACRYLIC OR METHACRYLIC RESINS AND METHOD FOR OBTAINING THEM
Carlo Sempio; Romeo Vailati, both of Busto Arsizio, and Tullo Ronchetti, Milan, all of Italy, assignors to Vedril S.p.A., Milan, Italy
Filed Nov. 17, 1986, Ser. No. 931,048
Claims priority, application Italy, Nov. 22, 1985, 22956 A/85
Int. Cl.[4] B32B *3/26, 27/08, 27/30, 27/36*
U.S. Cl. 428—34.5 7 Claims

1. A sanitary ware comprised of a first layer of at least one sheet of a thermoformed acrylic or methacrylic resin, and a reinforcing layer of a foamed, fiberglass-filled unsaturated polyester resin bonded to said first layer, said thermoformed resin being contacted by water when said sanitary ware is in use.

4,822,653
RECYCLABLE HOT MELT ADHESIVE COMPOSITIONS
Thomas F. Kauffman, Easton, Pa., and Paul P. Puletti, Gardner, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.
Filed Aug. 5, 1987, Ser. No. 82,009
Int. Cl.[4] B65D *11/04*
U.S. Cl. 428—34.2 11 Claims

1. A recyclable composite comprising at least one plastic substrate coated with a thermally stable hot melt adhesive composition consisting essentially of
(a) a styrene-ethylene-butylene-styrene tri-block or styrene-ethylene-butylene di-block copolymer or mixture thereof;
(b) at least one hydrogenated, tackifying resin selected from the group consisting of alpha-methyl styrene, styrene, vinyl toluene, coumarone-indene and dicyclopentadiene;
(c) 0 to 10% by weight of the adhesive of a non-hydrogenated pure monomer end block reinforcing resin;
(d) optionally an oil or wax diluent; and
(e) stabilizer.

4,822,654
NOVEL VULCANIZABLE RUBBER COMPOSITIONS AND APPLICATIONS THEREOF
Yasubiko Takemura; Shinichiro Zen; Yoshiaki Zama, all of Yokkaichi, and Hiroji Enyo, Suzuka, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 823,021, Jan. 27, 1986, abandoned. This application Mar. 10, 1988, Ser. No. 169,129
Claims priority, application Japan, Jan. 31, 1985, 60-15561; Mar. 30, 1985, 60-67683
Int. Cl.[4] C08L *27/12, 27/00;* C08F *5/10;* F16L *11/04*
U.S. Cl. 428—36.8 11 Claims

1. A vulcanizable rubber composition comprising (1) 100 parts by weight of a polymer composition comprising
(I) a vinylidene fluoride resin containing at least 90 mole % vinylidene fluoride,
(II) at least one rubber selected from the group consisting of acrylic rubbers, α,β-unsaturated nitrile-conjugated diene copolymer rubbers and hydrides of α,β-unsaturated nitrile-conjugated diene copolymer rubbers, said acrylic rubber consisting of (A) 30 to 99.9% by weight of an alkyl acrylate and/or an alkoxy-substituted alkyl acrylate, (B) 0.1 to 10% by weight of a crosslikable monomer and (C) 0 to 70% by weight of another ethylenically unsaturated compound copolymerizable with (A) and (B) (the sum of (A), (B) and (C) is 100% by weight), and said α,β-unsaturated nitrile-conjugated diene copolymer rubber consisting of (D) 10 to 60% by weight of an α,β-unsaturated nitrile, (E) 15 to 90% by weight of a conjugated diene and (F) 0 to 75% by weight of another ethylenically unsaturated compound copolymerizable with (D) and (E) (the sum of (D), (E) and (F) is 100% by weight), and
(III) optional blendable polymer,

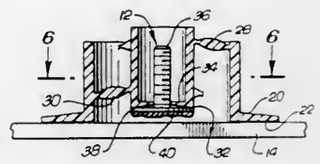
wherein the weight ratio of (I)/[(II)+(III)] is 5/95 to 60/40 and the weight ratio of (II)/(III) is 100/0 to 50/50, and (2) 5 to 40 parts by weight of a plasticizer.

4,822,655
BUTYL RUBBER PREFORMED TAPE SEALANT
Van R. Foster, Beaver Creek, Ohio, assignor to Beecham Home Improvements Products Inc., Dayton, Ohio
Filed Aug. 8, 1986, Ser. No. 894,931
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—40 3 Claims



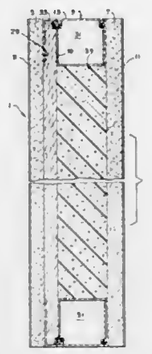
1. A sealant tape, which comprises a preformed strip of a deformable, tacky butyl rubber caulking composition having top and bottom surfaces, an elastic, abrasion-resistant preformed layer of an elastic abrasion-resistant rubber selected from the group consisting of styrene-butadiene-styrene block copolymers and styreneethylene-butadiene-styrene block copolymers laminated to said top surface of said preformed strip, and a strippable release member covering said bottom surface of said preformed strip, whereby the sealant tape is sufficiently deformable, flexible and elastic to be pressed into sealing contact with uneven joints and corners to be caulked.

4,822,656
FIXTURE FOR SECURING AN ADHESIVE ATTACHMENT TO A SUBSTRATE
Charles G. Hutter, III, Carson City, Nev., assignor to Physical Systems, Inc., Carson City, Nev.
Continuation of Ser. No. 772,610, Sep. 4, 1985, Pat. No. 4,668,546. This application Sep. 24, 1986, Ser. No. 911,075
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.[4] B32B *1/00, 7/06*
U.S. Cl. 428—40 7 Claims



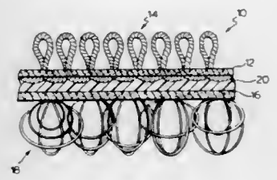
1. A fixture for use in securing an attachment to a substrate, comprising:
a support frame formed as a one-piece component, said support frame including connector means for releasable securement to the substrate, retainer means for releasably carrying the attachment, and means supporting said retainer means for movement relative to said connector means between a first position with the attachment supported substantially out of bearing engagement with the substrate when said connector means is secured to the substrate and a second position urging the attachment with a positive force into bearing engagement with the substrate.

4,822,657
BULLET RESISTANT PANEL
Terry W. Simpson, Tulsa, Okla., assignor to Alliance Wall Corporation, Norcross, Ga.
Filed Jan. 8, 1987, Ser. No. 1,383
Int. Cl.[4] B32B *15/14*
U.S. Cl. 428—69 3 Claims



1. A protective panel for resisting the high impact force of a bullet or similar projectile, which panel comprises an assembly of substantially rectangular configuration including a layer of impact resistant fabric and a layer of thermal insulation material, a frame forming the outer periphery of the assembly and including an inwardly directed annular slot within which the outer edges of the fabric layer are secured and an annular cavity for receiving insulation material, the assembly being disposed between a pair of intermediate substrate layers and a pair of exterior facing layers, and wherein at least one substrate layer is formed of cellulosic material and at least one facing layer is formed of metal.

4,822,658
CARPET BACKING AND INSTALLATION SYSTEM
Joseph R. Pacione, 127 Elgin Street, Thornhill, Canada
Filed Dec. 23, 1987, Ser. No. 136,953
Int. Cl.[4] B32B *3/00, 33/00*
U.S. Cl. 428—95 16 Claims



1. A laminated carpet system for use in wall-to-wall installation in a location by cutting and fitting of the carpet to fit the contours of the location on-site and for attachment to a floor without a separate underpad comprising:
(i) a primary backing layer having pile element means substantially covering a first side of the primary backing,
(ii) a secondary backing layer having loop element means substantially covering a first side of the secondary backing,
(iii) means for securing the secondary backing layer to the primary backing so that the pile element means and loop means are exposed on abutting faces of the carpet,
(iv) hook means on a first side of a separate or separable

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strip-like piece having means on a second opposite side for on-site attachment to the floor to attach such hook means to at least a portion of the loop element means on the secondary backing by engagement of the hook means into the loop means to hold such carpet to a floor;

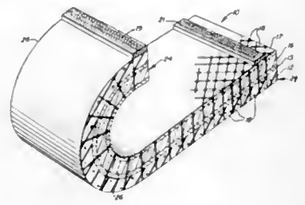
(v) wherein, the carpet lamination is substantially free of stiffener so as not to require stretching in wall-to-wall applications by the use of mechanical devices.

4,822,659

FIRE BLOCK SHEET AND WRAPPER

James S. Anderson, Gurnee; Kenneth S. Hoffman, Deerfield; Jeffrey E. Julis, Buffalo Grove, and Malinda Mercado, Des Plaines, all of Ill., assignors to Bisco Products Inc., Park Ridge, Ill.

Filed Sep. 30, 1987, Ser. No. 103,064
Int. Cl.[4] B32B *3/06, 7/04, 3/26*
U.S. Cl. 428—99 **21 Claims**



15. A fire block wrapper for electrical conducting cables comprising a thermally insulative fire block sheet including an elastomeric layer, said sheet having a surface flammability flame spread index of zero at 20 minutes of exposure in accordance with ASTM E-162 and which is capable, in a thickness of 1/16 inch, of blocking a flame of 1900° F. for more than one hour, said sheet having a rectangular configuration with two side margins and two end margins;

said fire block sheet comprising a flexible laminate of a support layer and said elastomeric layer, said elastomeric layer comprising a cured silicone foam rubber layer containing alumina trihydrate and being secured to one side surface of said support layer;

said fire block wrapper further including a layer of thermal insulation material adjacent the other side surface of said support layer;

fastening means secured to said wrapper and provided at one end margin on one surface of said laminate and at the other end margin on the opposite surface of said laminate; and

said silicone foam rubber layer, said support layer, and said insulation material layer being flexible, whereby said wrapper can be wrapped around a conduit or the like and secured in place with said fastening means.

4,822,660

LIGHTWEIGHT CERAMIC STRUCTURES AND METHOD

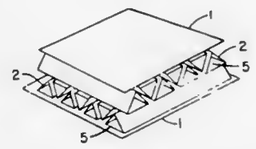
G. Daniel Lipp, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jun. 2, 1987, Ser. No. 57,533
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—113 **9 Claims**

1. A bonded composite ceramic structure comprising at least one ceramic facing sheet and one or more channeled ceramic support elements bonded to the facing sheet and having channel axes generally parallel thereto;

the facing sheet consisting of a sheet of composite ceramic material comprising a ceramic, glass or glass-ceramic matrix and an inorganic reinforcement phase disposed within the matrix; and

each support element being formed of a continuous composite ceramic polyhedral wall defining a circumferentially enclosed elongated channel, the composite ceramic wall comprising a glass, glass-ceramic, or ceramic matrix phase and a fiber reinforcement phase consisting of a multiplicity



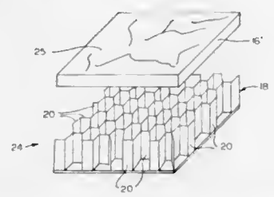
of inorganic fibers disposed within the matrix phase, the fiber reinforcement phase comprising fibers or fiber groups which are multidirectionally oriented within said walls such that at least some of the inorganic fibers traverse the corners in the polyhedral wall, and such that the prevailing directions of the fibers fall within ±60° of the direction of the channel axes of the channeled support elements.

4,822,661

LIGHTWEIGHT STONE FURNITURE

Gino C. Battaglia, 25022 Vermont Ave., Harbor City, Calif. 90710

Filed Jul. 20, 1987, Ser. No. 75,093
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 **15 Claims**



1. An article of furniture including a plurality of structural members comprised of flat slabs of stone each no greater than about one centimeter thick and each having an exposed surface and a concealed surface, and said concealed surfaces of said flat slabs of stone are bonded by adhesive to underlying supports, and at least some of said structural members meet with abutting edges at angles relative to each other, and said abutting edges which meet at angles are beveled beneath said exposed surfaces to thereby conceal said underlying supports and form straight, linear interfaces.

4,822,662

MACHINE PARTS WITH WEAR-RESISTANT SURFACE BROUGHT INTO CONTACT WITH ELONGATED FIBROUS MEMBER

Takashi Ishii, Tokyo; Hajime Kohama, Yokohama; Hisso Yabe, Fujisawa; Akira Yano, and Shinsuke Noto, both of Kanazawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki; Yano Koussakujo Corporation and Notoshiti Corporation, both of Kanazawa, all of, Japan

Filed Apr. 15, 1986, Ser. No. 852,219
Claims priority, application Japan, Apr. 17, 1985, 60-82057; Jun. 29, 1985, 60-143295; Aug. 28, 1985, 60-187328; Sep. 11, 1985, 60-200854; Sep. 11, 1985, 60-200855
Int. Cl.[4] B32B *3/10, 15/14*
U.S. Cl. 428—131 **11 Claims**



1. Machine parts which are in contact with an elongated fibrous member, each part comprising a substrate of an iron series metal and a smooth, wear-resistant surface layer formed on a surface of said substrate, which substantially contains chromium oxide (Cr_2O_3) as a constituent, the chromium oxide being converted from a chromium compound upon heating thereof, and an intermediate layer including a reaction product between the chromium oxide in said surface layer and said substrate being formed at an interface between said surface layer and said substrate.

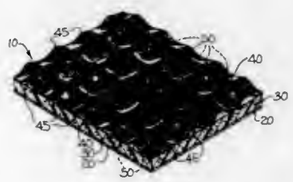
2. Machine parts according to claim 1, wherein said machine parts have an aperture.

4,822,663

CREASE RESISTANT LAMINATE

Gerald A. Reott, Mooresville, N.C., assignor to Collins & Aikman Corporation, New York, N.Y.

Filed Jan. 26, 1988, Ser. No. 148,666
Int. Cl.[4] B32B *3/26, 7/04, 31/00*
U.S. Cl. 428—159 **22 Claims**



1. A laminate comprising:

a foam layer having opposed substantially planar front and back surfaces,

a surface layer conforming to and overlying the substantially planar front surface of the foam layer and bonded thereto, and

a backing layer having spaced apart discrete areas thereof bonded to the rear surface of the foam layer with portions of the backing layer located between the discrete areas extending outwardly in spaced apart relation from the rear surface of the foam layer to form a series of bi-directional puckers extending biaxially in the backing layer.

4,822,665

PHOTOPOLYMERIZABLE MOLDING MATERIALS CONTAINING METAL WIRE INSERTS

Dankmar Scholz, and Klaus Liebe, both of Frankenthal, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 20, 1987, Ser. No. 17,089
Int. Cl.[4] B29D *7/02;* **H05B** *1/00*
U.S. Cl. 428—222 **6 Claims**

1. A photopolymerizable, sheet-like molding material containing a mixture of

1. an unsaturated polyester,
2. with or without a copolymerizable vinyl compound,
3. 0.005–0.5% by weight of an inhibitor,
4. 0.01–3% by weight of a photoinitiator,
5. 0.2–5% by weight of a thickening oxide or hydroxide of lithium, magnesium or calcium or of a metal alcoholate or of an isocyanate,
6. 1–50% by weight of an ultraviolet-transmitting pulverulent assistant and/or
7. 5–70% by weight of a fibrous reinforcing material, with or without
8. other conventional additives, the percentages being based on the mixture, and wherein said photopolymerizable, sheet-like molding material has inserted therein shapeable metal wire having a thickness of 0.1 to 3 mm, with said wire being present in an amout of from 10 to 500 parts by weight per 100 parts by weight of said mixture.

4,822,666

RADIATION STABILIZED FABRIC

Robert L. Hudson, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 2, 1987, Ser. No. 127,739
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—224 **5 Claims**

1. A radiation stabilized fabric comprising a nonwoven web formed of a propylene polymer containing a long-chain aliphatic ester of a 3,5-di-t-butyl-4-hydroxybenzoic acid.

4,822,667

WOVEN MEDICAL FABRIC

Conrad D. Goad, Greensboro, N.C., and Jeffrey L. Taylor, Cincinnati, Ohio, assignors to Precision Fabrics Group, Greensboro, N.C. and Standard Textile Co., Inc., Cincinnati, Ohio

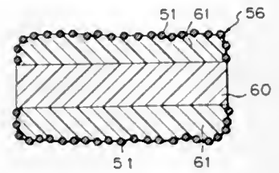
Filed Mar. 4, 1988, Ser. No. 164,197
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—265 **14 Claims**

1. A woven, reusable, launderable and sterilizable polyester fabric constructed from polyester yarn of from about 50 to 150 denier and a sum of the ends and picks of at least 100 per linear inch having a finish composition containing a fluorocarbon water repellent, a flame retardant, and an antimicrobial agent applied thereto and having the following properties initially and following 100 laundering cycles:

	Initial	After 100 Cycles
linting (INDA 160-0-83) particles	at most 5,000	at most 2,000
flammability (NFPA 702)	Class II	Class II
antimicrobial activity (CTM-0923) for Klebsiella pneumoniae	no growth	no growth
Suter hydrostatic resistance (AATCC-127) centimeters	at least 20.0	at least 10.0
spray rating (AATCC-22-1980)	at least 70.0	at least 50.0
air permeability (FTM 5450, Frazier method)	at most 5	at most 10

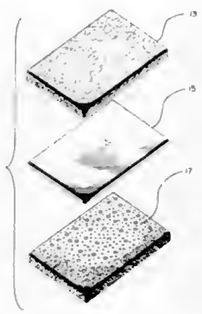
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4,822,668
ELASTIC ABSORBENT
Toyoaki Tanaka, Yokohama; Katuzi Ohira, Sagamihara; Akira Nakamura, Chigasaki; Ryosuke Kamei, and Akihiro Hashimoto, both of Yokohama, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 30, 1987, Ser. No. 44,373
Claims priority, application Japan, Jul. 18, 1986, 61-167884; Jul. 31, 1986, 61-178945; Aug. 13, 1986, 61-188698; Dec. 11, 1986, 61-293485; Dec. 22, 1986, 61-303934; Jan. 5, 1987, 62-1; Feb. 13, 1987, 62-29525
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—283 26 Claims



1. An elastic absorbent which comprises a substantially homogeneous mixture of pulverized cellulose pulp and staple fibers of a split yarn obtained by splitting a tape-form oriented three-layer laminate comprising two layers of a synthetic resin having a low melting point and a layer of a synthetic resin having a high melting point, which is interposed between said two low-melting-point resin layers, in which the layers of the synthetic resin having a low melting point are at least partially exposed to the surface, wherein at the crossing points of the staple fibers of the split yarn, the synthetic resin having a low melting point is at least partially fusion-bonded and the staple fibers of the split yarn are connected to one another in a state where the cellulose pulp is partially enclosed therein.

4,822,669
ABSORBENT FLOOR MAT
Robert C. Roga, Spotswood, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.
Filed Aug. 21, 1987, Ser. No. 88,168
Int. Cl.[4] B32B *27/34*
U.S. Cl. 428—287 11 Claims

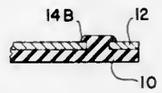


1. An improved low cost absorbent mat comprising an upper layer of nonwoven polyester fibers, a second layer thereinunder selected from the group consisting of paper and polypropylene fibers and mixtures thereof, a third layer therebelow being an impervious thermoplastic film, said third layer being laminated to the second layer, a bottom fourth layer being a foam that provides a non-skid surface adapted and constructed to lie on the floor of a surface.

4,822,670
REMOVABLE ADHESIVE SHEET OR TAPE
Kiyoshi Ono, Nagoya; Yasuo Sakurai, Chiryu; Yoshio Kishimoto, Anjo; Hiroyasu Miyasaka, Tanashi; Yasuaki Kitazaki, Iruma; Tetsuaki Matsuda, Kawagoe, and Junichi Kobayashi, Tokorozawa, all of Japan, assignors to Nichiban Company Limited, Tokyo, Japan
Filed Sep. 8, 1986, Ser. No. 904,292
Claims priority, application Japan, Dec. 18, 1985, 60-282779; Dec. 25, 1985, 60-290688
Int. Cl.[4] B32B *5/22;* C09J *7/02*
U.S. Cl. 428—317.3 25 Claims

1. A removable adhesive sheet or tape which consists essentially of adhesive fine particles attached on at least one side of a substrate through a primer resin layer comprising at least one selected from the group consisting of a poly resin, a poly resin having a polymerization degree of 400 or more and an inorganic pigment, a polyamide resin having a melting point of 80° C. or less and an inorganic pigment, a poly (vinyl chloridevinyl acetate) type resin and an inorganic pigment, and a maleated natural rubber and an inorganic pigment.

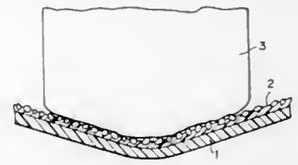
4,822,671
HEAT RIVETING RUBBER FOR EFFECTING A MECHANICAL LOCK
Robert L. Carper, Brighton, Mich., and James R. Goewey, Marion, Ind., assignors to GenCorp Inc., Akron, Ohio
Filed Dec. 31, 1987, Ser. No. 140,194
Int. Cl.[4] B21D *31/00;* B29C *65/00*
U.S. Cl. 428—33 10 Claims



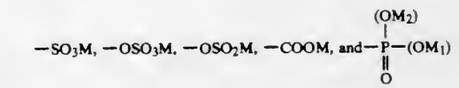
1. A process for mechanically bonding a rubber part to a reinforcing part, comprising the steps of:
(i) forming the rubber part with at least one upstanding post, said rubber part made from an ethylene-propylene rubber, an ethylene-propylene-diene rubber, or combinations thereof;
(ii) providing a reinforcing part with an opening for receiving said rubber part post;
(iii) assembling said rubber part and said reinforcing part with said rubber post extending through the opening in said reinforcing part; and
(iv) reforming said rubber post by heating so as to provide a mechanical bond between said rubber part and said reinforcing part.

4,822,672
ABASIVE TAPE
Nobutaka Yamaguchi; Eiichi Tadokoro, and Takahito Miyoshi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 27, 1987, Ser. No. 20,842
Claims priority, application Japan, Feb. 27, 1986, 61-42742
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—323 6 Claims

1. An abrasive tape comprising a flexible non-magnetic substrate, and an abrasive coating film having a thickness of not greater than 50 μm applied onto said flexible non-magnetic substrate and formed by kneading abrasive grains having a size in the range of from approximately 0.1 μm to 16 μm and having a Mohs hardness of not lower than 6, a binder and an additive, wherein said binder contains a resin in a ratio of not lower than 30% by weight with respect to the total amount of



the binder components, has a molecular weight of not higher than 50,000 and has, at a side chain, at least one polar group selected from the group consisting of



where M represents a hydrogen atom, lithium, sodium or potassium, M_1 represents a hydrogen atom, lithium, sodium, potassium, or an alkyl group, and M_2 represents a hydrogen atom, lithium, sodium, potassium, or an alkyl group, and
wherein the total amount of the binder components, including a curing agent if present, is not greater than 70 parts by weight per 300 parts by weight of the abrasive grains having a Mohs hardness of not lower than 6.

4,822,673
MICROWAVE DEVICE
Shizuo Umemura, Ibaraki, Japan, assignor to Fuji Photo Film Co., Ltd. and Research Development Corporation of Japan, both of Tokyo, Japan
Continuation of Ser. No. 790,715, Oct. 24, 1985, abandoned. This application Jul. 30, 1987, Ser. No. 80,199
Claims priority, application Japan, Oct. 30, 1984, 59-226783
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—328 14 Claims

1. A microwave device consisting essentially of a substrate consisting of a material selected from the group consisting of Al_2O_3, SiO_2 and porcelain, and a thin layer deposited on said substrate and having a thickness of from 20 to 500 Angstrom units, said thin layer consisting of fine metal particles wherein each deposited fine metal particle contacts adjacent deposited fine metal particles, said fine metal particles being of a uniform size of not greater than 0.1 μm in diameter, said fine metal particles being deposited so that the positional relationships between each fine metal particle and its respectively adjacent fine metal particles are substantially uniform with respect to any of said fine metal particles and the contacts between adjacent fine metal particles are substantially uniform point-to-point contacts throughout said microwave device, said fine metal particles being selected from the group consisting of pt and alloys thereof, Nb-Zr, Nb-Ta, Nb-Ti, Pb-Bi, Mo-Tc, Ta-Ti, Nb_3Sn, Nb_3Al, Nb_3Ge, Nb_3Au, Nb_3Pt, Ta_3Sn and V_3Si.

4,822,674
INK DONOR FILMS
Shadi L. Malhotra, Mississauga, and Maya D. Stevanovic, Weston, both of Canada, assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 27, 1987, Ser. No. 43,068
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—336 26 Claims

1. A thermal transfer ink donor film comprised of a supporting substrate with a coating of an ink composition on the top surface thereof, which ink is comprised of a blend of four hydrocarbon waxes, pigment particles, pigment dispersants, and binder polymers selected from the group consisting of (1) styrene-b-isoprene-b-dimethyl siloxane triblock copolymers; (2) blends of styrene-b-isoprene diblock copolymers with styrene-b-dimethylsiloxane diblock copolymers; (3) styrene/ethylacrylate/butylacrylate random copolymers; and (4) poly(vinylmethyl ether).

4,822,675
STABLE MAGNETO OPTIC RECORDING MEDIUM
Arnold W. Fankenbusch, White Bear Lake, and David W. Siitari, Edina, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 3,203, Jan. 14, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 176,092
Int. Cl.[4] H01F *10/00;* G11B *5/64*
U.S. Cl. 428—336 9 Claims



1. A magneto-optical recording medium comprising a substrate containing an element selected from the group consisting of sulfur and chlorine, a magnetizable rare earth-transition metal alloy layer on the substrate which alloy layer is protected from contact with the ambient atmosphere by a layer or layers on all sides, and a reflective surface located to reflect light through the magnetizable alloy layer, wherein the magnetizable alloy comprises a combination of an iron-terbium alloy and an added metal selected from the group consisting of yttrium, tantalum, and combinations thereof.

4,822,676
PRESSURE SENSITIVE ADHESIVE COMPOSITIONS FOR USE ON VINYL SUBSTRATES
Paul R. Mudge, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.
Filed Mar. 16, 1987, Ser. No. 26,364
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—343 16 Claims

1. Plasticized polyvinyl chloride substrates coated with a pressure sensitive adhesive composition having a Tg of −45° to −25° C., said adhesive comprising an emulsion polymer of 25–48% by weight of a vinyl ester of a alkenoic acid selected from the group consisting of vinyl formate, vinyl acetate, vinyl propionate, vinyl butyrate, vinyl isobutyrate, vinyl valerate, vinyl-2-ethyl-hexanoate, vinyl isooctanoate, vinyl nonate, vinyl decanoate, vinyl pivalate, and vinyl versetate; 10–25% by weight ethylene; 40–70% by weight of an acrylic acid ester selected from the group consisting of 2-ethylhexyl acrylate, butyl acrylate, hexyl acrylate, heptyl acrylate, octyl acrylate, n-decyl acrylate and dodecyl acrylate; 1 to 10 % by weight tertiary octyl acrylamide, and 1 to 10% by weight of a monocarboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, monoethyl maleate, monobutyl maleate and monooctyl maleate.

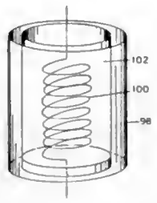
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4,822,677

HIGH-TEMPERATURE CARBON FIBER COIL

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Continuation-in-part of Ser. No. 591,323, Mar. 19, 1984, Pat. No. 4,534,997. This application Aug. 5, 1985, Ser. No. 762,409
Int. Cl.[4] B32B *9/00*; D02G *3/00*; H05B *1/00*
U.S. Cl. 428—367 6 Claims



1. An electrically conductive coil useful in high temperature applications including inductive heating, hot magnetic swagging, motors operable within furnaces and the like, comprising:
a plurality of windings having an electrically conductive elongated carbon filament as a core; and
an electrically insulative layer formed on each of the windings and insulating the windings from each other, the insulative layer being formed of a material selected from the group consisting of the borides, carbides and nitrides of silicon, hafnium and tantalum.

4,822,678

FIBERS AND HOLLOW FIBROUS TUBES

Harry Brody, Harrogate; Colin A. Dewar, Hucclecote, and Nigel W. Hayman, Cheltenham, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Apr. 24, 1987, Ser. No. 42,231
Claims priority, application United Kingdom, May 16, 1986, 8611974; Jan. 7, 1987, 8700247
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—373 2 Claims



1. A melt spun fibre having two polymeric fibrous components and containing from 30 to 70 parts by weight of a first component which is nylon 66, from 70 to 30 parts by weight of a second component which is polypropylene compatibilizer present in an amount sufficient to reduce the interfacial surface tension between the nylon 66 and polypropylene, each component being present in the fibre as fibrils which are substantially aligned to the axis of the fibre, the aligned fibrils being interconnected to each other in a random manner, the interconnections penetrating through the fibrils of the other component such that both components exist in the fibre as interpenetrating networks.

4,822,679

SPRAY-APPLIED CERAMIC FIBER INSULATION

Juan M. Cerdan-Diaz, North Tonawanda, N.Y.; Michael J. Sanders, Salsbury, N.C., and Mark E. Wellar, Niagara Falls, N.Y., assignors to Stemcor Corporation, Cleveland, Ohio

Division of Ser. No. 777,333, Aug. 26, 1985, Pat. No. 4,640,848. This application Jan. 13, 1987, Ser. No. 925,580
Int. Cl.[4] B32B *9/00*; D02G *3/00*
U.S. Cl. 428—392 5 Claims

1. Ceramic fiber having a dry coating thereon of an organic polymer binder which when wetted by a solvent for said organic binder is sufficient to impart a wet adhesion to steel of at least 0.2 gm/cm^2.

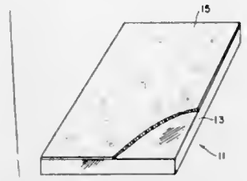
2. The ceramic fiber of claim 1 having a coating thereon in amount of 0.05 to 5.0 weight percent of an organic polymer selected from the group consisting of acrylamide, hydroxyethylcelluloses, carboxymethylcelluloses and carboxyethylcelluloses, or mixtures thereof.

4,822,680

POLYURETHANE VISIONARY LAMINATE GLASS AND METHOD OF MANUFACTURE

Gennaro J. Catalano, Washington Crossing, and Larry D. George, Bensalem, both of Pa., assignors to American Temporing, Inc., Union City, Calif.

Filed Aug. 28, 1987, Ser. No. 90,530
Int. Cl.[4] B32B *17/10*; G02C *7/10*
U.S. Cl. 428—425.6 13 Claims



1. An architectural opacified glass laminate comprising:
a sheet of clear plate glass; and
a sheet of opacified polyurethane film cross-linked molecularly bonded directly to one side of said glass plate without an interposed adhesive material.

4,822,681

ACTIVATED POLYMER SOLID BODIES AND PROCESSES FOR THE PRODUCTION THEREOF

Werner Schössler, Neu-Buch; Hans-Friedrich Boeden; Martin Holtzhauer, both of Berlin; Fritz Loth, Teltow; Falk Hiepe, Berlin; Dieter Bertram, Leipzig; Frank Mielke, Berlin; Reinhard Müller, and Dagmar Konjuchowa, both of Leipzig, all of German Democratic Rep., assignors to Veb Leipziger Arzeimittelwerk, Leipzig, German Democratic Rep.

Filed Jan. 29, 1987, Ser. No. 9,195
Claims priority, application German Democratic Rep., Jan. 29, 1986, 286581; Jan. 29, 1986, 286582
Int. Cl.[4] B32B *5/12*
U.S. Cl. 428—405 9 Claims

1. Process for the activation of hydroxyl group-containing polymeric solid body carrier material surfaces, comprising reacting said hydroxyl groups to form chemical bonding with an organo-silane of the formula (I)

$$(XR'_{n'})_nSiR_{4-n} \quad (I)$$

in which X carbonyl, carboxy, epoxy, isocyano, isothiocyano, nitroso, sulfhydryl or halocarbonyl, R' is alkyl, alkylphenyl or phenyl, R is alkoxy, phenoxy or halogen, n' is an integer from 0 to 20 and n is an integer from 1 to 3, or with two or more organo-silanes of formula (I), said two or more organo-silanes being provided together in mixture, or successively, said organo-silane being provided in a fluid phase.

4,822,682

ORIENTED POLYMER MATERIALS

Dieter Dorsch, Darmstadt; Rudolf Eldenschink, Mühltal, and Claus P. Herz, Heidelberg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jul. 23, 1987, Ser. No. 76,818
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624898
Int. Cl.[4] B32B *9/04*; B05D *3/06*
U.S. Cl. 428—411.1 5 Claims

1. In an article comprising a substrate coated on its surface with a polymer layer containing polar monomer units, the improvement wherein the monomer units and main polymer chains of the polymer originating from cyclic monomers have a substantially parallel orientation with respect to the surface due to the cyclic structure of the monomers and wherein said monomer units have a dipolar arrangement.

4,822,683

METHOD FOR PREPARING AN ADHESIVE BOND WITH A CURABLE COMPOSITION HAVING REDUCED SHRINKAGE DURING CURE

Raymond F. Schappert, Pittsburgh, and Robert M. Piccirilli, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 938,923, Dec. 8, 1986, Pat. No. 4,739,019. This application Nov. 6, 1987, Ser. No. 117,262
Int. Cl.[4] B32B *27/38*; C09J *5/02*
U.S. Cl. 428—414 12 Claims

1. A method for preparing an adhesive bond between two surfaces to form a bonded structure which comprises:
I. applying to at least one of the surfaces a curable composition comprising:
(i) one or more epoxide group containing materials containing at least two epoxide groups per molecule;
(ii) a positive amount of an effectively thermoplastic polyester, which does not react into the curable composition and is present as a blended ingredient, which does not exceed 40 percent by weight based on the total weight of the epoxide and polyester components of the composition, said polyester having a weight average molecular weight of from about 1,000 to about 8,000, being nonreactive with the one or more epoxide group containing materials of (a) and being insoluble in the one or more epoxide group containing materials of (i); and
(iii) a curing agent adapted to cure the epoxide group containing the materials of (i);
II. placing the surfaces in contact with the composition therebetween; and
III. at least partially curing the curable composition to form the bonded structure.

4,822,684

SANDWICH GLASS

Masahiro Hotta, Kashiwa, and Tadasu Inoue, Matsudo, both of Japan, assignors to Dainippon Plastics Co., Ltd., Osaka, Japan

Filed Oct. 30, 1987, Ser. No. 114,995
Claims priority, application Japan, Mar. 31, 1987, 62-80756
Int. Cl.[4] B32B *17/10, 27/32*
U.S. Cl. 428—426 14 Claims

1. A sandwich glass comprising a glass plate with one or more glass plates or hard plastic sheets which are laminated and united through a resin interlayer in which the resin interlayer comprises a block copolymer (a) comprising both terminal blocks comprising a polymer of an aromatic vinyl compound and an intermediate block comprising a polymer of conjugated diene series, said both terminal blocks constituting 10–40% by weight of the copolymer and being hydrogenated in a ratio of 10% or less and said intermediate block being hydrogenated in a ratio of 90% or more.

4,822,685

METHOD FOR PREPARING MULTI-LAYERED COATED ARTICLES AND THE COATED ARTICLES PREPARED BY THE METHOD

Leon A. Perez; Marvis E. Hartman, both of Pittsburgh, Pa., and Naomi R. Suss, Westlake, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 10, 1987, Ser. No. 130,923
Int. Cl.[4] B05D *1/36, 7/00*; B32B *27/00, 27/40*
U.S. Cl. 428—423.3 33 Claims

1. A method of forming a multilayered coating on a substrate, comprising:
(I) applying to the surface of a substrate an aqueous based film forming composition comprising color pigments and an aqueous polyurethane dispersion comprising an effective amount of the reaction product of:
(a) a substantially branched, isocyanate containing prepolymer; and
(b) a polyamine having primary and/or secondary amino groups;
(II) applying a clear film forming composition over the basecoat of step (I);
(III) allowing the clear composition of step (II) to at least partially dry or cure to form a transparent topcoat over said basecoat.

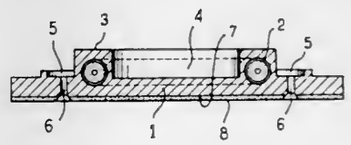
31. An article coated by the method of claim 1.

4,822,686

IRON BASEPLATE HAVING AN ENAMEL COATING

Bernard Louison, Saint Etienne, and Henri Piera, Annecy, both of France, assignors to Seb S. A., Selongey, France

Division of Ser. No. 856,168, Apr. 28, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 123,948
Claims priority, application France, May 2, 1985, 85 06684
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—457 3 Claims



1. A baseplate for an iron, comprising a first part (3) made from a cast aluminum alloy in which is embedded a tubular heating resistance (2), and a second part (1*a*) made from a rolled aluminum alloy sheet which is secured directly to a surface of said first part (3), the external face of said rolled sheet being covered with an enamel coating produced from an enamel frit composition frittable at a temperature comprised between 500° to 600° C.

4,822,687

SILICONE RELEASE COMPOSITIONS

Carl R. Kessel, and Stephen W. Bany, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 22, 1988, Ser. No. 146,977
Int. Cl.[4] C08G *77/20*
U.S. Cl. 428—447 23 Claims

1. A composite structure comprising a substrate bearing on one or more surfaces a layer comprising an epoxypolysiloxane in which greater than 20% of the siloxane units are substituted by an oxiranyl group-substituted monovalent, non-cyclic, lin-

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ear or branched aliphatic group, said epoxypolysiloxane being free of epoxy containing cycloaliphatic group-substituted siloxane units.

4,822,688

ADHESIVE COMPOSITIONS BASED ON POLYPROPYLENE MODIFIED BY GRAFTING AN UNSATURATED MONOMER

Pierre Nogues, Residence St. Germain, Blvd. de Normandie, 27000 Evreux, France

Continuation of Ser. No. 792,519, Oct. 29, 1985, Pat. No. 4,727,120. This application Jun. 19, 1987, Ser. No. 64,332
Claims priority, application France, Oct. 30, 1984, 84 16568
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] B32B *15/08, 27/08;* **C08F** *255/02*
U.S. Cl. 428—458 **14 Claims**

1. An adhesive composition consisting essentially of the reaction product of (a) a polypropylene compound consisting of polypropylene modified by grafting thereto an unsaturated monomer bearing an acid anhydride group, with (b) a compound R, bearing at least two amine groups, which are reactive with the anhydride group, in an amount such that the molarity ratio, prior to formation of the reaction product and defined as the ratio of the number of reactive groups carried by the compound R to the number of anhydride groups carried by the grafted polypropylene, is from about 0.01 to about 5 and wherein compound R is at least one member selected from the group consisting of polyamines and oligomers or alpha, omega-diamino polyamides.

4,822,689

HIGH VOLUME FRACTION REFRACTORY OXIDE, THERMAL SHOCK RESISTANT COATINGS

Harold H. Fukubayashi, Ibaki; Kenichi Tsushima, Hiroshima, both of Japan; Robert C. Tucker, Jr., Brownsburg, and Thomas A. Taylor, Indianapolis, both of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 789,099, Oct. 18, 1986, abandoned. This application Aug. 26, 1986, Ser. No. 900,318
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—472 **18 Claims**

1. A powdered coating composition comprising about 60 to 95 volume percent refractory oxide and a metal alloy comprising about 17 to 35 weight percent chromium, about 5 to about 14 weight percent aluminum, about 5 to about 20 weight percent tantalum, 0 to about 3.5 weight percent carbon, 0 to about 2 weight percent yttrium, 0 to about 2.5 weight percent silicon, 0 to about 3 weight percent tungsten, 0 to about 3 weight percent molybdenum, 0 to about 3 weight percent manganese, and at least one metal selected from the group consisting of cobalt, nickel, and iron, the weight percentages based upon the weight of the metal alloy.

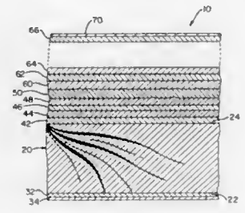
4,822,690

VIOLIN FINISH AND FINISHING METHOD

Eugene A. Wahl, 460 Ridgewood Ave., Glen Ridge, N.J. 07028

Continuation-in-part of Ser. No. 114,573, Oct. 29, 1987, Pat. No. 4,789,603. This application Oct. 12, 1988, Ser. No. 256,717
The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.
Int. Cl.[4] G10D *1/02*
U.S. Cl. 428—498 **23 Claims**

1. A wood violin having a multi-layer finish comprising as the first layer a pigment applied to the exterior surface of the violin, as a second layer plural coats of an alcohol based finish



having a dye dissolved therein, and as a third layer at least one coat of a spirit based finish having a dye dissolved therein.

4,822,691

COPIER RESISTANT COATING FOR POLYVINYL CHLORIDE

David R. Morse, Haverhill, Mass., assignor to Borden Inc., Columbus, Ohio

Division of Ser. No. 56,314, May 29, 1987, Pat. No. 4,740,541. This application Dec. 14, 1987, Ser. No. 132,027
Int. Cl.[4] B32B *27/30*
U.S. Cl. 428—522 **10 Claims**

1. A coated polyvinyl chloride film which comprises a polyvinyl chloride film and a coating consisting essentially of
(a) 90–96 parts by weight of a methacrylic resin,
(b) 4–10 parts by weight of a cellulose acetate butyrate resin, and
(c) 0.0–0.25 parts by weight of a slip additive.

4,822,692

SEAMLESS POROUS METAL ARTICLE AND METHOD OF MAKING

Paul C. Koehler, Dryden, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 935,644, Nov. 26, 1986, abandoned, which is a continuation of Ser. No. 697,391, Feb. 1, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 120,172
Int. Cl.[4] B22F *3/06;* **B32B** *5/18*
U.S. Cl. 428—547 **30 Claims**

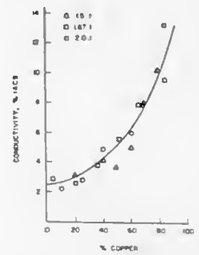
1. A method of manufacturing a seamless, hollow, porous article comprising:
(a) rotating a mold containing a stabilized suspension of a metal particulate at a rate and for a time such that said particulate is separated from said suspension and distributed on the interior wall of said mold, thereby forming a structure conforming to the interior wall of said mold and supernatant fluid, the rate of rotation being sufficiently high that at least about 100 Gs of acceleration is achieved at the interior wall of said structure;
(b) removing said supernatant fluid and drying said structure to provide a dried structure having green or unsintered strength;
(c) sintering the dried structure to remove volatile material and fuse the individual particles of said particulate to each other to form a seamless, hollow, porous article; and
(d) removing the seamless, hollow, porous article from said mold.

4,822,693

COPPER-IRON-NICKEL COMPOSITE MATERIAL FOR ELECTRICAL AND ELECTRONIC APPLICATIONS

Sankaranarayanan Ashok, Bethany; Jacob Crane, Woodbridge, and Julius C. Fister, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 23, 1987, Ser. No. 28,846
Int. Cl.[4] B32B *15/02*
U.S. Cl. 428—614 **8 Claims**



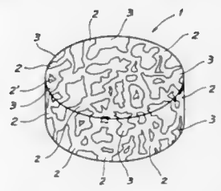
7. A substrate for supporting silicon chips comprising said substrate being formed from a composite material comprising a first phase consisting essentially of a continuous copper matrix and a second discontinuous phase consisting essentially of an iron nickel alloy with the iron to nickel ratio being in the range of from about 1.5:1 to about 2.0:1, said material consisting essentially of from about 20% to about 80% copper, from about 12% to about 59% iron and the balance nickel.

4,822,694

COMPOSITE MATERIAL

Jean-Paul Randin, Cortaillod, and Ludwig Gauckler, Schaffhausen, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Nov. 3, 1987, Ser. No. 116,173
Claims priority, application France, Nov. 3, 1986, 86 15380
Int. Cl.[4] B32B *3/26;* **B05D** *5/00*
U.S. Cl. 428—615 **18 Claims**



15. A composite material which includes an open pore rigid foam made of a first solid material and having a rigid three dimensional skeleton comprising a network of rigid component parts linked one to another to define cavities which communicate one to another and with the outside of the foam, and a second solid material disposed in the cavities of said foam, said second material having a liquid form in the presence of said foam which does not destroy said foam, and said composite material being made by a process comprising obtaining the second material in said liquid form, introducing the second material into the cavities of the foam while the second material is in said liquid form, and solidifying the second material after said introduction to fix said second material relative to said first material, said component parts and said cavities being so dimensioned that the zones constituted by the intersection of an outer surface of said composite material with said component parts and said cavities respectively are readily visible and may be distinguished sufficiently from each other by the naked eye to provide an aesthetic appearance, and said first and second solid materials together provide a solid composite material suitable for manufacturing an ornamental article.

4,822,695

LOW POROSITY SURFACING ALLOYS

Jay M. Larson, and Keith E. Mengel, both of Marshall, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 029,113, Mar. 23, 1987, abandoned. This application May 6, 1988, Ser. No. 193,160
Int. Cl.[4] B32B *15/01, 15/02;* **C22C** *30/00, 38/02*
U.S. Cl. 428—687 **3 Claims**

1. An improved metallic alloy adapted to be deposited in a molten state by a weld surfacing process upon a nitrogen containing steel substrate to provide a wear resistant surface thereupon, said alloy being substantially devoid of Tungsten and containing at least about 45.0% by weight iron to the total weight of the alloy and including the constituents:

Constituent	% By Weight to Total Alloy Weight	
	From About	To About
Carbon	1.5	1.7
Manganese	0.4	0.55
Chromium	26.1	28.0
Nickel	15.0	16.0
Molybdenum	4.5	5.5
Silicon	1.5	2.0
Phosphorus	0.0	0.01
Sulfur	0.0	0.01
Cadmium	0.0	0.01
Titanium	0.0	0.01
Aluminum	0.0	0.01
Boron	0.0	0.05
Iron	Balance	

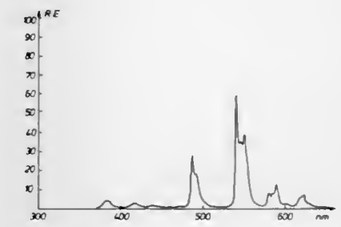
and said improvement characterized by said surface having reduced porosity arising from liberation of nitrogen during the process of depositing said surface upon said substrate by reason of said alloy further including silicon in the range of about 1.5% to about 2.0% by weight to the total weight of the alloy.

4,822,696

PROCESS FOR THE CONVERSION OF X-RAYS

Marinus J. Lammers, Nieuwegein; George Blasse, Bunnik, both of Netherlands; David R. Terrell, Lint, and Leo B. Alaerts, Boechout, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Aug. 5, 1987, Ser. No. 81,756
Claims priority, application European Pat. Off., Aug. 29, 1986, EP 86201485.9
Int. Cl.[4] C09K *11/80*
U.S. Cl. 428—690 **8 Claims**



1. A process for the conversion of X-rays into blue and/or green light with a phosphor which on exposure to X-rays emits light the spectrum of which contains main intensity lines below 460 nm and/or main intensity lines between 530 and 570 nm,

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characterized in that said phosphor comprises a gadolinium gallium garnet compound having the following empirical formula:

$$Gd_{8-x-y}Ln_yGa_xO_{12}$$

wherein : $5.14 \geqq x \geqq 4.90$ and $0.45 \geqq y \geqq 0.001$, and Ln is scandium and/or one or more rare earth elements other than gadolinium.

4,822,697

PLATINUM AND RHODIUM CATALYSIS OF LOW TEMPERATURE FORMATION MULTILAYER CERAMICS

Loren A. Haluska; Keith W. Michael, both of Midland, and Leo Tarhay, Sanford, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 3, 1986, Ser. No. 937,273
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—698 **52 Claims**

1. A process for forming on a substrate a multilayer, ceramic or ceramic-like, coating which process comprises:

(I) (A) coating an electronic device with a planarizing coating by means of diluting hydrogen silsesquioxane resin with a solvent, catalyzing the diluted hydrogen silsesquioxane resin solution with a metal catalyst selected from the group consisting of platinum catalysts and rhodium catalysts, and applying the catalyzed diluted hydrogen silsesquioxane resin solution to an electronic device; (B) drying the catalyzed diluted hydrogen silsesquioxane resin solution so as to evaporate the solvent and thereby deposit a catalyzed hydrogen silsesquioxane resin preceramic coating on the electronic device; (C) ceramifying the catalyzed hydrogen silsesquioxane resin preceramic coating to silicon dioxide by heating the coated device to a temperature between 150 and 1000 degrees Centigrade to produce a ceramic or ceramic-like planarizing coating;

(II) applying to the ceramic or ceramic-like planarizing coating a passivating coating selected from the group consisting of (i) a silicon nitrogen-containing coating, (ii) a silicon carbon-containing coating, and (iii) a silicon carbon nitrogen-containing coating, wherein the silicon nitrogen-containing coating is applied onto the planarizing coating of the electronic device by a means selected from the group consisting of (a) chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of ammonia, (b) plasma enhanced chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of ammonia, (c) ceramification of a silicon and nitrogen-containing preceramic polymer; and wherein the silicon carbon nitrogen-containing coating is applied onto the planarizing coating of the electronic device by a means selected from the group consisting of (1) chemical vapor deposition of hexamethyldisilazane, (2) plasma enhanced chemical vapor deposition of hexamethyldisilazane, (3) chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixture thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and further in the presence of ammonia, and (4) plasma enhanced chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixture thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and further in the presence of ammonia; and wherein the silicon carbon-containing coating is deposited by a means selected from the group consisting of (i) chemical vapor deposition of an alkylsilane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and (ii) plasma enhanced chemical vapor deposition of a halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane, to produce the passivating ceramic or ceramic-like coating, and

(III) applying to the passivating ceramic or ceramic-like coating a silicon-containing coating selected from the group consisting of (i) silicon coating, (ii) silicon carbon-containing coating, (iii) silicon nitrogen-containing coating, and (iv) silicon carbon nitrogen coating, wherein the silicon coating is applied onto the passivating coating by a means selected from the group consisting of (a) chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof, (b) plasma enhanced chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof, or (c) metal assisted chemical vapor deposition of a halosilane, halodisilane, halopolysilane or mixtures thereof, and wherein the silicon carbon coating is applied by a means selected from the group consisting of (1) chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane, (2) plasma enhanced chemical vapor deposition of an alkylsilane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane; and wherein the silicon nitrogen-containing coating is deposited by a means selected from the group consisting of (A) chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of ammonia, (B) plasma enhanced chemical vapor deposition of a silane, halosilane, halodisilane, halopolysilane or mixtures thereof in the presence of ammonia, and (C) ceramification of a silicon and nitrogen-containing preceramic polymer, and wherein the silicon carbon nitrogen-containing coating is deposited by a means selected from the group consisting of (i) chemical vapor deposition of hexamethyldisilazane, (ii) plasma enhanced chemical vapor deposition of hexamethyldisilazane, (iii) chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixture thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and further in the presence of ammonia, and (iv) plasma enhanced chemical vapor deposition of a silane, alkylsilane, halosilane, halodisilane, halopolysilane or mixture thereof in the presence of an alkane of one to six carbon atoms or an alkylsilane and further in the presence of ammonia, to produce the silicon-containing coating, whereby a multilayer, ceramic or ceramic-like, coating is obtained on the electronic device.

4,822,698

SEAWATER POWER CELL

John F. Jackovitz, Monroeville Borough; David Zuckerbrod, Pittsburgh, and Edward S. Buzzelli, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

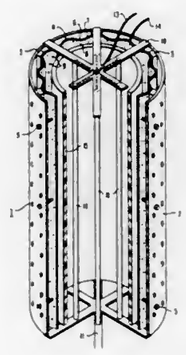
Filed May 15, 1987, Ser. No. 50,179
Int. Cl.[4] H01M *6/34*
U.S. Cl. 429—27 **6 Claims**

1. A seawater activated battery comprising

(A) a porous casing of inert material;

(B) an oxygen electrode as a cathode fixed inside and spaced apart from said casing;

(C) an anode selected from the group consisting of magnesium, zinc, and mixtures thereof, said anode being fixed inside said oxygen electrode, spaced therefrom; and



(D) means for collecting current from said anode and said cathode.

4,822,699

ELECTROCATALYST AND FUEL CELL ELECTRODE USING THE SAME

Chung-Zong Wan, Somerset, N.J., assignor to Engelhard Corporation, Menlo Park, N.J.

Filed Dec. 20, 1982, Ser. No. 451,696
Int. Cl.[4] H01M *4/86;* **B01J** *23/40, 23/42*
U.S. Cl. 429—40 **23 Claims**

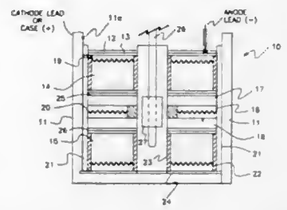
1. A platinum group metal alloy electrocatalyst comprises a platinum-gallium alloy of up to about fifty atomic percent gallium dispersed on a suitable conductive carrier.

4,822,700

SAFETY CATHODE FOR NON-AQUEOUS ELECTROCHEMICAL CELL

Narayan Doddapaneni, Glenside; David L. Chua, Wayne, both of Pa.; Gerald F. Hoff, Columbia, and James D. Jensen, Highland, both of Md., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 22, 1988, Ser. No. 185,586
Int. Cl.[4] H01M *10/36, 10/44*
U.S. Cl. 429—50 **14 Claims**



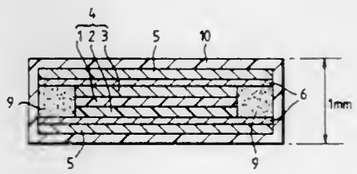
1. A reaction limiting cathode for a non-aqueous active metal electrochemical cell comprising an alkali metal anode, an electrolyte system including an electrolyte salt dissolved in a non-aqueous solvent depolarizer, said cathode comprising an amount of carbon black in an amount of binder and an amount of ceramic material, said ceramic material being substantially unreactive with other cell species below a predetermined temperture but capable of reacting to form substantially inactive products with the metal of the anode material at or above said predetermined temperature.

4,822,701

SOLID ELECTROLYTES

Dennis G H Ballard, Chester; Philip Cheshire, Wigan, and Josef E. Przeworski, Chester, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Sep. 11, 1987, Ser. No. 95,264
Claims priority, application United Kingdom, Sep. 19, 1986, 8622576; Apr. 30, 1987, 8710310
Int. Cl.[4] H01M *6/16*
U.S. Cl. 429—192 **10 Claims**



1. A solid electrolyte for an electrochemical cell, which comprises:

(a) a matrix of cross-linked polymer chains, having side chains linked thereto, which side chains comprise polar groups free from active hydrogen atoms,

(b) a polar aprotic liquid dispersed in the matrix, and

(c) an ionised monomeric ammonium or alkali metal or alkaline earth metal salt dissolved in the matrix and/or liquid.

4,822,702

METHOD FOR FORMING MULTI-COLOR TONER IMAGE

Nobuyoshi Hoshi; Masayasu Anzai, both of Hitachi; Isamu Komatsu, Takahagi, and Susumu Akimaru, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1982, Ser. No. 434,555
Claims priority, application Japan, Oct. 26, 1981, 56-170141; Feb. 12, 1982, 57-19615
Int. Cl.[4] G03G *15/01*
U.S. Cl. 430—42 **6 Claims**

1. A method of forming multi-color toner images comprising the steps of:

forming a first electrostatic latent image corresponding to a first image information on a photoconductive photosensitive material;

charging a first toner for a first color to the same polarity as that of said first electrostatic latent image, said first toner being used in the form of a mixture with a carrier;

forming a first toner image on said photoconductive photosensitive material by reversal development of said first electrostatic latent image with said first toner charged;

forming a second electrostatic latent image corresponding to a second image information on said photoconductive photosensitive material;

charging a second toner for a second color different from said first color to the same polarity as that of said second electrostatic latent image, the average charge quantity of said second toner being larger than that of said first toner;

charging the first toner incorporated in the second toner to the polarity opposite to the polarity of the charge forming said electrostatic latent images, by frictional action between said first toner and said second toner;

forming a second toner image on said photoconductive photosensitive material by reversal development of said second electrostatic latent image with said second otner charged; and

transferring electrostatically said first and second toner images on a recording medium.

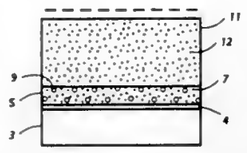
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4,822,703

PHOTORESPONSIVE IMAGING MEMBERS WITH POLYGERMANES

Santokh S. Badesha, Pittsford; Milan Stolka, Fairport; Ronald J. Weagley, Penfield, and Frederick J. Roberts, Jr., Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1988, Ser. No. 177,276
Int. Cl.[4] G03G 5/14
U.S. Cl. 430—58 21 Claims



1. A layered photoresponsive imaging member comprised of a supporting substrate, a photogenerating layer, and a charge transport layer in contact therewith, which layer is comprised of polygermane compounds or copolymers thereof.

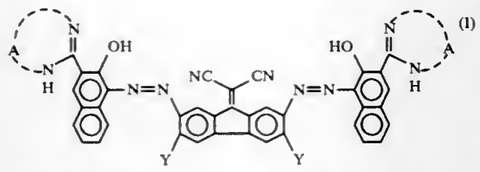
4,822,704

ELECTROPHOTOGRAPHIC PHOTORECEPTOR HAVING A BISAZO COMPOUND

Yutaka Akasaki; Akihiko Tokita; Kaoru Torikoshi; Akira Imai, and Touru Ishii, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1987, Ser. No. 80,357
Claims priority, application Japan, Jul. 31, 1986, 61-178712
Int. Cl.[4] G03G 5/06
U.S. Cl. 430—58 9 Claims

1. An electrophotographic photoreceptor comprising a conductive support having provided thereon a photosensitive layer containing a bisazo compound represented by formula (I)



wherein Y represents a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom, a cyano group, a nitro group or a hydroxyl group; and A represents a substituted or unsubstituted divalent aromatic hydrocarbon group or a substituted or unsubstituted divalent nitrogen-containing heterocyclic group.

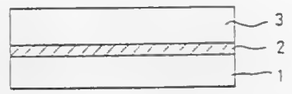
4,822,705

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR WITH LAYER PREVENTING CHARGE INJECTION

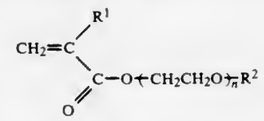
Toshio Fukagai; Kiyoshi Taniguchi, both of Numazu; Katsuichi Ohta, Mishima; Minoru Umeda, and Kayoko Yokoyama, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,748
Claims priority, application Japan, Feb. 24, 1987, 62-040751; Feb. 24, 1987, 62-040752; Feb. 24, 1987, 62-040753; Feb. 24, 1987, 62-040754; Feb. 24, 1987, 62-040755; Feb. 24, 1987, 62-040756; Mar. 9, 1987, 62-054813; Mar. 10, 1987, 62-056075; Mar. 10, 1987, 62-056076; Jun. 10, 1987, 62-145884
Int. Cl.[4] G03G 5/024, 5/14
U.S. Cl. 430—60 10 Claims

1. An electrophotographic photoconductor comprising an electroconductive support, an intermediate layer formed thereon, and a photoconductive layer formed on said intermediate layer, which intermediate layer comprises at least one component selected from the group consisting of:
(1) monohydric aliphatic alcohol,
(2) dihydric aliphatic alcohol,
(3) polyethylene glycol monoester and/or polyethylene glycol diester,
(4) polyethylene glycol monoether,



(5) crown ether,
(6) a random or block copolymer having as structure units a hydroxethylene group and a hydroxypropylene group, and hydroxyl groups at the terminal thereof, and
(7) a polymer of a monomer having formula (1) and a copolymer of said monomer and a counterpart monomer:



wherein R^1 is hydrogen or a methyl group; R^2 is hydrogen, a lower alkyl group or an unsubstituted or substituted aryl group; and n is an integer of 2 to 100.

4,822,706

BINDER FOR PHOTOCONDUCTIVE LAYER OF PERSISTENT CONDUCTIVITY-TYPE ELECTROPHOTOGRAPHIC RECORDING MEMBER

Donald J. Carolia, Plymouth, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 26, 1988, Ser. No. 160,651
Int. Cl.[4] G03G 5/05, 5/08
U.S. Cl. 430—89 13 Claims

1. A persistent conductivity-type electrophotographic recording member comprising a nonconductive layer and a photoconductive layer disposed on one surface of said nonconductive layer, wherein said photoconductive layer comprises a photosensitive material substantially uniformly dispersed in a binder, said binder having an acid value of less than 2 and consisting essentially of a copolymer of styrene with at least one alkyl acrylate, the alkyl group of which comprises from four to twelve carbon atoms.

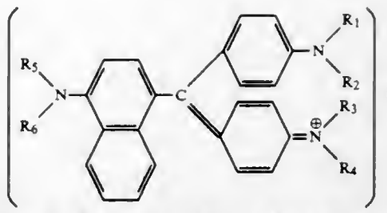
4,822,707

POSITIVELY CHARGEABLE TONERS FOR USE IN DRY TYPE ELECTROPHOTOGRAPHY COMPRISING A BLUE DYE LAKE CHARGE CONTROL AGENT

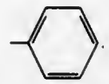
Satoru Inoue, Mishima, and Akio Matsui, Numazu, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1985, Ser. No. 756,521
Claims priority, application Japan, Jul. 30, 1984, 59-157251
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—106 12 Claims

1. A toner for use in a dry developer for electrophotography, which toner is triboelectrically charged with a positive electric charge, consisting essentially of a binder resin and a charge controlling agent, wherein said binder resin consists essentially of styrene resin or epoxy resin and said charge controlling agent is a lake which is a phosphotungstenmolybdic acid salt, phosphotungstic acid salt or phosphomolybdic acid salt of a compound having the formula



wherein R_1, R_2, R_3, R_4, R_5 and R_6, which are the same or different, are H, C_nH_{2n+1} wherein n is an integer of 1 to 5, or



4,822,708

CARRIER FOR USE IN DEVELOPING DEVICE OF ELECTROSTATIC LATENT IMAGE AND PRODUCTION THEREOF

Junji Machida, Toyonaka; Junji Ohtani, Osaka; Eiichi Sano, Takatsuki; Masahiro Anno, Sakai; Toshitaro Kohri, Higashiosaka; Yukio Tanigami, and Makoto Kobayashi, both of Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1987, Ser. No. 80,489
Claims priority, application Japan, Aug. 1, 1986, 61-182239; Aug. 1, 1986, 61-182241
Int. Cl.[4] G03G 9/14
U.S. Cl. 430—106.6 50 Claims

1. A carrier for use in a developing device for an electrostatic latent image, which carrier comprises a magnetic core and a coating layer formed over said magnetic core, said coating layer comprising fine magnetic particles in an amount sufficient to provide said carrier with an electrical resistance of from 10^{10} to 10^{15} ohm cm.

4,822,709

BINDER-TYPE CARRIER SUITABLE FOR A DEVELOPING METHOD OF ELECTROSTATIC LATENT IMAGES

Junji Ohtani, Osaka; Eiichi Sano, Takatsuki, and Toshitaro Kohri, Higashiosaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 8, 1987, Ser. No. 70,934
Claims priority, application Japan, Jul. 10, 1986, 61-163146
Int. Cl.[4] G03G 9/10
U.S. Cl. 430—106.6 5 Claims

1. A binder type carrier comprising magnetic particles and binder resin, characterized in that the binder resin has the characteristics of:

(a) a melting viscosity at 100° C. (η_{100}) (poise)) of:

$$4.5 \leqq \log(\eta_{100}) \leqq 8.2$$

(b) a temperature dependence of the melting viscosity of: (d_η/dT (poise/°K.));

$$1.2\times10^{-2} \leqq -d(\log \eta)/dT \leqq 9.5\times10^{-2}$$

and

(c) a softening temperature (Tm) (°C.) of:

$$95 \leqq Tm \leqq 145.$$

4,822,710

LIQUID DEVELOPER COMPOSITIONS

Melvin D. Croucher, Oakville; James M. Duff, Mississauga; John R. C. Fuller, Oakville; George R. Pravato, York, and Raymond W. Wong, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 20, 1987, Ser. No. 16,815
Int. Cl.[4] G03G 9/12
U.S. Cl. 430—115 31 Claims

1. An improved liquid developer composition comprised of a Magiesol oil base, pigment particles, a dispersant, and a thickener component selected from the group consisting of polyisobutylene and poly(isobutyl-co-isoprene)copolymer.

4,822,711

ELECTROSTATIC IMAGE-DEVELOPING PROCESS USING A MAGNETIC ROLLER

Masahiko Itaya; Hiroshi Fuma, and Toshiro Fujimori, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 119,155
Claims priority, application Japan, Nov. 12, 1986, 61-270212; Nov. 17, 1986, 61-275040
Int. Cl.[4] G03G 15/08
U.S. Cl. 430—120 9 Claims

1. An electrostatic image-developing process comprising, a step of supplying a developer comprising carrier and toner to a developer transporting means which includes a cylindrical development sleeve for carrying by rotation said developer to the close proximity of an electrostatic latent image formed on an image carrying member disposed opposite thereto, the outer diameter of said cylindrical development sleeve being 15 mm to 30mm, and a magnetic roller provided inside said cylindrical development sleeve, said roller having not less than ten magnetic poles, a step of forming a thin layer of said developer on the surface of said developer transporting means so that the maximum thickness of the developer layer is smaller than the minimum distance between the surface of said developer transporting means and the surface of said electrostatic image carrying member, a step of carrying said developer to a close proximity of the electrostatic image, and a step of forming a toner image on said electrostatic latent image carrying member.

4,822,712

REDUCTION OF SELENIUM ALLOY FRACTIONATION

Geoffrey M. Foley, Fairport; Santokh S. Badesha, Pittsford; Paul Cheria, Fairport; Kenneth J. Pheilshifter, Rochester, and Philip G. Perry, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 8, 1988, Ser. No. 179,375
Int. Cl.[4] G03G 5/082; C21D 1/00
U.S. Cl. 430—128 19 Claims

13. A process for preparing an electrophotographic imaging member comprising providing particles of an alloy comprising amorphous selenium and an alloying component selected from the group consisting of tellurium, arsenic, and mixtures thereof, said particles having an average particle size of at least about 300 micrometers and an average weight of less than about 1000 mg, forming crystal nucleation sites on at least the surface of said particles while maintaining the substantial surface integrity of said particles, heating said particles to at least a first temperature between about 50° C. and about 80° C. for at least about 30 minutes to form a thin, substantially continuous layer of crystalline material at the surface of said particles while maintaining the core of selenium alloy in said particles in an amorphous state, and rapidly heating said particles to at least a second temperature below the softening temperature of said particles, said second temperature being at least 20° C. higher than said first temperature and between about 85° C. and about 130° C. to crystallize at least about 5 percent by weight of said amorphous core of selenium alloy in said particles, and rapidly heating said particles to a temperature be-

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tween about 280° C. and and about 400° C. in a vacuum coater to vacuum deposit said alloy onto an adjacent substrate.

4,822,713
LIGHT-SENSITIVE COMPOSITION WITH FLUORINE CONTAINING ACRYLATE OR METHACRYLATE COPOLYMER SURFACTANT

Akira Nishioka, Shizuoka; Masayuki Kamei, Sakai, and Toshihiko Umaba, Takaishi, all of Japan, assignors to Fujl Photo Film Co., Ltd., Minaml-ashigara, Japan

Filed Jan. 21, 1987, Ser. No. 5,659
Claims priority, application Japan, Jan. 23, 1986, 61-12804
Int. Cl.⁴ G03C *1/60, 1/68, 1/76*
U.S. Cl. 430—175 **12 Claims**

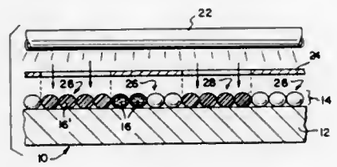
1. A light-sensitive composition comprising, in admixture, a fluorine-containing surfactant and a light-sensitive ingredient, wherein:
(a) the fluorine-containing surfactant is a copolymer of (i) an acrylate having a fluoroaliphatic group, Rf, which has 3 to 20 carbon atoms and at least 40% by weight of fluorine atoms, and at least three terminal carbon atoms which are fully fluorinated; and (ii) a poly(oxyalkylene) acrylate, or a combination of a poly(oxyalkylene)acrylate with a poly-(oxyalkylene)methacylate;
(b) the Rf group-containing acrylate monomer unit is included in the copolymer in an amount of from 25 to 70% by weight based on the total weight of the copolymer;
(c) the copolymer has a molecular weight of from 2,500 to 100,000;
(d) the poly(oxyalkylene)acrylate monomer unit is included in an amount of at least 15% by weight based on the total weight of the copolymer;
(e) the fluorine-containing surfactant is included in an amount of from 0.01 to 5% by weight based on the total weight of the light-sensitive composition;
(f) the light-sensitive ingredient, after exposure to light, has a change in solubility or swelling property in a developer;
(g) the light-sensitive ingredient is selected from the group of a diazo resin, an o-quinone diazide and an ethylenic unsaturated compound having at least two unsaturated double bonds in the molecule, capable of causing polymerization reaction upon exposure to actinic radiation; and
(h) the light-sensitive ingredient is included in an amount sufficient to make said composition light-sensitive.

12. A presensitized plate from which a lithographic printing plate is to be prepared, which plate comprises a support having provided thereon a light-sensitive layer including a light-sensitive composition comprising, in admixture, a fluorine-containing surfactant and a light-sensitive ingredient, wherein:
(a) the fluorine-containing surfactant is a copolymer of (i) an acrylate having a fluoraliphatic group, Rf, which has 3 to 20 carbon atoms and at least 40 % by weight of fluorine atoms, and at least three terminal carbon atoms which are fully fluorinated; and (ii) a poly(oxyalkylene)acrylate, or a combination of a poly(oxyalkylene)acrylate with a poly-(oxyalkylene)methacrylate;
(b) the Rf group-containing acrylate monomer unit is included in the copolymer in an amount of from 25 to 70% by weight based on the total weight of the copolymer;
(c) the copolymer has a molecular weight of from 2,500 to 100,000;
(d) the poly(oxyalkylene)acrylate monomer unit is included in an amount of at least 15% by weight based on the total weight of the copolymer;
(e) the fluorine-containing surfactant is included in an amount of from 0.01 to 5% by weight based on the total weight of the light-sensitive composition;
(f) the light-sensitive ingredient, after exposure to light, has a change in solubility or swelling property in a developer;
(g) the light-sensitive ingredient is selected from the group of a diazo resin, an o-quinone diazide and an ethylenic unsaturated compound having at least two unsaturated double bonds in the molecule, capable of causing polymerization reaction upon exposure to actinic radiation; and
(h) the light-sensitive ingredient is included in an amount sufficient to make said composition light-sensitive.

4,822,714
TRANSFER IMAGING SYSTEM

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 520,023, Aug. 3, 1983, Pat. No. 4,551,407, which is a continuation of Ser. No. 320,356, Nov. 12, 1981, Pat. No. 4,399,209. This application Apr. 26, 1985, Ser. No. 727,695
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.⁴ G03C *1/72, 5/16*
U.S. Cl. 430—138 **11 Claims**



1. An imaging sheet useful in forming images by exposure-controlled, image-wise reaction of a chromogenic material and a developer, said sheet comprising:
a support having a layer of microcapsules on one surface thereof,
said microcapsules having discrete capsule walls which encapsulate an internal phase,
said internal phase, including a photosensitive composition which undergoes a change in viscosity sufficient to control the release of the internal phase from said microcapsules,
a chromogenic material associated with said microcapsules such that, upon image-wise exposing said layer of microcapsules to actinic radiation and subjecting said layer of microcapsules to a uniform rupturing force, said chromogenic material image-wise becomes available for reaction with a developer to form an image.

9. An imaging sheet comprising a support having thereon pressure rupturable microcapsules encapsulating an internal phase including a radiation curable composition and a color precursor which forms a colored material upon contact with a co-reactant, said microcapsules having discrete capsule walls which encapsulate the internal phase.

10. A process comprising imagewise exposing an imaging sheet comprising a support having thereon pressure rupturable microcapsules encapsulating a radiation curable composition and a color precursor which forms a colored material upon contact with a co-reactant to immobilize the color precursor in the exposed areas; and rupturing said microcapsules in the unexposed areas in the presence of co-reactant to form a color image.

4,822,715
ALUMINUM ALLOY SUPPORTER FOR LITHOGRAPHIC PRINTING PLATE

Ryo Shoji; Chozo Fujikura, both of Tochigi; Kazushige Takizawa, and Hirokazu Sakaki, both of Shizuoka, all of Japan, assignors to Furukawa Aluminum Co., Ltd., Tokyo and Fuji Photo Film Co., Ltd., Minamiashigara, both of, Japan

Filed Mar. 30, 1987, Ser. No. 31,269
Claims priority, application Japan, Apr. 1, 1986, 61-75239
Int. Cl.⁴ G03C *1/94*
U.S. Cl. 430—155 **9 Claims**

1. A photosensitive lithographic printing plate, comprising:

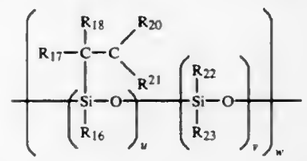
an aluminum alloy support having a photosensitive layer thereon, said aluminum alloy support comprising 0.05–0.5 wt.% of Fe, 0.1–0.9 wt.% of Mg, 0.01–0.3 wt.% of V and/or Ni, not more than 0.2 wt.% of Si, not more than 0.05 wt.% of Cu with the remainder being aluminum and the inevitable impurities.

4,822,716
POLYSILANES, POLYSILOXANES AND SILICONE RESIST MATERIALS CONTAINING THESE COMPOUNDS

Yasunobu Onishi; Shuji Hayase; Rumiko Horiguchi, all of Kanagawa, and Akiko Hirao, Chiba, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 8, 1986, Ser. No. 938,874
Claims priority, application Japan, Dec. 27, 1985, 60-293182; Mar. 31, 1986, 61-71107; May 21, 1986, 61-114673; Jun. 4, 1986, 61-128081
Int. Cl.⁴ G03C *1/52;* **G03L** *1/495*
U.S. Cl. 430—192 **5 Claims**

1. A silicone containing resist material for forming a resist pattern on a semiconducting material by exposure to irradiation and alkaline development, comprising a photosensitive agent and a polysiloxane that contains a structure consisting essentially of units of the formula:



wherein
R_{16} is an alkyl group with 1 to 10 carbon atoms, or a substituted or nonsubstituted aryl group with 6 to 14 carbon atoms,
at least one of substituent groups R_{17} to R_{21} is a group containing a phenolic hydroxy group, and the groups other than the group containing the phenolic hydroxy group R_{17} to R_{21} may be identical or may be different, each representing a hydrogen atom, a halogen atom, an alkyl group, an alkylcarbonyl group, an alkoxycarbonyl group, an alkoxy group, an alkoxyalkyl group, an acyloxy group, an allyl group, or a substituted or nonsubstituted aryl group with 6 to 14 carbon atoms,
R_{22} and R_{23} may be identical or may be different, each representing a vinyl group, an allyl group, an alkyl group with 1 to 10 carbon atoms, an aryl group, a siloxy group, a substituted siloxy group, or a group represented by $—CH_2—CH_2—CH_2—OCO—C(CH_3)=CH_2$,
u and w are positive integers and v is zero or a positive integer,
wherein said photosensitive agent is an azido compound or diazonium salt.

4,822,717
IMAGE-FORMING METHOD EMPLOYING LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND

Taku Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 14, 1987, Ser. No. 73,238
Claims priority, application Japan, Jul. 25, 1986, 61-176416
Int. Cl.⁴ G03C *5/54;* **G03F** *7/26*
U.S. Cl. 430—254 **12 Claims**

1. An image-forming method which comprises:
imagewise exposing to light a light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent and a polymerizable compound provided on a support, said polymerizable compound being solid at 25° C. to form a latent image of the silver halide;
simultaneously or thereafter developing the light-sensitive material to polymerize the polymerizable compound within the area where the latent image of the silver halide has been formed; and
pressing the light-sensitive material on an image-receiving material at a pressure of not lower than 100 kg/cm² while heating to transfer the unpolymerized polymerizable compound to the image-receiving material.

4,822,718
LIGHT ABSORBING COATING

William J. Latham; Terry L. Brewer, and Jeffry Hunninghake, all of Rolla, Mo., assignors to Brewer Science, Inc., Rolla, Mo.

Filed Feb. 4, 1986, Ser. No. 825,855
Int. Cl.⁴ G03C *1/76*
U.S. Cl. 430—271 **20 Claims**

1. A broad spectrum light absorbing coating material for microelectronic photolithography consisting essentially of a polyimide precursor vehicle and at least on soluble light absorbing dye in a solvent system, the dye being substantially completely soluble in the solvent and vehicle system and being effective to absorb substantially all light across a broad spectrum of light, from in the ultra violet spectrum to in the infra red spectrum, when the coating is coated on a microelectronic photolithographic substrate, the coating system having a high electrical resistivity and a high dielectric strength when coated on a substrate, and being effective to provide a uniform, tightly adhering coating, the coating being photolithographically imagable and effective to produce microelectronic images having fine line resolution and being developable and etchable by wet and dry etch microelectronic photolithography processes, the coating having a high specific absorptivity over a broad spectrum of light effective to provide a substantially black coating.

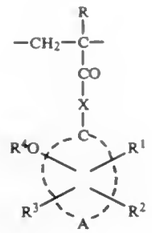
4,822,719
RADIATION-SENSITIVE MIXTURE, RADIATION-SENSITIVE RECORDING MATERIAL CONTAINING SAID MIXTURE, AND PROCESS FOR PREPARING RELIEF IMAGES

Arnold Schneller, Mainz; Ralf Schulze, Frankfurt; Jürgen Sander, Liederbach, and Kurt Erbes, Floersheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 13, 1986, Ser. No. 895,906
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3528929
Int. Cl.⁴ G03C *1/495*
U.S. Cl. 430—270 **7 Claims**

1. A radiation-sensitive mixture comprising:
(A) a water-insoluble polymeric binder which is soluble in aqueous alkaline solutions and has phenolic hydroxyl side groups and
(B) a combination of
(1) a halogen-containing, radiation sensitive compound which forms a strong acid under the action of actinic radiation and
(2) a compound which has at least one acid-cleavable C—O—C bond and the solubility of which in a liquid developer is increased by the action of acid,
wherein said binder comprises a polymer comprised of repeat units represented by the formula

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(I)

where

R is a hydrogen or a halogen atom, a cyanide group or an aliphatic hydrocarbon group of 1–4 carbon atoms, wherein said aliphatic hydrocarbon group is selected from branched and unbranched, saturated and unsaturated groups which can be substituted by halogen atoms or hydroxyl groups, or which contain ether or keto groups,

R^1, R^2, R^3 are identical or different, and each denotes a hydrogen or a halogen atom, an alkoxycarbonyl group, an acyl group, an aroyl group or a hydrocarbon group selected from branched and unbranched, saturated and unsaturated groups with cyclic and open chains which can be substituted by halogen atoms or hydroxyl groups, or which contain ether or keto groups,

R^4 is a hydrogen atom or a divalent organic group which is linked intermolecularly or intramolecularly to another unit represented by formula (I), R^4 being a hydrogen atom in at least 80 mol-% on average of units represented by formula (I),

X denotes an oxygen atom or one at the groups NR^8, $OCH_2CHOHCH_2OCO$, OCH_2CH_2O and OCH_2CH_2OCO, where R^8 is a hydrogen atom, alkyl or aryl group and

A denotes the atoms required for completing a mononuclear or dinuclear carbocyclic or heterocyclic aromatic ring system.

4,822,720

WATER DEVELOPABLE SCREEN PRINTING COMPOSITION

John E. Walls, Hampton, and Frank C. Pagano, Avenel, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 762,080, Aug. 2, 1985, abandoned. This application Jun. 16, 1987, Ser. No. 65,076

Int. Cl.[4] G03F *7/12;* **G03C** *1/94, 1/70*

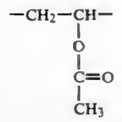
U.S. Cl. 430—284 **23 Claims**

1. A screen printing article comprising a fabric, having disposed thereon a composition comprising

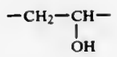
(a) a binder resin having the general formula

—A—B—C—

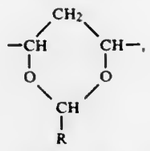
wherein of plurality of each of components A, B and C occur in ordered or random sequence in the resin and wherein A is present in said resin at about 5% to about 20% by weight and comprises groups of the formula



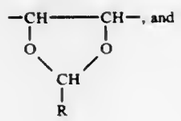
B is present in said resin at about 4% to about 30% by weight and comprises groups of the formula



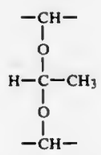
and C is present in said resin at about 50% to about 91% by weight and comprises acetal groups consisting of groups of the formulae



(I)



(II)



(III)

wherein said group I is present in component C from about 75% to about 85%; group II is present in component C from about 3% to about 5%; and group III is present in component C from about 10% to at 22%;

(b) a photopolymerizable mixture of

(1) a polyethoxylate diacrylated monomer

(2) an oligomeric amine diacrylate, wherein R is hydrogen or lower alkyl; and, and

(c) a photoinitiator.

2. The screen printing article of claim 1 wherein said photopolymerizable mixture further comprises a multifunctional acrylate monomer having two or more unsaturated groups, and an oligomeric urethane acrylate having one or two unsaturated groups.

4,822,721

A METHOD OF IMAGE-WISE EXPOSING AND DEVELOPING HALOGEN-CONTAINING POLYACRYLATE DERIVATIVES

Yoshitaka Tsutsumi, Sagamihara; Toru Seita, Atsugi; Hideo Shuyama, Hofu; Kousaburou Matsumura, Yokohama, and Kyoko Nakazawa, Machida, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Division of Ser. No. 946,055, Dec. 24, 1986, Pat. No. 4,752,635. This application Nov. 23, 1987, Ser. No. 123,799

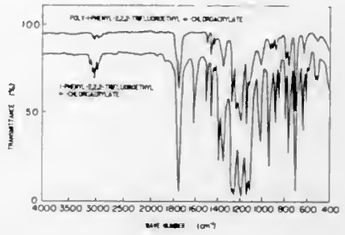
Claims priority, application Japan, Dec. 25, 1985, 60-290823; Apr. 14, 1986, 61-84172; May 15, 1986, 61-109621; Sep. 10, 1986, 61-211488; Sep. 12, 1986, 61-21401; Nov. 15, 1986, 61-270891

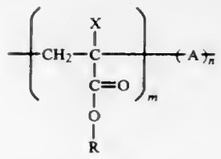
Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—325 **12 Claims**

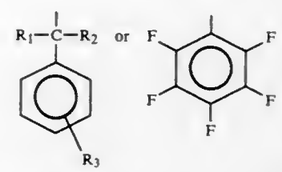
1. A method for forming a patterned article, comprising the steps of:

(i) image-wise exposing to a member selected from the group consisting of electron beams and X-rays, a coating on a substrate, said coating consisting essentially of a halogen-containing polyacrylate having the formula:





wherein A is a structural unit derived from a copolymerizable monomer having a double bond; R is



wherein each of R_1 and R_2 is a hydrogen atom or a fluorinated methyl group, provided R_1 and R_2 are not hydrogen atoms at the same time, and R_3 is a hydrogen atom or a lower alkyl group; X is a halogen atom or a methyl group; and m is a positive integer, n is 0 or a positive integer, and n/m is from 0 to 2, to obtain an image-wise exposed article; and

(ii) developing said image-wise exposed article to obtain said patterned article.

4,822,722

PROCESS OF USING HIGH CONTRAST PHOTORESIST DEVELOPER WITH ENHANCED SENSITIVITY TO FORM POSITIVE RESIST IMAGE

James M. Lewis, Williamsville; Robert A. Owens, E. Amherst; Susan A. Ferguson, W. Seneca; Roland L. Chin, Williamsville, and Valentine T. Zuba, Hamburg, all of N.Y., assignors to Petrarch Systems, Inc., Bristol, Pa.

Continuation of Ser. No. 756,206, Jul. 18, 1985, abandoned. This application Nov. 6, 1987, Ser. No. 119,295

Int. Cl.[4] G03F *7/26*

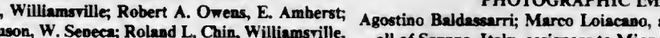
U.S. Cl. 430—326 **4 Claims**

1. In a process for developing a positive photoresist pattern on a radiation sensitive positive resist film formed of a photosensitive mixture of quinone diazide sulfonic acid derivatives with an alkali soluble resin, coated on a substrate and exposed to sufficient patterned radiation to expose the film whereafter the film is developed by dissolving the exposed parts in an alkaline developer to form the surface relief pattern, the improvement wherein high contrast is attained without increasing unexposed film loss by developing the film with an aqueous alkaline developer solution having a pH of at least 9 and comprising:

a solution of the following ingredients which are separate ingredients in solution,

(a) a sufficient amount of alkali metal base which with the other ingredients enables the developer solution to maintain a pH of at least 9;

(b) at least 0.0001% based on the weight of the developer, of a carboxylated surfactant selected from those of the formula:



where R is a linear or branched hydrocarbon radical of 6–18 carbon atoms, n is an integer of 1 to 24 and X is selected from the group consisting of H^+, Na^+, K^+; and

(c) from about 0.01% to about 20% based on the weight of the developer, of an inorganic compound furnishing ions.

4,822,723

DEVELOPER COMPOSITIONS FOR HEAVY-DUTY LITHOGRAPHIC PRINTING PLATES

Major S. Dhillon, Belle Mead, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 30, 1987, Ser. No. 126,147

Int. Cl.[4] G03C *5/18*

U.S. Cl. 430—331 **23 Claims**

1. A developer composition which comprises in admixture:

(a) from about 25.0% to about 75.0% of one or more components selected from the group consisting of propylene glycol monomethyl ether and dipropylene glycol monomethyl ether; and

(b) from about 0.5% to about 10.0% of one or more components selected from the group consisting of benzyl alcohol, phenoxypropenol and phenoxyethanol; and

(c) from about 0.05% to about 5.0% of one or more components selected from the group consisting of ethylene carbonate and propylene carbonate; and

(d) from about 1.0% to about 30.0% ethylene glycol diacetate; and

(e) from about 0.1% to about 10.0% of one or more components selected from the group consisting of sodium benzoate and lithium benzoate, and

(f) from about 0.05% to about 5.0% of one or more components selected from the group consisting of benzoic acid and citric acid; and

(g) from about 1% to about 35% of one or more components selected from the group consisting of ethylene glycol, propylene glycol and glycerin, and

(h) sufficient water to formulate an effective developer;

wherein said percentages are based on the weight of the developer composition.

4,822,724

PROCESS FOR THE FORMATION OF STABLE COLOR PHOTOGRAPHIC IMAGES

Agostino Baldassarri; Marco Loiacano, and Giuseppe Loviglio, all of Savona, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 11, 1987, Ser. No. 131,674

Claims priority, application Italy, Dec. 18, 1986, 22742 A/86

Int. Cl.[4] G03C *5/24, 7/32*

U.S. Cl. 430—379 **19 Claims**

1. A process for the formation of a color image upon exposure and reversal development of a photographic material comprising a support base and, coated thereon, at least one red-sensitive silver halide emulsion layer associated with dispersed hydrophobic non-diffusing cyan couplers, at least one green-sensitive silver halide emulsion layer associated with dispersed hydrophobic non-diffusing magenta couplers and at least one blue-sensitive silver halide emulsion layer associated with dispersed hydrophobic non-diffusing yellow couplers, characterized by the fact that at least one green-sensitive layer is developed in the presence of a magenta coupler present as a dispersion in an organic solvent which has a boiling tempera-

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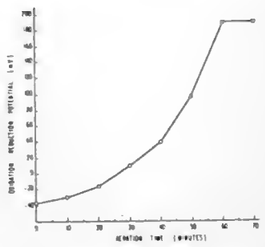
ture of 50° to 175° C. and a water solubility less than 10 parts by weight per 100 parts of water at 20° C. in said green-sensitive layer in the absence of a significant presence of oil.

4,822,725

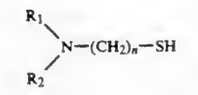
METHOD FOR BLEACHING COLOR PHOTOGRAPHIC MATERIAL

Akira Abe; Shinzo Kishimoto, and Yasuhisa Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

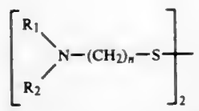
Continuation of Ser. No. 89,052, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 736,627, May 21, 1985, abandoned. This application Sep. 22, 1988, Ser. No. 248,288
Claims priority, application Japan, May 21, 1984, 59-102355
Int. Cl.[4] G03C *5/44*
U.S. Cl. 430—393 **14 Claims**



1. A method for processing a silver halide color photographic material which comprises subjecting an image-wise exposed silver halide color photographic material to color development and then bleaching the developed color photographic material with a bleaching solution containing a ferric salt of an aminopolycarboxylic acid in a continuous process in an automatic processor, wherein said bleaching solution additionally contains at least one compound represented by the following general formula (I) or (II)



(I)



(II)

wherein R_1 and R_2 are identical or different and each represents a hydrogen atom or a methyl or ethyl group, and n represents an integer of 1 to 3, the oxidation-reduction potential of the bleaching solution initially being 120 mV or greater, the oxidation-reduction potential being initially adjusted from a value above 100 mV to a value within the range of 0 to 100 mV and maintained within the range of 0 mV to 100 mV by controlled aeration of the bleaching solution or the oxidation-reduction potential being maintained by controlled aeration of the bleaching solution within 2 days after the initiation of bleaching such as to remain in the range of 9 mV to 100 mV.

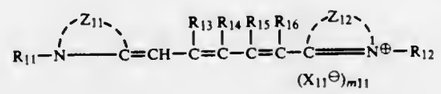
4,822,726

METHOD FOR FORMATION OF COLOR IMAGES AND HIGH SILVER CHLORIDE COLOR PHOTOGRAPHIC MATERIALS HAVING IMPROVED SPECTRAL SENSITIVITY AND DESILVERING PROPERTY FOR USE THEREWITH

Tadashi Ikeda; Tadashi Ogawa, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 8, 1987, Ser. No. 59,665
Claims priority, application Japan, Jun. 6, 1986, 61-131209; Nov. 18, 1986, 61-274916; Dec. 22, 1986, 61-306030
Int. Cl.[4] G03C *1/12, 1/08, 5/38, 5/44*
U.S. Cl. 430—550 **33 Claims**

1. A method for forming color images comprising imagewise exposing a silver halide color photographic material, processing with a color developer, and then successively processing with a solution having a bleaching ability and having a pH of about 6.5 or less for a period of time of about 75 seconds or less, wherein said photographic material comprises at least one light-sensitive layer on a support, said light-sensitive layer containing at least one coupler capable of forming a dye by a coupling reaction with an oxidation product of an aromatic primary amine color developing agent and a silver halide emulsion which substantially excludes silver iodide but contains silver chloride in an amount of about 80 mol% or more and which has been spectrally sensitized with a sensitizing dye represented by formula (I), (II), or (III):



(I)

wherein Z_{11} represents an atomic group necessary to form a benzoxazole nucleus, a naphthoxazole nucleus, a benzothiazole nucleus, a naphthothiazole nucleus, a dihydronaphthothiazole nucleus, a benzoselenazole nucleus, a naphthoselenazole nucleus or a dihydronaphthoselenazole nucleus;

Z_{12} represents an atomic group necessary to form a benzothiazole nucleus, a naphthothiazole nucleus, a dihydronaphthothiazole nucleus, a benzoselenazole nucleus, a naphthoselenazole nucleus or a dihydronaphthoselenazole nucleus;

the nitrogen-containing heterocyclic nuclei represented by Z_{11} and Z_{12} are unsubstituted or substituted by one or more substitutents;

R_{11} and R_{12} are the same or different and each represents a substituted or unsubstituted alkyl group or alkenyl group having 10 or less carbon atoms and which may optionally be substituted;

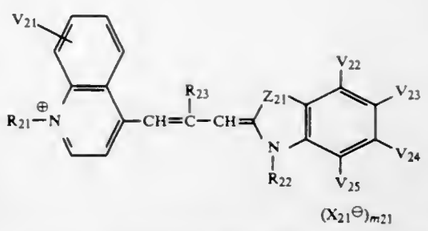
R_{13} and R_{15} both are hydrogen atoms, or R_{13} and R_{15} as linked together to form a 5- or 6-membered ring;

R_{14} represents a hydrogen atom, when R_{13} is linked with R_{15} to form a 5- or 6-membered ring; or when R_{13} and R_{15} both are hydrogen atom, R_{14} represents an alkyl group having 4 or less carbon atoms or a phenylalkyl group having 10 or less carbon atoms;

R_{16} represents a hydrogen atom, or is linked with R_{12} to form a 5- or 6-membered carbon-ring;

$X_{11}^{\ominus}$ represents an acid anion residual group;

m_{11} represents 0 or 1; and when the sensitizing dye represented by formula (I) forms an internal salt, m_{11} is 0;



(II)

wherein Z_{21} represents a sulfur atom or a selenium atom;

R_{21} and R_{22} each has the same definition as R_{11} or R_{12} in formula (I), with the proviso that at least one of R_{21} and R_{22} is a substituent containing a sulfo group or a carboxyl group;

R_{23} represents a hydrogen atom or a lower alkyl group having 4 or less carbon atoms;

V_{21} represents a hydrogen atom, an alkyl or alkoxy group having 6 or less carbon atoms, a fluorine atom, a chlorine atom, or a hydroxyl group;

V_{22} and V_{25} each represents a hydrogen atom;

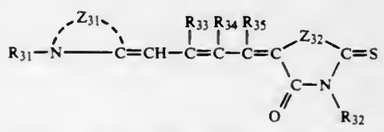
V_{23} represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, or a hydroxyl group;

V_{24} represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a chlorine atom, a lower alkoxycarbonyl group, a substituted or unsubstituted phenyl group, or a hydroxyl group; or

V_{22} and V_{23}, V_{23} and V_{24}, and V_{24} and V_{25} each is linked together to form a substituted or unsubstituted condensed benzene ring;

$X_{21}^{\ominus}$ represents and acid anion residual group;

m_{21} represents 0 to 1; and when the sensitizing dye represented by formula (II) forms an internal salt, m_{21} is 0;



(III)

wherein Z_{31} has the same definition as Z_{12} in formula (I), or represents an atomic group capable of forming a naphthoxazole nucleus, and the nitrogen-containing heterocyclic nuclei represented by Z_{31} is unsubstituted or substituted by one or more substitutents;

Z_{32} represents a sulfur atom, a selenium atom or



wherein R_{36} represents a hydrogen atom, a pyridyl group, a phenyl group, a substituted phenyl group or a substituted or unsubstituted aliphatic hydrocarbon group which contains or excludes an oxygen atom, a sulfur atom or a nitrogen atom in the carbon chain, the total number of carbon atoms in said aliphatic hydrocarbon group being 8 or less;

R_{31} has the same definition as R_{11} or R_{12} in formula (I);

R_{32} has the same definition as R_{11} or R_{12} in formula (I), or represents a hydrogen atom, a furfuryl group, or a substituted or unsubstituted mono cyclic aryl group;

R_{33} and R_{35} each represents a hydrogen atom, or R_{33} and R_{35} as linked together to form a 5- or 6-membered ring;

R_{34} has the same definition as R_{14} in formula (I); with the proviso that at least one of R_{31} and r_{32} does not contain a sulfo group and the other is a group containing a sulfo group or a carboxyl group.

4,822,727

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kunio Ishigaki; Yuji Yoshimura; Satoshi Kanetake, and Masaaki Torigoe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 857,671, Apr. 30, 1986, abandoned. This application May 25, 1988, Ser. No. 201,391
Claims priority, application Japan, Apr. 30, 1985, 60-93325
Int. Cl.[4] G03L *1/76*
U.S. Cl. 430—536 **14 Claims**

1. A silver halide photographic light-sensitive material having on a support at least one light-sensitive silver halide emulsion layer and at least one light-sensitive upper layer on the emulsion layer, in which at least one of said light-insensitive upper layer contains a polymer latex having a glass transition point of at least 20° C. and at least one of said light-insensitive upper layer contains a polymer latex having a glass transition point of lower than 20° C.

4,822,728

SILVER HALIDE COLOR PHOTOGRAPHIC ELEMENTS

Marco Loiacono, and Angelo Vallarino, both of Savona, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 11, 1987, Ser. No. 131,586
Claims priority, application Italy, Dec. 18, 1986, 22741 A/86
Int. Cl.[4] G03C *1/08, 7/32, 5/24, 1/46*
U.S. Cl. 430—551 **20 Claims**

1. A color silver halide photographic element comprising a support base and at least one silver halide emulsion layer containing dispersed therein a hydrophobic non-diffusible coupler which, upon reaction with an oxidized color developing agent, forms a non-diffusible image dye, characterized by the fact that said emulsion contains dispersed therein droplets of a high temperature boiling point organic solvent, said droplets containing dissolved therein said non-diffusible coupler, and said emulsion further contains a polymer particles in a sufficient quantity to obtain controlled smearing of the image dye.

4,822,729

2,5-DIACYLAMINOPHENOL-TYPE COLOR COUPLERS AND PHOTOGRAPHIC ELEMENTS CONTAINING SAME

Marcel J. Monbaliu, Mortsel, and Paul L. Van Meerbeeck, Hulshout, both of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 24, 1987, Ser. No. 124,609
Claims priority, application European Pat. Off., Dec. 5, 1986, EP 86202202.7
Int. Cl.[4] G03C *1/76, 1/40*
U.S. Cl. 430—552 **7 Claims**

1. 2,5-Diacylaminophenol-type colour couplers carrying a 3-chloro-2,2,3-trifluoropropionamido group, said couplers being capable of forming a cyan indoaniline dye by reaction with an oxidized aromatic primary amino developing agent, wherein said 3-chloro-2,2,3-trifluoropropionamido group makes part of the acylamino substituent standing in the 5-position of the phenol.

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4,822,730

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS CONTAINING A PYRAZOLOAZOLE MAGENTA COUPLER

Nobuo Furutachi; Toshio Kawagishi, and Kiyoshi Nakazyo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 773,162, Sep. 6, 1985, abandoned. This application May 28, 1987, Ser. No. 56,312

Claims priority, application Japan, Sep. 6, 1984, 59-187204; Dec. 20, 1984, 59-268924

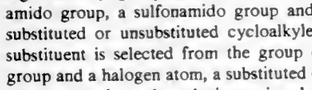
Int. Cl.[4] C03C *1/08, 7/26, 7/32*

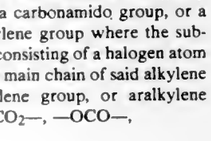
U.S. Cl. 430—558 8 Claims

1. A silver halide color photographic material comprising a support having formed thereon at least one silver halide emulsion layer containing a pyrazoloazole series magenta coupler having a group expressed by the following general formula [S] at a position other than the coupling active position

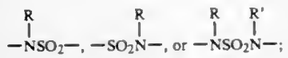
$$-(A)_n-L-B \qquad [S]$$

wherein A represens a substituted or unsubstituted alkylene group where the substituent is selected from the group consisting of an alkyl group, an aryl grup, a halogen atoms, a carbonamido group, a sulfonamido group and an alkoxy group, a substituted or unsubstituted cycloalkylene group where the substituent is selected from the group consisting of an aryl group and a halogen atom, a substituted or unsubstituted arylene group where the substituent is selected from the group consisting of a halogen atom and a carbonamido group, or a substituted or unsubstituted aralkylene group where the substituent is selected from the group consisting of a halogen atom and an alkyl group, in which in the main chain of said alkylene group, cycloalkylene group, arylene group, or aralkylene group —O—, —S—, —CO—, —CO_2—, —OCO—,

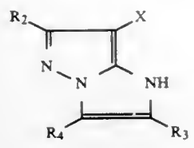




may be contained; L represents

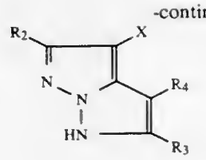


B represents a hydrogen atom or a substituted or unsubstituted alkyl or aryl group which does not contain therein —SO_2—, n is 0 or 1; R and R' each represents a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, provided that in the case that said pyrazoloazole series magenta coupler is a 1H-pyrazolo[5,1-c][1,2,4]triazole derivative, A does not represent an aralkylene group containing an arylene group directly connected to L, wherein said pyrazoloazole series magenta coupler is a compound represented by the following general formula (I-1), (I-2), (I-3), (I-4), (I-5) or (I-6):

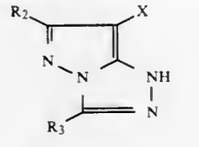


(I-1)

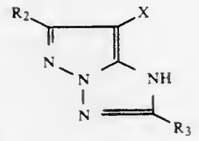
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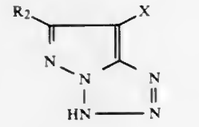
(I-2)



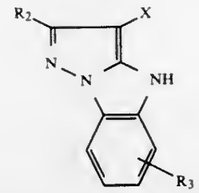
(I-3)



(I-4)

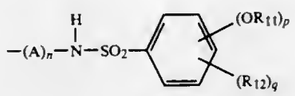


(I-5)



(I-6)

wherein R_2, R_3 and R_4 each represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a heterocyclic group, a cyano group, an alkoxy group, an aryloxy group, a heterocyclic oxy group, an acyloxy group, a carbamoyloxy group, a silyloxy group, a sulfonyloxy group, an acylamino group, an anilino group, a ureido group, an imido group, a sulfamoylamino group, a carbamoylamino group, an alkylthio group, an arylthio group, a heterocyclic thio group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, a sulfonamido group, a carbamoyl group, an acyl group, a sulfamoyl group, a sulfonyl group, a sulfinyl group, an alkoxycarbonyl group, or an aryloxycarbonyl group, in which at least one of R_2, R_3 and R_4 represents said group expressed by the general formula [S]; and X represents a hydrogen atom or a group bonded to a carbon atoms at the coupling position through an oxygen atom, a nitrogen atom or a sulfur atom and wherein said group expressed by the general formula [S] is a group expressed by the following general formula [S-1]



[S-1]

wherein A and n each has the same meaning as defined above; R_{11} represents a hydrogen atom, an alkyl group, a cycloalkyl group, an aryl group, an aralkyl group, or an acyl group; R_{12} is selected from the group consisting of an alkoxy group, an alkyl group and a halogen atom; p represents an integer of from 1 to 5; q represents an integer of from 0 to 4; and p+q is an integer of from 1 to 5.

4,822,731

PROCESS FOR LABELING SINGLE-STRANDED NUCLEIC ACIDS AND HYBRIDIZAITON PROBES

Robert M. Watson, Berkeley; Edward L. Sheldon, III, and Richard M. Snead, both of Oakland, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Jan. 9, 1986, Ser. No. 819,490

Int. Cl.[4] C12Q *1/68*

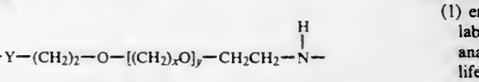
U.S. Cl. 435—6 28 Claims

1. A process for labeling a single-stranded nucleic acid which comprises the steps of:

(a) contacting the nucleic acid with one or more labeling compositions of the formula:

[A—[B—L

wherein A is an alkylating moiety, B is a divalent organic moiety having the formula:



where Y is 0, NH or N—CHO, x is a number from 1 to 4 and y is a number from 2 to 4, and L is a monovalent label moiety, wherein B is exclusive of any portion of the alkylating and label moieties, said contacting occurring so as to cause the alkylating moiety of the labeling composition to complex with the nucleic acid; and

(b) activating the complex so as to induce the alkylating moiety to bond covalently to the nucleic acid.

4,822,732

METHOD OF CONCENTRATING AND DETECTING BIOMOLECULES AND CELLS

Gunnar Sandström, PL 1209, S-91036 Sávar; Hans Wolf-Watz, PL 21223, 90590 Umeå, and Tänavik, Bofinkjv, 6A, 90237 Umeå, all of Sweden

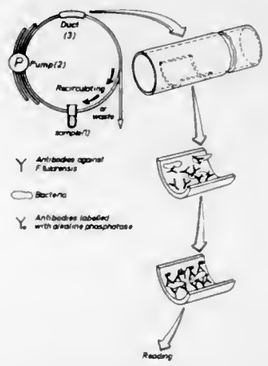
PCT No. PCT/SE85/00026, § 371 Date Sep. 23, 1985, § 102(e) Date Sep. 23, 1985, PCT Pub. No. WO85/03355, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 23, 1985, Ser. No. 779,775

Claims priority, application Sweden, Jan. 24, 1984, 8400374

Int. Cl.[4] G01N *33/543, 33/569*

U.S. Cl. 435—6 8 Claims



1. A method of detecting a biological substance in a fluid test sample, comprising the steps of:

flowing said fluid test sample through a housing having a solid inner peripheral surface to which a second substance, having an affinity for said biological substance, is attached, thereby defining an active surface within said housing, the volume of said fluid which is at any one time upon said active surface being far less than the total volume of said fluid test sample flowed across said active surface.

4,822,733

LIFETIME-RESOLVED ASSAY PROCEDURES

Larry E. Morrison, Lisle, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed May 28, 1985, Ser. No. 738,560

Int. Cl.[4] C01N *33/542;* G12Q *1/68*

U.S. Cl. 435—6 67 Claims

1. In a luminescent assay for detection of an analyte in a sample wherein a reaction mixture is formed containing the analyte and a photophore-labelled probe capable of a specific association with the analyte and wherein the presence of the analyte is determined by luminescent emission of a photophore upon excitation of the reaction mixture by a modulated light source, the improvement comprising:

(1) employing in said reaction mixture a first photophore-labelled probe capable of a specific association with said analyte, the photophore of which has a first emissive lifetime, and

a second photophore-labelled probe capable of a specific association with said analyte, the photophore of which has a second emissive lifetime,

one of the photophores having a significantly longer emissive lifetime than the other photophore,

said one photophore having a significantly longer emissive lifetime being excitable by said modulated light source to an excited state from which energy may be transferred to said other photophore having a significantly shorter emissive lifetime when in sufficient proximity thereto, thereby causing excitation and emisssion of said other photophore,

the association of said analyte with said first probe and said second probe resulting in said photophores of said first and second probes being in sufficient proximity to each other to allow the excitation of said one photophore having a significantly longer emissive lifetime by said modulated light source to result in transfer of energy to said other photophore having a significantly shorter emissive lifetime causing excitation of and emission by said other photophore;

(2) exciting the reaction mixture with said modulated light source;

(3) monitoring the reaction mixture to determine the luminescent emission of said other photophore having a significantly shorter emissive lifetime as excited by energy transfer from said one photophore excited by said modulated energy source, at a time beyond the lifetime of emission of said other photophore having a significantly shorter emissive lifetime relative to the time of each excitation of said reaction mixture by said modulated light source and

(4) using the determination of luminescent emission of said other photophore obtained by said monitoring step to determine the amount of analyte present in said sample.

4,822,734

METHOD FOR IMPROVING THE ELICITATION OF IGG CLASS MONOCLONAL ANTIBODIES TO TUMOR-ASSOCIATED ANTIGENS AND GLYCOPROTEINS

Alton C. Morgan, Jr., Edmonds; Robert McIntyre, Seattle; Clive S. Woodhouse, Edmonds, and Paul G. Abrams, Seattle, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

Filed Sep. 6, 1985, Ser. No. 773,340

Int. Cl.[4] C12P *21/00;* C12N *15/00, 5/00;* A61K *39/00*

U.S. Cl. 435—68 10 Claims

1. A method for improving the efficiency of elicitation of

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IgG_3 monoclonal antibodies to peripheral membrane protein antigens, comprising:

preparing a periperal protein extract of crude cell membranes, thereby forming an antigenic extract;

adsorbing the antigenic extract to a lectin immunosorbant wherein the lectin is selected from the group consisting of Dolichos biflorus agglutinin and peanut agglutinin, thereby forming a lectin-extract immunogen;

immunizing an animal with the lectin-extract immunogen;

fusing spleen cells from the immunized animal to myeloma cells to form IgG_3-secreting hybridomas capable of producing monoclonal antibodies directed against a peripheral membrane protein antigen;

culturing the hybridomas to produce IgG_3 monoclonal antibodies; and

collecting the IgG_3 monoclonal antibodies as a product of the hybrids.

4,822,735

T CELL GROWTH FACTOR AND METHOD OF MAKING SAME

David W. Anderson, Littleton, Colo., assignor to Eleanor Roosevelt Institute for Cancer Research, Inc., Denver, Colo.

Division of Ser. No. 460,727, Jan. 25, 1983, Pat. No. 4,623,622. This application Oct. 31, 1986, Ser. No. 925,188

Int. Cl.⁴ C12P *21/00;* **C12N** *15/00, 5/00;* **C12R** *1/91*

U.S. Cl. 435—68 **9 Claims**



1. A process for preparing T cell growth factor comprising:

(a) selecting an HAT sensitive strain of HSB-2-ERICR obtained by the process of treating a cell line identified as HSB-2-ERICR with an agent to deactivate the enzyme HGPRT, recovering and choosing cells resistant to said agent and determining sensitivity to HAT medium;

(b) culturing the cell line in a tissue culture medium;

(c) contacting the cells so obtained with an inducer which activates or stimulates the production of T cell growth factor;

(d) recovering the supernatant therefrom.

4,822,736

AMPLIFICATION OF ADENOSINE DEAMINASE GENES IN MAMMALIAN CELLS USING ADENOSINE, ALANOSINE, URIDINE, AND DEOXYCOFORMYCIN

Rodney E. Kellems, and Cho-Yau Yeung, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Jul. 5, 1984, Ser. No. 627,957

Int. Cl.⁴ C12P *219/3.4, 21/00;* **C12N** *15/00*

U.S. Cl. 435—91 **16 Claims**

1. A method for selects cultured mammalian cells with enhanced adenosine deaminase activity comprising:

growing the cells in a medium containing alanosine in a concentration sufficient to block de novo AMP synthesis, uridine in a concentration sufficient to alleviate the block in UMP biosynthesis caused by adenosine, and a cytotoxic concentration of adenosine.

4,822,737

PROCESS FOR PRODUCING ETHANOL BY FERMENTATION

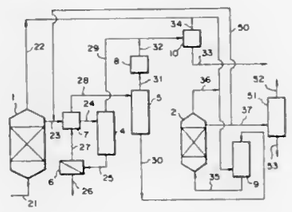
Toyoyasu Saida, Fujisawa, Japan, assignor to Research Association for Petroleum Alternatives Development, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,466

Claims priority, application Japan, Oct. 21, 1983, 58-197328

Int. Cl.⁴ C12P *7/10, 7/08, 7/06*

U.S. Cl. 435—162 **19 Claims**



1. In a process for the preparation of ethanol including the steps of fermenting, in a first fermenter, a saccharide in a fermentation liquid comprising said saccharide and water utilizing microorganisms effective to metabolize said saccharide to form a resulting fermented liquid containing ethanol therefrom and recovering the ethanol, the improvement which comprises:

vaporizing ethanol from the resulting fermented liquid in an evaporator and recovering separately from the vaporized ethanol, a residual fermented liquid comprising liquid ethanol, unfermented saccharide and water;

feeding the residual fermented liquid comprising liquid ethanol, unfermented saccharide and water from said evaporator to a reverse osmosis unit;

subjecting said residual fermented liquid to reverse osmosis in said reverse osmosis unit to remove water therefrom and thereby obtain a concentrated fermented liquid containing a higher concentration of saccharide and ethanol than said residual fermented liquid; and

then feeding said concentrated residual fermented liquid to a fermenter wherein fermentation of said saccharide is taking place.

4,822,738

TRANSDUCIBLE COMPOSITE PLASMID

Kiyoshi Miwa, Matsudo, and Konosuke Sano, Tokyo, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 719,951, Apr. 4, 1985, abandoned. This application Dec. 21, 1987, Ser. No. 135,481

Claims priority, application Japan, Apr. 4, 1984, 59-66879; Oct. 5, 1984, 59-209060

Int. Cl.⁴ C12N *1/20, 15/00;* **C12P** *21/00;* **C12R** *1/15*

U.S. Cl. 435—252.3 **11 Claims**

1. A composite vector capable of transducing a Coryneform bacterium, wherein said composite vector comprises a first DNA segment containing genetic information for replication of a plasmid capable of propagating in a Coryneform bacterium and a second DNA segment containing a DNA region of a phage capable of propagating in said bacterium, wherein said DNA region is a region incorporated into a particle of said phage when said bacterium is infected with said phage.

4,822,739

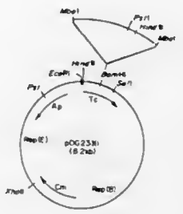
PARTITION PROFICIENCY IN GENETICALLY ENGINEERED PLASMIDS FOR TRANSFORMING GRAM-POSITIVE ORGANISMS

Shing Chang, Hercules, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 470,576, Feb. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 384,253, Jun. 2, 1982, abandoned. This application Dec. 24, 1985, Ser. No. 814,179

Int. Cl.⁴ C12N *15/00, 1/20, 1/00;* **C07H** *15/12*

U.S. Cl. 435—172.3 **8 Claims**



1. A method for creating engineered recombinant plasmids that will be partition proficient during Gram-positive host cell divisions comprising ligating a DNA fragment comprising a Gram-positive partition segment carried on at least one HaeIII - PstI fragment of approximately 260 base pairs isolated from the engineered recombinant *Bacillus Subtilis* plasmid pOG2381 (ATCC 39038) or the progeny thereof whereby said recombinant plasmids become partition proficient in a Gram-positive bacterial host.

4,822,740

BACTERIA FOR EXPRESSING A POLYSACCHARIDE DEPOLYMERASE CONTAINING A NOVEL RECOMBINANT PLASMID

Peter A. Vandenbergh, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Oct. 7, 1985, Ser. No. 784,769

Int. Cl.⁴ C12N *9/24, 9/36, 1/20, 15/00;* **C12R** *1/18;* **A61K** *37/54*

U.S. Cl. 435—200 **27 Claims**

1. A recombinant plasmid which can express a polysaccharide depolymerase in bacteria containing the plasmid which comprises:

(a) a linear segment from bacteriophage ERA 103 deposited as ATCC 39824 BI which infects Erwinia amylovora to produce the depolymerase and which segment codes for the production of the depolymerase; and

(b) a transformable vector plasmid segment ligated to the linear segment to provide the recombinant plasmid wherein the recombinant plasmid is stable in the bacteria so as to express the depolymerase.

4,822,741

BIOCOMPATIBLE POLYORGANOSILOXANE COMPOSITION FOR CELL CULTURE APPARATUS

Albert J. Banes, 2021 Bivins Rd., Durham, N.C. 27712

Division of Ser. No. 46,440, May 4, 1987, Pat. No. 4,789,601. This application Apr. 11, 1988, Ser. No. 179,844

Int. Cl.⁴ C08G *77/04*

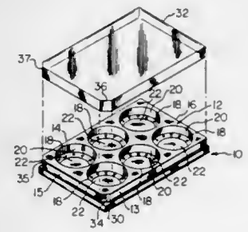
U.S. Cl. 435—300 **18 Claims**

1. A method for treating the surface of a polyorganosiloxane composition comprising the steps of:

(a) contacting the polyorganosiloxane surface with an acid selected from the group consisting of hydrochloric acid, hydrofluoric acid and hydrobromic acid and then decanting said acid;

(b) contacting the polyorganosiloxane surface with an amine selected from the group consisting of ammonium hydroxide, ammonium chloride and ammonium bicarbonate and then decanting said amine; and

(c) washing said polyorganosiloxane surface with water.



4,822,742

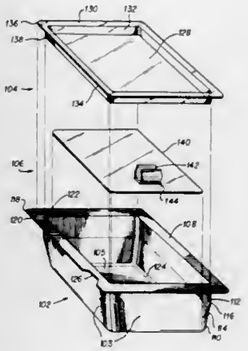
REACTION TRAY FOR MEMBRANE HYBRIDIZATIONS

Sharon S. Challberg, Boyds, and Randall Kiser, Frederick, both of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.

Filed May 11, 1987, Ser. No. 48,421

Int. Cl.⁴ C12M *1/00*

U.S. Cl. 435—310 **19 Claims**



1. An apparatus for facilitating chemical reactions involving a target reactant means and a freely diffusing reactant, the apparatus comprising:

the target reactant means;

a tray with a tray bottom for supporting the target reactant means; and

an overlay for insertion into said tray atop the target reactant means;

wherein a face of said overlay is matched to a face of said tray bottom so as to substantially evenly distribute the freely diffusing reactant.

12. A method for carrying out a chemical reaction involving a target reactant means and a freely diffusing reactant, the method comprising the steps of:

placing the target reactant means in the bottom of a tray;

adding the freely diffusing reactant to the target reactant means;

placing an overlay atop the target reactant means so as to substantially evenly distribute the freely diffusing reactant over the target reactant means; and

allowing the chemical reaction, if any, between the target reactant means and the freely diffusing reactant to occur.

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4,822,743

METHOD AND CLOTH FOR DETECTING LEAKS IN CLOSED BODIES

Jeffrey G. Wegrzyn, Alpharetta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 13, 1984, Ser. No. 681,375
Int. Cl.[4] G01N *21/19, 31/00*
U.S. Cl. 436—3 **10 Claims**

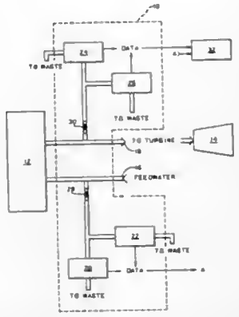
1. A dry method of detecting leaks in aircraft structures and other closed bodies comprising the steps of:
(a) providing a dry-to-the-touch woven, natural fiber cloth impregnated with a solution containing an acid-base indicator, a surfactant, a buffering system and humectant, said impregnated woven natural fiber cloth being freely permeable to both gaseous acids and gaseous bases and being sufficiently absorbent to be dry to the touch while retaining sufficient water in contact with reactive constituents of said solution to allow the acid-base indicator to react with a reactive gas escaping from a structure being tested;
(b) spreading said cloth on the surface of an aircraft or other closed body which has been pressurized with a mixture of air and a gaseous composition which will react with said solution and cause a distinctive color change in the color of said cloth; and
(c) observing said cloth for a color change indicative of said reaction so that the location of leaks in said structure or closed body become visible.

4,822,744

SYSTEM AND METHOD FOR DETECTING CONTAMINANTS IN A STEAM POWER GENERATING SYSTEM

James C. Bellows, Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1987, Ser. No. 44,623
Int. Cl.[4] G01N *27/00*
U.S. Cl. 436—38 **15 Claims**



5. A method for detecting increases in chloride ion concentration in a water heating system comprising a water heater which receives feedwater from at least one inlet pipe and which provides high temperature fluid through at least one outlet pipe, the method comprising the steps of:
(a) monitoring chloride ion concentration in a sample of feedwater;
(b) monitoring chloride ion concentration in a high temperature fluid sample; and
(c) determining whether the chloride ion concentration in the high temperature fluid sample is greater than the chloride ion concentration in the feedwater sample, an increase in chloride ion concentration indicating a breakdown of chlorinated compounds.

8. A method for detecting a presence of organic compounds and a formation of carboxylic acids in a steam generating system comprising a steam generating system comprising a steam generator which receives feedwater from at least one inlet pipe and which provides steam through at least one outlet pipe, the method comprising the steps of:
(a) monitoring hydrogen cation exchanged conductivity in a sample of feedwater;
(b) monitoring hydrogen cation exchanged conductivity in a steam sample; and
(c) determining whether the hydrogen cation exchanged conductivity of the steam sample is greater than the cation conductivity of the feedwater sample, wherein an increase in hydrogen cation exchanged conductivity is indicative of carboxylic acid formation from organic compounds.

4,822,745

METHOD FOR QUANTIFYING HUMAN RETICULOCYTES

Edward R. Burns, Flushing; Barry Wenz, White Plains, and Shraga N. Goldberg, Flushing, all of N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,547
Int. Cl.[4] G01N *33/48, 35/00, 35/02*
U.S. Cl. 436—63 **16 Claims**

1. A method for determining the reticulocyte population in a blood sample of a patient not having a hematological disease characterized by an abnormally dense red cell population, comprising the steps of:
(a) determining the average cell size of the blood sample;
(b) partitioning the sample by centrifugation through a medium of known density equal to a specific density of 1.089 so as to provide a fraction enriched with neocytes;
(c) determining the average cell size of the fraction obtained in step (b); and
(d) comparing the average cell size of the sample, determined in step (a), to the average cell size of the fraction, determined in step (c), and utilizing this comparison to provide a determination of the population of reticulocytes in the sample by correlating the comparison to a set of predetermined measurements of reticulocyte population and corresponding comparison values.

4,822,746

RADIATIVE AND NON-RADIATIVE ENERGY TRANSFER AND ABSORBANCE MODULATED FLUORESCENCE DETECTION METHODS AND SENSORS

David R. Walt, Lexington, Mass., assignor to Trustees of Tufts College, Medford, Mass.

Filed Jun. 25, 1986, Ser. No. 878,128
Int. Cl.[4] G01N *33/544, 21/76;* **G02B** *6/00*
U.S. Cl. 436—528 **23 Claims**

1. A method for detecting an analyte of interest in a fluid sample, said method comprising the steps of:
obtaining a discrete absorber ligand having a definable light absorption spectrum, and absorber ligand being in definable relationship with the analyte of interest in the sample;
admixing a fluorophore with said absorber ligand, said fluorophore having a definable light absorption spectrum which does not overlap the light absorption spectrum of said absorber ligand yet having a definable light emission spectrum which does overlap the light absorption spectrum of said absorber ligand, said fluorophore being able
(a) to absorb exciting light energy of a first wavelength,
(b) to transfer a part of said fluorophore absorbed energy to said absorber ligand for absorption, said transfer being selected from the group consisting of radiative and non-radiative energy transfers, and
(c) to emit the other part of said fluorophore absorbed energy as emitted light of a second wavelength;
introducing exciting light energy of the first wavelength to said admixture sufficient to cause said fluorophore to absorb said exciting light energy and to emit light of the second wavelength, a portion of said fluorophore absorbed energy being transferred to and absorbed by such ligand as is present in said admixture; and
detecting said light of the second wavelength emitted from said admixture after absorption of transferred energy by said ligand, said detected emitted light being a measure of the analyte of interest in the sample.

4,822,747

POLYACRYLAMIDE GEL PARTICLES HAVING HAPTEN MOIETIES BOUND THERETO AS IMMUNOASSAY REAGENT

Richard D. Johnson, Elkhart, Ind.; H. Volker Runzheimer, Bergisch Gladbach, Fed. Rep. of Germany; Ronald G. Sommer, and Kin F. Yip, both of Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Dec. 9, 1986, Ser. No. 939,902
Int. Cl.[4] G01N *33/547*
U.S. Cl. 436—532 **39 Claims**

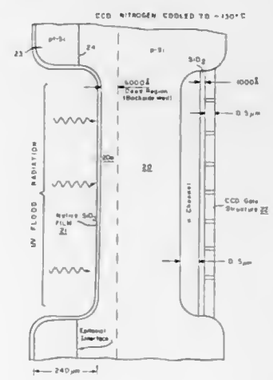
22. In an immunometric assay method for determining a hapten or analog thereof in a liquid test sample, wherein the test sample is contacted with a labeled antibody reagent capable of binding with said hapten or analog thereof and with an immobilized form of the hapten capable of binding with said antibody reagent, and wherein the amount of labeled antibody reagent which becomes bound to said hapten or analog thereof in the sample compared to that which becomes bound to the immobilized reagent is determined and related to the presence of the hapten or analog thereof in the test sample,
the improvement which comprises employing as the immobilized reagent a substantially stable immobilized hapten reagent comprising a polyacrylamide gel particle which is substantially swellable in water and a plurality of hapten moieties bound thereto, said gel particle comprising a plurality of external and internal function groups wherein substantially all of said bound hapten moieties are covalently linked to said external functional groups by a linking group which is substantially stable in aqueous solutions.

4,822,748

PHOTOSENSOR WITH ENHANCED QUANTUM EFFICIENCY

James R. Janesick, La Canada, and Stythe T. Elliott, Sun Valley both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 642,417, Aug. 20, 1984, abandoned. This application Aug. 24, 1987, Ser. No. 88,678
Int. Cl.[4] H01L *31/00, 31/14, 31/16*
U.S. Cl. 437—3 **5 Claims**



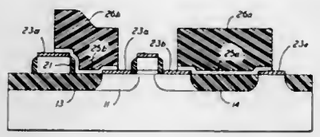
1. A method of improving the quantum efficiency of a charge-coupled-device image sensor having an array of pixels and charge transfer gates for reading out image charges from wells of said array of pixels in a layer of photosensitive semiconductor material produced on a substrate material, where the quantum efficiency is improved for blue, ultraviolet, far ultraviolet and low energy x-ray wavelengths comprised of the steps of
overthinning the backside of said charge-coupled-device image sensor to remove all substrate material, and covering the overthinned backside with a thin oxide film, thereby leaving a depletion region just under said thin oxide film over said overthinned photosensitive semiconductor material as a result of thinning, and
flooding the backside of said thinned photosensitive semiconductor material with intense ultraviolet radiation prior to using said charge-coupled-device imaging sensor thereby producing an accumulation layer of holes to greatly increase the quantum efficiency of said charge-coupled-device imaging sensor.

4,822,749

SELF-ALIGNED METALLIZATION FOR SEMICONDUCTOR DEVICE AND PROCESS USING SELECTIVELY DEPOSITED TUNGSTEN

Janet M. Flanner, Union City, Calif., and Paulus Z. A. van der Putte, Eindhoven, Netherlands, assignors to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Filed Aug. 27, 1987, Ser. No. 90,301
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—41 **12 Claims**



1. A method for forming a self-aligned metallization to exposed semiconductor regions of a semiconductor device, the method comprising the steps of:
(a) selectively depositing a first layer of tungsten on the exposed semiconductor regions of the surface of the device, these regions separated by insulating regions,
(b) depositing a nucleating layer of a material providing nucleating sites for tungsten on the surface of the device over the first selectively deposited tungsten layer,
(c) selectively removing portions of the nucleating layer to leave a pattern of areas overlying predetermined portions of the insulating regions and contacting at least edge portions of the first tungsten layer abutting these insulating regions, and
(d) selectively depositing a second layer of tungsten on the remaining areas of the nucleating layer and the exposed portions of the first tungsten layer, in order to interconnect the metallization across the predetermined insulating regions.

10. The method of claim 1 in which the device is an MOS device and the exposed semiconductor regions include at least source, drain and gate regions.

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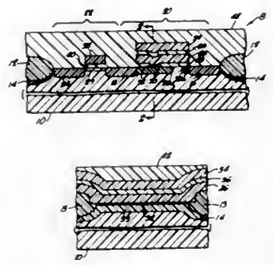
MOS FLOATING GATE MEMORY CELL CONTAINING TUNNELING DIFFUSION REGION IN CONTACT WITH DRAIN AND EXTENDING UNDER EDGES OF FIELD OXIDE

Gust Perlegos, Freemont, and Tsung-Ching Wu, San Jose, both of Calif., assignors to Seeq Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 936,965, Dec. 1, 1986, Pat. No. 4,701,776, which is a continuation of Ser. No. 527,213, Aug. 29, 1983, abandoned. This application Jul. 16, 1987, Ser. No. 74,085

Int. Cl.[4] H01L *27/04, 27/13*

U.S. Cl. 437—052 1 Claim



1. A process for fabricating a nonvolatile MOS memory device including the steps of:

first defining and doping a tunneling diffusion region in a semiconductor substrate,

forming four opposed field oxide regions to define a four-sided active field effect transistor region in an area on said substrate which includes said tunneling diffusion region such that said tunneling diffusion region lies appreciably under the edges of two opposing ones of said field oxide regions,

forming a first layer of dielectric material on top of said active field effect transistor regions, having a relatively thin portion therein disposed entirely over said tunneling diffusion region,

forming a first gate electrode on top of said first layer of dielectric material, extending entirely over said thin portion,

forming a second layer of dielectric material over and around said first gate electrode to electrically insulate said first gate electrode,

forming a second gate electrode on top of said second layer of dielectric material, disposed entirely over said first gate electrode,

forming source and drain regions in said active field effect transistor region at locations such that said tunneling diffusion region is in physical contact with said drain region and said tunneling diffusion region lies along the length of a channel formed by said source and drain regions.

4,822,751

METHOD OF PRODUCING A THIN FILM SEMICONDUCTOR DEVICE

Akira Ishizu, Amagasaki; Tadashi Nishimura, and Yasuo Inoue, both of Itami, all of Japan, assignors to Mitsubishi Denki Kabushi Kaisha, Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 30,904

Claims priority, application Japan, Apr. 2, 1986, 61-77413

Int. Cl.[4] H01L *21/268*

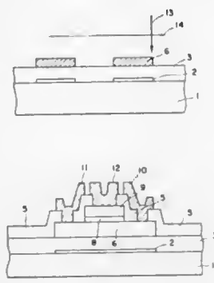
U.S. Cl. 437—173 10 Claims

1. A method of producing a thin film semiconductor device, comprising the steps of:

preparing a substrate,

forming a patterned metal thin film on said substrate,

forming an insulating layer on said metal thin film, and forming a patterned semiconductor thin film active layer, which overlies and is self-aligned to said patterned metal



thin film, by laser CVD wherein a laser beam is scanned unselectively across the surface of said substrate.

4,822,752

PROCESS FOR PRODUCING SINGLE CRYSTAL SEMICONDUCTOR LAYER AND SEMICONDUCTOR DEVICE PRODUCED BY SAID PROCESS

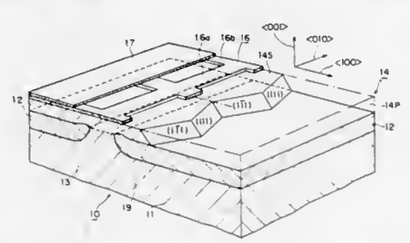
Kazuyuki Sugahara; Tadashi Nishimura; Shigeru Kusunoki, and Yasuo Inoue, all of Hyogo, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 6, 1987, Ser. No. 22,717

Claims priority, application Japan, Mar. 7, 1986, 61-48470; Mar. 7, 1986, 61-48471; May 24, 1986, 61-118438

Int. Cl.[4] H01L *21/306, 21/326, 21/479*

U.S. Cl. 437—174 16 Claims



1. A process for producing a single crystal semiconductor layer comprising:

a first step of laminating an insulator layer on a major surface of a single crystal semiconductor substrate of the cubic crystal while leaving an opening part for seeding, and building up a polycrystalline or amorphous semiconductor layer on the entire surface of said insulator layer inclusive of said opening part;

a second step of providing a protective layer for controlling the temperature of said polycrystalline or amorphous semiconductor layer, said protective layer comprising a reflective or anti-reflection film comprising stripes of a predetermined width at a predetermined angle to said opening part and at a regular interval so as to produce a difference in temperature characteristics between parts of said polycrystalline or amorphous semiconductor layer which correspond to gaps between said stripes, thereby completing a base for producing a semiconductor device, and wherein said single crystal semiconductor substrate has a (001) plane or an equivalent crystal face as a major surface, and in said second step said reflective or anti-reflection film is so provided that the longitudinal direction of said stripes of said reflective or anti-reflection film forms a predetermined angle θ_1, to a <110> direction or an equivalent direction on said major surface, and wherein said angle θ_1, satisfies the condition of $25° \leqq \theta_1 \leqq 55°$; and

a third step of irradiating said polycrystalline or amorphous semiconductor layer with an energy beam through said protective layer of said base to melt said semiconductor layer while scanning said energy beam in such a direction that the liquid-solid interface formed at the time of re-solidification of said melted semiconductor layer accords with at least one (111) plane, namley, {111} plane, or the plane which intersects {111} planes and a horizontal plane thereby converting said polycrystalline or amorphous semiconductor into a single crystal using the single crystal of said substrate making contact with said semiconductor layer at said opening part as a seed crystal.

4,822,753

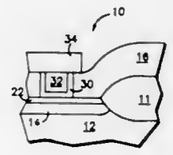
METHOD FOR MAKING A W/TIN CONTACT

Faivel Pintchovski, and Philip J. Tobin, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1988, Ser. No. 191,637

Int. Cl.[4] H01L *21/283, 21/316*

U.S. Cl. 437—192 14 Claims



1. A method for contacting a semiconductor device comprising the steps of: providing a silicon substrate having a device region formed at the surface thereof; forming a silicide region contacting said device region; forming an insulating layer overlying said substrate and having an opening therethrough; depositing titanium nitride in a blanket layer overlying said silicide and said insulating layer; applying a leveling agent overlying said titanium nitride and substantially filling said opening; etching said leveling agent to expose said titanium nitride overlying said insulating layer; etching said titanium nitride overlying said insulating layer to leave a portion of said titanium nitride and said leveling agent remaining in said opening; removing the remaining portion of said leveling agent to expose the remaining portion of said titanium nitride; and selectively depositing tungsten onto said remaining portion of said titanium nitride.

4,822,754

FABRICATION OF FETS WITH SOURCE AND DRAIN CONTACTS ALIGNED WITH THE GATE ELECTRODE

William T. Lynch, Summit, and Frederick Vratny, Berkeley, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 498,897, May 27, 1983, Pat. No. 4,453,306. This application Jun. 12, 1984, Ser. No. 619,892

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.[4] H01L *21/225*

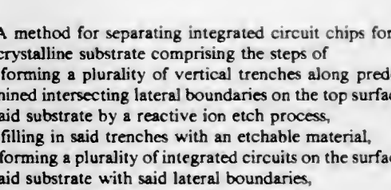
U.S. Cl. 437—193 3 Claims

1. A method of fabricating a field effect transistor including a source and drain region formed in the surface of a semiconductor substrate with a channel region therebetween, the method comprising the steps of:

forming over the channel region a multi-level electrode structure including a gate electrode metal;

forming an insulator along the edges of at least the gate electrode metal;

depositing a layer of polycrystalline silicon over essentially the entire transistor area;



rendering the portion of the polycrystalline silicon layer over the gate electrode selectively removable; and

selectively removing the said portion of the polycrystalline layer.

4,822,755

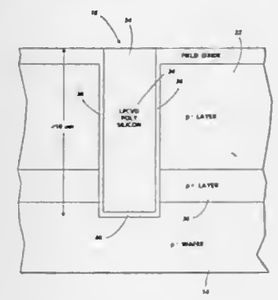
METHOD OF FABRICATING LARGE AREA SEMICONDUCTOR ARRAYS

William G. Hawkins, Webster; Donald J. Drake, Rochester, and Michael R. Campanelli, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 25, 1988, Ser. No. 185,600

Int. Cl.[4] H01L *21/00, 21/02, 21/72, 21/98*

U.S. Cl. 437—227 13 Claims



1. A method for separating integrated circuit chips formed on a crystalline substrate comprising the steps of

(a) forming a plurality of vertical trenches along predetermined intersecting lateral boundaries on the top surface of said substrate by a reactive ion etch process,

(b) filling in said trenches with an etchable material,

(c) forming a plurality of integrated circuits on the surface of said substrate with said lateral boundaries,

(d) passivating both surfaces of said substrate,

(e) and etching a plurality of grooves on the back of the wafer in general alignment with said vertical trenches, said etching being adapted to etch into, and free said trenches from said etchable material,

whereby said integrated circuits are separated by the combined action of said top and bottom etching steps, said circuits being formed with planar butting surfaces created by the vertical trench formation.

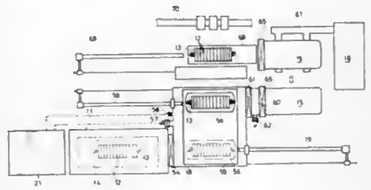
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4,822,756

REACTION FURNACE AND METHOD OF OPERATING THE SAME

Makoto Hirayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 124,430
Claims priority, application Japan, Nov. 19, 1986, 61-277031
Int. Cl.[4] H01L *21/324, 21/20*
U.S. Cl. 437—247 20 Claims



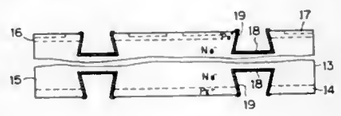
1. A reaction furnace, comprising:
fixed treatment chamber means for applying a reaction treatment onto a member to be treated placed therein, said fixed treatment chamber means having an atmosphere therewithin, and means for replacing said atmosphere with a predetermined atmosphere;
movable capsule means for receiving the member to be treated placed therein, said movable capsule means being movable between a receiving location and a delivery location proximate the fixed treatment chamber means and including an atmosphere replaceable with a different atmosphere prior to transference of said member to the fixed treatment chamber;
connection means connected to said fixed treatment chamber means and connectible to said movable capsule means moved to said delivery location for transferring the member to be treated therebetween.

4,822,757

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Masaaki Sadamori, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 118,890
Int. Cl.[4] H01L *29/00, 21/02, 21/04, 21/00*
U.S. Cl. 437—249 4 Claims



1. A method of manufacturing a semiconductor device having high reverse voltage blocking ability, said method comprising:
a step of preparing a drill having a cutting edge provided along a circumferential direction about the center of curvature of a rotation axis within a surface perpendicular to said rotation axis, said cutting edge being finished in a mesa type sectional configuration being decreased in width from a head portion toward a bottom portion;
a step of forming a semiconductor wafer having a first conductivity type inner region of low impurity concentration and a second conductivity type outer region of high impurity concentration provided in an exterior of said inner region;
a step of relatively moving said drill perpendicularly to a junction between said outer region and said inner region while rotatingly pressing said drill against a surface of said semiconductor wafer, thereby to form a ring-shaped vertical groove exposing said junction; and
a step of rotatingly relatively moving said drill parallely to said junction, thereby to finish said ring-shaped vertical groove in mesa type sectional configurations of positive beveled structure.

4,822,758

MEDIUM REFRACTIVE INDEX GLASS SUITABLE FOR OPHTHALMIC APPLICATIONS

Jean E. Boudot, and Jean-Pierre Mazeau, both of Avon, France, assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 23, 1988, Ser. No. 210,427
Claims priority, application France, Nov. 4, 1987, 87 15278
Int. Cl.[4] C03C *3/089, 3/093, 4/00*
U.S. Cl. 501—65 3 Claims

1. A glass having a refractive index between 1.599–1.602, an Abbe number between 40.5–41.5, a density between 2.64–2.66 g/cm^3, a transmission of visible radiatin at 400 nm through a thickness of 10 mm greater than 83%, a softening point between 670°–680° C., and a birefringence, measured as described, between −150 and +150 nm/cm, consisting essentially, expressed in terms of weight percent on the oxide basis, of:

SiO_2	52–57	K_2O	11.0–16.0
B_2O_3	2.5–7.0	CaO	2–3.5
Al_2O_3	0–1	ZrO_2	1–1.5
Li_2O	0.3–0.8	TiO_2	15.0–16.2
Na_2O	5.4–8.2	As_2O_3	0.1–0.4

with the condition that M=69–72 where

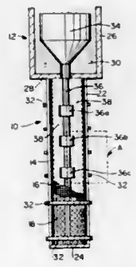
$$M = \frac{1}{100}\,[760x\%\ Li_2O + 270x\%\ Na_2O + 170x\%\ K_2O + 185x\%\ CaO + 130x\%\ TiO_2].$$

4,822,759

CERAMIC COMPOSITE STRUCTURES HAVING INTRINSICALLY FITTED ENCASEMENT MEMBERS THEREON & METHODS OF MAKING THE SAME

Marc S. Newkirk, Newark, and H. Daniel Lesher, Wilmington, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 908,073, Sep. 16, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 212,071
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—127 16 Claims



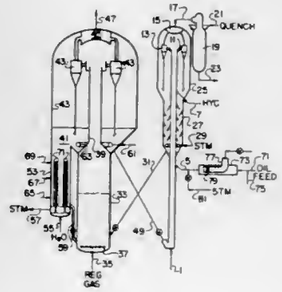
1. A method for producing a ceramic composite body maintained under compressive stress by an encasement member, said composite body comprising (1) a ceramic matrix obtained by oxidation of a parent metal to form a polycrystalline material comprising (i) an oxidation reaction product of said parent metal with an oxidant and (2) a mass of filler embedded by said matrix, the method comprising steps of:
(a) heating a parent metal to a temperature region above its melting point but below the melting point of its oxidation reaction product to form a body of molten parent metal;
(b) contacting said molten parent metal with a mass of filler material in the presence of an oxidant, at least a portion of said filler being contained within an encasement member and said filler being in conforming engagement with at least a portion of an interior surface of said encasement member, whereby said interior surface defines a surface boundary of said mass of filler material so that formation of oxidation reaction product will occur in a direction toward and into said mass of filler material; and
(c) at aid temperature region (1) reacting said molten metal with said oxidant to form said oxidation reaction product, (2) maintaining at least a portion of said oxidation reaction product in contact with and between said molten parent metal and said oxidant, to progressively draw molten parent metal through the oxidation reaction product towards the oxidant so that fresh oxidation reaction product forms within said filler at an interface between said oxdant and previously formed oxidation reaction product, and (3) continuing said reaction until said polycrystalline material has infiltrated said filler to at least a portion of said surface boundary to produce said ceramic composite body, and (4) recovering said ceramic composite body having said encasement member intrinsically fitted thereon for maintaining said composite body under compressive stress.

4,822,761

METHOD AND APPARATUS FOR COOLING FLUID SOLID PARTICLES USED IN A REGENERATION SYSTEM

Paul W. Walters; Lloyd E. Busch, and Oliver J. Zandona, all of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 865,911, May 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 617,764, Jun. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 532,253, Sep. 15, 1983, abandoned. This application Dec. 21, 1987, Ser. No. 136,234
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] B01J *38/12, 38/36*
U.S. Cl. 502—38 4 Claims



1. In a method for regenerating solid particulates in a regenerator comprising a upper regeneration zone containing particulates and a lower regeneration zone containing particulates, the improvement comprising:
(a) Passing downwardly at least a portion of said particulates in said upper zone through a substantially vertical cooling zone having a plurality of substantially parallel upwardly extending bayonet style heat exchanger means comprising coaxial tubes comprising an internal and an external coaxial conduit, capable of transferring heat exchange material upwardly through said internal coaxial conduit from a liquid heat exchange material inlet means and returning through said external coaxial conduit means a mixture of liquid and vapor heat exchange material to a lower portion of said cooling zone which is above said liquid heat exchange material inlet means and wherein said vertical cooling zone is in direct fluid communication both with said particulates in said upper regeneration zone and with particulates in said lower regeneration zone whereby said particulates is cooled by at least about 50° F. in said cooling zone;
(b) Passing a heat exchange fluid through said liquid heat exchange material inlet means and withdrawing a liquid and vapor mixture resulting from indirect heat exchange with particulate passing through said substantially vertical cooling zone;
(c) Passing fluidizing gas through said cooling zone external to said heat exchanger means to cause a counter flow of said fluidizing gas with respect to flow of said particulates from said upper regeneration zone;
(d) Recovering combustion product flue gases from said lower regeneration zone, and using said combustion product flue gases in the presence of a combustion gas and said fluidizing gas from said cooling zone to regenerate the particulates in said upper zone; and
(e) Passing the resulting regenerated particulates from said upper zone of said regenerator to a riser reactor.

4,822,760

PROCESS OF REGENERATING PALLADIUM SALT CATALYSTS

Masaki Kashibe; Hideyuki Sugishita, and Nobuyoshi Okada, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Continuation of Ser. No. 853,128, Apr. 17, 1986, abandoned, which is a continuation of Ser. No. 747,650, Jun. 21, 1985, abandoned. This application Dec. 24, 1987, Ser. No. 139,179
Claims priority, application Japan, Jun. 25, 1984, 59-130781
Int. Cl.[4] B01J *31/40, 27/28;* C07C *69/76, 53/10*
U.S. Cl. 502—24 9 Claims

1. A process of regenerating a palladium salt catalyst from an organic residue which has been separated from a reaction solution containing a biphenyl tetracarboxylic acid ester obtained through oxidative coupling in the presence of a palladium salt catalyst and a basic bidentate ligand comprising, in combination, the steps of
heating the organic residue at a temperature of not lower than 330° C. under an inert gas atmosphere flowing at a rate of more than 10Nl, per hour, per Kg. of organic residue. To produce a reduced and thermally decomposed bulky porous product having an apparent volume of at least five times as much as the initial volume of the said organic residue;
firing said porous product under oxygen-containing atmosphere to obtain a fired product containing a carbonaceous product of not higher than 1% by weight based on the fired product;
reducing said fired product to obtain a reduced product; and
treating said reduced product with an acid to produce a palladium salt.

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4,822,762

CATALYST FOR THE CONVERSION OF HYDROCARBONS

Daniel L. Ellig, Des Plaines, and George J. Antos, Bartlett, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 19, 1987, Ser. No. 63,878
Int. Cl.[4] B01J 29/32
U.S. Cl. 502—66 5 Claims

1. A hydrocarbon conversion catalyst comprising a platinum component, a non-acidic potassium form L-zeolite, and an amorphous silica binder, where the catalyst is prepared by the steps of:

(a) commingling the non-acidic potassium form L-zeolite with amorpous silica powder;

(b) adding an aqueous solution of potassium hydroxide to the L-zeolite and silica powder and mixing to form an extrudable dough;

(c) extruding the dough to form extrudates that are non-acidic as a result of the incorporated potassium hydroxide;

(d) calcining the extrudates at temperatures exceeding 26° C. without prior wasing or low-temperature drying of the extrudates or without subjecting the extrudates to any treatment that would neutralize or reduce the basicity of the extrudates or would result in a loss of potassium cations;

(e) contacting the calcined extrudate with a solution comprising a platinum component and a potassium component; and,

(f) subjecting the resultant extrudate of step (e) to an oxidation treatment and subsequently to a reduction treatment.

4,822,763

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFIN

Mitsuyuki Matsuura, and Takashi Fujita, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 63,443
Claims priority, application Japan, Jun. 18, 1986, 61-142311
Int. Cl.[4] C08F 4/64
U.S. Cl. 502—113 31 Claims

1. A catalyst component for olefin polymerization, comprising a contact product of the following components (A), (B), (C), (D) and (E), wherein

COMPONENT (A) is a solid catalyst component containing titanium, magnesium and a halogen as essential components, prepared by (i) contacting an alkoxymagnesium halide compound with a titanium compound containing an OR' group, wherein R' is a C_{1-10} hydrocarbyl group, (ii) contacting a magnesium halide with a titanium tetraalkoxide and a polymeric silicon compound of the formula:



wherein R is a C_{1-10} hydrocarbyl group and n is the degree of polymerization such that the viscosity of the polymer ranges from 1 to 100 centistokes, or (iii) reacting an organomagnesium compound with a halogenating agent, a reducing agent or combination thereof, and then the product obtained is contacted with a titanium compound containing an OR^1 group, wherein R' is as defined above;

COMPONENT (B) is an acyl halide compound;

COMPONENT (C) is a compound having an OR^2 group wherein R^2 represents a hydrocarbyl group or hydrogen atom, said compound being selected from the group consisting of alcohols, esters, ethers, a boron tri(lower)alkoxide, a silicon tetra(lower)alkoxide, a phosphorus tri(lower-)alkoxide, vanadyl tri(lower)alkoxide, phosphoryl tri(-lower)alkoxide and phosphoryl di(lower)alkoxide halide;

COMPONENT (D) is a silicon halide compound; and

COMPONENT (E) is a silicon compound of the formula: $R^{10}R^{11}{}_{3-n}Si(OR^{12})_n$, wherein R^{10} is a C_{3-20} branched hydrocarbyl group where the branching of the group is at the carbon atom adjacent the silicon atom, R^{11} is the same or different from R^{10} and is a C_{1-20} hydrocarbyl group, R^{12} is an aliphatic C_{1-4} hydrocarbyl group and n is defined as $1 \leqq n \leqq 3$.

4,822,764

SOLID BASE CATALYST FOR THE PREPARATION OF INTERNAL OLEFINS AND PROCESS FOR PREPARING THE CATALYST

Gohfu Suzukamo, Ibaraki, and Masami Fukao, Kurita, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 16, 1988, Ser. No. 155,848
Claims priority, application Japan, Feb. 16, 1987, 62-32790; Feb. 16, 1987, 62-32791; Feb. 16, 1987, 62-32792; Feb. 16, 1987, 62-32793
Int. Cl.[4] B01J 21/04, 23/04
U.S. Cl. 502—344 36 Claims

1. A solid base which is obtainable by reacting alumina with an alkali metal hydroxide and an alkali metal hydride or reacting water-containing alumina with an alkali metal metal hydride in an amount more than the molar equivalent of water contained in the water-containing alumina, at a temperature of 200° to 500° C. in an inert gas atmosphere.

4,822,765

PROCESS FOR TREATING ACTIVATED CARBON WITH AQUEOUS AMMONIA

Yasushi Nishimura, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 759,933, Jul. 29, 1985, Pat. No. 4,761,284, which is a continuation of Ser. No. 470,762, Feb. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 376,960, May 11, 1982, abandoned, which is a continuation-in-part of Ser. No. 274,736, Jun. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 158,203, Jun. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 52,141, Jun. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 970,106, Dec. 18, 1978, abandoned. This application May 8, 1987, Ser. No. 47,291
Claims priority, application Japan, Dec. 27, 1977, 52-156546; Jun. 26, 1979, 54-80537
Int. Cl.[4] C01B 31/08, 31/02; B01J 20/20; A61K 33/44
U.S. Cl. 502—418 13 Claims

1. A method of treating activated carbon, which consists of essentially spherical activated carbon comprising at least 85% in number of microscopically spherical particles of activated carbon which have smooth and convex-curved surface without conspicuous edges and a ratio of the maximum diameter to the minimum diameter of 1.0 to 1.3, said essentially spherical particles of activated carbon being 0.05 to 2 mm in diameter, 500 to 2,000 m^2/g in surface area and 0.05 to 1.0 cc/g in volume of pore cavity determined in the range of pore-radius of 100 to 75,000 Å, to provide an antidotally effective pharmaceutical composition, which comprises contacting said activated carbon with an aqueous ammonia solution, having a NH_3 concentration of 1 to 1,000 ppm, to provide the resultant activated carbon having a pH value of 6 to 8.

4,822,766

CATALYST CARRIER FOIL AND METHOD OF MANUFACTURING THE SAME

Theodor Cyron, and Wolfgang Staubwasser, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 895,169, Aug. 11, 1986, abandoned. This application Aug. 4, 1987, Ser. No. 81,187
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1985, 3528881
Int. Cl.[4] B01J 32/00, 35/04
U.S. Cl. 502—439 15 Claims

1. Coated metallic carrier foil, comprising an electroformed metal foil having two sides and having a plurality of microscopic holes formed therein, said metal foil having a thickness of substantially between 30 and 300 μm, said holes having diameters of substantially between 30 and 300 μm, and said holes being mutually spaced apart by substantially between 30 and 300 μm, and ceramic coatings applied on both of said sides of said metal foil, said ceramic coatings forming firm connecting bridges through said holes between said ceramic coatings on both of said sides of said metal foil.

4,822,767

SOLVENT FOR CHROMOGENIC DYE-PRECURSOR MATERIAL FOR PRESSURE-SENSITIVE RECORDING PAPER SHEET AND PRESSURE-SENSITIVE RECORDING PAPER SHEET PREPARED BY USING THE SOLVENT

Yoshio Okada, Matsudo; Tadashi Nakamura, and Youichi Ohhira, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 914,985, Oct. 3, 1986, Pat. No. 4,699,658. This application Jul. 21, 1987, Ser. No. 76,079
Claims priority, application Japan, May 2, 1986, 61-102276
Int. Cl.[4] B41M 5/16, 5/22
U.S. Cl. 503—213 5 Claims

3. A pressure-sensitive recording paper sheet coated with microcapsules containing a dye composition which is composed of a chromogenic dye-precursor material and a substantially odorless solvent for the chromogenic dye-precursor material for the pressure-sensitive recording paper sheet, consisting essentially of 60 to 80 % by weight of p-monoisopropylbiphenyl or a biphenyl mixture of not less than 80 % by weight of p-monoisopropylbiphenyl, not more than 20 % by weight of m-monoisopropylbiphenyl and not more than 10 % by weight of diisopropylbiphenyl, the biphenyl mixture being substantially completely devoid of o-monoisopropylbiphenyl, and 40 to 20 % by weight of hydrogenated terphenyl.

4,822,768

PRESSURE SENSITIVE RECORDING SHEET

Kunihiko Ohga, and Keiso Saeki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 26, 1987, Ser. No. 112,172
Claims priority, application Japan, Oct. 24, 1986, 61-252851
Int. Cl.[4] B41M 5/16
U.S. Cl. 503—214 9 Claims

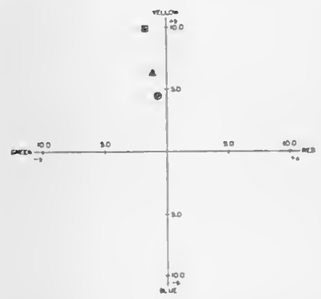
1. A pressure-sensitive recording sheet which forms a colored image by the reaction of an electron donating color former with an electron accepting developer, comprising a support having provided thereon a microencapsulated electron donating color former and an electron accepting developer, wherein one or more layers containing the microencapsulated electron donating color former contains at least one pigment having a pH of 8.5 or more measured as a 10% aqueous pigment dispersion.

4,822,769

HIGH SOLIDS CONTENT COATED BACK PAPER

George O. Langlais; Pat Y. H. Wang, and Joseph S. Chaplick, all of Nashua, N.H., assignors to Nashua Corporation, Nashua, N.H.

Division of Ser. No. 743,756, Jun. 12, 1985. This application Aug. 20, 1987, Ser. No. 87,601
Int. Cl.[4] B41M 5/16
U.S. Cl. 503—214 8 Claims



1. A coated sheet for use in a pressure-sensitive record element which, upon application of pressure, release a color-forming material, said sheet comprising a substrate having disposed on a surface thereof an adhered, dried, coating composition present at a coating weight greater than 3.00 grams per square meter, the coating composition comprising the following materials in the following parts by weight:

Material	Parts by Weight
Carboxymethylcellulose	10
a salt of a polyvalent metal	4.4–12.2
a wall-forming carboxylated acrylic resin	50–200
an organic cross-linker reactive with carboxymethylcellulose and said acrylic resin	10–150
spacer particles, and	100–500
a color-forming dye dissolved in oil solvent,	300–1,000

said composition having before application a total non-aqueous content of at least 30% by weight and a Brookfield viscosity at 78° F. of from about 50 to about 5,000 cps.

4,822,770

CARBONLESS COPY PAPER

Arun Sud, and Sankar K. Paul, both of West Bengal, India, assignors to Business Forms Limited, India

Filed Jun. 17, 1987, Ser. No. 63,100
Int. Cl.[4] B41M 5/14, 5/22
U.S. Cl. 503—214 8 Claims

1. A pressure-sensitive color transfer sheet containing an electron donating chromogenic color former for use in combination with a second sheet containing an electron accepting color developer, said color former being dispersed in substantially cluster-free microcapsule form in a hydrophilic colloid solution containing a water soluble graft copolymer having a backbone of carboxymethyl cellulose or gum arabic and side chains of polyacrylic acid or polymethacrylic acid, said side chains comprising from 5 to 10 percent by weight of said copolymer.

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4,822,771

HEAT-SENSITIVE RECORDING MATERIAL

Akira Igarashi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 8, 1987, Ser. No. 93,838
Claims priority, application Japan, Sep. 8, 1986, 61-211313
Int. Cl.[4] B41M 5/18
U.S. Cl. 503—226 10 Claims

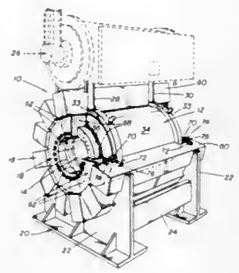
1. A heat-sensitive recording material comprising a support provided thereon a heat-sensitive recording layer containing a colorless electron donating dye precursor and an electron accepting compound, wherein a mixture of calcium carbonate and calcium hydroxide is incorporated into at least one of said heat-sensitive layer and an intermediate layer provided between said heat-sensitive layer and said support, said mixture having been prepared by the reaction of calcium hydroxide with carbon dioxide, wherein unreacted calcium hydroxide remains present in the thus formed mixture in an amount of from 1 to 5 wt% as a result of synthesis conditions.

4,822,772

ELECTROMAGNET AND METHOD OF FORMING SAME

Frederick R. Huson, The Woodlands, Tex., assignor to Houston Area Research Center, The Woodlands, Tex.

Filed Aug. 14, 1987, Ser. No. 85,546
Int. Cl.[4] H01F 7/22
U.S. Cl. 505—1 20 Claims



1. A method for manufacturing a unitary superconducting electromagnetic structure having an inner body containing at least two superconducting coils and an outer magnetic iron body about the inner body and associated magnetic field particularly adapted for use with a magnetic field having an intensity greater than that at which magnetic iron is saturated; said method comprising the following steps:

first establishing the volume, shape and intensity of the desired magnetic field for said unitary superconducting electromagnetic structure and providing means for access to said magnetic field for receiving objects to utilize the magnetic field; and

positioning said inner body containing said coils and said outer magnetic iron body in relation to each other and in relation to the magnetic field so that said outer magnetic iron body enhances the uniform distribution of flux and increases the magnetic field intensity at magnetic field intensities substantially above saturation of the magnetic iron in said outer body.

4,822,773

ENHANCEMENT OF ABSORPTION OF DRUGS FROM GASTROINTESTINAL TRACT USING CHOLINE ESTER SALTS

Jose Alexander, and Joseph A. Fix, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 749,696, Jun. 28, 1985, Pat. No. 4,729,989.
This application Dec. 20, 1987, Ser. No. 130,916
Int. Cl.[4] A61K 37/26, 37/00, 31/195
U.S. Cl. 514—3 16 Claims

1. A pharmaceutical composition for enhancing gasotrointestinal tract absorption comprising a therapeutically effective dosage amount of an orally or rectally administered amino acid drug selected from the group consisting of methyldopa, carbidopa, levodopa, fludalanine and α-aminobutyric acid or a polypeptide drug selected from the group consisting of cyclo(N-Me-Ala-Tyr-D-Trp-Lys-Val-Phe) acetate, somatostatin, insulin, gastrin, caerulein and cholecystokinin and a choline ester absorption enhancing agent of the formula:

$$[(CH_3)_3N^+CH_2CH_2OR]X^-$$

wherein R is saturated acryl (C_2–C_{20}), acyl (C_2–C_{20}) with 1 to 6 double bonds, hydroxyacyl (C_2–C_{20}) with 1 to 3 hydroxy groups, ketoacyl (C_4–C_{20}), unsaturated hydroxyacyl (C_5–C_{20}), carbalkoxyacyl (C_5–C_{20}) or carboxyacyl (C_4–C_{20}) and X is a pharaaceutically acceptable counterion.

4,822,774

PHYSIOLOGICALLY ACTIVE PEPTIDE

Osama Ito, Sakura, and Shinro Tachibana, Kashiwa, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 35,125, Apr. 6, 1987, Pat. No. 4,757,133.
This application Apr. 5, 1988, Ser. No. 177,998
Claims priority, application Japan, Apr. 17, 1986, 61-86987
Int. Cl.[4] A61K 37/02
U.S. Cl. 514—12 6 Claims

1. A method of treating a patient afflicted with asthma which comprises administering to said patient a therapeutically effective amount of a peptide having the primary structural formula:

His-Ser-Asp-Ala-Val-Phe-Thr-Asp-Asn-Tyr-Thr-Arg-Leu-Arg-Lys-Gln-X-Ala-Val-Lys-Lys-Tyr-Leu-Asn-Ser-Ile-Leu-Asn-Gly-Y

in which X is Met and Y is OH, Lys-OH, Arg-OH, Lys-Arg-OH or Lys-NH_2 or X is Leu and Y is Lys-NH_2, Lys-OH or Lys-Arg-OH.

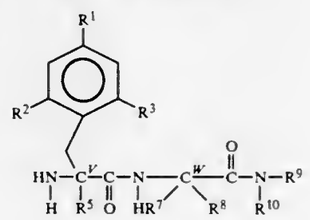
4,822,775

PHENYL SUBSTITUTED DIPEPTIDE AMIDES

Donald W. Hansen, Jr., Chicago; Barnett S. Pitzele, Skokie; Michael Clare, Skokie, and Robert W. Hamilton, Wilmette, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 829,266, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 765,882, Aug. 14, 1985, abandoned. This application Jul. 14, 1986, Ser. No. 882,794
Int. Cl.[4] A61K 31/34; C07D 317/54, 317/58; C07K 5/06
U.S. Cl. 514—19 24 Claims

1. A compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof:

wherein R^1 is hydrogen, lower alkyl, hydroxy, lower alkoxy, —OCO_2— lower alkyl, $O(CH_2)_m$-phenyl with the phenyl optionally substituted by a member of the group comprising halogen, —NO_2, —CN, —NH_2, or lower alkyl;

wherein m is an integer from 1 to 4;

wherein R^2 and R^3 represent lower alkyl, halogen or lower alkoxy, or either one of R^2 or R^3 is hydrogen and the other is lower alkyl, halogen or lower alkoxy;

wherein R^5, R^7, R^8 and R^9 may be the same or different and represent hydrogen or lower alkyl; wherein R^{10} is selected from the group consisting of —(ALK)X,

wherein ALK represents alkylene, tnioalkylene, or oxyalkylene having 1 to 5 carbon atoms; alkenylene or alkynylene having 2 to carbon atoms; and

wherein when ALK is alkylene, then X represents diphenylmethyl or substituted phenyl, and wherein the substituent on the substituted phenyl is methylene dioxy, carboxy, lower alkoxycarbonyl, carboxamide, cyano or dilower alkylamino and when ALK is not alkylene, then X represents diphenylmethyl, unsubstituted phenyl or substituted phenyl and wherein the substituent on the substituted phenyl is amino, hydroxy, halogen, nitro, methylenedioxy, lower alkyl, carboxy, lower alkoxycarbonyl, lower alkoxy, carboxamide, cyano or dilower alkylamino;

wherein V represents an asymmetric carbon atom that may be racemic or have the D or L configuration; and wherein W represents an asymmetric carbon atom when R^7 and R^8 are not the same which may be racemic or have the D or L configuration.

24. A method for treating pain in mammals comprising administering a therapeutically effective amount of a compound according to claim 1 to a mammal in need of such treatment.

4,822,776

LIPOPROTEIN LIPASE SUPPRESSION BY ENDOTOXIN-INDUCED MEDIATOR (SHOCK ASSAY)

Anthony Cerami, Flanders, N.J., and Masanobu Kawakami, Tokyo, Japan, assignors to The Rockefeller University, New York, N.Y.

Division of Ser. No. 414,098, Sep. 7, 1982, which is a continuation-in-part of Ser. No. 351,290, Feb. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 299,932, Sep. 8, 1981, abandoned. This application Oct. 29, 1985, Ser. No. 792,372
Int. Cl.[4] A61K 37/02, 35/26, 37/64
U.S. Cl. 514—21 2 Claims

1. A pharmaceutical composition for the treatment of obesity in humans, comprising:

A. a proteinaceous mediator substance capable of suppressing the activity of the anabolic enzymes lipoprotein lipase, acetyl Coenzyme A carboxylase and fatty acid synthetase, and inhibiting the growth and differentiation of erythroid-committed cells, or a specific binding partner thereto, wherein said mediator substance exhibits molecular weight levels of about 300,000, 70,000 and in the range of 400 to 1000 Daltons as determined by gel electrophoresis, and is derived from animal macrophage cells that have been incubated with a stimulator material that accompanies an invasive stimulus; and

B. a pharmaceutically effective carrier.

4,822,777

AMPHOTERICIN B/CHOLESTEROL SULFATE COMPOSITION

Robert Abra, San Francisco, Calif., assignor to Liposome Technology, Inc., Menlo Park, Calif.

Filed Feb. 27, 1987, Ser. No. 19,575
Int. Cl.[4] A61K 31/70
U.S. Cl. 514—31 3 Claims

1. An amphotericin B composition comprising particles of amphotericin B containing cholesterol sulfate in a mole ratio of amphotericin B to cholesterol sulfate of between about 1:1 to 1:4.

4,822,778

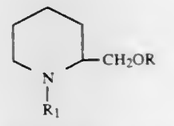
MEMBRANE STABILIZING PHENOXY-PIPERIDINE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS EMPLOYING SUCH COMPOUNDS

Gunnar A. K. Aberg, 519 Bergen St., Lawrenceville, N.J. 08648, and Bo T. af Ekenstam, Gothenburg, Sweden, assignors to Gunnar Aberg, Lawrenceville, N.J.

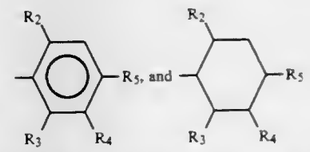
Filed Jan. 19, 1988, Ser. No. 148,162
Int. Cl.[4] C07D 211/08, 211/22; A61K 31/445
U.S. Cl. 514—317 12 Claims

1. A compound of the formula (1)

(1)



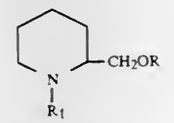
or an optically active isomer thereof or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 is selected from the group consisting of hydrogen, methyl, ethyl, n-propyl, n-butyl, 2-hydroxyethyl, 3-hydroxypropyl or 4-hydroxybutyl, and wherein R is selected from the group consisting of



in which R_2 and R_3 are both methyl, R_4 and R_5 are the same or different and are each independently selected from the group consisting of hydrogen and methyl.

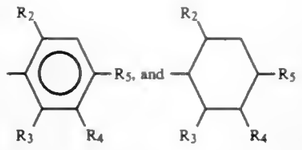
12. A method for membrane stabilization in mammals, said method consisting of administering to a mammal in need thereof an antconvulsive effective amount of a compound of the formula (1)

(1)



or an optically active isomer thereof or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 is selected from the group consisting of hydrogen, methyl, ethyl, n-propyl, n-butyl, 2-hydroxyethyl, 3-hydroxypropyl or 4-hydroxybutyl, and wherein R is selected from the group consisting of

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in which R_2 and R_3 are both methyl, R_4 and R_5 are the same or different and are each independently selected from the group consisting of hydrogen and methyl, together with a pharmaceutically acceptable carrier.

4,822,779

PHOSPHORIC AND THIOPHOSPHONIC ACID DERIVATIVES OF 5-HYDROXYPYRAZOLES, COMPOSITIONS AND USE

Ki J. Hwang; Yeong D. Gong, and Gil H. Kim, all of Daejeon, Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Chungcheongnam, Rep. of Korea

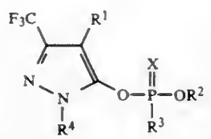
Filed Aug. 15, 1988, Ser. No. 233,098

Claims priority, application Rep. of Korea, Mar. 26, 1988, 88-3318

Int. Cl.[4] A01N *57/16;* **C07F** *9/09, 9/165*

U.S. Cl. 514—94 **17 Claims**

1. A compound corresponding to the formula (I)



(I)

wherein

R^1 represents hydrogen, or a halogen atom selected from the group consisting of bromine, chlorine and iodine;

R^2 represents a lower alkyl group;

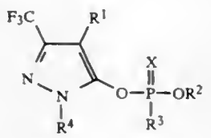
R^3 represents an alkoxy, lower alklythio, phenoxy or thiophenoxy group;

R^4 represents hydrogen, a lower alkyl, or substituted or unsubstituted phenyl group; and

X represents oxygen or sulfur;

wherein the lower alkyl group is a C_{1-6} straight or branched alkyl group.

7. An insecticidal composition comprising an inert carrier, a diluent and a surfactant with an active compound corresponding to the formula (I)



(I)

wherein

R^1 represents hydrogen, or a halogen atom selected from the group consisting of bromine, chlorine and iodine;

R^2 represents a lower alkyl group;

R^3 represents an alkoxy, lower alklythio, phenoxy or thiophenoxy group;

R^4 represents hydrogen, a lower alkyl, or substituted or unsubstituted phenyl group; and

X represents oxygen or sulfur;

wherein the lower alkyl group is a C_{1-6} straight or branched alkyl group.

4,822,780

CARBOXAMIDE COMPOUNDS

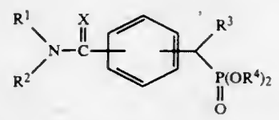
Yoshihiko Tsuda, and Yoshiaki Tsuda, both of Tokushima, Japan, assignors to Otsuka Pharmaceutical Factory, Inc., Tokushima, Japan

Filed Jul. 8, 1987, Ser. No. 71,010

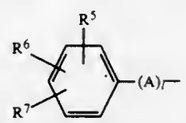
Int. Cl.[4] A01N *57/14;* **C07F** *9/18*

U.S. Cl. 514—119 **6 Claims**

1. A carboxamide compound of the formula:



wherein R^1 and R^2 represent, respectively, a hydrogen atom, an alkyl group, a cycloalkyl group, a diphenyl lower alkyl group, or a group of the formula:



in which R^5, R^6 and R^7 represent, respectively, a hydrogen atom, a halogen atom, a nitro group, a lower alkoxy group, a lower alkoxycarbonyl group, a lower alkyl group, a halogen-substituted lower alkyl group, a cyano group, a carboxy group or a hydroxy group; A represents a lower alkylene group; l represents 0 or 1; or R^1 and R^2 together with the nitrogen atom to which they are attached form a heterocyclic group or a heterocyclic group containing additional hetero atoms(s) selected from the group consisting of a nitrogen atom and an oxygen atom, or R^1 and R^2 form said heterocyclic group substituted with a lower alkyl group, a phenyl lower alkyl group, a phenyl group or a phenyl group substituted with a lower alkyl group, a lower alkoxy group, a halogen atom, or a halogen-substituted lower alkyl group as a substituent group; R^3 represents a hydrogen atom, an alkyl group, or a phenyl lower alkyl group; R^4 represents a lower alkyl group or a phenyl group; and X represents an oxygen atom or a sulfur atom.

4,822,781

SUBSTITUTED-8-ALKENYL-1,3,4,9-TETRAHYDROPYRANO-[3,4-B]INDOLE-1-ACETIC ACIDS

Alan H. Katz, Lawrenceville, and Christopher A. Demerson, Plainsboro, both of N.J., assignors to American Home Products, New York, N.Y.

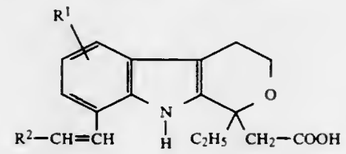
Filed Jun. 1, 1988, Ser. No. 201,010

Claims priority, application Canada, Oct. 8, 1987, 548883

Int. Cl.[4] A61K *31/62;* **C07D** *493/04*

U.S. Cl. 514—161 **8 Claims**

1. The compounds having the structure



(I)

wherein R^1 is hydrogen, lower alkyl containing 1 to 4 carbon atoms or halogen; R^2 is lower alkyl containing 1 to 4 carbon atoms and the pharmaceutically acceptable salts thereof.

6. A pharmaceutical composition comprising an anti-inflammatory or analgesic effective amount of a compound of structure (I), or a pharmaceutically acceptable salt thereof, as defined in claim 1, a nonsteroidal anti-inflammatory drug selected from the group consisting of acetaminophen, ibuprofen and aspirin, an opiate analgesic selected from the group consisting of codeine, oxycodone and morphine and a pharmaceutically acceptable carrier.

4,822,782

METHOD FOR TREATING AIDS USING STREPTOVARICIN C COMPOUNDS

Kazukiyo Onodera, Tokyo, and Shinichi Ito, Tokorozawa, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

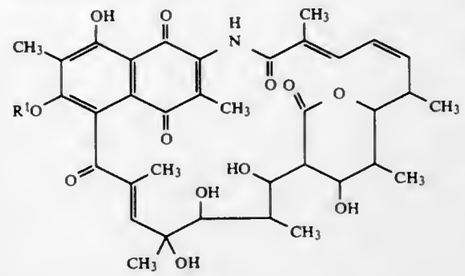
Filed Dec. 24, 1987, Ser. No. 137,823

Claims priority, application Japan, Dec. 27, 1986, 61-313463

Int. Cl.[4] A61K *31/395;* **C07D** *491/08*

U.S. Cl. 514—183 **2 Claims**

1. A method for treating acquired immune deficiency syndrome which comprises treating a patient suffering from HIV infection with an effective dose of a damavaricin Fc derivative represented by the formula (I):



wherein R^1 represents an alkyl group having 3 to 7 carbon atoms.

4,822,783

METHOD FOR TREATING HTLV-I USING STREPTOVARICIN C COMPOUNDS

Kazukiyo Onodera, Tokyo, and Shinichi Ito, Tokorozawa, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

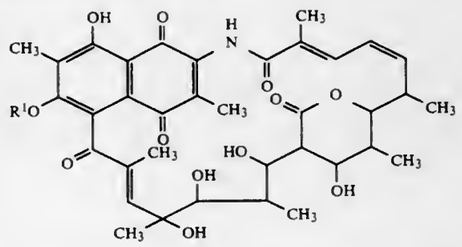
Filed Dec. 24, 1987, Ser. No. 137,824

Claims priority, application Japan, Dec. 27, 1986, 61-313463

Int. Cl.[4] A61K *31/395;* **C07D** *491/08*

U.S. Cl. 514—183 **5 Claims**

1. A method for treating a disease caused by HTLV-I which comprises treating a patient suffering from a disease caused by HTLV-I with an effective dose of a damavaricin Fc derivative represented by the formula (I):



wherein R^1 represents an alkyl group having 3 to 7 carbon atoms.

4,822,784

COMPLEX SALT

Henning Cierpka, Stockackerstrasse 1 a, 4153 Reinach, Switzerland

Division of Ser. No. 633,243, Jul. 23, 1984, Pat. No. 4,721,707, which is a continuation-in-part of Ser. No. 456,128, Jan. 6, 1983, Pat. No. 4,740,506. This application May 12, 1986, Ser. No. 861,853

Claims priority, application Switzerland, Jan. 22, 1982, 388/82; Jan. 22, 1982, 389/82

Int. Cl.[4] A61K *31/555*

U.S. Cl. 514—184 **4 Claims**

1. A nitroprusside of a short acting ganglionic blocking agent selected from the group consisting of sulfonium salts and ammonium salts.

4,822,785

CEPHALOSPORIN INJECTION

Yasuo Ishibashi, Gifu; Muneaki Matsuda, Ichinomiya, and Kazuhide Ashizawa, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

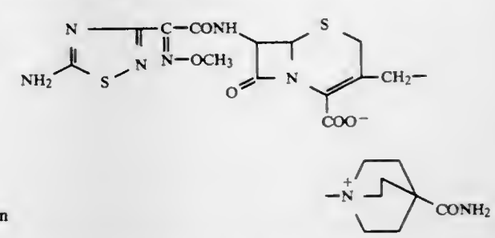
Filed Jun. 26, 1987, Ser. No. 67,507

Claims priority, application Japan, Jul. 10, 1986, 61-160746

Int. Cl.[4] A61K *31/545*

U.S. Cl. 514—202 **10 Claims**

1. An injection composition which comprises a cephalosporin having the formula:



or a non-toxic salt thereof, and one or more members selected from the group consisting of lactose and sodium chloride, with the provisos that (1) if lactose is used singly, the amount there is a pharmaceutically effective amount of at least 1 part by weight, (2) if sodium chloride is used singly, the amount there is a pharmaceutically effective amount of at least 0.1 parts by weight and (3) if both lactose and sodium chloride are used, when the amount of lactose is less than 0.25 parts by weight, the amount of sodium chloride is a pharmaceutically effective amount of at least 0.1 parts by weight and when the amount of lactose is a pharmaceutically effective amount of at least 0.25 parts by weight, the amount of sodium chloride is a pharmaceutically effective amount of at least 0.05 parts by weight, said parts by weight being based on one part by weight of the cephalosporin.

4,822,786

CEPHALOSPORIN COMPOUNDS, AND ANTIBACTERIAL AGENTS

Yoshiyuki Zama, Nagareyama; Nobuo Ishiyama, Washinomiya; Tsuneo Saita, Tokyo; Takanobu Naito, Funabashi; Masao Hirose, Iwai; Masaaki Yokoyama, Tokyo; Taiji Asano, Fukuoka; Hisato Senda, Tokyo; Keiji Sekine, Omiya, and Shigeru Sanai, Wako, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan

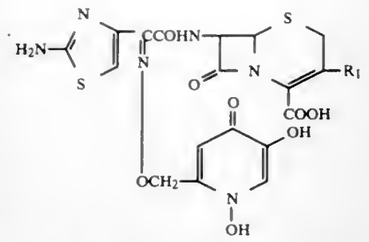
Filed Jun. 17, 1987, Ser. No. 63,077

Claims priority, application Japan, Jul. 1, 1986, 61-152706; Aug. 18, 1986, 61-191590

Int. Cl.[4] C07D *501/38;* **A61K** *31/545*

U.S. Cl. 514—202 **7 Claims**

1. A cephalosporin compound having the formula:



wherein R_1 is $—CH_2—A$ wherein A is tetrazolyl, thiazolylthio, isothiazolylthio, thiadiazxolylthio, triazolylthio, triazinylthio, tetrazxolylthio, triazolylpyrimidinylthio, pyridinium-4-ylthio or 2,3-cyclopenteno-pyridinium-4ylthio group which is unsubstituted or substituted hby one to three groups selected from the group consisting of a C_{1-4} alkyl group, a carboxymethyl group, a C_{1-4} alkoxycarbonylmethyl group, a hydroxy-(C_{1-4})alkyl group, a di-(C_{1-4})alkylamino-(C_{1-4})alkyl group, a carboxyl group, a hydroxyl group, an oxo group and an amino group, or a pharmaceutically acceptable salt thereof.

4,822,787

3-PYRROLIDINYLTHIO-1-AZABICYCLO(3.2.0)-HEPT-2-ENE-2-CARBOXYLIC ACID COMPOUNDS AND ANTIMICROBIAL ACTIVITY THEREOF

Masayoshi Murata, Osaka; Hideo Tsutsumi, Toynnaka; Keiji Matsuda, Takatsuki; Kohji Hattori, Sakai, and Takashi Nakajima, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

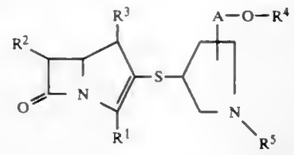
Filed Nov. 5, 1987, Ser. No. 116,965

Claims priority, application United Kingdom, Nov. 24, 1986, 8628063; Dec. 31, 1986, 8631081; Apr. 21, 1987, 8709399; Jul. 17, 1987, 8716937

Int. Cl.[4] A61K *31/33;* **C07D** *205/12*

U.S. Cl. 514—210 **12 Claims**

1. A compound of the formula:



in which

R^1 is carboxy or esterified carboxy,

R^2 is hydroxy(lower)alkyl, lower alkenyloxycarbonyloxy(-lower)alkyl, phenyl(lower)alkoxy carbonyloxy(lower)alkyl, nitrophenyl(lower)alkoxycarbonyloxy(lower)alkyl, mono- or di- or triphenyl(lower)alkenyloxy(lower)alkyl, tri(lower)alkylsilyloxy(lower)alkyl, triphenylsilyloxy(-lower)alkyl or tribenzylsilyloxy(lower)alkyl,

R^3 is hydrogen or lower alkyl,

R^4 is mono(or di or tri)phenyl(lower)alkylureido(lower)alkyl, mono(or di)(lower)alkoxyphenyl(lower)aikylureido(-lower)alkyl, bis(lower alkoxyphenyl)(lower)alkylureido(-lower)alkyl or ureido(lower)alkyl,

R^5 is hydrogen, lower alkanimidoyl lower alkenyloxycarbonyl, phenyl(lower)alkoxycarbonyl or nitrophenyl(lower-)alkoxycarbonyl, and

A is lower alkylene,

or pharmaceutically acceptable salts thereof.

12. An antimicrobial method for the treatment of infectious diseases which comprises administering an antimicorbially effective amount of a compound of claim 1 to a human being or animal.

4,822,788

1-SULFO-2-OXOZETIDINE DERIVATIVES AND THEIR PRODUCT ION

Shoji Kishimoto, Takarazuka; Taisuke Matsuo, Ibaraki, and Michihiko Ochiai, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

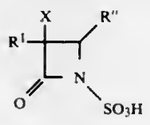
Filed Dec. 3, 1981, Ser. No. 326,938

Claims priority, application PCT Int'l Appl., Dec. 5, 1980, PCT/JP80/00297; Apr. 30, 1981, PCT/JP81/00103; Aug. 21, 1981, PCT/JP81/00183; Sep. 24, 1981, PCT/JP81/00252

Int. Cl.[4] A61K *31/395, 31/425;* **C07D** *205/08, 417/12*

U.S. Cl. 514—210 **23 Claims**

1. A compound of the formula



wherein R^1 represents

(1) amino,

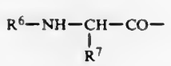
(2) an acylated amino group wherein the acyl moiety is

(i) a group of the formula:

$R^5—CO—$

wherein R^5 is an alkyl other than C_{1-5}alkyl-CH_2- or a heterocyclic• group;

(ii) a group of the formula:

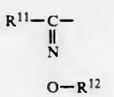


wherein R^6 is hydrogen, glycyl, alanyl, valyl, leucyl, isoleucyl, seryl, threonyl, cysteinyl, cystyl, methionyl, α- or β-aspartyl, α- or γ-glutamyl, lysyl, arginyl, phenylalanyl, phenylglycyl, tyrosyl, histidyl, tryptophanyl, an amino-protective group or a group $R^8—(CH_2)_{n_1}—CO—$ where R^8 is a heterocyclic• group and n_1 is an integer of 0 to 2, and R^7 is an alkyl, phenyl•, heterocyclic•-carbonylamino or a heterocyclic• group;

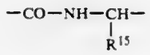
(iii) a group of the formula:

$R^9—R^{10}—CO—$

wherein R^9 is a group

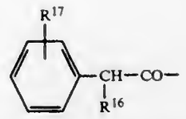


where R^{11} is alkyl•, heterocyclic• group or phenyl• and R^{12} is hydrogen, an alkyl, alkenyl or a group $-R^{13}-R^{14}$ where R^{13} is an alkylene or alkenylene and R^{14} is phenyl•, carboxyl or an alkyl ester thereof or mono- or di-alkylamino, and R^{10} is a direct bond or a group



where R^{15} is an alkyl, phenyl• or thiazolyl•;

(iv) a group of the formula:



wherein R^{16} is hydroxyl, hydroxysulfonyloxy, carboxy, ureido•, sulfamoyl•, sulfo, phenoxycarbonyl• or formyloxy and R^{17} is hydrogen, an alkyl, an alkoxy, halogen, nitro or hydroxy; or

(v) a group of the formula:

$R^{18}—R^{19}—CH_2—CO—$

wherein R^{18} is cyano, phenyl•, phenoxy•, an alkyl•, alkenyl• or a heterocyclic• grcup and R^{19} is a direct bond or —S—;

and, in symbols R^5 through R^{19}

(a) the heterocyclic group is 2- or 3-pyrrolyl; 2- or 3-furyl; 2- or 3-thienyl; 2- or 3-pyrrolidinyl; 2-, 3- or 4-pyridyl; N-oxido-2-, 3- or 4-pyridyl; 2-, 3- or 4-piperidinyl; 2-, 3- or 4-pyranyl; 2-, 3- or 4-thiopyranyl; pyrazinyl; 2-, 4- or 5-thiazolyl; 2-, 4- or 5-oxazolyl; 3-, 4- or 5-isothiazolyl; 3-, 4- or 5-isoxazolyl; 2-, 4- or 5-imidazolyl; 3-, 4- or 5-pyrazolyl; 3- or 4-pyridazinyl; N-oxido-3- or 4-pyridazinyl; 2-, 4- or 5-pyrimidinyl; N-oxido-2-, 4- or 5-pyrimidinyl; piperazinyl; 4- or 5-(1,2,3-thiadiazolyl); 3- or 5-(1,2,4-thiadiazolyl); 1,3,4-thiadiazolyl; 1,2,5-thiadiazolyl; 4- or 5-(1,2,3-oxadiazolyl); 3- or 5-(1,2,4-oxadiazolyl); 1,3,4-oxadiazolyl; 1,2,5-oxadiazolyl; 1,2,3- or 1,2,4-triazolyl; 1H- or 2H-tetrazolyl; pyrido[2,3-d] pyrimidyl; benzopyranyl; 1,8-, 1,5-, 1,6-, 1,7-, 2,7- or 2,6-naphthyridyl; quinolyl or thieno[2,3-b]pyridyl,

(b) the amino-protective group in R^6 is phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, acetyl, propionyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maleyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, β-trimethysilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, di-phenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, trialkylsilyl, benzyl or p-nitrobenzyl,

(c) the heterocyclic, phenyl, thiazolyl, phenoxycarbonyl and phenoxy with a superscript asterisk "•" may be substituted with one to three substituents selected from the group consisting of alkyl, alkoxy, alkenyl, aryl, aralkyl, mercapto, alkylthio, arylthio, aralkylthio, alkylsulfonyl, arylsulfonyl, aralkylsulfonyl, hydroxyl, oxo, thioxo, halogen, nitro, amino, cyano, carbamoyl, carboxy, acyl, acyloxy, acylamino, hydroxyalkyl, carboxyalkyl, haloalkyl and mono- or dialkylaminoalkyl, wherein the acyl group and the acyl moiety of acyloxy and acylamino are C_{1-6} alkylcarbonyl; benzoyl which may be substituted with hydroxyl or methoxy; C_{7-9} aralkylcarbonyl which may be substituted with hydroxyl or methoxy; 2-thienylcarbonyl; 2-furylcarbonyl; 2-, 4- or 5-thiazolylacetyl; 2- or 3-thienylacetyl; 2- or 3-furylacetyl or 2-amino-4- or 5-thiazolylacetyl,

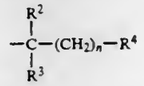
(d) the alkyl with a superscript asterisk "•" may be substituted with one to three members selected from halogen, hydroxyl, cyano and trifluoromethyl,

(e) the ureido with a superscript asterisk "•" may be substituted with sulfo in the form of a salt with sodium or potassium, carbamoyl, sulfamoyl, amidino or alkyl,

(f) the sulfamoyl with a superscript asterisk "•" may be substituted with an alkyl or amidino,

(g) the alkenyl with a superscript asterisk "•" may be substituted with one to three members selected from carboxyl and cyano, wherein the amino group, the carboxyl group and the hydroxyl group may be protected, or

(3) amino protected with phthalyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifuluoroacetyl, maleyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, trialkylsilyl, benzyl or p-nitrobenzyl, X represents hydrogen or methoxy, and R'' is a group of the formula

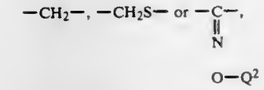


wherein n is an integer of 0 to 3; R^2 and R^3, which may be the same or different, stand for hydrogen, alkyl, cycloalkyl•, aralkyl•, aryl•, heterocyclic• group, alkoxycarbonyl or acyl, R^4 is cycloalkyl•, aryl•, a heterocyclic• group, alkoxy, aryl•-oxy, aralkyl•-oxy, acyloxy, carbamoyloxy, hydroxysulfonyloxy, nitro, carboxyl, alkoxycarbonyl, alkoxycarbonylalkyloxy, aminocarbonyl, alkylthiocarbonyl, acyl, alkylthio, aminoalkylthio, acylaminoalkylthio, heterocyclic•-thio or quarternary ammonium•;

wherein

(a') the heterocyclic group is as defined above in R^1,

(b') the acyl group and the acyl moiety of acyloxy and acylaminoalkylthio group is an alkylcarbonyl, haloalkylcarbonyl, arylcarbonyl or a group of the formula: wherein X is



and Q^1 is a 2- or 3-thienyl, 2- or 3-furyl or 2-, 4- or 5-thiazolyl which may be substituted with amino or an alkyl, and Q^2 is an alkyl group,

(c') the quaternary ammonium is pyridinium or quinolinium group, said group forming an inner salt with the sulfo group at the 1-position of the 2-oxoazetidine nucleus, and

(d') the cycloakyl, heterocyclic, aryl, aralkyl and quaternary ammonium group with a superscript asterisk "•" may be substituted with alkyl, alkoxy, alkenyl, aryl, aralkyl, mercapto, alkylthio, arylthio, aralkylthio, alkylsulfonyl, arylsulfonyl, aralkylsulfonyl, hydroxyl, oxo, thioxo, halogen, nitro, amino, cyano, carbamoyl, carboxyl, acyl, acyloxy, acylamino, hydroxyalkyl, carboxyalkyl, or mono- or dialkylaminoalkyl wherein the acyl group and the acyl moiety of the acyloxy and acylamino is as defined above in (b'), further among the above groups, the amino, carboxyl and hydroxyl group may be protected, and within the above groups R^1 and R'', alkyl is C_{1-6} alkyl; alkenyl is C_{2-6} alkenyl; alkoxy is C_{1-6} alkoxy; aryl is phenyl, α-naphthyl, β-naphthyl, biphenyl or anthryl; aralkyl is benzyl, phenethyl, phenylpropyl or naphthylmethyl; alkylene is C_{1-3} alkylene and alkenylene is C_{2-4} alkenylene, or a pharmaceuti-

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cally acceptable salt thereof, or an alkoxymethyl, α-alkoxyethyl, alkylthiomethyl, pivaloyloxymethyl, α-acetoxybutyl, ethoxycarbonyloxymethyl or α-ethoxycarbonyloxyethyl ester in the carboxyl group or groups contained in the group R^1 and/or R'' thereof.

4,822,789

METHOD OF PRODUCING RENAL FUNCTION-IMPROVING EFFECT AND DIURETIC EFFECT ON WARM-BLOODED ANIMAL

Isao Yamaguchi, Tokyo; Yoshiaki Akimoto, Kawaguchi, and Taku Nagao, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed Feb. 1, 1988, Ser. No. 150,619
Claims priority, application Japan, Feb. 10, 1987, 62-29396
Int. Cl.[4] A61K *31/55*
U.S. Cl. 514—211 **7 Claims**

1. A method for the treatment of renal failure in a warm-blooded animal which comprises administering to the animal in need of said treatment a therapeutically effective amount of 2-(4-methoxyphenyl)-3-acetoxy-5-[2-(dimethylamino)ethyl]-8-chloro-2,3-dihyro-1,5-benzothiazepin-4(5H)one or a pharmaceutically acceptable acid addition salt thereof.

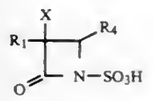
4,822,790

1-SULFO-2-OXOAZETIDINE DERIVATIVES AND THEIR PRODUCTION

Michihiko Ochiai, Suita, and Taisuke Matsuo, Ibaraki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 3, 1981, Ser. No. 326,939
Claims priority, application PCT Int'l Appl., Dec. 5, 1980, PCT/JP80/00296; Apr. 30, 1981, PCT/JP81/00102; Aug. 25, 1981, PCT/JP81/00192
The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
Int. Cl.[4] C07D *205/08, 417/12;* A61K *31/395, 31/425*
U.S. Cl. 514—210 **13 Claims**

1. A compound of the formula



wherein X is hydrogen or methoxy; R_1 is

(1) amino;

(2) amino mono-substituted by an acyl group selected from the group consisting of

(A) a group of the formula

$R_6—CO—$

wherein R_6 is

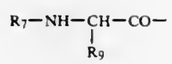
(i) C_{1-6} alkyl

(ii) phenyl which is unsubstituted or mono-substituted by (1) C_{1-3} alkyl, (2) C_{1-3} alkoxy, (3) halogen, (4) nitro or (5) amino

(iii) a heterocyclic group selected from the group consisting of isoxazolyl, piperazinyl and imidazolinyl, said heterocyclic group being unsubstituted or mono- to trisubstituted by (1) C_{1-3} alkyl, (2) C_{1-3} alkoxy, (3) halogen, (4) nitro, (5) amino, (6) oxo, (7) thioxo, (8) phenyl or (9) phenyl mono- to di-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro or amino,

(iv) benzoyl which is unsubstituted or mono-substituted by (1) C_{1-3} alkyl, (2) C_{1-3} alkoxy, (3) halogen, (4) nitro or (5) amino

(B) a group of the formula:



wherein R_7 is

(i) hydrogen,

(ii) an amino acid residue selected from the group consisting of seryl, threonyl, cysteinyl, cystyl, methionyl, lysyl, arginyl, phenylglycyl, tyrosyl, histidyl, tryptophyl or prolyl, the said amino acid residue being unsubstituted or mono- to di-substituted by amino, C_{1-3} alkyl amino, amino protecting group, carbamoyl, methylcarbamoyl, sulfamoyl, benzyl, 4-ethyl-2,3-dioxo-1-piperazinecarbonyl or 4-ethyl-2,3-dioxo-1-piperazinecarbonylamino, with the provisos that (1) phenylglycyl which is unsubstituted or mono-substituted by amino, and (2) unsubstituted lysyl are excluded,

(iii) an amino-protecting group selected from the group consisting of phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, trifluoroacetyl, maloyl, succinyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, 2-trimethylsilylethoxycarbonyl, methoxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, di- or trialkylsilyl, t-butyldimethylsilyl, t-butyldiphenylsilyl and p-nitrobenzyl,

(iv) a group of the formula $R_8—(CH_2)_{nl}—CO—$ in which

R_8 is

(a) hydrogen

(b) a heterocyclic group selected from the group consisting of 2-pyridyl, 3-pyridyl, 4-pyridyl, pyrimidinyl, pyrazinyl, pyridazinyl, piperazinyl, pyrazolinyl, imidazolidinyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, pyrido[2,3-d]pyrimidinyl, benzopyranyl, 1,8-naphthylidinyl, 1,5-naphthylidinyl, 1,6-naphthylidinyl, 1,7-naphthylidinyl, 2,7-naphthylidinyl, 2,6-naphthylidinyl, quinonyl, thieno[2,3-b]pyridinyl, tetrazolyl, thiadiazolyl, oxadiazolyl, triazinyl, thienyl, pyrrolyl and furyl, said heterocyclic group being unsubstituted or mono- to tetra-substituted by (1) C_{1-12} alkyl, (2) C_{1-12} alkyl mono-substituted by phenyl, halogen, hydroxy or C_{1-3} dialkylamino, (3) C_{1-3} alkoxy, (4) hydroxy, (5) oxo, (6) thioxo, (7) formyl, (8) trifluoromethyl, (9) amino, (10) halogen, (11) C_{1-3} alkylsulfonyl (12) 2,6-dichlorophenyl (13) coumarin-3-carbonyl, (14) 4-formyl-1-piperazinyl, (15) pyrrolaldoimino, (16) furanaldoimido, (17) 2-thiophenaldoimino, (18) 3-thiophenaldoimino, (19) mesyl, (20) amino-protecting group, (21) C_{2-4} alkanoylamino or C_{2-4} alkanoylamino mono-substituted by halogen

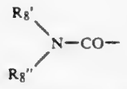
(c) phenyl which is unsubstituted or mono-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy, or amino,

(d) C_{1-3} alkyl which is unsubstituted or mono- to di-substituted by carboxyl, amino, ureido or carbamoyl

(e) phenylthio which is unsubstituted or mono-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy or amino,

(f) C_{1-3} alkylthio, (g) carboxyl, or (h) carbamoyl; nl is 0 or an integer of 1 to 4; and the group $—(CH_2)_{nl}—$ is unsubstituted or mono- to di-substituted by (1) amino or (2) a group of the formula —N-H—COR_8'''' wherein R_8'''' is amino, piperazinyl or piperazinyl mono- to trisubstituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy, oxo, thioxo or halogen,

(v) a group of the formula



wherein R_8' and R_8'' are independently (a) hydrogen, (b) C_{1-3} alkyl, (c) C_{1-3} alkyl-carbamoyl, (d) sulfo, (e) phenylcarbonyl or

(f) phenylcarbonyl mono-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxyl, hydroxysulfonyloxy or benzoyloxy, with the proviso that the case, where R_8' and R_8'' are hydrogen simultaneously is excluded,

(vi) a group of the formula R_8''' —SO_2— wherein R_8''' is C_{1-6} alkyl or C_{1-6} alkyl mono- to di-substituted by amino, carboxyl, benzyloxycarbonyl or protected amino, R_9 is

(i) hydrogen,

(ii) C_{1-3} alkyl which is unsubstituted or mono-substituted by hydroxyl, formyloxy, phenyl, carbamoyl, methylcarbamoyl, methylthio, thienylacetamide, ethoxycarbonylmethylcarbamoyl, N-methyltetrazolylthio, halogen or sulfamoyl,

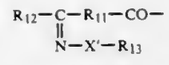
(iii) phenyl which is unsubstituted or mono- to di-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, hydroxy, hydroxysulfonyloxy, benzyloxy, benzoyloxy, trimethylsilyl or C_{2-10} alkanoyloxy,

(iv) a heterocyclic group selected from the group consisting of thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thienyl, furyl, pyrrolyl, imidazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, piperazinyl, triazinyl, tetrazolyl, thiadiazolyl and oxadiazolyl, said heterocyclic group being unsubstituted or monosubstituted by (1) C_{1-3} alkyl, (2) C_{1-3} alkoxy, (3) halogen, (4) hydroxy, (5) nitro, (6) hydroxysulfonyloxy (7) amino, (8) C_{2-4} alkanoylamino or (9) C_{2-4} alkanoylamino mono-substituted by halogen,

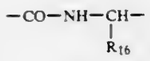
(v) cycloalkenyl selected from the group consisting of cyclohexenyl and cyclohexadienyl, or

(vi) piperazinylcarbonylamino which is unsubstituted or mono- to tri-substituted by C_{1-12} alkyl, C_{1-3} alkoxy, oxo, thioxo or amino and which may have a C_{1-3} alkylene chain between the piperazinyl and carbonylamino moieties;

(C) a group of the formula:

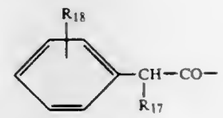


wherein X' is oxygen or sulfur, R_{11} is a chemical bond or a group of the formula:



wherein R_{16} is (a) C_{1-3} alkyl, (b) phenyl, (c) phenyl monosubstituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, amino or C_{2-10} alkanoyloxy, or (d) a heterocyclic group selected from the group consisting of thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thienyl, furyl, pyrrolyl, thiadiazolyl, oxadiazolyl, triazinyl, tetrazolyl, imidazolyl, pyrazinyl, pyrimidinyl, pyridazinyl and piperazinyl, said heterocyclic group being unsubstituted or mono-substituted by (1) C_{1-3} alkyl, (2) C_{1-3} alkoxy, (3) halogen, (4) hydroxyl, (5) amino, (6) C_{2-4} alkanoylamino or (7) C_{2-4} alkanoylamino substituted by halogen; R_{12} is (a) a heterocyclic group selected from the group consisting of 2-thiazolyl, 4-thiazolyl, 5-thiazolyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyrrolyl and 3-pyrrolyl, said heterocyclic group being unsubstituted or mono- to di-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxyl mesyl, halogen, imino, amino, mesylamino, C_{2-4} alkanoylamino or C_{2-4} alkanoylamino mono-substituted by halogen, or (b) phenyl which is unsubstituted or mono-substituted by (1) C_{1-3} alkyl (2) C_{1-3} alkoxy, (3) halogen, (4) nitro, (5) amino, (6) hydroxyl (7) benzyloxy, (8) benzoyloxy, (9) C_{2-10} alkanoyloxy, (10) γ-D-glutamyloxy or (11) 3-amino-3-carboxypropyloxy; R_{13} is (a) hydrogen, (b) phenyl which is unsubstituted or mono-substituted by C_{1-3} alkyl, C_{1-3} alkoxy or halogen, (c) C_{2-4} alkanoyl (d) C_{2-4} alkanoyl mono- to di-substituted by halogen, (e) C_{1-3} alkyl which is unsubstituted or monosubstituted by carbamoyl or halogen, (f) a group of the formula —R_{14}—R_{15} wherein R_{14} is C_{1-3} alkylene or C_{2-3} alkenylene, and R_{15} is carboxyl, methyl ester of carboxyl, ethyl ester of carboxyl, propyl ester of carboxyl, t-butyl ester of carboxyl, p-nitrobenzyl ester of carboxyl, 2-trimethylsilylethyl ester of carboxyl, t-butyldiphenylsilyl ester of carboxyl, diphenylmethyl ester of carboxyl, or a heterocyclic group selected from the group consisting of morpholino, tetrazolyl and triazolyl,

(D) a group of the formula:



wherein R_{17} is (a) hydroxy, (b) hydroxysulfonyloxy, (c) carboxyl, (d) sulfamoyl, (e) sulfamoyl substituted by C_{1-3} alkyl, (f) sulfo, (g) phenoxycarbonyl, (h) phenoxycarbonyl monosubstituted by C_{1-3} alkyl or C_{1-3} alkoxy, (i) benzyloxycarbonyl (j) formyloxy (k) phthalimido (l) azido or (m) halogen, R_{18} is (a) hydrogen, (b) C_{1-3} alkyl, (c) C_{1-3} alkoxy, (d) halogen, (e) azido, (f) nitro or (g) hydroxyl; and

(E) a group of the formula:

$R_{19}—R_{20}—CH_2—CO—$

wherein R_{19} is (a) cyano, (b) phenyl, (c) phenyl monosubstituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, amino, hydroxyl, aminomethyl or aminomethyl monosubstituted by carbamoyl, (2-oxo-3-benzylideneaminoimidazolidin-1-yl)carbonyl or (2-oxoimidazolidin-1-yl)carbonyl, (d) phenoxy, (e) phenoxy mono-substituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, amino, hydroxy or aminomethyl, (f) C_6 alkyl (g) C_{1-6} alkyl mono- to tri-substituted by halogen hydroxyl, cyano or trifluoromethyl, (h) alkenyl selected from the group consisting of vinyl and propenyl, said alkenyl being unsubstituted or mono-substituted by carboxyl or cyano, or (i) a heterocyclic group selected from the group consisting of 2-thienyl, benzothienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-thiazolyl, 4-thiazolyl, 5-thiazolyl, isothiazolyl, 1-tetrazolyl, 5-tetrazolyl, pyrrolidinyl, imidazolyl and 1,4-oxathiinyl, said heterocyclic group being unsubstituted ir mono- to trisubstituted by C_{1-3} alkyl, C_{1-3} alkoxy, halogen, nitro, hydroxyl, amino, amino-protective group, carboxyl, oxo, C_{2-4} alkanoylamino, C_{2-4} alkanoylamino mono-substituted by halogen, or C_{2-4} alkanoyl;

R_{20} is a chemical bond or —S—; or

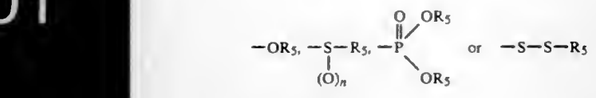
(3) amino protected by an amino-protecting group selected from the group consisting of phthaloyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maloyl, succinyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl,

2-trimethylsilylethoxycarbonyl, methoxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, di- or trialkylsilyl, t-butyldimethylsilyl and t-butyldiphenylsilyl,

R_4 is

(1) azido, or

(2) a group of the formula



wherein R_5 is

(A) C_{1-10} hydrocarbon which is unsubstituted or mono-substituted by (1) C_{1-3} alkoxy, (2) C_{1-3} alkoxycarbonyl, (3) carboxyl, (4) halogen, (5) phenoxy, (6) phenyl, (7) a heterocyclic group selected from furyl, thienyl, tetrazolyl and thiazolyl, (8) C_{1-3} alkylthio, (9) heterocycle-thio selected from tetrazolylthio and thiadiazolylthio, (10) amino, (11) acylated amino wherein the acyl moiety is formyl, acetyl or propionyl, (12) amino mono-substituted by iminomethyl or carbamoyl, or (13) cyano

(B) a carbonyl group substituted by C_{1-10} hydrocarbon which is unsubstituted or mono-substituted by (1) C_{1-3} alkoxy, (2) C_{1-3} alkoxycarbonyl, (3) carboxyl, (4) halogen, (5) phenoxy, (6) phenyl, (7) a heterocyclic group selected from furyl, thienyl, tetrazolyl and thiazolyl, (8) C_{1-3} alkylthio, (9) heterocycle-thio selected from tetrazolylthio and thiadiazolylthio, (10) amino, (11) acylated amino wherein the acyl moiety is formyl, acetyl or propionyl, (12) amino mono-substituted by iminomethyl or carbamoyl, or (13) cyano

(C) heterocyclic group selected from the group consisting of pyridyl, tetrazolyl, thiadiazolyl, thienyl, thiazolyl, isothiazolyl and benzothiazolyl, which groups are unsubstituted or mono-substituted by (1) C_{1-3} alkoxy, (2) C_{1-3} alkoxy-carbonyl, (3) carboxyl, (4) halogen, (5) phenoxy, (6) phenyl, (7) heterocyclic group selected from furyl, thienyl, tetrazolyl and thiazolyl, (8) C_{1-3} alkylthio, (9) heterocyclethio selected from tetrazolylthio and thiazolylthio, (10) amino, (11) acylated amino wherein the acyl moiety is formyl, acetyl or propionyl, (12) amino monosubstituted by iminomethyl or carbamoyl, or (13) cyano; n is 0, 1 or 2; or a pharmaceutically acceptable salt thereof.

12. An antibacterial composition which comprises an antibacterially effective amount of a compound or salt thereof as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

13. A β-lactamase inhibitory composition which comprises a β-lactamase inhibitory effective amount of a compound or salt thereof as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,822,791

PHARMACEUTICAL COMPOSITIONS OF-2,2-1,1-[BIS-2,2'-(3,1-BENZOXAZIN-4-ONE)9 ETHYLENES

Toshio Satoh; Hitoshi Matsumoto; Hisao Kakegawa, all of Tokushima; Yoshiko Kato, Kobe; Juichi Riku, Uji; Junji Yoshinaga, Neyagawa, and Yoshifumi Kanamoto, Kashihara, all of Japan, assignors to Sawai Pharmaceutical Co., Ltd., Japan

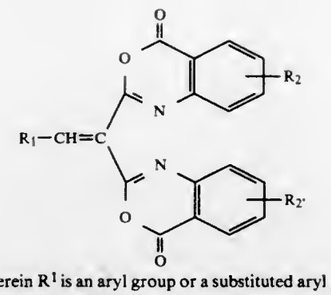
Division of Ser. No. 909,468, Sep. 19, 1986, Pat. No. 4,755,506, which is a division of Ser. No. 697,573, Feb. 1, 1985, Pat. No. 4,634,777. This application Mar. 2, 1988, Ser. No. 162,881

Claims priority, application Japan, Feb. 8, 1984, 59-22360; Aug. 13, 1984, 59-169702; Aug. 27, 1984, 59-179064; Sep. 17, 1984, 59-195219; Sep. 20, 1984, 59-197836

Int. Cl.[4] A61K *31/535;* **C07D** *265/36*

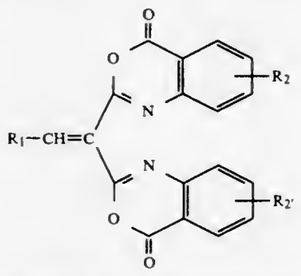
U.S. Cl. 514—212 **3 Claims**

1. A compound of the general formula:



wherein R^1 is an aryl group or a substituted aryl group wherein the substituent is halogen, hydroxy, $C_{(1-6)}$ lower alkoxy, $C_{(1-6)}$ lower alkylenedioxy, halo $C_{(1-6)}$ lower alkyl, cyano, nitro, mono- or di-$C_{(1-6)}$ alkylamino or $C_{(1-6)}$ lower alkanoylamino; or a 5-membered or 6-membered $C_{(1-6)}$ alkyl substituted or unsubstituted heterocyclic group containing a heteroatom selected from oxygen, nitrogen and sulfur, or a condensed heterocyclic group consisting of a heterocycle as defined above and a benzene nucleus and R^2 and $R^{2'}$ are independently hydrogen, halogen, nitro, $C_{(1-6)}$ lower alkyl or $C_{(1-6)}$ lower alkoxy.

2. A pharmaceutical composition comprising a therapeutically effective amount of a compound of the general formula:



wherein R^1 is an aryl group or a substituted aryl group wherein the substituent is halogen, hydroxy, $C_{(1-6)}$ lower alkoxy, $C_{(1-6)}$ lower alkylenedioxy, halo $C_{(1-6)}$ lower alkyl, cyano, nitro, mono- or di-$C_{(1-6)}$ alkylamino or $C_{(1-6)}$ lower alkanoylamino; or a 5-membered or 6-membered $C_{(1-6)}$ alkyl substituted or unsubstituted heterocyclic group containing a heteroatom selected from oxygen, nitrogen and sulfur, or a condensed heterocyclic group consisting of a heterocycle as defined above and a benzene nucleus and R^2 and $R^{2'}$ are independently hydrogen, halogen, nitro, $C_{(1-6)}$ lower alkyl or $C_{(1-6)}$ lower alkoxy in association with a pharmaceutically acceptable carrier, diluent or excipient.

4,822,792

SUBSTITUTED 3-PIPERIDINAMINES OR 3-AZEPINAMINES, THE PREPARATION THEREOF AND THEIR APPLICATIONS IN THERAPY

Patrick Carlier, Chatel-Guyon; Jacques A. Simond, Les-Martres-de-Veyre, and André J. Monteil, Chatel-Guyon, all of France, assignors to Riom Laboratoires C.E.R.M., Riom, France

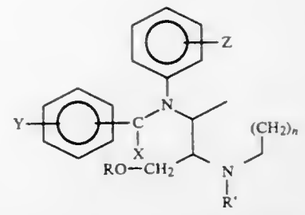
Filed Dec. 22, 1987, Ser. No. 136,302

Claims priority, application France, Dec. 23, 1986, 86 18083

Int. Cl.[4] A61K *31/445;* **C07D** *211/92*

U.S. Cl. 514—212 **5 Claims**

1. A compound of the formula:



in which R and R' each denote an alkyl radical having 1 to 7 carbon atoms or a cycloalkyl radical having 3 to 7 carbon atoms; X denotes =O or H_2; and Y and Z denote hydrogen or one or more radicals chosen from halogeno, hydroxy, straight or branched alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, trifluoromethyl or methylenedioxy; n may assume the values 2 or 3; or a pharmaceutically acceptable salt thereof.

5. Pharmaceutical composition for the treatment of cardiovascular disorders comprising an effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,822,793

BENZAZEPINE ANTIARRHYTHMIC AGENTS

John E. Arrowsmith, Deal, and Peter E. Cross, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.

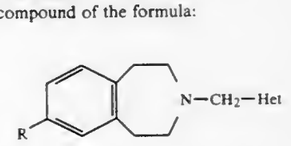
Filed Mar. 21, 1988, Ser. No. 170,487

Claims priority, application United Kingdom, Mar. 25, 1987, 8707121

Int. Cl.[4] A61K *31/33;* **C07D** *223/16*

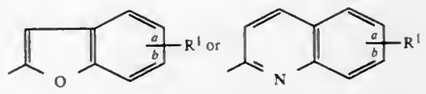
U.S. Cl. 514—213 **13 Claims**

1. A compound of the formula:



(A)

or a salt thereof, wherein "Het" is a group of the formula:



in which R^1 is attached to position "a" or "b" of the benzene ring and R and R^1, which are the same, are $—NHSO_2(C_1–C_4$ alkyl), $—NH_2$ or $—NO_2$.

8. A method of treating cardiac arrhythmias in mammals comprising administering to a mammal in need of such treatment an antiarrhythmic effective amount of a compound as claimed in claim 2.

4,822,794

PYRIDOOXAZINONE-PYRIDONE COMPOUNDS, CARDIOTONIC COMPOSITIONS INCLUDING THE SAME, AND THEIR USES

Alfred P. Spada, Ambler; William L. Studt, Harleysville; Henry F. Campbell, Lansdale, and Donald E. Kuhla, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed May 8, 1987, Ser. No. 47,394

Int. Cl.[4] A61K *31/539;* **C07D** *498/04*

U.S. Cl. 514—230.5 **10 Claims**

1. A compound which is 7-[3'-cyano-6'-methyl-2'-oxo-(1H)pyridin-5'-yl]-4-methyl-2H-pyrido-3,2-b]-1,4-oxazin-3(4H)-one or a pharmaceutically acceptable salt thereof.

9. A method for increasing cardiotonic contractility in a patient requiring such treatment which comprises administering to such patient an effective positive inotropic amount of a compound selected from the group consisting of 7-[3'-cyano-6'-methyl-2'-oxo-(1H)pyridin-5'-yl]-4-methyl-2H-pyrido-[3,2-b]-1,4-oxazin3(4H)-one, 7-[3'-cyano-6 -methyl-2'-oxo-(1H)pyridin-5'-yl]-4-methyl-2H-pyrido-[4,3-b]-1,4-oxazin-3(4H)-one, 7-[3'-cyano-6'-methyl-2'-oxo-(1H)pyridin-5'-yl]-4-methyl-2H-pyrido-[2,3-b]-1,4-oxazin-3(4H)-one, 6-3'-cyano-6'-methyl-2'-oxo-(1H)pyridin-5'-yl]-1-methyl-4H-pyrido-2,3-1,3 oxazin-2(1H)-one, 7-[3'-cyano-6'-methyl-2'-oxo-(1H)pyridin-5'-yl]-2,2,4-trimethyl-2H-pyrido-[3,2-b]-1,4-oxazin-3(4H)-one, 7-[3'-cyano-6'-methyl-2'-oxo-(1H)pyridin-5'-yl]-2-methyl-2H-pyrido[3,2-b]-1,4-oxazin-3(4H)-one, 7-[3'-cyano-6'- methyl-2'-oxo-(1H)pyridin-5'-yl]-2'4-dimethyl-2H-pyrido-[3,2-b]-1,4-oxazin-3(4H)-one and 7-[3'-cyano-6'-methyl-2 -oxo-(1H)pyridin-5'-yl]-2-phenyl-2H-pyrido-[3,2-b]-1,4-oxazin-3(4H)-one, or a pharmaceutically acceptable salt thereof.

4,822,795

PHARMACEUTICALLY USEFUL ESTERS AND AMIDES

Francis D. King, Harlow, England, assignor to Beecham Group p.l.c., Brentford, England

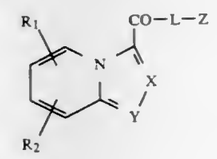
Filed Jul. 27, 1987, Ser. No. 78,105

Claims priority, application Switzerland, Jul. 25, 1986, 8618149; Apr. 14, 1987, 8708940

Int. Cl.[4] A61K *31/46;* **C07D** *451/04*

U.S. Cl. 514—214 **9 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof:



(I)

wherein

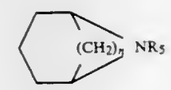
L is NH or O;

X is N or CR_3 wherein R_3 is hydrogen or C_{1-6} alkoxy;

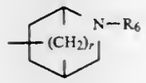
Y is N or CR_4 wherein R_4 is hydrogen, halogen, CF_3, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-6} alkylsulphonyl, C_{1-6} alkylsulphinyl, C_{1-7} acyl, cyano, C_{1-6} alkoxycarbonyl, C_{1-7} acylamino, hydroxy, nitro or amino, aminocarbonyl, or aminosulphonyl, optionally N-substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, and C_{3-8} cycloalkyl C_{1-4} alkyl or disubstituted by C_4 or C_5 polymethylene; phenyl or phenyl C_{1-4} alkyl group optionally substituted in the phenyl ring by one or two of halogen, C_{1-6} alkoxy or C_{1-6} alkyl groups;

R_1 and R_2 are independently selected from hydrogen, or halogen;

Z is a group of formula (a), (b) or (c):

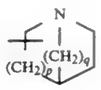


(a)



(b)

-continued



wherein
n is 2 or 3; p is 1 or 2; q is 1 to 3; r is 1 to 3; and
R_5 or R_6 is C_{1-4} alkyl.

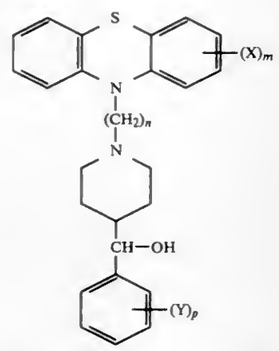
4,822,796

1-((PHENOTHIAZIN-10-YL)ALKYL)-ALPHA-PHENYL-4-PIPERIDINEMETHANOLS AND PHARMACEUTICAL USE

Grover C. Helsley, P.O. Box 94, Pluckemin, N.J. 07978; Larry Davis, P.O. Box 129, Sergeantsville, N.J. 08857, and Gordon E. Olsen, 8K Franklin Greens, Somerset, N.J. 08873

Filed Jun. 1, 1987, Ser. No. 56,199
Int. Cl.[4] A61K *31/54;* **C07D** *417/06*
U.S. Cl. 514—225.5 **10 Claims**

1. A compound of the formula



wherein X is a radical selected from the group consisting of halogen, trifluoromethyl, loweralkoxy, loweralkylthio, sulfamoyl, and dimethylsulfamoyl; Y is a radical selected from the group consisting of halogen, trifluoromethyl, loweralkyl and loweralkoxy; m is an integer having a value of 0 or 1; n is an integer having a value from 2 to 4 inclusive; and p is an integer having a value from 0 to 2 inclusive.

9. A method of alleviating pain comprising administering to a mammal in need of pain alleviating, a pain alleviating effective amount of a compound as defined in claim 1.

10. A method of treating psychoses comprising administering to a mammal in need of psychoses treatment a psychoses treating effective amount of a compound as defined in claim 1.

4,822,797

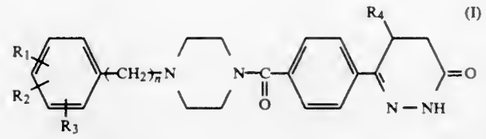
PIPERAZINYL CARBONYL PHENYL PYRIDAZINONE DERIVATIVES USEFUL AS CARDIOTONICS

Hiromi Okushima, Kawasaki; Akihiro Narimatsu, Yokohama; Makio Kobayashi; Rikizo Furuya, both of Tokyo, and Yoshimi Kitada, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

PCT No. PCT/JP86/00083, § 371 Date Mar. 31, 1987, § 102(e) Date Mar. 31, 1987, PCT Pub. No. WO87/05016, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 21, 1986, Ser. No. 26,758
Int. Cl.[4] C07D *403/10, 405/14;* **A61K** *31/50*
U.S. Cl. 514—252 **4 Claims**

1. A pyridazinone compound having the formula (I):

(c) (I)



wherein R_1, R_2 and R_3 represent a hydrogen atom, hydroxy group or an alkoxy group of not more than 5 carbon atoms, or two of R_1, R_2 and R_3 at adjacent carbons are combined together to form a group of $-O-CH_2-O-$ or $-CH_2-O-CH_2-O-$, R_4 represents an alkyl group of not more than 5 carbon atoms, n represents an integer of 1 to 4 and the dotted line represents a single or double bond; or pharmaceutically-acceptable salts thereof.

3. A cardiotonic pharamaceutical composition comprising an effective amount of one or more of the compounds of claim 1.

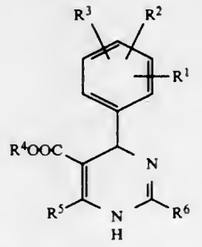
4,822,798

CIRCULATION-ACTIVE 4-PHENYL-6-SUBSTITUTED DIHYDROPYRIMIDINES

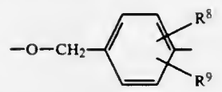
Jurgen Stoltefuss; Horst Boshagen, both of Haan; Matthias Schramm, Cologne, and Gunter Thomas, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 526,931
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234684
Int. Cl.[4] A61K *31/505;* **C07D** *239/20*
U.S. Cl. 514—255 **10 Claims**

1. A dihydropyrimidine of the formula



in which
R^1, R^2 and R^3 are identical or different and represent hydrogen, alkyl with 1–4 carbon atoms, fluorine, chlorine, nitro, trifluoromethyl or the group



in which
R^8 and R^9 are identical or different and represent hydrogen, alkyl with 1–4 carbon atoms, fluorine, chlorine, nitro or trifluoromethyl,
R^4 and R^5 are identical or different and represent alkyl which has 1–6 carbon atoms, is optionally interrupted in the chain by an oxygen and is optionally substituted by fluorine, chlorine, cyano, nitro or phenyl, and
R^6 represents hydrogen, alkyl with 1–4 carbon atoms, phenyl or pyridyl,
or a pharmacologically acceptable addition salt thereof.

9. A method of affecting the circulation of a patient which comprises administering to such patient a circulation-affecting effective amount of a dihydropyrimidine or salt thereof according to claim 1.

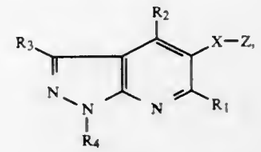
4,822,799

PYRAZOLOPYRIDINE ANALOGS OF MEVALONOLACTONE AND DERIVATIVES THEREOF USEFUL FOR INHIBITING CHOLESTEROL BIOSYNTHESIS IN MAMMALS

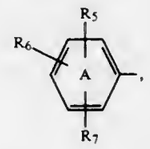
Faizulla G. Kathawala, Mountain Lakes, N.J., assignor to Sandoz Pharm. Corp., E. Honover, N.J.

Filed Jan. 27, 1988, Ser. No. 149,232
Int. Cl.[4] C07D *471/04;* **A61K** *31/395*
U.S. Cl. 514—303 **20 Claims**

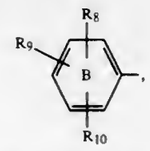
1. A compound of the formula



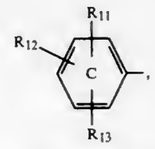
wherein
R_1 is C_{1-6}alkyl not containing an asymmetric carbon atom, C_{5-7}cycloalkyl, (C_{5-7}cycloalkyl)methyl, phenyl-$(CH_2)_m$-, pyridyl-2, pyridyl-3, pyridyl-4, thienyl-2, thienyl-3 or



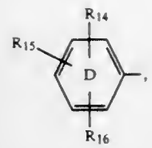
R_2 is C_{1-6}alkyl not containing an asymmetric carbon atom, C_{5-7}cycloalkyl, (C_{5-7}cycloalkyl)methyl, phenyl-$(CH_2)_m$-, pyridyl-2, pyridyl-3, pyridyl-4, thienyl-2, thienyl-3 or



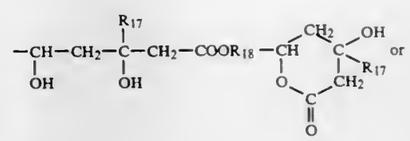
with the proviso that not more than one of R_1 and R_2 is a member of the group consisting of pyridyl-2, pyridyl-3, pyridyl-4, thienyl-2, thienyl-3, Ring A and Ring B,
R_3 is C_{1-6}alkyl not containing an asymmetric carbon atom, C_{5-7}cycloalkyl or

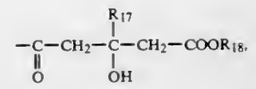


$R_4$is C_{1-6}alkyl not containing an asymmetric carbon atom, C_{5-7}cycloalkyl or

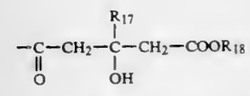


X is $-(CH_2)_n-$, $-CH=CH-$, $-CH_2-CH=CH-$ or $-CH=CH-CH_2-$, wherein n is 1, 2 or 3, and
Z is





wherein
R_{17} is hydrogen or C_{1-3}alkyl, and
R_{18} is hydrogen, R_{19} or M,
wherein
R_{19} is a physiologically acceptable ester group, and
M is a cation,
with the proviso that Z may be a group of the formula



only when (i) X is $-CH=CH-$ or $-CH_2-CH=CH-$, (ii) R_{17} is C_{1-3}alkyl or (iii) both (i) and (ii), wherein
each of R_5, R_8, R_{11} and R_{14} is independently hydrogen, C_{1-3}alkyl, n-butyl, i-butyl, t-butyl, C_{1-3}alkoxy, n-butoxy, i-butoxy, trifluoromethyl, fluoro, chloro, phenyl, phenoxy or benzyloxy,
each of R_6, R_9, R_{12} and R_{15} is independently hydrogen, C_{1-3}alkyl, C_{1-3}alkoxy, trifluoromethyl, fluoro, chloro, phenoxy or benzyloxy, and
each of R_7, R_{10}, R_{13} and R_{16} is independently hydrogen, C_{1-2}alkyl, C_{1-2}alkoxy, fluoro or chloro, with the provisos that not more than one substituent on each of Rings A, B, C and D independently is trifluoromethyl, not more than one substituent on each of Rings A, B, C and D independently is phenoxy, and not more than one substituent on each of Rings A, B, C and D independently is benzyloxy, and
each m is independently 1, 2 or 3.

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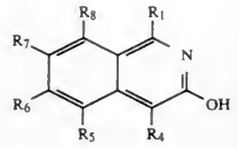
4,822,800

ISOQUINOLINOL COMPOUNDS HAVING CARDIOTONIC AND PHOSPHODIESTERASE FRACTION III INHIBITING PROPERTIES AND/OR RENAL VASODILATING PROPERTIES

Robert Falotico, Belle Mead; Ramesh M. Kanojia, Somerville; Jeffery B. Press, Rocky Hill, all of N.J., and Alfonso J. Tobia, Doylestown, Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jan. 9, 1986, Ser. No. 871,967
Int. Cl.[4] A61K *31/47;* **C07D** *217/24*
U.S. Cl. 514—309 **7 Claims**

1. A compound having a structure that corresponds to the formula:



wherein R_1 is a radical selected from the group consisting of hydrogen, lower alkyl, phenyl, substituted phenyl wherein the substituent is lower alkyl; halo lower alkyl and halo phenyl;

R_4 is a radical selected from the group consisting of hydrogen, halogen, lower alkyl, cycloalkyl, having 5–7 carbon atoms and $—(CH_2)_n—Y$ wherein Y is, OR, OCOR, CF_3, COR, $CON(R)_2$, and halogen, wherein R is hydrogen, lower alkyl and cycloalkyl having 5–7 carbon atoms and n is an integer from 1 to 10, inclusive; and

R_5–R_8 are independently selected from the group consisting of hydrogen, halogen, hydroxy, and lower alkoxy; and the pharmaceutically acceptable salts thereof.

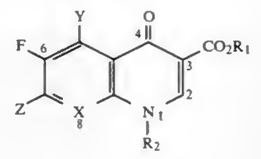
4,822,801

4-OXO-1,4-DIHYDROQUINOLINE-3-CARBOXYLIC ACID DERIVATIVE AS ANTIBACTERIAL AGENTS

John M. Domagala, Canton; Thomas F. Mich, Ann Arbor, and Joseph P. Sanchez, Canton, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

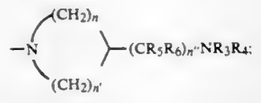
Continuation-in-part of Ser. No. 770,897, Aug. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 633,153, Jul. 20, 1984, abandoned. This application Oct. 20, 1986, Ser. No. 920,536
Int. Cl.[4] A61K *31/47;* **C07D** *401/02, 401/04*
U.S. Cl. 514—312 **20 Claims**

1. A compound of the formula



I

wherein Z is



Y is NH_2, NHR, NRR', OR, or OH wherein R and R', are each independently an alkyl of from one to six carbon atoms or a cycloalkyl of from three to six carbon atoms,; X is CH, CF, CCl, CBr, COR, COH_n; n is 1, 2, 3, or 4; n' is 1, 2, 3, or 4 wherein n+n, is a total of 2, 3, 4, or 5, and n," is 0, 1, or 2; R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation; R_2 is alkyl having from one to four carbon atoms, vinyl, haloalkyl, or hydroxyalkyl having from two to four carbon atoms, or cycloalkyl having three to six carbon atoms; R_3 is hydrogen, alkyl having from one to four carbon atoms or cycloalkyl having three to six carbon atoms; R_4 is hydrogen, alkyl from one to four carbon atoms, hydroxyalkyl having two to four carbon atoms, trifluoroethyl or $R_7CO—$ wherein R_7 is alkyl having from one to four carbon atoms, or alkoxy having from one to four carbon atoms; R_5 is hydrogen, or alkyl having from one to three carbon atoms; R_6 is hydrogen or alkyl having from one to three carbon atoms; and the pharmaceutically acceptable acid addition or base salts thereof.

19. A pharmaceutical composition comprising an antibacterially effective amount of a compound as claimed in claim **1** together with a pharmaceutically acceptable carrier.

4,822,802

METHOD OF FENTANLY ADMINISTRATION FOR POSTOPERATIVE PAIN RELIEF

Gerhard Levy, Williamsville, N.Y.; Mary Southam, Portola Valley, and Marilou S. Powers Cramer, Redwood, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Feb. 24, 1987, Ser. No. 18,241
Int. Cl.[4] A61U *31/44, 31/445*
U.S. Cl. 514—317 **8 Claims**

1. A method for inducing and maintaining postoperative analgesia in a surgical patient which comprises:

(a) administering to said patient a 100–300 μg dosage of a material selected from the group consisting of fentanyl, sufentanil, carfentanil, lofentanil and alfentanil, at the induction of anesthesia; and

(b) placing a transdermal delivery device adapted to continuously transdermally administer a material selected from the group consisting of fentanyl, sufentanil, carfentanil, lofentanil and alfentanil, at an analgetically effective rate, on said patient no later than the induction of anesthesia; and

(c) continuing the transdermal administration of said material at said rate by maintaining said device on said patient at least until said patient has recovered from anesthesia;

wherein said material is administered internally and transdermally for analgesia.

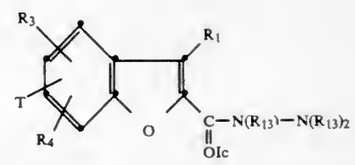
4,822,803

BENZOFURAN 2-CARBOXYLIC ACID HYDRAZIDES USEFUL AS INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

Joseph G. Atkinson, Montreal; Yvan Guindon, Ile Bizard, and Cheuk K. Lau, Pierrefonds, all of Canada, assignors to Merck Frosst Canada, Inc., Quebec, Canada

Division of Ser. No. 1,262, Jan. 7, 1987, Pat. No. 4,745,127, which is a division of Ser. No. 725,265, Apr. 19, 1985, Pat. No. 4,663,347, and a continuation-in-part of Ser. No. 800,624, Nov. 21, 1985, abandoned, which is a continuation of Ser. No. 584,061, Feb. 27, 1984, abandoned, and a continuation-in-part of Ser. No. 661,645, Oct. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 547,508, Oct. 31, 1983, abandoned. This application Feb. 4, 1988, Ser. No. 152,215
Int. Cl.[4] A61K *31/34;* **C07D** *307/85*
U.S. Cl. 514—320 **8 Claims**

4. A compound of the Formula Ic:



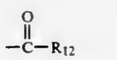
Ic

wherein

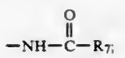
R_1 is hydrogen, C_1 to C_6 alkyl, $Ar_1—C_1$ to C_3 alkyl, Ar_1 or CH_2OH;

R_3, R_4 and T are each independently selected from:

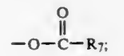
(1) hydrogen;
(2) alkyl having 1 to 4 carbon atoms;
(3) alkenyl having 2 to 4 carbon atoms;
(4) $—(CH_2)_nM$ wherein
n is 0 or 1, and
M is
(a) $—OR_5$;
(b) halogen;
(c) $—CF_3$;
(d) $—SR_5$;
(e) Ar_1;
(f) $—COOR_6$;
(g)



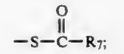
wherein R_{12} is H, C_1 to C_6 alkyl, or Ar_1;
(h)



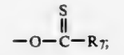
(i)



(j)



(k)



(l) NR_8R_9;
(m) $—NHSO_2R_{10}$ wherein R_{10} is C_1 to C_6 alkyl, phenyl, p-tolyl or CF_3;
(n) $—SOR_5$;
(o) $—CONR_8R_9$;
(p) $—SO_2NR_8R_9$;
(q) $—SO_2R_5$;
(r) k—NO_2; or
(s) —CN;

or any two of R_3, R_4 and T may be joined to form a saturated ring having 5 or 6 ring atoms, said ring atoms comprising 0, 1 or 2 oxygen atoms, the remaining ring atoms being carbon;

each R_5 is independently H, C_1 to C_6 alkyl, benzyl Ar_1, perfluoro-C_1–C_4 alkyl, $CH_2—R_{11}$ wherein R_{11} is hydroxy C_2 to C_5 alkyl, CH_2COOR_6, or $CH_2CO—R_7$;

each R_6 is independently H or C_1 to C_6 alkyl;

each R_7 is independently C_1 to C_6 alkyl, benzyl, Ar_1, NR_8R_9, $NHAr_1$, O—C_1 to C_4 alkyl;

each R_8 and each R_9 is independently H or C_1 to C_4 alkyl, or R_8 and R_9 may be joined through the N to which they are attached to form a heterocycloalkyl ring having 5 to 8 ring atoms;

each R_{13} is independently hydrogen, R_8, R_9, or Ar_1, and

each Ar_1 is independently 1- or 2-naphthyl, phenyl or mono- or disubstituted phenyl, wherein the substituents on the phenyl are independently selected from C_1 to C_3 alkyl, I, Br, Cl, F, $COOR_6$, $(CH_2)_n—NR_8R_9$ wherein n is 0 to 2, methylenedioxy, C_1 to C_3 alkoxy, OH, CN, NO_2, CF_3, C_1 to C_4 acyl, NR_8R_9, S—C_1 to C_6 alkyl, SO—C_1 to C_6 alkyl, and SO_2—C_1 to C_6 alkyl; with the proviso that at least one of the R_{13} groups in the Formula Ic is Ar_1, and one of R_3, R_4 and T is OR_5 or $—OCOR_7$;

or a pharmaceutically acceptable salt thereof.

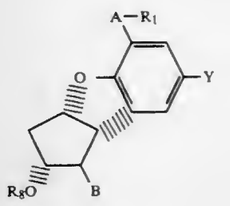
4,822,804

5,6,7,-TRINOR-4,8-INTER-M-PHENYLENE 2-NOR PGI_2 DERIVATIVES AND ANTI-ULCER, ANTI-THROMBOTIC AND ANTI-HYPERTENSIVE PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Kiyotaka Ohno, Fujisawa; Hiroshi Nagase; Mamoru Ishikawa, both of Kamakura; Kazuhisa Matsumoto, Tsujidohigashikaigan Fujisawa, and Shintaro Nishio, Ebina, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 96,273, Sep. 9, 1987, which is a continuation of Ser. No. 810,011, Dec. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 567,755, Jan. 1, 1984, Pat. No. 4,564,620, which is a continuation of Ser. No. 353,875, Mar. 2, 1982, abandoned. This application Sep. 29, 1987, Ser. No. 102,391
Claims priority, application Japan, Mar. 3, 1981, 56-29357
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[4] A61K *31/34, 31/557;* **C07D** *307/93*
U.S. Cl. 514—337 **34 Claims**

1. A 5,6,7-trinor-4,8-inter-m-phenylene PGI_2 derivative represented by the formula

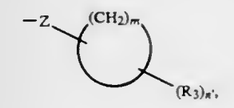


(I)

wherein

R_1 is a group selected from the class consisting of:

(a) a $COOR_2$, wherein R_2 denotes
(i) hydrogen or a pharmacologically acceptable cation,
(ii) a straight chain alkyl having 1–12 carbon atoms or a branched alkyl having 3–12 carbon atoms,
(iii)

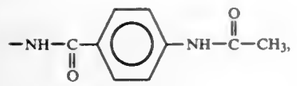


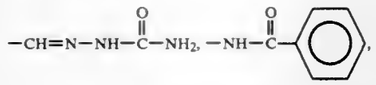
VOL 1101 ISS 3 APR 18 1989 UMI

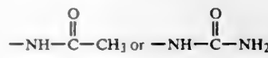
wherein Z denotes valence bond, or straight chain or branched alkylene which may be represented by C_tH_{2t}, wherein t denotes an integer of 1–5, further, m denotes an integer of 5–12, R_3 denotes hydrogen or alkyl having 1–5 carbon atoms, and n' denotes an integer of 1–3,

(iv) $-(CH_2CH_2O)_lCH_3$ wherein l is an integer of 1–5,

(v) —Z—Ar_1, wherein Z is the same as defined above, Ar_1 denotes phenyl, α-naphthyl, β-naphthyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, α-furyl, β-furyl, αthienyl, β-thienyl or substituted phenyl (wherein the substituent is at least one chlorine, bromine, fluorine, trifluoromethyl, alkyl having 1–4 carbon atoms, nitro, methoxy, phenyl, phenoxy,



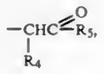




(vi) $-C_lH_{2l}COOR_3$

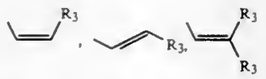
(vii) $-CH_2CH_lH_{2l}M(R_3)_2$ wherein l and R_3 are the same as defined above),

(viii)



wherein R_4 denotes hydrogen or benzoyl and R_5 denotes phenyl, p-bromophenyl, p-biphenyl, p-benzamidophenyl or 2-naphthyl,

(ix) $-C_pH_{2p}$—B', wherein B' is



or —C≡C—R_6, wherein R_3 is the same as defined above, R_6 denotes straight chain or branched alkyl having 1–30 carbon atoms, and p is an integer of 1–5, or

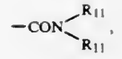
(x)



wherein R_7 denotes alkyl or acyl having 1–30 carbon atoms,

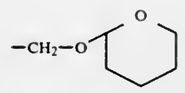
(b) $-CH_2OH$,

(c)



wherein R_{11} denotes hydrogen, alkyl having 1–10 carbon atoms, cycloalkyl having 3–12 carbon atoms, phenyl, substituted phenyl, aralkyl having 7–12 carbon atoms or $-SO_2R_{12}$, wherein R_{12} denotes alkyl having 1–10 carbon atoms, cycloalkyl having 3–12 carbon atoms, phenyl, substituted phenyl or aralkyl having 7–12 carbon atoms, the two R_{11} may be the same or different, however, when one denotes $-SO_2R_{12}$, the other is not $-SO_2R_{12}$, and

(d)



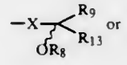
A denotes

$-(CH_2)_n-$,

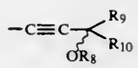
Y denotes hydrogen, chlorine, fluorine, bromine, formyl, methoxy or nitro,

B denotes to all A and Y

(i)

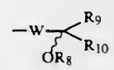


(ii)



further, when Y is chlorine, fluorine, bromine, formyl, methoxy or nitro, B further denotes

(iii)



wherein R_9 denotes hydrogen or alkyl group having 1–4 carbon atoms, R_8 denotes hydrogen, acyl having 1–12 carbon atoms, aroyl having 6–15 carbon atoms, tetrahydropyranyl, tetrahydrofurayl, 1-ethoxy ethyl or t-butyl,

X denotes

(i) $-CH_2ZCH_2-$,

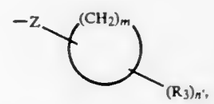
(ii) —CH=CH— (trans) or

(iii) —C≡C—

R_{10} denotes

(i) straight chain alkyl having 4–10 carbon atoms, or

(ii)



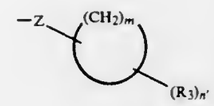
wherein Z, m, R_3 and n' are the same as defined above, or

(iii) —Z—AR_2, wherein Z is the same as defined above, and Ar_2 denotes phenyl, α-naphthyl, β-naphthyl or at least one chlorine, bromine, fluorine, trifluoromethyl, alkyl having 1–4 carbon atoms, nitro, methoxy, phenyl or phenoxysubstituted phenyl,

R_{13} denotes

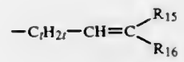
(i) branched alkyl having 5–10 carbon atoms, or

(ii) $-C_tH_{2t}OR_{14}$, wherein C_tH_{2t} is the same as defined above, and R_{14} denotes straight chain or branched alkyl having 1–5 carbon atoms,



'or —Z—Ar_2, wherein Z, m, R_3, n' and Ar_2 are the same as defined above, or

(iii)



wherein C_tH_{2t} is the same as defined above, R_{15} and R_{16} denote hydrogen, methyl, ethyl, propyl or butyl group,

W denotes

(i) $-CH_2CH_2-$ or

(ii) —CH=CH— (trans) and the formula (I) denotes d form, l form or dl form.

4,822,805

PYRIDYL-IMIDAZOLE COMPOUNDS WHICH HAVE USEFUL PHARMACEUTICAL ACTIVITY

Hisashi Takasugi, Osaka; Kiyotaka Ito, Ikeda; Shigetaka Nishino, Suita; Akito Tanaka, Toyonaka, and Takao Takaya, Kawanishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

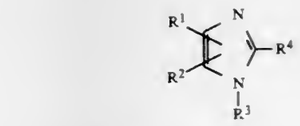
Filed Aug. 13, 1987, Ser. No. 84,862

Claims priority, application United Kingdom, Aug. 15, 1986, 8619971; Jui. 7, 1987, 8715932

Int. Cl.⁴ A61K *31/44;* **C07D** *401/04*

U.S. Cl. 514—341 **9 Claims**

1. A compound of the formula:



wherein R^1 is pyridyl,

R^2 is hydrogen, lower alkyl or hydroxy(lower)alkyl,

R^3 is hydrogen, hydroxy or lower alkyl, and

R^4 is phenyl substituted with hydroxy; with halo(lower)alkyl; with nitro; with amino; with lower alkanoylamino; with nitro-substituted or unsubstituted benzoylamino; with ureido; with lower alkylureido; with thioureido; with lower alkylthioureido; with benzoylthioureido; with lower alkylsulfonylamino; with tosylamino; with lower alkoxycarbonylamino; with halogen-substituted or unsubstituted phenyl(lower)alkoxy; with lower alkynyloxy; with carboxy; with lower alkoxycarbonyl; with lower alkoxy and lower alkylsulfinyl; with lower alkoxy and lower alkylsulfonyl; with lower alkoxy and hydroxy; with lower alkoxy and halogen-substituted or unsubstituted phenyl(lower)alkoxy; with lower alkoxy and nitro; with lower alkoxy and amino; with lower alkoxy and lower alkanoylamino; with lower alkoxy and (mono- or di(lower)alkyl)amino; with halogen and lower alkanoylamino; with lower alkyl and lower alkanoylamino; with lower alkoxy, halogen and hydroxy; with lower alkoxy, halogen and nitro; with lower alkoxy, halogen and amino; with lower alkanoylamino, lower alkoxy and halogen; with lower alkoxy, halogen and lower alkylamino; with lower alkoxy, halogen and N-lower alkanoyl-N-lower alkylamino; or with lower alkoxy, nitro and lower alkanoylamino; and a pharmaceutically acceptable salt thereof.

9. A method for therapeutic treatment of heart disease, thrombosis and inflammation which comprises administering a compound of claim 1 to human beings or animals.

4,822,806

α-METHYL-(6-PHENOXY)-2-PICOLYL CYCLOPROPANECARABOXYLATES HAVING PESTICIDAL ACTIVITY

Peter Ackermann, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

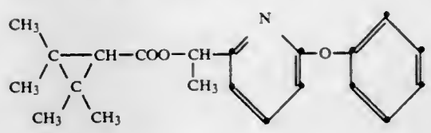
Division of Ser. No. 688,123, Dec. 31, 1984, Pat. No. 4,661,497. This application Jan. 12, 1987, Ser. No. 2,370

Claims priority, application Switzerland, Jan. 12, 1984, 140/84; Nov. 30, 1984, 5713/84

Int. Cl.⁴ C07D *213/64;* **A01N** *43/40*

U.S. Cl. 514—345 **3 Claims**

1. The compound of the formula



3. A method of controlling a variety of pests of animals and plants and soil pests, which comprises contacting said pests or their habitat with a pesticidally effective amount of the compound of claim 1.

VOL 1101 ISS 3 AP 18 1989 UMI

4,822,807

PHARMACEUTICAL COMPOSITION CONTAINING A STABLE MODIFICATION OF TORASEMIDE

Fritz Topfmeier, Heidelberg, and Gustav Lettenbauer, Lampertheim, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 895,355, Aug. 11, 1986, Pat. No. 4,743,693. This application Oct. 20, 1987, Ser. No. 111,439

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529529

Int. Cl.[4] C07D *213/74, 213/75;* **A61K** *31/44*

U.S. Cl. 514—347 **3 Claims**

1. A diuretic pharmaceutical composition comprising an effective amount of rapidly dissolving crystalline torasemide of pure modification I (monoclinic, space group $P2_1/c$, melting point 169° C.) substantially free of crystalline torasemide of modification II (monoclinic, space group P2/n, melting point 162° C.) and a pharmacologically acceptable carrier, said torasemide of modification I having solubility characteristics such that at least 60% is dissolved in water after 15 minutes, and at least 80% is dissolved in water after 30 minutes.

4,822,808

METHOD FOR PRODUCTION OF STABLE NICORANDIL PREPARATION

Yoshimitsu Iida, Wako, and Shuji Sumida, Tanashi, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 3,006, Jan. 13, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 211,095

Claims priority, application Japan, Jan. 17, 1986, 61-7722; Mar. 19, 1986, 61-61856

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—355 **20 Claims**

1. A process for producing a stable nicorandilcontaining pharmaceutical composition, comprising mixing nicorandil with a protecting compound which is solid at ordinary temperatures and which protects nicorandil from decomposing under humid conditions selected from the group consisting of a saturated higher aliphatic acid, a saturated higher alcohol, and a mixture thereof, and formulating the mixture into a suitable dosage form.

4,822,809

BENZAZOLE LIPOXYGENASE INHIBITING COMPOUNDS

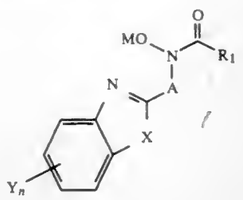
James B. Summers, and Andrew O. Stewart, both of Libertyville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Nov. 13, 1987, Ser. No. 120,251

Int. Cl.[4] A61K *31/425;* **C07D** *277/64*

U.S. Cl. 514—367 **12 Claims**

1. A compound of the formula:



wherein R_1 is (1) hydrogen, (2) C_1 to C_4 alkyl, (3) C_2 to C_4 alkenyl, (4) NR_2R_3, wherein R_2 and R_3 are independently selected from hydrogen, C_1 to C_4 alkyl and hydroxyl, but R_2 and R_3 are not simultaneously hydroxyl;

X is (1) oxygen, (2) sulfur, (3) SO_2, or (4) NR_4, wherein R_4 is (1) hydrogen, (2) C_1 to C_6 alkyl, (3) C_1 to C_6 alkoyl or (4) aroyl;

A is selected from C_1 to C_6 alkylene or C_2 and C_6 alkenylene; n is 0–4;

Y is independently selected at each occurrence from (1) hydrogen, (2) halogen, (3) hydroxy, (4) cyano, (5) halosubstituted alkyl, (6) C_1 to C_{12} alkyl, (7) C_2 to C_{12} alkenyl, (8) C_1 to C_{12} alkoxy, (9) C_3 to C_8 cycloalkyl, (10) aryl, (11) aryloxy, (12) aroyl, (13) C_1 to C_{12} arylalkyl, (14) C_2 to C_{12} arylalkenyl, (15) C_1 to C_{12} arylalkoxy, (16) C_1 to C_{12} arylthioalkoxy, and substituted derivatives of (17) aryl, (18) aryloxy, (19) aroyl, (20) C_1 to C_{12} arylalkyl, (21) C_2 to C_{12} arylalkenyl, (22) C_1 to C_{12} arylalkoxy, (23) C_1 to C_{12} arylthioalkoxy, wherein substituents are selected from halo, nitro, cyano, C_1 to C_{12} alkyl, alkoxy, and halosubstituted alkyl;

and M is hydrogen, a pharmaceutically acceptable cation, aroyl, or C_1 or C_{12} alkoyl.

11. A method for treating diseases in which lipoxygenase enzymes are contributory, comprising administering to a human or lower animal in need of such treatment a therapeutically effective amount to inhibit lipoxygenase of a compound of the claim **1**.

4,822,810

1-ARALKYL-5-IMINO-PYRAZOLE COMPOUNDS, PESTICIDAL COMPOSITION AND USE

Markus Lindig, Hilden, and Benedikt Becker, Mettmann, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

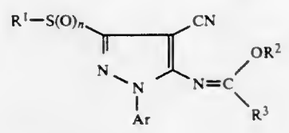
Filed Mar. 30, 1988, Ser. No. 175,380

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712072

Int. Cl.[4] A01N *43/56;* **C07D** *231/52*

U.S. Cl. 514—407 **9 Claims**

1. A 1-aralkylpyrazole of the formula



(I)

in which

R^1 represents alkyl,

R^2 represents alkyl,

R^3 represents hydrogen or alkyl,

Ar represents optionally substituted aralkyl and

n represents the numbers 0, 1 or 2.

7. An arthropodicidal composition comprising an arthropodicidally effective amount of a compound according to claim **1** and a diluent.

4,822,811

CARBAZOLE LIPOXYGENASE INHIBITING COMPOUNDS, COMPOSITIONS AND USE

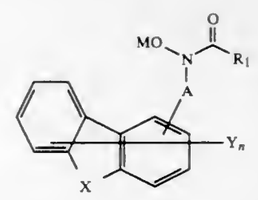
James B. Summers, Libertyville, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 120,301, Nov. 13, 1987, Pat. No. 4,769,387. This application Jun. 17, 1988, Ser. No. 208,350

Int. Cl.[4] A61K *31/40;* **C07D** *209/86, 209/88*

U.S. Cl. 514—411 **10 Claims**

1. A compound of the formula:



wherein

R1 is hydrogen, C1 to C4 alkyl, C2 to C4 alkenyl, or NR2R3, wherein R2 and R3 are independently selected from hydrogen, C1 to C4 alkyl and hydroxyl, but R2 and R3 are not simultaneously hydroxyl;

X is NR4, wherein R4 is hydrogen, C1 to C6 alkyl, C1 to C6 alkoyl or aroyl;

A is selected from C1 to C6 alkylene and C2 to C6 alkenylene;

Y is selected independently at each occurrence from hydrogen, halogen,hydroxy, cyano, nitro, halosubsitituted alkyl,C1 to C12 alkyl, C2 to C12 alkenyl, C1 to C12 alkenul, C1 to C12 alkoxy, c3 to c8 cycloalkyl aroyl, C1 to C12 arylalkyl,C2 to C12 arylalkenyl, C1 to C12 arylalkoxy,C1 to C12 arylthioalkoxy, and substituted derivatives of aryl-,aryloxy, aroyl,C1 to C12 arylalkyl, C2 to C12 arylalkenyl, C1 to C13 arylalkoxy, or C1 to C12 arylthioalkoxy,-wherein substituents are selected from halo, nitro,cyano, C1 to C13 alkyl, alkoxy, and halosubstituted alkyl; n is a number having the values of 0–4; when n=0 then Y=hydrogen;

and M is hydrogen, a pharmaceutically acceptablecation, aroyl, or C1 to C12 alkoyl.

6. A pharmaceutical composition for inhibitiong 5- and/or 12-lipoxygenase, comprising a pharmaceutical carrier and a therapeutically effective amount of a compound of claim **1**.

4,822,812

β-(FLUOROMETHYLENE)-5-HYDROXYTRYPTOPHAN AND DERIVATIVES AND THEIR USE AS PRODRUGS FOR MAO INHIBITION

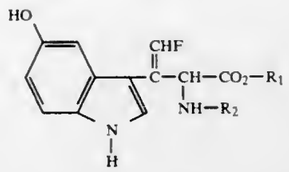
Ian A. McDonald, Loveland; Michael G. Palfreyman, Cincinnati, both of Ohio, and Jean-Noël Collard, Bischheim, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed May 21, 1987, Ser. No. 53,212

Int. Cl.[4] A61K *31/405;* **C07D** *209/20*

U.S. Cl. 514—419 **14 Claims**

1. A compound of the formula (I):



(I)

wherein R_1 is hydrogen or a lower alkyl group and R_2 is hydrogen or a formyl group; or a non-toxic pharmaceutically acceptable salt thereof.

13. A method for inhibiting monoamine oxidase in the brain which comprises administering to a patient in need thereof an effective amount of a compound as defined in claim **1**.

4,822,813

3-(2-HALOALKYL)-1,4-OXATHIINS AND 2-(2-HALOALKYL)-1,4-DITHIINS, AND TREATMENT OF LEUKEMIA AND TUMORS THEREWITH

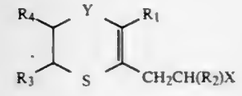
Walter G. Brouwer, Guelph; Ethel E. Felauer, Puslinch, and Marshal Kulka, Guelph, all of Canada, assignors to Uniroyal Chemical Ltd./Uniroyal Chemical Ltee, Don Mills, Canada

Continuation-in-part of Ser. No. 24,657, Mar. 11, 1987, abandoned. This application Jan. 21, 1988, Ser. No. 146,512

Int. Cl.[4] A61K *31/385, 31/39;* **C07D** *327/06, 339/08*

U.S. Cl. 514—433 **25 Claims**

1. A 3-(2-haloalkyl)-1,4-oxathiin or a 2-(2-haloalkyl)-1,4-dithiin of the formula



wherein

R_1 is an alkyl group containing up to 4 carbon atoms, cyclohexyl or phenyl;

R_2 is hydrogen or ethyl;

R_3 and R_4 are each hydrogen, methyl or ethyl, and

when either R_3 or R_4 is methyl or ethyl, the other is hydrogen;

X is halogen; and

Y is oxygen or sulfur and

when Y is sulfur, R_3 and R_4 are both hydrogen.

20. The pharmaceutical composition for inducing the regression of leukemia or tumors, which comprises an effective amount of the compound of claim **1**, in admixture with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

4,822,814

NEW 1,3-DITHIOL-2-YLIDENE-ALKYLSULFONYLACETATES AND THEIR USES

Hiroshi Ohyama, Chigasaki; Satoshi Hobara; Kazuyuki Tsujimoto, both of Atsugi, and Shouji Tanaka, Hatano, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

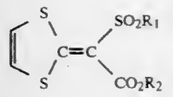
Filed Mar. 16, 1987, Ser. No. 26,205

Claims priority, application Japan, Mar. 19, 1986, 61-59600

Int. Cl.[4] C07D *339/06;* **A61K** *31/385*

U.S. Cl. 514—440 **6 Claims**

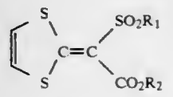
1. A 1,3-dithiol-2-ylidene sulfonylacetate derivative of the formula



(I)

Wherein R_1 and R_2 mean individually a lower alkyl group.

5. A method for therapeutically treating or preventing a liver disorder of animals, including humans, which comprises orally or parenterally administering to said animal in need of the therapy or prevention, an effective amount of a compound of the formula



(I)

wherein R_1 and R_2 mean individually a lower alkyl group.

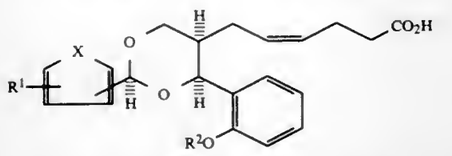
4,822,815

DIOXANE HEXENOIC ACIDS

George R. Brown, Wilmslow, and Michael J. Smithers, Macclesfield, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 10, 1986, Ser. No. 940,076
Claims priority, application United Kingdom, Dec. 30, 1985, 8531892
Int. Cl.[4] A61K *31/38*; C07D *409/00*
U.S. Cl. 514—444 11 Claims

1. A 1,3-dioxane hexenoic acid of the formula I



wherein X is oxy or thio, R^1 is selected from hydrogen, halogeno, trifluoromethyl, cyano and nitro; R^2 is hydrogen; and wherein the groups at positions 2, 4 and 5 of the 1,3-dioxane ring have cis - relative sterochemistry; or a biodegradable ester or a (1–6C)alkanesulphonamide thereof; or a pharmaceutically acceptable salt thereof.

4,822,816

COMPOSITIONS AND METHODS FOR ADMINISTERING VITAMIN C

Richard G. Markham, Prescott, Ariz., assignor to Oxycal Laboratories, Inc., Prescott, Ariz.

Filed Apr. 10, 1987, Ser. No. 36,598
Int. Cl.[4] A01N *43/08*; A61K *31/335*
U.S. Cl. 514—474 2 Claims

1. A vitamin composition comprising:

(a) an effective amount of a compound having Vitamin C activity, selected from the group consisting of (i) dehydroascorbic acid, (ii) L-ascorbic acid and the edible salts thereof; and

(b) at least one compound selected from the group consisting of the aldono-lactones of L-threonic acid, L-xylonic acid, L-lyxonic acid and the edible salts of L-threonic acid, L-xylonic acid and L-lyxonic acids, in an amount effective to increase the human body absorption rate of said Vitamin C compound.

4,822,817

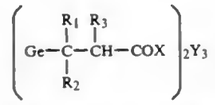
REMEDY FOR BONE DISEASE

Hajime Orimo, Tokyo; Norihiro Kakimoto, Machida, and Kohei Miyao, Tokyo, all of Japan, assignors to Asai Germanium Research Institute, Tokyo, Japan

Filed Jun. 4, 1987, Ser. No. 58,278
Claims priority, application Japan, Jun. 18, 1986, 61-142198
Int. Cl.[4] A61K *31/32, 31/28*
U.S. Cl. 514—492 9 Claims

1. A method for ameliorating the imbalance between osteogenesis and bone resorption, said method comprising administering to an organism in need of such treatment an effective amount to ameliorate the imbalance between osteogenesis and bone resorption of a compound of the formula:

(I)



wherein R_1, R_2 and R_3 are independently selected from a hydrogen atom, a lower alkyl group and a phenyl group; X denotes a hydroxyl, O-lower alkyl or amino group; and Y denotes an oxygen or sulfur atom.

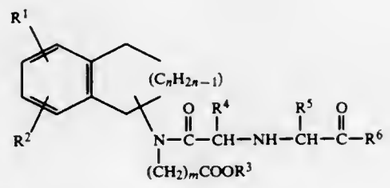
4,822,818

BICYCLE COMPOUNDS, THEIR PRODUCTION AND USE

Yoshikazu Oka, Kawanishi; Kobei Nishikawa, Kyoto, and Akio Miyake, Hirakata, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Oct. 19, 1981, Ser. No. 312,639
Claims priority, application Japan, Oct. 31, 1980, 55-154394; Apr. 28, 1981, 56-64371
Int. Cl.[4] A61K *37/43*; C07C *101/30, 101/02, 101/72*
U.S. Cl. 514—529 22 Claims

1. A compound of the formula:



wherein

R^1 and R^2 independently represent hydrogen, hydroxyl or C_{1-4} alkoxy, or R^1 and R^2 jointly form C_{1-4} alkylenedioxy,

R^3 is hydrogen or C_{1-4} alkyl,

R^4 is hydrogen, C_{1-4} alkyl or amino-C_{1-4} alkyl which is unsubstituted or substituted by acyl of the class consisting of C_{2-4} alkanoyl, benzoyl, C_{2-4} alkoxycarbonyl or benzyloxycarbonyl,

R^5 is hydrogen, C_{1-4} alkyl or phenyl-C_{1-4} alkyl which is unsubstituted or substituted by 1 to 3 members of halogen, C_{1-4} alkyl, C_{1-4} alkoxy, amino, nitro and hydroxyl,

R^6 is hydroxyl, C_{1-4} alkoxy, amino or mono- or di-C_{1-4}-alkylamino, and

m and n each means 1 or 2,

or a pharmaceutically acceptable salt thereof.

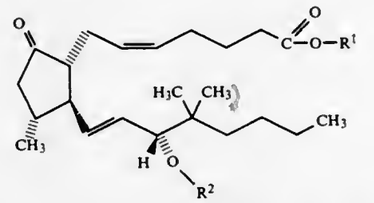
4,822,819

USE OF TRIMOPROSTIL AND DERIVATIVES IN GLAUCOMA THERAPY

Louis M. DeSantis, Fort Worth, and Verney L. Sallee, Southlake, both of Tex., assignors to Alcon Laboratories, Inc., Forth Worth, Tex.

Filed Nov. 7, 1986, Ser. No. 928,072
Int. Cl.[4] A61K *31/215, 31/19, 31/557*
U.S. Cl. 514—530 1 Claim

1. A method of treating glaucoma and ocular hypertension which comprises applying topically to the affected eye an opthalmic composition containing a therapeutically effective amount of a compound of formula:



wherein:

R1 is selected from hydrogen, an alkali metal cation, and alkyl having 1 to 6 carbon atoms; and R2 is selected from hydrogen and alkyl having 1 to 6 carbon atoms.

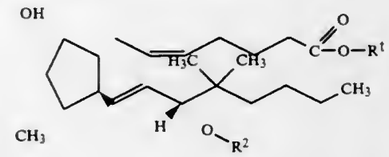
4,822,820

USE OF TRI-METHYL PG-F_2A AND DERIVATIVES IN GLAUCOMA THERAPY

Louis M. DeSantis, Fort Worth, and Verney L. Sallee, Southlake, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Nov. 24, 1986, Ser. No. 933,841
Int. Cl.[4] A61K *31/215, 31/19, 31/557*
U.S. Cl. 514—530 1 Claim

1. A method of treating glaucoma and ocular hypertension which comprises applying topically to the affected eye an ophthalmic composition containing a therapeutically effective amount of a compound of formula:



wherein:

R1 is selected from hydrogen, an alkali metal cation, and alkyl having 1 to 6 carbon atoms; and R2 is selected from hydrogen and alkyl having 1 to 6 carbon atoms.

4,822,821

METHOD FOR AUGMENTING FETAL HEMOGLOBIN

Susan Perrine, Stanford, Calif., assignor to Children's Hospital Medical Center of Northern California, Oakland, Calif.

Filed Oct. 10, 1986, Ser. No. 917,805
Int. Cl.[4] A61K *31/19, 31/195, 31/26*
U.S. Cl. 514—557 5 Claims

1. A method for ameliorating sickle cell anemia in a mammal comprising the step of introducing into the bloodstream of said mammal periodically during its gestation period and/or infancy, a compound selected from the group consisting α-amino-n-butyric acid, butyric acid, isomers and non-toxic salts thereof, insulin, and mixtures thereof, in an amount and frequency and duration of life sufficient to inhibit or reverse fetal τ to β-globin switching.

4,822,822

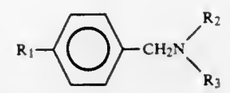
BENZYLAMINE DERIVATIVES, AND USE THEREOF

Masanobu Arita; Kiyoshi Arai, both of Yokohama; Nobuo Komoto, Mitaka; Setsuko Hirose, Tachikawa, and Takeshi Sekine, Hiratsuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

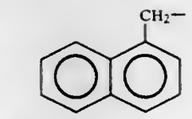
Filed Oct. 27, 1986, Ser. No. 923,274
Claims priority, application Japan, Nov. 1, 1985, 60-243831
Int. Cl.[4] A01N *33/02*; C07C *87/28*
U.S. Cl. 514—655 6 Claims

1. A benzylamine derivative having the general formula (I):

(I)



wherein R_1 is an iso-propyl or tert-butyl group, R_2 is a group of the formula:



and R_3 is a lower alkyl or lower alkenyl group, or its acid addition salt.

3. An industrial or agricultural fungicide comprising a benzylamine derivative having the general formula (I) in claim 1.

4,822,823

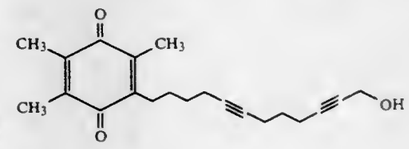
AQUEOUS PREPARATION AND METHOD OF PREPARATION THEREOF

Yujiro Yamamoto, Osaka; Hideo Terayama, Itami, and Yasushi Morita, Takasaki, all of Japan, assignors to Senju Pharmaceutical Co., Ltd., Japan

Filed Feb. 3, 1987, Ser. No. 10,534
Claims priority, application Japan, Feb. 17, 1986, 61-32265
Int. Cl.[4] A61K *31/12*
U.S. Cl. 514—690 9 Claims

1. An aqueous preparation comprising the compound (A) represented by the formula:

(A)



and at least one cyclodextrin selected from the group consisting of α-cyclodextrin and dimethyl-β-cyclodextrin wherein the content of compound (A) is in the range of from 0.001 to 0.5 w/v %, and the cyclodextrin content is in the range of from 0.1 to 15 w/v % and wherein the pH is 3–10.

4,822,824

COBALT-RUTHENIUM CATALYSTS FOR FISCHER-TROPSCH SYNTHESIS

Enrique Iglesia, Clinton; Stuart L. Soled, Pittstown, and Rocco A. Fiato, Basking Ridge, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 881,347, Jul. 2, 1986, Pat. No. 4,738,948.
This application Dec. 7, 1987, Ser. No. 129,747
Int. Cl.[4] C07C *1/04*
U.S. Cl. 518—709 4 Claims

1. A hydrocarbon synthesis process which comprises reacting hydrogen and carbon monoxide in the presence of a catalyst comprised of cobalt and ruthenium on titania, at reaction conditions suitable for the formation of higher hydrocarbons, the catalyst being prepared by impregnating titania with solutions of cobalt and ruthenium salts, drying the impregnated support, reducing the cobalt and ruthenium, treating the reduced metals with an oxygen containing stream at conditions sufficient to form oxides of cobalt and oxides of ruthenium and reducing the cobalt and ruthenium oxides.

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4,822,825

BASE-MODIFIED ZEOLITE-CONTAINING CATALYSTS FOR THE CONVERSION OF SYNTHESIS GAS TO ALCOHOLS

Ajit K. Bhattacharya, Hopewell Junction, N.Y.; Michael S. Bolmer, Collegeville, Pa., and Guillermo Prada-Silva, Wappinger Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,575
Int. Cl.[4] C07C 27/06
U.S. Cl. 518—714 6 Claims

1. In a method for preparing lower aliphatic alcohols which comprises reacting carbon monoxide and hydrogen in the presence of a zeolite-containing heavy metal oxide catalyst under carbon monoxide-hydrogenation conditions, said catalyst comprising:

(a) a zeolite support consisting of a member selected from the group consisting of Y zeolite, X zeolite, aluminophosphate, ZSM-5, ZSM-11, silicalite, zeolite A and mordenite;

(b) at least one heavy metal oxide selected from the group consisting of molybdenum oxide, tungsten oxide and rhenium oxide;

(c) optionally a heavy metal oxide from the group of elements consisting of cobalt oxide, iron oxide and nickel oxide; and

(d) a promoter comprising an alkali or alkaline earth element in free or combined form;

the improvement which comprises improving the selectivity to said alcohols by treating said zeolite support with a nitrogen-containing base selected from the group consisting of urea, dimetholurea, cyanuric acid, melamine, melan, melem and melon.

4,822,826

COMPOSITE MATERIAL AND METHOD OF MANUFACTURING SAME

Jean-Claude Pommier, Gradignan, and Joel Poustis, Pessac, both of France, assignors to La Cellulose Du Pin, Bordeaux, France

Filed Sep. 4, 1987, Ser. No. 94,134
Claims priority, application France, Sep. 4, 1986, 86 12414
Int. Cl.[4] C08L 98/02
U.S. Cl. 521—84.1 18 Claims

1. A method of manufacturing a composite material comprising treating a reinforcement material comprised of discontinuous cellulosic fibers to lower the water content thereof to about 0%, placing said treated reinforcement material in a mold with a thermoplastic resin system, and exposing said mold to conditions of temperature and pressure such that said resin is cured.

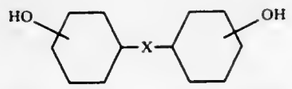
4,822,827

THERMOPLASTIC POLYURETHANES WITH HIGH GLASS TRANSITION TEMPERATURES

Henry W. Boak, Wallingford; Augustin T. Chen, and Benjamin S. Ehrlich, both of Cheshire, all of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1987, Ser. No. 134,262
Int. Cl.[4] C08G 18/28
U.S. Cl. 521—170 25 Claims

1. In a polyurethane plastic prepared from (i) an organic polyisocyanate, (ii) at least one chain extender, and (iii) 0 to about 25 parts by weight per 100 parts of total polyurethane reactants of a polyol having a functionality of at least 2 and a molecular weight of at least 500, the improvement which comprises employing as said extender (ii) a combination comprising (a) at least one cycloalkane diol selected from the group consisting of diols obtained by replacing two nuclear hydrogen atoms of a cycloalkane having from 4–12 cycloaliphatic carbon atoms by —OH groups and diols having the formula



wherein X is selected from the group consisting of a direct bond —SO_2—, —CO—, —O—, and lower-alkylene and (b) at least one other extender.

4,822,828

RADIATION CURABLE COATING COMPOSITION BASED ON A SILICA/VINYL-FUNCTIONAL SILANOL DISPERSION

Howard W. Swofford, Taylors, S.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 23, 1987, Ser. No. 123,847
Int. Cl.[4] C08K 3/36
U.S. Cl. 522—84 8 Claims

1. A radiation curable composition comprising:

(a) from 50 to 85 percent, based on the total weight of the composition, of colloidal silica and the partial condensate of a silane, such that at least sixty percent of the silane is a vinyl-functional silane conforming to the formula

$$(R)_a Si(R')_b(R'')_c$$

wherein
R is allyl or vinyl-functional alkyl
R′ is hydrolyzable alkoxy or phenoxy
R″ is non-hydrolyzable, saturated alkyl, phenyl, or siloxy
such that $a+b+c=4$; and
$a \geqq 1$;
$b \geqq 1$;
$c \geqq 0$,

(b) from 15 to 50 percent, based on the total weight of the composition, of one or more multifunctional acrylate or methacrylate monomers.

4,822,829

RADIATION-CURABLE MACROMERS BASED ON (METH)ACRYLATE-FUNCTIONAL POLYESTERS, AND THEIR USE

Hartmut Müller, Troisdorf, and Hans Huber, Lohmar, both of Fed. Rep. of Germany, assignors to Huels Troisdorf Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,527
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3516351
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.[4] C08F 2/54, 20/36, 20/58
U.S. Cl. 522—90 24 Claims

1. Radiation-curable macromers based on (meth)acrylate-functional polyesters, comprising

(a) base polyesters which are hydroxyl polyesters liquid at room temperature having hydroxyl numbers of 10 to 100, acid numbers lower than 5, a glass transition temperature lower than 0° C., and average molecular weight of from 2,000 to 5,000, said polyesters being fluid at 20° C. and having straight-chain alkyl or branched alkyl side chains of 4 to 36 carbon atoms directly bound through ester bonds or ether bonds of at least one of trifunctional or polyfunctional carboxylic acids, triols or polyfunctional polyols and hydroxydicarboxyclic acids along the main chain of the polyesters, the molar ratio of ester segments of the main chain to the alkyl side chains ranging from 1:0.2 to 1:2.0, and in which 10 to 90% of the hydroxyl groups of said polyesters have been reacted with

(b) acrylate compounds or methacrylate compounds having

additional reactive groups capable of reacting with the hydroxyl groups of said polyesters.

4,822,830

ORGANOPOLYSILOXANE ELASTOMERS HAVING IMPROVED ELECTRICAL PROPERTIES AND INSULATORS COATED THEREWITH

James R. Adkins, Adrian, Mich., assignor to Wacker Silicones Corporation, Adrian, Mich.

Filed Nov. 9, 1987, Ser. No. 118,125
Int. Cl.[4] C08K 9/06; C08L 83/08
U.S. Cl. 523—203 16 Claims

1. A room temperature vulcanizable composition which is stable in the absence of moisture, but when exposed to atmospheric moisture crosslinks to form an elastomer having improved electrical properties comprising an organopolysiloxane having terminal reactive groups selected from the group consisting of alkoxy, aryloxy and hydroxyl groups, an amino-substituted organosilicon crosslinking agent capable of reacting with the organopolysiloxane terminal reactive groups in the presence of moisture and having an average of at least two —NR_2^1 groups per molecule linked to silicon in an amount of at least one gram equivalent silicon atom of the amine-substituted organosilicon compound per gram equivalent of reactive groups on the organopolysiloxane, where R^1 is selected from the group consisting of a monovalent hydrocarbon radical having up to 18 carbon atoms and hydrogen, and an alumina trihydrate which has been treated with an organosilicon compound to impart hydrophobic properties thereto, in which the treated alumina trihydrate is present in the composition in an amount of from 40 to 75 percent by weight based on the weight of the organopolysiloxane and the alumina trihydrate.

4,822,831

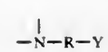
AQUEOUS DISPERSION TYPE RESIN COMPOSITION AND AN AQUEOUS COATING COMPOSITION CONTAINING THE SAME

Teruaki Kuwajima, Osaka; Hiroshi Miwa, Hyogo, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Sep. 11, 1986, Ser. No. 906,014
Int. Cl.[4] C08K 3/20
U.S. Cl. 523—421 2 Claims

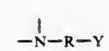
1. An aqueous coating composition comprising as a resinous vehicle

(1) an aqueous dispersion resin composition obtained by polymerizing at least one α, β-ethylenically unsaturated monomer in an aqueous medium in the presence of a water soluble resin having an amphonic group of the formula:



in which R is a substituted or unsubstituted C_1 to C_6 alkylene or phenylene group and Y is —COOH or —SO_3H, said resin selected from the group consisting of an alkyd resin, a polyester resin, an acryl modified alkyd resin, an acryl modifed polyester resin, a modified epoxy resin, an acrylic resin, a melamine resin and a polyether resin, and a water insoluble organic initiator, the weight ratio of said water solouble resin in solid form to said monomer being 10:90 to 90:10, and

(2) an acrylic water soluble resin having no amphionic group of the formula:



in which R and Y are as defined above.

4,822,832

THERMOSETTING EPOXY RESIN COMPOSITIONS AND THERMOSETS THEREFROM

Sung G. Chu; Harold Jabloner, and Brian J. Swetlin, all of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 724,133, Apr. 16, 1985, Pat. No. 4,656,208, which is a continuation-in-part of Ser. No. 702,518, Feb. 19, 1985. This application Apr. 7, 1987, Ser. No. 35,525
Int. Cl.[4] C08L 63/00; C08G 59/50; C08K 3/04
U.S. Cl. 523—423 5 Claims

1. A method of making damage tolerant thermoset composites that comprise a crosslinked epoxy resin matrix and high strength filaments and retain substantial compressive strength after impact, said method comprising (a) combining said high strength filaments and an epoxy resin composition that separates into crosslinked glassy phases upon cure thereof, said epoxy resin composition comprising a crosslinkable oligomer that has a number average molecular weight between about 2,000 and about 10,000 and a glass transition temperature between about 125° C. and 250° C. and (b) curing of said epoxy resin in the presence of said filaments.

4,822,833

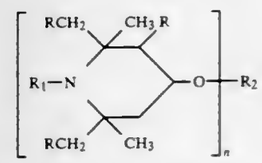
STABILIZED RIGID POLYVINYL CHLORIDE COMPOSITIONS

Jean M. Zappia, Yonkers, N.Y., and Gerald A. Capocci, Greenwich, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 80,143, Jul. 29, 1987, abandoned, which is a continuation of Ser. No. 837,984, Mar. 10, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 153,529
Int. Cl.[4] C08K 5/34, 3/22, 5/09, 5/58
U.S. Cl. 524—99 16 Claims

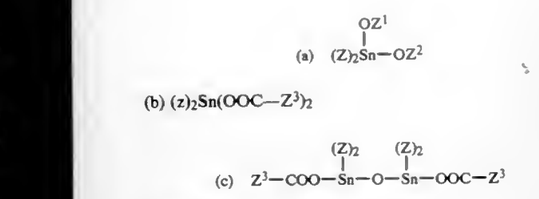
1. A rigid polyvinyl chloride composition comprising in addition to said polyvinyl chloride, (1) an effective stabilizing amount of a 2,2,6,6-tetraalkylpiperidine compound which corresponds to the formula

(II)



in which n is a number from 1–4 inclusive; R is hydrogen or methyl; R_1 is hydrogen, oxyl, C_1–C_{13} alkyl, C_3–C_8 alkenyl, C_3–C_8 alkynyl, C_7–C_{12} aralkyl, C_1–C_8 alkanoyl, C_3–C_5 alkenoyl, glycidyl, a group —$CH_2CH(OH)$—Z_1 wherein Z_1 is hydrogen, phenyl, C_1–C_{12} alkyl, allyl, benzyl, acetyl or acryloyl; and R_2 when n is 1 is hydrogen, C_1–C_{18} alkyl optionally interrupted by one or more oxygen atoms, cyanoethyl, benzyl, glycidyl, a monovalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic carboxylic acid, or of carbamic acid or of a phosphorus-containing acid, or a monovalent silyl radical, R_2 when n is 2 is C_1–C_{12} alkylene, C_4–C_{12} alkenylene, xylylene, a bivalent radical of an aliphatic, cycloaliphatic, araliphatic or aromatic dicarboxylic acid, of dicarbamic acid or of a phosphorus-containing acid, or a bivalent silyl radical; R_2 when n is 3 is a trivalent radical of an aliphatic, cycloaliphatic or aromatic tricarboxylic acid, of an aromatic tricarbamic acid or of a phosphorus-containing acid, or a trivalent silyl radical; and R_2 when n is 4 is a tetravalent radical of an aliphatic, cycloaliphatic or aromatic tetracarboxylic acid; and (2) an effective thermal stabilizing amount of at least one organotin carboxylate of the formulae

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(a) $(Z)_2Sn(OZ^1)-OZ^2$

(b) $(z)_2Sn(OOC-Z^3)_2$

(c) $Z^3-COO-Sn(Z)_2-O-Sn(Z)_2-OOC-Z^3$

(d) $(Z)_mSn(OOCCH=CHCOOZ^4)_{4-m}$

wherein

Z and Z^4 independently are C_1–C_{20} alkyl, cycloalkyl, aryl, alkaryl or aralkyl;

Z^1 is C_{10}–C_{30} alkyl or phenyl substituted by one or two C_8–C_{12} alkyl;

Z^2 is Z^1 or $-Sn(OZ^1)(Z)_2$;

Z^3 is C_1–C_{30} alkyl, cycloalkyl, aryl, alkaryl or aralkyl; and

m is an integer from 1 to 3.

4,822,834

VIBRATION DAMPING COMPOSITION SUITABLE FOR OUTER SPACE TEMPERATURE VARIATIONS

Creed E. Blevins, Orange, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1988, Ser. No. 183,200
Int. Cl.[4] C08K *3/04, 3/10;* **C08L** *9/02*
U.S. Cl. 524—427 **20 Claims**

1. A viscoelastic constrained layer vibration damping composition having a shear storage modulus of 500±100 psi consisting essentially of: 50 to 150 parts by weight of a first elastomer having a glass transitional point temperature of −50 degrees F.±15 degrees, 50 to 150 parts by weight of a second elastomer having a glass transitional point temperature of 60 degrees F.±15 degrees, 25 to 75 parts by weight of a thermoplastic polymer having a glass transitional point temperature of 130 degrees F.±15 degrees, 20 to 70 parts by weight of a plasticizer, and 25 to 75 parts by weight of a powdered filler.

4,822,835

ADHESIVE SYSTEM

Donald S. Close, Stow, Ohio, assignor to Syn-Coat Enterprises, Inc., Stow, Ohio

Filed May 31, 1988, Ser. No. 200,511
Int. Cl.[4] C08G *18/00*
U.S. Cl. 524—114 **7 Claims**

1. An adhesive composition comprising in combination:

a polyurethane polymer;

at least one amino silane coupling compound which includes at least one amino group as a part thereof;

at least one epoxy silane coupling compound which includes at least one epoxy group as part thereof, and

an organic solvent for such compounds and polymers.

4,822,836

POLYPHENYLENE ETHER/POLYAMIDE BLENDS HAVING IMPROVED MELT FLOW CHARACTERISTICS

Ronald J. Wroczynski, Schenectady, N.Y., assignor to General Electric Company, Albany, N.Y.

Filed Sep. 18, 1987, Ser. No. 98,579
Int. Cl.[4] C08K *5/51, 5/37, 5/54, 5/09*
U.S. Cl. 524—139 **13 Claims**

1. A compatibilized polyphenylene ether-polyamide composition having improved melt flow characteristics, comprising:

(a) a polyphenylene ether resin,

(b) a polyamide resin,

(c) a compatibilizer compound for a) and b), and

(d) a melt flow improving amount of a compound selected from the group consisting of straight chain fatty acids and organic carboxylic acids of the formula

R-CO(R)

wherein R is a monovalent alkyl or aralkyl radical having about 4 to 32 carbon atoms and R′ is —OH or halogen, and acid anhydride derivatives thereof, wherein the compatibilizer is selected from the group consisting of:

(A) a saturated aliphatic polycarboxylic acid or derivative thereof;

(B) a silane compound comprising at least one silicon atom bonded to a carbon atom via an oxygen bridge and at least one ethylene carbon-to-carbon double bond or a carbon-to-carbon triple bond and/or an amine or mercapto functional group which is not bonded directly to the silicon atom;

(C) a functionalized polyphenylene ether;

(D) an oxidized polyolefin wax, optionally in combination with an organic phosphite;

(E) a copolymer comprising units of a vinyl aromatic compound and an alpha-beta unsaturated dicarboxylic acid or dicarboxylic acid anhydride, or a copolymer with units of a vinyl aromatic compound of an imide compound of an alpha-beta unsaturated dicarboxylic acid; and

(F) the reaction product of (a) a 1,2-substituted olefinic compound with a carboxyl group or acid anhydride group, (b) a polyphenylene ether, and (c) a radical initiator.

4,822,837

POLYMER MIXTURE COMPRISING A POLYPHENYLENE ETHER AND A POLYAMIDE

Roelof van der Meer, Bergen op Zoom, Netherlands, assignor to General Electric Company, Albany, N.Y.

Division of Ser. No. 739,401, May 30, 1985, Pat. No. 4,659,760.
This application Oct. 6, 1986, Ser. No. 916,347
Int. Cl.[4] C08K *5/51, 5/52, 91/06*
U.S. Cl. 524—153 **8 Claims**

1. A polymer mixture comprising the following constituents:

(a) 1 to 99% by weight of a polyphenylene ether,

(b) 99 to 1% by weight of a polyamide, and

(c) 0.01 to 10% by weight based upon the weight of (a) and (b) together of an oxidized polyolefin wax.

4,822,838

CURABLE CHLORINATED POLYETHYLENE AND COPOLYETHYLENE COMPOSITION

Junichi Watanabe, Nishonomiya; Kozo Misumi, Sennan; Masanobu Miyaguchi, Kobe; Seiji Kadomatsu, Toyonaka, and Sei Nakazawa, Minoo, all of Japan, assignors to Osaka Soda Co., Ltd., Hyogo, Japan

Filed Jul. 31, 1987, Ser. No. 80,071
Claims priority, application Japan, Nov. 18, 1986, 61-275900
Int. Cl.[4] C08L *63/00, 33/08, 23/28*
U.S. Cl. 524—178 **16 Claims**

1. A curable chlorinated polyethylene and copolyethylene composition comprising

(A) 5 to 95% by weight, based on the total weight of (A) and (B), of a chlorinated polyethylene having a chlorine content of about 20 to about 50% by weight and derived from polyethylene having a melt index of 0.01 to 100,

(B) 95 to 5% by weight, based on the total weight of (A) and (B), of a chlorinated copolymer of ethylene and a C_1–C_5 alkyl acrylate or methacrylate, said copolymer having a chlorine content of about 2 to about 45% by weight and a melt index of 0.1 to 100,

(C) 0 to 30 parts by weight, per 100 parts by weight of (A) and (B) combined, of an epichlorohydrin polymer or copolymer at least 40 mole% of which is derived from the epichlorohydrin, said polymer or copolymer having a specific reduced viscosity of 0.1 to 10 dl/g,

(D) 0.1 to 5 parts by weight, per 100 parts by weight of (A), (B) and (C) combined, of a mercaptotriazine compound as a crosslinking agent,

(E) 0.5 to 3 moles, per mole of (D), of a basic amine compound as a crosslinking accelerator, and

(F) 0.5 to 30 parts by weight, per 100 parts by weight of (A), (B) and (C) combined, of a metal compound as an acid acceptor.

4,822,839

POLYUNSATURATED HYDROCARBON POLYMER-COMPATIBLE ANTIOXIDANT COMPOSITIONS

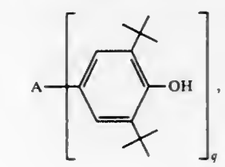
Martin J. Paisner, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 25, 1987, Ser. No. 125,104
Int. Cl.[4] C08K *5/36, 5/18*
U.S. Cl. 524—239 **8 Claims**

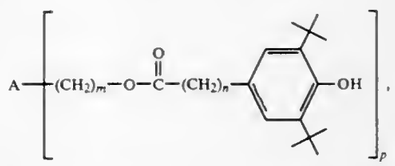
1. A ring-opening metathesis catalyst polymerizable composition comprising dicyclopentadiene and a polyunsaturated hydrocarbon polymer-compatible mixture comprising:

(a) at least one sterically bindered phenolic compound having one of the following general formulas:

1



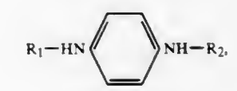
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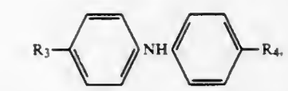
where A represents S or a mono or polyvalent organic radical selected from a straight-chain or branched C_1 to C_{20}-saturated aliphatic group, a straight-chain or branched C_2 to C_{20}-unsaturated aliphatic group, an aryl group, a C_7 to C_{20}-aralkyl group, or a C_7 to C_{20}-aralkenyl group; and m represents a positive integer from 0–20, and n represents a positive integer from 1–20, and p and q each represent a positive integer from 1–4; and

(b) at least one aryl amine compound having one of the following general formulas:

3

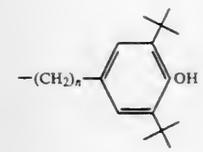


4

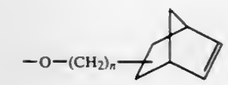


where R_1–R_4 can be the same or different and can be hydrogen atoms, or straight-chain or branched C_1 to C_{20}-alkyl groups, straight-chain or branched C_2 to C_{20}-alkylene groups, aryl groups, C_7 to C_{20}-aralkyl groups or a C_7 to C_{20}-aralkenyl groups, or radicals having one of the following formulas:

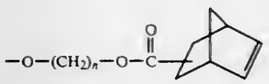
5



6



7



in which n represents a positive integer from 1–20, wherein the sterically hindered phenolic compound and aryl amine compound are present in a molar ratio ranging from about 0.1 to about 10 and the polyunsaturated hydrocarbon polymer-compatible mixture is present in an amount ranging from about 0.25 to about 4 parts per 100 parts by weight dicyclopentadiene.

4,822,840

LOW-CRYSTALLINE PROPYLENE RANDOM COPOLYMER COMPOSITION, PROCESS FOR PRODUCTION THEREOF, AND POLYPROPYLENE COMPOSITE LAMINATED STRUCTURE

Mamoru Kioka; Masahiro Sugi; Akinori Toyota, and Norio Kashiwa, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 106,585
Claims priority, application Japan, Oct. 9, 1986, 61-239340; Oct. 9, 1986, 61-239341; Jul. 15, 1987, 62-174833
Int. Cl.[4] C08L *23/16, 53/00;* **C08F** *255/04*
U.S. Cl. 525—240 **3 Claims**

1. A low-crystalline propylene random copolymer composition comprising

[I] 60 to 95% by weight of a propylene random copolymer characterized by

(A) being composed of 97 to 86 mole % of recurring units (a) derived from propylene, 0.5 to 6 mole % of recurring units (b) derived from ethylene and 2 to 13 mole % of recurring units (c) derived from an alpha-olefin having 4 to 20 carbon atoms, the mole ratio of c/(b+c) being from 0.3 to 0.9,

(B) having an intrinsic viscosity [η], measured in decalin at 135° C., of from 0.5 to 6 dl/g,

(C) having a melting point [Tm], measured by a differential scanning calorimeter, of from 115° to 145° C., and

(D) having a crystallinity, measured by X-ray diffractometry, of from 30 to 60%, and

[II] 5 to 40% by weight of a low-crystalline propylene random copolymer composed of 10 to 90 mole % of recurring units (d) derived from propylene and 10 to 90 mole % of recurring units (e) derived from an alpha-olefin having 4 to 20 carbon atoms,

said composition having

(i) 75 to 96 mole % of recurring units (f) derived from propylene, 0.3 to 5 mole % of recurring units (g) derived from ethylene and 4 to 20 mole % of recurring units (h) derived from an alpha-olefin containing 4 to 20 carbon atoms,

(ii) an intrinsic viscosity [η], measured in decalin at 135° C., of from 0.5 to 6 dl/g,

(iii) a crystallinity, measured by X-ray diffractometry, of from 25 to 60%,

(iv) a p-xylene-soluble content at 25° C. of not more than 30% by weight, and
(v) an n-hexane-extracted content at 50° C. of not more than 10% by weight.

4,822,841

STRONG AND ELASTIC POLYURETHANE, POLYUREA, POLYARYLATES AND ELECTRON BEAM-CURED COATINGS CONTAINING THE SAME

Kevin P. Murray; Robert E. Ansel, both of Hoffman Estates, and Steven R. Schmid, Buffalo Grove, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 6, 1987, Ser. No. 104,966
Int. Cl.[4] C08G *18/08, 18/16;* **C08F** *283/04;* **C08L** *75/02*
U.S. Cl. 524—356 **18 Claims**

1. An essentially isocyanate-free radiation-curable polyurethane, polyurea, polyethylenic oligomer comprising the reaction product of:
(1) organic diisocyanate;
(2) a stoichiometric deficiency, based on said diisocyanate, of difunctional materials reactive with isocyanate functionality; and consisting essentially of:
(A) a diol component having a molecular weight of from 200 to 2000 and selected from polycarbonate diol and polyoxyalkylene glycol in which the alkylene group contains from 2–4 carbon atoms;
(B) dihydric bisphenol-based alkylene oxide adduct in which the alkylene group contains from 2–4 carbon atoms and containing from 2–6 alkylene groups per molecule; and
(C) a diprimary diamine component having a molecular weight of from about 60 to 800 and selected from alkylene diamine and polyoxyalkylene diamine in which the alkylene groups contain from 2–4 carbon atoms;
said components (A) and (B) being present in a mole ratio of from 1:1.5 to 1:5 and said component (C) being present in an amount of from 5 equivalent percent to 20 equivalent percent of the total equivalents of component (2), the polyurethane polyurea of components (1) and (2) being capped by
(3) monohydric ethylenically unsaturated compound;
and the proportion of said monohydric ethylenically unsaturated compound providing a polyethylenically unsaturated oligomer having a molecular weight in the range of about 5,000 to about 30,000.

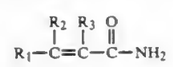
4,822,842

DELAYING THE GELATION OF WATER SOLUBLE POLYMERS

Naim A. Mumallah, and Ahmad Moradi-Araghi, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

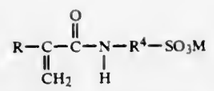
Filed Feb. 3, 1987, Ser. No. 10,507
Int. Cl.[4] C08K *5/13*
U.S. Cl. 524—346 **10 Claims**

1. A gelable composition comprising:
from 0.1–5 wt % of a water soluble polymer wherein said water soluble polymer contains from 100 mole % to 5 mole % of a monomer selected from those monomers represented by the following formula



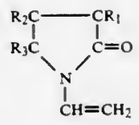
I

wherein R_1, R_2, and R_3 are independently selected from the group consisting of hydrogen or alkyl groups containing from 1 to 3 carbon atoms and from 0–95 mole % of a monomer selected from the group consisting of
(A) those monomers which can be represented by the following formula



II

wherein R is selected from the group consisting of hydrogen or alkyl radicals containing from 1 to 6 carbon atoms, R^4 is selected from the group consisting of alkylene radicals containing from 1 to 6 carbon atoms or an arylene radical containing from 6 to 10 carbon atoms, and M is selected from the group consisting of hydrogen, ammonium, potassium, or sodium, or
(B) a monomer represented by the following formula,



III

where R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen or alkyl radicals containing from 1 to 2 carbon atoms; or
(C) a monomer selected from the group consisting of acrylic acid, methacrylic acid, vinylsulfonic acid, vinylbenzylsulfonic acid, vinyl acetate, acrylonitrile, methyl acrylonitrile, vinyl alkyl ether, vinyl chloride, maleic anhydride, vinyl substituted cationic quaternary ammonium compounds, (acryloyloxyethyl)diethylmethylammonium methyl sulfate, sodium acrylate; or
(D) mixtures thereof; from 0.03–1.2 wt % of a water dispersible aldehyde; from 0.01–2 wt % of a phenolic compound; from 92–99.9 wt % water; and from 0.004—about 0.049 wt % of a metal ion selected from the group consisting of Fe^{3+}, Fe^{2+}, Cu^{2+}, Co^{3+}, Ni^{2+}, Sn^{4+}, Ti^{4+}, Zn^{4+}, V^{3+}, and Zr^{4+}.

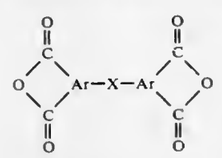
4,822,843

POLYSILOXANE-MODIFIED POLYIMIDESULFONE OR POLYIMIDEKETONE MOLDING COMPOSITION

Robert Edelman, Staten Island, N.Y., and Lincoln Ying, Bridgewater, N.J., assignors to M&T Chemicals Inc., Rahway, N.J.

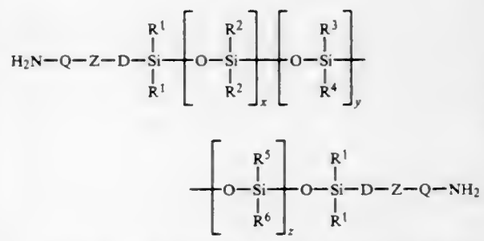
Continuation-in-part of Ser. No. 54,352, May 26, 1987, abandoned. This application Feb. 25, 1988, Ser. No. 160,456
Int. Cl.[4] C08K *3/40*
U.S. Cl. 524—494 **23 Claims**

1. A thermoplastic molding composition for fabricating articles having good solvent resistance, physical and mechanical properties at high temperatures comprising an amorphous, normally solid polysiloxane-modified polyimidesulfone or polyimideketone containing repeating imidization radical residua of:
(1) a dianhydride having the generic formula:

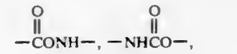


wherein
X is at least one of >C=O, —O—, $—SO_2—$ or a valence bond; and
Ar is an arylene group having 6 to about 10 carbon atoms;
(2) a diaminodiaryl compound having the generic formula:
$H_2N—Ar—Y—Ar—NH_2$

wherein Ar is as defined above and Y is >C=O or $—SO_2—$; and
(3) a diaminopolysiloxane having the generic formula:



wherein Q is a substituted or unsubstituted aromatic group,
Z is —O—, —S—, —SO—, $—SO_2—$, $—SO_2NH—$, —NH-$SO_2—$,



—C(O)O— or —OC(O)—,
D is a substituted or unsubstituted hydrocarbylene,
R^1, R^2, R^3, R^4, R^5 and R^6 are each substituted or unsubstituted hydrocarbyl and
x, y and z each have a value from 0 to 100; with the following provisos:
(A) the mole ratio of the dianhydride (1) to the total diamine present, the groups conferred by (2) and (3), is about 1:1, and
(B) the amount of diaminopolysiloxane (3) present is about 1 to 20 mole % of the total diamine present.

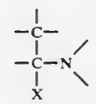
4,822,844

RUBBER COMPOSITIONS

Kinya Kawakami, Kanagawa, and Takao Muraki, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,978
Int. Cl.[4] C08K *3/04;* **C08L** *7/00, 9/00, 9/06*
U.S. Cl. 524—496 **4 Claims**

1. A rubber composition comprising:
(a) a starting rubber comprising from 20 to 80 parts by weight of at least one rubber selected from the group consisting of natural rubber and synthetic polyisoprene rubber, and from 80 to 20 parts by weight of styrene-butadiene rubber having a styrene content of 10 to 30 percent by weight and a 1,2-vinyl bond content of from 10 to 80 percent by weight, said styrene-butadiene rubber containing either in the molecular chain or at the terminal end thereof at least one atomic group of the formula



wherein X is OH or SH, the total amount of said starting rubber being 100 parts by weight; and
(b) from 30 to 80 parts by weight of carbon black per 100 parts of starting rubber, said carbon black having an iodine adsorption of from 60 to 70 mg/g, a specific surface area ratio of nitrogen adsorption to iodine adsorption of from 1.18 to 1.40 and a median width of Stokes' particle size distribution of from 70 to 130 millimicrons.

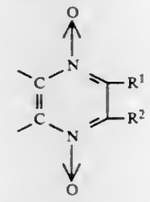
4,822,845

RUBBER COMPOSITIONS MODIFIED WITH HETEROCYCLIC DI-N-OXIDES

Daniel F. Graves, Clinton, Ohio, and Hans-Wilhelm Engels, Kerpen, Fed. Rep. of Germany, assignors to The Firestone Tire & Rubber & Company, Akron, Ohio

Filed Apr. 13, 1987, Ser. No. 37,486
Int. Cl.[4] C08K *3/04, 5/34;* **C08C** *4/00*
U.S. Cl. 524—519 **29 Claims**

1. A process for preparing filled vulcanizates which comprises
(A) mixing at a temperature of at least about 140° C., at least one rubber having an unsaturated carbon chain, at least one carbon black and a minor property-improving amount of at least one aromatic heterocyclic di-N-oxide compound of the partial formula



(I)

wherein the depicted carbon atoms are part of an optionally substituted aromatic ring, and R^1 and R^2 are each independently hydrogen, hydrocarbyl, halohydrocarbyl, hydrocarbyloxy, hydrocarbyl sulfonyl, hydrocarbyl thio, hydrocarbylsulfoxidyl, halogen, amino,

—CN

—OH

—CHO

—CH(O hydrocarbyl)$_2$

$—C(O)R^3$

$—C(O)OR^3$

$—C(N—OH)R^3$

$—C(O)NR^3R^6$

$—CH=N—NH—C(O)OR^3$

$—CH_2OC(O)CH_3$

$—R^4YR^3$

$—C(O)NHR^4OH$

$—C(NH)NR^7R^8$,

or

$—C(I)NHN(R^3)_2$

wherein each R^3 is independently hydrogen or a hydrocarbyl group, R^4 is a divalent hydrocarbyl group, R^6 is hydrogen, hydrocarbyl, $—R^4OR^3$, or $—R^4COOR^3$; R^7 is hydrogen or a hydrocarbyl group; R^8 is hydrogen or a hydrocarbyl, an amino, or a hydroxyl group; R^7 and R^8 may be hydrocarbyl groups joined together to form a ring including the nitrogen atom, and Y is O, divalent S, —NH—, —S(O)—or $—S(O)_2$ or R^1 and R^2 may be joined together to form a ring including the nitrogen atom, and Y is O or divalent S, or R^1 and R^2 may be joined together to form further ring systems which may be saturated or unsaturated, and further substituted or unsubstituted, and

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(B) vulcanizing said mixture with a conventional vulcanizing agent which is not a di-N-oxide compound.

4,822,846

MOLDING POLYAMIDE RESIN COMPOSITION

Isao Nomura; Kenichi Narita, both of Hiratsuka, and Masashi Kurokawa, Hadano, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 1, 1987, Ser. No. 127,505

Claims priority, application Japan, Dec. 1, 1986, 61-284430; Dec. 1, 1986, 61-284431

Int. Cl.⁴ C08L *77/00*

U.S. Cl. 524—538 **3 Claims**

1. A molding polyamide resin compostion comprising 100 parts by weight of (A) a poly(m-xylylenesebacamide) resin, and 1 to 20 parts by weight of (B) a crystalline polyamide selected from the group consisting of polyamide 610 and polyamide 612.

4,822,847

METHOD OF INCREASING VISCOSITY OF AN AQUEOUS SOLUTION WITH A SULFO BETAINE POLYMER

Donald N. Schulz, Annandale, and Jeffrey J. Kaladas, S. Bound Brook, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 822,841, Jan. 27, 1986, Pat. No. 4,708,998. This application Jul. 1, 1987, Ser. No. 68,450

Int. Cl.⁴ C08L *41/00*

U.S. Cl. 524—547 **1 Claim**

1. A method for increasing the viscosity of an aqueous solution which comprises the step of dissolving in said aqueous solution a water soluble polymer selected from the group consisting of N-(4-sulfoalkyl)N-methyl diallyl ammonium betaine and N-vinyl-pyrrolidone, N-(4-sulfoalkyl)N-methyl diallyl ammonium betaine and acrylamide and poly-N-(4-sulfoalkyl)N-methyldiallyl amine ammonium betaine.

4,822,848

HYDROPHILIC-HYDROPHOBIC THERMALLY REVERSIBLE TYPE POLYMER AND METHOD FOR PRODUCTION THEREOF

Shoji Ito; Kensaku Mizoguchi, both of Ibaraki, and Yoshio Suda, Hachioji, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Division of Ser. No. 943,703, Dec. 19, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 144,649

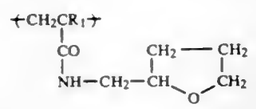
Claims priority, application Japan, Dec. 23, 1985, 60-290100

Int. Cl.⁴ C08L *41/00, 43/00*

U.S. Cl. 524—549 **5 Claims**

1. A hydrophilic-hydrophobic thermally reversible composition comprising:

a polymer consisting of repeating units represented by the formula:



wherein R_1 represents one member selected from the group consisting of a hydrogen atom and a methyl group, and possessing an intrinsic viscosity η in the range of 0.01 to 6.0 as measured in a methanol solution at 30° C., and

water,

said polymer being soluble in water at temperatures below a transition temperature wherein a transparent aqueous solution of the polymer is produced,

said polymer being insoluble in water at temperature above said transition temperature wherein an opaque, aqueous composition of the polymer is produced.

4,822,849

LOW SHRINK HYBRID RESINS

Douglas G. Vanderlaan, Jacksonville, Fla., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Aug. 3, 1987, Ser. No. 80,776

Int. Cl.⁴ C08G *67/06*

U.S. Cl. 525—17 **16 Claims**

1. An hydroxyl functional unsaturated polyester resin composition for use in a molding composition consisting essentially of:

(A) at least 70 parts by weight by an alpha, betaethylenically unsaturated polyester having an acid number of less than 40 and an hydroxyl number of about 20 to 300, and a molecular weight of about 300 to 20,000, consisting essentially of the reaction product of:

(a) at least one alpha,beta-ethylenically unsaturated dicarboxylic acid, anhydride, or derivative thereof;

(b) at least one other non-alpha,betaethylenically unsaturated dicarboxylic acid, polycaboxylic acid, anhydride, diester or corresponding derivative thereof;

(c) at least one polyol;

(B) not more than 30 parts by weight of an ethylenically unsaturated monomer polymerizable with (A);

(C) a polyisocyanate in an amount such that the molar ratio of hydroxyl groups to isocyanate varies from about 0.5 to 2.0;

(D) a radical initiator; and

wherein the amount of the alpha, beta-ethylenically unsaturated carboxylic acid component of said composition varies from at least about 20 to about 35 mole % of the total dicarboxylic acid residue of said composition; and wherein said composition has shrinkage upon molding of less than 1%, and a Barcol hardness of about 15 to 21.

4,822,850

MODIFIED POLYORGANOSILOXANE CONTAINING ISOCYANATE GROUP AND PROCESS FOR PREPARING THE SAME

Hirofumi Yashuda; Takahiro Saho; Nobumasa Obtake, and Takaharu Nakano, all of Yokohama, Japan, assignors to Chisso Corporation, Japan

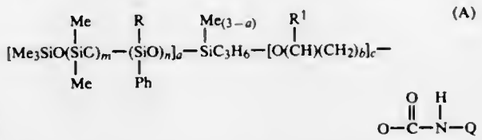
Filed Dec. 21, 1987, Ser. No. 136,132

Claims priority, application Japan, Dec. 24, 1986, 61-309773

Int. Cl.⁴ C08G *77/04*

U.S. Cl. 528—28 **18 Claims**

1. A modified polyorganosiloxane containing an isocyanate group which is represented by the general formula (A)



(A)

wherein Me is a methyl group, Ph is a phenyl group, R is a methyl or phenyl group, R^1 is H or a methyl group, each of m and n is 0 or more and a value of m+n is within the range of 0 to 600, a is 1, 2 or 3, b is 1, 2 or 3, c is a value of 1 to 300, and Q is a residue having at least one isocyanate group derived from a compound having at least two isocyanate groups.

4,822,851

PROCESS FOR THE PREPARATION OF CATIONIZED POLYVINYL ALCOHOL

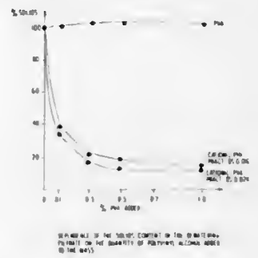
Reinhard Stober, Hasselroth; Ellen Kohn, Karlsdorf-Neuthard, and Dietmar Bischoff, Alzenau-Michelbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 29, 1986, Ser. No. 947,179

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626662

Int. Cl.⁴ C08F *8/00*

U.S. Cl. 525—61 **14 Claims**



1. A process for the direct preparation of cationized polyvinyl alcohol (PVA) without intermediate steps comprising reacting an alkylidene epoxide with PVA in particulate, free-flowing form in alkaline medium in the presence of water, said water being present in the amount of 11 to 30 weight %, based on the total amount of the reaction mixture, and 1 to 4 weight % of an alkaline compound selected from the group consisting of a alkali metal hydroxide, alkaline earth metal hydroxide and an alkaline earth metal oxide, based on the quantity of PVA.

4,822,852

HIGH-IMPACT DIMENSIONALLY STABLE POLYAMIDE MOLDING COMPOSITIONS

Dieter Wittmann, Krefeld; Uwe Westeppe, Remscheid; Karsten-Josef Idel, Krefeld; Christian Lindner, Cologne; Josef Merten, Korschenbroich, and Harald Selbeck, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Akteingesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 112,532

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637677

Int. Cl.⁴ C08L *51/00*

U.S. Cl. 525—66 **20 Claims**

1. A thermoplastic molding composition which comprises:

(A) at least 35%, by weight of

(1) partially crystalline thermoplastic (co)polyamide containing from 0.1 to 40%, by weight, of polydiorganosiloxane carbonamide units,

(2) (a) a mixture of partially crystalline thermoplastic polyamide and;

(b) an amorphous or a partially crystalline (co)polyamide containing polydiorganosiloxane carbonamide units, other than (a); wherein the mixture of (a) and (b) contains from .1 to 40%, by weight of polydiorganosiloxane carbonamide units, or (3) a mixture of (1) and (2),

(B) from 1 to 65%, by weight, of a graft copolymer obtained by grafting one or more vinyl monomers onto an elastomeric graft base having a glass transition temperature below −20° C., a particulate, cross-linked structure with an average particle diameter of from 0.25–0.8 μm and a gel content of at least 70%, by weight, selected from diene rubber, olefin rubber or acrylate rubber; and

(C) from 0 to 64%, by weight, of an amorphous polyamide, with the proviso that the total of A, B and C must equal 100%, by weight.

4,822,853

AMPHIPHILIC POLYIMIDE PRECURSOR CONTAINING C12-C30 HYDROPHOBIC GROUPS AND LANGMUIR-BLODGETT FILMS THEREFROM

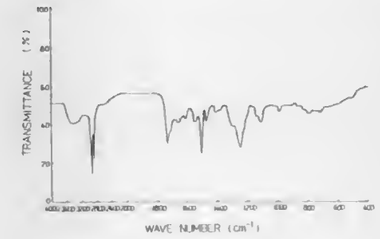
Masakazu Uekita, and Hiroshi Awaji, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1986, Ser. No. 885,666

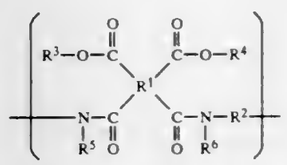
Claims priority, application Japan, Jul. 16, 1985, 60-157354

Int. Cl.⁴ C08G *73/10*

U.S. Cl. 528—125 **20 Claims**



1. A thin film made by the Langmuir-Blodgett technique from a polyamide precursor having at least 70% by mole of the recurring unit of the formula (1):



(1)

wherein R^1 is a tetravalent group having at least 2 carbon atoms, R^2 is a bivalent group having at least 2 carbon atoms, and each of R^3, R^4, R^5 and R^6 is independently a hydrogen atom or a monovalent group having 1 to 30 carbon atoms selected from the group consisting of an aliphatic group, an alicyclic group, an aromatic group, a group in which an aliphatic group is combined with an alicyclic group or an aromatic group, and the above groups substituted by a halogen atom, nitrogen group, amino group, cyano group, methoxy group or acetoxyl group, provided that at least one of R^3, R^4, R^5 and R^6 is a hydrophobic monovalent group having 12 to 30 carbon atoms.

4,822,854

CLEANING COMPOSITIONS CONTAINING A COLORANT STABILIZED AGAINST FADING

Laura A. Ciolino, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Filed Sep. 23, 1987, Ser. No. 99,934

Int. Cl.⁴ C11D *7/00, 7/60*; B66D *3/04*

U.S. Cl. 252—174.19 **40 Claims**

1. A cleaning composition comprising on a weight basis from about 5 to about 50% of a C_1–C_4 alkyl ether of alkylene and polyalkylene gylcols, said glycol ethers having a total of from about 3 to about 12 carbons and introducing impurities into the composition in an amount and of a nature normally chemically incompatible with oxidizable dye chromophores; from about 0.0001 to about 0.1% by weight of a dye including oxidizable dye chromophores; from about 0.00 to about 0.1%

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by weight oxalic acid or an oxalate salt thereof; from about 0.001 to about 5% by weight of a surfactant; the balance being water, said composition having an acidic pH.

4,822,855

THERMOPLASTIC ELASTOMER COMPOSITIONS

Seizo Kobayashi; Katumi Usui; Takashi Mizoe; Noboru Yamaoka, all of Yokohama, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Aug. 4, 1987, Ser. No. 81,464
Claims priority, application Japan, Aug. 5, 1986, 61-182691
Int. Cl.[4] C08L *23/28, 23/16, 23/18*
U.S. Cl. 525—194 **6 Claims**

1. A thermoplastic elastomer composition prepared by partially crosslinking a composition comprising the following components (A), (B) and (C):

(A) 30–70 parts by weight of an ethylene/α-olefin copolymer prepared by copolymerizing ethylene and an α-olefin having 3 to 12 carbon atoms in the presence of a catalyst comprising a solid component and an organoaluminum compound which solid component contains at least magnesium and titanium, said ethylene/α-olefin copolymer having the following properties (I) to (IV):

(I)	Melt index	0.01–100 g/10 min
(II)	Density	0.870–0.905 g/cm^3
(III)	Maximum peak temperature as measured according to a differential scanning calorimetry (DSC)	not lower than 100° C.
(IV)	Insolubles in boiling n-hexane	not less than 10 wt. %

(B) 70–30 parts by weight of a propylene polymer; and

(C) 70–200 parts by weight, based on 100 parts by weight of the components (A) and (B), of an ethylene/α-olefin copolymer rubber.

4,822,856

PREPARATION OF POLYMERIC BLEND STOCK

Eugene R. Moore, and Wen H. Tong, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 18, 1987, Ser. No. 16,022
Int. Cl.[4] C08L *27/06, 37/00, 51/04, 71/04*
U.S. Cl. 525—197 **9 Claims**

1. A process for preparing a polymeric blend stock comprising fluidizing a first particulated polymer or polymer mixture by use of a heated gaseous fluidizing medium contacting the fluidized particulated polymer or polymer mixture with droplets of a latex of a second polymer or polymer mixture, retaining the resulting product in a fluidized state under conditions sufficient to dry the latex, and recovering the resulting dried polymeric blend stock.

4,822,857

METHOD OF GRAFTING SILANE COMPOUNDS TO BLOCK COPOLYMERS

John E. Gorman, Houston, and John A. Morris, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1987, Ser. No. 136,622
Int. Cl.[4] C08F *4/00*
U.S. Cl. 525—245 **7 Claims**

1. A method of making silane-modified block copolymers, comprising the steps of:

melt-kneading a mixture of an alkoxy-silane compound having at least one unsaturated radical, a free radical initiator, and a block copolymer having at least one poly(monoalkenylarene) block and at least one hydrogenated poly(conjugated diene) block; and

including in the mixture an amount of zinc oxide of at least about 0.15%w of the mixture prior to completion of the melt-kneading step.

4,822,858

PROCESS FOR THE PREPARATION OF POLYBUTADIENE GRAFTED WITH STYRENE AND ACRYLONITRILE AND HAVING A VERY LOW END CONTENT OF UNREACTED RESIDUAL MONOMERS

Bruno Pivotto; Gualtiero Ferri, and Franco Campana, all of Ferrara, Italy, assignors to Enichem Tecnoresine S.p.A, Palermo, Italy

Filed May 22, 1986, Ser. No. 866,146
Claims priority, application Italy, May 24, 1985, 20891 A/85
Int. Cl.[4] C08F *279/04, 2/22*
U.S. Cl. 525—246 **9 Claims**

1. An emulsion polymerization process for the preparation of polybutadiene grafted with styrene and acrylonitrile monomers, having a very low end content of unreacted residual monomers, said process comprising conducting the graft copolymerization reaction with a mixture of acrylonitrile and styrene in the presence of a catalyst selected from cumene hydroperoxide, sodium persulfate, potassium persulfate, ammonium persulfate, di-isopropylbenzene hydroperoxide, and tert.butylperoxide, and a catalytic activator selected from dextrose, organic bases, salts and complexes containing iron ions, said acrylonitrile, styrene, catalyst and activator being continuously added to the polybutadiene, and wherein in the latter stages of the reaction but prior to the time when all of the styrene and acrylonitrile monomers have been added, there is added to the reaction an additional aliquot of acrylonitrile in an amount of from 0.1 to 3% by weight, and after the addition of the catalyst and activator is complete, there are added an additional aliquot of polymerization catalyst in an amount of from 0.02 to 0.4% by weight and an additional aliquot of polymerization activator in an amount of from 0.02 to 0.6% by weight, based on the weight of the monomers fed to the reaction.

4,822,859

GROUP TRANSFER POLYMERIZATION AND INITIATORS THEREFOR

Dotsevi Y. Sogah, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 872,610, Jun. 10, 1986, abandoned. This application Jan. 13, 1987, Ser. No. 4,831
Int. Cl.[4] C08F *6/06, 4/16, 6/00*
U.S. Cl. 525—326.7 **34 Claims**

1. A Group Transfer Polymerization process comprising contacting under Group Transfer Polymerizing Conditions at least one polar acrylic or maleimide monomer with (i) a tetracoordinate organosilicon polymerization initiator having at least one initiating site and (ii) a co-catalyst which is a source of bifluoride, fluoride, cyanide or azide ions or a suitable Lewis acid, Lewis base or selected oxyanion, the process further characterized in that the initiator is of the formula $Z^1—Si(Q')_3$, $(Z^1)_2—Si(Q')_2$, $[Z^1(Q'))_2Si]_2O$, or $Z^2—Si(Q')_3$ wherein:

each Q', independently, is selected from R^1, OR^1, SR^1 and $N(R^1)_2$, provided, however, all of the Q' groups are not R^1;

Z^1 is

$$—OC=C—R^2;$$
$$\quad\;\; |\quad\; |$$
$$\quad X^2\;\; R^3$$

Z^2 is —CN or 13 NC;

X^2 is $—OSi(R^1)_3$, $—R^6$, $—OR^6$ or $—NR'R''$;

R^6 is

(a) a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms;

(b) a polymeric hydrocarbyl radical containing at least 20 carbon atoms;

(c) a radical of (a) or (b) containing one or more ether oxygen atoms within aliphatic segments thereof;

(c) a radical of (a), (b) or (c) containing one of more functional substituents that are unreactive under polymerizing conditions; or

(e) a radical of (a), (b), (c) or (d) containing on or moe initiating sites;

each R^1, independently, is a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms or —H, provided that at least R^1 group is not —H;

each of R^2 and R^3 is independently selected from

(a) —H;

(b) a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms;

(c) a polymeric hydrocarbyl radical containing at least 20 carbon atoms;

(d) a radical of (b) or (c) containing one or more ether oxygen atoms with aliphatic segments thereof;

(e) a radical of (b), (c) or (d) containing one or more functional substituents that are unreactive under polymerizing conditions; and

(f) a radical of (b), (c), (d) or (e) containing one or more initiating sites; and

each of R' and R'' is independently selected from C_{1-4} alkyl.

4,822,860

FLUORINE-CONTAINING POLYMERIC AMINE-AMIDE COMPOUND AND A METHOD FOR THE PREPARATION THEREOF

Akira Sekiya, Tsukuba, Japan, assignor to Director General of Agency of Industrial Science & Technology, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,350
Claims priority, application Japan, Jan. 7, 1987, 62-1350
Int. Cl.[4] C08F *26/02*
U.S. Cl. 525—328.2 **4 Claims**

1. A fluorine-containing polymers having recurring units represented by the general formula

$$—CH_2—CH(CH_2—NH_2)]_{m-n}[CH_2—CH(CH_2—NH—CO—R_f)]_n,$$

in which R_f is a perfluoroalkyl group having 6 to 15 carbon atoms, m is a positive integer in the range from 10 to 1500 and n is a positive integer not exceeding m.

4,822,861

METHOD FOR THE PREPARATION OF POLYVINYL PHOSPHONIC ACID

William Rowe, Califon; Shashikant Saraiya, Parlin, and Ajay Shah, Elizabeth, all of N.J., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Mar. 15, 1988, Ser. No. 168,204
Int. Cl.[4] C08F *8/12*
U.S. Cl. 525—355 **10 Claims**

1. A process for preparing polyvinyl phosphonic acid, which comprises polymerizing bis(2-haloalkyl) vinyl phosphonate to form a reaction product mixture comprising poly bis(2-haloalkyl) vinyl phosphonate, and then admixing said poly bis(2-haloalkyl) vinyl phosphonate with an aqueous acidic solution to effect hydrolysis whereby polyvinyl phosphonic acid is obtained.

4,822,862

EMULSION POLYMERIZATION OF 4-ACETOXYSTYRENE AND HYDROLYSIS TO POLY(P-VINYLPHENOL

Raymond W. Rupp, and Donna L. Keene, both of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 7,541, Jan. 28, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 231,590
Int. Cl.[4] C08F *8/10*
U.S. Cl. 525—367 **15 Claims**

1. A process for preparing polymers of p-vinylphenol which comprises:

(a) emulsion polymerizing 4-acetoxystyrene monomer in water and, without isolating the polymer,

(b) hydrolyzing the acetoxy groups to phenolic groups with a base.

4,822,863

SULPHURYL CHLORIDE/POLYAMIDE DERIVATIVE

Douglas L. Ford, North Parramatta, Australia, assignor to Memtec Limited, New South Wales, Australia

PCT No. PCT/AU85/00260, § 371 Date Jun. 27, 1986, § 102(e) Date Jun. 27, 1986, PCT Pub. No. WO86/02654, PCT Pub. Date May 9, 1986
PCT Filed Oct. 29, 1985, Ser. No. 887,036
Claims priority, application Australia, Oct. 29, 1984, PG7884
Int. Cl.[4] C08G *69/48*
U.S. Cl. 525—420 **4 Claims**

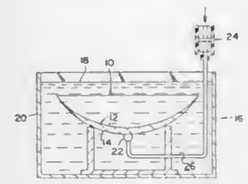
1. A process comprising reacting an aliphatic polyamide with a solution consisting essentially of sulphuryl chloride and a paraffin or cycloparaffin.

4,822,864

GAS PERMEABLE CONTACT LENS AND METHOD AND MATERIALS FOR ITS MANUFACTURE

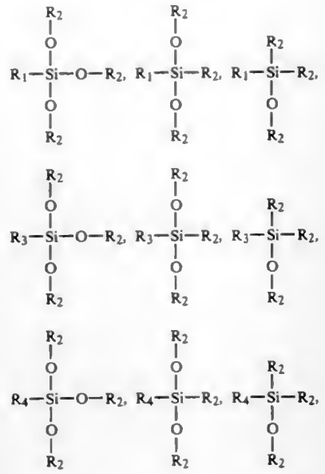
Richard Y. S. Chen, Raleigh, N.C., assignor to Ocular Technologies, Inc., Raleigh, N.C.

Continuation of Ser. No. 63,312, Jun. 18, 1987. This application Sep. 7, 1988, Ser. No. 241,190
Int. Cl.[4] C08F *30/08*
U.S. Cl. 526—279 **2 Claims**



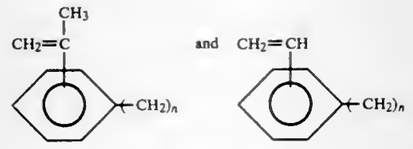
1. A polymer for making contact lens characterized in that it comprises 0% to 30% by weight of a hydrophilic agent, 0.1% to 5% by weight of a cross linker selected from the group consisting of ethyleneglycoldimethacrylate, diethyleneglycoldimethacrylate, triethyleneglycoldimethacrylate, tetraethyleneglycoldimethacrylate, silicone containing cross linkers, and mixtures thereof, 0.05% to 1% by weight of a polymerization initiator, and 2% to 94.85% by weight of at least one polymerizable silicone monomer selected from the group consisting of

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and mixtures thereof, where

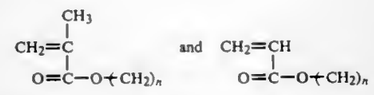
R_1 is selected from the group consisting of



where n=1 to 6, and mixtures thereof,

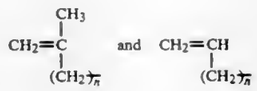
R_2 is selected from the group consisting of an alkyl group having from 1 to 8 carbon atoms, a saturated cyclic group and a benzene ring, and mixtures thereof,

R_3 is selected from the group consisting of



where n=1 to 6, and mixtures thereof, and

R_4 is selected from the group consisting of



where n=1 to 6, and mixtures thereof,

and in that said polymer transparent, hard, machinable and oxygen permeable.

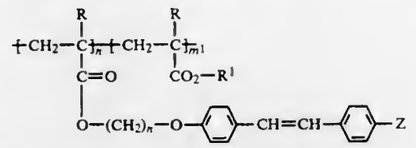
4,822,865

ACRYLIC COPOLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Ronald N. De Martino, Wayne, and Hyun N. Yoon, New Providence, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Nov. 10, 1987, Ser. No. 120,253
Int. Cl.[4] C08F *18/00*
U.S. Cl. 526—292.2 **11 Claims**

1. An isotropic acrylic copolymer which is characterized by recurring monomeric units corresponding to the formula:



where m and m^1 are integers which total at least 10, and the m monomer comprises between about 10–90 mole percent of the total $m+m^1$ monomer units; R is hydrogen or a C_1–C_4 alkyl, C_6–C_{10} aryl, halo or haloalkyl substituent; n is an integer between about 1–12; R^1 is a C_1–C_6 alkyl substituent; and Z is a nitro or cyano substituent.

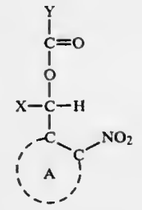
4,822,866

COPOLYMERS HAVING O-NITROCARBINOL ESTER GROUPS AND PRODUCTION OF SEMICONDUCTOR COMPONENTS

Reinhold Schwalm, Wachenheim, and Horst Binder, Lampertheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 142,930
Int. Cl.[4] G03C *1/70*
U.S. Cl. 526—311 **11 Claims**

1. A copolymer which contains as copolymerized units (a) from 5 to 50 mol % of one or more compounds of the general formula (I)



(I)

where

A is an aromatic or heteroaromatic, substituted or unsubstituted ring system of 5 to 14 ring members,

X is hydrogen, alkyl of 1 to 8 carbon atoms, or substituted or unsubstituted aryl or aralkyl, and

Y is an ethylenically unsaturated radical of 2 to 6 carbon atoms,

(b) from 94 to 30 mol % of methacrylonitrile,

(c) from 1 to 20 mol % of one or more olefinically unsaturated copolymerizable carboxylic acids of 3 to 6 carbon atoms,

(d) from 0 to 30 mol % of one or more further olefinically unsaturated, copolymerizable organic compounds other than (a), (b) and (c), whose homopolymers are transparent within the wavelength region from 250 to 400 nm, with the proviso that the percentages mentioned under (a) to (d) add up to 100.

4,822,867

PROTEIN POLYMER GRAFTS

Semih Erhan, 2301 Cherry St., Apartment 12B, Philadelphia, Pa. 19103

Filed Feb. 2, 1987, Ser. No. 9,677
Int. Cl.[4] C08H *1/00, 1/02*
U.S. Cl. 527—200 **6 Claims**

1. A process for modifying protein-bound arginine which comprises reacting an arginine containing gelatin with a compound selected from the group consisting of benzil and 4-hydroxybenzil in a suitable solvent in the presence of a base.

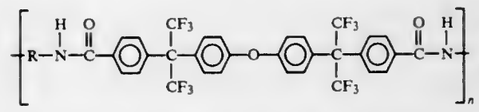
4,822,868

POLYCARBONAMIDE OF BIS(2-(4-CARBOXYPHENYL)-HEXAFLUOROISOPROPYL)DIPHENYL ETHER

Werner H. Mueller, Greenwich, and Dinesh Khanna, Warwick, both of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Nov. 24, 1987, Ser. No. 124,744
Int. Cl.[4] C08G *69/32, 65/00*
U.S. Cl. 528—208 **14 Claims**

1. A polycarbonamide polymer having a recurring unit in the polymer chain represented by the following structure:



wherein R is a divalent group selected from: an aromatic moiety having from 1 to 4 rings of six-carbon atoms wherein said ring is characterized by benzenoid unsaturation, an aliphatic moiety of 1 to 20 carbon atoms, an alicyclic aliphatic moiety of 4 to eighteen carbon atoms or mixtures thereof; and said polymer having an inherent viscosity in dimethylacetamide of at least 0.2 dl/g at 25° C. and 0.5 weight percent polymer concentration.

4,822,869

PROCESS FOR INTRODUCING GASES INTO LIQUIDS IN THE PRODUCTION OF POLYPHENYLENE ETHERS OR SULFOXIDIZED PARRAFINS USING HORIZONTAL REACTORS

Franz-Michael Bollenrath, Marl; Martin Bartmann, Recklinghausen, and Bernhard Hentschel, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 700,027, Feb. 11, 1985, abandoned.
This application Sep. 16, 1986, Ser. No. 907,177
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405629
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] C08G *65/00, 75/00*
U.S. Cl. 528—216 **8 Claims**

1. In a method for producing polyphenyl ethers, wherein 2,6-dialkylphenols are oxidatively coupled, or a method for sulfoxidation of paraffins by the light/water process, the improvement which comprises:

carrying out the coupling in at least one horizontally disposed stirred kettle by way of a method which comprises:

adding to said stirred kettle up to a level of at least 80–90% of its capacity a liquid into which gas is to be introduced,

supplying gas, in the form of bubbles, to said liquid at a rate adapted to the gas absorption capacity of said liquid, and

stirring said liquid, while supplying said gas, such that the maximum coherent volume of said gas is 2% of the volume of said stirred kettle, wherein said liquid and gas form a substantially homogeneous mixture with said gas dispersed in said liquid so that relatively large coherent interfaces between gas and liquid are avoided to thereby reduce chances of an explosion.

4,822,870

POLYIMIDE RESIN FROM BIS-IMIDE AND MONOMER HAVING TWO METHYLENE GROUPS ACTIVATED BY ADJACENT CARBONYLS

Alfred J. Restaino, Wilmington, Del., assignor to Creative Assets and Consulting Corporation, Wilmington, Del.

Filed Jul. 3, 1986, Ser. No. 881,853
Int. Cl.[4] C08G *69/26*
U.S. Cl. 528—322 **12 Claims**

1. The polyimide addition copolymer made by reacting a monomer having two methylene groups activated by adjacent carbonyls selected from those having the general formulas

R^3—CO—CH_2COCH_2COR^3 or

R^3—COCH_2—CO—Z—COCH_2COR^3

wherein R^3 is selected from H or same or different monovalent organic radicals and Z is selected from a carbon-carbon bond, or Z is a divalent radical having 2–25 carbon atoms, or a divalent radical having at least one carbon atom which is connected to at least one carbon atom which is connected to at least one carbonyl through a heteroatom, with an ethylenically unsaturated bis-imide compound.

4,822,871

POLYMERIZATION PROCESS

G. Bruce Klingensmith, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 18, 1987, Ser. No. 134,677
Int. Cl.[4] C08G *67/02*
U.S. Cl. 528—392 **4 Claims**

1. In the process of producing linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon in the presence of a catalyst composition formed from a palladium compound, the anion of trifluoroacetic acid and a bidentate phosphine ligand, the improvement which comprises providing the palladium compound and trifluoroacetate anion as preformed palladium trifluoroacetate.

4,822,872

METHOD OF PURIFYING FACTOR VIII

Syojyu Kameyama, Kyoto; Hideo Nishimaki, Nara; Yoshiro Iga, Osaka, and Tadakazu Suyama, Kyoto, all of Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed May 15, 1987, Ser. No. 50,105
Claims priority, application Japan, May 15, 1986, 61-109376
Int. Cl.[4] A61K *35/14; A23J 1/00*
U.S. Cl. 530—383 **5 Claims**

1. A method for purifying factor VIII complex comprising: (A) adsorbing an impure extract containing factor VIII complex on a water-insoluble carrier, and (B) recovering factor VIII complex in the unadsorbed fractions, wherein said water-insoluble carrier contains as a ligand a group represented by the formula (I) or (II):

$(CH_2)_n$—NH_2 (I) or

$(CH_2)_n$—CHO (II)

wherein n is an integer of from 3 to 10.

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4,822,873

CARMINOMYCINONE PRECURSES AND ANALOGUES

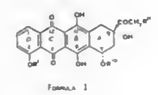
Donald W. Cameron; Geoffrey I. Feutrill, and Peter G. Griffiths, all of Victoria, Australia, assignors to University of Melbourne

PCT No. PCT/AU84/00214, § 371 Date Jun. 18, 1985, § 102(e) Date Jun. 18, 1985, PCT Pub. No. WO85/01726, PCT Pub. Date Apr. 25, 1985

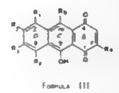
PCT Filed Oct. 19, 1984, Ser. No. 758,560

Int. Cl.[4] C07H *15/24*; C07C *49/66*

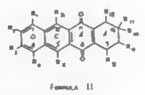
U.S. Cl. 536—6.4 **9 Claims**



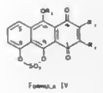
Formula I



Formula III

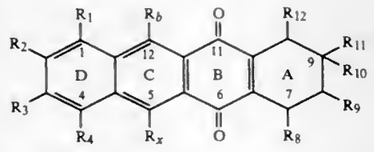


Formula II



Formula IV

1. A compound of the formula



and tautomeric forms thereof wherein;

R_1-R_4 are independently hydrogen, C_1-C_6 alkyl, aryl, C_7-C_{12} alkaryl, halogen, hydroxy, C_1-C_6 alkoxy, aryloxy, C_7-C_{12} aralkoxy, acyloxy, amino or C_1-C_6 alkylamino;

R_8 is hydrogen, hydroxy, C_1-C_6 alkoxy, aryloxy, acyloxy, amino, C_1-C_6 alkyamino or glycosyloxy;

R_9 and R_{12} are hydrogen, C_1-C_6 alkyl, aryl, C_7-C_{12} alkaryl, halogen, acyloxy, C_1-C_6 alkoxycarbonyl, aryloxycarbonyl or carboxy;

one of R_x and R_b is hydroxy and the other is hydrogen, halogen, C_1-C_6 alkoxy, aryloxy, or acyloxy; or

R_4 and R_x or R_1 and R_b taken together are —OSO_2O—;

R_{10} and R_{11} taken together are oxo or ethylenedioxy (provided that if R_{10} and R_{11} taken together are ethylenedioxy then if R_4 is hydrogen or methoxy, R_b is not hydrogen or acetoxy); or

R_{10} is hydroxy; and

R_{11} is C_1-C_6 hydroxyalkyl or C_1-C_6 dihydroxyalkyl or —CO—R_{15} where R_{15} is hydrogen, C_1-C_6 alkyl, aryl, C_7-C_{12} aralkyl or C_1-C_6 hydroxyalkyl; and

wherein aryl and aryloxy groups are single ring systems which may contain hetero atoms selected from the group consisting of nitrogen oxygen and sulfur.

4,822,874

PROCESS FOR PREPARING CYCLOOCTAAMYLOSE

Gerhard Schmid, and Hans-Jürgen Eberle, both of Munich, Fed. Rep. of Germany, assignors to Consortium fur Elektrochemische Industrie, GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 19, 1988, Ser. No. 183,661

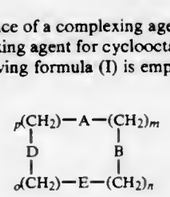
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716181

Int. Cl.[4] C08B *37/16*

U.S. Cl. 536—102 **9 Claims**

1. A process for the preparation of cyclooctaamylose, comprising the step of:

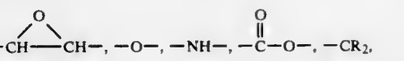
enzymatically cleavaging an aqueous preparation of starch in the presence of a complexing agent, wherein as a selective complexing agent for cyclooctaamylose, a compound of the following formula (I) is employed:

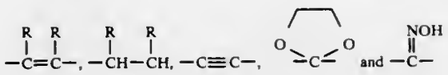


(I)

wherein,

A, B, D and E represent a substituent, independently selected from one another, selected from the group consisting of





wherein,

R is a substituent selected from the group consisting of a hydrogen atom, an alkyl radical, an hydroxyl radical, an alkoxy radical and a carboxyl radical,

m, n, o, p are integers each being within the range of 0 to 20, with the proviso that the number of atoms forming the ring is within the limits of 13 to 24.

4,822,875

SUCROSE POLYESTERS WHICH BEHAVE LIKE COCOA BUTTERS

Stephen A. McCoy; Bryan L. Madison; Peter M. Self, and David J. Weisgerber, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 942,902, Dec. 17, 1986, abandoned. This application May 2, 1988, Ser. No. 189,444

Int. Cl.[4] A23G *1/00*

U.S. Cl. 536—119 **10 Claims**

1. A cocoa butter substitute comprising sucrose fatty acid esters having at least four fatty acid ester groups, and where the make-up of the fatty acid groups is, by weight:

(a) from about 25% to about 50% lauric acid;

(b) from about 50% to about 75% palmitic acid; and

(c) up to about 5% other fatty acids.

6. A cocoa butter substitute comprising sucrose fatty acid esters having at least four fatty acid ester groups, and where the make-up of the fatty acid groups is, by weight:

(a) from about 25% to about 50% capric acid;

(b) from about 50% to about 75% stearic acid; and

(c) up to about 5% other fatty acids.

4,822,876

ESSENTIALLY PURE POLYALCOHOL ALUMINUM COMPLEXES AND THEIR PREPARATION

Arthur P. G. Wright, Markham; Betty Pui Lan Wen, Scarborough; Terry G. Schenck, Willowdale, and Antonina Maron, Scarborough, all of Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

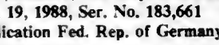
Filed Dec. 2, 1986, Ser. No. 937,175

Claims priority, application Canada, Nov. 21, 1986, 523588

Int. Cl.[4] A61K *31/70, 33/00*

U.S. Cl. 536—121 **17 Claims**

1. An essentially pure complex of a polyalcohol and aluminum having the formula:



wherein:

x=0.5,1

Y=2, and

L is a polyalcohol ligand.

4,822,877

MODIFIED HAEM

Yuji Inada, and Katsunobu Takahashi, both of Tokyo, Japan, assignors to Suntory Limited, Osaka and Bellex Corporation, Tokyo, both of, Japan

Filed Feb. 5, 1987, Ser. No. 11,216

Claims priority, application Japan, Feb. 5, 1986, 61-23577

Int. Cl.[4] C07D *487/22*

U.S. Cl. 540—145 **3 Claims**

1. A modified haemin wherein said haemin is ferriprotoporphyrin choloride characterized by a peroxidase activity and by a solubility both in water at a neutral pH and in organic solvents, wherein one or two carboxyl groups of said haemin are coupled to the non-methoxy end of a polyethyleneglycol monomethyl ether or an ω-amino derivative thereof through an ester bonding or an amide bonding.

4,822,878

CYCLIC ANHYDRIDE DERIVATIVES OF CHROMOPHORS

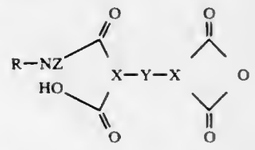
Spyros Theodoropulos, Yorktown Heights, N.Y., assignor to Viomedics, Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 068,438, Jun. 30, 1987, abandoned. This application May 27, 1988, Ser. No. 197,344

Int. Cl.[4] C07D *265/28, 237/32, 311/82*

U.S. Cl. 544—91 **14 Claims**

1. Cyclic anhydride derivatives of chromophors having the structural formula:



wherein R is an organic chromophoric group exhibiting fluorescence, luminesence, chemiluminescence or absorption properties; Z is hydrogen, alkyl, aryl, or a heterocyclic group composed of carbon, hydrogen and at least one of oxygen, nitrogen or sulfur, and wherein Z contains from 1 to 20 carbon atoms; each X contains 2 to 3 straight chaing carbon atoms connecting the carbonyl groups; and Y is a divalent or polyvalent group comprised of carbon, hydrogen, and optionally oxygen, and contains up to 20 cargon atoms, and provides at least one single or multivalent alkyl, alkenyl, cycloalkyl, bicycloalkyl, bicycloalkenyl, aryl or carbonyl containing group bridging the carbonyl-containing moieties through one or more of the carbon atoms of the X groups.

4,822,879

ENZYME-INHIBITORY GRISEOLIC ACID DERIVATIVES, AND THEIR USE

Fumio Nakagawa; Yoshio Tsujita, and Mitsuo Yamazaki, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

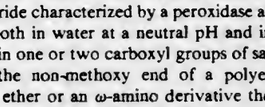
Continuation of Ser. No. 734,868, May 16, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 131,438

Claims priority, application Japan, May 22, 1984, 59-102993

Int. Cl.[4] C07D *19/40*; C07H *17/02*

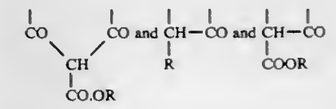
U.S. Cl. 544—277 **8 Claims**

1. Dihydrodesoxygriseolic acid or a pharmaceutically acceptable alkali metal or alkaline earth metal salt or C_1-C_6 alkyl ester thereof.



wherein

X and Y, which may be the same or different, are each selected from the group RCO—, —$CH_2CO.OR$, —$CH(CO.OR)_2$ and —CO.OR or X and Y taken together form a group selected from



and

X and Y taken together contain a total of from 12 to 52 saturated carbon atoms;

R is a hydrocarbyl group which contains at least 8 carbon atoms; A, B, C and D, which may be the same or different, are each hydrogen or a substituent Z, or A and B taken together with the two carbon atoms joining them form an optionally substituted cyclohexane ring or an optionally substituted benzene ring and/or C and D taken together with the two carbon atoms joining them form an optionally substituted cyclohexane ring or an optionally substituted benzene ring;

Z is lower alkyl, halogen, nitro, cyano or —$CO.OR^1$; and

R^1 is lower alkyl.

4,822,880

PROCESS FOR THE EXTRACTION OF METAL VALUES AND NOVEL METAL EXTRACTANTS

David P. Devonald, Oldham; Anthony J. Nelson, Manchester; Peter M. Quan, Rochdale, and David Stewart, Royton, all of England, assignors to Imperial Chemical Industries PLC, London, England

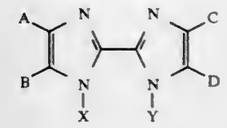
Division of Ser. No. 828,748, Feb. 12, 1986, Pat. No. 4,696,801. This application Jul. 20, 1987, Ser. No. 75,846

Claims priority, application United Kingdom, Feb. 25, 1985, 8504819

Int. Cl.[4] C07D *401/00*

U.S. Cl. 540—492 **11 Claims**

1. A compound of the formula:



4,822,881

TETRAHYDRO CARBAZOLONE INTERMEDIATES

Ian H. Coates, Hertford; John Bradshaw; James A. Bell, both of Royston; David C. Humber, London; George B. Ewan, Gerrards Cross, and William L. Mitchell, London, all of England, assignors to Glaxo Group Limited

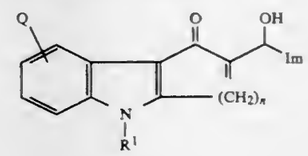
Filed Nov. 27, 1987, Ser. No. 126,202

Claims priority, application United Kingdom, Nov. 28, 1986, 8628473; Nov. 12, 1987, 8726537

Int. Cl.[4] C07D *403/06*

U.S. Cl. 540—603 **2 Claims**

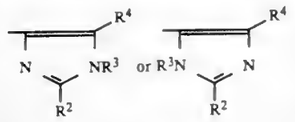
1. A compound of formula (II)



(II)

VOL
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1989
UMI

wherein Im represents an imidazolyl group of the formula:



R^1 represents a hydrogen atom or a group selected from C_{1-6}alkyl, C_{3-6}alkenyl, C_{3-10}alkynyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkylC_{1-4}alkyl, phenyl, phenylC_{1-3}alkyl, $—CO_2R^5$, $—COR^5$, $—CONR^5R^6$ or $—SO_2R^5$;

R^5 and R^6, which may the same or different, each represents a hydrogen atom, a C_{1-6}alkyl or C_{3-7}cycloalkyl group, or a phenyl or phenylC_{1-4}alkyl group, in which the phenyl group is unsubstituted or substituted by one or more C_{1-4}alkyl, C_{1-4}alkoxy or hydroxy groups or halogen atoms, with the proviso that R^5 does not represent a hydrogen atom when R^1 represents a group $—CO_2R^5$ or $—SO_2R^5$;

one of the groups represented by R^2, R^3 and R^4 is a hydrogen atom or a C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-6}alkenyl, phenyl or phenylC_{1-3}alkyl group, and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6}alkyl group;

Q represents a hydrogen or a halogen atom, or a hydroxy, C_{1-4}alkoxy, phenylC_{1-3}alkoxy or C_{1-6}alkyl group or a group $—NR^7R^8$ or $—CONR^7R^8$;

R^7 and R^8, which may be the same or different, each represents a hydrogen atom or a C_{1-4}alkyl or C_{3-4}alkenyl group, or together with the nitrogen atom to which they are attached form a saturated 5 to 7 membered ring; and

n represents 1, 2 or 3.

4,822,882

DC-52 DERIVATIVES AND THEIR ANTITUMOR USE

Hiromitsu Saito, Sagamihara; Yoichi Uosaki; Akira Sato, both of Machida; Tadashi Hirata, Yokohama; Makoto Morimoto, Shizuoka, and Tadashi Ashizawa, Numazu, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

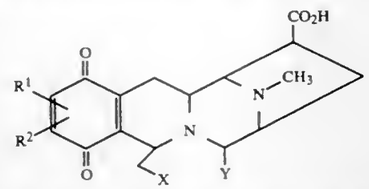
Filed Sep. 29, 1987, Ser. No. 102,359

Claims priority, application Japan, Oct. 3, 1986, 235858; Dec. 2, 1986, 287212; Aug. 20, 1987, 207180

Int. Cl.[4] **A61K** *31/495*; **C07D** *498/22, 487/18*

U.S. Cl. 544—342 **2 Claims**

1. Compounds represented by the following formula or by the corresponding hydroquinone type formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, C_{1-4} alkoxy, azido, amino, C_{1-3} alkylamino, C_{1-3} d-alkylamino, cyclic amino having from 3 to 6 ring members consisting of one nitrogen atom and the rest carbons C_{1-4} alkylthio, and optionally substituted arylthio selected from the group consisting of phenylthio, p-fluorophenylthio and p-methoxyphenylthio; and X is hydroxyl and Y is cyano or X and Y together represent —O— in the form of —X—Y—.

4,822,883

PEROXIDE FREE RADICAL INITIATORS CONTAINING HINDERED AMINE LIGHT STABILIZER GROUPS

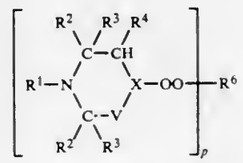
Terry N. Myers, Erie, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 831,393, Feb. 19, 1986, abandoned. This application Aug. 20, 1987, Ser. No. 87,473

Int. Cl.[4] **C07D** *491/13*

U.S. Cl. 546—16 **9 Claims**

1. A compound having the formula



wherein

p is 1 or 2, and

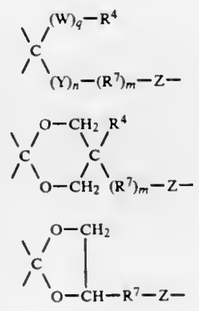
R^1 is selected from hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, substituted or unsubstituted aliphatic acyl of 2–21 carbons, substituted or unsubstituted alicyclic acyl of 6–13 carbons, substituted or unsubstituted aryl acyl of 7–11 carbons, substituted or unsubstituted araliphatic acyl of 7–22 carbons, $—C(=O)—N(R^4)(R^5)$, $—C(=O)—O—R^9$, and $—(CH_2—CH(R^4)—O)_r—R^4$ where r is 2–50, and

R^2 and R^3 may be the same or different and are independently selected from substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons, and substituted or unsubstituted araliphatic of 7–22 carbons, and R^2 and R^3 can be taken together with the carbon to which they are attached to form a substituted or unsubstituted saturated alicyclic group of 4–12 carbons, and

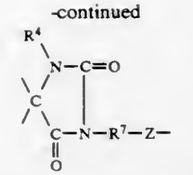
V is selected from $—CH(R^5)—$ and $—C(=O)—$, and

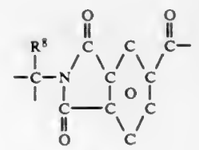
R^4 and R^5 may be the same or different and are independently selected from hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons, and substituted or unsubstituted araliphatic of 7–22 carbons, substituted or unsubstituted alicyclic of 5–12 carbons which may optionally contain 1–3 heteroatoms selected from oxygen, sulfur, and nitrogen atoms in the ring, the nitrogen atom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteroatoms must be separated from each other and from the portion of the compound to which the alicyclic group is bonded by at least one carbon atom, and

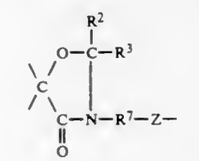
when V is $—CH(R^5)—$, X is selected from



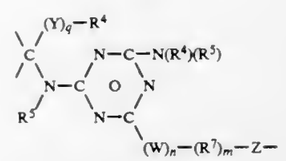
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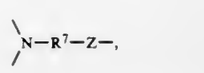




and



and when V is $—C(=O)—$, X is



and

R^7 is selected from a substituted or unsubstituted aliphatic diradical of 1–20 carbons, substituted or unsubstituted aryl diradical of 6–10 carbons, substituted or unsubstituted alicyclic diradical of 5–12 carbons, and substituted or unsubstituted araliphatic diradical of 7–22 carbons, and the diradical chain(s) may optionally contain 1–6 heteroatoms selected from oxygen, sulfur, and nitrogen atoms, the nitrogen atom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteroatoms must be separated from each other and from the portions of the compound to which the diradical is bonded by at least one carbon atom,

R^8 is selected from hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted aryl of 6–10 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, $—C(=O)—O—R^9$, and $—(CH_2—CH(R^4)—O)_r—R^5$, and

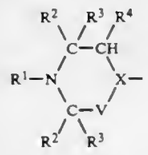
W is selected from —O—, —S—, and $—N(R^5)—$, and

Y is selected from —Z—, —O—, —S—, $—N(R^4)—$, $—S(=O)—$, $—O—S(=O)—$, $—O—S(=O)_2—$, $—NH—C(=O)—NH—$, $—O—C(=O)—O—$, $—C(=O)—O—$, $—O—C(=O)—C(=O)—O—$, $—O—C(=O)—C(=O)—N(R^4)—$, $—N(R^4)—C(=O)—C(=O)—O—$, and $—N(R^4)—C(=O)—C(=O)—N(R^4)—$,

n, m and q are intergers independently selected from 0 and 1 with the proviso that when m is 0, n must be 0,

Z is selected from $—C(=O)—$, $—S(=O)_2—$, $—C(R^9)(R^{10})—$, $—O—C(=O)—$, $—N(R^4)—C(=O)—$, $—O—C(=O)—C(=O)—$, $—N(R^4)—C(=O)—C(=O)—$, $—Si(R^4)(R^5)—$, $—Si(O—R^4)(O—R^5)—$, and $—P(O)(O—R^4)(O—R^5)—$, and

when p is 1, R^6 is selected from hydrogen, substituted or unsubstituted tertiary aliphatic of 4–24 carbons, substituted or unsubstituted tertiary alicyclic of 6–13 carbons, substituted or unsubstituted tertiary araliphatic of 9–24 carbons, substituted or unsubstituted aliphatic acyl of 2–21 carbons, substituted or unsubstituted aryl acyl of 7–11 carbons, substituted or unsubstituted araliphatic acyl of 7–22 carbons, $—C(=O)—N(R^4)(R^5)$, $—C(=O)—O—R^9$, $—C(R^9)(R^{10})—C(=O)—O—R^4$, $—S(=O)_2—R^4$, and



when p is 2, R^6 is selected from substituted or unsubstituted di-tertiary aliphatic of 6–27 carbons, substituted or unsubstituted di-tertiary alicyclic diradical of 7–14 carbons, substituted or unsubstituted di-tertiary araliphatic of 12–27 carbons, substituted or unsubstituted aliphatic diacyl of 3–21 carbons, substituted or unsubstituted alicyclic diacyl of 7–15 carbons, substituted or unsubstituted aryl diacyl of 8–12 carbons, or substituted or unsubstituted araliphatic diacyl of 9–24 carbons,

R^9 and R^{10} are independently selected from substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, and substituted or unsubstituted alicyclic of 5–12 carbons which may optionally contain 1–3 heteroatoms selected from oxygen, sulfur, and nitrogen atoms in the ring, the nitrogen atom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteroatoms must be separated from each other and from the portion of the compound to which the alicyclic group is bonded by at least one carbon atom, and when both are present, R^9 and R^{10} can be connected to each other by an alkylene diradical bridge containing 4–9 carbons, which may optionally contain 1–3 heteroatoms selected from oxygen, sulfur, and nitrogen atoms in the ring, the nitrogen atom having a hydrogen atom or a methyl group bonded thereto, with the provisos that multiple heteroatoms must be separated from each other and from the portions of the compound to which the diradical bridge is bonded by at least one carbon atom, and when R^6 is tertiary aliphatic, tertiary alicyclic or tertiary araliphatic, R^{10} may also be selected from $—OO—R^6$ and $—O—R^9$, and

optional substituents for R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9 and R^{10} are one or more groups selected from halogen, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, —C≡N, —OH, epoxy, carboxy, alkyoxycarbonyl of 2–6 carbons, acyloxy of 1–4 carbons, acryloyl, acryloyloxy, methacryloyl, methacryloyloxy, hydroxymethyl, hydroxyethyl, alkylmercapto of 1–4 carbons and trialkoxysilyl of 3–12 carbons.

4,822,884

QUINOLINE DERIVATIVES FOR THE PROTECTION OF CULTIVATED PLANTS

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 465,740, Feb. 11, 1983, Pat. No. 4,623,727. This application Sep. 29, 1986, Ser. No. 912,851

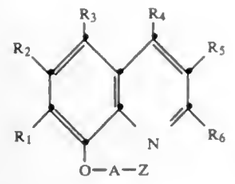
Claims priority, application Switzerland, Feb. 27, 1982, 980/82

Int. Cl.[4] **C07D** *401/02, 215/26, 215/28*

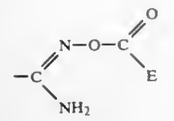
U.S. Cl. 546—177 **8 Claims**

1. A compound of the formula

VOL 1101 ISS 3 AP 18 1989 UMI



wherein
R_1, R_2 and R_3 independently of one another are each hydrogen, halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, nitro or cyano,
R_4, R_5 and R_6 independently of one another are each hydrogen, halogen or C_1–C_3-alkyl,
A is any one of the groups $—CH_2—$, $—CH_2—CH_2—$ or $—CH(CH_3)—$, and
Z is



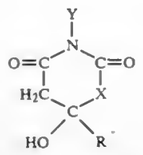
in which
E is $—NR_{10}R_{11}$, wherein R_{10} is C_1–C_8-alkyl which is unsubstituted or substituted by halogen, C_2–C_4-alkenyl, C_3–C_6-alkynyl, phenyl which is unsubstituted or substituted by halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, trifluoromethyl or nitro, or benzyl which is unsubstituted or substituted by halogen or nitro, R_{11} is hydrogen, C_1–C_8-alkyl or C_1–C_3-alkoxy, or R_{10} and R_{11} together with the nitrogen atom to which they are bound form a pyrrolidino or piperidino radical, including agriculturally acceptable acid addition salts and metal complexes thereof.

4,822,885
CYCLOPENTANONE DERIVATIVES
Elden H. Banitt, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 861,843, May 12, 1986, abandoned, which is a division of Ser. No. 674,233, Nov. 19, 1984, Pat. No. 4,599,434, which is a division of Ser. No. 551,965, Nov. 15, 1983, Pat. No. 4,497,954. This application May 3, 1988, Ser. No. 189,626
Int. Cl.[4] C07D *211/76, 317/72;* **C07C** *103/80*
U.S. Cl. 546—221 **3 Claims**

3. The compound 5-hydroxy-N-(6-oxo-2-piperidylmethyl)-2-(2,2,2-trifluoroethoxy)benzamide.

4,822,886
CYCLIC N-HYDROXYIMIDES
Stephen F. Donovan, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Aug. 12, 1987, Ser. No. 84,239
Int. Cl.[4] C07D *207/416, 211/94*
U.S. Cl. 546—243 **4 Claims**

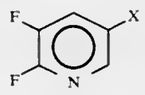
1. N-hydroxyimide compounds having the formula



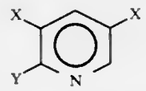
wherein X is either $—CH_2—$ or a direct bond to the adjacent ring carbon, provided that where X is $—CH_2—$, R is —COOH or an alkali metal or ammonium salt thereof, and where X is the direct bond, R is either $—CH_2—COOH$ or $—CH_2—CO—N—HOH$, or an alkali metal or ammonium salt thereof, and where Y is —OH or $—O^-M^+$, where M^+ is an alkali metal or ammonium cation.

4,822,887
PREPARATION OF DIFLUOROPYRIDINE COMPOUNDS
John C. Little, Concord, and Charles A. Wilson, Pittsburg, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 901,717, Aug. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 665,588, Oct. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 564,800, Dec. 23, 1983, abandoned. This application Feb. 29, 1988, Ser. No. 161,649
Int. Cl.[4] C07D *213/26*
U.S. Cl. 546—345 **8 Claims**

1. A method of preparing a product compound having the formula



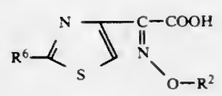
wherein X is Br or Cl,
which comprises contacting a starting compound having the formula



wherein each X is individually Br or Cl and Y is F, Cl or Br with an effective amount of KF in a polar aprotic diluent at an effective temperature of from 50° C. to the boiling point of the diluent, optionally in the presence of a phase-transfer catalyst, removing the product compound by distillation essentially as it is formed, and, optionally, adding additional starting compound as the product compound is removed.

4,822,888
NEW CEPHAM COMPOUNDS AND PROCESSES FOR THE PRODUCTION THEREOF
Takao Takaya, Kawanishi; Hisashi Takasugi; Kiyosha Tsuji, both of Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan
Division of Ser. No. 543,297, Oct. 19, 1983, Pat. No. 4,604,456, and Ser. No. 886,740, Mar. 14, 1979, Pat. No. 4,425,341. This application Feb. 19, 1986, Ser. No. 830,973
Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 75/78
Int. Cl.[4] C07D *277/40, 277/48*
U.S. Cl. 548—195 **12 Claims**

1. A compound of the formula:

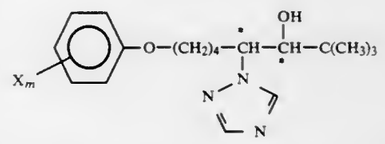


wherein
R^2 is halo(lower)alkyl, and

R^6 is amino or protected amino, or its reactive derivative at the carboxy group effective for transforming the carboxy group into a reactive N-acylating group.

4,822,889
TRIAZOLYL ALCOHOLS, THEIR PREPARATION AND THEIR USE AS FUNGICIDES
Hubert Sauter, Mannheim; Ludwig Schuster; Ernst-Heinrich Pommer, both of Limbergerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Continuation of Ser. No. 617,989, Jun. 6, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 874,833
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321023
Int. Cl.[4] C07D *249/12*
U.S. Cl. 548—262 **3 Claims**

1. A method for the production of the diastereomeric triazolyl alcohols of the formula



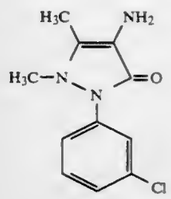
where X is hydrogen, halogen, trifluoromethyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, unsubstituted or substituted phenyl or unsubstituted or substituted phenoxy wherein the substitute on the phenyl or the phenoxy is halogen and m is an integer from 1 to 5, x being identical or different when m is greater than 1, which, as diastereomers, have the R*,S* configuration at the two chiral centers, and the enantiomers which have the configuration R,S or S,R at the two chiral centers, and their acid addition salts and metal complexes, which comprises reducing stereo-selectively the corresponding ketone of the above formula with, (a) an alkyl magnesium halide which contains an alkyl radical of 2–6 carbon atoms and a beta-hydrogen atom in the alkyl radical or, (b) hydrogen in the presence of ruthenium or ruthenium oxide hydroxide ($Ru(OH)_x$).

4,822,890
METHOD FOR THE PRODUCTION OF AMINO TERMINUS PROTECTED NATURALLY OCCURRING AMINO ACIDS
David R. Bolin, Denville, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Continuation of Ser. No. 772,238, Jun. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 496,775, May 20, 1983, abandoned. This application Jun. 24, 1986, Ser. No. 877,826
Int. Cl.[4] C07D *209/20, 233/18;* **C07C** *99/00*
U.S. Cl. 548—344 **9 Claims**

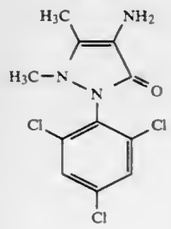
1. A method for preparing an essentially 100% pure amino-terminus protected amino acid comprising:
a. silylating one equivalent of a naturally occurring amino acid with at least two equivalents of a silylating agent in the presence of an organic solvent and an organic base;
b. acylating the reaction product of step (a) with an amino terminus acylating agent to form an amino terminus protected amino acid silyl ester; and
c. hydrolyzing the amino terminus protected amino acid silyl ester with an aqueous base whereby an essentially 100% pure amino terminus protected amino acid is formed.

4,822,891
4-AMINO-2,3-DI-SUBSTITUTED-1-(MONO- OR TRICHLOROPHENYL)-3-PYRAZOLIN-5-ONES
Yoshio Inagaki, and Tadao Shishido, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 858,830, Apr. 29, 1986, Pat. No. 4,711,963, which is a continuation-in-part of Ser. No. 459,028, Jan. 18, 1983, abandoned. This application Feb. 11, 1987, Ser. No. 13,593
Claims priority, application Japan, Jan. 18, 1982, 57-6606
Int. Cl.[4] C07D *231/46*
U.S. Cl. 548—365 **10 Claims**

1. 4-amino-2,3-di-substituted-1-(mono- or trichlorophenyl)-3-pyrazolin-5-ones represented by the following formulae (1) and (2):



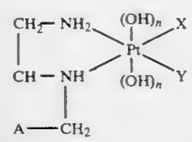
(1)



(2)

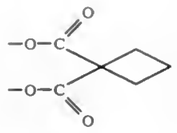
4,822,892
N-HETEROCYCLIC PLATINUM COMPLEXES
Masamitsu Honda; Kazumi Morikawa, and Kohichi Endoh, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 770,671, Aug. 29, 1985, abandoned. This application Feb. 24, 1988, Ser. No. 165,404
Claims priority, application Japan, Sep. 12, 1984, 59-189655; Sep. 12, 1984, 59-189656; Sep. 12, 1984, 59-189657; Dec. 22, 1984, 59-271411; Jan. 22, 1985, 60-8383; Apr. 25, 1985, 60-87615; Apr. 25, 1985, 60-87616; Aug. 1, 1985, 60-168559; Aug. 1, 1985, 60-168560
Int. Cl.[4] A61K *31/555;* **C07F** *15/00*
U.S. Cl. 548—402 **5 Claims**

1. A platinum complex of the formula:

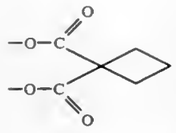


wherein A is $—CH_2—$ or $—(CH_2)_2—$; X and Y are independently a Cl atom, or combined together to form

VOL 1101 ISS 3 AP 18 1989 UMI



and n is 0 or 1; provided that X and Y are combined together to form



when n is 0, of X and Y are independently a Cl atom when n is 1.

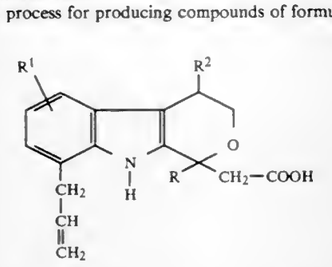
4,822,893

PRODUCTION OF SUBSTITUTED 1,3,4,9-TETRAHYDROPYRANO[3,4-B]INDOLE-1-ACETIC ACIDS

Amedeo A. Failli, Princeton Junction, N.J., assignor to American Home Products, New York, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,167
Int. Cl.[4] C07D *493/04*
U.S. Cl. 548—432 **15 Claims**

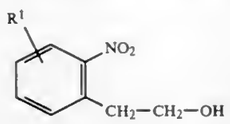
1. A process for producing compounds of formula (I)



(I)

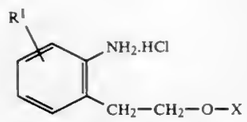
wherein R is lower alkyl containing 1 to 4 carbon atoms; R^1 is hydrogen, lower alkyl containing 1 to 4 carbon atoms, or halogen; R^2 is hydrogen and the pharmaceutically acceptable salts thereof which comprises the steps

(a) successively benzylating and reducing substituted 2-nitrophenethyl alcohols of structure (III)



(III)

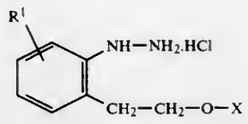
wherein R^1 is as defined above to produce the substituted amine of structure (VI)



(VI)

wherein R^1 is as defined above and X is benzyl

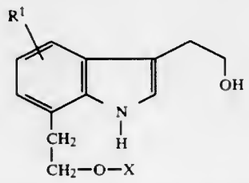
(b) reacting said amine (VI) with HNO_2 and $SnCl_2$ to produce the substituted hydrazine of formula (VII)



(VII)

wherein R^1 and X are as defined above

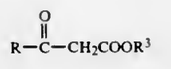
(c) reacting said hydrazine (VII) with dihydrofuran to produce the corresponding hydrazone and in the presence of zinc chloride converting the hydrazone to the corresponding tryptophol of structure (VIII)



(VIII)

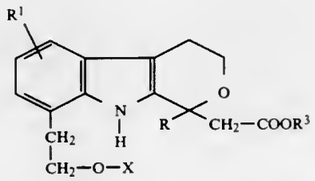
wherein R^1 and X are as defined above

(d) reacting said tryptophol of formula (VIII) with 3-oxo-2-alkanoic acid alkyl ester of formula (IX)



(IX)

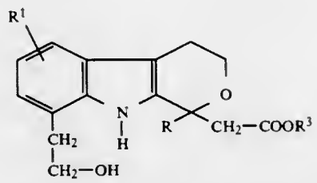
wherein R is as defined above and R^3 is lower alkyl containing 1 to 8 carbon atoms to produce the indole alkyl ester of formula (X)



(X)

wherein R, R^1, R^3 and X are as defined above

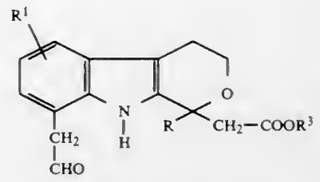
(e) reducing said indole (X) to produce the hydroxy ester of formula (XI)



(XI)

wherein R, R^1 and R^3 are as defined above

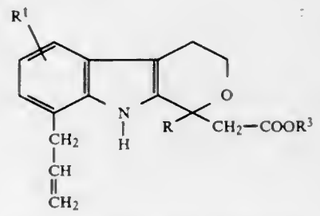
(f) oxidizing said hydroxy ester (XI) to produce the oxo ester of structure (XII)



(XII)

wherein R, R^1 and R^3 are as defined above

(g) methylenating said oxo ester (XII) to produce the ester of structure (XIII)



(XIII)

wherein R, R^1 and R^3 are as defined above

(h) hydrolyzing said ester to produce the desired compound of structure (I) and optionally converting said compound to a pharmaceutically acceptable salt.

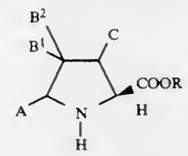
4,822,894

OPTICALLY ACTIVE BICYCLIC IMINO-ALPHA-CARBOXYLIC ESTERS

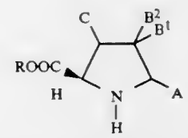
Rolf Geiger, Frankfurt am Main; Volker Teetz, Hofheim am Taunus; Dietrich Langner, Frankfurt am Main; Hansjörg Urbach, Kronberg, and Rainer Henning, Hattersheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 574,401, Jan. 30, 1984, Pat. No. 4,668,796.
This application Mar. 9, 1987, Ser. No. 23,277
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303112
Int. Cl.[4] C07D *209/42, 209/44, 209/52*
U.S. Cl. 548—252 **4 Claims**

1. A compound of the formulae Ia or Ib essentially free of its racemate, and salts of said compound,



(Ia)



(Ib)

in which the two bridgehead hydrogen atoms have the cis configuration, the COOR group is oriented endo with respect to the bicyclic ring system, the carbon atom α to the COOR group has the R or S configuration,

(a) A and B^1 denote hydrogen, and B^2 and C together form a chain of the formula $—(CH_2)_n—$, with n being 3, 4, 5, 6 or a chain of the formula $—(CH_2)_p—CH=CH(CH_2)_q—$, with (p+q) being 1, 2, 3 or 4, or

(b) C and B^2 denote hydrogen and A and B^1 together form one of the chains defined above under (a), and

(c) R represents alkyl having 1 to 6 carbon atoms, cycloalkyl having 4 to 8 carbon atoms or aralkyl having 7 to 13 carbon atoms which can optionally be substituted by NO_2.

4,822,895

3-AMINOAZETIDINE, ITS SALTS AND INTERMEDIATES OF SYNTHESIS

Dino Nisato, Pavia, and Marco Frigerio, Mantova, both of Italy, assignors to Societe Anonyme - SANOFI, Paris, France

Filed Feb. 21, 1985, Ser. No. 703,828
Claims priority, application France, Feb. 27, 1984, 84 02951
Int. Cl.[4] C07D *205/04*
U.S. Cl. 548—953 **13 Claims**

1. A compound selected from the group consisting of 3-aminoazetidine and its addition salts with inorganic or organic acids.

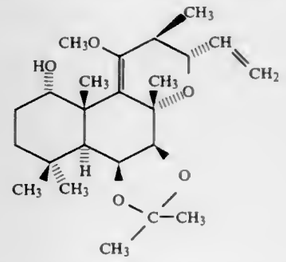
4,822,896

METHOD OF SYNTHESIZING FORSKOLIN FROM 9-DEOXYFORSKOLIN

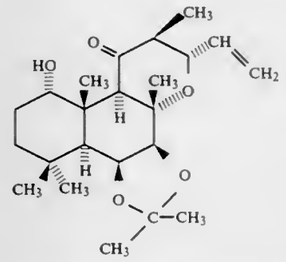
Nicholas J. Hrib, Somerville, N.J., assignor to Hoechst Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 846,550, Mar. 31, 1986, Pat. No. 4,734,513.
This application Jan. 25, 1988, Ser. No. 147,421
Int. Cl.[4] C07D *407/04, 311/78*
U.S. Cl. 549—229 **2 Claims**

1. A method of preparing the compound of the formula



which comprises reacting the compound of the formula



with dimethyl sulfate and potassium hydride to afford said compound.

4,822,897

PROCESS FOR PREPARING POLYFLUORO γ-KETOESTERS AND LACTONE ISOMERS THEREOF

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 472,985, Mar. 7, 1983, Pat. No. 4,686,300. This application Jun. 3, 1987, Ser. No. 56,897

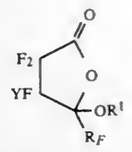
Int. Cl.⁴ C07D *307/32*; **C07C** *69/62, 67/22*

U.S. Cl. 549—313 **3 Claims**

1. A process for preparing a keto-ester of the formula



and its lactone



wherein

R_F is $-CF_3$ or $-R_F^1X$, where R_F^1 is a perfluoroalkylene group of 2-10 carbon atoms, optionally containing 1 or 2 in-chain ether oxygen atoms separated by at least 2 carbon atoms, and

X is —F, $-OR^2$, $-SR^2$ or $-SO_2R^2$;

R^1 is $-CH_3$, $-C_2H_5$, $-CH_2CF_3$ or $CH_2(CF_2CF_2)_{1\text{-}6}H$; and

Y is —F or —Cl; comprising

(a) contacting and forming a reaction mixture, in an aprotic solvent at a temperature between −20° C. and 100° C., of approximately equimolar quantities of an ethylenic monoolefin $CF_2{=}CFY$, a metal cyanide or quaternary ammonium cyanide $M(CN)_2$, and a fluoroester R_FCO_2R; and

(b) reacting the reaction mixture formed in step (a) with a molar excess of an alcohol R^1OH and a molar excess of mineral acid, in which R is $-CH_3$, $-C_2H_5$, $-CH_2CF_3$ or $-CH_2(CF_2CF_2)_{1\text{-}6}H$, M is an alkali metal, alkaline earth metal or quarternary ammonium ion, and a is the valence of M and isolation of said keto-ester and its lactone.

4,822,898

ASCORBIC ACID OR ERYTHORBIC ACID DERIVATIVES

Kazuo Kamaya, Toyonaka, and Yukihisa Takisawa, Misawa, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

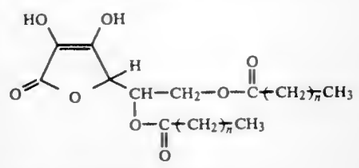
Filed Sep. 12, 1986, Ser. No. 906,373

Claims priority, application Japan, Sep. 20, 1985, 60-209499; Sep. 24, 1985, 60-211937

Int. Cl.⁴ C007 *307/62*

U.S. Cl. 549—317 **1 Claim**

1. An ascorbic acid or erythorbic acid derivative represented by the following general formula (I)a:



(I)a

wherein n represents an integer of 12 to 20.

4,822,899

METALLIC PORPHYRIN COMPLEXES AS CATALYSTS IN EPOXIDATION REACTIONS

John T. Groves, and Robert Quinn, both of Ann Arbor, Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Apr. 12, 1985, Ser. No. 722,956

Int. Cl.⁴ C07D *301/03, 301/04, 301/06*

U.S. Cl. 549—533 **19 Claims**

1. A process for the epoxidation of olefins, the process comprising contacting an olefin with a catalytic amount of a metallic porphyrin complex wherein the metal is Ru, Os, Rh, Ir, Nb or Re, in the substantial absence of coreductants and peroxidic oxidants under reaction conditions such that an epoxide of the olefin is formed.

4,822,900

PRODUCTION OF ETHYLENE OXIDE

Percy Hayden, Guisborough, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 771,057, Aug. 30, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 119,277

Claims priority, application United Kingdom, Sep. 12, 1984, 8423044

Int. Cl.⁴ C07D *301/10*

U.S. Cl. 549—534 **10 Claims**

1. A process of producing ethylene oxide comprising the steps of:

contacting ethylene and oxygen in the presence of a chlorine containing reaction modifier with a silver containing catalyst; and

improving the performance of the catalyst by contacting the catalyst also with nitropropane in which the nitropropane is pumped as a liquid at a temperature not exceeding 80° C. by a positive displacement pump in the substantial absence of oxidizing agents said pump being provided with relief against pressures greater than 50 bars and said nitropropane being introduced to the process at a point at which the temperature is in the range 50° to 100° C. and the pressure is at most 40 bars.

4,822,901

CARBOXY-SUBSTITUTED ORGANOSILICON STABILIZERS FOR A SILICATE-CONTAINING ANTIFREEZE

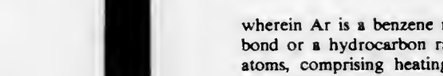
Paul H. Mohr, Chappaqua, and Enrico J. Pepe, Amawalk, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 855,379, Apr. 24, 1986, which is a continuation-in-part of Ser. No. 781,985, Sep. 30, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 126,894

Int. Cl.⁴ C07F *7/10, 7/18, 7/08*

U.S. Cl. 556—438 **1 Claim**

1. An organosilicon carboxylate having the formula:



wherein a is 0, b is 1, c is 0, n is an integer of 2 to 4, m is 10, M is a monovalent cation, R^1 is selected from the group consisting of hydrogen, monovalent hydrogen radicals and substituted monovalent hydrocarbon radicals and Z is a hydrolyzable moiety.

4,822,902

N-ACETONYLBENZAMIDES AND THEIR USE AS FUNGICIDES

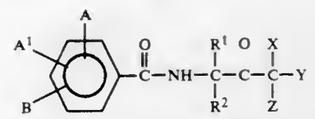
H. Edwin Carley, Chalfont, and Ashok K. Sharma, Horsham, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 26, 1984, Ser. No. 634,916

Int. Cl.⁴ C07C *161/02, 161/04, 121/66, 103/80*

U.S. Cl. 558—14 **3 Claims**

1. A compound of the formula:



wherein

A is a chloro, bromo, fluoro, iodo, trifluoromethyl, trifluoromethoxy, fluorosulfonyl, methyl, ethyl, phenyl, methoxy, chloromethyl, $(C_1\text{-}C_2)$alkoxycarbonyl, cyano or hydroxy group;

A^1 and B are each independently selected from the group consisting of hydrogen, chloro, bromo, fluoro and methyl group;

X is cyano, thiocyano, isothiocyano, methylsulfonyloxy, thio$(C_1\text{-}C_2)$alkyl, $(C_1\text{-}C_2)$alkoxy, carbamoyloxy (—OC(O)NR^3), thiocarbamoylthio (—SC(S)NR^3), azide, $(C_1\text{-}C_4)$alkylcarbonyloxy, phenylcarbonyloxy, phenoxy, phenylthio, trifluoromethylcarboxy, imidazolyl or triazolyl group; and when X is a phenylcarbonyloxy, a phenoxy or phenylthio substituent, the phenyl moiety may be independently substituted with one substituent selected from the group consisting of chloro, fluoro, bromo, iodo or methyl group;

Y and Z are each independently a hydrogen, cyano, thiocyano, isothiocyano, methylsulfonyloxy, thio$(C_1\text{-}C_2)$alkyl, $(C_1\text{-}C_2)$alkoxy, carbamoyloxy (—OC(O)NR^3), azide or $(C_1\text{-}C_4)$alkylcarbonyloxy group and either Y or Z may be an imidazolyl or triazolyl group;

R^1 and R^2 are each independently a $(C_1\text{-}C_6)$alkyl group; and

each R^3 is independently a hydrogen or a $(C_1\text{-}C_4)$alkyl group.

4,822,903

FLUORINATED SILICA CATALYST AND PREPARATION OF AROMATIC/ALIPHATIC NITRILES IN THE PRESENCE THEREOF

Roland Jacques, Ales; Michel Reppelin, Collonges-au-Mont-d'Or, and Laurent Seigneurin, Salindres, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 667,574, Nov. 2, 1984, abandoned, which is a division of Ser. No. 378,192, May 14, 1982, Pat. No. 4,504,595. This application May 27, 1986, Ser. No. 866,739

Claims priority, application France, May 15, 1981, 81 09693

Int. Cl.⁴ C07C *120/10*

U.S. Cl. 558—312 **12 Claims**

1. A process for the preparation of an aromatic or aliphatic nitrile having the formula:

Ar—A—CN (I)

wherein Ar is a benzene radical and A is a direct chemical bond or a hydrocarbon radical having from 1 to 6 carbon atoms, comprising heating to a temperature ranging from about 450° C. to about 550° C. a formamide or formanilide having the formula:

Ar—A—NHCHO (II)

or an amide having the formula:

Ar—A—$CONH_2$ (III)

in the presence of a fluorinated siliceous catalyst comprising silica particulates, the specific surface of which ranges from about 200 to about 300 m^2/g, having a total pore volume ranging from about 1 to about 1.5 cm^3/g, with an average pore diameter ranging from about 100 to about 200 Å, having an exchange pH of less than about 3, and with the fluorine content thereof bonded to the silica, expressed in F^-, ranging from about 0.5 to about 2% by weight based upon the silica, and the sodium content thereof, expressed as Na_2O, being less than about 1% by weight, also based upon the silica.

4,822,904

PERFLUOROALKYLATION PROCESS

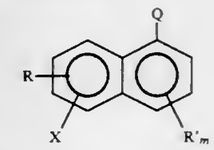
Robert I. Davidson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 12, 1985, Ser. No. 808,204

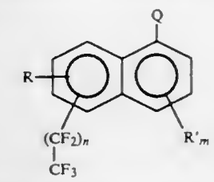
Int. Cl.⁴ C07C *120/00*

U.S. Cl. 558—378 **14 Claims**

2. A process which comprises reacting a halonaphthalene corresponding to the formula:



with at least about one equivalent of a potassium perfluoroalkanoate corresponding to the formula $KOOC(CF_2)_nCF_3$ wherein n is an integer of at least one in the presence of cuprous iodide and a dipolar aprotic solvent so as to form a perfluoroalkylnaphthalene corresponding to the formula:



in which substituted naphthalene formulas R and R″ are independently selected from chloro, fluoro, nitro, hydroxy, and alkyl and alkoxy substituents containing 1–6 carbons; Q is —CN or —COOR″; R″ is saturated hydrocarbyl; X is bromo or iodo; m is 0 or 1; and n is an integer of at least one.

4,822,905

CERTAIN 2-(2-(SUBSTITUTED PHENYL)ACETYL)-1,3-CYCLOHEXANEDIONES

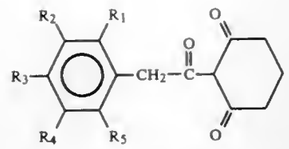
David L. Lee, Martinez; Donald R. James, El Sobrante, and William J. Michaely, Richmond, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 9, 1986, Ser. No. 872,070

Int. Cl.⁴ C07C *49/657*

U.S. Cl. 558—414 **4 Claims**

1. A compound having the structural formula



wherein R_1, R_2, R_3, R_4 and R_5 are the same or different and are selected from the group consisting of hydrogen, chlorine, bromine, iodine, nitro, trifluoromethyl, trifluoromethoxy, cyano, lower alkylsulfonyl, and alkylthio having from 1 to 4 carbon atoms, with the proviso that R_1, R_2, R_3 and R_4 are not all hydrogen.

4,822,906

CERTAIN 2-(2-SUBSTITUTED BENZOYL)-1,3-CYCLOHEXANEDIONES

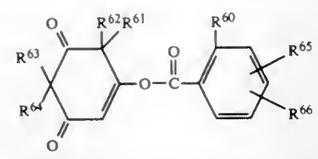
Charles G. Carter, San Francisco, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 880,370, Jun. 30, 1986, Pat. No. 4,780,127, which is a continuation-in-part of Ser. No. 872,067, Jun. 9, 1986, abandoned. This application Dec. 4, 1987, Ser. No. 129,125

Int. Cl.[4] C07C *121/76, 147/107, 69/76*

U.S. Cl. 558—416 **1 Claim**

1. An intermediate compound of the structural formula



wherein

R^{60} is hydrogen; halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; nitro; cyano; C_1–C_2 haloalkyl; or R^aSO_n— wherein n is 0 or 2 and R^a is C_1–C_2 alkyl, trifluoromethyl or difluoromethyl; or trifluoromethoxy or difluoromethoxy;

R^{61} is hydrogen or C_1–C_4 alkyl;

R^{62} is hydrogen or C_1–C_4 alkyl; or

R^{61} and R^{62} together are C_2–C_5 alkylene;

R^{63} is C_1–C_4 alkyl;

R^{64} is C_1–C_4 alkyl; or

R^{63} and R^{64} together are C_2–C_5 alkylene;

R^{65} and R^{66} independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^eC(O)$— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined.

4,822,907

METHOD FOR RECOVERING α-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Katsumi Sugiyama; Takashi Yamashita, and Toshihide Yukawa, all of Yokkaichi, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jun. 3, 1987, Ser. No. 56,907

Claims priority, application Japan, Jun. 3, 1986, 61-128405

Int. Cl.[4] C07C *103/52*

U.S. Cl. 560—41 **22 Claims**

1. A process for recovering the hydrochloride salt of α-L-aspartyl-L-phenylalanine methyl ester from a solution comprising:

desalting and concentrating a solution containing α-L-aspartyl-L-phenylalanine methyl ester in a vessel provided with a reverse osmosis membrane having a sodium chloride inhibition rate of from 30 to 80%, wherein the said solution contains α-L-aspartyl-L-phenylalanine, α-L-aspartyl-L-phenylalanine methyl ester, the methyl ester at the L-aspartic acid β-carboxyl residue of α-L-aspartyl-L-phenylalanine, the methyl ester at the L-aspartic acid β-carboxy residue of α-L-aspartyl-L-phenylalanine methyl ester, and chloride ions, in the following weight ratios:

$$\frac{(I)}{(II)} = \frac{\alpha\text{-A(M)PM(g)}}{\alpha\text{-AP(g)} + \alpha\text{-APM(g)} + \alpha\text{-A(M)P(g)}} \leq 1$$

$$\frac{(III)}{(I) + (II)} = \frac{Cl^-(g)}{\alpha\text{-AP(g)} + \alpha\text{-APM(g)} + \alpha\text{-A(M)P(g)} + \alpha\text{-A(M)PM(g)}} \geq 1$$

wherein:

α-AP is α-L-aspartyl-L-phenylalanine;

α-APM is α-L-aspartyl-L-phenylalanine methyl ester,

α-A(M)P is the methyl ester at the L-aspartic acid β-carboxyl residue of α-L-aspartyl-L-phenylalanine;

α-A(M)PM is the methyl ester at the L-aspartic acid β-carboxyl residue of α-L-aspartyl-L-phenylalanine methyl ester; and

Cl^{31} is chloride ion,

said solution being desalted and concentrated until the weight ratio of inorganic chloride to the sum of α-AP+α-APM+α-A(M)P+α-A(M)PM reaches a ratio of between 0.3 to 1, at which point the concentrate is brought into contact with an aqueous solvent containing methanol and hydrochloric acid to cause the precipitation of the hydrochloride salt of α-APM; and

separating the precipitated hydrochloride salt of α-L-aspartyl-L-phenylalanine methyl ester from the solution.

4,822,908

SUBSTITUTED ACRYLATES AND FUNGICIDES CONTAINING SAME

Stefan Karbach, Ludwigshafen; Ulrich Schirmer; Costin Rentzea, both of Heidelberg; Ernst-Heinrich Pommer, Limburgerhof; Eberhard Ammermann, Ludwigshafen; Wolfgang Steglich, Bonn-Roettgen; Barbara A. M. Schwalge, Lohmar, and Timm Anke, Kaiserslautern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

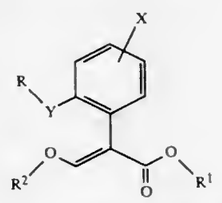
Filed Jun. 19, 1987, Ser. No. 64,126

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1986, 3620860

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—60 **7 Claims**

1. A substituted acrylate of the formula:



wherein R^1 and R^2 are identical or different and each represents C_1–C_8-alkyl, C_2–C_8-alkenyl or C_3–C_8-akynyl; X is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, cyano or nitro; Y is ethylene, ethenylene, methyleneoxy, oxymethylene, thiomethylene, methylenethio or oxygen; R is n-decyl, n-pentadecyl, n-octadecyl, n-eicosanyl, methoxyethyl, butoxyethyl, methoxycarbonylethyl, cyclopropyl, dichlorocyclopropyl, cyclooctyl, 2,6-dimethyl-2,6-octadiene-8-yl, C_6–C_8-cycloalkenyl, C_3–C_{10}-alkynyl and C_8-cycloalkynyl; and R^3 has the same definition as R^1 and is identical to or different from R^1.

4,822,909

7-FLUOROPROSTAGLANDINS AND PROCESS FOR THEIR PRODUCTION

Yasuda Arata; Kato Masao, both of Yokohama; Yamabe Masaaki, Machida, and Uchida Keiichi, Kawasaki, all of Japan, assignors to Asashi Glass Company Ltd., Tokyo, Japan

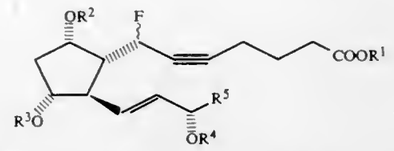
Division of Ser. No. 06/702,790, Feb. 11, 1985, Pat. No. 4,699,989. This application Jan. 9, 1987, Ser. No. 60,088

Claims priority, application Japan, Jun. 10, 1983, 58-102885

Int. Cl.[4] C07C *177/00*

U.S. Cl. 560—121 **14 Claims**

1. A process for producing a 7-fluoroprostaglandin of formula (I)



wherein:

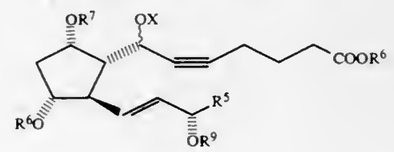
R^1 is a hydrogen atom or a $C_{1\text{-}10}$ alkyl group;

R^2, R^3 and R^4 are each independently a hydrogen atom or a protective group; and

R^5 is a linear, branched or cyclic $C_{3\text{-}7}$ alkyl group;

said process comprising:

(i) subjecting to the action of an amino sulfur trifluoride compound a prostaglandin of formula (II)



wherein:

X is a trimethylsilyl group;

R^6 is a $C_{1\text{-}10}$ alkyl group; and R^7, R^8 and R^9 are each independently a protective group; and

(ii) obtaining said 7-fluoroprostaglandin of formula (I).

4,822,910

PROCESS FOR THE PRODUCTION OF SUBSTITUTED BENZOIC ACID ESTERS

Gérard Pelerin, Cabris, France, assignor to Societe Anonyme Roure Bertrand Dupont, Argenteuil, France

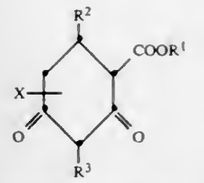
Filed Aug. 3, 1987, Ser. No. 80,798

Claims priority, application European Pat. Off., Aug. 20, 1986, 86.111536.8

Int. Cl.[4] C07C *69/74*

U.S. Cl. 560—126 **4 Claims**

1. Compounds of the general formula



wherein R^1 signifies methyl or ethyl and R^2 and R^3, independently from one another, signify $C_{1\text{-}4}$-alkyl; and X is chlorine or bromine, preferably chlorine, and situated in position 1 or 5.

4,822,911

PROCESS FOR THE SELECTIVE SEPARATION OF VINYLIDENE OLEFINS FROM MIXTURES WITH OTHER OLEFINS

Herbert E. Fried, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 25, 1987, Ser. No. 101,317

Int. Cl.[4] C07C *69/52*

U.S. Cl. 560—205 **30 Claims**

1. A process for the selective separation of a C_6 to C_{30} olefin mixture consisting essentially of an ethyl- and higher alkyl-branched vinylidene olefin component and a linear olefin component, and for the preparation of unsaturated alkyl esters of acrylic acids, which comprises steps for

(a) contacting the olefin mixture in the liquid phase at a temperature of between about 40° and 220° C. with one or more reactive agents selected from the group consisting of alkyl esters of acrylic acid in the presence of a catalytically effective amount of one or more ene reaction catalysts, to selectively convert all or part of the ethyl- and higher alkyl-branched vinylidene olefins of said mixture to higher alkyl acrylic acid esters and to produce a product mixture comprising the resulting higher acrylic acid esters and unreacted olefins,

(b) terminating step (a) prior to conversion of more than about 20% of the linear olefins by reaction with reactive agent, and

(c) separating the unreacted olefins from the product mixture.

4,822,912

PROCESS FOR THE PREPARATION OF 2,3,5,6-TETRAFLUOROBENZOIC ACID

Klaus Naumann, Leverkusen; Rudolf Braden, Odenthal, and Heinz Ziemann, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,270

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705410

Int. Cl.[4] C07C *63/04*

U.S. Cl. 562—493 **12 Claims**

1. A process for the preparation of 2,3,5,6-tetrafluorobenzoic acid comprising hydrogenating pentafluorobenzoic acid or an ester thereof in the presence of a hydrogenation catalyst, a base, and a solvent at a pressure of 2 to 100 bars, wherein 0.9 to 0.98 moles of hydrogen are employed per mole of pentafluorobenzoic acid wherein the catalyst is selected from the group consisting of palladium, cobalt, nickel, rhodium, ruthenium, iridium, rhenium and mixtures thereof, in metallic or oxidic form.

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4,822,913

PROCESS FOR PREPARING CARBOXYLIC ACIDS FROM ESTERS OF CARBOXYLIC ACIDS

Gary P. Hagen, Glen Ellyn, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 28, 1983, Ser. No. 546,410
Int. Cl.[4] C07C *27/02, 51/09, 53/08, 57/04, 57/10, 57/44*
U.S. Cl. 562—598 9 Claims

1. A process for preparation of carboxylic acids from carboxylic acid esters of the formula RCH_2COOR''' and carboxylic acid esters of the formula $R'CH{:}C(R'')COOR'''$ wherein R, R' and R'' are individually selected from the group consisting of -H, alkyl moieties of from 1 to 18 carbon atoms, aralkyl moieties, cycloalkyl moieties and alkylaryl moieties of from 3 to 18 carbon atoms, wherein R''' is an alkyl moiety of 1 to 18 carbon atoms, wherein said process is in the gas phase and comprises a hydrolysis reaction in the presence of water and an ester cleavage reaction in the absence of water, wherein said carboxylic acid esters are passed through an AMS-1B borosilicate crystalline molecular sieve catalyst at a temperature within the range of from about 200° C. to about 450° C. at a pressure of from 0.5 to 100 atmospheres and a liquid hourly space velocity of from about 0.05 to 20, volume of liquid per volume of said catalyst per hour.

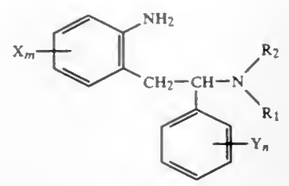
4,822,914

2-AMINO-N-METHYL-α-PHENYL-PHENETHYLAMINES

Lawrence L. Martin, Lebanon, N.J.; Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, and Charles A. Crichlow, Piscataway, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation of Ser. No. 300,006, Sep. 8, 1981, abandoned, which is a division of Ser. No. 91,062, Nov. 5, 1979, Pat. No. 4,309,424, which is a continuation-in-part of Ser. No. 948,896, Oct. 5, 1978, abandoned. This application Aug. 27, 1982, Ser. No. 412,187
Int. Cl.[4] C07C *87/28*
U.S. Cl. 564—373 4 Claims

1. A compound of the formula:



in which R_1 is hydrogen; R_2 is methyl; X and Y are the same or different and each can be hydrogen, chlorine, bromine, fluorine, methoxy, alkyl of from 1 to 3 carbon atoms, hydroxy or trifluoromethyl; m is the integer 1 or 2 and n is the integer 1, 2 or 3.

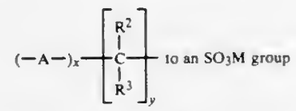
4,822,915

PHOSPHINE AND SULFONATE BEARING LIGANDS

Rex E. Murray, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 887,183, Jul. 21, 1986, Pat. No. 4,689,437. This application May 26, 1987, Ser. No. 53,736
Int. Cl.[4] C07F *9/02*
U.S. Cl. 568—13 10 Claims

1. An organophosphorus sulfonate ligand containing (a) at least one benzene ring having a trivalent phosphorus atom located at one position on the benzene ring and an SO_3M group located at a position on the benzene ring ortho thereto, or at least one benzene ring having a trivalent phosphorus atom connected through a methylene group to a first position on the benzene ring and an SO_3M group connected through a methylene group to a second position on the benzene ring ortho to the first position, or at least one bridging or fused aromatic ring system having a trivalent phosphorus atom and an SO_3M group, each located on a different aromatic ring in the system at substituent positions adjacent to one another, or at least one aromatic ring, other than a benzene ring, or heteroaromatic ring, each ring having a trivalent phosphorus atom and an SO_3M group located at substituent positions adjacent to one another, wherein M is selected from the group consisting of hydrogen, alkali metals, alkaline earth metals, and NR_4 and PR_4 wherein R is a hydrogen atom or a substituted or unsubstituted hydrocarbyl radical having 1 to 15 carbon atoms and each R can be alike or different or (b) a trivalent phosphorus atom connected through a group having the formula



wherein A is an oxygen atom, an NH radical, or an NR radical; R^2 and R^3 are hydrogen atoms or a substituted or unsubstituted hydrocarbyl radical having 1 to 6 carbon atoms and can be alike or different; x is an integer 0 or 1; y is an integer from 1 to 3; and R and M are as defined above.

4,822,916

PREPARATION OF DIARYL SULFONES

Alan M. Aaronson, Flushing Meadows; Robert L. Protzmann, New City, and John Tomko, Dobbs Ferry, all of N.Y., assignors to Akzo America Inc., New York, N.Y.

Filed Sep. 21, 1987, Ser. No. 99,265
Int. Cl.[4] C07C *147/06*
U.S. Cl. 568—34 6 Claims

1. A process for forming diaryl sulfones which comprises:
(a) reacting an aryl sulfonic acid with an aryl reagent containing active hydrogen while removing water by-product therefrom to aid in the conversion to the diaryl sulfone so as to achieve a yield of diaryl sulfone that is no less than about 60%, based on the amount of aryl sulfonic acid; and
(b) thereafter reacting the product from step (a), which comprises unreacted aryl sulfonic acid and diaryl sulfone product, with further aryl reagent containing active hydrogen and an added effective amount of sulfone condensing agent, said amount aiding in driving the process towards completion only after it has been initially run as defined in (a), to increase the amount of aryl sulfonic acid converted to diaryl sulfone by the reaction of the unreacted aryl sulfonic acid and aryl reagent containing active hydrogen.

4,822,917

PROCESS FOR THE HYDROFORMYLATION OF AN OLEFIN

Chihiro Miyazawa; Hiroshi Mikami; Akio Tsuboi, and Katsuhide Hamano, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Dec. 16, 1987, Ser. No. 133,807
Claims priority, application Japan, Dec. 23, 1986, 61-307121; Dec. 26, 1986, 61-313734; Oct. 7, 1987, 62-252710; Oct. 8, 1987, 62-253962
Int. Cl.[4] C07C *45/50*
U.S. Cl. 568—454 11 Claims

1. A process for the hydroformylation of an olefin, which comprises hydroformylating an olefinic compound by reacting it with carbon monoxide and hydrogen in a hydroformylation reaction zone in the presence of a catalyst solution containing rhodium and an oxide of an organic trivalent phosphorus compound to form an aldehyde having a carbon number larger by one than that of the olefinic compound; adding an organic trivalent phosphorus compound to the reaction mixture, followed by distillation to separate a distillate containing the aldehyde from a high-boiling residue containing rhodium; oxidizing the high-boiling residue at the same time as or subsequent to the distillation to convert the organic trivalent phosphorus compound to its oxide; and recycling the oxidized residue to the hydroformylation reaction zone as a recycling catalyst solution, the improvement wherein the hydroformylation reaction is conducted under such condition that the proportion of alcohol supplied in the recycling catalyst solution is maintained at a level not higher than 14% by weight based on the total amount of the olefinic compound and the catalyst solution supplied to the hydroformylation reaction zone.

4,822,918

REDUCTION OF ORGANIC SULFUR COMPOUNDS

Toni Dockner, Meckenheim, and Manfred Sauerwald, Roedersheim-Gronau, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 92,888
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631073
Int. Cl.[4] C07C *149/30, 149/28, 149/06*
U.S. Cl. 568—58 14 Claims

1. A process for the reduction of an organic sulfur compound selected from the group consisting of a sulfonic acid, sulfonyl halide, sulfonate, sulfonamide, sulfonic acid anhydride, sulfone, sulfoxide and disulfane, to form mercaptans or sulfanes which comprises:
reacting the sulfur compound in the liquid or gas phase with a hydrocarbon in the presence of 1 to 50% by weight of elemental carbon, based on the hydrocarbon, at from 100° to 500° C.

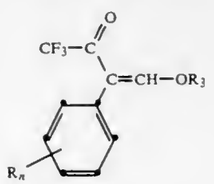
4,822,919

NOVEL PRODUCTION PROCESSES

Pierre Martin, Rheinfelden, and Robert W. Lang, Pratteln, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 784,984, Oct. 7, 1985, Pat. No. 4,705,801. This application Aug. 26, 1987, Ser. No. 90,200
Claims priority, application Switzerland, Oct. 16, 1984, 4950/84
Int. Cl.[4] C07C *49/248*
U.S. Cl. 568—308 2 Claims

1. A compound of the formula VI



(VI)

wherein
R is halogen, C_1-C_6-aikyl or C_1-C_6-haloalkyl,
n is 0, 1 or 2 and
R_3 is an C_1-C_6-alkyl or phenyl.

4,822,920

PREPARATION OF CYCLOPENTANONE

Helmut Lermer, Mannheim; Wolfgang Hoelderich, Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 116,879
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638005
Int. Cl.[4] C07C *45/48*
U.S. Cl. 568—355 4 Claims

1. A process for preparing cyclopentanone from an adipic ester, which comprises reacting an adipic ester of the formula

$$R^1OOC—(CH_2)_4COOR^2 \quad (I)$$

where R^1 and R^2 are each alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, aralkyl or aryl and R^2 can additionally be hydrogen, in the gas or liquid phase at from 150° C. to 450° C. in the presence of a zeolight catalyst having a pentasil or faujasite structure and/or of a phosphate catalyst containing the PO_4^{3-} ion.

4,822,921

METHOD FOR ONE-STEP SYNTHESIS OF METHYL T-BUTYL ETHER

John F. Knifton, and Neal J. Grice, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Mar. 14, 1988, Ser. No. 168,064
Int. Cl.[4] C07C *41/09*
U.S. Cl. 565—698 4 Claims

1. A method for synthesizing methyl t-butyl ether from t-butanol and methanol in one step wherein methyl t-butyl ether is synthesized from a 5:1 to 1:1 molar mix of methanol and t-butanol, over a fluorophosphoric acid-on-titania supported catalyst having a phosphorus content in the range of 1–10 wt%, at an operating temperature of 100°–180° C., an operating pressure of 50 to 500 psi, and a methanol plus t-Butanol LHSV in the range 0.1 to 10.

4,822,922

STABILIZATION OF MIXTURES OF CHLORINATION OF PHENOL/CHLOROPHENOLS

Jean-Roger Desmurs, Saint-Symphorien d'Ozon, and Serge Ratton, Villefontaine, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 25, 1987, Ser. No. 100,844
Claims priority, application France, Sep. 25, 1986, 86 13557
Int. Cl.[4] C07C *37/38*
U.S. Cl. 568—702 15 Claims

1. A process for the stabilization of a reaction mixture produced by the chlorination of at least one of a phenol and a chlorophenol, which mixture contains at least one gem-dichlorinated cyclic ketone, comprising stirring said mixture in the presence of an effective stabilizing amount of at least one of a strong protonic acid and a Lewis acid.

4,822,923

ISOMERIZATION OF BY-PRODUCTS OF BIS-PHENOL SYNTHESIS

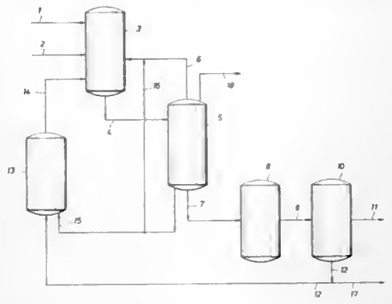
Simon M. Li, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 19, 1987, Ser. No. 111,240
Int. Cl.[4] C07C *37/68, 39/16*
U.S. Cl. 568—724 22 Claims

1. A process for isomerizing the undesired dehydroxy isomer containing by-products from the preparation of a desired bis-phenol having a 4,4'-dihydroxy form which comprises treating the by-products from the preparation of the desired bis-phenol from the condensation of a ketone and a phenol, at about 50° C. to 110° C. and about ambient pressure with a catalytic amount of an acid in the presence of a free mercaptan co-catalyst and

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a minor amount of water of up to about 1.5 percent weight based on the isomerization reaction solution to isomerize the



undesired by-products and recovering a product of a higher concentration of the desired bis-phenol.

4,822,924

PROCESS FOR PRODUCING 2,6-DICHLOROBENZYL ALCOHOL

Ichiro Otsu; Sueo Kanno; Sinichi Sato, and Tetsuya Kondo, all of Koriyama, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,086
Claims priority, application Japan, Dec. 27, 1986, 61-309114
Int. Cl.[4] C07C *33/46, 29/09*
U.S. Cl. 568—812 **5 Claims**

1. A process for producing 2,6-dichlorobenzyl alcohol, which comprises reacting 2,6-dichlorobenzyl chloride with an acetate-forming agent to form its acetate, wherein anhydrous sodium acetate is used as the acetate-forming agent, and a quaternary ammonium salt is added as a phase transfer catalyst during the acetate-forming reaction, and hydrolyzing said acetate with a hydrolyzing agent to form 2,6-dichlorobenzyl alcohol.

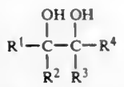
4,822,925

ORGANOSALTS OF METALATE ANIONS AND PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOLS THEREWITH

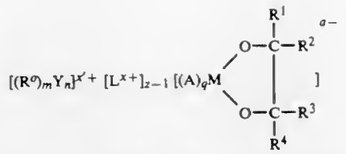
John R. Briggs, and John H. Robson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 594,264, Mar. 28, 1984, Pat. No. 4,607,045.
This application Feb. 6, 1987, Ser. No. 11,748
Int. Cl.[4] C07E *31/18, 31/24*
U.S. Cl. 568—853 **10 Claims**

1. A process for making alkylene glycols of the formula



comprising contacting a vicinal dioxyalkylene organometalate compound of the formula:



wherein x' is the integer 1; $[(R^o)_mY_n]^{x'+}$ comprises a cation having a positive change of x' selected from the group consisting of ammonium or phosphonium cations of the formulae:



wherein Y is nitrogen or phosphorus, sulfonium cations of the formula:



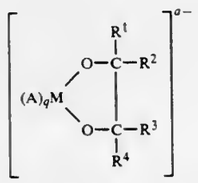
wherein Y is sulfur, and bis(hydrocarbyl-phosphine)imminiums of the formula:

$$[(R_3{}^9P)_2N]^+$$

wherein R^5 to R^9 are the same or different and comprise hydrogen or hydrocarbyl substituents selected from the group consisting of aliphatic or aromatic substituents having from 1 to 20 carbon atoms with the proviso that at least one of R^5 to R^9 is a hydrocarbyl substituent and that at least one of R^5 to R^9 contains sufficient carbon atoms that said vicinal dioxyalkylene organometalate is soluble in an organic solvent; L is a cation which has a positive charge of X wherein X is 1, which is selected from the group consisting of:

$$[(R^o)_mY_n]^{x'+}$$

as defined above, alkaline metal, quaternary ammonium and quaternary phosphonium cations; z is 1 to 4; a is from 1 to 4; and

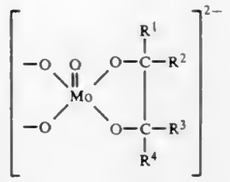


is an anion having a negative charge of a selected from the group consisting of anions of the formula

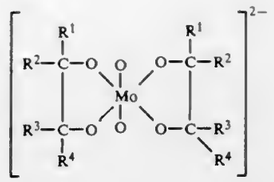
$$[VO_4C_2H_4]^{-1},$$

$$[V_2O_8C_2H_4]^{-4}, [C_2H_4O_2WO_3]^{-2},$$

$$[(C_2H_4O_2)_2WO_2]^{-2}, [V_2O_8C_2H_5]^{-3},$$



and



wherein R^1 to R^4 are the same or different and are hydrogen, alkyl of between 1 and about 10 carbons, monocyclic or bicyclic aryl having up to about 12 carbons, alkyl having 7 to about 10 carbons, monocyclic or bicyclic aralkyl having 7 to about 15 carbons, alkenyl having 2 to 3 carbons, cycloalkyl having 3 to about 8 carbons, and cyclic structures joining two of R^1, R^2, R^3 and R^4 having 3 to about 8 carbon atoms, with liquid water or water vapor at a temperature and pressure sufficient to provide the alkylene glycol wherein R^1, R^2, R^3 and R^4 correspond to R^1, R^2, R^3 and R^4 of said vicinal dioxyalkylene organometalate compound.

4,822,926

ETHYLENE OXIDE/GLYCOLS RECOVERY PROCESS

Robert F. Dye, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 29, 1988, Ser. No. 161,875
Int. Cl.[4] C07C *29/00, 29/80*
U.S. Cl. 568—867 **23 Claims**

1. A process for recovery of a low concentration of ethylene oxide as glycols from an aqueous solution comprising salts and ethylene oxide, which comprises the steps of:

(1) passing the aqueous solution comprising salts and ethylene oxide through a hydrolyzing zone at elevated temperature and elevated pressure for a sufficient length of time to insure the conversion of at least the greater portion of the ethylene oxide to glycols to obtain a dilute aqueous glycol solution;

(2) passing the dilute aqueous glycol solution through at least one flasher, wherein water is evaporated in the form of steam thereby producing at the bottom of the (last) flasher a solid-liquid two-phase slurry stream comprising salt-containing solids and a liquid phase comprising glycol, salt and water;

(3) sending said slurry-containing stream coming out of the (last) flasher to a centrifuge and centrifuging such stream to produce a solid phase and a liquid phase; and

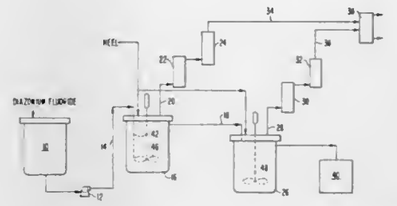
(4) passing said centrifuged liquid phase to a glycol flasher wherein glycols are separated.

4,822,927

CONTINUOUS DECOMPOSITION OF DIAZONIUM FLUORIDES

Nickolas J. Stepaniuk, Chesterfield, and Bruce J. Lamb, St. Charles, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Nov. 24, 1987, Ser. No. 124,501
Int. Cl.[4] C07C *17/22, 25/13, 41/22;* **C07D** *211/72*
U.S. Cl. 570—141 **12 Claims**



1. A process for continuous preparation of an aromatic carbocyclic or heterocyclic fluoride from the corresponding aromatic diazonim fluoride which comprises:

(a) continuously introducing to at least the first of one or more sequential reaction vessels a liquid feed solution of an aromatic diazonium fluoride in hydrogen fluoride;

(b) continuously agitating the reaction mixtures in the reaction vessels while heating the contents of the vessels to a remperature sufficient to decompose said diazonium fluoride; and

(c) continuously withdrawing reaction mixture from each of said reaction vessels and feeding withdrawn reaction mixture to next successive reaction vessel until the decomposition of said diazonium fluoride is substantially complete, the withdrawal and feed rates being sufficient to maintain the concentration of diazonium fluoride in the reacrion mixtures in each of the vessels at not more than 2.0 gram moles per liter.

4,822,928

PROCESS FOR PRODUCING 2,5-DICHLOROTOLUENE

Masashi Ohtsuru, Tokyo, and Toshio Hozumi, Iwaki, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1987, Ser. No. 81,072
Claims priority, application Japan, Aug. 5, 1986, 61-183644
Int. Cl.[4] C07C *17/33, 17/22, 21/24*
U.S. Cl. 570—190 **8 Claims**

1. A process for producing 2,5-dichlorotoluene, which process comprises the steps of chlorinating a 4-t-alkyltoluene or 4-isopropyltoluene at room temperature to a temperature of 80° C. in the presence of a Friedel-Crafts catalyst and sulfur or a sulfur-containing compound or in the presence of iron sulfide to obtain a 2,5-dichloro-4-t-alkyltoluene or 2,5-dichloro-4-isopropyltoluene without substantially forming trichlorotoluenes, and of bringing the obtained 2,5-dichloro-4-t-alkyltoluene or 2,5-dichloro-4-isopropyltoluene into contact with toluene in the presence of a Friedel-Crafts catalyst, thereby effecting transalkylation on the 2,5-dichloro-4-t-alkyltoluene or 2,5-dichloro-4-isopropyltoluene.

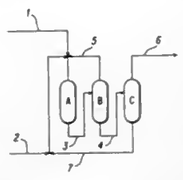
VOL 1101 ISS 3 AP 18 1989 UMI

4,822,929

PROCESS FOR THE CATALYTIC TRANS-HALOGENATION OF A POLYIODO-BENZENE, AND, IN PARTICULAR, OF A DI-IODO-BENZENE

Giuseppe Paparatto, Cinisello Balsamo, Italy, assignor to Montedipe S.p.A., Milan, Italy

Filed Aug. 5, 1987, Ser. No. 81,993
Int. Cl.⁴ C07C *17/15, 17/158*
U.S. Cl. 570—203 **13 Claims**



1. A process for the manufacture of mono-iodo-benzene by means of a catalytic trans-halogenation of a poly-iodo-benzene, characterized in in that said poly-iodo-benzene is reacted at 350°–450° C. with benzene and an oxygen-containing gas in the presence of a zeolite of the PENTASIL type, at least partially exchanged with a metal of Group II, III or IV of the Periodic System.

4,822,930

PROCESS FOR PREPARING MONOBROMINATED CYCLOBUTARENES

Ming-Biann Liu, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 22, 1987, Ser. No. 64,714
Int. Cl.⁴ C07C *21/24, 17/00*
U.S. Cl. 570—206 **32 Claims**

1. A method of preparing monobrominated cyclobutarenes consisting essentially of brominating a cyclobutarene in the presence of an organic complexing agent, an acid scavenger, or water.

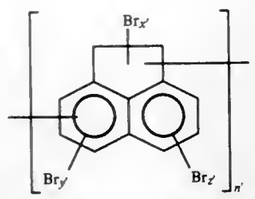
4,822,931

METHOD FOR PREPARATION OF POLYBROMOACENAPHTHENE AND/OR ITS CONDENSATE

Fumio Okisaki, Shinnanyo; Masashige Kubo, Tokuyama, and Hideo Sakka, Shinnanyo, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Nov. 18, 1987, Ser. No. 123,533
Claims priority, application Japan, Nov. 18, 1986, 61-272959
Int. Cl.⁴ C07C *17/12, 25/18*
U.S. Cl. 570—208 **6 Claims**

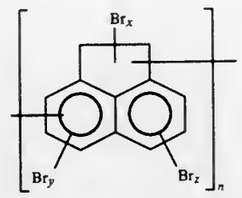
1. A method for preparing polybromoacenaphthene, condensates thereof, or mixtures thereof, each represented by the formula:



wherein n' is not less than 1, x', y' and z' are each a positive value ranging from 1–3; and y'+z' is a value ranging from 2 to 6, which comprises:

placing an iron catalyst and a halogenated hydrocarbon solvent in a reactor;

simultaneously adding a solution of an acenaphthene derivative, a condensate thereof or mixtures thereof, each represented by the formula:



wherein n is not less than 1; x, y and z are each a positive value and x+y+z is zero or one, and bromine to said reactor such that the feed ratio, on a mole basis, of bromine to acenaphthene units of the acenaphthene derivative, its condensates or mixtures thereof is 5 to 15 and such that the molar ratio of bromine introduced into the reactor relative to the acenaphthene units of the acenaphthene derivative, condensates thereof or mixtures thereof is 3 to 6; and

reacting the materials added to said reactor at a temperature ranging from 0° to 50° C.

4,822,932

HEAT RECOVERY IN PRODUCTION OF VINYL CHLORIDE BY PYROLYSIS OF DICHLOROETHANE

Gerhard Dummer, Burgkirchen; Klaus Haselwarter, Burghausen; Hermann Klaus, Markt; Ludwig Schmidhammer, Haiming, and Rudolf Strasser, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 937,710, Dec. 4, 1986, abandoned, which is a continuation of Ser. No. 779,256, Sep. 23, 1985, abandoned. This application Apr. 7, 1988, Ser. No. 178,477
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3441080
Int. Cl.⁴ C07C *17/24, 17/34, 21/06*
U.S. Cl. 570—226 **1 Claim**

1. In a method of treating the reaction product of pyrolysis of 1,2-dichloroethane at 10 to 14 bar to form vinyl chloride and hydrogen chloride with multiple stage cooling and distillation separation of the reaction product in a hydrogen chloride column and vinyl chloride column and recycle of unreacted 1,2-dichloroethane for the pyrolysis step, the said method being carried out at elevated pressure, the said pressure being controlled at the head of the hydrogen chloride column, the improvement consisting of

dissipating within 1 sec the heat of the vaporous pyrolysis product leaving the pyrolysis zone by direct cooling by injecting liquid sump product of the downstream quench column having a temperature of from 145° C. to 165° C. into the pyrolysis product to cool it from a temperature range of 480° to 540° C. down to 150° C. to 250° C. immediately after leaving the pyrolysis zone and before entering the quench column,

then charging the thus cooled product into the quench column,

recovering the vapours from the head of the quench column at temperatures of 120° C. to 140° C. after having removed any coke particles from the vaporous reaction product by scrubbing the upper gas stream in the quench column by returning condensate—obtained from the indirect heat exchangers in the further processing of the 1,2-dichloroethane pyrolysis product—as reflux to the quench column with further cooling by evaporization of this liquid reflux forming more vapour on the top of the quench column,

indirectly cooling of the vapours recovered from the head of the quench column by heat exchange to at least its condensation point in a plurality of indirect heat exchangers,

recycling a portion of the condensed product from said indirect heat exchangers to the liquid sump product of the quench column,

the heat exchange medium of each heat exchanger being at least one member of the group selected from the group consisting of

(a) 1,2-dichloroethane to be fed in heated condition to the pyrolysis unit,

(b) air used as combustion air to fire the pyrolysis zone,

(c) the sump of the hydrogen chloride column as defined above,

(d) liquid hydrogen chloride to be evaporated and,

(e) water, to dissipate heat not used within the measures according to the present invention,

and thereafter separating the hydrogen chloride from the 1,2-dichloroethane pyrolysis product by fractional distillation in the hydrogen chloride column.

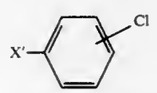
4,822,933

PROCESS FOR PRODUCING A CHLOROHALOBENZENE

Toshihiro Suzuki, and Yasushi Higuchi, both of Shizuoka, Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

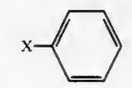
Continuation of Ser. No. 857,519, Apr. 23, 1986, abandoned, which is a continuation of Ser. No. 585,254, Mar. 1, 1984, abandoned. This application Nov. 12, 1987, Ser. No. 120,171
Claims priority, application Japan, Mar. 7, 1983, 58-36847
Int. Cl.⁴ C07C *17/12, 17/24*
U.S. Cl. 570—208 **15 Claims**

1. A process for producing a chlorohalobenzene of the formula:



(I)

with high selectivity for p-chlorohalobenzene, wherein X' is halogen; comprising: chlorinating a benzene of the formula: chlorinating a benzene of the formula:

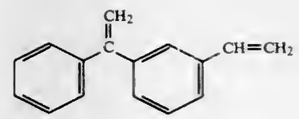


(II)

wherein:

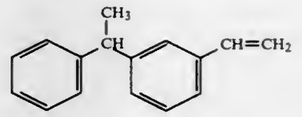
X is hydrogen or halogen, at a temperature of from 0° C. to a temperature not higher than the boiling point of the benzene in the liquid phase in the presence of a L-type zeolite catalyst,

wherein the chlorinating agent used in chlorine gas, sulfuryl chloride, N-chlorosuccimide, phosphorus pentachloride or chlorine monoxide.



(I)

2. A compound of the following formula:



(II)

4,822,934

1-(3-VINYLPHENYL)-1-PHENYLHYDROCARBONS AND METHOD FOR PRODUCING THE SAME

Isoo Shimizu; Yasuo Matsumura, both of Yokohama, and Yutaka Arai, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Japan

Filed Mar. 9, 1988, Ser. No. 165,727
Claims priority, application Japan, Mar. 12, 1987, 62-57099
Int. Cl.⁴ C07C *15/16*
U.S. Cl. 585—25 **2 Claims**

1. A compound of the following formula:

4,822,935

HYDROGASIFICATION OF BIOMASS TO PRODUCE HIGH YIELDS OF METHANE

Donald S. Scott, 382 Arden Place, Waterloo, Ontario, Canada (N2L 2N7)

Filed Aug. 26, 1987, Ser. No. 89,397
Claims priority, application Canada, Aug. 26, 1986, 516826
Int. Cl.⁴ C07C *1/00*
U.S. Cl. 585—240 **12 Claims**

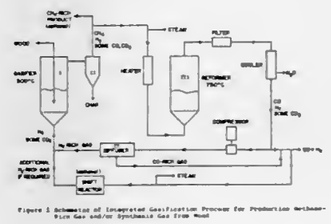


Figure 1 Schematic of Integrated Gasification Process for Production Methane-Rich Gas and/or Synthesis Gas from Wood

1. A process of hydrogasification of biomass for producing high yields of methane, said process comprising introducing biomass particles, hydrogen, particles of a catalyst that has both cracking and hydrogenation activity and heat into a reactor capable of carrying out rapid pyrolysis, mixing said biomass particles with said catalyst particles in said reactor in a hydrogen-rich atmosphere, carrying out said pyrolysis under the following reaction conditions:

(a) a temperature ranging from substantially 450° C. to substantially 600° C.;

(b) a pressure at least as high as substantially one atmosphere;

(c) a gas residence time not exceeding substantially 5 seconds;

(d) a biomass particle residence time at least as long as the gas residence time;

(e) a biomass particle size not exceeding substantially 2 mm; and recovering methane rich product gas so formed.

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4,822,936

SELECTIVE HYDROGENATION OF PHENYLACETYLENE IN THE PRESENCE OF STYRENE

Brian R. Maurer, and Mercedes Galobardes, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1987, Ser. No. 89,292
Int. Cl.[4] C07C 5/03
U.S. Cl. 585—259 10 Claims

1. A process comprising hydrogenating phenylacetylene in the presence of an excess of styrene by contacting a mixture of hydrogen and the phenylacetylene at a hydrogenation temperature of less than about 35° C. with a catalyst obtained by the reduction of a copper compound on a support.

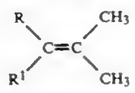
4,822,937

PROCESS FOR THE PRODUCTION OF ISOBUTYLBENZENES

Derek K. MacAlpine, and Malcolm J. Lawrenson, both of North Humberside, England, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 89,021, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 913,649, Sep. 15, 1985, abandoned. This application May 24, 1988, Ser. No. 198,685
Claims priority, application United Kingdom, Feb. 23, 1985, 8504707
Int. Cl.[4] C07C 1/00, 5/32
U.S. Cl. 585—319 13 Claims

1. A process for the production of an isobutylbenzene from a vinylcyclohexene selected from the group consisting of a vinylcyclohexa-mono-ene, a vinylcyclohexa-di-ene and a vinylcyclohexa-triene and an isoolefin having the formula:



(I)

wherein R and R^1 are independently either hydrogen or C_1 to C_6 alkyl groups, which process comprises:

(1) in a first stage contacting the vinylcyclohexene and the isoolefin with a dismutation catalyst under dismutation conditions to produce an isobutenylcyclohexene, and

(2) in a second stage contacting the isobutenylcyclohexene produced in the first stage with a dehydroisomerisation catalyst at elevated temperature to produce an isobutylbenzene.

4,822,938

PROCESSES FOR CONVERTING METHANE TO HIGHER MOLECULAR WEIGHT HYDROCARBONS VIA SULFUR-CONTAINING INTERMEDIATES

Costandi A. Andeh, Princeton; Weldon K. Bell, Pennington; Scott Han, Lawrenceville, all of N.J., and Robert E. Palermo, New Hope, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 3, 1988, Ser. No. 189,877
Int. Cl.[4] C07C 1/00
U.S. Cl. 585—324 11 Claims

1. A process for converting methane to higher molecular weight hydrocarbons, said process comprising the steps of:

(i) contacting methane with sulfur under conditions sufficient to generate carbon disulfide;

(ii) contacting said carbon disulfide of step (i) with methane and hydrogen under conditions sufficient to generate CH_3SH, whereby methane is converted along with carbon disulfide in this step (ii), and

(iii) contacting said CH_3SH of step (ii) with a sufficient catalyst under conditions sufficient to produce hydrogen sulfide and a mixture of hydrocarbons having at least two carbon atoms.

4,822,939

PROCESS FOR THE CONVERSION OF LOWER ALIPHATIC OXYGENATES TO OLEFINS AND AROMATICS WITH GALLIUM CONTAINING ZSM-5 CATALYST

Cynthia T. W. Chu, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 884,842, Jul. 11, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 163,587
Int. Cl.[4] C07C 11/20, 1/00
U.S. Cl. 585—408 7 Claims

1. A process for the conversion of a feedstock containing lower aliphatic oxygenates to provide improved yields of aromatics and light olefins comprising: contacting the feedstock under reaction conditions of about 500° C. to about 650° C. and a weight hourly space velocity of about 1 to about 10 with a catalyst consisting essentially of gallium-containing zeolite having the structure of ZSM-5; said zeolite having a silica-to-alumina ratio of about 5,000 to 35,0000 prior to gallium exchange and having at least 0.2 weight percent of zeolite gallium in tetrahedral coordination therein; and

recovering hydrocarbon product comprising a mixture of aromatic hydrocarbons, C_2–C_5 light olefins, and C_1–C_5 saturated hydrocarbons wherein the weight ratio of aromatics to saturates is at least 2 to 1, the ratio of light olefins to aromatics is at least 3:1, and wherein C_1–C_5 saturated hydrocarbons comprise less than 10 weight percent of the hydrocarbon product.

4,822,940

PROCESS FOR CONVERTING LIGHT HYDROCARBONS AND/OR NATURAL GAS TO LIQUID HYDROCARBONS

Alan A. Leff, Solon; Joseph E. Metcalfe, Aurora; Louis J. Velenyi, Lyndhurst, and Christos Paparizos, Willowick, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 17, 1987, Ser. No. 86,097
Int. Cl.[4] C07C 2/00
U.S. Cl. 585—415 26 Claims

1. A process for converting a feedstock comprising (i) hydrogen and (ii) ethylene and/or acetylene to a product comprising liquid hydrocarbons, the process comprising maintaining said feedstock in the absence or a catalyst at a temperature in the range of about 700° C. to about 1000° C. for about 100 to about 1000 millisecond.

4,822,941

CONVERSION OF ALIPHATICS TO AROMATICS OVER A ZEOLITE CATALYST

David J. Baillargeon, Princeton Junction, and Yung F. Chu, Plainsboro, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 136,215, Dec. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 14,147, Feb. 12, 1987, which is a continuation-in-part of Ser. No. 733,818, May 14, 1985, abandoned. This application Jul. 25, 1988, Ser. No. 224,258
Int. Cl.[4] C07C 2/52
U.S. Cl. 585—417 13 Claims

1. A process for producing aromatic compounds which comprises contacting under conversion conditions a feed comprising aliphatic hydrocarbons with a crystalline aluminosilicate zeolite catalyst in its acid form, having a Constraint Index in the range of about 1 to 12 and prepared by crystallizing a composition comprising an aqueous suspension of a precipitated amorphous silica or aluminosilicate precursor composed of a preponderant number of particles having a particle size in the range of about 1 to 500 microns, said composition being free of any organic directing agent and containing a dissolved alumina source if a precipitated amorphous silica is utilized or a precipitated amorphous aluminosilicate is utilized containing less than the desired amount of aluminum.

4,822,942

STYRENE PRODUCTION

Ralph M. Dessau, Edison, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 138,473, Dec. 28, 1987, abandoned. This application Jul. 1, 1988, Ser. No. 214,781
Int. Cl.[4] C07C 2/52, 12/46
U.S. Cl. 585—419 8 Claims

1. A process for producing styrene from n-octane comprising contacting n-octane over a catalyst composition, under conditions effective to dehydrocyclize n-octane to styrene, wherein the catalyst composition comprises a non-acidic crystalline microporous material containing indium and a dehydrogenation/hydrogenation metal, wherein the indium content of the composition ranges from 0.01 to 20 weight percent; wherein the dehydrogenation/hydrogenation metal comprises 0.01 to 30 weight percent and, by said contacting, producing styrene.

4,822,943

PRODUCTION OF PARA-DIISOPROPYLBENZENE

George T. Burress, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 568,012, Jan. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 429,600, Sep. 30, 1982, Pat. No. 4,469,908, which is a continuation of Ser. No. 969,630, Dec. 14, 1978, abandoned. This application Jun. 26, 1985, Ser. No. 748,883
Int. Cl.[4] C07C 2/68
U.S. Cl. 585—467 1 Claim

1. A process for the selective propylation of cumene with the selective production of meta-diisopropylbenzene and para-diisopropylbenzene, said process comprising contacting mixtures of cumene and propylene with a ZSM-12 catalyst under sufficient propylation conditions.

4,822,944

ENERGY EFFICIENT PROCESS FOR UPGRADING LIGHT HYDROCARBONS AND NOVEL OXIDATIVE COUPLING CATALYSTS

James F. Brazdil, Jr., Mayfield Village; John S. Hattenberger; Richard E. Hildebrand, both of Solon, and Joseph P. Bartek, Highland Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 11, 1986, Ser. No. 884,496
Int. Cl.[4] C07C 2/00
U.S. Cl. 585—500 3 Claims

1. A process for converting a gaseous reactant comprising methane or natural gas to higher molecular weight hydrocarbon products comprising:

(1) contacting said gaseous reactant with an oxidative coupling catalyst at a reaction temperature of at least about 900° C. for an effective period of time to form an intermediate product comprising ethane, ethylene or a mixture thereof, said catalyst being characterized by a melting point above said reaction temperature and being represented by the formula

$$SrLa_nO_x$$

wherein n is a number in the range of about 0.1 to about 100, and x is the number of oxygens needed to fulfill the valence requirements of the other elements; and

(2) pyrolyzing said intermediate product at a temperature of at least about 900° C. for an effective period of time to form said higher molecular weight hydrocarbon products using exothermic heat generated by the formation of said intermediate product.

4,822,945

PREPARATION OF DECENE OLIGOMERS AND USE THEREOF AS LUBRICATING OILS

Klaus Bronstert, Carlsberg; Helmut Mach, Heidelberg; Hans P. Rath, Gruenstadt, and Hans-Michael Walter, Ruppertsberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,342
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641237
Int. Cl.[4] C07C 2/02
U.S. Cl. 585—517 7 Claims

1. A process for the substantially complete oligomerization of decene-1 which comprises:

mixing decene-1 with an alkylaluminum chloride catalyst in a reactor in a first reaction stage in the absence of air and water at a temperature of from 0° to +25° C. and over a period of not less than 15 minutes, said mixing of decene-1 and catalyst taking place in the absence of alkyl halide cocatalyst; and

adding alkyl halide cocatalyst in a second reaction stage to the first stage reaction mixture at a temperature of from 0° to +35° C. over a period of 15 to 180 minutes.

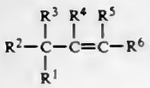
4,822,946

PREPARATION OF OLEFINS FROM TERTIARY ALKYL HALIDES

Martin Fischer, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

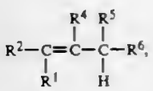
Filed Feb. 22, 1988, Ser. No. 158,614
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707903
Int. Cl.[4] C07C 1/00
U.S. Cl. 585—641 4 Claims

1. A process for the preparation of olefins of the formulae



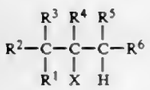
I

and



II

where R^1, R^2, R^3, R^5 and R^6 are hydrogen atoms or alkyl groups with from 1 to 6 carbon atoms and R^4 is an alkyl group with from 1 to 6 carbon atoms, by elimination of hydrogen halide from tertiary alkyl halides of the formula



III

where R^1 to R^6 are as given above and X is a chlorine or bromine atom, whose molecular weight does not exceed 280, the reaction being carried out by heating the alkyl halide suspended in water, as an aqueous reaction mixture substantially free of alcohols, to a temperature of from 40° C. to 130° C., and the olefins formed being removed continually from the reaction mixture by distillation.

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4,822,947

SEPARATION OF M-XYLENE FROM O-XYLENE BY EXTRACTIVE DISTILLATION WITH DMSO

Lloyd Berg, 1314 South Third Ave., Bozeman, Mont. 59715, and An-1 Yeh, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Continuation-in-part of Ser. No. 854,421, Apr. 21, 1986, abandoned. This application Jun. 15, 1987, Ser. No. 61,964
The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.
Int. Cl.[4] C07C *29/84;* B01D *3/40*
U.S. Cl. 585—805 1 Claim

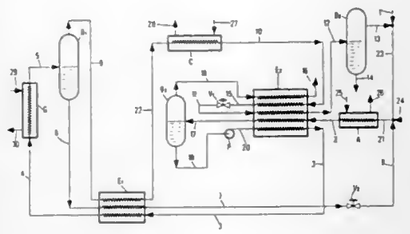
1. A method for recovering m-xylene from a mixture of m-xylene and o-xylene which comprises distilling a mixture of m-xylene and o-xylene in a rectification column in the presence of about one part of extractive agent per part of m-xylene—o-xylene mixture, recovering m-xylene as overhead product and obtaining the extractive agent and o-xylene from the stillpot, the extractive agent contains dimethylsulfoxide and at least one material selected from the group consisting of benzonitrile, phthalic anhydride, 1,4,-butanediol, hydroquinone, catechol, bis-phenol A, n-octanol, ethylene glycolphenyl ether, diisodecyl phthalate, methyl salicylate, glycerine, ethyl acetoacetate, 1,5-pentanediol, dipropylene glycol, dimethylformide, propyl p-hydroxybenzoate, ethyl salicylate, ethylene carbonate and propylene carbonate.

4,822,948

SELF-COOLED PROCESS FOR EXTRACTING HEAVY HYDROCARBON FRACTIONS

Joseph Larue, Chambourcy, and Alexandre Rojey, Garches, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 810,127, Dec. 18, 1985, abandoned. This application May 27, 1987, Ser. No. 56,343
Claims priority, application France, Dec. 18, 1984, 84 19500
Int. Cl.[4] C07C *5/48, 7/10, 7/00*
U.S. Cl. 585—834 11 Claims



1. In a process for treating a gas containing a light fraction and a heavy fraction, in order to recover at least a portion of the heavy fraction in the liquid phase, the light fraction containing at least one light hydrocarbon having 1 or 2 carbon atoms and the heavy fraction containing at least one heavy hydrocarbon having 2 to 6 carbon atoms, provided that, when the light fraction contains a hydrocarbon of 2 carbon atoms, the heavy fraction contains at least one hydrocarbon having from 3 to 6 carbon atoms, said process involving an extraction in a solvent liquid phase so selected that the solubility of the heavy fraction in the solvent is higher than that of the light fraction, and that the solvent liquid phase is substantially undistillable under the operating conditions of the process, the improvement comprising:

(a) contacting the gas with the solvent liquid phase, at least part of said contacting taking place at a temperature below room temperature, so as to selectively absorb at least a portion of the heavy fraction of the gas into said solvent liquid phase and to selectively decrease the heavy fraction content of the gas, and transferring heat from resultant mixture of gas and solvent to at least the expanded condensate of step (g) by indirect heat exchange,

(b) phase separating resultant mixture from step (a) to separately recover unabsorbed gas and resultant solvent liquid phase having selectively absorbed said at least a portion of the heavy fraction of the gas,

(c) increasing the pressure of the solvent liquid phase separated in step (b) and sufficiently increasing its temperature to desorb at least a portion of said at least a portion of the heavy fraction of the gas absorbed therein in step (a),

(d) phase separating resultant mixture from step (c) to separately recover a lean solution and a desorbed gas phase,

(e) cooling said lean solution, decreasing its pressure and feeding it back to step (a) to reconstitute at least a portion of the solvent liquid phase,

(f) cooling the desorbed gas phase so as to condense at least a portion thereof,

(g) expanding the condensate and transferring heat from the mixture of step (a) to the resulting expanded condensate indirectly so as to evaporate a portion thereof at a temperature of −50° C. to +10° C. and recover a heavy unevaporated liquid phase and a light evaporated gas phase and

(h) recovering said heavy unevaporated liquid phase.

4,822,949

PRODUCTION OF HYBRID CUCUMBER SEEDS

Shlomo Niego, Maskeret Batia; Esra Galun, and Margalith Levy, both of Rehovot, all of Israel, assignors to Yeda Research Development Company Limited, Rehovot, Israel

Filed Apr. 20, 1987, Ser. No. 39,896
Claims priority, application Israel, Apr. 20, 1986, 78745
Int. Cl.[4] A01H *1/02*
U.S. Cl. 800—1 6 Claims

1. A method for the production of F_1 hybrid cucumber seeds which comprises:

(a) growing a pollen-parent cucumber plant comprising an androecious plant which bears only male flowers and which does not produce fruit;

(b) growing a seed-parent cucumber plant which comprises a gynoecious plant which bears only female flowers and produces fruit;

(c) pollinating said seed-parent plant with pollen from said pollen-parent plant to produce fruit having F_1 hybrid seed; and

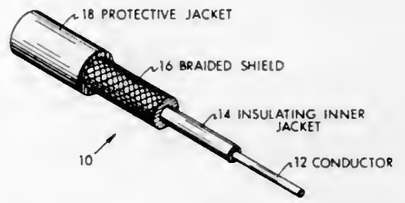
(d) harvesting said fruit and recovering the F_1 hybrid seed therefrom.

4,822,950

NICKEL/CARBON FIBER BRAIDED SHIELD

Richard J. Schmitt, 5 Linda Rd., Port Washington, N.Y. 11050

Filed Nov. 25, 1987, Ser. No. 125,190
Int. Cl.[4] H01B *7/34*
U.S. Cl. 174—36 5 Claims



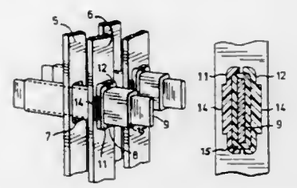
1. A shielded electrical conductor unit for transmitting electrical signals, comprising a composite having an electrically-conductive cable core, an electrically-insulating elastomeric jacket surrounding and enveloping said core, and a braided shield surrounding and enveloping said insulating jacket, said braided shield being formed from spun yarns of nickel-plated carbon fibers.

4,822,951

BUSBAR ARRANGEMENT FOR A SWITCHGEAR ASSEMBLY

Robert A. Wilson, Ancaster, and Kenneth N. Lam, Vancouver, both of Canada, assignors to Westinghouse Canada Inc., Hamilton, Canada

Filed Jun. 10, 1988, Ser. No. 205,275
Claims priority, application Canada, Nov. 30, 1987, 553092
Int. Cl.[4] H02B *1/20;* H02G *5/00*
U.S. Cl. 174—68.2 7 Claims



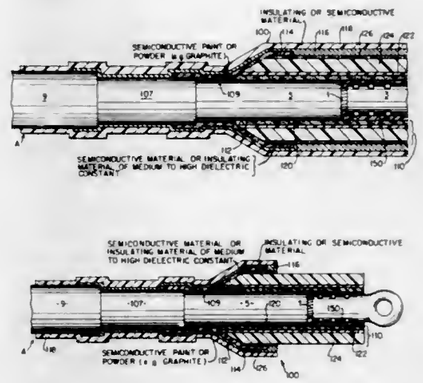
1. In a switchgear assembly, a plurality of supply riser buses, a plurality of load buses passing through apertures in said riser buses, means to support said load buses in said apertures comprising a plurality of pairs of insulating grommet blocks shaped to conform to and engage the inner edges of said apertures, each pair of grommet blocks being seated in a respective aperture and defining, by their inner surfaces, an inner aperture having dimensions greater than the dimensions of an individual load bus, insulating sleeves on said load buses surrounding said load buses where they pass through said apertures and essentially completely filling the spaces between the load buses and said inner apertures.

4,822,952

ELECTRICAL CABLE JOINT AND ELECTRICAL CABLE TERMINATION AND METHODS OF MAKING SAME

Carlos Katz, Edison; Attila Dima, Piscataway, and Bruce Bier, Warren Township, Union County, all of N.J., assignors to Cable Technology Laboratories, Inc., New Brunswick, N.J.

Filed Aug. 21, 1985, Ser. No. 767,648
Int. Cl.[4] H02G *15/068, 15/188*
U.S. Cl. 174—73.1 32 Claims



1. A joint between electrical cables, comprising:

electrical cables of the type having an electrical conductor, a coaxial insulation layer lying over the conductor, and a semiconductive insulation shield layer lying over the insulation layer, the end of the insulation layer of each cable being cut back to expose a portion of the respective conductor and the end of each semiconductor insulation shield layer being cut back to expose a portion of the respective insulation layer, the conductors being connected together, an insulating structure including

a heat-shrunk composite tube including, in successive, substantially coaxial layers, an inner semiconductive shield layer overlying said exposed portions of said conductors and extending over said exposed portions of said cable insulation layers in contact therewith, and a joint insulation layer joined to said inner semiconductive shield layer, said inner semiconductive shield layer being at least coextensive with said joint insulation layer and terminating at a distance from the ends of the semiconductive insulation shield layers of said cables; and

semiconductive coatings extending between and contacting said inner semiconductive shield layer of said tube and said semiconductive insulation shield layers of said cables.

15. A method for insulating a junction of electrical cables, each having a conductor and successive coaxial layers defining an insulation layer and an insulation shield semiconducting layer, said insulation layers having their ends cut back to exposed a portion of said conductors, and said insulation shield semiconducting layers having their ends cut back from the cut back ends of the insulation layers by at least one inch for every 10 kV of rated voltage between the conductor and ground, the expose portions of said conductors being connected together at said junction, said method comprising the steps of (1) providing a heat shrinkable composite tube comprising an inner semiconductive shield layer and an insulation layer joined to said inner semiconductive shield layer, said inner semiconductive shield layer being at least coextensive with said insulation layer and being dimensioned so as to have a length, when heat shrunk, which is predetermined on the basis of said rated voltage to be less than the distance between the cut back ends of said insulation shield semiconducting layers of said cables but greater than the distance between the cut back ends of the

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insulation layers of said cables, said composite tube being formed with feathered edges at the ends thereof, (2) positioning said composite tube over said junction such that when heat shrunk its ends will be spaced from the cut back ends of the insulation shield semiconducting layers of said cables but will overlap the cut back ends of the insulation layers of said cables, and (3) heat shrinking and composite tube.

17. An electrical cable termination comprising: an electrical cable of the type having an electrical conductor, a coaxial insulation layer lying over the conductor, and a semiconductive insulation shield layer lying over the insulation layer, the end of the insulation layer of the cable being cut back to expose a portion of said conductor to which a conductive lug is secured and the end of the semiconductive insulation shield layer being cut back from the cut back end of the insulation layer to expose a portion of said insulation layer;

a heat-shrunk composite tube including in successive, substantially coaxial layers over said exposed conductor, an inner semiconductive shield layer overlying said conductor and extending over said cable insulation layer in contact therewith, and a termination insulation layer joined to said inner semiconductive shield layer, said inner semiconductive shield layer being at least coextensive with said termination insulation layer and terminating at a distance from the cut back end of the semiconductive insulation shield layer of said cable; and

a semiconductive coating extending between and contacting said inner semiconductive shield layer of said tube and said semiconductive insulation shield layer of said cable.

31. A method for insulating a termination of an electrical cable having a conductor with a conductive lug secured thereto and successive coaxial layers defining an insulation layer and an insulation shield semiconducting layer, said insulation layer having its end cut back to expose a portion of said conductor, and said insulation shield semiconducting layer having its end cut back from the cut back end of the insulation layer by at least one inch for every 10 kV of rated voltage between the conductor and ground, said exposed portion of said conductor being joined to said conductive lug, said method comprising the steps of (1) providing a heat shrinkable composite tube comprising an inner semiconductive shield layer and an insulation layer joined to said inner semiconductive shield layer, said inner semiconductive shield layer being at least coextensive with said insulation layer and being dimensioned so as to have a length, when heat shrunk, which is predetermined on the basis of said rated voltage to be less than the distance between the end of the cable and the cut back end of said insulation shield semiconducting layer of said cable but greater than the distance between the end of the cable and the cut back end of the insulation layer of the cable, said composite tube being formed with a feathered edge at one end thereof, (2) positioning said composite tube over the end of said cable and a portion of said conductive lug such that when heat shrunk its feathered edge will be spaced from the cut back end of the insulation shield semiconducting layer of the cable but will overlap the cut back end of the insulation layer of the cable, and (3) heat shrinking said composite tube.

4,822,953

FIRE-PROTECTED ELECTRICAL CABLE CONNECTION

Gunther John, Hamburg, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

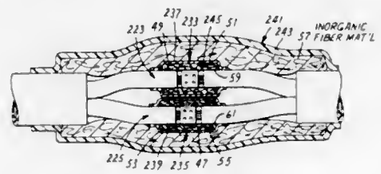
Continuation of Ser. No. 902,941, Sep. 2, 1986, abandoned. This application Sep. 25, 1987, Ser. No. 102,307

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533375

Int. Cl.[4] H02G *15/08*

U.S. Cl. 174—88 R **8 Claims**

1. An electrical cable connection comprising a plurality of core connections each having an electrically insulating and sealing core enclosure comprising a fire-resistant inorganic fiber material layer on said core connections and a shrunk sleeve thereover, and a sealing cable enclosure surrounding said core enclosures extending from a first cable sheath to a second cable sheath, said layer of fire-resistant inorganic fiber



material being capable of maintaining a substantially stable shape and being in the form of a molded body.

4,822,954

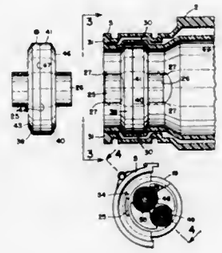
CABLE CLOSURE END CAP

Kenneth D. Rebers, and William J. Seim, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 11, 1987, Ser. No. 131,913

Int. Cl.[4] H02G *15/013*

U.S. Cl. 174—93 **26 Claims**



10. An end cap arrangement for sealing an end of a splice closure about at least one cable member directed therein; said end cap arrangement comprising:

(a) a wall member having an outer edge and at least one longitudinal cable bore; each cable bore being defined by a plurality of substantially concentric ring members spaced from one another by transverse wall sections; wherein said wall member is defined by first and second end cap members positioned against one another;

(b) mounting means constructed and arranged to mount said end cap arrangement on a cable member directed through said bore; said mounting mean including a cable slit arrangement communicating from said wall member edge to said cable bore; wherein said cable slit arrangement includes:

(i) means defining a cable slit in said first end cap member extending from an outer edge of said first end cap member through a portion of said bore therein; and

(ii) means defining a cable slit in said second end cap member extending from an outer edge of said second end cap member through a portion of said bore therein; and,

(iii) wherein said cable slits in said first and second end cap members being aligned non-co-planar with respect to one another, when said first and second end cap members are operationally positioned with respect to one another.

4,822,955

CABLE WITH A CORE SURROUNDED BY A BAND HAVING TENSILE ELEMENTS

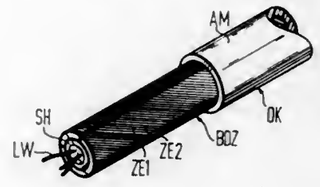
Helmut Pascher, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 2, 1988, Ser. No. 162,962

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708283

Int. Cl.[4] H01B *7/18*

U.S. Cl. 174—102 R **16 Claims**



1. In a cable having a cable core with a longitudinal axis, an elongated band having elongated edges, a plurality of tensile elements being connected to said band, said band and tensile elements being wrapped on the core with the edges of the band being adjacent to each other and extending parallel to the longitudinal axis of the core, the improvement comprising the tensile elements being wound onto the band to extend obliquely relative to the longitudinal edges of the band, to extend on both sides of the band and to be bent over the edges of said band.

4,822,956

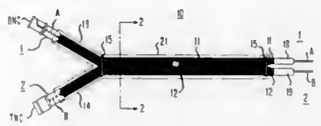
COAXIAL CABLE

Edmund N. Sepe, Ocean Township, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Aug. 11, 1986, Ser. No. 895,203

Int. Cl.[4] H01B *11/18*

U.S. Cl. 174—103 **10 Claims**



7. A plurality of coaxial cables each having an inner conductor surrounded by insulating material which, in turn, is surrounded by a metallic ground shield, the improvement comprising:

means for electrically meshing said metallic grounds shields of said plurality of cables substantially along their length, and

a plurality of clips, each attached to and surrounding said metallic ground shields, said clips being disposed beneath said meshing means and above said metallic ground shields, said clips additionally securing said metallic ground shields in contact with one another, whereby

the magnitude of the difference in any ground shield current of said plurality of coaxial cables is reduced.

4,822,957

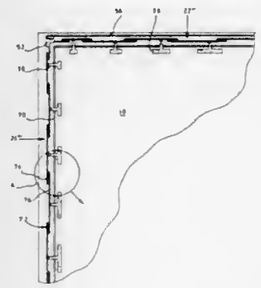
ELECTROGRAPHIC TOUCH SENSOR HAVING REDUCED BOW OF EQUIPOTENTIAL FIELD LINES THEREIN

John E. Talmage, Jr., Anderson County, and John T. Quirk, Jr., Campbell County, both of Tenn., assignors to Elographics, Inc., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 870,848, Jun. 5, 1986, Pat. No. 4,731,508, which is a continuation-in-part of Ser. No. 685,348, Dec. 24, 1984, Pat. No. 4,661,655. This application Aug. 19, 1987, Ser. No. 87,596

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **9 Claims**



1. A position touch sensor having resistive electrodes which provides a linear output response over an enhanced proportion of the surface area of said sensor by reducing the bow of equipotential lines along edges of said sensor, which comprises:

a resistive surface having a selected substantially uniform resistivity throughout said surface, said resistive surface defining perimeter edges;

a resistance element having a non-uniform resistance value per unit length positioned proximate each of said perimeter edges of said resistive surface for providing orthogonal electrical fields on said resistive surface, each of said resistance elements having opposite ends joined to proximate ends of adjoining resistance elements;

a plurality of electrodes positioned on, and electrically connected to, said resistive surface along a preselected symmetrical path proximate each perimeter edge of said surface, said electrodes each being electrically connected to selected connection points along said resistance elements and having a selected spacing and an effective length along said path;

wherein each said resistance element has at least one resistance unit interposed between adjacent selected connection points for said electrodes, each said resistance unit formed by a pair of lines of conductive material being in electrical contact with said resistive surface and space apart a selected distance and overlapping a selected length whereby said resistance unit has a resistance value established by said resistivity of said resistive surface and by said selected separation distance and said overlap length; and

wherein said length and spacing of said electrodes are selected to produce a selected voltage gradient at each of said electrodes to compensate for any cumulative voltage drop along said resistance element perpendicular to current flow in said resistive surface during operation of said sensor when said orthogonal fields are introduced into said resistive surface whereby said bow is reduced.

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4,822,958

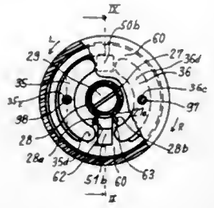
ELECTRIC ROTARY POWER TOOL APPARATUS HOLDABLE BY HAND DURING OPERATION, KIT COMPRISING THE SAME; AND NOVEL SWITCH MEANS THEREFOR

Christiaan G. M. Van Laere, Rigistrasse 4, CH-8802 Kilchberg, Switzerland

Continuation-in-part of Ser. No. 594,797, Mar. 29, 1984, Pat. No. 4,619,162, which is a continuation-in-part of Ser. No. 430,763, Sep. 30, 1982, Pat. No. 4,505,170. This application Jun. 27, 1986, Ser. No. 879,458

Int. Cl.⁴ H01H *9/00, 21/00;* **H02K** *11/00*

U.S. Cl. 200—1 V **12 Claims**



1. Electric direct current switch means having a central switch axis and a substantially planar contact zone extending normal to aid switch axis, said switch means comprising:

(1) stationary base means having an inner mounting face and an opposite outer face;

(2) first and second fixed contactor means mounted firmly in said base means and having, at outer ends thereof, each a terminal portion bearing a contactable surface region, while projecting from said inner mounting face and extending substantially in said contact plane; and lead means connected to inner ends of said contactor means and extending through said base means and out of said outer face thereof;

(3) a pivotable supporting member having at least one electrically insulating face turned toward said inner mounting face of said base means and an opposite outer face, each insulating face being spaced from and registering with a corresponding one of said contactable surface regions of said fixed contactor means; said pivotable supporting member having a peripheral rim thereabout extending radially spaced about said central switch axis;

(4) socket throughholes extending through said pivotable supporting member and each having orifices, respectively, in said opposite outer face thereof and in a correspondingly electrically insulating face thereof, said socket throughholes being adapted for receiving each a prong of an electric plug insertable therein from said opposite outer face of said pivotable supporting member, said plug being connectable to lead means from a source of electric direct current;

(5) at least two shiftable elongated and rigid contactor elements having each a contact-making section facing toward said base means, an opposite external face and a joining portion, taken in a zone perpendicular to said central switch axis, said joining portion being affixed to said pivotable supporting member in fixed engagement therewith and insulatedly spaced from one another and each located in such relation to a socket throughhole of said supporting member as to make contact between the respective contactor element and a prong inserted in the respective throughhole, and each of said contact making sections protrudes from a corresponding one of said electrically insulating faces of said pivotable supporting member;

(6) engaging means for pivotably mounting said pivotable supporting member on said stationary base means, comprising a first engaging member mounted fixedly on said inner mounting face of said base member so as to project therefrom toward said pivotable supporting member, and a second engaging member mounted fixedly on said pivotable supporting member for pivoting motion in unison therewith, and projecting therefrom toward said base means, one of said first and second engaging members having a male projection adapted for penetrating engagingly into an adjacent corresponding female portion of said other engaging members; and further comprising means for exerting forces on said first and second engaging members for urging them into engagement with one another alone said central switch axis;

(7) manual actuating means for tangentially acting on said peripheral rim of said pivotable supporting member for pivoting the same to at least one of the three positions of:

(a) an "off" position in which aid shiftable contact elements are in circuit-breaking position with regard to said fixed contactor means,

(b) a first "on" position in which a first shiftable contact element is in circuit-making contact with a corresponding first fixed contactor means and a second shiftable contact element is in circuit-making contact with a corresponding second fixed contactor means, thereby enabling direct current flow through said switch means in a given direction, and

(c) a second "on" position in which said first and second shiftable contact elements are in circuit-making contact, respectively, with said second and said first fixed contactor means, thereby enabling direct current flow through said switch means in the reverse direction, and

said actuating means being positively connected with said pivotable supporting member for rotation in unison therewith; and

(8) contact pressure-enhancing means intermediate said inner mounting face of said stationary mounting base means and said insulating face of said pivotable supporting member for urging the contact-making section of each of said shiftable contactor elements against a corresponding contactable surface region of said fixed contactor means, while said contactor elements and fixed contactor means are in an activated ("on") position.

4,822,959

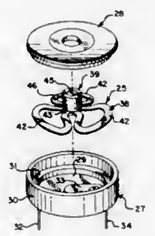
ELECTRICAL SWITCH HAVING A SNAP-ACTING SWITCH ELEMENT

Pierre P. Schwab, Port St. Lucie, Fla., assignor to Schwab-Koplin Assoc., Inc., Port St. Lucie, Fla.

Filed Jan. 25, 1988, Ser. No. 147,748

Int. Cl.⁴ H01H *13/14*

U.S. Cl. 200—5 A **25 Claims**



1. A snap-acting switch element comprising, a spring member of electrically conductive material having a plurality of generally horizontally disposed outer loops and an equal plurality of generally horizontally disposed inner loops interconnected to the outer loops where the inner loops are centrally disposed of said outer loops, said interconnected loops forming an endless ribbon with the ends of the inner loops connected to the ends of the outer loops, and an activating member of electrically conductive material interposed between said inner loops and sized to spread said inner loops and energize said spring member to a desired amount by prestressing said loops and causing the inner loops to be displaced together from a plane of said outer loops such that the switch element is generally dome-shaped, said activating member serving as a switch contact, whereby said spring and activating members coact to define a snap-acting function for said switch element such that it is capable of being used of monostable or bistable switch operation.

4,822,960

ROTARY CODING SWITCH

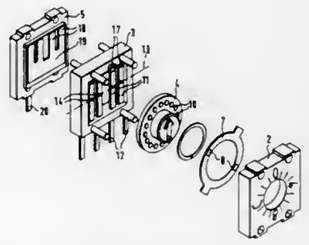
Rudolf S. Assum, Nürnberg, and Franz Sczepur, Erlangen, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Sep. 11, 1987, Ser. No. 95,188

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1986, 3631722

Int. Cl.⁴ H01H *19/60*

U.S. Cl. 200—11 R **14 Claims**



1. A rotary coding switch comprising:

a housing having a top part and a bottom part;

a contact frame disposed between said top and bottom parts;

a plurality of first contacts connected to and supported in said contact frame, each of said first contacts including a boss provided thereon;

a plurality of second contacts supported in said bottom part of said housing; and

a rotor means rotatably mounted between said top part and said contact frame, said rotor means including an underside surface which faces said first contacts and contains means defining a plurality of coding recesses;

whereby in operation of said switch, an open state of a respective first contact is defined by the boss of said respective first contact engaging in an associated coding recess in said rotor means under a normal first contact tension and a closed state of said respective first contact is defined by the underside surface of said rotor means contacting the boss of said respective first contact thereby forcing a portion of said respective first contact to contact a respective second contact.

4,822,961

SOFT BREAK SWITCH

Peter E. Hugin, 692 Distel Dr., Los Altos, Calif. 94022, and Ted N. Tilman, 3538 Telegraph Dr., San Jose, Calif. 95132

Filed Mar. 7, 1988, Ser. No. 164,658

Int. Cl.⁴ H01H *9/30, 15/00*

U.S. Cl. 200—16 R **13 Claims**

1. A soft break electrical current switch comprising: first and second conductive end terminals; coupling means mechanically connecting said first terminal to said second terminal and including

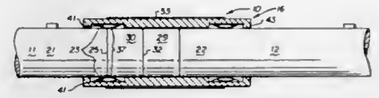
a resistor portion electrically connected to said first terminal, and

an insulator portion electrically separating said resistor portion and said first terminal from said second terminal; and

slider means moveable between a closed position and an open position and including

first contact means for engaging said first terminal when said slider means is in said closed position, for moving across and enagaging said resistor portion as said slider means is moved between said closed and open positions,

second contact means for continuously engaging said second terminal, and



a conductive sleeve for carrying and electrically interconnecting said first and second contact means;

whereby said conductive end terminals are electrically interconnected by a short circuit through said slider means when said slider means is in said closed position, said terminals are electrically connected by an increasingly resistive circuit through said resistor portion and said slider means as said slider means is moved from said closed position toward said open position, and said terminals are electrically isolated by said insulator portion when said slider means is in said open position.

4,822,962

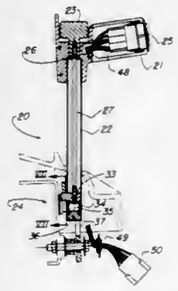
HYDROSTATIC HITCH CONTROL

Fergus J. MacCourt, Winnipeg, Canada, assignor to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 18, 1983, Ser. No. 476,486

Int. Cl.⁴ H01H *9/06*

U.S. Cl. 200—61.88 **8 Claims**



7. A vehicle control system for a hydrostatically powered tractor, said system comprising control lever means operable to select the speed and direction of movement of said tractor and being movable from neutral to fully forward and fully rearward positions, engagement means to allow said lever means to move from said neutral to said fully forward and fully rearward positions when said engagement means is disengaged, first switch means on said control lever means to control the raising and lowering of an implement, second switch means operable to define and adjust an implement operating position and third switch means operable to define automatic and manual implement positioning modes, said second switch means being inoperable when said third switch means is in said manual operating mode.

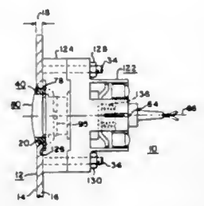
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4,822,963

VANDAL RESISTANT PUSH BUTTON ASSEMBLY

Adolf H. Martin, Glenview, Ill., assignor to Adams Elevator Equipment Co., Skokie, Ill.

Filed Jul. 10, 1985, Ser. No. 753,505
Int. Cl.[4] H01H *13/04*
U.S. Cl. 200—296 4 Claims



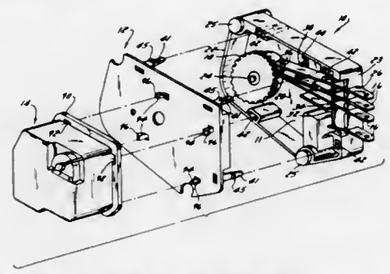
1. A vandal resistant push button assembly, comprising:
a metallic face plate having a predetermined thickness dimension;
said face plate having first and second sides each defined by a major flat surface, and an opening which extends between said first and second sides, said opening including a first shoulder immediately adjacent to said first major surface, with the metal defining the shoulder exhibiting a deformed microstructure caused by displacement of the metal originally surrounding the opening;
a metallic halo;
said halo being a tubular member having first and second axial ends, a stepped inner surface which extends between its ends, and a stepped outer surface which extends between its ends;
the stepped outer surface of said halo having a first outer surface which starts at the first end of the halo, said first outer surface stepping sharply inward to a second outer surface, after a predetermined dimension from the first end, defining a second shoulder at the transition between said first and second outer surfaces, said dimension between the second shoulder and the first end not exceeding the dimension between the first major surface of the face plate and the first shoulder;
the stepped inner surface of said halo including a first inner surface starting at the first end of said halo, said first inner surface stepping inwardly to a second inner surface after a predetermined dimension from the first end, defining a third shoulder at the transition;
means fixing said halo in the opening defined by said face plate, with the first and second shoulders in contact with one another;
a metallic push button having first and second axial ends and a stepped outer surface, the stepped outer surface of said button including a first outer surface starting at its first end and stepping radially inward to a second outer surface after a predetermined axial dimension, defining a fourth shoulder at the transition;
means mounting said button within the opening defined by said halo, for movement between first and second axial limits, with the means which mounts said button in said halo contacting the second end of said halo to define the first axial limit, and with contact between the third and fourth shoulders defining the second axial limit;
the first ends of said button and said halo defining surfaces which flow smoothly from one to another when the button is at the first axial limit;
and an electrical switch fixed to the second major surface of said face plate, said electrical switch including bias means which biases said button to the first axial limit, said electrical switch being in a first position when the button is at the first axial limit and a second position when the button is advanced against the bias of the bias means by an external force to the second axial limit defined by contact between the third and fourth shoulders.

4,822,964

SPLIT HOUSING TIMER MECHANISM HAVING SEPARATING COVER WITH SNAP-LOCK FASTENER

Claude V. Koch, Two Rivers, Wis., assignor to Paragon Electric Company, Inc., Two Rivers, Wis.

Filed Oct. 29, 1987, Ser. No. 114,456
Int. Cl.[4] H01H *9/02*
U.S. Cl. 200—303 18 Claims



5. An electrical timing device comprising:
(a) a first housing defining a cavity with a first open side and having a first set of catches spaced around said first open side;
(b) a second housing defining a cavity with a second open side and having a second set of catches spaced around said second open side; and
(c) a substantially flat intermediate cover positioned between said first and second housings;
(d) a first set of fastener finger means fixed to one side on said cover extending outwardly therefrom for cooperating with said first set of catches and for securing said first housing into an abutting and locked position with said one side of said cover thereby causing said first open side to be enclosed by said one side of said cover; and
(e) a second set of fastener finger means fixed to the other side of said cover and extending outwardly therefrom cooperating with said second set of catches for securing said second housing into an abutting and locked position with the other side of said cover thereby causing said second open side to be enclosed by said other side of said cover.

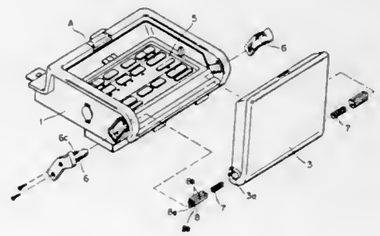
4,822,965

LID LOCKING MECHANISM IN AUTOMOBILE SWITCH PANEL DEVICE

Yukihiro Hyogo; Kikuo Kimura; Satoshi Iida, and Kazuya Arai, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 20, 1987, Ser. No. 75,507
Claims priority, application Japan, Jul. 21, 1986, 61-111618[U]; Jul. 21, 1986, 61-111619[U]
Int. Cl.[4] H01H *13/04*
U.S. Cl. 200—333 3 Claims

1. A lid locking mechanism for an automobile switch panel device constructed of an open-top case having a pair of first bearing sections at opposite sides thereof, a switch panel disposed in said open-top case, and a lid to cover said open-top case and having a pair of second bearing sections at opposite sides thereof and each second bearing section including a hole provided therein, and further wherein a shaft means is provided at each first bearing section of said open top case for engagement with one of said holes provided on each side of said lid, said lid locking mechanism comprising:
a pair of pivotal shafts, each extending from one of said shaft means into a corresponding one of said holes;
a pair of clutch members, each positioned in one of said holes, such that a clutch member and a pivotal shaft face one another with complimentary engagement faces wherein each clutch member has a clutch surface on said engagement face which is complimentary to a clutch surface on said engagement face of a corresponding one of said pivotal shafts, said clutch surfaces comprising complimentary vertical walls and complimentary inclined surfaces;
a biasing means for biasing each clutch member toward a corresponding pivotal shaft, such that said lid is maintained in a locked predetermined open angle by cooperative engagement of said clutch surfaces of said clutch member and pivotal shaft with one another, and such that said lid locking mechanism is unlocked when a closing force exceeding a predetermined torque is exerted onto the lid to close the lid;



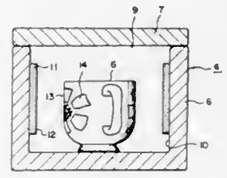
wherein each pivotal shaft includes at least one projecting portion extending in the direction of a corresponding clutch member, said projecting portion including said inclined surface on one side thereof and said vertical wall on a circumferentially opposite side thereof, and wherein each clutch member includes a projecting portion complementary to the projecting portion of said pivotal shaft and further includes said inclined surface and said vertical wall, such that said vertical walls from said clutch member and said pivotal shaft abut one another to prevent the opening of the lid in one direction, past said predetermined open angle, and said inclined surfaces allow movement of said lid in a direction opposite said one direction, said vertical walls in the clutch surfaces of the clutch members and pivotal shafts extending in an axial direction with respect thereto.

4,822,966

METHOD OF PRODUCING HEAT WITH MICROWAVES

Yuzuru Matsubara, Kitayama 220, Kitayama-cho, Owariasahi-shi, Aichi-ken 488, Japan

Continuation of Ser. No. 18,102, Feb. 20, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,968
Claims priority, application Japan, Jan. 27, 1986, 61-43091
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 M 4 Claims



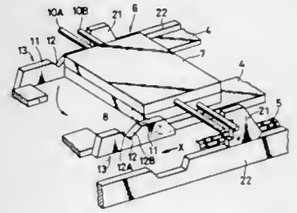
1. A method of forming a painted object which comprises the steps of: placing in a microwave oven a closed container made of heat insulating material which is substantially transparent to microwave radiation, said container containing therein a glass or ceramic object having a surface decorated with a paint containing a metal oxide, the internal wall of said container being partially covered by a layer of microwave absorption material which is adhered to said internal wall and is disposed in directly confronting relationship only to the decorated surface of said object and is spaced therefrom, said microwave absorption material comprising a substance selected from the group consisting of powdered carbon and silicon carbide; and irradiating said container with microwaves whereby to heat said layer of microwave absorption material and thereby indirectly heat said object and oxidize and bake said paint on said decorated surface of said object without deforming said object.

4,822,967

APPARATUS FOR STERILIZING SEALED FOOD STUFFS BY MICROWAVE IRRADIATION

Naoki Kumagami; Yoshihiro Nakagawa; Atsushi Yuzawa; Kiichiro Hirose; Yukie Sato, and Akihiro Shiosaka, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Mar. 3, 1988, Ser. No. 163,618
Claims priority, application Japan, Mar. 10, 1987, 62-34758[U]; Mar. 23, 1987, 62-42335[U]; Mar. 23, 1987, 62-42336[U]; Oct. 7, 1987, 62-153830[U]
Int. Cl.[4] H05B *6/78*
U.S. Cl. 219—10.55 F 13 Claims



1. A microwave heating apparatus comprising a retainer made of a material permeable to microwave and heat-resistant for containing a material to be sterilized, conveying means for conveying said retainer through a cavity being irradiated with microwave through a wave guide in a longitudinal direction, a conveying surface for slideably supporting said retainer during conveyance, supporting shaft means extending from said retainer on opposite sides of said retainer transverse to said longitudinal direction, said supporting shaft means including an upper slide surface and a lower slide surface, said upper surface being offset in said longitudinal direction with respect to said lower slide surface, retainer guide rail means having a turning-over part for operative association with said supporting shaft means to invert said retainer as it is conveyed through said cavity, said turning-over part having a turning-over groove with a first inclined surface and a second inclined surface, said turning-over groove being adapted to receive said upper slide surface of said supporting shaft means and subsequently receive said lower slide surface of said supporting shaft means to facilitate the inversion of said retainer during conveyance of said retainer through said cavity.

4,822,968

ELECTROMAGNETIC ENERGY SEAL FOR A MICROWAVE OVEN

Seok W. Chin, Busan, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 25, 1987, Ser. No. 126,254
Claims priority, application Rep. of Korea, Nov. 29, 1986, 10191/1986[U]
Int. Cl.[4] H05B *6/76*
U.S. Cl. 219—10.55 D 3 Claims

1. An electromagnetic energy seal in combination with a

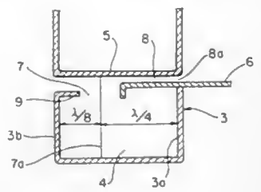
VOL 1101 ISS 3 APR 18 1989 UMI

microwave oven utilizing electromagnetic energy having a certain wavelength including an oven body having a front plate, a door hinged to the oven body, and a door frame having a first wall, a second wall, and a third wall, the three walls being formed perpendicular to each other to form a cross-sectional shape resembling a rectangular shape missing one of its lengths, the door frame being mounted at an outer peripheral edge of the door, said electromagnetic energy seal comprising:

seal means for preventing the electromagnetic energy of the microwave oven from leaking through the door;

said seal means including,

a seal plate fixed to the first wall of the door frame and disposed substantially parallel to the front plate of the oven body and substantially parallel to the second wall of



the door frame to form an opening for a cavity created by the three walls of the door frame and said seal plate, said opening having a center, said center and the first wall being spaced apart at a distance of one-quarter of the microwave oven's wavelength, said center and the third wall being spaced apart at a distance of one-eighth of the oven's wavelength, and

a bent member extending perpendicular from the third wall of the door frame and parallel to the second wall of the door frame in a direction towards the first wall of the door frame,

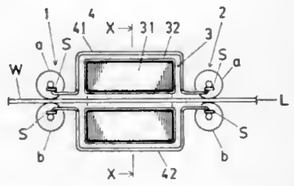
said bent member having slits with uniform width, said slits being formed at points where the electromagnetic energy's electric field component is at a maximum strength.

4,822,969

APPARATUS FOR CONTINUOUS-DIRECT-RESISTANCE HEATING OF LONG-LENGTH ARTICLES

Yugo Yao, Kanagawa, Japan, assignor to Netoren Company Limited, Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,614
Int. Cl.⁴ H05B *1/00*
U.S. Cl. 219—50 **14 Claims**



1. An apparatus for direct-resistance heating of long-length articles fed continuously being characterized by comprising the first and second roll electrodes disposed in a specified spacing along a feeding path, an annular transformer being disposed between the said first and second roll electrodes and conductive members being disposed closely along the periphery in the longitudinal direction of the said transformer, each of the said roll electrodes being such as to permit the long-length article to travel along the peripheral surface thereof in close contact therewith, the above transformer being annular through which the feeding path is provided and having a specified length with the primary coil of the transformer being wound in symmetry with respect to the feeding path, the said conductive members being in parallel and symmetry with respect to the feeding path and opposed to the said primary coil with the opposite ends thereof being connected to each roll electrode through a slider respectively, wherein the relation between the resistance **R1** of the long-length article and the resistance **R2** of the conductive member with respect to the conducting current is so set as to give

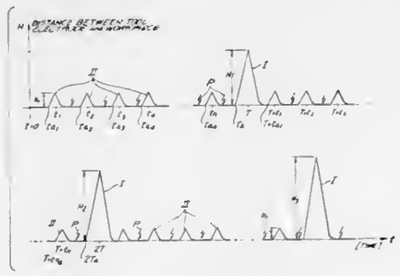
$$R1 >> R2.$$

4,822,970

METHOD AND APPARATUS FOR PURGING THE ERODING ZONE DURING ELECTROEROSIVE COUNTERSINKING

Gideon Levy, Orselina; Claudio Libotte, Gentilino; Marco Boccadoro, Verscio, and Silvano Magginetti, Locarno, all of Switzerland, assignors to AG fur industrielle Elektronik AGIE, Losone, Switzerland

Filed Dec. 17, 1987, Ser. No. 134,281
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3644042
Int. Cl.⁴ B23H *7/32*
U.S. Cl. 219—69.16 **18 Claims**



1. A method for purging the eroding zone in electroerosion countersinking wherein a tool electrode engages a workpiece in a dielectric, comprising the steps of:

(a) raising the electrode away from the workpiece to a relatively high stroke height and then lowering the electrode to the workpiece;

(b) thereafter raising the electrode away from the workpiece to a relatively low stroke height and then lowering the electrode to the workpiece; and

(c) thereafter repeating step (a); wherein step (b) is performed at least twice at different times between the performance of step (a) and step (c) and steps, (a), (b) and (c) are repeated as successive cycles.

4,822,971

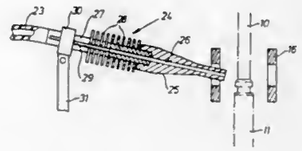
METHOD AND DEVICE FOR SOLDERING OR BRAZING

Christer C. I. Peterson, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Apr. 10, 1987, Ser. No. 36,582
Claims priority, application Sweden, Apr. 29, 1986, 8601977
Int. Cl.⁴ B23K *13/00*
U.S. Cl. 219—85.22 **8 Claims**

1. A device for joining members such as pipe-shaped elements comprising handling means for supporting a pipe-shaped elements in a soldering or brazing area, a rod-shaped solder member, a nozzle through which said solder member is fed, a single heating means comprising an inductive heating apparatus including an induction coil for heating said solder member and said pipe-shaped elements, the latter being heated to a temperature suitable for soldering or brazing, and said nozzle having a part thereof in said induction coil and said nozzle and

the solder member therein being preheated to a predetermined temperature by said induction coil prior to the solder member being fed to said pipe-shaped elements in said soldering or



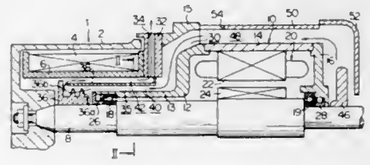
brazing area, the temperature of said solder member being increased but the solder retaining its shape and solid form until it is melted upon contact with said pipe-shaped elements.

4,822,972

BEARING COOLING APPARATUS OF HEATING ROLLER

Takami Sugioka; Shigeru Naoki, and Toshiyuki Ueno, all of Matsuyama, Japan, assignors to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Feb. 26, 1987, Ser. No. 19,130
Claims priority, application Japan, Mar. 3, 1986, 61-30305[U]
Int. Cl.⁴ H05B *6/14*
U.S. Cl. 219—10.492 **9 Claims**



1. A bearing cooling apparatus of a heating roller wherein said heating roller includes a rotatable roller, a heating coil disposed inside said rotatable roller, a cylindrical core having said heating coil wound therearound, and a rotatable shaft having said rotatable roller mounted thereon, comprising

a housing having said rotational shaft of said heating roller rotatably supported thereto by bearings attached to said housing and formed with a first passageway passing therethrough,

an annular flange having said cylindrical core attached thereto and formed with a second passageway passing therethrough, the annular flange being attached to said housing,

a cooling fin mounted on said rotational shaft between said bearing disposed adjacent said heating means and said rotatable roller, and

a partition wall extending axially from said annular flange along said rotational shaft and along said bearing disposed adjacent said heating coil and terminating short of said cooling fin so that a third passageway is defined by said housing, said partition wall and said cooling fin and a fourth passageway is defined by said cylindrical core, said partition wall and said cooling fin, the third passageway being held at one end thereof in fluid communication with said first passageway and at the other end thereof with one end of said fourth passageway, the other end of said fourth passageway being held in fluid communication with said second passageway, and

means for circulating a cooling medium through said first, second, third and fourth passageways.

4,822,973

COMPOSITE PLASTIC WITH LASER ALTERED INTERNAL MATERIAL PROPERTIES

Karsten Fahner, Winnesden-Birkmannsweiler, and Hans-Werner Depcik, Duesseldorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 716,757, Mar. 27, 1985. This application Sep. 28, 1987, Ser. No. 79,515
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411797
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121.6 **7 Claims**



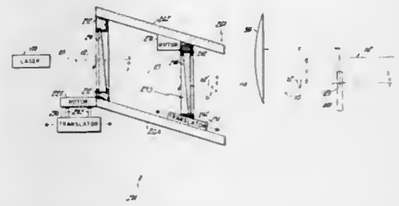
1. A composite plastic part of thermoplastic materials having good adhesion and compatability with one another and similar contraction behavior and having material properties altered by a laser beam, the composite plastic part having a thermoplastic surface layer with a layer thickness of from 0.1 to 2 mm, a light transmission value τ of greater than 0.8 and more particularly greater than 0.9 at a wavelength of from 1000 to 20,000 um, and an internal thermoplastic material region below the surface layer with a light absorption value to a depth of 2 mm of greater than 80% of incident laser beams, internal thermoplastic material region containing a subsequently laser induced change therein.

4,822,974

LASER HOLD DRILLING SYSTEM WITH LENS AND TWO WEDGE PRISMS INCLUDING AXIAL DISPLACEMENT OF AT LEAST ONE PRISM

Robert L. Leighton, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 18, 1988, Ser. No. 157,018
Int. Cl.⁴ B23K *26/06, 26/00, 26/08;* **G02B** *5/04*
U.S. Cl. 219—121.67 **7 Claims**



1. An optical system for directing a laser beam on a workpiece in a predetermined manner comprising:

first and second wedge prisms spaced at first and second prism positions along a first axis for serially deflecting said laser beam and having first and second azimuthal orientations, respectively;

means for rotating said second wedge prism to a predetermined angular position about a second prism axis parallel to said first axis, thereby defining a relative angular position of said first and second wedge prisms;

a lens, having a focal length and positioned at a predetermined focusing means distance along said first axis, for intercepting said laser beam at an interception distance from said first axis that depends on said relative angular

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position, and at a predetermined interception angle relative to said first axis after said laser beam has been deflected by said first and second wedge prisms and focusing said laser beam to a predetermined focal position, characterized in that:

at least one of said first and second prisms is connected to displacement means for displacing said prism parallel to said first axis, whereby at least one of said first and second prism positions may be varied with respect to the other of said first and second prism positions to define a relative prism displacement along said first axis, so that said interception distance may be varied by variation of said relative prism displacement as well as by variation of said relative angular position.

4,822,975

METHOD AND APPARATUS FOR SCANNING EXPOSURE

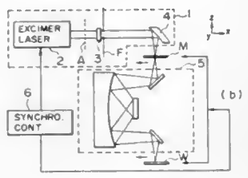
Makoto Torigoe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 45,183, Apr. 30, 1987, abandoned, which is a continuation of Ser. No. 769,772, Aug. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 694,843, Jan. 29, 1985, abandoned. This application Jul. 8, 1988, Ser. No. 217,058

Claims priority, application Japan, Jan. 30, 1984, 59-13316; Jan. 5, 1985, 60-122184

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.85 **12 Claims**



1. A method of scanning exposure, comprising:

irradiating a relatively moving object with a pulsed laser beam comprising pulses each having an intensity distribution in the direction of relative movement of the object;

wherein a relationship $V=L\cdot N$ is satisfied where V is the moving speed of the object, L is the distance between two positions in the direction of scan each corresponding to an intensity level portion which is approximately equal to a half of the maximum level of the intensity distribution of each pulse, and N is the number of pulses of the laser beam per a unit time.

4,822,976

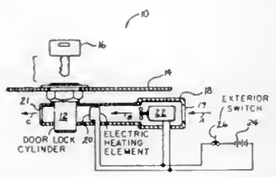
AUTOMOBILE DOOR LOCK WARMER

Pinyawat Buranathanit, 1927 St. Clair Ave., Greensburg, Pa. 15601

Filed Aug. 25, 1987, Ser. No. 89,166

Int. Cl.[4] E05B *17/00;* **H05B** *3/00;* **F24H** *3/04*

U.S. Cl. 219—202 **7 Claims**



1. In a combination with an automobile door provided with an interiorly located door lock cylinder, a new and improved automobile door lock warmer, comprising:

hollow casing means mounted in the interior of said automobile door;

said hollow casing means surrounding at least a portion of the automobile door lock cylinder;

electrical fan means in said casing means for blowing a stream of air on said portion of said door lock cylinder surrounded by said casing means;

electrical heating means in said casing means for heating said stream of air prior to impingement on said portion of said lock cylinder;

power means for supplying electrical energy to said heating means and said fan means; and

switch means for selectively activating said electrical heating means and said electrical fan means.

4,822,977

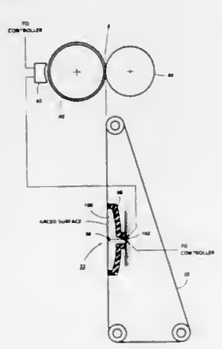
PAPER TEMPERATURE MEASUREMENT FUSER CONTROL

Walter F. Leising, Webster, and Michael Amato, Liverpool, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 20, 1987, Ser. No. 39,846

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—216 **9 Claims**



1. A fuser device comprising:

a fuser roll having a fuser roll surface,

a first temperature sensor contacting the fuser roll surface,

a pre-fuser transport establishing a paper path between a paper storage device and the fuser roll surface for conveying copy sheets to the fuser roll,

a controller, the first temperature sensor electrically connected to the controller, and

a second sensor disposed in contact with the pre-fuser transport, the second sensor electrically connected to the controller and positioned adjacent the path of said copy sheets, the second sensor being in direct contact with a copy sheet in said paper path during transport of said copy sheet to the fuser, the fuser roll temperature being controlled in response to variations in the ambient temperature at the pre-fuser transport and the temperature of said copy sheets.

4,822,978

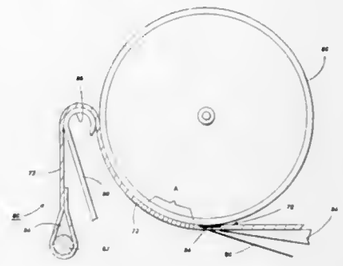
FUSER SYSTEM UTILIZING A PRESSURE WEB

Daniel L. Morris, Webster; Michael McManus, Rochester, and Robert J. Remis, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1988, Ser. No. 172,673

Int. Cl.[4] G03G *15/20*

U.S. Cl. 219—216 **4 Claims**



1. Heat and pressure fuser appratus for fixing toner images to copy substrates, said appartus comprising:

a fuser roll;

means for elevating the temperature of said fuser roll;

a pressure applying member having an elongated surface contacting said fuser roll to form a nip therebetween through which copy substrates pass with toner images carried thereby contacting said fuser roll said member having an electrically conductive surface proximate the fuser roll and means for mounting said pressure applying member and for urging substantially the entire surface thereof into pressure engagement with said fuser roll.

4,822,979

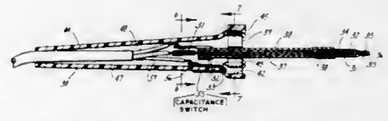
TEMPERATURE CONTROLLED SOLDERING IRON WITH A UNITARY ELECTRICALLY HEATED SOLDERING TIP AND THERMOCOUPLE

Cornelius T. deKam, 24565 Tamarack Cir., Southfield, Mich. 48075

Filed Jan. 2, 1987, Ser. No. 204

Int. Cl.[4] H05B *1/02;* **B23K** *3/02*

U.S. Cl. 219—241 **15 Claims**



1. In a temperature controlled soldering iron of the type having a soldering tip heated by an electric heating element and wherein a thermocouple is used for sensing and controlling the temperature of the soldering tip, the improvement which comprises:

at least one common pair of conductors made from dissimilar metals joined together to unitarily provide said soldering tip, the electric heating element for heating said tip and said thermocouple for sensing the temperature of the tip, the end portion of one conductor being joined to a portion of the other conductor to provide said soldering tip and the other end portion of said one conductor and an end portion of the other conductor being operatively connected to a power supply such that when current is supplied to the conductors, the soldering tip is electrically heated and a voltage is generated by said joined portions indicative of the temperature of said tip;

a handle for supporting said pair of dissimilar conductors;

means for mounting the pair of dissimilar conductors to said handle with said soldering tip extending outwardly from an end thereof;

said power supply operatively connected to the dissimilar conductors supplying current to said conductors to heat said soldering tip to generate said voltage for sensing the temperature of said tip; and

an electronic temperature control circuit operatively connected to said pair of dissimilar conductors and including means for regulating the temperature of said tip in response to said generated voltage.

4,822,980

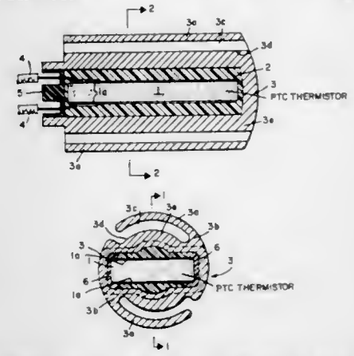
PTC HEATER DEVICE

Douglas C. Carbone, Standish, and Lee A. Prager, Raymond, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 4, 1987, Ser. No. 45,114

Int. Cl.[4] H05B *1/02, 3/00, 3/82;* **H01C** *7/02*

U.S. Cl. 219—315 **12 Claims**



1. A heating device adapted to be disposed in an elongated opening in a side wall of a vessel containing fluids to be heated, said device including:

a PTC thermistor having a pair of opposite sides and an elongated thermally conductive housing disposed about said PTC thermistor, said housing being adapted to conduct heat to said vessel from said PTC thermistor and further being adapted to be disposed inside of a receptacle;

means to conduct heat from said housing, said means including at least one arcuate, resilient, heat-dissipating elongated fin extending from a juncture on an outer side of said housing and extending lengthwise of the housing and overlying the outer surface thereof in spaced relation thereto, whereby to engage walls of the receptacle; and

means extending into said housing to conduct current to opposite sides of said PTC thermistor.

4,822,981

SELF-REGULATING WARMER DEVICE FOR FOOD PRODUCTS

Roderick J. Chaudoir, Milwaukee, Wis., assignor to Hatco Corporation, Milwaukee, Wis.

Filed Jun. 19, 1987, Ser. No. 63,665

Int. Cl.[4] H05B *3/14*

U.S. Cl. 219—385 **7 Claims**

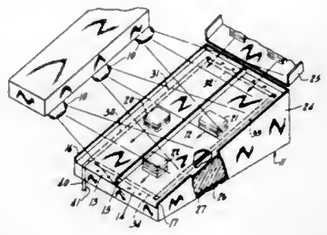
1. A self-regulating, food warmer unit comprising:

support means for individual food servings and comprising a relatively flat sheet having an exposed surface for receiving a plurality of food servings, and an oppositely disposed undersurface, and

a self-regulating electric heater element, said heater element comprising an elongate, continuous strip including spaced apart electrical conductors and a conductive material containing a mixture of a temperature actuated, expansible/contractible synthetic resin and particles of conduc-

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tive material, said strip disposed in a meandering configuration positioned on the undersurface of said sheet,
said conductive material being positioned between and in electrical engagement with said conductors,
the conductive material being characterized by expansion of said resin in localized areas proximate to said individual food servings when said individual food servings are at temperatures above a preselected temperature, and contraction of said resin when the temperature of an individual serving is reduced below the preselected temperature,



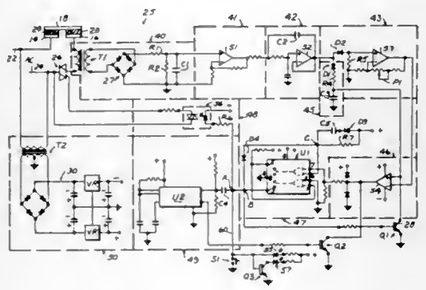
whereby individual conductive particles are separated relative to one another during resin expansion to cause an increase in electrical resistance of said conductive material to thereby reduce current flow between the said electrical conductors, and vice versa during localized contraction of the synthetic resin caused by exposure to individual food servings of reduced temperature to thereby reduce electrical resistance and increased current flow between said conductors.

4,822,982

AUTOMATIC CIRCUIT CONTROL FOR ELECTRICAL RESISTANCE COOKING APPARATUS

Maurice W. Lee, Jr., P.O. Box 25, Boley, Okla. 74829

Filed Sep. 8, 1987, Ser. No. 93,943
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **13 Claims**



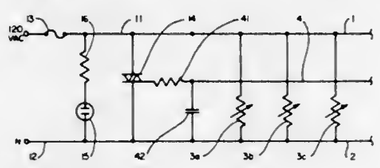
1. A food cooking control for an electric resistance cooker in which the magnitude of the RMS value of electrode current generated from an AC source passing through food interposed between electrodes increases, peaks and declines to a predetermined value before the food is cooked, the improvement comprising:
an electric supply circuit;
thyristor means arranged in series in the electric supply circuit,
said thyristor means including a gate control element having a gate voltage supply circuit;
switch means in said gate voltage supply circuit for closing the gate voltage circuit and rendering said thyristor means conductive;
switch means in said gate voltage supply circuit for closing the gate voltage circuit and rendering said thyristor means conductive;
current detection means including a current transformer and a filter/amplifier/comparator circuit connected with the electric supply circuit for sensing the change of the RMS value of current through the food as a function of its cooked condition;
capacitor means in the current detection circuit for storing a charge of the current peak as a reference voltage value; and,
switch operator means including a latching relay circuit interposed between said current detection means and said switch means for maintaining said thyristor means conductive and responsive to the current detection means for opening the gate voltage supply circuit in response to cooking current decline equal in value to a predetermined percent of the current peak reference voltage across said capacitor means.

4,822,983

ELECTRICAL HEATERS

Robert Bremner, San Francisco; Hugh Duffy, Cupertino, and Burton E. Miller, Sunnyvale, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 5, 1986, Ser. No. 938,659
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—505 **47 Claims**



1. An electrical heating assembly which comprises
(1) an electrical heater which comprises
(a) two electrodes which can be connected to a source of electrical power;
(b) a resistive heating element which is connected in parallel between the electrodes and which comprises a conductive polymer composition;
(c) a sensor conductor;
(d) a second conductor; and
(e) an insulating element which
(i) insulates the sensor conductor from the second conductor at all temperatures up to 250° C., and
(ii) if the heater is subject to an arcing fault, permits current to flow between the sensor conductor and the second conductor; and
(2) an electrical safety system which, when the electrodes of the heater are connected to a suitable power source,
(a) permits the electrodes to remain connected to the power source under normal operating conditions,
(b) does not compare the currents in the electrodes, and
(c) is connected to the sensor conductor so that if current flows between the sensor conductor and the second conductor, the heater is substantially disconnected from the power source.

4,822,984

PROCESS FOR ELECTRONIC PAYMENT USING A MEMORY

Patrick Remery, 8 Avenue de la lére Armée Francaise, 14000 Caen, France, and Jean-Pierre Boule, 12 Rue de la Résistance Soliers, 14540 Bourguebus, France

Filed Dec. 2, 1986, Ser. No. 936,775
Claims priority, application France, Dec. 2, 1985, 85 17778
Int. Cl.[4] G06K *5/00;* **G07F** *7/08*
U.S. Cl. 235—375 **8 Claims**



1. An electronic payment method representative of credits in a memory comprising the steps of:
writing in the memory a first set of 1 bits into a first zone denominated as a payment zone and an identical set of 1 bits in a second zone denominated as a reloading zone, said first and second zones having each a first bit and a last bit, with bits having a rank denominated from a first rank for the first bit to a last rank for the last bit,
writing in said reloading zone a 0 in place of a 1, for obtaining an end point indicated as a first stop-bit, said first stop-bit having a given rank,
a first counting step for a first payment operation, of a first amount in said payment zone from said first bit an amount of bits equal to 1, to a second bit having a second rank, equal to the rank of said first bit plus a number of bits indicative of said first amount,
checking whether said second rank of said second bit is not larger than said rank of said first stop-bit, and if so changing said second bit from 1 to 0,
a second counting step for a second payment operation, of a second amount, in said payment zone, from said second bit, which has been set equal to 0 after said first payment operation, a second amount of bits equal to 1, which gives a third bit having a third rank, checking whether said third rank of said third bit is not larger than said rank of said stop-bit, and if so changing said third bit from a 1 to 0,
and repeating said second counting step until said rank of said stop-bit is exceeded by the count.

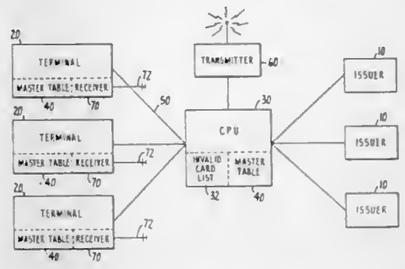
4,822,985

TRANSACTION APPROVAL SYSTEM

Elvis W. Boggan, Concord, Calif., and Carl M. Campbell, Jr., Newtown Square, Pa., assignors to Visa International Service Association, San Mateo, Calif.

Filed Jan. 6, 1987, Ser. No. 596
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **29 Claims**

1. In a transaction network including a central processor, a plurality of transaction terminals and a plurality of transaction cards, each card having an account number associated therewith, a method for identifying invalid cards comprising the steps of:
(a) generating a master table at said central processor, said table including at least a first bit map B bits in length;
(b) selecting a set of digits from the account number of a first invalid transaction card;
(c) calculating a first index value which is an algorithmic function of said set of digits, said first index value being between zero and B-1;
(d) placing an indicator within said first bit map corresponding to said first index value;
(e) repeating steps b though d for each invalid card; and
(f) supplying the master table to each transaction terminal whereby during a transaction, the transaction terminal



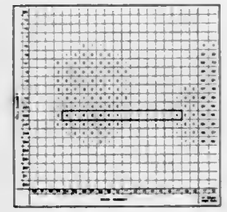
determines if an indicator exists in the master table corresponding to the account number of the card presented for the transaction.

4,822,986

METHOD OF DETECTING AND READING POSTAL BAR CODES

Rodney K. Guthmueller, Lewisville, and Richard K. Habitzreiter, Dallas, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Apr. 17, 1987, Ser. No. 40,267
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—462 **10 Claims**



1. A method of reading a bar code containing tall and short bars on a document, comprising the steps of:
detecting blackness levels of markings on the document;
generating cells of video data, each cell having a gray weight value corresponding to the detected blackness level of a small area of the document; and
analyzing the gray weight values to determine the positions of tall and short bars in the bar code.

4,822,987

METHOD AND APPARATUS FOR PROVIDING FUEL ROD IDENTIFICATION TO PERMIT TRACEABILITY DURING MANUFACTURE AND USE

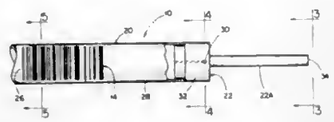
Mark P. Goldenfield, Columbia; David V. Lambert, St. Matthews, and Hassan J. Ahmed, Columbia, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 25, 1988, Ser. No. 148,326
Int. Cl.[4] G06K *1/12, 19/06*
U.S. Cl. 235—462 **42 Claims**

1. In a nuclear fuel rod identification system, a method of applying a bar code on a fuel rod cladding tube, comprising the steps of:
(a) positioning a fuel rod cladding tube with its end portion extending into a sealed chamber of a workstation;
(b) maintaining a gaseous atmosphere substantially consist-

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ing of an argon-oxygen mixture within the sealed chamber; and



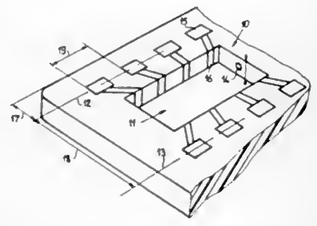
(c) engraving a bar code directly on a circumferential surface portion of the cladding tube end portion.

4,822,988

CARD CONTAINING A COMPONENT AND A MICROMODULE HAVING SIDE CONTACTS

Jean P. Gloton, Aix En Provence, France, assignor to Eurotechnique, Rousset, France

Filed Nov. 5, 1986, Ser. No. 927,182
Claims priority, application France, Nov. 8, 1985, 85 16603
Int. Cl.⁴ G06K *19/00*
U.S. Cl. 235—492 **9 Claims**



1. A flat plastic card containing an integrated circuit, said card having a first and a second parallel main face and a cavity formed in said first face and containing a micromodule, said cavity having a bottom and lateral walls, said micromodule incorporating an integrated circuit chip and electrical connections for supplying electrical signals to and from said chip, a plurality of conductive pads on said first face, said conductive pads adapted for matching with contacts of a card reading apparatus when said card is removably inserted within such a reading apparatus, a plurality of conductive leads, each extending from one conductive pad on said first face and having a portion on a lateral wall of said cavity, said electrical connections of the micromodule each being in contact with said portion of a respective conductive lead when said micromodule is in place in the cavity.

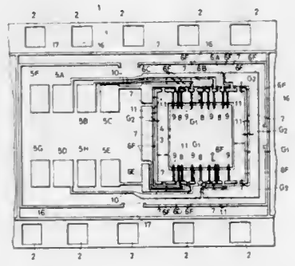
4,822,989

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THEREOF

Keiji Miyamoto, Ibaragi; Atsushi Nakamura, Kokubunji; Tsuneo Satoh, Tachikawa; Kazuo Kojima, Tokorozawa, and Masayuki Morita, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1987, Ser. No. 52,386
Claims priority, application Japan, May 21, 1986, 61-114590; May 26, 1986, 61-119220
Int. Cl.⁴ G06K *19/06*
U.S. Cl. 235—492 **41 Claims**

1. A semiconductor device comprising a wiring substrate in which wiring patterns having a plurality of leads electrically connected with a plurality of electrical pads of an IC chip and wirings for electrically connecting said leads with external electrodes are formed at the surface of an insulation medium and an IC chip contained within a hole of said wiring substrate which is formed for inserting said IC chip in said wiring substrate, the plurality of electrode pads of said IC chip and the plurality of leads of said wiring substrate being respectively electrically connected with each other, and the entire surface of said IC chip and the corresponding periphery thereof, extending partly unto said wiring substrate, being coated with a surface protecting layer made of resin, wherein there is further included a plurality of leads respectively extending from the surface of said wiring substrate to a portion above said hole and



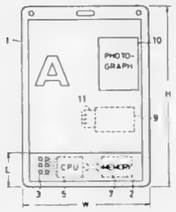
each being in contact with a corresponding one of said plurality of electrode pads of said IC chip which is contained within said hole, and barrier portions which are formed along the surface of said wiring substrate adjacent to the circumferential edge of said hole for controlling and limiting the outwardly flowing range of said protecting layer at the surface of said wiring substrate before coagulation of the surface protecting resin material.

4,822,990

ADMISSION CONTROL SYSTEM HAVING A TRANSPONDER ACTUATED BY AN INQUIRY SIGNAL

Masuo Tamada, Kanagawa; Tsutomu Tanaka, Tokyo, and Hideo Matsuoka, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 20, 1986, Ser. No. 932,596
Claims priority, application Japan, Nov. 29, 1985, 60-269159
Int. Cl.⁴ G06K *19/00*
U.S. Cl. 235—492 **11 Claims**



1. An admission control system for administering a controllable admission of a selected person to a place provided with at least one primary entrance to the place and subdivided into at least two sections, each section being provided with at least one secondary entrance to the section, the admission control system comprising:

portable means including a transponder to be carried by the person, for generating an identification code assigned to the portable means, in response to a reception of an inquiry radio wave which actuates the transponder;

primary admission control means to be located at the primary entrance, for granting an admission to the person, including:

first radio wave transmitter means for transmitting the inquiry radio wave,

first receiver means for receiving the identification code from the portable means when said identificatio code is generated by said portable means in response to said inquiry radio wave generated by said first radio wave transmitter means,

first memory means for memorizing admissible identification code, and

first gate means for granting admission to the person only when the identification code from the portable means carried by the person coincides with one of the admissible identification codes memorized in the first memory means;

secondary admission control means to be located at the secondary entrances for detecting a passage of the person, including:

second radio wave transmitter means for transmitting the inquiry radio wave,

second receiver means for receiving the identification code from the portable means when said identification code is generated by said portable means in response to the inquiry radio wave generated by said second radio wave transmitter,

second gate means for detecting the passage of the person, and

second memory means for recording the identification code received by the second receiving means and the passage detected by the second gate means; and

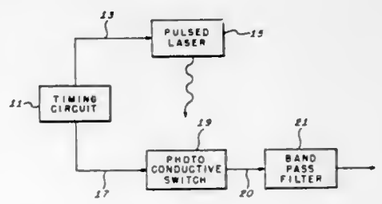
means for determining the location of the person within the place based at least in part on the identification code recorded in the second memory means.

4,822,991

OPTICALLY SWITCHED MICROWAVE PULSE GENERATOR

Robert F. Riggs; Lawrence H. Gilligan, and James D. Halsey, all of Charlottesville, Va., assignors to Sperry Marine Inc., Charlottesville, Va.

Filed Nov. 9, 1987, Ser. No. 118,812
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—211 J **4 Claims**



1. A radio frequency signal generator comprising:

means for providing a pulse of optical energy in response to an electrical trigger signal;

electrical signal means for providing an electrical trigger signal of predetermined duration to said optical energy means, thereby causing an optical energy pulse of said predetermined duration, and for providing a constant amplitude electrical signal commencing at a time prior to commencement of said electrical trigger signal and terminating at a time after termination of said electrical trigger signal;

light energy sensitive means coupled to receive said constant amplitude electrical signal and positioned to be illuminated by said pulse of optical energy for coupling said electrical signal to an output port for a time interval equal to said predetermined duration of said pulse of optical energy; and

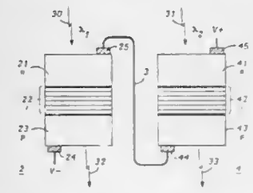
filter means coupled to said output port for providing an alternating current electrical signal having a preselected center frequency and a predetermined bandwidth.

4,822,992

WAVELENGTH CONVERSION USING SELF ELECTROOPTIC EFFECT DEVICES

Israel Bar-Joseph, Highlands; Daniel S. Chemla, Rumson, and David A. B. Miller, Fair Haven, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 31, 1987, Ser. No. 140,079
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—211 J **22 Claims**



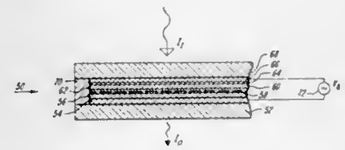
1. An optical device comprising first means including a quantum well region and second means including a quantum well region, said first means connected electrically in series with said second means for electrically controlling an optical absorption in the quantum well region of said second means, said second means for changing said optical absorption in response to said electrically controlling by said first means, wherein the improvement comprises said quantum well region of said first means including semiconductor material having a predetermined optical response characteristic at a first wavelength, said quantum well region of said second means including semiconductor material having said predetermined optical response characteristic at a second wavelength, and said first and second wavelengths are different from each other.

4,822,993

LOW-COST, SUBSTANTIALLY CROSS-TALK FREE HIGH SPATIAL RESOLUTION 2-D BISTABLE LIGHT MODULATOR

Robert F. Dillon, Stoneham, and Cardinal Warde, Newtonville, both of Mass., assignors to Optron Systems, Inc., Waltham, Mass.

Division of Ser. No. 15,055, Feb. 17, 1987. This application Feb. 25, 1988, Ser. No. 160,184
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—213 R **7 Claims**



1. A low cost substantially cross-talk free voltage driven high spatial resolution two-dimensional light modulator responsive to two-dimensional input signals of variable intensity, comprising:

a first planar two-dimensional transparent substrate;

a first planar two-dimensional transparent conductor disposed on one surface of said transparent substrate;

a planar two-dimensional electroluminescent phosphor thin film layer having a predetermined thickness disposed on

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the exposed surface of said first transparent conductor, said predetermined thickness being selected to provide a predetermined capacitance and a predetermined resistance for said electroluminescent phosphor film;

an opaque mask having a plurality of apertures disposed on said electroluminescent phosphor thin film layer, said plurality of apertures having predetermined dimensions and spacing to provide an array of pixels having an intended degree of cross-talk isolation for a given spatial resolution;

an input planar two-dimensional photoconductor thin film layer having a predetermined thickness disposed on the exposed face of said opaque mask, said predetermined thickness being selected to provide a predetermined capacitance and a predetermined dark resistance for said photoconductor thin film layer and to tune said light modulator to a predetermined input signal intensity threshold level;

a second planar transparent two-dimensional conductor disposed on said photoconductor thin film layer; and

means coupled to said first and second conductors for biasing said first and second conductors with a predetermined voltage; and wherein

said predetermined capacitance of said electroluminescen tphosphor thin film layer is substantially smaller than a predetermined capacitance of said photoconductor thin layer film and said predetermined dark resistance of said photoconductor thin film layer is greater than said predetermined resistance of said electroluminescent phosphor thin film layer wherein

said light modulator is responsive to the two-dimensional input signals of variable intensity less than said predetermined input signal intensity threshold level to cause said electroluminescent phosphor thin film layer to produce output intensities proportional to the intensity of the two-dimensional input signals; and wherein

said light modulator is responsive to the two-dimensional input signals of variable intensity of at least said predetermined input signal intensity threshold level to cause said electroluminescent phosphor thin film layer to produce a constant output intensity which is thereafter independent of the intensity of the two-dimensional input signals; and further wherein

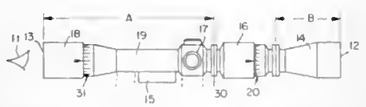
said constant output intensity of said electroluminescent thin layer film is greater than said predetermined input signal intensity threshold level of said photoconductor thin film layer to provide optical gain for said light modulator.

4,822,994

SMALL ARMS SIGHT FOR USE DURING DAYLIGHT AND NIGHTTIME CONDITIONS

Charles B. Johnson, Ft. Wayne, Ind., and Francis J. Augustine, Fairfax, Va., assignors to ITT Electro Optical Products a Division of ITT Corporation, Roanoke, Va.

Filed Sep. 23, 1987, Ser. No. 99,926
Int. Cl.[4] H01J *31/50*; F41G *1/38*
U.S. Cl. 250—213 VT **12 Claims**



1. A sight apparatus for sue in conjunction with firearms to enable a user of the firearm to operate the same during daylight as well a low light or nighttime conditions, comprising:

a first housing section having a first end and a second end, a port for receiving light located at said first end and first coupling means located at said second end;

a second housing section having a third end and a fourth end, second coupling means located at said third end and a port located at said forth end for viewing received light via the eye of a user;

a lens assembly positioned in at least one of said first and said second housing section for increasing the visual angle when viewing said received light during daytime conditions; and

an image intensifier module housing having an internal hollow for accommodating an image intensifier means to enable said user to view images at said increased visual angle during nighttime operation, said image intensifier module having two opposed ends, first coacting coupling means located at one of said opposed ends and second coacting coupling means located at the other of said opposed ends,

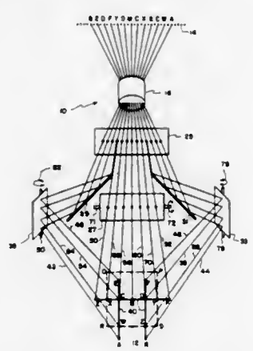
wherein in a first arrangement said first coupling means is selectively coupled directly to said second coupling means for operation in daylight conditions and in a second arrangement said first coupling means is selectively coupled to said first coacting coupling means and said second coacting coupling means is coupled to said second coupling means for operation in nighttime conditions.

4,822,995

LINEAR ARRAY MIRROR SYSTEM

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 16, 1987, Ser. No. 121,696
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—216 **27 Claims**



1. Apparatus for use in an optical system which includes imaging means for imaging radiation from a remote object on a linear array of detectors, comprising:

first reflecting means for directing radiation from a first line on the remote object to the imaging means to be imaged on a first portion of the array; and,

second reflecting means for directing radiation from a second line on the remote object to the imaging means to be imaged on a second portion of the array, the first and second lines being non colinear.

4,822,996

ICE BIN LEVEL SENSOR WITH TIME DELAY

LeRoy Lind, Minnetonka, Minn., assignor to King-Seeley Thermos Company, Prospect Heights, Ill.

Continuation of Ser. No. 847,917, Apr. 3, 1986, abandoned. This application Jun. 3, 1988, Ser. No. 205,608
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—222.1 **19 Claims**

1. An electrical circuit for use in a refrigeration device having an ice making device, an ice bin for receiving ice produced by said ice making device, said electrical circuit controlling said ice making device to cause said device to provide ice when the accumulated ice in said bin is below a predetermined level said circuit comprising:

a light source,

a light sensitive element spaced from said light source such that when said ice is above said predetermined level, the light path between said light source and said light sensitive element is interrupted, said light sensitive element producing a current proportional to the level of light it receives,

current-to-voltage convertor means which receives a current signal from said light sensitive element and converts said signal to a voltage signal,

peak detector means comprising at least one first operational amplifier having at least one diode providing feedback to said operational amplifier for detecting the peaks of said voltage signal from said current-to-voltage means,

threshold detector means comprising at least one second operational amplifier for passing the signal from said peak detector means only if said signal exceeds a predetermined threshold, and

time delay means which provides an output which controls said ice making device only after the signal from said threshold detector means exists for at least a first predetermined time duration, such that when said ice is below said predetermined level for said first predetermined time duration, said time delay means activates said ice making device, said time delay means further maintaining said output until said signal from said threshold detector does not exist for a second predetermined time duration, such that when said ice is above said predetermined level for said second predetermined time period, said time delay means deactivates said ice making device,

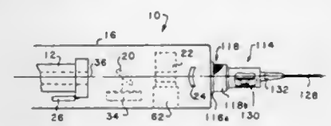
said time delay means comprising at least one third operational amplifiifier having an input and at least one resistor and capacitor circuit connected to the input of said third operational amplifier, said resistor and capacitor circuit also being connected to said threshold detector and defining a time constant which in turn defines both said first and said second predetermined time durations,

wherein said time constant is selected such that the discharge of ice from said ice making device does not deactivate said ice making device if the level in said bin is below said predetermined level, and

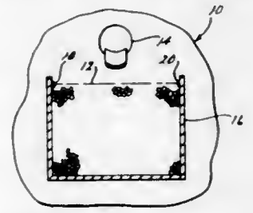
wherein said time constant is further selected such that the momentary displacement of ice in said bin during vending will not activate said ice making device.

conductor for storing a cumulative usage value representative of cumulative usage of the conductor,

circuit means responsive to the signal and operatively associated with the memory means for generating from the signal a usage value and for generating from the usage



value and the cumulative usage value an updated cumulative usage value representative of the total cumulative usage of the conductor, and for replacing the cumulative usage value in the memory means with the updated cumulative usage value.



4,822,997

APPARATUS FOR AND METHOD OF MEASURING AND/OR CONTROLLING THE USE OF FIBER OPTIC CONDUCTORS

Terry A. Fuller, Highland Park, and Anish A. Ukani, Wheeling, both of Ill., assignors to Fullen Research Corporation, Vernon Hills, Ill.

Filed Nov. 4, 1987, Ser. No. 117,119
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **27 Claims**

1. Apparatus for determining the usage of an optical conductor, comprising:

means for generating a signal representative of usage of the conductor,

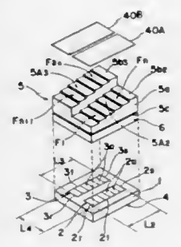
non-volatile memory means operatively associated with the

4,822,998

SPECTRAL SENSOR WITH INTERFERENCE FILTER

Satoshi Yokota; Masami Sugiyama; Nobukazu Kawagoe, all of Toyonaka, and Tomoko Miyaura, Habikino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 12, 1987, Ser. No. 49,287
Claims priority, application Japan, May 15, 1986, 61-111497; May 15, 1986, 61-111498; Aug. 8, 1986, 61-187360; Oct. 14, 1986, 61-245084
Int. Cl.[4] G01J *3/51*
U.S. Cl. 250—226 **12 Claims**



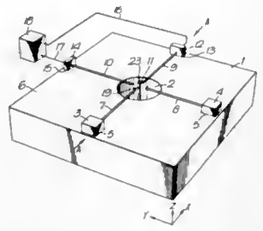
7. A spectral sensor comprising:

filtering means for transmitting and dividing incident light into a plurality of light components having different wavelengths, the respective wavelengths being continuously or stepwisely varied in accordance with the position of the incident light, and

light receiving means for receiving the light transmitted through the filtering means to convert the respective intensities of the plurality of light components into corresponding electrical signals, said light receiving means including a plurality of light receiving arrays, each of said light receiving arrays including a plurality of light receiving elements arranged within an imaginary circle having a diameter smaller than the sum of lengths of all of the light receiving arrays.

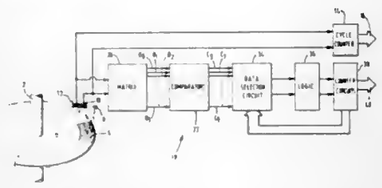
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4,822,999
APPARATUS AND METHOD FOR DETECTING MOVEMENT OF AN OBJECT
David T. Parr, 26 Smithy Brow, Near Warrington, Cheshire, United Kingdom
Filed Apr. 29, 1987, Ser. No. 43,696
Claims priority, application United Kingdom, May 1, 1986, 8610654
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 12 Claims



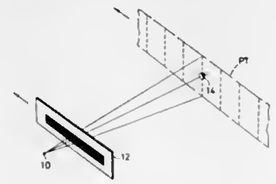
1. Apparatus for determining movement comprising: a body; at least one detector; at least one source for propagating polychromatic light along a path to the detector, the source and the detector each being mounted on or in the body, the detector comprising at least first and second photo-responsive elements, the responsivity with respect to wavelength of the first element being different from that of the second; radiation modulation means supported by the body such that a change in the movement of the body in at least one direction causes a displacement of the radiation modulation means in the said path such as to vary the distributed spectral content of the light reaching the one or more detectors; and analysis means for calculating, from the signals from the photo-responsive elements, the colour of the radiation incident on the one or more detectors as represented by two or more Chromaticity (CIE) Diagram parameters, so as to determine the change in the movement of the body.

4,823,000
APPARATUS FOR INDICATING THE VALUE OF A VARIABLE
Peter D. Onyon, Leicester, United Kingdom, assignor to Rank Taylor Hobson Limited, England
Filed Sep. 23, 1987, Ser. No. 100,020
Claims priority, application United Kingdom, Oct. 3, 1986, 8623752
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE 15 Claims



1. Apparatus for indicating the value of a variable comprising means for deriving a series of similar signals which change cyclically as said variable changes and which have different phases; means for storing a count representing the number of said changing signals which have achieved a predetermined condition; means for determining from some of said changing signals whether said stored count represents the number of said changing signals which have actually achieved said predetermined condition and providing a result representing the outcome of said determination and count changing means responsive to said result provided by said determining means to change said count in the event that said result indicates that said count is not consistent with the number of said changing signals which have actually achieved said predetermined condition so that said count as changed is consistent with the number of said changing signals which have actually achieved said predetermined condition.

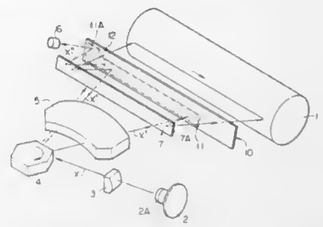
4,823,001
METHOD OF MEASURING THE AMOUNT OF MOVEMENT OF AN OBJECT HAVING UNIFORMLY PERIODIC STRUCTURE
Hiroshi Kobayashi, 3-15 Hanakoganei, Kodaira-shi, Tokyo; Haruhiko Machida, 10-7 Nakaochiai 4-chome, Shinjuki-ku, Tokyo; Hideaki Ema, Shizuoka, and Jun Akedo, Tokyo, all of Japan, assignors to Ricoh Company, Ltd.; Hiroshi Kobayashi and Haruhiko Machida, all of Tokyo, Japan
Filed Aug. 17, 1987, Ser. No. 86,942
Claims priority, application Japan, Aug. 15, 1986, 61-191455
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE 9 Claims



1. A method of measuring the amount of movement of an object having a uniformly periodic structure, comprising the steps of:
- applying divergent light emitted from a coherent spot light source to the object;
- positionally adjusting the spot light source, the object, and a light sensor to produce an enlarged shadow-picture-like diffraction pattern of the uniformly periodic structure with light passing through or reflected by said object, at a position in which said light sensor is disposed; and
- detecting the amount of movement of said shadow-picture-like diffraction pattern with said light sensor upon movement of said object in a direction transverse to the divergent light, for thereby measuring the amount of movement of said object.

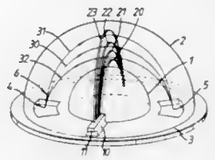
4,823,002
DEFLECTION SCANNING OPTICAL SYSTEM WITH REFLECTING SECTIONS
Taizo Saito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan
Filed Apr. 4, 1988, Ser. No. 177,398
Claims priority, application Japan, Apr. 6, 1987, 62-84055
Int. Cl.[4] H01J 3/14; G02B 26/08
U.S. Cl. 250—235 9 Claims

1. A deflection scanning optical system comprising:
- a laser beam source emitting a laser beam toward a surface to be scanned;
- a single first mirror arranged between said laser beam source and said surface to be scanned, said first mirror having a first reflecting section, a second reflecting section and a transparent section, the laser beam from said laser beam source being reflected by said first reflecting section;
- a second mirror for reflecting the laser beam reflected by said first reflecting section of said first mirror, toward said second reflecting section of said first mirror, said second mirror also reflecting the laser beam reflected by said first reflecting section of said first mirror to transmit the reflected laser beam through said transparent section of said first mirror, thereby directing the transmitted laser beam toward said surface to be scanned; and



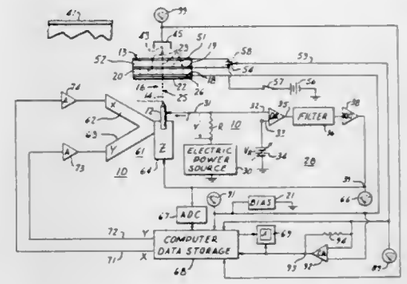
- detecting means receiving the laser beam reflected by said second mirror toward said second reflecting section of said first mirror and reflected by said second reflecting section, for detecting a scanning position of the laser beam with respect to said surface to be scanned.

4,823,003
CHARGED PARTICLE OPTICAL SYSTEMS HAVING THEREIN MEANS FOR CORRECTING ABERRATIONS
George C. King, 6 Hollingford Place, Knutsford, Cheshire WA16 9DP, and Frank H. Read, Hardingland Farm, Maclesfield Forrest, Cheshire SK10 0ND, both of England
Filed Jul. 13, 1987, Ser. No. 73,754
Claims priority, application United Kingdom, Jul. 16, 1986, 8617384
Int. Cl.[4] H01J 40/00, 47/00
U.S. Cl. 250—305 16 Claims



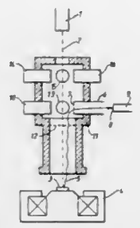
1. A charged particle optical system, such for example as an energy analyzer, a mass analyzer or a lens system, the system having
- means, on the optical axis of the system, defining a source of charged particles,
- means, on said optical axis, defining a desired image position, and
- means for defining the path of a beam of substantially mono-energetic particles from said source to said desired image position,
- the system being subject to the aberration in which the trajectories of the particles emitted from the source at relatively large angles to the axis are brought to a focus on the same axis nearer to or further from the source than the trajectories of particles emitted at relatively small angles to the axis,
- the system having a plurality of electrically-insulated corrector electrodes disposed in spaced-apart relationship across the said path of the beam thereby dividing the beam into separate portions and which electrodes, when suitably biassed, so deflect the beam portions as to cause the beam portions to intersect the optical axis at, or closer to, the desired image position, thereby reducing the aberration.

4,823,004
TUNNEL AND FIELD EFFECT CARRIER BALLISTICS
William J. Kaiser, West Covina, and L. Douglas Bell, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.
Filed Nov. 24, 1987, Ser. No. 125,009
Int. Cl.[4] H01J 37/26
U.S. Cl. 250—306 48 Claims



1. In a method of interacting carriers with a structure of matter, the improvement comprising in combination the steps of:
- providing said structure as a layered structure including an interface therein;
- providing an emitter electrode for emitting said carriers at a distance from a surface of said layered structure;
- causing said carriers to travel along ballistic trajectories inside said layered structure by providing along said distance a gap for performance of a process selected from the group of carrier tunneling and field emission and injecting said carriers emitted by said emitter electrode with said process ballistically into said layered structure through said gap and said surface; and
- analyzing with said carriers after said travel along said ballistic trajectories interface properties in said layered structure including said interfaces.

4,823,005
ELECTRON BEAM APPARATUS
Simon Garth, Cambridge, England, assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 19, 1987, Ser. No. 16,312
Claims priority, application United Kingdom, Feb. 20, 1986, 8604181
Int. Cl.[4] G01N 23/00
U.S. Cl. 250—310 19 Claims



1. Electron beam apparatus having an axis along the direction of which the electron beam is directed to a sample and secondary electrons from the sample are returned in the direction of the beam, comprising a first electrostatic deflector around said axis and energizable to deflect the secondary elec-

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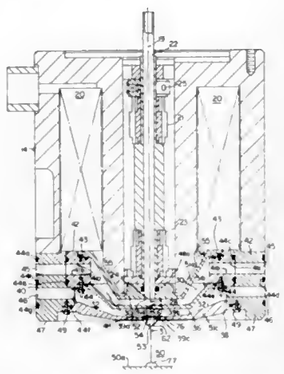
trons away from said beam direction to an electron collector, said energization resulting in distortion of the electron beam, and a further electrostatic deflector around said axis and energizable to counteract the distortion of the electron beam produced by said first electrostatic deflector.

4,823,006

INTEGRATED ELECTRON OPTICAL/DIFFERENTIAL PUMPING/IMAGING SIGNAL DETECTION SYSTEM FOR AN ENVIRONMENTAL SCANNING ELECTRON MICROSCOPE

Gerasimos D. Danilatos, North Bondi, Australia, and George C. Lewis, Sudbury, Mass., assignors to ElectroScan Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 52,700, May 21, 1987. This application Feb. 19, 1988, Ser. No. 158,208
Int. Cl.[4] H01J *37/252*
U.S. Cl. 250—310 **23 Claims**



1. An objective lens assembly for an environmental scanning electron microscope comprising:
(a) a substantially cylindrical objective lens magnetic housing containing an axially disposed vacuum liner tube and containing means for magnetically focusing a beam of electrons passing through said liner tube, said housing having upper and lower pumping ports therein axially distanced from one another;
(b) at least two annular diaphragms of nonmagnetic material and a final magnetic annular diaphragm attached to said housing at different axial locations and extending inwardly of said housing, said diaphragms defining at least two interior passages, each of which communicate with the said upper and lower pumping ports, respectively; and
(c) aperture means located within the central opening of said diaphragms to permit passage of said electron beam from said vacuum liner tube into said interior passages and then into the specimen chamber of said environmental scanning electron microscope and to limit passage of gas molecules from the said specimen chamber into the said interior passages.

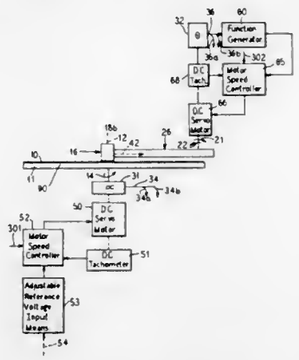
4,823,007

DNA SEQUENCING GEL READING SYSTEM AND METHOD

George E. Hanson, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Dec. 15, 1986, Ser. No. 941,684
Int. Cl.[4] G01T *1/00*
U.S. Cl. 250—327.2 **20 Claims**

1. In a system for the reading of a gel containing labeled material which has been distributed by electrophoresis,
rotatable support means for mounting a gel for rotation about an axis of rotation,
detector means sensitive to the labeled material,
scanner mounting means mounting the detector means for scanning movement across the rotatable support means for scanning along successive paths on a gel during rotation thereof, for scanning the gel surface,



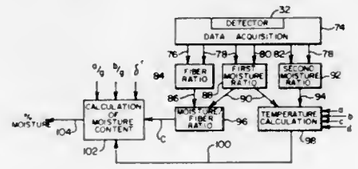
encoder means coupled with the rotatable support means and with the scanner means for encoding each scanning position of the detector means, and
signal storage means coupled with the detector means and with the encoder means for storing the output of the detector means as a function of scanning position.

4,823,008

APPARATUS AND METHODS EMPLOYING INFRARED ABSORPTION MEANS TO MEASURE THE MOISTURE CONTENT OF HEAVY GRADES OF PAPER

Steven P. Sturm, Columbus, Ohio, assignor to Process Automation Business, Inc., Columbus, Ohio

Filed Nov. 5, 1987, Ser. No. 116,987
Int. Cl.[4] G01N *21/35*
U.S. Cl. 250—339 **29 Claims**



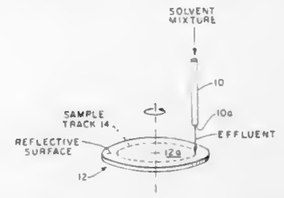
1. Apparatus for use in measuring the moisture content of paper during its continuous manufacture, comprising:
(a) a source of infrared radiation positioned on one side of the paper for directing infrared radiation into the paper;
(b) means, including at least one detector positioned on the opposite side of the paper from the source, for individually detecting a plurality of selected bands of infrared radiation emitted from the source and transmitted through the paper, the plurality including three narrow bands corresponding to a fiber absorption band, a moisture absorption band, and a reference band, wherein the centrum of the fiber absorption band is in a range extending from 1.5 microns to 1.8 microns, the apparatus being adapted to produce detector responses that can be processed to produce a measurement of the fractional moisture content or moisture percentage of the paper, and the response being indicative of the transmittances of the selected bands.

4,823,009

IR COMPATIBLE DEPOSITION SURFACE FOR LIQUID CHROMATOGRAPHY

Klaus Biemann, Alton Bay, N.H., and John J. Gagel, Cumberland Center, Me., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 877,242, Jun. 23, 1986, which is a continuation-in-part of Ser. No. 851,445, Apr. 14, 1986. This application Aug. 20, 1987, Ser. No. 87,427
Int. Cl.[4] G01N *21/01, 1/28, 1/10*
U.S. Cl. 250—341 **22 Claims**



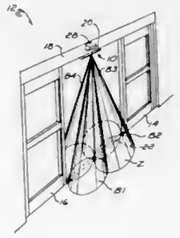
1. A deposition medium for collecting LC effluent for analysis over a range of IR wavelengths, comprising
an IR reflective planar front surface, and
a deposition surface inert to the LC effluent positioned above said front surface a distance greater than the longest quarter wavelength in said range, parallel thereto and substantially transparent over said IR range for collecting effluent deposits for IR analysis.

4,823,010

SLIDING DOOR THRESHOLD SENSOR

Henning N. Kornbrekke, Burlington, and Anthony R. Ranaudo, Naugatuck, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed May 11, 1987, Ser. No. 48,634
Int. Cl.[4] E05F *15/20*
U.S. Cl. 250—341 **21 Claims**



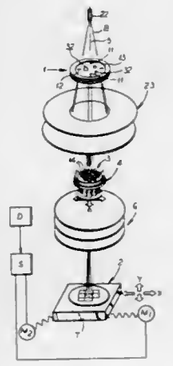
1. A safety sensor for a sliding door system of a type wherein an automatic operator is at least partially responsive to an operate signal for initiating the operation of a sliding door which is transversely moveable across a threshold having opposing entrance and exit sides for selectively opening and closing an entranceway comprising:
detection zone means comprising a plurality of infrared transmitters energizable for emitting infrared radiation to define a detection zone which substantially encompasses a region above the threshold and the threshold vicinity at the opposing sides of the threshold;
synchronization means for synchronizing the operation of said sensor with an alternating current line frequency;
pulsing means responsive to said synchronization means for sequentially pulsing said transmitters in a series of time spaced pre-established pulse intervals;
receiver means for receiving reflected infrared radiation from said detection zone and generating a corresponding electrical detection signal;
verification means responsive to said detection signal for determining whether an object is present in said detection zone;
operate input means for supplying a signal indicative of the status of the operate signal;
circuit means including a latch circuit selectively actuatable between unlatched and latched states, said circuit means being responsive to said verification means and said operate input means for activating said latch circuit to the latched state in the event that an object is present in the detection zone and said operate signal is present; and
safety signal means responsive to the latched state of said circuit means for generating a hold open output.

4,823,011

ION-PROJECTION LITHOGRAPHIC APPARATUS WITH MEANS FOR ALIGNING THE MASK IMAGE WITH THE SUBSTRATE

Gerhard Stengl, Villach, Fed. Rep. of Germany, and Hans Löschner, Vienna, Austria, assignors to Ionen Mikrofabrikations Systeme Gesellschaft mbH, Vienna, Austria

Filed May 15, 1987, Ser. No. 50,978
Claims priority, application Austria, May 16, 1986, I314/86
Int. Cl.[4] H01J *37/304*
U.S. Cl. 250—491.1 **19 Claims**



1. In an apparatus for controlling the positioning of an image of the structure of a mask on a substrate for ion-projection lithography in which the mask and the substrate are provided with respective markings for mutually corresponding locations, and an image of the markings of the mask is cast onto the substrate and brought into, coincidence with the markings at the corresponding location of the substrate, in an ion-lithography projector having:
a deflection means for deflecting said image in the plane of said substrate and disposed in an ion-beam path between said mask and said substrate,
a rotation control means for rotating said image in the plane of said substrate and
a scale control means for adjusting the scale of said image disposed in the ion-beam path and controllable by an applied voltage to vary the image-reproduction scale of the image of the mask structure projected onto said substrate, the improvement which comprises:
at least two pairs of spaced-apart first detectors respectively responsive to secondary radiation emitted from said markings on said substrate and operatively connected to said deflection means for controlling same;
at least a pair of spaced-apart second detectors responsive to secondary radiation emitted from said markings on said

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substrate and operatively connected to said rotation control means; and

at least a pair of spaced-apart third detectors responsive to secondary radiation emitted from said markings on said substrate and operatively connected to said scale control means so as to control said scale control means selectively to enlarge and reduce said image of said structure on said substrate,

wherein said markings on said substrate are straight lines, each of said pairs of detectors is operatively juxtaposed with a respective straight-line marking on said substrate to respond to secondary radiation therefrom, two of said straight-line markings being mutually aligned, a third of said straight-line markings being oriented at an angle to the mutually aligned straight-line markings, and a fourth of said straight-line markings being parallel to the third of said markings but laterally offset therefrom on said substrate.

4,823,012

STEP AND REPEAT EXPOSURE APPARATUS HAVING IMPROVED SYSTEM FOR ALIGNING

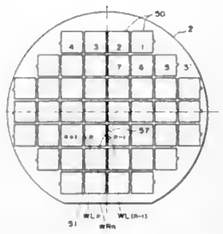
Masao Kosugi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,226

Claims priority, application Japan, Jul. 4, 1986, 61-156241

Int. Cl.[4] G01J *1/00*

U.S. Cl. 250—491.1 **12 Claims**



1. An exposure apparatus for sequentially exposing different portions of a workpiece to a pattern formed on a mask while moving the workpiece, said apparatus comprising:

detecting means operable to detect, substantially at the same time and by use of a common objective lens, alignment marks provided in association with at least two portions of the workpiece and for producing signals corresponding to the alignment marks of said portions; and

control means for controlling a relative position of each of said portions of the workpiece with respect to the mask in accordance with the signals produced by said detecting means.

4,823,013

CHARGED PARTICLES EXPOSURE APPARATUS HAVING AN OPTICALLY DEFORMABLE BEAM BOUNDING DIAPHRAGM

Karel D. van der Mast, Pijnacker, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

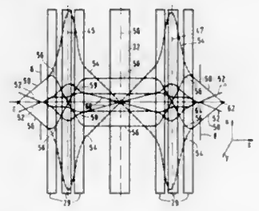
Filed Aug. 25, 1987, Ser. No. 89,092

Claims priority, application Netherlands, Aug. 29, 1986, 8602196

Int. Cl.[4] H01J *3/12*

U.S. Cl. 250—396 ML **15 Claims**

1. A charged particle exposure apparatus for exposing an object with a shaped beam of charged particles originating from a charged particle source, said apparatus including beam-shaping means comprising first and second beam-bounding diaphragms of predefined shapes and lens means disposed therebetween for imaging the first diaphragm onto the second diaphragm, characterized in that the lens means comprises, arranged along an axis, a lens system for forming in a first plane at a first position along said axis an astigmatic image of the



source extending in a first direction, said lens system including a multipole element for producing in said first plane a power field which is active in said first plane only in a direction transverse to the first direction.

4,823,014

POSITION DETECTING DEVICE USABLE WITH AN OBJECT HAVING A SURFACE

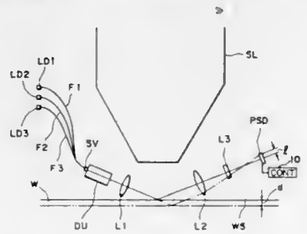
Mamoru Miyawaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1987, Ser. No. 65,569

Claims priority, application Japan, Jun. 27, 1986, 61-149691

Int. Cl.[4] G01B *11/00*

U.S. Cl. 250—561 **9 Claims**



1. A device for detecting the position of an object, said device comprising:

a plurality of light sources from which lights advance along respective light paths;

an optical waveguide type path combining element for combining the light paths for the lights from said light source into one light path;

light guide means for guidingly directing, inclinedly to the object, the light coming along said one light path from said path combining element;

photoelectric converting means for receiving the light reflected from the object and for producing a signal in accordance with the light reception; and

means for detecting the position of the object in accordance with the signal produced by said photoelectric converting means.

4,823,015

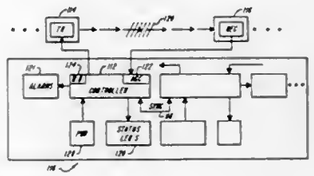
ELECTRICAL INTERFERENCE FREE PROJECTED BEAM SMOKE DETECTOR

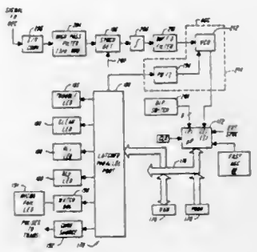
Aaron A. Galvin, Lexington; Douglas L. Mason, Newton Centre; Kenneth J. Leff, Halifax; John N. Schide, Watertown, and Ralph A. Giffone, Brighton, all of Mass., assignors to ADT, Inc., Parsippany, N.J.

Continuation of Ser. No. 37,430, Apr. 13, 1987, abandoned, which is a division of Ser. No. 731,918, May 8, 1985, Pat. No. 4,687,924. This application Sep. 1, 1988, Ser. No. 239,058

Int. Cl.[4] G01N *21/59*; **G08B** *17/10*

U.S. Cl. 250—564 **5 Claims**





1. A projected-beam smoke detector substantially free from undesirable electrical interference effects in a protected region, comprising:

an infrared energy transmitter and a transmitted infrared energy receiver spaced from said infrared energy transmitter defining therebetween an optical axis for infrared energy transmitted through the protected region wherein are present potentially interfering electrical effects having a spectrum including a significant component at a known frequency;

controller means coupled to said infrared energy transmitter for defining a transmit window and a nontransmit window for said projected-beam smoke detector, said controller means being operative to repetitively pulse said infrared energy during each transmit window to produce a pulsed transmitter signal of bursts of pulses separated by a predetermined non-zero time interval corresponding to said nontransmit window, each of said bursts having plural pulses having a preselected period selected to define a pulse frequency spectrally offset from the known frequency of the potentially interfering electrical effects, and wherein said controller means is coupled to said transmitted infrared energy receiver for controlling detection of said bursts of pulses of said pulse transmitter signal by said transmitted infrared energy receiver;

means coupled to said transmitted infrared energy receiver including band pass filter means centered about said spectrally offset pulse frequency of said bursts of pulses for filtering the known frequency of the potentially interfering electrical effects from said bursts of pulses of said pulsed transmitter signal detected by said transmitted infrared energy receiver and providing a filtered signal corresponding to said bursts of pulses of said pulse transmitter signal;

synchronous detector means means coupled to said band pass filter means for synchronously sampling said filtered signal and for providing sampled voltages corresponding to said filtered signal;

means coupled to said synchronous detector means and responsive to said sampled voltages for providing data corresponding to the sum of the intensity of said plural pulses of each burst of said pulse transmitter signal; and

means coupled to said data providing means for providing at least one alarm indication of smoke in the protected region whenever said data meets a predetermined criteria.

4,823,016

SCINTILLATION DETECTOR FOR THREE-DIMENSIONALLY MEASURING THE GAMMA-RAY ABSORPTION POSITION AND A POSITRON CT APPARATUS UTILIZING THE SCINTILLATION DETECTOR

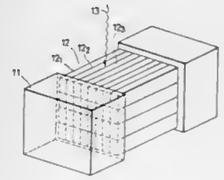
Takaji Yamashita; Hiroshi Uchida; Keiji Shimizu, and Tomohide Omura, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka and Research Development Corporation of Japan, Tokyo, both of, Japan

Filed Sep. 15, 1987, Ser. No. 96,459

Claims priority, application Japan, Sep. 18, 1986, 61-220313

Int. Cl.[4] G01T *1/164, 1/20*

U.S. Cl. 250—363.03 **17 Claims**



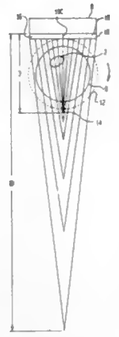
1. A scintillation detector for detecting gamma-rays, said detector comprising:

a scintillator bundle comprising a plurality of scintillator elements for emitting scintillation light incident to absorption of gamma-rays in said scintillator elements, each of said scintillator elements having two connecting end surfaces for outputting said scintillation light and said surfaces for leading said scintillation light to said connecting end surfaces; and

a position detecting photodetector coupled to said connecting end surfaces of each of said scintillator elements, said position detecting photodetector receiving said scintillation light from said connecting end surfaces and outputting electrical signals corresponding to an output intensity of said scintillation light to calculate an incident direction of said gamma-rays, wherein said position detecting photodetector further comprises position calculating means for receiving said electrical signals and three-dimensionally calculating the position of gamma-ray absorption in said scintiliator bundle.

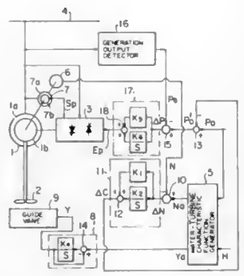
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4,823,017
SCINTILLATION CAMERA AND MULTIFOCAL FAN-BEAM COLLIMATOR USED THEREIN
Jiang Hsieh, Elk Grove Village, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.
Filed Dec. 19, 1986, Ser. No. 944,700
Int. Cl.[4] G01T *1/164;* G21K *1/02*
U.S. Cl. 250—363.03 **7 Claims**



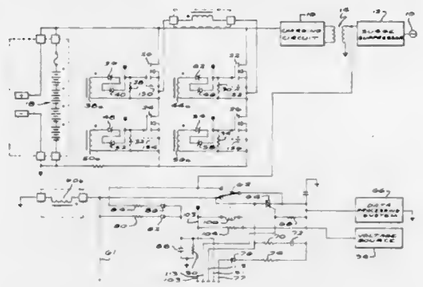
1. A scintillation camera system, comprising a scintillation camera head and fan-beam collimator having a plurality of focal lengths.

4,823,018
CONTROL SYSTEM FOR VARIABLE SPEED WATER-WHEEL GENERATOR APPARATUS
Takao Kuwabara; Akira Bando, both of Hitachi; Eiji Haraguchi, Ibaraki, and Hiroto Nakagawa, Mishima, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan
Filed May 7, 1987, Ser. No. 46,725
Claims priority, application Japan, May 12, 1986, 61-106641
Int. Cl.[4] F02D *29/06;* F01D *15/10*
U.S. Cl. 290—7 **8 Claims**



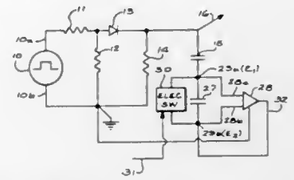
1. A control system for a variable speed water turbine generator apparatus including a generator having a primary winding connected to an electric power system and a secondary winding connected to said electric power system through frequency converter means, and a water turbine directly coupled to a shaft of said generator and having variable opening vanes, said control system comprising:
- a first function generator responsive to at least an output command signal for said variable speed water turbine generator apparatus for producing a rotation speed command signal;
- speed adjuster means for producing an output signal in accordance with a signal indicative of a difference between the rotation speed command signal of said first function generator and an actual rotation speed;
- an adder for adding the output command signal for said variable speed water turbine generator apparatus to the output signal of said speed adjuster means to determine an overall output command signal;
- output adjuster means for producing an output signal in accordance with a signal indicative of a difference between the overall command output signal of said adder and actual power of said generator, and means receiving the output signal of said output adjuster means for controlling the firing angle of said frequency converter means;
- a second function generator responsive to at least the output command signal for said variable speed water turbine generator apparatus for producing an opening command signal for the variable opening vanes of said water turbine; and
- opening adjuster means for producing an output signal in accordance with a signal indicative of a difference between the output signal of said second function generator and an actual opening of the variable opening vanes of said water wheel, and means receiving the output signal of said opening adjuster means for controlling the opening of said variable opening vanes.

4,823,019
STAND-BY POWER SYSTEM
Lennart A. Gronskog, and Timothy P. McGrath, both of San Diego, Calif., assignors to Computer Accessories Corporation, San Diego, Calif.
Filed Jul. 21, 1988, Ser. No. 222,219
Int. Cl.[4] H02H *3/28*
U.S. Cl. 307—66 **22 Claims**



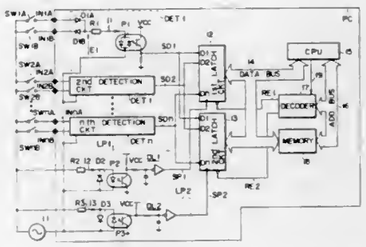
1. In combination for providing standby power to a data processing system when the main power to the data processing system is interrupted,
- microprocessor means for detecting when the main power to the data processing system is interrupted,
- relay means,
- first means responsive to he interruption in the main power to the data processing system to become energized,
- switching means having first and second states of operation and normally operative in the first state and responsive to the energizing of the relay means to become operative in the second state,
- second means responsive to the operation of the switching means in the second state to introduce the standby power to the data processing means, and
- third means responsive to the interruption in the main power to the data processing system for introducing the standby power to the data processing means during the conversion of the switching means from the first state to the second state.

4,823,020
HIGH VOLTAGE PULSE TOP CLIPPER WITH PRECISE REGULATION OF CLIPPING LEVEL
Richard S. Loucks, Northridge, Calif., assignor to ITT Gilfillan, Van Nuys, Calif.
Filed Dec. 15, 1987, Ser. No. 133,461
Int. Cl.[4] H02M *7/00*
U.S. Cl. 307—106 **14 Claims**



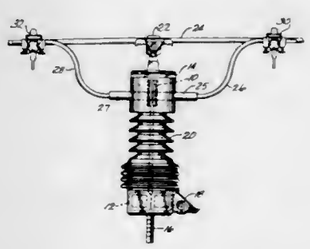
1. A pulse clipping circuit operative with a source of a train of pulses, for regulating said pulses to a predetermined uniform amplitude, comprising:
- first and second capacitors in series forming a capacitive divider, said second capacitor having a lead:
- a diode forward poled with respect to the polarity of said pulses and connected between said source and said first capacitor;
- and compensating means for sensing the voltage across said second capacitor for developing a compensating signal and for adding said compensating signal at said second capacitor lead in opposition to the voltage across said first capacitor.

4,823,021
CIRCUIT FOR DETECTING ON/OFF STATES OF SWITCHES
Yasuo Shimada, and Fumitaka Mouri, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 6, 1988, Ser. No. 178,218
Claims priority, application Japan, Apr. 6, 1987, 62-51021[U]
Int. Cl.[4] H04M *11/00;* H01M *7/00*
U.S. Cl. 307—112 **17 Claims**



1. A switch state detection circuit for detecting the ON/-OFF states of switches in accordance with the presence/absence of AC signals input through said switches, comprising:
- an AC signal source for outputting an AC signal;
- a first switch one terminal of which is connected to said AC signal source;
- a second switch one terminal of which is connected to said AC signal source;
- photocoupler means energized for outputting a signal having a predetermined signal level when a supplied current is positive and equal to or greater than a first current, and when the supplied current is negative and equal to or smaller than a second current;
- first rectifying means, connected to said first switch, for supplying the current corresponding to a positive component of the output signal from said AC signal source to said photocoupler means when said first switch is turned on;
- second rectifying means, connected to said second switch, for supplying the current which corresponds to negative component of the output signal from said AC a signal source to said photocoupler means when said second switch is turned on;
- first latch pulse output means, connected to said AC signal source, for latching a first latch pulse when the output signal from AC signal source is positive and has a predetermined phase;
- second latch pulse output means, connected to said AC signal source, for outputting a second latch pulse when the output signal from said AC signal source is negative and has a predetermined phase;
- first latch means, connected to said photocoupler means and said first latch pulse output means, for latching the output signal from said photocoupler means in response to the first latch pulse; and
- second latch means, connected to said photocoupler means and said second latch pulse output means, for latching output data from said photocoupler means in response to the second latch pulse.

4,823,022
APPARATUS AND METHOD FOR SENSING POWER LINE CONDITIONS
Keith E. Lindsey, La Canada, Calif., assignor to Lindsey Manufacturing Company, Azusa, Calif.
Continuation-in-part of Ser. No. 50,968, May 15, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 211,131
Int. Cl.[4] H01H *3/26*
U.S. Cl. 307—149 **41 Claims**



1. Electrical power line sensing apparatus comprising:
- an electrical insulator having first and second ends;
- means for sensing power line conditions embedded in the insulator;
- first and second cables coupled to the sensing means and extending therefrom outside the insulator;
- a power line clamp attached to the first end of the insulator; and
- a pole mounting base attached to the second end of the insulator.

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4,823,023

TRANSISTOR WITH DIFFERENTIATED CONTROL SWITCHING CIRCUIT

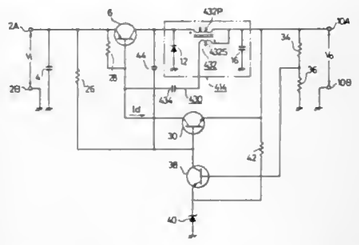
Tetsuhiko Shimpo; Isao Fujihata, and Atsushi Yanase, all of Tokyo, Japan, assignors to Nippon Chemi-Con Corporation, Tokyo, Japan

Continuation of Ser. No. 500,197, Jun. 1, 1983, abandoned. This application Jul. 15, 1986, Ser. No. 884,651

Claims priority, application Japan, Jun. 1, 1982, 57-93488; Sep. 10, 1982, 57-157704; Sep. 10, 1982, 57-137560[U]

Int. Cl.⁴ H03K *17/60, 3/06*

U.S. Cl. 307—254 **11 Claims**



1. A switching circuit, comprising, a switching transistor adapted to open or close responsive to an input pulse, a switching corrector circuit for receiving pulses from the switching transistor and reversing the polarity thereof, said switching corrector circuit differentiating said reversed pulses and providing the base of said switching transistor with said differentiated pulse superimposed on said input pulse, said switching corrector circuit comprising a choke transformer connected to said switching transistor, and a capacitor for providing the base of said switching transistor with differentiated pulses of reversed polarity from said choke transformer, whereby said input pulse has sharply inclined waveform to improve the efficiency of said switching circuit.

4,823,024

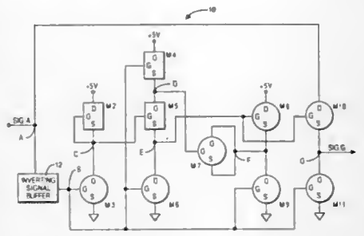
SIGNAL EDGE TRIMMER CIRCUIT

Ikuo J. Sanwo, San Marcos; James A. Donahue, and Donald G. Tipon, both of San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 29, 1988, Ser. No. 212,833

Int. Cl.⁴ H03K *5/00, 17/56, 3/01, 17/687*

U.S. Cl. 307—262 **11 Claims**



1. In a MOS device, a signal edge trimmer circuit for trimming a digital pulse signal having a first transition from a first signal level to a second signal level and a second transition from the second signal level back to the first signal level, wherein said circuit delays the first transition for a predetermined period of time and passes the second transition without delay, said circuit comprising:

MOS signal buffer means at the input of said circuit for delaying the pulse signal;

MOS output transistor means at the output of said circuit for providing the trimmed pulse signal, said MOS output transistor means connected for receiving the pulse signal and for passing the pulse signal in response to an enabling signal; and

MOS control means for receiving the delayed signal from said MOS signal bufffer means and providing the delayed signal to said MOS output transistor means as the enabling signal, so that said MOS output transistor means is enabled by the enabling signal to pass the pulse signal the predetermined period of time after the first transition of the pulse signal has been received by said MOS output transistor means, and so that said MOS output transistor means continues to be enabled by the enabling signal when the second transition of the pulse signal is received by said MOS output transistor means in order to pass the second transition without delay.

4,823,025

ELECTRONIC CIRCUIT ELEMENT WITH FIELD-EFFECT TRANSISTOR OPERATION APPLICATIONS OF THIS CIRCUIT ELEMENT, AND SUBSTITUTION CIRCUIT FOR SUCH AN ELEMENT

Johan D. Spek, Reinickendorfer Strasse 64, 4933 Blomberg, Fed. Rep. of Germany

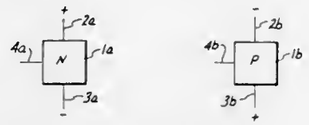
PCT No. PCT/NL86/00017, § 371 Date Apr. 6, 1987, § 102(e) Date Apr. 6, 1987, PCT Pub. No. WO87/00367, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 24, 1986, Ser. No. 30,848

Claims priority, application Netherlands, Jun. 24, 1985, 8501816

Int. Cl.⁴ H03K *3/353, 17/687, 19/094;* **G11C** *11/34*

U.S. Cl. 307—304 **8 Claims**



1. A field effect circuit element having an N-type or a P-type configuration and having source and drain terminals for connection to the poles of a current source through an intermediate load, and a gate terminal for connection to a control signal source,

said source terminal to be connected to the positive pole of said current source in the case of an N-type configuration, or to the negative pole in the case of a P-type configuration

characterized in that said circuit element is non-conductive while said gate terminal is at the voltage of said pole connected to said drain terminal.

4,823,026

APPARATUS AND METHOD FOR MEASUREMENT OF A SIGNAL WITH A SAMPLER

Eric R. Hanson, Monroe, N.Y., assignor to Hypres, Inc., Elmsford, N.Y.

Filed Sep. 28, 1987, Ser. No. 101,509

Int. Cl.⁴ H03K *5/153, 5/24*

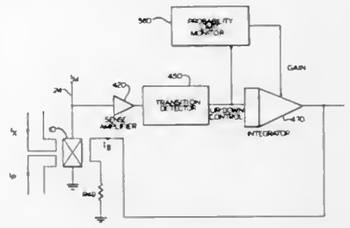
U.S. Cl. 307—352 **19 Claims**

1. An apparatus for measuring an input signal, comprising:

a monitor gate switchable between at least two distinguishable states, the input signal being applied as a control signal to the monitor gate along with a sampling pulse and an analog bias signal;

means for generating a detection signal that indicates whether or not the monitor gate has switched between states;

means for generating a digital output that corresponds to the integration of the detection signal;



means for converting the digital output of the integration means to the analog bias signal; and

feedback means for applying the analog bias signal to the monitor gate.

4,823,027

SAMPLE AND HOLD CIRCUIT

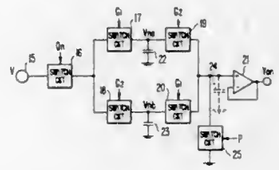
Koushiro Takahashi, Fujisawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 846,812, Apr. 1, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 111,093

Claims priority, application Japan, Apr. 10, 1985, 60-75602

Int. Cl.⁴ G11C *27/02*

U.S. Cl. 307—353 **7 Claims**



1. A sample and hold circuit comprising:

an input switching element for sampling an input signal;

an input means for inputting said input signal to an input terminal of said input switching element;

a hold capacitor connected between an output terminal of an input switching element and a reference potential;

an output switching element connected to an output terminal of said hold capacitor;

an output means for outputting a sample hold output signal from an output terminal of said output switching element;

a capacity component present at an output side of said output switching element; and a discharge switching element connected between said output terminal of said output switching element and said reference potential;

wherein said input switching element and said output switching element conduct alternatively, and wherein said discharge switching element conducts for a short period immediately before said output switching element conducts, said discharge switching element discharging said capacity component so as to return its output potential to said reference potential.

4,823,028

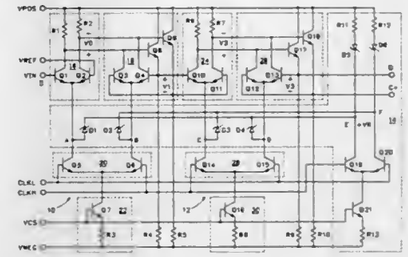
MULTILEVEL LOGIC CIRCUIT WITH FLOATING NODE VOLTAGE CLAMP

Randall B. Lloyd, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Ohio

Filed Dec. 4, 1987, Ser. No. 129,106

Int. Cl.⁴ H03K *19/086, 19/092, 19/003, 17/16*

U.S. Cl. 307—355 **13 Claims**



1. In a buffer circuit comprising a switch and at least one transistor having a control terminal for receiving an input signal, a first load terminal resistively coupled to a voltage source, and a second load terminal, the switch alternatively coupling a current source to and uncoupling the current source from the second load terminal in response to a control signal, the improvement comprising clamping means responsive to said control signal for maintaining a substantially constant voltage at said second load terminal while the switch decouples the current source from the second load terminal, the constant voltage being substantially equal to a steady-state voltage produced at said second load terminal when the switch couples the current source to the second load terminal.

4,823,029

NOISE CONTROLLED OUTPUT BUFFER

Thaddeus J. Gabara, North Whitehall Township, Lehigh County, Pa., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 25, 1987, Ser. No. 66,902

Int. Cl.⁴ H03K *17/16, 17/284, 17/687, 19/003*

U.S. Cl. 307—443 **6 Claims**

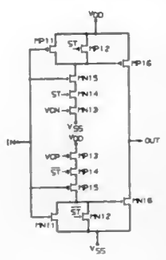
1. An integrated circuit comprising at least one output buffer having an input (IN) for receiving a logical signal and an output (OUT) for driving a conductor with said signal, wherein said buffer comprises at least one input transistor having its gate coupled to said input, and further comprises at least one output transistor having its gate coupled to the drain of said input transistor, and a controlled electrode coupled to said output,

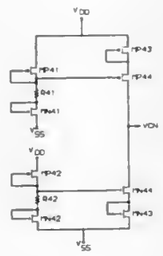
characterized in that said output buffer further comprises a control transistor included in the source path of said at least one input transistor, wherein said integrated circuit further comprises means for generating a control voltage applied to the gate of said control transistor, with said control voltage decreasing the conductance of said control transistor when said integrated circuit is fabricated by a process that yields transistor switching speeds faster than a nominal process,

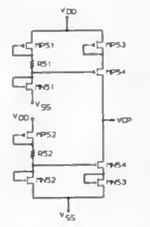
wherein said control voltage is derived from the node con-

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necting the drain of a first voltage divider transistor and a resistor coupled to a power supply voltage conductor, and







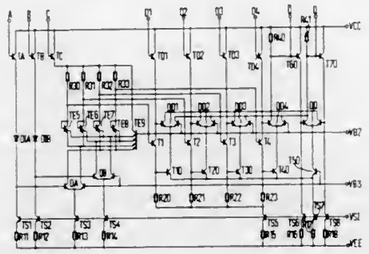
wherein said first voltage divider transistor has its gate connected to its drain.

4,823,030
ECL LOGIC GATE USING MULTI-EMITTER TRANSISTORS

Wilhelm Wilhelm, and Karl-Reinhard Schön, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 779,653, Sep. 24, 1985. This application Jan. 6, 1988, Ser. No. 144,588
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1984, 3435048
Int. Cl.⁴ H03K *19/086*
U.S. Cl. 307—455 **10 Claims**

1. A semiconductor circuit for forming logic functions in ECL technology, comprising first and second cascade-connected series-gating stages having respective first and second ECL current switches, said current switches having respective first and second control circuit each being controlled by at least two input variables, said current switches having respective first and second reference circuits connected to its corresponding control circuit, said first reference circuit having a multi-emitter transistor, said first control circuit having at least one diode-connected multi-emitter transistor connected at its collector to a resistor to form preliminary logic output signals

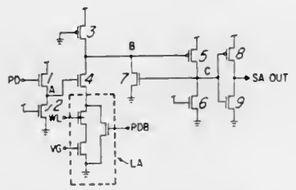


as a logic function of the at least two input variables applied to the first control circuit.

4,823,031
SINGLE-ENDED SENSE AMPLIFIER WITH POSITIVE FEEDBACK

Shailesh R. Kadakia, Stafford, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 1, 1988, Ser. No. 150,954
Int. Cl.⁴ G11C *7/06, 9/00, 17/04, 11/40*
U.S. Cl. 307—530 **12 Claims**



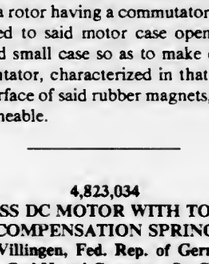
1. A sense amplifier for indicating the state of a bitline of an integrated-circuit logic array comprising:
- a supply voltage source,
- an activating transistor pair connected to an activating signal source,
- a sensing transistor pair connected to said activating transistor pair and to said bitline,
- an output driver transistor pair connected to said sensing transistor pair,
- a feedback transistor connecting the output of said output driver transistor pair to the input of said output driver transistor pair, and
- an inverter transistor pair connecting said output driver transistor pair to an output terminal of said sense amplifier.

4,823,032
END FRAME AND STATOR ASSEMBLY FOR A DYNAMOELECTRIC MACHINE

Robert W. Ward, Anderson; Rodney G. Hunter, Urbana, and William E. Boys, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1988, Ser. No. 226,707
Int. Cl.⁴ H02K *1/04*
U.S. Cl. 310—43 **8 Claims**

1. An end frame and stator for a dynamoelectric machine comprising, a stator assembly having a metallic core formed of magnetic material that has a plurality of slots, a stator coil winding comprising conductors disposed in said slots, a bearing that is adapted to rotatably support a rotor shaft, and a one-piece plastic housing molded to portions of said metallic core and to an outer portion of said bearing to maintain said core and bearing in a predetermined fixed relationship, and for

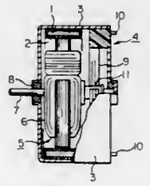


supporting said stator assembly and bearing, said housing and stator winding being so arranged that substantially no portion of said stator winding is encapsulated by said plastic housing.

4,823,033
MINIATURE MOTOR HAVING COATED RUBBER PERMANENT MAGNET

Hitoshi Fujiwara; Shotaro Hayakawa, and Takanobu Lee, all of Matsudo, Japan, assignors to Mabuchi Motor Co., Japan

Filed Feb. 26, 1988, Ser. No. 162,501
Claims priority, application Japan, Feb. 27, 1987, 62-44380
Int. Cl.⁴ H02K *15/12*
U.S. Cl. 310—45 **6 Claims**



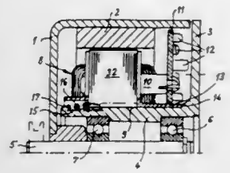
1. A miniature motor of the kind having a coated rubber permanent magnet, the motor having a motor case having rubber magnets on the inside surface and having an opening at one end thereof, a rotor having a commutator on a motor shaft, a small case fitted to said motor case opening, and brushes supported by said small case so as to make electrical contact with said commutator, characterized in that a coating film is formed on the surface of said rubber magnets, said coating film being gas-impermeable.

4,823,034
BRUSHLESS DC MOTOR WITH TOLERANCE COMPENSATION SPRING

Günter Wrobel, Villingen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH and Company, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 857,474, Apr. 30, 1986, Pat. No. 4,703,209. This application Oct. 27, 1987, Ser. No. 112,934
Claims priority, application Switzerland, Apr. 30, 1985, 01814/85
The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.
Int. Cl.⁴ H02K *5/26*
U.S. Cl. 310—67 R **26 Claims**

1. An electric motor comprising outside rotor means, stator means, and bearing support means operatively connected with a fastening flange, the stator means being mounted with a sliding seat on the outer surface of the bearing support means,

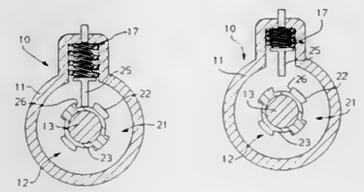


and a spring means for securing the stator means axially and against rotation.

4,823,035
ELECTRIC MOTOR WITH LOCKING APPARATUS

David P. Kudla, Dayton, and Susan E. Holbrook, Vandalia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 29, 1988, Ser. No. 162,030
Int. Cl.⁴ H02K/7/106 G05G *5/06* **F03G** *7/06*
U.S. Cl. 310—68 C **2 Claims**



1. An electric motor comprising a stator and a rotor rotatably supported therein, the motor further comprising commutator means for communicating armature current between the stator and the rotor and locking apparatus comprising, in combination:
- a slotted collar on the rotor comprising circumferentially spaced slots;
- a pin adapted for reciprocal movement between an inserted position in which a free end of the pin is engaged within one of the slots to prevent rotation of the rotor and a retracted position in which the free end of the pin is pulled out of engagement with the one of the slots to allow rotation of the rotor;
- a temperature sensitive actuator comprising first and second springs having eods connected together, said first and second springs exerting opposing forces, one in compression and the other in tension, the second spring being made of a temperature sensitive memory metal and effective at temperatures below a predetermined temperature to allow the first spring to move the pin into its inserted position and at temperatures above the predetermined temperature to move the pin against the first spring to its retracted position,
- the temperature sensitive actuator being electrically conductive and connected in series with the commutator means to carry the motor armature current and be heated thereby so that the pin is automatically placed in its retracted position to allow rotor rotation when armature current is provided to the motor and is automatically placed in its inserted position when armature current is stopped to lock the rotor against rotation.

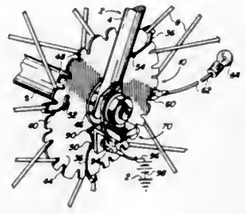
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4,823,036

DISC COMMUTATOR AND BRUSH APPARATUS FOR BICYCLE

Robert E. Roberts, 2033 N. Sunset Rd., Apache Junction, Ariz. 85220

Filed Dec. 18, 1984, Ser. No. 683,014
Int. Cl.[4] H02K *13/04*
U.S. Cl. 310—237 4 Claims



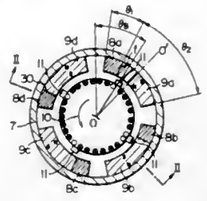
1. Electrical and brush apparatus for an electrical system for a bicycle, comprising, in combination:
a conductive frame;
a wheel rotatable on an axle and secured to the frame;
at least a single electrical element secured to the wheel;
a source of electrical power;
disc means secured to and rotatable with the wheel, including
a central aperture for receiving the wheel axle,
an outer periphery,
a nonconductive substrate,
a conductive layer on the substrate between the central aperture and the outer periphery, and
a terminal on the outer periphery integral with the substrate and the conductive layer;
connector and conductor means for electrically connecting the terminal with the electrical element;
brush means secured to the frame, including
a bracket base,
a bracket arm connected to the bracket base for securing the bracket base to the frame,
a brush base secured to the bracket base,
a brush arm connected to the brush base, and
a brush secured to the brush arm and electrically contacting the conductive layer of the disc means; and
conductor means electrically connecting the brush to the source of electrical power.

4,823,037

DC ELECTRIC MOTOR HAVING FIELD POLES OF PERMANENT MAGNET

Toshimi Abukawa, Hitachiota; Kazuo Tahara, Hitachi; Noriyoshi Takahashi, Hitachi, and Toshio Tomite, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 113,511
Claims priority, application Japan, Nov. 5, 1986, 61-261960
Int. Cl.[4] H02K *23/18*
U.S. Cl. 310—230 7 Claims



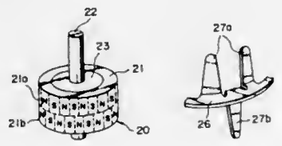
1. A DC electric motor comprising:
a rotor having an armature core, an armature winding and a commutator, and arranged to be selectively rotatable in one of a first direction and a second direction reverse to said first direction about a rotary axis;
a stator having a yoke and a plurality of field poles provided on an inner circumference of said yoke, each of said field poles having a permanent magnet and an auxiliary pole disposed at an entry side of said field pole viewed in said first direction of rotation of said rotor;
brush means including a plurality of brushes arranged for sliding movement on and in electrical contact with said commutator; and
brush holding means for holding each of said brushes movable between a first position near a geometrically neutral point of a pair of adjacent field poles and a second position separated by an electrical angle within a range of 50 to 90 degrees from said geometrically neutral point in said first direction of rotation of said rotor, said brush holding means holding each of said brushes at said first position when said rotor is to be rotated in said first direction and at said second position when said rotor is to be rotated in said second direction.

4,823,038

STEPPING MOTOR

Minoru Mizutani; Kunitaru Hayashi; Hiroshi Kikuchi, all of Tokyo, and Naoki Chiba, Fukushima, all of Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1988, Ser. No. 141,162
Claims priority, application Japan, Jan. 14, 1987, 62-2918
Int. Cl.[4] H02K *21/14*
U.S. Cl. 310—257 4 Claims



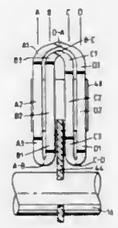
1. A stepping motor comprising:
a rotor assembly comprising
a rotor shaft,
a collar coaxially fixed to the rotor shaft,
a cylindrical permanent magnet block fixedly fitted on the collar;
a yoke assembly formed by fixedly combining an inner yoke, an upper outer yoke and a lower outer yoke;
a first driving coil accommodated in a space defined by the inner yoke and the upper outer yoke;
a second driving coil accommodated in a space defined by the inner yoke and the lower outer yoke;
a base plate fixed to the upper surface of the upper outer yoke;
a flange fixed to the lower surface of the lower outer yoke; and
bearing means respectively and fixedly provided in respective central portions of the base plate and the flange to support the rotor shaft therein for rotation;
wherein the inner yoke has n/4 (n is a number of steps for one turn of the rotor assembly) pieces of upper pole pieces arranged at regular angular intervals along an inner circumference thereof at a phase difference corresponding to an electrical angle of 2π, and n/4 pieces of lower pole pieces arranged at regular angular intervals along an inner circumference thereof at a phase difference corresponding to an electrical angle of 2π, and wherein a phase difference between the upper pole pieces and the lower pole pieces corresponds to an electrical angle of π, and wherein the upper outer yoke has n/4 pieces of pole pieces arranged at regular angular intervals along an inner circumference thereof at a phase difference corresponding to an electrical angle of 2π so as to extend between the upper pole pieces of the inner yoke, respectively, and wherein a phase difference between the pole pieces of the upper outer yoke and the upper pole pieces of the inner yoke correspond to an electrical angle of π, and wherein the lower yoke has n/4 pieces of pole pieces arranged at regular angular intervals along the inner circumference thereof at a phase difference corresponding to an electrical angle of 2π so as to extend between the lower pole pieces of an inner yoke, and wherein a phase difference between the pole pieces of the lower outer yoke and the lower pole pieces of the inner yoke correspond to an electrical angle of π, and wherein the cylindrical permanent magnet block is divided axially into an upper pole section and a lower pole section each having a plurality of magnetic poles arranged along a circumference thereof so that the phase difference between magnetic poles of the upper pole section and magnetic poles of the lower pole section corresponds to an electrical angle of $\pi/2$.

4,823,039

ELECTRICAL MACHINES

Cedric Lynch, 8 Heath Dr., Potters Bar, Hertfordshire, England EN6 1EH

Filed Dec. 18, 1986, Ser. No. 944,234
Claims priority, application United Kingdom, Dec. 18, 1985, 8531212
Int. Cl.[4] H02K *1/22*
U.S. Cl. 310—268 21 Claims



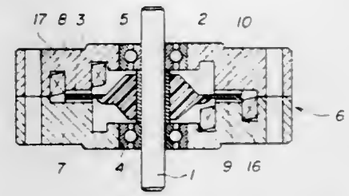
1. A rotor for an electrical machine, the rotor having a rotor axis and a current-carrying winding comprising a plurality of circumferentially distributed winding portions which lie in a plurality of planes perpendicular to said rotor axis, said winding portions extending from a radially inner region to a radially outer region, and a commutator provided by surface of the winding portions at said inner region, the winding being formed from a plurality of integrally formed conductive sections each having first and second ends, both of which lie at said outer region, and comprising first and second main portion which extend from respective ones of said ends inwardly in respective ones of said planes to the inner region and an inner bridging portion extending between said planes and providing integral connection between said main portions at said radially inner region of the rotor, interconnections between the said conductive sections being made only by way of said ends at said outer region, the conductive sections each comprising metal strip, the surface providing the commutator being edge surface of the metal strip, said edge surface facing in the direction of said rotor axis.

4,823,040

SINGLE-STAGE, TWO-PHASE OF FOUR-PHASE SYNCHRONOUS ELECTRIC MOTOR

Claude Oudet, Besancon, France, assignor to Portescap, Switzerland

PCT No. PCT/CH86/00149, § 371 Date Aug. 11, 1987, § 102(e) Date Aug. 11, 1987, PCT Pub. No. WO87/03751, PCT Pub. Date Jun. 18, 1987
PCT Filed Oct. 30, 1986, Ser. No. 96,026
Claims priority, application Switzerland, Dec. 11, 1985, 5283/85
Int. Cl.[4] H02K *1/22*
U.S. Cl. 310—268 4 Claims



1. Single-stage, two-phase or four-phase electric motor, comprising a rotor part defining a first side and a second side, said rotor part in the form of a flat annular disc having a first flat surface and a second flat surface, the flat annular disc magnetised axially in such manner as to present, on each of its flat surfaces, a series of magnetic poles disposed regularly along an annular zone, the rotor part being fast with a motor shaft mounted to be rotatable relatively to a stator assembly, the stator assembly comprising at least two stator parts of magnetically permeable material being coupled with stator pole parts disposed on either side of the rotor part so as to form an air-gap of variable height along at least a portion of the annular zone in which are disposed the magnetic poles of the rotor part, the stator pole parts constituting, on each side of the rotor part, at least two groups of pole parts, the stator assembly also comprising at least two electric control coils, each control coil surrounding at least one of said groups of said pole parts, characterised in that the groups of said pole parts and the control coils are disposed in such a manner that, on each side of the rotor part, each group of said pole parts surrounded by one of said coils is placed, from each side along the periphery of the rotor part, alongside one of said groups which is not surrounded by one of said control coils, the group which is not surrounded by one of said control coils coupled with one of said control coils surrounding one of said groups of said pole parts disposed on the other side of the rotor part.

4,823,041

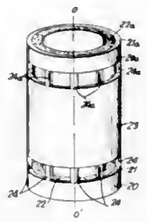
NON-DIRECTIONAL ULTRASONIC TRANSDUCER

Takeshi Inoue, Tokyo, and Masashi Konno, Yamagata, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,057
Claims priority, application Japan, Jul. 2, 1986, 61-156412; Jul. 2, 1986, 61-156413; Sep. 7, 1986, 61-162263; Sep. 7, 1986, 61-162264
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—322 14 Claims

1. A transducer comprising:
two cylindrical piezo-transducers vibrating radially;
a cylindrical sound radiator disposed between said two cylindrical piezo-transducers with its central axis coincident with the central axis of said piezo-transducers; and

a bending coupler provided at a predetermined interval on end surfaces whereat said cylindrical peizo-transducers



face to said cylindrical sound radiator and coupling said piezo-transducers and sound radiator.

4,823,042

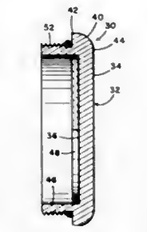
SONIC TRANSDUCER AND METHOD FOR MAKING THE SAME

Kenneth W. Coffey, Tulsa, and Toby E. Smith, Broken Arrow, both of Okla., assignors to Rich-Mar Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 886,826, Jul. 18, 1986, abandoned. This application Apr. 5, 1988, Ser. No. 180,602

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—322 **3 Claims**



1. A sonic transducer, comprising:

a piezoelectric crystal having a response to an applied signal, said response including a minimum impedance peak at a resonance frequency, a maximum impedance peak at an anti-resonance frequency, and intermediate impedance peaks near said minimum and maximum impedance peaks at frequencies near said resonance and anti-resonance frequencies;

a substantially tubular wall portion having a radially inner surface; and

means, connected to said wall portion and said crystal, for producing, in response to a signal applied to said crystal, an output having a substantially flat minimum impedance characteristic throughout a range of frequencies about said resonance frequency of said crystal and a substantially flat maximum impedance characteristic throughout a range of frequencies about said anti-resonance frequency of said crystal so that said output does not have said intermediate impedance peaks characteristic of said crystal, said means including an applicator body portion comprising:

a planar circular rear surface extending to said radially inner surface across an end of said wall portion, said planar circular rear surface having said crystal connected thereto, said crystal extending substantially to said radially inner surface of said wall portion; and

a front surface overlying said planar circular rear surface, said front surface having a projected area and said front surface including:

a planar circular face disposed a distance from said rear surface and parallel thereto, said planar circular face having substantially the same surface area as said crystal; and

a substantially annular edge surface extending only radially outwardly and rearwardly from said planar circular face and in substantially non-parallel relationship to said rear surface, said substantially annular edge surface comprising approximately 25% of said projected area of said front surface.

4,823,043

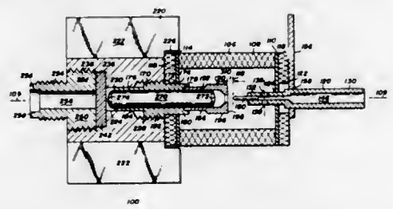
LENS PIPE ARC LAMP

Roy D. Roberts, Newark, and Norman L. Young, Felton, both of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 901,800, Aug. 29, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,255

Int. Cl.[4] H01J *17/26, 61/28*

U.S. Cl. 313—231.61 **15 Claims**



1. A lens pipe arc lamp comprising:

a body formed of a dielectric material having formed therein a hollow cavity containing pressurized gas;

a pair of electrodes mounted within said cavity with the distal ends of said electrode being spaced apart a distance to define an arc gap;

a lens pipe means mounted to pass from outside the body through a wall of the body and into said cavity, with a fresh end having a lens surface positioned inside said cavity and a second end positioned outside the body, the lens surface having a first focal point located at a light point proximate the distal end of one of the electrodes said light point having the highest light intensity of an arc discharge of said arc gap and a second focal point located beyond said second end of said lens pipe means, the lens pipe means for direct imaging of light from said light point to said second focal point without reflection off of the inner surface of the lens pipe means; and

an optic fiber connector attached to the body and positioned such that an optic fiber held in the optic fiber connector is positioned proximate said second focal point to receive said imaged light.

4,823,044

DISPENSER CATHODE AND METHOD OF MANUFACTURE THEREFOR

Louis R. Falce, Irvine, Calif., assignor to Ceradyne, Inc., Costa Mesa, Calif.

Filed Feb. 10, 1988, Ser. No. 154,743

Int. Cl.[4] H01J *9/04*

U.S. Cl. 313—346 DC **5 Claims**

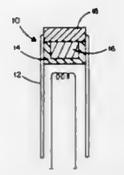
1. A dispenser cathode for cathode ray tubes comprising:

a reservoir formed of a refractory metal;

a first pellet contained within said reservoir formed by a mixture of about 50% to 80% barium calcium aluminate and about 20% to 50% tungsten;

a second pellet overlying and sealing said reservoir and comprising pressed and sintered porous tungsten; and

means for applying heat to said reservoir and pellets for emitting current therefrom;



said second pellet having no non-metal constituents which could otherwise clog pores in said second pellet.

4,823,045

PICTURE TAKING TUBE HAVING A BIAS LIGHT DEVICE

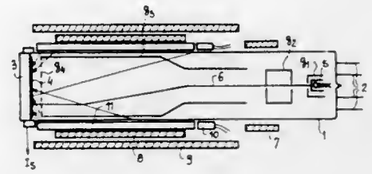
Jean-Luc Ricaud, St. Martin-Le-Vinoux, and Bernard Plos, St. Egreve, both of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 16, 1987, Ser. No. 109,174

Claims priority, application France, Oct. 17, 1986, 86 14414

Int. Cl.[4] H01J *31/38;* G02B *5/14*

U.S. Cl. 313—371 **6 Claims**



1. A picture taking tube having a bias light device, said tube including a photosensitive target and a vacuum enclosure formed essentially of glass, said bias light device comprising:

at least one ring of light emitting diodes positioned about the vacuum enclosure; and

at least one diffuser, positioned about the vacuum enclosure, the distance between said diffuser and said photosensitive target being less than the distance between said at least one ring of light diodes and said photosensitive target.

4,823,046

COLOR PICTURE TUBE WITH ASTIGMATISM CORRECTION MEANS

Albertus A. S. Sluyterman, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jul. 6, 1987, Ser. No. 69,687

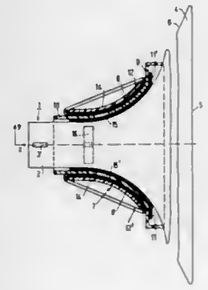
Claims priority, application Netherlands, Jul. 10, 1986, 8601803

Int. Cl.[4] H01J *29/70*

U.S. Cl. 313—431 **2 Claims**

1. In a combination comprising: a colour picture tube whose neck accommodates an electron gun system for emitting to a display screen three co-planar electron beams, including a central beam which coincides at least substantially with the axis of the picture tube and two outer beams located on either side thereof; a deflection unit which is secured coaxially around the neck of the picture tube and which comprises a system of line deflection coils which, when energized, produces a line deflection magnetic field which deflects the electron beam in a line direction and a system of field deflection coils which, when energized, produces a field deflection magnetic field orthogonal to the line deflection magnetic field and which deflects the electron beam in a field direction at right angles to the line direction; and a first pair of astigmatism correction elements of a soft magnetic material respectively positioned symmetrically on opposite sides of the plane through the non-deflected electron beams and extending substantially parallel to said field deflection magnetic field, such elements being located between the systems of line and field deflection coils in the proximity of the centre of the field deflection magnetic field generated by the system of field deflection coils; the improvement comprising:

a second pair of astigmatism correction elements of a soft magnetic material respectively positioned symmetrically on opposite sides of the plane through the tube axis normal



to the plane through the non-deflected electron beams, so that such second pair of correction elements are angularly rotated substantially 90° relative to the first pair of correction elements and each extend substantially orthogonal to and cut across said field deflection magnetic field;

said second pair of correction elements being located in a position at which field pre-deflection is produced by the deflection field generated by the system of field deflection coils and which is closer to the beam entrance side of such deflection field than the center thereof;

said second pair of correction elements providing astigmatism correction of higher order components of the deflection field.

4,823,047

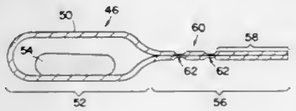
MERCURY DISPENSER FOR ARC DISCHARGE LAMPS

James L. Holmes, Montoursville, Pa., and Ralph P. Parks, Jr., Danvers, Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Oct. 8, 1987, Ser. No. 105,849

Int. Cl.[4] H01J *61.20, 61/24, 7/14*

U.S. Cl. 313—546 **13 Claims**



1. A mercury capsule comprising:

an annealed metal member and including a generally tubular main body portion which contains a predetermined amount of mercury to be released therefrom; a sealed end portion immediately adjacent said main body portion for providing a seal for said capsule; and means for sealing said end portion, said sealing means having a flattened, generally planar configuration and including a flattened portion consisting of a pair of walls, one of said walls having a predetermined wall thickness, and at least one sealing constriction formed in said flattened portion, said

VOL 1101 ISS 3 AP 18 1989 UMI

sealing constriction having a predetermined cross-sectional thickness less than said predetermined wall thickness of said one of said walls at said flattened portion, said sealing constriction enabling containment of said mercury within said capsule below a predetermined elevated temperature.

4,823,048

ELECTRIC LAMP HAVING PINCH A SEAL WITH PRIMARY FOILS ARRANGED BETWEEN EACH CURRENT SUPPLY CONDUCTOR AND A RESPECTIVE AUXILIARY FOIL

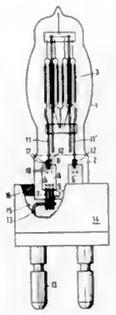
Leo F. Ooms, Turnhout, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1988, Ser. No. 168,193

Claims priority, application Netherlands, Mar. 25, 1987, 8700693

Int. Cl.[4] H01J *5/36, 61/36;* **H01K** *1/38*

U.S. Cl. 313—623 **8 Claims**



1. An electric lamp, comprising:

(a) a lamp envelope having a pinch seal;

(b) a light source energizable for emitting light arranged within said lamp envelope; and

(c) a current-supply conductor comprising an internal conductor connected to said light source having an end portion entering said pinch seal,

an external conductor extending into said pinch seal from the exterior having an end portion within said pinch seal spaced from said end portion of said internal conductor,

a primary metal foil extending in the pinch seal between said external and internal conductors, said primary metal foil having a first end portion welded to said end portion of said internal conductor and a second end portion welded to said end portion of said external conductor, and

an auxiliary metal foil having a first portion welded to said internal conductor adjacent said first end portion of said primary foil and having a second portion which extends over and is welded to said first end portion of said primary foil such that said first end portion of said primary foil is disposed between said second portion of said auxiliary metal foil and said end portion of said internal conductor.

4,823,049

VEHICLE LAMP HAVING A MOLDED LAMP CAP WITH INTEGRAL CURRENT-SUPPLY CONDUCTORS AND DIPPING CAP

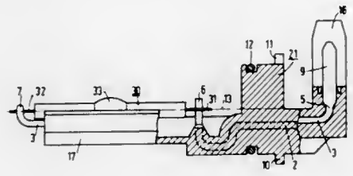
Rudolf Sanders, and Josephus F. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 932,955, Nov. 19, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 233,938

Claims priority, application Netherlands, Nov. 19, 1985, 8503181; Jan. 31, 1986, 8600226

Int. Cl.[4] H01J *61/30*

U.S. Cl. 313—623 **22 Claims**



1. A vehicle lamp, comprising:

(a) a discharge device having a longitudinal axis and opposing ends, said discharge device having first and second lead-throughs each extending from a respective end along said longitudinal axis;

(b) a one-piece insulative lamp base comprising a solid molding having a first face facing said discharge device, said first lead-through extending towards said first face and said second lead-through extending away from said first face; and

(c) first and second current-supply conductors each having a portion molded in said lamp base securing said current-supply conductors in said lamp base, each said current-supply conductor extending away from said first face towards said discharge device, each current-supply conductor being connected to a respective lead-through for energizing said discharge device and supporting said discharge device with respect to said lamp base; and

(d) each current-supply conductor having a portion defining lamp contacts extending from a portion of said lamp base other than said first face.

4,823,050

METAL-HALIDE ARC TUBE AND LAMP HAVING IMPROVED UNIFORMITY OF AZIMUTHAL LUMINOUS INTENSITY

George J. English, Reading; Harold J. Rothwell, Jr., Georgetown, and Thomas Gilligan, Salisbury, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Sep. 18, 1986, Ser. No. 909,359

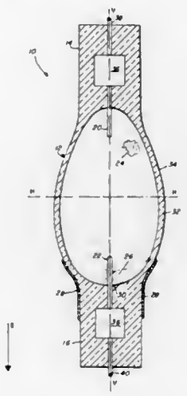
Int. Cl.[4] H01J *61/30*

U.S. Cl. 313—634 **12 Claims**

1. An arc tube for vertical operation having improved uniformity of azimuthal luminous intensity, said arc tube having a vertical axis and an azimuthal plane normal to said vertical axis, said arc tube comprising:

(a) a light-transmissive body elongated along said vertical axis with opposed top and bottom ends, said bottom end being closer to the earth than said top end when said arc tube is operationally positioned, said body hermetically enclosing an interior, each of said ends having an electrode mounted therein and protruding into said interior substantially along said vertical axis, said azimuthal plane passing half way between the internal termination points of said electrodes, the portion of said body below said azimuthal plane being more oblate than the portion of said body above said azimuthal plane, said body being divided into three regions all symmetrical about said vertical axis, a top region extending from said top end to a point on said body below said azimuthal plane, a bottom region extending from said bottom end toward said top region, and a middle region being intermediate said bottom and top regions;

(b) a heat-reflecting coating on the outside surface of said bottom region;



(c) a gaseous fill disposed within said interior, said fill being capable of sustaining an electrical arc therethrough;

(d) an additive including at least one metal-halide disposed within said interior:

(e) during operation of said arc tube, the inside surface of said top region being substantially free of said additive in condensate form; and

(f) means for providing electrical power from an external source to said electrodes.

4,823,051

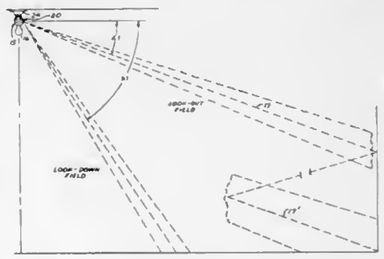
INFRARED ACTUATED CONTROL SWITCH ASSEMBLY

William A. Young, Aurora, Colo., assignor to Pittway Corporation, Northbrook, Ill.

Filed May 21, 1987, Ser. No. 52,763

Int. Cl.[4] G01J *5/08;* **G08B** *13/18*

U.S. Cl. 315—155 **47 Claims**



1. An infrared radiation activated control switch assembly operable to energize an electrical unit and usable with an electrical socket comprising:

a housing;

means carried by said housing for engaging the electrical socket mechanically and electrically;

means carried by said housing, spaced from said socket engaging means, for at least electrically engaging the electrical unit;

means, carried by said housing, for sensing infrared radiation with said sensing means including means for collecting radiation incident thereon from a 360° degree region surrounding said housing; and

control means coupled between said sensing means and said electrical unit engaging means, responsive to infrared radiation incident on said sensing means, for energizing the electrical unit.

4,823,052

HORIZONTAL DEFLECTION HIGH-VOLTAGE CIRCUIT

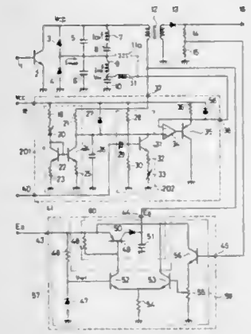
Makoto Onozawa; Koji Kito, both of Yokohama, and Michitaka Osawa, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,288

Claims priority, application Japan, Jun. 10, 1987, 62-143109

Int. Cl.[4] H01J *29/70*

U.S. Cl. 315—408 **14 Claims**



1. In a horizontal deflection high-voltage circuit comprising:

a horizontal output transistor, the base thereof being supplied with a horizontal drive pulse;

a first damper diode, one end thereof being connected with the output terminal of the horizontal output transistor;

a first resonant capacitor, both ends thereof being connected with both ends of the first damper diode;

a first resonant circuit formed of a series circuit of a horizontal deflection coil and a first trace capacitor, both ends of the first resonant circuit being connected with both ends of the first damper diode;

a flyback transformer, one input terminal thereof being connected with the output terminal of the horizontal output transistor;

a second damper diode, one end thereof being connected with the other end of the first damper diode and the other end of the second damper diode being grounded;

a second resonant capacitor, one end thereof being connected with the other end of the first damper diode and the other end of the second resonant capacitor being grounded;

a second resonant circuit formed of a series circuit of a modulation coil and a second trace capacitor, one end of the second resonant circuit being connected with the other end of the first damper diode and the other end of the second resonant circuit being grounded; and

source voltage control means detecting a high voltage output from the output terminal of the flyback transformer for supplying, in accordance with the result of the detection of the high voltage, a first control voltage to the other input terminal of the flyback transformer so that the high voltage output from the flyback transformer is kept constant; said horizontal deflection high-voltage circuit further comprising:

horizontal deflection current control means detecting a

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variation in the first control voltage input to the other input terminal of the flyback transformer for supplying a second control voltage in accordance with the result of the detection to the junction point of the modulation coil and the second trace capacitor so that a horizontal deflection current flowing through the horizontal deflection coil will not vary even if the high-voltage control voltage is varied.

4,823,053

CONTROL OF VIBRATION ENERGIZATION

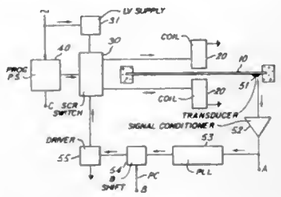
William McCracken, Elderslie, and Alexander J. Waddell, Denny, both of Scotland, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 908,008, Sep. 16, 1986, abandoned. This application Oct. 7, 1987, Ser. No. 105,956

Claims priority, application United Kingdom, Sep. 16, 1985, 8522819

Int. Cl.[4] H02K *33/00*

U.S. Cl. 318—132 **6 Claims**



1. A device for controlling vibration of a resiliently supported body, comprising:

electromagnetic drive means for vibrating said body, when energized;

means for detecting actual vibration of the body;

control means for controlling said drive means, including digital signal processing means for producing a control pulse train which represents a phase difference between said detected vibration and a desired vibration, and controlling energization of the drive means with an independently set phase difference from the detected frequency to sustain the vibration of the body.

4,823,054

CIRCUIT FOR PHASE SECTION CONTROL OF AN AC-DC MOTOR

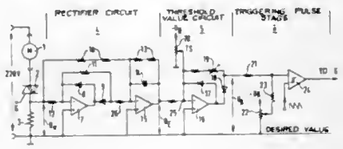
Wolfgang Millauer, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft

Filed Dec. 10, 1985, Ser. No. 807,262

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445348

Int. Cl.[4] H02P *7/638*

U.S. Cl. 318—245 **3 Claims**



1. In a circuit for phase control of an AC-DC motor for a machine operated in defined load conditions with a controllable current flow controller connected in series with the motor, said current flow controller having an associated impulse trigger impulse stage, the improvement comprising:

a measuring arrangement for determination of the load current flowing through the load path of the current flow controller, said measuring arrangement being composed of a load current circuitry;

a rectifier circuit with an associated filter circuit which rectifies a load current-proportional voltage measurable at the load current circuitry and switches the load current-proportional voltage onto a variable input of a threshold value circuit; and

the threshold value circuit having an input side and an output side, said input side is supplied by the measuring arrangement with a signal having magnitude corresponding to the load current, said output side, when a preset threshold level of the load current is not exceeded, generates a first firm basic desired value UA_1 for a trigger voltage level at the associated trigger impulse stage and, when the preset threshold level of the load current is exceeded, switches over onto a higher trigger voltage level UA_2, wherein the rectifier circuit is an ungrounded amplifying full wave rectifier circuit.

4,823,055

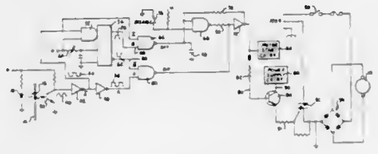
ELECTRONIC CONTROL CIRCUIT FOR COMMAND SYSTEMS

Richard G. Bowman, Big Bear Lake, Calif., assignor to Super-Drive Systems, Inc., Kansas City, Mo.

Filed Dec. 21, 1987, Ser. No. 136,204

Int. Cl.[4] H02P *5/16*

U.S. Cl. 318—314 **3 Claims**



1. A digital speed control circuit for an electric motor having a rotary output shaft, said circuit comprising:

means for sensing the rotational speed of the output shaft and converting the sensed speed into a first digital pulse having a duration inversely proportional to the shaft speed;

means for receiving an input speed command representative of the commanded speed at which the shaft is to rotate;

means for using said first digital pulse to trigger a second digital pulse initiated simultaneously with the first pulse and having a duration inversely proportional to the commanded speed;

means for generating a first digital control signal whenever the duration of the first pulse exceeds the duration of the second pulse and a second digital control signal whenever the duration of the second pulse exceeds the duration of the first pulse, said first and second digital control signals being logical complements of one another;

a digital control circuit for controlling the application of power to the motor, said digital control circuit having a first state in which full power is applied to the motor for energization of same and a second state in which no power is applied to the motor for deenergization of same; and

switching means controlled by said first and second digital control signals for effecting the first state of said digital control circuit immediately upon generation of said first digital control signal and for effecting the second state of said digital control circuit immediately upon generation of said second digital control signal, thereby maintaining correspondence between the sensed speed and the commanded speed without a dead band range in which the sensed speed can fluctuate without being changed.

4,823,056

PULSE-WIDTH MODULATION DRIVE CIRCUIT

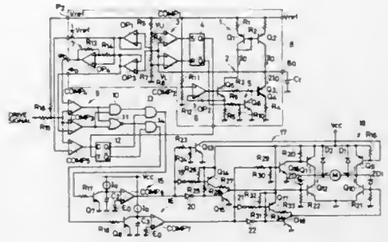
Yoshihiko Watanabe; Tsuneyoshi Nagashita; Susumi Niinuma; Isamu Nomura; Kimito Kobayashi; Akio Namiki; Hiroyuki Abe; Takayuki Iijima; Kazuto Shimokawa; Akira Haeno; Yoshio Aoyagi; Toshiyuki Kimura, and Isao Matsumoto, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 2, 1986, Ser. No. 881,540

Claims priority, application Japan, Jul. 2, 1985, 60-145071; Jul. 2, 1985, 60-145072; Jul. 2, 1985, 60-145073; Jul. 2, 1985, 60-145074; Jul. 2, 1985, 60-145075; Jul. 2, 1985, 60-145076; Jul. 2, 1985, 60-145077; Jul. 2, 1985, 60-145078; Jul. 2, 1985, 60-145079; Jul. 2, 1985, 60-145080

Int. Cl.[4] H02P *5/00*

U.S. Cl. 318—341 **16 Claims**



1. In a switching drive circuit which has a unidirectional element for absorbing reverse electromotive force across a load and which drives said load by switching current flow through said load on and off in response to a predetermined pulse signal, the improvement wherein said drive circuit comprises:

compensating circuit means receiving said predetermined pulse signal as an input and providing a drive pulse signal for said load, said drive pulse signal having a pulse width larger than a pulse width of said predetermined pulse signal by a predetermined amount, whereby an absorption of energy in said unidirectional element is compensated when said unidirectional element is absorbing said reverse electromotive force.

4,823,057

VARIABLE SPEED MOTOR CONTROL

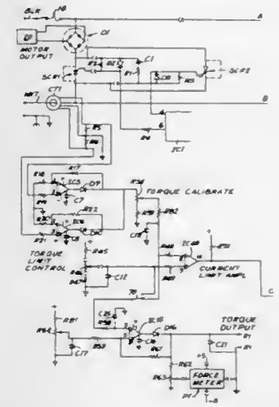
David L. Eley, Beloit, Wis., assignor to Greenlee Textron Inc., Rockford, Ill.

Filed Mar. 5, 1987, Ser. No. 22,237

Int. Cl.[4] H02P *5/16*

U.S. Cl. 318—432 **15 Claims**

1. A variable speed motor control for an electric motor controlled by opposing SCRs, comprising means for controlling the SCRs by comparing a synchronous ramp and speed error signal, means for sensing motor current as representative of motor torque and providing a motor shut-down signal when sensed motor current exceeds a setpoint, and means for overriding the speed error signal in response to the motor shut-down signal for deactivating the SCRs.



4,823,058

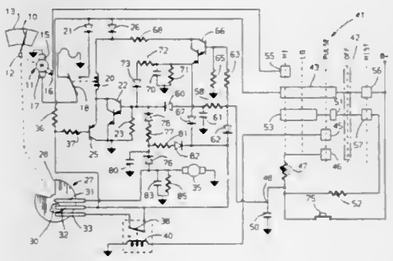
VEHICLE WINDOW WIPER WITH DUAL PAUSE

H. Charles Buchanan, Jr., Spring Valley, and Richard E. Wainwright, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 21, 1988, Ser. No. 222,689

Int. Cl.[4] B60S *1/08*

U.S. Cl. 318—443 **5 Claims**



1. A control for a wiper adapted to be driven back and forth in repeating cycles of a wipe pattern between inner wipe and outer wipe positions across a vehicle window by an electric motor, the control comprising, in combination:

a source of electric power;

an electric drive circuit effective to drive the motor from the source of electric power when activated;

a wiper activation switch having off, continuous and pause positions;

a first wiper position responsive switch closed throughout the wipe pattern except for the inner and outer wipe positions;

a second wiper position responsive switch closed throughout the wipe pattern except for the inner wipe position;

first circuit means connecting the first wiper position responsive switch in series with the electric power source to generate a signal to activate the electric drive circuit whenever the first wiper position responsive switch is closed;

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second circuit means including a timer effective, with the wiper activation switch in its pause position, to initiate activation of the electric drive circuit a predetermined time period after the first wiper position responsive switch opens, whereby the wiper is driven through repeating cycles of the wipe pattern with stops for the predetermined time period at both the inner and outer wipe positions of the wipe pattern in each cycle;

third circuit means effective with the wiper activation switch in its continuous position to provide continuous activation of the electric drive circuit; and

fourth circuit means responsive to the wiper activation switch at least in its off position to connect the first wiper position responsive switch in parallel with the second wiper position responsive switch to shunt the same at the outer wipe position, whereby the wiper will be parked only in the inner wipe position.

4,823,059

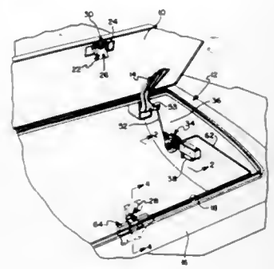
CONTROL APPARATUS FOR A COMPARTMENT PANEL PULL DOWN MECHANISM

David E. Compeau, Mt. Clemens; Lloyd W. Rogers, Utica; Ronald J. Pyszel, Sterling Heights, and Walter C. Chapman, Allenton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1988, Ser. No. 143,780

Int. Cl.[4] E05B *47/00, 65/19;* **E05F** *15/10*

U.S. Cl. 318—454 **8 Claims**



1. In a vehicle body having a compartment panel hinged for movement between open and closed positions with respect to a compartment defined by a body panel, a latch mechanism including a first element fixedly mounted on one of said panels and a second element retractably mounted on the other panel, and a pull down mechanism including an electric motor adapted to sequentially (1) move the compartment panel to a partially closed position for mechanically coupling the first and second elements of said latch mechanism, and (2) retracting the second element of said latch mechanism in the direction of such compartment panel movement to complete the closure of said panel, motor control apparatus, comprising:

switch means activated by a vehicle operator to generate a panel closure command;

first control means effective in response to the generation of said panel closure command by said switch means for supplying current to said motor in a direction which moves said compartment panel toward said partially closed position; and

second control means effective when the motor current supplied by said first control means exceeds a closing reference indicative of successful coupling of said latch mechanism elements for interrupting the supply of current by said first control means, and thereafter, supplying current to said motor in a direction to retract the second element of said latch mechanism until such current exceeds a sealing reference indicative of complete closure of said panel, thereby to sequentially control the operation of said motor without the use of mechanically activated limit switches.

4,823,060

CIRCUIT ARRANGEMENT FOR GENERATING A MEASUREMENT SIGNAL ASSOCIATED WITH THE FREQUENCY OF AN ALTERNATING CURRENT SIGNAL

Benno Doemen, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, Fed. Rep. of Germany

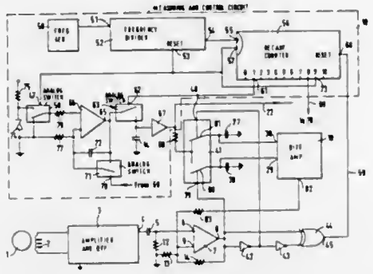
PCT No. PCT/DE86/00435, § 371 Date Jul. 6, 1987, § 102(e) Date Jul. 6, 1987, PCT Pub. No. WO87/03112, PCT Pub. Date May 21, 1987

PCT Filed Oct. 30, 1986, Ser. No. 85,566

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539556

Int. Cl.[4] G01R *23/09*

U.S. Cl. 318—464 **22 Claims**



19. A frequency-to-voltage converter, comprising:

comparator means, responsive to an alternating current input signal and to a reference value signal, for generating a pulse train having digitally high values and digitally low values;

means, responsive to the pulse train, for generating an output signal having a value which is a function of the frequency of the alternating current input signal; and

means for generating the reference value signal for the comparator means, the means for generating the reference value signal being responsive to the pulse train and including means for finding the difference between the average time that the pulse train has digitally high values and the average time that the pulse train has digitally low values.

4,823,061

STONE EXPANSION CONTROL FOR A HONING MACHINE

Michael A. Boulton, Cheltenham; Joseph I. Roberts, and Hamid R. Bassirat, both of Macclesfield, all of England, assignors to Delapena Honing Equipment Limited, Gloucestershire, England

PCT No. PCT/GB86/00766, § 371 Date Jul. 30, 1987, § 102(e) Date Jul. 30, 1987, PCT Pub. No. WO87/03711, PCT Pub. Date Jun. 18, 1987

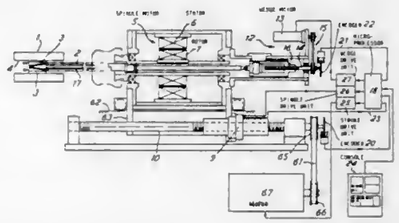
PCT Filed Dec. 16, 1986, Ser. No. 91,574

Claims priority, application United Kingdom, Dec. 16, 1985, 8530921; Jun. 30, 1986, 8615915

Int. Cl.[4] G05B *19/29*

U.S. Cl. 318—603 **12 Claims**

1. A stone expansion system for a honing machine which has honing stones mounted to expand radially with respect to a spindle of the machine; a stone expansion drive motor and a stone expansion drive linkage coupling the motor to the stones, the motor being a d.c. electric motor, the stone expansion system being characterised in that there is provided a constant-current amplifier connected to drive the motor; a torque control system whereby the operator can set a torque command input to determine the amplitude of the current from the constant-current amplifier; and a speed control system whereby the operator can set at least one speed command input to determine the speed of the motor, the arrangement being such



that the speed control system is effective to ensure control of speed as the stones approach the wall of the bore and that the torque control system is effective to control stone pressure during honing.

4,823,062

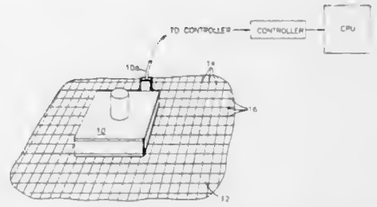
METHOD AND APPARATUS FOR PRECISION CONTROL OF LINEAR MOTORS AND THE LIKE EMPLOYING A CLOSED LOOP TECHNIQUE

Brian D. Hoffman, Somerville, N.J., and Stephen H. Pollack, Washington Crossing, Pa., assignors to Megamation, Incorporated, Princeton, N.J.

Filed Jul. 23, 1987, Ser. No. 77,112

Int. Cl.[4] G05B *11/00*

U.S. Cl. 318—687 **18 Claims**



1. Apparatus for accurately verifying the movement of linear motors and the like, said linear motors having first and second forcer means, said controlling means comprising:

a platen formed of a plate of magnetic material having first and second sets of parallel, uniformly spaced grid lines formed in the platen surface for defining an orthogonal matrix of teeth whose surfaces are exposed to said forcer means;

said grid lines having differing reflectivity characteristics;

first sensor means arranged on said linear motor for detecting said grid lines including means for generating a signal indicative of the presence of a grid line of only one of said sets of grid lines to the exclusion of the remaining one of said sets;

second sensor means for generating a signal representing the passage of a grid line and including means for detecting the passage of only the remaining ones of said grid lines to the exclusion of said first set of said grid lines,

said first and second sensor means each comprising a light source and a sensing element, each light source directing light diagonally toward said platen and each element being disposed to receive light reflected diagonally from the platen;

said first sensor means being arranged so that the alignment of said first sensor means is substantially orthogonal to the alignment of the second sensor means; and control means receiving signals from said first and second sensor means for terminating movement of the first and second forcer means when the counts of said sets of grid lines reach a predetermined value.

4,823,063

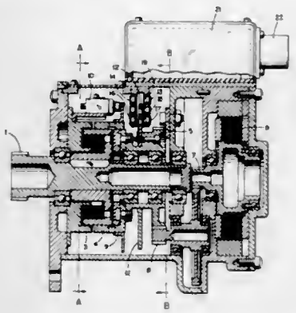
AUTHORITY LIMITER

Valentin G. Barba, Princeton Junction, N.J., and Eugene E. Sbube, Elmont, N.Y., assignors to Plessey Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 719,150, Apr. 2, 1985, Pat. No. 4,683,407. This application Apr. 16, 1987, Ser. No. 39,099

Int. Cl.[4] G05B *17/00;* **B64C** *3/18*

U.S. Cl. 318—689 **13 Claims**



11. In combination with an autopilot transfer device, an authority limiter comprising:

a. an input shaft which is normally free to rotate in either direction;

b. a motor gear output shaft;

c. an electromagnetic clutch used to couple the input shaft to the motor gear output shaft;

d. a torque motor geared to said output shaft;

e. an obtruding disc attached to the motor gear output shaft through a supplementary electromagnetic clutch, said obtruding disc having cut-out portions therethrough;

f. a number of sensors activated by the presence or absence of said cut-out portions of said obtruding disc;

g. an electronic circuit means for controllably applying current, dependent upon the output of said sensors, to said torque motor to generate an opposing torque on said output shaft; and

h. a centering means coupled to said obtruding disc for accumulating potential energy when said obtruding disc is driven from a null position in either direction, said centering means driving said obtruding disc to said null position when power is removed from both said clutches.

4,823,064

QUICK RESET MOTOR STARTING DEVICE

Lee A. Prager, Raymond, and Douglas C. Carbone, Standish, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 46,758, May 7, 1987. This application Feb. 29, 1988, Ser. No. 161,511

Int. Cl.[4] H02P *1/44*

U.S. Cl. 318—783 **6 Claims**

1. A combination for restarting electric motors, said combination comprising:

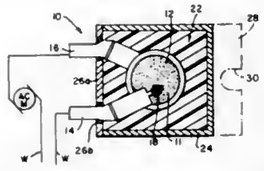
an electric motor, means to connect said motor to a power supply and a starter device, said starter device comprising:

a PTC resistor formed of a body and a pair of electrodes disposed on said body, said PTC resistor having a predetermined anomalous point;

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a lead terminal extending outwardly from each of said electrodes, said PTC resistor being capable of generating heat upon application of current to said electrodes, whereby the temperature of said PTC resistor can be increased;

a heat sink material disposed about said PTC resistor, said heat sink material comprising a metal oxide thermal conductor in particulate form dispersed in an electrically



non-conductive matrix material, whereby the heat generated by said PTC resistor is reduced to a temperature below the anomalous point;

a cover surrounding and enclosing said heat sink material; and

means electrically connecting said motor and the lead terminals of said PTC resistor to a power supply, whereby to restart the motor.

4,823,065

FREQUENCY CONVERTER FOR THE STABILIZED POWER SUPPLY OF ASYNCHRONOUS MOTORS

Alain Gousset, Rueil Malmaison, France, assignor to La Telemecanique Electrique, France

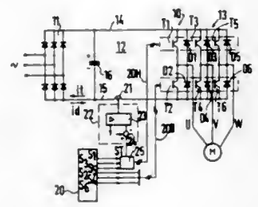
PCT No. PCT/FR87/00166, § 371 Date Jan. 19, 1988, § 102(e) Date Jan. 19, 1988, PCT Pub. No. WO87/07455, PCT Pub. Date Dec. 3, 1987

PCT Filed May 20, 1987, Ser. No. 161,079

Claims priority, application France, May 21, 1986, 8607192

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—798 **8 Claims**



1. A frequency converter for an AC power supply of an asynchronous type motor, comprising:

i. a rectifier bridge having input AC terminals which can be connected to a multiphase network and two DC output terminals connected to two respective conductors of a DC intermediate circuit;

ii. an inverter having two DC input terminals respectively connected to the said conductors so as to receive a DC current provided by the rectifier and flowing in the conductors, said inverter comprising three pairs of static switches, each pair being connected to the two DC input terminals and comprising two series connected switches, one of which is said to be a high channel switch, and the other, a low channel switch, and which are each provided with a recovery diode in parallel, each of said pairs having a middle point which constitutes an AC output terminal which can be connected to a phase impedance of the motor, the said inverter having output voltages between the output terminals;

iii. a device for controlling the switches being connected thereto for applying thereto modulated pulses for ensuring closing and opening thereof according to a modulation;

iv. a means for reading the DC current in one of the said conductors and for delivering an image signal of this DC current;

v. a processing means connected to the reading means, said processing means comprising means for detecting an instability of the image signal and means for generating a stabilization control signal when the said instability is detected;

vi. a means for reducing the output voltages of the inverter, said means being connected to the processing means so as to receive the stabilization control signal, and comprising means for modifying the modulated pulses delivered by the control device when the stabilization control signal is emitted, wherein the said conductors conduct a reverse current passing through the said recovery diodes and the processing means deliver a reverse current excess signal (ST) and include a processing circuit connected to the current reading means and providing a filtered peak signal representative of the peak value of the reverse current and a comparator comparing this signal (I_d) with an adjustable reference value (I_{REF}) for generating when $I_d > I_{REF}$, the reverse current excess signal (ST) applicable to the output voltage reduction means.

4,823,066

THREE-PHASE INDUCTION MOTOR CONTROL METHOD

Yoshiki Fujioka, Higashiyamato Shinichi Kouno, Hino, and Tatsuo Shinohara, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

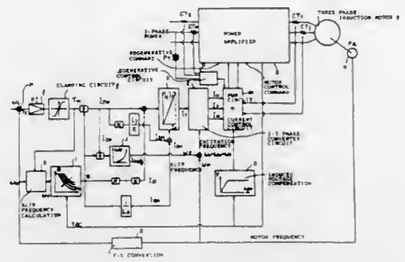
PCT No. PCT/JP86/00420, § 371 Date Apr. 10, 1987, § 102(e) Date Apr. 10, 1987, PCT Pub. No. WO87/01250, PCT Pub. Date Feb. 26, 1987

PCT Filed Aug. 14, 1986, Ser. No. 52,856

Claims priority, application Japan, Aug. 14, 1985, 60-179165

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—798 **4 Claims**



1. A three-phase induction motor control method based on vector control for converting an AC input into a direct current at the time of motor drive control, to drive a three-phase induction motor at a variable velocity by the output of a first inverter to which the direct current resulting from the conversion is applied, and for converting an output current of the three-phase induction motor into a direct current at the time of regenerative control to regenerate the output of a second inverter, to which the direct current resulting from the conversion is applied, in an AC power supply, the method comprising:

(a) vector analyzing an excitation current command and a secondary current command into an excitation flux direction component and a motor electromotive force direction component, respectively, on the basis of a torque command with respect to the three-phase induction motor and an excitation flux command decided to accommodate the three-phase induction motor;

(b) determining a primary current command of the motor based on a synthesis of the vector components determined in said step (a);

(c) detecting the voltage of a direct current link portion of a circuit for converting the AC input into a direct current;

(d) correcting the excitation flux command in dependence upon the detected voltage; and

(e) obtaining a linear torque command and performing constant output control irrespective of a fluctuation in the power supply voltage.

4,823,067

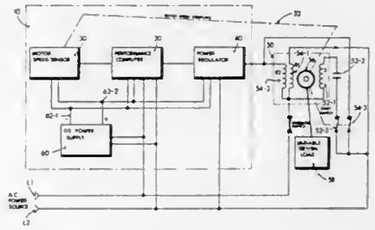
ENERGY CONSERVING ELECTRIC INDUCTION MOTOR CONTROL METHOD AND APPARATUS

Harold J. Weber, 313 Washington St., P.O. Box 6161, Hollis-ton, Mass. 01746

Filed Feb. 16, 1988, Ser. No. 155,829

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—799 **20 Claims**



1. Power control method for use with an electric induction motor, comprising the steps of:

providing a source of alternating current power;

providing the induction motor with a first RUN winding predetermined to produce a first partial level of motor field excitation when effectively coupled with the a.c. power source;

providing the induction motor with a second RUN winding predetermined to produce a second partial level of motor field excitation when effectively coupled with the a.c. power source;

combining the partial levels of motor field excitation to produce a full level of motor field excitation;

coupling the first RUN winding with the source of a.c. power;

driving an inconstant mechanical load with the induction motor;

predetermining a value of subsynchronous full load driving speed for the induction motor;

sensing instant motor speed;

variably coupling a.c. current power flow between the source and the second RUN winding;

increasing the variable coupling relative with any sensed speed decrease below the predetermined load driving speed; and,

decreasing the variable coupling relative with any sensed speed increase above the predetermined load driving speed.

4,823,068

CROSS TIE FOR INDUCTION MOTOR DRIVE

Robert W. Delmerico, Clifton Park, N.Y., and Paul M. Espelage, Salem, Va., assignors to General Electric Company, Salem, Va.

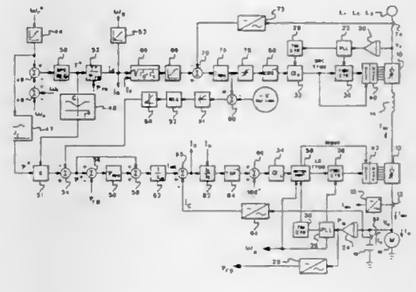
Filed Jun. 23, 1987, Ser. No. 65,471

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—807 **11 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 34 Pages)



1. An alternating current motor drive comprising:

(a) an alternating current induction motor;

(b) an alternating current to direct current converter for providing an output voltage and current of variable magnitude to a link circuit;

(c) control means for controlling said output current including,

(i) means responsive to an input signal representing desired motor speed to establish a control signal representing a desired output voltage of said alternating current to direct current converter, and,

(ii) means for limiting the magnitude of said control signal at a limited value;

(d) a direct current to alternating current converter for converting the direct current on said link circuit to an alternating load current for application to said motor;

(e) control means for controlling frequency of said load current including means responsive to the input signal representing desired motor speed for establishing an initial flux set point signal; and,

(f) a cross tie circuit for selectively effecting a modification of said initial flux set point signal to provide a final flux set point signal for use in the control of said converter, said cross tie circuit comprising:

(i) means to establish a reference signal representative of a percentage of the limited value of said control signal,

(ii) means to combine said reference signal with said control signal to provide a difference signal when said control signal exceeds said reference signal,

(iii) means to modify said difference signal to provide a cross tie signal and,

(iv) means to combine said cross tie signal with said initial flux set point signal to provide said final flux set point signal.

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4,823,069

LIGHT DIMMER FOR DISTRIBUTED USE EMPLOYING INDUCTORLESS CONTROLLED TRANSITION PHASE CONTROL POWER STAGE

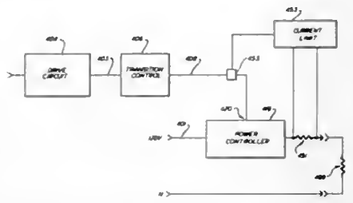
Michael Callahan, 201 W. 85th, New York, N.Y. 10024; John K. Chester, 331A Warren St., Brooklyn, N.Y. 11201, and Robert M. Goddard, 330 First Ave., New York, N.Y. 10009

Continuation-in-part of Ser. No. 640,978, Aug. 15, 1984, Pat. No. 4,633,161. This application Dec. 17, 1986, Ser. No. 943,381

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.[4] G05F *1/40*

U.S. Cl. 323—235 **27 Claims**



1. Electronic dimming apparatus comprising a semiconductor power controlling means for coupling a lamp load to an alternating current source, and for variably controlling the average power supplied to said lamp load by adjusting the relative proportion of substantially each half-cycle of the alternating current waveform in which said semiconductor power controlling means is in a substantially conductive versus a substantially non-conductive power condition; said semiconductor power controlling means having a control input and adapted to modulate the instantaneous amplitude of the voltage or current supplied to said lamp load under the active control of said control input, said semiconductor power controlling means further having an inherent minimum duration required for a transition between one and the other of its substantially conductive and substantially non-conductive power conditions in response to a stepped change between a value at its control input producing the one and a value producing the other of said power conditions; means for triggering responsive to at least a first input condition corresponding to a desired average power to be supplied to said lamp load and further responsive to the zero-crossing of said alternating current waveform, said means for triggering having at least one output, and producing at least one change in condition at said output substantially corresponding to the phase angle of said alternating current waveform of said half-cycle at which said semiconductor power controlling means must change from one of said power conditions to the other of said power conditions to supply said desired average power to said lamp load; means for transition control responsive to said output of said means for triggering and having an output coupled to said control input of said power controlling means, for controlling the duration of the change between said value at said control input of said power controlling means producing the one and said value producing the other of said power conditions, such that the power condition of said semiconductor power controlling means is gradually changed between one and the other of said power conditions over a period greater than said inherent minimum duration and less than the remaining portion of said half-cycle, whereby the electro-magnetic interference product of said transition is decreased, wherein said semiconductor power controlling means has a relationship between control input voltage and output current, and further including means to non-destructively limit peak current that clamps the maximum voltage at said control input at a value within the safe operating region of said control input so as to limit the maximum current supplied by said semiconductor power controlling means to a value greater than the maximum current required by the normal operation of said lamp load and less them the value that may cause destruction of said power controlling means.

4,823,070

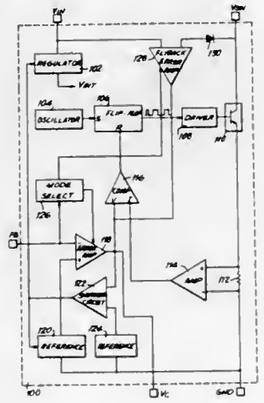
SWITCHING VOLTAGE REGULATOR CIRCUIT

Carl T. Nelson, San Jose, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Continuation of Ser. No. 932,158, Nov. 18, 1986, abandoned. This application Aug. 3, 1987, Ser. No. 82,989

Int. Cl.[4] G05F *1/563*

U.S. Cl. 323—285 **81 Claims**



1. An integrated circuit for use in a switching voltage regulator circuit, the switching voltage regulator circuit providing a regulated voltage output at an output terminal, the integrated circuit including internal drive circuitry, a power switching transistor and control circuitry for varying the switching duty cycle of the switching transistor, the integrated circuit having at most five terminals including an input terminal, an output terminal a ground terminal and first and second function terminals for connection to discrete external components to implement the switching voltage regulator circuit, the integrated circuit comprising:

first means connected to one of the function terminals for accepting a feedback signal from the output of the switching voltage regulator circuit and for enabling the integrated circuit to operate in a first mode to regulate the output of the switching voltage regulator by varying the duty cycle of the switching transistor as a function of the magnitude of the feedback signal;

second means connected to the input and output terminals for enabling the integrated circuit to operate in an isolated flyback mode to regulate the output of the switching voltage regulator circuit as a function of a feedback voltage developed across a primary winding of a discrete external transformer; and

mode select means connected to one of the function terminals and to said first and second means to disable the first means and to enable the second means in response to a disable signal applied to that function terminal by the discrete components.

4,823,071

CAPACITIVE MEASURING SYSTEM FOR MEASURING THE DISTANCE BETWEEN TWO RELATIVELY MOVABLE PARTS

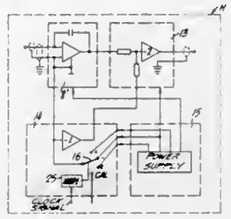
Kurt Ding, Augsburg; Hartwig Knoell, Karlsfeld; Josef Wenzl, Hebertshausen, and Hermann Biebl, Karlsfeld, all of Fed. Rep. of Germany, assignors to MTU Motoren -Und Turbinen-Union Munchen GmgH, Munich, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,261

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433351

Int. Cl.[4] G01R *27/26, 35/00*

U.S. Cl. 324—61 R **11 Claims**



1. A capacitive measuring system based on charge measurement for measuring the distance between two relatively movable parts, said system comprising:

a sensor coupled to one of the two relatively movable parts and facing the other of the two parts;

means for biassing the sensor and said other part to a variable bias voltage (U_{ref}) which is stabilized by a voltage supply unit to form a measuring capacitor in which one of the plates of the capacitor is constituted by said sensor and the other of the plates of the capacitor is constituted by said other part;

means for measuring charge of said capacitor at two reference potentials;

a charge amplifier connected to said sensor, said charge amplifier and voltage supply unit being arranged at a distance from said sensor;

a triaxial cable connecting said sensor to said charge amplifier and said voltage supply unit;

said charge amplifier having a bad width attuned to the frequency of the expected charge signal produced by said capacitor;

said sensor having a measuring face which faces said other part with a gap d therebetween;

and means for determining gap capacitance C_s from measured charge quantity Q of said capacitor at said two reference potentials from the relation $C=Q/U_{ref}$.

4,823,072

MEASUREMENT OF THE POLARIZED POTENTIAL OF BURIED PIPELINE HAVING IMPRESSED CURRENT CATHODIC PROTECTION

Kenneth J. Walcott, 6670 Statesboro Rd., Dayton, Ohio 43204; Neil G. Thompson, 7849 Spirowood St., Dublin, Ohio 43017; George T. Ruck, 6812 Bowerman St., W., Worthington, Ohio 43085, and Steven B. Helton, 1849 N.W. Ct., Apt. B, Columbus, Ohio 43212

Continuation-in-part of Ser. No. 904,098, Sep. 4, 1986, abandoned. This application Apr. 27, 1987, Ser. No. 43,040

Int. Cl.[4] G01R *27/20*

U.S. Cl. 324—65 CR **16 Claims**

1. A method for detecting the polarized potential of a buried pipe which is cathodically protected by rectified alternating current impressed upon a pipe by one or more rectified protection current sources, method comprising:

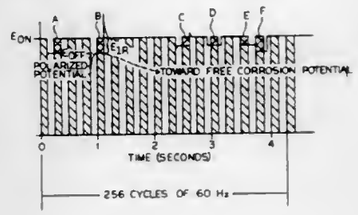
(a) periodically pulsing the rectified protection current each protection current source to an off state;

(b) sampling the potential waveform between the pipe and a reference electrode over a time interval equal to the off pulse period to collect a data set of sample signals representing said waveform;

(c) digitally filtering the data set to remove signals at the alternating current frequency and above;

(d) integrating sample signals of the data set during which no off pulses are present to get a first sum;

(e) integrating sample signals along the waveform to a second sum;



(f) subtracting the second sum from the first sum to obtain a difference which is proportional to the average IR drop E_{IR} in the soil;

(g) dividing the difference by the number of samples taken in each off pulse in order, to obtain E_{IR};

(h) diving said first sum by the number of summed samples in it to obtain potential E_{ON};

(i) subtracting E_{IR} from E_{ON} to obtain the polarized potential E_{OFF}; and

(j) displaying the polarized potential.

4,823,073

SENSOR FOR MEASURING THE CURRENT OR VOLTAGE OF ELECTRICALLY CONDUCTIVE LAYERS PRESENT ON A REFERENCE SUBSTRATE

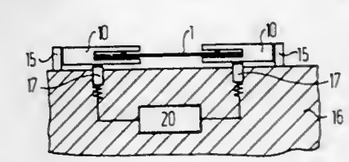
Konrad Schober, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,446

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710596

Int. Cl.[4] G01R *27/02*

U.S. Cl. 324—62 **8 Claims**



1. A sensor for measuring electrical properties of a coating on a reference substrate, comprising:

a substrate holder for supporting said reference substrate;

at least two electrical interconnects on said reference substrate;

carrier laminae supported on said reference substrate;

measuring laminae supported on said reference substrate for contact with said interconnects,

the measuring laminae which do not contact the same interconnect having no contact with each other, and

the measuring laminae including two spaced plates and a spacer located between said plates, one of said plate including an inwardly facing projection positioned to abut said reference substrate when said reference substrate and said measuring laminae are in assembled relation; and

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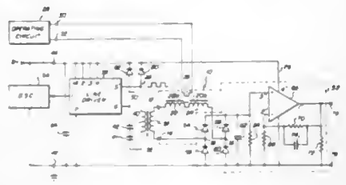
contact elements extending from said substrate holder and engaging said measuring laminae, the measuring laminae being free of contact to said substrate holder other than in the region of said contact elements.

4,823,074

LOW POWER CONSUMPTION CURRENT TRANSDUCER

Colonel W. T. McLyman, South Pasadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 15, 1987, Ser. No. 133,412
Int. Cl.⁴ G01R *1/20*
U.S. Cl. 324—117 R **14 Claims**



1. A low power consumption current transducer for providing an output representative of the current flowing in a conductor comprising:

(a) variable impedance means having an input, an output and a saturable core reactor including at least one gate winding connected between the input and output and a control winding the control winding being adapted to receive the current flowing through said conductor;

(b) a source of DC voltage;

(c) an AC voltage source connected to the input of the variable impedance means for applying a substantially square wave signal thereto;

(d) output means including first rectifying means connected to the output of the variable impedance means for providing a DC output voltage representative of the magnitude of the current flow through the gate winding; and

(e) second rectifying means coupled between the input of the variable impedance means and the DC voltage source for commutating back to the DC source the reactive current resulting from voltage induced across the input of the variable impedance means by the saturable core, the saturable reactor and AC voltage source being arranged so that current through the control winding will cause the inductance of the reactor and the DC output voltage to change substantially linearly with changes in the current being measured over a predetermined range.

4,823,075

CURRENT SENSOR USING HALL-EFFECT DEVICE WITH FEEDBACK

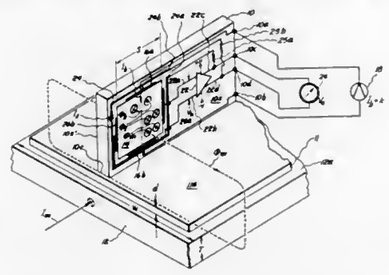
Robert P. Alley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 13, 1987, Ser. No. 107,328
Int. Cl.⁴ G01R *19/32, 21/08*
U.S. Cl. 324—117 H **15 Claims**

1. A current sensor for measurement, by the amplitude and direction of a signal to a meter external to the sensor, of a current I_m flowing in a conductor external to the sensor, comprising:

a Hall-effect element having a surface disposable substantially perpendicular to a magnetic flux Φ_m responsive to said current I_m, said element having first electrode means for providing a voltage V_h having a magnitude responsive to the net magnetic flux passing through said surface;

a single conductive loop substantially encircling the element and oriented to cause a magnetic loop flux Φ_m therefrom, responsive to a current I_1 in said loop, to be substantially perpendicular to the element surface, said current I_1 being proportional to, but different from, said current I_m; and



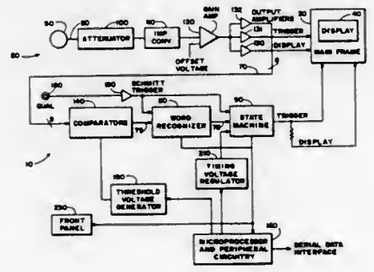
means, responsive to said element voltage V_h, for establishing said loop current I_1 to generate said loop flux Φ_1 with magnitude and polarity to cancel said flux Φ_m in said element, said establishing means providing said signal to said external meter proportional to the loop current.

4,823,076

METHOD AND APPARATUS FOR TRIGGERING

Douglas I. Haines, Mulino; W. Riley Stock, and David E. Dobak, both of Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 17, 1986, Ser. No. 840,634
Int. Cl.⁴ G01R *13/28*; G05B *19/02*
U.S. Cl. 324—121 R **24 Claims**



1. A trigger circuit for detecting plural analog input signals along plural input signal lines and generating a trigger display signal in response thereto, comprising:

logic level discrimination means for receiving the input signals and respectively reconstructing each input signal into a high logic level representation thereof corresponding to a level of the input signal relative to a first threshold level, a low logic level representation thereof corresponding to a level of the input signal relative to a second threshold level which is below the first, and into a transitional logic level representation thereof corresponding to a level of the input signal relative to a level between the first and second threshold levels; and

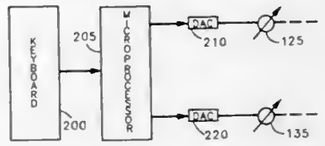
trigger event detection means for receiving the reconstructed input signals from the logic level discrimination means and detecting in the reconstructed input signals a triggering event comprising at least one predetermined combination of input signal logic level representations, the trigger event detection means including means for generating the trigger display signal in response to the detection of the triggering event.

4,823,077

CHANNEL-GAIN-VERNIER-TRACKING TRIGGER HYSTERESIS FOR AN OSCILLOSCOPE

Robert M. Landgraf, Woodland Park, and Johnie L. Hancock, Colorado Springs, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 928,936, Nov. 10, 1986, abandoned.
This application Nov. 14, 1988, Ser. No. 271,369
Int. Cl.⁴ G01R *13/20, 15/08*
U.S. Cl. 324—121 R **1 Claim**



1. A digital oscilloscope having a microprocessor and also having a display screen for displaying input signal waveforms, said oscilloscope comprising:

a trigger means for triggering the capture and display of said input signal, said trigger means having an adjustable trigger gain control;

a user-adjustable vertical gain vernier means for adjusting the vertical gain of said signal on said display screen, said vertical gain vernier means having a user-adjustable vertical gain control;

a plurality of digital-to-analog convertors, wherein a first digital-to-analog convertor is configured to interface between said microprocessor and said trigger gain control and a second digital-to-analog convertor is configured to interface between said microprocessor and said vertical gain control; and

wherein said microprocessor is configured to control the inputs of said first and second digital-to-analog convertors such that said vertical gain control is inversely tracked to said trigger gain control such that said oscilloscope has a constant effective trigger hysteresis, and such that the minimum amplitude of the signal required for triggering said oscilloscope remains constant, and such that the required trigger level resolution of said oscilloscope remains constant, and such that the slew rate demands of the trigger circuit of said oscilloscope remains constant, and such that throughout the range of vertical gain of said oscilloscope the input signal-noise rejection capability of said oscilloscope remains constant.

4,823,078

DEVICE FOR A.C. VOLTAGE TESTING USING A VOLTAGE MULTIPLIER AND LCD DISPLAY

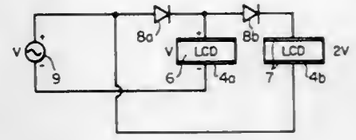
Masoochehr Mohebban, Foster City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 16, 1987, Ser. No. 121,505
Int. Cl.⁴ G01R *19/155, 31/00*
U.S. Cl. 324—133 **4 Claims**

1. A voltage testing device for testing the voltage of an A.C. electrical component, which comprises:

(a) a LCD;

(b) a voltage multiplier; the LCD being connected to an output of the voltage multiplier; the voltage multiplier comprising a first capacitor across which is developed a voltage during one half cycle of the voltage being tested and which voltage multiplier, during a subsequent, opposite half cycle of the voltage being tested, adds the voltage so developed in the first capacitor to the voltage being tested and applies the added voltages across the LCD, thereby multiplying the voltage across the LCD; and



(c) electrical contacts connected to an input of the voltage multiplier by means of which electrical connection can be made between the voltage multiplier and the electrical component.

4,823,079

DEVICE FOR EQUIPPING AN ADAPTER WITH CONTACT PINS USED WITH A CIRCUIT BOARD TEST EQUIPMENT

Wolfram Barth, Pforzheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 3, 1987, Ser. No. 21,134
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1986, 3606877
Int. Cl.⁴ G01R *1/073*
U.S. Cl. 324—158 F **8 Claims**



1. A device for equipping an adapter with contact pins for connecting test equipment to a circuit board having a plurality of raster points, some of said raster points being designated as test points for testing said circuit board, wherein the minimum spacing of the test points is equal to at least twice the raster dimension, comprising:

a contact pin magazine (MA), in which contact pins are stored in cells (MAZ) arranged in grating fashion, contact pins (ND1, ND2, ND3) being provided for every test point with the center distance between the cells (MAZ) being equal to said minimum spacing of said test points;

a plate-shaped intermediate adapter (ZA), onto one side of

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which the circuit board can be mounted, said adapter having adapter holes (ZAB)1 passing vertically through said adapter, said holes being provided to pass at least one pin (ND2) from said magazine, said adapter being constructed and arranged so that, with the circuit board in place, said one contact pin touches the circuit board at one of said test points; and

a guide plate (FP) provided for inserting the contact pins (ND1, ND2, ND3), said guide plate having guide holes (FBR) distributed in a pattern matching said test points, said plate being arranged on said intermediate adapter (ZA) and said magazine (MA) being arranged on top of said plate;

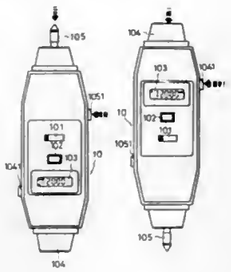
wherein cells (MAZ) of said magazine (MA) being constructed with said contact pins (ND1, ND2, ND3) having lateral play when they drop toward said guide plate (FP), wherein each cell is arranged with its central axis always pointing towards center of four raster points; the guide holes (FBR) of the guiding plate (FP) being large enough to enclose the axis of the corresponding cell (MAZ) of the magazine and to direct the tips (NSP) of the contact pins falling from the cells and guiding holes (FBN) through the adapter holes (ZAB)

4,823,080

TOUCHLESS (PHOTO TYPE) AND CONTACT DIGITAL DUAL PURPOSE TACHOMETER

Dong-Chang Lin, Fl. 7, No. 15, Lane 144, Minchuan West Road, Taipei, Taiwan

Filed Jun. 26, 1987, Ser. No. 66,708
Int. Cl.[4] G01P *3/36, 3/02*
U.S. Cl. 324—175 **4 Claims**



1. A combined touchless and contact digital tachometer for measuring and displaying a velocity value for a moving object, comprising:

a photo emitterreceiver sensor circuit for generating a first pulse signal responsive to a reflected light signal from said object;

a contact sensor circuit for generating a second pulse signal responsive to rotation of a perforate disk mechanically coupled to said object;

an amplifier circuit coupled to both said photo emitter-receiver sensor circuit and said contact sensor circuit by means of a selection switch for providing an amplified pulse signal by amplifying either said first pulse signal or said second pulse signal;

a regulator circuit coupled to said amplifier circuit for regulation and distortion compensation of said amplified pulse signal:

a micro-processor IC circuit coupled to said regulator circuit for calculating said velocity value for said object, said micro-processor IC circuit including a storage memory, decoding logic and display driving circuitry and,

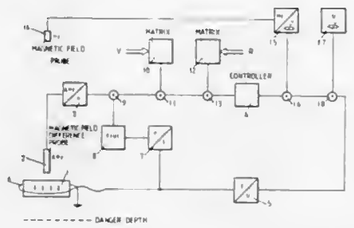
a digital display indicator coupled to said micro-processor IC circuit whereby said decoding logic and said display driving circuitry provide means to rotate said velocity value display 180 degrees responsive to one of said sensor circuits being coupled to said amplifier circuit by said selection switch.

4,823,081

INTERFERENCE MAGNETIC FIELD COMPENSATION METHOD WHICH INCLUDES SUPPLYING A CURRENT TO A COIL TO COMPENSATE THE FIELD

Reinhardt Geisler, Jesteburg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 697,079, Jan. 21, 1985, abandoned. This application Aug. 26, 1988, Ser. No. 237,671
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403982
Int. Cl.[4] G01R *33/02;* **G01N** *27/72;* **H01H** *47/28*
U.S. Cl. 324—225 **16 Claims**



1. A method for compensating the interference magnetic field of an object located in an external magnetic field by means of an interference field controlled magnetic self-protection system having a coil system connected to receive a magnetic field producing current and oriented to produce a magnetic field tending to compensate the interference magnetic field, said method comprising: generating a first signal by measuring the magnetic field gradient of the interference magnetic field of the object and coil system at a selected location relative to the object; generating a second signal from the current through the coil system to provide a representation of the value of the magnetic moment of the object; and controlling the current supplied to the coil system in dependence on at least the first and second signals, to give a minimum interference magnetic field and to maintain a minimum interference field in case of changes in the magnetic moment of the object.

4,823,082

SIGNAL PROCESSING METHOD FOR AN ELECTROMAGNETIC INDUCTION TEST

Shoji Nasu, Kobe; Yoshiro Nishimoto, Higashiosaka; Hiroaki Yasukuni, Kobe, and Masayoshi Iwasaki, Miki, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

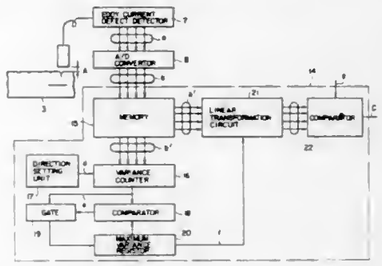
Filed Feb. 11, 1987, Ser. No. 13,424
Claims priority, application Japan, Feb. 18, 1986, 61-34498; Feb. 18, 1986, 61-34497; Apr. 10, 1986, 61-83921
Int. Cl.[4] G01N *27/90;* **G01R** *33/12*
U.S. Cl. 324—232 **5 Claims**

1. A signal processing method in an electromagnetic induction test for detecting defects, physical quantities and geometric quantities in a surface of a test object in which said test object is subjected to an electromagnetic induction by use of $N(N \geqq 1)$ kinds of test frequencies to obtain $M(M \leqq 2N)$ kinds of phase detection outputs corresponding to respective states of the test object said method comprising the steps of:

sampling the phase detection outputs at a plurality of measuring points, so that when there exists $n(n<M)$ kinds of disturbance factors of which a portion contribute to the electromagnetic induction test, said phase detection outputs have a variance due to said defects, physical quantities and geometric quantities greater than a variance of a target parameter of the test object and contribute to the electromagnetic induction test;

determining a first coordinate axis Z_1 in a direction in which said variance of said phase detection outputs approaches a maximum in an M-dimensional space formed from coordinate axes associated with the M kinds of the phase detection outputs;

determining a second coordinate axis Z_2 in a direction in which said variance of said phase detection outputs approaches a maximum in a space orthogonal to the coordinate axis Z_1 of the multi-dimensional space;



similarly determining a third coordinate axis Z_3, a fourth coordinate axis Z_4, . . . , and an M-th coordinate axis Z_m in directions in which said variance of said phase detection outputs approaches a maximum in a space orthogonal to the previously named axis of the multi-dimensional space; and

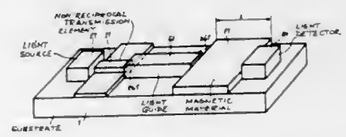
determining a presence or an absence of a defect, a physical quantity and a geometric quantity on a surface or in the vicinity of the test object related to the coordinate of the Z_{n+1} axis for each measuring point.

4,823,083

INTEGRATED HEAD FOR THE MEASUREMENT OF MAGNETIC FIELDS AND METHOD OF MAKING THIS HEAD

Paul-Louis Meunier, Paris; Gerard Doriath, Palaiseau, and Manijeh Razeghi, GYF-sur-Yvette, all of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 4, 1987, Ser. No. 93,828
Claims priority, application France, Sep. 5, 1986, 86 12507
Int. Cl.[4] G01R *33/032, 33/022;* **G02F** *1/09*
U.S. Cl. 324—244 **13 Claims**



1. An integrated head for the measurement of magnetic fields, comprising:

a light source emitting a first beam of planepolarized light;

a first flat layer of magnetic material placed in the path of said light beam and placed into a magnetic field to be measured, wherein the plane of polarization of the light which enters said magnetic material layer placed in said path is rotated;

a first means to measure the rotation of the plane of polarization of the light, wherein said first means is placed in the path of said beam after same beam has cross said layer of magnetic material;

wherein said light source and said layer of magnetic material are integrated into one and the same substrate and wherein they each possess a lattice constant which is equal to or is a multiple or sub-multiple of the lattice constant of the substrate, and wherein said first means to measure the rotation of the plane is also located on said substrate, said light source being coupled to said layer of magnetic material by a first light guide which is integrated into said substrate and is insensitive to said magnetic field.

4,823,084

METHOD OF DETERMINING THE SPECTRAL DISTRIBUTION OF THE NUCLEAR MAGNETIZATION IN A LIMITED VOLUME RANGE

Graeme C. McKinnon, Ellerau, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1987, Ser. No. 99,886
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632738
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **5 Claims**



1. A method of determining the spectral distribution of the nuclear magnetization in a limited volume range, in which in the presence of a homogeneous stationary magnetic field at least one sequence acts upon an examination area, which sequence comprises a first high-frequency pulse and then three selective 180° high-frequency pulses succeeding each other at equal intervals of time, each of said three high-frequency pulses occurring in conjunction with a magnetic gradient field, the gradient extending in a different one of three orthogonal directions during each of said three pulses, the echo signal produced in the volume range after the last 180° pulse being each time converted into digital sample values, after which a Fourier transformation is carried out, where the time interval (Tb) between two successive 180° high-frequency pulses is smaller than the time interval (Ta) between the first high-frequency pulse and the next 180° high-frequency pulse.

4,823,085

NUCLEAR MAGNETIC RESONANCE IMAGING METHOD AND DEVICE

Miha Fuderer, and Johannes J. M. Cuppen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1987, Ser. No. 76,466
Claims priority, application Netherlands, Aug. 7, 1986, 8602019
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—312 **15 Claims**

13. A device for determining a nuclear magnetization distribution in a region of a body, comprising:

(a) means for generating a steady, uniform magnetic field;

(b) means for generating an RF pulse;

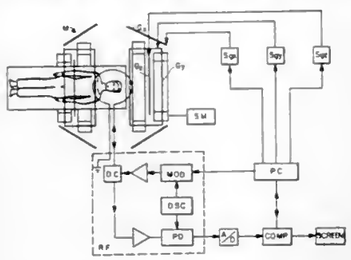
(c) means for generating a magnetic field gradient;

(d) sampling means for sampling, during a measurement period, a resonance signal generated by means of the means specified sub (a) and (b) and influenced by at least one magnetic field gradient;

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(e) processing means for processing signals supplied by the sampling means, and

(f) control means for controlling the means specified sub (b) to (e) for generating, sampling and processing a number of resonance signals, the control means supplying control signals to the means specified sub (c) for the adjustment of at least one of the strength, duration and direction of the magnetic field gradient, the integral of the strength over the duration and direction of the magnetic field gradient respectively being different after each repetition of cycles, characterized in that the device also comprises means for eliminating phase errors in pixels of a complex image of a nuclear magnetization distribution, where first the corrected phase and the corresponding phase error of a given pixel in the image are determined, after which the corrected phases and the corresponding phase errors of other pixels are determined in a sequence such that a next pixel is a pixel which is situated adjacent a pixel whose corrected phase and corresponding phase error have already



been determined, a corrected phase 0 or $\pm\pi$ being assigned to the respective next pixel if the phase difference between the phase of the respective next pixel and the phase error of the adjacent pixel whose corrected phase and corresponding phase error have already been determined, is situated modulo 2π in an interval $(-\Delta,\Delta)$ when the corrected phase of the respective adjacent pixel is 0, or in an interval $(\pm\pi-\Delta, \pm\pi+\Delta)$ when the corrected phase of this adjacent pixel is $\pm\pi$, or in an interval $(\pm\pi-\Delta, \pm\pi+\Delta)$ when the corrected phase of this adjacent pixel is 0, or in an interval $(-\Delta,\Delta)$ when the corrected phase of this adjacent pixel is $\pm\pi,\Delta$ representing the maximum phase error difference occurring between the two adjacent pixels, the phase error in the next pixel being defined as being equal to the difference between its non-corrected phase and its corrected phase, decreased or increased by so many times 2π that the difference with respect to the phase error of the adjacent pixel whose phase error has already been determined is minimum.

4,823,086

BATTERY MONITORING AND CONDITION INDICATOR SYSTEM FOR MULTI-BATTERY PACK

Warren T. Whitmire, P.O. Box 983, Shalimar, Fla. 32579, and Larry T. Anderson, 720 E. Sunset Blvd., Ft. Walton Beach, Fla. 32548

Continuation of Ser. No. 946,769, Dec. 23, 1986, which is a continuation-in-part of Ser. No. 830,203, Feb. 18, 1986, abandoned. This application Jul. 1, 1988, Ser. No. 217,147

Int. Cl.[4] G01N *27/46*

U.S. Cl. 324—434 **13 Claims**

1. A system for individually monitoring the condition of each battery and connecting cables in a multi-battery battery pack under load in order to provide a warning of possible battery pack failure, said system comprising:

means for detecting a voltage difference between two terminals of each of said batteries;

means responsive to said detecting means for positively indicating a battery condition for each of said batteries, each of said battery condition indicating means being independent of every other battery condition indicating means, said battery condition indicating means always indicating by means of one of two indicators always being



activated, first of said indicators indicating a continuous acceptable working potential, second of said indicators indicating either a low working potential or an initial temporary drop in working potential by remaining activated until being manually reset by a means for resetting said indicators.

4,823,087

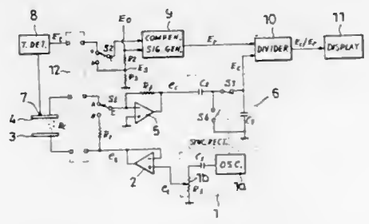
SALIMETER

Hideo Sugimori, 12-2, Koaza Shimokubota, Ohaza Hohsono, Seikacho, Sohraku-gun, Kyoto 619-02, Japan, assignor to Hideo Sugimori, Kyoto and Merbabu Corporation, Osaka, both of, Japan

Filed Jan. 16, 1987, Ser. No. 5,490

Int. Cl.[4] G01N *27/22, 27/42*

U.S. Cl. 324—441 **4 Claims**



1. A salimeter for detecting the salinity of a liquid solution through measuring the electric conductivity of said liquid solution and normalizing the same to the value expected at a predetermined standard temperature by the use of a means for compensating the effect of temperature on the electric conductivity, said means being included in said salimeter, said salimeter comprising:

an AC voltage source for supplying an exciting AC power necessary to measure the conductivity of an objective liquid solution whose salinity is to be detected, said AC voltage source being provided with an output voltage adjusting means;

a pair of electrodes to be immersed in said objective liquid solution;

an amplifying means for outputting a voltage proportional to the electric conductance developed in said pair of electrodes when the same is immersed in a liquid solution;

a reference resistor capable of being electrically substituted for said pair of electrodes;

a temperature detecting means for detecting the temperature of the liquid solution in which said pair of electrodes is immersed;

a temperature effect compensation voltage generating circuit devised so as to output, in accordance with the output voltage from said temperature detecting means, a voltage proportional to $1+\alpha(t-t_s)$, where α, t and t_s are respectively the temperature coefficient of electric conductivity of saline solution, the temperature detected by said temperature detecting means and a predetermined standard temperature;

a reference voltage generating means whose output is made capable of being substituted for the output from said temperature effect compensation voltage generating means;

a first switching means capable of making said reference resistor electrically substituted for said pair of electrodes;

a second switching means for selectively inputting either of the output from said temperature detecting means or the output from said reference voltage generating means to said temperature effect compensating voltage generating circuit;

an arithmetic divider for dividing the output from said amplifying means by the output from said temperature effect compensation voltage generating circuit; and

a display unit for displaying the value proportional to the output from said arithmetic divider.

4,823,088

METHOD OF AND APPARATUS FOR TESTING SEMICONDUCTOR DEVICE FOR ELECTROSTATIC DISCHARGE DAMAGE

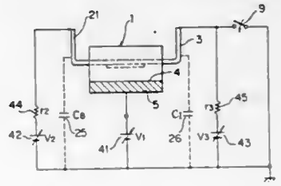
Yasuhiro Fukuda, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1987, Ser. No. 42,424

Claims priority, application Japan, May 9, 1986, 61-104720

Int. Cl.[4] G01N *27/60;* **G01R** *31/26*

U.S. Cl. 324—456 **13 Claims**



2. An apparatus for testing the susceptibility of a semiconductor device to damage due to a discharge of electrostatic charge on a package of the device, the semiconductor device having a dielectric package, a power source terminal and an input/output terminal, the apparatus comprising:

(a) a switch connected in series between the input/output terminal of the device and a reference potential source;

(b) a first means for applying a first potential to a surface of the dielectric package;

(c) a second means for applying a second potential to the power source terminal; and

(d) a third means for applying a third potential to the input-/output terminal,

wherein the switch operates to discharge the dielectric package, and whereby the second means and the third means eliminate the effects of a back capacitance and an input/output capacitance, respectively.

4,823,089

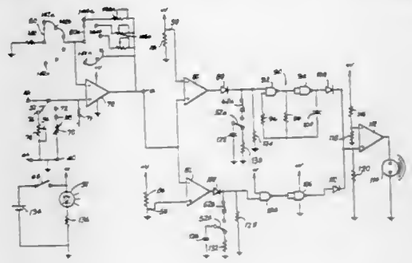
BURGLAR ALARM FAULT DETECTOR

Yehudah Z. Eckhaus, 3221 Skillman Ave., Oceanside, N.Y. 11572, and Ira Eckhaus, 810 E. 3rd St., Brooklyn, N.Y. 11218

Filed May 8, 1987, Ser. No. 47,774

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—525 **11 Claims**



1. A burglar alarm fault detector comprising, input means for coupling across a burglar alarm circuit, measuring means for measuring the actual resistance through the burglar alarm circuit as detected at the input means, alarm means, setting means for setting a desired resistance value below the actual measured resistance value and a desired resistance value above the actual measured resistance value, low end adjustment means for setting the alarm means to sound at the set resistance value below the actual measured resistance value, and high end adjustment means for setting the alarm means to sound at the set resistance value above the actual measured resistance value, and further comprising variable resistance setting means, switch means for switching said input means between the burglar alarm circuit and the variable resistance setting means, said variable resistance setting means capable of being set at a resistance value above and below the initially measured resistance value of the alarm circuit.

4,823,090

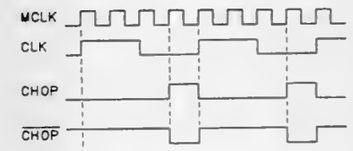
DIGITAL SIGNAL SYNTHESIS USING LOW FREQUENCY SAMPLING CLOCK

Mike R. Coleman, and John J. Ciardi, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 2, 1987, Ser. No. 103,997

Int. Cl.[4] H03B *19/00;* **H03K** *19/00*

U.S. Cl. 328—114 **2 Claims**



2. A calibration circuit for generating a modulated high frequency subcarrier and baseband signals comprising:

means for storing a representation of the modulated high frequency subcarrier and baseband signals in the form of digital samples;

means for converting the digital samples from the storing means to an analog signal at a rate which is greater than or equal to twice the bandwidth of the modulated high frequency subcarrier and baseband signals;

means for resampling the analog signal from the converting means to produce an impulsive analog signal;

means for filtering the impulsive analog signal from the resampling means to produce a sinusoid analog signal; and

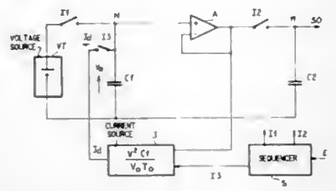
means for separating the sinusoid analog signal into the modulated high frequency subcarrier and the baseband signals.

4,823,091

FREQUENCY-VOLTAGE CONVERTER

Jean-Michel Moreau, Grenoble, France, assignor to Thomson Semiconducteurs, Paris, France

Filed Nov. 30, 1987, Ser. No. 126,852
Claims priority, application France, Dec. 2, 1986, 86 16807
Int. Cl.[4] H03K *5/00, 17/56, 5/22*
U.S. Cl. 328—140 **10 Claims**



1. A frequency-voltage converter comprising:

a voltage source connected to a first energy storage means for storing energy;

a current source connected to said first energy storage means, and a second energy storage means for storing energy connected to said first energy storage means;

a sequencer which receives a recurrent signal which has a recurrence frequency which can be varied, said sequencer connecting to said current source;

said first energy storage means being charged to a value Vo after a time To which is determined by said sequencer, after said value Vo is attained, said first energy storage means discharges a current Jd, said current Jd being proportional to a squared value of an instantaneous residual voltage on said first energy storage means during a time interval T-To determined by said sequencer;

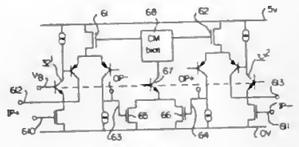
means for transferring a residual charge present in said first energy storage means after a period T to said second energy storage means at the beginning of each recurrence of said period T.

4,823,092

MOS TRANSCONDUCTANCE AMPLIFIER FOR ACTIVE FILTERS

John L. Pennock, Edinburgh, Scotland, assignor to Wolfson Microelectronics Limited, Edinburgh, United Kingdom

PCT No. PCT/GB86/00289, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/07215, PCT Pub. Date Dec. 4, 1986
PCT Filed May 23, 1986, Ser. No. 10,197
Claims priority, application United Kingdom, May 28, 1985, 8513329
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **4 Claims**



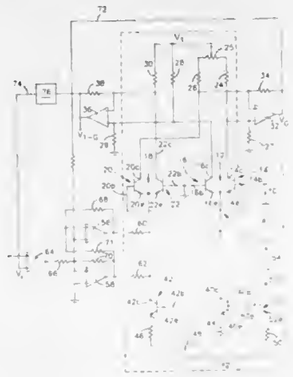
2. A differential input transconductor including a pair of field-effect transistors each having a substrate terminal, a source terminal, a gate terminal and a drain terminal, wherein the source terminals of the pair are connected together to a first fixed voltage; the substrate terminals of the pair are connected to a second fixed voltage; means is provided to set equal quiescent voltages on the gate terminals and to superimpose equal but opposite signal voltages on the two gate terminals; and means is provided to maintain the voltages on the drain terminals of the two transistors at an equal voltage chosen to keep the transistors in the triode region of operation for the expected variation of the gate-source voltage, a pair of capacitors being connected between respective drain terminals of each transistor and the gate terminal of the opposite transistor, to minimize the phase delay between the input voltage and the output current of the transconductor.

4,823,093

DYNAMICALLY BIASED VOLTAGE CONTROLLED ELEMENT

Douglas R. Frey, 1211 Stafore Dr., Bethlehem, Pa. 18047

Continuation of Ser. No. 15,502, Feb. 6, 1987, which is a continuation-in-part of Ser. No. 648,889, Sep. 10, 1984, Pat. No. 4,560,947, which is a continuation-in-part of Ser. No. 267,691, May 27, 1981, Pat. No. 4,471,320. This application Aug. 12, 1987, Ser. No. 84,584
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—254 **6 Claims**



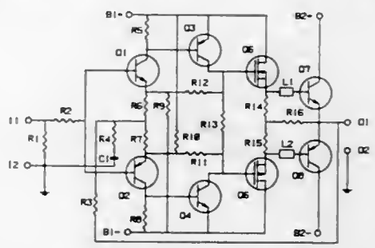
1. A method for regulating a voltage controlled amplifier comprising first and second pairs of transistors, each of said transistors having a base, an emitter and a collector; second transistor of each pair having their bases connected together; first transistors of each pair having their bases connected together; a control voltage being applied between said respective first and second connected pairs of bases; emitters of said transitors of said respective pairs being connected together, respective paired emitters being connected to means for drawing current therefrom; said current drawing means drawing respective currents from said respective connected emitters, the difference between said respective currents varying according to a signal input to said voltage controlled amplifier and a signal from said collectors of said first transistors to operate within extremes of Class A and Class AB operation comprising generating said control voltage as bias control signal from a summed combination of said signal input to said voltage controlled amplifier and signal output by said collectors of said first transistors voltage controlled amplifiers and applying said bias control signal to said voltage controlled amplifier to affect operation within said extremes.

4,823,094

DUAL-BAND HIGH-FIDELITY AMPLIFIER

Martin G. Reiffin, 5439 Blackhawk Dr., Danville, Calif. 94526

Continuation-in-part of Ser. No. 858,664, May 2, 1986, Pat. No. 4,728,903. This application Feb. 29, 1988, Ser. No. 162,112
Int. Cl.[4] H03F *3/30*
U.S. Cl. 330—263 **18 Claims**



1. A two-way high fidelity amplifiers for the reproduction of music without audible distortion and comprising

a single-ended push-pull high-frequency output stage,

a single-ended push-pull low-frequency output stage,

a drive stage for transmitting both high-frequency and low-frequency signals to said high-frequency output stage,

an output terminal for connection to a loudspeaker system,

reactive coupling means for transmitting high-frequency signals from the high-frequency output stage to the output terminal and for transmitting low-frequency signals from the high-frequency output stage to the low-frequency output stage, and

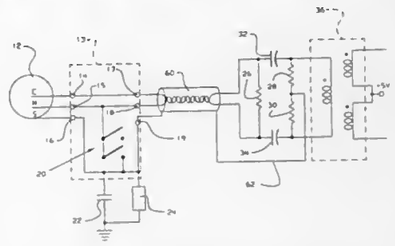
direct-current coupling means for transmitting low-frequency signals from the low-frequency output stage to the output terminal.

4,823,095

REMOTE CONNECTION OF TERMINATION NETWORK

Francois I. Atallah, Raleigh, N.C.; Paul W. Bond, West Hurley, and Denise E. Frey, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 115,454
Int. Cl.[4] H03H *7/00, 7/38*
U.S. Cl. 333—22 R **3 Claims**



1. An improved apparatus for terminating an electrical transmission line wherem said electrical transmission line comprises an insulated pair of electrical conductors within a shield capable of being connected to a dual mode jack for in one mode operating said transmission line as a coaxial line with one of the pair of electrical conductors grounded with said shield and in a second mode operating as a balanced pair line with only the shield grounded, comprising:

a length of interconnection line including a shield and a pair of conductors within a said shield and having a first end and a second end;

connector means including switch means, said connector means connecting the pair of conductors of said transmission line to said pair of conductors of said interconnection line at said first end, connecting the shield of said transmission line to the shield of said interconnection line and when said transmission line is operated as a coaxial cable connecting via said switch means that one of said pair of conductors of said interconnection line that is connected to said one of said pair of electrical conductors of said transmission line along with said shield to ground; and

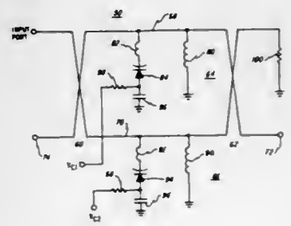
a center tapped termination network connected to said second end of said interconnection line, having a center tap connected to the shield thereof, and said pair of conductors of said interconnection line connected to the non-center tapped ports of said termination network, and having electrical elements selected in a range, so as to present a balanced or unbalanced impedance, as the case may be at substantially the matching value, to said interconnection line whether the transmission line is in a first or second mode.

4,823,096

VARIABLE RATIO POWER DIVIDER/COMBINER

Ronald J. Hash, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 11, 1988, Ser. No. 141,758
Int. Cl.[4] H01P *5/04*
U.S. Cl. 333—109 **17 Claims**



1. A variable ratio power divider comprising:

an input port adapted for receiving an input signal;

a first and a second output port for receiving a portion of the onput signal supplied at said input port;

a first and a second equal-split coupler, each having four terminals and an intervening path segments, and wherein said first and said second couplers are serially connected such that first and second terminals of said first coupler are connected to first and second terminals of said second coupler at first and second junctions. respectively;

wherein the third terminal of said firts coupler functions as said input port, and wherein the fourth terminal thereof functions as said first output port, and wherein the thrid terminal of said second coupler functions as siad second output port, and wherein the fourth terminal thereof is terminated with a load;

a first resonant circuit connected to said first junction;

a second resonant circuit connected to said second junction;

means for providing a control signal to each of said first and said second resonant circuits;

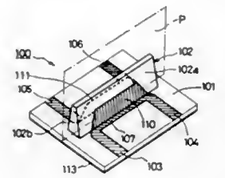
wherein the impedance of said first and second resonant circuits is variable between an open and a short under control of said control sinal applied thereto, such that a fist portion of said input signal is output at said first output port, and a second portion of said input signal is output at said second output port.

4,823,097

MICROWAVE DIRECTIONAL COUPLER

Yoshihiro Konishi, Sagamihara, and Haruaki Fujimoto, Yachiyo, both of Japan, assignors to Uniden corporation, Ichikawa, Japan

Filed May 27, 1987, Ser. No. 54,505
Claims priority, application Japan, Jul. 4, 1986, 61-156153
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—116 **4 Claims**



1. A microwave directional coupler comprising: a first dielectric board;

a second dielectric board erected on the first dielectic board;

coupling line part which consists of at least one pair of coupling elements facing each other separated by the second dielectric board, said at least one pair of coupling elements being formed by patterning, said at least one pair of coupling elements having patterns which are symmetric with respect to said second dielectric board, and lead lines which are connected to both ends of each of the pair of coupling line parts and which are formed on the first dielectric board;

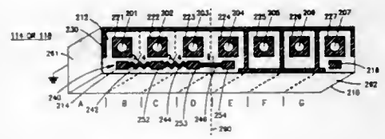
the coupling elements of the coupling line part being formed one on either surface of the second dielectric board above the first dielectric board and conductor parts extending in the elevation direction of the second dielectric board being formed to connect the coupling elements with the respective lead lines on the first dielectric board.

4,823,098

MONOLITHIC CERAMIC FILTER WITH BANDSTOP FUNCTION

David M. DeMuro, Schaumburg, Ill., and Darioush Agahi-Kesheh, Albuquerque, N. Mex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 14, 1988, Ser. No. 206,384
Int. Cl.[4] H01P *1/202, 1/213*
U.S. Cl. 333—206 **16 Claims**



1. A filter comprising:

dielectric means comprised of a dielectric material having top and bottom surfaces, said dielectric means further having at least two holes, including a first hole and a second hole with no intervening holes therebetween, extending from the top surface toward the bottom surface thereof and spatially disposed at a predetermined distance from one another, said dielectric means selectively covered with a conductive material to provide a transmission line resonator for each of said at least two holes;

input electrode means comprised of a conductive material coupled to the dielectric means at a predetermined distance from said first hole in dielectric means;

output electrode means comprised of a conductive material coupled to the dielectric means at a predetermined distance from said second hole in the dielectric means; and

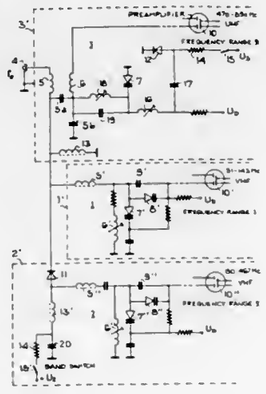
plating line means comprised of a conductive material contiguously disposed on the dielectric means adjacent said first hole and said second hole and coupled thereto to provide a bandstop filter function.

4,823,099

TELEVISION TUNER FOR THREE DIFFERENT FREQUENCY RANGES

Emil Leipert, Neustadt, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Oct. 1, 1987, Ser. No. 103,140
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633384
Int. Cl.[4] H03J *5/24*
U.S. Cl. 334—15 **5 Claims**



1. In a television tuner for three different frequency ranges including a common antenna connection to which three corresponding input filter circuits are connected, with each of these input filter circuits being followed by a respective amplifier circuit, with always only that one of the amplifier circuits which is associated with the frequency range to be received being activated; the improvement wherein: the antenna connection is spatially disposed in proximity of the input filter circuit for the highest frequency range, and is directly connected to one end of a coupling conductor which is coupled with an input circuit coil of the input filter circuit for the highest frequency range; the other end of said coupling conductor is directly connected to a coupling coil of the lowest frequency range input filter circuit and, via a switch, to a coupling coil of the input filter circuit associated with the medium frequency range; and a further switch is connected to a frequency determining element of the input filter circuit for the highest frequency range.

4,823,100

DEFLECTION DISTORTION CORRECTION DEVICE

Paul M. Bruey, Bordentown, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.

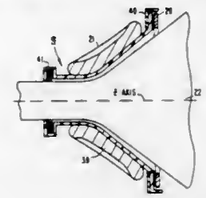
Continuation of Ser. No. 760,793, Jul. 31, 1985, abandoned. This application May 14, 1987, Ser. No. 51,232
Int. Cl.[4] H01F *7/00*
U.S. Cl. 335—210 **10 Claims**

1. A deflection arrangement including a deflection yoke for deflecting an electron beam of a cathode ray tube in a video display apparatus comprising:

horizontal and vertical deflection windings;

means for generating deflection current in said windings for producing horizontal and vertical deflection fields to deflect said electron beam in a raster pattern; and

a magnetically permeable member forming a substantially closed path that encircles said electron beam and is disposed adjacent the electron beam exit end of said deflection yoke at a longitudinal location that enables said member to significantly modify the field pattern for the magnetic flux generated by deflection current flowing in at least one of said horizontal and vertical deflection windings to correct deflection raster pattern distortion.

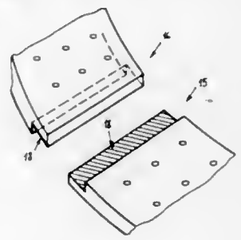


4,823,101

METHOD OF MANUFACTURING A BITTER TYPE COIL AND A SOLENOID MAGNET OBTAINED THEREBY

Guy Aubert, Grenoble, France, assignor to Centre National De La Recherche Scientifique, Paris, France

PCT No. PCT/FR86/00056, § 371 Date Oct. 16, 1986, § 102(e) Date Oct. 16, 1986, PCT Pub. No. WO86/05312, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 21, 1986, Ser. No. 926,416
Claims priority, application France, Feb. 28, 1985, 85 02971
Int. Cl.[4] H01F *5/00*
U.S. Cl. 335—299 **7 Claims**



5. A solenoid magnet with flat Bitter type annular disks, comprising such disks assembled end to end by indium welding, wherein:

(a) at each welded junction, the indium is in the form of a uniform layer resulting from the melting of two electrolytic deposits of indium on the assembled portions;

(b) the portions to be assembled together each comprises tongues and grooves of complementary shapes and dimensions; and

(c) the indium covers at least one of said tongues and grooves.

4,823,102

MAGNETIC ROLL FOR A COPIER

Abraham Cherian, and Joseph C. Foerster, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 5, 1987, Ser. No. 104,146
Int. Cl.[4] H01F *7/02*
U.S. Cl. 335—306 **18 Claims**

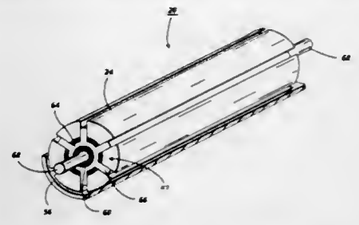
1. A magnetic roll for use in a processing station of an electrostatographic printing machine, including:

a support comprising a central portion, a plurality of spaced fins extending generally radially outwardly from said central portion, and a shaft extending outwardly from opposed ends of said central portion along the longitudinal axis thereof, said central portion being integrally formed with said plurality of fins and said shaft;

a plurality of magnets with each of said plurality of magnets being secured to said support in the space between adjacent fins in a selected orientation with respect to one another and extending a distance substantially equal to the length of said central portion so as to generate a predetermined magnetic field;

a sleeve; and

means for rotatably supporting said sleeve on said shaft of said support.

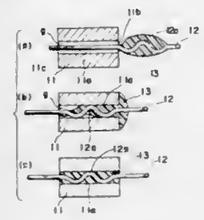


4,823,103

ELECTRICAL COMPONENT HAVING A LEAD WIRE SECURED IN A THROUGH HOLE

Masayuki Nakagawa, Nagaokakyo; Makoto Tabuchi, Osaka, and Mitsuro Hamuro, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Division of Ser. No. 762,963, Aug. 6, 1985. This application Jun. 13, 1988, Ser. No. 206,114
Claims priority, application Japan, Aug. 7, 1984, 59-166204; Dec. 27, 1984, 59-281615; Feb. 12, 1985, 60-25410
Int. Cl.[4] H01F *17/06*
U.S. Cl. 336—175 **2 Claims**



1. An electronic component, in which a lead wire is inserted through the through hole of an electronic component element, the lead wire being secured with bonding agent to the electronic component element, said lead wire having a diameter smaller than the inner diameter of the through hole of the electronic component element and having a bent portion formed therein, said bent portion having a transverse width larger than said inner diameter, the lead wire being inserted through said through hole with the bent portion in pressure contact against the through hole, said bonding agent being penetrated into a capillary gap between the through hole of said electronic component element and the lead wire inserted into said through hole with the interior of the through hole being filled with the bonding agent by capillarity from the outside.

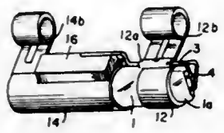
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4,823,104

CONTROLLED CYCLING THERMAL PROTECTOR

Robert Ekowicki, Westbrook, and Richard C. Watson, Sebago Lake, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 15, 1988, Ser. No. 219,116
Int. Cl.[4] H01H *61/02, 71/16*
U.S. Cl. 337—102 **6 Claims**



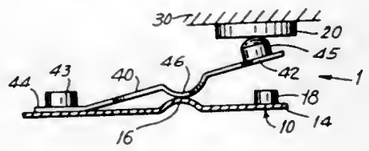
1. A protective device comprising:
a thermally conductive sealed envelope and a pair of electrodes disposed therein, one of said electrodes being stationary and the other being movable, said movable electrode having a heat responsive element, said electrodes further being disposed in an opposed relationship to each other whereby to open the contact between said electrodes when a predetermined temperature level is reached; and
a PTC heater comprising a ceramic body and a pair of electrodes disposed on each side of said body, said PTC heater being disposed external of said sealed envelope and in a heat-transmitting relationship therewith; and
a pair of electrical contact means attached to the exterior of said envelope; and
means connecting each of said contact means to each of said lead-in wires, and connecting each side of said PTC heater in parallel with said electrodes.

4,823,105

METHOD OF FORMING A THERMOSTATIC SWITCH WITH A NARROW OPERATING TEMPERATURE RANGE

Omar Givler, North Canton, Ohio, assignor to Portage Electric Products, Inc., North Canton, Ohio

Filed Aug. 4, 1988, Ser. No. 228,102
Int. Cl.[4] H01H *37/12, 37/54*
U.S. Cl. 337—368 **5 Claims**



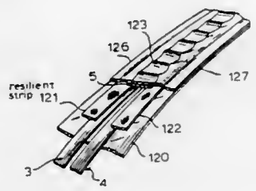
1. A method of forming a thermostatic switch with a calibrated operating temperature range that is defined by a calibrated actuation temperature and a calibrated reset temperature, said method including:
providing a thermostatic switch having,
a fixed contact,
a bimetal blade having a snap acting depression located between the ends of said bimetal blade, a range of actuation temperatures at which said snap acting depression snaps to produce a deformed state of said blade and a range of reset temperatures at which said snap acting depression snaps back to return said blade to an initial undeformed state, said blade being formed so that said range of actuation temperatures is above said calibrated actuation temperature and said range of reset temperatures is below said calibrated reset temperature,
a movable contact connected to one of said ends of said bimetal blade, and
means, having an elongated member and a contact point connected to said member for mounting said fixed contact so that said fixed contact is spaced from said member and faces towards said contact point, and for mounting said bimetal blade in a cantilevered manner from the other of its said ends so that when said blade is in its said deformed state, said movable contact is spaced from said fixed contact and said other end of said blade is located against said contact point and when said blade is in its initial, undeformed state, said movable contact is located against said fixed contact;
providing an ambient temperature environment for said switch that is initially equal to said calibrated actuation temperature;
providing a fulcrum-like calibration projection in said member to forcibly bear against said snap acting depression and to thereby prestress said blade to an extent that said snap action depression snaps to produce said deformed state of said blade;
decreasing said ambient temperature environment to be equal to said reset temperature; and
moving said contact point towards said fixed contact to a fixed position in which said blade is prestressed to an extent that said snap acting depression snaps back to produce said initial undeformed state of said blade.

4,823,106

TAPE ELEMENT AND METHODS, FOR HEATING, PRESSURE MEASUREMENT AND CIRCUIT FABRICATION

Walter C. Lovell, Wilbraham, Mass., assignor to Tapeswitch Corporation of America, Farmingdale, N.Y.

Division of Ser. No. 884,220, Jul. 10, 1986, Pat. No. 4,758,815. This application Feb. 8, 1988, Ser. No. 153,221
Int. Cl.[4] H01L *3/06*
U.S. Cl. 338—212 **37 Claims**



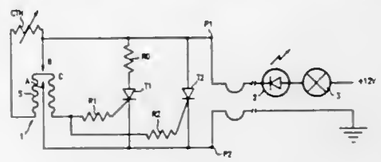
28. A pressure sensitive tape-switch comprising:
(a) a substrate having first and second electrical conductors positioned thereon;
(b) a strip of magnetic recording tape situated to overlie portions of the first and second conductors; and
(c) insulating means interposed between the strip of magnetic recording tape and the first and second conductors for insulating the strip of magnetic recording tape from said conductors and for selectively maintaining the tape out of contact therewith, so that only pressure exerted upon said tape-switch will cause said tape to electrically bridge said conductors.

4,823,107

CIRCUIT AND DEVICE FOR MONITORING AND/OR MANAGEMENT OF THE OPERATING CONDITION OF A TIRE

Jean-Pierre Pompier, Enval, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Mar. 17, 1988, Ser. No. 169,591
Claims priority, application France, Mar. 24, 1987, 87 04120
Int. Cl.[4] B60C *23/00*
U.S. Cl. 340—442 **10 Claims**



1. An electric circuit for monitoring of the operating condition of a tire, said circuit transmitting an electrical signal between electrically conductive rotating elements of a vehicle wheel and a stationary space of the vehicle by electric conduction by means of a first conductive path comprising the set of electrically conductive rotating elements, at least one bearing of the wheel and a wheel carrier, and by means of a second conductive path comprising a conductive element passing through mechanical elements placed on the inside of the at least one bearing, one of the paths providing an electrical connection to operation means placed on the vehicle, the other of the paths connected to a vehicle ground, said circuit identifying when tire pressure drops beneath a minimum pressure which is not considered normal and further providing an indication of at least one other parameter which makes it possible to determine that operation of said tire is in a dangerous zone when said at least one other parameter crosses a respective threshold associated therewith, said electric circuit comprising:
a pair of poles;
a sensing means for producing a signal indicative of said pressure and said other parameter;
a signal shaping means coupled to said sensing means for producing an output indicative of the state of said sensing means;
said sensing means and said signal shaping means placed between said poles; and
said sensing means and said shaping means having an electric resistance seen between the two poles which is very high if tire pressure is greater than said minimum and if the at least one parameter has not crossed said respective threshold, said electric resistance being intermediate if the pressure is less than said minimum and if said at least one other parameter has not crossed said respective threshold, and said electric resistance being slight if said at least one other parameter has crossed said respective threshold.

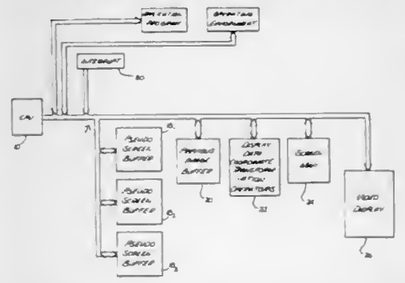
4,823,108

DISPLAY SYSTEM AND MEMORY ARCHITECTURE AND METHOD FOR DISPLAYING IMAGES IN WINDOWS ON A VIDEO DISPLAY

Gary W. Pope, Los Angeles, Calif., assignor to Quarterdeck Office Systems, Santa Monica, Calif.

Continuation of Ser. No. 606,336, May 2, 1984, abandoned. This application Mar. 17, 1988, Ser. No. 169,304
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—721 **13 Claims**

1. In a computer display system having a central processing unit (CPU), a memory architecture, display means for displaying output display data within a plurality of windows capable of overlapping on said display means, a plurality of applications programs each associated with one of said plurality of windows and having a display data stream including address information for enabling output display of a display screen of said display means, and first logic means for providing an operating environment for said computer system, the improvement comprising:
second logic means for providing a windowing environment for determining size and location of said windows and coordinate locations of data for display in said windows on said display, said second logic means independent of said first logic means;
a plurality of pseudo-screen buffer memory means, each of said pseudo-screen buffer memory means for storing display data from one of said applications programs for display in one of said plurality of windows, said pseudo-screen buffer memory means coupled to said CPU and to said second logic means;
said second logic means including identifying means for identifying one of said windows as a visible window, for identifying and updating sequentially occurring changes in said display data stored in said pseudo-screen buffer



memory means, and for identifying portions of display output data stored in said pseudo-screen buffer memory associated with said visible window as visible data;
said identifying means including a timer interrupt means, a previous image buffer memory means for storing display data on one pseudo-screen buffer memory means associated with said visible window, comparing means for logically comparing the contents of said one pseudo-screen buffer associated with said visible window with said previous image buffer and determining differences between data stored in memory locations of said one pseudo-screen buffer and said previous image buffer, and writing means for writing data from said memory locations of said pseudo-screen buffer from which said differences have been identified into said previous image buffer to update said previous image buffer during selected timer interrupt intervals with the contents of said pseudo-screen buffer;
transfer means coupled to said pseudo-screen buffer memory means and to said display means for transferring visible data from said pseudo-screen buffer memory means associated with said visible window to said visible window.

4,823,109

WARNING LIGHT SYSTEM

Frank S. Boyer, 32229 Olney Ct., Union City, Calif. 94587

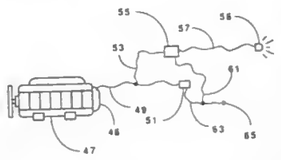
Filed Apr. 14, 1988, Ser. No. 181,481
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—467 **11 Claims**

1. A warning light system having at least one warning light for a vehicle powered by an engine having an engine brake, said engine brake being activated by a first signal on a control line, comprising:
delay means having a first terminal and a second terminal, said first terminal coupled to said control line, said delay means for supplying electrical power at said second termi-

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nal in response to said first signal after a preselected time delay;

a warning light for warning drivers of other vehicles of activation of said engien brake;



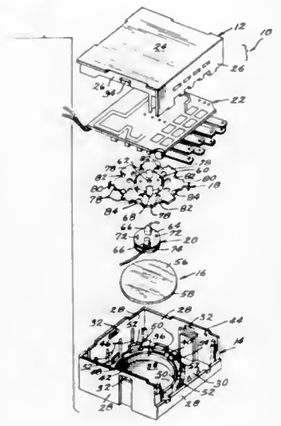
electrical connection means for connecting said second terminal of said delay means to said warning light so that electrical power is supplied to said warning light when electrical power is supplied to said second terminal.

4,823,110

TONE GENERATOR WITH IMPROVED DIAPHRAGM MOUNTING

Donald Dorward, Pickering, and Waldemar A. Hupa, Downsview, both of Canada, assignors to Magna International Inc., Markham, Canada

Filed Apr. 22, 1988, Ser. No. 184,801
Int. Cl.[4] G08B *3/00;* **G10K** *9/00*
U.S. Cl. 340—388 **20 Claims**



1. In a tone generator comprising a housing having means therein defining a pair of communicating chambers one of which is closed except for an area of communication with the other chamber, said chamber defining means including an annular flat surface having an inner periphery defining the area of communication of said one chamber with said other chamber and wall means extending from the outer periphery thereof in a direction away from said one chamber, a thin flat diaphragm of circular configuration having opposed outer peripheral marginal edge surfaces defining a thin outer peripheral edge, said diaphragm being mounted in an operative position over the area of communication between said one chamber and the other chamber with one marginal peripheral edge surface in engagement with said flat annular surface and with said peripheral edge in closely spaced relation with respect to said wall means, an annular diaphragm retaining member mounted in an operative position in superposed relation to said diaphragm, means for fixedly securing said retaining member in its operative position, electromagnetic coil means for causing said diaphragm to vibrate for tone generation purposes, and circuit means for energizing said electromagnetic coil means to cause said diaphragm to vibrate for tone generating purposes, the improvement which comprises

said retaining member having a plurality of annularly spaced transversely extending diaphragm engaging lugs formed on an annular peripheral portion thereof,

said lugs extending transversely inwardly of said wall means in engagement with the opposite marginal peripheral edge surface of said diaphragm when said retaining member is in its operative position so that the engagement of said lugs with said diaphragm serves to retain said diaphragm in its operative position,

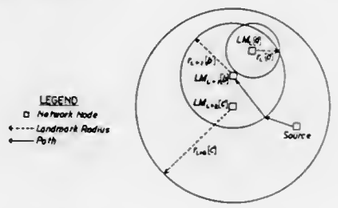
the spacing between the position of engagement of each lug with said marginal edge surface of said diaphragm with respect to the position of engagement of each adjacent lug being such as to accomplish a desirable balance between the amplitude of vibration at self-resonance which decreases as the spacing decreases and the extent of harmonic distortion which increases as the spacing increases.

4,823,111

LANDMARK HIERARCHY METHOD FOR ROUTING SIGNALS IN A COMMUNICATIONS NETWORK

Paul F. Tsuchiya, Washington, D.C., and W. Worth Kirkman, Fairfax, Va., assignors to The Mitre Corporation, Bedford, Mass.

Filed Feb. 22, 1988, Ser. No. 158,915
Int. Cl.[4] H04Q *9/00, 11/04*
U.S. Cl. 340—825.050 **3 Claims**



1. Method for routing signals in a communications network having plural nodes comprising:

establishing a hierarchy of landmarks among the nodes, each node having at least one hierarchy level designation and corresponding radius;

assigning one or more addresses to each of the nodes, the address comprising address components representing landmarks; wherein each landmark represented by the address component is within the radius of the landmark represented by the next lower address component;

establishing a routing table for each node in the network, each node's routing table including routing entries to landmarks within the radii of which a node resides;

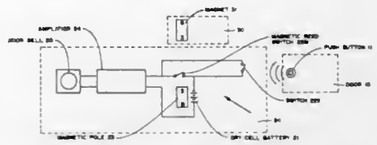
using the routing table to route signals by choosing a path toward the highest level visible landmark represented by the address components until the path reaches a node within the radius of the landmark represented by the next lower level address component; and repeating this procedure for the remaining address components until the signal reaches its destination.

4,823,112

MULTI-FUNCTION ELECTRIC BELL

Wen-Sen Chen, 3F, No. 5, Long 6, Lane 421, Guang-Fuh S. Rd., Taipei, Taiwan

Filed Jun. 8, 1987, Ser. No. 59,861
Int. Cl.[4] G08B *19/00, 3/00*
U.S. Cl. 340—521 **3 Claims**



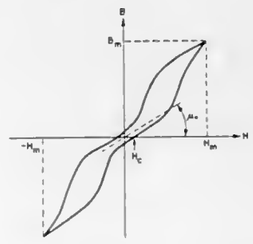
1. A sound producing device for installation on the surface of a door or window, said door or window having an outer surface, an inner surface and a frame, which comprises three parts: part (1) which is a sound wave generating means comprising a push button for installation on said outer surface of the door or window; part (2) which is an assembly comprising an integrated inner circuit (IC), including a power source (21), a sound wave sensing switch (22S) responsive to mechanical vibration, a magnetic reed switch (22M) electrically parallel to said sound wave sensing switch, a magnet (23) located in proximity of said magnetic reed switch, an amplifier (24) and a door bell (25), said assembly to be located on the inner surface of the door or window, and part (3) which comprises a fixed magnet (31) to be located opposite to said magnetic reed switch and adjacent to the side of the door frame or window, whereby when said door or window is closed, said push button produces a mechanical vibration, the sound wave switch (22) activates the power source and closes the integrated circuit and activates the door bell (25), and whereby said magnetic reed switch is subjected to the balanced influence of said magnet (23) and said magnet (31), and when said door or window is not properly closed, said fixed magnet (31) is displaced from its position aligned with said magnetic reed switch (22M), said magnet (23) attracts said magnetic reed switch (22M), the circuit is closed and the bell rings.

4,823,113

GLASSY ALLOY IDENTIFICATION MARKER

Ryusuke Hasegawa, Morristown, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 833,625, Feb. 27, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 170,602
Int. Cl.[4] G08B *13/18*
U.S. Cl. 340—551 **10 Claims**



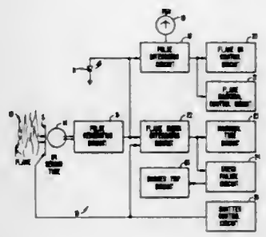
1. For use in a magnetic identification system, a marker comprising ductile amorphous ferromagnetic material adapted to generate magnetic fields at frequencies that are odd and even harmonics of an incident magnetic field applied to the marker within an interrogation zone, said odd and even harmonics being independently detectable and discriminable to provide said marker with signal identify and coding capability, said material exhibiting a Perminvar-type B-H loop pattern.

4,823,114

FLAME SCANNING SYSTEM

Ted Gotisar, Sparks, Nev., assignor to Coen Company, Inc., Burlingame, Calif.

Filed Dec. 2, 1983, Ser. No. 557,562
Int. Cl.[4] G08B *17/12*
U.S. Cl. 340—578 **7 Claims**



1. Flame scanning apparatus for monitoring the flame level of a burner, comprising:

a viewing head assembly adjustably mounted in proximity to the burner so as to receive electromagnetic radiation emitted from a flame produced by the burner;

a sensor disposed in said viewing head assembly, which responds to radiation in a predetermined range of the electromagnetic spectrum by emitting a signal corresponding to the amount of radiation detected in said range;

means for adjusting the position of said viewing head assembly so as to optimize the detection of radiation in said range by said sensor;

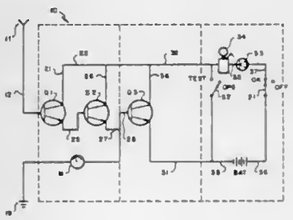
indicator means responsive to said signal, and located proximate to said viewing head assembly so as to be perceivable by an operator while adjusting said viewing bead assembly, for producing an intermittent indication at a frequency reflective of the intensity of radiation in said predetermined range detected by said sensor.

4,823,115

DETECTION OF LIGHTNING, STORMS AND THE LIKE

James A. McCallie, P.O. Box 946, Land o'Lakes, Fla. 34639

Filed Nov. 27, 1987, Ser. No. 126,063
Int. Cl.[4] G01W *1/00*
U.S. Cl. 340—601 **17 Claims**



1. In apparatus adapted to detect lightning, storms, or like electrostatic phenomena via an exterior antenna and a ground wire, the improvement comprising

unpowered bipolar junction sensing means

connected between the antenna and ground, and

responsive to fluctuating ambient electric field strength;

VOL 1101 ISS 3 APR 18 1989 UMI

and alerting means actuated by such sensing means.

4,823,116

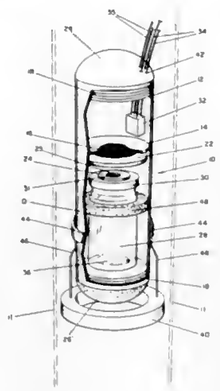
FLUID DETECTOR

George H. Kitchen, III; Nancy E. Kitchen, both of Rio Rancho; Neil B. McCleery, and Eduardo Builes, both of Albuquerque, all of N. Mex., assignors to International Lubrication and Fuel Consultants, Inc., Rio Rancho, N. Mex.

Filed Nov. 30, 1987, Ser. No. 126,903

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—603 **83 Claims**



1. A fluid detector for detecting a fluid of a selected substance comprising:

first container means comprising a body which comprises an upper portion, a lower portion, and at least one sealable cap comprising a fluid passing portion disposed on said lower portion of said body;

second container means positionable within said first container means comprising a receptacle, said receptacle comprising a mouth;

a receptacle lid;

receptacle lid attracting and moving means for attracting and moving said receptacle lid place on said receptacle mouth to cover and seal said receptacle; and

receptacle lid positioning means for positioning said receptacle lid adjacent to but spaced from said receptacle mouth, said receptacle lid positioning means being responsive to the fluid of said selected substance to allow said receptacle lid attracting and moving means to cause said receptacle lid to cover said receptacle mouth, thereby trapping some of the fluid within said receptacle.

4,823,117

ELECTRONIC OIL PRESSURE SENSOR CIRCUIT

Stephen W. Burcham, Madison, Ala., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 29, 1987, Ser. No. 114,332

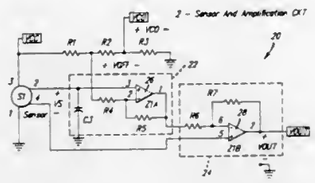
Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—626 **2 Claims**

1. An electronic fluid pressure sensor circuit for determining the fluid pressure in an engine, the circuit powered by a supply source, the circuit comprising:

sensing means for sensing fluid pressure and producing a differential signal representative of the fluid pressure where the sensing means is a piezoresistive device implanted on a silicon die;

amplification means for amplifying said differential signal where the amplification means includes a first amplification circuit receiving said signal from said sensing means and a second amplification circuit receiving said output signal from said first amplification circuit and where said amplification means further includes a single voltage divider for establishing a predetermined reference voltage, where the single voltage divider comprises three resistors connected in series where the resistive value of the first and third resistor are at least two orders of magnitude greater than the second resistor, thereby reducing the effects of tolerancing due to the second resistor;



comparator means for comparing the voltage of said amplified signal to a reference voltage and producing a control signal;

a lamp and a lamp driver circuit for allowing current to illuminate said lamp in response to said control signal;

gauge means for following the control signal and indicating the value of the fluid pressure; and

transient protection means for preventing the voltage from a supply source from exceeding a predetermined value.

4,823,118

FIRE SENSOR

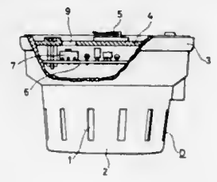
Takashi Suzuki, and Akihiro Kobayashi, both of Tokyo, Japan, assignors to Nittan Company, Limited, Japan

Filed Sep. 25, 1985, Ser. No. 779,847

Claims priority, application Japan, Jan. 21, 1985, 60-5443[U]

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—693 **4 Claims**



1. A fire sensor, comprising:

a housing;

a sensing means disposed in said housing for sensing a fire and transmitting a fire sensing indication signal to a fire signal receiver;

a printed circuit board provided in a bottom part of said housing;

address setting rotary digital codes switches installed on said printed circuit board to enable the fire signal receiver to address said sensor; and

said housing including a case covering said printed circuit board and said switches; and

said case including holes for providing access from the outside to said rotary digital codes switches, said holes being positioned adjacent said rotary digital codes switches.

4,823,119

PATTERN WRITE CONTROL CIRCUIT

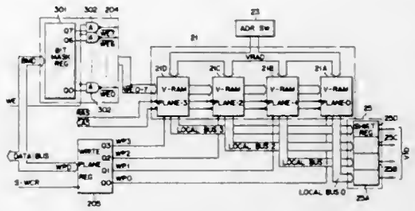
Takatoshi Ishii, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 563,442, Dec. 20, 1983, abandoned. This application Apr. 24, 1986, Ser. No. 858,553

Claims priority, application Japan, Dec. 22, 1982, 57-225201; Dec. 22, 1982, 57-225202; Feb. 2, 1983, 58-15941

Int. Cl.[4] G09G *1/28*

U.S. Cl. 340—703 **16 Claims**



1. A pattern write control circuit comprising:

memory means, having a plurality of memory planes, for storing color element data, each memory plane storing different color element data respectively to display color dots;

each memory plane including a plurality of memory elements and a plurality of words each having a group of dots in the same location of each memory element, each of said memory elements including one corresponding bit location in each one of said words, respectively, each of said memory elements including address data receiving means for receiving address data designating one of said bit locations within said memory element, and write-in data receiving means for receiving one-bit data to be written in said one of said bit locations;

address data supply means for supplying said address data to all of said memory planes, said address data being received on all of said address data receiving means corresponding to all memory elements of each memory plane so that all said one bit locations of said memory elements designated by said address data collectively form one of said words of each plane;

bit mask writing control means for selecting a selected number of bit locations within each of said one words designated by said address data;

said bit mask writing control means including bit mask data memory means for storing bit mask data which specifies said selected number of bit locations in each of said one words, and means for supplying a write permission signal to said memory elements selected by the bit mask data; and

color element data supply means for simultaneously supplying different color element data to the corresponding memory planes respectively, each said color element data being received on the write-in data receiving means of all memory elements of the memory plane corresponding thereto.

4,823,120

ENHANCED VIDEO GRAPHICS CONTROLLER

Laurence A. Thompson, Saratoga, and Robin B. Moore, Fremont, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 12, 1986, Ser. No. 906,753

Int. Cl.[4] G09G *1/28*

U.S. Cl. 340—703 **21 Claims**

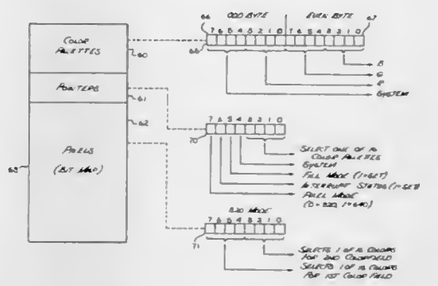
1. In a computer system which includes a host microprocessor and provides a video display, a video graphics controller for receiving information from said host microprocessor and for generating a video color signal for said display comprising:

a first memory for storing a plurality of color palettes, each color palette having a predetermined number of color control words which control generation of said video color signal for said display;

said first memory further including a plurality of pointer words, wherein each of said pointer words includes a predetermined number of bits for selecting at least one of said palettes for each scan line of said display;

said first memory further including a plurality of data fields, wherein each of said data fields provides display information for a predetermined number of pixels;

a second memory for storing said at least one of said palettes corresponding to a current scan line of said display, such that said data fields for each scan line addresses color control words stored in said second memory;



control means coupled to said first and second memories for addressing said memories and also for providing synchronizing signals to said display;

said control means selecting for each said scan line of said display a corresponding pointer which then selects said at least one of said palettes determined by said predetermined number of bits, loading said selected said at least one of said palettes into said second memory, reading corresponding data fields from said first memory, wherein said data fields address said color control words of said at least one of said palettes stored in said second memory to provide color for said current scan line;

said control means further allowing loading of said predetermined number of bits of said pointer words with pointer information anytime using processor memory cycles, such that different said palettes may be selected and loaded into said second memory for consecutive said scan lines.

4,823,121

ELECTROLUMINESCENT PANEL DRIVING SYSTEM FOR DRIVING THE PANEL'S ELECTRODES ONLY WHEN NON-BLANK DATA IS PRESENT TO CONSERVE POWER

Atsushi Sakamoto, Yamatokoriyama; Shigeyuki Harada, and Toshihiro Ohba, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1986, Ser. No. 918,902

Claims priority, application Japan, Oct. 15, 1985, 60-230659

Int. Cl.[4] G09G *3/30*

U.S. Cl. 340—781 **14 Claims**

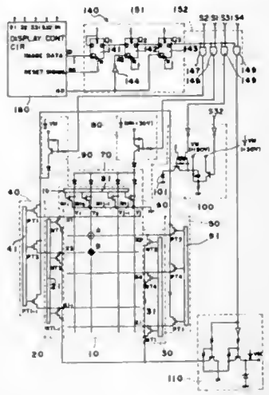
1. An electroluminescent panel display system comprising:

electroluminescent panel means, for displaying information, having a plurality of display lines;

display drive means, operatively connected to said electroluminescent panel means, for producing image data for each display line, said image data for each display line represented by a group of signals, each signal being either a first level or a second level, said first level representing a spot

of intended illumination on said electroluminescent panel means, said second level representing a spot of intended non-illumination on said electroluminescent panel means;

said display means providing drive signals, producing at a first instant in time a first voltage in accordance with said drive signals and producing at a second instant in time a second voltage in accordance with said drive signals, said first voltage preparing said electroluminescent panel means to illuminate, said second voltage causing a spot of illumination on said electroluminescent panel means; and



display control means, operatively connected to said display drive means to receive said image data and said drive signals, for detecting when at least one first level is present in said image data; said display control means permitting the production of said first and said second voltage by said display drive means when at least one first level is present in said image data and preventing the production of said first voltage and said second voltage by said display drive means when at least one first level is not detected in said image data, said display control means thereby preventing power loss when an individual display line contains no intended spots of illumination.

4,823,122

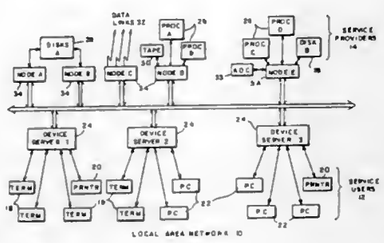
LOCAL AREA NETWORK FOR DIGITAL DATA PROCESSING SYSTEM

Bruce Mann, Mason, and Darrell Duffy, Windham, both of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 27,033, Mar. 19, 1987, which is a continuation of Ser. No. 616,553, Jun. 1, 1984, abandoned. This application Aug. 24, 1987, Ser. No. 88,063

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.28 **6 Claims**



1. A local area network including a plurality of device server units each of which connects to a service user and a node and a communications link to effect communications between the node and device server units,

A. said node including:

i. node message transfer means for transmitting service advertising messages and node data processing service messages over said communications link and for receiving device server data processing service messages from said communications link;

ii. service provider message transfer means for transmitting service provider information to and receiving processed service provider information from a service provider in connection with provision of a service by said service provider;

iii. service advertising message transmission enabling means for periodically enabling said node message transfer means to transmit service advertising messages to identify a data processing service provided by the service provider; and

iv. node data processing service message transfer means for generating, in response to the processed service provider information received by said service provider message transfer means, node data processing service messages for transfer by said node message transfer means for generating, in response to service provider data processing service messages received by said node message transfer means, service provider information for transfer by said service provider message transfer means to said service provider;

B. each device server unit including:

i. device server message transfer means for transmitting device server data processing service messages over and receiving node data processing service messages and service advertising messages from said communications link;

ii service user message transfer means for transmitting processed service user information to and receiving service user information from the service user connected thereto;

iii. service table means for establishing a service table including at least one entry including a node field and a service field identifying a node and a data processing service provided by the service provider connected to said node, the contents of the entry being provided by the service advertising messages received by said device server message transfer means;

iv. selection means responsive to a data processing service request from a service user for using said service table to select the node and service provider to provide a data processing service identified in said data processing service request; and

v. device server data processing service message transfer means for generating, in response to the service user information from the service user, service user data processing service messages for transmission by said device server message transfer means and for generating, in response to node data processing service messages received by said device server message transmission means, processed service user information for transfer by said service user message transfer means to said service user.

4,823,123

KNOWLEDGE BACK PAGER WITH FREQUENCY CONTROL APPARATUS

Kazimierz Siwiak, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,653

Int. Cl.[4] G08B *5/22*

U.S. Cl. 340—825.44 **7 Claims**

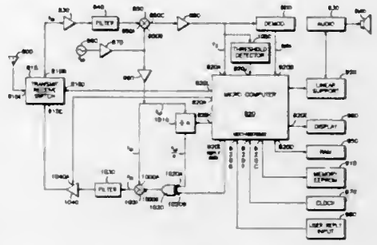
1. An acknowledge back pager for processing paging signals transmitted at a paging channel frequency of F_{RX} from a central paging station, said pager comprising;

a local oscillator oscillating at a frequency F_{LO} to generate an F_{LO} signal;

first mixing means, coupled to said oscillator, for mixing said paging signals with said F_{LO} signal to generate a down-converted signal at a frequency F_C;

frequency determining means, coupled to said first mixing means, for determining the frequency F_C of the down-converted signal;

sub-band selection means for selecting one of a plurality of frequency sub-bands on which said pager is to transmit an acknowledge back signal, said selection means determining a selected sub-band and a frequency offset F_D corresponding to said selected sub-band, said offset F_D being with respect to the frequency F_{RX};



memory means for storing the value of the frequency F_{RX};

determining means for determining the value of N for the selected sub-band wherein

$$N=(F_{RX}-F_C)/(F_D+F_C)$$

dividing means, coupled to said determining means, for dividing the F_{LO} signal by N to generate an F_{LO}/N signal, and

second mixing means, coupled to said dividing means and said oscillator means, for mixing said F_{LO} signal with said F_{LO}/N signal to generate a carrier signal for said acknowledge back signal.

4,823,124

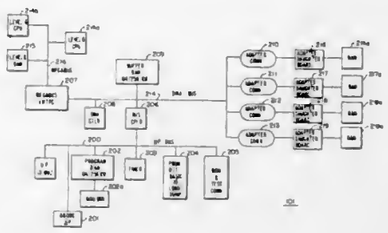
LAN CONTROLLER PROPRIETARY BUS

Edward Beauchemin, Marlboro, Mass., assignor to Bull HN Information Systems, Inc., Billerica, Mass.

Continuation of Ser. No. 891,498, Jul. 28, 1986, abandoned. This application Jan. 13, 1988, Ser. No. 144,674

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.52 **11 Claims**



1. A communications bus arrangement having an adapter interface connecting the bus arrangement to a plurality of local area networks (LANs), said bus arrangement being used to provide data communications between said LANs, said communications bus arrangement comprising:

a direct memory access (DMA) bus;

a first memory connected to said DMA bus, said first memory being used to temporarily store data received from one of said LANs via said DMA bus for transfer to another of said LANs, at least a portion of said memory being organized into a plurality of variable-length segments for receiving from LANs strings of data of a first length selected from a plurality of predetermined lengths and for sending to LANs strings of data of a second length selected from a plurality of predetermined lengths;

a microprocessor bus;

a microprocessor connected to said microprocessor bus;

a first transmit/receive means for transmitting information between said microprocessor bus and said DMA bus, said information being used to report the status of data communications between LANs to said microprocessor, or being generated by said microprocessor to specify said lengths of said segments of said first memory to meet data format requirements of data being transferred from said one LAN to said another LAN, and being used to control readout of data from said first memory received from said one LAN for transfer to another LAN; and

an adapter bus coupled to said DMA bus, and said adapter interface couples ones of said LANs to said DMA bus to store said data received from said one LAN or to transfer said data to said another LAN.

4,823,125

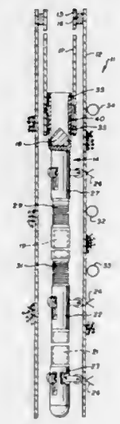
METHOD AND APPARATUS FOR STABILIZING A COMMUNICATION SENSOR IN A BOREHOLE

Louis H. Rorden, and Henry S. More, both of Los Altos, Calif., assignors to Develco, Inc., San Jose, Calif.

Filed Jun. 30, 1987, Ser. No. 68,433

Int. Cl.[4] G01V *1/00*

U.S. Cl. 340—854 **20 Claims**



1. Apparatus for maintaining a communication sensor for receiving and reacting to an electromagnetic signal from an external source at a fixed angular orientation relative to a borehole within which said communication sensor resides comprising:

means for maintaining a constant lateral displacement between a first end of said communication sensor and the boundary of said borehole adjacent said end; and

means for maintaining a constant lateral displacement between the opposite end of said communication sensor and the boundary of said borehole adjacent said opposite end.

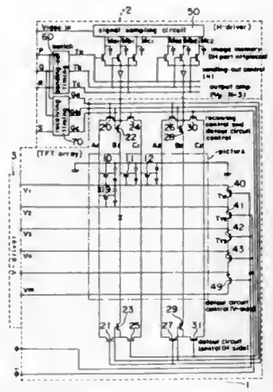
VOL 1101 ISS 3 AP 18 1989 UMI

4,823,126

DISPLAY DEVICE AND A DISPLAY METHOD

Seiichi Nagata, Sakai; Sadayoshi Hotta, Hirakata; Etsuya Takeda, and Yutaka Miyata, all of Hirakata, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 849,524, Apr. 8, 1986, abandoned. This application Aug. 28, 1987, Ser. No. 91,350
Claims priority, application Japan, Apr. 12, 1985, 60-77645
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.79 **6 Claims**



1. A display device comprising:
a first group of bus lines for transmitting display signals;
a second group of bus lines for transmitting scanning signals;
display units formed so as to correspond to each intersecting point between said bus lines of said first group and second group, wherein said bus lines of said first group are divided into a plurality of smaller groups each including N plural bus lines, (N≧2), which are adjacent to each other; and
a first switch means which is freely operable so as to be on and off and which is disposed so as to connect a particular bus line of said smaller group to at least one other bus line of said smaller group, and a second switch means which is freely operable so as to be on and off and which is disposed so as to connect a particular bus line of said second group and another bus line of said second group which is positioned adjacent to said particular bus line; and wherein during a first interval, all of said switch means for said smaller group are actuated and for each subsequent interval, the number of actuated switch means is reduced by one with the last of said actuated switch means being held on all of the time.

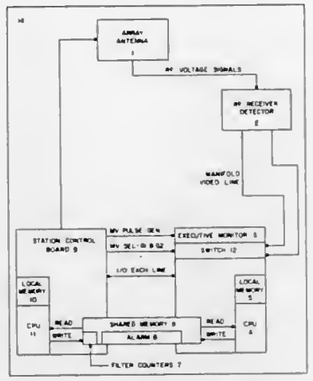
4,823,127

AUTOMATIC, REAL-TIME FAULT MONITOR VERIFYING NETWORK IN A MICROWAVE LANDING SYSTEM

Darrell D. Roelofs, Huntington Station; Alfred R. Lopez, Commack, and Kenneth R. Doris, Setauket, all of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Filed Apr. 20, 1987, Ser. No. 40,505
Int. Cl.[4] G08B *29/00*
U.S. Cl. 340—947 **5 Claims**

1. Apparatus for automatically verifying in real-time the proper operation of a fault monitor in an aircraft landing system, comprising:
antenna means for periodically transmitting aircraft guidance signals intended to have a predetermined characteristic during said transmission periods;
monitor means for receiving said transmitted signals and determining whether said characteristic exceeds a predetermined limit;
control means connected to the monitor means for replacing said received signals with a supplied signal having said characteristic and wherein said characteristic exceeds said predetermined limit;
memory means for storing a first number representing the number of times said characteristic of said transmitted signal exceeds said predetermined limit in a selected time period;
alarm means associated with said monitor means and said memory means for generating an alarm when said stored number represents a predetermined number;



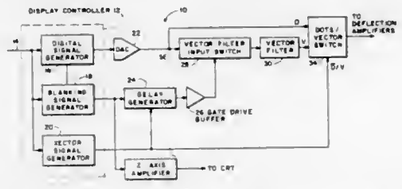
preconditioning means for replacing said stored first number with a second number between selected transmission periods of said antenna means, said second number being one less than said predetermined number; and
means for causing said control means to supply said supplied signal during the next transmission period following the replacement of said stored first number with said second number by said preconditioning means, thereby causing said stored number to become equal to said predetermined number, as a result of which said alarm means should generate an alarm.

4,823,128

DIGITAL-TO-ANALOG CONVERTER FILTER FOR PRODUCING A CONTINUOUS ANALOG SIGNAL OUTPUT WITHOUT DISTORTION

David T. Barak, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 19, 1986, Ser. No. 864,399
Int. Cl.[4] H03M *1/06*
U.S. Cl. 341—118 **1 Claim**



1. In an oscilloscope for displaying symbol and waveform information, a circuit for selectably producing from the output of a digital-to-analog converter discrete analog signals to display a symbol or a continuous analog signal from a first value to a second value to display a waveform, comprising:

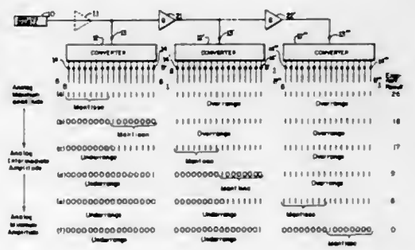
means for generating a digital input signal to produce an analog output signal, a blanking signal to coincide with a change in the digital input signal value, and a vector signal to determine the display of the symbol or waveform;
a first analog switch for receiving and passing the analog output signal of the digital-to-analog converter, the switch controlled by the blanking signal to block passage of the analog output signal until the analog signal settles after transition to the second value;
a vector filter for transmitting a delayed-transition signal from the first value of the analog output signal to the second value, the filter receiving the second value of the output signal upon command of the blanking signal; and
a second analog switch controlled by the vector signal for receiving both the delayed-transition signal of the vector signal and the analog output signal of the digital-to-analog converter and transmitting one of the signals upon command of the vector signal,
the analog output signal from the digital-to-analog converter displaying dots defining the symbol and the delayed-transition signal displaying a continuous line defining the waveform.

4,823,129

ANALOG-TO-DIGITAL CONVERTER

John H. Nelson, St. Louis Park, Minn., assignor to Bison Instruments, Inc., Minneapolis, Minn.

Filed Feb. 24, 1987, Ser. No. 18,034
Int. Cl.[4] H03M *1/18*
U.S. Cl. 341—139 **63 Claims**



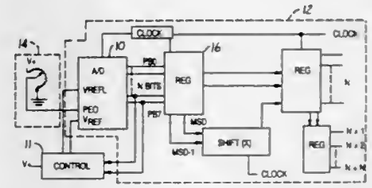
1. An analog-to-digital converter system for converting selected analog signal values from an analog signal provided at a converter system input to a digital representation of a substantially equivalent value, said digital representation being formed by a plurality of representation signals having a first subset thereof containing representation signal values representing a scaled number mantissa for said substantially equivalent value and a second subset thereof containing representation signal values representing that power to which a base value must be raised to give a scaling value by which said mantissa must be multiplied to provide said substantially equivalent value, said converter system comprising:
a receiving means electrically connected to said converter system input and having an output at which analog representations of said selected analog signal values are provided;
a first analog-to-digital converter means having an input electrically connected to said receiving means output to receive said analog representations of said selected analog signal values and having a plurality of outputs, said first analog-to-digital converter means being capable of receiving said analog representations of said selected analog signal values and being capable of providing at each of said first converter means outputs a digit signal of a selected value to thereby provide a first plurality of digit signals such that those values taken by each of said digit signals in differing combinations permit said first plurality of digit signals to represent analog signal values provided at said first converter means input, which have amplitudes within specified amplitude ranges, by providing an alternative initial conversion digit value combination for each of said such specified amplitude range analog signal values, but with at least some analog signal values outside said specified amplitude being represented by initial conversion digit value combinations substantially identical to one another; and
a scanning means having inputs electrically connected to said first converter means outputs to receive said first plurality of digit signals, said scanning means being capable of receiving a said conversion digit value combination from said first plurality of digit signals for that said analog representation provided for each said selected analog signal value, and of providing selected modifications thereto based on a plurality of conversion digit value combinations previously received to thereby form a corresponding modified conversion digit value combination selectively differing from its said initial conversion digit value combination, and being further capable of selecting a first fraction of said digit values from a said modified conversion digit value combination based on at least one said digit value in said first fraction of digit values from that said modified conversion digit value combination, and is further capable of selecting a second fraction of said digit values from said modified conversion digit value combination which excludes any of said first fraction of said digit values, said scanning means also being capable of providing said plurality of representation signals with said first subset of representation signal values based on said first fraction of digit values, and said second subset of representation signal values based on said second fraction of digit values.

4,823,130

METHOD AND CONTROL SYSTEM FOR GENERATING A VARIABLE OUTPUT BIT ANALOG TO DIGITAL CONVERTER

Danny O. Wright, Newport News, and Kregg S. Wiggins, Tabb, both of Va., assignors to Siemens-Bendix Automotive Electronics, L.P., Troy, Mich.

Filed Feb. 18, 1988, Ser. No. 157,768
Int. Cl.[4] H03M *1/20*
U.S. Cl. 341—157 **3 Claims**



1. A method for generating a variable output bit resolution from an N bit analog to digital converter comprising the steps of:
reading the analog voltage to be converted;
converting a first time in an analog to digital converter said analog voltage into an N bit digital word;
testing the most significant bit position of the N bit digital word for a binary zero value;
responding to a binary zero value in said most significant bit position for testing the binary value of each preceding consecutive significant bit position for a binary zero value until the first binary one value;
responding to said binary one value for shifting the high input voltage reference to said analog to digital converter to a value equal to 2^{-X} its original value, wherein X equals the number of consecutive zero bit positions start-

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ing from the most significant bit position and proceeding toward the least significant bit position until said first binary one value; and then

converting a second and final time in an analog to digital converter said analog voltage into an N+X bit digital word.

4,823,131

RADAR REFLECTOR

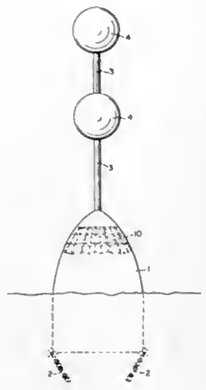
Stephen W. Bell, The Old Kennels, Easton, Woodbridge, Suffolk, IP13 0EN, England

Filed Jul. 21, 1987, Ser. No. 75,998

Claims priority, application United Kingdom, Jul. 22, 1986, 8617912; Jul. 22, 1986, 8617916

Int. Cl.⁴ H01Q *15/00*

U.S. Cl. 342—7 **26 Claims**



1. A radar reflector comprising a hollow, generally spherical radar transmitting housing, and a radar reflecting assembly disposed within said housing, said radar reflecting assembly being mounted inside said housing and comprising means, comprising a plurality of trihedral cube corner reflecting elements, for maximizing retroreflection of substantially horizontal radar transmission and for providing a substantially uniform retroreflection at all angles around a horizontal plane, said trihedral cube corner reflecting elements having axes and being arranged one above the other in strings having a first end and a second end, said first end being located above said second end, said axes of said cube corner reflecting elements being generally horizontal and active elements of said cube corner reflecting elements being disposed to face outwards in the corresponding string, a plurality of said strings being of said trihedral cube corner reflecting elements being arranged side-by-side around the inside of said housing, said hollow housing being formed as the top mark for a navigational buoy in the Cardinal system of buoyage.

4,823,132

DEVICE FOR THE SIMULATION OF RADAR TARGETS IN LABORATORY TESTS OF RADAR SEEKERS

Karl E. Platt, Zum Kretzer 26, and Nikolaus H. E. Scheerer, Frohsinnstrasse 18, both of 7770 Überlingen, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,520

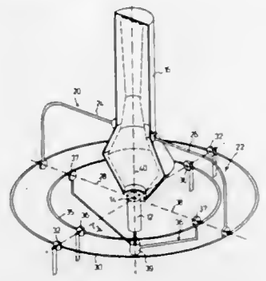
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701535

Int. Cl.⁴ G01S *7/40*

U.S. Cl. 342—169 **10 Claims**

1. A device for the simulation of radar targets within the framework of laboratory tests of the behaviour of radar seekers or of multimode seekers having a radar channel,

(a) wherein, by a radar anechoic chamber, an environment for a radar seeker provided with a detector is achieved, which comes close to the conditions of free space with regard to the radar radiation measurable at the location of the detector, and



(b) in which means emitting radar radiation are arranged, characterized in that

(c) the anechoic chamber is formed by a hollow body pivotable about the radar seeker,

(d) the hollow body has such a shape, that it acts as ray trap,

(e) at least one radar transmitter is fixedly arranged in this hollow body.

4,823,133

RADAR SYSTEM

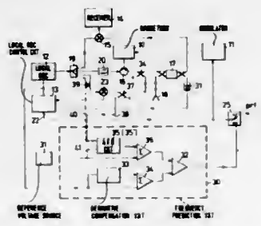
Kjell S. Anflo, Hägersten; Jan W. I. Grabs, and Roland H. Ivarsson, both of Järfälla, all of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1988, Ser. No. 148,783

Claims priority, application Sweden, Jan. 28, 1987, 8700329

Int. Cl.⁴ G01S *7/42;* **H03B** *9/10*

U.S. Cl. 342—199 **5 Claims**



1. A radar system comprising a periodically-tunable transmitter tube for producing radar pulses each having a respective frequency determined by an instant during a respective triggering interval when a trigger signal is applied to the tube, a modulator coupled to the tube for applying the trigger signal in response to an applied trigger-control signal, a local oscillator for producing an output signal having a frequency which varies in response to an applied frequency-control signal, means for transmitting the radar pulses and receiving echo pulses derived from the radar pulses, a mixer for receiving the echo pulses and the variable-frequency output signal and for producing an intermediate-frequency signal, and control means for supplying said trigger-control signal and said frequency-control signal, characterized in that said control means comprises:

a. a slave-control circuit coupled to the transmitter tube for sensing the instantaneous tuning frequency of said tube and for producing the frequency-control signal in response to said sensed tuning frequency, said signal controlling the frequency of the local oscillator output signal such that between triggering intervals, said frequency follows the tuning frequency and, during each triggering interval, said frequency is locked to the tuning frequency at the instant of triggering;

b. a frequency-predicting circuit including comparator means for comparing the variable-frequency output signal with a reference signal representing a predetermined frequency and, upon the occurrence of a predetermined relationship between the frequencies represented by said signals, producing a predicted-frequency trigger-control signal, said frequency-predicting circuit further including a correction circuit for sensing the frequency of a radar pulse transmitted in response to said trigger-control signal, said correction circuit including means for comparing said radar pulse frequency with the predetermined frequency and for storing a result of said comparison to effect correction of the frequency of a radar pulse produced in response to a subsequent one of said trigger control signals; and

c. means for selectively supplying to the modulator either the predicted-frequency trigger-control signal or a random trigger-control signal for effecting triggering of the transmitter tube at randomly-occurring frequencies.

4,823,134

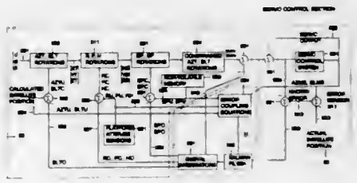
SHIPBOARD ANTENNA POINTING AND ALIGNMENT SYSTEM

Michael R. James, and John J. Maney, both of Palm Bay, Fla., assignors to Harris Corp., Melbourne, Fla.

Filed Apr. 13, 1988, Ser. No. 181,114

Int. Cl.⁴ H01Q *3/00;* **G01S** *5/02*

U.S. Cl. 342—359 **18 Claims**



1. A method of orienting a mechanism with respect to a target, said mechanism being mounted on a support structure having an orientation that is subject to variation with respect to time comprising the steps of:

(a) generating a prescribed coordinate system vector representative signal through which the orientation of said mechanism is to be controlled for orienting said mechanism with respect to a target and translating said vector representative signal through at least one coordinate system transformation;

(b) generating at least one mechanism orientation parameter representative signal in accordance with which said vector representative signal is translated in step (a);

(c) modifying said at least one mechanism orientation parameter representative signal in accordance with a correction signal representative of an estimated error in said at least one mechanism orientation parameter and generating therefrom at least one modified signal through which said vector representative signal is translated in step (a);

(d) applying said translated vector representative signal as a command signal to a mechanism orientation servo control system by way of which the orientation of said mechanism with respect to said target is controlled, said servo control system producing a servo error signal representative of an error in the orientation of said mechanism as sensed by the servo control system with respect to said command signal;

(e) comparing the actual orientation of said mechanism to the ideal orientation with respect to said target and generating an orientation difference signal representative of the difference therebetween;

(f) generating an error difference signal representative of a difference between said error output signal and said orientation difference signal; and

(g) applying said at least one mechanism orientation parameter representative signal and said error difference signal to a mechanism orientation error estimator through which said correction signal is generated.

4,823,135

SATELLITE RECEIVER HAVING IMPROVED POLARIZATION PLANE DETERMINATION MEANS

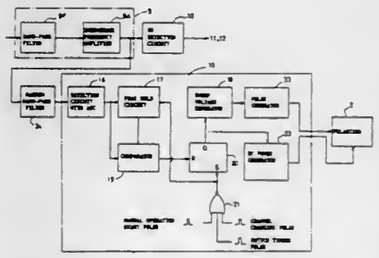
Masayoshi Hirashima, Ibaraki; Osamu Shizuya, Takatsuki, and Noriaki Omoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 1, 1986, Ser. No. 914,159

Claims priority, application Japan, Oct. 1, 1985, 60-218210; Oct. 1, 1985, 60-218212

Int. Cl.⁴ H01Q *21/06*

U.S. Cl. 342—362 **6 Claims**



1. A satellite receiver for receiving satellite television signals at a television signal reproducing part thereof, comprising:

an antenna for receiving plural satellite television signals having different polarization planes,

a polarizer for varying a polarization plane of the antenna,

polarizer control means responsive to a received satellite television signal for controlling the polarization plane of the antenna for adaptation of the polarization plane of the antenna to a polarization plane of the television signal to be received,

a first band-pass filter having a first passing bandwidth narrower than a transmission bandwidth allotted for receiving one channel of the plural satellite television signals, said first band-pass filter being provided in a television signal input path of said polarizer control means for feeding a control signal based on a signal of said first bandwidth to said polarizer control means, and

a second band-pass filter having a second passing bandwidth wider than said first passing bandwidth of said first band-pass filter, said second band-pass filter being provided in a television signal input path of said television signal reproducing part.

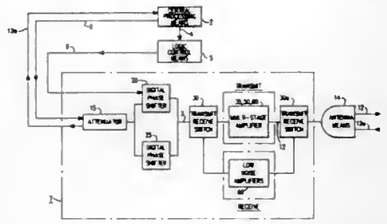
VOL 1101 ISS 3 APR 18 1989 UMI

4,823,136

TRANSMIT-RECEIVE MEANS FOR PHASED-ARRAY ACTIVE ANTENNA SYSTEM USING RF REDUNDANCY

Harvey C. Nathanson; Michael C. Driver, both of Pittsburgh, Pa.; Michael W. Cresswell, Plum Borough, Pa.; Ronald G. Freitag, Baltimore, Md.; Donald K. Alexander, and Daniel F. Yaw, both of Ellicott City, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 11, 1987, Ser. No. 13,490
Int. Cl.[4] H01Q *3/26*
U.S. Cl. 342—368 **20 Claims**



1. A transmit-receive means operable for use in an active, phased array antenna system to transmit or receive a multiplicity of individually phase-shifted radio frequency signals, comprising:

a single planar wafer of semiconductor material, said single planar wafer having a top and a bottom surface;

a plurality of transmit-receive cells, said transmit-receive cells layered upon said top surface of said single planar wafer of said semiconductor material, said transmit-receive cells comprising a multiplicity of redundant electronic devices, said devices operable to be selectively, permanently interconnected during manufacture and test of said transmit-receive means, said selectively permanently interconnected electronic devices interconnected by mechanical, pressure sensitive switches to form a transmit circuit and a receive circuit upon each of said transmit-receive cells;

a plurality of electrical energy input lines, said lines formed upon said top surface of said single planar wafer of semiconductor material between said individual transmit-receive cells, said plurality of electrical energy input lines operable to supply electrical energy to said selectively interconnected devices of said transmitreceive cell; and

a multiplicity of electrical interconnect via means, said via means etched within said single wafer of semiconductor material of said transmit-receive means, said via means operable to electrically interconnect said devices upon said top surface of said transmit-receive means, to direct current energy sources layered beneath said transmit-receive means, said via means further operable to interconnect and supply a radio frequency signal to said devices of said transmit-receive means during said active, phased array antenna system operation.

4,823,137

MULTIPLE-FIXED-FREQUENCIES NAVIGATION SYSTEM

Brian C. Mallick, 1525 Amherst Manor Dr., #510, Williamsville, N.Y. 14221

Filed Apr. 13, 1987, Ser. No. 38,040
Int. Cl.[4] G01S *3/02, 13/08, 21/00*
U.S. Cl. 342—457 **13 Claims**

1. A radio navigation system for calculating the bearing and distance of a local station from a central station, the system comprising:

a. a central station having:

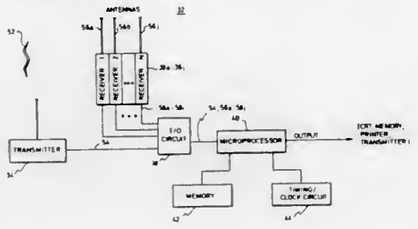
i. a central receiver for receiving a query signal and for transmitting a plurality of trigger pulses in response to said query signal;

ii. a plurality of central transmitters for receiving the plurality of trigger pulses from the central receiver and for transmitting navigational signals, each central transmitter transmitting a navigational signal at a different fixed frequency in response to one of said plurality of trigger pulses;

iii. an array of fixed, directional antennas for broadcasting the navigational signals, each antenna being conductively coupled to one of the central transmitters; and

b. a local station having:

i. a local transmitter for transmitting the query signal to the central receiver and for generating a transmission indication signal;



ii. a local receiver for receiving a navigational signal and for generating a signal reception indication; and

iii. a plurality of local receivers for receiving the navigational signals and for generating signal strength indication signals, each local receiver operating at a single fixed frequency, receiving the navigational signal transmitted by one of the central transmitters, and generating a signal strength indication signal; and

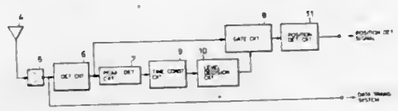
iv. a stored-program processor for receiving the transmission indication signal, the signal reception indication, and the signal strength indication signals, and for calculating the bearing and distance of the local station from the central station.

4,823,138

ROADSIDE BEACON SYSTEM

Yoshizo Shibano; Haruo Suzuki, and Tohru Iwai, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 15, 1987, Ser. No. 133,393
Claims priority, application Japan, Dec. 15, 1986, 61-298301; Feb. 4, 1987, 62-24208
Int. Cl.[4] G01S *3/02, 1/08;* **G08G** *1/12*
U.S. Cl. 342—457 **12 Claims**



1. In a roadside beacon system in which various data are transmitted between roadside antennas installed along roads at predetermined positions and vehicles, and each of said roadside antennas is a split beam antenna having a directivity such that an electric field strength of the signal radiated therefrom abruptly decreases in front of said antenna, a navigational device carried on a vehicle receiving a signal from said roadside antenna to calibrate and display vehicle position data, said navigational device comprising:

signal dividing means for dividing a signal received from said antenna into two division signals;

smoothing means for eliminating instantaneous level variations in a first of said division signals to provide a smoothed signal;

position detection region determining means for outputting, when a level of said smoothed signal provided by said smoothing means exceeds a first predetermined reference level, a position detection region determination signal indicating that said vehicle is existing near said roadside antenna;

position determining means for detecting when an electric field strength level of said received signal decreases abruptly to fall below a second predetermined reference level;

position determining gate means for receiving said position detection region determination signal as a control input signal, and for supplying the second division signal directly to said position determining means in response to said control input signal; and

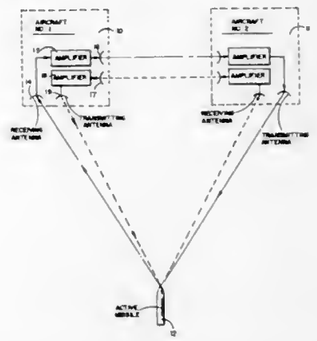
calibrating means for calibration said navigational device according to a position determination signal outputted by said position determining means and received data.

4,823,139

ELECTRONIC COUNTERMEASURE SYSTEM

William Eisner, La Mirada; Thomas W. Hoban, Fullerton; Robert M. Klees, Costa Mesa, and Richard L. Smith, Anaheim, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 28, 1968, Ser. No. 741,143
Int. Cl.[4] G01S *7/38*
U.S. Cl. 342—15 **4 Claims**



1. A communication method for use by two mutually cooperating aircraft as doppler countermeasure means against an active radar-homing anti-aircraft missile, comprising the steps of

transferring doppler-shifted radar signals received from said missile at each to the other of said two mutually cooperating aircraft; and

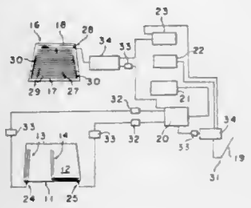
retransmitting said transferred radar signals toward said homing missile.

4,823,140

ANTENNA DEVICE FOR A TELEVISION RECEIVER MOUNTED ON AN AUTOMOBILE

Shinya Shibata, Kawasaki; Takayasu Hokusho, Yokohama; Masakazu Tsunoda, Fujisawa, and Yasushi Kawakami, Atsugi, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo and Nissan Motor Company, Limited, Yokohama, both of, Japan

Filed Jun. 12, 1985, Ser. No. 743,923
Claims priority, application Japan, Jun. 18, 1984, 59-123673; Mar. 7, 1985, 60-43625
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—713 **5 Claims**



1. An antenna device for a television receiver mounted on an automobile having a front windshield, a rear windshield, and a body, said antenna device comprising:

(a) a first antenna comprising:

(i) a first antenna conductor extending in the central portion of said front windshield in an at least substantially vertical direction and

(ii) a second antenna conductor extending in a side portion of said front windshield in an at least substantially vertical direction;

(b) a second antenna spaced from said first antenna; and

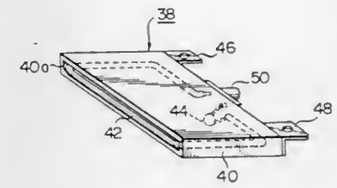
(c) a switching circuit means connected to said first and second antennas for receiving a signal from a selected one of said first and second antennas.

4,823,141

VEHICLE ANTENNA SYSTEM

Junzo Obe, Toyota, and Hiroshi Kondo, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 6, 1986, Ser. No. 893,875
Claims priority, application Japan, Aug. 9, 1985, 60-175221
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—713 **5 Claims**



1. An automobile antenna for use on a vehicle body, said system comprising:

high frequency pick up means for detecting high-frequency surface currents induced on the vehicle body, by broadcast waves, and concentrated on a marginal edge portion of a rear window frame of the vehicle body, said high frequency pick up means comprising an insulated loop antenna connected in series with a fixed capacitor; and

casing means made of plastic and provided for housing said

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high frequency pick up means, said casing means having a slotted opening on one side through which only one longitudinal side of the loop antenna extends and having mounting brackets for being mounted in an opening in the rear window frame so that the one longitudinal side of the insulated loop antenna extending through the slotted opening in said casing means contacts with the marginal edge portion of the rear window frame of the vehicle body.

4,823,142

AUTOMOBILE ANTENNA SYSTEM

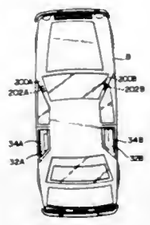
Junzo Ohe, Toyota, and Hiroshi Kondo, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 20, 1986, Ser. No. 876,704

Claims priority, application Japan, Jun. 21, 1985, 60-136691; Jun. 21, 1985, 60-136692; Jun. 21, 1985, 60-136693; Jul. 31, 1985, 60-170181

Int. Cl.[4] H01Q *1/32*

U.S. Cl. 343—713 **10 Claims**



1. An automobile diversity antenna system for receiving broadcast waves by a plurality of antennas disposed on a vehicle body and for outputting a selected antenna received signal from one of the plurality of antennas which is in an optimum receiving state, said antenna system comprising:

a first glass antenna disposed on a first portion of window glass of the vehicle body;

a second glass antenna disposed on a second portion of window glass of the vehicle body;

first high-frequency pickup means including a pickup element, a casing containing the pickup element and having an opening through which a portion of the pickup element is exposed and mounting means for disposing the first high-frequency pickup means at a first vehicle body location opposite to a marginal edge portion of the vehicle body where high-frequency surface currents are induced to flow by the broadcast waves to be received; and

second high-frequency pickup means including a pickup element, a casing containing the pickup element and having an opening through which a portion of the pickup element is exposed and mounting means for disposing the second high-frequency pickup means at a second vehicle body location opposite to a marginal edge portion of the vehicle body where high-frequency surface currents are induced to flow by the broadcast waves to be received.

4,823,143

INTERSECTING SHARED APERTURE ANTENNA REFLECTORS

Thomas A. Bockrath, Hawthorne, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 22, 1988, Ser. No. 184,646

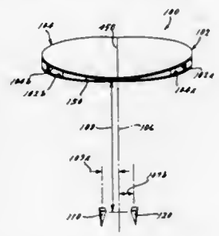
Int. Cl.[4] H01Q *19/14*

U.S. Cl. 343—781 P **13 Claims**

1. A reflector arrangement for an antenna system comprising:

a first reflector surface having a first focal point, a second reflector surface having a second focal point,

first and second reflector surfaces intersecting each other at the middle portion thereof and being connected together such that the surfaces are coextensive with each other to share a common projected aperture and so that the surfaces are spaced from each other along their major extend except for their point of intersection; and



the first and second focal points lying on opposite sides of a plane of symmetry passing through the intersection of the first and second reflector surfaces.

4,823,144

APPARATUS FOR TRANSMITTING AND/OR RECEIVING MICROWAVE RADIATION

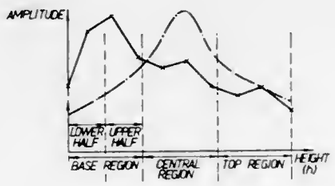
Ronald F. E. Guy, Maldon, England, assignor to The Marconi Company Limited, Stanmore, United Kingdom

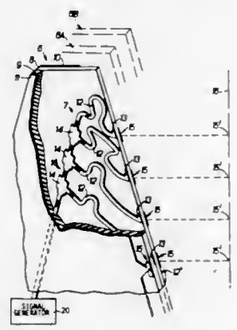
Filed Nov. 19, 1982, Ser. No. 443,067

Claims priority, application United Kingdom, Nov. 27, 1981, 8135948

Int. Cl.[4] H01Q *21/22*

U.S. Cl. 343—853 **6 Claims**





1. Apparatus for transmitting microwave radiation comprising means for generating signals at microwave frequency; and antenna having a top, a bottom and a center located between said top and bottom, with said top being positioned above said bottom when said antenna is in operation, so that said antenna has a length dimension extending between said top and said bottom, said antenna including individual elements spaced apart in the direction of said length dimension; and signal feeding means for feeding the signals from said signal generating means to the individual elements for causing said antenna to radiate energy, said signal feeding means comprising signal amplitude control means operatively associated with said elements for controlling the amplitude of the signals fed to each said element in a manner such that the amplitude of the energy radiated by said antenna has a first peak between the bottom and the centre of the antenna, and signal phase control means operatively associated with said elements for controlling the relative phase of the signals fed to each said element in a manner such that the second derivative of the phase of the energy radiated by said antenna, with respect to height as measured along a vertical line, has a first peak between the bottom and the centre of the antenna.

4,823,145

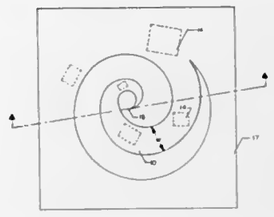
CURVED MICROSTRIP ANTENNAS

Paul E. Mayes, and David R. Tanner, both of Champaign, Ill., assignors to University Patents, Inc., Westport, Conn.

Filed Sep. 12, 1986, Ser. No. 906,852

Int. Cl.[4] H01Q *1/36*

U.S. Cl. 343—895 **7 Claims**



1. A low profile antenna adapted to send and/or receive circuitry polarized waves and constructed so as to exhibit a substantially constant input impedance over a predetermined frequency range, the combination comprising:

a ground surface, at least a section of which is conically shaped;

a single strip conductive means positioned over said ground surface, a portion of said conductive means exhibiting a gradually increasing width from a feed point, said portion juxtaposed over said conically shaped section of said ground surface; and

signal feed means connected to said feed point.

4,823,146

CARTRIDGE AND METHOD OF USING A CARTRIDGE FOR PHASE CHANGE INK IN AN INK JET APPARATUS

Theodore M. Cooke, Danbury, Conn.; Arthur Mikalsen, Carmel, N.Y.; Ernest O. Belmont, New Milford, and R. H. Van Brimer, Southbury, both of Conn., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 829,572, Feb. 14, 1986, Pat. No. 4,739,339. This application Mar. 31, 1988, Ser. No. 175,764

Int. Cl.[4] G01D *15/16, 9/00*

U.S. Cl. 346—1.1 **29 Claims**

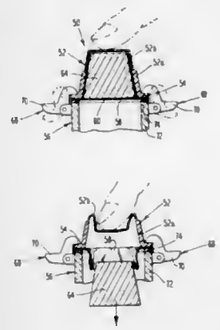
18. A method of supplying hot melt ink to an ink jet apparatus having at least one ink jet, reservoir means for melting the hot melt ink from its solid state form to a liquid state form and thereafter containing the hot melt ink in the liquid state form so as to be jettable from the at least one ink jet, and means, in thermal communication with the reservoir means, for receiving a pellet of hot melt ink in the solid state form, wherein the receiving means includes an outlet at a base portion thereof for flowing ink in the liquid state form into the reservoir means, said method comprising the steps of:

(a) providing a deformable, hollow member, open at least at one end thereof;

(b) filling said member with a predetermined quantity of hot melt ink in the liquid state form;

(c) allowing said member to cool with the quantity of hot melt ink therein so as to permit the hot melt ink in the liquid state form to revert to the solid state form, thereby forming the pellet;

(d) providing means for retaining the pellet within said member;



(e) sealing said at least one open end with means so as to form a sealed cartridge which is receivable by the receiving means, thereby preventing a contamination of the hot melt ink contained within said cartridge;

(f) coupling said cartridge to the receiving means;

(g) deforming said member so as to break said seal means and said retaining means, thereby introducing the pellet into the receiving means; and

(h) operating the reservoir means so as to melt the pellet contained within the receiving means.

4,823,147

GRAPHIC MACHINE WITH CONTINUOUS STORING DEVICE

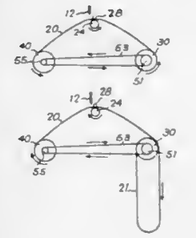
Pascal Charroppin, Le Vesinet, France, assignor to Schlumberger Industries, Montrouge Cedex, France

Filed Feb. 11, 1988, Ser. No. 154,806

Claims priority, application France, Feb. 16, 1987, 87 01957

Int. Cl.[4] G01D *15/24;* B65H *16/10, 18/10, 20/36*

U.S. Cl. 346—136 **15 Claims**



1. A graphic machine comprising:

a rotatable feed roll for supplying a continuous print medium wrapped thereon;

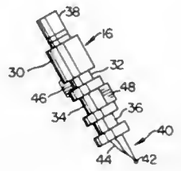
means for driving said print medium in a longitudinal direction generally perpendicular to the axis of said feed roll;

writing means for producing a drawing on said print medium when said print medium is moved in said longitudinal direction;

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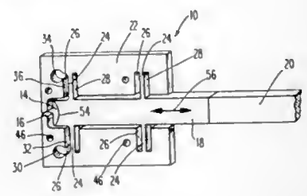
take-up means for storing said print medium after said drawing is produced on said print medium;
and motion transmitting means between said feed roll and said take-up means for driving said take-up means to take up said print medium when said feed roll is rotated in a forward rotational direction for which said print medium is payed out from said feed roll.

4,823,148
PLOTTER PEN WITH ASYMMETRIC POINT
Jonathan D. Sieber, and Joseph S. Sieber, both of 31 Granville Rd., Cambridge, Mass. 02138
Division of Ser. No. 882,239, Jul. 7, 1986, Pat. No. 4,736,211. This application Mar. 29, 1988, Ser. No. 174,831
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—139 R **4 Claims**



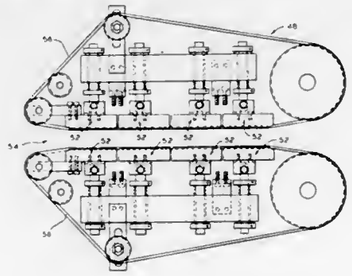
1. A calligraphic writing system including:
a plotter of the type having a pen carriage, a pen holder mouted on the carriage, a recording table, and means for moving the pen carriage relative to the table so that a pen mounted on said pen holder draws images on a sheet of paper or other medium mounted on said table, and,
a pen having an asymmetric point removably mounted in said pen holder,
said pen and said pen holder including positioning means arranged such that when said pen is removably mounted in said pen holder, said positioning means permits said pen to be mounted in said pen holder only in a predetermined and fixed annular position relative to said pen holder and maintains said pen in said annular position relative to said pen holder when said pen draws said images.

4,823,149
INK JET APPARATUS EMPLOYING PLATE-LIKE STRUCTURE
John G. Martner, Brookfield; William R. Gardner, Wilton, both of Conn., and Viasheslav B. Maltsev, Stormville, N.Y., assignors to Dataproducts Corporation, Woodland Hills, Calif.
Filed Mar. 9, 1987, Ser. No. 23,706
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **21 Claims**



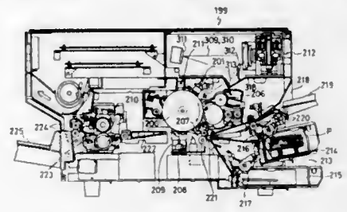
1. An ink jet apparatus comprising:
an ink jet chamber including an orifice;
elongated transducer means for changing the volume of the chamber in response to the state of energization of said transducer means by expanding and contracting along the axis of elongation;
a support means;
coupling means in communication with said support means and said transducer means, said coupling means comprising a drive portion juxtaposed to said transducer means in said ink jet chamber and a supporting portion including at least one strut, said strut extending from said drive portion in a direction substantially transverse to the axis of said orifice said strut having an area of relief in advance thereof toward said chamber and an area of relief behind and away from said chamber so as to permit said strut to flex toward said chamber and away from said chamber in the direction of said axis of the orifice thereby permitting said drive portion to move toward said chamber and away from said chamber.

4,823,150
METHOD OF AND APPARATUS FOR PRINTING EDGES OF FLEXIBLE SHEETS IN ASSEMBLED RELATIONSHIP
Hermann J. Kage; Don E. Detterman; Wade A. Eden, and Alex B. Chapman, all of Willard, Ohio, assignors to R. R. Donnelley & Sons Company, Lisle, Ill.
Filed Feb. 3, 1988, Ser. No. 151,871
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—146 **25 Claims**



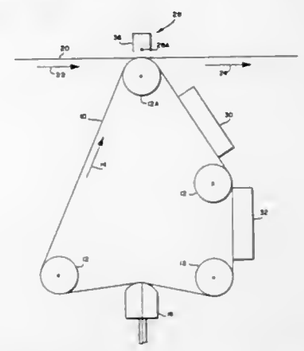
1. A method of printing on corresponding edges of a plurality of flexible sheets maintained in assembled relationship, comprising the steps of:
providing means for printing on said edges of said flexible sheets in non-contact fashion;
providing means for controlling said printing means, said controlling means comprising a font programmable to represent indicia to be printed on said edges of said flexible sheets, said controlling means being operatively associated with said printing means;
dividing said edges of said flexible sheets into a grid, said grid being defined by a network of evenly distributed horizontal and vertical spaces;
selecting a position on said edges of said flexible sheets for printing said indicia, identifying said spaces in said grid to receive portions of said indicia to be printed thereon, and determining said portions of said indicia to be printed in each of said spaces in said grid so identified; and
programming said font to cause said printing means to print said portions of said indicia so determined in said spaces of said grid so identified after said position for printing of said indicia has been selected.

4,823,151
MULTI-BEAM SCANNING SYSTEM WITH SYNC SIGNAL GENERATION BASED ON SINGLE BEAM DETECTION
Kunihiko Miura, Hiratsuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 23, 1987, Ser. No. 137,529
Claims priority, application Japan, Dec. 26, 1986, 61-315333
Int. Cl.[4] C01D *15/00*
U.S. Cl. 346—160 **18 Claims**



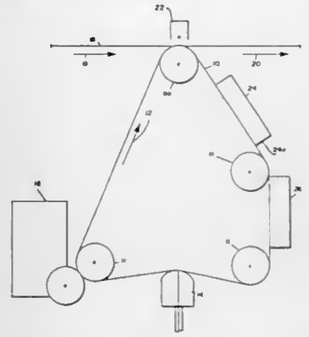
1. A multi-beam scanning apparatus comprising:
a light source for generating a plurality of light beams;
optical scanning means for directing the beams with respect to the predetermined scanning range of an object to be scanned;
beam detecting means for detecting one of the beams scanned by said optical scanning means;
sync signal generating means for generating a sync signal on the basis of a detection output from said beam detecting means; and
signal generating means for generating control signals for driving said light source in accordance with the sync signal from said sync signal generating means.

4,823,152
TRANSFER CORONA SHIELD
Walter C. Dean, II, Simsbury, Conn., assignor to Moore Business Forms, Inc., Grand Island, N.Y.
Filed Dec. 11, 1987, Ser. No. 131,769
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160.1 **15 Claims**



1. A transfer corona shield for a non-impact offset printer comprising a dielectric shield having a toner-carrying image surface, support means including an arcuate surface for supporting the dielectric belt for movement, feed means for feeding a continuous strip of paper along a path of paper movement in synchronism with the dielectric belt, the path of paper movement including a toner transfer zone wherein the belt and paper are in coextensively wrapped relation to the arcuate surface with the paper in intimate contact engagement with the toner-carrying image surface of the belt, a corona device in adjacent aligned relation to the toner transfer zone, the corona device providing an electric field for transferring toner from the belt to paper, and a shield between the corona device and the path of paper movement, the shield being movable into direct contact engagement with the paper across the paper's entire width in the toner transfer zone for completely blocking the corona electric field from an adjacent upstream non-contact region of paper being fed to the toner transfer zone.

4,823,153
CLEANING SYSTEM FOR NON-IMPACT PRINTER
Richard J. Cobura, East Hartford, Conn., assignor to Moore Business Forms, Inc., Grand Island, N.Y.
Filed Dec. 11, 1987, Ser. No. 131,753
Int. Cl.[4] C01D *15/00*
U.S. Cl. 346—160.1 **16 Claims**



1. Cleaning apparatus for a non-impact, direct charge deposition electrographic printer belt comprising
a housing,
a pair of cylinders supported for counter-rotation on the housing in side-by-side relation, the cylinders each having a brush on its outer surface,
vacuum means for creating a high vacuum zone between the cylinders, and
a dielectric belt having one side providing a toner-carrying image surface, the belt being supported for movement along a path spanning the cylinders with their brushes in direct surface engagement with the one side of the belt,
the pair of cylinders including a first cylinder upstream of a second cylinder with the first cylinder rotating in an angular direction corresponding to the path of movement of the belt upon engagement therewith,
the vacuum means creating a force for maintaining the one side of the moving belt in surface engagement with the brushes of the counter-rotating cylinders for cleaning toner from said one side of the belt.

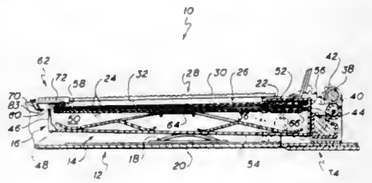
4,823,154
FILM ADVANCING ASSEMBLY FOR SELF-DEVELOPING FILM
John L Sturgis, Stoneham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Sep. 1, 1988, Ser. No. 240,006
Int. Cl.[4] G03B *17/52*
U.S. Cl. 354—86 **7 Claims**

1. Photographic apparatus for use with a cassette of the type having a stack of self-developing film units located therein with leading ends thereof located adjacent a leading end wall of the cassette having a film egress therein and trailing ends thereof located adjacent a trailing end wall of the cassette having an ingress therein through which a film advancing

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means may enter the cassette for removal of an endmost film unit in the stack, said photographic apparatus comprising: means for supporting the cassette; and

film advancing means including first and second means mounted adjacent the trailing end wall of the cassette for movement in first and second directions toward and away from, respectively, the trailing end wall, said first means, when moved in said first direction, being adapted to enter the cassette via the ingress in its trailing end wall and wedge itself between the trailing ends of an endmost film



unit in the stack and an adjacent film unit in a manner which deflects the trailing end of the adjacent film unit out of a path of travel of said second means while simultaneously supporting the trailing end of the endmost film unit in position to be engaged by said second means, and said second means being constructed when moved in said first direction, to subsequently enter the cassette via the ingress and engage the trailing end of the endmost film unit and move it toward the exterior of the cassette via its egress.

4,823,155

INSTANT CAMERA WITH SPRING-URGED PRESSURE PLATE

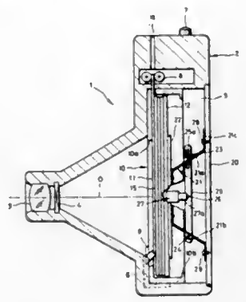
Hideaki Kataoka; Ashita Murai, and Akira Haishi, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,531

Claims priority, application Japan, Mar. 25, 1987, 62-44001[U]

Int. Cl.⁴ G03B *17/52*

U.S. Cl. 354—86 **4 Claims**



1. An instant camera with a back cover for allowing a film pack containing a stack of instant film units to be loaded in said camera, said film pack being of the type having an exposure opening in its front wall and a bottom opening in its rear wall, said instant camera comprising:

urging means attached to said back cover of said instant camera and adapted to contact a said stack of instant film units through said opening in said back wall of a said film pack for urging said stack of film units in a direction to bring the foremost instant film unit of said stack of instant film units into contact with said front wall of a said film pack; and

pressure relieving means for moving back said urging means so as to relieve pressure on said stack of instant film units when said foremost instant film unit is being withdrawn from said film pack, thereby allowing said foremost film unit to be withdrawn with reduced friction.

4,823,156

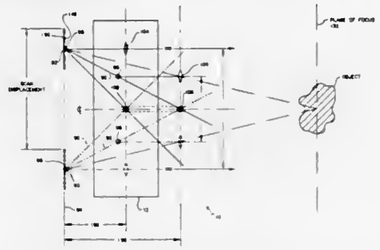
AUTO-FOCUS TRAVELLING LENS CAMERA FOR THREE-DIMENSIONAL PHOTOGRAPHY

Robert L. Shrader, 3158 Brent Ct., Castro Valley, Calif. 94546, and Douglas F. Winnek, 28091 Robinson Canyon Rd., Carmel Valley, Calif. 93924

Filed Feb. 16, 1988, Ser. No. 155,863

Int. Cl.⁴ G03B *35/08*

U.S. Cl. 354—115 **9 Claims**



1. An improved camera apparatus for three-dimensional photography including a stationary frame, a camera body with a film holder for holding photographic film in a film plane and a controllable shutter for exposing film held in the film holder at a film plane, and a focusable lens assembly attached to the body and including a lens, the improved camera further including:

camera body carriage means moveably mounted to the stationary frame, the carriage means for securing the camera body thereto, the camera body carriage means being moveable along a first limited range of substantially linear movement transverse to the field of view of the camera lens,

vertical grating means having a predetermined number of equally spaced vertical light transmitting means and pitch defining the spacing therebetween said grating means being disposed within the camera body immediately in front of the film holder and moveable over a second limited range of transverse movement,

lenticular grating movement control means responsive to the relative position of the camera body carriage means with respect to the base for moving the vertical grating means relative to the film holder over the second limited range of movement as the camera body carriage means moves throughout its range of substantially linear movement,

lens assembly carriage means mounted to be moveable relative to the stationary frame, the lens assembly carriage means for securing the lens assembly and being transversely moveable over a third limited range of transverse movement relative to the base, and

lens assembly carriage control means responsive to focus position of the main lens relative to the film plane and responsive to the relative position of the camera body carriage means with respect to the base for moving the lens assembly carriage means relative to the film holder over the third limited range of movement as the camera body carriage means moves throughout the first limited range of substantially linear movement, the relative movement between the lens assembly carriage means and the film holder being dependent upon the focus setting of the lens assembly means in a range between zero relative movement at an infinity focus setting of the lens and a maximum range of relative movement at a maximum close up focus setting of the lens.

4,823,157

CAMERA WITH AUTOMATIC FOCUSING APPARATUS

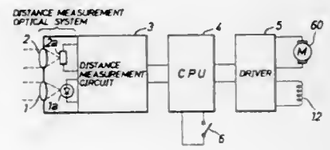
Masataka Sawamura, and Yasushi Hoshino, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 1, 1988, Ser. No. 162,425

Claims priority, application Japan, Mar. 2, 1987, 62-48556

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—403 **13 Claims**



1. An automatic focusing apparatus for a camera, comprising:

means for obtaining distance data corresponding to a distance from a camera to an object;

storage means for storing said distance data as a digital value;

a photographing lens means which is movable along an optical axis;

means coupled to said movable lens means for generating a pulse signal in accordance with movement of said lens means along said optical axis, said pulse signal including a plurality of pulses;

count means for counting the pulses of said pulse signal generated when said lens means is moved along said optical axis, and for producing a count value;

stop means coupled to said lens means for selectively stopping movement of said lens means at least as a function of the count value from said count means;

detection means for detecting a pulse width of at least one pulse of said pulse signal; and

drive control means coupled to said stop means and responsive to said count means having counted a number of said pulses of said pulse signal corresponding to said digital value, for delaying a drive operation of said stop means by a delay time which is a function of the pulse width of said at least one pulse of said pulse signal as detected by said detection means, said at least one pulse being generated before said lens means reaches a position corresponding to said stored distance data by a predetermined distance.

4,823,158

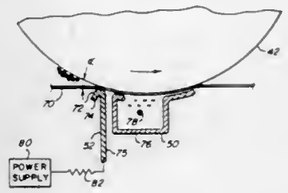
BIASED PRETRANSFER BAFFLE

Brendan C. Casey, Webster; William L. Gary, Lyons, and Albert E. Andrews, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1987, Ser. No. 65,212

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 TR **8 Claims**



4. An electrographic printing apparatus in which an electrostatic latent image is formed on a charge retaining member having a relatively high background potential of a first polarity, and is developed with toner to provide a toner image, which image is transferred onto a copy sheet at a transfer station, said transfer station comprising:

a transfer corotron having a relatively high potential of a second polarity and providing a transfer region for the transfer of toner to the copy sheets,

a paper transport disposed near the transfer station for conveying copy sheets to the transfer region, and

a pre-transfer baffle disposed adjacent to the transfer corotron, the pre-transfer baffle being charged to a potential approximately the same as the charge retaining member and having said first polarity, the pre-transfer baffle and the charge retaining member forming a gap for the passage of the copy sheets to the transfer region, the copy sheets being in contact with the charge retaining member before reaching said transfer region.

4,823,159

IMAGE FORMING APPARATUS

Yasuyoshi Yamamoto; Masashi Ohashi, both of Tokyo; Tatsuya Shiratori, Yokohama; Michiro Koike, Kawasaki; Atsushi Kubota, Machida; Nobukazu Sasaki; Akiyoshi Kimura, both of Tokyo; Takashi Ozawa, Ichikawa; Toshirou Kasamura, Yokohama, and Toshihiko Kusumoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

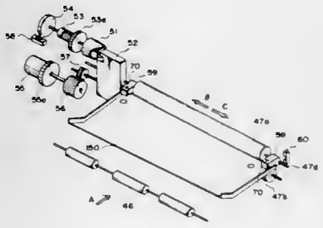
Continuation of Ser. No. 57,669, Jun. 2, 1987, abandoned, which is a continuation of Ser. No. 855,463, Apr. 24, 1986, abandoned.

This application Nov. 30, 1987, Ser. No. 129,366

Claims priority, application Japan, Apr. 25, 1985, 60-90308; Apr. 26, 1985, 60-90119

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 SH **7 Claims**



1. An image forming apparatus, comprising:

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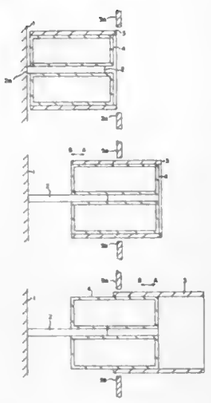
an image forming station for forming an image on a sheet;
a rotatable member for transferring the sheet in a first direction toward said image forming station;
supporting means for supporting said rotatable member for displacement in a second direction which traverses the first direction;
driving means for displacing said rotatable member in the second direction to correct deviation of the sheet in the second direction; and
inlet guiding means for guiding the sheet to said rotatable member, said guiding means being displaceable in the second direction together with said rotatable member, wherein
said rotatable member is disposed upstream of said image forming station with respect to transportation of the sheet and functions also as a registration roller to control timing of sheet transportation to said image forming station.

4,823,160

METHOD AND APPARATUS FOR LOADING/UNLOADING A DRUM MEMBER

Hirotoshi Ikuta, Yokohama, and Akira Takayama, Yamato, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 18, 1987, Ser. No. 50,393
Claims priority, application Japan, May 20, 1986, 61-116401
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 DR **16 Claims**



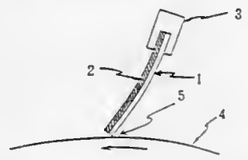
1. An apparatus for loading/unloading a drum member relative to a frame in which the drum member is used, comprising:
(a) a center shaft secured at a first end thereof to a first end of the frame;
(b) a cylindrical, rigid, inner support member attached to the center shaft to be slidable in the direction of the center shaft axis while being guided by the center shaft to guide said drum member until an end portion of said drum member extends beyond a second end of the frame; and
(c) the drum member having an inner surface which is supported by the inner support member to be slidable in the direction of the center shaft axis while being guided by the inner support member,
wherein, the length of the inner support member is shorter than the length of the drum member and the total length of both the center shaft and the inner support member is longer than the length of the drum member.

4,823,161

CLEANING BLADE FOR ELECTROPHOTOGRAPHIC COPYING MACHINES OR THE LIKE

Yoshio Yamada, Takatsuki, and Mitsuaki Hashiyama, Otsu, both of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka and Ricoh Co., Ltd., Tokyo, both of, Japan

Filed Dec. 23, 1987, Ser. No. 136,987
Claims priority, application Japan, Dec. 23, 1986, 61-314652
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 **9 Claims**



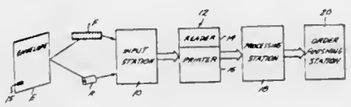
1. A cleaning blade for use in electrophotographic copying machines, facsimile machines, printers or the like which is characterized in that it has a double-layer structure and comprises a contact member made of a poly(urethane)ureamide polymer and to be held in contact with a toner image bearing member, and a support member for the contact member having the same hardness or substantially the same hardness as the contact member and lower than the contact member in glass transition temperature.

4,823,162

METHOD AND APPARATUS FOR MARKING PHOTOGRAPHIC ORDERS

John O. Renn; Hans U. Schlapfer, both of Seattle; Kenneth G. Hammerquist, and Charalambos Caraconstantis, both of Bellevue, all of Wash., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 15, 1987, Ser. No. 50,816
Int. Cl.[4] G03B *27/32;* **G06F** *15/20;* **B41J** *1/20*
U.S. Cl. 355—40 **6 Claims**



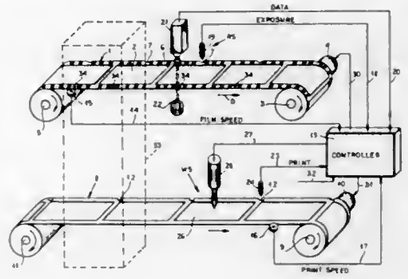
4. In a photographic processing system for handling customer orders consisting of exposed photographic film, an envelope having an identification number on it in which the film is delivered to the processor, and photographic prints made from the film, a method of marking the parts of the order to maintain correlation between them, comprising the steps of:
reading the envelope number from the envelope;
printing the envelope number on a first portion of a continuous splice tape stock in machine-readable form and simultaneously printing a human-readable identification number on said first portion of said splice tape adjacent said machine-readable number;
separating the first portion from the stock
applying said first portion to the film; and
encoding at least a portion of the envelope number on the photographic prints in machine-readable form, said encoding step including representing said envelope number in binary form, cutting a notch on a first edge of said prints to represent a zero and cutting a notch on a second edge of said prints to represent a one, and cutting said notches between successive prints until at least the least significant digit of said envelope number is encoded on said prints.

4,823,163

APPARATUS FOR MARKING THE BACKS OF PHOTOGRAPHIC PROOFS

Georges Rollet, Les Cotes d'Arey, and Bernard Alexandre, Vienne, both of France, assignors to Societe Inter-Color, Lyon, France

Filed Mar. 21, 1988, Ser. No. 171,476
Claims priority, application France, Mar. 19, 1987, 87 04185
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—41 **5 Claims**



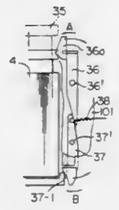
1. An apparatus for marking the back of a photographic proof with data corresponding to data on the corresponding negatives, the negatives being on a film strip having at each negative an edge notch and the proofs being on a print strip having spaced cutouts, the apparatus comprising:
film drive means including an upstream and a downstream drive roll between which the film strip is spanned for advancing same from the upstream to the downstream drive roll past a read location;
means including a sensor between the rolls for detecting the film-advance speed and generating an output corresponding thereto;
print drive means including an upstream and a downstream drive roll between which the print strip is spanned for advancing same from the respective upstream to the respective downstream roll past a write location;
means including a sensor between the print-strip rolls for detecting the paper-advance speed and generating an output corresponding thereto;
control means connected to at least one of the drive means and to the sensors for synchronizing displacement of the strips past the respective locations such that each proof is at the write location generally when the respective negative is at the read location;
means including a detector between the film drive rolls for generating an output each time a notch is in a predetermined position at the read location;
means including a read head at the read location triggered through the control means by the notch detector each time the exposure data of the respective negative is in the read location for reading this data;
means including a detector between the print drive rolls for generating an output each time a cutout is in a predetermined position at the write location; and
means including a write head at the write location triggered through the control means by the cutout detector each time the print is aligned with the write head for marking the back of the print strip with the exposure data read by the read head on the respective negative.

4,823,164

IMAGE FORMING APPARATUS

Masahiro Ishikawa, 13-23, Akashicho, Hiratsuka-Shi, Kanagawa 254, and Shigeru Suzuki, 440, Moro-okacho, Kohoku-Ku, Yokohama-Shi, Kanagawa 222, both of Japan

PCT No. PCT/JP87/00017, § 371 Date Nov. 9, 1987, § 102(e) Date Nov. 9, 1987, PCT Pub. No. WO87/04269, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 12, 1987, Ser. No. 107,591
Claims priority, application Japan, Jan. 14, 1986, 61-2608
Int. Cl.[4] G03B *27/58, 17/26*
U.S. Cl. 355—72 **5 Claims**



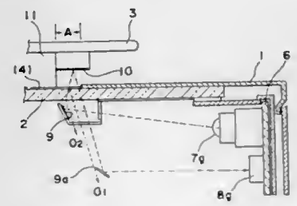
1. An image forming apparatus having a mounting arrangement for releasably receiving a film holder in position for exposing film carried by the film holder when a light shield of the film holder is withdrawn from a light shielding position toward an open position, and lock means for preventing removal of the film holder from the mounting arrangement when the light shield is in other than its light shielding position, the improvement wherein the lock means comprises a lever arrangement mounted on said apparatus in cooperative association with the light shield of a mounted film holder for pivotal movement of a portion of said lever arrangement into the path of removal of the film holder responsive to withdrawal of the light shield from its light shielding position.

4,823,165

DOCUMENT SIZE DETECTOR FOR COPYING MACHINE

Atsushi Narukawa, Nara, and Haruo Nishiyama, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 24, 1987, Ser. No. 124,962
Claims priority, application Japan, Nov. 26, 1986, 61-282595; Oct. 30, 1987, 62-276997
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 **5 Claims**



1. A document size detector for a copying machine comprising:
a machine housing;
a corner aligning document support of a generally rectangular configuration made of transparent plate material and mounted atop the housing;
a cover hingedly supported by the housing for movement

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between closed and opened positions and adapted to cover the document support when in the closed position;

a strip of light reflective material secured to the underside of the cover at a location which, when the cover is in the closed position, will align with one side of the corner aligning document support to which one side of a document to be copied is abutted, said one side being opposite to a hinge of the cover;

first and second intermediate optical reflector means for forming a forward-going optical path and a rearward-going optical path, respectively, each of said forward-going and rearward-going optical paths extending through said one side of the document support for reflection from the strip of light reflective material within a short distance;

at least one set of light emitting and receiving elements, said light emitting element being disposed at a starting point of the forward-going optical path formed by the first intermediate optical reflector means, said light receiving element being disposed at a terminating point of the rearward-going optical path formed by the second intermediate optical reflector means; and

discriminating means for discriminating the presence or absence of the document, which intercepts each of the optical paths, in reference to an output signal from the light receiving element;

whereby said document size detector may be confined to an area underneath only one side of the document support, thereby ensuring an accurate detection of the document size.

4,823,166

OPTICAL TIME-DOMAIN REFLECTOMETRY

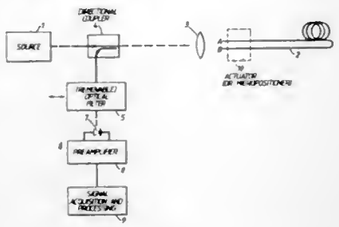
Arthur H. Hartog, Southampton; Martin P. Gold, Chandler's Ford, and Adrian P. Leach, Shirley, all of United Kingdom, assignors to York Limited, Hampshire, United Kingdom

Filed Aug. 19, 1986, Ser. No. 897,943

Claims priority, application United Kingdom, Aug. 20, 1985, 8520827

Int. Cl.⁴ G01J *5/10*; G01N *21/65*

U.S. Cl. 356—44 **20 Claims**



1. An optical time-domain reflectometry method of sensing respective values of a physical parameter at different locations along an optical fibre, in which method radiation is launched into the fibre at one end thereof and resulting back-scattered optical radiation is used to produce electrical output signals indicative of the values being sensed, wherein optical filtering means are employed to ensure that said back-scattered radiation used to produce the electrical output signals is restricted to a preselected single spectral line resulting from inelastic scattering in the fibre.

4,823,167

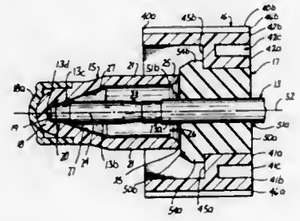
CATHETER CALIBRATION DEVICE

Wayne E. Manska, Anaheim, and Roger G. Bickelhaupt, Modjeska Canyon, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Dec. 16, 1986, Ser. No. 942,356

Int. Cl.⁴ G02B *23/24*

U.S. Cl. 356—243 **26 Claims**



25. An apparatus, comprising:

a packaging tray;

an optical calibration element mounted on the packaging tray;

means for holding the optical calibration element on the packaging tray in a substantially fixed position;

an optical catheter on said packaging tray, said optical catheter having a distal end face;

means for releasably retaining the optical catheter on the packaging tray with the distal end face in a calibration position in which the optical catheter can be calibrated using the optical calibration element; and

said retaining means including means responsive to a force on said catheter in a direction generally transverse to the catheter at said retaining means for releasing the catheter from the retaining means.

4,823,168

FLOW-THROUGH CELL FOR A PHOTOMETER FORMED USING A PAIR OF CELL BODY MEMBERS

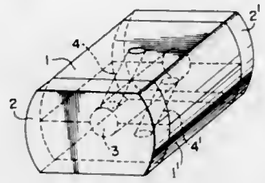
Masao Kamahori; Yoshio Watanabe; Junkichi Miura, all of Hitachi; Mamoru Taki, Ibaraki, and Hiroyuki Miyagi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1987, Ser. No. 116,543

Claims priority, application Japan, Nov. 7, 1986, 61-263783

Int. Cl.⁴ G01N *21/05*

U.S. Cl. 356—246 **23 Claims**



1. A flow cell for a photometer, which comprises a cell body integrated from a pair of cell body members by joining, at least one of which is provided with a linear groove on the joining surface of the cell body member from one end to another to the full length, as exposed to the joining surface, the groove playing both roles of a liquid sample passage and a detecting light path by the integration of the cell body members, and is further provided with a liquid sample inlet passage at a position near one end of the groove and a liquid sample outlet passage at a position near the other end of the groove, both passages being communicated with the groove, the cell body members being formed of a material selected from the group consisting of glass, silicon and silicon oxide, and a pair of light transmission window members joined with the flow cell body at both ends of the groove-open sides thereof.

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REFLECTION DENSITY MEASURING SYSTEM

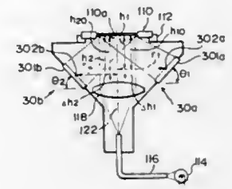
Nobuhiko Ogura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 26, 1987, Ser. No. 19,402

Claims priority, application Japan, Feb. 26, 1986, 61-40890; Apr. 19, 1986, 61-90956

Int. Cl.⁴ G01N *21/47*

U.S. Cl. 356—446 **9 Claims**



1. A reflection density measuring system comprising a means for projecting an irradiation light onto the surface-to-be-measured of a sample and at least first and second of photodetectors each of which has a photosensor for detecting light reflected by the surface-to-be-measured of the sample to impinge upon the photosensor through a light inlet side element of the photodetector, characterized in that

when the distances h between the center of the light inlet side element of the first photodetector and a regular position of the surface-to-be-measured of the sample and between the center of the light inlet side element of the second photodetector and the regular position as measured along the optical axis of the irradiation light are respectively represented by h_1 and h_2, the angles θ which the light inlet side elements of the first and second photodetector respectively form with the surface-to-be-measured are respectively represented by θ_1 and θ_2 and the distances r between the center of the light inlet side element of the first photodetector and the optical axis of the irradiation light and between the center of the light inlet side element of the second photodetector and the optical axis are respectively represented by r_1 and r_2,

the first photodetector is disposed so that h_1 is smaller than value h_{10} which is the value of h at which output I_1 of the photosensor of the first photodetector takes a peak value on an output curve representing the change of the output I_1 with the distance h when the distance h is varied under the combination of r_1 and θ_1, and the second photodetector is disposed so that h_2 is larger than value h_{20} which is the value of h at which output I_2 of the photosensor of the second photodetector takes a peak value on an output curve representing the change of the output I_2 with the distance h when the distance h is varied under the combination of r_2 and θ_2,

the reflection density of the surface-to-be-measured being determined on the basis of the sum of the outputs of the photosensors.

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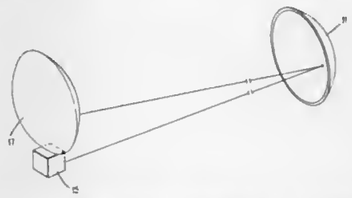
LINE OF SIGHT MEASURING SYSTEM

Per K. Hansen, South Burlington, Vt., assignor to Position Orientation Systems, Ltd., Burlington, Vt.

Filed Feb. 22, 1985, Ser. No. 704,526

Int. Cl.⁴ G01B *7/03*

U.S. Cl. 356—375 **29 Claims**



1. A cursor control system for measuring movements including linear movements and rotational movements of object means placeable in a predetermined space in front of a display means, said system displaying said movements in the form of a display indicative of the line-of-sight between said object means and a prescribed target, comprising:

(a) light source means;

(b) position sensing detector means adjacent said light source means;

(c) focusing reflector means attached to said object means;

(d) control means for controlling activation of said light source means, for receiving signals from said position sensing detector means and for calculating said line-of-sight; and

(e) said display means connected to said control means for displaying information indicative of changes in said light-of-sight in the form of changes in the position of a display cursor.

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COMPOUND SEMICONDUCTOR DEVICE

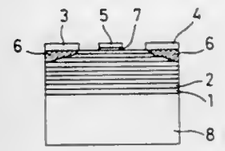
Yuichi Matsui, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 31, 1987, Ser. No. 32,765

Claims priority, application Japan, Apr. 5, 1986, 61-78499

Int. Cl.⁴ H01L *27/12*

U.S. Cl. 357—4 **5 Claims**



1. A compound semiconductor device having a channel layer, said channel layer having an increased probability of existence of electrons in a $In_xGa_{1-x}As$ layer ($0.7 \leqq x \leqq 1.0$) of said channel layer, said device having alternate laminations of $In_xGa_{1-x}As$ semiconductor layers ($0.7 \leqq x \leqq 1.0$) with thicknesses of 16 atomic planes or less and $In_yGa_{1-y}As$ layers ($0 \leqq y \leqq 0.3$) with thicknesses of 14 atomic planes or less so that the thickness of the $In_xGa_{1-x}As$ ($0.7 \leqq x \leqq 1.0$) is greater than that of the thickness of the $In_yGa_{1-y}As$ layer ($0 \leqq y \leqq 0.3$), and wherein n-type impurities are doped only in the $In_yGa_{1-y}As$ layer ($0 \leqq y \leqq 0.3$).

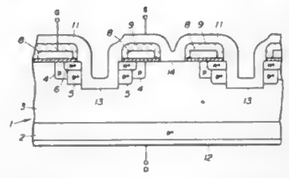
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VERTICAL MOSFET HAVING SCHOTTKY DIODE FOR LATCH-UP PREVENTION

Teruyoshi Mihara, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Jun. 10, 1987, Ser. No. 60,224
Claims priority, application Japan, Jun. 17, 1986, 61-139122
Int. Cl.[4] H01L *29/48*
U.S. Cl. 357—15 **15 Claims**



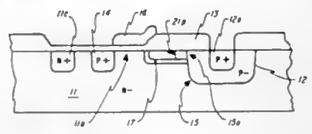
1. A vertical MOS filed effect semiconductor device comprising:
- a substrate comprising a first semiconductor layer of a first conductivity type, said substrate having a first surface formed by said first semiconductor layer, and a second surface,
- a drain electrode formed on said second surface of said substrate,
- a channel region of a second conductivity type opposite to said first conductivity type, formed in said first semiconductor layer,
- a source region of said first conductivity type, surrounded by said semiconductor channel region,
- a gate electrode formed above said channel region between said source region and said first semiconductor layer, and separated from said channel region by a gate insulating layer, and
- a metal source electrode having a first portion extending into said substrate from said first surface, passing through said source region and said channel region and terminating at an innermost end which forms a first Schottky junction with said first semiconductor layer at a location remote from said first surface.

4,823,173

HIGH VOLTAGE LATERAL MOS STRUCTURE WITH DEPLETED TOP GATE REGION

James D. Beasom, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 7, 1986, Ser. No. 831,384
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 **19 Claims**



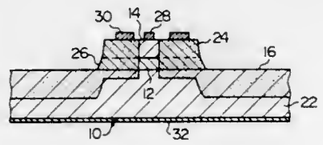
1. In a semiconductor device of the type including a lateral drift region of a first conductivity type formed in a body region, said drift region serving as a JFET channel, the improvement comprising:
- a top gate of a semiconductor material electrically connected to said body region and having a second conductivity type over said drift region to cause depletion of said drift region rom the top upon application of a reverse bias voltage to said device,
- wherein said top gate laterally abutts a device region to form a junction and has a surface area doping density such that said top gate becomes totally depleted at a reverse bias voltage below the reverse breakdown voltage of the top gate to device region junction, and
- wherein said top gate has a surface are a doping density such that it becomes totally depleted at a reverse bias voltage less than the reverse bias voltage at which said drift region becomes depleted.

4,823,174

BIPOLAR TRANSISTOR AND PROCESS OF FABRICATION THEREOF

Tadatsugu Itoh; Hideaki Kohzu, and Yasuhiro Hosono, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 843,177, Mar. 24, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 205,573
Claims priority, application Japan, Mar. 25, 1985, 60-59957; Mar. 25, 1985, 60-59958
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—34 **8 Claims**



1. A bipolar transistor comprising
(a) an emitter region of a first semiconductor material doped to a first conductivity type,
(b) a semi-insulating region of the first semiconductor material doped to be semi-insulating, said seminsulating region having a portion circumscribing a portion of said emitter region,
(c) an active base region directly overlying, substantially aligned and coextensive with said emitter region; said active base region being of a second semiconductor material and being doped to be a second conductivity type which is opposite to said first conductivity type, said second semiconductor material having an energy and gap which is less than an energy bandgap of said first semiconductor material,
(d) a collector region directly overlying, substantially alignedand extensive with said active base region; said collector region being of said second semiconductor material and being doped to be said first conductivity type, and
(e) a base contact region on said semi-insulating region, the base contact region being of said second semiconductor material being doped to said second conductivity type to a concentration which is higher than a concentration to which said active base region is doped, said base contact region surrounding said active base region and said collector region, said collector region and said base contact region having respective surfaces which are substantially flush with each other and said emitter region and said base contact region forming a substantial p-n junction therebetween.

4,823,175

ELECTRICALLY ALTERABLE, NONVOLATILE FLOATING GATE MEMORY DEVICE

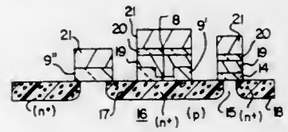
Gabriella Fontana, Vimercate, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Filed May 27, 1987, Ser. No. 54,712
Claims priority, application Italy, Jun. 3, 1986, 83623 A/86
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.5 **1 Claim**

1. An electrically alterable, floating gate type, nonvolatile, semiconductor memory device comprising:

a substrate of a semiconductor material having a channel region of a first type of conductivity contained between a first and a second region of a second type of conductivity, formed at the surface of said substrate of semiconductor material, said channel region providing a region in the semiconductor material capable of passing an electric current between said first and said second region;

a first level of conducting material forming a floating gate extending over said channel region between said first and said second region and over an injection area above one of said first and a second region, said floating gate being electrically insulated from the semiconductor material by a layer of gate oxide having an injection window within said injection area, the insulating layer within said window being represented by a layer of tunnel oxide essentially thinner than the layer of gate oxide; and

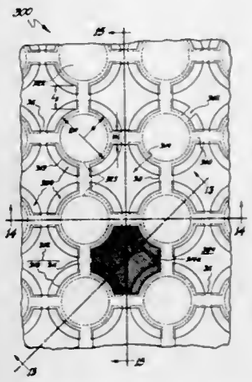


a second level of conducting material, insulated from said first level of conducting material and forming a control gate of the device;

a select MOS transistor being associated with said memory device, substantially in electrical series thereof;

wherein, the reference to said injection area, that portion of said insulating layer of gate oxide between said floating gate and the relevant one of said first or second region, except for the area of said injection window, has a thickness greater than the thickness of the portion of said layer of gate oxide superposing over said channel region, and said select MOS transistor has a gate oxide having the same thickness as the gate oxide present over said injection area of the memory device.

as plurality of spaced apart first gate segments, each of said first segments being substantially circular, and



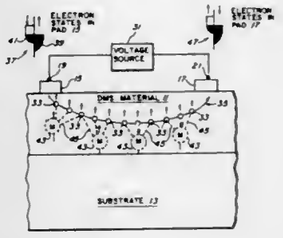
a plurality of second gate segments, each of said second segments extending between, and interconnecting, two adjacent one s of said first segments.

4,823,177

METHOD AND DEVICE FOR MAGNETIZING THIN FILMS BY THE USE OF INJECTED SPIN POLARIZED CURRENT

Gary A. Prinz; James J. Krebs, both of Alexandria, Va., and Berend T. Jonker, Bowie, Md., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1988, Ser. No. 213,862
Int. Cl.[4] H01L *41/06*
U.S. Cl. 357—27 **27 Claims**



1. A device comprising:
- a material having a magnetic constituent;
- a ferromagnetic film disposed at a first location on said material, said ferromagnetic film being magnetized in a first direction;
- a conductive first film disposed at a second location on said material; and
- means for accepting a voltage between said ferromagnetic and first films to enable a spin-polarized current to flow through said material to magnetize said material.

4,823,176

VERTICAL DOUBLE DIFFUSED METAL OXIDE SEMICONDUCTOR (VDMOS) DEVICE INCLUDING HIGH VOLTAGE JUNCTION EXHIBITING INCREASED SAFE OPERATING AREA

Bantval J. Baliga; Tat-Sing P. Chow, both of Schenectady, and Hsueh-Rong Chang, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1987, Ser. No. 33,952
Int. Cl.[4] H01L *29/78, 29/44*
U.S. Cl. 357—23.4 **32 Claims**

1. A semiconductor field effect device comprising:
- a body of semiconductor material having a major surface; and
- an insulated gate electrode grid disposed on said major surface, said grid comprising:

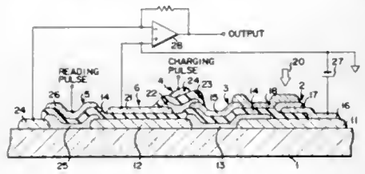
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4,823,178

PHOTOSENSOR SUITED FOR IMAGE SENSOR

Yoshiyuki Suda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 1985, Ser. No. 780,598
Claims priority, application Japan, Sep. 29, 1984, 59-204806
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 357—30 **8 Claims**



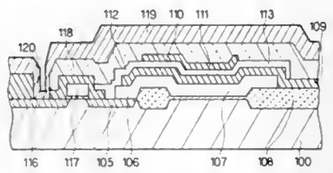
1. A photosensor comprising:
a circuit substrate;
a thin film transistor formed on said circuit substrate and having a gate electrode and drain and source electrodes forming a channel therebetween in response to a control voltage applied to said gate electrode, a channel current controlled by said control voltage flowing through said channel;
an amorphous silicon photodiode formed on said substrate integral with said thin film transistor between one of said drain and source electrodes and said gate electrode of said thin film transistor, said amorphous silicon photodiode having an inter-electrode capacitance;
charging means coupled to said photodiode for charging said inter-electrode capacitance of said photodiode; and
detecting means coupled to said thin film transistor for detecting the channel current of said thin film transistor which is controlled by a voltage across said inter-electrode capacitance of said photodiode, the voltage varying in response to incident light after said inter-electrode capacitance has been charged, said detecting means including a charge storage capacitor coupled to said thin film transistor and adapted to be charged by the channel current thereof; an output amplifier for taking out an output signal of said photosensor; and detecting switching element adapted to be turned on and off by an externally applied control signal to couple said charge storage capacitor to said output amplifier.

4,823,179

SEMICONDUCTOR MEMORY DEVICE WITH FLIP-FLOP MEMORY CELLS WHICH INCLUDE POLYCRYSTALLINE LOAD RESISTORS

Shigeru Koshimaru, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 22, 1986, Ser. No. 821,305
Claims priority, application Japan, Jan. 22, 1985, 60-9435
Int. Cl.⁴ H01L *27/02, 29/04*
U.S. Cl. 357—41 **6 Claims**



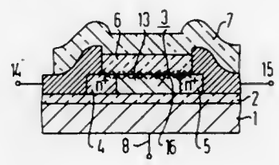
1. A semiconductor memory including a number of static memory cells formed in a substrate, each memory cell comprising a flip-flop circuit including a pair of first and second insulated gate field effect transistors formed in the substrate, each of the transistors having a gate connected to one end of the source-drain path of the other transistor of the transistor pair, and a pair of first and second load resistors connected to the above one ends of the first and second transistors, respectively, each of the load resistors being constituted of a polycrystalline semiconductor resistor including a high resistance portion of high resistivity and a low resistance portion of low resistivity electrically connected to opposite ends of the high resistance portion, the high resistance portion of high resistivity being formed through the intermediary of an insulative layer of a thickness of not greater than 2000 angstroms on the gate of the transistor whose source-drain path is connected in series to the other load resistor, whereby the effective resistance of each load polycrystalline semiconductor resistor is controlled by a potential of the gate electrode of the field effect transistor whose source-drain path is connected in series to the other load resistor, in such a manner that the resistance of the polycrystalline semiconductor resistor becomes a low resistance when the potential of the gate electrode is at a high level.

4,823,180

PHOTO-TRANSISTOR IN MOS THIN-FILM TECHNOLOGY AND METHOD FOR PRODUCTION AND OPERATION THEREOF

Armin Wieder, Gauting, and Lothar Risch, Ottobrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Manich, Fed. Rep. of Germany

Filed Oct. 28, 1982, Ser. No. 437,302
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1981, 3146981
Int. Cl.⁴ H01L *27/14, 31/10*
U.S. Cl. 357—30 **8 Claims**



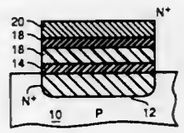
1. A method of operating a photo-transistor in MOS thin film technology, comprising steps of:
(a) providing the MOS photo-transistor as
(1) a semiconductor body comprising polycrystalline silicon having a source zone and drain zone located therein and spaced from one another by an undoped channel region,
(2) a gate electrode formed of polycrystalline silicone positioned at and separated from said semiconductor body by an SiO_2 layer generated on the silicon semiconductor body by thermal oxidation, and
(3) a high defect density boundary region between the semiconductor body and the SiO_2 layer;
(b) applying an alternating voltage to the gate and applying an operating voltage between the source and drain zones;
(c) exposing the photo-transistor to varying light amplitudes to cause variations in drain current; and
(d) the photo-transistor being operable with the gate voltage lying anywhere in a range from 100 Hz to 1 Mhz.

4,823,181

PROGRAMMABLE LOW IMPEDANCE ANTI-FUSE ELEMENT

Amr M. Mohsen, Saratoga; Esmat Z. Hamdy, Fremont, and John L. McCollum, Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Filed May 9, 1986, Ser. No. 861,519
Int. Cl.⁴ H01L *29/52, 29/92, 27/10, 29/04*
U.S. Cl. 357—51 **29 Claims**



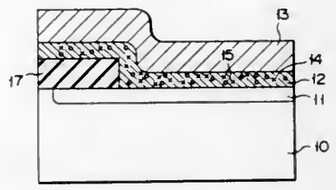
1. An electrically programmable semiconductor device comprising a plurality of elements each of which comprises a first electrode, a second electrode, a multilayer dielectric comprising at least two dielectric layers of different dielectric constant disposed between the first electrode and the second electrode, and wherein at least one element has a conductive filament passing through the multilayer dielectric ohmically connecting the first electrode to the second electrode.

4,823,182

SEMICONDUCTOR DEVICE WITH A DIFFUSION BARRIER CONTACT OF A REFRACTORY METAL NITRIDE AND EITHER CARBON OR BORON

Katsuya Okumura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 20, 1987, Ser. No. 123,371
Claims priority, application Japan, Nov. 21, 1986, 61-277956
Int. Cl.⁴ H01L *29/46*
U.S. Cl. 357—67 **9 Claims**



1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type which has a surface layer with an impurity region of a second conductivity type;
a nitride of a high melting point metal formed on said semiconductor substrate and containing at least one of boron and carbon; and
a metal film formed on said nitride of a high melting point metal.

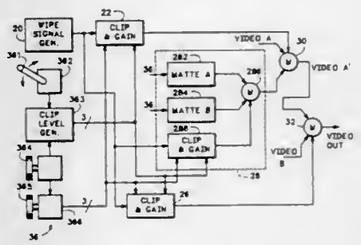
4,823,183

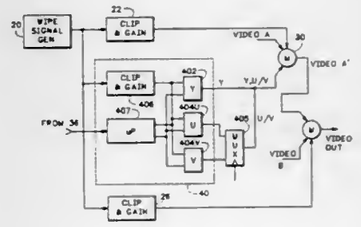
VIDEO MIXER WITH MULTICOLOR BOARDER

Richard A. Jackson, and John Abt, both of Nevada City, Calif., assignors to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Feb. 1, 1988, Ser. No. 150,598
Int. Cl.⁴ H04N *9/76*
U.S. Cl. 358—22 **9 Claims**

1. Video effects apparatus comprising:
a wipe generator for generating a wipe signal,
a matte generator for generating a matte signal, the matte generator receiving the wipe signal and the color represented by the matte signal being dependent on the wipe signal,
control means connected to receive the wipe signal and provide at least a first control signal therefrom, and
mixer means having signal input terminals for receiving first and second video signals and the matte signal and also having a mix control input terminal connected to receive said first control signal, the mixer means providing an output signal representing a picture composed of a first image portion represented by the first video signal, a second image portion represented by the second video signal, and a band between the first and second image portions, the band being represented by the matte signal.





4,823,184

COLOR CORRECTION SYSTEM AND METHOD WITH SCENE-CHANGE DETECTION

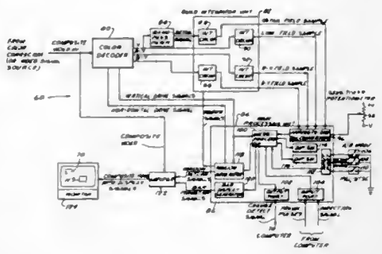
Armand Belmares-Sarabia, Catskill, N.Y., and Stanley J. Chayka, Parsippany, N.J., assignors to Corporate Communications Consultants, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 722,801, Apr. 12, 1985, Pat. No. 4,694,329, which is a continuation-in-part of Ser. No. 598,468, Apr. 9, 1984, Pat. No. 4,679,067. This application Sep. 8, 1987, Ser. No. 94,241
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 358—27 **20 Claims**

18. An apparatus for electrically analyzing video signals which form a plurality of video pictures to detect a scene change, said apparatus comprising:
bandpass filter means for transmitting video signals within a preselected pass band;
scene sensing means responsive to the video signals transmitted by said bandpass filter means, said scene sensing means including means for determining a first average level of said transmitted video signals in at least a portion of a second field, means for comparing the difference between

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the first and second average levels to a predetermined standard, and means for producing an output signal indica-



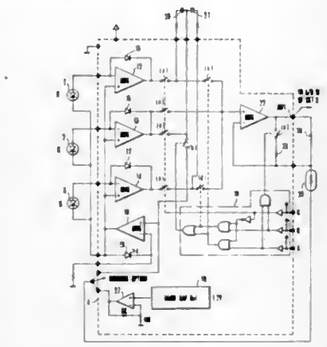
tive of a scene change if the predetermined standard is satisfied.

4,823,185

COLORIMETRIC CIRCUIT WITH STORAGE OF SIMULTANEOUSLY DETECTED COLOR COMPONENTS

Ryosuke Miyamoto, and Shinji Sakai, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 114,091
Claims priority, application Japan, Oct. 30, 1986, 61-260243
Int. Cl.[4] H04N *9/73*
U.S. Cl. 358—29 **17 Claims**



1. A colorimetric circuit comprising a plurality of detecting portions for detecting different color components from each other, memory means for memorizing detection outputs of said detecting portions at the same instant, and control means for taking out an output of said memory means in sequence.

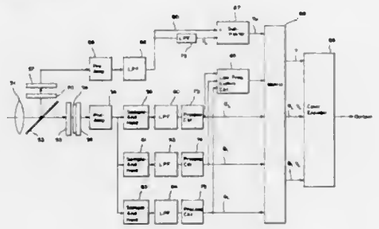
4,823,186

COLOR VIDEO SIGNAL GENERATING DEVICE USING MONOCHROME AND COLOR IMAGE SENSORS HAVING DIFFERENT RESOLUTIONS TO FORM A LUMINANCE SIGNAL

Akira Muramatsu, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 18, 1987, Ser. No. 134,748
Claims priority, applicatioo Japan, Dec. 19, 1986, 61-301688
Int. Cl.[4] H04N *9/09, 9/04*
U.S. Cl. 358—43 **6 Claims**

1. A device for generating a video signal, comprising:
means for splitting an optical image from an image pickup system into first and second images;
a monochrome image sensor which scans said first image in a horizontal direction and which has a first Nyquist spatial frequency band in said horizontal direction to produce a monochrome signal;
a color image sensor having a color filter array on a surface thereof which scans said second image in a horizontal direction and which has a second Nyquist spatial frequency band in said horizontal direction which is lower than said first Nyquist spatial frequency band to produce color-separated signals;
optical low-pass filter means for limiting said second image to a spatial frequency band lower than said first Nyquist spatial frequency band prior to scanning by said color image sensor;



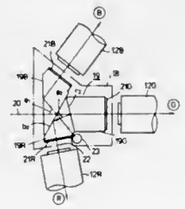
low frequency luminance signal forming means for forming a low frequency luminance signal in response to said color-separated signals;
high frequency luminance signal forming means for forming a high frequency luminance signal in response to said monochrome signal;
a matrix circuit for forming a luminance signal in response to said low frequency and high frequency luminance signals and for forming color difference signals in response to said low frequency luminance signal and selected ones of said color-separated signals; and
means for generating said video signal in response to said luminance signal and said color difference signals formed by said matrix circuit.

4,823,187

COLOR TELEVISION CAMERA HAVING A TEST PATTERN PROJECTED THROUGH A NON-INCIDENT PRISM PLANE

Mitsuaki Toyama, Musashino; Tameaki Ebihara, Yamato; Syohei Kawai, Sagamihara; Keizo Kono, Tokyo, and Nobuo Shimoda, Hachioji, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Jul. 7, 1987, Ser. No. 70,429
Claims priority, application Japan, Jul. 9, 1986, 61-159569
Int. Cl.[4] H04N *9/093, 9/097, 9/09*
U.S. Cl. 358—51 **6 Claims**



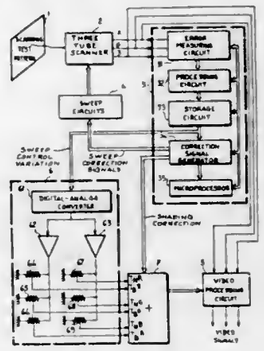
1. A color television camera comprising:
lens means for receiving light from an object to be picked up, said light passing through said lens means,
prism means for separating said light into red, green and blue lights, said red, green and blue lights following optical paths of said camera, said prism means having a front plane facing said lens means to receive said light which passes through said lens means and an incident plane provided exclusively for passing an image of a test pattern into said optical paths of said camera, said incident plane being a plane other than said front plane,
pattern projection means for projecting the image of said test pattern onto said incident plane of said prism means,
image pickup means for converting the lights sent from said prism means into electrical signals, and
signal process means for processing said electrical signals and producing a video signal.

4,823,188

APPARATUS FOR CORRECTING FOR SHADING DEFECTS IN VIDEO SIGNALS INDUCED BY VARIATIONS IN THE SPEED OF SCANNING SPOTS IN A TV CAMERA

Jean Noel Fanquet, Saint Leu La Foret, and Gérard Desmoons, Clichy, both of France, assignors to Thomson Video Equipement, Gennevilliers, France

Filed Sep. 3, 1985, Ser. No. 771,771
Claims priority, application France, Sep. 7, 1984, 84 13812
Int. Cl.[4] H04N *9/093, 5/228;* **H01J** *29/72*
U.S. Cl. 358—51 **3 Claims**



1. An apparatus for correcting for shading induced in video signals from a television camera by variations in the speed of scanning spots in pickup tubes of said television camera, said scanning spot speed variations being produced for correction of geometry and convergence errors in said pickup tubes, said apparatus comprising:
means for producing digital correction values for correcting said geometry and convergence errors, including a microprocessor;
storage means, connected to said producing means, for storing said digital correction values;
means for producing black and white spot correction signals based on said digital correction values;
means for detecting variations in the speed of a scanning spot in at least one of said pickup tubes in at least one scanning direction, comprising:
(a) digital-to-analog converting means, coupled to receive stored digital correction values from said storage means;
(b) amplifier means, coupled to said digital-to-analog converting means, for producing shading correction signals; and
means for combining said shading correction signals and said black and white spot correction signals with said video signals to produce corrected video signals.

4,823,189

METHOD AND APPARATUS FOR CREATING A DITHER PATTERN

Douglas I. Haines, Mulino, and Patrick E. Welborn, Tualatin, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 8, 1987, Ser. No. 47,815
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **8 Claims**

1	17	93	145	13	29	76	156	2	18
33	49	97	177	44	80	104	188	34	50
81	113	129	209	92	124	140	220	92	114
191	193	225	241	172	204	236	252	192	194
9	22	70	150	11	27	75	155	5	21
38	54	102	182	44	56	107	187	37	53
88	118	134	214	91	123	138	218	85	117
193	198	230	246	171	203	235	251	185	197
13	28	77	157	0	19	64	144	14	30

1. A method of creating a record in which a given color is rendered with a selected gray scale level, comprising:
resolving an addressable area of a record medium into a multiplicity of addressable record locations, the record locations being in a rectangular array of rows and columns,
organizing the addressable record locations into a plurality of groups each containing a rectangular array of m×n addressable record locations, where m and n are each greater than two, and each group having four locations in respective corners of the m×n array,
organizing the groups into a plurality of dither cells each containing a rectangular array of M×N groups, whereby each dither cell contains M×N×m×n addressable record locations,
applying the given color to j record locations in each group of at least one dither cell, where j is an integer in the range from zero to m×n−1, and in the event that j is greater than one, each of the j record locations in a group being in the same row or column as at least one other of the j record locations of that group, and in the event that j is less than ten, all j addressed record locations of that group being within a 3×3 array, with the record location at one corner of the 3×3 array being at one of the corners of the m×n array, and
applying the given color to one additional record locationin each of i groups of said one dither cell, where i is an integer in the range from zero to M×N−1, in the event that j is greater than zero, the additional record location in each of the i groups being in the same row or column as at least one of the j record locations of that group, in the event that j is less than nine, the additional record location in each of the i groups being within said 3×3 array and in the event that i is greater than one, the i groups being distributed substantially uniformly over the dither cell.

4,823,190

APPARATUS FOR ENHANCING CONTOURS OF TELEVISION SIGNAL

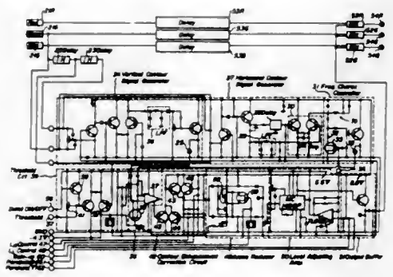
Kazumi Yamamoto, Tokyo, Japan, assignor to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 32,226
Claims priority, application Japan, Apr. 11, 1986, 61-82360
Int. Cl.[4] H04N *5/208*
U.S. Cl. 358—166 **12 Claims**

1. An apparatus for enhancing contours of an image signal having a color subcarrier, comprising:
contour signal producing means for extracting a contour signal from an image signal whose contours are to be enhanced;

means for filtering said contour signal to produce a filtered contour signal, said means for filtering having a center frequency near the color subcarrier frequency and having a figure of merit Q;

means for selectively changing the figure of merit Q, said means for selectively changing the figure of merit Q including a series combination of a resistor and a semiconductor switch, the series combination being connected to the means for filtering;



contour enhancement signal producing means for processing said filtered contour signal non-linearly in accordance with the amplitude of the filtered contour signal to derive a contour enhancement signal; and

means for adding said contour enhancement signal to said image signal.

4,823,191

IMAGE-SENSING APPARATUS

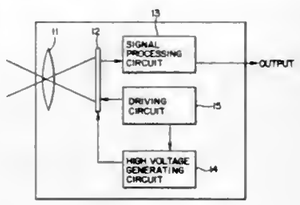
Junichi Andoh, and Yukio Endo, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 23, 1988, Ser. No. 172,273

Claims priority, application Japan, Mar. 31, 1987, 62-76169

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.31 **9 Claims**



1. An image-sensing apparatus comprising:

solid-state image-sensing devices having photoelectric converter sections;

means included in said solid-state image-sensing devices for reading signal charges stored within said photoelectric converter sections;

a driving circuit for supplying timing pulses to said solid-state image-sensing devices;

a pulse voltage generating circuit for generating multiple phase pulse voltages by utilizing said timing pulses produced from said driving circuit; and

high voltage generating circuit means for adding pulse voltages received from said pulse voltage generating circuit so as to generate a high voltage and for supplying the generated high voltage to said means for reading signal charges.

4,823,192

REPRODUCTION APPARATUS

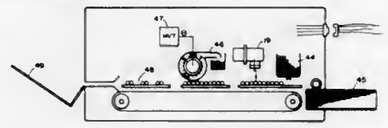
Katsuichi Shimizu, Kunitachi; Shunichi Masuda, Tokyo; Toshiaki Yagasaki, Hino, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 694,475, Jan. 23, 1985, abandoned, which is a continuation of Ser. No. 278,074, Jun. 29, 1981, abandoned. This application Dec. 29, 1986, Ser. No. 947,425

Claims priority, application Japan, Jun. 30, 1980, 55-88720; Jun. 30, 1980, 55-88721

Int. Cl.[4] H04N *1/32, 1/21*

U.S. Cl. 358—256 **14 Claims**



1. An image processing system comprising:

a bus line for the transmission of data comprising image information;

means for storing a frame of image information and supplying the stored image information to said bus line;

means for forming an image on a recording medium in accordance with the image information transmitted through said bus line, said forming means including a beam scanner device for repeatedly scanning the recording medium with a beam based on the image information on a line by line basis, and being arranged to produce for each successive line scan of said beam scanner device a synchronizing signal in synchronism with that scan;

means for the DMA transfer through said bus line of image information supplied by said storing means for use by said forming means; and

DMA control means responsive to the production of each said synchronizing signal in the operation of said forming means for allowing said DMA transfer means to affect DMA transfer of the image information for a line scan of image forming.

4,823,193

DATA COMMUNICATION APPARATUS

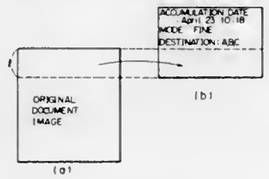
Masatomo Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1986, Ser. No. 906,802

Claims priority, application Japan, Sep. 19, 1985, 60-205423

Int. Cl.[4] H04N *1/32*

U.S. Cl. 358—257 **30 Claims**



1. An image data communication apparatus comprising:

reading means for reading an image of an original document;

memory means for storing image data read by said reading means;

transmitting means for transmitting, after storage of the image data in said memory means, the image data stored in said memory means;

information generating means for generating information relating to a transmitting destination of the stored image data and for generating information relating to the storage time at which said memory means stores the image data;

readout means for reading out a part of the image data stored in said memory means; and

recording means for recording, at an image data transmitting side of the apparatus, the part of the image data read out by said readout means, the information relating to the transmitting destination obtained by said information generating means, and the information relating to the storage time obtained by said information generating means.

4,823,194

METHOD FOR PROCESSING GRAY SCALE IMAGES AND AN APPARATUS THEREOF

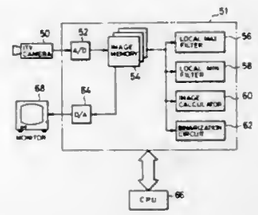
Tadaaki Mishima, Hitachi; Morio Kanasaki; Masao Takatoo, both of Katsuta; Kazunori Fujiwara, and Yoshiki Kobayashi, both of Hitachi, all of, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,874

Claims priority, application Japan, Aug. 1, 1986, 61-179985; Jan. 16, 1987, 62-8593

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—282 **20 Claims**



1. A method for processing an original picture of a gray image composed of a target image and a background image to extract the target image separated from the background image, comprising the steps of:

(a) obtaining a background image by processing gray levels of the original picture; and

(b) extracting the target image on the basis of a different image between the original picture and the background image obtained in step (a).

4,823,195

RECORDING APPARATUS

Yoshio Ito, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 929,617

Claims priority, application Japan, Nov. 15, 1985, 60-254924; Dec. 12, 1985, 60-277959; Dec. 12, 1985, 60-190345[U]; Dec. 12, 1985, 60-190346[U]; Dec. 27, 1985, 60-292974; Dec. 27, 1985, 60-292975; Jan. 14, 1986, 61-4293; Jan. 14, 1986, 61-4294; Jan. 30, 1986, 61-11030[U]; Jan. 31, 1986, 61-18116; Sep. 10, 1986, 61-211495

Int. Cl.[4] H04M *1/04;* **H04N** *1/21*

U.S. Cl. 358—285 **25 Claims**

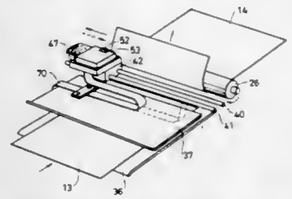
1. A recording apparatus for reading an original image of an original and recording an image in accordance with the original image onto a recording medium, said apparatus comprising:

original reading means for reading the original image;

recording means for recording an image ready by said original reading means in accordance with the original image;

means for reciprocally and integrally moving said original reading means in a direction crossing a conveyance path of said original and said recording means in a direction crossing a conveyance path of the recording medium; and

common conveying means for commonly and simultaneously conveying the original along said original conveyance path and the recording medium along said recording medium conveyance path by synchronizing the original with the recording medium.



4,823,196

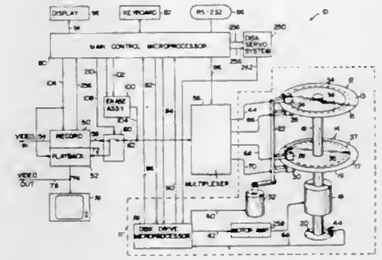
IMAGE STORAGE AND RETRIEVAL APPARATUS

Larry D. Goddard, Decatur, Ga., assignor to Goddard Technology Corporation, Atlanta, Ga.

Filed Jun. 30, 1987, Ser. No. 68,268

Int. Cl.[4] H04N *9/79*

U.S. Cl. 358—310 **17 Claims**



1. An image storage and retrieval apparatus having a storage mode and a retrieval mode and comprising:

a. a storage disk mounted for rotation on a spindle and having a number of addressable circular tracks;

b. a servo-controlled motor connected to the spindle for rotating the storage disk at a preselected speed;

c. a read/write head moveably mounted adjacent the disk for selectively receiving an analog signal and for recording the analog signal on the disk during the storage mode and for sensing the analog signal on the disk and for transmitting the analog signal during the retrieval mode;

d. head drive means for selectively positioning the read/write head adjacent each of the addressable circular tracks for recording and sensing the analog signal;

e. record circuit operable during the storage mode for receiving a video signal on a record input, which video signal includes a sync signal, a luminance component, and a chroma component, separating the components, frequency converting the chroma component by a first preselected reference frequency, frequency modulating the luminance component, subsequently recombining the components to produce the analog signal on a record output for transmission to the read/write head;

f. playback circuit operable during the retrieval mode for receiving the analog signal on a playback input from the read/write head, separating the luminance component from the chroma component, frequency demodulating and delaying the luminance component, frequency converting the chroma component by a second preselected reference frequency, and subsequently recombining the components to recover the video signal at a playback output; and

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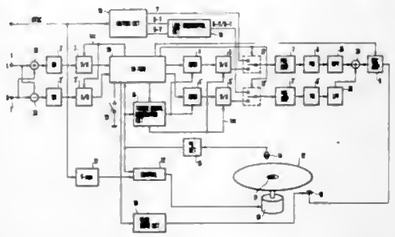
g. control means responsive to external instructions for selecting a particular one of the circular tracks in response to receiving an address and for selecting between the storage and retrieval mode.

4,823,197

RECORDING APPARATUS AND REPRODUCING APPARATUS

Tsuguhide Sakata; Norio Kimura, both of Tokyo, and Masahiro Takei, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1986, Ser. No. 945,348
Claims priority, application Japan, Feb. 27, 1985, 60-297223
Int. Cl.[4] H04N *9/79*
U.S. Cl. 358—310 **40 Claims**



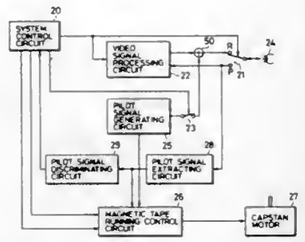
1. A signal recording apparatus comprising:
(a) first means for processing a signal of first signal band to record;
(b) second means for processing a signal of second signal band different from said first signal band to record, the recording processing of said second means including a modulating process; and signal and a
(c) means for selecting one of an audio video signal to be supplied with its first and second informations to said first and said second means respectively.

4,823,198

VIDEO RECORDING AND REPRODUCING DEVICE AND METHOD INCLUDING VIDEO SIGNAL RECORD RESTART DURING REWIND/PLAYBACK OPERATION AFTER NON-DETECTION OF PILOT SIGNAL IN VIDEO TRACK

Nobuyoshi Okumura, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,351
Claims priority, application Japan, Dec. 25, 1984, 59-278598; May 10, 1985, 60-99985
Int. Cl.[4] H04N *5/782;* **G11B** *15/20*
U.S. Cl. 358—311 **27 Claims**



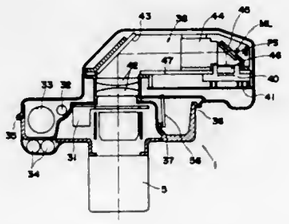
1. A video recording and reproducing device for a magnetic tape using rotary magnetic heads, said device comprising:
recording means for recording, during a recording operation, a plurality of video signals and pilot signals, each pilot signal being different in frequency from one another in video tracks on a magnetic tape, each pilot signal being sequentially different in frequency according to the order of the video tracks, the pilot signals being superposed on the video signals;
switching means, operable during a temporary recording stop mode, for providing only video signals for recording on the video tracks such that a last video track with a video signal but without a pilot signal is produced, and for ending the recording operation by said recording means after recording the last video track;
magnetic tape running control means for rewinding the magnetic tape a predetermined length from the last video track and for stopping said magnetic tape, said control means including means for reproducing, during a temporary recording stop removal mode, the pilot signals for tracking of the magnetic tape running operation; and
means for detecting, during the temporary recording stop removal mode, the last video track and for starting a successive recording operation of said recording means at a video track after the last video track.

4,823,199

STILL VIDEO ADAPTER DEVICE DETACHABLE TO A CAMERA BODY

Kunitetu Sakakibara, Amagasaki; Mitsuru Saito, Ibaraki; Tetsuyuki Tanimoto; Yasuhiro Morimoto, both of Takatsuki, and Hiroshi Ishibe, Kyoto, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1987, Ser. No. 24,702
Claims priority, application Japan, Mar. 11, 1986, 61-36821[U]; Mar. 11, 1986, 61-36822[U]; Mar. 11, 1986, 61-36824[U]; Mar. 11, 1986, 61-36825[U]; Mar. 11, 1986, 61-36826[U]; Mar. 11, 1986, 61-36827[U]; Mar. 11, 1986, 61-36829[U]
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 **7 Claims**



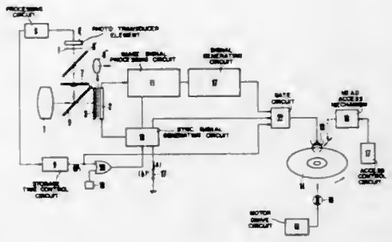
2. A still video adapter device detachably mounted to a back portion of a camera body in place of a rear cover, said camera body being used for film exposure with said rear cover attached, said device comprising:
an image sensor which outputs picture signals for still video photography;
a relay optical system, including a condenser lens, an image forming lens, a first reflecting mirror and a second reflecting mirror, for relaying and reimaging on said image sensor an image on a plane where film would normally be located in said camera body, one of said first and second reflecting mirrors being a half mirror for splitting light incident thereto and directing a portion thereof onto said image sensor; and
a light receiving means disposed so as to receive another portion of the light split by said half mirror for generating an output used for still video photography.

4,823,200

CAMERA FOR FLASH PHOTOGRAPHY HAVING AN IMAGE RECORDING SYSTEM

Tokuichi Tsunekawa; Nobuaki Date; Hiroshi Aizawa, all of Kanagawa; Kazuya Hosoe, Machida, and Kazunori Urushibara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 347,966, Feb. 11, 1982, Pat. No. 4,658,304, which is a division of Ser. No. 31,168, Apr. 18, 1979, Pat. No. 4,366,501. This application Jan. 16, 1987, Ser. No. 4,148
Claims priority, application Japan, Apr. 23, 1978, 53-48010; Apr. 23, 1978, 53-48011
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 **16 Claims**



1. An image pickup system comprising:
(a) an image pickup device for transducing an optical picture image information into an electric picture image information and storing the information;
(b) light incidence control means for controlling light incident on the picture recording device;
(c) means for driving the image pickup device and effecting storage of a predetermined electric picture image information in the image pickup device;
(d) trigger means; and
(e) means for starting the light incidence control means in response to the output of the trigger means, and for controlling the image pickup device drive means so as to start the storing of the electric picture image information in the image pickup device a predetermined time after the start of the light incidence control means.

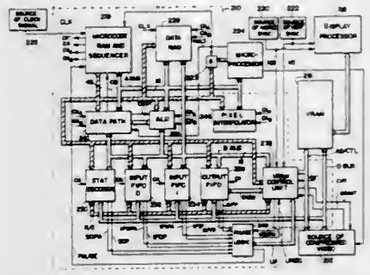
4,823,201

PROCESSOR FOR EXPANDING A COMPRESSED VIDEO SIGNAL

Allen H. Simon, Belle Mead; David L. Sprague, Hopewell, both of N.J.; John M. Keith, Washington Crossing, Pa.; Michael F. Patti, Plainsboro, N.J.; Kevin Harney, Brooklyn, N.Y.; Lawrence D. Ryan, Princeton Junction, N.J.; Nicola J. Fedele, Kingston, N.J., and Brian Astle, Cranbury, N.J., assignors to Technology, Inc. 64, Princeton, N.J.

Filed Nov. 16, 1987, Ser. No. 121,753
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—133 **13 Claims**

1. A video signal processor including:
input means for applying digital data representing a video image including compressed video data and pixel data, wherein a portion of said digital data is statistically encoded;
statistical decoding means, coupled to said input means and responsive to a control signal for decoding the statistically encoded digital data provided by said input means to generate decoded digital data;
pixel interpolating means, responsive to said control signal and to the pixel data provided by said input means for developing interpolated pixel values representing pixels in said video image which are interstitial to pixels in said video image that are represented by said pixel data;
arithmetic data processing means, responsive to said control signal, for performing arithmetic operations on the digital data provided by said statistical decoding means and on the interpolated pixel values provided by said pixel interpolating means;
output means, coupled to said arithmetic data output means, processing means for providing processed video data from said arithmetic data processing means as an output signal; and



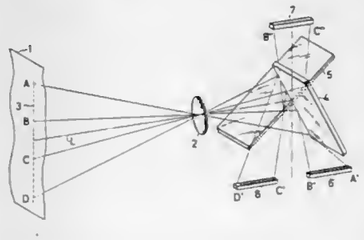
sequencing means for generating said control signal to condition said statistical decoding means, said arithmetic data processing means and said pixel interpolating means to operate simultaneously to produce decoded and decompressed pixel data as said output signal.

4,823,202

OPTICAL BEAM-SPLITTING ARRANGEMENTS ON IMAGE SIDE OF A LENS

Yoshiaki Morizumi, Moriyama, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Aug. 20, 1986, Ser. No. 898,209
Claims priority, application Japan, Aug. 20, 1985, 60-181128
Int. Cl.[4] H04N *1/028, 3/15, 5/335*
U.S. Cl. 358—294 **8 Claims**



1. A picture reading apparatus for imaging a linear area of an original picture, said reading apparatus comprising:
a projecting lens for receiving light from the linear area of the original picture and transmitting said light through said lens, said lens having an optical axis, an object side and an image side;
a plurality of line sensors each having a respective plurality of linearly aligned photoelectric elements; and
a light dividing means, disposed on the image side of said projecting lens in a position to receive at least a portion of said light transmitted through said projecting lens, said light dividing means being effective for dividing said received light into a plurality of light beams and directing each of said light beams to a respective one of said line sensors, said light dividing means including two flat mirrors, disposed on opposite sides of an imaginary plane which contains said linear area and said optical axis, each

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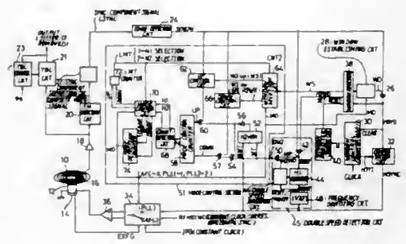
of said two flat mirrors being inclined relative to said linear area and said two flat mirrors being inclined in inversely opposed directions.

4,823,203

ROTATION SPEED DETECTION CIRCUIT IN A VIDEO DISC PLAYBACK DEVICE FOR DETECTING A STATE IN WHICH THE ROTATION SPEED IS DOUBLE A NORMAL SPEED

Sadayuki Narusawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 29, 1986, Ser. No. 913,483
Claims priority, application Japan, Oct. 7, 1985, 60-221782
Int. Cl.[4] G11B *7/00*
U.S. Cl. 358—342 **4 Claims**



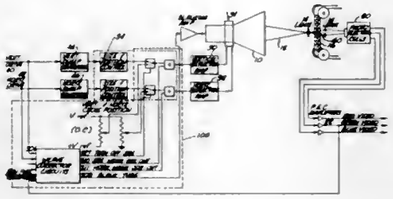
1. A rotation speed detection circuit in a video disc playback device comprising:
- a horizontal synchronizing signal separation circuit for separating horizontal synchronizing signals from a signal reproduced from a video disc;
- a window circuit for establishing windows for detecting horizontal synchronizing signals at expected timings of the horizontal synchronizing signals;
- a counter for counting signals occurring in the reproduced signal at a timing intermediate between windows established by said window circuit; and
- a rotation speed judgment circuit receiving a result of counting by said counter and producing a speed detection signal to provide an indication that the rotation speed of the playback device is approximately twice its nominal speed when the result of counting has reached a predetermined count within a predetermined period of time.

4,823,204

METHOD AND APPARATUS FOR FILM WEAVE CORRECTION

David E. Holland, Granada Hills, Calif., assignor to Image Transform, North Hollywood, Calif.

Filed Jan. 18, 1987, Ser. No. 64,998
Int. Cl.[4] H04N *3/36*
U.S. Cl. 358—347 **17 Claims**



1. A method for detecting the position of a sprocket hole in a film recording or reproducing apparatus which employs a continuous motion film drive comprising the steps of

causing the scanning beam to scan the sprocket hole in a vertical direction to detect a vertical edge of the sprocket hole,

positioning the scanning beam within the sprocket hole based on the detection of a vertical edge, and

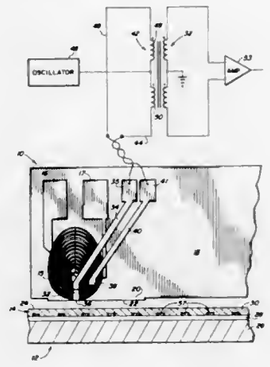
causing the scanning beam to scan the sprocket hole in a horizontal direction.

4,823,205

CAPACITIVE SENSOR FOR HEAD POSITIONING IN MAGNETIC RECORDING DISK FILES

David M. Hannon, Palo Alto, and Donald E. Horne, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,101
Int. Cl.[4] G11B *13/00, 5/596*
U.S. Cl. 369—14 **8 Claims**



1. A sensor for detecting data head position information in a data recording disk file having at least one rotatable disk with a capacitive contrast pattern formed thereon and an actuator for positioning the head generally radially relative to data tracks on the disk, the sensor comprising:
- an air bearing slider supporting a data head and connected to the actuator;
- a sensing probe of conductive material attached to the slider and having an end in close proximity to and facing a disk surface;
- a dummy probe of conductive material attached to the slider and having an end spaced from the disk surface a distance substantially greater than the spacing between said sensing probe end and the disk surface;
- an inductor having one end electrically connected to the sensing probe and the other end connected to the dummy probe; and
- means electrically coupled to the center of the inductor for generating an oscillating electrical signal, wherein the inductor generates a signal in response to the capacitive contrast pattern on the disk sensed by the sensing probe.

4,823,206

VIDEO SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

Shoji Nemoto, Kanagawa, and Yukihiko Machida, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

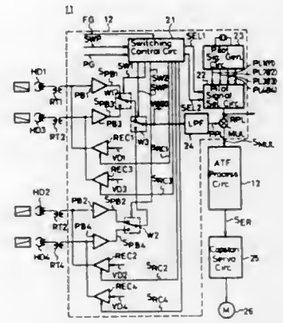
Filed Aug. 19, 1987, Ser. No. 86,789
Claims priority, application Japan, Aug. 21, 1986, 61-196735
Int. Cl.[4] G11B *21/10, 27/10;* **H04N** *5/782*
U.S. Cl. 360—19.1 **13 Claims**

1. A video recording and/or reproducing apparatus comprising:

first, second, third and fourth magnetic heads of which said first and third heads each have a first azimuth gap angle and said second and fourth heads each have a second azimuth gap angle;

a rotary drum on which said first, second, third and fourth heads are mounted successively in the order stated with substantially equal angular distances therebetween;

means rendering all of said first, second, third and fourth heads operative, in a recording mode of the apparatus, for recording information on a recording medium in first, second, third and fourth recording tracks, respectively, so as to change azimuth gap angles from track to track and, in a reproducing mode of the apparatus, for reproducing



recorded information from said first, second, third and fourth recording tracks, respectively;

means operative in said recording mode for superimposing first, second, third and fourth pilot signals having respective different frequencies on said information recorded by said first, second, third and fourth heads, respectively; and

means operative in said reproducing mode for tracking said first, second, third and fourth heads in respect to said first, second, third and fourth recording tracks, respectively, in such a fashion that said first, second, third and fourth pilot signals are reproduced from said corresponding first, second, third and fourth recording tracks by said first, second, third and fourth heads, respectively.

4,823,207

PCM RECORDING AND PLAYBACK WITH VARIABLE READ AND WRITE SPEEDS

Masaharu Kobayashi, and Takao Arai, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1987, Ser. No. 9,293
Int. Cl.[4] G11B *20/10;* **H04N** *5/95*
U.S. Cl. 360—32 **3 Claims**

1. A method of recording and reproducing a PCM audio signal comprising:

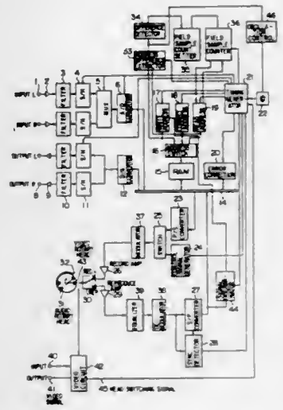
converting an analog audio signal at a predetermined sampling rate to a first digital signal having a predetermined number of quantization bits in each of a plurality of predetermined sampling periods;

recording the first digital signal on a recording medium to provide a recorded signal, while controlling the drive of the recording medium with a video signal having periods asynchronous with the sampling periods, the recording including determining the number of digitized quantization bits to be recorded in each of a plurality of predetermined periods synchornous with the video signal periods on the basis of the ratio between the predetermined sampling periods and the predetermined synchronous periods, and recording the first digital signal in accordance with such determination;

reproducing the recorded signal from the recording medium to provide a second digital signal;

converting the second digital signal to a reproduced analog audio signal;

determining a first output rate representative of the number of quantization bits in the second digital signal in each of the predetermined synchronous periods



determining a second output rate representative of the number of quantization bits in the second digital signal in each of the predetermined sampling periods

determining the difference between the first output rate and the second output rate; and

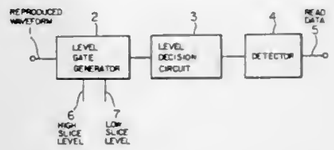
adjusting the duration of the sampling period in accordance with the determined difference to cause the reproduced analog audio signal to correspond with the PCM audio signal.

4,823,208

MULTI SLICE LEVEL SIGNAL CIRCUIT

Yasuhide Ouchi, Koganei; Hajime Aoi, Tachikawa; Nobomasa Nishiyama, Hachioji; Takashi Tamura, Odawara; Makoto Saitoh, Tokyo, and Reijiro Tsuchiya, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 21, 1987, Ser. No. 76,009
Claims priority, application Japan, Jul. 25, 1986, 61-173646
Int. Cl.[4] G11B *5/09, 20/10*
U.S. Cl. 360—46 **17 Claims**



1. A signal read out circuit included in a magnetic recording device, comprising:
- a level gate generator for producing a plurality of gate pulse signals from a reproduced waveform by using a redetermined number of slice levels, said reproduced waveform being obtained by reproducing information which is recorded on a recording medium, by a magnetic head;
- a level decision circuit for judging whether or not each portion of said reproduced waveform is correct, on the

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basis of said plural gate pulse signals delivered from said level gate generator; and

a detector for generating correct read data on the basis of the result of judgement of said level decision circuit;

wherein said level decision circuit judges that portion of said reproduced waveform which has a signal amplitude level exceeding a predetermined value, to be correct, and judges that portion of said reproduced waveform which has a signal amplitude level between said predetermined value and another predetermined value, to be correct only when said portion and a different portion spaced apart from said portion a distance of one both, are opposite in polarity to each other.

4,823,209

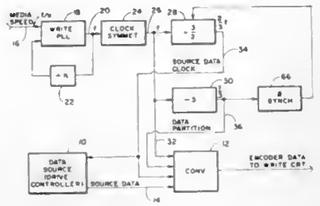
1,7,2,3 ENCODING/DECODING EMPLOYING 3/2 FREQUENCY DIVISION

Vadim B. Minuhin, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Nov. 5, 1987, Ser. No. 116,989

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—51 **5 Claims**



1. Apparatus for encoding or decoding data in a 1,7,2,3 code with a data transfer rate of 1/T, where T is the time interval of a source data bit cell, said apparatus comprising oscillator means responsive to the speed of a recording media on which encoded data is to be recorded to produce a media speed signal having a frequency f, or responsive to data to be decoded recovered from a recording media to produce a read signal having a frequency f; first divider means responsive to the signal produced by said oscillator means for producing a source data clock signal having a frequency equal to $\frac{3}{2}$ f and a clock period equal to T; second divider means responsive to the signal produced by said oscillator means for producing a data partition clock signal having a frequency equal to $\frac{1}{3}$ f and a clock period equal to 2T; converter means responsive to a source data signal and to said media speed signal and to said data partition clock signal and to said source data clock signal to encode said source data in 1,7,2,3 code, or responsive to separated data recovered from said media and to said read signal and to said data partition clock signal and to said source data clock signal to decode said separated data from 1,7,2,3 code; and phase synchronization means responsive to said data partition clock signal to synchronize operation of said first divide means.

4,823,210

COPY PROTECTED DISK

Charles R. Bond, Milpitas, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

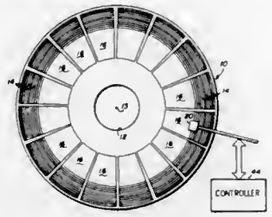
Filed Aug. 13, 1984, Ser. No. 639,733

Int. Cl.[4] G11B *15/04, 5/86, 19/04*

U.S. Cl. 360—60 **7 Claims**

1. In a copy protected magnetic storage disk having a magnetic recording layer including a plurality of record tracks suitable for recording information-bearing data accompanied by a clock signal comprising a sequence of uniformly spaced pulses having a signal strength comparable to the signal strength of the information-bearing data, the clock signal being represented on a magnetic recording layer of a magnetic disk by a series of transitions that occur at the frequency of the clock signal pulses, the improvement comprising:

(a) at least one of the record tracks including a control pattern of magnetic transitions, recorded at a predetermined location on the recording layer of the disk, representative of a code burst derived by temporarily changing the frequency of the pulses of the clock signal during a recording operation, the frequency of the transitions of the control pattern being beyond the frequency capability



of an associated playback device, to cause, in response to the playing back of the control pattern, random playback data to be produced which are dissimilar from one playback operation to the next playback operation;

(b) the recording layer including a plurality of radially arrayed sectors wherein the code burst follows a data sync gap in a predetermined recording track of one of said sectors; and

(c) a serial number is encoded about the predetermined recording track following the code burst.

4,823,211

ROTARY MAGNETIC TAPE TRANSDUCER HEADWHEEL STRUCTURE

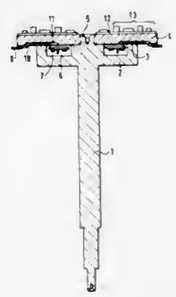
Axel Schulz, Bickenbach; Manfred Hescher, Weiterstadt, and Berthold Eiberger, Darmstadt, all of Fed. Rep. of Germany, assignors to Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

Filed Sep. 14, 1987, Ser. No. 96,857

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644502

Int. Cl.[4] G11B *15/14, 5/102, 5/52*

U.S. Cl. 360—64 **12 Claims**



1. Rotary headwheel structure (1), for recording and reproduction of signals on and from, respectively. a magnetic recording medium such as magnetic tape, having

a disk-like headwheel carrier (2) having an upper-face (3);

a disk-like headwheel (4) having a lower-face, secured to the upper-face of the headwheel carrier;

a plurality of recording/reproducing transducer heads (8) secured to the headwheel;

reproducing preamplifier means coupled to the transducer heads; and

an amplifier carrier plate (7) secured to the headwheel for rotation therewith and mechanically supporting said reproduction preamplifier means

and wherein, in accordance with the invention,

at least one of:

the upper-face of the headwheel carrier (2); the lower-face of the headwheel disk (4)

are formed with a recess defining an annular chamber (6) and

wherein at least part of the amplifier carrier plate (7) and the reproduction preamplifier means thereon is located in said chamber (6).

4,823,212

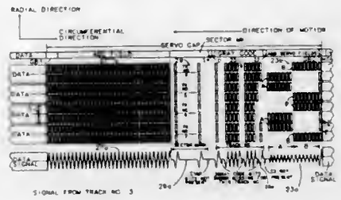
SAMPLED SERVO CODE FORMAT AND SYSTEM FOR A DISC DRIVE

Vernon L. Knowles, and Robert E. Kier, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 26, 1986, Ser. No. 935,663

Int. Cl.[4] G11B *5/58*

U.S. Cl. 360—77.08 **9 Claims**



1. In a magnetic disc drive, the improvement comprising:

a. a rotatable magnetic memory disc having a plurality of concentric circular tracks which are each divided into sectors, each sector being radially aligned with sectors in adjacent tracks, each sector having a servo gap which is radially aligned with servo gaps in adjacent tracks in that sector; and

b. an automatic gain control filed in each servo gap, having magnetic dibits which have a radial length less than one-half of the distance between the centers of adjacent tracks, disposed in uniformly circumferentially spaced positions, in radially spaced, end-to-end alignment with each other, in half-track positions on each side of the center of the tracks; whereby a magnetic head traversing the automatic gain control field, overlaps substantially the same amount of magnetic dibit, whether or not positioned at the center of a track.

4,823,213

RECORDING AND REPRODUCING DISC DRIVING APPARATUS

Toshimasa Naruki, Koriyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1987, Ser. No. 370,034

Claims priority, application Japan, Jan. 17, 1986, 61-7240; Jan. 17, 1986, 61-7241; Mar. 26, 1986, 61-67663; Mar. 26, 1986, 61-67664; Mar. 26, 1986, 61-67665; Mar. 26, 1986, 61-67666; Mar. 26, 1986, 61-67668; Mar. 26, 1987, 61-67667

Int. Cl.[4] G11B *5/016, 33/02*

U.S. Cl. 360—78.12 **10 Claims**

1. A recording and reproducing disc driving apparatus having a given rectangular outer configuration when viewed from above, said apparatus comprising:

(a) a sub-base having an outer configuration that forms said given rectangular configuration of the apparatus;

(b) a main base fixedly mounted on said sub-base, above a top surface of said sub-base;

(c) fastening means attaching said main base to said sub-base;

(d) a head disposed for opposition to a data recording and reproducing disc;

(e) a carriage mounted on said main base and supporting said head;

(f) a first motor, mounted on said main base, for driving said carriage to move said head to desired positions with respect to a disc;

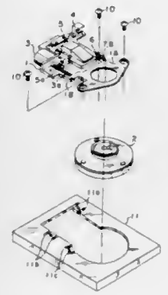
(g) a sensor, mounted on said main base, for detecting when said head is in a desired position; and

(h) a second motor for rotating the disc,

wherein:

(i) said main base has formed thereon a seat for receiving at least a portion of said second motor and a plurality of mounting openings for mounting said second motor and for mounting said main base on said sub-base;

(j) a projection of said main base on said subbase is formed by a perimeter of said main base and fitted within said outer configuration of said subbase;



(k) the area of said projection is smaller than the area formed by said top surface of said sub-base;

(l) said main base has at least one cut portion formed therein such that said perimeter of said main base passes substantially adjacent to said carriage, said first motor, said sensor, said seat, and said mounting openings;

(m) the area of said projection is substantially as small as possible for the mounting of said carriage, said first motor, and said sensor and for the provision of said seat and said mounting openings;

(n) said main base comprises a plurality of engaging portions at its outer periphery which are engageable with a plurality of said fastening means for connecting said main base to said sub-base;

(o) said at least one cut portion extends near said engaging portions;

(p) said sub-base comprises a further plurality of engaging portions; and

(q) said sub-base has slots formed therein near each of said engaging portions formed in said sub-base so that displacement in position of said engaging portions of said sub-base is allowed.

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4,823,214

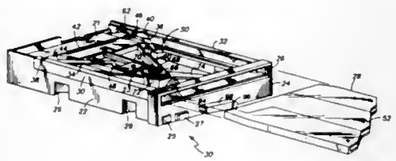
DISK DRIVE FOR CARTRIDGE DISKS

Marvin B. Davis, Colorado Springs, Colo., assignor to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Division of Ser. No. 777,814, Sep. 19, 1985. This application Nov. 19, 1987, Ser. No. 122,795

Int. Cl.[4] G11B *17/02, 15/18*

U.S. Cl. 360—97.01 **22 Claims**



1. Apparatus for driving a disk comprising:

disk drive having a frame;

receiving means in said frame for receiving a disk cartridge;

a disk cartridge having a first surface area, a disk therein and received in said receiving means;

drive means for driving said disk in said disk cartridge wherein said drive means includes a spindle movable between an engaged position for rotating said disk and a disengaged position in which said disk is not rotated by said spindle;

movable support means supporting at least said spindle, said movable support means and said spindle having a second surface area less than said first surface area; and

means for moving said movable support means wherein at least portions of said spindle are moved outside of said cartridge to arrive at said disengaged position while said cartridge is in a substantially stationary position and wherein at least portions of said spindle are moved towards said cartridge to arrive at said engaged position.

4,823,215

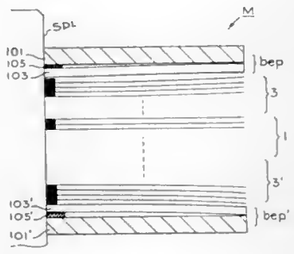
FLEXIBLE DISK PACK MODULE WITH IMPROVED DELTA-PAK STIFFENERS

Dean DeMoss, Camarillo; Harvey J. Richardson, Sepulveda, and Tom Narasaki, Camarillo, all of Calif., assignors to Unisys Corp., Detroit, Mich.

Filed Feb. 27, 1981, Ser. No. 238,741

Int. Cl.[4] G11B *25/04, 23/02*

U.S. Cl. 360—98.02 **1 Claim**



1. In combination with a pack of flexible record disks, the disks being stacked in concentric array to be co-rotated at a prescribed rotational velocity, the improvement thereof comprising:

a pair of floppy end-plates, each end-plate being disposed at a respective end of the pack and adapted to assume a semi-rigid "Delta" shape when co-rotated with the record stack at the said velocity;

each end-plate being formed of at least two stacks of like contiguous flexible disks, the stacks being separated by wedge spacer means, with the thickness and mass of the "outer" stack being determined according to the stiffness desired; and with the thickness and mass of the "inner" stack(s) being selected to cause it to bend smoothly toward the "outer" stack when so co-rotated.

4,823,216

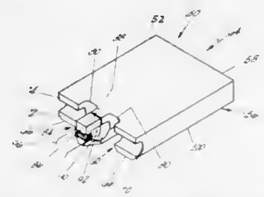
MICROMINIMONOLITHIC MAGNETIC HEAD SLIDER

Mehmet K. Atesmen, Goleta, and Warren D. Myers, II, Santa Barbara, both of Calif., assignors to Applied Magnetics Corporation, Goleta, Calif.

Filed Oct. 23, 1987, Ser. No. 112,895

Int. Cl.[4] G11B *5/60*

U.S. Cl. 360—103 **43 Claims**



1. A microminimonolithic slider adapter for use with a magnetic head flying on an air cushion over a moving magnetic media for recording and reproducing tracks of information, said slider comprising

means for defining an aerodynamic surface having a pair of spaced, parallel load rails which are adapted to fly over the moving magnetic media, said aerodynamic defining means further including means for defining an air bearing surface formed on each of said load rails having a width in a direction substantially normal to and which is greater than the track width of information on a magnetic media;

means for defining an the aerodynamic surface, and between said pair of spaced, parallel load rails, a central rail having an apex which defines an air bearing surface having a width in a direction substantially normal to the track of information on a magnetic media and which is less than the width of the air bearing surface on each of said load rails;

means for defining a trailing edge located rearward of said aerodynamic surface and for defining through the trailing edge a transverse slot which is spaced from and extends substantially perpendicular to said pair of spaced, parallel load rails and said central rail, said transverse slot including means for defining a magnetic pole piece contiguous the central rail and the air bearing surface formed on the apex thereof; and

means for defining in the trailing edge of said slider and through the transverse slot a pair of spaced, parallel, vertically extending slots which are substantially normal to said transverse slot, said vertically extending slots being positioned with said central rail located therebetween.

4,823,217

CIRCUITING DEVICE

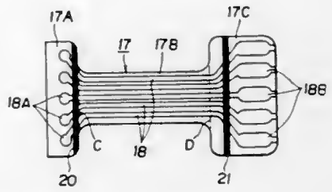
Minoru Kato, and Yutaka Hayashi, both of Chichibu, Japan, assignors to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Continuation of Ser. No. 748,952, Jun. 26, 1985, abandoned. This application Aug. 27, 1987, Ser. No. 91,302

Claims priority, application Japan, Jul. 5, 1984, 59-138012

Int. Cl.[4] G11B *5/48;* **H05K** *1/00*

U.S. Cl. 360—104 **8 Claims**



1. A circuiting device comprising:

a flexible base member including at least one end portion having a first width, a second portion adjacent said at least one end portion having a second width, and electrical insulating properties, said first width being greater than said second width;

an electrical wiring portion disposed on at least one surface of said base member;

at least one connecting portion disposed on said at least one end portion having said first width and on at least one end of said electrical wiring portion for connecting electrically said electrical wiring portion to an external circuit, said electrical wiring portion being movable relative to said at least one connecting portion; and

at least one insulating protective film disposed on said at least one end portion having said first width and in a direction intersecting said electrical wiring portion, said at least one insulating protective film having the shape of a stripe and covering only a portion of said electrical wiring portion having a specified width in the direction from said connecting portion to said electrical wiring portion, said at least one insulating protective film being adjacent to an area for making an electrical connection with said external circuit, whereby a connecting material comprising said connecting portion is prevented from flowing from said connecting portion to said second portion.

4,823,218

BALANCE COMPENSATED ROTARY MAGNETIC HEAD DEVICE

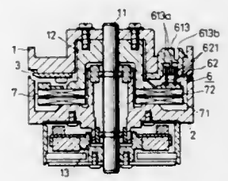
Makoto Ibe, and Masanori Kochi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,573

Claims priority, application Japan, Sep. 3, 1986, 61-205991

Int. Cl.[4] G11B *5/02, 5/52*

U.S. Cl. 360—104 **9 Claims**



1. A rotary magnetic head device comprising a fixed cylinder and a rotary cylinder coaxial with said fixed cylinder and rotatable about an axis, said fixed cylinder and said rotary cylinder having a tape guide face on the outer peripheries thereof for enabling running of a tape thereon, at least one magnetic head installed on said rotary cylinder, a first conductive member electrically connected with at least one reading and/or writing coil of said at least one magnetic head, a head connector installed on said rotary cylinder and having a second conductive member electrically connected to said first conductive member, and at least one unbalance compensating weight mounted on said head connector for enabling said at least one magnetic head and said head connector to be balanced with respect to the axis of said rotary cylinder when said head connector is installed on said rotary cylinder.

4,823,219

CARRIAGE RECORDING HEAD SANDWICHED BY ELECTROMAGNETIC COIL SECTIONS

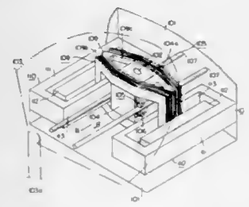
Takaharu Ueda; Takashi Yumura; Tetsu Yamamoto, and Kiyosi Funai, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 27, 1987, Ser. No. 54,778

Claims priority, application Japan, May 27, 1986, 61-120076

Int. Cl.[4] G11B *5/55, 21/08*

U.S. Cl. 360—106 **7 Claims**



1. A carriage assembly for disc operating apparatus, said carriage assembly comprising:

a frame;

a carriage movably supported by said frame;

recording head means carried by said carriage for recording and reproducing information on the disc;

radial guide means for supporting said carriage for movement in a radial direction relative to the disc to position said recording head means to a desired radial location relative to the disc; and

radial drive means, including an electromagnetic coil mounted to said carriage and a permanent magnet mounted to said frame and electromagnetically coupled with said electromagnetic coil, for driving said carriage in the radial direction;

said electromagnetic coil including two sections which are mounted to opposite ends of said carriage in the radial direction of the disc and which are symmetrical, said coil sections being separated at central portions, said carriage being sandwiched between said coil section central portions and said coil sections being closer together at both lateral sides thereof than at said central portions, said coil sections being wound between said lateral sides around said radial guide means.

4,823,220

DETECTOR FOR MAGNETOOPTIC RECORDERS

Thomas D. Milster, and Shingshwang Yao, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1987, Ser. No. 121,209

Int. Cl.[4] G11B *5/127*

U.S. Cl. 369—13 **15 Claims**

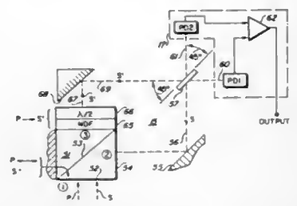
1. In apparatus for reproducing information carried in a

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modulated light beam wherein the modulation of the light beam consists of a plurality of linear light polarization rotations and having P and S components; the improvement including, in combination:

first optical means for supplying the light beam having said P and S components subjected to polarization rotation for carrying information;

a P and S component to intensity optical beam convertor



means in optical communication with the first optical means for receiving the P and S modulated light beam having both said P and S components and converting same into an intensity-modulated light beam wherein the intensity modulation carries said information; and

a photodetector means in optical communication with the convertor means for receiving the intensity-modulated beam and converting same into a modulated electrical signal carrying said information.

4,823,221

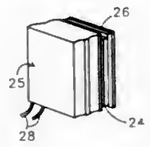
MAGNETIC HEAD WITH PLANAR INTERFACE POSITION REGISTRATION MEANS

Charles H. McCoaica, Windsor; Arthur Miksch, Loveland, and Mark E. Wanger, Ft. Collins, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 864,164, May 16, 1986, Pat. No. 4,750,069. This application Mar. 2, 1988, Ser. No. 163,039

Int. Cl.[4] G11B *5/48*

U.S. Cl. 360—125 **7 Claims**



1. A magnetic head of the type comprising a plurality of sandwiched members, a planar interface being defined by an abutting surface of a selected one of said plurality of sandwiched members, wherein said magnetic head includes access means therein cooperating with an alignment fixture to permit direct access to said planar interface by said alignment fixture in a manner such that said planar interface may be positioned in a precise, predetermined alignment attitude, with said plurality of sandwiched members of said magnetic head comprising at least one I-block and one C-block, and wherein said planar interface is defined by an abutting surface of said I-block.

4,823,222

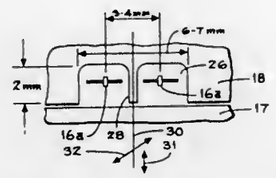
WEBBED SCANNER WINDOW

Steven L. Magnusson, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 29, 1987, Ser. No. 114,936

Int. Cl.[4] G11B *21/06, 15/61*

U.S. Cl. 360—130.24 **8 Claims**



1. A head assembly for a tape transport including a guide drum, a scanner body mounted on the guide drum so as to be freely rotatable, said scanner body having an outer diameter which is generally equivalent to that of said guide drum, a guide element on an outer surface of the drum to define a tape path for moving the tape around the scanner body, an opening in the surface of the scanner body disposed in the tape path, a pair of magnetic read/write heads, each disposed in the opening, with each head having a tip end, each head so mounted in the scanner opening as to protrude the tip end thereof slightly outward of the scanner body and above the outer surface thereof, to contact and move across the tape for read/write operations as the scanner drum rotates while the tape is guided in the specified path around the scanner body, and a member attached to the scanner body and extending into the opening in the surface of the scanner body to be disposed between the two tip ends and to support the tape at the scanner opening and between the two head tips as it moves around the tape path.

4,823,223

MECHANISM FOR LOCKING TAPE REEL IN MAGNETIC TAPE CASSETTE

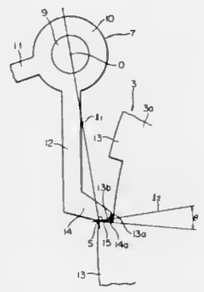
Kimimoto Hirose, and Yasuhiro Hasegawa, both of Tamako, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,677

Claims priority, application Japan, Apr. 21, 1987, 62-60297[U]

Int. Cl.[4] G11B *15/32, 23/02*

U.S. Cl. 360—132 **1 Claim**



1. A device for locking a tape reel in a magnetic tape cassette comprising;

a tape reel having a groove serrated on a circumferential surface thereof,

a reel locking lever being pivotally supported around a shaft

fixed in the cassette, thereby said reel locking lever taking at least two positions in which one of the positions is a lock position and the other is a release position,

said reel locking lever having a claw portion capable of coming in engagement with the groove, said claw portion forming an engaging point with an upper part of the groove on the lock position, and

said claw portion having a sliding surface, extending from the engaging point to the bottom part of the groove,

said sliding surface being arranged at angles from 0 to 14 deg to a cross line perpendicular at the engaging point to a line connecting between the engaging point and the center of the shaft, the angles locating at a side of the cross line opposite to the shaft.

4,823,224

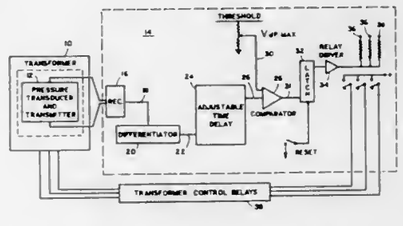
RAPID PRESSURE RISE CIRCUIT

Richard E. Hagerman, Penfield, and Joseph F. Foster, Fairport, both of N.Y., assignors to Qualitrol Corporation, Fairport, N.Y.

Filed Jan. 21, 1988, Ser. No. 146,376

Int. Cl.[4] H02H *7/04*

U.S. Cl. 361—37 **5 Claims**



3. Apparatus for controlling the power to an electric power transformer having a liquid filled tank comprising,

means for measuring the pressure in the transformer tank,

means for generating an electrical signal proportional to the pressure measured,

means for differentiating the signal proportional to the pressure measured to generate a signal proportional to the rate of change of transformer tank pressure,

means for providing a field adjustable time delay of the rate of change signal to generate a time response signal,

means for generating a maximum rate of change signal,

means for comparing the time response signal with the maximum rate of change signal, to generate a shut-off signal when the said time response signal exceeds the maximum rate of change signal,

latch circuit means to retain the comparator status and shut-off signal until reset or until power is removed,

relay driver means responsive to the shut-off signal, and

output relay means responsive to the relay driver to control current to the transformer windings.

4,823,225

BIPOLAR IMMERSION DETECTION CIRCUIT INTERRUPTER

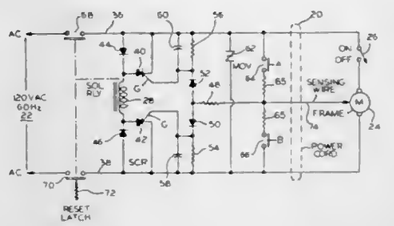
Robert W. Foster, Hinsdale, and Donald J. Kempiak, Palatine, both of Ill., assignors to Associated Mills Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 86,904, Aug. 18, 1987, abandoned. This application Jan. 6, 1988, Ser. No. 141,928

Int. Cl.[4] H02H *3/16*

U.S. Cl. 361—42 **17 Claims**

1. An immersion detector comprising at least a pair of input terminals to which an electrical power source is to be applied, an appliance having a sensing potential point which may become energized if said appliance becomes immersed in a body of water, a power cord including at least a pair of wires, each of said wires extending from said terminals through a normally conducting switch to said appliance, sensing conductor means extending from said sensing potential point to a power cut off circuit, said power cut off circuit comprising a pair of electronic switch means; diode means for isolating said electronic switch means to provide a steering circuit so that the electronic switch means associated with a hot side of said two wires operates responsive to a potential on said sensing conductor



means, each of said electronic switch means having a control electrode coupled to said sensing conductor means, means responsive to said potential point becoming energized for operating one of said electronic switch means via said sensing conductor means, and circuit breaking means responsive to said operating of said electronic switch means for making said normally conducting switches non-conducting in order to break said pair of wires.

4,823,226

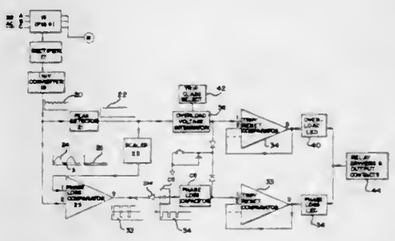
PHASE LOSS DETECTION CIRCUIT INCLUDING TRANSIENT PROTECTION

Ryan T. Reed, Waterford, and Earl J. Carran, Jr., South Milwaukee, both of Wis., assignors to Square D Company, Palatine, Ill.

Filed Sep. 17, 1987, Ser. No. 98,101

Int. Cl.[4] H02H *3/00*

U.S. Cl. 361—85 **7 Claims**



1. A phase loss detection circuit for a three phase electrical system providing three phase power as to a motor, the three phase electrical system being subject to a phase loss condition and a transient condition, said transient condition including starting transients, stopping transients or severe load transients, said phase loss detection circuit for distinguishing between a phase loss condition and said transient condition and indicating when said loss of phase has occurred comprising:

means for detecting an instantaneous voltage of said electrical system;

means for generating an instantaneous voltage signal representing said instantaneous detected voltage;

means for detecting a peak detected voltage of said electrical system;

means for generating a peak detected voltage signal representing said peak detected voltage;

means for comparing said peak detected voltage with said instantaneous voltage and generating a compared signal,

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said compared signal comprising a first polarity during steady state operation, a second, opposite polarity during said transient condition and an alternating polarity during said phase loss condition; and

means for detecting said alternating polarity compared signal, thereby indicating said phase loss condition.

4,823,227

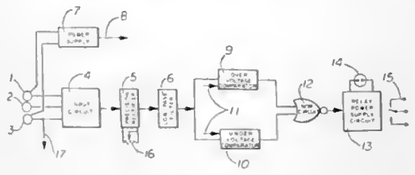
THREE-PHASE MONITOR CIRCUITRY

James E. Grant, Orlando, Fla., assignor to Sta-Con, Inc., Apopka, Fla.

Continuation of Ser. No. 776,509, Sep. 16, 1985, abandoned. This application Oct. 21, 1987, Ser. No. 111,130

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—90 **6 Claims**



1. A three-phase monitoring device monitoring phase sequence and voltage amlpitude to protect equipment using three-phase AC voltage, which comprises:

an input circuit means comprising three input lines, phase A, phase B and phase C, in which a voltage of phase A passes through two resistor to join together with a voltage of phase B as the voltage of phase B passes through a capacitor, said capacitor having a certain value to result in the voltage of phase B being shifted to be in phase with the voltage of phase A, a voltage of phase C being the ground potential to which the summation of the voltages of phases A and B are referenced, said summation of the voltages being further divided lower in amplitude prior to being rectified and being proportional to the three-phase AC voltage;

a means of converting the three-phase AC voltage to rectified direct current (DC) voltage;

a means for filtering the rectified DC voltage to yield a filtered receified DC voltage;

a means for comparing the filtered rectified DC voltage to two DC reference voltages;

a means for disconnecting the three-phase AC voltage from the equipment using the three-phase voltage if the filtered rectified DC voltage is not within predetermined limits set by the two DC reference voltages and an output circuit that uses the voltage of phase A to energize an output load relay in a switching manner that requires low power dissipation; and a means for supplying a low dissipation power source using the voltage of phase A, the output of said source from which is a voltage potential used to operate the monitoring circuitry, as well as providing a stable reference voltage.

4,823,228

RF HARMONIC MONITOR FOR DETECTING POTENTIAL LIGHTNING STRIKES BY INDUCED CORONA

Burt J. Bittner, Palm Bay, Fla., assignor to Harris Corp., Melbourne, Fla.

Filed Feb. 8, 1988, Ser. No. 152,946

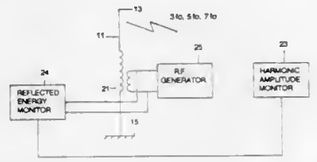
Int. Cl.[4] G01R *29/12, 31/02;* **H01G** *1/08;* **H05F** *3/00*

U.S. Cl. 361—218 **18 Claims**

1. A method of detecting the onset of an electrostatic discharge condition comprising the steps of:

(a) radiating, from a conductive element, an electromagnetic wave;

(b) monitoring a characteristic of at least one harmonic component of the electromagnetic wave radiated from said conductive element; and



(c) in response to a modification of said characteristic of said at least one harmonic component of said radiated electromagnetic wave caused by an electrostatic condition-induced corona, generating an output signal representative of the onset of said condition.

4,823,229

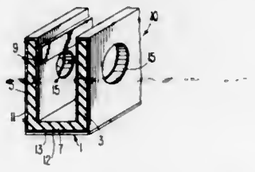
CANOPY DRYSEAL

Alfred F. Waterland III, 40 Plum Point Rd., Elkton, Md. 21921

Filed Aug. 13, 1987, Ser. No. 85,514

Int. Cl.[4] B64C *1/14;* **F16J** *15/10;* **H05F** *1/00*

U.S. Cl. 361—218 **7 Claims**



1. A canopy seal for use between an aircraft canopy and its framework comprising: resilient compressible core having at least one vertical leg with an inner and outer edge and with a row of apertures cut into said leg; a horizontal base member interconnected with the vertical leg to form an L-shaped channel; a second vertical member attached to the horizontal base member; and a low density polymeric stress intensifier bonded to the inner edge of the vertical leg, said core and intensifier strip being partially encapsulated by electrically conductive polymeric tape.

4,823,230

PRESSURE TRANSDUCER

Jerome J. Tiemann, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 4, 1988, Ser. No. 164,300

Int. Cl.[4] G01L *9/12;* **H01G** *7/00*

U.S. Cl. 361—283 **20 Claims**

1. A pressure-to-capacitance transducer, comprising:

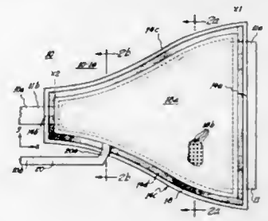
a substrate having a surface;

a first electrode formed of a conductive material upon said substrate surface and having a preselected shape;

a layer of an insulative material covering at least those surfaces of said first electrode not in abutment with said substrate;

a support wall of an insulative material extending above said substrate surface and having a periphery, completely enclosing the active area of said transducer, with a base joined to one of said insulative layer and said substrate in a pressure-tight manner and having a top portion opposite to the base portion; and

a second electrode joined to the support wall top portion completely around the wall periphery and hermetically enclosing a cavity, defined between facing interior surfaces of said wall and said first and second electrodes, of a generally trapezoidal geometry in a plane substantially parallel to said surface and having a first portion wider than a second opposed portion thereof, said second electrode being formed of a conductive material thin film which deflects toward said first electrode with relatively



high sensitivity in said first portion and relatively low sensitivity in said second portion responsive to relatively low pressure, and with relatively low sensitivity in said first portion and relatively high sensitivity in said second portion responsive to relatively high pressure, applied to that surface of said second electrode opposed to said cavity, with monotonically increasing electrical capacitance, between said first and second electrodes, for increasing applied pressures greater than a reference pressure in said cavity.

4,823,231

CURRENT TAPPING DEVICE DISCONNECTABLE FROM AN OMNIBUS BAR DISTRIBUTION COLUMN

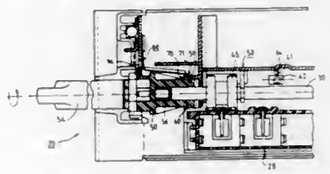
Gérard Jego, Brazey en Plaine; Guy Lacan, le Mesnil le Roi Maisons Laffitte; Jean-Pierre Thierry, Couternon, and Serge Verdenne, Marcilly sur Tille, all of France, assignors to La Telemecanique Electrique, France

Filed Jan. 22, 1987, Ser. No. 6,828

Claims priority, application France, Jan. 22, 1986, 86 00842

Int. Cl.[4] H02B *1/20*

U.S. Cl. 361—331 **11 Claims**



1. In a current tapping device disconnectable from a distribution column with parallel non coplanar omnibus bars, having:

a fixed part with means for electric connection to at least one switch apparatus, as well as at least one pre-break microcontact which is actuated by control means, said or each switch apparatus occupying a tripped position in response to the actuation of the or each microcontact;

a part movable in translation including a slide which carries clips engageable on the bars and disengageable therefrom, the translational movement of the slide being produced so as to provide current tapping and respectively disconnection;

means controlling the disconnection including a rotary shaft whose rotation controls the translational movement of the slide through a movement transformation member, and a rotary plug driving the shaft which is mounted for translation on the shaft while being urged by a return spring, the plug being actuated by a control member;

said means controlling the pre-break include a transmission piece movable in translation while being urged by another return spring and having at least one ramp driving a member actuating the respective microcontact, the transmission piece occupying, in the engaged position, a first rest position in which said or each switch apparatus is engaged and said transmission piece also includes a spur in the form of a hook engageable, for the engaged position, in an annular groove formed in the external periphery of the plug at one of its ends so as to allow, in this engaged position, the translational movement both of the plug along the axis of the shaft under the action of a pressure force exerted thereon by the control member and of the transmission piece from its rest position whose ramp or ramps, during this movement, urge the member actuating the respective microcontact so as to cause tripping of the respective switch apparatus, the control of the disconnection by rotation of the shaft taking place at the end of the movement of the plug-transmission piece assembly and by maintaining the pressure force, the spur being in sliding abutment in the groove of the plug during control of the disconnection.

4,823,232

HIGH-VOLTAGE COMPRESSED-GAS CIRCUIT BREAKER

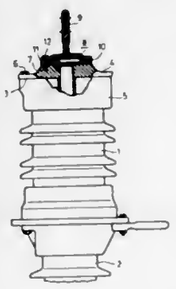
Heiner Marin, and Dieter Noack, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,764

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 8704828[U]

Int. Cl.[4] H02B *5/00, 7/00;* **H02G** *15/02*

U.S. Cl. 361—335 **4 Claims**



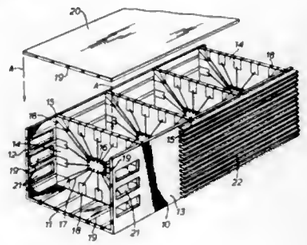
1. A high-voltage compressed-gas circuit breaker, comprising:

at least one interrupter unit which is sealed off at its outer end faces by terminal plates, said terminal plates having contact faces for attachment by cables, at least one said contact face being a part separable from said terminal plate; and

bores in said part and in said terminal plate for receiving means for attaching said part to said terminal plate, said bores in said terminal plate arranged so as to prevent impairment of sealing of an interior of said interrupter unit, wherein distribution of said bores in said terminal plate and said bores in said part is such as to permit said contact face to be attached to said terminal plate in at least one of a first position and a second position which is rotated by 90° from said first position.

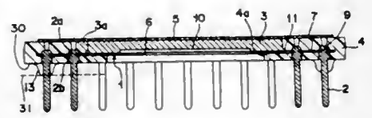
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4,823,233
CIRCUIT ASSEMBLY
David F. Brown, Thorplands, and Michael J. Anstey, Wokingham, both of England, assignors to Dowty Electronic Components Limited, Buckinghamshire, England
Continuation of Ser. No. 346,539, Feb. 8, 1982, Pat. No. 4,582,898. This application Dec. 24, 1984, Ser. No. 686,310
Claims priority, application United Kingdom, Feb. 10, 1981, 8103954; Nov. 3, 1981, 8133177; Nov. 24, 1981, 8135415; Feb. 1, 1982, 8202829
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—383 5 Claims



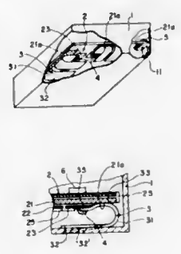
1. An electrical circuit assembly, comprising:
a plurality of substantially identically-shaped electrical component carrier members each having a pre-determined plurality of electrical contacts arranged along its periphery and each being similarly sized and each carrying a respective single electrical component which is electrically connected directly to at least some of the said contacts; and
a mounting structure supporting said members in predetermined stacked relationship;
the mounting structure including wall portions made of relatively flexible material and a plurality of longitudinal conductive members extending along the stack and mounted on the wall portions, said wall portions including slots therein into which said conductive members extend and which are configured to accept the peripheries of said carrier members, whereby the conductive members in said slots electrically engage the contacts on the said carrier members, at least some of the conductive members each making common electrical contact with said contacts on different ones of said carrier members, whereby the mounting structure provides electrical connection between such different ones of said carrier members.

4,823,234
SEMICONDUCTOR DEVICE AND ITS MANUFACTURE
Akira Koaishi, and Teruo Wakano, both of Kyoto, Japan, assignors to Dai-Ichi Seiko Co., Ltd., Japan
Filed Jul. 1, 1986, Ser. No. 880,832
Claims priority, application Japan, Aug. 16, 1985, 60-180901; Aug. 16, 1985, 60-180902; Dec. 19, 1985, 60-287346
Int. Cl.[4] H02B 1/00
U.S. Cl. 361—386 39 Claims



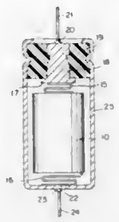
1. A carrier for semiconductor device, comprising;
a plug-in type package having one or more semiconductor chips packaged therein;
said plug-in type package comprising a flexible printed wiring substrate, electrically conductive terminals attached to said substrate, a heat sink for semiconductor attachment, and a surrounding package body,
said substrate comprising an insulating film or this sheet with an opening and a plurality of through holes for terminal attachment, and printed wirings of conductor patterns formed on one or both sides of said insulating film or thin sheet;
said terminals each having a collar portion, and each being inserted at its head portion into a respective through hole of the substrate so that said collar is in contact with said substrate, said terminals being electrically connected at said head or collar portions to the respective conductor patterns on the substrate;
said heat sink being fixedly attached to said substrate so as to close the opening of said substrate, and
said substrate, head and collar portions of said terminals and said heat sink being encapsulated in said package body so that one surface of said heat sink is exposed from one side of the package body.

4,823,235
EARTH CONNECTION DEVICE IN METAL CORE PRINTED CIRCUIT BOARD
Mitsuaki Suzaki, Tokyo; Katsuyuki Arai, Kawasaki; Yasushi Kojima; Mitsusada Toyama, both of Yokohama; Jun Sakiura, Tokyo; Hisao Hayashi, Yokohama, and Hiroshi Yamaji, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
PCT No. PCT/JP87/00078, § 371 Date Oct. 6, 1987, § 102(e) Date Oct. 6, 1987, PCT Pub. No. WO87/04892, PCT Pub. Date Aug. 13, 1987
PCT Filed Feb. 6, 1987, Ser. No. 110,696
Claims priority, application Japan, Feb. 6, 1986, 61-025154
Int. Cl.[4] H05K 9/00
U.S. Cl. 361—424 10 Claims



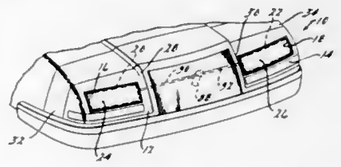
1. A device for providing an earth connection in a printed circuit board and which said board has a metal core and an earth pattern, said device comprising:
a conductive shield casing; and
at least one conductive connecting member which is soldered to the earth pattern and which said connecting member is in surface contact with the metal core and comes into surface contact with the conductive shield casing when the printed circuit board is assembled in the conductive shield casing.

4,823,236
HIGH TEMPERATURE ALUMINUM ELECTROLYTIC CAPACITOR
E. James Fresia, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.
Filed May 23, 1988, Ser. No. 201,000
Int. Cl.[4] H01G 9/02
U.S. Cl. 361—506 3 Claims



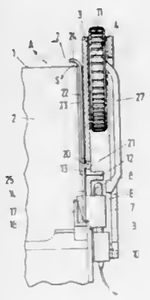
1. A high temperature aluminum electrolytic capacitor comprises a wound-foil capacitor section containing an electrolyte solution having a room temperature resistivity range of 300 to 400 ohm-cm, said solution comprising 10 to 32 wt% diethylammonium fumarate, 4 to 7 wt% water, 0.1 to 0.5 wt% ammonium dihydrogen phosphate, 10 to 30 wt% N-methylpyrrolidinone, and up to 60 wt% ethylene glycol.

4,823,237
HEADLIGHT DOOR ACTUATING MECHANISM
John Horansky, Sterling Heights; John H. Schult, Jr., Royal Oak, and Henry J. Kessler, St. Clair Shores, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed Aug. 4, 1988, Ser. No. 228,084
Int. Cl.[4] B60Q 1/00
U.S. Cl. 362—64 5 Claims



1. In a vehicle provided with front end body panel structure defining a pair of openings, a pair of headlights recessed in the openings, each opening being closed by a pivotable door when the headlights are turned off, the doors being pivotable to an open position when the headlights are turned on, the body panel structure including two sections each of which is angled rearwardly and outwardly from a point inboard of the outboard sides of the vehicle, one of the openings being provided in each of the sections, each opening and each door being configured in the general shape of a non-right angle parallelogram including non-vertical side edges which appear to be vertical when viewed from the front of the vehicle, the improvement comprising a door actuating mechanism for each door, each door actuating mechanism including inboard and outboard bracket structure extending rearwardly from each respective side edge of the door, a pivot shaft fixedly secured to the vehicle, the outboard bracket structure being pivotally and slidably mounted on the pivot shaft, the inboard bracket structure comprising first and second portions, the first portion being fixedly attached to the door, hinge means pivotally attaching the second portion to the first portion, the pivot axis of the hinge means being at substantially right angles to the longitudinal axis of the pivot shaft, a crank shaft fixedly attached to said second portion, the longitudinal axis of the crank shaft being angled downwardly with respect to the longitudinal axis of the pivot shaft in a vertical plane and angled forwardly with respect thereto in a horizontal plane, and drive means connected to the crankshaft for selectively rotating the crankshaft to open or close the door in a vertical direction with the door simultaneously
a pivoting and sliding sideways on the pivot shaft to prevent engagement of the door with the side edges of the opening in the body panel structure during opening and closing of the door, the sideways sliding or the pivot shaft being accompanied by pivoting of the first portion of the inboard bracket structure with respect to the second portion via said hinge means.

4,823,238
AIR OUTLET DEVICE
Karl-Heinz Bauer, and Gerold Eckert, both of Bad Neustadt/Saale, Fed. Rep. of Germany, assignors to Preh, Elektrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany
Filed May 6, 1988, Ser. No. 191,002
Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715145
Int. Cl.[4] B60Q 3/02; F21V 33/00
U.S. Cl. 362—74 9 Claims



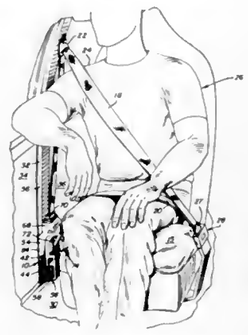
1. An air outlet device comprising an air outlet channel which has an open front and is located near an actuating part for the operation of a closing flap, and wherein behind the actuating part an acceptance chamber for a plug base of a lamp is located for conducting light to the actuating part, wherein the acceptance chamber is provided with a passage opening to the air outlet channel, the plug base is provided with a guide bead which, in the operating position, extends through the passage opening into the air outlet channel and ends as a handle at the front of the air outlet channel, and wherein by means of the guide bead the plug base can be pulled through the air outlet channel and the passage opening out of the acceptance chamber and then reintroduced into the acceptance chamber.

4,823,239
SEAT RETRACTOR WITH LIGHTING MEANS
Gerald A. Doty, Crown Point, Ind., assignor to Gateway Industries, Inc., Hazel Crest, Ill.
Filed Jul. 7, 1983, Ser. No. 512,009
Int. Cl.[4] B60Q 3/02
U.S. Cl. 362—75 5 Claims

1. A combination seat belt retractor and light assembly to be mounted in a vehicle van adjacent a support pillar between forward and rearward doorways for illuminating the floor and step adjacent the doorways, the retractor assembly comprising:
a frame,

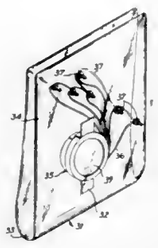
VOL 1101 ISS 3 APR 18 1989 UMI

a pair of reels mounted rotatably on the frame,
a lap belt and shoulder belt, each having one end attached to one of the reels,
biasing means for each reel for imparting torsion thereto so as to rotate the respective reels and wind the respective belts therearound,
a housing having a forward wall adjacent the forward side of the support pillar, a rearward wall adjacent the rearward side of the support pillar, a side wall extending between the forward and rearward walls, and a top wall adjacent



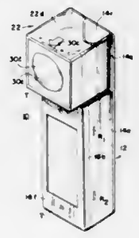
the pillar and integrally connected to the forward, rearward, and side walls, the housing having openings to accommodate the lap belt and shoulder belt respectively, means on the housing guiding the belts into and from their respective reels,
forward lighting means mounted on the forward wall for illuminating the vehicle interior adjacent the forward doorway, and
rearward lighting means mounted on the rearward wall of the housing for illuminating the interior of the vehicle and the step and floor adjacent the rearward doorway.

4,823,240
AUDIO-VISUAL ASSEMBLY FOR ARTICLES OF CLOTHING
Nathan Shenker, 962 E. 13th St., Brooklyn, N.Y. 11230
Filed Sep. 1, 1987, Ser. No. 91,715
Int. Cl.[4] F21L *15/08*
U.S. Cl. 362—103 **20 Claims**



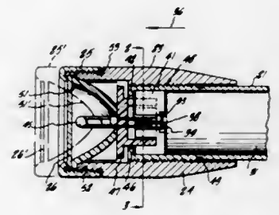
1. A clothing display assembly comprising:
a garment having an inner surface and an outer surface;
at least one means for emitting light removably connected to said garment and positioned at least partially along the outside surface thereof at a location visible during the wearing of said garment;
an audio means for producing a sound sequence removably positioned on the inside surface of said garment at a location not visible during ordinary wearing of said garment; and
means for simultaneously activating said at least one light emitting means and said audio means.

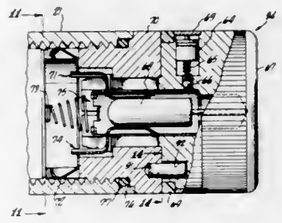
4,823,241
PORTABLE SOLAR CHARGED OPERATED LAMP HAVING ORIENTATION SWITCH FOR SELECTIVELY ENERGIZING LAMP BASED UPON ITS PHYSICAL ORIENTATION
Burton Trattner, Ringwood, N.J., assignor to Harvey-Westbury Corp., Westbury, N.Y.
Filed Sep. 21, 1987, Ser. No. 98,964
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—183 **7 Claims**



1. A lamp unit comprising a hollow housing;
a battery compartment in said housing containing a portable battery source;
a lamp compartment in said housing and orientation sensitive switch means for selectively electrically coupling said lamp to said battery source when said housing is in a first orientation and for electrically decoupling said lamp from said battery source when said housing is in a second orientation;
means for substantially permanently affixing said housing to a normally movable lid member such as a chest, truck or hatchback lid adapted as a closure for a storage region;
said housing being affixed to the interior surface of said lid whereby said orientation sensitive switch is in the open position when the lid is in its closed position and whereby the orientation sensitive switch is in the closed position when said lid is in its open position;
said housing being provided with a solar cell compartment housing a solar cell;
said housing having a light transmissive lens portion to permit light rays to reach said solar cell;
said solar cell being electrically connected to said battery source when said solar cell is energized by light rays;
said lid being provided with a light transmissive member or window;
said lens portion of said housing being positioned to engage the interior surface of said window to facilitate the passage of light through said window and said lens to activate said solar cell, typically during daylight hours.

4,823,242
DOUBLE SWITCH MINIATURE FLASHLIGHT
Anthony Maglica, Ontario; Ralph E. Johnson, Los Alamitos, and Armis L. Lewis, Cucamonga, all of Calif., assignors to Mag Instrument, Inc., Ontario, Calif.
Division of Ser. No. 111,538, Oct. 23, 1987, which is a continuation-in-part of Ser. No. 34,918, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 828,729, Feb. 11, 1986, Pat. No. 4,658,336, which is a continuation of Ser. No. 648,032, Sep. 6, 1984, Pat. No. 4,577,263. This application Jul. 6, 1988, Ser. No. 215,725
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—187 **12 Claims**

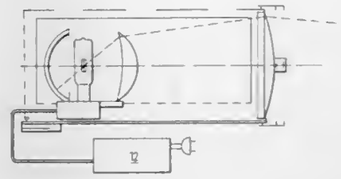




1. A flashlight comprising:
battery retaining means;
a lamp bulb;
means for holding the lamp bulb
a substantially parabolic reflector;
a substantially planar lens;
means for retaining the reflector and the lens at one end of said battery retaining means;
first switch means for switching the flashlight on or off and for changing the focus of the flashlight by rotation of the means for retaining the reflector and the lens; and
a tailcap including a second switch means for switching the flashlight on or off by rotation of the tailcap through a predetermined angle when said flashlight is placed in its on position by said first switch means.

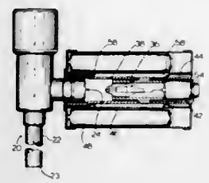
4,823,243
MINIATURE SPOTLIGHT WITH EXTREMELY VARIABLE EXIT ANGLE AND CONSTANT EVEN FIELD OF ILLUMINATION
Dedo Weigert, Munich, Fed. Rep. of Germany, assignor to Dedotec optronische und mechanische Systeme GmbH, Fed. Rep. of Germany
Filed Aug. 26, 1987, Ser. No. 89,548
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1986, 3628875
Int. Cl.[4] F21V *13/02*
U.S. Cl. 362—281 **4 Claims**

1. A miniature spotlight for producing a uniform beam for use in illuminating small parts of a stage at close distances, said spotlight having an extremely extended and variable optical exit angle from 2° to 120°, said spotlight comprising:
a housing having an inner and an outer jacket and a base plate;
an exchangeable field lens removably attached to the front exit side of said housing;
a movable slide mounted on said base plate within said housing;



an optical assembly mounted on said slide, said optical assembly including a front aspheric meniscus lens, a rear dichoric reflector and a low voltage filament bulb disposed between said meniscus lens and said reflector, said meniscus lens being movable on said slide relative to said bulb and said optical assembly being movable relative to said field lens.

4,823,244
LIGHT SOURCE ASSEMBLY
Erdem Alaybayoglu, Etobicoke; Ian D. Anderson, Fonthill, and Robert J. Griffin, Richmond Hill, all of Canada, assignors to Niagara Medical Innovations Inc., Woodbridge, Canada
Filed Jan. 29, 1988, Ser. No. 150,336
Int. Cl.[4] F21L *11/00*
U.S. Cl. 362—194 **20 Claims**



1. Light source assembly for instrument which instrument provides a glass fibre path to conduct light from a tip-remote to a tip-adjacent location, comprising:
a holder for mounting a lamp defining a radiation path for said source,
means for coupling said holder to said instrument designed to direct said radiation path onto the fibres at the tip remote location,
a frame including at least one battery,
said frame and holder being designed for sliding assembly and disassembly,
means responsive to said assembly to connect said at least one battery to said light source.

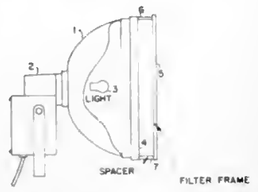
VOL 1101 ISS 3 AP 18 1989 UMI

4,823,245

MEANS FOR ADDING COLORS TO ELECTRIC LIGHTS

Robert Leverte, Elmont, N.Y., assignor to The Douglas Leigh Organization, New York, N.Y.

Filed Apr. 14, 1988, Ser. No. 182,197
Int. Cl.[4] F21V 9/00
U.S. Cl. 362—293 **2 Claims**



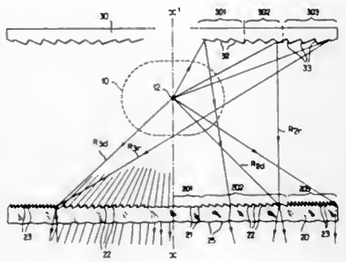
1. Apparatus for adding color to electric lights of the type having a bulb mounted in a hollow member having an open end comprising:
- a frame mounted over the open end,
- a translucent color sheet removably mounted in said frame
- a first clear sheet mounted on one side of the color sheet, a second clear sheet mounted on the other side of said color sheet whereby the color may be changed by changing the color sheet.

4,823,246

SHALLOW INDICATOR LIGHT FOR A MOTOR VEHICLE

Gilbert Dilonya, Paris, France, assignor tn Cible Projecteurs, Bobigny Cedex, France

Filed Dec. 23, 1987, Ser. No. 137,455
Claims priority, application France, Dec. 23, 1986, 86 18038
Int. Cl.[4] F21V 13/04
U.S. Cl. 362—328 **11 Claims**



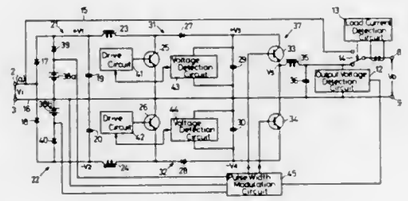
1. An indicator light for a motor vehicle, the light being of the type comprising a substantially point light source and a flat closure glass situated in front of the source, together with beam-forming means for forming a beam of light rays propagating along a given general emission direction of the light, said beam-forming means comprising:
- a set of deflector zones which are generally in the form of concentric rings on the glass, each zone being formed by a set of narrow prisms all having the same profile within each zone; and
- a generally flat or concave mirror disposed behind the light source and comprising a set of reflecting zones homologous to the deflecting zones of the glass, each reflecting zone comprising a set of sloping rings inclined to reflect light rays from the source towards a homologous deflecting zone of the glass, with the average direction of said reflected rays being different from the average direction of the light rays emitted directly from the source to the same deflecting zone, and with the profile of the prisms in each deflecting zone being designed as a function of said two average directions in order to deflect said light rays so that they propagate in a direction close to said general emission direction.

4,823,247

STABILIZED POWER SUPPLY UNIT

Sadaharu Tamoto, Kawasaki, Japan, assignor to Yutaka Electric Mfg. Co., Ltd., Japan

Filed Jan. 29, 1988, Ser. No. 150,374
Claims priority, application Japan, Jun. 26, 1987, 62-159393
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—16 **4 Claims**



1. A stabilized AC power supply comprising:
- rectification circuit means for converting AC input from AC supply terminals into direct current (DC);
- DC-AC inverter means;
- DC power source means for inputting DC power to said DC-AC inverter means to obtain AC output at AC output terminals when said AC input is interrupted;
- a first direct AC supply circuit connecting a first of said AC supply terminals to a first of said AC output terminals through change-over switch means;
- a second direct AC supply circuit connecting a second of said AC supply terminals and a second of said AC output terminals through a common connection.
- said rectification circuit means providing from said AC input almost equal DC voltages of positive and negative polarities relative to said common connection;
- boosting chopper circuit means connected between said rectification circuit means and said DC-AC inverter means for both said positive and negative polarities with respect to said common connection;
- said DC-AC inverter means including a pair of switching means providing half-bridge type circuit means capable of supplying almost equal voltages of opposite polarity with respect to said common connection.

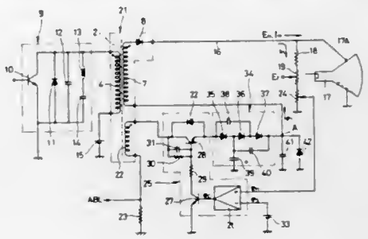
4,823,248

HIGH VOLTAGE GENERATOR

Hiroshi Ikeuchi, and Nobuaki Imamura, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Apr. 5, 1988, Ser. No. 177,758
Claims priority, application Japan, Apr. 7, 1987, 62-84956; Nov. 13, 1987, 62-286630
Int. Cl.[4] H02M 3/335; H04N 5/63
U.S. Cl. 363—20 **8 Claims**

1. A high voltage generator arranged to step up flyback pulse from a horizontal deflection circuit by means of a flyback transformer consisting of a primary low voltage coil and a secondary high voltage coil and to supply the resulting high voltage output to the anode of a cathode-ray tube through a rectification circuit, said high voltage generator comprising:
- a tertiary coil magnetically coupled with said primary coil and adapted to produce an output voltage substantially corresponding to 1/n of the variation in the voltage of the high voltage when the high voltage output current of said secondary coil is varied to a maximum within a variable range;
- a high voltage output variation detector circuit adapted to detect variations in the high voltage output to be supplied to the anode of said cathode-ray tube from said secondary coil;
- a summing control circuit for controlling the rate of the output voltage to be additively supplied to said secondary coil from said tertiary coil, according to the variation detector signal from said high voltage output variation detector circuit; and
- a multiplying circuit for multiplying the voltage from said summing control circuit substantially by n-times and supplying the multiplied voltage to the low voltage end of said secondary coil.

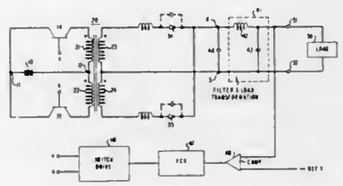


4,823,249

HIGH-FREQUENCY RESONANT POWER CONVERTER

John D. Garcia, II, Greenville, Tex., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 27, 1987, Ser. No. 43,008
Int. Cl.[4] H02M 1/14
U.S. Cl. 363—48 **9 Claims**



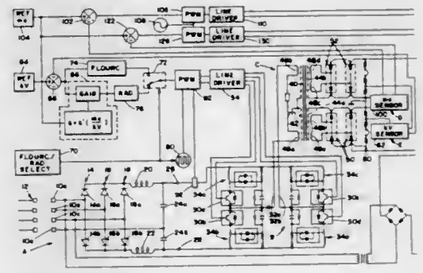
1. A power converter comprising:
- input means for accepting a dc voltage source,
- a power transformer including a primary winding and a secondary winding;
- a resonating capacitor having first and second access terminals;
- a first switch for applying the dc voltage source to the primary winding in a first direction;
- a second switch for applying the dc voltage source to the primary winding in a second direction opposite the first direction;
- a first secondary resonant circuit connected to a first terminal of the secondary winding and including, a first inductance derived in part from a leakage inductance of the transformer, a first rectifying diode and a connection to the first access terminal of the resonating capacitor;
- a second secondary resonant circuit connected to a second terminal of the secondary winding and including a second inductance derived in part from a leakage inductance of the transformer, a second rectifying diode and a connection to said first access of the resonating capacitor;
- the resonating capacitor having resonant operation with both the first and second resonant circuits; and
- output means connected to the resonating capacitor, having constant current sink characteristics and adapted for accepting a load to be energized.

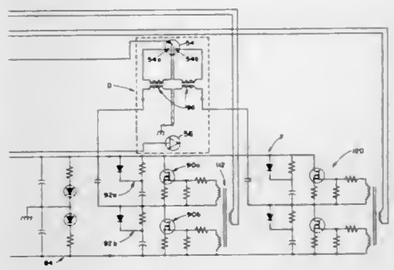
4,823,250

ELECTRONIC CONTROL FOR LIGHT WEIGHT, PORTABLE X-RAY SYSTEM

Norman S. Kolecki, Mentor; Thomas L. Rarick, Mayfield Hts., and Harry W. Fox, Jr., Brecksville, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Nov. 5, 1987, Ser. No. 117,793
Int. Cl.[4] H02M 7/00
U.S. Cl. 363—71 **24 Claims**





1. A radiographic tube control circuit for a radiographic tube having an anode and a cathode, the control circuit comprising:
- a closed current loop including:
  - a tube current sensing means for sensing actual current between the anode and cathode,
  - a current comparing means for comparing the sensed actual current with a preselected reference current and generating a current deviation signal in accordance therewith,
  - a current control means for controlling the cathode current in accordance with the current deviation signal;
- a closed voltage loop which inherently interacts with the closed current loop, the closed voltage loop including:
  - a voltage sensing means for sensing actual voltage across the cathode and anode,
  - a voltage comparing means for comparing the sensed voltage with a reference voltage and generating a voltage deviation signal in accordance therewith,
  - a voltage control means for controlling the voltage across the anode and cathode in accordance with the voltage deviation signal; and,
- a compensating means operatively connected with the

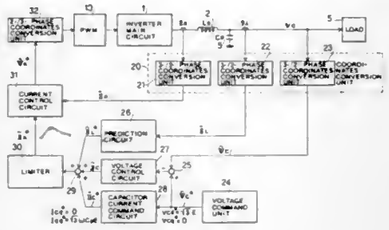
VOL 1101 ISS 3 APR 18 1989 UMI

closed current loop and the closed voltage loop for compensating for the inherent interaction therebetween.

4,823,251
CONTROLLER FOR INSTANTANEOUS OUTPUT CURRENT AND/OR VOLTAGE OF 3-PHASE CONVERTER

Takao Kawabata; Takeshi Miyashita, and Yushin Yamamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 155,049
Claims priority, application Japan, Jul. 28, 1987, 61-189352
Int. Cl.[4] H02M 7/68
U.S. Cl. 363—95 12 Claims



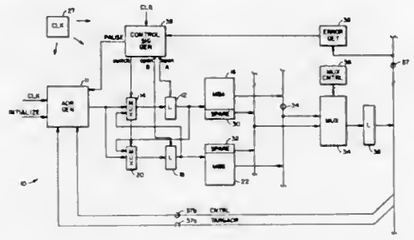
1. A controller for a 3-phase converter comprising:
an output filter provided between a load and a 3-phase converter which converts power of a power supply into the AC power of desired frequency through an ON-OFF control of electric valves,
a d-q current minor loop which accepts feedback of the d and q axes components of the output current of said converter converted by a synchronous revolutional coordinate system and controls the instantaneous value of the output current of the converter,
a d-q voltage major loop which accepts feedback of the d and q axes components of the output voltage of the output filter and controls the instantaneous value of the output voltage of the output filter wherein;
the sum of the current value to be applied to the load and the current value required to compensate deviation between the output voltage of the filter and a desired voltage command are applied for each of d and q components as the current command of said d and q current minor loop.

4,823,252
OVERLAPPED CONTROL STORE

Robert W. Horst, Cupertino, and Cirillo L. Costantino, Castro Valley, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Division of Ser. No. 845,738, Mar. 28, 1986, Pat. No. 4,754,396. This application Feb. 12, 1988, Ser. No. 155,427
Int. Cl.[4] G06F 11/20
U.S. Cl. 371—8 9 Claims

8. In a memory system of the type having first and second memory banks for storing copies of a set of data elements, a system for recovering from soft errors comprising;
means for monitoring data, read from a given storage location in the first memory bank, to detect errors in said data whenever data is read from said given storage location;
means for reading data in the second memory bank which is the copy of the data of the first memory bank; and
means for writing to the given memory location of the first memory bank the data copy from the second memory

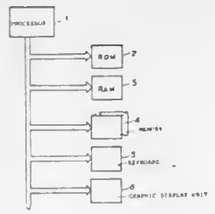


bank whenever an error is detected so that the error detected in the first memory bank is corrected.

4,823,253
CONVERSATIONAL-TYPE PROGRAMMING APPARATUS

Atsushi Shima, Koganei; Naoki Fujita, Hino, and Kozo Kamada, Takatsuki, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00590, § 371 Date Aug. 20, 1987, § 102(e) Date Aug. 20, 1987, PCT Pub. No. WO87/03391, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 19, 1986, Ser. No. 83,785
Claims priority, application Japan, Nov. 20, 1985, 60-259948
Int. Cl.[4] G06F 15/46, 3/04
U.S. Cl. 364—167.01 2 Claims

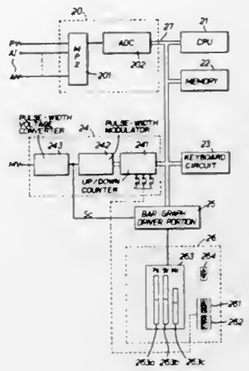


1. A conversation-type programming apparatus for performing programming by inputting the contents of a machining operation, which is to be carried out by a numerically controlled machine tool, as numerical control (NC) information on the basis of a graphic display on a screen, said apparatus comprising:
an automatic programming unit for processing NC information by conversational-type programming, said automatic programming unit comprising:
a memory for storing menu pages, parameter items of the menu, and auxiliary graphics corresponding to each parameter item;
a graphics display unit, coupled to said memory, for displaying the menu, each parameter and the auxiliary graphics corresponding to each parameter, said graphics display unit indicating, using a cursor, a position corresponding to data to be entered on a display selected from the menu, and for simultaneously indicating, using two cursors, each parameter item and auxiliary graphics corresponding to data to be entered on a display selected from the menu; and
a data input unit, coupled to said memory, for inputting numerical values and graphic symbols to said automatic programming unit.

4,823,254
DIGITAL CONTROLLER DISPLAY

Keisuke Takada, and Masamichi Mizutani, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 902,104, Aug. 29, 1986, abandoned, which is a continuation of Ser. No. 564,560, Dec. 22, 1983, abandoned. This application Apr. 4, 1988, Ser. No. 180,616
Claims priority, application Japan, Dec. 23, 1982, 57-232526
Int. Cl.[4] G06F 15/46
U.S. Cl. 364—188 5 Claims

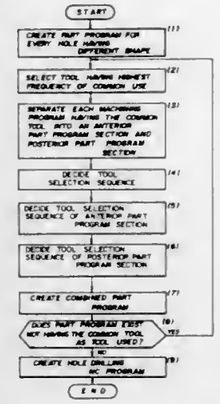


1. A digital controller comprising:
means for receiving analog signals indicating process variables of a process;
means for converting said signals to digital form;
a microprocessor for calculating a manipulated variable by arithmetic operations in accordance with a predetermined algorithm to cause the process variable signal to follow a setpoint variable;
an operation data output system for delivering an output for controlling the process, said system having means for holding the manipulated variable received from the microprocessor and manually operable if said microprocessor fails;
bar graph display type electronic indicating means for displaying the process variable, the setpoint variable, and the manipulated variable; and
driver means including
control circuit means for outputting control signals and clock signals to control the timing of operation of said driver means,
two registers for receiving the process variable and the setpoint variable from the microprocessor, said two registers selectively outputting the process variable and the setpoint variable in response to signals from the microprocessor,
counter means for counting said clock signals output from said control circuit means, and selective drive means for furnishing selective drive signals to said bar graph display type electronic means in response to said control signals from said control circuit means said driver means further acting to receive the manipulated variable from the holding means of the operation data output system for driving the electronic indicating means.

4,823,255
METHOD OF CREATING PROGRAM FOR DRILLING HOLES

Kunio Tanaka, and Yasushi Onishi, both of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00206, § 371 Date Dec. 19, 1986, § 102(e) Date Dec. 19, 1986, PCT Pub. No. WO86/06514, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 25, 1986, Ser. No. 2,673
Claims priority, application Japan, Apr. 30, 1985, 60-92909; Apr. 30, 1985, 60-92911
Int. Cl.[4] B23Q 15/00; G05B 19/18, 19/403
U.S. Cl. 364—191 9 Claims



1. A method of creating a hole drilling program in an automatic programming apparatus, comprising the steps of:
(a) creating a part program for every hole of a different shape, each part program comprising records arranged in a machining process sequence and including at least one tool used and machining depth, the part program specifying a tool use sequence for the hole;
(b) automatically determining a tool selection sequence to bring a number of times tool are changed close to a minimum value while the tool use sequence specified by each part program is maintained;
(c) creating a combined part program comprising said records arranged in the tool selection sequence determined in step (b); and
(d) creating a hole drilling numerical control program using said combined part program.

8. A method of creating a hole drilling program, comprising the steps of:
(a) creating a part program for every hole of a different shape, each part program comprising records arranged in a machining process sequence and including at least one tool used and machining depth, the part program specifying a tool use sequence for the hole;
(b) automatically determining a tool selection sequence to bring a number of times tools are changed close to a minimum value while the tool use sequence specified by each part program is maintained;
(c) creating a combined part program comprising said records arranged in the tool selection sequence determined in step (b);
(d) creating a hole drilling numerical control program using said combined part program;
(e) revising at least one of the records in at least one part program;
(f) determining whether said (revision is one which)revising in step (e) would have an effect upon the tool use sequence of the at least one part program revised in step (e);
(g) creating a new hole drilling program by performing step

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(b) to determine a new tool one part program revised in step (e) is determined in step (f) to have an effect upon the tool use sequence of the at least one part program; and

(h) creating the new hole drilling program without performing step (b) to determine the new tool selection sequence if said revising in step (e) is determined in step (f) to have any effect upon the tool use sequence of the at least one part program

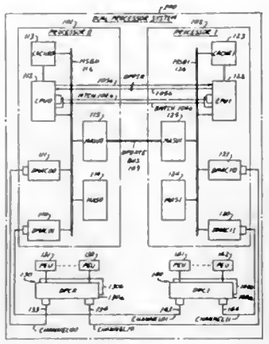
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4,823,256

RECONFIGURABLE DUAL PROCESSOR SYSTEM

Thomas P. Bishop, Aurora; Jonas Butvila, LaGrange; David J. Pitch, Naperville; Robert C. Hansen, Wheaton; David A. Schmitt, Glen Ellyn, and Grover T. Surratt, West Chicago, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 22, 1984, Ser. No. 623,481
Int. Cl.⁴ G06F *11/20*
U.S. Cl. 364—200 **19 Claims**



1. A processing system comprising:

a first and a second processor;

a first main memory included in the first processor and a second main memory included in the second processor, the first and second main memories having the same contents;

means interconnecting the first and the second memories, when active for automatically updating each main memory with content changes being made in the other main memory to cause the first and second main memories to continue having the same contents; and

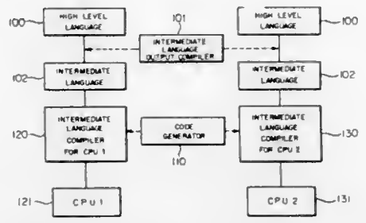
means for automatically changing system operation from a first to a second mode of operation transparently to execution of application tasks in response to certain conditions, wherein in the first mode both processors are active and each is executing substantially independently of the other tasks selected from a different one of a first and a second group of tasks, and wherein in the second mode of operation a selected either one of the processors is inactive and the other of the processors is active and executing tasks selected from both the first and second groups of tasks, the operation-changing means including means for fully occupying processor state of the one processor with at least one task that need not be continued on the other processor, at time of inactivation of the one processor, to ensure that any processor state existent in the one processor during the first mode of operation prior to the inactivation and relating to an application task not completed by the one processor is stored by the one processor in the one processor's main memory and by operation of the memory updating means is copied form the one processor's main memory to the other processor's main memory to be available to the other processor for execution of the related application task during the second mode of operation without recalculation by the other processor of the processor of the processor state relating to the application task.

4,823,257

INFORMATION PROCESSING SYSTEM HAVING SMART MEMORIES

Motonobu Tonomura, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1987, Ser. No. 83,288
Claims priority, application Japan, Aug. 8, 1986, 61-185084
Int. Cl.⁴ G06F *9/44, 15/16*
U.S. Cl. 364—200 **2 Claims**



1. An information processing system comprising:

a host central processing unit;

at least two external memories, each of said external memories having means providing a memory function to store information and means providing an arithmetic and logical function, so that each external memory operates as a co-processor of said host central processing unit; and

bus means for coupling said two external memories to said host central processing unit;

said external memories being different from each other in at least a part of the particular internal program language used therein;

said host central processing unit operating with a high level program language and having means for converting said high level program language into an intermediate language and for transmitting said intermediate language to each external memory on said bus means; and

each of said external memories including means for interpreting said intermediate language and for converting the intermediate language into the internal language used by the particular external memory.

4,823,258

INDEX LIMITED CONTINUOUS OPERATION VECTOR PROCESSOR

Isamu Yamazaki, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation-in-part of Ser. No. 940,211, Dec. 5, 1986, abandoned, which is a continuation of Ser. No. 469,630, Feb. 25, 1983, abandoned. This application Sep. 18, 1987, Ser. No. 98,313
Claims priority, application Japan, Feb. 26, 1982, 57-28905
Int. Cl.⁴ G06F *01/00*
U.S. Cl. 364—200 **2 Claims**

1. An index limited continuous operation vector processor for continuously performing conditional vector operations upon data conditionally selected out of data in arrays of data, comprising:

first memory means for storing a plurality of arrays of data;

second memory means for storing a plurality of sets of indexes as index sets;

first specifying means for specifying one of said index sets by holding an address of a location of an element of the specified index set;

second specifying means for specifying another one of said

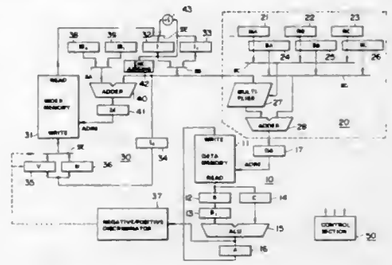
index sets by holding an address of a location into which an element of the specified index set is stored;

test condition means having a data input port and a result output port, for generating and outputting a signal from said output port if and only if the input data fed through said data input port meets one of a plurality of predetermined conditions; and

pipeline means having stages for performing conditional vector operations upon said arrays of data, including:

index read stages for successively reading-out indexes of an index set specified by said first specifying means from the second memory means;

selecting stages for successively reading-out selected data of



arrays from the first memory means, wherein the selection is made such that every datum corresponds to each index fed from said index read stages, respectively;

operating stages for performing one of a plurality of arithmetic and logical operations upon every datum fed from said selecting stages, generating an operation result and feeding the result at least to the data input port of said test condition means; and

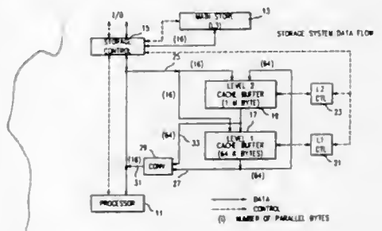
classifying stages for classifying every index fed from said index read stages and storing each of said indexes into the location specified by the second specifying means and making new index sets for later conditional vector operations, wherein the classification is made according to the signal fed from said test condition means.

4,823,259

HIGH SPEED BUFFER STORE ARRANGEMENT FOR QUICK WIDE TRANSFER OF DATA

Frederick J. Aichelmann, Jr., Hopewell Junction; Rex H. Blumberg, Hyde Park; David Meltzer, Wappingers Falls; James H. Pomerene, Chappaqua; Thomas R. Puzak, Yorktown Heights; Rudolph N. Rechtschaffen, Scarsdale, all of N.Y., and Frank J. Sparacio, Bergen, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 626,089, Jun. 29, 1984, abandoned. This application Jun. 23, 1988, Ser. No. 213,506
Int. Cl.⁴ G06F *12/00*
U.S. Cl. 364—200 **2 Claims**



1. A cache module for permitting the efficient transfer of *m* byte wide data entities between a fast, level L1 cache and a slower level L2 cache in a single access of said L1 and L2 cache, where m bytes is the width of a single cache line and is greater than 16 bytes, wherein:

said L1 cache includes an array of *n* memory circuits, such that *n* times the number *p* bits accessed per memory circuit equals *m*, and further having *m* byte wide input means and *m* byte wide output means for respectively receiving and transmitting said *m* byte wide data entity between said L1 and L2 caches;

said L2 cache including an array of *x* memory circuits, sueh that *x* times the number *y* bits accessed per memory circuit equals *m*, and further having *m* byte wide input means and *m* byte wide output means for respectively receiving and transmitting said *m* byte wide data entity between said L1 and L2 caches;

intercache bus for coupling said L1 and said L2 caches comprising first *m* byte wide coupling means for coupling said L1 cache output means to said L2 cache input means and second *m* byte wide coupling means for coupling said L2 cache output means to said L1 cache input means;

a common main storage data bus coupled to said main storage, said main storage data bus having a width that is a fraction *w/m* of said inter-cache bus first and second *m* byte wide coupling means width, said input means of said L1 and L2 caches being coupled to said common main storage data bus; at least one output data bus having a width of *m* bytes coupled to said output means of said L1 and L2 caches;

first converter means for sequentially furnishing fractions of a *w/m* wide data block to said processor and/or said main storage data bus having only said fractional width *w/m*, said first converter means being coupled to said output means of said L1 and L2 caches via said at least one output data bus;

register array means having a capacity of at least *m* data bytes coupled to said output data bus, for storing at least one data block of *m* bytes from said first converter means; and

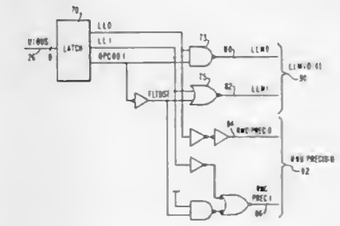
second converter means coupled to said register array means, for sequentially furnishing fractions of any m-byte data block stored in said register array means to said processor and/or main storage data bus.

4,823,260

MIXED-PRECISION FLOATING POINT OPERATIONS FROM A SINGLE INSTRUCTION OPCODE

Michael T. Imel, Beaverton; Konrad Lai, Aloha; Glenford J. Myers, Aloha; Randy Steck, Aloha, and James Valerio, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 12, 1987, Ser. No. 119,547
Int. Cl.⁴ G06F *7/48*
U.S. Cl. 364—200 **4 Claims**



1. In a data processor including an instruction decoder (12) and a floating point unit (22) connected together by a microinstruction bus (29) which carries a current microinstruction generated by said decoder in the course of the decoding of a

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macroinstruction by said decoder, said macroinstruction including a source address field, a destination address field, and an opcode field, said opcode field including first means (LL0, LL1) specifying the precision of arithmetic operations specified by said macroinstruction, the improvement characterized by:

said microinstruction generated by said instruction decoder (12) including second means (opcode 1) for indicating that the address range of said source or destination address in said macroinstruction includes the address of a floating point register (44) in said floating point unit 22; and,

third means (73, 75) responsive to said second means (opcode 1) for modifying said first means (LL0, LL1) to specify extended precision.

4,823,261

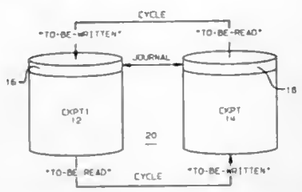
MULTIPROCESSOR SYSTEM FOR UPDATING STATUS INFORMATION THROUGH FLIP-FLOPPING READ VERSION AND WRITE VERSION OF CHECKPOINT DATA

Judith H. Bank, 37 Balmoral Dr., Chestnut Ridge, N.Y. 10977; Harry G. Familetti, 15 Hemlock Ct., Fishkill, N.Y. 12524, and Charles W. Lickel, 82 Mandalay Dr., Poughkeepsie, N.Y. 12603, assignors to International Business Machines corp., Armonk, N.Y.

Filed Nov. 24, 1986, Ser. No. 934,378

Int. Cl.[4] G06F *15/74, 11/30*

U.S. Cl. 364—200 **5 Claims**



3. In a multi-access spool computer complex including processors, main storage, at least one direct access storage device (DASD) connected to said main storage by a channel subsystem, a subsystem in an address space in said main storage and a checkpoint data set stored in a predetermined area in said main storage containing control blocks for each of said processors, the method for communicating subsystem status among said processors comprising the steps of:

creating a single, shared to-be-read-from version of said checkpoint data set including a first journal formatted on a track of a DASD, said first journal including records for containing changed control blocks, and a single, shared to-be-written-to version of said checkpoint data set including a second journal formatted on a track of a DASD, said second journal including records for containing changed control blocks, and

executing a channel program in said address space for performing input/output operations on said versions when one of said processors solely controls and has access to said checkpoint data set, said operations comprising the steps of:

reading from said first journal and overwriting portions of said checkpoint data set in said predetermined area with only changed data read from said first journal,

reading only changed ones of said records in said to-be-read-from version and overwriting records in said checkpoint data set in said predetermined area with said changed ones of said records,

writing said ones of said changed records in said checkpoint data set in said predetermined area to said to-be-written-to version,

recording status information of in-progress updates to control blocks in said checkpoint data set corresponding to said one of said processors that solely controls and has access to said checkpoint data set in said predetermined area,

writing in-progress updates that have been written to said checkpoint data set in said predetermined area to said second journal in said to-be-written-to version,

flip-flopping said to-be-read-from version to said to-be-written-to version and said to-be-written-to version to said to-be-read-from version following said input/output operations by said solely controlling processor, and

repeating said operations with a different one of said processors controlling and having access to said checkpoint data set.

4,823,262

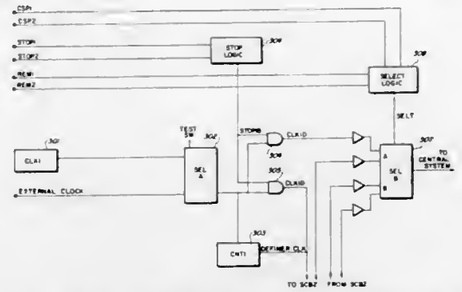
APPARATUS FOR DYNAMICALLY SWITCHING THE CLOCK SOURCE OF A DATA PROCESSING SYSTEM

Jaime Calle, Glendale, Ariz., assignor to Honeywell Bull Inc., Phoenix, Ariz.

Filed Jun. 26, 1987, Ser. No. 66,689

Int. Cl.[4] G06F *15/16, 9/00*

U.S. Cl. 364—200 **5 Claims**



1. In a data processing system which includes a first and a second central system (CS), each central system having a central processing unit (CPU), a system control unit (SCU), and a memory unit and an input/output (I/O) unit operatively connected to the SCU, and further wherein the CPU of the first central system is operatively connected to the SCU of the second central system and the CPU of the second central system is operatively connected to the SCU of the first central system, each central system including a service processor and a timing subsystem for providing clocking signals, each central system further including an apparatus for distributing the clocking signals such that each central system is clocked from predetermined ones of said clocking signals in response to control signals from said service processors, and further wherein the distribution of the clocking signals can be switched dynamically while the central systems are operating, the switching of the clocking signals being accomplished without affecting the operation of the central systems, said apparatus comprising:

(a) generating means, for generating local clocking signals;

(b) first logic means, for generating a stop signal at a predetermined time relative to said local clocking signals in response to predetermined ones of said control signals;

(c) gating means, operatively connected to said first logic means and to said generating means, for conditionally outputting said local clocking signals, in response to said stop signal; and

(d) select means, having an input terminal adapted to receive remote clocking signals from the timing subsystem of the other central system, the select means operatively connected to said gating means, for selectively outputting said local clocking signals or said remote clocking signals in response to said predetermined control signals, the control signals being modified during a time period that the stop signal is active, thereby permitting the select means to select alternate clocking signals before the stop signal becomes inactive thereby switching the source of the clocking signals which are clocking the central systems without perturbing the tasks being executed in said central systems.

4,823,263

APPARATUS FOR CONTROLLING THE OPERATION OF TIPPING A MELTING CRUCIBLE

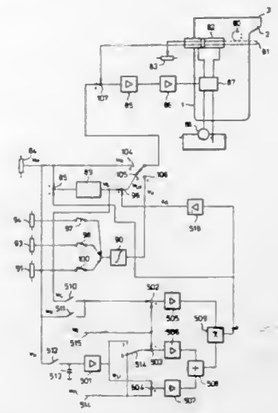
Friedrich-Werner Thomas, Geinhausen, and Jürgen Bruch, Rodenbach, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus, Koln, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 885,455

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524858

Int. Cl.[4] F27B *14/20*; B22D *41/00*

U.S. Cl. 364—559 **16 Claims**



1. An apparatus for controlling the tipping of a melting crucible for pouring molten material, comprising:

a control means for controlling the tipping of the melting crucible;

a memory connected to the control means, said memory storing an ideal pouring control curve for controlling the tipping of the melting crucible;

said control means, under ideal conditions, being responsive to the ideal pouring control curve to control the tipping of the melting crucible from at least an ideal initial pour point angle αPL when the material begins to pour out of the crucible, and continuing to control the tipping of the melting crucible until the melting crucible has been completely emptied at which point the melting crucible is tipped at an ideal end pour point angle αE;

said ideal pouring control curve being a continuous function $\alpha = f(t)$ in which α represents the tipping angle of the melting crucible and t represents time; and

a correction circuit for converting the continuous function $\alpha = f(t)$ for control of pouring under ideal conditions into a corrected continuous function $\alpha' = f_1(t)$ for control of pouring under actual conditions, said correction circuit taking into account an actual initial pour point angle $\alpha' PL$ and deriving the corrected function $\alpha' = f_1(t)$ based on the difference between αPL and $\alpha' PL$,

said corrected continuous function having the actual initial pour point angle $\alpha' PL$, at a point in time t_A, and, at the end of the crucible pouring operation at a point in time t_E, at which said corrected function has an actual end of pouring angle $\alpha' E$ which is identical to the ideal end of pouring angle αE.

4,823,264

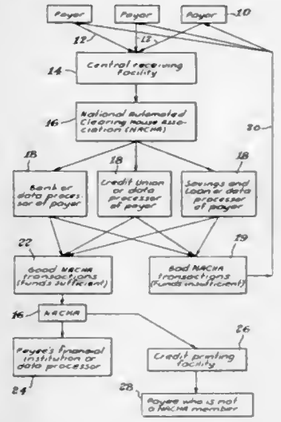
ELECTRONIC FUNDS TRANSFER SYSTEM

Gilbert R. Deming, 7853 25th Ave., Kenosha, Wis. 53140

Filed May 27, 1986, Ser. No. 866,759

Int. Cl.[4] G06F *15/30*

U.S. Cl. 364—408 **3 Claims**



1. In combination in a system for electronic transfer of funds, the system comprising means for a payor to designate payee and payor information, including a transaction amount a payor account code is to be debited and payee account code is to be credited and a personal identification code of the payor, means to transfer payee and payor information to a central receiving facility, means for entering payee information, including payee account code, payee account code destination and payor information, including payor account code, payor account code destination, payor's personal identification code and the transaction amount into a record capable of being processed by an automated clearing house, means for transmitting the record to an automated clearing house for processing and further transmission to payor account code destination, means for receiving the processed automated clearing house record at the payor account code destination, means for verifying that the transaction amount is in the payor account code and if the amount is present, debiting the payor account code with the transaction amount, means for the payor account code destination to then designate the payee account code destination in the automated clearing house record, means for transmitting the automated clearing house record to the automated clearing house for further transmission to to the payee account code destination, means for receiving the automated clearing house record at the payee account code destination and crediting the payee account code with the transaction amount.

4,823,265

RENEWABLE OPTION ACCOUNTING AND MARKETING SYSTEM

George E. Nelson, 11816 Douglynn Dr., Minnetonka, Minn. 55343

Filed May 11, 1987, Ser. No. 48,629

Int. Cl.[4] G06G *7/52*

U.S. Cl. 364—408 **25 Claims**

10. An automated renewable option accounting and marketing system for a transaction involving an underlying security comprising;

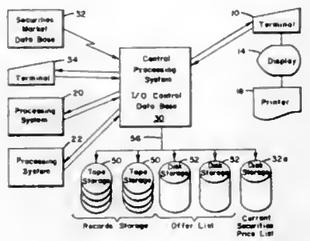
(a) terminal means for entry and display of data including customer data and renewable option transaction data including buy and sell data;

(b) programmed processor means for processing the data entered at the terminal means;

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(c) first data communications means for providing data transfer between the terminal means and the programmed processor means;

(d) data storage means electrically interconnected to the programmed processor means for storing data including data entered at the terminal means, the data stored in the data storage means including individual customer data including customer name, address, and account identifier data and renewable option transaction data including



transaction identifier data and renewable option premium data;

(e) means interconnected to the programmed processor means for providing the programmed processor means with date data and market data; and

(f) program means for processing the renewable option premium data, date data and market data to determine whether a renewal premium is due and the amount of the renewal premium due.

4,823,266

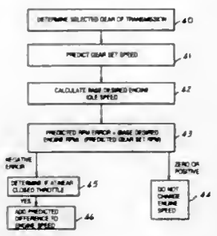
CONTROL OF ENGINE SPEED WITH AUTOMATIC TRANSMISSIONS

Paul A. Baltusis, Northville; Lawrence H. Buch, Farmington Hills; Richard S. Holcomb, Dearborn; Leonard J. Kurdziel, Westland, and Gerald W. Rein, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 29, 1987, Ser. No. 102,223

Int. Cl.[4] G06F *15/50;* **G06G** *7/70*

U.S. Cl. 364—424.1 **12 Claims**



6. An engine control apparatus coupled to an engine of a vehicle used in combination with an automatic transmission for controlling engine speed including:

calculation means for calculating a base desired engine speed as a function of engine operating parameters; and

adjustment means for adjusting the base desired engine speed as a function of transmission gearset speed to a final adjusted desired engine speed; and

engine speed change means to adjust actual engine speed to the final adjusted desired engine speed to reduce the difference between the magnitude of actual engine speed and the magnitude of transmission gearset speed.

4,823,267

RATIO CONTROL FOR CONTINUOUSLY VARIABLE TRANSMISSION FOR AUTOMOTIVE VEHICLE

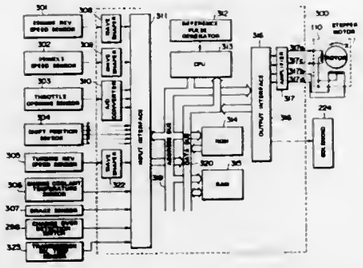
Haruyoshi Kumura, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 21, 1987, Ser. No. 99,444

Claims priority, application Japan, Sep. 19, 1986, 61-219237

Int. Cl.[4] B60K *41/12, 41/18;* **G06F** *15/50*

U.S. Cl. 364—424.1 **9 Claims**



1. A control system for a continuously variable transmission for an automotive vehicle with a brake, including a hydraulically operable driver pulley and follower pulley, a V-belt tensioned between the driver and follower pulleys, and means, including a shift actuator and a shift control valve, for hydraulically controlling a reduction ratio between the driver and follower pulleys by controlling a ratio of hydraulic fluid pressure applied to the driver pulley to hydraulic fluid pressure applied to the follower pulley, the control system comprising:

means for generating an output signal upon application of the brake of the vehicle; and

means for controlling the shift actuator such that the continuously variable transmission is prohibited against effecting downshifting after predetermined conditions have been satisfied after application of the brake as indicated by said output signal generated by said output signal generating means.

4,823,268

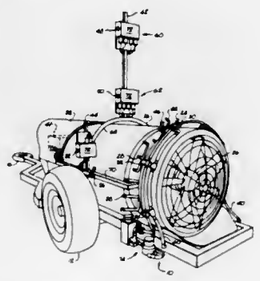
METHOD AND APPARATUS FOR TARGET PLANT FOLIAGE SENSING AND MAPPING AND RELATED MATERIALS APPLICATION CONTROL

Durham K. Giles; Michael J. Delwiche, both of Davis, Calif., and Roy B. Dodd, West Union, S.C., assignors to Clemson University, Clemson, S.C.

Filed Jun. 23, 1987, Ser. No. 66,137

Int. Cl.[4] G06F *15/14;* **B05B** *9/06*

U.S. Cl. 364—424.07 **39 Claims**



1. Apparatus for obtaining distance data between the apparatus and a plurality of target trees aligned in a row, while being transported past such trees, said apparatus comprising:

distance determining means for independently operating in cycles to sense respectively the distances between different vertical locations on said apparatus and the nearest tree foliage therefrom of a target tree situated in a row of such trees along which said apparatus is transported, and for providing respective distance data outputs corresponding with each of said different vertical locations, which outputs are updated for each cycle of distance determining means operation;

transport displacement sensing means for outputting an incremental distance signal indicative of said apparatus being transported a predetermined incremental distance relative a row of target trees; and

data storage means, adapted to receive said respective distance data outputs and said incremental distance signal, for orderly storing of said respective distance data outputs for the respective current cycle of distance determining means operation occurring at the time of each incremental distance signal, whereby such orderly stored data outputs may be subsequently processed with respect to said predetermined incremental distance to obtain profiles of foliar volumes for a plurality of sensed target trees.

4,823,269

WHEEL SPIN CONTROL APPARATUS

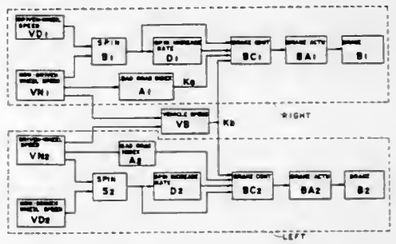
Hideaki Fujioka, and Koji Takata, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 2, 1987, Ser. No. 127,437

Claims priority, application Japan, Dec. 2, 1986, 61-287107

Int. Cl.[4] B60T *8/32*

U.S. Cl. 364—426.03 **16 Claims**



1. A wheel spin control apparatus for controlling a spin occurring on at least one of driven wheels of a vehicle by the application of a breaking force to said driven wheel, said apparatus comprising:

a spin detector for detecting the spin amount of said driven wheel;

a spin acceleration detector for detecting an acceleration of the spin amount;

a calculator for calculating a varying control variable FUNC which is proportional to a sum of the spin amount and the spin acceleration; and

a control means for controlling said driven wheel such that, when the control variable FUNC exceeds a first threshold having a positive value, the braking force is increasingly applied to the driven wheel, and when the control variable FUNC falls below a second threshold having a negative value, the braking force is decreasingly applied to the driven wheel.

4,823,270

METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

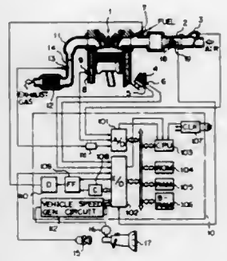
Toshinari Nagai, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1986, Ser. No. 927,589

Claims priority, application Japan, Nov. 9, 1985, 60-249967

Int. Cl.[4] F02M *51/00*

U.S. Cl. 364—431.05 **16 Claims**



1. A method for controlling an air-fuel ratio in an internal combustion engine having an air-fuel ratio sensor provided in an exhaust pipe for detecting an air-fuel ratio thereof and a signal processing circuit of a flow-in type for processing an output of said air-fuel ratio sensor, comprising the steps of:

receiving said output of said air-fuel ratio sensor and calculating an air fuel ratio correction amount in accordance with the detected air-fuel ratio, so that the air-fuel of said engine is brought close to a predetermined air-fuel ratio;

detecting a running state parameter of said engine;

setting an upper limit value of said air-fuel ratio correction amount at a definite value;

calculating a lower limit value of said air-fuel ratio correction amount in accordance with said running state parameter;

defining a range between a maximum value and a minimum value of said lower limit value;

limiting said lower limit to within said range;

limiting said air-fuel ratio correction amount to within a second range defined between said upper limit value and said lower limit value; and

adjusting an air-fuel ratio of said engine in accordance with the air-fuel ratio correction amount.

4,823,271

DATA PROCESSING ARRANGEMENTS

William J. R. Clark, Great Baddow; John J. Ward, Cheltenham, both of England; Harry M. Jones, Edinburgh, Scotland, and John H. Powell, Lytham-St.-Annes, England, assignors to GEC Avionics Limited, Rochester; Smiths Industries p.l.c., London; Ferranti p.l.c., Cheadle and British Aerospace p.l.c., London, all of, England

Filed Aug. 28, 1985, Ser. No. 770,381

Claims priority, application United Kingdom, Aug. 29, 1984, 8421815

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—443 **20 Claims**

1. A data processing arrangement including:

(a) means for holding data derived from disparate sources relating to positional information;

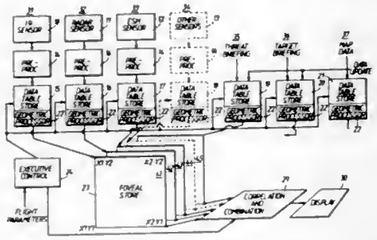
(b) means for assigning addresses in a two-dimensional format to selected portions of said data from each source representing spatial fields having a common positional relationship and orientation; and

(c) correlation means utilizing the co-ordinate addresses for combining and correlating data derived from the selected portions to generate a resultant combined output.

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20. A method of processing data derived from disparate sources relating to positional information, comprising the steps of:

(a) assigning addresses in a mutually compatible format to selected portions of data from each source representing a



common spatial field organized as aligned respective two-dimensional data planes, and

(b) combining and correlating data having common locations in the different planes to generate a combined resultant output.

4,823,272

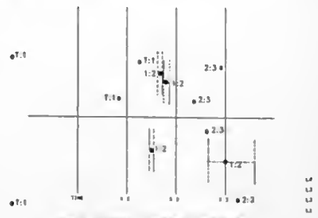
N-DIMENSIONAL INFORMATION DISPLAY METHOD FOR AIR TRAFFIC CONTROL

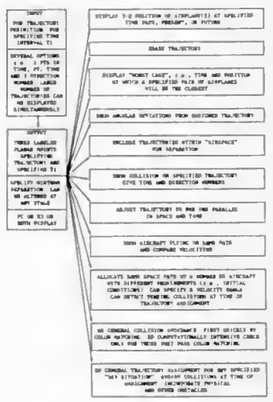
Alfred Inselberg, Los Angeles, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1987, Ser. No. 22,832

Int. Cl.⁴ G06F *15/48*

U.S. Cl. 364—461 **11 Claims**





1. A method for displaying, at a display interface coupled to a processor, position and motion information among objects in three-dimensional space, comprising the processor-controlled steps of:

generating and displaying at the interface a parallel coordinate plane having a plurality of axes, including a velocity axis and, orthogonal thereto, four parallel coordinate axes comprising three axes representing spatial dimensions and one axis representing a temporal dimension; and

displaying on said parallel coordinate plane a plurality of multi-segmented lines, each multi-segmented line forming a unique representation of the position and motion information of one of said objects so that separation between said multi-segmented lines in one of said parallel coordinates can be detected as indicative of a lack of a conflict between the positions of the objects.

4,823,273

AREA CUTTING METHOD

Kunio Tanaka, and Yasushi Onishi, both of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

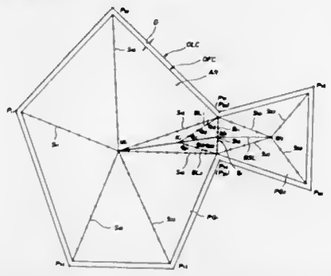
PCT No. PCT/JP86/00367, § 371 Date Mar. 16, 1987, § 102(e) Date Mar. 16, 1987, PCT Pub. No. WO87/00648, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 17, 1986, Ser. No. 36,678

Claims priority, application Japan, Jul. 17, 1985, 60-157926

Int. Cl.⁴ G05B *19/403*

U.S. Cl. 364—474.29 **9 Claims**



1. An area cutting method for cutting the interior of an area bounded by the curve of an external shape, comprising the steps of:

a first step of dividing the area into a plurality of convex polygons;

a second step of calculating the centroid of each convex polygon;

a third step of finding the longest line segments among line segments connecting the centroid and apices in every convex polygon, and finding, for every convex polygon, a number Ni of partitions for which a length of a partitioned line segment obtained by equally partitioning each longest line segment will have a value closest to a preset cut-in pitch without exceeding said cut-in pitch;

a fourth step of finding a convex polygon having a maximum number M of partitions, and finding a maximum number m of partitions from among numbers of partitions of convex polygons adjacent the largest convex polygon;

a fifth step of dividing, into M equal parts, line segments connecting a centroid and apices of the largest convex polygon, equally dividing, into m equal parts, line segments connecting a centroid and apices of each convex polygon adjacent said largest convex polygon, and equally dividing, into m equal parts, median lines connecting a mid-point of a boundary line between the largest convex polygon and an adjacent convex polygon with the two end points of said boundary line;

a sixth step of generating a plurality of first closed paths successively connecting corresponding partitioning points, on the centroid side, of the line segments connecting said centroid and apices of the largest convex polygon;

a seventh step of generating a plurality of second closed paths successively connecting corresponding partitioning points of line segments, which connect the centroid and apices of each convex polygon, and of the median lines; and

an eighth step of moving a tool along each of said generated closed paths.

4,823,274

INJECTION MOLDING MACHINE WHICH ALLOWS PROCESS MONITORING

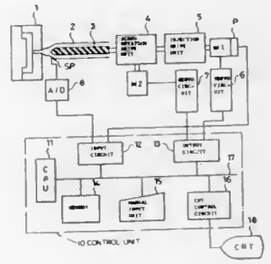
Nobuyuki Kiya, and Noriaki Neko, both of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Continuation of Ser. No. 885,567, Jul. 8, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 185,289

Claims priority, application Japan, Nov. 9, 1984, 59-235256

Int. Cl.⁴ B29C *45/76*

U.S. Cl. 364—476 **2 Claims**



1. An injection molding machine for monitoring an injection molding process during a plurality of injection molding cycles, comprising:

first detecting means for detecting a cycle time and a mixing time;

second detecting means for detecting an injection time, a peak injecton pressure and a switched pressure;

third detecting means for detecting a cushion amount;

current value memory means for storing data corresponding to a plurality of current variables including the cycle time, the mixing time, the injection time, the peak injection pressure, the switched pressure and the cushion amount for a current molding cycle;

past value memory means for storing data corresponding to a plurality of past variables including the cycle time, the mixing time, the injection time, the peak injection pressure, the switched pressure and the cushion amount for at least two preceding molding cycles, said past value memory means including a first memory section for storing the data corresponding to the plurality of past variables for a first preceding cycle, and a second memory section for storing the data corresponding to the plurality of past variables for a second preceding cycle;

a display unit;

display control means for reading data from said current value memory means and said past value memory means, and for causing data representing the current variables for the current molding cycle and the past variables for at least two preceding molding cycles to be simultaneously displayed on said display unit; and

updating control means for automatically transferring the data stored in said current value memory means to said past value memory means after the current molding cycle ends, so as to automatically start and execute updating of the data in said past value memory means without manual intervention by an operator, said updating control means being operable to transfer the data stored in said current value memory means to said first memory section of said past value memory means to said first and second memory sections of said past value memory means, respectively, after each molding cycle ends.

4,823,275

AREA CUTTING METHOD

Kunio Tanaka, and Yasushi Onishi, both of Tokyo, Japan, assignors to Fanuc, Minamitsuru, Japan

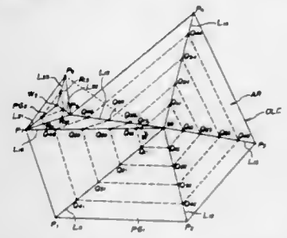
PCT No. PCT/JP86/00369, § 371 Date Mar. 16, 1987, § 102(e) Date Mar. 16, 1987, PCT Pub. No. WO87/00650, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 17, 1986, Ser. No. 44,944

Claims priority, application Japan, Jul. 17, 1985, 60-157928

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—474 **3 Claims**



1. A area cutting method for cutting the interior of an area bounded by a closed curve, comprising the steps of:

determining whether the area bounded by said closed curve is to be divided;

obtaining, if division is necessary, a division value for all sets of apices, in which two apices form a set, by using an evaluation function indicative of a preset division value, and the division value produced based on said evaluation function increases with a decrease in distance between two apices Pi, Pj, increases with an increase in angles at the apices Pi, Pj on the area side, and increases with a decrease in an angle defined by a bisector of each of said angles on the area side and a straight line PiPj;

dividing the area by a straight line connecting two apices of a set having a maximum division value;

repeating, for each divided area until there is no longer need for division, the obtaining and dividing steps using said evaluation function when division is necessary; and

determining tool paths on the basis of the divided areas and performing area cutting by moving a tool along said tool paths.

4,823,276

COMPUTER-AIDED AUTOMATIC WIRING METHOD FOR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Tamotsu Hiwatashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 16, 1987, Ser. No. 26,301

Claims priority, application Japan, Mar. 20, 1986, 61-63215

Int. Cl.⁴ G06F *15/60*

U.S. Cl. 364—491 **11 Claims**

1. An automatic wiring method for a semiconductor integrated circuit device in which function blocks selected to obtain desired logical functions are arranged on a substrate and channels are defined around the function blocks to serve as wiring regions, said method comprising the steps of:

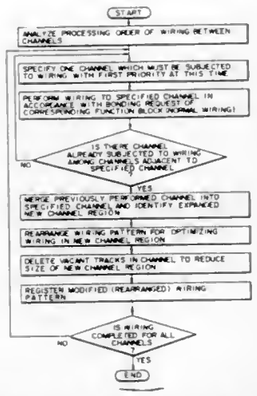
(a) selecting a first channel from the channels on said substrate in accordance with a predetermined processing order;

(b) performing routing/wiring processing to determine electrical connecting paths between associated function blocks in said first channel in accordance with a bonding request, thereby obtaining a normal wiring pattern;

(c) detecting, after the routing/wiring processing is completed, a second channel which neighbors said first channel and has been already subjected to normal routing/wiring processing, said second channel having a processing order

immediately before a processing order of said first channel;

(d) merging said first and second channels to form a new third channel, the area of which is expanded, said third channel having a combined wiring pattern obtained by combining wiring patterns of said first and second channels;



(e) performing wiring pattern rearranging to modify said combined wiring pattern of said third channel to matching with the shortest routing rule at an expanded space of said third channel; and

(f) verifying whether a vacant space not contributing to wiring is left in the modified wiring pattern of said third channel, and if such a vacant space is detected, removing the vacant space to reduce the area of said third channel, thereby to optimize the entire wiring pattern of said integrated circuit device and maximize packing density of said integrated circuit device.

4,823,277

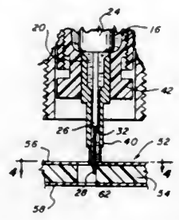
FORMING PLATED THROUGH HOLES IN A PRINTED CIRCUIT BOARD BY USING A COMPUTER CONTROLLED PLOTTER

Ronald G. Reed, Colorado Springs, Colo., assignor to Proto-CAD, Inc., Colorado Springs, Colo.

Continuation-in-part of Ser. No. 725,817, Apr. 16, 1985, Pat. No. 4,720,798. This application Nov. 10, 1986, Ser. No. 929,390

Int. Cl.⁴ G05C *9/02*

U.S. Cl. 364—488 **25 Claims**



1. An instrument for applying a relatively high viscosity fluid onto the wall of a hole formed in a layer of material, comprising:

a member having a tube extending therefrom which terminates at a terminal end, the member also defining a hollow interior within which to contain the fluid;

a plunger member positioned substantially within the interior and comprising a shaft and a tip extending from the shaft, the tip and the shaft extending into the tube;

the tube slideably retaining the tip and the shaft for reciprocative movement along a predetermined axis between an extended position wherein the tip extends beyond the terminal end of the tube and a retracted position wherein the tip withdraws to within the tube; and

means connected to and moving with the shaft and the tip for positively displaying fluid from within the tube onto the tip upon movement of the shaft and tip from the retracted position to the extended position.

8. A process of coating each side wall of a hole formed in a layer of material with a relatively high viscosity fluid which contains electrically conductive particles upon which a layer of metal can be substantially evenly electroplated to form a plated through hole in the layer of material, comprising the steps of:

positively displacing a quantity of the fluid onto a tip of an instrument, the tip having a curved exterior surface and a cross-sectional size substantially less than the area of the hole;

inserting the tip into the hole; and

moving the tip peripherally around the side wall of the hole to smear a substantially even coating of the fluid onto the side wall from the tip.

4,823,278

METHOD OF LOGIC DESIGN OF INTEGRATED CIRCUIT

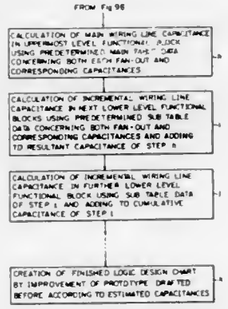
Hideo Kikuchi, Yokohama; Sadao Tsutsumi, Kawasaki, and Akira Kaneko, Yokohama, all of Japan, assignors to Fujitsu Limited, Osaki, Japan

Continuation of Ser. No. 758,466, Jul. 24, 1985, abandoned. This application Feb. 8, 1988, Ser. No. 154,452

Claims priority, application Japan, Jul. 25, 1984, 59-154665

Int. Cl.⁴ G06F *15/60*

U.S. Cl. 364—491 **12 Claims**



1. A method for constructing an integrated circuit including designing the integrated circuit with consideration of a propagation delay time of each wiring line capacitance on a single integrated circuit chip, said method comprising the steps of:

(i) classifying logic units and logic gates of the integrated circuit into hierarchal functional blocks;

(ii) specifying an uppermost level functional block for a closed network and further specifying lower level functional blocks contained in the uppermost level functional block and inter-connected by the closed network;

(iii) calculating estimates for wiring line capacitances in each of the functional blocks in accordance with predetermined data concerning average wiring line capacitances for every level;

(iv) estimating a network wiring line capacitance of the closed network by summing the estimates for the wiring line capacitances; and

(v) allocating the hierarchal functional blocks on the integrated circuit chip to form the integrated circuit, said allocating starting with the lowest level functional blocks and progressing sequentially to the uppermost level functional block.

4,823,279

COORDINATE CONVERSION SYSTEM AND METHOD FOR CONTROLLING AN INDUSTRIAL ROBOT

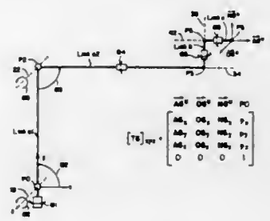
William Pensley, Weston; Rajan C. Penkar, Danbury, both of Conn., and Jeffrey R. Davis, Sunnyvale, Calif., assignors to Unimation, Inc., Danbury, Conn.

Filed Feb. 27, 1986, Ser. No. 834,284

Int. Cl.⁴ G06F *15/50;* **B25J** *17/02;* **G05B** *19/42*

U.S. Cl. 364—513 **15 Claims**





1. In a programmable manipulator of the type having a manipulator arm which is movable in three primary axes defining joint angles θ_1, θ_2 and θ_3 and includes an outermost link and a manipulator hand which is connected to said outermost link a_2 and is movable in three secondary axes, said manipulator hand including a fixed offset b between two of said secondary axes, the method of moving said manipulator arm in response to an input signal representing a desired position and orientation of said manipulator hand, said input signal being in the form of a matrix which includes a column vector A6 representing the approach orientation direction of said manipulator hand and a column vector representing the Cartesian coordinates of said desired position of said manipulator hand, which includes the steps of,

a. reading the final joint angle value θ_1, θ_2 and θ_3 from the previous command signal,

b. approximating a direction vector a2 corresponding to the direction of said outermost link utilizing the final joint angle values θ_1, θ_2 and θ_3 from said previous command signal,

c. computing the vector cross product of said direction vector a2 and said approach vector A6 to obtain a b unit vector corresponding approximately to the direction of said fixed offset,

d. multiplying said b unit vector by the length of said fixed offset to obtain a product corresponding to the magnitude and direction of said b vector in space,

e. obtaining a tentative value for the position of the end of said outermost link by combining said obtained product with a position corresponding to the intersection of the two outermost ones of said secondary axes,

f. computing a set of tentative joint angles θ_1, θ_2 and θ_3 for said three primary axes from said tentative value end of outermost link position,

g. computing from said set of tentative joint angles a more accurate direction vector a_2,

h. iterating steps (c) to (g) inclusive to obtain successive sets of more accurate intermediate joint angles for said three primary axes,

i. terminating said iteration of steps (c) to (g) when the last two sets of tentative joint angles so produced are within a predetermined amount of each other, and

j. rotating said three primary arm axes to the joint angles corresponding to said last set of tentative joint angles so produced, thereby to position said manipulator hand at said desired position and orientation.

4,823,280

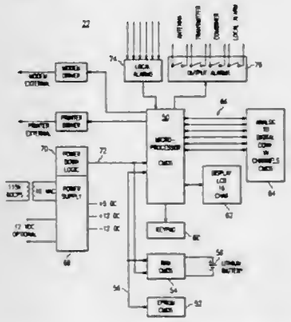
COMPUTER-CONTROLLED ELECTRONIC SYSTEM MONITOR

Peter Mallandt, Dallas, and John R. Hicks, Lone Oak, both of Tex., assignors to Decibel Products, Inc., Dallas, Tex.

Filed Mar. 12, 1987, Ser. No. 25,216

Int. Cl.⁴ G06K *15/00;* **G01R** *19/00*

U.S. Cl. 364—514 **8 Claims**



1. An electronic communication monitoring apparatus for monitoring a communication system having a transmitter, and a site housing for the transmitter, comprising:

a power sensor means for selective connection to the communication system for producing selected power measurements;

a plurality of environmental sensors connected to the site housing for determining environmental conditions affecting the site housing; and

a programmable controller means located in the site housing and connected to the power sensor means and plurality of environmental sensors, said programmable controller means including a display means, a power monitoring means operatively connected to the power sensor means for continuously monitoring operations of the communication system including power measurements for display by the display means, means for storing maintenance parameters, comparison means connected to power monitoring means for comparing the power measurements with the maintenance parameters, means connected to the comparison means for signaling a need for maintenance operations prior to failure of the communication system, environmental sensor monitoring means connected to the plurality of environmental sensors for detecting environmental signals indicative of adverse environmental conditions associated with the transmitter station housing, and an alarm means connected to the environmental sensor monitoring means for producing alarms indicative of adverse environmental conditions.

4,823,281

COLOR GRAPHIC PROCESSOR FOR PERFORMING LOGICAL OPERATIONS

Carlo J. Evangelisti, Jefferson Valley, N.Y., and Leon Lumelsky, Stamford, Conn., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 729,003, Apr. 30, 1985, abandoned. This application Dec. 4, 1987, Ser. No. 129,970

Int. Cl.⁴ G06F *3/14*

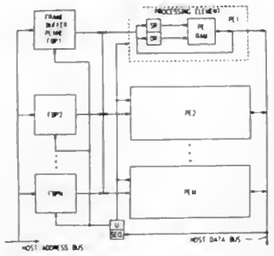
U.S. Cl. 364—518 **13 Claims**

1. A color graphic processor for performing logical operations on graphics representing digital data comprising:

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a multi-plane frame buffer for storing multi-bit pixels with an input and an output,

at least one processing element including multi-bit source and destination registers, said source and destination registers including multiple fields, and said processing element further including a digital memory addressable by said source and destination registers, said digital memory having an output of sufficient capacity to accommodate a width of said multi-bit pixel, said digital memory including



a plurality of digital memory sections, each digital memory section addressed by a different field of said source and destination registers in combination,

a data path from said frame buffer output to said source and destination registers and a second data path from said digital memory output to said frame buffer input,

whereby pixel data output from said frame buffer addresses said digital memory and data extracted from said digital memory is written back to said frame buffer.

4,823,282

GRAPHIC DISPLAY APPARATUS HAVING BOUNDARY DETECTION TARGET REGION DESIGNATING CIRCUIT

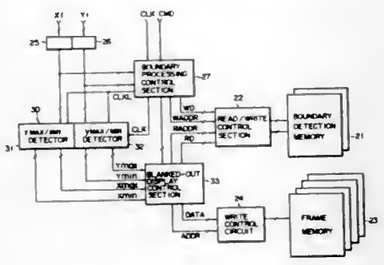
Nobuhiko Yamagami, Tachikawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 24, 1986, Ser. No. 911,060

Claims priority, application Japan, Sep. 27, 1985, 60-212521

Int. Cl.⁴ G06F *15/72*

U.S. Cl. 364—518 **7 Claims**



1. A graphic display apparatus comprising:

boundary detection memory means for storing frame data of a figure;

frame memory means for storing image data for displaying an image on a screen, the image data corresponding to the frame data stored in the boundary detection memory means;

target region designating means for detecting maximum and minimum vertex coordinate values of the frame data and for generating a minimum rectangular region including the frame data of the figure; and

blanking-out display control means for detecting the boundary of the frame data in a target region of the boundary detection memory means corresponding to the minimum rectangular region generated according to the maximum and minimum vertex coordinate values detected by the target region designating means, and for blanking-out a region in the frame memory means corresponding to a region surrounded by the frame data in the target region of the boundary detection memory means.

4,823,283

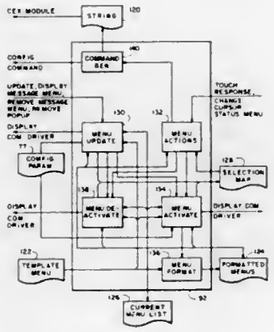
STATUS DRIVEN MENU SYSTEM

Brian D. Diehm, Lake Oswego, and James C. Stanley, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 14, 1986, Ser. No. 918,458

Int. Cl.⁴ G06F *3/153*

U.S. Cl. 364—518 **9 Claims**



7. A method for adjusting the operating state of an instrument of the type having display means for displaying menus, and having memory means for storing data including configuration parameter values, the operating state of the instrument being determined according to said configuration parameter values, comprising the steps of:

storing menu data in said memory means describing characteristics of a plurality of menus, each menu having an operator selectable menu item, said menu data including instructions associated with the operator selectable menu item for displaying the associated menu and for altering configuration parameter values when an operator selects the selectable menu item of the associated menu;

automatically selecting a first menu from among said plurality of menus according to the configuration parameter values stored by said memory means;

causing said display means to display said first menu according to said instructions included in said menu data;

adjusting configuration parameter values stored by said memory means according to said instructions included in said menu data in response to operator selection of the selectable menu item of the displayed first menu;

selecting a second menu from among said plurality of menus for display by said display means according to the adjusted configuration parameter values; and

causing said display means to display said second menu according to said instructions included in said menu data.

4,823,284

HIGH SPEED VLSI BASED SERIAL TO MULTIPLEXED DATA TRANSLATOR

Joseph W. Ward, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 16, 1987, Ser. No. 120,906

Int. Cl.⁴ G01D *15/00*

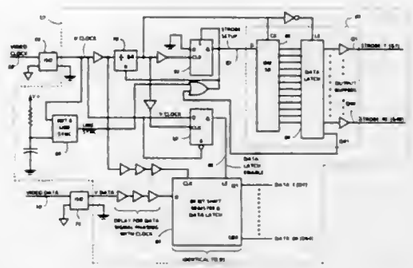
U.S. Cl. 364—519 **19 Claims**

1. A data translator for converting high speed video serial data into real time multiplexed parallel applied data comprising:

a multi pin writing head,

a video clock signal and a video data signal,

a first parallel shift register for receiving the video data signals,



a second shift register for receiving the video clock signals and providing multiplexing strobe signals, said second shift register operated in time-divided synchronism with the first shift register for shifting blocks of said serial data in parallel to said multi pin writing head.

4,823,285

METHOD FOR DISPLAYING HAIRSTYLES

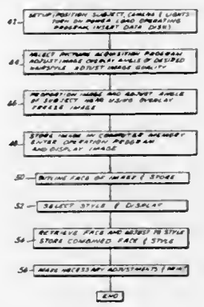
Vito L. Biancato, 8333 NW. 14 Ct., Coral Springs, Fla. 33065

Continuation of Ser. No. 796,981, Nov. 12, 1985, Pat. No. 4,731,743. This application Mar. 14, 1988, Ser. No. 167,273

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.⁴ G06F *15/66;* **H04N** *7/18;* **G09B** *19/10*

U.S. Cl. 364—521 **19 Claims**



1. In a method of displaying on a video screen an image of a subject with a new haistyle, the method comprising:

producing first video data representative of a plurality of available hairstyles;

producing second video data representative of at least the face and present hairstyle of the subject;

displaying on the screen images of at least the face and present hairstyle based on the second video data, said images also including a hairline representing a boundary between the face and present hairstyle;

removing from the screen at least the image of those portions of the present hairstyle which are beyond the boundary of the face;

displaying on the screen based on the first video data an image of the new hairstyle selected from the plurality of available hairstyles; and

positioning the images of the face and the new hairstyle together on the screen.

4,823,286

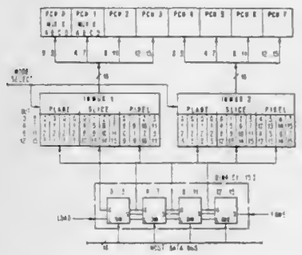
PIXEL DATA PATH FOR HIGH PERFORMANCE RASTER DISPLAYS WITH ALL-POINT-ADDRESSABLE FRAME BUFFERS

Leon Lumelsky, Stamford, Conn.; Joe C. St. Clair, Round Rock; Robert L. Mansfield, Austin, both of Tex.; Marc Segre, Rhinebeck, N.Y., and Alexander K. Spencer, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 12, 1987, Ser. No. 13,847

Int. Cl.⁴ G06F *12/06*

U.S. Cl. 364—521 **14 Claims**



1. A multi-channel pixel data path architecture comprising a plurality of functional elements for communication between a host processor and an all-points addressable frame buffer for use in a video raster display adapter, said data path including;

functional element means within said architecture for automatically interconnecting the data path architecture to the frame buffer to selectively provide access to the frame buffer for:

(1) operations on a plurality of pixels,

(2) operations on a plurality of pixel slices and,

(3) operations on bit planes,

functional element means within said architecture for selectively performing both logical and arithmetic operations on video data presented to the data path,

functional element means within said architecture for extending bit-blt (bit block transfer) operations comprising the parallel access and processing of multiple contiguous pixels of video data from the frame buffer to provide antialiased text and graphics and,

functional element means within said architecture for assisting "burst" mode updating of an arbitrary plane of the frame buffer.

4,823,287

DIGITAL CONTOUR LINE GENERATOR

Eldon J. Thompson, Ruckersville, Va., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 28, 1987, Ser. No. 55,104

Int. Cl.⁴ G06F *15/50, 15/72;* **G01S** *13/00*

U.S. Cl. 364—522 **10 Claims**

10. A contour line generator for displaying topological features on a moving electronic map display comprising:

means for providing digital data signals representative of a plurality of elevations neighboring a preselected location on said map display;

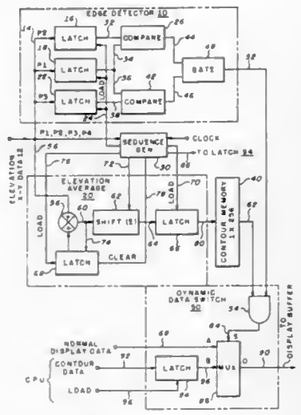
means for comparing pairs of said digital data signals and for providing an output signal when one of said pairs corresponds to unequal values of said elevations;

means for providing an average of said digital data signals;

data storage means having a plurality of addressable storage locations indicative of predetermined contour line inter-

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vals and responsive to said average of said digital data signals for providing an output signal corresponding to the presence of a desired contour line location at said preselected location; and



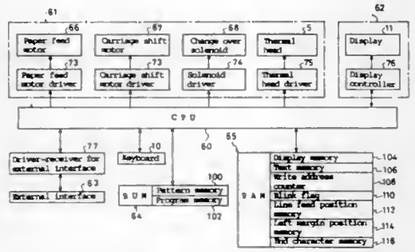
switch means responsive to a source of normal terrain data representative of said moving map display, to a source of contour line data, and to a coincidence of said output signals from said means for comparing and said storage means, for enabling a display of said contour line data at said preselected location.

4,823,288

DOCUMENT PROCESSOR

Hideo Ueno, and Shigeto Yamada, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 19, 1987, Ser. No. 51,402
Claims priority, application Japan, May 20, 1986, 61-115886
Int. Cl.⁴ B41J *5/30*
U.S. Cl. 364—519 **7 Claims**



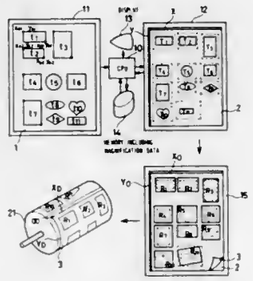
1. A document processor comprising:
input means for inputting code data of characters and symbols, and various command data,
display means for displaying characters and symbols inputted from said input means on a display having at least two display lines,
control means for controlling said display means, including data memory for storing data to be displayed by said display means,
wordlap determining and command means for determining data inputted at an utmost right position regulated by a right margin set position on said display means is data of a character other than an end character of a word, and for outputting a wordlap command when said data in said data memory is representative of a character other than said end character of a word,
distinguishing display command means for outputting a distinguishing display command to said control means, when receiving said wordlap command from said wordlap determining and command means, for commanding a distinguishable display of the data as a word separated at said right margin set position and displayed on two display lines of said display, and
wordlap control means for commanding said control means to display all characters of said separated word on the succeeding display line of said display from the left utmost position regulated by a left margin set position, after inputting the end character of said separated word.

4,823,289

POSITIONING ORIGINALS ON AN ORIGINAL SCANNING DRUM OF AN IMAGE REPRODUCING SYSTEM

Makoto Hirosawa, and Mitsuhiko Yamada, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 6, 1985, Ser. No. 731,141
Claims priority, application Japan, Jun. 8, 1984, 59-118720
Int. Cl.⁴ G03F *9/00*; H04N *1/00*
U.S. Cl. 364—523 **13 Claims**



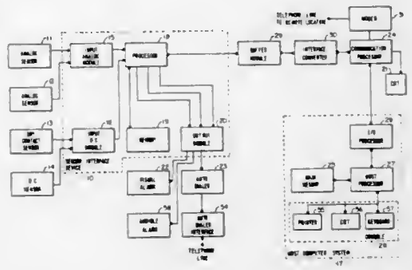
12. A method of positioning plural originals on an original scanning drum of an image reproducing system, comprising the steps of:
(a) forming a block copy on which reproduction frames indicating trimming areas of all reproduction images are configured;
(b) obtaining position data of said reproduction frames obtained and also obtaining magnification data;
(c) determining position and size of original frames indicating the trimming areas of every original in accordance with data obtained in step (c);
(d) configuring said original frames on a first sheet as determined in step (c);
(e) sticking originals on a transparent second sheet placed on the first sheet so that the area to be reproduced of each original does not exceed the corresponding original frame configured in step (d), visible through the first sheet; and
(f) placing the transparent second sheet on said original scanning drum,
wherein said step (c) of determining position and size of original frames is performed by a CPU based on said position data obtained in step (b), and wherein said configuring step (d) comprises the step of plotting said original frames at the positions determined in step (c) under control of said CPU.

4,823,290

METHOD AND APPARATUS FOR MONITORING THE OPERATING ENVIRONMENT OF A COMPUTER SYSTEM

Martin L. Fasack, Port Washington, N.Y.; William A. Rutz, Brookfield Center, and Robert G. Voll, Southbury, both of Conn., assignors to Honeywell Bull Inc., Minneapolis, Minn.

Filed Jul. 21, 1987, Ser. No. 76,235
Int. Cl.⁴ G06F *15/20*; G05B *23/02*
U.S. Cl. 364—550 **24 Claims**



1. A method for monitoring an operating environment of a computer system that includes a computer facility housing a central processor and memory for storage of data and programs, said method comprising the steps of:
utilizing monitoring equipment for generating indicator signals indicating a state of a plurality of environmental conditions in and around said computer system including its environment using a like plurality of sensors;
storing over a period of time said indicator signals periodically generated by said sensors along with signals indicating the date and time that each of said indicator signals were stored;
checking said indicator signals to determine if the environmental conditions they indicate exceed one or more predetermined levels including predetermined rates of change over a predetermined period of time and predetermined fixed levels;
providing an alarm indication when said checking indicates that any of said indicator signals has exceeded any of said predetermined levels; and
producing a histogram for each sensor using the stored indicator signals from each sensor and the time and date signals associated therewith, said histograms indicating environmental trends in said computer system which can point to potential troubles in the operating environment of the computer system, which potential troubles may be rectified before they actually become troubles that cause damage to the computer system.

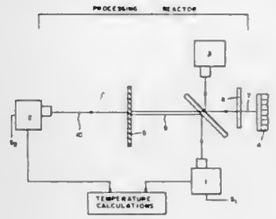
4,823,291

RADIOMETRIC MEASUREMENT OF WAFER TEMPERATURES DURING DEPOSITION

Herbert L. Berman, Los Altos Hills, Calif., assignor to Sensor Control, Inc., Sunnyvale, Calif.

Filed Sep. 10, 1987, Ser. No. 95,378
Int. Cl.⁴ G01J *5/10*; G01K *1/02*
U.S. Cl. 364—557 **4 Claims**

1. Apparatus for measuring the temperature of a semiconductor wafer being processed in a processing reactor comprising a radiant source directed at said wafer, shutter means for intermittently interrupting radiation from said radiant source impinging on said wafer, a beam splitter for passing said radiation to said wafer, radiometer means cooperating with said beam splitter detecting the radiation emitted from, transmitted by and reflected by said wafer, and means for calculating the temperature of the wafer in real time based on the relationship



$$W_w = \frac{S_1' - W_a}{e_W \tau_{BS}} + W_a$$

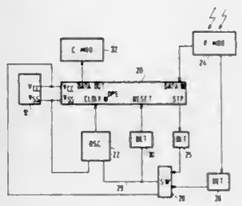
wherein S_1' is the signal from said radiometer when said source is blocked by said shutter, τ_{BS} is the reflectance of the beam splitter, W_a is the blackbody radiance equivalent to ambient temperature, e_w is wafer emittance as determined by $e_w = 1 - r_w - t_w$ where r_w is the reflectance of the wafer and t_w is the transmittance of the wafer, and W_w is the instantaneous blackbody radiance of the wafer, the instantaneous wafer temperature T_w having a fixed known relationship to W_w.

4,823,292

DATA PROCESSING APPARATUS WITH ENERGY SAVING CLOCKING DEVICE

Hervé Hillion, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1987, Ser. No. 86,440
Claims priority, application United Kingdom, Aug. 18, 1986, 8620056
Int. Cl.⁴ G09G *3/00*; G06F *1/00*
U.S. Cl. 364—707 **14 Claims**



1. A data processing apparatus, comprising:
a. data processing element, having an operating mode and stop mode, said element comprising:
i. a data input;
ii. a first data output;
iii. a reset signal input;
iv. a clock input;
first power supply terminal means; and
vii. rest means for, under combined control of a series of clock pulses and a reset signal on said rest signal input, attaining an initial state within a redetermined time interval;
b. oscillator means for feeding said clock input with clock pulses, said oscillator means having second power supply terminal means;
c. a data receiving module for receiving external data, aid module having a second data output connected to the data input;
d. switching means, disposed within the data processing

element, and connected between said second power supply terminal means and said oscillator means, the switching means having:

i. a first control input for detecting an interrupt signal produced by said data receiving module and for, upon detecting said interrupt signal, causing said switching means to assume an operating power transmitting state for said second supply terminal means;

ii. a second control input, fed by said stop signal, for, upon detection of a stop signal generated by said data processing element, driving said switching means to a stand-by power transmitting state for said second supply terminal means;

e. a transition signal detector, connected between said witching means and said reset signal input, for, upon detecting any transition form said stand-by power transmitting state to said operating power transmitting state, generating a rest pulse, that has a trailing edge occurring only after termination of said predetermined time interval

characterized in that said switching means comprises:

i. rest-set-latch having a rest input. a set input, and an output terminal;

an interrupt-signal-detector feeding said reset input and connected to said first control input for detecting the interrupt signal produced by said data receiving module;

ii. a stop-signal detector connected to said set input and said second control input and fed by said stop signal output for detecting the stop signal; and

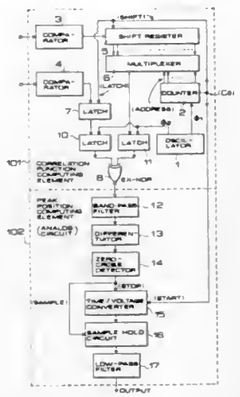
iii. a transistor having a control electrode connected to said output terminal and having a conduction path connected between an input of said transition-signal detector and said second power supply means.

4,823,293

CORRELATION TIME-DIFFERENCE DETECTOR

Minoru Oda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,719
Claims priority, application Japan, Mar. 13, 1985, 60-48398
Int. Cl.[4] G06J *1/00;* **G06F** *15/336;* **G04F** *10/04*
U.S. Cl. 364—604 **6 Claims**



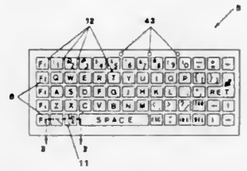
1. A correlation time-difference detector including a correlation function computing element operated periodically for obtaining the correlation function between two analog input signals and further including a peak position element for providing a peak position of the obtained correlation function by computation, wherein said peak position computing element comprises an analog circuit including means for extracting a fundamental frequency component of the same frequency as the operating frequency of said correlation function computing element from the output of said correlation function computing element and means for detecting the phase of the extracted fundamental frequency component with reference to a start signal of each operating cycle of said correlation function computing element.

4,823,294

SINGLE-HAND COMPUTER KEYBOARD

S. Zia Rouhani, 3028 Hartert Dr., Idaho Falls, Id. 83401

Filed Aug. 28, 1986, Ser. No. 901,431
Int. Cl.[4] G06F *3/02;* **H03K** *17/94;* **H04L** *15/08*
U.S. Cl. 364—709.12 **18 Claims**



1. In a data entry system having a keyboard provided with a plurality of keys to be depressed by an operator, such keyboard being electronically connected to a data processing device and a readout and data storage device, the improvement comprising:

a. a keyboard of reduced size, the size being such that the fingers of an operator are too large to adequately distinguish between individual keys of said keyboard, a plurality of said keys each having at least two separate and distinct functions;

b. a hand-held pen-like key pointer for depressing individual keys of said keyboard;

c. said keypointer electrically connected to the keyboard, and being provided with a ,plurality of keys which when depressed by the operator s fingers, provide separate and distinct functions for said keyboard keys when depressed; and

d. the keyboard configured to send

(i) a first signal to the data processing device when a keyboard key is depressed by the keypointer; and

(ii) a second signal to the data processing device when a keypointer key is depressed as a keyboard key is depressed by the keypointer.

4,823,295

HIGH SPEED SIGNAL PROCESSOR

James M. Mader, Indialantic, Fla., assignor to Harris Corp., Melbourne, Fla.

Filed Nov. 10, 1986, Ser. No. 929,057
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—716 **30 Claims**

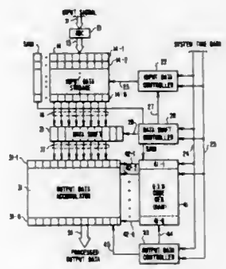
1. An apparatus for carrying out a prescribed signal processing operation on input signals respective values of which are provided in digitally encoded format as multibit digital signal codes comprising:

first means, coupled to receive said multibit digital signal codes, for controllably shifting respective ones of the codes by a controllable number of bits and providing the resulting shifted multibit codes over respective bit lines of a multibit output link;

second means for generating a plurality of signal processing operation control codes over respective ones of a plurality of control code output lines; and

third means, coupled to the multibit output link of said first means and to said plurality of control code output lines of said second means, for generating a plurality of digital

output codes in accordance with a relationship between the contents of the respective ones of said signal process-



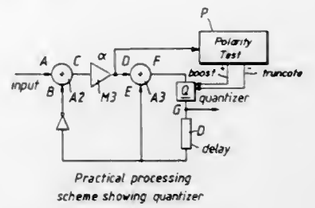
ing operation control codes and shifted multibit digital codes provided over said multibit output link.

4,823,296

FIRST ORDER DIGITAL FILTER WITH CONTROLLED BOOST/TRUNCATE QUANTIZER

Paul C. Millar, Felixstowe, England, assignor to British Telecommunications public limited company, England

Filed Apr. 28, 1986, Ser. No. 856,474
Claims priority, appilcation United Kingdom, Apr. 30, 1985, 8510969
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.03 **7 Claims**



Practical processing scheme showing quantizer

1. A first-order digital filter comprising:

an input node connected via subtraction means, multiplication means, addition means and quantization means to an output node for accepting an input digital signal at said input node and providing an output digital signal at said output node which results from operation of said subtraction means, multiplication means, addition means and quantization means upon said input digital signal;

said quantization means reducing the number of bits appearing at said output node relative to the number of bits resulting from operation of said subtraction means, multiplication means and addition means; and

delay means for feeding back the output digital signal to both the subtraction means and the addition means;

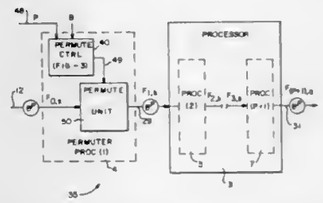
the quantization means being arranged in operation to selectively either (a) truncate or (b) truncate and increment the signal input thereto in dependence on the value of the output of the multiplication means.

4,823,297

DIGIT-REVERSAL METHOD AND APPARATUS FOR COMPUTER TRANSFORMS

David M. W. Evans, Palo Alto, Calif., assignor to Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Dec. 12, 1986, Ser. No. 941,021
Int. Cl.[4] G06F *15/332*
U.S. Cl. 364—725 **20 Claims**



1. An apparatus for the digit-reverse reordering of an N-valued initial sequence having elements x_i in the order $x_0, x_1, \ldots, x_i, \ldots x_{(N-1)}$ to form a reordered sequence having elements x_j in the order $x_0, x_1, \ldots, x_j, \ldots, x_{(N-1)}$ where i and j are indices formed of P base-B digits, b_k, as $i=(b_Pb_{P-1}, \ldots, b_k, \ldots, b_2b_1)$ where k has values P, P−1, . . . , 2, 1 and $j=(b_1b_2, \ldots, b_k, \ldots, b_{P-1}b_P)$ where k has values 1, 2, . . . , P−1, P, where B is greater than or equal to 2, where N equals B^P, and where B and P are integers comprising:

means for providing seed values where the seed values are a function of P,

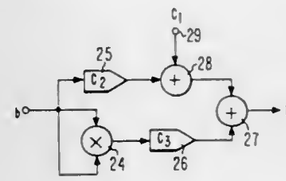
means for calculating the digit reversed pairs of indices i and j based upon said seed values.

4,823,298

CIRCUITRY FOR APPROXIMATING THE CONTROL SIGNAL FOR A BTSC SPECTRAL EXPANDER

Hai-Ping Wu, Princeton Jct., and Ronald Kolczynski, Hamilton Township, Mercer County, both of N.J., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed May 11, 1987, Ser. No. 48,428
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—735 **8 Claims**



1. Apparatus for generating a control signal k(b) from a signal b where values of the signal k(b) are substantially equivalent to values represented by the function

$k(b)=R(b+1)/(b+51)$, where R is a constant, comprising:

an input terminal for applying a signal;

means coupled to said terminal for developing a further signal corresponding substantially to the RMS value of said signal;

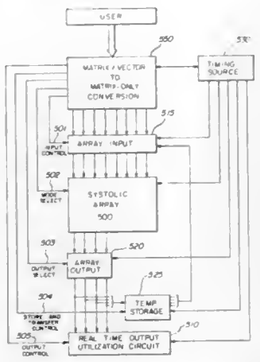
means coupled to said terminal for developing a signal corresponding substantially to the mean square of said signal;

means for scaling said further signal by a first constant coefficient C2;

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means for scaling said mean square of said signal by a second constant coefficient C3;
means for providing a constant value C1; and
means for arithmetically combining said constant value C1, the further signal scaled by the constant C2 and the mean square of said signal scaled by the constant C3 to produce said control signal.

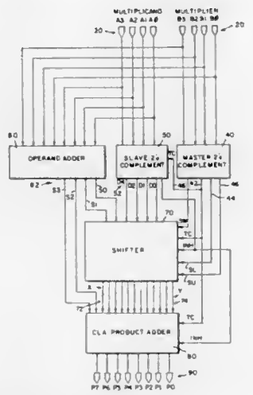
4,823,299
SYSTOLIC VLSI ARRAY FOR IMPLEMENTING THE KALMAN FILTER ALGORITHM
Jaw J. Chang, Arcadia, and Hen-Geul Yeh, Lomita, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Apr. 1, 1987, Ser. No. 32,819
Int. Cl.[4] G06F *7/38, 7/52*
U.S. Cl. 364—735 **13 Claims**



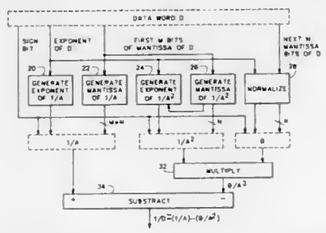
10. Apparatus for solving equations having a matrix and vector terms in real time, said apparatus comprising:
means for mapping a first equation, having both matrix and vector terms, into an equivalent equation which contains matrix-only values that represent both the matrix and vector terms of said first equation;
a systolic array, with an appropriate number of cell elements according to the size of matrix to provide a real-time solution of said matrix-only values, connected to said mapping means; and
means for applying electrical signals representing the matrix-only values to said systolic processing array for solution thereof.

4,823,300
PERFORMING BINARY MULTIPLICATION USING MINIMAL PATH ALGORITHM
Chrostopher W. Malinowski, Melbourne Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.
Filed May 19, 1987, Ser. No. 51,386
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—757 **34 Claims**

1. A binary multiplier for performing a binary multiplication of multiplicand and multiplier operands comprising:
first means for selecting complement or non-complement multiplication as a function of non sign bits of one of said operands; and
multiplication means for performing non-complement multiplication of the multiplier and multiplicand operands for a non-complement selection and for performing complement multiplication of the multiplier and multiplicand operands for a complement selection.

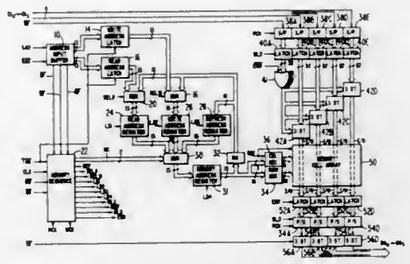


4,823,301
METHOD AND CIRCUIT FOR COMPUTING RECIPROCALS
David L. Knierim, Wilsonville, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Oct. 22, 1987, Ser. No. 111,965
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—761 **12 Claims**



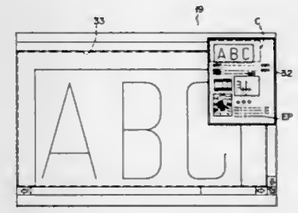
1. A circuit for generating an output signal representing an output number approximating a reciprocal of an input number of magnitude D represented by an input signal, said input signal comprising a set of M most significant bits and a set of N next most significant bits, the circuit comprising:
first means responsive to said input signal for generating a first signal representing a first number approximating 1/A, wherein A is a number in accordance with said M most significant bits of said input signal;
second means responsive to said input signal for generating a second signal representing a second number approximating B/A^2, wherein B is a number approximately equal to D—A; and
third means for combining said first and second signals to generate said output signal representing said output number.

4,823,302
BLOCK ORIENTED RANDOM ACCESS MEMORY ABLE TO PERFORM A DATA READ, A DATA WRITE AND A DATA REFRESH OPERATION IN ONE BLOCK-ACCESS TIME
Todd J. Christopher, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Jan. 30, 1987, Ser. No. 8,695
Int. Cl.[4] G06F *12/00;* **G11C** *7/00*
U.S. Cl. 364—900 **10 Claims**



1. A digital data memory system realized as a single integrated circuit comprising:
block oriented digital data storage means wherein each block includes D dynamic data storage elements and has a unique address, where D is a positive integer;
an input port for applying a continuous stream of input data values to the memory system;
control means, coupled to said input port and to said block oriented digital data storage means, for performing a write operation which includes storing D data values applied via said input port into one of said blocks during a time interval T_{WR}, performing a read operation which includes retrieving D data values from one of said blocks during a time interval T_{RD}, and performing a refresh operation which includes refreshing at least D data values held in one of said blocks during a time interval T_{RF} where the time intervals T_{WR}, T_{RD} and T_{RF} are mutually exclusive;
a source of data output clock signal having a maximum frequency of f_c; and
data output means, coupled to said block oriented digital data storage means, having a parallel input port for receiving the D data values provided by said block oriented digital data storage means during said time interval T_{RD}, and a serial output port for providing the received D data values sequentially in synchronism with D successive pulses of said data output clock signal to provide a continuous stream of output data values;
wherein said control means is designed to perform one read operation, one write operation and one refresh operation in a time interval not greater than an amount of time represented by a mathematical expression, D/f_c to condition said memory system to store said continuous stream of input data values and to provide said continuous stream of output data values.

4,823,303
DISPLAY CONTROL APPARATUS FOR USE IN COMPOSITE DOCUMENT PROCESSING APPARATUS
Michiyuki Terasawa, Iruma, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 15, 1987, Ser. No. 73,744
Claims priority, application Japan, Jul. 17, 1986, 61-166743
Int. Cl.[4] G06F *15/72*
U.S. Cl. 364—521 **4 Claims**



1. A display control apparatus for a composite document processing apparatus, comprising:
document data storage means for separately storing different types of data, including character code data, image data and graphic data, which together constitutes a composite document;
data attribute storage means for storing attribute data for each data stored in said document data storage means, said attribute data including a location in said composite document, an area size and a type of said each data stored in said document data storage means;
window/viewport storage means for storing attribute data including a window size and a viewport size;
display data storage means for storing image-formation display data;
display means for displaying said image-formation display data; and
control means for writing said data stored in said document data storage means into said display data storage means in an image form in accordance with said attribute data stored in said data attribute storage means and said attribute data stored in said window/viewport storage means, said control means including:
first display control means for reducing all of said composite document or an arbitrary portion of said composite document responsive to a size of a first window, indicating a region of said document data storage means where data is to be displayed, and a first viewport for indicating a display region of said display means on which said display data on said first window is to be displayed, said reducing being such that said first window falls within said first viewport, and for writing said reduced document data into said display data storage means in an image form, thus providing a reduced display to said display means when said reduced document data is read therefrom,
second display control means for performing an equal enlargement or a greater of a second window, which has as a maximum size the same size as said first window, and a display data within said second window, in such a manner that said second window falls within a second viewport corresponding to said second window, and for writing said enlarged display data in said display data storage means in an image form, thereby providing an enlarged display to said display means, and
third display control means, responsive to an updating of data by said second display control means for updating, in real time, data displayed on said first viewport which corresponds to updated data.

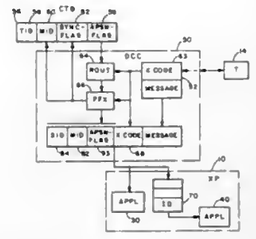
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4,823,304

METHOD OF PROVIDING SYNCHRONOUS MESSAGE EXCHANGE IN AN ASYCHRONOUS OPERATING ENVIRONMENT

Billy J. Frantz, Cloutarf, Australia, and Sven E. Hellstrom, Vallingby, Swedea, assignors to International Business Machines Incorporated, Armonk, N.Y.

Filed Jan. 15, 1987, Ser. No. 3,444
Int. Cl.[4] G06F *7/00, 7/38, 9/00, 15/16*
U.S. Cl. 364—900 **5 Claims**



1. A method for establishing and maintaining conversational status among communicating endpoints in a transaction processing system, said system including a plurality of terminals, a data communication component (DCC) connected to the terminals, and a transaction processor (XP) for exchanging message data with the DCC for transmission to selected terminals, comprising the steps of:

ascertaining, at the DCC, whether a transaction initiated by a message produced at a terminal and forwarded to the XP through the DCC is synchronous or asynchronous;

passing said transaction from the DCC to the XP for generation of a response; and

processing responses to synchronous transactions in progress while buffering the. responses to asynchronous transactions until said responses to said synchronous transactions are completed.

4,823,305

SERIAL DATA DIRECT MEMORY ACCESS SYSTEM

Earl J. Holdren, Windsor, Canada, and Alexander J. Owski, Redford, Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Continuation-in-part of Ser. No. 887,013, Jul. 18, 1986, abandoned. This application May 26, 1988, Ser. No. 203,620
Int. Cl.[4] G06F *3/04*
U.S. Cl. 364—900 **6 Claims**

1. A method for storing transient response data derived from rapidly changing physical phenomena, said data being in the form of serial digital numbers, said method includes the steps of:

(a) adding a predetermined number of code bits to each of said digital numbers to form a digital word having a START bit, a select number of operational bits and a frame of information bits, said digital word providing a particular protocol for processing transient response data;

(b) adding a clock signal of a chosen frequency to each of said data words;

(c) encoding each of said serial words and said added clock signal into a chosen code format suitable for data transmission;

(d) transmitting each of said encoded serial words and clock signal as digital light signal stream over a fiber optic cable to an optical receiver, said optical receiver being capable of receiving the light signal stream transmitted over said optical fiber cable;

(e) at said digital receiver, converting said digital light signal stream transmitted over said fiber optics cable into a reconstructed encoded serial digital electric signal data stream;

(f) decoding said serial digital electric signal data stream so as to reconstruct each of said serial digital data words and said added clock signal;

(g) counting each bit in each of said serially presented word to detect said START bit to provide an indicating of a sufficient number of bits for forming a message word;

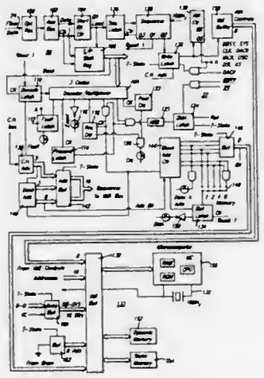
(h) sequentially shifting each bit of said serial digital electric signal data onto parallel output lines at the reconstructed added clock rate;

(i) latching at said parallel output lines the sufficient number of serial bits of said data stream in response to the indication of the START bit to reconstruct each of said data words which form a message word;

(j) providing a direct memory access computer bus system comprised of a master computer, an interface bus, and static and dynamic memories;

(k) providing a control circuit capable of sharing control of said interface bus with said master computer, said control circuit being responsive to each of said message words in controlling directly accessing said memories of said bus system;

(l) providing a message word used in conjunction with subsequent critical message words needed for operating said control circuits for preventing erroneous messages being employed to operate said control circuit;



(m) providing a critical message word used to operate said control circuit so as to arbitrate with said master computer for control over said interface bus;

(n) decoding each of said operational code bits of each word so as to operate said control circuit in either a pre-DMA mode, a DMA mode or a post DMA mode;

(o) after gaining control over said interface bus, forming an address word which is added to each of said data words for providing an address location in the memories of said computer memory system for each of said message words that is stored in memory.

(p) designating block locations of memory for storing designated forms of message words;

(q) writing a plurality of sample data words into memory address and block locations corresponding to the locations designated by each of said formed address words and the designated blocks, the writing of said sample data words being such as to exhort the memory locations causing over writing of the data in memory locations specified to receive the sample data;

(r) writing the transient response data in memory in a manner preventing the overwrite of such data; and

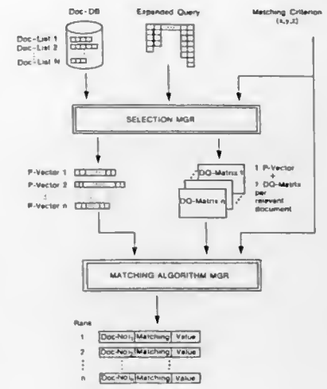
(s) after said control circuit finishes controlling accessing the memories via said interface bus, relinquishing control of said interface bus to said master computer.

4,823,306

TEXT SEARCH SYSTEM

Federico Barbic, Bergamo, Italy, and David M. Choy, Los Altos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1987, Ser. No. 85,110
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—900 **20 Claims**



1. A method implemented in a data processing apparatus for retrieving from among more than one library document those matching the content of a sequence of query words, comprising the steps of:

(a) defining a set of equivalent words for each of the query words and assigning a word equivalence value to each of said equivalent words; and

(b) computing a relevance factor for a library document, comprising the steps of:

(i) locating target sequences of words in the library document that match the sequence of query words, and equivalence thereof, according to a set of matching criteria;

(ii) evaluating similarity values of said target sequences of words, each similarity value being evaluated as a function of the equivalence values of words included in the corresponding target sequence; and

(iii) said relevance factor being computed as a function of the similarity values of its target sequences.

4,823,307

MOS SELFCHECKING MICROPROGRAMMED CONTROL UNIT WITH ON-LINE ERROR DETECTION

Marcello Melgara; Maurizio Paolini, both of Valenza, and Maura Turolla, Torino, all of Italy, assignors to Cselt - Centro Studi e Laboratori Telecomunicazioni S.P.A., Italy

Filed Mar. 12, 1986, Ser. No. 839,114
Claims priority, application Italy, Mar. 25, 1985, 67285 A/85
Int. Cl.[4] G06F *11/28, 9/00, 7/02*
U.S. Cl. 364—900 **9 Claims**

1. An MOS selfchecking microprogram control unit with on-line error detection, comprising:

a microinstruction memory (MIM1) generating at an output thereof in the event of a failure only unidirectional errors, said microinstruction memory containing microinstructions each containing, in addition to a microinstruction datum field, two further fields consisting respectively of a current address code (CS) of a position in the microinstruction memory (MIM1) at which the microinstruction is physically contained and a future address code (FS) of a position in the microinstruction memory (MIM1) at which the next microinstruction is physically contained, said microinstructions including conditional-jump microinstructions being allocated in said microinstruction memory (MIM1) with codes related to one another by gating logic relationships and determining jumps to respective addresses according to a value of a variable;

a temporary storage microinstruction register (MIR1) connected to said output of said microinstruction memory (MIM1);

a first register counter (RCT1) connected to said temporary storage microinstruction register (MIR1);

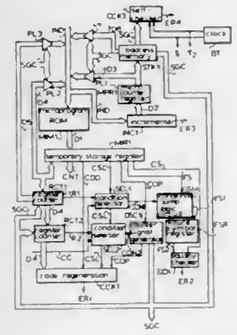
a second register counter (RCT2) connected to said first register counter (RCT1);

a first condition selector (SEL1) connected to said temporary storage microinstruction register (MIR1) and to said first register counter (RCT1);

a second condition selector (SEL2) connected to said second register counter (RCT2) and to said first condition selector (SEL1);

a programmed-logic-array control signal generator (DSC1) having an input connected to an output of said temporary storage microinstruction register (MIR1) and generating in the event of failure only unidirectional errors at outputs of the programmed-logic-array control signal generator, said programmed-logic-array control signal generator (DSC1) being connected to said temporary storage microinstruction register (MIR1) and to said second condition selector (SEL2);

a microprogram counter comprising an incrementer (INC1)



connected to said microinstruction memory (MIM1) and a microprogram counter register (MPR1) connected to said incrementer (INC1), said incrementer (INC1) and said microinstruction memory (MIM1) receiving external inputs through a bus (IND);

a temporary address memory (STK1) of stack-point addresses of a main instruction sequence haivng an input connected to an output of said microprogram counter register (MPR1), said temporary address memory (STK1) including a first selfchecking equality checker (VA1) for checking results of operations on control signals for registers of the temporary address memory (STK1), said temporary address memory (STK1) having an output connected to said bus (IND);

a code-regeneration selfchecking microinstruction checker (CCK1) connected to said second register counter (RCT2), to said second condition selector (SEL2), to said programmed-logic-array control signal generator (DSC1) and to said temporary storage microinstruction register (MIR1);

means connected to said temporary storage microinstruction register (MIR1) and responsive to said current address code (CS) and said future address code (FS) and controlled by said first condition selector (SEL1) for comparing a current address code (CS) of a particular microinstruction from said temporary storage microinstruction

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register (MIR1) with a future address code (FS) from a prior microinstruction from the temporary storage microinstruction register (MIR1) delayed by a microinstruction time and present in the prior microinstruction modified by said logic relationships as determined by said first condition selector (SEC1) and emitting a first error indication (ER2) upon a discrepancy in the comparison to effect a self-check of jump microinstruction;

said incrementer (INC1) being connected to and receiving inputs from said bus (IND) being constructed to generate upon possible circuit failures only unidirectional errors on address outputs to said microprogram counter register (MPR1) in the event of failures at address inputs thereto and to output a second error indication (ER3) upon development of arithmetical errors involving internal carry signals; and

means for applying control signals generated by said programmed-logic-array control signal generator (DSC1) to said temporary address memory (STK1) of stack-point addresses whereby said temporary address memory (STK1) is controlled by the control signals received from said programmed-logic-array control signal generator (DSC1) and which are carried to said first selfchecking equality checker (VA1) emitting a third error indication (ER4) upon a failure of the control signals from said programmed-logic-array control signal generator (DSC1),

said code-regeneration selfchecking microinstruction checker (CCK1) generating a microinstruction code from words passed from said temporary storage microinstruction register (MIR1) through said register counters (RCT1) and (RCT2), and from control signals from said temporary storage microinstruction register (MIR1), said second condition selector (SEL2) and said programmed-logic-array control signal generator (DSC1) and comparing the thus-generated microinstruction code with a microinstruction code contained in the microinstruction emitted by said temporary storage microinstruction register (MIR1) to emit a fourth error signal (ER1) upon a comparison discrepancy.

4,823,308

MICROCOMPUTER WITH SOFTWARE PROTECTION

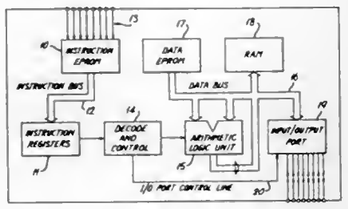
Michael J. Knight, Dorking, England, assignor to Knight Technology Ltd., Dorking, England

Filed Jan. 25, 1985, Ser. No. 695,194

Claims priority, application United Kingdom, Feb. 2, 1984, 8402795

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—900 **11 Claims**



1. A single chip microcomputer for protecting computer software from unauthorised copying and use, comprising: non-volatile memory means for non-volatilely storing instructions of a computer program; means for executing said instructions; a first internal communication channel connecting said memory to said means for executing instructions to couple said instructions from said memory means to said executing means; input/output means for passing data to and from the microcomputer, said input/output means being under sole control of instructions stored in said memory means so that said instructions cannot be read or indirectly inferred as a result of other externally-generated instructions controlling said input-/output means; and a second internal communication channel connecting the input/output means to the means for executing instructions, wherein said first and second communication channels are configured such that there is no permanent path and no conditional path, for the transfer of instructions between the first and second channels in either direction so that said instructions cannot be read or indirectly inferred by external means.

4,823,309

DATA PROCESSING SYSTEM WITH IMPROVED OUTPUT FUNCTION

Yuko Kusaka, and Keiji Matsumoto, both of c/o NEC Corporation, 33-1, Shiba 5-chome, Minato, Tokyo, Japan

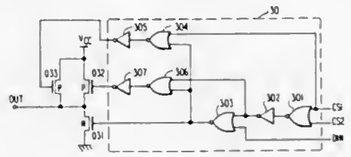
Division of Ser. No. 604,249, Apr. 26, 1984, Pat. No. 4,728,822.

This application Aug. 21, 1987, Ser. No. 87,842

Claims priority, application Japan, Apr. 26, 1983, 58-73279

Int. Cl.⁴ G06F *13/00*; H03K *19/094*

U.S. Cl. 364—900 **9 Claims**



1. In a data processing system which is energized by a power supplied between a first power line held at a high level voltage and a second power line held at a low level voltage and which has an output switching stage having an output terminal and producing a processed data at said output terminal in a normal processing period and producing a stationary out signal at said output terminal in a standby period, said processed data having either said high or low level voltage, and said output switching stage including a first switch circuit connected between said output terminal and first power line and a second switch circuit connected between said output terminal and said second power line, the improvement comprising a means for producing a first or second control signal at a time in said standby period and a means for controlling said output switching stage to turn both of said first and second switch circuits into non-conductive states in response to said first control signal, thereby to disconnect said output terminal from both of said first and second power lines, and to turn one and the other of said first and second switch circuits into conductive and non-conductive states in response to said second control signal, thereby to connect said output terminal to either one of said first and second power lines.

4,823,310

DEVICE FOR ENABLING CONCURRENT ACCESS OF INDEXED SEQUENTIAL DATA FILES

Arthur Grand, Nashua, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Aug. 10, 1987, Ser. No. 84,253

Int. Cl.⁴ G06F *7/00, 7/08*

U.S. Cl. 364—900 **41 Claims**

1. In a computer system for storing a file of data elements, a method of sequentially reading a list of succeeding ordered elements in the file while concurrently allowing the list to be modified, the steps comprising:

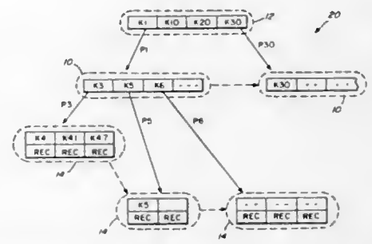
providing in a first memory area of the computer system a tree-structure data file for holding a plurality of ordered elements and therewith defining a list, the tree-structure having a plurality of nodes each holding an ordered sub-

group of the ordered elements, the nodes linked to each other, in order, by associated pointers;

assigning timestamps to the elements in the tree structure upon providing the tree structure;

reading an element;

recording in a second memory area both an indication of the read element and an indication of the timestamp corresponding to the read element;



updating the timestamp of the read element to a current timestamp each time the node holding the element is modified; and

comparing the current timestamp assigned to the read element with the timestamp as indicated by the recorded indication before reading a succeeding element to determine a currently succeeding element of the read element such that modifying the list is enabled while the list is sequentially read.

4,823,311

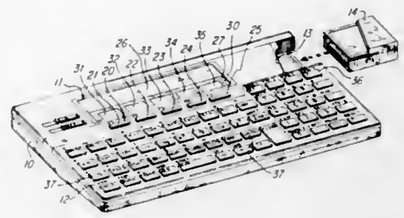
CALCULATOR KEYBOARD WITH USER DEFINABLE FUNCTION KEYS AND WITH PROGRAMMABLY ALTERABLE INTERACTIVE LABELS FOR CERTAIN FUNCTION KEYS

Arthur C. Hunter, Wylie, and Linda J. Ferrio, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 30, 1986, Ser. No. 868,987

Int. Cl.⁴ G06F *3/02*

U.S. Cl. 364—900 **8 Claims**



1. A data processing apparatus comprising:

a data processing unit for receiving data inputs and providing data outputs indicative of the data inputs and/or computation from such data inputs;

a keyboard coupled to said data processing unit and having a plurality of individual keys for providing data inputs to said data processing unit in response to actuation of individual keys;

said keyboard including a dedicated keyboard portion of said plurality of individual keys providig a plurality of dedicated definable-function keys distinct from the remaining plurality of individual keys of said keyboard, each of said dedicated definable-function keys being subject to recharacterization to any one of a plurality of different functions;

means for defining respective different specific functions assigned to each of said plurality of dedicated definable-function keys, said function-defining means including a mode-define key on said keyboard separate from said dedicated definable-function keys and operable upon actuation to enable data inputs from keys other than the dedicated definable-function keys to define the functions attributable to each said dedicated definable-function key;

said data processing unit including means responsive to said function-defining means to assign respective function labels to each of said plurality of dedicated definable-function keys, the function labels of each of said plurality of dedicated definable-function keys being replaceable by any one of a plurality of different function labels respectively corresponding to a different one of said plurality of functions to which each of said plurality of dedicated definable-function keys may be assigned by said function-defining means;

display means coupled to said data processing unit on which the data inputs from the actuation of individual keys and-/or computations resulting from such data inputs visually appear, said display means including a dedicated display portion corresponding to said plurality of dedicated definable-function keys of said keyboard for visually indicatig a key label symbol for each of said plurality of dedicated definable-function keys defining the function attributable to each respective dedicated definable-function key; and

graphic means responsive to said function label-assigning means for providing visual symbols on said dedicated display portion of said display means as respective labels indicative of the functions assigned to each of said dedicated definable-funtion keys, said graphic means providing a different visual symbol on said dedicated display portion of said display means as a different label for each of said plurality of dedicated definable-function keys in response to the assignment of a respective different specific function to any one of said plurality of dedicated definable-function keys by said function-defining means, whereby each of said plurality of dedicated definable-function keys may be relabeled to be designated by a different visual symbol when any one of said plurality of dedicated definable-function keys is reassigned to a respective different specific function by said function-defining means.

4,823,312

ASYNCHRONOUS COMMUNICATIONS ELEMENT

Martin S. Michael, San Jose; Prashant A. Kanhere, Santa Clara; Richard P. Burnley, Mountain View; Franco Iacobelli, Sunnyvale, and Ta-Wei Chien, San Jose, all of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed Oct. 30, 1986, Ser. No. 924,797

Int. Cl.⁴ H04Q *9/00*; H04L *25/38*; G06F *3/04*

U.S. Cl. 364—900 **15 Claims**

1. A data communications device of the type that performs parallel-to-serial conversion on digital data transmitted by a data processing system for serial transfer to a communication station, such as a peripheral device or modem, which is external to the data processing system and serial-to-parallel conversion on digital data received from the communications station for parallel transfer to the data processing system, the data communications device comprising:

(a) a receiver shift register that receives serial data transfers from the communications station;

(b) a receiver buffer register having storage capacity for a single data character received from the receiver shift register for parallel transfer to the data processing system;

(c) selectively enable receiver memory means comprising a plurality of storage locations for storing data characters received in parallel from the receiver shift register when

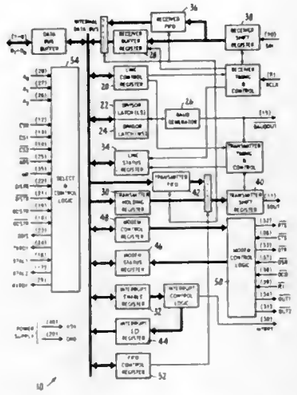
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the receiver memory means is enabled for parallel transfer to the data processing system;

(d) transmitter memory means for receiving data characters transferred in parallel from the data processing system;

(e) a transmitter shift register that receives data characters in parallel from the transmitter memory means for serial transfer to the communications station; and

(f) means for enabling the receiver memory means such that data characters transferred from the receiver shift register are transferred to the data processing system via the receiver memory means.

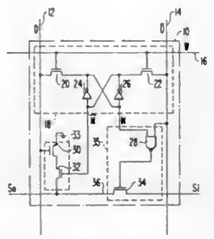


4,823,313

MEMORY DEVICE WITH COMPARISON FUNCTION

Hiroshi Kadota, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 12, 1986, Ser. No. 930,364
Claims priority, application Japan, Nov. 19, 1985, 60-258938
Int. Cl.[4] G11C *15/00*
U.S. Cl. 365—49 **13 Claims**



1. A memory device with a comparison function comprising:

a plurality of unit cells connected in a matrix of rows and columns such that each row forms a memory word; each unit cell including:

(a) a memory cell for holding data to be stored, said memory cell coupled to a bit line and a word line;

(b) a sense input node connected to a sense output node of a less significant neighboring memory cell in the word;

(c) a sense output node connected to a sense input node of a more significant neighboring memory cell in the word;

(d) a first switching circuit disposed between one of said sense nodes and a first power supply terminal, and having two control inputs which receive the logical complement of the stored data in said memory cell and input data on said bit line, respectively, wherein said first switching circuit is conductive only when both control inputs are at a logical "1" level;

(e) a second switching circuit disposed between said sense output node and said sense input node, and having two control inputs which receive the stored data in said memory cell and the logical complement of the input data on said bit line, respectively, wherein said second switching circuit is non-conductive only when both control inputs are at a logical "1" level;

load elements respectively disposed between a second power supply terminal and the sense output node of the most significant MSB memory cell in each word;

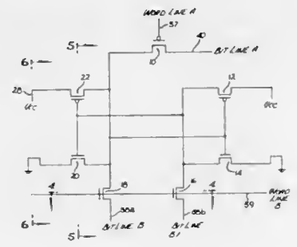
whereby, results of the comparison can be detected by the voltages across said load elements.

4,823,314

INTEGRATED CIRCUIT DUAL PORT STATIC MEMORY CELL

Owen Sharp, Aptos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 808,464, Dec. 13, 1985, abandoned.
This application Dec. 14, 1987, Ser. No. 132,416
Int. Cl.[4] G11C *5/02, 11/40;* **H01L** *27/02*
U.S. Cl. 365—51 **14 Claims**



1. A plurality of integrated circuit dual port static memory cells, comprising:

a substrate of a first conductivity type;

a first continuous region of a second conductivity type formed on said substrate;

said plurality of cells formed in said substrate, said plurality of cells comprising a fist memory cell and a second memory cell, said second memory cell formed as a mirror image of said second memory cell;

said first memory cell comprising:

(a) a first word line disposed in a first direction for accessing said cell at a first port;

(b) a second word line disposed in a second direction, generally perpendicular to said first direction, for accessing said cell at a second port;

(c) a first bit line generally parallel to said second word line for providing data for said first port;

(d) at least one second bit line generally parallel to said first word line for providing data for said second port;

(e) a bistable circuit;

(f) a first transistor of a first conductivity type formed in said first continuous region coupled with said first word line and said bistable circuit;

(g) a second transistor of a second conductivity type formed in said substrate coupled with said second word line and said bistable circuit;

(h) a third and fourth transistor of a first conductivity type and a fifth and sixth transistor of a second conductivity type, said first, third and fourth transistors being formed in a common well;

whereby a plurality of dual port memory cells are realized

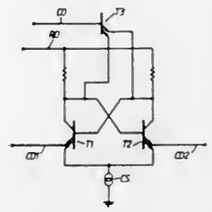
requiring formation of a single continuous region on said substrate.

4,823,315

PLURAL EMITTER MEMORY WITH VOLTAGE CLAMPING PLURAL EMITTER TRANSISTOR

Ian C. Wood, and David G. Taylor, Both of Northampton, England, assignors to Plessey Overseas Limited, Ilford, England

Filed May 18, 1987, Ser. No. 51,450
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—155 **1 Claim**



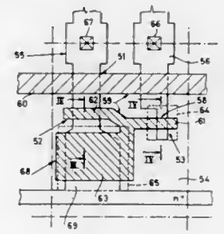
1. A transistor memory cell device comprising a pair of cross-coupled transistors constituting storage elements for storing binary information and having column drive emitter inputs to which a relatively high column drive current is arranged to be applied for the selective read or write operation of storage elements of the cell device, in which a constant current source provides a relatively low value hold current to maintain the binary digit information stored in the storage elements in the absence of the column drive current, in which a voltage clamping dual emitter transistor has the emitters thereof connected directly to the respective base-collector interconnections of the pair of cross-coupled transistors, with the base of the clamping transistor having applied to it an offset voltage higher than a voltage applied to a non select line connected to the collector circuits of the cross-coupled transistors whereby the possible forward bias of the cross-coupled transistor pair base-collector junction is small enough to avoid saturation.

4,823,316

EEPROM MEMORY CELL WITH A SINGLE POLYSILICON LEVEL AND A TUNNEL OXIDE ZONE

Carlo Riva, Monza, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Filed Nov. 12, 1987, Ser. No. 119,498
Claims priority, application Italy, Nov. 18, 1986, 22373 A/86
Int. Cl.[4] G11C *13/00, 11/40*
U.S. Cl. 365—185 **2 Claims**



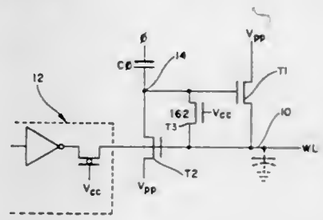
1. EEPROM memory cell comprising a selection transistor, a pickup transistor with floating gate and control gate, and a tunnel condenser with thin oxide zone formed using a single layer of polysilicon for the floating gate and the tunnel condenser and at least one active area with n^+ diffusion for the control gate said thin oxide zone of the tunnel condenser being formed on an active area distinct and separate from that of the pickup transistor, the active area of the pickup transistor being serially connected with said diffusion of the control gate.

4,823,317

EEPROM PROGRAMMING SWITCH

Dhaval J. Brahmbhatt, San Jose, Calif., assignor to ICT International CMOS Technolgy, Inc., San Jose, Calif.

Filed Jan. 20, 1988, Ser. No. 146,231
Int. Cl.[4] G11C *7/02;* **H03K** *17/687, 19/017*
U.S. Cl. 365—189 **5 Claims**



1. A circuit for charging a word line in an EEPROM device comprising

a word line,

decoder means operably connected to said word line to prevent charge accumulation on said word line when said word line is not selected for programming and for allowing charge accumulation on said word line when said word line is selected for programming,

a programming voltage (V_{PP}) source,

a clock voltage (ϕ) source,

capacitive means having first and second terminals, said first terminal connected to said clock voltage source and said second terminal defining a charge pump node,

a first field effect transistor serially connected between said programming voltage source and said word line, said first transistor having a gate electrode,

means connecting said charge pump node to said gate electrode of said first transistor,

a second field effect transistor serially connected between said programming voltage source and said charge pump node, said second transistor having a gate electrode, and

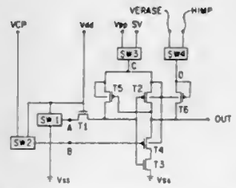
means connecting said word line to said gate electrode of said second transistor.

4,823,318

DRIVING CIRCUITRY FOR EEPROM MEMORY CELL

Sebastiano D'Arrigo, Houston, Tex.; Giuliano Imondi, Rieti, Italy; Sung-Wei Lin, Houston, and Manzur Gill, Rosharon, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 2, 1988, Ser. No. 239,877
Int. Cl.[4] G11C *11/84, 7/00*
U.S. Cl. 365—189 **19 Claims**



1. A circuit for applying reading, programming and erasing

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voltages to a wordline in a floating-gate-type EEPROM cell array comprising:

a first isolating transistor of a first type with source drain path connected between a first signal input terminal and an inverter input terminal and with gate connected to an external supply voltage source;

an inverter transistor pair having a first type transistor and a second type transistor with source-drain paths connected in series between a programming/sense voltage source and a reference potential and with gates connected to said inverter input terminal, said source-drain path and the tank of said second type transistor connected to said programming/sense voltage source;

a second isolating transistor of a second type with source-drain path connected in series between said transistors of said inverter transistor pair, with gate connected to a second signal input terminal, and with tank connected to said programming/sense voltage source;

a feedback transistor of a second type with source-drain path connected between said programming/sense voltage source and said inverter input terminal, with gate connected to the common source-drain terminal of said second-type inverter transistor and said second isolating transistor, and with tank connected to said programming-/sense voltage source; and

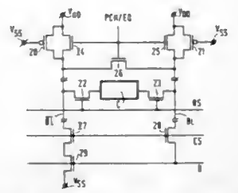
a third isolating transistor of a second type with source-drain path connected between an erasing voltage source/high impedance and said common source-drain terminal of said second-type inverter transistor and said second isolating transistor, with gate connected to said erasing voltage source/high impedance, and with tank connected to said programming/sense voltage source;

wherein the output of said circuit is connected to said common source-drain terminal of said second-type inverter transistor and said second isolating transistor.

4,823,319
INTEGRATED MEMORY CIRCUIT HAVING COMPLEMENTARY BIT LINE CHARGING

Leonardus C. M. G. Pfennings, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1987, Ser. No. 39,400
Claims priority, application Netherlands, Sep. 29, 1986, 8602450
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—189 **5 Claims**

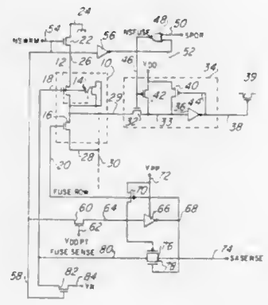


1. An integrated memory circuit in which memory cells are arranged in columns and in which each column is connected to two bit lines, and in which, for writing information into a memory cell of a column, that memory cell can be selected by means of selection means, which selection means connect the memory cell to the two bit lines and connect the two bit lines to a data bus for supplying information to the memory cell, each of the two bit lines being connected, via a respective load, to a first supply terminal, the data bus comprising a line which supplies a signal to a first bit line, inverting means being provided per column that generate a logically complementary signal on a second bit line, whereby upon selecting a column the first bit line in said column is connected to the data bus, characterized in that the inverting means comprise a single first transistor and the load on the second bit line, the first transistor having a conduction path placed between the second bit line and a second supply terminal and having a control electrode connected to said line of the data bus.

4,823,320
ELECTRICALLY PROGRAMMABLE FUSE CIRCUIT FOR AN INTEGRATED-CIRCUIT CHIP

Michael C. Smayling, Missouri City; Sebastiano D'Arrigo, Houston, both of Tex.; Giuliano Imondi, Rieti, and Sossio Vergara, Frattamaggiore, both of Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 8, 1986, Ser. No. 860,940
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—189 **3 Claims**



1. A fuse circuit for an integrated circuit device, comprising:

a non-volatile programmable memory element having two programmed states;

a programming circuit coupled to said memory element for programming said memory element in response to a programming control signal;

a read circuit coupled to said memory element for detecting the programmed state of said programming circuit and for generating a low voltage level for one of said two programmed states and a high voltage level for the other of said programmed states; and

a pass transistor coupled to said read circuit switchable from an open to a closed condition in response to a change in output voltage level of said read circuit;

wherein a NOR gate is used for forcing the output of said read circuit to zero in response to a SPOR input signal to said NOR gate;

wherein said integrated circuit device includes a read line coupled to said read circuit through a read pass gate transistor which is turned off during a write or programming mode or in response to a SPOR signal being high; and

wherein said read circuit includes a transistor coupled between supply voltage V_{DD} and a read end of a source to a drain path of said read pass gate transistor and responsive to conduct on the opening of said read pass gate transistor.

4,823,321
DUAL PORT TYPE SEMICONDUCTOR MEMORY DEVICE REALIZING A HIGH SPEED READ OPERATION

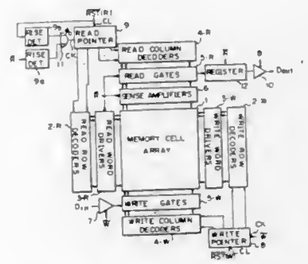
Keizo Aoyama, Yamato, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1987, Ser. No. 134,997
Claims priority, application Japan, Dec. 19, 1986, 61-301602; Dec. 19, 1986, 61-301603; Dec. 19, 1986, 61-301604
Int. Cl.⁴ G11C *7/00, 8/00;* G06F *1/00*
U.S. Cl. 365—189 **5 Claims**

1. A semiconductor memory device comprising:

a dual port storing portion to which addresses 0, 1, . . . , and n-1 are allocated;

write pointer means which is reset by a write reset signal and counts a write clock signal after receiving said write reset signal, said write pointer means writing input data into an address location of said storing portion corresponding to the count value of said clock signal;



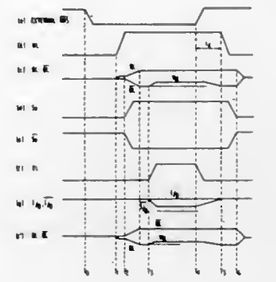
read pointer means which is reset by a read reset signal and counts a read clock signal as well as said read reset signal after the reception thereof, said read pointer means reading data stored in an address location of said storing means corresponding to the count value of said read clock signal; and

a register for storing data read by said read pointer means and transmitting said stored data as output data in response to each read clock signal.

4,823,322
DYNAMIC RANDOM ACCESS MEMORY DEVICE HAVING AN IMPROVED TIMING ARRANGEMENT

Hideshi Miyatake; Masaki Kumanoya; Hideto Hidaka; Yasuhiro Konishi; Katsumi Dosaka; Hiroyuki Yamasaki; Masaki Shimoda; Yuto Ikeda, and Kazuhiro Tsukamoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1987, Ser. No. 102,683
Claims priority, application Japan, Nov. 29, 1986, 61-284850
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—190 **17 Claims**



1. A dynamic random access memory device comprising:

(a) a plurality of pairs of bit lines (BL, /BL);

(b) a plurality of word lines (WL) for applying word signals;

(c) a plurality of memory cells, each of said memory cells being connected to a respective bit line and a respective word line, and each of said memory cells comprising a MOS transistor (**4**) and charge storage means (**12**);

(d) a plurality of sense amplifier circuits (**16**), each of said sense amplifier circuits comprising a first and a second MOS driver transistor, said first driver transistor being connected between one bit line of a corresponding pair of bit lines and a common potential node, a gate electrode of said first driver transistor being connected to the other bit line of said corresponding pair of bit lines, said second driver transistor being connected between said other bit line of said corresponding pair of bit lines and said common potential node, a gate electrode of said second driver transistor being connected to said one of said corresponding pair of bit lines;

(e) an enable MOS transistor (**7**) connected between said common potential node and a ground node, a gate electrode of said enable transistor receiving an enable signal;

(f) a pair of input/output lines (I/O, /I/O);

(g) a plurality of pairs of transfer MOS transistors, one transistor of each of said pairs of transfer transistors being connected between one bit line of an associated pair of bit lines and one of said input/output lines, a gate electrode of said one transistor of each of said pairs of transfer transistors receiving a column signal, the other transistor of each of said pairs of transfer transistors being connected between the other bit line of said associated pair of bit lines and the other of said pair of input/output lines, and a gate electrode of said other transistor of each of said pairs of transfer transistors receiving said column signal;

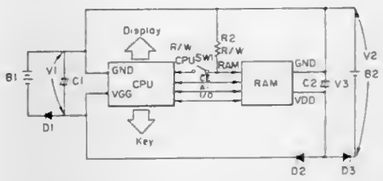
(h) an input/output load (**13**) connected to said pair of input-/output lines; and

(i) a control circuit receiving an external /RAS signal and generating an internal /RAS signal controlling at least production of said word signals and said enable signals, a reset timing of said internal /RAS signal being delayed with respect to a reset timing of said external /RAS signal, whereby a time when the MOS transistor of a selected memory cell and said enable MOS transistor are made nonconductive is delayed beyond a time when a selected one of said pairs of transfer MOS transistors are made nonconductive.

4,823,323
ELECTRONIC APPARATUS WITH REPLACEABLE POWER SOURCE

Masayuki Higuchi, Ueno, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jnn. 25, 1986, Ser. No. 889,493
Claims priority, application Japan, Jul. 29, 1985, 60-169168
Int. Cl.⁴ G11C *11/40;* H02J *9/06*
U.S. Cl. 365—228 **13 Claims**



1. An electronic apparatus comprising: memory means for storing data;

control means for controlling input and output of data in and from said memory means by supplying write and read signals to the memory means;

replaceable power supply means for supplying power to said control means and to said memory means; and

memory protect means for detecting the removal of said replaceable power supply means and, in response thereto, disabling the supply of the write and read signals output by said control means to said memory means during the replacement of said replaceable power supply means, said memory protect means including first switch means responsive to an operation necessary for removing the re-

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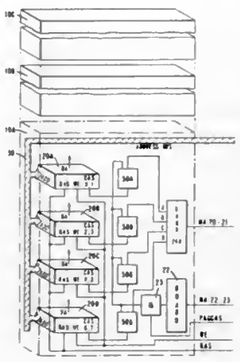
placeable power supply means to disconnect the write and read signals from said memory means and second switch means for initializing and operating said control means to address the memory means from an initial address when reconnecting the write and read signals in response to a condition after replacement of said replaceable power supply means, thereby preventing data of said memory means from being destroyed after replacing said replaceable power supply means.

4,823,324

PAGE MODE OPERATION OF MAIN SYSTEM MEMORY IN A MEDIUM SCALE COMPUTER

Billy K. Taylor, and Larry C. James, both of West Columbia, S.C., assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 23, 1985, Ser. No. 778,815
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **7 Claims**



1. A memory device comprising:
a plurality of memory boards each comprising a plurality of memory banks, said memory banks comprising memory elements;
each memory element addressably by one of a plurality of row addresses and one of a plurality of column addresses;
means for simultaneously applying a row strobe signal to the memory elements of a plurality of said memory banks;
means for applying one of said row addresses to the memory elements of each of said memory banks in response to said row strobe signal;
a memory board selection means for providing a board enabling signal to a selected memory board; and
a memory bank selection means for providing a column strobe signal to each memory of a selected memory bank on a board, when said board enabling signal is present, so as to enable the selected memory elements to receive one of said column addresses.

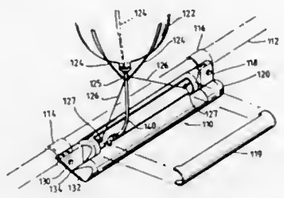
4,823,325

STREAMER RETRIEVAL SYSTEM AND METHOD

Jim R. Cole, Jr., Katy, Tex., assignor to Syntrieve, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 588,713, Mar. 12, 1984, abandoned. This application May 6, 1985, Ser. No. 730,652
Int. Cl.[4] G01V *1/38*; H01B *7/12*
U.S. Cl. 367—20 **9 Claims**

1. A retrieval system for a seismic streamer comprising:
a flotation device which can be coupled to said seismic streamer, wherein said flotation device can be activated to eject and inflate a flotation bag to cause the streamer to surface, said flotation device comprising a source of compressed gas contained in a cylinder and a rotary motor and a drill capable of puncturing said cylinder for releasing said gas from said cylinder; and



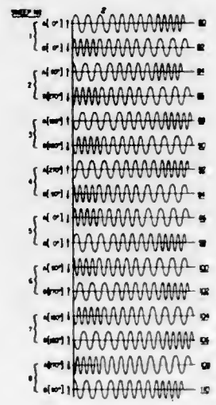
an actuator which can be activated from a signal generated at a location which is remote to the retrieval system to cause the streamer to surface.

4,823,326

SEISMIC DATA ACQUISITION TECHNIQUE HAVING SUPERPOSED SIGNALS

Roger M. Ward, Carrollton, Tex., assignor to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 887,377, Jul. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 813,593, Dec. 26, 1985, abandoned. This application Jun. 23, 1987, Ser. No. 65,557
Int. Cl.[4] G01V *1/143*
U.S. Cl. 367—41 **17 Claims**



1. A method for producing separate seismic records derived respectively from a plurality of spaced-apart concurrently operated vibrator seismic sources, the seismic records having reduced harmonic distortion, comprising the steps of:
geneating frequency sweeping pilot signals for respectively driving at least two of said vibrator seismic sources concurrently in a sequence of at least four sweeps, the pilot signal for each vibrator seismic source having a plurality of initial phase angles during said sweeps,
detecting a seismic signal produced by said concurrently operated vibrator seismic sources for each of said sweeps,
correlating each of said detected seismic signals separately with each of the corresponding pilot signals which were used to drive the vibrator seismic sources that produce the detected seismic signal, said step of correlating for generating at least first and second separate correlated records for each of said sweeps,
summing said first correlated record for each of said sweeps to produce a first seismic record derived predominantly form a first of said concurrently operated vibrator seismic sources, and

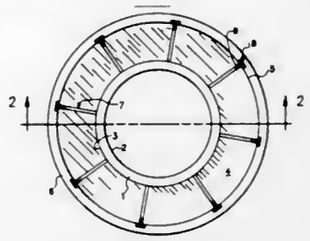
summing the second correlated record for each of said sweeps to produce a second seismic record derived predominantly from a second of said vibrator seismic sources.

4,823,327

ELECTROACOUSTIC TRANSDUCER

Horst Hilmers, Kronshagen, Fed. Rep. of Germany, assignor to Honeywell-Elac-Nautik GmbH, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 57,062
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620085
Int. Cl.[4] H04R *17/00*
U.S. Cl. 367—157 **12 Claims**



1. An electroacoustic transducer comprising:
a unitary piezoceramic tube extending along a central longitudinal axis, said tube having outer and inner wall surfaces, each having an electrode thereon;
metallic mass members fixed directly to the electrode on the outer wall surface of said piezoceramic tube and circumferentially spaced apart with a gap between adjacent members, said mass members being arranged to form a segmented annulus about said tube, each of said mass members having an outer surface at a larger distance from the central axis than the outer surface of said piezoceramic tube and having a greater length parallel with the axis than said piezoceramic tube; and profile bars of T-shaped cross section each having a central leg and a cross member are provided for closing the gaps between adjacent mass members at the outer surfaces thereof, with the central legs of the T-shaped profiles projecting into said gaps.

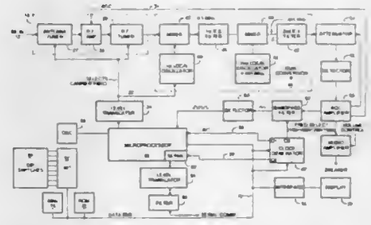
4,823,328

RADIO SIGNAL CONTROLLED DIGITAL CLOCK

Charles C. Conklin, 10371 N. Blaney Ave., Cupertino, Calif. 95014; Michael W. Faber, 833 Abbie St., Pleasanton, Calif. 94566; David Schachter, 801 Middlefield Rd.; Philip M. Spira, 2025 Tasso St., both of Palo Alto, Calif. 94301; Chi-Wen Wang, 1314 Shelby Creek La., San Jose, Calif. 95120, and Paul L. Williams, 2200 Monroe St., No. 915, Santa Clara, Calif. 95050

Continuation-in-part of Ser. No. 90,045, Aug. 27, 1987, abandoned. This application Feb. 29, 1988, Ser. No. 161,792
Int. Cl.[4] G04C *11/02*
U.S. Cl. 368—47 **21 Claims**

1. A radio signal controlled clock for keeping time in accordance with broadcast time-based radio signals, said clock comprising:
receiver means for receiving broadcast time-based radio signals at a specified carrier frequency, said radio signals containing encoded time information including a multiplicity of binary coded digits representing the current time;
processing means coupled to said receiver means for decoding the time information contained in said time-based radio signal, including:
data collecting means for decoding and storing the binary bits encoded in said tie-based radio signal; and
digit verification means for determining the digit values represented by said decoded binary bits, including scoring means for each of a multiplicity of said digits for scoring each potential value of said digit in accordance with the number of said decoded bits which are consistent with said potential value, and verifying means for verifying one



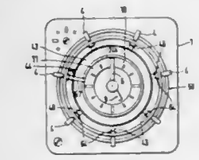
of said potential digit values as the correct value when the score for said one potential digit value exceeds the scores for all of the other potential digit values by at least a specified threshold value;
and output means for generating a verified time signal corresponding to digit values verifying by said verifying means.

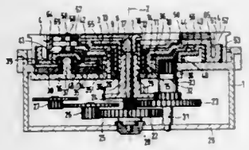
4,823,329

ELECTRIC TIMER WITH PROGRAM CARRIER SWITCHABLE FROM A SHORT TERM TO A LONG TERM PROGRAM

Lukas Schwer, and Manfred Karger, both of Haigerloch, Fed. Rep. of Germany, assignors to Theben-Werk Feitantomatik GmbH, Fed. Rep. of Germany

Filed Mar. 17, 1988, Ser. No. 169,410
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 3708611
Int. Cl.[4] G04F *8/00*; H01H *43/00*
U.S. Cl. 368—107 **13 Claims**





1. A timer having an analog time display comprising: a time-controlled clockwork; a circular program carrier synchronously driven by said time-controlled clockwork, said program carrier having slide contacts; a scale ring having one side with designations corresponding to a short-program in which there is one revolution in 24 hours and an opposite side with designations corresponding to a long-term program in which there is one revolution in seven days, the scale ring being selectively applied on said program carrier; a first drive ring disposed concentric with the axis of rotation of said program carrier, said first drive ring being driven at a speed corresponding to the short-term program; a second drive ring dis-

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posed concentric with the axis of rotation of said program carrier, said second drive ring being driven at a speed corresponding to the long-term program; and, radially displaceable coupling means connected with said program carrier and adjustable to different radial positions for selectively coupling with one of said first and said second drive rings for movement therewith.

4,823,330

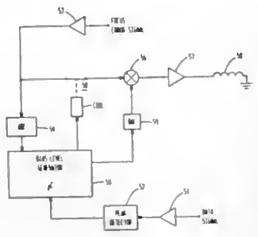
FOCUS SERVO LOOP OFF-SET COMPENSATION

Nelson K. Arter; Mark G. Call, and Mark L. Rhoades, all of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 698,518, Feb. 4, 1985, abandoned. This application May 4, 1987, Ser. No. 52,128

Int. Cl.[4] **G11B** *7/12*

U.S. Cl. 369—45 **2 Claims**



1. In an optical disc system having

laser means for supplying energy to read or to write on an optical disc,

means for focussing said energy at a surface on said disc,

detecting means for supplying a feedback signal proportional to focussing error, and

servo means responsive to said feedback signal for maintaining said focussing means at substantially best focus,

the improvement comprising:

microprocessor means including

(1) means for indicating when said focus means is at substantially best focus having

(a) means for decoupling said feedback signal from said servo means,

(b) peak detecting means responsive to data read from said optical disc, and

(c) means for moving said focus from one side of said surface to the opposite side of said surface; and

(2) means for providing a correction signal having a value equal to the feedback signal value when the focussing means is at substantially best focus having

(a) means responsive to the peak detecting means for storing the value of said feedback signal; and means for offsetting said correction signal from said feedback signal.

4,823,331

FOCUSING DETECTION APPARATUS

You Yoshitoshi; Yoshiyuki Matsumoto, and Hidehiro Kume, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP87/00105, § 371 Date Oct. 23, 1987, § 102(e) Date Oct. 23, 1987, PCT Pub. No. WO87/05142, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 18, 1987, Ser. No. 130,112

Claims priority, application Japan, Feb. 24, 1986, 61-38576; May 31, 1986, 61-126318

Int. Cl.[4] **G11B** *7/00*

U.S. Cl. 369—45 **11 Claims**

1. A focusing detection apparatus comprising:

a semiconductor laser fixed on a semiconductor substrate;

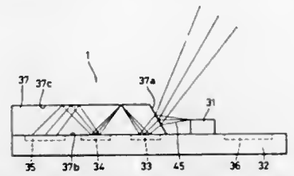
a prism fixed on said semiconductor substrate;

a first semi-transmissible reflecting surface formed on a prism surface opposite to said semiconductor laser;

a second semi-transmissible reflecting surface constituted by a prism surface in contact with said semiconductor substrate and formed at a position where a beam passing through said first semi-transmissible reflecting surface is incident;

a first photosensor including three photosensor elements formed on said semiconductor substrate at a position in contact with said first semi-transmissible reflecting surface and aligned in a predetermined direction; and

a second photosensor including three photosensor elements aligned in a predetermined direction and formed on said semiconductor substrate at a position where the beam reflected by said second semi-transmissible reflecting surface is incident,



wherein the optical recording medium is irradiated with the beam emitted from said semiconductor laser and reflected by said first semi-transmissible reflecting surface,

a beam from the optical recording medium passed through said first semi-transmissible reflecting surface is converged after the beam is reflected by said second semi-transmissible reflecting surface but before the beam is incident on said second photosensor, and

a sum of detection signals from end photosensor elements of said three photosensor elements of said first photosensor and a central photosensor element of said three photosensor elements of said second photosensor is compared with that from a central photosensor element of said three photosensor elements of said first photosensor and end photosensor elements of said three photosensor elements of said second photosensor to produce a focusing error signal for the optical recording medium.

4,823,332

SIMPLIFIED SOUND REPRODUCING DEVICE CAPABLE OF REPRODUCING A PLURALITY OF RECORD DISCS

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Mar. 9, 1987, Ser. No. 23,817

Claims priority, application Japan Apr. 30, 1986, 61-100542.

Int. Cl.[4] **G11B** *31/00;* **A63H** *03/33*

U.S. Cl. 369—63 **6 Claims**

1. A simplified sound reproducing device capable of reproducing a plurality of record discs comprising:

a casing;

an indexing table carrying a plurality of record discs which can be received by said casing, a recorded face of each disc being faced toward an interior of the casing;

a tone arm carrying a sound reproduction stylus directed toward the recorded face of one of the plurality of record discs, said tone arm being swingably movable between the starting point and the end point of sound reproduction of the one record disc and urged by a return spring toward the starting point of sound reproduction;

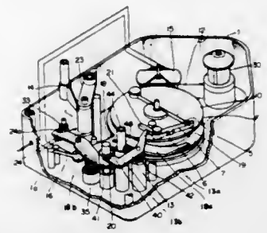
a rotatable turn table disposed within the casing and urged by a stylus force spring in an axial direction, said turn table being formed with a pulley groove defined between a pair of flanges disposed at the axially forward end and rear end of the turn table, respectively;

a speaker diaphragm disposed within said turn table;

a sound transmitting member connected to said speaker diaphragm and to said tone arm for transmitting sound reproduction vibrations of said tone arm to said speaker diaphragm;

a reproduction terminating means to retract said turn table against the biasing force of the stylus force spring, said reproduction terminating means being a bar disposed within said casing and swingably supported at a halfway point thereof, one end of said bar extending up to and around the outer face of said pulley groove so that said bar can urge said turn table to retract against the resilient force exerted by said stylus force spring; and

a starting means for advancing said turn table by said stylus force spring, said starting means being disposed to be correlated with another end of said bar so that depression of the starting means causes the bar to move against the biasing force and allow the turn table to advance by means of said stylus force spring, the starting means comprising



an engaging means which holds said bar against said biasing means to maintain said turn table at its position advanced where said starting means is depressed, said engaging means further comprising a cancelling means, one end of which is opposite to another end carrying said sound reproduction stylus of said tone arm and is urged to project outwards from the circumferential periphery of said indexing table so that said engaging means can be placed out of engagement by the collision of said cancelling means with said reproduction terminating means;

an electric motor for driving said turn table, said turn table being rotatably connected to said motor by a belt drive system; and

at least one electrical contact for supplying electrical power to the turn table when activated by said starting means and for cutting off electrical power when actuated by said reproduction terminating means;

wherein the indexing table, when received by the casing, can fix a selected record disc at a position in which said selected record disc is confronted with said turn table.

4,823,333

OPTICAL DISK DUPLICATING APPARATUS USING SECTOR DATA IDENTIFICATION INFORMATION FOR CONTROLLING DUPLICATION

Isao Satoh, Neyagawa; Yoshihisa Fnkushima, Osaka; Makoto Ichinose, Sakai; Yuzuru Kuroki, Toyonaka, and Yuji Takagi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 16, 1987, Ser. No. 3,832

Claims priority, application Japan, Jan. 21, 1986, 61-10819; Jul. 29, 1986, 61-178018

Int. Cl.[4] **G11B** *7/28*

U.S. Cl. 369—84 **7 Claims**

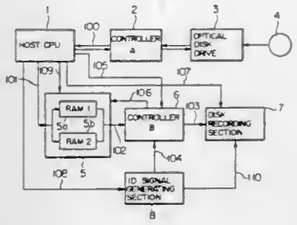
1. An optical disk duplicating apparatus for duplicating data from a first optical disk onto a second optical disk, said first optical disk having a plurality of sectors having data recorded therein, each of said sectors being composed of a sector identifier area having a sector identifier signal recorded therein and a data field area for recording data therein, the sectors of said first optical disk including a sector having data properly recorded in the data field area thereof and a sector having a marking signal recorded in the data field area thereof, said marking signal indicating that the sector in which it is recorded is defective, said apparatus comprising:

means for reproducing data from a said first optical disk;

means for examining a data field area of each reproduced sector to determine if it contains said marking signal;

means responsive to the examining means for producing a sector data identification information signal for each reproduced sector which identifies whether the data field area thereof contains recorded data or said marking signal,

means responsive to said sector data identification information signal, for each reproduced sector, for forming a



signal to be recorded in a data field area of a corresponding sector on a second optical disk, said signal to be recorded containing data reproduced from a data field of a reproduced sector of said first disk, or a marking signal, depending on the content of said sector data identification information signal,

means for receiving the signal to be recorded for each sector and adding thereto a sector identifier signal to produce a recordable sector signal, and

means for recording said recordable sector signal on a second optical disk in a sector which corresponds to a reproduced sector of said first optical disk from which said sector data identification information signal, used to form said recordable sector signal, was produced.

4,823,334

OPTICAL HEAD WITH EASILY ADJUSTABLE COLLIMATOR HAVING TWO LENS COMPONENTS

Shinichi Tanaka, Kyoto, and Hiromichi Ishibashi, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 26, 1986, Ser. No. 935,309

Claims priority, application Japan, Nov. 27, 1985, 60-266508; May 12, 1986, 61-107904

Int. Cl.[4] **G11B** *7/00*

U.S. Cl. 369—112 **7 Claims**

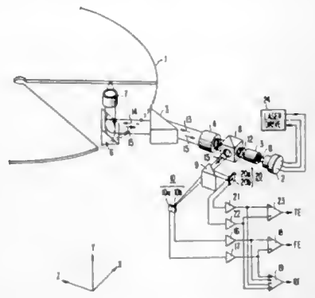
1. An optical head for optically recording information on a recording medium and/or optically reproducing the recorded information from the recording medium, comprising:

light generating means for generating a divergent light beam;

collimation means positioned for receiving said divergent light beam from said light generating means and for collimating said divergent light beam into a parallel light beam, said collimation means having first lens means for converting said divergent light beam into a light beam which diverges or converges at a smaller angle than the angle of divergence of said divergent light beam, and

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second lens means for converting said light beam from said first lens means into said parallel light beam; and



convergence means positioned for receiving said parallel light beam and for converging said parallel light beam to focus on the recording medium.

4,823,335

OPTICAL HEAD DEVICE HAVING DEFLECTION MEANS INCLUDING MEANS FOR REDUCING REFLECTED LIGHT ANGLE

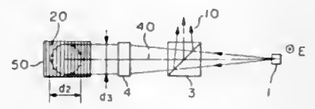
Shinsuke Shikama; Mitsushige Kondo, and Eiichi Tiode, all of Mitsubishi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1987, Ser. No. 103,689

Claims priority, application Japan, Oct. 21, 1986, 61-250128

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—112 **19 Claims**



1. An optical held device which comprises:

a semiconductor laser beam source,

a deflection means for deflecting a laser beam emitted from said laser beam source at an angle of about 90°,

a first optical means placed between said laser beam source and said deflection means, and

a convergent optical element for converging said laser beam deflected by said deflection means on an optical type data recorded medium, wherein said deflection means has a surface on which is formed a means for causing said laser beam impinging on said surface at an angle α with respect to a normal to said surface to be reflectively diffracted from said surface at an angle β with respect to the normal, wherein $\beta < \alpha$ and said means for causing comprises a reflecting diffraction grating, and wherein said surface is formed at an angle of inclination in the range from 0° to 45° with respect to the central optical axis of said laser beam emitted from said laser beam source so that a diffraction beam reflected by said diffraction grating is used as a deflected beam.

4,823,336

OPTICAL DISK DRIVE

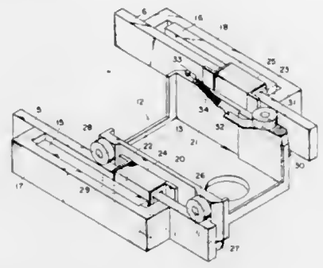
Hitoshi Inada, Atsugi, and Tetsuo Kanno, Ebina, both of Japan, assignors to Ricoh Company, Limited, Tokyo, Japan

Filed Feb. 13, 1987, Ser. No. 14,288

Claims priority, application Japan, Feb. 14, 1986, 61-18833[U]; Feb. 14, 1986, 61-18834[U]

Int. Cl.⁴ G11B *3/38, 21/10*

U.S. Cl. 369—215 **11 Claims**



1. A disk drive comprising:

a pair of guide shafts spaced apart over a predetermined distance, each extending straight and parallel to each other and each of said pair of guide shafts having a pair of top and bottom surfaces and a pair of inner and outer side surfaces;

a carriage for mounting thereon a read/write means for reading and writing information to and from a recording medium; and

a plurality of rollers rotatably mounted on said carriage, said plurality of rollers including a first plurality of rollers in rolling contact with one of said pair of guide shafts and a second plurality of rollers in rolling contact with the other of said pair of guide shafts, thereby allowing said carriage to move along said pair of guide shafts linearly, said first plurality of rollers including two pairs of rollers which are rotably mounted on said carriage, each pair of which includes a vertical roller in rolling contact with the top surface of a corresponding one of said pair of guide shafts and a horizontal roller in rolling contact with the inner side surface of the corresponding one of said pair of guide shafts, and said second plurality of rollers including a pair of a horizontal roller in rolling contact with the inner side surface of the other of said pair of guide shafts and a vertical roller in rolling contact with the bottom surface of the other of said pair of guide shafts.

4,823,337

DEVICE FOR RECORDING INFORMATION ON OR READING INFORMATION FROM AN INFORMATION DISC

Pieter Van Zanten, and Evert-Jan Mulder, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

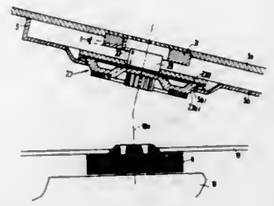
Filed Sep. 21, 1987, Ser. No. 99,268

Claims priority, application Netherlands, Apr. 8, 1987, 8700819

Int. Cl.⁴ G11B *17/02, 25/04;* **G01D** *15/32*

U.S. Cl. 369—270 **5 Claims**

1. A device for recording information on or reading information from a rotating information disc, in particular an optical disc, comprising a turntable which is rotatable about an axis of rotation and which has a supporting surface for the information disc, and a clamping device for clamping the information disc on the turntable, which clamping device comprises a disc-pressure means, a support for the disc-pressure means, which support is movable between an operating position and a rest position, and a permanent magnet system comprising a first axially magnetized annular magnet ad a second axially magnetized magnet which cooperates with said first magnet, one of said magnets being secured to the support and the other being secured to the disc-pressure means, which magnet system presses the disc-pressure means magnetically against the information disc on the turntable in the operating position of the support, in which position the disc-pressure means is freely



rotatable relative to the support, which support as it moves from its operating position to its rest position, cooperates with the disc-pressure means to move the disc-pressure means away from the information disc and thus release the information disc, the support carrying the disc-pressure means in its rest position, characterized in that said permanent magnets are positioned coaxially relative to each other, a radial air gap being formed between the first and the second magnet at least in the operating position of the support.

4,823,338

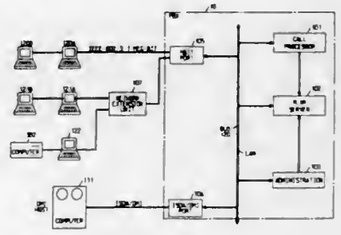
VIRTUAL LOCAL AREA NETWORK

Kenneth K. Chan, Eatontown, N.J.; Philip W. Hartmann, Boulder; Scott P. Lamons, Fort Collins, both of Colo.; Terry G. Lyons, Princeton, and Argyrios C. Milonas, Middletown, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Aug. 3, 1987, Ser. No. 81,081

Int. Cl.⁴ H04J *3/02, 3/24*

U.S. Cl. 370—85 **10 Claims**



1. A device for controlling communications between a plurality of end-systems, said device comprising

means for establishing one or more groups of end-systems, each of said established groups identifying each end-system authorized to be a member thereof,

means for receiving first information from a calling one of said end-systems, said first information including an identification of this end-system and a request for membership in one of said established groups,

means responsive to said first information and to said one or more established groups for granting said request if and only if said calling end-system is an authorized member of the group requested, and

means responsive to second information from said calling end-system and to the granting of said request for controlling communications between this calling end-system and called one of said end-systems identified in said second information.

4,823,339

METHOD AND DEVICE FOR PROTECTING MODEMS AGAINST ECHOES

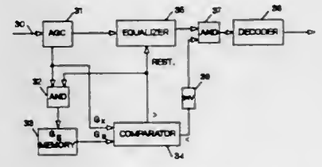
Firmin Bigo, Cagnes Mer, and Francois LeMaut, Nice, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1987, Ser. No. 55,223

Claims priority, application European Pat. Off., Jul. 15, 1986, 86430027.2

Int. Cl.⁴ H04B *3/20*

U.S. Cl. 370—32.1 **3 Claims**



3. A device for providing protection against echoes in a modem comprising an AGC device (31) for adapting the elements of the modem to the energy level Gx of the received signals, an equalizer (35) for equalizing said signals and a decoder for decoding signals provided by said equalizer said device being characterized in that it includes:

a level memory means (33) for storing a value Gs, which value is zero before a first message has been received,

comparator means (34) for comparing the level Gx provided by said AGC device upon receipt of a message with said value Gs stored in said level memory means, and for supplying a resetting signal to the equalizer to reset the coefficients thereof to zero and, simultaneously, a signal for storing level Gx as a new value Gs in said level memory means when said level Gx exceeds said value Gs by a predetermined amount, and for supplying a signal for inhibiting the decoding of the data signals provided by said equalizer to said decoder when said value Gx exceeds the level of Gx by a predetermined amount, thereby indicating that the received message is an echo.

4,823,340

CIRCUIT ARRANGEMENT FOR NON-BLOCKING SWITCHING OF PCM CHANNELS IN THE SPACE AND TIME DOMAIN

Wolfgang Graesman, Backnang; Walter Berner, Leutenbach, and Günter Müller, Oppenweiler, all of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 129,959

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1986, 3641561; Jun. 23, 1987, 3720644

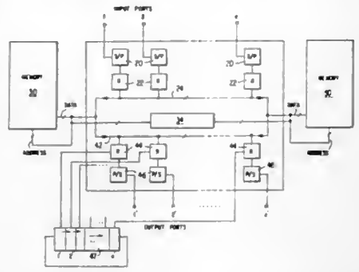
Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—58 **16 Claims**

1. In a circuit arrangement for switching PCM channels conducting baseband signals, the circuit arrangement including n input ports for receiving serial data to be switched, with n being at least 2, first conversion means connected to the input ports for converting serial data received by the input ports into blocks of data in parallel form, memory means for intermediately storing, and subsequently reading, out each block in parallel form, second conversion means connected for converting each block read out from the memory means to serial form, and n output ports each connected to receive the data of respective blocks converted to serial form from the second con-

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version means, in which the data in each data block formed by the first conversion means is intended to be conducted to a respective output port, the improvement comprising: n input registers each connected to said first conversion means for intermediately storing the parallel data blocks derived from the serial data received at a respective input port; n output registers each connected to said second conversion means, each associated with a respective output port, and each connected for intermediately storing those parallel data blocks read out of said memory means which are intended for the associated output port; and least one RAM memory forming part of said



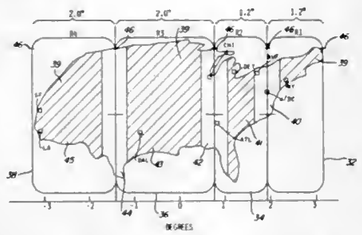
memory means and having a plurality of memory locations, each memory location having an address associated with one output port, said memory being operable for writing in data blocks from said input registers, in succession in the order in which the data contained in those data blocks arrives at said input ports, and storing each data block in a memory location associated with the output port to which the data in that block is to be conducted, and said memory further being operable for reading out the data blocks stored therein sequentially and for conducting each data block to that one of said output registers which is associated with the output port to which the data in that block is to be conducted.

4,823,341

SATELLITE COMMUNICATIONS SYSTEM HAVING FREQUENCY ADDRESSABLE HIGH GAIN DOWNLINK BEAMS

Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 14, 1986, Ser. No. 896,982
Int. Cl.[4] H04J 1/10; H04B 7/19
U.S. Cl. 370—75 **20 Claims**



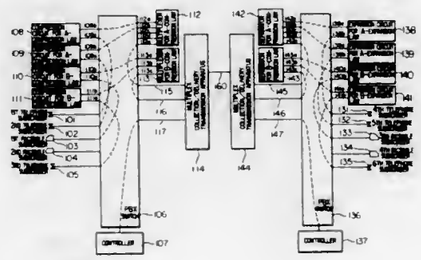
1. A satellite communications system for communicatively interconnecting a plurality of terminal sites distributed over an area of the earth, comprising:
an earth orbiting satellite; and
frequency responsive means carried by said satellite for forming a plurality of beams of electromagnetic radiation between said area on the earth and said satellite with each beam of radiation having a carrier frequency, said beam forming means including an array of radiating elements and an antenna for producing all of said beams, said beams being arranged in at least two groups thereof respectively covering two essentially contiguous zones within said area, the beams in said groups thereof intersecting said area on the earth in seriatim along an arc with the position of each of said beams along said arc being determined by the carrier frequency of the beam, said groups of beams being arranged essentially end-to-end along said arc, the beams in each group thereof being carried by the same preselected set of frequencies such said set of frequencies is reused by said beams.

4,823,342

TIME DIVISION EXCHANGE SYSTEM HAVING FUNCTIONS OF COMPRESSING AND EXPANDING INFORMATION

Takashi Morita; Koji Hirai, and Akira Kusaba, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,175
Claims priority, application Japan, Feb. 7, 1986, 61-23706
Int. Cl.[4] H04J 3/18
U.S. Cl. 370—109 **8 Claims**



1. A time division exchange system having a function of compressing information such as an input signal on the transmitting side and a function of expanding the information on the receiving side, comprising:
an originating office;
a destination office; and a tandem switch connected between said originating office and said destination office to effect communication therebetween, said tandem switch including:
(a) at least one compression means for compressing information such as an input signal in a accordance with one of a plurality of compression laws;
(b) at least one expansion means for expanding information such as an input signal in accordance with one of a plurality of expansion laws; and
(c) switching means for applying the to-be-compressed information selectively to compression means which carries out signal compression according to a desired compression law, at each time slot, and for applying the to-be-expanded information selectively to expansion means which carries out signal expansion in accordance with an expansion law corresponding to the desired compression law, at each time slot;
(d) means for counting the frequency of each compression law and for sending compression career information to the destination office; and
(e) means for receiving compression career information from the originating office and for judging whether or not received compression career information meets a predetermined condition and for preventing further signal compression when the received compression career information fails to meet the predetermined condition.

4,823,343

DIAGNOSTIC SYSTEM FOR REMOTE COMPUTERS

Etsno Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 165,166
Claims priority, application Japan, Mar. 6, 1987, 62-50376
Int. Cl.[4] G06F 11/00
U.S. Cl. 371—16 **3 Claims**



1. A diagnostic system comprising:
a switched telephone network;
a plurality of remote computers connected to said switched telephone network;
an administrator's station connected to said switched telephone network; and
a diagnostic center connected to said switched telephone network, said diagnostic center comprising:
a first memory;
means for preparing diagnostic files respectively for said remote computers and storing said files into said file memory, each of said diagnostic files including a diagnostic command, an expectation value, a remote computer's identification, a remote computer's telephone number and an administrator's telephone number;
a second memory;
means for transferring the diagnostic files from said first memory to said second memory, addressing one of the diagnostic files in said second memory to recall data contained in the addressed file, sending dialing information to said network according to the recalled remote computer's telephone number to cause the network to establish a first path from said center to the remote computer identified by the recalled remote computer's identification, applying a test signal to said first path according to said recalled diagnostic command to detect a response from said identified remote computer, detecting a mismatch between said response and the recalled expectation value and releasing said first path and sending dialing information to said network according to the recalled administrator's telephone number to cause the network to establish a second path from said center to said administrator's station; and
means for transmitting contents of said mismatch and said recalled remote computer's identification to said administrator's station through said second path.

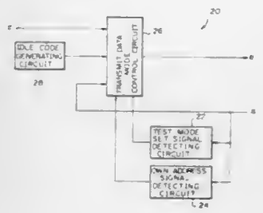
4,823,344

REMOTE TEST CIRCUIT FOR CHANNEL TERMINAL

Akifumi Yoachara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 21,933
Claims priority, application Japan, Mar. 6, 1986, 61-47240
Int. Cl.[4] G01R 31/28; H04B 3/46
U.S. Cl. 371—22 **4 Claims**

1. A communication system comprising:
a data center having a master data terminal and a data channel end connected to said master data terminal;
a multi-junction unit for distributing data from said data center to a plurality of channels and feeding data form said plurality of channels to said data center; and
multiple channel terminals each being connected to a respective one of said channels and including a slave data channel end which is connected to said multi-junction unit and is provided with an apparatus for setting up a return path between said channel terminal and said data center, and a slave data terminal for interchanging data with said slave data channel;
wherein said apparatus for setting up a return path comprises:



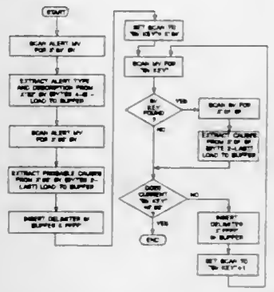
test start signal detecting means for detecting a start signal sent from said data center to produce a test start detection signal;
an address signal detecting means for detecting an address which is identical with an address from address signals sent from said data center and producing an address detection signal; and
control means for supplying an idle code to said slave data terminal in response to the test start detection signal and for connecting an output of said multi-junction unit to said slave terminal in response to the address detection signal.

4,823,345

METHOD AND APPARATUS FOR COMMUNICATION NETWORK ALERT RECORD IDENTIFICATION

Arthur A. Daniel, Rochester, Minn.; David R. Irvin, Raleigh, and Robert E. Moore, Durham, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 15, 1987, Ser. No. 62,915
Int. Cl.[4] G06F 11/12
U.S. Cl. 371—37 **6 Claims**



1. A method of generating a fixed length, unique alert message identifier for unique combinations of plural data field contents in a plural data field variable length alert message report record, said record comprising an alert type field, an alert description code field, one or more probable cause code fields, one or more delimiter code fields, one or more user cause code fields, one or more install cause code fields, and one

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or more failure cause code fields, said method comprising steps of:

extracting from said record the entire contents of a selected subplurality of said data fields;

placing said contents of said selected subplurality of data fields into a storage queue;

inputting the contents of said storage queue to a cyclic redundancy check generation device;

generating in said cyclic redundancy check device a fixed length unique data field from the contents of said storage queue; and

concatenating a product identification code field to said fixed length unique data field, thereby constructing a unique alert message identifier.

4,823,346

MAXIMUM LIKELIHOOD DECODER

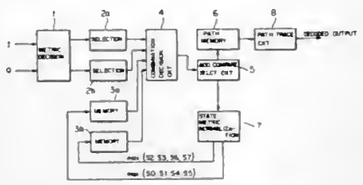
Naoya Kobayashi, Musashino; Makoto Ohnishi, Tokyo, and Yoshiro Kokuryo, Tachikawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki, both of Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 39,030

Claims priority, application Japan, Apr. 16, 1986, 61-85982; Apr. 16, 1986, 61-85983

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—43 **4 Claims**



1. A maximum likelihood decoder comprising:

a path metric decision circuit for determining path metric of (an) input signal(s) against (a) reference signal(s);

selection circuits for selecting n out of M (n<M) path metric determined by said path metric decision circuit in a descending order;

first memories for storing m state metric selected in a descending order from M (m<M) state of metric before one symbol interval;

first means for receiving the output of said selection circuits and the output of said first memories to determine a combination of states and paths to be operated;

second means for adding, comparing and selecting against the m states and n paths determined by said first means;

normalization means for normalizing the output of said second means and selecting the m state metric(s) at current time and storing the selected state metric(s) into said first memories;

a path memory for storing paths connected to the current state metric(s) determined by said second means as survival paths; and

a path tracing circuit for estimating a decoder output based on the survival paths stored in said path memory.

4,823,347

DEFERRED PARITY CHECKING OF CONTROL SIGNALS ACROSS A BIDIRECTIONAL DATA TRANSMISSION INTERFACE

Victor H. Chin; Carol Chihara, and Allen S. Sha, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1987, Ser. No. 50,778

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—49 **10 Claims**

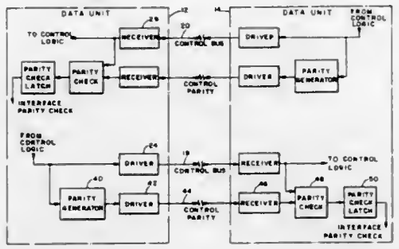
1. An apparatus for checking the integrity of control signals which control data transfers across a bidirectional data transmission interface in a multidirectional data transmission system, comprising:

a source of a sequence of data transfer timing periods, said sequence including a first timing period during which first and second sets of control signals are transferred, and a second timing period during which third and fourth sets of control signals are transferred, said second transfer period following said first transfer period in said sequence;

a first data unit for transmitting said first set of control signals and receiving said second set of control signals across a data transmission interface;

a second data unit connected to said first data unit for transmitting said second set of control signals and receiving said first set of control signals across said interface;

first parity means in said first data unit and responsive to said first and second sets of control signals for determining the condition of a joint characteristic of said first and second sets of control signals and indicating said condition by a first error check signal;



second parity means in said second data unit and responsive to said first and second sets of control signals for determining the condition of said joint characteristic of said first and second sets of control signals and indicating said condition by a second error check signal;

first storage means responsive to said sequence and connected to said first parity means for storing said first error check signal during said first data transfer period;

second storage means responsive to said sequence and connected to said second parity means for storing said second check error signal during said first data transfer period;

signal conduction means connected to said second storage means for unidirectionally conducting said second error check signal to said first data unit during said first data transfer period; and

first comparator means connected to said first storage means and to said signal conduction means for comparing said first and second error check signals and for indicating the result of said comparison during said second data transfer period.

4,823,348

LASER STABILIZATION DEVICE

Michael Hercher, Marblehead, Mass., assignor to Optra, Inc., Peabody, Mass.

Continuation of Ser. No. 870,190, Jun. 3, 1986, abandoned. This application Aug. 18, 1988, Ser. No. 235,834

Int. Cl.⁴ H01S *3/13*

U.S. Cl. 372—32 **17 Claims**

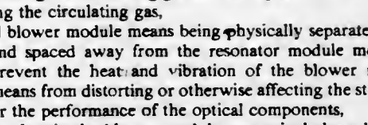
1. A frequency stabilized laser comprising:

an elongated laser tube having two ends, said laser tube having contained therein a gaseous medium, at least two oppositely disposed and facing mirrors within said laser tube, means to excite said medium in said laser tube so as to cause resonance of electromagnetic energy therein;

said at least two mirrors being disposed a distance apart, said distance corresponding to a multiple of the wavelength of said electromagnetic energy resonating in said laser tube when excited by said means to excite, thereby defining the optical and physical length of said laser tue;

at least one of said ends having an elongated extension extending from said at least one end and generally in the direction of elongation of said laser tube;

at least one of said mirrors being disposed and fixed within said elongated extension;



said elongated extension having a reduced section disposed between said at least one of said mirrors and said at least one of said ends;

means for adjusting at least one of the said optical or the said physical length of said laser tube, said adjustment means being applied to said reduced section of said elongated extension.

4,823,349

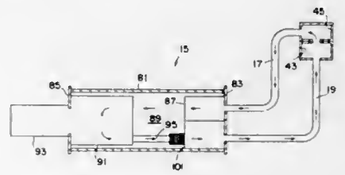
RESONATOR MODULE AND BLOWER MODULE ASSEMBLY

Dale E. Koop, Sunnyvale, and Joseph F. Rando, Los Altos Hills, both of Calif., assignors to Rofin-Sinar, Inc., San Jose, Calif.

Filed Mar. 31, 1987, Ser. No. 33,093

Int. Cl.⁴ H01S *3/04*

U.S. Cl. 372—34 **4 Claims**



1. A flowing gas laser of the kind in which the gas used in the lasing region flows continuously through the lasing region and is circulated through a heat exchanger for cooling before being returned to the lasing region, said laser comprising,

resonator module means having an outer surface for mounting the optical components of the laser and having interior structure for conducting the circulating gas to the lasing region,

blower module means having heat exchanger structure for cooling the circulating gas and having a blower for pumping the circulating gas,

said blower module means being physically separated from and spaced away from the resonator module means to prevent the heat and vibration of the blower module means from distorting or otherwise affecting the structure or the performance of the optical components,

and wherein the blower module means includes a housing having a first fixed end wall, a second removable end wall, first and second heat exchangers associated with the fixed end wall, a motor and pump associated with the removable end wall, a chamber space between the first heat exchanger and the blower and which space serves as a gas accumulator and ballast space, a conduit extending from the blower outlet to the inlet of the second heat exchanger, and plug in connector means at the heat exchanger end of said conduit for permitting the blower to be readily attached to and disconnected from the second heat exchanger as the motor and pump are inserted into and removed from said housing for maintenance or repair, and

ducting means for conducting the circulating gas between the resonator module means and the blower module means.

4,823,350

LASER DEVICE

Etsuo Yamazaki, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

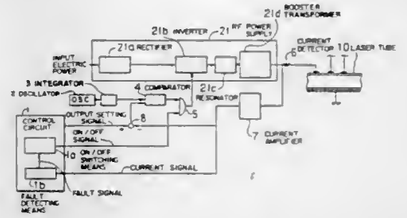
PCT No. PCT/JP87/00752, § 371 Date May 31, 1988, § 102(e) Date May 31, 1988, PCT Pub. No. WO88/02939, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 6, 1987, Ser. No. 205,322

Claims priority, application Japan, Oct. 14, 1986, 61-243952

Int. Cl.⁴ H01S *3/00*

U.S. Cl. 372—38 **10 Claims**



1. A gas laser device having a plurality of electrodes mounted on an electric discharge tube and high-frequency power supplies connected respectively to the electrodes, the laser device comprising:

output detecting means for detecting output conditions of the high-frequency power supplies, respectively;

fault detecting means for detecting a failing high-frequency power supply from the output conditions detected by said output detecting means and for outputting a failure signal upon detection of the failing high-frequency power supply; and

on/off switching means for turning off the failing high-frequency power supply in response to the failure signal from said fault detecting means.

4,823,351

DEVICE FOR FAST SWITCHING BETWEEN DIFFERENT WAVELENGTHS OF LASERS

Martin Endemann, and Hansjuergen Hoeffgen, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP86/00104, § 371 Date Sep. 4, 1986, § 102(e) Date Sep. 4, 1986, PCT Pub. No. WO86/05631, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 1, 1986, Ser. No. 6,561

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1985, 3508707

Int. Cl.⁴ H01S *3/10*

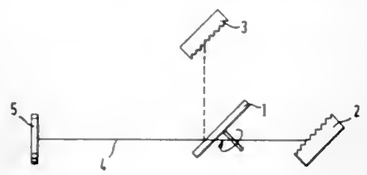
U.S. Cl. 372—20 **8 Claims**

1. In a tunable pulsed laser, having an optical resonator and a device comprising a first and a second reflecting means defined by an output end mirror of said laser and a reflective dispersing means which permits the selection of wavelengths for the laser beam,

said device for fast switching of different wavelengths of said laser comprising a rotatable chopper mirror (1) located on the optical axis (4) of said resonator, with rotating means to rotate said chopper mirror about said optical axis and at an acute angle to said optical axis so that the light is directed alternately between at least two optical paths defined by

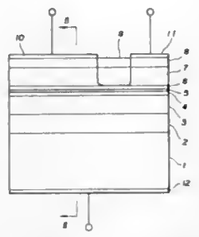
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(a) a first reflecting means comprising said laser output end mirror (5) and said dispersive reflecting means (2), and



(b) a reflective surface of said chopper mirror (1) and at least a second dispersive reflective means (3) so as to permit the rapid alternating selection of at least two wavelengths for the laser beam.

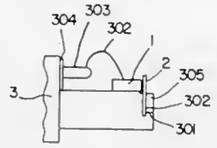
4,823,352
SEMICONDUCTOR LASER WITH A VARIABLE OSCILLATION WAVELENGTH
Mitsunori Sugimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 13, 1987, Ser. No. 15,252
Claims priority, application Japan, Feb. 14, 1986, 61-31207
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **5 Claims**



1. A semiconductor laser comprising:
a first cladding layer of a first conductivity type,
at least one a quantum well active layer provided over said first cladding layer,
a second cladding layer of a second conductivity type provided over said at least one active layer,
resonator facets including a pair of planes approximately orthogonal to the layer structure of said first cladding layer, said at least one active layer, and said second cladding layer,
two exclusive electrodes in ohmic contact with said second cladding layer and positioned separately in an axial direction of a resonator composed of said resonator facets, and
a common electrode in ohmic contact with said first cladding layer and facing said exclusive electrodes.

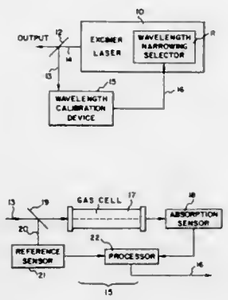
4,823,353
SEMICONDUCTOR LASER ARRAY APPARATUS
Mototaka Taneya, Ibaraki; Mitsuhiro Matsumoto, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to 501 Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 8, 1987, Ser. No. 106,740
Claims priority, application Japan, Oct. 8, 1986, 61-239478
Int. Cl.[4] H01S *3/119*
U.S. Cl. 372—50 **6 Claims**

1. A semiconductor laser array apparatus comprising a semiconductor laser array device having a plurality of active waveguides in a parallel manner with an optical phase-coupling between the adjacent waveguides and an optical phase-shifting means attaining a 180° phase-shift between the adjacent laser beams emitted from the adjacent waveguides of the laser array



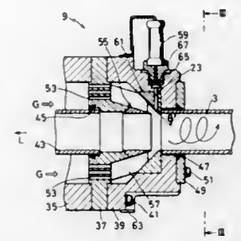
device, said phase-shifting means being disposed with a gap from the light-emitting facet of the laser array device in the vicinity of the light-emitting facet of the laser array device.

4,823,354
EXCIMER LASERS
Thomas A. Znotins, Ottawa; John Reid, Dundas, and Steven J. Gütz, Nepean, all of Canada, assignors to Lumonics Inc., Kanata, Canada
Filed Dec. 15, 1987, Ser. No. 133,388
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—57 **19 Claims**



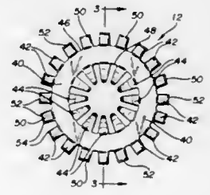
1. A laser system comprising:
(a) an excimer laser including means for selecting a desired narrow bandwidth wavelength for the laser output, and
(b) a feedback loop connected between the laser output and said selecting means, said loop including a calibration device comprising
(i) a processor including means for modifying said selecting means in such a manner as to step the laser wavelength between a pair of wavelength values a predetermined distance apart and located on opposite sides of the desired wavelength,
(ii) a cell containing a gas having an absorption peak substantially at the desired wavelength,
(iii) means for passing a portion of said output through this cell, and
(iv) means for measuring absorption from said output by the gas in the cell at each of said wavelength values,
(c) said processor further including means connected to said measuring means for comparing the measured absorption by the gas at said different wavelength values for generating from such comparison a correction signal indicative of the direction of any deviation of the laser output from the desired wavelength, and means for applying said signal to the selecting means to move the wavelength of the laser output in the direction towards the desired wavelength.

4,823,355
HIGH SPEED AXIAL FLOW GAS LASER GENERATOR
Ryoji Koseki, La Habra, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.
Filed Mar. 10, 1987, Ser. No. 24,032
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—58 **8 Claims**



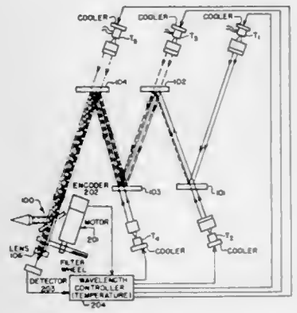
1. A high-speed axial-flow gas laser generator comprising:
a laser tube means having a gas inflow means for supplying a laser gas into said laser tube means and a gas outflow means for discharging said laser gas out of said laser tube means, wherein a first hollow passageway is formed inside said gas inflow means;
means for generating a spiral rotation motion in said laser gas through said laser tube means, said spiral rotation motion generating means being disposed within said first hollow passageway of said gas inflow section means;
means for straightening said laser gas, said straightening means being provided within said first hollow passageway of said gas inflow means and disposed upstream from said spiral rotation motion generating means;
pumping means for generating a population inversion in said laser gas; and
optical resonator means for resonating radiation emitted from said population inversion to generate a laser beam.

4,823,356
CAPILLARY BORE TUBE SUPPORT STRUCTURE
David C. Riley, Eugene Lane, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.
Filed Aug. 13, 1987, Ser. No. 85,638
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—65 **7 Claims**



1. A laser capillary bore tube support structure, comprising:
an annular middle portion having outer and inner peripheries;
an outer plurality of circumferentially-spaced spring fingers intergrally connected to and extending from said outer periphery of said middle portion, said outer spring fingers being alternately bent in opposite directions, each of said outer spring fingers having an outer end arranged to contact the inside surface of a glass outer envelope of a laser, and said outer end of each outer spring finger being curved at a terminal edge thereof to define a pair of pointed corners, said pointed corners being sufficiently sharp such that said corners dig into the inside surface of a glass outer envelope of a laser when said support structure is positioned therein so as to anchor the support structure thereto; and
an inner plurality of circumferentially-spaced spring fingers integrally connected to and extending from said inner periphery of said middle portion.

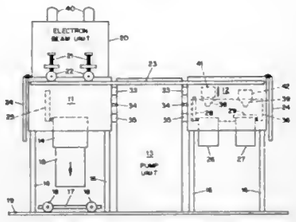
4,823,357
DIFFRACTION LIMITED DICHROIC COMBINER DIODE LASER
William L. Casey, Warren County, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Nov. 10, 1986, Ser. No. 928,356
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—92 **5 Claims**



1. A laser transmitter system comprising:
a plurality of laser sources, emitting laser beams with discrete wavelengths;
a means for superimposing the laser beams received from the laser sources to produce a combined laser beam wherein said superimposing means comprises a plurality of narrowband filters which intercept and combine the laser beams from the plurality of laser sources, each of said narrowband filters having a body with a transmissivity of about 92%, each of said narrowband filters being aligned, with a tilt of about 10 degrees, with two of said laser sources such that the laser beams of a first laser source are conducted through the body of the narrowband filter to join with the laser beams of a second laser source, said laser beams of said second laser source being reflected off a reflective side of the narrowband filter to join with the laser beams of said first laser source, said plurality of narrowband filters thereby superimposing and combining the laser beams of all the laser sources so that they are aligned in parallel and superimposed into the combined laser beam;
a means for sampling said combined laser beam received from said superimposing means at said discrete wavelengths, said sampling means producing output signals which indicate when one of said plurality of laser sources ceases to emit at its discrete wavelength, said sampling means splitting said combined laser beam from said plurality of narrowband filters to output said combined laser beam and a sample of said combined laser beam so that said sample may be photodetected to produce said output signals; and
a means for adjusting said laser sources, said adjusting means receiving the output signals from said sampling means and responding by adjusting the laser sources so that they emit their laser beams at their discrete wavelengths by producing minute changes in operating temperatures around said laser sources.

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4,823,358
HIGH CAPACITY ELECTRON BEAM COLD HEARTH FURNACE
Carlos E. Aguirre, Downingtown, and Howard R. Harker, Malvern, both of Pa., assignors to 501 Axel Johnson Metals, Inc., Lioville, Pa.
Filed Jul. 28, 1988, Ser. No. 225,228
Int. Cl.[4] H01J *37/305*
U.S. Cl. 373—10 **12 Claims**



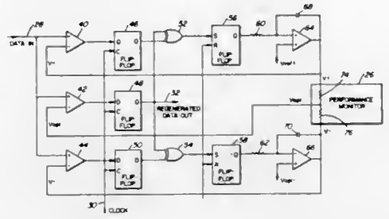
1. An electron beam furnace arrangement comprising first hearth means for receiving raw material to be melted and refined, second hearth means spaced from the first hearth means for receiving raw material to be melted and refined, each of the first and second hearth means having removable lid means, electron beam gun means adapted to be mounted in sealed relation with each of the first and second hearth means selectively, and pump- means for evacuating each of the first and second hearth means when either the electron beam gun means or the lid means is positioned in sealing relation with the hearth means.

4,823,359
FURNANCE HAVING DENSE REFRACTORY OXIDE LINER
Neil N. Ault, Holden; Anthony K. Butkus, Worcester, and Louis J. Trostel, Princeton, all of Mass., assignors to Norton Company, Worcester, Mass.
Continuation of Ser. No. 855,973, Apr. 25, 1986, abandoned.
This application Nov. 25, 1987, Ser. No. 125,092
Int. Cl.[4] C04B *35/10, 35/12*
U.S. Cl. 373—137 **6 Claims**

1. A furnace for melting glass or gasifying coke and coal wherein the improvement comprises:
a furnace lining consisting essentially of a sintered mixture of particulate oxides wherein the oxides are at least 98% pure, said lining is at least 92% of its theoretical density with the porosity present being non-continuous and uniformly distributed throughout the lining, and said mixture of oxides is made up of 10% to 90% alumina and 90% to 10% chromia.

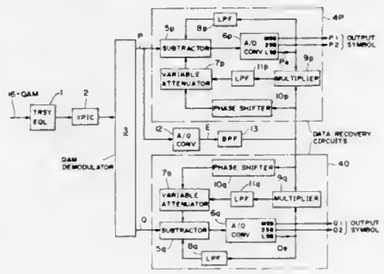
4,823,360
BINARY DATA REGENERATOR WITH ADAPTIVE THRESHOLD LEVEL
Yves Tremblay, and David J. Nicholson, both of Nepean, Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Feb. 12, 1988, Ser. No. 155,413
Int. Cl.[4] H04L *25/06*
U.S. Cl. 375—4 **10 Claims**

1. A regenerator comprising:
means for regenerating a data signal with respect to first, second and third threshold levels to produce respectively first, second and third regenerated signals;
means for controlling the first threshold level in dependence upon differences between the first and second regenerated signals;
means for controlling the third threshold level in dependence upon differences between the second and third regenerated signals; and



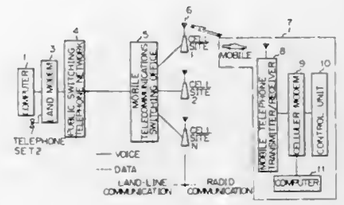
means for determining the second threshold level, the means for determining the second threshold level being responsive to the first and third threshold levels to produce the second threshold level therebetween.

4,823,361
INTERFERENCE IMMUNE DIGITAL MODULATION RECEIVER
Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Nov. 19, 1987, Ser. No. 122,970
Claims priority, application Japan, Nov. 19, 1986, 61-277155; Oct. 7, 1987, 62-253303; Oct. 9, 1987, 62-254893
Int. Cl.[4] H04B *1/12*
U.S. Cl. 375—102 **24 Claims**



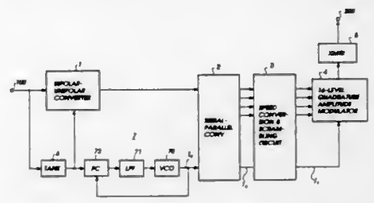
1. A receiver for a digital modulation system, comprising:
a demodulator for demodulating a received digitally modulated signal to produce a 2^n-level signal;
a subtractor for cancelling an interfering signal contained in said 2^n-level signal with cancelling signal;
a first (n+m)-bit analog-to-digital converter for resolving the amplitude of the 2^n-level signal into $2^{(n+m)}$ equal intervals and generating an (n+m)-th significant bit as a replica of said interfering signal, where m is equal to or greater than unity;
a second (n+m)-bit analog-to-digital converter for resolving the amplitude of an output signal from said subtractor into $2^{(n+m)}$ equal intervals and generating n higher significant bits modulator output signal and an (n+m)-th lower significant bit as an error signal; and
a feedback control circuit for controlling the amplitude of said replica of said interfering signal in accordance with said error signal and supplying the controlled replica of said interfering signal to said subtractor as said cancelling signal.

4,823,362
BLOCK SYNCHRONIZATION DATA COMMUNICATION UNIT IN MOBILE RADIO
Hiroshi Etoh, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Division of Ser. No. 833,716, Feb. 27, 1986, Pat. No. 4,694,473.
This application Jun. 25, 1987, Ser. No. 66,737
Claims priority, application Japan, Mar. 8, 1985, 60-44741
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.[4] H04L *7/00*
U.S. Cl. 375—116 **1 Claim**



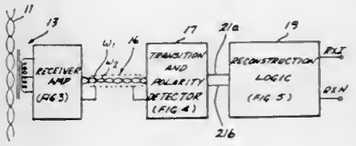
1. A block synchronization data communication unit in a mobile radio comprising:
(1) a transmitting part including:
(a) a means for encoding data and forming said data into blocks to be transmitted;
(b) a means for adding a block synchronization signal, having a plurality of different successive patterns positioned in a prescribed order, to said data formed into blocks;
(c) a circuit means for modulating said data formed into blocks with said block synchronization signal, and
(2) a receiving part including:
(a) a receiver means for receiving data;
(b) a circuit means for demodulating said received data;
(c) a means for decoding said demodulated received data; and
(d) a means for recognizing one of said patterns constituting said block synchronization signal and for estimating the data position based on a position of said recognized pattern in said plurality of different successive patterns.

4,823,363
PHASE-LOCKED CLOCK REGENERATION CIRCUIT FOR DIGITAL TRANSMISSION SYSTEMS
Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Jul. 7, 1986, Ser. No. 882,163
Claims priority, application Japan, Jul. 9, 1985, 60-152024; Jul. 9, 1985, 60-152026
Int. Cl.[4] H03D *3/24;* **H04L** *25/49;* **H04J** *3/06*
U.S. Cl. 375—120 **7 Claims**



1. A digital transmission system comprising:
a phase-locked loop having a low-pass filter, a voltage-controlled oscillator connected thereto, and a phase comparator for supplying to said low-pass filter a signal which is representative of the phase difference between an incoming two-level data bit stream and an output of said voltage-controlled oscillator and for generating a first clock signal from said voltage-controlled oscillator;
first means including frequency dividing means for deriving a second clock signal from said first clock signal and means for converting said incoming data bit stream into a plurality of first parallel data bit streams synchronized with said second clock signal, said second block signal having a frequency which is lower than the frequency of said first clock signal;
second means for deriving a third block signal from said second clock signal and for converting said first parallel data bit streams into a plurality of second parallel data bit streams synchronized with said third clock signal, said third clock signal having a frequency which is higher than the frequency of said second clock signal; and
third means for converting said second parallel data bit streams into an outgoing multi-level digital signal in response to said third, higher-frequency clock signal.

4,823,364
RECEIVE COUPLER FOR BINARY DATA COMMUNICATION SYSTEMS
Hans K. Herzog, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Mar. 12, 1987, Ser. No. 25,168
Int. Cl.[4] H04L *25/03;* **H04B** *3/02*
U.S. Cl. 375—36 **10 Claims**



1. A receive coupler for a binary data communication system that carries data in rectangular waveform over a current mode data bus, said receive coupler comprising:
(a) coupling means for detecting rectangular waveform data signals carried by a current mode data bus and applying said signal to a transition and polarity detector, said coupling means including:
(1) a coupling transformer for coupling rectangular waveform data signals carried by said current mode data bus to a low input impedance receiver amplifier, said coupling transformer constructed such that the wires that form said current mode data bus also form the primary winding of said coupling transformer, said coupling transformer having a high secondary to primary turns ratio; and,
(2) a low input impedance receiver amplifier having its input connected to the secondary winding of said coupling transformer for amplifying said rectangular waveform data signals;
(b) a transition and polarity detector connected to said low input impedance receiver amplifier of said coupling means for receiving said rectangular waveform data signals and producing a pulse for each transition of said rectangular waveform data signals; and,
(c) logic means connected to said transition and polarity detector for receiving the pulses produced by said transition and polarity detector for each transition of said rectangular waveform signals and replicating said rectangular waveform signals based on said pulses.

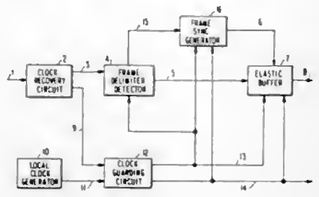
VOL 1101 ISS 3 AP 18 1989 UMI

4,823,365

SYNCHRONIZATION METHOD AND ELASTIC BUFFER CIRCUIT

Boris Z. Loginov, San Diego, Calif., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jun. 28, 1988, Ser. No. 211,655
Int. Cl.[4] H04L *25/36, 25/40*
U.S. Cl. 375—118 **5 Claims**



1. A synchronization circuit for asynchronous data communication comprising:

clock recovery circuit means for receiving a data signal and generating a recovered data signal and a recovered clock signal;

frame delimiter detector means connected to receive said recovered data signal for generating an asynchronous data signal and a frame start pulse;

clock guarding circuit means responsive to a local clock signal and said recovered clock signal for generating a guarded clock signal and a data clock signal, said local clock signal and said recovered clock signal having a nominal frequency equal to a data bit rate of said recovered data signal, and said guarded clock signal being derived from the recovered clock signal so that the recovered clock signal cannot switch within a certain zone associated with each active edge of the local clock signal;

frame sync generator means responsive to said frame start pulse for generating a frame sync signal having a duration determined by active edges of said guarded clock and data clock signals; and

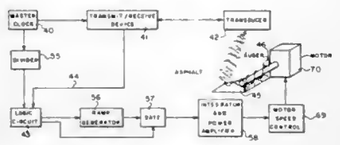
elastic buffer means controlled by said guarded clock signal and said data clock signal and responsive to said asynchronous data signal and said frame sync signal for generating a synchronized output data signal.

4,823,366

MATERIAL CONVEYING EQUIPMENT WITH CONTROL FOR PAVING MATERIALS USING ULTRASONIC WAVES

Loren E. Williams, Olney, Ill., assignor to White Consolidated Industries, Inc., Ohio

Filed Feb. 17, 1987, Ser. No. 14,991
Int. Cl.[4] E01C *19/48*
U.S. Cl. 377—2 **20 Claims**



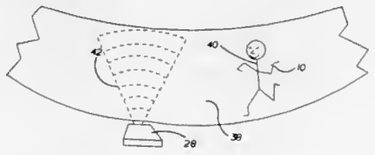
1. In a paving material conveying equipment having a first conveying device for distributing a paving material in a first direction on a surface to be paved, a second conveying device for conveying said paving material in a second direction to said first conveying device, sensing means for sensing the height of said paving material distributed by said first conveying device onto said surface to be paved, at a given position, for producing a control signal, and means responsive to said control signal for controlling the quantity of paving material distributed by said first conveying device to said given position for maintaining said height substantially constant; the improvement wherein said sensing means comprises non-contacting sensing means fixedly mounted on said equipment spaced from said paving material at a predetermined height above said surface to be paved for producing said control signal, whereby said control signal is a function of the distance between said non-contacting sensing means and an upper surface of said paving material at said given position.

4,823,367

METHOD AND APPARATUS FOR AUTOMATIC LAP COUNTING

Robert J. Kreutzfeld, Rochester, Mich., assignor to Rikagaku Kenkyujyo and Hochiki Corp., Tokyo, Japan

Filed Aug. 7, 1987, Ser. No. 83,514
Int. Cl.[4] G01C *22/00*
U.S. Cl. 377—24.2 **14 Claims**



1. A device which allows an individual in a recurring event to automatically count the number of times that said person passes within range of a stationary point on a recurring event path such that each pass by said person is counted as one event, said device comprising:

a receiver having means for attaching said receiver to a person, said receiver further having photoelectric detector means for detecting an infrared light beam and means for counting discrete detection signals;

an infrared light beam transmitter for placement at said stationary point, said infrared light beam transmitter having means for pulse encoding an infrared light beam; and

in association with said receiver, time-delay, lock-out means for locking out detection of said infrared light beam for a predetermined interval after said signal can no longer be detected by said receiver.

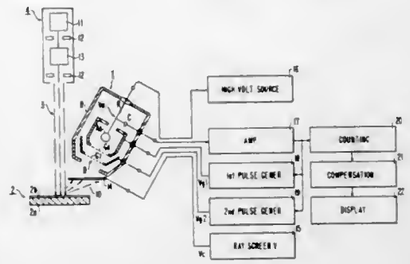
4,823,368

OPEN COUNTER FOR LOW ENERGY ELECTRON DETECTION WITH SUPPRESSED BACKGROUND NOISE

Masayuki Uda; Yukio Tomioka; Chikara Kouno, all of Tokyo; Hiroshi Ishida, and Yukio Yamauchi, both of Kanagawa, all of Japan, assignors to Rikagaku Kenkyujyo, Tokyo, Japan

Filed Jun. 30, 1987, Ser. No. 68,184
Int. Cl.[4] G01F *23/00*
U.S. Cl. 250—372 **12 Claims**

1. A device for counting photoelectrons in a photoelectron detector, which are emitted from a subject in response to irradiation by ray irradiation, in which the open photoelectron detector consists of photoelectron emission prohibition means for preventing photoelectrons from being emitted from inner surfaces of the detector due to rays scattered from the same subject; wherein said photoelectron emission prohibition means consists of a surface layer or film having a work function which is greater than that of parts of the detector, and



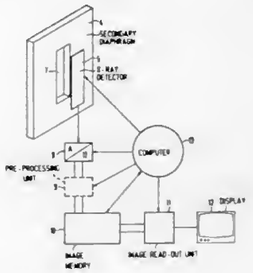
which is applied to the parts from which photoelectrons are emitted due to rays scattered from the subject.

4,823,369

DENTAL X-RAY DIAGNOSTICS INSTALLATION FOR PRODUCING PANORAMA SLICE EXPOSURES OF THE JAW OF A PATIENT

Werner Guenther; Manfred Muether; Erich Heubeck, all of Bensheim; Michael Doebert, Lorsch, and Leonhard Werner, Hemsbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 31, 1987, Ser. No. 140,123
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704857
Int. Cl.[4] A61B *6/00*
U.S. Cl. 378—22 **8 Claims**



1. A dental x-ray diagnostics installation for producing panorama tomograms of the jaw of a patient comprising:

an x-ray source;

a secondary diaphragm having an opening therein;

an x-ray detector disposed behind said opening of said secondary diaphragm and having a size coincident with said opening, said x-ray detector consisting of at least one semiconductor substrate with a scintillation layer thereon and generating electrical signals corresponding to x-radiation incident on said x-ray detector;

means for rotating said x-ray source, said secondary diaphragm and said x-ray detector around the jaw of said patient with the jaw disposed between the x-ray source and the detector so that x-radiation attenuated by the jaw is incident on said detector;

means connected to said x-ray detector for selectively adding less than all of the signals from said x-ray detector as a function of time to generate successive sets of added signals;

means for storing said sets of added signals; and

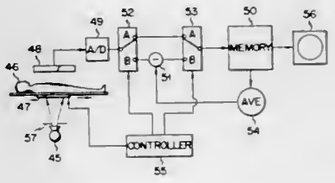
means for adding said sets of added signals as a function of time to generate a tomogram of a selected slice of said jaw.

4,823,370

X-RAY DIAGNOSTIC APPARATUS

Katsuya Kikuchi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 601,349, Apr. 17, 1984. This application Oct. 13, 1987, Ser. No. 106,956
Claims priority, application Japan, Apr. 25, 1983, 58-73552; May 11, 1983, 58-80971
Int. Cl.[4] H05G *1/64*
U.S. Cl. 378—99 **7 Claims**



1. An X-ray diagnostic apparatus of the type in which trasmitted X-ray image data, produced by an X-ray detector as the result of irradiating an object in an X-ray projection area, is digitized and visually displayed, said apparatus comprising:

X-ray shield means having an X-ray shield section consisting essentially of a pair of X-ray blocking, orthogonally interseccting straight lines forming X and Y axes;

means for moving said shield means into and out of the path of said X-rays irradiating said object, said X-ray shield section, when in said X-ray path, causing the generation of X-ray transmission image data containing X and Y axis shield data;

means for computing a scattered X-ray component signal using said X and Y axis shield data in accordance with a mathematical algorithm describing scattered X-ray intensity for an object like a human body based on an impulse response function having a Gaussian form; and

compensating means for subtracting said scattered x-ray component signal from the transmitted X-ray image data produced when said X-ray shield means is retracted from said X-ray path, thereby producing image data comprising a primary X-ray component and a minimized scattered X-ray component.

4,823,371

X-RAY TUBE SYSTEM

John K. Grady, 43 Slough Rd., Harvard, Mass. 01451

Filed Aug. 24, 1987, Ser. No. 88,703
Int. Cl.[4] H01J *35/06*
U.S. Cl. 378—134 **16 Claims**

1. An X-ray tube for generating a plurality of different X-ray intensities comprising:

a plurality of filaments of different sizes;

a plurality of separate means for supplying current to each of the filaments to cause thermionic emission of electrons from the filaments;

an anode spaced from the filaments;

means for applying a positive potential to the anode so that the anode attracts electrons from the filaments and generates X-rays;

a plurality of bias means at different potentials each connected to one of the separate current supplying means to applying a selected positive potential to its associated filament of a magnitude sufficient to prevent emission from the associated filament; and

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switching means for selectively connecting each bias means to its associated filament;

wherein rapid switching between emissions from the various filaments to achieve different X-ray intensities can be achieved by independently connecting each bias means to its associated filament.

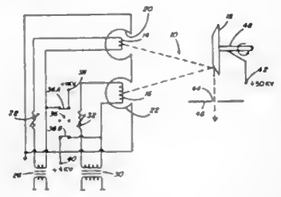
9. An X-ray tube for generating a plurality of different X-ray intensities comprising:

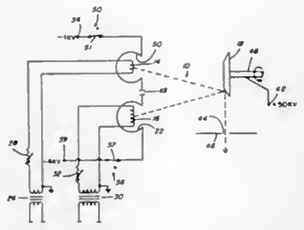
a plurality of filaments of different sizes;

means for supplying current to the filaments to cause thermionic emission of electrons from the filaments;

an anode spaced from the filaments;

means for applying a positive potential to the anode so that the anode attracts electrons from the filaments and generates X-rays;





a plurality of focus cups electrically isolated from one another, each of the cups surrounding an associated filament;

a plurality of bias means at different potentials each connected to one of the focus cups for applying a selected negative potential to its associated focus cup of a magnitude sufficient to prevent emission from the associated filament; and

switching means for selectively connecting each bias means to its associated filament;

wherein rapid switching between emissions from the various filaments to achieve different X-ray intensities can be achieved by independently connecting each bias means to its associated focus cup.

4,823,372

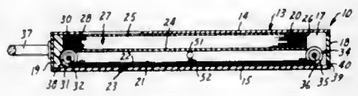
FILM EXPOSURE AND PROCESSOR SYSTEM

John A. Svendsen, May Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 12, 1987, Ser. No. 13,739

Int. Cl.⁴ G03B *42/04*

U.S. Cl. 378—185 **5 Claims**



1. A cassette for use with sheets of film to permit exposure of one sheet in an exposure position and then the dispensing of the exposed sheet and the feeding of another sheet from a supply of sheets to said exposure position, said cassette comprising a housing, said housing comprising a generally rectangular top and bottom wall spaced by connecting side and end walls, said bottom wall affording X-ray exposure of a said sheet therethrough,

storage means for containment of a number of sheets in said housing between said said top and bottom wall,

one said end wall having an opening through which an exposed sheet may be dispensed,

means forming a light seal at said opening,

movable pressure pad means for pressing a sheet against said bottom wall,

a first drive roller means disposed within said housing for advancing a sheet between said pressure pad means and said bottom wall,

a second drive roller means for driving an exposed sheet from between said pressure pad means and said bottom wall out said opening, and

drive means, including first and second pinion gears external to said side walls of the cassette, for operation of said first and second drive roller means respectively in response to external forces being placed against said drive means; and

one-way bearings for each of said first drive roller means and said second drive roller means affording rotation with said first and second pinion gears each in only one respective direction.

4,823,373

LINE SWITCHING CONTROL SYSTEM FOR MOBILE COMMUNICATION

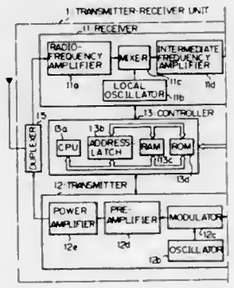
Chusei Takahashi; Tadashi Amakasu, and Hiroshi Etoh, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 109,021

Claims priority, application Japan, Oct. 16, 1986, 61-244064

Int. Cl.⁴ H04M *11/00*; H04B *7/26*

U.S. Cl. 379—58 **4 Claims**



1. A line switching control system comprising:

(a) a transmitter/receiver means for transmitting and receiving signals through an antenna;

(b) a input means combined with a handset;

(c) a switching means for effecting switching between a first mode in which a signal line from said transmitter/receiver means is connected to a modem and a second mode in which said signal line is connected to said handset; and

(d) a control means for detecting line switching information which is inputted by said input means and for controlling said switching means in response to a switching command comprising coded line switching information which is sent from said handset to said modem via said transmitter/-receiver means.

4,823,374

TELEPHONE EXCHANGE SYSTEM WITH PERFORMANCE FEATURES ACTIVATABLE FROM AN AUTHORIZED SUBSCRIBER STATION

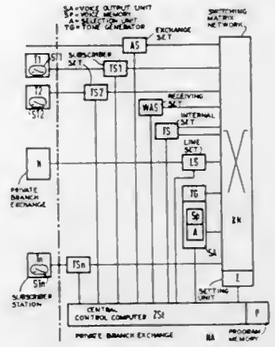
Axel Verlohr, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 766,988, Aug. 19, 1985, abandoned. This application Jul. 11, 1988, Ser. No. 218,465

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1984, 3431614

Int. Cl.⁴ H04M *3/42*

U.S. Cl. 379—67 **5 Claims**



1. A method of providing performance features during a call or the set up of a call connection in a program-controlled telephone exchange system, comprising the steps of:

storing in a memory of plurality of information corresponding to all performance features which may be activated;

activating a single signal switch in a subscriber station to transmit a request signal for performance feature service;

recognizing the request signal in the exchange system and the calling state of the subscriber and sequentially reading the memory and transmitting performance feature signals available to the subscriber in that calling state as sensorily perceptible information with each transmission followed by a predetermined time interval;

sequentially and symbolically displaying the performance features at the subscriber station in response to the performance feature signals; and

activating the single signal switch symbolically displaying a performance feature during the following predetermined time interval to actuate the exchange system to provide the corresponding service to the requesting subscriber.

4,823,375

DATA COMMUNICATION APPARATUS CUPABLE OF DISABLING AN OUTPUT COMPONENT WHEN OUTPUT OF A TYPE PROVIDED BY THAT COMPONENT IS UNNECESSARY

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 32,369

Claims priority, application Japan, Apr. 3, 1986, 61-077032

Int. Cl.⁴ H04M *11/00*

U.S. Cl. 379—100 **6 Claims**

1. A data communication apparatus comprising:

means for performing data communication between said apparatus and another station;

informing means for outputting information contained in an answer signal received from the other station; and

means for controlling an operation of said informing means in accordance with a characteristic of a communication network used in the data communication,

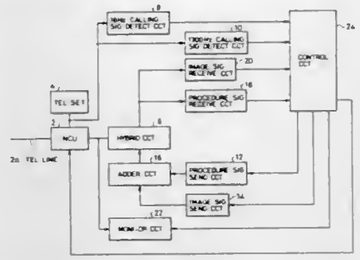
wherein said control means disables said informing means when a network for exclusive use for data communication is used.

5. A facsimile apparatus comprising:

speech communication means for performing speech communication between said apparatus and another station;

data communication means for performing image data communication between said apparatus and the other station;

means for switching between said speech communication means and said data communication means;



informing means for outputting information contained in an answer signal received from the other station in an image data communication mode in which image data communication is performed by said data communication means; and

control means for controlling an operation of said information means in accordance with a characteristic of a communication network used in the image data communication,

wherein, unless the communication network used in the image data communication is one also used for speech communication, said control means disables said informing means.

4,823,376

TIME LIMITED DATA COMMUNICATION SYSTEM

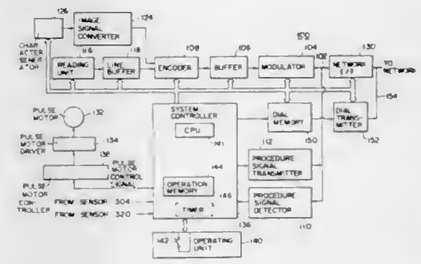
Shuichi Takahashi, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,373

Claims priority, application Japan, Dec. 16, 1985, 60-281005; Dec. 19, 1985, 60-284312; Mar. 14, 1986, 61-54868

Int. Cl.⁴ H04M *17/00, 15/02, 11/00*

U.S. Cl. 379—100 **8 Claims**

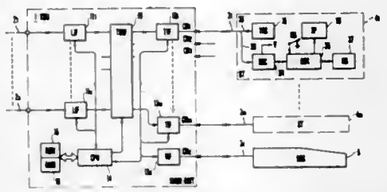


1. A data communication apparatus for use in a communication system which automatically disconnects a connection between a transmitter and a receiver upon expiration of a communication time period, comprising:

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reading means for reading an original document to produce an image data;
transmitting means for transmitting said image data;
detecting means for detecting the presence of a remaining portion of said image upon occurrence of said disconnection; and
means responsive to said detecting means for reestablishing a connection between said transmitter and said receiver for transmitting said remaining portion of said image data by said transmitting means.

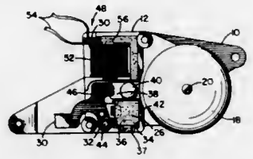
4,823,377
SYSTEM FOR SETTING REGISTRATION MODE FOR KEY TELEPHONE SET
Ryuzo Sugiura; Kenichi Kanno, both of Tokyo, and Hisami Ojima, Kanagawa, all of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan
Filed Oct. 28, 1987, Ser. No. 114,407
Claims priority, application Japan, Oct. 29, 1986, 61-255797
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—156 **9 Claims**



1. A key telephone system comprising a main unit including:
a speech path switch for selectively switching between at least one office line and a plurality of key telephone sets;
a plurality of calling processing interfaces connected between said speech path switch and said plurality of key telephone sets;
an operating data memory for storing operating data required for operating said system;
operation mode setting means for setting an operation mode of said system in one of a call processing mode and a data setting mode; and
control means for controlling said speech path switch by referring to said operating data memory when data transmission is periodically performed with said plurality of key telephone sets through said calling processing interfaces in the call processing mode, and for updating contents of said operating data memory according to operating data externally input in the data setting mode,
wherein said system further comprises a direct station selection interface for connecting at least one direct station selection console to perform periodical data transmission and first detecting means for detecting that first normal data received, after a periodic data transmission with said direct station selection interface is an abnormal transmission for at least a predetermined period of time is data unique to said key telephone set, and
said control means controls said operation mode setting means in association with an output from said detecting means to change the call processing mode into the data setting mode.

4,823,378
Patent Not Issued For This Number

4,823,379
TELEPHONE RINGER
Jerry D. Palmer, Corinth, Miss., assignor to Alcatel Business Systems, Corinth, Miss.
Filed Jan. 29, 1988, Ser. No. 150,788
Int. Cl.[4] H04M *1/02*
U.S. Cl. 379—373 **15 Claims**

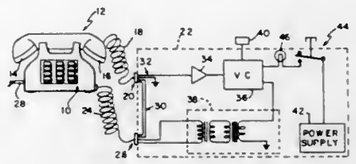


1. A telephone ringer assembly, comprising:
a housing;
a gong mounted to said housing;
means mounted to said housing for establishing a fixed magnetic field adjacent said gong;
means mounted to said housing for selectively establishing an alternating magnetic field for modulating said fixed magnetic field;
a moveable armature disposed in said fixed magnetic field, said armature being positioned a predetermined distance from said gong by said fixed magnetic field and being selectively driven in alternating opposite directions towards and away from said gong by said alternating magnetic field, whereby the armature alternately strikes said gong; and
means for positionally adjusting said means for establishing a fixed magnetic field in a direction parallel to the direction of travel of the armature, whereby the strength of the alternating magnetic field needed to drive the armature to strike the gong can be varied by varying the position of the means for establishing a fixed magnetic field.

4,823,380
VOICE CHANGER
Chaim Kohen, 2108 Cypress Bend Dr., Apt. 208 B-10, Pompano Beach, Fla. 33069, and Itzhak Berliner, Ramat-Gan, Israel, assignors to Chaim Kohen, Pompano Beach, Fla.
Filed Mar. 27, 1987, Ser. No. 30,624
Int. Cl.[4] H04M *1/00;* **H03G** *3/00;* **G06F** *3/16*
U.S. Cl. 379—387 **23 Claims**

1. A telephone voice changer for connection between a hand set and a telephone set comprising:

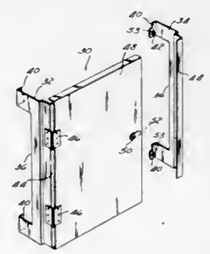
a first port means for connection to a hand set,
a second port means for connection to a telephone set, and
voice changing means for selectively changing the frequency content of voice signals transmitted between said first and second ports, and including
an analog to digital converter means whose input is connected to said first port means;
a digital to analog converter means whose output is connected to said second port means;



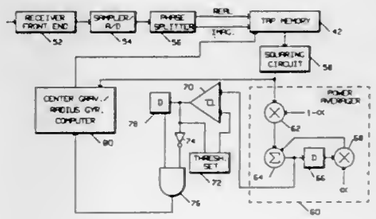
a digital processor means having an input and an output for receiving, storing and sending signal from its input and to its output;
a serial to parallel converter means connecting said analog to digital converter means to said digital processor means input; and
a parallel to serial converter means connecting said digital processor means output to said digital to analog converter means.

4,823,382
ECHO CANCELLER WITH DYNAMICALLY POSITIONED ADAPTIVE FILTER TAPS
Aldo A. Martinez, Miami, Fla., assignor to Racal Data Communications Inc., Sunrise, Fla.
Filed Oct. 1, 1986, Ser. No. 913,929
Int. Cl.[4] H04B *3/23*
U.S. Cl. 379—411 **19 Claims**

4,823,381
SECURITY COVER FOR TELEPHONE LINE INSTALLATION BACKBOARD AND METHOD OF RETROFITTING THE SAME
Robert D. Olson, 1301 N. Cheyenne, Tacoma, Wash. 98406
Filed Sep. 22, 1986, Ser. No. 910,002
Int. Cl.[4] H04M *1/00;* **H05K** *7/14, 7/18;* **H01R** *13/44;* **H02B** *1/02;* **H02G** *3/08*
U.S. Cl. 379—399 **14 Claims**



1. A security cover device for attachment to a telephone line backboard, said backboard having a plurality of peripheral edges at least two of which are generally opposite one another and at least one telephone wire connected thereto with said telephone wire extending over at least one of said edges and said backboard being fixed to a support surface by one or more mounting fasteners, said security cover device comprising:
a pair of mounting members sized and configured to extend along generally opposite edges of the backboard and to be attachable thereto so as to extend outwardly thereform, at least one of said mounting members being provided with at least one cutaway region sized and configured to permit attachment of such mounting member along one of said opposite edges while the said telephone wires remain operatively connected to the backboard and extended over said edge;
a cover panel movably attached to at least one of said mounting members; and
means formed on said mounting members for fastening said pair of mounting members to the backboard, said cover panel sized to extend between said pair of mounting members and be disposed in a first closed position wherein said cover panel prevents access to the backboard and a second position wherein said cover panel allows access to the backboard.



1. A method of allocating filter taps in an echo canceller for a transmission line comprising the steps of:
storing a plurality of samples of a signal representative of said transmission line's impulse response in a memory;
examining said plurality of stored samples to find variable sized ranges of samples of said impulse response having at least a predetermined amount of echo energy, said examining step including computing a center of echo of each of said ranges of said samples in order to find the approximate center of each of said ranges of samples of impulse response containing echo energy; and

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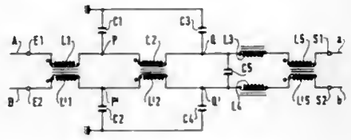
allocating a variable total number of filter taps of said echo canceller by turning on only those taps corresponding to said ranges of samples having at least said predetermined amount of echo energy.

4,823,383

PROTECTION DEVICE FOR TERMINAL EQUIPMENT ON TELEPHONE SUBSCRIBER PREMISES

Gérard Cardot, Lachapelle Saint Pierre, and Giovanni Dortu, Montigny, both of France, assignors to Telic Alcatel, Paris, France

Filed Nov. 17, 1987, Ser. No. 121,833
Claims priority, application France, Nov. 17, 1986, 86 15950
Int. Cl.[4] H04M *1/00*; H03H *7/09*; H02H *9/00*
U.S. Cl. 379—412 **2 Claims**



1. A protection device for terminal equipment on telephones in subscriber premises, for providing protection against radio frequencies and interference conveyed by a telephone line, the device being constituted by a filter in series with the telephone line, said filter comprising:
- in series between a first input terminal and a first output terminal, first, second, third, and fourth inductors;
- and in series between a second input terminal and a second output terminal, fifth, sixth, seventh, and eighth inductors;
- the first, second, fifth, and sixth inductors having the same inductance;
- the first and fifth inductors sharing a common magnetic circuit;
- the second and the sixth inductors sharing a common magnetic circuit;
- the third and the seventh inductors having the same inductance and different magnetic circuits;
- the fourth and the eighth inductors having the same inductance and a common magnetic circuit;
- a first point common to the first and second inductors being connected by a first capacitor to ground;
- a second point common to the fifth and the sixth inductors being connected by a second capacitor to ground;
- a third point common to the second and third inductors being connected via a third capacitor to ground;
- a fourth point common to the sixth and seventh inductors being connected by a fourth capacitor to ground;
- the third and fourth points being interconnected by a fifth capacitor; and
- the first, second, third, and fourth capacitors having the same capacitance.

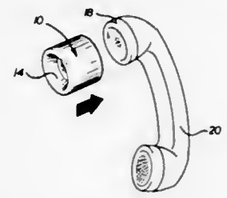
4,823,384

TELEPHONE APPARATUS FOR THE HEARING IMPAIRED

Stephen L. Lindsay, Livonia, Mich., assignor to Lindsay H. Industries, Inc., Novi, Mich.

Filed Dec. 24, 1987, Ser. No. 137,875
Int. Cl.[4] H04M *1/00, 11/00*
U.S. Cl. 379—441 **14 Claims**

1. A telephone accessory for attachment to a telephone handset earpiece for use by hearing impaired individuals while wearing a hearing aid, said telephone earpiece having an outer surface for emitting sound and for placement in direct proximity to the user's ear, comprising:
- a body having means for attachment to the telephone handset earpiece, and
- an ear horn portion of said body having an upstanding cylindrical wall forming an open end, said cylindrical wall extending from said outer surface when said accessory is mounted to the telephone handset earpiece, said cylindrical wall substantially covering the user's ear when the telephone handset earpiece is positioned adjacent the



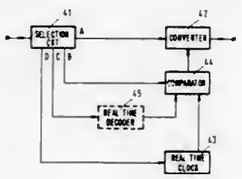
user's ear, said ear horn portion having a depth measured from said open end to said earpiece outer surface of at least one-half inch whereby said ear horn portion permits said handset to be used by a hearing impaired individual without causing feedback of said hearing aid.

4,823,385

SYSTEM FOR PROCESSING CODED INFORMATION

Max Hegendörfer, Forchheim, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1987, Ser. No. 131,781
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642629
Int. Cl.[4] B04K *1/00*
U.S. Cl. 380—10 **11 Claims**



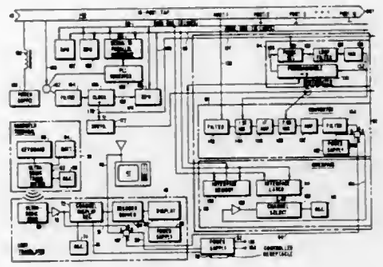
1. A system for processing coded information, in which a receiver receives coded information from a source and is equipped with a real time clock which generates a real time signal and a decoder (4) to decode the coded information only when the real time signal of the real time clock is in a given time interval, characterized in that:
- the coded information also comprises a source time signal;
- the coded information contains a time interval signal corresponding to the given time interval;
- means for comparing the source time signal in the coded information with the real time signal of the real time clock (43) of the receiver, and producing a comparison signal corresponding to the time difference between the source time signal and the real time signal; and
- means for decoding the coded information only when the comparison signal indicates that the time determined by the real time clock (43) of the receiver is within the given time interval.

4,823,386

ADDRESSABLE SUBSCRIBER CABLE TELEVISION SYSTEM

Lewis D. Dumbauld, Phoenix, Ariz., and Gilbert L. Tash, San Clemente, Calif., assignors to Texscan Corporation, Scottsdale, Ariz.

Continuation of Ser. No. 827,485, Feb. 6, 1986, abandoned, which is a continuation of Ser. No. 636,847, Aug. 1, 1984, abandoned, which is a continuation of Ser. No. 250,215, Apr. 2, 1981, Pat. No. 4,475,123. This application May 27, 1987, Ser. No. 57,675
The portion of the term of this patent subsequent to Oct. 2, 2001, has been disclaimed.
Int. Cl.[4] H04N *7/167*
U.S. Cl. 380—13 **11 Claims**



1. A cable television system for distributing a plurality of different television channel signals to a plurality of subscribers, each subscriber having access only to those television channel signals which such subscriber has been authorized to receive, said cable television system comprising in combination:
- a. transmission cable means for transmitting the plurality of different television channel signals, said transmission cable means having a head end for generating the plurality of different television channel signals transmitted by said transmission cable means;
- b. authorization means coupled to the head end of said transmission cable means for generating authorization signals transmitted by said transmission cable means, the authorization signals including an address portion for identifying a particular subscriber ana data portion for indicating which television channel signals the particular subscriber has been authorized to receive;
- c. subscriber selection means operated by each subscriber for generating a selection request signal indicating which television channel signal the subscriber desires to receive;
- d. a plurality of multiple subscriber controllers coupled to said transmission cable means, each of said controllers controlling reception of television channel signals by a particular plurality of subscribers, each of said controllers storing the data portion of authorization signals having an address portion that identifies one of the particular subscribers controlled by each controller, each of said controllers being coupled to said subscriber selection means of each of the subscribers for which it control reception for receiving the selection request signal therefrom, and each of said controllers comparing the selection request signals received from the plurality of subscribers stored data portions of corresponding authorization signals for determining whether each respective subscriber may received the television channel signal desired by the subscriber, each said controller including a preprogrammed memory means for storing a lookup table of predetermined N values each corresponding to a particular selection request signal; and
- e. a plurality of controller selection means associated with each of said controllers, each of said controller selection means
  1. being coupled between said transmission cable means and one of the particular plurality of subscribers for which reception is controlled by each associated controller, at a location remove from its associated subscriber;
  2. coupling one of the plurality of television channel signals to the associated subscriber as determined by the selection request signal and stored data portion corresponding to the associated subscriber; and
  3. having a separate frequency-synthesized local oscillator including a continuously closed phase-locked loop, said phase-locked loop including a programmable divider and register means for storing an N value for programming said programmable divider,

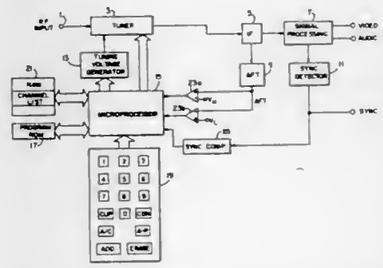
wherein said controller further includes conditional logic means for supplying a particular N value from said lookup table to the register means associated with a particular subscriber if the particular subscriber is authorized to receive the television channel signal desired, and for otherwise enabling the particular subscriber's controller selection means to couple an alternate television channel signal to the particular subscriber, said conditional logic means including means for accessing a memory location in said preprogrammed memory means which is determined by a selection request signal.

4,823,387

TELEVISION TUNING SYSTEM WITH PROVISIONS FOR TUNING RF SIGNALS WITH SCRAMBLED VIDEO INFORMATION

Juri Tults, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed May 8, 1987, Ser. No. 47,848
Int. Cl.[4] H04N *7/167*
U.S. Cl. 380—13 **3 Claims**



1. A tuning system for tuning channels with non-standard frequency radio frequency (RF) signals comprising:
- local oscillator (LO) means for generating a (LO) signal;
- mixer means for combining said (LO) signal with an RF signal having picture and sound carriers to produce an intermediate frequency (IF) signal having corresponding picture and sound carriers;
- detector means for demodulating said picture carrier of said IF signal to produce a video signal having a synchronization component;
- automatic fine tuning (AFT) means responsive to said IF signal for generating an AFT signal; and
- control means for changing the frequency of said LO signal during a search in a number of frequency steps in a predetermined sequence for each channel selected to be tuned; said control means evaluating both of said AFT signal and said synchronization component at each frequency step of said predetermined sequence to determine the presence of one of said carriers of said IF signal;
- said control means including memory means for storing a frequency step at which said AFT signal indicates the

presence of one of said carriers of said IF signal as the frequency of said LO signal continues to be changed during said search; said control means normally utilizing a frequency step at which said synchronization component indicates the presence of one of said carriers for tuning said selected channel, but utilizing said stored frequency step for tuning said selected channel if said search has been completed, whereby both of said AFT signal and said synchronization component have been evaluated at each frequency step of said predetermined sequence, and said synchronization signal has not indicated the presence of one of said carriers at any frequency step of said entire predetermined sequence.

4,823,388

COMMUNICATIONS NETWORK USING AN ENCIPHERING AND DECIPHERING DEVICE

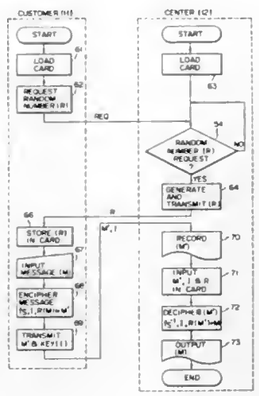
Hiroyuki Mizutani, Yokohama, and Takashi Kamitake, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 739,282, May 30, 1985, abandoned. This application Feb. 5, 1987, Ser. No. 14,213

Claims priority, application Japan, Jun. 25, 1984, 59-130534

Int. Cl.[4] H04L *9/00*

U.S. Cl. 380—23 **15 Claims**



1. A two-way communication network system in which a plurality of peripheral terminals and a central terminal are connected by communication lines, comprising:

each peripheral terminal comprising a first device for executing only a first algorithm which is one of an enciphering algorithm and a deciphering algorithm;

said central terminal comprising a second device for executing only a second algorithm which is the other of the enciphering algorithm and the deciphering algorithm;

said first device, when a first communication message input from outside is transmitted by a sender from said peripheral terminal to said central terminal, enciphering said message in accordance with said first algorithm, and said second device deciphering said message transmitted thereto in accordance with said second algorithm, wherein said first message operated on by said first algorithm produces a first unique signature;

said second device, when a second communication message input from outside is transmitted from said central terminal to said peripheral terminal, enciphering said second message in accordance with said second algorithm, and said first device deciphering said second message transmitted thereto in accordance with said first algorithm, wherein said second message operated on by said second algorithm produces a second unique signature;

whereby it is possible to determine a source of a message operated on by either of said first and second algorithms based on said first and second signatures.

4,823,389

METHOD AND CIRCUIT APPARATUS FOR CHECKING THE AUTHORIZATION OF ACCESS TO A SIGNAL PROCESSING SYSTEM

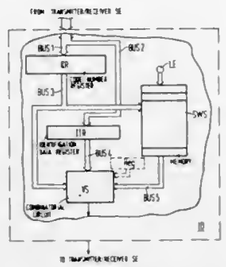
Johann F. Wurzenberger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 14, 1986, Ser. No. 863,218

Claims priority, application Fed. Rep. of Germany, May 28, 1985, 3519049; Mar. 11, 1986, 3608028

Int. Cl.[4] H04L *9/00*

U.S. Cl. 380—23 **9 Claims**



1. A method for checking authorization to access a signal processing system from a designated peripheral unit connected to said system for the purpose of at least one of transmitting and receiving signals by means of a code number allocated to the respective peripheral unit and by means of identification data freely selectable for the respective peripheral unit, characterized in that, for each peripheral unit (TE, BS) a keyword is provided in the signal processing system, the keyword being always derived from the specified code number and the identification data of the respective peripheral unit and being unknown to a user of the respective peripheral unit such that, for access from a peripheral unit, first of all, the code number and the identification data are transmitted for said purpose by said peripheral unit and mathematically combined with the keyword allocated to the respective peripheral unit.

4,823,390

FM STEREO GENERATOR

Glen R. Wittrock, Sioux Falls, S. Dak., assignor to Sencore, Inc., Sious Falls, S. Dak.

Filed Feb. 10, 1988, Ser. No. 154,304

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—4 **13 Claims**

1. An FM stereo generator for providing 19 KHz and 38 KHz signals, said circuit comprising in combination:

means for applying left and right stereophonic audio signals to said generator;

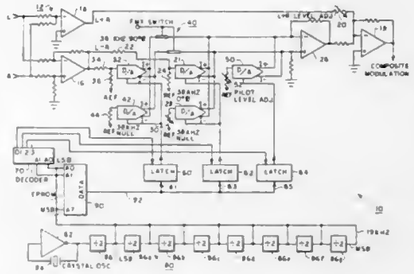
means receptive of said audio signals for providing sum and difference components of said audio signals;

a source of clock pulses;

a digital synthesis circuit responsive to said clock pulses and said difference components for providing a modulated double sideband suppressed carrier signal;

a digital-to-analog converter coupled to said circuit and being responsive to said clock pulses for providing a pilot subcarrier signal whose phase is commonly derived with

the phase of said double sideband suppressed carrier signal; and,



means for adding said pilot and suppressed carrier signals and combining the added signals with said sum component.

4,823,391

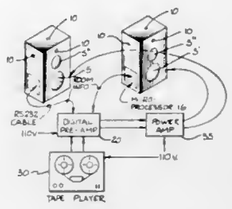
SOUND REPRODUCTION SYSTEM

David M. Schwartz, 26873 Moody Rd., Los Altos Hills, Calif. 94022

Filed Jul. 22, 1986, Ser. No. 887,955

Int. Cl.[4] H03G *5/00*

U.S. Cl. 381—103 **1 Claim**



1. A sound reproduction system capable of sensing and compensating for the acoustic environment in which it is placed comprising:

audio source means for producing an electrical signal representative of a recorded audio signal;

digital preamplification means comprising means for receiving said electrical signal from said audio source means and digital signal producing means for producing a digital signal corresponding to the electrical signal produced by said audio source means, said preamplification means being capable of converting said digital signal into a converted digital signal having preselected audio characteristics and further being capable of converting said converted digital signal into an analog signal;

power amplification means operatively connected with said preamplification means for receiving and amplifying said analog signal;

speaker means located in an acoustic environment and operatively connected to said power amplification means to receive the amplified analog signal and convert the amplified analog signal into an audio signal representative of the recorded audio signal;

spatial sensing means for periodically sensing preselected spatial characteristics of the acoustic environment of said speaker means; and

a microprocessor means provided with data storage means and operably connected to said spatial sensing means and the output of said digital preamplification means for comparing the preselected spatial characteristics and, therefore, the spectral profile of the acoustic environment sensed by said spatial sensing means with the characteristics of an anechoic environment for the speaker means, to produce signals which are used to convert the digital signal produced by said digital preamplification means in a predetermined manner to compensate for differences between the spectral profile of the acoustic environment of the speaker means produced by said sensor means and said microprocessor means, with an anechoic environment.

4,823,392

COMPRESSOR

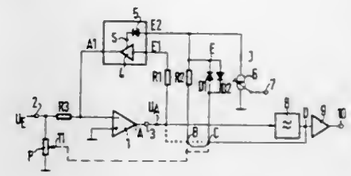
Michael Walker, Baltmannsweiler, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 12, 1987, Ser. No. 13,704

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604832

Int. Cl.[4] H03G *7/00*

U.S. Cl. 381—106 **5 Claims**



1. A compressor for controlling the dynamic range of audio signals comprising:

an operational amplifier;

a gain-controlled amplifier connected in inverse parallel with said operational amplifier and having a control input;

a rectifier connected to said control input and receiving an exponential waveform only from a given level of an audio signal applied to the input of said operational amplifier, and wherein an adjustable current is impressed on said rectifier;

a PNP transistor having its base-emitter path connected to said rectifier, a base voltage divider being connected to the base of said transistor;

a zener diode connecting the emitter of said transistor to ground; and

a resistor connected to said rectifier.

4,823,393

BILL DISCRIMINATING DEVICE

Moriatsu Kawakami, Zushi, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,210

Claims priority, application Japan, Nov. 11, 1986, 61-172777[U]

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—7 **2 Claims**

1. A bill discriminating device comprising:

image sensor means for reading a picture image of a bill and generating picture image data output;

picture image data storing means for storing said picture image data output received from said image sensor;

first bill-type discriminating means for preliminarily discriminating a denomination of a bill by computing a width of the bill based upon said picture image data output received from said picture image data storing means;

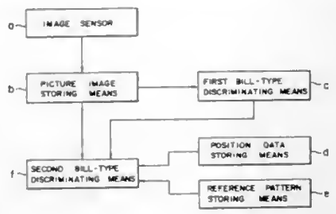
position data storing means for storing a characteristic region of each denomination of bill, said characteristic region containing said picture image data output to be read

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for discriminating the denomination of the bill and said characteristic region being selected based upon the denomination preliminarily descriminated by said first bill-type descriminating means;

reference pattern storing means for storing a reference pattern corresponding to said characteristic region of each denomination of bill; and

second bill-type discriminating means for discriminating a denomination of the bill preliminarily descriminated by



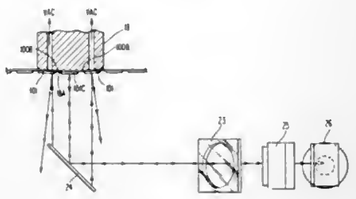
said bill-type discriminating means by reading said reference pattern corresponding to the bill denomination preliminarily descriminated by said first bill-type discriminating means from said reference pattern storing means and reading picture image data output in the characteristic region from said picture image data storing means based upon the output from said position data storing means and comparing the read picture image data output with said reference pattern.

4,823,394

PATTERN RECOGNITION SYSTEM

George Berkin, Yardley; Richard F. Heady, Jenkintown; Jeffrey Clarke, Telford, all of Pa.; Asuri Raghavan, Bedminster, N.J.; Raymond Foran, Philadelphia, Pa.; Ralph Mayer, Ambler, Pa., and Joseph Chlebda, Langhorne, Pa., assignors to Kulicke & Soffa Industries, Inc., Willow Grove, Pa.

Filed Apr. 24, 1986, Ser. No. 855,760
Int. Cl.[4] G06K *9/48*
U.S. Cl. 382—8 **19 Claims**



1. A pattern recognition system for determining the position of a candidate die mounted on flexible die holding means comprising:

(a) a light source for illuminating the candidate die;

(b) means for presenting the candidate die such that the flexible die holding means surrounding said die is inclined at an angle greater than about zero degrees with respect to the plane of the candidate die;

(c) means for sensing substantially only that light reflected at an angle of about 90° from the candidate die to provide a video image, whereby the image of the candidate die is enhanced with respect to the image of the die holding means;

(d) means for generating digital data representing said video image;

(e) memory means for storing said digital data in binary format;

(f) means for definin[e] a corridor across said die in said digital data, said corridor having a width y and a length x;

(g) means for processing said digital data to obtain a signature element, said signature element being the widthwise summation of said y binary data within said corridor at a plurality of x points along the length of said corridor; and

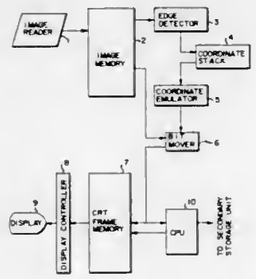
(h) means for analyzing said signature element to distinguish the surface of the candidate die from the surface of the holding means, whereby the position of said candidate die is determined within said corridor.

4,823,395

IMAGE INFORMATION RECOGNITION APPARATUS

Masami Chikasuchi, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 854,163, Apr. 21, 1986, abandoned.
This application Apr. 11, 1988, Ser. No. 183,287
Claims priority, application Japan, May 17, 1985, 60-105553
Int. Cl.[4] G06K *9/20*
U.S. Cl. 382—48 **3 Claims**



1. An image information recognition apparatus comprising:

image reading means for reading image information over a certain scanning region and for producing corresponding image signals;

memory means, coupled to the image reading means, for storing the image signals output form said image reading means in respective memory positions corresponding to their location in the scanning region;

edge detecting means for detecting a peripheral edge of a manuscript that is carrying image information and placed within the scanning region read by the image reading means from the condition of the stored image signals output from the memory means, and for producing corresponding coordinate date, said edge detecting means scanning substantially all image signals stored in the memory means along a first scanning direction required to obtain a first set of said coordinate data, and then scanning substantially all the image signals stored in the memory means along at least a second scanning direction required to obtain at least a second set of said coordinate data;

boundary detecting means, coupled to the edge detecting means, for defining manuscript boundaries corresponding to the detected edges of the manuscript from the coordinate data supplied from said edge detecting means regardless of whether the defined manuscript boundaries are parallel to at least one of said first and second scanning directions, and for producing corresponding boundary data; and

output means, coupled to the boundary detecting means, for reading out image signals corresponding only to manuscript image information in a range defined by the boundary data, and including means responsive to neither of said first and/or second scanning directions being in parallel

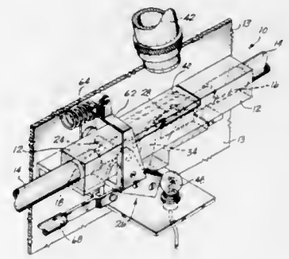
with said at least one of the defined manuscript boundaries for reading out said image signals form the memory positions of said memory means in a direction parallel to one of the defined manuscript boundaries, and for outputting the readout image signals in accordance with the boundary data supplied form said boundary detecting means and in a desired rotational orientation.

4,823,396

AUTOMATED FASTENER INSPECTION SYSTEM

Douglas Thompson, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 21, 1987, Ser. No. 76,166
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 **14 Claims**



1. In an assembly operation in which a mechanical fastener is used, said fastener being moved along a feed path to said assembly operation, a device for inspecting said fastener prior to use in said assembly operation, comprising:

a body positioned in said path, and having a chamber through which said fastener travels;

a cam member pivotally connected to said body, said cam member being rotatable between a fastener stopping position and a fastener releasing position, wherein when said cam member is in said fastener stopping position a blocking portion of said cam member projects into said chamber, to stop fastener travel and to hold said fastener at a certain preselected location in said chamber, and when said cam member is in said releasing position said blocking portion of said cam member is moved out of said chamber, in a manner so that said fastener may travel therethrough;

spring means, connected to said cam member, for normally rotating said cam member into said fastener stopping position;

cam member release means operable for rotating said cam member in opposition to said spring means and in a direction from said fastener stopping position to said fastener releasing position;

camera means operable for producing an image showing the actual dimensions of said fastener; and

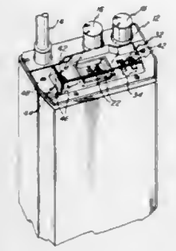
image analyzer means operable for comparing said actual fastener dimensions provided by said camera means with certain preidentified desirable fastener dimensions, wherein said cam member is further operable to release said fastener after said camera means produces said image, and wherein if said actual dimensions of said fastener substantially match said preidentified desirable dimensions said fastener is known to be acceptable for use in said assembly operation.

4,823,397

TRANSCEIVER WITH MOISTURE RESISTANT COVER FOR THUMBWHEELS AND THE LIKE

Robert M. Hewitt, Fort Lauderdale, Fla., assignor to Southern Marine Research, Inc., Miami, Fla.

Filed Jan. 29, 1988, Ser. No. 150,024
Int. Cl.[4] H04B *1/38, 1/08*
U.S. Cl. 455—89 **9 Claims**



1. A handheld radio comprising

(a) a frame supporting electronic components;

(b) a case surrounding said frame including a top panel with at least one opening therethrough;

(c) a multiplicity of thumbwheels rotatably supported in said case and having a circumferential portion thereof extending through said opening in said top panel;

(d) a resiliently deflectable cover disposed on said top panel and having a pedestal portion overlying said thumbwheels including a top wall spaced thereabove and a depending sidewall extending thereabout to said top panel, said cover including a flange extending outwardly about the periphery of said sidewall and along a portion of the surface of said top panel, said cover being fabricated from a relatively transparent synthetic resin and being readily deflectable by a finger of the user of the radio to depress the top wall into frictional engagement with a thumbwheel and thence movable laterally to effect rotation thereof;

(e) a clamping plate overlying said flange of said cover and having an aperture therein through which said pedestal portion extends; and

(f) fasteners extending through said clamping plate and cover and into said top panel to provide sealing engagement between said flange and said top panel to prevent rain and spray from entering said case about said thumbwheels.

4,823,398

DIVERSITY RECEIVER

Kazuya Hashimoto, c/o NEC Corporation, 33-1, Shiba 5-chome, Minato-ku, Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 944,546
Claims priority, application Japan, Dec. 23, 1985, 60-289832
Int. Cl.[4] H04B *11/16*
U.S. Cl. 455—134 **4 Claims**

1. A diversity receiver comprising:

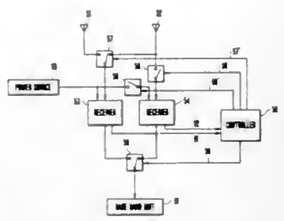
a first receiver having a first antenna and generating a first demodulated signal and a first electric field detection output in accordance with an electric field received by said first antenna;

a second receiver having a second antenna and generating a second demodulated signal and a second electric field detection output in accordance with an electric field received by said second antenna;

a first switch for selecting between the first and second demodulated signals from said first and second receivers in accordance with an output switching control signal and outputting the selected one of the first and second demodulated signals;

comparing means for comparing the first and second electric field detection outputs from said first and second receivers respectively, and supplying the output switching control signal to said first switch in accordance with the result of said comparison;

a second switch for turning on/off a power supply source of said first receiver in accordance with a power source switching control signal; and



a controller for receiving the second electric field detection output from said second receiver to average an intensity of the electric field received by said second antenna, and to supply the power source switching control signal to said second switch to turn on said second switch when the average intensity of the electric field is higher than a reference voltage and to turn off said second switch when the average intensity of the electric field is lower than or equal to the reference voltage.

4,823,399

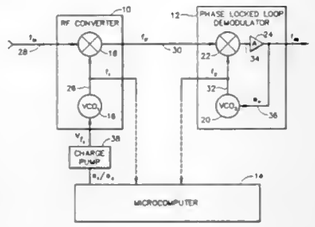
REFINED TUNING OF RF RECEIVER WITH FREQUENCY-LOCKED LOOP

Ashok K. George, San Diego, Calif., assignor to General Instrument Corporation, New York, N.Y.

Filed Jul. 30, 1987, Ser. No. 80,412

Int. Cl.[4] H03D *7/16;* **H03J** *7/04;* **H04N** *5/50*

U.S. Cl. 455—192 **10 Claims**



1. A frequency tuning system, comprising

a first voltage-controlled oscillator (VCO) for providing an output signal at a predetermined nominal frequency that is the sum or difference of a selected input carrier frequency and a predetermined intermediate frequency;

first means for mixing an input signal at the selected input carrier frequency with the output signal from the first VCO to provide an input signal at the intermediate frequency;

a second VCO for providing an output signal at the intermediate frequency;

second means for mixing said input signal at the intermediate frequency with the output signal from the second VCO to provide an input signal at a baseband frequency;

means responsive to said input signal provided by the second mixing means for causing the second VCO to provide its output signal at the frequency of the input signal to the second mixing means;

means for measuring the frequency of the output signal from the second VCO;

means for comparing the measured frequency of the output signal from the second VCO with the predetermined intermediate frequency;

means for tuning the first VCO in response to said comparison of the measured frequency of the output signal from the second VCO with the predetermined intermediate frequency to maintain the input signal to the second mixing means at the predetermined intermediate frequency;

means for measuring the frequency of the output signal from the first VCO;

means for comparing the measured frequency of the output signal from the first VCO with the predetermined nominal frequency to provide a first error signal; and

means for tuning the first VCO in response to said comparison of the frequency of the output signal from the first VCO with the predetermined nominal frequency when said comparison provides a said first error signal that is greater than a predetermined value, to thereby bring the frequency of the output signal from the first VCO toward the predetermined nominal frequency; and

wherein the means for tuning the first VCO in response to said comparison of the measured frequency of the output signal from the second VCO with the predetermined intermediate frequency includes means for enabling said tuning only when said first error signal is less than said predetermined value.

4,823,400

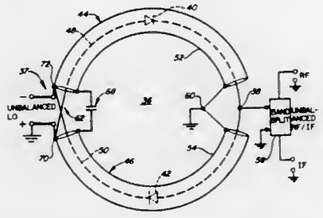
RADIO FREQUENCY MIXER

Pierre Dobrovolny, North Riverside, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 15, 1987, Ser. No. 96,683

Int. Cl.[4] H04B *1/26*

U.S. Cl. 455—326 **14 Claims**



1. A mixer having a balanced LO port and an RF/IF port comprising:

first and second shield means;

first and second diodes symmetrically and respectively shielded by said first and second shield means and disposed between said LO and RF/IF ports;

means at said LO port for coupling said first diode with said second shield means and said second diode with said first shield means; and

means at said RF/IF port for terminating said diodes and said shield means such that said diodes are operatively coupled in parallel across said LO port.

4,823,401

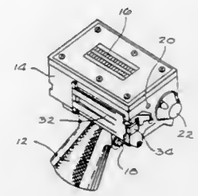
"MILES" TRANSCEIVER DISPLAY CONTROLLER UNIT

Rudolph R. Gammarino, Pasadena; Mark S. Doerning, Arcadia, and Barry J. Cuccia, Placentia, all of Calif., assignors to Applied Solar Energy Corporation, City of Industry, Calif.

Filed Dec. 4, 1987, Ser. No. 128,800

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—606 **19 Claims**



1. A pistol style controller unit for use with Multiple Integrated Laser Engagement System (MILES) type simulated warfare systems comprising:

a pistol style housing and handle;

detector means mounted on said housing for receiving input coded MILES signals;

light emitting means for transmitting coded MILES signals including both a weapons code and an identity code;

switching means on said housing for switching said unit between transmit and receive modes of operation, and for selecting weapons type information to be transmitted;

liquid crystal display means mounted on said housing for displaying information to be transmitted by said light emitting means when said unit is in the transmit mode; and for displaying information identifying the received signals when said unit is in the receive mode; and

electronic circuit means mounted within said housing for processing incoming signals received by said detector means when said unit is in the receive mode, and for applying signals to said displaying means indicating weapons type, and any source identity, if any; and for causing signals to be transmitted from said light emitting means corresponding to the displayed weapon type and source identity, when said unit is in the transmit mode.

4,823,402

AGILE OPTICAL BEAM STEERING SYSTEM

Robert E. Brooks, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Apr. 21, 1986, Ser. No. 853,836

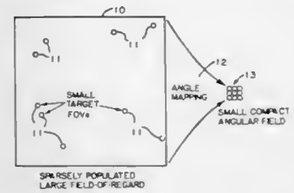
Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—607 **48 Claims**

1. An optical beam deflection system, comprising:

first beam deflection means, for deflecting one or more optical beams rapidly through small increments to direct the beams successively to any subfields of view selected from a plurality of N subfields of view, where N is greater than the number of optical beams, and to point the beams as desired within each subfield of view; and

second beam deflection means having an equal plurality of N optical elements arrayed in the corresponding subfields of view to receive the beams from the first beam deflection means, wherein the angular positions of the optical elements are selected to direct the optical beams successively



to desired target areas in a relatively large angular field of regard.

4,823,403

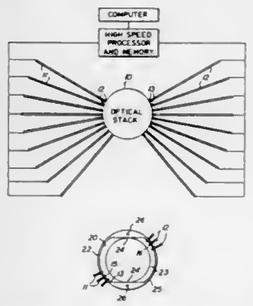
SYSTEM FOR OPTICALLY TRANSMITTING DATA BETWEEN CIRCUIT PACKS, SUCH AS PRINTED CIRCUIT BOARDS

Ted H. Twietmeyer, Holcomb, N.Y., assignor to Switch Tech, Inc., East Bloomfield, N.Y.

Filed Mar. 26, 1987, Ser. No. 30,358

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—607 **21 Claims**



1. An optical system for transmitting data between circuit packs such as printed circuit boards, said system comprising:

a. a plurality of chambers having reflective interiors, said chambers being arranged in a stack;

b. each of said chambers having a plurality of ports communicating with said reflective interiors and adapted for accepting light emitters and light detectors;

c. a plurality of said circuit packs arranged so that edges of said circuit packs extend along said chambers so that each of said circuit pack edges are disposed adjacent one of said ports in each of said chambers; and

d. said light emitters and light detectors being arranged on said edges of said circuit packs so that each one of said light emitters extends into one of said ports to be aimed into a single one of said chambers, and each one of said detectors is arranged in a single one of said ports to detect light in a single one of said chambers, and so that each of said reflective chambers can receive light pulses from at least one of said light emitters and said light pulses in each of said reflective chambers can be detected by at least one of said detectors.

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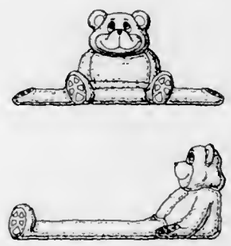
DESIGNS

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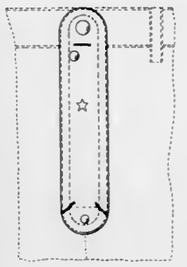
300,680
SANDWICH COOKIE
Richard B. Gerstman, Tenafly, N.J.; Juan F. Concepcion, Brooklyn, N.Y.; Michael P. Lucas, Ridgewood, N.J., and Robert Tabor, New York, N.Y., assignors to Nabisco Brands, Inc., Persippany, N.J.
Division of Ser. No. 731,492, May 7, 1985. This application Jun. 20, 1988, Ser. No. 225,956
Term of patent 14 years
U.S. Cl. D1—109



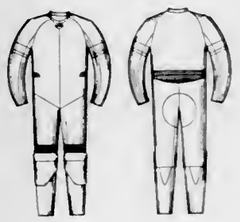
300,681
COMBINATION ANIMAL BACK REST AND SLEEPING BAG
Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304
Filed Jan. 27, 1986, Ser. No. 822,659
Term of patent 14 years
U.S. Cl. D2—25



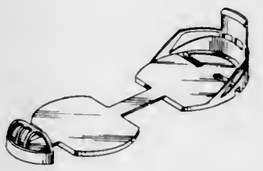
300,682
PATCH FOR TROUSERS
Aldo Ciavatta, Superstrada Consolare San Marino 76, Rimini, Italy
Filed Aug. 6, 1986, Ser. No. 894,271
Claims priority, application Italy, May 29, 1986, 22035
Term of patent 14 years
U.S. Cl. D2—25



300,683
COVERALLS FOR MOTORCYCLIST
Hisashi Kushitani, Tokyo, Japan, assignor to Kushitani Company, Ltd., Tokyo, Japan
Filed Sep. 12, 1986, Ser. No. 907,540
Term of patent 14 years
U.S. Cl. D2—29



300,684
BOWLING SHOE PROTECTOR
James M. Turner, 600 Central Ave., Riverside, Calif. 92507
Filed Apr. 21, 1986, Ser. No. 856,144
Term of patent 14 years
U.S. Cl. D2—277

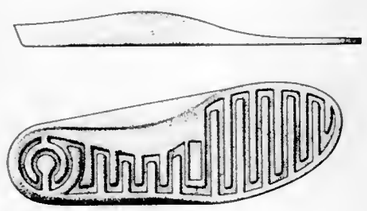


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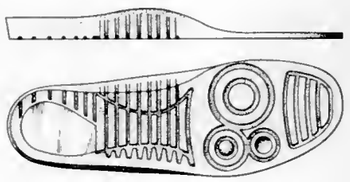
300,685
PIVOTING ANKLE STABILIZER
Tuan H. Le, Cohasset, and Paul E. Litchfield, Grafton, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Oct. 2, 1986, Ser. No. 914,763
Term of patent 14 years
U.S. Cl. D2—314



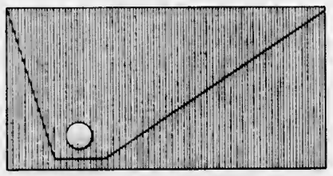
300,686
SHOE INSOLE
Robert L. Peterson, Taichung, Taiwan, assignor to Pensa, Inc., Portland, Oreg.
Filed Aug. 22, 1986, Ser. No. 899,101
Term of patent 14 years
U.S. Cl. D2—318



300,687
SHOE INSOLE
Brenda Kelley, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.
Filed Aug. 22, 1986, Ser. No. 899,102
Term of patent 14 years
U.S. Cl. D2—318



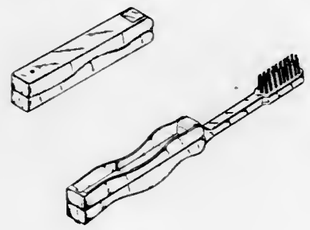
300,688
TOP FLAP SPECTACLE CASE
Robert J. Marks, Las Vegas, Nev., assignor to California Optical Leather, Inc., San Leandro, Calif.
Filed Oct. 28, 1985, Ser. No. 791,992
Term of patent 14 years
U.S. Cl. D3—34



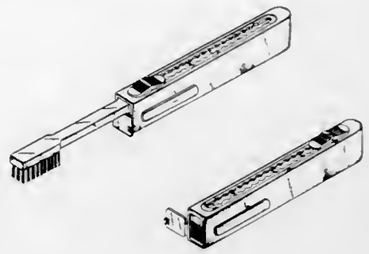
300,689
COMBINED GARMENT BAG AND LUGGAGE PIECE
William L. King, Denver, Colo., and Charles K. Weisbart, Mequon, Wis., assignors to Samsonite Corporation, Denver, Colo.
Filed Feb. 19, 1986, Ser. No. 834,069
Term of patent 14 years
U.S. Cl. D3—71



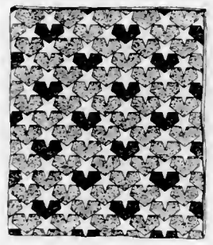
300,690
COMBINED TOOTHBRUSH AND CONTAINER THEREFOR
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed Dec. 30, 1987, Ser. No. 139,432
Term of patent 14 years
U.S. Cl. D4—108



300,691
COMBINED TOOTHBRUSH AND CONTAINER THEREFOR
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed Dec. 30, 1987, Ser. No. 139,702
Term of patent 14 years
U.S. Cl. D4—108



300,692
TEXTILE FABRIC
Louis le Brocquy, 28 Ovoca Road, Dublin 8, Ireland
Division of Ser. No. 701,098, Feb. 12, 1985. This application Dec. 4, 1987, Ser. No. 128,576
Term of patent 14 years
U.S. Cl. D5—41



300,693
EMBOSSED FABRIC
Louis B. Grasso, Merrick, N.Y., assignor to Personal Products Company, Milltown, N.J.
Filed May 9, 1983, Ser. No. 492,968
Term of patent 14 years
U.S. Cl. D5—53



300,694
INFLATABLE BABY SUPPORT
Arlene Krok, Los Angeles, Calif., assignor to A-Plus Products, Inc., Beverly Hills, Calif.
Filed Sep. 15, 1986, Ser. No. 907,642
Term of patent 14 years
U.S. Cl. D6—333



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300,695
ADJUSTABLE LOUNGE SEAT
Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki, Osaka, Japan
Filed Aug. 5, 1986, Ser. No. 893,417
Term of patent 14 years
U.S. Cl. D6—361



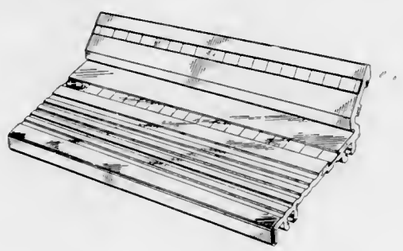
300,696
CHAIR
Rolf Garnich, Esslingen/Zell, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany
Filed Sep. 4, 1986, Ser. No. 904,267
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1986, 8MR 932
Term of patent 14 years
U.S. Cl. D6—365



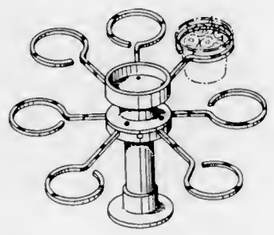
300,697
ADJUSTABLE CRIB
David R. Wallace, 112 Indiana Drive, Sault Ste. Marie, Ontario, Canada (P6A 4Y5); George E. Rothschild, 1210 Prince of Wales Drive, Ottawa, Ontario, Canada (K2C 1M9), and Robert W. Hamilton, 1 Benlea Drive, Nepean, Ontario, Canada (K2G 4A3)
Filed Jun. 6, 1986, Ser. No. 871,630
Claims priority, application Canada, Feb. 10, 1986, 10-02-86-2
Term of patent 14 years
U.S. Cl. D6—391



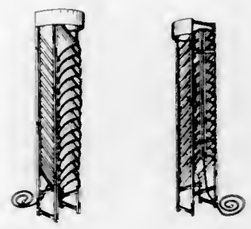
300,698
FENCE FOR AN EXTENSION TABLE OR THE LIKE
T. David Price, 648 Turin St., So. St. Paul, Minn. 55075
Filed Apr. 24, 1986, Ser. No. 857,460
Term of patent 14 years
U.S. Cl. D6—400



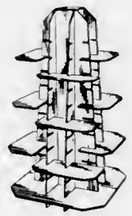
300,699
OUTDOOR SUPPORT FOR MULTIPLE FLOWER POTS
Bernice B. Penrod, Tipp City, Ohio, assignor to Dayton Precision Mfg. Co., Dayton, Ohio
Filed Jul. 13, 1987, Ser. No. 73,930
Term of patent 14 years
U.S. Cl. D6—405



300,700
DISPLAY STAND FOR FLOOR SAMPLES
Rolf Thyselius, Eriksgatan 5, S-561 43 Huskvarna, Sweden
Filed Sep. 30, 1986, Ser. No. 913,867
Claims priority, application Sweden, Apr. 3, 1986, 86.0803
Term of patent 14 years
U.S. Cl. D6—409



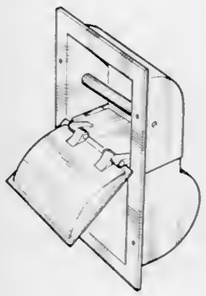
300,701
DISPLAY STAND
Robert G. C. Jonker, Toernooiveld 24, 4902 PH Oosterbout, Netherlands
Filed Feb. 20, 1986, Ser. No. 834,458
Claims priority, application World Int. Prop. O., Aug. 28, 1985, DM/005743
Term of patent 14 years
U.S. Cl. D6—474



300,702
PLANT HANGER
Thomas W. Larson, 5808 W. 50th St., Sioux Falls, S. Dak. 57106
Filed Oct. 8, 1986, Ser. No. 917,377
Term of patent 14 years
U.S. Cl. D6—513

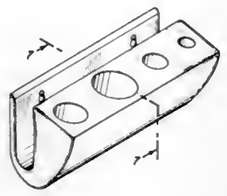


300,703
TOILET TISSUE DISPENSER
Edward T. Miels, 545-D Oakdale La., El Cajon, Calif. 92021
Filed Dec. 12, 1986, Ser. No. 941,262
The portion of the term of this patent subsequent to Oct. 6, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—523



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300,704
WALL MOUNTED SUPPORT FOR HAIR CARE APPLIANCES
Rosemarie Ianni, 15546 Friar St., Van Nuys, Calif. 91411
Filed Dec. 29, 1986, Ser. No. 947,553
Term of patent 14 years
U.S. Cl. D6—553



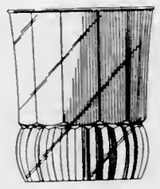
300,705
TUMBLER
James F. Pomroy, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Filed Jan. 5, 1984, Ser. No. 568,494
Term of patent 14 years
U.S. Cl. D7—14



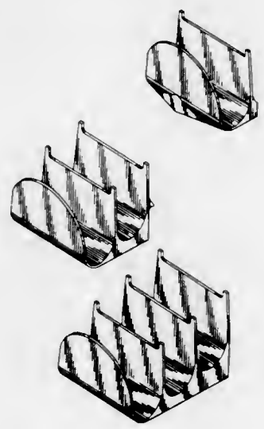


300,706
TUMBLER OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Apr. 9, 1986, Ser. No. 850,922
Term of patent 14 years
U.S. Cl. D7—14





300,707
TACO HOLDER
Mark W. Walmesley, 37 Eastshore, Irvine, Calif. 92714
Filed Apr. 21, 1986, Ser. No. 856,138
Term of patent 14 years
U.S. Cl. D7—76



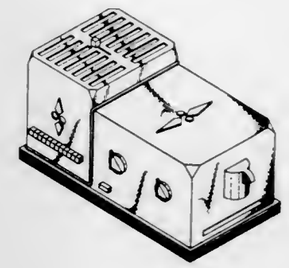
300,708
HEAT-INSULATED JUG
Furio Minuti, Macerata, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Jul. 2, 1986, Ser. No. 881,251
Claims priority, application Italy, Jan. 8, 1986, 20422/86[U]
Term of patent 14 years
U.S. Cl. D7—317



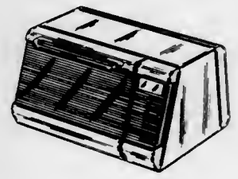
300,709
VACUUM FLASK
Jeng C. Chen, Jen Ai Mansion 5A, 37 Sec. 4, Jen Ai Road, Taipei, Taiwan
Filed Feb. 18, 1986, Ser. No. 833,765
Term of patent 14 years
U.S. Cl. D7—321

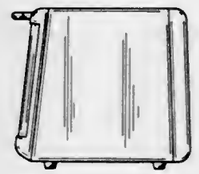


300,710
COMBINED BREAD TOASTER AND OVEN
Ethel Williams, 9242 Manistique St., Detroit, Mich. 48224
Filed Nov. 27, 1985, Ser. No. 806,930
Term of patent 14 years
U.S. Cl. D7—330



300,711
COMBINED MICROWAVE OVEN AND ELECTRIC OVEN
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 5, 1987, Ser. No. 11,138
Claims priority, application Japan, Aug. 8, 1986, 61-31281
Term of patent 14 years
U.S. Cl. D7—351





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300,712
REMOVEABLE PROTECTIVE COVER TRAY FOR A HOT DRINK DISPENSER
Pol F. Lambert, Milton Malsor, United Kingdom, assignor to Vortan International Holding N.V., Curacao, Netherlands Antilles
Filed Nov. 8, 1985, Ser. No. 803,990
Claims priority, application World Int. Prop. O., May 10, 1985, DM/005239
Term of patent 14 years
U.S. Cl. D7—397



300,713
ARM-ATTACHED TREE CLIMBING TOOL
Richard Trapasso, 56-46 Cloverdale Blvd., Bayside, N.Y. 11364
Filed Mar. 19, 1986, Ser. No. 845,060
Term of patent 14 years
U.S. Cl. D8—1



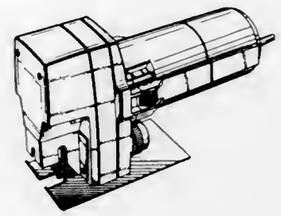
300,714
WEEDER TOOL
Jerome M. Skibell, 5412 Castlewood, Dallas, Tex. 75229
Filed Sep. 4, 1986, Ser. No. 904,218
Term of patent 14 years
U.S. Cl. D8—9



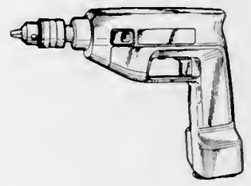
300,715
TREE PRUNING IMPLEMENT
Sidiram Ragoonath, 6020 Milton St., Apt. 1095, Dallas, Tex. 75206
Filed Aug. 14, 1987, Ser. No. 85,134
Term of patent 14 years
U.S. Cl. D8—12



300,716
BAYONET SAW
Earl R. Clowers, Jackson, Tenn., assignor to Porter Cable Corporation, Jackson, Tenn.
Division of Ser. No. 742,987, Jun. 10, 1985, Pat. No. D. 297,401. This application Apr. 6, 1988, Ser. No. 178,088
Term of patent 14 years
U.S. Cl. D8—64



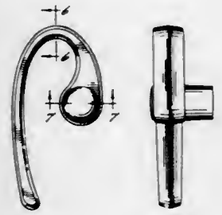
300,717
CORDLESS ELECTRIC DRILL
Hideaki Hasegawa, and Yoshihiro Yamada, both of Ibaragi, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed Feb. 24, 1987, Ser. No. 18,123
Claims priority, application Japan, Aug. 22, 1986, 61-32967
Term of patent 14 years
U.S. Cl. D8—68



300,718
CORDLESS DRIVER DRILL
Fusao Fushiya, and Michio Okumura, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Mar. 12, 1987, Ser. No. 25,084
Claims priority, application Japan, Sep. 16, 1986, 61-36440
Term of patent 14 years
U.S. Cl. D8—68

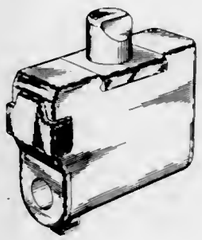


300,719
DOOR PULL
Nolan K. Rhoades, Beloit, Wis.; Dick W. Haner, and Loren E. Abraham, both of Stillwater, Minn., assignors to Amerock Corporation, Rockford, Ill. and Andersen Corporation, Bayport, Minn.
Continuation of Ser. No. 841,734, Mar. 5, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 160,096
Term of patent 14 years
U.S. Cl. D8—308



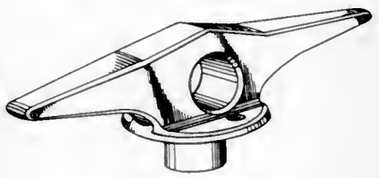


300,720
SHOPPING CART LOCK
Antoine Trubiano, Pointe-aux-Trembles, Canada, assignor to Cari-All Inc., Montreal, Canada
Filed Feb. 18, 1986, Ser. No. 833,764
Term of patent 14 years
U.S. Cl. D8—330

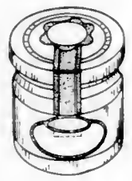


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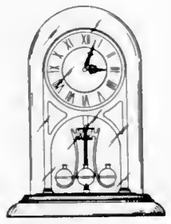
300,721
COMBINED LIFT RING AND CLEAT FOR BOATS
Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Apr. 21, 1986, Ser. No. 857,427
Term of patent 14 years
U.S. Cl. D8—356



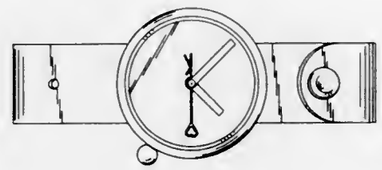
300,722
COMBINED JAR AND SEAL OR SIMILAR ARTICLE
Gerold Müller, Lenzburg, Switzerland, assignor to Hero Conserven Lenzburg, Lenzburg, Switzerland
Filed Oct. 15, 1985, Ser. No. 787,446
Claims priority, application Switzerland, Apr. 17, 1985, 114,418
Term of patent 14 years
U.S. Cl. D9—352



300,723
REVOLVING PENDULUM CLOCK
Thomas Albin, Sea Grit, N.J., assignor to Harris & Mallow, Inc., Lakewood, N.J.
Filed Mar. 27, 1986, Ser. No. 844,866
Term of patent 14 years
U.S. Cl. D10—28



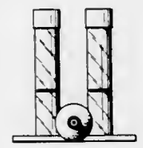
300,724
WATCH
Alain Silberstein, 13, Quai de Strasbourg, 25000 Besancon, France
Filed Dec. 20, 1985, Ser. No. 811,682
Term of patent 14 years
U.S. Cl. D10—32



300,725
SAND TIMER
Anderson Lin, No. 8, Alley 9, Lane 82, Pa Te Rd., Sec. 1, Taipei, Taiwan
Filed Mar. 10, 1986, Ser. No. 842,439
Term of patent 14 years
U.S. Cl. D10—44



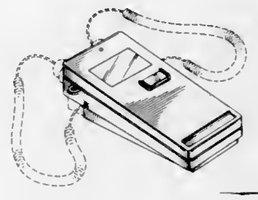
300,726
FABRIC POROSITY DEMONSTRATOR
Thomas Ebeling, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Mar. 31, 1986, Ser. No. 847,616
Term of patent 14 years
U.S. Cl. D10—46



300,727
TEMPERATURE AND HUMIDITY MEASURING DEVICE
Kinpei Fukushima, Tokyo, Japan, assignor to Yamato Scientific Co., Ltd., Tokyo, Japan
Filed Mar. 18, 1986, Ser. No. 845,351
Claims priority, application Japan, Sep. 20, 1985, 60-39289
Term of patent 14 years
U.S. Cl. D10—52



300,728
ELECTRONIC THERMOMETER CASE
Stephen O. Ross, La Jolla, Calif., assignor to Ivac Corporation, San Diego, Calif.
Filed Sep. 19, 1986, Ser. No. 909,493
Term of patent 14 years
U.S. Cl. D10—57

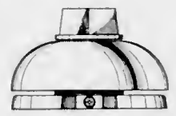


300,729
TIRE PRESSURE GAUGE
Paul Skaggs, Spokane, Wash.; Brian Neil, Hayden Lake, Id., and David R. Ripley, Flower Mound, Tex., assignors to Neotech Industries, Inc., Flower Mound, Tex.
Filed May 19, 1986, Ser. No. 864,951
Term of patent 14 years
U.S. Cl. D10—86



300,730
COMBINED BELL AND LAMP
Tatsuya Arai, Kitamoto, Japan, assignor to Kobishi Electric Co., Ltd., Japan
Filed Sep. 9, 1985, Ser. No. 773,821
Claims priority, application Japan, Aug. 30, 1985, 60-36762
The portion of the term of this patent subsequent to Jan. 12, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—116



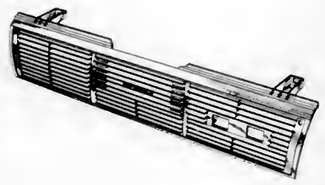


300,731
FINGER-CONTOURED RING
Ralph W. Flinchbaugh, 8309 Winder St., Vienna, Va. 22180
Filed Apr. 7, 1986, Ser. No. 850,389
Term of patent 14 years
U.S. Cl. D11—29



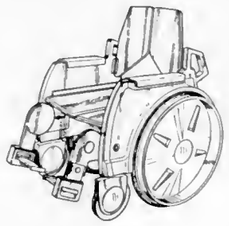
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300,732
PLANTER
Arthur R. Carlson, Rowville, Australia, assignor to Decor Corporation Pty. Ltd., East Malvern, Australia
Filed Feb. 28, 1986, Ser. No. 838,025
The portion of the term of this patent subsequent to Jun. 28, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—152

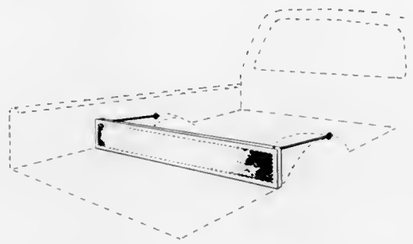




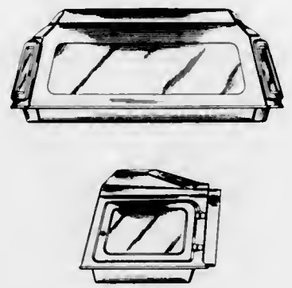
300,733
WHEELCHAIR
Kenneth E. Wagner, Chesterland, Ohio, assignor to Iatrics, Part of the Synod Group, Fenton, Mich.
Filed Aug. 15, 1986, Ser. No. 897,175
Term of patent 14 years
U.S. Cl. D12—131



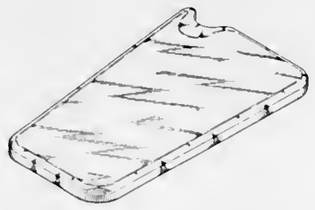
300,734
TRUCK BED CARGO RESTRAINING UNIT
John Krultbosch, 3077 South 4700 West, Rte. #1, Ogden, Utah 84401
Filed Aug. 28, 1986, Ser. No. 901,459
Term of patent 14 years
U.S. Cl. D12—155



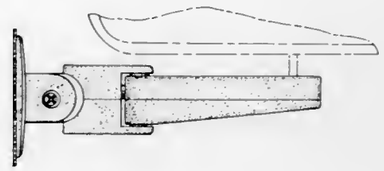
300,735
PICKUP TRUCK CAB SLEEPER
Paul E. Thomas, 1808 Mill La., Dothan, Ala. 36302
Filed Feb. 25, 1986, Ser. No. 836,171
Term of patent 14 years
U.S. Cl. D12—156



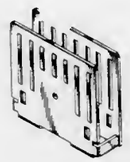
300,736
COVER FOR MOTORCYCLE FAIRING COMPARTMENT
James A. Smith, 1144 Mountain Dew Ave., Manteca, Calif. 95336
Filed Oct. 6, 1986, Ser. No. 916,443
Term of patent 14 years
U.S. Cl. D12—182



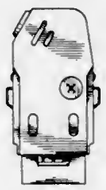
300,737
REAR VIEW MIRROR MOUNTING
Pierre Charet, and Duke Kraai, both of Miami, Fla., assignors to Rally Manufacturing, Inc., Miami, Fla.
Filed Nov. 26, 1986, Ser. No. 935,549
Term of patent 14 years
U.S. Cl. D12—187



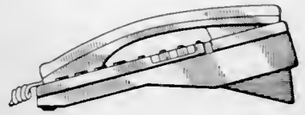
300,738
HEAT SINK OR SIMILAR ARTICLE
William D. Jordan, Dallas, and Donald L. Bland, Ft. Worth, both of Tex., assignors to Thermalloy Incorporated, Dallas, Tex.
Filed Nov. 16, 1987, Ser. No. 120,804
Term of patent 14 years
U.S. Cl. D13—23



300,739
ELECTRICAL CONNECTORS
Shigeru Kikuta, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Apr. 16, 1986, Ser. No. 852,923
Claims priority, application Japan, Dec. 17, 1985, 60-52417; Dec. 17, 1985, 60-52419
Term of patent 14 years
U.S. Cl. D13—24

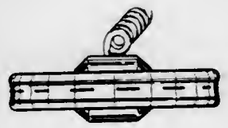


300,740
TELEPHONE SET WITH MOVEABLE DISPLAY
Akira Sekiguchi, Tokyo; Ushio Kubo, Hino, and Yasukazu Kogen, Kanagawa, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Aug. 10, 1987, Ser. No. 86,029
Term of patent 14 years
U.S. Cl. D14—151





300,741
TELEPHONE HANDSET
Takei Yoshiharu, Shatin, Hong Kong, assignor to Tasca International Ltd., Kowloon, Hong Kong
Filed Oct. 16, 1987, Ser. No. 109,425
Claims priority, application United Kingdom, Jun. 19, 1987, 1042958
Term of patent 14 years
U.S. Cl. D14—248



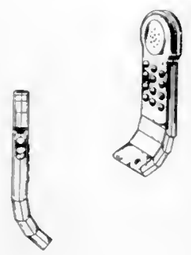


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300,742
HOUSING FOR A PORTABLE TELEPHONE OR SIMILAR ARTICLE
Leonid Soren, Lincolnwood, and Albert L. Nagele, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 11, 1987, Ser. No. 97,462
Term of patent 14 years
U.S. Cl. D14—148



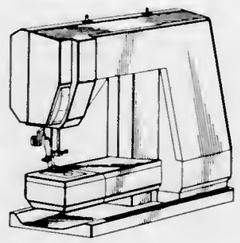
300,743
HANDSET TELEPHONE WITH ARTICULATED END
Hans Zaugg, Derendingen; Franz Raible, Oberdorf, and Rico U. Ruffner, Solothurn, all of Switzerland, assignors to Autophon Telecom AG, Switzerland
Filed Nov. 19, 1987, Ser. No. 122,673
Claims priority, application Switzerland, Aug. 4, 1987, 116104
Term of patent 14 years
U.S. Cl. D14—147



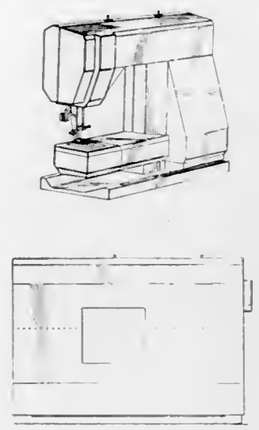
300,744
COMBINED COMPUTER DISPLAY TERMINAL AND TELEPHONE
Takao Oura; Hideki Okada, and Masayoshi Hosaka, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 17, 1986, Ser. No. 887,550
Claims priority, application Japan, Jan. 20, 1986, 61-1544
Term of patent 14 years
U.S. Cl. D14—101



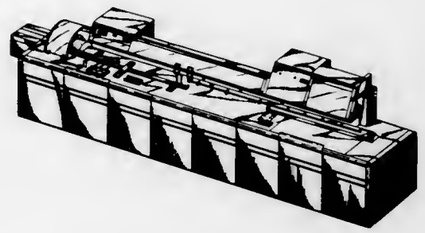
300,745
COMBINED SEWING MACHINE AND COVER
Olindo Baruffa, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland
Filed Jun. 13, 1985, Ser. No. 744,332
Claims priority, application Switzerland, Dec. 13, 1984, 114209
The portion of the term of this patent subsequent to Apr. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—69



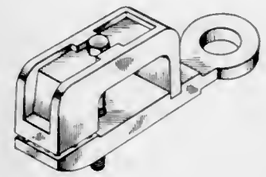
300,746
COMBINED SEWING MACHINE AND COVER
Olindo Baruffa, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland
Filed Jun. 13, 1985, Ser. No. 744,333
Claims priority, application Switzerland, Dec. 13, 1984, 114208
The portion of the term of this patent subsequent to Apr. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—69



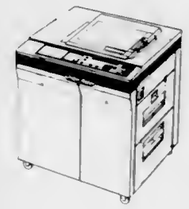
300,747
MAIL HANDLING MACHINE
Charles E. Bain, West Dundee, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Sep. 13, 1985, Ser. No. 775,844
Term of patent 14 years
U.S. Cl. D15—147



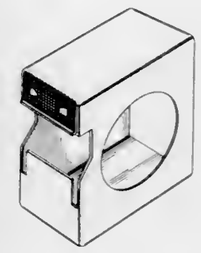
300,748
BOX CLAMP FOR AUTOMOBILE BODY STRAIGHTENING UNIT
Davis R. Jarman, Rte. 1, Box 844 B, Hortense, Ga. 31543, and Virgil H. Hinson, 206 Fairway Oaks Dr., Brunswick, Ga. 31520
Filed May 28, 1986, Ser. No. 867,752
Term of patent 14 years
U.S. Cl. 15—199



300,749
ELECTROPHOTOGRAPHIC COPIER
Hiroyuki Tokuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 29, 1986, Ser. No. 890,419
Claims priority, application Japan, Jan. 30, 1986, 61-3144
Term of patent 14 years
U.S. Cl. D18—38



300,750
DISPENSER FOR PACKAGING TAPE
Gary G. Mead, Santa Ana, Calif., assignor to Spartan Container Corp., Orange, Calif.
Filed Aug. 25, 1986, Ser. No. 899,603
Term of patent 14 years
U.S. Cl. D19—67

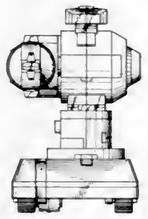


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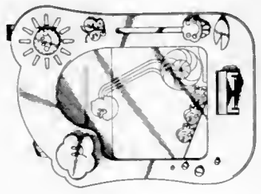
300,751
HUMAN FIGURE GAME DIE
Peter Hendrikx, Düsseldorf, Fed. Rep. of Germany, assignor to C.C. Creative Consulting S.A., Kronbubl, Switzerland
Filed Jan. 24, 1986, Ser. No. 822,103
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, URA920/85
Term of patent 14 years
U.S. Cl. D21—41



300,752
TOY MANIPULATOR
Masaki Mayuzumi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jul. 23, 1986, Ser. No. 888,444
Claims priority, application Japan, Jan. 31, 1986, 61-3265
Term of patent 14 years
U.S. Cl. D21—59



300,753
MANIPULATIVE WATER GAME
Kaori Matsui, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,714
Claims priority, application Japan, Aug. 12, 1986, 61-31543
Term of patent 14 years
U.S. Cl. D21—59



300,754
CRIB TOY
Chuk-Sun T. Ng, Hong Kong, Hong Kong, assignor to Blue Box Toy Factory Limited, Hong Kong
Filed Aug. 25, 1986, Ser. No. 899,817
Claims priority, application United Kingdom, Mar. 24, 1986, 1033023
Term of patent 14 years
U.S. Cl. D21—64



300,755
RATTLE TOY
Tim J. Harris, St Arvans, Wales, assignor to Hestair Keddicraft Limited, Bristol, England
Filed May 1, 1987, Ser. No. 45,663
Claims priority, application United Kingdom, Nov. 4, 1986, 1037803
Term of patent 14 years
U.S. Cl. D21—64



300,756
SCOOTER
Darold B. Cummings, 5320 W. 124th Pl., Hawthorne, Calif. 90250
Filed Nov. 19, 1987, Ser. No. 122,672
Term of patent 14 years
U.S. Cl. D21—80



300,757
TOY SPORTS MODULE
Ernest L. Thornell, Booneville, Ark., assignor to Spang & Company, Butler, Pa.
Filed Mar. 17, 1986, Ser. No. 845,042
Term of patent 14 years
U.S. Cl. D21—201



300,758
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Apr. 4, 1986, Ser. No. 847,892
The portion of the term of this patent subsequent to Apr. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—217



300,759
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Apr. 4, 1986, Ser. No. 850,340
The portion of the term of this patent subsequent to Apr. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—217



300,760
GOLF GREEN REPAIR TOOL
Bernard J. Krokus, Sr., 2116 Eastman Ave., Bethlehem, Pa. 18018
Filed Mar. 27, 1986, Ser. No. 846,990
Term of patent 14 years
U.S. Cl. D21—234



300,761
COMBINED GOLF BALL TEEING AND RETRIEVING DEVICE
Roy O. Bury, 910 Sims St. S.W. Decatur, Ala. 35603
Filed May 14, 1986, Ser. No. 862,832
Term of patent 14 years
U.S. Cl. D21—234

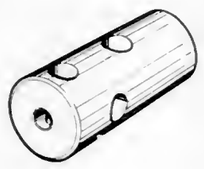


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300,762
BOW HANDLE
Thomas P. Jennings, Sun Valley, Calif., and Gary L. Simonds, Gainesville, Fla., assignors to Kidde Recreation Products, Inc., Northbrook, Ill.
Filed Apr. 30, 1986, Ser. No. 858,287
Term of patent 14 years
U.S. Cl. D22—107



300,763
MUZZLE ATTACHMENT FOR GUNS
Vincent E. Mazzanti, 6114 Terryhill Dr., La Jolla, Calif. 92037
Filed May 27, 1986, Ser. No. 867,744
Term of patent 14 years
U.S. Cl. D22—108



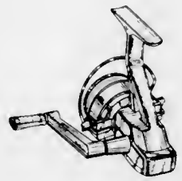
300,764
FISHING LURE HEAD
Samuel E. Duncan, 524 Orange Ave., Altamonte Springs, Fla. 32701
Filed Jun. 16, 1986, Ser. No. 875,365
Term of patent 14 years
U.S. Cl. D22—133



300,765
REEL FOR FISHING
Kanji Iinuma, and Yasuhisa Kameda, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jun. 17, 1986, Ser. No. 875,660
Claims priority, application Japan, Dec. 20, 1985, 60-53046; May 7, 1986, 61-17017
Term of patent 14 years
U.S. Cl. D22—141



300,766
REEL FOR FISHING
Kanji Iinuma, Musashino, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jul. 1, 1986, Ser. No. 881,179
Claims priority, application Japan, Jan. 7, 1986, 61-106
Term of patent 14 years
U.S. Cl. D22—141



300,767
HANDLE FOR A FISHING ROD
James E. Andreasen, Eastgate Ave., Magnolia Springs, Ala. 36555, and Casey J. Childre, Rte. 3, Foley, Ala. 36535
Filed Mar. 17, 1986, Ser. No. 845,038
Term of patent 14 years
U.S. Cl. D22—142



300,768
HANDLE FOR A FISHING ROD
James E. Andreasen, Eastgate Ave., Magnolia Springs, Ala. 36555, and Casey J. Childre, Rte. 3, Foley, Ala. 36535
Filed Mar. 17, 1986, Ser. No. 845,040
Term of patent 14 years
U.S. Cl. D22—142



300,769
WATER DISPENSER
Michael W. Hindmarch, Danbury, England, assignor to Plantpak Limited, Maldon, England
Filed May 21, 1985, Ser. No. 736,256
Claims priority, application United Kingdom, Nov. 21, 1984, 1023396
Term of patent 14 years
U.S. Cl. D23—225



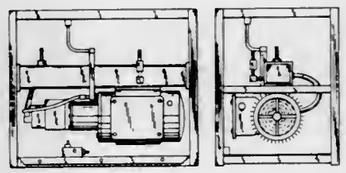
300,770
HANDLE
Herbert V. Kohler, Jr., Kohler, Wis., and Paul P. Kolada, Bexley, Ohio, assignors to Kohler Co., Kohler, Wis.
Filed Jan. 16, 1986, Ser. No. 820,200
Term of patent 14 years
U.S. Cl. D23—250



300,771
PLATE HEAT EXCHANGER
Roy Holmberg, Jönköping, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden
Filed Feb. 22, 1985, Ser. No. 704,195
Claims priority, application Sweden, Sep. 27, 1984, 842602
Term of patent 14 years
U.S. Cl. D23—314

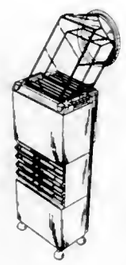


300,772
FRICTION FURNACE
Louis D. Powell, 6383 Holcomb Ave., Des Moines, Iowa 50322
Filed Sep. 4, 1986, Ser. No. 904,220
Term of patent 14 years
U.S. Cl. D23—329

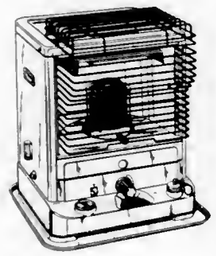


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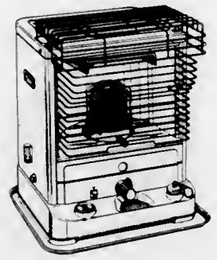
300,773
PORTABLE AIR CONDITIONING UNIT
Ricagni Angelo, Via Marcona 16, Milan, Italy (20129)
Filed Nov. 25, 1986, Ser. No. 934,933
Claims priority, application Italy, Jun. 19, 1986, 22320/86[U]
Term of patent 14 years
U.S. Cl. D23—333



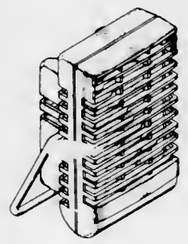
300,774
KEROSENE STOVE
Koichi Sakai, Moriguchi, Japan, assignor to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Jun. 10, 1986, Ser. No. 873,206
The portion of the term of this patent subsequent to Apr. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—338



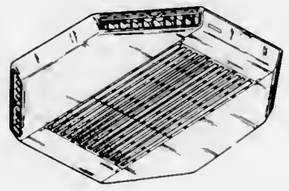
300,775
KEROSENE STOVE
Koichi Sakai, Moriguchi, Japan, assignor to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Aug. 28, 1986, Ser. No. 901,452
The portion of the term of this patent subsequent to Apr. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—338



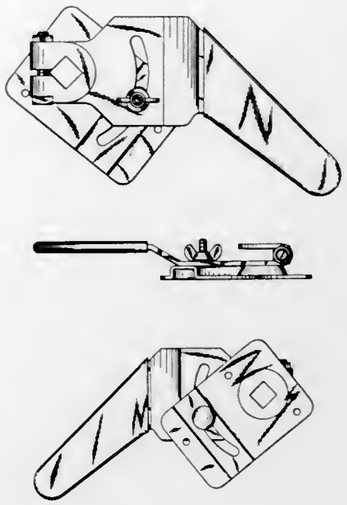
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Chenn-Yuan Fu, Cerritos, and Milton J. Halsted, San Juan Capistrano, both of Calif., assignors to Tatung Company of America, Inc., Long Beach, Calif.
Filed Oct. 27, 1986, Ser. No. 923,758
Term of patent 14 years
U.S. Cl. D23—370



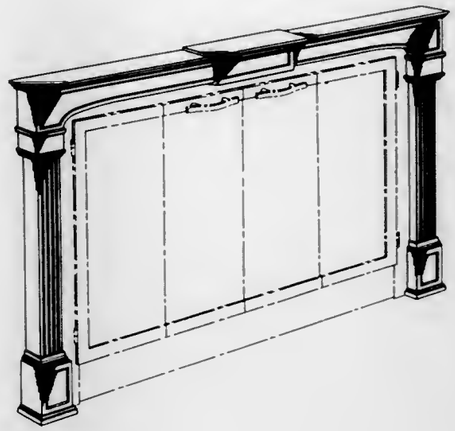
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David W. Bales, Manchester, and James E. Roth, DeSoto, both of Mo., assignors to Nordyne, Inc., St. Louis, Mo.
Filed Aug. 22, 1986, Ser. No. 899,251
Term of patent 14 years
U.S. Cl. D23—392



300,778
DAMPER REGULATOR ASSEMBLY
Charles Giannone, Babylon, N.Y., assignor to Duro-Dyne Corporation, Farmingdale, N.Y.
Filed Jan. 10, 1986, Ser. No. 817,554
Term of patent 14 years
U.S. Cl. D23—393



300,779
FIREPLACE MANTELPIECE
Vance R. Smith, Brookfield, Vt., assignor to Vermont Castings, Inc., Randolph, Vt.
Filed Jun. 12, 1986, Ser. No. 875,363
Term of patent 14 years
U.S. Cl. D23—404



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Abou-Sayed, Ahmed S.: *See*—
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Abra, Robert, to Liposome Technology, Inc. Amphotericin B/cholesterol sulfate composition. 4,822,777, Cl. 514-31.000.

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Abukawa, Toshimi; Tahara, Kazuo; Takahashi, Noriyoshi; and Tomite, Toshio, to Hitachi, Ltd. DC Electric motor having field poles of permanent magnet. 4,823,037, Cl. 310-230.000.

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Ackroyd, Rand H.; and Corcoran, Mark T., to Watts Regulator Company. Tamperproof coupling. 4,821,763, Cl. 137-218.000.

Actel Corporation: *See*—
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Adams, Michael J.; and Edmondson, Brian, to Lever Brothers Company. Apparatus for stamping a detergent bar. 4,822,273, Cl. 425-385.000.

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Adkins, James R., to Wacker Silicones Corporation. Organopolysiloxane elastomers having improved electrical properties and insulators coated therewith. 4,822,830, Cl. 523-203.000.

Adleff, Kurt, to J. M. Voith GmbH. Actuating device for a disk brake. 4,821,846, Cl. 188-72.600.

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Ahmed, Hassan J.; and Fogg, James L., to Westinghouse Electric Corp. Method and apparatus for passively gamma scanning a nuclear fuel rod. 4,822,552, Cl. 376-257.000.

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Aichert, Hans; Stephan, Herbert; Stumpp, Hermann; Dietrich, Walter; and Kiessling, Michael, to Leybold Aktiengesellschaft. Melting furnace for producing strand-cast ingots in a protective gas atmosphere. 4,821,791, Cl. 164-506.000.

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Burk, Ronnie F., to Deere & Company. Extension and retraction sequencing circuit. 4,821,622, Cl. 91-29.000.

Burkhardt, George J. Self-adjusting orthopedic cervical pillow. 4,821,355, Cl. 5-434.000.

Burkhardt, Rudolf; Hass, Hansjurgen; Hitze, Reiner; and Zoche, Gunther, to Huels Troisdorf AG. Sealing composition for soil barriers. 4,822,420, Cl. 106-74.000.

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Baker, Ross G., Jr.; Whistler, Stephen J.; Ideker, Raymond E.; Calfee, Richard V.; and Haluska, Edward A., 4,821,723, Cl. 128-419.00D.

International Business Machines: *See—*
Chase, Judith A.; Phelps, Douglas W., Jr.; Redmond, Robert J.; and Starr, Stephen G., 4,821,945, Cl. 228-179.000.

International Business Machines Corporation: *See—*
Aichelmann, Frederick J., Jr.; Blumberg, Rex H.; Meltzer, David; Pomerene, James H.; Puzak, Thomas R.; Rechtschaffen, Rudolph N.; and Sparacio, Frank J., 4,823,259, Cl. 364-200.000.
Arter, Nelson K.; Call, Mark G.; and Rhoades, Mark L., 4,823,330, Cl. 369-45.000.
Ashcraft, Glinden R.; Gorman, Richard E.; Kozol, Edward J.; and Paul, Robert J., 4,822,442, Cl. 156-361.000.
Atallah, Francois I.; Bond, Paul W.; and Frey, Denise E., 4,823,095, Cl. 333-22.00R.
Bank, Judith H.; Familetti, Harry G.; and Lickel, Charles W., 4,823,261, Cl. 364-200.000.
Barbic, Federico; and Choy, David M., 4,823,306, Cl. 364-900.000.
Bigo, Firmin; and LeMaut, Francois, 4,823,339, Cl. 370-32.100.
Carrington, James E.; and Westcott, Gerald R., 4,821,639, Cl. 101-93.140.
Chin, Victor H.; Chihara, Carol; and Sha, Allen S., 4,823,347, Cl. 371-49.000.
Daniel, Arthur A.; Irvin, David R.; and Moore, Robert E., 4,823,345, Cl. 371-37.000.
Evangelisti, Carlo J.; and Lumelsky, Leon, 4,823,281, Cl. 364-518.000.
Fleet, Russell W.; Long, David C.; Stroms, Karl F.; and Weiss, Gerhard, 4,821,614, Cl. 83-100.000.
Hannon, David M.; and Horne, Donald E., 4,823,205, Cl. 369-14.000.
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Lumelsky, Leon; St. Clair, Joe C.; Mansfield, Robert L.; Segre, Marc; and Spencer, Alexander K., 4,823,286, Cl. 364-521.000.
Milster, Thomas D.; and Yao, Shingshwang, 4,823,220, Cl. 369-13.000.

International Business Machines Incorporated: *See—*
Frantz, Billy J.; and Hellstrom, Sven E., 4,823,304, Cl. 364-900.000.

International Flavors & Fragrances Inc.: *See—*
Sprecker, Mark A.; Androulakis, Margo; and Hanna, Marie R., 4,822,515, Cl. 252-174.110.

International Fried Ice Cream: *See—*
Clegg, Melodee L.; Clegg, Terry R.; and Maxwell, Leon R., 4,822,627, Cl. 426-101.000.

International Lubrication and Fuel Consultants, Inc.: *See—*
Kitchen, George H., III; Kitchen, Nancy E.; McCleery, Neil B.; and Builes, Eduardo, 4,823,116, Cl. 340-603.000.

Intra-Sonix, Inc.: *See—*
Martinelli, Michael A.; and von Thuna, Peter, 4,821,731, Cl. 128-662.060.

Ionen Mikrofabrikations Systeme Gesellschaft mbH: *See—*
Stengl, Gerhard; and Loschner, Hans, 4,823,011, Cl. 250-491.100.

Ionics, Incorporated: *See—*
MacDonald, Russell J., 4,822,471, Cl. 204-301.000.

Ionor, Inc.: *See—*
Eichel, Herman J.; and Massman, Brent D., 4,822,619, Cl. 424-492.000.

Iotti, Alcide: *See—*
Bolzani, Otello; and Iotti, Alcide, 4,821,632, Cl. 99-330.000.

IPL Inc: *See—*
Poirier, Charles, 4,821,910, Cl. 220-266.000.

Iqbal, Muhammad; and Buccicone, Dana F., to Kohler Co. Valve for faucet or the like. 4,821,765, Cl. 137-270.000.

Irish, William D.: *See—*
Markley, Joseph P.; and Irish, William D., 4,821,399, Cl. 29-458.000.

Irvin, David R.: *See—*
Daniel, Arthur A.; Irvin, David R.; and Moore, Robert E., 4,823,345, Cl. 371-37.000.

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Gavagan, James A., 4,821,374, Cl. 16-321.000.

Ishibashi, Hiromichi: *See—*
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Ishibashi, Yasuo; Matsuda, Muneaki; and Ashizawa, Kazuhide, to Eisai Co., Ltd. Cephalosporin injection. 4,822,785, Cl. 514-202.000.

Ishibe, Hiroshi: *See—*
Sakakibara, Kuniteru; Saito, Mitsuru; Tanimoto, Tetsuyuki; Morimoto, Yasuhiro; and Ishibe, Hiroshi, 4,823,199, Cl. 358-335.000.

Ishida, Hiroshi: *See—*
Uda, Masayuki; Tomioka, Yukio; Kouno, Chikara; Ishida, Hiroshi; and Yamauchi, Yukio, 4,823,368, Cl. 250-372.000.

Ishigaki, Kunio; Yoshimura, Yuji; Kanetake, Satoshi; and Torigoe, Masaaki, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,822,727, Cl. 430-536.000.

Ishiguri, Masaaki: *See—*
Tani, Tatsuhiro; Ishiguri, Masaaki; Kikuchi, Rokuro; and Ohyama, Akio, 4,821,412, Cl. 29-882.000.

Ishiguro, Yoichi: *See—*
Kanamori, Hiroo; Yokota, Hiroshi; Tanaka, Gotaro; Ishiguro, Yoichi; Takagi, Masahiro; Suganuma, Hiroshi; and Shigematsu, Masayuki, 4,822,399, Cl. 65-3.120.

Ishihara Sangyo Kaisha Ltd.: *See—*
Kimura, Fumio; Haga, Takahiro; Maeda, Kazuyuki; Hayashi, Koji; Ikeguchi, Masahiko: and Yoshida, Tsunezo, 4,822,402, Cl. 71-90.000.

Ishii, Takashi; Kohama, Hajime; Yabe, Hisao; Yano, Akira; and Noto, Shinsuke, to Kabushiki Kaisha Toshiba; Yano Kousakujo Corporation; and Notoshiti Corporation. Machine parts with wear-resistant surface brought into contact with elongated fibrous member. 4,822,662, Cl. 428-131.000.

Ishii, Takatoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Pattern write control circuit. 4,823,119, Cl. 340-703.000.

Ishii, Touru: *See—*
Akasaki, Yutaka; Tokita, Akihiko; Torikoshi, Kaoru; Imai, Akira; and Ishii, Touru, 4,822,704, Cl. 430-58.000.

Ishii, Yoshiaki: *See—*
Shinoda, Yasuhiro; Takahashi, Yoshifumi; Takaso, Tsuneto; Hagiwara, Akira; and Ishii, Yoshiaki, 4,822,211, Cl. 405-154.000.

Ishikawa, Hiroshi; and Shingai, Hidetaka, to Nippondenso Co., Ltd. Variable capacity compressor. 4,822,252, Cl. 417-222.000.

Ishikawa, Mamoru: *See—*
Ohno, Kiyotaka; Nagase, Hiroshi; Ishikawa, Mamoru; Matsumoto, Kazuhisa; and Nishio, Shintaro, 4,822,804, Cl. 514-337.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Tsuchida, Yutaka; Takahashi, Shuzo; Osada, Shiro; Sato, Hisashi; Ozeki, Akichika; and Hasebe, Nobuhisa, 4,821,790, Cl. 164-430.000.

Ishikura, Shinichi: *See—*
Kuwajima, Teruaki; Miwa, Hiroshi; and Ishikura, Shinichi, 4,822,831, Cl. 523-421.000.

Ishimoto, Tsukasa: *See—*
Tsuchida, Seiichi; and Ishimoto, Tsukasa, 4,822,526, Cl. 260-103.000.

Ishiyama, Nobuo: *See—*
Zama, Yoshiyuki; Ishiyama, Nobuo; Saita, Tsuneo; Naito, Takanobu; Hirose, Masao; Yokoyama, Masaaki; Asano, Taiji; Senda, Hisato; Sekine, Keiji; and Sanai, Shigeru, 4,822,786, Cl. 514-202.000.

Ishizu, Akira; Nishimura, Tadashi; and Inoue, Yasuo, to Mitsubishi Denki Kabushi Kaisha. Method of producing a thin film semiconductor device. 4,822,751, Cl. 437-173.000.

Ishizuka, Satoshi, to Nissan Motor Co., Ltd. Vehicle roof structure having sliding roof lid. 4,822,097, Cl. 296-216.000.

Isomura, Akihiko: *See—*
Iwata, Kouichi; Takahashi, Hideo; and Isomura, Akihiko, 4,822,615, Cl. 424-423.000.

Isover Saint-Gobain: *See—*
Rias, Jean-Claude, 4,821,491, Cl. 53-438.000.

Isshiki, Naotsugu, to Aisin Seiki Kabushiki Kaisha. Stirling cycle engine. 4,821,516, Cl. 60-517.000.

Isuzu Motors Limited: *See—*
Koshizawa, Toshifumi, 4,821,854, Cl. 192-0.072.

Itaya, Masahiko; Fuma, Hiroshi; and Fujimori, Toshiro, to Konica Corporation. Electrostatic image-developing process using a magnetic roller. 4,822,711, Cl. 430-120.000.

Ito, Kenji; and Kimura, Kaoru, to Toagosei Chemical Industry Co., Ltd. Primer composition useful for application to non-polar on highly crystalline resin substrates. 4,822,426, Cl. 106-189.000.

Ito, Kiyotaka: *See—*
Takasugi, Hisashi; Ito, Kiyotaka; Nishino, Shigetaka; Tanaka, Akito; and Takaya, Takao, 4,822,805, Cl. 514-341.000.

Ito, Osamu; and Mizutani, Hiroshi, to Kao Corporation. Absorbent article. 4,822,350, Cl. 604-372.000.

Ito, Osamu; and Tachibana, Shinro, to Eisai Co., Ltd. Physiologically active peptide. 4,822,774, Cl. 514-12.000.

Ito, Shinichi: *See—*
Onodera, Kazukiyo; and Ito, Shinichi, 4,822,782, Cl. 514-183.000.
Onodera, Kazukiyo; and Ito, Shinichi, 4,822,783, Cl. 514-183.000.

Ito, Shoji; Mizoguchi, Kensaku; and Suda, Yoshio, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Hydrophilic-hydrophobic thermally reversible type polymer and method for production thereof. 4,822,848, Cl. 524-549.000.

Ito, Susumu: *See—*
Suzuki, Akira; Ito, Susumu; Okamoto, Kikuhiko; Hoshino, Eiichi; Yokosuka, Michio; and Murata, Moriyasu, 4,822,516, Cl. 252-174.120.

Ito, Yoshio, to Canon Kabushiki Kaisha. Recording apparatus. 4,823,195, Cl. 358-285.000.

Itoh, Ken-ich: *See—*
Takahashi, Jun; Fukushima, Shigeru; Narumi, Toshikatu; Itoh, Ken-ich; and Ogawa, Seiya, 4,822,634, Cl. 427-48.000.

Itoh, Tadatsugu; Kohzu, Hideaki; and Hosono, Yasuhiro, to NEC Corporation. Bipolar transistor and process of fabrication thereof. 4,823,174, Cl. 357-34.000.

Itoh, Takaaki: *See—*
Tomoda, Atsuo; Kijima, Takao; Yamada, Muneharu; and Itoh, Takaaki, 4,821,830, Cl. 180-140.000.

ITT Defense Communications, a division of ITT Corporation: *See—*
McAdams, Richard L., 4,822,141, Cl. 350-330.000.

ITT Electro Optical Products a Division of ITT Corporation: *See—*
Johnson, Charles B.; and Augustine, Francis J., 4,822,994, Cl. 250-213.0VT.

ITT Gilfillan: *See—*
Loucks, Richard S., 4,823,020, Cl. 307-106.000.

Ivarsson, Roland H.: *See—*
Anflo, Kjell S.; Grabs, Jan W. I.; and Ivarsson, Roland H., 4,823,133, Cl. 342-199.000.

Ivey, Don L., to Texas A&M University System, The. Advanced dynamic impact extension module. 4,822,208, Cl. 404-6.000.

Iwai, Shingo: *See—*
Matsuda, Takashi; Suzuki, Ryozo; Iwai, Shingo; and Ikeda, Ryoji, 4,822,258, Cl. 417-423.300.

Iwai, Tohru: *See—*
Shibano, Yoshizo; Suzuki, Haruo; and Iwai, Tohru, 4,823,138, Cl. 342-457.000.

Iwai, Tomio, to Sanshin Kogyo Kabushiki Kaisha. Two-stroke engine. 4,821,687, Cl. 123-65.00P.

Iwasa, Tooru: *See—*
Hanaoka, Seiji; Minowa, Masahiro; Okamura, Masataka; Masumura, Masao; Iwasa, Tooru; Watanabe, Noboru; Mitsugi, Shoichi; and Miyazawa, Norimichi, 4,822,186, Cl. 400-120.000.

Iwasaki, Dean H.; and Iliff, Michael D., to Marquest Medical Products, Inc. Arterial blood gas syringe. 4,821,738, Cl. 128-765.000.

Iwasaki, Eiji: *See—*
Fukumoto, Ryoichi; Shiraishi, Daiichi; and Iwasaki, Eiji, 4,821,589, Cl. 74-89.220.

Iwasaki, Masayoshi: *See—*
Nasu, Shoji; Nishimoto, Yoshiro; Yasukuni, Hiroaki; and Iwasaki, Masayoshi, 4,823,082, Cl. 324-232.000.

Iwasaki, Toshio; Katoh, Akihiko; Murao, Atsuhiko; Tsukada, Masakazu; Nakano, Takashi; and Nasu, Masaru, to Nippon Kokan Kabushiki Kaisha. Coupling pin for sucker rod made of fiber-reinforced plastic material. 4,822,201, Cl. 403-268.000.

Iwata, Hiromu: *See—*
Miura, Yashuhiro; and Iwata, Hiromu, 4,821,576, Cl. 73-788.000.

Iwata, Kouichi; Takahashi, Hideo; and Isomura, Akihiko, to Sumitomo Electric Industries, Ltd. Antithrombic resin composition. 4,822,615, Cl. 424-423.000.

Iwata, Michitaka: *See—*
Manabe, Seiichi; Iwata, Michitaka; and Inoue, Mamoru, 4,822,540, Cl. 264-41.000.

Izumine, Zenzo, to Yutaka Giken Co., Ltd. Brake disk. 4,821,848, Cl. 188-218.0XL.

Izumisawa, Osamu, to Shinano Pneumatic Industries Inc. Tightening device. 4,821,611, Cl. 81-464.000.

J. I. Case Company: *See—*
Oldfather, Raymond L.; and Oliver, Robert J., 4,822,094, Cl. 296-65.100.
Warner, Steven D.; Swick, William C.; and Anderson, David M., 4,821,993, Cl. 248-674.000.

J. M. Voith GmbH: *See—*
Adleff, Kurt, 4,821,846, Cl. 188-72.600.
Lindenthal, Hans, 4,822,204, Cl. 403-337.000.
Sieberth, Ralf, 4,821,429, Cl. 34-114.000.

Jabloner, Harold: *See—*
Chu, Sung G.; Jabloner, Harold; and Swetlin, Brian J., 4,822,832, Cl. 523-423.000.

Jackel, Johann, to Lu Lamellen und Kupplungsbau GmbH. Torque transmitting assembly. 4,821,855, Cl. 192-3.290.

Jackovitz, John F.; Zuckerbrod, David; and Buzzelli, Edward S., to Westinghouse Electric Corp. Seawater power cell. 4,822,698, Cl. 429-27.000.

Jackson, Andrew: *See—*
Audeh, Costandi A.; and Jackson, Andrew, 4,822,504, Cl. 252-46.300.

Jackson, Peter J. Pressure regulator. 4,821,767, Cl. 137-491.000.

Jackson, Richard A.; and Abt, John, to Grass Valley Group, Inc., The. Video mixer with multicolor boarder. 4,823,183, Cl. 358-22.000.

Jacobsen, Alan N. Method and apparatus for spinning yarn. 4,821,505, Cl. 57-401.000.

Jacques, Roland; Reppelin, Michel; and Seigneurin, Laurent, to Rhone-Poulenc Specialites Chimiques. Fluorinated silica catalyst and preparation of aromatic/aliphatic nitriles in the presence thereof. 4,822,903, Cl. 558-312.000.

Jaeger: *See—*
Reymond, Philippe, 4,821,571, Cl. 73-317.000.

Jaffe, Norman S., to Cilco, Inc. Intraocular lens. 4,822,358, Cl. 623-6.000.

James, Darryl G.: *See—*
Callis, Richard A.; and James, Darryl G., 4,822,436, Cl. 156-211.000.

James, David E.; and Nowicki, Neal R., to Amoco Corporation. Process for preparation of anthraquinones and fluorenones. 4,822,527, Cl. 260-369.000.

James, Donald R.: *See—*
Lee, David L.; James, Donald R.; and Michaely, William J., 4,822,905, Cl. 558-414.000.

James, Larry C.: *See—*
Taylor, Billy K.; and James, Larry C., 4,823,324, Cl. 365-230.000.

James, Michael R.; and Maney, John J., to Harris Corp. Shipboard antenna pointing and alignment system. 4,823,134, Cl. 342-359.000.

James River Corporation of Virginia: *See—*
Tse, Stephen H.; Hollenberg, David H.; Martin, Richard L.; and Manning, James H., 4,822,452, Cl. 162-146.000.

James, Robert C.; and Pederson, Richard J., to Bemis Company, Inc. Easy-open case taping. 4,821,487, Cl. 53-412.000.

Janchris Corporation: *See—*
Christner, Susan A.; Janda, Elaine R.; and Sidebottom, Mark, 4,822,054, Cl. 277-12.000.

Janda, Elaine R.: *See—*
Christner, Susan A.; Janda, Elaine R.; and Sidebottom, Mark, 4,822,054, Cl. 277-12.000.

Janesick, James R.; and Elliott, Stythe T., to California Institute of Technology. Photosensor with enhanced quantum efficiency. 4,822,748, Cl. 437-3.000.

Jankowski, Fred: *See—*
Redmon, John W., Jr.; and Jankowski, Fred, 4,821,610, Cl. 81-322.000.

Janssen, Johannes A.: *See—*
Weterings, Cornelis A. M.; and Janssen, Johannes A., 4,822,582, Cl. 423-321.00R.

Japan Styrene Paper Corporation: *See—*
Kuwabara, Hedeki; Kitagawa, Atusi; and Kanbe, Masato, 4,822,542, Cl. 264-50.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Takemura, Yasuhiko; Zen, Shinichiro; Zama, Yoshiaki; and Enyo, Hiroji, 4,822,654, Cl. 428-36.800.

Japan Tobacco, Inc.: *See—*
Kumata, Katsuhiko; Endo, Isao; and Nishikimoto, Taro, 4,821,746, Cl. 131-282.000.

Jaques, Bernard; and Chatelain, Francis, to Montres Rado, S.A. Bracelet comprising a flexible core. 4,821,532, Cl. 63-3.000.

Jarvis, Wilbur W.; and Smith, John I., to Whirlpool Corporation. Automatic dishwasher with a pump having a selectively adjustable impeller clearance. 4,822,241, Cl. 415-132.000.

Jasenak, James R., to Mobay Corporation. Novel polyisocyanate mixture. 4,822,517, Cl. 252-182.210.

Jasper, Joseph C.: *See—*
Cordea, James N.; Jasper, Joseph C.; and Sheth, Harshad V., 4,822,556, Cl. 420-59.000.

Jeco Company Limited: *See—*
Hanaoka, Seiji; Minowa, Masahiro; Okamura, Masataka; Masumura, Masao; Iwasa, Tooru; Watanabe, Noboru; Mitsugi, Shoichi; and Miyazawa, Norimichi, 4,822,186, Cl. 400-120.000.

Jeffers, Albert L.: *See—*
Lansky, Marc A.; and Clemens, Philip M., 4,821,438, Cl. 40-156.000.

Jego, Gerard; Lacan, Guy; Thierry, Jean-Pierre; and Verdenne, Serge, to La Telemecanique Electrique. Current tapping device disconnectable from an omnibus bar distribution column. 4,823,231, Cl. 361-331.000.

Jenkins, David H.: *See—*
Ngian, Kian F.; Hartshorn, Angus J.; and Jenkins, David H., 4,822,575, Cl. 423-82.000.

Jenne, Dietmar: *See—*
Jenne, Gustav; and Jenne, Dietmar, 4,821,813, Cl. 173-135.000.

Jenne, Gustav; and Jenne, Dietmar, to Terre AG fur Tiefbautechnik. Percussion drilling apparatus. 4,821,813, Cl. 173-135.000.

Jennings, Homer F.; and Martinez, Ozzie, to Weider Health & Fitness. Adjustable barbell bar with rotating handles. 4,822,035, Cl. 272-123.000.

Jensen, James D.: *See—*
Doddapaneni, Narayan; Chua, David L.; Hoff, Gerald F.; and Jensen, James D., 4,822,700, Cl. 429-50.000.

Jensen, Robert L., to SensorMedics Corporation. High frequency ventilator and method. 4,821,709, Cl. 128-204.210.

JGC Corporation: *See—*
Kato, Koji; Umehara, Noritsugu; Adachi, Shigeru; and Sato, Shin, 4,821,466, Cl. 51-317.000.

Jidosha Kiki Co., LTD.: *See—*
Masaki, Minoru, 4,821,690, Cl. 123-179.00H.

Jimenez, Louis M. Catheter bag holder. 4,821,988, Cl. 248-227.000.

Jimmy, Michael F. Illuminating spectacle apparatus. 4,822,161, Cl. 351-158.000.

Joensen, Per: *See—*
Morrison, S. Roy; Frindt, Robert F.; Joensen, Per; Gee, Michael A.; and Miremadi, Bijan K., 4,822,590, Cl. 423-561.100.

Joh, Yasushi; and Kaneko, Noriaki, to Ube Industries, Ltd. Medical tubes with porous textured walls. 4,822,352, Cl. 623-1.000.

John, Gunther, to Minnesota Mining and Manufacturing Company. Fire-protected electrical cable connection. 4,822,953, Cl. 174-88.00R.

Johns Hopkins University, The: *See—*
Makofski, Robert A.; Massey, Joe T.; Mark, F. Fausten; Weiskopf, Francis B., Jr.; Guier, William H.; Walsh, Patrick C.; and Marshall, Fray F., 4,821,729, Cl. 128-660.030.
Newman, Arnold L., 4,822,566, Cl. 422-68.000.

Johnson, April E. Face shield. 4,821,340, Cl. 2-9.000.

Johnson, Charles B.; and Augustine, Francis J., to ITT Electro Optical Products a Division of ITT Corporation. Small arms sight for use

during daylight and nighttime conditions. 4,822,994, Cl. 250-213.0VT.

Johnson, David A.: *See—*
Johnson, Peter E.; Johnson, David A.; and Kahl, George W., 4,822,234, Cl. 414-798.900.

Johnson, Dennis M. Picture hook with safety closure. 4,821,992, Cl. 248-493.000.

Johnson, Jerry L.: *See—*
Martin, Craig A.; and Johnson, Jerry L., 4,822,405, Cl. 71-92.000.

Johnson, Paul R.; and Wheeler, Kevin M., to Dover Resources, Inc. Pump rotor. 4,822,265, Cl. 418-182.000.

Johnson, Peter E.; Johnson, David A.; and Kahl, George W., to Tekmax Inc. Plate feed apparatus. 4,822,234, Cl. 414-798.900.

Johnson, Ralph E.: *See—*
Maglica, Anthony; Johnson, Ralph E.; and Lewis, Armis L., 4,823,242, Cl. 362-187.000.

Johnson, Richard D.; Runzheimer, H. Volker; Sommer, Ronald G.; and Yip, Kin F., to Miles Inc. Polyacrylamide gel particles having hapten moieties bound thereto as immunoassay reagent. 4,822,747, Cl. 436-532.000.

Johnson, Richard E. Multipurpose article holding tray. 4,821,931, Cl. 224-42.420.

Johnson, Ronald C.: *See—*
Clausen, Charles C.; Johnson, Ronald C.; Chee, Wan T.; and Schmidt, Warren E., 4,821,980, Cl. 244-54.000.

Johnson, Thomas K., to Rolls-Royce plc. Apparatus for securing a component. 4,822,013, Cl. 269-7.000.

Johnston, Bernard A. Reelable door closure. 4,821,786, Cl. 160-23.100.

Johnston, James S.; Pownall, David W.; and White, Melvyn S., to Rosemount Limited. Air data measurement apparatus. 4,821,566, Cl. 73-178.00R.

Jolidon, Francois: *See—*
Richard, Willy; and Jolidon, Francois, 4,821,541, Cl. 70-272.000.

Jolly, David F.; and Wilson, Michael T. Reinforced elastic sleeve for use with a limb prosthetic device. 4,822,371, Cl. 623-32.000.

Jones, Bradford H. Process and apparatus for fixing, encapsulating, stabilizing and detoxifying heavy metals and the like in metal-containing sludges, soils, ash and similar materials. 4,821,653, Cl. 110-229.000.

Jones, Colleen A.: *See—*
Parker, Timothy A.; and Jones, Colleen A., 4,822,310, Cl. 441-70.000.

Jones, Eric; and Doncaster, Alan M., to English Electric Valve Company Limited. Hydrogen sulphide sensor. 4,822,465, Cl. 204-192.100.

Jones, Gregory R. Toilet bowl cleaning composition dispenser. 4,821,346, Cl. 4-226.000.

Jones, Harry M.: *See—*
Clark, William J. R.; Ward, John J.; Jones, Harry M.; and Powell, John H., 4,823,271, Cl. 364-443.000.

Jones, J. Paul, to PRD Corporation. Round dispenser for sutures. 4,821,878, Cl. 206-370.000.

Jones, John I.: *See—*
Davis, Cecil J.; Loewenstein, Lee M.; Jucha, Rhett B.; Matthews, Robert T.; Hildenbrand, Randall C.; Freeman, Dean W.; and Jones, John I., 4,822,450, Cl. 156-643.000.

Jonker, Berend T.: *See—*
Prinz, Gary A.; Krebs, James J.; and Jonker, Berend T., 4,823,177, Cl. 357-27.000.

Jordan, Terence: *See—*
Denning, Ralph M.; Hall, John M.; and Jordan, Terence, 4,821,979, Cl. 244-23.00D.

Jorritsma, Johannes N. Method and apparatus for calculating flow rates through a pumping station. 4,821,580, Cl. 73-861.000.

Josef Maier: *See—*
Merkel, Josef, 4,821,995, Cl. 249-219.100.

Joslyn Corporation: *See—*
Cunningham, Francis V., 4,822,291, Cl. 439-187.000.

Joslyn, Larry, to Joslyn Value Corporation. Method for the recovery of sterilants. 4,822,563, Cl. 422-31.000.

Joslyn Value Corporation: *See—*
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Jost, Gerhard, to Carl Schenck AG. Method and apparatus for the continuous measuring of bulk material passing over a measuring wheel. 4,821,581, Cl. 73-861.360.

Jost, Heinz: *See—*
Pennewiss, Horst; Jost, Heinz; and Knoell, Helmut, 4,822,508, Cl. 252-56.00R.

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Rentzea, Costin; Sauter, Hubert; Tuerk, Wolfgang; Wenderoth, Bernd; Richarz, Winfried; Jung, Johann; and Rademacher, Wilhelm, 4,822,400, Cl. 71-76.000.

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Kabushiki Kaisha Dymosha: *See—*
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Kabushiki Kaisha Kaneda Kikai Seisakusho: *See—*
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Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
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Kabushiki Kaisha Kobe Seiko Sho: *See—*
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Kato, Isamu; Yuhda, Sadayuki; Oda, Naoki; and Suganuma, Masahiro, to Sankin Kogyo Kabushiki Kaisha. Antibiotic alloys. 4,822,567, Cl. 420-95.000.

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Nager, Urs F., Jr., to Burndy Corporation. Electrical connection apparatus for flat conductor cables and similar articles. 4,821,409, Cl. 29-747.000.

Nagira, Keiji, to Canon Kabushiki Kaisha. Electronic equipment utilizing forward/reverse rotation of motor. 4,822,019, Cl. 271-9.000.

Nagoya Oilchemical Co., Ltd.: *See*—
Horiki, Seinosuke; and Makino, Reiji, 4,822,650, Cl. 428-34.200.

Naito, Hideo; Matsuda, Tsukasa; and Uchiyama, Katsuhiko, to Fuji Photo Film Co., Ltd. Magazine for light-sensitive material having a contoured folded portion adjacent a material dispensing opening of the magazine. 4,821,876, Cl. 242-71.100.

Naito, Takanobu: *See*—
Zama, Yoshiyuki; Ishiyama, Nobuo; Saita, Tsuneo; Naito, Takanobu; Hirose, Masao; Yokoyama, Masaaki; Asano, Taiji; Senda, Hisato; Sekine, Keiji; and Sanai, Shigeru, 4,822,786, Cl. 514-202.000.

Naito, Tamotsu: *See*—
Senshu, Hisashi; Matsubara, Sadahiko; and Naito, Tamotsu, 4,822,424, Cl. 106-22.000.

Naito, Tsutomu: *See*—
Hino, Takashi; Naito, Tsutomu; Kuroda, Hiroyuki; Tsushima, Eiki; and Nomura, Tomio, 4,822,587, Cl. 423-447.100.

Naitoh, Masanori: *See*—
Suzuki, Hiroaki; Murase, Michio; Hatamiya, Shigeo; Naitoh, Masanori; and Tominaga, Kenji, 4,822,557, Cl. 376-282.000.

Nakagawa, Fumio; Tsujita, Yoshio; and Yamazaki, Mitsuo, to Sankyo Company Limited. Enzyme-inhibitory griseolic acid derivatives, and their use. 4,822,879, Cl. 544-277.000.

Nakagawa, Hiroto: *See*—
Kuwabara, Takao; Bando, Akira; Haraguchi, Eiji; and Nakagawa, Hiroto, 4,823,018, Cl. 290-7.000.

Nakagawa, Masayuki; Tabuchi, Makoto; and Hamuro, Mitsuro, to Murata Manufacturing Co., Ltd. Electrical component having a lead wire secured in a through hole. 4,823,103, Cl. 336-175.000.

Nakagawa, Yoshihiro: *See*—
Kumagami, Naoki; Nakagawa, Yoshihiro; Yuzawa, Atsushi; Hirose, Kiichiro; Sato, Yukie; and Shiosaka, Akihiro, 4,822,967, Cl. 219-10.55F.

Nakajima, Nobuyuki; Inomata, Kenichi; and Okada, Shigeru, to Diesel Kiki Co., Ltd. Sliding-vane rotary compressor. 4,822,263, Cl. 418-133.000.

Nakajima, Takashi: *See*—
Murata, Masayoshi; Tsutsumi, Hideo; Matsuda, Keiji; Hattori, Kohji; and Nakajima, Takashi, 4,822,787, Cl. 514-210.000.

Nakamura, Akira: *See*—
Tanaka, Toyoaki; Ohira, Katuzi; Nakamura, Akira; Kamei, Ryosuke; and Hashimoto, Akihiro, 4,822,668, Cl. 428-283.000.

Nakamura, Atsushi: *See*—
Miyamoto, Keiji; Nakamura, Atsushi; Satoh, Tsuneo; Kojima, Kazuo; and Morita, Masayuki, 4,822,989, Cl. 235-492.000.

Nakamura, Hideo; Miura, Toshiharu; and Kikkawa, Kazuhiro, to Sumitomo Chemical Company Limited; Sumitomo Chemical Engineering Co., Ltd.; and Nippon Valqua Kogyo Kabushiki Kaisha. Apparatus for cleaning of coupler elements. 4,821,753, Cl. 134-59.000.

Nakamura, Kazuhiro: *See*—
Nakamura, Tomoji; Sawada, Ryoji; and Nakamura, Kazuhiro, 4,821,567, Cl. 73-182.000.

Nakamura, Masaru; and Yamagauchi, Masao, to Hirose Electric Co., Ltd. Electrical connector. 4,822,303, Cl. 439-607.000.

Nakamura, Norihiko: *See*—
Baika, Toyokazu; Nakamura, Norihiko; Noguchi, Hirosi; Tanahasi, Tosio; and Hirose, Katsuhiko, 4,821,686, Cl. 123-65.0VD.

Nakamura, Tadashi: *See*—
Okada, Yoshio; Nakamura, Tadashi; and Ohhira, Youichi, 4,822,767, Cl. 503-213.000.

Nakamura, Taku, to Fuji Photo Film Co., Ltd. Image-forming method employing light-sensitive material containing silver halide, reducing agent and polymerizable compound. 4,822,717, Cl. 430-254.000.

Nakamura, Tomoji; Sawada, Ryoji; and Nakamura, Kazuhiro, to Sanshin Kogyo Kabushiki Kaisha; and Yamaha Hatsudoki Kabushiki Kaisha. Running speed detecting device for marine vessels. 4,821,567, Cl. 73-182.000.

Nakano, Takaharu: *See*—
Yashuda, Hirofumi; Saho, Takahiro; Ohtake, Nobumasa; and Nakano, Takaharu, 4,822,850, Cl. 528-28.000.

Nakano, Takashi: *See*—
Iwasaki, Toshio; Katoh, Akihiko; Murao, Atsuhiko; Tsukada, Masakazu; Nakano, Takashi; and Nasu, Masaru, 4,822,201, Cl. 403-268.000.

Nakao, Toshiyuki: *See*—
Abe, Seiichi; Fujita, Kenji; and Nakao, Toshiyuki, 4,821,946, Cl. 228-180.200.

Nakashima, Hiroshi. Dual reel string winding and unwinding apparatus for use with stunt kites. 4,821,976, Cl. 242-96.000.

Nakayama, Hiroshi: *See*—
Saito, Yoshifusa; Nakayama, Hiroshi; Fukui, Hisao; and Matsuoka, Naoya, 4,821,805, Cl. 169-5.000.

Nakayama, Yoji; and Yasui, Akira, to Ryobi Ltd. Fishing rod and method of manufacturing same. 4,821,447, Cl. 43-18.100.

Nakazawa, Hitoshi: *See*—
Kirigakubo, Minoru; Nakazawa, Hitoshi; and Yamazaki, Kyuya, 4,821,673, Cl. 118-319.000.

Nakazawa, Kyoko: *See*—
Tsutsumi, Yoshitaka; Seita, Toru; Shuyama, Hideo; Matsumura, Kousaburou; and Nakazawa, Kyoko, 4,822,721, Cl. 430-325.000.

Nakazawa, Sei: *See*—
Watanabe, Junichi; Misumi, Kozo; Miyaguchi, Masanobu; Kadomatsu, Seiji; and Nakazawa, Sei, 4,822,838, Cl. 524-178.000.

Nakazyo, Kiyoshi: *See*—
Furutachi, Nobuo; Kawagishi, Toshio; and Nakazyo, Kiyoshi, 4,822,730, Cl. 430-558.000.

Namiki, Akio: *See*—
Watanabe, Yoshihiko; Nagashita, Tsuneyoshi; Niinuma, Susumi; Nomura, Isamu; Kobayashi, Kimito; Namiki, Akio; Abe, Hiroyuki; Iijima, Takayuki; Shimokawa, Kazuto; Haeno, Akira; Aoyagi, Yoshio; Kimura, Toshiyuki; and Matsumoto, Isao, 4,823,056, Cl. 318-341.000.

Namura, Kiyoshi: *See*—
Tsubouchi, Kuniyoshi; Yoshida, Shohei; Namura, Kiyoshi; Okusawa, Tsutomu; and Arai, Akira, 4,822,250, Cl. 417-45.000.

Nankee, Robert J., II; Frantz, Douglas C.; Tamm, James R.; and Gutermuth, Terry R., to Chrysler Motors Corporation. Purge corruption detection. 4,821,701, Cl. 123-520.000.

Naoki, Shigeru: *See*—
Sugioka, Takami; Naoki, Shigeru; and Ueno, Toshiyuki, 4,822,972, Cl. 219-10.492.

Nappholz, Tibor A.: *See*—
Whigham, Robert H.; and Nappholz, Tibor A., 4,821,724, Cl. 128-419.00P.

Narasaki, Tom: *See*—
DeMoss, Dean; Richardson, Harvey J.; and Narasaki, Tom, 4,823,215, Cl. 360-98.020.

Nardis, Frank E.: *See*—
Barnes, Christine B.; Martin, Thomas E.; and Nardis, Frank E., 4,821,760, Cl. 137-82.000.

Narimatsu, Akihiro: *See*—
Okushima, Hiromi; Narimatsu, Akihiro; Kobayashi, Makio; Furuya, Rikizo; and Kitada, Yoshimi, 4,822,797, Cl. 514-252.000.

Narita, Kenichi: *See*—
Nomura, Isao; Narita, Kenichi; and Kurokawa, Masashi, 4,822,846, Cl. 524-538.000.

Narukawa, Atsushi; and Nishiyama, Haruo, to Sharp Kabushiki Kaisha. Document size detector for copying machine. 4,823,165, Cl. 355-75.000.

Naruki, Toshimasa, to Mitsubishi Denki Kabushiki Kaisha. Recording and reproducing disc driving apparatus. 4,823,213, Cl. 360-78.120.

Narumi, Toshikatu: *See*—
Takahashi, Jun; Fukushima, Shigeru; Narumi, Toshikatu; Itoh, Ken-ich; and Ogawa, Seiya, 4,822,634, Cl. 427-48.000.

Narusawa, Sadayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Rotation speed detection circuit in a video disc playback device for detecting a state in which the rotation speed is double a normal speed. 4,823,203, Cl. 358-342.000.

Naruse, Koji: *See*—
Sawaki, Atsushi; Ono, Mamoru; Okazaki, Toshio; and Naruse, Koji, 4,822,434, Cl. 156-48.000.

Nash, Lavonne. Extensible shampoo bowl designed for individual confined to a wheelchair. 4,821,347, Cl. 4-516.000.

Nashua Corporation: *See*—
Langlais, George O.; Wang, Pat Y. H.; and Chaplick, Joseph S., 4,822,416, Cl. 106-21.000.
Langlais, George O.; Wang, Pat Y. H.; and Chaplick, Joseph S., 4,822,769, Cl. 503-214.000.

Nasu, Masaru: *See*—
Iwasaki, Toshio; Katoh, Akihiko; Murao, Atsuhiko; Tsukada, Masakazu; Nakano, Takashi; and Nasu, Masaru, 4,822,201, Cl. 403-268.000.

Nasu, Shoji; Nishimoto, Yoshiro; Yasukuni, Hiroaki; and Iwasaki, Masayoshi, to Kabushiki Kaisha Kobe Seiko Sho. Signal processing method for an electromagnetic induction test. 4,823,082, Cl. 324-232.000.

Nathanson, Harvey C.; Driver, Michael C.; Cresswell, Michael W.; Freitag, Ronald G.; Alexander, Donald K.; and Yaw, Daniel F., to Westinghouse Electric Corp. Transmit-receive means for phased-array active antenna system using rf redundancy. 4,823,136, Cl. 342-368.000.

National Biomedical Research Foundation: *See*—
Ledley, Robert S., 4,821,728, Cl. 128-661.010.

National House Industrial Co., Ltd.: *See*—
Nagai, Satoru; Imahashi, Kazuo; Nagaya, Yoshio; Yoshida, Shigeo; Kitagawa, Satoshi; and Miyazawa, Takatoshi, 4,822,541, Cl. 264-42.000.

National Research Development Corporation: *See*—
Lings, Geoffrey P., 4,821,826, Cl. 180-58.000.
McCracken, William; and Waddell, Alexander J., 4,823,053, Cl. 318-132.000.

National Semiconductor Corp.: *See*—
Michael, Martin S.; Kanhere, Prashant A.; Burnley, Richard P.; Iacobelli, Franco; and Chien, Ta-Wei, 4,823,312, Cl. 364-900.000.

National Starch and Chemical Corporation: *See*—
Kauffman, Thomas F.; and Puletti, Paul P., 4,822,653, Cl. 428-34.200.
Mudge, Paul R., 4,822,676, Cl. 428-343.000.

Nattrass, Peter J., to Bulk Lift International Incorporated. Semi-bulk transport bags with lifting members of bag material. 4,822,179, Cl. 383-17.000.

Naumann, Klaus; Braden, Rudolf; and Ziemann, Heinz, to Bayer Aktiengesellschaft. Process for the preparation of 2,3,5,6-tetrafluorobenzoic acid. 4,822,912, Cl. 562-493.000.

NCR Corporation: *See*—
Hain, David A., 4,822,018, Cl. 271-3.000.
Porter, Warren W., 4,822,295, Cl. 439-330.000.
Sanwo, Ikuo J.; Donahue, James A.; and Tipon, Donald G., 4,823,024, Cl. 307-262.000.
Taylor, Billy K.; and James, Larry C., 4,823,324, Cl. 365-230.000.

NEC Corporation: *See*—
Inoue, Takeshi; and Konno, Masashi, 4,823,041, Cl. 310-322.000.
Itoh, Tadatsugu; Kohzu, Hideaki; and Hosono, Yasuhiro, 4,823,174, Cl. 357-34.000.
Koshimaru, Shigeru, 4,823,179, Cl. 357-41.000.
Muir, Ronald J., 4,822,502, Cl. 252-33.400.
Sugimoto, Mitsunori, 4,823,352, Cl. 372-45.000.
Suzuki, Syuji, 4,822,124, Cl. 350-96.110.
Takahashi, Etsuo, 4,823,343, Cl. 371-16.000.
Yonehara, Akifumi, 4,823,344, Cl. 371-22.000.
Yoshida, Yasuharu, 4,823,361, Cl. 375-102.000.
Yoshida, Yasuharu, 4,823,363, Cl. 375-120.000.

Nechaev, Sergei V.: *See*—
Lobazov, Alexandr F.; Mostovnikov, Vasily A.; Nechaev, Sergei V.; and Belenky, Boris G., 4,822,167, Cl. 356-317.000.

Negi, Yoshitaka; and Matsuura, Hiroshi, to Fujikiko Kabushiki Kaisha. Rotary seat. 4,822,099, Cl. 297-349.000.

Nehls, Charles O., to Unistrut International Corp. Modular frame structure. 4,822,199, Cl. 403-171.000.

Neko, Noriaki: *See*—
Kiya, Nobuyuki; and Neko, Noriaki, 4,823,274, Cl. 364-476.000.

Nelson, Anthony J.: *See*—
Devonald, David P.; Nelson, Anthony J.; Quan, Peter M.; and Stewart, David, 4,822,880, Cl. 540-492.000.

Nelson, Carl T., to Linear Technology Corporation. Switching voltage regulator circuit. 4,823,070, Cl. 323-285.000.

Nelson, George E. Renewable option accounting and marketing system. 4,823,265, Cl. 364-408.000.

Nelson, John H., to Bison Instruments, Inc. Analog-to-digital converter. 4,823,129, Cl. 341-139.000.

Nelson, Joyce K., to Union Carbide Corporation. Composite membranes, their manufacture and their use. 4,822,382, Cl. 55-16.000.

Nelson, Kirk A.: *See*—
Strege, Gary L.; Renno, Gerd W.; Nelson, Kirk A.; and Melink, Stephen K., 4,822,385, Cl. 55-248.000.

Nelson, LeRoy O., to Media/Graphics, Inc. Locking system for display panels. 4,821,788, Cl. 160-135.000.

Nelson, Peter E., to BOC Group, Inc., The. Water separator. 4,821,737, Cl. 128-730.000.

Nelson, Richard D., to Microelectronics and Computer Technology Corporation. Method of making a pin fin heat exchanger. 4,821,389, Cl. 29-157.30R.

Nelson, William W., to Coinview Corporation. Coin-operated timer for pay TV. 4,821,862, Cl. 194-241.000.

Nemoto, Shoji; and Machida, Yukihiko, to Sony Corporation. Video signal recording and/or reproducing apparatus. 4,823,206, Cl. 360-19.100.

NeoRx Corporation: *See*—
Morgan, Alton C., Jr.; McIntyre, Robert; Woodhouse, Clive S.; and Abrams, Paul G., 4,822,734, Cl. 435-68.000.

Neri, James. Beach mat with adjustable sun shade. 4,821,353, Cl. 5-418.000.

Nesterov, Ivan I.: *See*—
Dyadechko, Vladimir N.; Nesterov, Ivan I.; Tolstokorova, Lidia E.; and Platonova, Svetlana V., 4,822,490, Cl. 210-611.000.

Net Associates, Inc.: *See*—
Turner, Paul F., 4,821,918, Cl. 221-70.000.

Neturen Company Limited: *See*—
Yao, Yugo, 4,822,969, Cl. 219-50.000.

Neufeld, Ronald J.: *See*—
Lencki, Robert W. J.; Neufeld, Ronald J.; and Spinney, Trevor, 4,822,534, Cl. 264-4.300.

Neuhauser, John K.: *See*—
Moyer, James D.; Neuhauser, John K.; Conaghan, Thomas B.; and Kite, J. Sellers, 4,822,060, Cl. 277-166.000.

Neurodynamics, Inc.: *See*—
Ghajar, Jamshid B. G.; Hariri, Robert J.; and Ghadjar, Fathali G., 4,821,716, Cl. 128-303.00B.

Neutrogena Corporation: *See*—
Wortzman, Mitchell S., 4,822,600, Cl. 424-59.000.

Nevell, Vincent J. Orthodontic trivider. 4,822,277, Cl. 433-3.000.

New York Society for the Relief of the Ruptured and Crippled, Maintaining the Hospital for Special Surgery: *See*—
Inglis, Allan E.; Ranawat, Chitranjan S.; and Burstein, Albert H., 4,822,364, Cl. 623-20.000.

Newell Co.: *See*—
Randall, Harold M., 4,821,892, Cl. 211-90.000.

Newhouse, Stanley; Lerner, Robert; and Martin, Roy. Insulin delivery method and apparatus. 4,822,337, Cl. 604-50.000.

Newkirk, Marc S.; and Lesher, H. Daniel, to Lanxide Technology Company, LP. Ceramic composite structures having intrinsically fitted encasement members thereon & methods of making the same. 4,822,759, Cl. 501-127.000.

Newman, Arnold L., to Johns Hopkins University, The. Optimized capacitive sensor for chemical analysis and measurement. 4,822,566, Cl. 422-68.000.

Newman, Bruce A.: *See*—
Fu, Ta-Wei; and Newman, Bruce A., 4,822,479, Cl. 208-131.000.

Newsom, Cosby M. Vacuum diaphragm device. 4,822,651, Cl. 428-36.800.

Newton, William: *See*—
Summach, Terry; Pask, Glen S.; Summach, Dennis; and Newton, William, 4,821,809, Cl. 172-179.000.

Ngian, Kian F.; Hartshorn, Angus J.; and Jenkins, David H., to ICI Australia Limited. Process for the purification of zirconium compounds. 4,822,575, Cl. 423-82.000.

NGK Insulators, Ltd.: *See*—
Oda, Isao; Matsui, Minoru; and Tsuno, Nobuo, 4,822,645, Cl. 427-376.300.

Niagara Medical Innovations Inc.: *See*—
Alaybeyoglu, Erdem; Anderson, Ian D.; and Griffin, Robert J., 4,823,244, Cl. 362-194.000.

Nichiban Company Limited: *See*—
Ono, Kiyoshi; Sakurai, Yasuo; Kishimoto, Yoshio; Miyasaka, Hiroyasu; Kitazaki, Yasuaki; Matsuda, Tetsuaki; and Kobayashi, Junichi, 4,822,670, Cl. 428-317.300.

Nicholson, David J.: *See*—
Tremblay, Yves; and Nicholson, David J., 4,823,360, Cl. 375-4.000.

Nicholson, Donald; and Nordmyer, Robert, to Aquaity, Inc. Metering mechanism for a swimming pool chemical dispenser. 4,822,571, Cl. 422-119.000.

Nicollet Technologies, Inc.: *See*—
Hagedorn, Guenter E., 4,823,378, Cl. 379-233.000.

Niego, Shlomo; Galun, Esra; and Levy, Margalith, to Yeda Research Development Company Limited. Production of hybrid cucumber seeds. 4,822,949, Cl. 800-1.000.

Nielsen, James W.: *See*—
Corliss, Lyal S.; and Nielsen, James W., 4,822,595, Cl. 424-61.000.

Niepieklo, Andrzej: *See*—
Doerffer, Jerzy W.; Rowinski, Lech; Niepieklo, Andrzej; Klopocki, Jan; and Siwek, Boguslaw, 4,822,311, Cl. 441-87.000.

Nifco, Inc.: *See*—
Kaneko, Yoshio; Fukuhara, Kunihiro; and Watanabe, Koji, 4,821,381, Cl. 24-297.000.

Nihon Seimitsu Sokki Co., Ltd.: *See*—
Koshino, Shinji, 4,821,734, Cl. 128-680.000.

Niinuma, Susumi: *See*—
Watanabe, Yoshihiko; Nagashita, Tsuneyoshi; Niinuma, Susumi; Nomura, Isamu; Kobayashi, Kimito; Namiki, Akio; Abe, Hiroyuki; Iijima, Takayuki; Shimokawa, Kazuto; Haeno, Akira; Aoyagi, Yoshio; Kimura, Toshiyuki; and Matsumoto, Isao, 4,823,056, Cl. 318-341.000.

Nijboer, Sjoerd: *See*—
Voinis, Sylvie; and Nijboer, Sjoerd, 4,822,536, Cl. 264-22.000.

Nikolov, Zvetan K.: *See*—
Butchkov, Dimiter T.; Dragieva, Yovka D.; Nikolov, Zvetan K.; Georgiev, Georgi G.; Slavtcheva-Staikova, Mina S.; and Grozdanova, Ivanka S., 4,822,409, Cl. 75-0.5AA.

Nippon Chemi-Con Corporation: *See*—
Shimpo, Tetsuhiko; Fujihata, Isao; and Yanase, Atsushi, 4,823,023, Cl. 307-254.000.

Nippon Filcon Co. Ltd.: *See*—
Tate, Takuo, 4,821,780, Cl. 139-383.00A.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Narusawa, Sadayuki, 4,823,203, Cl. 358-342.000.

Nippon Hume Pipe Co., Ltd.: *See*—
Shinoda, Yasuhiro; Takahashi, Yoshifumi; Takaso, Tsuneto; Hagiwara, Akira; and Ishii, Yoshiaki, 4,822,211, Cl. 405-154.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Iwasaki, Toshio; Katoh, Akihiko; Murao, Atsuhiko; Tsukada, Masakazu; Nakano, Takashi; and Nasu, Masaru, 4,822,201, Cl. 403-268.000.
Tsuchida, Yutaka; Takahashi, Shuzo; Osada, Shiro; Sato, Hisashi; Ozeki, Akichika; and Hasebe, Nobuhisa, 4,821,790, Cl. 164-430.000.

Nippon Oil Company, Limited: *See*—
Kobayashi, Seizo; Usui, Katumi; Mizoe, Takashi; Yamaoka, Noboru; and Matsuura, Kazuo, 4,822,855, Cl. 525-194.000.

Nippon Paint Co., Ltd.: *See*—
Kuwajima, Teruaki; Miwa, Hiroshi; and Ishikura, Shinichi, 4,822,831, Cl. 523-421.000.

Nippon Petrochemicals Company, Limited: *See*—
Shimizu, Isoo; Matsumura, Yasuo; and Arai, Yutaka, 4,822,934, Cl. 585-25.000.

Nippon Scientific Co., Ltd.: *See*—
Ohta, Hiroyuki; Yoshida, Naoki; and Goto, Hideo, 4,822,441, Cl. 156-345.000.

Nippon Soken, Inc.: *See*—
Kawai, Naoki; Shimogawa, Toshiaki; Kuwakado, Satosi; Imai, Koji; Ina, Toshikazu; and Kuno, Akira, 4,822,093, Cl. 296-65.100.

Nippon Steel Corporation: *See*—
Fujikake, Yoichi; Sugimoto, Takao; Tamaki, Kiyohide; and Udagawa, Yoshio, 4,821,575, Cl. 73-626.000.

Nippon Valqua Kogyo Kabushiki Kaisha: *See*—
Nakamura, Hideo; Miura, Toshiharu; and Kikkawa, Kazuhiro, 4,821,753, Cl. 134-59.000.

Nippondenso Co., Ltd.: *See*—
Ishikawa, Hiroshi; and Shingai, Hidetaka, 4,822,252, Cl. 417-222.000.

Kawai, Naoki; Shimogawa, Toshiaki; Kuwakado, Satosi; Imai, Koji; Ina, Toshikazu; and Kuno, Akira, 4,822,093, Cl. 296-65.100.
Tamura, Hiroshi; Hiromasa, Shunichiro; and Kondo, Toshio, 4,821,726, Cl. 123-498.000.
Yamauchi, Yoshiyuki; Ohhara, Toshio; Ogawa, Shinji; Kuroyanagi, Isao; Otsuka, Haruhiko; Takahashi, Toshio; and Kasebe, Osamu, 4,821,531, Cl. 62-515.000.

Nisato, Dino; and Frigerio, Marco, to Societe Anonyme - SANOFI. 3-aminoazetidine, its salts and intermediates of synthesis. 4,822,895, Cl. 548-953.000.

Nishikawa, Kazunori: *See—*
Tajima, Kenji; Nishina, Takao; and Nishikawa, Kazunori, 4,822,522, Cl. 252-400.240.

Nishikawa, Kohei: *See—*
Oka, Yoshikazu; Nishikawa, Kohei; and Miyake, Akio, 4,822,818, Cl. 514-529.000.

Nishikawa, Yasunori: *See—*
Inaba, Hirobumi; and Nishikawa, Yasunori, 4,822,301, Cl. 439-436.000.

Nishikimoto, Taro: *See—*
Kumata, Katsuhiko; Endo, Isao; and Nishikimoto, Taro, 4,821,746, Cl. 131-282.000.

Nishimaki, Hideo: *See—*
Kameyama, Syojyu; Nishimaki, Hideo; Iga, Yoshiro; and Suyama, Tadakazu, 4,822,872, Cl. 530-383.000.

Nishimoto, Yoshiro: *See—*
Nasu, Shoji; Nishimoto, Yoshiro; Yasukuni, Hiroaki; and Iwasaki, Masayoshi, 4,823,082, Cl. 324-232.000.

Nishimura, Tadashi: *See—*
Ishizu, Akira; Nishimura, Tadashi; and Inoue, Yasuo, 4,822,751, Cl. 437-173.000.
Sugahara, Kazuyuki; Nishimura, Tadashi; Kusunoki, Shigeru; and Inoue, Yasuo, 4,822,752, Cl. 437-174.000.

Nishimura, Yasushi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for treating activated carbon with aqueous ammonia. 4,822,765, Cl. 502-418.000.

Nishina, Takao: *See—*
Tajima, Kenji; Nishina, Takao; and Nishikawa, Kazunori, 4,822,522, Cl. 252-400.240.

Nishino, Shigetaka: *See—*
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Onozawa, Makoto; Kito, Koji; and Osawa, Michitaka, to Hitachi, Ltd. Horizontal deflection high-voltage circuit. 4,823,052, Cl. 315-408.000.

Onyon, Peter D., to Rank Taylor Hobson Limited. Apparatus for indicating the value of a variable. 4,823,000, Cl. 250-231.0SE.

Ooms, Leo F., to U.S. Philips Corporation. Electric lamp having pinch a seal with primary foils arranged between each current supply conductor and a respective auxiliary foil. 4,823,048, Cl. 313-623.000.

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Rehrig, Houston, to Rehrig International, Inc. Strenghtened plastic dolly. 4,822,066, Cl. 280-79.110.

Rehrig International, Inc.: *See*—
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Reiber, M. Andrew. Walking adapter for postsurgical shoes. 4,821,432, Cl. 36-110.000.
Reichhold Chemicals, Inc.: *See*—
Vanderlaan, Douglas G., 4,822,849, Cl. 525-17.000.
Reid, Dwight K., to Betz Laboratories, Inc. Process and composition for color stabilized distillate fuel oils. 4,822,378, Cl. 44-53.000.
Reid, John: *See*—
Znotins, Thomas A.; Reid, John; and Gutz, Steven J., 4,823,354, Cl. 372-57.000.
Reif, Stephen C.: *See*—
Paulsen, Gary; Thomas, Lawrence E.; Reif, Stephen C.; and Brown, Wade R., 4,821,927, Cl. 222-263.000.
Reiffin, Martin G. Dual-band high-fidelity amplifier. 4,823,094, Cl. 330-263.000.
Rein, Gerald W.: *See*—
Baltusis, Paul A.; Buch, Lawrence H.; Holcomb, Richard S.; Kurdziel, Leonard J.; and Rein, Gerald W., 4,823,266, Cl. 364-424.100.
Reinherz, Barry P.; and Sullivan, Robert M., to Ciba-Geigy Corporation. Method of shaping a coated glass sheet on a shaping die. 4,822,396, Cl. 65-60.700.
Reis, August K.; Kirmaier, Norbert L.; and Schoberl, Meinolf H. A., to Reis, August K. Electrolytic cell for a disinfection device. 4,822,472, Cl. 204-302.000.
Reiss, Peter F., to Atlas Powder Company. Multi-directional signal transmission in a blast initiation system. 4,821,645, Cl. 102-275.700.
Relhor S.A.: *See*—
Richard, Willy; and Jolidon, Francois, 4,821,541, Cl. 70-272.000.
Relyea, Christopher M.; and Relyea, Michael S., to Drustar Inc. Back-to-back drawer assembly with staggered bypassing slides. 4,822,116, Cl. 312-209.000.
Relyea, Michael S.: *See*—
Relyea, Christopher M.; and Relyea, Michael S., 4,822,116, Cl. 312-209.000.
Remery, Patrick; and Boule, Jean-Pierre. Process for electronic payment using a memory. 4,822,984, Cl. 235-375.000.
Remis, Robert J.: *See*—
Morris, Daniel L.; McManus, Michael; and Remis, Robert J., 4,822,978, Cl. 219-216.000.
Rempala, Chester S.: *See*—
Kowalik, Matthew F.; and Rempala, Chester S., 4,821,641, Cl. 101-148.000.
Remus, David R. Hunting decoy. 4,821,444, Cl. 43-2.000.
Renn, John O.; Schlapfer, Hans U.; Hammerquist, Kenneth G.; and Caraconstantis, Charalambos, to Ciba-Geigy Corporation. Method and apparatus for marking photographic orders. 4,823,162, Cl. 355-40.000.
Renno, Gerd W.: *See*—
Strege, Gary L.; Renno, Gerd W.; Nelson, Kirk A.; and Melink, Stephen K., 4,822,385, Cl. 55-248.000.
Rentzea, Costin; Sauter, Hubert; Tuerk, Wolfgang; Wenderoth, Bernd; Richarz, Winfried; Jung, Johann; and Rademacher, Wilhelm, to BASF Aktiengesellschaft. 1,3-dioxan-5-ylalkyltriazoles, their use for regulating plant growth, and agents for this purpose. 4,822,400, Cl. 71-76.000.
Rentzea, Costin: *See*—
Karbach, Stefan; Schirmer, Ulrich; Rentzea, Costin; Pommer, Ernst-Heinrich; Ammermann, Eberhard; Steglich, Wolfgang; Schwalge, Barbara A. M.; and Anke, Timm, 4,822,908, Cl. 560-60.000.
Reott, Gerald A., to Collins & Aikman Corporation. Crease resistant laminate. 4,822,663, Cl. 428-159.000.
Reppelin, Michel: *See*—
Jacques, Roland; Reppelin, Michel; and Seigneurin, Laurent, 4,822,903, Cl. 558-312.000.
Research Association for Petroleum Alternatives Development: *See*—
Saida, Toyoyasu, 4,822,737, Cl. 435-162.000.
Research Development Corporation of Japan: *See*—
Umemura, Shizuo, 4,822,673, Cl. 428-328.000.
Yamashita, Takaji; Uchida, Hiroshi; Shimizu, Keiji; and Omura, Tomohide, 4,823,016, Cl. 250-363.030.
Resonant Technology Company: *See*—
Gurries, Raymond A., 4,821,808, Cl. 172-40.000.
Restaino, Alfred J., to Creative Assets and Consulting Corporation. Polyimide resin from bis-imide and monomer having two methylene groups activated by adjacent carbonyls. 4,822,870, Cl. 528-322.000.
Reuter, David F.; Mort, Dewey F.; and Flory, Donald M., to General Motors Corporation. Modulator with two-stage orificed master cylinder bypass valve. 4,822,112, Cl. 303-92.000.
Rexnord Inc.: *See*—
Hodlewsky, William G., 4,821,869, Cl. 198-779.000.
Reymond, Philippe, to Jaeger. Damping device and a device for measuring the level of fuel in a motor vehicle fuel tank including such a damping device. 4,821,571, Cl. 73-317.000.
Rhoades, Mark L.: *See*—
Arter, Nelson K.; Call, Mark G.; and Rhoades, Mark L., 4,823,330, Cl. 369-45.000.
Rhone-Poulenc Chimie: *See*—
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Rhone-Poulenc Specialites Chimiques: *See*—
Chane-Ching, Jean-Yves; and Dumousseau, Jean-Yves, 4,822,580, Cl. 423-293.000.
Jacques, Roland; Reppelin, Michel; and Seigneurin, Laurent, 4,822,903, Cl. 558-312.000.
Rias, Jean-Claude, to Isover Saint-Gobain. Process for packaging panels of a compressible material and the packages produced by this process. 4,821,491, Cl. 53-438.000.
Ricaud, Jean-Luc; and Plos, Bernard, to Thomson-CSF. Picture taking tube having a bias light device. 4,823,045, Cl. 313-371.000.
Rice, David W.: *See*—
Kohus, Louis M.; Mariol, John V.; and Rice, David W., 4,822,033, Cl. 272-86.000.
Rich-Mar Corporation: *See*—
Coffey, Kenneth W.; and Smith, Toby E., 4,823,042, Cl. 310-322.000.
Richard, Herve : *See*—
Lang, Gerard; Richard, Herve ; Leduc, Madeleine; and Junino, Alex, 4,822,375, Cl. 8-423.000.
Richard, Willy; and Jolidon, Francois, to Relhor S.A. Time lock. 4,821,541, Cl. 70-272.000.
Richard Wolf GmbH: *See*—
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Richards, Brian D., to Du Pont de Nemours, E. I., and Company. Tension measuring apparatus. 4,821,583, Cl. 73-862.480.
Richards, Harvey J.: *See*—
Goel, Anil B.; and Richards, Harvey J., 4,822,518, Cl. 252-182.260.
Richards, William D.; Clark, Richard A.; and Meade, John C., to Ophthalmic Ventures Limited Partnership. Driver for surgical microstapler. 4,821,942, Cl. 227-132.000.
Richardson, Harvey J.: *See*—
DeMoss, Dean; Richardson, Harvey J.; and Narasaki, Tom, 4,823,215, Cl. 360-98.020.
Richardson, Robert W.; and Feldman, Barbara M. Method and device for measuring retinal response as a function of position of the retina. 4,822,162, Cl. 351-243.000.
Richarz, Winfried: *See*—
Rentzea, Costin; Sauter, Hubert; Tuerk, Wolfgang; Wenderoth, Bernd; Richarz, Winfried; Jung, Johann; and Rademacher, Wilhelm, 4,822,400, Cl. 71-76.000.
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Ricoh Company, Ltd.: *See*—
Fukagai, Toshio; Taniguchi, Kiyoshi; Ohta, Katsuichi; Umeda, Minoru; and Yokoyama, Kayoko, 4,822,705, Cl. 430-60.000.
Inada, Hitoshi; and Kanno, Tetsuo, 4,823,336, Cl. 369-215.000.
Inoue, Satoru; and Matsui, Akio, 4,822,707, Cl. 430-106.000.
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; and Akedo, Jun, 4,823,001, Cl. 250-231.0SE.
Takahashi, Shuichi, 4,823,376, Cl. 379-100.000.
Yamada, Yoshio; and Hashiyama, Mitsuaki, 4,823,161, Cl. 355-15.000.
Rider, Frederick H., Jr., to General Motors Corporation. Insulator housing having operating member. 4,822,299, Cl. 439-402.000.
Rider, John D. M. Dispenser for light curable substances. 4,822,280, Cl. 433-229.000.
Ridgway Packaging Corp.: *See*—
Prater, Donald R., 4,821,492, Cl. 53-458.000.
Riebel, Hans-Jochem: *See*—
Fest, Christa; Riebel, Hans-Jochem; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Robert H., 4,822,406, Cl. 71-93.000.
Rieffel, Donald W. Sandal with contained granular material to provide a pad for a person's foot. 4,821,431, Cl. 36-88.000.
Riggs, Robert F.; Gilligan, Lawrence H.; and Halsey, James D., to Sperry Marine Inc. Optically switched microwave pulse generator. 4,822,991, Cl. 250-211.00J.
Rijckaert, Josephus F.: *See*—
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Rikagaku Kenkyujyo: *See*—
Uda, Masayuki; Tomioka, Yukio; Kouno, Chikara; Ishida, Hiroshi; and Yamauchi, Yukio, 4,823,368, Cl. 250-372.000.
Rikagakn Kenkyujyo and Hochiki Corp.: *See*—
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Riku, Juichi: *See*—
Satoh, Toshio; Matsumoto, Hitoshi; Kakegawa, Hisao; Kato, Yoshiko; Riku, Juichi; Yoshinaga, Junji; and Kanamoto, Yoshifumi, 4,822,791, Cl. 514-212.000.
Riley, David C., to Spectra-Physics, Inc. Capillary bore tube support structure. 4,823,356, Cl. 372-65.000.
Riom Laboratoires C.E.R.M.: *See*—
Carlier, Patrick; Simond, Jacques A.; and Monteil, Andre J., 4,822,792, Cl. 514-212.000.
Ripatonda, Gilberto. Perfected unit for the preparation of a portion of fried food, and for the immediate distribution of this food. 4,821,633, Cl. 99-357.000.
Risch, Lothar: *See*—
Wieder, Armin; and Risch, Lothar, 4,823,180, Cl. 357-30.000.
Ritchie, Charles E., Jr.: *See*—
Alessi, Louis F.; and Ritchie, Charles E., Jr., 4,821,934, Cl. 224-252.000.
Riva, Carlo, to SGS Microelettronica S.p.A. Eeprom memory cell with a single polysilicon level and a tunnel oxide zone. 4,823,316, Cl. 365-185.000.
Rizzo, Salvatore J. Lawn seeding machine. 4,821,655, Cl. 111-8.000.

Robert Bosch GmbH: *See*—
Kaczynski, Bernhard; Schmitt, Alfred; Eblen, Ewald; and Komaroff, Iwan, 4,821,696, Cl. 123-298.000.

Roberts, Frederick J., Jr.: *See*—
Badesha, Santokh S.; Stolka, Milan; Weagley, Ronald J.; and Roberts, Frederick J., Jr., 4,822,703, Cl. 430-58.000.

Roberts, Joseph I.: *See*—
Boulton, Michael A.; Roberts, Joseph I.; and Bassirat, Hamid R., 4,823,061, Cl. 318-603.000.

Roberts, Lois M. Semantic mapping device for teaching language skills. 4,822,283, Cl. 434-171.000.

Roberts, Robert E. Sun tea adapter for plastic cartons. 4,821,630, Cl. 99-323.000.

Roberts, Robert E. Disc commutator and brush apparatus for bicycle. 4,823,036, Cl. 310-237.000.

Roberts, Roy D.; and Young, Norman L., to ILC Technology, Inc. Lens pipe arc lamp. 4,823,043, Cl. 313-231.610.

Robot Coupe S.A.: *See*—
Fleche, Michel, 4,821,968, Cl. 241-37.500.

Robotic Vision Systems, Inc.: *See*—
Schmidt, Richard, 4,822,163, Cl. 356-1.000.

Robson, John H.: *See*—
Briggs, John R.; and Robson, John H., 4,822,925, Cl. 568-853.000.

Robson, Michael H., to General Dynamics, Pomona Division. Bell housing sealing assembly for mounted connector. 4,822,293, Cl. 439-271.000.

Rochester, Willard G. Marine steering and propulsion system. 4,822,308, Cl. 440-66.000.

Rockefeller University, The: *See*—
Cerami, Anthony; and Kawakami, Masanobu, 4,822,776, Cl. 514-21.000.

Rockenfeller, Uwe. Method and apparatus for transferring energy and mass. 4,822,391, Cl. 62-12.000.

Rockford Controls Corporation: *See*—
Bramblet, John W., 4,822,000, Cl. 251-298.000.

Rockwell International Corporation: *See*—
Eisner, William; Hoban, Thomas W.; Klees, Robert M.; and Smith, Richard L., 4,823,139, Cl. 342-15.000.

Rodaway, Shirley J.: *See*—
Lutz, Albert W.; and Rodaway, Shirley J., 4,822,408, Cl. 71-121.000.

Rodero, Alejandro, to S. C. Johnson & Son, Inc. Water-soluble foamable insecticidally-active compositions. 4,822,613, Cl. 424-405.000.

Rodero, Alejandro, to S. C. Johnson & Son, Inc. Bioactive film-forming composition for control of crawling insects and the like. 4,822,614, Cl. 424-405.000.

Rodgers, Colin, to Sundstrand Corporation. Radial turbine with variable axial nozzle. 4,821,506, Cl. 60-39.200.

Rodriguez, Alan. Post-tensioning anchor. 4,821,474, Cl. 52-223.00L.

Roegiers, Jean C.: *See*—
Thiercelin, Marc; and Roegiers, Jean C., 4,821,577, Cl. 73-799.000.

Roelofs, Darrell D.; Lopez, Alfred R.; and Doris, Kenneth R., to Hazeltine Corporation. Automatic, real-time fault monitor verifying network in a microwave landing system. 4,823,127, Cl. 340-947.000.

Roethig, Hermann F. Cleaning device for agricultural products. 4,821,886, Cl. 209-618.000.

Rofin-Sinar, Inc.: *See*—
Koop, Dale E.; and Rando, Joseph F., 4,823,349, Cl. 372-34.000.

Roga, Robert C., to Colgate-Palmolive Company. Absorbent floor mat. 4,822,669, Cl. 428-287.000.

Rogers, Lloyd W.: *See*—
Compeau, David E.; Rogers, Lloyd W.; Pyszel, Ronald J.; and Chapman, Walter C., 4,823,059, Cl. 318-454.000.

Rogers, M. Maurice. Depth gauge-analyzer. 4,821,587, Cl. 73-864.630.

Rogers, Ralph R. Suspension system for a truck or the like. 4,822,007, Cl. 267-32.000.

Rohm GmbH: *See*—
Pennewiss, Horst; Jost, Heinz; and Knoell, Helmut, 4,822,508, Cl. 252-56.00R.

Rohm and Haas Company: *See*—
Carley, H. Edwin; and Sharma, Ashok K., 4,822,902, Cl. 558-14.000.
Law, Andrew B., 4,822,511, Cl. 252-106.000.

Rohr Industries, Inc.: *See*—
Weingart, Oscar; Lunde, Gerald A.; and Taylor, Clark D., 4,822,444, Cl. 156-441.000.

Rojey, Alexandre: *See*—
Larue, Joseph; and Rojey, Alexandre, 4,822,948, Cl. 585-834.000.

Rolan. Protective cover. 4,821,785, Cl. 150-166.000.

Rolland, Jean-Luc; Meunier, Paul L.; and Mage, Jean-Claude, to Compagnie Europeene de Composants Electroniques LCC. Method for making a flat magnetic structure for read/write magnetic heads. 4,821,403, Cl. 29-603.000.

Rollet, Georges; and Alexandre, Bernard, to Societe Inter-Color. Apparatus for marking the backs of photographic proofs. 4,823,163, Cl. 355-41.000.

Rolls-Royce PLC: *See*—
Denning, Ralph M.; Hall, John M.; and Jordan, Terence, 4,821,979, Cl. 244-23.00D.
Johnson, Thomas K., 4,822,013, Cl. 269-7.000.

Romalayland Enterprises: *See*—
Layland, Donald L., Jr., 4,821,392, Cl. 29-267.000.

Ronchetti, Tullo: *See*—
Sempio, Carlo; Vailati, Romeo; and Ronchetti, Tullo, 4,822,652, Cl. 428-34.500.

Roos, Gerhard: *See*—
Baur, Siegfried; Brandstetter, Rudi; and Roos, Gerhard, 4,821,552, Cl. 72-351.000.

Rorden, Louis H.; and More, Henry S., to Develco, Inc. Method and apparatus for stabilizing a communication sensor in a borehole. 4,823,125, Cl. 340-854.000.

Rorer Pharmaceutical Corporation: *See*—
Spada, Alfred P.; Studt, William L.; Campbell, Henry F.; and Kuhla, Donald E., 4,822,794, Cl. 514-230.500.

Rosemount Limited: *See*—
Johnston, James S.; Pownall, David W.; and White, Melvyn S., 4,821,566, Cl. 73-178.00R.

Rosen, David I.; and Rosen, William E. Apparatus and method for overcoming the habit of tobacco smoking. 4,821,745, Cl. 131-270.000.

Rosen, Harold A., to Hughes Aircraft Company. Satellite communications system having frequency addressable high gain downlink beams. 4,823,341, Cl. 370-75.000.

Rosen, William E.: *See*—
Rosen, David I.; and Rosen, William E., 4,821,745, Cl. 131-270.000.

Rosenberg, David E.: *See*—
Burkhart, Gilbert B., III; Casper, Don; and Rosenberg, David E., 4,821,400, Cl. 29-527.400.

Rosenquist, Joel C.: *See*—
Thompson, Kenneth J.; Foster, Wayne G.; Rosenquist, Joel C.; and Ketner, David S., 4,822,448, Cl. 156-538.000.

Rosenthal, J. Scott. Key positioning apparatus. 4,821,542, Cl. 70-454.000.

Rosheim, Mark E.; and Trechsel, Hans W., to Rosheim, Mark E. Robot joints. 4,821,594, Cl. 79-479.000.

Roskilly, Stephen. Nursing bottle accessory having means for the introduction of a separate substance. 4,821,895, Cl. 215-11.100.

Rossi, Guglielmo; Gemma, Mario; and Bosing, Hans, to Ranco Incorporated of Delaware. Pressostat for pressure sensitive activation. 4,821,626, Cl. 92-48.000.

Rossiter, Valentine J. Flow-through cells for spectroscopy. 4,822,166, Cl. 356-246.000.

Rotec Industries: *See*—
Oury, Robert F.; and Arndt, Charles J., 4,822,210, Cl. 404-106.000.

Roth, Charles H., Jr.: *See*—
Wood, John D.; Savinell, Alan; Roth, Charles H., Jr.; Ellingson, Frederick J.; and Dailey, George F., 4,822,554, Cl. 376-261.000.

Rotherham, Alan C., to Tee-Sert Pty. Ltd. T-nut insertion machine. 4,821,940, Cl. 227-107.000.

Rothwell, Harold J., Jr.: *See*—
English, George J.; Rothwell, Harold J., Jr.; and Gilligan, Thomas, 4,823,050, Cl. 313-634.000.

Rouhani, S. Zia. Single-hand computer keyboard. 4,823,294, Cl. 364-709.120.

Rouleau, Alain; Rouleau, Patrick; and Touret, Jean-Pierre. Advanced apparatus for gripping flexible, and in particular textile, layers. 4,822,020, Cl. 271-18.300.

Rouleau, Patrick: *See*—
Rouleau, Alain; Rouleau, Patrick; and Touret, Jean-Pierre, 4,822,020, Cl. 271-18.300.

Roussel, Xavier; and Silets, Elaine, to Silets, Elaine G. Parking barrier. 4,822,206, Cl. 404-6.000.

Rousselot, Andre J., to Somfy. Ball cage for a worm-and-nut type drive unit. 4,821,592, Cl. 74-424.8NA.

Rowe, William; Saraiya, Shashikant; and Shah, Ajay, to Polychrome Corporation. Method for the preparation of polyvinyl phosphonic acid. 4,822,861, Cl. 525-355.000.

Rowinski, Lech: *See*—
Doerffer, Jerzy W.; Rowinski, Lech; Niepieklo, Andrzej; Klopocki, Jan; and Siwek, Boguslaw, 4,822,311, Cl. 441-87.000.

Roy, Glenn M.: *See*—
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RPG Diffusor Systems, Inc.: *See*—
D'Antonio, Peter; and Konnert, John H., 4,821,839, Cl. 181-198.000.

Ruck, George T.: *See*—
Walcott, Kenneth J.; Thompson, Neil G.; Ruck, George T.; and Helton, Steven B., 4,823,072, Cl. 324-65.0CR.

Rudd, Eric J.: *See*—
Bishara, Jeries I.; Vaccaro, Anthony J.; and Rudd, Eric J., 4,822,509, Cl. 252-62.560.

Rudick, Arthur G.; and Torrance, Hugh Y., to Coca-Cola Company, The. Non-venting microgravity carbonator and method. 4,822,531, Cl. 261-25.000.

Rueb, John T.: *See*—
Deziel, Edward W.; Rueb, John T.; Sorlien, Mark D.; Dahlstrom, Jack A.; and Erismann, David W., 4,821,359, Cl. 15-159.00R.

Ruis, Jean-Pierre, to Societe Nationale d'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M A.". Turbine plant intake housing. 4,821,758, Cl. 137-15.100.

Rumfield, Michael A. Turbocharger protector screen. 4,821,520, Cl. 60-614.000.

Runzheimer, H. Volker: *See*—
Johnson, Richard D.; Runzheimer, H. Volker; Sommer, Ronald G.; and Yip, Kin F., 4,822,747, Cl. 436-532.000.

Rupp, Raymond W.; and Keene, Donna L., to Hoechst Celanese Corporation. Emulsion polymerization of 4-acetoxystyrene and hydrolysis to poly(p-vinylphenol. 4,822,862, Cl. 525-367.000.

Ruscello, Vincent: *See*—
Young, David; Lamoure, Richard; Bratt, William; Ruscello, Vincent; and Wilson, John E., 4,822,467, Cl. 204-212.000.

Rushbrook, Stanley E.; and Scott, Tommy M., to Rushbrook, Stanley E. Shingle cutting tool. 4,821,609, Cl. 81-45.000.

Rusnica, Edward J.: *See*—
Merkovsky, Daniel; and Rusnica, Edward J., 4,822,558, Cl. 376-347.000.

Russell, Malcom H.: *See*—
Vogt, Hans; Russell, Malcom H.; McKechnie, Richard C.; and Gentle, Derek F., 4,822,098, Cl. 296-901.000.

Russell, Peter J., to Knight-Mechadyne Limited. Torque-apportioning differential mechanism for motor vehicles. 4,821,603, Cl. 74-715.000.

Russell, Robert H.: *See*—
Schleicher, Israel D.; and Russell, Robert H., 4,821,706, Cl. 128-660.010.

Rutz, William A.: *See*—
Fasack, Martin L.; Rutz, William A.; and Voll, Robert G., 4,823,290, Cl. 364-550.000.

Ryan, Lawrence D.: *See*—
Simon, Allen H.; Sprague, David L.; Keith, John M.; Patti, Michael F.; Harney, Kevin; Ryan, Lawrence D.; Fedele, Nicola J.; and Astle, Brian, 4,823,201, Cl. 358-133.000.

Ryans, Glenn D.: *See*—
Inoue, Seizaburo; and Ryans, Glenn D., 4,822,236, Cl. 414-591.000.

Rydqvist, Sune S. L. Partition panel system. 4,821,477, Cl. 52-239.000.

Ryobi Ltd.: *See*—
Nakayama, Yoji; and Yasui, Akira, 4,821,447, Cl. 43-18.100.
Uetsuki, Haruo; Kobayashi, Takehiro; and Makino, Kounoshin, 4,821,975, Cl. 242-84.52B.

S. C. Johnson & Son, Inc.: *See*—
Knoll, Donald W.; Shelton, David L.; and Szymczak, Thomas J., 4,822,604, Cl. 424-70.000.
Rodero, Alejandro, 4,822,613, Cl. 424-405.000.
Rodero, Alejandro, 4,822,614, Cl. 424-405.000.

Saab-Scania Aktiebolag: *See*—
Adler, Horst F., 4,821,591, Cl. 74-339.000.

Sabatelli, Anthony D., to Procter & Gamble Company, The. Cosmetic sticks. 4,822,602, Cl. 424-65.000.

Sabatov, Nissim: *See*—
Ben-Gal, Ofer; and Sabatov, Nissim, 4,822,315, Cl. 446-102.000.

Sadamori, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and method of manufacturing the same. 4,822,757, Cl. 437-249.000.

Saeki, Hideo: *See*—
Ikeno, Masahiko; and Saeki, Hideo, 4,821,675, Cl. 118-667.000.

Saeki, Keiso: *See*—
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Safety Cross Mirror Co., Inc.: *See*—
Stout, Thomas R., 4,822,157, Cl. 350-629.000.

Saglio, Robert: *See*—
Druelle, Philippe; Vidal, Pierre; Saglio, Robert; and Tocci, Jean-Louis, 4,821,545, Cl. 72-53.000.

Saho, Takahiro: *See*—
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Yanase, Motoaki; and Yamamoto, Tatsuya, to Agency of Industrial Science and Technology. Mandrel for use in a manufacture of an article made of composite material. 4,822,272, Cl. 425-328.000.
Yaniger, Stuart I., to Lockheed Corporation. Electronic device fabrication on non-conductive polymer substrate. 4,822,638, Cl. 427-79.000.
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Yashuda, Hirofumi; Saho, Takahiro; Ohtake, Nobumasa; and Nakano, Takaharu, to Chisso Corporation. Modified polyorganosiloxane containing isocyanate group and process for preparing the same. 4,822,850, Cl. 528-28.000.
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501 Diamond Arch Systems Canada Inc.: *See—*
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501 Sharp Kabushiki Kaisha: *See—*
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BioSystems Research Inc.: *See*—
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Boeing Company, The: *See*—
Rudolph, Peter K. C., Re. 32,907, Cl. 244-215.000.
Jones, Thomas L. Shower mirror apparatus. Re. 32,906, Cl. 4-605.000.
Lionelle, Joseph E.; and Staffa, Jeffrey A., to BioSystems Research Inc. Metal oxycarboxylates and method of making same. Re. 32,909, Cl. 556-131.000.
Pfender, Emil, to University of Minnesota, Regents of the. Method of utilizing a plasma column. Re. 32,908, Cl. 427-37.000.
Rudolph, Peter K. C., to Boeing Company, The. Airfoil flap assembly with flap track member. Re. 32,907, Cl. 244-215.000.
Staffa, Jeffrey A.: *See*—
Lionelle, Joseph E.; and Staffa, Jeffrey A., Re. 32,909, Cl. 556-131.000.
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Andrews, James S.; and Hierath, Leonard L., to Magrath Company, The. Electric stock prod. B1 4,394,956, 4-18-89, Cl. 231-7.000.
Berry, Jimmy D.: *See*—
Pettibone, Craig R.; and Berry, Jimmy D., B1 4,733,884, Cl. 280-661.000.
Birkner, John M.; and Chua, Hua-Thye, to Monolithic Memories, Inc. Programmable array logic circuit. B1 4,124,899, 4-18-89, Cl. 364-716.000.
Buell, Kenneth B., to Proctor & Gamble Co., The. Contractable side portions for disposable diaper. B1 3,860,003, 4-18-89, Cl. 604-385.200.
Burkner, Wolfgang, to Carl Schenck AG. Method and apparatus for producing and transporting single and multilayer chipboards. B1 1,030,759, 4-18-89, Cl. 264-118.000.
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Corenman, James E.: *See*—
New, William, Jr.; and Corenman, James E., B1 4,653,498, Cl. 128-633.000.
Daikuzono, Norio, to Surgical Laser Technologies Ohio, Inc. Medical and surgical laser probe. B1 4,592,353, 4-18-89, Cl. 128-303.100.
Hierath, Leonard L.: *See*—
Andrews, James S.; and Hierath, Leonard L., B1 4,394,956, Cl. 231-7.000.
Hirotsu, Dennis O.; and Robertson, Anthony J., to Procter & Gamble Company, The. Absorbent article. B1 4,662,875, 4-18-89, Cl. 604-389.000.
Iwamoto, Toshiyuki: *See*—
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Jenkins, Walter N., to National Research Development Corporation. Method of distributing liquid onto a substrate. B1 4,647,471, 4-18-89, Cl. 427-37.000.
Magrath Company, The: *See*—
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Monolithic Memories, Inc.: *See*—
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Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Paramount Packaging Corp.: *See*—
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Peppiatt, Harry R., to Paramount Packaging Corp. Reusable plastic bag with loop handle. B1 4,573,203, 4-18-89, Cl. 383-29.000.
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Van der Knaap, Jacques C. M., 6,740, Cl. 74.000.
Van der Knaap, Jacques C. M., 6,741, Cl. 74.000.
Van der Knaap, Jacques C. M., 6,742, Cl. 74.000.
Van der Knaap, Jacques C. M., 6,743, Cl. 74.000.
Van der Knaap, Jacques C. M., 6,744, Cl. 74.000.
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CLASS 2
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4,821,888
13 4,821,889
18 4,821,890
31 4,821,891
59.3 4,821,894
90 4,821,892
123 4,821,893

CLASS 215

11.1 4,821,895
11.3 4,821,896
32 4,821,897
216 4,821,898
235 4,821,899
355 4,821,900

CLASS 217

18 4,821,901

CLASS 219

10.492 4,822,972
10.55 D 4,822,968
10.55 F 4,822,967
10.55 M 4,822,966
50 4,822,969
69.16 4,822,970
85.22 4,822,971
121.6 4,822,973
121.67 4,822,974
121.85 4,822,975
202 4,822,976
216 4,822,977
4,822,978
241 4,822,979
315 4,822,980
385 4,822,981
497 4,822,982
505 4,822,983

CLASS 220

1 T 4,821,902
4,821,903
3.2 4,821,904
4 A 4,821,906
4 B 4,821,905
5 A 4,821,907
67 4,821,911
86 R 4,821,908
207 4,821,909
231 4,821,912
266 4,821,910
270 4,821,913
421 4,821,914
441 4,821,915

CLASS 221

13 4,821,916
69 4,821,917
70 4,821,918
131 4,821,919
167 4,821,920

CLASS 222

65 4,821,921
77 4,821,922
80 4,821,923
129.4 4,821,925
209 4,821,926
211 4,821,924
263 4,821,927
321 4,821,928
367 4,821,929
454 4,821,930

CLASS 224

42.42 4,821,931
222 4,821,932
248 4,821,933
252 4,821,934

CLASS 226

92 4,821,935
170 4,821,936

CLASS 227

8 4,821,937
10 4,821,938
19 4,821,939
107 4,821,940
130 4,821,941
132 4,821,942

CLASS 228

10 4,821,944
45 4,821,943
179 4,821,945
180.2 4,821,946
219 4,821,947
223 4,821,948

CLASS 229

157 4,821,949
160.2 4,821,950
162 4,821,951

CLASS 231

7 B1 4,394,956

CLASS 232

17 4,821,952
35 4,821,953

CLASS 235

375 4,822,984
380 4,822,985
462 4,822,986
4,822,987
492 4,822,988
4,822,989
4,822,990

CLASS 236

48 R 4,821,954
49.3 4,821,955

CLASS 237

12.3 A 4,821,956

CLASS 238

317 4,821,957

CLASS 239

121 4,821,959
131 4,821,958
211 4,821,960
253 4,821,961
265.15 4,821,962
419.3 4,821,963
432 4,821,964
741 4,821,965

CLASS 241

37.5 4,821,967
4,821,968
55 4,821,966
99 4,821,969
192 4,821,970

CLASS 242

55 4,821,971
56 R 4,821,972
57 4,821,973
68.4 4,821,974
71.1 4,821,876
84.1 R 4,821,978
84.52 B 4,821,975
96 4,821,976
220 4,821,977

CLASS 244

23 D 4,821,979
54 4,821,980
76 C 4,821,981
76 R 4,821,982
104 FP 4,821,983
141 4,821,984
215 Re.32,907

CLASS 248

97 4,821,985
188.7 4,821,986
200 4,821,987
227 4,821,988
316.5 4,821,990
430 4,821,989
4,821,991
4,821,992
493 4,821,993
674

CLASS 249

91 4,821,994
219.1 4,821,995

CLASS 250

211 J 4,822,991
4,822,992
213 R 4,822,993
213 VT 4,822,994
216 4,822,995
222.1 4,822,996
226 4,822,998
227 4,822,997
4,822,999
231 SE 4,823,000
4,823,001
235 4,823,002
305 4,823,003
306 4,823,004
310 4,823,005
4,823,006
327.2 4,823,007
339 4,823,008
341 4,823,009
4,823,010
363.03 4,823,016
4,823,017
372 4,823,368
396 ML 4,823,013
491.1 4,823,011
4,823,012
561 4,823,014
564 4,823,015

CLASS 251

9 4,821,996
11 4,821,997
58 4,821,998
129.02 4,821,999
298 4,822,000
306 4,822,001
331 4,822,002
332 4,822,003

CLASS 252

2 4,822,498
8.551 4,822,500
8.554 4,822,501
8.8 4,822,499
32.7 E 4,822,505
33.4 4,822,502
33.6 4,822,503
45 4,822,506
46.3 4,822,504
49.5 4,822,507
56 R 4,822,508
62.56 4,822,509
95 4,822,510
106 4,822,511
4,822,512
4,822,513
108 4,822,514
174.11 4,822,515
174.12 4,822,516
174.19 4,822,854
182.21 4,822,517
182.26 4,822,518
299.61 4,822,519
301.4 S 4,822,520
376 4,822,521
400.24 4,822,522
511 4,822,523
603 4,822,524
629 4,822,525

CLASS 254

122 4,822,004
134.4 4,822,005
228 4,822,006

CLASS 260

103 4,822,526
369 4,822,527
397.3 4,822,528
403 4,822,529
665 R 4,822,530

CLASS 261

25 4,822,531
65 4,822,532
72.1 4,822,533

CLASS 264

4.3 4,822,534
4,822,535
22 4,822,536
26 4,822,537
29.4 4,822,538
40.4 4,822,539
41 4,822,540
42 4,822,541
50 4,822,542
104 4,822,544
118 B1 Re.30,759
141 4,822,545
143 4,822,546
169 4,822,547
209.2 4,822,548
250 4,822,549

263 4,822,550
275 4,822,551
292 4,822,553
521 4,822,543

CLASS 267

32 4,822,007
74 4,822,008
140.1 4,822,009
4,822,010
201 4,822,011
221 4,822,012

CLASS 269

7 4,822,013
54.1 4,822,015
71 4,822,014

CLASS 270

58 4,822,016

CLASS 271

2 4,822,017
3 4,822,018
9 4,822,019
18.3 4,822,020
35 4,822,021
97 4,822,022
118 4,822,023
296 4,822,024
4,822,025

CLASS 272

3 4,822,026
67 4,822,027
4,822,028
69 4,822,029
70.3 4,822,030
71 4,822,031
73 4,822,032
86 4,822,033
123 4,822,034
4,822,035
129 4,822,036
4,822,037
134 4,822,038
146 4,822,039

CLASS 273

54 D 4,822,040
60 B 4,822,041
73 R 4,822,042
93 C 4,822,043
109 4,822,044
110 4,822,045
4,822,049
113 4,822,047
127 R 4,822,046
144 B 4,822,048
149 P 4,822,050
157 R 4,822,051
162 D 4,822,052
411 4,822,053

CLASS 277

12 4,822,054
27 4,822,055
83 4,822,056
84 4,822,057
152 4,822,058
4,822,059
166 4,822,060
181 4,822,061
235 B 4,822,062

CLASS 280

30 4,822,064
47.2 4,822,070
47.331 4,822,065
79.11 4,822,066
152.1 4,822,067
211 4,822,068
402 4,822,069
646 4,822,071
661 B1 4,733,884
668 4,822,072
673 4,822,073
840 4,822,063

CLASS 281

15.1 4,822,074

CLASS 285

3 4,822,075
8 4,822,076
12 4,822,077
110 4,822,078
162 4,822,079
179 4,822,080
334 4,822,081
334.1 4,822,082
367 4,822,083

CLASS 290

7 4,823,018

CLASS 292

251.5 4,822,085
270 4,822,084
338 4,822,086

CLASS 294

1.1 4,822,087
49 4,822,090
50.7 4,822,088
82.34 4,822,089
86.4 4,822,091

CLASS 296

63 4,822,092
65.1 4,822,093
4,822,094
97.1 4,822,095
194 4,822,096
216 4,822,097
901 4,822,098

CLASS 297

349 4,822,099
367 4,822,100
379 4,822,101
403 4,822,102
411 4,822,103
468 4,822,104

CLASS 299

1 4,822,105
9 4,822,106
10 4,822,107

CLASS 301

36 R 4,822,108
37 P 4,822,109
63 DD 4,822,111

CLASS 303

56 4,822,110
92 4,822,112
100 4,822,113
115 4,822,114
116 4,822,115

CLASS 307

66 4,823,019
106 4,823,020
112 4,823,021
149 4,823,022
254 4,823,023
262 4,823,024
304 4,823,025
352 4,823,026
353 4,823,027
443 4,823,029
455 4,823,030
530 4,823,031

CLASS 309

355 4,823,028

CLASS 310

43 4,823,032
45 4,823,033
67 R 4,823,034
68 C 4,823,035
230 4,823,037
237 4,823,036
257 4,823,038
268 4,823,039
4,823,040
322 4,823,041
4,823,042

CLASS 312

209 4,822,116
214 4,822,117
244 4,822,118
328 4,822,119

CLASS 313

231.61 4,823,043
346 DC 4,823,044
371 4,823,045
431 4,823,046
546 4,823,047
623 4,823,048
4,823,049
634 4,823,050

CLASS 315

155 4,823,051
408 4,823,052

CLASS 318

132 4,823,053
245 4,823,054
314 4,823,055
341 4,823,056
432 4,823,057
443 4,823,058
454 4,823,059
464 4,823,060
603 4,823,061
687 4,823,062
689 4,823,063
783 4,823,064
798 4,823,065
4,823,066
799 4,823,067
807 4,823,068

CLASS 323

235 4,823,069
285 4,823,070

CLASS 324

61 R 4,823,071
62 4,823,073
65 CR 4,823,072
117 H 4,823,075
117 R 4,823,074
121 R 4,823,076
4,823,077
133 4,823,078
158 F 4,823,079
175 4,823,080
225 4,823,081
232 4,823,082
244 4,823,083
309 4,823,084
312 4,823,085
434 4,823,086
441 4,823,087
456 4,823,088
525 4,823,089

CLASS 328

114 4,823,090
140 4,823,091

CLASS 330

253 4,823,092
254 4,823,093
263 4,823,094

CLASS 333

22 R 4,823,095
109 4,823,096
116 4,823,097
206 4,823,098

CLASS 334

15 4,823,099

CLASS 335

210 4,823,100
299 4,823,101
306 4,823,102

CLASS 336

175 4,823,103

CLASS 337

102 4,823,104
368 4,823,105

CLASS 338

212 4,823,106

CLASS 340

388 4,823,110
442 4,823,107
467 4,823,109
521 4,823,112
551 4,823,113
578 4,823,114
601 4,823,115
603 4,823,116
626 4,823,117
693 4,823,118
703 4,823,119
4,823,120
721 4,823,108
781 4,823,121
825.030 4,823,111
825.28 4,823,122
825.44 4,823,123
825.52 4,823,124
825.79 4,823,126
854 4,823,125
947 4,823,127

CLASS 341

118 4,823,128
139 4,823,129
157 4,823,130

CLASS 342

7 4,823,131
15 4,823,139
169 4,823,132
199 4,823,133
359 4,823,134
362 4,823,135
368 4,823,136
457 4,823,137
4,823,138

CLASS 343

713 4,823,140
4,823,141
4,823,142
781 P 4,823,143
853 4,823,144
895 4,823,145

CLASS 346

1.1 4,823,146
136 4,823,147
139 R 4,823,148
140 R 4,823,149
146 4,823,150
160 4,823,151
160.1 4,823,152
4,823,153

CLASS 350

1.7 4,822,120
6.6 4,822,121
96.10 4,822,123
96.11 4,822,124
96.15 4,822,125
4,822,126
4,822,127
96.16 4,822,128
96.18 4,822,129
96.20 4,822,130
96.21 4,822,131
96.23 4,822,132
4,822,133
4,822,134
96.29 4,822,135
96.31 4,822,122
96.34 4,822,136
252 4,822,138
255 4,822,137
257 4,822,139
279 4,822,140
330 4,822,141
332 4,822,142
337 4,822,143
339 F 4,822,144
345 4,822,145
348 4,822,146
354 4,822,147
356 4,822,148
389 4,822,149
394 4,822,150
401 4,822,151
427 4,822,152
429 4,822,153
572 4,822,154
608 4,822,155
613 4,822,156
629 4,822,157

CLASS 351

57 4,822,158
124 4,822,159
158 4,822,160
4,822,161
243 4,822,162

CLASS 354

86 4,823,154
4,823,155
115 4,823,156
403 4,823,157

CLASS 355

3 DR 4,823,160
3 SH 4,823,159
3 TR 4,823,158
15 4,823,161
40 4,823,162
41 4,823,163
72 4,823,164
75 4,823,165

CLASS 356

1 4,822,163
28.5 4,822,164
44 4,823,166
239 4,822,165
243 4,823,167
246 4,822,166
4,823,168
4,822,167
4,822,168
364 4,822,169
375 4,822,170
4,823,170
382 4,822,171
446 4,823,169

CLASS 357

4 4,823,171
15 4,823,172
22 4,823,173
23.4 4,823,176
23.5 4,823,175
27 4,823,177
30 4,823,178
4,823,180
34 4,823,174
41 4,823,179
51 4,823,181
67 4,823,182

CLASS 358

22 4,823,183
27 4,823,184
29 4,823,185
43 4,823,186
51 4,823,187
4,823,188
75 4,823,189
133 4,823,201
166 4,823,190
213.31 4,823,191
256 4,823,192
257 4,823,193
282 4,823,194
285 4,823,195
294 4,823,202
310 4,823,196
4,823,197
311 4,823,198
335 4,823,199
4,823,200
342 4,823,203
347 4,823,204

CLASS 360

19.1 4,823,206
32 4,823,207
46 4,823,208
51 4,823,209
60 4,823,210
64 4,823,211
77.08 4,823,212
78.12 4,823,213
97.01 4,823,214
98.02 4,823,215
103 4,823,216
104 4,823,217
4,823,218
106 4,823,219
125 4,823,221
130.24 4,823,222
132 4,823,223

CLASS 361

37 4,823,224
42 4,823,225
85 4,823,226
90 4,823,227
218 4,823,228
4,823,229
283 4,823,230
331 4,823,231
335 4,823,232
383 4,823,233
386 4,823,234
424 4,823,235
506 4,823,236

CLASS 362

64 4,823,237
74 4,823,238
75 4,823,239
103 4,823,240
183 4,823,241
187 4,823,242
194 4,823,244
281 4,823,243
293 4,823,245
328 4,823,246

CLASS 363

16 4,823,247
20 4,823,248
48 4,823,249
71 4,823,250
95 4,823,251

CLASS 364

167.01 4,823,253
188 4,823,254
191 4,823,255
200 4,823,256
4,823,257
4,823,258
4,823,259
4,823,260
4,823,261
4,823,262
408 4,823,264
4,823,265
424.07 4,823,268
424.1 4,823,266
4,823,267
426.03 4,823,269
431.05 4,823,270
443 4,823,271
461 4,823,272
474 4,823,275
474.29 4,823,273
476 4,823,274
488 4,823,277
491 4,823,276
4,823,278
513 4,823,279
514 4,823,280
518 4,823,281
4,823,282
4,823,283
519 4,823,284
4,823,288
521 4,823,285
4,823,286
4,823,303
522 4,823,287
523 4,823,289
550 4,823,290
557 4,823,291
559 4,823,263
604 4,823,293
707 4,823,292
709.12 4,823,294
716 4,823,295
B1 4,124,899
724.03 4,823,296
725 4,823,297
735 4,823,298
4,823,299
757 4,823,300
761 4,823,301
900 4,823,302
4,823,304
4,823,305
4,823,306
4,823,307
4,823,308
4,823,309
4,823,310
4,823,311
4,823,312

CLASS 365

49 4,823,313
51 4,823,314
155 4,823,315
185 4,823,316
189 4,823,317
4,823,318
4,823,319
4,823,320
4,823,321
4,823,322
B1 4,207,618
4,823,323
4,823,324

CLASS 366

101 4,822,173
142 4,822,172
279 4,822,174
347 4,822,175

CLASS 367

20 4,823,325
41 4,823,326
157 4,823,327

CLASS 368

47 4,823,328
107 4,823,329

CLASS 369

13 4,823,220
14 4,823,205
45 4,823,330
4,823,331
63 4,823,332
84 4,823,333
112 4,823,334
4,823,335
215 4,823,336
270 4,823,337

CLASS 370

32.1 4,823,339
58 4,823,340
75 4,823,341
85 4,823,338
109 4,823,342

CLASS 371

8 4,823,252
16 4,823,343
22 4,823,344
37 4,823,345
43 4,823,346
49 4,823,347

CLASS 372

20 4,823,351
32 4,823,348
34 4,823,349
38 4,823,350
45 4,823,352
50 4,823,353
57 4,823,354
58 4,823,355
65 4,823,356
92 4,823,357

CLASS 373

10 4,823,358
137 4,823,359

CLASS 374

57 4,822,176

CLASS 375

4 4,823,360

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116 4,823,362
118 4,823,365
120 4,823,363

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257 4,822,552
261 4,822,554
272 4,822,555
282 4,822,557
347 4,822,558
415 4,822,559

CLASS 377

2 4,823,366
24.2 4,823,367

CLASS 378

22 4,823,369
99 4,823,370
134 4,823,371
185 4,823,372

CLASS 379

58 4,823,373
67 4,823,374
100 4,823,375
4,823,376
156 4,823,377
233 4,823,378
373 4,823,379
387 4,823,380
399 4,823,381
411 4,823,382
412 4,823,383
441 4,823,384

CLASS 380

10 4,823,385
13 4,823,386
4,823,387
23 4,823,388
4,823,389

CLASS 381

4 4,823,390
103 4,823,391
106 4,823,392

CLASS 382

7 4,823,393
8 4,823,394
4,823,396
48 4,823,395

CLASS 383

4 4,822,177
17 4,822,179
29 B1 4,573,203
33 4,822,178
57 4,822,180

CLASS 384

12 4,822,181
107 4,822,182
607 4,822,183

CLASS 400

54 4,822,185
120 4,822,186
124 4,822,187
4,822,188
208 4,822,189
613.3 4,822,190
616.1 4,822,184
4,822,191
616.3 4,822,192

CLASS 401

198 4,822,193
207 4,822,194

CLASS 402

53 4,822,195

CLASS 403

11 4,822,196
154 4,822,197
170 4,822,198
171 4,822,199
229 4,822,200
268 4,822,201
4,822,202
314 4,822,203
337 4,822,204
402 4,822,205

CLASS 404

6 4,822,206
4,822,207
4,822,208
89 4,822,209
106 4,822,210

CLASS 405

154 4,822,211
227 4,822,212
303 4,822,213

CLASS 406

86 4,822,214

CLASS 408

9 4,822,215
54 4,822,216

CLASS 409

11 4,822,217
136 4,822,218
137 4,822,219
233 4,822,220
309 4,822,221

CLASS 410

29.1 4,822,222

CLASS 411

82 4,822,223
4,822,224
306 4,822,225
342 4,822,226
373 4,822,227
519 4,822,228

CLASS 414

4 11 4,822,235
21 4,822,229
22.54 4,822,230
225 4,822,233
591 4,822,236
708 4,822,237
730 4,822,238
789.5 4,822,231
795.3 4,822,232
798.9 4,822,234

CLASS 415

2 R 4,822,239
105 4,822,240
132 4,822,241
205 4,822,242

CLASS 416

49 4,822,243
95 4,822,244
134 A 4,822,245
175 4,822,246
189 4,822,247
192 4,822,248
235 4,822,249

CLASS 417

45 4,822,250
63 4,822,251
222 4,822,252
364 4,822,253
368 4,822,254
389 4,822,257
401 4,822,255
420 4,822,256
423.3 4,822,258
426 4,822,259
440 4,822,260
540 4,822,261

CLASS 418

120 4,822,262
133 4,822,263
150 4,822,264
182 4,822,265

CLASS 420

59 4,822,556
95 4,822,567
470 4,822,560
472 4,822,562
530 4,822,561

CLASS 422

31 4,822,563
52 4,822,564
57 4,822,565
68 4,822,566
73 4,822,568
103 4,822,569
119 4,822,570
4,822,571
126 4,822,572
143 4,822,573
228 4,822,574
263 4,822,579

CLASS 423

82 4,822,575
228 4,822,576
243 4,822,577
245.3 4,822,578
293 4,822,580
302 4,822,581
321 R 4,822,582
322 4,822,583
4,822,584
348 4,822,585
359 4,822,586
447.1 4,822,587
450 4,822,588
502 4,822,589
561.1 4,822,590
574 R 4,822,591
627 4,822,592
629 4,822,593

CLASS 424

9 4,822,594
46 4,822,596
47 4,822,598
48 4,822,597
52 4,822,599
59 4,822,600
4,822,601
61 4,822,595
65 4,822,602
66 4,822,603
70 4,822,604
85.2 4,822,605
88 4,822,606
95 4,822,607
98 4,822,608
112 4,822,609
145 4,822,610
195.1 4,822,611
4,822,612
405 4,822,613
4,822,614
423 4,822,615
432 4,822,616
449 4,822,617
453 4,822,618
480 4,822,629
492 4,822,619

CLASS 425

7 4,822,267
34.1 4,822,266
203 4,822,269
289 4,822,270
296 4,822,271
328 4,822,272
385 4,822,273
450.1 4,822,274
454 4,822,268
539 4,822,275

CLASS 426

2 4,822,620
3 4,822,635
5 4,822,621
4,822,622
39 4,822,623
53 4,822,624
93 4,822,625
94 4,822,626
101 4,822,627
274 4,822,628
614 4,822,630

CLASS 427

14.1 4,822,631
34 4,822,632
37 Re.32,908
B1 4,647,471
43.1 4,822,633
48 4,822,634
69 4,822,636
79 4,822,638
128 4,822,637
211 4,822,640
240 4,822,639
250 4,822,641
255.1 4,822,642
256 4,822,643
280 4,822,644
376.3 4,822,645
387 4,822,646
421 4,822,647

CLASS 428

4 4,822,648
33 4,822,671
34 4,822,649
34.2 4,822,650
4,822,653
34.5 4,822,652
36.8 4,822,651
4,822,654
40 4,822,655
4,822,656
69 4,822,657
95 4,822,658
99 4,822,659
113 4,822,660
116 4,822,661
131 4,822,662
159 4,822,663
222 4,822,665
224 4,822,666
265 4,822,667
283 4,822,668
287 4,822,669
317.3 4,822,670
323 4,822,672
328 4,822,673
336 4,822,674
4,822,675
343 4,822,676
367 4,822,677
373 4,822,678
392 4,822,679
405 4,822,681
411.1 4,822,682
414 4,822,683
423.3 4,822,685
425.6 4,822,680
426 4,822,684
447 4,822,687
457 4,822,686
458 4,822,688
472 4,822,689
498 4,822,690
522 4,822,691
547 4,822,692
614 4,822,693
615 4,822,694
687 4,822,695
690 4,822,696
698 4,822,697

CLASS 429

27 4,822,698
40 4,822,699
50 4,822,700
192 4,822,701

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42 4,822,702
58 4,822,703
4,822,704
60 4,822,705
89 4,822,706
106 4,822,707
106.6 4,822,708
4,822,709
115 4,822,710
120 4,822,711
128 4,822,712
138 4,822,714
155 4,822,715
175 4,822,713
192 4,822,716
254 4,822,717
270 4,822,719
271 4,822,718
284 4,822,720
325 4,822,721
326 4,822,722
331 4,822,723
379 4,822,724
393 4,822,725
536 4,822,727
550 4,822,726
551 4,822,728
552 4,822,729
558 4,822,730

CLASS 431

153 4,822,276

CLASS 433

3 4,822,277
91 4,822,278
202.1 4,822,279
229 4,822,280

CLASS 434

29 4,822,281
129 4,822,282
162 4,822,284
171 4,822,283
272 4,822,285

CLASS 435

6 4,822,731
4,822,732
4,822,733
68 4,822,734
4,822,735
91 4,822,736
162 4,822,737
172.3 4,822,739
200 4,822,740
252.3 4,822,738
300 4,822,741
310 4,822,742

CLASS 436

3 4,822,743
38 4,822,744
63 4,822,745
528 4,822,746
532 4,822,747

CLASS 437

3 4,822,748
41 4,822,749
052 4,822,750
173 4,822,751
174 4,822,752
192 4,822,753
193 4,822,754
227 4,822,755
247 4,822,756
249 4,822,757

CLASS 439

76 4,822,287
84 4,822,288
92 4,822,289
137 4,822,290
187 4,822,291
207 4,822,292
271 4,822,293
274 4,822,294
330 4,822,295
343 4,822,296
395 4,822,297
402 4,822,298
4,822,299
417 4,822,300
436 4,822,301
544 4,822,302
607 4,822,303
610 4,822,286
4,822,304
681 4,822,305
709 4,822,306

CLASS 440

1 4,822,307
66 4,822,308

CLASS 441

35 4,822,309
70 4,822,310
87 4,822,311

CLASS 445

49 4,822,312

CLASS 446

69 4,822,313
75 4,822,314
102 4,822,315
466 4,822,316

CLASS 450

14 4,822,317

CLASS 453

57 4,822,318

CLASS 455

89 4,823,397
134 4,823,398
192 4,823,399
326 4,823,400
606 4,823,401
607 4,823,402
4,823,403

CLASS 464

101 4,822,319

CLASS 474

111 4,822,320
117 4,822,321
135 4,822,322
242 4,822,323
268 4,822,324

CLASS 493

1 4,822,325
77 4,822,326
190 4,822,327
359 4,822,329
425 4,822,328

CLASS 494

16 4,822,330
4,822,331

CLASS 501

65 4,822,758
127 4,822,759

CLASS 502

24 4,822,760
38 4,822,761
66 4,822,762
113 4,822,763
344 4,822,764
418 4,822,765
439 4,822,766

CLASS 503

213 4,822,767
214 4,822,768
4,822,769
4,822,770
226 4,822,771

CLASS 505

1 4,822,772

CLASS 514

3 4,822,773
12 4,822,774
19 4,822,775
21 4,822,776
31 4,822,777
94 4,822,779
119 4,822,780
161 4,822,781
183 4,822,782
4,822,783
184 4,822,784
202 4,822,785
4,822,786
210 4,822,787
4,822,788
4,822,790
211 4,822,789
212 4,822,791
4,822,792
213 4,822,793
214 4,822,795
225.5 4,822,796
230.5 4,822,794
252 4,822,797
255 4,822,798
303 4,822,799
309 4,822,800
312 4,822,801
317 4,822,778
4,822,802
320 4,822,803
337 4,822,804
341 4,822,805
345 4,822,806
347 4,822,807
355 4,822,808
367 4,822,809
407 4,822,810
411 4,822,811
419 4,822,812
433 4,822,813
440 4,822,814
444 4,822,815
474 4,822,816
492 4,822,817
529 4,822,818
530 4,822,819
4,822,820
557 4,822,821
655 4,822,822
690 4,822,823

CLASS 518

709 4,822,824
714 4,822,825

CLASS 521

84.1 4,822,826
170 4,822,827

CLASS 522

84 4,822,828
90 4,822,829

CLASS 523

203 4,822,830
421 4,822,831
423 4,822,832

CLASS 524

99 4,822,833
114 4,822,835
139 4,822,836
153 4,822,837
178 4,822,838
239 4,822,839
346 4,822,842
356 4,822,841
427 4,822,834
494 4,822,843
496 4,822,844
519 4,822,845
538 4,822,846
547 4,822,847
549 4,822,848

CLASS 525

17 4,822,849
61 4,822,851
66 4,822,852
194 4,822,855
197 4,822,856
240 4,822,840
245 4,822,857
246 4,822,858
326.7 4,822,859
328.2 4,822,860
355 4,822,861
367 4,822,862
420 4,822,863

CLASS 526

279 4,822,864
292.2 4,822,865
311 4,822,866

CLASS 527

200 4,822,867

CLASS 528

28 4,822,850

125 4,822,853
208 4,822,868
216 4,822,869
322 4,822,870
392 4,822,871

CLASS 530

383 4,822,872

CLASS 536

6.4 4,822,873
102 4,822,874
119 4,822,875
121 4,822,876

CLASS 540

145 4,822,877
492 4,822,880
603 4,822,881

CLASS 544

91 4,822,878
277 4,822,879
342 4,822,882

CLASS 546

16 4,822,883
177 4,822,884
221 4,822,885
243 4,822,886
345 4,822,887

CLASS 548

195 4,822,888
252 4,822,894
262 4,822,889
344 4,822,890
365 4,822,891
402 4,822,892
432 4,822,893
953 4,822,895

CLASS 549

229 4,822,896
313 4,822,897
317 4,822,898
533 4,822,899
534 4,822,900

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438 4,822,901

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14 4,822,902
312 4,822,903
378 4,822,904
414 4,822,905
416 4,822,906

CLASS 560

41 4,822,907
60 4,822,908
121 4,822,909
126 4,822,910
205 4,822,911

CLASS 562

493 4,822,912
598 4,822,913

CLASS 564

373 4,822,914

CLASS 565

698 4,822,921

CLASS 568

13 4,822,915
34 4,822,916
58 4,822,918
308 4,822,919
355 4,822,920
454 4,822,917
702 4,822,922
724 4,822,923
812 4,822,924
853 4,822,925
867 4,822,926

CLASS 570

141 4,822,927
190 4,822,928
203 4,822,929
206 4,822,930
208 4,822,931
4,822,933
226 4,822,932

CLASS 585

25 4,822,934
240 4,822,935
259 4,822,936
319 4,822,937
324 4,822,938
408 4,822,939
415 4,822,940
417 4,822,941
419 4,822,942
467 4,822,943
500 4,822,944
517 4,822,945
641 4,822,946
805 4,822,947
834 4,822,948

CLASS 600

30 4,822,333

CLASS 604

16 4,822,332
20 4,822,334
4,822,335
50 4,822,336
4,822,337
54 4,822,338
82 4,822,339
135 4,822,340
175 4,822,341
180 4,822,342
187 4,822,343
248 4,822,344
282 4,822,345
319 4,822,346
329 4,822,347
346 4,822,348
367 4,822,349
372 4,822,350
385.2 B1 3,860,003
389 B1 4,662,875
411 4,822,351

CLASS 623

1 4,822,352
2 4,822,353
4,822,354
4,822,355
3 4,822,356
4,822,357
6 4,822,358
4,822,359
4,822,360
12 4,822,361
20 4,822,362
4,822,364
4,822,365
4,822,366
22 4,822,367
4,822,368
4,822,369
23 4,822,370
27 4,822,363
32 4,822,371

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1 4,822,949

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D1— 109 300,680
D2— 25 300,681
300,682
29 300,683
277 300,684
314 300,685
318 300,686
300,687
D3— 34 300,688
71 300,689
D4— 108 300,690
300,691
D5— 41 300,692
53 300,693
D6— 333 300,694
361 300,695
365 300,696
391 300,697
400 300,698
405 300,699
409 300,700
474 300,701
513 300,702
523 300,703
553 300,704
D7— 14 300,705
300,706
76 300,707
317 300,708
321 300,709
330 300,710
351 300,711
397 300,712
D8— 1 300,713
9 300,714
12 300,715
64 300,716
68 300,717
300,718
308 300,719
330 300,720
356 300,721
D9— 352 300,722
15— 199 300,748
D10— 28 300,723
32 300,724
44 300,725
46 300,726
52 300,727
57 300,728
86 300,729
116 300,730
D11— 29 300,731
152 300,732
D12— 131 300,733
155 300,734
156 300,735
182 300,736
187 300,737
D13— 23 300,738
24 300,739
D14— 101 300,744
147 300,743
148 300,742
151 300,740
248 300,741
D15— 69 300,745
300,746
147 300,747
D18— 38 300,749
D19— 67 300,750
D21— 41 300,751
59 300,752
300,753
64 300,754
300,755
80 300,756
201 300,757
217 300,758
300,759
234 300,760
300,761
D22— 107 300,762
108 300,763
133 300,764
141 300,765
300,766
142 300,767
300,768
D23— 225 300,769
250 300,770
314 300,771
329 300,772
333 300,773
338 300,774
300,775
370 300,776
392 300,777
393 300,778
404 300,779

CLASSIFICATION OF PLANTS

P.— 7 6,748
43 6,747
51 6,745
6,746
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6,739
6,740
6,741
6,742
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,821,425	4,821,706	4,822,363	4,823,204	4,821,414	4,821,482
4,821,610	4,821,713	4,822,404	4,823,205	4,821,493	4,821,702
4,821,836	4,821,719	4,822,410	4,823,210	4,821,512	4,821,704
4,821,914	4,821,721	4,822,427	4,823,215	4,821,522	4,821,757
4,822,047	4,821,722	4,822,436	4,823,216	4,821,563	4,821,761
4,822,231	4,821,748	4,822,444	4,823,222	4,821,655	4,821,867
4,822,319	4,821,759	4,822,446	4,823,242	4,821,736	4,821,950
4,822,379	4,821,775	4,822,458	4,823,252	4,821,787	4,821,987
4,823,117	4,821,785	4,822,476	4,823,268	4,821,802	4,822,005
02 : 4,821,647	4,821,793	4,822,571	4,823,272	4,821,939	4,822,031
04 : 4,821,358	4,821,794	4,822,595	4,823,291	4,822,027	4,822,034
4,821,428	4,821,832	4,822,600	4,823,297	4,822,074	4,822,214
4,821,431	4,821,861	4,822,624	4,823,299	4,822,141	4,822,244
4,821,483	4,821,862	4,822,637	4,823,312	4,822,219	4,822,308
4,821,496	4,821,885	4,822,638	4,823,314	4,822,289	4,822,358
4,821,630	4,821,892	4,822,651	4,823,317	4,822,296	4,822,456
4,821,669	4,821,929	4,822,661	4,823,328	4,822,349	4,822,482
4,822,310	4,821,930	4,822,731	4,823,341	4,822,383	4,822,740
4,822,341	4,821,933	4,822,739	4,823,347	4,822,386	4,822,744
4,822,467	4,821,955	4,822,748	4,823,349	4,822,418	4,822,849
4,822,524	4,821,985	4,822,749	4,823,355	4,822,569	4,822,959
4,822,594	4,821,988	4,822,750	4,823,365	4,822,577	4,823,086
4,822,816	4,821,992	4,822,777	4,823,391	4,822,625	4,823,096
4,823,036	4,821,997	4,822,821	4,823,399	4,822,693	4,823,115
4,823,220	4,822,003	4,822,834	4,823,401	4,822,827	4,823,123
4,823,262	4,822,029	4,822,887	4,823,402	4,822,886	4,823,134
4,823,386	4,822,037	4,822,905	4,124,899	4,822,974	4,823,173
05 : 4,821,714	4,822,038	4,822,906	4,653,498	4,823,010	4,823,227
4,821,990	4,822,045	4,822,961	08 : Re.32,909	4,823,146	4,823,228
4,822,118	4,822,057	4,822,983	4,821,368	4,823,149	4,823,285
06 : 4,821,353	4,822,066	4,822,985	4,821,462	4,823,152	4,823,295
4,821,354	4,822,076	4,823,004	4,821,464	4,823,153	4,823,300
4,821,356	4,822,085	4,823,019	4,821,724	4,823,279	4,823,380
4,821,365	4,822,121	4,823,020	4,821,737	4,823,286	4,823,382
4,821,371	4,822,125	4,823,022	4,821,738	4,426,860	4,823,397
4,821,392	4,822,127	4,823,024	4,821,762	10 : 4,822,403	13 : 4,821,481
4,821,417	4,822,130	4,823,043	4,821,871	4,822,440	4,821,820
4,821,442	4,822,134	4,823,044	4,822,036	4,822,759	4,821,827
4,821,452	4,822,226	4,823,055	4,822,346	4,822,832	4,821,912
4,821,453	4,822,227	4,823,070	4,822,394	4,822,839	4,821,922
4,821,456	4,822,278	4,823,074	4,822,495	4,822,859	4,821,925
4,821,479	4,822,285	4,823,078	4,822,611	4,822,870	4,821,949
4,821,489	4,822,288	4,823,094	4,822,735	4,822,897	4,821,959
4,821,506	4,822,292	4,823,108	4,822,995	11 : 4,823,111	4,822,012
4,821,511	4,822,293	4,823,109	4,823,051	12 : 4,821,343	4,822,089
4,821,542	4,822,295	4,823,120	4,823,077	4,821,360	4,822,380
4,821,558	4,822,309	4,823,125	4,823,214	4,821,398	4,822,531
4,821,652	4,822,314	4,823,139	4,823,221	4,821,418	4,822,666
4,821,665	4,822,330	4,823,143	4,823,277	4,821,432	4,822,743
4,821,671	4,822,334	4,823,156	4,823,330	4,821,440	4,823,196
4,821,672	4,822,345	4,823,167	4,394,956	4,821,449	15 : 4,822,261
4,821,678	4,822,351	4,823,181	4,733,884	4,821,451	16 : 4,821,965
4,821,699	4,822,360	4,823,183	09 : 4,821,409	4,821,469	4,822,006

4,822,069	21 : 4,821,399	4,821,961	4,822,368	4,822,163	4,821,982
4,823,212	4,821,715	4,822,041	4,822,416	4,822,196	4,822,030
4,823,294	4,821,823	4,822,054	4,822,443	4,822,209	4,822,033
17 : 4,821,370	4,821,841	4,822,063	4,822,769	4,822,213	4,822,044
4,821,372	4,822,117	4,822,063	4,823,009	4,822,331	4,822,053
4,821,375	4,822,172	4,822,070	4,823,122	4,822,337	4,822,055
4,821,376	4,822,429	4,822,077	4,823,310	4,822,338	4,822,058
4,821,379	4,822,442	4,822,079	34 : 4,821,355	4,822,364	4,822,084
4,821,390	4,822,761	4,822,092	4,821,864	4,822,389	4,822,112
4,821,459	22 : 4,821,362	4,822,100	4,821,870	4,822,395	4,822,116
4,821,539	4,821,445	4,822,104	4,821,903	4,822,415	4,822,175
4,821,560	4,821,557	4,822,119	4,821,924	4,822,422	4,822,178
4,821,620	4,821,587	4,822,157	4,822,080	4,822,437	4,822,183
4,821,641	4,821,667	4,822,164	4,822,088	4,822,478	4,822,232
4,821,681	4,821,872	4,822,199	4,822,248	4,822,492	4,822,237
4,821,692	4,822,075	4,822,224	4,822,284	4,822,510	4,822,239
4,821,744	4,822,221	4,822,241	4,822,393	4,822,539	4,822,276
4,821,786	4,822,537	4,822,265	4,822,401	4,822,563	4,822,294
4,821,798	4,822,904	4,822,290	4,822,405	4,822,581	4,822,299
4,821,835	23 : 4,821,446	4,822,321	4,822,408	4,822,586	4,822,316
4,821,857	4,821,507	4,822,343	4,822,474	4,822,605	4,822,326
4,821,873	4,822,056	4,822,357	4,822,477	4,822,607	4,822,336
4,821,897	4,822,980	4,822,377	4,822,480	4,822,629	4,822,342
4,821,901	4,823,064	4,822,419	4,822,487	4,822,630	4,822,398
4,821,913	4,823,104	4,822,421	4,822,496	4,822,635	4,822,432
4,821,927	24 : 4,821,510	4,822,483	4,822,504	4,822,660	4,822,439
4,821,932	4,821,609	4,822,486	4,822,515	4,822,679	4,822,499
4,821,966	4,821,631	4,822,564	4,822,545	4,822,692	4,822,509
4,821,973	4,821,728	4,822,671	4,822,570	4,822,703	4,822,514
4,821,986	4,821,729	4,822,695	4,822,583	4,822,712	4,822,518
4,821,993	4,821,733	4,822,697	4,822,597	4,822,722	4,822,553
4,821,996	4,821,839	4,822,801	4,822,621	4,822,745	4,822,556
4,822,035	4,821,907	4,822,830	4,822,626	4,822,755	4,822,599
4,822,046	4,822,042	4,822,856	4,822,669	4,822,802	4,822,602
4,822,062	4,822,106	4,822,899	4,822,676	4,822,825	4,822,603
4,822,072	4,822,520	4,822,930	4,822,690	4,822,833	4,822,609
4,822,094	4,822,566	4,822,936	4,822,699	4,822,836	4,822,619
4,822,108	4,822,608	4,822,979	4,822,720	4,822,843	4,822,623
4,822,126	4,822,742	4,823,059	4,822,723	4,822,878	4,822,646
4,822,179	4,823,229	4,823,237	4,822,754	4,822,883	4,822,655
4,822,210	25 : 4,821,340	4,823,266	4,822,776	4,822,901	4,822,714
4,822,238	4,821,361	4,823,367	4,822,778	4,822,916	4,822,812
4,822,279	4,821,393	4,823,384	4,822,781	4,822,950	4,822,835
4,822,281	4,821,420	27 : Re.32,908	4,822,796	4,822,977	4,822,845
4,822,291	4,821,436	4,821,348	4,822,799	4,822,978	4,822,854
4,822,339	4,821,657	4,821,359	4,822,800	4,823,026	4,822,875
4,822,438	4,821,664	4,821,378	4,822,824	4,823,068	4,822,940
4,822,527	4,821,680	4,821,416	4,822,847	4,823,069	4,822,944
4,822,601	4,821,731	4,821,444	4,822,861	4,823,075	4,823,008
4,822,610	4,821,763	4,821,461	4,822,865	4,823,089	4,823,035
4,822,659	4,821,782	4,821,472	4,822,890	4,823,102	4,823,058
4,822,733	4,821,838	4,821,578	4,822,893	4,823,127	4,823,072
4,822,762	4,821,942	4,821,582	4,822,896	4,823,137	4,823,105
4,822,775	4,822,022	4,821,594	4,822,914	4,823,158	4,823,150
4,822,809	4,822,051	4,821,634	4,822,938	4,823,176	4,823,250
4,822,811	4,822,120	4,821,788	4,822,939	4,823,184	3,860,003
4,822,841	4,822,135	4,821,811	4,822,941	4,823,224	4,662,875
4,822,913	4,822,136	4,821,866	4,822,942	4,823,230	40 : 4,821,339
4,822,963	4,822,145	4,821,888	4,822,943	4,823,240	4,821,380
4,822,997	4,822,197	4,821,931	4,822,952	4,823,245	4,821,629
4,823,017	4,822,240	4,822,147	4,822,956	4,823,259	4,821,810
4,823,098	4,822,297	4,822,181	4,822,992	4,823,261	4,822,479
4,823,145	4,822,312	4,822,194	4,823,062	4,823,281	4,822,494
4,823,225	4,822,332	4,822,373	4,823,063	4,823,284	4,822,588
4,823,256	4,822,362	4,822,431	4,823,100	4,823,290	4,822,657
4,823,366	4,822,365	4,822,451	4,823,113	4,823,403	4,822,842
4,823,400	4,822,382	4,822,464	4,823,201	37 : Re.32,906	4,822,982
18 : 4,821,438	4,822,449	4,822,643	4,823,241	4,821,347	4,823,042
4,821,528	4,822,454	4,822,675	4,823,298	4,821,410	41 : 4,821,492
4,821,538	4,822,471	4,822,687	4,823,338	4,821,423	4,821,530
4,821,619	4,822,497	4,822,706	35 : 4,822,039	4,821,485	4,821,769
4,821,650	4,822,544	4,822,885	4,822,207	4,821,500	4,821,868
4,821,770	4,822,631	4,822,996	4,823,116	4,821,628	4,821,976
4,821,880	4,822,691	4,823,129	36 : 4,821,341	4,821,749	4,822,234
4,821,904	4,822,746	4,823,209	4,821,349	4,821,849	4,822,488
4,822,366	4,822,993	4,823,265	4,821,352	4,821,859	4,823,028
4,822,747	4,823,015	4,823,345	4,821,366	4,822,043	4,823,076
4,822,994	4,823,050	4,823,372	4,821,397	4,822,322	4,823,090
4,823,032	4,823,067	4,823,378	4,821,408	4,822,381	4,823,128
4,823,239	4,823,106	28 : 4,823,379	4,821,457	4,822,448	4,823,189
4,823,302	4,823,124	29 : 4,821,422	4,821,473	4,822,606	4,823,260
4,823,387	4,823,148	4,821,480	4,821,523	4,822,632	4,823,283
19 : 4,821,395	4,823,154	4,821,909	4,821,586	4,822,663	4,823,301
4,821,401	4,823,236	4,822,001	4,821,614	4,822,667	4,823,356
4,821,426	4,823,348	4,822,533	4,821,621	4,822,741	42 : 4,821,383
4,821,495	4,823,359	4,822,718	4,821,639	4,822,864	4,821,400
4,821,497	4,823,371	4,822,927	4,821,695	4,823,095	4,821,448
4,821,498	26 : 4,821,342	4,823,357	4,821,716	38 : 4,821,969	4,821,546
4,821,514	4,821,345	30 : 4,822,947	4,821,732	39 : 4,821,346	4,821,554
4,821,622	4,821,374	31 : 4,821,435	4,821,879	4,821,470	4,821,556
4,821,624	4,821,441	4,821,717	4,821,889	4,821,540	4,821,569
4,821,642	4,821,519	4,822,007	4,821,906	4,821,583	4,821,615
4,821,679	4,821,535	4,822,578	4,821,934	4,821,612	4,821,645
4,821,806	4,821,590	32 : 4,821,450	4,821,936	4,821,760	4,821,745
4,821,807	4,821,593	4,821,600	4,821,947	4,821,840	4,821,812
4,821,818	4,821,597	4,821,808	4,821,952	4,821,847	4,821,819
4,821,918	4,821,605	4,821,843	4,821,960	4,821,851	4,821,821
4,823,007	4,821,627	4,822,391	4,821,974	4,821,856	4,821,878
20 : 4,821,494	4,821,697	4,822,656	4,822,021	4,821,874	4,821,948
4,821,550	4,821,701	4,823,114	4,822,040	4,821,883	4,822,010
4,821,584	4,821,741	33 : 4,821,536	4,822,087	4,821,898	4,822,052
4,821,648	4,821,774	4,821,653	4,822,129	4,821,899	4,822,060
4,821,682	4,821,795	4,821,890	4,822,148	4,821,915	4,822,111
4,822,064	4,821,824	4,821,938	4,822,149	4,821,941	4,822,131
4,822,065	4,821,828	4,822,002	4,822,150	4,821,953	4,822,173
4,822,773	4,821,908	4,822,313	4,822,162	4,821,958	4,822,222

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	4,822,235		4,573,203		4,821,752		4,822,501		4,821,525		4,823,396
	4,822,305	44 :	4,821,513		4,821,756		4,822,546		4,821,677	54 :	4,821,608
	4,822,376		4,821,543		4,821,771		4,822,547		4,821,720		4,822,915
	4,822,387		4,821,954		4,821,772		4,822,576		4,821,742		4,822,925
	4,822,388		4,822,868		4,821,784		4,822,591		4,821,844	55 :	4,821,424
	4,822,396	45 :	4,821,750		4,821,799		4,822,736		4,821,920		4,821,429
	4,822,397		4,821,837		4,821,803		4,822,753		4,821,972		4,821,487
	4,822,407		4,822,086		4,821,804		4,822,772		4,822,193		4,821,559
	4,822,457		4,822,215		4,821,814		4,822,819		4,822,452		4,821,613
	4,822,511		4,822,552		4,821,816		4,822,820		4,822,485		4,821,676
	4,822,517		4,822,828		4,821,882		4,822,857		4,822,991		4,821,688
	4,822,554		4,822,862		4,821,891		4,822,871		4,823,130		4,821,694
	4,822,558		4,822,987		4,821,902		4,822,911		4,823,177		4,821,765
	4,822,585		4,823,324		4,822,000		4,822,921		4,823,287		4,821,789
	4,822,592	46 :	4,823,390		4,822,017		4,822,923	53 :	Re.32,907		4,821,853
	4,822,593	47 :	4,821,391		4,822,032		4,822,926		4,821,454		4,821,869
	4,822,642		4,822,028		4,822,081		4,822,954		4,821,463		4,821,970
	4,822,653		4,822,236		4,822,208		4,822,986		4,821,572		4,822,174
	4,822,680		4,822,254		4,822,212		4,823,031		4,821,815		4,822,283
	4,822,683		4,822,425		4,822,216		4,823,249		4,821,937		4,822,328
	4,822,685		4,822,453		4,822,223		4,823,280		4,821,980		4,822,385
	4,822,698		4,822,957		4,822,304		4,823,311		4,821,981		4,822,430
	4,822,700	48 :	4,821,389		4,822,317		4,823,318		4,822,048		4,822,604
	4,822,794		4,821,394		4,822,344		4,823,320		4,822,068		4,822,613
	4,822,867		4,821,458		4,822,353		4,823,325		4,822,107		4,822,614
	4,822,902		4,821,467		4,822,371		4,823,326		4,822,113		4,822,644
	4,822,976		4,821,474		4,822,378		4,207,618		4,822,412		4,822,677
	4,823,029		4,821,520		4,822,450	49 :	4,822,627		4,822,428		4,822,964
	4,823,047		4,821,564		4,822,460	50 :	4,821,945		4,822,734		4,822,981
	4,823,093		4,821,635		4,822,466		4,823,170		4,823,162		4,823,057
	4,823,136		4,821,709		4,822,470	51 :	4,821,427		4,823,364		4,823,226
	4,823,358		4,821,712		4,822,475		4,821,508		4,823,381		4,823,264
	4,823,394		4,821,723		4,822,500		4,821,509				

DESIGN PATENTS

01 :	300,735		300,707		300,737	27 :	300,698		300,713	48 :	300,714
	300,761		300,728		300,764		300,705		300,778		300,715
	300,767		300,736	13 :	300,748	29 :	300,777	39 :	300,699		300,738
	300,768		300,750	17 :	300,742	32 :	300,688		300,726	49 :	300,734
05 :	300,757		300,756		300,747	34 :	300,680		300,733	50 :	300,779
06 :	300,681		300,762	19 :	300,772		300,723	41 :	300,687	51 :	300,731
	300,684		300,763	24 :	300,758	36 :	300,690	42 :	300,760	53 :	300,729
	300,694		300,776		300,759		300,691	46 :	300,702	55 :	300,719
	300,703	08 :	300,689	25 :	300,685		300,693	47 :	300,716		300,770
	300,704	12 :	300,721	26 :	300,710						

PLANT PATENTS

06 :	6,747	17 :	6,745	6,746	22 :	6,748	

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PATENTS

April 25, 1989

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April 25, 1989 Volume 1101 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.
THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the Official Gazette at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the Official Gazette at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the Official Gazette at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the Official Gazette at 1079 O.G. 50 on June 23, 1987.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the Official Gazette at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed :	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30) :	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations :	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

DONALD J. QUIGG,
Assistant Secretary and
Commissioner of Patents
and Trademarks.

Mar. 29, 1989.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on Apr 22, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,583,246 through 4,584,720
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on April 20, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,325,148 through 4,326,298
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as ammended effective Apr. 17, 1985, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original o r reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant..... $495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$ 245.00
By other than a small entity.....$ 490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of threee years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a main tenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid. According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 5, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,497,071	06/350,321	02/05/85
4,497,076	06/469,256	02/05/85
4,497,077	06/496419	02/05/85
4,497,080	06/473,780	02/05/85
4,497,086	06/437,163	02/05/85
4,497,090	06/476,987	02/05/85
4,497,101	06/459,538	02/05/85
4,497,117	06/531,076	02/05/85
4,497,124	06/507,042	02/05/85
4,497,125	06/517,669	02/05/85
4,497,127	06/483,165	02/05/85
4,497,130	06/513,167	02/05/85
4,497,134	06/417,354	02/05/85
4,497,141	06/499,565	02/05/85
4,49,7144	06/625,192	02/05/85
4,497,145	CS/357,902	02/05/85
4,497,155	06/377567	02/05/85
4,497,156	06/421,242	02/05/85
4,497,168	06/374,244	02/05/85
4,497,172	06/445,569	02/05/85
4,497,175	06/563,266	02/05/85
4,497,178	06/479,368	02/05/85
4,497,189	06/477,883	02/05/85
4,497,194	06/387,999	02/05/85
4,497,195	06/440,338	02/05/85
4,497,207	06/539,702	02/05/85
4,497213	06/505,469	02/05/85
4497217	06/519143	02/05/85
4,497,226	06/478793	02/05/85
4,497,238	06/595,695	02/05/85
4.497.243	06/499,826	02/05/85
4,497.249	06/393,881	02/05/85
4,497.259	06/456,539	02/05/85
4,497,260	06/417,062	02/05/85
4,497262	06/548284	02/05/85
4,497,264	06/439355	02/05/85
4,497,271	06/430,150	02/05/85
4,497,273	06/413,076	02/05/85
4,497,275	06/536,132	02/05/85
4,497,278	06/619,779	02/05/85
4497,281	06/602,271	02/05/85
4,497,305	06/549,749	02/05/85
4,497,308	06/536,943	02/05/85
4,497,311	06/412,525	02/05/85
4,497,312	06/554,536	02/05/85
4497,315	06/364,661	02/05/85
4,497,322	06/384,497	02/05/85
4,497,326	06/365,707	02/05/85
4,497,329	06/400,457	02/05/85
4,497,336	06/487,858	02/05/85
4,497,344	06/447,063	02/05/85
4,497,345	06/397,772	02/05/85
4,497,349	06/346,629	02/05/85
4,497,351	06/449,916	02/05/85
4,497,352	06/492,957	02/05/85
4,497,356	06/380,751	02/05/85
4,497,362	06/477,021	02/05/85
4,497,365	06/522,976	02/05/85
4,497,367	06/464,104	02/05/85
4,497,372	06/499,976	02/05/85
4,497,375	06/357,897	02/05/85
4,497,387	06/413,750	02/05/85
4,497,399	06/446,715	02/05/85
4,497,402	06/506,022	02/05/85
4,497,404	06/537,782	02/05/85
4,497,413	06/575,877	02/05/85
4,497,417	06/477,947	02/05/85
4,497,420	06/378,128	02/05/85
4,497,423	06/374,163	02/05/85
4,497,424	06/272,686	02/05/85
4,497,434	06/483,690	02/05/85
4,497,439	06/380,606	02/05/85
4,497,448	06/474,752	02/05/85
4,497,451	06/520,103	02/05/85
4,497,453	06/494,883	02/05/85
4,497,457	06/524,758	02/05/85
4,497,463	06/506,681	02/05/85
4,497,467	06/418,590	02/05/85
4,497,469	06/476,798	02/05/85
4,497,471	06/517,502	02/05/85
4,497,472	06/441,685	02/05/85
4,497,474	06/55,9839	02/05/85

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Patent Number	Serial Number	Issue Date
4,497,475	06/560,510	02/05/85
4,497,478	06/533,578	02/05/85
4,497,480	06/557,234	02/05/85
4,497,481	06/424,962	02/05/85
4,497,483	06/514,829	02/05/85
4,497,485	06/616,838	02/05/85
4,497,486	06/637,596	02/05/85
4,497,497	06/623,010	02/05/85
4,497,500	06/510,961	02/05/85
4,497,519	06/443,534	02/05/85
4,497,521	06/392,517	02/05/85
4,497,524	06/430,669	02/05/85
4,497,537	06/502,809	02/05/85
4,497,540	06/478,130	02/05/85
4,497,558	06/550,790	02/05/85
4,497,559	06/523,676	02/05/85
4,497,572	06/457,060	02/05/85
4,497,574	06/503,818	02/05/85
4,497,580	06/562,165	02/05/85
4,497,583	06/398,580	02/05/85
4,497,584	06/501,825	02/05/85
4,497594	06/429,895	02/05/85
4,497,604	06/406,645	02/05/85
4,497,607	06/386,829	02/05/85
4,497,611	06/478,286	02/05/85
4,497,614	06/474,993	02/05/85
4,497,625	06/550,310	02/05/85
4,497,630	06/589,486	02/05/85
4,497,631	06/416,944	02/05/85
4,497,635	06/446,031	02/05/85
4,497,641	06/553,038	02/05/85
4,497,647	06/466,825	02/05/85
4,497,656	06/391,134	02/05/85
4,497,662	06/468,075	02/05/85
4,497,664	06/539,900	02/05/85
4,497,675	06/555,099	02/05/85
4,497,681	06/550,412	02/05/85
4,497,686	06/590,722	02/05/85
4,497,690	06/379,664	02/05/85
4,497,691	06/458,904	02/05/85
4,497,696	06/340,351	02/05/85
4,497,705	06/523,960	02/05/85
4,497,717	06/363,865	02/05/85
4,497,727	06/579,407	02/05/85
4,497,730	06/596,636	02/05/85
4,497,739	06/463,553	02/05/85
4,497,747	06/515,283	02/05/85
4,497,750	06/621,149	02/05/85
4,497,753	06/397,775	02/05/85
4,497,758	06/505,037	02/05/85
4,497,766	06/453,889	02/05/85
4,497,775	06/406,828	02/05/85
4,497,778	06/577,884	02/05/85
4,497,780	06/546,647	02/05/85
4,497,781	06/442,114	02/05/85
4,49,7797	06/393,506	02/05/85
4,497,801	06/529,646	02/05/85
4,497,804	06/441,144	02/05/85
4,497,805	06/475,899	02/05/85
4,497,806	06/468,727	02/05/85
4,497,817	06/487,357	02/05/85
4,497,818	06/290,126	02/05/85
4,497,827	06/412,477	02/05/85
4,497,828	06/454,628	02/05/85
4,497,852	06/439,017	02/05/85
4,497,871	06/489,001	02/05/85
4,497,884	06/421,542	02/05/85
4,497,887	06/384,308	02/05/85
4,497,934	06/606,429	02/05/85
4,497,937	06/477,402	02/05/85
4,497,945	06/505,706	02/05/85
4,497,965	06/585,050	02/05/85
4,497,969	06/578,426	02/05/85
4,49,7970	06/483,102	02/05/85
4,497,987	06/251,410	02/05/85
4,497,988	06/432,336	02/05/85
4,498,002	06/374,335	02/05/85
4,498,004	06/379,026	02/05/85
4,498,072	06/386,786	02/05/85
4,498,073	06/559,031	02/05/85
4,498,082	06/342,564	02/05/85
4,498,103	06/417,525	02/05/85
4,498,113	06/332,333	02/05/85
4,498,118	06/482,143	02/05/85
4,498,123	06/478,697	02/05/85
4,498,126	06/539,898	02/05/85
4,498,152	06/482,154	02/05/85
4,498,157	06/255,379	02/05/85
4,498,163	06/403,346	02/05/85
4,498,164	06/512,196	02/05/85
4,498,184	06/484,327	02/05/85
4,498,185	06/434,381	02/05/85
4,498,197	06/39,5780	02/05/85

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4437,207	06/391,835	06/24/82	03/20/84	03/24/89

Patent Cooperation Treaty (PCT) Update
Accession to the Patent Cooperation Treaty (PCT) by Burkina Faso

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) that Burkina Faso deposited its instrument of accession to the PCT on 21 December 1988.

Therefore, according to PCT Article 63(2), Burkina Faso may be designated in international applications filed on and after 21 March 1989.

It should be noted that since BUrkina Faso is a member of the African Intellectual Property Organization (OAPI), any designation of Burkina Faso has the effect of a designation of that country for the purposes of a regional patent issued by OAPI in Yaounde, Cameroon.

See listing of PCT Member Countries on next page.

Listing of PCT Member Countries

Country	Ratification or Accession	Date of Ratification or Accession	Date from which Country may be Designated
(1)Central African Republic*	Accession	15 September 1971	01 June 1978
(2)Senegal*	Ratification	08 March 1972	01 June 1978
(3)Madagascar .	Ratification	27 March 1972	01 June 1978
(4)Malawi .	Accession	16 May 1972	01 June 1978
(5)Cameroon* .	Accession	15 March 1973	01 June 1978
(6)Chad*	Accession	12 February 1974	01 June 1978
(7)Togo*	Ratification	28 January 1975	01 June 1978
(8)Gabon*	Accession	06 March 1975	01 June 1978
(9)United States of America	Ratification	26 November 1975	01 June 1978
(10)Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11)Congo*	Accession	08 August 1977	01 June 1978
(12)Switzerland**	Ratification	14 September 1977	01 June 1978
(13)United Kingdom**	Ratification	24 October 1977	01 June 1978
(14)France**	Ratification	25 November 1977	01 June 1978
(15)Soviet Union	Ratification	29 December 1977	01 June 1978
(16)Brazil	Ratification	09 January 1978	01 June 1978
(17)Luxembourg**	Ratification	31 January 1978	01 June 1978
(18)Sweden**	Ratification	17 February 1978	01 June 1978
(19)Japan	Ratification	01 July 1978	01 October 1978
(20)Denmark	Ratification	01 September 1978	01 December 1978
(21)Austria**	Ratification	23 January 1979	23 April 1979
(22)Monaco	Ratification	22 March 1979	22 June 1979
(23)Netherlands**	Ratification	10 April 1979	10 July 1979
(24)Romania	Accession	23 April 1979	23 July 1979
(25)Norway	Ratification	01 October 1979	01 January 1980
(26)Liechtenstein**	Accession	19 December 1979	19 March 1980
(27)Australia	Accession	31 December 1979	31 March 1980
(28)Hungary	Ratification	27 March 1980	27 June 1980
(29)Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30)Finland	Ratification	01 July 1980	01 October 1980
(31)Belgium**	Ratification	14 September 1981	14 December 1981
(32)Sri Lanka	Accession	26 November 1981	26 February 1982
(33)Mauritania*	Accession	13 January 1983	13 April 1983
(34)Sudan	Accession	16 January 1984	16 April 1984
(35)Bulgaria	Accession	21 February 1984	21 May 1984
(36)Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37)Mali*	Accession	19 July 1984	19 October 1984
(38)Barbados	Accession	12 December 1984	12 March 1985
(39)Italy**	Ratification	28 December 1984	28 March 1985
(40)Benin*	Accession	26 November 1986	26 February 1987
(41)Burkina Faso	Accession	21 December 1988	21 March 1989

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI member countries designated.

**Member of European Patent Convention (EPC) regional patent system. Either national or European patents for member countries are available through PCT, except for France, Belgium and Italy, for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries under the PCT.

March 29, 1989

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,339,945, Re. S.N. 313,825, Filed Feb. 23,1989, Cl. 73/061.2, PROCESS AND APPARATUS FOR TESTING FLUID FOR FOULING, James G. Knudsen, et al., Owner of Record: *Drew Chemical Corp., Newark, N.J.*, Attorney or Agent: Burton A. Amernick, Ex. Gp.: 265

4,636,128, Re. S.N. 297,818, Filed Jan. 13, 1989, Cl. 414/217, SEMICONDUCTOR SLICE CASSETTE UNIT, Edwin G. Millis, et al., Owner of Record: *Texas Instruments Inc., Dallas, Tex.*, Attorney or Agent: Joseph E. Rogers, Ex. Gp.: 317

4,637,925, Re. S.N. 298,581, Filed Jan. 18,1989, Cl. 423/447.4, ULTRAHIGH STRENGTH CARBON FIBERS, Tohru Hiramatsu, et al., Owner of Record: *Toray Industries, Inc., Tokyo, Japan*, Attorney or Agent: Ronald J. Kubovcik, Ex. Gp.: 113

4, 645,240, Re. S.N. 315,464, Filed Feb. 24, 1989, Cl. 283/74, NUMBERED DOCUMENTS, Colin J. Whitehead, et al., Owner of Record: *Thomas De La Rue And Co., London, England*, Attorney or Agent: Steve I. Weisburd, Ex. Gp.: 324

4,645,279, Re. S.N. 313,229 Filed Feb. 21, 1989, Cl. 439/68, CHIP CARRIER SOCKET HAVING IMPROVED CONTACT TERMINALS, Dimitry G. Grabbe, et al. Owner of Record: *A.M.P. Inc., Harrisburg, Pa.*, Attorney or Agent: William A. Webb. Ex. Gp.: 322

4,645,591, Re. S.N. 315,455, Filed Feb. 23, 1989, Cl. 210/108, SELF-CLEANING FLUID FILTER, Benedict R. Gerulis, Owner of Record: *Inventor(s)*, Attorney or Agent: Alan D. Kamrath, Ex. Gp.: 136

4,670,331, Re. S.N. 296,540, Filed Jan. 12, 1989 Cl. 428/303, MOULDED FIBER REINFORCED PLASTIC ARTICLES, Bronislaw Radvan, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Regis E. Slutter, Ex. Gp.: 154

4,706,026, Re. S.N. 313,676, Filed Feb. 21,1989, Cl. 324/309, METHOD FOR REDUCING IMAGE ARTIFACTS DUE TO PERIODIC SIGNAL VARIATIONS IN NMR IMAGING, Nobert J. Pelc, et al., Owner of Record: *General Electric Co., Milwaukee, Wis.*,, Attorney or Agent: Douglas E. Stoner, Ex. Gp.: 265

4,738,406, Re. S.N. 313,106, Filed Feb. 21, 1989, Cl. 242/16, CONTROLLED APPARATUS AND METHOD, David J. Lothamer, Owner of Record: *Essex Group, Inc., Fort Wayne, Ind.*, Attorney or Agent: R. Thomas Payne, Ex. Gp.: 245

4,753, 177, Re. S.N. 313,533, Filed Feb. 22, 1989, Cl. 110/299, FLUIDIZED BED REACTOR, Folke Engstrom, Owner of Record: *A. Ahistrome Corp., Karhula, Finland*, Attorney or Agent: Robert A. Vanderhye, Ex. Gp.: 344

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,315,261, Reexam. No. 90/001,729, Requested Mar. 15, 1989, Cl. 343/18, RADAR SIGNAL DETECTOR, Richard Mosher, Owner of Record: *Controlonics Corp., Littleton, Ma.*, Attorney or Agent; C.L. Gagnebin, Ex. Gp.: 220, Requester; R.E. Hattis, Chicago, Ill.

4,510,193, Reexam. No. 90/001,730, Requested: Mar. 13, 1989 Cl. 428/196. FIBER SHEET MATERIAL, Hubert Blucher, et al., Owner of Record: *Inventor(s), Dusseldorf, Federall Republic of Germany*, , Attorney or Agent: Sprung, Horn, Kramer & Woods, Ex. Gp.: 150, Requester: Owner

4,624,327, Reexam. No. 90/001,728, Requested: Mar. 13, 1989, Cl. 175/67, METHOD FOR COMBINED JET AND MECHANICAL DRILLING, James R. Reichman Owner of Record: *Flowdril Corp., Kent, Wa.* Attorney or Agent: Knobbe, Martens, et al., Ex. Gp.: 240, Requester: Baker, Mills & Glast, Dallas, Tex.

4,660,936, 90/001,727, Requested: Mar. 10, 1989, Cl. 350/339, ARRANGEMENT TO MINIMIZE REFLECTED AMBIENT LIGHT IN A DISPLAY, Richard W. Nosker, Owner of Record: *GE/RCA Licensing Inc., Princeton, N.J.*, Attorney or Agent: E.M. Whitacre, Ex. Gp.: 250, Requester: Owner

Errata

"All reference to Patent No. 4,813,276 to Jose M. Rivero-Olemedo of Puerto Rico for EXPANSION MECHANISM FOR METER BOX OR METER YOKE appearing in the Official Gazette of Mar. 21, 1989 should be deleted since no patent was granted."

"All reference to Patent No. 4,813,411 to Theodore S. Borek, Jr., of Mass. for FACE MASK WITH INTEGRAL ANTI-GLARE, ANTI-FOG EYE SHIELD appearing in the Official Gazette of Mar. 21, 1989 should be deleted since no patent was granted."

"All reference to Patent No. 4,814,310 to Main Chang of Texas for METHOD FOR PREPARING A SUPPORT METALLOCENE-ALUMOXANE CATALYST FOR GAS PHASE POLYMERIZATION appearing in the Official Gazette of Mar. 21, 1989 should be deleted since no patent was granted."

"All reference to Patent No. 4,816,931 to Hermann Lia of LI for METHOD AND ARRANGEMENT FOR THE RECORDING AND PLAYBACK OF DATA appearing in the Official Gazette of Mar. 28, 1989 should be deleted since no patent was granted."

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Ignacio Villarreal, d.b.a. V Magazine, Highland Beach, Fla., Reg No. 1,290,015 for the mark "VIVA NY AND DESIGN", Canc. No. 17,514.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board
For JEFFERY M. SAMUELS,
Assistant Commissioner for Trademarks.

United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

Cameron Weiffenbach,
Director, Office of
Enrollment and Discipline,

v. Disciplinary Proceeding
No. DP87-02

Gerald L. Lett,
Respondent

Final Order

On June 9, 1987, the Director of the Office of Enrollment and Discipline filed a disciplinary complaint against respondent, Gerald L. Lett, pursuant to 37 CFR § 10.134. While proceedings were pending before the Administrative Law Judge, the Director and respondent reached a settlement. The settlement has been approved.

The complaint charges respondent with 46 counts of misconduct under the Patent and Trademark Office Code of Professional Responsibility. The charges include neglect of legal matters, making misrepresentations to his clients and to the PTO and billing clients for services which were not rendered. As part of the settlement agreement, respondent pleaded guilty to Counts 7 to 9, 12 to 23, 26 to 36 and 38 of the complaint. The remaining counts have been previously waived or waived as part of the settlement agreement.

The Director also found that respondent's alcoholism caused the misconduct, that respomdent began treatment for his alcoholism in January of 1988 and is currently in treatment for his alcoholism. In view of respondent's alcoholism, the Director recommends that respondent be excluded from practice for five years but that the execution of exclusion be stayed and that the respondent be placed on probation for those five years.

In view of the settlement agreement, it is ordered that respondent, Gerald L. Lett, whose Registration No. is 24,509, is excluded from practice before the Patent and Trademark Office, in all cases, for a period of five years. Execution of the exclusion is stayed and respondent is placed on probation for a period of five (5) years. The terms of probation are set forth in paragraph 11 of the settlement agreement approved March 7, 1989. The conditions of probation include the following:

1. Gerald L. Lett will completely abstain from alcohol and drugs other than over-the-counter medicines and those pre scribed by a physician.
2. Gerald L. Lett will continue counseling for alcoholism for the probationary period.
3. Gerald L. Lett's abstainence and continued counseling will be verified by a sobriety monitor who has the right to require respondent's attendance at Alcoholics Anonymous as well as other counseling or treatment for the probation ary period.
4. Gerald L. Lett's professional conduct relating to his current corporate employer will be supervised by a practice monitor or monitors.
5. Gerald L. Lett's practice subsequent to or in addition to his current corporate employer, will be in association with or under the supervision of another attorney who will act as practice monitor and supervise and monitor such practice, including financial and billing matters, and be irrevocably grants such other attorney access to his professional and personal financial records for the period of probation.
6. Gerald L. Lett irrevocably authorizes the monitors to disclose information regarding compliance with and any violation of the probation or any occurrence of misconduct to the Director.
7. Any violation of probation or any occurence of misconduct during the probationary period will result in immediate exclusion from practice.

Subject to the conditions of probation, Gerald L. Lett may continue to practice before the Patent and Trademark Office.

It is further ordered that this final order be published forthwith in the Official Gazette. All medical records, counseling records and monitors' reports shall remain confidential pursuant to 37 CFR § 10.159(c).

Entry of this order terminates the disiplinary proceeding. This order is being entered pursuant to 35 U.S.C. § 32 and the Commissioner's inherant authority to exclude individuals from practice in non-patent cases. 5 U.S.C. § 500(d)(2) and Herman v. Dulles, 205 F.2d 715 (D.C. Cir. 1953).

Mar. 29, 1989

DONALD J. QUIGG
Commissioner of Patents and Trademarks

cc: Hon. Hugh J. Dolan
Chief Administrative Law Judge
U.S. Department of Commerce
Suite 6716
Washington, D.C. 20230

Thomas D. Engle, Esquire
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[Billing Code 3510-16]
DEPARTMENT OF COMMERCE
Docket No. 90391-9091
PATENT AND TRADEMARK OFFICE

Extension of Existing Interim Orders

Agency: Patent and Trademark Office, Commerce
Action: Extension of Existing Interim Orders
Summary: The Assistant Secretary and Commissioner of Patents and Trademarks has determined that the existing interim orders should be extended until Oct. 31, 1989, due to the Diplomatic Conference on the Protection of the Layout-Designs of Integrated Circuits to be held in Washington in May, 1989.
Date: Existing interim orders are hereby extended until Oct. 31, 1989.
Address: Address correspondence to Assistant Commissioner for External Affairs, United States Patent and Trademark Office, Box 4, Washington, D.C. 20231
For Further Information Contact :Michael K. Kirk, Assistant Commissioner for External Affairs, United States Patent and Trademark Office, Box 4, Washington, D.C. 20231, phone (703) 557-3065
Supplementary Information: : Under the Semiconductor Chip Protection Act of 1984 (SCPA) the Assistant Secretary and Commissioner of Patents and Trademarks has been delegated the tasks of determining when and under what conditions foreign mask works will be eligible for interim protection in the United States. To be eligible for interim protection, it must be established that a foreign government is making good faith efforts toward establishing a regime of protection substantially similiar to that which is provided under the SCPA.

Thus far, the Assistant Secretary and Commissioner of Patents and Trademarks has issued interim orders extending protecton to 18 States. Among those countries, several now have laws in place, including Japan and Sweden. On Sept. 16, 1988, 53 FR 36089, the Commissioner initiated an evaluation concerning the issuance of Presidential proclamations for Japan and Sweden.

As Representative Robert W. Kastenmeier, Chairman of the House Subcommittee on Courts, Civil Liberties and the Administration of Justice noted, the transition provisions in section 914 were "intended to encourage the rapid development of a new worldwide regime for the protection of semiconductor chips."

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133 Cong. Rec. E1283 (daily ed. Apr. 6, 1987). These provisions empowered the Executive Branch to use the issuance of interim protection orders under section 914 of the SCPA as a means to encourage other nations to move speedily to establish substantially similiar systems of protection.

The Congress extended the authority to issue interim orders until July 31, 1991 in the belief "this process is promoting the protection of U.S. mask works abroad," and that "[t]he speedy enactment of laws in Japan and Sweden, patterned after American law, is not only a sign of progress, but a great compliment to the United States Congress." H.R. Rep. No. 100-388 100th Cong. 1st Sess. (1987). In that report, the Congress also noted the "serious preparatory work" that is under way in the World Intellectual Property Organization "leading to the creation of a new multilateral treaty for the protection of layout designs of integrated circuits" and that the United States had offered to host a Diplomatic Conference for the conclusion of such a treaty.

During the time since the hearing, pursuant to which the interim orders for the Member States of the European Community, Australia, Canada, Finland, Japan, Sweden, and Switzerland were extended to expire on May 31, 1989, these countries have closely cooperated with the United States to work toward the establishment of a new treaty for the international protection of mask works in the World Intellectual Property Organization. In fact, a Diplomatic Conference for the negotiation of a Treaty on the Protection of the Layout-Designs of Integrated Circuits will be held in Washington during the month of May. It is expected that these countries will be occupied with preparation for their participation in the Diplomatic Conference and initiating a proceeding for the extension of the interim orders would only detract from these efforts.

No complaints have been received concerning unauthorized reproduction of mask works in any of the countries to which interim orders have been extended.

Consequently, in order to promote the development of international comity through the negotiation of this important new treaty, the existing interim orders for these countries are extended to expire on Oct. 31, 1989.

This extension of the orders will promote the orderly conduct of the Diplomatic Conference. The extension until Oct. 31, 1989, will allow the United States to evaluate the effectiveness of participation of these States in the Diplomatic Conference, and to determine whether further proceedings under section 914 will be necessary, or to determine whether the orders should be extended in the anticipation of the Treaty coming into effect.

DONALD J. QUIGG
Mar. 28, 1989 *Assistant Secretary and Commissioner of Patents and Trademarks*

DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

Interim Protection for Mask Works of Nationals, Domiciliaries, and Sovereign Authorities of Austria

Agency: Patent and Trademark Office, Commerce
Action: Notice of Initiation of Proceedings
Summary: The Secretary of Commerce has delegated the authority under section 914 of title 17 of the United States Code to make findings and issue orders for interim protection of mask works to the Assistant Secretary and Commissioner of Patents and Trademarks by Amendment 1 to Department Organization Order 10-14. Guidelines for the submission of petitions for the issuance of interim orders were published in November 7, 1984, in the *Federal Register*, 49 FR 44517-9, and on November 13, 1984, in the *Official Gazette*, 1048 O.G. 30.

On March 7, 1989, the Patent and Trademark Office received a petition for the issuance of an interim order from the Austrian Patent Office. Consequently, in accordance with paragraph F of the guidelines, this notice announces the initiation of an interim order.

In the interests of time, a date is being set for the submission of comments in accordance with paragraph F(a), and a public hearing is being scheduled.

Dates: Comments and requests to testify must be received in the Office of the Commissioner of Patents and Trademarks before 5:00 P.M. on April 25, 1989. A public hearing has been scheduled for May 4, 1989, at 1:00 P.M.

Address: Address written comments to: Commissioner of Patents and Trademarks, Attention: Assistant Commissioner for External Affairs, Box 4, Washington, D.C. 20231. The hearing will be held in the Commissioner's Conference Room, 9th Floor, Crystal Park Building 2, Room 912, 2121 Crystal Drive, Arlington, Virginia.

Materials submitted and a transcript of the hearing will be available for public inspection in Suite 902, Crystal Park Building 2, 2121 Crystal Drive, Arlington, Virginia.

For Further Information Contact: Michael K. Kirk, Assistant Commissioner for External Affairs, by telephone at (703) 557-3065 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Attention: Assistant Commissioner for External Affairs, Box 4, Washington, D.C. 20231.

Supplementary Information: Chapter 9 of title 17 of the United States Code establishes an entirely new form of intellectual property protection for mask works that are fixed in semiconductor chip products. Mask works are defined in 17 U.S.C. 901(a)(2) as:

"a series of related images, however, fixed or encoded

(A) having or representing the predetermined, three-dimensional pattern of metallic, insulating or semiconductor material present or removed from the layers of semiconductor chip product; and

(B) in which series the relation of the images to one another is that each image has the pattern of the surface of one form of the semiconductor chip product."

Chapter 9 further provides for a 10-year term of protection for original mask works measured from their date of registration in the U.S. Copyright Office, or their first commercial exploitation anywhere in the world. Mask works must be registered within 2 years of their first commercial exploitation to maintain this protection.

Foreign mask works are eligible for protection under this chapter under basic criteria set out in section 902; first, that the owner of the mask works is a national, domiciliary, or sovereign authority of a foreign nation that is a party to a treaty providing for the protection of the mask works to which the United States is also a party, or a stateless person wherever domiciled; second, that the mask work is first commercially exploited in the United States; or that the mask work comes within the scope of a Presidential proclamation. Section 902(a)(2) provides that the President may issue such a proclamation upon a finding that:

"a foreign nation extends to mask works of owners who are nationals or domiciliaries of the United States protection (A) on substantially the same basis as that on which the foreign nation extends protection to mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation, or (B) on substantially the same basis as provided under this chapter to mask works (i) of owners who are, on the date on which the mask works are registered under section 908, or the date on which mask works are first commercially exploited anywhere in the world, whichever occurs first, nationals, domiciliaries, or sovereign authorities of that nation, or (ii) which are first commercially exploited in that nation.

Although this chapter generally does not provide protection to foreign owners of mask works unless the works are first commercially exploited in the United States, it is contemplated that foreign nationals, domiciliaries, and sovereign authorities may obtain full protection if their nation enters into an appropriate treaty or enacts mask works protection legislation. To encourage steps toward a regime of international comity in mask works protection, section 914(a) provides that the Secretary of Commerce may extend the privilege of obtaining interim protection under chapter 9 to nationals, domiciliaries and sovereign authorities of foreign nations if the Secretary finds:

"(1) that the foreign nation is making good faith efforts and reasonable progress toward --

(A) entering into a treaty described in section 902(a)(1)(A), or

(B) enacting legislation that would be in compliance with subparagraphs (A) or (B) of section 902(a)(2); and

(2) that the nationals, domiciliaries and sovereign authorities of the foreign nation, and persons controlled by them, are not engaged in the misappropriation, or unauthorized distribution or commercial exploitation of mask works; and

(3) that issuing the order would promote the purposes of this chapter and international comity with respect to the protection of mask works."

On March 7, 1989, a petition for the issuance of an interim order under 17 U.S.C. section 914 was submitted to the Commissioner by the Austrian Patent Office on behalf of the Austrian Government. The petition, in the form of a letter from Dr. Josef Fichte (President of the Austrian Patent Office) and a copy of the Austrian Federal Law of June 23, 1988 on the Protection of the Topographies of Microelectronic Semiconductor Products is sufficient to permit the initiation of proceedings under the guidelines and is reproduced as part of this notice.

In remarks reported at 49 Cong. Rec. S12919 (daily ed. October 3, 1984) and 49 Cong. Rec. E4434 (daily ed. October 10, 1984), both Senator Mathias and Representative Kastenmeier suggest that "[i]n making determinations of good faith efforts and progress..., the Secretary should take into account the attitudes and efforts of the foreign nation's private sector, as well as its Government. If the private sector encourages and supports action toward chip protection, that progress is much more likely to continue... With respect to the participation of foreign nationals and those controlled by them in chip piracy, the Secretary should consider whether any chip designs, not simply those provided full protection under the Act, are subjected to misappropriation. The degree to which a foreign concern that distributes products containing misappropriated chips knows or should have known that it is selling infringing chips is a relevant factor in making a finding under section 914(a) (2). Finally, under section 914(a) (3), the Secretary should bear in mind the role that issuance of the order itself may have in promoting the purposes of this chapter and international comity."

The Commissioner is considering issuing an interim order extending the protection of chapter 9 of title 17 of the United States Code to the nationals, domiciliaries, and sovereign authorities of Austria. Written comment on the request of the petitioners and requests to testify must be received in the Office of the Commissioner of Patents and Trademarks on or before 5:00 P.M., April 25, 1989. A public hearing is scheduled for May 4, 1989, at 1:00 P.M. to received further public comment on this petition.

DONALD J. QUIGG
Mar. 28, 1989 *Assistant Secretary and Commissioner of Patents and Trademarks*

February 24, 1989

Mr. Donald J. Quigg
Commissioner of Patents and Trademarks,
United States Department of Commerce,
Patent and Trademark Office
Box 4
Washington D.C. 20231
U.S.A.

Dear Sir,

The Austrian Patent Office takes the honor to present a petition in accordance with Section 914 SCPA to issue an order for an interim protection under Chapter 9 with respect to nationals, domiciliaries and sovereign authorities of Austria.

As to the respective requirements which we ask to have evaluated according to Section 902, in respect to the Austrian legal and effective situation we like to communicate the following to you:

Austria has enacted a Federal Law of June 23, 1988, on the Protection of the Topographies of Microelectronic Semiconductor Products (Semiconductor Protection Law) which entered into force on October 1, 1988. The English translation of the text which was furnished in cooperation between WIPO and the Austrian Patent Office, is published in the January review of WIPO "Industrial Property".

The Law gives, upon request, an exclusive right to the creator of a topography defined as a three-dimensional structure of micro-electronic semiconductor products. It provides for a sui generis form of protection modelled along the lines of patent protection, and accords protection on the basis of originality resulting form an intellectual effort on the part of the creator who produced a topography which was not commonplace. Compulsory licenses are not provided for. The effect of the protection shall not extend to acts of reverse engineering (Section 6 (2)). The innocent infringer is protected (Section 6 (7)).

The Law provides for a registration system, without examination as to substance. Protection under the Law will be accorded for a maximum period of ten years after the commencement of protection. Among the other provisions are provisions relating to the establishment of a register in the Patent Office, cancellation proceedings to be conducted in the Patent Office, and both civil and criminal court proceedings for infringement.

Protection under the Law is available to both nationals of and residents in Austria and, on a reciprocal basis, to nationals of, and residents in, States party to an intergovernmental agreement to which Austria is also party, or of States identified in ordinances of the Federal Minister for Economic Affairs (Section 5 (1) and (2)). The Austrian Law does not provide for the possibility of interim extended protection. After the reciprocity has been established the same protection will be granted to foreigners as to Austrian nationals and domicilaries. Such an extension would be permanent. In this connection the Austrian Government will declare its intention to extend the protection to US mask works by an ordinance of the Federal Minister for Econmic Affairs.

We therefore are of the opinion that the statutory criteria for eligibility under Section 902 (a) (2) SCPA would be met insofar as the protection afforded under the Austrian Law is substantially the same as that provided for under the SCPA.

Austria is not only one of the first European Countries having enacted a law taking into account the international standards in this field but it also took an active part on the preparatory work in respect to the Diplomatic Conference in Washington in May 1989, and will be represented in this conference in order to cooperate in finding solutions for all acceptable.

Having demonstrated this situation in view to make evidence that Austria has been making good faith efforts and reasonable progress as required in Section 914 we would ask you to find the initiation of an evaluation for the issuance of a Section 902 proclamation in favor of owners of mask works who are Austrian nationals, domicilaries or sovereign authorities appropriate.

Encl.

Yours sincerely,

Dr. Josef FICHTE

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President of the
Austrian Patent Office

AUSTRIA

Federal Law of June 23, 1988, on the Protection of the Topographies of Microelectronic Semiconductor Products (Semiconductor Protection Law)*

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Subject of Protection

1.-(1) Protection under this Federal Law may be obtained, upon request, for three-dimensional structures of microelectronic semiconductor products (topographies) if and insofar as they are original (Section 2).

(2) The protection of a topography of a semiconductor product under subsection (1) shall not apply to the concepts, processes, systems, techniques or stored information contained in the topography, but only to the topography as such.

Originality

2.-(1) A topography shall be original if it is the result of its creator's own intellectual effort and is not commonplace in semiconductor technology.

(2) A topography consisting of an arrangement of portions that are commonplace in themselves shall nevertheless be protected insofar as the arrangement is original as a whole.

Right to Protection

3.-(1) The right to semiconductor protection shall belong to the creator of the topography.

(2) If the topography has been created in the course of employment or otherwise on commission of another person, the right to semiconductor protection shall belong, where not otherwise agreed, to the employer or the person who has given the commission.

(3) Where the person entitled under subsections (1) or (2) is unable to assert his right for failure to satisfy the requirements of Section 5 and where the topography has not previously been commercially exploited by another person or has only been exploited confidentially, the right shall belong to the person who has received from the entitled person an exclusive authorization to commercially exploit the topography for the first time in the country other than confidentially. Assertion of such right through an application shall cause the right based on subsections (1) and (2) to lapse.

(4) The right to semiconductor protection (subsections (1) to (3)) shall be assignable.

Lapse of Right

4. The right shall lapse 15 years after the day of first fixation if the topography has up to that date been neither

1. commercially exploited, other than confidentially, nor
2. filed with the Patent Office.

Assertion of Right

5.-(1) The right to semiconductor protection (Section 3) may only be asserted by Austrian nationals or by natural persons who have their permanent domicile in the country and by legal entities and associations under commerical law that are not incorporated and that possess a real and effective establishment in the country.

(2) Other persons may only assert a right to semiconductor protection if they possess the nationality of the State that affords persons or firms within the meaning of subsection (1) the same protection or if they have their permanent domicile or a real and effective establishment in such State and reciprocity has been established by international agreement or by order published in the *Federal Law Gazette* by the Federal Minister for Economic Affairs.

Effect of Protection

6.-(1) Semiconductor protection shall have the effect that the owner of the right may prohibit others, for commerical purposes, from:

1. reproducing the topography or its independently exploitable portions or producing representations for the manufacture of the topography;
2. offering, putting on the market or distributing, or importing for such purposes, representations for the manufacture of the topography or a semiconductor product containing the topography or its independently exploitable portions.

(2) The effect of protection of the topography shall not extend, in particular, to

1. acts done for non-commercial purposes,
2. reproduction of the topography for the purpose of analysis, evaluation or teaching, of
3. the commercial exploitation of a topography created on the basis of such analysis or evaluation and which is itself original (Section 2).

7. Semiconductor protection shall not have effect with respect to a person who acquires a semiconductor product without knowing or without being assumed to know that it contains a protected topography; as soon as that person knows or is assumed to know that the topography is protected by a semiconductor protection right, he shall be required to pay to the owner of protection, at the latter's demand, for any further commercial exploitation of the previously acquired semiconductor product, an adequate compensation in accordance with the circumstances. The owner of protection shall be entitled to require the rendering of accounts in accordance with Section 151 of the Patent Law 1970 (BGBl. No. 259).

Commencement and Duration of Protection

8.-(1) Protection shall commence on the day of the first commercial exploitation, other than confidential, of the topography, if the lattter is filed with the Patent Office within two years or on the day of filing with the Patent Office, if the topography has not been previously exploited commercially, or has only been exploited confidentially.

German title: Bundesgesetz vom 23 Juni 1988 uber den Schutz der Topographien von mikroelektronischen Halbleitererzeugnissen (Halbleiterschutzgesetz-HlSchG).
Source: Bundesgesetzblatt fur die Republik Osterreich (BGBl.), July 15, 1988. p. 2629.
Entry into force: October 1, 1988.
**Added by WIPO.

1 See *Industrial Property Laws and Treaties*, AUSTRIA - Text 2-001.

(2) Protection shall terminate at the latest on expiry of the tenth calendar year after the year of commencement of protection.

(3) Protection can only be enforced once the semiconductor protection right has been entered in the Semiconductor Register.

Application Requirements

9.-(1) Applications in respect to topographies shall be filed in writing with the Patent Office. A separate application shall be filed for each topography.

(2) The application shall contain:

1. a request for registration of protection of the topography in the Semiconductor Register and a brief and precise designation thereof (title);
2. materials identifying or illustrating the topography or a combination thereof and, in addition, where appropriate, the semiconductor product itself;
3. the day of first commercial exploitation, other than confidential, of the topography, where such day is earlier than the application; and
4. particulars from which the right to semiconductor protection under (Section 3(3) results and particulars concerning the entitlement to assert the right (Section 5).

(3) The request shall be subject to a fee of 3,000 schillings.

(4) The detailed requirements for application as well as the materials to be furnished shall be laid down in a decree issued by the Federal Minister for Economic Affairs, whereby attention shall be paid to introducing provisions that are as effective, speedy, simple and economic as possible and that take into account the needs of the semiconductor industry and the current status of technical development.

Semiconductor Register

10.-(1) Where the application complies with the requirements of Section 9 and of the decree under that Section, the semiconductor protection right shall be entered in the Semiconductor Register kept by the Patent Office, without further examination.

(2) The Semiconductor Register shall contain the number, title, filing date and, where appropriate, the date of first commercial exploitation, other than confidential, of the topography (Section 9(2)3) as well as the name and place of residence of the owners of the protection and of their representatives. The commencement, expiry, nullity, lack of title and transfer of rights of protection, grant of licenses, liens and other rights *in rem*, restoration of rights, declaratory statements and disputes shall also be entered in the Register.

(3) Any person may inspect the Semiconductor Register.

(4) The detailed provisions on the Semiconductor Register shall be laid down in a decree issued by the Federal Minister for Economic Affairs, whereby the maintenance of industrial and business secrets and also the need for public information shall be taken into account.

(5) The materials filed in accordance with Section 9(2)2 and, where appropriate, the semiconductor product itself shall be kept for a period of six years after the end of semiconductor protection. On expiry of this period, the last owner of protection entered in the Semiconductor Register shall be given a time limit to recover the materials and, where appropriate, the semiconductor product. If he does not comply within the time limit, the materials and, where appropriate, the semiconductor product shall be destroyed by the Patent Office.

(6) Where an application does not lead to entry in the Semiconductor Register, the period of storage shall be one year computed from the date on which the refusal decision takes force.

Publication

11. Entries in the Semiconductor Register (Section 10(2)) shall be published in the Patent Gazette [Patent-blatt].

Transfer; Licenses

12.-(1) A semiconductor protection right may be transferred as a whole or conceptual in shares. It shall be inheritable; it shall not pass to the State.

(2) Any transfer shall be entered in the Semiconductor Registry and shall become effective on entry.

(3) License rights may be acquired in respect of a semiconductor right. License rights shall be entered, upon request, in the Semiconductor Register; through the entry they shall be effective also in respect of third parties.

(4) The provisions of Sections 27 and 37 of the Patent Law 1970 shall otherwise apply *mutatis mutandis*.

Declaration of Nullity

13.-(1) Any person may request that a specifically designated semiconductor right be declared null and void if

1. the protected topography was not protectable (Sections 1 and 2),
2. the right to semiconductor protection under Section 4 had lapsed or the time limit for application (Section 8(1)) had lapsed without use having been made of it.
3. entitlement to assert the right (Section 5) was lacking or subsequently ceased to apply, or
4. the materials under Section 9(2)2 did not correspond to the semiconductor product where filed.

(2) The final declaration of nullity shall be retroactive to the commencement of protection (Section 8(1)); where the declaration of nullity is based on the fact that entitlement to assert the right has ceased to apply (subsection (1)3), the final declaration of nullity shall be retroactive to the time at which the semiconductor right became contestable.

Declaration of Lack of Title

14.-(1) The owner shall be declared to lack title to the semiconductor right if it is proven that he was not entitled to the claim the grant of such right (Section 3).

(2) Only the person having the claim to the protection right shall have a claim to declaration of lack of title in respect of the semiconductor right and such a claim shall become statute-barred against a *bona fide* owner of protection after three years of the date of entry in the Semiconductor Register.

(3) Where the applicant's claim is allowed, he may, within one month of the decision becoming final, request transfer of the semiconductor right to himself, subject to his being entitled to assert the right to semiconductor protection (Section 5).

(4) Failure to request such transfer in good time shall be deemed equivalent to renunciation of the semiconductor right.

Requests for Declaration

15.-(1) Anyone who commercially exploits a topography, particularly by offering, putting on the market, distributing, or importing for such purposes, a semiconductor product containing a topography, or who intends to carry out such acts, may request the Patent Office to issue a declaration against the owner of a semiconductor right or the exclusive licensee that the topography or the semiconductor product containing such topography is neither in whole nor in part subject to the semiconductor right (Section 6).

(2) The owner of a semiconductor right or the exclusive licensee may request the Patent Office to issue a declaration against anyone who commercially exploits a topography, in particular who offers, puts on the market, distributes, or imports for such purposes, a semiconductor product containing a topography, or who intends to carry out such acts, that the topography or the semiconductor product containing such topography is subject in whole or in part to the semiconductor right (Section 6).

(3) Requests under subsections (1) and (2) shall be refused where the person opposing the request proves that infringement proceedings between the same parties, concerning the same topography, instituted prior to presentation of the request for a declaration are pending before a court (Section 21).

(4) A request for a declaration may only relate to a single semiconductor right. The request must be accompanied by materials within the meaning of Section 9(2)2 and, where appropriate, also by the semiconductor product itself, in four copies. One copy of the materials and, where appropriate, of the semiconductor product shall be attached to the final decision.

(5) In assessing the scope of protection of the semiconductor right that is the subject matter of the declaratory proceeding, the Patent Office shall take into account the state of the art proven by

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the parties.

(6) Where the behavior of the opposing party has not given reason for the filing of the request and that party has recognized the claim within the period of time stipulated for the reply, the cost of proceedings shall be borne by the requesting party.

Competence

16.-(1) The Semiconductor Register shall be kept by the Patent Office.

(2) The decision on entry in the Semiconductor Register (Section 10) shall be taken by the technical member competent according to the distribution of responsibilities.

(3) Decisions in matters relating to granted semiconductor rights shall be taken, except where the courts, the Supreme Patent and Trademark Chamber or the Appeals Section or the Nullity Section of the Patent Office are competent, by the legal member of the Legal Section competent according to the distribution of responsibilities.

(4) The Appeals Section and the Nullity Section shall take their decisions composed of three members, one of whom shall preside. The presiding member and one further member must be legally qualified.

(5) Sections 58 to 61 and 74, 75, and 76(1), (4) and (5) of the Patent Law 1970 shall apply.

Procedure

17. Where not otherwise stipulated, Sections 52 to 56, 64, 66 to 73, 77 to 79, 82 to 86, 112 to 126, 127(1), (2), (4) and (5), 128, first sentence, 129 to 145, 168 and 169 of the Patent Law 1970 shall apply *mutatis mutandis* to procedure; the procedural fee laid down in Section 132(1)(*b*) of the Patent Law 1970 shall correspond to the application fee in patent proceedings.

Inspection of Files

18.-(1) The parties to proceedings shall be entitled to inspect files relating to the proceedings.

(2) Any person may inspect files concerning granted semiconductor rights-with the exception of records of deliberations and those parts of the files relating to internal business-, subject to the following provisions. Such inspections shall also apply to the materials and, where appropriate, to the semiconductor product itself filed with the application under Section 9(2)2, with the proviso, however, that inspection of materials that contain industrial or commercial secrets and have been designated as such by the applicant in the application shall only be granted in nullity, lack of title or declaration proceedings on the instructions of the Nullity Section or in a legal dispute concerning the infringement of the semiconductor right on the instructions of the court, in respect of persons who are party to the nullity, lack of title or declaration proceedings to the legal dispute. Materials required to identify or illustrate the topography may not be designated as a whole as industrial or commercial secrets.

(3) Secrecy under subsection (2) shall not prevent inspection of files by that person against whom the owner of protection has invoked his right.

Representation

19. The provisions of Section 21 of the Patent Law 1970 shall apply to representation in proceedings before the Patent Office and before the Supreme Patent and Trademark Chamber.

Obligation to Furnish Information

20. Any person who designates articles in such a way as to create the impression that they enjoy semiconductor protection shall be required, on request, to provide information on the right on which the designation is based.

Infringement of Semiconductor Rights

21.-(1) Any person who has suffered an infringement of his semiconductor right (Section 6) may take action under Sections 147 to 154 and 164 of the Patent Law 1970, applied *mutatis mutandis*, for injunction, removal, publication of judgment, appropriate compensation, damages, surrender of profit and rendering of accounts. Any person who has reason to suspect such infringement may also institute action for injunction and for publication of judgment.

(2) Injunction orders can be issued even where they do not fulfill the requirements of Section 381 of the Injunctions Code. Where reasonable grounds exist, the court may withdraw an injunction it has issued if the defendant provides adequate security.

22.-(1) Any person who infringes a semiconductor right (Section 6) shall be condemned by the court to a fine of up to 360 daily amounts.

(2) The same penalty shall be imposed on the owner or director of an enterprise who does not prevent the infringement of a semiconductor right by a person working for him or on his behalf in the course of the activities of the enterprise. Where the owner of the enterprise is a legal entity, this provision shall apply to those organs of the enterprise that have committed such omission. The enterprise shall be jointly and equally liable with the guilty party for the fines inflicted on the organs.

(3) Prosecution shall take place only at the request of the injured party.

(4) In penal proceedings, Sections 160 and 161 of the Patent Law 1970 shall apply *mutatis mutandis*.

Competence

23.-(1) The Commercial Court of Vienna shall have exclusive jurisdiction for actions and injunctions under this Federal Law. Decisions shall belong to the Chamber (Section 7(2), first sentence, Section 8(2) of the Jurisdictional Rules), irrespective of the value in dispute. This shall also apply to injunctions.

(2) Jurisdiction in criminal matters under this Federal Law shall belong to the Vienna District Court for Criminal Matters *[Landesgericht fur Strafsachen Wien]*.

Preliminary Questions

24.-(1) Sections 156 and 157 of the Patent Law 1970 shall apply *mutatis mutandis*, subject to subsection (2), in assessing the validity or effectiveness of a semiconductor right on which an infringement action is based.

(2) Section 156(3) of the Patent Law 1970 shall apply with the restriction that proceedings shall only be interrupted if nullity is claimed on the basis of Section 13(1)1 or 4.

Relationship to the Copyright Law

25. The commercial exploitation of topographies shall not be affected by copyright in works of literature under Section 2(3) of the Copyright Law (BGBI. No. 111/1936) and neighboring rights for photographs under Section 73 of the Copyright Law.

Citations

26. The Federal Law provisions cited in this Federal Law shall be applied in their currently valid version.

Entry into Force

27.-(1) This Federal Law shall enter into force at the start of the third month following its publication.

(2) Decrees based on this Federal Law may be issued as from the day following its publication. However, they may not enter into force until this Federal Law enters into force.

Implementation

28. The following shall be responsible for implementing this Federal Law:

1. with respect to Section 17, where application *mutatis mutandis* of Section 168(6) of the Patent Law 1970 is provided for, the Federal Minister for Economic Affairs, in consultation with the Federal Minister for Finance,

2. with respect to Sections 21 to 24, the Federal Minister for Justice, in consultation with the Federal Minister for Economic Affairs,

3. with respect to all other provisions of this Federal Law, the Federal Minister for Economic Affairs.

Status of PTO Services

The following is an update of the status of PTO services for March 1989:

Service Item	FY 1989 Goal (Calendar Days 1])	Monthly Average (Calendar Days 1])
Filing Receipts:		
Patents	22	21
Trademarks	30	17
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	18 Hours
Window Coupons	5	2
Mail Coupons	12	5
Letter Orders	16	11
Certified Copies:		
Trademark Registrations	21	28
Applications-As-Filed	17	11*
File-Wrapper/Contents	N/A	15
Walk-up Certification	1	1
Trademark Search Library:		
Filing Pending Marks	21	23**
Filing Reg. Certificates	Issue Date+2 days	+6 Days**
Filing Temp. Drawings	6	5
Assignments:		
Recording Patent Assignments	20	73***
Receipt Date of Oldest Patent Documents Returned		July 28, 1988
Recording Trademark Assignments	20	44****
Receipt Date of Oldest Trademarks Documents Returned		Dec. 19, 1988
Avg. Days from Issue Fee Payment to Issue Date	90-100	94
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	95% on Issue Date	99% within 2 days after Issue Date****
Trademark Copies Available	95% on Issue Date	99%on Issue Date

1] Unless otherwise noted.

* The 5% of orders for which fiche are not on site are not included in calculations.

** Average time reduced by 9 days since last month.

*** Efforts are continuing to reduce the backlog.

**** Time for patent assignments reduced by 13 days and for trademarks by 35 days since last month.

Apr. 4, 1989

THERESA A. BRELSFORD
Assistant Commissioner for Administration

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PATENT NOTICES

Certificates of Correction for the Week of Apr. 25, 1989

D297,932	4,752,085	4,776,883	4,787,000
D299,259	4,752,370	4,777,111	4,787,204
4,458,219	4,752,633	4,777,838	4,787,447
4,525,038	4,752,803	4,778,043	4,788,335
4,589,776	4,754,241	4,778,533	4,788,350
4,605,593	4,754,296	4,778,668	4,788,378
4,652,802	4,755,636	4,779,519	4,788,415
4,655,800	4,755,902	4,779,697	4,788,484
4,656,059	4,756,650	4,779,785	4,788,655
4,678,870	4,757,480	4,779,806	4,788,752
4,693,704	4,758,746	4,779,824	4,788,963
4,709,016	4,759,033	4,780,697	4,789,013
4,713,554	4,759,745	4,780,857	4,789,132
4,717,076	4,762,160	4,780,995	4,790,058
4717,773	4,762,410	4,781,141	4,790,211
4,720717	4,764,209	4,781,187	4,790,349
4,721,697	4,764,286	4,781,256	4,790,529
4,721,968	4,764,498	4,781,318	4,790,533
4,722,907	4,766,091	4,781,665	4,790,651
4,726,477	4,767,399	4,781,708	4,790,693
4,727,018	4,768,802	4,781,946	4,790,757
4,728,064	4,769,839	4,782,408	4,790,978
4,731,440	4,769,977	4,782,414	4,791,312
4,733,646	4,771,065	4,783,182	4,791,708
4,736,331	4,771,266	4,783,309	4,791,933
4,738,639	4,771,970	4,783,596	4,792,268
4,739,685	4,772,467	4,783,721	4,792,951
4,740,326	4,772,575	4,783,888	4,793,548
4,742,800	4,772,696	4,783,963	4,793,607
4,743,750	4,773,300	4,784,195	4,794,018
4,744,360	4,773,774	4,784,264	4,794,031
4,744,698	4,774,019	4,785,156	4,794,133
4,745,610	4,774,270	4,785,492	4,794,676
4,745,926	4,774,301	4,785,528	4,794,767
4,747,216	4,774,590	4,785,604	4,795,081
4,747,751	4,774,713	4,785,777	4,795,088
4,749,838	4,774,735	4,785,801	4,795,095
4,750,302	4,775,361	4,785,888	4,800,411
4,750,464	4,775,803	4,786,471	
4,751,931	4,776,316	478,6615	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions,* and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collec patents from either microfilm or paper collections are generallcontemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
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	Miami–Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 275-2562
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kentucky	Louisville Free Public Library	(502) 561-8617
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New Mexico	Albuquerque: University of New Mexico Library	(505) 277-4412
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin—Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 11, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	8-21-86
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	11-24-86
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	12-18-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	7-7-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	8-12-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during February 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,638,239 to 3,646,613, inclusive
Plant Patents ..... None

REEXAMINATIONS

APRIL 25, 1989

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

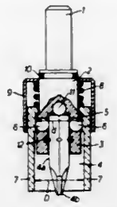
B1 3,970,719 (1045th)
PREPARATION OF BLOCK COPOLYMERS
James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Reexamination Request No. 90/001,474, Mar. 21, 1988.
Reexamination Certificate for Patent No. 3,970,719, issued Jul. 20, 1976, Ser. No. 709,194, Jan. 16, 1958.
Int. Cl.[4] C08F *297/08;* **C08L** *23/00*
U.S. Cl. 525—247

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

1. A block copolymer comprising a first polymer block of a homopolymer of propylene and ajacent thereto a second polymer block of a copolymer of ethylene and propylene.

B1 4,287,923 (1046th)
SCREWING HEADS
Ewald Hornung, Forstweg, Fed. Rep. of Germany, assignor to Feinwerkbau Helfer & Co. KG, Rinteln, Fed. Rep. of Germany
Reexamination Request No. 90/001,373, Nov. 12, 1987.
Reexamination Certificate for Patent No. 4,287,923, issued Sep. 8, 1981, Ser. No. 25,606, Mar. 30, 1979.
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843684
Int. Cl.[4] B25B *15/00;* **B23B** *31/22*
U.S. Cl. 81—429

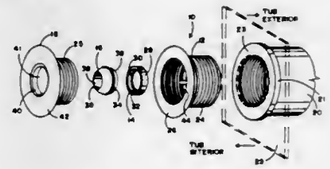


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A screwing head, comprising shank means adapted to be rotatably driven, said shank means having a longitudinal axis and said shank means having an end portion of annular cross-section, said end portion of annular cross-section defining a seat, a screwdriver bit comprising a shank part, said shank part being located in said seat, locking members for releasably locking the shank part of the screwdriver bit within the seat so that the screwdriver bit can be rotated by the shank means, said locking members being mounted in the end portion of annular cross-section for movement transversely of the longitudinal axis of the shank means between radially inner positions in which the locking members lock the shank part of the screwdriver bit for rotation with the shank means, and radially outer positions in which the locking members release the shank part of the screwdriver bit to permit relative rotation between the shank means and the shank part of the screwdriver bit, an annular casing mounted on the shank means for longitudinal movement relative thereto, said casing surrounding the annular end portion of the shank means and having an internal surface, said internal surface comprising a portion of relatively small internal diameter and a portion of relatively larger internal diameter, said casing being movable longitudinally relative to the shank means from a locking position in which the small internal diameter portion holds the locking members in the radially inner positions and a release position in which the locking members can move radially outwardly into the larger internal diameter portion, and spring means biasing the casing into its locking position, the casing being movable from its locking to its release position by engagement with a workpiece upon a predetermined depth of screwing being attained.

B1 4,349,923 (1047th)
JET NOZZLE ASSEMBLY FOR THERAPY BATHS
Philip E. Chalberg, 1119 Maple Ave., Orange, Calif. 92668
Reexamination Request No. 90/001,499, Apr. 26, 1988.
Reexamination Certificate for Patent No. 4,349,923, issued Sep. 21, 1982, Ser. No. 215,888, Dec. 12, 1980.
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **6** are determined to be patentable as amended.

Claims **2–5** and **7–10**, dependent on an amended claim, are determined to be patentable.

1. A nozzle assembly for connection to a source outlet through an orifice in the wall of a whirlpool bath for controlling the direction of flow of a high velocity stream of aerated water into the bathtub, the assembly comprising:

a first cylindrical pipe fitting having an annular flange at one end for compressive engagement with said wall, and having means for securely engaging said source outlet,

a second cylindrical pipe fitting having an annular flange at *a first* **[**one**]** end for compressive overlapping engagement with said first fitting flange, and having means for securely engaging said first cylindrical pipe fitting in concentric relation therewith, said second fitting flange completely blocking said first fitting flange from view,

a spherical member having a cylindrical channel for passage of said aerated water, said spherical member being rotatably seated within said second cylindrical pipe fitting, with said channel providing said flow direction control, and,

means for rotatably securing said spherical member within said second cylindrical pipe fitting *coupled to a second end of said second cylindrical pipe fitting* for limited rotation therein *whereby said spherical member is captured between said rotatable securement means and said first end of said second cylindrical pipe fitting.*

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B1 4,628,072 (1048th)

MODIFIED BLOCK COPOLYMER COMPOSITION

Toshinori Shiraki, Yamato; Fusakazu Hayano, Chigasaki, and Hideo, Morita: Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Reexamination Request No. 90/001,406, Dec. 23, 1987.
Reexamination Certificate for Patent No. 4,628,072, issued Dec. 9, 1986, Ser. No. 432,923, Aug. 13, 1982.
PCT No. PCT/JP82/00316, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO83/00492, PCT Pub. Date Feb. 17, 1983
Claims priority, application Japan, Aug. 13, 1981, 56-125882; Aug. 24, 1981, 56-131650
Int. Cl.[4] C08L *51/00, 53/00, 53/02*
U.S. Cl. 525—57

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 3, 10–12, 15 and 17 are determined to be patentable as amended.

Claims 2, 4–9, 13, 14, 16 and 18, dependent on an amended claim are determined to be patentable.

New claims 19–22 are added and determined to be patentable.

1. A modified block copolymer composition comprising:
(a) at least one thermoplastic polymer selected from the group consisting of polar thermoplastic polymers each containing at least one polar functional group,polyoxymethylenes, polycarbonates, modified polycarbonates, polysulfones, modified polysulfones, nitrile polymers, polyphenylene ethers, modified polyphenylene ethers, polyarylene sulfides and modified polyarylene sulfides and
(b) at least one modified block [polymer] *copolymer* which comprises a base block copolymer of at least [one] *two* monovinyl substituted aromatic hydrocarbon polymer [block] *blocks* A and at least one olefin compound polymer block B having an ethylenic unsaturation degree not exceeding 20%, said base block copolymer having at least one molecular unit grafted thereto, said at least one molecular unit containing at least one member selected from a [carboxylic] *dicarboxylic* acid group and groups derived therefrom, said monovinyl substituted aromatic hydrocarbon being contained in said base block copolymer in an amount of over 60% by weight up to 95% inclusive by weight based on said base block copolymer, said at least one thermoplastic polymer (a) being present in a weight ratio of 90:10 to 5:95 relative to said at least one modified block copolymer (b),
said polar thermoplastic polymers excluding said modified block copolymer (b).

B1 4,657,971 (1049th)

MODIFIED BLOCK COPOLYMER COMPOSITION

Toshinori Shiraki, Yamato; Fusakazu Hayano, Chigasaki, and Hideo Morita, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Reexamination Request No. 90/001,405, Dec. 23, 1987.
Reexamination Certificate for Patent No. 4,657,971, issued Apr. 14, 1987, Ser. No. 769,466, Aug. 26, 1985.
Division of Ser. No. 432,923, Sep. 30, 1982.
Claims priority, application Japan, Aug. 13, 1981, 56-125882; Aug. 24, 1981, 56-131650
Int. Cl.[4] C08L *51/04, 51/06, 53/02, 77/00*
U.S. Cl. 525—57

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 3, 9–12, 14 and 16 are determined to be patentable as amended.

Claims 2, 4–8, 13, 15 and 17, dependent on an amended claim, are determined to be patentable.

New claims 18–21 are added and determined to be patentable.

1. A modified block copolymer composition comprising:
(a) a thermoplastic polymer component selected from the group consisting of members (i) and (ii), said member (i) being at least one thermoplastic polymer selected from the group consisting of polar thermoplastic polymers each containing at least one polar functional group, polyoxymethylenes, polycarbonates, modified polycarbonates, polysulfones, modified polysulfones, nitrile polymers, polyphenylene ethers, modified polyphenylene ethers, polyarylene sulfides and modified polyarylene sulfides, said polar thermoplastic polymers being exclusive of polyamides,
said member (ii) being a polyamide and at least one thermoplastic polymer selected from the group consisting of polar thermoplastic polymers each containing at least one polar functional group, polyoxymethylenes, polycarbonates, modified polycarbonates, polysulfones,modified polysulfones, nitrile polymers, polyphenylene ethers, modified polyphenylene ethers, polyarylene sulfides and modified polyarylene sulfides, said polar thermoplastic polymers being exclusive of polyamides; and
(b) at least one modified block copolymer which comprises a *linear* base block copolymer of at least [one] *two* monovinyl substituted aromatic hydrocarbon polymer [block] *blocks* A and at least one olefin compound polymer block B having an ethylenic unsaturation degree not exceeding 20%, said *linear* base block copolymer having at least one molecular unit grafted thereto, said at least one molecular unit containing at least one member selected from a [carboxylic] *dicarboxylic* acid group and groups derived therefrom, said monovinyl substituted aromatic hydrocarbon being contained in said *linear* base block copolymer in an amount of 5 to 60% by weight based on said *linear* base block copolymer;
said thermoplastic polymer (a) being present in a weight ratio of 70:30 up to 98:2 relative to said modified block copolymer (b);
said polar thermoplastic polymers excluding said modified block copolymer (b).

B1 4,736,817 (1050th)

STAMP FORMED MUFFLER

Jon Harwood, Toledo, Ohio, assignor to AP Industries, Inc., Toledo, Ohio

Reexamination Request No. 90/001,580, Aug. 22, 1988.
Reexamination Certificate for Patent No. 4,736,817, issued Apr. 12, 1988, Ser. No. 59,605, Jun. 8, 1987.
Continuation of Ser. No. 934,642, Nov. 25, 1986, Pat. No. 4,700,806.
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[4] F01N *1/02, 7/18*
U.S. Cl. 181—282

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

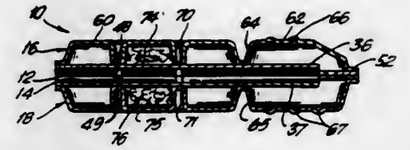
Claim 4 is cancelled.

Claims 1 and 5 are determined to be patentable as amended.

Claims 2, 3, and 6–8, dependent on an amended claim, are determined to be patentable.

New claims 9–22 are added and determined to be patentable.

1. An exhaust muffler comprising:
first and second stamp formed internal plates secured in face to face *abutting* relationship with one another and defining an array of tubes *of selected lengths* therebetween, *at least one tube in said array defining an elongated tuning tube, with the length of said tuning tube extending along the abutting surfaces of said internal plates, said tuning tube having a tuning aperture extending through at least one of said plates,* said array of tubes *further* defining at least one inlet and at least one outlet to the muffler, selected portions of said *array of* tubes being perforated; and
first and second stamp formed external shells, said first and second external shells each including peripheral portions with the respective peripheral portions of said first and second external shells being secured in contact with one another and with at least portions of the respective first and second internal plates, said first and second external shells further including at least one crease connecting two spaced apart locations on the peripheral portions thereof, said crease being disposed substantially in face to face contact with the respective first and second internal plates substantially continuously between the peripheral portions of said external shell, such that the crease and the peripheral portions of said external shell define a plurality of chambers, with at least one of said chambers substantially enclosing the perforated portions of the array of tubes formed by said internal plates, *and with at least one of*



said chambers substantially enclosing the tuning aperture in the tuning tube to define a low frequency resonating chamber, whereby the length and cross section of the tuning tube and the volume of the low frequency resonating chamber are selected in accordance with acoustical characteristics of low frequency noise to be attenuated.

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REISSUES

APRIL 25, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,910

ARRANGEMENT FOR MOUNTING COMPONENTS ON A CARRIER BOARD AND METHOD OF INDICATING MOUNTING LOCATIONS

Gerd Stackler, Birkenweg 14, D8151 Osterwarngau, Fed. Rep. of Germany

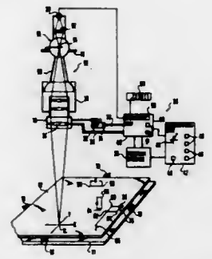
Original No. 41,633,090, dated Aug. 7, 1979, Ser. No. 851,830, Nov. 16, 1977. Continuation of Ser. No. 290,546, Aug. 6, 1981, abandoned. Application for reissue Feb. 1, 1985, Ser. No. 697,436

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716548

Int. Cl.[4] B23Q *15/00*

U.S. Cl. 29—407

11 Claims



8. A method of indicating at least one mounting location among a plurality of mounting spots spaced on a surface onto which the component is to be mounted which comprises:

(a) projecting a luminous dot on said surface;

(b) moving said projected dot continuously and without cessation of projection during such movement back and forth between two said mounting spots for indicating at least one said mounting location.

Re. 32,911

ADJUSTABLE WAVEFORM SPARK SOURCE

John P. Walters, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Original No. 3,749,975, dated Jul. 31, 1973, Ser. No. 66,920, Aug. 26, 1970. Continuation-in-part of Ser. No. 800,180, Feb. 18, 1969, abandoned. Application for reissue Jun. 6, 1980, Ser. No. 157,286

Int. Cl.[4] H05B *7/20*; G01J *3/443*

U.S. Cl. 356—313

46 Claims

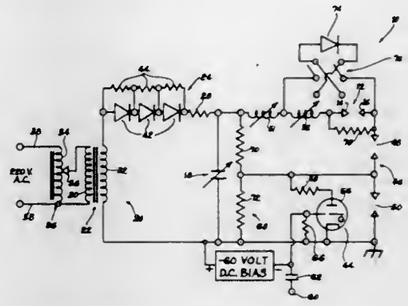
1. A spark *type light* source *for producing light for spectroscopic analysis*, comprising

[a] *an analytical* spark gap,

a storage capacitor

means for causing said capacitor to be discharged across said spark gap,

first and second [reactive elements] *inductive devices* connected between said capacitor and said spark gap to carry the discharge current,



and a rectifier shunted across said spark gap and said second [reactive element] *inductive device* to modify the waveform of the discharge current across said spark gap.

Re. 32,912

PARABOLIC FOCUSING APPARATUS FOR OPTICAL SPECTROSCOPY

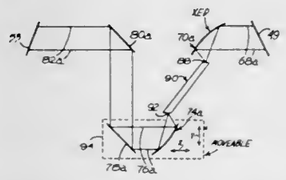
Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Utica, N.Y.

Original No. 4,591,266, dated May 27, 1986, Ser. No. 580,120, Feb. 14, 1984. Continuation of Ser. No. 291,402, Aug. 10, 1981, abandoned. Application for reissue Apr. 24, 1987, Ser. No. 42,056

Int. Cl.[4] G01J *3/45*; G01N *21/01*

U.S. Cl. 356—244

17 Claims



6. In a spectrometer having a collimated radiation beam approaching a sample region, and a collimated radiation beam leaving the sample region, a sample-illuminating optical system comprising:

a first paraboloid reflector which reflects the approaching collimated beam in such a way as to focus the radiation at the sample;

a second paraboloid reflector which receives radiation from the sample and which reflects that radiation to provide the collimated beam leaving the sample region; and

means for allowing constrained translational adjustment movement of at least one of the paraboloid reflectors relative to the other paraboloid reflector, such means including (a) means for allowing such movement of at least one of the paraboloid reflectors along a first path, and (b) means for allowing such movement of at least one of the paraboloid reflectors along a second path perpendicular to the first path.

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Re. 32,913

SHIELDS FOR ANTENNAS OF BOREHOLE LOGGING DEVICES

Brian Clark, Missouri City, Tex., assignor to Schlumberger Technology Corp., New York, N.Y.

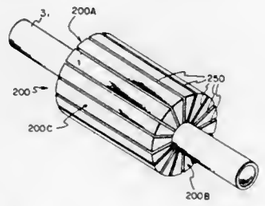
Original No. 4,536,714, dated Aug. 20, 1985, Ser. No. 368,922, Apr. 16, 1982. Application for reissue Jul. 23, 1987, Ser. No. 76,635

Int. Cl.[4] G01V *3/30*; H01Q *1/52*

U.S. Cl. 324—338 32 Claims

1. For use in conjunction with a borehole logging device wherein transmitting and receiving antennas, which transmit or receive electromagnetic energy having transverse magnetic components and transverse electric components, are mounted on a support means which includes a central electrically conductive pipe; a shield for an antenna of said device, comprising:

a hollow [closed-ended] body joined at its ends to the electrically conductive pipe of said support means and surrounding said antenna, said body being formed of an electrically conductive material generally in the shape of a surface of revolution and having a series of substantially equally spaced slots therein, each slot extending [radially outward from said support means] along a plane which passes substantially through the axis of said support means, so as to divide said body into a number of conductive sections each of which forms a closed conductive



path with said conductive pipe, whereby said conductive paths are operative to prevent passage of transverse magnetic components through said shield, but to allow transverse electric components through the slots of said shield.

PLANT PATENTS

GRANTED APRIL 25, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,749

CONCETTA TM (PAPCONC) C.V. (ROSE PLANT)

Ellen T. Paparozzi, Lincoln, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Sep. 24, 1987, Ser. No. 100,777

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by its brilliant orange red color with a darker velvety overtone to its open flowers; plant growth somewhat similar to that of its parent, Gabriella, but more adaptable to pot forcing and growing outdoors even in cold climates.

6,750

ALSTROEMERIA NAMED ELSBETH

Cornelius van Duyn, Rijnsburg, Netherlands, assignor to Groot Associates II, Irvine, Calif.

Filed Jun. 1, 1987, Ser. No. 57,233

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive Alstroemeria cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its medium and profusely blooming flowers.

6,751

ALSTROEMERIA NAMED SUNNY WAY

Cornelis van Duyn, Rijnsburg, Netherlands, assignor to Groot Associates II, Irvine, Calif.

Filed Jun. 1, 1987, Ser. No. 57,234

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive Alstroemeria cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its medium sized and profusely blooming flowers.

6,752

ALSTROEMERIA NAMED CYPRUS

Cornelis van Duyn, NA Rijnsburg, Netherlands, assignor to Groot Associates II, Irvine, Calif.

Filed Jun. 1, 1987, Ser. No. 57,235

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive Alstroemeria cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its medium to small and profusely blooming flowers.

6,753

NECTARINE TREE ("MID GLO")

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Jan. 13, 1988, Ser. No. 143,656

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree characterized by its large size, vigorous, upright growth and a productive and regular bearer of large size, firm, yellow flesh, clingstone fruit, maturing 4 to 5 days before Fantasia Nectarine (non-patented); the fruit is further characterized by its good flavor and eating quality; its attractive red skin color and its ability to store and ship to long distant markets.

6,754

CHRYSANTHEMUM NAMED CALIFORNIA GOLDDUST

Rene Van Wingerden, Carpinteria, Calif., assignor to California Plant Company, Carpinteria, Calif.

Filed Dec. 28, 1987, Ser. No. 138,141

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 1 Claim

1. A new and distinct variety of Chrysanthemum plant and the parts thereof, substantially as herein shown and described, characterized by its profuse recurrent production of medium sized flowers of a bright yellow coloration borne on straight stems forming part of a general spray formation on a tall flowering stem, the plant branching prolifically, if pinched, with vigorous, upright flowering stems of good strength.

6,755

APRICOT TREE ("TRI-GEMS")

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Jan. 11, 1988, Ser. No. 142,491

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—39 1 Claim

1. A new and distinct variety of apricot tree, substantially as illustrated and described which is a regular and productive bearer of medium size, very firm, freestone fruit that can be mechanically harvested without showing excessive bruising, and after being canned, maintaining excellent shape and texture with good flavor and eating quality; the fresh fruit is characterized by its uniform ripening, good flavor and eating quality and having excellent storage and shipping quality.

6,756

PLUM TREE

Larry Kitahara, Clovis, Calif., assignor to Kitahara Farms, Reedley, Calif.

Filed Apr. 13, 1987, Ser. No. 37,345

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree substantially as described and illustrated, which generally resembles the Friar (unpatented) variety in the very upright growth of the tree and by some characteristics of its fruit, but can be readily distinguished therefrom and is an improvement thereon by having a bloom timing which is later than the Friar and Santa Rosa varieties and resembles the Simka (U.S. Plant Pat. No. 1,882) variety, and by ripening of its fruit three to four weeks later than the Friar variety.

6,757

ALSTROEMERIA NAMED CORDU JOY

Cornelis van Duyn, Rijnsburg, Netherlands, assignor to Groot Associates II, Irvine, Calif.

Filed Jun. 1, 1987, Ser. No. 57,232

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive Alstroemeria cultivar, substantially as herein shown and described, characterized by the distinctive coloration of its medium and profusely blooming flowers.

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6,758
HYBRID TEA ROSE PLANT CV. AROTIGY
Jack E. Christensen, Ontario, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.
Filed Nov. 30, 1987, Ser. No. 126,876
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of hybrid tea rose plant cv. Arotigy, and the parts thereof, being particularly characterized by its bright yellow blossoms having a red border on the petal margins, the red border developing in the absence of strong sunlight; the light and spicy fragrance of its blossoms; and the clustering of its blooms, two to four flowers per stem, essentially as described and illustrated herein.

6,759
PEACH TREE, "FLAVOR QUEEN"
James F. Doyle, 7685 N. Thompson Ave., Clovis, Calif. 93612
Filed Dec. 28, 1987, Ser. No. 138,922
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described which is somewhat remotely similar to the Gemfree Peach Tree (U.S. Plant Pat. No. 1,409) which matures in approximately the same season but from which it is distinguished therefrom and characterized as to novelty by producing fruit which are mature for commercial harvesting approximately June 4 through June 10 in the San Joaquin Valley of central California and which additionally produces medium sized, globose shaped fruit which have a semi-clingstone nature, a deep red to lighter orange-red skin color, and a flesh color which is golden yellow; the fruit of the subject variety having an excellent flavor, and noteworthy aroma.

6,760
GRAPEVINE, "TUDOR PREMIUM RED"
John A. Bakas, Delano, Calif., assignor to Dan Tudor & Sons, Delano, Calif.
Filed Jan. 4, 1988, Ser. No. 140,662
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—47 1 Claim

1. A new and distinct variety of grapevine to be denominated varietally as Tudor Premium Red substantially as illustrated and described which is characterized principally as to novelty by its production of a red colored, substantially seedless berry which is mature for harvesting and shipment approximately September 10 through 17, in Delano, Calif., said grapevines maturing in approximately the same season as the Emperor Grapevine (unpatented) with which it is most closely similar, but from which it is distinguished as to novelty by producing berries which are mature for commercial harvesting and shipment approximately ten to fourteen days earlier than the Emperor variety of grapevine, and has a fruit texture which is more firm and crisp than the fruit produced by the Emperor Grapevine.

6,761
GERANIUM PLANT NAMED SERENADE
Guenter Duemmen, 4134 Rheinberg 4, Dammweg 18-20, Fed. Rep. of Germany
Filed Oct. 21, 1987, Ser. No. 110,772
Claims priority, application Italy, Apr. 24, 1987, 101 NV/87
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of geranium known as *Pelargonium zonala,* to be known by the cultivar name Serenade, as described and illustrated, and particularly characterized by the combination of characteristics of: a large umbel; a large diameter of the corolla; a strong zonation of the foliage; and dark green foliage.

6,762
IMPATIENS PLANT NAMED MORIO
Ludwig Kientzler, Bad Kreuznach, Fed. Rep. of Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.
Filed Nov. 12, 1987, Ser. No. 119,775
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Impatiens plant named Morio, as illustrated and described, and parts thereof.

6,763
INTERSPECIFIC TREE (FLAVOR SUPREME)
Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351
Filed Dec. 18, 1987, Ser. No. 135,155
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of interspecific (plum × plumcot) tree, substantially as illustrated and described, characterized by its large size, being vigorous, semi-upright in growth and being a regular and productive bearer of medium size, firm, red flesh, clingstone fruit, with excellent flavor and eating quality and the ability to ship to long distance markets.

6,764
PLUM TREE
Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351
Filed Dec. 28, 1987, Ser. No. 138,649
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree, substantially as illustrated and described, characterized by its large size, vigorous, upright growth and being a productive and regular bearer of large size, firm, clingstone fruit with good eating, storage and shipping quality; the fruit is further characterized by being nearly uniform in size throughout the tree, nearly globose in shape with an attractive blackish blue skin color and maturing approximately 10 days before Queen Ann Plum (non-patent).

PATENTS

GRANTED APR. 25, 1989

ERRATA

For CLASS	See PATENT NO.
004-255	4,823,416
073-118	4,823,462
024-569	4,823,636
425-004	4,823,765
123-571	4,823,798
180-053	4,824,128
350-427	4,824,236
411-378	4,824,314
446-371	4,824,410
048-206	4,824,440
562-416	4,824,992
323-351	4,825,018
235-383	4,825,045
370-002	4,825,113
246-166	4,825,189
341-023	4,825,200
361-065	4,825,323

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PATENTS

GRANTED APRIL 25, 1989

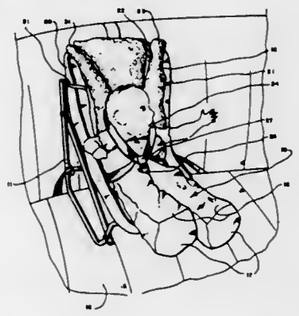
GENERAL AND MECHANICAL

4,823,404
TWO PIECE PROTECTIVE GARMENT
Lori A. Morell, Alpharetta, and Joyce A. Wessel, Acworth, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Jun. 10, 1988, Ser. No. 205,709
Int. Cl.[4] A41B *1/08*; A41D *1/06, 13/02*
U.S. Cl. 2—69 10 Claims



1. In a protective garment including a front opening top having a front portion, back portion, neck opening, right and left sleeves and a bottom having a front portion, back portion, waist opening, right and left legs,
the improvement wherein said top and bottom front portions are made from a nonwoven having a smooth calendered outer surface and an uncalendered inner body facing surface and said top and bottom back portions are made from a breathable material having a Frazier air vapor permeability of at least about 150 ft^3 per minute per $ft.^2$ and wherein said front opening includes a "Z" closure without exposed raw edges.

4,823,405
BABY SAFETY BAG
E. Ilene Porter, 4729 S. 200 West, County of Weber, Ogden, Utah 84403
Filed Jul. 20, 1988, Ser. No. 221,883
Int. Cl.[4] A41D *11/00*
U.S. Cl. 2—80 8 Claims



1. A baby safety and warmth bag of flexible fabric for use with automobile baby seats having shoulder and crotch strap means for securing an infant therein, said bag comprising:
an elongate tubular portion sized to enclose therein the torso of an infant from its crotch to its upper chest, said torso portion having front, back, left and right side portions;
a pair of parallel elongate tubular members joined with and extending downwardly from the crotch end of the torso tube, each sized to enclose a leg of the infant;
a back portion secured to and extending upwardly from the top edge of the back side portion of the torso tube, said back portion being configured to permit use of the strap means to retain the bag and contained infant within the automobile baby seat wherein the upwardly extending back portion comprises a pair of slits providing clearance for the shoulder straps, said slits each extending to an edge of said back portion.

4,823,406
METHOD OF MANUFACTURING STOCKING CAP AND RESULTANT ARTICLE
Theodore Markson, Woodmere, N.Y., assignor to Paris Accessories, Inc., New York, N.Y.
Filed Aug. 1, 1988, Ser. No. 227,077
Int. Cl.[4] A42B *1/04*
U.S. Cl. 2—201 5 Claims



1. The method of manufacturing a hat of the stocking cap type which comprises the steps of providing a tubular sleeve having an inner and an outer face and distal edges, providing a tubular liner having first and second distal ends, the length of said liner being less than one half the length of said sleeve, everting one half of said sleeve to bring said distal edges of said sleeve into alignment, thereafter encompassing said sleeve within said liner, to position said first distal end of said liner in registry with said aligned distal edges of said sleeve, thereafter forming a first overlock stitch seam across said aligned edges and first distal end of said liner, thereafter forming a second overlock stitch seam transversely across said aligned edges and first distal end of said liner said second stitch seam intersecting said first stitch and being offset by substantially 90° attaching said second distal end of said liner to said everted sleeve by a circumferential blind stitch to define a hem and thereafter everting said sleeve and liner to dispose said outer face of said sleeve outermost.

4,823,407
HEADWEAR WITH FACE TUNNEL FOR COLD WEATHER ENVIRONMENT
James G. Phillips, Jr., Pleasant Grove; Jeanne Harlow, Orem, both of Utah, and James M. Clanton, Camp Hill, Ala., assignors to Burlington Industries, Inc., Greensboro, N.C.
Filed May 22, 1987, Ser. No. 52,989
Int. Cl.[4] A42B *1/04*
U.S. Cl. 2—202 28 Claims

1. Protective headwear for cold weather environments comprising:
headgear for enclosing an individual's head and having a margin along a front portion thereof defining an opening for the individual's face;
said headgear having an access opening remote from said front portion for receiving the individual's head;
means defining a tunnel having opposite ends and including wall portions therebetween perimetrically enclosing said

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tunnel between said ends, one of said ends being connected to said headgear about said margin such that said tunnel defining means projects forwardly from said headgear;

each of said headgear and said tunnel defining wall portions being formed of an interior lining, an intermediate layer of



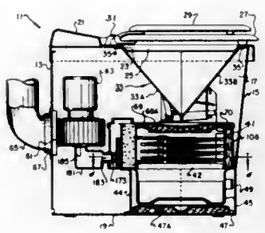
foam material, and an outer fabric layer, one of said outer fabric layer and said interior lining comprising a fabric having an air permeability of less than 15 cubic feet per minute per square foot at 0.5 inches head of water, and having a moisture vapor transmission rate of at least one thousand grams per square meter per 24 hours.

4,823,408

INCINERATOR TOILET WITH HUMPBACK CATALYST CONTAINER

Ernest B. Blankenship, Dallas, Tex., assignor to Research Products/Blankenship Corporation, Dallas, Tex.

Filed Feb. 26, 1988, Ser. No. 160,525
Int. Cl.[4] A47K *11/02*
U.S. Cl. 4—111.5 **5 Claims**



1. An incinerator toilet comprising:

housing structure,

incinerator chamber means located in said housing structure and having an upper end and a lower end with a central opening extending therethrough,

bowl means located above said chamber means,

a removable pan adapted to be located below said lower end of said chamber means,

heating means located in said central opening of said chamber means,

said incinerator means comprising:

an inner cylindrical shaped side wall,

a partially cylindrical shaped outer side wall forming an arc greater than 180° spaced from and partially surrounding said inner side wall forming a partially annular insulation holding space therebetween,

a catalyst chamber having side wall means coupled to said partially cylindrical shaped outer side wall, bridging the gap formed between the two side edges of said partially cylindrical shaped; outer side wall and extending radially outward therefrom defining said catalyst chamber having a radial dimension greater than the radial dimension of said annular insulation holding space,

perforations formed through said side wall means and through the portion of said inner cylindrical shaped side wall located radially between said side wall means and the axis of said inner cylindrical shaped side wall,

top wall means coupled to the upper ends of said inner cylindrical shaped side wall, said, partially cylindrical shaped outer side wall, and said side wall means,

bottom wall means coupled to the lower ends of said inner cylindrical shaped side wall, said partially cylindrical shaped outer side wall, and said outer catalyst chamber side wall,

heat insulation material located in said partially annular insulation holding space,

a heat activated catalyst located in said catalyst chamber, and

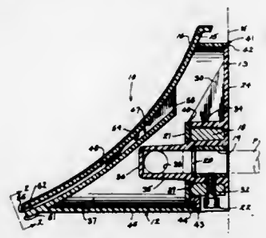
evacuation means for withdrawing gaseous products of combustion from said central opening of said incinerator chamber means by way of said perforations and said heat activated catalyst.

4,823,409

SHEET FLOW SPOUT

Thomas E. Gaffney, Sheboygan, Wis., and Patrick S. Wahlen, West Lafayette, Ind., assignors to Kohler Co., Kohler, Wis.

Filed Jan. 13, 1987, Ser. No. 2,842
Int. Cl.[4] E03C *1/04*
U.S. Cl. 4—192 **4 Claims**



1. A waterflow spout of the type having an inlet for admitting a flow of water, a flow chamber downstream of the inlet and an elongated outlet downstream of the flow chamber for permitting the water to exit the spout, the flow chamber defining a passageway for water movement from said inlet to said outlet, the improvement wherein:

the flow chamber has a elongated crest downstream of the inlet and upstream of the outlet and said flow chamber slopes downwardly and diverges in the downstream direction from the crest toward the outlet;

the flow chamber has a center section and side sections, said center section being arcuate in each of two orthogonal directions, the center section being narrower top to bottom than the side sections and diverging in width in the direction of flow, wherein one of said two orthogonal directions is in the direction of flow and the other of said directions is transverse to the direction of flow, a first radius defines the center section in the flow direction to be concave up, and a second radius defines the center section in the transverse direction to be convex up;

the flow chamber is defined at least in part by upper and lower flow surfaces which converge toward one another, at least one of said flow surfaces having a central section which is raised relative to side sections of the flow surface and said raised portion diverges in width in the direction of fluid flow to define in part the center section of the flow chamber;

the raised central section of at least one of the flow surfaces is adjacent to the outlet to define the outlet narrower in the center than at the sides; and

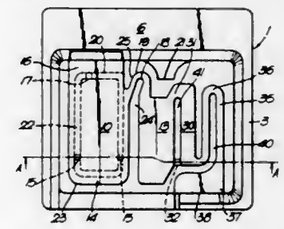
whereby the narrowing of the center section of the flow chamber and the center of the outlet assists in inhibiting the water exiting the outlet from collapsing toward the center of the water stream to maintain the exiting water in a continuous sheet shape for a distance outside of the spout.

4,823,410

DISPENSERS

John I. Peckston, 4 Quennell Ave., Mangere, Auckland, New Zealand

Filed Sep. 16, 1986, Ser. No. 907,870
Claims priority, application New Zealand, Sep. 18, 1985, 213533
Int. Cl.[4] E03D *9/03*
U.S. Cl. 4—228 **9 Claims**



1. A dispenser for containing a quantity of dispensable material and dispensing a quantity of said material into a body of liquid in which the dispenser is placed when the level of the body of liquid is lowered from a first level to a second level, said dispenser comprising:

a body;

a storage chamber in said body for containing a selected dispensable material;

a dilution chamber in said body;

a passageway in said body communicating said storage chamber with said dilution chamber and having a shape for providing an air lock in said passageway;

an outlet from said dilution chamber;

flow controlling means associated with said dilution chamber outlet for controlling the flow of fluid therethrough;

an inlet to said dilution chamber for admitting fluid from the environment exterior of said body to said dilution chamber;

a replenishment chamber in said body having a top open to the environment exterior of said body and having a bottom, said replenishment chamber being shaped to be refillable from said top thereof in use and being connected with said storage chamber to facilitate fluid flow from said replenishment chamber to said storage chamber;

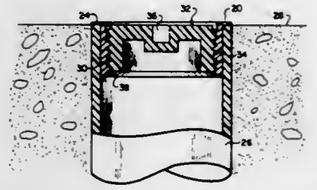
said passageway having an inner surface the highest point of which in normal use providing said air lock being positioned at a level below the level of said bottom of said replenishment chamber so that in use dispensable material passes from said storage chamber through said passageway past said air lock into said dilution chamber and fluid from outside said body enters said dilution chamber through said dilution chamber inlet.

4,823,411

CLEANOUT EXTENSION ADAPTOR

Hans Nettel, P.O. Box A-80547, San Diego, Calif. 92138

Continuation of Ser. No. 565,535, Dec. 27, 1983, abandoned, which is a continuation of Ser. No. 402,201, Jul. 26, 1982, abandoned. This application Oct. 18, 1984, Ser. No. 661,980
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—255 **7 Claims**



1. A cleanout extension adaptor for use in the flush mounting of a cleanout extension, comprising:

a cylindrical body having an axial throughbore and an external diameter that is slightly less than the internal diameter of the cleanout extension;

a radially outwardly extending lip on the top of said cylindrical body for extending over and engaging the top edge of said cleanout extension for positioning and supporting the cleanout extension adaptor in position when inserted into said cleanout extension;

means for affixing said cleanout extension adaptor to the interior of said cleanout extension; and

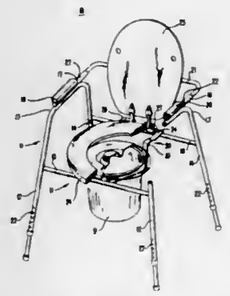
means on the interior of said cleanout extension adaptor for seating a sealing plug so that said sealing plug is substantially even with the area surrounding the top of the cleanout extension.

4,823,412

COMMODE CHAIR WITH PAIL AND SEAT SUPPORT

Alan M. Spiegel, New Rochelle, N.Y., assignor to Tenco Home Health Care Products, Inc., Passaic, N.J.

Filed Aug. 28, 1987, Ser. No. 90,779
Int. Cl.[4] A47K *13/26*
U.S. Cl. 4—483 **5 Claims**



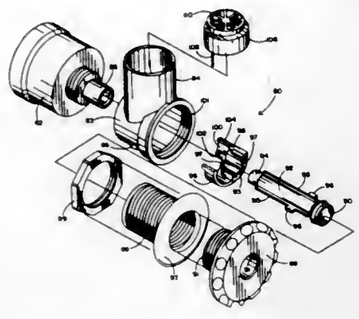
1. In combination with a commode apparatus with a removable receptacle, including a chair portion having front and rear leg portions, a hinged toilet seat, horizontally extending front and rear brace members extending between said front leg portions and said rear leg portions, respectively, and said rear brace member adapted for mounting said hinged toilet seat thereto, the improvement comprising:

a support structure connecting said rear brace member to said front brace member which includes:

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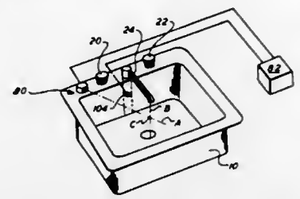
(i) a seat supporting portion including a raised portion for providing support to the rear portion of said toilet seat near said rear brace member, and,
(ii) a receptacle supporting portion for retaining said removable receptacle between said seat supporting portion and said front brace member,
whereby said support structure adds support to the rear portion of said toilet seat which carries a substantial portion of the user's weight.

4,823,413
COMBINED PNEUMATIC SWITCH AND AIR CONTROL FOR USE IN WHIRPOOL BATHS
Philip E. Chalberg, Costa Mesa; Manochehr Gordbegli, Santa Ana, and Paul N. Kenchel, Costa Mesa, all of Calif., assignors to Hydrabaths, Inc., Santa Ana, Calif.
Filed Mar. 14, 1988, Ser. No. 168,112
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—544 4 Claims



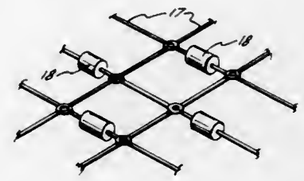
1. A combined pneumatic switch and air control apparatus for a whirlpool bath, the whirlpool bath of the type having a plurality of Venturi-type jets dispersed about a tub wall and connected to an air line and a water line, the water line being connected to a pneumatically switchable water pump; the apparatus comprising:
a pneumatic pump having a depressible plunger for generating a pulse of air pressure for activating and deactivating said water pump;
a push tube affixed to said plunger and extending axially therefrom to provide access for depressing said plunger from within said tub wall, said push tube having at least one radially extending protrusion;
an air control body having an aperture for receiving said plunger, an air bole for admitting ambient air, an air outlet for connection to said air line and a threaded aperture for receiving a threaded body;
an integral push tube retainer and tapered ring, said tapered ring being shaped to rest against the inner surface of said air control body for selectively blocking air flow into the said air outlet, said push tube retainer having means for receiving said push tube in axial slideable engagement therewith along the axis of said threaded aperture;
a threaded body having a first threaded portion for connection to said air control body at said threaded aperture and a flange, said first threaded portion being adapted to extend through an orifice in said tub wall and said flange being adapted to engage the inside tub wall surface adjacent said orifice; and
a face member having a second threaded portion for engaging said first threaded portion of said threaded body and a face portion for engaging said flange of said threaded body, said face member having an axially located channel for receiving said push tube said second threaded portion having at least one groove for receiving said push tube protrusion whereby rotation of said face portion rotates said tapered ring for regulating the air flow through said air control body;
said push tube protrusion being adapted to disengage from said face member groove upon depression of said plunger whereby to permit removal of said face member from said threaded body.

4,823,414
AUTOMATIC FAUCET-SINK CONTROL SYSTEM
Frank S. Piersimoni, New City, N.Y., and Hans Weigert, Ridgewood, N.J., assignors to Water-Matic Corporation, New City, N.Y.
Continuation of Ser. No. 821,406, Jan. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 714,366, Mar. 21, 1985, abandoned. This application Apr. 22, 1988, Ser. No. 185,377
Int. Cl.[4] E03C *1/05*
U.S. Cl. 4—623 13 Claims



1. A system for automatically providing the flow of fluid to a faucet of a sink in response to an object, such as a pair of hands, being placed in said sink below said faucet, and for turning off the flow of fluid to said faucet a predetermined time after the initiation thereof, or when said object is withdrawn from below said faucet before said predetermined time, said system comprising:
light emitting means positioned for emitting a light beam of predetermined spectrum and frequency to intersect the fluid flow path beneath said faucet;
light sensor means juxaposed to said light emitting means for detecting reflected light beams originating from said light emitting means, and reflected back from objects inserted beneath said faucet, whereby said light sensor means is positioned for ensuring its "cone of vision" is centered about the point of interest of said fluid flow path by said light beam, said light sensor means providing a low level output signal in response to said reflected light beams, and immediately terminating said output signal upon termination of said reflected light;
high-Q filter means tuned to the frequency of said light beams, receptive of said low-level output signal from said light sensor means, for filtering out unwanted signals and "noise" from said output signal;
variable gain amplifier means for both amplifying the filtered signal from said high-Q filter, and setting the sensitivity of said system, said variable gain amplifier means further including gain control means for manually adjusting the gain of said amplifier means for setting the sensitivity of said system relative to component variations, and the positioning of said light emitting means and light sensor means with respect to fluid flow path from said faucet;
detector means receptive of an output signal from said amplifier means for rectifying or demodulating the same, to provide a DC output signal;
DC voltage level detecting means responsive to said DC output signal, for providing a flow control signal upon said detector DC output signal attaining a predetermined level;
valve means connected between a source of fluid and said faucet, said valve means including an input terminal receiving said flow control signal, said valve means being responsive only to the presence of said flow control signal at said input terminal for permitting fluid to flow to said faucet; and
timer means including first means actuated by said flow control signal, for shunting said flow control signal away from said input terminal of said valve means upon elapse of a predetermined time period said timer means further including second means responsive to termination of said flow control signal by said detector DC output signal falling beneath said predetermined level for substantially immediately resetting said timer means;
whereby said water flow is shut off either by removal of said hands or objects from said sink; or (with said hands or object present) by elapse of said predetermined timer period.

4,823,415
CONVERTIBLE INFANT BED
Lucille B. Lampard, 1008 Martin Behrman Walk, Metairie, La. 70005
Filed Dec. 15, 1987, Ser. No. 133,375
Int. Cl.[4] A47C *29/00*; A47D *7/01*
U.S. Cl. 5—93 R 10 Claims



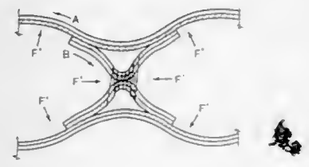
1. A convertible bed for use with both infants and toddlers up to eight (8) years in age comprising:
a. a pair of spaced apart headboards;
b. a pair of sides, at least one side having a movable portion that can be lowered, the headboards and sides defining a bed frame with an interior area;
c. a mattress support for supporting a mattress carried by the frame and vertically adjustable with respect to the frame, so that as the infant grows to be a toddler, the mattress can be lowered;
d. a domed canopy;
e. plurality of posts for supporting the canopy in a position spaced above the top of the headboards;
f. first removable connection means for disassembling/assembling the canopy and posts so that the canopy can be supported a distance above the top of the headboards so that a parent can lift an infant into or out of the bed interior;
g. second removable connection means for mounting the canopy upon the headboards to form a closure over bed interior with headboards and sides so that a toddler cannot escape the bed by climbing over the side or a headboard of the bed, the domed canopy defining an increased head room area of the bed above the sides to accommodate a toddler standing on the mattress when the toddler's head extends above the upper surface of the sides; and
h. an access doorway in at least one of the headboards and operable from both inside and outside of the interior area of the bed so that a toddler can enter and leave the bed interior at will.

4,823,416
METHOD AND APPARATUS TO PREVENT CLOGGING OF SEWER LINES
Arthur J. Biancato, 128 Englewood Ave., Barnegat, N.J. 08005, and Edward G. Kobylarz, 231 Dogwood La., Forked River, N.J. 08731
Filed Dec. 11, 1986, Ser. No. 940,591
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—255 19 Claims



1. Apparatus for use in a threaded hole in a cleanout plug in a sewer or drain pipe or for use in a threaded hole in a sewer or drain pipe, which apparatus comprises:
a rod having a threaded portion for threadably engaging the hole so that a portion of the rod is disposed within the pipe substantially transverse to the longitudinal extent of the pipe, whereby the rod is disposed substantially transverse to the direction of the flow of fluid through the pipe, the rod being disposed within the pipe so that the length of the portion which is disposed therewithin is adjustable and the portion does not extend substantially from one side of the interior of the pipe to the other side of the interior of the pipe, and the rod further having a means affixed to the portion of the rod which is not disposed within the pipe for use in rotating the rod; and
means, carried by said rod and being adjustable therealong, for sealing the hole when the rod is threadably engaged thereinto.

4,823,417
CORE STRUCTURE AND METHOD OF ITS MANUFACTURE
Miwa Fukuichi, Ibaraki, Japan, assignor to Kabushiki Kaisha Sanko Vinyl Kogyosho, Japan
PCT No. PCT/JP87/00043, § 371 Date Sep. 22, 1987, § 102(e) Date Sep. 22, 1987, PCT Pub. No. WO87/04605, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 23, 1987, Ser. No. 108,826
Claims priority, application Japan, Jan. 30, 1986, 61-19003
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—455 12 Claims

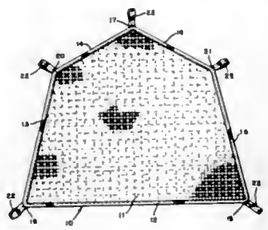


1. In a core structure for holding down an inflation of an air filled product wherein said air filled product is made of leathery type sheets, the improved core structure comprising upper and lower leathery type sheets (3), each leathery type sheet (3) being of a double layer construction and each being formed by

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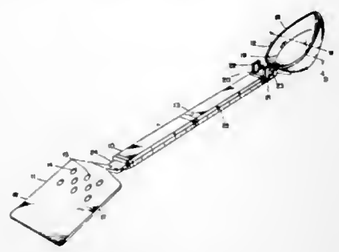
joining together a cloth sheet (1) and a high frequency wave fusible plastic sheet (2), said plastic sheets (2) being positioned toward the inside portion of said air filled product, a plurality of pairs of leathery type sheets (4) being provided as core members for said air filled product, each of said pairs of leathery type sheets (4) being of a double layer construction substantially identical to the double layer construction of said upper and lower leathery type sheets (3), each of said plurality of pairs of leathery type sheets (4) being positioned between said upper and lower leathery type sheets (3) such that the high frequency wave fusible plastic sheets (2') associated respectively therewith are positioned in opposed relationship with the high frequency wave fusible plastic sheets (2) associated with said upper and lower leathery type sheets (3), each leathery type sheet (4) having its opposite end portions (5) fused respectively with the corresponding upper and lower leathery type sheets (3), and each of said pairs of leathery type sheets (4) being bonded in a central region thereof by sewing with yarn.

4,823,418
BIRTH SAFETY NET
Margaret C. Downs, No. 1, 48th St., Valley, Ala. 36854
Filed Jul. 1, 1988, Ser. No. 214,593
Int. Cl.[4] A47C *21/00, 31/00;* A61G *1/00*
U.S. Cl. 5—503 10 Claims



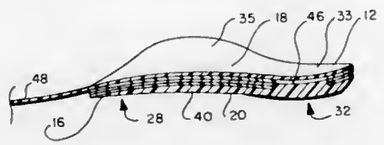
1. A birth safety net for use with a birthing chair or a birthing bed comprising:
(a) a body of substantially flat fabric having five sides and five corners; and
(b) attachment means at each corner for securring said safety net in five separate directions to said birthing chair or said birthing bed.

4,823,419
MULTI-PURPOSE UTENSIL FOR FOOD PREPARATION
Cynthia C. Stimpson, 8611 Inverness Dr. N.E., Seattle, Wash. 98115
Filed Aug. 12, 1988, Ser. No. 232,112
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—113 15 Claims



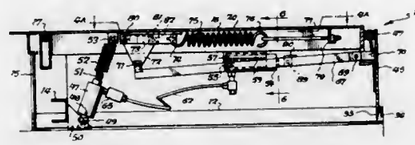
1. A multi-purpose utensil comprising:
a spoon/ladle assembly,
a spatula assembly, and
a handle assembly,
said handle assembly comprising a first part and a second part, said first part having a first end and a second end, said first end being attached to said spoon/ladle assembly,
said second part having a third end and a fourth end, said fourth end being attached to said spatula assembly,
said third end fitting telescopically into said second end,
whereby when said second and third ends are telescopically engaged said utensil comprises said handle assembly with said spoon/ladle assembly at one end and said spatula assembly at its other end and, when said second and third ends are telescopically disengaged said first part with said spoon/ladle assembly attached can be placed adjacent to said second part with said spatula assembly attached with said first and second parts in parallel proximity to each other and said spoon/ladle and spatula assemblies nested next to each other.

4,823,420
CONTOUR MOLDED INSOLE
Hans Bartneck, 291 Ferry Landing, Sanibel, Fla. 33957
Filed Dec. 4, 1986, Ser. No. 937,881
Int. Cl.[4] A43B *13/40, 13/38*
U.S. Cl. 12—142 N 3 Claims



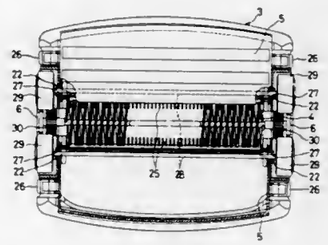
1. The method of forming an insole for footwear wherein said insole accurately conforms to the bottom contour of an individual's foot, said method comprising the steps of: providing a preform of resilient cushioning material (40) having a heel portion and an arch portion with an upwardly concave portion formed on the underside of said heel portion; providing a layer of moldable material (42) in overlying relation to said preform; imparting plasticity to said layer of moldable material; and forcing said layer of moldable material against the bottom of said individual's foot until said plasticity is diminished.

4,823,421
HYDRAULIC LIP ACTUATOR FOR DOCK LEVELER
Joseph P. H. Kleyujans; Walesty Kalempa, both of Corsopolis, and Dominic J. Pealer, Bridgeville, all of Pa., assignors to Eriks Holding N.V., Alkmaar, Netherlands
Filed Jul. 1, 1987, Ser. No. 69,008
Int. Cl.[4] E01D *1/00*
U.S. Cl. 14—71.3 29 Claims



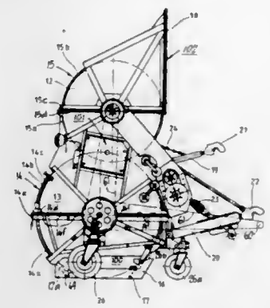
1. An actuating construction for raising a lip at the outer end of the deck of a dock leveler in response to raising said deck and for lowering said lip in response to the lowering of said deck comprising a base frame, a deck, first hinge means pivotally mounting said deck on said base frame, a lip, second hinge means for pivotally mounting said lip on said deck, means for pivotally raising and lowering said deck about said first hinge means, first fluid cylinder and piston means, first connecting means effectively coupling said first fluid cylinder and piston means between said deck and said base frame, second fluid cylinder and piston means, second connecting means effectively coupling said second fluid cylinder and piston means between said deck and said lip, and conduit means coupling said first fluid cylinder and means to said second fluid cylinder and piston means, said first fluid cylinder and piston means being actuatable in response to pivotal movement of said deck about said first hinge means during raising of said deck for pumping fluid through said conduit means to said second fluid cylinder and piston means to pivot said lip in a first direction about said second hinge means and thus raise said lip, said fluid being pumped from said second fluid cylinder and piston means through said conduit means to said first fluid cylinder and piston means in response to pivotal movement of said deck about said first hinge means during lowering of said deck to thereby pivot said lip about said second hinge means in a second direction which is opposite to said first direction to thereby lower said lip, said second connecting means including lost motion means for permitting externally actuated raising of said lip without affecting flow of fluid through said conduit means between said first and second fluid cylinder and piston means, and a stop associated with said second connecting means for limiting externally actuated lowering movement of said lip.

4,823,422
FLOOR SWEEPER
Kouichi Yoshimura, and Tsuyoshi Ishii, both of Osaka, Japan, assignors to Yamazaki Corporation, Osaka, Japan
Filed Jun. 3, 1988, Ser. No. 203,176
Claims priority, application Japan, Apr. 13, 1988, 63-92190
Int. Cl.[4] A47L *11/33*
U.S. Cl. 15—41 R 3 Claims



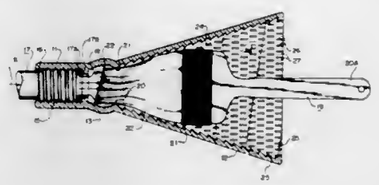
1. A manual cleaner comprising a case having a pair of side plates and having its bottom open, wheels mounted on axles extending through said side plates, a roller brush mounted so as to extend between said side plates and substantially in parallel with said axles, driven rollers, mounted at both ends of said roller brush and driven by said wheels, said roller brush being adapted to rotate with said driven rollers, and dust pans provided at both sides of said roller brush so as to cover the open bottom of said case, dust boxes defined by said dust pans and said case for collecting dust on the floor picked up by said roller brush, said each dust pan being formed at both sides thereof with bearing projections rotatably received in said side plates of said case so as to be pivotable about said bearing projections, said each bearing projection being formed with an axle mounting hole elongated in a horizontal direction so as to allow said axles received in said axle mounting holes to move only in a direction toward and away from said roller brush, whereby bringing said wheels into and out of contact with said driven rollers.

4,823,423
STREET SWEEPING APPARATUS
Max Schmid, Pocking, and Peter Lex, Griesbach, both of Fed. Rep. of Germany, assignors to Linnhoff GmbH, Pocking and Saku Maschinenbav A. Schmid, Winsen, both of, Fed. Rep. of Germany
PCT No. PCT/EP86/00208, § 371 Date Dec. 8, 1986, § 102(e) Date Dec. 8, 1986, PCT Pub. No. WO86/06120, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 8, 1986, Ser. No. 34,556
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1985, 3512730
Int. Cl.[4] F01H *1/04*
U.S. Cl. 151—83 17 Claims



1. A street sweeping apparatus comprising a sweeping device for sweeping a street surface to collect sweepings thereon, a container for the collected sweepings, a pickup device for propelling the sweepings from the street surface into the container, a motor vehicle supporting said sweeping device and container for transport therewith, the motor vehicle having a drive means, said pickup device being an independent unit, means detachably connecting said pickup device to said vehicle for transport therewith, said pickup device comprising a housing having a lower inlet opening at the level of the street and an upper outlet opening, said container having an inlet opening which communicates with the outlet opening of said housing when the pickup device is connected to the vehicle, said pickup device further comprising intermeshing sweeping rollers rotatably supported in said housing for taking up the sweepings and feeding the same into said containers, said intermeshing sweeping rollers comprising two superimposed brushes in said housing and a power take-off means for driving said brushes from the drive means of the vehicle.

4,823,424
PAINT BRUSH CLEANING FUNNEL
Dixon L. Allen, Smithfield, Utah, assignor to Stephen J. Thatcher, Logan, Utah
Filed Sep. 14, 1987, Ser. No. 95,765
Int. Cl.[4] B08B *3/04*
U.S. Cl. 15—104.92 5 Claims

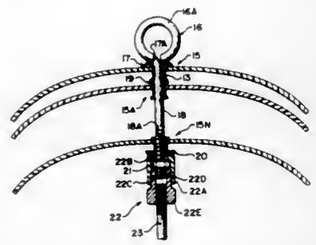


1. A paint brush cleaning funnel comprising a threaded

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liquid-inlet end, an outwardly flared funnel portion provided an unobstructed fluid exit end and having a longitudinal axis and an interior opening, and a brush-tip-receiving hollow intermediate portion disposed between and integral with said inlet end and said funnel portion, a representative transverse cross-section of said flared funnel portion opening, transverse to the said longitudinal axis of said flared funnel portion, being essentially rectangular, greater in length than in width, and of uniform width, to and through said fluid exit end.

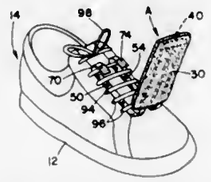
4,823,425
CHIMNEY FLUE BRUSH
Alan J. Drobot, 449 Trent Avenue, Winnipeg, Manitoa, Canada R2G 1K1
Filed Oct. 1, 1987, Ser. No. 103,290
Int. Cl.[4] F23J *3/00*
U.S. Cl. 15—162 **12 Claims**



1. A brush for cleaning a chimney flue comprising a central hub portion arranged to extend longitudinally of a central axis of the chimney and a plurality of projecting members for engaging an inner surface of the flue, each of the projecting members comprising a strip of flexible plastics material having a width angularly of the axis greater than a thickness longitudinally of the axis and a length greater than the width thereof, said central hub portion and said projecting members being divided into a plurality of separate portions each portion having a central disc and a plurality of said projecting members arranged in the plane of the disc and equiangularly spaced around the disc, said central hub including means mounting said discs together in a stack such that each disc is prevented from rotating relative to a next adjacent disc and such that the projecting members of each disc are angularly offset from those of a next adjacent disc, each said projecting member having a curvature in a direction out of a radial plane of said central axis containing the disc such that each separate portion substantially lies in a cone shape with the portions having their cone shapes all directed in the same longitudinal direction along said central axis wherein each of said projecting members having a central hole, and said disc includes eyelet means at said central hole for securing the projecting member of each of said portions together.

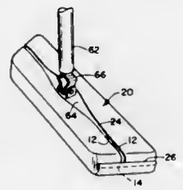
4,823,426
SHOE SOLE CLEANING DEVICE
Laurence G. Bragga, 144 S. Chestnut St., Jefferson, Ohio 44047
Filed Feb. 22, 1988, Ser. No. 158,881
Int. Cl.[4] A47L *23/00*
U.S. Cl. 15—210 R **9 Claims**

1. A sole cleaning device for a hardcourt athletic shoe having tie means extending transversely across the upper portion thereof, said device comprising a pad assembly including an inner cushion pad element and a fabric outer cover enclosing said pad element, said fabric outer cover being adapted to wipe clean a shoe sole of dust and dirt, and attachment means connected to said pad assembly, said attachment means comprising strap means adapted to extend in a releasably secured loop



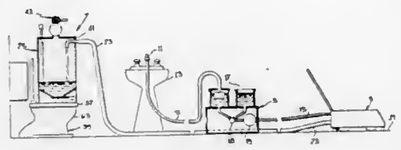
around said tie means to releasably attach said pad assembly to said upper portion of said shoe.

4,823,427
ELASTIC DUST MOP HEAD COVER
Lesley L. Gibbs, Norcross, and Charles J. Morell, Dunwoody, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 4, 1986, Ser. No. 848,431
Int. Cl.[4] A46B *17/04*; A47L *13/44*
U.S. Cl. 15—247 **48 Claims**



29. An elastic dust mop head cover comprising:
a web of thermoplastic nonwoven materials which is elastic in at least one direction and which is configured to form a pouch and to define an opening into the interior of said pouch;
wherein said opening is adapted to allow insertion of a mop-head into said interior of said pouch; and
wherein said cover is adapted to be secured in closely conforming relationship to said head solely by elastic forces exerted by the cover against the head.

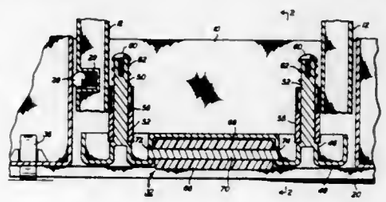
4,823,428
WASTE LIQUID DISPOSAL APPARATUS
Conrad Sevigny, 1555 Castelneau, Quebec, Canada J2S 7K6
Continuation-in-part of Ser. No. 423,360, Sep. 24, 1982, abandoned. This application Nov. 30, 1983, Ser. No. 556,528
Claims priority, application Canada, Sep. 27, 1982, 41213
Int. Cl.[4] A47L *5/38*
U.S. Cl. 15—302 **9 Claims**



1. A waste water disposal apparatus, for particular use in an industrial cleaning system, comprising:
a waste liquid accumulation tank;

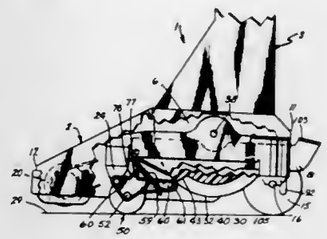
means on said tank for the mounting thereof over a draining means;
inlet means on said tank for the ingress of waste water thereinto;
means on said tank to cause discharge of said waste water into said tank through said inlet means, said means to cause discharge of waste water into said tank comprising:
means connected to said tank for withdrawing air therefrom to create a vacuum suitable to draw waste water therein from said inlet means,
means for automatically flushing waste liquid from said tank into said draining means when said waste liquid has reached a predetermined high level in said tank,
said means for automatically flushing were liquid from said tank comprising:
a bottom wall on said tank defining a waste water outlet;
a dump valve normally closing said outlet;
means for sensing high and low levels of waste liquid in said tank, said sensing means comprising a set of electrodes extending vertically into said tank with the ends thereof located at different heights corresponding to said high and low levels,
control means for automatically switching said air withdrawing means off when said high level in said tank is reached and for switching said air withdrawing means on when said low level in said tank is reached, and
pivot means mounting said dump valve on the bottom wall of said tank whereby said dump valve automatically pivots to open position under the weight of said waste liquid in said tank when said air withdrawing means is switched off, to allow said waste liquid to be flushed by gravity into said draining means.

4,823,429
VACUUM CLEANER
Salvatore Petralia, Sayreville, N.J., assignor to The Regina Co., Inc., Rahway, N.J.
Filed Apr. 25, 1988, Ser. No. 185,659
Int. Cl.[4] A47L *5/28, 5/34*
U.S. Cl. 15—333 **10 Claims**



1. In an upright vacuum cleaner having a nozzle housing movable over a surface over which said cleaner is movable and having forward and rearward ends, a top and a bottom, a brush rotatably mounted in said nozzle housing about an axis extending in a direction across the width of said nozzle housing and in the forward end thereof, said brush extending extending outwardly from the bottom of the nozzle housing, said vacuum cleaner also having a body with a bottom end pivotally mounted within said nozzle housing and rockable in a forward direction toward the forward end of said nozzle housing at least to a position where said body is upright and rearwardly past said upright position toward the rearward end of said nozzle housing, an improved mechanism for lifting the forward end of said housing to raise the forward end sufficiently to bring said brush out of engagement with the surface to be cleaned, which mechanism comprises a stanchion having a base of length at least about half the width of said nozzle housing, said stanchion also having a pair of posts disposed upright on said base and presenting upper ends above said base, said posts being spaced apart along the length of said base, mounting means for said stanchion in said nozzle housing having a pair of holes spaced from each other a distance equal to the spacing of said posts and in which said posts are reciprocably mounted and for locating said posts adjacent to the bottom of said body, a surface of the bottom of said body being engageable with the upper ends of said posts when said body is pivoted forwardly at least to said upright position thereof for reciprocating said stanchion downwardly beyond the bottom of said nozzle housing a sufficient distance to lift the brush above, and disengage said brush from, the surface over which said cleaner is movable.

4,823,430
VACUUM CLEANER WITH BRUSH LIFT-OFF
Robert A. Yonkers, Grandville, and Henry J. Rosendall, Grand Rapids, both of Mich., assignors to Amway Corporation, Ada, Mich.
Filed Nov. 17, 1987, Ser. No. 121,525
Int. Cl.[4] A41L *5/34*
U.S. Cl. 15—361 **17 Claims**



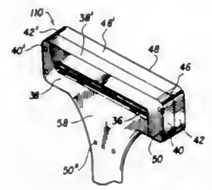
1. An appliance comprising:
a base having a working end;
a handle structure pivotally connected to said base and including a barrel portion having an arcuate, peripheral surface, said barrel portion further including at least one slot on a predetermined portion of said peripheral surface; and
a lift-off mechanism including an arm member pivotally attached to said base and a lift-off roller rotatably attached to said arm member and supporting said working end of said base at a variable height above a surface to be worked, said arm member being in engagement with said peripheral surface of said barrel portion such that said arm member is selectively received into and out of said at least one slot when said handle structure is pivoted, to thereby pivotally move said arm member and said lift-off roller attached thereto and thereby vary the height of said working end.

4,823,431
FAN BLADE CLEANING DEVICE
Weda B. Carpenter, Rt. 2, Box 907 R, Fort Worth, Tex. 76135
Filed Jun. 1, 1987, Ser. No. 55,833
Int. Cl.[4] A47L *9/06*
U.S. Cl. 15—394 **1 Claim**

1. A portable vacuum attachment device for cleaning ceiling fan blades comprising:
a molded front housing assembly,
a molded rear housing assembly,
said front housing assembly and rear housing assembly having fastening means for the mutual attachment thereof,
said front and rear housing assemblies forming a molded vacuum assembly defining an air chamber therein,
a frame element in the form of a closed loop having inwardly disposed cleaning bristles mounted within said air chamber and forming a passageway for the insertion of ceiling fan blades for contact with said bristles for the cleaning of

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said blades, said front and rear housing assemblies provided with an elongated orifice adjacent said closed loop passageway, and



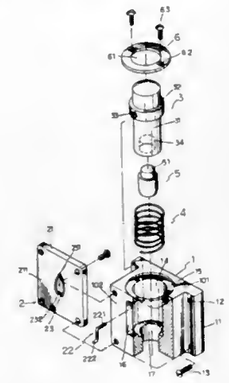
said vacuum assembly terminating at an inlet end element communicating with said air chamber and adapted to be joined to a source of vacuum.

4,823,432

DEVICES FOR STOPPING SWINGING DOORS

Cow M. Jan, No. 39-3, Aelly 350, Li Zen Rd., Tainan, Taiwan

Filed Feb. 5, 1988, Ser. No. 152,541
Int. Cl.⁴ E05F *5/00*
U.S. Cl. 16—86 A **1 Claim**



1. A door stop system fixedly secured to a door and adapted to frictionally engage a floor surface to maintain said door is fixed position with respect to said floor surface, comprising:

a body housing having a vertically directed cylindrical well formed therein, said well extending from an upper surface of said body housing, said body housing including a passage hole extending from a lower surface of said body housing in open communication with said cylindrical well, said cylindrical well and said passage hole defining a shoulder at an interface therebetween, said body housing including a port formed through a sidewall thereof in open communication with said cylindrical well;

a control member fixedly secured to said sidewall of said body housing, said control member having a guiding groove formed therein, said guiding groove defining a substantially heart-shaped closed contour having a first stop position at an apex of said guiding groove and a second stop position at a lower end of said guiding groove, said guiding groove in communication with said port;

a pin member having a pair of displaced substantially parallel end portions, one of said end portions of said pin member being displaceably engaged within said guiding groove; and,

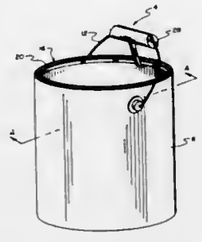
operational displacement means for controlling frictional engagement with said floor surface, said operational displacement means including a plunger member slideably displaceable within said cylindrical well, said plunger member having an upper end extending above said body housing upper surface, said plunger member further including a horizontally directed recess for receiving said other end of said pin member, said operational displacement means further including a friction member secured to a lower end of said plunger member for frictionally engaging said floor surface when said pin member is displaced to said second stop position and a spring member for biasing said plunger member in an upward direction, said operational displacement means being maintained within said body housing.

4,823,433

PAINT BUCKET HANDLE ACCESSORY

George C. Curtis, 302 E. 700 South, Springville, Utah 84663

Filed Jan. 19, 1988, Ser. No. 145,261
Int. Cl.⁴ A47J *45/07*
U.S. Cl. 16—114 R **10 Claims**



1. A removable holder attachment for use with a paint bucket having a wire loop handle and an inwardly and downwardly projecting lip on the upper rim thereof, said attachment comprising

a handle for grasping by a user, said handle including a channel formed generally on the top thereof and dimensioned for removably receiving the wire loop of the paint bucket, and

an elongate element having a hook which at one end is placeable under the lip of the paint bucket, the other end of which is attached to the handle so that when the wire loop is positioned in the channel of the handle and the hook is placed under the bucket lip, the bucket may be lifted by the handle to position and hold the wire loop to one side, allowing access to the interior of the bucket.

4,823,434

OUTER DOOR HANDLE

Akio Inagaki, Okazaki, and Masuo Shimomura, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

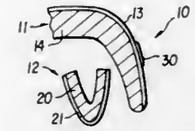
Filed Oct. 16, 1987, Ser. No. 109,034
Claims priority, application Japan, Oct. 17, 1986, 61-159697[U]
Int. Cl.⁴ B60J *9/00, 1/20*
U.S. Cl. 16—115 **4 Claims**

1. An outer door handle comprising:

a stationary case fixed to a door; and

a handle member movably mounted on said door adjacent said case;

wherein at least one of said case and said handle member comprises a base portion formed of polycarbonate resin having therein glass fiber at a rate of 10% by weight, and



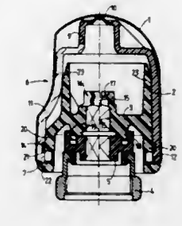
a thin film of said polycarbonate resin lacking glass fiber laminated on said base portion.

4,823,435

MULTIPART HANDLE FOR A SANITARY TAP

John Chappuis, Archamps, France, assignor to Kugler, Fonderie et Robinetterie SA, Geneva, Switzerland

Filed Aug. 2, 1988, Ser. No. 227,154
Claims priority, application Switzerland, Sep. 15, 1987, 3550/87
Int. Cl.⁴ B25G *1/10*
U.S. Cl. 16—121 **4 Claims**



1. Handle for sanitary apparatus intended to be fixed by mounting onto the free end of a control shaft, characterized by the fact that it comprises a metallic thin envelope defining the outside shape and the appearance of the handle, said envelope having a lower flange; a supple insert mounted inside the envelope comprising a dome to which several deformable flaps are attached, the lower edge of said flaps cooperating in a service position with the flange of the envelope, and a lock mounted inside the supply insert comprising portions applying the flaps of the supple insert directly against the internal surface of the envelope, the lower flange of the envelope resting on a lower flange of the lock, and by the fact that coupling means are provided on the inside surface of the lock enabling through their cooperation with each other the assembly of the three parts in assembled service position.

4,823,436

TWO-PART CONNECTING FIXTURE FOR FURNITURE WHICH INCLUDES A SPRUNG-DETENT LOCKING LEVER

Luciano Salice, Carimate, Italy, assignor to Arturo Salice S.p.A., Novedrate, Italy

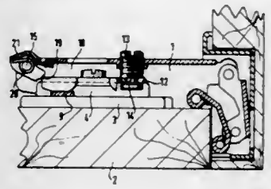
Filed Nov. 24, 1987, Ser. No. 124,529
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1986, 3640012
Int. Cl.⁴ E05D *7/12*
U.S. Cl. 16—258 **6 Claims**

1. A two-part connecting fixture for connecting parts of a piece of furniture, preferably to a hinge bracket and mounting plate assembly, wherein one of the parts of the fixture is provided with a spring-loaded pivoted lever and the other with an abutment that is interengageable with the lever,

the lever and the abutment are respectively provided on confronting surfaces with a curved detent flank and with an engaging edge facing the detent flank,

the lever is arranged to move about a pivot axis and snap to a locking position as the parts are fitted together,

actuating means is provided for moving the lever from its locking position to a release position in which the lever is free of the abutment,



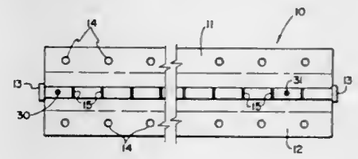
a stop is provided, for limiting the displacement of the parts which are interlocked, and the fixture includes interengaging means on the detent flank and the engaging edge respectively for arresting the lever as it is moved from the locking position toward the release position and preventing separation of the parts except by movement of the pivot axis of the lever.

4,823,437

SPRING LOADED HINGE

Stanley R. Tatara, 4911 Schutt Rd., Akron, N.Y. 14001

Filed Mar. 21, 1988, Ser. No. 170,835
Int. Cl.⁴ E05F *1/08*
U.S. Cl. 16—300 **5 Claims**



1. An elongated, continuous piano-type hinge, comprising:

(a) a door leaf and a door frame leaf in meshing, rotating relation;

(b) a pair of elongated, solid pivot pins in axially aligned spaced relation, the two pins engaging the leaves and holding them in meshing, rotating relation, the pins being oppositely disposed and sized to carry the weight of a door to which the door leaf is secured, the pins having more closely spaced ends with slots for receiving opposing ends of a spring;

(c) a single flat spring with a rectangular cross-section disposed longitudinally between the pins in engaged relation with the slots, the spring having a torsional strength which is correlated to the weight of the door to which the door leaf is secured;

(d) a hollow cylindrical sleeve extending between the pins in surrounding relation with the spring, the sleeve having an outer diameter which is substantially the same as the outer diameter of each pin; and

(e) means for securing one of the pins to the door leaf for unitary rotation therewith and the other of the pins to the door frame leaf for unitary rotation therewith.

VOL 1101 ISS 4 AP 25 1989 UMI

4,823,438

HINGE ASSEMBLY FOR SHOWER STALLS

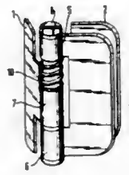
Heinz-Rudolf Roloff, Hüttenallee 39, D-4150 Krefeld, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,900

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 8701703[U]

Int. Cl.⁴ E05F *1/08*

U.S. Cl. 16—307 **2 Claims**



1. A hinge assembly for shower stalls, comprising:
a hinge pin having an axis;
first and a second hinge sleeves mounted at opposite ends of said pin and rotatable about said axis, said first and second hinge sleeves being axially spaced apart;
first and a second hinge leaves, said leaves having respective interior sides, said first hinge leaf being connected with said first and second hinge sleeves;
a third hinge sleeve rotatably mounted on said hinge pin between said first and second hinge sleeves and spaced from said first sleeve, said third and first hinge sleeves defining an axially extending gap therebetween, said third sleeve being adjacent to said second sleeve and connected with said second hinge leaf;
first and a second socket sleeves at the respective first and second leaves, said socket sleeves being parallel to said axis and fixed on the respective interior sides against said first and third hinge sleeves; and
a helical spring having two ends, said helical spring being coiled around said hinge pin and positioned in said gap, each of said ends of said spring being received by a respective one of said socket sleeves, so that said hinge leaves are biased toward each other by spring tension.

4,823,439

MACHINE FOR FILLING DOUGH-LIKE MATERIALS

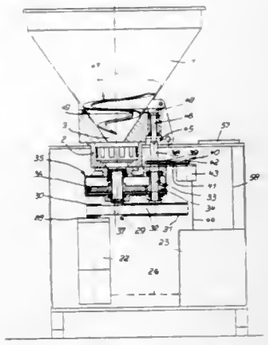
Karl Schnell, Mühlstrasse 28, 7065 Winterbach, Fed. Rep. of Germany

Filed May 22, 1987, Ser. No. 54,268

Claims priority, application Fed. Rep. of Germany, May 24, 1986, 3617560

Int. Cl.⁴ A22C *11/10*

U.S. Cl. 17—33 **32 Claims**



1. A machine for filling pasty media, particularly sausage stuffing, into a hose shaped sleeve, comprising a filling pump having a pressure side;
a filling pipe for receiving a sausage sleeve and connected with said pressure side of said filling pump and having a free end;
a braking ring arranged so that a medium is pulled through the sleeve between said braking ring and said free end of said filling pipe;
an electrically controlled motor which intermittently drives at least said pump;
a microcomputer which controls said motor;
a removable turning device for forming sausage tips;
means for driving said turning device; and
a second controllable motor arranged for driving said turning device, said second motor being controllable by said microprocessor.

4,823,440

WEB WEIGHT CONTROL SYSTEM

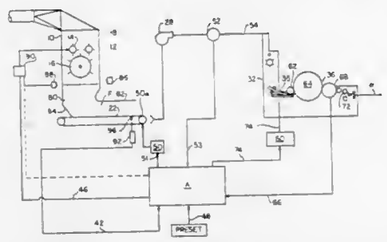
Akiva Pinto, Gastonia, N.C., assignor to John D. Hollingsworth On Wheels, Inc., Greenville, S.C.

Continuation-in-part of Ser. No. 886,711, Jul. 18, 1986, Pat. No. 4,689,857. This application Aug. 28, 1987, Ser. No. 90,736

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.⁴ D01H *5/38*

U.S. Cl. 19—105 **19 Claims**



13. Apparatus for controlling the weight of a web produced by a carding machine of the type having a fiber feeding system which includes a fiber supply means which supplies and weighs the fibers, and fiber delivery means for delivering said weighed fibers to a fiber storage means which stores said fibers and forms said fibers into a fiber batt for feeding to a card feed roll of the carding machine, said apparatus comprising:
first sensor means operatively connected to said fiber supply means for weighing fibers being supplied to said fiber delivering means by said fiber supply means and generating a fiber weight signal corresponding to the actual weight of fibers being supplied;
a preset web weight signal representing a desired weight for said web produced by said carding machine;
control means connected to receive said actual fiber weight signal and said preset web weight signal;
said control means connected to said card feed roll to control the rate that said fiber batt is fed to said carding machine by said card feed roll as a function of the comparison of the actual fiber weight signal and said preset web weight signal; and the improvement comprising
said fiber supply means including a conveyor means for transporting fibers to said fiber delivery means, and said first sensor means weighing said fibers while being transported by said conveyor means.

4,823,441

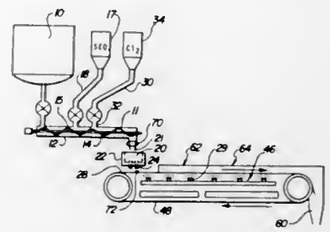
HIGHLY ALKALINE DETERGENT PELLETS AND PROCESS THEREFOR

Terrence Cotter, Southgate; Theodore Anderson, Grosse Ile; Robert Ganseer, Riverview, all of Mich., and Louis Kryk, Windsor, Canada, assignors to Diversey Corporation, Mississauga, Canada

Filed Nov. 10, 1987, Ser. No. 118,959

Int. Cl.⁴ C11D *13/20, 17/06*

U.S. Cl. 23—313 R **8 Claims**



1. A multi-step mixing process for manufacturing a highly alkaline detergent pellet, comprising:
(a) heating a concentrated aqueous alkaline material or a mixture of alkaline material to an elevated temperature;
(b) dispensing the concentrated aqueous alkaline material into a feed tube;
(c) downstream of the feed tube mixing a sequestrant with the concentrated aqueous alkaline material to form a detergent mixture;
(d) feeding the mixture from the feed tube into a distribution box; and
(e) dropping droplets of the mixture from the box onto a chill belt to form solid pellets thereof consisting of alkaline material and sequestrant.

4,823,442

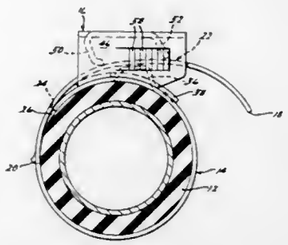
HOSE CLAMP

Charles Behr, Brighton, Mich., assignor to Gagnier Products Company, Oak Park, Mich.

Filed Mar. 7, 1988, Ser. No. 165,244

Int. Cl.⁴ B65D *63/02*

U.S. Cl. 24—20 R **8 Claims**



1. A hose clamp comprising:
an elongated strip having two ends:
a narrowed tail projection at one end of said strip and an aperture in said strip enabling said tail projection to pass through said aperture when said strip is wrapped upon itself about an article;
a separable housing on said strip, said housing including a pair of side walls extending from longitudinal sides of said strip transverse to said strip and opposing one another, and a top spanning between said two walls enclosing the housing over said strip;
a member projecting from said strip within said housing for seating said strip within said housing when said strip is wrapped upon itself in a use position;
means projecting from said top of said housing for sandwiching said strip between said housing projecting means and said strip projecting member;
one or more angular barbs on both longitudinal sides of said strip adjacent to one of said ends of said strip; and
one or more angular barbs on each of said housing side walls for meshing with said strip angular barbs for locking said strip within said housing when said strip is wrapped upon itself in a use position.

4,823,443

STRAP TIE DOWN DEVICE AND METHOD FOR ITS USE

Veldon Waters, 5083 Harris Blvd., Ogden, Utah 84403

Filed Jun. 18, 1987, Ser. No. 63,326

Int. Cl.⁴ B25B *25/00*

U.S. Cl. 24—68 CD **6 Claims**



1. A strap adjusting and tension device for securing cargo and the like which utilizes a combined winch-pulley effect permitting one to greatly increase the tension force that can be applied, which device comprises: a rigid frame means comprising a base, a pair of spaced elongated side plate members attached perpendicularly to opposite sides of said base, two sets of two extending connecting rod means joined to both side plate members above and across the said base, with a set of two connecting rod means at each end of said base, a first of said sets having its two extending connecting rod means separated from each other by sufficient distance to permit looping of a strap placed between said connecting rod means of said first set, which loop being capable of being held in place by adding a removable rod means between the side plates under the loop, a winch strap tightening means possessing a slot for insertion of a strap attached between said side plate members above the base and between the two sets of connecting rod means at both ends of the frame, and means for rotating the winch strap tightening means so as to tighten a strap placed in the slot of the winch strap tightening means, and means for holding the winch strap tightening means connected between a side plate member and said winch strap tightening means to prevent unwinding of the strap placed in the slot.

4,823,444

EXTENSIBLE LOOP HOOK FASTENING DEVICE

Walter Louis Larsen, P.O. Box 18302, Seattle, Wash. 98118

Filed Mar. 17, 1986, Ser. No. 840,607

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

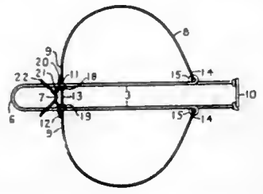
Int. Cl.⁴ A44B *13/02*

U.S. Cl. 24—231 **64 Claims**

1. A connecting device generally capable of connecting an object to a generally linear member, said device comprising the combination of a hook and a clip having a generally elongated loop of at least semi rigid construction for fastening the hook to the linear member, wherein the clip has means for allowing the effective length of the loop to be elastically extended, wherein there is means for attaching the object, at least indirectly and at least temporarily, to the hook, generally to the non-hooked or shank portion of the book, wherein the book is of such size with respect to the diameter or thickness of the linear member to which it is being fastened that the linear member is compara-

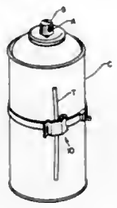
VOL 1101 ISS 4 APR 25 1989 UMI

tively thin with respect to the size of the hook, as exemplified by the comparison in size between a typical garment hanger hook and a typical clothesline, and wherein the installed position and assembled configuration of said connecting device is one in which the object, when it is being connected to the linear member, is attached to the hook by means mentioned above, the hook is hooked to the linear member in the normal manner, and the clip is positioned with respect to the hook and the linear member such that the loop contacts and bears upon the outside surface of the hook at two substantially inwardly



inclined locations on the hook, one such location being on each side of the position occupied by the linear member, and the loop effectively lies between said two locations where it contacts the outside surface of the hook so as to pass under the linear member and to contact and bear on the undersurface of the linear member, thereby positively and forcefully clamping the hook to the linear member, whereby, in having said object attached or attachable to the hook while the hook is, in turn, fastened or fastenable to the linear member by the clip, said object can be connected to the linear member by said connecting device.

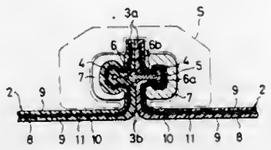
4,823,445
STORAGE CLIP
Michael P. Diener, P.O. Box 161, Novato, Calif. 94948
Filed Feb. 23, 1988, Ser. No. 159,269
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—326 **3 Claims**



1. A storage clip for releasably retaining an accessory object to a primary object, said storage clip conditioned for attachment to a mounting strap having a free end and a strap lock portion, said storage clip comprising:

a clasp member having a single jaw portion, said single jaw portion conditioned for secure capture of said mounting strap, a body portion adjacent to said jaw portion and configured to define a void between said body portion and said mounting strap, and a tab portion adjacent to said body portion, said tab portion providing a manually engageable surface for lifting said body portion away from said mounting strap, wherein when said mounting strap free end is wrapped around a primary object and secured in said strap lock portion, said clasp member body portion is urged by tension against said strap member to capture an accessory object placed therebetween.

4,823,446
FLUID-TIGHT SLIDE FASTENER STRINGER
Noritaka Tsubata, Uozu; Koichi Tsukawa, Toyama, and Kozo Watanabe, Kurobe, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan
Continuation of Ser. No. 24,529, Mar. 11, 1987. This application Mar. 1, 1988, Ser. No. 165,423
Claims priority, application Japan, Mar. 14, 1986, 61-37979[U]; Mar. 18, 1986, 61-39607[U]
Int. Cl.[4] A44B *19/32*
U.S. Cl. 24—389 **1 Claim**



1. A fluid-tight slide fastener stringer comprising:

(a) a fluid-tight tape including

(1) a ground fabric having non-stretchable warp inlaid threads and stretchable weft inlaid threads, and

(2) a fluid-tight layer of elastic material covering opposite surfaces of said ground fabric;

(b) a series of discrete coupling elements mounted on said tape along an inner longitudinal edge portion thereof, each of said coupling elements having a generally I shape having a base portion, a leg portion and a head portion;

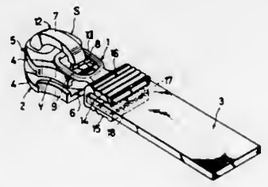
(c) said inner longitudinal edge portion of said tape having a longitudinally extending fold so as to extend around said base portions of said coupling elements;

(d) a series of generally C-shaped clamping strips each surrounding in clenched form said fold portion of said tape over said base portion of a respective one of said coupling element;

(e) said fluid-tight layer at a rear side of said ground fabric having a thickness greater than the thickness of said layer at a front side of said ground fabric to which side said clamping strips are clinched; and

(f) the fluid-tight layer at the rear of the ground fabric having in its free state a thickness greater than the thickness of said fluid-tight layer.

4,823,447
PULL TAB ATTACHMENT FOR SLIDE FASTENER SLIDER
Shunji Akaishi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Aug. 10, 1988, Ser. No. 230,437
Claims priority, application Japan, Aug. 12, 1987, 62-124064[U]
Int. Cl.[4] A44B *19/26*
U.S. Cl. 24—429 **8 Claims**



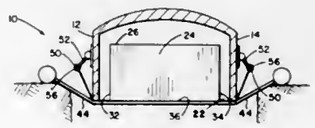
1. A pull tab attachment for attaching a pull tab to a slider body of a slide fastener slider, the pull tab having an end and the slider body having a pull tab retainer, said pull tab attachment comprising:

an attachment body made of a plastically deformable material;

a ring member on one end of said attachment body for being loosely fitted in the pull tab retainer; and

a pair of jaws comprising a pair of gripper arms on the opposite end of said attachment body for gripping the end of the pull tab therebetween, said gripper arms having on inner confronting surfaces thereof a plurality of biting teeth extending in different directions for biting engagement with the end of the pull tab gripped between said gripper arms.

4,823,448
CASKET COVER
Clarence G. Martin, Rt. 1, Box 255, Sulphur Springs, Ark. 72768
Filed Sep. 26, 1986, Ser. No. 911,730
Int. Cl.[4] A61G *17/00*
U.S. Cl. 27—35 **3 Claims**



1. A casket system comprising:

a unitary casket cover having opposed sides, opposed ends, an open bottom and a top closable by a hinged lid;

the casket cover having at least two pairs of handles extending from each of said opposed sides, the pairs of handles being of the same number on each said side of said casket cover and equally spaced apart from each other on each side and each handle having an outer end and an inner end, the inner end of each handle being affixed to a said casket cover side and the outer end having openings therethrough, the openings of the handles affixed to each casket cover side being in alignment;

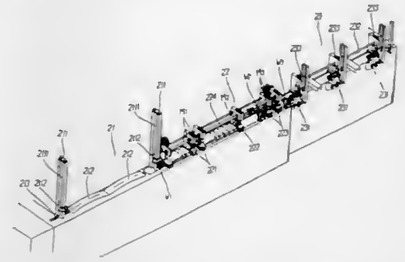
a coffin having a bottom, a top, opposed sides and opposed ends and being dimensioned to receive a human body therein and to be received within said casket cover through said casket cover open bottom;

a plurality of web slings positioned below said coffin bottom and said casket cover open bottom, there being one web sling for each said pair of handles on a said side of said casket cover with each web sling having opposed ends;

a tubular member formed by each of said web sling's opposed ends, the length of each tubular member being less than the spacing between said outer ends of each handle and each tubular member being positioned between the outer ends of said handle with the opening in the tubular members being aligned with said openings in said handles; and

a pair of elongated handle rods, there being one for each of said sides of said casket cover, each handle rod being received by said openings in each of said handles and being received by said tubular members positioned between the outer end of each handle whereby said web slings are retained in position below said casket cover and said coffin and said coffin is retained within said casket cover as long as said elongated handle rods are in place and whereby said handle rods may be slideably removed from said handles and said tubular members to permit said coffin to be removed from within said casket cover.

4,823,449
AUTOMATIC AND CONTINUOUS MECHANISM FOR PROCESSING AND ASSEMBLING VENETIAN BLIND SLATS
A-Shen Chang, No. 15-1, Lane 494, Fu Chien Road, Fu Hsin Ts'un, Fu Hsin Hsiang, Changhua Hsien, Taiwan
Filed Nov. 9, 1987, Ser. No. 118,224
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—24.5 **3 Claims**



1. An automatic and continuous mechanism for processing and assembling blind slats comprising

a first stage feed means;

a second stage length setting and perforating station which receives a venetian blind slat from said first stage feed means; and for cutting the slat into a predetermined size and, at the same time, effecting the perforation of said slat; and

a third stage cord fixing station which receives said slat removed from said length setting and perforating station;

said first stage feed means, said second stage length setting and perforating station and said third stage cord fixing station being arranged in a rectilinear consecutive manner for delivering stacks of elongated venetian blind slats one by one to said length setting and perforating means;

wherein said first stage feed means includes a pair of rearward and forward upright guide members spacedly located at rearward and forward ends of said feed means, each guide member having an elongated slot disposed thereon for accommodation of forward and rearward ends of a stack of slats, with an adjustable press weight slidable located between said guide members for pressing on top of said stack in operation, and a cylinder-actuated delivery block, disposed under the rearward guide member, for moving a bottommost slat in said stack forward in operation by pushing the rearward end thereof, a first pair of rolling rollers being disposed at the forward end of said feed means, just next to the forward guide member so that the pushed slat can be further pulled forward by said first pair of rolling rollers to move into said second stage length setting and perforating station continuously in operation;

said second stage length setting and perforating station including three sets of cutting devices, each having a ram head, spacedly located and synchronously operated by means of a drive axle so to enable the ram heads of said cutting devices to punch on said slat simultaneously, the distance between said cutting devices being adjustable; second and third pairs of rolling rollers being disposed just rearward and forward of the forward most cutting device, respectively, for effecting continuous transfer of the slat to the said third stage cord fixing station;

said third stage cord fixing station comprising three sets of upright cord fixing units spacedly located, each with a vertically hung stair chair rope assembly attached thereon, means for feeding said slat into rings of said stair chain rope assembly and three sets of lifter means synchronously operated by a driving rod, and a limiting switch means disposed at a forward end of the cord fixing station

for controlling the operation of feeding in and lifting up of the slat, whereby each assembled slat may be raised one by one and accumulated in a stack.

4,823,450

ROLLER UNIT FOR CALENDERS, PLANISHERS OR THE LIKE

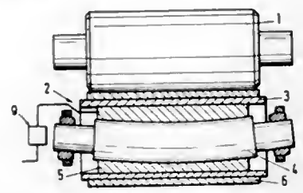
Rolf Ramisch, Krefeld; Josef Pav, Krefeld-Fischeln; Hans-Dieter Patermann, Willich, and Dieter H. Müller, Achim, all of Fed. Rep. of Germany, assignors to Ramisch Kleinewefers GmbH, Fed. Rep. of Germany

Filed Oct. 30, 1986, Ser. No. 924,994

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 8531065[U]; European Pat. Off., Sep. 9, 1986, 861124659

Int. Cl.[4] B21B *13/02*

U.S. Cl. 29—116.2 **11 Claims**



1. A roller unit for calenders, glazing rollers or the like, including a sag-compensated roller having a roller shell which is supported for the compensation of sags, and including a mating roller, whereby one of the rollers includes a surface engraving, comprising the improvement wherein the roller provided with the surface engraving is a sag-compensated roller; the surface engraving of the sag-compensated roller is arranged on an outer portion of the sag-compensated roller; the outer portion is removable in an axial direction; and the outer portion has at least its support region composed of a material having a lower coefficient of expansion than the component part it respectively envelopes.

4,823,451

FORGED COLD-ROLLING ROLL

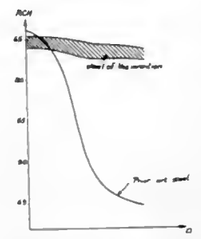
Joseph J. Terrasse, Pont Salomon; Michel Seux, Le Chambon, and Robert Leveque, Firminy, all of France, assignors to Chavanne Ketin, Puteaux, France

Continuation-in-part of Ser. No. 882,252, Jul. 7, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 166,800

Claims priority, application France, Jul. 8, 1985, 85 10426

Int. Cl.[4] B21B *27/00*

U.S. Cl. 29—129.5 **2 Claims**



1. A forged cold-rolling roll made from a low alloy steel having after quenching a high surface hardness of between 90 and 105 shore C and an improved depth of the hardened layer of at least 27 mm, said alloy steel having the following composition by weight: C: 0.76 to 0.92; S<0.020; P<0.025; Ni<0.60; CR: 1.50 to 2.20; V: 0.08 to 0.25; Cu<0.50 and amounts of Mn, Si and Mo selected in the ranges: 0.70 to 1.40 for Mn; 0.70 to 1.40 for Si and 0.15 to 0.55 for Mo resulting in an improved hardenability, the remainder of the steel being iron and accidental impurities.

4,823,452

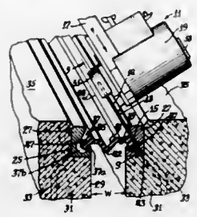
SEAM FORMING APPARATUS FOR ASSEMBLING FLEXIBLE EXPANSION JOINT SYSTEMS

Marie-Louis Cloutier, 2821 W. 38th Pl., Hobart, Ind. 46342

Filed Feb. 3, 1984, Ser. No. 576,713

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—235 **6 Claims**



1. Seam forming apparatus for forming an interlocking seam in a flexible strip seal expansion joint system of the type including at least one rail having a substantially uniform transverse cross-sectional configuration which defines an involute channel having a relatively narrow throat and relatively bulbous interior, and a seal gland also having a substantially uniform transverse cross-sectional configuration which defines a compressible head section that presents a pair of shoulders and which is affixed to a web; said involute channel in said rail being adapted for receiving said compressible head section of said seal gland to form an interlocking seam therewith; said apparatus comprising:

a substantially flat and circular disc, rotatable about its center;

a plurality of spaced-apart teeth about the circumference of said disc;

an abutting surface on each of said teeth engagable with one of said shoulders of said compressible head;

said spaced-apart teeth having a fin-like configuration, swept back with respect to the direction of rotation of said disc; and

pushing means adapted for applying a force to said rotatable disc in a direction substantially normal to the axis of rotation of said disc;

so that when said compressible head is located adjacent said involute channel such that one of said shoulders is placed in the bulbous interior of said involute channel and the abutting surface of at least one of said teeth is engaged with said other shoulder of said compressible head section, a force can be applied to said pushing means and transferred to said teeth causing a longitudinal portion of the compressible head section to collapse, so that said other shoulder can be squeezed through the throat and received in the bulbous interior of the involute channel and permitted to expand to its unstressed configuration, thus starting said seam formation and,

so that the remainder of the compressible head section of the seal gland can be fed into the involute channel in a sequential, zipper-like, manner by maintaining said force on said pushing means, rotating the disc and moving it along the channel causing new teeth to sequentially engage successive sections of said other shoulder of said compressible head and pushing successive sections through the throat and into the bulbous interior of said involute channel, thus completing the formation of the interlocking seam between said seal gland and rail.

4,823,453

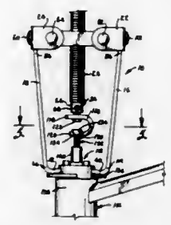
COMBINATION FAUCET CARTRIDGE AND HANDLE PULLER

Joseph E. Bartlett, 235 S. Parker, Olathe, Kans. 66061

Filed Oct. 2, 1987, Ser. No. 103,711

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—261 **7 Claims**



1. A tool for removing a faucet handle from the stem of a faucet and a flow control cartridge from within a housing in the faucet, said tool comprising:

a block having an internally threaded aperture;

a pair of spaced apart jaws having upper and lower ends, said jaws pivotally coupled at said upper ends with said block;

means for coupling said jaws with said faucet handle and supporting said jaws on said faucet, said means coupled with said lower ends of said jaws;

an elongated threaded member coupled with said aperture in said block and having upper and lower ends;

an axially extending inner passageway formed within the lower end of said threaded member;

a first element having a lower end sized for engaging said cartridge stem and having an upper end sized for placement within said passageway;

a second element interchangeable with said first element and having an upper end sized for placement within said passageway and a claw-shaped lower end for coupling with said cartridge stem;

means for releasably securing the upper ends of said first and second elements within said passageway;

wherein said first and second elements may be extended and retracted when coupled with said elongated member by rotation thereof, and

wherein said handle may be removed when said first element is coupled with said elongated threaded member by coupling said jaws with said handle and extending said first element to engage said cartridge stem and exert a resulting force on said handle parallel to a longitudinal axis of said elongated threaded member,

wherein when said second element is interchanged with said first element said cartridge maybe removed by coupling the claw-shaped lower end with the cartridge stem, supporting said jaws on said faucet and retracting said second element to exert a resulting force on said cartridge parallel to said longitudinal axis.

4,823,454

METHOD OF ATTACHING A ROTATABLE CUTTING BIT SHIELD

Ronald D. Mills, 960 S. Jay Cir., Anaheim, Calif. 92807

Division of Ser. No. 762,928, Aug. 6, 1985, Pat. No. 4,660,890. This application Apr. 10, 1987, Ser. No. 36,789

Int. Cl.[4] B23P *11/02*

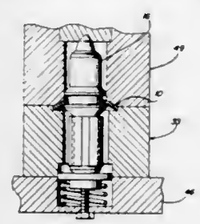
U.S. Cl. 29—437 **3 Claims**

1. A process for fastening to a cylindrical shaft a object made of hard malleable metal having relatively uniform thickness, a convex upper surface, concave lower surface, and a hole through the thickness dimension of said object, the diameter of said hole being initially larger than the diameter of said cylindrical shaft, said process comprising:

(a) sliding said object coaxially over said shaft to a desired axial position,

(b) supporting said lower surface of said object, and

(c) impacting said upper surface of said object,



whereby the resultant reduction of convexity of said upper surface and the resultant reduction in concavity of said lower surface of said object causes material of said object to flow plastically inward, thereby reducing the initial diameter of said hole in said object to a smaller final value, and thereby decreasing clearance space between the inner circumferential surface of said hole and the outer circumferential surface of said shaft.

4,823,455

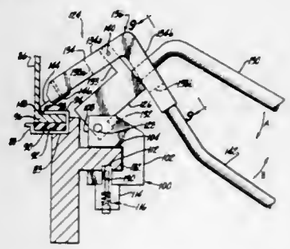
RADIATOR CRIMPING AND DECRIMPING TOOLS

Richard A. Desiro, 42995 Ambridge, Northville, Mich. 48167

Continuation-in-part of Ser. No. 32,965, Apr. 1, 1987, Pat. No. 4,769,888, which is a division of Ser. No. 268,551, Jun. 1, 1981, Pat. No. 4,411,414. This application Feb. 18, 1988, Ser. No. 156,756

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—243.5 **7 Claims**



1. A decrimping tool for use in the decrimping of tabs of internal combustion engine radiators of the type including a radiator core, a header secured to said radiator core, and a tank joined to said header by a series of tabs bent over a radiator tank flange, said tabs in the crimped position extending immediately adjacent a radiator tank side wall, said radiator tank side wall extending generally normally to said radiator tank flange, said decrimping tool comprising:

a pair of mutually parallel side rails, each of said side rails having a top surface, a mutually facing surface and an outfacing surface, each of said side rails further having a shouldered recess at the juxtaposition of said mutually facing surface with said top surface;

a rail projection member attached to said outfacing side of each of said side rails, said rail projection member having a slot along its length;

a generally U-shaped base portion defining a cavity, said cavity being structured to receive said rail projection member, said U-shape base portion having a clevis attached thereto;

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a retaining member retractably mounted to said U-shaped base portion, said retaining member projecting into said cavity, said retaining member further being structured to be receivable by said slot in said rail projection member of each said side rails;

means for biasing said retaining member in a direction toward said cavity;

means for selectively retracting said retaining member from said cavity;

a primary block having a first end and a second end, said primary block being pivotably attached at said first end thereof to said clevis, said primary block having at said second end thereof a first handle, said primary block further having a secondary block pedestal attached thereto adjacent said first handle;

a secondary block having a first end and a second end, said secondary block being pivotably attached to said secondary block pedestal, said secondary block having a first portion and a secondary portion mutually oriented at substantially 90° to each other, said secondary block having a channel for insertion of said secondary block pedestal thereinto and for insertion of said first handle therethrough, said secondary block further having a second handle attached to said second portion at said first end of said secondary block; and

a hook finger attached to said first portion of said secondary block at said second end of said secondary block for abutting a tip of said tab;

whereby said tab is decrimped using said decrimping tool when said header is received in said shouldered recess of each said side rail, said rail projection member is received by said cavity, and said retaining member is received by said slot, said decrimping of tabs being accomplished by a simultaneous rotary motion applied to said first handle and a squeezing action applied to said second handle.

4,823,456

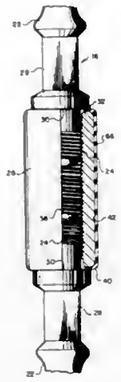
METHOD FOR PROTECTING SUCKER ROD COUPLINGS FROM ABRASION AND CORROSION

Kenneth W. Gray, 2403 Bobwhite Dr., Odessa, Tex. 79762

Filed Oct. 26, 1987, Ser. No. 113,549

Int. Cl.⁴ B23P *25/00*

U.S. Cl. 29—458 **11 Claims**



1. The method of protecting tubular sucker rod couplings having threads, a diameter and two ends having radial faces from corrosion and abrasion, comprising:

a. reducing the diameter of the couplings by removing metal,

b. choosing a granulated resinous material having a specific fusion temperature,

c. heating said coupling to a temperature above said fusion temperature,

d. inserting plugs into each end of the coupling,

e. contacting all exposed surfaces of said coupling with said granulated resinous material until a desired amount of resinous material fuses onto the exposed surface of the coupling, said desired amount to be a thickness equal to the metal removed as described in step (a) above,

f. removing said plugs from said coupling,

g. cooling said coupling.

4,823,457

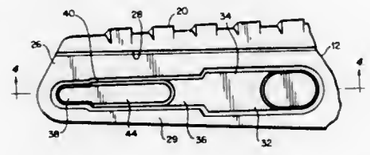
DISPOSABLE SURGICAL SCALPEL

Frank H. Prochaska, Waynesboro, Va., assignor to American Safety Razor Company, Verona, Va.

Filed Apr. 20, 1988, Ser. No. 184,051

Int. Cl.⁴ B21D *39/00*

U.S. Cl. 29—509 **19 Claims**



1. A method of securing a surgical scalpel blade and a handle one to the other, comprising the steps of:

providing a surgical scalpel blade with a through keyway;

forming the handle with a blade receiving surface adjacent an end thereof for receiving a side face of the blade and a key projecting from said surface, said key having spaced first and second elements projecting from said surface distances greater than the thickness of the blade and a third element between said first and second elements projecting from said surface a distance substantially no greater than the thickness of said blade;

disposing said blade on said handle with said key received in said keyway and a side face of the blade bearing against the blade receiving surface; and

cold staking said first and second elements to overlie portions of the opposite side face of the blade to secure the blade and handle one to the other.

4,823,458

FOAM BODIED HAIR CURLER

Detlef Hollenberg, Hilden; Hans Schneider, Schwalmtal, and Georg Weihrauch, Kreidach, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 654,833, Sep. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 573,074, Jan. 23, 1989, abandoned. This application Jun. 20, 1986, Ser. No. 877,697

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346164

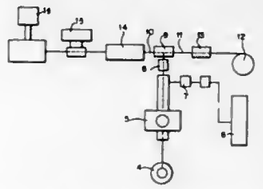
Int. Cl.⁴ B29C *47/02*

U.S. Cl. 29—527.2 **22 Claims**

1. In a process for the preparation of a hair curler comprising an axially elongated, low-density, elastic, foamed plastic body having a length suitable for a hair curler, and two opposed ends, with a substantially axially extending wire insert therein whose length is shorter than that of said plastic body, by continuously delivering low-density polyethylene granulate containing appropriate additives to an extruder and melting to a plastic mass, continuously supplying the mass melted in said extruder with blowing gas from a gas bolder via metering pumps to form a continuous foam plastic melt, continuously cooling said foam plastic melt in a following cooling zone, continuously delivering a resulting cooled melt to a crosshead,

continuously delivering a continuous wire to said crosshead, continuously forming a continuous strand of elastic foamed cooled low-density polyethylene having a density of less than about 100 kg/m³ around said continuous wire whereby said continuous wire is continuously embedded in the core of said continuous strand of foamed low-density polyethylene, the improvement comprising:

(a) cutting the continuous strand of foamed low-density polyethylene and wire into a piece with a predetermined



length suitable for a hair curler, having two ends with the wire therein between the ends, and

(b) subsequently forming the embedded wire into an effective length which is shorter than said predetermined length so that each effective end of said wire is embedded within said cut piece a distance from each proximal end of said cut piece by pushing back the ends of the piece towards each other then forming each end of the embedded wire into a rounded loop or rounded head, and then causing the piece to spring back.

4,823,459

AUTOMATIC FINISHING SYSTEM FOR WOUND COIL IN COIL WINDING MACHINE

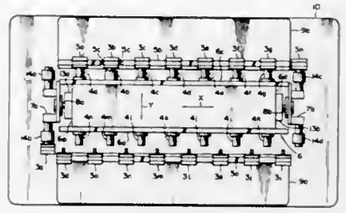
Shuji Takeda, Tokyo, Japan, assignor to Tanaka Seiko Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,861

Claims priority, application Japan, Sep. 30, 1986, 61-232631

Int. Cl.⁴ B23Q *7/00;* **B65G** *25/00*

U.S. Cl. 29—563 **3 Claims**



1. An automatic finishing system for a wound coil in a coil winding machine comprising:

a wound coil moving means for moving a wound coil intermittently along a circulating endless path, said wound coil moving means including

an X-Y movable bed having first and second opposite sides, third and fourth opposite sides, a lower portion fixed to a central portion of a base and an upper portion movable back and forth along each of two directions with respect to said loawer portion;

guide rails provided on said base at said first and second sides of said X-Y movable bed each facing the sides of said X-Y movable bed;

swing arms having first and second ends mounted respectively on said third and fourth sides of said X-Y movable bed not facing said guide rails so that their end positions can be reversed by rotation through an angle of approximately 180 degrees;

a plurality of chuck units mounted on one side of the upper portion of said X-Y movable bed facing one of said guide rails and at each of said first and second ends of said swing arms;

a plurality of finishing jigs for holding the wound coil for the respective finishing steps, and

a plurality of movable jig-holders adapted to be held by said chuck units for moving along said guide rails and holding said finishing jigs;

finishing apparatuses for respective finishing steps disposed in order around said endless path; and

a controller for synchronously controlling at least said wound coil moving means and said finishing apparatuses for the respective finishing steps whereby finishing operations are carried out continuously and automatically when the wound coil reaches the respective finishing apparatuses.

4,823,460

METHOD OF MANUFACTURING AN ELECTROMAGNETIC DEFLECTION UNIT

Adriaan J. Groothoff; Albertus A. S. Sluyterman; Dik R. Overdijk, and Jacob Van Maastricht, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,384

Claims priority, application Netherlands, Dec. 1, 1986, 8603056

Int. Cl.⁴ H01F *7/06*

U.S. Cl. 29—605 **8 Claims**



1. A method of manufacturing an electromagnetic deflection unit for a cathode ray tube, which deflection unit comprises at least one pair of saddle-shaped deflection coils, said method comprising the following steps:

providing a jig for winding each saddle-shaped coil,

providing an electrically insulating support in the jig, said support carrying electrically conductive connectors for the coil terminators,

winding a saddle-shaped coil in the jig, said coil comprising a plurality of turns and a pair of coil terminators,

connecting the coil terminators to the connectors,

passing a current through the coil so that turns of said coil are bonded together, and then

removing the coil and the support from the jig as one assembly.

4,823,461

METHOD OF MANUFACTURING FLUIDIC ANGULAR RATE SENSOR

Fumitaka Takahashi, Wako; Kunio Okazaki, Hatano; Masaru Shiraishi, Funabashi, and Masayuki Takahashi, Hatano, all of Japan, assignors to Honda Motor Co., Ltd. and Stanley Electric Co., Ltd., both of Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,044

Claims priority, application Japan, May 29, 1987, 62-136016

Int. Cl.⁴ H01C *17/28*

U.S. Cl. 29—612 **17 Claims**

1. A method of manufacturing a fluidic angular rate sensor

of the type wherein fine wires are mounted in tension over the ends of two pairs of of spaced apart metal supports which are mounted on a ceramic disc having fluid passage apertures therein, comprising the steps of:

plating a gold layer on said wires;



fixedly mounting said gold plated wires to said spaced apart metal supports such that said gold plated wires are in tension between respective pairs of said metal supports; and

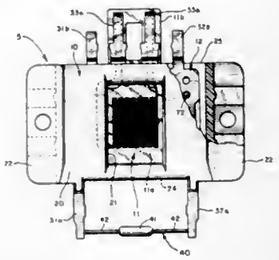
heating said mounted gold plated wires in a predetermined atmosphere for removing said plated gold from said wires and to cause said wires to be crystallized.

4,823,462

MASS AIR FLOW SENSOR ASSEMBLY AND METHOD OF MANUFACTURE

Duane J. Huber, Bartlett, Ill., assignor to Hilex Poly Company, Inc., Los Angeles, Calif.

Filed Apr. 14, 1987, Ser. No. 38,624
Int. Cl.[4] G01M *19/00;* **H05K** *13/00*
U.S. Cl. 73—118.2 **4 Claims**



1. A method of manufacturing a mass air flow sensor assembly, comprising the steps of:

(a) straight molding one side panel of a sensor body;

(b) providing a sensor element and a circuit strip blank and seating them, one on top of the other, on said one side panel; and

(c) forming a second side panel of said sensor body over said sensor element and said circuit strip blank by injection molding dielectric material so as to encapsulate portions of said element and blank and bond itself to said one panel while leaving a window in said second side panel through which at least one of said sensor element and said circuit strip is exposed.

4,823,463

POCKET-KNIFE HAVING A HANDLE PROVIDED WITH A SLIDABLE BLADE

Denis Lemaire, 534 de la Vérendrye, Boucherville, Québec, Canada J4B 2Y1

Filed Jul. 11, 1988, Ser. No. 217,166
Claims priority, application United Kingdom, Jul. 13, 1987, 8716418
Int. Cl.[4] B26B *1/08*
U.S. Cl. 30—162 **4 Claims**

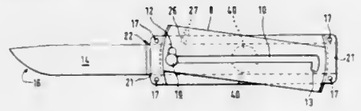
1. A pocket-knife having a handle comprising:

a front component having a pivotal plate provided with a slot having a recess at each of its extremities, said pivotal plate being provided with a pivotal connection for pivotal movement;

a blade having an extremity to be moved out from the handle;

a pin connected to the other extremity of the blade and being adapted to slide along said slot, said pin having an extremity emerging from said slot;

a back component forming with said front component a channel with an opening into which said blade can slide longitudinally inside said handle, said blade being slid by positioning said pivotal plate in a first position in which



said pin can be slid by a user along said slot to move said blade along said channel, said blade being locked outside or inside said handle by positioning said pivotal plate in a second position in which said pin is either located in one of said recesses of the slot adjacent to said opening to lock the blade outside or in the other of said recesses of the slot to lock the blade inside; and

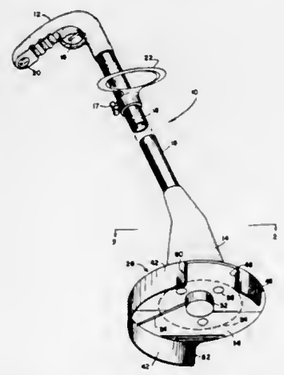
resilient means having one of its ends attached to the blade, and its other end attached to a portion of the handle distal from said opening so that said blade is automatically retracted inside said handle when said pivotal plate is in said first position.

4,823,464

GRASS TRIMMER

John W. Gorski, Rock Hill, S.C., assignor to Textron Inc., Providence, R.I.

Filed Sep. 14, 1987, Ser. No. 95,634
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 **14 Claims**



13. A shield for a grass trimmer comprising:

a shield member defined by a base member and a circular rim member, said circular rim member having a radius "A" from a first center; and

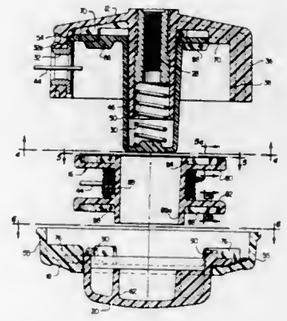
a flexible rotating cutting element defining a circular perimeter having a radius "B" smaller than radius "A" and a center of rotation, said center of rotation being displaced rearward from the first center toward the rim member thereby defining oppositely directed volute pathways between the circular rim and the circular perimeter.

4,823,465

LINE FEED MECHANISM FOR LINE TRIMMERS

Imack Collins, Shreveport, La., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 943,309, Dec. 17, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 126,824
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 **18 Claims**



1. A head assembly for a flexible line trimmer comprising:

housing means having upper and lower members, one of the members having a generally cylindrical sidewall with a least one aperture formed therein, and being releasably coupled to the other member to gain access to the interor of the housing:

means for coupling the upper housing member to a drive shaft for rotation about an axis;

locking means rotatably driven by the housing means, the locking means being reciprocable relative to the housing means between upper and lower positions;

spring means disposed between the upper member of the housing means and the locking means urging the locking means into the lower position;

spool means containing a supply of flexible cutting line disposed in the housing means, the spool means being restrained from axial movement relative to the housing means;

a supply of cutting line wound on the spool with the free end extending through the aperture in the housing means into a cutting plane when the head assembly is rotated at high speed;

cooperating means disposed on the locking means and on the spool means for locking the spool against rotation relative to the housing when the locking means is in the lower position and for permitting a first predetermined increment of relative rotation as the locking means is moved from the lower position to the upper position and a second predetermined increment of the relative rotation as the locking means is moved from the upper position back to the lower position;

the locking means including ground bumping means protruding from the bottom of the housing means for shifting the locking means from the lower position to the upper position when the operator bumps the head assembly against the ground and to be returned by the force of the spring to the lower position to allow the spool to rotate through the first and second increments of rotation in response to centrifugal force on the line extending through the aperture into the cutting plane to thereby payout a controlled increment of line; and

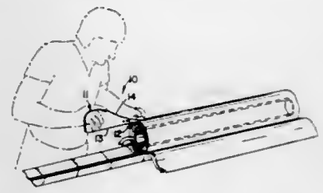
the locking means being separable into upper and lower members by the operator to permit the spool to be removed for replacing a new supply of line, the spring means being disposed between the upper member of the locking means and the upper member of the housing means.

4,823,466

SLABBER DEVICE

William C. Mason, 429 Freeman Rd., Cloquet, Minn. 55720

Filed Nov. 2, 1987, Ser. No. 115,978
Int. Cl.[4] B26B *5/00*
U.S. Cl. 30—344 **1 Claim**



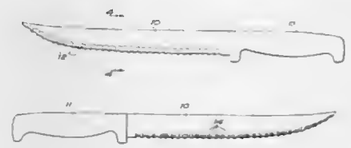
1. A slabber comprising a plate-like tool having a straight lower edge and an arcuate upper edge, said arcuate upper edge having a first portion comprising a convex surface and a second portion comprising a concave portion, said second portion ending in a ramp-like pointed end, said slabber comprising two members, one of said members being a handle portion and the other member being a disposable tearing portion, said other member providing said ramp-like pointed end, said one member and said other member being joined by a tongue and groove interconnection, said one member including a groove portion and said other member including a tongue portion, said groove portion of said one member having a pair of shoulders and said other member having a pair of shoulders and wherein said shoulders of said one member bear directly on the corresponding shoulders of said other member, a pair of screws extending through said tongue portion and said groove portion to bind said members together, said handle portion and said tearing portion being constructed of wood, said plate-like tool having a thickness of about $\frac{1}{8}$-inch, said handle portion having a deep vertically oriented groove along a forward edge, said tearing portion having a vertically oriented tongue, said tongue tightly and fully fitting in said groove, said groove providing a pair of vertical outer shoulders and said tearing portion having a pair of mating shoulders at the forward portion of said tongue, whereby force transmitting from said tip to said handle is transmitted through said shoulders and wherein said tearing portion may be discarded and replaced with a like portion upon being chipped or broken.

4,823,467

SERRATED-EDGE KNIVES

Barrie M. Campbell, Bamford, and Dennis Spooner, Sheffield, both of United Kingdom, assignors to Walter Lawrence Manufacturing Limited, Sawbridgeworth, United Kingdom

Filed Dec. 29, 1987, Ser. No. 139,021
Claims priority, application United Kingdom, Jan. 5, 1987, 8700062
Int. Cl.[4] B26B *9/02*
U.S. Cl. 30—355 **10 Claims**



1. A serrated-edge knife with a blade which has been made from a parallel-sided blade blank, the blank having been provided on one side with a plurality of scallops and on the other side thereof with a plurality of closely spaced serrations, the

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scallops intersecting the serrations at a cutting edge of the blade to produce a fine saw-like V-shaped cutting edge substantially centrally of the thickness of the blade.

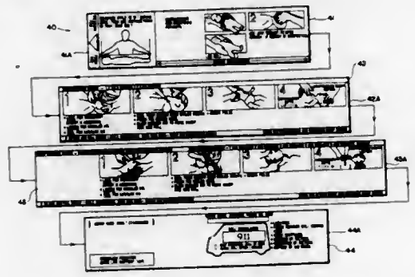
4,823,468
TOOL FOR CENTER-PUNCHING AND SCRIBING WORKPIECES
Martin Kollegger, Stredas 12, CH-7500, St. Moritz, Switzerland
Filed May 28, 1987, Ser. No. 55,094
Claims priority, application Switzerland, Jun. 3, 1986, 2236/86
Int. Cl.⁴ B26F *1/00*
U.S. Cl. 30—368 **6 Claims**



1. A tool comprising:
a slidable center punch having a tip for punching and scribing center lines in slots of working pieces;
a plurality of slidable hollow shafts including an innermost and an outermost shaft concentrically surrounding the center punch, the hollow shafts having respective lengths which are progressively shortened from the innermost shaft to the outermost shaft for effecting a stepwise decrease in respective outer diameters of the shafts toward respective ends of the center punch; and
a plurality of spacer sleeves each provided for a corresponding shaft at an end thereof which is directed toward the end of the center punch not having the tip, the spacer sleeves having respective outer diameters which increase progressively in size from the spacer sleeve provided for the innermost shaft to the spacer sleeve provided for the outermost shaft for effecting a stepwise increase in the outer diameters of the spacer sleeves toward the tip of the center punch, such that the spacer sleeves can be compressed contiguously toward each other.

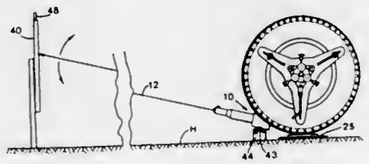
4,823,469
MEASURING TAPE FOR DIRECTLY DETERMINING PHYSICAL TREATMENT AND PHYSIOLOGICAL VALUES AND PROCEDURES
James B. Broselow, Rte. 12, Hickory, N.C. 28602
Continuation of Ser. No. 910,490, Sep. 23, 1986, Pat. No. 4,713,888, which is a continuation-in-part of Ser. No. 789,497, Oct. 21, 1985, abandoned. This application Dec. 17, 1987, Ser. No. 133,956
The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.
Int. Cl.⁴ G01B *3/02*
U.S. Cl. 33—760 **7 Claims**

1. A measuring tape having increments of indicia thereon for measuring a patient, said indicia representing a medically correct physical treatment procedure based upon a scientifically



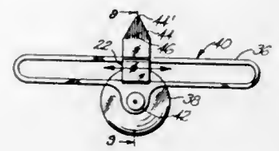
valid correlation between the length of a patient and that procedure.

4,823,470
METHOD AND ARRANGEMENT FOR THE MEASUREMENT OF WHEEL ALIGNMENT ANGLES IN THE FRONT AXLE AND SUSPENSION ASSEMBLY OF A MOTOR VEHICLE
Torgny Hörvallius, Skogsslingan 13, S-803 59 Gävle, Sweden
Filed Sep. 23, 1987, Ser. No. 100,244
Claims priority, application Sweden, Oct. 1, 1986, 8604173
Int. Cl.⁴ G01B *11/275*
U.S. Cl. 33—228 **20 Claims**



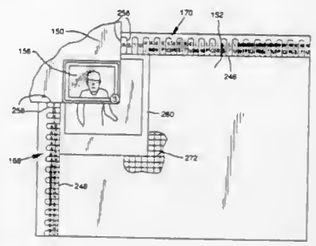
1. A method for measuring the standard characteristic angles of camber, king pin inclination, and caster for one of first and second steerable wheels of a front axle and suspension assembly of a vehicle in relation to mutually perpendicular reference planes containing longitudinal, transverse and vertical axes of the vehicle, the method being carried out with the wheels installed on the vehicle and independently of whether the vehicle is on a level surface which is horizontal in a true sense, comprising the steps of: installing on the first wheel an elongation pin so that a lengthwise axis of the pin extends parallel to an axis of rotation of the first wheel; locating a friction-reducing device beneath the first wheel for the purpose of facilitating steering movements thereof during the measurements; providing a beam projector having holding means for supporting the projector on the elongation pin so that the projector can pivot about the axis of the pin while the emitted beam remains perpendicular to the axis of the pin and to the axis of the first wheel; placing a screen provided with a reference line a predetermined distance in front of and facing the first wheel; orienting the screen so that the reference line thereon coincides with the reference planes of the vehicle by temporarily pivotally supporting the projector by the holding means on a bar supported adjacent the first and second wheels and parallel to a line extending through two points respectively equally situated on the first and second wheels while adjusting the position of the screen in its own plane until the beam emitted when the projector is pivoted about the lengthwise axis of the bar defines a line across the screen which is parallel to the reference line on the screen; thereafter supporting the projector on the elongation pin using the holding means; thereafter pivoting the projector about the axis of the elongation pin so that its beam sweeps across the screen and defines a camber line; and recording the angular position of the camber line in relationship to the reference line of the screen as the camber angle.

4,823,471
LANE MARKER STEERING GUIDE
Wilbur B. Van Schaack, 4215 25th St. W., Bradenton, Fla. 33505
Continuation of Ser. No. 931,250, Nov. 17, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 152,971
Int. Cl.⁴ G01C *21/04*
U.S. Cl. 33—264 **7 Claims**



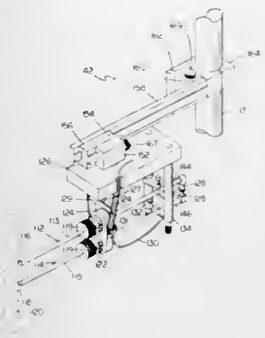
1. A lane marker steering guide for a vehicle comprising:
a sight member formed of a relatively thin rigid transparent material and having a pointed upper end;
means connected to said sight member for releasably adhering said steering guide to the inner surface of the vehicle windshield and for positioning said sight member in a generally upright orientation and in close proximity to the windshield;
said pointed upper end opaque;
said sight member connected at its lower end to a slide member;
said connecting means including at least one suction cup connectable to a slide guide;
said slide guide adapted structurally to support said slide member for lateral translation therein.

4,823,472
FRAMER
Glenn G. Gauer, 2414 NE. 46th Ave., Portland, Oreg. 97213
Continuation-in-part of Ser. No. 862,130, May 12, 1986, Pat. No. 4,704,796, and a continuation-in-part of Ser. No. 914,058, Oct. 1, 1986, and a continuation-in-part of Ser. No. 46,721, May 7, 1987. This application Oct. 1, 1987, Ser. No. 103,535
Int. Cl.⁴ G01B *3/00*
U.S. Cl. 33—1 B **20 Claims**



1. A framer for selecting and defining the position of a portion of a visual work having fixed references such as borders comprising:
an overlay having a visual aperture defined therein capable of being placed over such visual work and moved relative thereto to place said aperture over a selected portion of said work,
positioning means on the base for orienting the overlay on the base and for orienting the visual work in a first known position relative to the base;
the base having communication indicia positioned along at least two regions thereof and disposed at substantial angles relative to each other for denoting the position of the aperture relative to the fixed references on the work when the aperture is in the first position.

4,823,473
EXTENSOMETER FOR MATERIAL TESTING MACHINE
Stephen M. McMahon, Quincy, Mass., assignor to Instron Corporation, Canton, Mass.
Continuation-in-part of Ser. No. 909,272, Sep. 19, 1986, abandoned. This application Feb. 13, 1987, Ser. No. 14,809
Int. Cl.⁴ G01B *5/00*
U.S. Cl. 33—787 **12 Claims**



1. An extensometer for measuring strain in a specimen comprising
a frame,
a first arm having a contact end for frictionally contacting a first portion of a transverse surface of said specimen so as to move with said portion and a remote end, said first arm being freely pivotally supported about a first pivot axis between said ends by said frame, said first pivot axis passing through said first arm near the center of said first arm,
a second arm having a contact end for frictionally contacting a second portion of said transverse surface of said specimen so as to move with said second portion and a remote end, said second arm being freely pivotally supported about a second pivot axis between said ends by said frame, said second pivot axis passing through said second arm near the center of said second arm,
a noncontact sensor assembly having at least one component connected to a said arm at a portion that moves as said contact ends to measure change in distance between said contact ends, and
a support,
said frame being pivotally mounted with respect to said support to provide even contact of said contact ends with said sample.

4,823,474
BOW SIGHT
Loyd I. Reynolds, Rt. 1, Box 480, Catoosa, Okla. 74015
Continuation-in-part of Ser. No. 919,039, Oct. 15, 1986, abandoned. This application Aug. 21, 1987, Ser. No. 88,595
Int. Cl.⁴ F41G *1/00*
U.S. Cl. 33—265 **12 Claims**

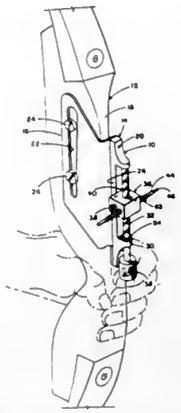
1. A bow sight providing yardage adjustability by movement of a finger of an archer's hand that is holding the bow in a shooting position, comprising:
an elongated sight housing,
means for removable mounting of the sight housing to the bow in a position such that the bow sight can be adjusted

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vertically by movement of a finger of an archer's hand that is holding the bow in a shooting position,

upper and lower opposed support members extending from an upper and a lower portion of the sight housing,

an elongated screw member having an upper portion rotatably mounted to the upper support member and a lower end thereof extending downwardly through the lower support member,



a sight carriage mounted to the screw member including means to vertically move the sight carriage as the screw member rotates, and including a horizontal sighting element extending from the sight carriage, and

a knob mounted to the lower end of the screw member wherein rotation of said knob by a finger of the archer's hand that is holding the bow in a shooting position provides a single adjustability for yardage.

4,823,475

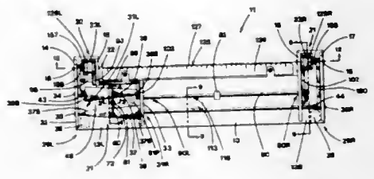
DRAFTING DEVICE

Poul E. Hoegh, 655 Chatsworth Pl., San Jose, Calif. 95128

Filed Mar. 21, 1988, Ser. No. 170,832

Int. Cl.[4] B43L *13/14*

U.S. Cl. 33—449 **18 Claims**



1. A drafting device for use on a drafting surface to permit the drafting device to move upon the drafting surface in an arcuate manner about a vanishing point, comprising:

a carriage;

a rule on said carriage defining at least one drafting edge;

a first wheel assembly mounted to said carriage, at least one second wheel assembly mounted to said carriage, said first and said second wheel assembly being spaced from each other and adapted to support said carriage upon the drafting surface and permit translatory movement thereof upon the drafting surface, each said wheel assembly including contact disk means having a convexly curved peripheral surface adapted to provide each said wheel assembly with single point contact with said drafting surface, said contact disk means on said first wheel assembly and said second wheel assembly having substantially the same outside diameter, said drafting edge on said rule being located substantially coincidental with a straight line reaching from said single point contact on said first wheel assembly to said single point contact on said second wheel assembly and coincidental with a true radial line extending to said vanishing point;

means on said carriage for conveying rotational energy linking said first wheel assembly and said second wheel assembly to each other, said means dfor conveying rotational energy including ratio means for establishing and maintaining a ratio of rotation between said first wheel assembly and said second wheel assembly, whereby radial distance from the drafting device to said vanishing point is governed by the ratio in said ratio means;

extension means on said carriage for extending said first wheel assembly, said second wheel assembly and said drafting edge of said rule away from said ratio means to permit manual drafting of true radial lines along said drafting edge unhampered by any portions of said means for conveying rotational energy, said extension means including extension drive means connecting said first wheel assembly and said second wheel assembly to said ratio means.

4,823,476

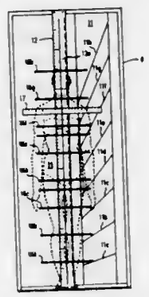
METHOD AND APPARATUS FOR MEASURING PHYSICAL ATTRIBUTES OF A HUMAN BODY

Marilyn A. Curtin, 2245 Woodside La., #7, Sacramento, Calif. 95825

Continuation of Ser. No. 895,765, Aug. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 698,650, Feb. 6, 1985, abandoned. This application Nov. 13, 1987, Ser. No. 120,337

Int. Cl.[4] G01B *3/02*; A41H *1/02*

U.S. Cl. 33—512 **9 Claims**



1. Apparatus for measuring a plurality of attributes of a human body in relation to the values of said attributes in a theoretically ideal human body comprising:

a transparent proportional panel member having a plurality of sloping lines, said sloping lines being calibrated with the values of said attributes for said ideal human body for a range of heights of the human body:

a vertically oriented transparent measurement guide member having graduated height measurement indicia thereon:

means for moving said proportional panel member laterally behind said measurement guide with a person whose body is to be measured positioned behind said measurement guide:

means for determining the lateral position of said panel at which the uppermost of said sloping lines crosses a vertical centerline of said measurement guide at the top of the measured person's head: and

means for marking on said measurement guide the vertical position thereon at which each of the other of said sloping lines crosses said centerline, whereby said markings on said measurement guide represent the locations of said attributes in an ideal body of the same height as the measured person.

4,823,477

METHOD AND APPARATUS FOR THE LEVELLING OF THE HUMIDITY PROFILE OF A CONTINUOUS WEB BY DIELECTRIC DRYING

Mauri Soininen, Naantali, Finland, assignor to Imatran Voima Oy, Helsinki, Finland

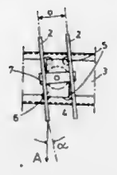
PCT No. PCT/FI86/00148, § 371 Date Aug. 12, 1987, § 102(e) Date Aug. 12, 1987, PCT Pub. No. WO87/03632, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 12, 1986, Ser. No. 133,127

Claims priority, application Finland, Dec. 12, 1985, 854916

Int. Cl.[4] B01K *5/00*

U.S. Cl. 34—1 **14 Claims**



1. A method for reducing moisture differentials in a moving web containing wet streaks extending in the processing direction of the web, by the application of high-frequency electromagnetic energy fed to bar-formed electrodes which are located close to the surface of the web, wherein

the longitudinal axes of the electrodes are aligned approximately parallel to the Processing direction of the web and the electrodes can be moved transverse to the processing direction of the web and rotated at an angle relative to the processing direction of the web so as to be positioned only over each wet streak of the web in order to provide a uniform moisture profile in the web.

4,823,478

FREEZE DRYER FOR UNATTENDED OPERATION

Taylor N. Thompson, Sr., Kingston, N.Y., assignor to FTS Systems, Inc., Stone Ridge, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,752

Int. Cl.[4] F26B *5/06*

U.S. Cl. 34—5 **62 Claims**

1. A process of freeze drying a product contained in a bottle with a freeze dryer device that furnishes a freeze drying manifold presenting a sealed interior chamber, a refrigeration system including a condenser in said manifold for collecting condensable vapors in said interior chamber, a vacuum pump system for reducing the ambient pressure in said interior chamber and said manifold presenting at least one port adapted to receive said bottle and selectively to place the interior of said bottle and product in gaseous communication with said interior chamber, said product being frozen in said bottle, said process comprising:

A. activating a device controller automatically to prepare said freeze dryer device for properly receiving at least one bottle containing a frozen product;

B. using said device controller automatically to energize said refrigeration system while using said device controller automatically to maintain said vacuum pump quiescent;

C. measuring the temperature of said condenser in said manifold with said device controller by leads extending from said device controller to said condenser;

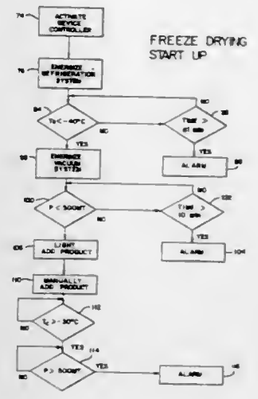
D. using said device controller automatically to energize said vacuum pump for simultaneous operation with said refrigeration system only after said device controller measures a desired reduced temperature at said condenser;

E. measuring the pressure in said sealed interior chamber with said device controller by leads extending from said device controller;

F. activating a user recognizable indicator upon said device controller measuring a desired reduced pressure in said interior chamber with a maintenance of said desired reduced temperature at said condenser;

G. automatically maintaining, with said device controller, at least said desired reduced temperature at said condenser and said desired reduced pressure in said interior chamber; and

H. connecting said at least one bottle to said at least one port for effecting gaseous communication between said product and said interior chamber, so that said desired reduced temperature and pressure can effect said freeze drying of said product.



4,823,479

MATERIAL DRYER, ESPECIALLY FOR BULK MATERIAL TRAVELLING CONTINUOUSLY THROUGH THE DRYER

Peter Dornier; Rudolf Langer; Gerhard Troetscher, and Anton Hecht, all of Lindau, Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau/Bodensee, Fed. Rep. of Germany

Filed May 13, 1987, Ser. No. 49,700

Claims priority, application Fed. Rep. of Germany, May 20, 1986, 3616966

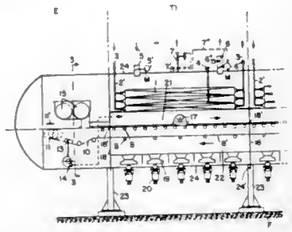
Int. Cl.[4] F26B *17/02*

U.S. Cl. 34—210 **14 Claims**

1. A material dryer, comprising dryer means including a self contained entrance unit, a plurality of self-contained intermediate units, and a self-contained discharge unit, said units forming stationary housing means for enclosing a pressurized drying space, endless belt type conveyor means operatively supported in said stationary housing means for transporting said material through said dryer, treatment means operatively arranged in said intermediate units of said dryer means for circulating and regenerating a drying medium in said housing means, each of said intermediate units of said dryer means being constructed as a fully functional, individually controllable modular unit comprising a stationary housing section of said stationary housing means, a section of said endless belt type conveyor means, treatment medium circulating means as part of said

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treatment means for applying treatment medium to said material, treatment medium regenerating means as part of said treatment means for individually regenerating the dried in accordance with drying conditions individually controllable in each modular unit, said self-contained entrance and discharge units comprising guide means for said endless belt type conveyor means, pressure-tight material feed-in means (15) located in said self-contained entrance unit for feeding material to be dried into said dryer, drive means for said endless belt type



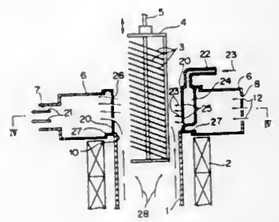
conveyor means, and pressure-tight material discharge means (16) located in said self-contained discharge unit for removing dried material from said dryer, said dryer further comprising means for interconnecting said modular units in a pressure-tight manner, whereby a stationary drying channel of any desired length may be formed by interconnecting a required number of modular intermediate units between said entrance unit and said discharge unit, and means, said fluffing-up means being located in at least one of said modular drying units above the belt type conveyor means.

4,823,480

SEMICONDUCTOR HEAT-TREATING APPARATUS

Yasuo Komatsuzaki, Ibaraki, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 26, 1987, Ser. No. 19,453
Claims priority, application Japan, Mar. 6, 1986, 61-49203
Int. Cl.[4] F26B *3/06*
U.S. Cl. 34—218 7 Claims



1. A semiconductor heat-treating apparatus comprising: a main heat treatment furnace including a port for carrying semiconductors into and out of said main furnace, a first chamber engaging and fitted around said port for semiconductors, the first chamber comprising a perforated wall for supplying and withdrawing gas, a second chamber including a partial partition mounted on one side of the perforated wall opposite the port and a conduit for supplying inert gas into said second chamber and into the first chamber from the second chamber via the perforated wall, and a gas system for discharging gases from said first and second chambers.

4,823,481

MOP HEAD SPREADER ATTACHMENT FOR ENHANCED DRYING

Johnny L. Trotter, Box 85E Covington Hwy., Slidell, La. 70460

Filed Dec. 3, 1986, Ser. No. 938,006
Int. Cl.[4] F26B *9/10*
U.S. Cl. 34—239 9 Claims



1. A mop drier system, comprising:
an attachment for drying the strands of a mop head element on a mop;
a mop having a narrow, elongated staff having a mop head element at one of its ends, which mop head element includes a plurality of mopping strands;
said attachment including
hook element gripping said narrow, elongated staff positioned near said mop head element;
a shaft portion extending transversely from said hook element in a direction toward said mop head element along the axis of said staff;
spreader means attached to said shaft portion spreading said mop strands apart, said spreader means having a wire-like periphery extending transversely to said shaft portion out away from said staff having
a pair of generally flared portions extending a distance outward from said shaft portion in a plane generally transverse to the axis of said staff which extend to form a pair of generally arc shaped portions on said plane and extending toward each other and being joined together, said arc shaped portions defining a generally curved portion on which said strands are spread and flared apart for enhanced, expedited drying in the ambient with said strands extending generally radially outward from said staff in a direction generally along a distance of a radius of said curved portion, and hanging in a generally transverse direction by said spreader means so that the ends of said strands extend in a direction generally along the axis of said staff both parallel to each other and separated for enhanced, expedited drying, said curved portion being disposed in a configuration on one side of said staff, and said hook element means being disposed in a configuration on the opposite side of said staff, the weight of said strands on said curved portion causing said hook element to more firmly grip said staff.

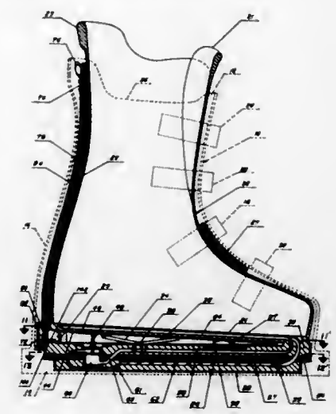
4,823,482

INNER SHOE WITH HEAT ENGINE FOR BOOT OR SHOE

Nikola Lakic, 73-355 Guadalupe Ave. Unit M, Palm Desert, Calif. 92260

Filed Sep. 4, 1987, Ser. No. 93,579
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[4] A43B *7/02, 5/04;* F28F *7/00*
U.S. Cl. 36—2.6 25 Claims

1. In a boot of the construction having an outer shell and an inner shoe lining with an inner shoe having an upper portion with an integral inner sole and a contour conforming to the inner shape of said shell, the improvement comprising:
a. a lower sole coextensive with said integral inner sole of said inner shoe and pivotally secured thereto at the toe of said shoe, and having at least a first open-topped compartment of a size and shape to fit within the heel area of said outer shell;
b. resilient lift means biasing the heel of said inner sole in an upward direction;
c. a heat engine operating on a Carnot cycle that includes:
(1) a closed circulation loop having first and second coils separated by a restrictor;



(2) a working fluid within said loop;
(3) a compressor for the working fluid; and
d. mechanical means linking said heel of said inner sole to said compressor, whereby up and down movements of said heel are operative to compress said working fluid and circulate it through said closed loop releasing heat in said first coil and absorbing heat in said second coil.

4,823,483

SHOE INSERT AND LAMINATING METHOD

Bernard Chapnick, 3 Pasture Rd., Beverly, Mass. 01915

Filed Sep. 23, 1986, Ser. No. 910,656
Int. Cl.[4] A43B *13/38*
U.S. Cl. 36—43 29 Claims



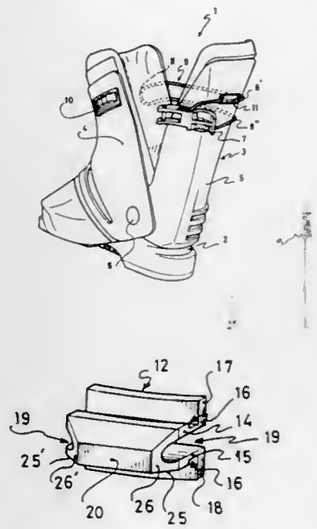
1. A molded shoe insert comprising,
a first layer of a heat-compressed, polyurethane, cellular thermoplastic foam, and
a second layer of a heat-compressed, polyurethane, cellular thermoplastic foam, the first and second layers being laminated directly together in facing relation, permanently compressed and shaped to form a unitary insert by the application of heat and pressure from a heated mold after each of the layers had been previously formed as a separate unit.

4,823,484

SKI BOOT CLOSURE DEVICE

Catherine Couty, Annecy, France, assignor to Salomon S. A., Annecy, France

Filed Dec. 8, 1987, Ser. No. 130,493
Claims priority, application France, Dec. 8, 1986, 86 17517
Int. Cl.[4] A43B *5/04;* A43C *11/00*
U.S. Cl. 36—117 8 Claims



1. Device for guiding and retaining a system designed to close two mutually movable parts of a ski boot, said device comprising a recessed key (12) inserted into an opening (13) provided in a part of the boot, a recessed portion of said key forming a channel within which at least one traction cable (9) may slip freely, said traction cable (9) being sandwiched between an outer surface (5''') of said boot part and a solid bottom (20) of said key.

4,823,485

SYSTEM FOR SECURING A FOOT OR INNER SHOE IN THE TOE OR INSTEP REGION OF A SHELL

Karl Kemmer, Graz, Austria, assignor to Koflach Sport Gesellschaft GmbH & Co. KG, Voecklabruck, Austria

PCT No. PCT/AT87/00019, § 371 Date Nov. 19, 1987, § 102(e) Date Nov. 19, 1987, PCT Pub. No. WO87/05474, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 20, 1987, Ser. No. 127,897
Claims priority, application Austria, Mar. 21, 1986, 764/86
Int. Cl.[4] A43B *5/04, 7/14*
U.S. Cl. 36—119 19 Claims

1. A system for securely and comfortably holding a foot in a boot, particularly in the toe and instep regions, comprising:
a shell covering at least the toe and instep regions;
a sole;
an inner shoe adapted to fit within said shell;
first and second plate-shaped parts, each connected to an opposite side of said sole along the longitudinal axis of said sole, extending over said inner shoe so as to overlap each other in the toe and instep regions without being attached to each other wherein said plate-shaped parts may move freely with respect to each other in the overlapping regions; and

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tension element means for adjusting the position of said plate-shaped parts with respect to said shell and to said



instep and toe regions of the foot and for distributing pressure on said plate-shaped parts.

4,823,486

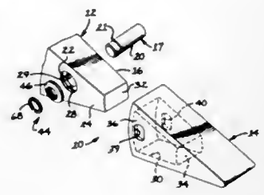
POSITIVE KEEPER MEANS FOR PINS OF EARTHWORKING TIPS

Mark S. Diekevers, Washington, and Jerry D. Fidler, East Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 004,515, Jan. 20, 1987, abandoned. This application Sep. 30, 1987, Ser. No. 105,469

Int. Cl.⁴ E02F *09/28*

U.S. Cl. 37—142 R **8 Claims**



1. An earthworking device comprising:

an adapter having a nose with forwardly converging lateral sidewalls and defining a transverse bore and;

an earthworking tip telescopically mounted on the nose of the adapter and having a pair of spaced apart forwardly converging lateral sidewalls and a pair of laterally aligned holes defined in the sidewalls, the bore and the holes being substantially axially aligned, a recess formed in the nose or the earthworking tip and in substantial axial alignment with the bore and the holes;

a cylindrical pin having a groove and during assembly being slidably disposed in the bore and the holes for retaining the tip on the adapter; and

a keeper means for securing the pin in the bore being located in the recess for abutting contact with the nose and one of the sidewalls, the keeper means including a metallic washer and a split resilient retaining ring, the metallic washer having frusto-conical side surface disposed adjacent one of the pair of spaced apart forwardly converging lateral sidewalls of the earthworking tip or one of the forwardly converging lateral sidewalls of the nose and an inside surface defining a bore and a groove opening into the bore, the bore of the metallic washer being axially alignable with the bore in the nose, the resilient retaining ring having a cross-section of a predetermined radial thickness captured in one of the grooves in the pin and the washer and adapter during assembly to permit slidable insertion of the pin in the bore and the holes for locking engagement of the retaining ring with the other of the grooves, the depth and configuration of the grooves being sufficient to prevent camming of the ring out of the grooves, and the retaining ring and washer being of a configuration sufficient to prohibit disassembly of the pin without an external force being applied to the pin sufficient to shear the retaining ring or to fracture the washer with each of the sides of the washer constructed to effectively concentrate the force close to the interface of the grooves.

4,823,487

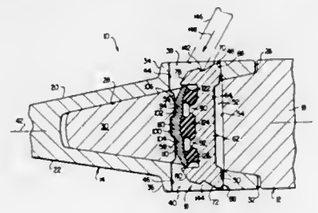
RESILIENT FLEX PIN APPARATUS FOR EXCAVATING TOOTH POINT AND ADAPTER ASSEMBLIES

Howard W. Robinson, Grapevine, Tex., assignor to GH Hensley Industries, Inc., Dallas, Tex.

Filed Jul. 30, 1987, Ser. No. 79,354

Int. Cl.⁴ E02F *9/28*

U.S. Cl. 37—142 A **38 Claims**



26. An improved flex pin for captively retaining an excavating tooth point on an adapter portion of an excavating tooth and adapter assembly, said flex pin being adapted to be received in generally aligned openings formed through said tooth point and adapter portion, and comprising:

an elongated rigid locking member having an exterior side surface portion extending along its length, and a pair of opposite end portions adapted to be engaged by a first portion of said assembly, a laterally central portion of said exterior side surface portion having an elongated recess formed therein, which defines and internal cavity within said locking member, said recess having an elongated inner side surface and a pair of opposite end surfaces;

an elongated rigid wedge member engageable by a second portion of said assembly and laterally movable thereby into said recess in response to relative movement between said first and second assembly portions, said wedge member having opposite ends which underlie said opposite end surfaces of said recess, said wedge member and said recess being relatively dimensioned in a manner such that said second assembly portion, during movement thereby of said wedge member into said recess, will engage and atop said exterior side surface portion of said locking member prior to causing said wedge member to laterally bottom out in said recess;

resilient means, disposed in said locking member recess, for resiliently resisting movement of said wedge member into said locking member recess; and

retention means, associated with one of said locking member and said wedge member, for captively retaining said improved flex pin in said generally aligned openings,

said resilient means including an elongated resilient member positioned in said recess and longitudinally extending generally parallel to said inner side surface thereof, and

one of said locking member and said wedge member having formed thereon a longitudinally spaced series of lateral projections, including a plurality of longitudinally centrally disposed lateral projections, adapted to engage and compress longitudinally spaced portions of said resilient member when said wedge member is moved toward said inner limit position thereof, and to displace portions of said resilient member into the spaces between said projections.

4,823,488

TUNNEL FINISHER HAVING REMOVABLE ROLLER ENVELOPES

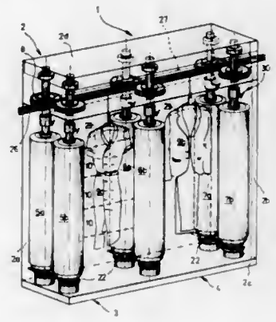
Franz Fottner, Hilgertshausen-Tandern, Fed. Rep. of Germany, assignor to Veit GmbH & Co., Fed. Rep. of Germany

Filed Mar. 29, 1988, Ser. No. 174,711

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710674

Int. Cl.⁴ D06F *61/06;* D06B *23/16, 23/02*

U.S. Cl. 38—14 **9 Claims**



1. A tunnel finisher comprising pneumatic rollers for defining an entrance and an exit, respectively, of a clothing treatment chamber, each said pneumatic roller comprising a shaft supported at its ends in bearings fixedly mounted in a housing, bottom- and top-side discs connected to said shaft, an envelope adapted to be connected to said discs so as to surround a cylindrical space extending therebetween, and further adapted to be supplied with air, and a drive transmission wheel mounted on said shaft above said top-side disc, characterized in that said shaft (11) consists of an upper section (11*a*) fixedly retained in said housing and carrying said drive transmission wheel (25), and a one-piece lower section (11*b*) carrying said discs (16, 17), having its upper end releasably coupled to said upper section (11*a*) and its lower end supported on a tilt bearing (14) permitting it to be tilted outwards of said housing (2) for the replacement of said envelope (18).

4,823,489

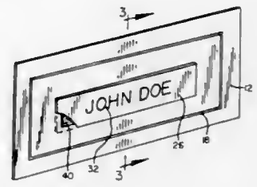
METHOD OF MAKING A THREE DIMENSIONAL COMPOSITE DISPLAY CARD

Gary L. Cea, Salem, Oreg., assignor to Richard Bryan Phipps, Salem, Oreg.

Filed Nov. 10, 1987, Ser. No. 119,050

Int. Cl.⁴ G09F *1/00*

U.S. Cl. 40—124.1 **11 Claims**



1. A method for manufacturing a three dimensional composite display card comprising:

selecting a planar backing member made of a flexible material selected from the group consisting of paper and cardboard, said backing member having first and second sides;

selecting a planar metallic member having first and second sides, said second side being entirely smooth along the surface thereof:

engraving a selected message in the surface of said first side of said metallic member:

adhering said first side of said backing member to said second side of said metallic member using an adhesive material in a manner wherein said metallic member and said backing member, when secured together, are parallel to each other.

4,823,490

SIGNAL DISPLAY ELEMENT FOR THE SELECTIVE DISPLAY OF INFORMATION WITH ELECTROMAGNETICALLY ACTUATED TILTING PLATES

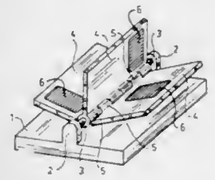
László Jáki; Sándor Jodál; József Mandzsu, and Endre Pap, all of Budapest, Hungary, assignors to Fok-Gyem Finommechanikai es Elektronikus Muszergyarto Szovetkezet, Hungary

Filed Oct. 14, 1986, Ser. No. 918,773

Claims priority, application Hungary, Oct. 11, 1985, 3947/85

Int. Cl.⁴ G09F *9/00*

U.S. Cl. 40—449 **6 Claims**



1. Signal display element for the selective exhibition of more than two informational displays comprising a plurality of electromagnetically excited magnetic titling plates, tiltable about an axis of rotation wherein at least two of said tilting plates may be arranged in a stable condition covering information carrying surfaces of a baseplate, each of said tilting plates supported by bearings at a minimum of two points, said bearings displaced with respect to the placement of the bearings of each other tilting plate in the display element, said axis of rotation of the tilting plate distanced from said baseplate by at least one half of the total thickness of said tilting plates bearing up against one another, wherein an axle is supported on said base plate along said axis of rotation for mounting said tilting plates thereon, said bearings being slit-plate-bearings having a slit running axially on the side lying opposite to the connection of the bearing to the tilting plate and in a width less than the diameter of the axle, said tilting plates (are) being thus adapted to be snapped onto the axle.

4,823,491

QUICK POINT REVERSIBLE SLING SWIVEL ASSEMBLY FOR A RIFLE OR THE LIKE FOR RIFLE AND SHOTGUNS

Emiliano C. Llames, 14 San Gregorio St., Capitol-8, Pasig, Metro Manila, Philippines 3130

Filed Nov. 16, 1987, Ser. No. 120,845

Claims priority, application Philippines, Nov. 21, 1986, 9930

Int. Cl.⁴ F41C *23/02*

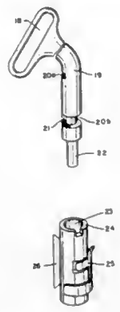
U.S. Cl. 42—85 **4 Claims**

1. A swivel assembly for connecting a sling to a long firearm comprising:

(a) A receptacle for mounting on the butt or foreend of the firearm, said receptacle having a tubular portion and a passage extending through the tubular portion to define first and second receptacle openings on opposite sides of said firearm

(b) spring means extending into a center portion of said tubular portion, and

(c) a rotating part having a male member for insertion into either of the first or the second receptacle opening of said tubular portion and having a sling receiving portion that



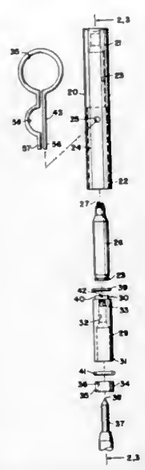
defines an opening, said male member having channel means for engagement with said spring means to lock said rotating part within the tubular portion of said receptacle yet allow rotation of said rotating part about an axis passing through said tubular portion of said receptacle.

4,823,492

EXPENDABLE EXPLOSIVE HEAD FOR SPEAR GUN

William H. Rogers, Jacksonville, Fla., assignor to Sea Search, Inc., Jacksonville, Fla.

Filed Jun. 27, 1988, Ser. No. 211,764
Int. Cl.[4] A01K *81/04, 81/00*
U.S. Cl. 43—6 **20 Claims**



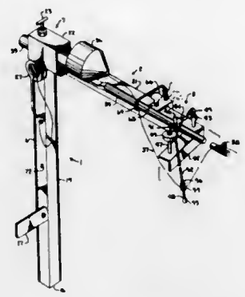
1. A molded plastic expendable head for an underwater spear gun comprising an elongated hollow cylindrical outer receptacle having a closed forward end and an open rearward end, said forward end being adapted to receive a cartridge with a base percussion cap facing rearwardly, a hollow cylindrical inner receiver having a closed forward end and an open rearward end, said rearward end being adapted to receive a tip of a spear gun spear to position a sharp point of a tip of a spear adjacent said forward end of said inner receiver, said inner receiver being slidable into said rearward end of said outer receptacle with said closed forward end of said inner receiver being contiguous with said base of said cartridge.

4,823,493

FISH CATCHING DEVICE

Norman L. Gray, 322 S. 6th St. Terr., Blue Springs, Mo. 64015

Continuation-in-part of Ser. No. 7,773, Jan. 28, 1987, Pat. No. 4,750,286. This application Jun. 14, 1988, Ser. No. 206,712
The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.
Int. Cl.[4] A01K *91/06*
U.S. Cl. 43—15 **4 Claims**



1. In a fishing device including a support structure for holding a fishing pole with a fishing line in a set configuration and a triggered configuration and further including biasing means urging the pole from the set configuration to the triggered configuration but being restrained by a trigger mechanism until the triggering mechanism is tripped and further wherein the triggering mechanism includes a restraining bar, held in covering relation to the pole when in the set configuration, by a trigger lever engaging the restraining bar at one end thereof and said lever being rotatable by pressure exerted on an opposite end thereof by a fish pulling on the fishing line looped over said lever so as to rotate to a triggered position whereupon the lever no longer covers the restraining bar so as to release the bar and allow the pole to swing to the triggered configuration; the improvement wherein said device includes:

(a) a stop positioned intermediately along said restraining bar and extending upwardly therefrom; said stop operatively limiting the movement of said lever along said bar when in the set configuration thereof.

4,823,494

COMBINATION TIP-UP AND HOLE COVER

Phillip S. Waterman, 241 South St., Amery, Wis. 54001

Filed Dec. 17, 1987, Ser. No. 134,315
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 **1 Claim**

1. A combination tip-up and hole cover for ice fishing, including:

a. an insulating member for placement over a hole formed through the ice;

b. an aperture formed through said insulating member;

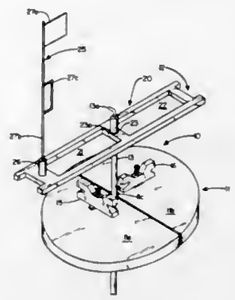
c. an actuation rod having a line containing reel on end thereof, said reel being arranged below the surface of the water and said latching element being arranged above said insulating member, said actuation rod passing through said aperture of said insulating member;

d. an alterting and signaling device positionable on said insulating member having a portion thereof engageable with said latching element for release and signaling upon rotation of said reel;

e. said altering and signalling device including a longitudinally extending base;

f. mounting means on said insulating member to receive and position said base relative to said aperture and said actuation rod;

g. said mounting means including a pair of rotatable attachment means spaced on said insulating member; and,



h. said alerting and signalling device including a pair of attachment receiving apertures therethrough to receive said mounting means for attachment to said insulating member.

4,823,495

FISHING LINE DEFLECTING MEMBER

Jonathan P. Camilleri, 2 Audrelane Court, Scarborough, Ontario, Canada M1V 3S4.

Filed May 27, 1987, Ser. No. 54,847
Int. Cl.[4] A01K *91/06*
U.S. Cl. 43—43.13 **4 Claims**



1. A fishing line and dodger combination wherein said dodger comprises a line deflector plate slideably mounted on said fishing line, said deflector plate being flat from side to side thereacross and having a plurality of openings at longitudinally spaced locations centrally along said plate, said plate being fitted with a smooth wall tube fitted through and extending between said openings for a line resistant fitting of said line at said plate, said plate being bent in a sine wave configuration and said line passing centrally through said plate such that said plate is in a balanced position on said line.

4,823,496

LUMINOUS FISHING ROD CLIP

Dorothy Powell, 4839 S. Vancouver, Tulsa, Okla. 74107

Filed Aug. 31, 1987, Ser. No. 91,499
Int. Cl.[4] A01K *87/02*
U.S. Cl. 43—17.5 **3 Claims**

1. A resilient luminous fishing rod clip having a generally U-shaped configuration including a pair of legs having confronting surfaces adapted to fit around and shape-matingly engage the outer surface of a circular end ring of a fishing rod, said clip having a C-shaped cross section, the C-shaped cross section of each leg opening toward the C-shaped cross section of the other leg, in combination with a fishing rod having a



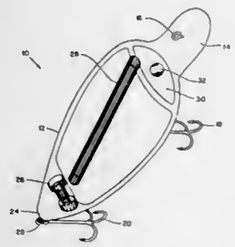
circular end ring resiliently releasably nested between said legs in said C-shaped cross section.

4,823,497

RATTLING, GLOWING, SCENT DISPENSING FISHING LURE

Kevin W. Pierce, 10832 Onyxstone, El Paso, Tex. 79924

Filed May 20, 1988, Ser. No. 196,267
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—17.6 **3 Claims**



1. A new and improved rattling, glowing, scent dispensing fishing lure, comprising:

an elongated body having a generally tapered oval configuration;

said body formed from a transparent plastic material;

a flattened diving lip extending forwardly from a front end portion of said body;

a line attachment eyelet extending upwardly from said diving lip;

a cylindrical recess extending rearwardly into said body portion adjacent said front end portion, said recess extending generally parallel to a longitudinal axis of said body;

chemical light producing means in said cylindrical recess;

an elongated cavity in said body beneath said cylindrical recess and adjacent said front end portion;

a plurality of balls received in said enlarged cavity;

a first front hook attachment eyelet extending centrally from a bottom surface of said body;

a first hook attached to said first eyelet;

a tapered radiused rear tip portion formed on said body;

a second hook attachment eyelet extending generally parallel to said body longitudinal axis from said tapered radiused rear tip portion;

a second hook attached to said second eyelet;

a transverse bore extending through said body adjacent said rear tip portion;

a counter sunk portion formed at each end of said transverse bore; and

a cylindrical sponge treated with a fish attracting scent received in said transverse bore.

4,823,498
LINE CUTTING TOOL AND MOUNTING BASE THEREFOR
Larry D. Banta, Hillsboro, Oreg., assignor to LCD American, Inc., Beaverton, Oreg.
Filed Mar. 25, 1987, Ser. No. 30,219
Int. Cl.[4] A01K 87/00
U.S. Cl. 43—25 25 Claims

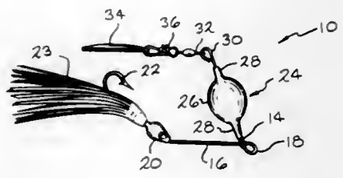


1. A fishing line cutting apparatus for attachment to a fishing rod shaft, comprising:
a line cutting tool including mounting means for removably mounting a cutting element for cutting fishing line; and
a mounting base separate from the tool for mounting the tool and including means for attaching the base to the fishing rod shaft, the base and tool including cooperative interconnecting means for removably connecting the tool to the base and thereby to the fishing rod.

4,823,499
BAIT
Alan Bissonnett, Lakeville, Mass., and Bernard Engelhardt, 51 Abbeywood Trail, Don Mills, Toronto, Ontario, Canada M3B 3B4, assignors to Bernard Engelhardt, Toronto, Canada
Filed Sep. 15, 1982, Ser. No. 418,305
Int. Cl.[4] A01K 69/08
U.S. Cl. 43—41 21 Claims

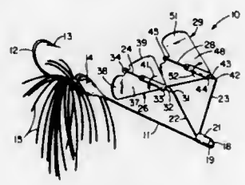
1. In a method of baiting crustacea or fish in which bait is housed in a trap to lure the crustacea or fish, the improvement comprising supporting the bait in a housing consisting of an elastic casing having orifices to expose the bait to the crustacea or fish, the casing comprising an elastic material and being elastically extended around and in contact with the bait, the elastically extended casing being elastically adjustable to continuously contract about the encased bait.

4,823,500
OSCILLATING LURE
Walter E. Shindeldecker, 505 W. Yates Ave., Findlay, Ohio 45840
Filed Nov. 4, 1987, Ser. No. 116,705
Int. Cl.[4] A01K 85/00
U.S. Cl. 43—42.13 12 Claims



1. A fishing lure comprising, in combination,
a V-shaped wire member having first and second ends,
line attaching means connected to said wire member between said first and second ends,
hook means including a shank having a free end and an end including attachment means such as an eye, said attachment means being connected to the first end of said wire member so that said free end is between said shank and said second end of said wire member,
weight means connected to and supported on said lure between the line attaching means and the free end of said hook means,
a bulbous member mounted on said wire member between said line attaching means and said second end of said wire member, said bulbous member having an outer surface which is substantially spherical, said outer surface being spherical to the extent that when the lure is retrieved through the water, said outer surface imparts a substantial side-to-side motion to said second end of said wire member, relative to said first end of said wire member, so that the lure oscillates, and
retaining means connected to said wire member for retaining said bulbous member on said wire member.

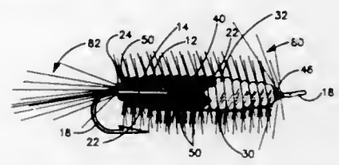
4,823,501
AUDIBLE FISHING LURE AND METHOD OF MAKING SAME
Calvin G. Standish, Jr., Route 1, box 171, Pequot Lakes, Minn. 56472
Continuation-in-part of Ser. No. 612,749, May 21, 1984, abandoned. This application Jan. 25, 1988, Ser. No. 147,696
Int. Cl.[4] A01K 85/00
U.S. Cl. 43—42.31 42 Claims



1. An audible fishing lure comprising: a body having a forward end and rear end, hook means connected to the rear end of the body, blade support means having loop means located in a side-by-side relation with at least one portion of the body, collar means holding the loop means and the portion of the body in a tight fitting relation relative to each other, and a plurality of blades rotatably mounted on the blade support means, said blades having portions that contact each other on rotation of the blades thereby providing intermittent sounds.

4,823,502
FISHING LURE
Michael A. Tucker, 1777 Cody St., Lakewood, Colo. 80215
Filed Feb. 25, 1988, Ser. No. 160,399
Int. Cl.[4] A01K 85/00
U.S. Cl. 43—42.37 20 Claims

1. A fishing lure having the appearance of an item of food attractive to a fish, comprising:
a fish hook including a shank, a hook portion at a fist end of the shank and an eye portion at a second end of the shank opposite the first end and operative to permit attachment of a length of fishing line;
shell means positioned about a portion of the shank for forming a chamber around said portion of the shank, said shell means having an interior and defining external light transmissive skin around said shank that simulates the exoskeleton of an insect;
a ballast material in the interior of the chamber;
means for closing said chamber to retain said ballast material therein; and,



a core material positioned between said shank and said shell means, said core material simulating the internal structure of an insect.

4,823,503
FISH HOOK POSITIONER AND RELEASE
Michael A. Tesch, 17001 Bataan St. NE., Ham Lake, Minn. 55304
Filed Mar. 18, 1988, Ser. No. 169,980
Int. Cl.[4] A01K 83/00
U.S. Cl. 43—42.04 1 Claim



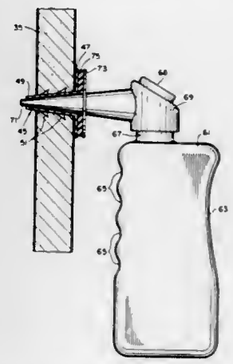
1. A fishing lure body with at least one depending hook and a slitted hollow circular hook positioner means attached to the body whereby the shank of said hook can be inserted into said positioner means so that the shank of said hook is parallel to the longitudinal axis of said lure body to limit movement of the hook and a pull of a fish can release the hook from the positioner means.

4,823,504
TRAPPING APPARATUS
Curtis W. Ronning, R.R. #2, Box 216, Bagley, Minn. 56621
Filed Mar. 31, 1988, Ser. No. 176,259
Int. Cl.[4] A01M 23/24
U.S. Cl. 43—96 2 Claims



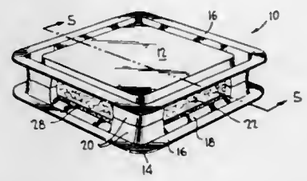
1. A trapping apparatus comprising a trap having a pair of longitudinally extending jaws with lateral end portions pivotally connected together, a mounting strap having one end fixed to the jaws at their pivotal connection, said strap extending outward and upward in a path parallel to the lateral ends of the jaws, a magnet having one surface magnetically securing the strap to the magnet with sufficient magnetic strength to support the strap and the attached trap thereon with another surface having a conformation engagement and the magnetic strength to secure the strap to a metal culvert to support the strap and trap at an intermediate height in the culvert above a waterway in the culvert, with said magnet being weak enough that it will along with the strap and trap detach magnetially and physiclaly from the culvert under the weight or movement noramlly associated with a trapped animal attempting to escape to allow the trap and trapped animal to submerge in the waterway of the culvert to reduced the likelihood of detection of the trap and trapped animal by poachers.

4,823,505
FUMIGATION SYSTEM FOR EXTERMINATING INSECTS IN AN EXISTING BUILDING
John C. Jackson, 313 S. Lakeside Dr., Lake Worth, Fla. 33460
Filed May 21, 1987, Ser. No. 52,290
Int. Cl.[4] A01M 7/00, 1/20
U.S. Cl. 43—124 12 Claims



1. In a fumigation system adapted for installation into an existing building, comprising an exterior wall including a load-bearing structural portion having two opposed major surfaces, a self supporting interior wall attached to, spaced from and covering one of the major surfaces of said structural portion, and a sealer coating on the other major surface, said interior wall having at least one accessing wall aperture into the space between said exterior and said interior walls, said fumigation system comprising a tunnel device permanently installed and mated with said wall aperture, and means for introducing a fog of fumigant from a cannister of fumigant under pressure into said space operationally and detachably connected to said tunnel device, and wherein said tunnel device is a separate fixture mounted in said wall aperture, said fixture having a surface adapted to pressure seal the outer contour of a fumigant injection nozzle to said surface.

4,823,506
INSECT BAIT DEVICE
Scott W. Demarest; John Martin; John H. Hainze, and Stanley J. Flashinski, all of Racine, Wis., assignors to S.C. Johnson & Son, Inc., Racine, Wis.
Filed Jul. 2, 1987, Ser. No. 69,338
Int. Cl.[4] A01M 1/02
U.S. Cl. 43—131 11 Claims



1. An insect bait device for exterminating crawling insects

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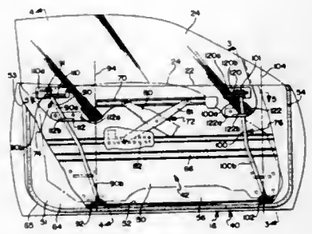
and the like, comprising, in combination, an insecticide composition, a two-piece housing that includes at least two substantially identical housing portions which when joined together define means for entry into said housing by an insect, each of said housing portions defining a respective inner cavity of predetermined dimension, at least one relatively-stiff absorbent pad impregnated with the insecticide composition, the absorbent pad being so dimensioned relative to the housing-cavity dimensions as to be disposable in one of the housing portion cavities, wherein each said housing portion further defines means for snap-engaging said pad into one of the housing portion cavities, wherein each one of said housing portions includes a plurality of spaced-apart upstanding, integral shoulders so dimensioned as to be able to receive the pad in the housing portion cavity thereof, and wherein the means for snap engaging said pad in said one housing portion cavity for snap engaging said pad in said one housing portion cavity comprises a complementary plurality of ledges, inwardly-disposed relative to each other and to the housing portion cavity, each one of such ledges being integral with a respective one of the shoulders, for removably retaining one of the relatively-stiff pads in a respective one of the housing-portion cavities, whereby the thus-engaged pad is spaced from the other housing portion.

4,823,507

WINDOW REGULATOR MECHANISM FOR FRAMELESS WINDOWS

Larry D. Miller, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1987, Ser. No. 65,946
Int. Cl.[4] E05F *11/52*
U.S. Cl. 49—227 **6 Claims**



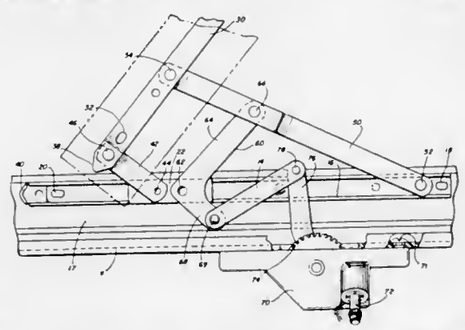
1. In an automotive vehicle having body structure defining a body opening and an exterior seal on the body structure adjacent the body opening and extending along its top and upper side portions of its sides, a frameless door assembly supported by the body structure for movement between open and closed positions, said door assembly comprising a door having inner and outer spaced panels and a pair of end walls which together define a well, a window supported for movement between an open position in which it is disposed within said well and a closed position in which it is disposed within said well and a closed position in which a major portion thereof is disposed above the door and in which its top and sides engage said exteriorly facing seal on the body structure, and a window regulator mechanism carried by said door assembly and operatively connected with said window for supporting and moving said window between its open and closed positions, said window when being moved from its closed position toward its open position moving along a path in which its upper end moves away from said seal during a first portion of its downward movement and when being moved from its open position toward its closed position being movable along a reverse path, the improvement being that said window regulator mechanism comprises first and second curved horizontally spaced, guide posts disposed within said well and fixed to said door assembly, first and second vertically spaced guides secured to said window adjacent its lower end and adjacent one side thereof, third and fourth vertically spaced guides secured to said window adjacent its lower end and adjacent its other side thereof, said first and second and said third and fourth guides having elongated slots therein for respectively slidably receiving said first and second guide posts whereby said window is stabilized in directions to and from the plane of the window, said slots in said guides having a configuration and said posts having a curvature such that the window for any given position during its downward or upward movement is trapped against horizontal movement relative to the guide posts and such that the window is caused to be translationally moved from one of said end walls defining said well toward the other of said end walls as well as having its upper end caused to be moved outwardly of said seal during a first portion of its downward travel when the window is being moved from its closed position toward its open position and being moved in reverse direction during a latter portion of its upward travel when being moved from its open position toward its closed position.

4,823,508

COMBINED WINDOW OPERATOR AND HINGE

R. George Allen, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Nov. 10, 1987, Ser. No. 119,177
Int. Cl.[4] E05D *15/42*
U.S. Cl. 49—252 **7 Claims**



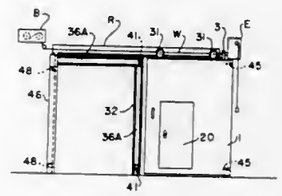
1. A combined window operator and hinge wherein said hinge has an elongate track, a shoe movable along said track, a sash arm, means mounting said sash arm for movement with and pivotal movement relative to said shoe, a control arm having a first pivot connection at one end to said track and a second pivot connection at an opposite end to the sash arm intermediate said one end and opposite end of the sash arm, said hinge having a window-closed position wherein said sash arm overlies said control arm, and means pivotally connected to said control arm intermediate said one end and opposite end of the control arm for imparting torque to said control arm for pivoting thereof about said first pivot connection to exert a moving force on the sash arm and comprising a bell crank pivoted on said shoe and having one end thereof making said pivot connection to the control arm, a movable operator arm, and a drag link extending parallel to said track when the hinge is in said window-closed position and pivotally connected to the operator arm and to the other end of the bell crank.

4,823,509

SELF-CLOSING DOOR SEALING STRUCTURE

Kazuaki Ando, 418, Aza Kawaharabata, Amagasaki-shi, Hyogo, 661, Japan

Division of Ser. No. 896,861, Jul. 1, 1986. This application Feb. 11, 1988, Ser. No. 154,384
Claims priority, application Japan, Nov. 27, 1984, 59-180317[U]; Mar. 26, 1985, 60-63073
Int. Cl.[4] E06B *7/20*
U.S. Cl. 49—303 **2 Claims**



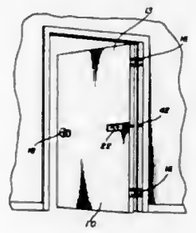
1. A sliding door sealing structure comprising
a sliding door having an open and a closed position,
a passage frame having three sides and positioned to be closed by said sliding door,
a first side of said three sides of said passage frame being a side post,
a retractable support frame being located in said side post,
second and third sides of said three sides of said passage frame being an inverted L-shaped frame having an auxiliary frame retractably mounted therein,
contact members, each including an angled surface, mounted at upper and lower portions of said sliding door on a side of said door facing said inverted L-shaped frame,
means positioned in said inverted L-shaped frame for engagement by said contact members upon the closing of said sliding door, and
said sliding door in said closed position moves said retractable support frame in said side post and said retractable auxiliary frame in said inverted L-shaped frame, whereby the sliding door is sealed by pressing contact of said sliding door with said three sides of said passage frame when said sliding door is closed.

4,823,510

SECURITY DOOR SYSTEM

Everett A. Amos, P.O. Box 396, Kenbridge, Va. 23944

Filed Apr. 14, 1987, Ser. No. 37,992
Int. Cl.[4] E05D *11/10*
U.S. Cl. 49—383 **5 Claims**



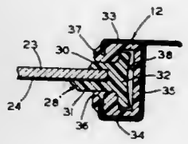
1. A security door system, comprising:
a door having first and second major surfaces and a plurality of minor surfaces extending around the perimeter of the door defining the door edge, said first major surface defining the interior side of the door and second major surface defining the exterior side of the door;
a door frame at least partially surrounding said door, said door frame including a jamb aligned with the minor surfaces frame of said door when said door is in a closed position, said door having at least one aperture in said jamb;
a plurality of hinges for pivotally supporting said door on said door frame, said hinges including a first hinge plate attached to the door edge and a second hinge plate connected to said door jamb, said first hinge plate and said second hinge plate being pivotally connected with a removable hinge pin accessible from the exterior side of said door;
a hinge security bolt means positioned along the hinged edge of said door including an exterior plate juxtaposed to the exterior side of said door, and an interior plate juxtaposed to the interior side of said door and aligned in a plane substantially parallel to the exterior plate; said interior plate including a security bolt protrusion offset from and longitudinally extending along a major surface and beyond an edge of said interior plate whereby said protrusion is so disposed with respect to said at least one aperture that the protrusion is automatically inserted within said at least one aperture in response to the swinging motion of the door about said hinges to a closed position; and
connecting means for connecting said interior plate to said exterior plate and for affixing said hinge security bolt means to said door.

4,823,511

RETENTION SHIELD WINDOW ASSEMBLY AND METHOD OF MAKING THE SAME

Siegfried H. Herliczek, Ida, Mich., and David M. Ginter, El Cerrito, Calif., assignors to Libbey-Owens Ford Co., Toledo, Ohio

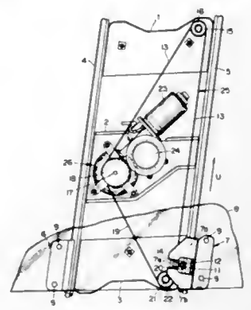
Filed Feb. 5, 1987, Ser. No. 12,726
Int. Cl.[4] E05D *15/06*
U.S. Cl. 49—404 **20 Claims**



1. A movable window assembly for cooperation with a window frame defining an opening having a seal comprising:
a sheet of transparent material including a retention sheet formed of a plastic material, said retention sheet extending to a predetermined portion of a periphery of said sheet of transparent material; and
an edge support connected to said retention sheet and adhered to at least a predetermined portion of a peripheral edge of said sheet of transparent material, and having a main body, said main body and said peripheral edge of said sheet of transparent material adapted to extend into and slidably engage a channel formed in a window frame seal for movement of said sheet of transparent material and said edge support along thee channel, said main body having a cross-sectional shape and area substantially the same as a cross-sectional shape and area of the channel wbereby when pressure is applied tending to force said sheet of transparent material from a window opening defined by the window frame, said edge support main body cooperates with the channel and retains said sheet of transparent material in the window frame.

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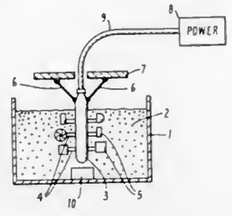
4,823,512
WIRE-TYPE WINDOW REGULATOR WITH WIRE TENSIONER
Junichi Maekawa, Yokohama; Satoru Ugawa, Hadano, both of Japan, and Satoshi Obuchi, deceased, late of Fukuoka, Japan (by Fukashi Obuchi, Ruriko Obuchi, Legal Representatives), assignors to Nissan Motor Co., Ltd. and Ohi Siesakusho Co., Ltd., both of Yokohama, Japan
Filed Oct. 6, 1986, Ser. No. 915,653
Claims priority, application Japan, Oct. 7, 1985, 60-221839
Int. Cl.[4] E05F *11/48*
U.S. Cl. 49—352 **17 Claims**



1. A door window regulator for moving a window glass pane relative to a door in which said regulator is mounted, said window regulator comprising:
a guide rail attached to said door;
a carrier member slidably engaged with said guide rail to run along the same, said carrier member carrying thereon said window glass pane;
pull-up and pull-down wires which extend toward each other from opposed positions with respect to said carrier member and connected at their leading ends to spaced portions of said carrier member in such a manner that the wires extend along a common line;
drive means for driving said wires and thus said carrier member along said guide rail; and
a wire tensioner mounted on said carrier member for tensioning said wires, said wire tensioner comprising a torsion spring having outwardly extending end portions, said end portions of said torsion spring being directly engaged with the leading ends of said wires to bias the same toward each other.

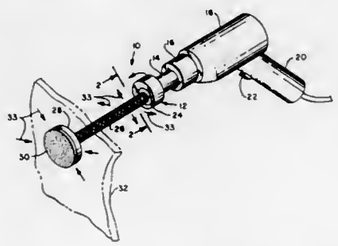
4,823,513
APPARATUS AND PROCESS FOR VIBRATORY FINISHING OF PARTS
R. Steven Marcus, Columbus, Ohio, and Richard N. Mercurio, Carmel, Ind., assignors to Mermark, Inc., Carmel, Ind.
Filed Oct. 13, 1987, Ser. No. 108,266
Int. Cl.[4] B24B *31/00*
U.S. Cl. 51—7 **8 Claims**

1. Apparatus for finishing preformed parts in finishing media comprising:
a container for the media;
a vibrating head which:
(a) has means on the exterior thereof for attaching the parts to the head whereby the parts are vibrated when the head vibrates; and
(b) has internal means for vibrating the head; and
means for introducing the head into the container to submerge at least part of the head and the attached parts in the media and for removing the head and attached parts from the media; and



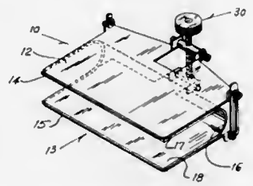
means for transmitting power to the internal vibrating means in the vibrating head.

4,823,514
AIR GRINDER MOTOR VIBRATING SANDING ACCESSORY FOR AUTO BODY WORK AND THE LIKE
Mario S. DeLuca, 15 Danville Dr., Greenlawn, N.Y. 11740
Filed Jan. 21, 1988, Ser. No. 146,493
Int. Cl.[4] B24B *23/02*
U.S. Cl. 51—170 MT **3 Claims**



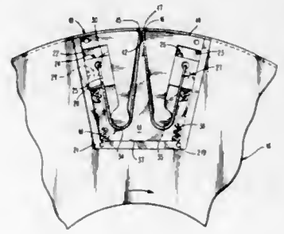
1. An air grinder motor vibrating sanding accessory for auto body work and the like, comprising, a main body, a shaft integrally attached to said main body, for mounting said accessory in a chuck of an air grinder motor, a bearing mounted eccentrically in said main body, rotatively securing a knurled shank with head means for placement of a sanding disc thereon.

4,823,515
ADJUSTABLE SANDING DEVICE
Robert W. Blome, 2360 Memorial Dr., Brookfield, Wis. 53005
Filed Apr. 11, 1988, Ser. No. 179,748
Int. Cl.[4] B24D *17/00*
U.S. Cl. 51—363 **9 Claims**



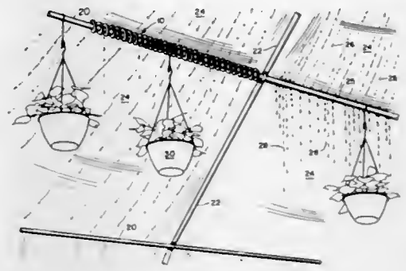
6. An adjustable sanding device for sanding curved surfaces comprising:
a. flexible membrane means for supporting an abrasive surface on one side, said membrane means having first and second opposed edge portions and a flexible free portion disposed between said opposed edge portions;
b. first support means for supporting said first edge portion of said membrane means;
c. second support means for supporting said second edge portion substantially parallel to said first edge wherein said membrane means is supported by said first and second support means on its non-abrasive surface, forming said abrasive surface into a concave free portion interior to said sanding device;
d. linkage means comprising at least one pair of links pivotally connected to opposite sides of said first and second support means for permitting said first and second support means to be moved to a plurality of spaced positions relative to one another whereby the radius of curvature of said concave free portion will correspondingly vary; and,
e. lock means for locking said first and second support means and said linkage means in preselected spaced positions relative to one another.

4,823,516
CUTTING TOOL WHEEL HAVING A REMOVABLE ABRASIVE BELT
Charles B. Matson, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed May 6, 1988, Ser. No. 190,912
Int. Cl.[4] B24D *9/04*
U.S. Cl. 51—367 **18 Claims**



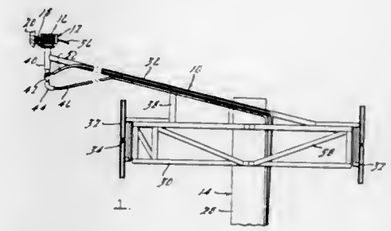
1. A cutting tool for removing material from a workpiece including:
rotatable means having a substantially rigid circumferential surface;
said rotatable means having a recess therein;
said rotatable means having a transverse slot extending through said circumferential surface to said recess to communicate said recess exterior of said circumferential surface of said rotatable means;
a belt removably mounted on said circumferential surface of said rotatable means, said belt having material removal means for removing material from a workpiece when said belt engages the workpiece during rotation of said rotatable means;
said belt having search of its ends extending through said slot into said recess in said rotatable means;
first engageable means in said recess of said rotatable means engageable with one end of said belt to produce a tension thereon in accordance with the speed of rotation of said rotatable means;
and second engageable means in said recess of said rotatable means engageable with the other end of said belt to produce a tension thereon in accordance with the speed of rotation of said rotatable means.

4,823,517
DRIP STOP SPACER FOR GREENHOUSES
James M. Dickinson, P.O. Box 145, Surry, Me. 04684
Filed Oct. 6, 1987, Ser. No. 104,964
Int. Cl.[4] A01G *9/14*
U.S. Cl. 52—39 **13 Claims**



1. A drip stop spacer for spacing a roof or wall covering from purlins or other frame members comprising:
an elongate cylindrical helix comprised of a length of helical chord of flexible material having a chord depth dimension in the radial direction of the helix selected to achieve a desired spacing and being formed with a helix diameter sufficient to place the helix in turns around the frame members with desired lead or pitch spacing between turns of the helix and without requiring removal of frame members, said chord being formed with an elongate "hourglass" like cross sectional configuration oriented in the depth direction and narrower in the middle and wider at the top and bottom.

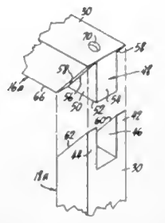
4,823,518
LIFT MOUNTED SNOWMAKER
James L. Dilworth, Petoskey, and Robert J. Brinks, Alanson, both of Mich., assignors to Nubs Nob, Inc., Harbor Springs, Mich.
Continuation of Ser. No. 709,939, Mar. 8, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 933,319
Int. Cl.[4] E01H *4/02*; A01G *15/00*; F25C *3/04*
U.S. Cl. 52—40 **9 Claims**



1. A structure for mounting a snowmaker apparatus to a ski lift tower of the type having one or more cross members for supporting horizontally separated lift cable pulleys comprising:
a boom having one end portion affixed to said ski lift tower,
a tubular collar affixed to the other end of said boom,
a post disposed in said tubular collar and rotatable therein, said snowmaking apparatus attached to one end of said post,
means for conducting water to said snowmaking apparatus,
means for conducting electrical power to said snowmaking apparatus, and

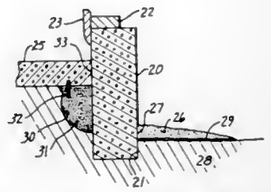
one or more cables wrapped around said post enabling controlling rotation of said post within said collar.

4,823,519
INTERLOCKING JOINT FOR A LEAN-TO STRUCTURE, OR THE LIKE AND RELATED METHOD
Terry Gilliland, Hayward, Calif., assignor to Four Seasons Solar Products Corp., Holbrook, N.Y.
Continuation-in-part of Ser. No. 929,271, Nov. 12, 1986. This application Dec. 22, 1986, Ser. No. 945,768
Int. Cl.[4] E04B 7/00
U.S. Cl. 52—93 **9 Claims**



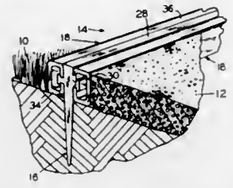
1. A lean-to structure adapted for being supported against a supporting structure and comprising generally vertical and horizontal beams, said vertical beam being spaced from said supporting structure and said horizontal beam extending between and having a weight which is supported by said vertical beam and supporting structure, and interengaged means on said beams tending, in response to at least part of the weight of the horizontal beam, to urge the vertical beam to tilt towards said supporting structure, the beams having flat abutting end faces sloping downwardly towards said supporting structure and providing a vector of a force derived from the weight of the horizontal beam which tends to tilt the vertical beam away from said supporting structure, the interengaged means comprising a tongue-and-groove arrangement, said tongue extending from the flat end face of the horizontal beam and having a lower edge and said groove having a floor, said lower edge and floor being flat and in abutting relation and sloping downwardly away from the supporting structure, the vertical beam including upstanding and spaced parallel walls defining said groove and straddling said tongue.

4,823,520
GRANULAR TERMITE BARRIER
Walter Ebeling, 10659 Rochester Ave., Los Angeles, Calif. 90024, and Charles F. Forbes, 7343 Via Lorado, Rancho Palos Verdes, Calif. 90274
Filed Jun. 17, 1987, Ser. No. 63,582
Int. Cl.[4] A01M 1/20
U.S. Cl. 52—101 **10 Claims**



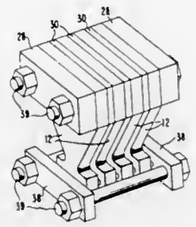
1. The method of protecting the foundation of a structure from termite incursion, comprising:
applying adjacent to and in contiguous contact with said foundation a depth of sand having particle sizes and interstitial sapces such that a termite cannot move the particles aside or pass through said spaces, said depth of sand having an upper surface, embedding an impermeable structural barrier in said sand with an edge portion rising above said upper surface, said barrier confining said sand to contact with said foundation, and pouring concrete atop said upper surface and completely over said upper edge, whereby to form a solid barrier against the passage of insects along the said upper surface.

4,823,521
LANDSCAPING BED DIVIDER
Donald E. Kontz, Jr., P.O. Box 484, Lincoln City, Oreg. 97367
Filed Sep. 28, 1987, Ser. No. 101,734
Int. Cl.[4] E02D 27/00
U.S. Cl. 52—102 **9 Claims**



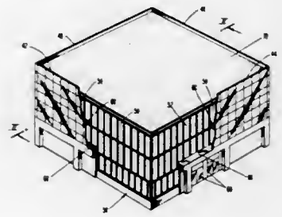
1. A landscaping bed divider comprising:
(a) an elongated continuous integral anchoring and dividing plate having opposite side faces and a top face,
(b) at least one elongated tubular edge piece, and
(c) connecting means on the tubular edge piece and one side face of the anchoring and dividing plate for connecting the tubular edge piece to said one side face for extension alongside said anchoring and dividing plate adjacent the top face thereof.

4,823,522
ENERGY ABSORBING AND ASSEMBLY FOR STRUCTURAL SYSTEM
William H. White, Concord, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.
Filed Apr. 22, 1987, Ser. No. 41,180
Int. Cl.[4] E04H 9/00
U.S. Cl. 52—167 **11 Claims**



1. In a structural system:
a vertical column; a horizontal floor beam; means at one end of the floor beam near the upper part thereof for pivotally mounting the floor beam on the column; and an energy absorbing assembly coupled to the column and to the floor beam near the lower part of the floor beam and adjacent to said one end thereof, the assembly including a plurality of horizontally spaced, vertically extending, plate-like elements, the upper ends of the elements being coupled with the lower part of the floor beam and strut means coupling the lower ends of the elements to the column, said lower ends of the elements being movable as a function of the movement of the floor beam relative to said column.

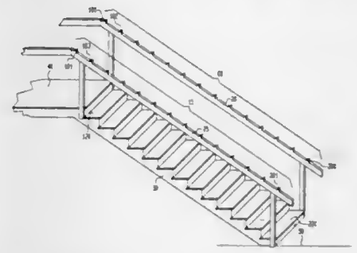
4,823,523
ELECTROMAGNETIC RADIATION SHIELDING ENCLOSURE AND SHIELDING COMPONENTS
Donald N. Coupard, 8001 Overhill Dr.., Bethesda, Md. 20814; Andrew K. Chang, 11731 Glen Mill Rd., Potomac, Md. 20854; John E. Fuller, 4415 Brookeville Rd., Brookeville, Md. 20853, and Angelo Mauriello, 1232 Hilltop Rd., Southampton, Pa. 18966, assignors to Donald N. Coupard, Bethesda; Andrew K. Chang, Potomac; John E. Fuller, Brookeville, all of, Md. and Angelo J. Mauriello, Southampton, Pa., a part interest
Continuation of Ser. No. 1,225, Jan. 6, 1987. This application Jan. 29, 1988, Ser. No. 150,286
Int. Cl.[4] E04B 2/02
U.S. Cl. 52—173 R **15 Claims**



1. A shielding enclosure for preventing propagation of electromagnetic radiation into or out of the enclosure comprising:
a support structure,
a floor,
a ceiling;
perimeter walls;
a plurality of sheets of electrically conductive material supported on said structure and covering said floor, ceiling and perimeter walls of said shielding enclosure, each of said sheets having an edge extending therearound and a region of overlap extending inwardly of and along said edge, said region being in overlapping engagement with the region of overlap of sheets adjacent thereto on said support structure, the overlapping regions of any two adjacent sheets defining a wave guide gap having a dimension of width and depth, and
pressing means disposed externally of said sheets to press adjacent sheets together at the overlapping regions of overlap to maintain a wave guide gap through which the electromagnetic radiation cannot propagate.

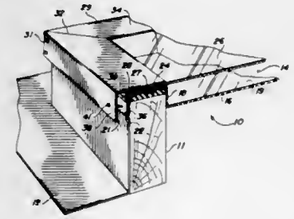
4,823,524
APPARATUS FOR AIDING PEOPLE IN WALKING UP AND DOWN STAIRS
Joseph A. Bednar, 123 Howard St., Hopelawn, N.J. 08861
Filed Jul. 9, 1987, Ser. No. 71,394
Int. Cl.[4] E04F 11/00
U.S. Cl. 52—182 **11 Claims**

1. Apparatus for aiding a person in walking up and down a staircase, which staircase has at least one railing extending along the staircase and being disposed at a predetermined distance above the staircase, the top surface of the at least one railing extending substantially parallel to the staircase, the apparatus comprising:
a multiplicity of support means for supporting a person's hands, the multiplicity of support means being affixed to the top surface of the at least one railing at space apart



locations and the top surface of each of the support means protruding above the top surface of the at least one railing.

4,823,525
SKYLIGHT STRUCTURE
Joseph W. Roberts; John C. Roberts, both of Orlando, and Gordon MacLeod, Apopka, all of Fla., assignors to Tub-Master Corporation, Orlando, Fla.
Filed Sep. 13, 1988, Ser. No. 243,916
Int. Cl.[4] E04B 7/18
U.S. Cl. 52—200 **12 Claims**



1. A skylight structure for use in connection with a roof opening having a curb extending around the edges of the opening, comprising:
an internal plastic member adapted to cover said opening, said plastic member having an integral peripheral flange adapted and configured to seat on said curb, said flange including a downturned portion for location outwardly of said curb, said downturned portion having a lowermost end;
an external glass member overlying said internal member in spaced relationship at opposing central portions of said members and abutting said internal member marginally at confronting portions of said integral flange internally of said downturned portion;
means providing a seal between said confronting portions for establishing an insulating dead air space between said central portions;
a framing member in the form of a cap bordering an upper surface of said external member, said cap having a first flange extending downwardly outwardly beyond a perimetal edge of said external member and adjacent an outer surface of said downturned portion, and a second downwardly extending flange spaced outwardly from said first flange and establishing a sheltered gap between said second flange and said downturned portion for impeding the inward flow of water from exposed surfaces of said skylight structure; and

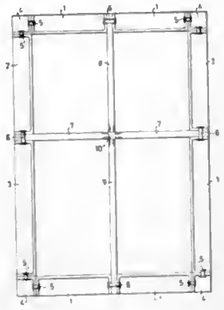
means securing said cap to said internal and external members.

4,823,526

FRAME CONSTRUCTION PROVIDING LEAD THROUGH FACILITIES FOR CABLES OR LIKE DEVICES

Bengt-Göran Johansson, Lyckeby; Tomas Kreutz, Karlskrona, and Bengt Olausson, Nättraby, all of Sweden, assignors to Lycab AB, Karlskrona, Sweden

Filed Nov. 12, 1987, Ser. No. 119,378
Claims priority, application Sweden, Nov. 11, 1986, 8604818
Int. Cl.⁴ E04C *1/39*
U.S. Cl. 52—220 **10 Claims**



1. A rectangular frame construction for providing lead-through facilities for passing cables and like devices sealingly through a wall or like structure,

said frame construction comprising:

a first pair of frame sides including a left frame side and a right frame side, each having two opposite ends;

a second pair of frame sides including a top frame side and a bottom frame side, each having two opposite ends;

both said frame sides of at least one of said pairs each comprising at least two frame side-pieces arranged in a respective line so as to have the respective said opposite ends on different ones of the respective said frame side-pieces in a respective said line, so that each of said frame side-pieces which comprises a respective side frame comprising at least two frame side-pieces has at least one frame side-piece end which lies intermediate the respective said frame side;

both said frame sides of at least another of said pairs each comprising at least one frame side piece;

at least one partition wall means arranged orthogonally of said frame construction so as to extend perpendicular to and between the frame sides of one of said pairs of frame sides each comprising at least two frame side-pieces and so as to extend parallel to and between the frame sides of another of said pairs of frame sides each comprising at least one frame side-pieces;

each partition wall means having two opposite end portions, each intervened between two respectively adjacent side piece ends which lie intermediate opposite ends of a respective frame side;

respective opposite ends of said frame sides of said first pair being arranged to adjoin respective opposite ends of said frame sides of said second pair at four respective corners;

four corner pieces disposed, respectively, at said four corners;

a plurality of first fastening devices each fastening a respective two adjoining ends of a respective two frame sides, to a respective said corner piece;

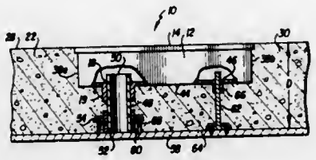
a plurality of second fastening devices each fastening a respective two adjacent side-piece ends which lie intermediate opposite ends of a respective frame side, to a respective end, which intervenes between them, of a respective said partition wall means, whereby said frame sides and said partition wall means constitute mutually interconnected frame members which divide said frame constructions, interiorly thereof, into a plurality of sections each adapted to be filled, in use, with a respective packing piece made from a material having a given compressibility, such as to provide a plurality of through-passing holes which correspond in size and numbers to cables or like devices which are to be passed through said frame construction.

4,823,527

PLUMBING CONCRETE FORM ACCESSORY

Gerold J. Harbeke, 2807 S. Military Trail, West Palm Beach, Fla. 33415

Continuation-in-part of Ser. No. 807,927, Dec. 12, 1985, abandoned. This application Sep. 1, 1987, Ser. No. 91,692
Int. Cl.⁴ E04G *15/06*
U.S. Cl. 52—221 **12 Claims**



1. A plumbing concrete form accessory to be mounted on a concrete form for molding a void at a surface of a concrete wall for installation of a plumbing fixture therein and for simultaneously providing a cast-in, liquid-conveying pipe stub for servicing said plumbing fixture, said form accessory comprising:

a hollow displacement member having a bottom wall, side walls, and an open top, said displacement member being of a size for forming a working void at said surface of said concrete wall in which said plumbing fixture can be easily coupled to said pipe stub, said hollow displacement member having a hole in said bottom wall thereof, said bottom wall defining an annularly-shaped sleeve at said hole for fitting an outside surface of said pipe stub relatively snugly, except for said hole said bottom wall and side walls of said displacement member being closed for displacing wet concrete poured into said concrete form and thereby forming said working void, but said top being open for providing access to the interior of said hollow displacement member through which said plumbing fixture can be coupled to said pipe stub once the concrete has cured;

said liquid-conveying pipe stub with a first end having an outer surface with a size and shape for snugly fitting into said sleeve and sliding therein and a second end for being attached to a concrete form;

first attachment means for attaching said sleeve to the outer surface of said pipe stub to thereby mount said hollow displacement member on said pipe stud while leaving access to said first end of said pipe stub from within the interior of said hollow displacement member whereby said plumbing fixture can be coupled to said pipe stub from within the interior of said hollow displacement member;

second attachment means for being attached to said form and to said second end of said pipe stub for thereby mounting said pipe stub and said hollow displacement member on said form; and

an additional shaft support extending from said hollow displacement member to said form wall for providing additional support for said hollow displacement member;

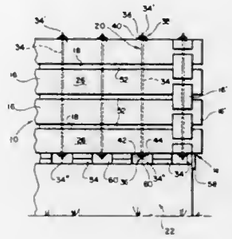
whereby said hollow displacement member can be mounted on the exterior surface of the pipe stub and the pipe stub can be mounted on a concrete form so that this entire structure is thereby supported and held in position in said concrete form while concrete is poured and cured in said concrete form and thereafter left in position to have said plumbing fitting coupled to said first end of said pipe stub from the interior of said hollow displacement member and a further pipe attached to said second end of said pipe stub.

4,823,528

LOG WALL AND CORNER JOINT FOR LOG BUILDING STRUCTURES

Garland Faw, Rte. 11, Box 525-D, Salisbury, N.C. 28144

Filed Feb. 3, 1987, Ser. No. 10,326
Int. Cl.⁴ E04B *1/10*
U.S. Cl. 52—233 **9 Claims**



1. A log wall for use in a building structure, comprising a plurality of elongate log units arranged coplanarly in stacked relationship along respective longitudinal stacking surfaces thereof, said stacked log units having a plurality of aligned openings extending therethrough transversely with respect to their said stacking surfaces at spacings along said log units, a plurality of connecting rods extending respectively through said aligned openings, each said rod having opposite threaded end portions respectively exposed outwardly adjacent the opposite outwardmost-stacked log units, first nut means threadedly engaging one exposed end portion of each said rod and being fixed with respect to the adjacent outwardmost-stacked log unit, and second nut means threadedly engaging the other exposed end portion of each said rod for periodic selective tightening movement with respect to said log units for maintaining said log units in their said stacked relation against any tendency to separate from one another due to shrinkage, warpage and settlement of said log units, the fixed engagement of each said first nut means being effective to prevent any unitary movement of any said first nut means and its associated rod upon selective tightening movement of the associated second nut means to insure tightening of said log units in spite of any tendency of said second nut means and said rod for unitary movement.

4,823,529

DECK CONSTRUCTION

Ronald P. Canfield, and Richard C. Hagel, both of 1124 Bennett Clark Rd., Nacogdoches, Tex. 75963

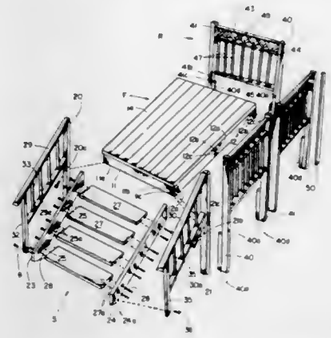
Filed Mar. 17, 1987, Ser. No. 26,944
Int. Cl.⁴ E04B *1/00*
U.S. Cl. 52—263 **6 Claims**

1. A modular deck system comprising:

(a) a rectangular floor member having a perimeter support frame consisting of end and side members joined together at their adjacent ends and adapted to receive a floor, said side members being twice as long as said end members;

(b) a plurality of railing sections each as long as one of said end members and having a pair of laterally spaced vertical support members adapted to be secured to the end and/or the side members of said perimeter support frame, in a pre-determined position;

(c) a pair of upper and lower laterally spaced vertical support members for supporting stair runners and stair treads attached thereto;



(d) knee means on said vertical support members adapted to engage the lower side of said perimeter support members for supporting said support frame and said floor; and

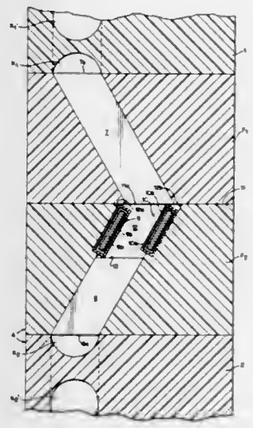
(e) means for positioning said vertical support member at either end of the rectangular floor member or in either of two pre-determined positions on either side of said rectangular floor member.

4,823,530

THERMIC INSULATING COVERS FOR FAÇADE AND THE LIKE WALLS

Rolf A. Häring, Hauptstrasse 73, CH-4148 Pfeffingen, Switzerland

Continuation-in-part of Ser. No. 859,918, Apr. 5, 1986, abandoned. This application Dec. 4, 1986, Ser. No. 938,033
Claims priority, application Switzerland, May 8, 1985, 1943/85
Int. Cl.⁴ E04B *1/94, 1/70*
U.S. Cl. 52—317 **12 Claims**



1. An internally ventilated facade insulation comprising synthetic resin panels and extending between a lower end zone

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and an upper end zone of a facade having a determined height and width as well as ventilation ducts extending from said lower to said upper end zone substantially over the entire height of said facade,

said facade insulation consisting essentially of (a) at least two horizontally extending facade regions, and (b) a flame barrier between said regions, having an upper end face and a lower end face and extending horizontally across substantially the entire width of the facade,

at least one of said facade regions being a lower one having an upper region-end face and supporting said lower flame barrier end face thereon, and at least a second one of said facade regions being an upper one having a lower region-end face and resting therewith on said upper flame barrier end face, above said first facade region;

said flame barrier comprising (i) a plurality of barrier ducts, adapted for connecting ventilation ducts in said lower facade region with corresponding ducts in said upper facade region, and (ii) an elongated transverse channel extending substantially horizontally and transversely to said barrier ducts and intersecting said barrier ducts so as to be in free communication with said ventilation ducts therebelow and thereabove up to a temperature limit, and

heat-expandable blocking means lodged in and extending along said transverse channel, and being adapted for expanding, when the temperature in said ventilation ducts located in said lower facade region adjacent said transverse channel reaches said temperature limit, in a manner such that at least about 80% of the cross-sectional area of each of said barrier ducts and upper facade region ducts is blocked off above said transverse groove.

4,823,531

HINGED CLOSURE PANEL WITH SEPARATE HINGE MEMBER

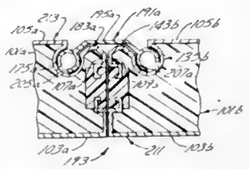
H. M. Robert Labelle, 50 Westmooreland Ave., Cornwall, Ont., Canada K6J 2G4

Continuation of Ser. No. 8,473, Jan. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 573,671, Jan. 25, 1984, abandoned. This application Mar. 23, 1988, Ser. No. 172,275

Claims priority, application Canada, May 2, 1983, 427214

Int. Cl.⁴ E04B *1/344*

U.S. Cl. 52—586 **4 Claims**



1. A rolling closure comprising a plurality of panels and a plurality of hinge members hingedly joining the panels together so that the closure can be suspended with the panels aligned when in use, or wound on a drum for storage when not in use; each panel having: a front wall, a back wall parallel to the front wall and side walls joining the front and back walls to form a tubular structure having a generally rectangular cross-section; a pair of hinge sockets formed within the tubular structure, the hinge sockets extending across the structure parallel to the side walls with one hinge socket located close to one of the side walls and the back wall and the other hinge socket located close to the other side wall and the back wall; each hinge socket defined by a wall that is part-circular when viewed in cross-section and that extends over an arc that is substantially greater than 180°; connecting wall means connecting each hinge socket to the back wall, said connecting wall means defining an opening extending from the back wall into the hinge socket, the opening being narrower in cross-section than the cross-section of the hinge socket; the back wall comprising at least a long back wall section extending between said pair of hinge sockets each hinge member joining each adjacent pair of panels together having a shallow channel cross-sectional shape defined by a main support wall having a specific thickness and first and second connecting walls extending from opposite sides of the support wall and terminating in free sides, and a pintle on the free side of each connecting wall; one pintle of each hinge member mounted in a socket of one panel and the other pintle of each hinge member mounted in the adjacent socket of an adjacent panel with the main support wall of each hinge member extending parallel to the back walls of the adjacent panels when the panels have their back walls aligned.

4,823,532

BUILDING ELEMENT AND COUPLING-PIN FOR INTERCONNECTING SUCH ELEMENTS

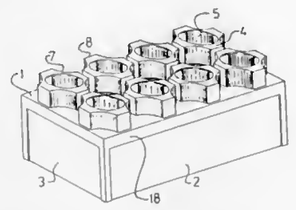
Joseph P.M. Westerburgen, assignor to Cornelia P.M. Westerburgen, Heythuysen, Netherlands

Filed Nov. 10, 1986, Ser. No. 928,399

Claims priority, application Netherlands, Nov. 14, 1985, 8503134

Int. Cl.⁴ E04C *1/10*

U.S. Cl. 52—594 **8 Claims**



3. Rectangular building element, which at one side is provided with projections and at the other side with recesses, such that, by arranging two elements one upon each other, the projections of the one element fit into recesses of the other element and whereby the projections are provided with a central aperture, wherein the central aperture comprises a top round opening and walls which are locally widened allowing connection of both elements by means of a coupling-pin having a head at the one end and hook-like lugs at the other end and which in operative position rests with its head on a projection of the one element and snaps with its lugs in the widening of the central aperture of the projection of the other element and further characterized in that the locally widened walls of the central aperture have an undulated cross-section with inwardly directed crests, the top of which constitute a local continuation of the top round opening of the central aperture.

4,823,533

STRUCTURAL CLADDING APPARATUS

David U. Hillstrom, Novi, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Dec. 30, 1987, Ser. No. 139,479

Int. Cl.⁴ G09F *13/04*

U.S. Cl. 52—727 **20 Claims**

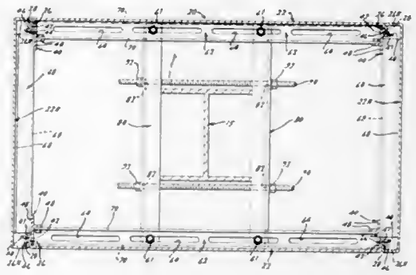
1. A cladding apparatus adapted for substantially enclosing a column, pole or other longitudinal structure, said cladding system comprising:

a number of longitudinally-extending corner frame members adapted to be disposed in a spaced-apart relationship relative to the longitudinal structure:

a number of cross members spaced away from the longitudinal structure and extending laterally between and interconnecting adjacent pairs of said corner frame members, said cross members further being longitudinally spaced apart from one another;

a number of pairs of mounting members disposed at a generally aligned longitudinal position relative to said cross members, each pair of said mounting members being secured to first generally opposite lateral sides of the longitudinal structure and laterally interconnecting a pair of said cross members spaced from second generally opposite sides of the longitudinal structure; and

a number of cladding panel members laterally interconnecting adjacent pairs of said corner frame members and extending longitudinally in a generally parallel and spaced-apart relationship with the longitudinal structure in order to substantially surround and obscure the longitudinal structure, said corner frame members having at least two corner frame flange portions extending along at least a portion of their lateral sides, said cladding panel members



having angled edge portions thereon, said angled edge portions on adjacent cladding panel members being adapted for engagement with said corner frame flange portions on the same corner frame member, said corner frame flange portions on each of said corner frame members protruding laterally outwardly therefrom and are disposed at an angular relationship relative to one another, one of said angled edge portions on a first of said adjacent cladding panel members engaging a first of said angularly disposed corner frame flange portions on one of said corner frame members and one of said angled edge portions on a second of said adjacent cladding panel members engaging a second of said angularly disposed corner frame flange portions on the same one of said corner frame members and substantially covering said one angled edge portion on said first of said adjacent cladding panel members.

4,823,534

METHOD FOR CONSTRUCTING INSULATED FOAM HOMES

Carl L. Hebinck, 53 Highland Pl., Land O'Lakes, Fla. 34639

Filed Feb. 17, 1988, Ser. No. 156,903

Int. Cl.⁴ E04B *1/16*

U.S. Cl. 52—743 **5 Claims**

1. A method of constructing walls for buildings consisting of:

providing a form in the ground;

pouring concrete into said form;

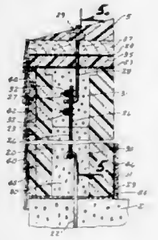
placing substantially vertically disposed rigid reinforcing rods in said concrete at spaced intervals, before said concrete hardens, said reinforcing rods having a bottom portion in said concrete and a portion above said concrete;

applying liquid adhesive to a top portion of said concrete once it has cured;

securing a rigid expanded polystyrene block to the top of said concrete by placing the bottom thereof on said liquid adhesive and on the top portion of said concrete, said expanded polystyrene block having a plurality of vertically disposed openings spaced apart at substantially the same intervals as the spacing of said reinforcing rods whereby said openings, and said block also includes a horizontal depression formed in said block and extending substantially completely along the top thereof in liquid communication with said vertically disposed openings;

placing at least two rigid horizontal reinforcing rods along the length of said depression;

pouring concrete into said vertically disposed openings through said depressions;



pouring concrete into said depression whereby the result will be horizontal beam of concrete resting on and tied into a plurality of vertical concrete posts all surrounded by said expended polystyrene block;

adhesively securing an expanded polystyrene strip gasket over the top of the concrete in said depression;

adhesively securing a wooden top plate over said strip gasket; and,

securing an EPS foam wedge over the top of said wooden top plate.

4,823,535

DEVICE FOR UNLOADING X-RAY FILM CASSETTES

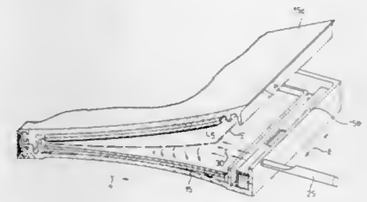
Manfred Schmidt, Kirchheim, and Johann Zanner, Unterhaching, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 152,022

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3706046

Int. Cl.⁴ B65B *5/10, 43/38;* **B65G** *65/04*

U.S. Cl. 53—266 R **11 Claims**



1. In a device for unloading X-ray film cassettes, comprising means defining a compartment for receiving a cassette to be unloaded; means for driving the cassette in and out of the compartment; means for light-tight closing said compartment; means for lifting a lid of said cassette; air blowing means which include at least one nozzle directed to the partially lifted lid of said cassette for separting a film being removed from the cassette; means for removing the film from the cassette; and a control device for controlling all said means, the improvement comprising said nozzle being positioned at said cassette and formed such that an air stream produced thereby is blown below a film stuck towards said lid into a gap between a bottom portion of said cassette and said lid as an acutely directed

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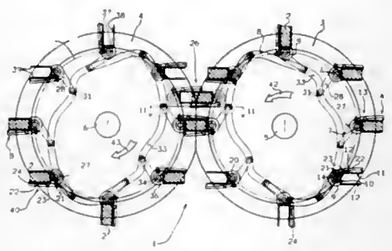
blow air stream, said nozzle being switchable on for short intervals by said control device so that vacuum is generated laterally of said stream between said film and said bottom portion whereby said film is sucked by said vacuum from said lid downwardly.

4,823,536

HANDLING METHOD AND DEVICE

Alberto Manservigi, and Riccardo Mattei, both of Bologna, Italy, assignors to G.D Societa Per Azioni, Bologna, Italy

Filed Dec. 17, 1987, Ser. No. 134,366
Claims priority, application Italy, Dec. 17, 1986, 3610-A/86
Int. Cl.[4] B65B *11/30*
U.S. Cl. 53—466 12 Claims



1. A handling method comprising:

successively mounting and retaining the items (2) on respective first supporting elements (9) equally spaced about the periphery of a first wheel (3 or 45) turning at substantially constant speed about a first axis; the first wheel (3 or 45) being located adjacent to a second wheel (4 or 46) turning about a second axis parallel with the first axis, and having second equally spaced peripheral supporting elements (36) for the items (2); each supporting element (9, 36) being connected to the respective wheel (3, 4, or 45, 46) in such a manner as to perform, together with the respective wheel (3, 4 or 45, 46), a first displacement along a circular trajectory about the axis of the wheel (3, 4 or 45, 46), and to perform, in relation to the wheel (3, 4 or 45, 46), a second displacement about a respective further axis parallel with the first and second axes; the distance between adjacent further axes being constant, and being the same on both first and second wheels (3, 4, 45, 46);

turning the two wheels (3, 4, or 45, 46) in opposite directions and at the same speed, so as to cause each supporting element (9, 36) to perform the first displacement;

causing each supporting element (9, 36) to perform the second displacement during part of the first displacement in which the supporting element (9, 36) approaches the other wheel (3, 4 or 45, 46); the second displacement of each supporting element (9, 36) being such as to position and maintain it in line with a corresponding supporting element (9, 36) on the other said wheel (3, 4 or 45, 46) over part of the respective circular trajectory; the distance between the first and second axes being such that, when located a minimum distance (26) apart, the distance between each first supporting element (9) on the first wheel (3 or 45) and the corresponding second supporting element (36) in line with it on the second wheel (4 or 46) is substantially equal to a dimension on the respective item (2) measured perpendicularly to the respective further axis; and

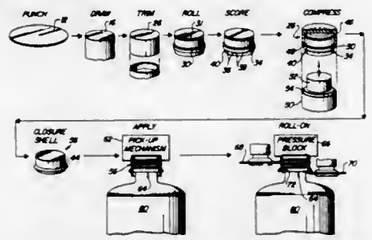
transferring each item (2) from the respective first supporting element (9) on to the corresponding second supporting element (36), substantially in the minimm distance position (26).

4,823,537

METHOD OF FORMING A PILFERPROOF CLOSURE

James D. Duke, New Paris, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 22, 1987, Ser. No. 52,982
Int. Cl.[4] B65B *7/20*
U.S. Cl. 53—488 14 Claims



1. A method of forming a pilferproof closure comprising in sequence the steps of:

(a) forming a cup-shaped member having an end wall and an annular sidewall depending therefrom;

(b) forming an annular ring in said sidewall such that said ring has a greater diameter than the outside diameter of said sidewall;

(c) forming a circumferential scoreline consisting of alternately arranged slits and fracturable bridges in a right cylindrical portion of the sidewall below and adjacent to said annular ring, said scoreline bifurcating said sidewall into an upper portion which is susceptible to being deformed about a threaded neck of a container and a lower portion which is adapted to be at least partly turned inwardly and into engagement with an annular shoulder formed on said container below said threaded neck;

(d) supporting said sidewall in the zone of said scoreline against inward collapse; and

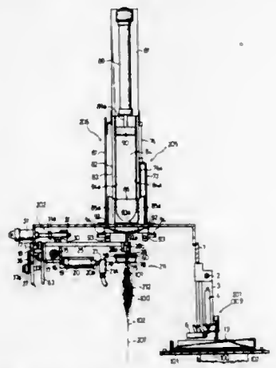
(e) while supporting said sidewall, compressing said annular ring to form an outwardly and downwardly extending bead at least partially covering said bridges.

4,823,538

BAGGING MACHINE

Yoshiyuki Takamura, Nagoya, Japan, assignor to Fuji Pack System Ltd., Aichi, Japan

Filed May 29, 1987, Ser. No. 55,630
Claims priority, application Japan, May 30, 1986, 61-126455; Jun. 19, 1986, 61-143461; Sep. 11, 1986, 61-139584; Feb. 3, 1987, 62-24359
Int. Cl.[4] B65B *31/06, 43/18*
U.S. Cl. 53—512 29 Claims



1. A bagging machine adapted to open, fill and close a bag, comprising

a bag supply means having a mounting member reciprocating between a bag supply position and a bag opening position, and a first bag-attracting portion mounted to the mounting members;

a bag-opening means having a second bag-attracting portion which is substantially facing the first bag-attracting portion when the mounting member of the bag supply means is in the bag opening position and which is movable in a first direction toward and away from the first bag-attracting portion, and means for shifting the second bag-attracting portion in a second direction substantially perpendicular to the first direction relative to the first bag-attracting portion when the second bag-attracting portion is in an abutting position with the first bag-attracting portion so as to hold the bag therebetween and to stagger the right and left side surfaces of an opening of the bag;

bag-filling means for putting selected articles in the bag;

bag-sealing means for closing the bag after opening and filling the bag; and

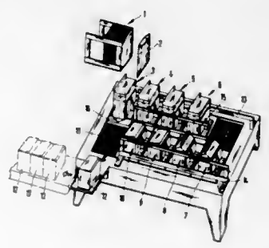
bag-moving means having a pair of openable holding members reciprocating between the bag-opening means and the bag-sealing means, the holding members being capable of closing the bag while holding the opening of the bag therebetween.

4,823,539

FORMING AND FILING DEVICE FOR CARDBOARD PACKAGE

Gustav Kuckhermann, and Per-Ulf Hansson, both of Achern, Fed. Rep. of Germany, assignors to Icoma Packtechnik GmbH, Achern, Fed. Rep. of Germany

Filed Aug. 26, 1987, Ser. No. 89,371
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3628952
Int. Cl.[4] B65B *43/34*
U.S. Cl. 53—579 12 Claims



1. An apparatus for forming, filling and closing packages especially made from cardboard, having a plurality of serially arranged processing stations, said apparatus comprising:

a plurality of sets of cassettes with each set having different sizes of cassettes corresponding to predetermine different package formats, each cassette being adapted for receiving therein flat one side open package having a format corresponding to said cassette format for spreading said flat package within said cassette, detachable means for moving each of said cassette with package spread therein or transportation of said packages between said processing stations, wherein said cassettes are substantiallay U-shaped, each cassette including two vertical plates which face one another, and a common bottom plate extending therebetween;

said apparatus further comprising a spreading device for spreading said package apart, said spreading device including movable profile plates, which press the package against the interior sides of vertical plates of said cassette, and form bottom flaps that extend laterally from the edge of the bottom of the package; and

pressure pads moving with the cassettes along a portion of their path and movable along the sides of said vertical plates, and equipped for fixing or holding down said bottom flaps.

4,823,540

STRETCHABLE ONE-PIECE HOOD

Betty E. Kosarek, 4800 Frazier Dr., Hood River, Oreg. 97031

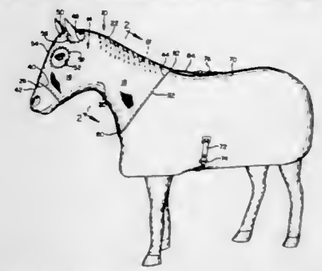
Filed May 18, 1987, Ser. No. 50,787
Int. Cl.[4] B68B *7/00*
U.S. Cl. 54—80 7 Claims

1. A hood for shaping the mane and protecting and polishing a portion of a coat of a horse, comprising:

an air permeable, stretchable unitary sleeve means capable of being stretched to fit over a horse's head while being pulled in place and yet proportioned to cling tightly to a head portion and neck portion of a horse for training the mane to lie in a predetermined direction and for rubbing against the coat with sufficient force to polish it;

a pair of eye openings defined by the sleeve means for enabling the horse to see in all directions while wearing said sleeve means; and

means attached to the sleeve means for connecting the sleeve



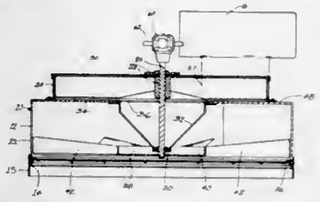
means to a horse blanket mounted on the horse to allow the sleeve means to stretch to maintain its position relative to the horse's head as the horse lowers its head from its normal angle of repose.

4,823,541

AGRICULTURAL HARVESTER

Glen T. A. Hewson, 116 Broome Street, Cottesloe, Western Australia, Australia 6011

PCT No. PCT/AU86/00001, § 371 Date Sep. 15, 1986, § 102(e) Date Sep. 15, 1986, PCT Pub. No. WO86/03932, PCT Pub. Date Jul. 17, 1986
PCT Filed Jan. 2, 1986, Ser. No. 916,481
Claims priority, application Australia, Jan. 14, 1985, PG8867
Int. Cl.[4] A01D *87/10*
U.S. Cl. 56—13.4 10 Claims



1. An agricultural harvesting apparatus which comprises a ground engaging housing, said housing defining an open lower end, a suction blade assembly mounted within the housing adjacent the open lower end of the housing for rotation about a substantially vertical axis and comprising a plurality of outwardly extending blade members arranged to cause air to be sucked through the suction blade assembly and to suck up crop material upon rotation of the suction blade assembly, a first outlet means in the housing mainly intended for removal of said air and a second outlet means in the housing mainly intended for removal of said crop material, an impeller blade assembly mounted in the housing for rotation about a common axis with the suction blade assembly, said impeller blade assembly comprising a backing plate and a plurality of depending outwardly extending blades mounted to said backing plate, said impeller blade assembly being positioned above the suc-

tion blade assembly and adjacent the first outlet means, said suction blade assembly being positioned adjacent the second outlet means.

4,823,542

LAWN MOWER COMBINATION

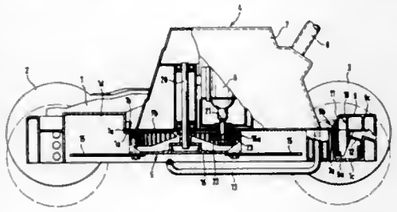
Manfred Klever, Saarbrücken-Scheidterberg, and Karl-Heinz Rott, Saarbrücken-Bubingen, both of Fed. Rep. of Germany, assignors to Gutbrod-Werke GmbH, Saarbrucken-Bubingen, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 112,488

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1986, 3636385

Int. Cl.[4] A01D *34/67*

U.S. Cl. 56—17.5 9 Claims



1. A mobile lawn mower of the type having rigid blades rotating in a horizontal mowing plane, comprising in combination:

a self-acting portable grass trimmer having a protective casing having an outer backing edge surface, a single-arm guide bar connected to said protective casing, and a mowing mechanism which includes a motor and a disc type rotating member drivingly connected to said motor for being rotationally driven thereby, said rotating member carrying on a circumference thereof a plurality of mowing blades attached articulately thereto for pivotal movement radially inwardly and outwardly of said circumference whereby said blades may be each manually pivoted radially inwardly to lie within the circumference of said rotating member, said blades being pivotable radially outwardly to describe a blade circle having a diameter greater than that of the circumference of said rotating member; and

a carriage housing enclosing a horizontal mowing plane, said carriage housing having a pair of front wheels and a pair of hind wheels, said carriage housing further having a horizontal backing surface corresponding in contour with the backing edge surface of the protective casing of said grass trimmer for receiving said backing edge surface thereon, said horizontal backing surface being provided with a center opening therein sized for just permitting insertion of said mowing mechanism of said grass trimmer therethrough when said blades of said rotating member are pivoted radially inwardly to lie within the circumference of said rotating member, the blade circle of said mowing mechanism projecting beyond the contour of said horizontal backing surface when said backing edge surface of said protective casing is received on said horizontal backing surface of said carriage housing, said carriage housing having a worm-like configuration with an inclined channel for lateral discharge of grass clippings therefrom.

4,823,543

APPARATUS FOR THE SPINNING OF YARN

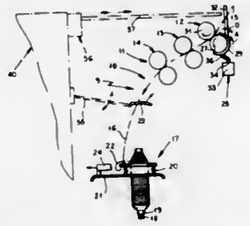
Wolfgang Igel, Ebersbach; Helmut Nickolay, Göppingen; Karl-Heinz Mack, Weilheim, and Werner Meissner, Hattenhofen, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,479

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622406; Oct. 29, 1986, 3636779

Int. Cl.[4] D01H *13/16*

U.S. Cl. 57—80 14 Claims



1. Apparatus for spinning of yarns from rovings comprising:

a spinning frame;

a plurality of spinning units arranged on said frame wherein each two neighboring spinning units form a spinning units pair which is supplied with the roving to be drawn from a common double-roving bobbin;

a plurality of drawing means for drawing said rovings which means are also arranged on said frame and one of said drawing means is associated with each of said spinning units;

a yarn break sensor assigned to each of said spinning units; and

stopping means for arresting and restarting feeding of said rovings simultaneously to both said drawing means of a spinning units pair, each of said stopping means including a pair of shells which press both rovings against a pair of upper rollers arresting said rollers.

4,823,544

PROCESS AND APPARATUS FOR JOB CONTROL OF SERVICING ELEMENTS AT A TEXTILE SPINNING INSTALLATION

Wolfgang Igel, Ebersbach/Fils, Fed. Rep. of Germany, assignor to Zinser Textilmaschines GmbH, Fed. Rep. of Germany

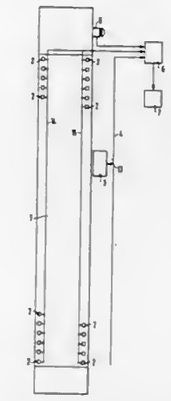
Filed Jan. 22, 1988, Ser. No. 146,937

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701796

Int. Cl.[4] D01H *13/32, 13/14*

U.S. Cl. 57—265 21 Claims

1. A process for job control of a plurality of servicing elements at a textile spinning installation having a plurality of servicing locations, wherein existing servicing cases are detected and analyzed for controlling their correction, characterized by the steps of ranking the servicing elements according to their respective capabilities for correcting differing servicing cases, automatically detecting existing servicing cases separately according to number and correction requirement, and, depending on number and degree of difficulty of the servicing cases detected, transmitting a job instruction signal to the servicing element having the correction capability corresponding to the existing servicing cases detected, the job instruction signal being one of at least two signal stages each of



which is respectively associated with a corresponding one of the ranked servicing elements.

4,823,545

METHOD OF AND APPARATUS FOR FALSE-TWIST SPINNING

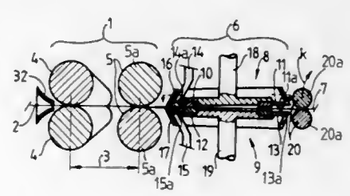
Hans Flueckiger, Oetwil Am See, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Aug. 24, 1988, Ser. No. 241,001

Claims priority, application Switzerland, Aug. 31, 1987, 03333/87

Int. Cl.[4] D01H *5/28, 1/12;* D02G *1/04*

U.S. Cl. 57—328 26 Claims



1. A method of false-twist spinning or yarn, comprising the steps of:

delivering a fiber sliver in a predeterminate sliver width from a sliver feeder having a pair of exit rolls forming a nip line for movement of the fiber sliver in a predetermined direction of conveyance;

engaging by suction means ends of fibers of the fiber sliver which constitute front fiber ends, as viewed in the predetermined direction of conveyance of the fiber sliver;

the step of engaging by the suction means the ends of the fibers of the fiber sliver entailing moving two suction surfaces of the suction means in opposite directions for suctionly engaging predominantly all of the fibers of the fiber sliver and conveying on the suction surfaces the thus suctionly engaged fibers towards one another for commingling the suctionly engaged fibers with one another and for conveyance of said suctionly engaged fibers in said predetermined direction of conveyance;

supplying an inner portion of the engaged fibers to fiber twisting means arranged downstream of the suction means, as viewed from the location of the sliver feeder in the predetermined direction of conveyance of the fiber sliver;

forming at the fiber twisting means a false-twisted yarn core from said inner portion of the engaged fibers which are twisted to be wound at predeterminate pitch;

utilizing as the fiber twisting means two oppositely movable friction surfaces with which merge associated ones of the suction surfaces as viewed in said predetermined direction of conveyance;

supplying by means of said suction means at least outer portions of said fiber sliver as edge fibers to said false-twisted yarn core such that said edge fibers are wound by said fiber twisting means around the false-twisted yarn core with a pitch steeper than the predeterminate pitch of the wound fibers of said false-twisted yarn core in order to produce a yarn travelling in a predetermined direction of movement; and

selecting a distance between the nip line of the eit rolls of the sliver feeder and an imaginary predeterminate intersection of the suction surfaces to be in such a relationship to an average fiber length of the fibers of the fiber sliver that the false-twisted yarn core engages the edge fibers at their front ends as long as rear ends thereof remain clamped in the nip line, so that the edge fibers leave the nip line only after the edge fibers have been twisted around the yarn core and are engaged by a spinning triangle formed by the inner portion of the engaged fibers twisted to form said false-twisted yarn core.

13. An apparatus for false-twist spinning a yarn, comprising:

fiber sliver feeder means defining a nip line;

said fiber sliver feeder means delivering a fiber sliver in a predeterminate width from said nip line;

spinning means for spinning said fiber sliver into a yarn;

said spinning means comprising:

suction means for engaging and conveying fiber ends of the fiber sliver delivered by said fiber sliver feeder means and thus forwarding the fibers engaged at said fiber ends, said fiber ends being front ends of the fiber sliver as viewed in a predetermined direction of movement of the fibers of the fiber sliver;

said suction means comprising two perforate suction surfaces arranged opposite one another;

said two perforate suction surfaces being movable in directions towards one another and overlapping one another;

twisting means for twisting a portion of said fibers of the fiber sliver delivered by said suction means into a false-twisted yarn core;

said twisting means comprise two friction surfaces;

a respective one of the suction surfaces and a respective one of said friction surfaces being disposed adjacent one another and arranged for movement in the same direction;

each said respective suction surface being disposed before said friction surface at least at the region of said fiber sliver feeder means as considered in said predetermined direction of movement; and

means for drawing-off the spun yarn in a predetermined direction of yarn movement.

4,823,546

STEAM-INJECTED FREE-TURBINE-TYPE GAS TURBINE

Dah Y. Cheng, Los Altos Hills, Calif., assignor to International Power Technology

Division of Ser. No. 577,899, Feb. 7, 1984. This application Apr. 13, 1988, Ser. No. 181,198

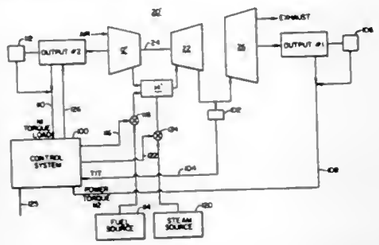
Int. Cl.[4] F02C *3/10*

U.S. Cl. 60—39.04 6 Claims

1. A method of operating a free turbine engine having at least a compressor, a core turbine mechanically coupled to said compressor to power it, and a power turbine, comprising the steps of:

injecting steam into a working fluid in said free turbine engine, wherein said free turbine engine has a single flow

path for substantially all of said working fluid and injected steam, first through said core turbine, and then through said power turbine;



operating two independent loads from said free turbine engine, one load from said power turbine and a variable load from said compressor/core turbine; and

controlling the amount of each of said loads such that core turbine/compressor mismatch is prevented.

4,823,547

THRUST REVERSER

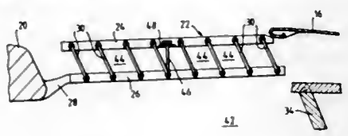
Arnold C. Newton, Derby, England, assignor to Rolls-Royce plc, Derby, England

Filed Aug. 25, 1987, Ser. No. 89,340

Claims priority, application United Kingdom, Oct. 30, 1986, 8625930

Int. Cl.⁴ F02K *3/04*

U.S. Cl. 60—226.2 **12 Claims**



1. A gas turbine engine including a cowl, an annular portion of which is translatable relative to the remainder thereof, at least one cascade structure comprising a pair of rectangular frames which, in a non-operative position are superimposed, one upon the other within said cowl, a plurality of vanes each having a leading and a trailing edge with said leading edges being pivotally connected to one of said frames and said trailing edges being pivotally connected to the other of said frames, one of said frames being connected to said cowl, the other of said frames being pivotally attached through the trailing edges of said plurality of vanes, to said one frame so as to enable relative, bodily arcuate movement thereof from said non-operative position wherein substantially no propulsive gases can pass between said vanes to a position wherein the frames are spaced from each other and the vanes are in an attitude wherein, in operation, they deflect propulsive gases which enter between them.

4,823,548

INTERNAL ANTI-POPPING ASSEMBLY FOR SOLID PROPELLANT ROCKET MOTOR

Jean Beboux, Bordeaux, France, assignor to Societe Europeenne de Propulsion, Suresnes, France

Continuation of Ser. No. 938,066, Dec. 4, 1986, abandoned. This application Sep. 6, 1988, Ser. No. 247,436

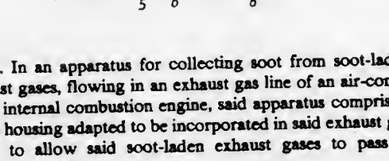
Claims priority, application France, Dec. 5, 1985, 85 18021

Int. Cl.⁴ F02K *9/00*

U.S. Cl. 60—253 **1 Claim**

1. An internal anti-popping arrangement for a solid propellant rocket motor comprising a propellant grain block housed in a casing and heat-protection means including a heat protection layer interposed between the propellant grain and the casing, the propellant grain defining a combustion chamber, said anti-popping arrangement comprising:

a separation zone formed in at least one end portion of the rocket motor between the propellant grain and the heat-protection layer by means of a skin detached from said heat protection layer and adhering to the propellant grain block, said separation zone being of variable volume to accommodate dimensional variations of said propellant



grain block within said casing, said separation zone being in gas flow communication with said combustion chamber; and

projections or teeth formed in one piece with at least one of said detached skin and said heat-protection layer and projecting into said separation zone to ensure a minimum spacing of said detached skin with respect to said heat-protection layer and provide a permanent passage allowing easy access of gases from the combustion chamber to the separation zone.

4,823,549

APPARATUS FOR COLLECTING SOOT FROM EXHAUST GASES OF AN AIR-COMPRESSING, SELF-IGNITING INTERNAL COMBUSTION ENGINE

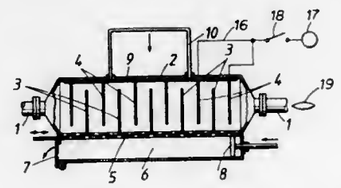
Franz Moser, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 844,836, Mar. 17, 1986, abandoned. This application Dec. 4, 1987, Ser. No. 129,867

Claims priority, application Austria, Apr. 2, 1985, 960/85

Int. Cl.⁴ F01N *3/02;* **B07D** *41/00*

U.S. Cl. 60—275 **19 Claims**



1. In an apparatus for collecting soot from soot-laden exhaust gases, flowing in an exhaust gas line of an air-compressing internal combustion engine, said apparatus comprising

a housing adapted to be incorporated in said exhaust gas line to allow said soot-laden exhaust gases to pass therethrough,

baffle walls contained in said housing and arranged to repeatedly deflect the exhaust gases flowing through said housing to cause soot to be separated from said exhaust gases and to deposit, at least in part, on said baffle walls, and

an accumulating container disposed beneath said baffle walls and arranged to receive soot which has been separated from said exhaust gases at said baffle walls,

the improvement comprising:

means included in said apparatus to cause soot deposited on at least part of said baffle walls to be be removed therefrom and to fall into said accumulating container;

said accumulating container being adapted to permit soot accumulated in said container to be removed from said apparatus;

a grate having openings disposed between said housing and said accumulating container; and

means provided for selectively closing the openings of said grate.

4,823,550

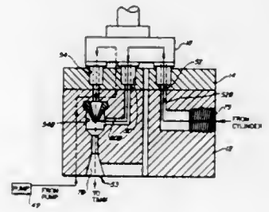
ROTARY VALVE WITH JET PUMP ASPIRATOR

Arnold F. Decker, Aurora, Ill., assignor to Templeton, Kenly & Co., Broadview, Ill.

Filed Jun. 23, 1987, Ser. No. 65,938

Int. Cl.⁴ F04F *5/10;* **F15B** *13/04*

U.S. Cl. 60—412 **16 Claims**



13. A directional flow control valve for controlling the flow of liquid to a hydraulic cylinder or the like comprising a valve body and a valve rotor having a plurality of liquid passageways disposed therein; said valve rotor being adjustably positionable relative to said valve body whereby different liquid passageways are formed between said valve body and rotor when said rotor is disposed in different positions of adjustment relative to said valve body; means for effecting fluid-tight connections between the passageways of said valve body and said valve rotor in said different positions of adjustment; aspirator means in said valve communicating with at least two of said fluid passageways in one position of rotor adjustment whereby liquid flow through one of said passageways into said aspirator means generates a partial vacuum adequate to induce flow of liquid into said aspirator means from a second of said fluid passageways communicating with said aspirator means.

4,823,551

HYDRAULIC CONTROL CIRCUIT FOR AN INJECTION MOLDING WITH TWO LOADS DRIVEN BY A PUMP

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Loesburg 1, Fed. Rep. of Germany

Filed Dec. 30, 1985, Ser. No. 814,634

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1984, 3447709

Int. Cl.⁴ F15B *13/06*

U.S. Cl. 60—422 **7 Claims**

1. A hydraulic control system for simultaneously driving two hydraulic loads of a production machine, particularly an injection molding machine, by means of a variable delivery pump feeding hydraulic drive fluid to said hydraulic loads through separate load lines, in accordance with independently controllable programs of flow rate and pressure, the hydraulic control system comprising in combination:

a variable delivery pump feeding drive fluid to a main supply line, the main supply line branching into two load lines which lead to the two hydraulic loads of the production machine;

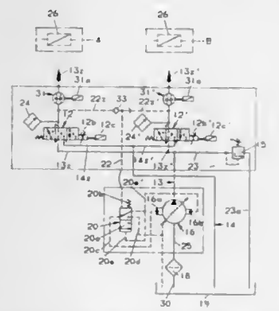
program means operable to generate flow rate programs and pressure programs for each load line, independently of the program assigned to the other load line;

flow-controlling valve means arranged in each load line for adjusting the flow rate in the associated load line in accordance with a flow rate program supplied by the program means;

pressure-controlling valve means arranged in each load line for adjusting the pressure in the associated load line in accordance with a pressure program supplied by said program means;

pressure transducing means associated with each load line for verifying the adjusted load line pressure against the pressure program supplied by the program means;

a pump adjusting valve having a pressure feedback line with two feedback branches linking the pump adjusting valve to both load lines downstream of their associated flow-controlling valve means and pressure-controlling valve means, the pump adjusting valve responding to the pressure in the major load line, which is the line momentarily carrying a higher operating pressure, by continuously adjusting the pump output so as to maintain a constant operational pressure gradient between the main supply line and the major load line downstream of its associated flow-controlling valve means and pressure-controlling valve means;



flip-flop valve means arranged in the junction between the feedback line and the two feedback branches for disconnecting from the feedback line the minor load line, which is the line momentarily carrying a lower operating pressure;

means associated with each of the two load lines for compensating the pressure imbalance in the minor load line, independently of the magnitude of said operational pressure gradient.

4,823,552

FAILSAFE ELECTROHYDRAULIC CONTROL SYSTEM FOR VARIABLE DISPLACEMENT PUMP

Larry O. Esell, Clinton; John Schmid, and Peter Tovey, both of Jackson, all of Miss., assignors to Vickers, Incorporated, Troy, Mich.

Filed Apr. 29, 1987, Ser. No. 43,829

Int. Cl.⁴ F16H *39/46;* **F04B** *49/06;* **G01L** *3/10;* **G01F** *1/00*

U.S. Cl. 60—443 **20 Claims**

1. An electrohydraulic fluid control system comprising:

means for providing a source of hydraulic fluid under pressure,

means responsive to hydraulic fluid at metered pressure for performing a preselected operation,

electrohydraulic proportional valve means having fluid ports coupled between said source and said pressure-responsive means, and a control input responsive to electronic valve control signals for metering fluid from said source to said pressure-responsive means as a proportional function of said valve control signals,

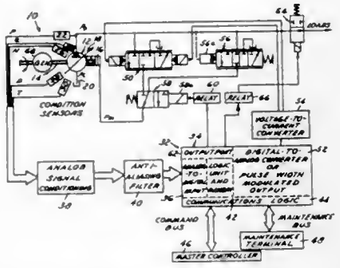
hydromechanical proportional valve means having a control input port coupled to said source, and primary fluid ports

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connected between said source and said pressure-responsive means in parallel with said electrohydraulic valve means for metering fluid to said pressure-responsive means as a proportional function of pressure of fluid at said control port,

fluid pressure at said pressure-responsive means being controlled by said electrohydraulic valve means and said hydromechanical valve means independently, and

second electrohydraulic two-position valve means responsive to second electronic valve control signals for selectively connecting said fluid ports of one of said electrohydraulic valve and said hydromechanical valve, but not both, to said pressure-responsive means.



4,823,553

PLASTIC MASTER CYLINDER WITH FLANGE-SUPPORTING ARMS

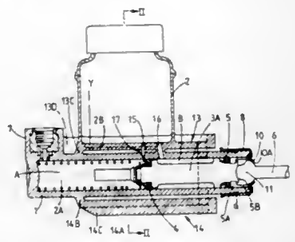
Desmond H. J. Reynolds, West Midlands, Great Britain, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Nov. 25, 1987, Ser. No. 125,143

Claims priority, application United Kingdom, Nov. 29, 1986, 8628601

Int. Cl.[4] B60T *11/22*; F16J *10/02*

U.S. Cl. 60—585 **15 Claims**



1. In a pressure cylinder of plastics material having an internal bore, an external cylinder wall and a mounting flange and including in use a piston reciprocally slidable in the cylinder bore in the direction of the longitudinal axis of the cylinder and a seal on the high pressure side of the piston, the improvement comprising:

a plurality of angularly spaced longitudinal load transmission arms extending substantially longitudinally of and in radially outwardly spaced relationship from the external cylinder wall;

a mounting flange end on each arm; and

a substantially radially outwardly projecting mounting flange connected to and supported by said mounting flange ends on said arms;

said arms being connected to the cylinder at a location remote from said mounting flange and beyond the end of the length of working stroke of the piston seal;

said cylinder, flange and arms being an integral molded structure.

4,823,554

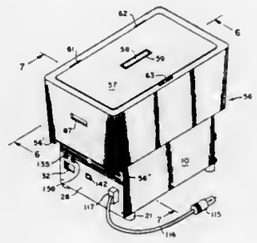
VEHICLE THERMOELECTRIC COOLING AND HEATING FOOD AND DRINK APPLIANCE

Leonard Trachtenberg, 512 Pleasant Valley Way, West Orange, N.J. 07052, and Peter W. Trachtenberg, R.D. 6, Box 505, Branchville, N.J. 07826

Continuation of Ser. No. 41,093, Apr. 22, 1987, Pat. No. 4,759,190. This application Jul. 15, 1988, Ser. No. 220,022

Int. Cl.[4] F25B *21/02*

U.S. Cl. 62—3 **8 Claims**



2. In combination an appliance for use in a vehicle, a thermoelectric heat or cold unit having a first mating means for receiving said appliance and including a thermally insulated upper body portion with a heat or cold conductive plate therein, said appliance having a bottom thermally conductive portion, means for detachably mating the appliance with the heat or cold unit in a rigid position so that the bottom surface of the appliance lies in thermal contact with the conductive plate of said unit despite vibration of said vehicle and to ensure the supply of heat or cold to said appliance, said appliance including a second mating means and a bottom cover attachable to the second mating means of the appliance to enclose the bottom conductive plate of the appliance.

4,823,555

SYSTEM FOR CONTROLLING A COMPRESSOR OF AN AIR CONDITIONER FOR MOTOR VEHICLES

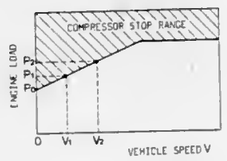
Hiroya Ohkumo, Koganei, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,584

Claims priority, application Japan, Dec. 26, 1986, 61-312964

Int. Cl.[4] B60H *1/32*

U.S. Cl. 62—133 **2 Claims**



1. In a system for controlling a compressor of an air conditioner for a vehicle powered by an engine, the system having an electromagnetic clutch for coupling the engine with the compressor, an electrically operated switch provided in a circuit for engaging the clutch, vehicle speed detecting means for detecting vehicle speed and for producing a vehicle speed signal corresponding to the vehicle speed, and engine load detecting means for detecting pressure in an intake manifold of the engine and for producing an actual pressure signal corresponding to the actual pressure in the intake manifold, the improvement comprising:

reference load characteristic memorizing means memorizing a characteristic comprising a desired pressure signal representing a continuously decreasing function of decreasing of the vehicle speed signal,

decision means for reading out a value of the desired pressure signal from the reference load characteristic memorizing means corresponding to and in response to the vehicle speed signal,

comparator means for comparing the actual pressure signal with the read out value and for producing a clutch disengagement signal when the actual pressure signal is larger than the read out value; and

control means responsive to the clutch disengagement signal for opening the electrically operated switch to stop operation of the compressor so as to reduce the load on the engine to increase the power for driving the vehicle.

4,823,556

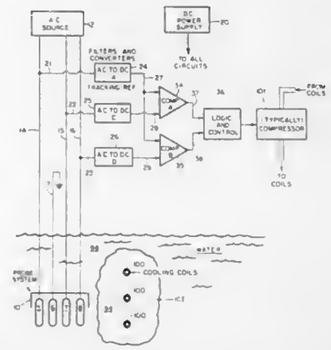
ELECTRONIC ICE BANK CONTROL

Milton L. Chesnut, San Antonio, Tex., assignor to Lancer Corporation, San Antonio, Tex.

Filed May 15, 1987, Ser. No. 51,080

Int. Cl.[4] F25C *1/00*

U.S. Cl. 62—139 **4 Claims**



1. An apparatus for controlling the size of an ice bank around cooling coils immersed in a water bath as part of a refrigeration system comprising:

a first controlling probe immersed in said water bath and located at a distance from said cooling coils representing the minimum desired size of the ice bank;

a second controlling probe immersed in said water bath and located at a distance from said cooling coils representing the maximum desired size of the ice bank;

a ground probe immersed in said water bath and located at a greater distance from said cooling coils than either of said first or second controlling probes;

a reference probe immersed in said water bath and located at a greater distance from said cooling coils than either of said first or second controlling probes;

means for producing a constant current between said first controlling probe and said ground probe, between said second controlling probe and said ground probe, and between said reference probe and said ground probe;

means for measuring the voltage potentials of said first controlling probe, said second controlling probe, and said reference probe as constant current flows from each of said probes to said ground probe;

means for turning said refrigeration system on when the potential of said first controlling probe is equal to the potential of said reference probe; and

means for maintaining the refrigeration system in an on condition even as the potential of said first controlling probe becomes greater than the potential of said reference probe due to ice formation around said first controlling probe and for turning off the refrigeration system when the potential of said second controlling probe becomes greater than the potential of said reference probe due to ice formation around said second controlling probe.

4,823,557

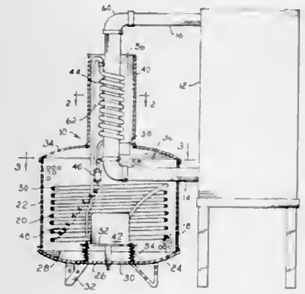
DEHUMIDIFIER WATER HEATER STRUCTURE AND METHOD

Edward W. Bottum, Jr., and Edward W. Bottum, both of 9357 Spenser Rd., Brighton, Mich. 48116

Filed Nov. 5, 1987, Ser. No. 117,044

Int. Cl.[4] F25B *27/02*

U.S. Cl. 62—238.6 **38 Claims**



1. Dehumidifier water heater structure comprising a compressor, combined condenser heat exchanger, expansion device and evaporator connected in series in a heat pump circuit, means for first circulating the air to be dehumidified around the evaporator to cause the moisture in the air to be dehumidified to condense on the evaporator and second circulating the dehumidified air over the compressor, and mans operably associated with the combined condenser heat exchanger for subsequently passing the dehumidified, heated air out of the dehumidifier water heater structure past the condenser heat exchanger and for circulating material to be heated through the condenser heat exchanger to transfer heat from the condenser heat exchanger into the material to be heated.

4,823,558

PLASTIC PAN ASSEMBLY FOR USE IN AIR CONDITIONERS AND REFRIGERATORS

Il Yoo Kim, 779 Audubon Ave. B-7, Alexandria, Va. 22306

Filed Jun. 28, 1988, Ser. No. 212,699

Int. Cl.[4] F25D *21/00*

U.S. Cl. 62—272 **7 Claims**

1. A primary pan assembly adapted to be mounted to the motor of an air conditioning system which comprises:

a plastic primary pan provided with a drainage hole disposed on at least one side thereof, a rail disposed on the outside of the bottom thereof, and a C-shaped circumferential portion on one side thereof,

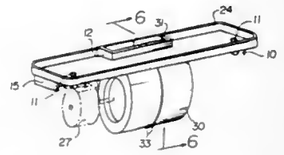
a channeled supporting bracket having a plurality of elongated apertures disposed in the center thereof for receiving said rail of said primary pan,

a motor mounted to said channeled supporting bracket by screws through said elongated apertures, and

a pair of fan covers having elongated slots disposed on the top surface thereof for receiving said supporting bracket, and a circumferential raised portion disposed around a

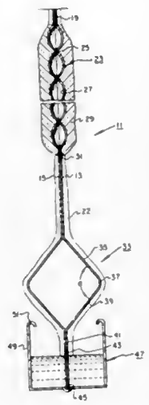
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lower outlet thereof for suspending said fan covers on said C-shaped circumferential portion of the plastic primary pan, whereby the primary pan assembly can be mounted to housing walls of the air conditioning system at an incli-



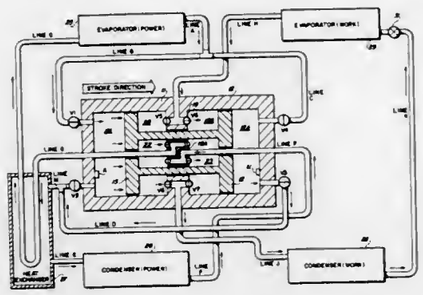
nation for easily draining the condensate water through the drainage hole and can be easily installed without a large number of screws and the primary pan can be smoothly mounted to and easily separated from the channeled supporting bracket.

4,823,559
ICE MAKING APPARATUS
William F. Hagen, Rte. 1, Box 1017, Argyle, Tex. 76226
Filed Apr. 18, 1988, Ser. No. 182,800
Int. Cl.[4] F25C *1/12*
U.S. Cl. 62—347 **11 Claims**



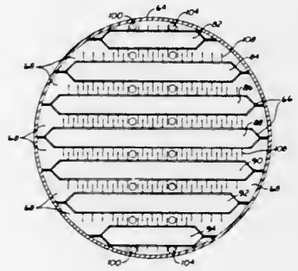
1. An ice making apparatus, comprising in combination:
a pair of plates welded together with spaced apart upper and lower longitudinal welds, having inner wall surfaces facing each other and outer wall surfaces facing in opposite directions from each other;
a refrigerant portion defined by the longitudinal welds, the refrigerant portion having a plurality of pattern welds between the plates, the plates being spaced apart from each other between the pattern welds to define coolant passages for receiving a cold refrigerant fluid to flow in contact with the inner wall surfaces to chill the plates in the refrigerant portion to form ice, and in alternating sequence a warm refrigerant fluid to warm the plates to release the ice;
water supply means for discharging a stream of water onto the outer wall surface of each plate above the refrigerant portion for flowing over the refrigerant portion to form the ice;
a trough located at the bottom of the plates for receiving water from the water supply means after it has flowed over the refrigerant portion; and
a deflecting area below the lower longitudinal weld on the outer side of each plate, each deflecting area having an outward inclined section located above the trough and extending outward and downward from each plate for directing ice outward past the trough when released from the plates, each deflecting area having a inward inclined section, each deflecting area having a curved section joining the inward inclined section and the outward inclined section, each outward inclined section and each curved section being a solid sheet of impervious metal for causing all of the water flowing from the water supply means to flow over the outward inclined section, around the curved section and into the trough.

4,823,560
REFRIGERATION SYSTEM EMPLOYING REFRIGERANT OPERATED DUAL PURPOSE PUMP
C. Allen Rowley, Mesa, and Hector M. Gutierrez, Phoenix, both of Ariz., assignors to E Squared Inc., Mesa, Ariz.
Filed May 27, 1988, Ser. No. 199,676
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—467 **9 Claims**



1. An engine comprising:
a first elongated expansion-compression device having a pair of ends and defining a pair of axially aligned first and second chambers separated by a common flange and each having a linearly movable piston therein which are axially interconnected by a hollow cylinder extending through said flange,
each of the pistons divide its associated chamber into a first sub-chamber and a second sub-chamber of varying size as its associated piston moves therealong,
a second expansion-compression device mounted within said cylinder and comprising a stationary member forming a portion of said flange extending laterally across said cylinder,
said member dividing the hollow interior of said cylinder into third and fourth sub-chambers of varying size as the pistons of said first device moves along their associated chambers,
conduit means, one extending into each end of said first device and through its associated piston and into said cylinder,
passageways formed in said portion of said flange, each connecting a different one of said third and fourth sub-chambers to the hollow interior of a different one of said conduit means,
each of the first and second sub-chambers having a first inlet port and a first outlet port and first valve means associated with each first inlet and first outlet port for controlling the flow of a refrigerant therethrough, and
each of the third and fourth sub-chambers having a second inlet port and a second outlet port formed in said portion of said flange and second valve means associated with each second inlet and each second outlet port for controlling the flow of refrigerant from one of the third and fourth subchambers through one of said passageways and into one of said conduit means,
said valve means of the first and second devices open and close their associated ports in a predetermined sequence.

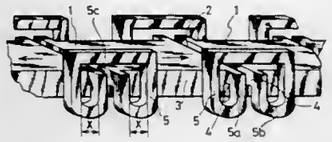
4,823,561
REFRIGERATION APPARATUS HAVING A HEAT EXCHANGER PRE-COOLING ELEMENT
Danny H. Medlock, 5008 W. Linebaugh Ave., Ste. 24, Tampa, Fla. 33 624
Filed Mar. 18, 1988, Ser. No. 169,840
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—513 **7 Claims**



1. In a refrigeration system including a compressor, a condenser, a heat exchanger and an evaporator all connected in series, the improvement comprising an elongated heat exchanger having an outer wall enclosing:
a multiplicity of longitudinally extending cooling cells each enclosing a first channel containing vaporized refrigerant;
a second channel from an entrance to the heat exchanger, and directed in a serpentine fashion throughout the heat exchanger juxtaposed to the cooling cells and exiting through a first outlet through the outer wall connected to a conduit which is connected to the evaporator;
the second channel having a second outlet through the outer wall to a conduit outside the heat exchanger leading to a solenoid operated valve;
a conduit from the solenoid operated valve to a metering valve device which lowers the refrigerant pressure and causes it to vaporize;
a conduit from the metering valve device to the first channel enclosed by the cooling cell whereby the vaporized refrigerant acts to cool the cooling cells and in so doing also cools the refrigerant passing through the second channel within the heat exchanger; and
the heat exchanger connected to the condenser by a conduit through which hot liquid condensed refrigerant is fed to the entrance to the heat exchanger.

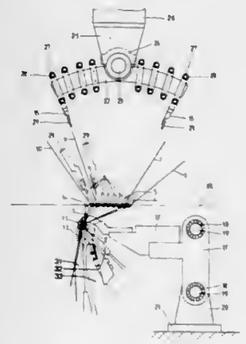
4,823,562
BAND FOR WATCH
Takasuke Yokote, and Nobuo Kamimura, both of Tokyo, Japan, assignors to Shoyo Sangyo Co., Ltd. and Seiko Instruments Inc., both of Tokyo, Japan
Filed May 18, 1987, Ser. No. 51,470
Claims priority, application Japan, May 16, 1986, 61-111959
Int. Cl.[4] A44C *5/00*
U.S. Cl. 63—5.1 **7 Claims**

1. An expansible integral band comprising: a plurality of beam portions disposed in side-by-side relation in the lengthwise direction of the band, each beam portion having two opposed side surfaces disposed in spaced-apart relation in the widthwise direction of the band so as to define for each pair of adjacent beam portions a corresponding pair of side surfaces adjacent to each other in the lengthwise direction, each pair of adjacent side surfaces having a pair of arm portions protruding outwardly from the respective adjacent side surfaces in the widthwise direction; and a plurality of elastic bridge portions integrated with the beam portions through the arm portions, each bridge portion being elastically connected between a pair of arm portions of adjacent beam portions to enable the inte-



gral band to expand and contract in the lengthwise direction, each bridge portion lying in a first plane which is parallel to the lengthwise direction and which intersects with a second plane which is parallel to both the lengthwise and widthwise directions, and each bridge portion being elastically deformable in the lengthwise direction along the first plane.

4,823,563
WARP KNITTING MACHINE WITH PILE INSTRUMENT BAR
Roland Wunner, Schwarzenbach, Fed. Rep. of Germany, assignor to Liba Maschinenfabrik GmbH, Naila, Fed. Rep. of Germany
Filed Sep. 10, 1987, Ser. No. 95,827
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630821
Int. Cl.[4] D04B *23/06*
U.S. Cl. 66—84 R **7 Claims**



1. In a warp knitting machine having a needle bar supporting a plurality of knitting needles which is supported for vertical reciprocal movement, means for opening and closing said needles as said needle bar reciprocates, a sinker bar having a plurality of sinkers for cooperating with said needles, a plurality of guide bars supporting a plurality of yarn guides mounted above said needle bar for swinging movement for guiding base and pile yarns about said needles, and a pile instrument bar having a plurality of pile forming instruments for forming pile loops, the improvement comprising:
(a) mounting means for supporting said pile instrument bar so that said pile loop forming instruments are located adjacent said needle bar while being offset from said yarn guide mounting means and below the zone of swinging guide bar movement.

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4,823,564

DEVICE FOR CLAMPING WEFT THREADS IN A WARP KNITTING MACHINE

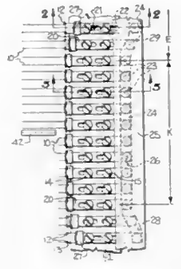
Roland Wunner, Schwarzenbach, Fed. Rep. of Germany, assignor to LIBA Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 230,904

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729344

Int. Cl.[4] D04B *23/06*

U.S. Cl. 66—84 A **7 Claims**



1. A device for clamping weft threads in a warp knitting machine including a row of knitting needles (42), weft thread hooks (12) supported on longitudinal conveyors (43, 44) extending perpendicular to and adjacent opposite ends of said row of knitting needles (42), a weft thread guide carriage (37) supported for back-and-forth movement between said weft thread hooks (12) for feeding weft thread arrays (38) so that weft thread waste portions extend around the outsides of said hooks (12) while the weft threads (10) are cut adjacent opposite ends of said row of knitting needles (42) with said hooks (12) forming one part of clamping means interacting with the hooks, the combination therewith wherein the other part of said clamping means comprises clamping slides (20) mounted on said longitudinal conveyors (43, 44) for sliding movement in a perpendicular direction relative to the movement of said longitudinal conveyors (43, 44), means for maintaining said clamping slides (20) in a retracted position away from said hooks (12) through a placement zone (E) located upstream of said row of knitting needles (42), and for maintaining said slides (20) in active position pressed against said hooks (12) and the weft thread (10) as said longitudinal conveyors (43, 44) move through a clamping zone (K) extending both upstream and downstream of said row of knitting needles (42).

4,823,565

WINDING SUPPORT

Manfred Hahm, Ahornweg 17, 5100 Aachen, Fed. Rep. of Germany

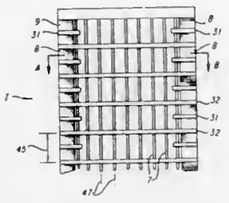
Continuation of Ser. No. 722,269, Apr. 11, 1985, abandoned. This application Mar. 29, 1988, Ser. No. 177,895

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1984, 8411284[U]

Int. Cl.[4] D06B *23/04*

U.S. Cl. 68—198 **25 Claims**

25. A winding support for treatment of threads or yarns being molded as a single part in a mold having two mold parts, and a separation plane separating the two mold parts, the support comprising a shell ring having two end rings, and intermediate rings having the same diameter as the end rings disposed between said end rings, said intermediate rings being formed of a multiplicity of ring elements; and spacer elements interconnecting said ring elements in said shell ring, all of said ring elements and spacer elements having surfaces being perpendicular to said separation plane for allowing the mold parts to separate from the molded support; said winding support being molded as one piece of material; other spacer elements having surfaces being parallel to said separation plane, and two rows of ring segments oppositely disposed, axially stacked in



opposing pair halves between said intermediate rings and supported by said first-mentioned spacer elements and said other spacer elements.

4,823,566

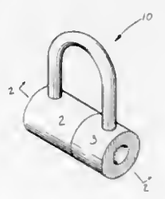
PADLOCK AND LOCKING MECHANISM THEREFOR

Victor L. Patton, 13435 Allison Ranch Rd., Grass Valley, Calif. 95949

Division of Ser. No. 33,828, Apr. 3, 1987, Pat. No. 4,748,832. This application Apr. 18, 1988, Ser. No. 182,494

Int. Cl.[4] E05B *67/22*

U.S. Cl. 70—38 C **13 Claims**



1. A padlock comprising in combination:

a shackle having a generally U-shaped configuration with one short leg and one long leg,

said long leg having at a free end thereof a flange which underlies a cylindrical portion which in turn is spaced below a notch on said long leg,

a padlock main body having an opening therein to receive said shackle long leg, and another opening therein to receive the shackle short leg, said padlock main body further having a blend bore including an open end formed therein,

lock means within said main body to engage the said long leg either at said notch, thereby locking said long leg, or to engage only the long leg at said cylindrical portion, thereby allowing said long leg to rotate about its longitudinal axis, or to removeably free said long leg by having said lock means clear said flange, thus defining three positions,

a stop means disposed in the blind bore of the main body between the lock means and the open end of the blind bore, whereby the lock means engages and cooperates with the stop means preventing accidental removal of the lock means from the main body.

4,823,567

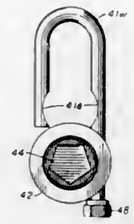
PADLOCK AND LOCKING MECHANISM

Victor L. Patton, 13435 Allison Ranch Rd., Grass Valley, Calif. 95949

Division of Ser. No. 33,828, Apr. 3, 1987, Pat. No. 4,748,832. This application Apr. 18, 1988, Ser. No. 182,495

Int. Cl.[4] E05B *67/22*

U.S. Cl. 70—38 A **10 Claims**



1. A padlock comprising, in combination:

a shackle having a generally U-shaped configuration with one short leg and one long leg;

the long leg having a free end, said long leg having at the free end thereof an arcuate notch formed on said long leg, the short leg having an arcuate notch formed therein oriented facing the arcuate notch formed on the long leg;

a padlock main body having an opening therein to receive said shackle long leg and another opening therein to receive the shackle short leg; and

lock means within said main body to engage and lock the short leg at said arcuate notch thereof and to engage said long leg at the arcuate notch thereof, thereby locking said leg and said short leg.

4,823,568

ANTI-THEFT APPARATUS FOR A RIDING SADDLE

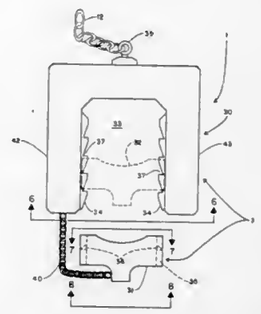
Kermett A. Rogers, 7220 Hooper Rd., Baton Rouge, La. 70811; Robert C. Tucker, 10229 Veranda Ct., and Mani Iyer, 1843 General Lee Ave., both of Baton Rouge, La. 70810

Continuation-in-part of Ser. No. 747,765, Jun. 24, 1985, Pat. No. 4,683,729. This application Jul. 31, 1987, Ser. No. 80,442

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—58 **6 Claims**



1. In combination with a riding saddle including a saddle horn having a neck, a means for preventing theft of said saddle, comprising a lock ring, said ring being lockable around said neck and connectable to a tether, said ring further comprising:

a. a u-shaped first member having two legs;

b. a second member, slidably positionable between said legs; and

c. a locking means for locking the position of said second member relative to said first member.

4,823,569

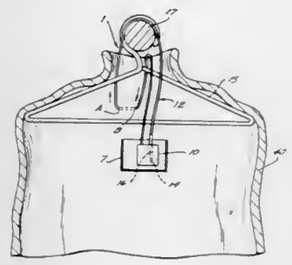
CLOTHING LOCK

David Leinoff, 71 Park Ave., New York, N.Y. 10016, and Louis Puglisi, P.O. Box 199, Little Neck, N.Y. 11362

Filed Aug. 28, 1987, Ser. No. 91,260

Int. Cl.[4] E05B *69/00*

U.S. Cl. 70—59 **6 Claims**



1. A security device for a garment comprising a lock, a lock pin for said lock and a cable secured at one end to said lock, said cable having a free end including said lock pin, said lock pin consisting of a stiff metal needle having a tapered point for piercing a garment, said needle including a catch recess formed therein for forming the shaft of the lock and being adapted to be inserted into the lock to act as a lock pin.

4,823,570

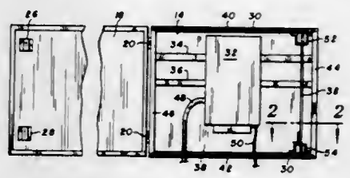
LOCKING MECHANISM FOR VENDING MACHINES

Richard D. Jurek, Lakeville, Minn., assignor to Air-Vend, Inc., Mendota Heights, Minn.

Filed Jul. 1, 1987, Ser. No. 68,422

Int. Cl.[4] E05C *19/18*

U.S. Cl. 70—129 **12 Claims**



1. In an enclosure including a housing and an access means movable with respect to the housing for alternatively permitting and denying access to the interior of the enclosure, an apparatus for securing said enclosure against unauthorized entry, including:

a first containing means integral with said housing, and a second containing means integral with said access means and substantially aligned with said first containing means whenever said access means is closed;

an elongate, substantially rigid locking member, disposed in a longitudinal direction and substantially uniform in transverse cross-section;

said first containing means including means forming a first retaining opening through a wall portion of said housing corresponding in shape to and slightly larger than the transverse cross section of the locking member, a substantially planar cover plate disposed generally in a transverse plane and fixedly mounted proximate to and in longitudi-

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nally inward spaced relation to said wall portion and means forming an opening through said cover plate comprising a second retaining opening having a size and shape corresponding to that of said first retaining opening, said retaining openings permitting longitudinal insertion of the locking member into said enclosure to a locking position wherein the locking member is simultaneously contained by said first and second containing means to prevent the opening of said access means, and wherein said locking member when so contained is contained within each of said first and second retaining openings; and

a retaining member inside of said enclosure and a mounting means for supporting said retaining member inwardly with respect to said cover plate, for movement between a latching position wherein the retaining member engages said locking member to maintain the locking member in said locking position, and a release position disengaged from said locking member to permit longitudinal movement of the locking member away from said locking position.

4,823,571
CAM LOCK AND BRACE ASSEMBLY
James O'Gara, 444 W. 258th St., Riverdale, N.Y. 10471
Filed Aug. 23, 1988, Ser. No. 235,366
Int. Cl.[4] E05B *65/06*
U.S. Cl. 70—139 **14 Claims**



1. A cam lock assembly comprising:

a sleeve having at least one formation adapted to hold said sleeve against rotation in a similarly formed opening provided in a panel to be locked against a frame;

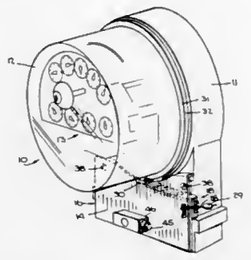
a lock cylinder rotatably seated in said sleeve and traversing same to extend beyond an end thereof, the extension of said lock cylinder formed with a shank portion;

an elongated camming tongue mounted at one end thereof on said shank portion and rotatable by said lock cylinder between a locked position in which the other end of said tongue extends across a separation between said panel and said frame and engages said frame, and an unlocked position in which said tongue lies wholly within an outline of said panel; and

brace means mounted on said sleeve and extending substantially to said separation and formed with at least one slot adapted to receive said tongue at least in the locked position thereof.

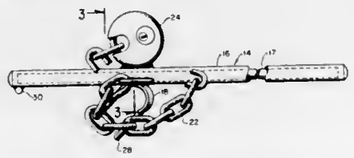
4,823,572
LOCKABLE TERMINAL COVER FOR BOTTOM CONNECTED METERING DEVICES
John A. Signorelli, 2150 East 29th St., Brooklyn, N.Y. 11229
Filed Sep. 2, 1986, Ser. No. 902,872
Int. Cl.[4] B65D *55/14*
U.S. Cl. 70—163 **17 Claims**

2. In electrical metering apparatus comprising electrical consumption measuring means mounted on a base at one side thereof and walls extending from said base defining an electrical connecting terminal cavity having terminals therein for connecting said measuring means to an electrical power source, said cavity and said terminals being disposed at said side of said base in laterally offset relation to said measuring means and said cavity opening outwardly in the direction away from said base, the improvement comprising a protective cover covering the opening of said cavity without surrounding said measuring means to prevent access to said terminals, said



cover having a face facing toward said cavity and extending traversely to said direction and lock receiving means in fixed relation to said base and disposed outside and spaced from said cavity, but disposed on a line intersecting and extending perpendicularly to said face of said cover and spaced from said walls defining said cavity, said lock receiving means having an opening therein receiving a key releasable and reusable lock having a portion which extends into the path of movement of said cover away from said terminals in said direction and said cover having means which prevents unauthorized access to said opening.

4,823,573
STEERING WHEEL LOCK
Lee M. Latta, 1922 Rodeo Rd., Los Angeles, Calif. 90018
Filed Jul. 29, 1988, Ser. No. 225,883
Int. Cl.[4] B60R *25/02*
U.S. Cl. 70—209 **4 Claims**



1. A locking mechanism for the steering wheel of a vehicle, including:

a rigid, hollow bar having first and second ends and a central portion, said bar having a length significantly exceeding the radius of the steering wheel to which it is to be applied;

an arcuate boot having a radius of curvature of the steering wheel to which it is to be applied and having a cross-sectional curvature corresponding to the cross-sectional curvature of such steering wheel, said boot being positioned on said bar a distance from said first end thereof corresponding to the outer radius of such steering wheel, whereby, when said boot is in firm engagement with the outer surface of said steering wheel, said first end of said bar lies over the center of the steering wheel to which it is applied;

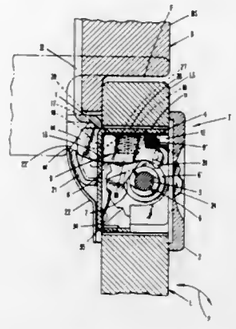
said bar, in use, being positioned over one spoke of the steering wheel to which it is applied;

a chain lock fixedly carried by said bar proximate to the central portion thereof; and,

a chain having a first end fixedly carried by said bar proximate the central portion thereof, having a second end free to pass around a proximate spoke of the steering wheel to which it is to be applied and having a length sufficient to permit said second end of said chain to be engaged by said chain lock;

said first end of said bar carrying a rod extending at right angles to said bar a distance approximately the radius of the central hub of the steering wheel to which the locking mechanism is to be applied.

4,823,574
PERMUTATION LOCK
Hans U. Werner, Solingen, Fed. Rep. of Germany, assignor to S. Franzen Sohne GmbH & Co., Solingen, Fed. Rep. of Germany
Filed Sep. 29, 1986, Ser. No. 912,423
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—312 **1 Claim**



1. In combination, a case comprising first and second parts, and a permutation lock for releasably securing said parts together, said first part forming a lid of said case and including a first front surface, said second part including a second front surface disposed in a common plane with said first front surface when said lid is in a closed position, said second part carrying a hasp, said lid being hingedly coupled to said second part for rotation out of said closed position in a direction perpendicular to said front surface, said lock mounted on said first part and comprising:

a housing having a rear wall situated opposite to a front side of said housing, said rear wall and front side being spaced apart in a front-to-rear direction of said housing, said rear wall including an opening,

a front plate oriented parallel to said common plane and arranged for closing said front side of said housing, said front plate including slots,

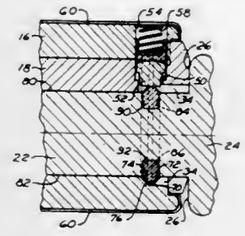
an axle mounted in said housing and extending transversely of said front-to-rear direction,

a plurality of sleeves independently rotatably mounted on said axle and carrying setting disks which project forwardly through said slots to be exposed for manual actuation, said sleeves carrying collars which each includes an interruption in its outer periphery,

a locking bolt rotatably mounted in said housing for rotation about an axis oriented parallel to said axle and situated adjacent said front plate, said bolt including a portion extending rearwardly from said axis and substantially perpendicularly to said front plate when in an on-lock condition, and including locking means at a rear end thereof movable in a direction transversely of said front-to-rear direction during rotation of said bolt to lockingly engage or disengage said hasp, said bolt including sensing surfaces arranged to engage said collars for rotating said bolt into a hasp-unlocking position when said interruptions are sensed and into a hasp-locking position when remaining portions of said collar are sensed, and

spring means yieldably biasing said bolt into engagement with said collars.

4,823,575
CYLINDER LOCK AND KEY
David W. Florian, Southington, and Thomas F. Hennessy, Bristol, both of Conn., assignors to Bauer Kaba AG, Sicherheits-Schliessysteme, Switzerland
Filed Sep. 28, 1987, Ser. No. 101,501
Int. Cl.[4] E05B *63/00*
U.S. Cl. 70—358 **26 Claims**



1. A lock comprising:

shell means including a shell having a forward end, a longitudinally spaced rear end and a longitudinal axis, said shell means defining at least a first row of primary pin tumbler means receiving chambers and an auxiliary pin tumbler means receiving chamber, said shell means further defining a bearing surface traversing an interior portion thereof in generally equidistantly spaced relationship with said longitudinal axis, said bearing surface being juxtapositioned to said forward end;

plug means rotatably mounted in said shell means, said plug means having a forward face and defining a longitudinally extending keyway comprising a reduced slot portion and an enlarged slot portion extension, said enlarged slot portion extension opening through said face and generally intersecting said shell means auxiliary pin tumbler means receiving chamber, said enlarged slot portion extension also being in radial alignment with said bearing surface, said plug means defining at least a first row of primary pin tumbler means receiving chambers alignable with said shell means pin tumbler means receiving chambers and an auxiliary pin tumbler means receiving chamber alignable with said shell means auxiliary pin tumbler means receiving chamber, a shear line being defined between said shell means and said plug means; and

tumbler means reciprocally mounted in said plug means primary and auxiliary chambers, said pin tumbler means each having first ends which are biasable into said keyway and second ends oppositely disposed with respect to said first ends, said pin tumbler means extending across said shear line, said pin tumbler means second ends being engaged in respective ends of said shell means pin tumbler means receiving chambers whereby said pin tumbler means coact with said plug means and shell means in the locked condition of the lock to prevent rotation of said plug means relative to said shell means, said pin tumbler means each defining a shear line,

insertion of a properly configured key in said keyway causing reciprocation of said pin tumbler means whereby the shear lines of said pin tumbler means register with the shear line between the key plug means and the shell means

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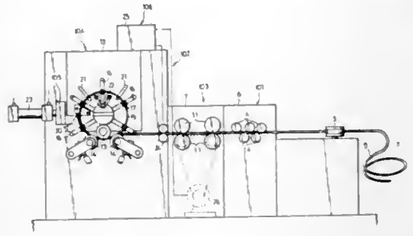
and rotation of said plug means relative to said shell means to the unlocked position of the lock is permitted, the key being engageable with said bearing surface to prevent withdrawal of the key during at least a portion of the key rotation.

4,823,576

APPARATUS FOR MANUFACTURING RING-SHAPED MEMBER FROM ELONGATE WORKPIECE

Shigeo Yoshioka, Bisai, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Oct. 6, 1987, Ser. No. 105,029
Claims priority, application Japan, Oct. 20, 1986, 61-249233
Int. Cl.[4] B21F *1/00, 11/00*
U.S. Cl. 72—17 **1 Claim**



1. An apparatus for manufacturing a ring-shaped member from an elongate workpiece, comprising:

(a) straightening means for straightening a coiled elongate workpiece, said means including rollers disposed in a zigzag pattern, said coiled elongate workpiece passing through and between said rollers so as to be straightened thereby;

(b) measuring means including measuring rollers for measuring an elongate workpiece straightened by said straightening means to a specified length only by rotation of said measuring rollers in a forward direction thereof;

(c) feeding means for feeding the measured length of said elongate workpiece, said feeding means including feed rollers for feeding said elongate workpiece, and control means for controlling said feeding rollers to stop rotation thereof when said elongate workpiece has been fed for a prescribed length, said control means including said measuring rollers, said measuring rollers being in rotatable contact with said elongate workpiece as said elongate workpiece is fed by said feeding rollers, a processor to which the amount of rotation of said measuring roller is input and storing the amount of rotation of said measuring roller which corresponds to said prescribed length of said elongate workpiece, and a servomotor electrically connected to said processor for driving said feeding rollers, whereby when the stored amount of rotation and the supplied amount of rotation are equalized, said processor outputs a signal to said servomotor to stop said servomotor and said feeding rollers;

(d) coiling means having bending rollers for bending said elongate workpiece fed by said feeding means to a curved shape; a plurality of pairs of guide pins provided along a circular moving locus of a leading end portion of said elongate workpiece bent by said bending rollers, each pair of said guide pins sandwiching and guiding said leading end portion of the bent elongate workpiece to form a coiled portion from said elongate workpiece; and a plurality of guide members extending in a radial direction of said circular moving locus, each said guide member being slidable in said radial direction, each said pair of guide pins being provided on a said guide member so as to be adjustable in position in said radial direction so as to correspond to a change of a radius of said coiled portion; and

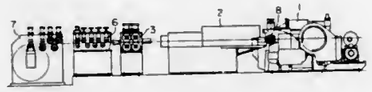
(e) cutting means for cutting the coiled portion off said elongate workpiece into a ring-shaped member.

4,823,577

METHOD OF FEEDING MATERIAL TO HOT FORGING MACHINE

Yoshio Kawashima; Shunji Ogata; Masaaki Yokoyama; Masato Tomiku, all of Kitakyushu; Tsuneo Yamada, Takarazuka; Tsutomu Kuno, Kitakyushu; Hisao Murakami, Yukuhashi; Hiroyuki Morimoto, Kitakyushu; Toyoshige Myojo, Higashimurayama; Kozo Watanabe, Sakado, and Toshihiro Tanaka, Nihama, all of Japan, assignors to Sumimoto Metal Industries, Ltd., Osaka and Sumitomo Heavy Industries, Ltd., Tokyo, both of, Japan

Division of Ser. No. 835,027, Feb. 28, 1986, Pat. No. 4,761,980.
This application Feb. 8, 1988, Ser. No. 153,383
Claims priority, application Japan, Mar. 1, 1985, 60-38903; Oct. 23, 1985, 60-237854; Oct. 23, 1985, 60-237855; Oct. 23, 1985, 60-163439[U]; Oct. 31, 1985, 60-242859
Int. Cl.[4] B21J *7/46, 1/06*
U.S. Cl. 72—24 **2 Claims**



1. A method of forging including driving pinch rollers by driving device for uncoiling a coiled material, straightening the uncoiled material, and intermittently feeding the straightened material through a heating device and subsequently through feed rollers until the forward end of the material is brought in engagement with a stopper, heating the material while it passes through said heating device, cutting the material by a cutting device and then feeding the cut material into a hot forging machine wherein said feeding of said material to said hot forging machine comprises: preparing said driving device which drives said pinch rollers mechanically independently from said hot forging machine; picking up the timing of forging conducted by said hot forging machine as an electric signal; and controlling said driving device in accordance with said electric signal; said driving device driving said pinch rollers at a speed corresponding both to the operation speed of said hot forging machine and the length in which said material is to be cut; and after the cutting by said cutting device, said driving device is being controlled in such a manner that said pinch rollers are driven backwardly relative to a forward direction of said material so as to feed backward the subsequent material at least by an amount equal to the amount of thermal expansion caused by the heating by said heating device and, in the next feeding stroke, said material is fed forwardly by a distance equal to the sum of the predetermined cutting length and the difference between said amount of the backward feed and said amount of thermal expansion.

4,823,578

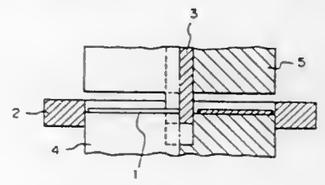
METHOD OF MANUFACTURING SUBSTRATE FOR MEMORY DISK

Thomas U. Coe, Saratoga, Calif.; Atsushi Yamazaki, Tochigi, Japan, and Chris Krishnan, San Jose, Calif., assignors to Furukawa Aluminum Co., Ltd., Tokyo; Kawasaki Steel Corp., Hyogo and C. Itoh & Co., Ltd., Osaka, all of, Japan

Filed Oct. 27, 1987, Ser. No. 110,764
Claims priority, application Japan, Dec. 28, 1985, 60-297596
Int. Cl.[4] B21D *53/00*
U.S. Cl. 72—47 **3 Claims**

1. A method of manufacturing a substrate for a memory disk characterized in that a blank material comprising a non-magnetic metal substrate covered by plating with a non-magnetic metal as an underlayer is subjected to a coining operation by two dies having flat compressing surfaces within an apparatus

including a mandrel and a die ring arranged to limit the spreading extent of the material whereby a surface having ultra-pre-



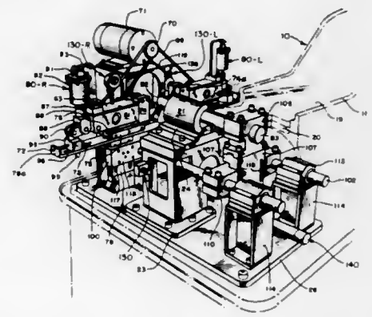
ciseness is obtained without mechanical surface finishing before and after the coining operation.

4,823,579

APPARATUS FOR CUTTING HOLLOW PIPES

Wilhelmus P. Castricum, Rolling Meadows, Ill., assignor to Spiro America Inc., Wheeling, Ill.

Filed Dec. 2, 1987, Ser. No. 127,744
Int. Cl.[4] B21C *37/12*
U.S. Cl. 72—49 **18 Claims**



1. An apparatus for cutting pipe which is spirally formed from a flat strip, whereby the pipe moves in an axial direction and rotates while it is being formed, comprising:

first knife means to be positioned inside the pipe;

second knife means to be positioned outside the pipe;

means for reciprocating the second knife means into and out of an overlapping relationship with the first knife means; and

guide means for allowing the first and second knife means to move in the axial direction of the pipe, so that during a cutting operation the second knife means will reciprocate and overlap the first knife means as the pipe moves axially and rotates between the first and second knife means.

4,823,580

WHEEL-BODY FORMING APPARATUS

Kazuo Kadotani, 28-45, Tojicho, Kokubu, Kashiwara-shi, Osaka, Pref, Japan

Filed Oct. 22, 1987, Ser. No. 111,303
Int. Cl.[4] B21H *1/06*
U.S. Cl. 72—105 **3 Claims**

1. A wheel body forming apparatus comprising

an extended shape forming cylindrical roller comprising a wheel body forming part at the middle of a lateral external circumferential surface;

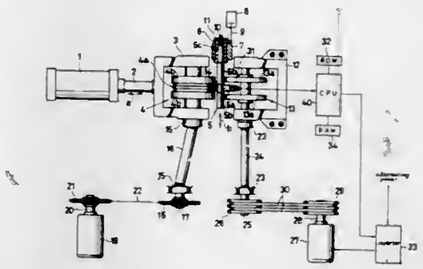
an extended cylindrical mandrel positioned on one side of and parallel to said shape forming roller and movable to be contactable with said shape forming roller, said mandrel comprising a wheel body forming portion at the middle of a lateral external circumferential surface and a regulation surface on circumferential surfaces on both lateral sides of said body forming portion;

an extended supporting cylindrical roller positioned parallel to and on a side of said mandrel opposite to said shape forming roller, said supporting roller having an external circumferential surface contactable with said regulation surface of said mandrel;

first drive means for rotating said shape forming roller;

second drive means for independently driving said supporting roller;

sensor means for generating signals indicative of a ratio of the inner diameter and outer diameter of said work piece, said sensor means comprising a sensor device disposed to be in contact with the outer circumferential surface of said



wheel body being worked by said mandrel and said shape forming roller for continuously measuring the variations in the outer diameter of said wheel body being worked, memory means for storing information related to desired inner and outer diameters of said wheel body, and means for obtaining the ratio of inner and outer diameters based on the measurement of the outer diameter by said sensor device; and

control means responsive to said signals from said sensor means for controlling the second driving means so that the number of rotations per unit time of said supporting roller is controlled to be substantially equal to the number of rotations per unit time of said shape forming roller multiplied by the ratio of said inner diameter of said wheel body being worked to said outer diameter of said wheel body being worked.

4,823,581

BEARING WHEEL BODY FORMING APPARATUS

Kazuo Kadotani, and Hideo Kadotani, both of 28-45, Tojocho, Kokubu, Kashiwara, Japan

Continuation of Ser. No. 844,616, Mar. 27, 1986, abandoned.
This application Aug. 27, 1987, Ser. No. 91,348
Int. Cl.[4] B21D *15/04*
U.S. Cl. 72—105 **4 Claims**

1. A bearing wheel body forming apparatus comprising

a rotatable mandrel of cylindrical shape comprising a pair of contacting surfaces of a first diameter and a forming surface of a second diameter, said second diameter being smaller than said first diameter;

wherein the apparatus is used to work on a cylindrical shaped wheel body to be formed, said body comprising a cylindrical body, an outer circumferential surface of a third diameter, an inner circuferential surface of a fourth diameter, and a center hole, said fourth diameter being greater than said first diameter, said wheel body being disposed to fit about the forming surface of said mandrel with part of said inner surface of the wheel body being against said forming surface during forming operation;

a rotatable support roller comprising a pair of contact surfaces of a fifth diameter, wherein said fifth diameter di-

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vided by two is greater than the third diameter divided by two, and an inner cylinder surface therebetween of an axial length greater than the width of said wheel body and of a diameter smaller than said fifth diameter;

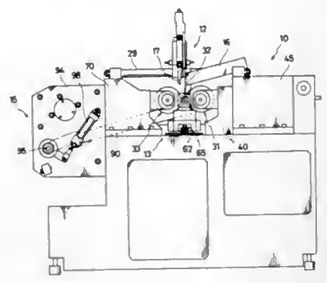
a rotatable forming roller comprising a pair of contact surfaces of a sixth diameter and a forming surface disposed therebetween of a seventh diameter;

wherein when the contacting surface of the mandrel is against the contacting surface of the forming roller, the space between the forming surface of the mandrel and the forming surface of the forming roller is the desired dimension of the wheel body to be formed;

first pressing means for pushing said pair of contacting surfaces of said support roller against said pair of contact surfaces of said mandrel;

second pressing means for pushing said pair of contact surfaces of said forming roller toward said pair of contacting surfaces of said mandrel;

wherein said wheel body is disposed on the mandrel between the pair of contact surfaces of the support roller, and with the inner circumferential surface disposed toward the



forming surface of the mandrel and the outer circumferential surface contacting the forming surface of the forming roller; and

drive means for rotating the support roller and the forming roller at the same speed, comprising motor means, a pair of one-way clutches driven by said motor means, and connecting means disposed between said pair of one-way clutches and each of said respective support roller and said forming roller, wherein said connecting means comprises a pair of free coupling means, whereby said motor means continuously rotates said support roller and said forming roller concurrently with the application of pressure by said first and second pressing means, and said connecting means causes said forming roller to become free of said rotating by said motor means when the speed of the outer circumferential surface of the wheel body is greater than the circumferential speed of the pair of contact surfaces of the mandrel thereby to provide substantially the same circumferential speed at the forming surface of the forming roller and the outer circumference surface of the wheel body being formed.

4,823,582

DEVICE FOR PLANING A SHEET METAL STRIP UNDER TENSION

Jean-Claude Bourbon, Ferrieres-en-Gatinais, and Guy Gerard, Beaufort, both of France, assignors to Fabrique de Fer de Maubeuge, Louvroil and Redex, Ferrieres, both of, France

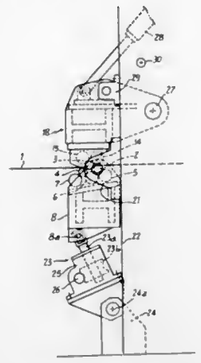
Continuation of Ser. No. 901,129, Aug. 28, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 166,799

Claims priority, application France, Sep. 5, 1985, 83 13201

Int. Cl.[4] B21D *1/02*

U.S. Cl. 72—164 **7 Claims**

1. A device for planing a sheet metal strip under tension supplied from a source of metal strip that has been produced by milling, comprising only three working rolls comprising at least two small-diameter first and second working rolls between which the strip passes while being subjected to successive flexural deformation in opposite directions, and a third working roll located downstream in the direction of travel of the strip with respect to the first two rolls and positionally adjustable with respect to said first two rolls and at least two tensioning means respectively disposed upstream of said first two rolls and downstream of said third working roll for effecting said tension of the strip with the direction of feed being



from said first working roll to said third working roll of said planning device, wherein the third working roll aforesaid is rotatably mounted on a support pivoted about a shaft of the first working roll with respect to the frame which carries the second working roll so as to provide means for adjusting the angle of winding of the metal strip on the second roll and for producing a third flexural deformation of the strip in a direction opposite to its deformation on the second roll with an amplitude which is a function of the relative position of said third roll with respect to said second roll.

4,823,583

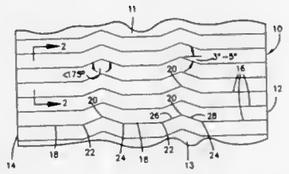
PARTICULATE TRAP

Wesley Bullock, Ravenna, and William A. Whittenberger, Garrettsville, both of Ohio, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 60,459, Jun. 11, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 231,623

Int. Cl.[4] B21D *13/04, 13/10*

U.S. Cl. 72—196 **7 Claims**



1. A method for making a particulate trap and providing for nonnesting of an accordion folded corrugated thin metal strip which comprises corrugating said thin metal strip with a longitudinally running series of peaks and grooves by passing said metal strip between corrugating gears from a leading edge to a trailing edge, each of said peaks and grooves including a plurality of spaced longitudinally extending displacements deviating from and returning to a straight line extending between the longitudinal marginal edges of said metal strip and dividing each of said peaks and grooves into a series of displacements

and alternating straight line segments lying therebetween, the total amount of the straight line segments equalling from about 75% to about 90% of the total width of said metal strip, the displacements extending in the direction of the leading edge of said metal strip and being the first of each peak and groove to contact the mating corrugating gears and being, as a result, in compression.

4,823,584

ROLL CHANGE ARRANGEMENT FOR BEAM MILL STAND

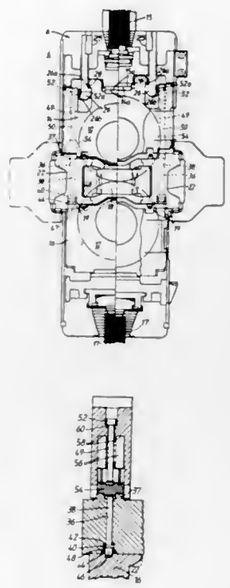
Ralph G. Haynes, Sheffield, England, assignor to Davy McKee (Sheffield) Limited, Sheffield, England

Filed May 29, 1987, Ser. No. 55,285

Claims priority, application United Kingdom, May 30, 1986, 8613143

Int. Cl.[4] B21B *13/08, 31/08*

U.S. Cl. 72—225 **9 Claims**



1. A beam mill stand, comprising:

a housing;

pairs of upper and lower horizontal roll chocks slidably supported in the housing;

upper and lower horizontal rolls rotatably supported in respective chocks;

vertical roll chocks slidably supported in the housing;

a pair of vertical rolls rotatably supported in respective chocks; and

resilient support means for resiliently supporting the upper horizontal roll chocks and the upper horizontal roll on the vertical roll chocks, including engagement means movable between an inoperative position where the engagement means is retracted into the upper horizontal roll chocks, and an operative position where the engagement means is displaced to engage the vertical roll chocks; resilient means for displacing the engagement means from the inoperative position to the operative position; and retraction means operative to hold the engagement means retracted in the inoperative position, against the urging of the resilient means; whereby when the retraction means is inoperative the engagement means is released to be urged by the resilient means to the operative position into engagement with the vertical roll chocks, the upper horizontal roll chocks being resiliently supported on the vertical roll chocks by the resilient means through the engagement means.

4,823,585

HOT ROLLING METHOD

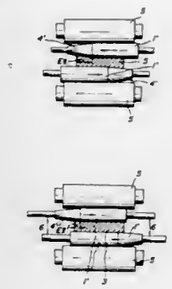
Itaru Hishinuma; Akio Adachi, and Ko Toyoshima, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 706,101, Feb. 27, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,578

Claims priority, application Japan, Feb. 29, 1984, 59-37478/84; May 29, 1984, 59-107553/84; Oct. 1, 1984, 59-204147/84

Int. Cl.[4] B21B *31/18, 31/20*

U.S. Cl. 72—247 **4 Claims**



1. A hot rolling method using a hot finishing mill including a pair of work rolls shiftable relative to each other in their axial directions and each having a tapered end at one end only of its barrel and arranged one above the other with the taper ground ends being on opposite sides to locate both edges of a plate-like material to be rolled in respective zones of said taper ground ends, said method comprising rolling a number of plate-like material sin succession in a manner that every time at least one of said plate-like materials is rolled, shifting said pair of rolls relative to each other and rolling at least one of said plate-like materials in the shifted positions of said rolls so that a distance E_L from an edge of said materials to a starting point of the tapered end adjacent the barrel of one of the work rolls is increased stepwise until the distance E_L arrives at its maximum allowable value, and decreasing thereafter the distance E_L stepwise until it arrives at its minimum allowable value associated with the other work roll, determining the maximum value of the shifting distance such that the shape of the materials on an exit side of the rolls does not exceed a limit value of the shape of the materials, determining the minimum value of the shifting distance such that it is not less than a value enabling their crown-controlling performance to be maintained, repeating the rolling and shifting in this manner and stepwise varying the distance E_L between the maximum and minimum allowable distances associated with the pair of work rolls every rolling of at least one material, thereby preventing edge built-ups of the material and simultaneously controlling edge drops of the material within a constant range.

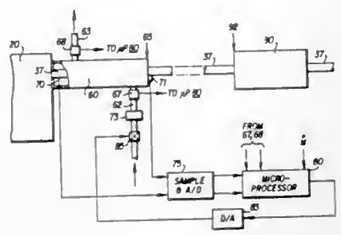
VOL 1101 ISS 4 APR 25 1989 UMI

4,823,586

CONFORM PRODUCT THERMOMECHANICAL TREATMENT

Uday K. Sinha, and E. Henry Chia, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 31, 1987, Ser. No. 140,164
Int. Cl.[4] B21C *31/00*
U.S. Cl. 72—257 24 Claims



1. In an apparatus for continuously extruding material into a desired conform product by feeding material to be extruded against a rotating extrusion wheel cooperating with a fixed member to define a groove within which the material is frictionally carrier to a stationary abutment blocking said groove and is thereupon forced in a heated state into an extrusion chamber and through a die to produce the conform product, the improvement comprising first means for cooling the conform product immediately upon exit from the die to maintain the product at a predetermined uniform elevated temperature upon egress thereof from the first cooling means, and second means for cooling the product after a delay time interval sufficient to produce self-annealing of the product following egress thereof from said first cooling means.

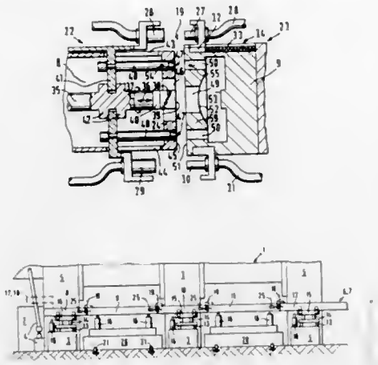
4,823,587

ARRANGEMENT AND METHOD FOR COUPLING AND DECOUPLING GRIPPER RAIL PARTS IN A TRANSFER PRESS

Michael Wolfgang; Gerald Mikusch, both of Goeppingen, and Eckhard Brangs, Bielefeld, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Oct. 23, 1987, Ser. No. 111,631
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636011
Int. Cl.[4] B21D *43/10*
U.S. Cl. 72—405 18 Claims

17. An arrangement for coupling and decoupling plural gripper rail parts for handling workpieces to be moved toward and away from a press as well as between press stations and in which some gripper rail parts remain in the press and some gripper rail parts are operable to be exchanged with other exchangeable gripper rail parts, comprising clamping means in end portions of the gripper rail parts including clamping bolt means movable in a longitudinal axial direction of and relative to respective gripper rail parts and rotatable about a line extending parallel to said axial direction, said clamping bolt means being operable to engage with a clamping anchor means behind a clamping surface in another respective gripper rail part to be coupled or decoupled to the gripper rail part having said end portion, centering means for the mutual alignment of the gripper rail parts to be coupled or decoupled, coupling means for connecting energy line means carried with the gripper rail parts, bridge means connected to and moving said centering and coupling means with said clamping bolt means, and means for sequentially closing the coupling means in the



energy line means leading to the clamping means of plural rail parts.

4,823,588

HAND TOOLS INCLUDING A HYDRAULIC JACK FOR THE CONTROL OF WORKING MEMBERS

Marcel Bussereau, Vendôme; Alain Courtois, and Jean-Pierre Huet, both of Blois, all of France, assignors to Societe D'Etudes Et De Methode D'Applications, Vendôme, France

PCT No. PCT/FR85/00091, § 371 Date Dec. 19, 1985, § 102(e) Date Dec. 19, 1985, PCT Pub. No. WO85/04831, PCT Pub. Date Nov. 7, 1985
Continuation of Ser. No. 822,305, Dec. 19, 1985, abandoned.
This PCT application Apr. 19, 1985, Ser. No. 119,247
Claims priority, application France, Apr. 20, 1984, 84 06346
Int. Cl.[4] B21J *9/12*
U.S. Cl. 72—453.06 19 Claims

1. An hydraulic hand-tool including an hydraulic jack capable of being operated manually using one hand comprising:

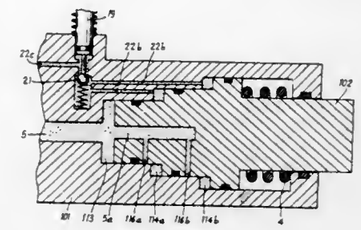
(a) an elongate piston having a front end adapted to be connected to a tool and at least two sections of different transverse cross-sectional areas having an exterior surface area;

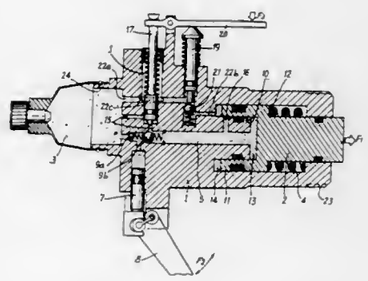
(b) a housing including a hollow front end portion having an interior surface defining a plurality of sections with different inner diameters corresponding in size, position and number so as to accommodate said sections of said piston in a manner which permits said piston to slide in a reciprocating manner within said hollow front end portion of said housing whereby a plurality of chambers including a main chamber and at least one auxiliary chamber for receiving hydraulic fluid are defined by said exterior surface area and said interior surface as said piston slides in a forward direction;

(c) an hydraulic fluid supply conduit having a primary line with an end opening directly into said main chamber and at least one supplemental line having a port adapted to communicate with said at least one auxiliary chamber after said piston slides in a forward direction a predetermined distance to a position forward of said port;

(d) an hydraulic fluid reservoir adapted to supply hydraulic fluid to another end of said primary line;

(e) a pump in communication with said primary line adapted to transfer fluid from said reservoir through said primary line first into said main chamber to cause said piston to move in a forward direction for said predetermined distance and thereafter through said at least one supplemental line into said at least one of auxiliary chamber to cause said piston to continue to move in a forward direction, thereby successively placing said main chamber into fluid communication with said at least one auxiliary chamber while maintaining said main chamber separate from said





auxiliary chamber as said piston moves in said forward direction; and

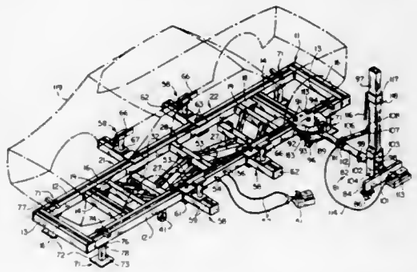
(f) an hydraulic jack operably connected to said pump capable of being operated manually by one hand.

4,823,589

AUTOMOTIVE FRAME STRAIGHTENING APPARATUS AND METHOD

Douglas C. Maxwell, Jr., San Mateo, Calif., and Walter D. Whitney, deceased, late of San Mateo, Calif. (by Douglas C. Maxwell, Jr., executor), assignors to Whitney Equipment Sales, Inc., San Carlos, Calif.

Continuation of Ser. No. 917,778, Oct. 10, 1986, abandoned.
This application Apr. 29, 1988, Ser. No. 188,732
Int. Cl.[4] B21D *01/12*
U.S. Cl. 72—457 16 Claims



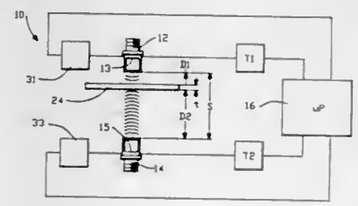
1. In apparatus for straightening the body/frame of a vehicle: a generally planar bench having a low profile which permits the vehicle to be driven over the bench when the bench is in a lowered position and resting substantially horizontally on the ground, means for securing the vehicle to the bench, a puller connected to the bench and engageable with the body/frame of the vehicle for pulling on the same, and a plurality of scissor lifts carried by the bench and engageable with the ground for moving the bench between the lowered position and a raised position, each of said scissor lifts having an upper arm and a lower arm connected pivotally together, means pivotally connecting the upper arm to the bench, a ground engaging wheel carried by the lower arm, a link pivotally connected between the bench and the lower arm, and an actuator connected between the bench and the arms for moving the arms between a collapsed position in which the arms are generally parallel to each other in the plane of the bench and an extended position in which the arms extend in a generally vertical direction beneath the bench.

4,823,590

AUTOMATIC CALIBRATION METHOD FOR THICKNESS GAUGES

James N. Kniest, Edmonds, and Dean D. Campbell, Seattle, both of Wash., assignors to Ultrasonic Arrays, Inc., Woodinville, Wash.

Filed Oct. 2, 1987, Ser. No. 104,420
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—1 J 20 Claims



1. A method for automatically calibrating a thickness measurement system while the system is in use, the system including at least one distance measuring probe, the method comprising the steps of:

periodically generating signals directed towards a reference region through which a target may be passed;

measuring the time period that elapses between generation of each particular signal and reception of the particular signal at a designated location there being an estimated separation indicative of the distance the particular signal must travel between generation and reception in the absence of a target;

determining whether the target is present based in part upon the time period measurement;

whereby if a target is present, the time period measurement is used in conjunction with the estimated separation to calculate the thickness of the target; and

whereby if no target is present, the time period measurement is used to update the estimated separation.

4,823,591

CALIBRATION METHOD FOR EXHAUST MASS FLOW MEASURING SYSTEM

Gary W. Lewis, Fountain Valley, Calif., assignor to Horiba Instruments Incorporated, Irvine, Calif.

Filed Nov. 5, 1987, Ser. No. 118,195
Int. Cl.[4] G01F *25/00*
U.S. Cl. 73—3 4 Claims

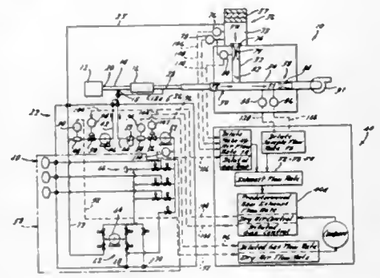
1. A method for calibrating an apparatus for measuring exhaust mass flow of an internal combustion engine having an exhaust conduit, the apparatus including a test conduit having an exhaust inlet coupled to the exhaust conduit, a subsonic venturi coupled to the test conduit for enabling passage of a fluid, a transducer means coupled with said subsonic venturi for producing a signal, a sonic venturi coupled to the test

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conduit for enabling passage of a fluid, transducer means coupled with said sonic venturi for producing a signal, and a computer coupled with both transducer means for interpreting the signals, said method comprising:

capping the exhaust inlet of said test conduit;

causing a quantity of fluid to flow through said subsonic venturi, through said test conduit and through said sonic venturi;



measuring the flow through said sonic venturi to produce a first signal;

measuring the flow through said subsonic venturi to produce a second signal;

comparing said first and second signals to determine an error;

adjusting either of said first and second signals to null said error and thereby calibrate said apparatus.

4,823,592

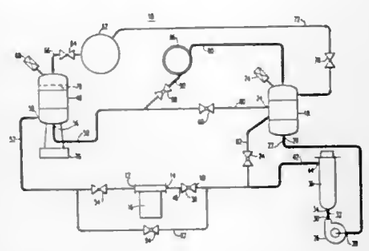
TEST APPARATUS FOR PROVING THE PERFORMANCE OF MASS FLOW METERS

David T. Hahn, Longmont, Colo., assignor to Micro Motion, Inc., Boulder, Colo.

Filed Feb. 5, 1988, Ser. No. 153,281

Int. Cl.[4] G01F *25/00*

U.S. Cl. 73—3 **10 Claims**



1. Test apparatus adapted to be connected to both a fluid outlet and a fluid inlet of a fluid mass flow meter to measure accurately the mass flow of high-temperature fluid passing through the meter being tested so that the meter can then be accurately calibrated, if required, to register accurately the mass flow therethrough of the high-temperature fluid, said apparatus comprising:

reservoir tank means for retaining selected organic fluid to be passed through the meter to be tested, said selected organic fluid having the characteristic of remaining fluid at the elevated temperatures at which mass fluid flow is to be measured with only a relatively low pressure of inert gas blanket maintained thereover, and said reservoir tank means having a fluid inlet and a fluid outlet;

fluid pump means having an inlet and an outlet, the inlet of said pump means being in fluid connection to the fluid outlet of said reservoir means, and said pump means operable to pump said selected organic fluid through said test apparatus;

organic fluid heater means having a fluid inlet and a fluid outlet, said heater means operable to heat organic fluid passing therethrough to the predetermined temperature at which the meter is to be tested, the fluid inlet of said heater means being in fluid connection with the outlet of said pump means; a first fluid flow control valve having an inlet and an outlet and operable to control the flow of fluid therethrough, the inlet of said first fluid flow control valve connected to the outlet of said heater means and the outlet of said first fluid flow control valve adapted to be connected to the inlet of said meter to be tested;

batch tank means for receiving and retaining the fluid which is passed through said meter during testing, said batch tank means having a fluid inlet and a fluid outlet, the fluid inlet of said batch tank means connected through a flexible fluid conduit to a second fluid flow control valve which is adapted to be connected to the outlet of said meter to be tested, and the fluid outlet of said batch tank means connected through a flexible conduit and a third fluid flow control valve to the inlet of said reservoir tank means;

inert gas supply means connected to said batch tank means through a gas-pressure-controlling valve means and a flexible gas conduit for maintaining a predetermined gas pressure in said batch tank means to maintain said heated organic fluid in a liquid state at the predetermined temperature at which said meter is to be tested;

inert gas supply means also connected through a gaspressure-controlling valve means to said reservoir tank means for maintaining a predetermined gas pressure in said reservoir tank means to maintain said heated organic fluid in a liquid state;

means for causing fluid to flow from said batch tank means to said reservoir tank means when said first fluid flow control valve is closed and said third fluid flow control valve is open; and

weighing means associated with said batch tank means for weighing said batch tank means at the start of a test run and also when partially filled with said heated organic fluid at the end of a test run, said weighing means operating to measure the weight of said batch tank means and any fluid therein with a minimum of deflection in order to eliminate measured weight errors which might occur due to any appreciable distortion in said flexible conduits which connect to said batch tank means whereby the total mass flow of said heated organic fluid is measured by said meter undergoing test can be compared to the measured total mass flow of said organic fluid into said batch tank means.

4,823,593

FLUERIC PARTIAL PRESSURE SENSORS

Owen D. Furlong, East Coker, Nr. Yeovil, and Searle, Robin H. J., Hardington Mandeville, both of England, assignors to Normalair-Garrett (Holdings) Limited, Somerset, England

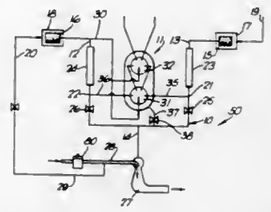
Filed Dec. 2, 1987, Ser. No. 127,419

Claims priority, application United Kingdom, Dec. 8, 1986, 8629264; Dec. 8, 1986, 8629265; Dec. 8, 1986, 8629266; Jun. 1, 1987, 8712797

Int. Cl.[4] G01N *7/00*

U.S. Cl. 73—23 **12 Claims**

1. A flueric partial pressure sensor comprising a flueric bridge having two legs, one of said legs being adapted for sensing a reference gas and the other said leg being adapted for sensing a sample-gas mixture, each leg including a linear flow resistor and an orifice flow resistor in series, a pressure signal outlet connected in each bridge leg at a position between the linear flow resistor and the orifice flow resistor, a flueric laminar flow proportional amplifier connected to said pressure signal outlets, a flueric aspirator connected for drawing reference gas and sample-gas mixture through the respective bridge legs and for operating the flueric amplifier by way of a power line conjoined with the bridge legs at a common outlet to the flueric aspirator, a pressurized gas delivery line including a pressure reducing valve for delivering pressurized working gas to operate the flueric aspirator, the pressure reducing valve having temperature-responsive means comprising temperature-sensitive adjustment means adapted to adjust the pressure



reducing valve to increase the pressure of working gas delivered to the flueric aspirator with increasing temperature whereby suction applied by the flueric aspirator at the common outlet is increased thereby increasing the velocity of gas flowing through the main power jets of the flueric amplifier to maintain the working Reynolds number of the main power jets within a range which provides stable operation of the amplifier.

4,823,594

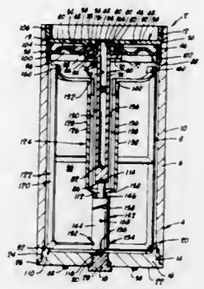
CONTAINER FOR A FLUID TO BE TESTED UNDER PRESSURE

Dennis W. Gray, Comanche, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 14, 1988, Ser. No. 167,830

Int. Cl.[4] G01N *11/10*

U.S. Cl. 73—54 **16 Claims**



1. A container for cement slurry to be tested under pressure, comprising:

a cup having defined therein a cavity for receiving cement slurry to be tested under pressure;

a first member retained within said cup near a mouth of said cavity, said first member including a neck portion disposed at substantially the center of said first member and extending toward a closed end of said cavity, said neck portion having an outer surface;

a second member retained within said cavity so that at least a part of said second member is disposed within said neck portion of said first member, said second member including a flange adjacent said neck portion and extending beyond said outer surface of said neck portion; and

seal means for providing a seal from adjacent said neck portion of said first member and said flange of said second member to said cup so that said seal means is between said first member and the closed end of said cavity to separate a pressurizing medium, communicated through said first member to said seal means, from cement slurry received in said cavity to be tested under the pressure exerted by the pressurizing medium.

4,823,595

PROCESS AND APPARATUS FOR MEASURING THE EQUILIBRIUM MOISTURE IN A HYGROSCOPIC, LAMINAR MATERIAL WHICH IS COATED ON BOTH SIDES

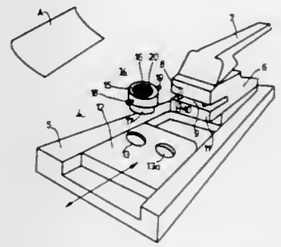
Saleman Hamed, Leichlingen, and Jörg M. Söder, Cologne, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 28, 1987, Ser. No. 101,997

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634518

Int. Cl.[4] G01N *21/00*

U.S. Cl. 73—73 **8 Claims**



1. A process for measuring equilibrium moisture in hygroscopic, laminar material having each side coated adaptable as a photographic paper support

comprising measuring the relative moisture of air contiguous to a laminar material coated on each side and having hygroscopic properties,

including the steps of forming cut surfaces in said material, removing samples from said cut material, introducing said samples into a container, sealing the container containing said samples from ambient atmosphere,

establishing an equilibrium moisture within said sealed container,

and measuring the relative moisture in said sample containing sealed container.

4,823,596

MANUAL TRANSMISSION SHIFT EVALUATION DEVICE

Richard S. Meyers, and George A. Willford, both of Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Nov. 24, 1986, Ser. No. 933,790

Int. Cl.[4] G01M *13/02*

U.S. Cl. 73—118.1 **17 Claims**

1. A method of testing a manual transmission, comprising the steps of:

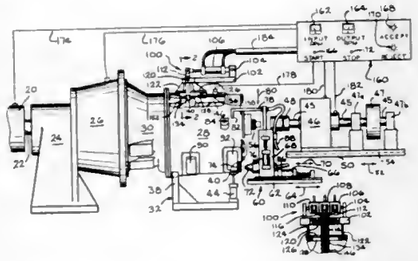
(a) inserting an actuating arm through a shift tower opening in a manual transmission to operatively engage a shifting member therein;

(b) applying a predetermined force to the actuating arm to move the shifting member from a first predetermined position to a second predetermined position to shift the shifting member;

(c) measuring the time required for said predetermined force to move the shifting member from said first predetermined position to said second predetermined position;

(d) comparing said required time with a predetermined reference time to determine a shifting quality of said transmission; and

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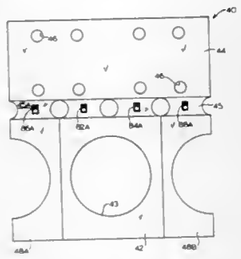
(e) subsequent to step (b), removing the actuating arm from the transmission.

4,823,597

SLIVER MEASURING APPARATUS

Homer S. White, Durham, N.C., assignor to Myrick-White, Inc., Durham, N.C.

Filed Jun. 6, 1988, Ser. No. 202,257
Int. Cl.[4] G01L *5/04*
U.S. Cl. 73—160 **6 Claims**



1. An apparatus for measuring the unit weight of sliver as it passes through a trumpet, comprising:

(a) an integral vertically positioned plate member having an upper portion secured to a base, a lower portion having a central opening for mounting a trumpet and a central portion of reduced cross-section joining said upper and lower portions;

(b) a trumpet for passing sliver, said trumpet being mounted in said lower portion and operative to deflect said central portion when sliver is passed therethrough;

(c) a pair of vertically positioned vibration compensating elements separately joined to said central portion and adapted to vibrate independent of said lower portion; and

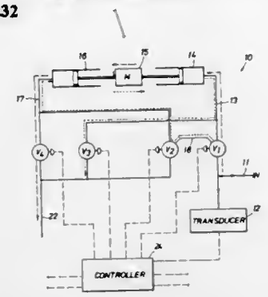
(d) detection and signaling means operative when sliver is passed through said trumpet and during vibration of said base to detect deflection in said central portion imposed by passing of sliver through said trumpet and by vibration of said lower portion and vibration compensating elements and to develop therefrom a measuring voltage substantially indicative of the deflection imposed on said trumpet in the absence of said vibration as an indication of said unit weight.

4,823,598

GAS METERING APPARATUS FOR USE WITH SMALL VOLUME, SMALL FLOW GAS SOURCE

Clarence W. Carpenter, 8610 Cederbrake Dr., Houston, Tex. 77055, and Coleman Wood, 902D W. 23rd, Houston, Tex. 77008

Filed Dec. 21, 1987, Ser. No. 135,314
Int. Cl.[4] G01F *11/02*
U.S. Cl. 73—232 **14 Claims**



1. A gas measuring apparatus which comprises:

(a) a movable piston in a cylinder defining a gas receiving chamber therein;

(b) motor means for moving said piston in said cylinder to change the volume of the chamber therein;

(c) control means connected to said motor means for controlling operation of said motor means to thereby control movement of said piston in said chamber;

(d) pressure transducer :neans connected to the chamber within said cylinder for measuring the pressure therein and forming a signal for said control means to move said piston to obtain a specified pressure;

(e) said control means moving said motor means incrementally by uniform increments, said control means forming a countable signal on each incremental operation thereof and wherein said countable signals are provided at an output terminal;

(f) summing means connected to receive said countable signals to form an incremental count representing gas volume of said gas receiving cylinder; and

(g) said control means controlling said motor means to seek the specified pressure after gas is received in said chamber so that said summing means incremented count represents gas volume received in said chamber.

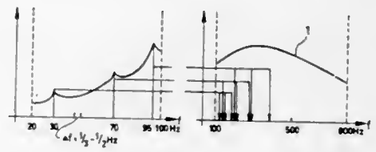
4,823,599

METHOD OF OPERATING A MACHINE FOR THE STRESS RELIEF OF WORKPIECES BY VIBRATION

Dietmar Schneider, Am Unterfeld 2, 6229 Schlagen bad-Georgenborn, Fed. Rep. of Germany

Filed Sep. 15, 1987, Ser. No. 97,212
Claims priority, application European Pat. Off., Sep. 26, 1986, 86113278.5
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—579 **12 Claims**

1. A method of operating a vibrator for the stress relief of workpieces in which the workpiece is subjected to vibrations at selected speeds of the vibrator and in which the selection of the speeds of the vibrator is taken from a measurement which reproduces the vibratory behavior of the workpiece upon excitation by the vibrator within its operating range, characterized in that for the individual speeds of the vibrator within its operating range, there are determined, within a defined harmonics region the harmonics corresponding to those vibrations in the operating range in which resonances or similar stable states of vibration occur and that, as a criterion for the stress relief of the workpiece, there are selected those speeds which



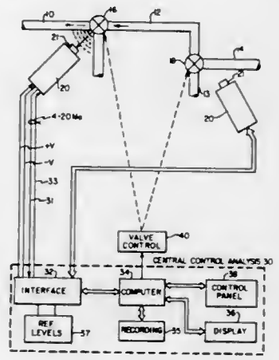
cause the higher numbers of harmonics in said defined harmonics region.

4,823,600

ULTRASONIC TRANSDUCER AND CURRENT LOOP TRANSMITTER

Michael Biegel, Warwick, and Mark Goodman, Peekskill, both of N.Y., assignors to UE Systems, Inc., N.Y.

Filed Nov. 5, 1987, Ser. No. 118,221
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—592 **22 Claims**



1. A remote ultrasonic sensor and control system comprising:

at least one remote ultrasonic sensor means for detecting ultrasonic vibrations in its vicinity and converting them into an electrical signal, said sensor means having a variable gain which can be changed in discrete steps according to a control signal;

a central control means for analyzing the electrical signal from the sensor means and for generating the control signal for the sensor means; and

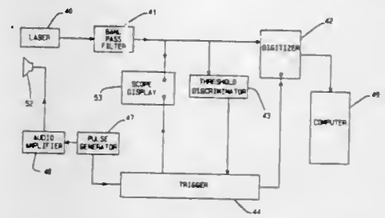
a current loop transmission means connecting said sensor means and central control means, said current loop transmission means including a first current loop continuously delivering the control signals to said sensor means as discrete current levels and a second current loop continuously delivering the electrical signal from said sensor means as a current level.

4,823,601

VIBRATION SENSING METHOD AND APPARATUS

Basil A. Barna, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 7, 1987, Ser. No. 70,763
Int. Cl.[4] G01M *7/00*
U.S. Cl. 73—594 **11 Claims**



1. An apparatus for evaluating a structure comprising:

means for exciting resonant vibrations in a structure to be evaluated;

stabilized laser means having a laser cavity capable of producing an output laser beam and an electrical signal related to the phase and frequency of light backscattered into said laser cavity, said laser means oriented such that said output laser beam impinges on the vibrating structure to be evaluated and scatters therefrom;

means for directing a substantial amount of the laser light scattered from said structure back into said laser cavity to generate an electrical signal;

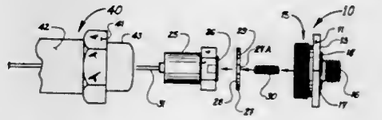
means for processing said signal to obtain information related to the vibrations excited in said structure to be evaluated.

4,823,602

ACCELEROMETER MOUNTING DEVICE

Able B. Christensen, Jr., Danbury, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 19, 1987, Ser. No. 64,262
Int. Cl.[4] G01H *11/06*
U.S. Cl. 73—661 **15 Claims**



1. An adaptor for removably mounting an accelerometer thereto, said accelerometer having a first housing member , said first housing member enclosing the accelerometer, said first housing member containing a first mating surface, said adaptor comprising:

a base plate with a first and second side and an opening centrally disposed therein; said first side adapted for contacting the first mating surface of the first housing of the accelerometer;

an annular portion sealably attached to the first side of the base plate and adapted for removably attaching a second housing member thereto for enclosing the accelerometer and the first housing member with the first mating surface;

an elongated portion sealably attached to the second side of the base plate; said elongated portion comprising a tubular portion sealably connected at one end to the opening of the base plate and sealed at the other end, said tubular portion having threads on the outer surface thereof adapted for threadingly engaging a threaded bore dis-

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posed in an apparatus of interest to be monitored for vibrations with the accelerometer, said tubular portion having threads on the inner surface thereof adapted for threadingly receiving a threaded rod, said rod adapted for connecting the accelerometer and the first housing member with the first mating surface to the adaptor; and

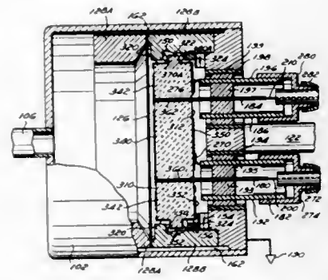
a raised portion providing a mating surface for contacting the apparatus of interest and transferring vibration through the base plate wall without substantial attenuation through the adaptor walls to the first mating surface of the first housing of the accelerometer whereby vibration is sensed by the accelerometer, said raised portion annularly disposed around the base of the tubular portion and centrally disposed on the second side of the plate.

4,823,603

CAPACITANCE MANOMETER HAVING STRESS RELIEF FOR FIXED ELECTRODE

Robert J. Ferran, La Jolla, and Gordon E. Osterstrom, Spring Valley, both of Calif., assignors to Vacuum General, Inc., San Diego, Calif.

Filed May 3, 1988, Ser. No. 189,780
Int. Cl.[4] G01L *7/08, 9/12*
U.S. Cl. 73—724 **17 Claims**



6. A variable capacitance manometer for measuring changes in pressure, said manometer comprising:

an electrically conductive housing, said housing comprising a material having a first coefficient of thermal expansion;

a diaphragm mechanically and electrically coupled to said housing, said diaphragm separating said housing into first and second pneumatically isolated pressure chambers, said first pressure chamber having a first pressure and said second pressure chamber having a second pressure that is variable relative to said first pressure thereby providing a pressure differential between the first and second chambers, said diaphragm having a portion thereof movable in a first direction along an axis toward one of said first and second chambers when said pressure differential increases and movable in a second direction along said axis away from said one of said first and second pressure chambers when said pressure differential increases, said diaphragm being the first electrode of a variable capacitor;

a second electrode of said variable capacitor positioned within one of said first and second pressure chambers proximate to said diaphragm, said second electrode spaced apart from said portion of said diaphragm by a distance that varies in response to changes in said pressure differential between said first and second pressure chambers;

an insulating support that supports said second electrode in a fixed position in said housing in a plane perpendicular to said axis, said insulating support comprising a material having a second coefficient of thermal expansion different from said first coefficient of thermal expansion; and

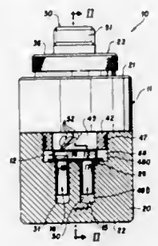
roller bearings interposed between said insulating support and said housing, said roller bearings positioned to prevent movement of said insulating support in a direction perpendicular to said plane while allowing movement of said insulating support in a direction within said plane.

4,823,604

PRESSURE TRANSDUCER ASSEMBLY

Bernard F. Silverwater, Plainview, N.Y., assignor to Pall Corporation, N.Y.

Filed May 22, 1987, Ser. No. 52,889
Int. Cl.[4] G01L *9/00*
U.S. Cl. 73—717 **18 Claims**



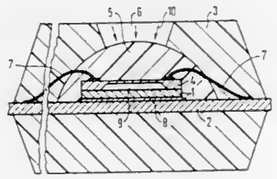
1. A pressure transducer assembly comprising transducer means for generating electrical signals in response to differential pressures; means for encasing the transducer means, the encasing means including first and second means for respectively communicating fluids at first and second pressures to the transducer means; and housing means for enveloping the encasing means with first and second fluids having a pressure at least approximately equal to the first or second pressure, the encasing means being removably disposed within the housing means.

4,823,605

SEMICONDUCTOR PRESSURE SENSOR WITH CASING AND METHOD FOR ITS MANUFACTURE

Karl-Ulrich Stein, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,371
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708831
Int. Cl.[4] G01L *7/08, 9/06*
U.S. Cl. 73—727 **6 Claims**



1. A pressure sensor comprising:

a pressure sensor chip of semiconductor material fastened on a conductor tape, the chip including a piezoresistive diaphragm;

a casing for containing the pressure sensor chip and piezoresistive diaphragm, the casing defining an aperture for allowing the ambient pressure to communicate with the diaphragm of the pressure sensor chip, the conductor tape being a component of the casing; and

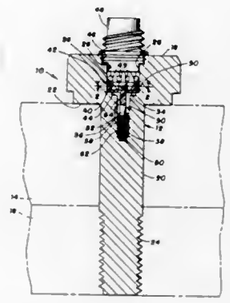
an elastic material for covering a portion of the diaphragm and transmitting pressure to the diaphragm.

4,823,606

DIAPHRAGM TRANSDUCER FOR SENSING LOADING

Raymond W. Malicki, Dearborn Heights, Mich., assignor to Carron & Company, Inkster, Mich.

Filed Jun. 23, 1988, Ser. No. 210,723
Int. Cl.[4] F16B *31/02*
U.S. Cl. 73—761 **12 Claims**



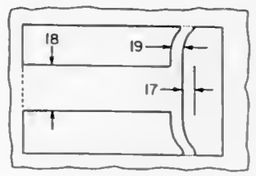
1. A diaphragm transducer for sensing loading comprising: a bolt having a head and a shank extending from the head; said bolt defining a transducer hole having a head portion located within the bolt head and having a shank portion located within the bolt shank; said head portion of the bolt hole being larger than the shank portion thereof; a transducer member received within the bolt hole and including a diaphragm fixedly mounted within the head portion of the bolt hole; said transducer member also including a stem that extends from the diaphragm into the shank portion of the bolt hole and has a distal end fixedly secured to the bolt; and at least one strain gauge on the diaphragm for sensing deflection thereof as the bolt is loaded.

4,823,607

RELEASED FILM STRUCTURES AND METHOD OF MEASURING FILM PROPERTIES

Roger T. Howe, Lafayette, Calif.; Mehran Mehregany, Prairie Village, Kans., and Stephen D. Senturia, Boston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 18, 1987, Ser. No. 51,526
Int. Cl.[4] G01N *19/06*
U.S. Cl. 73—783 **17 Claims**



10. A releasable structure comprising:

a substrate; and

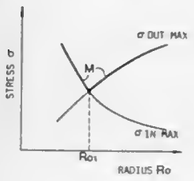
a film formed on the substrate having a main body and a bridge structure with intrinsic tensile stress such that the structure is maintained by the substrate and is releasable from the substrate such that the structure deforms.

4,823,608

METHOD OF MEASURING RESIDUAL STRESS IN A CARRIER PRODUCED IN MANUFACTURING OF A BELT FOR CONTINUOUSLY VARIABLE TRANSMISSION

Keiji Satoh, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1988, Ser. Nn. 168,184
Claims priority, application Japan, Mar. 20, 1987, 62-067407
Int. Cl.[4] G01N *19/06*
U.S. Cl. 73—783 **4 Claims**



1. A method of measuring residual stress in a heat-treated carrier of a belt for a continuously variable transmission, comprising the steps of:

bending an endless metal carrier at a predetermined radius;

applying heat treatment to the bent carrier;

cutting the heat-treated carrier at a portion;

measuring the radius of the cut carrier;

comparing the measured radius with a standard radius of a standard carrier so as to determine the difference between the radii, the standard carrier having a predetermined residual stress, the predetermined residual stress being such that the sum of the moments of the residual stress in the standard carrier is zero at a posture where an outer surface maximum stress and an inner surface maximum stress of the standard carrier coincide with each other; and

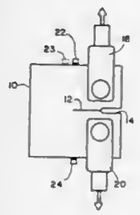
determining whether the difference between the radii is within a predetermined range.

4,823,609

ULTRASONIC METHOD AND APPARATUS FOR DETERMINING CRACK OPENING LOAD

William T. Yost, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 23, 1988, Ser. No. 210,277
Int. Cl.[4] G01N *19/08*
U.S. Cl. 73—799 **12 Claims**



1. An ultrasonic apparatus for determining crack opening load in a specimen having a crack and under a variable tension load, comprising:

an ultrasonic generator for outputting a series of tone bursts;

a transmit transducer for placement on the specimen and receiving the output of the ultrasonic generator;

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a receive transducer for placement on the specimen, and receiving acoustic signals which have interacted with the crack, and outputting a fundamental output signal and a harmonic output signal;

conversion means for converting the output signals of the receive transducer into electrical signals; and

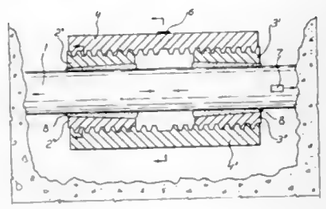
means for measuring a harmonic amplitude of the converted harmonic output signals as said variable tension load applied to the specimen increases to determine a peak harmonic amplitude which indicates crack opening load.

4,823,610

DEVICE FOR AND METHOD OF MEASURING TENSILE FORCE IN REINFORCING MEMBER OF REINFORCED CONCRETE

Ari Adini, 104-20 Queens Blvd., Forest Hills, N.Y. 11375

Filed Feb. 16, 1988, Ser. No. 155,994
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—828 **14 Claims**



1. A device for measuring a tensile force of a reinforcing member arranged in reinforced concrete, comprising

an actuating unit arranged to be placed on a portion of a reinforcing member in a reinforced concrete and to reduced an initial tensile force of the reinforcing member with an accompanying increase of a stress in said actuating unit;

means arranged to be placed on another portion of the reinforcing member for indicating a moment when the tensile force is reduced to a zero value; and

means arranged on said actuating unit for measuring the stress of said actuating unit when said indicating means indicates the moment of reduction of the tensile force in the reinforcing member substantially to zero, the thus measured stress in said actuating unit at said moment, being multiplied by a cross sectional area of said actuating unit, is a measure of the initial tensile force of the reinforcing member.

4,823,611

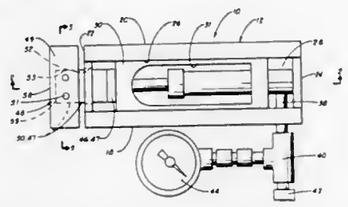
CERAMIC TILE SHEAR TESTING APPARATUS AND METHOD

Robert T. Young, 201 E. Ranchwood Circle, Oklahoma City, Okla. 73160

Filed Nov. 18, 1987, Ser. No. 122,048
Int. Cl.[4] G01N *3/24*
U.S. Cl. 73—842 **20 Claims**

1. A method of testing a shear strength of a bond holding a tile to a working surface, said method comprising the steps of:

removing at least some grouting material adjacent the tile to be tested;



applying a force to said tile in a direction substantially parallel to said working surface for shearing said bond; and

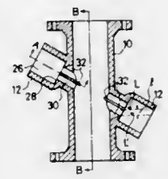
measuring said force.

4,823,612

SOCKET STRUCTURE FOR MOUNTING ULTRASONIC GAS FLOW MEASURING DEVICE WITH RESPECT TO GAS FLOW PIPE

Kouji Ichino, Tokyo, Japan, assignor to Kaijo Denki Co., Ltd., Japan

Filed Jul. 10, 1986, Ser. No. 687
Int. Cl.[4] G01F *1/66*
U.S. Cl. 73—861.18 **5 Claims**



1. A socket structure for mounting an ultrasonic gas flow measuring device on a gas flow pipe, comprising:

a pair of sockets provided at said pipe to respectively receive therein probe heads of said ultrasonic gas flow measuring device therein with a suitable gap being defined therebetween and communicated to said pipe, said sockets being arranged in a manner to be spaced from each other at an angle of 180 degrees in the circumferential direction of said pipe and oblique with respect to an axis of said pipe; and

a plurality of grooves formed on an inner surface of said socket which surrounds said probe head, said grooves allowing condensed moisture collected in a gap between said inner surface of said socket and said probe head to escape therethrough to said gas flow pipe;

said grooves each being formed so as to be gradually enlarged outwardly in the radial direction to said socket toward said gas flow pipe so that it may be gradually increased in depth toward said gas flow pipe.

4,823,613

DENSITY INSENSITIVE CORIOLIS MASS FLOW RATE METER

Donald R. Cage, Longmont, and Gerald M. Grammens, Boulder, both of Colo., assignors to Micro Motion, Inc., Boulder, Colo.

Continuation of Ser. No. 914,932, Oct. 3, 1986, abandoned. This application May 11, 1988, Ser. No. 192,706
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **6 Claims**

1. A method for designing Coriolis mass flow rate meters having flow conduits with essentially uniformly thick walls made of a homogeneous material, each of said flow conduits driven to oscillate resonantly, comprising:

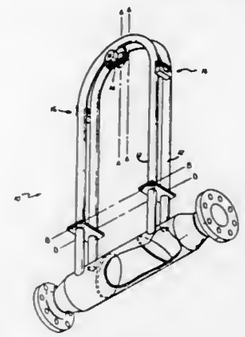
(a) determination of a first frequency for said flow conduit, having no attachments, about the axis relative to which the flow conduit is driven to oscillate;

(b) determination of a second resonant frequency for said flow conduit, with all attachments to said flow conduit required for operation of said flow meter, about the axis relative to which said flow conduit is driven to oscillate;

(c) determination of the modal mass for said flow conduit as a function of the determined first and second resonant frequencies and of the masses of said attachments;

(d) determination of a third resonant frequency for said flow conduit, having no attachments, about the axis relative to which said flow conduit is deflected by Coriolis forces;

(e) determination of a fourth resonant frequency for said



flow conduit, with all attachments to said flow conduit required for operation of said flow meter, about the axis relative to which said flow conduit is deflected by Coriolis forces;

(f) determination of the modal inertia for said flow conduit as a function of the determined third and fourth resonant frequencies and of the inertias of said attachments about the axis relative to which said flow conduit is deflected by Coriolis forces; and

(g) changing the masses and locations of mounting of said attachments to said flow conduit so that the ratio of the modal mass to modal inertia equals the ratio of the mass of said attachments to the inertia of said attachments about the axis relative to which said flow conduit is deflected by Coriolis forces, thereby having the ratio of the second resonant frequency to the fourth resonant frequency equal a constant.

4,823,614

CORIOLIS-TYPE MASS FLOWMETER

Dahlin, Erik B., 1936 Arroyo Seco Dr., San Jose, Calif. 95125

Continuation-in-part of Ser. No. 856,939, Apr. 28, 1986, abandoned. This application Jun. 11, 1986, Ser. No. 873,201
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **21 Claims**

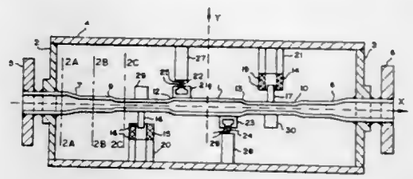
1. A Coriolis flowmeter for measuring the mass flow rate of a material flowing therethrough comprising:

(a) at least one flow tube having a fixed inlet end and a fixed outlet end and through at least one of which flow tubes the material flows;

(b) means for vibrating the flow tube(s) at the resonance frequency of a predetermined mode such that two contiguous sections exist wherein each point in one of said contiguous sections has a velocity component opposite to the direction of the velocity vector of all points in the other of said contigous sections; and

(c) means for measuring at least one parameter of the motion of the flow tube(s) whicb depends on the Coriolis forces generated by the vibration,

said flow tube(s) having sections of low bending resistance to the vibrating motion at points where the amplitude of the vibration is the largest and higher bending resistance



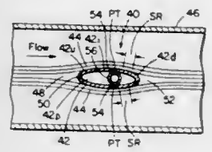
to the vibrating motion elsewhere, thereby reducing at least one of said resonance frequency of said predetermined mode and the ratio of said resonance frequency of said predetermined mode to the natural frequency of the mode associated with the bending pattern produced by the Coriolis forces.

4,823,615

SELF-AVERAGING PITOT TUBE PROBE AND METHOD FOR MEASURING FLUID FLOW

Sami H. Taha, St. Laurent, Canada, assignor to Preso Industries, Plattsburgh, N.Y.

Filed Nov. 4, 1987, Ser. No. 116,590
Int. Cl.[4] G01F *1/34*
U.S. Cl. 73—861.66 **11 Claims**



1. A pitot tube probe for use in a device for measuring a pressure differential to determine fluid flow rate in a conduit, which comprises:

an elongated body insertable transversely with respect to a stream of fluid flowing within the conduit, said body including an upstream portion, a downstream portion having upstream ends spaced from a downstream edge of said body, and an intermediate portion between the upstream portion and the upstream ends of the downstream portion, and said body having an elliptically-shaped configuration which produces a laminar flow of fluid around said body so that the fluid remains attached to said body and does not separate from said body at least until the fluid reaches the upstream ends of the downstream body portion;

upstream port means in the upstream portion of said elliptically-shaped body for sensing a high fluid pressure component of the measured pressure differential;

an elongated high pressure sensing passageway in said elliptically-shaped body in fluid communication with said upstream high pressure sensing port means;

an elongated low pressure sensing passageway in said elliptically-shaped body adjacent a transition from the intermediate body portion to the upstream ends of the downstream body portion and;

downstream port means opening from said low pressure sensing passageway through said elliptically-shaped body upstream from separation points at which said laminar flowing fluid separates from said elliptically-shaped body,

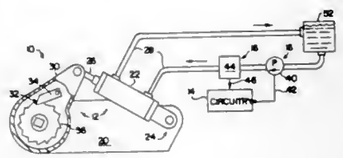
for sensing a low pressure component of the measured pressure differential, said downstream port means located downstream from a minor axis of said elliptically shaped body between said minor axis and said separation points at which said laminar flowing fluid separates from said elliptically-shaped body.

4,823,616

TORQUE AND ANGULAR DISPLACEMENT SENSING IN YIELD THRESHOLD CONTROLLED WRENCHES

Angelo Tambini, Kilbride, Ireland, assignor to SPS Technologies, Inc., Newtown, Pa.

Filed Jun. 29, 1987, Ser. No. 67,896
Int. Cl.[4] B23P *19/06*; B25B *23/143*
U.S. Cl. 73—862.23 **13 Claims**



10. Yield threshold controlled wrench apparatus, comprising:

a power wrench mechanism driven by a pressurized fluid to turn a wrench head for tightening a threaded fastener;

transducer means for sensing a signal in proportion to the torque applied by said wrench head;

transducer means for sensing the flow of said fluid to said wrench mechanism to derive a signal in proportion with the angular displacement of said wrench head;

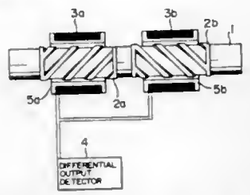
circuit means for processing said torque and said angular displacement signals to indicate when the yield threshold is reached.

4,823,617

TORQUE SENSOR

Hiroyuki Hase, Katano; Shinya Tokuono, Ashiya, and Masayuki Wakamiya, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 14, 1988, Ser. No. 218,827
Claims priority, application Japan, Jul. 16, 1987, 62-177462
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.36 **5 Claims**



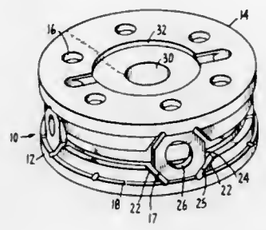
1. A torque sensor comprising a rotary shaft, a pair of strips of a magnetostrictive amorphous magnetic alloy helically fixed to the surface of said rotary shaft to make a predetermined angle with respect to the axial direction of said rotary shaft, a pair of independent coils disposed outside of the respective strips of the amorphous magnetic alloy in a relation coaxial with and spaced apart by a predetermined distance from said rotary shaft, and electrical means detecting a strain produced on the surface of said rotary shaft due to transmission of a torque to said rotary shaft by detecting changes in the inductances of said coils due to changes in the permeabilities of said strips of the amorphous magnetic alloy, thereby detecting the magnitude and direction of the torque on the basis of the difference between the inductances of said coils, wherein the saturation magnetostriction of said amorphous magnetic alloy is selected to lie within a range of 3×10^{-6} to 35×10^{-6}, and the coefficient of thermal expansion of said amorphous magnetic alloy is selected to be smaller than that of the material of said rotary shaft so as to previously produce an internal compressive strain in said strips of the amorphous magnetic alloy.

4,823,618

FORCE-MOMENT SENSORS

John E. Ramming, Woodland, Calif., assignor to JR3, Inc., Woodland, Calif.

Continuation-in-part of Ser. No. 909,103, Sep. 17, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 84,878
Int. Cl.[4] G01L *5/16, 1/22*
U.S. Cl. 73—862.04 **15 Claims**



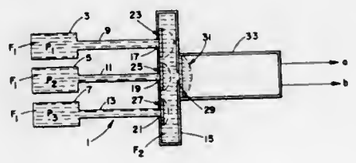
1. An article of manufacture for use as a multiple force and/or moment measuring element of a force-moment sensor unit, including a pair of parallel disc members joined together adjacent to the outer periphery of said discs by a plurality of circumferentially spaced bridge elements to form a hollow cylindrical chamber between said discs, each of said bridge elements being spaced from each other circumferentially around the periphery of said discs to thereby hold said discs generally parallel to each other and form a slot extending circumferentially between each of said bridge elements, and each of said bridge elements having a pair of transverse slots formed in the edges thereof extending generally transverse to the adjacent ends of said circumferential slot to define a generally circular load carrying member in each of said bridge elements for transmitting forces and moments between said parallel disc members.

4,823,619

SENSOR AND TRANSDUCER APPARATUS

Nicholas F. D'Antonio, and Nicholas J. D'Antonio, both of 7695 Admiral Dr., Liverpool, N.Y. 13088

Filed Feb. 28, 1986, Ser. No. 834,939
Int. Cl.[4] G01L *1/02*
U.S. Cl. 73—862.58 **25 Claims**



15. A pressure sensor apparatus comprising:

at least one pad means for holding a quantity of fluid, said pad means being of a unitary construction having a flexible wall structure and compressible in response to the application of pressure to said pad means for displacing said fluid;

at least one first diaphragm means operatively connected to said pad means;

fluid contained in said pad means;

said fluid being displaced in response to the compression of said pad means to deflect said diaphragm means by an amount reflective of the pressure applied to said pad means;

transducer diaphragm means operatively associated with said first diaphragm means; and,

at least one displaceable deflection transfer means interconnecting said at least one first diaphragm means and said transducer diaphragm means;

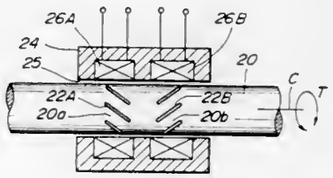
said transducer diaphragm means deflecting in response to the displacement of said deflection transfer means for deflecting said transducer diaphragm means according to the deflections of said first diaphragm means.

4,823,620

MAGNETOSTRICTIVE DEVICE FOR MEASURING TORSIONAL TORQUE

Shouichi Edo, Otaru, and Hiroyuki Aoki, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Feb. 5, 1987, Ser. No. 11,330
Claims priority, application Japan, Feb. 10, 1986, 61-28364; Nov. 5, 1986, 61-262009
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.36 **14 Claims**



1. A device for measuring torsional torque applied to a shaft made of a magnetic material at least in a surface region thereof, the device comprising:

an exciting coil positioned close to the shaft so as to produce a magnetic circuit in which the magnetic flux path includes a selected section of the shaft;

detection means for detecting a magnetostrictive change induced in said section of the shaft by torsional torque applied to the shaft; and

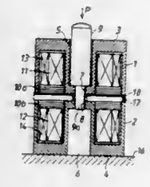
flux directioning means for differentiating the level of the surface of the shaft in a series of elongate and parallel regions of said section, said flux directioning means being integral with the shaft, said elongate and parallel regions being inclined at a predetermined angle with the longitudinal axis of the shaft, wherein said flux directioning means comprises a series of elongate and parallel grooves formed in the surface of said section of the shaft and inclined at said predetermined angle, wherein the surface region of the shaft is carburized at least in said selected section after forming said grooves.

4,823,621

MAGETOELASTIC FORCE TRANSDUCER

Jarl Sobel, and Lars Örnholmer, both of Västerås, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Apr. 29, 1988, Ser. No. 188,204
Claims priority, application Sweden, Apr. 30, 1987, 8701806
Int. Cl.[4] G01L *1/12*
U.S. Cl. 73—862.69 **10 Claims**



1. A magnetoelastic force transducer comprising a closed core of a solid magnetoelastic material provided with two excitation windings adapted to be supplied with alternating current, and two measuring windings adapted to be connected to a measuring device capable of sensing the electricl signal induced therein by the excitation winding s and changes in said induced signal caused by forces applied ot the core;

the closed core including two centrally and axially connected cylindrical bodies each having

(a) outwardly-directed end surfaces in which a respective first hole is provided centrally and axially, the axial length of said holes being shorter than the axial length of the respective body;

(b) respective second threaded holes provided axially in the remaining central part of the body; and

(c) an axially extending and concentrically located annular space in each said body;

a force-transmitting member extending with clearance through the first providd hole in one of said bodies and being threadedly engaged in each of said second holes provieed in the bodies by means of a threaded end thereof, the measuring and excitation windings being located in the annular spaces provided within the core,

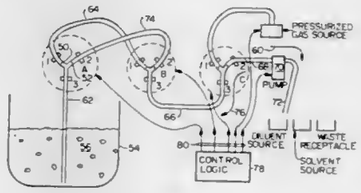
and between the two bodies a magnetically asymmetrical center pole is arranged provided with a center hole surrounding said threaded end of the force-transmitting member.

4,823,622

SAMPLE METERING VALVE FOR A SAMPLE PREPARATION SYSTEM

Andre J. Nohl, Menlo Park; Vance J. Nau, Cupertino, both of Calif., and Andre Metzger, Le Verger, France, assignors to Spectra Physics, San Jose, Calif.

Filed Dec. 16, 1986, Ser. No. 942,201
Int. Cl.[4] G01N *1/14*
U.S. Cl. 73—863.71 **3 Claims**



1. A sample metering valve system for accurately diluting sample having entrapped gas bubbles comprising:

first means for pumping precisely controlled, user defined

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amounts of sample liquids alternatively into and out of a first system port, said first system port for selective coupling either to a waste receptacle or to a source of diluent or to a source of solvent at different predetermined times;
second means for supplying pressurized gas into a second system port;
a container for storing sample or diluted sample;
valve means for allowing said pumping means to pump sample out of said container into a sample chamber which may be selectively coupled at predetermined times to either said first or said second system ports and for allowing sample in said sample chamber to be isolated from said container and both said ports and for allowing sample in said sample chamber to be placed back into said container and having control inputs for controlling which of the states said valve means is in; and
control means coupled to said control inputs and to said first and second means for causing said valve means, said first means and said second means to operate in a predetermined sequence to isolate a known amount of sample in said sample chamber and to remove all the remaining sample from said valve means and from said container and to wash said valve means and said container after said removing operation with a solvent and to cause the sample so isolated to have any gas bubbles which may be entrapped therein to be compressed prior to isolation of said known amount of sample, and for pumping said isolated known amount of sample, plus a programmable amount of diluent liquid back into said container.

4,823,623

DEVICE FOR TRANSFER OF FLUID INTO SEALABLE VIALS

Robert E. Carpenter, Nutley, N.J., and Robert D. Morrison, Madison, Wis., assignors to Norton Company, Worcester, Mass.

Filed Apr. 6, 1988, Ser. No. 178,155
Int. Cl.[4] G01N *1/20, 1/10*
U.S. Cl. 73—864.74 10 Claims



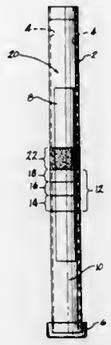
1. A fluid sample transfer device comprising:
a body having a bottom portion extending upwardly from a bottom side to an upper portion adjacent an upper side of the body, a fluid inlet passage extending through the body from an inlet end in the upper portion to an outlet end in the bottom portion, and a fluid outlet passage extending through the body from an inlet end adjacent the outlet end of the fluid inlet passage at the bottom side to an outlet end on another side of the body;
a relatively long sharply pointed hollow needle having an upper inlet end fixed to the bottom portion, connected to and adapted to extend from the outlet end of the fluid passage a predetermined distance beyond the bottom side to a sharply pointed outlet end of the hollow needle adapted to pierce a selfsealing septum sealing an upper end of a vial and convey fluid into the vial at a point adjacent an inner bottom side of the vial to be filled when the upper end of the vial is positioned adjacent the bottom side of the body;
a relatively short sharply pointed hollow fluid outlet needle connected to the inlet end of the fluid outlet passage in the bottom portion and extending a predetermined relatively short distance beyond the bottom side to a lower sharply pointed inlet end adapted to pierce and extend a short distance below the self sealing septum whereby fluid above the fluid being conveyed to and filling the vial may exhaust through the fluid outlet passage;
connecting means on the upper portion of the body for connecting the inlet end of the fluid inlet passage to an outlet end of apparatus adapted to take and convey the fluid sample to the transfer device;
guide means fixed to the bottom portion and extending a predetermined distance from the bottom side to an end thereof situated below the pointed outlet end of the long needle for holding and guiding the sealed vial and septum into and out of piercing sealing engagement with the long and short hollow needles, the guide means comprising
a plurality of elongated guide rods spaced around and adapted for frictional engagement with an outer surface of the vial inserted in between the guide rods.

4,823,624

MATERIAL LAYER VOLUME DETERMINATION WITH CORRECTION BAND

Rodolfo R. Rodriguez, Randolph; Matthew W. Lesnieaky, Stanhope; Charles F. Galanaugh, West Milford, all of N.J.; Robert A. Levine, Guilford; Stephen C. Wardlaw, Old Saybrook, both of Conn., and Theodore Juraschek, Wyckoff, N.J., assignors to Becton Dickinson & Company, Parsippany, N.J.

Division of Ser. No. 68,572, Jul. 1, 1987, Pat. No. 4,774,965.
This application Sep. 26, 1988, Ser. No. 248,632
Int. Cl.[4] A61B *5/14*
U.S. Cl. 73—865.9 1 Claim



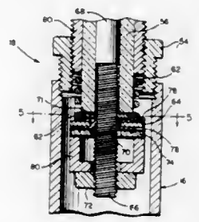
1. A method for determining whether an annulus has a radial thickness which deviates from a predetermined target thickness, said method comprising the steps of:
(a) providing a transparent tube;
(b) providing an elongated float in said tube, said float and said tube combining to form said annulus in said tube with the radial thickness of said annulus being defined by the difference between the ID of said tube and the OD of said float;
(c) positioning a known volume of a flowable material in said annulus and confining said flowable material to said annulus so that said flowable material forms a reference band in said annulus which reference band has a length as measured axially of said tube which equals a predetermined standard target length when the radial thickness of the annulus equals predetermined target thickness; and
(d) measuring the actual length of said reference band to determine whether the actual measured length of the band deviates from the standard target length thereby providing an indication of the manner and extent of any deviations of the annulus radial thickness from the predetermined target thickness of said annulus.

4,823,625

CONTAMINANT SENSING SYSTEM

Samuel L. Hamilton, 3800 NW. 22nd Ave., Miami, Fla. 33142

Filed May 13, 1988, Ser. No. 193,660
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—866.5 10 Claims



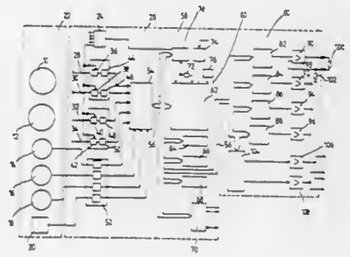
1. In combination with a fluid contamination sensor having axially spaced discs and an absorbent element held in contact with two of said discs to establish a conductive path of variable resistance therethrough, means for seating the absorbent element in abutment with said two of the discs radially outward of one of the two discs and means for insulating said two of the discs from each other radially inwardly of the absorbent element.

4,823,626

INERTIAL SENSOR ARRANGEMENT

Ulrich Hartmann, Uhldingen; Reinhard Fessel, Gaienhofen, and Dirk Jansen, Ohlsbach, all of Fed. Rep. of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen/Bodensee, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,095
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621953
Int. Cl.[4] G01C *19/28, 19/30*
U.S. Cl. 74—5.34 10 Claims



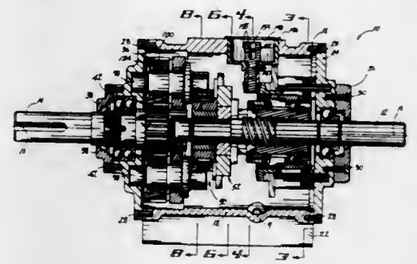
1. Inertial sensor arrangement, comprising
(a) at least one gyro with a spin axis,
(b) a pick-off provided on the gyro and responding to rotational movement about an input axis perpendicular to the spin axis of the gyro and generating a pick-off signal,
(c) a torquer arranged on the gyro to exert a torque on the gyro about an axis perpendicular to the spin axis and to the input axis,
(d) signal processing means, to which the pick-up signal is supplied, said signal processing means being arranged to generate a restraining signal applied to the torquer,
(e) means for generating a digital output signal indicative of the restraining signal, wherein
(f) the pick-off signal is applied to an analog-to-digital converter for generating a digitized pick-off signal
(g) the signal processing means comprise a digital computer which provides said output signal as a digital signal for further processing indicative of angular rate about said input axis, and
(h) the ditigal output signal is applied to a digital-to-analog converter which provides an analog signal as restraining signal which is applied to the torquer.

4,823,627

MECHANICAL TRANSMISSION

Ned D. Mills, P.O. Box 924, Richland, Wash. 99352

Filed Jun. 23, 1987, Ser. No. 66,238
Int. Cl.[4] F16H *29/00*
U.S. Cl. 74—117 21 Claims



1. A transmission comprising:
an input drive shaft rotatable about a central axis;
a cam selectively rotatable about the central axis with the input drive shaft, the cam being generated about a cam axis parallel to the central axis;
a plurality of cam follower means engaging the cam for converting rotational motion of the input drive shaft to alternating radially directed motion of a selected amplitude;
first eccentric bearing means rotatable with the input drive shaft and mounting the cam for rotation about a first eccentric axis parallel to and spaced to one side of the central axis for selectively positioning the cam axis relative to the central axis;
counterbalance means for offsetting eccentric forces imparted to the input drive shaft during rotation of the cam about the central axis, the counterbalance means being selectively rotatable about the central axis with the input drive shaft and having a counterbalance axis parallel to the central axis;
second eccentric bearing means rotatable with the input drive shaft and mounting the counterbalance means for rotation about a second eccentric axis parallel to and spaced to the opposite side of the central axis for selectively positioning the counterbalance axis relative to the central axis;
a plurality of unidirectional clutch means respectively connected to the cam follower means for converting the alternating radially directed motion of the cam follower means to rotary motion of the unidirectional clutch means;
an output driven shaft;
a piurality of rotatable drive means arranged equiangularly about the output driven shaft and being operably interposed between the unidirectional clutch means and the output driven shaft for rotating the output driven shaft; and
adjustment means operably connecting the cam and the

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counterbalance means for angularly moving the cam axis relative to the first eccentric axis and the counterbalance axis relative to the second eccentric axis by simultaneously rotating the cam and the counterbalance means about their respective first and second eccentric axes to impart opposite radially directed movement to the cam and the counterbalance means relative to the central axis, the adjustment means comprising:

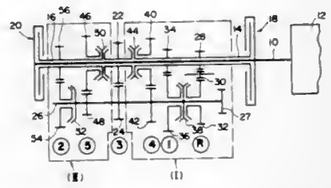
a plurality of orbital rotational elements drivingly interconnecting the cam and the counterbalance means, the driving rotational elements being mounted for rotation with the input drive shaft and also for selective rotation about the input drive shaft independent of rotation of the input drive shaft.

4,823,628

SYNCHROMESH TRANSMISSION SUITED FOR USE AS AN AUTOMOTIVE AUTOMATIC TRANSMISSION

Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Dec. 28, 1982, Ser. No. 454,005
Claims priority, application Japan, Jan. 8, 1982, 57-926
Int. Cl.⁴ F16H *3/08*
U.S. Cl. 74—330 **11 Claims**



1. A transmission comprising:

an input shaft operatively connected with a source of rotational energy;

a first intermediate shaft rotatably disposed about said input shaft;

first clutch means for selectively providing a drive connection between said input shaft and said first intermediate shaft;

a second intermediate shaft rotatably disposed about said input shaft;

second clutch means for selectively providing a drive connection between said input shaft and said second intermediate shaft;

an output shaft;

a first input gear located between said first and second intermediate shafts and arranged to rotatable with respect to said input shaft;

a first output gear on said output shaft, said first output gear being arranged to be in constant means with said first input gear;

a first group of intermeshing input and output gears comprising second and third gears fixed on said first intermediate shaft for synchronous rotation therewith and second and third output gears rotatably mounted on said output shaft;

a second group of intermeshing input and output gears comprising a fourth input gear rotatably mounted on said second intermediate shaft and a fourth output gear fixed to said output shaft; and

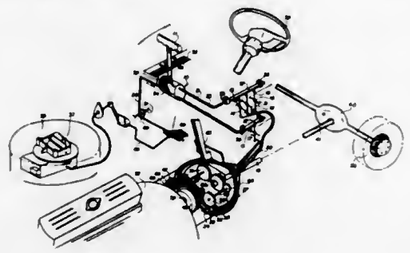
synchronizer means for selectively connecting input and output gears with said input shaft, said first and second intermediate shafts and said output shaft in a manner for selectively producing a predetermined number of speed change ratios between said input and output shafts.

4,823,629

AUTOMATIC TRANSMISSION SYSTEM

Jin S. Ha, 12750-14 Centralia St., Lakewood, Calif. 90715

Filed Aug. 27, 1987, Ser. No. 90,136
Int. Cl.⁴ B60K *20/12*
U.S. Cl. 74—335 **17 Claims**



1. An automatic transmission system for use in vehicles, which comprises:

a clutch wheel containing a plurality of concentric rings of decreasing diameter, said clutch wheel being attached to an engine of the vehicle;

a plurality of clutch gears corresponding in size to said concentric rings, said clutch gears being adapted to selectively and frictionally engage with said concentric rings of the clutch wheel;

an accelerator pedal and a gear selector, said accelerator pedals being connected to one end of a substantially U-shaped frame member, the other end of said substantially U-shaped frame member selectively engaging with one end of one of wires received in a pair of apertures of said gear selector;

a plurality of drive gear controllers and a reverse gear controller;

means operatively connected with said gear selector and said plurality of drive gear controllers and reverse gear controller for selectively engaging one of said drive and reverse gear controllers depending upon the position of the gear selector; and

means for individually connecting said drive and reverse gear controllers with the corresponding clutch gears whereby upon the selection of the gear selector, friction engagement is achieved between the clutch gear and the clutch wheels for rotating the wheel in the forward or reverse direction.

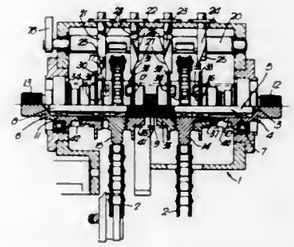
4,823,630

DISTRIBUTOR FOR INDEPENDENTLY DISTRIBUTING ROTATIONAL DRIVE IN A SAILING CRAFT

Richard D. J. Huggett, Horndean, United Kingdom, assignor to Lewmar Marine Limited, England

Filed Nov. 12, 1985, Ser. No. 797,014
Claims priority, application United Kingdom, Nov. 19, 1984, 8429164
Int. Cl.⁴ F16H *5/06, 37/06*
U.S. Cl. 74—337.5 **12 Claims**

1. A distributor for distributing rotational drive in a sailing craft, the distributor having a plurality of independently rotatable drive input means, a plurality of drive output means, said plurality drive input means and said plurality drive output means being coaxial on a single axis, and means for coupling in a first position two of said input drive means to one of said output drive means, coupling in a second position two of said input drive means to another of said output drive means and coupling in a third position one of said input drive means only



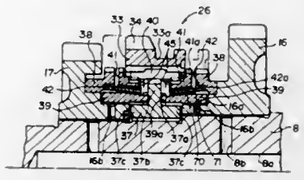
to said one output drive means and another of said input drive means only to said another output drive means.

4,823,631

TRANSMISSION SYNCHRONIZER

Minoru Kishimoto, Hiroshima, Japan, assignor to Mazda Motor Corp., Kanagawa, Japan

Filed May 26, 1987, Ser. No. 53,725
Claims priority, application Japan, May 26, 1986, 61-120810
Int. Cl.⁴ F16H *3/38*
U.S. Cl. 74—339 **10 Claims**



1. A synchronizer for a gear type transmission in which a plurality of pairs of gears are provided on input and output shafts, the two gears of each pair being always in mesh with each other with one gear of each pair being fixedly connected to one of the input and output shafts and the other gear of each pair being rotatably connected to the other shaft to be rotatable relative thereto, and the other gear of each couple is adapted to be drivingly connected to said other shaft by way of a clutch hub with a radially extending disc portion and an axially extending boss portion fixedly provided on said the other shaft, a gear spline provided on said the other gear of each couple integrally therewith, and a hub sleeve which is engaged with the clutch hub to be rotated together therewith and is slidable in the axial direction of the clutch hub to be engaged with the gear spline to transmit rotation of the clutch hub to the gear spline, said synchronizer being for synchronizing the two gears of at least one of the pairs and comprising

an inner cone which has a tapered outer surface and is rotatably mounted on a hub portion formed integrally and coaxially with said the other gear of the couple and is in engagement with said clutch hub to permit rotation of the inner cone relative to the clutch hub by a predetermined amount,

an outer cone which has a tapered inner surface opposed to the tapered outer surface of the inner cone, and is adapted to be engaged with said hub sleeve by way of splines to be rotated together therewith when the hub sleeve is slid into engagement with the gear spline,

a double cone which is disposed between the inner surface of the outer cone and the outer surface of the inner cone and is supported for rotation together with said the other gear of the couple and for sliding movement in the axial direction of said the other gear, and

a synchronizer key which is movable in response to the sliding movement of the hub sleeve to move the outer cone in the axial direction of the clutch hub to bring the outer cone into frictional engagement with the double cone, thereby bringing the double cone into frictional engagement with the inner cone;

a first friction surface existing between the inner cone and the double cone, and a second friction surface existing between the double cone and the outer cone;

a substantial portion of the inner peripheral surface of the inner cone laps over an outer cylindrical surface of said boss portion of the clutch hub in the direction of the output shaft,

a front portion of the inner cone having a plurality of keys therein which are disposed between a plurality of protrusions on the clutch hub; each of the plurality of protrusions being spaced apart by a predetermined spacing; each of the plurality of keys having a width in the peripheral direction which is smaller than said predetermined spacing;

the inner cone and the clutch hub being rotatable relative to each other through a predetermined angle in the peripheral direction;

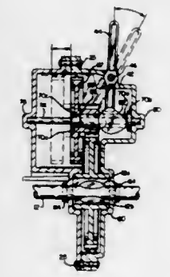
whereby, during engagement of the hub sleeve with the gear spline, the synchronizer key pushes the outer cone into frictional engagement with the double cone which in turn comes into frictional engagement with the inner cone, thereby synchronizing the gear spline and the hub sleeve.

4,823,632

GEAR BOX ASSEMBLY

Lawrence R. Harrod, Fort Wayne, and Michael R. Siebers, Angola, both of Ind., assignors to Kranco, San Francisco, Calif.

Filed Aug. 12, 1987, Ser. No. 85,468
Int. Cl.⁴ F16H *3/22, 5/06, 57/02; A63H 17/00*
U.S. Cl. 74—342 **7 Claims**



1. In a vehicle which includes a driven axle shaft extending transversely of the vehicle having wheels secured thereto:

a drive gear concentric with the axle shaft nonrotatably connected to the shaft, the drive gear having an integral hub on each of opposite sides thereof,

a pinion gear shiftably mounted above the drive gear having one position engaging the drive gear and shiftable laterally to disengage from the drive gear,

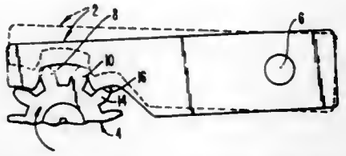
a shift lever mounted in a position projecting upwardly from the pinion gear actuatable to shift the pinion gear,

an electric motor with output shaft mounted with the output shaft paralleling the axle shaft and having a driving gear mounted thereon,

a multiple gear gear train mounted so as to establish a driving connection between said driving gear and said pinion gear, and

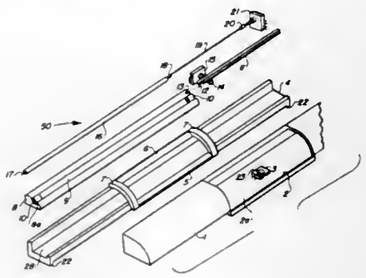
a transmission housing enclosing the driving gear, gear train, pinion gear and drive gear, the housing including sleeve portions rotatably receiving said hubs of the drive gear and thus rotatably mounting the drive gear and the axle shaft connected to the drive gear.

4,823,633
GEAR LOCK
Timothy D. Pike, Hayward, Calif., assignor to f.m.e. Corporation, Hayward, Calif.
Filed Sep. 23, 1987, Ser. No. 99,948
Int. Cl.[4] F16D *49/00*; G05G *5/18*
U.S. Cl. 74—411.5 **11 Claims**



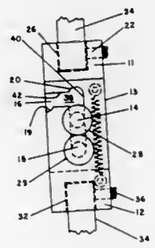
1. A gear locking element, for use with a movable toothed gear having a first gear tooth with a gear side, the gear side movable in a first direction, comprising:
a body movable between a free movement position and a gear locked position;
the body having guide surface means for engaging a tip portion of the first gear tooth and guiding the gear towards a proper position during an initial movement of the body from the free movement position to the gear locked position;
the body having a locking face positioned opposite the gear side when the gear is in the proper position and the body is in the gear locked position, the gear side and locking face defining a tangent contact plane when in contact;
the contact plane being oriented at a first angle to the first direction;
the gear side and the locking face having a first coefficient of sliding friction; and
the tangent of the first angle being less than the first coefficient of sliding friction so that substantial movement of the gear in the first direction is prevented by the engagement of the locking face with the gear side.

4,823,634
MULTIFUNCTION TACTILE MANIPULATABLE CONTROL
Craig F. Culver, 201 Ware Rd., Woodside, Calif. 94086
Filed Nov. 3, 1987, Ser. No. 116,105
Int. Cl.[4] G05G *9/02*; G09G *1/00*
U.S. Cl. 74—471 XY **17 Claims**



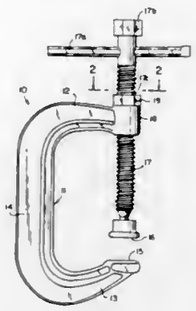
1. A tactile manipulatable control having a controlled device, said control having a support structure, means juxtaposed to said support structure for detecting a first motion, and means juxtaposed to said support structure for detecting a second motion; said control providing a first linear motion and a second rotary motion and comprising:
a support track in said support structure, said track having an elongated recess;
an elongated movable bar positioned in and longitudinally movable in said track recess;
a linearly and rotatively movable elongated cylindrical element journalled in said bar, portions of said bar and said cylindrical element being spacedly juxtaposed and exposed for isolated or combined digit-operable tactile movement;
means operable by linear movement of said bar or said cylindrical element for producing a motion signal for accessing a first motion detector; and
means operable by rotative movement of said cylindrical element independent of said bar for producing a motion signal for accessing a second motion detector.

4,823,635
SHIFT LEVER STOWING DEVICE
Charles R. Selby, 1710 F Rd., Delta, Colo. 81416
Continuation-in-part of Ser. No. 000,737, Jan. 5, 1987, abandoned. This application Feb. 8, 1988, Ser. No. 153,360
Int. Cl.[4] G05G *1/04*
U.S. Cl. 74—524 **7 Claims**



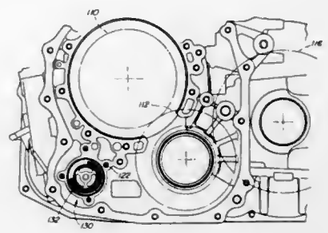
1. In a shift apparatus having a shift lever, improved means for easily moving a lever portion, to a stowed position, which improved means comprises:
lever means arranged for connecting with the shift lever, said lever means having first and second lever portions arranged for movement relative to one another;
slot means provided on one of said first and second lever portions, said slot means being a single unitary slot and having a longitudinal slot portion and a transverse slot portion arranged to have one of its ends intersect said longitudinal slot portion at a substantially right angle between the ends of said longitudinal slot portion thereby providing first and second end parts of said longitudinal slot portion on either side respectively of the intersection of said transverse slot portion with said longitudinal slot portion;
pin means provided on the other of said first and second lever portions, said pin means having a portion sized to be matingly received within one of said end parts of said longitudinal slot portion; and
bias means connected between said first and second lever portions for urging said lever portions to a first relative position, said slot means and pin means being arranged to permit relative movement of said first and second lever portions from the first relative position to a second relative position upon the application of force to one of said lever portions to thereby overcome urging of the bias means connected between said lever portions.

4,823,636
WRENCHABLE C-CLAMP
Charles R. Suska, R.R. 1 - Box 14, Roxbury, Conn. 06783
Filed Apr. 28, 1987, Ser. No. 43,371
Int. Cl.[4] B25B *5/06, 27/00*
U.S. Cl. 24—569 **4 Claims**



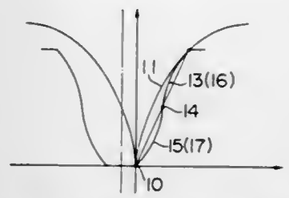
1. A C-clamp comprising a generally C-shaped frame formed by a pair of arms joined by a shank, a clamping screw having actuating means at its outer end and threadably engaging a threaded hole through one arm of same frame, said one arm having a hexagonal wrenchable potion thereon coaxial with said clamping screw, said hexagonal portion being sized to fit standard open end and box wrenches and extending toward the outer end of the clamping screw and capable of receiving torque applied thereto by a standard size open end or box wrench, whereby the C-clamp can be effectively and safely held against rotation by a chosen one of said wrenches while clamping forces are applied by rotation of the clamping screw.

4,823,637
AUTOMATIC TRANSAXLE FOR AUTOMOTIVE VEHICLE
Hiromi Taguchi, Zama, and Kazuyoshi Iwanaga, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jul. 22, 1987, Ser. No. 76,577
Claims priority, application Japan, Jul. 23, 1986, 61-111975
Int. Cl.[4] F16H *57/02*
U.S. Cl. 74—606 R **8 Claims**



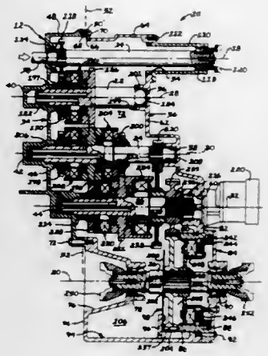
1. A transaxle, comprising:
a casing, said casing housing a mechanism which includes a bearing;
a reinforcing portion in the housing for reinforcing a site in which said bearing is disposed; and
an accumulator, said accumulator having a first bore formed in said reinforcing portion, said bore defining a chamber, a piston reciprocatively disposed in said first bore, and a conduit providing fluid communication between said accumulator and a control circuit associated with said mechanism.

4,823,638
TOOTH PROFILE OF SPLINE OF STRAIN WAVE GEARING
Shoichi Ishikawa, Yokohama, Japan, assignor to Harmonic Drive Systems Inc., Tokyo, Japan
Filed Oct. 27, 1987, Ser. No. 114,119
Claims priority, application Japan, Nov. 5, 1986, 61-262930
Int. Cl.[4] F16H *33/00, 55/06*
U.S. Cl. 74—640 **4 Claims**



1. A strain wave gearing comprising a rigid circular spline, a flexible flexspline disposed inside the circular spline, a wave generator means for, when rotated, deforming the flexspline and rotating the resulting shape of the thus deformed flexspline to produce a relative rotation between the flexspline and the circular spline, wherein the tooth face of each of the splines has a shape defined by a mapping curve which is a similarity transformation having a reduced scale of $\frac{1}{2}$ applied to a movement locus of the flexspline to the circular spline in accordance with the shape of the wave generator, said transformation being effected on a reference point where the splines are transferred from a condition of contact with each other to a condition of disengagement from each other.

4,823,639
COUNTERSHAFT TRANSMISSION
Michael W. Kranse, Manito, and Willis E. Windish, Pekin, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Jun. 4, 1984, Ser. No. 617,281
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—360 **4 Claims**



1. In a countershaft transmission of the type having an input first gear, a first countershaft having a second gear connected for joint rotation therewith and a third gear mounted for free rotation thereon, a first clutch for selectively connecting the third gear to the first countershaft, a second countershaft

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having a fourth gear connected for joint rotation therewith and a fifth gear mounted for free rotation thereon, the second and fourth gears being intermeshed, and a second clutch for selectively connecting the fifth gear to the second countershaft, the improvement comprising:

a sixth gear mounted for free rotation on the second countershaft;

a third clutch for selectively connecting the sixth gear to the second countershaft;

a seventh gear mounted for joint rotation with the second countershaft;

a third countershaft and an eighth gear connected for joint rotation therewith and being intermeshed with the sixth gear;

a ninth gear mounted for free rotation on the third countershaft and being intermeshed with the fourth gear;

a fourth clutch for selectively connecting the ninth gear to the third countershaft;

a tenth gear mounted for free rotation on the third countershaft and being intermeshed with the seventh gear;

a fifth clutch for selectively connecting the tenth gear to the third countershaft;

an input shaft connected for joint rotation with the first gear;

another gear connected for joint rotation with the input shaft;

a further gear mounted for free rotation on the first countershaft and directly intermeshing with the another gear;

another clutch for selectively connecting the further gear to the first countershaft;

the input first gear being drivingly intermeshed with the third gear and the fifth gear such that selective actuation of one of the first clutch and the another clutch provides two forward modes and selective actuation of the second clutch provides a reverse mode of operation of the second countershaft; and

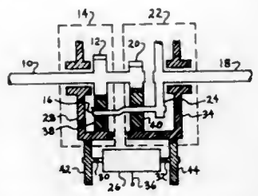
selective actuation of one of the third, fourth and fifth clutches provides a plurality of output speeds of the third countershaft with simultaneous actuation of one of the first clutch, the second clutch and the another clutch.

4,823,640

BALANCED-REACTION VARIABLE-RATIO TRANSMISSION

Richard J. Donnelly, 522 21st St., Santa Monica, Calif. 90402-3034

Filed Oct. 19, 1987, Ser. No. 109,416
Int. Cl.[4] F16H *47/04, 37/06*
U.S. Cl. 74—687 **11 Claims**



1. A variable-ratio transmission comprising:

a rotary input shaft;

a rotary output shaft;

a first planetary differential gear set having a sun gear element rotationally coupled to said input shaft, a planet-carrier gear element rotationally coupled to said output shaft, and a ring reaction gear element, referred to henceforth as a reactor, rotatably disposed in concentric relation around said input shaft,

a second planetary differential gear set having a sun gear element rotationally coupled to said input shaft, a planet-carrier gear element rotationally coupled to said output shaft, and a ring gear reactor rotatably disposed in concentric relation around said output shaft; and

an auxiliary variable-ratio power-transfer device having a first driveshaft rotationally coupled to one of said reactors, a second driveshaft rotationally coupled to the other of said reactors, and control means adapted to enable said auxiliary power-transfer device to regulate bilateral power exchange and rotational speed ratio between said first driveshaft and said second driveshaft,

wherein the base ratio, being the locked-reactor input/output rotational speed ratio, of said first differential gear set is made different than the base ratio of said second differential gear set,

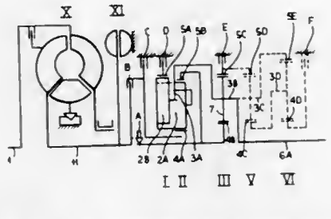
whereby said control means is enabled to vary the operating ratio of said transmission over a continuous working range extending at least between the base ratio of said first differential gear set and the base ratio of said second differential gear set.

4,823,641

PLANETARY-GEAR SPEED-CHANGE TRANSMISSION

Walter Kuhn, and Hans Müller, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP86/00236, § 371 Date Dec. 30, 1986, § 102(e) Date Dec. 30, 1986, PCT Pub. No. WO86/06808, PCT Pub. Date Nov. 20, 1986
PCT Filed Apr. 19, 1986, Ser. No. 34,157
Claims priority, application Luxembourg, May 4, 1985, 00200
Int. Cl.[4] F16H *57/10, 3/44*
U.S. Cl. 74—760 **6 Claims**



1. A planetary gear transmission for a motor vehicle, comprising:

an input shaft;

a hydrodynamic unit connected to said input shaft and having an output element;

a fist planetary gear set having

an internal gear lying only in said first planetary gear set, and

a planet gear meshing with said internal gear;

a second planetary gear set forming a reducing drive with said first planetary gear set and having

an internal gear,

a planet gear extending over both said first and second planetary gear sets and meshing with said internal gear of said second planetary gear set and with said first planetary gear,

a aun gear meshing with said planet gear of said second planetary gear set, and

means forming a common planet carrier carrying both of said planet gears;

a third planetary gear set having

a sun gear connected with the internal gear of said second planetary gear set,

a planet gear meshing with said sun gear of said third planetary gear set, and

a planet carrier positively connected to said common planet carrier and carrying said planet gear of said third planetary gear set;

an output shaft positively connected to said common planet carrier;

speed selection means including respective clutches for connecting said output element of said hydrodynamic unit to said sun gear and to said internal gear of said second planetary gear set, and respective brakes for braking said sun gear of said second planetary gear set and said internal gear of said first planetary gear set wherein said third planetary gear set has an internal gear meshing with the planet gear of said third planetary gear set, and said speed selection means includes another brake connected to brake said internal gear of said third planetary gear set,

a fourth planetary gear set having

an internal gear connected to the internal gear of said third planetary gear set,

a planet gear meshing with the internal gear of said fourth planetary gear set,

a planet carrier carrying said planet gear of said fourth planetary gear set,

means connecting the planet carrier of said fourth planetary gear set with said common planet carrier, and

sun gear meshing with said planet gear of said fourth planetary gear set;

a fifth planetary gear set having

a planet carrier connected to the sun gear of said fourth planetary gear set,

an internal gear connected to the planet carrier of said fourth planetary gear set,

a planet gear meshing with said internal gear of said fifth planetary gear set and carried by the planet carrier of said fifth planetary gear set, and

a sun gear meshing with the planet gear of said fifth planetary gear set; and

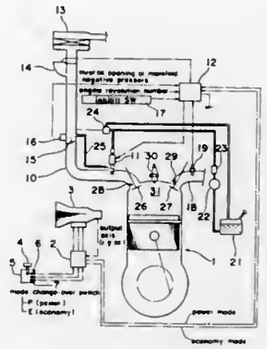
a further brake connected for selectively braking said sun gear of said fifth planetary gear set.

4,823,642

AIR-FUEL RATIO CONTROLLING APPARATUS OF AN ENGINE WITH AN AUTOMATIC CHANGE GEAR OF ELECTRONIC CONTROL TYPE

Masato Iwaki, Higashihiroshima; Ikuo Okamoto; Kenji Ushijima, both of Hiroshima, and Hiroshi Kinoshita, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 24, 1987, Ser. No. 42,060
Claims priority, application Japan, Apr. 30, 1986, 61-100649
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—860 **8 Claims**



1. In an air-fuel ratio controlling apparatus of an engine having an automatic change gear of an electronic control type, which may select either one of a power mode for controlling the gear ratio in accordance with a first shift pattern determined with emphasis on high engine power, or an economy mode for controlling the gear ratio in accordance with a second shift pattern determined with emphasis on low fuel consumption, the improvement thereof comprising:

means for setting up and generating a shift change of the power mode different from a shift change of the economy mode;

means for detecting an enrich area set within a given low load range;

means for detecting selection of the power mode; and

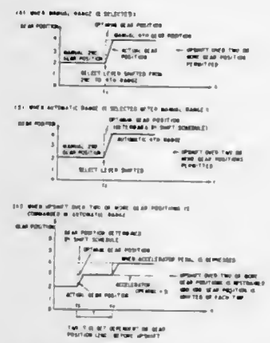
air-fuel ratio adjusting means for making the air-fuel ratio richer upon receiving a detecting signal from each of the detecting means during a running of the power mode in said enrich area set within the given low load range, whereby a mode difference between the power mode and the economy mode is generated on the basis of a difference in transmission operation and on the basis of a difference in the air-fuel ratio during the low load range.

4,823,643

ELECTRONIC AUTOMATIC GEAR TRANSMISSION CONTROL APPARATUS

Toshifumi Koshizawa, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,726
Claims priority, application Japan, Dec. 27, 1986, 61-315291
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—866 **2 Claims**



1. An electronic automatic gear transmission control apparatus having a shift schedule map for commanding an optimum gear position based on a vehicle speed signal and an accelerator opening signal, said electronic automatic gear transmission control apparatus comprising:

first means for comparing a gear position commanded by the shift schedule map with a present gear position;

second means for effecting a gear shift to a gear position which is one gear position higher than the present gear position and for restraining a gear shift to the commanded gear position for a prescribed period of time, if the commanded gear position requires an upshift to a gear position which is two or more gear positions higher than the present gear position as a result of the comparison performed by said first means; and

third means for holding the gear position which is one gear position higher than the present gear position until an accelerator pedal is depressed again, when the accelerator opening signal indicates an idling position while the gear shift up to the gear position which is one gear position higher than the present gear position, is being effected by said second means.

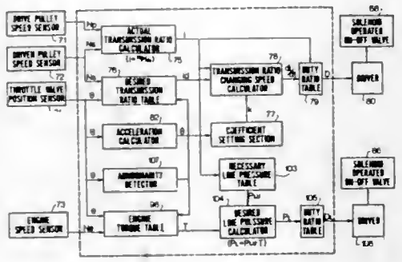
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4,823,644

FAIL SAFE FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Hiroya Ohkumo, Koganei, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 944,346
Claims priority, application Japan, Dec. 19, 1985, 60-286611
Int. Cl.[4] B60K *41/12*
U.S. Cl. 74—866 11 Claims



1. In a control system for a continuously variable transmission for transmitting the power of an internal combustion engine to driving wheels of a motor vehicle through a clutch, the transmission having a drive pulley including a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley including a hydraulically shiftable disc and a second hydraulic cylinder for operating the disc of the driven pulley, and a belt engaged with both pulleys, the system including a transmission ratio control valve having ports and a spool, a hydraulic circuit having a pump for supplying oil to the second hydraulic cylinder and to the first hydraulic cylinder through the transmission ratio control valve, the system comprising:

a sensor for detecting load on the engine and for producing a load signal;

first means responsive to the load signal for producing a desired transmission ratio signal;

second means responsive to the desired transmission ratio signal for shifting the spool of the transmission ratio control valve so as to provide a transmission ratio of the transmission; and

a fail-safe system comprising:

third means for comparing a first load signal with a subsequent load signal and said third means produces a fail-safe signal when the difference in value between the first load signal and the subsequent load signal is smaller than a predetermined value, whereby said fail-safe system is by-passed after an indication that said sensor is functioning properly;

said first means being responsive to the fail-safe signal for producing a corrected desired transmission ratio signal so as to provide a moderate transmission ratio, instead of providing the desired transmission ratio signal corresponding to the load signals.

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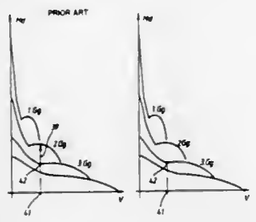
ARRANGEMENT FOR ADJUSTING THE TORQUE OF AN INTERNAL COMBUSTION ENGINE

Hermann Gaus, Stuttgart; Gunter Jürgens, Waiblingen, and Albrecht Greiner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 17, 1987, Ser. No. 97,720
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1986, 3632965
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—866 9 Claims

1. Arrangement for adjusting torque of an internal combustion engine which drives a change-speed gearbox with an automatic gear changing device and whose power is controlled by an accelerator pedal operated by a driver, in dependence on stored characteristics with specified variation of a required torque value as a function of power demand, using switch-in signals which are derived from said gear changing device and which initiate switching of a said stored characteristic into an adjustment element influencing said torque, for controlling said adjustment element, wherein:

at least two different gears are each associated with an individual said stored characteristic;



said switch-in signals contain information on a gear to be selected;

engine power is at least approximately constant for each engine operating point in an engine characteristic field when changing between two said associated stored characteristics for said required torque value; and

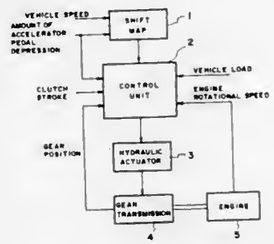
said adjustment element is controlled by said switch-in stored characteristic until said gear changing device switches to said gear having said different associated stored characteristic.

4,823,646

APPARATUS FOR CONTROLLING AUTOMATIC GEAR TRANSMISSION

Hiroshi Yoshimura, Yokohama, and Youichi Iida, Numadu, both of Japan, assignors to Isuzu Motors Limited, Kawasaki, Japan

Filed Mar. 17, 1987, Ser. No. 26,974
Claims priority, application Japan, Mar. 17, 1986, 61-59013; Mar. 17, 1986, 61-59014
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 7 Claims



1. An apparatus for controlling an automatic gear transmission of a motor vehicle having an engine with an output and being subjected to a running resistance, the automatic gear transmission having a present gear position said apparatus comprising:

arithmetic means, operatively connected to receive an optimum gear position, for computing a maximum output of the engine for the present gear position if the optimum gear position is the present gear position;

arithmetic means, operatively connected to receive an optimum gear position, for computing an engine output corresponding to the running resistance of the motor vehicle for the present gear position;

comparison means for comparing the computed maximum output of the engine and the computed engine output; and

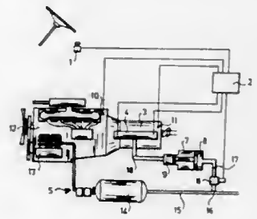
command modifying means for modifying the optimum gear position to a lower gear position and commanding a shift-down when the computed engine output corresponding to running resistance is larger than the computed maximum engine output based on the result of comparison effected by said comparison means.

4,823,647

HYDROMECHANICAL TRANSMISSION SYSTEM

Sándor Simonyi, Salgótarján; László Törocsik, Budapest; György Válóczi, and István Tóth, both of Salgótarján, all of Hungary, assignors to Csepel Autógyár, Szigetszentmiklós, Hungary

Filed Jan. 21, 1988, Ser. No. 146,465
Int. Cl.[4] F02N *15/00*; B60K *41/00*
U.S. Cl. 74—867 3 Claims



1. In a motor vehicle having an internal combustion engine, a hydrodynamic transmission including a friction clutch and shift gears, a solenoid valve system for controlling said shift gears and said friction clutch, and a compressed air system including a compressed air vessel, a push-starting control system which comprises,

(a) a hydropneumatic actuator having a pneumatic space and a hydraulic space,

(b) a solenoid pressurizing valve for connecting said pneumatic space to said compresed air vessel, for pressurizing said hydraulic space,

(c) a push-start control system for controllably actuating said solenoid valve system and said solenoid pressurizing valve,

(d) said control system including manually operable switch means and means for sensing the speed of selected vehicle drive components,

(e) said control system being operable, upon actuation of said manually operable switch means and the sensing of a predetermined speed of said selected drive components, to cause (i) actuation of said pressurizing valve, (ii) engagement of said friction clutch, and (iii) engagement of predetermined push-start gears of said transmission.

4,823,648

HYDRAULIC CONTROL SYSTEM FOR FOUR-WHEEL DRIVE TORQUE TRANFER MECHANISM FOR VEHICLE

Yoichi Hayakawa, Toyoake, and Yasunobu Ito, Aichi, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

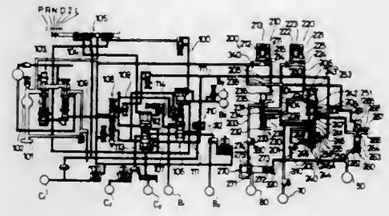
Filed Sep. 29, 1982, Ser. No. 427,049
Claims priority, application Japan, Sep. 30, 1981, 56-156431
Int. Cl.[4] B60K *41/22*
U.S. Cl. 74—869 7 Claims

1. A hydraulic control system for four-wheel drive torque transfer mechanism for a vehicle, comprising:

an automatic transmission;

a transfer mechanism connected to the output end of said automatic transmission, including a four-wheel drive frictional engagement means with a hydraulic servomotor, direct-coupling drive frictional engagement means and reduced-speed drive frictional engagement means for selectively establishing said transfer mechanism in one of a two-wheel drive direct-coupling gear, a four-wheel drive direct-coupling gear and a reduced-speed four-wheel drive gear; and

a hydraulic control circuit including at least a source of pressurized fluid at a line pressure and valve means to apply the line pressure to the hydraulic servomotor for said four-wheel drive frictional engagement means when said transfer mechanism is established in the reduced-



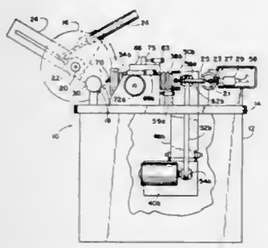
speed four-wheel drive gear and to apply a reduced pressure less than the line pressure to the hydraulic servomotor for the four-wheel drive frictional engagement means when said transfer mechanism is established in the four-wheel drive direct-coupling gear whereby the reduced pressure applied to the hydraulic servomotor in the four-wheel drive direct-coupling gear allows for slipping operation of the four-wheel drive frictional engagement means, thereby absorbing a tortional force resulting from a differential in revolving rates between a front and a rear axle, the line pressure applied to the hydraulic servomotor in the reduced-speed four-wheel drive gear preventing slipping operation.

4,823,649

AUTOMATIC DUAL SIDE GRINDER

James Emter, 23429 NE. 29th Ave., Ridgefield, Wash. 98642

Continuation-in-part of Ser. No. 788,925, Oct. 18, 1985. This application Feb. 29, 1988, Ser. No. 162,196
Int. Cl.[4] B23D *63/14*
U.S. Cl. 76—41 11 Claims



1. In a dual side grinder for resharpening the teeth of a circular saw blade, said dual side grinder comprising a frame supporting a pair of movable plates and having a pair of grinding wheels mounted thereon for grinding the teeth of said circular saw blade from either side thereof, the improvement comprising:

grinding wheel radial angle adjustment means comprising rotatable cam means affixed to said frame for interacting with said movable plates to selectively alter the radial

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angle between the grinding wheels and the teeth of the circular saw blade.

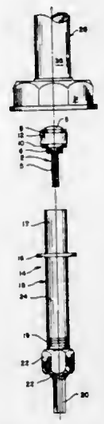
4,823,650
POWER DRIVEN WIRE NUT WRENCH
John E. Tuttle, 19220 32nd Ave., NW., Stanwood, Wash. 98292
Filed Dec. 9, 1987, Ser. No. 130,641
Int. Cl.[4] B25B *13/06*
U.S. Cl. 81—124.2 7 Claims



1. A wrench for the installation of helical spring wire connectors, having either two outwardly extending diametrically opposed wing portions or a plurality of vertically extending grooves space equally about the outer surface thereof, for use in power tools having locking jaws or chucks, comprising:
(a) a tapered housing having an outer wall and an inner wall and having a generally conical shape and having an internal cavity, said housing also having a top and a bottom, said top being open thereby allowing access to the internal cavity of said housing, said top having a larger diameter than said bottom, said housing also having slot means integrally formed therein to secure said wing portions of said helical spring wire connectors having wing portions, said housing also having grip means integrally formed thereon to grip and secure the grooves of said helical spring type wire connectors, having grooves thereon;
(b) shaft means fixedly attached to said bottom of said housing and extending outwardly therefrom, said shaft means being longer than wider, said shaft means being sized to be held in the chuck of said power tools.

4,823,651
EXPANSION PLUG AND TOOL
Frank R. England, 4819 Old Mooringsport Rd., Shreveport, La. 71107
Filed Aug. 14, 1987, Ser. No. 85,141
Int. Cl.[4] B25B *13/02*
U.S. Cl. 81—124.4 2 Claims

1. In an expansion plug for insertion in a gas conduit, said expansion plug characterized by a bolt having a head and a threaded shank extending from said head, a pair of rigid washers provided on said shank and a flexible washer sandwiched between said rigid washers and a nut threaded on said shank and seated against one of said rigid washers, the improvement in combination therewith comprising a tool for selectively inserting said expansion plug in the gas conduit and removing said expansion plug from the gas conduit, said tool comprising elongated sleeve means; a nut slot provided in one end of said sleeve means for engaging said nut in said expansion plug and selectively tightening and loosening said expansion plug in the gas conduit, responsive to rotation of said sleeve means; sleeve threads provided on one end of said sleeve means, an engaging nut adapted for threading on said sleeve threads and a thread-engaging end carried by said engaging nut and wherein said engaging threads are provided in said thread-engaging end and a set of engaging threads provided in the opposite end of said



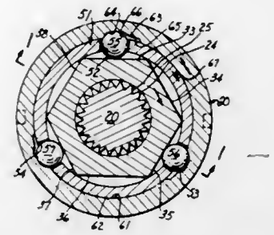
sleeve means for threadibly engaging said threaded shank and removing said expansion plug from the gas conduit.

4,823,652
NUT GRABBER
William P. Morrissey, Rt. 1, Box 3, Green Pond, S.C. 29446; Christopher M. Horsley, 525 Recold Rd., and John A. Yurcho, Jr., Rt. 4, Box 386, both of Walterboro, S.C. 29488
Filed May 18, 1987, Ser. No. 51,277
Int. Cl.[4] B25B *13/02*
U.S. Cl. 81—125 6 Claims



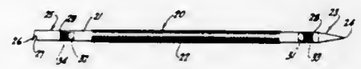
1. An improvement in a wrench comprising; a bore in a side of said wrench, a plunger having first and second ends, said plunger first end tapering to a point to engage a nut to be held by said plunger, said plunger second end being a cylindrical portion of reduced diameter on which a spring is mounted, said spring surrounding said reduced diameter portion; a first end of said bore is tapered to receive said tapering first end of said plunger, and a second end of said bore is threaded to receive an externally threaded set screw, whereby the pressure said plunger exerts on said nut can be selectively varied.

4,823,653
FREE SPINNING, SELF-LOCKING THREADED FASTENER, AND METHOD AND TOOL FOR SETTING IT
Ronald W. Batten, Torrance, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.
Division of Ser. No. 653,693, Sep. 21, 1984. This application May 13, 1987, Ser. No. 50,246
Int. Cl.[4] B25B *23/145*
U.S. Cl. 81—468 5 Claims



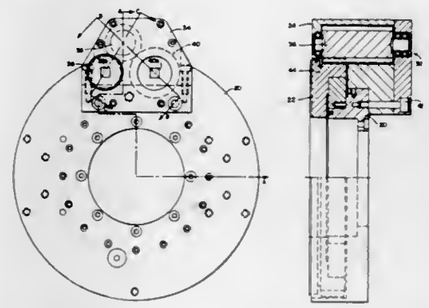
1. A tool for setting a fastener, which fastener comprises an externally threaded pin and an internally threaded collar, said collar having external driving faces, said pin and collar having a mutual central axis and respective threads which engage and enable said collar to be freely spun onto said pin, said tool having a central axis that is coincident with the central axes of the collar and pin when the three are engaged, said tool comprising:
a tubular drive spindle having an axis and a radial aperture;
a drive ball in said aperture adapted to move radially therein;
a cam member comprising a tube surrounding said drive spindle with an inner cylindrical surface embracing said drive spindle, and a cam in said inner cylindrical surface having a first and a second segment at different radial distances from said central axis, and a transition segment connecting them, said drive spindle and cam member being rotatable together, and said cam member being rotatably movable relative to said drive spindle and drive ball, said first segment being radially spaced from said central axis so that when it abuts the ball, it presses it against a drive surface so as to turn the collar when the drive spindle is turned, said second segment being spaced closer to said central axis so that when it presses against the ball as the consequence of rotary movement of the cam member relative to the drive spindle, the ball is indented into said face so as to distort material of the thread in said collar against the thread on said pin, whereby to form at least a running lock between said collar and said pin.

4,823,654
WAFER HANDLING TOOL AND METHOD OF USE
Gary M. Moore, San Jose, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.
Filed Feb. 8, 1988, Ser. No. 154,166
Int. Cl.[4] B25B *33/00*; B25F *1/00*
U.S. Cl. 81—488 13 Claims



1. A wafer handling tool, comprising: an elongated handle having first and second ends; the first end of said handle comprising a first, elongated end member having a transverse end surface angled forwardly and having a notch adjacent said end surface approximately two to three millimeter deep defining said front end surface into a thin flat hook for engaging a wafer by the end thereof; and the second end of said handle comprising a generally conical, elongated member terminating in a point for engaging a wafer.

4,823,655
MULTI-SPEED DRIVE SYSTEM FOR A PORTABLE LATHE
Jerald VanderPol, Eldorado Hills, Calif., assignor to Tri Tool Inc., Rancho Cordova, Calif.
Filed Sep. 8, 1986, Ser. No. 904,404
Int. Cl.[4] B23B *3/22*
U.S. Cl. 82—113 3 Claims



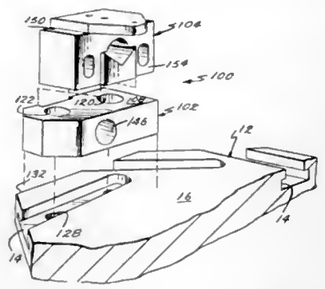
1. A multi-speed drive system for a portable lathe cutting head comprising:
(a) a stationary support;
(b) a cutting tool holder ring rotatably attached to the stationary support;
(c) driven gear means attached to the cutting tool holder ring so as to rotate therewith;
(d) a main drive pinion gear operatively engaging the driven gear means such that rotation of the main pinion drive gear causes rotation of the cutting tool holder ring, the main drive pinion gear having an axial length with a first axial portion adapted to be in operative engagement with input drive pinion gears and a second axial portion in operative engagement with the driven gear means;
(e) a plurality of input drive pinion gears, each input drive pinion gear having a different pitch diameter and being operatively engageable with the first axial portion of the main drive pinion gear such that rotation of an input drive gear causes rotation of the main drive pinion gear, each input drive pinion gear having an axial length less than the axial length of the main drive pinion gear;
(f) a gear housing;
(g) mounting means rotatably mounting the main drive gear and the plurality of input drive pinion gears to the gear housing such that all input pinion gears simultaneously engage the main drive gear; and,
(h) means to removably attach the gear housing to the stationary support such that the main drive gear operatively engages the driven gear means.

4,823,656
TOOL HOLDING ASSEMBLY FOR A LATHE TURRET
Albert G. Weil, 419 Wilton Ave., Palo Alto, Calif. 94306
Continuation-in-part of Ser. No. 711,970, Mar. 14, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 929,401
Int. Cl.[4] B23B *29/28, 29/32*
U.S. Cl. 82—159 2 Claims

1. In combination, a multi-station turret for a machine tool and at least one tool holding means for holding tools on said turret and for aligning the tools with a workpiece, said tool

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holding means including a base member attached to said turret, which base member has front and top surfaces, and at least one tool holding member removably attached to said base member and having top, front and rear surfaces, said tool holding means including cooperating mating portions on said base member and said tool holding member to fix relative horizontal movement therebetween while permitting relative vertical movement therebetween, one of said mating portions including means defining a groove having a pair of opposite sides with generally vertically extending faces and an associated substantially planar surface extending between and joining said opposite groove side faces, said groove side faces forming a pair of respective angles with said associated member surface when viewed in a horizontal plane which total at least 180°, the other of said mating portions having means defining a tongue having a corresponding pair of opposite sides with vertically extending faces and a corresponding associated substantially planar



surface extending between and joining said opposite tongue side faces, and said tool holding member having means positioned thereon for adjustably setting the vertical positioning between said tool holding member and said base member;

wherein said tool holding means further includes elongate mounting means and means for fixedly attaching one end of said mounting means to said tool holding member with said mounting means extending away from said rear surface of said tool holding member, said base member further including a bore extending from said front surface of said base member into said base member for receiving said mounting means, and means for releasably securing said mounting means in said bore for receiving said mounting means; and

wherein said means for releasably securing includes means defining an aperture in a side surface of said mounting means and a screw positionable in said aperture.

4,823,657

SELF-CENTERING STEADY REST

Guy Welin-Berger, Hornsgatan 142, S-11728 Stockholm, Sweden

PCT No. PCT/SE86/00385, § 371 Date May 1, 1987, § 102(e) Date May 1, 1987, PCT Pub. No. WO87/01320, PCT Pub. Date Mar. 12, 1987

PCT Filed Aug. 29, 1986, Ser. No. 49,999

Claims priority, application Sweden, Sep. 3, 1985, 8504090

Int. Cl.⁴ B23B *25/00*

U.S. Cl. 82—162 **4 Claims**

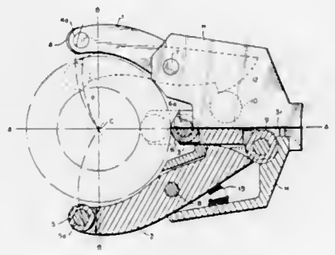
1. A self-centering steady rest with extensive diameter clamping range for machine tools, e.g. lathes, for centering long, cylindrical workpieces and overhangs using a constant linear displacement clamping force, comprising:

a housing,

two similar, pivoting levers arranged in symmetry relative to a plane of symmetry passing through a centering point for a workpiece and pivotable about axles extending parallel to said plane of symmetry, said axles being supported in the housing and each of said levers having a first part swingable inside the housing and a second part protruding outside the housing, and said levers having starting positions in which said levers have a V-shaped configuration and can receive workpieces of various diameters between said second parts for a clamping operation, and from which the second parts of said levers move toward one another for the clamping operation,

an elongated slide linearly displaceable between the pivoting levers and movable in said plane of symmetry and perpendicularly to said pivot axles for the pivoting levers, an end of said slide which is turned towards the centering point for the workpiece cooperating with ends of said second parts of the levers to hold between them the workpiece, and said slide end and said lever ends each being provided with a rotatable workpiece supporting roller which contacts the workpiece when the steady rest is operated,

coupling means in the form of a cam on an end portion of each of said inner first parts of the levers and cam followers in the form of rollers mounted on portions of the slide, the rollers being partially disposed in recesses in the slide adjacent respective sides of said lever end portions facing the slide and having such a shape that a linear displacement of the slide towards the centering point of the work-



piece causes such a pivoting of the levers that contact points for said workpiece supporting rollers with the workpiece are always at the same radial distance from the centering point, and

a device operable with constant working pressure for displacing the slide at a constant linear displacement force throughout the entire diameter clamping range of the levers, wherein the levers are essentially solid except for holes accommodating said pivoting axles and axles for supporting said rotatable supporting rollers in the ends of the said second parts of the levers, the levers being swingable from their starting positions, i.e., the maximum open position of the steady rest, in which the levers have the V-shaped configuration, to final positions in which the levers are substantially parallel to each other, and wherein the slide is of thin construction and the cams on the ends of the first parts of the levers, are closely adjacent to the plane of symmetry as a result of said cam follower rollers being partially disposed in said recesses in said thin slide, with no part of the slide, including the roller-mounting portions, projecting on opposite sides of the plane of symmetry beyond parts of the cam follower rollers extending out from the slide.

4,823,658

PUNCH PRESSES

Andrew I. Spicer, 15 Arell Street, Brisbane, Queensland 4034, Australia

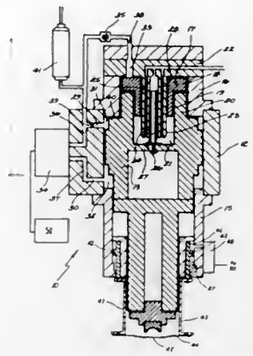
PCT No. PCT/AU86/00312, § 371 Date Oct. 17, 1985, § 102(e) Date Oct. 17, 1985, PCT Pub. No. WO87/02309, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 20, 1986, Ser. No. 86,044

Claims priority, application Australia, Oct. 18, 1985, PH2975

Int. Cl.⁴ B26D *5/12*; F15B *15/08*; T15B *21/02*

U.S. Cl. 83—74 **12 Claims**



1. A punching head assembly for a punch press, said punching head assembly comprising a cylinder portion having a first piston member adapted for reciprocating movement therein, said first piston member having a pair of radial work surfaces each defining part of a respective one of a first extend chamber and a retract chamber; control means, said first extend chamber and said retract chamber being in respective fluid communication with said control means adapted to alternate a flow of pressurized fluid to said chamber to obtain reciprocating movement of the piston member, said control means comprising valve means controlled by a microprocessor; a second piston member juxtaposed axially with said first piston member and having a radial work surface defining part of a second extend chamber which is in controlled fluid communication with said control means, whereby the flow of pressurized fluid to said second extend chamber is selectively opened to drive said first and second piston members together and closed to disable said second piston member, said first piston member being connected to a ram having a punching tool at an operative end thereof; and a stripper assembly having a stripper plate at least partially surrounding said punching tool, a hydraulic piston adapted for reciprocating movement axially relative to said ram and being connected to said stripper plate, and valve means operated by said microprocessor for controlling axial movement of said hydraulic piston and said stripper plate independently of said punching tool.

4,823,659

HOLDER FOR A PANEL CUTTING PLATE

Roland Falascoai, Pointe Claire, Canada, assignor to Rofalex International Inc., Canada

Filed Feb. 6, 1987, Ser. No. 11,587

Claims priority, application Canada, Nov. 3, 1986, 522052

Int. Cl.⁴ B26D *7/18, 1/62*

U.S. Cl. 83—100 **17 Claims**

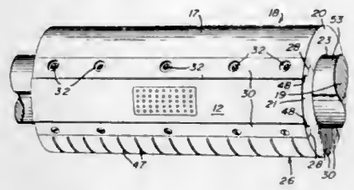
1. A rotary cutter for cutting panels from sheet-like material, said rotary cutter comprising:

a thin metallic cutting plate on which is formed integrally a cutting edge having a contour corresponding to the outline of a panel to be cut, said cutting plate further comprising opening means formed on an area on said cutting plate which is edged by said cutting edge; and

a holder for said cutting plate, said holder being adapted to be mounted on a driving shaft for rotation about an axis to bring successively in engagement said cutting plate with said sheet-like material, said holder including:

(a) a seat for receiving said cutting plate, said seat being divided into a plurality of portions;

(b) a plurality of vacuum chambers adapted to communicate each with a source of vacuum, each vacuum chamber



being associated with a respective portion of said seat, and communicating therewith by a plurality of passageways for creating a zone of vacuum in the vicinity of said opening means to retain a panel cut from said sheet-like material to said cutting plate; and

(c) clamping means for retaining said cutting plate in said seat, said clamping means including a plurality of spaced apart keys, to retain said cutting plate in said seat, two opposite edges of said cutting plate being clamped by two keys, each portion of said seat being bound by two adjacent keys.

4,823,660

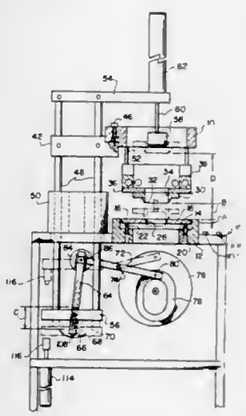
LABEL CUTTING DEVICE AND METHOD

Frederick Forthmann, 688 Pascack Rd., Washington Township, Old Tappan County, N.J. 07675

Filed Feb. 20, 1986, Ser. No. 831,930

Int. Cl.⁴ B26D *7/10*

U.S. Cl. 83—123 **6 Claims**



1. A device for cutting labels from a strip of heat meltable material comprising: a frame; a die plate connected to said frame and having a die surface; a punch mounted for movement on said frame and having a cutting edge for cutting labels; heating means connected to said punch for heating said cutting edge to melt the heat meltable material; reciprocating means operatively connected between said frame and said punch for reciprocal movement of said punch toward and away from said

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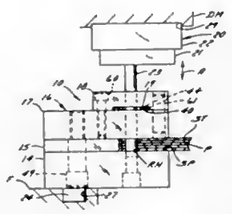
die plate for engaging said cutting edge with said die surface to cut labels from the heat meltable material; and biasing means operatively connected between said die plate and said punch for permitting retraction of at least one of said die plate and punch with respect to movement of said punch toward said die plate by said reciprocating means while said cutting edge is in engagement with said die surface, said reciprocating means comprising a reciprocating assembly mounted for movement to said frame and carrying said punch, said heating means including a heating unit connected to said reciprocating assembly adjacent said punch, and lifting means connected to said frame and operatively engageable with said reciprocating assembly to move said punch away from said die plate by a larger amount than during upward movement of said punch toward and away from said die plate, said lifting means comprising a cylinder connected to said frame having a piston engageable with said reciprocating assembly, said reciprocating means including a reciprocating lever movably mounted to said frame, a pusher member operatively connected to said reciprocating lever and engaged with said reciprocating assembly for pushing said reciprocating assembly and disconnect means operatively connecting said reciprocating lever to said pusher member and activatable to disengage said pusher member from said reciprocating lever so that said pusher member can move with said reciprocating assembly when said lifting cylinder is actuated.

4,823,661

DIE ASSEMBLY FOR PUNCHING HOLES IN PAPER

Donald E. Freres, Racine, Wis., assignor to Sterling Tool Co., Racine, Wis.

Filed Dec. 23, 1987, Ser. No. 137,056
Int. Cl.[4] B26F *1/14*
U.S. Cl. 83—146 8 Claims



1. A die assembly for use in a die press to punch a hole in a stack of paper sheets comprising:

a die block having a die hole therethrough;

guide means disposed in spaced apart relationship with respect to said die block so as to define a space for receiving said stack,

said guide means comprising two guide plates, each guide plate having a guide hole therethrough, each guide hole being aligned with the other and with said die hole;

a separator and stack containment plate mounted between said die block and one of said guide plates;

lubricating wick means disposed between said two guide plates;

punch retainer means disposed for relative movement away from and toward said guide means between open and closed positions, respectively;

said punch retainer means comprising a punch retainer plate having a punch retainer hole therethrough and a cap plate rigidly secured to said punch retainer plate;

and a punch mounted on said punch retainer means and slidably received in said guide hole,

said punch having a head end with a projection thereat entrapped between said cap plate and said punch retainer plate,

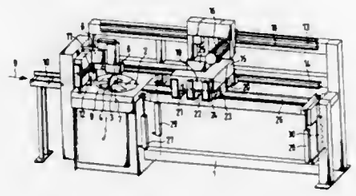
said punch extending through said punch retainer hole and being axially shiftable and laterally shiftable for relatively small distances within said punch retainer hole to enable said guide holes in said guide plates to precisely align said punch with said die hole as said punch is moved axially by said punch retainer means.

4,823,662

APPARATUS FOR HANDLING BAR-LIKE WORKPIECE MATERIAL IN A SAWING MACHINE

Armin Stolzer, Renchen, Fed. Rep. of Germany, assignor to Keuro Maschinenbau GmbH & Co., KG, Achern-Gamshurst, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,125
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702223
Int. Cl.[4] B23D *47/04*; B26D *7/02*
U.S. Cl. 83—150 23 Claims



1. An apparatus including a workpiece table and a machine frame for handling bar-like workpiece material in a sawing machine, in particular in a miter-box saw having a miter angle that is adjustable about an axis vertical to said workpiece table relative to a circular cold saw blade rotatable about a horizontal axis, said saw blade being displaceable from below said workpiece table through a pivotable slit in the workpiece table, a first pair of openable and closable clamping jaws immovably disposed on the workpiece feed side of the cutting plane of said saw blade in terms of the feed direction of the material, for retaining said material in place on said workpiece table during cutting and for releasing said material subsequent to being cut, a roller conveyor that precedes said workpiece table for feeding said material to be cut, one of said jaws of said first clamping jaws is disposed stationary in a vertical plane parallel to the material feed direction of the material, a vertically movable clamping jaw disposed on the machine in the vicinity of the cutting plane by means of which the material is clamped against the machine table during cutting,

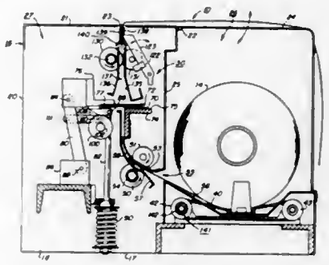
a movable clamping carriage (15) disposed above said workpiece table (2) movable on said machine frame (1) horizontally and parallel to the feed direction (9) of the workpiece material (36), two horizontally openable and closable bearing jaws (19, 20) disposed beside one another in the material feed direction on the clamping carriage and extending in a vertical plane, said bearing jaws (19, 20) are spaced apart by a mutual distance (24) allowing the passage therethrough of said saw blade (4) over an adjustable range of the miter angle (8), in the feed direction of movement of the workpiece material, said bearing jaws being openable and closable in a horizontal direction on the clamping carriage toward said workpiece material, and three movable clamping jaws (21, 22, 23), including two outer jaws and a middle jaw that cooperate with said bearing jaws for gripping said workpiece material, said three clamping jaws all disposed beside one another in the material feed direction, and a mutual spacing distance between said edges oriented toward one another of said two outer clamping jaws (21, 23) dimensioned such that for a largest possible cross section of the workpiece material, these said two outer clamping jaws are located outside a working range of said saw blade when given a maximum miter angle (8).

4,823,663

CUT SHEET ROLL SUPPLY

Thomas J. Hamlin, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1987, Ser. No. 20,805
Int. Cl.[4] B26D *5/26*
U.S. Cl. 83—208 13 Claims



1. A roll supply for supplying cut sheets of selected length to a machine, comprising, in combination:

(a) a housing having a sheet discharge for the discharge of cut sheets;

(b) support means in said housing for rotatably supporting a roll of sheet material with said roll being free to rotate on said support means;

(c) sheet cutting means in said housing for cutting off a selected length of said sheet material from said supply roll, said cutting means including:

(1) a substantially planar stationary knife;

(2) a movable knife in opposed relation to said stationary knife;

(3) means supporting said movable knife for multi-directional movement;

(4) means for imparting substantially reciprocating movement to said movable knife to cause said movable knife to move in a first direction into and out of cutting relation with said stationary knife to cut said selected length of sheet material from said roll; and

(5) biasing means urging said movable knife in a second direction substantially normal to said first direction whereby said stationary and movable knives are biased into cutting relation with one another;

(d) first sheet feeding means upstream of said sheet cutting means for withdrawing sheet material from said supply roll and feeding said sheet material to said sheet cutting means;

(e) second sheet feeding means downstream of said sheet cutting means for feeding said sheet material from said cutting means toward said sheet discharge; and

(f) means responsive to feeding said selected length of sheet material from said supply roll through said cutting means by said first and second sheet feed means to actuate said sheet cutting means and cut off said length of said sheet material,

said movable knife having a relatively slight V-shape relative to the plane of said stationary knife whereby as said movable knife moves into and out of cutting relation with said stationary knife, contact between said movable and stationary knives progressively displaces said movable knife in said second direction to progressively cut said sheet material from each end toward the middle,

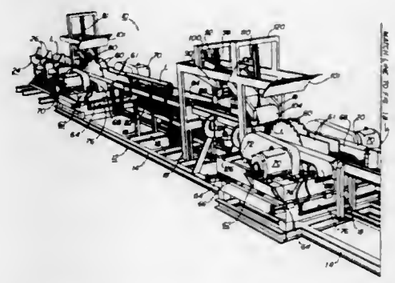
each end of one of said stationary and movable knives being extended so as to provide a support for supporting said movable knife, said extended ends guiding said movable knife into cutting relation with said stationary knife during reciprocating movement of said movable knife while preventing face to face contact of said movable knife with said stationary knife.

4,823,664

TANDEM SAWMILL ASSEMBLY

Hill M. Cooper, Jr.; Cooper, William B., and Robert M. Cooper, all of P.O. Box 550, Wadley, Ga. 30477

Filed Jul. 15, 1987, Ser. No. 73,517
Int. Cl.[4] B27B *7/00*
U.S. Cl. 83—367 19 Claims



1. A tandem sawmill assembly comprising a main frame assembly including base members and spaced parallel frame members mounted at an elevation above said base and defining a generally central track, conveying means disposed between said frame members and adapted for moving logs axially therealong, a first set of motor-driven saw means having spaced parallel blades for cutting two sides from a log as the log is moved therebetween, means disposed downstream from said first saw means for rotating the log ninety degrees to rest on one of said cut sides, an overhead conveying means including a roller means having log engaging projections extending around the circumference thereof connected to said frame members and suspended therefrom over the log for moving the log forwardly, control means for selectively activating said overhead conveying means and a second set of motor driven saw means having spaced parallel blades for cutting the remaining two sides from the log as the log is moved therebetween by said conveyor means.

4,823,665

DEVICE FOR THE ALTERNATE POSITIONING OF THE BLADE EDGE IN A CUTTING MACHINE

Elio Cavagna, Melegnano, Italy, assignor to Elio Cavagna S.R.L., Melegnano, Italy

Continuation-in-part of Ser. No. 810,655, Dec. 18, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 145,474
Int. Cl.[4] B26D *1/02*
U.S. Cl. 83—529 1 Claim

1. The device for automatically positioning the edge of a cutting blade into contact with the plane of a running film to be cut and causing up and down reciprocation of said blade intermittently below the running plane for a distance C, which comprises:

a fixed structure comprising a first and a second parallel cylindrical chambers and a central moving rod;

a cover closing the upper parts of the chambers;

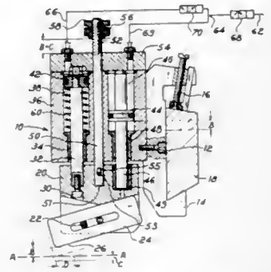
a blade-carrier having a blade fixed thereto with an inclination corresponding to the shear angle, said blade-carrier being hinged to the lower portion of the central rod and being provided with a cylindrical chamber;

the upper portion of the central rod protruding from the cover and being threaded;

a regulating nut screwed on the threaded portion of the central rod; the distance between the nut and the cover

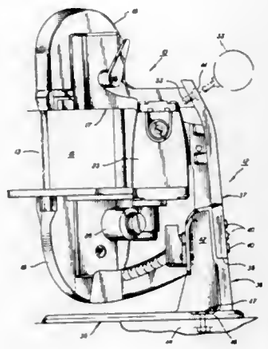
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being regulated to correspond to the total lowering of the blade-carrier;
a first piston with a first piston rod slidably mounted in the first chamber; the blade-carrier being fixed to the end of said first piston rod;
a spring contained inside the first chamber and arranged around the first piston rod to oppose to its lowering movement;
a second piston with a second piston rod slidably mounted in the second chamber, the distance between the second



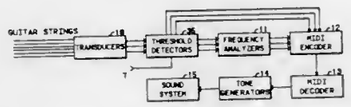
piston and the end wall of the second chamber corresponding to the distance between the cutting edge of the blade in the raised position and the running plane;
the end portion of the second piston rod being slidably inserted into the cylindrical chamber of the blade-carrier;
a source of pressurized fluid or air connected to the upper parts of the first and second chambers above the pistons; and
a valve regulating the periodic alternate introduction of pressurized fluid or air connected with said source and with the upper part of the first chamber.

4,823,666
STAND FOR PORTABLE BAND SAW
Ronald G. Galloway, 87 Tappan St., Baldwinsville, N.Y. 13027
Filed May 9, 1988, Ser. No. 191,433
Int. Cl.[4] B23D *53/00, 55/00, 55/02*
U.S. Cl. 83—788 **9 Claims**



1. A stand for supporting a portable band saw of the type having a motor mounted in a casing over the saw blade so that the axis of the motor is generally parallel with said saw blade, a trigger mounted in a trigger guard behind the motor and a threaded hole for receiving a hand engageable grip in the casing forward of the motor, said stand including a support unit having a horizontally disposed base, a vertically disposed pedestal mounted on said base, a vertically disposed rigid arm secured to the top section of said pedestal, hanger means mounted in the top of said arm for removably engaging the front of the saw casing to suspend said saw in an upright position in said stand with said trigger guard positioned beneath the motor directly over said base whereby an exposed portion of the saw blade passes vertically through a work station, and open channel means mounted beneath the hanger means that include a pair of rigid spaced apart members for slidably receiving therein a portion of the trigger guard to prevent movement of the saw in said stand when a workpiece engages said blade in the work station.

4,823,667
GUITAR CONTROLLED ELECTRONIC MUSICAL INSTRUMENT
Ralph Deutsch, Sherman Oaks, and Leslie J. Deutsch, Sepulveda, both of Calif., assignors to Kawai Musical Instruments Mfg. Co., Ltd., Hamamatsu, Japan
Filed Jun. 22, 1987, Ser. No. 64,427
Int. Cl.[4] G10H *3/18, 7/00*
U.S. Cl. 84—1.16 **8 Claims**

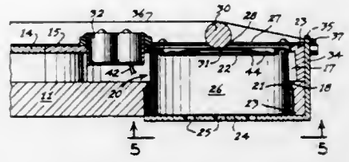


1. In combination with a musical instrument having a plurality of strings which produce musical tones when any of said strings are placed in a mechanical vibration state, apparatus for controlling a plurality of musical tone generators comprising;
a plurality of frequency controlling devices each of which is associated with a corresponding one of said plurality of strings wherein each one of said plurality of frequency controlling devices comprises;
a vibration transducer whereby in response to the mechanical vibration state of said associated strings a string waveshape signal having an envelope is generated,
a threshold detect unit whereby an on-signal is generated if said envelope of said string waveshape signal is greater than or equal to a prespecified threshold signal amplitude and whereby an off-signal is generated if said on-signal has been generated and said envelope of said string waveshape signal is less than said prespecified threshold signal amplitude,
a frequency analyzer means whereby a note data word is generated which identifies the closest musical note corresponding to said string wavehsape signal,
a note encoding means whereby said note data word is encoded into a digital interface format data word in response to said on-signal and whereby a zero note data word is encoded into said digital interface data word in response to said off-signal,
a tone generator whereby a prespecified musical waveshape is generated in response to said digital interface format data word, and
a conversion means whereby said musical waveshape is transformed to an audible musical sound.

4,823,668
RESONATOR GUITAR SIMULATOR
M. Duane Marrs, 1258 Sioux Ter., Madison, Tenn. 37115
Filed Jan. 28, 1988, Ser. No. 149,474
Int. Cl.[4] G10D *3/02*
U.S. Cl. 84—296 **9 Claims**

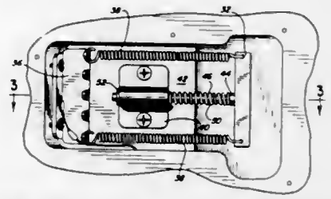
1. A stringed musical instrument comprising:
(a) a peg box,

(b) a sound box having top and bottom surfaces and a tail end portion, and a sound board comprising said top surface,
(c) an elongated hollow neck extending between said peg box and said sound box,
(d) a resonator within said sound box having a cylindrical side wall and a top wall spaced proximate to said sound board, said resonator having an opening through said bottom surface,



(e) an elongated solid bridge bar mounted transversely in said sound board and in contact with said top wall,
(f) an electrical pick-up mounted in said sound board spaced longitudinally from said bridge bar, and
(g) elongated strings extending from said peg box over said neck to said tail end portion, said strings lying in contact with said bridge bar and spanning said pick-up.

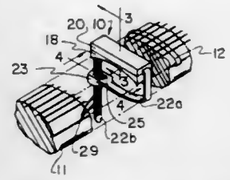
4,823,669
TREMOLO DEVICE FOR AN ELECTRIC GUITAR
William Sarricola, Jr., 3533 George St., Franklin Park, Ill. 60131
Filed Jun. 21, 1988, Ser. No. 209,693
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—313 **7 Claims**



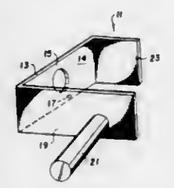
1. A positioning device for maintaining the tuning of strings on an electric guitar with a block tremolo device having a spring block, said positioning device comprising:
a first support means connected to the guitar;
first spring means connecting said first support means to the spring block and forcing the spring block toward said first support means;
a second support means connected to the guitar body; an elongated member having first and second ends, said first end connected to said second support means, and said second end contacting the spring block; and
second spring means for forcing said second end of said elongated member against the spring block.

4,823,670
CAPO
Steven B. Gherman, 318 N. 13th Street, #2, Allentown, Pa. 18102, and David L. Roche, 415 S. St. George St., Allentown, Pa. 18104
Filed Nov. 23, 1987, Ser. No. 124,242
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—318 **9 Claims**

1. A device for uniformly changing the pitch of the strings extending lengthwise of the fingerboard of a fretted stringed instrument comprisisng a rigid capo bar capable of transversely spanning the fingerboard of the stringed instrument, a pair of flexible strap portions extending outwardly from the ends of said capo bar and adjustable strap fastening means for releasably interconnecting the ends of said strap portions, said strap fastening means having a resilient clasp for clamping said capo bar against the strings at selected lengthwise positions on the fingerboard intermediate said frets for simultaneously changing the pitch of all of said strings, said fastening means comprising transversely-extending grooves spaced lengthwise of one of the strap portions, and wherein said clasp is secured to the other strap portion, a slot in said clasp, said slot being dimensioned to receive said first strap and a latching tooth on said clamp, resilient means biasing said latching tooth towards said grooves for releasably clamping said capo bar onto said strings at positions lengthwise of said fingerboard.



4,823,671
DEVICE FOR MANUALLY RECOILING SLIDE ACTION PISTOLS
Frank Buryta, 875 Pioneer Dr., North Tonawanda, N.Y. 14120
Filed Nov. 20, 1987, Ser. No. 123,265
Int. Cl.[4] F41C *27/00;* **F41D** *11/00*
U.S. Cl. 89—1.4 **6 Claims**



1. A slide back device for manually recoiling the slide member on a slide action type pistol comprising:
a. a front engaging plate, said plate having an opening therein, said opening being sufficiently large to receive the muzzle portion of a pistol barrel and pass the pistol barrel therethrough, said opening being sufficiently small not to pass the slide member of the pistol, said plate having a contact surface for engaging the front portion of a pistol slide member,
b. a side extention extending perpendicular from said engaging plate, and
c. said extention having a gripping handle mounted thereon and extending outward substantially perpendicular thereto.

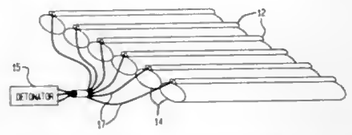
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4,823,672

APPARATUS AND METHOD FOR NEUTRALIZING MINE FIELDS

Shmuel Eidelman, Rockville, Md., assignor to Science Applications International Corporation, La Jolla, Calif.

Filed Aug. 24, 1987, Ser. No. 88,273
Int. Cl.[4] E41H *11/12*; E41F *1/00*; E42D *3/00*
U.S. Cl. 89—1.13 9 Claims



1. A method of neutralizing mines in a mine field, comprising the steps of:

deploying a plurality of explosive charges over a mine field in an array and in spaced relation to the ground and one another so as to create on detonation a substantially planar wavefront blast; and

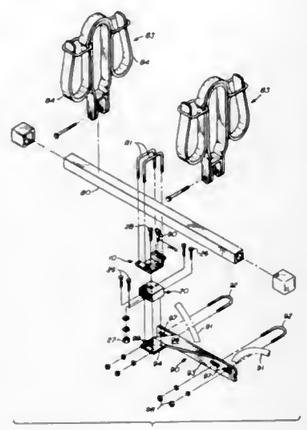
substantially simultaneously detonating the explosive charges, the initial impact on the ground comprising said substantially planar wavefront blast which creates a substantially uniform impulse and overpressure on the mine field whereby mines contained in said mine field are neutralized, wherein during said step of deploying said explosive charges are spaced above said mine field by a first distance and said plurality of explosive charges are separated from one another by a second distance wherein said second distance is less than or equal to said first distance.

4,823,673

SWIVEL ADAPTER FOR A GUN HOLDER

William A. Downing, 14001 Hughes Rd. West, Dickinson, Tex. 77539

Filed Nov. 5, 1987, Ser. No. 116,897
Int. Cl.[4] F41F *23/14*
U.S. Cl. 89—37.04 12 Claims



1. An adapter for a gun mount carried by a handle bar guided wheeled vehicle, said vehicle including at least one front wheel, said adapter comprising:

first and second members rotatably connected;

means for releasably linking said first and second members in a plurality of positions;

means for connecting one of said members to said gun mount and means for joining the other of said members to said handle bar carried by said vehicle; and

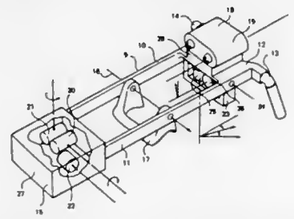
said plurality of positions includes at least one position wherein a gun carried by said gun mount points in a direction comprising forward movement of said vehicle, another position wherein said gun so carried points in a direction substantially perpendicular to said direction of forward movement, and a further position wherein said gun so carried points in a direction intermediate said directions of forward movement and substantially perpendicular thereto.

4,823,674

ANTI-AIRCRAFT SIGHT

Hans-Arne Nilsson, Jönköping, Sweden, assignor to Saab Instruments Aktiebolag, Jonkoping, Sweden

PCT No. PCT/SE86/00372, § 371 Date Apr. 6, 1987, § 102(e) Date Apr. 6, 1987, PCT Pub. No. WO87/01190, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 18, 1986, Ser. No. 44,850
Claims priority, application Sweden, Aug. 19, 1985, 8503860
Int. Cl.[4] F41G *3/06, 5/08*
U.S. Cl. 89—41.22 8 Claims



1. A ranging unit for a gun such as an anti-aircraft gun that is normally fired at moving targets and comprises a barrel with a barrel axis an aiming unit which is mounted on the barrel for angular adjusting motion relative to it and which defines an aiming axis that a gunner manually maintains aligned on a target during a period terminating at an instant of firing to thus aim the barrel, and servo means reacting between the barrel and the aiming unit and responsive to outputs from a calculating device for angularly adjusting said aiming axis relative to said barrel axis in accordance with lead and offset angles needed for an projectile fired from the gun to hit the target, said ranging unit comprising:

A. An elongated frame having

(1) a front end portion,

(2) an opposite rear end portion,

(3) a pair of laterally spaced apart side members between said portions, and

(4) yoke means on said side members engageable with shoulders of an operator by whom the frame is supported and whose turning swings the frame about a vertical axis, said yoke means providing for tilting of the frame about a horizontal azis transverse to its length;

B. optical means on the front portion of said frame through which an operator supporting the frame can view a target and which defines a sighting axis that is fixed on the frame to be maintained aligned on a target by the operator's turning and by manual tilting of the frame about said horizontal axis;

C. a laser ranging device fixed on said front portion of the frame and connected with said calculating device, said laser ranging device being arranged

(1) to emit and receive laser beam radiations along a laser axis substantially coinciding with said sighting axis and

(2) to produce range outputs which correspond to distances from the sighting unit to a target aligned with said sighting axis and which are delivered to said calculating device as inputs for the latter;

D. azimuth determination means mounted on said frame and connected with said calculating device, said azimuth determination means being arranged

(1) to detect a function of swinging of said frame about said vertical axis and

(2) to produce azimuth outputs corresponding to that function which are delivered to said calculating device as inputs thereto; and

E. elevation determination means mounted on said frame and connected with said calculating device, said elevation determination means being arranged

(1) to detect a function of tilting of said frame about said horizontal axis and

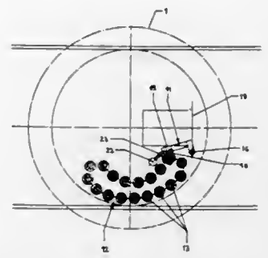
(2) to produce elevation outputs corresponding to that function which are delivered to said calculating device as inputs thereto.

4,823,675

APPARATUS FOR LOADING GUNS, PARTICULARLY TANK HOWITZERS

August Schiele, and Gert Kaustrüter, both of Augsburg, Fed. Rep. of Germany, assignors to Kuka Wehrtechnik GmbH, Augsburg, Fed. Rep. of Germany

Filed Aug. 10, 1987, Ser. No. 83,289
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1986, 3627042
Int. Cl.[4] F41F *9/04, 9/10*
U.S. Cl. 89—46 9 Claims



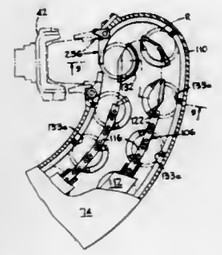
1. An apparatus for loading howitzers having a gun barrel, the apparatus comprising a rotary magazine containing a plurality of shells and positioned below and alongside the gun barrel which comprises a gun chamber receiving one of said plurality of shells, wherein a substantially vertically positioned loading arm having a gripper for one of such plurality of shells is supported at a vertical axis and is pivotable about said vertical axis between a reception position at the rotary magazine for receiving one of said plurality of shells and a position below and in front of the chamber of the gun, said loading arm is pivotable about an approximately horizontal axis along a pivot-pin at right angles to a core axis of the gun barrel and is pivotable from said position below and in front of the chamber of the gun into a loading position in which the shell in the gripper is aligned with the core axis of the gun barrel, and wherein a rammer is fitted to the loading arm for transporting the shell from the loading position into the chamber of the gun.

4,823,676

AUTOLOADER FOR MILITARY VEHICLE

Roger H. Wiethoff, Minnetonka, and Gary J. Nelson, Buffalo, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Division of Ser. No. 784,921, Oct. 4, 1985, Pat. No. 4,700,609.
This application May 7, 1987, Ser. No. 46,749
Int. Cl.[4] F41F *9/02, 9/10*
U.S. Cl. 89—46 15 Claims



1. An autoloading apparatus for loading and unloading cartridges having cases into or out of a gun having a breech block and mounted for pivotal movement about a substantially horizontal axis, comprising:

locking means for selectively locking the gun in a predetermined position and unlocking the gun for pivotal movement about said horizontal axis;

magazine conveying means for supporting a plurality of cartridges and having a load-unload station;

load tray means for pivotal movement between a substantially vertical position and a substantially horizontal position in alignment with the gun when locked;

cartridge clamp means on said load tray means for movement between a cartridge clamping position and an open cartridge guiding position;

rammer and extensible empty tray case eject means for ramming a cartridge on said load tray means into said gun and after firing to eject the empty cartridge case from said auto loading apparatus;

power means for operating said gun locking means, said magazine conveying means, said load tray means, said cartridge clamp means and said rammer and extensible empty tray case and eject means;

automated control means for sequentially locking the gun in said predetermined position, driving said magazine conveying means to position a selected cartridge at said load-unload station, translating said load tray means into said load-unload station, moving said cartridge clamp means into gripping engagement with said selected cartridge, moving said load tray means and selected cartridge into alignment with the gun, moving the rammer for ramming the cartridge into the gun to be fired, closing the breech block, and unlocking said locking means for releasing the gun to be aimed and fired;

said load tray means including a rear restraint damper; said magazine conveying means being supported for movement within a magazine housing having a load-unload station therein, a magazine gate assembly having restraining arms movable between a closed and an open position in said load-unload station;

wherein when a cartridge in the gun is to be returned unfired to said magazine housing; said automatic control means opening said restraining arms and opening said cartridge clamp means while raising said load tray means into said substantially horizontal position in alignment with said gun, opening the breech block which propels the cartridge out of the gun onto said load tray means and against said rear restraint damper, closing said cartridge clamping means for gripping the cartridge, lowering said load tray

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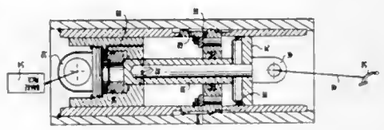
means and clamped cartridge to said substantially vertical position, translating said load tray means and cartridge into said load-unload station, closing said restraining arms, opening said cartridge clamp mean to release the cartridge onto said magazine conveying means, and returning said load tray means out of said load-unload port of said magazine housing.

4,823,677

BRAKE POWER ASSIST SERVOMOTOR

Thomas G. Ore, Portage, Mich., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 19, 1988, Ser. No. 144,902
Int. Cl.[4] F15B 9/10, 11/15
U.S. Cl. 91—49 17 Claims



1. A brake power assist unit comprising, in combination:
A. a cylindrical casing;
B. a manually actuatable first piston slidingly received in one end of said casing;
C. a second piston slidingly received in the other end of said casing, said second piston including means for mechanical connection to a brake actuator;
D. a barrier plate fixedly mounted within said casing to define with said first piston a hydraulic fluid reservoir and to define with said second piston a power chamber, said barrier plate including a central opening and at least one passage connecting said reservoir and chamber in fluid communication;
E. a piston rod affixed to said first piston and extending slidingly through said barrier plate opening to a terminal portion disposed in brake actuating relation with said second piston;
F. inlet means for continuously introducing hydraulic fluid under pressure to said reservoir;
G. a check valve positioned to permit unidirection flow of hydraulic fluid through said barrier plate passage from said reservoir to said chamber;
H. first valve means for selectively venting hydraulic fluid from said chamber; and
I. second valve means for selectively pressurizing hydraulic fluid in said chamber from said inlet means;
J. whereby, upon manual actuation of said first piston causing said piston rod to exert a mechanical brake actuating force on said second piston, said reservoir fluid volume is decreased to force hydraulic fluid through said barrier plate passage into said chamber, said first valve means closes, and said second valve means opens to pressurize said chamber, thus to exert an assisting hydrostatic brake actuating force on said second piston.

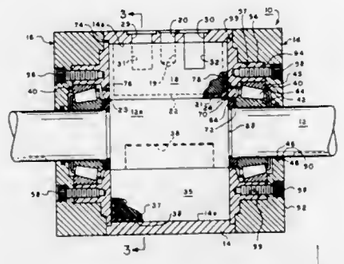
4,823,678

ROTARY ACTUATOR

Phillip A. Sollami, 1300 E. Pine, Herrin, Ill. 62948

Filed Oct. 26, 1987, Ser. No. 112,296
Int. Cl.[4] F01C 9/00
U.S. Cl. 92—125 5 Claims

1. In a fluid operated oscillatory rotary device of the type including a body having a cylindrical bore therein, first and second head assemblies fixedly mounted to said body over the respective ends of said bore to define a generally cylindrical operating chamber in said bore between said first and second head assemblies first and second annular bearings respectively mounted in said head assemblies, a shaft journaled in said annular thrust bearings, a stator affixed to said body and extending radially into said bore, a vane affixed to said shaft and extending radially from said shaft, first sealing means carried by said stator and sealing said stator to said head assemblies and to said shaft, and second sealing means carried by said vane and sealing said vane to said head assemblies and to the cylindrical wall of said bore, the improvement residing in at least one of said head assemblies and comprising in combination
a head member having a central bore and a counterbore through which said shaft extends,
an annular end plate disposed in said counterbore and having an annular peripheral portion compressed between said head member and said body,



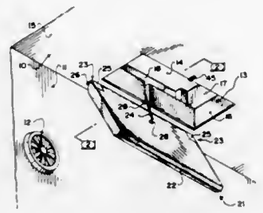
said end plate having a planar annular surface in sealing engagement with said first and second sealing means and further having an annular flange defining a cylindrical cavity in which said first annular thrust bearing is disposed,
means fixedly securing said end plate to said head member, annular resilient sealing means surrounding said shaft and sealing said shaft to said end plate to prevent the flow of fluid in said cavity from one side of said vane to the other, and
a passageway through said end plate for carrying fluid from said operating chamber to the side of said resilient sealing means remote from said operating chamber.

4,823,679

BUILDING VENTILATION SYSTEM WITH AIR INLET FLAP CONTROL

R. Ralph Robbins, 62 Thatcher Drive, Winnipeg, Manitoba, Canada R3T 2L3

Filed Apr. 29, 1988, Ser. No. 188,534
Int. Cl.[4] F24F 7/007
U.S. Cl. 98—33.1 30 Claims



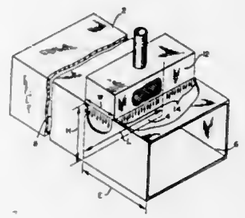
1. In a building having walls and a substantially horizontal ceiling defining a substantially closed interior area of the building, an air ventilation system comprising air extraction means for withdrawing air from the area, and an air inlet means separate from the air extraction means for allowing air into the area to replace air withdrawn therefrom, the air inlet means comprising an opening formed in the ceiling through which air can pass, a flap member, hinge means of said flap member being mounted directly on the ceiling for pivotal movement of the flap member about an axis along one side of the opening such that the flap member can move from a closed position covering the opening and preventing air movement therethrough to an open position in which the flap member extends from the axis downwardly to allow air to pass through the opening, and spring means biasing the flap member to a closed position.

4,823,680

WIDE LAMINAR FLUID DOORS

Mark S. Nowotarski, Ossining, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 7, 1987, Ser. No. 129,748
Int. Cl.[4] F24F 9/00
U.S. Cl. 98—36 46 Claims



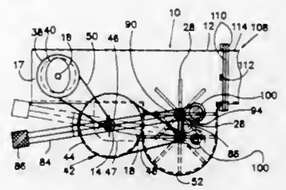
1. A method of protecting at least a portion of a contained space from the incursion of external fluids through at least one opening to said contained space, said method comprising: causing at least one chosen fluid to flow, in laminar form, in proximity to or directly across at least a portion of at least one opening to said contained space, wherein the thickness or depth of said at least one chosen fluid layer at the source of origin of said fluid layer is at least about 0.05 times the distance across said opening in the principal direction of flow of said fluid layer at the source of origin of said fluid layer, wherein the width, transverse the direction of fluid flow of said laminar fluid flow at its source of origin is at least about as great as the maximum width, transverse the direction of fluid flow, of said portion of said opening, and wherein said at least one chosen fluid flow has a Force Number ranging from about 0.05 to about 50.0.

4,823,681

GAS DUCT OUTLET

David R. Gore, 3044 S. Akron St., Denver, Colo. 80231

Continuation-in-part of Ser. No. 93,536, Sep. 4, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 176,351
Int. Cl.[4] F24F 13/14
U.S. Cl. 98—40.3 11 Claims



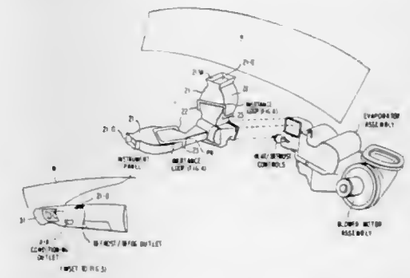
1. An outlet for a gas duct to regulate the direction of gas flow out of said duct comprising in combination:
housing means having a gas flow passage therethrough and including an enclosed recession that is not in said gas flow passage,
deflector vanes for directing the gas flow out of said outlet, said deflector vanes being mounted in said housing means for selected continuous movement whereby the direction of gas flow out of said outlet can be continuously changed by said deflector vanes,
drive means operatively connected to said deflector vanes to continuously change the position thereof, said drive means being positionable at least partially in the gas flow passage whereby said drive means are in fact drivable by said flow of gas, and
positioning means carrying said drive means, said positioning means being adapted to move the drive means between a position in the gas flow passage and a position in the enclosed recession.

4,823,682

VEHICLE WINDSHIELD DEFROST APPARATUS WITH REDUCED DASHBOARD SPACE REQUIREMENTS

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Columbia, Md.

Filed Aug. 12, 1983, Ser. No. 522,884
Int. Cl.[4] B60H 1/00
U.S. Cl. 98—2.09 4 Claims



1. In a vehicle defrost system, including a fluidic oscillator in the dashboard of said vehicle for sweeping a jet of defrost air across the interior surfaces of a vehicle windshield, said vehicle having a longitudinal axis, the improvement wherein said fluidic oscillator has a power nozzle and an interaction chamber defined by a pair of sidewalls which first diverge from said power nozzle and then converge to an outlet opening defined by said pair of sidewalls converging towards each other and being longer in a direction parallel to said longitudinal axis than in a direction transverse to said longitudinal axis, and the pivot for the sweeping of said jet is within said oscillator and proximate said outlet opening to thereby reduce the amount of open space of said outlet extending transverse of the longitudinal axis on said dashboard for issuing defrost air upon said windshield.

4,823,683

POPCORN POPPER

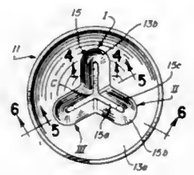
Edward H. Meisner, Short Hills, N.J., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Feb. 9, 1988, Ser. No. 154,082
Int. Cl.[4] A23L 1/18
U.S. Cl. 99—323.5 5 Claims

1. A popcorn popper for use in a microwave oven, comprising a receptacle of a relatively stiff material transparent to microwave energy, said receptacle including a bottom section and an integral upstanding wall section; and means overlying an upper end portion of the receptacle for retaining popped and unpopped popcorn kernels within the receptacle when the latter is exposed to microwave energy; said receptacle bottom section having a downwardly and inwardly tapered interior first surface area connected to a lower portion of the wall

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section and an interior second surface area integral with said first surface area and spaced inwardly from said wall section, said second surface area being provided with trough-like



means having a substantially uniform width and length greater than width for initially accommodating a predetermined volume of unpopped kernels and arranging same in at least one elongated relatively narrow strip-like formation.

4,823,684

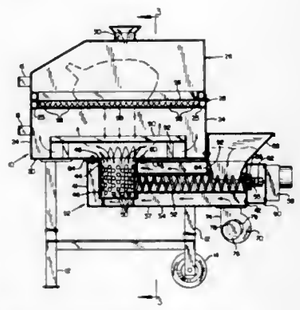
PELLET-FIRED BARBECUE

Joseph P. Traeger, 250 S. Oak St.; Randolph J. Traeger, 530 Alder St., and Mark A. Traeger, 540 Leo St., all of Mt. Angel, Oreg. 97362

Filed Oct. 19, 1987, Ser. No. 110,457

Int. Cl.[4] A47J *37/07*

U.S. Cl. 99—447 **5 Claims**



1. A pellet-fired barbecue comprising:
a pan with bottom and sides and open at the top,
a fire pot having sides and an open top mounted adjacent the bottom of the pan with the sides of the pot joining with the bottom of the pan and with the open top of the fire pot communicating with the interior of the pan,
auger means for supplying pellet fuel to the fire pot, said auger means comprising an auger tube mounted beneath said pan with an end of the tube connected with a side of said pot and a rotatable auger disposed within said auger tube,
food-support means for supporting food to be cooked disposed above the fire pot and adjacent the top of said pan and,
means for admitting air into the fire pot to support combustion comprising perforations in the sides of the pot spaced from where said tube is connected with a side of said pot, said air being channeled by said pot upwardly into the interior of said pan.

4,823,685

APPARATUS FOR PREPARING HOT DRINKS

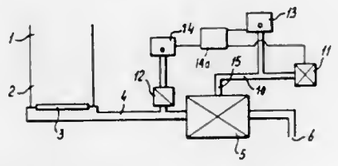
Peter M. Boumans, De Bongerd 7, 6151 Br Munstergeleen, and Hendrik J. J. Sobczak, Achter de Kerk 7, 6365 Schinnen, both of Netherlands

Continuation-in-part of Ser. No. 948,342, filed as PCT EP86/00193 on Mar. 28, 1986, published as WO86/05670 on Oct. 9, 1986. This application May 14, 1987, Ser. No. 49,428

Claims priority, application Netherlands, Mar. 28, 1985, 8500925

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—287 **8 Claims**



1. An apparatus for preparing hot drinks from a beverage material and a liquid comprising:
a container for receiving the material and the liquid,
a filter positioned so that the brewed hot liquid from said container can pass therethrough,
a discharge conduit positioned generally below said filter and having a discharge outlet,
a forcing means for forcing a continuous steady flow of gas into said discharge conduit up through said filter and into said container to agitate the material and liquid therein,
said forcing means being connected to said discharge conduit at a connection point,
a controlling means for adjustably controlling the operation time of said forcing means, and
a control valving positioned between said discharge outlet and said connection point.

4,823,686

BALE WRAPPING DEVICE

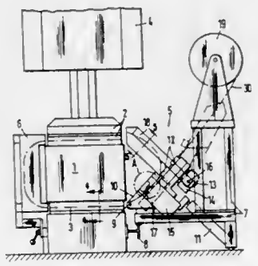
Gerold Fleissner, Chur, Switzerland, assignor to VEPA Aktiengesellschaft, Riehen/Basel, Switzerland

Division of Ser. No. 786,549, Oct. 11, 1985, Pat. No. 4,665,815. This application Dec. 8, 1986, Ser. No. 938,968

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3437884

Int. Cl.[4] B65B *13/04*

U.S. Cl. 100—26 **8 Claims**



1. An apparatus for wrapping a bale of fibers with a metal wire which comprises a supply coil on which the metal wire is wound; a wrapping device arranged laterally of the bale, said wrapping device including means for withdrawing the metal wire from the supply coil and for causing the wire to loop around the bale, means for fixing an advanced free end of wire after the wire has looped around the bale and means for tightening the wire around the bale; a metal tube feeding means for supplying a metal tube for joining the advance free wire end to a portion of the wire being fed from the supply coil; and a crimper means for crimping the advanced wire end and the portion of said wire within said metal tube to form a seal; said metal tube feeding means comprising a movable holder device for positioning a metal tube in an operative position along a path of movement of the wire so that the advance free wire end fed from the supply coil passes through the metal tube before the wire is looped around the ball, said movable holder device transferring said metal tube from a magazine to the operative position; a guide duct for guiding the advanced free wire end after looping around the bale again into and through the metal tube; said wrapping means including means for fixing a section of the free wire end in or at the metal tube; and a cutting device for severing the wire fed from the supply coil after formation of the seal by said crimper means.

4,823,687

DIE-HEIGHT ADJUSTING DEVICE OF MECHANICAL PRESS

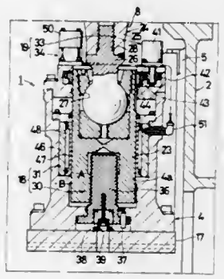
Keitaro Yonezawa, Amagasakishi, and Yoshimitsu Tsutsui, Hatanoshi, both of Japan, assignors to Kabushiki Kaisha Kosmek and Amada Company, Limited, Japan

Filed Dec. 4, 1987, Ser. No. 129,757

Claims priority, application Japan, Dec. 4, 1986, 61-289814; Dec. 4, 1986, 61-289815

Int. Cl.[4] B30B *1/06*

U.S. Cl. 100—53 **12 Claims**



1. A die-height adjusting device for a mechanical press said press having a slide and a prime mover therefor and a slide actuator coupled between the slide and the prime mover, said device mounted at least in part within said slide and gearable to extend or contract said slide comprising:
means for extending and contracting said slide and clamp means carried by said slide; first actuator means coupled to said means for extending and contracting and second actuator means coupled to said clamp means, said means for extending and contracting including a driving member coupled to said first actuator and a driven member coupled to said driving member, said clamp means clamping said driven member to said driving member to prevent loose movement therebetween in response to actuation thereof by said second actuator.

4,823,688

CALENDERING APPARATUS USING INDUCTIVE HEATING FOR HOT-CALENDERING A PAPER WEB

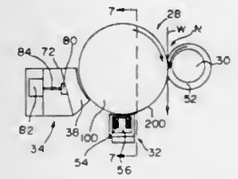
Gregory L. Wedel, Beloit, Wis., and J. Larry Chance, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 10, 1987, Ser. No. 84,714

Int. Cl.[4] B30B *15/34, 3/04*

U.S. Cl. 100—93 RP **13 Claims**

1. A calendering apparatus for hot calendering a paper web, said apparatus comprising:
a rotatable calendering roll defining a smooth calendering surface;
a backing roll rotatably cooperating with said calendering roll for defining therebetween a calendering nip for the passage therethrough of the web;
induction heating means disposed in close proximity to said calendering surface for inducing eddy currents within said calendering roll such that said calendering roll is uniformly heated in a cross-machine direction;
air blowing means disposed in close proximity to said calendering surface and downstream relative to said heating means, said blowing means defining a plurality of compartments disposed in a cross-machine direction, each of said compartments selectively blowing a current of cooling air against said calendering surface for controlling the temperature of said calendering surface such that the average temperature at said nip is lower than the temperature of said calendar surface during passage of said surface part said heating means so that the temperature of said adjacent to said nip is controlled in a cross-machine surface direction;



said calendering roll further including;
a core;
an annular insulating layer surrounding said core; and
a heatable annular shell surrounding said insulating layer, said shell defining said calendering surface.

4,823,689

ELASTIC ROLLER WITH INTERNAL OPENINGS FOR USE WITH IMAGE FORMING APPARATUS

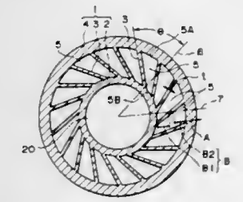
Kazuo Kishino, Kawasaki; Takao Tanaka, Yamato; Michio Shigenobu, Tokyo; Hiromitsu Hirabayashi, Yokohama; Takashi Hibi, Kodaira, and Kensaku Kasaka, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1987, Ser. No. 26,975

Claims priority, application Japan, Mar. 18, 1986, 61-058297; Mar. 18, 1986, 61-058299; Mar. 18, 1986, 61-058300; Apr. 21, 1986, 61-090152; Apr. 21, 1986, 61-090153; Apr. 21, 1986, 61-090154; Apr. 21, 1986, 61-090155; Apr. 21, 1986, 61-090156; Apr. 21, 1986, 61-058776[U]

Int. Cl.[4] B30B *3/00, 3/04*

U.S. Cl. 100—155 R **42 Claims**



1. An elastic rotatable member, comprising:
a base member; and
an elastic rubber-like layer on said base member, said elastic layer defining a plurality of openings extending continu-

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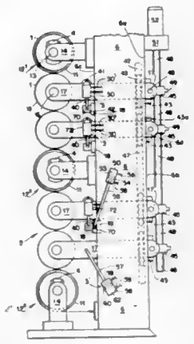
ously in a longitudinal direction from adjacent one longitudinal end of the elastic rotatable member to adjacent the other end, wherein the openings are arranged such that any radial line in a cross-section of the elastic rotatable member in a direction substantially perpendicular to the longitudinal direction, crosses at least two of such openings.

4,823,690

ROLL CALENDER WITH NIP RELIEVING DEVICES

Wolf-Gunter Stotz, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Apr. 15, 1988, Ser. No. 182,086
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1987, 3713561
Int. Cl.[4] B30B *3/04*
U.S. Cl. 100—163 A 12 Claims



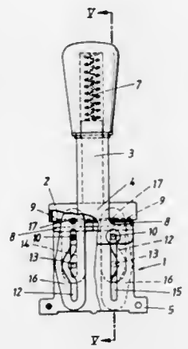
12. A roll calender, comprising:
a roll stand;
at least one roll defining an intermediate roll;
said intermediate roll having an axle;
a lever provided for the axle of said intermediate roll;
pivot means provided at said roll stand for said lever;
said axle being supported by said lever;
said lever being substantially vertically pivotably suspended by said pivot means at said roll stand;
a nip relieving device for selectively controlling the position of said lever;
means for supporting said nip relieving device at the roll stand;
a bearing element provided for said lever and provided with said pivot means;
means for substantially vertically adjustably displacing the bearing element at said roll stand; and
said bearing element being substantially vertically adjustable such that upon changing the position of said intermediate roll said lever can be set in a substantially horizontal position by accomplishing a predeterminate displacement of the bearing element and in which substantially horizontal position said axle of said intermediate roll and said pivot means of said lever lie in a substantially horizontal plane.

4,823,691

SELF-INKING STAMP FOR PERFORMING AN INKING UPSTROKE

Klaus Müller, Österreich, Austria, assignor to Walter Just Gesellschaft m.b.H., Wels, Australia

Filed Mar. 11, 1988, Ser. No. 166,686
Claims priority, application Austria, Mar. 25, 1987, A716/87
Int. Cl.[4] B41J *27/00*
U.S. Cl. 101—104 4 Claims



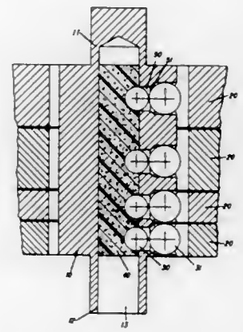
1. A self-inking stamp comprising
(a) a single base part having two end walls and a bottom surface adapted to be placed on a surface to be stamped,
(b) an ink pad contained in said base part and spaced above said bottom surface,
(c) an actuating member having (2) two end legs guided by respective ones of said end walls, the actuating member being displaceable in a predetermined direction toward and away from said bottom surface,
(d) spring means opposing the displacement of said actuating member toward said bottom surface,
(e) a stamp insert means mounted in each of said end legs and in said base part between said ink pad and said bottom surface, the stamp insert means including
(1) two insert members,
(2) a respective printing plate part carried by each insert member,
(3) a respective pivot carried by each insert member, and
(4) a pair of longitudinal tracks formed at opposite sides of each insert member adjacent the end walls,
(f) two pairs of cam slots, one pair associated with each insert member said pairs of cam slots being carried by said end walls, and cooperating with the pivot of the associated insert member, and
(g) two pairs of guide pins, one pair associated with each insert member said pairs of guide pins being carried by said end walls, and cooperating with the longitudinal tracks formed in the associated insert member,
(1) the longitudinal tracks, the pivots, the cam slots and the guide pins constituting camming means arranged to reciprocate the insert members jointly and at the same time between said ink pad and said bottom surface while inverting the insert members about the respective pivots thereof.

4,823,692

ARRESTING SUPPORT FOR TYPE WHEELS

Helmut Munch, Hattersheim, Fed. Rep. of Germany, assignor to Francotyp-Postalia GmbH, Berlin, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,710
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711009
Int. Cl.[4] B41J *1/60*
U.S. Cl. 101—110 5 Claims



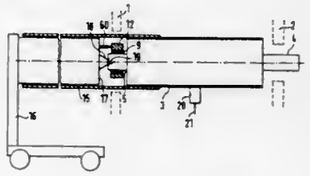
1. Arresting support for type wheels of printing mechanisms in franking and postage machines and in portable postage and numbering devices, comprising a bearing shaft having pins disposed thereon, said bearing shaft having a blind bore formed therein extended in axial direction of said pins, an elastic insert disposed in said blind bore, said bearing shaft having a given number of stepped bores formed therein extending perpendicularly to the axial direction of said bearing shaft, two resilient arresting spheres of different diameter disposed in each respective stepped bore, and said given number of type wheels disposed next to each other on said bearing shaft, said spheres resting in cup-shaped indentations formed in said type wheels, said type wheels being retained in a selected position by said resilient arresting spheres, and said type wheels being adjusted against pressure provided by said resilient arresting spheres.

4,823,693

PRINTING CYLINDER SLEEVE APPLICATION APPARATUS AND METHOD

Ingo Köbler, Anhausen, Fed. Rep. of Germany, assignor to Man - Roland Druckmaschinen AG, Augsburg, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,089
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702889
Int. Cl.[4] B41F *27/00*
U.S. Cl. 101—218 18 Claims



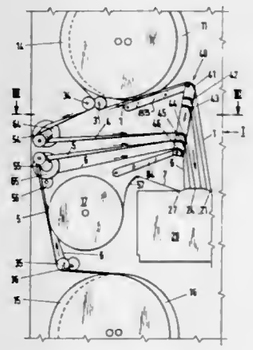
1. In combination wit a printing machine,
a printing cylinder sleeve application apparatus (16) to apply a cover sleeve (15) on a printing cylinder (3,22, 23) retained by stub shafts in bearing means in the printing machine without disassembly of the cylinder from the printing machine;
wherein the printing machine includes tow sidewalls (1, 2);
said bearing means (8, 9; 46,49; 52, 55) rotatably retaining the printing cylinder (3, 22, 23) in the machine;
adjustable positioning means (33) surrounding said bearing means and adjustably retaining said bearing means in said sidewalls of the machine to control the position of the printing cylinder in the machine;
means (13, 14; 27, 28) releasably securing the adjustable positioning means in the sidewalls of the machine, and
wherein at least one of the sidewalls of the machine is formed with an opening (7) in alignment with the printing cylinder,
said sleeve application apparatus (16, 17) comprising means for carrying said sleeve (15) for application of said sleeve over the printing machine cylinder, and means for supporting the cylinder on the side adjacent said opening (7), after release of the adjustable positioning means from the sidewall of the machine,
and means (57, 35, 36, 60) for maintaining and locking the relative position of the adjustable positioning means (12, 33), with respect to a predetermined reference position after release of the adjustable positioning means from the at least one sidewall of the machine and during application of said sleeve on the cylinder for maintaining the relative adjusted position of said cylinder in the machine after application of said sleeve and after re-securing the adjustable positioning means in the at least one sidewall while maintaining said bearing means and eccentric means in place on the cylinder ends said bearing means and adjustable positioning means remaining on said printing cylinder stub shafts during said sleeve application.

4,823,694

DEVICE FOR FEEDING SEVERAL PAPER WEBS TO A PRINTER

Fritz Siegenthaler, Trub, Switzerland, assignor to Autelca AG., Gümligen, Switzerland

Filed Jul. 22, 1988, Ser. No. 223,096
Claims priority, application Switzerland, Sep. 28, 1987, 03713/87
Int. Cl.[4] B41F *13/56*
U.S. Cl. 101—227 7 Claims

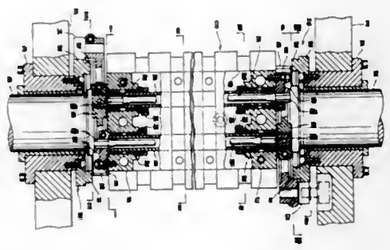


1. Device for feeding the paper webs (1-7) of several storage reels (11-17) to paper feed slots (21-27), arranged in parallel side-by-side, of a printer (20), wherein respectively one of the introduced paper webs is conveyed to a printing station, imprinted, the printed section of paper web is cut off and issued, characterized in that at least one (12-15) of the storage reels (11-17) is arranged to be laterally offset with respect to the paper feed slots (21-27); and that the paper web (2-5) thereof

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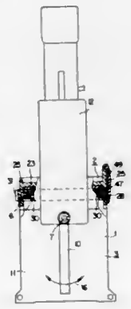
is rerouted at at least one rerouting member (52/62, 53/63, 54/64, 55/65, 42–45) on a rerouting path extending along part of a helical winding.

4,823,695
SHEET TURN-OVER APPARATUS FOR SHEET-FED ROTARY PRINTING PRESS
Kenji Kida, Ibaraki, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan
Filed Nov. 12, 1987, Ser. No. 119,735
Claims priority, application Japan, May 20, 1986, 61-113688
Int. Cl.[4] B41F 5/02
U.S. Cl. 101—230 5 Claims



1. A sheet turn-over apparatus for a sheet-fed rotary printing press including a turn-over cylinder provided with first gripper units for receiving a sheet from grippers of an upstream cylinder and gripping a trailing edge of the sheet and second gripper units for gripping the trailing edge of the sheet released and turned over from said first gripper units and causing grippers of a downstream cylinder to grip the trailing edge of the sheet, said first and second gripper units being adjacent to each other on an outer surface of said turn-over cylinder, comprising:
right and left frames;
a turn-over cam for said second gripper units, and first and second opening/closing cams for said first gripper units, all of which are fixed to one of said frames;
a turn-over cam for said first gripper units and third and fourth opening/closing cams for said second gripper units, all of which are fixed to the other frame;
first and second hollow cam lever shafts having different circumferential phases;
a first cam lever fixed to one end of said first hollow cam lever shaft and a second cam lever fixed to the other end of said second hollow cam lever shaft, said first cam lever being provided with a segment gear at one end thereof and a first cam follower at the other end thereof, said second cam lever being provided with a segment gear at one end thereof and a second cam follower at the other end thereof, said first cam follower being in contact with said turn-over cam for said second gripper units, and said second cam follower being in contact with said turn-over cam for said first gripper units;
a first gripper pad shaft for said first gripper units and a second gripper pad shaft for said second gripper units, said first and second gripper pad shafts extending in an axial direction of said turn-over cylinder;
a first gripper shaft for said first gripper units and a second gripper shaft for said second gripper units, said first and second gripper shafts being hollow, adjacent to said first and second gripper pad shafts, respectively, and extending along the axial direction of said turn-over cylinder;
a third cam lever fixed to one end of said first gripper pad shaft and a fourth cam lever fixed to the other end of said second gripper pad shaft, said third and fourth cam levers being provided with third and fourth cam followers, respectively, said third cam follower being in contact with said third and fourth opening/closing cams, and said fourth cam follower being in contact with said first and second opening/closing cams;
first to fourth torsion bars extending through said first and second cam lever shafts and said first and second gripper shafts, respectively, one end of each of said first to fourth torsion bars being fixed to a corresponding one of said first and second cam lever shafts and said first and second gripper shafts, said first and second torsion bars being coupled to said first and second cam levers at the other end and one end of said first and second cam lever shafts, respectively, and said third and fourth torsion bars being coupled to said third and fourth cam levers, respectively, said first and second cam lever shafts being coupled to said first and second gripper pad shafts and said first and second gripper shafts through a gear mechanism.

4,823,696
HAND STAMP WITH SELF-INKING DEVICE
Karl Skopek, Dr. Franz Arming Strasse 5, A-4600 Wels, Austria
PCT No. PCT/AT87/00006, § 371 Date Oct. 23, 1987, § 102(e) Date Oct. 23, 1987, PCT Pub. No. WO87/04980, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 13, 1987, Ser. No. 124,853
Claims priority, application Austria, Feb. 13, 1987, 476/86
Int. Cl.[4] B41K 1/40
U.S. Cl. 101—334 6 Claims



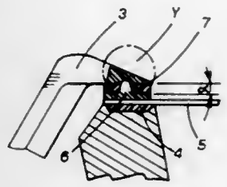
1. A hand stamp comprising, in combination,
(a) a housing comprising a metal frame part which includes
(1) a top wall and
(2) two side walls extending downwardly from the top wall and forming a U-shaped yoke jointly with the top wall,
(b) printing types and an inversion mechanism arranged in the housing for moving the printing types about a pivot between an upwardly pointing inking position and a downwardly pointing printing position,
(c) an ink carrier slidably inserted in the housing like a drawer adjacent the upwardly pointing inking position of the printing types,
(d) an integral guide element body of plastic material carried by the metal frame part adjacent the top wall thereof, the plastic guide element body including
(1) two longitudinal edge strips each spinning between the two side walls of the metal frame part and extending parallel to the pivot of the printing types, at least one of the edge strips defining an opening through which the ink carrier is slidably inserted
(2) a bridge interconnecting the two longitudinal edge strips across the metal frame part whereby the ink carrier may be pushed through said opening between the two longitudinal edge strips and may be guided therealong like a drawer, and
(3) a sleeve projecting upwardly from the bridge centrally intermediate the side walls,

(e) a U-shaped actuating yoke extending across the housing for moving the printing types between said positions, the actuating yoke including
(1) respective legs slidably supported on the side walls,
(f) a spiral spring having a lower end guided in the upwardly projecting sleeve of the guide element body and upwardly biasing the actuating yoke into a position wherein the printing types are in contact with the ink carrier, and
(g) a downwardly projecting socket with a handle connected thereto, the upwardly projecting sleeve being slidably guided in the downwardly projecting socket and the socket receiving an upper end of the spiral spring whereby manual depression of the handle against the spring bias will move the printing types into the printing position.

4,823,697
MAGNETIC PLATE CYLINDER
Vincent Z. Randazzo, Rochester, N.H., assignor to AM International Incorporated, Chicago, Ill.
Filed Feb. 25, 1988, Ser. No. 160,343
Int. Cl.[4] B41F 27/02
U.S. Cl. 101—375 7 Claims

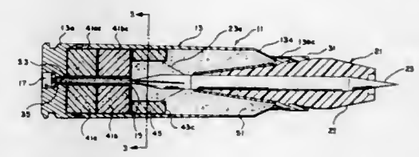
1. An apparatus comprising:
a printing plate cylinder;
a magnetic printing plate to be secured to said printing plate cylinder;
permanent magnet means disposed within the printing plate cylinder for providing a magnetic field in the magnetic printing plate, the action of the magnetic field between the magnetic printing plate and said permanent magnet means securing the magnetic printing plate to the printing plate cylinder; and
shorting means disposed on the printing plate cylinder and movalbe relative thereto for terminating action of the magnetic field between the magnetic printing plate and said permanent magnet means, said shorting means being made from highly permeable magnetic material and including an elongate member having opposite axial end portions and a central portion connecting said axial end portions, said elongated member being supported by said opposite axial end portions on the printing plate cylinder for rotation about an axis parallel to and spaced from the longitudinal central axis of the printing plate cylinder;
said elongate member haaving a first position in which said central portion of said elongate member is isolated from said permanent magnet means and magnetic lines of flux of the magnetic field pass through a first reluctance path in the magnetic printing plate and a second position in which said central portion of said elongate member engages said permanent magnet means and the magnetic lines of flux of the magnetic field pass through a second reluctance path in said central portion extending parallel to said first reluctance path in the magnetic printing plate whereby the magnetic field in the magnetic printing plate is shorted and the magnetic printing plate can be removed from the printing plate cylinder.

4,823,698
SHEET GRIPPER ASSEMBLY FOR A SHEET-FED ROTARY PRINTING PRESS
Manfred Ruger, Hessenstamm, and Valentin Gensheimer, Muhlheim/Main, both of Fed. Rep. of Germany, assignors to M.A.N. Roland Druckmaschinen, Fed. Rep. of Germany
Continuation of Ser. No. 892,781, Jul. 31, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 213,437
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1985, 3529599
Int. Cl.[4] B41F 1/30
U.S. Cl. 101—409 4 Claims



1. A sheet gripper assembly for a sheet-fed rotary printing press comprising
a sheet gripper support defining a first sheet retaining surface,
a gripper having a tip at one end thereof, said gripper being mounted for rotational movement relative to said support for moving said gripper tip between a retracted position and sheet gripping position in closely adjacent relation to said first sheet retaining surface,
a non-resilient pressure element mounted on said tip,
said non-resilient pressure element defining a second retaining surface that cooperates with said first retaining surface for engaging a sheet therebetween upon rotational movement of said gripper tip to said sheet gripping position,
a resilient intermediate layer element interposed between said gripper tip and said non-resilient pressure element, and
said non-resilient pressure element being formed with a protrusion disposed in adjacent relation to said gripper tip for creating a pivot point that permits limited relative movement of said non-resilient pressure element with respect to said gripper tip and the interposed resilient layer element so as to ensure parallel positioning of the retaining surface of said non-resilient pressure element with respect to the retaining surface of the gripper support upon engagement of a sheet therebetween.

4,823,699
BACK-ACTUATED FORWARD IGNITION AMMUNITION AND METHOD
Anthony L. Fariaacci, Baldwin, Md., assignor to AAI Corporation, Hunt Valley, Md.
Filed Apr. 14, 1987, Ser. No. 38,085
Int. Cl.[4] F42B 5/16
U.S. Cl. 102—443 15 Claims



1. A back-actuated forward ignition cartridge comprising a cartridge case having an open forward end,

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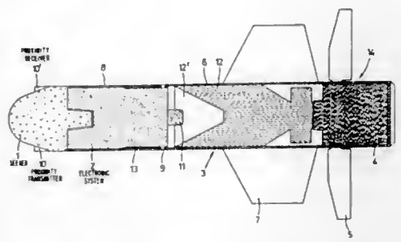
a fin-stabilized projectile having stabilizing fins on its rear end,
a puller sabot secured in said forward end of said case and carrying said projectile,
said puller sabot having a tapered rear end, and said stabilizing fins being disposed rearwardly of said sabot,
a compacted propellant formed as a solid mass disposed in the rear section of said case, rearward of said projectile,
loose propellant disposed about said tapered rear end of said puller sabot and said projectile fins and disposed forward of said compacted propellant solid mass,
primer means disposed in the rear end of said case,
and flame-guiding means connecting between said primer means and the forward section of said case and extending through said compacted propellant mass to enable ignition flame propagation from said primer means to the vicinity of said loose propellant to thereby enable primer-initiated ignition of said loose propellant prior to ignition of said compacted propellant.

4,823,700

MISSILE WITH REMOTE-CONTROLLED WARHEAD

Erich Alker; Walter Diesinger, both of Bergisch Gladbach, and Rainer Schöffl, Odenthal, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 723,155, Apr. 15, 1985. This application Oct. 16, 1987, Ser. No. 109,162
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 3414414
Int. Cl.[4] F42B *13/10*
U.S. Cl. 102—476 **17 Claims**



1. A missile, which comprises a missile case; a remote-controlled hollow charge warhead at the forward end of the case; at least one component arranged in front of the warhead for directing the missile to a target; and means for ejecting the at least one component arranged in front of the warhead in the flight direction upon closely approaching the target, before the warhead is detonated to obtain a piercing effect on said target.

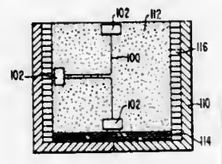
4,823,701

MULTI-POINT WARHEAD INITIATION SYSTEM

Earl E. Wilhelm, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 655,697, Sep. 28, 1984, abandoned. This application Apr. 27, 1987, Ser. No. 42,538
Int. Cl.[4] F42B *13/18*
U.S. Cl. 102—492 **4 Claims**

2. A multi-point explosive system for a warhead comprising:
a cast explosive;
a non-explosive stripline lead including a plurality of point detonators fixed to said lead at predetermined positions cast in said explosive in a manner to place said detonators at desired locations in said explosive and without a mechanical safe-arm device between said detonators and said explosive; and



means electrically connected to said detonators through said lead for independently actuating each said detonator.

4,823,702

SHOTGUN PROJECTILE

Robert Woolsey, 16 Chicory Way, Irvine, Calif. 92715

Filed Jun. 19, 1987, Ser. No. 63,964
Int. Cl.[4] F42B *13/21*
U.S. Cl. 102—502 **17 Claims**



1. A projectile for insertion into a shotgun muzzle extrinsic from its source of propulsion for shooting against a target such as an animal target which is designed to decrease damage to the target comprising:
a nose section having an outer wall of a material which is sufficiently deformable to allow deformation upon impact and sufficiently resilient to provide for maintenance of the characteristics of said nose section for aerodynamic flight;
a second section attached to said nose section which is attached to and trails behind said nose section upon firing formed as an elongated launching tube suitable for emplacement within a shotgun muzzle so that upon firing thereof it is discharged from the shotgun; and,
a friable material within said nose section outer wall formed in part of bonded pelletized materials that breaks upon impact and allows the nose section to expand to provide a greater surface area upon impact to impart the projectile force over a greater surface area.

4,823,703

ARMOR PENETRATING AND SELF-LUBRICATING PROJECTILE

Coleman D. Donaldson, Gloucester, Va., assignor to The Titan Corporation, San Diego, Calif.

Filed Aug. 11, 1987, Ser. No. 83,814
Int. Cl.[4] F42B *13/06*
U.S. Cl. 102—521 **10 Claims**



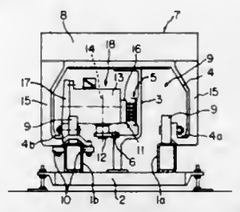
1. A projectile adapted to be launched from a gun barrel including a penetrator comprising a long cylindrical rod of high density metal, a penetrating sabot comprising a cylindrical tube of lower density than said penetrator surrounding said penetrator, a sabot engageable with said penetrating sabot to transmit axial thrust from the sabot to said penetrating sabot and said penetrator when the projectile is being launched from the gun barrel, said sabot being separable from said penetrating sabot and said penetrator during flight of the projectile, and at least one cavity within said penetrator and a lubricant filling said cavity, said lubricant having a higher density than the metal of said penetrator and a lower melting point than the material of the penetrated armor.

4,823,704

RAIL VEHICLE CONVEYING SYSTEM AND RAIL COVERS THEREFOR

Shigeyoshi Fujita, Suita; Tomoyuki Sasaki, Amagasaki; Kazuyoshi Fukuhara, Kashiwara, and Hiroshi Nishikawa, Osaka, all of Japan, assignors to Daifuku Co., Ltd., Osaka, Japan

Continuation of Ser. No. 730,276, May 3, 1985, abandoned. This application Aug. 14, 1987, Ser. No. 87,103
Claims priority, application Japan, Jun. 18, 1984, 59-126182; Nov. 19, 1984, 59-244283
Int. Cl.[4] B62D *1/26*; B63K *37/02*
U.S. Cl. 104—247 **8 Claims**



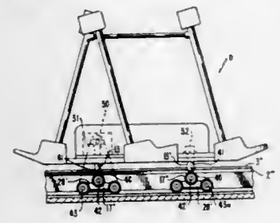
1. A conveying system comprising:
(a) a pair of spaced rails supported substantially on a floor face and fixedly secured to rail supports along a conveying route, with an upper face of each rail being substantially horizontal for mounting wheels thereon;
(b) a plurality of rail cover struts spaced apart from each other and positioned along said conveying route between said rails, with each of said rail covers struts supported by said rail supports and extending upwardly therefrom;
(c) a plurality of rail covers positioned above and outwardly spaced from said rails, said rail covers having a transverse dimension greater than the distance between said rails, said rail covers forming a continuous rail covering extending along the conveying route, with each of said rail covers having a middle portion attached to and supported by one or more of said rail cover struts and having a pair of lateral sides extending downwardly from said middle portion, and with said rails having a height less than a lower end of said lateral sides of said rail covers; and
(d) a cart travelling on said rails, said cart having a carrier bed located above said rail covers and including at least two brackets extending downwardly from said carrier bed along opposed sides thereof and outside of said lateral sides of said rail covers, with a lower end of each bracket having a wheel rotatably mounted thereto, with the lower end of each bracket extending beneath the lateral sides of said rail covers between the rail covers and the rails such that the brackets ride on the upper face of an associated rail by said wheels.

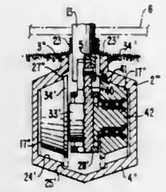
4,823,705

GOLF CART SYSTEM WITH EMBEDDED RAIL HAVING INCLINED SURFACES

Tomiichi Fukuda, 3-23-18, Denenchofu, Ota-ku, Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 756,693
Claims priority, application Japan, Jul. 26, 1984, 59-155915; Dec. 27, 1984, 59-275452; Mar. 8, 1985, 60-47007
Int. Cl.[4] B61B *13/10*; B61F *13/00*
U.S. Cl. 104—140 **13 Claims**





1. A golf car system comprising:
a longitudinal rail to be implanted in the terrain of a golf course and formed by a plurality of channel members;
each said channel member having a transverse cross section defined by spaced side walls joined at lower ends thereof by a bottom wall having an inner upper surface, said side walls having at upper ends thereof upper walls extending inwardly toward each other and having inner lower surfaces, said upper walls having spaced inner edges having extending upwardly therefrom mouth portions, and said inner edges and said mouth portions defining therebetween a longitudinal groove opening downwardly into the interior of said rail, said inner upper surface of said rail lower wall being formed by two inwardly and downwardly convergent inclined surfaces, and said inner lower surfaces of said rail upper walls comprising inwardly and upwardly convergent inclined surfaces, and said inclined surfaces of said bottom and upper walls as well as inner surfaces of said side walls defining within said channel member a longitudinal channel having a generally hexagonal transverse cross section;
a golf car to be moved along said rail;
support means mounted on said cart and extending downwardly therefrom through said longitudinal groove, said support means comprising at least one vertical shaft and a frame mounted on said vertical shaft;
at least two pairs of wheels mounted on said frame within said rail interior at positions forwardly and rearwardly with respect to said vertical shaft, each said pair including two wheels rollingly contacting respective said inner upper surfaces of said rail bottom wall;
means supported by said cart for rotating at least some of said wheels for thereby moving said cart along said rail; and

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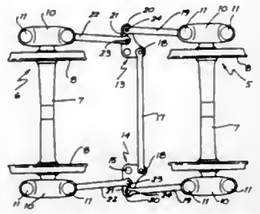
means for preventing said cart from falling sideways from said rail and comprising a pair of rollers supported by said frame between said two pairs of wheels and positioned within said rail interior, each of said rollers contacting a said inner lower surface of a respective said rail upper wall.

4,823,706

RAILWAY WAGON SUSPENSION SYSTEM

Brett S. McSweeney, Granville, Australia, assignor to The Ani Corporation Limited, New South Wales, Australia

Filed Nov. 9, 1987, Ser. No. 118,864
Claims priority, application Australia, Nov. 10, 1986, PH8878
Int. Cl.⁴ B61F *5/38*
U.S. Cl. 105—165 **7 Claims**



1. A suspension system for a railway wagon having at least two axle assemblies one of which is disposed forwardly of a center of a length of the wagon body and the other is disposed rearwardly thereof, each of said axle assemblies comprising a pair of wheelsets spaced longitudinally with respect to the wagon body so that one of said wheelsets is outboard and the other of said wheelsets is inboard with respect to said center of said body; each of said wheelsets including an axle, a pair of wheels and axle boxes on end portions of the axles; spring means supporting the wagon body upon said axle boxes; a pair of bellcranks having pivot mounts with respect to the wagon body and located adjacent to opposite sides thereof; a first link extending transversely of said wagon body and pivotally interconnecting a first set of arms of said bellcranks; and further links substantially longitudinally extending with respect to said wagon body and pivotally interconnecting pivoting fulcrums of a second set of arms of said bellcranks to respective axle boxes, said pivoting fulcrums for said further links connected to the axle boxes of the inboard wheelset being spaced closer to said pivot mounts than the pivoting fulcrums of said further links connected to the axle boxes of the outboard wheelset so that the outboard wheelset is permitted to pivot about a vertical axis to a greater extent than is the inboard wheelset as the wagon negotiates a curve on a railway track.

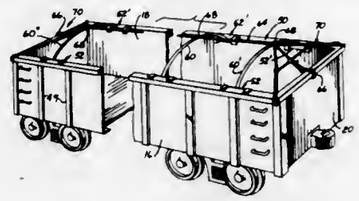
4,823,707

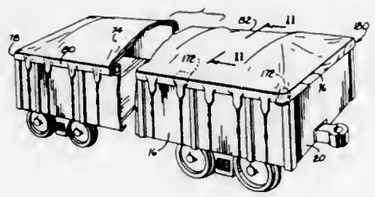
APPARATUS FOR COVERING AN OPEN-TOPPED VEHICLE

H. Allen Salsbury, 8212 NW. Delta, Kansas City, Mo. 64151, and Gary E. Wymer, 5915 W. 88th Terrace, Overland Park, Kans. 66207

Filed Mar. 7, 1988, Ser. No. 165,073
Int. Cl.⁴ B61D *39/00*
U.S. Cl. 105—377 **15 Claims**

1. In combination with a normally open-topped vehicle inherently having upstanding side walls and end walls, a removable covering means comprising:
(a) a flexible cover having ends and sides; and
(b) a cover supporting means for supporting said flexible cover in covering relation with respect to the open-topped vehicle, said cover supporting means including:
(1) a plurality of removable rib supporting brackets mounted on the side walls of the vehicle, with brackets on each vehicle side wall being adjustably longitudinally spaced apart from each other and each bracket on each vehicle side wall having a corresponding bracket on the other vehicle side wall to form cooperative pairs of brackets;
(2) a cover supporting rib associated with each cooperative pair of brackets, each cover supporting rib extending across the vehicle between the side walls of the vehicle and having an end connected to each of the brackets of each cooperative pair of brackets;
(3) a flexible ridge line means extending axially of the vehicle between the end walls of the vehicle for supporting said flexible cover and for establishing preset spacings between adjacent cover supporting ribs, said ridge line means having ends, with each ridge line means end being connected to one of the vehicle end walls, said ridge line





means including a plurality of rib attaching means thereon for fixedly attaching said ribs to said ridge line means whereby said ribs are axially supported at said rib attaching means, said rib attaching means being spaced apart from each other along the length of said ridge line means a predetermined distance so that upon attaching said ribs to said ridge line means by said rib attaching means, said preset spacing between adjacent cover supporting ribs is established; and
(4) cover attachment means for attaching said flexible cover to said cover supporting means.

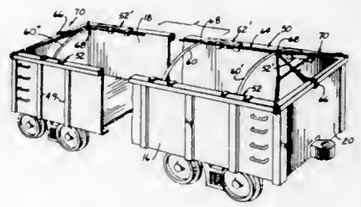
4,823,708

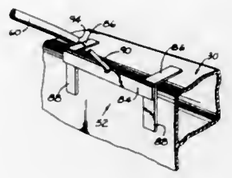
METHOD FOR COVERING AN OPEN-TOPPED VEHICLE

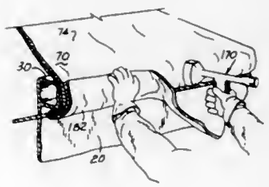
Gary E. Wymer, 5915 W. 88th Terrace, Overland Park, Kans. 66207, and H. Allen Salsbury, 8212 NW. Delta, Kansas City, Mo. 64151

Filed Mar. 7, 1988, Ser. No. 165,021
Int. Cl.⁴ B61D *39/00*
U.S. Cl. 105—377 **10 Claims**

1. A method of removably covering a normally open-topped vehicle which has side walls and end walls, which comprises the steps of:
(a) removably mounting a plurality of rib supporting brackets on each of the vehicle side walls to form a plurality of cooperative bracket pairs;
(b) attaching a plurality of cover supporting ribs to respective said bracket pairs to extend across the width of the vehicle between the vehicle side walls and to form a cage on the vehicle;
(c) providing a flexible ridge line means and presetting a spacing between adjacent cover supporting ribs and axially supporting, longitudinally of said vehicle, said ribs by fixedly attaching said ridge line means to each rib with a rib attaching means;
(d) attaching said ridge line means to said vehicle ends;
(e) providing a flexible cover for covering the vehicle, the flexible cover being formed of a material having ends and sides;
(f) placing the flexible cover on top of the cage; and







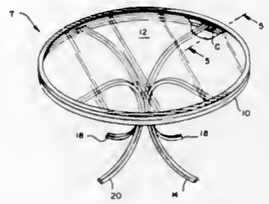
(g) attaching at least one end of the flexible cover to an end wall of the vehicle.

4,823,709

APPARATUS AND METHOD FOR ATTACHING A TABLE LEG TO A TABLE TOP

Bobby Tesney, Haleyville, Ala., assignor to Winston Furniture Company Inc., Birmingham, Ala.

Filed Oct. 2, 1987, Ser. No. 103,702
Int. Cl.⁴ A47B *3/06*
U.S. Cl. 108—157 **18 Claims**



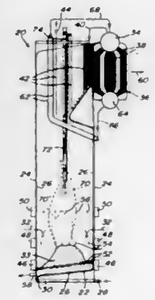
1. An assembly for securing a leg of a table or the like, comprising:
(a) table top means including first and second spaced flange means;
(b) clip means for being secured to a leg and including first means engageable with said first flange means and second means comprising first and second juxtaposed hingedly connected leg members, one of said members engageable with said second flange means; and,
(c) means for forcing said members apart so that said first means is forced securely against said first flange means and said one member is forced securely against said second flange means.

4,823,710

NON-PERIPHERAL BLOWING OF OXYGEN-CONTAINING GAS IN STEAM GENERATING BOILERS

Guillermo F. Garrido, St-Bruno; Robert G. H. Lee, Montreal; Derek Hornsey, Beaconsfield, and José M. Dieguez, St-Bruno, all of Canada, assignors to Canadian Liquid Air Ltd.-Air Liquide Canada Ltee., Canada

Filed Oct. 13, 1987, Ser. No. 107,174
Int. Cl.⁴ F23B *7/00*
U.S. Cl. 110—234 **81 Claims**



1. A method of improving combustion in a steam generating boiler having a bottom wall supporting a char bed and sidewalls with ports through which air is admitted for combustion species in the char bed and emanating therefrom, which comprises introducing an oxygen-containing gas into a lower central zone of the boiler, from at least one point remote from said sidewalls and from said char bed to thereby cause intimate mixing of the oxygen contained in said gas with said combustible species, said oxygen-containing gas being blown downwardly from an upper section of the boiler at a distance from said char bed sufficient to avoid oxidation of spent chemicals contained in said char bed.

4,823,711

THERMAL DECOMPOSITION PROCESSOR AND SYSTEM

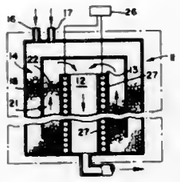
Gerald F. Kroneberger, Novato, and John B. Wilcox, San Jose, both of Calif., assignors to In-Process Technology, Inc., Sunnyvale, Calif.

Filed Aug. 21, 1987, Ser. No. 88,094
Int. Cl.⁴ F23D *14/00*
U.S. Cl. 110—236 **27 Claims**

1. A thermal decomposition processor and system comprising
means defining a reaction zone,
heat means disposed in heat exchange relation to said reaction zone and having means for controllably supplying heat to or removing heat from said zone,
said heat means including at least one heat generator physically separated from said reaction zone,
means passing a feed material in gaseous, vaporized or finely divided form through said reaction zone for decomposition of said material,
means defining a gas preheating zone for process gas, means

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directing preheated process gas into mixing relation to said feed material prior to passage through said reaction zone for passing preheated gas and mixed feed material through said reaction zone and



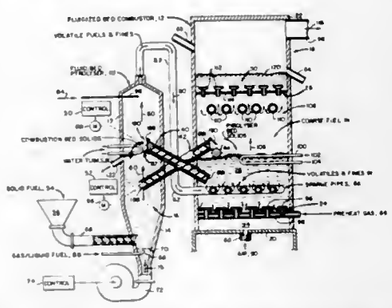
outlet means for removing decomposed material from said reaction zone.

4,823,712

MULTIFUEL BUBBLING BED FLUIDIZED BED COMBUSTOR SYSTEM

Alex F. Wormer, Marblehead, Mass., assignor to Wormser Engineering, Inc., Woburn, Mass.

Division of Ser. No. 810,424, Dec. 18, 1985, abandoned. This application May 5, 1988, Ser. No. 193,152
Int. Cl.[4] F23G *7/00*
U.S. Cl. 110—245 **5 Claims**



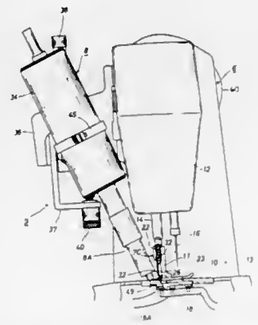
1. Apparatus for generating heat, said apparatus comprising:
a fluidized bed pyrolyzer comprising:
a pyryolyzer vessel;
means for supporting a pyrolyzer bed of granular material within said pyrolyzer vessel;
means for fluidizing said pyrolyzer bed;
means for adding fuel to said pyrolyzer bed;
means for removing gaseous effluents from said pyrolyzer vessel; and
means for removing bed material from said pyrolyzer bed;
a fluidized bed combustor comprising:
a combustor vessel;
means for supporting a combustor bed of granular material within said combustor vessel;
means for adding the gaseous effluents removed from said pyrolyzer bed to said combustor bed;
means for adding granular material to said combustor bed;
means for removing gaseous effluents from said combustor vessel;
means for removing bed material from said combustor;
a heat exchanger comprising a vessel; means for ading gaseous effluents to, and means for removing gaseous effluents from, said heat exchanger vessel, and means for adding an exchange coolant to, and means for removing an exchange coolant from, said heat exchanger vessel;
particulate collector means connected to said heat exchanger for removing particulate matter from said gaseous effluents removed from said heat exchanger; and
stack means connected to said particulate collector for releasing said gaseous effluents removed from said heat exchanger to the atmosphere;
means for conveying gaseous effluents from said pyrolyzer to said combustor bed;
means for conveying combustor bed material from said combustor bed to said pyrolyzer at a rate sufficient to pyrolyzer said fuel;
means for conveying pyrolyzer bed material from said pyrolyzer bed to said combustor bed at a rate sufficient to maintain the bed level in the pyrolyzer at a predetermined level; and
means for conveying gaseous effluents from said combustor vessel to said heat exchanger;
a second fluidized bed located within said combustor vessel;
said second combustor bed being supported by a distributor plate mounted within said combustor vessel;
said second fluidized bed being located above the freeboard of said combustion bed;
means for conveying said effluent gases leaving said combustor bed to said second fluidized bed through passages in said second bed distributor plate;
means for conveying said effluent gases leaving said second bed to said heat exchanger;
means for adding solids to said second bed; and
means for removing solids from said second bed.

4,823,713

SEWING MACHINE WITH AN ULTRASONIC HEATER FOR FOLDING BACK SEWN EDGES

Yoshitake Ogawa, Kasugai; Akira Takeuchi, Obu, and Hisataka Mizutani, Bisai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 7, 1987, Ser. No. 105,222
Claims priority, application Japan, Oct. 31, 1986, 61-261369; Nov. 12, 1986, 61-268878
Int. Cl.[4] D05B *35/02*
U.S. Cl. 112—217 **8 Claims**



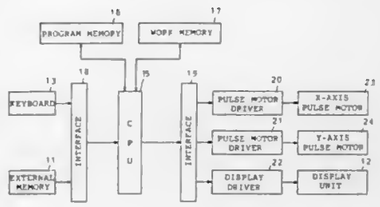
1. A sewing machine for sewing together edges of two sheets of material, for folding back the sewn edges and for creasing the folded edges, comprising:
stitch-forming means for forming a stitch at a sewing point;
feeding means for feeding in a feeding direction the two sheets of material through the sewing point;
folding means for turning apart and folding back each edge of the two sheets of material;
an anvil provided downstream of said folding means with respect to the feeding direction of the material;
including a tip means for an ultrasonic horn cooperating with said anvil for heating the folded back edges of the two sheets of material to crease the same by means of ultrasonic waves;
an ultrasonic generator provided for said ultrasonic horn; and
a horn adjuster provided on a frame of the sewing machine including means for moving said tip to a specific angular position in relationship to a sewing support surface, said adjuster including further means to push said horn towards said anvil with the two sheets of material therebetween.

4,823,714

ELECTRONIC CONTROLLED STITCH PATTERN SEWING MACHINE AND METHOD

Masaaki Yokoe, Nagoya; Yoshikazu Kurono, Hazu; Koji Hayashi, and Tomoe Goto, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 20, 1988, Ser. No. 184,097
Claims priority, application Japan, Apr. 24, 1987, 62-102183
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—262.3 **5 Claims**





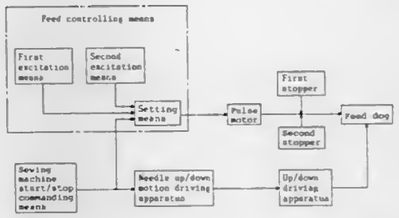
5. A method for sewing a stitch pattern in a desired sewing region of a workpiece by a sewing machine having a reciprocal needle, workpiece holding means and drive means for causing relative movement between the needle and the workpiece holding means, the method comprising steps of:
making stitch pattern data of the stitch pattern to be sewn on the workpiece;
determining a size of a stitch pattern area which is an envelope of the stitch pattern based on the stitch pattern data;
determining a size of the sewing region;
calculating a ratio of the size of the sewing region to the size of the stitch pattern area;
modifying the stitch pattern data based on the ratio so that the size of the stitch pattern area comes close to the size of the sewing region; and
controlling the drive means based on the modified stitch pattern data.

4,823,715

FEED CONTROL APPARATUS FOR A SEWING MACHINE

Fujio Horie, and Mitsuyasu Kyuno, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 7, 1987, Ser. No. 82,600
Claims priority, application Japan, Aug. 8, 1986, 61-187200
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—315 **7 Claims**

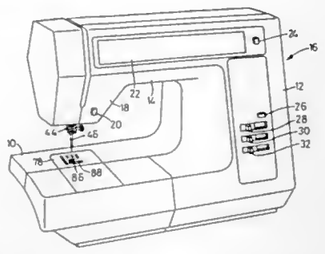


1. A feed control apparatus for a sewing machine adapted to feed a work fabric to a sewing needle from and upstream location to a downstream location and having an endwise reciprocating needle, a stitch forming controlling means and a presser foot for pressing a work fabric on a work supporting bed; a feed device having a feed dog for horizontally feeding the work fabric from the upstream location to the downstream location in cooperation with said presser foot while the work fabric is positioned above the surface of said work supporting bed; driving means for driving said feed dog and down relative to said bed surface in synchronization with up-and-down motion of said needle; a pulse motor having a predetermined number P of excited states and adapted to rotate by a predetermined angular amount S by switching the pulse motor between each excited state, said pulse motor being operatively connected with said feed dog; and feed controlling means performing feed control of the work fabric by sequentially switching the excited state of said pulse motor using an open loop control system according to a feed signal from the stitch forming controlling means relating to the amount of horizontal feed of said feed dog; said feed controlling means comprising:
a first stopper and a second stopper defining a first limit position and a second limit position downstream from said first limit position, respectively, for stopping said feed dog or a member operatively connected thereto, in order to define the range of horizontal feeding motion of said feed dog;
first excitation control means for controlling the excited states of said pulse motor so that the excited state of said pulse motor at the start or end of horizontal feeding motion of said feed dog becomes a first predetermined specific excited state into which said pulse motor is excited while said pulse motor rotates by a angular amount of P·S/2 away from a specific position where said pulse motor is positioned, when said feed dog is defined at the first limit position by said first stopper;
second excitation control means for controlling the excited states of said pulse motor so that the excited state of pulse motor at the end of horizontal feeding motion of said feed dog becomes a second predetermined specific excited state into which said pulse motor is excited while said pulse motor rotates by an amount of P·S/2 away from a specific position where said pulse motor is positioned, when said feed dog is defined at the second limit position by said second stopper; and
sequence setting means for moving said feed dog to said second limit position so that said second excitation control means becomes operative in horizontal feeding motion at the start-up of the first sewing operation and for moving said feed dog to said first limit position so that said first

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excitation control means becomes operative during subsequent horizontal feeding motion.

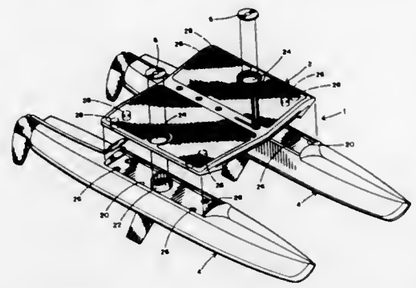
4,823,716
SEWING MACHINE WITH FABRIC-EDGE TRACING FUNCTION
Akifumi Nakashima, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan
Filed Nov. 24, 1987, Ser. No. 124,834
Claims priority, application Japan, Nov. 26, 1986, 61-281466
Int. Cl.⁴ D05B *3/02*
U.S. Cl. 112—453 **16 Claims**



1. A sewing machine having a function of tracing an edge of a workpiece to form a line of stitches along said edge, comprising:
a machine frame;
a work bed on which the workpiece is placed;
an endwise reciprocable needle bar which has a sewing needle fixed at its lower end;
a feed mechanism for feeding the workpiece in a predetermined feeding direction;
a needle-bar oscillator for supporting said needle bar such that the needle bar is endwise reciprocable with said needle, said needle-bar oscillator being disposed on said machine frame, such that the oscillator is joggable in a lateral direction substantially perpendicular to said feeding direction of the workpiece;
a fabric sensor for detecting the edge of the workpiece which extends in said feeding direction, said fabric sensor including a light emitting portion for producing a radiation, and a light receiving portion;
a smooth reflecting surface provided on said work bed, in the vicinity of a lowered position of said needle, for reflecting said radiation toward said light receiving portion of said fabric sensor, said reflecting surface having a concave shape in cross section taken in a vertical plane parallel to said feeding direction; and
actuator and control means responsive to said fabric sensor, for effecting a controlled jogging movement of said needle-bar oscillator in said lateral direction, according to an amount of said radiation received by said light receiving portion of said fabric sensor, so that said line of stitches is spaced apart from said edge of the workpiece by a predetermined distance.

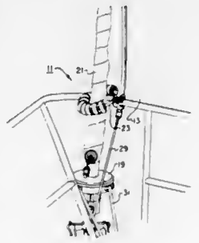
4,823,717
DECK CONNECTION SYSTEM FOR A BOAT
Robert F. Roberson, San Clemente, Calif., assignor to Hot Sports, Inc., Corona del Mar, Calif.
Filed Mar. 15, 1988, Ser. No. 169,029
Int. Cl.⁴ B63B *1/12*
U.S. Cl. 114—61 **14 Claims**

14. A system for connecting a wing to a hollow hull to complete a deck assembly for a boat, said system comprising:
means for aligning said wing with said hull, said aligning means including a hollow, open ended member extending upwardly from and communicating with the interior of said hollow hull and an opening in said wing for receiving said open ended member therethrough;
means for attaching said wing to said hull from a location at the interior of said hull; and



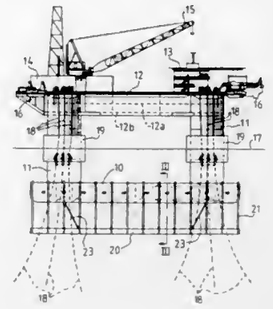
cover means removably positioned over the opening in said wing for blocking access to the interior of said hollow hull via the open ended member of said hull.

4,823,718
SPIN TACK CONTROL
Harry L. Dale, 537 Dove Creek Cir., Grapevine, Tex. 76051
Filed Nov. 16, 1987, Ser. No. 121,038
Int. Cl.⁴ B63H *9/10*
U.S. Cl. 114—113 **7 Claims**



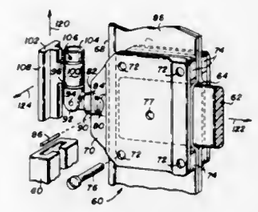
1. In an apparatus for controlling the tack of a cruising spinnaker in a vertical plane when a roller furling headsail is being used for most efficient sailing of a boat that includes:
a. a mast;
b. a plurality accessories for controlling the sails on the boat;
c. a headsail;
d. a roller furling jib system to which is connected said headsail such that said headsail becomes wrapped around said furling jib system when said furling jib system is rotated for taking up said headsail,
the improvement comprising:
e. a ring encompassing said furling jib system and said headsail and having a larger diameter than said furling jib system and said encompassing headsail; said ring having a means for emplacement around said furling jib system and said headsail and means for attaching said ring to the tack of the spinnaker and to a line controlling the vertical height of said tack of the spinnaker;
f. a plurality of rollers rotatably mounted on said ring and disposed more than half way around said ring on at least the side of said ring opposite said means for attaching said ring with the tack of said spinnaker and the line connected therewith such that said ring can traverse vertically along said furling jib system and said rolled headsail about the furling jib system without damage to said headsail.

4,823,719
SEMISUBMERSIBLE VESSEL HAVING MEANS FOR INCREASING STABILITY AND DAMPEN MOTION
Anders Sarwe, Göteborg, Sweden, assignor to Gotaverken Arendel AB, Sweden
Filed Jan. 20, 1988, Ser. No. 146,282
Claims priority, application Sweden, Jan. 23, 1987, 8700263
Int. Cl.⁴ B63B *39/06*
U.S. Cl. 114—126 **6 Claims**



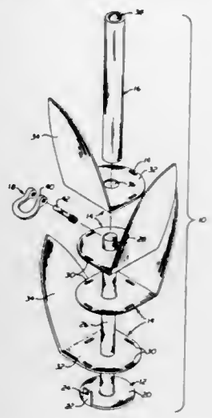
1. A semisubmersible vessel having means for holding the vessel stationary during development of an oil or gas field and comprising:
at least one submerged body as well as a number of legs supported thereby for carrying a work deck at a secure level above the operational waterline,
means for increasing the waterline area of at least some of the legs, and
means for rigidly connecting at least one horizontal plate below said submerged body, the area of the plate times the vertical distance from the body determining the volume of the mass of water vacillating well below the water line following the elastic movements of the vessel.

4,823,720
BATTEN ATTACHMENT
Lewis R. Foster, 112 Bond Ct., Los Gatos, Calif. 95302
Filed Jul. 24, 1987, Ser. No. 77,178
Int. Cl.⁴ B63H *9/10*
U.S. Cl. 114—98 **8 Claims**



1. A batten attachment comprising:
a slide member shaped to slide along a slide track of a mast, the slide track having a slide axis;
a rigid connecting link pivotally connected to the slide member to allow rotational movement about a first pivot axis parallel to said slide axis, and having a pivot means to allow rotational movement about a second pivot axis which is perpendicular to said slide axis and a batten axis which is perpendicular to said second pivot axis; and
a batten receptacle shaped to receive a batten along said batten axis, the batten receptacle being pivotally connected to the connecting link to allow rotational movement about said batten axis.

4,823,721
MARINE ANCHOR
Robert E. Peknay, 355 53rd St., N., St. Petersburg, Fla. 33710
Filed Jan. 26, 1988, Ser. No. 148,559
Int. Cl.⁴ B63B *21/46*
U.S. Cl. 114—303 **1 Claim**



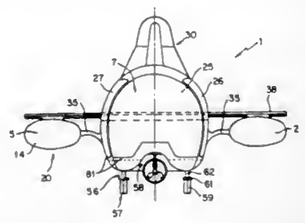
1. A marine anchor assembled of its component parts comprising:
a. a unitary structure consisting of a vertical shank with a fixed end plate on one end;
b. said end plate having a projection generally parallel to, but not in line with, said shank;
c. multiple flukes;
d. said projection used as a means for radially fixing said flukes about said vertical shank;
e. said flukes having apertures mating with said projection;
f. said flukes, after being mated with said projection on said end plate, being demountably attached;
g. by a conveniently removable locking device, whereby an anchor of great strength and holding power is quickly assembled from its compact and easily stowable component parts.

4,823,722
SEMI-SUBMERSIBLE MARINE CRAFT
André Gass, 6, Avenue de la Marseillaise, 67000 Strasbourg, France
Continuation-in-part of Ser. No. 738,038, May 24, 1985, abandoned. This application Aug. 11, 1987, Ser. No. 84,386
Claims priority, application France, May 29, 1984, 84 08631
Int. Cl.⁴ B63G *8/22*
U.S. Cl. 114—333 **19 Claims**

1. A semi-submersible marine craft comprising, a watertight hull having a passenger cabin made in part of transparent material, two elongate, tubular flotation and water ballast floats secured on opposite sides of the hull, the two floats having means for independently receiving volumes of water internally thereof and discharging the water therein, flotation control means for variably controlling the buoyancy of the craft by controlling entry of water into the flotation and water ballast floats and discharge of water therefrom for variably controlling volumes of water ballast in the floats to control extent of partial submergence of the craft including the hull and surfacing thereof, the water ballast effectively partially submerging the craft hull for viewing from the passenger cabin below the water surface in a partially submerged condition of

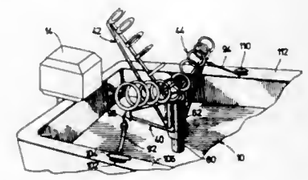
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the cabin, the flotation control means including other ballast below the level of the floats, means for jetissoning said other ballast, a driven propulsion shaft having a drive screw driven



rotationally from internally of the hull, and drive means internally of the hull for rotationally driving said drive shaft for driving the marine craft forwardly and astern.

4,823,723
TROLLING RIG FOR FISHING BOATS
Kenneth J. Brooks, P.O. Box 31, Sante Fe, Tenn. 38482
Filed Jan. 20, 1988, Ser. No. 146,292
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—343 **4 Claims**



1. A rig for removably mounting a plurality of fishing rods in position for trolling from a forwardly moving boat comprising:

central hub means having a longitudinal axis;

a plurality of bracket means fixedly secured to and projecting outwardly and upwardly from said hub means, including first, second and third bracket means, said first and third bracket means being spaced substantially diagonally opposite one another on said hub, and said second bracket being disposed on the aft side of said hub when mounted on said boat and radially midway between said first and third brackets means;

means associated with each of said bracket means and defining an open channel for receiving the butt end of a fishing rod therein so that said rod projects upwardly and outwardly from said hub means; and means mounting said hub means at a location on the aft end of said boat between and within the port and starboard gunwales of said boat, and at a height sufficient to cause rods in said channels to project above said gunwales, whereby at least one of said bracket means is directed starboard of said boat and at least one of said bracket means is directed port of said boat.

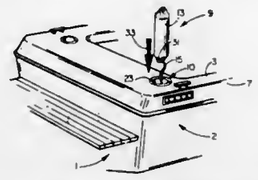
4,823,724
BUMPER STORAGE SYSTEM
Anthony P. Lumpkin, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Feb. 17, 1988, Ser. No. 156,701
Int. Cl.[4] B63B *59/02*
U.S. Cl. 114—343 **25 Claims**

1. A bumper storage system for a marine vessel having a hull comprising:

a. an elongated bumper adapted to cushion the vessel against a dock or the like;

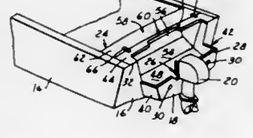
b. receptacle means recessible into the vessel hull for removeably receiving the bumper; and

c. tether means tied to the receptacle means for suspending the bumper alongside the vessel at a proper location to protect the vessel from the dock or the like,



so that when the receptacle means is recessed into the vessel hull the bumper may be selectively stowed unobtrusively within the hull and placed in an operative position wherein it is protectively located by the tether means between the vessel and the dock.

4,823,725
OUTBOARD MOTORBOAT WITH SPACE SAVER POCKET TRANSOM
Delbert G. Smith, Little Falls, Minn., assignor to Nordic Boat Company, Inc., Little Falls, Minn.
Filed Feb. 17, 1988, Ser. No. 157,290
Int. Cl.[4] B63B *5/00*
U.S. Cl. 114—343 **12 Claims**



1. An outboard motorboat of the type having sides and a transom and which further comprises:

a buttress panel constructed and arranged to receive and mount an outboard motor thereon, means securing said buttress panel to said boat aft of said transom and in a generally upright position,

said buttress panel having a width and a height each of at least about one-fourth of that of said transom and wherein the upper edge of said buttress panel lies below the upper edge of said transom,

a motorwell in said transom and having a bottom, sides and front constructed and arranged to provide clearance between such motor and said transom as such motor when mounted on said buttress panel pivots from its fully lowered position to its fully raised position and when in such fully raised position from a fully rotated generally clockwise position to a fully rotated generally counterclockwise position, and

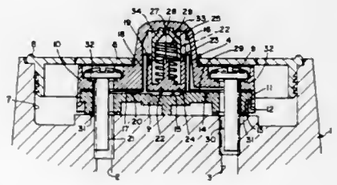
a cover disposed between the sides of the boat and superimposed over said front and at least a portion of said sides, and bottom of said motorwell, and said cover having a notch formed therein constructed and arranged to provide a clearance between said cover and said motor as said motor pivots from its fully lowered position to its fully raised position and when in such fully raised position from its fully rotated generally clockwise position to its fully rotated generally counterclockwise position.

4,823,726
INFLATABLE BOAT WITH A RIGID OR SEMIRIGID KEEL AND A CATAMARAN OR TRIMARAN BOTTOM, AND WITH GUIDES ARRANGED FLUSH WITH THE BOAT FLOOR
Giuseppe Pennati, Corso Lodi, 29, 20135 - Milano, Italy
Filed Feb. 17, 1987, Ser. No. 15,424
Claims priority, application Italy, Feb. 19, 1986, 20991/86[U]
Int. Cl.[4] B63B *7/00*
U.S. Cl. 114—345 **1 Claim**



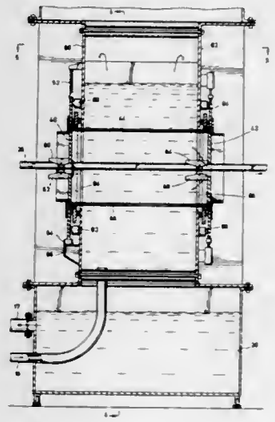
1. An inflatable boat, comprising a bottom made of substantially rigid materials and including longitudinal sliding guides for locking, at the desired positions, and without the need of making holes, all of the members usually arranged on the boat floor, on the outside of said bottom there being provided longitudinally restrained tubular elements which, at the bow, are mutually coupled by a further tubular element, wherein said bottom is provided with a downward projecting keel having a diehedral cross-section portion so as to assume the attitude of a trimaran, said keel projecting exclusively at the boat aft zone to increase the full load lift, said bottom being further provided with two lower side ridges stiffened by stringer members, so as to assume an attitude like that of a trimaran.

4,823,727
PRESSURE INDICATOR
David Baggett, Newcastle upon Tyne; Alan Bateman, Washington, and Colin T. Billet, Durham, all of England, assignors to Domnick Hunter Filters Limited, Birtley, England
Filed Feb. 8, 1988, Ser. No. 153,225
Claims priority, application United Kingdom, Feb. 10, 1987, 8702897
Int. Cl.[4] G01L *13/02*
U.S. Cl. 116—272 **7 Claims**



1. A self-contained pressure indicator for connection to a pneumatic circuit element, the indicator comprising a housing, a rolling diaphragm mounted within the housing and dividing the housing into a first outer region and a second inner region, one sealed from the other by said diaphragm, said diaphragm having an outer sleeve section and an inner cup section connected to and lying within the outer sleeve section, an outer surface of the diaphragm being contiguous with and subject to pressure in the first region and an inner surface of the diaphragm being contiguous with and subject to pressure in the second region, an indicator means seated within the cup section, an inlet into the first region, means biasing the cup section towards the first region against pressure therein and into a position wherein the indicator means lies substantially wholly within the cup section and is shielded from view thereby, the housing having a transparent section through which the indicator means may be viewed as it moves out of the cup section in response to increasing pressure differential between the first and second regions, and first and second bolts passing through respective first and second bolt holes in the housing for engagement with respective bolt-receiving sections of the pneumatic circuit element, at least the first bolt having an axial cut-away section opening into the first outer region of the housing for allowing communication between said first outer region and a first part of a pneumatic circuit comprised within the pneumatic circuit element.

4,823,728
VACUUM PAINTING APPARATUS
Jack L. Sturdivant, 17 Windermere La., Houston, Tex. 77063
Filed Dec. 14, 1987, Ser. No. 132,199
Int. Cl.[4] B05C *3/02*
U.S. Cl. 118—50 **17 Claims**



1. An apparatus for vacuum painting a strip material, comprising:

an application chamber having first and second opposing walls, each of said walls having an interior surface and an exterior surface, said first wall having a first opening and said second wall having a second opening;

a first template having a third opening smaller than said first opening, said first template being rollably attached to the exterior surface of said first wall, and substantially covering said first opening;

a second template having a fourth opening smaller than said second opening, said second template being rollably attached to the exterior surface of said second wall, and substantially covering said second opening; and

a plurality of compression struts joining said first template to said second template.

4,823,729
MACHINE FOR APPLYING A FUSED CONFIGURATION OF POWDER ON A SHOE SUBSTRATE
Albert I. Morse, Beverly, Mass., assignor to DVSG Patentverwaltungs, Frankfurt, Fed. Rep. of Germany
Filed Jan. 20, 1987, Ser. No. 4,507
Int. Cl.[4] B05C *1/16*
U.S. Cl. 118—213 **7 Claims**

1. A machine for applying a fused configuration of powder on a shoe substrate comprising:

a non-rigid deformable flat belt for receiving a deposit of powder on an upper surface thereof;

a stencil disposed above said belt and having a selectively configured cut-out;

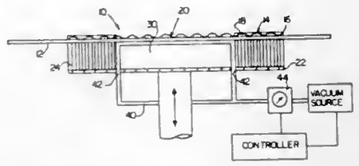
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means communicating with said stencil for depositing powder onto said stencil;

means for deforming from said flat condition a portion of said belt beneath said cut-out to define with said stencil a selectively configured powder receiving volume, said means including:

a lower support assembly disposed beneath said belt comprising:

a support pad adapted to be elevated to forcefully engage said belt against said stencil;



an arcuate opening extending vertically downwardly into said support pad:

a selectively configured removable spacer element located within said opening having a top surface spaced from said belt with the lower support assembly in the elevated position wherein said belt is forcefully engaged against said stencil: and

vacuum means communicating with said arcuate opening to pull said belt downwardly against the top surface of said spacer element thereby defining a selectively configured volume to receive powder deposited on said stencil.

4,823,730

APPARATUS FOR FINISHING ENDLESS MATERIAL WITH A PADDING DEVICE

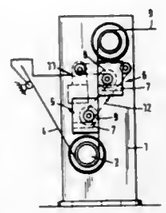
Heinz Fleissner, Riehn/Basel, Switzerland, assignor to Vepa Aktiengesellschaft, Basel, Switzerland

Filed Apr. 9, 1984, Ser. No. 598,462

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3313991

Int. Cl.[4] B05C *1/08*; D06B *1/14*

U.S. Cl. 118—223 **5 Claims**



1. An apparatus for finishing endless material which comprises a vertically extending frame, two padding devices arranged in superposition on said frame, each of said padding devices comprising a rotatably supported padding roller immersed in a bath of finishing liquid, said roller transferring the finishing liquid during its revolution to an endless material in contact with the padding roller, and means for guiding the endless material in a stretched condition along a vertical path, said guide means including driven guide rollers, one arranged at the top and one at the bottom of said frame for effecting a meander-shaped guidance of the endless material comprising a synthetic fiber tow, said padding devices being arranged between said guide rollers with one of the padding devices being arranged on one side of the tow and the other padding device being arranged on the other side of the tow whereby both sides of the tow are provided with a uniform application of said finishing liquid.

4,823,731

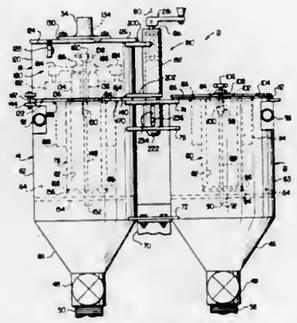
MULTIPLE FILTER/CYCLONE AIR FILTRATION APPARATUS WITH SINGLE, MOVABLE FILTER CLEANING SYSTEM

D. Franklin Howeth, 233 Chuck Wagon Trail, Forth Worth, Tex. 76108

Filed Feb. 24, 1987, Ser. No. 17,814

Int. Cl.[4] B05B *15/12*

U.S. Cl. 118—326 **26 Claims**



1. A filtration system comprising:

a plurality of separate filter housings each adapted to have a hollow filter mounted therein in a manner such that gas is flowed into a selected one of said separate filter housings, across its filter into the interior thereof, and then outwardly through the selected filter housing to remove particulate matter from the gas while each other filter housing and its associated filter are idle so that they may be cleaned or serviced during gas flow through said selected filter housing;

filter cleaning means connectable to any selected one of said plurality of separate filter housings and operable to backflush a filter mounted therein, said filter cleaning means including a gas discharge housing having an inlet for receiving filtered gas and an outlet for discharging the received filtered gas, and a filter backflushing system carried within said gas discharge housing for movement therewith; and

support means for supporting said gas discharge housing in a manner permitting it to be disconnected from one of said plurality of separate filter housings, pivoted about an axis of said support means, and then operatively connected to a selected other one of said plurality of separate filter housings to receive filtered gas discharged therefrom.

4,823,732

ATOMIZED PARTICLE LUBRICATION OF CUP-SHAPED CAN BODIES

James A. Bray, Salineville, and Robert L. Applegate, New Cumberland, both of W. Va., assignors to Weirton Steel Corporation, Weirton, W. Va.

Division of Ser. No. 68,065, Jun. 30, 1987, which is a continuation-in-part of Ser. No. 11,112, Feb. 5, 1987, Pat. No. 4,724,155, which is a continuation-in-part of Ser. No. 681,630, Dec. 14, 1984, abandoned. This application Aug. 25, 1988, Ser. No. 236,235

Int. Cl.[4] B05D *1/04*

U.S. Cl. 118—622 **8 Claims**

1. Apparatus for providing atomized liquid lubrication of interior and exterior surfaces of cup-shaped sheet metal can bodies while continuously moving such can bodies along a longitudinally-extended travel path through a can body fabricating line comprising, in combination

a lubricant source means providing lubricant in liquid form,

a lubricant deposition chamber,

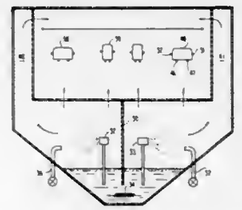
means defining a horizontally-oriented travel path for can bodies through such deposition chamber,

atomizing chamber means including atomizing means for converting such liquid lubricant into particles capable of being pneumatically transported by gas under pressure supplied to such atomizing chamber,

such lubricant deposition chamber being defined by enclosure means including lateral side wall means on opposite lateral sides of such longitudinally-extended horizontally-oriented travel path, floor means below such travel path, top wall means above such travel path, and longitudinal end walls defining respective entrance and exit openings for can bodies entering into and exiting from such deposition chamber,

such atomizing chamber means being located vertically below such deposition chamber and separated therefrom by such floor means;

means for supplying cup-shaped can bodies having a closed end wall and a side wall extending longitudinally therefrom symmetrically with a can body central longitudinal



axis to define an open end longitudinally opposite such can body closed end wall,

such can bodies including flange metal extending radially outwardly from such open end in a plane substantially perpendicularly transverse to such central longitudinal axis,

conveyance means for controlling continuous-line passage of such can bodies in spaced relationship to each other through such lubricant deposition chamber,

such conveyance means defining such horizontally-oriented travel path through such deposition chamber along which such can bodies are oriented open end down with their central longitudinal axes substantially vertical in parallel relationship, and

means for pneumatically directing movement of gas-borne atomized lubricant particles into the lubricant deposition chamber including

apertures defined in the floor means of such deposition chamber below such horizontal travel path for directing atomized lubricant particles directly into open ends of such can bodies from apertures vertically below such open ends and extending along such travel path for deposition by flow impingement on internal surfaces of such can bodies during such continuous-line passage.

4,823,733

CONVEYER HANGER FOR USE IN ELECTRO-STATIC PAINTING

Seizou Arai, Yokohama; Kikuo Fukumoto, Kanagawa; Seizo Sunaga, Hiratsuka, and Kouji Izumida, Ayase, all of Japan, assignors to Topy Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1987, Ser. No. 62,578

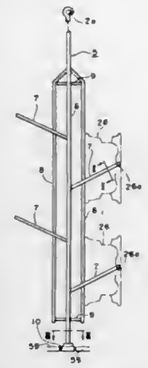
Int. Cl.[4] B05B *5/02*

U.S. Cl. 118—630 **19 Claims**

1. A conveyer hanger for carrying an annular work which is conveyed through an electro-static painting station, comprising:

a vertically extending support rod;

at least one arm, fixed at its one end to said support rod, for



carrying said work, said arm extending obliquely upward in a direction away from said support rod and having a substantially sharp edge running substantially the length of the arm at a top side of a cross-section of the arm where the work is supported by the arm.

4,823,734

INSTALLATION FOR THE CHEMICAL VAPOR INFILTRATION OF A REFRACTORY MATERIAL OTHER THAN CARBON

Francois Christin, Saint Aubin De Medoc, France, assignor to Societe Europeenne De Propulsion, France

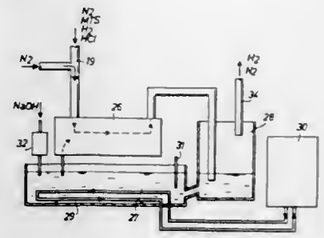
PCT No. PCT/FR87/00036, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/04733, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 9, 1987, Ser. No. 112,609

Claims priority, application France, Oct. 2, 1986, 86 01790

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—719 **6 Claims**



1. An installation for the densification of porous pieces by chemical vapor infiltration of a refractory material other than carbon, installation comprising a graphite armature defining a reaction chamber, an inductor surrounding the armature and heating the reaction chamber by induction, a sealed enclosure containing said armature and inductor, means for supplying reactant gases to the reaction chamber, means for supplying inert gas to the enclosure, and means for removing gases from said reaction chamber and said enclosure, wherein, the armature constitutes a tight structure inside the enclosure and is connected outside said enclosure with the reactant gases supplying means, the enclosure is supplied with inert gas in order to keep up a permanent flow of inert gas in the space around the armature inside the enclosure, and the removal of gases

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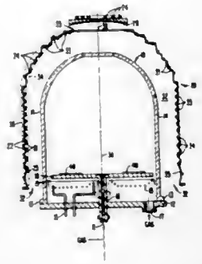
from the reaction chamber and of inert gas form the enclosure is achieved via respective outlet conduits which join up outside the enclosure, so that substantially equal pressures are maintained in the enclosure, inside and outside the reaction chamber.

4,823,735

REFLECTOR APPARATUS FOR CHEMICAL VAPOR DEPOSITION REACTORS

Marlowe A. Pichel, Aguanga; James McDiarmid, San Jose; Glenn A. Pfefferkorn, San Jose, and Roger P. Cory, San Jose, all of Calif., assignors to Gemini Research, Inc., Fremont, Calif.

Filed May 12, 1987, Ser. No. 48,716
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—730 32 Claims



1. In a chemical vapor deposition reactor having a susceptor for holding substrates, means for heating said susceptor and substrates and an enclosure around said susceptor, said enclosure substantially transparent to radiant energy from said susceptor and substrates during operation of said reactor,

a reflector unit surrounding said enclosure, said reflector comprising a plurality of facets, each facet adjusted with respect to said susceptor such that radiant energy from said susceptor and substrates, is reflected by each facet back to said susceptor and substrate in a predetermined manner.

4,823,736

BARREL STRUCTURE FOR SEMICONDUCTOR EPITAXIAL REACTOR

Robert C. Post; Kevin N. Bordelon, both of Dallas, and Burl M. Moon, Richardson, all of Tex., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 757,539, Jul. 22, 1985, abandoned. This application Nov. 26, 1985, Ser. No. 801,978
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—730 2 Claims

1. In a barrel-shaped susceptor for holding wafers exposed in a wafer processing environment, said susceptor comprising:

a flat top plate of generally polyhedron configuration having a slide opening;

a bottom plate of generally polyhedron configuration similar to said top plate and spaced from and arranged generally parallel to said top plate;

means maintaining the spacing of said bottom plate relative to said top plate; and

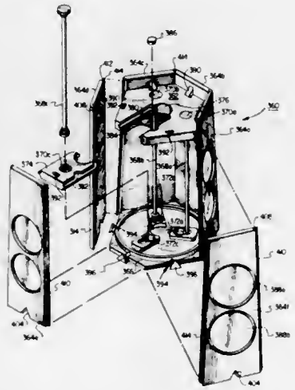
a plurality of individual susceptor panels each having a plurality of cavities for supporting the wafers to be processed and exposed in the processing environment, said individual susceptor panels extending above said top plate and between and about said top plate and said bottom plate to collectively enclose the spacing therebetween;

the improvement for preventing entry of gases and light into the interior of said susceptor and displacement of said panels during wafer processing which comprises:

lock means for securing each individual susceptor panel both to said top plate and to said bottom plate, said lock means comprising a cavity located normally inward from each facet face of said top plate, a back draft tab extending laterally outward from each edge facet of said bottom plate and cooperating means on each of said individual panels for interlocking with said cavity and said tab;

said cooperating means comprising a downwardly depending hook extending from the back face of a panel for insertion in the associated lock means cavity in the top plate and a notch defined in an underface of the same panel for engagement with said backdraft tab;

a top slide for mounting in the slide opening of said top plate for providing in combination with the top plate, an opening to receive one of said susceptor panels, the top slide further including means for supporting one of said susceptor panels comprising a cavity located normally inward from the facet face of said slide; and



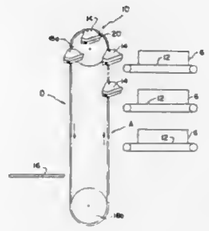
joining means for securing adjacent of said individual panels to each other in a secured joint formation that is substantially impervious to gas and light entry from the external processing environment, said joining means comprising a vertically extending longitudinal groove extending along one side edge of each of said individual susceptor panels substantially the entire length of the panel between said bottom plate and said top plate and a vertically extending longitudinal tongue extending along the other side of each of the panels substantially the entire length of the panel between the bottom plate and said top plate, whereby the tongue of one panel interfits with the groove of the adjacent panel to form an overlapping dovetail interfit therebetween and whereby said groove and said tongue are displaced generally behind the face plane of the panel of adjacent panels so that when the panels are joined they have a surface contour substantially uninterrupted by the joint formation threat that could disturb gas flow.

4,823,737

EGG TRANSFER DEVICE

Hideo Nakajima, and Minoru Yamamoto, both of 33, Shinonoi Ai, Nagano, 388, Japan

PCT No. PCT/JP86/00622, § 371 Date Aug. 7, 1987, § 102(e) Date Aug. 7, 1987, PCT Pub. No. WO87/03567, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 8, 1986, Ser. No. 87,253
Claims priority, application Japan, Dec. 9, 1985, 60-276632
Int. Cl.[4] A01K *45/00*
U.S. Cl. 119—22 7 Claims



1. An egg transfer device for transferring eggs comprising:

sidewalls disposed a predetermined distance apart;

an endless member operatively secured to each of said sidewalls for movement from a first elevation to a second elevation;

drive means for imparting movement to said endless member, said movement defining an ascending section and a desending section of movement of said endless member;

a plurality of coupling rods extending between said sidewalls;

a plurality of egg collecting shelves each having a plurality of approximately V-shaped egg collecting shelf pieces arranged in a spaced apart relationship to form comb-like teeth, each egg collecting shelf being operatively connected to one of said plurality of coupling rods;

a plurality of hanging shafts secured to each of said endless members, each egg collecting shelf being operatively connected to one of said plurality of hanging shafts on each of said endless members for mounting each of said egg collecting shelves for swinging movement relative to said endless members for maintaining the same disposition as said egg collecting shelf is moved from said first elevation to said second elevation;

said plurality of V-shaped shelf pieces forming a concave surface for receiving an egg and retaining the egg in a predetermined disposition during travel from said first elevation to said second elevation;

a holding section located adjacent to said ascending section of said endless member, said holding section including a plurality of holding pieces arranged in a spaced apart relationship to form comb-like teeth capable of passing between the comb-like teeth of said egg collecting shelves for transferring eggs to said egg collecting shelves; and

a discharge section located adjacent to said descending section of said endless member, said discharge section including a plurality of discharge pieces arranged in a spaced apart relationship to form comb-like teeth capable of passing between the comb-like teeth of said egg collecting shelves for transferring eggs from said egg collecting shelves;

wherein eggs transferred to said collecting shelves from said holding section are maintained in a predetermined disposition on said V-shaped shelf pieces during travel from said holding section to said discharge section by the swinging movement of each of said egg collecting shelves about each said hanging shaft.

4,823,738

FREE-WHEELING DISPENSER MECHANISM FOR MANUALLY OPERATED ANIMAL FOOD DISPENSING MACHINE

Arthur Gold, Northbrook, Ill., assignor to Carousel Industries, Inc., Des Plaines, Ill.

Filed Mar. 30, 1987, Ser. No. 31,864
Int. Cl.[4] A01K *5/00*
U.S. Cl. 119—51 R 5 Claims



1. An animal granular food dispensing machine having a free-wheeling metered dispensing mechanism adapted to be manually operated by a domesticated animal, said machine comprising:

A. A housing (**30**) having a base (**74**) for supporting the machine in operation with its longitudinal axis vertically oriented, said housing having an interior horizontal platform (**104**) vertically displaced from said base;

B. A granular food storage container globe (**22**) mounted spaced above said platform on and communicating with said housing for receiving and storing granular food;

C. A discharge chute (**114**) integral with said housing and opening at one end thereof (**126**) through said platform, the opposite end of said chute defining an exit port (**128**) to ambient atmosphere;

D. A boss (**108**) upstanding from said platform coaxial with the longitudinal axis of said machine;

E. A lower dispenser plate (**144**) mounted on said boss for free rotation on a vertical axis in opposite angular directions and having at least one opening therethrough arranged to be moved into registry with said opening (**126**) into said discharge chute for passage of granular food from said housing into said chute;

F. A metering plate (**142**) located adjacent said lower dispenser plate and mounted for free rotation on a vertical axis in opposite angular directions in synchronization with said lower dispenser plate, said metering plate having an upwardly extending wall (**152**) extending along the perimeter thereof and a plurality of symmetrically arranged spokes (**158**) extending radially outward to said wall (**152**) to define a plurality of generally triangularly shaped metering compartments (**162**), each compartment (**162**) communicating with said at least one opening in said lower dispenser plate (**144**);

G. An upper dispenser plate (**140**) mounted in a fixed position adjacent said lower dispenser plate (**144**) and having guide means for guiding food into said lower dispenser plate; and

H. Free-wheeling external actuator means (**198**) operably connected to rotate said lower dispenser plate freely in opposite angular directions whereby to align said lower dispenser plate opening with said opening into said discharge chute so that said metered quantity of food can be dispensed to ambient atmosphere through said exit port (**128**);

I. Said actuator means (**198**) and lower dispenser plate (**144**) having cooperating meshed gears for rotating said lower dispenser plate to align said openings for discharging food to ambient atmosphere, said actuator means including an external actuator wheel (**18**) adapted to be engaged by the animal for freely rotating the actuator wheel in opposite angular directions, said wheel being rotatable on an axis

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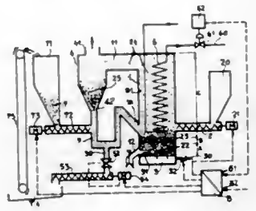
transverse to the longitudinal axis of the machine and the axis of rotation of said dispenser plates.

4,823,739

APPARATUS FOR CONTROL OF THE HEAT TRANSFER PRODUCED IN A FLUIDIZED BED

Michel Marcellin, Le Creusot, France, assignor to Framatome, Courbevoie, France

Division of Ser. No. 709,269, Mar. 7, 1985, Pat. No. 4,674,560.
This application Mar. 3, 1987, Ser. No. 21,279
Claims priority, application France, Mar. 8, 1984, 84 03580
Int. Cl.[4] F22B *35/00, 1/02*
U.S. Cl. 122—4 D **2 Claims**



1. In apparatus for controlling the heat transfer produced between a circulating fluidized bed of solid particles and a heat-transfer fluid circulating in a heat exchanger (b) placed inside an enclosure (1) supplied with solid particles and provided at its base with means (3) for injecting an upward stream of fluidizing gas, the fluidized bed comprising a dense phase (b) with a high particle concentration and a dilute phase (C) containing fine particles entrained with the gases escaping from the upper part of the enclosure (1) towards a separating device (4) connected to the base of the enclosure by a circuit (5) for recycling the recovered particles into the fluidized bed, said apparatus comprising means (7) for controlling the solid particle concentration of the dilute phase (C) and the height of the dense phase (B),

the improvement wherein the means (7) for controlling the concentration of solid particles comprise a hopper (71) for storing inert particles, a variable rate feed device (72) connecting said hopper to the circuit (5) for recycling the recovered particles, said circuit being provided with a device (50) for withdrawing the particles at a variable rate and being associated with a device (8) for controlling the feed and withdrawal rates as a function of the heat transfer requirement, responding to a change in the heat transfer requirement by a change in the same direction of the rate of supply of inert particles or a change in the opposite direction of the rate of withdrawal.

4,823,740

THERMAL REACTOR

Takahiro Ohshita; Tsutomu Higo, both of Kanagawa; Shigeru Kosugi; Naoki Inumaru, both of Tokyo, and Hajime Kawaguchi, Kanagawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation of Ser. No. 6,066, Jan. 21, 1987, abandoned. This application Jul. 26, 1988, Ser. No. 224,273
Claims priority, application Japan, Jan. 21, 1986, 61-8880; Mar. 12, 1986, 61-52559; Jul. 3, 1986, 61-155059; Aug. 13, 1986, 188589; Sep. 5, 1986, 61-207702; Sep. 12, 1986, 61-214028
Int. Cl.[4] B09B *3/00*
U.S. Cl. 122—4 D **9 Claims**

1. A thermal reactor comprising:

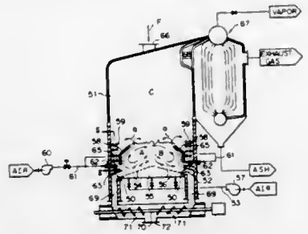
a fluidizing bed chamber surrounded by walls;

a fluidizing medium provided in said fluidizing bed chamber;

diffusor means, at the bottom of said reactor below said fluidizing medium and coupled to a pressurized gas source, for blowing gas upwardly above said diffusor means into said fluidizing medium;

partition wall means disposed in said fluidizing bed chamber adjacent to but spaced from said walls of said reactor or another partition wall means to form a recovery chamber with openings both at the top and the bottom communicating with said fluidizing bed chamber;

heat exchanging means disposed in said recovery chamber; and



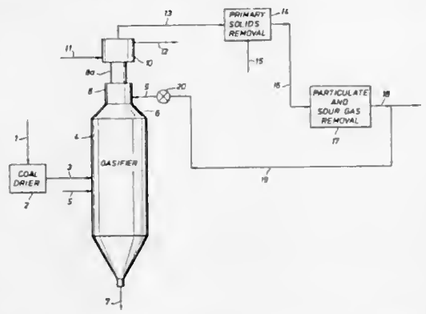
auxiliary diffusor means for directing a pressurized gas into said recovery chamber, said auxiliary diffusor means being disposed horizontally and provided with perforations, the size of the area of said perforations increasing in a direction from a first end of said auxiliary diffusor means extending into said recovery chamber to a second end thereof.

4,823,741

COAL GASIFICATION PROCESS WITH INHIBITION OF QUENCH ZONE PLUGGING

Drucilla G. Davis; L. W. R. Dicks, both of Houston, and J. A. Horwege, Seabrook, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 131,607, Dec. 11, 1987, abandoned.
This application Jul. 13, 1988, Ser. No. 223,737
Int. Cl.[4] F22D *1/00*
U.S. Cl. 122—7 R **3 Claims**



1. A process for the gasification of coal comprising oxidizing coal under conditions to produce hot synthesis gas containing flyslag and having a temperature of from about 1050° C.to about 1800° C.;

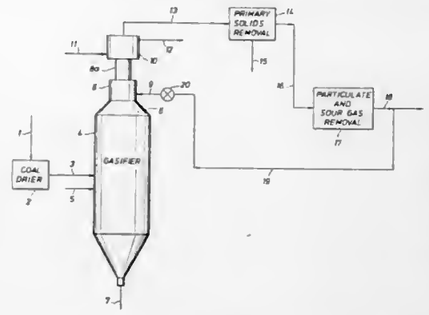
passing the hot synthesis gas containing flyslag upward from the gasification zone and quenching the synthesis gas and flyslag in a quench zone, the quench zone comprising an indirect heat exchange zone, the heat transfer surfaces of said indirect heat exchange zone in contact with said hot synthesis gas and flyslag and through which heat is extracted from the hot gas to a coolant at least partly being composed of boron nitride.

4,823,742

COAL GASIFICATION PROCESS WITH INHIBITION OF QUENCH ZONE PLUGGING

D. G. Davis, and L. W. R. Dicks, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 131,608, Dec. 11, 1987, abandoned.
This application Jul. 13, 1988, Ser. No. 220,422
Int. Cl.[4] F22D *1/10*
U.S. Cl. 122—7 R **3 Claims**



1. A process for the gasification of coal comprising oxidizing coal under conditions to produce hot synthesis gas containing flyslag and having a temperature of from about 1050° C. to about 1800° C.;

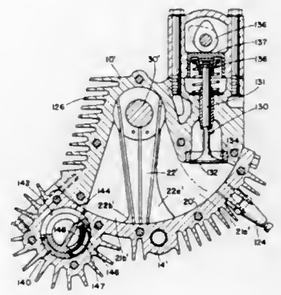
passing the hot synthesis gas containing flyslag upward from the gasification zone and quenching the synthesis gas and flyslag in a quench zone, the quench zone comprising an indirect heat exchange zone, the heat transfer surfaces of said indirect heat exchange zone in contact with said hot synthesis gas and flyslag and through which heat is extracted from the hot gas to a coolant at least partly being composed of silicon carbide.

4,823,743

OSCILLATING VANE MACHINE

Richard F. Ansdale, Tintern, England, assignor to Compression Technology Inc., Mechanicsburg, Pa.

Filed Jun. 17, 1986, Ser. No. 875,340
Int. Cl.[4] F02B *53/00*
U.S. Cl. 123—18 R **29 Claims**



1. Apparatus for pressurizing a fluid, comprising:

a housing having a chamber therein;

at least one vane positioned in said chamber and adapted to oscillate therein to pressurize a fluid;

a seal means secured to said at least one vane for sealing between said at least one vane and said chamber;

propulsion means for oscillating said at least one vane;

counter-oscillating means operably secured to said propulsion means and moving in opposition to a movement of said at least one vane to minimize a vibration produced in said housing by an oscillation of said at least one vane, wherein said propulsion means comprises a shaft to which said at least one vane is secured and wherein said counter-oscillating means comprises a counterweight which is rotatably mounted on said shaft; and,

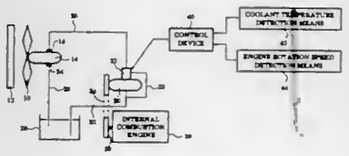
valve means secured to said housing and in fluid communication with said housing chamber to control a movement of fluid into and out of said chamber.

4,823,744

ROTATION SPEED CONTROL DEVICE FOR A HYDRAULICALLY OPERATED COOLING FAN OF AN INTERNAL COMBUSTION ENGINE

Seiji Omura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 15, 1988, Ser. No. 182,217
Claims priority, application Japan, Apr. 16, 1987, 62-058003[U]
Int. Cl.[4] F01P *7/02*
U.S. Cl. 123—41.12 **4 Claims**



1. A rotation speed control device for a hydraulically operated cooling fan of an internal combustion engine in a vehicle such as an automobile, said fan being driven by a hydraulic motor which is operated by an operating fluid supplied from a pump drivingly coupled to and driven by an output shaft of the internal combustion engine, said hydraulic motor being controlled by the rotation speed thereof depending on the flow rate of the operating fluid supplied thereto, comprising:

a coolant temperature detection means which detects the temperature of a coolant for cooling the engine;

an engine rotation speed detection means which detects the rotation speed of the engine;

a coolant temperature related fan control amount determination means which determines a coolant temperature related fan control amount so that the rotation speed of the cooling fan increases with an increase in coolant temperature;

an engine rotation speed related fan control amount determination means which determines an engine rotation speed related fan control amount so that the rotation speed of the cooling fan decreases with an increase in engine revolution speed;

a final fan control amount determination means which determines the rotation speed of the cooling fan based on either said coolant temperature related fan control amount or said engine rotation speed related fan control amount which provides a lower rotation speed of the cooling fan than the other; and

a relief valve type flow control means which controls a first part of the operating fluid supplied from said pump toward said hydraulic motor and a second part of the operating fluid supplied from said pump toward a relief in a mutually complementary relationship depending on either said coolant temperature related fan control amount or said engine rotation speed related fan control amount determined by said final fan control amount determination means so that said first part is increased or decreased relative to said second part as either said coolant tempera-

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ture related fan control amount or said engine rotation speed related fan control amount, based on which said final fan control means determines the rotation speed of the cooling fan, increases or decreases, respectively.

4,823,745

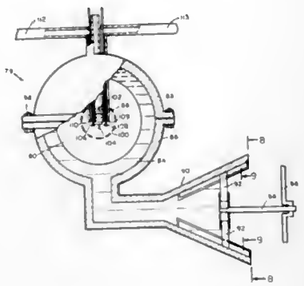
CONFORMABLE BLADDER ENGINE

Ping Yang, 1101 E. Garvey Ave., Suite 213, Monterey Park, Calif. 91754

Division of Ser. No. 915,509, Oct. 6, 1986, which is a division of Ser. No. 753,670, Jul. 10, 1985, Pat. No. 4,651,690, which is a continuation-in-part of Ser. No. 646,773, Sep. 4, 1984, abandoned. This application Jul. 15, 1988, Ser. No. 219,190

Int. Cl.⁴ F01B *19/00*

U.S. Cl. 123—51 R **3 Claims**



1. An internal combustion engine comprising:

a combustion chamber formed by a conformable bladder member capable of conforming in conformance with internal combustive forces in an outward expanding direction and of resuming its normal state thereafter;

said bladder member surrounded by a confined liquid medium contained in a closed receptable;

piston means operatively connected to said closed receptacle activated by the pressure exerted through the liquid medium by said bladder member in its expanded state to move in reciprocal action capable of driving a crankshaft;

a hollow casing received in the interior of said bladder member having a plurality of holes therethrough to permit outward expanding combustive forces to pass therethrough to expand said bladder member;

ignition means secured in said hollow casing adapted to selectively ignite a gas contained in said combustion chamber; and

means for permitting said gas to selectively enter into and exit from said combustion chamber.

4,823,746

ENGINE IGNITOR WITH INTEGRAL COMPRESSION RELEASE VALVE

Selwyn Kaplan, 101 Hermosa Dr., Shell Beach, Calif. 93449

Filed Sep. 25, 1987, Ser. No. 600,911

Int. Cl.⁴ F02P *19/02;* **F02N** *17/08*

U.S. Cl. 123—145 A **3 Claims**

1. An improved engine ignitor comprising in combination:

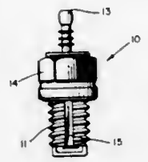
(a) a glow plug including a threaded shell capable of being screwed into an internal combustion cylinder block;

(b) a generally cylindrical heating head;

(c) a peripheral grip member disposed between the heating heat and said threaded shell of said glow plug; and

(d) an integral vent element disposed on a peripheral portion of said threaded shell;

wherein said peripheral grip member is capable of manual rotation within said cylinder block to a first position to allow trapped excessive fuel in said cylinder block to escape through said vent element disposed on a peripheral portion of said threaded shell, and to a second position to



close said vent element and to lock said glow plug into said cylinder block.

4,823,747

CYLINDER HEAD CAMSHAFT MOUNTING ARRANGEMENT

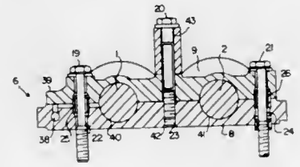
Wolf-Dietrich Wagner, Stuttgart; Rolf Klumpp, Kernen, and Thomas Hardt, Ostfildern, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 2, 1987, Ser. No. 127,464

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641129

Int. Cl.⁴ F01L *1/04, 1/26;* **F02F** *1/24*

U.S. Cl. 123—193 H **11 Claims**



1. Device for mounting two camshafts on a cylinder head housing of a multi-cylinder in-line internal combustion engine having four valves per cylinder, the device comprising bearing housing areas for the two crankshafts which are supported on the cylinder-head housing in plural transverse web means located at approximately equal distances from one another along the line of cylinders, plural longitudinal web means connected to the transverse web means, and wherein the longitudinal web means and transverse web means form a camshaft bearing frame which is separate from the cylinder-head housing and which can be screwed to the cylinder-head housing.

4,823,748

ACTUATING ARRANGEMENT

Herbert Ampferer, Sachsenheim, and Klaus Groeger, Hemmingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

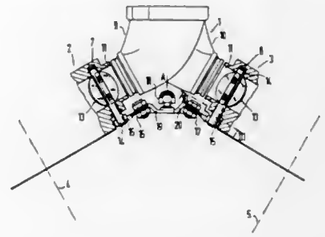
Filed Sep. 4, 1987, Ser. No. 92,882

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630432

Int. Cl.⁴ F02D *9/08*

U.S. Cl. 123—336 **12 Claims**

1. An actuating arrangement for several throttle valves belonging to suction pipes which are to be actuated synchronously, each throttle valve including a bearing shaft operatively connected with lever means extending outside of the suction pipes, a common linkage means for said lever means, yielding means between the linkage means and the bearing shafts for compensating variances in valve closed end position due to tolerance differences of the valves while maintaining synchronized opening movement thereof, and further means at



the linkage means stressing the throttle valves by means of the lever means into closed positions.

4,823,749

DEVICE FOR CONTROLLING THE INTAKE AIR IN AN INTERNAL COMBUSTION ENGINE

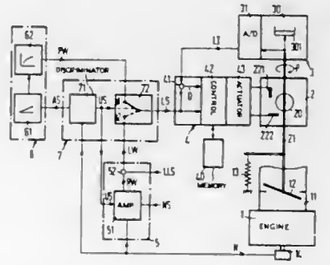
Manfred Eisenmann, Wiesentheid, and Hans Schreiber, Lappersdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 23, 1988, Ser. No. 172,223

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3711972

Int. Cl.⁴ F02D *41/16*

U.S. Cl. 123—339 **19 Claims**



1. Device for controlling the intake air of an internal combustion engine,

having a speed generator that supplies a speed value, N, that is dependent on the speed of the internal combustion engine,

having a throttle valve that is mechanically coupled to a drive motor, to a restoring spring and to a displacement transducer,

having a position control circuit that controls the drive motor dependent on a difference signal D, that is dependent on an actual position value, LI, of the displacement transducer and on a rated position value, LS, that is in turn dependent on a pedal value, PW, of a generator part for a driving operation of the internal combustion engine,

having a final control element for no-load speed that, for idling operation of the internal combustion engine, is dependent on a no-load value, LW, that a means for speed regulating provides dependent on the difference between the speed value, N, and a rated speed value, NS, for the idling speed,

and having control means for discriminating between the driving operation and the idling operation of the internal combustion engine, comprising:

the drive motor being a stepping motor whose field vector is controllable in rough and fine steps;

the throttle valve also serving as the final control element for the idling operation and directly attached to a shaft of the stepping motor; and

the rated position value, LS, for the position control circuit being dependent in the idling operation on the no-load value, LW, of the means for speed regulating.

4,823,750

AUTOMOTIVE ENGINE IDLE SPEED CONTROL DEVICE

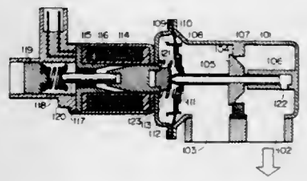
Chiaki Nlida; Tomoo Ito, both of Katsuta; Torazo Nishimiya, Mito; Takashi Iseyama, Ibaraki, and Koichiro Yamada, Mito, all of Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Engineering, both of Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,492

Claims priority, application Japan, Dec. 10, 1985, 60-277286; Apr. 18, 1986, 61-88009

Int. Cl.⁴ F02M *3/12*

U.S. Cl. 123—339 **5 Claims**



1. An idle speed control device for an automotive engine of a type that includes an intake pipe and a bypass air passage extending in bypassing relationship to a throttle valve in said intake pipe so that, when said throttle valve is in a substantially closed idle position, air flows through said bypass air passage with a pressure thereof pulsated in accordance with the engine rotation, said device including a solenoid, a plunger movable by said solenoid, and a valve means operative to control the rate of the air flow through said bypass air passage in accordance with a displacement of said plunger, wherein:

said valve means has a valve stem which is formed therein with a communication passage;

a casing for said device, said casing including a support formed integrally on said casing, one end of said valve stem being slidably supported in said support, and said support having an orifice formed therein in communication with said communication passage of the valve stem;

a diaphragm is disposed on an air inlet side of said bypass air passage and fixed to said valve stem;

a vacuum chamber is defined between said diaphragm and a casing enclosing said diaphragm, said vacuum chamber being supplied with vacuum from an air outlet side of said bypass air passage through said communication passage in said valve stem;

said vacuum chamber being provided with a vacuum-leak passage formed between said vacuum chamber and said air inlet side of said bypass air passage;

a closure member is provided on an end of said plunger in opposite relationship to an end of said communication passage in said valve stem to cooperate therewith to control the supply of vacuum into said vacuum chamber; and

said closure member and said valve stem are separated when said valve means is moved in a valve-closing direction due to an increase in the vacuum in said intake pipe, to cause engine intake vacuum to be fed into said vacuum chamber whereby the diaphragm moves said valve means in a valve-opening direction.

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4,823,751

CONTROL APPARATUS FOR AN INJECTION PUMP

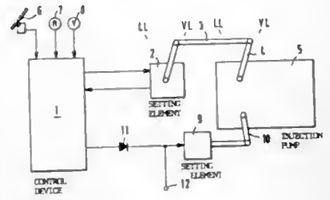
Manfred Pfalzgraf; Bernward Stoll, both of Frankfurt am Main; Kurt Probst, Schwalbach; Heinz-Friedrich Ohm, Weiterstadt, and Andreas Wokan, Darmstadt, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,132

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629265

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—359 13 Claims



1. An apparatus operable with an injection pump of a diesel motor, wherein the injection pump has a power output setting element and a fuel shut-off element, each of said elements comprising a mechanical actuator, and wherein further the output setting element is regulatable by a digital control device, the apparatus further comprising the digital control device; and wherein

the shut-off element is pulsatingly controllable from the digital control device to attain a predetermined rotational speed of the diesel motor; pulsating control by the digital control device being operative, upon indication of defect in control of the output setting element, to command the shut-off element to shut off the motor until motor rotation drops below a predetermined value of rotation, after which drop in motor rotation the digital control device commands the shut-off element to admit sufficient fuel to maintain a reduced speed of motor rotation.

4,823,752

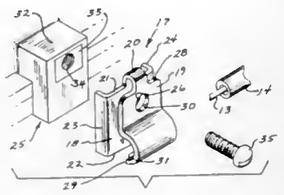
ENGINE SPEED CONTROL CABLE CLAMP

Arvo F. Uuskallio, Hartland, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Feb. 23, 1988, Ser. No. 159,380

Int. Cl.[4] F16C *1/06*

U.S. Cl. 123—400 12 Claims



1. In an internal combustion engine including an engine speed control lever on the engine and a remote speed control cable for moving said engine speed control lever to control the speed of the engine, said remote speed control cable defining a longitudinal axis and having a control wire connected at one end to a remote speed control lever and at its other end to said engine speed control lever and a casing surrounding said control wire slidably receiving said wire therein, a casing clamp assembly for fixedly mounting said casing on the engine to permit sliding movement of said control wire relative to said casing, said casing clamp assembly comprising:

a casing clamp including a flat base plate having a first fastener-receiving opening formed therethrough, a clamp plate spaced from and parallel to said base plate including a flat body portion having a second fastener-receiving opening formed therethrough disposed in alignment with said first fastener-receiving opening and an arcuate cable-receiving portion, and a non-resilient deformable link member connecting said base plate and clamp plate, said link member collapsible from a first position wherein said plates are spaced from one another to a second position wherein said plates are rigidly fixed with respect to one another upon movement of said clamp plate toward said base plate by a fastener to permit clamping of a cable between said arcuate portion and said base plate;

a fastener insertable through said first and second openings; and

mounting means on the engine for receiving said fastener and removably mounting said casing clamp thereon.

4,823,753

IGNITION TIMING CONTROLLER FOR ENGINE

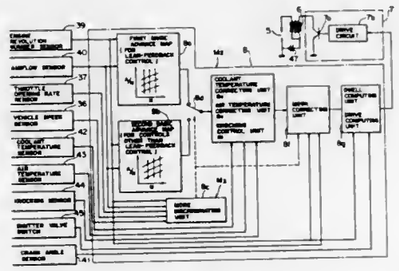
Nobuaki Murakami, and Yasuyuki Hatsuda, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 113,735

Claims priority, application Japan, Oct. 31, 1986, 61-260528

Int. Cl.[4] F02M *35/10*; F02P *5/15*

U.S. Cl. 123—417 16 Claims



3. An ignition timing controller for an engine, comprising:

a swirl control valve arranged in an intake passage of an engine displaceably depending on the state of operation of the engine between a first position where a strong swirling state is developed in an air stream flowing into an intake port of the engine and a second position where no swirling state is developed in the air stream;

an operation zone detecting means for detecting the operation zone of the engine;

a first ignition timing setting means for generating ignition timing information which is suitable when the air stream is in the strong swirling state in a specific operation zone;

a second ignition timing setting means for generating ignition timing information which is suitable when the air stream is in a state other than the strong swirling state in an operation zone other than the specific operation zone;

an ignition timing change-over means for selectively receiving ignition timing information from the first ignition timing setting means when the engine is in the specific operation zone or ignition timing information from the second ignition timing setting means when the engine is in the operation zone other than the specific operation zone, upon receipt of a detection signal from the operation zone detecting means;

a position sensor for detecting an actual position of the swirl control valve; and

a swirl ignition timing correction means for making a logical decision on a signal from the operation zone detection means and a signal from the position sensor so as to correct the ignition timing information, which has been selected by the ignition timing change-over means, with a desired correction value in at least one of as situation that the engine is in the specific operation zone and the swirl control valve is at a position other than the first position and another situation that the engine is in an operation zone other than the specific operation zone and the swirl control valve is at a position other than the second position.

4,823,754

RETAINING APPARATUS FOR FUEL INJECTOR IN INTERNAL COMBUSTION ENGINE

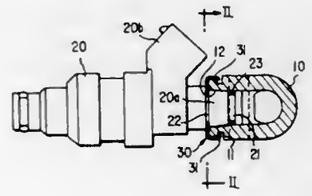
Naoki Minamoto, Toyota, and Takuya Isobe, Takaoka, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 5, 1988, Ser. No. 152,826

Claims priority, application Japan, Feb. 9, 1987, 62-017669[U]

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—470 6 Claims



1. In an internal combustion engine having an airtight main fuel delivery pipe, at least one auxiliary fuel delivery pipe branched off therefrom and at least one fuel injector, an apparatus for airtightly retaining said fuel injector on said auxiliary fuel delivery pipe, comprising:

a cylindrical portion of said fuel injector being sealingly fitted in said auxiliary fuel delivery pipe for permitting delivery of fuel from said auxiliary fuel delivery pipe to said fuel injector; and

resilient retaining means slidably mounted on main fuel delivery pipe and cooperating with said fuel injector for rotatably retaining said fuel injector on said auxiliary fuel delivery pipe,

including at least one longitudinal slot formed on said main fuel delivery pipe for slidably mounting said retaining means, said retaining means having a flange inserted in each said slot,

including a circular slot formed in said cylindrical portion, wherein said retaining means has a surface defining a circular opening with a diameter larger than that of said circular slot and a connecting opening connecting said circular opening with an edge of said retainer and having a width smaller than the diameter of said circular slot,

wherein said edge extends transverse to the direction of elongation of said main fuel delivery pipe when said retaining means is mounted thereon, said surface of said retaining means covering said surface of said main fuel delivery pipe when said retaining means is mounted thereon, and

wherein said retaining means has guide wall means for guiding said fuel injector during installation and removal, said guide wall means extending from a portion of said surface adjacent said circular opening and circumferentially opposite said connecting opening, said guide wall means comprising a planar wall extending in a direction transverse to both said surface and said direction of elongation of said main fuel delivery pipe.

4,823,755

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

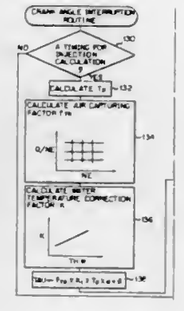
Katsuhiko Hirose, Susono; Hiroshi Noguchi, Gotenba; Toyokazu Baika, Susono; Kingo Horii, Susono; Hideo Nagaosa, Susono; Toshio Tanahashi, Susono, and Toshio Itoh, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

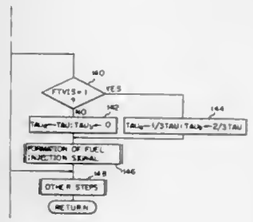
Filed Dec. 23, 1987, Ser. No. 137,528

Claims priority, application Japan, Jan. 27, 1987, 62-015101; Jan. 27, 1987, 62-015102; Jan. 27, 1987, 62-015103; Jan. 27, 1987, 62-015104; Jan. 27, 1987, 62-015105; Jan. 27, 1987, 62-015106

Int. Cl.[4] F02D *41/26*; F02M *51/00*

U.S. Cl. 123—480 20 Claims





1. An internal combustion engine comprising:

an engine body;

an intake system connected to the engine body for an introduction of air thereto;

an exhaust system connected to the engine body for a removal of a resultant exhaust gas;

means for supplying a desired amount of fuel to the engine;

means for calculating said desired amount of fuel in accordance with basic engine operating conditions including an

map means for storing data of a parameter for a compensation of the amount of air to be blown out, said map means comprising a plurality of values of said parameter, each value being determined by a combination of at least an engine load and engine speed;

means for reading a value of said parameter from said map means corresponding to a combination of an engine load and engine Speed;

means for correcting the calculated fuel amount by incorporating the calculated parameter, and;

means for generating a signal directed to the fuel supply means for introduction of a corrected amount of fuel into the engine.

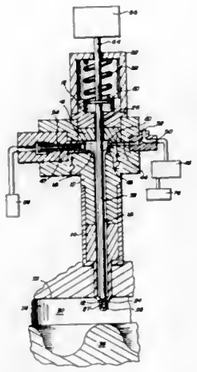
VOL 1101 ISS 4 APR 25 1989 UMI

4,823,756

NOZZLE SYSTEM FOR ENGINES

Mariusz Ziejewski, and Hans J. Goettler, both of Fargo, N. Dak., assignors to North Dakota State University of Agriculture and Applied Science, Fargo, N. Dak.

Filed Mar. 24, 1988, Ser. No. 172,402
Int. Cl.[4] F02M 67/02
U.S. Cl. 123—531 15 Claims



1. A method for effecting an improved degree of combustion of fuel and for reducing unwanted carbon buildup in an injection orifice structure feeding a combustion chamber of an internal combustion engine having at least one such combustion chamber within which a piston reciprocates through a compression stroke followed by a power stroke, said method comprising:

a. continuosuly maintaining an elevated pressure in a premix chamber by supplying thereto elevated pressure air from an air reservoir through a passage equipped with an unidirectional valve,

b. closing an open communication from the premix chamber through the injection orifice structure to the combustion chamber of the internal combustion engine, said injection orifice structure closure being effected at the time when the pressure in the combustion chamber is below that of the elevated pressure of the air in the premix chamber,

c. spurting into the premix chamber, momentarily after said injection orifice structure closure, a measured quantity of fuel under a pressure in excess of the elevated pressure of the air in said premix chamber, and

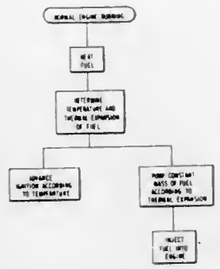
d. opening communication from the premix chamber through the injection orifice structure to the combustion chamber at a time during the compression stroke of the piston and sufficiently before said injection orifice structure closure to effect full discharge of premixed air and fuel from the premix chamber into the combustion chamber by said elevated air pressure air form the air reservoir as well as a follow up air purge by said elevated pressure air through the orifice structure to minimize residual fuel in said orifice structure before said injection orifice structure closure.

4,823,757

METHOD OF SUPPLYING FUEL TO AN INTERNAL COMBUSTION ENGINE, AND AN ENGINE USING THE METHOD

Jean E. A. Redele, 11-13 rue Forest, 75018 Paris, France

Continuation-in-part of Ser. No. 517,478, Jul. 26, 1983, abandoned. This application Jun. 4, 1987, Ser. No. 58,056
Claims priority, application France, Jul. 27, 1982, 82 13066
Int. Cl.[4] F02M 31/00
U.S. Cl. 123—557 3 Claims



1. A method of supplying a fuel to a fuel injection internal combustion diesel engine, comprising the steps of:

heating the fuel to be injected to an elevated and substantially constant temperature;

pumping said heated fuel at a higher flow rate than is required for unheated fuel so as to maintain substantially constant a mass flow rate of said fuel during said pumping and thus compensate for the thermal expansion of said fuel resulting from the heating of said fuel to said substantially constant temperature during said heating step whereby said thermal expansion tends to reduce said mass flow rate;

injecting said heated and pumped fuel into a combustion chamber of said diesel engine, whereby said diesel engine is supplied with heated fuel at the maintained substantially constant mass flow rate with said mass flow rate being defined as the mass of fuel introduced into the cylinder of said diesel engine for each degree of rotation of the crank shaft of said diesel engine; and

adjusting an ignition advance of said diesel engine in accordance with said elevated and substantially constant temperature wherein said heating, pumping and maintaining are operative during a normal running of said diesel engine.

4,823,758

MECHANICAL SUPERCHARGER

Toru Tamura, Obu; Masaki Chujo, Chiryu, and Kazuharu Jinnouchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 21, 1987, Ser. No. 87,823
Claims priority, application Japan, Aug. 22, 1986, 61-127212
Int. Cl.[4] F02B 33/38; F04C 18/08
U.S. Cl. 123—564 4 Claims

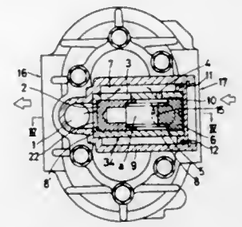
1. A mechanical supercharger for compressing a precombustion intake mixture for an internal combustion engine, comprising:

a housing having an inlet port and an outlet port;

compression means in said housing for compressing the precombustion intake mixture provided through said inlet port and discharging the compressed precombustion mixture to said outlet port, said compression means comprising two rotors mounted on parallel shafts and means at one end of said shafts for rotatably driving said shafts;

passage means separate from said compression means and comprising a bypass passage disposed in said housing adjacent another end of said shafts and connecting said inlet port and said outlet port with each other;

relief valve means disposed in said passage means and comprising means for selectively releasing outlet port pressure to said inlet port vial said passage means, wherein said relief valve means comprises an insert member positioned in said passage means, said insert member having a relief



valve passage communicating said inlet port with said outlet port, a relief valve slidably disposed in said insert member and positionable for closing said relief valve passage, and spring means for biasing said relief valve to close said relief valve passage, and

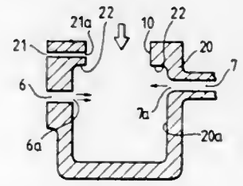
a pressure equalizing opening independent of said relief valve passage and extending between an interior of said insert member and a portion of said passage means outside of said insert member.

4,823,759

PRESSURE DERIVING PORT OF INTERNAL COMBUSTION ENGINE

Tateki Mitani, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 212,634
Claims priority, application Japan, Jun. 29, 1987, 62-161670
Int. Cl.[4] F02M 25/06
U.S. Cl. 123—568 2 Claims



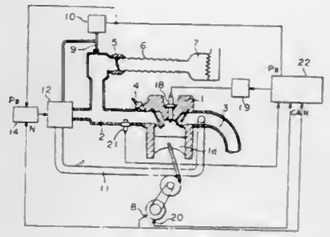
1. A structure of a pressure deriving port of an internal combustion engine having an intake manifold in which at least one of an exhaust gas recirculating port and a blow-by gas discharge port and an opening of said pressure deriving port are formed, comprising said opening of said pressure deriving port positioned on an upstream side of said at least one of said exhaust gas recirculating port and said blow-by gas discharge port and formed in a stepped-up portion of an inner wall of said intake manifold.

4,823,760

INTERNAL COMBUSTION ENGINE CONTROLLING APPARATUS

Minoru Nishida, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,662
Claims priority, application Japan, May 21, 1987, 62-126667; May 21, 1987, 62-126666
Int. Cl.[4] F02M 25/06
U.S. Cl. 123—571 9 Claims



1. An internal combustion engine controlling apparatus which comprises:

a recirculating means for adjustably returning a part of exhaust gas from an internal combustion engine to an air intake system to mix it with intake air,

a detecting means for detecting at least one operation parameter indicating operational conditions in said engine,

an oxygen sensor for detecting the concentration of oxygen in said intake air after recirculating said exhaust gas to said air intake system, and

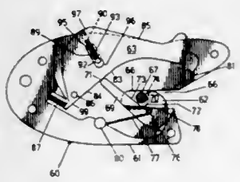
a control means which includes a memory means to store data for determining a control parameter for said engine in response to a plurality of operational conditions in the engine, the operational conditions being defined by a calculated value obtained by said operation parameter and said oxygen concentration in said intake air, and which outputs a signal for correcting said operation parameter on the basis of said data stored in said memory.

4,823,761

ADJUSTABLE COMPOUND LEVERAGE BOWSTRING RELEASE

Kenneth D. Lewis, Wisconsin Rapids, Wis., assignor to Lewis and Lewis Corporation, Nekoosa, Wis.

Filed Jun. 26, 1987, Ser. No. 67,699
Int. Cl.[4] F41B 5/00
U.S. Cl. 124—35 A 26 Claims



1. A compound leverage bowstring release which may be held in the hand of an archer, comprising:

(a) a housing assembly having an outer contour to be grasped by the hand and a slot for receiving a bowstring;

(b) a latch cam which is pivotally mounted to the housing assembly, the latch cam including a lever portion and a latching portion having a drive wall against which the bowstring pushes when placed in the slot to pivot the

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latch cam from an open position to a latched position, and a retaining wall which retains the bowstring within the slot when the latch cam is in a latched position, the lever portion pivoting through a lever pathway when the latch cam pivots between the open and latched positions;

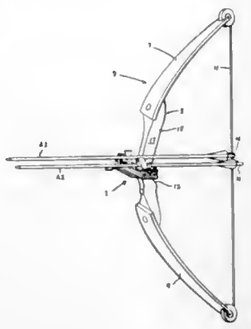
(c) a trigger cam which is pivotally mounted to the housing assembly, the trigger cam including a smooth wall which is a smooth continuous curvilinear even surface over which the lever portion always slides smoothly from engagement to disengagement without passing over corners and other impediments, and a grip portion which can be pressed by the archer's hand to pivot the trigger cam from a release position to at least one locking position where the smooth wall intersects the lever pathway of the latch cam lever portion to prevent the latch cam from pivoting from the latched position to the open position, wherein one locking position is a hand-held locking position in which the latch cam lever portion imposes a torque which tends to pivot the trigger cam toward its release position, said torque being counteracted by the archer's hand pressing the grip portion such that when the archer releases his pressure on the grip portion, the trigger cam can pivot so that the latch cam lever portion can pivot the smooth wall out of the lever pathway, thereby allowing the latch cam to pivot fully to the open position.

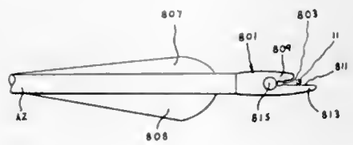
4,823,762

ARROW HOLDING AND LOADING DEVICE FOR ARCHERY BOWS

Gregory E. Pugh, 13635 Leroy, Southgate, Mich. 48195

Filed Jul. 23, 1987, Ser. No. 76,798
Int. Cl.[4] F41B *5/00, 5/02, 5/06*
U.S. Cl. 124—52 **54 Claims**





1. An arrow loader for an archery bow, said bow having a shooting position, said arrow loader comprising means for supporting a first arrow on said bow in said shooting position, means including an arrow rest for supporting a follow-up arrow on said bow in a pre-shooting position parallel to a first arrow in the shooting position, and means for moving the arrow rest and follow-up arrow transversely to its length into the shooting position wherein the arrow is aligned and ready for nocking, drawing, aiming and release by the archer.

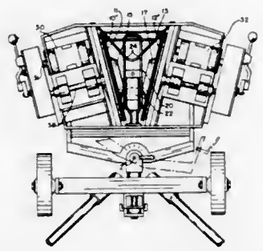
53. An arrow nock for use on arrows that are to be loaded on to a bow by sideways movement of the arrow, said nock comprising a body having a groove for the bow string, said groove dividing the body into a leading side and a trailing side with respect to said sideways movement, said leading side being substantially shorter than the trailing side whereby the arrow may be moved sideways until the inside face of the trailing side comes into contact with the bow string.

4,823,763

BALL PROJECTING APPARATUS

Larry J. Ponza, 910 Columbia St., Santa Cruz, Calif. 95060

Filed Jul. 13, 1987, Ser. No. 72,999
Int. Cl.[4] F41B *3/04*
U.S. Cl. 124—78 **17 Claims**



1. A ball throwing machine comprising:

a pair of rotary ball-contacting discs having angular opposed ball-contacting surfaces whose spacing varies between a maximum distance greater than the diameter of a ball to be thrown and a minimum distance no greater than the ball diameter;

rotary means for rotating said ball contacting members; and

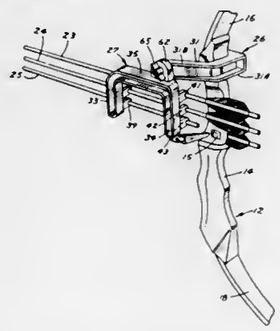
a pair of positioning discs for precisely controlling the tangential release position of the ball, each said positioning disc being associated with a particular one of said ball contacting discs, and arranged to contact the ball simultaneously with said ball contacting surfaces.

4,823,764

BOW MOUNTED QUIVER

Randy L. Knaack, 1419 Tainter St., Menomonie, Wis. 54751

Filed Jul. 16, 1987, Ser. No. 74,068
Int. Cl.[4] F41B *5/06*
U.S. Cl. 124—88 **15 Claims**



9. A quiver for mounting on a bow proximate the bow handle and arrow rest and carrying a supply of arrows, comprising:

a C-shaped frame having a first leg carrying a first row of resilient arrow holding clips and a second leg parallel to the first leg and carrying a second parallel row of resilient arrow holding clips spaced a short distance from the first row;

each arrow clip of the first row in alignment with an arrow clip of the second row forming a plurality of arrow shaft holders;

each clip having a head fixed to the frame and having an arrow shaft engaging opening and a throat communicating with the opening for insertion and removal of a portion of an arrow shaft;

mounting means for movably mounting the frame to a bow so that frame is movable between a first alert position with the first and second legs of the frame horizontally disposed when the bow is in horizontal orientation so that the first and second rows of arrow holding clips are vertically disposed in facing relationship to the bow handle on the discharge side of the bow to hold a supply of arrows in horizontal orientation in parallel, vertically aligned relationship preparatory to loading and shooting, and a second storage position with said first and second rows of arrow holding clips generally horizontally disposed to hold a supply of arrows for storage in generally parallel relationship to the bow;

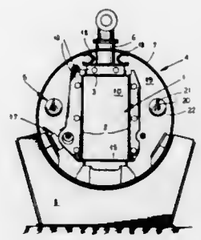
linear guide means connected to an end of one of the legs of the frame and extended to a position proximate the arrow rest on the bow handle when the frame is in the first position, said guide means located beneath the arrow holding clips on the legs whereby an arrow shaft released from the clips can drop by gravity to the guide means for guidance to a position proximate the arrow rest on the bow handle.

4,823,765

STEAM CHEST MOLD FOR MAKING A RECTANGULAR-SECTION FOAM BLOCK

Franz-Josef Bröhl, Geldern-Pont, and Lothar Finck, Duisburg, both of Fed. Rep. of Germany, assignors to Munchow & Huhne Maschinenbaugesellschaft mbH, Duisburg, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,372
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 3700479
Int. Cl.[4] B29D *27/00*
U.S. Cl. 425—4 R **10 Claims**



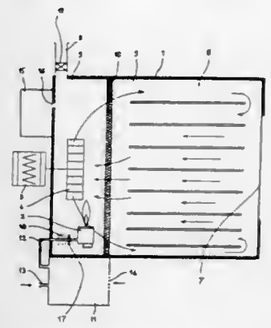
1. In a mold for making a rectangular foam block from a plurality of blowable and sinterable plastic particles, especially prefoamed polystyrene pieces, with the help of steam comprising a rectangular inner mold with a plurality of inner mold walls movable from each other and an outer mold tightly closable surrounding said inner mold and having at least one steam inlet and an air evacuation and vacuum pump connector pipe, the improvement wherein said outer mold comprises a pipelike pressurizable container with a front mold wall comprising a pressure-tight door and with a block ejector mounted in a rear mold wall which can be pushed approximately perpendicularly to said rear mold wall into said inner mold, the inner mold side walls of said inner mold walls being pivotable with the upper ends of said inner mold side walls on the associated outer ends of an inner mold cover wall of said inner mold walls and being mounted with the lower ends of said inner mold side walls on at least one eccentric drive by means of which said inner mold side walls are movable from each other and pressable upwardly from each other.

4,823,766

GAS STEAM OVEN

Raymond Violi, Faverges, France, assignor to SC Bourgeois, Faverges, France

Filed Dec. 30, 1987, Ser. No. 139,436
Claims priority, application France, Aug. 1, 1987, 87 00413
Int. Cl.[4] A21B *1/08*
U.S. Cl. 126—20 **8 Claims**



1. A direct heating and convection gas oven, including an oven enclosure intended to contain the material to be heated, at least one gas burner placed inside the enclosure, a turbine stirring the atmosphere inside the enclosure, a burnt gas discharge pipe, an intermediate duct connecting the burner to external equipment including an air booster and means for producing and feeding into the intermediate duct an appropriate mixture of air leaving the booster and gas coming from a gas intake duct, further comprising:

a steam generator and a duct for bringing the steam produced by the steam generator into the oven enclosure,

heating means for maintaining the gas burner permanently at a temperature greater than the steam condensation temperature, thus avoiding the formation of liquid water in or on the gas burner,

means for preventing the steam present in the oven enclosure from penetrating into the intermediate duct.

4,823,767

APPARATUS FOR STEAMING FOOD

E. Wüst, Kamorastrasse 4, CH-9030 Abtwil, Switzerland

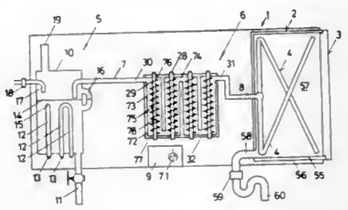
PCT No. PCT/CH86/00007, § 371 Date Nov. 4, 1986, § 102(e) Date Nov. 4, 1986, PCT Pub. No. WO86/04221, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 20, 1986, Ser. No. 913,667
Claims priority, application Switzerland, Jan. 21, 1985, 253/85; European Pat. Off., Jun. 24, 1985, 85810290.8
Int. Cl.[4] A21B *1/00*
U.S. Cl. 126—20 **17 Claims**

1. A steamer comprising:

container means for receiving food to be treated and having a) steam distribution means therein, b) walls and c) an opening,

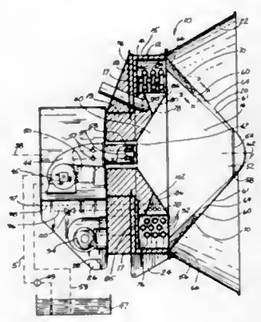
the steam distribution means having steam inlet means and perforated legs, perforations or orifices of which are substantially adjacent the walls of the container means, said steam distribution means comprising a substantially U-shaped tube having two leg portions connected by a web portion, and wherein said leg portions adjoining ends of said web portion are positioned toward side walls of the container means, said leg portions being bent out of a

planar U-shape in opposite directions, extending diagonally along said side walls, and said web portion being positioned toward a rear wall of the container means,
door means for closing the opening in said container means,
means for generating steam outside of said container means comprising:
(a) first heater means having inlet means and outlet means,
(b) means for conducting water from a cold water source to the inlet means,
(c) second heater means having inlet means and outlet means,



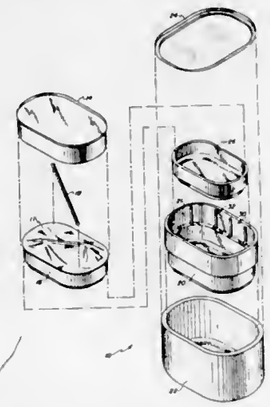
(d) first means for conducting steam from the outlet means of the first heater means to the inlet means of the second heater means,
(e) second means for conducting steam from the outlet means of said second heater means to the steam inlet means in the web portion of said steam distribution means, and
(f) control means for controlling operation of elements (a) through (e) of said means for generating steam.

4,823,768
RADIANT HEATER
Gerhard Schmidt, 5325-93 Street, Edmonton, Alberta, Canada T6E 5R4, and Heinz Schmidt, AM Burgfeld 32, 5042 Erftstadt Lechenich, Fed. Rep. of Germany
Filed Nov. 19, 1987, Ser. No. 122,383
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—91 R **11 Claims**



1. A radiant heater, comprising:
a. a housing;
b. a combustion chamber in said housing, said combustion chamber defining a central axis and having an intake end having an intake opening thereat and an exhaust end and having a discharge opening thereat, said chamber defining a flow passage for products of combustion along said central axis;
c. a heat exchange chamber surrounding said intake end of said combustion chamber;
d. a heat exchanger disposed within said heat exchange chamber, said heat exchanger having a pipe formed into a plurality of coils one end of which is adapted to be connected to means for circulating fluids;
e. radiator means surrounding said combustion chamber, said radiator means defining said exhaust end of said combustion chamber for radiating heat radially outwardly of said exhaust end of said combustion chamber, said radiator means having a plurality of fluid flow passages disposed in planes containing said central axis, each said passage having an inlet end communicating with said combustion chamber and an outlet end opening into said heat exchange chamber, whereby products of combustion enter said passage inlets and flow therealong and into said heat exchange chamber; and
f. reflector means surrounding said radiator means for reflecting axially outwardly of said housing heat radiated by said radiator means.

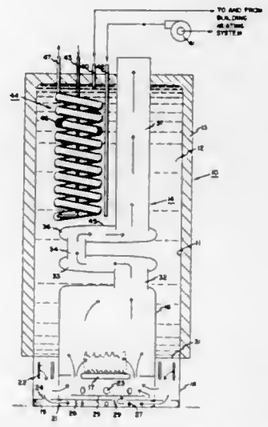
4,823,769
SELF HEATING FOOD RECEPTACLE
Najl Semaan, 1929 N. Pine Island Rd., Plantation, Fla. 33322
Filed Oct. 5, 1987, Ser. No. 105,085
Int. Cl.[4] F24J *1/00*
U.S. Cl. 126—263 **6 Claims**



1. A self-contained food heating system, comprised of:
a vessel containing food to be heated;
a hermetically sealed reaction chamber disposed below said food vessel, said reaction chamber containing a rupturable water-containing vessel and a quantity of calcium oxide;
a relatively rigid rod disposed between said food vessel and said reaction chamber in juxtaposition with said water containing vessel wherein downward movement of said rod causes said water containing vessel to rupture, releasing a supply of water therein into reactive contact with said calcium oxide, permitting said water to take part in a exothermic reaction with said calcium oxide;
said reaction chamber is generally rectangular, said water containing vessel being transversely disposed therein and conforming to the diagonal length of said rectangular chamber, said water containing vessel thereby held fast against shifting movement;
a generally resilient housing for receiving said reaction chamber and said food containing vessel in spaced, stacked relation; and
a raised peripheral shoulder portion integrally connected to said housing for supporting said food containing vessel in spaced relation above said reaction chamber;
said food containing vessel being movable relative to said water containing vessel to thereby urge said water containing vessel into rupturing contact with said rigid rod;

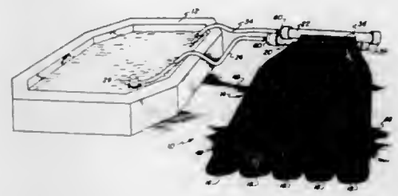
said housing having a bottom surface means for supporting said reaction chamber, said housing having a yieldable lower peripheral corner section means for causing said bottom surface means to bow upwardly thereby causing said reaction chamber to move upwardly which in turn moves said water containing vessel into rupturing engagement with said rigid rod.

4,823,770
COMBINATION HYDRONIC SPACE HEATER AND TANKLESS HOT WATER HEATER
Herbert H. Loeffler, Arlington, Mass., assignor to Logical Heating Systems, Inc., Manchester, Conn.
Filed Aug. 3, 1987, Ser. No. 80,777
Int. Cl.[4] F24H *1/00*; F22B *5/00*
U.S. Cl. 126—362 **3 Claims**



1. A combination space heating and tankless hot water heater, comprising:
(a) a vertical closed tank, having upper and lower ends, adapted to hold a large reservoir of liquid heat transfer medium therewithin;
(b) a high-efficiency gas/liquid heat exchanger disposed within said tank, comprising:
(i) a generally cylindrical combustion chamber disposed at said lower end of said tank;
(ii) a plurality of pancake-shaped cylindrical heat exchange elements, having diameter dimensions substantially greater than heighth dimensions, lying one above another, and with their diameters perpendicular to the longitudinal axis of said tank;
(iii) risers, having diameters substantially less than the diameters of said pancake-shaped heat exchange elements, serially connecting said heat exchange elements to each other and to said combustion chamber; and
(iv) a stack connected to the uppermost of said heat exchange elements and rising vertically through said upper end of said tank; whereby, combustion gases generated in said combustion chamber can flow upwards through said chamber, then serially through said heat exchange elements, and then through said stack to exit said tank;
(c) burner means disposed within said generally cylindrical combustion chamber to provide hot gases to flow upwards through said gas/liquid heat exchanger for transfer of heat from said gases across the walls of said gas/liquid heat exchanger and to said heat transfer medium;
(d) means for withdrawing and returning said heat transfer medium from and to said tank to supply said heat transfer medium to means for forced circulation for space heating;
(e) heat exchanger means disposed within said tank for receiving cold water and supplying domestic hot water; and
(f) a baffle arrangement disposed in said lower end of said combustion chamber and lying underneath said burner substantially preventing any surface upon which said tank is supported from receiving radiant heat transfer from said burner and causing some combustion air to said burner means to flow across and cool a portion of the surface upon which said combination space heating and tankless hot water heater is supported.

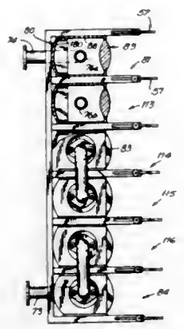
4,823,771
APPARATUS FOR SOLAR HEATING
Jurgen Meaning, 7490 SW. 104 St., Miami, Fla. 33156
Filed Aug. 10, 1987, Ser. No. 83,182
Int. Cl.[4] F24J *2/24*
U.S. Cl. 126—448 **3 Claims**



1. A solar collector array adapted to receive water from a spa, to heat the received water and then to conduct the heated water back to the spa, the solar collector array including:
cylindrical inlet manifold having an axial opening by which water from the spa may be received and having a series of equally spaced radial holes extending along its length;
a cylindrical outlet manifold having an axial opening by which heated water may be conducted back to the spa and having a series of equally spaced radial holes extending along its length;
a plurality of flexible tubes arranged in a plurality of sets of tubes with each of the tubes having a first end attached to a hole in the inlet manifold and a second end attached in a hole of the outlet manifold thereby forming a flow path between the inlet and outlet manifolds with a transverse centerline defined midway between the manifolds and the ends of the tubes when said array is extended; and
a plurality of webbing components arranged side-by-side and in pairs with each pair having one webbing component on one side of the transverse centerline and another webbing component on the other side of the centerline with first ends of the webbing components adjacent and spaced from a manifold to define a first space in the direction of the lengths of the tubes between the first ends of each webbing component and the adjacent manifold and a second space in the direction of the lengths of the tubes between a second end of each webbing component and a second end of an associated webbing component of each pair with each webbing component receiving tubes from one of said sets of tubes from one adjacent manifold only whereby the manifolds may be located parallel with respect to each other a distance equal to the length of the tubes with each pair of webbing components coupling to only one set of tubes, each webbing component being separated from its laterally adjacent webbing component whereby the tubes may be folded with the manifolds located parallel with and adjacent to each other with the webbing components on one side of the centerline along with their received tubes being laterally separated from each other with the lateral separations therebetween filled by separated webbing components from the other side of the centerline.

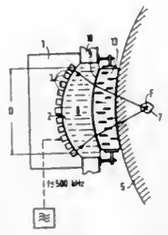
VOL 1101 ISS 4 APR 25 1989 UMI

4,823,772
APPARATUS AND METHOD FOR EXTRACTING FOCUSED SOLAR RADIANT ENERGY
Erwin Lenz, 180 Cabrini Blvd., New York, N.Y. 10033
Filed Oct. 5, 1987, Ser. No. 104,465
Int. Cl.[4] F24J *2/24*
U.S. Cl. 126—448 17 Claims



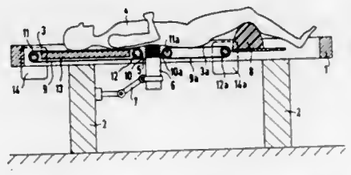
1. A solar heat collecting apparatus comprising a solar collector panel; rotatable support means for rotatably supporting the solar panel about a horizontal axis and a vertical axis; and drive means for rotating the panel about the two axes; the collector panel comprising a battery of individual collector units, each collector unit comprising an elongated trough member, a concave reflective surface forming at least a portion of the interior surface of the trough, and a fluid-carrying pipe extending longitudinally within the trough member, the longitudinal axis of the pipe being substantially coincident with the focal line of the concave reflector surface, the fluid-carrying pipe being formed of material that is substantially transparent to solar radiation; and a linear focusing lens substantially covering and extending over the concave reflective surface, the focal line for the linear lens being substantially coincident with the longitudinal axis of the fluid-carrying pipe.

4,823,773
EXTRACORPOREAL SHOCK WAVE SOURCE WITH A PIEZOELECTRIC GENERATOR
Georg Naser, Zirndorf; Helmut Reichenberger, Eckental, and Hubert Schwark, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Apr. 1, 1987, Ser. No. 32,603
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1986, 3610818
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A 5 Claims



1. An extracorporeal shock wave source positionable against a patient for directing shock waves at a selected focus locating within said patient, comprising:
a piezo-electric ultrasound generator means for generating pressure pulses, said generator means having a diameter of at least about 10 cm and an effective radius of curvature for focussing of less than or equal to about 20 cm;
means for operating said generator at an ultrasound frequency less than or equal to about 500 kHz; and
transmission means connected between said ultrasound generator means and said patient for propagating said pressure pulses toward said focus location, said transmission means including a propagation medium selected form the group consisting of glycerine, and ethylene glycol.

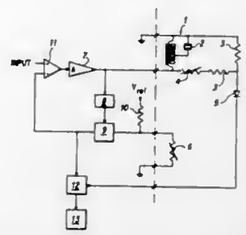
4,823,774
COMBINATION PATIENT SUPPORT TABLE AND SHOCK WAVE TUBE
Franz Grasser, Eggolsheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jun. 5, 1987, Ser. No. 58,760
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 8620535[U]
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A 2 Claims



1. A patient support table in combination with a shock wave tube for generating shock waves serving for disintegrating calculi in the body of a patient, said table including a bearing surface having an opening in which the shock wave tube is arranged, the improvement comprising conveying means in the form of conveyor belts arranged at both sides of the opening whose ends facing one another limit the opening, by means of which the patient is displaceable on the bearing surface relative to the opening, a drive motor for each conveyor belt and a control means for the drive motors being provided for selectively driving the conveyor belts synchronously and in the same direction and for driving the conveyor belts independently of the movement of one another.

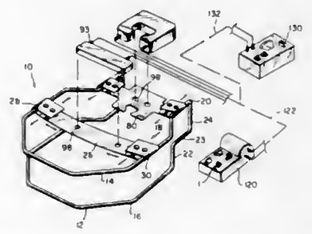
4,823,775
APPARATUS FOR TREATING A PATIENT WITH ULTRASONIC WAVES
Petrus P. M. Riadt, Delft, Netherlands, assignor to N.V. Vereenigde Instrumentenfabrieken Enraf-Nonius, Netherlands
Continuation of Ser. No. 776,745, Sep. 16, 1985, abandoned. This application Sep. 9, 1987, Ser. No. 96,316
Claims priority, application Netherlands, Sep. 14, 1984, 8402845
Int. Cl.[4] A61H *1/00*
U.S. Cl. 128—24 A 4 Claims

1. Apparatus for treating a patient with ultrasound waves, comprising:
means for receiving an electrical signal of ultrasonic frequency and adjustable amplitude;
an amplifier having an input and an output, the input receiving an input signal from the receiving means depending upon a desired intensity of the ultrasound waves and the output providing an output electrical signal,
a treatment head,
means for detachably connecting the treatment head to the output of the amplifier,
said treatment head having a converter element with means for converting the electrical output signals into ultrasound waves and an adjustable element with means for indicating the efficiency and the impedance of the converter element, wherein the apparatus further includes a controlling means having first and second inputs and an output,



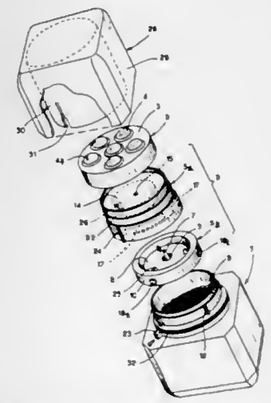
the first input being connected to the amplifier output, wherein said connecting means connect the adjustable element to the second input of the controlling means, said controlling means outpnt being coupled to the amplifier to control the electrical output signal in dependence on the adjustment of the adjustable element.

4,823,776
ADJUSTABLE CRANIAL HEAD SUPPORT
J. W. Foster, and W. June Foster, both of 1049 Jamestown Crescent, Norfolk, Va. 23508
Filed Jan. 26, 1988, Ser. No. 148,481
Int. Cl.[4] A61H *1/00*
U.S. Cl. 128—33 14 Claims



10. An adjustable head support for ensuring passive immobilization of a patient's head while the patient is lying in a prone position comprising:
a base support having a lower rail and an upper rail; said lower and upper rails formed from a continuous piece of wire bent into a pair of multi-sided shapes arranged in lower and upper parallel planes, and having one side of each lower and upper multi-sided shapes open, with short horizontal wire portions on the open sides of said shapes extending away from said shapes and parallel to the spinal axis of a patient utilizing said adjustable head support and in the same planes as said multi-sided shapes, said short horizontal wire portions of said lower and upper multi-sided shapes being interconnected by short vertical portions of said continuous piece of wire such that a spring hinge action is effected between said lower and upper rails, said spring hinge action having an effective pivot point near the base of the patient's neck;
said lower rail for engaging a support surface such as a mattress; and
said upper rail having a first strap for supporting a pad upon which a patient's chin rests, said strap laterally adjustable in connectors attached on said rail whereby the vertical distance from the mattress to the strap may be set; said upper rail having a second strap for supporting a pad upon which a patient's forehead rests, said strap laterally adjustable in connectors attached to said rail, and said connectors longitudinally adjustable on said rail whereby the vertical distance from the mattress to the strap may be set, and whereby the distance between the first strap and the second strap may be adjusted; and said pads having hydraulic means to enhance the comfort of a patient while lying in the prone position.

4,823,777
DEVICE FOR MANUALLY MASSAGING THE CUTANEOUS COVERING
Antonin Goncalves, Groslay, and Philippe Osmond, Aulnay-la-Riviere, both of France, assignors to L'Oreal, Paris, France
Filed Jul. 14, 1987, Ser. No. 73,254
Claims priority, application France, Jul. 21, 1986, 86 10531; Sep. 10, 1986, 86 12653
Int. Cl.[4] A61H *15/00*; B67D *3/00*
U.S. Cl. 128—57 10 Claims



1. In a device for manually massaging the cutaneous covering simultaneously with application thereto of a liquid or pasty product, said device comprising:
(a) reservoir means containing the product to be applied;
(b) applicator means including ball means, housing means holding said ball means, and means to said housing means defining at least one opening on the side nearer the reservoir means for admitting the product to be applied from the reservoir means to the internal volume of said housing means; and
(c) obturator means between the reservoir means and said applicator means;
the improvement wherein:
(d) said obturator means comprises
(da) a first movable obturator part, said first obturator part including a central stud and means defining at least one opening to allow the product to be applied to pass through said first obturator part, and
(db) a second actuating obturator part, said second obturator part comprising a disc, means defining a central hole in said disc, and a skirt extending downwardly from said disc and surrounding at least said first obturator part;
(e) said applicator means includes means releasably fixing it to said second obturator part;
(f) said first and second obturator parts comprise cooperating means to ensure relative displacement between said first and second obturator parts to a first relative position in which said central stud closes said central hole and a

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second relative position in which the central hole is completely freed; and

(g) said cooperating means of said first and second obturator portions are operative to pass in a continuous movement from said first relative position to said second relative position;

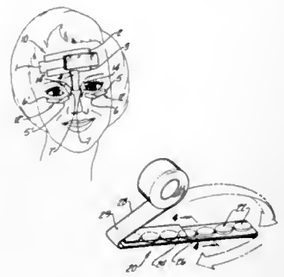
said reservoir comprising a neck on which said second obturator part is fixed, and a stop at the base of said neck; said skirt of said second obturator part comprising a projection and wherein said device includes a cap which is able to be fitted on said neck, said cap including means defining a slot which cooperates with both said projection and said stop when said cooperating means of the first and second obturator parts are in said first relative position.

4,823,778

FACIAL EXERCISE METHOD

Carol A. Ewing, 7011 Biscayne, Milford, Mich. 48042

Filed Apr. 17, 1985, Ser. No. 724,282
Int. Cl.⁴ A61F *5/08*; A63B *21/12*
U.S. Cl. 128—76 B **9 Claims**



1. The method of exercising facial muscles for the purpose of tightening the skin comprising the steps of:

selecting a muscle underlying the region of skin to be tightened,

applying a primary stiffener by adhesion to the surface of the skin adjacent the selected muscle and applying secondary stiffeners by adhesion to other regions of skin which might be creased by contraction of the selected muscle,

attaching a weight to the primary stiffener,

and using the selected muscle repeatedly to lift and lower the weight in a controlled manner a predetermined number of times,

whereby the selected muscle is shortened and the skin overlying it is tightened.

4,823,779

PENILE IMPLANT WITH COMPENSATOR

Mark D. Daly, Milwaukee; James T. Maerzke, Kenosha; Jeffrey R. Gengler, Milwaukee, and Robert E. Trick, Racine, all of Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed May 15, 1987, Ser. No. 50,746
Int. Cl.⁴ A61F *2/26*
U.S. Cl. 128—79 **1 Claim**



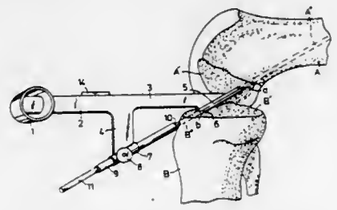
1. In a self-contained penile implant which comprises an elongated, generally cylindrical smooth walled member having a conical tip and an anchoring base, said member containing in its interior a pressure chamber, a reservoir for pressurizing fluid, a pump operatively connected to the reservoir and pressure chamber for transferring fluid from the reservoir to the pressure chamber, a relief valve operatively connected to the pressure chamber for monitoring the pressure in the pressure chamber at a safe level and a compensator which absorbs sharp pressure peaks in the pressure chamber, the improvement which comprises a generally cylindrical compensator having a relatively large diameter first end connected to the pressure chamber, a relatively smaller second and connected to the relief valve and a double opposed radii intermediate section extending between the first and second ends, said intermediate section being flexible so that the overall length of the cylindrical member can be reduced without disrupting its smooth outer wall by moving the first end of the compensator back towards the relief valve and over the intermediate section.

4,823,780

DRILL GUIDING AND ALIGNING DEVICE

Magnus G. Odensten, Hjulsbrovägen 104, S-582 69 Linköping, and Jan I. Gillquist, Stjärnorpsvägen Berg, S-590 61 Vreta Kloster, both of Sweden

PCT No. PCT/SE85/00114, § 371 Date Nov. 5, 1985, § 102(e) Date Nov. 5, 1985, PCT Pub. No. WO85/04092, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 13, 1985, Ser. No. 803,401
Claims priority, application Sweden, Mar. 14, 1984, 8401427
Int. Cl.⁴ A61F *5/04*
U.S. Cl. 128—92 VD **2 Claims**



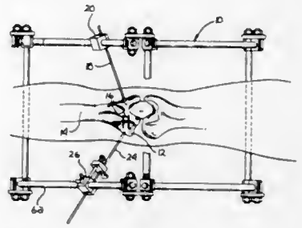
2. A device for aligning and guiding a reciprocatingly movable drill for drilling a hole through at least either the tibia or the femur bones forming a knee joint, in which hole end of an interior cruciate ligament substitute is intended to be inserted and thereafter attached to the bone, the device including a first aligning and guiding element (5; 26) intended for insertion into the space between the condyles (A') of the femur, and a second aligning and guiding element (9; 24), means for connecting the first and second aligning and guiding elements with the second element in line with the first element and adapted to be located externally of said space and spaced from the first element at a distance for bridging a part of the tibia or the femur (B, A) located adjacent the space, characterized in that the ends of the first element (5 26) are spaced apart at a distance corresponding to the length of the cruciate ligament so as to abut both the femur and tibia (A, B) respectively at the two ligament attachment points thereof, that the device further comprises a handle (2; 21) adapted to be set parallel to the femur and that the aligning and guiding elements (5, 9; 26, 24) form an angle of approximately 28° with said handle.

4,823,781

METHOD AND APPARATUS FOR PERCUTANEOUS FRACTURE REDUCTION AND FIXATION

William J. Buchanan, 118 Montreal St., Playa del Rey, Calif. 90293

Filed Jul. 2, 1987, Ser. No. 69,048
Int. Cl.⁴ A61F *5/04*
U.S. Cl. 128—92 Z **12 Claims**



1. An improved fracture reduction apparatus of the type in which at least one first pin and at least one second pin are secured to a rigid frame, said first pin for attachment to a fractured bone and said second pin having a fixed proximal end for attachment to a bone fragment, wherein the improvement comprises:

means for securing said second pin to the frame, said securing means including means for imparting controlled motion to said second pin relative to the frame such that said second pin moves substantially axially without rotation about its axis; and

means for fixing said second pin in a predetermined position;

wherein the means for imparting motion comprises:

a first block having means for attachment to the frame;

a second block having a first hole therethrough for slideable insertion of said second pin;

locking means for securing said second pin within said second block; and

a threaded screw axially captive in said first block and engaging mating threads in a second hole in said second block, said second hole approximately parallel to said first hole;

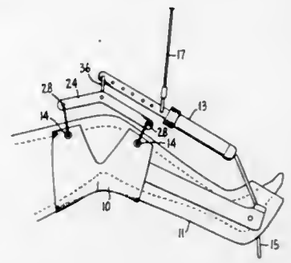
whereby rotation of said threaded screw causes axial movement of said second pin.

4,823,782

LEG SLING

Roy Y. Powlan, 1 Chapel Dr., Lafayette, Calif. 94549

Filed Dec. 31, 1984, Ser. No. 688,075
Int. Cl.⁴ A61F *5/40*
U.S. Cl. 128—94 **6 Claims**



1. A sling for supporting the leg of a patient at the knee, said sling comprising:

(a) a substantially rectangular fabric panel having two pairs of fastening means disposed adjacent the corners of the panel,

(b) said panel being foreshortened along a central axis, and

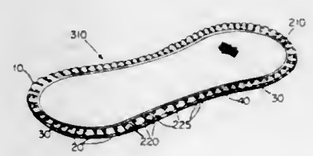
(c) means for suspending said panel by said fastening means, one pair of said fastening means being suspended from a point below the patient's knee and the other of said pair of fastening means being suspended from a point above the patient's knee.

4,823,783

ADHESIVE-FREE BONDING OF CONTINUOUSLY MOVING WEBS TO FORM LAMINATE WEB AND PRODUCTS CUT THEREFROM

William Willhite, Jr., Cincinnati; Gerald M. Weber, Loveland, and Godfrey Retier, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 835,068, Feb. 28, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 156,394
Int. Cl.⁴ A61L *15/00*
U.S. Cl. 128—156 **7 Claims**



1. A resiliently compressible bandage structure suitable for absorbing bodily discharges, said structure being bonded on-the-fly by the input of mechanical energy thereto, said structure comprising:

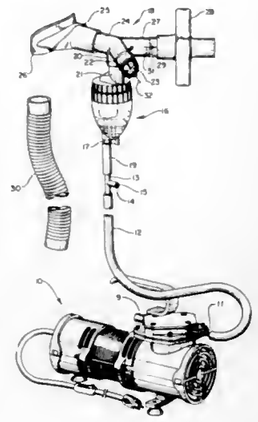
(a) a first body contacting layer comprised of a fluid-pervious polymeric material which is softenable by the input of mechanical energy thereto;

(b) a subjacent moisture absorbent layer comprised of a resiliently compressible material which exhibits a significant interstitial void volume; and

(c) a moisture barrier layer comprised of a fluid-impervious polymeric material which is softenable by the input of mechanical energy thereto, said moisture barrier layer underlying said moisture absorbent layer and being fused to said body contacting layer adjacent the perimeter of said bandage through the interstitial void volume in said resiliently compressible moisture absorbent layer, said moisture barrier layer being continuously fused to said body contacting layer to form a substantially continuous moisture-impervious seal adjacent the entire perimeter of said bandage to prevent leakage of absorbed bodily discharges contained within said resiliently compressible moisture absorbent layer from reaching the edges of said bandage.

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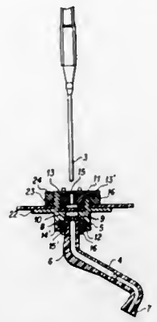
4,823,784
AEROSOL INHALATION APPARATUS
Maurice E. Bordoni, Westtown, and Ephraim Lieberman, Suffern, both of N.Y., assignors to Cadema Medical Products, Inc., Middletown, N.Y.
Continuation-in-part of Ser. No. 928,826, Nov. 10, 1986, Pat. No. 4,703,753, which is a division of Ser. No. 779,426, Sep. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 707,387, Mar. 1, 1985, Pat. No. 4,398,704, which is a division of Ser. No. 642,718, Aug. 22, 1984, Pat. No. 4,510,929, which is a continuation of Ser. No. 360,370, Apr. 30, 1982, abandoned. This application Nov. 2, 1987, Ser. No. 115,903
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—200.14 25 Claims



1. An aerosol inhalation apparatus for supplying an aerosol mist to a subject comprising:
a disposable aerosol inhalation device, the device including a nebulizer having a compressed air inlet and an outlet for an aerosol mist generated therein, a first conduit in fluid communication with said outlet of said nebulizer, a second conduit having a first one-way valve therein for providing one-way fluid communication from ambient to an intersection between said first conduit and said second conduit, a third conduit providing fluid communication from the intersection between said first conduit and said second conduit, a filter coupled to said third conduit, a second one-way valve positioned in said third conduit for providing one-way fluid communication from the intersection to ambient via said filter and fourth conduit providing fluid communication between an airway of a patient and the intersection;
a source of compressed air; and
means coupling said source of compressed air to said compressed air inlet of said nebulizer for delivering compressed air thereto.

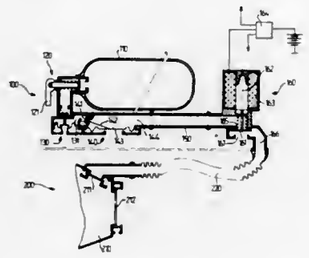
4,823,785
DEVICE ASSOCIATED WITH A BREATHING MASK FOR ALLOWING THE INTRODUCTION OF LIQUID SUBSTANCES FOR THE USER, AND THE ASSOCIATED BREATHING MASK
Federico Mancosu, Milan, and Giosue' Citelli, Abbiategrasso, both of Italy, assignors to Industrie Pirelli S.p.A., Italy
Continuation of Ser. No. 701,017, Feb. 12, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 936,943
Claims priority, application Italy, Feb. 29, 1984, 19842 A/84
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—202.15 10 Claims

3. A device, adapted for use with a breathing mask having an aperture, for introducing liquid substances to a user of the mask from an external container including a penetrating element attached to one end thereof, said device comprising a substantially tubular conduit having two ends to be (i) disposed inside the mask and (ii) secured at one end to the aperture in the mask, such that the penetrating element can be inserted through the aperture in the mask into said conduit, said conduit including at least one curvilinear elbow means, said elbow means being elastically deformable from a first idle position adapted to be remote from the user's mouth to a second position adapted to



be in proximity of the user's mouth responsive to the penetrating element of the container being introduced inside said conduit, via the aperture of the mask, through the entire elbow means and from said second position to said first position responsive to the penetrating element being removed from said elbow means, said conduit comprising a greater wall thickness along the one side thereof adapted to be closest to the user's mouth in said first position for a predetermined arc in cross-section at said elbow means.

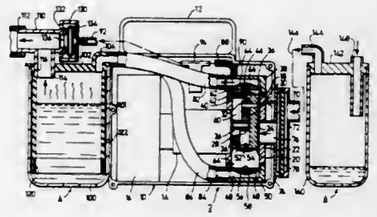
4,823,786
BREATHING EQUIPMENT FOR PROVIDING PROTECTION AGAINST DROWNING, IN PARTICULAR FOR THE DRIVER OF A MOTORIZED WATER VESSEL
Gérard Silber, Chilly-Mazarin, France, assignor to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.), Massy Cedex, France
Filed Mar. 31, 1988, Ser. No. 175,712
Claims priority, application France, Apr. 2, 1987, 87 04626
Int. Cl.[4] A68B *7/02;* B63C *11/18*
U.S. Cl. 128—202.27 4 Claims



1. Equipment for providing protection against drowning, in particular for use by the driver of a motorized water vessel, the equipment comprising:
a supply of air under pressure, feeding a regulating pressure expander;
a face mask including a breathe-in valve and a breathe-out valve; and

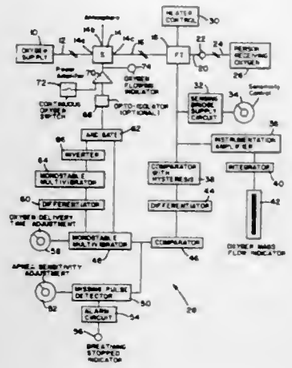
switch means for selectively connecting the breathe-in valve of the face mask either to the regulating pressure expander or else to the atmosphere, said switch means being constituted by an electrically controlled valve permanently powered via a safety inertia switch, such that the breathe-in valve of the face mask is connected to the surrounding air so long as the electrically controlled valve is fed with electricity, and that in the event of the inertia switch interrupting the supply of electricity to the electrically controlled valve, because of the vessel being subjected to a shock, the breathe-in valve of the face mask is immediately switched to the regulating pressure expander.

4,823,787
PORTABLE VENTILATOR APPARATUS
Carmeli Adahan, 1316/02 Ramot 03, Jerusalem 97 725, Israel
Filed Jul. 9, 1987, Ser. No. 71,327
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—203.27 14 Claims



1. Portable ventilator apparatus particularly useful for providing mechanical ventilation of a patient at home or during transport, comprising:
a pump unit including a negative-pressure chamber having an inlet for drawing air into the chamber, and a positive-pressure chamber having an outlet for outletting pressurized air therefrom to the patient; said pump unit including a pair of reciprocating pistons each of a diameter of less than 5 cm, and a drive for driving said pistons through reciprocatory cycles, whereby there is produced a relatively low volume-displacement during each reciprocatory cycle;
a separate humidifier unit having a compartment for a humidifying liquid, an inlet into said compartment and connectable to the positive-pressure outlet of the pump unit, an outlet from said compartment, and a delivery tube connected to said latter outlet for delivering pressurized, humidified air to the patient;
a separate fluid collector unit including a first port connectable to the negative-pressure inlet of the pump unit, and a second port connectable to the patient's lungs for draining fluid accumulating therein;
an exhalation valve assembly including a venting port for venting the delivery tube to the atmosphere, a valve member movable either to a closed position for disconnecting said delivery tube from said ventilating port to effect inhalation into the patient's lungs via said delivery tube, or to an open position for connecting said delivery tube to said ventilating port to permit exhalation from the patient's lungs;
and control means for controlling said valve member to control said inhalation and exhalation.

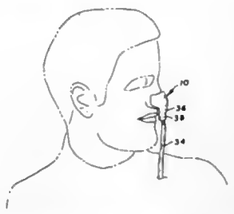
4,823,788
DEMAND OXYGEN CONTROLLER AND RESPIRATORY MONITOR
Richard F. M. Smith, 1571 Mulberry Ave., Upland, Calif. 91786, and Robert G. Irvine, 1393 Carthage Ct., Claremont, Calif. 91711
Filed Apr. 18, 1988, Ser. No. 182,456
Int. Cl.[4] A62B *9/02*
U.S. Cl. 128—205.24 16 Claims



1. In an in vivo respiratory system, a method of supplying a mass of breathing gas, such as oxygen, to a person during each of the very initial stages of such person's inspiration cycles to maintain the proper arterial oxygen tension in such person's bloodstream and to significantly reduce the consumption of oxygen by such person without reducing thereby such arterial oxygen tension required to be maintained in such person's bloodstream to support life, comprising the steps of:
supplying such person the mass of oxygen by connecting such person to said source of breathing gas;
using valve means to control the mass of oxygen being supplied to such person;
flowing such gas through mass flow sensing means to derive an electrical output voltage proportional to the magnitude and direction of such mass flow of gas through said mass flow sensing means;
operatively associating circuitry means with said valve means to control said valve means;
inputting such electrical output voltage derived from said mass flow sensing means to said circuitry means to thereby control said valve means;
operatively associating heater means with said mass flow sensing means;
thermally connecting upstream and downstream active resistor arms of a Wheatstone bridge with said Wheatstone bridge determining mass flow;
operatively associating heater control circuit means with said upstream and downstream active resistor arms of said Wheatstone bridge to lower the resistance of said upstream active resistor arm more than the resistance of said downstream active resistor arm when gas flows through said mass flow sensing means to thereby unbalance said Wheatstone bridge by an amount proportional to the mass of gas flowing through said mass flow sensing means thereby causing said heater means to heat such flowing mass of gas; and
operatively associating two resistor arms of said Wheatstone bridge with sensing bridge supply circuit means.

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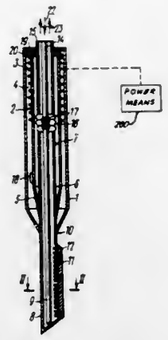
4,823,789
NOSE TUBE ANCHORING STRIP
Arthur A. Beisang, III, Des Moines, Iowa, assignor to Genetic Laboratories, Inc., St. Paul, Minn.
Filed Feb. 16, 1988, Ser. No. 155,819
Int. Cl.[4] A61M 15/08
U.S. Cl. 128—207.18 7 Claims



1. A device for anchoring a gastro-intestinal tube to the nose of a patient, comprising:
a planar sheet of flexible plastic material exhibiting a uniaxial stretch property along an easy stretch axis and a compliance modulus irrespective of thickness in the range of from 0.5 to 110 pounds per inch and an elastic recovery less than 98%, said sheet being bilaterally symmetrical and including a concave, arcuate, upper edge extending generally transverse to said easy stretch axis and first and second notches downwardly displaced from said upper edge with one edge of each of said notches being inwardly and downwardly sloping and the notches extending inwardly toward the center of said sheet from the opposed side edges of said sheet to define therebetween a medial strip of a predetermined length and width dimension corresponding to the outer diameter of the tube to be anchored, said medial strip being aligned with said easy stretch axis, said planar sheet being coated on one major surface thereof with a biocompatible adhesive material.

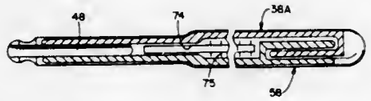
4,823,790
CRYOGENIC-AND-ULTRASONIC SCALPEL
Boris I. Alperovich, ulitsa Dzerzhinskogo, 36, kv. 47; Ljutsia Paramonova, ulitsa Ferentsa Mjunnikha, 3, kv. 25; Gennady Tjulkov, ulitsa Nakhimova, 15, kv. 142; Valery I. Soloviev, pereulok Krasnogo pozharnika, 5, kv. 4, and Alexandr I. Paramonov, ulitsa Ferentsa Mjunnikha, 3, kv. 25, all of Tomsk, U.S.S.R.
Continuation-in-part of Ser. No. 900,457, Aug. 26, 1986, Pat. No. 4,724,834. This application May 28, 1987, Ser. No. 55,168
Claims priority, application U.S.S.R., Nov. 20, 1985, 3973881
The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.
Int. Cl.[4] A61B 17/36
U.S. Cl. 128—303.1 20 Claims

1. A cryogenic-and-ultrasonic scalpel, comprising:
blade means for dissecting biological tissues, said blade having a cutting edge;
a body;
a source of ultrasonic vibrations, said source being positioned within said body;
a transformer positioned within said body and connected to said source of ultrasonic vibrations;
a heat exchanger positioned within said body and including an outer tube and an inner tube arranged within said outer tube both of said tubes fluidly communicating with each other, said outer tube connected with and positioned within said transformer and said body and connected with said blade means to impart ultrasonic vibrations to said blade means through said outer tube; and



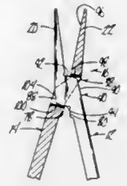
said heat exchanger admitting a refrigerating agent to said blade means and withdrawing said agent from said blade means for cooling the latter.

4,823,791
ELECTROSURGICAL PROBE APPARATUS
Frank D. D'Amelio, Naugatuck, Conn.; Dawn M. DeLemos, Cornwall; Dominick G. Esposito, Mamaroneck, both of N.Y.; Michelle D. Maxfield, Norwalk, Conn.; Claude E. Petruzzi, Bronxville, and Robert H. Quint, Jamaica, both of N.Y., assignors to Circon ACMI Division of Circon Corporation, Stamford, Conn.
Filed May 8, 1987, Ser. No. 47,666
Int. Cl.[4] A61B 17/39
U.S. Cl. 123—303.14 44 Claims



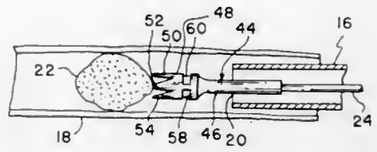
1. An electrosurgical probe for use in the treatment of tissue comprising:
an elongated substrate member having a peripheral surface of dielectric material and a longitudinal axis extending between a working end and an attachment end;
at least a pair of electrically isolated electrodes only on said peripheral surface of said substrate member and extending continuously between an active region at said working end and an electrical terminal region at said attachment end for selective connection/disconnection, respectively, to opposite poles of a source of electrical energy; and
an outermost dielectric covering on said substrate member at a region extending intermediate said attachment end and said working end and overlying said electrodes as a continuous peripheral band between said active region and said electrical terminal region to electrically isolate said intermediate region.

4,823,792
GRIPPING DEVICE AND LOCKING MECHANISM FOR USE THEREWITH
David H. Dulebohn, Tonka Bay, and David J. Ackland, Maple Grove, both of Minn., assignors to Andrew Tool Company, Plymouth, Minn.
Filed May 11, 1987, Ser. No. 49,207
Int. Cl.[4] A61B 17/28
U.S. Cl. 128—321 17 Claims



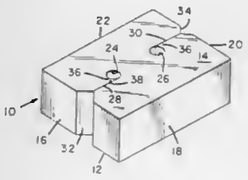
1. A gripping device comprising:
first and second elongated members each having a longitudinal axis, first and second opposite walls, and first and second opposite edges, and including a gripping end on one side of a pivot section, and a handle end on the opposite side of the pivot section:
said first and second elongated members being pivotally and releaseably engaged at said pivot sections so that upon converging movement of the handles, the gripping ends converge to allow the gripping of an object;
said pivot section of said first elongated member comprising a generally rectangular box aperture extending between and through the first and second walls of the first elongated member, the long axis across the box aperture extending along the longitudinal axis of the first elongated member;
said second member being insertable through said box aperture and having a cam means integrally formed at the pivot section of the second elongated member, said cam means having front and rear bearing surfaces which form pivot surfaces of the pivot section of the second member and retain said cam in said box aperture of the pivot section of the first elongated member upon sufficient convergence of said handle ends, but which allows release of the cam from the box aperture upon sufficient separation of the handles; and
a fulcrum means positioned outside of the pivot sections of the first and second elongated members.

4,823,793
CUTTING HEAD FOR ULTRASONIC LITHOTRIPSY
Earl D. Angulo, Silver Spring, Md., and Roger Goodfriend, Los Gator, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.
Filed Oct. 30, 1985, Ser. No. 793,006
Int. Cl.[4] A61B 17/22
U.S. Cl. 128—328 7 Claims



1. A surgical cutting head for attachment to an ultrasonically vibrated wire probe, comprising:
a cylindrical cutting tip section having a plurality of cutting teeth arranged circumferentially at one end thereof, said teeth being equidistantly spaced on said one end of said cutting tip section and having flat top ends and expanding three-sided cross sections along the length of said teeth to form a cup-shaped seat having inwardly projecting intersections formed by two sides of said three-sided cross sections to form cutting edges within said cup-shaped seat; and
a cylindrical collar coaxial and integrally formed with the other end of said cutting tip section.

4,823,794
SURGICAL PLEDGET
William S. Pierce, 1201 Saradana Rd., Harrisburg, Pa. 17112
Continuation of Ser. No. 397,484, Jul. 12, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 676,601
Int. Cl.[4] A61B 17/00
U.S. Cl. 128—335 12 Claims



1. A pledget for use in cardiovascular surgery to distribute the tension of a suture strand over a broad area of cardiovascular tissue, the pledget including an integral body consisting of a single piece of soft, resilient and suture compressable pledget material, the body including a surface adapted to engage cardiovascular tissue to be sutured, a wall, a suture strand hole extending through the body away from the wall permitting a suture strand to be freely drawn through the hole during suturing, and a slit extending from the wall to the hole, the slit intersecting the hole tangentially, the resiliency of the pledget material keeping the slit closed with opposed sides of the slit abutting each other except while an acute angle suture strand is passed through the slit to the hole, the body including a continuous portion on one side of the hole with the portion including an acute angle tip at the junction of the slit and the hole whereby upon movement of of a suture strand from the wall, along the slit, past the portion and into the hole the portion engages the strand and resists withdrawal of the strand from the hole along the slit.

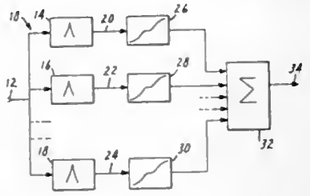
4,823,795
SIGNAL PROCESSOR FOR AND AN AUDITORY PROSTHESIS HAVING SPECTRAL TO TEMPORAL TRANSFORMATION
Christopher van den Honert, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Mar. 13, 1987, Ser. No. 25,485
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[4] A61N 1/00; H05G 00/00
U.S. Cl. 128—420.5 11 Claims

1. An auditory prosthesis adapted to receive a sound signal, to transform said sound signal to a signal representing sound to a person and to transmit said signal to said person, comprising:
transducer means adapted to receive said sound signal for transforming said sound signal to an electrical signal;
a plurality of filters, each passing a different center frequency, operatively coupled to receive said electrical signal, each of said plurality of filters providing a resonant signal which has an impulse response which is oscillatory

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whereby each of said plurality of filters has a temporal behavior which selectively mimics that of an individual neuron tuned to said center frequency;

a plurality of compressing means, selectively coupled to said resonant signals of said plurality of filters, for individually compressing the amplitude of each of said resonant signals



as a function of the amplitude of said each of said resonant signals;

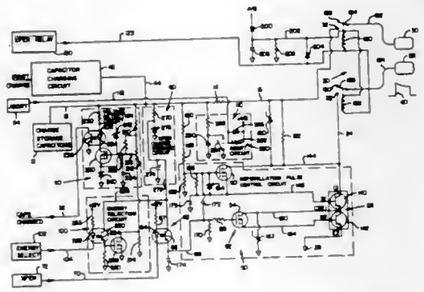
coupling means operatively coupled to said plurality of compressing means for receiving all of the compressed resonant signals and transmitting said compressed resonant signals in a form which may be adapted to be supplied to said person.

4,823,796

DEFIBRILLATOR CIRCUIT FOR PRODUCING A TRAPEZOIDAL DEFIBRILLATION PULSE

Jonathan M. Benson, Oregon City, Oreg., assignor to Laerdal Manufacturing Corp., Portland, Oreg.

Filed Apr. 3, 1987, Ser. No. 34,487
Int. Cl.⁴ A61N *1/36*
U.S. Cl. 128—419 D **24 Claims**



1. A defibrillator circuit for applying trapezoidal defibrillation pulses to a patient comprising:

means for producing a defibrillation pulse delivery control signal;

capacitor charge storage means;

charging circuit means for charging the capacitor charge storage means;

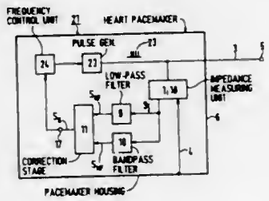
defibrillation pulse discharge circuit means for coupling the capacitor charge storage means in series with the patient and for selectively delivering a trapezoidal-shaped defibrillation pulse from the capacitor charge storage means to the patient, the discharge circuit means including a first electronic defibrillation pulse delivery switch means in the series path, the first pulse delivery switch means comprising means for shifting to a first conducting state in response to a defibrillation pulse delivery control signal to permit the partial discharge of the capacitor charge storage means through the patient, the first pulse delivery switch means also comprising means for shifting to a second non-conducting state when the pulse delivery control signal is removed to block further discharge of the capacitor charge storage means through the patient, the discharge circuit means including defibrillation pulse delivery control means for selectively delivering the pulse delivery control signal to and removing the pulse delivery control signal from the first pulse delivery switch means to thereby respectively commence and terminate the application of a defibrillation pulse to the patient.

4,823,797

APPARATUS AND METHOD FOR IMPEDANCE MEASUREMENT OF BODY TISSUES

Roland Heinze, and Karl Stangl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 61,547
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1986, 3620276
Int. Cl.⁴ A61N *1/36*
U.S. Cl. 128—419 PG **16 Claims**



1. An apparatus for impedance measurement of body tissue, said body tissue having a conductance, said apparatus comprising:

means connected to said body tissue for impressing an electrical signal therein;

means connected to said body tissue for acquiring an impedance signal therefrom dependent on the impressed electrical signal, said impedance signal including low-frequency components corresponding to said conductance of said body tissue, and higher frequency components;

means for filtering said low-frequency signal components corresponding to said conductance of said body tissue out of said impedance signal;

means for filtering said higher frequency signal components out of said impedance signal; and

means for connecting said higher frequency signal components using said low-frequency signal components for eliminating the influence of changes in said conductance of said body tissue on said higher frequency signal components, and generating a corrected signal at an output.

4,823,798

DIAGNOSING SYSTEM FOR AN EXHAUST GAS RECIRCULATION SYSTEM OF AN AUTOMOTIVE ENGINE

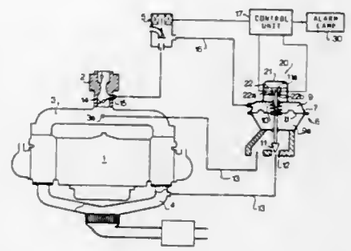
Kazuharu Ichikawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1987, Ser. No. 25,361
Claims priority, application Japan, Mar. 12, 1986, 61-54130
Int. Cl.⁴ F02B *47/08*
U.S. Cl. 123—571 **9 Claims**

1. A diagnosing system for an exhaust gas recirculation system having an EGR passage communicating an exhaust pipe of an engine with an intake passage of the engine, an EGR valve provided in the EGR passage, control means for producing a valve operating signal for operating the EGR valve in accordance with engine operating conditions, the diagnosing system comprising

means for detecting the position of the EGR valve and for producing a position signal dependent on the position of the EGR valve;

trouble detector means responsive to the valve operating signal and to the position signal for producing a trouble signal as an alarm signal when the detecting means produces a position signal of an actual closed state of the EGR valve and the control means produces a valve operating signal representing an open state of the EGR valve, said detecting means is a photoelectric transducer,



the photoelectric transducer comprises a photodiode and a phototransistor,

said transducer includes a shaft connected to a valve body of the EGR valve,

said shaft is movable by movement of the valve body into a path between said photodiode and phototransistor, and

said transducer includes a U-shaped holder having said photodiode and phototransistor facing each other on arms of the holder.

4,823,799

BIOFEEDBACK INTERFACE FOR SENSORY ENHANCEMENT OF THE PLANTAR SURFACE OF THE FOOT

Stevens E. Robbins, 388 Olivier, Apt. 8, Westmount, Quebec, Canada H3Z 2C9

Continuation of Ser. No. 840,948, Jul. 31, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 170,690
Int. Cl.⁴ A43B *5/06, 7/00*
U.S. Cl. 128—581 **8 Claims**



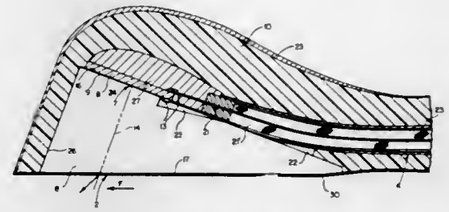
1. A biofeedback interface adapted to be interposed between an integument of a foot of an individual and a sole of a footwear, a relatively high level of loading being exerted between said foot and said sole, said biofeedback interface comprising sensation enhancement means for substantially enhancing the sensation perceived by said individual, potentially up to pain level, the sensation enhancement inducing a feedback reaction by said individual tending to adopt a posture for reducing the level of sensation perceived by said individual resulting in a moderation of the loading of said foot, said biofeedback interface including a plurality of compartments, each compartment receiving a loose relatively hard sensation enhancement member substantially smaller than said compartment for moving therein with respect said foot.

4,823,800

IMPLANTABLE ULTRASONIC PROBE AND METHOD OF MANUFACTURING THE SAME

Andre C. Compos, Pantin, France, assignor to Virbac, a French Corporation, Carros, France

Filed Aug. 11, 1986, Ser. No. 895,428
Claims priority, application France, Aug. 12, 1985, 85 12297
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—661.08 **25 Claims**



1. A generally elongate ultrasonic transmitter/receiver probe adapted to be implanted in a human or animal body in contact with a vessel or a wall of an organ to allow exploration inside said organ by ultrasonics, the probe comprising:

piezo-electric transmitter/receiver transducder means,

support means for said transducer means having a first surface in operative juxtaposition to said transducer means and a second surface remote from said first surface for placement in contact with a vessel or a wall of an organ means for releasably attaching said probe to a vessel or organ,

means including conductors extending from an end of said probe for connecting the transducer means with the outside of the body to carry information to and from said transducer means,

means for encasing said transducer means and at least a portion of said support means but not said second surface, and a portion of said conductors adjacent to said transducer means and to said support means, the outer surface of said encasing means being polished and widening out progressively and continuously from adjacent said portion of said conductors and covering said transducer means and at least part of said support means, said conductors extending from said transducer means and support means in a direction substantially parallel to said second surface of said support means, whereby to allow the probe to be removed from the body by the pulling from outside on the conductors.

4,823,801

CORNEA THICKNESS MEASURING ULTRASONIC PROBE

Toshio Sakane, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1986, Ser. No. 921,009
Claims priority, application Japan, Nov. 1, 1985, 60-245830; Nov. 5, 1985, 60-247613
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—661.06 **10 Claims**

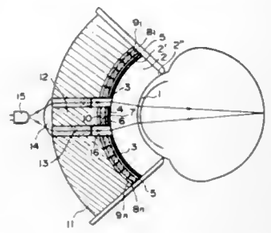
1. A cornea thickness measuring ultrasonic probe comprising:

an ultrasonic wave propagation layer having first and second spherical surfaces adapted to be formed substantially concentrically with the center of curvature of the cornea of an eye to be examined, said first surface being adapted to contact the cornea; and

a plurality of fixed ultrasonic wave vibrators disposed behind said second spherical surface of said ultrasonic wave propagation layer and adapted to be formed substantially concentrically with the center of curvature of the cornea, said vibrators being arranged corresponding to at least one

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meridian direction of the cornea surface and comprising at least one vibrating element for measuring the thickness of



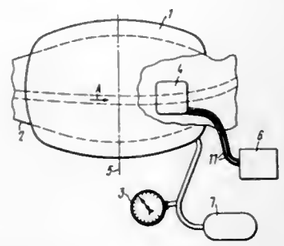
the center portion of the cornea and at least one vibrating element for measuring the thickness of at least one marginal portion of the cornea.

4,823,802

DEVICE FOR MEASUREMENT OF ARTERIAL BLOOD PRESSURE

Antonina M. Romanovskaya, Moscow, U.S.S.R., assignor to Vsesojuzny Nauchno-issledovatelsky i ispytatelny institut meditsinskoi Tekhniki, Moscow, U.S.S.R.

Filed Apr. 3, 1987, Ser. No. 34,420
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—688 **14 Claims**



1. A casing-free device for measurement of arterial blood pressure, comprising:

a compression cuff to be applied to a patient's body, said cuff having an axis arranged square with the direction of the pulse wave propagation;

a manometer for measurement of pressure in said compression cuff, said manometer being connected to said compression cuff;

a pulse wave sensor interposed between said compression cuff and the patient's body surface and located below said axis of the compression cuff, said sensor having an elastic piezoelectric crystal plate which comprises a first working surface and a second working surface, both of which freely receive a pulse wave directly over the entire area of the surface thereof;

a first eleastic current-conducting layer situated on said first working surface;

a second elastic current-conducting layer situated on said second working surface;

a first electric-insulating layer situated on the surface of said first elastic current-conducting layer;

a third elastic current-conducting layer situated on the surface of said first elastic electric-insulating layer;

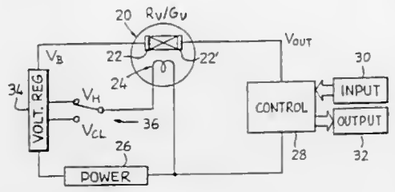
a recorder connected to said pulse wave sensor and adapted to make records of the pulse wave propagated.

4,823,803

HALITOSIS DETECTOR DEVICE

Katunori Nakamura, Iwatsuki, Japan, assignor to Winners Japan Company Limited, Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 172,595
Claims priority, application Japan, Jul. 31, 1987, 62-190159
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—717 **4 Claims**



1. A halitosis detector device for testing human exhalation for halitosis, comprising

(a) a chamber having an air inlet through which the exhalation to be tested is to be admitted into said chamber and an air outlet through which the exhalation tested is to be discharged from said chamber,

(b) sensing means located in said chamber and, when thermally activated, sensitive to malodorant gases including those of predetermined chemical compositions for producing an electrical signal variable in magnitude with the detected concentration of said malodorant gases,

(c) means which, when electrically activated, is operative to heat said sensing means,

(d) control means responsive to said signal for determining the degree of malodorousness on the basis of said signal and producing an electric signal representative of the degree of malodorousness determined, and

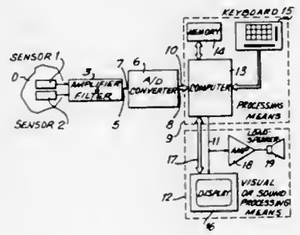
(e) display means responsive to the signal from said control means for displaying information relating to the degree of malodorousness represented by the signal from said control means.

4,823,804

APPARATUS FOR MONITORING ACTIVITY LEVEL OF HUMAN ORGAN

Marquis Ghislaine, Les Ulis; André Martin, Joue-Les-Tours; Jean Murat, Tours, and Jean-Pierre Prulhiere, Bordeaux, all of France, assignors to Universite de Tours Francois Rabelais, Paris and Commissariat A L'Energie Atomique, Tours Cedex, both of, France

Filed Oct. 15, 1987, Ser. No. 109,258
Claims priority, application France, Oct. 15, 1986, 86 14328
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—733 **4 Claims**



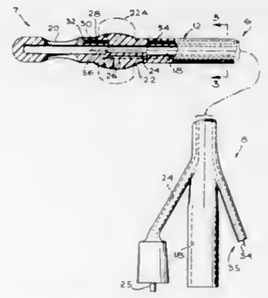
1. Apparatus for monitoring an activity level of an organ of a human body, comprising at least one pair of differentially connected sensors adapted to be positioned in the vicinity of said organ, said sensors supplying, on their respective outputs, electric signals representative of the activity level of said organ, differential amplification and filtering means respectively connected by inputs to the outputs of said sensors, said amplification and filtering means supplying on an output an amplified and filtered signal of the said electrical signals, an analog-digital converter connected by an input to the output of the amplification and filtering means, said analog-digital converter supplying on an output digital values corresponding to the amplitude of the amplified and filtered input analog signal, processing means connected by an input to the output of the converter, said processing means processing the digital values and supplying on at least one output a signal characterizing the activity level of said organ and visual and/or sound processing means of said characteristic signal connected to the output of said processing means, wherein said processing means comprise a processor, an input and output of which respectively constitute the input and the output of said processing means, storage means connected to said processor for recording said digital values to be processed and for recording a program for processing said digital values by a sampling corresponding to each period of a succession of periods of predetermined duration, the start of a period being shifted by a predetermined time interval compared with the start of the preceding period of said succession, the processing program controlling the calculation of the Fourier transform of said digital values during each period by the processor in order to obtain in each predetermined time interval, the frequency spectrum of the input signal, said program then controlling, for each spectrum, the selection of a peak maximum amplitude with corresponding to said organ for each spectrum and the detection of the amplitude of said peak of maximum amplitude, the processing means supplying on their output a signal representative of the evolution of the amplitude of said peaks of the maximum amplitude corresponding to the successive time intervals, said signal characterizing the activity level of said organ.

4,823,805

CATHETER INCORPORATING STRAIN RELIEF

Dennis Wojcik, San Diego, Calif., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 761,975, Aug. 1, 1985. This application Jan. 16, 1987, Ser. No. 4,157
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—736 **8 Claims**



1. A catheter apparatus for medical applications comprising:

an elongated body having a first end intended to be passed through a patient's body passageway into a body cavity and a second end intended to be coupled to a utility device, said elongated body being formed of a flexible material enabling it to conform to the shape of said patients body passageway;

a transducer mounted in said elongated body proximate to said first end; and

a substantially straight elongated transducer wire mounted in said elongated body extending from said transducer to said second end, said transducer wire being flexible enabling it to conform to the shape of said elongated body; and

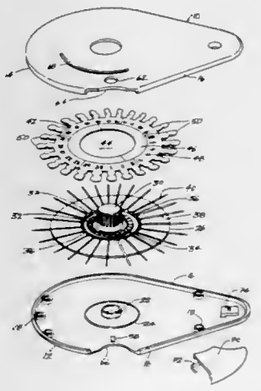
a substantially straight elongated strain relief line mounted in and anchored to said elongated body extending substantially parallel to said transducer wire, from proximate to said first end to proximate to said second end, said strain relief line being flexible enabling it to conform to the shape of said elongated body and exhibiting a smaller ratio of elongation to tensile load than either said elongated body or said transducer wire to thereby prevent significant elongation of said elongated body whereby said transducer can be retained proximate to said first end without breaking said transducer wire.

4,823,806

APPARATUS FOR TESTING THE SENSORY SYSTEM ON HUMANS OR ANIMALS

Serge Bajada, 30 Holdsworth Street, Fremantle, Western Australia, Australia 6160

PCT No. PCT/AU86/00348, § 371 Date Apr. 28, 1987, § 102(e) Date Apr. 28, 1987, PCT Pub. No. WO87/02888, PCT Pub. Date May 21, 1987
PCT Filed Nov. 18, 1986, Ser. No. 86,096
Claims priority, application Australia, Nov. 18, 1985, PH3457
Int. Cl.[4] A61B *17/34*
U.S. Cl. 128—744 **12 Claims**



1. An apparatus for testing the sensory system in humans or animals which comprises a volume enclosing housing having mounted therein a plurality of pins, means for holding said pins captive in the housing, said pins being arranged to have tips sequentially available at a point of use for testing the sensory system in humans or animals, and means for preventing tips of used pins being returned to the point of use wherein once a pin has been used on a subject, the used pin is movable away from the point of use such that the tip of a used pin is rendered inaccessible.

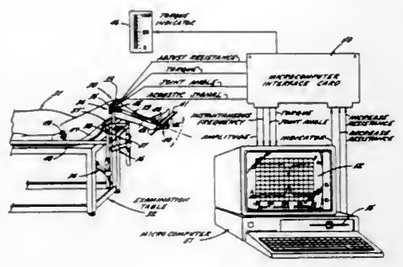
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4,823,807

DEVICE FOR NON-INVASIVE DIAGNOSIS AND MONITORING OF ARTICULAR AND PERIARTICULAR PATHOLOGY

1. Jon Russell; Thomas C. Carlson, and Gilbert A. Vipraio, all of San Antonio, Tex., assignors to Board of Regents, Univ. of Texas System, Austin, Tex.

Filed Feb. 11, 1988, Ser. No. 155,033
Int. Cl.[4] A61B 5/10, 5/12
U.S. Cl. 128—773 20 Claims



1. A method of examining a patient for signs of disease or damage related to a joint defining an angle between at least two bones while permitting relative angular movement between said bones, said method including the steps of:

(a) sensing acoustic signals emitted from said joint during said relative angular movement of said bones over a certain range of said angle while applying a resistance to said relative angular movement of said bones, and

(b) obtaining an indication of the presence of disease or damage related to said joint from the sensed acoustic signals.

4,823,808

METHOD FOR CONTROL OF OBESITY, OVERWEIGHT AND EATING DISORDERS

Charles T. Clegg, 1418 Thayer Ave., Los Angeles, Calif. 90024, and Garn A. Wallace, 1647 Manning Ave., Los Angeles, Calif. 90024

Filed Jul. 6, 1987, Ser. No. 70,178
Int. Cl.[4] A61B 7/00
U.S. Cl. 128—773 20 Claims

1. A method for the treatment of obesity, overweight, compulsive overeating, emotional overeating, binge eating, bulimia, anorexia and hypertension associated with weight loss, said method comprising

measuring gastrointestinal sound in a person under treatment while the person is eating or drinking;

transmitting the measured sound to a data processor which produces an auditory analog signal;

amplifying the auditory analog signal; and

reproducing the auditory analog signal for the person under treatment to hear, thus giving the person under treatment a clear, audible feedback of gastrointestinal sound.

4,823,809

PERIODONTAL PROBE SYSTEM

F. Kenneth Gott, Jr., La Jolla; John T. Rickard, and Stephen F. Connelly, both of San Diego, all of Calif., assignors to Orincon Corporation, San Diego, Calif.

Filed Aug. 21, 1987, Ser. No. 88,152
Int. Cl.[4] A61B 5/10
U.S. Cl. 128—776 20 Claims

1. A system for performing periodontal measurements, comprising:

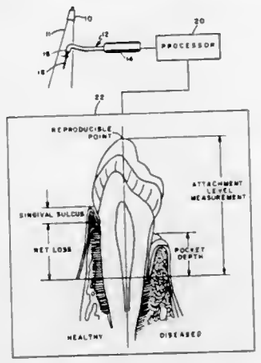
a probe having a forward end and a handle surface;

an electrical signal conductor in said probe;

a pressure sensor in said probe and connected to provide a pressure signal on said electrical signal conductor indicative of a pressure acting on said forward end;

an elongate tip in said forward end for insertion in a periodontal pocket;

measurement means mounted externally on said tip for simultaneously measuring periodontal pocket depth and periodontal tooth attachment level and for providing first and second depth signals to said electrical signal conductor indicative of said pocket depth and attachment level,



a signal processing apparatus connected to said electrical signal conductor, which responds to pressure signals by receiving and converting first and second depth signals into measurement signals, which accumulates a file of measurement signals, and which stores an accumulated file of measurement signals in an examination file format; and

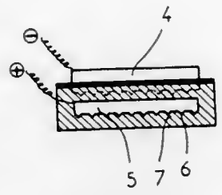
a display appratus which responds to converted first and second depth signals by visibly displaying pocket depth and attachment level in a dental chart format.

4,823,810

BIPOLAR ELECTRODES DISCHARGING SPARKS OF PIEZO-ELECTRIC ORIGIN FOR THE RELIEF OF PAINS AND CONTRACTURES BY DIRECT APPLICATION TO THE SKIN

Dominique Dervieux, Villa Lou Mion Roc, Lieu dit des Cabanes, 06790 Aspremont, France

Continuation of Ser. No. 835,867, Apr. 19, 1986, abandoned.
This application Feb. 4, 1988, Ser. No. 159,418
Int. Cl.[4] A61N 1/02
U.S. Cl. 128—783 7 Claims



1. In an apparatus for the relief of pain and contractures by direct application to skin, comprising a piezoelectric generator having actuating means and at least one discharge electrode operatively connected to said piezoelectric generator, the improvement in which: said at least one discharge electrode is a bipolar electrode having coextensive elongated parallel positive and negative poles in closely spaced relation less than one

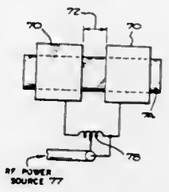
centimeter apart, the length of the poles being substantially greater than the distance between them; and an insulating partition adapted to contact the skin of a patient to be treated, said partition extending between said positive and negative poles and projecting a substantial distance beyond said positive and negative poles sufficient to maintain said positive and negative poles spaced from the skin to which said apparatus is applied with said partition in contact with the skin.

4,823,811

ELECTROSTATIC DEEP HEATING APPLICATOR

William H. Harrison, Malibu, Calif., assignor to Donald L. Morton & Associates, Los Angeles, Calif.

Filed Jan. 23, 1987, Ser. No. 6,219
Int. Cl.[4] A61N 1/40
U.S. Cl. 128—804 10 Claims



1. An electrostatic deep heating applicator for tissue in the body, comprising:

a pair of conductive sleeve means for surrounding said tissue, said sleeve means being adapted to be disposed axially along said body to form a gap for depositing RF energy to said tissue, and each of said sleeve means and said body defining an annular air space of distributed capacitive reactance such that said applicator is loosely coupled to said tissue; and

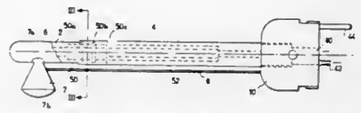
inductor means, attached to said sleeve means and adapted to be coupled to a source of RF energy, for resonating the resonant circuit defined by said sleeve means, said capacitive reactance, said body, and said inductor means to establish an electric field across said gap and currents in said tissue, whereby said currents caused preferential and uniform heating in said gap.

4,823,812

APPLICATOR FOR INSERTION INTO A BODY OPENING FOR MEDICAL PURPOSES

Uzi Eshel, Herzlia, and Avigdor Lev, Petach Tikva, both of Israel, assignors to Biodan Medical Systems Ltd., Kiryat Weizmann, Israel

Filed May 5, 1987, Ser. No. 46,195
Claims priority, application Israel, May 12, 1986, 78755
Int. Cl.[4] A61N 5/02
U.S. Cl. 128—804 10 Claims



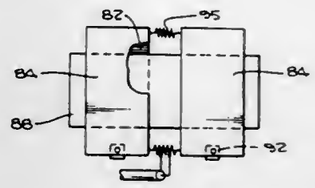
1. An applicator for insertion into a body opening for medical treatment or for diagnostic purposes, characterized in that said applicator includes: an elongated jacket having a proximal open end and a distal closed end for insertion into the body opening; a disposable sleeve of elastomeric material also having a proximal open end and a closed distal end received on said jacket; and a balloon of elastomeric material integrally formed with and joined to said disposable sleeve at one side of said sleeve and jacket, said balloon occupying only the distal end of said disposable sleeve and being inflatable by a fluid to press the opposite side of the jacket and sleeve facing away from the balloon laterally against the tissue of the body opening, thereby to fix the position of the jacket within the body opening and to conform the pressed body tissue to the shape of said opposite side of the jacket and sleeve.

4,823,813

ELECTROSTATIC DEEP HEATING APPLICATORS

William H. Harrison, 32180 Mulholland Dr., Malibu, Calif. 90265

Continuation-in-part of Ser. No. 6,219, Jan. 23, 1987. This application May 19, 1987, Ser. No. 52,246
Int. Cl.[4] A61N 1/40
U.S. Cl. 128—804 8 Claims



1. An electrostatic deep heating applicator for tissue in the body comprising:

first and second conductive plate means for forming a gap for depositing RF energy to said tissue, said first and second plate means adapted to be disposed axially along said body to form said gap, with each of said plate means and said body defining an air space of distributed capacitive reactance such that said applicator is loosely coupled to said tissue;

inductor means, attached to said first and second plate means and adapted to be coupled to a source of RF energy, for resonating the resonant circuit defined by said first and second plate means, said capacitive reactance, said body, and said inductor means to establish an electric field across said gap and currents in said tissue; and

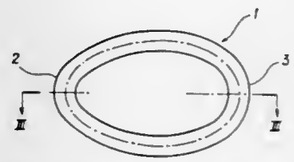
control means, connected to said first and second plate means, for effecting uniformity in the energy distribution over the surface area of said first and second plate means and thereby of said electric field in said gap to cause preferential and uniform heating in said gap.

4,823,814

PESSARY

Arie C. Drogendijk, Krimpen A/D Ijssel, and Cornelis Kruithof, Rotterdam, both of Netherlands, assignors to Fortune Capital Management B.V., Amsterdam, Netherlands

Filed Jan. 16, 1987, Ser. No. 4,100
Int. Cl.[4] A61F 5/46
U.S. Cl. 128—834 6 Claims



1. A pessary for treating prolapses of the female sex organs comprising a ring member comprising an outer biocompatible deformable material and a helically-shaped, non-resilient inner core member, said ring member being capable of being de-

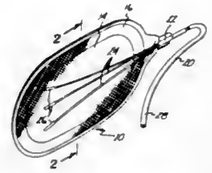
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formed by hand into various shapes, the circumferential dimension of said ring member being capable of being changed by hand to increase or decrease said circumferential dimension, and said ring member being capable of retaining the shape and circumferential dimension into which said ring member has been deformed or adjusted by hand.

4,823,815
TISSUE EXPANDING DEVICE AND METHOD OF MAKING SAME

David A. Watson, Goleta; Michele R. Jensen, Montecito, and Dennis E. Condon, Santa Barbara, all of Calif., assignors to Mentor Corporation, Goleta, Calif.

Continuation of Ser. No. 909,223, Sep. 19, 1986, abandoned. This application Aug. 3, 1988, Ser. No. 228,841
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—897 **4 Claims**

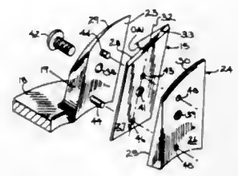


1. A skin expanding device comprising:
a substantially non-extensible base;
an expansion layer joined to the periphery of the base defining an expansion chamber when fluid is introduced between the base and the expansion layer;
means for introducing fluid between the base and the expansion layer; and
wherein the expansion layer includes only first and second area portions, the first area portion being 50% to 300% thicker than the second area portion such that when fluid is introduced between the expansion layer and the non-extensible base, the first area portion expands proportionally differentially from the second area portion, both area portions expanding as fluid is being introduced, the expansion layer and base initially being flat in a non-expanded state so that the expansion layer is in contact with the base throughout the layers' entire area so that neither base nor layer has any folds or wrinkles when in the non-expanded state.

4,823,816
BLADE APPARATUS FOR RENEWING CUTTING EDGES IN CORN PROCESSING EQUIPMENT

Gerald F. Maruska, 329 Cheyenne Trail, Madison, Wis. 53705

Division of Ser. No. 733,989, May 13, 1985. This application Dec. 3, 1986, Ser. No. 937,320
Int. Cl.[4] A01F *11/06*
U.S. Cl. 130—9 B **17 Claims**

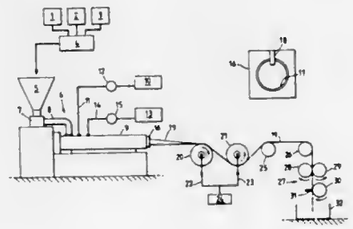


1. A knife blade adapted for installation in a knife blade holder in a rotatable cutting head in a corn processing machine to encounter an oncoming longitudinally oriented ear of corn that is fed through the cutting head, the knife blade comprising:
a substantially planar elongated body which is formed along a blade axis to be disposed longitudinally with respect to an ear of corn moving longitudinally through the machine and which is formed of steel at a thickness from 0.005 to 0.025 inches inclusive and is heat treated with a first treatment to harden the body and is heat treated with another heat treatment so as to be flexible in a direction transverse to the longitudinal axis, and
a cutting edge formed at a forward end of the body and disposed at an initial oblique angle relative to the transverse direction of the body so that when the blade is flexed in a direction transverse to the blade axis the cutting edge can attain an objective oblique angle and better withstand forces encountered in the direction of the blade axis.

4,823,817
TOBACCO RECONSTITUTION

John A. Luke, Eastleigh, England, assignor to British-American Tobacco Company, Limited, London, England

Filed Feb. 22, 1988, Ser. No. 158,513
Claims priority, application United Kingdom, Feb. 23, 1987, 8704197
Int. Cl.[4] A24B *3/14*
U.S. Cl. 131—375 **13 Claims**



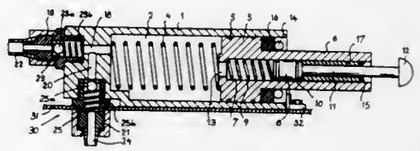
1. A tobacco reconstitution process, wherein a mixture of particulate tobacco, starch and binder, with the addition of water, is extruded in an extruder comprising a die provided with an exit orifice, to provide a sheet form extrudate comprising a cellular interior structure, under such conditions that water in said extruder is in the liquid phase and immediately upon issuing from said die the extrudate expands to assume a cross-section greater than that of said exit orifice, said extrudate in a plastic phase thereof is drawn down to reduce the thickness dimension thereof, the drawn down ratio being at least 1.5, and the drawn down extrudate is cut to provide a product of tobacco-filler size particles.

4,823,818
DISPENSING DEVICE FOR WASHING PRODUCTS FOR A DISHWASHING MACHINE

Edouard De Buyer, La Celle Saint Cloud, France, assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed Aug. 17, 1987, Ser. No. 86,438
Claims priority, application France, Aug. 20, 1986, 86 11894
Int. Cl.[4] A47L *15/44*
U.S. Cl. 134—95 **7 Claims**

1. A dispenser of washing products for a dishwashing machine of a fixed basket-type having a door and operating during a full washing period, including several washing cycles, said dishwasher having a tank provided with a door, and means for projecting washing products into the tank, said dispenser including a manually operated first means for injecting into said tank from said projecting means a given quantity of washing products for setting the concentration of a washing bath at the start of said washing period, and a second means for regulating said concentration by injecting from said projecting means a given quantity of washing products during each said

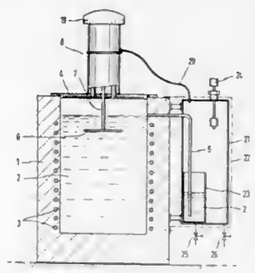


cycle and during said full washing period, said second means being operated mechanically by the action of closing said door through the intermediary of a transmission system.

4,823,819
APPARATUS FOR REMOVING RESIDUES FROM PARTS OF PLASTICS PROCESSING MACHINES

Rudolf Schmidt, Munich, Fed. Rep. of Germany, assignor to C. Christ Abgasfreie Werkzeugreinigungsapparate für die Kunststoffindustrie, Munich, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 180,244
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 3712640
Int. Cl.[4] B08B *3/12, 15/02*
U.S. Cl. 134—104.4 **13 Claims**

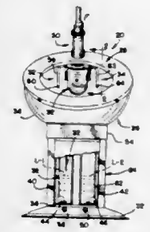


1. Apparatus for removing residues, especially plastic residues from parts of processing machines,; comprising:
a vessel closable in airtight manner and having an interior containing a heat transfer fluid in which the parts are introduced;
heating means for raising the temperature of said heat transfer fluid above a melting temperature of the residues to thereby remove the residues from the parts;
relief means cooperating with said vessel for allowing a pressure relief in the interior of said vessel, said relief means including a housing divided in an essentially closed lower compartment and an upper compartment open toward the outside, and at least one pipe connecting the interior of said vessel with said upper compartment;
filter means arranged in said upper compartment for absorbing substances escaping through said pipe into said upper compartment; and
oscillating means accommodated in said lower compartment for oscillating said heat transfer fluid.

4,823,820
SOLVENT VAPOR COLLECTION AND EVACUATION SYSTEM

Douglas A. Larson, Oak Park, and John C. Justice, Elburn, both of Ill., assignors to Safety-Kleen Corp., Elgin, Ill.

Filed Jul. 28, 1987, Ser. No. 78,772
Int. Cl.[4] B08B *3/08*
U.S. Cl. 134—109 **17 Claims**



1. An apparatus for cleaning spray guns and the like, said apparatus comprising, in combination, a cleaning basin with an outer periphery defining an open top portion of said basin, a reservoir adapted to receive and retain a supply of cleaning solvent, means for positioning said basin with respect to a fixed support surface; means operatively associated with said basin and said reservoir for causing solvent to be withdrawn from said reservoir and directed to the interior of said basin, means defining a fluid return flow path between said basin interior and the interior of said reservoir, whereby solvent withdrawn from said reservoir may be returned thereto, and a vapor collection system associated in use with said basin, said vapor collection system including a vapor collection manifold having means thereon to permit said manifold to be positioned adjacent said outer periphery of said basin, said vapor collection manifold being of generally tubular cross-section, and having portions thereof defining manifold inlet means extending about a substantial extent of the upper periphery of said basin, means defining an exhaust opening in a portion of said manifold, vacuum source means having its inlet end in communication with said manifold exhaust opening and its outlet end in communication with a vapor discharge line, said vacuum source being thereby adapted, upon actuation, to evacuate vapors from the interior of said vapor collection manifold by inducing air and vapor flow from the interior of said basin through said manifold and into said vapor discharge line.

4,823,821
AUTOMATIC SINGLE PUSH BUTTON TYPE UMBRELLA

San-Tong Day, 1 Chung Yang North Road, Ching Shui, Taichung Hsien, Taiwan

Filed May 11, 1987, Ser. No. 47,488
Int. Cl.[4] A45B *25/16*
U.S. Cl. 135—24 **5 Claims**

1. An automatically actuated umbrella having a single push button to initiate expanding and collapsing operations, comprising:
outer shaft means including an outer tubular shaft and a lower ring fixedly attached to said outer tubular shaft,
intermediate shaft means including an intermediate tubular shaft slidably telescoped within said outer tubular shaft and an intermediate ring affixed to said intermediate tubular shaft at a location above said outer tubular shaft,
upper inner shaft means including an upper inner shaft slidably telescoped relative to an upper end of said intermediate tubular shaft and an upper ring affixed to said upper inner shaft at a location above said intermediate shaft means,
a lower inner shaft slidably telescoped within a lower end of

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said intermediate tubular shaft, and a rib arrangement including dome ribs, stretcher ribs, and supporting ribs having inner ends thereof pivotably connected to said upper ring, intermediate ring, and said lower ring, respectively, with outer ends of said stretcher ribs and supporting ribs being pivotably connected to said dome ribs and stretcher ribs, respectively, to form an umbrella frame, said rib arrangement being movable between expanded and collapsed positions,

first spring means arranged to act between said outer and intermediate shaft means for moving said rib arrangement to said collapsed position,

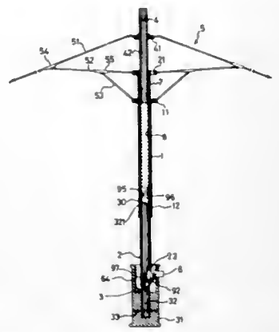
second spring means arranged to act between said lower inner shaft and said upper inner shaft means for moving said rib arrangement to said expanded position,

said outer tubular shaft, said intermediate tubular shaft, and said lower inner shaft including lateral openings which are laterally alignable,

locking pawl means mounted for movement in said lower inner shaft, having a locking head, and being yieldably spring-biased laterally outwardly to a locking position wherein

said locking head projects into all of said openings when said openings are laterally aligned, to retain said rib arrangement in a collapsed position with said second spring means being in an energy-storing state,

a grip affixed to a lower end of said lower inner shaft and

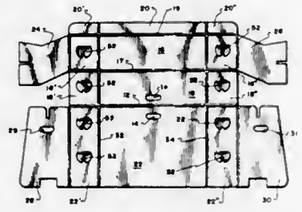


including a side wall disposed outside of said lower inner shaft, said grip including a push button mounted in said side wall and yieldably spring-biased laterally outwardly, said push button including an abutment surface opposing said locking head and said aligned openings,

said push button being movable in a direction of actuation to displace said locking head inwardly and out of said opening of said outer tubular shaft in response to a first inward depression of said push button to a first stop position in engagement with said outer tubular shaft to enable said upper inner shaft means and said outer shaft means to be raised relative to said intermediate shaft means by said second spring means in a manner expanding said rib arrangement while causing said first spring means to store energy, with said locking head remaining within said opening of said intermediate tubular shaft and retaining said first spring means in such energy storing state,

said push button being movable in said direction of actuation to displace said locking head inwardly and out of said opening of said intermediate tubular shaft in response to a second inward depression of said push botton to a second stop position beyond said first stop position vacated by said outer tubular shaft upon the raising of the latter, said second stop position defined by engagement of said push button with said intermediate tubular shaft to enable said second spring means to raise said upper inner shaft means relative to said outer shaft means and to enable said first spring means to raise said intermediate shaft means relative to said upper inner shaft means for collapsing said rib arrangement.

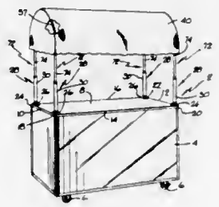
4,823,822
PORTABLE SUN SHADE
Rachel Maya, 441 N. Carson Ave., Los Angeles, Calif. 90036
Filed Feb. 24, 1988, Ser. No. 159,811
Int. Cl.[4] E04H *15/00*; A45B *13/00*
U.S. Cl. 135—87 **5 Claims**



1. A portable apparatus for use as a shelter for protection against sunshine and wind comprising;

a homogeneous sheet of lightweight material having creases forming hinges connecting a roof panel, back panels and side panels; said side panels when folded at approximately right angles to said back panel holding said homogeneous sheet in a upright position, said side panels being formed as upper and lower sections extending outward from opposite sides of said back panel and roof panel; means for securing said side panels at said approximately right angles to said back panel; said means for securing said side panels at said approximately right angles to said back panel comprising mutually engaging slots in a leading edge of said upper and lower sections of said side panels; whereby said homogeneous sheet of lightweight material may be held upright to form a shelter by engaging said slots in said upper and lower panel sections.

4,823,823
SELF-RAISING CANOPY FOR MERCHANDISING CART
Stanley A. Gallery, 11745 W. 66th Pl., Arvada, Colo. 80004, and Daniel J. Gallery, 11600 Shoshone, Westminster, Colo. 80234
Filed Apr. 22, 1988, Ser. No. 184,620
Int. Cl.[4] E04H *15/02*
U.S. Cl. 135—96 **20 Claims**



1. A movable cart for merchandising products comprising:

a movable cart having a body portion having an upper surface having at least four corner locations;

upwardly extending support means secured to said upper surface at areas next adjacent to said at least four corner locations;

canopy means for said cart located at a distance spaced above said body portion;

frame means for supporting said canopy and having at least four corners;

mounting means for mounting said canopy on said frame means;

downwardly extending support means connected to said frame means at areas next adjacent to said at least four corners;

said downwardly extending support means being mounted within said upwardly extending support means to permit relative sliding movement therebetween;

locking means between said upwardly extending support means and said downwardly extending support means to hold said upwardly extending support means and said downwardly extending support means in a relatively fixed relationship; and

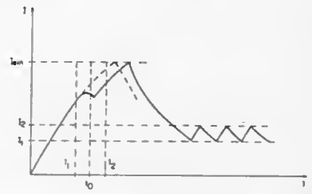
pivot means for pivotally connecting each of said downwardly extending support means to said frame means.

4,823,824
TENT CONSTRUCTION
Katharine F. Smith, Cranston, R.I., assignor to Hasbro, Inc.
Filed Aug. 22, 1988, Ser. No. 234,954
Int. Cl.[4] E04H *15/00*
U.S. Cl. 135—120 **8 Claims**



1. A tent construction comprising a tent member including a frame portion and a flexible wall portion supported on said frame portion, and periscope means operative from the interior of said tent member for viewing the area surrounding said tent member.

4,823,825
METHOD OF OPERATING AN ELECTROMAGNETICALLY ACTUATED FUEL INTAKE OR EXHAUST VALVE OF AN INTERNAL COMBUSTION ENGINE
Josef Büchl, Rehsteig 12, D-8071 Lenting, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 856,032, Apr. 25, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 135,700
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3515042
Int. Cl.[4] F16K *31/02*; F01L *9/04*
U.S. Cl. 137—1 **5 Claims**



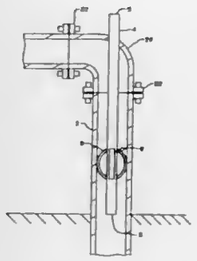
1. A method of monitoring an operational cycle of a valve actuated by electromagnetic means including a first electromagnet for moving and maintaining said valve in one of two terminal positions and a second electromagnet for moving and maintaining said valve in a second of said two terminal positions, said cycle comprising a first phase of moving said valve into one of its first and second terminal positions by energizing one of said first and second electromagnets with current increasing to a first level and a second phase of maintaining said valve in said one of said first and second terminal positions by current reduced to a lower level, said first and second electromagnets being alternatingly energized and deenergized, comprising the steps of:

monitoring said current increase in said one of said first and second electromagnets during an interval commencing a predetermined time after the deenergization of the other of said first and second electromagnets to detect a temporary drop in the energizing current characteristic of said valve having moved into one of its said first and second terminal positions;

generating a signal in the absence of said current drop; and

moving said valve to said one of said first and second terminal positions in response to said signal.

4,823,826
PROCESS AND APPARATUS FOR INTRODUCING AQUEOUS CHLORIDE DIOXIDE INTO HIGH PRESSURE WATER INJECTION WELLS
Frank J. Sacco, Mission Viejo, Calif., assignor to Pony Industries, Inc., New York, N.Y.
Filed Dec. 22, 1986, Ser. No. 944,794
Int. Cl.[4] E21B *43/00*
U.S. Cl. 137—1 **13 Claims**



1. A method of treating a high pressure water-containing line used for carrying water into a subterranean oil field so as to minimize clogging and corrosion of the pipeline, the method comprising the steps of:

providing a small diameter tube centrally disposed along the longitudinal axis of said line and having a discharge end provided with at least one opening to permit the effluence of an aqueous solution from said tube, said tube being made from an NCMC alloy;

introducing an aqueous chlorine dioxide solution into said tube; and

injecting the aqueous chlorine dioxide solution into the high pressure water-containing line.

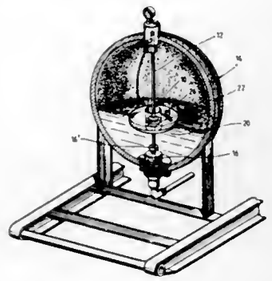
4,823,827
FLOAT SYSTEM FOR ACCUMULATOR
Ingo Olejak, 6815 Farnaby Ct., Spring, Tex. 77379
Filed Jun. 27, 1988, Ser. No. 212,237
Int. Cl.[4] F16K *33/00*, *31/24*
U.S. Cl. 137—2 **13 Claims**

13. A method for providing a combination float and valve closing system in a bowl type accumulator comprising the steps of:

providing said bowl type accumulator with a float travel guide rod;

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surrounding said float travel guide rod with a ball member;
surrounding said ball member with a substantially circular hollow float;
coupling said ball member to said substantially circular hollow float with an arcuate band so that said substantially circular hollow float may tilt with respect to said guide rod;



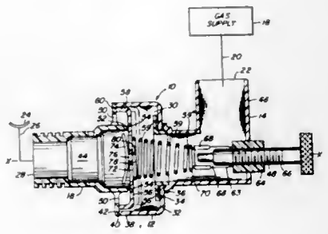
whereby when said accumulator is in an upright position said substantially circular hollow float will move up and down along said guide rod and when said accumulator is tilted, said arcuate band will permit said substantially circular hollow float to tilt with respect to said guide rod so as to prevent flooding of said substantially circular hollow float.

4,823,828

PRESSURE RELIEF VALVE

Gerald E. McGinnis, 131 Kelvington Dr., Monroeville, Pa. 15146

Filed May 28, 1987, Ser. No. 55,077
Int. Cl.[4] A62B *9/02*
U.S. Cl. 137—102 **8 Claims**



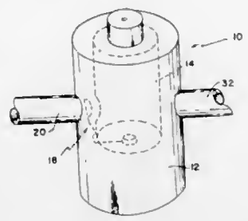
1. In a valve for controlling medical gas delivery to a patient and for providing a threshold resistance for positive end expiratory pressure therapy for such:
pressure valve for administering positive end expiratory pressure therapy to a patient by providing a threshold resistor which includes a valve element that is biased toward a closed position by a variable bias to provide threshold resistance which prevents exhalation flow from such a patient until such threshold resistance is overcome, the improvement comprising:
a spring bias means for biasing the valve element toward the closed position with said spring bias means comprising a conically formed coil spring having varying coil density with the maximum coil density adjacent the larger diameter end thereof and a minimum coil density adjacent the smaller diameter end thereof.

4,823,829

LIQUID METERING AND MIXING DEVICE

Percy Woods, 5554 Mabel Rd., Las Vegas, Nev. 89110

Filed Dec. 29, 1987, Ser. No. 138,877
Int. Cl.[4] F16K *19/00*
U.S. Cl. 137—114 **8 Claims**



1. A fluid metering and mixing device, comprising:
an outer tank housing having means for ingress and means for exit of a fluid transversing therethrough;
said outer tank housing having deployed therein a cylindrical inner tank container adapted to hold a disparate fluid and having a bottom and a vertical side wall meeting at a circular lower corner, said outer tank housing surrounding and fully containing said inner tank container;
said inner tank container having switching means for valving a fluid therefrom, said switching means being deployed proximate to said ingress means of said outer tank housing, whereby fluid entering said outer tank housing abuts agianst. said switching means with the fluid pressure thereof actuating said switching means;
said inner tank container bottom provided with an aperture;
valving means juxtaposed said inner tank container bottom aperture;
linking means connecting said switching means and valving means, a removable nozzle having a precisely machined orifice positioned within said aperture substantially proximate to said valving means;
said linking means comprising a lever including two arms disposed with a right angle at a pivot situated just below said lower corner of said inner tank container;
said means for ingress and means for exit including a pair of horizontal conduits entering said outer tank housing;
one of said lever arms extending upwardly to said switch means at a level juxtaposed said means for ingress;
the other of said lever arms extending to said valving means; and
a leaf spring contiguous to said one arm and said side wall of said inner tank container slightly above said lower corner of said inner tank container and biasing said one of said arms away from the side wall;
whereby a venturi actuated fluid admixture is achieved within said outer tank housing with fluid being drawn through said nozzle orifice as said valving means is actuated.

4,823,830

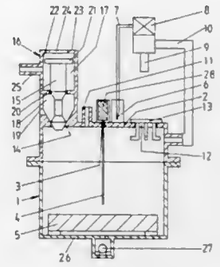
RINSE-INJECTION BOX FOR AUTOMATICALLY INTRODUCING CONTROLLED FLOWS OF A RINSE

Heinrich Bucker, Langenberg, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jan. 15, 1988, Ser. No. 144,830
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 8701540[U]
Int. Cl.[4] F16K *24/00*
U.S. Cl. 137—205 **6 Claims**

1. In a rinse-injection box for automatically introducing controlled flows of a rinse, comprising means forming a liquid chamber including a lid, an inlet in the lid for water, means forming a suction opening for connecting to a vacuumized line,

and an inlet for the rinse, the improvement comprising: valve means positioned upstream of the water inlet and having an opening to the atmosphere and a valve body mounted to sit in a closing position wherein the water inlet is closed off and responsive to incoming water for moving to an opening position wherein the water inlet is open and wherein the valve means has means forming a control chamber, a safety chamber downstream of the control chamber and a constriction in which the valve body sits and through which the control chamber and the safety chamber communicate and wherein the opening to the atmosphere is in the safety chamber.

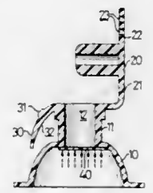


4,823,831

NOZZLE FOR INFLATABLE OBJECTS

Horng-Chang Jaw, 6 Fl., No. 21, Alley 29, Lane 372, Sec. 5, Chungsiao E. Rd., Taipei, Taiwan

Filed Oct. 4, 1988, Ser. No. 253,225
Int. Cl.[4] F16K *15/18, 15/20*
U.S. Cl. 137—223 **5 Claims**



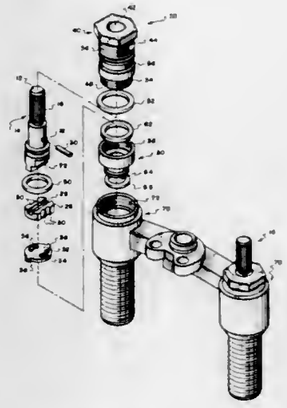
1. A nozzle for an inflatable object being made of a plastic material, comprising:
a nozzle seat which is retractable into said inflatable object upon pressing and extendable from a surface of said inflatable object only when being pulled out for inflation of said inflatable object;
an annular wall extended from said nozzle seat which defines an air inlet for air;
a plug which is insertable into said air inlet;
a plug arm extending from said annular wall and connecting said plug with said nozzle seat; and
a piece of one-way membrane extending from a lower inner face of said nozzle seat and allowing air to flow in through said air inlet during inflation but blocking air from flowing out from said air inlet when said nozzle seat is extended from a surface of said inflatable object.

4,823,832

CARTRIDGE VALVE

Harvey Rodstein, late of Los Angeles, Calif. (by Barbara L. Rodstein, legal representative), assignor to Harden Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 629,774, Jul. 11, 1984, abandoned. This application Jan. 20, 1988, Ser. No. 144,781
Int. Cl.[4] F16K *27/00*
U.S. Cl. 137—454.5 **4 Claims**



1. In a disc-type valve cartridge which includes a cartridge body having exterior threads for installing the cartridge in a housing member within the flow of a fluid is to be controlled, and elongated passageway through the cartridge body, a stem rotatable within said passageway and having handle means at one end thereof, a pair of discs disposed at the other end of the stem within the other end of the cartridge body, the discs being in face-to-face relationship and relatively rotatable about the axis of the stem to provide a valving action, and one of the discs being secured to said other end of said stem to rotate therewith, the improvement comprising:
a disc retainer holding the other disc within said other end of the cartridge body in non-rotatable relation thereto; and
said disc retainer being secured to said other end of said cartridge body and providing an axial force against said other disc, said disc retainer being axially adjustable relative to said cartridge body and its position of axial adjustment determining the face-to-face pressure between said discs and thereby establishing the torque that is required to turn the stem.

4,823,833

FLUID COMMUNICATION DEVICE

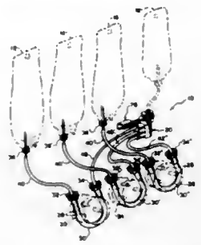
Lawrence R. Hogan, Lake Villa; Herbert Mittleman, Deerfield; Edward G. Oilschlager, Lake Villa; Ellen Rouch, Ingleside, and William L. Rudzena, McHenry, all of Ill., assignors to Baxter Healthcare Corporation, Deerfied, Ill.

Continuation of Ser. No. 391,784, Jun. 24, 1982, abandoned. This application Sep. 11, 1984, Ser. No. 648,630
Int. Cl.[4] E03B *15/00*
U.S. Cl. 137—567 **29 Claims**

1. A fluid communication device for a high speed bulk compounder comprising:
a plurality of first fluid lines, each said first fluid line connecting a respective fluid connector to a respective first pump fitting providing a fluid path therebetween;
a plurality of pump tubing segments maintained in tension connecting each said respective first pump fittings to respective second pump fittings furnishing a fluid path therebetween;
a plurality of second fluid lines, each said second fluid line

connecting each said respective second pump fitting to a common junction block; and

said common junction block including a fluid passageway in fluid communication with each said second fluid line, a chamber in fluid communication with the fluid passageway, and exit port means therein communicating with such chamber for providing a path for further fluid communication external said junction block, said common



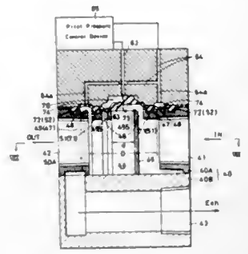
junction block further including a closure to cover said exit port means to prevent particulate matter from accumulating thereon, said closure including a retaining ring securing said closure to said common junction block and a flexible member connecting said retaining ring to said closure and said closure, flexible member and retaining ring lying in substantially the same plane when said exit port means is uncovered.

4,823,834

DIAPHRAGM TYPE OF PILOT OPERATED DIRECTIONAL CONTROL VALVE

Ryozo Ariizumi, Urawa; Masakuni Kainuma; Shoji Suda, both of Ohmiya; Toshikazu Aoki, Kawagoe; Takashi Ejiri; Masao Kojima, both of Tokyo, and Mitsunori Hoshi, Ohmiya, all of Japan, assignors to Fujikura Rubber Ltd., Tokyo, Japan

Division of Ser. No. 50,110, May 15, 1987, Pat. No. 4,744,388.
This application Mar. 16, 1988, Ser. No. 169,238
Claims priority, application Japan, May 19, 1986, 61-114360; May 28, 1986, 61-80863; Sep. 30, 1986, 61-232933
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—596.14 **3 Claims**



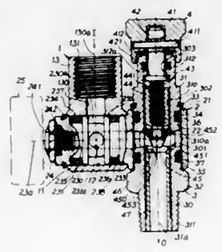
1. A diaphragm type of pilot operated directional control valve, comprising a pair of opposed passage block and control block, and a diaphragm which is held between the passage block being provided with a plurality of ports which are connected to respective fluid passages which open into the end face of the passage block that is located adjacent to the control block, said control block being provided with pilot pressure passages which are connected to a pilot pressure control device to exert a pilot pressure on the face of the diaphragm that is located adjacent to the control block, so that the fluid connection between the ports can be controlled by the control of the pilot pressure exerted on the diaphragm through the pilot pressure passages, wherein said passage block is composed of a main block and another block element which is connected to the main block, said main block being provided with a feeding port which is connected to a pressurized fluid source and a loading port, said feeding port and said loading port being connected to the end face of the passage block that is located adjacent to the control block through two concentric passages provided in the passage block, said passage block being also provided with a third passage which opens into the end face of the passage block adjacent to the control block and which is concentric to the two passages, said diaphragm having a center valve portion and a circumferential annular valve portion around the center valve portion, said center valve portion and said circumferential valve portion being independently subjected to the pilot pressure to selectively control the fluid connection between the two adjacent passages.

4,823,835

UNIVERSAL SWIVEL HAVING A DRIVING HANDLE AND VALVE MEANS

George Chu, P.O. Box 10160, Taipei, Taiwan

Filed Aug. 5, 1988, Ser. No. 228,717
Int. Cl.[4] F16K *37/00*; F16L *27/00*
U.S. Cl. 137—557 **6 Claims**



1. A universal swivel comprising:

an inlet section having a first block having a first female through hole transversely formed therein and an inlet conduit for connecting an inlet tube for pneumatic or hydraulic fluid protruding upwardly from the first block having an inlet hole formed in said inlet tube communicated with the first female through hole;

a swivel coupling means having a second block having a second female through hole vertically formed in the second block having a center line of said second female through hole perpendicular to a center line of said first female through hole, a side conduit laterally formed on a side wall of said second block rotatably engageable with said first female through hole of said first block, and a pressure gauge fixed on an outermost end of said side conduit fluidically communicated with said side conduit and said inlet conduit;

an outlet section having an outlt conduit rotatably engageable with said second female through hole of said second block having a lower portion connected with a flexible hose or outlet tube for a fluid; and

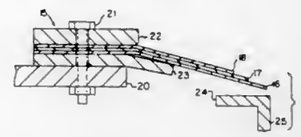
an adjusting valve means rotatably formed in said outlet conduit operatively adjusting or closing a fluid flow through said outlet conduit and operatively forming a driving handle in combination with said outlet conduit for universally rotating the outlet conduit relative to the inlet conduit.

4,823,836

DAMPERS WITH LEAF SPRING SEALS

Lothar Bachmann, Dillingham Hill Rd., R.F.D. #3, and William F. Koch, R.F.D. #3 Box 483, both of Auburn, Me. 04210

Filed May 31, 1988, Ser. No. 200,504
Int. Cl.[4] F16K *25/00*
U.S. Cl. 137—601 **17 Claims**



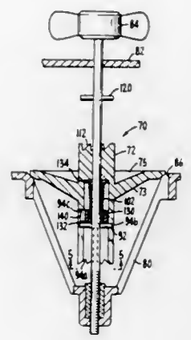
1. A damper including a first member having a port, a second member in the form of a blade movable into and out of an operative position relative to the margins of the port, a seat and a seal, one of the members provided with the seat, the seal attached to the other member, said seat and seal disposed and dimensioned for mutual engagement in said operative position and in said operative position sealing the members against leakage between them throughout the length of the seal, said seal comprising a set of leaf springs, and clamping components including a clamping bar and a ledge including an inner clamping portion, each of the leaf springs bent along a lengthwise line to establish inner and outer portions having the same angular relationship, the inner portions between the clamping bar and the inner portion of the ledge, the outer portions progressively narrower, at least the outer portion of maximum width dimensioned and disposed to include a section for engagement with or by the seat, with the leaf spring set then to be tensioned, and clamping connectors extending through and clamping the inner leaf spring portions to said bar and inner ledge portion, the ledge inclined in the same direction as the outer leaf spring portions and disposed and dimensioned to engage an outer leaf spring portion and hold the leaf spring set tensioned at least until said operative position is reached.

4,823,837

SKIMMER COVER PLATE

Herman E. Frentzel, Kentfield, Calif., assignor to Arneson Products, Inc., Corte Madera, Calif.

Division of Ser. No. 7,923, Jan. 28, 1987, Pat. No. 4,776,953.
This application Apr. 25, 1988, Ser. No. 186,008
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—624.11 **8 Claims**



1. An automatic valve for restricting fluid flow through an orifice comprising:

a central rod aligned with and passing through said orifice;

support means for maintaining the position of said central rod with respect to said orifice;

a piston journalled about said central rod and mounted for reciprocal movement between first, second and third positions along the length of said rod, said piston carrying a sealing means configured to restrict fluid flow through said orifice when the piston is in the first position and to permit fluid flow through said orifice when the piston is in the second position;

means for providing automatic indexing of said piston between said first and second positions in response to the nonuniform flow of fluid, said means including a first cammed surface at one end of said piston and formed integrally therewith, said cammed surface including a plurality of radially spaced slots, said means further including a stop pin receivable in one of said slots when the piston is in one of the first or second positions, with the selection of said first and second positions being governed by the length of the particular slot within which the pin is presently engaged, said means further including a coiled spring journalled about said central rod for urging the piston towards said third position when the fluid flow is lessened thereby disengaging the pin from a slot, and with said cammed surface being configured such that when the fluid flow is increased and the piston moves towards said first and second positions, the pin will become engaged with the next successive slot, and

means for limiting the relative rotational movement between said coiled spring and said piston as said piston is indexed.

4,823,838

OUTDOOR GAS COOKING APPLIANCE

William J. Ferlin, Plymouth, Mich., assignor to Lincoln Brass Works, Inc., Detroit, Mich.

Continuation of Ser. No. 920,233, Nov. 13, 1986, abandoned.
This application Apr. 29, 1988, Ser. No. 188,746
Int. Cl.[4] F16K *31/48*
U.S. Cl. 137—624.12 **3 Claims**

1. A semiautomatic timed shut-off valve assembly adapted for use in a gas grill, comprising:

normally closed valve means including fuel inlet means and fuel outlet means, said fuel outlet means being connected to a valve for controlling fuel flow to a gas burner;

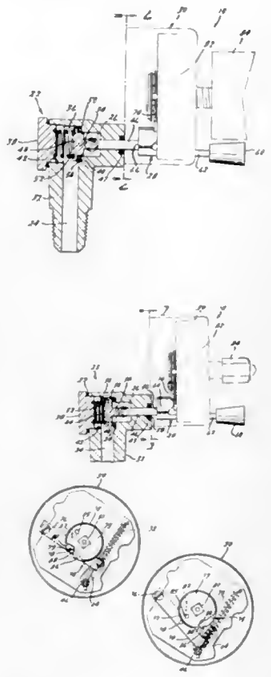
a first manually actuatable actuator for opening said valve means, said first actuator including a tang portion extending transversely therefrom;

a second separate manually actuatable actuator spaced from said first actuator; and

a timed means being actuatable by said second actuator, said timed means including a pivotal arm, said tang portion including a surface thereon for engagement with said pivotal arm, said pivotal arm being pivoted for engaging said surface of said tang portion for causing said valve means to remain in said open position for a variable preset time and for thereafter releasing said first actuator to permit said valve means to close, said second actuator being actuatable only after the actuation of said first actua-

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tor, said second actuator actuating said timed means when actuated in a first direction, and retaining said valve in an



open position indefinitely when actuated in a second direction.

4,823,839

ROTARY VALVE ASSEMBLY AND A METHOD OF ASSEMBLING A ROTARY VALVE

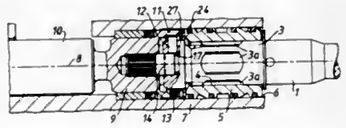
Alan Rayner, Yatton, Great Britain, assignor to TRW Cam Gears Limited, Clevedon, Great Britain

Filed Apr. 13, 1987, Ser. No. 37,808

Claims priority, application United Kingdom, Apr. 14, 1986, 8609018

Int. Cl.[4] F15B *13/04*

U.S. Cl. 137—625.24 **16 Claims**



1. A rotary valve assembly comprising:

a sleeve member;

a rotor member received within said sleeve member coaxial therewith, said rotor member being rotatable relative to said sleeve member about a common axis from a neutral condition of said rotary valve assembly to control flow of fluid therethrough;

a first C-shaped spring arranged about said common axis for biasing said sleeve and rotor members to said neutral condition;

first and second abutments connected, respectively, to said sleeve and rotor members for rotation therewith and engageable by said first C-shaped spring, respective predetermined circumferential positions in which said first and second abutments are connected to said sleeve and rotor members, determining a predetermined circumferential orientation of said sleeve and rotor members in said neutral condition; and

at least one adjustment member which is adjustable relative to at least one of said sleeve and rotor members to an initially adjusted position and is thereafter secured to said one of said sleeve and rotor members in the initially adjusted position;

said adjustment member in the initially adjusted position connecting a respective one of said first and second abutments to the one of said sleeve and rotor members in a predetermined circumferential position relative to said one of said sleeve and rotor members for joint rotation of said one of said first and second abutments and said one of said sleeve and rotor members, said adjustment member comprising a spring member circumscribing said common axis and biased into frictional engagement with said one of said sleeve and rotor members prior to be moved to its initially adjusted position, and said spring member being displaceable relative to said one of said sleeve and rotor members against its biasing force to its initially adjusted position.

4,823,840

CHANGEOVER VALVE

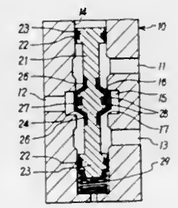
Seiji Kosugi, and Yoshio Asou, both of Soka, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,808

Claims priority, application Japan, Dec. 29, 1986, 61-202659[U]

Int. Cl.[4] F16K *11/044*

U.S. Cl. 137—625.27 **9 Claims**



1. In a poppet changeover valve having a slidable valve rod carrying a valve body adapted to switch the flow of fluid between a plurality of ports in a valve casing by coming in and out of contact with two opposite valve seats provided therein, the improvement which comprises:

an annular projection on which a valve body of an elastic substance is to be fitted being provided in a portion of the valve rod between said two valve seats, a first annular groove being provided on each side of the annular projection by a reduced diameter of the valve rod and a second annular groove being cut at the center of the annular projection;

a valve body fitted on the annular projection being bisected into two segments individually mounted on both sides of said second annular groove;

each of the bisected valve body segments having first and second fitting projections integrally formed thereon and adapted to fit into the first groove and the common second groove; and

the second fitting projection on the bisected valve body segment having an annular flange projecting inward toward the valve rod, the annular flange having a bore whose diameter is reduced to a minimum within a limit that will permit detachment from forming molds.

4,823,841

FLUID MIXING DEVICE, IN PARTICULAR HOT AND COLD WATER MIXING DEVICE

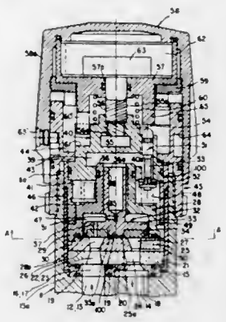
Heinz Graber, Oberkulm, Switzerland, assignor to KWC AG, Unterkulm, Switzerland

Filed Sep. 20, 1988, Ser. No. 246,750

Claims priority, application Switzerland, Oct. 1, 1987, 3821/87

Int. Cl.[4] F16K *21/04, 3/02, 11/18*

U.S. Cl. 137—625.41 **13 Claims**



1. A mixing device for admixing hot and cold water, comprising:

rotary slide means for controlling in an opposing sense the inflow of hot and cold water;

means for suppressing the flow of the hot and cold water through the rotary slide means;

said flow suppressing means comprising a closure portion of servo valve means; and

said rotary slide means constituting seat means for said closure portion of said servo valve means.

4,823,842

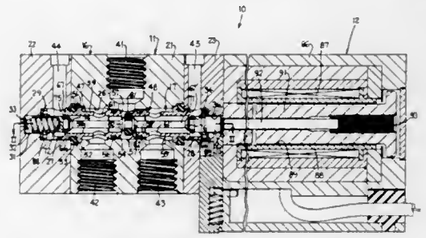
SINGLE-STEM FOUR-WAY VALVE

Vytautas J. Toliusis, Van Buren County, Mich., assignor to Humphrey Products Company, Kalamazoo, Mich.

Continuation of Ser. No. 97,818, Sep. 16, 1987, abandoned. This application Feb. 16, 1988, Ser. No. 158,084

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—625.65 **10 Claims**



1. A four-way valve assembly, comprising:

a housing having a center housing part and first and second end housing parts fixedly attached to opposite ends of said center housing part, said housing defining bore means therein, said bore means including a main bore which extends through said main housing part and first and second end bores which are respectively formed in said first and second end housing parts and are coaxially aligned with opposite ends of said main bore;

first and second substantially identical sleevelike liners sealingly and stationarily supported within said main bore in axially spaced relation, said first and second liners having the inner ends thereof disposed in adjacent but axially spaced relationship and respectively defining thereon first and second annular valve seats which are axially spaced and axially face one another, said first and second valve seats being disposed in surrounding relationship to first and second bores which extend coaxially through the respective first and second liners;

said first liner having a sleevelike hub part associated with an outer end thereof, said sleevelike hub part projecting coaxially into said first end bore so as to concentrically align the latter relative to said main bore;

said second liner having a sleevelike hub part associated with an outer end thereof, said sleevelike hub part projecting coaxially into said second end bore so as to concentrically align the latter relative to said main bore;

a supply port formed in said housing and communicating with said main bore at a location between said first and second valve seats;

first and second load ports formed in said housing and communicating with said main bore at locations which are disposed on axially opposite sides of said supply port, said first and second liners respectively having opening means extending radially therethrough for providing communication between the respective bore and the respective first and second load ports;

a first discharge port formed in said first end housing part and communicating with said first end bore;

a second discharge port formed in said second end housing part and communicating with said second end bore;

a single elongated valve disposed within and extending along said bores and being shiftable between first and second end positions for respectively establishing fluid connection of said first and second load ports to said supply port and said second discharge port when in a first end position, and for respectively establishing fluid connection of the first and second load ports to the first discharge port and the supply port when in the second end position;

said valve including a single elongated rodlike valve stem extending axially throughout said bores and having a single elastomeric poppet ring stationarily mounted thereon in surrounding relationship thereto, said poppet ring being disposed in the space between said opposed valve seats and having the opposite sides thereof disposed for alternate sealing engagement with said second and first valve seats when the valve is shifted between said first and second end positions; and

said valve stem having first and second sealing rings mounted thereon adjacent the opposite ends thereof and disposed for slidable sealing engagement with the respective first and second liners for selectively controlling the opening and closing of said first and second discharge ports respectively in response to shifting movement of said valve.

4,823,843

VALVE APPARATUS

Francis H. Golembiski, Elverson, Pa., assignor to Aptec, Inc., Honey Brook, Pa.

Filed Jun. 1, 1988, Ser. No. 201,081

Int. Cl.[4] F16K *23/00, 11/20*

U.S. Cl. 137—637.1 **10 Claims**

1. A valve apparatus for use in controlling the flow of two different fluids alternately to a single destination comprising:

a first rotary valve having a valve element movable by

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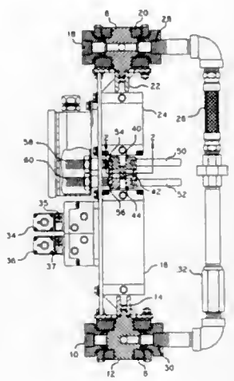
rotation through a first angular displacement between first and second valve positions;

a first fluid-driven actuator connected to operate said first valve through said first angular displacement between a first limit in which the first valve is in its first position and a second limit in which the first valve is in its second position;

a second rotary valve having a valve element movable by rotation through a second angular displacement greater than said first angular displacement between first and third valve positions through a second valve position;

a second fluid-driven actuator connected to operate said second valve through said second angular displacement between a third limit in which the second valve is in its first valve position, through an intermediate position in which the second valve is in its second valve position, to a fourth limit in which the second valve is in its third valve position;

lost-motion coupling means connected to said first and second valves, said coupling means (a) permitting the second actuator to rotate the second valve to its second valve



position while the first valve is in its first position, (b) preventing the second valve from moving beyond its second position when the first valve is in its first position, and (c) permitting the second rotary valve to rotate to its third position when the first valve is in its second position;

the first fluid-driven actuator exerting a greater torque than the second fluid-driven actuator, whereby, when the first rotary valve is in its first position, the coupling means prevents the second rotary valve from moving beyond its second valve position towards its third valve position; and

said rotary valves including a first fluid inlet port connectable to receive a first fluid from a fluid supply, a second fluid inlet port connectable to receive a second fluid from a fluid supply, and an outlet port, said valves being connected and arranged to prevent the flow of the first fluid to the outlet port when the valves are in their first positions, to permit the flow of the second fluid to said outlet port when the first valve is in its first valve position and the second valve is in its second valve position, and to permit the flow of the first fluid to said outlet port when the first valve is in its second valve position and the second valve is in its third valve position.

4,823,844

FLUID PRESSURE SURGE DAMPER FOR A FLUID SYSTEM

Donald D. Bartholomew, Marine, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Nov. 2, 1987, Ser. No. 115,338
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 **17 Claims**



1. A fluid pressure surge damper for damping pressure surges of fluid in a fluid system comprising,

a housing,

a connector means for connecting said housing to said fluid system,

an elastomeric element contained within said housing, said elastomeric element comprised of an elastomer material being partially compressed by a peripheral flexible impervious membrane sealing the elastomeric material such that a subatmospheric pressure is formed within the membrane, and

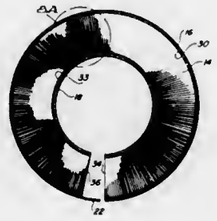
means within said housing for preventing said elastomeric element from impeding the flow of said fluid.

4,823,845

PIPE INSULATION

Phillip C. Martin, Conifer, and Carl R. V. Linden, Littleton, both of Colo., assignors to Manville Corporation, Denver, Colo.

Filed Sep. 4, 1987, Ser. No. 93,288
Int. Cl.[4] B32B *5/12*
U.S. Cl. 138—149 **6 Claims**



1. Insulation for covering a length of pipe of predetermined diameter, comprising:

a generally cylindrical split tube comprised of bonded glass fibers, the split tube having an an inner cylindrical surface, adapted to surround the pipe, and an outer cylindrical surface;

the tube further having spaced opposed edges extending generally lengthwise of the tube and forming the split in the tube;

a flexible substantially non-stretchable sheet adhered to the inner cylindrical surface of the split tube, the circumference of the inner cylindrical surface of the split tube corresponding in dimension to the circumference of the pipe to be covered;

a majority of the glass fibers being oriented substantially at right angles to the flexible sheet so as to be oriented substantially radially of the pipe on which the insulation is installed; and

a flexible sheet adhered to the outer surface of the split tube;

a significant number of the fibers extending from the flexible sheet extend a greater distance than other fibers wherein the number of fibers adjacent the outer flexible sheet is significantly greater than the number of fibers adjacent the inner flexible sheet; the fibers adjacent the outer flexible sheet being oriented substantially radially of the outer flexible sheet;

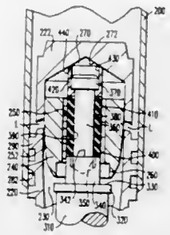
the split tube of insulation being adapted to the spread apart at the split portion thereof to form a gap wide enough to allow the split tube to be installed on a length of pipe, the split tube being sufficiently resilient to cause the spaced opposed edges to snap back toward each other after being installed so that the distance therebetween becomes less than the width of the gap.

4,823,846

TUBE PLUG TIP RESTRAINER APPARATUS

James W. Everett, Hempfield Township, Westmoreland County, and Frank Sadofsky, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 24, 1987, Ser. No. 137,622
Int. Cl.[4] F16L *55/12*
U.S. Cl. 138—89 **24 Claims**



1. A restrainer apparatus for restraining a tip of a plug when the tip is fracturedly separated from the plug, the plug capable of being disposed in a tubular member for plugging the tubular member, comprising:

(a) a shell having a closed first end defining the tip and having an open second end, said shell defining an open cavity therein;

(b) shell expander means disposed in the cavity for expanding said shell into engagement with the tubular member, said shell expander means having a first bore therethrough; and

(c) restrainer means disposed in the first bore for expansibly engaging the first bore of said expander means enabling said expander means to expand into engagement with said shell as said expander means expansibly engages the first bore and restrain the tip of said shell by force of friction as the tip is fracturedly separated from said shell.

4,823,847

MULTI-LAYER HELICAL SEAM STEEL PIPE

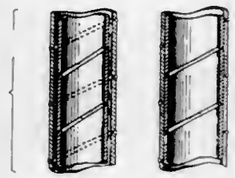
Heinz Grosse, Dortmund; Friedrich-Otto Koch, Unna-Massen; Adolf Peeck, Hamm, and Werner Wennemann, Dormund, all of Fed. Rep. of Germany, assignors to Hoesch Werke AG, Dortmund, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,478
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3135966
Int. Cl.[4] F16L *9/14*
U.S. Cl. 138—143 **6 Claims**

1. A multi-layer gap-less steel pipe comprising an inner pipe produced from thermomechanically rolled steel strip with high notched bar impact strength, and

an outer pipe produced from thermomechanically rolled steel strip with high notched bar impact strength and the inside of the outer pipe being disposed adjacent to the outside of the inner pipe;

wherein in the final status of the multi-layer pipe the inner



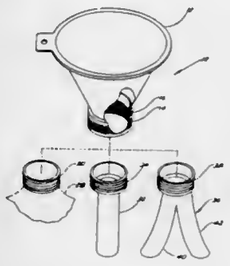
pipe has compression stress and the outer pipe has tensile stress, and wherein the multi-layer gap-less steel pipe is produced by mechanically expanding individual helical welding seam pipes, where one pipe is inserted into a second pipe.

4,823,848

MULTIPURPOSE FUNNEL

Darryl J. Sentmore, Sr., and Marrilyn M. Sentimore, both of #2 Christopher Ct., New Orleans, La. 70128

Filed Feb. 25, 1988, Ser. No. 160,298
Int. Cl.[4] B65B *39/00*; B67C *11/00*
U.S. Cl. 141—334 **1 Claim**



1. A new and improved multipurpose funnel comprising:

funnel means; and

neck means removably attached to said funnel means configured for selective engagement with a container opening to facilitate a filling thereof with a chosen material wherein said neck means includes an internally threaded closure removably attached to said funnel means;

said internally threaded closure comprises a container cap, and

wherein said container cap includes a topmost positioned through-extending aperture, said funnel means being positionable within said aperture,

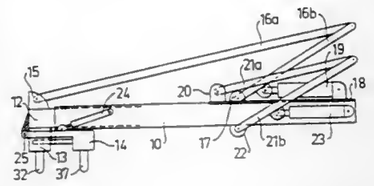
and further including a funnel shaped insert removably interconnected between said funnel means and said container cap, said insert comprising an attachment means between said funnel means and said container cap, and

wherein said neck means further includes a neck portion threadably attachable thereto, and

wherein said neck portion includes external threads which are engageable with internal threads formed in said internally threaded closure, and

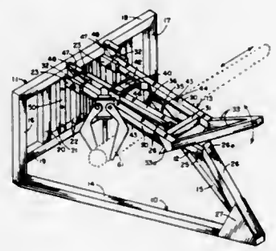
wherein said neck portion is of a bifurcated design which includes a first neck directable to a first container and a second neck directable to a second container, thereby to facilitate the concurrent filling of said first and second containers with a selected material.

4,823,849
WOOD PROCESSOR
Olov Unosen, Lanervägen 2, S-930 93 Laisvall, Sweden
Filed Mar. 1, 1988, Ser. No. 162,599
Int. Cl.[4] A01G *23/08*
U.S. Cl. 144—3 D **10 Claims**



1. A wood processor for felling, delimbing and cutting a tree trunk, comprising:
an arm system including a series of telescopically-related longitudinally-elongated beams, including an outer beam having an inner end mountable to a vehicle, and an outer end, and an inner beam having an outer end, said arm system being longitudinally retractable and extensible between a retracted position in which the outer end of the inner beam is located adjacent the outer end of the outer beam, and an extended position in which the outer end of the inner beam is spaced substantially away from said outer end of said outer beam longitudinally of said arm system;
a delimbing head having a set of openable-closable trunk-grasping claws;
means pivotally connecting said delimbing head to said outer end of said inner beam for pivotal movement about a first horizontal axis between a horizontal position in which said delimbing head faces downwards, and a vertical position in which said delimbing head faces forwards;
a felling head having a set of openable-closable trunk-grasping claws;
means pivotally connecting said felling head to said outer end of said outer beam for pivotal movement about a second horizontal axis between a horizontal position in which said felling head faces downwards, and a vertical position in which said felling head faces forwards;
said first and second horizontal axes being substantially coaxial when said arm system is in said retracted position;
said delimbing head and said felling head being provided with respective disconnectable connecting means operable to connect said delimbing head and said felling head together for coordinated pivoting about said first and second horizontal axes when said arm system is in said retracted position, and which are operable to disconnect said delimbing head from said felling head as said arm system extends from said retracted position towards said extended position;
means engaged with said arm system and at least one of said delimbing and felling heads, when said arm is in said retracted condition, for coordinately pivoting said delimbing and felling heads, about said horizontal axes, between said vertical and horizontal positions;
means engageable with said beams for longitudinally extending and retracting said arm system between said retracted and extended positions thereof; and
said felling head being adapted for mounting of a cutter thereto,
whereby, in use, with the arm system in its retracted position, the delimbing and felling heads may be pivoted to the vertical positions thereof by said coordinately pivoting means, and said trunk-grasping claws of said delimbing and felling heads operated to grasp an upright tree trunk, to thereby hold a tree while the trunk is cut off by a cutter, whereupon the coordinately pivoting means may be operated to pivot said delimbing and felling heads to the horizontal positions thereof, thereby felling the cut-off tree, whereupon the claws of the delimbing head may be relaxed somewhat while the claws of the felling head continue to grasp the tree trunk, and the means for extending and retracting the arm system operated to extend the arm system from said retracted position towards said extended position thereof, thereby disconnecting said disconnectable connecting means so that said delimbing head becomes disconnected from said felling head and is moved longitudinally of the tree trunk with the claws of the delimbing head in interfering relation with limbs projecting radially outwards from the trunk, thereby at least partially delimbing the trunk, whereupon the claws of the delimbing head may be tightened again into gripping relation with the trunk, the claws of the felling head relaxed somewhat, and the means for extending and retracting the arm system towards said retracted position thereof thereby bringing a site on said trunk at which a cut is to be made, into adjacency with said feeling head, for cutting.

4,823,850
PULLTHROUGH DELIMBING DEVICE
John M. Strean, 3910 Highway 40 West, Columbia Falls, Mont. 59912
Filed Aug. 23, 1988, Ser. No. 235,119
Int. Cl.[4] A01G *23/08*; B27L *1/00*
U.S. Cl. 144—2 Z **6 Claims**

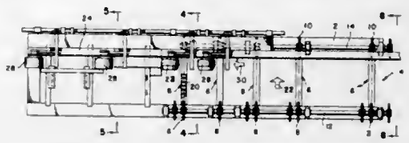


1. A pull through, movable jaw type delimbing device for cut trees, comprising, in combination:
a base having a planar lower surface structurally supporting an elongate substantially perpendicular support member at one side edge;
a lower delimbing jaw, fixedly mounted between the base and the vertical support, defining an elongate delimbing beam sloping downwardly and inwardly to the support member and a support beam extending downwardly and outwardly from the delimbing beam to the base;
an upper delimbing jaw having at least one elongate delimbing beam pivotally interconnected at a first inner end to the upper medial part of the vertical support to extend over the lower jaw, said upper delimbing beam carrying at its outer end an upwardly and outwardly extending jaw beam and having an auxiliary delimbing member pivotally interconnected in the medial outer portion of the delimbing beam to extend inwardly for limited downward motion relative to the upper delimbing beam.

4,823,851
INFEED TABLE FOR LUMBER PLANER MACHINE
David E. Seffens, Hot Springs, Ark., assignor to H. W. Culp Lumber Co., New London, N.C.
Filed Mar. 8, 1988, Ser. No. 165,504
Int. Cl.[4] B27B *1/00*
U.S. Cl. 144—245 R **9 Claims**

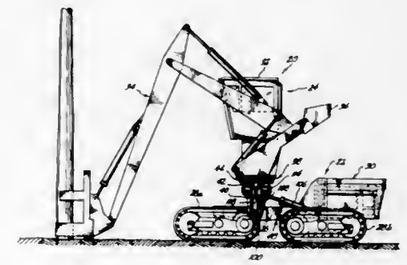
1. An infeed table for delivering pieces of lumber to a planer machine, comprising

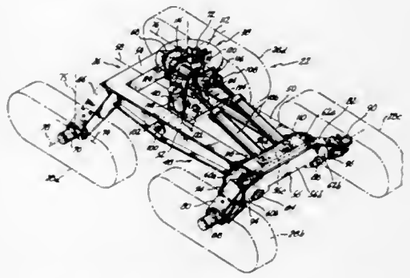
(a) a stationary frame;
(b) a linebar adjustably connected with said frame and extending in a longitudinal direction;
(c) chain drive means connected with said frame for laterally transferring pieces of lumber successively against said linebar;
(d) a plurality of independently rotatably driven press roller assemblies connected with said frame adjacent said linebar



in longitudinally spaced relation for transporting the pieces of lumber longitudinally to the planer machine; and
(e) control means connected with said press roller assemblies for independently controlling the rotational speed of said press roller assemblies, whereby said pieces of lumber are quickly accelerated in said longitudinal direction for successive transport to the planer machine at a speed corresponding with the speed of the planer feedworks.

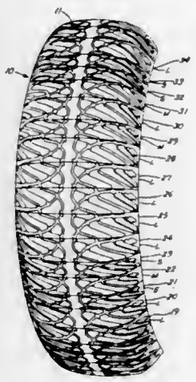
4,823,852
TREE FELLER-BUNCHER
Frederic E. Langford, Redmond, Wash., assignor to Allied Systems Company, Sherwood, Oreg.
Division of Ser. No. 11,518, Feb. 5, 1987, Pat. No. 4,763,742.
This application Jan. 28, 1988, Ser. No. 149,650
Int. Cl.[4] B60P *1/18*; B62D *55/08*
U.S. Cl. 144—3 D **22 Claims**





1. A multi-track vehicle especially adapted for operation on steep slopes, comprising:
a frame having a longitudinal dimension and a transverse dimension, said frame being mounted on track pods disposed on opposite lateral sides of the frame and having opposite ends;
a first trunnion and means mounted said first trunnion to a central portion of said frame for swinging movement about a transverse axis;
a second trunnion and means mounting said second trunnion to said first trunnion for swinging movement about an axis oriented longitudinally relative to said frame;
a turntable and means mounting said turntable to said second trunnion for rotational movement about a generally upright axis;
an upper unit mounted on said turntable; and
pod-connecting means for connecting each of the pods to the frame, vertical lines through each of the pod-connecting means defining a tip boundary of the machine, opposite ends of said pods being offset from said first trunnion sufficiently in a longitudinal direction and said pods being offset from said second trunnion sufficiently in a transverse direction to allow a center of gravity of said entire vehicle and upper unit to remain inside the tip boundary of said machine when said upper unit is upright and said frame is angulated in any direction relative to the horizontal.

4,823,853
NOISE CONTROL TECHNIQUES FOR TIRES EMPLOYING THREE DIFFERENT SIZE DESIGN CYCLES
Leo J. Hitzky, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed May 21, 1986, Ser. No. 865,447
The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.
Int. Cl.[4] B60C *11/03*
U.S. Cl. 152—209 R **1 Claim**



1. A tire provided with a tread comprising:
a plurality of repeating design cycles placed continuously about the circumference of said tire, said design cycles having a total of three different design cycle lengths including a short length, a medium length, and a long length that define a percent variation and a percent unbalance, wherein the three design cycle lengths have a ratio of about 17-21-26.

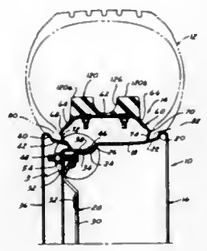
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4,823,854

SAFETY TIRE AND RIM COMBINATION WITH SAFETY INSERT

Roger E. Payne, Okemos, and J. Bruce Weeks, Eaton Rapids, both of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 822,832, Jan. 27, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 129,050
Int. Cl.[4] B60B *21/10*; B60C *17/00*
U.S. Cl. 152—382 23 Claims



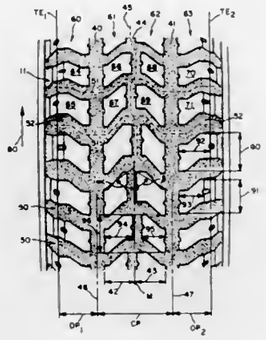
1. In a safety tire and wheel assembly comprising a vehicle wheel including a take-apart wheel rim having axially spaced bead flanges and a rim base, a tire of standard radial or bias construction having axially spaced bead toes and a circumferential tire tread, and safety runflat insert means comprising base-beadlock means extending circumferentially around said rim within an air chamber surrounded by said tire and rim and having axially spaced side edges clamping said bead toes against said bead flanges, the improvement wherein said insert means comprises an annulus constructed of relatively thin sheet metal of generally channel shape in radial cross section open at its radially inner periphery between said side edges and having a relatively high aspect ratio, said annulus having a generally central bight portion extending generally axially and bounded by radially in-turned leg portions, said leg portions diverging relative to one another radially inwardly towards said tire bead toes at an angle of about at least 50° relative to the axis of said wheel and terminating in toe portions extending generally radially inwardly relative to said leg portions, the outer surfaces of said toe portions bearing generally flat against the interior surfaces of said tire toe beads such that said annulus is pre-stressed by deflection of said toe portions towards one another axially of said wheel such that said channel is stressed in direct opposition to stresses imposed on said channel when side tire is operated to run on said rim without inflation pressure in said air chamber, and an elastomeric tread bonded to the outer surface of said central bight portion, said tread comprising a substantially complete annulus bonded to at least said bight portion of said annulus and extending radially outwardly therefrom a predetermined distance to have a clearance with the interior surface of the tire under normal running conditions, said tire tread having a circumferential center groove therein defined by two laterally spaced circumferentially extending radially outwardly protruding leg portions, said annulus comprising a pair of semi-circular members having interengageable mating ends releasably interconnected at said mating ends to form a complete annulus.

4,823,855

PNEUMATIC TIRE TREAD PATTERN

René Goergen, Colmar-Berg; Leo J. Hitzky, Walferdange, both of Luxembourg; Frederick W. Miller; Richard L. Galante, both of Akron, Ohio; Terry J. Walbel, Wadsworth, Ohio; Michael A. Kolowski, Mogadore, Ohio, and William M. Hopkins, Hudson, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 23, 1987, Ser. No. 124,303
Int. Cl.[4] B60C *11/11*
U.S. Cl. 152—209 R 34 Claims



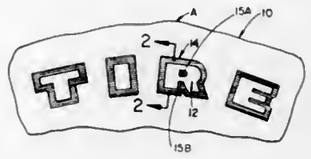
1. A pneumatic tire comprising a tread extending circumferentially about the axis of rotation of the tire and having a pair of lateral edges with a sidewall portion extending radially inwardly from each lateral edge of the tread, said tire having an aspect ratio in the range of 0.60 to 0.95, a ratio of tread radius to maximum section width in the range of 1.0 to 2.4, and a ratio of tread radius to tread arc width in the range of 1.4 to 2.8; said tread having first and second straight grooves therein which extend circumferentially about the tire, one of said straight circumferentially extending grooves being disposed on each side of a mid-circumferential plane of the tire and each of said straight circumferenetially extending grooves being spaced from said mid-circumferential plane by a distance in the range of 10% to 25% of the tread arc width, a circumferentially extending central groove is disposed axially betwene said first and seocnd circumfernetially extending straight grooves, a plurality of laterally extending zigzag grooves each of which extends across the tread are disposed circumferennetially about the tire, said circumferntially and laterally extending grooves cooperating with one another to define four circumferentially extending arrays of circumferentially aligned block elements, circumferentially aligned block elemetns of the two axially centermost arrays cooperate with one anoyhter to present "v" formations, the portion of the tread that is disposed between the centerlines of said circumferentially extending straight grooves having a net-to-gross ratio that is greater than the net-to-gross ratio of the portions of the tread that are disposed axially outwardly of the centerlines of said circumferentially extending straight grooves, said block elements having radially outer surfaces with the axial extents of the radially outer surfaces of circumferentially adjacent block elements in each circumferentially extending array alternating between wide and narrow widths.

4,823,856

SERRATED OUTLINE MARKING FOR A TIRE SIDE WALL

Charles W. Roberts, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 683,824, Dec. 19, 1984, abandoned. This application Jul. 31, 1986, Ser. No. 891,053
Int. Cl.[4] B60C *13/02*
U.S. Cl. 152—523 23 Claims



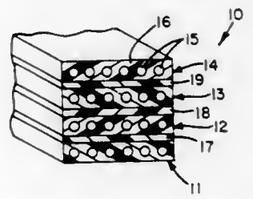
1. A tire sidewall marking comprising:
a serrated margin area including a plurality of ribs separated by grooves, said ribs and grooves being located in a surface of a tire article;
an indicium integral with said article and completely surrounded by said margin area ribs and grooves,
wherein said indicium is defined by a substantially flat ungrooved portion of said article surface, said indicium and said margin area being completely surrounded by a substantially flat ungrooved portion of said article surface; and,
at least one counter area at least partially surrounded by said indicium, said counter area being serrated and being defined by ribs and grooves, said counter area grooves being located in said article surface.

4,823,857

TIRE BEADS

Gurdev Orjela, Akron; Mahmond C. Assaad, Uniontown; David B. Beltz, Springfield Township, Clark County, and Amit Prakash, Hudson, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 16, 1988, Ser. No. 168,847
Int. Cl.[4] B60C *15/04*
U.S. Cl. 152—540 18 Claims



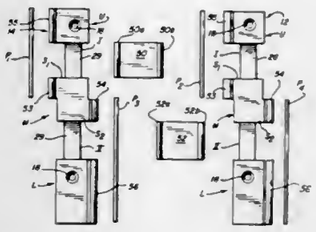
1. An annular bead member for a tire comprising two or more radially superposed layers each of which comprises a composite of fibers embedded in a matrix of a polymeric material, each next adjacent pair of say layers being separated from one another by a layer of polytetrafluoroethylene that is not attached to both of said adjacent layers by either adhesive or mechanical bonds.

4,823,858

PORTABLE DISPLAY PANEL AND HINGE SYSTEM

Simon G. A. Perutz, Evanston, Ill., assignor to Nimlok Company, Niles, Ill.

Filed Jun. 2, 1987, Ser. No. 57,382
Int. Cl.[4] A47G *5/00*
U.S. Cl. 160—135 8 Claims



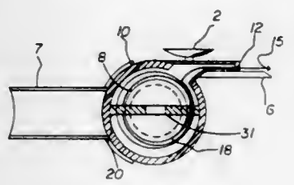
5. A display panel and hinge system comprising a plurality of display panels arranged in side-by-side relation; and a plurality of hinges interconnecting adjoining panels; each display panel including a frame, and front and rear sections sandwiching and substantially concealing therebetween said frame; each of said hinges including elongated first and second hinge segments, the first hinge segment being mounted on a vertical first peripheral part of the frame of a first one of the adjoining panels and the second hinge segment being mounted on a corresponding vertical first peripheral part of the frame of a second of the adjoining panels; each hinge segment of each hinge being of unitary construction and having corresponding first and second vertical sides, each vertical side having sections thereof in fixed vertically spaced relation, corresponding vertical sides of the first and second hinge segments being interconnected by at least a pair of longitudinally spaced link means, each of said link means having opposed vertical sides, each hinge segment being provided with a middle portion located between and separating the link means, vertical edges of said middle portion forming a portion of said sections of the first and second vertical sides of said hinge segment and being hingedly connected to corresponding vertical sides of the link means whereby, when said first and second panels are disposed in a substantially parallel face-to-face relation, one of said first and second adjoining panels is selectively rotated relative to the other of said first and second adjoining panels through a maximum arc of substantially 360°, by rotating about a pair of substantially parallel primary vertical hinge axes defined by the vertical sides of said link means.

4,823,859

WINDSHIELD PROTECTIVE DEVICE

Steve S. Park, 70 Woodcrest Dr., Syosset, N.Y. 11791

Filed Dec. 11, 1987, Ser. No. 131,568
Int. Cl.[4] B60J *3/02*
U.S. Cl. 160—370.2 6 Claims



4. A sun shade device for vehicle windshields comprising:

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a. housing means for being mounted on the inside of a windshield adjacent one lateral end of said windshield along one side of said vehicle;
b. conically shaped roller means mounted within said housing means with the larger diameter of said roller means being located at the bottom side of said windshield;
c. a sheet of protective shade mounted on said roller, said protective shade being made from an electrostatic vinyl sheet material;
d. slot means in said housing means to permit said shade to be unrolled from said roller means;
e. means attached to the end of said shade protruding from said slot and being mounted on the other lateral end of said windshield to pull said shade off said roller means as said housing means is moved across said windshield; and
f. means mounted on said housing meand adjacent said slot to force contact of said shade with said windshield as said shade is being withdrawn so that said shade will be in contact with said windshield over the full length of said windshield, said shade being trapezoidal in shape to fit on said conically shaped roller means and to fit said windshield after said shade is extended.

4,823,860

ROLL CASTING PROCESS AND ROLL CASTING SYSTEM FOR CARRYING OUT THE PROCESS

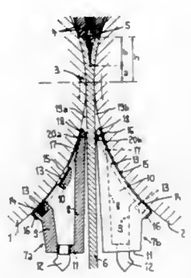
Wilhelm F. Lauener, Gerlafingen, Switzerland, assignor to Larex AG, Recherswil, Switzerland

Filed Feb. 9, 1987, Ser. No. 12,347

Claims priority, application Switzerland, Feb. 13, 1986, 581/86

Int. Cl.⁴ B22D *11/06, 11/124*

U.S. Cl. 164—480 **11 Claims**



1. A roll casting process for continuous casting of a metal strip comprising the steps of:
injecting molten metal between a first and a second rotating roll which produce a solidified metal strip;
disposed first and second barriers between said solidified metal strip and said first and second rotating rolls, respectively;
providing a continuous flow of coolant along a first coolant flow path in a first space substantially bounded by said first barrier, said first rotating roll, and said solidified metal strip, and along a second coolant flow path in a second space substantially bounded by said second barrier, said second rotating roll, and said solidified metal strip;
measuring a parameter indicative of said solidified metal strip position; and
adjusting said coolant flow in response to said parameter, whereby said solidified metal strip is forced into a symmetrical position.

7. A roll casting system comprising:
a molten metal supply means for providing a source of molten metal;
first and second rotating roll means for receiving molten metal from said molten metal supply means and for producing a solidified metal strip into a receiving area;
first and second barrier means disposed between said first and second rotating rolls, respectively, and said receiving area;
coolant supply means for supplying a continuous flow of coolant along a first and second coolant flow path bounded by said receiving area, said first and second rotating rolls, respectively, and said first and second barriers, respectively; and
measuring means for measuring a parameter indicative of said solidified metal strip position;
wherein said coolant supply means adjusts said coolant supply in response to said measuring means so as to force said solidified metal strip into a symmetrical position.

4,823,861

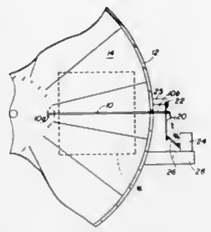
FIRE DETECTION DEVICE FOR REGENERATIVE AIR HEATER

Richard J. Warrick, North Canton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 6, 1988, Ser. No. 241,162

Int. Cl.⁴ F28G *13/00*

U.S. Cl. 165—5 **17 Claims**



1. In combination with a regenerative air heater having a housing, a matrix in the housing and means for supplying, through the housing, air to be heated by the matrix, and gas to heat the matrix, a device for detecting a hot spot in the matrix comprising at least one elongated expansion element made of material having a high co-efficient of expansion, said expansion element extending through the matrix and having one end fixed with respect to the housing and an opposite free end, whereby said expansion element is expandable in length upon being exposed to a hot spot in the matrix, and means for detecting expansion of the length of the elongated expansion means.

4,823,862

PLASTIC RADIATOR FOR TRANSVERSE-FLOW COOLING SYSTEMS OF INTERNAL COMBUSTION ENGINES

Axel Temmesfeld, Bad Feilnbach, and Karl Tauber, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

PCT No. PCT/EP85/00664, § 371 Date Apr. 17, 1987, § 102(e) Date Apr. 17, 1987, PCT Pub. No. WO86/03555, PCT Pub. Date Jun. 19, 1986

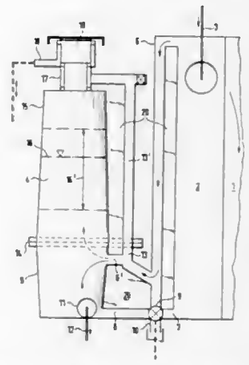
PCT Filed Dec. 4, 1985, Ser. No. 46,879

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444275

Int. Cl.⁴ F28D *15/00*

U.S. Cl. 165—104.32 **4 Claims**

1. A plastic water chamber means for transverse-flow radiators of internal combustion engines, comprising: at least a two part balancing chamber means through which an ancillary flow of coolant passes, a water chamber means fluidly connected to the balancing chamber means, a first part of the two part balancing chamber means being made integrally with the water chamber means, the balancing chamber means in an area corresponding to a normal range of coolant level within the water chamber means, having a second and transparent part



wherein the second transparent part is an upper part that is connected on the first part that is integral with the water chamber means at a point below the normal range of coolant level.

4,823,863

THERMAL CONDUCTION DEVICE

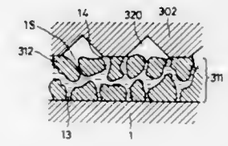
Tadakatsu Nakajima, Ibaraki; Wataru Nakayama, Kashiwa; Shigeo Oohashi, Ibaraki; Heikichi Kuwabara, Ibaraki, and Takahiro Daikoku, Usiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 20, 1987, Ser. No. 28,202

Claims priority, application Japan, Mar. 20, 1986, 61-60558

Int. Cl.⁴ F28F *7/00*

U.S. Cl. 165—80.4 **6 Claims**



1. A thermal conduction device comprising a heat generating element, a heat sink element which carries heat generated by said heat generating element, out of said device, notches which are formed in a surface of said heat sink element, a porous layer which is formed by sintering ultrafine grains and has microscopic cavities and which is provided on said notches of said surface of said heat sink element, and a liquid which is contained in said cavities, said heat generating element being held in close contact with said porous layer by a surface tension of said liquid.

4,823,864

CHEMICAL ENERGY STORAGE SYSTEM

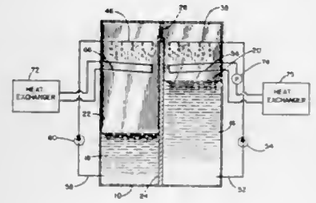
Uwe Rockenfeller, P.O. Box 1086, Boulder City, Nev. 89005

Continuation-in-part of Ser. No. 38,323, Apr. 14, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 215,204

Int. Cl.⁴ F25B *17/02*

U.S. Cl. 165—104.12 **23 Claims**

1. Apparatus for transferring heat comprising
a first vessel containing a liquid solution of a compound selected from the group consisting of alkali and alkaline earth metal hydroxide, halide and thiocyanate, ammonium halide and thiocyante, and mixtures thereof, said solution having an initial concentration of between about 30% and about 80%, by weight of said compound, said liquid selected from the group consisting of water, ammonia an alcohol having between 1 and 8 carbon atoms, glycerol, glycols, polyglycols, glycol ethers, aliphatic amines and alkanol amines having between 1 and about 6 carbon atoms, and mixtures thereof, and a first space above the level of said liquid solution and means for pumping said liquid solution to distribution means for directing said liquid solution into said first space,
a second vessel containing said liquid without said compound therein, and a second space above the level of said liquid and means for pumping said liquid to distribution means for directing said liquid into said second space,



both said first and second vessels being closed to atmosphere and capable of holding a vacuum,
conduit means communicating between said first space and said second space for allowing liquid vapor and pressure changes to pass therebetween, and valve means cooperating with said conduit means for terminating communication between said spaces,
heating means for heating said solution to a temperature of above about 90° F., and cooling means for cooling said liquid to a temperature below about 55° F.,
first heat exchange means cooperating with said first vessel for transferring heat from heated solution therein, and
second heat exchange means cooperating with said second vessel for transferring heat to liquid therein.

4,823,865

TURBULATOR CONSTRUCTION FOR A HEAT EXCHANGER

Dennis R. Hughes, Germantown, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 18, 1988, Ser. No. 157,291

Int. Cl.⁴ F28F *1/40, 13/12*

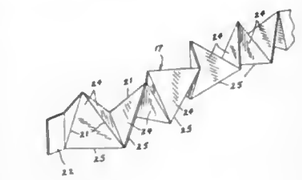
U.S. Cl. 165—109.1 **12 Claims**

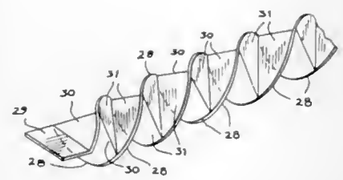
1. A heat exchanger, comprising a tube to conduct a fluid in a downstream direction, a turbulator disposed within the tube and disposed in the form of a double helix, said turbulator in combination with said tube defining a pair of helical passages, the upstream end of said turbulator being generally flat and extending generally diametrically across the tube to divide the tube into a pair of inlet passages, each inlet passage communicating with one of said helical passages, said turbulator being composed of a plurality of triangular sections, each triangular section having three side edges and each section disposed at an angle with respect to adjacent sections, a pair of said side edges of each section being connected to side edges of adjacent sections and each section having a third exposed side edge facing the inner surface of said tube.

11. A heat exchanger, comprising a tube to conduct a fluid in a downstream direction, a turbulator disposed within the tube and disposed in the form of a double helix, said turbulator in combination with said tube defining a pair of helical passages, the upstream end of said turbulator being generally flat and

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extending generally diametrically across the tube to divide the tube into a pair of inlet passages, each inlet passage communicating with one of said helical passages, said turbulator being composed of a plurality of generally triangular sections, each triangular section disposed at an angle with respect to adjacent





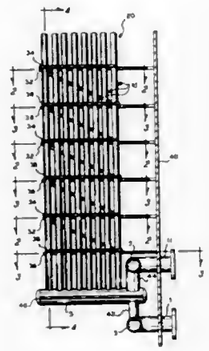
sections, each section having a pair of sides connected to the sides of adjacent sections with each section having a third exposed side facing the inner surface of said tube, said third side being generally convex and conforming to the curvature of the inner surface of said tube.

4,823,866

TUBE SUPPORT FOR HEAT EXCHANGER

Harold R. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 9, 1987, Ser. No. 118,822
Int. Cl.[4] F28D *7/00*
U.S. Cl. 165—162 **12 Claims**



1. Apparatus comprising:

(a) a plurality of parallel tubes forming a tube hundle having a longitudinal axis, such tubes being arranged in a plurality of parallel tube rows with regular straight lanes being defined through the tube bundle transverse to the direction of the tube rows, there being a first plurality of lanes defined through the tube bundle at an angle of $+\theta 1$ with respect to the direction of the tube rows and a second plurality of lanes being defined through the tube bundle at an angle of $-\theta 1$ with respect to the direction of the tube rows, there being a third plurality of lanes defined through the tube bundle at an angle of $+\theta 2$ with respect to the direction of the tube rows and a fourth plurality of lanes defined through the tube bundle at an angle of $-\theta 2$ with respect to the direction of the tube rows, wherein $\theta 1$ is in the range of 10° to 60° wherein $\theta 2$ is in the range of 40° to 80°, and wherein $\theta 2$ is greater than $\theta 1$,

(b) a first band embracing an outer tube limit of the tube bundle,

(c) a first plurality of rods attached to said first band and extending through the first plurality of lanes, each rod of said first plurality of rods being of sufficient diameter to contact the tubes defining the limits of each lane of the first plurality of lanes, each tube of the tube bundle being contacted by at least one rod of the first plurality of rods,

(d) a second band spaced longitudinally apart from the first band with respect to the longitudinal axis of the tube bundle, said second band embracing the outer tube limit of the tube bundle; and

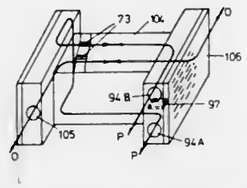
(e) a second plurality of rods attached to said second band extending through said second plurality of lanes, each rod of said second plurality of rods being of sufficient diameter to contact the tubes defining the limits of each lane of the second plurality of lanes, each tube of the tube bundle being contacted by at least one rod of the second plurality of rods.

4,823,867

FLUID FLOW APPARATUS

Raymond J. Pollard, 6 Sandringham Street, Alexandra Hills, Queensland, Australia 4161, and Geoffrey F. Ford, 574 Robinson Road, Aspley, Queensland, Australia 4034

Continuation of Ser. No. 410,900, Aug. 24, 1982, abandoned. This application Oct. 9, 1986, Ser. No. 917,024
Claims priority, application Australia, Sep. 11, 1981, PF0723
Int. Cl.[4] F28F *3/02*
U.S. Cl. 165—166 **8 Claims**



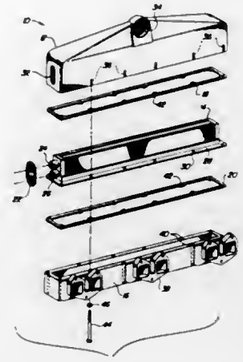
1. A heat exchanger comprising: a core element, said core element including a plurality of substantially parallel plates in stacked relationship so as to define a multiplicity of flow passages for a working fluid alternating with a plurality of flow passages for a process fluid, said working fluid flow passages being substantially parallel to said process fluid flow passages, wherein one of said working or process fluids makes at least two passes through said core element in different flow passages in series and the other of said working or process fluids makes a single pass through said core element with both working and process fluids exiting from each passage externally of said core element; diversion means associated with one end of said core element for diverting said one fluid back through said core element so as to make said at least two passes therethrough and for directing flow of said other fluid, and access means associated with another end of said core element for directing flow of both said working fluid and said process fluid; said plurality of plates forming a plurality of openings at said one end and said another end of said core element, whereby the specific juxtaposition of parallel plates, the diversion means, and the access means selectively controls the flow of the process fluid and the working fluid through the heat exchanger.

4,823,868

INTERCOOLER AND METHOD OF ASSEMBLING THE SAME

Dennis R. Neebel, Corvallis, Oreg., assignor to Deere & Company, Moline, Ill.

Filed May 26, 1988, Ser. No. 198,884
Int. Cl.[4] B22C *13/10;* **F02B** *33/00*
U.S. Cl. 165—178 **10 Claims**



1. An intercooler comprising:

an intercooler core having an inlet, an outlet, and a flange peripherally extending therefrom with a plurality of holes spaced around said flange;

first and second gaskets positioned on either side of said flange, each gasket having a plurality of holes corresponding to the plurality of holes in said flange;

a housing having a face mateable with said first gasket with a plurality of screw bores formed therein corresponding to said holes in said flange and having an opening formed in one end thereof through which said inlet and said outlet extend;

an intake manifold having a face mateable with said second gasket and a plurality of through bores formed therein corresponding to said bores in said flange;

a plurality of cap screws extending through said through bores and holes into said screw bores for clamping said housing, gaskets, flange and manifold together to form an air-tight seal therebetween; and

a highly compressible intercooler seal positioned about said inlet and outlet and compressed between said intercooler core and an inside surface of said housing about said opening to form a seal therebetween.

4,823,869

HEAT SINK

Allen J. Arnold, Lagrangeville, and Kerry L. Sutton, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

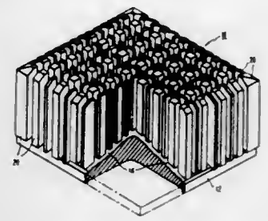
Continuation of Ser. No. 876,054, Jun. 19, 1986, abandoned. This application Mar. 2, 1988, Ser. No. 166,740
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—185 **4 Claims**

1. A heat sink for cooling modules containing semicondcutor chips comprising:

a base member of heat conducting material having a top surface and a bottom surface, said bottom surface in thermal contact with at least one semiconductor chip, said top surface having a pyramidal top surface having a peak at the intersection of four triangular surfaces; and

a rectilinear array of cooling fins extending from said top surface, said rectilinear array providing a plurality of air flow channels between said cooling fins and in contact with all of the triangular planar surfaces;

whereby an impinging flow of cooling air is directed by the peak of the top surface through the air flow channels and



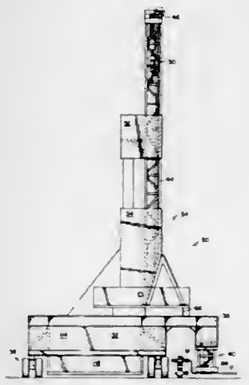
along the top surface, thereby improving the cooling efficiency of the heat sink.

4,823,870

CANTILEVER DRILLING STRUCTURE

Ronald S. Sorokan, 14 Aspen Heights, 2330 Township, Rd 522, Sherwood Park, Alberta, Canada T8B 1H8

Continuation of Ser. No. 022,610, Mar. 3, 1987, abandoned, Continuation of Ser. No. 629,100, Jul. 9, 1984, abandoned. This application Aug. 1, 1988, Ser. No. 227,492
Int. Cl.[4] E21B *7/00, 15/00*
U.S. Cl. 166—79 **54 Claims**



1. A drilling structure comprising:

a base unit having a side positionable generally adjacent a well head,

a friction reducing means supporting said base unit on a support surface on which said base unit is movable,

a drilling rig mast assembly positioned generally above and supported by said base unit,

said base unit including a cantilever member extending out from said side of said base unit in a fixed position relative to said side of said base unit,

a positioning means for sliding said drilling rig mast assembly on and relative to said cantilever member between a drilling position over said cantilever member and a moving position disposed away from said outer portion of said cantilever member and closer to the center of gravity of said base unit than is said drilling position.

43. A method of moving a drilling structure relative to a well row comprising the following steps:

providing a drilling structure having a base unit, a wheel assembly connected to said base unit and movable horizontally relative to said base unit, said base unit having a side and a cantilever member extending out from and fixed in position relative to said side, a movable leg attached to

and extending down from an outer portion of said cantilever member, and a drilling rig mast assembly supported by said base unit and movable on said cantilever member, said drilling rig being positioned in a driling position wherein said base unit rests on a support surface adjacent a well head with said cantilever member extending over said well head and said leg resting on a support surface on the opposite side of said well head as said side and supporting said cantilever member, and said drilling rig mast assembly being positioned on said cantilever member over the well head,

moving said drilling rig mast assembly along said cantilever member and on said base unit away from said leg towards the center of gravity of said base unit,

positioning the lower end of said leg so that it is spaced above the support surface,

raising said base unit so that it is supported on said wheel assembly,

rolling said drilling rig on said wheel assembly to a new location,

said rolling step including rolling said drilling rig to a new location whereat said side is positioned adjacent a second well head and said cantilever member extends over said second well head,

lowering said base unit so that it rests on the support surface, after said drilling rig has been rolled to said new location,

lowering the outer end of said leg until it rests on a support surface on the opposite side of said second well head as said side and so that it supports the outer portion of said cantilever member, and

moving said drilling rig mast assembly along and on said cantilever member towards said leg until positioned in a drilling position over said second well head.

4,823,871

HANGER AND SEAL ASSEMBLY

James P. McEver, Cypress, and David H. Theiss, Houston, both of Tex., assignors to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Feb. 24, 1988, Ser. No. 159,946
Int. Cl.[4] E21B *33/04*
U.S. Cl. 166—182 **17 Claims**

1. A hanger and seal assembly for installation in a wellhead housing having an internal landing shoulder and an internal sealing surface,

a hanger having an external landing shoulder for seating on the housing landing shoulder and an external sealing surface,

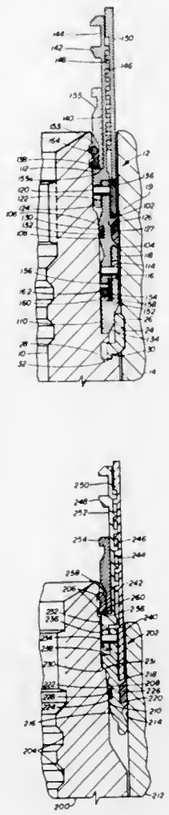
a seal assembly including

a seal body having an upper outer annular seal leg and a lower outer annular seal leg, the upper outer annular seal leg extending upwardly and outwardly and having its largest free diameter at its outer end less than the diameter of the internal housing sealing surface and inner upper and lower annular seal legs which converge inwardly toward each other and have their smallest free inner diameter at their inner ends less than the diameter of the external hanger sealing surface,

an upper load ring surrounding the upper portion of said seal body and engaging the upper outer annular seal leg,

an upper body movably connected to said seal body and movable with respect thereto,

means connecting said upper body to said load ring whereby downward movement of said upper body with respect to said seal body moves said load ring downwardly on said upper outer annular seal leg to cause said annular seal leg to move downwardly and outwardly into sealing engagement with the internal housing sealing surface, and



means for retaining said upper outer annular seal leg in sealing engagement with the internal housing sealing surface.

4,823,872

DOWNHOLE LOCKING APPARATUS

Mark Hopmann, Broken Arrow, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 22, 1988, Ser. No. 184,833
Int. Cl.[4] E21B *23/03*
U.S. Cl. 166—217 **10 Claims**

1. For use with a well locking tool insertable in a well conduit and having an external shoulder engagable with a no-go shoulder in the well conduit, radially shiftable lock elements for engaging a conduit recess and an axially shiftable lock mandrel movable from a first position to a second position to radially shift said lock elements into locking engagement with said conduit recess, a run-in tool comprising:

a tubular housing having wireline engagable means on the upper end thereof;

a plurality of peripherally spaced latch windows in the lower portions of said tubular housing;

a plurality of latch elements respectively radially movable relative to said latch windows;

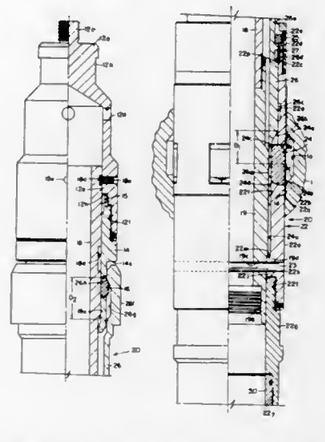
a latch operating sleeve telescopically cooperating with the bore of said tubular housing;

a bearing surface on said latch operating sleeve engagable, in one axial position of said latch operating sleeve, with said latch elements to secure same in a radially expanded position of engagement with the lock mandrel for run-in purposes;

first shearable means securing said latch operating sleeve to said tubular housing in said one axial position;

second shearable means for securing said latch operating sleeve to said locking tool;

said second shearing means being shearable only by upward jarring forces, whereby the application of downward jarring forces to said run-in tool after said locking tool engages said conduit no-go shoulder effects the shearing



of said first shearable means and the downward movement of said tubular housing relative to both said lock mandrel and said latch operating sleeve;

a downwardly facing surface on said tubular housing engagable with said lock mandrel to shift same downwardly and thus radially shift said lock elements into the conduit recess; and

recess means on said latch operating sleeve below said bearing surface alignable with said latch elements when said lock mandrel is moved by said tubular housing to said second position, thereby permitting disengagement of said latch elements from said well locking tool.

4,823,873

STEAM MEDIATED FLUOROCHEMICALLY ENHANCED OIL RECOVERY

Athanasios Karydas, Brooklyn, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1987, Ser. No. 129,518
Int. Cl.[4] E21B *43/22, 43/24*
U.S. Cl. 166—272 **17 Claims**

1. A method of increasing steam mediated oil production using a steam injection recovery process, with one, two or more wells, which comprises

contacting a deposit containing crude oil or containing a crude oil generating material with an effective amount of a fluorochemical of formula I

$$[(R_f)_n(R')_p]_mZ \qquad (I)$$

wherein

each R_f is independently a straight or branched chain perfluoroalkyl, perfluoroalkoxy-perfluoroalkyl, omega-hydroperfluoroalkyl or perfluoroalkenyl, each R_f independently having 4 to 20 carbon atoms,

n is 1, 2 or 3,

p is 0 or 1,

m is an integer of from 1 to about 5000,

R' is a direct bond when p is 0, or is an organic group having a valency of n+1, is convalently bonded to both R_f and Z, and

when n is 1 and p is 1, R' is a divalent organic linking group bound to R_f and to Z and is selected from the group consisting of $-(C_{1-10}\text{alkylene})_\alpha-R_1-(C_{1-10}\text{alkylene})_\beta-$, $-(R_1)_\alpha-[C_{1-10}\text{alkylene})-(R_1')_\beta-$, $-(R_1)_\alpha$-phenylene-$(R_1')_\beta-$, and $-R_1-$phenylene$-C_{1-10}$ alkylene—, in each case being bound to Z through the bond shown on the right of the above formulae, wherein α and β are independently 0 or 1, said R' C_{1-10} alkylene and R' phenylene being independently unsubstituted or substituted by hydroxy, halo, nitro, carboxy, C_{1-6}alkoxy, amino, C_{1-6}alkanoyl, C_{1-6}carbalkoxy, C_{1-6}alkanoyloxy, or C_{1-6}alkanoylamino, each R_1 and R_1' being independently selected from —L—, —LCO—, —COL—, —L—COO—, —OOCL—, $-LSO_2-$, $-SO_2L-$, $-LCON(R_2)-$, $-OP(O)(OR_2)-$, $P(O)(OR_2)O-$, $-P(O)(OR_2)-$, —CO—, —S—, —SO—, $-SO_2-$, —COO—, —OOC—, $-SO_2-$, $-OSO_2-$, $-OSO_2O-$, —OCOO—, and —O—; in which L is $-N(R_2)-$ or $-N^+(R_2)(R_3)-$; each R_2 being independently selected from H, and C_{1-6}alkyl which is unsubstituted or substituted by C_{1-6}alkoxy, by halo, by hydroxy, by carboxy, by C_{1-6}carbalkoxy, by C_{1-6}alkanoyloxy, or by C_{1-6}alkanoylamino; and R_3 is H or C_{1-6}alkyl which is unsubstituted or substituted by OH, by C_{1-6}alkoxy, by C_{1-6}alkanoyloxy, or by C_{1-6}carbalkoxy; and when L is $-N^\oplus(R_2)(R_3)-$, a counterion $X^\ominus$ is present; or said R' is interrupted or has a portion thereof replaced by an ionic bridge pair group $-Q^\oplus{}^\ominus T-$ or $-T^\ominus{}^\oplus Q$ wherein $T^\ominus$ is an anionic group selected from carboxy, sulfoxy, sulfato, phosphono, and phenolic hydroxy and $Q^\oplus$ is a cationic group selected from quaternary ammonium;

when n is 2 and p is 1, R' is a trivalent organic linking group covalently bound to two R_f groups and to Z and selected from the group consisting of

$-(R_1)_\alpha$ \ (C1-10alkatriyl)—$(R_1)_\alpha-$, / $-(R_1)_\alpha$

$-(C_{1-10}\text{alkylene})_\alpha$ \ $R_1-(C_{1-10}\text{alkylene})_\gamma-(R_1)_\beta-$, / $-(C_{1-}\text{alkylene})_\alpha$

\ $(C_{1-10}\text{alkatriyl})-R_1-(C_{1-10}\text{alkylene})_\alpha-$,

\ R_1-phenylene-(R_1' or $C_{1-10}\text{alkylene})_\alpha-$,

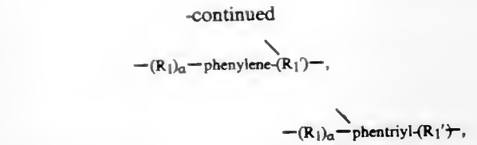
$-(R_1)_\alpha$ \ phentriyl-(C_{1-10}alkylene or $R_1')_\alpha-$, / $-(R_1)_\alpha$

$-(R_1-\text{phenylene})$ \ $C_{1-10}\text{alkatriyl}-$, / $-(R_1-\text{phenylene})$

$-(R_1)_\alpha$ \ $-(R_1-\text{phenylene})-C_{1-10}\text{alkatriyl-}$,

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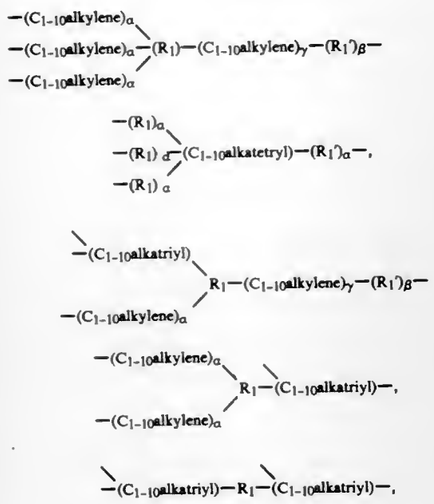
in each case being bound to Z through the bond shown on the right hand side of the above formulae, wherein each α is individually 0 or 1 β is 0 or 1, and γ is 0 or 1 but when β is 1, α is 0, and γ is 1; wherein each R' C_{1-10}alkylene, R' C_{1-10}alkatriyl, R' phenylene, and R' phentriyl is independently unsubstituted or substituted by hydroxy, halo, nitro, carboxy, C_{1-6}alkoxy, amino, C_{1-6}alkanoyl, C_{1-6}carbalkoxy, C_{1-6}alkanoyloxy or C_{1-6}alkanoylamino;

each R_1 and R_1' being independently selected from —L—, —L—CO—, —C(O)L—, —LCOO—, —OOCL—, —L-SO_2—, —SO_2L—, —L—C(O)L—, —OP(O)—(OR_2)—, —P(O)(OR_2)O—, —P(O)(OR_2)—, —CO—, —S—, —SO—, —SO_2—, —COO—, —OOC—, —SO_2—, —OSO_2—, —OSO_2O—, —O—COO—, and —O—; in which each L is independently —NR_2— or —$N^+(R_2)(R_3)$—;

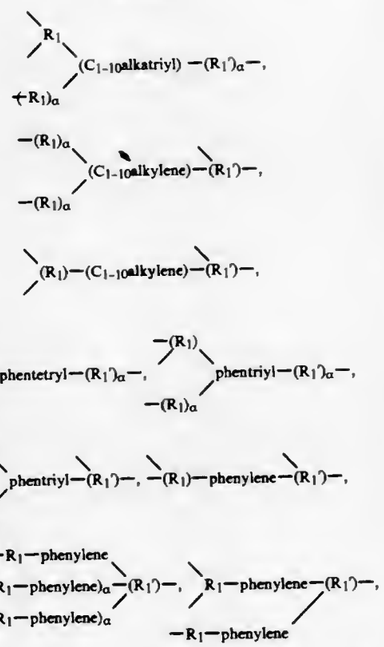
each R_2 being independently selected from a free valence, H, and C_{1-6}alkyl which is unsubstituted or substituted by C_{1-6}alkoxy, by halo, by hydroxy by carboxy, or by C_{1-6}alkanoylamino; or R_2 is a radical of C_{1-6}alkyl group which is unsubstituted or substituted by C_{1-6}alkoxy by halo, by hydroxy, by crboxy, or by C_{1-6} alkanoylamino, and has an additional free valance; and R_3 is a valence, H, or C_{1-6}alkyl which is unsubstituted or substituted by OH, by C_{1-6}alkoxy, by C_{1-6}alkanoyloxy, or by C_{1-6}carbalkoxy, or R_3 is C_{1-6}alkyl which is unsubstituted or substituted by hydroxy, by C_{1-6}alkoxy, by C_{1-6}alkanoyloxy, or by C_{1-6}carbalkoxy having an additional free valence; and when L is —$\oplus N(R_2)(R_3)$—, a counterion $X^\ominus$ is present;

or said R' is interrupted or has a portion thereof replaced by an ionic bridge pair group —$Q^\oplus{}^\ominus T$— or —$T^\ominus{}^\oplus Q$ $^\oplus Q$— wherein $T^\ominus$ is an anionic group selected from carboxy, sulfoxy, sulfato, phosphono, and phenolic hydroxy, and $Q^\oplus$ is a cationic group selected from quaternary ammonium, or

when n is 3 and p is 1, R' is a tetravalent organic linking group covalently bonded to three R_f groups and to Z and is selected from the group consisting of



-continued



in each case being bound to Z through the bond shown on the right side of the above formulae, wherein each α, β, and γ is 0 or 1, but when β is 1, γ is 1, and α is 0; wherein each R' C_{1-10}alkylene, R' C_{1-10}alkatriyl, R' C_{1-10}alkatetryl, R' phenylene, R' phentrityl, and R' phentetryl is independently unsubstituted or substituted by hydroxy, halo, nitro, carboxy, C_{1-6}alkoxy, amino, C_{1-6}alkanoyl, C_{1-6}carbalkoxy, C_{1-6}alkanoyloxy, or C_{1-6}alkanoylamino;

each R_1 and R_1' being independently selected from —L—, —L—CO—, —C(O)L—, —LCOO—, —OOCL—, —L-SO_2—, —SO_2—L—, —LC(O)L—, —OP(O)(OR_2)—, —P(O)(OR_2)O—, —P(O)(OR_2)—, —CO—, —S—, —SO—, —SO_2—, —COO—, —OOC—, —OSO_2—, —OSO_2O—, —OC(O)O—, and —O—;

in which each L is independently —NR_2— or $N^+R_2R_3$—;

each R_2 being independently selected from

(a) a free valence,

(b) H, and

(c) C_{1-6}alkyl which is unsubstituted or substituted by C_{1-6}alkoxy, by halo, by hydroxy, by carboxy, by C_{1-6}carbalkoxy, by C_{1-6}alkanoyloxy, or by C_{1-6}alkanoylamino each of said R_2 unsubstituted and substituted C_{1-6}alkyl groups having 0–2 additional free valencies; and R_3 is (a) a free valence, (b) H, or (c) C_{1-6}alkyl which is unsubstituted or substituted by OH, by C_{1-6}alkoxy, by C_{1-6}alkanoyloxy, or by C_{1-6}alkoxy, by C_{1-6}alkanoyloxy, or by C_{1-6}carbalkoxy, each of said R_3 unsubstituted or substituted C_{1-6}alkyl groups having 0–2 additional free valencies; and when L is —$^+NR_2R_3$—, a counterion is present; or said R' is interrupted or has a portion thereof replaced by an ionic bridge pair group —$Q^\oplus{}^\ominus T$ or —$T^\ominus{}^\oplus Q$— wherein $T^\ominus$ is an anionic group selected from carboxy, sulfoxy, sulfato, phosphono, and phenolic hydroxy, and $Q^\oplus$ is a cationic group selected from quaternary ammonium, and

Z, when m is 1, is selected from the group consisting of

(a) C_{6-24}alkyl and C_{6-24}alkenyl, each of which are unsubstituted or substituted by Cl, Br, C_{1-18}alkoxy, nitro, alkanoyl of up 18 carbon atoms, alkylmercapto of up to 18 carbon atoms, amino, C_1–C_{18}alkylamino, or di-C_{1-18}alkylamino;

(b) phenyl or naphthyl, each of which is unsubstituted or substituted by C_{1-20}alkyl, C_{1-20}alkoxy, alkanoyl of up to 20 carbon atoms, alkanoyloxy of up to 20 carbon atoms, mono- or di-alkylamino of up to 20 carbon atoms;

(c) mono- or di-C_{6-24}alkylamino-C_{2-7}alkylene;

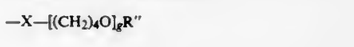
(d) alkoxyalkylene of 4–20 carbon atoms which is unsubstituted or substituted by one or two C_{6-24}carbalkoxy or C_{6-24}carbamoyl groups;

(e) polyC_{6-24}alkoxy-C_{6-24}alkyl or polyC_{6-24}alkoxy-C_{6-24}-alkenyl;

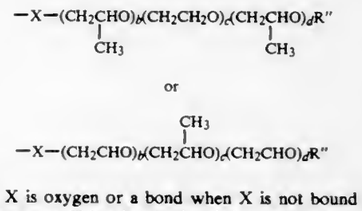
(f) a heterocyclic group selected from piperidino, piperazino, azepino, N-pyridium, morpholino, benztriazolyl, triazinyl, pyrrolidino, furanyl and tetrahydrofuranyl, each of which is unsubstituted or substituted by halo, C_{1-18}alkoxy, nitro, alkanoyl of up to 18 carbon atoms, C_{1-18}alkylmercapto, amino, or C_{1-18}alkylamino;

(g) poly-C_{2-3}alkoxy-phenyl, the phenyl group of which is unsubstituted or substituted by C_{1-20}alkyl;

(h) a group of the formula

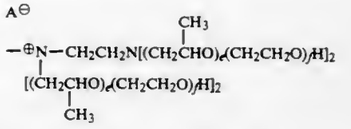


or



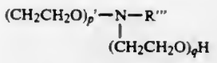
wherein X is oxygen or a bond when X is not bound to an oxygen atom, or X is a bond when it is bound to an oxygen atom, g is 2–80, b is 0–40, c is 0–80, and d is 0–40, while b+c+d is at least one; and R'' is H or C_{1-4}alkyl;

(i) a group of the formula



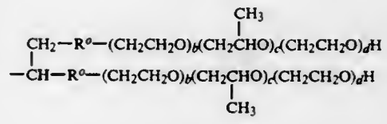
wherein each e is 3–20, and each f is 3–20 and A is an anion;

(j) a group of the formula



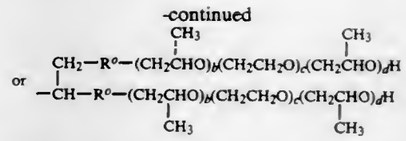
wherein p' is 1–15, q is 1–15 and R''' is C_{6-22} alkyl or C_{6-22}alkanoyl; and

(k) a group of the formulae



or

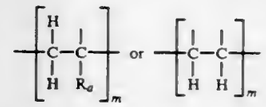
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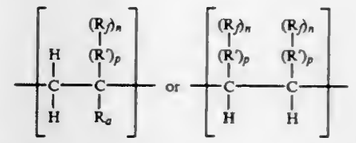
wherein b, c, and d are defined above and R^o is alkylene, arylene, or arylene-alkylene, each having up to 18 carbon atoms and which is uninterrupted or interrupted by a hetero atom selected from —O—, —S—, or —NH—,

Z, when m is 2, is a polyalkyleneoxy containing group, the terminal members of which are covalently bound to R' when p is 1 and to R_f when p is zero; or Z is phenylene or naphthylene each of which is unsubstituted or substituted by C_{1-20}alkyl, by C_{1-20}alkoxy, by alkanoyloxy of up to 20 carbon atoms, by alkanoylamino of up to 20 carbon atoms, by halo, by amino, or by C_{1-20}alkylamino; or Z is an alkylene or alkenylene of up to 20 carbon atoms, each of which is unsubstituted or substituted by C_{1-20}alkoxy, by C_{1-20}alkylamino, by alkanoyl of up to 20 carbon atoms, by alkanoylamino of up to 20 carbon atoms, or by alkanoyloxy of up to 20 carbon atoms; or Z is N,N' piperazinylene or triazinylene, or

Z, when m is up to 5000, is the backbone structure



of a polymer or copolymer having a repeating unit of the formula



where R', R_f, n and p are defined above, and Ra is H or lower alkyl, and

extracting said oil from said deposit by a steam injection oil recovery process.

4,823,874

REDUCING SLUDGING DURING OIL WELL ACIDIZING

William G. F. Ford, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 22, 1988, Ser. No. 223,142

Int. Cl.[4] E21B *43/27*

U.S. Cl. 166—279 **11 Claims**

1. In a method of reducing the production of sludge when contacting a subterranean formation containing oil which is subject to sludging with an aqueous acid solution wherein an anti-sludging agent and one or more other additives are combined with the aqueous acid solution and the subterranean formation is contacted with the resulting mixture, the improvement comprising combining a dispersing agent with said aqueous acid solution, anti-sludging agent and one or more other additives in an amount in the range of from about 1% to about 10% by weight of said solution whereby a long-term homogeneous composition is produced and then contacting said subterranean formation therewith, said dispersing agent being comprised of an ethoxylated alkyl phenol dissolved in a solvent

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comprised of a mixture of ethylene glycol, methanol and water, the ethoxylated alkyl phenol having from 6 to 10 carbon atoms in the alkyl substituent and having been reacted with from about 1 to about 30 moles of ethylene oxide.

4,823,875

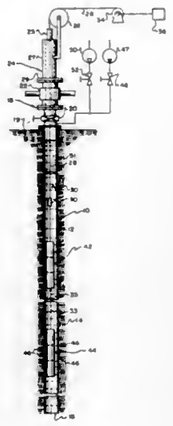
WELL TREATING METHOD AND SYSTEM FOR STIMULATING RECOVERY OF FLUIDS

Gilman A. Hill, Englewood, Colo., assignor to Mt. Moriah Trust, Englewood, Colo.

Continuation-in-part of Ser. No. 943,551, Dec. 18, 1986, Pat. No. 4,718,493, which is a continuation-in-part of Ser. No. 686,990, Dec. 27, 1984, Pat. No. 4,633,951. This application Dec. 30, 1987, Ser. No. 139,614

Int. Cl.[4] **E21B** *43/26, 43/267*

U.S. Cl. 166—280 **54 Claims**



1. A method for fracturing a subterranean earth formation to stimulate the production of fluid from said formation wherein a wellbore extends at least to said formation from a surface point, said wellbore being provided with casing means forming a substantially fluid-tight interior space, said method comprising the steps of:

providing said wellbore interior space with a fracture fluid comprised of a substantially pure liquid, the fracture liquid extending to a predetermined controlled column height within the wellbore;

superposing on the column height of fracture liquid a second controlled column height of a foam pad; and

releasing through apertures in the wellbore casing into an adjacent formation to be fractured, the fracture liquid previously pressurized to a pressure value exceeding the fracture value of the formation to effect fracture of the formation by forces of decompression imposed by released fracture fluids.

4,823,876

FORMATION STIMULATING TOOL WITH ANTI-ACCELERATION PROVISIONS

Henry H. Mohaupt, 1151 Estrella Dr., Santa Barbara, Calif. 93110

Filed Sep. 18, 1985, Ser. No. 777,360

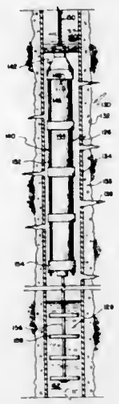
Int. Cl.[4] **E21B** *37/00, 43/263*

U.S. Cl. 166—299 **2 Claims**

2. A method for stimulating a subterranean formation penetrated by a well having a casing string providing perforations including a lowermost perforation communicating with the formation and having a column of liquid in the casing string adjacent the formation, comprising

lowering a propellant charge on a wire line into the liquid in the well;

igniting the propellant charge and creating a bubble of high pressure gaseous combustion products adjacent the formation intermediate the liquid column for creating a liquid pocket below the perforations and below the bubble;



delivering the gaseous combustion products into the formation; and

suspending a disc shaped drogue, connected to the wire line, in the liquid pocket entirely below the lowermost perforation out of sealing contact with the well and retarding upward movement of the wire line by moving the drogue through the liquid pocket.

4,823,877

OPEN HOLE PIPE RECOVERY CIRCULATION VALVE

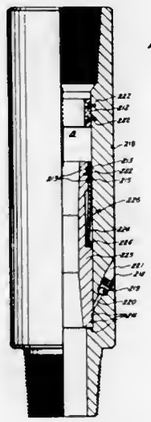
Robert J. McDaniel, 711 Church St., Columbia, Miss. 39429, and Daniel A. Hadley, #10 Cedar La., Gretna, La. 70053

Continuation-in-part of Ser. No. 766,093, Aug. 14, 1985, Pat. No. 4,685,520. This application Aug. 7, 1987, Ser. No. 83,627

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[4] **E21B** *31/03, 34/14*

U.S. Cl. 166—319 **10 Claims**



1. A method of open hole well drilling, comprising:

(a) spacing a plurality of valve bodies longitudinally along a drillstring, each valve body having:

(i) a wall defining an internal longitudinal fluid flow bore;

(ii) a transverse port in the wall;

(iii) valving means therein, the valving means including a sleeve shiftable between a first position preventing fluid flow through the transverse port and a second position allowing fluid flow through the transverse port from the interior of the valve body to the exterior thereof; and

(b) maintaining the port closed to backpressure flow if the sleeve shifts from the second to the first position by utilizing a backpressure valve means within said transverse port.

4. A pipe recovery circulation valve, comprising:

(a) a valve body having a fluid flow bore therethrough;

(b) a transverse port in the wall of the valve body for allowing fluid to flow through the wall of the body from the interior of the valve body to the exterior thereof;

(c) an internal sleeve member shiftable between a first position blocking fluid flow through the transverse port and a second position allowing a portion of the fluid to flow out of the wall of the valve body through the transverse port yet allowing fluid flow to continue through the bore of the valve;

(d) means for maintaining the internal sleeve member in the second position allowing fluid flow through the transverse port, wherein the means for maintaining the internal sleeve member in the second position comprises a detent pin; and

(e) backpressure valve means within said transverse port for maintaining the port closed to backpressure flow when the sleeve moves from the second to the first position.

4,823,878

GUIDELINELESS REENTRY SYSTEM WITH FIXED ROLLERS

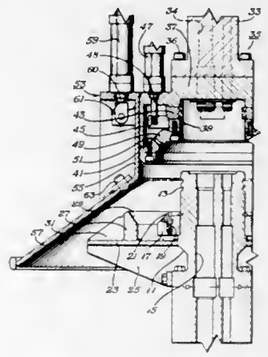
Norman Brammer, Scotland, Scotland, and Charles E. Jennings, Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Oct. 8, 1987, Ser. No. 106,838

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] **E21B** *43/013*

U.S. Cl. 166—341 **4 Claims**



1. An apparatus for connecting a riser extending from a floating vessel to a subsea well assembly of the type having an upward extending tubular mandrel having a plurality of circular grooves on its exterior, comprising in combination:

a guide frame assembly mounted to the mandrel a selected distance below the top of the mandrel;

a mandrel connector mounted to the lower end of the riser;

a plurality of dogs carried by the mandrel connector for radial movement between an outer retracted position and an inner locking position in engagement with the grooves on the mandrel;

cam means hydraulically actuated and carried by the mandrel connector for moving the dogs between the retracted and locking positions;

a downward facing guide funnel carried by the riser for insertion over the mandrel into engagement with the guide frame assembly, the guide frame assembly having an annular surface adapted to be contacted by the guide funnel, the funnel diverging at substantially the same angle as the angle of a line extending from the top of the mandrel to the annular surface;

the mandrel protruding upward from all portions of the guide frame assembly a distance sufficient to receive the mandrel connector around the mandrel; and

means carried by the funnel and material connector for moving the funnel from a lower extended position relative to the riser and mandrel connector as the funnel is being lowered into engagement with the guide ring, to an upper retracted position once the funnel has landed on the guide frame assembly, causing the riser and mandrel connector to move downward relative to the funnel onto the mandrel and positioning the dogs adjacent the grooves, enabling the cam means to move the dogs into the locking position.

4,823,879

GUIDELINELESS REENTRY SYSTEM WITH NONROTATING FUNNEL

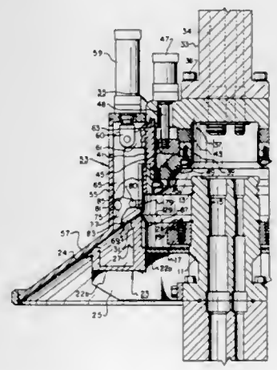
Norman Brammer, Turriff, Scotland, and Charles E. Jennings, Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed Oct. 8, 1987, Ser. No. 106,837

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] **E21B** *43/01*

U.S. Cl. 166—341 **4 Claims**



2. An apparatus for connecting a riser extending from a floating vessel to a subsea well assembly of the type having an upward extending tubular mandrel, comprising in combination:

a guide frame mounted to the mandrel;

a guide ring mounted to the guide frame, encircling the mandrel and extending upward from the guide frame;

a mandrel connector mounted to the lower end of the riser for landing of the top of the mandrel to communicate the interior of the mandrel with the interior of the riser;

connector means carried by the mandrel connector for engaging the sidewall of the mandrel to secure the mandrel connector to the mandrel;

a downward facing guide funnel carried by the riser for insertion over the mandrel into engagement with the

guide ring, the riser and mandrel connector being rotatable relative to the funnel;

a plurality of latches mounted to the funnel for movement between a locked position locking the funnel to the guide ring and a retracted position;

cam means carried by the funnel for moving the latches between the retracted and locked positions, the cam means being vertically movable relative to the funnel and in unison with the mandrel connector, the mandrel connector being rotatable relative to the cam means and to the funnel;

means carried by the funnel and the mandrel connector for moving the mandrel connector, riser and the cam means downward to an intermediate position relative to the funnel after the funnel has engaged the guide ring, to cause the cam means to move the latches to the locked position;

the latches restricting rotation of the funnel and cam means relative to the guide ring once the latches have latched the funnel to the guide ring, allowing the riser and mandrel connector to be rotated relative to the mandrel to orient the mandrel connector; and

means carried by the funnel and the mandrel connector for allowing the mandrel connector, riser and cam means to move farther downward from the intermediate position once the mandrel connector has been rotated to the proper orientation, positioning the connector means around the mandrel to allow the connector means to operate to secure the mandrel connector to the mandrel.

4,823,880

GASWELL DEHYDRATE VALVE

Wayne Klatt, Medicine Hat, Canada, assignor to 374928 Alberta Limited, Canada

Filed Sep. 15, 1988, Ser. No. 244,782
Claims priority, application Canada, Jun. 16, 1988, 569610
Int. Cl.[4] E21B *21/00, 34/12, 34/16*
U.S. Cl. 166—373 **12 Claims**

1. Sleeve valve for use in a gas production well, said valve adapted for connection to a well tubing string and operable to selectively open or close communication between the exterior of said tubing string and the interior of said tubing string and said valve comprising:

inner and outer valve components defining a continuous bore therethrough, said inner component being axially fixed but rotatable relative to said outer component and means for maintaining said components in axial alignment;

said inner component being adapted for attachment to said well tubing string with said valve bore communicating with the interior of said string and said inner component secured for rotation with said string;

said outer component adapted for attachment to means restraining said outer component from rotating with said inner component;

one or more ports extending through said outer component from the valve bore to the exterior of said valve;

a valve sleeve threadedly engaged with said inner component and axially slidable within said outer component but rotationally restrained whereby rotation of said inner component translates to axial movement of said valve sleeve within said outer component between respective positions wherein said ports are blocked or exposed by said valve sleeve; and

sealing means between said inner and outer valve components preventing the passage of fluids or gases between said components.

11. A method of removing incidental water from a natural gas well bore utilizing a sleeve valve as set forth in claim 1 comprising:

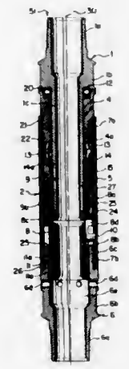
attaching said outer component of said valve to a segregation packer and said inner component to a well tubing string;

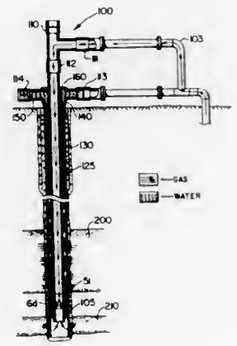
sinking said segregation packer, said valve and said well tubing string down the casing of said well to a position intermediate an upper and a lower gas productive zone of said well;

attaching said well tubing string in a sealed, rotatable relationship with well tree equipment of said well;

rotating said tubing string to rotate said valve inner component and clsoe said valve to enable collection of natural gas from each said zone when there is little or not incidental water in said upper zone of said well;

rotating said valve inner component by rotation of said





tubing string to open said valve and allow the gas pressure of either said lower zone or the gas pressure of a gas collection pipeline in connection therewith or both in unison, to lift a column of incidental water collected above said segregation packer and eject said water from said well; and

rotating said tubing string to close said valve after the ejection of said incidental water from said well to resume normal production of natural gas from each said zone of said well.

4,823,881

HYDRAULIC SETTING TOOL

Steven G. Streich, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 11, 1988, Ser. No. 155,182
Int. Cl.[4] E21B *23/06*
U.S. Cl. 166—382 **20 Claims**

1. A packer setting apparatus comprising:

case means for attaching to a tool string positionable in a well bore;

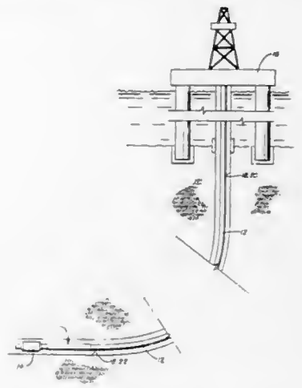
flow passageway means in said case means for providing fluid communication between said tool string and a packer;

flow valve means in said case means for controlling flow of fluid through said flow passageway means, said flow valve means being reponsive to one differential pressure between a well annulus and said flow passageway means;

bypass passageway means in said case means for providing a fluid bypass within said case means around said flow valve means;

fill valve means for closing said bypass passageway means in response to a pressure in said bypass passageway means acting on an area defined on said fill valve means; and

packer setting means in said case means for setting said packer in said well bore in response to another differential pressure between said flow passageway means and said well annulus.



17. A method of positioning and setting a packer on a tool string in a well bore, said method comprising the steps of:

running said tool string into said well bore while internally bypassing fluid in a setting tool adjacent said packer around a flow valve disposed in said setting tool;

positioning said packer at a desired location in said well bore;

providing pressure in said setting tool and well bore for acting on an area defined on a fill valve in said setting tool for closing said fill valve;

pressurizing said tool string above the pressure in said well annulus for actuating a setting piston and thereby at least partially setting said packer into engagement with said well bore; and

pressurizing said well annulus above a pressure in said tool string for opening said flow valve.

4,823,882

MULTIPLE-SET PACKER AND METHOD

Charles O. Stokley, and Lawrence Sanford, both of Houston, Tex., assignors to TAM International, Inc., Houston, Tex.

Filed Jun. 8, 1988, Ser. No. 204,087
Int. Cl.[4] E21B *23/06, 33/127*
U.S. Cl. 166—387 **20 Claims**

1. A multiple-set packer assembly for selectively positioning within a well bore to seal the annulus between interior walls of the well bore and a tubing string having a passageway, the packer assembly adapted to be set in the well bore by lowering a ball having a selectively sized diameter through the tubing string to plug the passageway and thereafter pressurizing fluid in the passageway above the set ball, the packer assembly comprising:

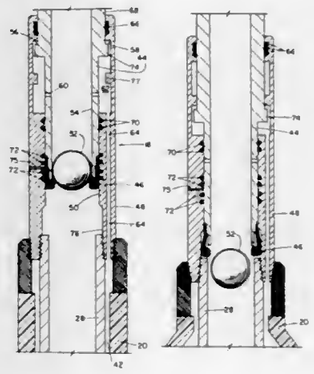
a flexible tubular packer body radially expandable and retractable for contact with and release from the interior walls of the well bore;

a control sub secured to the packer body and having an interior guide wall, a recessed cavity radially outward of the guide wall, and a flow path in pressure communication with the packer body whereby the packer body may be radially expanded by fluid pressure in the flow path in the control sub;

a sleeve axially movable within the control sub from a ball stop position to a ball release position, the sleeve having a cylindrical-shaped interior surface having a selectively sized diameter slightly larger than the diameter of the ball, and having a port for fluid communication between the passageway in the tubing string and the flow path in the control sub when the sleeve is in the ball stop position;

a seal for automatically closing off communication between the passageway in the tubing string and the flow path in the control sub when the sleeve is in the ball release position; and

a stop member carried by the sleeve and radially movable from an inward position such that the ball is axially stopped by the stop member within the cylindrical shaped interior surface of the sleeve, to an outward position such that the ball may be passed axially by the sleeve and the stop member;



the stop member being restricted from radially outward movement to its outward position by the interior guide wall of the control sub when the sleeve is axially in the ball stop position, and the stop member being movable radially outward into the recessed cavity within the control sub when the sleeve is axially in the ball release position, whereby the ball may be lowered into engagement with the stop member when the sleeve is in the ball stop position, pressurized fluid in the passageway above the ball passed through the port in the sleeve and the flow path in the control sub for setting the packer assembly in the well bore, and the sleeve thereafter moved to the ball release position to seal pressurized fluid in the packer body and permit the ball to pass by the stop member as the stop member is positioned radially outward into the recessed cavity.

14. A method of setting a packer assembly positioned in a well bore to seal the annulus between an interior wall of the well bore and a tubing string having a passageway, the packer assembly including a flexible tubing packer body radially expandable and retractable for contact with a release from the interior wall of the well bore, and a control sub secured to the packer body and having a flow path in pressure communication with the packer body whereby the packer body may be radially expanded by blocking the passageway with a closure member and increasing fluid pressure in the tubing string for

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transmission to the packer body through the control sub flow path, a method comprising:

providing an axially movable sleeve within the control sub movable between a closure stop position and a closure release position, the sleeve having an interior surface having a selectively sized diameter slightly larger than the diameter of the closure member, and a port for pressure communciation between the passageway in the tubing string and the flow path in the control sub when the sleeve is in the closure stop position;

providing a stop member carried by the sleeve and radially movable from an inward position such that the closure member is axially stopped within the sleeve by the stop member to an outward position such that the closure member may pass axially by the stop member;

restricting the stop member from radial movement to the outward position when the sleeve is axially in the closure stop position;

lowering the closure member through the tubular string to engage the stop member while the sleeve is in the closure stop position;

increasing fluid pressure in the passageway above the closure member within the tubular string when the sleeve is in the closure stop position to set the packer assembly in the well bore;

closing off communication between the passageway in the tubular string and the flow path in the control sub when the sleeve is in the closure release position; and

moving the sleeve axially to the closure release position and the stop member radially to its outward position while simultaneously sealing fluid within the flow path of the control sub to maintain the packer assembly in the set position.

4,823,883

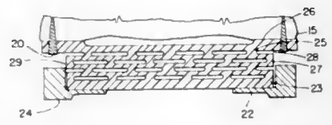
SHOCK RELIEVING HORSESHOE

Richard C. Colonel, P.O. Box 2192, 701 122th Ave., NE., #410, Belview, Wash. 98007, and De Vere V. Lindh, 1910 Dogwood Dr., SE., Auburn, Wash. 98002

Filed Oct. 8, 1987, Ser. No. 106,252

Int. Cl.[4] A01L *1/00*

U.S. Cl. 168—12 **6 Claims**



1. A shock relieving horseshoe having a top, a bottom, a first side, a second side, a front, a back and an external shape in plan view, said horseshoe comprising a spring,

said spring comprising a top layer, a bottom layer, at least one intermediate layer having a first side and a second side, a plurality of compression members on said first side positioned with first spaces between them and a plurality of compression members on said second side positioned with second spaces between them, said second plurality of compression members being positioned opposite said first spaces,

said top layer having a first thickness, said bottom layer having a second thickness and said at least one intermediate layer having a third thickness, said third thickness being less than said first and second thickness,

said external shape essentially matching the outline of the bottom of a horse's hoof.

4,823,884

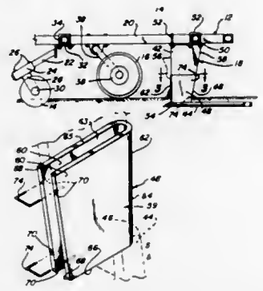
PLOW CLEANING DEVICE

Keith H. McCall, Rt. 2, Box 83, St. Francis, Kans. 67756

Filed Oct. 21, 1987, Ser. No. 111,916

Int. Cl.[4] A01B *3/24, 71/08*

U.S. Cl. 172—508 **20 Claims**



1. A cleaning device for attachment to a shank supporting a subsoil plow comprising:

a body means of a non-stick, abrasion-resistant material consisting essentially of a vertical, U-shaped channel having a rounded forward portion facing towards the plow's direction of travel and two generally parallel, spaced side walls extending rearwardly from opposite sides of said forward portion and terminating at laterally spaced tail edge portions facing away from said plow's direction of travel, said tail edge portions including upper and lower sets of holes along rear edges thereof, each of said rear edges from a top edge to a bottom edge being forwardly tapered relative to the plow's direction of travel and facing away from said direction of travel; and

fastening means for rigidly attaching said body means to a plow shank comprising U-shaped staples insertable into said sets of holes thereby extending across said channel from one to the other of said tail edge portions.

4,823,885

TORQUE ADJUSTING DEVICE FOR POWER DRIVEN ROTARY TOOLS

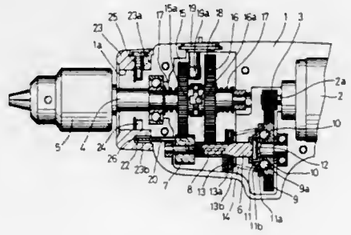
Michio Okumura, Anjo, Japan, assignor to Makita Electric Works, Ltd., Anjo, Japan

Filed Aug. 5, 1987, Ser. No. 81,694

Claims priority, application Japan, Aug. 8, 1986, 61-122237[U]

Int. Cl.[4] B25B *23/14*

U.S. Cl. 173—12 **4 Claims**



1. A power driven rotary tool comprising:

a housing including front and rear ends;

an electric motor mounted within said housing adjacent the rear end thereof;

a transmission shaft rotatably supported by said housing;

a drive gear idly supported by said transmission shaft and operatively connected to said electric motor;

a spindle rotatably mounted in said housing and including a portion extending through the front end of said housing;

a plurality of speed change gears mounted on said spindle for selective driving engagement therewith;

clutch means operably positioned on said transmission shaft and in generally confronting relation with said drive gear and between said drive gear and said speed change gears to selectively interconnect said drive gear and the selected speed change gear;

a slider including front and rear ends axially movably fitted on said transmission shaft;

a spring positioned between said slider and said clutch and adapted to urge said clutch toward said drive gear; and

a manually-rotatable selector ring attached to the front end of said housing, said selector ring including a cam face positioned along a peripheral edge thereof and having a plurality of steps formed in a direction axially of said transmission shaft and engageable with said slider to selectively displace said slider in said axial direction for adjusting the axial position of said slider relative to said transmission shaft and amount of compression of said spring.

4,823,886

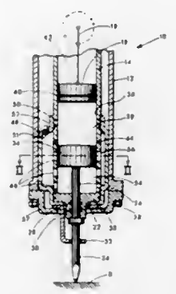
VACUUM-COMPRESSION TYPE PERCUSSION POWER TOOL

Vladimir Pyatov, 507 - 21 Ave., San Francisco, Calif. 94121

Filed Apr. 29, 1988, Ser. No. 187,925

Int. Cl.[4] B23Q *5/033*

U.S. Cl. 173—14 **19 Claims**



1. A vacuum-compression type percussion power tool comprising:

housing means;

cylinder means located in said housing means and fixed therein, said cylinder means having inner and outer walls, and a closed bottom wall with an inner and outer sides, said closed bottom wall having a central opening;

reciprocating drive means supported by said housing means on the side thereof opposite to said bottom wall;

piston means slidingly guided in said cylinder means and driven by said reciprocating drive means;

a working tool with a tail portion inserted into said cylinder means through said central opening, said working tool having a flange which limits insertion of said working tool into said cylinder means;

a floating striker means having upper and lower end faces and located in said cylinder means for sliding therein between said piston means and said tail portion of said working tool inserted into said cylinder;

a main working chamber formed in said cylinder means between said piston means and said striker means;

a hollow casing having a wall surrounding a portion of said cylinder means and forming a space with said outer walls of said cylinder means;

an auxiliary chamber formed by said space of said hollow casing in combination with a space between said bottom wall, said lower end face of said striker means, and said inner walls of said cylinder means;

a space which is formed between said housing means, said cylinder means, and said hollow casing, and is connected to the atmosphere;

a first set of through holes formed in the wall of said cylinder means above said striker means, said first set of holes connecting said main working chamber with said auxiliary chamber;

a second set of through holes in said walls of said cylinder means between said first set of holes and said bottom wall, said second set of holes connecting said space, of said hollow casing with said space below said striker means, said holes of said second set having diameters substantially greater than those of said holes of said first set;

one-way valve means in said wall of said hollow casing, said valve means passing air into said auxiliary chamber from said space between said housing means and cylinder means and preventing air from flowing in the opposite direction; and

sealing means in said piston means for sealing said piston means against said inner walls of said cylinder means.

4,823,887

WORKING/ASSEMBLING DEVICE WITH SELF-CLAMPING MEANS

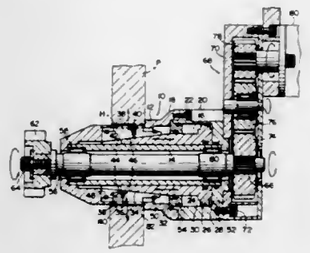
Masahiro Umeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 28, 1988, Ser. No. 174,345

Claims priority, application Japan, Mar. 27, 1987, 62-44332[U]

Int. Cl.[4] E21C *11/00*

U.S. Cl. 173—31 **4 Claims**



1. A device for applying a working or assembling process to an article at an appropriately selected position as temporarily mounted to a supporting plate through a hole formed therein, comprising:

a housing having a generally twofold tubular structure comprising an outer tubular wall portion engageable in said hole of said supporting plate and an inner tubular wall portion coaxially arranged at the inside of said outer tubular wall portion thereby defining an annular cylindrical chamber space between said outer and inner tubular wall portions, said outer tubular wall portion being formed with a plurality of cotter openings spaced angularly around a central axis thereof;

a generally tubular plunger member disposed in said annular cylindrical chamber space and having a piston portion cooperating with said housing so as to define a first and a second pressure chamber on axially opposite sides thereof and a wedge portion having a tapered outside surface;

a plurality of cotter members each being generally disposed in said annular cylindrical chamber space and slidably

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engaged into each one of said plurality of cotter openings so as selectively partly to project radially outwardly from each said cotter opening and having an inclined wedge surface slidably engaged with said tapered outside surface of said wedge portion of said plunger member;

fluid passage mean incorporated in said housing for alternatively supplying and exhausting fluid into and out of said first and second pressure chambers;

a shaft member mounted through said inner tubular wall portion and supported by said housing to do a predetermined movement relative to said housing, said shaft member being adapted to support a tool for working or assembling the article at a forward end thereof projecting out from a forward free end of said housing; and

a driving mechanism mounted to said housing for driving said shaft member to operate the tool.

4,823,888

APPARATUS FOR MAKING A SUBTERRANEAN TUNNEL

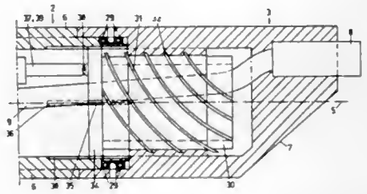
Nic H. W. Smet, Kasteelstraat 29, B - 2400 Mol, Belgium

Filed Dec. 15, 1987, Ser. No. 133,347

Claims priority, application Belgium, Dec. 30, 1986, 2/61145

Int. Cl.[4] E21B *7/08, 10/60, 47/024*

U.S. Cl. 175—45 **10 Claims**



1. An apparatus for, making a subterranean tunnel, comprising:

a head which includes:

a body having a geometrical axis and a front end, and

a nose mounted on the front end of the body for rotation about the geometrical axis of said body and being asymmetrical relatively to the geometrical axis and having at one side an abutment face adapted to make an angle with the geometrical axis of said body,

at least one nozzle mounted on the nose and oriented away from the body,

a duct for fluid under pressure connected to said nozzle, and

a remote-controlled steering mechanism mounted in the head and including means for rotating the nose relatively to the body so that the position of the abutment face of the nose relative to the body can be adjusted by rotation of the nose.

4,823,889

DOWNHOLE SCREW MOTOR

Dmitry F. Baidenko, Moscow; Leonid A. Kondratenko, Podolsk, and Valery I. Semenets, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Burovol Tekhniki, Moscow, U.S.S.R.

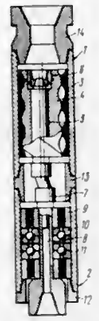
PCT No. PCT/SU85/00107, § 371 Date Aug. 21, 1987, § 102(e) Date Aug. 21, 1987, PCT Pub. No. WO87/04215, PCT Pub. Date Jul. 16, 1987

PCT Filed Dec. 30, 1985, Ser. No. 124,776

Int. Cl.[4] E21B *43/00*

U.S. Cl. 175—107 **5 Claims**

1. A downhole screw motor comprising a spindle section (2) and a motor section (1) having working members in the form of a stator (3) and a hollow rotor (4) having an axial passage (5) communicating with a high-pressure zone of working liquid, a regulator (6) of working liquid flow having a nozzle (16) being mounted in the axial passage, characterized in that the nozzle (16) has two chambers disposed in series in the direction of working liquid flow an admission chamber (A) and a delivery chamber (B) having their surfaces (19, 20) washed with liquid which are conjugated along a breaking line (21), an annular



portion (22) of the admission chamber (A), which is adjacent to the breaking line (21), being convex with respect to the direction of working liquid flow, and the cross-sectional area of the admission chamber (A) at the outlet thereof being smaller than the cross-sectional area of the same chamber at the inlet thereof.

4,823,890

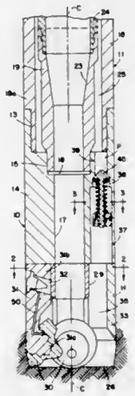
REVERSE CIRCULATION BIT APPARATUS

Alan F. Lang, Sandy, Utah, assignor to Longyear Company, Salt Lake City, Utah

Filed Feb. 23, 1988, Ser. No. 159,358

Int. Cl.[4] F21B *21/10, 21/12*

U.S. Cl. 175—318 **10 Claims**



1. Reverse circulation rock bit apparatus for having pressurized fluid flow inwardly therethrough, cutting a bore hole that has a transverse inner surface, and have core cuttings entrained in fluid flow outwardly therethrough, and that has a central axis, comprising an axially elongated bit housing having axial opposite inner and outer transverse surfaces and wall means defining a central return bore extending axially therethrough, including opening through the housing transverse surfaces to have entrained cuttings flow thereinto, the central bore including a first bore portion and an axial inner second bore portion that opens through the transverse inner surface, is of a smaller diameter than that of the first bore portion and opens to the first bore portion to form an annular outwardly facing shoulder, a cutter head assembly joined to the housing inner transverse surface to extend inwardly of the housing, the head assembly at least two cutter arms and arcuate segments joined together to cooperatively define an enclosure that opens outwardly to the housing inner transverse surface and has the second bore portion opening thereto, and during use to open to the bore hole inner transverse surface that is cut, there being an arcuate segment extending arcuately between angular adjacent arms and joined thereto and a rotary cutter mounted on each arm to at least in part be located within the enclosure and in part further axially inwardly than the segments, the housing having at least two angular spaced axially extending fluid passages, there being a passage for each cutter arm to conduct pressurized fluid inwardly, the passages having ends opening through the housing transverse inner surface to the enclosure angularly between adjacent arms and in angular spaced relationship to one another, the passages being radially spaced from the central bore second bore portion and opening through the shoulder in angularly spaced relationship, and check valve means in each passage for permitting pressurized fluid flow inwardly through the respective passage and block fluid flow therethrough in an outward direction, the central bore being in fluid communication with the enclosure, each valve means including a valve device and resilient means mounted in the respective passage for resiliently urging the valve device to block fluid flow from the enclosure and outwardly through the passage.

4,823,891

STABILIZER SLEEVE FOR DRILL STRING

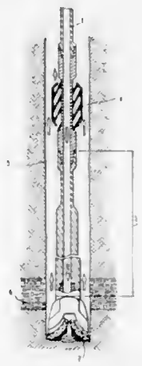
Noureddine Hommani, Chenove, and Daniel Kadjar, Vaucresson, both of France, assignors to TOTAL Compagnie Francaise des Petroles, Paris, France

Filed Aug. 27, 1987, Ser. No. 89,805

Claims priority, application France, Aug. 27, 1986, 86 12117

Int. Cl.[4] E21B *17/10, 21/00*

U.S. Cl. 175—323 **5 Claims**



1. A drilling apparatus comprising, in combination, an elongate drill string (1), a cutter bit (2) mounted to a lower end of the string, and a stabilizer (4) serially connected in the string and spaced from the cutter bit, wherein the stabilizer comprises:

(a) an elongate tubular element (10) having connector means (7, 9) at opposite ends thereof for serially coupling into the drill string for rotation therewith, said tubular element being hollow to enable the descending flow of a drilling fluid during the rotation of the drill string and cutter bit,

(b) a cylindrical sleeve (11) disposed coaxially surrounding the tubular element and being secured thereto by,

(c) a plurality of circumferentially spaced, helically oriented blades (17) extending between and fixedly secured to an outer surface of the tubular element and an inner surface of the sleeve such that the sleeve rotates together with the tubular element,

(d) the sleeve having a smooth outer surface and an outer diameter sufficiently smaller than the outer diameter of the cutter bit to define an annular space between said outer surface and a surrounding wall of a borehole (5) drilled by said cutter bit to implement the establishment of an annular fluid bearing by drilling fluid flowing upwardly through said annular space, and the blades implementing a pumping function to enhance the upward discharge flow of the drilling fluid and entrained cuttings, and

(e) said sleeve having an inwardly converging, truncated conical member (16) extending axially from a lower edge (15) of the sleeve and serving to deflect a portion of the upwardly flowing drilling fluid outwardly to enhance the establishment of the fluid bearing.

4,823,892

ROTARY DRILL BITS

John Fuller, Penzance, England, assignor to NL Petroleum Products Limited, England

Division of Ser. No. 754,506, Jul. 12, 1985, Pat. No. 4,718,505, This application Nov. 9, 1987, Ser. No. 118,604

Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—329 **1 Claim**



1. A rotary drill bit for use in drilling or coring holes in subsurface formations, comprising a bit body having a shank for connection to a drill string, a plurality of preform cutting elements mounted at the surface of the bit body, and a passage in the bit body for supplying drilling fluid to the surface of the bit for cooling and/or cleaning the cutting elements, the bit body being formed from steel, and each cutting element being pre-mounted on a separately preformed stud which is subsequently mounted in a preformed socket in the steel bit body, the stud including, rearwardly of the cutting element with respect to the normal direction of rotation of the bit, particles of superhard material embedded in the stud prior to the mounting of said stud in said preformed socket, at least a portion of the stud which includes the particles of superhard material projecting clear of the bit body.

4,823,893

METAL INSERT MOUNTING

James F. Cantrel, Easton, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 17, 1987, Ser. No. 74,810

Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—410 **4 Claims**

1. A cutting tool comprising:

a body of base metal having a surface;

a cylindrical socket formed in said body and extending inwardly from said surface, said socket having a bottom and a cylindrical side wall, said cylindrical side wall having a local circumferential band of deformed and compressed metal axially spaning a portion thereof; and

a hard metal insert mounted in said socket, said hard metal insert having a cylindrical wall surface, a bottom surface

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and a tapered surface extending longitudinally and inwardly from the cylindrical wall surface to the bottom surface, said local circumferential band of deformed and



(PRIOR ART)

compressed metal of the cylindrical side wall extending axially from a point above the tapered surface of the hard metal insert to a point below the cylindrical wall surface of the hard metal insert.

4,823,894

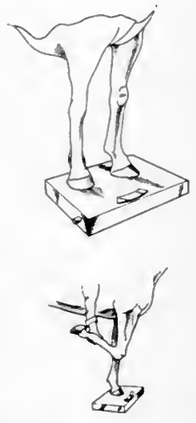
METHOD OF WEIGHING EQUINES

Walter J. Koerner, P.O. Box 1022, Bella Vista, Calif. 96008

Filed Feb. 10, 1988, Ser. No. 155,071

Int. Cl.[4] G01G *19/40*

U.S. Cl. 177—25.14 **6 Claims**



1. A method of weighing an equine by standing one forefoot of said equine onto a portable scale device with the handler supporting the other said equine forefoot off the ground, said scale device consisting of a load responsive means to measure applied weight and read out means to indicate a weight greater than the said applied weight, said indicated weight being the quotient of the said measured weight divided by a fixed factor, being the predetermined percentage of total family equine weight carried by said family equine forefoot.

4,823,895

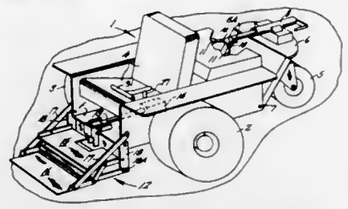
THREE WHEELED VEHICLE WITH COMBINED POWER TRANSMISSION AND STEERING SYSTEM

James F. Kimball, 83617 Rattlesnake Rd., Dexter, Oreg. 97431

Continuation-in-part of Ser. No. 919,979, Oct. 17, 1986, abandoned. This application Jul. 20, 1987, Ser. No. 75,547

Int. Cl.[4] B60K *4/26*; B66B *9/20*

U.S. Cl. 180—6.48 **11 Claims**



1. A power transmission system for a wheel support vehicle, said system comprising in combination,

a power source,

a first and second variable speed hydraulic transmission unit having output shafts and driven by said power source, drive means coupling the transmission output shafts to some of the vehicle wheels, and

an operator actuated vehicle control mechanism including a control member, mounting means supporting said control member for movement both about a horizontal axis and a generally upright axis, first and second appendages oppositely offset from and carried by said control member, first and second linkages coupling said first and second appendages to said first and second transmission units whereby movement of said control member about said horizontal axis will simultaneously increase or decrease the output shaft speed of said transmission units in a synchronous manner while movement of said control member about the upright axis will alter the rotation of said transmission output shafts in a differential manner, said control member housing switch means in circuit with said power source, said control member slidably supported by a vehicle surface, said control member adapted for movement toward and away from said vehicle surface to open and close said switch means in response to operator exerted pressure on the control member and the absence of such pressure whereby in the absence of such operator exerted pressure on the control member this switch means will disable the power source.

4,823,896

CYLINDER ATTACHMENT FOR ELEVATING TRANSPORTER

John G. Evans, Binbrook, and Bogdan Charczuk, Smithville, both of Canada, assignors to Paling Spring Limited, Hamilton, Canada

Filed Aug. 7, 1987, Ser. No. 82,596

Claims priority, application Canada, Jun. 12, 1987, 539500

Int. Cl.[4] B62D *61/10*

U.S. Cl. 180—24.01 **24 Claims**

1. A retractable undercarriage for dual wheels for a large vehicle comprising:

a support member adapted for connection to and support of said vehicle and having a vertically extending leg;

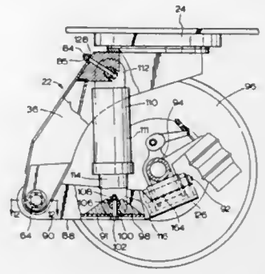
an arm member pivotally connected at one end thereof to the lower end of said leg by a pin connection;

a running gear sub-assembly connected to and mounted on the other end of said arm member, said sub-assembly including an axle arrangement for mounting dual wheels;

a first mounting block rigidly attached to an upper portion of said support member and having a slot formed therein for receiving a pivot pin and open at one end;

a second mounting block rigidly attached to said arm member and spaced from said one end of the arm member, said second block also having a slot formed therein for receiving a pivot pin and open at one end;

hydraulic cylinder means for extending and retracting said undercarriage by pivoting said arm member, an upper end of said cylinder means being pivotally connected by a first



pivot pin to said first mounting block and a lower end of said cylinder means being pivotally connected by a second pivot pin to said second mounting block;

a first pair of threaded fasteners for securing said first pivot pin in said slot of said first mounting block; and

a second pair of threaded fasteners for securing said second pivot pin in said slot of said second mounting block.

4,823,897

DRIVE ARRANGEMENT FOR ALL-WHEEL DRIVE VEHICLES

Peter Wohlfarth, Ludwigsburg, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 110,865

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637523

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—75.1 **14 Claims**

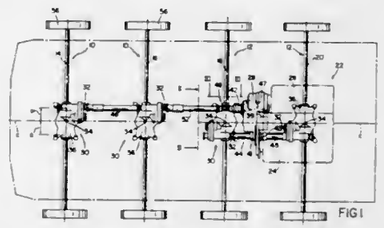


FIG 1

1. In a drive arrangement for all-wheel drive vehicles with two axle-groups, each of which includes at least one axle driven by an axle transmission, the input shafts of the axle transmissions being driven by a transfer gearbox which has output drives connected with each axle group via one connecting shaft each, the improvement comprising:

said input shafts of said axle transmissions of said two axle groups are located on different sides relative to the axle transmission centers;

said axle transmissions have a free space on their transmission casing opposite to said input shaft; and

said free space of an axle transmission of the axle belonging to the axle group nearest to said transfer gearbox is aligned with the input shaft of the axle transmission belonging to the axle of the other axle group so that a drive shaft driven by said transfer gearbox can be passed through said free space.

4,823,898

MOUNT FOR A STEERING GEAR BOX

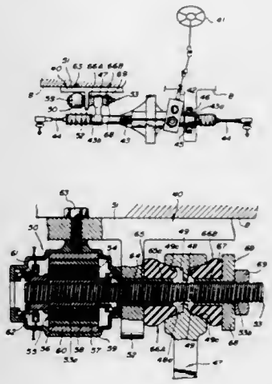
Masami Ogura; Kazuhiro Seki; Masaru Abe; Mitsuya Serizawa; Yoshimichi Kawamoto; Toru Yasuda, and Takashi Kobata, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

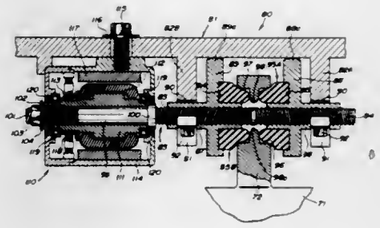
Filed Mar. 21, 1988, Ser. No. 170,829

Claims priority, application Japan, Feb. 12, 1986, 61-19095; Feb. 12, 1986, 61-19096; Aug. 20, 1986, 61-126941; Dec. 16, 1986, 61-203408

Int. Cl.[4] B62D *15/00*

U.S. Cl. 180—140 **7 Claims**





1. A steering gear box mount comprising:

a steering gear box;

a motor vehicle body;

a first resilient member interposed between said motor vehicle body and a portion of said steering gear box for allowing said steering box to move; and

means interposed between said motor vehicle body and another portion of said steering gear box for limiting allowed movement of said steering gear box;

said means includes a mechanism for continuously adjusting the allowed movement of said steering gear box; and

said mechanism comprises:

support means supporting said steering gear box on said motor vehicle body;

an attachment portion of said steering gear box which is attached to said motor vehicle body;

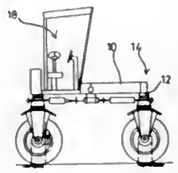
a shaft extending in parallel with said steering gear box through said support means and said attachment portion;

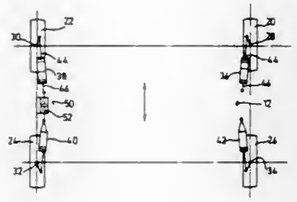
a second resilient member disposed on opposite sides of said

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attachment portion and sandwiching the attachment portion in an axial direction of said shaft;
a movable member disposed on said shaft adjacent to said second resilient member and movable in the axial direction of said shaft, said second resilient member being variable in rigidity in response to movement of said movable member; and
drive means disposed around and coaxial with said shaft for moving said movable member.

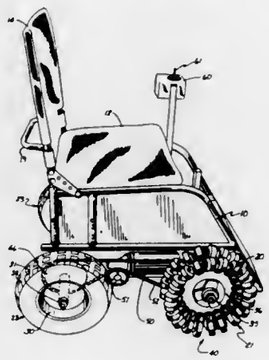
4,823,899
STEERING APPARATUS
Shimon Ron, Givataim, Israel, assignor to Asbot Ashkelon Industries Ltd., Ashkelon, Israel
Continuation of Ser. No. 884,188, Jul. 10, 1986, abandoned. This application Apr. 13, 1988, Ser. No. 183,385
Int. Cl.[4] B62D *9/00*
U.S. Cl. 180—140 **9 Claims**





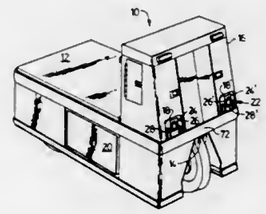
1. A tractor comprising:
a chassis:
steering apparatus including:
first, second, third and fourth wheels, each pivotably and rotatably mounted onto said chassis;
first positioning means for selectably positioning said first, second, third and fourth wheels in first and second extreme positions and for selectably positioning said first and second wheels at predetermined angled positions intermediate said first and second extreme positions;
second positioning means associated with said second and third wheels and operative to provide selectable steering of said second and third wheels,
said first, second, third and fourth wheels being pivotably mounted at vertices of an imaginary rectangle, whereby said first and second wheels are separated by a first distance, said third and fourth wheels are separated by said first distance, said second and third wheels are separated by a second distance and said first and fourth wheels are separated by said second distance, said first distance being greater than said second distance, wherein first distance represents the tractor wheelbase for off-highway operation and said second distance represents the tractor wheelbase for highway operations, said first and second wheels being selected to be at the front leading end of said tractor for off-highway operations and said second and third wheels are selected to be at the front leading end of said tractor for highway operations,
said first positioning means comprising first, second, third and fourth fluid operated piston and cylinder assemblies associated with said first, second, third and fourth wheels respectively for providing selectable pivotal positioning thereof,
the stroke lengths of all of said first, second, third and fourth fluid-operated piston and cylinder assemblies each providing a 90 degree pivot range for an associated wheel,
said second positioning means comprising a bidirectional piston assembly which is coupled to said second and third piston and cylinder assemblies in a series arrangement,
said second positioning means also comprising means for locking said bidirectional piston assembly in a central position only when the tractor is operated for off-highway operations.

4,823,900
FOUR-WHEEL DRIVE WHEEL-CHAIR WITH COMPOUND WHEELS
Jeffrey Farnam, 3035 Humboldt Ave. S., Minneapolis, Minn. 55408
Continuation of Ser. No. 928,620, Nov. 4, 1986, abandoned, which is a continuation of Ser. No. 783,325, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 605,858, May 1, 1984, abandoned. This application Jun. 9, 1988, Ser. No. 204,509
Int. Cl.[4] A61G *5/04;* **B62D** *11/04*
U.S. Cl. 180—6.5 **3 Claims**



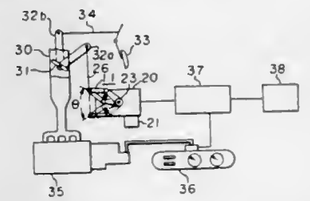
1. A four-wheel drive wheelchair comprising:
a frame;
a pair of non-compound rear wheels mounted near the rear end and on opposite sides of said frame for supporting the rear end thereof, each of said rear wheels mounted for rotation in a fixed plane parallel to the side of said frame;
a pair of front compound-wheels mounted near the front end and on opposite sides of said frame for supporting the front end thereof, each of said wheels mounted for rotation in a fixed plane parallel to the side of said frame and providing a substantially continuous traction-providing surface with respect to wheel rotation in said plane and supporting the front end of said vehicle to roll substantially freely transverse to said plane from side to side;
differential steering means including first means for connecting the front and rear wheels on one side of said frame to turn in unison, second means for connecting the front and rear wheels on the other side of said frame to turn in unison and motorized drive means including one or more electric motors and control circuits for applying forward to rearward drive power to each set of connected wheels so that said vehicle may be steered differentially, said motorized drive means further including rechargeable batteries for supplying drive power thereto;
a wheelchair seat having an area for supporting the user's seat and a back rest to support the back of a user, said wheelchair seat mounted to said frame with said area supporting the user's seat positioned forward of the rear axles of said rear wheels;
said batteries and control circuits mounted to said frame underneath said wheelchair seat between said front and rear wheels;
said one or more motors mounted to said frame and below said wheelchair seat;
said frame including a foot rest positioned to support the feet of said user approximately between and forward of said front wheels;
whereby a substantial amount of the combined weight of the user seated in said seat and the weight of said motorized drive means is supported by said front wheels to cause the front wheels to play an active role in the driving, steering and braking of the wheelchair so that powered four-wheel drive and four-wheel differential steering is provided, said front compound-wheels permitting the wheelchair to be turned with substantially less power than that required to turn a skid-steer four-wheel drive system and permitting said wheelchair to be turned without damage to indoor floor surfaces.

4,823,901
APPARATUS AND METHOD FOR DETECTING FAULTS IN AN OBSTACLE DETECTION SYSTEM
Joseph J. Harding, Mentor, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio
Filed Jul. 22, 1988, Ser. No. 222,853
Int. Cl.[4] B60T *7/16*
U.S. Cl. 180—167 **13 Claims**



1. Apparatus for detecting obstacles in the path of a work vehicle upon which said apparatus is mounted, comprising:
transducer means for producing radiant energy, receiving reflected produced radiant energy, and controllably producing an article detected signal in response to receiving said reflected produced radiant energy, said transducer means being pivotally mounted to said work vehicle;
means for causing said transducer means to produce the article detected signal at regular predetermined intervals;
means for receiving the article detected signal and producing a sensor failed signal in response to said transducer means ceasing to produce the article detected signal at said regular predetermined intervals;
means for producing an end of detector swing signal in response to said transducer means being at a predetermined angular swing position; and
logic means for receiving the produced article detected signals and end of detector swing signals and producing an obstacle detected signal only in response to the presence of the article detected signal coincident with the absence of the end of detector swing signal.

4,823,902
CONSTANT-SPEED CRUISING APPARATUS
Masayoshi Onishi, and Takeshi Yasukawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 20, 1987, Ser. No. 110,285
Claims priority, application Japan, Oct. 22, 1986, 61-252319; Dec. 16, 1986, 61-300359; Dec. 16, 1986, 61-300360
Int. Cl.[4] B60K *31/00*
U.S. Cl. 180—170 **5 Claims**



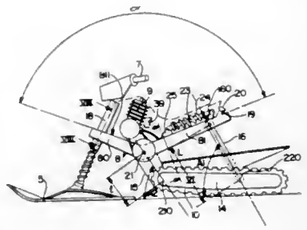
1. A constant-speed cruising apparatus which comprises:
(a) a motor;
(b) a motor-driven actuator having an output shaft for transmitting the driving force at a reduced speed from said motor;
(c) a power transmitting means including a wire which transmits a turning movement from said output shaft to a first link one end of which is connnected to a throttle valve in a carburetor, said throttle valve being also operated by an acceleration pedal through a second link;
(d) a control unit for comparing the car speed detected by a car speed sensor with a constant speed previously set and for driving said motor by generating a control signal on the basis of a deviation detected by the comparison;
(e) a switch means for setting or releasing the constant speed; and
(f) a variable-length lever mechanism having a radius in swing movement, said variable-length lever mechanism comprising:
(i) two pairs of arms which are movably connected through four elbows to comprise a changeable rhombic shape;
(ii) a linear actuator which is interposed between a first pair of said four elbows at first opposite corners among said four elbows to expand or contract the distance between said first pair of elbows, and
(iii) one of a second pair of said four elbows at second opposite corners connected to said output shaft and the other one of said second pair of elbows connected to said wire so that the radius in swing movement of said variable rhombic shaped lever mechanism is changed by the operation of said linear actuator based on a signal from said control unit.

4,823,903
MOTORIZED SNOW VEHICLE
Jean-Claude Bibollet, Thones, and Alain Isambert, Charvonnex, both of France, assignors to Bibollet S.A., Bons En Chablais, France
PCT No. PCT/FR86/00281, § 371 Date Apr. 8, 1987, § 102(e) Date Apr. 8, 1987, PCT Pub. No. WO87/01085, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 6, 1986, Ser. No. 46,887
Claims priority, application France, Aug. 13, 1985, 85 13288
Int. Cl.[4] B62D *55/06*
U.S. Cl. 180—193 **20 Claims**

1. A motorized snow vehicle comprising (i) a a rear support assembly comprising a chassis including a support frame and a motor for activating a tread mounted above said support frame, (ii) a steering assembly comprising a steering column

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pivotally mounted to said rear support assembly and connected at a lower end to a front runner and at its upper end to means for steering, wherein a central portion of the chassis is a traversed transversely by a pivot axis of a front retention arm of a tread support while a rear portion is traversed transversely by a pivot axis of a rear retention arm of the said tread support,



wherein said front retention arm and said rear retention arm for support of the tread are inclined from their respective pivot axis on the chassis downwardly and towards the rear, a first length of the front retention arm being less than a second length of the rear retention arm, and (iii) a suspension system operably connected to said tread support positioned above the rear portion of the chassis.

4,823,904

INSTALLATION FOR SLIPPAGE LIMITATION, RESPECTIVELY, PREVENTION OF DRIVEN WHEELS OF A MOTOR VEHICLE

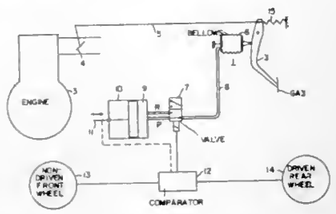
Christian Dietrich, Wessling, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 661,961, Oct. 17, 1984. This application Sep. 26, 1986, Ser. No. 912,689

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1983, 3337664

Int. Cl.⁴ B60K *28/10*

U.S. Cl. 180—197 **7 Claims**



1. An installation for limitation of slippage of driven wheels of a driver operated motor vehicle having an internal combustion engine controllable by a directly actuatable output-adjusting means having a gas pedal, comprising

adjustble abutment means applying direct force to the output-adjusting means for transmitting via the gas pedal to the driver information concerning the status of driven wheel slippage, said adjustable abutment means being operable to reposition the gas pedal during the occurrence of abnormal slippage from a preselected gas pedal position corresponding to a first engine power output magnitude into a gas pedal position corresponding to a second power output magnitude different from said first magnitude in which the wheels possess substantially predetermined maximum permissive slippage.

4,823,905

IMPACT ACTUATED SAFETY APPARATUS FOR A VEHICLE

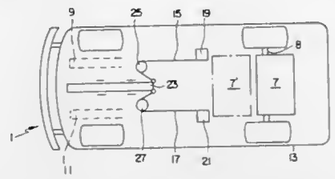
Ferdinand Piëch, Ingolstadt, Fed. Rep. of Germany, assignor to Audi AG., Ingolstadt, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 17,819

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605599

Int. Cl.⁴ B60R *22/46*

U.S. Cl. 180—274 **11 Claims**



1. An apparatus for activating a safety device for the protection of a passenger in a vehicle comprising body means defining a predetermined periphery and a front axle, a rear axle and drive means mounted adjacent said rear axle, comprising:

means mounted to said vehicle for movement relative thereto in response to an impact exceeding a predetermined force and comprising at least one elongated member having at least one end section positioned inwardly of said periphery and substantially facing said impact, said elongated member comprising a drive shaft connecting said drive means with said front axle and including a section extending forwardly of said front axle and inwardly of said periphery;

means for substantially preventing physical distortion of said mounted means in response to said impact thereby to assure its movability; and

means operatively connected to said mounted means for activating said safety device in response to said movement.

4,823,906

STETHOSCOPE HAVING A BODY CONTACT PIECE PROVIDED WITH TWO ALTERNATIVELY EMPLOYED AUSCULTATION HEADS

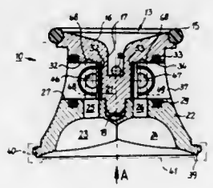
Jochen Gabriel, Stuttgart, Fed. Rep. of Germany, assignor to Wilhelm Haselmeier GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Feb. 4, 1986, Ser. No. 826,137

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 8504877[U]

Int. Cl.⁴ A61B *7/02*

U.S. Cl. 181—137 **38 Claims**



1. A stethoscope comprising

a double-headed body contact piece provided with first and second acoustic connector portions which are respectively connectable to first and second acoustic-signal-transmitting passages of a two-acoustic-passage stethoscope-tube attachment,

the double-headed body contact piece comprising a first, non-differential auscultation head having a single auscultation chamber that is to be placed in acoustic communication with a surface of the body of a patient,

the double-headed body contact piece furthermore comprising a second, differential-auscultation head having a pair of auscultation chambers which are to be placed simultaneously with each other in acoustic communication with the surface of said body of the patient with a predetermined spacing between the two chambers of the pair of chambers,

the double-headed body contact piece furthermore comprising a switchover mechanism operative for establishing acoustic connections from predetermined ones of said auscultation chambers to said acoustic connector portions and for acoustically isolating said acoustic connector portions from predetermined ones of said auscultation chambers, and for acoustically isolating each chamber of said pair of chambers of said second head from said single chamber of said first head, the switchover mechanism being movable between

a first setting establishing acoustic connections from the single chamber of the first, non-differential auscultation head to both said first and said second acoustic connector portions while acoustically isolating said single chamber of said first auscultation head from both the one and the other chamber of said pair of chambers of said second auscultation head, and

a second setting establishing an acoustic connection from one chamber of said pair of chambers of said second head to one of the two acoustic connector portions and an acoustic connection from the other chamber of said pair of chambers of said second head to the other of the two acoustic connector portions, while acoustically isolating each of said pair of chambers of said second head from said single chamber of said first auscultation head.

4,823,907

BALLOON ASSEMBLY

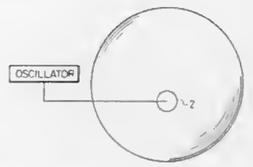
Hatsuo Hoshi, No. 13-19, Shikiji 2-chome, Shizuoka-shi, Shizuoka-ken, Japan

Filed May 19, 1987, Ser. No. 51,321

Claims priority, application Japan, Nov. 19, 1986, 61-275885

Int. Cl.⁴ H04R *7/00*; H05K *5/00*

U.S. Cl. 181—148 **4 Claims**



1. An acoustic speaker system, said system comprising:

a balloon amplifier, said balloon amplifier having a pocket formed therein;

a thin plate vibrating element disposed within said pocket, so that, when said balloon amplifier is fully inflated, said balloon amplifier contacts both surfaces of said thin plate vibrating element; and

an electrical oscillator means for sending a signal to said thin plate vibrating element, said signal causing said thin plate vibrating element to vibrate, said signals being in turn amplified by said balloon amplifier assembly.

4,823,908

DIRECTIONAL LOUDSPEAKER SYSTEM

Tsuneo Tanaka, Amagasaki; Mikio Iwasa, Katano; Youichi Kimura, Suita, and Akira Nakamura, Minoo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

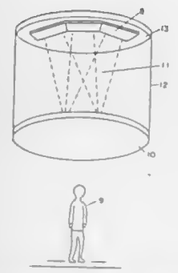
PCT No. PCT/JP85/00469, § 371 Date Apr. 28, 1986, § 102(e) Date Apr. 28, 1986, PCT Pub. No. WO86/01670, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 26, 1985, Ser. No. 862,349

Claims priority, application Japan, Aug. 28, 1984, 59-179743; Nov. 20, 1984, 59-245136; May 2, 1985, 60-94702; May 20, 1985, 60-107505; Jul. 4, 1985, 60-147555; Aug. 26, 1985, 59-179742

Int. Cl.⁴ E04B *1/99*

U.S. Cl. 181—175 **21 Claims**



1. A directional loudspeaker system comprising:

an enclosure means for surrounding a respective space defined therein and in which a medium is disposed;

ultrasonic wave radiator means directed toward the space within said enclosure means for generating as a primay wave a finite amplitude ultrasonic wave modulated by an audible sound through the medium which produces a secondary wave at a frequency at which the secondary wave is audible; and

the enclosure means comprising a shield portion for preventing said primary wave from propagating through the enclosure means and out of said space and an acoustic filter means portion for allowing only said secondary wave to propagate through the enclosure means and out of said space.

4,823,909

VEHICULAR SOUNDPROOF STRUCTURE

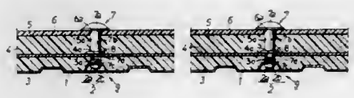
Mitsuo Nakamura, and Tsuyoshi Yamashita, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1987, Ser. No. 102,978

Claims priority, application Japan, Oct. 1, 1986, 61-234148

Int. Cl.⁴ E04B *1/82*

U.S. Cl. 181—290 **5 Claims**

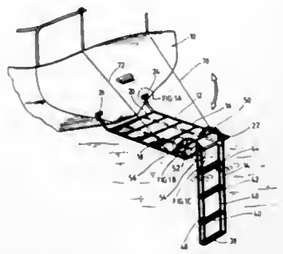


1. A vehicular soundproof structure comprising a vehicle body forming panel, a lower side sound absorbing foamed resin layer disposed on a surface of the vehicle body forming panel, a sound insulating panel having a high rigidity and disposed on a surface of the lower side sound absorbing foamed resin layer, an upper side sound absorbing layer disposed on the sound insulating panel, and a press means extending between said

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vehicle body forming panel and said sound insulating panel for pressing the sound insulating panel toward the vehicle body forming panel while compressing said lower side sound absorbing foamed resin layer which is disposed between the sound insulating panel and the vehicle body forming panel.

4,823,910
BOAT PLATFORM LADDER
Roger P. Day, P.O. Box 1065, Kemah, Tex. 77565
Filed Jul. 29, 1988, Ser. No. 225,768
Int. Cl.[4] B63B *29/20*; E06C *5/04*
U.S. Cl. 182—84 **6 Claims**

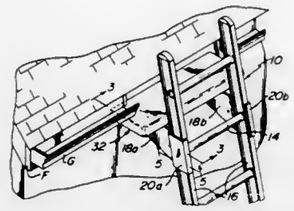


1. A boat ladder to be affixed to the stern of a recreational water-borne vessel, comprising:
- a platform section having a pair of parallel extension arms projecting from a first end;
- a hinge mechanism carried at the end of each extension arm and adapted for attachment to the stern of a vessel, the hinge mechanism providing the platform section with pivotal movement between a raised position wherein the platform surface is substantially, vertically disposed and a lowered position wherein the platform surface is substantially, horizontally disposed;
- a ladder section carried at an opposing, second end of the platform and having a plurality of steps spaced along a pair of parallel side members having arcuate ends;
- a rotational coupling mechanism connecting the ladder section to the platform section and providing rotational movement of the ladder relative to the platform so that when the platform is in its lowered position, the ladder assumes a position perpendicular to the platform, and when the platform is in its raised position, the ladder assumes a position parallel to the platform;
- a locking mechanism carried by each arcuate end of the ladder side members, the locking mechanisms coupling the ends of the ladder to the platform to fix the ladder in its perpendicular position;
- one or more platform support means coupled between a vessel and the platform for supporting the platform in its lowered position; and
- control means attached to the platform for raising and lowering of the platform.

4,823,911
LADDER SCAFFOLD
Steven A. Dore, 5316 191st St. SW., Lynnwood, Wash. 98036
Filed Aug. 15, 1988, Ser. No. 232,351
Int. Cl.[4] E06C *7/16*; E04G *1/30*
U.S. Cl. 182—119 **1 Claim**

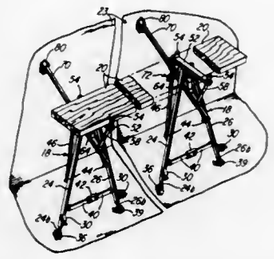
1. The combination of a ladder having generally parallel rails connected by rungs, a scaffold plank having hooks projecting from one end thereof and disposed respectively alongside the outer sides of said ladder, and a scaffold plank hanger bearing against the edges of said ladder rails having a crossbar the end portions of which crossbar project beyond the opposite sides of said ladder, and are engaged by said scaffold plank hooks, and said hanger having elongated hooks spaced apart a distance somewhat less than the width of said ladder and having hooked upper end portions engaged over a rung of said ladder.

4,823,912
MULTIPURPOSE LADDER FIXTURE
William E. Gould, 12981 Gambusa Way, San Diego, Calif. 92129; Richard J. Gould, 78 Pequot Trail, Medford, N.J. 08055, and Steven P. Gould, 107 Chatham Rd., Mount Laurel, N.J. 08054
Filed Jun. 6, 1988, Ser. No. 203,131
Int. Cl.[4] E06C *7/48*
U.S. Cl. 182—214 **18 Claims**



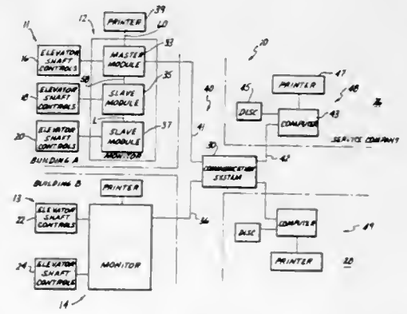
1. A multipurpose fixture for a ladder comprising, in combination:
- a pair of juxtapositioned brackets each including symmetrically opposite elongated channel means for engaging the outer sides of the ladder stiles, and support means extending from said channel means having a first edge at an obtuse angle with the length thereof for bearing a vertical load and a second edge normal to said first edge for bearing a lateral load, said obtuse angle being supplementary to a predetermined leaning angle of the ladder;
- securing means coupled to said brackets for clamping said channel means about the stiles engaged therein; and
- transverse means operatively connected to said brackets for selectively positioning against said first or second edge.

4,823,913
SIMPLIFIED SELF SUPPORTING SCAFFOLD STRUCTURE HAVING SAFETY FEATURES
Clifford S. Riegel, Jr., 12251 Eagle Rd., New Lebanon, Ohio 45345
Filed Apr. 27, 1988, Ser. No. 186,803
Int. Cl.[4] B27B *21/00*; B25H *1/05*; E04G *3/04*
U.S. Cl. 182—225 **17 Claims**



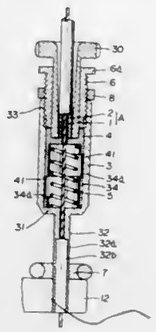
17. Self supporting scaffold structure for positioning adjacent a wall, comprising:
- a plurality of upstanding leg members, the leg members being inclined one toward the other,
- a load support member, the load support member being provided with a pair of end portions and an intermediate portion, the intermediate portion being between the end portions,
- means attaching the leg members to intermediate portion of the load support member,
- a brace member positioned angularly with respect to the load support member, the brace member being positioned between the upper portions of the leg members,
- and means attaching the brace member to the load support member,
- wherein the leg members are adapted to be positioned adjacent a wall and wherein the brace member is adapted to engage the wall and to maintain the load support member in substantially horizontal orientation.

4,823,914
STATUS LINE MONITORING SYSTEM AND METHOD OF USING SAME
Robert C. McKinney, Lakeside; Lloyd F. Perry, San Diego, and Scott T. Boden, El Cajon, all of Calif., assignors to Elevator Performance Technologies, Inc., Santee, Calif.
Filed Jun. 24, 1987, Ser. No. 66,014
Int. Cl.[4] B66B *3/00*
U.S. Cl. 187—133 **16 Claims**



1. A system for use with a plurality of segregated groups of controls, each group of controls having corresponding status control lines indicative of the operational status of an elevator, an escalator, or the like, the system comprising:
- a series of monitor devices for monitoring the status control lines;
- each one of said monitor devices corresponding to an individual one of the group of controls, for detecting operational problems associated therewith;
- each one of said monitor devices having means for compiling said operational problems;
- each of said monitor devices having means being responsive to the complied operational problems for diagnosing said problems to determine specific individual operational fault conditions associated with and corresponding to an individual one of the status control lines;
- each of said monitor devices having means for generating fault message report information based on said operational problems, said report message identifying the diagnosed fault condition and the specific location of the operational problem.

4,823,915
OPERATING FORCE TRANSMISSION DEVICE FOR A BRAKE
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Feb. 11, 1988, Ser. No. 155,044
Claims priority, application Japan, Feb. 17, 1987, 62-34244
Int. Cl.[4] B60T *1/00*; B62L *5/20, 1/06*; G05G *1/00*
U.S. Cl. 188—2 D **7 Claims**



1. An operating force transmission device for a brake, for transmitting an input operating force applied to a brake lever to braking members of the brake through a control cable interconnecting the brake lever and the brake, the control cable comprising an inner wire disposed within an outer sheath, said device comprising:
- a housing;
- a receiving member supported movably relative to said housing and being adapted to retain thereto one of the inner wire and the outer sheath of the control cable;
- a control spring means for deflecting responsive to a braking force output provided by the braking members of the brake exceeding a predetermined magnitude, to enable said receiving member to move relative to said housing when said predetermined braking force magnitude is exceeded so as to reduce a magnitude of a further braking force output of the braking members of the brake with respect to a magnitude of the input operating force supplied to the brake lever and transmitted to the braking members of the brake;
- an adjuster means for adjusting a spring force of said control spring means to change said predetermined magnitude of said braking force output at which said control spring means deflects to enable said receiving member to move relative to said housing;
- a stopper means for impeding movement of said receiving member relative to said housing in excess of a predetermined amount, said stopper means being provided between said housing and said receiving member and including a stopper having a plurality of impeding positions for impeding movement of said receiving member with respect to said housing; and
- a selection means for causing said receiving member to selectively engage with said impeding positions.

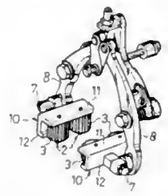
4,823,916
ROLLER-TYPE BICYCLE BRAKE STRUCTURE
Yeong-Ji Shyu, No. 99, Jen Yi Street, San Chung City, Taiwan
Filed Aug. 31, 1987, Ser. No. 91,194
Int. Cl.[4] B62L *1/02, 5/10*; F16D *69/02*
U.S. Cl. 188—24.12 **7 Claims**

1. A roller-type brake for a bicycle having a wheel with a rim portion and a brake arm comprising:
- (a) a base iron comprising a corner iron having a first side

wall defining a pair of generally parallel oval holes and a second side wall extending from the first side wall at an approximate right angle, the second side wall defining an opening;

(b) a pair of rubber, generally cylindrical roller brake elements;

(c) attaching means extending through the oval holes to attach the roller brake elements to the first side wall; wherein the attaching means comprises a headed rivet having a portion extending through a roller brake element



and a tenon portion extending through an oval hole to form a mortise and tenon joint; and,

(d) mounting means mounting the second side wall to the brake arm such that, during braking, the roller brake elements are pressed against the rim portion of the wheel, the attaching means allowing slight rotation of the roller brake elements to prevent wheel lock-up and consequent sliding of the wheel, the mounting means comprising a bolt extending through the opening and attached to the brake arm by a nut.

4,823,917

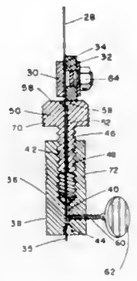
BICYCLE CALIPER BRAKE ADJUSTING TOOL

Thomas L. Kenny, 985 Cranberry Trail, Roswell, Ga. 30076

Filed Oct. 13, 1987, Ser. No. 107,028

Int. Cl.[4] F16D *65/46*

U.S. Cl. 188—24.19 **7 Claims**



1. In combination with a cable operated bicycle caliper-type brake assembly including first and second components movable toward and away from each other to apply and release, respectively, the brake assembly and wherein one of said components stationarily mounts one end of a cable assembly housing and the other component includes a first through passage adjustably slidably receiving the corresponding end of the cable assembly core therethrough as well as releasable clamp structure for releasably securing the cable assembly core end in adjusted shifted position relative to said passage, a brake adjusting tool including an elongated body having opposite end portions and a second through passage formed longitudinally therethrough, one end portion of said body including an abutment mounted thereon for adjusted shifting longitudinally of said body outward of said one end and defining a third through passage therethrough registered with said first passage, said corresponding end of said core projecting through said first and third passages and at least partially into said second passage, said body including releasable anchor means for releasably anchoring said core end in longitudinally displaced position in said second passage, said abutment engaging the side of said other component remote from said one component and being operative, when extended relative to said one end of said body, to displace said other component toward said one component.

4,823,918

DEVICE FOR HOLDING OUTER WIRE OF BRAKE

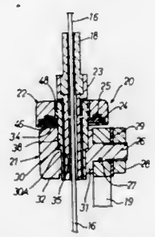
Kenichi Yoshigai, Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Co., Ltd., Higashi-Osaka, Japan

Filed Mar. 21, 1988, Ser. No. 177,520

Claims priority, application Japan, Apr. 3, 1987, 62-51279[U]

Int. Cl.[4] B62L *3/02*

U.S. Cl. 188—24.19 **7 Claims**



1. In a brake including a pair of large and small pivotally movable brake arches, each having a brake shoe at a lower end, a spring for biasing the lower ends of the brake arches away from each other, an inner wire for pulling the large brake arch to move the lower ends of the brake arches toward each other, an outer wire having the inner wire extending therethrough, and an outer wire holder for fixedly holding the outer wire at the outer end of an arm extending from the small brake arch, and a device for holding the outer wire of the brake, wherein said device comprises a hollow screw tube for holding one end of the outer wire as inserted therein, a wire adjusting nut having the screw tube screwed therein, a holder main body mounted on the arm of the small brake arch and rotatably supporting the wire adjusting nut thereon, a rotatable knob portion provided at one end of the wire adjusting nut and formed with a recess in a side thereof that is opposed to the holder main body, a ring fitted in the recess in a rotatably fixed and axially displaceable manner relative to the knob portion, and a biasing member provided in the recess and biasing the ring toward the holder main body, one of the holder main body and the ring being formed with a rugged surface opposed to the other, the other of the holder main body and the ring being provided with at least one projection that is engageable with the rugged surface under action of the biasing member in a manner enabling rotation of the wire adjustment nut in and out with a resultant production of a noise due to contact between the rugged surface and projection as the ring moves axially with and against the biasing of said biasing member.

4,823,919

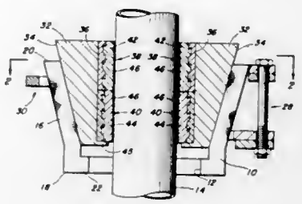
SLIP CONSTRUCTION FOR SUPPORTING TUBULAR MEMBERS

Asadoallah Hayatdavoudi, Lafayette, La., assignor to Premiere Casing Services, Inc., Lafayette, La.

Continuation of Ser. No. 907,492, Sep. 15, 1986, abandoned, which is a continuation of Ser. No. 551,833, Nov. 15, 1983, abandoned. This application Jan. 28, 1988, Ser. No. 149,540

Int. Cl.[4] B65H *59/10*

U.S. Cl. 188—67 **5 Claims**



1. A holder apparatus for axially receiving and carrying a well casing for an oil or gas well, said holder apparatus comprising:

housing means having a tapered inner wall;

a plurality of slips having a tapered radially outer surface engaging said tapered inner wall of said housing means, and having a dovetail transverse cross-section axial groove disposed in a radially inner surface thereof;

at least one pair of slip inserts received and radially retained in said dovetail groove of each of said slips, said pair of slip inserts including:

a radially inner insert means having a toothed radially innermost surface for engaging and supporting said well casing; and

a radially outer insert means for supporting a radially outer surface of said inner insert means; and

wherein said outer insert means has a modulus of elasticity from about one-third to about one-seventh a modulus of elasticity of said inner insert means.

4,823,920

SLIDING CALIPER DISC BRAKE AND BRAKE SHOE ASSEMBLY THEREFOR

Anthony C. Evans, Northville, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed May 2, 1988, Ser. No. 188,939

Int. Cl.[4] F46D *65/09*

U.S. Cl. 188—73.34 **24 Claims**

1. A disc brake assembly for applying a braking force to a rotatable disc having an axis of rotation and an inboard and an outboard frictional surface, said disc brake assembly comprising

a rigid stationary member inboard of said disc and having two circumferentially spaced torque receiving arms axially extending above and across the periphery of said rotatable disc,

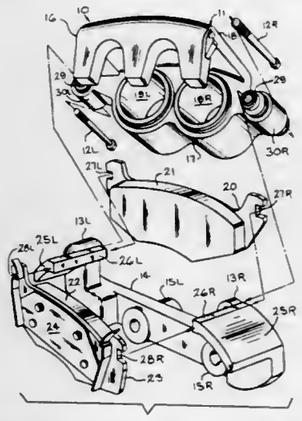
first and second pin members releasably and rigidly fixed to said stationary member and extending parallel to the axis,

a caliper having an inboard leg and an outboard leg, said caliper being supportable in an operative position on said pin members for limited sliding movement thereon,

an inboard brake shoe assembly including an inboard backing plate and a friction pad secured thereto, said inboard backing plate being supportable on said torque receiving arms, on the inboard side of said disc, for axial sliding movement, so that braking torque is transferred to said torque arms,

an outboard brake shoe assembly including an outboard backing plate, a friction pad secured to one side thereof and radial caliper retaining means movable between a first position in which said means are operable and a second position in which said means are inoperable to engage a stop on said caliper and to restrain radially outward movement of said caliper when it is supported on said pin members, said outboard backing plate being supportable on said torque receiving arms, on the outboard side of said disc, for axial sliding movement, so that braking torque is transferred to said torque arms,

brake actuation means mounted on said caliper for applying an axial force to said inboard backing plate to urge said inboard friction pad into frictional engagement with said



disc thereby causing axial movement of said caliper so that said outboard leg of said caliper urges said outboard friction pad into engagement with said disc,

wherein, when the second pin is released from said rigid stationary member and said radial caliper retaining means are in the second position, said caliper is free to rotate about said first pin from the operative position to a service position and

wherein, when said caliper is in the service position, it does not interfere with the removal of the inboard brake shoe assembly and the outboard brake shoe assembly from the torque receiving arms.

4,823,921

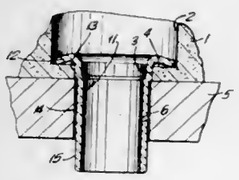
RIVETED BRAKE ASSEMBLY

Robert R. Bosco, Waterbury, Conn., assignor to Anstro Manufacturing Co., Inc., Wolcott, Conn.

Filed Feb. 8, 1988, Ser. No. 153,400

Int. Cl.[4] F16D *19/04, 61/00*

U.S. Cl. 188—250 G **6 Claims**



1. A riveted brake assembly comprising:

a friction pad defining a plurality of pad holes therethrough each comprising a large diameter hole and a small diameter hole,

a support plate disposed adjacent said friction pad and defining a plurality of plate holes therethrough,

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said pad holes and said plate holes being substantially aligned in pairs, and

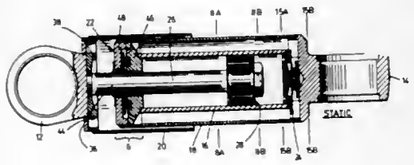
a plurality of rivets disposed in said holes and securing said friction pad to said support plate, each said rivet comprising a rivet head disposed in said large diameter pad hole, integrally formed with a cylindrical shoulder portion disposed in tight engagement with zero to negative clearance said small diameter pad hole, integrally formed with a cylindrical shank portion only slightly less diameter than said shoulder portion disposed in said plate hole, integrally formed with a tubular tip portion extending beyond said support plate and adapted to be curled over to secure said friction pad to said support plate, wherein said rivet head portion, shoulder portion, shank portion, and tip portion are defined by a hollow member of substantially uniform wall thickness.

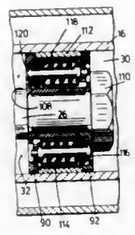
4,823,922

HEAVY DUTY VEHICULAR SHOCK ABSORBER

Joseph Ergun, Itasca, Ill., assignor to Maremont Corporation, Carol Stream, Ill.

Filed Jul. 2, 1987, Ser. No. 69,304
Int. Cl.[4] F16F *9/34, 9/36;* F16K *17/26*
U.S. Cl. 188—322.15 **3 Claims**





1. A vehicular shock absorber including a hydraulic fluid comprising, in combination:

an inner cylinder having a first inner open end and a second inner open end;

an intermediate cylinder having an intermediate open end and an intermediate closed end, said intermediate cylinder being adapted to receive said inner cylinder;

an outer cylinder having an outer open end and an outer closed end, said outer cylinder being adapted to receive said intermediate open end of said intermediate cylinder;

a cylinder head assembly secured to said first inner open end and said intermediate open end, said cylinder head assembly defining a piston rod passageway and including a rod scraper assembly;

a compression head assembly secured to said second inner open end; and

a piston including a piston assembly adapted to slide within said inner cylinder and a piston rod secured to said piston assembly and said outer closed end, said piston rod passing through said piston rod passageway;

said inner cylinder, intermediate cylinder, cylinder head assembly, compression head assembly, and piston assembly cooperating to define a compression chamber, a recoil chamber and a reservoir;

said piston assembly including two identical piston body halves, abutted and secured to said piston rod in mirror image so as to define a series of identical valve openings, and a series of identically dimensionally configured valve assemblies positioned within said valve openings, a first series of said valve assemblies passing said hydraulic fluid under pressure from said recoil chamber to said compression chamber, a second series of valve assemblies passing said hydraulic fluid under pressure from said compression chamber to said recoil chamber, each of said two identical piston body halves including an alignment opening;

said rod scraper assembly engaging said piston rod to remove debris therefrom;

said piston assembly further including a pin adapted to engage said alignment openings so as to facilitate assembly of said two identical piston body halves;

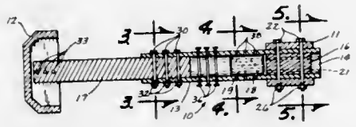
said compression head assembly including two-way valve means for passing said hydraulic fluid between said compression chamber to said reservoir.

4,823,923

ENERGY DAMPENING APPARATUS

James E. Moyer, 403 Marquis St., Staunton, Va. 24401

Filed Sep. 6, 1988, Ser. No. 240,265
Int. Cl.[4] F16F *7/12;* B60R *19/34, 19/26*
U.S. Cl. 188—376 **3 Claims**



1. An energy dampening apparatus for attachment to a frame having at least one hole extending therethrough, said energy dampening apparatus comprising:

an elongated cylinder having a longitudinal axis, said cylinder having a constant internal configuration along a substantial length thereof;

a first hole extending through one end of said cylinder, a second hole extending through the other end of said cylinder and a third hole extending through said cylinder between the first and second holes therein, said first, second and third holes extending substantially transversely to the longitudinal axis of the cylinder;

a first piston having an outer configuration substantially matching the internal configuration of said cylinder and received in said one end of the cylinder;

at least one hole extending through said first piston transverse to the longitudinal axis of said cylinder;

mounting bolt means extending through the hole in said first piston, through the first hole in the cylinder and through a hole in said frame for holding the cylinder in a predetermined position and tending to prevent said first piston cylinder from sliding inside of said cylinder;

a second piston having a longitudinal axis the same as the longitudinal axis of the first cylinder, said second piston having an outer substantially constant configuration substantially matching the internal configuration of said cylinder, at least one hole extending through said second piston substantially transverse to the longitudinal axis of said second piston;

first shear bolt means extending through the second hole in the cylinder and through the hole in said second piston for being broken when adequate forces impact said second piston;

second shear pin means extending through said third hole in said cylinder for resisting the force of sliding movement of said second piston within said cylinder;

a liquid gel;

packet means for enclosing said gel within said cylinder between said first and second position; and

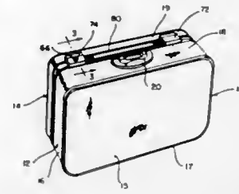
port means in said cylinder adjacent to said packet means for restrictively permitting said gel to be forced ont therethrough when said second piston is forced into said packet means and toward said first piston.

4,823,924

APPARATUS TO REINFORCE THE FRAME OF LUGGAGE

John W. Goodin, Mission Viejo, Calif., assignor to Skyway Luggage Company, Seattle, Wash.

Filed Nov. 23, 1987, Ser. No. 123,899
Int. Cl.[4] A45C *13/04, 13/10, 13/36*
U.S. Cl. 190—119 **14 Claims**



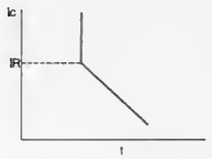
1. A carrying case having first and second case halves hinged together and each case half having a lengthwise edge, top, bottom, side and end walls, the top walls interfitting when the case is closed and having spaced latch mechanisms and a carrying handle, a support frame encircling the first case half, said support frame including means on one side for securing the support frame to one lengthwise edge of the top wall of a first case half, and a strengthening doubler channel fitted into the top of the support frame, said doubler channel having a substantial vertical cross section extending upwardly above the support frame for providing beam strength in the center of the top of the case.

4,823,925

CONTROL SYSTEM FOR A CLUTCH FOR A VEHICLE

Hiroya Ohkumo, Koganei, and Ryuzo Sakakiyama, Tokyo, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1987, Ser. No. 40,402
Claims priority, application Japan, Apr. 24, 1986, 61-096464
Int. Cl.[4] B60K *41/02;* F16D *37/02*
U.S. Cl. 192—0.076 **11 Claims**



1. In control system for controlling and electromagnetic clutch for a motor vehicle having an engine with a throttle valve operatively connected to an accelerator pedal, a transmission operatively transmitting the power of the engine to wheel through a power transmitting path, sensing means for sensing operating conditions of the engine and transmission and for producing condition signals dependent on the operating conditions, start mode providing means for providing a start mode and for producing a start clutch current at depression of the accelerator pedal, drag mode providing means responsive to release of the accelerator pedal for providing a drag mode and for producing a drag clutch current to produce a drag troque on the electromagnetic clutch, and mode deciding means for deciding one of the modes responsive to the condition signals, the improvement in the control system comprising;

transient state deciding means for deciding a transient state responsive to an output signal of the more deciding means at the release of the accelerator pedal for producing a transient signal,

clutch current detecting means responsive to an output signal of the start mode providing means for detecting clutch current just before the release of the accelerator pedal,

clutch current control means responsive to an output signal of the clutch current detecting means for quickly reducing the clutch current to a first predetermined value and thereafter gradually reducing the clutch current to a second predetermined value lower than the first predetermined value to disengage the clutch, and

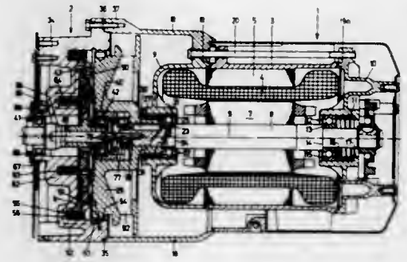
engine speed control means gradually reducing the speed of the engine upon the release of the accelerator pedal, so as to prevent oscillation of the power transmitting path.

4,823,926

ELECTRIC MOTOR REGULATING AND CONTROL DRIVE HAVING A CLUTCH-BRAKE UNIT

Hilmar Wittler, Karlsruhe; Adolf Martin, Rheinstetten, and Herbert Palloch, Schwetzingen/Baden, all of Fed. Rep. of Germany, assignors to Frankl & Kirchner GmbH & Co. KG, Schwetzingen/Baden, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,147
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1986, 36332064
Int. Cl.[4] F16D *67/06, 69/04*
U.S. Cl. 192—18 B **3 Claims**



1. An electric motor regulating and control drive, especially for industrial sewing machines, comprising:

a constantly drivable motor having a motor shaft;

a flywheel attached to said motor shaft and having a clutch surface;

an output shaft;

a clutch-brake unit including a clutch-brake disk which is affixed to and co-rotational with said input shaft and which has an armature ring with a brake facing and a clutch facing;

a nonrotating brake bearing member provided with a brake surface;

said clutch-brake disk being selectively displaceable into frictional engagement with said brake surface of said brake bearing member or with said clutch surface of said flywheel;

said frictional engagement causing said brake facing and said clutch facing to swell because of heating during operation,

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thereby thermally causing axial expansion of said facings requiring a gap between said clutch facing and said clutch surface and a gap between said brake facing and said brake surface;

a clutch winding and a brake winding, both for displacing said clutch-brake disk, with which said armature ring is associated;

at least said brake facing being mounted dampingly with respect to said armature ring, damping means being provided between said brake facing and saidi armature ring;

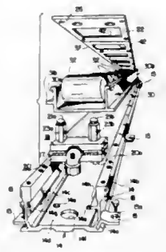
in said damping means, at least one spring element for mounting between said brake facing and said armature ring, means for supporting said brake facing against said spring element leaving a spring gap between said brake facing and said spring element for resiliently absorbing the impact of said brake facing on said brake surface, and means for supporting said spring element against said armature ring leaving a strike-through gap between said armature ring and said spring element so that in the event of abrupt braking said spring element can flex to such an extent as to contact damping pads between lands of said armature ring.

4,823,927

RETRACTABLE ROLLER SYSTEM FOR CARGO HANDLING

Richard H. Jensen, Torrance, Calif., assignor to Ancra Corporation, Hawthorne, Calif.

Filed Aug. 24, 1987, Ser. No. 89,358
Int. Cl.[4] B65G *13/00*
U.S. Cl. 193—35 SS **4 Claims**



1. A retractable roller system for handling cargo comprising:

a main channel member having a bottom wall and first and second opposing side walls, a ledge running along the inner surface of each of said side walls, the ledge of said second side wall being at a higher elevation than the ledge of said first side wall,

an inflatable bladder supported on the bottom wall of said channel member,

a roller tray member having a bottom wall and first and second opposing side walls, a ledge running along the outer surface of each of said roller tray member side walls, the ledge of said second side wall being at a higher elevation than the ledge of said first side wall, a plurality of rollers rotatably supported between the side walls of the roller tray member,

cover plate means,

means for removably attaching said cover plate means to the top edges of the side walls of said main channel member directly opposite the bottom wall of said main channel member,

said cover plate means having a plurality of apertures formed therein through which at least a portion of each of said rollers can pass; and

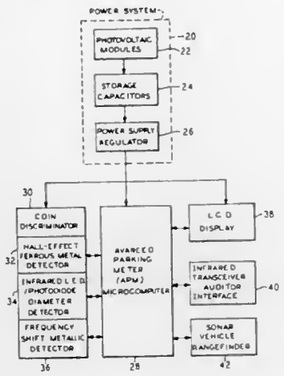
means for inflating said bladder such that said bladder drives said roller tray member upwardly to cause said rollers to protrude through the apertures in the cover plate means, the ledges of the first side walls of said main channel member and said roller tray member and the ledges of the second side walls of said main channel member and said roller tray member abutting against each other respectively, thereby arresting upward movement of said roller tray member at a predetermined position, said roller tray member being tiltably removable from said main channel member when the bladder is deflated and said cover plate means is removed.

4,823,928

ELECTRONIC PARKING METER SYSTEM

Gary W. Speas, Little Rock, Ak., assignor to POM Incorporated, Russellville, Ark.

Filed Apr. 16, 1987, Ser. No. 37,252
Int. Cl.[4] G07F *17/24*
U.S. Cl. 194—217 **55 Claims**



31. An electronic parking meter for receiving at least one type of payment element comprising;

means for providing power;

means for processing connecting to said means for providing power, said means for processing having at least a power-up mode, a standby mode and an operational mode;

means for receiving the payment element and generating a payment signal upon receipt thereof;

means for activating said means for processing in response to said payment signal, receipt of said payment signal causing said means for processing change from said standby mode to said operational mode;

means for identifying the payment element and providing an identification signal to said means for processing indicative of the payment element;

means for oscillating providing an oscillator output signal having a predetermined frequency, said oscillator output signal frequency divided by means for dividing to supply a clock signal to said means for processing, said means for dividing being deactivated by said means for activating when said means for processing is in said standby mode and activated by said means for activating when said means for processing is in said operational mode;

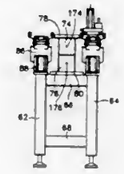
means for displaying information connected to said means for processing.

4,823,929

MULTI-STATION ASSEMBLY MACHINE

Marc A. Fleming, Cardiff, and LaMonte D. Porter, San Marcos, both of Calif., assignors to Hunter Industries, San Marcos, Calif.

Filed Feb. 1, 1988, Ser. No. 150,987
Int. Cl.[4] B65G *47/22*
U.S. Cl. 198—345 **20 Claims**



1. A modular assembly line unit for a system for carrying out multiple manufacturing and/or assembly operations, comprising:

an elongated support structure comprising a plurality of vertically extending legs, a plurality of elongated horizontally extending tubular combination support and manifold members supported on said legs and defining means for providing at least two sources of pressurized fluid, and a plurality of horizontally extending mounting rails mounted on said tubular support members;

conveyor means extending along opposite sides of said support structure for transporting articles of manufacture therealong;

work piece carrying means releasably carried on said conveyor means; and

means for establishing a plurality of work stations along said support structure, including first means for selecting a work piece from said conveyor means, second means for positioning said work piece for enabling an operation to be performed on said work piece; and

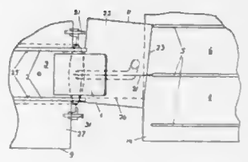
means for transferring a pressurized fluid between the manifold members and at least one workstation to operate the workstation.

4,823,930

APPARATUS FOR REDISTRIBUTING FLAT ARTICLES

Martin Löw, Gächlingen, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Dec. 10, 1987, Ser. No. 131,092
Claims priority, application Switzerland, Dec. 23, 1986, 5192/86
Int. Cl.[4] B65G *47/68*
U.S. Cl. 198—437 **5 Claims**



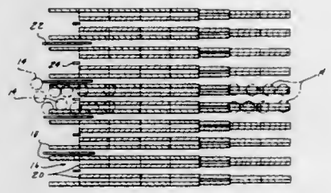
1. In a conveyor apparatus including first guide means defining a plurality of inlet lanes in which inlet columns of flat articles are forwarded in a direction of advance determined by said first guide means; second guide means defining a plurality of outlet lanes in which outlet columns of the flat articles are advanced; said outlet lanes being situated downstream of said inlet lanes as viewed in said direction of advance and being different in number from that of said inlet lanes; and a plurality of routing gates each arranged at a discharge end of a separate said inlet lane; each said routing gate being pivotally supported and arranged to be pivoted into one of two end positions for redistributing the articles from the inlet lanes into the outlet lanes and actuating means for moving said routing gates from the one into the other of said end positions; the improvement wherein said actuating means comprises separate actuating units operatively connected to separate said routing gates for independently operating each said routing gate; each said actuating unit comprising sensor means arranged at a respective said inlet lane for emitting a signal upon passage of an article on the respective inlet lane and a setting motor connected to a respective said routing gate and said sensor means for operating the respective routing gate in response to said signal; further wherein each said routing gate has an upper face defining a planar article supporting surface, an upstream end oriented towards said first guide means, a downstream end oriented towards said second guide means and a pivotal axis lying in a vertical plane extending parallel to said direction of advance; said pivotal axis intersecting the plane of said upper face at an acute angle in a zone of said downstream end of said routing gate.

4,823,931

MAGNETIC CAN LANER

Keith J. Rhodes, Pontiac, and Scott D. Voorheis, Drayton Plains, both of Mich., assignors to Magnetic Products, Inc., Walled Lake, Mich.

Filed Jan. 7, 1988, Ser. No. 141,551
Int. Cl.[4] B65G *47/12*
U.S. Cl. 198—445 **16 Claims**



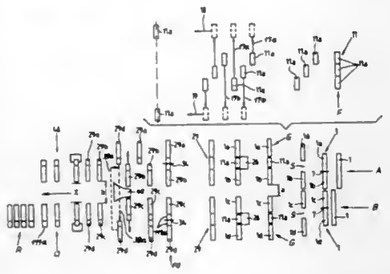
1. A magnetic article laner for use with a conveyor having a conveying surface carrying a plurality of magnetic articles randomly distributed at transverse positions on said conveying surface and moving along a path of travel comprising:

magnetic means, disposed in a plane parallel to said path of travel and vertically spaced from said conveying surface, for aligning said plurality of magnetic articles into lanes with preselected linear paths of travel, each lane having first and second magnetic poles of opposite polarity disposed respectively adjacent first and second transversely spaced lane boundaries, wherein adjacent magnetic lanes have adjacent magnetic poles of identical polarity disposed adjacent a common lane boundary each of said magnetic lanes further having a magnetic field of diminishing strength downstream from divider means; and

said divider means, disposed adjacent said lane boundaries, for diverting said magnetic articles into aligned rows parallel to said path of travel in cooperation with said magnetic means.

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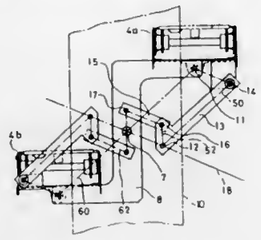
4,823,932
METHOD OF AND APPARATUS FOR MANIPULATING FILTER CIGARETTES
Werner Hinz, Lauenburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany
Filed Feb. 23, 1988, Ser. No. 159,206
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1987, 3706573
Int. Cl.[4] B65G 47/22
U.S. Cl. 198—450 17 Claims



1. A method of manipulating successive formations of four coaxial rod-shaped articles each, particularly filter cigarettes, wherein first and second outer articles are respectively adjacent first and second inner articles, comprising the steps of advancing successive formations in a predetermined direction substantially at right angles to the axles of the articles; staggering the first outer articles of successive formations relative to the inner articles of the respective formations in said predetermined direction; shifting the thus staggered first outer articles of successive formations axially into alignment with the second inner articles of the respective formations so that the first outer articles and the second inner articles of successive formations form a first row of aligned articles; staggering the second outer articles of successive formations in said predetermined direction relative to the inner articles of the respective formations; and shifting the thus staggered second outer articles of successive formations axially into alignment with the first inner articles of the respective formations so that the second outer articles and the first inner articles of successive formations form a second row of aligned articles, said arrows extending in said predetermined direction.

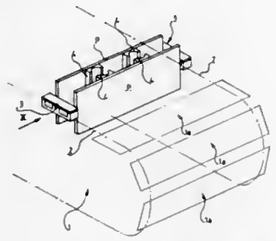
4,823,933
BALLET SHIFTER
Naoyuki Hashimoto, Moriguchi; Kazuichi Yamashita, Kyoto, and Manabu Yamane, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 11, 1986, Ser. No. 884,502
Claims priority, application Japan, Jul. 12, 1985, 60-154589
Int. Cl.[4] B65G 37/00
U.S. Cl. 198—465.3 2 Claims

1. A pallet shifter for transferring pallets from one conveyor having a discharge end to another conveyor having a receiving end, comprising:
driving lever means, having a midpoint and opposite ends, carried for reversible rotation about said midpoint on a horizontal shaft journalled in a fixed frame and driven by reversible driving means;
pallet carriers pivotally carried about horizontal axes on said opposite ends of said driving lever means for movement thereby between the discharge and receiving ends, respectively, of two pallet carrying conveyors moving in opposite directions so that when one pallet carrier is at the discharge end of one conveyor to receive a pallet therefrom, the other pallet carrier is at the receiving end of the other conveyor to discharge thereto a pallet previously received from the one conveyor; and
stabilizing lever arrangements for maintaining said pallet carriers substantially horizontal during their movements between the conveyor ends, each of said arrangements including a first stabilizer lever having one end thereof pivotally connected to said fixed frame and the other end thereof to the respective carrier so that the axis of said shaft, the axis of the pivotal connection of the respective carrier to an end of said driving lever means and the axes of the two pivotal connections of said first stabilizing lever and the structural parts of said frame, said driving lever means, said respective carrier and said first stabilizing



lever extending between said axes define a parallelogram linkage and a second stabilizing lever having one end thereof pivotally connected to said driving lever means and the other end thereof to said first stabilizing lever so that the axis of said shaft, the axes of the two pivotal connections of said second stabilizing lever and the axis of the pivotal connection of said first stabilizing lever to said frame and the structural parts of said frame, said driving lever means, said second stabilizing lever and said first stabilizing lever extending between said axes define a second parallelogram linkage arranged to be stable when said first parallelogram linkage becomes unstable when all the pivot axes thereof are arranged in a straight line.

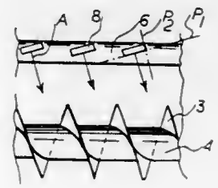
4,823,934
DEVICE FOR GRIPPING AND HOLDING BACK ARTICLES, SUCH AS FOR EXAMPLE CONTAINERS, ON A CONVEYOR, AND CONVEYOR EQUIPPED WITH THIS DEVICE
Didier Lemaire, Cherisy, and Jean-Marc Dronet, Putanges Pont Ecrepin, both of France, assignors to E. P. Remy & Cie., France
Filed Nov. 30, 1987, Ser. No. 126,579
Claims priority, application France, Dec. 1, 1986, 86 16752
Int. Cl.[4] B65G 37/00
U.S. Cl. 198—470.1 7 Claims



1. In a device for gripping and holding back articles or containers of any shape or dimension, comprising
a conveyor having two chains or belts,

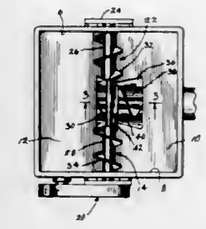
two mechanisms, each solid respectively with one of both chains or belts, and
two plates transversally arranged with respect to the chains or belts and mounted through ends thereof between said two mechanisms which permit adjusment of spacing of both plates between the chains or belts,
the improvement comprising
two casings, said mechanisms each enclosed in a respective casing which is fixed on a respective one of the chains or belts, and
said mechanisms each comprise two racks and a pinion, each said rack engaging said pinion and each said rack coupled to one end of a respective one of the plates,
whereby rotation of said pinion will drive said racks to either make the plates come closer together or move further apart.

4,823,935
APPARATUS FOR FEEDING MATERIAL TO AN ECCENTRIC-WORM PUMP
Fritz Seeberger, Bottrop, Fed. Rep. of Germany, assignor to Pumpen- und Maschinenbau Fritz Seeberger KG, Bottrop, Fed. Rep. of Germany
Filed May 6, 1988, Ser. No. 191,203
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715542
Int. Cl.[4] B65G 47/16
U.S. Cl. 198—533 2 Claims



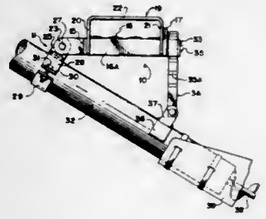
1. A feeder for an eccentric worm pump, comprising:
a housing formed with an upwardly open funnel of substantially rectangular plan configuration and with a feed trough closing the bottom of said funnel and opening axially into said worm pump;
a feed worm rotatable in said housing and including a worm shaft extending in said trough and at least one generally helical
rib formed on said worm shaft for displacing material introduced through said funnel into said worm pump; and
a bridge breaker in said funnel above said feed worm, said bridge breaker comprising:
a pair of mutually parallel breaker shafts parallel to said worm shaft and spaced above said worm shaft, and
a multiplicity of breaker paddles mounted on said breaker shafts and projecting radially therefrom, said breaker paddles of the respective breaker shafts being offset on one breaker shaft with respect to the other breaker shaft and having lengths such that the orbits of the outer ends of said paddles of the two breaker shafts intersect and closely approach the orbit of said rib, said paddles having inclinations to the axes of the respective breaker shafts such that material cast from said paddles is projected substantially tangential to the direction of the rib at locations where said orbits of said paddles approach the orbit of said rib and planes of at least said outer ends are substantially perpendicular to planes of said ribs at said locations.

4,823,936
DISCHARGE AUGER FOR A HOPPER OR THE LIKE
Nick J. Lesar, Palmyra, Wis., assignor to Weiler & Co., Whitewater, Wis.
Filed Oct. 15, 1987, Ser. No. 109,187
Int. Cl.[4] B65G 69/06
U.S. Cl. 198—550.1 5 Claims



1. An auger for discharging materials such as meat or the like from a hopper having a material holding cavity and a trough with a discharge opening located adjacent to a bottom portion of said cavity, said auger comprising:
a rotatable shaft located adjacent said discharge opening, said shaft having a first end portion and a second end portion and a central portion disposed therebetween, wherein the transverse dimension of said central portion of said shaft is reduced relative to the transverse dimension of said first and second end portions, each of said end portions including spiraled flighting for moving said material in opposite directions toward said discharge opening in response to rotation of said shaft to create a concentration of said material adjacent said discharge opening; and
disruptor means disposed on said central portion of said shaft and located adjacent said discharge opening for intermittently disrupting the concentration of material adjacent said discharge opening and for forcing said material into said discharge opening in responser to rotation of said shaft for discharging said material from said cavity through said discharge opening.

4,823,937
AUGER INCLUDING A STEP CONTRUCTION DESIGNED FOR ATTACHMENT THERETO
Rene Page, Box 55, Pickardville, Alberta, Canada T0G 1W0
Filed Apr. 12, 1988, Ser. No. 180,569
Int. Cl.[4] B65G 33/00
U.S. Cl. 198—657 9 Claims



1. An auger comprising a circular cylindrical auger tube inclined from a lower end to an upper end thereof, transport means extending along the tube on the interior of the tube for transporting material along the tube from an exposed portion at the lower end of the tube to said upper end, a hopper on the lower end of the tube for receiving material to be transported and confining it for engagement by said exposed portion, and a

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step mounted on top of the tube and defining a substantially horizontal surface arranged to receive the feet of a user and extending at a height above the hopper, the step comprising a step member having a substantially horizontal surface on which feet of a suer can stand, a clamp member shaped to surround and clamp upon a circular cylindrical boy, a pivot coupling attached to said step member and to said clamp member such that the step member extends outwardly away one side portion of the clamp member and is pivotal relative thereto, and a support member extending downwardly from said step member at a position spaced from the clamp member and including means at a lower end thereof arranged to engage and rest upon a portion of the circular body spaced from the clamp member and means for adjusting the distance between said step member and said lower end of said support member.

4,823,938

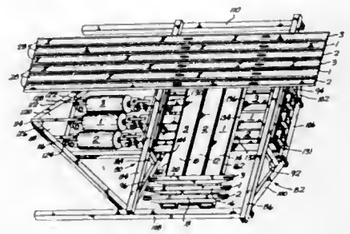
IMPROVED DRIVE SYSTEM FOR A RECIPROCATING FLOOR CONVEYOR

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Division of Ser. No. 346,865, Feb. 2, 1982, Pat. No. 4,492,303. This application Mar. 26, 1984, Ser. No. 593,696

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—750 **7 Claims**



1. A reciprocating floor conveyor, comprising:

at least one group of at least three elongated floor members mounted adjacent each other for independent longitudinal reciprocation;

a plurality of transverse drive beams, one for each floor member within a group, with like floor members of each group being connected to the same transverse drive beam;

drive means for said floor members comprising a plurality of reversible linear actuators, one for each transverse drive beam;

a plurality of elongated drive rods, one for each actuator, each said drive rod being connected at one end to its actuator, and extending therefrom in the direction of floor member reciprocation, and being also connected to a said transverse drive beam;

frame means including a first transverse frame member located rearwardly of said transverse drive beams, below said floor members, and a second transverse frame member located forwardly of said transverse drive beams, below said floor members; and

the improvement comprising:

each drive rod being a drive tube formed form a length of relatively large cross section metal tubing; and

guide bearing means for the drive tubes comprising a pair of parallel, laterally spaced apart, longitudinal side beams, positioned below the transverse frame members, having first and second ends, and at their ends being connected to the transverse frame members, said side beams being positioned immediately outwardly adjacent the drive tubes, and said side beams providing bracing between the two transverse frame members, longitudinally of the conveyor;

a first cross member below the first ends of said longitudinal side beams, connected at its ends to the side beams;

a second cross member below the second ends of said longitudinal side beams, connected at its ends to the side beams;

spacer members located horizontally between adjacent drive tubes and vertically between the transverse frame members and the cross members, said spacers being connected at their tops to the transverse frame members and at their bottoms to the cross members;

said longitudinal side beams, said transverse frame members and said cross members defining drive tube receiving guideways extending in the direction of floor member reciprocation, in which guideways said drive tubes are received; and

plastic bearing material in said guideways, contacting said drive tubes, to provide slide bearing surfaces in contact with said drive tubes.

4,823,939

CURVED PATH CHAIN CONVEYOR

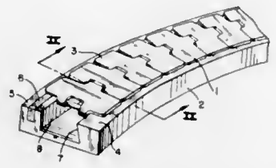
Gerhard P. Langhans, Betzdorf; Jürgen Fett, Atzelgift, and Karl G. Oelschläger, Hagen, all of Fed. Rep. of Germany, assignors to Rexnord Kette GmbH & Co KG, Betzdorf, Fed. Rep. of Germany

Continuation of Ser. No. 853,456, Apr. 18, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 212,064

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 8530825[U]

Int. Cl.[4] B65G *23/18*

U.S. Cl. 198—805 **2 Claims**



1. A curved path chain conveyor, comprising an articulated chain-like conveying band, a guide track, the guide track defining two spaced-apart sliding surfaces, the conveying band slidably mounted on the sliding surfaces, the conveying band made of ferro-magnetic material and the guide track made of plastics material, at least one of the sliding surfaces defining a longitudinally extending groove, the groove having an opening contiguous with the sliding surface, a flexible strip of plastics material, a permanent magnet in the form of magnetic powder being embedded in the plastics material of the flexible strip, the flexible strip being received in the groove.

4,823,940

FLAT ARTICLE CONVEYOR

Richard Cretser, Willseville, N.Y., assignor to Schuyler Dynamics, Trumansburg, N.Y.

Filed Jan. 15, 1988, Ser. No. 144,091

Int. Cl.[4] B65G *15/10*

U.S. Cl. 198—817 **18 Claims**

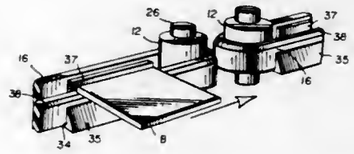
1. A conveyor for transport of articles having opposite side edges, comprising:

a flexible endless conveyor belt disposed along one side of the conveyor and spaced laterally from support means on the opposite side of the conveyor, said belt extending generally parallel to the direction of travel along the conveyor;

a pair of rollers mounted adjacent opposite ends of the conveyor for rotation about spaced, generally vertical, axes, said belt extending about said rollers and having, in cross-section, a depth dimension greater than its width dimension for supporting articles along its upper surface thereby

to maximize access to the under surface of the articles carried by the conveyor;

a guide surface for said belt, said guide surface defining an elongated groove for receiving said belt with the upper most portion of said guide surface along the outside face of said conveyor belt being lower than the upper surface



of said belt, a portion of said guide surface underlying said belt, and means for mounting said belt with respect to said rollers for biasing said belt for movement about said rollers in a generally vertically downward direction maintaining said belt in engagement with said underlying portion of said guide surface.

4,823,941

HIGH SPEED TUBULAR BELT CONVEYOR AND SYSTEM AND METHOD FOR MAKING

Alex Mindich, 8339 N. Christiana, Skokie, Ill. 60076

Filed Nov. 20, 1985, Ser. No. 799,928

Int. Cl.[4] B65G *15/08*

U.S. Cl. 198—819 **13 Claims**



1. A high speed transport system for pourable material, comprising:

an endless tubular conveyor belt having opposite longitudinal edges and being prestressed along the transverse width thereof to provide a normally closed tube configuration with the edges normally under compressive force against one another;

a distributed drive and support system comprising drive roller means mounted for engaging the tubular belt at spaced points along the length thereof for moving the belt along its length between selected load and unload positions, the endless belt comprising a load branch in that portion moving from the load position to the unload position;

a first, load pulley and a second, unload pulley, each said pulley supporting and opening the normally closed belt at the respective load or unload position; and

a loader for loading material onto the moving conveyor belt at a rate and velocity conformed to the capacity and velocity of the belt and comprising: vertical frame means; an upper bunker mounted to the frame for gravity dispensing, the bunker having a dispensing opening of area selected for dispensing the material at a flow rate conformed to the capacity of the moving conveyor belt, and being located at a height above the conveyor for loading the material onto the conveyor at a speed approximating that of the belt; funnel means mounted between the bunker and the conveyor for directing the material flow through the load opening into the conveyor along a direction substantially corresponding to the direction of the conveyor movement; and means for varying the vertical positioning of the funnel means to conform the cross-section of the material flow to that of the conveyor.

4,823,942

ELECTRICALLY CONDUCTIVE DOCUMENT TRANSPORT BELT

Billy P. Martin, and Larry D. Goettach, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 457,552, Jan. 13, 1983, abandoned. This application Aug. 21, 1987, Ser. No. 88,175

Int. Cl.[4] B65G *15/34*

U.S. Cl. 198—847 **7 Claims**



1. A static conductive document transport belt having means for dissipating static electricity comprising: an outer layer of ethylene propylene rubber or ethylene propylene diene rubber, said outer layer containing light reflective pigments and an electrically conductive, high tensile strength inner layer of ethylene propylene rubber or ethylene propylene diene rubber, said inner layer containing about 30 to about 120 parts by weight per 100 parts by weight rubber of conductive carbon black having a specific surface area (N_2SA) of about 254 to about 125 m^2/g incorporated therethrough, exhibiting resistivity of less than 10^6 ohms-centimeter and having a minimum tensile strength of 12.4 MPa as determined according to ASTM D412.

4,823,943

EYEGLASSES CASE OR CONTACT LENS CASE COVER

Haehie Chang, Washington, D.C., assignor to Non Nu, Inc., Alexandria, Va.

Filed Nov. 9, 1987, Ser. No. 118,044

Int. Cl.[4] B65D *85/38*

U.S. Cl. 206—5 **4 Claims**



1. An eyeglasses case or contact lens case cover comprising:

(a) a pouch sized and shaped to receive a pair of eyeglasses or a contact lens case for storage;

(b) a closure hingedly attached to said pouch and sized, shaped, and positioned so that it can be pivoted away from said pouch to facilitate the insertion or removal of a pair of eyeglasses or a contact lens case from said pouch and pivoted into contact with said pouch to protect a pair of eyeglasses or a contact lens case contained therewithin; and

(c) at least one magnetic fastener comprising a first member attached to the inside of said pouch and a second member attached to the inside of said closure in position to releasably engage said first member when said closure is pivoted into close proximity to said pouch, wherein:

(d) said pouch is made from two pieces sewn together;

(e) said closure is an extension of one of said two pieces;

(f) said one of said two pieces comprises:

(i) an outer layer made of cloth;

(ii) an intermediate stiffening layer;

(iii) an intermediate padding layer; and

(iv) an inner layer made of cloth; and

(g) said intermediate stiffening layer is not contained in said closure.

4,823,944

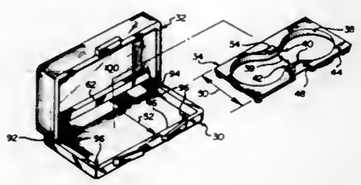
LENS CASE

Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.

Filed Oct. 10, 1986, Ser. No. 918,097

Int. Cl.[4] A45C *11/04*

U.S. Cl. 206—5.1 **16 Claims**



1. A carrying case for contact lens case having a predetermined external peripheral configuration, said carrying case comprising: a base member defining a predetermined peripheral configuration and having a predetermined depth; a cover member defining a predetermined peripheral configuration similar to that of the base member; hinge means joining said cover member to said base member generally along respective facing edges thereof so as to define an open condition and a closed condition of the carrying case, said similarly configured peripheries being substantially abutting and aligned in the closed condition; and an insert member mounted within said base member; said insert member comprising a frame-like member having a flat surface raised above a bottom surface of said base member and a through opening in said flat surface for forming a recess in said base member, and said frame having an internal peripheral surface surrounding said opening of complementary internal peripheral configuration with said predetermined external peripheral configuration of said lens case for surroundingly engaging and receiving said contact lens case within the recess formed by the frame member in the base, and latching means on said insert member for engaging said contact lens case for releasably holding the same received in said recess.

4,823,945

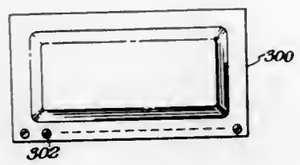
PROTECTIVE CUSHIONING

Herbert B. Adelman, Hockessin, Del., assignor to The Crowell Corporation, Newport, Del.

Continuation-in-part of Ser. No. 665,383, Oct. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 589,699, Mar. 15, 1984, Pat. No. 4,601,157, and a continuation-in-part of Ser. No. 477,241, Mar. 21, 1983, Pat. No. 4,584,225, which is a continuation-in-part of Ser. No. 348,782, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 246,372, Mar. 23, 1981, Pat. No. 4,321,297. This application Jun. 17, 1987, Ser. No. 63,573

Int. Cl.[4] B65D *73/02, 81/14, 81/26, 85/30*

U.S. Cl. 206—204 **3 Claims**



1. An article sensitive to mechanical shock and electric fields, the article being packaged in a laminate of metallized polyethylene terephthalate film about one mil (25.4 microns) thick, laminated to a layer of microcellular cushioning plastic foam between about 1/32 inch (0.796 mm) and about ⅛ inch (3.18 mm) thick, the foam carrying an antistat agent.

4,823,946

TWO-COMPARTMENT CONTAINER

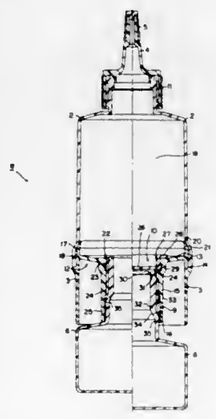
Albert Stoeffler; Diethelf Mehl, both of Duesseldorf, and Hans Schneider, Schwalmtal, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,469

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722371

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—221 **10 Claims**



1. An assembly of bottles which are designed to be individually filled and stored with different fluids which are intended to be mixed at the time of use, said bottles being connectable to each other in a first engagement position, in which their compartments remain isolated, and in a second communication position, in which their compartments are open to each other, comprising a first bottle having a housing forming a first compartment, comprising a top wall having a dispensing cover, a cylindrical side wall terminating in a cylindrical flange element surrounding an open bottom, and an attachable floor wall comprising a cylindrical skirt element having a cylindrical outer wall the top of which is attachable to the base flange of the side wall to form an annular base wall having a central opening therein and having an elongate cylindrical nozzle depending from said opening and carrying a screw thread on the interior surface thereof, a stopper within the compartment of said first bottle and sealingly engaged within said central opening, engagement means on the base flange of the side wall of the container and on the cylindrical outer wall of the skirt element for enabling the skirt element to be pushed up into sealing engagement with the side wall of the first container to form the floor thereof, and engagement means on the inside of the cylindrical nozzle, adjacent said opening, and on the outside of the stopper for providing sealing engagement of said stopper within said opening, and a second bottle having a housing forming a second compartment, said bottle having an elongate cylindrical neck having an annular top rim, and carrying a screw thread on the exterior thereof, which screw thread is engagable by a sealing cap to seal said second container and is also engagable, when said cap is removed, with the interior screw thread of the nozzle of the first container, whereby the neck of the second container can be screwed into said nozzle to a first engagement position, in which the bottles are connected to each other but the stopper remains engaged to isolate the compartments of said containers, and to a second communication position, in which the rim of the neck of the second container engages and forces the stopper out of sealing engagement with the opening to permit mixing of fluids which may be present in the compartments of the two containers.

4,823,947

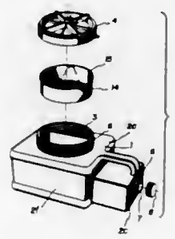
DEVICE FOR PACKAGING, STORING AND DISPOSING OF OIL AND OTHER PRODUCTS

Walter P. Maynard, Jr., 1215 Hightower Trail, Atlanta, Ga. 30338

Continuation of Ser. No. 892,348, Aug. 1, 1986, abandoned. This application Nov. 20, 1987, Ser. No. 124,345

Int. Cl.[4] B65D *81/36*

U.S. Cl. 206—223 **16 Claims**



1. A device for packaging, collecting, storing, and disposing of oil and other products comprising:

(a) a container having a collection opening of comparatively large size for collecting products without the use of funneling means, the opening being of such size as is sufficient to allow entry of product into said container without contact with the exposed surfaces of said device, said collection opening formed by means of a neck upwardly projecting from said container;

(b) a collection basket having a body portion capable of extending through said collection opening into said container;

(c) means for selectively maintaining said body portion within said collection opening;

(d) a sealing cap capable of sealingly engaging with said neck;

(e) a pour opening for pouring products from said device; and

(f) a handle positioned along the longitudinal axis of said container between said collection opening and said pour opening.

4,823,948

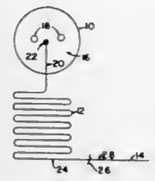
PREASSEMBLED SEW-READY BUTTON

George D. Bonar, 333 Bowery, New York, N.Y. 10003

Filed Sep. 28, 1987, Ser. No. 101,804

Int. Cl.[4] B65D *69/00*

U.S. Cl. 206—227 **13 Claims**



1. The combination of a button, a length of thread having a first end fixedly connected to one surface of said button, and a needle fixedly connected to the second end of said thread remote from said button, wherein said first end of thread is fixedly connected to one surface of said button by means of glue or epoxy cement or epoxy paint or other suitable bonding material.

4,823,949

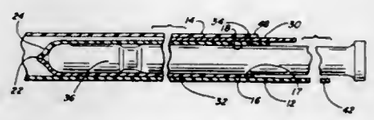
SHEATH FOR PROBE WITH IMPROVED SEAL ARRANGEMENT

Harry Bala, 2024 Williamsburg Dr., Streamwood, Ill. 60107

Continuation of Ser. No. 41,935, Apr. 24, 1987, abandoned. This application Jan. 10, 1988, Ser. No. 205,316

Int. Cl.[4] B65D *85/38*

U.S. Cl. 206—306 **6 Claims**



1. A packaged sheath for a probe, which comprises:

a backing web;

a flattened probe sheath having an open end and a closed end, said sheath defining a pair of connected, flat sides, a portion of one flat side of said sheath being sealed adjacent its open end to said backing web;

a tab member sealed in an area to the other flat side of said sheath adjacent its open end; and

an upper web peripherally sealed to said backing web at side areas, said upper and backing webs being separable by manual tearing apart for access to said probe sheath, said probe sheath being permanently sealed only adjacent its open end to the backing web and said backing web defining a transverse line of tearing weakness positioned more remotely from said open end than the sealed area of said sheath and backing web, whereby said tab member, said probe sheath, and the end portion of the backing web may be separated from the remainder of the backing web by breaking said transverse line, said tab member being separate from said backing and upper webs, said tab member

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and end portion of the backing web serving as a handle for the probe sheath.

5. A packaged sheath for a probe, which comprises:

a backing web;

a flattened probe sheath having an open end and a closed end, said sheath defining a pair of connected, flat sides, a portion of one flat side of said sheath being permanently sealed only adjacent said open end to said backing web;

a tab member sealed in an area to the other flat side of said sheath adjacent its open end; and

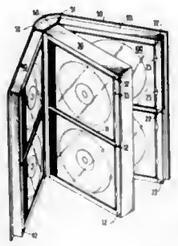
an upper web peripherally sealed to said backing web at side areas, at least a portion of said probe sheath which is more remote from said open end than said portion of one flat side being releasably adhered to said backing web, said upper web being substantially free of adhesion to said probe sheath, said backing web defining a transverse line of tearing weakness positioned more remotely from said open end than the sealed area of said sheath to the backing web, whereby said tab member, said probe sheath, and an end portion of the backing web may be separated from the remainder of the backing web by breaking said transverse line, said tab member being separate from said backing and upper webs, said tab member and end portion of the backing web serving as a handle for the probe sheath, said upper and backing webs being separable by manual tearing apart for access to the probe sheath.

4,823,950

STORAGE ARRANGEMENT FOR OPTICAL DISCS AND THEIR CONTAINERS

Paul F. Roze, 8 Rue de la Lande Seche, Cesson - Sevigne, France 35-510

Filed Mar. 15, 1988, Ser. No. 168,212
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—311 5 Claims



1. A storage container for optical discs comprising:

at least one rectangular frame, said rectangular frame having interior and exterior dimensions with an interior length greater than twice a width of a conventional optical disc container, an interior width greater than a length of a conventional optical disc container and a depth greater than a depth of a conventional optical disc container.

a pair of rigid, generally planar members, each of a length and width greater than exterior length and width of said rectangular frame, frame means associated with each of said planar members providing a pair of optical disc container compartments for each of said planar members,

hinge means joining said rigid, generally planar members into a book like assembly providing for rotational movement of said rigid, generally planar members relative to each other about a longitudinal axis of said hinge means,

at least one rigid optical disc container support, said support having a length and a width slightly less than inside dimensions of said rectangular frame so that said support can be inserted into said rectangular frame, and

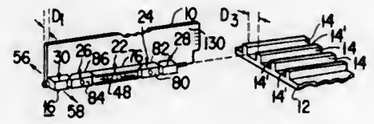
securing means for securing said rectangular frame to said book like assembly.

4,823,951

RETAINER FOR HOLDING A PRINTED CIRCUIT CARD BETWEEN SPACED SURFACES

Theodore S. Colomina, Monrovia, Calif., assignor to EG&G, Inc., Wellesley, Mass.

Continuation of Ser. No. 920,372, Oct. 20, 1986, abandoned.
This application Apr. 1, 1988, Ser. No. 180,714
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 9 Claims



1. A retainer for holding a printed circuit card between spaced surfaces comprising:

a rod;

a plurality of members slidably mounted end-to-end on said rod, at least one of said members having an internal longitudinal channel having a transverse dimension greater than the corresponding outside dimension of said rod to permit movement of said one member along a transverse path relative said rod, said one member and members adjacent said one member each having end portions engageable one another and shaped to force said one member to move in a first direction along said transverse path relative said adjacent members upon forcing of said adjacent members toward said one member;

first means for selectively forcing said adjacent members towards said one member; and

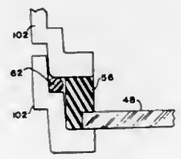
second means, attached to said one member, for applying a spring bias between said rod and said one member opposing movement of one member in said first direction.

4,823,952

MODULAR PACKAGING SYSTEM, PARTICULARLY FOR ELECTRONICS

William E. Fletcher, Nashua, N.H.; Charles M. Ault, Winchester, and Dennis O. Sawyer, Tyngsboro, both of Mass., assignors to Termiflex Corporation, Merrimack, N.H.

Filed Jul. 29, 1983, Ser. No. 518,365
Int. Cl.[4] B65D *83/48, 73/02, 21/02*
U.S. Cl. 206—328 14 Claims



1. A modular packaging system for electrical components comprising:

(A) a pair of nested substantially identical frame-like members;

(B) means for mounting at least one printed electrical circuit board to at least one of said frame-like members; and,

(C) a back cover nested with the rearmost one of said members,

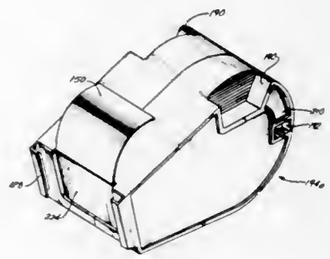
said frame-like members providing spaces peripheral flanges about the sides of a package.

4,823,953

TAPE CARTRIDGE FOR A LETTERING SYSTEM

J. Becher Anderson, Hermosa Beach, and Jacob de Gelder, Rancho Palos Verdes, both of Calif., assignors to Leteron Mfg. Co., Torrance, Calif.

Filed Aug. 12, 1986, Ser. No. 895,744
Int. Cl.[4] B65D *85/671*
U.S. Cl. 206—408 19 Claims



1. A cartridge for dispensing tape to be lettered, the cartridge comprising:

a cartridge frame for supporting and guiding a roll of tape including means for supporting the roll by contacting an interior surface thereof;

a tape guide;

means mounted on the frame for frictionally engaging the tape, said roll support means comprising a roll guide stand fixed on the frame for frictional engagement with a core of the roll for providing frictional resistance to rotation and slipping rotation of the roll upon application of a predetermined force to withdraw tape from the dispenser;

a head comprising a pad for frictionally engaging a strip of tape; and

a race adjacent the tape guide, said race and pad having longitudinal dimensions wherein the longitudinal dimension of the race is about 0.2 inches longer than the longitudinal dimension of the pad for movement of the pad longitudinally of the race.

19. A cartridge for dispensing tape to be lettered in a first direction out of the cartridge, the cartridge comprising:

a frame for supporting a roll of tape and for including means mounted on the frame for supporting the roll by contacting an interior surface thereof;

a tape guide;

means mounted on the frame for frictionally engaging the tape, said roll support means comprising a roll guide stand fixed on the frame for frictional engagement with a core of the roll to provide frictional resistance to rotation while permitting slipping rotation thereof upon the application of a predetermined force to withdraw the tape from the cartridge;

a head for frictionally engaging a strip of the tape; and

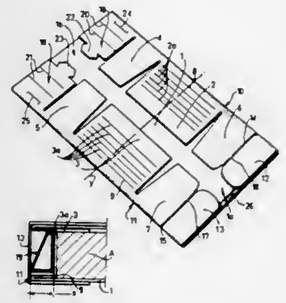
biasing means comprising a spring having first and second ends, the first end of the spring being mounted on the housing and the second end being attached to the head, wherein said head is spring biased toward the housing and engages the tape against the housing, within a race having a stop at least on its inner end and wherein further the head moves under th influence of the spring a short distance along the race upon withdrawal of the tape and thereafter returns to its rest position at the stop after the tape is cut from the roll thereby retracting the cut free end of tape a short distance within the housing.

4,823,954

PACKAGE PROVIDED WITH ADHESIVE FLAPS

Pierre A. Chevalier, 31, boulevard d'Auteuil, Boulogne 92100, France

Continuation of Ser. No. 406,764, Aug. 10, 1982, abandoned.
This application Oct. 13, 1987, Ser. No. 106,887
Claims priority, application France, Nov. 9, 1981, 81 17200
Int. Cl.[4] B65D *81/14*
U.S. Cl. 206—424 24 Claims



1. A wrapped package comprising:

an article and a packaging wrapper defined by a cardboard sheet,

said packaging wrapper having a plurality of portions, including a middle portion and first and second end portions extending from said middle portion and extending around the article so that said end portions overlap on one side of the article,

said packaging wrapper further having deflected tabs secured along lateral edges of one of said portions, said tabs extending from said one portion and being pressed against the article and toward said one portion by at least one of said end portions, a portion of said tabs lying between the article and said end portions,

flaps under tension extending from said first end portion to an outside surface of said middle portion, and

means for securing said flaps under tension to said middle portion.

3. A method of enclosing an article by using a packaging wrapper including a cardboard sheet of fixed length extending between first and second transverse edges of said cardboard sheet and having a middle portion, a first end portion extending between said first transverse edge and said middle portion, and a second end portion extending between said second transverse edge and said middle portion, tabs secured to side edges of said middle portion, said tabs each having a base deflecting line defined therein displaced from said side edges of said middle portion, said end portions being adapted to wrap around articles of different heights placed on said middle portion, said cardboard sheet further including flaps attached to opposite side edges of said first end portion adjacent to said first transverse edge, said flaps being of sufficient length to fold around to the outside surface of said middle portion when said end portions are wrapped around an article placed on said middle portion, and means for securing said flaps to the outside surface of said middle portion when said end portions are wrapped around an article placed on said middle portion, comprising:

deflecting each tab away from the middle portion along the base line deflecting line to expose an area of the middle portion at least equal to the area of the article;

placing the article on said middle portion;

pressing each tab back over the article;

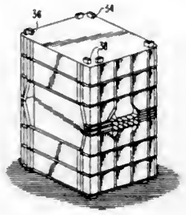
wrapping said end portions of the packaging wrapper successively over the article;

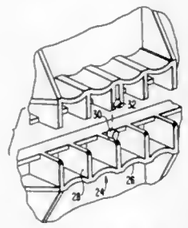
folding the flaps on said first end portion around the side

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edges of the middle portion to the outside surface of the middle portion; and
attaching the flaps under tension to the middle portion.

4,823,955
NESTING AND STACKING STORAGE CONTAINER
William P. Apps, Anaheim, Calif., assignor to Rehrig-Pacific Company, Inc., Los Angeles, Calif.
Filed Aug. 27, 1987, Ser. No. 89,992
Int. Cl.[4] B65D *21/02, 21/04*
U.S. Cl. 206—506 **24 Claims**

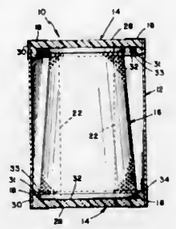


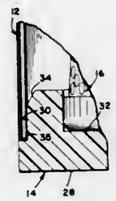


1. A nesting and stacking storage container comprising:
first and second spaced end walls having top edges and defining a rectangular opening therebetween;
a generally rectangular bottom joining said end walls;
handle means for gripping said storage container disposed on each of said end walls; and
securing means integrally formed with said end walls and located on said handle means for releasably securing one of said storage containers to another of said storage containers when top edges of one container end walls are disposed on top edges of another container end walls.

4,823,956
COMPOSITE CONTAINER AND ITS METHOD OF MANUFACTURE
John I. Belisle, Hampton, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.
Filed Aug. 13, 1986, Ser. No. 896,420
Int. Cl.[4] B65D *81/02, 85/30*
U.S. Cl. 206—523 **5 Claims**

1. A composite shipping container, which comprises:
an upright, tubular sidewall of predetermined polygonal cross-section having opposite open ends;
said sidewall being formed from a rectangular blank of corrugated fiberboard having inside and outside surfaces, opposite edges, opposite ends, and means for securing the ends together in abutting relationship;
the inside surface of said blank being longitudinally scored at predetermined spaced apart locations and folded thereat to define corners between adjacent flat portions of said sidewall, with the corrugations thereof oriented generally circumferentially for improved rip resistance at the ends of said sidewall;
a pair of foam end caps of similar polygonal cross-section, one seated in each end of said sidewall, to close the container and cushion a product therein against shock;
each end cap including a flat outer end surface flush with the associated end of said sidewall, a recessed inner end surface and a surrounding raised inner end surface, a surrounding outside surface with alternating corners and flat portions joining the outer and raised inner end surfaces at a chamfered edge to facilitate receipt in an end of said





sidewall, and a surrounding inside surface joining the recessed and raised inner end surfaces;
the inner surfaces of said end caps being adapted to receive and engage therebetween the product to be shipped; and
means for securing each end cap to said sidewall.

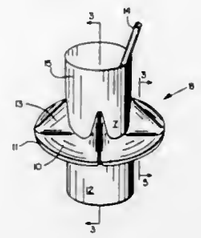
4,823,957
BRACKET TABLE COVER
Lewis Skeirik, 24 Central St., Georgetown, Mass. 01833
Filed Jan. 13, 1988, Ser. No. 143,338
Int. Cl.[4] B65D *1/34, 6/04*
U.S. Cl. 206—557 **10 Claims**





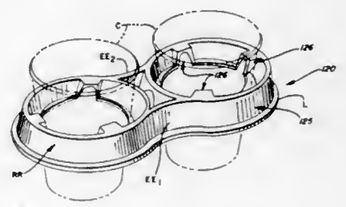
1. For use at a dental operating station, a bracket table cover comprising:
(a) a sheet including a base paper component impregnated with a water and organic solvent impervious component;
(b) said sheet being provided throughout its periphery with a ridge having downwardly depending outer edges;
(c) said sheet being no greater than three mils thick;
(d) said ridge being provided with a flap.
2. The bracket table cover of claim 1 wherein said impervious component is paraffin wax.

4,823,958
SERVING TRAY
Khalid Mahmud, 6601 Southcrest Dr., Edina, Minn. 55435
Filed Aug. 12, 1987, Ser. No. 84,619
Int. Cl.[4] B65D *1/34*
U.S. Cl. 206—561 **13 Claims**



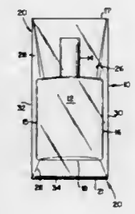
1. A food and beverage serving tray container comprising:
(a) an upright, upwardly open receptacle having side walls;
(b) a flange extending outwardly from the side walls of the receptacle and providing a generally horizontal upper surface for supporting food servings;
(c) a plurality of radially extending upward depressions in the bottom surface of the flange and a plurality of corresponding upward ridges arising from the upper surface of the flange and defining a plurality of angularly spaced ribs extending radially from the flange to the walls of the receptacle, the ribs providing mutual support between the flange and receptacle and defining, with the flange and receptacle, separate upwardly open food receiving compartments, the receptacle and flange being son configured and arranged as to nest with identical assemblies.

4,823,959
CARRIER FOR BEVERAGE CONTAINERS
Kenneth D. Bixler, Lake Forest, Ill., assignor to Packaging Corporation of America, Evanston, Ill.
Filed Feb. 11, 1988, Ser. No. 154,939
Int. Cl.[4] B65D *71/00*
U.S. Cl. 206—562 **13 Claims**



1. A device for manually carrying a plurality of beverage containers, the latter having downwardly tapered side walls, said device being of unitary construction and comprising a plurality of container-accommodating sections arranged in laterally spaced relation, each section including a continuous peripheral rib delimiting an opening for removably accommodating a portion of a container side wall, each rib being provided with an outer flange and an inner flange, said flanges having corresponding upper edges interconnected, said outer flange extending downwardly and outwardly from the interconnected upper edges and said inner flange extending downwardly and inwardly from said interconnected upper edges, said rib having a plurality of relatively spaced shoulders extending into the inner flange and forming same into a plurality of flange segments arranged in endwise circumferentially spaced relation, each shoulder including a top portion extending inwardly from the interconnected flange upper edges, and opposed side portions depending from said top portion and interconnecting said top portion with corresponding ends of adjacent flange segments, and a plurality of rib extensions, each extension interconnecting portions of the rib outer flanges of adjacent container-accommodating sections and coacting therewith to form a continuous peripheral rim encompassing the plurality of laterally spaced container-accommodating sections.

4,823,960
PACKAGE DEVICE AND SYSTEM
William Perlberg, Franklin Lakes, N.J., and Albert B. Skolnik, New York, N.Y., assignors to Hartz Mountain Corporation, Harrison, N.J.
Filed Apr. 7, 1988, Ser. No. 178,466
Int. Cl.[4] B65D *25/54*
U.S. Cl. 206—587 **18 Claims**



1. A package device for supporting and displaying a vessel, said packaging device comprising:
(a) a housing having (i) a first pair of two opposed, rigid, spaced-apart translucent side walls (ii) a second pair of two opposed, rigid, spaced-apart side walls juxtaposed to said first pair and (iii) opposed, rigid, spaced-apart top and bottom walls;
(b) a pair of spaced apart removable inserts formed of resilient translucent material arranged to be immobile and adjacent respective opposed walls of said housing, each of said inserts having a generally concave surface extending away from the housing wall to which it is adjacent, and mutually opposed inwardly opening recesses in their respective generally concave surfaces to receivably support a vessel within said housing, said inserts being opposing sides of a channel shaped member, said channel shaped member having a bottom member which is arranged to be adjacent and immobile with respect to the wall of the housing extending between the walls adjacent the spaced apart inserts.
15. A method of packaging a vessel comprising:
(a) providing a pair of spaced apart removable inserts formed of resilient translucent thermoplastic material, each of said inserts having a generally concave surface and having mutually opposed recesses in their respective generally concave surfaces;
(b) providing a housing formed of rigid thermoplastic material having (i) a first pair of two opposed, spaced-apart translucent side walls (ii) a second pair of two opposed spaced-apart side walls juxtaposed to said first pair and (iii) opposed spaced-apart top and bottom walls;
(c) arranging a vessel between the spaced apart resilient, translucent thermoplastic inserts outside of said housing so that the vessel is receivably supported in the mutually opposed recesses of the inserts;
(d) directing the pair of spaced apart resilient inserts with the vessel receivably supported thereby into the housing in a direction such that each of said inserts is adjacent a respective side wall of said second pair of side walls and resil-

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iently bears against said side wall to hold said vessel immobile in said housing.

18. A package device for supporting and displaying a vessel, said packaging device comprising:

a housing having a first pair of two opposed, rigid, spaced apart translucent side walls, a second pair of two opposed, rigid, spaced apart side walls juxtaposed to said first pair and opposed, rigid, spaced apart top and bottom walls;

a pair of spaced apart removable inserts formed of resilient translucent material arranged to be immobile and adjacent respective opposed walls of said housing, each of said inserts having a generally concave surface extending away from the housing wall to which it is adjacent, and mutually opposed inwardly opening recesses in their respective generally concave surfaces to receivably support a vessel within said housing, said housing being in the shape of a right parallelipiped and said spaced apart inserts being the opposite sides of a channel shaped member having a bottom member which is substantially coextensive with the bottom wall of the housing and is supportably contacted by the bottom wall of the housing.

4,823,961

RECLOSABLE PACKAGE

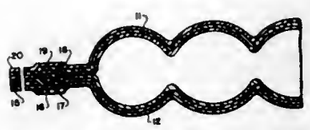
Ray H. Griesbach, Monona, and Gerald O. Hustad, McFarland, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Continuation of Ser. No. 841,916, Mar. 20, 1986, Pat. No. 4,782,951. This application Jul. 12, 1988, Ser. No. 218,388

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[4] B65D *75/26, 81/20*

U.S. Cl. 206—632 **10 Claims**



1. A reclosable hermetically sealed vacuum package comprising:

(a) two multi-layered oxygen barrier films having their inner layers in intimate face to face contact with each other forming a hermetic vacuum seal around a vacuum product cavity, each of said films comprising a plurality of layers, the inner layers of said films being of dissimilar composition and being capable of forming a hermetic vacuum peel seal when in intimate contact with each other;

(b) a food product in said vacuum product cavity;

(c) a portion of said hermetic vacuum seal on at least one side of the package being a hermetic vacuum peel seal formed between said inner layers; and

(d) reclosable, flexible, thermoplastic interlocking closure strips attached respectively to said two films peripherally to said hermetic vacuum peel seal, said closure strips comprising one or more interlocking ribs and grooves extending along said one side of said package, said closure strips being adapted to reclose said package after said hermetic vacuum peel seal has been opened; said hermetic vacuum peel seal being of sufficient opening force to withstand processing, handling and shipping and to maintain a vacuum, yet low enough to allow access to the product cavity and to ensure that the structural and functional integrity of the films, closure strips and remaining seals is maintained.

4,823,962

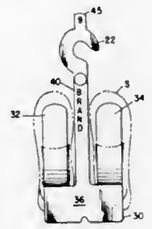
SHOE DISPLAY AND STORAGE HANGER

Juan C. Arias, P.O. Box 13364 Santurce Station, Santurce, P.R. 00908

Filed Oct. 2, 1987, Ser. No. 103,653

Int. Cl.[4] A47F *7/08*

U.S. Cl. 211—34 **8 Claims**



1. A display and storage hanger for shoes for mounting on substantially horizontally extending rods, comprising:

A. an elongated member having two ends and one of said ends including hook means for mounting on said rods so that the said elongated member and said hook means define a plane that is perpendicular to said rods when mounted thereon;

B. a U-shaped member rigidly mounted to the other end of said elongated member and said U-shaped member including two tongue members that extend upwardly parallel to said elongated member and terminating at a point substantially on the center of said elongated member so that said tongue members are inserted inside said shoes for their support and wherein said tongue members are in the same plane of said elongated member.

4,823,963

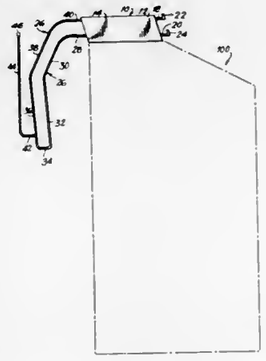
TRAY FOR ORGANIZING ORIGINALS IN A PHOTOCOPY MACHINE

Eugene A. Helmetsie, Spencer, N.Y., assignor to Ozalid Corp., Binghamton, N.Y.

Filed Mar. 11, 1988, Ser. No. 167,038

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—50 **4 Claims**



1. A rack for a photocopy machine comprising:

a first tray;

a second tray above and parallel to said first tray; and

hinged bracket means to hold said first and second trays to a top surface of the photocopy machine;

said first and second trays having a horizontal input portion,

a vertical storage portion, and a diagonal transition portion therebetween;

said first and second trays being adapted to hold wide-format originals for the photocopy machine.

4,823,964

HOLDER FOR PACKS OR PACKAGES

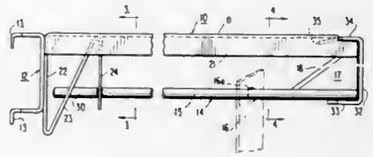
Nils-Arne Lundberg, Regementsvägen 31 C, S-852 38 Sundsvall, Sweden

Filed Sep. 22, 1987, Ser. No. 99,602

Claims priority, application Sweden, Sep. 25, 1986, 8604063

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—57.1 **5 Claims**



1. A holder for packages having a plastic film casing containing a hole for suspension of the package from the holder, comprising

(a) a cantilevered horizontal arm adapted for connection at one end with a fixed structure, said arm including at said one end a carrying assembly;

(b) a horizontal pin including connecting means at one end thereof for removable connection with the other end of said arm, the other end of said pin being fixed within said carrying assembly of said arm, said pin being arranged parallel to and below said arm in spaced relation therefrom; and

(c) a cutting assembly connected with only a partial extent of said pin adjacent said connecting means, said cutting assembly including a cutting edge extending upwardly toward and adjacent to said arm, whereby when said pin is disconnected from said arm, a plurality of packages are arranged on and suspended from said pin by passing said pin through said package holes, and when said pin is connected with said arm, the outermost package adjacent said pin one end is removed from the holder by pulling the package across said cutting edge to cut the package adjacent the package hole to the edge of the package.

4,823,965

CORD WOOD RACK AND CARRIER

Gordon Hughes, 1601 N. Rhodedendron, Apt. 527, Florence, Oreg. 97439

Filed Oct. 27, 1987, Ser. No. 113,001

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—60.1 **5 Claims**

1. A wood rack and carrier for the transport and securement of firewood comprising,

a carrier means for transporting firewood wherein said carrier means comprises a flexible band including a first and second terminal end and further including support rods secured at said first and second terminal ends,

handle elements securable to said rod elements for transport of said carrier means, and

said carrier means nestable within a rack means for supporting said firewood and carrier and preventing its repositioning when nested,

said rack means including a plurality of rectangular frame members pivotally secured together to pivot in a scissor-like manner,

said rack means including a plurality of reinforcement elements and support elements,

said reinforcement elements spanning and securing said rectangular frame members at respective lower terminal portions and said support elements spanning terminal ends



of said rectangular frame members remote from said lower terminal portions.

4,823,966

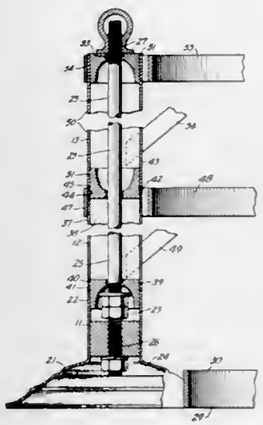
TIERED COMPOTE TRAY

Robert H. Haber, Woodcliff Lake, N.J., assignor to D. W. Haber & Son, Inc., Bronx, N.Y.

Filed Aug. 13, 1987, Ser. No. 84,826

Int. Cl.[4] A47F *3/14*

U.S. Cl. 211—128 **2 Claims**



1. An improved tiered tray construction comprising: a base element, an intermediate support element and an upper support element, said elements being in mutually pivotal stacked relationship, said base element including a generally horizontally oriented base member, a cylindrical socket member extending vertically therefrom, and a tray supporting ring extending laterally therefrom, said socket member having a vertically oriented rod extending therefrom; said intermediate support element having a vertically oriented tubular sleeve pivotally engaging said rod and supported by said base element and having a laterally extending tray-supporting ring thereon at least partially overlying said tray-supporting ring on said base support element; said upper support element including a vertical elongated sleeve pivotally engaged upon said rod, and supported by said intermediate support element at a lower end thereof, said sleeve mounting a laterally extending tray supporting ring at least partially overlying said tray supporting ring of said intermediate support element; and means engaging

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said rod at an upper end thereof, and maintaining intermediate and upper support elements in mutual pivotal association.

4,823,967

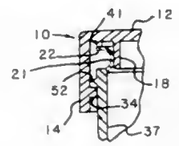
CLOSURE FOR CONTAINER AND METHOD FOR FORMING THE CLOSURE

Mortimer S. Thompson, Maumee, Ohio, assignor to Tri-Tech Systems International Inc., Maumee, Ohio

Continuation-in-part of Ser. No. 61,100, Jun. 10, 1987, abandoned. This application Jun. 17, 1987, Ser. No. 63,119

Int. Cl.⁴ B65D *41/06*

U.S. Cl. 215—222 **28 Claims**



1. A container-cap combination for containing a product comprising:

(a) a container comprising:

an opening for receiving or discharging the product,

a neck surrounding the opening having engaging means thereon and including a lip,

an annular flexible member integral with the lip adapted to be compressed in response to an axial compressive load applied to the lip,

(b) a cap comprising;

a top wall,

a depending skirt with engaging means thereon, and

a depending wall spaced from the skirt and extending from the top wall to a free end which engages the annular flexible member of the container and is adapted to constantly urge the engaging means on the cap and the container together upon engagement therebetween.

4,823,968

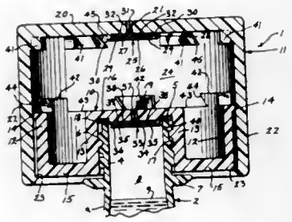
CLOSURE FOR CARBONATED BEVERAGE CONTAINER WITH INTEGRAL PUMP MECHANISM

Walter A. Handzlik, 1305 W. Chestnut, West Bend, Wis. 53095

Filed Aug. 25, 1988, Ser. No. 236,143

Int. Cl.⁴ B65D *51/24*

U.S. Cl. 215—228 **12 Claims**



1. An apparatus for closing an open end of a mouth of a carbonated beverage container and for pressurizing the interior of the container with air, comprising:

a base threadably engageable on the mouth of the container, said base including a lid portion covering the open end of the container, said lid portion containing an opening therethrough to permit passage of air into the interior of the container;

a cap including a cover having a port therethrough and a depending wall portion surrounding said base, said cap slidably mounted on said base between an upstroke position wherein said cover is spaced from said lid portion to define a pumping chamber above said base and a downstroke position wherein said cover is adjacent said lid portion to pump air from said chamber through said opening into the interior of said container;

sealing means disposed between said base and depending wall portion of said cap for sealing the depending wall portion against the base;

first valve means mounted in the cover of said cap which allows air to be displaced through said port into said pumping chamber on the upstroke of said cap and seals said port on the downstroke of said cap; and

second valve means mounted in the lid portion of said base which allows air to be displaced through said opening from said pumping chamber into the interior of said container on the downstroke of said cap and seals said opening on the upstroke of said cap.

4,823,969

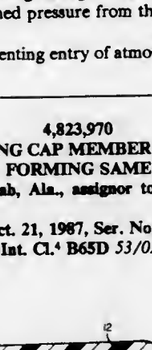
CARBONATION CAP

Michael C. Caldwell, P.O. Box 144846, Miami, Fla. 33134-4846

Filed Feb. 1, 1988, Ser. No. 151,294

Int. Cl.⁴ B65D *51/16*

U.S. Cl. 215—260 **5 Claims**



1. In combination with a screw top bottle, a carbonation cap for use during the collection and storage of a predetermined pressure of carbon dioxide gas in the bottle, said cap including:

(a) an internally threaded housing for attachment to the bottle,

(b) at least one radially extending outlet in the housing,

(c) a resilient tubular seal normally extending across the outlet for preventing leakage of carbon dioxide gas below said predetermined pressure from the bottle to the atmosphere, and

(d) means for preventing entry of atmospheric gases into the bottle.

4,823,970

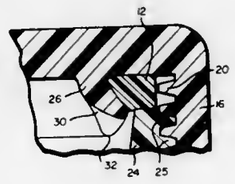
GASKET RETAINING CAP MEMBER AND METHOD OF FORMING SAME

Larry L. Young, Arab, Ala., assignor to Ryder International Corp., Arab, Ala.

Filed Oct. 21, 1987, Ser. No. 111,034

Int. Cl.⁴ B65D *53/02*

U.S. Cl. 215—329 **3 Claims**



1. A gasket retaining cap member comprising: a peripheral downwardly extending annular cap wall having a threaded portion on an inner surface thereof for selectively joining said cap member with a complimentary pattern of threads of an associated container; an integral downwardly extending annular retention wall located radially inward of said cap wall and defining an inner wall of a ring-shaped well formed between said cap wall and said retention wall; and gasket means disposed in said ring-shaped well between said retention wall and said cap wall, said retention wall having a series of circumferentially spaced indentations formed in an upper surface thereof so as to bring selected portions of said retention wall into overlying relation with said gasket while still allowing the gasket to be subjected to visual inspection and thereby insuring said cap member will form a tight and perfect closure when secured to an associated container thus preventing fluid or gas from permeating the cap member and associated container combination.

4,823,971

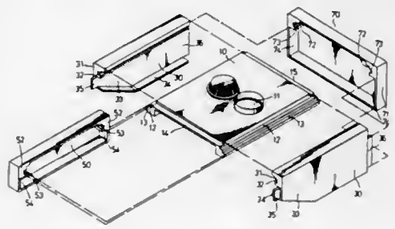
HOUSING ASSEMBLY FOR A SMOKE EXHAUST ELECTRICAL FAN

Shiow-Ju Her, No. 23, Ya-Shiow Road, Ta-Ya Tsun, Ta-Ya Hsiang, Taichung Hsien, Taiwan

Filed Mar. 10, 1987, Ser. No. 24,248

Int. Cl.⁴ B65D *6/00*

U.S. Cl. 220—4 R **2 Claims**



1. A housing assembly for a smoke exhaust electrical fan, comprising: a front housing; a rear housing; a pair of opposed side housings; and an upper housing with an exhaust opening, said exhaust opening opening downwardly thereby drawing smoke downwardly, each of said front, rear, side and upper housings being detachable from the housing assembly, each of said side, front and rear housings being connected to said upper housing by a transverse tongue and groove engagement, and each of said side housings being connected to each of said front and rear housings by a longitudinal tongue and groove engagement.

4,823,972

COLLAPSIBLE CHILD'S TOY CONTAINER

Gerald S. Ressler, and Gail E. Ressler, both of 11100 Lighthouse Dr., Apt. 126, Belleville, Mich. 48111

Filed Jan. 4, 1988, Ser. No. 140,615

Int. Cl.⁴ B65D *7/00*

U.S. Cl. 220—4 F **10 Claims**

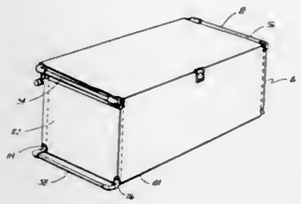
1. A collapsible toy container comprising: a three dimensional rectangular frame structure that includes two parallel upright side frames;

each side frame comprising an upper tubular side rail, a bottom tubular side rail, and two upright tubular corner posts extending therebetween;

two parallel spaced tubular rails (60, 62) extending between the bottom side rails on the respective side frames; said cross rails being located inwardly from the ends of the respective bottom rails;

a flexible fabric cover having a hollow bag-like configuration; said fabric cover comprising a bottom fabric panel having a rectangular configuration matching the plan dimension of the space circumscribed by the corner posts, two fabric flat side panels extending right angularly from side edges of the bottom panel, and two fabric flat end panels extending right angularly from end edges of the bottom panel; the upstanding side edges of the end panels being joined to the adjacent side edges of the side panels, whereby the panels form a hollow flexible bag structure;

bottom end rails releasably connected to end areas of the bottom end rails;



and upper end rails releasably connected to upper ends of adjacent ones of the corner posts;

said bag structure having internal dimensions mated to the external dimensions of the rectangular frame structure, whereby the frame structure can be positioned on the bottom panel of the bag structure, after which the fabric end panels and side panels can be pulled upwardly to grip outer surface areas of the corner posts.

4,823,973

BOTTOM SEAM FOR PAIL

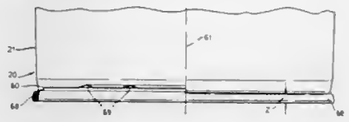
Joseph H. Jewitt, Stanley, and Jack Harley, Coventry, both of United Kingdom, assignors to International Paint PLC, London, England

Continuation of Ser. No. 38,061, Apr. 14, 1987, abandoned. This application Jun. 9, 1988, Ser. No. 204,986

Claims priority, application United Kingdom, Apr. 17, 1986, 8609459

Int. Cl.⁴ B65D *8/00*

U.S. Cl. 220—67 **11 Claims**



1. A metal pail suitable for storing and transporting paint and corrosive materials comprising:

a. a pail body having a longitudinal axis;

b. a pail wall having a top end and bottom end;

c. an end part of said pail wall in the direction towards the bottom end of the pail inwardly inclined to form a conical surface at a minor angle of X° with respect to said wall and said longitudinal axis;

d. a region next to said end part and further in the direction towards said bottom end of the pail, outwardly inclined to form a conical surface at a minor angle of Y° with respect to said pail wall and said longitudinal axis;

e. a first flange attached to said region;

f. an end wall, said end wall being inserted in the bottom end of the pail below said inwardly inclined end part of the pail wall;

g. a rim part of said end wall extending downwardly and outwardly at an angle with respect to the plane of the end wall, said angle being equal to (90+Y)°, said rim part being in close contact with said outwardly inclined region

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of said pail body so as to leave substantially no gap between said rim part and said region, the portion of said rim part remote from said end of the pail lying against the upper portion of said outwardly inclined region of said pail body; and

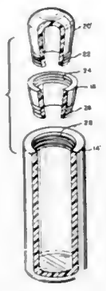
h. a second flange on said rim part, said second flange being engaged with the first flange to seam the end wall to the pail body.

4,823,974

CHILL CYLINDER FOR BEVERAGE CONTAINERS

Hayward B. Crosser, 7015-½ Glasgow Ave., Los Angeles, Calif. 90045

Filed Oct. 20, 1987, Ser. No. 110,945
Int. Cl.⁴ A45C *11/00*
U.S. Cl. 220—85 H **11 Claims**



1. A container assembly for chilling wine bottles or the like comprising:

a bottle of a potable liquid;

said bottle having a neck portion;

a thermally insulating container having a closed bottom and an open top, for enclosing the main body of said bottle, with sufficient additional space for a quantity of small particles of ice sufficient to chill the bottle of liquid between the container and the bottle, said space for ice constituting a substantial proportion of the space within the container;

said open top having internal threads;

ice in a finely divided form filling the space between said bottle and said container;

means for sealing around the top of the container between the bottle and the container, whereby the potable liquid may be poured from the bottle without spilling the ice or water from the melted ice;

said means for sealing being wedge shaped and having a central opening for receiving and sealing surrounding said bottle neck portion;

said means for sealing having lower external threads, for sealingly engaging the container internal threads, and upper threads; and

cap means for engaging said sealing means for covering the top of the bottle after it has been opened

said cap means having lower threads for mating with the upper threads of said wedge shaped sealing means.

4,823,975

CAN CLOSURE

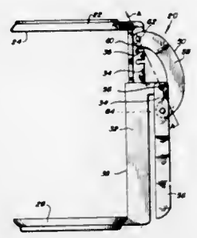
Lynn R. Schwankl, 5833 Eleventh Ave. South, Minneapolis, Minn. 55417

Filed Jun. 6, 1988, Ser. No. 202,378
Int. Cl.⁴ B65D *6/12, 6/14, 25/00*
U.S. Cl. 220—85 H **14 Claims**

1. A can closure for a cylindrical can typically to be opened at the can top having a rim thereabout and characteristically containing carbonated beverages, drinks or the like which otherwise may go flat or spoil if the can is left in its once opened condition for an extended length of time, comprising

(a) a can cover plate having an underside surface sealably engageable with the can top rim;

(b) a can support plate oriented below and opposing the can cover plate for appropriately supporting the can;



(c) an expansible back connecting the can cover and support plates in expansible and contractible opposing relation to permit the can closure to close down upon and sealably engage the can top rim; and

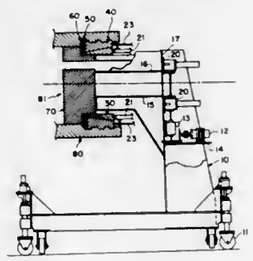
(d) a locking mechanism to secure the back once the can cover plate is sealably engaged with the can top rim.

4,823,976

QUICK ACTUATING CLOSURE

Dorsey E. White, III, Poquoson; Benjamin T. Updike, deceased, late of Newport News (by Barbara G. Updike, legal representative), and Johnny W. Allred, Newport News, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 4, 1988, Ser. No. 190,186
Int. Cl.⁴ B65D *55/00*
U.S. Cl. 220—211 **10 Claims**



1. A quick actuating closure for a pressure-sustaining vessel comprising:

a wedge ring vertically supported and horizontally slidable, having a conical outer surface;

means to move said wedge ring forward and rearward;

a plurality of shear blocks sized to fit together around said wedge ring, with conical inner surfaces, annularly grooved outer surfaces, and means attached to limit rearward movement;

said conical outer surface of said wedge ring and said conical inner surfaces of said shear blocks slidably communicating, with protruding and receiving means between said surfaces to both restrict rotational movement and to cause radially inward movement of said shear blocks from a rearward movement of said wedge ring;

an opening in said pressure-sustaining vessel with an axial wall having annuar flanges protruding therefrom, sized to fit within said annularly grooved outer surfaces of said shear blocks; and

an end closure plug sized to fit within said opening with means to seal said opening, and means to transmit rearward pressure to said shear blocks;

whereby forward movement of said wedge ring forces said shear blocks radially outward until said annularly grooved outer surfaces of said shear blocks contact said annular flanges of said opening, forming a locked position, securing said end closure plug within said opening when a positive pressure exists within said pressure-sustaining vessel; and

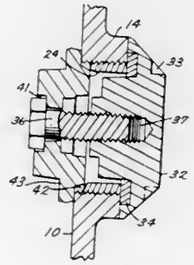
whereby rearward movement of said wedge ring and the interaction between said protruding means and said receiving means forces said shear blocks radially inward until said annularly grooved outer surfaces of said shear blocks clear said axial wall of said opening, forming an unlocked position, allowing said end closure plug to be removed from said opening.

4,823,977

ABANDONING PLUG FOR HOSE NOZZLE

Mervin D. Stanley, Stonington, and Joseph L. Daghe, Decatur, both of Ill., assignors to Mueller Co., Decatur, Ill.

Filed Jul. 6, 1988, Ser. No. 215,787
Int. Cl.⁴ B65D *45/00*
U.S. Cl. 220—243 **6 Claims**



1. An abandoning plug assembly for a nozzle barrel comprising:

outer cap means for covering an outer end of a nozzle barrel,

reversible inner retainer means for engaging an inner end of the nozzle barrel,

fastener means for connecting and drawing together said inner retainer and outer cap means,

said reversible inner retainer means having opposite sides of alternate configuration wherein each of said opposite sides is adapted to receive said fastener means to a different seating depth within said reversible inner retainer means.

4,823,978

PLASTIC HOLE PLUG WITH SELF-PIERCING POINT

Frederick J. Pufpaff, Loudonville, N.Y., assignor to Simmons Fastener Corporation, Albany, N.Y.

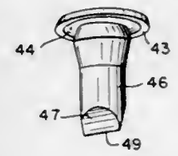
Filed Sep. 11, 1987, Ser. No. 95,523
Int. Cl.⁴ B65D *39/04*
U.S. Cl. 220—307 **2 Claims**

1. A hole plug which is a unitary one-piece injection-molded plastic resin member adapted to fit into a hole in a panel having a tape closing the hole and plastic foam behind the hole, the plug comprising:

a top closure wall portion, said top wall portion having a central opening and terminating at its outer edge of the top face in a curved lip and having a bottom support ledge portion which is adapted to rest on the panel face;

a shank portion extending from the top wall portion and having a central axis;

the shank portion consisting of an upper section connected to the top wall portion and consisting of an annular tube having an outer wall which is smooth and without protrusions and an inner wall forming an elongated cavity extending from said central opening, the outer wall having an outwardly protruding annular point of greatest diameter, said panel being captured between said point of greatest diameter and said bottom support ledge portion, and a lower section having an outer wall having two opposite inwardly directed flat faces meeting in a chisel point to pierce said tape.

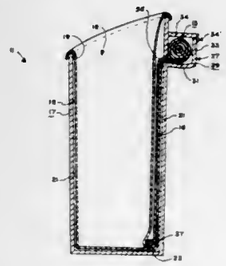


4,823,979

TRASH CONTAINER

Ceffus Clark, Jr., 4088 Archer Dr., Memphis, Tenn. 38109

Filed Aug. 8, 1988, Ser. No. 229,716
Int. Cl.⁴ B65D *25/16*
U.S. Cl. 220—407 **3 Claims**



1. A trash container for use in combination with a roll of trash bags having a free end, said trash container comprising:

(a) a main body compartment having an open interior and having an open mouth communicating with said interior and through which trash may be inserted;

(b) holding means for holding said roll of trash bags adjacent said main body compartment;

(c) said main body compartment having a slot therethrough to allow said free end of said roll of trash bags held within said holding means to extend therethrough into said interior of said main body compartment; said main body compartment including a wall member and a bottom member extending across and closing the lower end of said wall member; and

(d) an arm member extending across said interior of said main body compartment directly above said bottom member to allow said free end of said roll of trash bags to be threaded thereunder and for causing said individual trash bags to be held adjacent said bottom member.

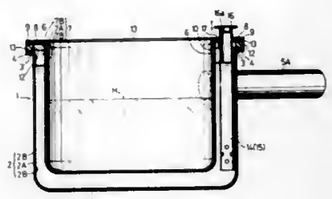
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4,823,980

ENAMELLED DOUBLE PAN

Tetsumi Ejiri, Seto, Japan, assignor to Ejiri Horo Kabushiki Kaisha, Owariasahi, Japan

Filed Apr. 11, 1988, Ser. No. 180,234
Claims priority, application Japan, Dec. 23, 1987, 62-326225
Int. Cl.[4] A47J *27/10*; B65D *1/40*
U.S. Cl. 220—408 10 Claims



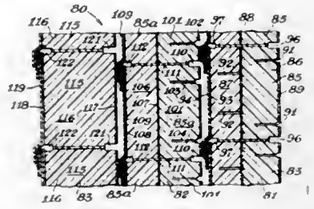
1. An enamel double pan comprising:
an outer pan member having an open top, a peripheral flange formed on said open top and a handle mounted on an outer side thereof, said outer pan member being coated with an enamel layer;
an inner pan member having an open top and a peripheral flange formed on said open top, said inner pan member being coated with an enamel layer, said inner pan member being received in said outer pan member with a space defined therebetween for reserving water, said peripheral flange covering an upper end of said space;
a packing provided between said peripheral flange of said outer pan member and said peripheral flange of said inner pan member;
a clamping ring for clamping said peripheral flange of said outer pan member and said peripheral flange of said inner pan member; and
a water filler aperture formed in said peripheral flange of said inner pan member for filling the water into said space.

4,823,981

INSULATION OF VESSELS HAVING CURVED SURFACES

Hiroshi Tonokowa, Kanuma, Japan; Emil Ekker, Lier, Norway, and Hubert S. Smith, Essexville, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 29, 1985, Ser. No. 728,422
Int. Cl.[4] B65D *88/04, 90/06*
U.S. Cl. 220—414 3 Claims



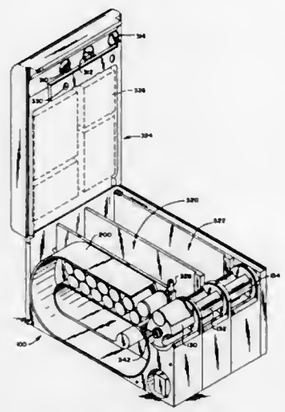
1. An improved insulated cryogenic vessel, the cryogenic vessel comprising at least a first containment vessel having an exterior curved surface, a first layer of a foam insulation disposed adjacent the external surface and covering at least a substantial portion thereof, the insulation being in the form of a plurality of turns of a strip-like material, having a continuous gas barrier layer affixed thereto remote from said containment vessel, adjacent turns of the insulation being heat bonded to adjacent turns of insulation; a second layer of foam insulation being disposed over and unadhered to the first layer of foam insulation and external thereto and spaced from the continuous gas barrier layer affixed to said first layer of insulation, the second layer being in the form of a plurality of turns of strip-like material, adjacent turns of the insulation being heat bonded to adjacent turns of insulation of the second layer of insulation, the first layer of foam insulation comprising a laminated strip-like material, the first layer of foam insulation having affixed thereto a reinforcing scrim and which in turn has affixed thereto said gas barrier layer, a second reinforcing scrim located between laminates forming said strip-like material, the strip-like material defining a plurality of longitudinally extending slots opening toward the exterior surface of the containment vessel, the slots terminating at a location generally adjacent said second reinfocing scrim, a vapor barrier affixed to said second insulation layer remote from said gas barrier layer, said reinforcing scrim affixed to the first layer of insulation being disposed adjacent the exterior cuved surface of the containment vessel with the further limitation that adjacent turns of the strip-like material define inwardly facing grooes adjacent the exterior curved surface of the containment vessel and adjacent turns of strip-like material defining outwardly facing grooves remote from the containment vessel in both the first and second layers of insulation.

4,823,982

MULTIPLE CARTRIDGE DISPENSING SYSTEM

Edward M. Aten, Hazelwood, Mo., and Larry E. Parkhurst, Boulder, Colo., assignors to Medical Microsystems, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 722,073, Apr. 11, 1985, Pat. No. 4,674,652. This application Jun. 29, 1987, Ser. No. 67,323
Int. Cl.[4] B65B *59/00*; G06F *15/20*
U.S. Cl. 221—3 85 Claims



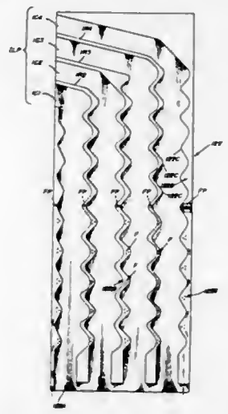
1. A dispensing device, comprising:
multiple storage cartridges, each separable from a main housing, for storing a plurality of articles, of the same or different types, to be dispensed one at a time in predetermined order, said articles being supported along flexible strips stored in said cartridges;
means, separate from said storage cartridges, upon an actuation thereof, for independently dispensing articles from said storage cartridges and regardless of the positional orientation of said dispensing device;
means for supervising the dispensing of said articles including:
first memory means for storing basic dispensing operation instructions,
second memory means for storing a dispensing schedule and control instructions for each said cartridge, said schedule and control instructions being specific to the type of article being dispensed from a particular cartridge,
logic means for interpreting and executing said basic and specific dispensing instructions, and
time keeping means for providing time and data information;
power supply means for providing power to said logic means and to said time keeping means; and
a housing containing compartments for said storage cartridges, dispensing means, dispensing supervision means, and power supply means.

4,823,983

INCREASED COLUMN/SELECTIVITY VENDER

Phillip B. Groover, Woodstock, and Paul A. Phillips, Marietta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 6, 1987, Ser. No. 105,044
Int. Cl.[4] G07F *11/34*
U.S. Cl. 221—92 4 Claims



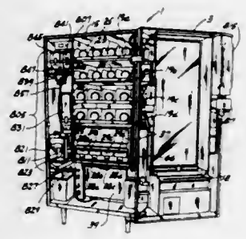
3. A vend rack structure for product vending machines for delivering vendable products from a top loading position to a bottom dispensing position in a vending machine, comprising:
upright hollow wall portions having first means defining a plurality of serpentine paths thereon over a major extent of the vertical dimension thereof;
said first means comprising hollow bosses extending outward from said wall portions and having the interior thereof in communication with said hollow wall portions;
second means defining a plurality of canted substantially horizontal chutes on said wall portions stacked one above the other and interconnecting the upper ends of respective ones of said serpentine paths to said top loading position at one side of said wall portion;
said serpentine paths on adjacent ones of said hollow wall portions defining serpentine product columns extending from said top loading position to said bottom dispensing position;
port means formed in selected ones of said bosses connecting the interior thereof with said product columns over a predetermined portion thereof above said bottom dispensing position;
flow means for permitting a flow of refrigerated air upward through said hollow wall portions and bosses and out through said port means for cooling a selected portion of said vendable products in said product columns prior to vending same;
a refrigerated plenum having a ported to plate portion;
circulation means in said plenum for forcing refrigerated air through said ported top plate portion; and
bracket means for retaining the bottom ends of said wall portions, mounted on said top plate portion;
said flow means comprising open bottom portions in said bracket means permitting said refrigerated air to flow therethrough and into said open bottom portions in said upright hollow wall portions and port means in said bracket means permitting said refrigerated air to flow therethrough and into said open bottom portions of said upright hollow wall portions.

4,823,984

CONTAINER STORAGE AND DISPENSING APPARATUS AND VENDING MACHINE FOR DISPENSING REFRIGERATED, UNREFRIGERATED AND/OR HEATED FOODS

Leonard A. Fickes, St. Louis County, Mo., assignor to Unidynamics Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 857,937, Apr. 30, 1986, Pat. No. 4,730,750. This application Apr. 21, 1987, Ser. No. 41,760
Int. Cl.[4] A47F *1/00*
U.S. Cl. 221—96 67 Claims



51. A vending machine for dispensing drink containers, food packages and hot liquids comprising:
a housing having a refrigerated drink container storage and dispensing area, a food package storage and dispensing area and a liquid storage and dispensing area, each area being separate from the other areas;
a self-contained refrigeration unit for providing forced cool air circulation into the refrigerated drink container storage and dispensing area;
a common receiving device for receiving dispensed drink containers and food packages, the common receiving device adjacent both the drink container and food package storage and dispensing areas;
a separate receiving device for receiving dispensed heated liquid and cups;
a heating unit for heating the liquid prior to dispensing;
a cup dispenser having a dispensing mechanism for depositing the cups into the separate receiving device;
a selection panel having plurality of switches for selecting the food package, drink container or hot liquid to be dispensed;
a drink container dispenser in the refrigerated area having a dispensing mechanism responsive to the switches of the selection panel for depositing one of the containers into the common receiving device;
a food package dispenser having a dispensing mechanism responsive to the switches of the selection panel for depositing one of the food packages into the common receiving device; and
a hot liquid dispenser having a dispensing mechanism responsive to the switches of the selection panel for dispensing the hot liquid into a cup deposited in the separate receiving device.

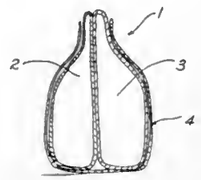
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4,823,985

FORMING IN SITU A COMPOSITION CONSISTING OF TWO SEPARATELY PACKAGED CONSTITUENTS AND DISPENSING ASSEMBLY FOR CARRYING OUT THIS PROCESS

Jean-Francois Grollier, Paris; Lyonel Peritz, Boulogne, and Hervé F. Bouix, Marly le Roi, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 903,618, Sep. 5, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 218,139
Claims priority, application France, Sep. 10, 1985, 85 13387
Int. Cl.[4] B67B *7/00*; B65D *35/22*
U.S. Cl. 222—1 17 Claims



1. A process for forming a composition in situ by mixing two constituents A and B to be simultaneously dispensed and used for hair coloration comprising the steps of:

(a) taking two containers having a wall which is sufficiently deformable to enable simultaneous compression to be effected by successive squeezing actions by the user so as to dispense the contents of said containers and having outflow orifices adapted to be positioned adjacent to one another so that the constituents will contact each other upon dispensing with their outflow jets meeting each other, said outflow orifices being adapted to be opened simultaneously and each having a cross-section of from 0.1 to 75 mm^2;

(b) selecting constituents A and B which have individually and when mixed respective viscosities A, B, A+B, which, when measured under laminar flow conditions at a rate of 45 s^{-1} using a HAAKE "ROTOVISCO RV 100" viscometer at 25° C., fulfil the following conditions:

ηA	$\leqq$	1,500 cP,
ηB	$\leqq$	1,500 cP,
$\eta A - \eta B$	$\leqq$	1,000 cP,
$\eta A + B$	$\leqq$	3,000 cP,

one of said constituents including a foaming agent in a quantity between 0.1 and 30% by weight of the total weight of the composition;

(c) taking volumes of the constituents A and B which satisfy the relationship:

$$0.2 \leqq \frac{\text{volume of } A}{\text{volume of } B} \leqq 2;$$

and

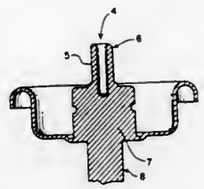
(d) packaging the constituents A and B separately in respective ones of said containers.

4,823,986

DELAYED TIME ACTUATION FOR TOTAL-RELEASE CONTAINERS AND SIMILAR DEVICES

Robert C. Pearce, III, Arlington, Tex., assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 926,287, Nov. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 790,925, Oct. 24, 1985, abandoned. This application Feb. 10, 1988, Ser. No. 154,779
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—54 21 Claims



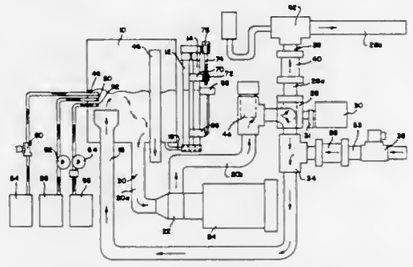
1. In a continuous-spray propellant device having a container with a valve stem, a valve and a continuous valve actuator for discharging the container contents through a terminal orifice of the container, the improvement which comprises having in removable association with the valve stem, the valve and the valve actuator, a material susceptible to displacement at ambient temperature by an actuating factor in the container, whereby when the valve is actuated, the susceptible material is displaced by the actuating factor over a period of time, thereby delaying the release of the container product.

4,823,987

LIQUID MIXING SYSTEM AND METHOD

Thomas G. Switall, Wheeling, Ill., assignor to Ryco Graphic Manufacturing, Inc., Wheeling, Ill.

Filed Apr. 28, 1986, Ser. No. 856,403
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—63 13 Claims



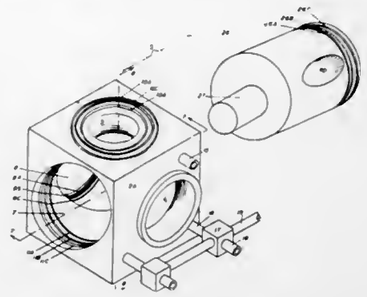
1. A system for automatically preparing a batch mixture of liquids, said system comprising a liquid holding tank, a plurality of liquid columns outside of said tank and in fluid communication with said tank, whereby the level of liquid in said columns will be the same as the level of liquid in said tank, liquid level detection means outside of said tank and said columns for detecting liquid in said columns at each of several predetermined levels, said liquid level detection means including a static capacity type proximity sensor for each of said columns and for each of said predetermined levels, at least one of said sensors being vertically movable relative to another of said sensor, liquid charging means responsive to said liquid level detection means of charging separately and in seriatum a plurality of liquids into said tank, each in a predetermined quantity sufficient to raise the liquid in the column from one predetermined level to the next, and liquid transport means responsive to said liquid level detection means for mixing the liquids which have been charged into the tank and for discharging the liquid mixture from the tank after the liquids have been charged into the tank and mixed.

4,823,988

ASEPTIC FILLING ARRANGEMENT

Glen F. Raque, and Edward A. Robinson, both of Louisville, Ky., assignors to Raque Food Systems, Inc., Louisville, Ky.

Continuation of Ser. No. 567,536, Jan. 3, 1984, Pat. No. 4,699,297. This application Oct. 9, 1987, Ser. No. 107,259
Int. Cl.[4] B67D *5/48*
U.S. Cl. 222—148 8 Claims



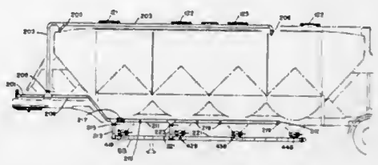
1. A valve member including a valve block and an elongated rotatable valve having a first end and a second end, the valve block formed to include a first port, a second port, and a third port, the valve member for use in a fluid dispensing arrangement of the type which includes a fluid supply, control means for alternately withdrawing a predetermined amount of fluid from the fluid supply and emitting the predetermined amount of fluid out of the dispensing arrangement, with the valve rotatable within the valve block to control the flow of the fluid through the valve member, the improvement comprising, means for continuously sterilizing both the first and second ports of the valve block and the first and second ends of the valve while the valve controls dispensing of the predetermined amount of fluid.

4,823,989

COMPARTMENTALIZED PNEUMATIC VESSEL FILTERING AND UNLOADING SYSTEM

Allan Nilsson, Azle, Tex., assignor to J&L Tank, Inc., Rhome, Tex.

Filed Jun. 25, 1987, Ser. No. 67,290
Int. Cl.[4] B65D *83/06*
U.S. Cl. 222—189 24 Claims



1. A system for receiving, transporting, and discharging dry flowable material, comprising:

a transportable vessel formed by enclosing wall structure,

at least one bulkhead separating said vessel into at least two compartments for carrying dry flowable material,

said wall structure of said vessel at its upper end having two separate openings extending therethrough leading to said two compartments respective for receiving dry flowable material into said two compartments,

two lids for closing said two openings respectively whereby said vessel comprising said two compartments may be pressurized with air,

a passageway extending between said two compartments for equalizing the pressure therein,

a filter extending across said passageway for blocking the flow of dry flowable material through said passageway but allowing the flow of air therethrough,

two separate material discharge means coupled to said wall structure of said vessel at its lower end and leading to said two compartments respectively for removing dry flowable material separately from each of said compartments, and

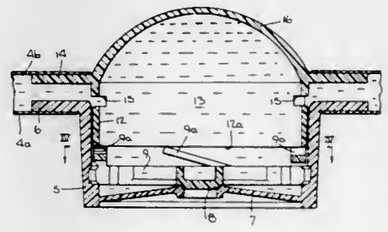
a pneumatic air conduit coupled to one of said compartments for use for pressurizing said one compartment, when said two lids are closed, whereby both of said compartments will be equally pressurized by way of said passageway during the removal of dry flowable material from any one of said compartments by way of its discharge means.

4,823,990

DISPENSING DEVICE

Stanley L. Roggenburg, Staten Island, N.Y.; Robert H. Laauwe, Franklin Lakes; John L. Polite, Saddle River, both of N.J., and Michael Tully, Staten Island, N.Y., assignors to Essex Chemical Corporation, Clifton, N.J.

Filed Dec. 18, 1987, Ser. No. 134,703
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—207 7 Claims



1. A dispensing device for a bag made of flexible material and forming upper and lower walls through which mutually registered holes are formed for receiving the device, the device comprising a tubular lower part having a top forming an outward flange which is sealed to the inside of the lower wall with the lower part depending through the hole in the lower wall, and a tubular upper part having a top forming an outward flange which is sealed to the inside of the upper wall and depending through the hole in the upper wall and telescoped inside the lower part and movable up and down therein, the top of the upper part forming a piston closing the top and accessible on the outside of the upper wall, spring means for elastically biasing the parts apart from each other so that normally there is a space between the flanges, the lower part having a lower end and a self-closing valve normally closing the lower end of the lower part, the upper part having at least one side port normally open to said space so that liquid in the bag can flow into the parts, movement of the upper part into the lower part moving the flanges into intercontact and sealing the space between the flanges.

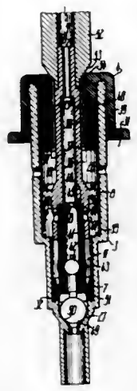
VOL 1101 ISS 4 APR 25 1989 UMI

4,823,991

MANUALLY OPERATED DUAL INVERTIBLE PUMP

Thomas Skorka, Radolfzell, Fed. Rep. of Germany, assignor to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 10, 1986, Ser. No. 850,506
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 3513575
Int. Cl.[4] B65D *8/02*; B67D *5/42, 5/52*
U.S. Cl. 222—255 36 Claims



1. A manually operated dispenser (1) for dispensing media from a media supply means, said dispenser comprising:
pump means (15, 16) providing two pumps (15, 16) having pump chambers (22, 23),
a first one (15) of said two pumps being provided for operation in an upright position of the dispenser,
a second one (16) of said two pumps being provided for operation in an inverted position of said dispenser,
suction ports (25, 26) connecting said pumps (15, 16) to said media supply means,
outlet duct means (57) discharging the media from said pump chambers (22, 23), said outlet duct means (57) being connected to said pump chambers (22, 23), and
wherein said outlet duct means has a common outlet duct (57) for said two pumps (15, 16), said common outlet duct (57) traversing one of said pumps.

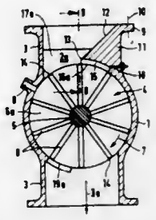
4,823,992

METERING DEVICE FOR FEEDING LIQUIDS TO A MIXING HEAD

Carlo Fiorentini, Saronno, Italy, assignor to AFROS S.p.A., Varese, Italy

Filed Aug. 27, 1987, Ser. No. 90,070
Claims priority, application Italy, Sep. 3, 1986, 21581 A/86
Int. Cl.[4] G01F *11/02*
U.S. Cl. 222—333 8 Claims

1. A metering unit for feeding and metering chemical components to be mixed in a high-pressure mixing device comprising in combination a pumping unit and a control device, said pumping unit including means defining a cylindrical chamber, said control device comprising spaced apart first and second supporting members and an intermediate frame member interconnecting said first and second supporting members, said second supporting member having means defining a cylindrical aperture extending therethrough leading to said cylindrical chamber and being axially aligned therewith, said cylindrical chamber comprising a metering chamber defined by cylindrical walls, said metering chamber including means defining at least one aperture opening therein for permitting the flow of a component, a plunger axially reciprocable within said cylindrical aperture and said metering chamber, said plunger including means defining an axially extending hollow portion, said cylindrical aperture including guide means for guiding the plunger, a worm screw operatively connected to said control device, said worm screw having first and second ends with said first end being rotatably supported at said first supporting member, means for rotatably supporting said second end within the



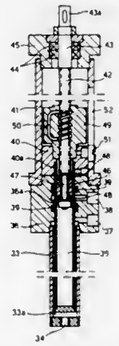
hollow portion of said plunger, said control device further including a lead screw operatively connected to said worm screw and movable within said frame member, means for connecting said lead screw to said plunger and means for preventing the lead screw from rotating during movement of said plunger.

4,823,993

BUCKET WHEEL GATE FOR DISPENSING GRANULATED BULK MATERIAL

Wolfgang Siegel, Ravensburg; Reinhold Eck, Offenau; Dieter Heep, Berqatreute, and Paul Vogel, Ravensburg, all of Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 806,972, Dec. 9, 1985, abandoned. This application Sep. 25, 1987, Ser. No. 101,079
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445710
Int. Cl.[4] G01F *11/10*
U.S. Cl. 222—345 8 Claims



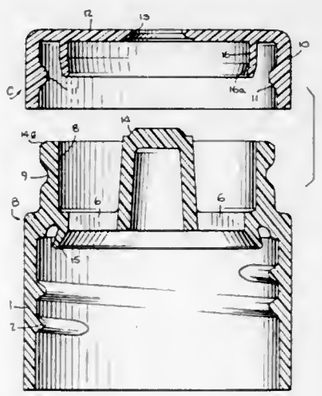
1. A bucket wheel gate for dispensing granulated bulk material, having a cylindrical housing provided with a feed inlet and a discharge outlet and a wheel formed by radial blades, adjacent ones of which define chambers, rotatably mounted therein about a central axis, the cross-section of said feed inlet being limited by a baffle extending from the inside wall of the housing and covering part of the feed inlet cross-section traversed last by the adjacent blades forming the chambers in relation to the running direction of the wheel, said baffle having an inclined upper surface and a circumferential lower surface spaced coaxially from the generatrix of the cylinder defined by the rotating wheel and terminating in a pre-stripping edge, said pre-stripping edge and cylindrical lower surface extending continuously across the width of the housing and lying one to two grain diameters co-arcuately above the surface of the cylinder defined by the generatrix of the rotating wheel to form a curved recess receiving the grain passing the pre-stripping edge, said recess terminating in a depending wall defining a stripping edge lying on the surface of the generatrix of the cylinder defined by the rotating wheel, said depending wall comprising two symmetrical edge sections extending at a V to each other, each of said edge sections extending symmetrically from the respective frontal edges of the housing and ending in an apex lying in the plane through the center of said housing at right angles to the axis of said wheel, and defining an angle with the genetrix of the cylinder defined by the rotating wheel, said angle being at least equal to the angle of friction (Reibungswinkel) between the bulk material and the material of which the housing is made, and a canopy displacing wall arranged in the feed inlet, at the level of the end of the stripping edge and at an inclination to the rotating wheel to form a cavity therebetween, the lower edge of said canopy lying on the surface of the generatrix defined by the rotating wheel, the width of said canopy displacing wall having such dimension that the cavity resulting beneath said canopy displacing wall equals at least the volume of the bulk material stripping off along the stripping edge of the direction of this cavity.

4,823,994

SPECIALITY CLOSURES FOR BOTTLE NECKS

Robert H. Laauwe, 237 Green Ridge Rd., Franklin Lakes, N.J. 07417

Filed Feb. 25, 1987, Ser. No. 18,706
Int. Cl.[4] B22D *37/00*
U.S. Cl. 222—521 1 Claim



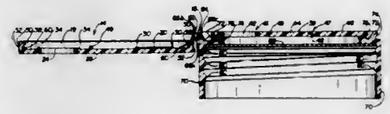
1. A closure for a squeeze bottle having a neck, the closure comprising a base having a lower portion for connection to said neck and a tubular upper portion internally having an upstanding post mounted on a radial support fixed to the inside of the lower part, said support forming at least one axially extending passage, said base having an upstanding tubular extension having an external screw thread; and a cap having a skirt rotatively surrounding said upper portion, said skirt having at least one internal protuberance in screw-threaded engagement with said screw thread, said post having an upper end and said cap having a closed top in which a hole is formed in axial registration with said upper end and which is closed by said upper end when said cap is screwed downwardly and opened when said cap is screwed upwardly, said base having means for preventing complete unscrewing of said cap, said skirt being radially outwardly flexible so that said protuberance can be snapped into said screw-threaded engagement by pushing said cap onto said base to assembly said closure, said base integrally having an inwardly extending portion from which a frusto-conical elastic seal depends with an outward angularity and seals deflectingly against the top of said neck and, said closed top integrally having a depending elastic skirt seal and said tubular extension having an inside against which said skirt seal slidingly presses outwardly, said external screw thread having a terminal end against which said protuberance abuts to prevent said complete unscrewing; and said external screw thread having a bump in advance of said terminal end and having one side over which said protuberance elastically rides and having another side opposite to the first named side and which is engaged by the protuberance after it slides over the first named side at said terminal end.

4,823,995

CONTAINER CAP

Duane H. Lewis, Claysville, Pa., assignor to Continental Plastics, Inc., Triadelphia, W. Va.

Filed Jan. 4, 1988, Ser. No. 140,367
Int. Cl.[4] B65D *47/08*
U.S. Cl. 222—545 12 Claims



1. A container cap comprising:
a fixed member having a circular end wall and a cylindrical skirt depending from the periphery of the end wall, said skirt defining means for securing the fixed member to a container and said end wall defining in at least one sector thereof dispensing openings,
a rotor member including a disc defining in one sector thereof an opening sector,
said fixed member and rotor member defining axially engageable locking elements securing the rotor member to the fixed member with the disc rotatable against said end wall between an open position wherein the opening sector in the disc is aligned with the dispensing openings in the end wall and a closed position wherein the dispensing openings and said opening sector are out of alignment,
a tab joining the rotor member to the fixed member and defining at least one hinge axis about which the rotor member is pivotable relative to said fixed member to axially align said locking elements of said rotor member and fixed member for engagement with said rotor member in said closed position, said tab being frangible to permit rotation of the rotor member relative to the fixed member, and
said tab comprising tab sections projecting radially and axially from the rotor member and fixed member respectively to define said hinge axis axially spacing the rotor member from the fixed member with the rotor member pivoted into axial alignment with the fixed member, said tab being folded inwardly so that said tab does not project beyond the outside of said rotor means.

4,823,996

ROOF-TOP ACCESSORY BAR, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Patrick W. Mosher, 24507 Haskell, Taylor, Mich. 48180

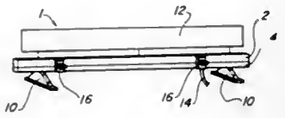
Filed Jul. 24, 1987, Ser. No. 77,385
Int. Cl.[4] B60N *11/00*; B60Q *1/00*
U.S. Cl. 224—322 10 Claims

1. A selectively lowerable and raisable vehicle accessory bar comprising:
a first elongate fixed bar having a top side and a bottom side;

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a second elongate movable bar having a top side and a bottom side;

a hinge connected to and extending along both the top side of the first elongate fixed bar and the bottom side of the second elongate movable bar, so that the second elongate movable bar may be moved arcuately parallel to its length with respect to the first elongate fixed bar said hinge connected to said first bar and said second bar allows said first bar and said second bar to be reversibly moved relative to one another from a raised position whereby said top side of said first bar and said bottom side of said second bar substantially overlap to a lowered position whereby said top side of said first bar and said bottom side of said second bar do not overlap to allow underpassage of the vehicle through plases of restricted height;



at least two foot members fitte to the bottom side of said first elongate fixed bar adjacent opposite ends thereof and adapted for mounting said first bar on a vehicle roof;

at least one safety device disposed upon said top side of said second elongate fixed bar; and

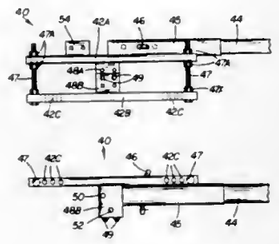
means for selectively holding said bars in said overlapped position.

4,823,997

CYCLE CARRIER

Joseph G. Krieger, Fort Collins, Colo., assignor to P & J Enterprises, Inc., Fort Collins, Colo.

Filed Jan. 5, 1988, Ser. No. 141,296
Int. Cl.⁴ B60R *9/06*
U.S. Cl. 224—42.03 B **4 Claims**



1. A cycle carrier which is adapted to be detachably mounted to a vehicle hitch of the type including a square tubular receiver having a transverse aperture therethrough; said cycle carrier comprising:

(a) an elongated frame member having first and second ends; wherein each said end includes a plurality of spaced transverse apertures therein;

(b) an elongated tongue member carried by said frame member and projecting outwardly therefrom; wherein said tongue member is perpendicular to said frame member; and wherein said tongue member is adapted to be slidably received in said tubular receiver and detachably secured therein;

(c) first and second wheel support members carried by said first and second ends of said frame member; wherein each said wheel support member includes first and second sections which are detachably secured together in a manner such that the spacing between said sections may be adjusted; wherein said first section includes a tubular mounting member which slidably engages said frame member and which is movably adjustable on said frame member; wherein each said mounting member includes an aperture extending transversely therethrough; wherein each said mounting member is adapted to be detachably secured to said frame member at a desired position by means of a pin extending through registering apertures in said frame member and said mounting member; wherein said first and second sections include a plurality of spaced-apart transverse apertures therethrough; wherein bolts are passed through registering apertures in said first and second sections to define the length of each said wheel support member; and wherein said length is adjustable;

(d) first and second retention means carried by said wheel support members and being adapted to retain a wheel of a cycle in each said wheel support member;

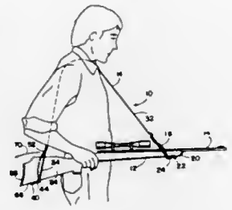
wherein said frame member is disposed in a horizontal plane; and wherein the wheels of a cycle to be carried are adapted to be received in said wheel support members and retained therein by said retention means.

4,823,998

SLING FOR CARRYING SHOULDER WEAPON IN A HORIZONTAL ORIENTATION

David A. Johnson, 3432 Tanglewood Way, Salem, Oreg. 97302

Filed Apr. 25, 1986, Ser. No. 856,642
Int. Cl.⁴ F41C *23/02*
U.S. Cl. 224—150 **15 Claims**



9. A sling assembly for carrying a shoulder weapon of the type having a front portion and a butt stock located rearwardly from said portion, comprising:

(a) a sling strap member having a front end and a rear end;

(b) rear end attachment means connected with said rear end of said aling strap member for attaching said rear end to the butt stock of said shoulder weapon; and

(c) front end attachment means for connecting said sling assembly to said front portion of said shoulder weapon, said front end attachment means including a sling strap-receiving loop of rigid metal material, connected to said front end of said sling strap member and having a pair of open ends, and a loop of elongate flexible material fixedly connected to said sling strap-receiving loop with portions of said elongate flexible material extending into said open ends, portions of said metal material being deformed to secure said elongate flexible material mechanically within said open ends.

4,823,999

LADDER RACK

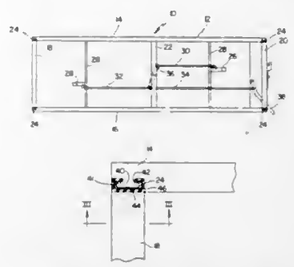
Earl E. Payne, R.D. #2, Box 411, Blairsville, Pa. 15717

Filed Oct. 8, 1987, Ser. No. 107,493
Int. Cl.⁴ B60R *9/00*
U.S. Cl. 224—309 **9 Claims**

1. A ladder rack for retaining and transporting fiberglass ladders on a vehicle, said ladder rack comprising:

a rigid structural frame including cross members to support such fiberglass ladders thereon; and upright elements carried by said frame and projecting upwardly thereof to confine such supported ladders laterally with respect to said frame;

said cross members and said upright elements including stationary cushioning means structurally supported by said cross member and said upright elements to provide stationary plastic load bearing cushioned surface means comprising plastic sheaths at least partially surrounding said cross members and said upright elements for support of such fiberglass ladders, whereby damage to such fiberglass ladders is minimized when such ladders are carried by said ladder rack; and



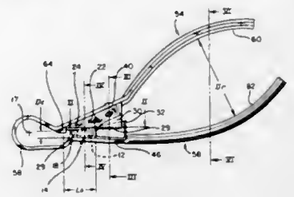
locking means for holding such supported fiberglass ladders on said rack wherein said locking means comprises at least one clamp or gripping rungs of a ladder.

4,824,000

PILL-DIVIDING APPARATUS

Genevieve S. Baxter, 225 Lake St., Lake Dallas, Tex. 75065, and Roy L. Chandler, Burleson, Tex., assignors to Genevieve S. Baxter, Dallas, Tex.

Filed Feb. 9, 1988, Ser. No. 159,527
Int. Cl.⁴ B26F *3/00*
U.S. Cl. 225—103 **15 Claims**



1. An apparatus for dividing a pill into two halves, with one half being immediately accessible and the second half being captured so that it may be held for later use, if desired, comprising:

(a) a platform adapted to support a pill in a generally horizontal mode;

(b) centering means for positioning a pill on top of the platform in such a way that the pill is bisected by a cleavage plane, regardless of the size of the pill;

(c) a movable blade mounted for moving in the cleavage plane such that any pill that is centered on top of the platform can be divided in half;

(d) means for capturing half of the pill adjacent the movable blade so as to preclude the captured portion of the pill from mixing with any portion of the remainder of the pill, and for holding the captured portion of the pill until such time as the movable blade is retracted; dispensing means including an opening which communicates with said platform top for dispensing the uncaptured remainder of the pill prior to retracting the movable blade; and

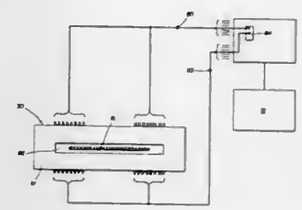
(e) mechanical means for causing the movable blade to be moved at will to a pill-fracturing position and for retracting said movable blade at a desired time.

4,824,001

METHOD FOR CENTERING MATERIALS

Ronald L. Mick, Jr., Clinton; Kent K. Kipling, Solon, both of Ohio, and Fred G. Edler, Mesa, Ariz., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 27, 1982, Ser. No. 424,737
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—64 **5 Claims**



1. A method for centering an object with respect to a central axis utilizing a first detection means having a plurality of sensors adapted to detect the position of a first edge of said object and a second detection means having a plurality of sensors adapted to detect the position of a second edge of said object and further utilizing means for positioning said object, comprising the steps of:

(a) determining the number of sensors of said first detection means actuated by said first edge of said object;

(b) determining the number of sensors of said second detection means actuated by said second edge of said object;

(c) moving said object in order to cause an equal number of sensors of said first detection means and said second detection means to be actuated;

(d) moving said object towards said first detection means until said first detection means has at least one more sensor activated than said second detection means to a first position;

(e) moving said object towards said second detection means until said second detection means has at least one more sensor actuated than said first detection means to a second position;

(f) measuring the distance between said first position and said second position; and

(g) moving said object toward said first detection means one-half the distance between said first position and said second position.

4,824,002

CONTACTLESS WEB SUPPORT GUIDE

John W. Ford, 54 Chesham Road, Kingston Upon Thames, Surrey KT1 3AQ, and Maurice J. Dyer, 3 Sylvan Avenue, Mill Hill, London, N.W.7, both of England

Filed Jun. 4, 1987, Ser. No. 58,279
Claims priority, application United Kingdom, Jun. 6, 1986, 8613764; May 1, 1987, 8710433
Int. Cl.⁴ B65H *23/24*
U.S. Cl. 226—197 **17 Claims**

1. A contactless support guide for guiding a moving web of material, comprising:

means defining an arcuate support face for controlling the moving web;

a first plurality of pockets within the support face and distributed over the support face;

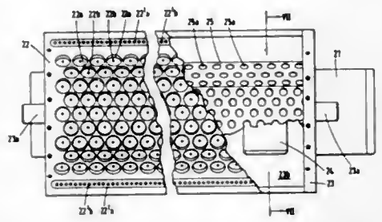
an air supply manifold for receiving pressurized air;

means for establishing communication between the air supply manifold and the pockets to create an air cushion

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extending around the support face to support the moving web in a generally uniform spaced relationship to the support face;

the total cross-sectional area of the pockets taken at the support face being greater than the cross-sectional area of the support face between the pockets;



an elongate pocket provided in the support face at a region where the web enters the guide and an elongate pocket provided in the support fact at a region where the web exits the guide; and

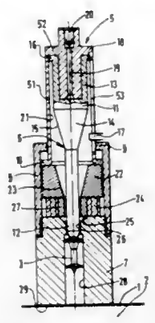
means provided for establishing communication between the manifold and the elongate pockets to provide higher pressure in the air cushion at said regions relative to the remainder of the air cushion.

4,824,003

INDIRECT FIRING FASTENER DRIVING TOOL

Roland Almeras, Tournon, and Jean-Claude Vernerey, Bourgles-Valence, both of France, assignors to Societe De Prospection Et D'Inventions Techniques S.P.I.T., Paris, France

Filed Dec. 18, 1987, Ser. No. 135,121
Claims priority, application France, Dec. 23, 1986, 86 18018
Int. Cl.⁴ B25C *1/14*
U.S. Cl. 227—10 **13 Claims**



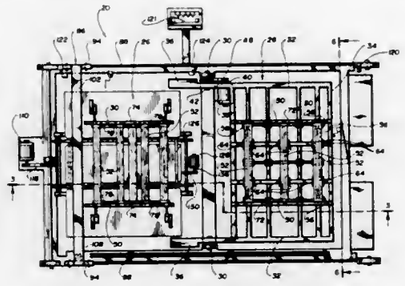
1. An indirect firing fastener driving tool, including a piston mounted in a barrel for, under the action of the combustion gases of a propulsive charge, driving a fastener for fixing a work piece on a support, means for absorbing the piston energy being provided between the barrel and a fastener guide disposed in front of the barrel, for absorbing the excess propulsion energy of the piston and limiting its stroke, the absorbing means comprising, in combination, a ring arranged for cooperating with the piston, a first intermediate ring, made from a resilient material, disposed between the ring cooperating with the piston and the fastener guide, and a scond intermediate ring, made from a rigid but slightly deformable material, movable axially between the ring cooperating with the piston and the fastener guide, characterized in that the fastener guide and the second intermediate ring are arranged so the the length of the axial displacement of this second intermediate ring is equal to the maximum reduction of the axial dimension of the first intermediate ring after compression said first and second intermediate rings being concentrically disposed relative to each other.

4,824,004

APPARATUS AND METHOD FOR FORMING A PALLET

Garry L. Hanson, 3407 138th La. NW., Anoka, Minn. 55304

Filed Nov. 13, 1987, Ser. No. 120,586
Int. Cl.⁴ B27F *7/09*
U.S. Cl. 227—152 **7 Claims**



1. Apparatus for forming a pallet from a plurality of stringer boards and a plurality of deck boards to be applied to each of opposite sides of the stringer boards, comprising:

(a) a bed having an input section and an output section spaced linearly from said input section along an axis of said bed;

(b) inverter means mounted for pivotal movement between a first position, overlying said input section, and a second position, overlying said output section:

(c) means, carried by said inverter means, for mounting, when said inverter means is in said first position, a plurality of the stringer boards and a plurality of deck boards to be applied to a first side of the stringer boards;

(d) tooling, overlying said output section, for receiving a partially formed pallet from said inverter means when said inverter means is pivoted from said first position thereof to said second position thereof, and deck boards to be applied to a second side of the stringer boards;

(e) means for pivoting said inverter means from said first position thereof to said second position thereof; and

(f) means, reciprocable along said axis, for securing, when the inverter means is in said first position, deck boards to the first sides of stringer boards in said mounting means to partially form a pallet, and deck boards to the second sides of stringer boards of a previously partially formed pallet received in said tooling, to complete the pallet.

4,824,005

DUAL MODE ULTRASONIC GENERATOR IN A WIRE BONDING APPARATUS

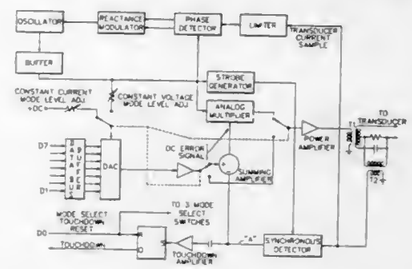
Hal W. Smith, Jr., Costa Mesa, Calif., assignor to Orthodyne Electronics Corporation, Costa Mesa, Calif.

Filed Aug. 13, 1986, Ser. No. 899,043
Int. Cl.⁴ B23K *1/06*
U.S. Cl. 228—1.1 **9 Claims**

1. A wire bonding device comprising:

a wire bonding tool connected to a transducer which is driven by an oscillator and further comprising switch means to provide constant voltage or constant current from said oscillator to said transducer; and,

a phase detector and reactance modulator connected between said transducer and said oscillator to control the



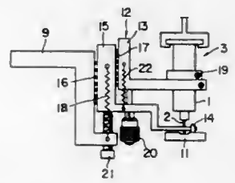
output of said oscillator in response to the movement of said transducer.

4,824,006

DIE BONDING APPARATUS

Yasuhiko Shimizu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 9, 1988, Ser. No. 154,007
Claims priority, application Japan, Feb. 9, 1987, 62-27660
Int. Cl.⁴ B23K *3/06*
U.S. Cl. 228—10 **5 Claims**



1. A die bonding apparatus comprising:

paste supply means having a needle for supplying paste onto a package to secure a semiconductor pellet;

driving means for moving said paste supply means in directions of X, Y and Z, respectively;

follow-up means movable up and down for causing a tip of the needle to follow a contour of a surface of the package; and

supporting means for supporting said paste supply means by means of said follow up means.

4,824,007

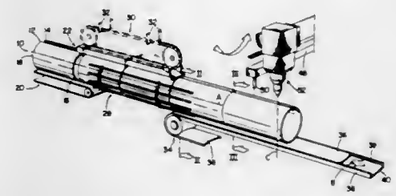
METHOD AND DEVICE FOR THE ORIENTATION AND LOGITUDINAL MOVEMENT OF ROUNDED CAN BODIES IN RELATION TO A WELDING APPARATUS

Albano Depaoli, Mühlacker, Fed. Rep. of Germany, and Peter Gysi, Bellikon, Switzerland, assignors to Elpatronic AG, Zug, Switzerland

Filed Dec. 7, 1987, Ser. No. 130,103
Claims priority, application Switzerland, Dec. 9, 1986, 04906/86
Int. Cl.⁴ B23K *26/04, 26/08, 31/06*
U.S. Cl. 228—102 **8 Claims**

1. A method for the orientation and longitudinal movement of rounded can bodies (10) in relation to a welding apparatus (52) for the butt-welding of longitudinal edges (12, 14) of the can bodies (10), the longitudinal edges (12, 14) being moved, situated opposite one another, along a guide member (22) upstream of the welding apparatus, characterized in that, on the way from the guide member (22) to the welding apparatus (52), the longitudinal edges (12, 14) of the can bodies (10) are magnetized with opposite polarity and are thereby held contiguous with one another and the magnetization is also used to transmit conveying forces to the can bodies (10).

4. A device for orienting and longitudinally moving rounded can bodies for butt-welding the longitudinal edges (12, 14) of the can bodies in a can welding machine having a sizing tool



(28) and a guide member (22) which define a conveying axis (A), a welding apparatus (52) which has a working axis (C) disposed transversely to the conveying axis (A), and a conveyor (34) for conveying the can bodies (10) along the conveying axis (A), characterized in that disposed at each side of a plane which contains the conveying axis (A) are opposite poles (N_S, S_N) of a magnet (40) which comprises a supporting surface (42, 44) for a conveyor belt (36) of the conveyor (34).

4,824,008

SURFACE BONDING OF CERAMIC BODIES

Stanley J. Laszcz, Hockessin; Andrew W. Urquhart, and Marc S. Newkirk, both of Newark, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 907,930, Sep. 16, 1986, abandoned. This application Apr. 17, 1987, Ser. No. 39,510
Int. Cl.⁴ B23K *28/00*
U.S. Cl. 228—121 **14 Claims**

1. A method of bonding ceramic bodies along substantially congruent surfaces, comprising:

(a) providing a first body of ceramic, said first body comprising a ceramic product formed by the oxidation reaction of molten parent metal and a vapor-phase oxidant and grown as molten metal is transported through, and oxidized on, the surface of its own previously formed oxidation reaction product, said ceramic body comprising a polycrystalline oxidation reaction product and interconnected residual metal;

(b) assembling said first body of ceramic adjacent a second body of ceramic in a manner such that a pair of surfaces of said first and second bodies to be bonded together face one another at bonding surfaces of said first and second bodies of ceramic; and

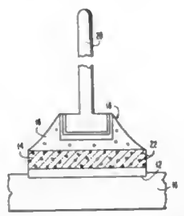
(c) heating the assembled ceramic bodies in the presence of a vapor-phase oxidant to a temperature above the melting point of said residual metal but below the melting point of the oxidation reaction product to be formed and below the melting point of the first and second body of ceramic, to induce transport of said residual metal toward said bonding surfaces where oxidation reaction product continues to grow as in step (a) thereby effecting a bond between said ceramic bodies.

4,824,009

PROCESS FOR BRAZE ATTACHMENT OF ELECTRONIC PACKAGE MEMBERS

Raj N. Master, Wappingers Falls; Marvin S. Pittler; Paul A. Totta, both of Poughkeepsie; Norman G. Ainslie, Croton-on-Hudson, and Paul H. Palmateer, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,246
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—124 8 Claims



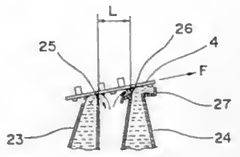
1. A process for joining a metallic coated conductive connector pin to a ceramic substrate comprising the steps of:
depositing a layer of molybdenum on a surface of said substrate;
depositing a film of nickel on said molybdenum layer;
heating said assembly at a specified temperature for diffusing a portion of said nickel into said molybdenum layer;
applying a layer of substantially pure gold to said nickel film followed by sintering said gold, to combine it with undiffused portions of said nickel to form a continuous gold-nickel solid solution; and
brazing said connector pin with a gold-tin brazing compound via said gold-nickel solid solution to join said pin to said substrate.

4,824,010

PROCESS AND APPARATUS FOR SOLDERING PRINTED CIRCUIT BOARDS

Takao Inoue, Hirakata; Keiji Saeki, Kadoma; Chuichi Matsuda, Neyagawa, and Schuichi Murakami, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 654,671, Sep. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 587,852, Mar. 13, 1984, abandoned, which is a continuation of Ser. No. 298,527, Sep. 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 652,680, Sep. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 317,848, Nov. 3, 1981, abandoned. This application Oct. 17, 1986, Ser. No. 920,142
Claims priority, application Japan, Dec. 26, 1980, 55-186364; Dec. 26, 1980, 55-186365; Jan. 6, 1981, 56-858; Feb. 23, 1981, 56-25873; Apr. 7, 1981, 56-52718
Int. Cl.[4] H05K *3/34*
U.S. Cl. 228—180.2 29 Claims



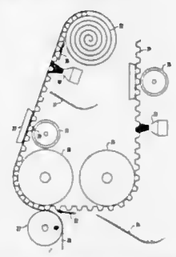
1. An apparatus for soldering spaced forward and rearward electrodes of a chip type component to conductor portions printed on a circuit board, the component being mounted on the circuit board and flux being applied to the electrodes and the conductor portions, said apparatus comprising:
means for moving the circuit board at a given speed along an upwardly inclined path with the component facing downwardly and with the forward and rearward electrodes of the component leading and trailing, respectively, in the direction of movement;
first nozzle means positioned beneath said path for discharging a first molten solder wave at least in a forward direction with respect to said direction of movement, such that the component passes through said first solder wave, at a speed greater than said given speed, and thereby for applying molten solder at least between the rearward electrode and a respective conductor portion and expelling therefrom flux gas produced by application of said molten solder to the flux, thus forming an excessive solder padding between the rearward electrode and the respective conductor portion, said excessive padding having a height greater than and extending downwardly beyond the rearward electrode;
second nozzle means, positioned downstream of said first nozzle means with respect to said direction of movement and at a level above said first nozzle means, for discharging a second molten solder wave in a direction rearwardly with respect to said direction of movement, such that the component passes through said second solder wave, with a space between said first and second solder waves, and thereby directing said second solder wave toward the forward electrode and a respective conductor portion; and
means defining a solder well extending forwardly of the outlet of said second nozzle means for maintaining stable said second solder wave, with the component passing through said solder well, and for removing excessive solder paddings formed previously on the electrodes.

4,824,011

CATALYST CARRIER BODY AND METHOD AND APPARATUS FOR BRAZING THE SAME

Wolfgang Maus, Bergisch Gladbach; Rolf Kottmann, Lindlar; Theodor Cyron, Bergisch Gladbach, and Ludwig Wieres, Overath, all of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 923,308
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3538080
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—173.7 9 Claims



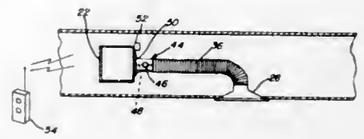
1. Method for producing honeycomb-like brazed metallic catalyst carrier bodies, which comprises applying brazing material to thin at least partially structured metal sheets having end surfaces, rolling or laminating the metal sheets in alternating layers forming honeycombs therebetween, subsequently heating areas to be brazed at high temperature in a normal atmosphere with laser beams of a laser producing brazed connections, defocussing the laser beams to cover an area greater than the height of one of the honeycombs, and directing the laser beams at the end surfaces of the metal sheets at an angle for adjusting the depth of the heated areas.

4,824,012

AIR FLOW DAMPER CONTROL SYSTEM

Billy G. Tate, Chattanooga, Tenn., assignor to United Enertech Corporation, Chattanooga, Tenn.

Filed Apr. 22, 1988, Ser. No. 185,060
Int. Cl.[4] F24F *13/10*
U.S. Cl. 236—49.5 3 Claims



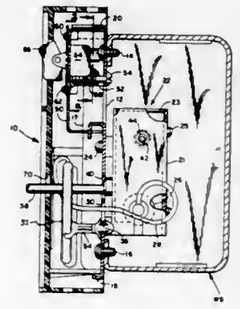
2. An airflow control system for selectively controlling a plurality of individual damper valves in a group of rooms sharing a common air supply conduit with another room having a thermostat control for opening and shutting the flow in the conduit, said system comprising an electric motor for each individual damper valve, circuit means for controlling each motor independently to shut the respective damper, said circuit means including a receiver controlled by a remote signal and time delay means for permitting said motor to reopen the damper automatically after a fixed time period, said system further including a transmitter for providing said remote signal selectively at the option of an occupant of the respective room to shut the damper.

4,824,013

TEMPERATURE CONTROLLER

Glenn C. Gouldey, Beaverton, Oreg., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 24, 1987, Ser. No. 124,711
Int. Cl.[4] G05D *15/00*
U.S. Cl. 236—78 R 10 Claims



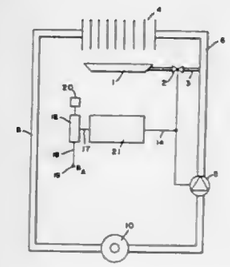
1. A line voltage temperature controller for an electrically operated heating and cooling system comprising:
(a) a metal baseplate adapted for mounting on a single width electrical outlet box and having at least one cutout therethrough, and baseplate having provision for attachment over said box;
(b) a thermostatically actuated line voltage switch mounted to the backside of said baseplate for being received in a single width electrical outlet box upon mounting of said baseplate thereover, said thermostatic switch including a bulb and capillary fluid expansion actuator with said bulb mounted on the front side of said baseplate;
(c) a switch cover formed of impact resistant plastic material and mounted on the face of said baseplate covering said cut out and retained thereon;
(d) line voltage function switch means mounted on said switch cover interiorly thereof with an actuator therefor extending through said cover and exteriorly thereof with said actuator electrically isolated from the line voltage components of said switch, and including insulated lead means from said switch means through said wiring cutout to the backside of said baseplate said lead means completely encased by said cover and thereby inaccessible on the frontside of said baseplate;
(e) fastening means operable to secure said switch cover to said baseplate, said fastening means accessible only from the backside of said baseplate;
(f) an outer cover disposed over said baseplate, said switch cover and said bulb and capillary, said outer cover providing for access to said function switch means actuator from the exterior thereof.

4,824,014

GENERATION OF A SET POINT IN A HEATING CONTROL SYSTEM

Dieter Stuch, Wermelskirchen, Fed. Rep. of Germany, assignor to Joh. Vaillant GmbH. u. Co., Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 000,132, Jul. 30, 1983. This application Apr. 27, 1984, Ser. No. 604,725
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 8224608; Aug. 28, 1982, 8224607; Feb. 11, 1983, 8303819
Int. Cl.[4] F24D *3/00*
U.S. Cl. 237—8 R 20 Claims



1. A control method for a heating plant comprising heating a fluid medium disposed in a heater;
carrying the fluid medium from the heater to a heat exchanger provision via a feed line;
returning thermally depleted fluid medium from the heat exchanger to the heater via a return line;
controlling the temperature of the fluid medium along a sequence of two straight line sections in a diagram of outside temperature versus feed fluid medium temperature between a first end point where the outside temperature is equal to the fluid medium temperature in the feed line and a second end point where the minimum outside temperature corresponds to the maximum feed line temperature such that a third point on the curve for constant inside room temperature between the said end points is connected with a straight line to each of the end points.

4,824,015

RAIL BRACE

Arthur W. Farrell, Naperville, and James A. Remington, Richton Park, both of Ill., assignors to ABC Rail Corporation, Chicago, Ill.

Filed Nov. 6, 1987, Ser. No. 118,215
Int. Cl.[4] E01B *9/60*
U.S. Cl. 238—336 22 Claims

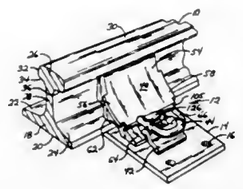
1. A rail brace assembly for buttressing the head of a rail resting on the top surface of a brace plate by engaging fishing

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surfaces formed on the head and base of the rail which comprises:

a rail brace having an upper slanted surface for engaging the head fishing surface, a lower surface for engaging the base fishing surface, a bottom surface adapted to rest upon said brace plate, a front surface for receiving one leg of a resilient fastener, and a pair of laterally extending ears;

a shoulder having laterally extending side surfaces and an opening for receiving another leg of said resilient fastener;



wherein said brace ears overlie said laterally extending side surfaces to prevent longitudinal movement of said rail brace;

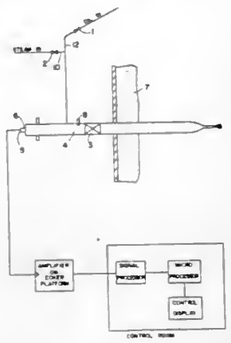
a resilient fastener having one leg adapted to engage said rail brace surface and another leg adapted to be inserted into said shoulder opening acting to apply a vertical downwardly directed force biasing said brace against said brace plate and a horizontal inwardly directed force biasing said brace against said rail to thereby prevent lateral and rotational movement of said rail brace.

4,824,016

ACOUSTIC MONITORING OF TWO PHASE FEED NOZZLES

George D. Cody, Princeton, N.J.; Craig A. Joseph, Oakland; Uri Seis, Walnut Creek, both of Calif., and Charles L. Baker, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 10, 1987, Ser. No. 131,366
Int. Cl.[4] G01H *3/00*
U.S. Cl. 239—8 **6 Claims**



1. A passive acoustic nozzle monitoring process for correcting the operating conditions of a feed nozzle injecting a liquid gas mixture into a process vessel or chamber so as to maintain the correct mixing of said liquid and gas exiting the nozzle comprising:

determining a Reference Power Spectrum (RPS) showing vibrational resonances from a vibrational resonances from a nozzle when said nozzle is performing at a standard mixing or flow condition which is the desired operating state of the nozzle and where the vibrational resonances that characterize the the flow through the nozzle in the range over which the Power Spectrum is determined,

(b) determining a current Power Spectrum (CPS) showing vibrational resonances at a later time from said vibrational sensor in close proximity to said nozzle,

(c) comparing said CPS with said RPS, so as to determine a change in said vibrational resonances, and

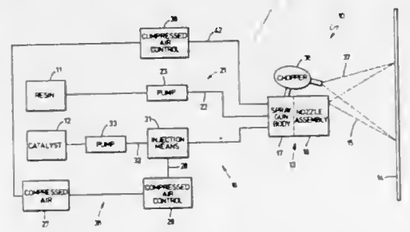
(d) correcting the flow state of the nozzle by changing the variables controlling the relative volumes of gas and liquid entering the nozzle so as to return said nozzle to said desired operating state.

4,824,017

EXTERNAL MIX SPRAYING SYSTEM

Gregory A. Mansfield, Indianapolis, Ind., assignor to Glas-Craft, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 885,006, Jul. 14, 1986, abandoned. This application Jul. 31, 1987, Ser. No. 80,475
Int. Cl.[4] B05B *7/08*
U.S. Cl. 239—9 **22 Claims**



1. Means for forming an article from a catalyzed, resinous material, comprising:

a first source of resin;

a second source of catalyst for said resin;

spraying means to mix said catalyst with said resin and to direct mixed catalyst and resin at an article-forming substrate;

liquid delivery means to provide a flow of resin from said first source to said spraying means;

air delivery means to provide a flow of compressed air to said spraying means; and

injection means to introduce catalyst in said air delivery means,

said spraying means comprising a liquid nozzle for forming the resin flow into a fan-like resin film with expanding edges extending from a liquid orifice, and a nozzle assembly directing compressed air and catalyst particles at the fan-like resin film,

said nozzle assembly including an annular chamber terminated at its forward end with a spherical-shaped, internal surface portion and an elongated air-catalyst orifice, said liquid nozzle being located centrally within the annular chamber of said nozzle assembly and including an internal passageway terminating in a hemispherical surface, and said liquid orifice being formed by a V-shaped external groove intercepting the internal hemispherical surface of the liquid nozzle to form the elongated liquid orifice, said compressed air and catalyst particles being directed through said elongated air-catalyst orifice to assist the formation and mixing of catalyst and resin spray particles uniformly throughout the spray pattern by a greater mass flow of compressed air and catalyst particles juxtaposed to the expanding edges of the fan-like film of resin,

said liquid nozzle and said nozzle assembly being adapted to that the compressed air and catalyst particles interact with the fan-like resin film and its expanding edges to provide a spray pattern with mixed catalyst and resin particles substantially uniformly distributed throughout the spray pattern.

4,824,018

QUICK CHANGE SPRAY PAINT RECEPTACLE APPARATUS

Donald R. Shreve, 2712 Feasler St., Erie, Pa. 16506

Filed Nov. 23, 1987, Ser. No. 123,765
Int. Cl.[4] B05B *15/02;* **A47L** *25/00*
U.S. Cl. 239—114 **6 Claims**



1. In combination a paint receptacle [10] comprising a can [11], a lid [12] adapted to have a removable spray gun [14] having a paint tube supported thereon and a wiper assembly [124] to wipe paint from the paint tube,

means supporting said lid [12] on said can [11],

said lid [12] having a fluid tube opening [13],

a wiper assembly [124] in said fluid tube opening,

said wiper assembly [124] comprising a first flange [126] and a second flange [127] of resilient, flexible material [33],

each said flange [126,127] having a first surface and a second surface,

a cylindrical body [120] between said first flange [126] and said second flange [127] fixed to said flanges, [126,127],

a first opening [113'] through said first flange [126] and a second opening [113''] through said second flange [127],

said openings [113',113''] through said flanges being smaller than said opening [13] through said lid [12],

said first opening [113'] through said first flange [126] [124] and said second opening [113''] through said second flange [127] being adapted to receive a fluid tube [15] on said spray gun [14],

said flanges [126,127] extending inwardly from said cylindrical body [120],

said flanges [126,127] extending outward from said cylindrical body [120] and overlying said lid [12] adjacent said fluid tube opening [113],

said openings [113,113''] through said wiper assembly [124] each being defined by a cylindrical surface extending from said first surface of said particular flange to the said second surface thereof,

said first opening [113'] and said second opening [113''] through said wiper assembly [124] being of lesser diameter than said fluid tube [15] whereby said wiper assembly [124] is distorted and wipes paint from said fluid tube [15] and returns said paint to said can [11] through said second opening [113''],

said second flange [127] and said first wiper flange [126] each having a notch [136,137] formed therein spaced from said cylindrical body [120] for venting air from said can [11],

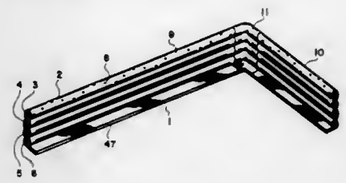
said notches [136,137] each terminating in spaced relation to said cylindrical body [120] and circumferentially spaced from one another.

4,824,019

LAWN-BORDER SPRINKLER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 272,326, Jun. 10, 1981, abandoned. This application Apr. 25, 1983, Ser. No. 488,195
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—201 **4 Claims**



1. A lawn-border sprinkler for watering a lawn or vegetable garden comprising in combination:

(a) at least one sprinkling conduit including a plurality of minute holes through a wall of said sprinkling conduit disposed along the length of said sprinkling conduit, said sprinkling conduit divided into a plurality of separate compartments; and

(b) a plurality of supplying conduits disposed parallel to said sprinkling conduit, each of said plurality of supplying conduits including a plurality of blockages blocking a flow path through said each of supplying conduits at various sections and a plurality of flow path-switching ports connecting said each of plurality of the supplying conduits to another of said plurality of the supplying conduits adjacent to said each of plurality of supplying conduits or various sections wherein said plurality of the blockages and said plurality of flow path-switching ports provide a plurality of mutually exclusive routes through said plurality of supplying conduits, each of said mutually exclusive routes supplying the water to each of said plurality of separate compartments included in said sprinkler conduit;

whereby, a manifold valve connected to said sprinkling conduit and to said plurality of supplying conduits at the upstream end of said lawn-border sprinkler supplies the water to one of said plurality of separate compartments included in said sprinkling conduit at one time in a sequential manner.

4,824,020

SPRINKLER STAND

Randall T. Harward, Spanish Fork, Utah, assignor to Harward Irrigation Systems, Inc., Spanish Fork, Utah

Filed Mar. 30, 1987, Ser. No. 31,353
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—264 **15 Claims**

9. An agricultural irrigation system comprising

a header conduit extending across a parcel of land to be irrigated;

means for providing water under pressure to the header conduit;

lateral conduits spaced along said header conduit and extending outwardly in a direction away from said header conduit;

a plurality of quick disconnect couplings spaced along each of said lateral conduits; and

at least one portable sprinkler unit comprising

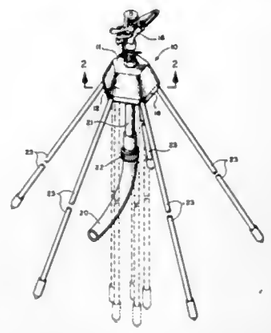
a central support hub having a top and a bottom, with a central, elongate opening extending from said top to said bottom of said support hub;

a riser conduit extending upwardly from the opening at the top of said support hub, said riser conduit being fixed relative to said support hub;

a sprinkler head coupled to the extending end of said riser

conduit, said sprinkler head being of the type that produces a reactive, lateral force on the riser conduit;

at least five, flexible, elongate legs attached to said support hub so as to be substantially equally spaced around the elongate opening in said support hub such that the legs can be positioned in an extended support position in which they extend outwardly in an acute angle from a central axis which is substantially coaxial with said elongate opening in said support hub, with said legs comprising flexible



rods having sufficient flexibility to dissipate the reactive force of said sprinkler head through the legs such that the stand is stable during operation;

a flexible supply conduit having a first and second end, with the first end attached to the bottom of said support hub in flow communication with the central, elongate opening in said support hub; and

means for releasably coupling the second end of said flexible supply conduit to any of the plurality of quick disconnect couplings on said lateral conduits.

4,824,021

WINDOW WASHING SYSTEM FOR MOTOR VEHICLES

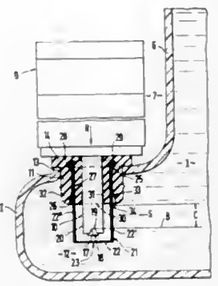
Hartmut Binder, Leonberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,391

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709926

Int. Cl.⁴ B05B *1/10*

U.S. Cl. 239—284.1 **15 Claims**



1. A window washing installation for motor vehicles, comprising reservoir tank means for the washing liquid, self-priming centrifugal feed pump means including a suction pipe, the suction pipe being inserted into the reservoir tank means under interposition of a sealing means and protruding sectionwise into the tank interior space, agitator means for priming said centrifugal pump means with washing liquid from the reservoir tank means disposed inside of the suction pipe and extending approximately to the free end of the suction pipe and is thereat in contact directly with the washing liquid by way of at least one aperture means open in the downward direction and provided along the circumference of the suction pipe, and sieve means surrounding and spaced from the lower end area of the suction pipe, to maintain the agitator means in direct contact with the washing liquid and prevent the formation of an air cushion.

4,824,022

METHOD OF AND APPARATUS FOR APPLYING A SPRAYED CONCRETE LAYER TO A SURFACE

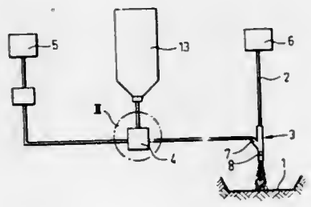
Bernd Hillemeier, Wiesbaden; Günter Brockmann, Bad Homburg/Obereschbach, and Richard Pohl, Walldorf, all of Fed. Rep. of Germany, assignors to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,144

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703761

Int. Cl.⁴ B28C *5/46*

U.S. Cl. 239—407 **5 Claims**



1. In an apparatus for applying a sprayed concrete layer to a surface comprising a concrete feed pipe for a pumpable and sprayable concrete mixture made with water, a sprayer and a compressed air source having a pressure of several bar, said concrete feed pipe opening into a sprayer compressed air connector device, said sprayed concrete mixture being sprayable by entrainment with compressed air from said source, the improvement which comprises a compressed air feed device formed with, a register having a plurality of compressed air chambers which open into said compressed air feed connector, individual ones of said compressed air chambers being connectable by a plurality of control valves in alternating sequence to a powder silo for loading of the chambers with a powdery concrete additive or for blowing through of a compressed air partial flow, selectively, to mix said additive with the concrete mixture, the upstream and downstream end of said individual ones of said compressed air chambers each having at least one control valve, in the region between said control valves at said upstream end and said downstream end said compressed air chambers being connected to said powder silo by a connecting duct with a pump and by a return pipe.

4,824,023

FLOW DEFLECTING DEVICE

Norio Sugawara, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 1, 1987, Ser. No. 68,337

Claims priority, application Japan, Jul. 2, 1986, 61-155397; Jul. 2, 1986, 61-155398

Int. Cl.⁴ B05B *1/26*

U.S. Cl. 239—509 **16 Claims**

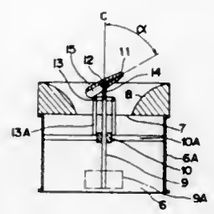
1. A flow deflecting device comprising:

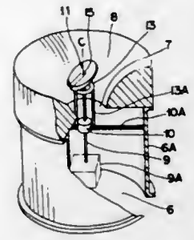
a housing having a flow path having upstream and downstream ends therein;

a nozzle means in said housing at the downstream end of said flow path for issuing a flow therefrom;

a flow deflecting means at the downstream end of said nozzle for deflecting the flow issuing from said nozzle; and

control means attached to said housing and attached to said flow deflecting means for controlling the angle of inclina-





tion of said flow deflecting means with respect to said flow path and for controlling the angle of rotation of said flow deflecting means with respect to the direction of said flow path for controlling the angle of rotation and the angle of inclination of the flow issuing from said nozzle with respect to said flow path.

4,824,024

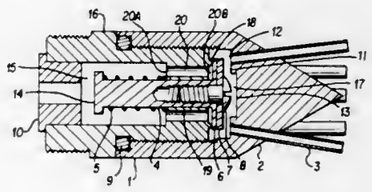
SPRAY APPARATUS

Paul W. Bishop, Telford, and Karl H. Wundschock, Harleysville, both of Pa., assignors to Rhone-Poulenc Nederland B.V., Amstelveen, Netherlands

Filed Jun. 19, 1987, Ser. No. 65,059

Int. Cl.⁴ B05B *1/14, 1/30;* **B64D** *1/18*

U.S. Cl. 239—333.15 **10 Claims**



1. A spray apparatus comprising:

(a) a substantially cylindrical body defining a substantially cylindrical recess and having a front end and a trailing end;

(b) an annular shoulder integral with said body and disposed at said trailing end, said annular shoulder having a system of openings substantially axially disposed on said annular shoulder;

(c) a projection integral with said body extending from said annular shoulder having a base portion disposed concentric to and interiorly of said axially disposed body openings, said annular shoulder defining a central recess disposed interiorly of said body openings and terminating at a back portion to provide an internal reservoir;

(d) tubes projecting through said substantially axial body openings and extending beyond said annular shoulder and said projection;

(e) a connector detachably secured to said body, said connector having parallel axially disposed connector-passageways, a fluid inlet, a fluid outlet, and a reservoir channel;

(f) a valve means secured to the output end of said connector, said valve means extending both out of and into the reservoir-channel along the central axis of said reservoir-channel;

(g) a fluid pressure responsive plunger communicating with said fluid outlet, said fluid plunger being adapted to be urged toward the trailing end of said body and into the central recess of said body under the influence of fluid pressure to permit fluid to pass through said connector-passageways, through said internal reservoir, through said body openings and through said tubes, and being further adapted, when not under the influence of fluid pressure, to isolate the connector reservoir-channel from said internal reservoir.

4,824,025

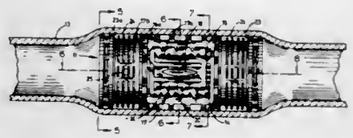
ONE-PIECE IN-LINE PRESSURE COMPENSATING DRIP IRRIGATION EMITTER

David B. Miller, 6531 N. Tellman, Fresno, Calif. 93711

Filed May 26, 1987, Ser. No. 54,468

Int. Cl.⁴ B05B *1/30*

U.S. Cl. 239—542 **9 Claims**



1. A conduit line having a cylindrical one-piece in-line pressure compensating drip irrigation emitter unit disposed therein, said emitter unit comprising:

(a) An emitter body of flexible elastic material having a plurality of inlet means in communication with the interior of the conduit line for transferring fluid under pressure therefrom;

(b) Deformable flow regulating means including a tubular member diametrically traversing the cylinder of said irrigation emitter unit, and interposed between said inlet means and a plurality of annular output regions for regulating the volume of fluid flowing therebetween, said tubular member being adapted to be deformed by greater fluid pressure in the conduit line to restrict the flow of fluid therethrough; and

wherein said plurality of annular output regions are coupled to said tubular member, each having a plurality of gapped support ribs therein for providing a direct path for the free flow of fluid from said tubular member across said annular output regions to the exterior of the conduit line through a plurality of output orifices cut into the conduit line immediately adjacent to said annular output regions, whereby changes in fluid pressure in the conduit line inversely affect fluid flow through said tubular member, so that output fluid flow rates tend to remain relatively stable.

4,824,026

AIR ATOMIZING ELECTROSTATIC COATING GUN

Kenji Tamura, Nagoya; Hirofumi Hashimoto; Yoichiro Baba, both of Toyota, and Sadao Inose, Yokohama, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Ransburg-Gema K.K., Tokyo, Japan

Filed Jul. 31, 1987, Ser. No. 80,637

Claims priority, application Japan, Aug. 6, 1986, 61-120727 [U]; Aug. 6, 1986, 61-120728[U]; Aug. 6, 1986, 61-120729[U]; Aug. 6, 1986, 61-120730; Aug. 6, 1986, 61-120731[U]

Int. Cl.⁴ B05B *5/02*

U.S. Cl. 239—707 **7 Claims**

1. An air atomizing electrostatic coating gun comprising,

a gun body including a front end and a rear end;

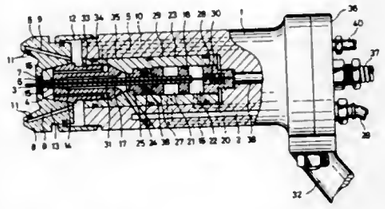
a paint nozzle disposed at the front end of the gun body to

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eject a liquid paint supplied through a paint supply passage formed through a wall portion of said gun body;

an air cap for atomizing liquid paint ejected from said paint nozzle, and said air cap being disposed at the front end of said gun body and having a central air orifice through which said nozzle extends and a plurality of air orifices encircling said central air orifice, said central air orifice and said plurality of air orifices communicating with an atomizing air supply passage formed through a wall portion of said gun body;

a needle valve device for controlling ejection of said paint from said paint nozzle, said needle valve device being disposed inside said gun body and having a thin, elongated, rodlike valve having a front end portion generally in the shape of a cone adapted to be selectively brought into contact with or detached from a valve seat formed by a slanted inner wall of said paint nozzle, a valve driving piston fixed to a rear end of said valve, and an air cylinder accomodating said piston therein;



a paint-particle charging electrode made of an elongated conductor attached to said valve of said needle valve device, the front end of said charging electrode projecting forward from a front end opening of said paint nozzle, and a dc high voltage source coupled to said charging electrode through a high-resistance element; and

means for controlling said needle valve device to selectively place the front end portion of said rodlike valve into contact with or detacted from said valve seat with exposure of said valve driving piston to pressure generated by supplying air to said air cylinder through an air passage formed through a wall portion of said gun body;

said air cylinder of said needle valve device having a forwardly extending, cylindrical frontend portion to which said paint nozzle is attached so as to form a nozzle-needle valve assembly, said nozzle-needle valve assembly being detachably attached and fixed to said gun body by inserting and fitting it into a generally cylindrical cavity in said gun body from the front side thereof, said cylindrical cavity being formed at the front end of said gun body to have a forwardly facing opening.

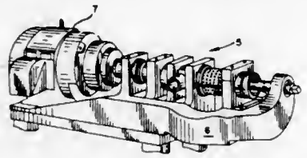
4,824,027

MEAT SEPARATING MEANS AND METHOD

Jimmie Shaw, and Charles R. Brooker, both of Davenport, Iowa, assignors to The Kartridg Pak Co., Davenport, Iowa

Filed Oct. 13, 1987, Ser. No. 108,093
Int. Cl.[4] B02C *23/16*
U.S. Cl. 241—24 **9 Claims**

1. In a machine for separating meat from a feed material having an appreciable content of bone and including, a foraminous cylinder having a rear infeed end and a front discharge end, a conveying auger co-axially rotatable within said foraminous cylinder, and valve means at the discharge end of said auger providing a restricted orifice through which compacted de-meated bone material discharges, the improvement which comprises, the outer diameter of the flight on said auger being tapered outwardly from its infeed end to its discharging end with the radial clearance between the outer diameter of the flight on said auger at its infeed end and the inner diameter of said cylinder being approximately 0.25 inch., and with the radial clearance between the outer diameter of the flight on said auger at its discharge end and the inner diameter of said cylinder being in the range of from about 0.010 to about 0.025



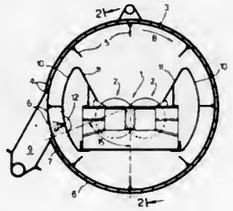
of an inch and the areas of the foramina in said cylinder being substantially greater at said infeed end and becoming substantially smaller toward said discharge end.

4,824,028

SHREDDING PROCESS AND APPARATUS FOR CARRYING OUT SAID PROCESS

Fabio Rota, Milan, Italy, assignor to Satrind S.r.l., Cornaredo, Italy

Filed Jan. 4, 1988, Ser. No. 140,754
Claims priority, application Italy, Jan. 2, 1987, 20402 B/87
Int. Cl.[4] B02C *4/08*
U.S. Cl. 241—24 **9 Claims**



1. An apparatus for shredding shreddable material comprising:

a perforated rotating screening drum having a horizontal or inclined longitudinal axis, said screening drum including inwardly extending blades,

shredding means positioned within said drum comprising two rows of rotating intermeshing cutting blades, said rows of blades being aligned substantially parallel to the longitudinal axis of said drum,

a fixed outer wall surrounding at least a lower portion of said perforated screening drum, said screening drum and said fixed outer wall defining therebetween an annular space, and

an outlet in said fixed outer wall for the recovery of shredded material which passes through said perforated rotating screening drum, said outlet communicating with said annular space and positioned above the lowermost portion of said annular space.

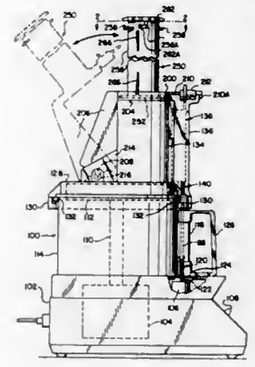
4,824,029

CHILD-LOCK FOR FOOD PROCESSOR

Richard L. Stottmann, Louisville, Ky., and Edward F. Ponikwia, Dayton, Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 7, 1988, Ser. No. 141,439
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—375 **6 Claims**

1. In a food processor having a drive motor and control means for enabling the operation of said drive motor, a working bowl, a shaft projecting upwardly through said bowl and being coupled to said drive motor for rotation of a food processing tool coupled to said shaft within said bowl, a bowl cover detachably secured to said bowl and defining a feed tube for introducing food items through said bowl cover into said bowl, and a feed tube cover detachably secured to said bowl cover for movement between a position closing said feed tube



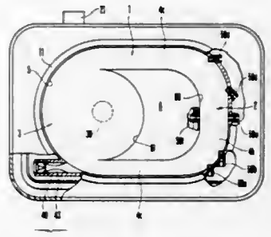
and an opened position, an improved operating interlock comprising child-lock means for securing said feed tube cover to said bowl cover and said bowl cover to said bowl without enabling operation of said food processor whereby said food processing tool is enclosed within said bowl to discourage inadvertent contact with said food processing tool when said food processor is not in use.

4,824,030

JET AIR FLOW CRUSHER

Osamu Kano, Tokorozawa; Yukiyoshi Yamada, Hiki; Shigemi Fujisawa, Kawagoe, and Masayuki Yasuguchi, Sagamihara, all of Japan, assignors to Nisshin Flour Milling Co., Ltd. and Nisshin Engineering Co., Ltd., both of Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 90,667
Claims priority, application Japan, Sep. 12, 1986, 61-215346
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—39 **2 Claims**



1. A jet air flow crusher for crushing powder grains, said crusher comprising:

an outer wall in which an internal space is defined;

powder grain introducing means open to said internal space for introducing powder grains therein;

a partition wall within said outer wall, said partition wall partitioning said internal space into a crushing zone and a classifying zone open to said crushing zone,

said crushing zone defined and extending in a powder flow direction between an outer guide surface of said partition wall and an internal surface of said outer wall,

said classifying zone comprising an outlet through which crushed powder grains are discharged from said internal space;

a plurality of nozzles open to said crushing zone, said nozzles spaced apart and directed in said powder flow direction, and said nozzles connectable to a source of compressed air for jetting air into said crushing zone in substantially said powder flow direction to cause the powder grains to be crushed in said crushing zone and to carry the powder grains from said crushing zone toward said classifying zone; and

flow resisting means disposed in said crushing zone between respective ones of said plurality of nozzles for inhibiting the flow of powder grains in said powder flow direction from one of said respective ones of said plurality of nozzles to the other of said respective ones of said plurality of nozzles whereby powder grains accrue in the crushing zone at said flow resisting means prior to flowing to said other of said respective ones of said plurality of nozzles,

said flow resisting means comprising nozzle means open to said crushing zone at a location between said respective ones of said plurality of nozzles, directed perpendicular to said powder flow direction, and connectable to a source of compressed air flow for directing a jet of air into said crushing zone in a direction perpendicular to said powder flow direction, and

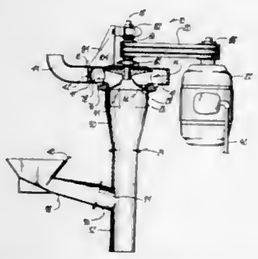
said other of said respective ones of said plurality of nozzles disposed, in said powder flow direction, between said flow resisting means and said classifying zone.

4,824,031

MEANS OF PNEUMATIC COMMINUTION

Allen C. Wiley, Coralville, Iowa, assignor to MicroFuel Corporation, Ely, Iowa

Division of Ser. No. 697,042, Jan. 31, 1985. This application Dec. 24, 1987, Ser. No. 138,364
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—39 **5 Claims**



1. A centrifugal pneumatic comminutor comprising, a housing containing a fan which has a plurality of blades and is mounted on a vertical rotatable axis and capable of operative connection to a motor means, said housing having an inlet opening and a vertical conduit defining said inlet opening and being aligned with the axis of said fan, and an outlet opening and conduit, a sealing ring member for rotatably mating the fan and said vertical conduit in said housing for creating improved air flow and comminution through said comminutor; said sealing ring member comprising an annular member sealingly secured in said inlet to said housing and having at least first and second annular parallel spaced-apart flanges extending inwardly therefrom which mateably retain said fan in a centered position in said housing, and create an effective air lock through out the comminutor, and each blade of said fan having a lower portion of one length and an upper portion which has a length greater than said one length, wherein said lengths are

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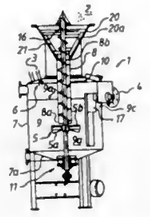
measured radially from the rotatable axis of said fan, and said upper and lower portions are joined so as to form a continuous fan structure, and said inlet opening has a diameter which is larger than twice said one length.

4,824,032

METHOD AND AN ARRANGEMENT FOR MIXING A DRY MATERIAL WITH A LIQUID

Bengt Johansson, Ingelstad, Sweden, assignor to Fläkt AB, Nacka, Sweden

Filed Oct. 16, 1987, Ser. No. 109,040
Claims priority, application Sweden, Oct. 20, 1986, 8604468
Int. Cl.[4] B02B *1/00*; B02C *13/00*
U.S. Cl. 241—46 B **33 Claims**



1. A method for mixing a dry or substantially dry powder material with a liquid to form a slurry mixture having a surface in a vessel which contains the liquid and which is provided with agitating or stirring means, comprising the steps of:

continuously or intermittently discharging the powder material into the liquid at a distance beneath the surface of the liquid via a pipe, the discharging end of the pipe through which the powder material is discharged is positioned at a distance beneath the surface of the mixture; and

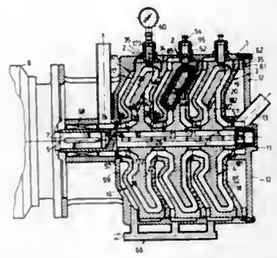
crushing lumps in the mixture in a milling means arranged at the bottom of the vessel.

4,824,033

GAP-TYPE BALL MILL FOR CONTINUOUS PULVERIZATION, PARTICULARLY BREAKDOWN OF MICROORGANISMS, AND DISPERSION OF SOLIDS IN A LIQUID

Gerhard Buehler, Rheinfelden, Fed. Rep. of Germany, assignor to FRYMA-Maschinenbau GmbH, Rheinfelden, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,801
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716295
Int. Cl.[4] B02C *17/16*
U.S. Cl. 241—66 **24 Claims**



1. A gap-type ball mill for continuous pulverization particularly breakdown of microorganisms, and dispersions of solids in a liquid, comprising:

(a) stator discs removably mounted in a mill housing, said stator discs being fixed at their outer edges;

(b) said stator discs being matched, at least in pairs to form a stator unit which extends generally radially and includes a rotationally symmetrical pulverization space unit;

(c) a rotor shaft connected to rotary drive and extending centrally through said stator unit and being at least indirectly rotationally-mounted at one end in said mill housing;

(d) said rotor shaft bears at least one easily replaceably rotor disc which, with two stator discs, forms a pulverization gap in said pulverization unit;

(e) the rotor disc extends generally radially outward from a longitudinal mill axis and in axial cross section forms a gap loop which is closed to the exterior; and

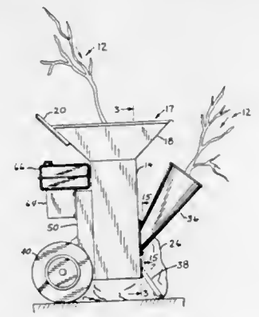
(f) said gap loop is short-circuited by preferably at least two ball return channels which extend radially outward from said mill axis and serve as centrifugal guiding structures.

4,824,034

APPARATUS AND METHOD FOR CHIPPING AND/OR SHREDDING BRANCHES AND THE LIKE

Herbert R. Baker, 2334 South 63rd St., West Allis, Wis. 53219

Division of Ser. No. 124,039, Nov. 23, 1987. This application Jul. 21, 1988, Ser. No. 222,637
Int. Cl.[4] B02C *13/30*
U.S. Cl. 241—101.2 **11 Claims**



1. An apparatus for shredding branches, limbs, twigs, leaves or like material, comprising:

a housing having a cavity disposed therein and a passage through which said material enters said cavity;

a rotatable shredding mechanism disposed within said cavity for shredding said material, said shredding mechanism including a drive shaft to which a drive sheave is connected;

a motor for rotatably driving said shredding mechanism, said motor including a rotatable motor shaft having a motor sheave connected thereto;

a belt provided about said motor sheave and said drive sheave; and

a clutch mechanism for selectively transferring rotary power from said motor to said shredding mechanism through said motor and drive sheaves, said clutch mechanism comprising:

a clutch sheave;

a movable clutch bar to which said clutch sheave is rotatably connected, said clutch bar being movable between an engaged position in which said clutch sheave tensions said belt about said motor sheave and said drive sheave so as to cause rotation of said drive sheave in response to rotation of said motor sheave, and a disengaged position in which slack is introduced into said belt so that rotation of said motor sheave is not transferred to said drive sheave; and

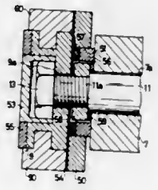
bias means for biasing said clutch bar toward said engaged position.

4,824,035

CAGE MILL

Sousuke Naito, Osaka; Hidekazu Takahashi, Tokyo; Shunzo Shimai, Togane; Toshio Watanabe, Osaka, and Yasuji Otsuka, Tokyo, all of Japan, assignors to Toshiba Ceramics Co., Ltd.; Kansai Zyari Kabushiki-Kaisha and Otsuka Iron Works, Ltd., all of, Japan

Filed Feb. 24, 1988, Ser. No. 160,017
Int. Cl.[4] B02C *7/04, 13/20*
U.S. Cl. 241—188 A **10 Claims**



1. A cage mill comprising:

a housing;

a disc rotatably supported within the housing;

a plurality of support shafts each fixed at one end to the disc so as to form a cage;

a band fixed to the other end of each of the support shafts;

a plurality of ceramic pins each having a through-hole;

a plurality of nuts for releasably fixing respective ones of the support shafts to the disc and the band;

the support shafts being loosely placed in the through-holes of the respective ceramic pins;

each of the support shafts having at an end thereof a small-diameter portion;

a plurality of press members each of which is set at the small-diameter portion of a respective one of the support shafts;

a plurality of ceramic spacers each contacting a respective end of each of the ceramic pins;

the ceramic spacers being positioned outside the press members, respectively;

a plurality of first rings made of a resilient material, each one of which is placed between a respective one of the press members and one of the ceramic pins inside the ceramic spacers;

a plurality of second rings made of a resilient material, each one of which is placed between a respective one of the ceramic spacers and the band; and

a plurality of ceramic linings fixed to the band, each one of which is positioned outside a respective one of the ceramic spacers so as to cover the second rings;

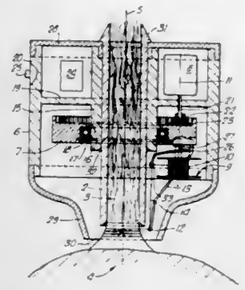
whereby, when the nuts are in a fixing condition, the first rings are pressed by the press members and the ceramic pins while the second rings are pressed by the ceramic spacers and the band.

4,824,036

APPARATUS FOR THE SPIRAL WINDING OF ELONGATED OBJECTS, ESPECIALLY STRANDS OF HAIR

Ramos K. Buta, Kohlenstr. 105, D-3500 Kassel, Fed. Rep. of Germany

Filed Oct. 1, 1987, Ser. No. 103,831
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1986, 8626352[U]
Int. Cl.[4] A45D *8/00*; B65H *81/06*
U.S. Cl. 242—7.19 **12 Claims**



1. An apparatus for spirally winding a winding material in the form of at least one thread, strip, ribbon or the like, around an elongated object, such as a thread, strip, strand, tube or rod, especially a strand of hair, said apparatus comprising: a casing; a tube mounted in said casing for receiving and protecting the object without exerting any stress thereon; said tube having a first axis and two ends; an annular disk mounted in said casing for rotation relative to said tube and having a central passage through which said tube passes; a motor mounted at said casing and coupled to said disk for rotating the disk about said tube; at least one spool for storing the winding material thereon and being mounted on said disk for rotation about a second axis; and at least one guide fastened to said disk and disposed slightly outside of, and in close vicinity of, one of said two tube ends, for guiding, and for winding, the winding material about the object in the vicinity of said one tube end, upon rotation of said disk by said motor.

4,824,037

APPARATUS FOR FREEING THE BOTTOM WRAPS AND THE DOWNWINDS OF YARN FROM A TEXTILE BOBBIN

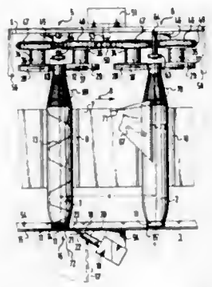
Egon Haberkorn, Radolfzell, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 83,266
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1986, 3627118
Int. Cl.[4] B65H *54/22, 67/08*
U.S. Cl. 242—35.6 E **12 Claims**

1. Apparatus for freeing the bottom wraps and the downwinds of yarn from a textile bobbin to provide a free yarn end in preparation for subsequent unwinding of said bobbin, said apparatus comprising a frame, means for supporting the bobbin on the frame in a generally vertical disposition, three rotatable rollers mounted on said frame for rotation about generally vertical axes and engagable with the circumference of said bobbin adjacent the upper end thereof for rotatable support of said bobbin, means for rotating at least one of said rollers, at least one of said rollers being mounted with its axis skewed in relation to the axis of at least one of the other rollers to provide

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rotational support of said bobbin by said rotating rollers independent of said bobbin supporting means, and means acting on said bottom wraps and downwind yarn of said rotating bobbin to free said yarn.

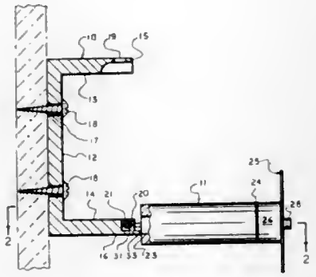


4,824,038

HOLDER FOR ROLLED PAPER

Jerry W. Chandler, 48 Upland Dr., Salem, Va. 24153

Continuation-in-part of Ser. No. 37,341, Apr. 13, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 202,463
Int. Cl.[4] B65H *19/00*
U.S. Cl. 242—55.2 10 Claims



1. A holder for a cylindrical roll of spirally wound toilet paper wherein various lengths are torn from the roll along perforations parallel to the axis of the rolle, said holder comprising:

(a) a generally U-shaped frame having a base portion and opposed parallel upper and lower arms perpendicularly emergent from said base portion and extending to distal extremities, said base portion having mounting means, the distal extremity of said upper arm having retaining means, and the distal extremity of said lower arm having first pivot means, and

(b) a cylindrical core having attached and free extremities, removable flange means located at said free extremity in perpendicular disposition to the axis of said core, and release means axially centered upon said flange means,

(c) second pivot means associated with said attached extremity and interactive with said first pivot means in a manner to define a horizontal axis of rotation and dispose said core vertically substantially within the boundaries of said frame while locked in said disposition by engagement of said release means with said retaining means, and enabling said core to be rotated 90 degrees downwardly about said horizontal axis of rotation to a horizontal disposition coextensive with said lower arm, and

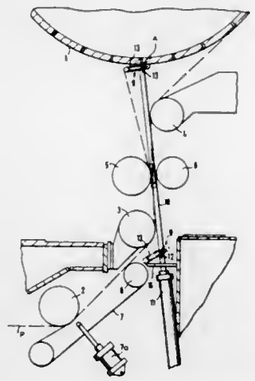
(d) abutment means interactive between said lower arm and said cylindrical core to provide structural stability of said core in its horizontal disposition.

4,824,039

APPARATUS FOR APPLYING A PAPER WEB TO THE UNDERSIDE OF A ROLL-MAKING DRUM

Georg Müller, Neuss; Gerhard Buschmann, Düsseldorf, and Peter Hoffmann, Korschenbroich, all of Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,897
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710143
Int. Cl.[4] B65H *19/28*
U.S. Cl. 242—65 7 Claims



1. An apparatus for lifting a leading end of a paper web and applying it to the underside of a paper-roll-making machine drum, comprising:

feed means for advancing a paper web beneath a paper-roll-making machine drum so that a leading end of said web lies below said drum;

an evacuatable suction box adapted to draw by suction said paper web at said leading end against an elastically deformable suction surface of said box;

a selectively raisable and lowerable lifting device disposed below said paper-roll-making machine drum and carrying said suction box to raise said suction box from a location at which said suction box engages said web to the underside of said paper-roll-making machine drum;

means for pivotally mounting said suction box on said lifting device for swinging movement about an axis generally parallel to an axis of said paper-roll-making machine drum, whereby said surface can assume an approximately vertical orientation as said paper web is lifted to the underside of said paper-roll-making machine drum; and

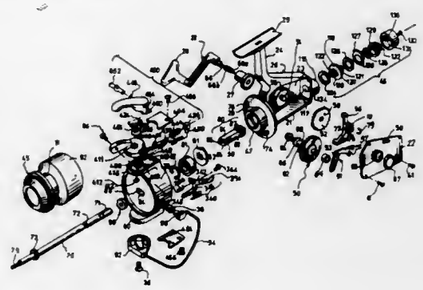
means for elastically biasing said suction box into a position in which said suction surface is generally vertical, said suction box being swingable upon approach to the underside of said paper-roll-making machine drum to press a leading end of said web with surface contact against said underside of said drum, said suction surface being elastically deformable by said paper-roll-making machine drum as said suction box is pressed thereagainst.

4,824,040

QUICK BAIL OPENING SYSTEM FOR FISHING REEL

Robert L. Carpenter, and Steven L. Swisher, both of Tulsa, Okla., assignors to Zebco Corporation, Tulsa, Okla.

Division of Ser. No. 820,579, Jan. 16, 1986, Pat. No. 4,676,450, which is a continuation of Ser. No. 568,746, Jan. 6, 1984, abandoned. This application Jun. 1, 1987, Ser. No. 36,978
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—84.2 G 7 Claims



1. In a spinning reel having a housing with a front and rear and having a stem and mounting shoe, a center shaft mounted in the housing, a spool mounted on the shaft for bolding a fishing line, a handle and gear train assembly mounted in the housing, a rotor coaxially mounted on the shaft and rotatable by cooperative movement of the handle and assembly, first and second bail ears carried by the rotor, first and second bail arms carried by the first and second bail ears respectively, and a movable bail mounted on the bail arms and having a closed retrieving position and an open casting position, the improvement comprising a bail actuating mechanism for moving the bail from the retrieving position to the casting position comprising:

(a) first and second pivot means for pivotally supporting the respective first and second bail arms on the bail ears;

(b) first post means pivotally mounted on the first bail ear in spaced apart relation to the first pivot means;

(c) second post means pivotally mounted on the first bail arm at a point offset laterally from the first pivot means;

(d) a guide means carried by one post means and being slidably received in the other post means;

(e) biasing means on the guide means for urging the first post means away from the second post means and for bolding the bail either in the retrieving position or in the casting position; and

(f) trigger means operatively associated with the first bail arm for pivoting the bail arm from the retrieving position toward the casting position whereby movement of the trigger means moves the guide means and biasing means from one side of a line passing through the first post means and the first pivot means to the other side of that line whereupon the biasing means drives the bail arms and bail into the casing position,

said trigger means including an elongate arm supported in cantilever fashion from said first bail arm so that the length of the trigger arm is aligned generally in a fore and aft direction with the bail in the retrieving position,

said arm on the trigger means extending forwardly beyond the bail and second bail arm with the bail in a retrieving position so that the trigger means arm is readily accessible to be grasped by a user and wherein pivoting the trigger means and first bail arm beyond the line joining the pivot means for the first bail arm and the first post means will permit the biasing means to drive the bail into the open casting position,

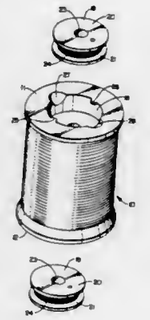
said trigger means arm further having a concave surface opening towards the centershaft axis to be engaged by the finger of a user in operating the trigger means.

4,824,041

BOBBIN-RECEIVING SPOOL FOR SEWING THREAD AND THE LIKE

Edward W. Myers, 729 Third St., Marietta, Ohio 45750

Filed Feb. 16, 1988, Ser. No. 155,963
Int. Cl.[4] B65H *75/02*
U.S. Cl. 242—118.41 5 Claims



1. In a bobbin-receiving spool for sewing thread and the like, said spool having a thread-receiving surface disposed between a pair of relatively apaced apart end surfaces and a bobbin-receiving cavity opening formed in at least one of said end surfaces, that improvement which comprises:

(a) Catch means integrally formed on said at least one end surface for releasably holding a bobbin in the bobbin-receiving cavity; and

(b) Access means integrally formed on said at least one end surface in spaced relation to the catch means for manually prying the bobbin out of said bobbin-receiving cavity.

4,824,042

UNIVERSAL PACKAGE HOLDER

Ross C. Whitaker, 2768 Tanglewood Dr., and Richard E. Edwards, 3729 Thrushwood Dr., both of Chattanooga, Tenn. 37415

Filed Apr. 26, 1988, Ser. No. 186,354
Int. Cl.[4] B65H *49/06*
U.S. Cl. 242—130 13 Claims

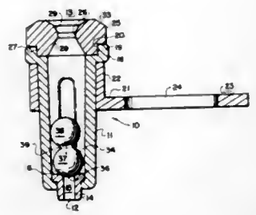


1. A universal package holder for holding packages having a tubular or conical interior and for securing the same to an external support, comprising:

a first support section formed in a first plane by first and second elongate resilient wire portions, said first and second wire portions being substantially parallel;

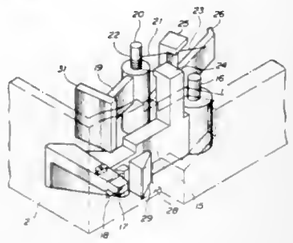
a second support section formed in a second plane by said first and second wire portions, said first and second planes forming an acute angle with respect to each other;
means at an end of said second support section which is distal from said first support section for preventing packages placed on the holder from sliding thereover and to provide vertical and horizontal stability for the package;
means at the end of the second support section which is distal from said first support section, to provide vertical and horizontal stability for the package by engaging the external support; and
means for attaching said first support section to the external support.

4,824,043
YARN TENSIONING DEVICE
Otto Zollinger, Spartanburg, S.C., assignor to Otto Zollinger, Inc., Spartanburg, S.C.
Filed Mar. 23, 1988, Ser. No. 172,289
Int. Cl.[4] B65H *59/24*
U.S. Cl. 242—149 **14 Claims**



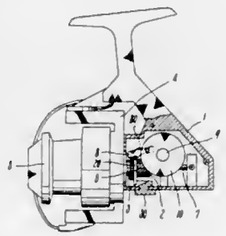
1. A yarn tensioning device comprising a housing having a yarn inlet and a yarn outlet for travel of yarn through said housing, said housing having an annular seat formed in said yarn inlet, a yarn tensioning element in said housing engagable on said seat for applying tension to a yarn traveling between said seat and said tensioning element, and a cap fixed against removal in said yarn outlet and having a yarn passageway therethrough smaller than said tensioning element to prevent removal or replacement of said tensioning element, said cap being formed with a frusto-conical inner annular surface tapering from said housing to said passageway.

4,824,044
TAPE CASSETTE
Takashi Oogi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 28, 1988, Ser. No. 149,504
Claims priority, application Japan, Feb. 10, 1987, 62-17228
Int. Cl.[4] G11B *23/087*
U.S. Cl. 242—198 **6 Claims**



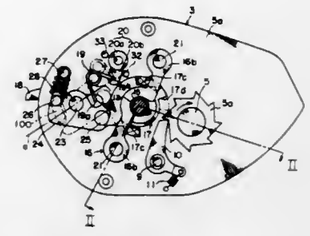
1. A tape cassette comprising:
a tape;
a casing for enclosing said tape therein and having an opening from which said tape can be drawn out;
a lid consisting of a front plate and a pair of side plates projecting from said front plate, said lid being rotatably supported on said casing at said side plates so as to cover said opening;
a support shaft mounted within said housing;
a lock lever rotatably mounted on said support shaft; and
biasing means for biasing said lock lever so that it is engaged with said lid in a closed state to cause said lid to be in a locked condition, said lock lever having an abutting portion for receiving a release pin movable along an axis so as to release the locked condition of said lid by rotating said lock lever against the biasing force of said biasing means, said axis being at a nominal distance from said support shaft which is subject to a mounting tolerance and said abutting portion having a surface inclined in the moving direction of the release pin so that said lock lever rotates through an angle that is substantially independent of fluctuations in said distance.

4,824,045
SPINNING REEL
Yuzo Kawabe, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Sep. 1, 1987, Ser. No. 91,897
Claims priority, application Japan, Sep. 3, 1986, 61-134989
Int. Cl.[4] A01K *89/02*
U.S. Cl. 242—219 **2 Claims**



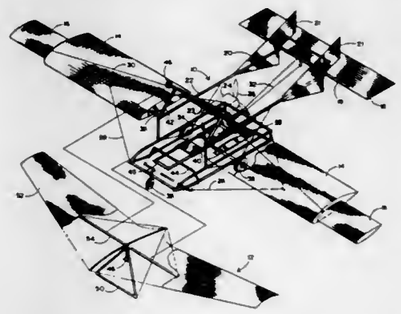
1. A spinning reel having a handle which is related to drive a rotary frame to wind a fishing line onto a spool, said reel comprising:
a reel body;
a handle shaft supported rotatably relative to said reel body and carrying a master gear and said handle;
a driving shaft for driving said rotary frame, said driving shaft carrying a pinion engaging with said master gear, said driving shaft being driven responsive to rotation of said handle shaft;
an anti-reverse-rotation gear means supported non-rotatably on said driving shaft for impeding reverse rotation of said driving shaft;
a retaining pawl means pivotally supported to said reel body for detachable engagement with said anti-reverse-rotation gear means;
a pawl control member supported rotatably on said driving shaft and including (i) an impeding portion for impeding said retaining pawl means from engaging with said anti-reverse-rotation gear means, (ii) an engagement-allowing portion for allowing said retaining pawl means to engage with said anti-reverse-rotation gear means and (iii) an engaging projection;
a friction means for enabling said pawl control member to rotate substantially in concert with rotation of said driving shaft during at least a portion of a complete revolution of said driving shaft;
an operating means supported movably to said reel body for changing positions of said impeding portion and said engagement-allowing portion of said pawl control member with respect to said retaining pawl means, said operating means being positioned at a bottom wall of said reel body near a side wall of said reel body and comprising (i) an abutting portion which abuts against said engaging projection of said pawl control member and (ii) an operating portion which projects outwardly from said reel body; and
a regulation means, cooperating with said engaging projection, for regulating a rotation range of said pawl control member.

4,824,046
CLUTCH MECHANISM FOR USE IN FISHING REELS
Masaharu Emura, and Takehiro Kobayashi, both of Fuchu, Japan, assignors to Ryobi Limited, Hiroshima, Japan
Continuation of Ser. No. 858,948, May 2, 1986, abandoned. This application Sep. 16, 1987, Ser. No. 98,748
Claims priority, application Japan, May 7, 1985, 60-67572[U]
Int. Cl.[4] A01K *89/02*
U.S. Cl. 242—220 **11 Claims**



1. A fishing reel, comprising:
a support;
a spool shaft rotatably mounted on said support and connected to a spool on which fishing line is stored;
a pinion coupled to handle for rotation thereby, said pinion being rotatably mounted on said support;
mean for enabling movement of said pinion along its axial direction;
means on said pinion and said spool shaft for locking one to the other to rotate jointly;
clutch means for moving said pinion between a pinion ON position in which the locking means is engaged for locking said spool shaft to the pinion to drivingly couple the handle to the spool shaft, and a pinion OFF position in which the locking means is disengaged to free said spool shaft from said pinion to enable payout of the fishing line, said clutch means including a clutch cam rotatably mounted to said support;
operating means for actuating said clutch means including a lever rotatably mounted at a point on said support and coupled to said clutch cam, said lever having a lever ON position corresponding to a clutch cam ON position in which said clutch means places the pinion in said pinion ON position, and said lever having a lever OFF position in which said clutch means places the pinion in said pinion OFF position;
a flipping cam coupled for movement relative to said support, said movement involving only rotation, with such rotation being around an axis substantially perpendicular to said support, and stopping means for limiting a swing angle of said flipping cam between a first position and a second position;
resilient means connected between said lever and said flipping cam such that rotation of said flipping cam causes movement of said resilient means between a flipping position when the flipping cam is in its first position, and a non-flipping position when said flipping cam is in its second position, said resilient means, in its non-flipping position, urging said lever to its lever ON position, when said lever is in said lever ON position, urging said lever to its lever OFF position when said lever is in the lever OFF position, and urging said flipping cam toward its said first position, said resilient means, in its flipping position, urging said lever to its lever ON position both when said lever is in the lever ON position and when said lever is in the lever OFF position, and urging said flipping cam toward its said second position;
whereby when the flipping cam is in its first position, the lever remains in whichever one of the lever ON and lever OFF positions it is placed and the flipping cam is maintained by the resilient means in its first position, while with the flipping cam in its second position, the lever remains in its lever OFF position only while force is applied to rotate the lever from its lever ON to its lever OFF position against an urging force of the resilient means, and the flipping cam is maintained by the resilient means in its second position.

4,824,047
HANG GLIDER LAUNCH VEHICLE
William R. Chadwick, 3621 W. Crystal La., Santa Ana, Calif. 92704
Continuation of Ser. No. 29,168, Mar. 23, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 203,484
Int. Cl.[4] B64D *5/00*; B64C *37/02*
U.S. Cl. 244—2 **8 Claims**



1. A piloted launch vehicle having aerodynamic surfaces for carrying a hang glider having a support frame and a hang glider pilot aloft and releasing the glider for free flight; the vehicle comprising:
frame means for supporting said aerodynamic surfaces, said frame means including means for supporting said launch vehicle pilot and said glider pilot within said frame means to permit unaided vocal communication therebetween;
means for powering and controlling said vehicle coupled to said frame means;
means for supporting said hang glider in flight-ready configuration on said vehicle coupled to said frame means, said means for supporting said hang glider being releasably coupled to said glider support frame at both an upper and a lower portion thereof; and,
means for selectively releasing said hang glider from said vehicle by said glider pilot coupled to said means for supporting said hang glider at a desired altitude.

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4,824,048

INDUCTION LIFT FLYING SAUCER

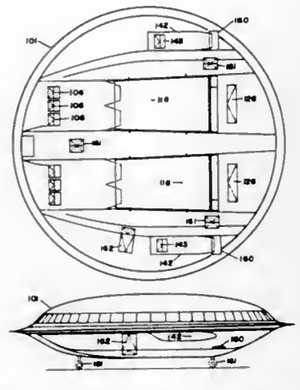
Kyusik Kim, 5026 Rhoads Ave., Santa Barbara, Calif. 93111

Continuation-in-part of Ser. No. 849,116, Apr. 7, 1986, Pat. No. 4,651,953, which is a continuation of Ser. No. 701,856, Feb. 14, 1985, Pat. No. 4,667,900, which is a continuation of Ser. No. 240,615, Mar. 5, 1981, Pat. No. 4,429,775. This application Mar. 16, 1987, Ser. No. 27,174

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] B64C *39/06*

U.S. Cl. 244—12.2 **3 Claims**



1. An inductive lift flying saucer comprising:

a circular airframe having an aerodynamic outer surface and a central power plant housing section;

an aerodynamic generating channel having an elongated main generating channel located in the central power plant housing section and defined by an inlet adjacent a jet engine which communicates with the main generating channel, an upper portion defining a reverse flow channel and wherein the lower portion and outlet of the main generating channel is opened and is part of said main generating channel;

a vacuum cell induction lift wing airfoil including a leading edge and a trailing edge and having a top panel and an acoustically treated hollow interior, said airfoil including airtight partitions forming individual cells within said hollow interior and having inclined slots which extend from the top panel of said airfoil into each of said individual cells, said inclined slots extending at an angle from each of said individual cells toward the trailing edge of said airfoil, said airfoil being adapted to be positioned within an aerodynamic generating channel in the lower portion thereof and spaced from the upper portion forming said elongated channel with the top panel of the airfoil being adapted to form a lower boundary of a said aerodynamic generating and forming an outlet for the main generating generating channel between the trailing edge of the airfoil and the rearward section of the upper portion forming the reverse flow channel and being adapted to define a slipflow thereacross from an airstream passing through a said aerodynamic generating channel;

support means operatively coupled to said airfoil adjacent the trailing edge for enabling said airfoil to be rotated therearound to change the angle of incidence of the top panel to a said airstream passing thereacross; and

pivoting means actuators operatively coupled to said airfoil adjacent the leading edge for moving said airfoil leading edge relative to a said airstream by rotating said airfoil around said support means to change the angle of incidence of said top panel relative a said airstream enabling a said airflow to generate a vacuum within said individual cells having a pressure which is determined by the angle of incidence of the top panel of the airfoil to the said airstream and by the shearing stress of a said airstream passing over said inclined slots in the top panel of said airfoil.

4,824,049

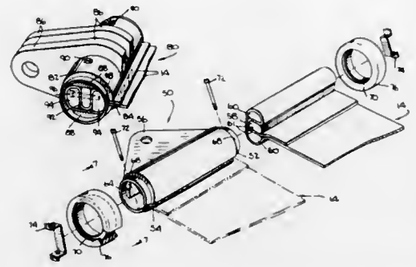
MECHANICAL COUPLING FOR TAPE

Terence C. Kelly, Sr., Swarthmore, Pa., assignor to Wickes Manufacturing Company, Southfield, Mich.

Filed Nov. 24, 1987, Ser. No. 124,721

Int. Cl.[4] B64F *1/02*

U.S. Cl. 244—110 C **8 Claims**



1. An aircraft arresting system coupling for connecting an aircraft engaging pendant and an energy absorber drive tape comprising:

an elongated hollow coupling body which is at least as long as the tape is wide and which has at least one open end,

a plurality of clamping bars having complementary tape gripping surfaces for frictionally restraining the tape from sliding therebetween,

said clamping bars having a size and shape that when their complementary surfaces are applied to the opposite sides of the tape, the assembly of tape and clamping bars can pass through the open end of the coupling body into the hollow interior of the coupling body,

said coupling body having an axial slot extending therethrough which starts at an open end of the coupling body and has a width and length which is at least equal to, respectively, the thickness and width of the tape, whereby a section of the tape which is connected to the arresting system can pass through the slot as the assembly of the clamping bars and the tape is inserted into the hollow interior of the coupling body through its open end, and

a bracket means for connecting said coupling body to the aircraft engaging pendant, said bracket means being affixed to said coupling body opposite to said slot, whereby when the coupling is in operation and the pendant and tape are in tension, the coupling has through-the-center loading.

4,824,050

CARGO TRAY FOR USE IN AIRCRAFT

Jack P. Courter, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 2, 1987, Ser. No. 69,518

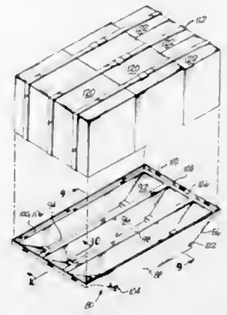
Int. Cl.[4] B64D *9/00*; **B64C** *1/20*

U.S. Cl. 244—118.1 **33 Claims**

1. In an aircraft compartment of the type having a floor and sidewalls curving upwardly and outwardly from the floor, the combination comprising:

cargo conveyor and restraint means secured to the floor; said means including roller means for supporting and aiding the positioning of cargo units, and carrier restraint means located along opposite outboard portions of the floor; and

at least one cargo tray having a substantially continuous bottom wall, a substantially rectangular flat horizontal peripheral lip, opposite sidewalls that slope downwardly and inwardly from the lip to the bottom wall to conform the configuration of the tray and cargo carried thereby to the compartment sidewalls, engagement means carried by said opposite sidewalls for engaging the carrier restraint



means, and at least one support surface extending between opposite sides of the lip substantially on a single horizontal plane with the lip; said lip and said support surface being positioned and dimensioned to provide spans between said support surface and said lip that are less than a minimum dimension of rectangular boxes with various standardized dimensions.

4,824,051

ORBITAL SYSTEM INCLUDING A TETHERED SATELLITE

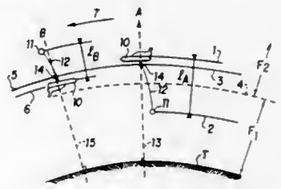
Uwe Engelking, Bonn, Fed. Rep. of Germany, assignor to Agence Spatiale Europeenne, Paris, France

Filed Jan. 12, 1987, Ser. No. 2,034

Claims priority, application France, Jan. 16, 1986, 86 00540

Int. Cl.[4] B64G *1/10*

U.S. Cl. 244—158 R **15 Claims**



10. A method of operating an orbital system having a platform connected by a cable to a satellite, comprising the steps of:

(a) placing the system in orbit;

(b) passing the system at least part of the time in an F_2 layer of the ionosphere;

(c) operating a winch means to wind the cable out to deploy the satellite;

(d) subsequently selectively operating said winch means to wind the cable in synchronism with the systems natural frequency angular oscillations to dampen said oscillations; and

(e) further selectively operating said winch means in synchronism with said oscillations to dampen or to excite the oscillations thus enabling a transfer between a propulsion and a measurement configuration in which the satellite is disposed above and below said platform respectively, said satellite being disposed above said platform with said system passing in the F_2 layer of the ionosphere to substantially eliminate air drag on said cable in the propulsion configuration.

4,824,052

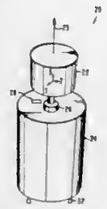
NUTATION SENSOR AND NUTATION CONTROL SYSTEM FOR A DUAL-SPIN STABILIZED SATELLITE

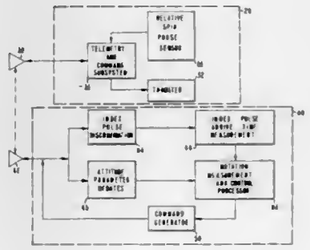
John W. Smay, Torrance; John F. Yocum, Jr., Rancho Palos Verdes, and Eugene Gonzalez, Jr., Hawthorne, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 18, 1987, Ser. No. 63,373

Int. Cl.[4] B64G *1/38*

U.S. Cl. 244—170 **18 Claims**





1. A nutation control system for a dual-spin stabilized device having a nominally spun rotor and a nominally despun platform, said system comprising:

a relative spin phase sensor for sensing the relative spin phase between said rotor and said platform and for providing successive signals indicative thereof;

means for receiving said signals from said spin phase sensor and for calculating the nutation of said device from the relative positions of successive relative phase signals; and

means for applying a torque to said device to reduce the nutation of said device.

4,824,053

TELESCOPIC WING

Branko Sarh, 2957 Devonshire Rd., Riverside, Calif. 92506

Filed Aug. 27, 1987, Ser. No. 90,545

Int. Cl.[4] B64C *3/56*

U.S. Cl. 244—218 **20 Claims**

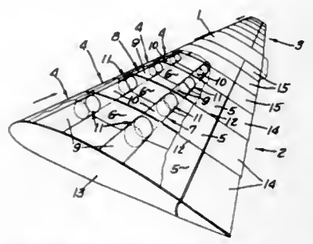
1. An extendable and retractable spar comprising:

a plurality of tubular spar sections arranged on a common axis, with each spar section overlapping the adjacent spar sections;

alternate spar sections being rotatable, and intermediate spar sections being non-rotatable;

thread means interconnecting the overlapping portions of said spar sections, the thread means at one end of each spar section being of right-hand direction, and the thread means at the other end being of left-hand direction;

said thread means including a rolling element bushing interposed between the overlapping portions of said spar sections, said rolling element bushing consisting of a plurality of rolling elements running in helical grooves formed in opposed surfaces of said overlapping spar sections, and a



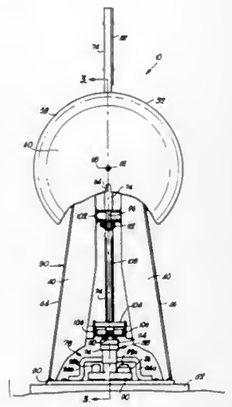
cage confining said rolling elements so that they remain in the same relative positions to one another at all times; and means for rotating said rotatable spar sections, thereby causing the spar to extend or retract depending upon the direction of rotation.

4,824,054

RAILROAD SWITCH STAND

Edward Kohake, 413 Rice Rd., Silver Lake, Kans. 66539, and John T. Butler, 3000 SW. Gisbourne, Topeka, Kans. 66614

Continuation of Ser. No. 1,743, Jan. 9, 1987, abandoned. This application Jun. 28, 1988, Ser. No. 214,894
Int. Cl.[4] B61L *5/02*
U.S. Cl. 246—406 **7 Claims**



1. A switch stand for use with a railroad switch in order to enable a person to operate the switch between open and thrown positions, the switch having an elongated, generally horizontally disposed throw rod by which alternate, longitudinal movement thereof operates the switch between respective corresponding open and thrown positions, said switch stand comprising:

a hand-operable, rotatable member rotatable about a generally horizontal axis and including a graspable portion spaced from said axis for grasping by the person and for rotating said member about said horizontal axis;

means rotatably mounting said member with said horizontal axis about normal chest height of the person for rotation thereof about said horizontal axis;

an elongated, upright, rotatable throw shaft rotatable about an upright axis, said throw shaft presenting a lower portion located generally at the level of the throw rod and a remote upper portion extending upwardly at least to about the height of said horizontal axis;

attachment means intercoupling said member with said upper portion for translating rotation of said member about said horizontal axis into corresponding rotation of said shaft about said upright axis; and

securement means separate from said attachment means for intercoupling said lower portion of said shaft with the throw rod and for translating rotation of said shaft about said upright axis into corresponding longitudinal movement of the throw rod,

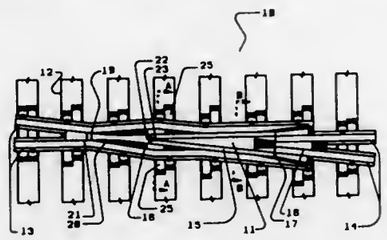
said switch stand being thereby structured so that the person may grasp the rotatable member at normal chest height and without bending over rotate said member about said horizontal axis in order to move the throw rod between the open and thrown positions.

4,824,055

RAILROAD FROG

Allen J. Tuningley, Delta; Keith M. Barlow, New Westminster, and Thomas R. Stanley, Vancouver, all of Canada, assignors to Nortrak Limited, Richmond, Canada

Filed Feb. 2, 1987, Ser. No. 9,731
Int. Cl.[4] E01B *7/10*
U.S. Cl. 246—458 **14 Claims**



1. A railroad FROG casting comprising:

a main casting portion having a top area of triangular shape;

a heel extension at one end of said main casting portion;

said top area widening toward said heel portion;

means defining flangeways adjacent opposite sides of said top area;

said flangeways converging towards a throat; and

said throat extending towards a toe;

a plurality of solid sections spaced apart along said casting and each comprising a solid mass of metal extending to opposite side surfaces of said casting and from top to bottom of said casting;

a plurality of downwardly open recesses spaced apart along said casting and formed in the underside of said casting between successive ones of said solid sections; and

supporting structures integral with said solid sections and bridging said recesses.

4,824,056

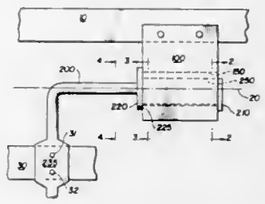
SUSPENSION SYSTEM HANGER MEANS FORMED BY COLD FORMING PROCESSES

Robert A. Wuebker, Westerville; Ova A. Helton, Columbus; Albert R. Roggeman, Stryker, and Thomas P. Switzer, Baltimore, all of Ohio, assignors to General Signal Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,601
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—60 **6 Claims**

1. In a suspension system, for suspending a vehicular muffler or exhaust system element underneath a vehicular frame, having a hanger means an isolator means having opposing sides,

formed with a passageway therethrough and adapted to be connected to said hanger means by insertion of a length of said hanger means into said passageway, and having said hanger means and said isolator means connected between the vehicular muffler or exhaust system element and the vehicular frame, the improvement comprising a pair of raised portions on that length of said hanger means adjacent to and inserted into said passageway, said raised portions being separated by an intermediate portion having a length approximately equal to the length of said passageway such that, upon insertion of said



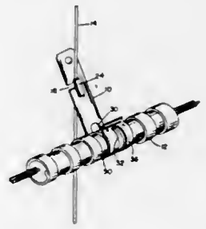
hanger means into and through said passageway, said raised portions are adjacent and substantially in contact with said opposing sides of said isolator means at said passageway so as to restrict motion of said hanger means within and along said passageway in either direction by engaging the exterior of said isolator means, said passageway being surrounded by flexible material and the width or diameter of the passageway opening being approximately equal to the width or diameter of the intermediate portion of said hanger means which may be inserted in said passageway.

4,824,057

HANGER

Paul W. Suprono, East Greenwich, R.I., assignor to Nortek Corporation, Providence, R.I.

Filed Sep. 23, 1987, Ser. No. 100,337
Int. Cl.[4] E21F *17/02*
U.S. Cl. 248—62 **10 Claims**



1. A hanger for suspending armored cable from a vertical wire, said hanger having a mechanism for grasping said wire, said mechanism including

a notch having a sharp edge for engaging a surface of said wire,

a flexible finger adjacent said notch and associated with said sharp edge for applying a force to press said sharp edge against said wire to prevent said hanger from slipping down along said wire, and

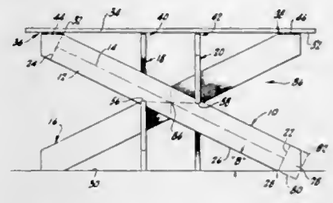
a slot which extends from an edge of said hanger to said notch and into which said wire may be slipped to reach a position where said sharp edge engages said wire and said finger applies said force to press said sharp edge against said wire.

4,824,058

TABLE BASE

Scott Glendinning, 5515 Doyle St. #2, Emeryville, Calif. 94608

Filed Dec. 14, 1987, Ser. No. 132,217
Int. Cl.[4] F16M *11/32*
U.S. Cl. 248—764 **7 Claims**



1. A universal support structure capable of being assembled with like structures to form a base for a platform, comprising:

an elongated member extending along an axis having a selected length and including a transverse thickness dimension along said axis; said elongated member including first and second opposite edge portions extending along said axis;

said member including a first slot having a floor and one flat wall portion, the transverse distance along said floor being at least equal to said transverse thickness dimension of said elongated member, said first slot being open toward said first edge portion of said elongated member, said one flat wall portion of said first being substantially perpendicular to said axis;

said elongated member including a second slot having a floor and one flat wall portion, the traverse distance along said floor being at last equal to said thickness dimension of said elongated member, said second slot being open toward said opposite second edge portion of said elongated member said one flat wall portion of said second slot being substantially perpendicular to said axis; and,

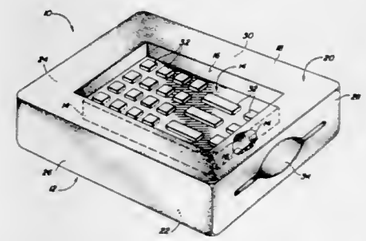
said center of said floors of said first and second slots lying equidistance from the center of said axis, said floor of said first slot being substantially identical, dimensionally, to said floor of said second slot.

4,824,059

CUSHIONING DEVICE FOR REMOTE CONTROL TELEVISION EQUIPMENT, AND ASSEMBLY THEREOF

Les L Butler, 13028 Valleyheart Dr., #205, Studio City, Calif. 91604

Filed Feb. 1, 1988, Ser. No. 150,851
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—176 **8 Claims**



1. An improved cushioning device for remote control television equipment, said device comprising a stretchable, resilient elastomeric block having a closed bottom and sides and a top with an open cavity therein adapted to grippingly receive a remote television control panel, and having it available for

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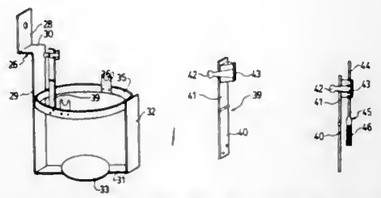
immediate use while in said block, said block also having an opening in one side thereof in communication with said cavity for passage of wires and radio signals from said remote control panel to television equipment wherein said block has a pocket in another side thereof for reception of a television program guide magazine.

4,824,060

PAINT CAN HOLDER FOR HOLLOW RUNG LADDERS

Edward S. Korda, 244 Moorgate St., Winnipeg, Manitoba, Canada R3J 2L2

Filed Mar. 23, 1988, Ser. No. 171,965
Claims priority, application Canada, Apr. 7, 1987, 534098
Int. Cl.[4] E06C 7/14
U.S. Cl. 248—210 16 Claims



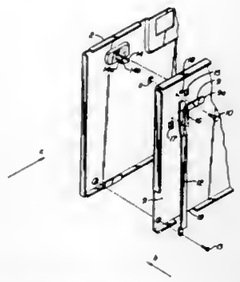
1. A holder for paint cans and the like for use with ladders having hollow rungs comprising in combination a ladder rung engaging shaft, means on one end of said shaft to detachably retain same in the ladder rung, means on the other end of said shaft to detachably clamp same into the ladder rung and further means on said other end of said shaft to detachably retain and support a container offstanding from said other end of said shaft and clear of the associated ladder, said means to retain said shaft in the ladder rung including a swing latch plate pivoted adjacent one end thereof to said shaft and normally swinging by gravity to a substantially retaining position perpendicular to the axis of said shaft.

4,824,061

MOUNTING ASSEMBLY FOR COOKING APPLIANCES

Yoshimitsu Sumikama, Nara, and Yoshihiro Aramaki, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 82,691, Jul. 20, 1987, abandoned, which is a continuation of Ser. No. 775,828, Sep. 13, 1985, abandoned.
This application Jan. 25, 1988, Ser. No. 147,437
Claims priority, application Japan, Oct. 24, 1984, 59-161669[U]
Int. Cl.[4] F24H 9/06
U.S. Cl. 248—225.2 4 Claims



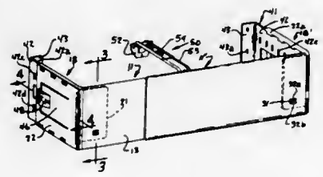
1. A mounting assembly for mounting a cooking apparatus with a back plate on a vertical wall, said assembly comprising
a mounting plate adapted to be secured vertically to said wall, bottom sections of said back and mounting plates being engageable with respect to each others, and
at least one set of securing means for securing said plates together, said one set of securing means including
a latch head affixed at an upper part of either one of said plates and protruding horizontally therefrom, said latch head having a step-like hooking section and a sloping surface in front of said hooking section,
an elongated operating lever disposed vertically,
means for affixing said elongated operating lever to said bottom sections of said back and mounting plates after said plates are secured together,
a lock lever rotatably supported around an axis at an upper part of the other of said plates and rotatably connected to said operating lever, and
a biasing means for applying a biasing force on said lock lever around said axis,
said securing means being so structured that said sloping surface presses said lock lever against said biasing force to rotate said lock lever around said axis and to engage said lock lever with said hooking section as said plates are caused to approach each other.

4,824,062

CURTAIN ROD AND END BRACKET ASSEMBLY

John S. Wagner, Madison, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed Aug. 25, 1988, Ser. No. 236,610
Int. Cl.[4] A47H 1/10
U.S. Cl. 248—265 12 Claims



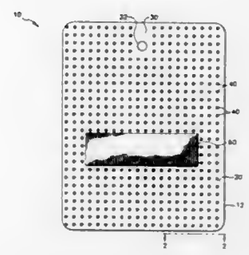
1. A curtain rod and bracket assembly comprising, at least one elongated rod member having a front wall and upper and lower U-shaped flanges extending lengthwise along a rear side of the front wall, corner bracket means having a generally upright rod support panel means and a generally upright mounting panel means extending rearwardly from the rod support panel means and integral therewith, the rod support panel means having a front face adapted to engage the rear side of the front wall of the rod member, the rod support panel means having upper edge means and being constructed and arranged to extend into the upper flange on the rod member adjacent one end thereof and support the rod member for pivotal movement about the upper edge means toward and away from the front face of the rod support panel means, latch means on the rod support panel means spaced below the upper edge means and engageable with the rod member when the latter is pivoted about the upper edge means into engagement with the front face of the rod support panel means for releasably retaining the rod member against pivotal movement away from the front face of the rod support panel means, and means for attaching the rod corner bracket means to a support surface.

4,824,063

DRYING BOARD

Arthur F. Miller, 766 Carnation Lane, Fallbrook, Calif. 92028

Continuation-in-part of Ser. No. 36,335, Apr. 9, 1987, abandoned. This application May 23, 1988, Ser. No. 197,691
Int. Cl.[4] A47B 91/00
U.S. Cl. 248—346 14 Claims



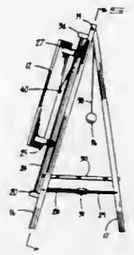
1. A device for supporting a freshly coated article during drying comprising:
a rigid support structure; and
a plurality of rigid upright projections extending upward from said support structure; each projection including:
a base connected to said support structure; and
a terminating upper end;
and wherein:
said upper ends of said projections define a support plane for substantially uniformly supporting a freshly coated article during drying; and
said projections are spaced apart to allow air flow to the supported side of the coated article; and wherein
said support structure includes a gripping portion devoid of said projections.

4,824,064

VERTICAL DRAWING BOARD

Russell P. Oncale, 506 Parish Rd., Thibodaux, La. 70301

Filed May 3, 1988, Ser. No. 189,951
Int. Cl.[4] A47B 19/00
U.S. Cl. 248—441.1 4 Claims



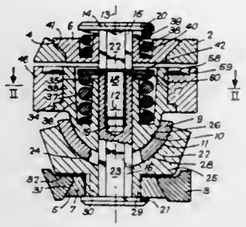
1. A vertical drawing board, comprising:
a generally rectangular drawing board;
a pair of spaced A-frames;
an elongated slide guide rod mounted on each of said A-frames;
journal bearing means mounting said drawing board for sliding adjustment along said slide guide rods;
a pulley secured at an apex of one of said A-frames;
a cable around said pulley having one end secured to said drawing board and having a counterweight secured to an opposite end;
and
a ratchet actuation mechanism connected to said pulley for enabling adjustment of said drawing board in discreet increments.

4,824,065

REARVIEW MIRROR FOR VARIOUS VEHICLES UTILIZING FRICTION BEARING SURFACE

Stéphane Manzoni, Saint-Claude, France, assignor to Societe Manzoni Bouchot, France

Filed Jan. 22, 1988, Ser. No. 146,979
Claims priority, application France, Jan. 23, 1987, 87 00796
Int. Cl.[4] A47G 1/24
U.S. Cl. 248—483 10 Claims



1. A rearview mirror for a vehicle, said rearview mirror comprising:
a casing having a forked extension portion defining two arms, each arm of said forked extension portion having a bore therein, each said bore of each of said arms having a central axis axially aligned to define a transverse axis, each said bore further being circumscribed by a conical seat;
a first conical jaw mounted to said conical seat of one of said bores in one of said two arms, said first conical jaw having a passage therein;
a second conical jaw mounted to the other conical seat of the other of said bores in the other of said two arms;
a fixed cylindrical jaw juxtaposed said second conical jaw, said fixed cylindrical jaw being spaced a predetermined distance from said second conical jaw and one of said arms to allow movement of said fixed cylindrical jaw relative to said other of said conical seat, said fixed cylindrical jaw having a passage therein;
a fixed base mounted to said vehicle, said fixed base having a cylindrical extension portion, said cylindrical extension portion interposed between said fixed cylindrical jaw and said mobile cylindrical jaw for intimate communication therewith, said cylindrical extension portion further having a passage therein;
means for pivoting said casing in a first predetermined direction a predetermined distance about said transverse axis; and
means for tilting said mobile cylindrical jaw in a second predetermined direction, said second predetermined direction being about the locus of said mobile cylindrical jaw.

4,824,066

APPARATUS FOR AIDING IN THE STORING AND PRESERVING OF DONOR CORNEAS

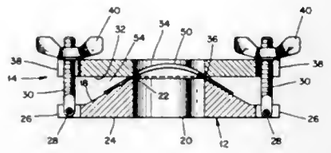
S. Gregory Smith, Cloud Farm, Nine Gates Rd., Yorklyn, Del. 19736

Continuation of Ser. No. 483,636, Apr. 11, 1983, abandoned.
This application May 25, 1988, Ser. No. 203,565
Int. Cl.[4] A61B 19/00
U.S. Cl. 248—500 10 Claims

1. Apparatus for aiding in the storing and preserving of a human cornea to be subsequently transplanted comprising a

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first relatively rigid plate member having a raised central section providing a first surface formed with a first circular opening therein having a diameter on the order of 12 millimeters to provide one relatively sharp, line-like edge for bearing against only the sclera of the cornea to be preserved, said first surface sloping downwardly from said one relatively sharp, line-like edge at an angle to a location spaced sufficiently from said one edge so as to underlie and support all of the sclera integral with the human cornea to be preserved, said angle corresponding to that forming the natural concavity of the sclera of the human cornea so as to provide said support, a second relatively rigid plate member providing a second surface formed with a second



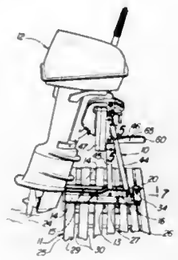
circular opening therein to provide a second relatively sharp, line-like edge registrable with, and of a size also on the order of 12 millimeters so as to be engageable with said one relatively sharp, line-like edge of the first circular opening in the absence of a cornea, said first and second surfaces diverging outwardly from the edges of said relatively sharp, line-like first and second openings, and spaced respective clamping means acting in a direction to pull said members toward each other, said openings adapted to accommodate therein the cornea to be preserved free of engagement by said first and second members in that only the relatively sharp, line-like edges of said first and second openings bear against the sclera integral with the cornea to be preserved.

4,824,067

REMOVABLE OUTBOARD MOTOR BRACKET FOR A BOAT SWIM PLATFORM

Timothy P. O'Brien, 6748 Donnybrook, Utica, Mich. 48087

Filed Jul. 5, 1988, Ser. No. 215,332
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—642 **7 Claims**



3. A removable outboard motor bracket adapted to be detachably mounted on a swim platform on the rear end of a power boat, including:

(a) a mounting means adapted to be seated on the swim platform;

(b) retaining means for detachably securing the mounting means on the swim platform;

(c) a linkage assembly pivotally attached to said mounting means;

(d) an outboard motor mounting pad mounted on an attachment means which is pivotally supported by said linkage assembly, and wherein said linkage assembly is movable manually between a lowered position, where an outboard motor carried on said mounting pad is in an operative position, and a raised position where the outboard motor is held in a vertical inoperative position;

(e) means for locking the linkage assembly in the lowered and raised positions;

(f) said linkage assembly includes a front elongated link, and a rear elongated link which is shorter in length than the front link;

(g) said links each having a lower end pivotally mounted on said mounting means with said link lower ends being longitudinally spaced apart, with the lower end of the front link positioned forwardly of the lower end of the rear link;

(h) said outboard member mounting pad attachment means being substantially vertically disposed in both the lowered and raised positions; and,

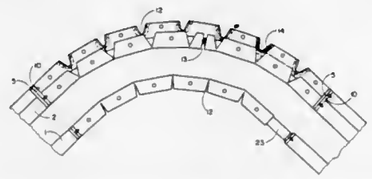
(i) the upper ends of the front and rear links being pivotally connected to the outboard motor mounting pad attachment means with the rear link upper end being disposed below and apart from the front link upper end.

4,824,068

FLEXIBLE FORM FOR STREET AND SIDEWALK CURBS

Guy Ferland, 749 Seigneuriale, Beauport, Québec, Canada G1B 2B4

Filed Jun. 15, 1988, Ser. No. 206,747
Int. Cl.[1] E01C *19/50*
U.S. Cl. 249—2 **4 Claims**



1. A flexible form for pouring concrete to form a curved wall, said form including spaced inner and outer "C" channels each having a web interconnecting a pair of vertically spaced wings in which each wing has a plurality of first Vee openings spaced longitudinally along the channel and a spring straddling each opening, the ends of said spring being fixed to each side of the Vee opening, each spring being in a neutral unbiased state when the web adjacent to the Vee opening is straight, and exerting a bias when the web is curved either way from said straight condition.

4,824,069

MOLD ASSEMBLY FOR PRODUCING SKIN-COVERED FOAMED PLASTIC ARTICLE

Makoto Shoji, and Yoshitoshi Oshikawa, both of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

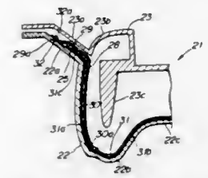
Filed Jun. 29, 1988, Ser. No. 212,793
Claims priority, application Japan, Aug. 28, 1987, 62-131212[U]
Int. Cl.[4] B29C *33/14*
U.S. Cl. 249—91 **8 Claims**

1. A mold assembly for producing a skin-covered foamed plastic article, comprising:

a lower mold having a cavity formed therein, said lower mold having a first skirt portion which extends around a mouth of said lower mold;

an upper mold which is to be put on said lower mold to close said cavity, said upper mold having a second skirt portion which is mated with said first skirt portion of said lower mold when these two molds are properly coupled; and

a holding plate which is detachably connected through fastening means to the first skirt portion of said lower mold, the holding plate including a first portion which is detachably connected to said first skirt portion and a second portion which extends over an inner wall portion of the cavity of the lower mold,



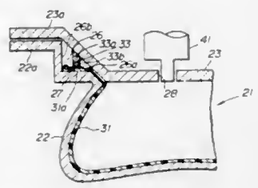
whereby when a bag-shaped outer skin member is properly set in the cavity, said holding plate presses a given portion of said outer skin member against the inner wall of said cavity.

4,824,070

MOLD ASSEMBLY FOR PRODUCING SKIN-COVERED FOAMED PLASTIC ARTICLE

Hisayoshi Mizuno, and Masami Mori, both of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 29, 1988, Ser. No. 212,792
Claims priority, application Japan, Sep. 30, 1987, 62-149758
Int. Cl.[4] B29C *33/14*
U.S. Cl. 249—93 **8 Claims**



1. A mold assembly for producing a skin-covered foamed plastic article, comprising:

a lower mold having a cavity formed therein, said lower mold having a first flange portion which extends around a mouth of said lower mold;

an upper mold which is to be put on said lower mold to close said cavity, said upper mold having a second flange portion which is mated with said first flange portion of said lower mold when the two molds are properly coupled;

means defining at an inboard side of said first flange portion a recess which is defined by a horizontal wall and a vertical wall;

a press plate which is pivotally connected to said horizontal wall of said recess;

biasing means for biasing said press plate in a direction to achieve an abutment with said horizontal wall; and

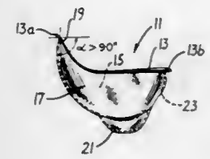
a press structure provided on and extending from said second flange portion of the upper mold, said press structure abutting on the press plate to press the same toward the horizontal wall when said upper mold is properly mounted on the lower mold.

4,824,071

AN APPARATUS USED TO FABRICATE A CUSTOM FEMALE URINE COLLECTION DEVICE

Karen Duffy, Devon; Helfer, Joel, Chesire, and Terese Campion, Waterbury, all of Conn., assignors to Chesebrough-Pond's, Inc., Greenwich, Conn.

Division of Ser. No. 628,463, Jul. 6, 1984, abandoned. This application Aug. 6, 1987, Ser. No. 65,325
Int. Cl.[4] B29C *39/24, 39/26*
U.S. Cl. 249—117 **4 Claims**



1. A device for taking an impression of the female urogenital region for use in fabricating a customized female urine receptacle comprising:

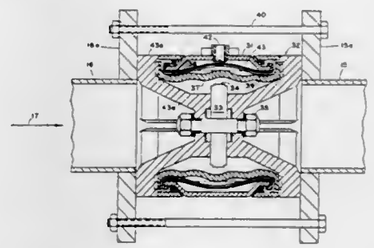
a receptacle having a rim and connecting wall portions which together define an opening, said device when used being oriented generally in a ventral-dorsal direction, wherein the dorsal end of said receptacle is tapered and the dimensions of the receptacle are such that the device may be positioned interiorly of the labia major and the opening defined by the rim and wall portions being sufficient to surround the urethral opening; said device having an opening in the wall portion and means for introducing an impression forming material through said opening in the wall portion.

4,824,072

TUBE-DIAPHRAGM VALVE

Avi Zakai, Rishon Le-Zion, Israel, assignor to Mil Mutzarim Techniim (1971) B.M., Holon, Israel

Continuation-in-part of Ser. No. 550,039, Nov. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 363,822, Mar. 31, 1982. This application Jul. 21, 1987, Ser. No. 78,003
Int. Cl.[4] F16L *55/14*
U.S. Cl. 251—005 **4 Claims**



1. A tube diaphragm valve for controlling hydraulic flow therethrough, said valve comprising

valve casing means;

inlet and outlet port means spaced apart in said casing means along a longitudinal axis of said casing means;

an impervious stationary disc-like barrier located in a substantially median position in said casing means normal to said longitudinal axis;

sets of radially spaced apart support limbs, a first pair of extremities of said limbs being respectively secured to opposite sides of said barrier, a second and opposite pair of

extremities of said limbs being secured to said casing means, respectively adjacent said inlet and outlet port means;

a resilient tubular diaphragm surrounding said barrier and said support limbs and extending substantially from port to port, having ends of said diaphragm secured to said casing means;

said diaphragm having a valve closed position when abutting said barrier thereby preventing flow around said barrier and a valve open position remote from said barrier thereby enabling flow around said barrier;

a control chamber defined by said casing means and said diaphragm;

aperture means in said casing means to enable varying the pressure in said control chamber to move said diaphragm between said valve closed position and said valve open position;

said diaphragm including

innermost and outermost layers of substantially elastic resiliently distortable fluid-tight material,

and an intermediate layer of mesh material of relatively limited stretchability, unbonded to said innermost and outermost layers and free to independently stretch to its limit without affecting the flexibility of said innermost and outermost layers,

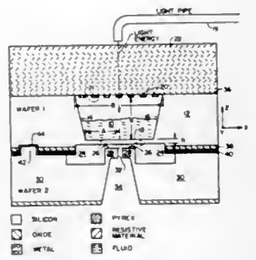
said innermost layer being normally stretched so as to abut said barrier and defining the limit of stretch of said intermediate layer of mesh material with lesser diameter on the downstream side of said diaphragm and said barrier than on the upstream side of said diaphragm and said barrier, when said intermediate layer of mesh material is pressed against said innermost layer in the valve closed position.

4,824,073

INTEGRATED, MICROMINIATURE ELECTRIC TO FLUIDIC VALVE

Mark Zdeblick, Mountain View, Calif., assignor to Stanford University, Calif.

Filed Sep. 24, 1986, Ser. No. 911,242
Int. Cl.[4] F16K *27/00*
U.S. Cl. 251—11 **12 Claims**



11. An apparatus comprising:

a volume of material;

a first semiconductor substrate having a trench etched therein to form at least one flexible wall of said first semiconductor substrate;

a second substrate hermetically bonded to said first semiconductor substrate so as to trap said volume of material in said trench, and having attached thereto means for heating said trapped material, said attachment being such that said means for heating said trapped material can couple energy into said trapped material from an external source for causing deflection of said flexible wall;

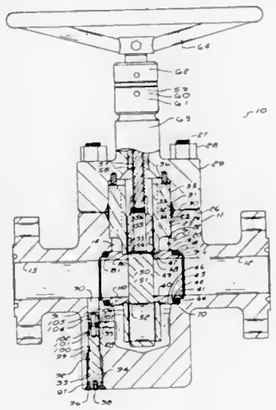
means integrated on a third substrate adjacent to said flexible wall for using said deflection thereof with changing temperature of said trapped material to do any task.

4,824,074

BI-DIRECTIONAL GATE VALVE

Benton F. Baugh, 14626 Oak Bend, Houston, Tex. 77079

Continuation of Ser. No. 579,698, Feb. 13, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 844,884
Int. Cl.[4] F16K *3/16*
U.S. Cl. 251—172 **9 Claims**



1. A valve comprising:

a valve body having an inlet and an outlet with a chamber therebetween;

one or more seats means located within said chamber in said body;

a gate means with a hole therethrough located within said chamber within said body for cooperating with said one or more seats means for preventing fluid flow in the closed position when said hole is not aligned with said one or more seats means and for permitting fluid flow in the open position when said hole is aligned with said one or more seats means;

sealing means with a resilient non-metal portion between said valve body and said one or more seats means, adapted to be axially compressed by insertion of the gate means between the seats means which axially moves the seats means relative to said body, said sealing means with a resilient non-metal portion being fluidly pressured by the movement of the seat means along the valve body centerline between the inlet and the outlet such that the fluid type pressure in the sealing means with a resilient non-metal portion causes improved sealing engagement with an internal diameter within said chamber in said body and improved sealing engagement with an external diameter on said one or more seat means.

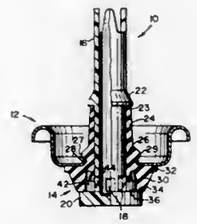
4,824,075

TILT ACTION DISPENSING VALVE ASSEMBLY

Walter Holzboog, 964 Claytonbrook Dr., Ballwin, Mo. 63011

Continuation of Ser. No. 580,118, Feb. 14, 1984, abandoned, which is a continuation of Ser. No. 284,478, Jul. 17, 1981, abandoned. This application May 1, 1987, Ser. No. 44,970
Int. Cl.[4] B65D *85/00*
U.S. Cl. 251—349 **3 Claims**

1. For use in a tilt action valve assembly in which a valve body has a valve seat and a hollow stem with port means communicating between the interior of the stem and the top of the valve seat for passage therethrough of a viscous product under pressure; said valve body being secured to a mounting means by a sealing grommet which surrounds at least a lower portion of the valve stem, including the port means, and abuts the top of the valve seat; tilting of the valve stem relative to the mounting means causing the valve seat to move away from a lower portion of the sealing grommet and opening access to the port means for product located below the valve seat; the improvement which comprises means for inhibiting the seepage of the product between the valve stem and the sealing grommet, said inhibiting means comprising a pocket formed in the lower portion of the grommet, said pocket configured and positioned for receiving some of the viscous product as it flows



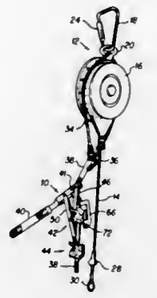
toward the port means and retaining such product even after valve stem tilting is terminated; said pocket having a side wall lying along a significant length of the lower portion of the valve stem, so as to abut the top of the valve seat, such that pocket retained product exerts a significant force against said side wall to urge it against the lower portion of the valve stem to thereby inhibit product seepage therebetween.

4,824,076

CABLE WINCH WITH KICKER BAR

David L. Ward, Glasglow Pines, Del., assignor to Research and Trading Corporation, Wilmington, Del.

Filed Sep. 11, 1987, Ser. No. 95,139
Int. Cl.[4] B66D *1/04*
U.S. Cl. 254—384 **12 Claims**



1. In combination with a cable and a cable winch of the type including a first and a second cable gripping assembly each movably disposed on a support member adapted to be secured at one end to a support, said first gripping assembly being disposed on said support member closest to the end to be secured to said support, each of said gripping assemblies having a rotatable cable engaging element biased into contact with a non-rotatable cable receiving element, an operating lever pivotally connected to said support member, and first and second links respectively coupling said first and second gripping assemblies to spaced locations on said operating lever such that reciprocating movement of said operating lever effects reciprocating movement of said gripping assemblies along said support member, towards and away from each other, said gripping assemblies alternately gripping the cable, transporting said cable as the gripping assembly is moved along said support member by the operating lever, and releasing the grip on the cable as the gripping assembly is moved in the reverse direction along said support member to grip another location on said cable, the improvement comprising:

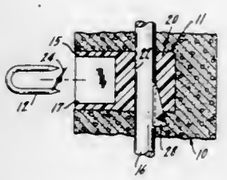
a mechanism operatively associated with said first gripping assembly to effect rotation of said cable engaging element of said first assembly out of engagement with said cable, said mechanism comprising a shaped element having one end portion pivotally mounted on said support member adjacent to said first gripping assembly and a free end portion having an engaging portion adapted to engage and lift said cable engaging element of said first gripping assembly out of contact with said cable upon movement of said operating lever in the direction to move said second gripping assembly toward said first gripping assembly, said shaped member being supported to pivot relative to said support member but not to reciprocate relative to said support member.

4,824,077

CONCRETE FENCE POST

Melvin J. Brickner, #208-33298 Robertson Ave., Abbotsford, B.C., Canada V2S 1Z5

Continuation-in-part of Ser. No. 880,617, Jun. 30, 1986. This application Jun. 30, 1987, Ser. No. 68,606
Int. Cl.[4] B21F *27/00*
U.S. Cl. 256—51 **7 Claims**



1. A concrete fence post capable of supporting multiple strands of fencing materials such as barbed wire by means of conventional fasteners, said post including,

a main body portion composed of concrete, and

a reinforcement is located substantially at the radial center of said main body portion,

said reinforcement rod supporting at least one yielding insert member received on and carried by the rod,

said insert member having an extension portion extending to and exposed at the surface of the post and a pocket in said extension having a width less than the thickness of a conventional fencing staple and which provides a seat for said staple whereby said staple can be repeatedly gripped and held by said insert member.

4,824,078

MAGNETIC STREAMLINING AND FLOW CONTROL IN TUNDISHES

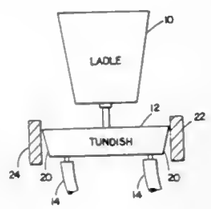
Julian Szekely, Weston, and Olusegun J. Ilegbusi, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

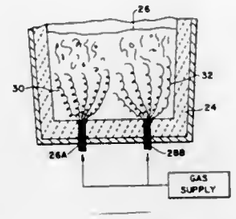
Filed Aug. 19, 1987, Ser. No. 87,151
Int. Cl.[4] C21B *13/00*; C21C *5/42*
U.S. Cl. 266—237 **14 Claims**

1. A tundish for receiving molten metal at an inlet portion and for discharging the metal at one or more outlet portions comprising magnetic field generating apparatus adapted to generate a magnetic field across the tundish that extends the

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full depth of the molten metal in the tundish at a location between the inlet and outlet portions, the magnetic field being substantially perpendicular to the principal direction of the flow of the molten metal in the tundish.



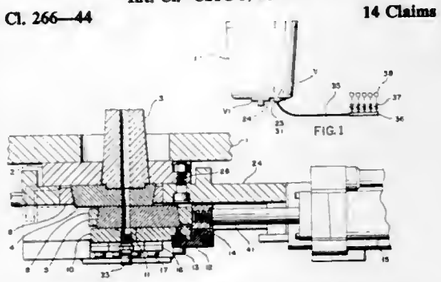


4,824,079

INJECTION VALVE COMPONENTS AND METHOD

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed Jul. 15, 1986, Ser. No. 885,873
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—44 **14 Claims**


FIG. 1

7. An injection valve for use at a molten metal interior portion of a teeming vessel comprising, in combination,

a mounting plate securing the valve to the vessel at a molten metal interior portion thereof and at an orifice thereof,

a well block nozzle positioned in the orifice for the injection valve having a central injection orifice,

a stationary refractory plate at the upper portion of the injection valve positioned for injection communication through the stationary plate orifice in alignment with the well block orifice,

a sliding refractory injection plate and sliding plate carrier each secured to the other, and positioned beneath the stationary plate and having a central orifice proportioned for communication with the orifices of the stationary plate and the well block nozzle,

spring loaded rocker arm means secured to the valve and in compressive relationship with the sliding plate and carrier,

and gas injection means secured to the lower portion of the carrier in open communication with the slide plate orifice for the injection of additives to the metal in the vessel.

4,824,080

APPARATUS FOR INTRODUCING GAS INTO MOLTEN METAL BATHS

Joseph W. Tommaney, Buffalo Township, Butler County, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Division of Ser. No. 18,150, Feb. 24, 1987, Pat. No. 4,758,269. This application Feb. 4, 1988, Ser. No. 152,121
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—218 **3 Claims**

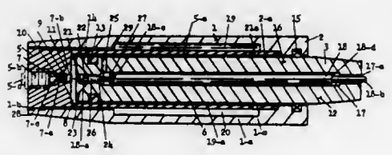
1. A tuyere inserted through a lower wall portion of a refractory-lined vessel wherein the exit end of the tuyere is below the level of molten metal therein; said tuyere comprising a refractory core and an outer wall defining spiral passageways therewith for directing gas into the molten metal bath through the respective passageways at angles to the longitudinal axis of the tuyere.

4,824,081

PISTONLESS-PLUNGER POSITIONER WITH INTERNAL CYLINDER AND ANNULAR FLUID SPACE

Richard S. Pauliukonis, Cleveland, Ohio, assignor to Grazina J. Pauliukonis, Cleveland, Ohio

Continuation-in-part of Ser. No. 714,967, Mar. 22, 1985, Pat. No. 4,667,780. This application Apr. 13, 1987, Ser. No. 37,778
Int. Cl.[4] F16F *9/32*
U.S. Cl. 267—64.12 **10 Claims**



1. A servo gas cylinder comprising:

a pressurized tubular column including a first internal cylinder spaced therein with a first end open and adapted to receive a hollow pistonless plunger with a head seal slidably movable therein forming fluid chambers at both head sides including fluid communication passage means therebetween interconnected with external control means with fine adjustment means incorporated therein to facilitate plunger position change from a first retracted to a second extended positions including means for locking the plunger therein, while an internal cylinder second end is closed and provided with cylinder charging and discharging means with pressurized working fluid via a floating check valve means inside a fluid supply port means incorporated therein, a first fluid chamber in said internal cylinder second end,

a coaxial externally spaced second cylinder interconnected with said first internally spaced cylinder so as to form an annulus therebetween along the length thereof to serve as a second fluid chamber jointly with an annular space formed by said plunger inside said first internal cylinder including a radial hole means for fluid communication therebetween adjacent said open end thereof,said first internal cylinder abutting a counterbore shoulder of an end wall of both cylinders,

a metering valve means inside said hollow plunger incorporated therein so as to allow metered fluid flow between said fluid chambers facilitating plunger position change at controlled speed, an actuating rod means inside said hollow plunger interconnected with said metering valve means and adaptable of external actuation thereof for flow initiation between said fluid chambers,

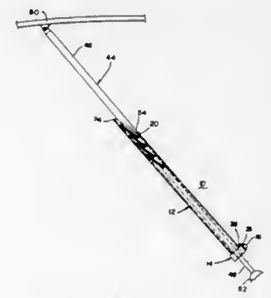
means for attaching said tubular column by the ends thereof to a structure means subject to height adjustment, and when said actuating rod means becomes pushed down against a biasing force of the working fluid housed therein the flow between fluid chambers initiates facilitating motion of said plunger until said actuating rod means is released at a position selected defining height desired for an automatic plunger locking and vice versa, within stroke limitations provided therein.

4,824,082

MECHANICAL SUPPORT FOR FAILED GAS STRUTS AND METHOD

Edward R. Schaupp, 2120 N. Yosemite St., Stockton, Calif. 95204

Filed Mar. 8, 1988, Ser. No. 164,879
Int. Cl.[4] F16F *5/00, 9/32*
U.S. Cl. 267—120 **9 Claims**



1. A support assembly for supporting a gas strut which has a rod at a rod end and a cylinder at a cylinder end, the support assembly comprising:

an elongate support having a first length along a first side with a first side cylinder end and a second length along a second side with a second side cylinder end and said second length being longer that said first length; and attachment means on said elongate support and operable for removably securing said elongate support to a rod of a gas strut such that said first side and said second side extend partially along the cylinder of the gas strut when the gas strut is retracted and such that said first side cylinder end is moved by gravity to contact and block the cylinder from retracting when the gas strut is moved to an extended position with said second side extending partially along the cylinder;

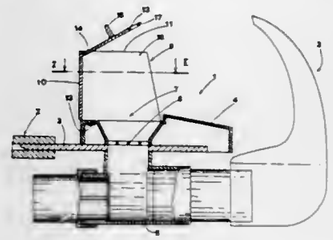
and wherein said elongate support is generally tubular such that it fits at least partially around a gas strut and wherein said elongate support has a slot extending along the entire length of the elongate support, said slot having a sufficient width to allow the gas strut rod to fit therethrough and wherein said support is operable such that the cylinder remains at least partially within the support for the full stroke of the gas strut and wherein said support assembly is an add-on for a pre-existing gas strut and wherein said support assembly is springless.

4,824,083

WORK REST, AS USED IN PARTICULAR BY DENTAL TECHNICIANS AND GOLDSMITHS

Augusto Cattani, Parma, Italy, assignor to Officine Augusto Cattani & C. S.P.A., Italy and Daicel Chemical Industries Ltd., Japan

Filed Dec. 22, 1987, Ser. No. 136,291
Claims priority, application Italy, Jan. 30, 1987, 2890487[U]
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—15 **7 Claims**



1. A work arrangement, comprising

a base having a support structure, a suction pipe located at a distance from said base, an air intake connecting said suction pipe with the base, said air intake having a neck portion situated within said base and in the vicinity of the support structure, a folding cover having at least a part situated within said neck portion and having two side walls and a cross wall interconnecting said side walls, said cross wall being pivotally attached to said neck portion, said cross wall being movable between open and closed positions,

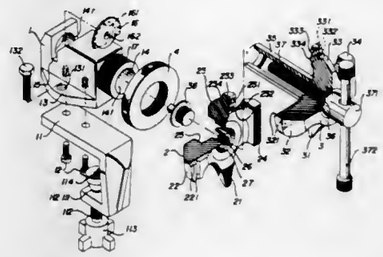
wherein in the closed position said cross wall closes said neck portion of the air intake, and in the open position said cross wall supports said side walls in an upright position so that a box-type structure open toward the support structure is defined.

4,824,084

VERSATILE VISE

Sheen Tzong-Lin, 22, Lane 2, Liu Bridge E. Rd., Kang Shan Chen, Kaohsiung Hsien, Taiwan

Filed Mar. 10, 1988, Ser. No. 166,497
Int. Cl.[4] B25D *1/00*
U.S. Cl. 269—87.2 **5 Claims**



1. A versatile vise comprising:

a jaw holder having a base, said jaw holder including a longitudinal shaft hole which is separated by a lateral groove into a rear hole and a front hole, said longitudinal shaft hole having a hole axis;

an attaching means for attaching said base to a surface;

a punch plate including a central hole mounted in said rear

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hole of said longitudinal shaft hole adjacent said front hole;

a back jaw including a central C-shaped ring defining a central threaded hole and a C-shaped hole thereabout, and a plurality of back jaw faces disposed about said central ring;

a mounting means for mounting and locking said back jaw to said jaw holder such that said back jaw is rotatable about the hole axis to bring one of said jaw faces to a working position and then said back jaw is lockable to hold the one of the jaw faces in the working positions;

a front jaw including a central C-shaped tube shaft and a plurality of front jaw faces disposed about said central tube shaft, said C-shaped tube shaft having a distal end away from said front jaw faces and being received about said C-shaped ring in said C-shaped hole of said back jaw such that said front jaw rotates as said back jaw rotates;

a screw which is mounted for free rotation in said front jaw and which is threadably received in said central threaded hole of said C-shaped ring of said back jaw such that rotation of said screw causes said front jaw to be displaced relative to said back jaw, to pinch an object therebetween by rotation in one direction and to allow removal of a pinched object by rotation in the other direction; and

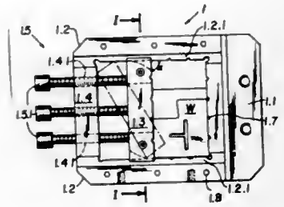
a punch which is mounted to said distal end of said tube shaft such that said punch is moved into said central hole of said punch plate and through an object disposed in said lateral groove as said screw is rotated to move said front jaw toward said back jaw.

4,824,085

DEVICE FOR HOLDING AND HANDLING A FLAT OBJECT

René Büchler, Oberbüren, Switzerland, assignor to Buchler B-Set AG, Flawil, Switzerland

Filed May 18, 1987, Ser. No. 51,535
Int. Cl.⁴ B25B *1/22*
U.S. Cl. 269—139 **14 Claims**



1. Device for holding and handling a flat object, specifically for holding a flat work piece on a machine tool, comprising:

a fixed clamp and a movable clamp wherein the object can be clamped between said fixed clamp and said movable clamp;

a closed, rectangular, flat frame, one side of which serves as the fixed clamp, said movable clamp being insertable into said frame from the outside thereof and being guided in said frame and attachable to the flat object;

clamping means for clamping said movable clamp to said frame; and

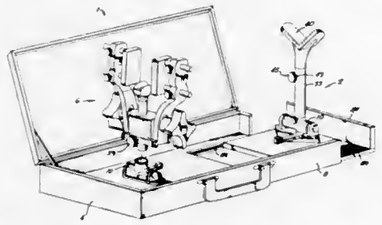
at least one fastening means acting upon the movable clamp arranged on a side of said frame opposite to the fixed clamp, said movable clamp being substantially in the shape of a square parallelipiped and having a groove in each of two front sides thereof opposite each other, and said frame having a guide bead arranged on each of two inner surfaces, facing each other, of longitudinal sides of the frame, each guide bead engaging in a respective groove.

4,824,086

PORTABLE BENCH REST SHOOTING STAND AND GUN CASE HOLDER

Arthur Rickling, deceased, late of Huntington Beach, Calif., and by Margie J. Rickling, executrix, 5521 Moesvale Clr., Huntington Beach, Calif. 92649

Continuation of Ser. No. 752,237, Jul. 3, 1985, which is a continuation-in-part of Ser. No. 494,784, May 16, 1983, Pat. No. 4,548,392. This application Oct. 17, 1986, Ser. No. 918,700
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.⁴ B23Q *3/18*
U.S. Cl. 269—156 **5 Claims**



1. A portable gun holder comprising;

a front-end support member comprised of a support pad, a shaft, a hollow tube, a height adjustment means and a locking means wherein said support pad is mounted atop said shaft which is telescopically connected to said hollow tube, said shaft further being equipped with a height adjustment means which allows the shaft to be adjusted in height with respect to the hollow tube and is held in place by said locking means;

a rear-end support and clamping member which is comprised of a support shaft, a central body member, a pair of clamping arms, each clamping arm having an articulated aperture passing through said arm and further each clamping arm having a clamping pad adjustably mounted on one end of the arm, and a pair of tightening handles and further wherein an aperture passes through said central body member, two pairs of support flanges extend outward in opposite directions from the central body member and a tightening rod also extends outward from each side of the central body member in the same direction as the support flanges such that the support shaft passes through the aperture in the central body member, and a clamping arm is pivotally attached to each pair of support flanges such that the tightening rod passes through the articulated aperture in said clamping arms and a tightening handle is connected to the end of each tightening rod; and

a pair of mounting brackets, said mounting brackets including means for receiving the adjustable front-end support member and the rear-end support and clamping member and said mounting brackets further including means to affix said mounting brackets to a support.

4,824,087

CLAMP

Clifford L. Hansel, Orange, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

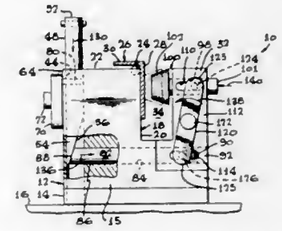
Filed May 23, 1988, Ser. No. 197,721
Int. Cl.⁴ B25B *1/08*
U.S. Cl. 269—234 **3 Claims**

1. A clamp for locking a part comprising:

a base having a fixed vertically deposed first jaw rising from said base;

a second jaw movably mounted to said base, said second jaw moveable in a horizontal direction to a first position, locking the part to said first jaw, to a second position unlocking the part from said first jaw; and

actuation means mounted to said base and coupled to said second jaw for receiving actuation forces applied from



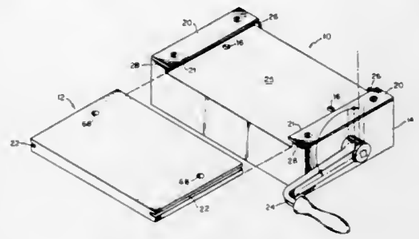
only one vertical direction to move said second jaw in said horizontal directions and for locking said second jaw in either said first or second position.

4,824,088

HOLDER FOR POSITIONING AND HOLDING A PALLET THAT SUPPORTS A WORKPIECE

Gunther R. Siegel, Walsh Rd., LaGrangeville, N.Y. 12540

Filed Feb. 5, 1988, Ser. No. 152,842
Int. Cl.⁴ B23Q *3/00*
U.S. Cl. 269—309 **13 Claims**



1. A pallet clamp for precisely positioning and holding a pallet supporting workpieces comprising,

a base member;

a plurality of vertically movable registration pins supported on said base adapted to engage corresponding alignment bores on said pallet;

at least one upwardly facing pallet support surface on said base member adapted in operation to engage the lower surface of said pallet;

jaw means movably supported on said base member adapted to engage and clamp said pallet against said support surface; said jaw means comprised of spaced elongated clamping bars located over and in spaced relation to said pallet support surface, and at least two vertically movable guide members supported by said base that are attached to said clamping bars,

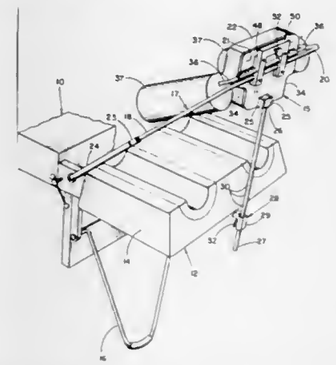
an actuating means for initially moving said registration pins into said corresponding alignment bores, and subsequently moving said jaw means into clamping engagement with said pallet.

4,824,089

RETRACTABLE BUTTOCKS SUPPORT FOR OPERATIONS IN THE PRONE SITTING POSITION

Eugene A. Dickhudt, New Brighton, and Charles D. Ray, Wayzata, both of Minn., assignors to Cedar Surgical, Inc., Minnetonka, Minn.

Filed Jun. 25, 1987, Ser. No. 66,149
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.⁴ A61G *13/00*
U.S. Cl. 269—328 **15 Claims**



1. Buttocks support useful in conjunction with a kneeling attachment including a platform on which a patient kneels with the torso positioned over one end of an operating table, said buttocks support comprising:

a rigid seatplate,

elongated support means for connecting the seatplate to the inboard end of the platform,

a mast,

means for connecting one end of the mast to the seatplate at a point beneath said elongated support means in order to support the seatplate against downward force, and

pivotable means for telescopically connecting the other end of the mast to the outboard end of the platform to permit the seatplate to be lowered to the level of the platform and to be adjustably raised to support the patient's buttocks while the platform is connected to the operating table.

4,824,090

AUTOMATICALLY SETTING THE PAPER PATH COMPONENTS OF A REPRODUCTION MACHINE IN ACCORDANCE WITH THE SIZE COPY SHEET BEING PROCESSED

Ronald P. Booth, Sr., Pittsford, and Joseph S. Calcagno, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1982, Ser. No. 444,634
Int. Cl.⁴ B65H *5/22*
U.S. Cl. 271—3.1 **4 Claims**

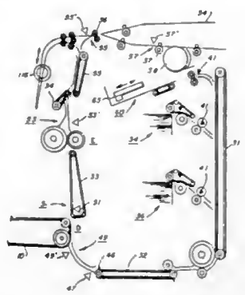
1. In a reproduction machine for producing copies having a paper path along which copies being produced move during processing, the paper path including at least one copy processing station having sheet handling means for receiving the copy sheets during processing thereof, said processing station sheet handling means including a receptacle for receiving copy sheets during processing, adjustable sheet stop means for intercepting said copy sheets input to said receptable, and drive means for moving said stop means to adjust the operating dimension of said receptable in the direction of copy sheet movement in accommodation of the size copy sheets being

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processed, and sheet transport means for moving the copy sheets along the paper path, the combination of:

(a) means to determine the size of the copy sheets being processed from the first one of said copy sheets as said first copy sheet moves along said path;

(b) control means for adjusting the operating dimension of said processing station sheet handling means in accordance with the copy sheet size determined, said control



means actuating said drive means to move said stop means and adjust the operating dimension of said receptacle in accordance with the copy sheet size determined; and

(c) means establishing a home position for said stop means, said control means actuating said drive means to move said stop means to said home position prior to actuation of said drive means to move said sheet stop means to adjust said receptacle operating dimension.

4,824,091

SHEET COLLECTION DEVICES AND SHEET PROCESSORS UTILIZING SAME

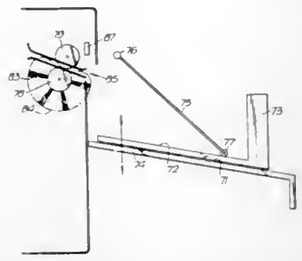
Margaret A. Knight, Welwyn Garden, United Kingdom, assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1983, Ser. No. 511,036

Claims priority, application United Kingdom, Jul. 7, 1982, 8219711

Int. Cl.⁴ B65H *29/40*

U.S. Cl. 271—178 **5 Claims**



1. A sheet processor apparatus adapted to place images of a document onto a copy sheet and transport the copy sheet to an exit portion of the processor, nip means positioned within said processor and adjacent said exit portion of said processor and adapted to transport the copy sheet through said exit portion and into a registration stop that aligns the edges of the sheet within a sheet collection device, said nip means including one or more brushes adapted to serve as a means for guiding the copy sheet through said nip means and subsequently engage the trail edge of the copy sheet and drive it out of said exit portion and into said registration stop of said collection device, and wherein said brushes are adapted to wipe down against trail ends of copy sheets stacked in said collection device to compact the copy sheets in order to increase the capacity of said collection device for receiving upcurled sheets.

4,824,092

APPARATUS FOR STACKING SHEETS

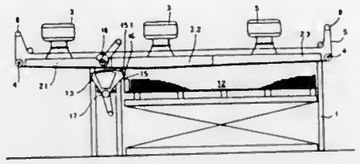
Horst Kriefall, Bad Hersfeld; Helmut Rohrbach, Ronshausen, and Siegfried Fischer, Bad Hersfeld, all of Fed. Rep. of Germany, assignors to Babcock-Bsh Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 126,413

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641157

Int. Cl.⁴ B65H *29/68*

U.S. Cl. 271—183 **16 Claims**



1. In a stacking apparatus for stacking a plurality of sheets comprising a horizontal vacuum conveyor whose feed path ends above a stacking location, a brake device below said feed path upstream of said stacking location including a vacuum chamber around which an air permeable feed member circulates and a deflection device for deflecting the ends of said sheets from said vacuum conveyor to said brake device, the improvement wherein said horizontal vacuum conveyor is a vacuum belt conveyor with a vacuum box which extends in the feed direction over said brake device and completely over said stacking location and on whose underside provided with a plurality of vacuum openings a plurality of circulating vacuum belts are located and said feed member of said brake device is a circulating brake belt whose upper stretch is supported by a permeable bounding surface of said vacuum chamber and which reaches toward said stacking location, said deflection device comprising a revolving brush equipped with bristles over a circumferential angle of from 180° to 270°.

4,824,093

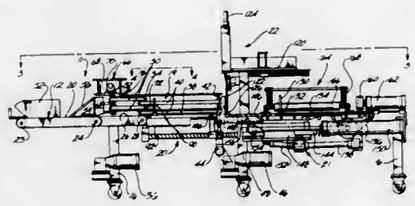
HANDLING SIGNATURES

William P. Belden, Redlands, Calif., assignor to Baldwin Technology Corporation, San Bernardino, Calif.

Filed May 6, 1988, Ser. No. 190,873

Int. Cl.⁴ B65H *29/66*

U.S. Cl. 271—216 **5 Claims**



1. A machine for handling a succession of flexible sheets, such as signatures, to obtain discrete bundles of the signatures from the succession, the machine comprising:

first and second conveyors aligned to define a path along which the signatures are advanced, each of the conveyors being configured to support the signatures in an edge-standing condition with the signatures bowed convex forwardly in the direction of advance so the midportion of each sheet leads the side edges for that sheet, each of the conveyors having moving surfaces against which the signatures are positioned such that the signatures move with the moving surfaces, the moving surfaces of the second conveyor being along the sides of that conveyor;

the second conveyor being located immediately after the first conveyor so the signatures pass from the moving surfaces of the first conveyor to the moving surfaces of the second conveyor;

drive means for advancing the moving surfaces of the first and second conveyors, with the surfaces of the first conveyor normally moving at a velocity no less than the surfaces of the second conveyor;

means for momentarily increasing the speed of the surfaces of the second conveyor to a velocity greater than the velocity of the surfaces of the first conveyor to produce a region of looseness in the succession of signatures;

a sword located in a home position adjacent the path where the region of looseness develops and normally being retracted from the path;

means for extending the sword into the path so it passes between two adjacent signatures in the region of looseness;

means for thereafter moving the sword forward to create a distinct gap in the succession of signatures so as to isolate a bundle of signatures ahead of the gap;

compression fingers located adjacent the path in the vicinity of where the region of looseness develops;

means for extending the compression fingers into the gap behind the isolated bundle of signatures;

means for moving the extended compression fingers along the path and away from the first conveyor so as to move the isolated bundle of signatures off the second conveyor;

means for causing the extending sword to contact and support the forward end of the succession of signatures to the rear of the gap;

means for moving the sword in front of the succeeding signatures toward a support in the path;

means for retracting the sword from the path so the forward end of the following signatures bear against the support; and

means for returning the sword to its home position.

4,824,094

DEVICE FOR ENGAGING A SHEET WITH MAINTENANCE OF REGISTER AND DISPOSED IN THE FEEDER PLATE OF A ROTARY PRESS

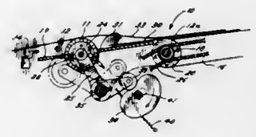
Claus Simeth, Geschwister-Scholl-Str. 15-17, 6050 Offenbach-/Main, Fed. Rep. of Germany

Filed Aug. 27, 1987, Ser. No. 90,462

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629080

Int. Cl.⁴ B65H *9/14*

U.S. Cl. 271—231 **15 Claims**



1. An apparatus disposed between the front lays of a sheet fed rotary printing press and a sheet feed table adapted for supplying a flow of partially overlapping sheets comprising: suction rolls disposed below the path of said flow of sheets, means supporting said suction rolls for rotational movement, means for rotatably driving said suction rolls, means for supplying a timed supply of suction pressure to said suction rolls to create a suction pressure at the periphery of said rolls for enabling said suction rolls to engage the underside of successive sheets under the influence of said suction pressure and transfer the engaged sheet in proper register in the direction of said first lays, said suctions rolls being mounted for oscillating movement between a retracted position in which the upper periphery of said rolls is substantially in the plane of said feed table and a raised position in which the upper periphery of said rolls is above the level of said feeder plate, and means for oscillating said suction rolls between said retracted and raised positions such that said suction rolls physically engage the underside of successive sheets directed from said feed table for raising the engaged sheet and separating it from a flowing sheet disposed below the engaged sheet.

4,824,095

DEVICE FOR POSITIONING A THIN OBJECT OF LOW STIFFNESS

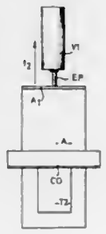
Jacques Fort, Darnieulles, France, assignor to Society les Applications Industrielles Vosgiennes en Abrégé , Darnieulles, France

Filed Jul. 9, 1984, Ser. No. 628,988

Claims priority, application France, Jul. 8, 1983, 83 11388

Int. Cl.⁴ B65H *9/04*

U.S. Cl. 271—245 **3 Claims**



1. A device, including a frame and a stop, for positioning an object of small thickness and of low stiffness as a sheet of paper or a price of fabric against said stop, said object being moved with said device until a portion of said object abuts said stop and said object being further moved once the friction giving it sufficient adherence to the device is overcome, and permitting that movement by means of a reciprocating conveyor, characterized in that said reciprocating conveyor is shovel-like (A), that said shovel-like reciprocating conveyor has sufficient dimensions in both the longitudinal and transverse directions to fully accommodate and support said object to be positioned during the entire stroke of the reciprocating conveyor, that said stop includes a rectilinear stationary angle iron (CO) located crosswise with respect to the movement of the shovel, and that the shovel (A) slides in a slot (CF) provided between the upper face of the top table of the frame (BA) and the lower face of the angle iron—stop (CO), under the action of a double acting jack (V1).

4,824,096

SHEET CLAMP COUNTERBALANCING SYSTEM FOR HIGH SPEED SHEET HANDLING DRUMS

June C. Fichter, Canton; Theodore J. LaBelle, Dorchester, and Kenneth A. McAuley, Boston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 17, 1987, Ser. No. 74,688

Int. Cl.⁴ B65H *5/12*

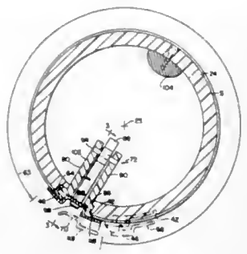
U.S. Cl. 271—277 **16 Claims**

1. In a sheet clamping system for rotatable drums, the system

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including a pair of clamping bars for releasably clamping leading and trailing edges of a sheet to the drum periphery, each of said pair of clamping bars extending for the axial length of the drum and being support at opposite ends for generally radial movement relative to the drum axis between sheet clamping and retracted positions the improvement comprising:

means for releasably retaining the central portion of each of



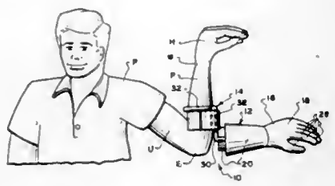
said clamping bar pair in the respective sheet clamping positions thereof upon rotation of said drum at speeds causing centrifugal force to bow said bars outwardly from said sheet clamping positions, said releasable retaining means including centrifugal force responsive means biased to a retracted, non-retaining position and responsive to centrifugal force to move against the bias to a central clamping bar portion engaging and retaining position.

4,824,097

PUPPET-ON-THE-ARM ILLUSION DEVICE

Stephen B. Axtell, 272 Dalton St., Ventura, Calif. 93003

Filed Feb. 10, 1988, Ser. No. 154,387
Int. Cl.[4] A63J *3/00*; A63H *3/14*
U.S. Cl. 272—8 N **22 Claims**



1. An arm-mounted device for producing a puppet-on-the-arm illusion, comprising:

(a) a fake at least partial forearm and hand member in the form of a glove having a hand portion and writs and partial forearm portion extending therefrom; and

(b) means operable for attaching said fake member directly to the forearm of a puppeteer next to the elbow thereof for securing said fake member to the puppeteer's forearm such that when the forearm is bent upward and a forearm-length puppet slipped over the hand and forearm of the puppeteer said fake member will define an extension from an upper portion of the puppeteer's arm for creating the illusion of a glove-covered hand and forearm supporting the puppet on the puppeteer's forearm proximate the elbow thereof;

(c) said means operable for attaching said fake member including a connector having a first portion attached to said fake member and a second portion extending therefrom and being adapted for coupling to the puppeteer's forearm next to the elbow thereof;

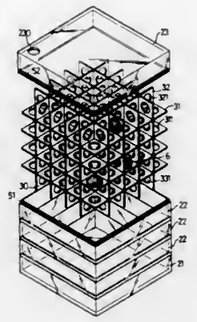
(d) said second portion of said connector member including at least one generally straight elongated element adapted to extend along a lower side of the puppeteer's forearm next to the elbow thereof.

4,824,098

THREE-DIMENSIONAL LABYRINTH

Hong Y. Huang, 3Fl., No. 26, Lane/68, Ta-Feng Road, Hsin-Tien City, Taipei Hsien, Taiwan

Filed Aug. 29, 1988, Ser. No. 237,437
Int. Cl.[4] A63F *7/04*
U.S. Cl. 272—19 **2 Claims**



1. A three-dimensional labyrinth comprising a transparent or translucent case, a plurality of levels of compartments disposed inside said case, a ball and plurality of dumbell-like blockades;

said case being constituted by a bottom casing which is like a box without the cover, a top casing which is like a box without a bottom and which a hole formed thereon, and a plurality of intermediate casings which are like boxes without both the cover and the bottom and are stacked between said bottom casing and top casing, each casing being secured to another with an engaging means;

each level of said compartments being separated from each other with a level plate which has a plurality of equally-spaced and evenly-distributed holes formed therethrough, and being constructed by a plurality of latitudinal septa and a plurality of longitudinal septa perpendicularly intersecting and interlocking each other, each of said septa, being a strip, having a plurality of holes and elongated notches alternately and equally spaced therealong so that the elongated notches of said longitudinal septa is engageable with the notches of said latitudinal septa to construct compartments of a level;

said dumbell-like blockades which are made of soft and resilient material, being able to be forced to engage with a plurality of holes formed either on said level plate or on said septa and blocking said holes so as to define a route pattern to allow said ball which is placed inside said case in advance to be moved out of said case via said hole formed on said cover casing.

4,824,099

ROTATING AMUSEMENT DEVICE

Robert T. Rusu; David O'Connor, both of Vancouver; Walter Cadwallader, Tsawwassen; Michael de Champlain, Vancouver, and Ulf Ottho, Tsawwassen, all of Canada, assignors to Alpha Dynamics Corporation, Vancouver, Canada

Filed Oct. 5, 1987, Ser. No. 105,409
Int. Cl.[4] A63G *1/12*
U.S. Cl. 272—33 R **10 Claims**

1. A spinning and rotating seating amusement device, comprising:

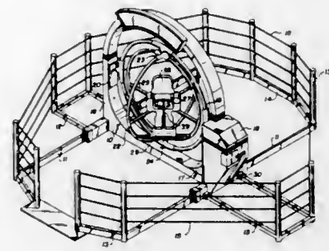
a support stand having a base with pivotably mounted wheels;

crowd control means secured to said support stand;

a pair of upright members mounted on said support stand and at opposite ends thereof;

a first ring supported by said upright members for rotation on an horizontal axis;

a pair of support rings forming a frame and bisecting each other at right angles, said frame being supported by said first ring for rotation on a second axis at right angles to said horizontal axis;



a pair of bisecting crossbars centrally positioned in said frame for receiving a seat, said seat having means for securing a passenger thereon;

bearing means connecting said frame to said first ring and said first ring to said upright members; and

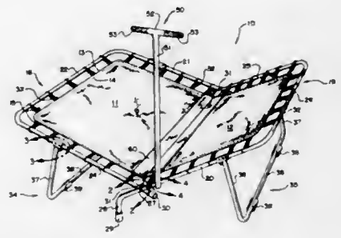
hydraulic driving means located at one of said upright members for rotating said first ring.

4,824,100

OPPOSED REBOUNDING EXERCISE DEVICE

Lance L. Hall, 1071 E. 800 North, Shelley, Id. 83274, and W. Peter Schwarz, 5386 Nevesco, Idaho Falls, Id. 83402

Filed Mar. 23, 1987, Ser. No. 28,778
Int. Cl.[4] A63B *5/00, 69/18*
U.S. Cl. 272—65 **1 Claim**



1. An exercise device comprising

a single sheet of strong durable material;

a pair of frame members of generally U-shaped configuration each surrounding the sheet of material, insert - frame member including a pair of spaced apart legs at opposite sides of the sheet of material and a web member at one end of the sheet material whereby the sheet material is within the legs and web members of the frame members, with the ends of the pair of legs of one frame member forming ground engaging center legs for the device; springs spaced around each of the frame members;

means spaced around the sheet of material and coupling said sheet of material to the springs;

means pivotally connecting the legs of one frame member to the legs of the other frame member;

a center post member extending between the legs of one frame member and overlying the center of said sheet of material; and

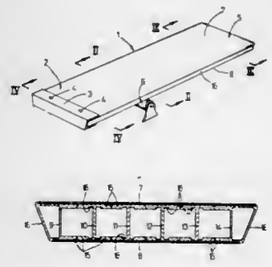
leg means supporting each of said frame members, whereby each of said frame members and the portion of the sheet material carried thereby extend upwardly and outwardly from the center post member, said leg means each comprising a sleeve and lock means mounted to slide on each leg of a frame member, a side member pivotally attached to each sleeve such that the side member will pivot between a position normal to the leg of the frame member and a position extending substantially parallel to the leg member, a ground member interconnecting the side members at the ends of the side members remote from the sleeves, and means to adjustably secure the sleeves to the legs of the frame members for adjustment of the relative angle between the frames when the side members are positioned normal to the leg means of the frames.

4,824,101

SPRING BOARD

Hermanus L. J. Karlas, Spoorstraat 6, 3743 EG Baarn, Netherlands

Filed Feb. 8, 1988, Ser. No. 153,138
Int. Cl.[4] A63B *5/08*; E04C *3/30*
U.S. Cl. 272—66 **8 Claims**



1. A spring board which can be fixed at its rearward end, and supported by a fulcrum to leave its forward end free to move, comprising:

an upper plate defining a first inner and a first outer surface;

a lower plate defining a second inner and a second outer surface and positioned a specific distance below and parallel to said upper plate such that said first inner surface and said second inner surface face one another while said first outer surface and said second outer surface face away from one another, said upper and lower plates being in essentially parallel planes; and

a plurality of profiles extending longitudinally between and fixedly connecting said plates to form the spring board, each of said profiles having an upper end with an upper end flange which contacts and is fixed to said first inner surface and a lower end with a lower end flange which contacts and is fixed to said second inner surface, said upper end flange extending parallel to said first inner surface and said lower end flange extending parallel to said second inner surface, said profiles maintaining a constant parallel distance between said upper and lower plates along the entire length of the spring board, the cross sectional area of said upper and lower end flanges varying, so that the cross sectional areas of the upper and lower flanges along the length of the spring board's longitudinal axis are greater at that point corresponding to the point at which the spring board is supported by the fulcrum then the cross sectional areas of the flanges at the forward free end of the spring board so that the spring board has a higher moment of inertia at the point at which is supported by the fulcrum than it has at its forward free end while maintaining a constant thickness along its entire length.

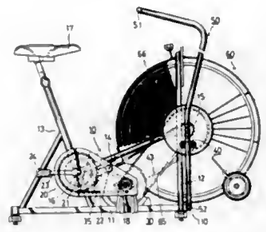
VOL 1101 ISS 4 APR 25 1989 UMI

4,824,102

EXERCISE BICYCLE FOR EXERCISING ARMS AND LEGS

Peter K. Lo, P.O. Box 13-124, Taipei, Taiwan

Filed May 10, 1988, Ser. No. 192,166
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—73 5 Claims



1. An exercise bicycle comprising:

a frame assembly including a base frame, a driven wheel frame fixed on a front portion of said base frame, and a seat frame fixed on a rear portion of said base frame;

a foot operated drive assembly including a driving shaft journalled on said seat frame, a rear driving sprocket sleeved rigidly on an intermediate portion of said driving shaft, two crank arms respectively secured to two ends of said driving shaft, and two pedals secured to said respective crank arms;

a hand operated drive assembly including a wheel axle journalled on said wheel frame, a front driving sprocket sleeved rigidly on said wheel axle, two swing arms secured to two opposite end portions of said wheel axle, and two hand operated swing levers mounted pivotally at their lower ends on said base frame, each of said levers having a guide-way along a longitudinal axis thereof, each of said swing arms having a crank pin member which is connected slidably to said corresponding lever, so that said crank pin member can slide along said guide-way of said corresponding lever;

a driven sprocket assembly including a driven shaft journalled on said base frame between said driving shaft and said wheel axle, a foot driven sprocket sleeved rotatably on said driven shaft, clutch means for locking said foot driven sprocket on said driven shaft when said foot driven sprocket rotates in a predetermined direction, a foot driven chain trained on said rear driving sprocket wheel and said foot driven sprocket, a hand driven sprocket sleeved rotatably on said driven shaft, clutch means for locking said hand driven sprocket on said driven shaft when said hand driven sprocket rotates in a predetermined direction, a hand driven chain trined on said front driving sprocket and said hand driven sprocket, and a wheel driving sprocket sleeved rigidly on said driven shaft; and

a wheel assembly including a wheel hub sleeved rotatably on said wheel axle, a wheel sleeved rigidly on said wheel hub, a hub sprocket sleeved rigidly on said wheel hub, and a wheel driving chain trained on said wheel driving sprocket and said hub sprocket;

whereby, when said pedals are rotated in said predetermined direction, said driving shaft, rear driving sprocket, foot driven chain, foot driven sprocket, driven shaft, wheel driving sprocket, wheel driving chain, hub sprocket, hub, and wheel are in turn rotated in said pedetermined direction;

when said levers are swung, said wheel axle, front driving sprocket, hand driven chain, hand driven sprocket, driven shaft, wheel driving sprocket, wheel driving chain, hub sprocket, hub, and wheel are in turn rotated in said predetermined direction; and

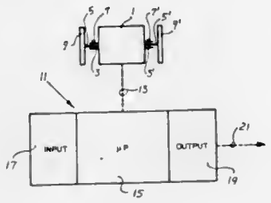
when a first torque is applied to said driven shaft through said foot driven sprocket by rotating said pedals in said predetermined direction, and when a second torque is applied to said driven shaft through said hand driven sprocket by swinging said levers, the sum of said first and second torques are output through said wheel driving sprocket.

4,824,103

MUSCLE TESTING AND EXERCISING APPARATUS

Gary L. Smidt, 8 W. Park Rd., Iowa City, Iowa 52240

Filed Mar. 14, 1988, Ser. No. 168,002
Int. Cl.[4] A63B *21/00*; A61B *5/22*
U.S. Cl. 272—125 20 Claims



1. Apparatus for testing and exercising a plurality of individual muscle groups of a human subject, said apparatus comprising:

a housing;

first and second coupling means extending from within said housing in substantially opposite first and second directions;

force transducer means disposed within said housing and responsive to forces applied to said first and second coupling means in said first and second directions for providing an electrical force signal representative of the magnitudes of the applied forces;

at least first and second differently configured engagement means, alternatively connectable to said first coupling means, for applying a first force in at least one of said first and second directions to said force transducer means via said first coupling means, the different configurations of said first and second engagement means being such that said first engagement means is selectively engageable by the human subject in a first manner and that said second engagement means is selectively engageable by the human subject in a second manner which is different from said first manner; and

at least third engagement means individually and selectively connectable to said second coupling means for applying a second force opposing said first force to said force transducer means via said second coupling means;

wherein said housing, including said force transducer means and first and second coupling means, weighs no more than five pounds and occupies a volume no greater than twenty five cubic inches.

4,824,104

ISOKINETIC EXERCISE METHOD AND APPARATUS, USING FRICTIONAL BRAKING

Ralph F. Bloch, 202 Rosemary Lane, Ancaster, Ontario, Canada (L9G 2K7)

Filed Jul. 10, 1987, Ser. No. 72,149
Int. Cl.[4] A63B *21/22, 21/24*
U.S. Cl. 272—125 11 Claims

4. Muscular exercise apparatus, for maintaining a maximum speed independent of an exercise torque applied by an exercising person, comprising:

a. a rotating exercise member to which said exercise torque is applied to the apparatus;

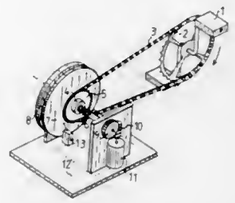
b. an electric reference motor;

c. a mounting frame;

d. frictional braking means coupled between the exercise member and the mounting frame, for resisting said exercise torque;

e. electrical switching means serially connected with the reference motor;

f. mechanical speed comparator means coupled to said frictional braking means, said reference motor and said exercise member for translating a difference in the rotational



speed of the reference motor and the exercise member into liner motion in said frictional braking means to control the frictional braking means, by increasing the braking torque of the frictional braking means as the speed of the exercise member exceeds the speed of said reference motor; and

g. switch control means coupled to said electrical switching means and responsive to said linear motion of said comparator means for controlling the switching means, to interrupt power to the reference motor if the speed of the motor remains greater than the speed of the exercise member.

4,824,105

ABDOMINAL EXERCISE DEVICE

Zinovy Goldenberg, 2074 20th La., Apt. 3E, Brooklyn, N.Y. 11214

Filed Feb. 1, 1988, Ser. No. 151,019
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—130 2 Claims



1. Device for performing abdominal lift exercises comprising:

a flexible body belt adapted to be fastened adjustably and removably about an exerciser's waist, said body belt having a centrally disposed opening, said opening facing and corresponding in size and position to the exerciser's abdomen;

an expandable pocket mounted on said body belt, said pocket being affixed to the periphery of and surrounding said belt opening, sadi pocket being in the form of a bellows capable of being expanded outwardly and having an opening toward, facing sand corresponding in size and position to said belt opening and the exerciser's abdomen;

an air-tight infaltable bag attached to the lower edge of said pocket, said bag being contained completely within said pocket when not inflated, said bag being shaped to protrude through said pocket opening and to press inwardly and upwardly directly against the exerciser's abdomen through said belt opening and said pocket opening when inflated;

adjustable control means for regulating the magnitude of air pressure directed against the exerciser's abdomen, said adjustable control means being mounted on said body belt and being characterized by the ability to limit and control selectively

the expansion of said pocket and said bag outwardly from said body belt, thus directing more of less of said air pressure against the abdomen;

a bellows-type air pump adjustably suspended from said body belt, said air pump being adapted to rest against the exerciser's thighs and to be operated by hand pressure thereagainst; and

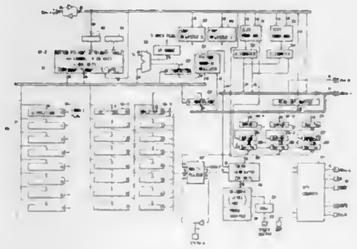
flexible conduit means connecting said air pump and said inflatable bag for transmitting air therebetween.

4,824,106

T.V. GAME SYSTEM HAVING REDUCED MEMORY NEEDS

Hiroo Ueda, Toyonaka, and Hiromitsu Yagi, Itami, both of Japan, assignors to Ricoh Co., Ltd., Tokyo and Nintendo Co., Ltd., Kyoto, both of, Japan

Continuation of Ser. No. 869,383, May 30, 1986, abandoned, which is a continuation of Ser. No. 564,091, Dec. 21, 1983, abandoned. This application Feb. 12, 1987, Ser. No. 14,150
Claims priority, application Japan, Dec. 22, 1982, 57-234487; Dec. 23, 1982, 57-234473
Int. Cl.[4] G09G *1/16*
U.S. Cl. 273—1 E 8 Claims



1. A T.V. game system for use with a raster scanning type display connected thereto for displaying at least one motion picture character on a screen of said display, comprising:

pattern data generating means for generating pattern data of at least one motion picture character;

designating data generating means for generating designation data designating an identification and a display position of at least one motion picture character to be displayed on the screen of said display;

first storing means for storing designation data designating the identification and the display position of at least one motion picture character to be displayed in a frame;

first writing means for writing in said first storing means during a vertical blanking period of said display the designation data designating the identification and the display position of at least one motion picture character which has been selected to be displayed in the next frame based on the designation data from said designating data generating means;

second storing means for temporarily storing designation data designating the identification and the display position of at least one motion picture character to be displayed on the next following horizontal scanning line;

second writing means for writing in said second storing means during a horizontal scanning period of said display the designation data designating the identification and the display position of at least one motion picture character

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which has been selected to be displayed on the next following horizontal scanning line based on the designation data stored in said first storing means;

third storing means including an area capable of storing pattern data of up to a predetermined number of motion picture characters which can be displayed on a horizontal scanning line at the same time for temporarily storing pattern data of predetermined bits in the horizontal scanning direction of at least one motion picture character to be displayed;

third writing means for writing in said third storing means pattern data of at least one motion picture character to be displayed on the next following horizontal scanning line based on the designation data stored in said second storing means during a horizontal blanking period of said display; and

reading out means for reading out pattern data from said third storing means in synchronism with horizontal scanning of said display to thereby have the pattern data thus read out supplied to said display.

4,824,107

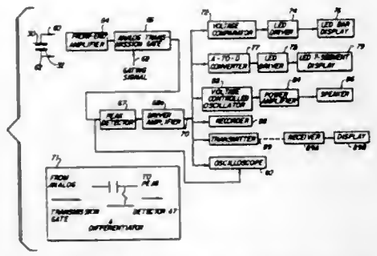
SPORTS SCORING DEVICE INCLUDING A PIEZOELECTRIC TRANSDUCER

Barry J. French, 30612 Salem Dr., Bay Village, Ohio 44140

Continuation-in-part of Ser. No. 785,969, Oct. 10, 1985, Pat. No. 4,761,005. This application Sep. 8, 1986, Ser. No. 904,356

Int. Cl.[4] A63B *67/00, 69/00*

U.S. Cl. 273—1 GC **13 Claims**



1. An apparatus for indicating velocity with which an object stikes a target pad, said apparatus comprising:

a fixed backing plate having a front side;

a layer of deformable material affixed to said front side of said backing plate;

at least a portion of piezoelectric transducer means affixed to said deformable material for generating an analog output signal in response to the object striking the target pad;

calculating means, responsive to said along output of said piezoelectric transducer means, for calculating the velocity of said object based upon said analog output and the mass of said object; and

indicator means connected to said calculating means for indicating the calculated velocity of said object.

4,824,108

REBOUNDING BALL GAME

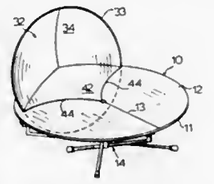
David McLean, 643 Sheraton Rd., Burlington, Ontario, Canada L7L 4B3

Filed Dec. 24, 1987, Ser. No. 137,569

Int. Cl.[4] A63B *67/04*

U.S. Cl. 273—30 **17 Claims**

1. Apparatus for a rebounding ball game comprising a generally circular court adapted for a generally horizontal orientation, and a deflecting element having a forward spherical concave rebound surface and a peripheral edge, adapted to be mounted generally vertically relative to the court such that at least a substantial portion of the court extends forwardly of the deflecting element and at least a substantial portion of the



deflecting element extends upwardly from the court with the peripheral edge generally orthogonal thereto.

4,824,109

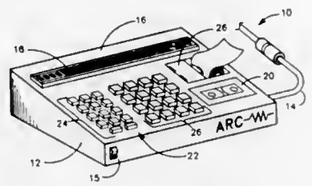
PORTABLE ELECTRONIC BOWLING SCORING DEVICE

Adan R. Cervantes, 6547 N. Academy, Ste. 451, Colorado Springs, Colo. 80907

Filed Sep. 23, 1985, Ser. No. 779,154

Int. Cl.[4] A63D *5/04*

U.S. Cl. 273—54 C **23 Claims**



1. A scoring device adapted for use in scoring a bowling game wherein balls are bowled to knock down pins during each of a succession of frames, said scoring device for displaying the successive pin falls and for automatically calculating and displaying the running score of one or more bowlers, comprising:

a display having a plurality of sub-display regions including a name display region having alpha-numeric symbols, a plurality of primary frame display regions and a final frame display region:

each said primary frame display region having a first ball display portion, a second ball display portion, a subtotal ball score display portion and a frame active indicator with said first ball display portion including a variable single digit numeric symbol and said second ball display portion including a variable single digit numeric symbol and spare/strike symbol in the form of an X-shaped symbol:

said final frame display region having five final ball display portions with each final ball display portion including a variable single digit numeric symbol and some of said final ball display portions including a spare/strike symbol in the form of an X-shaped symbol, and having a total ball score display and a final frame active indicator;

a ball indicator corresponding to each ball display portion operative to index that its associated ball display portion is addressable;

memory means for storing name data identifying a selected person and pinfall data correlated to the selected bowler's performance for each ball bowled;

a keyboard input having identity key means for entering said name data into said memory means, pinfall key means for entering pinfall data into said memory means and command key means;

computer means for interfacing said keyboard input, said memory means and said display, said command key means

for inputting command instructions into said computer means: and

frame and ball display portion selecting means for causing said computer means to address a selected frame region and a selected ball display portion within said frame region whereby pinfall data may be inputted through said keyboard input and displayed at the selected ball display portion indicated by its associated said ball indicator, said keyboard input including a "spare" key means for causing the spare/strike symbol of an addressed frame region to display a line symbol for a "spare" and a "strike" key means for causing the computer means to skip the single digit numeric symbols and to cause the spare/strike symbol of an addressed frame region to display a cross symbol for a "strike" with activation of the "strike" key causing the computer means to skip the single digit numeric symbol located in the addressed frame region;

said computer means operative to cause said name display region to display said name data and whereby pinfall data is displayed for each successive frame display at its corresponding ball display portions, said computer means summing said pinfall data to display a subtotal score on a primary frame's subtotal ball score display portion and the total score on the total ball score display portion of the final frame display region, operation of the "spare" key means for an addressed primary frame display region causing the computer means to add the next entered pinfall data into the subtotal and total scores for the addressed frame display region and operation of the "strike" key means for an addressed frame display region causing the computer means to add the next two entered pinfall data into the subtotal scores for the addressed frame display region.

4,824,110

GOLF CLUB HEAD

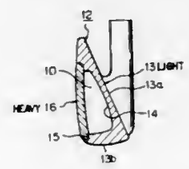
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf, Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1987, Ser. No. 19,722

Claims priority, application Japan, Feb. 28, 1986, 61-041540

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—78 **10 Claims**



1. A club head of a golf club comprising;

a head body having a face which is made of a material having a first specific elasticity and a first specific gravity, said head body being provided therein with at least one cavity, said at least one cavity being located close to said face and extended along substantially the whole surface of said face; and

a weight body made of a different material having a second specific gravity greater than said first specific gravity and a second specific elasticity smaller than said first specific elasticity, said weight body being provided at and covering a substantial portion of the rear portion of the said head body such that said at least one cavity remains within said head body, wherein the total weight of said weight body is heavier than that of said head body and the eigentones of said face of said head body is substantially greater than that of said weight body.

4,824,111

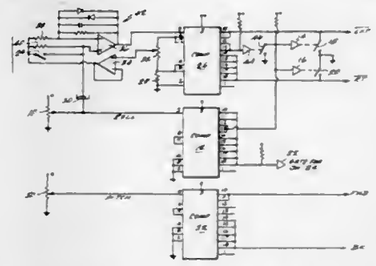
PROPORTIONAL CONTROL WITH AN AUTOMATIC CENTERING MANUAL INPUT DEVICE FOR INPUTTING COMPUTER VARIABLES

Robert S. Hoye, Lovettsville, and Theodore H. Roach, Leesburg, both of Va., assignors to T.R. Applied Development Corporation, Leesburg, Va.

Division of Ser. No. 773,567, Sep. 9, 1985, abandoned. This application Jan. 26, 1988, Ser. No. 148,634

Int. Cl.[4] A63F *9/00*

U.S. Cl. 273—148 B **13 Claims**



1. Apparatus for applying input signals to a terminal of a computer to which a keyboard is normally connected comprising:

a manual input device including a member manually movable in opposite directions from a neutral position, means for automatically returning said member to said neutral position when said member is released and means for translating a position of said member into a corresponding signal;

means for sequentially generating a predetermined code corresponding to a keyboard character a specific number of times, said specific number being related to a characteristic of said corresponding signal so that said specific number is related to an amount of change in position of said member to provide proportional control; and

means for applying said code to said terminal of said computer to which a keyboard is normally connected.

4,824,112

THREE-DIMENSIONAL PUZZLE BUILDING

Ray Roy, 120 Chester St., Lawrence, Mass. 01843

Filed May 4, 1987, Ser. No. 46,291

Int. Cl.[4] A63F *9/12*

U.S. Cl. 273—157 R **14 Claims**



1. A jigsaw puzzle assemblable into a three dimensional building-like structure having walls joined by corners, comprising:

plural jigsaw puzzle wall pieces capable of interlocking in a vertical plane to form at least one of the walls of the building-like structure, each wall piece having an image bearing outer surface and peripheral male and female

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shapes which are capable of interlocking in said vertical plane with complimentary peripheral male and female shapes of other wall pieces to form a portion of the wall;

plural, self-standing, unitary jigsaw puzzle corner pieces capable of forming the corners of the building-like structure, each corner piece capable of completely forming one of the corners of the building-like structure, each corner piece having a vertical height which is the full vertical height of the walls joined by the corner, each corner piece having peripheral male and female shapes which are capable of interlocking in a vertical plane with complimentary peripheral male and female shapes of some of said wall pieces, and each corner piece further comprised of first and second corner piece members, each member having an image bearing outer surface and joined substantially at a right angle to provide a substantially gap-free corner edge;

said plural puzzle wall pieces and said plural puzzle corner pieces being cooperative to form the building-like structure when all of said wall pieces and said corner pieces are correctly interlocked together;

said plural puzzle wall pieces and said plural puzzle corner pieces having a thickness dimension selected to be sufficient to stably support the building-like structure without aid when said wall pieces and said corner pieces are correctly interlocked together; and

said image bearing outer surfaces collectively providing a visually continuous image on the walls and around the corners of the building-like structure when said plural puzzle wall pieces and said plural puzzle corner pieces are correctly interlocked together.

4,824,113

CHANCE GAME MACHINE

Georg Lange, Heidelberger Str. 21, S-2800 Bremen 1, Fed. Rep. of Germany

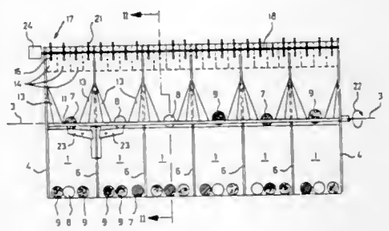
PCT No. PCT/DE86/00232, § 371 Date Mar. 23, 1987, § 102(e) Date Mar. 23, 1987, PCT Pub. No. WO86/07482, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 4, 1986, Ser. No. 29,043

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520123

Int. Cl.⁴ A63F *5/02*

U.S. Cl. 273—144 B **30 Claims**



1. A chance game device, said device comprising:

a drawing chamber containing a group of playing elements, said group of playing elements having at least two differently designed playing elements;

a drawing receptacle coupled to said drawing chamber;

at least one drawing means for selecting one of said playing elements and feeding said selected playing element to said drawing receptacle;

at least one mixing means for mixing said playing elements within said drawing chamber during a mixing phase;

a plurality of intermediate receptacles formed in said drawing chamber, each of said receptacles having an inlet and an outlet, the number of said intermediate receptacles corresponding to the number of said playing elements, each of said intermediate receptacles receiving one of said playing elements through said inlet after the mixing phase;

a gate means for randomly blocking all but one of said outlets during a first drawing phase, said playing element that is not blocked being fed via said drawing means to said drawing receptacle during a second drawing phase.

4,824,114

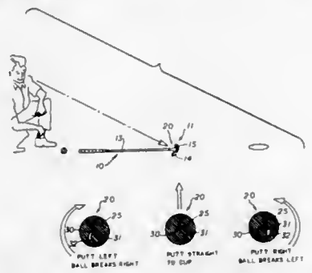
GOLF PUTTER WITH SLOPE INDICATING MEANS THEREIN

Guy G. Catalano, 9522 Telephone Rd., #108, Houston, Tex. 77075

Filed Sep. 23, 1987, Ser. No. 100,313

Int. Cl.⁴ A63B *3/00, 69/36*

U.S. Cl. 273—162 B **8 Claims**



1. A golf club putter for use on a golf green for judging a desired curvature of a path of a ball from a point on the golf green to a cup thereon,

said putter comprising

a shaft having a head-supporting end,

a putter head secured on the head-supporting end of said shaft,

said putter having a first surface oriented for striking a golf ball on swinging movement of said club, and a second surface positioned at substantially a right angle to said first surface,

direction indicating means supported in said second surface including indicia adapted, when said club is positioned with said first surface flat on said putting green, to indicate a desired angle at which said first surface should strike a ball and the desired curvature of the path of travel of the ball to the cup, and

said direction indicating means comprising a pendulum operating as a plumb bob to determine the angular relationship of said putting green with respect to a horizontal plane,

said pendulum further including a first portion of said indicia,

said first indicia portion cooperating with a second, stationary portion of said indicia for indicating the desired angle at which said first surface should strike the ball and the desired cuvature of the path of the ball to the cup.

4,824,115

GOLF CLUB HEAD

Dieter Walther, 15 2nd Avenue, Orange Grove, Transvaal, South Africa

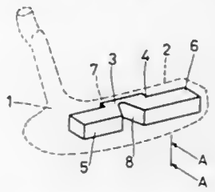
Filed Sep. 11, 1987, Ser. No. 96,394

Claims priority, application South Africa, Sep. 14, 1986, 86/1902

Int. Cl.⁴ A63B *53/04*

U.S. Cl. 273—169 **12 Claims**

1. A golf club head comprising a heel and a toe, a front striking surface and a top surface, a center weight the density of which is greater than that of the material from which the remainder of the club head is made, the center weight extending toward the heel and the toe and through and on each side of a plane substantially perpendicular to said front striking surface and said top surface and extending through the center of gravity of the club head with the mass of the center weight increasing progressively to a maximum with distance away from said plane extending through the center of gravity and



with the center weight providing that part of the striking surface in front of the center of gravity and the mass of said center weight decreasing from the striking surface side of the head towards the rear thereof.

4,824,116

GOLF CLUB HEAD

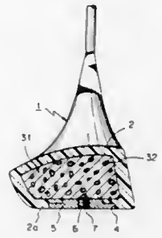
Itsushi Nagamoto; Tatsuo Nakanishi, and Ryohei Tajima, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Division of Ser. No. 905,952, Sep. 11, 1986, Pat. No. 4,714,577. This applicatioo Jul. 13, 1987, Ser. No. 72,525

Claims priority, application Japan, Sep. 17, 1985, 60-205093; Dec. 20, 1985, 60-287193

Int. Cl.⁴ A63B *53/04*

U.S. Cl. 273—171 **6 Claims**



1. A wood-type golf club head comprising a hollow shell constructed of fiber reinforced plastics having a sole side provided with a first opening, a lid received within said first opening to provide an enclosure therefore, said lid having a second opening therein providing direct communication between the hollow interior of said shell and the exterior thereof, and foamable synthetic resin beads of a predetermined amount having metal pieces dispersed therein provided within the hollow interior of said shell through said second opening, said foamable synthetic resin forming a foam synthetic resin core upon application of heat thereto.

4,824,117

BOARD GAME

John Russell, Martin Rd., LaGrangeville, N.Y. 12540

Filed Jan. 15, 1988, Ser. No. 144,485

Int. Cl.⁴ A63F *3/00*

U.S. Cl. 273—248 **10 Claims**

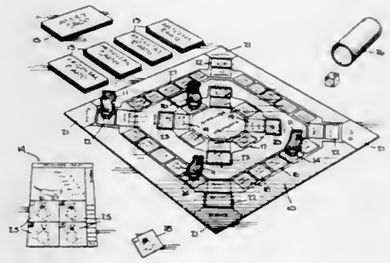
1. A board game comprising:

a board having at least one path including a plurality of spaces bearing instructions thereon;

a plurality of tokens, each said token having a representation of an animal therein distinct from the remaining tokens;

a plurality of sets of "Hospital" designated cards, each set corresponding to a respective token and including individual cards containing indicia of at least one selected part of an animal represented on said respective token;

a plurality of score cards, each card corresponding to a respective token and having indicia of selected parts of an animal represented on said respective token and indicia of a numerical value corresponding to each part;



an indicator for controlling movement of a selected token in said path on said board; and

a set of "Winner" cards including at least two cards containing a different instruction from the other for determining a game winner.

4,824,118

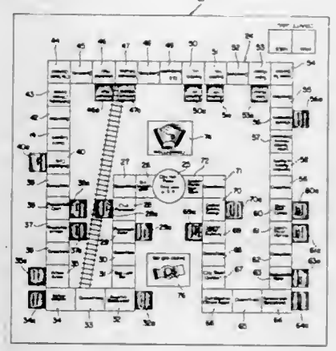
METHOD OF PLAYING A BOARD GAME

William A. Fusaro, 518 Birch St., Fall River, Mass. 02724, and Gabriel T. Andrade, 239 Ames St., Fall River, Mass. 02721

Division of Ser. No. 11,331, Feb. 3, 1987. This application Mar. 21, 1988, Ser. No. 170,426

Int. Cl.⁴ A63F *3/00*

U.S. Cl. 273—256 **7 Claims**



1. A method of playing a board game comprising selecting a plurality of game players, designating a different playing piece for each game player, distributing a predetermined amount of game currency to each game player, determining a playing order and sequentially advancing the playing pieces of said game players along a predetermined path of progression on a game board, said game board having a plurality of sequential locations defining said path of progression thereon, a portion of said locations being possessory real estate locations having predetermined rental rates, a portion of said locations being connection locations and a portion of said locations being penalty locations, a portion of said real estate locations being developable through the use of legal payments of game currency to increase the rental rates thereof, a portion of said real estate locations being developable through the use of political

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connections to increase the rental rates thereof, a portion of said real estate locations being developable through the use of illegal payoffs to increase the rental rates thereof, each player randomly receiving political connections upon landing on said connection locations and selectively purchasing previously unpurchased real estate locations upon landing thereon, each player selectively developing his or her real estate locations through the use of legal payments of game currency, political connections, illegal payoffs of game currency or selected combinations thereof, each player making a predetermined rental payment to the owner of a real estate location owned by another player in accordance with the rental rate thereof upon landing thereon, each player receiving a game penalty upon landing on a penalty location after the player has used an illegal payoff in the development of one of his or her real estate locations.

4,824,119

BACK SPELLING CARD GAME

Charles C. Matthews, 3618 Tindall Ct., Fayetteville, N.C. 28311

Filed Jun. 20, 1988, Ser. No. 208,472
Int. Cl.[4] A63F *1/04*
U.S. Cl. 273—308 **10 Claims**



1. A method of playing a card game wherein the card game includes a plurality of playing cards each representing an individual item, the method of playing said card game comprising the steps of: dealing a set of playing cards to a plurality of players; first, identifying said playing cards by writing the names of said items represented by said playing cards; next, writing the identified items backwards; underlining words contained within said backwards spelled items; and awarding points to players according to how players perform said steps.

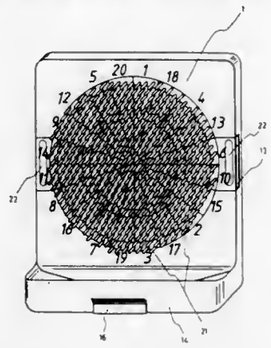
4,824,120

TOY GUN TARGET BOARD CAPABLE OF COLLECTING SOFT PROJECTILES

Hsieh Y. Wang, 22296 S. De Anza Cir., Cupertino, Calif. 95014

Filed Jan. 14, 1988, Ser. No. 143,726
Int. Cl.[4] F41J *3/00*
U.S. Cl. 273—347 **4 Claims**

1. A toy gun target board device mainly comprising a box body, a movable plate disposed inside the box body and spring means provided between the movable plate and bottom plate of the box body; wherein a score board with holes equally and properly spaced is disposed on the surface of the box body; the movable plate has extensions to form ejection portions that extend out through openings at the upper part of both sides of the box body; a plurality of sticks corresponding in number and position to the holes on the score board are disposed on the movable plate, and individually extend out through the holes



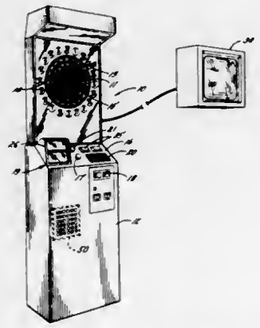
toward the users; and a receiving tray is formed at the lower part of the box body for collecting soft projectiles.

4,824,121

DART GAME WITH PROGRAMMABLE DISPLAYS

Paul F. Beall, and Eugene G. Harlan, both of Rockford, Ill., assignors to Arachnid, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 88,723, Aug. 24, 1987, Pat. No. 4,793,618, which is a continuation-in-part of Ser. No. 926,916, Nov. 3, 1986, abandoned. This application Oct. 28, 1987, Ser. No. 114,194
Int. Cl.[4] F41J *3/00, 3/02*
U.S. Cl. 273—376 **10 Claims**



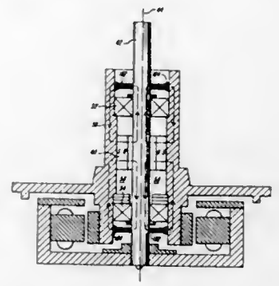
1. An electronic target game for automatically tallying and displaying the score of a game, wherein projectiles are thrown at a target board, said electronic target game comprising:
a display;
said target board comprising a plurality of moveable segments mounted to a switch martrix such that each segment is associated with at least one switch of said switch matrix such that movement of a segment activates at least one switch;
a processor means responsive to the activation of the switches of said switch matrix in both a first mode and a second mode; and
a means for placing said processor means in either said first mode or said second mode;
said first mode responsive to activation of the switches of said switch matrix for providing game condition information to said display; and
said second mode responsive to activation of the switches of said switch matrix for providing a customized image to said display when said electronic target game is not tallying and displaying said score of said game.

4,824,122

COMPACT MAGNETIC FLUID LOW PRESSURE SEAL

Kuldip Raj, Merrimack, and Ronald Moskowitz, Hollis, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 20,460, Mar. 2, 1987, Pat. No. 4,772,032. This application Jul. 6, 1988, Ser. No. 215,735
Int. Cl.[4] F16J *15/40, 15/44*
U.S. Cl. 277—80 **14 Claims**



1. A magnetic fluid seal assembly comprising:
a housing;
a shaft having an axis of rotation;
a bearing assembly for supporting said shaft and for permitting rotation of said shaft relative to said housing, said bearing assembly including at least two axially spaced-apart bearings between said shaft and said housing;
annular magnet means axially positioned between said bearings for, producing a magnetic field;
polepiece means including an annular polepiece axially positioned outside said bearing assembly and extending outwardly from said shaft toward said housing, said polepiece having a closely-spaced, noncontacting relationship with said housing, thereby defining a gap between said polepiece and said housing, at least a portion of said magnetic field existing in said gap, said annular polepiece being spaced from said annular magnet means by one of said bearings, said polepiece means being located entirely outside said bearing assembly so as to form an open magnetic circuit wherein said annular magnet means is not in contact with said polepiece means; and
a magnetic fluid retained by said magnetic field in the gap between said polepiece and said housing, thereby providing on at least one end of said bearing assembly a low pressure capacity magnetic shaft seal having a short axial dimension.

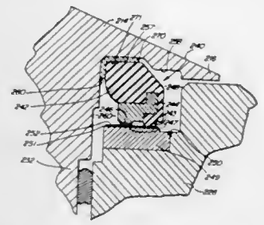
4,824,123

MECHANICAL FACE SEAL FOR ROCK BITS

Weng-Kwen R. Chia, Irvine, and George F. Anderson, Buena Park, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 31, 1988, Ser. No. 176,073
Int. Cl.[4] F16J *15/38*
U.S. Cl. 277—84 **28 Claims**

1. A metal-to-metal seal for a rotary cone rock bit, said seal is positioned in a seal cavity formed between a leg of said rock bit, and a rotatable cone mounted on a journal bearing extending from said leg of said bit, said seal comprising:
a first metal ring, said ring forming a diameter that will fit within said seal cavity, a first radially disposed sealing surface formed from a metallic material of said metal ring, said metal ring subsequently serves as part of said metal-to-metal seal,
a second metal, radially disposed sealing surface formed in said cone is positioned adjacent said first radially disposed sealing surface of said metal ring, said second metal sealing surface is formed from a metallic material in said cone, said metallic material forming said first sealing surface is softer than said metallic material forming said second sealing surface in said cone, said first and second sealing surfaces being pre-lapped to substantially perfect a seal



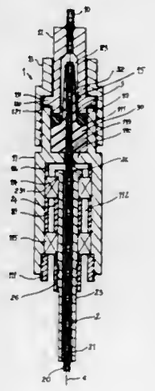
between sealing surfaces prior to insertion of said first metal ring into said seal cavity formed between said leg and said cone of said rotary cone rock bit, and
a resilient material confined within said seal cavity and positioned adjacent said first metal ring, said resilient material is located away from said radially disposed sealing surface, said resilient material serves to urge said first radially disposed metal sealing surface against said second metal, radially disposed sealing surface to maintain said first and second sealing surfaces in sealing engagement thereby.

4,824,124

ROTARY AND SEALED CONNECTION FOR PRESSURIZED FLUIDS

René D. M. Albagnac, Paris, France, assignor to S.A.T. (Societe Anonyme de Telecommunications), Paris, France

Filed Oct. 22, 1987, Ser. No. 112,379
Claims priority, application France, Oct. 22, 1986, 86 14663
Int. Cl.[4] F16J *15/00*; F16L *27/00*
U.S. Cl. 277—188 R **20 Claims**



1. A rotary sealed connection for connecting a pressurized fluid source to an apparatus using said fluid and which is mounted for relative rotation about a shaft, comprising:

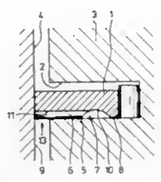
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a first part, secured to said fluid source having a recess for communication therewith and for receiving a flexible seal;
a second part, hollow and of revolution, secured for rotation with said fluid-using apparatus, communicating therewith and with said recess and extending through said first part through a passage forming an annular space about said second part;
a flexible seal provided with at least one annular part preventing flow of said pressurized fluid through said annular space, said second part being mounted on said fluid-using apparatus with a degree of radial freedom and said seal serving as a bearing for said second part and holding it without play in said passage.

4,824,125
AXIAL SEAL FOR A ROTARY-PISTON ENGINE

Dankwart Eiermann, Weissensberg-West, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 197,858
Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717800
Int. Cl.[4] F16J *9/12*
U.S. Cl. 277—215 **5 Claims**



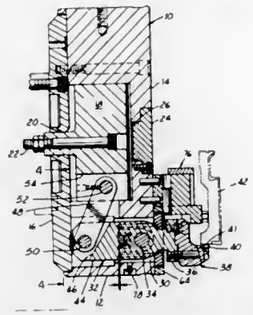
1. In an axial sealing arrangement for a rotary-piston engine, where a sealing member is movably disposed in a groove that is provided in one of two components that have opposing parallel surfaces and that move relative to one another, and where said sealing member, in cooperation with sealing bolts disposed at its ends, and at bends of the seal boundary formed by said sealing member, seals an associated chamber from the clearance between said parallel surfaces of said two components, and hence from the other chambers of said engine, the improvement wherein:
said sealing member has an underside that bears against a low-pressure side of said groove, which also has a base in said one component, said underside of said sealing member being provided, on that portion that is closest to said base of said groove, with a ledge that is rounded where it bears against said low-pressure side of said groove, said underside of said sealing member also being provided, on that side of said ledge remote from said base of said groove and facing said parallel surface of said other component, with recesses that extend to a first contact surface of said sealing member, which first contact surface, remote from said base of said groove, bears against said parallel surface of said other component.

4,824,126
POWER CHUCK

Daniel P. Martin, 1150 S. Oxford, Grosse Pointe Woods, Mich. 48236

Filed Apr. 7, 1986, Ser. No. 849,194
Int. Cl.[4] B23B *31/18*
U.S. Cl. 279—1 C **3 Claims**

1. A power chuck comprising:
a support rotatable about a central axis having a forward end for holding a workpiece thereto for rotation around the axis;
a plurality of rocker arms each having a first end, a second end and a pivot pin seat;
jaw members mounted on said second ends of said rocker arms for engagement with the workpiece;
actuation means mounted for reciprocation parallel to the axis of said support such that a clamping operation may be undertaken as the actuation means moves away from said forward end of the support;
toggle levers pivotally connected to said actuation means and to the first ends of the rocker arm, said levers being operable by reciprocation of said actuation means to rock said arms on said pivot pin joints relative to said support so that the jaws are moved radially of said axis;

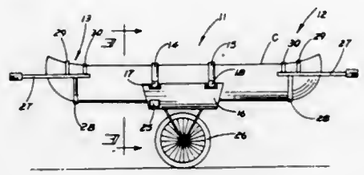


pivot pin joints for each of said rocker arm so as to pivotally balance the rocker arms intermediate the ends thereof concentrically about the axis of the support including a pivot said, said support including a housing and a plurality of carriers corresponding to said rocker arms so that the pivot pin passes through the pivot pin seat of the rocker arm into said carrier members and the pivot pin seat surrounds the pivot pins in a constant seated relationship; and
said carrier member movable relative to the housing but normally urged substantially along the central axis toward the support forward end by spring means such that the spring means may yield when said jaws engage a workpiece allowing the workpiece to be pulled towards said forward end during the clamping operation.

4,824,127
CANOE CARRIER

Lawrence G. Stamm, 1498 Brookside Dr., San Leandro, Calif. 94577

Filed Oct. 6, 1987, Ser. No. 104,934
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—47.331 **1 Claim**

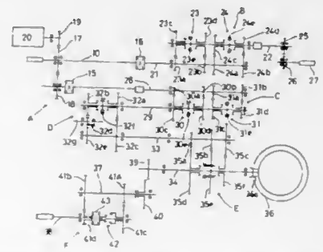


1. A canoe carrier for portage of a canoe comprising,
an arcuate carriage means for yieldingly supporting a canoe therein by means of cushioning means,
respective first and second terminal support portion means about a canoe proximate its ends, each terminal support portion means including means for manual grasping and guidance of said canoe,
wherein said means for manual grasping includes a pair of handles projecting away from said canoe for enabling manual grasping thereof,
wherein each of said first and second terminal support portion means further includes an underlying body support strap positionable about an underside of said canoe connected to and extending between said handles, and a pair of adjustable support strap means extending between said handles for securement about an upper portion of said canoe for attachment of said first and second support portion means to respective ends of said canoe,
wherein said carriage means includes a pair of first and second strap elements adjustably securable about the over periphery of said canoe,
wherein said cushioning means on said carriage means includes a plurality of expandable chambers formed to an interior surface of said arcuate carriage means for yieldingly supporting said canoe, and
wherein a portable air pump is secured within a storage compartment formed on an exterior surface of said carriage means.

4,824,128
TRACTOR TRANSMISSION

Masao Takagi, Hasimoto; Masayoshi Miyahara, Sakai, and Nobuyuki Toshikuni, Neyagawa, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 29, 1987, Ser. No. 43,724
Claims priority, application Japan, Nov. 22, 1986, 61-279233; Nov. 25, 1986, 61-181617[U]; Dec. 22, 1986, 61-197167[U]; Feb. 26, 1987, 62-44398
Int. Cl.[4] B60K *17/28*
U.S. Cl. 180—53.1 **12 Claims**



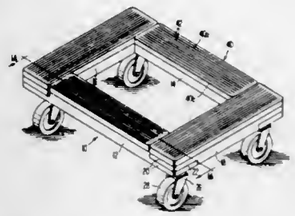
1. A transmission for a tractor comprising a first change speed gear mechanism, and a second change speed gear mechanism for receiving a drive from the first change speed gear mechanism, wherein the first change speed gear mechanism and the second change speed gear mechanism are distributed to opposite lateral sides of a longitudinal vertical plane through a mid-position of said transmission in a direction from the front to the back of said tractor.

4,824,129
PLASTIC DOLLY WITH PROTECTIVE CAPS

Houston Rehrig, Pasadena, Calif., assignor to Rehrig International, Inc., Richmond, Va.

Filed Oct. 13, 1987, Ser. No. 107,052
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—79.11 **1 Claim**

1. A dolly comprising:
a pair of longitudinal side members having end portions, each said end portion having an opening for receiving a caster bolt;
a pair of transverse end members having end portions, each said end portion having an opening for receiving a caster bolt;
said end portions interfitting to form lap joints coupling said longitudinal side members and said transverse end members to form a frame, said lap joints being securely fastened together at the corners of said frame;
a riser pad having an upper surface and side walls extending therefrom, each side wall includes an inner and outer surface parallel to the longitudinal axis thereof, said riser pad being disposed on at least one of said members and having a plurality of slots disposed along at least a portion of at least one of said side walls, wherein each slot includes a shoulder portion which forms a first planar surface extending from a respective outer wall surface toward a respective inner wall surface along the thickness of said at

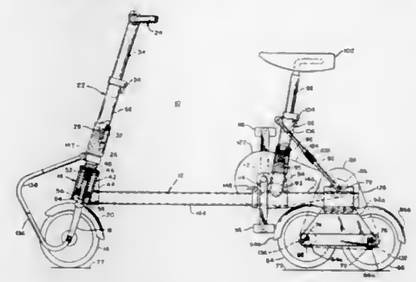


least one side wall and a second planar surface extending from said respective inner wall surface toward said respective outer wall surface and being in a different plane than said first planar surface, said second planar surface having a larger surface area than said first planar surface; and
a protective cap having an upper surface and side walls extending therefrom, said protective cap being disposed over said riser pad and having a plurality of tabs corresponding to said riser pad slots for engagement therewith, each tab comprising an upper protrusion for engagement with said shoulder portion and a lower protrusion being disposed against respective longitudinal side and transverse end members thereby forcing said upper protrusions upwardly behind said shoulder portion to secure said protective cap on said riser pad.

4,824,130
MINI FOLDABLE CYCLE

David Chiu, 252 Indian Head Rd., Kings Park, N.Y. 11754-4804

Filed Oct. 19, 1987, Ser. No. 109,660
Int. Cl.[4] B62K *5/00, 15/00*
U.S. Cl. 280—239 **17 Claims**



1. A cycle for use in riding on a pavement comprising:
a. elongated casing means having a front end and a rear end and means for supporting a passenger;

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b. means mounted on the front end of said casing means for supporting a front cycle wheel; and

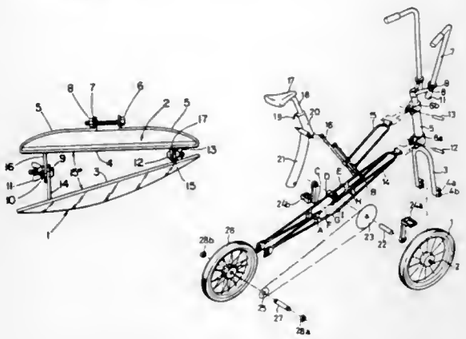
c. means mounted on the rear end of said casing means for supporting a pair of simultaneously driven wheels comprising one front and one rear wheel in tandem, including means to support said front wheel in tandem in a normal, raised position so as not to make contact with a smooth pavement during use of said cycle.

4,824,131

COLLAPSIBLE FOLDING BICYCLE ASSEMBLY

Ching H. Thay, 446, Chien Kuo 1st Rd., San Min District, Kaoshiung, Taiwan

Filed Feb. 9, 1988, Ser. No. 154,076
Int. Cl.[4] B62D *15/00*
U.S. Cl. 280—278 **6 Claims**



1. A folding bicycle comprising an elongated frame mechanism (14) extending in a front-to-rear direction at a slight downward angle;

a front steering assembly comprising a front tube (5) having a pivotal connection (12) with the front end of said frame-mechanism, a post extending downwardly through said front tube, a wheel fork (3) attached to the lower end of said post, and two fold-down handle bars(7) swingably connected to the upper end of said post;

a front ground wheel rotatably supported in said wheel fork, and a rear ground wheel rotatably supported at the rear end of the elongated frame mechanism;

a seat assembly located substantially above the mid point of the frame mechanism, said seat assembly comprising a substantially vertical pipe (20) and a seat-support stem (18) extending within said pipe;

an elongated reinforcement rod means (16) having one end thereof pivotably connected to the elongated frame mechanism (14) at a point near the frame mechanism front end, said reinforcement rod means extending upwardly and rearwardly, with its other end pivotably and detachably connected to said seat assembly pipe;

an elongated arm means (15) having one end thereof pivotably connected to said front tube, said arm means extending rearwardly and downwardly, with its other end pivotably connected to said reinforcement rod means;

an elongated support bar (21) having one end thereof affixed to said seat assembly pipe, said bar extending downwardly and rearwardly with the other end pivotably connected to the elongated frame mechanism at a point spaced rearwardly from the midpoint of the frame mechanism;

said elongated frame mechanism comprising a sprocket shaft support means located in an upper edge area of the frame mechanism at a point substantially directly below the seat assembly pipe: said shaft support means comprising two hingely connected strut mechsnisms having pivot connections (at F and H) with longitudinally spaced portions of the frame mechanism; said frame mechanism including a hinge joint (at I) below said strut mechanisms;

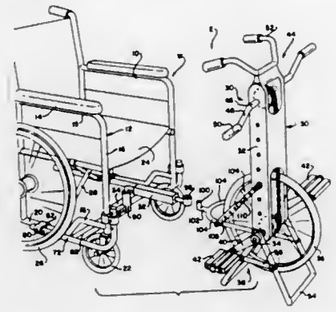
whereby, when the reinforcement rod means is detached from the seat assembly pipe the elongated frame mechanism can be folded at the aforementioned pivot connections and hinge joint so that the front end of the frame mechanism is brought relatively close to the rear end of the frame mechanism.

4,824,132

EXERCISING DEVICE FOR USE WITH A WHEELCHAIR

Jonie M. T. Moore, 1455 W. 120th St., Los Angeles, Calif. 90047

Continuation-in-part of Ser. No. 809,265, Dec. 16, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 145,105
Int. Cl.[4] B62M *1/14*
U.S. Cl. 280—304.1 **22 Claims**



1. An exercising device for attachment to the frame of a wheelchair, said device comprising:

(a) a cross-bar extendable laterally across the frame of a wheelchair and being comprised of first and second cross-bar sections,

(b) attachment means at each end of said cross-bar for releasable attachment to the frame of the wheelchair,

(c) a crankable assembly comprised of a driven wheel and a crank mechanism capable of turning the wheel in the assembly when cranked and which will thereby enable exercising by turning of the wheel,

(d) a connecting arm arrangement extending between the crankable assembly and the cross-bar,

(e) pivotal connecting means on the cross-bar and on the crankable assembly for pivotal and releasable connection to the connecting arm arrangement,

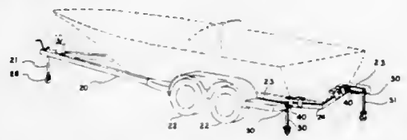
(f) pivot means intermediate tbe ends of the cross-bar and in close proximity to said connecting means permitting pivotal connection of the first and second cross-bar sections and thereby permitting collapsing of the wheelchair.

4,824,133

TRAILER CADDY

Gary W. Wilson, Rte 2, Box 517-AA, Zwolle, La. 71486

Filed May 17, 1988, Ser. No. 196,069
Int. Cl.[4] B60P *3/10*; B60S *9/14*
U.S. Cl. 280—414.1 **4 Claims**



1. An auxiliary wheeled support device for use in combination with a trailer having a castor wheeled front jack, comprising;

a pair of mounting brackets attached to the rear of said trailer;

a pair of support blocks attached to the rear of said trailer, located between said mounting brackets;

a pair of legs, each said leg having two ends, the first end of each said leg pivotally attached to one of said mounting brackets, so that each said leg may be pivoted to a vertical position extending downwardly from said mounting bracket, or pivoted to a horizontal position;

first means for locking each said leg to a respective mounting bracket in said vertical position;

second means for locking each said leg to a respective support block in said horizontal position;

a pair of castor wheels, each of said wheels attached to the second end of one of said legs;

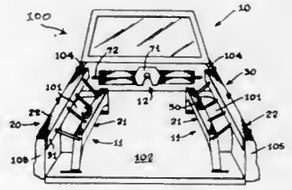
whereby when said trailer jack is lowered, said legs can be moved to said vertical position and when said trailer jack is raised thereafter, said trailer is solely supported by said wheeled front jack and said wheeled pair of legs and said trailer can be moved around upon the castor wheels.

4,824,134

PORTABLE FIFTH WHEEL HITCH APPARATUS

George M. Harris, Rte. 14, Box 3010A, Kennewick, Wash. 99337

Filed Mar. 18, 1988, Ser. No. 169,694
Int. Cl.[4] B60D *1/00, 53/06*
U.S. Cl. 280—438.1 **6 Claims**



1. A portable fifth wheel hitch assembly in combination with a conventional pick-up truck construction having a truck bed, raised wheel well housing, and sidewalls having a top surface provided with a plurality of spaced stake wells; wherein, the assembly comprises:

a draw bar unit comprising a draw bar member having a centrally disposed hitch box and a pair of pintle pins projecting from opposite ends of the draw bar member; and,

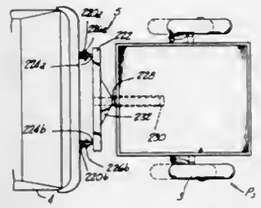
a pair of rail units; wherein, each of the rail units comprises a rail member having: a generally U-shaped lower element adapted to overlie the opposed wheel well housings; an elongated horizontally disposed upper element; and, a plurality of brace elements extending between said upper and lower elements; wherein, the upper element of each rail member is provided with a plurality of securing means that are spaced and dimensioned to be received within the plurality of stake wells in the side walls of the truck to form the operative connection between the truck and the rail units; and, wherein the lower element of each rail member is provided with a pintle capturing means for operatively connecting the draw bar unit to the conventional pick-up truck construction.

4,824,135

AUTOMATIC SELF-STEERING TRAILER AXLE

Donald T. McGregor, 8067 Monroe Ave., Stanton, Calif. 90680

Filed Nov. 10, 1986, Ser. No. 928,512
Int. Cl.[4] B62D *13/00*
U.S. Cl. 280—442 **25 Claims**



1. An automatic self-steering vehicle axle comprising:

a pair of rotation pivoting wheel assemblies, each of said wheel assemblies including a rotation plate;

a pair of steering arms, each of said steering arms being connected to one of said wheel assembly's rotation plates; and

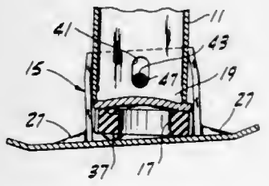
a rod member pivotally connecting said steering arms, wherein said wheel assemblies are rotatably connected to the ends of the axle, said wheel assemblies rotation plates being capable of rotation about a vertical axis and, further, wherein each of said wheel assemblies are pivotally connected to said rotation plates, said wheel assemblies capable of pivoting about a horizontal axis wherein said horizontal pivotal axis intersects said vertical rotational axis; and further wherein said wheel assembly includes a ratchet locking means for locking the axial rotation of the wheel assembly.

4,824,136

LANDING GEAR FOR A VEHICLE

G. Bobby Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

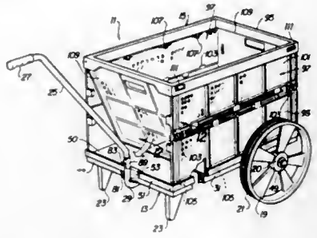
Filed May 11, 1987, Ser. No. 48,597
Int. Cl.[4] B60S *9/00*
U.S. Cl. 280—475 **8 Claims**



1. Landing gear for a vehicle such as a trailer, comprising a leg, a foot at the lower end of the leg adapted for engagement with the ground, a pair of generally channel-shaped members forming a tube which extends up from the foot and telescopically receives the lower end of said leg, an elastomeric member disposed in the tube between the lower end of the leg and the foot, bearing plate means in the tube interposed between the elastomeric member and the lower end of the leg, and means attaching the tube to the lower end of the leg and permitting limited telescopic movement of the leg and the foot whereby said foot is adapt ed to move upwardly relative to the leg as the landing gear accepts the weight of the vehicle thereby resiliently to compress the elastomeric member between the foot and said bearing plate means, said channel-shaped members

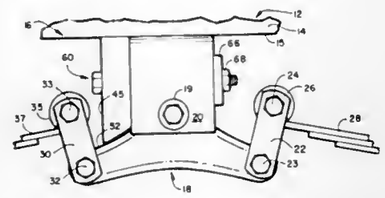
having edges spaced from one another to form relatively narrow gaps extending generally axially of the tube to permit drainage from the interior of the tube.

4,824,137
COLLAPSIBLE CART
Ronald J. Bolden, Katy, Tex., assignor to USEC, Inc., Winchester, Va.
Filed Apr. 1, 1988, Ser. No. 176,667
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—652 **5 Claims**



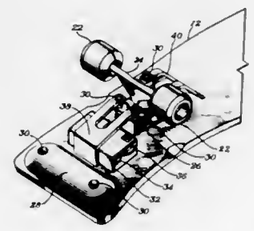
1. A collapsible cart comprising a frame;
a pair of laterally spaced front legs depending from one end of the frame as a part thereof;
a transverse axle shaft mounted upon the frame adjacent the other end thereof and projecting therefrom mounting a pair of wheels;
a collapsible basket of rectangular shape overlying, mounted upon and removably secured to said frame;
a handle socket between said legs centrally underlying and removably secured to said frame;
a formed central handle having one end portion aligned with and removably nested and secured within said socket, with its other end projecting forwardly;
said handle socket being right angular in shape including an upturned handle support having a transverse concave U-shaped portion operatively receiving said one end portion of said handle;
and a fastener interconnecting said handle support and handle.

4,824,138
ROCKER ARM STABILIZER BAR ASSEMBLY
Darwin Rappold, 3920 El Canto Dr., Spring Valley, Calif. 92077
Filed Feb. 8, 1988, Ser. No. 152,949
Int. Cl.[4] B60G *11/10*
U.S. Cl. 280—682 **5 Claims**



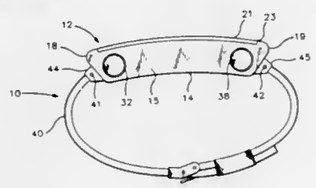
1. A rocker arm stabilizer bar assembly for a tandem axle trailer comprising:
a vertically oriented elongated stabilizer bar for installation between the bottom surface of a tandem axle trailer frame and the top surface of a rocker arm that has its repsective forward and rearward ends connected to one end of the front wheel leaf spring and one end to the rear wheel leaf spring of the trailer, said stabilizer bar having a top end, a bottom end, a front surface and a rear surface;
an aperture in said stabilizer bar intermediate its top and bottom ends, said aperture passing through said stabilizer bar from its front surface to its rear surface; and
a primary bolt having a shank portion that is threaded adjacent its one end, a spanner plate having an aperture passing therethrough, the shank of said primary bolt passing through the aperture of said stabilizer bar and the aperture in said spanner plate and a nut is threaded on the end of said primary bolt whereby said stabilizer bar may be clamped in position against one end of a bracket that supports the rocker arm and the spanner plate can be clamped against the opposite end of the bracket.

4,824,139
SKATEBOARD WITH AUDIO ENTERTAINMENT DEVICE
William D. Robbins, Succasunna, N.J., assignor to nash Manufacturing Co., Fort Worth, Tex.
Filed Jan. 22, 1988, Ser. No. 147,140
Int. Cl.[4] A63C *17/02, 17/14*
U.S. Cl. 280—816 **14 Claims**



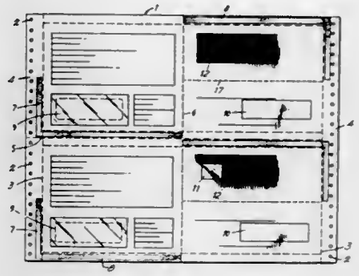
1. An improved skateboard comprising:
(a) a board having a lower surface and an upper surface adapted to support a rider;
(b) a plurality of ground engaging members mounted to said lower surface including at least a forward truck and wheel assembly, a rearward truck and wheel assembly, and a tail skid member mounted at the rear of the board on said lower surface;
(c) an audio entertainment device secured to the board on said lower surface between said rearward truck and wheel assembly and said tail skid member; and
(d) audio output means associated with said audio entertainment device.

4,824,140
WRIST NOTE PAD
Virginia W. Rankin, 11 Half Moon Bend, Coronado, Calif. 92118
Filed Apr. 29, 1988, Ser. No. 187,973
Int. Cl.[4] B42D *19/00*; B41L *31/00*; G09F *11/18*; B42F *17/28*
U.S. Cl. 281—8 **1 Claim**



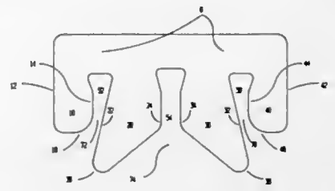
1. A wrist note pad comprising:
an elongated housing having a bottom wall, laterally spaced upstanding side walls and laterally spaced upstanding end walls that form a chamber therewithin, the bottom wall of said housing having a concave curvature to better mate with the wrist of the person wearing the wrist note pad;
a scrolled paper roll;
means for rotatably mounting said scrolled paper roll within said housing adjacent one of said end walls;
a take-up roll shaft, and take-up roll shaft having a longitudinally extending slot through which the front end of said scrolled paper roll would be threaded;
means for rotatably mounting said take-up roll shaft within said housing adjacent its other end wall;
an elongated writing surface cover for closing the top of said housing, said cover having a top surface and a bottom surface, said cover having longitudinally spaced laterally extending slots through which paper from scrolled paper roll can be threaded to overlay the top surface of said cover so that said paper may be written upon, the top surface of said cover having a convex curvature, one end of said writing surface is attached by a hinge to the top surface of said housing and the other end of said writing surface cover has a snap clip thereon for locking said writing surface cover;
an elongated wrist fastening band having first and second ends; and
means for pivotally connecting the first and second ends of said wrist fastening band to the respective opposite ends of said housing.

4,824,142
CONTINUOUS BUSINESS FORMS
Bernard Doessche, Mariakerke, Belgium, assignor to Moore Business Forms, Inc., Glenview, Ill.
Continuation of Ser. No. 914,085, Oct. 1, 1986, abandoned. This application Aug. 31, 1987, Ser. No. 91,344
Claims priority, application United Kingdom, Oct. 3, 1985, 8524389
Int. Cl.[4] B41L *1/26*
U.S. Cl. 282—11.5 A **24 Claims**



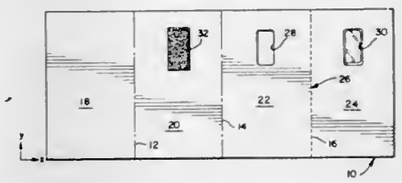
1. A business forms assembly comprising a continuous assembly of self mailer web parts in the form of a single web folded longitudinally into two web parts or of two separate web parts collated together and having heat sealed adhesive to secure the web parts together characterized in that the part of the assembly to receive a personal identification number has attached to it a patch of self copy paper with the sensitive coating side of the self copy paper towards the forms assembly and the other side of the patch bearing masking printing.

4,824,141
PAGE HOLDER FOR BOOKS
Arthur M. Lewis, and Flora B. Lewis, both of 157 Shelter Rock Rd. #36, Danbury, Conn. 06810
Filed Apr. 6, 1987, Ser. No. 34,915
Int. Cl.[4] B42D *9/00*; B41J *11/00*; A44B *19/00*
U.S. Cl. 281—42 **6 Claims**



1. A page holder for holding a book open to desired pages, said page holder comprising a transparent generally flat sheet sufficiently rigid to resist self-closing forces of said book, said sheet comprising four fingers extending to one side of a common base, the tips of the two central fingers being farther from said base than the tip of the end fingers, said page holder being dispose across the top or bottom of said book with each of said central fingers inserted behind a plurality of leaves behind each of said desired pages, and with each of said end fingers disposed in front of one of said desired pages, wherein an edge of each said end fingers and the proximal edge of the nearest of said central fingers define an end slot whose narrowest point is away from said base.

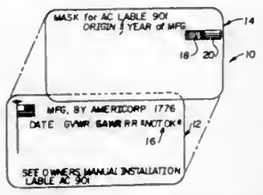
4,824,143
LIPSTICK SAMPLER AND METHOD OF FABRICATION
Frederick Grainger, West Greenbrook, N.J., assignor to Webcraft Technologies, Inc., N. Brunswick, N.J.
Filed Oct. 8, 1987, Ser. No. 105,790
Int. Cl.[4] G09F *5/02*; B65D *73/00*; B42D *5/00*; A45D *40/00*
U.S. Cl. 283—56 **29 Claims**



1. A cosmetic sampler, comprising:
(a) a first panel;
(b) a spreadable solid material overlying a portion of said first panel;
(c) a transparent panel overlying said first panel and including a bubble portion overlying at least a portion of said material; and,
(d) a second panel overlying said first and transparent panels, said second panel being substantially opaque and including a first window through which said bubble portion extends so that said material may be viewed.

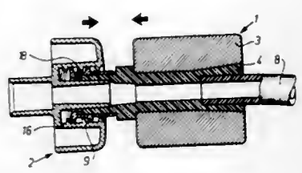
VOL 1101 ISS 4 APR 25 1989 UMI

4,824,144
COLOR IDENTIFICATION SYSTEM
Gerald W. Tasma, 12600 Shaner, N. E., Cedar Springs, Mich. 49319
Filed Apr. 10, 1987, Ser. No. 37,163
Int. Cl.[4] B42D 15/00
U.S. Cl. 283—87 17 Claims



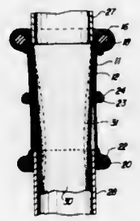
1. An identification system comprising an identifying member and an authenticating device, said identifying member having thereon characters in at least two different colors with areas of said characters overlapping so as to be confusing to the naked eye, certain of said characters of at least two of said colors being an authentication mark, said authentication mark being in a preselected pattern of at least two portions, one portion in one color and another portion in a second color, and said authenticating device including filter segments with each filter segment being of a different color and being a filter for at least said two colors, and said filter segments being arranged in said preselected pattern, said identifying member and said authenticating device having a preselected relationship with each other whereby said authentication mark will appear only when said identifying member is associated with said authenticating device in said preselected relationship.

4,824,145
COUPLING COMPONENTS
Per-Olov A. Carlsson, Sosdala, Sweden, assignor to Gambro AB, Sweden
Filed Apr. 10, 1987, Ser. No. 36,597
Claims priority, application Sweden, Jun. 6, 1986, 8602562
Int. Cl.[4] F16L 21/00
U.S. Cl. 285—38 37 Claims



1. A female coupling component adapted to be alternately coupled to and released from a male coupling component including a tubular male coupling member, said female coupling component comprising an inner tubular female coupling member including a first end and a second end, said first end of said inner tubular female coupling member including a tubular orifice having a size adapted to frictionally engage said tubular male coupling member when inserted therein, said second end of said inner tubular female coupling member including adapter means for connection to a tube member, and an outer tubular female coupling member including an inner passage adapted to engage the outer surface of said inner tubular female coupling member, said outer tubular female coupling member being substantially rigid and said inner female coupling member being substantially resilient as compared to said outer tubular female coupling member and being axially compressible, whereby axial movement of said outer tubular female coupling member so as to be coupled to said male coupling component carries said inner tubular female coupling member therewith, and said inner tubular female coupling member may be axially compressed thereby.

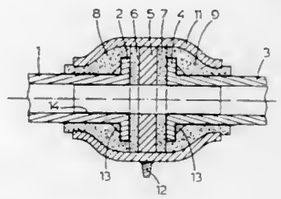
4,824,146
FLEXIBLE CONNECTOR TUBE
John H. Redfield, Huntington Woods, Mich., assignor to The Acme Group, Detroit, Mich.
Filed Feb. 8, 1988, Ser. No. 153,078
Int. Cl.[4] F16L 11/12
U.S. Cl. 285—45 13 Claims



9. A flexible connector for connecting together adjacent ends of a pair of spaced apart conduits which are located one above the other, and wherein one of said conduits is capable of repetitively moving relative to the other, comprising:
an elongated tube formed of a cloth-like material having an upper end portion sized to overlap and closely surround the lower end of the upper conduit, and a lower end portion sized to overlap and closely surround the upper end of the lower conduit for interconnecting the two conduits;
means for securing the upper and lower end portions of the tube to their respective overlapped conduit portions;
an interior tubular sleeve formed of a cloth-like material arranged coaxially within the tube, said sleeve having an upper end including an upper edge, said upper end secured to the upper end portion of the tube;
stitching means for securing the upper end of said sleeve to the upper end portion of the tube, said sleeve being otherwise free of securement to the tube and loosely hanging downwardly within the tube for loosely extending into the upper end of the lower conduit,
whereby the tube independently yields and flexes under the impacts and contacts from particulate material flowing from the upper conduit, through the connector and into the lower conduit.

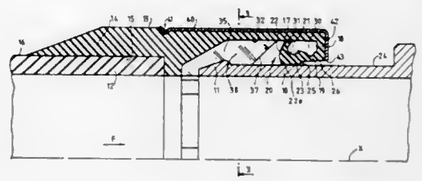
4,824,147
ELECTRICALLY INSULATED PIPE JOINT
Wilhelmus A. E. M. De Gruijter, Zwijndrecht, Belgium, assignor to Angli Holding B.V., Rotterdam, Netherlands
Filed May 13, 1987, Ser. No. 51,954
Claims priority, application Netherlands, May 14, 1986, 8601210
Int. Cl.[4] A16L 21/00
U.S. Cl. 285—53 17 Claims

1. An electrically insulated pipe joint, comprising:
two metallic tubular elements each having a respective end and an associated flange at said respective end, said flanges having front faces facing each other and each having an outer diameter greater than that of said tubular element associated with said flange;
means for coupling said two tubular elements together and including a metallic coupling sleeve surrounding said flanges and extending behind said flanges over said two tubular elements;
means for insulating said coupling sleeve from said two tubular elements to prevent grounding through said coupling sleeve and including a first electrical insulation disposed between said coupling sleeve and each of said tubular elements; and
means for establishing two resistances in series between said two tubular elements regardless of a path followed by an eventual electrical discharge due to lightning striking and including a metal ring disposed between said two tubular



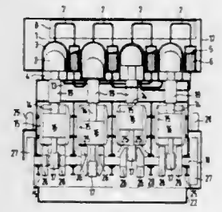
elements and a second electrical insulation disposed between said metal ring and each of said front faces of said flanges, said metal ring having a circumferential surface with an outer diameter greater than that of each of said flanges and said circumferential surface being in contact with said coupling sleeve, said coupling sleeve having an inner periphery that is forceably squeezed only onto said first insulation and said circumferential surface of said metal ring.

4,824,148
DEVICE FOR SEALINGLY FIXING A TUBE OR PIPE TO AN END COUPLING
Jean Grabowski, Chalette-sur-Loing, France, assignor to Hutchinson, Paris, France
Filed Oct. 27, 1987, Ser. No. 113,938
Claims priority, application France, Oct. 30, 1986, 86 15118
Int. Cl.[4] F16L 17/00
U.S. Cl. 285—110 8 Claims



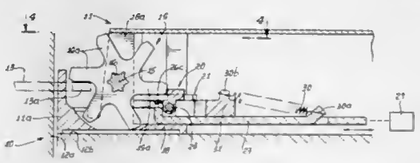
1. A device for fixing a hose to an end coupling in fluid communication wherein the end coupling has an external face, the device comprising a generally cylindrical element having an internal surface, a portion of said internal surface being fixed to an external surface of the hose, and the element having a free end portion adapted to be positioned around the external face of the end coupling, said device further including an annular peripheral lip at the free end portion of the element located inwardly of the internal surface of the element for engaging the external face of the coupling, said annular peripheral lip having a deformable end portion curved toward and engaging said internal surface of said element and defining an annular chamber between said annular lip and said internal surface of said element, said deformable end portion further being curved inwardly to said annular chamber and effectively forming a valve for said annular chamber, said chamber being in fluid communication through said valve with the hose whereby said chamber is pressurized to an elevated fluid pressure by fluid pressure in the hose thereby forcing said annular lip into tight sealing engagement with the outer surface of the coupling, and the chamber substantially maintaining the elevated fluid pressure during subsequent times of lower fluid pressure in the hose and end coupling.

4,824,149
GENERATOR SET
Günter Reuchlein, Augsburg, Fed. Rep. of Germany, assignor to MAN Technologie GmbH, Fed. Rep. of Germany
Filed Mar. 14, 1988, Ser. No. 167,342
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709266
Int. Cl.[4] F02G 1/04
U.S. Cl. 290—1 R 18 Claims



1. A generator set comprising at least a four cylinder double-acting hot gas or stirling engine which each piston:
a. operates in a cylnder between a hot and a cold cylinder chamber in a reciprocating mode;
b. is connected through a piston rod to a cross head in which cross head guidance is limitedly conducted, and
c. that a coupling rod which is attached to the cross head is connected with a crank shaft, in which in each of the cross heads are built the moveable components of a linear generator consisting of the permanent magnets and exciting coils, and on which each cross head guidance there are arranged the stationary components of a linear generator, namely, the stators, wherein the coupling rods in the crank shaft, inasmuch as no power is to be transmitted from the crank shaft, merely permit synchronization of the operating cycles of the pistons, said coupling rods being constructed of lightweight material, and wherein the crank shaft is additionally not conducted out of the crank shaft housing which encompasses the drive mechanism chamber, said crank shaft housing being hermetically sealed.

4,824,150
FIRE RESPONSIVE SAFETY DOOR ASSEMBLY
Gregg L. Smith, Rolling Hills Estates, and Mansam Choi, Monrovia, both of Calif., assignors to Adams Rite Manufacturing Company, City of Industry, Calif.
Filed Feb. 29, 1988, Ser. No. 161,952
Int. Cl.[4] E05B 65/10; E05C 3/36
U.S. Cl. 292—92 8 Claims



1. In a door retention assembly that locks a door in closed position in response to high temperature as during a fire, the door element having an edge portion closable into adjacent relation to an edge portion defined by a header element, there

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being a strike carried by one of the elements, the combination comprising:

(a) a latch carried by the other element to relatively move into latching relation with the strike when the door element is closed relative to the header element, thereby to hold the door closed,

(b) and control means to control movement of the latch into and out of said latching relation with the strike, said means including a heat fusible part that, when fused, renders said control means inoperable to effect movement of the latch out of latching relation with the strike,

(c) said means including a jamming part directly carried only by said heat fusible part to become displaced into jamming relation with said control means in response to fusing of the fusible part,

(d) said jamming part being a pin carried by said heat fusible part in a first position wherein said control means is not jammed, and said jamming part is dropped by said fusible part during heat fusing thereof, and into a second position wherein the control means is then jammed.

4,824,151

DOOR LOCK

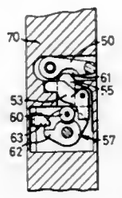
Andrew M. Taylor, New Milton, United Kingdom, assignor to Taylor Lock Company Ltd., Dorset, United Kingdom

Filed Nov. 19, 1986, Ser. No. 932,347

Claims priority, application United Kingdom, Nov. 19, 1985, 8528445

Int. Cl.⁴ F05C *3/06*

U.S. Cl. 292—201 **14 Claims**



1. A door lock comprising a locking arm mountable to a door frame and a lock apparatus mountable to a door, said lock apparatus comprising means defining a recess suitable for receiving said locking arm, a slidable engaging element, first means for urging said slidable engaging element into an extended position into said recess, an internally located locking element, second means for urging said locking element to move into a locking position locking said slidable engaging element in said extended position, and latch means for moving said locking element into said locking position in response to full entry of said locking arm in the recess whereby in the locked position said slidable engaging element cooperates with the predetermined form of said locking arm to prevent the withdrawal thereof from the recess; and unlocking means capable of moving said locking element from said locking position to unlock said slidable engaging element.

4,824,152

VEHICLE DOOR LATCH

Philip S. Jeavons, Birmingham, England, assignor to Rockwell Automotive Body Components (UK) Ltd., United Kingdom

PCT No. PCT/GB86/00639, § 371 Date Aug. 7, 1987, § 102(e) Date Aug. 7, 1987, PCT Pub. No. WO87/02738, PCT Pub. Date May 7, 1987

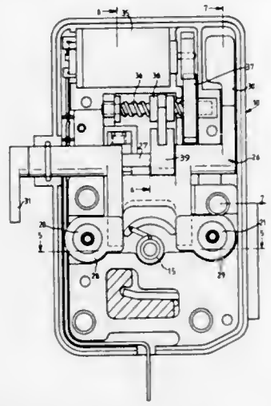
PCT Filed Oct. 20, 1986, Ser. No. 83,858

Claims priority, application United Kingdom, Oct. 25, 1985, 8526426

Int. Cl.⁴ E05C *3/16*

U.S. Cl. 292—216 **8 Claims**

1. A latch assembly for releasably latching a vehicle door in a closed position to a vehicle door frame including a latch bolt in the form of a rotatably mounted claw formation defining a mouth with which a cylindrical portion of an interacting striker formation of the door frame cooperates to latch the door; retention means cooperating with the bolt to hold it at a latched position keeping the door fully closed and at a safety position at which opening movement of the door beyond a near closed position is prevented; and release means connected to operating means of the door to actuate the retention means for freeing the bolt to allow the door to open; characterized in



that the retention means includes first and second pawl members guided for movement in respective rectilinear paths each parallel to an axis about which said latch bolt rotates, each said pawl member being resiliently urged independently of the other into coacting relationship with the bolt, the first pawl holding the bolt at the safety position and the second pawl holding the bolt at the latched position; and in that the release means acts to shift both pawl members to free the bolt and allow the door to open in use.

4,824,153

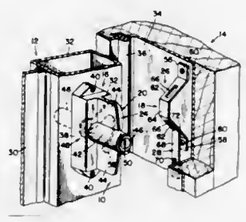
LOCK FOR SLIDING DOOR ASSEMBLY

Thomas J. Dugan, 226 Paseo de Cristobal, San Clemente, Calif. 92672

Continuation of Ser. No. 678,077, Dec. 4, 1984, abandoned. This application Nov. 21, 1986, Ser. No. 935,063

Int. Cl.⁴ E05C *17/16*

U.S. Cl. 292—262 **3 Claims**



1. A strike part for a door lock comprising:

a strike member comprising an elongate strap having opposite ends with holes to receive screws for securing said strike member to a supporting part and two spaced longitudinal slots between said ends located in a common longitudinal plane of the strap perpendicular to the side surfaces of the strap,

an elongate securement strap having shaped longitudinal edges forming a T formation at and constituting one end of the securement strap,

said securement strap having a certain position relative to said strike member wherein said T formation parallels and is insertable into and removable from one of said strike member slots, and wherein; said securement strap is rotatable while its T formation is positioned in said one strike member slot to locate said T formation crosswise of said one slot and thereby lock said securement strap to said strike member strap, and said securement strap while thus locked to said strike member is pivotally rotatable relative to said strike member and in said common plane of said slots.

4,824,154

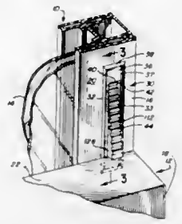
SECURITY LOCK FOR DOUBLE-HUNG WINDOW

Harold Simpson, Hazel Crest, Ill., assignor to Ashland Products Company, Chicago, Ill.

Filed Feb. 10, 1988, Ser. No. 154,656

Int. Cl.⁴ E05C *17/44*

U.S. Cl. 292—338 **6 Claims**



1. A security lock for use in a double-hung sash window assembly having upper and lower sash window frames formed of assembled header and hollow stile members and installed for vertical reciprocal sliding movement one relative to the other, a stile of said upper sash frame having a recess into the interior thereof from a side of the stile, and security lock comprising:

A. a casing having an internal cavity, a faceplate overlaying said cavity having an opening into the cavity and a pivot lug in the cavity secured to a wall of the casing , said casing adapted to be installed in said recess with the faceplate surrounding the perimetric edges of said recess;

B. a leaf spring having opposite ends and mounted in said cavity;

C. an elongated tumbler having an upper and lower ends with said upper end including pivot means pivotally mounting said tumbler on said lug in the casing and said lower end being movable between a locking position and a retracted position in the opening of the faceplate relative to the header of the lower sash frame;

D. said spring having one end engageable with the lower end of the tumbler normally to bias said lower end of the tumbler to protrude beyond said opening into said locking position to engage against the lower sash frame and prevent such relative sliding movement between the sash frames;

E. said pivotally mounted tumbler being retractable manually into the cavity to disengage said lower end of the tumbler from the lower sash frame header and permit such relative sliding movement between the sash frames;

F. said second end of the spring protruding from the casing into engagement with said side of the stile; and

G. said lower end of the tumbler and faceplate and said pivot means having means cooperating to releasably maintain said lower end of the tumbler in said retracted position.

4,824,155

POWER-DRIVEN GRIPPER, ESPECIALLY FOR MANIPULATING MOULD PARTS AND COOPERATING COMPONENTS IN AN AUTOMATED FOUNDRY PLANT

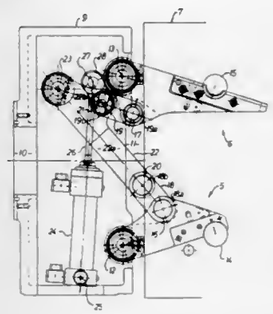
Ole A. Jacobsen, Tisvildeleje, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Oct. 14, 1987, Ser. No. 108,391

Claims priority, application Denmark, Oct. 14, 1986, 4897/86

Int. Cl.⁴ B66C *3/16*

U.S. Cl. 294—88 **6 Claims**



1. A gripper (3) for manipulating objects or machine parts, such as a core mask (7) in an automated foundry plant and of the kind comprising

(a) a gripper base (9),

(b) a first gripping-jaw bearing (12) substantially fixedly positioned on said base (9),

(c) a second gripping-jaw bearing (13) substantially fixedly positioned on said base (9) a distance from said first gripping-jaw bearing (12),

(d) a first gripping jaw (5) having a first actuating pin (16) eccentrically spaced from said first gripping jaw bearing (12) and being pivotably supported about said first gripping-jaw bearing (12) and adapted to be moved between

(d1) a gripping position extending from said gripper base (9), and

(d2) a rest position withdrawn to said gripper base (9),

(e) a second gripping jaw (6) having a second actuating pin (17) eccentrically spaced from said second gripping jaw bearing (13) and being pivotably supported about said second gripping-jaw bearing (13) and adapted to be moved between

(e1) a gripping position extending from said gripper base (9), and

(e2) a rest position withdrawn to said gripper base (9) and is positioned outside of and close to the withdrawn first gripper jaw (5), and

(f) actuating means (18,19,22,24,26) for providing mutually coordinated movements of the two gripping jaws (5,6) between said gripping positions and rest positions, characterized in

(g) that said actuating means comprises two mechanically interconnected knee-joint mechanisms (18,22*a*,19,22*b*), one for each said gripping jaw (5,6), each of said knee-joint mechanisms having a respective first end pivotably secured to a bearing (23) on said gripper base (9) and a respective second end pivotably connected with the respective actuating pin (16,17) of the respective gripping jaw (5,6), said knee-joint mechanisms being thus dimensioned and situated

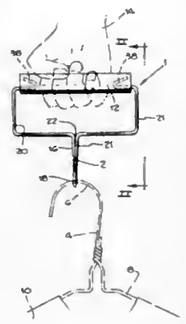
(g1) that when said actuating means is made to move the gripping jaws (5,6) from the gripping position to the rest position, the first gripping jaw (5) will initially move faster than the second gripping jaw (6), and

(g2) that when this movement is completed, the second

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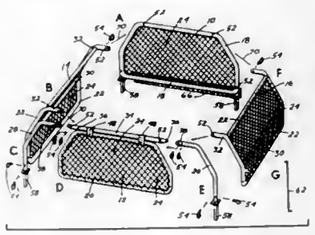
gripping jaw (6) will be positioned outside of the first gripping jaw (5).

4,824,156
HANGER HOLDER
Barry N. Greene, P.O. Box 10541, Beverly Hills, Calif. 90213
Filed Jan. 25, 1988, Ser. No. 148,077
Int. Cl.[4] A45C *13/26*; A45B *3/06*
U.S. Cl. 294—142 35 Claims



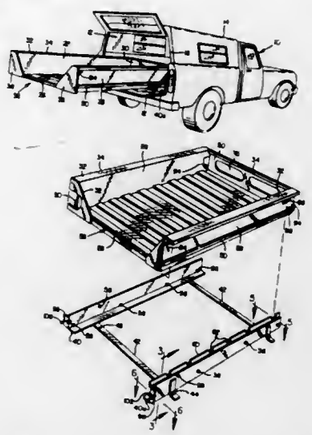
1. A hanger holder for holding hangers which have body portions and grasping portions comprising:
loop means for attaching one or more hangers;
handle means for carrying the loop means;
means for connecting the loop means to the handle means; and
said loop means having loop portions which lie in a direction essentially parallel to the fingers of a hand holding the handle means.

4,824,157
UTILITY CAGE FOR VEHICLES
Wade S. Nielsen, 9232 Stanford La., and Steven L. Abshier, P.O. Box 307, both of Durham, Calif. 95938
Filed Apr. 25, 1988, Ser. No. 185,951
Int. Cl.[4] B60P *7/02*
U.S. Cl. 296—100 10 Claims



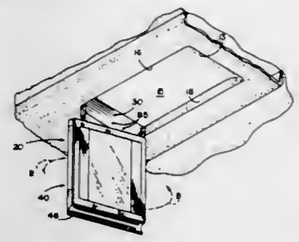
1. A utility cage for vehicles comprising,
a dismantlable cage structure including:
a first vertically oriented end cage panel member configured in a particular shape;
a second vertically oriented end cage panel member configured in a particular shape;
said particular shape of both said end cage panel members being substantially a half octagon figure formed upwardly from a long horizontal base as if cut centrally diametrically through said octagon;
said first and said second end cage panel members both fabricated of tubular edge framing fully covered on one side with expanded metal material;
said first end cage panel member being a singular structure with cornerwise downwardly extending insert attachment means sized and arranged adjustably to fit existing stake apertures in various vehicles particularly pickup truck side walls and side-walled trailers;
said second end cage panel member upwardly hingedly attached to a secondary conformingly shaped framing with said conformingly shaped framing dismantlable and downwardly affixed cornerwise with said downwardly extending insert attachment means adjustably compatible to said stake apertures in said vehicles and particularly said pickup truck side walls and said side-walled trailers;
two interchangeable substantially rectangular side cage panels longitudinally horizontally oriented, each said side cage panel being a tubular frame with expanded metal material covering one side, each said side cage panel affixed with a longitudinal tubular frame member positioned to angle said side cage panel expanded metal material in configuration with angled short-end vertical tubular framing of said side cage panels for symmetrical conformation vertically with said upwardly half-octagon shape of said vertically oriented end cage panels;
apertures positioned upwardly and downwardly in said tubular framing of said first end cage panel member and in said secondary framing of said second end cage panel member placed for alignment with apertures in angled hanger extensions at all four corners of said tubular edge support frame of both said side cage panels, said apertures arranged for changeable pin hinging pivotally of said side cage panels to said first end cage panel and said secondary framing of said second end cage panel;
pivotal hinge pins having snap-in retainer means and sized to removably fit said apertures;
a combination stop and locking means affixed at one terminal end of each of said pivotal hinge pins;
a substantially rectangular top cage panel sized and oriented for flat positioning removably attached atop said cage structure, said top cage panel longitudinally aligned with said horizontally longitudinally aligned side cage panels, said top cage panel tubular framed with rounded corners and reinforced substantially with longitudinal tubular supports centrally spaced in said top cage panel tubular frame and having one side covered with expanded metal material, there being attachment means at both shorter ends of said top cage panel and hand grip openings one adjacent each said shorter end of said top cage panel aligned centrally and cut through said expanded metal material covering;
means for attaching said top cage panel in the opened tailgate area of a pickup truck for ramp use;
means for supporting a free end of said top cage panel sufficiently elevated to be positioned as an extension of said pickup truck tailgate;
means for retaining said side cage panels and said upwardly hinged second end cage panel in fixed open positions;
means for blocking access to said pickup truck bed between said first end cage panel and the back of the cab housing of said pickup truck;
means for attaching said tubular frame of said second end cage Panel member immediately to said tubular frame of said first end cage panel member;
covering means with attachments removably fitting over and supported by said cage structure.

4,824,158
COMBINATION ACCESS BOX AND BED LINER FOR VEHICLES
Richard E. Peters, and Larry J. Parlette, both of 2627 SE. Holgate, Portland, Oreg. 97202
Filed Jul. 23, 1987, Ser. No. 76,943
Int. Cl.[4] B60R *5/00*
U.S. Cl. 296—37.6 4 Claims



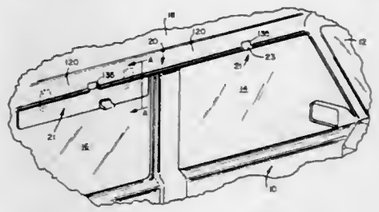
1. An access box for vehicles of the type having a covered cargo area with forward and rearward ends defined by a floor and side walls, said access box comprising
an open top container including a bottom wall, side walls, a front wall, and a rear reinforcing corner web projecting laterally beyond at least one of said side walls,
a pair of laterally spaced, longitudinal support members arranged for securement to the floor of a vehicle cargo area,
an outwardly turned flange at the rearward end of at least one of said support members,
longitudinal reinforcing rail means on each side of said container,
horizontal axis guide rollers on said support members supporting said box above the floor of the cargo area for longitudinal movement between a forward loaded position and a rearward access position,
said rail means and rollers providing self support of said box in said movable positions as well as in said rearward access position at a point such that articles in the front thereof can be reached from the rear of the vehicle cargo area,
said longitudinal rail means and rollers providing cantilevered and straight line, self support of said box in said rearward access position and in alignment with its line of travel,
latch means on said support members and container arranged to locate said container in said forward loaded position and said rearward access position as well as intermediate positions,
vertical axis guide rollers engageable between said support members and said container providing lateral stability of said container on said support members in said longitudinal positions of said container between said forward loaded and rearward access positions,
said stop means on said outwardly turned flange of said support member engageable with said lateral projecting corner web of said container for stopping forward travel of said container with said latch means in said forward loaded position to prevent forward and rearward play of said container while the vehicle is in motion,
said stop means being adjustable in the direction of movement of said container for positioning it selectively to stop said container at precisely the engaged position of said latch in its forward loaded position.

4,824,159
PIVOTED ROTATABLE ILLUMINATED REAR SEAT VANITY MIRROR
William J. Fluharty; Ronald A. Dykstra, and Mark W. Hawks, all of Holland, Mich., assignors to Prince Corporation, Holland, Mich.
Filed Sep. 23, 1987, Ser. No. 100,269
Int. Cl.[4] B60R *27/00*
U.S. Cl. 296—37.7 18 Claims



1. A vanity mirror assembly for use by rear seat passengers of a vehicle comprising:
a frame including a mirror mounted therein; and
means for coupling said frame to a vehicle roof in an area rearwardly of the front seats such that said mirror can be used by rear seat passengers, said coupling means allowing movement of said frame in mutually orthogonal axes between a stored position adjacent the vehicle roof to a lowered use position and rotated once lowered for use by rear seat passengers on either side of the vehicle.

4,824,160
VISOR CONTROL
Dennis J. Fleming, Holland, Mich., assignor to Prince Corporation, Holland, Mich.
Filed Apr. 29, 1983, Ser. No. 489,940
Int. Cl.[4] B60J *3/02*
U.S. Cl. 210—17.4 19 Claims

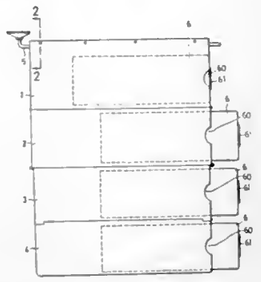


9. A window visor control assembly for a vehicle comprising:
a visor panel;
at least a pair of parallel arms spaced from one another and each having one end pivotally secured to said visor panel about axes arranged orthogonal to the plane of the visor panel;
support means for supporting the opposite end of each arm to permit pivotal movement of said visor panel on said arms in a first plane generally orthogonal to the pivot axes of said arms and parallel with said arms between a raised stored position and a lowered use position;
a pivot plate located on a second plane parallel to said first plane and pivotally secured to said support means and to at least one of said arms about the pivot axis of said at least

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one arm for pivotal movement on said second plane about an axis orthogonal to the first and second planes;
bias means coupled to said pivot plate for urging said pivot plate and thus said arms and said visor panel toward at least one of said stored and use positions; and
latch means operatively associated with said pivot plate for releasably holding said panel in the other of said stored and use positions.

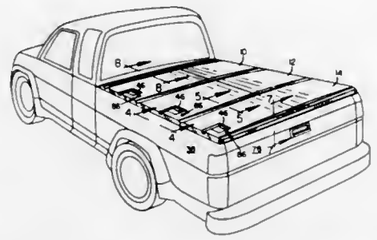
4,824,161
AREA-VARIABLE AUTOMOBILE SUN VISOR
Chien-Li Lee, 9th Fl., No. 189, Chi Hsien Erh Rd., Chyan Chin District, Kaohsiung City, Taiwan
Filed Nov. 3, 1987, Ser. No. 116,384
Int. Cl.⁴ B60J *3/00*
U.S. Cl. 296—97.8 **9 Claims**



1. An area-variable automobile sun visor comprising:
a hanging rod, adapted to be mounted rotatably on a roof panel and having a horizontally extending hanging portion rotatable about a vertical axis;
a vertical series of shield plates, each adjacent pair of said shield plates being pivotally coupled together, an uppermost one of said shield plates being coupled to said hanging portion of said hanging rod along an upper edge thereof so that said series of shield plates extends downwardly from said hanging portion, said uppermost shield plate including in its upper edge surface and open-ended slot which is defined by two clamping walls interconnected at their lower ends for receiving said hanging portion of said hanging rod in a lower portion of said open-ended slot, a lock bolt extending through said clamping walls above said hanging portion, a nut engaged threadably with said lock bolt to an extent so that said hanging portion is clamped tightly between said clamping walls, whereby, when said lock bolt is loosened from said nut, said uppermost shield plate can be rotated about said hanging portion of said hanging rod; and
means for holding said shield plates together when said shield plates are all superposed one by one on said uppermost shield plate.

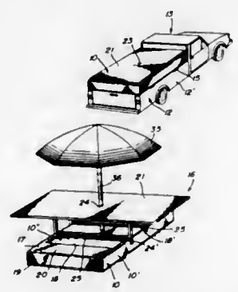
4,824,162
COVER FOR PICKUP TRUCK BED
Richard J. Geisler, 15721 S. Washington, Oregon City, Oreg. 97045; Gary M. Scott, 17385 Colina Vista Ave., Milwaukie, Oreg. 97267, and Thomas M. Telford, 7485 Carson Cir., Gladstone, Oreg. 97027
Filed Aug. 13, 1987, Ser. No. 85,397
Int. Cl.⁴ B60P *7/02*
U.S. Cl. 296—100 **21 Claims**

1. A cover on a pickup truck bed, said truck bed having side walls and a front end and a rear end, said cover comprising; a plurality of cover panels each having forward, rearward and side edges, a rear cover panel extending across the side walls for covering an area of the truck bed adjacent to the rear end of the truck bed, and a second cover panel for covering an area of the truck bed adjacent to and forward of said rear end area, said rear panel having a forwardly projected channel-shaped hinge portion along its forward edge and said second panel having a rearwardly projected channel-shaped hinge portion along its rearward edge, the rearwardly projected hinge portion of the second panel and the forwardly projected hinge portion of the rear panel interlocked to provide a hinged con-



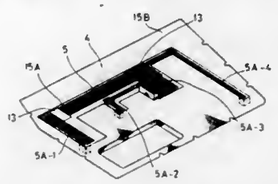
nection between the panels, and a lock mechanism for each panel to releasably and selectively lock said cover panels to the side walls of the truck bed, and said panels each being releasably free to pivot about the hinged connection whereby with either one of said cover panels locked in place over the truck bed, that panel functions as an anchored cover panel about which the other can be released and folded open to expose the underlying truck bed area.

4,824,163
CONVERTIBLE COVER
Jaroslav Hendrych, 4530 Boul. des Sources, Apt. 120, D.D.O., Quebec, Canada
Filed Mar. 15, 1988, Ser. No. 168,484
Int. Cl.⁴ B60P *7/02*
U.S. Cl. 296—100 **15 Claims**



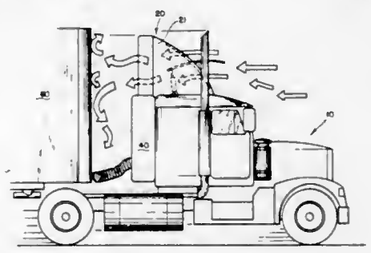
1. A convertible cover for an open-top vehicle box, said cover having attachment means for detachably securing same to said box, an integral top wall having at least one opening therein spaced from an edge of said integral top wall to form a seat section on said integral top wall intermediate said opening and an adjacent side edge of said integral top wall, a flat removable panel secured in close fit on said integral top wall and overlying at least said opening and detachable to be supported to constitute a table top and support means for supporting said panel elevated from said integral top wall to constitute said table top, said table top being supported at a predetermined orientation with respect to said opening.

4,824,164
WIRE HARNESS INCORPORATED IN AUTOMOTIVE VEHICLE DOORS
Yoshiaki Nakayama, and Yasuhiro Miyazawa, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan
Filed Nov. 25, 1987, Ser. No. 125,584
Int. Cl.⁴ H02G *3/26;* **B60J** *5/00;* **B60R** *16/02*
U.S. Cl. 296—146 **5 Claims**



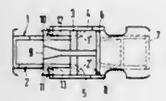
1. A wire harness incorporated in an automotive vehicle door including electric elements, said harness being disposed between an outer door frame having openings formed therein and a trim panel having openings formed therein, which comprises:
a plurality of parallel-arranged trunk conductors;
a plurality of sets of parallel-arranged branch conductors, an end of one of each of said branch conductors being connected to an end of one of said trunk conductors in one to one correspondence in predetermined order; and
a plurality of connector terminals provided at predetermined ends of said branch conductors so as to project at right angles in an outward direction from a flat surface of said wire harness through the openings formed in the door frame and in an inward direction from said flat surface through the openings formed in the trim panel.

4,824,165
APPARATUS FOR SELECTIVELY VARYING AIR RESISTANCE ON A LAND TRANSPORT VEHICLE TO OPTIMIZE REDUCTION OF DRAG
Stanley E. Fry, 1876 Sherrer Rd., York, S.C. 29745
Filed Oct. 15, 1987, Ser. No. 108,685
Int. Cl.⁴ B62D *35/00*
U.S. Cl. 296—180.3 **16 Claims**



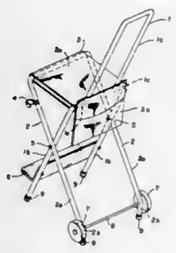
1. An apparatus for selectively varying air resistance on a land transport vehicle to optimize reduction of drag except when drag is desirable as a speed reduction aid, the vehicle including a cab and a trailing cargo container, said apparatus comprising:
(a) first and second wings mounted on respective vertical axes on opposite sides of said cab adjacent the rear thereof; and
(b) means for moving said wings when desired between a first, relatively low drag position wherein said wings lie substantially flush with the sides of the cab and a second, relatively high drag position wherein said wings project outwardly beyond the sides of the cab and into the air stream moving past said cab to increase drag and reduce the braking distance of the vehicle, wherein said means for moving said wings includes means for projecting the forward edge of said wings outward into the air stream for diverting said air stream inwardly and against the forward end of said cargo container.

4,824,166
UNDERSTRUCTURE FOR AN AUTOMOBILE
Dietrich Deaker, Cremlingen; Peter Seifert, Gifhorn; Otto Weber, Wolfsburg, and Horst Schicht, Gifhorn, all of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany
Filed Jul. 1, 1987, Ser. No. 68,652
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622332
Int. Cl.⁴ B62D *21/00*
U.S. Cl. 296—204 **7 Claims**



1. An improved understructure for an automobile having a passenger compartment, the understructure having longitudinal members which support a drive unit and bear on sill members by way of connecting means, and a floor panel forming a foot slope the course of which is followed by the longitudinal members so as to form gaps for vibration neutralization, the improvement comprising: the longitudinal members being provided so as to by connected with the floor panel in an upper region of the foot slope as well as behind the slope and further provided so as to bear on a part of said connecting means, arranged in a mid-longitudinal region of the passenger compartment and connected with the sill members, without being connected with the sill members arranged in front thereof.

4,824,167
COMBINATION CHAIR AND LUGGAGE CARRIER
Mynor King, 1652 Pacific Ave. #1, San Leandro, Calif. 94577
Filed Feb. 29, 1988, Ser. No. 161,843
Int. Cl.⁴ A47C *13/00*
U.S. Cl. 297—129 **6 Claims**



1. A combination chair and luggage carrier comprising:

(a) first and second substantially U-shaped members defining respective first and second pairs of spaced legs;
(b) means pivotally connecting the members together for disposition between an unfolded position in which the members define a chair, and a folded position in which the members define a luggage carrier;
(c) a flexible web carrier by the first and second members for forming a seat in the unfolded position;
(d) wheel means carried by the first pair of legs;
(e) the first pair of legs terminating in a pair of elongate end portions disposed at an angle with respect to the first legs; and
(f) the angle between the first legs and their respective end portions being such that when the members are disposed in the unfolded position, the end portions engage the ground surface and maintain the wheel means in a raised position, and when the members are in the folded position, the wheel means is permitted to engage the ground surface.

4,824,168
ORGANIZING APPARATUS FOR UMBRELLA STROLLERS
Kathyrn J. Makoski, 517 Buckingham Dr., Greensburg, Pa. 15601
Filed Jan. 15, 1988, Ser. No. 144,190
Int. Cl.[4] A47C *31/18*
U.S. Cl. 297—229 **6 Claims**



1. A removable organizing apparatus for baby strollers and the like comprising a body formed of a flexible and resilient textile material, said body including:
(a) a generally rectangular seat segment sized to cover a seat of a baby stroller, said seat segment having an upper surface and a lower surface, said seat portion also including a pocket portion including elastic means adapted to receive retain in position a front end portion of a seat of the baby stroller;
(b) a generally rectangular back segment sized to cover and hang down from a back member of a baby stroller, said back segment having an upper surface and a lower surface, said back segment having a hanging portion positioned remote from said seat segment and having a cover portion thereof positioned integrally adjacent to said seat segment, said hanging portion sized and positioned to hang over said back member, said cover portion sized and positioned to cover said back member;
(c) a tuck portion formed at the intersection of said back segment and said seat segment, said tuck portion sized to permit said seat segment to extend in a different plane than said back segment, said tuck portion formed by folding said seat segment upon said back segment forming a fold line having fold points at either end thereof; folding said side points inward onto said back segment to form generally triangular side portions; and then attaching said side portions onto said back segment;
(d) at least one pocket member attached to the hanging portion to provide a plurality of readily accessible back pockets; and
(e) a separate strip of fabric attached around a perimeter of said body to prevent fraying of the body fabric and to provide additional strength and rigidity to the body.

4,824,169
ORTHOPEDIC SEAT
Loyd E. Jarrell, 2920 Sandstone Trail, Marietta, Ga. 30064
Filed Feb. 25, 1988, Ser. No. 160,243
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—230 **3 Claims**



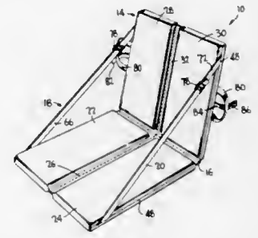
1. A portable orthopedic seat comprising:
a backing adapted to be placed upon the seat and back of a chair and having a fold which extends from a first side edge to a second side edge of said backing between back and seat portions of said backing;
a generally wedge-shaped seat cushion having a narrower portion at one end and a thicker portion at an opposite end;
a generally half-teardrop shaped lordotic cushion having a narrower portion at one end and a thicker portion at an opposite end;
first fastening means comprising masses of interlockable fibers for releasibly fastening said seat cushion upon said seat portion of said backing in four different orientations with respect to said seat portion including a first orientation wherein said narrow portion is generally parallel and proximal to said fold, a second orientation wherein said narrow portion is generally parallel and distal to said fold, a third orientation wherein said narrow portion is generally perpendicular to said fold and proximal to said backing first side edge, and a fourth orientation wherein said narrow portion is generally perpendicular to said fold and proximal said backing second side edge; and
second fastening means comprising masses of interlockable fibers for releasibly fastening said lordotic cushion upon said back portion of said backing in two orientations with respect to said back portion including a first orientation wherein said narrow portion of said lordotic cushion is generally parallel and proximal to said fold and a second orientation wherein said narrow portion of said lordotic cushion is generally parallel and distal to said fold;
whereby the backing may be positioned upon a chair and the seat and lordotic cushions respectively fastened to the seat and back portions of said backing in orientations selected to accommodate the specific spinal abnormalities of the user.

4,824,170
OUTDOOR SWIVEL CHAIR
Steven Goldmeier, 47 Barry La. South, Old Bethpage, N.Y. 11804
Continuation-in-part of Ser. No. 597,694, Apr. 6, 1984. This application Mar. 3, 1988, Ser. No. 163,608
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—349 **10 Claims**

1. A detachable and adjustable swivel base for a chair comprising:
laterally expandable means for releasably engaging each of a chair's legs;
a base member adapted to contact the ground and support a chair in a stable upright manner; and
a swivel mechanism pivotally interconnecting said expandable engaging means and said base member, said swivel mechanism having a lower surface and an upper member to which said expandable engaging means is rigidly attached, said upper member being adapted to ride on said lower surface and to rotate relative thereto whereby said chair may be pivoted relative to said base member while being supported in a stable upright manner.

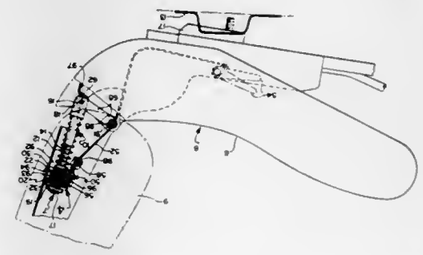


4,824,171
COLLAPSIBLE BEACH CHAIR
W. Dale Hollingsworth, 742 Ridgefield Rd., Wilton, Conn. 06897
Filed Mar. 17, 1988, Ser. No. 169,436
Int. Cl.[4] A47C *1/14, 15/00*
U.S. Cl. 297—351 **8 Claims**



1. A collapsible beach chair comprising:
a flexible covering defining a front side and a rear side of said chair, said covering having portions joined together to define four compartments including first and second generally rectangular seat compartments and first and second generally rectangular back compartments separated by integral hinge-defining portions of said covering, wherein said first and second seat compartments are in substantial longitudinal alignment with said first and second back compartments, respectively, said hinge-defining portions comprising means for facilitating folding of said chair to a compact collapsed stack of said four compartments in side-by-side relation;
four compartment stiffening members disposed in said four compartments, respectively, each stiffening member comprising a rigid rectangular member having at least one padded surface facing the front side of said chair;
wherein said hinge-defining portions include a transverse hinge portion extending between seat compartment and said back compartments, a longitudinal back hinge portion extending between said first and second back compartments, and a longitudinal seat hinge portion extending between said first and second seat compartments;
an integral back support strap extending transversely through said first and second back compartments and having first and second free ends extending out from first and second mutually remote longitudinal edges of said first and second back compartments, respectively, wherein said back support strap is bonded to said covering inside each of said first and second back compartments at locations between the stiffening members and the rear side of the chair;
an integral seat support strap extending transversely through said first and second seat compartments and having first and second free ends extending out from first and second mutually remote longitudinal edges of said first and second seat compartments, respectively, wherein said seat support strap is bonded to said covering inside each of said first and second seat compartments at locations between the stiffening members and the rear side of the chair;
first engagement means for releasably securing the first ends of said back support strap and said seat support strap directly together to provide an adjustable length engagement between the first longitudinal edge of said first back compartment and the first longitudinal edge of said first seat compartment; and
second engagement means for releasably securing the second ends of said back support strap and said seat support strap directly together to provide an adjustable length engagement between said second longitudinal edge of said second back compartment and said second longitudinal edge of said second seat compartment.

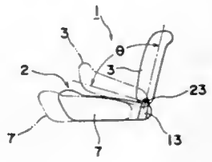
4,824,172
RECLINING SEAT BACK APPARATUS AND METHOD OF UTILIZATION THEREOF
Richard W. A. Rees, Holland Landing, Ontario, Canada, assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 11, 1988, Ser. No. 154,756
Int. Cl.[4] A47C *1/00*
U.S. Cl. 297—361 **1 Claim**



1. A vehicle seat recliner seat latch for setting the inclination of a seat back having a flared aperture and being pivotally mounted with respect to a seat cushion along a first pivotal axis, said seat latching combination comprising:
a threaded rod pivotally mounted with respect to said seat cushion along a second pivotal axis generally parallel with said first axis;
a sleeve threadably connected on said rod with exterior gear teeth;
bearing means capturing said sleeve and being pivotally mounted in said flared aperture of said seat back along a third pivotal axis fixed with respect to said seat back;
a first spring encircling said rod and captured between said second pivotal axis and said flared aperture urging said seat back away from said second pivotal axis and biasing said seat back towards an upright position;
a second spring mounted to said to said seat back and a slider having an inclined slot and being mounted by said inclined slot along a rod fixed with respect to said seat back, whereby said slider is biased by said second spring into a position to selectively incrementally engage with a plurality of said gear teeth of said sleeve for restraining said sleeve from rotating on said rod to set the inclination of

said seat back and whereby said slider is connected with a release cable to pull said slider away from engaging with said sleeve to allow the adjusting of the inclination on said seat back.

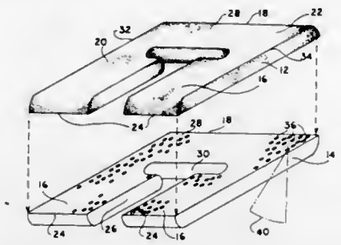
4,824,173
AUTOMOBILE REAR SEAT
Toshihiko Tomita, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Aug. 12, 1986, Ser. No. 895,824
Claims priority, application Japan, Aug. 23, 1985, 60-185990
Int. Cl.[4] A47C *4/02*
U.S. Cl. 297—443 **14 Claims**



1. An automobile rear seat assembly comprising:
a pair of first rail members mounted on a floor panel of the automobile,
a base member including a pair of second rail members slidably mounted on the pair of first rail members for displacement relative thereto in a front-to-rear direction parallel to the longitudinal sense of the automobile for adjustment of the base in that direction,
a seat back including a lower portion mounted to a rear side of the base member by a pivot connection so that the seat back is pivotable downwardly toward the base member,
a cushioning body mounted on the base member,
a plurality of guide members rigidly connected to one of the cushioning body and base member and movable relative to the other of the cushioning body and base member in a front-to-rear direction parallel to the longitudinal sense of the automobile to permit the cushioning body to be displaced relative to the base member forwardly away from the pivot connection to enhance the extent to which the seat back can be pivoted toward the base member in order to facilitate the introduction of the seat assembly into the automobile, and
restricting means detachably connectible between the cushioning body and the base member for restricting the displacement of the cushioning body relative to the base member.

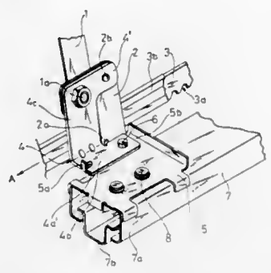
4,824,174
SEATING DEVICE
Richard A. Dunn, Sr., 2440 Kuhio Ave., Ste. 1701, Honolulu, Hi. 86815
Filed May 2, 1988, Ser. No. 188,916
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—453 **5 Claims**

1. A seating device for alleviating backache including;
top and bottom laminations assembled together and defining front and back portions and two side portions, an entire front rim and a back rim on said laminations,
said passageway extending from said back rim completely through said laminations in said back portion for allowing a seated person's coccyx to be relatively free of mechanical stress and pain,
said passageway comprising two openings, a first longitudinal one said opening extending inwardly of said device and joined with a second transverse one said opening perpendicular to said first opening said two openings together defining a substantially T-shaped configuration allowing freer flowing circulation of air to the genital area of a seated person,
said front rim being completely extensive across the entire front portion of said seating device between said side portions,
a plurality of holes disposed within said bottom lamination for venting purposes,
said top lamination made of compressible foam material enhancing beat reduction,



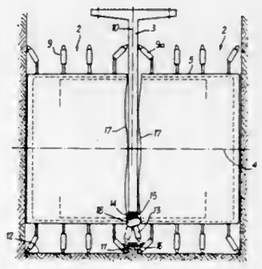
at least certain of said plurality of holes disposed adjacent to said front rim angled downwardly and inwardly at substantially a 30 degree angle to the vertical thereby increasing air flow when said top lamination is compressed, and said plurality of holes including holes adjacent said two openings to increase ventilation to the genital area of a seated person.

4,824,175
ANCHORAGE FOR WEBBING OF VEHICLE SEAT BELT SYSTEM
Osamu Tokugawa, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 2, 1988, Ser. No. 162,976
Claims priority, application Japan, Mar. 3, 1987, 62-30039[U]
Int. Cl.[4] A62B *35/00*
U.S. Cl. 297—473 **6 Claims**



6. In an anchorage for a webbing of a vehicle seat belt system, said anchorage being of the type that when an abrupt tensile force is applied to the webbing, a bracket fixed on a seat slide rail is deformed to bring a pin of a base plate secured on the bracket into engagement with a recess of an anchor stay fixed on a stationary base of a vehicle thereby to distribute the abrupt tensile force to the stationary base, the improvement wherein the anchor stay is arranged alongside the seat slide rail with an interval left therebetween, and the bracket comprises a first bracket fixed on the seat slide rail and a second bracket which is secured on the base plate and is deformed upon application of the abrupt tensile force of at least said predetermined value to the webbing, the first bracket has an extension extending toward the anchor stay beyond the seat slide rail, the second bracket is formed of a substantially L-shaped plate member having a base portion seated on the extension of the first bracket and a raised portion extending upright from the base portion, an engaged portion is provided with one of the first bracket and second bracket, an engaging portion is provided with the other bracket, and the engaged portion and engaging portion are normal maintained in mutual engagement.

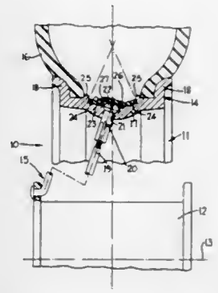
4,824,176
MILLING ENGINE FOR EXCAVATING TRENCHES IN THE GROUND
Daniel Barre, Moret sur Loing, France, assignor to Soletanche, Nanterre, France
Filed Sep. 17, 1987, Ser. No. 98,389
Claims priority, application France, Oct. 8, 1986, 86 14003
Int. Cl.[4] F21C *1/00*
U.S. Cl. 299—59 **5 Claims**



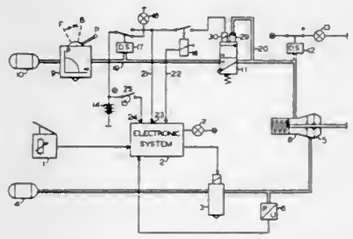
1. A milling engine for excavating trenches in the ground comprising:
(a) at least one substantially vertical thick support plate (3) having a lower edge, said plate being aligned along a central plane (10);
(b) a horizontal axis substantially perpendicular to said plate, first and second milling drums (2) mounted on opposite sides of said plate, said drums being rotatable about said horizontal axis (4);
(c) at least one movable finger (13) mounted between said drums on said lower edge of said plate, and driving means on said drums causing oscillation of said finger through said central plane (10) responsive to rotation of said first and second drums.

4,824,177
SPOKED VEHICLE WHEEL WITH TUBELESS TIRE
Jorge N. Aloy, Sant Just Residencial No. 91, Sant Just Desvern, Barcelona, Spain
Filed Oct. 29, 1987, Ser. No. 114,904
Int. Cl.[4] B60B *1/02*
U.S. Cl. 301—58 **4 Claims**

1. An improved spoke-type wheel structure for permitting use thereon of a tubeless pneumatic tire, such as for a motorcycle wheel, characterized by an annular tire support rim having peripherially in its outer perimetrical side and centered in the width thereof an annular groove having a bent bottom wall and beveled convergent lateral borders, a perimetrical annular elastic belt surrounding the rim within the groove for covering the heads of tension nuts of the wheel spokes which project outwardly through the rim into the groove, and a recessed metallic disc positioned under the elastic belt in overlying relation to the outer end of each spoke.



4,824,178
FLUID PRESSURE RESPONSIVE AND ELECTRICALLY-CONTROLLED BRAKE SYSTEM
Erwin Petersen, Wunstorf, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany
Continuation of Ser. No. 889,143, Jul. 24, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 210,602
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1985, 3527907
Int. Cl.[4] B60T *13/70, 13/22*
U.S. Cl. 303—15 **14 Claims**



1. A dual-circuit electrically-controlled fluid pressure responsive brake system for a motor vehicle, said dual-circuit brake system comprising:
(a) an electronic control device positioned on such motor vehicle to receive a plurality of input signals which are then processed in said electronic control device, said electronic control device generating and transmitting a plurality of output control signals which control said brake system on such motor vehicle;
(b) a brake means positioned on such motor vehicle for applying and releasing a braking force in response to said control signals generated in said electronic control device;
(c) a first brake circuit positioned on such motor vehicle, at least a portion of said first brake circuit being located in a position accessible to an operator of such motor vehicle, said at least a portion of said first brake circuit capable of being manipulated by such operator, said first brake circuit including:
(i) an electrical brake signal value transmitter means electrically-connected to said electronic control device to transmit a signal value representative of a desired brake pressure to be applied by said brake to an input terminal

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of said electronic control device in response to a manipulation by such operator,

(ii) a first source of fluid pressure positioned on such motor vehicle, and

(iii) a fluid pressure modulator positioned on such motor vehicle, said fluid pressure modulator electrically-connected to receive an output control signal from said electronic control device and connected at a fluid pressure inlet port to receive fluid pressure from said first source of fluid pressure and connected on a fluid pressure output port to a first fluid pressure inlet port on said brake to deliver fluid pressure from said first source of fluid pressure to said brake in response to a manipulation of said electrical brake signal value transmitter means by such operator and an output control signal from said electronic control device; and

(d) a second brake circuit positioned on such motor vehicle, at least a portion of said second brake circuit being located in such position accessible to such operator of such motor vehicle, said at least a portion of said second brake circuit capable of being manipulated by such operator, said second brake circuit including:

(i) a second source of fluid pressure positioned on such motor vehicle,

(ii) a parking brake valve connected at a fluid pressure inlet port to said second source of fluid pressure,

(iii) a manual brake lever connected to said parking brake valve and manipulatable by such operator to position said parking brake valve into one of a running position, a braking position, and a parking position, and

(iv) a solenoid valve means positioned on such motor vehicle, said solenoid valve means electrically-connected to receive an output control signal from said electronic control device and connected at a fluid pressure inlet port to receive fluid pressure from a fluid pressure outlet port on said parking brake valve and connected on a fluid pressure outlet port to a second fluid pressure inlet port on said brake to deliver fluid pressure from said second source of fluid pressure to said brake through said parking brake valve and said solenoid valve means in response to a positioning of said manual brake lever by such operator and said output control signal from said electronic control device.

4,824,179

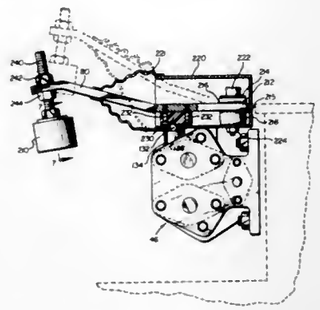
EMPTY AND LOAD BRAKE APPARATUS FOR UNITIZED RAILROAD TRAINS

James G. Rees, 1212 N. Lake Shore Dr., Chicago, Ill. 60610

Filed Jul. 31, 1986, Ser. No. 891,711

Int. Cl.⁴ B60T *8/18;* **G01L** *5/00*

U.S. Cl. 303—22.7 **3 Claims**



1. An empty and load air brake control apparatus for use in a unitized railroad train; the train including a plurality of railroad car body segments articulated together in end-to-end array; each car body segment being capable of being loaded independently of the other car bodies; and a plurality of railroad car trucks, the trucks being connected to the car body segments so that a single truck supports two adjacent car body ends; the air brake control apparatus comprising, in combination, a brake pipe capable of being pressurized with air, a control valve connected to the brake pipe, a control valve pipe connected to the control valve, a plurality of brake modulator valves each connected to the control valve pipe, and a corresponding plurality of brake actuators, each actuator being associated with a single truck and connected to a single modulator valve, the modulator valve including sensor means for sensing whether an associated truck is supporting loaded car body segments or empty car body segments, and modulating means for modulating air pressure provided from the control valve pipe to the brake actuator associated with the modulator valve in accordance with the condition of the sensor means so as to provide full pressure to the brakes when the car body segments are loaded, and partial pressure to the brakes when the car body segments are empty, the modulator valve sensor means including a sensor mallet, the mallet having a shank, an elastomeric member connected to the shank, a head member connected to the elastomeric member, the head defining a well within which is disposed the elastomeric member in spaced apart relationship to at least one well wall, the modulator valves each having a body mounted to the associated truck, and the mallet being disposed for intermittent engagement with the car body for sensing loaded or empty car body conditions.

4,824,180

BRAKE CORRECTOR SUBJECT TO THE LOAD OF A VEHICLE

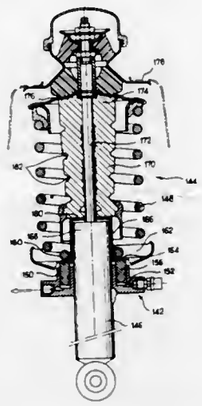
Roland Levrai, Stains, France, assignor to Bendix France, Drancy, France

Filed Feb. 8, 1988, Ser. No. 153,618

Claims priority, application France, Feb. 26, 1987, 8702538

Int. Cl.⁴ B60T *8/18, 8/22*

U.S. Cl. 303—22.5 **3 Claims**



1. A fluid pressure sensor connected fluidically to a brake corrector subject to the load of a vehicle having at least one suspension element mounted between a support plate connected with a vehicle chassis and a suspended part of said vehicle, said suspension element comprising coaxially a shock-absorber having one end connected to said suspended part, a suspension spring, a rod having one end connected to a piston of said shock-absorber, and an elastomeric sleeve arranged around said rod, the other end of said rod and associated ends of said suspension spring and said elastomeric sleeve being mounted to said support plate, said fluid pressure sensor comprising an annular piston mounted slidably and sealingly in an annular groove provided in an annular collar surrounding said shock-absorber, one end of said suspension spring being received in an annular part of a bearing element which is mounted slidably around said shock-absorber and engaging said annular piston, said bearing element having a central cup-shaped part surrounding the shock-absorber and facing one end of said elastomeric sleeve, said central cup-shaped part being integral with said annular part, and the end of the elastomeric sleeve opposite said support plate engaging with said central cup-shaped part in order to exert force upon the annular piston in addition to force exerted by the spring, via the bearing element, upon the annular piston.

4,824,181

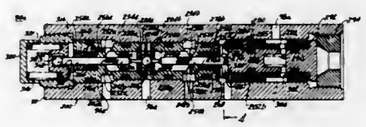
PRESSURE ACTIVATED ISOLATION VALVE

Ambrose Tomala, Royal Oak, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 21, 1987, Ser. No. 88,171

Int. Cl.⁴ B60T *15/36, 8/48*

U.S. Cl. 303—84.2 **14 Claims**



1. A pressure responsive isolation valve for use within an adaptive braking system comprising:

passage means including a first port adapted to receive pressurized fluid from a brake master cylinder, an outlet port adapted to communicate with a brake cylinder, a second port adapted to be connected to a control valve for receiving pressurized fluid from a pressure source other than the brake master cylinder; and a pressure port remote from the other ports, adapted to receive pressurized fluid from a second pressurized source;

valve means movable to open and close one or another of opposingly situated first and second passages and to alternatively communicate the first port to the outlet port or the second port to the outlet port;

means for moving the valve means relative to one or the other of the passages, including first means movable in response to pressurized fluid from the second source for urging the valve means to seat upon the first passage to control communication to and from the brake master cylinder to the output port wherein when the first passage is closed the brake master cylinder is isolated from the brake cylinder, wherein the moving means includes opposingly situated first and second rods, respectively received through the first and second passages and a rod cap positioned about an extending end of the first rod opposite the valve means, the rod cap including a partial bore to loosely receive the extending end, a ball between the cap and the extending end and a first spring for biasing the rod cap in a direction to urge the valve means to close the second passage.

4,824,182

ANTI-LOCK HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

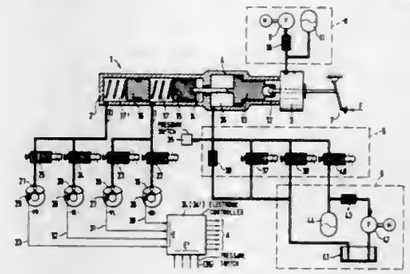
Helmut Steffes, Hattersheim; Norbert Ocvirk, Offenbach; Gunther Buschmann, Griesheim; Anton David, Goetzenhain; Johannes Graeber, Frankfurt am Main; Otto Determann, Darmstadt, and Ivica Batistic, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 92,974

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630342

Int. Cl.⁴ B60T *8/88, 17/22*

U.S. Cl. 303—92 **6 Claims**



1. In an anti-lock hydraulic brake system for automotive vehicles including a pedal-actuated braking pressure generator having a master cylinder with a brake power booster inserted upstream thereof and a hydraulically controlled pressure modulator interconnected between the master cylinder and the brake power booster, said pressure modulator being respectively alternately connected to an auxiliary-pressure source and a pressure-compensating reservoir by way of electrically actuatable valves of a valve assembly, said pressure modulator generating a resetting force opposing a force applied to said pedal of said braking pressure generator, the said resetting force reducing the force which is transmitted to the master cylinder pistons on brake application, said system further including wheel valves which are interposed into the pressure-fluid conduits leading from the braking pressure generator to the wheel brakes the said wheel valves being controllable by an anti-lock controller for closing the pressure-fluid conduits, the improvement comprising a pressure-measuring means connected to the pressure modulator and test circuit means which, at predetermined points of time, initiate a test cycle during which pressure fluid from the auxiliary-pressure source is metered into the pressure modulator and is subsequently discharged from the pressure modulator responsive to the actuation of corresponding ones of said valves of said valve assembly, and the corresponding pressure variation ascertained by the pressure-measuring means being evaluated as a function of the subsequent actuation of said corresponding ones of said valves connected to the pressure modulator as a criterion for operability of the system, wherein said pressure-measuring means provides a pressure reduction signal when said pressure fluid is discharged from said pressure modulator by way of actuation of at least one of said corresponding ones of said valves during said test cycle, wherein said pressure-measuring means provides a pressure increase signal when said pressure fluid is metered into said pressure modulator by way of actuation of at least one of said corresponding ones of said valves during said test cycles, and means responsive to the signals provided by said pressure-measuring means to provide an error signal when the signal provided by said pressure-measuring means fails to correspond to the actuation of the respective one of said corresponding ones of said valves during said test cycles, and means responsive to the signals provided by said

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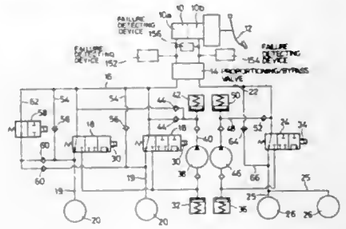
pressure-measuring means to provide an error signal when the signal provided by said pressure-measuring means fails to correspond to the actuation of the respective one of said corresponding ones of said valve.

4,824,183

DUAL-CIRCUIT HYDRAULIC ANTI-LOCK BRAKING SYSTEM

Kiyoyuki Uchida; Michio Akiyoshi, and Yoshiaki Tsuchiya, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 15, 1988, Ser. No. 182,214
Claims priority, application Japan, Apr. 21, 1987, 62-97986
Int. Cl.[4] B60T 8/88
U.S. Cl. 303—92 10 Claims



1. A dual-circuit hydraulic anti-lock braking system for an automotive vehicle having a first wheel group including at least one wheel and a second wheel group including at least one wheel different from the at least one wheel of the first wheel group, comprising:

a dual-circuit hydraulic braking device including a first and a second brake circuit which are hydraulically independent of each other,

said first brake circuit comprising (a) a first brake-cylinder group including at least one brake cylinder for applying brake to a corresponding wheel of said first wheel group, (b) a first pressure source for producing a first braking pressure, and (c) a first fluid-passage group including at least one fluid passage for transmitting said first braking pressure from said first pressure source to a corresponding brake cylinder of said first brake-cylinder group,

said second brake circuit comprising (d) a second brake-cylinder group including at least one brake cylinder for applying brake to a corresponding wheel of said second wheel group, (e) a second pressure source for producing a second braking pressure which is hydraulically independent of said first braking pressure, and (f) a second fluid-passage group including at least one fluid passage for transmitting said second braking pressure from said second pressure source to a corresponding brake cylinder of said second brake-cylinder group;

wheel rotating condition detecting means for detecting a rotating condition of at least one wheel of each of said first and second wheel groups;

vehicle running condition detecting means for detecting a running condition of said automotive vehicle;

braking pressure regulating means for regulating, when the detected rotating condition of said at least one wheel of each of said first and second wheel groups is brought into a predetermined relationship with the detected running condition of said automotive vehicle, each of said first and second braking pressures to apply the regulated pressure to one of said brake cylinders corresponding to the wheel whose detected rotating condition is brought into said predetermined relationship, said braking pressure regulating means conducting at least one of pressure-increasing and pressure-decreasing operations for a duration of time for regulating said each braking pressure;

failure detecting means for detecting that each of said first and second hydraulic brake circuits has failed; and

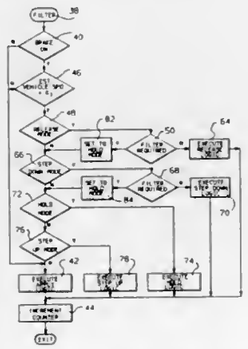
time setting means for determining said duration of time at a first duration value when the failure of any one of the first and second brake circuits is not detected by said failure detecting means, and determining said duration of time at a second duration value different from said first duration value when said failure is detected.

4,824,184

ANTIBLOCK BRAKE CONTROLLER WITH BRAKE MODE FILTER

Peter J. Spadafora, Sterling Heights; Philip M. Headley, Brighton; Alan J. Lee, Farmington Hills, all of Mich., and Jill G. Hersberger, Kokomo, Ind., assignors to General Motors Corporation, Detroit and Delco Electronics Corporation, Troy, both of, Mich.

Filed Dec. 11, 1987, Ser. No. 132,077
Int. Cl.[4] B06T 8/58, 8/64
U.S. Cl. 303—100 1 Claim



1. A method of limiting the brake pressure applied to a wheel brake of a vehicle, the vehicle being characterized in that resonances are excited therein in response to a cycling of the brake pressure at frequencies greater than a predetermined frequency F, the method comprising the steps of:

repeatedly determining a braking mode to establish a brake pressure cycle for limiting the brake pressure applied to the wheel brake to prevent a lockup condition, each determined braking mode comprising one of a pressure release phase, a pressure step down phase, a pressure hold phase and a pressure increase phase;

incrementing a count in a counter for each repeated determination of a braking mode;

resetting the count in the counter when (A) the last determined braking mode is the pressure release phase or a pressure step down phase, (B) the previously determined braking mode was a pressure hold phase or a pressure increase phase, and (C) the count exceeds a value X representing a period equal to $1/F$;

resetting the last determined braking mode to the pressure hold phase when (A) the last determined braking mode is the pressure release phase or a pressure step down phase, (B) the previously determined braking mode was the pressure hold phase or a pressure increase phase and (C) the count in the counter is less than X; and

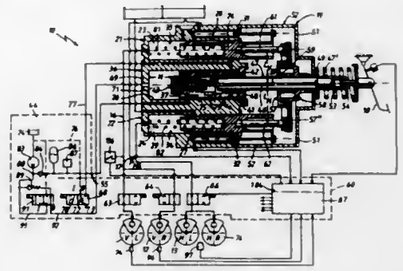
controlling the brake pressure applied to the wheel brake in accord with the determined braking phase.

4,824,185

HYDRAULIC DUAL-CIRCUIT BRAKING SYSTEM

Heinz Leiber, Oberriexingen; Walter Klinker, and Manfred Steiner, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,595
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723917
Int. Cl.[4] B60T 8/44
U.S. Cl. 303—110 17 Claims



1. A hydraulic dual-circuit braking system for a road vehicle having front wheel and rear wheel brake means which are controlled by a front axle and a rear axle braking circuit means for supplying separate braking actuating pressures P_{VA} and P_{HA} to the front and rear wheel brake means in response to a pedal means applying a force via a braking force amplifier;

each braking circuit means including a main piston-cylinder means arranged in a common housing adjacent to one another in a twin-type construction and including a piston means;

a two armed rocker means having one of its arms connected to each piston means of the piston-cylinder means is provided to cause displacement of each piston means;

said rocker means is supported for displacement by an actuating force in the direction of displacement of the piston means and pivotable about an axis which extends vertically with respect to the displacement direction of movement of the piston means;

the rocker arms having a length L_V and L_H for the front and rear braking circuit means, respectively;

wherein a ratio L_V/L_H of the effective lengths L_V and L_H of the rocker arms corresponds to a ratio of F_H/F_V, wherein F_H and F_V are affective piston areas of the respective main cylinder pistons;

said pedal means acting through said rocker means to provide a permanent balancing of a braking force distribution F_{VA}/F_{HA}, wherein F_{VA} and F_{HA} are the braking forces applied to the front and rear wheel brakes, respectively, for a dynamically stable braking behavior of the road vehicle in an entire range of variations of vehicle decelerations with highest adhesion-force coefficients between roadway and wheels of the vehicle;

an anti-blocking system means (ABS) having braking pressure actuator means driven by electric output signals of an electronic ABS control unit means;

said anti-blocking system means (ABS) operating to provide braking pressure holding phases at the front wheels of the vehicle, and including: one position transmitter means for each of the main cylinder pistons, for providing electric output signals of the respective piston positions as information inputs to a processing unit means provided within the electronic control unit means;

wherein said processing unit means evaluates the position output signals of the position transmitters means as indicative of the braking pressures P_{VA} and P_{HA} generated in the two main piston-cylinder means, as well as ideal front and rear axle braking force components F_{HA} and F_{VA} to produce braking force components F'_{HA} and F'_{VA} for the front and rear braking means, which are correlated to a particular vehicle deceleration Z;

said processing unit means comparing said rear axle braking force component F'_{HA} with an ideal value component F_{HAi} of the rear axle braking force component determined from measurement data of the vehicle when attempting to provide equal adhesion force closure at the front and rear brakes;

and wherein if the value component F'_{HA} determined in this manner is lowered by more than a threshold value F_{HA1} than the ideal value component F_{HAi} said processing unit means triggers a signal which, in turn, triggers a braking pressure holding phase at the front axle brake to maintain the braking force at the front axle constant, while increasing the braking force at the rear brakes;

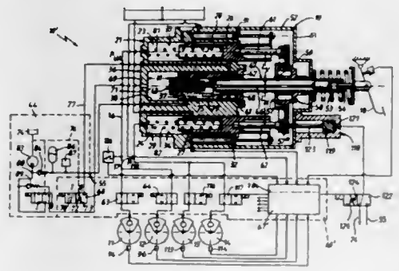
and wherein when the rear axle braking force component exceeds a value which is lower by less than a second difference threshold F_{HA2}, which is smaller than the first threshold value F_{HA1}, than the ideal value component F_{HAi} of the rear axle braking force, said signal processing means releases the braking pressure holding phase at the front axle brake to allow the brake pressure at the front brake to increase.

4,824,186

HYDRAULIC DUAL-CIRCUIT BRAKE SYSTEM

Heinz Leiber, Oberriexingen; Walter Klinker, and Manfred Steiner, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,804
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723916
Int. Cl.[4] B60T 8/44
U.S. Cl. 303—110 19 Claims



1. A hydraulic dual-circuit braking system for a road vehicle having front wheel and rear wheel brake means which are controlled by a front axle and a rear axle braking circuit means for supplying separate braking actuating pressures P_{VA} and P_{HA} to the front and rear wheel brake means in response to a pedal means applying a force via a braking force amplifier;

each braking circuit means including a main piston-cylinder means arranged in a common housing adjacent to one another in a twin-type construction and including a piston means;

a two armed rocker means having one of its arms connected to each piston means of the piston-cylinder means is provided to cause displacement of each piston means;

said rocker means is supported for displacement by an actuating force in the direction of displacement of the piston means and pivotable about an axis which extends vertically with respect to the displacement direction of movement of the piston means;

VOL 1101 ISS 4 AP 25 1989 UMI

the rocker arms having a length L_V and and L_H for the front and rear braking circuit means, respectively;

wherein a ratio L_V/L_H of the effective lengths L_V and L_H of the rocker arms corresponds to a ratio of F_H/F_V, wherein F_H and F_V are affective piston areas of the respective main cylinder pistons;

said pedal means acting through said rocker means to provide a permanent balancing of a braking force distribution F_{VA}/F_{HA} wherein F_{VA} and F_{HA} are the braking forces applied to the front and rear wheel brakes, respectively, for a dynamically stable braking behavior of the road vehicle in an entire range of variations of vehicle decelerations with highest adhesion-force coefficients between roadway and wheels of the vehicle;

propulsion starting-slip-control means (ASR) for the driven rear wheels for keeping a vehicle wheel, tending to spin as a result of the activation of its wheel brake, within a range of drive-slip values which is compatible with good driving stability;

an anti-blocking means (ABS) having brake pressure actuator means driven by electrical output signals from a combined electronic ABS and ASR control unit means for controlling at least one of alternately or simultaneously brake pressure holding phases on the front wheel brake means and brake pressure build-up phases on the rear wheel brake means; and including: one position transmitter means for each of the main cylinder pistons, for providing electric output signals of the respective piston positions as information inputs to a processing unit means provided within the electronic control unit means;

wherein said processing unit means evaluates the position output signals of the position transmitters means as indicative of the braking pressures P_{VA} and P_{HA} generated in the two main piston-cylinder means, as well as ideal front and rear axle braking force components F_{HA} and F_{VA} to produce braking force components F'_{HA} and F'_{VA} for the front and rear braking means, which are correlated to a particular vehicle deceleration Z;

said processing unit means comparing said rear axle braking force component F'_{HA} with an ideal value component F_{HAi} of the rear axle braking force component determined from measurement data of the vehicle when attempting to provide equal adhesion force closure at the front and rear brakes;

and wherein if the value component F'_{HA} determined in this manner is lowered by more than a threshold value F_{HA1} than the ideal value component F_{HAi}, said processing unit means triggers a signal which, in turn, triggers a braking pressure holding phase at the front axle brake to maintain the braking force at the front axle constant, while increasing the braking force at the rear brakes;

and wherein when the rear axle braking force component exceeds a value which is lower by less than a second difference threshold F_{HA2}, which is smaller than the first threshold value F_{HA1}, than the ideal value component F_{HAi} of the rear axle braking force, said signal processing means releases the braking pressure holding phase at the front axle brake to allow the brake pressure at the front brake to increase.

4,824,187

PRESSURE BOOSTER AND MODULATOR

Gerhard Heess, Tamm, and Anton Van Zanten, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

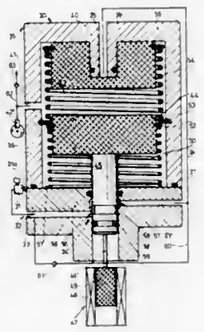
Filed Jul. 23, 1986, Ser. No. 887,301

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526190; Jun. 27, 1986, 3621492

Int. Cl.[4] B60T *8/32, 13/74*

U.S. Cl. 303—114 **27 Claims**

1. A pressure booster and modulator in a vehicle brake system having an integrated anti-skid system for realizing anti-skid of ABS functions including pressure modulations, comprising a housing, an inlet (**17, 33, 68, 80**) and a main outlet (**18, 41, 76, 81**) in said housing, a potential energy storage means in said housing, a pressure chamber relative to said potential energy storage means, said pressure chamber (**6a, 42, 71, 71'**) acted upon at least by brake pressure applied at said inlet from a master cylinder, and pressure chamber communicating via said outlet (**18, 41, 76, 81**) at least with an associated wheel brake cylinder and said pressure chamber (**6a, 42, 71, 71'**) being so embodied that with increasing and decreasing brake pressure from said master cylinder, storage of potential



energy is simultaneously transferred to an extent increasing in one direction of movement of said potential energy storage means, in order to effect wheel brake cylinder pressure chamber of pressure without an external pressure supply, said potential energy storage means includes at least a first movable permanent magnet forming a relationship of mutual attraction with a second movable permanent magnet, a relief means associated with said first and second permanent magnets which function with displacement of said first and second permanent magnets for realizing ABS functions.

4,824,188

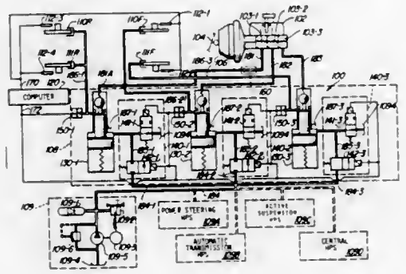
MODULATION ARRANGEMENT FOR ANTI-LOCK BRAKE SYSTEM

Frank E. Hatch, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 21, 1988, Ser. No. 146,635

Int. Cl.[4] B60T *8/40*

U.S. Cl. 303—116 **20 Claims**



1. In an anti-lock brake system for a brake having master cylinder means coupled to brake actuation means, and braking means associated with preselected wheels of the vehicle, an arrangement for modulating brake fluid pressure at the braking means comprising:

modulation valve means coupled to the master cylinder means for receipt of brake fluid therefrom and coupled to the braking means for delivery of brake fluid thereto;

hydraulic power supply means coupled to the modulation valve means for supplying hydraulic fluid thereto;

wheel speed sensor means associated with the preselected wheel;

computer means coupled to the wheel speed sensor means and to the modulation valve means for providing modulation control signals to the modulation valve means; and

pressure transducer means coupled to the modulation valve means and to the computer means, operative to provide the computer means with a signal indicative of brake fluid pressure delivered to the braking means by the modulation valve means;

wherein the modulation valve means includes means for altering brake fluid pressure presented to the braking means in response to receipt of hydraulic fluid from the hydraulic supply means and means for isolating the brake fluid from the hydraulic fluid and wherein the means for altering brake fluid pressure comprises:

a stepped cylinder having a first cylinder bore section of a first diameter coupled to a second cylinder bore section having a second diameter, an input port in an end of the first section coupled for receipt of brake fluid from the master cylinder means, an output port extending from a wall of the first section coupled for delivery of brake fluid to the braking means, and a control port extending from a junction of the first and second cylinder bore sections, a stepped piston having a first portion slidably received in the first cylinder bore section and a second portion slidably received in the second cylinder bore section, biasing means coupled between the second portion of the stepped piston and an end of the second cylinder bore, check valve means in the first cylinder bore section adjacent the input port operative, whenever the stepped piston moves away from the input port, to prevent brake fluid flow into the input port, and control valve means coupled between the control port and the hydraulic power supply means and electrically coupled to the computer means, the control valve means operative upon receipt of a first modulation control signal from the computer means to direct hydraulic fluid into the control port thereby driving the stepped piston away from the input port and against the biasing means and further operative upon receipt of a second modulation control signal to provide a return path for the hydraulic fluid back out of the control port to enable the piston to move toward the input port under control of the biasing means.

4,824,189

BRAKE SYSTEM WITH SLIP CONTROL FOR AUTOMOTIVE VEHICLES WITH FRONT-WHEEL OR REAR-WHEEL DRIVE

Jochen Burgdorf, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

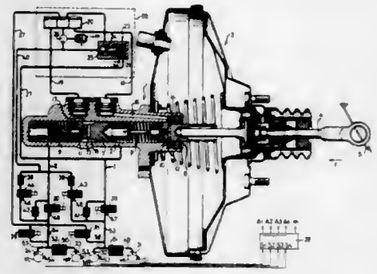
Filed Mar. 30, 1987, Ser. No. 32,490

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3613470

Int. Cl.[4] B60T *8/26, 8/32*

U.S. Cl. 303—119 **8 Claims**

1. A brake system with slip control for automotive vehicles with front-wheel and vehicles with rear-wheel drive comprising a pedal-actuated, auxiliary-force-assisted braking pressure generator (**1**), with wheel brakes (**31** to **34**) of one front wheel and one rear wheel being respectively connected by way of two separate brake lines (**53, 54**) to the pressure generator (**1**), said wheel brakes comprising brake elements connected to respective wheels for rotation therewith, said brake system comprising an auxiliary-pressure hydraulic supply system with a hydraulic pump, and a pressure compensating and pressure-fluid supply reservoir (**20**), and an auxiliary-pressure control valve (**23**), a plurality of wheel sensors (**S1** to **S4**) and electronic circuits for determining the wheel rotational behavior and for generating electric braking-pressure control signals which, for the purpose of slip control, serve to control electromagnetically actuatable pressure-fluid inlet valves (**29, 30; 43, 44**) and outlet valves (**35, 36**) inserted into the pressure-fluid lines (**37; 45, 46; 53, 54**), wherein there is provided a hold-back element delaying the application of brake shoes of the wheel



brakes of the driven vehicle wheels on at least one brake element wherein when pressure builds up in the main brake lines (**54, 54**) connected to one of the braking pressure generator (**1**) and alternatively to the auxiliary-pressure source (**55**) upon commencement of the braking operation, only the wheel brakes of the non-driven vehicle wheels are effective, said hold-back element being a spring.

4,824,190

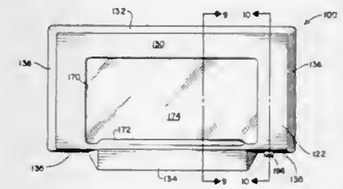
CABINETRY DOOR AND TRANSPARENCY VIEWER

Randall N. Bartlett, Bay Minette, Ala.; Robert Case, Chicago, Ill.; John Sauls, Bay Minette, Ala.; Arden Jenkins, Bay Minette, Ala., and James McNew, Bay Minette, Ala., assignors to Den-Tal-Ez, Inc., Philadelphia, Pa.

Filed Jul. 18, 1983, Ser. No. 515,009

Int. Cl.[4] A47F *3/00*

U.S. Cl. 312—138 R **11 Claims**



1. A cabinetry door and transparency viewer, adapted to being swung up and slid back into the upper part of a cabinet along tracks provided therein, which comprises:

a first member forming the front of the door, the first member having a planar main surface and a backwardly extending peripheral lip surrounding the main surface, the main surface having a light transmitting portion comprising a cutaway portion in the main surface and a panel of translucent material disposed adjacent the cutaway portion, and a transparency holding means for supporting a transparency against the light transmitting portion which comprises a forwardly extending lip at a bottom edge of the cutaway portion;

a second member forming the back of the door, the second member having a planar main surface, a forwardly extending peripheral lip surrounding the main surface, and a peripheral flange parallel to the main surface surrounding the peripheral lip;

illumination means, disposed between the first and second

members, for providing light to the light transmitting portion;

securing means for attaching the front of the peripheral flange of the second member to the rear of the main surface of the first member; and

at least one hinge attached adjacent an upper edge of the main surface of the second member and adapted for engagement with the tracks of the cabinet to allow the door to be swung up and slid back into the cabinet;

whereby the door may also be used as a transparency viewer when it is not slid back into the cabinet.

4,824,191

OPTICAL PICKUP

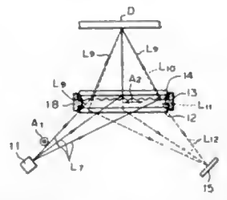
Masayuki Kato, Atsugi; Fumio Yamagishi, Ebina; Shin-ya Hasegawa, Machida; Hiroyuki Ikeda, Yokohama, and Takefumi Inagaki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 839,554, Mar. 14, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 173,050

Claims priority, application Japan, Mar. 20, 1985, 60-057456; Nov. 20, 1985, 60-260317; Jan. 10, 1986, 61-003337

Int. Cl.⁴ G02B *5/32*

U.S. Cl. 350—3.72 **11 Claims**



1. An optical pickup, comprising:

a light source irradiating a light beam onto an information recording media;

an optical sensor detecting the light beam reflected by said information recording media; and

an optical lens system, having a wave plate through which said light beam passes, comprising:

a first hologram lens;

a second hologram lens parallel to said first hologram lens with the light beam irradiated from said light source passing through said first and said second hologram lenses, and said wave plate, reflecting off of said information recording media, and passing again through said wave plate and said second and said first hologram lenses, one of said first and said second hologram lenses diffracting the light beam from said light source toward said information recording media, and the other hologram lens transmitting the same light beam diffracted by the one of said first and second hologram lenses, and said other hologram lens diffracting the reflected light beam from said information recording media toward said optical sensor, and the one of said hologram lenses transmitting the reflected light beam diffracted by said other hologram lens.

4,824,192

OPTICAL PROCESSING

Nicholas C. Roberts, Bristol, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Oct. 16, 1987, Ser. No. 109,045

Claims priority, application United Kingdom, Oct. 18, 1986, 8625016

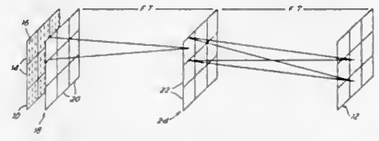
Int. Cl.⁴ G02B *5/32*; G06F *7/56*

U.S. Cl. 350—3.73 **8 Claims**

1. An optical processor including a series of M similar logic modules, each logic module comprising N logic gates and a set of connections between a plurality of logic gates within each logic module, the set of connections being the same for each logic module, said logic modules being connected with each other to form an optical processor, said logic modules and said connections comprising:

a logic gate array having an input plane and an output plane, including (N×M) logic gates, each logic gate having an input and an output on the input plane and the output plane, respectively, and said logic gates arranged in the form of N cells, each cell including M logic gates, the number of cells (N) defining the number of gates in each module of the optical processor and the number of gates (M) in each cell defining the number of modules in the processor; and

a holographic array having M facets, each facet having incident thereon output signals from a respective associated cell of said logic gate array, each of said facets comprising means for providing a predetermined mapping function and for causing output signals from said associated cell to be mapped onto said input plane of the array, at least one of said facets comprising a means for providing a cell-to-cell mapping function and for causing all outputs from an associated cell to be mapped onto the corresponding inputs of a respective predetermined cell, and at least one of said facets comprising a means for providing a cell-shifted mapping function which causes only some of said outputs from an associated cell to be mapped onto the inputs of a respective predetermined cell, wherein said at least one facet comprising means for providing a cell-to-cell mapping function determines said set of connections between logic gates within each logic module and said at least one facet comprising means for providing a cell-shifted mapping function determines the connections between said logic modules.



4,824,193

HOLOGRAPHIC MULTIPLEXER/DEMULTIPLEXER AND ITS MANUFACTURING METHOD

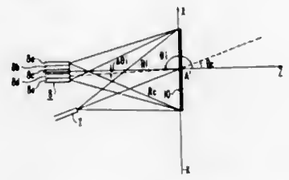
Teizou Maeda; Toshihiro Kubota, both of Hirakata, and Hiroyuki Ishii, Hokkaido, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 25, 1986, Ser. No. 889,890

Claims priority, application Japan, Jul. 26, 1985, 60-165124; Jul. 26, 1985, 60-165125; Sep. 30, 1985, 60-217008; Sep. 30, 1985, 60-217009

Int. Cl.⁴ G02B *5/32, 6/34*

U.S. Cl. 350—3.72 **20 Claims**



1. A holographic multiplexer comprising:

a plurality of input optical fibers which respectively radiate optical signals having different wavelengths which are transmitted therethrough;

a diffraction grating means for diffracting the optical signals radiated from the input optical fibers so that the diffracted optical signals converge to one point; and

a single output optical fiber disposed at said one point to receive and transmit the diffracted optical signals as one multiplexed optical signal containing the different wavelengths,

said diffraction grating means being constituted by a hologram having a pattern of interference between two light waves, at least one of said two light waves being an aspherical wave.

4,824,194

LIGHT GUIDE APPARATUS FORMED FROM STRIP LIGHT GUIDES

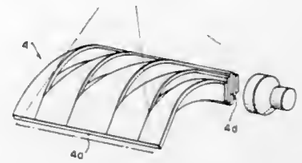
Hiroyuki Karasawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1988, Ser. No. 172,524

Claims priority, application Japan, Mar. 25, 1987, 62-70881; Jun. 17, 1987, 62-150824

Int. Cl.⁴ G02B *6/00*

U.S. Cl. 350—96.10 **6 Claims**



1. A light guide comprising a plurality of strip-like light guide materials each of which has first and second end faces and which are arranged and connected together side by side at respective end portions including said first end faces so that the first end faces form a linearly extending light input face and are bent at respective intermediate portions so that respective the other end portions including said second end faces extend substantially in parallel to the light input face, said the other end portions of the respective strip-like light guide materials being superposed one on another and bundled so that the second end faces form a light output face in a plane substantially perpendicular to the light input face.

4. A light guide comprising a light guide sheet material which has a linearly extending light input end face, a light output end face at an angle to the light input end face and an arcuate end face which joins the outer ends of the light input end face and the light output end faces and is convex outward, the arcuate end face being provided with a light reflecting layer, and said light guide sheet material being rolled about an axis substantially perpendicular to the light output end face with the light input face being positioned on the outer side of the roll.

4,824,195

MONOMODE OPTICAL TRANSMISSION FIBRE HAVING A TAPERED END PORTION PROVIDED WITH A LENS AND METHOD OF MANUFACTURING SUCH A FIBRE

Glok D. Khoe, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

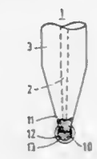
Continuation of Ser. No. 801,369, Nov. 25, 1985, abandoned. This application Feb. 2, 1988, Ser. No. 153,531

Claims priority, application Netherlands, Dec. 24, 1984, 8403931

Int. Cl.⁴ G02B *6/32*

U.S. Cl. 350—96.18 **9 Claims**

1. A monomode optical transmission fibre comprising a core surrounded by a cladding, the fibre having a straight portion terminating in a uniformly tapered portion which extends completely to one end of the fibre; and a spherical lens contacting said end of the fibre and consisting of a droplet of transparent material solidified thereon from the liquid state, such droplet having a diameter substantially larger than the diameter of said core at said end of the fibre; characterized in that said lens material has a melting temperature which is lower than that of either said core material or said cladding material and has a refractive index which is substantially equal to that of said core material.



4,824,196

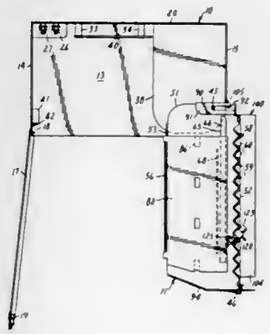
OPTICAL FIBER DISTRIBUTION PANEL

James R. Bylander, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 26, 1987, Ser. No. 53,965

Int. Cl.⁴ G02B *6/36*

U.S. Cl. 350—96.20 **34 Claims**



1. A distribution panel for supporting a plurality of connector sockets which are adapted to be connected to a transmission cable by conductors fastened to the rear of said sockets, said panel comprising

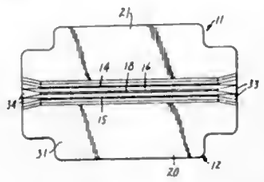
a housing having a plurality of sides,

an array of conductor sockets in rows and columns adjacent one side of said housing,

means on said housing for supporting a plurality of said sockets for limited translational movement to move said plurality of sockets with relationship to others of said sockets from a normally closed retracted position to a projected position spaced from said other sockets in a row or column to expose said sockets allowing easy finger access thereto for connection and disconnection of a mating plug with a said socket and restricting access to the rear of said sockets and said conductors, and for pivotal movement affording access to the rear of said sockets and said conductors.

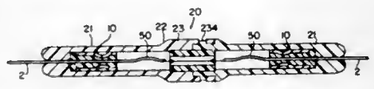
VOL 1101 ISS 4 AP 25 1989 UMI

4,824,197
STAMPED PRECISION LIGHTGUIDE INTERCONNECT CENTERING ELEMENT
Richard A. Patterson, Georgetown, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 18, 1988, Ser. No. 182,872
Int. Cl.⁴ G02B 6/36
U.S. Cl. 350—96.21 **20 Claims**



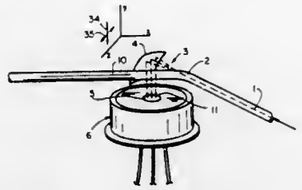
1. A splice element for use in butt splicing two optical fibers, said element being formed from a thin sheet of deformable material having opposite surfaces and a pair of parallel grooves formed in one surface, two of the walls defining said grooves form a rib having equal converging sides and a first fiber supporting surface therebetween, the other two side walls forming the grooves are separated at their base portions from said two of the walls by land areas at which said sheet is folded, and said other two side walls extend from said land areas to said one surface of said sheet and include surface areas defining two additional fiber supporting surfaces which are disposed in an angular relationship to each other and with said first fiber supporting surface of said rib which surfaces collectively define an optical fiber passageway larger than the dimensions of a fiber when said sheet is folded to receive and align two opposed fiber ends at the axis of said passageway, and the sides of said sheet parallel to said grooves form legs which diverge from each other with the sheet folded and serve to draw the supporting surfaces toward one another upon movement of the edges of the legs toward one another to engage two said fiber ends and clamp them in axially aligned position.

4,824,198
HOUSING FOR A FIBER OPTIC SPLICE
John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Continuation of Ser. No. 542,318, Oct. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 268,462, May 29, 1981, abandoned. This application Jun. 10, 1985, Ser. No. 743,271
Int. Cl.⁴ G02B 6/36, 7/26
U.S. Cl. 350—96.21 **1 Claim**



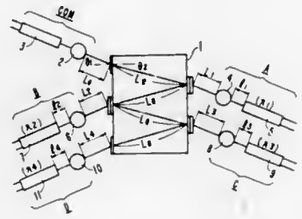
1. A fiber optic splice assembly comprising:
a splice housing composed of mating hermaphroditic housing halves, each half providing at least a first cavity and both halves, when mated, defining a third cacity, and
a ferrule crimp residing in each of said first cavities and an elastomeric splice residing in said third cavity defined by said mated housing halves.

4,824,199
OPTICAL FIBER TAP UTILIZING REFLECTOR
William D. Uken, Fremont, Calif., assignor to Raychem Corp., Menlo Park, Calif.
Continuation of Ser. No. 14,890, Feb. 13, 1987, Pat. No. 4,741,585. This application Jan. 15, 1988, Ser. No. 144,898
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.⁴ G02B 6/26
U.S. Cl. 350—96.15 **15 Claims**



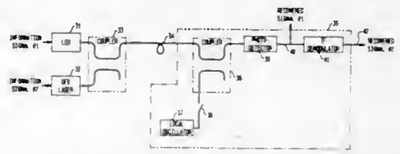
11. A tap for coupling between an intermediate portion of an optical fiber and a light element, comprising:
a light element having an end surface;
means for maintaining the intermediate portion of the optical fiber bent and disposed in a plane, the end surface of the light element being completely outside the plane;
an optical coupler in contact with an outer surface of the optical fiber; and
a light reflector extending traverse to the plane so as to deflect the light between the light element and the optical fiber intermediate portion.

4,824,200
OPTICAL BRANCHING FILTER
Hideki Isono, Kawasaki; Kazushi Asauma, Suzaka; Takashi Yokota, Yamato, and Kiyoshi Terai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 6, 1987, Ser. No. 11,602
Claims priority, application Japan, Feb. 6, 1986, 61-25151
Int. Cl.⁴ G02B 6/28
U.S. Cl. 350—96.16 **8 Claims**



1. An optical branching filter for branching or mixing a plurality of wavelengths of light, comprising:
an optically transparent block having first and second parallel surfaces;
a primary input/output port including a primary optical fiber for providing or receiving a mixed wavelength light beam to or from said block and a primary lens;
primary input/output means, mounted on the first surface of said block, for provided to or receiving from said primary input/output port the mixed wavelength light beam;
a plurality of secondary input/output means, mounted on said first and second surfaces of said block, one corresponding to each wavelength of light in said mixed wavelength light beam, each said secondary input/output means for inputting or outputting its corresponding wavelength of light into or out of said block and reflecting all other wavelengths of light, forming an optical path within said block; and
a plurality of secondary input/output ports, one corresponding to each of said secondary input/output means, each including a secondary optical fiber for receiving or providing each of the predetermined wavelengths of light from or to its corresponding secondary input/output means and a secondary lens,
wherein a position of each said secondary input/output ports is selected so that the length of wavelength optical paths formed between said primary input/output port and each of said secondary input/output ports are in reverse proportion to the lengths of the wavelengths corresponding to each of said secondary input/output ports and each of said primary and secondary lenses is positioned at a single predetermined distance from their respective said primary and secondary optical fibers.

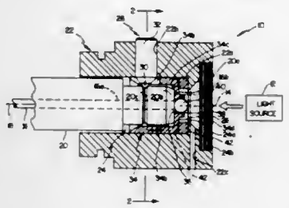
4,824,201
SIMULTANEOUS TRANSMISSION OF LED AND LASER SIGNALS OVER SINGLE MODE FIBER
Leonid G. Kazovsky, Aberdeen, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.
Filed Jul. 13, 1987, Ser. No. 72,715
Int. Cl.⁴ G02B 6/28
U.S. Cl. 380—96.16 **20 Claims**



1. An optical transmission system for simultaneously transmitting plural digital signals between a transmitting end and a receiving end over a single mode optical fiber comprising:
at the transmitting end, a wide linewidth optical device for intensity modulating a first of said digital signals, a narrow linewidth optical device for angle modulating a second of said digital signals, and means for combining the outputs of said wide and narrow linewidth optical devices for transmission over the single mode fiber,
and at the receiving end, means for recovering the first of said digital signals by detecting the intensity variations in the optical signal received over the single mode fiber, and means for recovering the second of said digital signals by detecting the angle variations in the optical signal received over the single mode fiber.

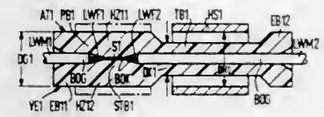
4,824,202
FIBER OPTIC CONNECTOR
Alain G. Auras, Oakland, Calif., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.
Filed Aug. 12, 1987, Ser. No. 84,995
Int. Cl.⁴ G02B 5/14
U.S. Cl. 350—96.18 **18 Claims**

1. An assembly for optically coupling a light source and an optical waveguide having an axis of optical transmission and a generally planar end face comprising:
a housing defining a chamber for receiving the end of such a waveguide and for transmitting light from the light source toward the waveguide end face;
means for supporting the end of a waveguide received in said chamber in a first predetermined position;
a lens;
means movable relative to said housing for supporting said lens in said chamber in a second predetermined position relative to a waveguide end supported in said first position for directing light passing from the light source toward the end face of the optical waveguide; and



resilient means interposed between said housing and said lens supporting means for yieldably urging said lens toward a waveguide end supported in said first position.

4,824,203
CONNECTOR DEVICE COMPRISING A RECEPTACLE PART SURROUNDING THE LIGHT WAVEGUIDE
Dieter Kunze, Neuried; Norbert Odemar, and Josef Schramm, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jan. 14, 1988, Ser. No. 143,752
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3701038
Int. Cl.⁴ G02B 6/36, 6/38
U.S. Cl. 350—96.21 **12 Claims**



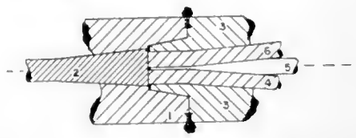
1. A connector device comprising at least one sleeve and a receptacle part surrounding the light waveguides, which are each provided with an unstripped jacket portion and an end with a stripped optical fiber portion, the receptacle part comprising at least one cylindrical region having a small outside diameter and at least one further cylindrical region having a large outside diameter, said one cylindrical region with the large outside diameter forming a press-on region, said part having an axially extending bore with a small diameter portion for receiving the stripped optical fiber portions and subsequent bores with large diameter portions for receiving the unstripped jacket portions of the waveguides, all of said bores lying in the press-on region to form a joint region, said sleeve having an inside diameter that is slightly less than the outside diameter of the press-on region, the length of the small diameter bore portion being less than the length of the press-on region so that both stripped optical fiber portions, as well as unstripped jacket portions of the light waveguides, are received in the joint region and are subjected to radical clamping forces when the sleeve is assembled onto the press-on region.

4,824,204

FIBER OPTIC CONNECTOR THAT JOINS MULTIPLE, BUT AT LEAST ONE, FIBER OPTIC CABLES TO A DUAL DIAMETERED FIBER OPTIC CABLE AND A MULTIPLE POSITION CLAMP TO JUXTAPOSE A PLURALITY OF THE SAID FIBER OPTIC CONNECTER

Thomas L. Pafford, 12404 Harbor Dr., Woodbridge, Va. 22192

Filed May 30, 1986, Ser. No. 868,539
Int. Cl.[4] G12B 6/38
U.S. Cl. 350—96.21 3 Claims



1. A fiber optic connector comprising at least one fiber optic cable joined to a dual diametered fiber optic cable, said fiber optic connector including a male member containing said at least one optic cable and a female member containing said dual diametered fiber optic cable an end of said male member being coated with a reflective material and said at least one fiber optic cable being free of reflective material.

4,824,205

APPARATUS FOR IMPROVING IMAGE FORMED BY IMAGING OPTICAL SYSTEM

Nobuo Yamashita; Susumu Takahashi, both of Hachiouji, and Hiroshi Matsui, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,739
Claims priority, application Japan, Sep. 9, 1986, 61-210527; Sep. 22, 1986, 61-224537
Int. Cl.[4] G02B 6/06
U.S. Cl. 350—96.25 25 Claims



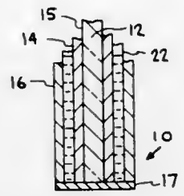
1. An apparatus for improving an image formed by an imaging optical system comprising:
an objective lens;
an image receiving means for receiving an image formed by said objective lens;
a prism system means arranged on an optical axis between said objective lens and said image receiving means, said prism system means including:
a first prism means having an incident surface and an emerging surface which is arranged to be inclined surface to said optical axis, and
a second prism means having an incident surface which is spaced from the emerging surface of said first prism means and an emerging surface; and
a driving means for vibrating at least one of said first and second prism means along said optical axis in such a manner that angles made by the incident and emerging surfaces of said first and second prism means with said optical axis are not varied and said image formed by said objective lens is vibrated in a direction perpendicular to said optical axis due to the vibration of at least one of said first and second prism means.

4,824,206

MODULAR FIBER OPTIC CHEMICAL SENSOR

Stanley M. Klainer, San Ramon, Calif.; J. Milton Harris, Huntsville, Ala., and Kisholoy Goswami, Walnut Creek, Calif., assignors to ST&E, Inc., Livermore, Calif.

Filed Nov. 25, 1987, Ser. No. 125,259
Int. Cl.[4] G02B 6/02, 6/16
U.S. Cl. 350—96.29 20 Claims



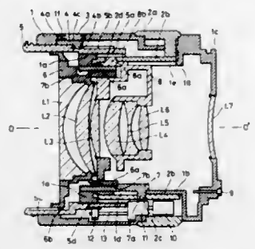
1. A fiber optic sensor comprising:
a fiber core;
a reactive surface formed on the core;
a capillary tube disposed about the core and reactive surface to form a fiber optic clad and a protective layer for the reactive surface.

4,824,207

LENS BARREL

Shigeru Kamata, Tokyo, and Hidefumi Notagashira, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1987, Ser. No. 48,829
Claims priority, application Japan, May 22, 1986, 61-77294[U]
Int. Cl.[4] G02B 7/02
U.S. Cl. 350—255 10 Claims



7. A lens barrel comprising:
a fixed outer tube comprising an outer peripheral surface and a channel in said outer peripheral surface;
a rotatable inner tube positioned inside said outer tube, wherein said rotatable inner tube comprises a zoom operation ring positioned in said channel in said outer peripheral surface of said outer tube;
a front lens moving means for moving lenses positioned at the front of said lens barrel, wherein said front lens moving means engages said rotatable inner tube and is adapted for axial movement in the direction of an optical axis;
a rear lens holding means engaging said rotatable inner tube and adapted for axial movement in the direction of said optical axis, wherein said front lens moving means and said rear lens holding means are displaced in opposite directions in the direction of said optical axis in response to the rotation of said rotatable inner tube;
an indication window arranged in the outer peripheral surface of said fixed outer tube;

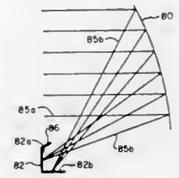
a focusing ring, disposed inward of the inner periphery of said fixed outer tube, movable in the direction of said optical axis, and rotatable about said optical axis;
a distance scale ring disposed inward of the inner periphery of said indication window and only rotatable about said optical axis, said distance scale ring having distance scale marks formed over its outer peripheral surface; and
an interconnecting mechanism interconnecting said focusing ring with said distance scale ring, said interconnecting mechanism being constructed and arranged to rotate said distance scale ring in response to the rotation of said focusing ring about said optical axis without moving said distance scale ring in the direction of said optical axis.

4,824,208

DISPLAY FOR CONTRAST ENHANCEMENT

James L. Fergason, Atherton, and Robert Parker, Alamo, both of Calif., assignors to Talig Corporation, Sunnyvale, Calif.

Division of Ser. No. 53,583, May 18, 1987, Pat. No. 4,732,456, which is a continuation of Ser. No. 645,457, Aug. 28, 1984, abandoned. This application Oct. 5, 1987, Ser. No. 104,850
Int. Cl.[4] G02B 27/00; G02F 1/13
U.S. Cl. 350—276 SL 3 Claims



1. An apparatus for reducing glare comprising a light absorbing target and a concave reflector means for focusing specular reflection onto said target, said reflector means having a radius of curvature R and said target located on a viewing side of said reflector at a distance of between 0.4R and 0.5R therefrom and said target comprising vertically and horizontally extending light absorbing surfaces wherein the height of said vertically extending surface is approximately 0.0625R and the length of said horizontally extending surface is at least 0.1R.

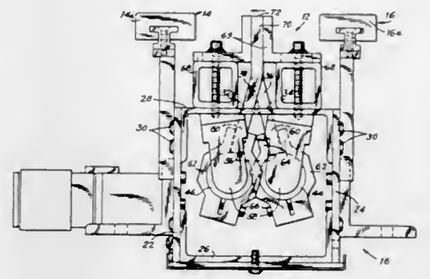
4,824,209

LIGHT SOURCE ASSEMBLY

Joseph A. Bolton, Queensbury; Raymond W. Beck, Fort Ann, and Robert B. Ramey, Whitehall, all of N.Y., assignors to Albany International Corporation, Menands, N.Y.

Filed Mar. 30, 1988, Ser. No. 176,108
Int. Cl.[4] G02B 7/00
U.S. Cl. 350—319 15 Claims

1. A light assembly for generating a narrow beam of light of relatively uniform intensity for use in association with a light sensor for sensing variations in light intensity, said assembly comprising:
a source of light which includes a plurality of elongated bulbs having longitudinal axes;
light extending means comprising at least two sheets of light transmissive material, said means functions to channel light from the light source into a narrow, relatively uniform, longitudinal path defining a slot; and
the axes of at least two of said bulbs being non axially aligned and said two bulbs extending in a manner that an end portion of one is in juxtaposition with respect to that of the other so that light is uniformly transmitted through the light extending means in an alternating manner.

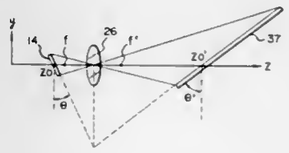


4,824,210

LIQUID CRYSTAL PROJECTOR

Tatsuo Shimazaki, Higashimurayama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 812,293, Dec. 23, 1985, abandoned. This application Aug. 28, 1987, Ser. No. 93,108
Claims priority, application Japan, Feb. 21, 1985, 60-23790[U]; Feb. 21, 1985, 60-23791[U]
Int. Cl.[4] G02F 1/13; G03B 21/00, 21/14, 21/22
U.S. Cl. 350—331 R 3 Claims



1. A liquid crystal projector comprising:
a case provided with a projecting window;
a light source disposed within said case, said light source including a lamp and a reflecting mirror having an optical axis;
means for converting light emitted from said light source into a parallel light;
a liquid crystal display panel for displaying an image, said liquid crystal display panel being tilted at a predetermined angle with respect to said optical axis of said reflecting mirror and having a back surface irradiated with said parallel light;
condenser lens means for condensing light passing through said liquid crystal display panel;
projecting lens means for projecting in a magnified fashion the image displayed on said liquid crystal display panel by the light condensed by said condenser lens means through said projecting window of said case;
screen means arranged to receive the magnified image projected from said projecting lens means thereon for displaying said magnified image, said screen means being tilted at a predetermined angle in a direction opposite to the tilting direction of said liquid crystal display panel; and
means for cooling said liquid crystal display panel;
an angle θ formed between said liquid crystal display panel and a line perpendicular to said optical axis of said reflecting mirror bearing the following relationship with an

VOL 1101 ISS 4 AP 25 1989 UMI

angle θ' formed between said liquid crystal display panel and a vertical line of said screen means:

$$(Zo+y \tan \theta)(Zo'+y' \tan \theta')=f \cdot f'=-f^2$$

where:

f: focal length of said projecting lens means on the side of said liquid crystal display panel;

Zo: position on said optical axis of said reflecting mirror with "f" set as the origin;

y: position on a line perpendicular to said optical axis;

f': focal length of said projecting lens means on the side of said screen means;

Zo': position on said optical axis of said reflecting mirror with "f" set as the origin; and

y': position on a line perpendicular to said optical axis.

4,824,211

METHOD OF DRIVING A LIQUID CRYSTAL DISPLAY DEVICE

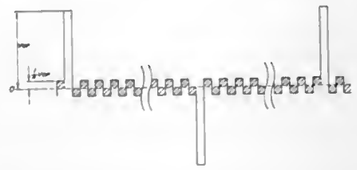
Tetsuo Murata, Tenri, Japan, assignor to Sharp Kabushiki Kaishi, Osaka, Japan

Continuation of Ser. No. 80,175, Jul. 31, 1987, abandoned, which is a continuation of Ser. No. 759,068, Jul. 24, 1985, abandoned. This application Dec. 18, 1987, Ser. No. 134,597

Claims priority, application Japan, Aug. 3, 1984, 59-163987

Int. Cl.⁴ G02F *1/133;* **G09G** *3/36*

U.S. Cl. 350—332 **2 Claims**



1. A method of reducing unevenness in contrast in driving a liquid crystal display device at a high duty ratio by voltage averaging, said method comprising the step of operating said device at a bias ratio 1.2–4 times as large as the theoretically optimum bias ratio of said liquid crystal display device.

4,824,212

LIQUID CRYSTAL DISPLAY DEVICE HAVING SEPARATE DRIVING CIRCUITS FOR DISPLAY AND NON-DISPLAY REGIONS

Kouki Taniguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

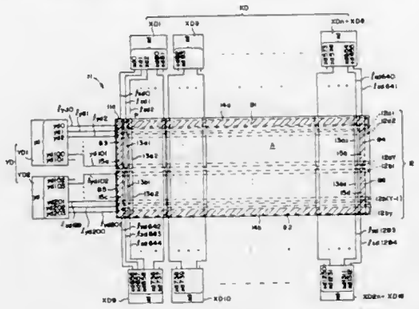
Filed Mar. 14, 1988, Ser. No. 167,889

Claims priority, application Japan, Mar. 14, 1987, 62-59183

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—333 **5 Claims**

1. A liquid crystal display device, comprising: a display section comprising an effective display region having a plurality of transparent electrodes arranged on both sides of liquid crystal elements so as to make characters visible and a non-display region other than said effective display region; and liquid crystal driving means comprising first driving circuits for driving the liquid crystal elements in said effective display region to display desired characters, and second driving circuits for driving the liquid crystal elements in said non-display region to make said non-display region dark or bright.



4,824,213

LIQUID CRYSTAL DISPLAY HAVING OPAQUE PORTIONS ON THE ELECTRODES

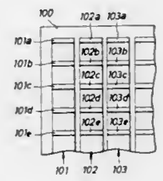
Shigeru Morokawa, Higashiyamato, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,589

Claims priority, applicatioo Japan, Dec. 16, 1983, 58-193811[U]; Dec. 16, 1983, 58-193812[U]; May 24, 1984, 59-105587

Int. Cl.⁴ G02F *1/133*

U.S. Cl. 350—336 **10 Claims**



1. A "normally white" liquid crystal display device comprising:

a first transparent substrate having a plurality of transparent electrode columns formed thereon;

a second transparent substrate having a plurality of transparent electrode lines formed thereon; and

a liquid crystal disposed between said first and second transparent substrates, said transparent electrode columns of said first transparent substrate facing said transparent electrode lines of said second transparent substrate, said electrode columns and said electrode lines being orthogonal to each other, thus forming a plurality of picture elements in the form of a matrix, wherein said transparent electrode columns are provided with a plurality of non-connected horizontal conductive light shielding bars disposed at equal distances and said transparent electrode lines are provided with a plurality of nonconnected longitudinal conductive light shielding bars disposed at equal distances to mask the spaces between adjacent said picture elements in said matrix when said first and second transparent substrates are overlapped.

4,824,214

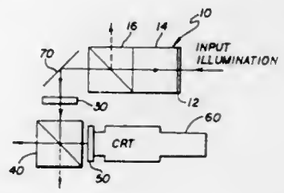
UNITARY PREPOLARIZING PRISM ASSEMBLY FOR A FOUR COLOR LIQUID CRYSTAL LIGHT VALVE IMAGE PROJECTOR

Arno G. Ledebuhr, Pleasanton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 27, 1987, Ser. No. 13,480

Int. Cl.⁴ G02F *1/13;* **G02B** *27/28, 21/00*

U.S. Cl. 350—337 **5 Claims**



1. A four color liquid crystal light valve image projector comprising:

a prepolarizing prism assembly for which provides, from an input beam of unpolarized white light, an output beam of light having a first component of a first color and first polarization state and a second component of a second color and a second polarization state, said prepolarizing prism assembly providing a first optical path from an input end to an output end;

an optical switch for selectively changing the polarization state of input light, said optical switch disposed for receiving said output beam of light from said prepolarizing prism assembly, said optical switch alternately interchanging the polarization state of said first component of said output beam with the polarization state of said second component of said output beam to provide a sequential output beam;

liquid crystal light valve means for modulating the polarization of light received on an input optical axis and directing polarization-modulated light back along said input optical axis; and

a main polarizer disposed to receive said sequential output beam of light from said optical switch and said polarization-modulated light from said liquid crystal light valve means.

4,824,215

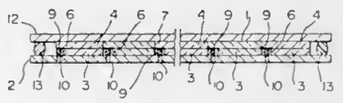
LIQUID CRYSTAL DISPLAY APPARATUS

Ezekiel Joseph; Gordon Kramer, both of Huntington Beach, and Chan S. Oh, Diamond Bar, all of Calif., assignors to Xtalite Technology Limited/La Technologie Xtalite Limitée, Charlottetown, Canada

Filed Jan. 22, 1988, Ser. No. 147,289

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—339 D **8 Claims**



1. A liquid crystal display apparatus comprising a plurality of individual liquid crystal modules in juxtaposed relationship to define a planar display, each said module including base plate means; top plate means and a conductive liquid crystal coating layer between said plate means, one edge of said top plate means extending beyond a corresponding edge of said base plate means, the remainder of the top plate means being coterminous with said bottom plate means; diffuser plate means carrying said modules for scattering light passing through or reflected by the diffuser plate means; and electrically conductive contact means extending between said one edge of said top plate and said diffuser plate means for conducting electrical current to each said module.

4,824,216

DEVICE FOR THE MODULATION OF THE ILLUMINATING LIGHT OF AN ELECTRO-OPTIC DISPLAY SCREEN

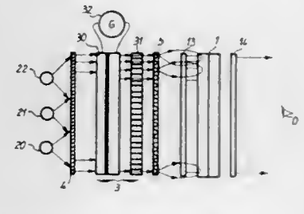
Jean N. Perbet, Gif Sur Yvette; Michel Hareng, La Norville, and Bruno Mourey, Boulogne Billancourt, all of France, assignors to Thomson-CSF, Paris, France

Filed Apr. 20, 1987, Ser. No. 39,721

Claims priority, application France, Apr. 22, 1986, 86 05801

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—346 **8 Claims**



1. An illuminated electro-optic display device comprising:

a light source for illuminating said electro-optic display device

electrically controlled means for modulating said light source which is located between said light source and said electro-optic display device;

a voltage generator connected to said electrically controlled modulating means for supplying a control voltage thereto; and

an ambient light detection circuit for detecting ambient light intensity and coupled to said voltage generator for controlling said voltage generator responsive to said detected ambient light.

4,824,217

COMPOUNDS FOR FERROELECTRIC LIQUID CRYSTAL DEVICES

Lawrence K. M. Chan, Hull; David Coates, Bishop's Stortford; Peter A. Gemmell, Runcorn; George W. Gray, Cottingham; David Lacey; Kenneth J. Toyne, both of Hull; Daniel J. S. Young, Doncaster; Matthew F. Bone, Bishop's Stortford; Adam Jackson, Hull, and Richard M. Scrowston, Walkington, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB85/00511, § 371 Date Aug. 19, 1986, § 102(e) Date Aug. 19, 1986, PCT Pub. No. WO86/02937, PCT Pub. Date May 22, 1986

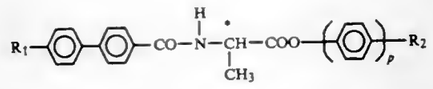
PCT Filed Nov. 8, 1985, Ser. No. 890,844

Claims priority, application United Kingdom, Oct. 9, 1985, 8524879

Int. Cl.⁴ G02F *1/13;* **C09K** *19/52, 19/12;* **C07C** *101/02*

U.S. Cl. 350—350.5 **10 Claims**

1. A ferroelectric smectic liquid crystal mixture in which a first constituent of the mixture is chiral, which first constituent is admixed with a second constituent which exhibits a tilted smectic C phase, and wherein the said first constituent consists of one or more compounds having a molecular structure in which the chiral group of the molecule is sterically hindered with respect to the main molecular core, said compound(s) having a molecular structure:



wherein R_1 is n-alkyl or n-alkoxy containing 5–12 carbon atoms, p is 0 or 1, R_2 is C_1–C_4 n-alkyl or n-alkoxy, provided that if p is 0, then R_2 is C_1–C_4 n-alkyl.

4,824,218

OPTICAL MODULATION APPARATUS USING FERROELECTRIC LIQUID CRYSTAL AND LOW-RESISTANCE PORTIONS OF COLUMN ELECTRODES

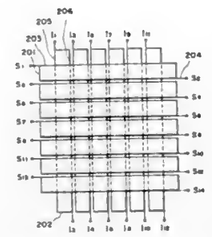
Mitsutoshi Kuno, Tokyo; Masahiko Enari, Yokohama; Hitoshi Shindo, Atsugi; Isamu Shimoda, Zama; Seishiro Yoshioka, Isehara; Shuzo Kaneko, Tokyo, and Tsutomu Toyono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 33,578

Claims priority, application Japan, Apr. 9, 1986, 61-82924; Apr. 9, 1986, 61-82925; Apr. 9, 1986, 61-82926; Apr. 9, 1986, 61-82927; Apr. 11, 1986, 61-83925; Apr. 25, 1986, 61-96172; Jun. 10, 1986, 61-132745; Jun. 10, 1986, 61-132748; Jun. 23, 1986, 61-147796; Jun. 23, 1986, 61-147799

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—350 S **98 Claims**



1. An optical modulation apparatus, comprising:
an optical modulation device comprising a first substrate having thereon a conductor film, and a plurality of first electrodes disposed electrically connected to the conductor film; a second substrate having thereon a plurality of second electrodes; and an optical modulation material disposed between the first and second substrates;
a scanning line driver circuit comprising means for supplying a scanning line to the second electrodes; and
a data line driver circuit comprising means for supplying driving signals to odd-numbered electrodes among the first electrodes in phase with the scanning signal and means for supplying data signals to even-numbered electrodes among the first electrodes in phase with the scanning signal.

4,824,219

HYDRAZIDE-CONTAINING THERMOPLASTIC POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

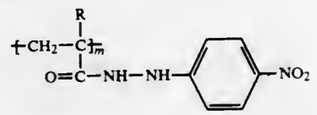
Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 93,680, Sep. 8, 1987. This application Jun. 22, 1988, Ser. No. 209,984

Int. Cl.⁴ G02B *5/23*

U.S. Cl. 350—354 **7 Claims**

1. A transparent nonlinear optical medium comprising a thermoplastic polymer which is characterized by a recurring monomeric unit corresponding to the formula:



where R is a substituent selected from hydrogen and C_1–C_4 alkyl groups; and m is an integer of at least 3.

4,824,220

DEVICE FOR FORMING AN IMAGE WITH A LASER BEAM

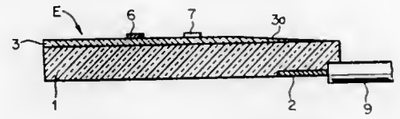
Takemi Yamamoto; Kuniyasu Makino, and Makoto Suzuki, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 2, 1987, Ser. No. 104,830

Claims priority, application Japan, Oct. 2, 1986, 61-235212; Dec. 16, 1986, 61-299752

Int. Cl.⁴ G02F *1/01, 1/11;* H01S *3/10*

U.S. Cl. 350—354 **8 Claims**



1. A device for modulating and deflecting a light beam comprising a light-transmittable crystal, a first optical wave guide formed on a first surface of said crystal for receiving entering light waves and generating a harmonic of half the wavelength of the entered light and radiating the same at an angle with respect to the path of the entering light waves, a second optical wave guide formed on a surface of said crystal opposite said first surface for receiving the light radiated from said first optical wave guide, and means positioned beside the path of said radiated light for on-off modulating the light passing into said second optical wave guide and deflecting the same onto a predetermined plane.

4,824,221

ELECTROCHROMIC DEVICE

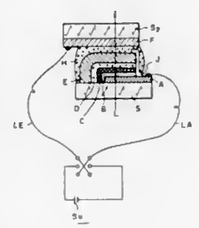
Tatuso Endo, Yokohama, and Tatsuo Niwa, Sakura, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,472

Claims priority, application Japan, Apr. 3, 1987, 61-82382

Int. Cl.⁴ G02F *1/01, 1/17*

U.S. Cl. 350—357 **8 Claims**



1. An electrochromic device comprising:
a first electrode layer;
a second electrode layer;
an electrochromic layer provided between said first and second electrode layers;
an electroconductive resin layer provided on the side opposite to the electrochromic layer with respect to said second electrode layer so as to contact said second electrode layer;
a third electrode layer with a resistance value lower than that of said second electrode layer, said third electrode layer being provided on the side opposite to said second electrode layer with respect to said electroconductive resin layer so as to contact said electroconductive resin layer; and
means for giving a potential difference between said first electrode layer and said third electrode layer.

4,824,222

OXIDE BRONZE MATERIALS

Mino Green, London, United Kingdom, assignor to National Research Development Corporation, London, England

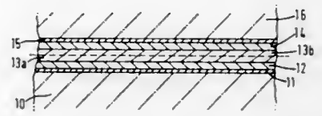
Filed Sep. 2, 1986, Ser. No. 902,751

Claims priority, application United Kingdom, Sep. 2, 1985, 8521753

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 350—357 **16 Claims**



1. An oxide bronze material comprising a host oxide material containing guest metal atoms which can be reversibly removed from the host material when the host material is incorporated in a suitable electrochemical cell, which oxide bronze material has an absorption band for electromagnetic radiation which has an intensity dependent on the concentration of guest metal atoms in the oxide bronze material, and which material can be formed as thin, substantially transparent layers which do not undergo any substantial visible color change upon the reduction to substantially zero of said guest atom concentration, wherein the host material is a solid solution of a first oxide component selected from the group consisting of molybdenum oxide (MoO_3), tungsten oxide (WO_3), zirconium oxide (ZrO_2), niobium oxide (Nb_2O_5) and mixtures of at least two thereof and a second oxide component selected from the group consisting of vanadium oxide (V_2O_5) titanium oxide (TiO_2 and mixtures thereof.

4,824,223

PROJECTION OBJECTIVE WITH VARIABLE FOCAL LENGTH

Bernhard Doctor, Wetzlar-Nanborn, and Ingolf Menzel, Braunfels-Neukirchen, both of Fed. Rep. of Germany, assignors to Docter-Optic-Wetzlar GmbH, Schoffengrund, Fed. Rep. of Germany

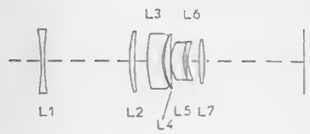
Filed Aug. 31, 1987, Ser. No. 91,024

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1986, 3629724; Jan. 5, 1987, 3700162

Int. Cl.⁴ G02B *15/14, 15/177*

U.S. Cl. 350—427 **3 Claims**

1. A projection objective with variable focal length, having a front member (F) with negative refractive power and a multiple-lens basic objective (G) with positive refractive power, with a multiple-lens variator (V) displaceable in the direction of the optical axis and with positive refractive power being arranged therebetween, whereof the middle lens has a negative refractive power, characterized by seven self-contained lenses (L1–L7) separated from each other by air spaces and free of cemented surfaces, whereof the front member (F) consists of one single lens (L1) with negative refractive power, the basic objective (G) consists of a Cookes or Taylor lens (L5, L6, L7) and the variator (V) likewise consists of a Cookes or





Taylor lens (L2, L3, L4); the improvement comprising: that said variator includes means providing that its three lenses are maintained as a unit in fixed, spaced apart relationship to each other; and that said variator as said unit is adapted to be displaced along the optical axis between a position adjacent said front member (F) and a position adjacent said basic objective (G).

4,824,224

LENS SYSTEM FOR A CATHODE RAY TUBE PROJECTION SYSTEM

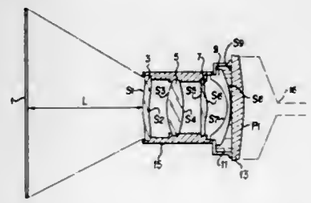
Kyohei Fukuda, Fujisawa; Hiroki Yoshikawa, Hiratuka; Shigeru Mori, Chigasaki; Koji Hirata, and Soichi Sakurai, both of Toksuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1986, Ser. No. 948,251

Claims priority, application Japan, May 28, 1986, 61-121039

Int. Cl.⁴ G02B *13/18, 3/02;* H04N *5/74, 5/72*

U.S. Cl. 350—432 **28 Claims**



1. An optical system for enlarging an image produced on face glass of a cathode ray tube and projecting the image onto a screen, comprising from its screen side:
a first aspheric lens of relatively weak power;
a second biconvex lens for providing the major portion of the enlargement provided by the optical system;
a third aspheric lens of relatively weak positive power; and
a fourth lens with a concave face on its screen side of relatively large negative power;
wherein a surface of said face glass of said cathode ray tube to which phosphor elements are mounted is aspheric and wherein the radius of curvature of said surface is greatest at the optical axis and is less radially outward thereof to reduce the amount of light from said phosphor elements

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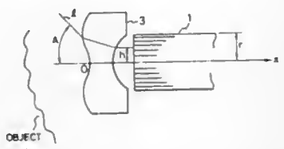
which undergoes total internal reflection from a central portion of said concave face of said fourth lens.

4,824,225

ILLUMINATION OPTICAL SYSTEM FOR AN ENDOSCOPE

Kimihiko Nishioka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 945,951, Dec. 24, 1986, abandoned.
This application Jun. 1, 1988, Ser. No. 205,483
Claims priority, application Japan, Dec. 28, 1985, 60-293645
Int. Cl.[4] G02B *13/18, 6/32, 23/26*
U.S. Cl. 350—432 27 Claims



1. An illumination optical system for an endoscope comprising an illumination lens including at least one aspherical lens element and a light source having a light emitting surface of a certain size in a direction perpendicular to the optical axis of said illumination lens, said illumination optical system for an endoscope fulfilling the conditions (2), (3) and (4) shown below wherein:

the inequality of $d^2/dh^2\{\sin A(h)\} \leqq 0$ establishes for at least certain values of the variable h within a range of

$$2 \leqq h \leqq r. \quad (2)$$

$$\sin A \geqq 0.2588 \quad (3)$$

$$\left\{ \sin A \leqq \frac{1}{0.4r} \int_{0.6r}^{r} \sin A(h)dh \right\} \quad (4)$$

$$[x_1] \leqq [x_2]$$

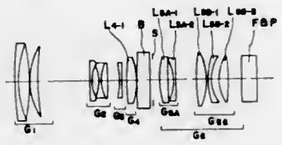
where, reference symbol h represents the height of ray emitted from said light source and incident on said illumination lens, reference symbol A(h) represents the refraction angle of the ray, whose height of the ray is h, measured from the optical axis after said ray passes through the aspherical lens element, reference symbol r represents the distance measured from the optical axis on the light-emitting surface of said light source to the end thereof, reference symbol x_1 represents the difference between the positions of the foremost point and the rearmost point on the first surface of the illumination lens measured in the direction of the optical axis, and reference symbol x_2 represents the difference between the positions of the foremost point and the rearmost point on the second surface of the illumination lens measured in the direction of the optical axis.

4,824,226

COMPACT ZOOM LENS SYSTEM FOR VIDEO CAMERA

Masami Tanaka, Hirakata, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 5, 1987, Ser. No. 82,200
Claims priority, application Japan, Aug. 12, 1986, 61-188873; Aug. 12, 1986, 61-188874
Int. Cl.[4] G02B *15/16, 9/64*
U.S. Cl. 350—427 8 Claims



1. A compact zoom lens system for a video camera, comprising from the object side to the image side:

a first lens unit of a positive refractive power fixed on the optical axis of the lens system;

a second lens unit of a negative refractive power shiftable along the optical axis in the zooming operation;

a third lens unit of a negative refractive power shiftable along the optical axis in the zooming operation and in the focusing operation;

a fourth lens unit of a positive refractive power fixed on the optical axis of the lens system and consisting of one positive lens component;

an aperture diaphragm, and

a fifth lens unit including a front lens unit consisting of a positive lens component whose object side surface has a stronger refractive power than its image side surface and a negative lens component whose object side surface has a stronger refractive power than its image side surface, and a rear lens unit of a positive refractive power consisting of a positive lens component, a negative meniscus lens component whose object side surface has a stronger refractive power than its image side surface, and a positive lens component whose object side surface has a stronger refractive power than its image side surface;

wherein the lens system fulfills the following condition:

$$0.13 < |\phi_3 \times d_2 < 0.20$$

wherein:

ϕ_3 represents the refractive power of the third lens unit, and

d_2 represents the axial distance between the second lens unit and the third lens unit at the infinity focusing position in the longest focal length condition.

4,824,227

OPTIMUM RISER ANGLE FOR FRESNEL LENSES IN PROJECTION SCREENS

Jill F. Goldenberg, Pelham Manor, and T. Stewart McKechnie, Ossining, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 20, 1985, Ser. No. 800,012
Int. Cl.[4] G02B *3/08*
U.S. Cl. 350—452 12 Claims

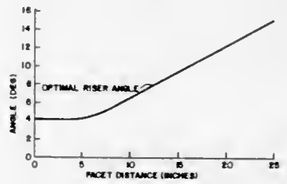
1. A projection lens system comprising

an extended light source emitting a first extreme ray and a second extreme ray at respective extremities thereof;

a Fresnel lens having a base surface and a plurality of lens elements on said base surface, each lens element having a refracting surface and a riser surface, the riser surface of a first of said elements intersecting said base surface and the refracting surface of a contiguous one of said lens elements along a line;

and wherein each of said riser surfaces is at an optimal riser angle with respect to said base, said optimal riser angle





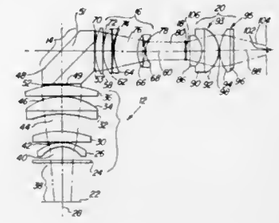
varying as a function of the distance of said riser surface from the center of said Fresnel lens.

4,824,228

STEREOMICROSCOPIC INSPECTION SYSTEM WITH LOW EYESTRAIN FEATURES

David R. Wickholm, and Donald J. Strittmatter, both of Tucson, Ariz., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 28, 1986, Ser. No. 935,866
Int. Cl.[4] G02B *21/22, 27/22*
U.S. Cl. 350—516 11 Claims



1. A stereomicroscopic inspection system with low eyestrain features comprising:

a common objective means for forming an image of an object being inspected by a viewer and positioned a predetermined working distance adjacent to the object;

first and second optical paths, each said path including:

prism means positioned immediately adjacent to said common objective means for orienting said image viewed through said objective means along a heads-up axis;

telephoto objective assembly means positioned adjacent said prism means for focusing of said image transmitted through said prism means;

reticle means positioned adjacent said telephoto objective means, said telephone objective means focusing said image transmitted through said telephoto objective means onto said reticle means; and

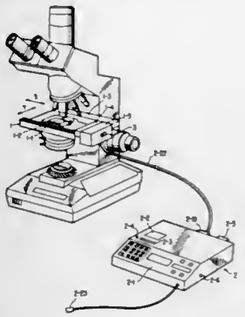
eyepiece means positioned adjacent said reticle means for providing heads-up viewing of the object by the viewer over a field of view, said eyepiece means including an instrument myopia corrector wedge, said wedge being disposed most proximate the viewer, said system focusing the image at a predetermined distance being substantially equal to the natural focusing distance of the eye.

4,824,229

MICROSCOPE WITH AUTOMATIC SWEEPING DEVICE

Hiroshi Narita; Minoru Uemura, both of Yaizu, and Yoshitada Mori, Tokyo, all of Japan, assignors to Sapporo Breweries, Ltd., Tokyo, Japan

PCT No. PCT/JP86/00174, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/06357, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 9, 1986, Ser. No. 141,308
Int. Cl.[4] G02B *21/26, 21/00*
U.S. Cl. 350—531 1 Claim



1. A microscope with an automatic sweeping device, comprising:

a holder for holding a container which contains or possibly contains subjects in a wide area;

transfer mechanism for moving the holder two-dimensionally under the object lens of the microscope, including a position detector for detecting the position of the examination region of the container, and electromagnetic clutches which are engaged for motor-driven operation and disengaged for manual operation;

driving means including a plurality of motors for driving the transfer mechanisms, and a control handle for manually moving the transfer mechanisms;

a printer;

memory means;

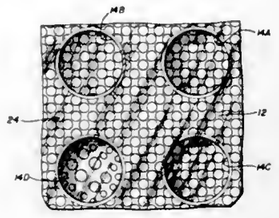
display means;

a control console; and

control means which controls the printer, memory means and display means to print, store and display position and other various data, makes manual operation possible immediately after suspension of automatic operation, stores data of the position where the suspension occurred in the memory means and returns the holder to the position where the suspension occurred to resume sweeping operation whenever the automatic operation is restarted, moves the holder directly to a particular memorized position when a memory number is keyed in from the control console, and to a position at particular coordinates when coordinates of position other than the memorized position are inputted from the control console, as well as controls the driving means according to instructions from the control console to perform automatic sweeping by stepped or continuous movement of the holder.

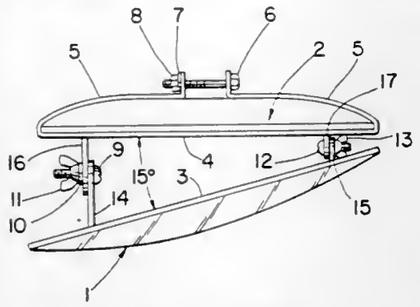
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4,824,230
VISUALIZATION DEVICE
Gerald J. Litt, Wellesley, Mass., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 13, 1985, Ser. No. 808,461
Int. Cl.[4] G01N *1/28, 21/01*
U.S. Cl. 350—574 1 Claim



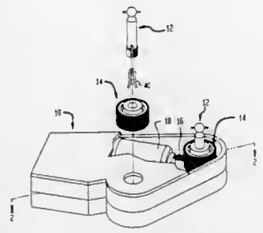
1. Apparatus for determining the presence of a liquid on a microtiter plate, the apparatus comprising a substrate having a pattern thereon, the pattern having contrasting first and second areas, the substrate being positioned below the microtiter plate so that at least a portion of a first and second contrasting area is visible through the microtiter plate and so that light reflected from the portion of the pattern visible through the plate is passed through the microtiter plate, the visual perception of the contrasting areas of the pattern observable by an observer being modified by the presence of liquid on the microtiter plate, thereby providing a visually perceptible indication of the liquid.

4,824,231
BROAD ANGLE REAR VIEW MIRROR ASSEMBLY
Ross Quintana, P.O. Box 5031, Moss Point, Miss. 39563
Filed Jul. 20, 1987, Ser. No. 75,415
Int. Cl.[4] G02B *5/10*
U.S. Cl. 350—632 5 Claims



1. A rear viewing apparatus comprising:
(a) a back mounting plate;
(b) a convex mirror being connected to said back mounting plate;
(c) a first connecting means for connecting said convex mirror to said back mounting plate;
(d) a second connecting means for attaching said back mounting plate to a presently flat conventional mirror; and
(e) said first connecting means forming a horizontal plane angle of about 15 degrees between said convex mirror and said back mounting plate.

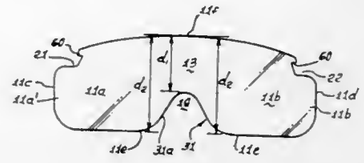
4,824,232
DRIVE SYSTEM WITH RESILIENT YIELDABLE BIASED ACTUATOR SHAFT FOR ELECTRIC REAR VIEW MIRROR
James A. Thompson, Saranac, Mich., assignor to Babcock Industries, Inc., Fairfield, Conn.
Filed Dec. 23, 1987, Ser. No. 137,070
Int. Cl.[4] B60R *1/06;* G02B *7/18*
U.S. Cl. 350—633 14 Claims



1. In a remote control system for a vehicle mirror having a mirror mounted for pivotable movement relative to a motor housing, electric motor means secured to the housing and having a worm gear on an output shaft thereof, which shaft engages an externally threaded pinion gear rotatably mounted on the motor housing, and wherein the pinion gear is also provided with internal threads forming an internal diameter to serve as a nut, the rotation of which by the worm gear causes a nonrotatable mirror-engaging actuator shaft having one end in threaded engagement with the internal threads of the nut to move longitudinally to reposition the mirror, the improvement in said actuator shaft which comprises:
said actuator shaft being made of a yieldable, resilient material;
a slot extending from said one end of said actuator shaft to divide said shaft one end into first and second resilient end portions;
threads on said first end portion of said shaft; and
means resiliently biasing said first end portion into engagement with the interior threads of said pinion gear to allow override of said threads at the end of travel but otherwise to provide firm engagement between said threads on said first end portion and the interior threads of said pinion gears for accurate driving of said actuator shaft;
wherein said second end portion is unthreaded and has means to co-act with the interior of said pinion gear to increase the biasing force on said first end portion against said interior threads of said pinion gear.

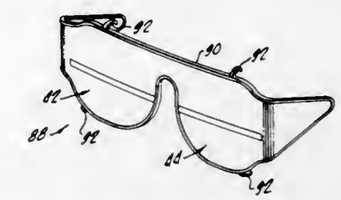
4,824,233
MULTI-COMPONENT SUNGLASSES
James H. Jannard, 30741 Fox Run La., San Juan Capistrano, Calif. 92675
Division of Ser. No. 787,242, Oct. 15, 1985, Pat. No. 4,730,915, which is a continuation-in-part of Ser. No. 690,642, Jan. 11, 1985, Pat. No. 4,674,851. This application Feb. 11, 1988, Ser. No. 156,352
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[4] G02C *9/00*
U.S. Cl. 351—47 9 Claims

1. Sunglass, comprising:
(a) a unitary transparent pane adapted to extend in a curved pane in the path of a wearer's field of vision, both frontally and sidewardly;
(b) a top frame extending along and bounding the elongated upper edge of the pane, the top frame having an elongated slot formed to extend upwardly in the frame from the lower side of the frame, along the frame length, to removably vertically receive and closely fit the upper edge of the pane;
(c) projections on the pane to interlock with integral portions of the top frame; and



(d) ear stems removably attached to the top frame at opposite ends thereof, and adapted to extend rearwardly to the wearers ears.

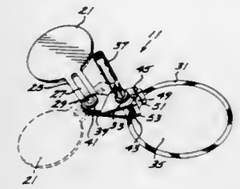
4,824,234
PUTTING GLASSES
John M. Sparks, 44498 Windmill Dr., Canton, Mich. 48187, and Emily S. Hackler, 18752 Via San Marco, Irvine, Calif. 92715
Continuation of Ser. No. 926,098, Nov. 3, 1986, abandoned. This application Mar. 8, 1988, Ser. No. 164,781
Int. Cl.[4] G02C *9/00*
U.S. Cl. 351—158 4 Claims



1. An eyeglass attachment for practicing and/or playing the game of golf, said eyeglass attachment comprising:
a frame having means for supporting an optical device in front of each eye of a wearer and means for attaching said frame to a conventional pair of eyeglasses;
an optical device disposed in said frame, said optical device including lens means for limiting clear visibility through the optical device by the wearer to a relatively narrow band compared to the wearer's normal range of vision, said narrow band being oriented to enable clear visibility between the right and left side of the wearer, said lens means including two spaced apart dark transparent portions with a clear portion therebetween, said optical device including side portions thereof adapted for extending along the wearer's temple for reducing light from entering the wearer's eyes from the side of the wearer, said optical device lens means and side portions being formed from a single piece of material;
coating means, disposed on each lens over both the dark transparent portion and the clear portions, for reflecting light in a uniform manner across the entire lens to prevent a non-wearer of the glasses from seeing the dark and clear portions of the lens.

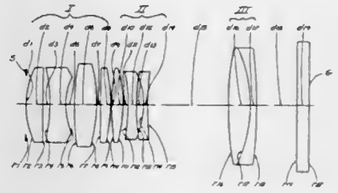
4,824,235
OPTICAL OCCLUDER
Michael Eddy, 510 1/2 Sierra Pl., El Segundo, Calif. 90245
Filed Nov. 30, 1987, Ser. No. 126,833
Int. Cl.[4] A61B *3/10;* G02B *23/16*
U.S. Cl. 351—200 14 Claims

1. Optical occluder apparatus for use with an optical instrument having a monocular eyepiece with an optical axis defined through it, adapted for viewing by a person using just one eye, the apparatus comprising:
an eye shield of sufficient size to substantially block the vision of a person's eye;
a cord adapted to be snugly wrapped around the eyepiece of the optical instrument, regardless of the eyepiece's shape; and
retaining means for connecting together said eye shield and



said cord and for holding said eye shield in a selected position relative to the eyepiece of the optical instrument, such that when the person views through the eyepiece with one eye, said eye shield substantially blocks the vision of the person's other eye, wherein said retaining means includes means defining a constricting hole for receiving the two ends of said cord, thereby forming a loop having a length that is adjustable by pulling said cord through said hole.

4,824,236
ZOOM LENS SYSTEM FOR USE IN MICROFILM PROJECTION APPARATUS
Toshihiko Ueda, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 6, 1987, Ser. No. 35,037
Claims priority, application Japan, Apr. 8, 1986, 61-80748
Int. Cl.[4] G02B *15/14, 9/64*
U.S. Cl. 350—427 12 Claims



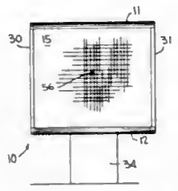
1. A zoom lens system for use in a microfilm projection apparatus in which the image projection is conducted at a condition of a definite object-image distance, the system comprising from the enlargement side to the reduction side:
an aperture stop disposed fixedly;
a first lens group of a positive refractive power located near the aperture stop at the largest focal length side;
a second lens group of a negative refractive power; and
a third lens group of a positive refractive power,
wherein the first to third lens groups are moved along the optical axis all toward the shortest focal length side while increasing a distance between the first and second lens groups and decreasing a distance between the second and third lens groups in an operation of zooming from the longest focal length side to the shortest focal length side.

4,824,237

VISION AND HAND/EYE COORDINATION EXERCISING AND TESTING MACHINE

Harvey Ratner, Silver Spring; Ronald Ratner, Rockville, both of Md.; Glenn A. Seifert, Southampton, N.Y.; Stephen Selwyn, Brooklyn, N.Y., and Marvin Zaro, New York, N.Y., assignors to National Capital Center for Sports Vision Inc., New York, N.Y.

Filed Feb. 7, 1986, Ser. No. 826,961
Int. Cl.[4] A61B *3/00*; A63B *71/02*
U.S. Cl. 351—203 **27 Claims**



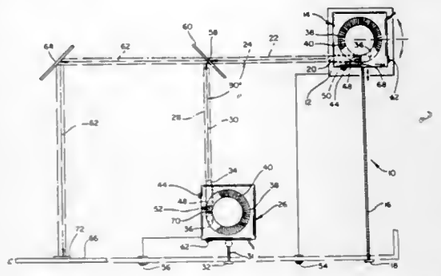
1. A vision and hand/eye exercising and testing device comprising:
a housing having a front panel;
a multiplicity of lamp positions and dummy positions interspersed on said panel in an array, said lamp positions being substantially visually indistinguishable from said dummy positions when viewed from in front of said panel;
a first plurality of lamps, each mounted in said housing behind a respective lamp position such that each lamp, when illuminated, is visible from in front of said panel;
first actuation means for momentarily and sequentially illuminating said first plurality of lamps one at a time in an order determined by said actuation means;
a plurality of manually actuable switches, one switch for each lamp position, each switch being located on said panel at a respective lamp position so as to be associated with the lamp at that lamp position; and
logic means for detecting actuation of each switch relative to the time at which the lamp associated with that switch is illuminated.

4,824,238

COMPARATOR FOR OPTIC DISC ANALYSIS AND METHOD OF USE THEREOF

Robert L. Feldman, Philadelphia, Pa., and George L. Spaeth, 15 Langhlin La., Chestnut Hill, Pa. 19118, assignors to George L. Spaeth, Chestnut Hill, Pa.

Filed May 27, 1987, Ser. No. 56,374
Int. Cl.[4] A61B *3/02, 3/14*; G03B *29/00*
U.S. Cl. 351—206 **7 Claims**



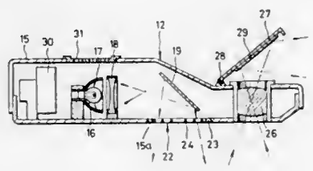
1. A method of comparing eye fundus slides for analysis thereof comprising the steps of:
a. retrieving an archival eye fundus slide for use as a reference;
b. using an adjustably mounted first projector, projecting the image of the reference along a given first pathway;
c. preparing a current eye fundus slide for comparison with the reference;
d. using an adjustably mounted second projector, projecting the image of said current eye fundus slide along a given second pathway;
e. superimposing the image of the current eye fundus slide on the image of the reference by the substeps of:
1. optically merging said first and said second projection pathways into a resultant common projection pathway;
2. adjusting said first and said second projector until the outlines of the respective eye fundus images thereof are substantially coincident; and,
3. viewing the superimposed image of the current eye fundus slide on the reference;
f. differentiating the current eye fundus structure from the reference structure; and,
g. visually analyzing changes with respect to time of optic disc conditions.

4,824,239

REFLECTION-TYPE OVERHEAD PROJECTOR

Takashi Sekine, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1986, Ser. No. 943,321
Claims priority, application Japan, Dec. 25, 1985, 60-198336[U]
Int. Cl.[4] G03B *21/06*
U.S. Cl. 353—66 **2 Claims**



1. In a reflection-type overhead projector for projecting a transparency onto a remote screen comprising
base means having a Fresnel mirror on which said transparency to be projected is placed,
a projection head having a housing for an illuminating light source and a projection lens,
supporting means for supporting thereon said projection head above said base,
there being an opening through the bottom of said housing for allowing light from said source to illuminate said transparency and be reflected by said mirror through said projection lens to a said remote screen;
the improvement comprising a protective screen fitted in said opening for the prevention of easy access to the inside of said housing, said screen having meshes which are centrally large and peripherally smaller.

4,824,240

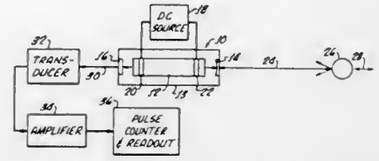
INTERNAL LASER INTERFEROMETER

Christopher S. Myers, Carlsbad, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 15, 1986, Ser. No. 852,055
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—4.5 **25 Claims**

1. A laser motion measuring system comprising,
a laser body,
a laser medium in said body,

means for exciting the laser medium to generate coherent energy oscillation of a first frequency,
front and back reflectors mounted in said body to define a laser cavity and reflecting energy generated by the laser medium to provide energy oscillations within the cavity at said first frequency, said front reflector transmitting an energy beam of said first frequency from said cavity to an object of which motion is to be measured and transmitting energy reflected from said object back into the cavity to vary the amplitude of the energy oscillations within the cavity of said first frequency and provide interference peaks corresponding to the relative phase of the energy reflected from the object, said interference peaks having



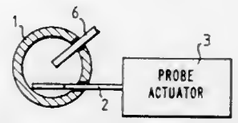
an amplitude that varies in accordance with variation of transmissivity of said front reflector, and
output means for receiving energy of said first frequency from said cavity and for detecting the interference peaks of energy oscillations within the cavity at said first frequency, to thereby provide a measure of motion of said object,
said front reflector having a transmissivity that causes the energy oscillations within the cavity to have substantially maximum interference peak values when the energy oscillations within the cavity of said first frequency are varied by reflections from an object of which motion is to be monitored.

4,824,241

ATOMIC SPECTROSCOPY

David Littlejohn, and John Marshall, both of Glasgow, United Kingdom, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 581,484, Feb. 17, 1984, abandoned. This application Jun. 2, 1987, Ser. No. 57,727
Claims priority, application United Kingdom, Mar. 2, 1983, 8305745
Int. Cl.[4] G01N *21/74*
U.S. Cl. 356—36 **8 Claims**



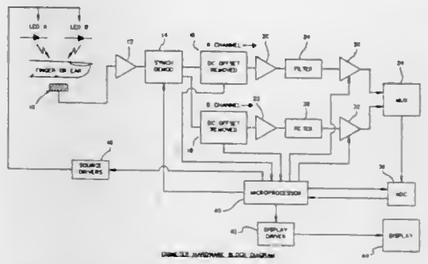
1. A method of atomizing a sample for atomic spectroscopy comprising the steps of
inserting a probe into a cuvette,
separately depositing a sample onto said probe within said cuvette,
heating said cuvette to a first temperature below an atomization temperature of said sample to dry said sample within said cuvette,
withdrawing said probe and said sample from said cuvette after said sample is dried,
thereafter heating said cuvette to a second temperature, said second temperature being at least equal to said atomization temperature of said sample,
reinserting said probe and said sample back into said cuvette, and
atomizing said sample in said cuvette at said second temperature.

4,824,242

NON-INVASIVE OXIMETER AND METHOD

Gene Frick, Anaheim, and Rex McCarthy, Whittier, both of Calif., assignors to Sensormedics Corporation, Anaheim, Calif.

Filed Sep. 26, 1986, Ser. No. 912,993
Int. Cl.[4] G01N *33/49, 21/35*
U.S. Cl. 356—41 **5 Claims**



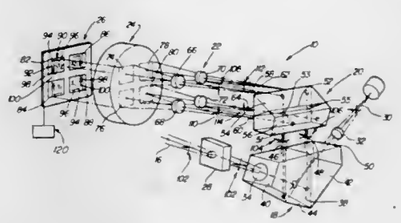
1. An oximeter for non-invasively measuring oxygen saturation of the arterial blood comprising:
means for transmitting light of two wavelengths through a specimen,
means for monitoring the transmitted light to produce at least a first and second data stream comprising a series of values representative of the attenuation of light by the specimen over time,
means for storing the series of values for each data stream, whereby each of the stored values is a discrete moment in time and the stored values are continually updated over time,
means for evaluating the stored values separately for each data stream, comprising a means for determining over time a series of quantities, each quantity substantially equivalent to the mean of the stored values at that time, and a means for determining the deviation of the series of quantities from the series of stored values, and
means for comparing the deviation of the data streams.

4,824,243

COMPACT CONTINUOUS WAVE WAVEFRONT SENSOR

Bryce A. Wheeler, Los Angeles, and Lacy G. Cook, El Segundo, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 26, 1987, Ser. No. 53,901
Int. Cl.[4] G01J *1/20*
U.S. Cl. 356—121 **16 Claims**

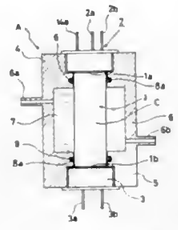


1. A wavefront sensor comprising:

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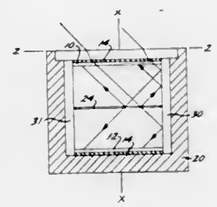
means for obtaining an input beam sample;
first means for splitting said beam into two component beams;
second means for splitting said two component beams into four component beams such that a portion of said beams are reflected by said second means for splitting and a portion of said beams are transmitted through said second means for splitting; and
means for detecting the intensity distribution of said four component beams.

4,824,244
SENSOR FOR MIXING RATIO OF GASOLINE AND ALCOHOL OR THE LIKE
Shigeru Miyata, and Yoshihiro Matsubara, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan
Filed May 26, 1987, Ser. No. 54,390
Int. Cl.[4] F02D *1/00*; F02B *3/00*; G01N *21/41*
U.S. Cl. 356—133 **2 Claims**



1. A sensor for determining mixing ratio of liquid fuel comprising:
a cylindrical enclosure (6) having both inlet and outlet openings to act as a passage through which a mixing liquid flows:
a transparent column (1) concentrically disposed in said enclosure to provide an outer surface thereof at least partially in contact with said mixing liquid fuel;
a light emitting diode (135) placed at one end of said column so that light beams emanated from said diode enter into said column to reach the boundary of said column and said mixing liquid fuel, said plight beams incident on said boundary at an angle of less than a critical angle being passed beyond said boundary to said mixing liquid fuel, while said light beams incident on said boundary at an angle greater that said critical angle are totally reflected back at said boundary;
a photo diode (155) placed at the other end of said column (1) to receive said light beams totally reflected back at said boundary so as to produce an output, the intensity of which is in accordance with a ratio of said mixing liquid fuel;
the improvement being a temperature compensation means comprising:
first light measurement portion (163) having a compensation photo diode (136) across both terminals of which an amplifier (OP1) is connected;
second light measurement portion (166) having an amplifier (OP4) connected across said photo diode (155) to produce an output in proportion with an increase of alcohol component of said mixing liquid;
a control portion (164) having an amplifier (OP2) through which an output of said amplifier (OP1) is fed to said light emitting diode (135) in a manner to maintain a constant intensity of light beams from said diode (135) by controlling current flowing therethrough so as to regulate an output variation of said photo diode (136) under changing ambient temperature;
a voltage follower (165) having an amplifier (OP3) positive input terminal which receives an output of said light emitting diode (135) while the negative terminal of which is connected to an output terminal of said amplifier (OP3) and grounded by way of electrical resistance;
a calculation circuit (167) having an amplifier (OP5) one input terminal of which receives the output of said voltage follower (165) while other input terminal of which receives the output of said amplifier (OP4) to produce an output corresponding to subtraction between the output of said voltage follower (165) and the output of said amplifier (OP4) thereby correcting the measured refraction index under changing ambient temperature.

4,824,245
RESPONSE RATIOING ANGLE OF ARRIVAL SENSOR THAT IS RESPONSIVE TO SCINTILLATION
Leland V. Gardner, Buellton, and Arthur H. Hardy, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Continuation of Ser. No. 33,422, Apr. 2, 1987. This application Aug. 19, 1988, Ser. No. 235,743
Int. Cl.[4] G01B *11/26*; G01C *1/00*
U.S. Cl. 356—141 **20 Claims**



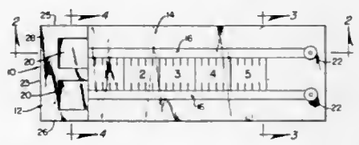
1. A sensor for determining one angular component of incident electromagnetic radiation comprising:
a housing having first and second parallel sides that are parallel to the plane containing the angular component of incident electromagnetic radiation to be determined, said parallel sides having facing surfaces reflective of said radiation and defining therebetween two sides of a planar entrance aperture normal to said sides for said radiation;
a planar gradient beamsplitter located between said first and second parallel sides and oriented parallel to said entrance aperture, said beamsplitter having a portion varying in the amount of incident radiation reflected and transmitted as a function of distance along said beamsplitter in a direction parallel to said first and second sides; and
first and second detectors located on either side of said beamsplitter and extending between said first and second parallel sides, said first detector located between said entrance aperture and said beamsplitter, said detectors located for detecting incident radiation reflected by and transmitted through the same area of said beamsplitter, said area depending upon said angular component, said detectors for providing first and second detector outputs indicative of the intensities of incident radiation reflected and transmitted, said detectors having a width in the direction parallel to said first and second sides that is small in comparison to said portion of said beamsplitter;
whereby said angular component of incident electromagnetic radiation is determined from the relative intensities of incident radiation reflected and transmitted by said beamsplitter that are detected by said first and second detectors, the effects of scintillation on the determination of said angular component being substantially reduced.

4,824,246
COLORED OBJECT WHICH EXHIBITS IMPROVED CONSTANCY OF COLOR APPEARANCE UPON CHANGE OF ILLUMINANTS AND METHOD
William A. Thornton, Jr., 27 Harvard Rd., Cranford, N.J. 07016
Filed Nov. 23, 1987, Ser. No. 124,288
Int. Cl.[4] G01J *1/02*
U.S. Cl. 356—243 **4 Claims**



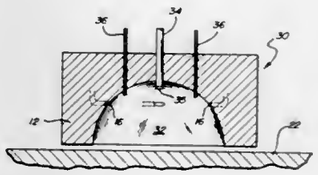
1. A colored object which is to be illuminated by any of many different types of sources of illumination and which exhibits an improved constancy of color appearance upon change of illuminants, the exterior portion of said colored object which provides the color appearance for said colored object comprising:
color-absorbing components combined to exhibit reflectance substantially confined to bands peaking at about 450 nm in the blue-violet, about 530 nm in the green and about 610 nm in the orange-red, and said reflectance bands each comprising a narrow range of radiations substantially confined to a radiation range of from about 40 nm to about 80 nm as measured at one-half of the maximum measured reflectance of said bands; and
the relative proportions of each of said color-absorbing components being preselected to produce a desired composite color for said exterior portion of said object.

4,824,247
METHOD AND APPARATUS FOR MEASURING SPERM PENETRATION
Karen J. True, Golden; G. Barbara Griffin, Lakewood; Daniel V. Griffin, and William M. Nickels, both of Denver, all of Colo., assignors to Avtar Sciences, Inc., Denver, Colo.
Filed Aug. 31, 1987, Ser. No. 91,414
Int. Cl.[4] G01N *21/01*; A61B *10/00*
U.S. Cl. 356—244 **15 Claims**



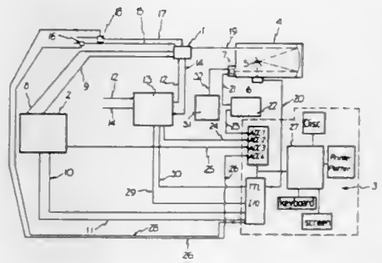
1. Apparatus for measuring sperm penetration comprising:
an elongated slide having a unitary base plate and a cover slip overlying said base plate, and an elongated channel extending longitudinally between said base plate and said cover slip;
first means communicating with one end portion of said channel for introduction of a liquid medium, including means for releasably closing said one end portion of said channel; and
second means communicating with an opposite end portion of said channel spaced from said one end portion for the introduction of a specimen to be measured, at least that portion of said cover slip overlying said channel being transparent for viewing of the extent of penetration of the specimen into said medium.

4,824,248
STABILIZED SENSOR DEVICE
Catharine G. Neumann, Southfield, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.
Filed Dec. 21, 1987, Ser. No. 135,256
Int. Cl.[4] G01N *21/01, 21/86*
U.S. Cl. 356—244 **18 Claims**



1. An optical sensor adapted to be stabilized in a fixed, spaced apart and angular relationship relative to a subjacent surface, said sensor including:
at least one optical element;
a bearing member adapted to retainably support the optical element, said bearing member having a cavity defined therein, said cavity including a side wall and being open at the bottom, which is disposed proximate the subjacent surface; and
means adapted to introduce a fluid stream into the cavity such that the fluid follows a helical path of travel therethrough and exits through the bottom thereof, so that a high pressure region is created proximate the wall of the cavity and a low pressure region is created proximate the center of the cavity, whereby said high and low pressure regions cooperate to maintain said bearing member and optical element in a fixed, spaced apart and angular relationship with said subjacent surface.

4,824,249
SYSTEMS FOR THE DIRECT ANALYSIS OF SOLID SAMPLES BY ATOMIC EMISSION SPECTROSCOPY
Michael A. Lucas, Ivanhoe, and Terry C. Hughes, Carlton North, both of Australia, assignors to Chamber Ridge Pty. Ltd., Camberwell, Australia
PCT No. PCT/AU87/00101, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/06341, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 15, 1987, Ser. No. 165,261
Claims priority, application Australia, Apr. 16, 1986, PH05481
Int. Cl.[4] G01J *3/30*
U.S. Cl. 356—311 **8 Claims**



1. An analysis system for analysis of samples by atomic emission spectroscopy comprising an atomic spectral lamp adapted to receive a solid sample to be analysed as a cathode of

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said spectral lamp; means for producing a primary electric discharge by cathodic sputtering from said sample, means for passing an inert gas through said spectral lamp; means for producing a secondary boosted discharge for analytical emission; spectral wave length analysis means arranged to receive and determine intensity of spectral lines emitted from said spectral lamp; and control means including means for controlling cathodic sputtering current used for generating said primary electric discharge from said sample and means for controlling operation of said spectral wave length analysis means, all on the basis of output parameters of said spectral wave length analysis means, whereby the cathodic sputtering current is controlled to maximise intensity of a spectral line of an element under investigation such that the relation between spectral line intensity and concentration of the element in said sample under investigation is maintained in a region which is substantially linear.

4,824,250

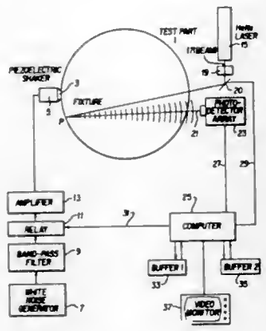
NON-DESTRUCTIVE TESTING BY LASER SCANNING

John W. Newman, 601 Maplewood Ave., Wayne, Pa. 19087

Continuation of Ser. No. 931,067, Nov. 17, 1986, abandoned. This application May 5, 1988, Ser. No. 191,744

Int. Cl.[4] G01N *29/04*

U.S. Cl. 356—345 **31 Claims**



1. A system for non-destructive testing of an object, comprising:

(a) means for holding the object,

(b) means for vibrating the object, the vibrating means being connected to the holding means,

(c) means for directing a beam of coherent light onto a predetermined point on the object, so as to form a reflection pattern,

(d) means for detecting the reflection pattern obtained from the object,

(e) control means, the control means being adapted to energize and de-energize the vibrating means, and to control the beam directing means, wherein successive points on the object can be scanned by the beam, the control means being programmed to energize and de-energize the vibrating means while the beam is directed towards each point on the object, and

(f) display means for indicating, for each point on the object, the difference between the reflection pattern when the object is vibrating and when the object is stationary.

4,824,251

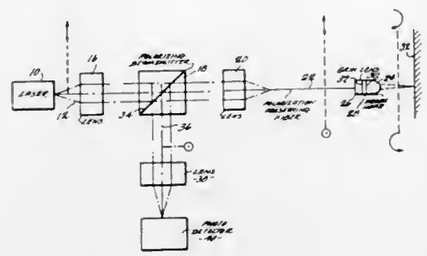
OPTICAL POSITION SENSOR USING COHERENT DETECTION AND POLARIZATION PRESERVING OPTICAL FIBER

Anthony R. Slotwinski, Reston, and Stephen C. Kenyon, Stafford, both of Va., assignors to Digital Signal Corporation, Springfield, Va.

Filed Sep. 25, 1987, Ser. No. 101,102

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—349 **20 Claims**



1. Optical distance measuring apparatus, comprising:

laser source means for providing a source laser beam having a first polarization;

beam splitter means, for receiving and said source beam and directing it along a first optical axis;

first lens means for receiving said source beam from said beam splitter means and focusing it;

polarization preserving fiber means, having first and second transmission axes and first and second ends, for receiving the focused source beam from said first lens means at said first end and transmitting it to said second end along said first transmission axis;

a probe head disposed at a target location and coupled to said fiber means second end;

second lens means, disposed in said probe head, for focusing the source light beam emerging from said fiber second end on a target;

quarter wave means, disposed in said probe head, for converting the polarization of said first polarization source beam into a second polarization source beam;

local oscillation means, disposed in said probe head for deriving a local oscillator beam having a third polarization from said second polarization source beam, an for mixing said third polarization local oscillator beam with a return beam reflected from a target and having said third polarization to form a mixed beam;

said quarter wave means converting the third polarization mixed beam into a fourth polarization mixed beam;

said polarization preserving optical fiber means transmitting said mixed beam from said second end to said first end along said second transmission axis;

said first lens means directing said mixed beam from said fiber means second end to said beam splitter means;

said beam splitter means directing said mixed beam along a second optical axis;

third lens means for receiving said mixed beam from said beam splitter means and focusing it;

detector means for optical heterodyne detecting said mixed beam, and for providing an output signal indicative of a distance between said probe head and said target.

4,824,252

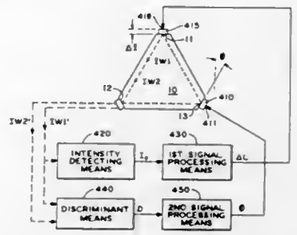
LASER GYRO SYSTEM

Wah L. Lim, Anaheim, Calif., and Francis H. Zeman, New Brighton, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 25, 1982, Ser. No. 392,410

Int. Cl.[4] G01C *19/64*

U.S. Cl. 356—350 **15 Claims**



1. A tri-mode device for adjusting the position of a reflective surface having the capability of two degrees of freedom of tilt and one degree of freedom of translation comprising:

a first substantially thermally and mechanically stable block for providing a reflective surface having,

a first portion for mounting said block to a base structure;

a resilient portion having a first surface and a second surface wherein said first surface includes said reflective surface capable of reflecting electromagnetic waves;

a second substantially thermally and mechanically stable block for providing a mechanical link to said first block resilient portion having,

a central portion being rigidly coupled to said resilient portion second surface, and

at least first, second, and third sections located outwardly from said central portion; and

at least first, second, and third mechanical transducing means coupled to said first, second, and third sections respectively, each of said mechanical transducing means being responsive to a control signal presented thereto and capable of independently providing a degree of movement of said second block and said central portion so as to deform said resilient portion and vary the position of said reflective surface relative to said base structure.

4,824,253

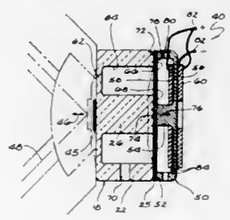
GLASS DRIVER FOR LASER MIRROR

Alfred L. Butler, and Robert A. Chechile, both of Thousand Oaks, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 8, 1987, Ser. No. 35,809

Int. Cl.[4] G01C *19/64*

U.S. Cl. 356—350 **21 Claims**



1. A device for driving a deflection-type laser mirror of low expansion glass to move a reflective surface of the mirror in a preselected axial direction, comprising:

a driver comprising a low expansion glass body which matches the mirror in coefficient of thermal expansion and has:

a membrane portion capable of deflection in the axial direction; and

a hub portion coupled to the membrane portion to transmit deflection forces to the mirror; and

at least one transducer mounted to the membrane portion for axial deflection of the membrane portion and the mirror in response to an electrical input.

4,824,254

ALIGNMENT MARKS ON SEMICONDUCTOR WAFERS AND METHOD OF MANUFACTURING THE MARKS

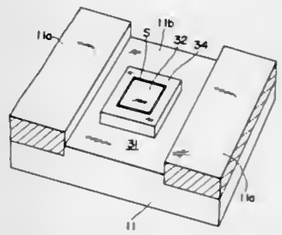
Hiroshi Ohtsuka; Yoshio Itoh; Tadashi Nishimuro, all of Tokyo, and Hisamitsu Mitsutomi, Miyazaki, all of Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 18, 1984, Ser. No. 612,023

Claims priority, application Japan, May 20, 1983, 58-87542

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—401 **3 Claims**



1. An alignment mark on a semiconductor wafer, comprising:

a first alignment island of phospho-silicate glass projecting from a surface of said wafer; and

a second alignment island of polycrystalline silicon having substantially the same height as said first alignment island and surrounding said first alignment island and spaced therefrom to form a slit having a rectangular or square form therebetween, said slit having a width of no more than about 1 micron,

the opposed surfaces of said islands defining said slit therebetween being roughened for attenuation, through random reflection, light entering said slit, whereby when said slit is utilized as a pattern for aligning with an alignment mark on a photomask, said slit is observed as a clear black line.

4,824,255

DRIVE APPARATUS FOR A SCREW INJECTION MOLDING UNIT AND A PROCESS FOR ITS OPERATION

Walter Wohlrab, Weissenburg, Fed. Rep. of Germany, assignor to Krauss-Maffei A.G., Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 66,460

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 3621463

Int. Cl.[4] B29B *1/06*

U.S. Cl. 366—78 **18 Claims**

1. A drive apparatus useful for screw injection molding comprising:

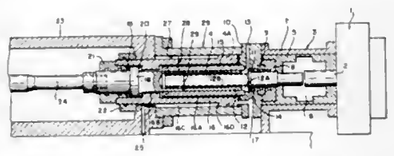
means for rotating a drive shaft around a longitudinal axis;

a drive piston having movement around and along said axis and connected by a drive shaft coupling with said drive shaft for rotation around said axis; and

a drive cylinder concentric with and connected to said drive

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piston with a coupling such that; (a) said drive cylinder has no substantial rotational motion; and (b) said drive piston may rotate substantially freely relative to said drive



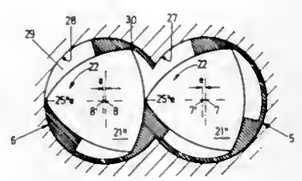
cylinder yet may only move to any substantial extent along said axis when said drive cylinder means moves along said axis.

4,824,256

CO-ROTATING TWIN-SCREW KNEADERS WITH KNEADING DISKS

Erwin Häring, Stuttgart; Gerhard Weihrich, and Wolfgang Wörz, both of Illingen, all of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 684,454, Dec. 21, 1984, abandoned. This application Mar. 26, 1986, Ser. No. 844,456
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1984, 3412258
Int. Cl.[4] B01F *7/08*; B29B *7/48*
U.S. Cl. 366—85 **9 Claims**



1. A co-rotating twin-screw kneader for kneading thermoplastic material comprising a casing having two essentially axially parallel bores defined by the casing wall and which intersect with one another in a region to form gussets in said casing wall adjacent the intersecting region; two essentially axially parallel shafts arranged to be driven in the same direction of rotation, each shaft being arranged in a respective one of said bores; at least one screw body having at least one screw thread flight for conveying said material in a conveying direction and being mounted on a part of the length of each shaft; multi-flight kneading disks each having a plurality of crests mounted on a part of the length of each shaft provided behind said screw body with respect to said conveying direction, each said disk on one shaft being associated with another said disk on the other shaft in a plane perpendicular to the axes of said shafts and said disks being arranged to be moved past one another in a virtually clearance-free manner in the intersecting region of said bore to self-clean said disks; each multi-flight kneading disk having a radius Ra measured from its center to its crest, said casing wall and said kneading disks being sized to provide a clearance between said casing wall and said kneading disk crests of approximately 0.03 to 0.09 Ra, and wherein

$$\frac{Dg}{a} \geqq \frac{1}{\cos\frac{\pi}{2n}}$$

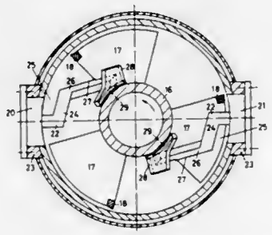
in which
Dg=diameter of the bores;
a=center-to-center distance of the bores
n=number of flights on each kneading disk;
and in which the number N of the screw thread flights of each screw body is $1 \leqq N \leqq n-1$ and in which the clearance between the casing wall and the at least one screw thread flights is approximately 0.002 to 0.01 Ra to clean the casing wall.

4,824,257

KNEADER-MIXER

Heinz List, and Jörg List, both of Pratteln, Switzerland, assignors to List AG, Pratteln, Switzerland

Filed Jan. 20, 1988, Ser. No. 145,835
Claims priority, application Switzerland, May 6, 1987, 1726/87
Int. Cl.[4] B01F *7/04*
U.S. Cl. 366—99 **12 Claims**



1. A kneader-mixer for treatment of products in a liquid, pasty or pulverulent state, comprising a cylindrical casing, a kneader shaft rotatably supported within said casing along an axis thereof, at least two disk elements normally fixed to said shaft in axially spaced relation to one another and rotatable together with said shaft, each disc element carrying at an outer edge thereof a kneading blade which axially extends adjacent to said casing, at least one kneading counterelement comprising a kneading arm segment and a disk scraping segment, said kneading are segment extending in a predominantly axial direction toward one of said disk elements in space relation to said casing to form a kneading gap through which the kneading blade of said one of said disk elements can pass, said disk scraping segment extending alongside said one of said disk elements in a predominantly radial direction and having first and second disk scraping edges which are at an angle relative to one another whereby different areas of said one of said disk elements are cleaned by each edge and a product is divided into two differently directed product flows.

4,824,258

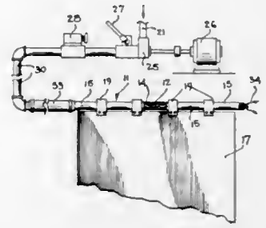
FLUID DRIVEN SCREW TYPE (MOYNO) SONIC OSCILLATOR SYSTEM

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Jul. 27, 1987, Ser. No. 78,282
Int. Cl.[4] B01F *11/00*; F01C *5/04*; F03C *2/00*
U.S. Cl. 366—118 **8 Claims**

1. A system for providing sonic vibrational energy to a load comprising:
an orbital oscillator including a housing, an elongated screw shaped stator mounted in said housing and an elongated screw shaped rotor mounted for precessionally rolling rotation freely in said stator;
a fluid inlet formed in one end of said housing;
a fluid outlet formed in the end of said housing opposite said one end thereof;
means for supporting said housing;
liquid drive means fed into said fluid inlet and exited from said fluid outlet for rotatably driving said freely mounted rotor at a rolling precessional speed such as to effect orbital lateral sonic vibration of said housing; and

means for coupling substantially the entire extent of said housing to said load to transfer said sonic vibration thereto in a uniform in-phase manner through the coupling between the housing and the load;



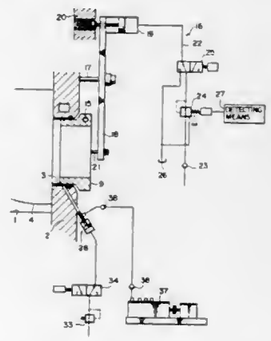
said rotor drive means and said means for supporting said housing being coupled to said rotor and said housing respectively so as to effect minimal constraint to the lateral vibration of said housing.

4,824,259

DUST SEAL ASSEMBLY FOR USE IN A CLOSED TYPE MIXER AND ITS CONTROL MECHANISM

Akimasa Kuriyama, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 855,672, Apr. 25, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 183,278
Int. Cl.[4] F16J *15/34*; B01F *7/08, 15/00*
U.S. Cl. 366—349 **4 Claims**



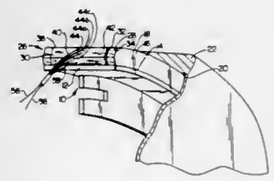
1. A dust seal assembly for a closed type mixer, having a mixing chamber, comprising:
a rotor shaft opening at at least one end of said mixing chamber;
a rotor shaft extending through said opening and which includes a flange;
a unitary collar ring fitted on and engaging said rotor shaft for rotation therewith and having a radially projecting flange portion which includes a ring plate sliding portion for closing said rotor shaft opening and a press ring face portion located opposite said ring plate sliding portion;
a fixed gland ring positioned radially outwardly of said collar ring for engaging with said radially projecting flange portion of said collar ring and having a ring tip portion located opposite said ring plate sliding portion for imparting sealing pressure thereto and for pressing said press ring face portion against said flange of said rotor shaft;
means for detecting mixing conditions in said mixer;
variable pressing means for applying a variable controlled pressure to said gland ring in response to detected mixing conditions in said mixer; and
abrasion resistant members of a hardness of 770–850 HV attached to said ring plate sliding portion of said collar ring and of a hardness of 590–680 HV attached to said tip portion of said gland ring, respectively, the abrasion resistant member of said gland ring being formed with a forwardly tapered shape in section.

4,824,260

BRAKE BLOCK TEMPERATURE AND WEAR MEASURING DEVICE

Raymond J. Novotny, Spartan, and Robert B. McCune, Allendale, both of N.J., assignors to Abex Corporation, Boston, Mass.

Filed Apr. 13, 1988, Ser. No. 181,179
Int. Cl.[4] G01K *1/14, 7/02*; F16D *66/00*
U.S. Cl. 374—179 **35 Claims**



1. A thermocouple for use with a brake block having a friction element with a friction face adapted to be moved into contact with a braking face of a brake drum and for outputting a signal indicative alternatively of the steady state temperature of the brake block friction element and of the transient temperature of the friction element-brake drum interface which comprises:
an erodible metallic plate forming one element of a junction of the thermocouple affixed to said brake block;
said plate having the same approximate depth as said friction element and having a working face parallel with said friction element friction face;
wherein said working face is adapted to engage said brake drum braking face when said brake block friction element is moved into contact with said brake drum such that said metallic plate erodes with said friction element in a direction perpendicular to said interface;
said plate having a width substantially greater than its thickness and sufficient to ensure that a substantial portion of said working face engages said brake drum braking face when said friction element is moved into contact with said brake drum; and
at least one alloy lead affixed to said plate to form the second element of said thermocouple junction.

4,824,261

RECLOSABLE BAG AND HOOK AND LOOP SEALING STRIPS FOR USE THEREIN

George A. Provost, Litchfield, N.H., assignor to Velcro Industries B.V., Amsterdam, Netherlands

Continuation of Ser. No. 924,205, Oct. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 790,966, Oct. 24, 1985, abandoned. This application Apr. 1, 1988, Ser. No. 180,622
Int. Cl.[4] B65D *33/24*; A44B *18/00*
U.S. Cl. 383—81 **11 Claims**

1. In a bag of flexible, frangible material including a bottom, opposed spaced sides, and opposed spaced front and rear pieces terminating at the top in front and rear edges respectively, the improvement to provide tamperproof resealability comprising:
(a) a flap-containing member of the flexible, frangible material having a front flap extending from a fold point over

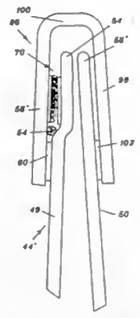
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the front edge and down along the front piece and having a rear flap extending from said fold point over the rear edge and down along the rear piece;

(b) a strip of adhesive disposed along the bottom edge of said rear flap to secure it to the rear piece;

(c) attachment means disposed along the bottom edge of said front flap for securing it to the front piece;

(d) a pair of elongated strips of a hook and loop fastening system disposed between said front flap and front piece above and adjacent to said attachment means with one of said pair of strips adhesively attached to said front flap and the other of said pair of strips adhesively attached to the front piece, at least one of said pair of strips having an engaging area along an upper longitudinal edge portion which is sufficiently narrower than the engaging area of the other strip that the remaining area along a lower longitudinal edge of the one strip is lacking in the ability for that strip to form a releasable attachment to the adjacent area of the other strip, wherein said fold point of said flap-containing member provides a means of placing said



strips in substantial alignment with one another along their longitudinal edges so that one strip overlies the other strip; and

(e) releasing means, for releasing said front flap from said front piece, close adjacent said lower longitudinal edges of said pair of strips whereby after initial opening of the bag by releasing said releasing means and when one strip engages and overlies the other strip with their longitudinal edges substantially aligned with one another, said front flap and a sufficient portion adjacent the lower longitudinal edge of one of said pair of strips can be laterally rolled back away from the other of said pair of strips sufficiently to be directly gripped by human fingers to laterally pull the one strip out of attachment with the other strip, whereby the initial lateral separation forces of both strips are intermediate the longitudinal edges of said strips substantially along the boundary of said engaging area and said remaining area so that peeling of either of said pair of strips from said front flap and front piece is prevented thereby avoiding delamination of either strip from the member of the bag to which it is adhesively attached.

4,824,262

UNLUBRICATED SLIDING MEMBER

Osami Kamigaito; Haruo Doi; Shoji Noda, and Masao Kouzaki, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aza Yokomichi, Japan

Filed Sep. 25, 1987, Ser. No. 100,946

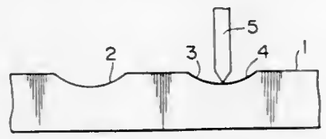
Claims priority, application Japan, Sep. 27, 1986, 61-229066; Sep. 2, 1987, 62-219497

Int. Cl.⁴ F16C *29/00, 33/02*

U.S. Cl. 384—42 **12 Claims**

1. An unlubricated sliding member comprising:

a first sliding body having a first sliding part, said first sliding part being composed of a ceramic base portion and a thin film which is integrally provided on the surface of said ceramic base portion and which is composed of at least one selected from the group consisting of metals of Nb, Cr, Ti, Zr, Hf, Y and Si and oxides of said metals; and



a second sliding body having a second sliding part which comes into sliding contact with said first sliding part, said second sliding part being composed of a diamond containing surface portion.

4,824,263

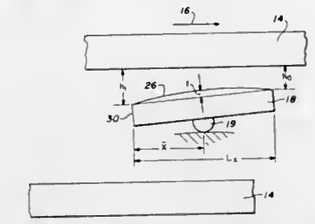
THRUST BEARING SHOES

Anant P. Singh, Olean, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 568,953, Jan. 6, 1984, abandoned, which is a continuation of Ser. No. 368,778, Apr. 15, 1983, abandoned. This application Oct. 30, 1985, Ser. No. 793,719

Int. Cl.⁴ F16C *17/06*

U.S. Cl. 384—306 **9 Claims**



1. A thrust bearing support for a moving body, said bearing support having a thrust surface and comprising:

a. a bearing shoe tilted relative to said thrust surface for spaced apart motion relative to said thrust surface;

b. an optimized curved one-dimensional convex profile shape on said shoe as viewed perpendicular to the direction of relative motion, said profile shape being designed for maximum load carrying capacity in accordance with the ratio of width to length of said bearing shoe surface; and

c. A lubricant adapted to form a film over said shoe surface and said thrust surface to space them apart upon relative motion therebetween.

4,824,264

BEARING OF AN AXLE DRIVE BEVEL PINION

Peter Hoebel, Wiernsheim-Serres, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 17, 1988, Ser. No. 156,605

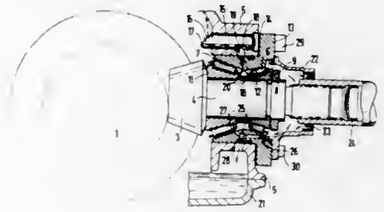
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705607

Int. Cl.⁴ F16C *33/66, 33/36;* **F16H** *57/04*

U.S. Cl. 384—473 **10 Claims**

1. A bearing arrangement of an axle drive bevel pinion of a motor vehicle, having two tapered roller bearing means that are lubricated via an oil feeding duct arranged between said bearing means, by splash oil that is collected in a collecting receptacle located above said tapered roller bearing means, comprising joint outer race means for said two roller bearing means, a top side of said joint outer race means containing said

oil feeding duct and a bottom side of said joint outer race means containing an oil return duct which is spaced from said



tapered roller bearing means and connectable with a transmission oil sump.

4,824,265

CAGE FOR TAPERED ROLLER BEARING

Heinrich Hofmann, and Günther Glas, both of Schweinfurt, Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,423

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728877

Int. Cl.⁴ F16C *33/46*

U.S. Cl. 384—560 **10 Claims**

1. A tapered roller bearing comprising:

a tapered outer ring;

a tapered inner ring radially inward of the outer ring, the inner ring having a radially smaller side and having a radially outwardly projecting lip at the radially smaller side;

a plurality of tapered rollers each having a smaller end, the rollers being disposed between the inner and the outer rings;

a window cage disposed between the inner and the outer rings of the bearing, the cage comprising a small side cage ring toward the radially smaller side of the bearing inner ring and beyond the smaller end of the bearing rollers, and a plurality of cage webs spaced at intervals around the cage small side ring, the webs being positioned for separating adjacent ones of the rollers of the bearing;

the small side ring of the cage comprising approximately radially directed undulations extending around the cage side ring;

the cage having radially inwardly directed projections which are sized to snap into the space axially inward of the lip of the inner ring, thereby positioning the cage with respect to the inner ring; the small side ring of the cage being of sufficiently flexible and resilient material to enable the small side ring to expand sufficiently to permit the projections from the cage to pass over the lip on the inner ring and to enable the small side ring to contract and to define the undulations more sharply for causing the cage projections to snap behind the bearing inner ring lip.

4,824,266

APPARATUS AND METHOD FOR STORING REGULAR AND IRREGULAR CHARACTERS

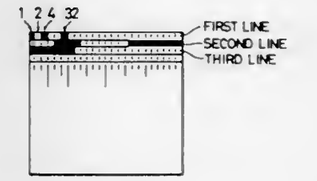
Kenichi Fujii, and Kenmei Tanaka, both of Hyogo, Japan, assignors to Kanzaki Paper Mgb. Co., Ltd, Japan

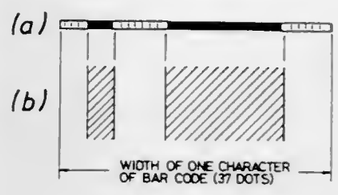
Filed Dec. 29, 1986, Ser. No. 947,397

Claims priority, application Japan, Dec. 27, 1985, 60-298675; Feb. 8, 1986, 61-26596

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 400—120 **13 Claims**





1. A line-head type thermal printer, comprising:

a font memory means for storing font patterns having a predetermined number of transverse dots from a source of standard font patterns having a number of transverse dots corresponding to predetermined number of transverse dots and from a source irregular font patterns having a number of transverse dots different from said predetermined number of transverse dots, said means for storing including means for representing said irregular font patterns as at least one bit pattern having said predetermined number of transverse dots and restoring data for restoring said irregular font pattern from said at least one bit pattern having said predetermined number of transverse dots;

an output buffer for storing standard and irregular font patterns to be printed; and

a thermal printer head for printing said standard font patterns and said irregular font patterns stored in said output buffer.

4,824,267

CONTROL APPARATUS FOR HAMMER TYPE IMPACT PRINTER

Yoshinori Nakajima, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 745,750, Jun. 17, 1985, Pat. No. 4,627,751, which is a continuation of Ser. No. 404,799, Aug. 3, 1982, abandoned. This application Aug. 5, 1986, Ser. No. 893,515

Claims priority, application Japan, Aug. 7, 1981, 56-123059

Int. Cl.⁴ B41J *1/30*

U.S. Cl. 400—144.2 **4 Claims**

1. A control apparatus for a proportional spacing printer constructed to selectively print with first and second fonts comprising a common set of characters, widths of at least some characters in the first font differing from widths of respective characters in the second font, comprising:

read-only storage means for pre-storing first proportional space data for the first font;

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read-write storage means for storing second proportional space data for the second font;

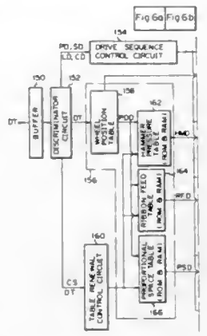
buffer means for temporarily storing character codes corresponding to said characters respectively and the second proportional space data input thereto;

discrimination means operatively connected to the buffer means for discriminating the character codes from the second proportional space data;

transfer means operatively connected to the buffer means and discrimination means for transfering the second proportional space data discriminated by the discrimination means from the buffer means to the read-write storage means; and

control means for controlling the printer to perform proportional printing with the first font using the first proportional space data stored in the read-only storage means and to perform proportional printing with the second font using the second proportional space data stored in the read-write storage means;

the transfer means being further operatively connected to the read-only storage means for initially transferring the first proportional space data from the read-only storage means to the read-write storage means, the transfer means subsequently transferring the second proportional space data from the buffer means to the read-write storage means to replace respective data in the read-write storage means, the second proportional space data comprising data for only those characters of the second font having widths differing from widths of respective characters in the first font.



4,824,268

ERGONOMIC KEYBOARD

Dieraisse H. V., 9 Kaufman Dr., Westwood, N.J. 07675

Filed Aug. 27, 1987, Ser. No. 91,290

Int. Cl.[4] B41J *5/10*

U.S. Cl. 400—486 **8 Claims**

1. A keyboard for the transmission of information and instructions comprising:

a plurality of keys irregularly arranged according to the shape of the hands in such a manner that when the bent non-thumb fingers of both hands are placed on the keyboard, each of eight home keys are located under the tip of each of the non-thumb fingers;

a plurality of keys arranged in such a manner that when the non-thumb fingers are extended from their respective home keys, each of four top center keys on each keyboard half is located under the tip of each of the non-thumb fingers;

a plurality of keys arranged in such a manner that when the non-thumb fingers are bent toward their respective wrists from their respective home keys, each of four bottom center keys on each key board half is located under the tip of each of the non-thumb fingers;

a plurality of keys arranged in such a manner that when each index finger is moved from its respective home key and toward the center of the keyboard, an inner center key is located under the tip of each index finger;

a plurality of keys arranged in such a manner that when each index finger is moved away from its home key at an angle between each respective inner center key and each respective top center key operated by the respective index finger, an inner top key is located under the tip of each index finger;

a plurality of keys arranged in such a manner that when each index finger is moved away from its home key at an angle between each respective inner center key and each respective bottom center key operated by the respective index finger, an inner bottom key is located under the tip of each index finger;

a plurality of keys arranged in such a manner that when each little finger is moved away from its home key and toward the outside of the keyboard at an upward angle, an outer center key is located under the tip of each little finger;

a plurality of keys arranged in such a manner that when each little finger is moved away from its home key at an angle between each respective outer center key and each respective top center key operated by each respective little finger, an outer top key is located under the tip of each little finger;



a plurality of keys arranged in such a manner that when each little finger is moved away from its home key at an angle between each respective outer center key and each respective bottom center key operated by each respective little finger, an outer bottom key is located under the tip of each little finger;

a plurality of keys for operation by the index fingers and located further away from the home key of each respective index finger than the respective top center key operated by the respective index finger;

a plurality of keys arranged in such a manner that when the non-thumb fingers rest on their respective home keys, the outer phalange of each thumb rest on its respective thumb home key;

a plurality of keys for operation by each thumb and arranged together with each thumb home key on an irregular home key curve on each half of the keyboard;

a plurality of keys for operation by each thumb and irregularly arranged farther away from the operator and outside each thumb home key curve; and

a plurality of keys for operation by each thumb and irregularly arranged closer to the operator and inside each thumb home key curve.

4,824,269

VARIABLE COLOR DISPLAY TYPEWRITER

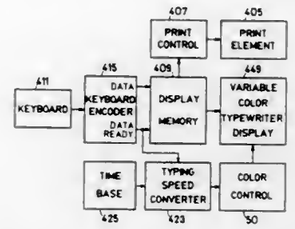
Karel Havel, 15 Kensington Road, Apt. #704, Bramalea, Ontario, Canada (L6T 3W2)

Continuation of Ser. No. 839,626, Mar. 14, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 150,913

Claims priority, application Canada, Mar. 13, 1987, 531943

Int. Cl.[4] B41J *29/00*

U.S. Cl. 400—704 **25 Claims**



1. A method of simultaneously displaying a typed text and indicating a typing speed, on a variable color display means, by causing the typed text to be visually presented on said display means, by determining the typing speed, and by controlling the color of said display means in accordance with the typing speed.

4,824,270

DISPENSERS FOR FLOWABLE COMPOSITIONS

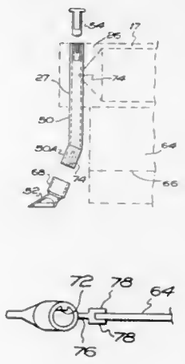
Frederick Clarke, Huddersfield, England, assignor to Clantex Limited, Leeds, England

Filed Aug. 8, 1986, Ser. No. 894,915

Claims priority, application United Kingdom, Aug. 9, 1985, 8520043

Int. Cl.[4] B05C *17/00*

U.S. Cl. 401—48 **6 Claims**



1. A nib portion either integral, attached or attachable to a nozzle tube portion for use with a flowable composition cartridge that is used to dispense a liquid into a crease, said cartridge having a transverse bore for receiving a nozzle tube, or for attachment to an outlet tube of a flowable composition cartridge, said nib portion comprising a hollow body having an elongated outlet slot from which composition charged into the body can be dispensed as a narrow ribbon, and engagement means for engagement with a guide means said guide means being mounted to and projecting from said cartridge and used to guide said cartridge as it moves along a crease whereby the outlet slot is maintained in alignment with the guide means and thereby with the crease.

4,824,271

NIB FOR WRITING INSTRUMENTS

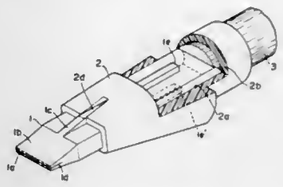
Masamitsu Nagahama, Saitama; Masaaki Ohsawa, Ashikaga, and Masayuki Kawasaki, Soka, all of Japan, assignors to Pental Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 640,834

Claims priority, application Japan, Aug. 31, 1983, 58-134551

Int. Cl.[4] B43K *1/12, 1/04, 8/02*

U.S. Cl. 401—196 **3 Claims**



1. A nib for a writing instrument, said nib comprising:

an elongated member having a greater width than height and a writing tip end portion;

a plurality of separate ink feeding channels extending throughout the entire length of said member and opening at said tip end portion, said channels being laterally spaced from each other across said width of said member; and

a split formed in said tip end portion of said member, said split extending across the entire said width of said member and communicating all of said channels with one another, and said split being defined by opposed contacting surfaces without a space therebetween.

4,824,272

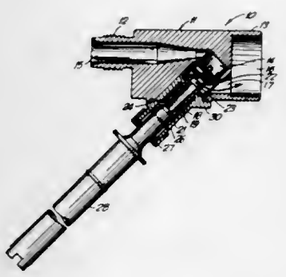
PAINT VALVE

Scott J. Collins, and Timothy B. Strandell, both of Milwaukee, Wis., assignors to Brenner Associates, Ltd., Englewood, N.J.

Filed Nov. 16, 1987, Ser. No. 121,451

Int. Cl.[4] B05C *17/02, 1/10*

U.S. Cl. 401—197 **4 Claims**



1. A paint valve for loading a roller apparatus from a paint supply means which includes a filler tube, said valve having a roller channel and a paint supply channel coupled to the valve at one end and a handle having a paint reservoir mounted therein coupled to the other end of the valve comprising:

a valve body having a main portion and a secondary portion of smaller diameter than said main portion projecting outwardly at one end, said secondary portion having a bore extending inwardly to provide a paint path to a roller

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and a threaded outer wall for mounting to a roller, said main portion including a bore extending inwardly at an angle and connected to said reduced portion bore and an outlet bore joined to the paint reservoir in the handle, and

a valve mounted within said valve body having a valve stem, said valve stem having a filler tube engaging portion mounted at an outer end, a cavity extending axially therealong, and at least one port in the stem wall at the inner end thereof connecting to said cavity,

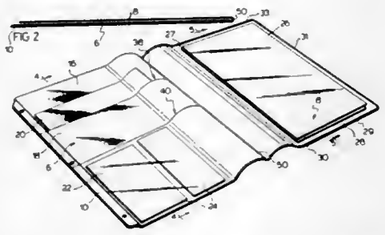
a removable sleeve mounted about the outer end of the valve stem, said sleeve being mounted to the valve body and engageable with the paint supply means to load the reservoir.

4,824,273

ORGANIZATIONAL INSERT AND ALBUM

Lacy Silva, 78 Pettit Drive, Etobicoke, Ontario, Canada M9R 2X2, and Maria Moniz, 10 Pettit Drive, Etobicoke, Ontario, Canada M9R 2W7

Filed Nov. 9, 1987, Ser. No. 117,987
Int. Cl.⁴ B42F *3/02*
U.S. Cl. 402—79 **20 Claims**



1. A loose-leaf binder insert comprising a first generally rectangular in shape section and a second section of similar shape, said first and second sections being integrally connected along one straight edge and defining a fold line therebetween, with said sections being movable about said fold line from an extended to a folded orientation, said first section at an edge opposed to said fold line including a securing region for fastening of said insert in a binder;

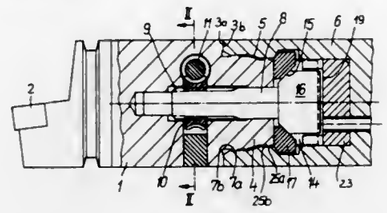
said first section comprising a full back layer and an overlying middle layer which, in combination with said back layer, defines a first pocket for storage of material that requires removal to review, said second section comprising two opposed transparent layers defining a pocket therebetween which is open at the top and closed on the sides and bottom for display of material stored therein, and wherein said back layer of said first section is of a plastic sheet material and said middle layer terminates at an upper edge substantially spaced from an upper edge of said back layer, and wherein said first section further includes a transparent sheet overlying said middle layer and defining therewith a display pocket which is open along an edge thereof to insert material, said display pocket overlying said first pocket.

4,824,274

COUPLING FOR THE CONNECTION OF A TOOL HEAD AND A TOOL HOLER IN A MACHINE TOOL

Rainer von Haas, Geesthacht, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed May 20, 1987, Ser. No. 51,631
Claims priority, application Fed. Rep. of Germany, May 26, 1986, 3617695
Int. Cl.⁴ F16B *1/00*; B23B *29/00*
U.S. Cl. 403—24 **13 Claims**



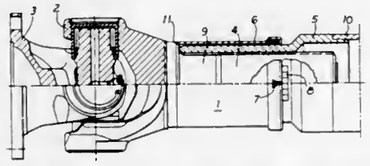
1. In a combination including a tool head and a tool holder of a machine tool, the tool head having a shank and an outwardly radially projecting contact collar carried by the shank and the tool holder being formed to have a receiving bore which provides a counterface disposed to cooperate with the contact collar, the combination further including clamping means for locking the tool head to the tool holder with the contact collar bearing against a selected portion of the counterface, the improvement wherein: said contact collar and said selected portion of said counterface are cylindrical and, when said contact collar is out of engagement with said counterface, said contact collar has an outer diameter which is slightly greater than the diameter of said selected portion of said counterface for effecting secure clamping of said tool head to said tool holder; said tool head having a longitudinal axis and said clamping means including clamping members for locking said too head to said tool holder, and a clamping element displaceable along said longitudinal axis and coupled to said clamping members for effecting radial displacement thereof; and said clamping element being movable in a manner to force said shank out of said bore.

4,824,275

TORQUE INDICATING PROPELLER SHAFT

Albrecht Schlonski, Essen, Fed. Rep. of Germany, assignor to GKN Cardantec International Gesellschaft Für Antriebstechnik mbH, Essen, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,745
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636167
Int. Cl.⁴ B25G *3/00*
U.S. Cl. 403—27 **7 Claims**



1. An adjustable length propeller shaft comprising axially extending first and second shaft parts; said first shaft part having an axially extending end portion telescopically engaged within an axially extending sleeve on said second shaft part, said end portion and said sleeve having cooperating profiles for

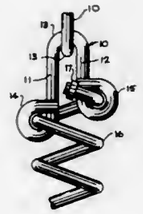
the transmission of torque between said shaft parts; a sealing collar secured to said shaft part and extending axially of said end portion, said sealing collar extending axially along and encircling said second shaft part, means on said sealing collar in contact with an outer surface of said sleeve on said second shaft part for providing sealing contact with said sleeve while accommodating variations in axial length in the telescopic engagement of said first and second shaft parts; and torsional load indicating means on said sealing collar and said sleeve for indicating overloads in torque transmission between said shaft parts.

4,824,276

HELIX COUPLING

William S. Ginell, Encino, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 19, 1982, Ser. No. 359,973
Int. Cl.⁴ F16G *15/64*; F03G *7/06*; F16B *4/00*
U.S. Cl. 403—213 **9 Claims**



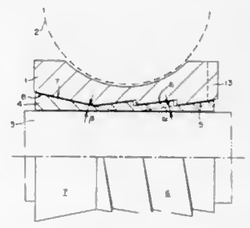
1. A coupling for helical members comprising: a pair of similarly constructed U-shaped units each having a pair of leg members interconnected by a "U" section, said leg members being of different lengths and provided with openings at the ends thereof; said pair of U-shaped units being interlocked directly to each other by said "U" sections thereof, and each unit being adapted to be connected to associated helical members by inserting an end of such an associated helical member through said openings in said leg members of said U-shaped units.

4,824,277

MOUNTING DEVICE WITH A CLAMPING SLEEVE

Rune Adolfsson, Boras, Sweden, assignor to SKF Nova AB, Sweden

Filed Jun. 19, 1987, Ser. No. 64,139
Claims priority, application Sweden, Jul. 1, 1986, 8602923
Int. Cl.⁴ B25G *3/20*
U.S. Cl. 403—370 **8 Claims**



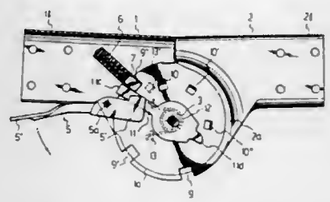
1. A device for securing a first machine element to a second machine element comprising a clamping sleeve disposed between said machine elements having first and second opposing clamping surfaces forming opposing angles α and β with the axis of said sleeve and with at least one of the clamping surfaces being formed by thread flanks one of the machine elements having complementary clamping surfaces confronting and engaging said first and second clamping surfaces, the angle (α,β) formed between the sleeve axis and said opposed clamping surfaces being smaller than the friction angle in each associated clamping contact whereby relative rotation of said sleeve and one of the machine elements produces a clamping action over substantially the entire length of said sleeve.

4,824,278

POSITIONING JOINT FOR FOLDING LADDERS

Moon S. Chang, Seoul, Rep. of Korea, assignor to Woo Kyong Industrial Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 15, 1987, Ser. No. 73,585
Claims priority, application Rep. of Korea, Feb. 21, 1987, 2003/87
Int. Cl.⁴ F16C *11/00*; E06C *7/50*
U.S. Cl. 403—93 **2 Claims**



1. A positioning joint for a folding ladder of the type in which two joint members which are relatively pivotable about an axial bolt are capable of being inter-locked in a series of predetermined angular positions by engaging a spring-biased pawl mounted on one of the members in notches formed at the peripheral edge of the other member, the one member having a pair of spaced-apart circular plates, the other member having a circular portion located between said plates, a control means in cooperation with a manually operated lever, pivotally connected to said one member and having a release element, controls the locking and unlocking of the joint, the improvement comprising;

a U-shaped member acting as the control means for locking and unlocking said joint, said U-shaped member being pivotable about said bolt and having a sustaining portion for engaging and disengaging said pawl, and two bolt receiving portions each with a central elliptically shaped bore, said bolt receiving portions lying on opposite sides of said circular portion, one of said bolt receiving portions having a protrusion at a free end thereof and said U-shaped member having a hook-like projection located between the other of said bolt receiving portions and said sustaining portion, said bolt extending through each said bore;

one of said plates having a limit stop and a hook-like projection extending toward said U-shaped member, and a spring loosely coiled about said bolt, said spring having ends respectively engaging said hook-like projections for biasing said U-shaped member against said limit stop;

said circular portion having spaced projections extending toward said protrusion, one of said spaced projections engaging said protrusion for shifting said U-shaped member out of engagement with said stop when unfolding the joint upon pivotal movement of said joint members in one direction to permit the pawl to engage in one of the notches, said spring shifting said U-shaped member away from said one projection during said unfolding, said pawl being disengaged from said one of said notches by said release element upon pivotal movement of said lever when further unfolding the joint upon further pivotal movement of said joint members in said one direction, said

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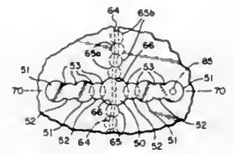
U-shaped member engaging said stop and said spring shifting said U-shaped member toward said one projection during said further unfolding for preventing said pawl from engaging said one of said notches, said protrusion having a curved edge permitting said U-shaped member to by-pass said spaced projections without stopping when folding the joint upon pivotal movement of said joint members in an opposite direction.

4,824,279

DEVICE AND METHOD FOR METAL STITCHING

Mark L. Casazza, Kearns, Utah, assignor to Morton Machine Company, Inc., Salt Lake City, Utah

Filed Jan. 28, 1987, Ser. No. 7,984
Int. Cl.[4] F16B *7/00*
U.S. Cl. 403—294 **8 Claims**



1. A lock insert for use in the process of metal stitching of castings and similar structures, said lock comprising:

at least one center lobe coupled to a plurality of radially smaller locking lobes and a plurality of connecting lobes which are radially smaller than the locking lobes and which are disposed in interconnecting relationship with the locking lobes, said center lobe being coupled to at least one locking lobe;

each of said lobes having a cylindrical body which intercepts the body of an adjacent lobe such that exterior wall portions of the two respective cylindrical bodies are intercepting and form a locking groove at a lateral surface of the lock insert at a junction of the wall surfaces of the respective intercepting lobes;

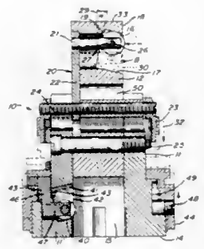
each of said lobes having a central axis in parallel, axial alignment with other central axes of the remaining lobes and being coupled to no more than two adjacent lobes.

4,824,280

LOCKING ADAPTER FOR INTERCONNECTING A DRIVABLE ELEMENT TO A DRIVE TOOL

Allan Alter, 11977 Pavillon, Pierrefonds, Quebec H8Z 1M6, Canada

Filed Jan. 21, 1987, Ser. No. 5,608
Int. Cl.[4] F16D *1/00*; **B25B** *13/00*
U.S. Cl. 403—322 **13 Claims**



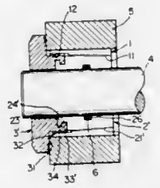
1. An adapter device for interconnecting a drivable element to a drive means, said device comprising a body having a connecting shank protruding therefrom, said shank having automatic lock means for automatic locking engagement of said shank on a flat wall of a cavity of a drivable element when positioned therein at any orientation, said lock means having a roller bearing with an outer circular wall displaceable in a bearing cavity formed in a flat wall of said shank, said bearing cavity having a flat angulated roller guide wall on which said roller bearing is displaced to position said roller bearing to an engaging and disengaged position, biasing means to normally bias said roller bearing to said engaging position, said biasing means having a spring biased linkage connected to said roller bearing, said spring biased linkage having a roller support rod, said roller bearing being displaceably connected to said support rod, said spring biased linkage having a guided link rod to which is secured said bearing support rod an annular ring member displaceably supported about a portion of said body and concentrically with said shank, a fastener interconnecting said guided link rod to said annular ring member, and said biasing means including a helical spring urging said annular ring member toward said shank to urge said roller bearing to said engaging position, said body having a locking cavity to connect said body to said drive means to impart an axial rotating motion to said connecting shank, said locking cavity being located in an end of said body opposed to said connecting shank and axially aligned therewith, and connecting means in said locking cavity for automatic locking engagement with a drive shank of said drive means positioned in said locking cavity at any orientation, said lock means of said connecting shank and said connecting means of said locking cavity being connected to a respective disconnect means for disengagement of said lock means and connecting means.

4,824,281

DEVICE FOR CONNECTING A WHEEL-LIKE BODY TO A SHAFT

Shinji Katsube, Shiga, Japan, assignor to Tsubakimoto Chain Co., Japan

Filed Feb. 23, 1988, Ser. No. 159,118
Claims priority, application Japan, Feb. 24, 1987, 62-39278
Int. Cl.[4] F16B *2/14*
U.S. Cl. 403—369 **2 Claims**



1. A device for connecting a wheel-like body to a shaft comprising:

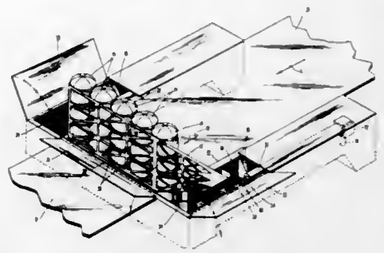
an outer ring having axial slits, an inner tapered surface, an inner threaded surface formed adjacent to a maximum inside diameter end of said inner tapered surface, and an outer peripheral surface adapted to bear on said wheel-like body; a split inner ring engageable on said shaft and having an outer tapered surface complementary to said inner tapered surface of the outer ring, and an annular groove formed at a maximum outside diameter end side of said outer tapered surface; and a nut having a complementary threaded surface to the inner threaded surface of said outer ring, an annular projection fitting into said annular groove in the inner ring, and a seating surface perpendicular to the shaft.

4,824,282

METHODS AND APPARATUS FOR QUICKLY ERECTING A VEHICLE BARRIER ACROSS A ROADWAY

Donald E. Waldecker, 1000 Water St. SW., Washington, D.C. 20024

Filed Nov. 6, 1987, Ser. No. 117,948
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **14 Claims**



10. A barrier adapted to be extended across a roadway for resisting the advance of vehicles comprising:

a flexible net formed of high strength material,

inflatable bag means connected to said net, and

means for inflating said bag means to extend said bag means and said net across said roadway.

12. A method of stopping a vehicle comprising the steps of:

inflating an inflatable bag means such that said bag means extends across a roadway from a folded condition beneath the ground surface, said bag means simultaneously raising a net connected to said bag means, said net having two ends connected to energy dissipating means,

causing said inflated bag means to be compressed upon impact by said vehicle such that said bag means is compressed between said net and vehicle to impose a first-stage speed deceleration on said vehicle,

causing said energy dissipating means to yield as said net is displaced by the vehicle, to impose a second-stage speed deceleration on the vehicle, and

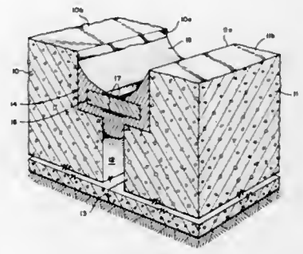
imposing non-yieldable forces on said net rendering said net stationary after said second-stage speed deceleration is terminated, to impose a third-stage speed deceleration on said vehicle.

4,824,283

SEALED HIGHWAY JOINT AND METHOD

Michael C. Belangie, 27 Q St., Salt Lake City, Utah 84103

Filed Jan. 9, 1987, Ser. No. 1,699
Int. Cl.[4] E01C *11/10, 11/02*
U.S. Cl. 404—64 **14 Claims**



1. A sealed joint between adjoining slabs of concrete in a highway or other area subject to vehicular traffic, the slabs being separated by a shrinkage-control cut or by a construction joint, said sealed joint comprising a joint installation channel wider than and above and extending along and across said cut or construction joint, said channel having a width sufficiently narrow that traffic loads are carried by the concrete bordering said channel rather than by said sealed joint; a mass of ductile and elastic type of adhesive deposited in said channel along its length and across its width and bonded to the concrete facings which define said channel; and a relaxed, preformed length of a heat-cured ductile and elastic material embedded in said adhesive and spanning said cut or construction joint and extending therealong, said preformed length having an intermediate portion carrying an anti-bonding material over a width approximating the width of said cut or construction joint and substantially coextensive therewith, said adhesive being bonded to said preformed length except where covered by said anti-bonding material.

10. A method of making a sealed joint between adjoining slabs of concrete in a highway or the like that are separated by a shrinkage-control cut or by a construction joint, comprising the steps of forming a sealed joint installation channel wider than and above and extending along and across said cut or construction joint, said channel having a width sufficiently narrow that traffic loads are carried by the concrete bordering said channel rather than by said sealed joint; depositing a mass of a ductile and elastic uncured adhesive within said channel along its length and across its width for bonding to the concrete facings which define said channel; embedding into said mass of uncured adhesive a preformed length of heat-cured ductile and elastic material in relaxed condition, said preformed length being manipulated so as to extend over at least a width approximately the width of said cut or construction joint and carrying an adhesive anti-bonding material over a width approximating the width of said shrinkage-control cut or construction joint and substantially coextensive therewith; and bonding said adhesive to said length except in those areas covered by said anti-bonding material.

4,824,284

PURIFYING SYSTEM OF WATER AREA

Kazuaki Akai, 201 Ogura, Wakayama, Japan 649-62

Continuation of Ser. No. 610,280, May 1, 1984, abandoned. This application Nov. 10, 1986, Ser. No. 928,735
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—21 **4 Claims**



1. A water purification system for flowing water comprising:

a porous breakwater surrounding a predetermined water area for blocking direct communication of water inside of said surrounded area and outside of said surrounded area and allowing water inside of said surrounded area and outside of said surrounded area to pass the porous structure of said breakwater for communication therebetween said breakwater incorporating:

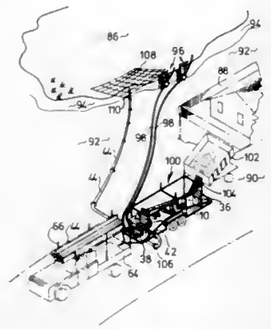
means for breaking waves of said water outside of said surrounded area and thus causing aerating of said breaking water, said wave breaking means providing sufficient oxygen in said breaking water for maintaining microorganisms in said porous structure; and

means defining water flow gaps in said breakwater for passing said water inside and outside of said surrounding area therethrough, said water flow gaps being so constructed

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to allow said microorganisms to live therein and thus causing catalytic oxidation of said water passing therethrough,
said breakwater purifying same by said aeration and oxidation.

4,824,285
APPARATUS AND METHOD FOR BEACH RECLAMATION
Joseph C. Trierweiler, 2875 Sanatorium Rd., Howell, Mich. 48843
Filed Aug. 14, 1987, Ser. No. 85,619
Int. Cl.[4] E02B *3/04*
U.S. Cl. 405—17 **17 Claims**



1. A method for environmentally benign beach reclamation adjacent a water body and sensitive upland area comprising,
placing a gas permeable, solid impermeable mat on the area to be reclaimed and a manually moveable pump adjacent the water body.
pumping water from the adjacent water body with the manually moveable pump adjacent the water body through a manually portable conduit over the sensitive upland area to a remote further upland mobile mixing and pumping unit,
mixing the water with a prewashed aggregate to form a water aggregate slurry,
pumping the slurry from the remote mobile unit to a location above the mat and
manually directing the flow of slurry to cover the mat with aggregate and return the water to the water body.

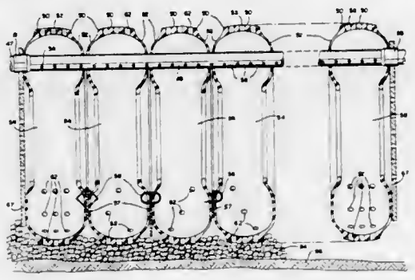
4,824,286
APPARATUS FOR DISSIPATING SURFACE WAVES, PARTICULARLY FOR PROTECTING FLOATING OR FIXED STRUCTURES OR COASTS
Heinrich Waas, Am Stadtwald 50, 5300 Bonn (Bad Godesberg), Fed. Rep. of Germany
Continuation of Ser. No. 745,310, Jun. 19, 1985, abandoned. This application Apr. 9, 1987, Ser. No. 37,102
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3432888
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—27 **4 Claims**

1. Apparatus for dissipating surface waves to protect floating or fixed structres or coasts, comprising a floatable carpet formed from a plurality of floating motor vehicle tires in horizontal disposition and arranged in rows, flexible spacer means interconnecting said tires characterized in that the floating carpet (**10**) provides a structure that is stiff in a horizontal direction and flexible in a vertical direction such that individual tires assume zig-zag inclinations therebetween under influence of main waver directions at an installed location of said carpet and with the angles of inclination being about 10 degrees to 25 degrees to a horizontal plane, said spacer means including upper and lower spacers (**22A, 22B**) for interconnecting said tires in upper and lower areas thereof, and inflatable supporting hoses (**23**) extending between adjacent tires and traversing the areas between said upper and lower spacers for supporting said interconnected tires on inflation, said tires being internally expanded by fillers (**29**).



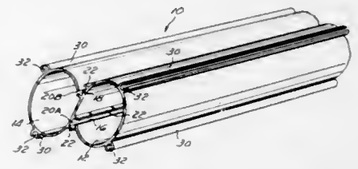
ZEV = ENERGY DISSIPATION ZONE

4,824,287
SEPTIC SYSTEM
Lawrence M. Tracy, 241 Ball Pond Rd., New Fairfield, Conn. 06812
Filed Feb. 19, 1988, Ser. No. 157,938
Int. Cl.[4] E02B *13/00*
U.S. Cl. 405—36 **53 Claims**



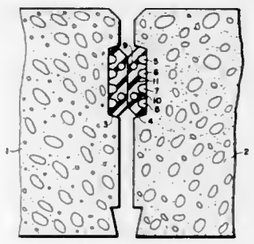
1. In a septic system,
A. a septic tank in which household wastes are treated, with solid wastes being decomposed by natural bacterial processes and settling in the tank while effluent flows from the tank into an adjoining drain field, comprising:
i. a plurality of vehicle tires forming a vertical stack of tires;
ii. means sealing said vertical stack of tires to form a watertight and lighttight enclosure therewithin;
iii. an inlet conduit in at least one of said plurality of tires for permitting influx of household wastes into said enclosure; said inlet conduit adapted to be connected to a sewage line; and
iv. an outlet conduit in at least one of said plurality of tires for permitting egress of effluent from said enclosure, said outlet conduit connected to a pipe leading to a drain field; and
B. a drain field permitting effluent from said septic tank to seep into adjoining ground, comprising:
i. an array of vehicle tires in axial alignment, each of said vehicle tires in said array defining an interior hollow chamber;
ii. delivery means operatively connected to said array of tires for introducing effluent from a septic tank into said hollow chambers of said tires; and
iii. means permitting effluent introduced by said delivery means into said hollow chambers of said tires to seep into adjoining ground.

4,824,288
CULVERT DRAINPIPE SYSTEM AND METHOD OF USE
Norie Naito, Fukui, Japan, assignor to Interpot International, Newport Beach, Calif.
Filed Jun. 14, 1988, Ser. No. 206,519
Int. Cl.[4] E02B *11/00, 13/00*
U.S. Cl. 405—48 **15 Claims**



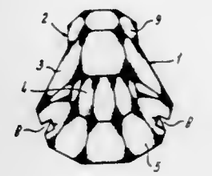
1. An improved culvert drainpipe comprising:
an elongate drainpipe element formed having a generally S-shaped cross-sectional configuration defining a pair of flow channels therein;
an axially extending inlet formed on each of said pair of flow channels;
a wall extension formed on said drainpipe element adjacent each inlet positioned to form an abutment for limiting movement of the distal edges of said drainpipe element; and
plural curvilinear extensions formed axially on the exterior of said drainpipe element.

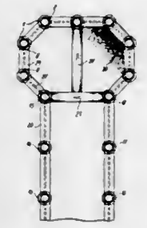
4,824,289
SEALING PROFILE FOR TUNNEL SEGMENTS
Siegfried Glang, Hamburg, and Werner Grabe, Winsen, both of Fed. Rep. of Germany, assignors to Phoenix Aktiengesellschaft, Hamburg, Fed. Rep. of Germany
Filed Aug. 5, 1987, Ser. No. 82,071
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626890; Aug. 8, 1986, 3626891
Int. Cl.[4] E21D *11/14*
U.S. Cl. 405—152 **12 Claims**



1. In a sealing profile formed of rubber or rubber-like material for tunnel segments having a recess therefor extending therearound, said profile having a base side facing said segment and a back side facing away from said segment, a plurality of longitudinally extending parallel flutes in said base side, lateral flanks extending angularly from said base side, and a plurality of longitudinally extending crossed-sectionally closed parallel ducts disposed above the base side, the improvement comprising said sealing profile including at least one centrally disposed bridge through extending from said base side to said back side without impairment in its supporting effect by a longitudinal duct, said at least one bridge being located only in the center region of said sealing profile so as to result the concentration of the force of reaction in said bridge and less stress relaxation therein during use.

4,824,290
METHOD OF CONSTRUCTING A RIGID STRUCTURE UPON THE BOTTOM OF A WATER AS WELL AS LOST CASING FOR PERFORMING SAID METHOD
Ahmad Masoudi, Pasdaran, Golestan 5, Heravi Sq., Mostafa Vafa Manesh St., After Mozafarian Alley, 16698 Tehran, Iran
Filed Nov. 17, 1986, Ser. No. 931,665
Claims priority, application Iran, Nov. 17, 1985, 26904
Int. Cl.[4] E02B *17/02*; E02D *5/18*; B22C *9/24*
U.S. Cl. 405—203 **21 Claims**





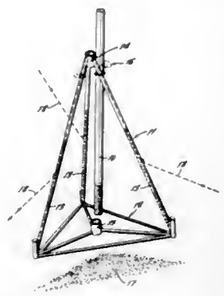
1. A method of constructing a rigid structure upon the bottom of a body of water comprising:
constructing a lost casing of polygonal cross-section over its entire height and having a conical outer shape widest at a lower edge thereof by welding flat sheet metal plates into a hollow, double-walled casing having an open top end smaller than a bottom base end and flat outer and inner walls defining a casing hollow space open at the top end and closed at the bottom end so as to form a sharp lower edge;
placing the casing upon the bottom of the body of water at a depth of the water which is less than the height of the finished casing;
providing the inside of said hollow space with concrete reinforcing rods either before or after said casing has been placed on said bottom;
at least partially filling said casing hollow space with hardening material and
removing material from the bottom where it contacts the sharp lower edge to further position said casing into the bottom of the body of water.

4,824,291
OFFSHORE TOWER STRUCTURES
Anton Coppens, Oegstgeest, Netherlands, assignor to Heerema Engineering Service BV, Vondellaan, Netherlands
Filed Feb. 12, 1988, Ser. No. 155,368
Claims priority, application United Kingdom, Feb. 12, 1987, 8703222
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—204 **9 Claims**

1. A method of assembly of an offshore tower structure of the kind comprising a central column to extend upwardly in use from the sea bed to support a platform and carry services

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such as conductors and risers between the sea bed and the platform, and a structure to support the column, the support structure including at least three legs joined at their apex by a column-receiving sleeve which in use surrounds and supports the column above the sea bed, which method includes the steps of positioning the column in the water with its longitudinal axis



vertical or nearly vertical, positioning the support structure in the water with the column-receiving sleeve uppermost, the axis of the sleeve vertical or nearly vertical and the sleeve above the top of the column, and engaging the column in the sleeve by relative longitudinal movement between the column and support structure.

4,824,292

SUPPORT FOR BUILDING STRUCTURES

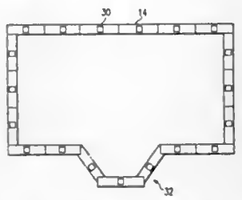
Roger A. Bullivant, Burton-on-Trent, England, assignor to Roger Bullivant of Texas, Inc., Grand Prairie, Tex.

Filed May 12, 1987, Ser. No. 49,122

Claims priority, application United Kingdom, May 13, 1986, 8611598

Int. Cl.⁴ E02D *27/00*

U.S. Cl. 405—229 **16 Claims**



1. A method of forming a continuous footing and support casing foundation for a building comprising:

forming a plurality of abutting connecting holes in the ground surface which holes define a continuous beam of predetermined depth and width, each said hole having a top portion with an upwardly facing multi-sided face with one side of each face being substantially co-extensive with one side of the face of the adjacent hole or overlapping a portion of the rectangular face of the adjacent hole, and

filling said holes with concrete to form a foundation structure with a substantially continuous surface exposed footing of predetermined uniform width.

4,824,293

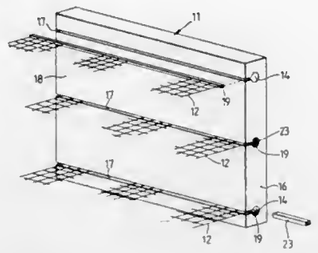
RETAINING WALL STRUCTURE

Richard L. Brown, 905 40th St. S., Birmingham, Ala. 35222, and George L. Morris III, 3507 Pine Ridge Rd., Birmingham, Ala. 35213

Filed Apr. 6, 1987, Ser. No. 34,720

Int. Cl.⁴ E02D *29/02*

U.S. Cl. 405—284 **9 Claims**



1. In a retaining wall construction utilizing a plurality of panels as retainers for an underlying mass with each panel secured to said mass by anchors embedded in said mass, the improvement comprising:

(a) a plurality of channels formed in said panels with each channel communicating with the side of said panel adjacent said underlying mass via a slit extending along said channel; and

(b) means for securing one end of said anchor within said channel to prevent withdrawal of said anchor through said slit with said slit having a transverse width slightly greater than the thickness of said anchor proximal said one end with said one end having an increased terminal thickness and smaller than the transverse width of said channel and said means for securing comprising an interference rod inserted within said channel such that the effective width of said slit is reduced.

4,824,294

METHOD OF AND EQUIPMENT FOR HYDRAULIC FORWARDING OF SOLIDS OVER LONG DISTANCES AND/OR TO DIFFERENT HEIGHTS; IN PARTICULAR IN UNDERGROUND MINESHAFTS

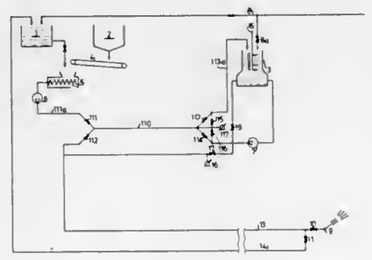
Michael Kortenbusch, Unna, and Kurt A. Osenberg, Wilnsdorf, both of Fed. Rep. of Germany, assignors to Siemag Transplan GmbH, Netphen, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,386

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1986, 3623727

Int. Cl.⁴ B65G *53/30*

U.S. Cl. 406—93 **19 Claims**



1. A method of transporting solids, comprising the steps of:

(a) forming a slurry of said solids in a transport liquid;

(b) filling at least one tube chamber of a tube-chamber distributor system operating in accordance with booster displacement principles and having shutoff devices controlling flow from and to said tube chamber, with a transport liquid;

(c) displacing a quantity of said transport liquid from said tube chamber by introducing a corresponding quantity of said slurry into said tube chamber;

(d) measuring the quantity of transport liquid displaced from said tube chamber by the introduction of said slurry into said tube chamber in step (c);

(e) forcing said transport liquid under pressure into said tube chamber to displace under pressure said slurry from said tube chamber into a transport pipeline and along said transport pipeline;

(f) terminating the forcing of said transport liquid into said tube chamber in step (e) in accordance with the quantity of displaced transport liquid measured in step (d), thereby reintroducing into said tube chamber a quantity of said transport liquid at least equal to the measured quantity displaced therefrom in step (c); and

(g) repeating steps (c)–(f) to displace said solids along said pipeline.

4,824,295

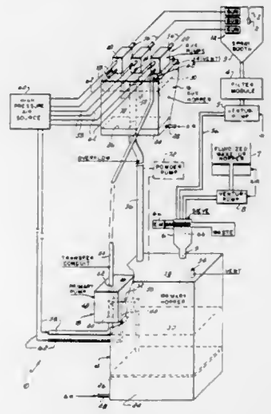
POWDER DELIVERY SYSTEM

John Sharpless, Oberlin, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Continuation-in-part of Ser. No. 681,502, Dec. 13, 1984, abandoned. This application Mar. 19, 1986, Ser. No. 841,210

Int. Cl.⁴ B65G *53/40*

U.S. Cl. 406—109 **6 Claims**



1. In combination, a powder spray booth, a powder spray gun for spraying solid particulate powder onto workpieces contained within said booth; a filter module for collecting oversprayed powder from said booth, and a sieve for receiving powder from said filter module and separating said oversprayed powder from coarser particles,

a primary fluidized bed hopper for receiving powder from said sieve, said primary hopper having an interior chamber adapted to receive and fluidize powder material,

a primary pneumatic powder pump having an inlet port and a discharge port, said primary powder pump having a low pressure venturi pumping chamber contained therein and a powder flow passage intersecting said venturi pumping chamber, said powder flow passage having an inlet connected via a siphon tube to said interior chamber of said primary hopper,

means connecting said inlet port of said primary powder pump to a source of high pressure air,

an auxiliary fluidized bed hopper having an interior chamber of substantially less capacity than said interior chamber of said primary hopper, said auxiliary fluidized bed hopper being located in close proximity to said powder spray booth,

first conduit means connecting said outlet port of said primary powder pump to said interior chamber of said auxiliary hopper,

at least one auxiliary pneumatic powder pump having an inlet port and a discharge port, said auxiliary powder pump having a low pressure venturi pumping chamber contained therein and a powder flow passage intersecting said venturi pumping chamber, said powder flow passage of said auxiliary powder pump having an inlet connected via a siphon tube to said interior chamber of said auxiliary hopper,

second conduit means connecting said outlet port of said auxiliary powder pump to said powder spray gun, said second conduit means being substantially shorter than said first conduit means, and

means for maintaining a constant level of fluidized powder in said auxiliary hopper, said means for maintaining a constant level of fluidized powder in said auxiliary hopper comprising an overflow tube extending between said auxiliary hopper and said primary hopper, said overflow tube having an inlet spaced upwardly from the bottom of said interior chamber of said auxiliary hopper.

4,824,296

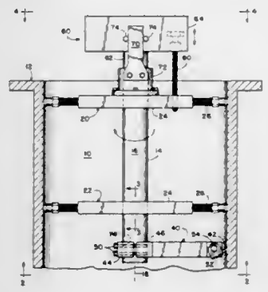
BEARING ARRANGEMENT FOR A ROTATABLE TURNING BAR

David S. Strait, Newberg, Oreg., assignor to Climax Portable Machine Tools, Inc., Newberg, Oreg.

Filed Oct. 14, 1987, Ser. No. 108,542

Int. Cl.⁴ B23B *41/00*

U.S. Cl. 408—80 **12 Claims**



1. A machine for surfacing a workpiece, the machine comprising:

a turning bar having an external surface of circular cross section defining a central axis of said turning bar;

support means mountable upon the workpiece;

an outer bearing race affixed to said support means; and

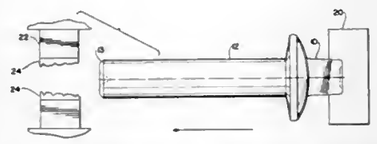
roller bearing elements each having an axis of rotation substantially parallel to said central axis, each being captive between said outer bearing race and the external surface of said turning bar and each held against movement relative to the support means in directions parallel to the central axis.

4,824,297

THREAD FORMING APPARATUS HAVING TANGENTIAL CHASERS FOR CUTTING A THREAD ON A RAILROAD SPIKE

Chalmer Jordan, Saegertown; Lee Connor, Meadville; Robert Lybarger, Meadville, and Charles Gutshall, Waynesboro, all of Pa., assignors to Saegertown Manufacturing Corporation, Saegertown, Pa.

Filed Sep. 3, 1987, Ser. No. 92,624
Int. Cl.[4] B23G 5/04
U.S. Cl. 408—217 19 Claims



1. A plurality of thread cutting chasers for forming a tapering portion and cutting thereon a thread on a spike when said plurality of chasers are rotating relative to and axially advancing along a central axis of said spike, said spike having a head, a tip opposite said head, and a shank therebetween, the tip of said shank being located forwardly of said head in an advancement direction of said spike, said thread having on said tapered portion a constant crest diameter, a constant root, a constant pitch and a constant gap between adjacent turns of said thread, said chasers comprising:

a cutting edge profile on each chaser extending from a forward end of the chaser to a rearward end in the advancement direction of said spike, each cutting edge profile having a series of tapered cutting edges alternating with a series of thread forming notches, each of said notches having a forward flank and a rearward flank intersecting at a crest of said notch, forward and rearward acute flank angles being respectively defined between said forward flank and said rearward flank and a normal to said central axis, each notch in said series of notches having a constant root and forward and rearward acute flank angles different from the forward and rearward acute flank angles of an adjacent notch in said series of notches, each of said cutting edges being defined between a forward flank of one notch and a rearward flank of a preceding notch, the crests of adjacent notches being separated by one pitch, said cutting edges having equal lengths each corresponding to the length of said gap, each of said cutting edges penetrating successively deeper into said shank in the advancement direction of said spike;

each of said plurality of chasers having a different cutting edge profile, a cutting edge in the series of cutting edges on one chaser being located rearwardly of and penetrating successively deeper than a corresponding cutting edge in the series of cutting edges on a preceding chaser, the forward and rearward acute flank angles on a thread cutting notch on one chaser being no greater than the forward and rearward acute flank angles on a corresponding thread cutting notch on a preceding chaser.

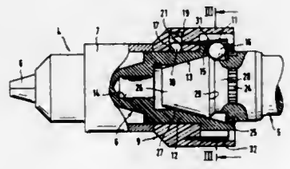
4,824,298

HAND-HELD TOOL WITH DETACHABLE TOOL BIT CHUCK

Wolfgang Lippacher, Herrsching, and Reinhard Riedl, Grossenzemoos, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Oct. 22, 1987, Ser. No. 112,743
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636027
Int. Cl.[4] B23B 31/04; B25D 17/08
U.S. Cl. 408—240 10 Claims

1. Hand-held tool for use as a power drill, a hammer drill, a powered screwdriver and the like, comprising a housing having a front end and a rear end, a rotary spindle located within said housing and having a front end and a rear end and an axis of rotation extending in the front end—rear end direction with said front end of said spindle projecting from the front end of said housing, a chuck arranged to hold a drill bit detachably on an axially extending front end part of said spindle and projecting in the axis of rotation direction of said spindle from the front end thereof, said chuck includes a chuck part fitted on the front end part of said spindle and having an axially extending chuck section connected to the front end part of said spindle, said chuck section being rotatably lockable with said spindle wherein the improvement comprises that said chuck section and front end part have corresponding axially extending conically-shaped surfaces engageable with one another, said conically-shaped surfaces comprise a conically-shaped shaft section on one of said spindle and said shaft section and means forming a conically-shaped bore on the other one, said spindle having an outer surface and comprises a recess formed as a circumferentially extending annular groove extending in the axis of rotation direction on said outer surface and said recess having an opening in the outer surface and a base inwardly of said opening with said base being shorter in the axis of rotation direction of said spindle than the opening, said recess having a flank closer to the front end of said spindle inclined from the opening of said recess to the base thereof in the direction towards the rear end of said spindle, a clamping member supported in a radially extending through opening of said chuck section and said clamping member extends into said recess in said spindle in abutment with said flank, a spring member in engagement with said clamping member for displacing said clamping member into engagement with said recess in said spindle, means in contact with said spring member for displacing said clamping member into and out of engagement with said recess, and the dimension of said clamping member within said recess in the axis of rotation direction corresponding at most to the least dimension in the axis of rotation direction of the opening in said recess.



4,824,299

CHIP BREAKING DEVICE FOR ANNULAR CUTTERS

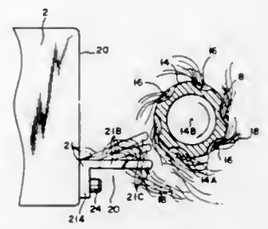
Michihiro Shoji, and Osamu Asano, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 122,122
Claims priority, application Japan, Sep. 24, 1987, 62-145770
Int. Cl.[4] B23C 9/00
U.S. Cl. 409—137 7 Claims

1. A chip breaking device for annular cutters each including a hollow cylindrical body having an outer periphery and an axis, said device being fixed to a boring machine, comprising:

a stem extending parallel with said outer periphery; and

at least three elongated chip breaking elements adapted to break chips around said annular cutter and extending parallel with each other and perpendicularly form said stem into proximity to said outer periphery, adjacent ones of said chip breaking elements being separated axially of said body, at a spacing, each of said chip breaking elements having a tip, the tips of all of said chip breaking elements being disposed on a plane parallel with said outer periphery.

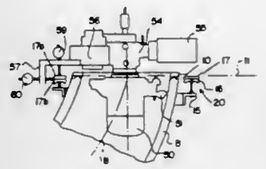


4,824,301

DEVICE FOR ADJUSTING THE WORKING POSITION OF A MACHINE FOR PRODUCING A CHAMFER

Alain Martin, Caluire, France, assignor to Framatome, Courbevoie, France

Filed Apr. 27, 1988, Ser. No. 186,996
Claims priority, application France, Apr. 27, 1987, 8705935
Int. Cl.[4] B23C 1/20
U.S. Cl. 409—179 7 Claims



1. Device for adjusting the working position and orientation of the axis of rotation of a machine producing a chamfer (10) on a rotationally symmetrical part of a hollow workpiece (5), said machine comprising a body (50) provided with adjustable fastening means (51) defining the axis of rotation (12) of the machine, and comprising a part (54) mounted for rotational movability about the axis (12) on the body (50) and carrying the chamfer machining tool, composed of an assembly of annular shape whose inside diameter is greater than the outside diameter of the part of the workpiece to be machined, and which comprises:

(a) a first ring (15), called the support ring, comprising means (18, 19) for fastening on the hollow workpiece (5) around the part to be machined, and screw adjustment means (25) bearing against the hollow workpiece (5) for the adjustment of the position of the support ring (15) in at least two directions at right angles to the axis of revolution of the part to be machined, as well as at least three adjustable support assemblies (20) regularly distributed on the circumference of the support ring (15),

(b) a second ring (16), or orientation ring, having a plane face and carried by the support ring (15) with the aid of support assemblies (20) of adjustable length enabling the position of the orientation ring (16) to be adjusted in the direction of the axis of revolution of the part to be machined and enabling its orientation to be adjusted in relation to the cross-sectional planes of the part to be machined which are perpendicular to the axis of revolution, and

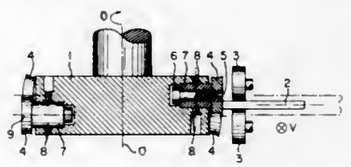
(c) a third ring (17), or adjustment ring, carried by the orientation ring (16) and provided with means (40) for its displacement in at least two directions of the plane of the orientation ring, and with means (42) for its fastening on the orientation ring (16), the adjustment ring (17) additionally comprising, on at least a part (17*a*) of its plane face opposite the plane of the orientation ring (16) and on at least a part (17*b*) of its side surface, zones machined to constitute two reference surfaces of the adjustment of the chamfering machine.

4,824,300

EDGE MILLER FOR MACHINING THE EDGES OF SHEET METAL

Josef Pomikacsek, Amunden, Austria, assignor to Linsinger Maschinenbau GmbH, Austria

Filed Feb. 19, 1987, Ser. No. 16,220
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1986, 3605861
Int. Cl.[4] B23C 3/12
U.S. Cl. 409—138 2 Claims



1. An edge miller for machining the edges of sheets advanced in motion relative thereto, said edge miller including a milling unit supported for rotation therein and in turn supporting circular cutters for rotation relative thereto, said milling unit having bearings for each of said circular cutters supporting such rotation thereof, said circular cutters having axes of rotation, which are disposed alternatingly above and below the thickness centerline of the sheet and determined by the bearings in both the axial and radial directions in such a way that each circular cutter has a cutting edge range between first and second cutting edge points, said first cutting edge point, when said circular cutter is in engagement with the workpiece, being a point obtained by projecting the axis of rotation of the cutter perpendicular to the direction of rotation of the milling unit until it intersects the circumference of the cutter, said second cutting edge point, when said second circular cutter is in engagement with the workpiece, being a point obtained by projecting the axis of rotation of the cutter parrallel to the direction of rotation of the milling unit until it intersects the circumference of the cutter, said first and second cutting edge points bounding said cutting edge range and machining forces between such cutting edge and said workpiece during such engagement thereof producing a torque for rotating said circular cutter.

4,824,302

EXTENSIBLE TWIST TO LOCK LOAD OR CARGO BRACING DEVICE

Kevin A. Schultheis, Dulzura, and Delmer Trimble, Santee, both of Calif.

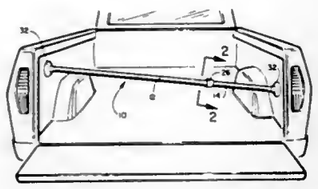
Filed Mar. 7, 1988, Ser. No. 165,231
Int. Cl.[4] B60P 7/06
U.S. Cl. 410—151 5 Claims

1. A telescoping load stabilizing supporting pole for attachment between adjacent surfaces comprising:

inner and outer telescoping tubular members, said inner tubular member having a smooth bore therethrough;

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locking means carried by said inner tubular member for locking said tubular member in a selected extended relative position against relative rotation, said locking means locking said tubular members in said extended relative position when said tubular members are rotated in opposite directions until locked against further rotation and releasing said tubular members from a locked together position by relative rotation in an opposite direction to the locking direction of rotation;



a lubricous bushing sleeve on the end of said outer tubular member for receiving said inner tubular member therethrough for smooth relative telescopic movement therebetween; and

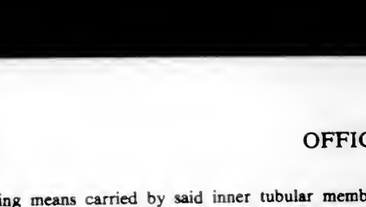
a suction cup attached to the distal ends of said tubular members, said suction cups having an extended pliable neck between their attachment to said tubular members and the distal end thereof.

4,824,303

LOCKING WEDGE APPARATUS FOR PRINTED CIRCUIT BOARD

William A. Dinger, Oakland, N.J., assignor to Rexnord Inc., Torrance, Calif.

Filed Sep. 24, 1987, Ser. No. 100,464
Int. Cl.[4] F16B *2/14*
U.S. Cl. 411—79 **9 Claims**



1. A locking wedge apparatus for locking a printed circuit board within an elongated slot in a rack, comprising:

a center wedge having sloped surfaces at its opposite ends;

first and second end wedges located at opposite ends of the center wedge and having surfaces that abut against the sloped surfaces of the center wedge;

a screw interconnecting the first and second end wedges, wherein the remote end of the screw, opposite the screw's head, threadedly engages a threaded bore in the first end wedge and projects beyond the first end wedge, and wherein rotation of the screw in a first direction draws the two end wedges toward each other such that the end wedges and interconnecting screw are deflected transversely by the sloped surfaces of the center wedge, to lock the printed circuit board within the elongated slot in the rack;

a friction nut threaded onto the portion of the remote end of the screw projecting beyond the first end wedge;

two flat, abutting low-friction spacers encircling the remote end of the screw, between the friction nut and the first end wedge;

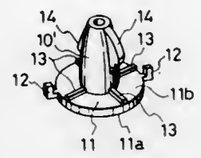
wherein the friction nut and two spacers prevent the screw from being inadvertently unthreaded fully from the first end wedge.

4,824,304

ROTARY WELDING MEMBER MADE OF RESIN

Teruji Shibayama, and Yoshio Kaneko, both of Yokohama, Japan, assignors to Nifco, Inc., Yokohama, Japan

Filed Jul. 22, 1987, Ser. No. 76,572
Claims priority, application Japan, Jul. 23, 1986, 61-173129
Int. Cl.[4] F16B *39/06*
U.S. Cl. 411—171 **22 Claims**



1. A rotary welding member integrally molded of synthetic resin material, comprising:

a post portion;

a disk-shaped flange portion integrally mounted upon one end of said post portion;

means mounted upon said rotary welding member for enabling high-speed rotation of said rotary welding member by means of a high-speed rotating tool;

said disk-shaped flange portion having a first surface to be friction welded to a substrate as a result of partial melting of said first surface of said disk-shaped flange portion in response to heat generated between said first surface of said disk-shaped flange portion and said substrate as a result of friction developed between said first surface of said disk-shaped flange portion and said substrate during said high-speed rotation of said welding member by said high-speed rotating tool while in contact with said substrate; and

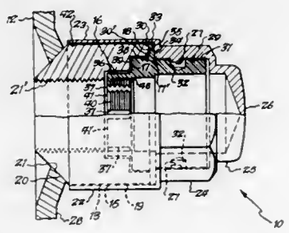
three or more radially extending ribs formed upon a second surface of said disk-shaped flange portion opposite said first surface for causing cooling air to flow across said second surface of said disk-shaped flange portion in order to dissipate an excess portion of said generated heat so as to prevent deterioration of said substrate.

4,824,305

DECORATIVE AND PROTECTIVE CAP FOR LOCKNUT

Lewis D. McCauley, Eggertsville, N.Y., assignor to McGard, Inc., Buffalo, N.Y.

Filed Mar. 15, 1988, Ser. No. 168,912
Int. Cl.[4] F16B *37/14*
U.S. Cl. 411—431 **24 Claims**



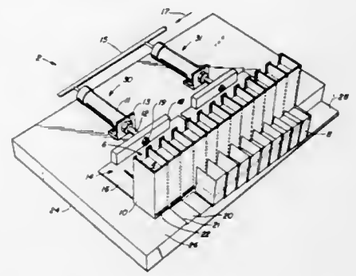
1. A decorative and protective cap capable of repeated mounting and demounting relative to a threaded stud proximate a locknut through which said threaded stud protrudes comprising an outer decorative shell having an inner shell surface and a predetermined outer configuration, a cap insert having an outer insert surface and an inner insert surface, interfitting means on said inner shell surface and said cap insert for retaining said cap insert within said decorative shell and for locking said outer decorative shell and said cap insert against relative rotational movement, thread means on said inner insert surface for receiving said threaded stud in threaded engagement to thereby effect repeated mounting and demounting of said decorative and protective cap on said threaded stud proximate said locknut, and wrench-receiving means on said outer shell for receiving a wrench in interfitting engagement for rotating said decorative and protective cap, said mounting and demounting being effected by applying a rotating force to said wrench-receiving means on said outer shell to thereby effect rotation of said cap insert relative to said threaded stud because of said locking engagement between said outer shell and cap insert against relative rotational movement.

4,824,306

COLLATING APPARATUS AND METHOD

Clarence L. Stevenson, Saint Helena, Calif., assignor to Colmac, Inc., Napa, Calif.

Filed Jun. 2, 1986, Ser. No. 869,360
Int. Cl.[4] B65G *57/10, 60/00*
U.S. Cl. 414—788.4 **15 Claims**



1. A laminate plastic chip workpiece sorting and stacking apparatus including:

a plurality of aligned vertical reservoirs; tines for ejecting one chip workpiece out of each of the bottoms of the vertical reservoirs;

ramp means adjacent to the reservoirs and inclined with respect to a substantially horizontal bottom line of the reservoirs for stacking the workpieces in vertical stacks of increasing height;

a plurality of orthogonal sextahedrons on the ramp means each having an open top and one open side for enclosing the vertical stacks of workpieces; and

the reservoirs having at least three workpiece encapsulating walls extending npwardly from the bottom line of the reservoirs for temporarily fixedly storing a multiplicity of uncollated workpieces.

4,824,307

APPARATUS FOR VERTICALLY STACKING BATTERY PLATES

Peter E. Johnson, and David A. Johnson, both of Corvallis, Oreg., assignors to Tekmax Inc., Tangent, Oreg.

Filed Feb. 11, 1988, Ser. No. 154,757
Int. Cl.[4] B65H *31/38*
U.S. Cl. 44—798.2 **6 Claims**

1. An apparatus for handling battery plates comprising:

(a) a pair of side-by-side endless drive loops each having a plurality of upwardly extending paddles connected thereto;

(b) said paddles arranged in sets with an upwardly opening pocket being created between each set for receiving, supporting and transporting a plurality of battery plates in a vertical stack, and one paddle in each set being attached to each of said drive loops;

(c) means for moving said drive loops in synchronization with one another so that the distance between the paddles in each set remains constant as said drive loops are moved;

(d) adjustment means for altering the phase relationship between said drive loops so as to change the distance between the paddles in each set;

(e) means for interrupting the movement of said drive loops when one of said pockets is in a loading position where it receives the plates which constitute said stack;



(f) means for opening said one of said pockets when it is in said loading position to facilitate the insertion of plates therein;

(g) counter means for determining the number of plates received by said one of said pockets when it is in said loading position;

(h) wherein said means for interrupting includes drive loop sequencing means which is responsive to said counter means for interrupting movement of said drive loops until a predetermined number of said plates have been received in said one of said pockets;

(i) means for blocking the plates in each of said pockets so that said plates are in horizontal alignment with one another; and

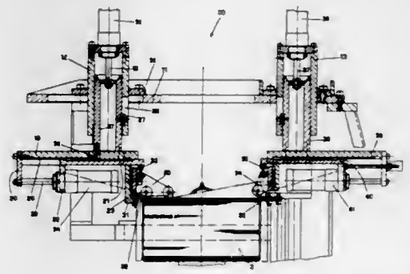
(j) means for centering the plates in each of said pockets so that said plates are in vertical alignment with one another.

4,824,308

SEPARATING AND LIFTING DEVICE FOR STACKED-UP FLAT ELEMENTS

Flavio Carboniero, and Aldo Pontini, both of Schio, Italy, assignors to Omera Spa, Schio, Italy

Filed Jul. 29, 1987, Ser. No. 79,115
Claims priority, application Italy, Jul. 29, 1986, 85583 A/86
Int. Cl.[4] B65H *3/50*
U.S. Cl. 414—797 **13 Claims**



1. A device for the separation and removal of flat elements such as metal sheets stacked in a pile, said device comprising: an open supporting frame having a lower central portion for

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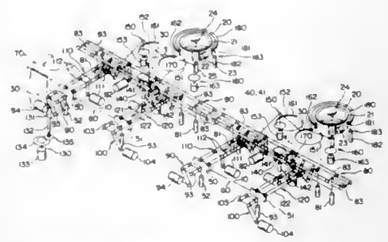
receiving a plurality of metal sheets and having two opposing lateral stands positioned on two opposing sides, respectively, of said pile;
first and second roller means provided at inner ends of said two lateral stands, respectively, for leaning on and guiding one metal sheet of said plurality of metal sheets;
first template means, provided below said first roller means, for horizontally displacing said one metal sheet;
second template means, provided below said second roller means, for lifting a segment of said one metal sheet subsequent to horizontal displacement by said first template means; and
means for removing said horizontally displaced and lifted one metal sheet from the remaining ones of said plurality of metal sheets;
whereby a successive separation of each one of said plurality of metal sheets is by horizontal displacement by said first template means and by subsequent lifting by said second template means.

4,824,309

VACUUM PROCESSING UNIT AND APPARATUS

Yutaka Kakehi, Hikari; Norio Nakazato, Kudamatsu; Yoshimasa Fukushima, Hikari; Fumio Shibata, Kudamatsu; Tsunehiko Tsubone, Kudamatsu, and Norio Kanai, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 674,772, Nov. 26, 1984, abandoned.
This application Sep. 8, 1986, Ser. No. 904,202
Claims priority, application Japan, Nov. 28, 1983, 58-222004
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—217 **9 Claims**



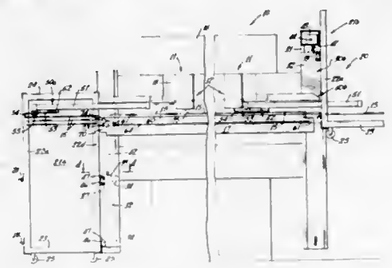
3. A vacuum processing apparatus comprising at least two connected vacuum processing units, wherein each of said vacuum processing units comprises:
a processing chamber means for processing a sample under a vacuum;
a substantially rectangular buffer chamber means adapted to be evacuated and communicatable with said processing chamber means;
a vacuum pre-chamber means communicatable with said buffer chamber means through a first vacuum opening/-closing for opening and closing a first opening in a first side wall of said buffer chamber means;
sample carrier means for carrying the sample between said vacuum prechamber means and said buffer chamber means, inside said buffer chamber means and between said buffer chamber means and said processing chamber means;
wherein said buffer chamber means includes at least one further opening at a location different from a location of said first opening so as to enable said sample to be removed and delivered between said sample carrier means to carry said sample inside the buffer chamber means and outside the buffer chamber means, said at least one further opening being provided in at least one side wall of the buffer chamber means disposed substantially normal to said first side wall and being non-communicatable with said prechamber means; and
wherein the two vacuum processing units are connected to each other in such a fashion that said buffer chamber means of one vacuum processing unit is capable of being communicated with said buffer chamber means of an adjoining vacuum processing unit through said at least one further opening.

4,824,310

AUTOMATED WORK-PIECE HANDLING SYSTEM FOR MACHINE TOOL

Wojciech B. Kosmowski, 26392 Calle Roberto, San Juan Capistrano, Calif. 92675, and Sabatino Capaldi, 30215 Via Victoria, Rancho Palos Verdes, Calif. 90274

Continuation of Ser. No. 773,502, Sep. 4, 1985, abandoned, which is a continuation of Ser. No. 470,457, Feb. 28, 1983, abandoned. This application Nov. 5, 1986, Ser. No. 928,628
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—222 **13 Claims**



1. An automated machine tool system comprising:
a machine tool having a plurality of workstations spaced along a longitudinally movable worktable, wherein automated machining operations are performed on workpieces at each workstation;
first transport means for transporting workpieces to one end of said machine tool, adjacent a first workstation;
first feeder means on said machine tool for (a) engaging workpieces on the first transport means, (b) drawing workpieces from said first transport means and delivering said workpieces onto said worktable, and (c) disengaging the workpieces after delivery to the worktable;
means for facilitating the shifting of workpieces to different workstations along the worktable, said means including means for maintaining the workpieces stationary while the worktable is moved in a first longitudinal direction thereby to shift each workpiece to an adjacent workstation;
means for selectively elevating workpieces above said worktable and lowering workpieces onto said worktable; and
means connected to said machine tool for engaging said workpieces when elevated above said worktable for preventing movement of said workpieces with said worktable as said worktable moves longitudinally whereby movement of said worktable with said workpieces elevated shifts said workpieces along said worktable.

4,824,311

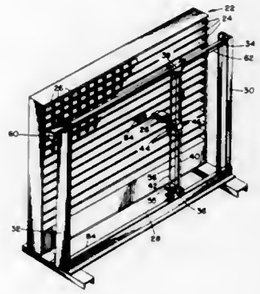
COMPONENT ASSEMBLY SYSTEM

Bruce L. Mims, P.O. Box 153, Greens Farms, Conn. 06436

Filed Dec. 29, 1986, Ser. No. 947,174
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—273 **7 Claims**

1. A system for transporting components to a predetermined location for assembly comprising:
a plurality of component containers each adapted to contain a supply of similar components;
rack means providing home positions for said containers in a plurality of substantially horizontal planes;

each said container being located in a predetermined home position on said rack means;
means providing an assembly position on one of said substantially horizontal planes of said rack means at which components may be withdrawn from the said containers;
means on the rack means for providing a ready position in the same substantially horizontal plane as the assembly position and adjacent to the assembly position for the containers;
transport means to individually transport the containers from their respective home positions to the ready position



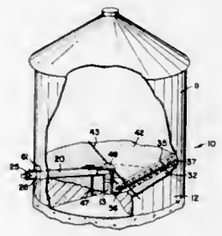
and from the assembly position back to the respective home positions;
moving means to move a container located in the ready position to the assembly position;
control means for the transport means and the moving means; and
whereby the control means activates the moving means to move a container from the ready position to the assembly position promptly upon the transport means moving a container from the assembly position, said transport means and moving means being separately and concurrently operable.

4,824,312

GRAIN STORAGE UNLOADING SYSTEM

Boyd D. Schiltz, R.R. #2, Box 88, Wessington, S. Dak. 57381

Filed Jan. 5, 1988, Ser. No. 141,110
Int. Cl.[4] B65G *65/46*
U.S. Cl. 414—310 **7 Claims**



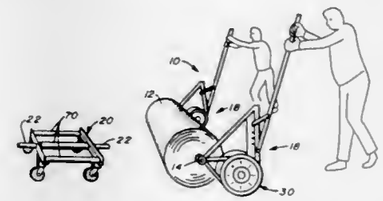
1. Apparatus for unloading grain from a storage bin having a floor, comprising:
(a) a discharge auger conveyor having a first auger, said discharge auger conveyor having an inlet end portion located at a first point inside said bin and an opposite outlet end communicating with a second point outside said bin;
(b) means for supporting said discharge auger conveyor including said inlet end portion spaced above said floor;
(c) means for conveying to said inlet end portion said grain incapable from flowing under the influence of gravity to said inlet end portion, said conveying means including a second auger;
(d) means for driving said first auger; and
(e) means for disconnectably coupling said first and second augers so that when said first and second augers are uncoupled, said grain is unloaded by only said first auger and when said first and second augers are coupled, said grain is unloaded by said second auger feeding said first auger, wherein said grain unloading apparatus is located completely above said floor so that said apparatus can be installed in a previously constructed bin having a floor.

4,824,313

DEVICE FOR LIFTING AND MOVING CARPET ROLLS

Marvin Miller, P.O. Box 5637, Tahoe City, Calif. 95730

Filed Nov. 27, 1987, Ser. No. 125,879
Int. Cl.[4] B62B *1/06*
U.S. Cl. 414—346 **15 Claims**



1. An apparatus for lifting a heavy, elongated roll of material so as to maneuver it onto a surface above ground level, comprising:
an elongated beam means adapted for insertion axially within said roll so that end portions of said beam means extend from each end of said roll;
a pair of lifting means for engaging each said end portion of said roll, each said lifting means comprising a fulcrum means, a pair of first and second rigid members attached to and extending divergently from said fulcrum means, a holder means attached to the end of said first member for engaging one extending end portion of said beam means; a lever arm means having an extended length and attached to said second rigid member; whereby with said beam means inserted in said roll of material and with said holder means engaging said extending end portions of said beam means, force applied to said lever arm means will cause said holder means to move about said fulcrum means and thereby raise said roll of material from the ground; said apparatus further including in combination a generally rectangular platform means for supporting the roll of material after it has been lifted from the ground level; and extended transverse side members projecting outwardly from said platform and adapted to be engaged by said holder means of said lifting means.

4,824,314

COMPOSITE FASTENER SYSTEM AND MANUFACTURING METHOD THEREOF

Edgar L. Stencel, Alta Loma, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

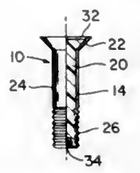
Continuation-in-part of Ser. No. 702,783, Feb. 19, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 14,903
Int. Cl.[4] F16B *35/00*
U.S. Cl. 411—378 **11 Claims**

1. A lightweight threaded fastener having a high resistance to shear and compression forces and capable of withstanding high tension loads, comprising:

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a metallic load bearing shell in the form of a generally cylindrical member having a flanged head portion for engaging a surface of a workpiece to be joined and a shank portion extending from said flange for extending through workpieces to be joined, said shank portion being enclosed at an end thereof opposite said head portion and including external threads in said shank extending from the closed end along at least a portion of said shank toward said head portion,

means forming a threaded surface internal to said cylindrical member, said externally and internally threaded portion of said shank having a thickness at least twice the height of the external thread of the shank and not greater than 2.2 times the height of said external thread, and



an internal core of material having a density less than the density of the metallic load bearing shell conformally filling the internal surfaces of the cylindrical member and bonded thereto, said internal core having mating treads complementary to the inner threaded surfaces of said cylindrical member and further including a flange portion in intimate engaging contact with the flange portion of said cylindrical member so as to form a fastener element having unitary external metal load bearing surfaces with an internal core member molded and bonded thereto wherein tension forces between the external threads of said cylindrical member and the flange portion of said cylindrical member are shared between said core member and said shell.

4,824,315
EQUIPMENT FOR EMPTYING CONTAINERS STATEMENT AS TO RIGHTS TO INVENTIONS MADE UNDER FEDERALLY-SPONSORED RESEARCH AND DEVELOPMENT

Jakob Naab, Mainz; Karl-Heinz Dröge, Löhne, and Hans-Joachim Pieperhoff, Zornheim, all of Fed. Rep. of Germany, assignors to Zoller-Kipper GmbH, Mainz-Laubenheim, Fed. Rep. of Germany

Filed Jul. 20, 1987, Ser. No. 75,733
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1986, 3624590
Int. Cl.[4] B65F *3/02*
U.S. Cl. 414—408 **18 Claims**

1. Equipment for emptying containers, said equipment comprising in combination:

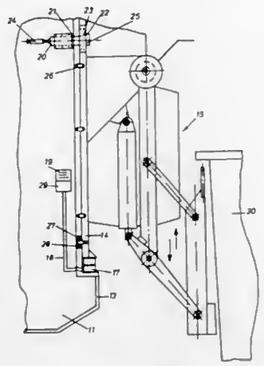
(a) a pour-in utility provided with a pour-in opening and with structural means, including stressable members, adapted to grasp, lift, return and off-load said containers,

(b) a force transducer which is carried by a member of said means and which is responsive to strain in the said member during the operation of said means,

(c) said pour-in utility further including indicator means having a control and computing unit,

(d) said indicator means being connected with said force transducer to receive signals therefrom, and having timing circuitry for selecting predetermined time interval windows during which readings from said force transducer are made,

(e) one of said time interval windows existing during the lifting of said containers by said structural means, and another of said time interval windows existing during the return of said containers, said indicator means automatically providing weight difference readings corresponding to the signals received from the force transducer during said other time interval window and said one time interval window,

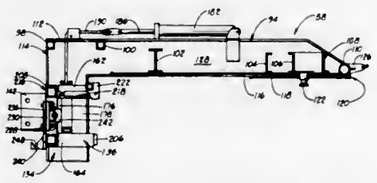


(f) the said weight difference readings indicating the weight of the contents of the container which have been emptied therefrom and poured into the pour-in opening of the pour-in utility.

4,824,316
TRANSPORT SYSTEM

James R. Cobb, Oklahoma City, Okla., assignor to Incorporated Tank Systems, Inc., Oklahoma City, Okla.

Filed Jan. 4, 1988, Ser. No. 140,395
Int. Cl.[4] B60P *3/40*
U.S. Cl. 414—458 **18 Claims**



1. A system for mobilizing a structure for transport to a site of use by a towing vehicle, comprising:

a wheeled dolly;

two coupling members, one mountable on the towing vehicle and one mounted on the dolly, for coupling opposite ends of the structure to the towing vehicle and the dolly during transport of the structure;

wherein a fixed connector is mounted at a selected location on each end of the structure and wherein each coupling member comprises:

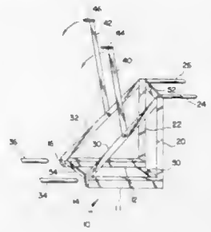
a fixed connector mounted at a selected location on one end of the coupling member to mate with the fixed connector on one end of the structure; and

structure positioning means for independent vertical, longitudinal and lateral positioning of said one end of the structure so as to mate the connector on the structure with the connector on the coupling member.

4,824,317
FORK LIFT EXTENSION DEVICE

Jurgen R. Schroder, P.O. Box 5]6], Houston, Tex. 77262

Filed Sep. 28, 1987, Ser. No. 101,573
Int. Cl.[4] B66F *9/12*
U.S. Cl. 414—607 **8 Claims**



1. An extension device for a forklift truck, the forklift truck having forwardly extending truck fork tines comprising flat elongated members mounted on a truck carriage, the truck carriage movably connected to the truck so that the truck carriage is vertically movable with respect to the truck, the extension device comprising

a frame, having a top and a bottom, the frame having a top cross member having a notch area therein for facilitating emplacement of extension fork tines on the top cross member,

channels in the bottom of the frame for receiving and holding the truck fork tines,

one or more extension fork tines comprising flat elongated members extending from the frame parallel to the truck fork tines at a point above the bottom of the frame, the extension fork tines disconnectably secured to the frame,

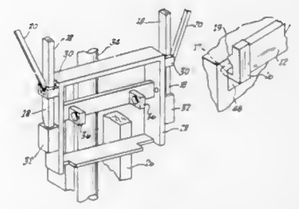
one or more arms pivotably mounted to the frame for disconnectably engaging a portion of the carriage thereby securing the frame to the carriage, and

the extension fork tines having holding elements secured thereto which are emplaceable about the top cross member at the notch area and are then slidable onto an area of the top cross member away from the notch area so that the extension fork tines are held securely about the top cross member.

4,824,318
QUICK DISCONNECT CONTAINER CARRIER

Angel Dones. Miami, Fla., assignor to Glenn Warner and Mark McCortney, both of Ocean Beach, Calif.

Continuation-in-part of Ser. No. 596,819, Apr. 4, 1984, abandoned. This application Jun. 11, 1986, Ser. No. 873,861
Int. Cl.[4] B66F *9/14*
U.S. Cl. 414—607 **4 Claims**



1. A quick disconnect container carrier comprised of:

an elongated horizontal frame member sized to span the longitudinal length of a conventional cargo container;

a pair of hook means rigidly disposed one at each end of said elongated frame member sized and shaped for mating releasable connection to said cargo container;

a pair of parallel vertical leg members rigidly connected to said horizontal frame member separated by a distance equal to approximately the outer width of a conventional fork lift carriage;

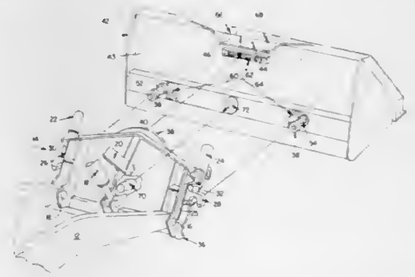
a pair of transverse brace members connected kittycorner between said vertical legs and said horizontal frame member;

a pair of leg member bracket means for accepting said vertical leg members in male-female mating association, each of said bracket means being rigidly connected to a side portion of said fork lift carriage.

4,824,319
LOADER COUPLER

Carroll H. Arnold, Westminster, Mass., assignor to Wain-Roy, Inc., Hubbardston, Mass.

Filed Sep. 2, 1987, Ser. No. 92,173
Int. Cl.[4] E02F *3/81*
U.S. Cl. 414—723 **20 Claims**



1. A coupler for attaching and detaching a tool for use on wheel or track loaders and material handlers having an hydraulically operated arm, comprising

a coupler frame hingedly mounted at the end of said arm and adapted to be swung in a vertical plane by means on said arm,

a radius plate mounted on said frame in a plane generally parallel to that of said frame and forwardly thereof,

a central pivot pin mounted on said frame below said plate and extending forwardly of said frame,

said pin being at the focal point of curvature of the rim of said radius plate,

a receptacle mounted on the top rear face of the tool to be coupled and adapted to receive and retain the upper edge portion of said radius plate as the coupler is moved into coupling engagement with said tool thereby raising said tool and locking the upper portion of the tool to the coupler frame after coupling,

means providing a central pivot pin bore in the lower rear face of said tool adapted to receive said central pivot pin during coupling and to pivotally retain the same while the tool is coupled,

bearings mounted on the rear face of said tool within said receptacle for engagement with the curved surface of said plate during coupling,

tool connection pivot pins extending rearwardly from the lower rear face of the tool to be connected,

locking means on said frame adapted to engage said pivot pins to retain the lower portion of said tool in coupled engagement with said frame, and

shoulder means on the ends of said pins for preventing relative axial movement of said pins and locking means while the tool is coupled to the frame.

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4,824,320

DEVICE FOR PICKING UP, DISPLACING AND DELIVERING PRODUCTS

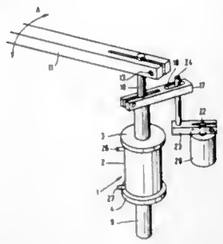
Jan Zwijnenburg, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1988, Ser. No. 160,423

Claims priority, application Netherlands, Mar. 30, 1987, 8700735

Int. Cl.[4] G66C *23/00*

U.S. Cl. 414—744.3 9 Claims



1. A device for picking up, displacing, and delivering products in analysis apparatus comprising

a rod being reciprocatingly displaced in a longitudinal direction, and said rod being rotatingly movable about said longitudinal direction,

supporting means connected to said rod for handling products, said supporting means extending transversely to said rod,

an adjustable arm extending outwardly from said rod,

motor means for driving said adjustable arm in rotation about an axis of rotation parallel to the center line of said rod,

drive means for reciprocating said rod in said longitudinal direction, said drive means including

(a) a piston cylinder having means for admitting or extracting pressurized fluid to or from said piston cylinder,

(b) a bush supporting said rod and extending through said piston cylinder to said adjustable arm,

(c) a piston in said piston cylinder secured to said bush, said piston and said bush being displaceable parallel to the center line of said bush by admission or extraction of said pressurized fluid, and

(d) means for restricting longitudinal displacement of said rod with respect to said bush in at least one direction.

4,824,321

DEVICE FOR TURNING OVER A LENGTH OR SHEET OF FLEXIBLE MATERIAL

A. H. van der Donk, Almere; F. van den Berg, Beekbergen, and J. Snoeij, Hengelo, all of Netherlands, assignors to Research-Vereniging Nederlandse Kleding-Entricotage-Inds., Amsterdam, Netherlands

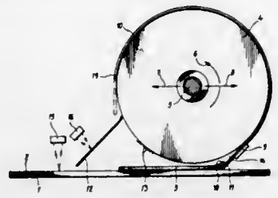
Filed Nov. 19, 1987, Ser. No. 122,901

Claims priority, application Netherlands, Nov. 20, 1986, 8602953

Int. Cl.[4] B65H *15/00*

U.S. Cl. 414—757 20 Claims

1. Device for turning over a length of flexible material, such as a length of textile fabric, consisting of; a supporting surface for the length, a turning over apparatus positioned above said supporting surface and extending transversely across said supporting surface, means for effecting relative to and fro movement of said turning over apparatus with respect to the supporting surface in a direction perpendicular to said transverse direction and parallel to said supporting surface, said turning over apparatus having an endless work surface driven in one direction and whose lower part is at a working distance above the top surface of said supporting surface, which distance is equal to or greater than the thickness of the length to be turned over, the speed at which said work surface is driven during the relative movement of said turning over apparatus over said supporting surface speed being essentially equal to the relative displacement speed between said work surface and said turning over apparatus, a foil which is located above said work surface to form a space between the work surface and the foil and which includes a pick-up plate attached to said turning



over apparatus and extending toward said supporting surface at an acute angle to said supporting surface which forms a feed slot with the work surface for picking up a length from said supporting surface upon relative movement between said turning-over apparatus and said supporting surface transferring said length into the space between said work surface and said foil and depositing said length in inverted orientation back onto said supporting surface.

4,824,322

PERIPHERAL TOROIDAL BLOWERS

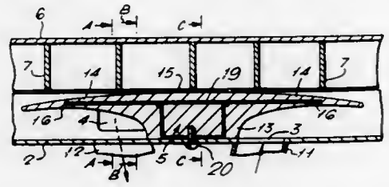
Andrew H. Middleton, Southampton, United Kingdom, assignor to British Gas Corporation, London, England

Continuation of Ser. No. 378,235, May 14, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,493

Claims priority, application United Kingdom, Aug. 3, 1981, 8123667

Int. Cl.[4] F01D *1/12*

U.S. Cl. 415—53 T 10 Claims



1. A peripheral toroidal blower comprising:

a stator housing having adjacent inlet and outlet ports,

a rotor housing containing a series of impeller blades,

said stator and rotor housings being mounted for relative rotation and defining a toroidal chamber therebetween,

a stripper mounted in said toroidal chamber and between said inlet and outlet ports,

said stripper and said impeller blades cooperating, when said stator and rotor housings rotate relatively, to induce the flow of air through said inlet port, around said toroidal chamber along a helical path and out through said outlet port,

said stripper including a central block part and a pair of shaped vanes projecting respectively in opposite directions from said block part around said stator chamber,

said vanes being respectively located in spaced, partial covering relationship relative to said inlet and outlet ports, the radial width of each said vane diminishing gradually from its point of connection with said block part to its free end, and

stripper active surfaces defined by substantially all of the surfaces of said block part and said vanes upon which air passing through said peripheral toroidal blower impinges during operation, and formed of a cellular construction so that the generation of noise is reduced at blade passing frequency resulting from the interaction between said impeller blades and said stripper active surfaces during said relative rotation.

4,824,323

RADIAL TURBO-MACHINE WITH DISC DIFFUSOR

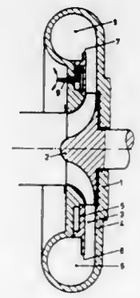
Hartmut Griepentrog, Müllheim, and Helmut Beer, Berlin, both of Fed. Rep. of Germany, assignors to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,102

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707103

Int. Cl.[4] F04D *29/46*

U.S. Cl. 415—148 5 Claims



1. A turbo-operation machine of radial design, comprising: a housing: a rotor disk rotating in said housing; said rotor disk having a disk diffusor downstream of said rotor disk; said disk diffusor having a diffusor channel with a radial length differing locally so that the static pressure at the circumference of said disk diffusor is substantially uniform; said disk diffusor rotatable about an axis of rotation of said rotor disk.

4,824,324

WATER PUMP

Michitoshi Mitsumaru; Keiichi Furukawa; Teruo Ojima, and Shiro Sawa, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

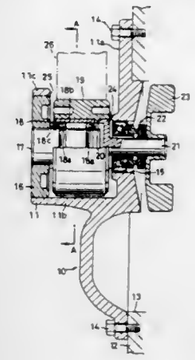
Filed Apr. 29, 1988, Ser. No. 188,530

Claims priority, application Japan, May 1, 1987, 62-109364; Aug. 17, 1987, 62-204542; Aug. 17, 1987, 62-204544; Aug. 17, 1987, 62-204543

Int. Cl.[4] F04D *29/08*

U.S. Cl. 415—170 A 8 Claims

1. A water pump comprising a pump shaft having an impeller and mounted on one end portion of a pump housing with a seal provided therebetween, a stationary shaft in alignment with the pump shaft and supported at its one end by the other end portion of the pump housing, a pulley for reeving a belt therearound provided around the outer ring of an antifriction bearing mounted around the stationary shaft within the pump housing, and a watertight flange positioned between the seal and the antifriction bearing and fixedly provided between the



end portion of the pump shaft and the end portion of the pulley.

4,824,325

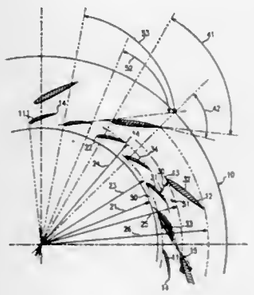
DIFFUSER HAVING SPLIT TANDEM LOW SOLIDITY VANES

Phiroze Bandukwalla, Olean, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,592

Int. Cl.[4] F04D *29/44*

U.S. Cl. 415—211 4 Claims



1. In a compressor diffuser, the improvement comprising:

a first stage of low solidity vanes;

a second stage of low solidity vanes;

each vane having a leading edge and a trailing edge;

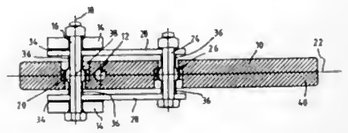
the leading edges of the second stage being located radially outward from the trailing edges of the first stage vanes;

the second stage vanes being fewer in number than the first stage vanes; and

each second stage vane being in substantial alignment with the flow of fluid passing over a particular first stage vane.

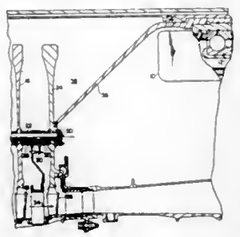
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4,824,326
AUTOGYRO
James A. Watts, Colchester, England, assignor to Property Associates Limited, Colchester, England
Filed May 28, 1987, Ser. No. 55,232
Int. Cl.[4] B64C *27/52*
U.S. Cl. 416—102 8 Claims



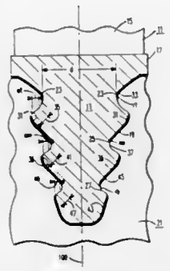
1. In an autogyro having a rotor head supporting rotor blades, an autogyro pitch and roll control means comprising:
a support for the rotor heads;
a spherical bearing on which the rotor head support is mounted;
means for rotating the rotor head support about a pitch axis through the center of the spherical bearing for pitch control of the autogyro;
means operational independently of the pitch axis rotating means for rotating the rotor head support about a roll axis through the center of the spherical bearing orthogonal to the pitch axis and for roll control of the autogyro; and
restraining means acting to prevent rotation of the rotor head support about an axis orthogonal to both the pitch and roll axes, including the orthogonal axis through the center of the spherical bearing.

4,824,327
GAS TURBINE ENGINE OIL DRAIN SLOT
George F. Titterton, III, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 15, 1987, Ser. No. 133,473
Int. Cl.[4] B64C *11/30*; F01D *25/18*
U.S. Cl. 416—174 2 Claims



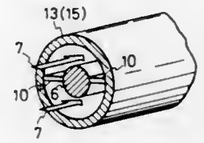
1. An apparatus for draining spillage oil from the rotor of a gas turbine engine comprising:
a disk carrying blades;
a shaft portion of a rotor having a first small radius;
a bearing supporting said shaft portion;
an impervious conical hub connecting said shaft portion at said first radius and said disk at a second large radius;
an outwardly radially extending flange integral with said conical hub at said second radius having an abutment surface parallel to and abutting said disk;
a substantially radial groove through the radial extent of said abutment surface for drainage of oil from the interior of said conical hub.

4,824,328
TURBINE BLADE ATTACHMENT
Frank A. Pisz, Titusville, Fla.; Arthur S. Warnock, Bethlehem, Pa., and Roger W. Heinig, Cocoa Beach, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 22, 1987, Ser. No. 53,237
Int. Cl.[4] B21K *3/04*
U.S. Cl. 416—219 R 11 Claims



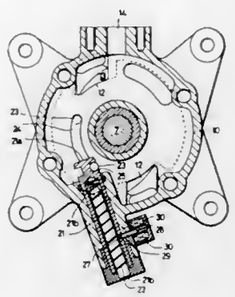
1. A bilaterally serrated steeple shaped side entry root, symmetric about a surface of symmetry, for attaching a turbine blade to a rotor, the rotor having a longitudinal axis of symmetry, the blade having a foil portion and a platform interposed between the foil portion and said root, said root positionable in a complementary steeple shaped groove disposed about the turbine rotor, said root comprising:
an upper serrated portion positioned against the platform, said upper portion including a pair of upper tangs symmetrically arranged on opposite sides of said root, a pair of upper fillets each spaced a distance d apart and having a radius of curvature, rt, of at least 0.14 d, each upper fillet positioned between a corresponding one of the upper tangs and the platform, and a pair of upper lands, each of the lands being positioned between a corresponding one of the fillets and an associated one of the tangs, the upper lands having a projected width, wt, no greater than 0.56 rt, said projected width taken along a plane perpendicular to the surface of symmetry and parallel to the rotor axis for the transmission of centrifugal forces between the turbine blade and the rotor;
a middle serrated portion extending from said upper portion in a direction away from the platform, said middle portion including a pair of middle tangs symmetrically arranged on opposite sides of said root, a pair of middle fillets each having a radius of curvature, rm, of at least 0.08 d, each middle fillet positioned between an upper tank and a middle tang on opposite sides of said root, each middle fillet adjoining a different middle land, and two middle lands, each of the middle lands having a projected width, wm, no greater than 1.15 rm, each middle land being interposed between a middle fillet and a middle tang for the transmission of forces between the turbine blade and the rotor; and
a lower serrated portion extending from said middle portion in a direction away from the platform, said lower portion including a pair of lower tangs symmetrically arranged on opposite sides of said root, a pair of lower fillets each having a radius of curvature, rb, at least 0.08 d, each lower fillet positioned between a middle tang and a lower tang on opposite sides of said root, each lower fillet adjoining a different lower land, and the two lower lands each having a projected width, wb, no greater than 1.1 rb, each lower land interposed between a lower fillet and a lower tang for the transmission of forces between the turbine blade and the rotor.

4,824,329
METHOD AND APPARATUS FOR CONTROLLING LIQUID METAL FLOW
Hajime Yamamoto; Tadashi Gotou; Masanori Yamakawa; Noboru Nakao, all of Hitachi, and Takashi Ikeda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 18, 1986, Ser. No. 875,680
Claims priority, application Japan, Jul. 5, 1985, 60-146566; Nov. 29, 1985, 60-267156
Int. Cl.[4] H02K *44/00*
U.S. Cl. 417—50 14 Claims



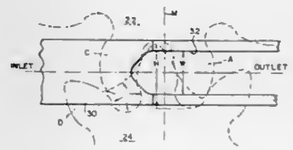
4. An apparatus for controlling a flow of liquid metal comprising:
a flow path means for liquid metal located where a magnetic field and an electric current intersect perpendicularly to each other, while the flow path means for liquid metal perpendicularly intersects both the magnetic field and the electric current;
means for generating the magnetic field; and
material varying in electric property with a temperature of the liquid metal and installed in at least one of the path of the magnetic field, a path of the electric current and the means for generating the magnetic field.

4,824,330
VARIABLE-CAPACITY GAS COMPRESSOR
Takeshi Kobayashi, and Junichi Asai, both of Chiba, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Chiba, Japan
Filed Mar. 27, 1987, Ser. No. 32,063
Claims priority, application Japan, Mar. 28, 1986, 61-45773[U]; Mar. 31, 1986, 61-47590[U]
Int. Cl.[4] F04B *49/02*; F04C *29/08*
U.S. Cl. 417—295 12 Claims



1. A variable-capacity gas compressor for use with an automobile air conditioning system for cooling the automobile passenger compartment, comprising:
a cylinder;
front and rear side blocks attached to ends of said cylinder;
a rotor disposed horizontally for rotation within said cylinder and having a plurality of vanes slidable in the radial direction;
a control plate formed with a recess which communicates with a communication port in the front side block and a cylinder chamber, and secured to the inner side of said front side block for rotation within a given angular range;
a driving means for driving said control plate, having a front end thereof connected to said control plate and a rear end thereof exposed to the outside of the compressor and thus to atmospheric pressure, a piston cylinder which moves into and out of a suction chamber and a spring which urges said piston cylinder into said suction chamber; and
a control means for enabling said piston cylinder to actuate in accordance with the temperature in the passenger compartment to thus control said driving means and said control plate.

4,824,331
VARIABLE DISCHARGE GEAR PUMP WITH ENERGY RECOVERY
Charles J. Bowden, Battle Creek, Mich., assignor to Hydreco, Incorporated, Augusta, Ga.
Filed Jul. 29, 1987, Ser. No. 79,010
Int. Cl.[4] F04C *29/08*; F04B *49/02, 49/08*
U.S. Cl. 417—310 13 Claims



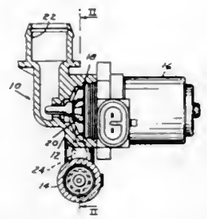
1. A variable discharge gear pump comprising:
an inlet chamber and outlet chamber;
a pair of gears rotatable about parallel axis in opposite direction and have an intermeshing area between said inlet and outlet chambers, said intermeshing area having a meshing area of decreasing displacement at said outlet chamber and a demeshing area of increasing displacement at said inlet chamber;
adjustment means in fluid communication with said outlet chamber for adjustably providing high pressurized fluid from said outlet chamber to selected portions of said demeshing area adjacent said meshing area of said intermeshed gears to vary the discharge flow of the pump and vary the amount of energy recovery; and
said adjustment means including a spool having a slot, said slot being in continuous communication with said outlet chamber and positioning means for moving said spool rectilinearly along an axis to align said slot in communication with selected portions of said intermeshing area.

4,824,332
REVERSIBLE PUMP ASSEMBLY
Jimmie G. Perkins, Monroe, and James W. Grim, Cookeville, both of Tenn., assignors to McCord Winn Textron Inc., Winchester, Mass.
Filed Mar. 7, 1988, Ser. No. 164,833
Int. Cl.[4] F04B *39/10*; F04D *18/00*
U.S. Cl. 417—315 2 Claims

1. A windshield washer pump assembly comprising an impeller chamber, a reversible impeller rotatably mounted in the impeller chamber, an inlet for windshield washer fluid communicating with the impeller chamber, an outlet chamber, dual outlets communicating between the impeller chamber and opposite ends of the outlet chamber, a piston slidably mounted in the outlet chamber, axially aligned tubular discharge passages extending from the outlet chamber, oppositely disposed projections formed on said piston for being alternatively urged into engagement with said tubular discharge passages for alternately pumping fluid through the tubular discharge passages

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wherein said outlet chamber and said piston and cylindrically shaped, with said piston having conically shaped recesses



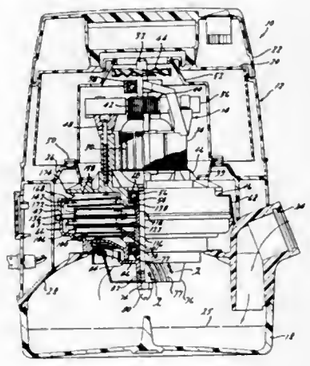
formed in opposite ends thereof and bottoming out in respective flat surfaces, said projection being a concentric, conically shaped projection formed on each flat bottom surface.

4,824,333

AIR BLOWER ASSEMBLY FOR VACUUM CLEANERS

Roy O. Erickson, Jr., Cadillac, Mich., assignor to Rexair, Inc., Troy, Mich.

Division of Ser. No. 782,510, Oct. 1, 1985, Pat. No. 4,735,555. This application Mar. 18, 1988, Ser. No. 169,820
Int. Cl.[4] F04B *39/14*
U.S. Cl. 417—360 4 Claims



1. In a blower assembly for a vacuum cleaner of the type having one or more rotating fan assemblies, one or more stage assemblies, and a motor base, the improvement comprising,

said motor base having an outer depending ring portion with an inner diameter which closely receives said stage assembly, said ring portion inner diameter further having one or more inwardly projecting lugs, said motor base further having a central spool portion with one or more pockets, and

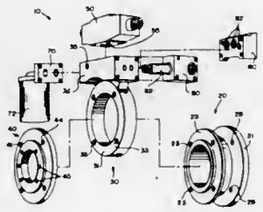
said stage assembly having a stage back with one or more outer peripheral notches, and stage assembly further having a stage plate with a central hole having one or more inwardly projecting tabs, said spool portion pockets receiving said tabs and permitting said fixed stage assembly to be rotated to a position at which said notches engage said lugs thereby locking said fixed stage assembly in an assembled condition with said motor base.

4,824,334

MODULAR HYDRAULIC POWER SYSTEM

Ronald D. Ramsay, 1357 Hartnell Ave., #C, Redding, Calif. 96002

Filed Nov. 2, 1987, Ser. No. 115,711
Int. Cl.[4] F04B *49/00*
U.S. Cl. 417—360 6 Claims



1. A modular hydraulic power system comprising

an annular frame,

an annular motor adapter adapted to be removably attached to a motor and to said frame, and

an annular pump adapter adapted to be removably attached to a pump and to said frame opposite said motor adapter,

said annular frame including a valve mount, said valve mount containing a manifold with an arrangement of passages and having a mounting surface with ports and bolt-accepting holes formed thereon according to a standard pattern, said ports opening into said passages, and said mounting surface being adapted for attachment of a directional control valve.

4,824,335

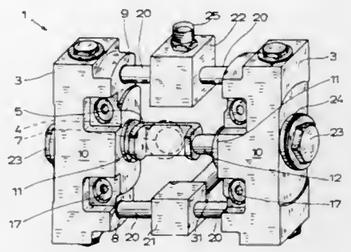
MODULAR HIGH PRESSURE PUMP

Klaus Lubitz, Meppen, and Wolfgang Suttner, Bielefeld, both of Fed. Rep. of Germany, assignors to Elektra-Beckum Lubitz & Co., Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,209
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705608
Int. Cl.[4] F04B *37/12, 39/12*
U.S. Cl. 417—360 5 Claims

1. A high pressure pump for fluids of a frame-like modular construction having a pair of identical piston pump units, each of which is comprised of an elongated block-like casing within which a working space is provided, reciprocating pump pistons of which are connected to each other and to a motor via a drive shaft and a drive unit that has a drive element and a power transmission element extending between the pistons, and said pump also having a support member to which said elongated block-like casings of the pump units are fixedly connected; wherein an inlet and outlet of each pump unit is disposed at a respective end portion of the respective casing of the pump unit and a duct, through which a portion of the respective pump piston sealingly passes through the casing to move back-and-forth within said working space, is disposed between the inlet and outlet, said inlet, outlet, and duct of each pump unit being oriented parallel to each other on a longitudi-

nal side of the respective casing and the inlet, outlet, and duct of one pump unit being axially aligned with the respective inlet, outlet, and duct of the other pump unit, said inlet and outlet of each pump unit being connected by a respective collection pipe to a common central inlet and a common central outlet, respectively, each of the collection pipes being a straight pipe piece and the central inlet and central outlet being T-pieces, and said inlets and outlets of the pump units being formed with sealed plug-in sockets for the ends of the collection pipes.

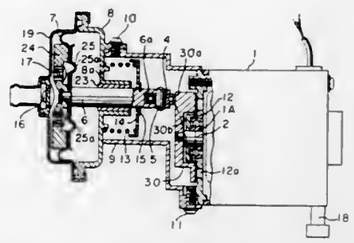


4,824,336

VACUUM PUMP

Yoshiyuki Iwaki, Himeji; Akio Matsumoto, Hyogo, and Kimiaki Seki, Kasai, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 6/908,971, Sep. 17, 1986, abandoned, which is a continuation of Ser. No. 6/685,898, Dec. 24, 1984, abandoned. This application Apr. 21, 1988, Ser. No. 180,199
Claims priority, application Japan, Dec. 26, 1983, 58-203637[U]
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—415 4 Claims



1. A vacuum pump comprising:

(a) a slide shaft mounted for axial reciprocal movement;

(b) a motor encased in a motor housing having a forward face having a forward surface;

(c) a bearing mounted in said forward face of said motor housing and extending forwardly therefrom;

(d) a motor shaft journaled in said bearing and extending forwardly therefrom;

(e) a cup-shaped bearing case comprising a planar bottom and a cylindrical lip surrounding the forward extension of said bearing,

(i) the forward surface of said bearing making planar contact with the rearward surface of said planar bottom of said bearing case,

(ii) the outer surface of the forward extension of said bearing making cylindrical contact with the inner surface of said cylindrical lip,

(iii) the rearward surface of said cylindrical lip making planar contact with said front surface of said forward face of said motor housing, and

(iv) said motor shaft extending through a hole in said planar bottom of said cup-shaped bearing case; and

(f) a cam plate mounted on said motor shaft for rotary motion therewith,

(i) said cam plate comprising a cylindrical body having a first axial surface facing said motor housing and a second axial surface facing said slide shaft,

(ii) said first axial surface of said cam plate being coplanar with the rearward surface of said cylindrical lip,

(iii) said cam plate containing an axial recess sized, shaped, and positioned to closely receive but not to contact the outer surface of said cylindrical lip and the forward surface of said planar bottom of said bearing case, said axial recess having a bottom surface defining an end of a bore into which said motor shaft is fitted, and

(iv) said second axial surface of said cam plate having an annular cam surface therein sized, shaped, and positioned to engage said slide shaft so that rotary motion of said cam plate is translated into axial motion of said slide shaft,

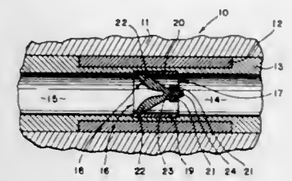
wherein said annular cam surface extends both axially and circumferentially with respect to said cam body, and wherein more than one half of said annular cam surface is positioned rearwardly of said bottom surface of said axial recess.

4,824,337

VALVE ASSEMBLY FOR AN OSCILLATING PUMP

Darrell M. Lindner, Ashland, and John R. Freeman, Bellville, both of Ohio, assignors to The Gorman-Rupp Company, Bellville, Ohio

Filed Dec. 24, 1987, Ser. No. 137,592
Int. Cl.[4] F04B *17/04, 21/04*
U.S. Cl. 417—417 6 Claims



1. A valve assembly for an oscillating pump of the type having a reciprocating armature carrying an impeller which defines a pump chamber for the passage of fluid, the assembly comprising a valve seat made of a rigid material and carried by the impeller for reciprocating therewith, and an elastomeric valve carried by said valve seat, said valve including a valve stem and a retaining barb at the end of said valve stem, said valve seat including a cylindrical portion engageable by said valve, and means extending across said cylindrical portion within the pump chamber to engage said valve stem, said retaining barb maintaining said means engaged with said valve stem, said valve being in the pump chamber and dividing the same into a pump inlet side and pump outlet side such that during reciprocation of the impeller said valve alternatingly discharges fluid from said pump outlet side by engagement with said valve seat and permits the passage of fluid from said pump inlet side to said pump outlet side by disengagement from said valve seat.

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4,824,338

PUMP ARRANGEMENT WHICH INCLUDES AXIALLY EXTENDING CYLINDRICAL RING NOSES ON CONED RINGS WITH A CENTERING RING AND SEAL RING RADIALLY OF THE FACE WHEREIN TWO OF THE RING NOSE ARE OPPOSITIONALLY DIRECTED AND LAID TOGETHER

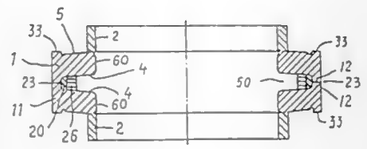
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 788,174, Oct. 16, 1985, Pat. No. 4,701,113, which is a continuation-in-part of Ser. No. 853,244, Apr. 17, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 87,849

The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.

Int. Cl.[4] F04B *43/00*; F01B *19/00*

U.S. Cl. 417—472 **3 Claims**



1. A pump, comprising, in combination, a fluid containing working chamber (**50**) with inlet- and outlet- valves (**69, 70**) formed between at least one first hollow coned ring element (**1, 11**) and at least one closing wall portion (**6, 7, 66, 1, 11**) with said hollow coned ring and said chamber subjected to periodic axial compression and expansion by an arrangement which includes a reciprocating piston (**66**) which at least indirectly subjects said coned ring element and thereby said working chamber to periodically alternating compression and expansion,

wherein an improvement is provided and includes the provision of a substantially cylindrically shaped, axially extending, ring nose provided on the radial outer portion of said coned ring element, extending in axial direction oppositionally directed relative to the axial direction of the cone of said coned ring element with said axially extending ring nose (**12**) ending in an axial end face (**13**), whereby a meeting face (**23**) is formed between said end face (**13**) and the face (**13**) which it meets,

wherein a second coned ring element is laid with its radial outer portion and thereby with its end face of its axial extension against the end face of said axial extension of said first coned ring element to form by both of said end faces (**13**) a seal seat (**23**) for a fluid containing chamber (**50**) between said two coned ring elements,

wherein a centering ring (**20**) of rigid material and of a radial extension of a small fraction of the radial extension of said coned ring elements is assembled radially of said seal seat (**23**) and thereby between portions of said coned ring elements (**1** and **11**), while a plastically deformable seal ring (**26**) is assembled radially inwardly of said centering ring in the direction remote from said seal seat, and,

wherein said centering ring meets portions of faces of said ring noses of said coned ring elements and portions of the axial end faces of the coned portions of said coned ring elements.

4,824,339

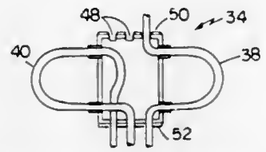
PERISTALTIC PUMP CARTRIDGE

Marlene A. Bainbridge, Lakewood; Charles B. Powell, Westminster, and P. Michael Finsterwald, Denver, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Aug. 19, 1987, Ser. No. 87,097

Int. Cl.[4] F04B *43/12*

U.S. Cl. 417—477 **17 Claims**



1. A peristaltic pump cartridge comprising:

a continuous flexible tube having two ends and a portion therebetween providing a U-shaped loop for use with a rotor and rollers to provide a peristaltic pump.

a cartridge housing having supports for maintaining said portion of said flexible tube in said U-shaped loop external to said housing, the legs of said U-shaped loop leading into said housing.

said housing having apertures through which connecting portions of said flexible tube remote from said U-shaped loop have been treaded from the interior to the exterior of said housing,

said housing having at least three apertures, at least one said aperture not having a tube passing through it, permitting the same cartridge housing and tube to be used to provide cartridges with connecting tube portions in different orientations.

4,824,340

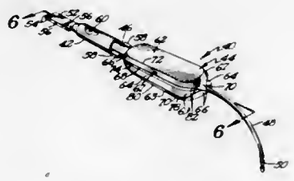
BELLOWS PNEUMATIC SYSTEM

Jon Bruggeman, North Oaks, and Dallas W. Simonette, Stacy, both of Minn., assignors to Power Flo Products Corp., Minneapolis, Minn.

Filed Apr. 11, 1988, Ser. No. 180,217

Int. Cl.[4] F04B *43/08*; F16L *55/14*; F16J *3/04*

U.S. Cl. 417—479 **10 Claims**



1. In a pneumatic system including a bellows having a vent hole and a discharge tube and including means for selectively compressing the bellows, with the improvement comprising, in combination: a vent hole tube in fluid communication with the bellows including the vent hole, with the vent hole tube having an outer diameter; and a valve tube having first and second ends and having an inner diameter greater than the outer diameter of the vent hole tube, with the valve tube being received on the vent hole tube with the vent hole located intermediate the first and second ends of the valve tube, with the bellows compressing means compressing the valve tube to contract and seal the vent hole while the bellows are being compressed.

4,824,341

HELIX-CONTROLLED DIRECT FUEL INJECTION PUMP

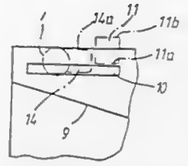
Ulrich Augustin, Kernen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 116,889

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640460

Int. Cl.[4] F02M *45/06*

U.S. Cl. 417—499 **6 Claims**



1. Helix-controlled fuel injection pump for internal combustion engines, in particular direct injection engines for commercial vehicles, with a relief valve, with a cam-operated pump piston, which is guided axially and rotationally in a pump cylinder and controls a cutoff bore hole in the pump cylinder, serving to supply fuel into the pump working space, by an upper control edge for initiation of the injection (pre-injection phase) and by a lower helical control edge for ending of the injection (main injection phase), furthermore with first and second recesses made in the pump cylinder, the second recess being constantly connected to the fuel bore hole and running parallel to the upper control edge of the pump piston, and a peripheral groove on the pump piston having an upper control edge, the peripheral groove connecting the first recess and the cutoff bore hole, for interruption of the injection, the first recess and the cutoff bore hole being arranged—seen in circumferential direction of the pump cylinder—one behind the other in such a way that, while the peripheral groove overlaps with the cutoff bore hole, the recess at the same time establishes a connection with the peripheral groove corresponding to the end pre-injection, wherein the relief valve is designed as a constant-pressure relief valve and wherein the first and second recesses arranged in the pump cylinder each have a rectangular opening cross-section, the upper edge of the second recess forming a tangent to the fuel bore hole and the first recess having a lower counter-control edge running parallel to the control edge of the peripheral groove on the pump piston, overlapping cross-sections formed between the counter-control edge and the control edge of the peripheral groove and between an upper control edge of the recess and the upper control edge of the pump piston having at least approximately the same cross-sectional area in a delivery stroke position in which the largest overlapping cross-section exists between the cutoff bore hole and the peripheral groove.

4,824,342

CHEMICAL INJECTOR SYSTEM FOR PISTON PUMPS

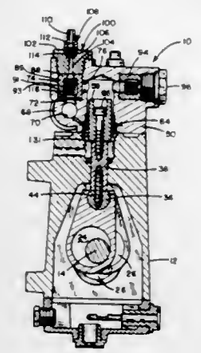
Michael D. Buck, Minneapolis, Minn., assignor to Hypro Corp., St. Paul, Minn.

Filed Feb. 16, 1988, Ser. No. 156,325

Int. Cl.[4] F04B *21/02*

U.S. Cl. 417—503 **5 Claims**

1. In combination with a positive-displacement piston pump of the type including a crank case housing in which is journaled a crank shaft having one or more eccentric lobes, a connected rod coupled to each of said one or more lobes, a cylinder block including one or more cylinders, said block being attached to said crank case housing, plunger means disposed in each of said one or more cylinders and joined to said connecting rod for reciprocating movement within said cylinders, a cylinder head fastened to said cylinder block and including a fluid inlet port and a fluid outlet port, intake valve means individually operatively associated with each of said cylinders for allowing a one-way flow of a first fluid from said inlet port to said cylinders only during a suction stroke of its associated plunger means, outlet valve means individually operatively associated with each of said cylinders for allowing a one-way flow of said first fluid from said cylinders only during a pressure stroke of its associated plunger means, and a



plug for each of said intake valve means and outlet valve means for holding said intake valve means and said outlet valve means in place in said cylinder head, the improvement comprising:

one of said plug means associated with a given intake valve means including injector valve means whereby that given intake valve means is held in place in said cylinder head while allowing a second fluid to be drawn into the cylinder associated with said given intake valve means during the suction stroke of the plunger means contained in that one cylinder.

4,824,343

SCROLL-TYPE FLUID TRANSFERRING MACHINE WITH GAP ADJUSTMENT BETWEEN SCROLL MEMBERS

Toshiyuki Nakamura; Tsutomu Inaba; Yasuyuki Suzuki, and Norihide Kobayashi, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 855,675, Apr. 25, 1986, Pat. No. 4,740,143. This application Dec. 17, 1987, Ser. No. 134,356

Claims priority, application Japan, May 16, 1985, 60-106306; May 16, 1985, 60-106308; May 17, 1985, 60-106501

Int. Cl.[4] F01C *1/04, 19/08*; F16J *15/40*

U.S. Cl. 418—55 **3 Claims**

1. A scroll-type fluid transferring machine having stationary and oscillatable scroll members, each being provided with a base plate and a wrap plate projecting from a surface of said base plate, which are combined in such a manner that a plurality of compression chambers are formed by the surface of said base plates and wrap plates and a fluid contained in said chambers is transferred, compressed or expanded by the revolution of said oscillatable scroll member, comprising:

a first fine adjustment element having the same spiral form as the wrap plate of said stationary scroll member;

a second fine adjustment element having the same spiral form as the wrap plate of said oscillatable scroll member;

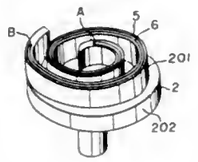
a first guide groove having the same spiral form as, and a width no greater than, said first fine adjustment element and being formed in the top end surface of the wrap plate of said stationary scroll member;

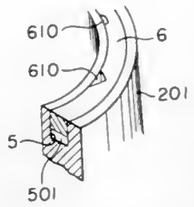
a second guide groove having the same spiral form as, and a width no greater than, the second fine adjustment element

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and being formed in the top end surface of the wrap plate of said oscillatable scroll member, wherein said first and second fine adjustment elements are respectively received in said first and second guide grooves with an air gap between each of said fine adjustment elements and a bottom of a respective one of said grooves; and

means for fluidically communicating said air gap with said compression chambers, said means for communicating





comprising a plurality of recesses along the length of at least one of said fine adjusting elements, so that the fluid in said compression chamber may flow into said air gap and, wherein said air gap and said plurality of recesses comprise means for maintaining a minute gap between the end surfaces of the fine adjustment elements and the surfaces of said base plates facing respective ones of said fine adjustment elements.

4,824,344

SCROLL-TYPE COMPRESSOR WITH OIL PASSAGEWAY IN THRUST BEARING

Tadashi Kimura; Tsutomu Inaba; Masahiro Sugihara, and Norihide Kobayashi, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 29, 1987, Ser. No. 113,982

Claims priority, application Japan, Nov. 5, 1986, 61-263147; Apr. 8, 1987, 62-87416

Int. Cl.⁴ F04C *18/04, 29/02;* **F16C** *33/10*

U.S. Cl. 418—55 **12 Claims**

1. A scroll-type compressor comprising:

a stationary scroll which comprises a disk-shaped, stationary end plate having a discharge port formed in the center thereof, and a stationary spiral wrap which extends perpendicularly from the bottom side of said stationary end plate and curves outwards from the center of said stationary end plate in the shape of a spiral;

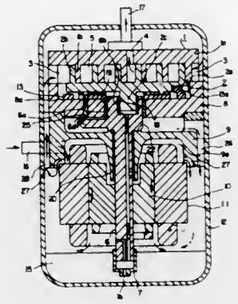
an orbiting scroll which comprises a disk-shaped, moving end plate, a moving spiral wrap which extends perpendicularly from the top side of said moving end plate and curves outwards from the center of said moving end plate in the shape of a spiral, and a shaft which extends perpendicularly from the bottom side of said moving end plate, said stationary end plate and said moving end plate being parallel with one another and said stationary spiral wrap and said moving spiral wrap being interfit with one another so as to form a plurality of spiral compression chambers;

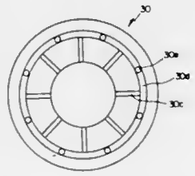
means for orbiting said orbiting scroll about the center of said stationary scroll;

a bearing support frame having a plurality of oil return holes formed therein which extend between its top and bottom surfaces;

an Oldham coupling which is supported by the top surface of said bearing support frame and which engages with said orbiting scroll so as to prevent said orbiting scroll from rotating on its axis while enabling it to orbit about the center of said stationary scroll;

a disk-shaped thrust bearing which is supported by the top surface of said bearing support frame, said thrust bearing having a flat upper surface and a through hole at its center through which the shaft of said orbiting scroll extends, the bottom surface of said moving end plate resting on the upper surface of said thrust bearing, the lower surface of said thrust bearing surrounding the upper ends of said oil





return holes and being in intimate contact with the top surface of said bearing support frame in a region surrounding the upper ends of said oil return holes, the diameter of said thrust bearing being smaller than the diameter of said moving end plate and of said Oldham coupling, the upper surface of said thrust bearing having a plurality of oil passageways formed therein whose inner ends communicate with said central hole and whose outer ends open onto said oil return holes and which do not extend to the outer periphery of said thrust bearing, said oil passageways being always covered by the bottom surface of said moving end plate; and

means for supplying oil to the center hole of said thrust bearing.

4,824,345

SCROLL MEMBER FOR SCROLL TYPE FLUID DISPLACEMENT APPARATUS

Seiichi Fukuhara, Takasaki, and Eiji Fukushima, Fujumi, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Apr. 28, 1987, Ser. No. 43,460

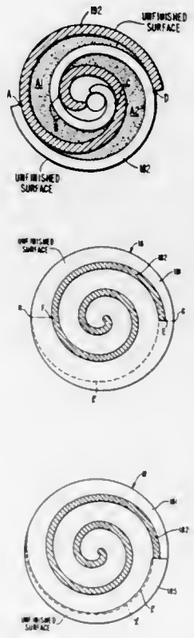
Claims priority, application Japan, Apr. 28, 1986, 61-98797; Apr. 28, 1986, 61-98798

Int. Cl.⁴ F01C *1/04, 21/08;* **B23P** *15/10*

U.S. Cl. 418—55 **12 Claims**

1. In a scroll type fluid displacement apparatus including a housing, a pair of scroll members, one of said scroll members being fixedly disposed relative to said housing and having an end plate from which a first spiral element extends into the interior of said housing and the other scroll member movably disposed for non-rotative orbital movement within the interior of said housing and having an end plate from which a second spiral element extends, said first and second spiral elements interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, and drive means operatively connected to said outer scroll member to effect the orbital motion of said other scroll member and said line contacts whereby said fluid pockets move inwardly and change in volume, the two innermost fluid pockets eventually merging into a single pocket near the center of said spiral elements,

the improvement wherein said scroll members include smooth finished outer surfaces in a first area for securing sealing of said fluid pockets and rougher unfinished outer surfaces in a second area, said second area being located along the outer surface of at least one of said first and



second spiral elements and extending from an outer terminal end of said one of said spiral elements to the point of contact with the outer terminal end of said opposed spiral element at the orbital position where sealed off fluid pockets are initially formed.

4. In a scroll type fluid displacement apparatus including a housing, a pair of scroll members, one of said scroll members being fixed disposed relative to said housing and having an end plate from which a first spiral element extends into the interior of said housing and the other scroll member movably disposed for non-rotative orbital movement within the interior of said housing and having an end plate from which a second spiral element extends, said first and second spiral elements interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, and drive means operatively connected to said other scroll member to effect the orbital motion of said other scroll member and said line contacts whereby said fluid pockets move inwardly and change in volume, the two innermost fluid pockets eventually merging into a single pocket near the center of said spiral elements,

the improvement wherein at least one of said end plates of said scroll members includes steplike low portion at an outer peripheral edge portion thereof, said low portion having an unfinished outer surface and a radially inner wall, and said low portion extending from an outer terminal end of said spiral element connected to said one of said circular end plates, along said radially inner wall and radially outward of said radially inner wall, said radially inner wall being defined generally by an extension of the involute curve line defining the inner wall surface of said spiral element form which said low portion extends, said low portion being formed in a portion of the material of said last-mentioned end plate extending radially outward of said extension of the involute curve line.

4,824,346

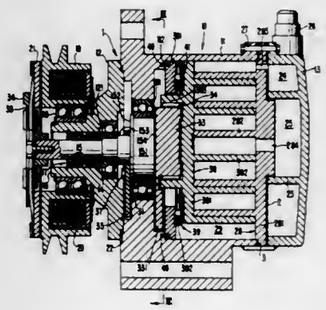
SCROLL TYPE FLUID DISPLACEMENT APPARATUS WITH BALANCED DRIVE MEANS

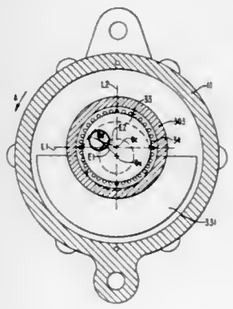
Masaharu Hiraga, Hoajyo; Kiyoshi Teranchi, Isesaki; Kiyosh Miyazawa, Annaka, and Seiichi Sakamoto, Gunma, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Mar. 18, 1981, Ser. No. 244,961

Int. Cl.⁴ F01C *1/04, 19/00*

U.S. Cl. 418—55 **27 Claims**





1. Fluid apparatus of the positive displacement scroll type comprising:

a. a first wrap element defining at least an inner facing flank surface of generally spiroidal configuration about a first axis and extending between first and second axial tip portion;

b. a second wrap element defining at least an outer facing flank surface of generally spiroidal configuration about a second axis and extending between first and second axial

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tip portions, said first and second wrap elements being disposed in intermeshing, angularly offset relationship with their respective axes generally parallel;

c. end plate means in overlying, substantially sealing relationship to the first and second axial tip portions of said first and second wrap elements;

d. radially compliant means for effecting relative orbital motion between said first and second wrap elements such that actual moving line contact between the inner facing flank surface of said first wrap element and the outer facing flank surface of said second wrap element defines between said end plate means a moving volume which progresses from one of a radially outer and inner portion of said wrap elements to the other of said portions; said radially compliant means including:

i. crankshaft means including shaft means supported for rotation about a shaft axis parallel to said first and second axes and crank means affixed to said shaft means and radially offset therefrom;

ii. linkage means operatively interconnecting said crankshaft means and one of said first and second wrap elements such that rotation of said crankshaft means is accompanied by orbital motion of said one wrap element about said shaft axis and said one wrap element is free to undergo at least limited movement in a radial direction with respect to said shaft axis; said linkage means comprising a linkage member operatively connected to said crank means at a crank axis and to said one wrap element at a third axis substantially parallel to said crank and shaft axes such that a drive force acts along a first line extending between said crank axis and said third axis during orbital motion of said one wrap element, said first line making a predetermined angle with respect to a line drawn through said third axis tangent to the orbit path of said one wrap element such that the drive force has a component acting in a radially outward direction with respect to said shaft axis, whereby a sealing force is provided between the flank surfaces of said first and second wrap elements at their moving line contacts; and

iii. counterweight means acting upon said one wrap element and rotatable with said crankshaft, said counterweight means having a mass so-positioned and of a magnitude as to impose a force upon said one wrap element in a radially inward direction with respect to said shaft axis which is substantially equal to the radially outward centrifugal force experienced by said one wrap element as it undergoes orbital motion, whereby the sealing force between said first and second wrap elements is substantially independent of the rotational speed of said crankshaft means; and

e. fluid port means for admitting a working fluid to said moving volume adjacent said one of the radially outer and inner portions of said wrap elements, and for discharging same adjacent the other of said portions.

4,824,347

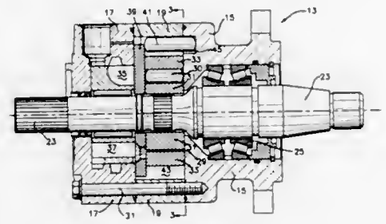
INTERNAL GEAR MACHINE WITH REINFORCED HOUSING

Andrew N. Dlugokecki, Bridgton, Me., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Sep. 24, 1987, Ser. No. 100,520
Int. Cl.⁴ F03C *2/08*; F04C *2/113*
U.S. Cl. 418—61.3 **2 Claims**

1. An improved internal gear machine of the type having variable displacement fluid chambers formed between a rotating inner gear and an orbiting outer gear, the orbiting outer gear being retained in an orbiting motion by a plurality of roller dowells received in arcuate recesses on the radial outside of the outer gear and closely fitting in a locating ring disposed radially outside the outer gear, the locating ring being connected to a gear machine end piece; the improvement comprising:

said gear machine end piece having cylindrical recesses extending coaxially with said roller dowells and sized to closely receive said roller dowells; and



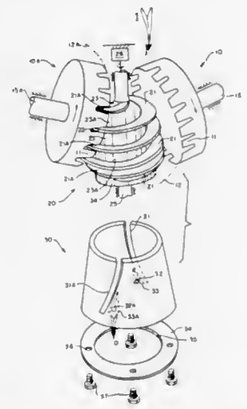
said roller dowells extending closely within said cylindrical recesses from said locating ring so as to reinforce the connection between said locating ring and said gear machine end piece against torsional stresses.

4,824,348

MULTIPLE TOOTH ENGAGEMENT SINGLE SCREW MECHANISM

David C. Winyard, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1986, Ser. No. 908,859
Int. Cl.⁴ F01C *3/08*
U.S. Cl. 418—195 **3 Claims**



1. A single screw mechanism having an inlet and an outlet, comprising:

a conical mainrotor formed with a plurality of threads, each said thread having a thread wrap angle around said mainrotor of at least one full turn;

a casing, cooperating with said mainrotor threads, forming at least one chamber, each said chamber in fluid communication at a first end with said inlet of said single screw mechanism and in fluid communication at a second end with said outlet of said single screw mechanism;

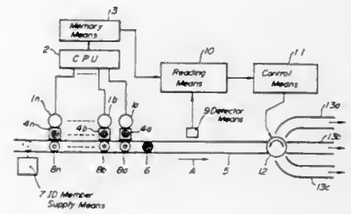
a plurality of cylindrical gaterotors having teeth which are in meshing relation with said mainrotor threads, said gaterotor teeth sealedly cooperating with each said chamber such that said first end of said chamber is sealed from each said second end of said chamber by a plurality of teeth of one gaterotor and at least one tooth of another gaterotor for at least a portion of each cycle.

4,824,349

APPARATUS FOR CONTROLLING TRANSPORTATION OF CURED TIRES

Masaharu Oku, Kodaira; Akio Ohbayashi, and Toshiyuki Innami, both of Kuroiso, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,216
Claims priority, application Japan, Dec. 8, 1986, 61-291750
Int. Cl.⁴ B29C *35/02*; B07C *5/00*
U.S. Cl. 425—29 **14 Claims**



1. Apparatus for curing tires, comprising: plural tire curing machines, means for conveying cured tires from said machines; means for storing tire identification information for plural different kinds of tires; means for placing cured tires in a predetermined order on said means for conveying;

means for placing an identification member on said conveying means such that a plurality of said cured tires are classifiable as a group thereby;

means for detecting said identification member placed on said conveying means and for generating an identification signal according to the classification of said group;

means for reading tire information out of said storing means; and

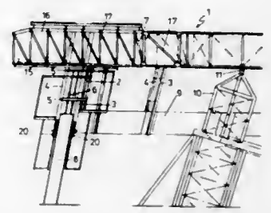
means for controlling the transportation of said group of tires on said means for conveying in accordance with tire information read from said storing means and said identification signal.

4,824,350

SLIDING SHUTTERING SYSTEM

Arnold Sommer, Kaarst, Fed. Rep. of Germany; Richard Lienbacher, Golling, and Guido Herzog, Salzburg, both of Austria, assignors to Gleitbau-Gesellschaft m.b.H., Salzburg, Austria

Filed Dec. 12, 1986, Ser. No. 941,081
Int. Cl.⁴ E04G *11/22*
U.S. Cl. 425—63 **8 Claims**



1. A sliding shuttering system for producing structure walls for conical and sloping reinforced concrete structures with annularly closed, varying cross-sections, comprising:

circumferentially spaced associated pairs of substantially parallel inner and outer elongate piles carrying radially spaced inner and outer sliding shuttering;

support means for supporting said piles and said sliding shuttering, said support means including an intrinsically rigid support truss fixable above the top of a wall of a structure and arranged substantially horizontally;

a lengthwise adjustable means connecting said inner and outer piles and said inner and outer sliding shuttering to said rigid support truss, said lengthwise adjustable means adjusting angular deflection of said inner and outer piles over their lengths in a tangential direction and comprising a universal joint to accommodate the angular deflection of said inner and outer piles;

a pile cross member extending between the inner pile and the outer pile of each said associated pair above said shuttering thereby forming a pile structure;

said pile cross members being articulatable relative to and adjustably connected to at least one pile in a transverse direction relative to said wall for adjustably maintaining the spacing between the inner and the outer piles;

a lifting means for sliding said sliding shuttering system up relative to the ground, said lifting means engaging with said pile structure;

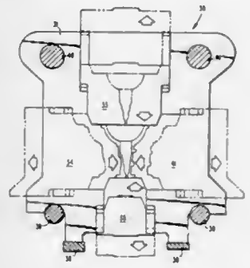
a fixing means provided to fix at least some of said inner and outer piles which are spaced over the circumference of the structure wall relative to said support truss for preventing horizontal shifting of said piles.

4,824,351

MOLDING AND GAUGING SYSTEM

Charles Ramsey, Dunkirk, Ind., assignor to Matrix Technologies, Incorporated, Muncie, Ind.

Filed Oct. 14, 1987, Ser. No. 108,484
Int. Cl.⁴ B29C *39/44*
U.S. Cl. 425—135 **25 Claims**



1. A molding system including at least first and second molding system elements that are adpated to move relative to each other in forming a close mold cavity, comprising:

a first molding system element having a first surface;

a second molding system element having a second surface;

means for relatively moving said first and second molding system elements to a closed position to form a closed mold cavity, said first and second surfaces being adapted to adjoin one another when said first and second molding system elements are in said closed position; and

means for monitoring a spacing between said first and second surfaces during operation of said molding system, said monitoring means including:

means for defining a first orifice at said first surface of said first molding system element;

a source of fluid under pressure;

a fluid line coupling said source of fluid under pressure to said first orifice for directing fluid through said first orifice from said first surface, said fluid line including means for defining a passageway extending through said first molding system element and coupled to said first orifice;

means for defining a second orifice in said fluid line between said source of fluid under pressure and said first orifice;

a pressure-sensitive device connected to said fluid line be-

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tween said first orifice and said second orifice for sensing the fluid pressure in said fluid line between said first and second orifices, said fluid pressure being indicative of the spacing between said first and second surfaces; and

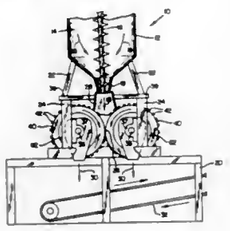
means connected with said pressure-sensitive device for producing an output measurement of the spacing between said first and second surfaces.

4,824,352

APPARATUS FOR PELLETIZING MATERIALS

Richard S. Hadley, 6310 Talmadge Rd., Independence, Oreg. 97351, and Kenneth A. Cade, P.O. Box 368, Boardman, Oreg. 97818

Filed Oct. 16, 1987, Ser. No. 109,936
Int. Cl.[4] B30B *11/28*
U.S. Cl. 425—168 **5 Claims**



1. A pelletizing apparatus comprising:

(a) a first cylindrical die having a plurality of circumferentially spaced apart teeth formed to protrude radially outwardly therefrom;

(b) a second cylindrical die having a plurality of circumferentially spaced apart teeth formed to protrude radially outwardly therefrom, the number of teeth formed in the second die belong fewer than the number of teeth formed in the first die, each die having a row of discrete passageways formed between adjacent teeth, each passageway extending radially through the die and having a radially outer end and a radially inner end, the inner end terminating in an interior chamber that is formed within the die; and

(c) drive means for rotating the first and second dies about parallel axes of rotation so that the teeth of both dies mesh.

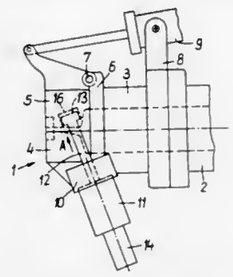
4,824,353

EXTRUDER HEAD

Ingo Hirschkorn, Neu Wulmstorf, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft Mit Beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 126,412
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640527
Int. Cl.[4] B29C *47/18, 47/16*
U.S. Cl. 425—190 **8 Claims**

1. In an extruder head with at least one pivotable head member rotatable about an axis, a stationary head member and, on each side, at least one hydraulic cylinder for clamping said at least one pivotable head member to said stationary head member to form an operable unit, the improvement wherein two of said hydraulic cylinders are mounted rigidly each on one side of said stationary head member and each of said hydraulic cylinders is associated with a respective one of said pivotable head members, a piston rod of each said hydraulic cylinder being extendable in a direction to the respective pivotable head member which contacts on said stationary head member and a releasable clamping means on said piston rod disposable to engage and clamp said pivotable head member against said



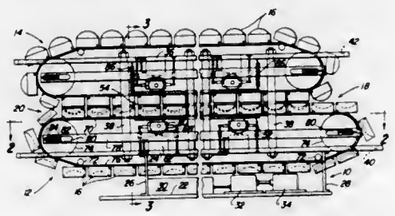
stationary head member with said piston rod being under tension.

4,824,354

HYDRAULIC CONTINUOUS PRESS WITH IMPROVED DRIVE

Clyde D. Keaton, 48 Dickenson St., Woodstown, N.J. 08098

Filed Feb. 16, 1988, Ser. No. 156,323
Int. Cl.[4] B28B *5/00*
U.S. Cl. 425—345 **8 Claims**



1. A press for simultaneously pressing and conveying a workpiece from an input to an output, a set of rails comprising first and second groups of rails disposed side-by-side, a reaction member disposed opposite said groups of rails in spaced relation and adapted to accept a workpiece between said groups of rails and said member, and each group of rails having driving means for pressing and simultaneously advancing the workpiece during one period and releasing the workpiece and retracting the group of rails during an alternate period, whereby the two groups of rails alternately press and advance the workpiece, the improvement wherein the driving means comprises:

at least one rack on each rail group,

at least one pinion in meshing relationship with each rack,

means for supporting each pinion for rotation,

transverse actuating means for each rail group for advancing and retracting each respective supporting means relative to said reaction member for pressing and releasing the workpiece,

longitudinal actuating means for each rail group for reversibly rotating each respective pinion for advancing and retracting said rail group relative to said output, and

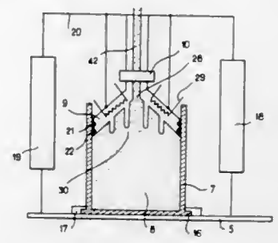
means for energizing the actuating means for one rail group for pressing and advancing while energizing the actuating means for the other rail group for releasing and retracting and vice versa.

4,824,355

PREPARATION OF A PLASTIC FOR ITS EXTRUSION PARTICULARLY IN THE FORM OF A GAGED BEAD INTENDED TO BE USED AS A SEAL AND INTERLAYER IN MULTIPLE GLAZINGS

Karl Lenhardt, Neuhausen-Hamberg, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France

Division of Ser. No. 753,608, Jul. 10, 1985, Pat. No. 4,714,425.
This application Nov. 3, 1987, Ser. No. 116,037
Claims priority, application France, Jul. 10, 1984, 84 10946; Sep. 17, 1984, 84 14181; Sep. 17, 1984, 84 14182; Sep. 17, 1984, 84 14183; Sep. 17, 1984, 84 14184
Int. Cl.[4] B29C *47/86*
U.S. Cl. 425—378.1 **8 Claims**



1. An installation for preparing a plastic material of the type having a butyl rubber base, comprising:

a tank having an open top and containing raw plastic material;

a cover inserted in said open top, said cover having an outlet orifice, a face of said cover oriented towards said plastic material having a shape such that a sectional area of a volume of the plastic material enclosed by said cover is smaller the closer said plastic material is to said outlet orifice;

means for heating said cover;

means for pressing said cover for movement into said tank, whereby the plastic material in said tank is heated and forced through said outlet; and

a plurality of heating appendages formed on said face of said cover and extending toward said plastic material,

wherein said appendages extend parallel to a direction of movement of said cover, and wherein the length of said appendages increases in inverse correspondence with the distance of said appendages from said outlet, whereby said heating appendages closest to said outlet provide increased heat transfer surface area to the plastic material as compared to ones of said heating appendages further from said outlet.

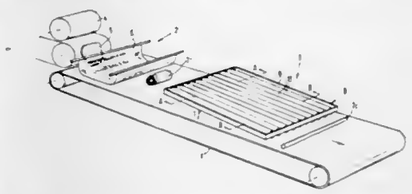
4,824,356

APPARATUS FOR EXTENDING ROLLS OF DOUGH

Johan Benier, Haaren, Netherlands, assignor to Mobepa B.V., Hertogenbosch, Netherlands

Filed May 15, 1987, Ser. No. 50,618
Claims priority, application Netherlands, May 16, 1986, 8601257
Int. Cl.[4] A21C *3/02*; B29C *43/02, 43/46*
U.S. Cl. 425—373 **6 Claims**

1. An apparatus for compressing and extending dough comprising an endless conveyor, a vertically adjustable compression bed mounted in such a way so as to define the space between the compression bed and endless conveyor, the space being larger at the entrance to the compression bed and the conveyor compression bed than at the exit of the compression bed, the compression bed further comprising elements jour-



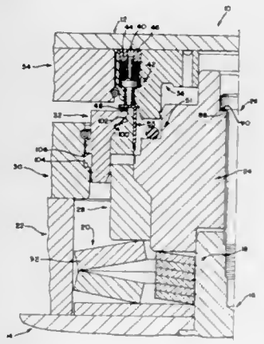
naled for rotation about axes generally perpendicular to the rotational axes of the means mounting said conveyor.

4,824,357

APPARATUS FOR MANUFACTURING SEAL COMPONENTS

Keith W. Christiansen, Fox River Grove, Ill., assignor to Chicago Rawhide Manufacturing Corporation, Elgin, Ill.

Filed May 18, 1988, Ser. No. 195,592
Int. Cl.[4] B29C *33/12*
U.S. Cl. 425—417 **8 Claims**



1. A mold assembly for manufacturing fluid seals, said mold assembly being repeatedly operable through an operating cycle which includes the steps of receiving a seal casing having an axial annular skirt and a radial flange when said mold is open, forming a flash barriers while closing, completing closure, and opening for finished part removal, said mold assembly comprising, in combination,

a lower mold cover plate having mold core unit having at least partially radially outwardly directed surfaces forming apart of annular molding cavity, and a core barrier surface for snugly engaging a skirt margin surface on a seal casing positionable within the mold assembly such that a bonding surface on said casing forms a part of said molding cavity-forming surfaces for receiving and positioning a charge of moldable material, and at lest one guide and barrier surface on said core for cooperatively engaging a part of a mold top insert to create a flow barrier as portions of said mold assembly are closing,

a mold bottom insert member having radially inwardly directed, annular cylindrical surface for engageable with and supporting the axial skirt portion of said seal casing a tapered surface of enlarged diameter at one end of said bottom insert engageable with a skirt margin portion of said axial annular seal casing skirt, and a radially extending annular support surface a the other end of said bottom insert for engaging a radial flange of said seal casing unit,

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a top mold insert member having a cylindrical guide and annular flash barrier surface slidially engageable with said guide and barrier surfaces on said mold core member, at least one surface defining another portion of said surface on said mold core for receiving and positioning said charge of moldable material, and a top insert annular flash barrier surface,

first resilient means disposed between said stationary lower mold coverplate member and a portion of said mold bottom insert unit and biasing said bottom insert away from said stationary mold part support unit,

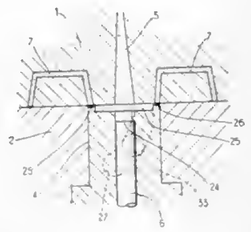
second resilient means disposed between said lower mold cover plate and a portion of said mold core unit away from said stationary mold part support unit, said mold bottom insert unit and sid mold core unit being relatively movable with respect to each other during the mold closure portion of said operating cycle, whereby, in use, a seal casing with radial flange and axial skirt may be positioned over and supported by said bottom insert when said mold assembly is open, and upon mold closure, the relative motion between said core and said bottom insert serves to pinch the casing skirt margin between said tapered bottom insert surface and sad barrier surface on said core unit before said top insert has completed its closing movement relative to said core unit, whereby said fluent material is retained in said cavity by engagement between respective portions of said casing and said core barrier surface and said top insert barrier surface, said cavity also being sealed by engagement between said combination guide and barrier surfaces on said tip insert and said core, respectively.

4,824,358

RESIN MOLDING DIE

Hiroshi Takeuchi, Tokyo, Japan, assignor to Shinkoh Sellbic Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,998
Claims priority, application Japan, Jul. 17, 1987, 62-178654
Int. Cl.⁴ B29C *39/30, 45/38*
U.S. Cl. 425—436 R **12 Claims**



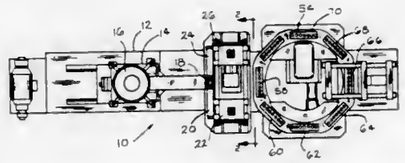
1. A resin molding die comprising a movable die plate, a stationary die plate having a molding cavity, a rotary block mounted rotatably within said movable die plate or stationary die plate and provided in its one end face with a gate defining a resin passage communicating with said molding cavity, and at least one operating member adapted to rotate said rotary block so as to deviate the gate of said rotary block from the resin passage, whereby a gate slug formed in injection molding is cut off from a molded product before a mold is open.

4,824,359

DUAL INJECTION MOLD PREFORM TRANSFER ASSEMBLY

Rudolf H. Poehlsen, Tecumseh, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 941,768, Dec. 15, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 170,785
Int. Cl.⁴ B29C *49/00*
U.S. Cl. 425—534 **21 Claims**



1. An apparatus for continuously transferring preforms from a pair of injection mold assemblies to a blow molding machine, said mold assemblies each including a mold having a cavity therein, a neck forming portion, and a core rod block having a core rod projecting therefrom into said cavity when said mold assembly is closed, said preforms being removed from said cavity by said core red block and neck forming portion moving away together from said mold, said preform being carried on said core rod and gripped by said neck forming portion, said preform being stripped from said core rod by separation of said neck forming portion from said core rod block and released by said neck forming portion, said apparatus comprising:

a base supporting said mold assemblies in a spaced apart relation;

a frame assembly on said base;

holding means for releasably holding said preforms as they are released from said pair of injection mold assemblies;

arm means attached at one end to said holding means for translational movement of said holding means;

lift means attached to said frame assembly for raising and lowering said arm means; and

motor means at the other end of said arm means for rotating said arm means about a vertical axis, said motor means being attached to said lift means, whereby as said preforms are released from one of said pair of mold assemblies they are received by said holding means, moved horizontally over said base by said arm means, raised by said lift means, rotated by said motor means about said vertical axis, said holding means then releasing said preforms so as to position said preforms in said blow molding machine.

4,824,360

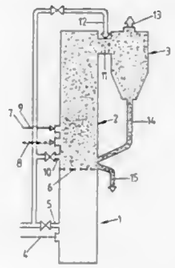
METHOD FOR DECREASING EMISSIONS OF NITROGEN OXIDES AND SULFUR OXIDES WHEN BURNING FUELS WHICH CONTAIN NITROGEN AND SULFUR

Pentti Janka, Tampere, and Seppo Ruottu, Karhula, both of Finland, assignors to Oy Tampella AB, Tampere, Finland

PCT No. PCT/FI86/00098, § 371 Date May 14, 1987, § 102(e) Date May 14, 1987, PCT Pub. No. WO87/01790, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 19, 1986, Ser. No. 53,856
Claims priority, application Finland, Sep. 20, 1985, 853615
Int. Cl.⁴ F23B *7/00*; F23C *9/00*
U.S. Cl. 431—7 **14 Claims**

1. A method for decreasing emissions of nitrogen oxides and sulfur oxides in the combustion of a fossil fuel which contains nitrogen and sulfur, the method being based on the regulation of the combustion in order to decrease the formation of nitrogen oxides and/or on the reduction of the nitrogen oxides present in the flue gases, and on the binding, into a pulverous material, of the sulfur oxides present in the flue gases, characterized in that the fuel and a stoichiometric or higher than

stoichiometric amount of oxygen-containing gas are fed into a combustion reactor so as to provide an air coefficent which is about 1–2 and to burn the fuel, the temperature of the combustion reactor being 900°–1500° C., and so that the resulting combustion gases contain an oxygen content and are directed into a suspension reactor the temperature of which is 750°–1050° C. and into which a pulverous material which binds sulfur oxides is fed to provide a combustion gases-pulverous



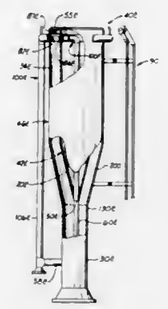
material suspension having a density of 1–200 kg/m³, the oxygen concentration in the combustion reactor and the suspension reactor being adjusted so that the total air coefficient in said combustion reactor and in said suspension reactor is about 1–2, the gases then being directed into an after-treatment reactor, into which an oxygen-containing gas is fed for adjusting the oxygen content in the resulting flue gases so that the residual oxygen content in the flue gases emerging from the after-treatment reactor is 0.5–16% by volume.

4,824,361

SMOKE SUPPRESSANT APPARATUS FOR FLARE GAS COMBUSTION

Eugene C. McGill, Skiatook, and Robert L. Rawlings, Tulsa, both of Okla., assignors to McGill Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 365,588, Apr. 5, 1982, Pat. No. 4,538,982, which is a continuation-in-part of Ser. No. 431,180, Sep. 30, 1982, abandoned. This application Apr. 18, 1983, Ser. No. 485,623
Int. Cl.⁴ F23D *00/00*
U.S. Cl. 431—202 **2 Claims**



1. An improved smoke suppressant apparatus for flare gas combustion comprising:

a flare housing having an upper end;

a liner cylinder having first and second ends and coaxially supported within the flare housing, the liner cylinder forming an annular orifice channel between the inner wall of the flare housing and the outer wall of the liner cylinder;

a first flare conduit connected in fluid communication with the annular orifice channel so that a first flare gas portion passing through the first flare conduit is discharged from the orifice channel at an exit port of the annular orifice channel at the upper end of the flare housing, the first flare gas portion discharging from the exit port of the annular orifice channel forming a cylindrically shaped perimeter zone discharge;

internally disposed fluid injector means positioned within the upper portion of the flare housing for injecting selected fluids into the cylindrically shaped perimeter zone discharge of the first flare gas portion;

externally disposed injector means secured around the upper portion of the flare housing for injecting selected fluids into the cylindrically shaped perimeter zone discharge of the first flare gas portion; and

annular ring plate means disposed within the orifice channel for preventing air from backflowing along surfaces of the housing at first liner member defining the orifice channel, the annular plate means comprising:

a first ring plate member having an upper beveled end portion, the first ring plate member being disposed within the orifice channel and secured to an inner wall of the housing such that the beveled end portion of the first ring plate member forms an acute angle with the elongated axis of an upper portion of the housing; and

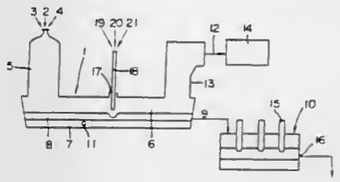
a second ring plate member having an upper beveled end portion, the second ring plate member being disposed within the orifice channel and secured to an outer wall of the first liner member such that the beveled end portion of the second ring plate member forms an acute angle with the elongated axis of an upper portion of the first liner member.

4,824,362

METHOD FOR OPERATION OF FLASH SMELTING FURNACE

Takayoshi Kimura; Yasuo Ojima, and Yoshiaki Mori, all of Niihama, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 154,355
Claims priority, application Japan, Feb. 13, 1987, 62-30962
Int. Cl.⁴ F27D *3/00*; F27B *19/02*
U.S. Cl. 432—13 **4 Claims**



1. A method of producing a copper or nickel-containing matte from a powdered concentrate which contains a copper or nickel sulfide ore in an apparatus which includes a vertical reaction shaft that has a concentrate burner at an upper end thereof and forms a lower end, a horizontal settler which is connected at a first end thereof to a said lower end of said reaction shaft and has a ceiling and a second end, and an uptake shaft connected to said second end of said settler, said method comprising the steps of (a) blowing a reaction gas and a powdery raw material which includes said powdered concentrate through said concentrate burner so that said powdered concentrate will react with said reaction gas as said powdered concentrate descends within said reaction shaft, thereby providing in said settler a lower liquid layer of copper or nickel-containing matte, an upper liquid layer of slag and a hot waste gas containing dust, (b) providing at least one downwardly-extending lance pipe in said ceiling of said settler, (c) jointly

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blowing said powdered concentrate, recycled dust, powdery auxiliary fuel and a reaction gas through each lance pipe at a speed of 50 to 150 m/s and into said slag layer in said settler, thereby providing additional slag, copper or nickel-containing matte and hot waste gas, (d) removing said hot waste gas from said settler through said uptake shaft, (e) recovering said dust from said hot waste gas, and (f) recycling at least some of said recovered dust for use in step (c).

4,824,363

PROCESS AND EQUIPMENT FOR REMOVING ODOROUS SUBSTANCES FROM THE FRESH AIR FOR VEHICLE CABINS

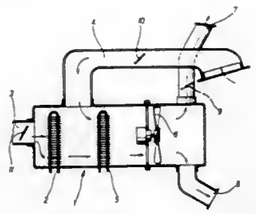
Joerg Abthoff, Pluederhausen; Hans-Dieter Schuster, Schorndorf; Karlwalter Schmidt, Weinstadt; Gottfried Wollenhaupt, Stuttgart, and Hans-Georg Schmitz, Waiblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,251

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3334992

Int. Cl.⁴ F24H *1/00*; B60H *1/02*

U.S. Cl. 432—222 **3 Claims**



1. Apparatus for removing odorous substances from fresh air for a vehicle cabin comprising

a heat exchanger means for heating air to be conducted to the cabin and having a heat emitting surface with a catalyst thereon for oxidizing at least one pollutant from the mixture,

means transmitting heat to said surface and catalyst for heating the mixture of air and pollutant,

means for flowing said mixture of air and pollutants in contact with said heat emitting surface and catalyst, and

means for introducing the air output from the heat emitting surface minus the oxidized pollutant to the vehicle cabin.

4,824,364

NON-FERROUS METAL SMELTING FURNACE

Osamu Kobari, and Takashi Kida, both of Chiba, Japan, assignors to Toho Development Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 107,648

Claims priority, application Japan, May 15, 1987, 62-118542

Int. Cl.⁴ F24H *7/00*; C21B *9/00*

U.S. Cl. 432—30 **2 Claims**

1. A non-ferrous metal smelting furnace comprising:

a preheating tower provided at a substantially central portion of a body of the furnace and having a preheating chamber in which a material to be smelted is charged;

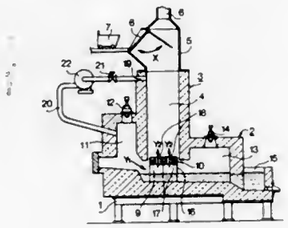
a smelting chamber provided below said preheating chamber and communicating with a lower portion of said preheating chamber;

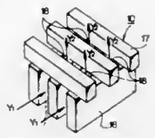
a combustion chamber provided adjacent to said smelting chamber;

a burner mounted on an upper furnace of a body of said combustion chamber and generating a combustion gas on its upper furnace body;

a molten metal retaining chamber adjacent to a side of said smelting chamber opposite to said combustion chamber so as to sandwich said smelting chamber; and

a gas diffusion unit mounted in said smelting chamber and having a grating arrangement comprising a stack of ceramic material, said stack of ceramic material being formed of a plurality of walls of the ceramic material arranged separated from each other and directed in parallel relation toward said molten metal retaining chamber, the stack including a plurality of elongated retaining members placed on upper surfaces of said walls and separated from each other and positioned orthogonally to a longitudinal direction of said walls, there being a plurality of openings defined by said walls and said retaining members substantially uniformly distributed between said preheating chamber and said smelting chamber.





4,824,365

DENTAL MATRIX IN A FLEXIBLE STRIP WITH TIGHTENER CONNECTED TO IT

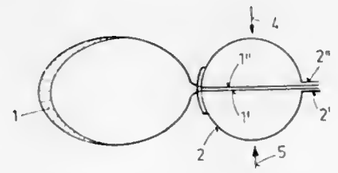
Hans von Weissenfluh, Magadino, Switzerland, assignor to Hawe-Neos Dental Dr. H. Von Weissenfluh S.A., Gentilino, Switzerland

Filed Feb. 16, 1988, Ser. No. 156,144

Claims priority, application Switzerland, May 14, 1987, 1845/87

Int. Cl.⁴ A61C *9/00*

U.S. Cl. 433—40 **8 Claims**



1. A dental matrix band and tightener assembly comprising:

a loop-shaped dental matrix band including two terminal extensions each having respective juxtaposed end portions;

a loop-shaped tightener for said dental matrix band having opposing deformable portions of said loop, said lightener being in the form of single strip having a central portion and two terminal extensions extending from said central portion each having respective end portions, said central portion of said tightener including an opening which slidably receives both said terminal extensions of said matrix band, and said respective end portions of said terminal extensions of said tightener extending along each side of said juxtaposed end portions of said matrix band and being fastened to said end portions of said matrix band to form said opposing deformable portions of said loop.

4,824,366

METHOD AND APPARATUS FOR REMOVAL OF OBJECTS GLUED ONTO DENTAL ENAMEL, IN PARTICULAR BRACKETS

Wolfgang Hohmann, Berlin; Peter-Michael Schopf, Bad Vilbel; Klaus Gerkhardt, Worms, and Bogdan Kocjancic, Frankfurt, all of Fed. Rep. of Germany, assignors to Scheu-Dental Inhaber Rudolf Scheu, Iserlohn, Fed. Rep. of Germany

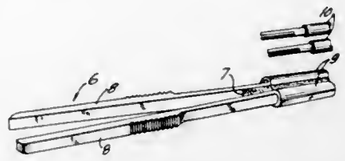
PCT No. PCT/DE86/00346, § 371 Date May 7, 1987, § 102(e) Date May 7, 1987, PCT Pub. No. WO87/01577, PCT Pub. Date Mar. 26, 1987

PCT Filed Aug. 30, 1986, Ser. No. 55,712

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532656

Int. Cl.⁴ A61C *3/00*

U.S. Cl. 433—32 **5 Claims**



1. Device for safe removal of brackets or like metallic dental objects glued to dental enamel and serving for orthodontic treatment by heating the glued objects by direct electric resistance heating, said device comprising:

a forceps- or tweezer-like gripping instrument with two forceps-like gripping legs electrically insulated from each other and whose ends are configured to directly grip the glued object to establish a low resistance series circuit of the gripping legs and object and capable when the glue weakens to remove the bracket,

a source of low voltage, high current pulses having a short time interval,

and means for connecting the pulse source to the gripping legs, the current pulses having characteristics such that application of such a pulse to the gripped object will by direct electric resistance heating of the object sufficiently raise the temperature of the glue so that the glue becomes weakened and thus allows the instrument to readily remove the gripped object without over-heating the dental enamel.

4,824,367

DENTAL DRILL ALIGNMENT INDICATOR

Stephen F. Rosenstiel, Worthington, Ohio, and Edwin R. I. Deane, London, England, assignors to National Research Development Corporation, London, England

Filed Oct. 17, 1986, Ser. No. 920,000

Claims priority, application United Kingdom, Oct. 17, 1985, 8525625

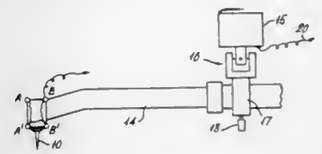
Int. Cl.⁴ A61C *3/00*

U.S. Cl. 433—75 **6 Claims**

1. A parallel alignment indicator for a dental handpiece, comprising:

angle-indicator means for generating electrical angle signals representative of an angular orientation of an axis of a cutter held, in operation, by a dental handpiece;

setting means for setting electrical reference signals representing a position of a pre-selected axis; and



warning means arranged to generate a warning when a relationship between the electrical angle signals and the electrical reference signals falls outside predetermined limits.

4,824,368

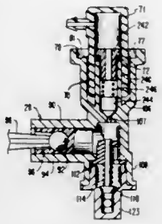
ORAL HYGIENE APPLIANCES

Clarence J. Hickman, Ft. Collins, Colo., assignor to Teledyne Industries, Inc., Fort Collins, Colo.

Filed Aug. 23, 1982, Ser. No. 410,257

Int. Cl.⁴ A61G *17/02*

U.S. Cl. 433—80 **2 Claims**



1. In a device which includes a supply of liquid, a pump for propelling said liquid and means for delivering the propelled liquid to a point of use, the improvement comprising:

a housing defining a cavity within which said pump is seated;

means defining an outlet in said housing;

means defining an inlet in said housing;

said supply of liquid including a reservoir removably seated atop said housing above said pump and, when seated, sealingly coupled to said inlet;

a motor seated inside said cavity for driving said pump;

said pump having a hollow body with a chamber defined in a first portion thereof;

a piston disposed for reciprocation in said chamber with a predetermined length of stroke;

means coupled to said motor for reciprocating said piston;

means for coupling a second portion of said body to said outlet;

means for coupling a third portion of said body to said inlet;

a first check valve effectively disposed in said third portion of said body and operable to pass liquid only from said inlet to said chamber;

a second check valve effectively disposed in said second portion of said body and operable to pass liquid only from said chamber to said outlet;

said first and second check valves including respective different biasing means with said biasing means being selected to ensure that either one of said valves is closed whenever the other is open during operation of said pump;

and said outlet means including a pair of nested concentric cylinders with said second check valve being disposed within the innermost one of said cylinders.

4,824,369

MANUALLY OPERATED ENDODONTIC INSTRUMENT

Guy Levy, 49, rue Croix de Regnier, F-13004 Marseille, France

Filed May 12, 1987, Ser. No. 48,685
Int. Cl.[4] A61C 5/02
U.S. Cl. 433—102 8 Claims



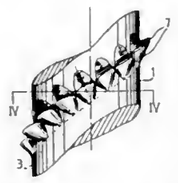
1. A manually operated endodontic instrument comprising: an endodontic file; and a handle to which said file is immovably secured, said handle being formed to be gripped between the thumb and the index finger, having a longitudinal axis and an outer surface and including a central, longitudinally extending portion and first and second bulbous portions each joined to a respective longitudinal end of said central portion and each projecting laterally beyond said central portion, said handle being provided, at its outer surface, with at least two circumferentially spaced recesses extending longitudinally along at least part of said central portion, and wherein: said handle has a length of at least 10 mm; said recesses are formed such that, in the direction perpendicular to the longitudinal axis, said recesses have a minimum spacing which is less than one-half the maximum dimension of said handle; said handle is configured and dimensioned so that when gripped, the tips of the thumb and index finger bear against that one of said bulbous portions which is at the end of said handle to which said file is secured and portions of the thumb and index finger spaced from the tips thereof bear against the other one of said bulbous portions; said outer surface of said handle has, in the direction of the longitudinal axis of said handle, a concave gradual curvature at each location where a respective bulbous portion is joined to said central portion; and said recesses are oriented relative to one another so that the tangents to the centers of the recesses, which tangents lie in a plane perpendicular to the longitudinal axis of said handle, form an acute angle of greater than 0° with one another.

4,824,370

DENTAL DRILL

Jean M. Laurichesse, Paris, and Henri Leonard, Besancon, both of France, assignors to Micro-Mega, Besancon, France

Continuation of Ser. No. 70,090, Jul. 6, 1987, abandoned, Continuation of Ser. No. 799,359, Nov. 18, 1985, abandoned. This application Aug. 25, 1988, Ser. No. 237,660
Claims priority, application France, Jan. 11, 1985, 85 00485
Int. Cl.[4] A61C 5/02
U.S. Cl. 433—102 5 Claims



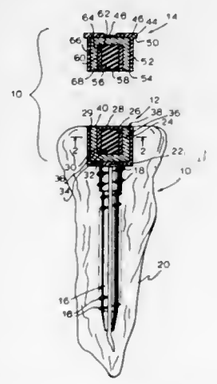
1. A dental drill comprising, a tip, an elongate drill body tapered to said tip, said drill body having a plurality of barbs projecting outwardly from the drill body and arranged helically about the drill body, the barbs each having an outer peripheral profile resembling a parabola in shape extending generally toward said tip, each barb having a flat surface contiguous with a corresponding flat surface of an adjacent barb, each flat surface of the barbs being disposed in a common helical path about the drill body and each having a shape resembling a parabola projecting outwardly from the drill body, and each barb having a shape resembling a paraboloid in which crossections defined by intersections by planes parallel to the corresponding flat surface thereof and spaced axially on the drill body resemble parabolas with axes thereof decreasing in length as the intersections are made in a direction toward said tip.

4,824,371

RETENTION DEVICE FOR DENTURES AND THE LIKE

Allan S. Deutsch, and Barry L. Musikant, both of New York, N.Y., assignors to Essential Dental Systems, Inc., New York, N.Y.

Filed Dec. 17, 1986, Ser. No. 942,761
Int. Cl.[4] A61C 13/235
U.S. Cl. 433—189 21 Claims



15. A magnetic device for releasably retaining a denture to a tooth into which a dental post is threaded,

said device comprising an open ended non-magnetic non-corrosive denture holder containing a permanent magnet having opposed magnetic poles, one of which being directed to the open end of said denture holder,

means for insulating said one magnet pole of said magnet with said other magnetic pole thereof being exposed, and

magnetic conductor means filling said denture holder in contact with said exposed magnetic pole for conducting the magnetic flux from said exposed magnetic pole to the open end of said denture holder.

a dental post having threads and having an open ended holder of non-magnetic non-corrosive material and in which said dental post holder contains a permanent magnet having opposite magnetic poles one of which being directed to the open end of said post holder,

means for insulating said one magnetic pole of said dental post magnet with the other magnetic pole thereof being exposed,

said exposed magnetic pole of said dental post being of a magnetic polarity opposite to that of said exposed magnetic pole of said denture magnet, and

magnetic conductor means filling said dental post holder in contact with said exposed magnetic pole of said dental post for conducting the magnetic flux from said exposed magnetic pole of the dental post to the open end of its respective holder,

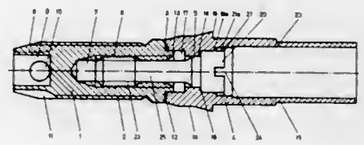
said magnetic conductor means of said holders of said denture and dental post forming a closed magnetic path therebetween and between their respective magnets to releaseably retain the denture to the dental post.

4,824,372

APPARATUS FOR THE FIXATION OF A SINGLE-TOOTH RESTORATION

Lars Jörnéus; Lennart Lööf, both of Gothenburg, and Bo Rangert, Mölnlycke, all of Sweden, assignors to Nobelpharma AB, Gothenburg, Sweden

Filed Oct. 21, 1987, Ser. No. 110,994
Claims priority, application Sweden, May 13, 1987, 8701949
Int. Cl.[4] A61C 13/00
U.S. Cl. 433—174 8 Claims



1. An apparatus for anchoring a single-tooth restoration to an implant fixture permanently anchored in the maxillary and having an internally threaded bore in the upper portion of the fixture, said apparatus comprising:

a tubular spacer member having an outer wall for connecting to the single-tooth restoration and an annular internal inwardly extending shoulder provided along an inner wall of a lower portion of said spacer member;

a screw member insertable into said tubular spacer for connecting said tubular spacer member to the implant fixture, said screw member including:

a lower externally threaded portion at one end thereof, screwable into the internally threaded portion of the fixture;

a substantially cylindrical head portion on the opposite end thereof provided with a corresponding outwardly extending substantially planar shoulder which cooperates with said annular shoulder on said tubular spacer member for connecting said spacer member to said screw member; and

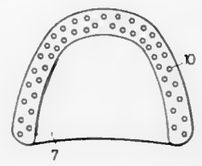
a non-thread loaded portion having a length larger than the thread diameter of said threaded portion.

4,824,373

SWAGED METAL DENTURE BASE

Minoru Okada; Yoshiaki Shida; Tomio Nishikawa, all of Amagasaki; Isamn Kato, Kawanishi; Kazuyuki Nakano, Kawanishi, and Ryozo Isomura, Kawanishi, all of Japan, assignors to Sankin Industry Co. and Sumitomo Metal Industries, Ltd., both of, Japan

Filed Oct. 2, 1987, Ser. No. 103,648
Claims priority, application Japan, Oct. 8, 1986, 61-240024
Int. Cl.[4] A61C 13/00
U.S. Cl. 433—200.1 13 Claims



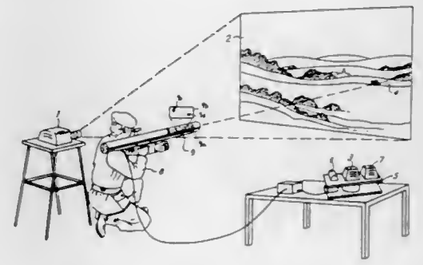
1. A denture base having a flange portion in which plural openings are formed, the denture base being a pressure-formed, superplastic alloy plate and having a polished, smooth surface, the alloy plate being pressure-formed at a temperature where the alloy exhibits superplasticity.

4,824,374

TARGET TRAINER

Dennis J. Hendry, and Peter J. King, both of c/o Fitzalan Road, Arundel, West Sussex BN18 9JS, England

Filed Aug. 4, 1986, Ser. No. 892,864
Int. Cl.[4] F41J 5/08
U.S. Cl. 434—22 9 Claims



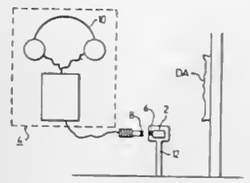
1. A target trainer comprising a screen for displaying a picture of a terrain; a target projector means for projecting onto the screen a target image; drive means coupled with said target projector for moving the target image across the screen; a shot simulator/detector arrangement having (a) a target beam projector means for projecting onto the target a spot of infra-red light, (b) a television camera directed at the region of the target and responsive to the infra-red spot, and (c) means connected to said television camera for analyzing the position of the infra-red spot in the camera field of view to give an output signal representative of the position of the fall-of-shot, and a fall-of-shot indicator having a further projector means for projecting a fall-of-shot indicator beam of light onto the screen and including positioning means responsive to the output signal to position the fall-of-shot indicator beam on the screen independent of the target.

4,824,375

SOUND-PRODUCING AMUSEMENT OR EDUCTIONAL APPARATUS

Avish J. Weiner, Tel-Aviv, Israel, assignor to Megatone Ltd., Tel Aviv, Israel

Continuation-in-part of Ser. No. 3,040, Jan. 13, 1987, abandoned, which is a division of Ser. No. 116,842, Nov. 5, 1987, Pat. No. 4,778,391. This application Jan. 19, 1988, Ser. No. 145,160
Claims priority, application Israel, Jan. 2, 1987, 81146
Int. Cl.[4] G09B 19/00
U.S. Cl. 434—319 19 Claims



1. Apparatus for carrying out an amusement, educational or

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similar function accompanied by audible sounds relating to an article, said apparatus comprising:

a static memory unit adapted to be located at a fixed location with respect to said article and including a read-only memory having digitally stored therein a recording of particular audible sounds relating to the article, and an output device;

and a portable sound-producing unit to be carried by a user and including an input device adapted to be coupled to the output device of the static memory unit and means to convert a digital recording stored in the read-only memory of the static memory unit to audible sounds;

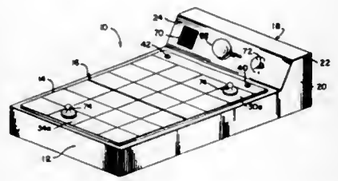
said sound-producing unit further including a random-access memory for storing the digital data stored in said static memory unit at a rate faster than the normal speech rate, and control means for subsequently playing-back the digital data recorded in said random-access-memory at the normal speech rate.

4,824,376

EDUCATIONAL DEVICE

Ahmad R. Arash, 1 Howe St., Ipswich, Mass. 01938

Filed Apr. 20, 1987, Ser. No. 40,029
Int. Cl.[4] G09B *3/00*
U.S. Cl. 434—330 **11 Claims**



1. An educational device adapted to use interchangeable card members having comparable informational indicia thereon comprising:

means forming a casing;

a top dielectric panel member having upper and lower surfaces removably secured to said casing;

a plurality of pairs of normally open electric current paths associated with the lower surface of said panel member, each of said current paths having a normally open magnetic switch means thereby forming a corresponding pair of magnetic switch means;

a source of electrical energy connected to said open electric current paths;

indicating means electrically connected to said pairs of current paths operative when activated to provide a sensurous indication when a corresponding pair of said normally open switch means is closed;

said interchangeable card members adapted to be positioned on the upper surface of said panel member and having an upper indicia bearing surface comprising a first section having a plurality of informational indicia thereon and a second section having a plurality of informational indicia thereon, each of said indicia of said first section having a related indicia in said second section to thereby form pairs of comparable indicia; and

a pair of manipulatable magnetic selector means constructed and arranged to close said normally open magnetic switch means when positioned on said indicia bearing surface adjacent said magnetic switch means;

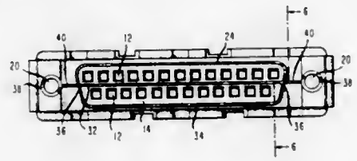
said pair of magnetic selector means being movable over the indicia bearing surface whereby an intelligent selection of a pair of said comparable indicia accompanied by a correct positioning of said selector means adjacent the associated pair of magnetic switch means closes said magnetic switch means and activates said indicating means.

4,824,377

UNMATED PIN CONNECTOR HAVING IMPROVED ELECTROSTATIC DISCHARGE PROTECTION

Agostino L. De Burro, Atkinson, N.H., assignor to Americal Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 3, 1988, Ser. No. 151,841
Int. Cl.[4] H01R *13/53*
U.S. Cl. 439—186 **4 Claims**



1. A female pin connector which, when not mated, prevents damaging levels of an electrostatic discharge from reaching a pin of the connector, comprising,

a body fabricated of an insulative material having a plurality of contact housing channels defined therein said contact housing channels having, at one end, pin insertion holes,

a plurality of contacts disposed in said contact housing channels for electric connection to conductive pins of a mating plug upon insertion of the conductive pins through the pin insertion holes, and

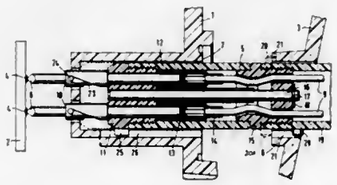
a conductive wire supported by the body of insulative material and traversing a path which encircles said pin insertion holes, said conductive wire being coupled to a grounding terminal whereby an electrostatic discharge directed towards the conductive pins of the female pin connector when not connected to a mating plug will be discharged through said conductive wire and grounding terminal rather than being discharged to the contacts of the female pin connector.

4,824,378

SYSTEM FOR THE PROGRAMMING OF A MEASURING INSTRUMENT INSTALLED IN AN AUTOMOTIVE VEHICLE

Egon Betz, Kronberg, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 5, 1987, Ser. No. 82,823
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631549
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—55 **12 Claims**



1. In a system for programming a measuring instrument installed in an automotive vehicle and having a front plate and a cover glass and within which an electric circuit is disposed, the improvement wherein

said front plate and said cover glass are formed with openings aligned with each other,

contacts are connected with the electric circuit and are arranged in a region of an opening in the front plate,

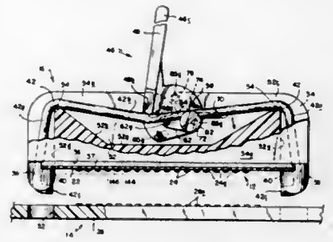
an opening in the front plate is provided with an anti-turning device for receipt of a programming plug which is to be introduced.

4,824,379

FLEXIBLE CIRCUIT CONNECTION ASSEMBLY

Joseph A. Roberts, Hudson, and Thomas H. Stearns, Nashua, both of N.H., assignors to Advanced Circuit Technology, Nashua, N.H.

Continuation of Ser. No. 416,490, Sep. 10, 1982, abandoned. This application Dec. 31, 1984, Ser. No. 686,631
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—77 **33 Claims**



1. A connector assembly comprising

A. frame means defining a reference surface;

B. spring means

(1) movably mounted to the frame means, and

(2) defining a pair of spaced-apart arm whose ends extend proximate to the reference surface; and

C. actuating means movably mounted to the frame means in engagement with the spring means, said actuating means being movably between

(1) a first position wherein the actuating means urge the spring means to an extended position on the frame means while simultaneously flexing the spring means so that said arm ends are spaced away from said reference surface and simultaneously spread apart,

(2) a stable second position wherein the actuating means permit the spring means to relax whereby said arm ends spring together to an unstressed neutral position, and

(3) a stable third position wherein the actuating means retract the spring means on the frame means while simultaneously flexing the spring means so that the arm ends are drawn in close to said reference surface and toward one another enabling those ends to engage an electrical circuit member and resiliently press that member toward said frame means reference surface.

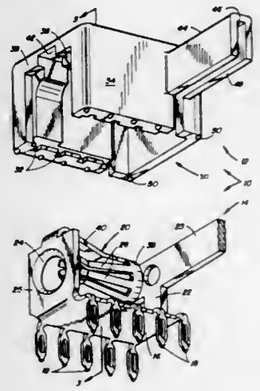
4,824,380

QUICK DISCONNECT CONNECTOR AND SYSTEM WITH INTEGRAL CONDUCTOR

Russell H. Matthews, Modesto, Calif., assignor to Elcon Products International Company, Fremont, Calif.

Filed Nov. 24, 1987, Ser. No. 124,747
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—78 **13 Claims**

1. A connector, which comprises a generally rectangular housing having a bottom and a conductive element substantially contained within said housing, the bottom of said housing having an opening dimensioned to allow insertion of said conductive element substantially within said housing, said conductive element having a common conductive portion and a plurality of conductive pins extending downward from the common conductive portion, the opening of the bottom of said housing having a like plurality of peripheral slots each configured to receive one of the plurality of conductive pins, said conductive element having a face connected to said common conductive portion; the face having a socket opening and a plurality of contact tines connected to the face and positioned axially behind the socket opening, said housing having a surface in addition to the bottom, the surface having an aperture



positioned facing the socket opening, at least the common conductive portion, face and plurality of contact tines being integrally formed from a single metal member.

4,824,381

CIRCUIT BOARD CONTAINING A METAL NET

Tommy H. Hertzberg, Perstorp, and Bernt Ekström, Tyringe, both of Sweden, assignors to Perstorp AB, Perstorp, Sweden

Continuation of Ser. No. 942,780, Dec. 17, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 149,928
Claims priority, application Sweden, Dec. 23, 1985, 8506105
Int. Cl.[4] H01R *13/48*
U.S. Cl. 439—87 **11 Claims**

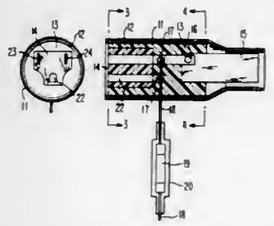
1. A printed circuit board which comprises as a part of the circuit board at least one metal net made of a material taken from the group consisting of Covar, Invar, molybdenum or wolfram.

4,824,382

ADAPTER FOR A WELDER

Richard P. Ryan, 5633 Lilac Blossom La., San Jose, Calif. 95124

Continuation of Ser. No. 66,308, Jun. 25, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 224,237
Int. Cl.[4] H01R *4/66, 21/00*
U.S. Cl. 439—105 **2 Claims**



1. An adapter for providing electrical power from a welding machine having an output welding lead connected to an electrode holder and having an electrical ground, comprising:

a tubular housing;

an electrical plug receptacle mounted in an output end of

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said housing, said electrical plug receptacle having at least a groud pole and first and second power poles extending within said housing;

a ground clip;

a ground wire electrically connected at one end to said ground pole and to said first power pole, and connected at the other end to said ground clip for connection to an electrical ground point;

a male power pickup strip extending from an input end of said tubular housing and electrically connected to said second power pole within said housing, said power pickup strip being connectable to the electrode holder of the welding machine and being the only conductive strip extending from said housing input end;

elastic means surrounding and protecting said housing and said power pickup strip; and

resin means within said housing and surrounding inner ends of said ground and power poles.

4,824,383

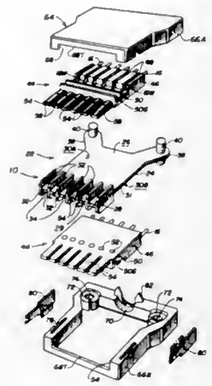
TERMINATOR AND CORRESPONDING RECEPTACLE FOR MULTIPLE ELECTRICAL CONDUCTORS

Timothy A. Lemke, Carlisle, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 91,002, Sep. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 932,921, Nov. 18, 1986, abandoned. This application May 13, 1988, Ser. No. 193,611

Int. Cl.[4] H01R *4/66*

U.S. Cl. 439—108 **39 Claims**



1. A terminator for multiple electrical conductors, comprising:

a metallic ground structure formed of a baseplate with a plurality of upstanding walls thereon cooperating to define a predetermined number of channels arranged in side-by-side relationship across the ground structure;

an insulated support structure having a body portion with a plurality of forwardly extending fingers thereon, each of the fingers being received in one of the channels; and

an electrical contact element being disposed on each of the fingers, each of the contact elements being connectable to one of the conductors so that, in use, the ground structure is connectable to a predetermined electrical potential whereby the electrical contact elements are electrically isolated from each other.

4,824,384

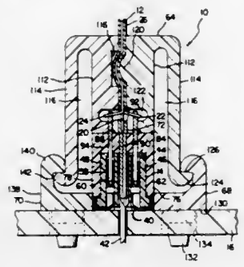
ELECTRICAL CABLE CONNECTOR AND METHOD OF USE

Vincent Nicholas, Spring Hill, and Paul P. Siwinski, Seminole, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 23,760, Mar. 9, 1987, Pat. No. 4,747,787. This application Dec. 22, 1987, Ser. No. 136,785

Int. Cl.[4] H01R *13/650*

U.S. Cl. 439—108 **22 Claims**



1. An electrical connector assembly comprising an electrical connector and a multiconductor cable having a plurality of individual wires, the connector comprising:

an insulative housing having a plurality of apertures extending between a first surface and a second surface;

conductor termination means including a plurality of contact terminals located in the apertures, each contact terminal having means for receiving a wire at one end proximate the first surface;

strain relief means for holding the cable to preclude movement thereof from the connector;

the connector being characterized in that the strain relief means is oriented to position the cable parallel with a longitudinal central plane of the connector, at least the one end of the contact terminals also extending parallel to the longitudinal central plane of the connector with the means for receiving a wire in each contact terminal oriented to extend transversely to the longitudinal central plane of the connector, the individual wires being bent transversely relative to the longitudinal central plane of the connector and received in the means for receiving a wire in each contact terminal.

4,824,385

RIGID SHEATH FOR A SPARK PLUG CABLE AND ITS ASSOCIATED BOOT

Ronald P. Sturdevan, Tifton, Ga., assignor to Prestolite Wire Corporation, Farmington Hills, Mich.

Filed Nov. 13, 1987, Ser. No. 121,046

Int. Cl.[4] H01R *11/16, 13/516*

U.S. Cl. 439—128 **19 Claims**

10. A rigid sheath for a spark plug cable and its associated boot, comprising:

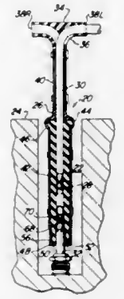
a first rigid sheath component having a lower portion for receiving a first portion of said boot and an upper portion for receiving a first portion of said spark plug cable;

a second rigid sheath component having a lower portion for receiving the remaining portion of said boot and an upper portion for receiving a second portion of said spark plug cable, said second rigid sheath component being joinable to said first rigid sheath component along a common plane to form a rigid sheath having a lower portion intimately contacting said boot therein and an upper portion for receiving said spark plug cable;

means for retaining said first rigid sheath component in a joined relation with said second rigid sheath component;

means for interlocking said rigid sheath with respect to said boot for providing correlative movement between said rigid sheath and said boot whenever said rigid sheath is moved; and

means for gripping said rigid sheath, said means for gripping being located adjacent said upper portion of said first and



second rigid sheath components, said means for gripping having a guide passage therethrough for receiving said spark plug cable and providing a guide for directing said spark plug cable in a predetermined direction.

4,824,386

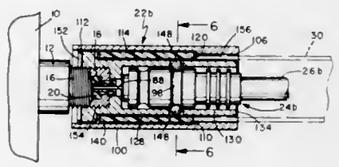
SECURITY CONNECTOR ASSEMBLY FOR MATING COAXIAL CONNECTORS

Roger B. Souders, 10180 Eagle Rock Ave., San Diego, Calif. 92126

Filed Oct. 5, 1987, Ser. No. 104,403

Int. Cl.[4] H01R *13/44, 13/625*

U.S. Cl. 439—133 **23 Claims**



1. An apparatus for providing selective electrical coupling between a pair of mating connectors comprising:

an outer casing;

an inner casing rotatably disposed about a common axis with said outer casing within said outer casing, said inner casing having means for attaching said inner casing to one of a pair of mating connectors;

a sleeve member rotatably disposed about said common axis between said outer and inner casings; and

connector mating means for retaining the other one of said pair of mating connectors in a selected one of first and second positions within said inner casing, said other mating connector being engaged and disengaged from electrical contact with said one mating connector when respectively positioned in said first and second positions.

4,824,387

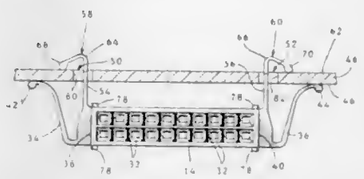
BIASED FLOATING CONNECTOR

Peter C. deJong, Harrisburg; Robert W. Elicker, Dillsburg, and Thomas J. Zola, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 897,186, Aug. 15, 1986, Pat. No. 4,755,149. This application Nov. 4, 1987, Ser. No. 117,167

Int. Cl.[4] H01R *13/62, 13/74*

U.S. Cl. 439—248 **10 Claims**



6. A connector mountable to a panel, said panel having opposed first and second major surfaces and aperture means extending therebetween, said connector comprising:

a housing having contact receiving passages therein, said housing adapted to be mounted to the panel with said contact receiving passages extending parallel to the major surfaces of the panel, said housing adapted to be moveable toward and away from the panel during mating with a complementary connector;

a spaced pair of resilient first means extending from the housing to first free ends adapted to engage the first major surface of the panel at respective spaced first locations proximate the aperture means;

a spaced pair of resilient second means extending from the housing to respective forward ends insertable through the aperture means, each said forward end including a bight section and an end section extending from the bight section to a second free end adapted to engage the second major panel surface, said second free ends engageable with the second major surface of the panel at respective second locations proximate the aperture means, whereby upon mounting said connector to the panel, said resilient first means engage the first major surface of the panel such that the connector housing is biased away from the panel by said pair of resilient first means, said resilient second means extend through the aperture means to engage the second major surface of the panel such that the connector housing is biased toward the panel by said pair of resilient second means, said connector housing assuming a first unmated position with respect to the panel and incrementally moveable against said biases to a second position relative to the panel upon mating with a complementary connector.

4,824,388

MALE OR FEMALE CONNECTOR FLOATINGLY MOUNTED IN A MOUNTING PLATE

Wolfgang Pickel, Stuttgart, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed May 13, 1988, Ser. No. 193,917

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716152

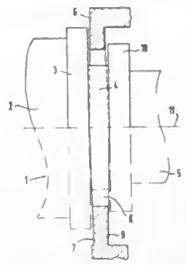
Int. Cl.[4] H01R *13/64*

U.S. Cl. 439—248 **5 Claims**

1. A connector floatingly mounted in a mounting plate having an opening through which a rear threaded shank of the connector is inserted from one side of the plate until a housing of the connector strikes against the one side of the mounting plate, the connector being fixed on an other side of the plate by means of a nut screwed against a shoulder of the connector,

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wherein at a center axis of the opening, the mounting plate has a material thickness which is equal to the thickness of the



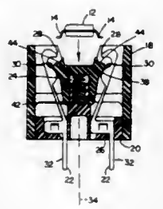
shoulder of the connector and which decreases in opposite directions from the center axis of the opening.

4,824,389

SOCKET FOR ELECTRONIC COMPONENT

John T. Doyle, Winchester, Mass., and Richard D. Wiciel, Kingston, N.H., assignors to Precision Connector Designs, Inc., Peabody, Mass.

Filed Apr. 26, 1988, Ser. No. 185,528
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—269 **5 Claims**



1. A socket for an electronic component having conductors for making electrical connection with external circuitry, said socket comprising

a base member,

a plurality of resilient contacts that are mounted on said base member at contact support portions and have free contact ends for engaging said conductors of said component, said contacts also having inwardly-directed first cam surfaces,

a component support that is slidably mounted with respect to said base member and contacts along an axis and has outwardly-directed second cam surfaces that act to displace said contacts transversely to said axis as said component support is moved along said axis,

said component support having conductor support surfaces for supporting said conductors of said component,

said contacts extending, between said first cam surfaces and said contact ends, outwardly of said support member and then inwardly toward said conductor support surfaces so as to engage said conductors when said conductors are sandwiched between said contact ends and said conductor support surfaces, and

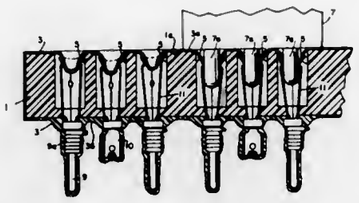
means to bias said base member with respect to said support to bias said contact ends toward said conductor support surfaces.

4,824,390

COATED ELECTRICAL CONNECTOR

Robert A. Crane, Windham, and John J. Naplorkowski, Cape Elizabeth, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 8, 1988, Ser. No. 153,681
Int. Cl.[4] H01R *13/52*
U.S. Cl. 439—271 **13 Claims**



1. An electrical connector comprising:

an electrical insulating member, and at least two exposed electrical contacts disposed in said member;

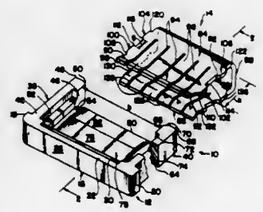
an electrically insulating coating of self-adhering gel-like deformable polymeric material disposed on said member and said contacts, said material being deformable and penetratable at ambient temperatures whereby to provide for penetration thereof by mating electrical contacts and enabling an electrical connection between said male and female contacts.

4,824,391

CONNECTOR FOR FLAT FLEXIBLE CIRCUIT MEMBERS

Hidehiro Ii, Yokohama, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed Oct. 23, 1987, Ser. No. 111,951
Claims priority, application Japan, Nov. 28, 1986, 61-183292[U]
Int. Cl.[4] H01R *23/66*
U.S. Cl. 439—329 **18 Claims**



1. A connector for joining a plurality of flat flexible circuit members in face to face contact with one another, said connector comprising:

a carrier comprising a base, a pair of generally spaced apart guides connected to and extending from said base, at least one of said guides including at least one locking recess, and a support connected to and extending from said base and disposed intermediate said guides; and

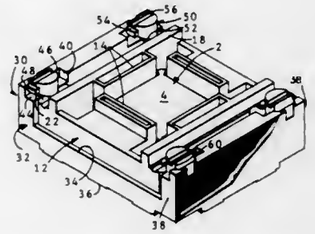
a resilient clip comprising a pair of opposed arms and a connecting member extending therebetween, said clip being dimensioned to be slideably inserted over said support of said carrier and intermediate the guides thereof, said clip including locking means engageable with said locking recess for locking the clip to the carrier, whereby, the flat flexible circuit members may be placed in face to face relationship on the support of the carrier and between the guides thereof and whereby, the clip may be slideably advanced between the guides of the carrier and over the flat flexible circuit members and the support of the carrier to securely hold the flat flexible circuit members in face to face contact with one another and against the support.

4,824,392

BURN-IN SOCKET FOR GULL WING INTEGRATED CIRCUIT PACKAGE

Timothy B. Billman, King, and Joseph R. Goodman, Walkertown, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 10, 1987, Ser. No. 118,916
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—331 **7 Claims**



1. An electrical connector for accepting a carrier member and a semiconductor package and for effecting an electrical interconnection between semiconductor package leads and traces of a printed circuit board, where the carrier member comprises an insulative material having an upper surface and a lower surface and a package receiving pocket therebetween with the semiconductor package body installed within the pocket, the electrical connector comprising:

an insulative housing having an upper package receiving face and a lower mounting face, the housing having a plurality of laterally spaced terminal receiving cavities extending between the faces;

a plurality of electrical terminals positioned within the cavities, the terminals including portions extending beyond the lower face for contact with the printed circuit board, and resilient contact portions which extend upwardly with at least a portion of the contact portion above the upper face; and

latching means mounted to said connector being rotatable relative thereto and having a contacting surface, defined as a helical rampart, spaced from an axis of rotation for imparting a downward vertical force on said carrier to effect electrical connection between said package leads and said electrical terminals.

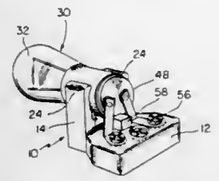
4,824,393

SOCKETLESS LIGHT BULB HOLDER

Joseph M. Armbruster, 2700 N. E. 47th St., Lighthouse Point, Fla. 33064

Filed Jul. 11, 1986, Ser. No. 884,518
Int. Cl.[4] H01R *13/625*
U.S. Cl. 439—332 **6 Claims**

1. A holder for a light bulb having a cylindrical base provided with a pair of radially projecting pins and a pair of contact terminals in the bottom end of the base comprising a bracket constructed of rigid, non-conductive material and including a mounting base and bulb mount oriented in perpendicular relation, means mounting said mounting base from a supporting structure, said bulb mount including a pair of spaced members having partially cylindrical interior surfaces for frictionally receiving the cylindrical base of the light bulb and a pair of conductor members attached to the mounting base and extending to the proximity of the pair of terminals on the light bulb supported by the holder for connection thereto,



said mounting base including means for locking the base of the bulb thereto.

4,824,394

1DC CONNECTORS WITH ROTATED CONDUCTOR PAIRS AND STRAIN RELIEF BASE MOLDED ONTO CABLE

Alan L. Roath, Madison, Ohio, and John N. Tengler, Chico, Calif., assignors to Ohio Associated Esterprises, Inc., Painesville, Ohio

Continuation-in-part of Ser. No. 850,254, Apr. 10, 1986, abandoned. This application Feb. 9, 1987, Ser. No. 12,190
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—395 **46 Claims**



1. A method of making a cable termination assembly that includes plural electrical conductors and respective contacts for connecting such conductors with external conductive members, comprising

placing part of such cable in a mold,

rotating/twisting at least one pair of conductors of such cable during the closure of such mold,

molding a strain relief body to the cable using such mold,

using the rotating/twisting mechanism to effect a shut off function for such mold to define recess openings in such strain relief body for access to respective conductors.

4,824,395

PUSH-IN WIRE CONNECTOR

William E. Blaha, St. Charles, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Feb. 8, 1988, Ser. No. 153,052
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—438 **11 Claims**

1. A connector for connecting electrical conductors, comprising:

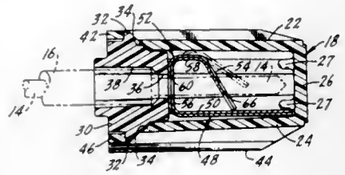
a housing defining an enclosure and at least one opening providing access to the enclosure;

at least one lug formed on the housing and extending into the enclosure; and

a one-piece, conductive clip disposed in the housing, having a first, flat portion and a second, curved portion, the first portion engaging the lug to retain the first portion in a

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fixed position in the housing and the second portion having a hole aligned with the housing opening to permit electrical conductors to be inserted into the housing, between the first and second portions of the conductive clip, the second portion being folded back on the first portion to define a cantilevered spring normally located



opposite the opening in the housing such that the spring is deflected away from the first portion of the clip by electrical conductors inserted into the housing, the deflected spring being engageable with the conductors to impart a clamping force on them to retain them in the housing and provide electrical connection between said conductors.

4,824,396

ELECTRICAL CONNECTION APPARATUS

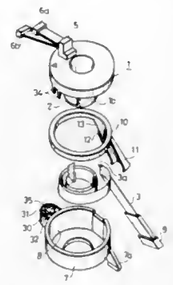
Kunihiko Sasaki; Kiichi Yamaguchi; Tsumoru Oka; Takasi Ohya; Mituaki Shinraku; Akihiro Konno, and Yuichi Ida, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 17, 1988, Ser. No. 170,918

Claims priority, application Japan, May 27, 1987, 62-78734[U]; Jul. 7, 1987, 62-103307[U]

Int. Cl.⁴ H01R *39/02*

U.S. Cl. 439—475 **8 Claims**



1. In an electrical connection apparatus including a fixed member, a movable member pivotably mounted on the fixed member, and a flat cable having one end secured to the fixed member and the other end secured to the movable member to electrically connect them, an electrical connection apparatus characterized in that said flat cable is provided with a turning portion at a fixing portion thereof to said fixed member, and that a cutter is provided at a fixing portion of said fixed member to enter toward a folding line of said turning portion of said flat cable so that the cutter cuts said flat cable when said movable member is rotated beyond a predetermined amount.

4,824,397

ELECTRICAL CONNECTING DEVICE

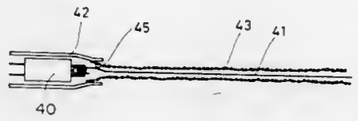
Tunehiko Tanabe, and Fumiyoshi Kawada, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 51,167, May 18, 1987, abandoned, which is a continuation of Ser. No. 822,968, Jan. 28, 1986, abandoned, which is a continuation of Ser. No. 676,226, Nov. 30, 1984, abandoned, which is a continuation of Ser. No. 468,960, Feb. 23, 1983, abandoned. This application Apr. 27, 1988, Ser. No. 188,102

Claims priority, application Japan, Feb. 25, 1982, 57-30213; Feb. 25, 1982, 57-30214

Int. Cl.⁴ H01R *13/04*

U.S. Cl. 439—496 **10 Claims**



1. An electrical connecting assembly consisting of:

a connector having two rows of parallel electrical terminals projecting from one side of said connector;

a connector cover made of a conductive material surrounding said connector;

a flexible wiring substrate with a plurality of electrical wiring patterns formed on only one surface of said substrate each of said electrical wiring patterns terminating at a plurality of rows of respective electrodes positioned on said one surface of said substrate, each electrode corresponding to each of said terminals of said two parallel rows of terminals, at least one row of said electrodes being completely surrounded by electrical wiring, said substrate being turned on itself so as to be inserted between said two rows of terminals of said connector such that electrical connection is made between each of said terminals and said respective corresponding electrodes, said electrical wiring patterns having a protective insulating film coating; and

an electrically conductive cable protection cover made of a braided woven metal net of wire surrounding said flexible wiring substrate to enclose said substrate, said protection cover being secured to said connector cover, whereby said connector cover and woven metal net protection cover function, in combination, to protect said flexible wiring substrate from electrical noise, said braided woven metal net of wire providing a protective cover which will neither expand nor contract in either a longitudinal direction or across its width.

4,824,398

SOLDERABLE STANDOFF BOARDLOCK

Robert L. Taylor, Mechanisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 21, 1987, Ser. No. 86,880

Int. Cl.⁴ H01R *13/648*

U.S. Cl. 439—557 **26 Claims**

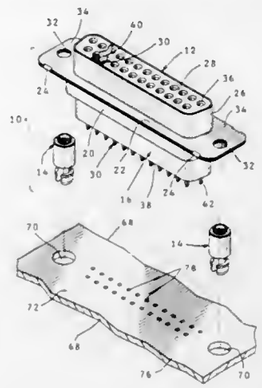
6. A standoff boardlock for securing a connector assembly having a connector housing to a printed circuit board, comprising:

a body having first and second ends;

means at the first end of the body for securing the standoff to a connector housing;

a pair of spring means extending from the second end of the body to respective free ends, each of said spring means having a shoulder extending outward from the axis and a cooperative tapered section, said shoulder and said tapered section located intermediate the second end of the body and the free end thereof, said spring means adapted to be inserted into and seated in an aperture in the printed

circuit board with a first surface of the printed circuit board received against said shoulder and a second surface



of the printed circuit board engaging said tapered section, whereby the boardlock is secured to the printed circuit board.

4,824,399

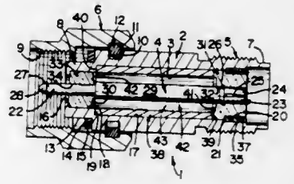
PHASE SHIFTER

Jerry H. Bogar, and Edgar W. Forney, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 64,166, Jun. 19, 1987, abandoned. This application May 20, 1988, Ser. No. 198,630

Int. Cl.⁴ H01R *17/18*

U.S. Cl. 439—578 **9 Claims**



1. A method for selecting a phase shift along an electrical transmission line of fixed physical length and in the form of an electrical connector comprising,

an elongated conductive shell of fixed length, electrical connector coupling means at the ends of the shell for coupling the shell along a corresponding electronic transmission line, an elongated passage extending through the shell, an elongated electrical conductor of fixed length extending through the passage, and electrical contact means at the ends of the conductor for electrical coupling of the conductor along the corresponding electronic transmission line, the method comprising the steps of:

selecting a first dielectric means and a second dielectric means directly together in series for concentrically encircling the conductor,

varying selectively an electrical length of the transmission line while maintaining a fixed physical length of the transmission line by selectively varying the proportion of the individual physical lengths of the first dielectric means and the second dielectric means in relation to a constant sum of the individual physical lengths,

supporting the conductor concentrically within the passage by a third dielectric means and

encircling concentrically the conductor with the first dielectric means and the second dielectric means within the passage.

4,824,400

CONNECTOR FOR A COAXIAL LINE WITH CORRUGATED OUTER CONDUCTOR OR A CORRUGATED WAVEGUIDE TUBE

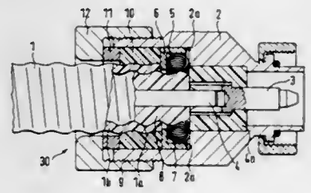
Georg Spinner, Am Eichberg 12, 8152 Feldkirchen-Westerham, Fed. Rep. of Germany

Filed Mar. 10, 1988, Ser. No. 166,106

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708242

Int. Cl.⁴ H01R *17/04*

U.S. Cl. 439—578 **12 Claims**



1. A connector for a coaxial line with corrugated outer conductor or a corrugated waveguide tube; comprising:

a metal casing;

contacting means arranged within said metal casing and surrounding the outer conductor or waveguide tube for contacting the latter, said contacting means including a helical spring ring of conductive material; and

thrust means for urging said helical spring ring axially in direction toward a radial annular contact surface of said metal casing.

4,824,401

CONNECTOR FOR COAXIAL LINES WITH CORRUGATED OUTER CONDUCTOR OR FOR CORRUGATED WAVEGUIDE TUBES

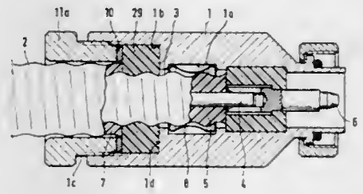
Georg Spinner, Am Eichbert 12, 8152 Feldkirchen-Westerham, Fed. Rep. of Germany

Filed Mar. 10, 1988, Ser. No. 166,184

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708241

Int. Cl.⁴ H01R *17/04*

U.S. Cl. 439—584 **6 Claims**



1. A connector for coaxial lines with corrugated outer conductor or for corrugated waveguide tubes or the like, comprising:

a metal casing defining an interior;

fastening means threadably engagable with said metal casing; and

an elastic plastic ring arranged in said metal casing and surrounding a conductor with corrugated outer surface, said plastic ring bearing with its one end face against a radial annular surface of said fastening means and bearing

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with its other opposing end face remote to said fastening means against a radial annular surface of said metal casing so as to be compressible by said fastening means and forced into the corrugation of the conductor to thereby provide a form-locking connection therewith and to attain a strain relief of the conductor and a sealing of said interior of said metal casing.

4,824,402

CONNECTOR PLUG

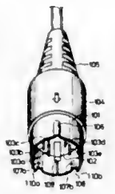
Mitsuo Sorimachi, Isesaki, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

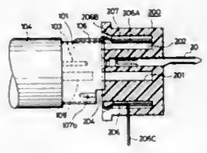
Filed Nov. 24, 1987, Ser. No. 124,651

Claims priority, applicatioo Japan, Dec. 26, 1986, 61-201765[U]

Int. Cl.⁴ H01R *13/648*

U.S. Cl. 439—680 **4 Claims**





1. A connector plug comprising:

a disc-shaped insulating body holding a plurality of contact pins;

a cylindrical metal cover having said insulating body fitted therein;

a main positioning protrusion extending from the front marginal edge of said cylindrical metal cover in its axial direction and protruding outwardly from the outer peripheral surface of said cylindrical metal cover;

a flexible insulating cap fitted on the rear portion of the cylindrical metal cover; and

a cut-away portion cut in the front marginal edge of said cylindrical metal cover along a part of the circumference of said front edge, said cut-away portion defining two corner portions in the front marginal edge of said cylindrical metal cover at opposite ends of said part of said circumference which corner portions cooperate with said main positioning protrusion to position said connector plug relative to a socket into which said plug is inserted.

4,824,403

TELEPHONE CONNECTOR BLOCK FOR CRADLE TYPE INSTALLTION

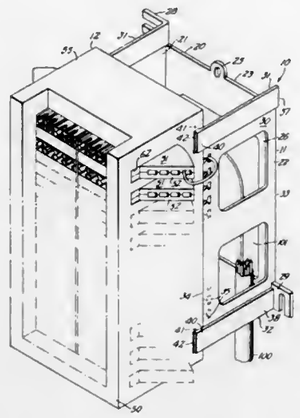
Paul V. De Luca, Plandome Manor; William V. Carney, Oyster Bay; Helmuth Neuwirth, Garden City, and Michael Fasano, Huntington, all of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Jan. 15, 1988, Ser. No. 144,040

Int. Cl.⁴ H01R *9/22*

U.S. Cl. 439—714 **3 Claims**

1. In a telephone connector block of a type including a first exposed wall mounting a plurality of quick clip connectors for engaging individual subscriber pairs, insertable channel means for guiding individual parts of conductors through said block to exit therefrom at identified locations for subsequent external connection, said first exposed wall having plural slotted openings, said block having second and third exposed walls disposed at right angles relative to said first exposed wall, said insertable channel means extending through slotted openings in said first, second and third exposed wall, the improvement



comprising: said channel means extending outwardly of said second and third walls and having edge surfaces lying in planes disposed at an angle less than a right angle with respect to the plane of said first exposed wall, said edge surfaces providing entry to channels leading internally to said quick clip connectors, whereby to facilitate entry of conductors fed from an area adjacent said first exposed surface.

4,824,404

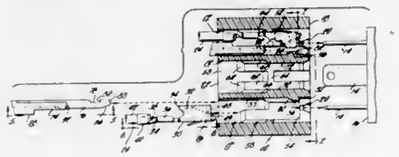
SECONDARY TERMINAL LOCK

Peter H. Bullard, Harleysville, Pa., assignor to Dill Products Incorporated, Norristown, Pa.

Filed Jun. 8, 1987, Ser. No. 58,982

Int. Cl.⁴ H01R *13/426*

U.S. Cl. 439—752 **10 Claims**



1. A secondary lock assembly for securing an electrical female terminal within a cavity of a terminal block and wherein said terminal comprises a channel-shaped opening for receiving a male contact and further comprises a spring for engagement with said male contact, said secondary lock assembly comprising a lock element having a locking tongue, said lock element being adapted for sliding entry into a terminal block cavity adjacent a terminal previously positioned in said cavity, said locking tongue engaging said terminal spring and being resiliently biased by said spring toward a wall of said cavity, latching means cooperatively disposed on said lock element tongue and the cavity wall against which said tongue is biased by said spring, said latching means in conjunction with said spring effecting a locking of said secondary lock element against withdrawal from said cavity when said lock element is fully seated within said cavity, and means on said

lock element for preventing withdrawal of said terminal from said cavity when said lock element is in the locked position thereby holding said terminal fixedly within said cavity in a predetermined position.

4,824,405

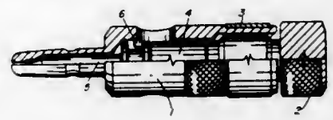
SELF-LOCKING ELECTRICAL BANANA PLUG

Ronald Derain, 66 Boyd Avenue, Weston, Ontario, Canada M9N 2C9

Filed May 28, 1987, Ser. No. 55,146

Int. Cl.⁴ H01R *13/639*

U.S. Cl. 439—807 **16 Claims**



1. A self-locking electrical banana plug comprising a main body member having an expandable plug member at one end, said main body member including a hollow portion, a locking plunger for expanding said plug member, a contact plug disposed in said hollow portion of said main body and abutting said locking plunger, cable receiving and cable clamping means disposed intermediately between the ends of said main body member, said cable receiving and cable clamping means comprising at least one cable receiving aperture in a sidewall of said main body member, whereby, in use, a cable end is received in said cable receiving aperture and is disposed between the contact plug and locking plunger, said banana plug further comprising locking means at the other end of said body member, said locking means, in operation, simultaneously effecting expansion of said expandable plug member and activating said cable clamping means.

4,824,406

ELECTRICAL CONNECTORS

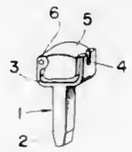
Francis Vause, Vine House Farm, Whinney Lane, Mellor, Blackburn, Lancashire, England

Continuation-in-part of Ser. No. 444,890, Nov. 12, 1982, abandoned. This application Oct. 18, 1985, Ser. No. 788,512

Claims priority, application United Kingdom, Mar. 13, 1981, 8108030

Int. Cl.⁴ H01R *4/50*

U.S. Cl. 439—864 **7 Claims**



1. An electrical connector comprising first and second members, the second member being arranged with a floating pivot to pivot on the first member between a closed position and an open position in which, in said closed position an electrical conductor is adapted to be gripped between the first and second members and in which, in the open position, an electrical conductor may be located in, or removed from the connector, the connector being such that when the first and second members are in the closed position and grip an electrical conductor between the first and second members and a force is exerted on the electrical conductor to tend to withdraw the conductor from the connector, that force being exerted on the electrical conductor to tend to withdraw the conductor from the connector urges the second member at least partly towards the open position and urges the second member towards the first member to increase the grip on the electrical conductor.

4,824,407

TRIMMING DEVICE FOR MARINE PROPULSION APPARATUS

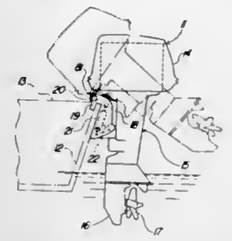
Katsumi Torigai, and Masanori Takahashi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 14, 1987, Ser. No. 72,871

Claims priority, application Japan, Jul. 17, 1986, 61-166815

Int. Cl.⁴ B63H *21/26*

U.S. Cl. 440—1 **14 Claims**



1. In a trim control arrangement for marine outboard drive adapted to be supported for movement relative to the transom of an associated watercraft between a plurality of trim positions, propulsion means carried by said outboard drive, power means for moving said outboard drive between said trim positions, selectively operable control means for activating said power means for operator control of the trim position and said outboard drive, the improvement comprising means responsive to the speed of said propulsion means acting in parallel with said selectively operable control means and independent of the condition of said control means for activating said power means to effect a change of the trim position of said outboard drive when the speed of said propulsion means reaches a predetermined value.

4,824,408

REMOTELY CONTROLLED STEERING APPARATUS FOR OUTBOARD TROLLING MOTORS

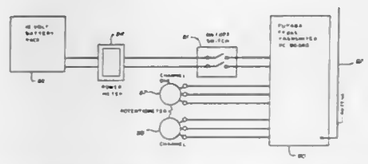
Walter P. Aertker; William L. Taylor, and Frank Medica, all of Alexandria, La., assignors to N. Elton Dry and Charles C. Garvey, Jr., both of New Orleans, La., part interest to each

Division of Ser. No. 523,940, Aug. 17, 1983, Pat. No. 4,565,529. This application Jan. 15, 1986, Ser. No. 819,219

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.⁴ B63H *21/26*

U.S. Cl. 440—6 **13 Claims**



1. A control mechanism for a piloted boat having an outboard trolling motor that is to be directionally steered in directions selected by the boat pilot and while the pilot occupies a position in the boat, comprising:

a. a steering mechanism connected to the outboard trolling

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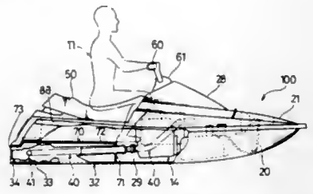
motor for steering the outboard trolling motor with respect to the boat between left and right steering positions;
b. an electric, rotary drive motor for powering the steering mechanism;
c. switch means associated with the electric, rotary drive motor for directionally activating the electric rotary drive motor to rotate the outboard trolling motor in different directions including left and right steering positions;
d. control means normally operable within the boat by the pilot of the boat for activating the switch means and including multiple control positions that respectively correspond to left and right steering positions of the outboard trolling motor;
e. the control means including a transmitter operable by the pilot from one of a plurality of positions within the boat for emitting wireless airwave signals, which travel between the control means and the switch means, and which include directional information such as "left" and "right" steering position information; and
f. a receiver positioned adjacent the electric, rotary drive motor for activating the switch means responsive to receipt of airwave signals that contain the directional information from the transmitter, wherein the wireless airwave signals are radio waves.

4,824,409

MARINE VESSEL WITH INTERNAL COMBUSTION ENGINE HAVING AN EXHAUST PIPE.

Noboru Kobayashi, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 934,229, Nov. 21, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 178,836
Claims priority, application Japan, Nov. 26, 1985, 60-265889
Int. Cl.⁴ B63H *11/02*
U.S. Cl. 440—47 **2 Claims**



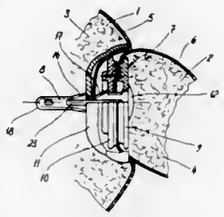
1. A boat operated by an internal combustion engine comprising a boat body having a bow and a stern, said engine being mounted on said boat body, inlet means in said boat body for receiving water from outside the boat body, a flow passage means extending from said inlet means to the stern of the boat, said flow passage means having an outlet nozzle disposed at the stern of the boat through which the water exits from the flow passage means, a propeller disposed within said flow passage means, a hollow enclosure means mounted on said boat body and enclosing therein substantially the entire flow passage means, said hollow enclosure means having two generally upright side walls extending fore and aft and a top wall connected to said upright side walls such that said hollow enclosure means has a substantially inverted U-shaped cross-sectional configuration, said hollow enclosure means also having an opening at one end thereof located at the stern of the boat, said hollow enclosure means further having a forward transverse wall, a propeller drive shaft extending between said engine and said propeller, a propeller shaft enclosure means disposed about said shaft, said propeller shaft enclosure means being connected to said flow passage means and extending forward of said inlet means, said propeller shaft enclosure means extending through said forward transverse wall of said hollow enclosure means, said engine having an exhaust conduit connected to one of said side walls of said hollow enclosure means such that exhaust gases from the engine pass into said hollow enclosure means and exit the latter through said opening in said hollow enclosure means, said flow passage means being spaced from said upright side walls and also being spaced from said top wall, said flow passage means being thereby disposed within said hollow enclosure means such that under operating conditions of the boat, a pressure less than atmospheric pressure is provided within the hollow enclosure means to facilitate the exhaust of the engine exhaust gases from said exhaust conduit into said hollow enclosure means.

4,824,410

JOINT FOR TOY FIGURES, ESPECIALLY STUFFED BEARS

Rüdiger Sommer, Neustadt, Fed. Rep. of Germany, assignor to Plüco Spielwaren GmbH, Neustadt, Fed. Rep. of Germany

Filed Jan. 28, 1988, Ser. No. 149,662
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703284
Int. Cl.⁴ A63H *3/46*
U.S. Cl. 446—371 **13 Claims**



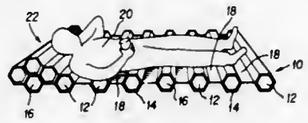
1. A device for articulating limbs and head to a body of toy figures, particularly stuffed animals, comprising: a body portion having a recessed concave shape covered with fabric; a movable member extending into said recessed concave shape and covered with fabric; a bolt having a head and three substantially cylindrical barbed securing sections; a first disk for mounting on a first of said sections adjacent the head of said bolt and having a plurality of rings of teeth; a second disk for mounting on a second of said sections adjacent said first section and having teeth engaging the teeth on said first disk, the teeth on said second disk being displaced by half their width in relation to the teeth on said first disk; the fabric on said movable member being gripped between the teeth on said first disk and the teeth on said second disk; and a third disk for securing the fabric covering said body portion with said movable member and having a bowl-shape receiving at least a part of said first and second disks and being seated on the third of said sections.

4,824,411

SEGMENTED FORMABLE FLOAT APPARATUS AND METHOD

Gary McClanahan, 712 Grove St., Graham, Tex. 76046

Filed Jan. 25, 1988, Ser. No. 148,041
Int. Cl.⁴ B63B *35/86*
U.S. Cl. 441—129 **8 Claims**



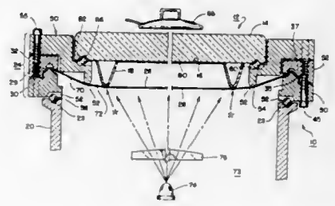
1. A segmented formable float comprising:
A. a plurality of parallel, separate, shaped flotation means;
B. an encapsulating connecting covering means surrounding said flotation means so that said flotation means are separated from each other by spaces of said covering means and so that said flotation means, when folded onto itself, is held in place where folded, by the combination of said shaped flotation means with said spaces of said covering means; and
C. wherein the sides of said flotation means just fit into said spaces and contact other sides of said flotation means and is further held in position thereby.

4,824,412

METHOD FOR MOUNTING A TENSION MASK COLOR CATHODE RAY TUBE

Lawrence W. Dougherty, Sleepy Hollow, and James R. Fendley, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 831,696, Feb. 21, 1986, Pat. No. 4,721,488. This application Dec. 21, 1987, Ser. No. 135,118
Int. Cl.⁴ H01J *9/227*
U.S. Cl. 445—45 **13 Claims**



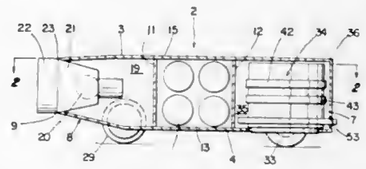
1. A method of fabricating an envelope section for a color cathode ray tube comprising the following:
providing a flat faceplate having a target surface with a frame on opposed sides of said target surface;
tensing an apertured foil substantially to a predetermined tension in a tensing structure;
effecting relative translation of said faceplate and said tensed foil until said faceplate frame effects a positive displacement of said tensed foil;
effecting an indexing directly between said tensing structure and said faceplate;
fabricating a screen comprising a pattern of elemental phosphor areas including photoexposing, through said tensed foil, a photosensitive coating deposited upon said target surface of said faceplate; and
re-indexing said tensing structure and said faceplate and thereafter securing said tensed apertured foil to said faceplate frame in registration with said phosphor areas established on said target surface of said faceplate.

4,824,413

TOY VEHICLE WITH ROTATABLE POWER PACK

Jerzy Perkitny, Bay Village, Ohio, assignor to Those Characters from Cleveland, Cleveland, Ohio

Filed May 9, 1988, Ser. No. 191,710
Int. Cl.⁴ A63H *17/00, 33/22, 17/26*
U.S. Cl. 446—94 **9 Claims**



1. A toy vehicle comprising a body having at least one idler wheel mounted thereon, electric battery removably mounted in the body, an electric circuit conductively coupled to the batteries and including contact means, a power pack including an electric motor rotatably received in the body and having a conductive strip means thereon engaged by the contact means electrically to drive the motor, and at least one driven wheel mounted on and rotatable with the power pack and driven by the motor, the at least one driven wheel extending through the body to drive the toy in any direction depending upon the relative angular orientation of the at least one driven wheel relative to the body.

4,824,414

INFLATABLE TOY WITH HOOK AND LOOP BALL ATTACHMENT

Harold Goldblatt, 3240 N. Lakeshore Dr., Chicago, Ill. 60657

Filed Apr. 4, 1988, Ser. No. 176,929
Int. Cl.⁴ A63H *33/00, 3/06;* **A63B** *67/00*
U.S. Cl. 446—226 **8 Claims**



1. A toy comprising an inflated counterbalanced and closed figure with an outstretched hand, said figure being made of durable sheet material and having a domed-shaped bottom so as to bob back and forth when struck and to come to rest in an upright position, a first fastener means on said outstretched hand, and a separate ball with a second fastener means which is complementary to said first fastener, whereby said ball can be releasably attached to said hand when said fasteners are joined and may be knocked from said fibure by an impact of a child with said figure.

4,824,415

DOLL WITH REMOTE CONTROLLED SUPPORTING ACCESSORY

Horst-Dieter Herbstler, Bolingbrook, and Rouben T. Terzian, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

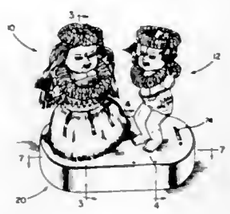
Filed Feb. 10, 1988, Ser. No. 154,653
Int. Cl.⁴ A63H *15/04, 17/25, 11/18, 17/25*
U.S. Cl. 446—276 **9 Claims**



1. A doll and supporting accessory comprising in combination:
a doll having a torso, bead, arms and legs;
the head being mounting atop the torso;
the arms being mounted at each side of the torso, adjacent the top of the torso;

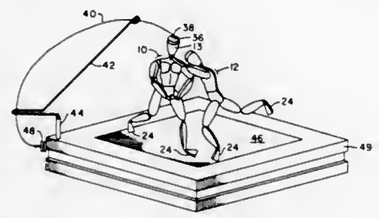
each leg being pivotally connected adjacent a bottom side of the torso for pivotal movement about an axis extending laterally through the torso and substantially transverse to the axis about which the head pivots;
means causing each leg to swing forwardly when the leg is lifted off of a supporting surface upon which the doll is standing;
a motor driven, steerable wheeled vehicle accessory;
means for remotely controlling forward and side-to-side movement of the motor driven accessory;
means on the accessory cooperating with the doll for removably connecting the doll to the accessory in a generally upright standing position with the legs on the supporting surface;
a rotating cam on the accessory and a cam follower on the means for removably connecting the doll cooperating with the cam for generating pivotal motion of the means for removably connecting the doll in response to the remotely controlled driven movement of the accessory so as to rock the doll from side-to-side to cause one leg after the other to be lifted from the supporting surface;
a pair of spaced apart, substantially coaxial wheels on the wheeled vehicle;
means for independently driving each one of the pair of wheels in one direction to move the accessory forward or to one or the other side;
each of the wheels being mounted on an end of a separate coaxial axle;
each of the axles having an inner end opposite the wheel; and
means maintaining the inner end of each axle in drivable engagement with the cam only upon rotation of the axle in the one direction.

4,824,416
DANCING KEIKI DOLLS
Lo Chun-Hoi, Kwai Chung, Hong Kong, and Douglas S. T. Kim, 1350 Ala Moana Blvd., No. 403, Honolulu, Hi. 96814, assignors to Douglas S. T. Kim, Honolulu, Hi.
Filed Jan. 12, 1988, Ser. No. 143,062
Int. Cl.[4] A63H *3/28, 19/60, 13/00*
U.S. Cl. 446—298 **4 Claims**



4. Dancing dolls comprising:
a hollow base,
a first doll having an upper portion resembling the head through waist of a human, a lower portion resembling the waist through hip portion of a human, support means for supporting said upper portion and said lower portion above said base including pivot means for pivotably connecting said upper portion to said lower portion,
a second doll having an upper portion resembling the head through waist of a human, a lower portion resembling the legs of a human, two pins extending through said base, each pin being fixed to the front of a different one of said legs to mount the feet of said legs on said base, and means for pivotably connecting each of said legs with said upper portion,
drive means located in said base,
a rod interconnecting said lower portion of said first doll and said drive means to reciprocate said lower portion of said first doll transverse to said support means, and
said two pins being connected to said drive means to pivot both of said feet of said legs of said second doll towards and away from each other,
said drive means including a motor driving a wheel, one end of said rod being eccentrically mounted on said wheel, and said motor drives spur gears in opposite directions of rotation, a cam being mounted on a shaft of each spur gear to drive cam followers fixed to said two pins.

4,824,417
DYNAMIC WRESTLING FIGURES
Paul C. Jackson, East Elmhurst, N.Y., assignor to Redemption Church of Christ, Troy, N.Y.
Filed Aug. 3, 1987, Ser. No. 80,812
Int. Cl.[4] A63H *13/06*
U.S. Cl. 446—335 **7 Claims**



1. An amusement device comprising:
a first movably jointed game figure set on a frictionally constraining surface and adapted for sliding movement thereover, said first figure adapted to alone receive irregular torquing moment at a head portion;
means for applying irregular torquing moment only to the head of said first figure; and
a second movably jointed game figure pivotally attached to said first figure, whereby application of said irregular torquing moment to the first figure causes it to spasmodically twist over said surface into a contorted posture and carry the second figure into a similarly contorted posture thereby effecting a postural relationship between said figures resembling a dynamic physically combative pair.

4,824,418
ARTICULATED JOINT BETWEEN TWO SHAFTS
Hubert Tanbert, Wingertsbergstrasse 3, 5450 Neuwied 23, Fed. Rep. of Germany
PCT No. PCT/DE86/00337, § 371 Date Apr. 23, 1987, § 102(e) Date Apr. 23, 1987, PCT Pub. No. WO87/01163, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 21, 1986, Ser. No. 45,847
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 8524285[U]
Int. Cl.[4] F16D *3/18*
U.S. Cl. 464—159 **26 Claims**

15. An articulated joint comprising a first drive element at the end of a first rotary shaft and a second drive element at the end of a second rotary shaft, said drive elements being pivotably engageable in such a way that the axes of the shafts can be pivoted with respect to one another up to a given angle, characterized in that the first drive element is shaped substantially like a hollow cylinder and is provided on its inner face with axis-parallel, uniformly circumferentially distributed, alternately convex and concave depressions and elevations which pass into one another and that the second drive element is substantially spherical and has on its surface alternating depressions and elevations, which run in the longitudinal direction in accordance with a plane containing the axis of the second shaft

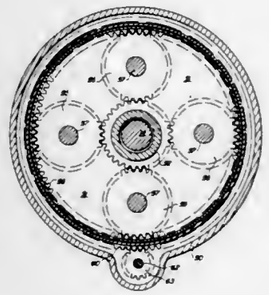
and having in the circumferential direction, particularly in the equatorial plane of the spherical second drive element a configuration roughly complimentary to the inner face of the first drive element,
said spherical second element having a spherical center and first and second hemispheres on each side of the center

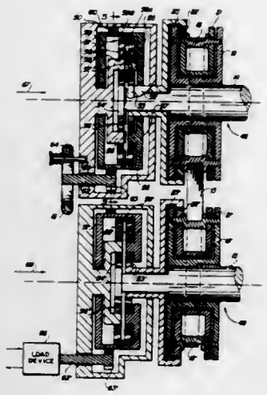


along the axis of the second element, the depressions in said second element having minima extending along respective circular arcs each in a plane of the axis of the shaft of said second element, the circular arcs in each hemisphere having a center axially offset from the spherical center in the direction of the other hemisphere.

4,824,419
FLAT BELT CONTINUOUSLY VARIABLE TRANSMISSION WITH GEARED SPEED RATIO CONTROL SYSTEM
Emerson L. Kumm, Tempe, Ariz., assignor to Kumm Industries, Inc., Phoenix, Ariz.
Filed Jul. 5, 1988, Ser. No. 215,417
Int. Cl.[4] F16H *9/10, 55/54*
U.S. Cl. 474—49 **15 Claims**

1. In a continuously variable transmission including:
(A) first and second pulley assemblies, each said pulley assembly including:
1. a shaft;
2. a pair of pulley sheaves;
3. a series of belt engaging elements, each said belt engaging element having:
a. an elongated central shank including a drive surface adapted to be engaged by said drive belt;
b. a first bearing region at a first end of said central shank; and
c. a second bearing region at a second end of said central shank;
4. each said pulley sheave including:
a. a pair of relatively movable guideway disks lying alongside each other in juxtaposition;
i. an inner guideway disk of each said pair including a first series of guideways extending in one direction;
ii. an outer guideway disk of each said pair including a second series of guideways extending in a second direction;
iii. said first and second series of spiral guideways providing intersections for capturing and locating said bearing regions of said belt engaging elements, said intersections providing locations for said bearing regions to establish radial positions of said belt engaging elements with respect to said shaft;
5. means connecting said inner guideway disks of said pulley sheaves together to establish an inner guideway disk set which rotates about the axis of said shaft;
6. means connecting said outer guideway disks of said pulley sheaves together to establish an outer guideway disk set which rotates about the axis of said shaft;
7. means coupling at least one of said guideway disks to said shaft for rotation therewith; and
8. means for adjusting the angular relationship between said inner guideway disk set and said outer guideway disk set to establish the effective diameter of said pulley assembly; and
(B) a flat drive belt coupling said first and second pulley assemblies;
the improvement in which said means for adjusting the angular relationship between said inner guideway disk set and said outer guideway disk set of at least one of said pulley assemblies comprises:
(C) a planetary gear system mechanically disposed intermediate said inner guideway disk set and said outer guideway disk set, said planetary gear system including:
1. a first sun gear coupled to said inner guideway disk set;
2. a second sun gear coupled to said outer guideway disk set;

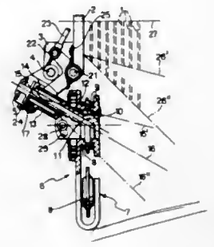




3. said first and second sun gears being axially aligned;
4. a rotatable planet carrier;
5. a set of planet gears meshing with one of said first and second sun gears, said planet gears being supported on said planet carrier;
6. a set of star gears meshing with the other of said first and second sun gears, each of said star gears being supported in fixed angular position with respect to said other of said first and second sun gears;
7. an internal ring gear meshing with said planet gears and said star gears; and
8. means for selectively changing the angular relationship between said planet carrier and said star gears.

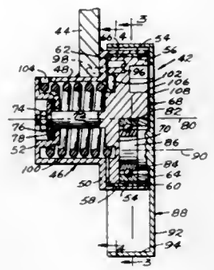
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4,824,420
REAR DERAILER FOR BICYCLE GEARS
Antonio Romano, Padua, Italy, assignor to Campagnolo S.p.A., Vicenza, Italy
Filed Feb. 26, 1988, Ser. No. 160,947
Claims priority, application Italy, Apr. 29, 1987, 67366 A/87
Int. Cl.[4] F16H *11/08*
U.S. Cl. 474—78 5 Claims



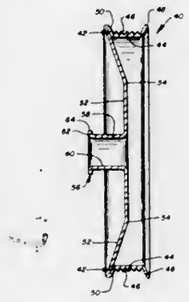
1. A rear derailer for bicycle gears, comprising a support member intended to be fixed to a bicycle frame, a chain transmission member connected to the support member and movable relative thereto, means for causing movement of the transmission member which is mounted for rectilinear sliding on guide means carried by the support member, said guide means being comprised of a cylindrical guide pin with said transmission member having an appendage to which the transmission member is orientably connected and which is slidably mounted on the guide pin, and means for clamping the transmission member in the preselected position.

4,824,421
BELT TENSIONER WITH RELEASABLE BELT LOAD DAMPING
Jacek S. Komorowski, Weston, Canada, assignor to Litens Automotive Partnership, Woodbridge, Canada
Filed Aug. 28, 1987, Ser. No. 90,495
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—135 39 Claims



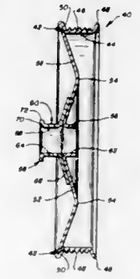
1. The combination comprising
an internal combustion engine including an engine frame subject to vibrational forces resulting from the operation of said internal combustion engine,
a plurality of shafts mounted for rotational movement about parallel axes fixed with respect to said engine frame,
a plurality of pulleys fixed to said plurality of shafts,
one of said plurality of shafts constituting an output shaft of said internal combustion engine,
an endless flexible belt of a size capable of being loosely trained about said plurality of pulleys, and
a belt tensioner comprising
a fixed structure fixed with respect to said engine frame,
a pivoted structure,
a belt tensioning pulley mounted on said pivoted structure for rotational movement about a rotational axis,
said pivoted structure being mounted on said fixed structure for pivotal movement about a fixed pivotal axis parallel with said rotational axis between a first position and a second position,
spring means for resiliently biasing said pivoted structure in a direction toward said second position with a spring torque which varies as the position of said pivoted structure approaches said second position so that said belt tensioning pulley is biased into an intermediate operating static equilibrium position in tensioning engagement with said belt wherein the spring torque is equal and opposite to a belt load torque which varies with the variation in the spring torque as the intermediate operation position approaches said second position due to belt elongation by maintaining the belt load force generally constant and varying a lever arm distance to said pivotal axis through which the belt load force acts,
means for damping the pivotal movements of said pivoted structure as a result of dynamic belt load forces varying from the generally constant belt load force when the belt is moving,
said damping means including sliding friction surface means for establishing a damping torque resistance sufficient to restrict the pivotal movements of said pivoted structure by virtue of the pressure of interengagement of said sliding friction surface means and the position of interengagement of said sliding friction surface means from said pivotal axis to an extent such that movements in response to dynamic changes in the belt load force within a range of changes are prevented,
said damping means being operable in response to the vibrational forces to which said engine frame is subject to instantaneously release the damping torque resistance to a level permitting instantaneous pivotal movements in response to dynamic changes in the belt load force which would otherwise be prevented by said sliding friction surface means as being within said range of changes.

4,824,422
PULLEY WITH INTEGRAL HUB CONSTRUCTION
Radisav Jocic, Unionville, Canada, assignor to Magna International (Canada) Inc., Concord, Canada
Filed Oct. 23, 1987, Ser. No. 111,643
Int. Cl.[4] F16H *55/49*
U.S. Cl. 474—170 12 Claims



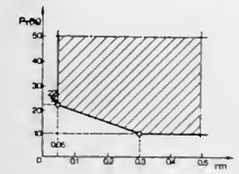
1. In a pulley having an axially extending annular belt engaging wall construction including an axial wall portion formed of sheet metal, said sheet metal also forming a circular wall portion formed integrally at one end with said axial wall portion and extending radially inwardly and axially inwardly with respect to the one end of said axial wall portion, said circular wall portion having an annular bend in an intermediate annular area thereof and extending therefrom to a hub construction, the improvement which comprises
said circular wall portion extending generally radially inwardly from said annular bend to said hub construction,
the entire hub construction being formed integrally from the sheet metal forming said axial wall portion and said circular wall portion and extending axially outwardly from said circular wall portion in a cylindrical wall structure having an interior cylindrical shaft engaging surface,
said cylindrical wall structure having an axial extent greater than the diameter of said shaft engaging cylindrical surface,
the axially outward end of said cylindrical wall structure providing an integral radially outwardly extending annular lip suitable to be operatively engaged by a pulling tool for removing said interior cylindrical surface from engagement with a shaft on which it has been engaged.

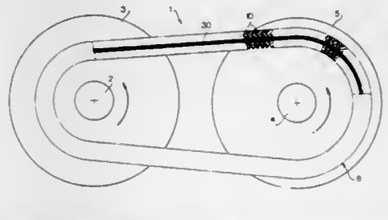
4,824,423
PULLEY WITH HUB CONSTRUCTION OF TWO AXIAL PARTS
Radisav Jocic, Unionville, Canada, assignor to Magna International (Canada) Inc., Concord, Canada
Filed Oct. 23, 1987, Ser. No. 111,644
Int. Cl.[4] F16H *55/49*
U.S. Cl. 474—170 14 Claims



1. In a pulley having an axially extending annular belt engaging wall construction including an axial wall portion formed of sheet metal, said sheet metal also forming a circular wall portion formed integrally at one end with said axial wall portion and extending radially inwardly and axially inwardly with respect to the one end of said axial wall portion, said circular wall portion having an annular bend in an intermediate annular area thereof and extending therefrom to a hub construction, the improvement which comprises
said hub construction being formed of first and second axial parts, the first axial part being formed integrally from the sheet metal forming said axial wall portion and said circular wall portion and extending axially inwardly from said circular wall portion in a cylindrical wall structure having an interior cylindrical shaft engaging surface,
said second axial part being formed of sheet metal to include a cylindrical wall portion and an annular flange extending outwardly from one end of said cylindrical wall portion,
said annular flange being rigidly secured to said circular wall portion,
said cylindrical wall portion extending axially outwardly from said annular flange and having an interior cylindrical shaft engaging surface aligned with the interior cylindrical shaft engaging surface of said cylindrical wall structure,
the axially outward end of said cylindrical wall portion providing an integral radially outwardly extending annular lip suitable to be operatively engaged by a pulling tool for removing said interior cylindrical surfaces from engagement with a shaft on which they have been engaged.

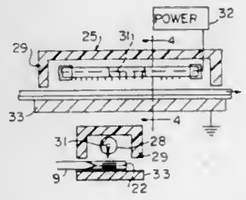
4,824,424
BELT FOR A BELT DRIVE DEVICE
Tohru Ide, and Mitsugu Satoh, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 30, 1987, Ser. No. 139,655
Claims priority, application Japan, Aug. 24, 1987, 62-209826; Aug. 24, 1987, 62-209827
Int. Cl.[4] F16G *5/16*
U.S. Cl. 474—242 16 Claims





1. A belt drive device comprising
a drive pulley, a driven pulley, carrying means, and a belt composed of a plurality of metal elements arranged on said carrying means and engaged with both said pulleys,
said elements comprise at least two kinds of elements which are divided along thickness, percentage of the largest number of one of the kinds of elements being at least fifty percent, ratio of difference of thicknsses between the thickest kind of the elements and a subordinate kind of the elements is in a range of 0.05 and 0.5, except a range lower than a line connecting a point of 22% at the ratio 0.05 and a point of 10% at a ratio 0.3, and all said elements are arranged at random.

4,824,425
WEB HEM METHOD AND APPARATUS FOR INSURING A FLAT HEM IN A WEB
David K. Stock, Green Bay, Wis., assignor to Amplas, Inc., Green Bay, Wis.
Filed Feb. 22, 1988, Ser. No. 158,419
Int. Cl.[4] B31B *1/64*
U.S. Cl. 493—193 13 Claims



10. The method of forming a draw tape bag from a folded

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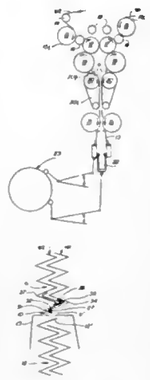
web having a pair of aligned side edge portions comprising forming each of said edge portions of the web with a hem with a plastic tape therein, applying a high voltage electrostatic field to said hems to induce a charge in the walls of the hem to insure said hems remain flat during subsequent processing of the web, and heat sealing the web including said hems on longitudinally spaced transverse areas extended completely across the folded web including said hems.

4,824,426

METHOD AND APPARATUS FOR INTERFOLDING WEBS

Allen J. DuFresne, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed May 11, 1987, Ser. No. 48,266
Int. Cl.[4] B05B *1/14*; B31F *1/00*
U.S. Cl. 493—346 **9 Claims**



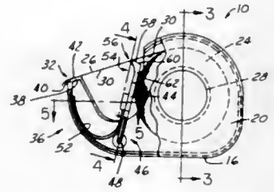
6. In a method of zig-zag folding a pair of continuous webs to provide stacks each having a specified number of segments wherein the segments are offset one-half segment length in one web from the other, the steps of severing said webs between stacks and reversely folding on itself a portion only of the leading stack segment of each web to provide a spacing from the trailing segments of the stack preceding, and zig-zag folding said webs together along equally spaced transverse lines.

4,824,427

METHOD AND APPARATUS FOR DISPENSING A TAPE PRODUCT

Charles M. Smillie, III, 4812 Park Hill Ct., West Bloomfield, Mich. 48033

Filed Mar. 24, 1988, Ser. No. 172,641
Int. Cl.[4] B26F *3/02*
U.S. Cl. 493—353 **14 Claims**



1. Apparatus for dispensing a determinate length of a tape product with a leading end portion tab, the tape product being characterized as having a leading end portion and at least one trailing portion and the tape product being drawn from upstream to downstream along a feeding path having an upstream end and downstream end, the apparatus comprising:

dispensing means for establishing the feeding path;

a roll for holding the tape product mounted within said dispenser;

a fixed cutting edge disposed at the downstream end of the feeding path;

a stationary touch element disposed in the feeding path upstream of and proximate the cutting edge;

said dispenser means having opposed side portions and a bottom portion connecting said side portion extending at least from the roll to the cutting edge to provide lateral and underlying coverage for any members mounted within the dispenser; and

a movable touch element disposed within said dispenser in the feeding path upstream of the stationary touch element and being translatable within said dispenser along the feeding path toward the stationary touch element and into juxtaposition therewith and being translatable away from the stationary touch element to a disposition remote therefrom,

biasing means disposed within said dispenser biasing the movable touch element away from the stationary touch element;

whereby, when the movable touch element is remote from the stationary touch element and the tape product is drawn so that the leading end portion is in contact with the stationary touch element and the movable touch element is in contact with the at least one trailing portion of the tape product, the movable touch element may be translated within said dispenser into juxtaposition with the stationary touch element so as to bring a portion of the tape product proximate the leading end portion into contact with a portion of the tape product proximate the at least one trailing portion and thereby form a tab, which tab may be grasped to draw the tape product downstream along the feeding path and beyond the cutting edge until the determinate length of tape product is beyond the cutting edge and cut off at the cutting edge.

4,824,428

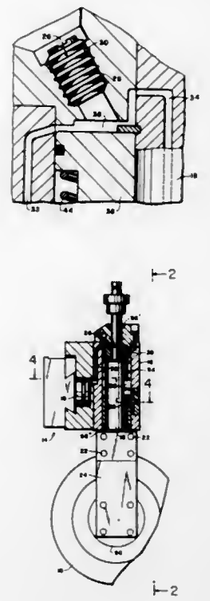
APPARATUS FOR CUTTING AND/OR CREASING OF LAMINAR SHEET MATERIAL

Elio Cavagna, San Zenone Al Lambro, Italy, assignor to Elio Cavagna S.R.L., Milan, Italy

Continuation of Ser. No. 809,072, Dec. 13, 1985, abandoned, Continuation of Ser. No. 543,764, Oct. 20, 1983, abandoned. This application Jun. 3, 1987, Ser. No. 58,689
Claims priority, application Italy, Jan. 10, 1983, 19046 A/83
Int. Cl.[4] B26D *1/14*; B23D *19/00*; B31F *1/08*
U.S. Cl. 493—370 **1 Claim**

1. In an apparatus for cutting or creasing sheet material comprising a support beam, a rotatable blade cooperating with a counter-blade, an operative unit movable mounted on said support beam for operating said rotatable blade to engage with said counter-blade by vertical and horizontal movement of said rotatable blade, means for locking said operative unit on said support beam to prevent movement thereof, a first fluid pressure system for operating said locking means, a second fluid pressure system for acting on said operative unit to impart vertical movement to said rotatable blade, a third fluid pressure system for acting on said operative unit to impart horizontal movement to said rotatable blade, and regulating valve means in said fluid pressure systems to regulate the flow rate of the pressurized fluid, the improvement consisting in that:

the regulating valve means comprising a valve which includes a helicoidal means for the passage of said pressurized fluid and consists of a male screw engaging into a female thread, said female thread having a truncated profile so that same male thread does not completely occupy said female thread thereby forming a passage for the pressurized fluid which may be regulated by adjusting the extend of longitudinal penetration so as to regulate the flow rate and the same valve regulates the flow rate of the pressurized fluid for the first, second and third fluid pressure systems.

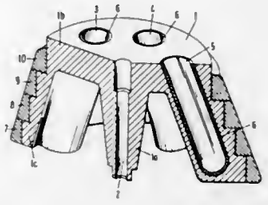


4,824,429

CENTRIFUGE FOR SEPARATING LIQUIDS

Martinus H. Keunen, Delden, and Pieter J. A. de Bakker, Almelo, both of Netherlands, assignors to Ultra-Centrifuge Nederland N.V., Almelo, Netherlands

Filed Mar. 15, 1988, Ser. No. 168,275
Claims priority, application Netherlands, Mar. 18, 1987, 8700642
Int. Cl.[4] B04B *5/02, 7/08*
U.S. Cl. 494—16 **11 Claims**



1. A rotor for a centrifuge for separating liquids, comprising:

a rotationally substantially symmetrical body having a disk-shaped end wall having a center and a radially outer periphery, said end wall having an axially outer surface and an axially inner surface, an outer peripheral sidewall depending from said radially outer periphery of said end wall so as to radially surround said axially inner surface of said end wall, and a central boss having one end based on said end wall, said boss extending longitudinally from said axially inner surface of said end wall so as to be radially spacedly surrounded by said sidewall, said sidewall having a radially outer surface, a radially inner surface, and, located distally of said end wall, a free end;

means defining a plurality of equi-angularly spaced socket-like holes in said body, each such hole having a mouth opening through said axially outer surface of said end wall of said body and extending longitudinally internally into said sidewall while being spaced from both said radially outer and radially inner surfaces of said sidewall and terminating in a closed end located axially short of said end of said sidewall; said holes, as seen in transverse cross-section, having longitudinal axes forming apices of an imaginary regular polygon;

each said hole having an inner peripheral surface extending from said mouth to said closed end thereof;

means provided on said central boss for mounting said rotor to a motor shaft for providing motorized rotation to said rotor;

said body being made of plastics material and characterized by being substantially hollow radially between said central boss and said radially inner surface of said sidewall; and

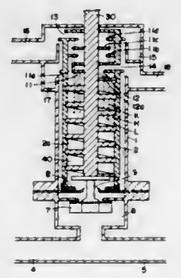
reinforcing ring means disposed externally on said radially outer surface of said sidewall and mounted to said body for rotation therewith, said reinforcing ring means comprising at least one tangentially-oriented long fibre of reinforcement material.

4,824,430

HIGH-SPEED CENTRIFUGAL EXTRACTOR HAVING SPIRAL LIQUID PATH

Hidechiyo Kashihara, Mito; Shin-ichi Nemoto, and Kazuhiro Ueno, both of Ibaraki, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 62,119
Claims priority, application Japan, Jun. 19, 1986, 61-143531
Int. Cl.[4] B04B *5/06*
U.S. Cl. 494—22 **1 Claim**



1. In a high speed centrifugal extractor for centrifuging a mixture of heavy and light liquids into a heavy liquid phase and a light liquid phase, the centrifugal extractor having a cylindrical rotor in which the mixture is centrifuged, an inlet disposed at the bottom of the cylindrical rotor and through which the mixture is introduced into the rotor, a heavy liquid outlet and a light liquid outlet each disposed at an upper portion of the rotor, a heavy liquid weir operatively connected between the rotor and the heavy liquid outlet and through which the heavy liquid phase of the mixture centrifuged in the rotor passes to the heavy liquid outlet, and a light liquid weir operatively connected between the rotor and the light liquid outlet and through which the light liquid phase of the mixture centrifuged in the rotor passes to the light liquid outlet, wherein the improvement comprises:

said cylindrical rotor having an internal peripheral surface in which a spiral groove extends, and

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a rotor rotary shaft extending in and threadingly engaging said rotor, said rotary shaft having a central shaft portion and a flange extending spirally along said shaft portion, said flange having an outer peripheral edge portion extending in said spiral groove and engaging said rotor therein so as to facilitate the threaded engagement of the cylindrical rotor and the rotor rotary shaft,

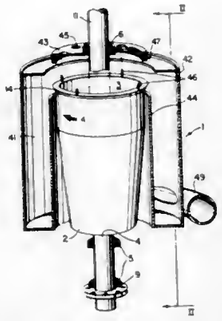
said shaft portion, said flange and the internal peripheral surface of said rotor collectively defining a spiral passageway within said rotor.

4,824,431

CENTRIFUGAL CONCENTRATOR

Steven A. McAlister, 32778 Bellvue Crescent, Clearbrook, B.C., Canada V2S 5K3

Filed Jan. 13, 1987, Ser. No. 2,805
Int. Cl.⁴ B04B *1/02*
U.S. Cl. 494—43 **10 Claims**



1. A concentrator for separating particulate material of higher specific gravity form particulate material of lower specific gravity comprising:

(a) a hollow drum having an open end and interior surface;

(b) means for rotatably supporting said drum on an axis;

(c) drive means for rotating said drum about said axis; and

(d) material supply means to deliver said particulate material into the end of said drum spaced from said open end;

wherein said interior surface of said drum comprises an outwardly inclined migration zone, a retention zone above said migration zone which is substantially parallel to said axis of rotation and an inwardly inclined lip zone above said retention zone, where said hollow drum comprises an open interior providing unobstructed delivery of said particulate material to said migration zone of said interior surface and where the respective lengths of said migration, retention and lip zones and the relative degrees of inclination of said migration and lip zones are selected to provide a sufficient component of force on said particulate material to expel said lighter particulate material from said drum and to permit said heavier particulate material to be retained in said retention zone.

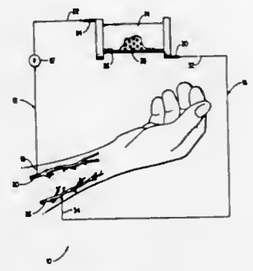
4,824,432

METHOD FOR TREATING AIDS AND OTHER IMMUNE DEFICIENCIES AND IMMUNE DISORDERS

Simon Skurkovich, and Boris Skurkovich, both of Rockville, Md., assignors to S.V.S. Laboratories, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 446,680, Dec. 3, 1982, Pat. No. 4,605,394, which is a continuation-in-part of Ser. No. 247,205, Mar. 24, 1981, Pat. No. 4,362,155. This application Mar. 25, 1986, Ser. No. 843,528
The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.
Int. Cl.⁴ A61M *37/00*
U.S. Cl. 604—4 **49 Claims**

27. In the method of treatment of mammals having immunodisorders associated with the disturbance of the synthesis of interferons and the production of defective interferons, the improvement comprising selectively removing blood from the body thereof, contacting the removed blood with an immunosorbent for said defective interferons, removing said defective interferons on said immunosorbent and returning said blood free of defective interferons to said body.



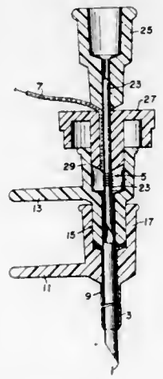
48. In the method of treatment of humans having acquired immune deficiency syndrome, the improvement comprising selectively removing blood from the body thereof, contacting the removed blood with an immunosorbent for HTLV-III/-LAV, removing said HTLV-II/LAV on said immunosorbent and returning said blood free of HTLV-III/LAV to said body.

4,824,433

PUNCTURING AND CATHETERIZING DEVICE FOR THE HUMAN OR ANIMAL BODY

Peter März, and Jürgen Postel, both of Munich, Fed. Rep. of Germany, assignors to Sterimed Gesellschaft für medizinischen Bedarf mbH, Saarbrücken, Fed. Rep. of Germany

Filed Apr. 5, 1984, Ser. No. 604,651
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1982, 3239466
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—21 **3 Claims**



1. A puncturing and cathetering device for the human or animal body with a metallic puncture needle and a cannula which surrounds the puncture needle in the region between its point and rear end and through which, after the puncture needle has been pulled out, a longer guidewire can be inserted into the body, which then, after the cannula has also been pulled out, serves as a guide for a catheter to be inserted, wherein the puncture needle (3,3') is electrically conductive from its point (1) to its end projecting out of the cannula (9)

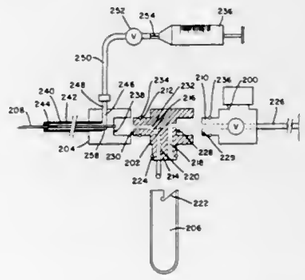
and is equipped with an electrical connecting piece (5; 31,33) at the rear end and means for connecting the electrical connecting piece to an electrical source.

4,824,434

APPARATUS USED IN A METHOD FOR REMOVING TISSUE AND LIVING ORGANISMS FROM HUMAN BODY CAVITIES

H. Michael Seitz, Jr., 214 Airdale Rd., Rosemont, Pa. 19010

Continuation-in-part of Ser. No. 3,133, Jan. 14, 1987, Pat. No. 4,731,052. This application Dec. 21, 1987, Ser. No. 135,701
Int. Cl.⁴ A61M *1/00*
U.S. Cl. 604—27 **10 Claims**



1. Apparatus for removing tissue and living organisms comprising:

a first body having a hollow needle with distal and proximal end portions, said needle extending outwardly therefrom and extending into a chamber within said first body on the other end, said first body also having a syringe passageway connected to a jacket surrounding a proximal portion of said needle, said jacket being sealed against the needle at its distal end and providing a space connecting to a plurality of fenestrations in said needle for the introduction of flushing fluid into said needle;

a second body fixable to said first body and having a first bore extending from an end portion of said second body to a side portion of said second body, said side portion having means for connection to a collection vessel, said second body having a second bore extending from said side portion to a chamber within said second body on the other end;

a third body fixable to said second body and having a bore which contains flexible tubing, said tubing being connectable to vacuum means on one end and extending outwardly from an end portion of said third body and into the chamber of said second body on a second end; and

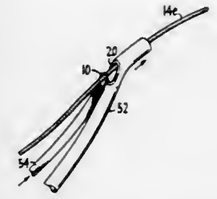
valve means extending from said third body and being in releasable engagement with said tubing for decompressing or compressing said tubing for actuating on-off suction action through said needle, said suction action occurring upon application of pressure to said valve.

4,824,435

INSTRUMENT GUIDANCE SYSTEM

Jerry D. Giesy, Portland, and Matthew W. Hoskins, Beaverton, both of Oreg., assignors to Thomas J. Fogarty, Palo Alto, Calif.

Filed May 18, 1987, Ser. No. 51,864
Int. Cl.⁴ A61M *31/00*
U.S. Cl. 604—49 **6 Claims**



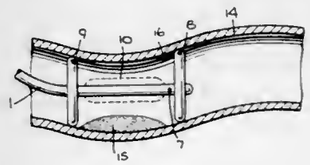
1. An improved method of positioning a member within a tortuous body passage, said method comprising: extending a guide wire into the passage to the location where it is desired to position the member; providing a narrow annular loop external of the member and secured thereto solely adjacent the distal end of the member; threading the annular loop over the guide wire whereby the loop may follow the wire while permitting hinged articulation of the member relative to an away from the wire at the point of connection of the loop to the wire; and, sliding the annular loop along the guide wire to direct the member to the desired position within the body passage.

4,824,436

METHOD FOR THE PREVENTION OF RESTENOSIS

Harvey Wolinsky, 175 Riverside Dr., New York, N.Y. 10024

Filed Apr. 21, 1987, Ser. No. 42,569
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—53 **6 Claims**



1. A method for inhibiting the proliferation of arterial smooth muscle cells following angioplasty which comprises the steps of:

1. Conducting an angioplasty using a catheter with an expansible balloon to expand at least a portion of a plaque body and removing the catheter,
2. Inserting into the artery a catheter comprising a main catheter body having means including two spaced balloon elements adapted to be positioned ajacent respective proximate and distal ends of the original site of the plaque body and to hold said main catheter body in place and expansible against the arterial walls for providing a chamber about said site, and means carried by said main catheter body for delivering heparin into said chamber,
3. Inflating said two spaced balloon elements, to form a chamber at the site of the angioplasty,
4. Delivering heparin into said chamber through said heparin delivering means under a pressure of 200 to 1000 mmHg at the site of the angioplasty whereby the heparin sticks to and penetrates the adjacent arterial tissue defined by the chamber,
5. Deflating said two spaced balloon elements, and
6. Removing the catheter from the artery.

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4,824,437

THERMAL TRANSFER PRINTING SHEET AND PROCESS

Peter Gregory, Bolton, England, assignor to Imperial Chemical Industries PLC, London, England

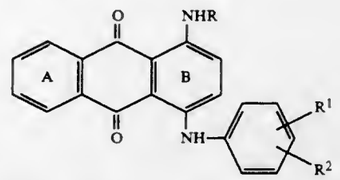
Continuation of Ser. No. 880,732, Jul. 1, 1986, abandoned. This application Dec. 17, 1987, Ser. No. 136,444

Claims priority, application United Kingdom, Jul. 23, 1985, 8518572

Int. Cl.⁴ B41M *5/26*

U.S. Cl. 8—471 **9 Claims**

1. A thermal transfer printing sheet comprising a substrate having a thickness less than 10 micrometers, carrying a coating comprising a resin or polymeric binder and an anthraquinone dye of the formula:



wherein R is C_{1-6}-alkyl, C_{4-8}-cycloalkyl or C_{2-6}-alkenyl;
R^1 is C_{1-6}-alkyl or C_{2-6}-alkenyl; and
R^2 is H, C_{1-6}-alkyl or C_{2-6}-alkenyl.

4,824,438

PROCESS FOR PRODUCING SMOKELESS, CURED FUEL BRIQUETTES

Peter R. McCrainor, Solihull, England; Peter B. Caplin, Johannesburg, South Africa; James W. Middlemass, Leatherland, England; Geraint Rees, Dyfed, Wales, and Mario Angelini, Bruxelles, Belgium, assignors to Petrofina, U.K. Ltd., England

Filed Jan. 28, 1988, Ser. No. 149,287

Claims priority, application United Kingdom, Jan. 28, 1987, 8701866

Int. Cl.⁴ C10L *5/20, 5/06*

U.S. Cl. 44—16 F **20 Claims**

16. A composition comprising smokeless, cured fuel briquettes produced according to the process comprising the steps of:

(a) forming green briquettes from a particulate carbonaceous material and a lignosulfonate binder; and

(b) curing said green briquettes in an oven in the presence of circulating gases containing a high percentage of oxygen and superheated steam, wherein the sulfur derived from said lignosulfonate binder is oxidized and hydrolyzed exothermally at the curing temperature forming sulfuric acid which is dissociated endothermally in case of a temperature rise above a threshold thereby promoting thermal balance within the curing zone, any remaining small excess amount of heat is removed in the circulating gases.

4,824,439

INFLAME DESULFURIZATION AND DENOXIFICATION OF HIGH SULFUR CONTAINING FUELS

Domingo R. Polanco, Calle Los Gabrieles; Jose S. Perez, San Antonio de Los Altos; Euler J. Grazzina, Caracas, and Niomar Marcano, Los Teques, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

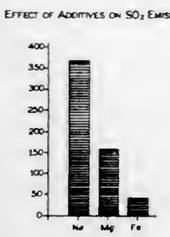
Continuation-in-part of Ser. No. 14,871, Feb. 17, 1987, which is a continuation-in-part of Ser. No. 875,450, Jun. 17, 1986. This application Dec. 16, 1987, Ser. No. 133,323

Int. Cl.⁴ C10L *1/32*

U.S. Cl. 44—51 **7 Claims**

1. A process for controlling sulfur oxide and nitrogen oxide formation and emissions when burning by forming a combustible fuel prepared from a bitumen or residual fuel oil hydrocarbon containing sulfur and nitrogen comprising:

(a) mixing a sulfur and nitrogen containing hydrocarbon with a water soluble additive wherein said water soluble additive consist essentially of Na^+, Fe^{++} and an element X selected from the group consisting of Mg^{++}, Ba^{++},



Ca^{++}, Li^+, K^+ and mixtures thereof wherein Na^+ is present in an amount of less than or equal to 40 wt.%, Fe^{++} is present in an amount of greater than or equal to 0.4 wt.%, balance essentially X wherein the ratio of Na^+ to Fe^{++} is about between 7.5:1.0 to 100:1.0 and the molar ratio of additive to sulfur in said hydrocarbon is greater than about 0.500.

4,824,440

PRODUCTION OF METHANE CONTAINING GASES

Reginald G. S. Banks, West Midlands, United Kingdom, assignor to British Gas plc, London, United Kingdom

Filed Mar. 2, 1987, Ser. No. 20,901

Claims priority, application United Kingdom, Mar. 21, 1986, 8607029

Int. Cl.⁴ C10J *3/16;* **C07C** *9/04*

U.S. Cl. 48—206 **2 Claims**

1. A process for the production of methane-containing gases wherein an aromatic feedstock is reacted with steam in the presence of a nickel-alumina-containing coprecipitated catalyst, said aromatic feedstock being vaporizable at a temperature of not more than 500° C., being obtained by removing sulfur-containing compounds from a fraction obtained by distillation or fractionation of a tarry liquor condensate produced as a by-product of coal gasification, said feedstock containing heterocyclic oxygen-containing aromatic compounds or oxygen-substituted aromatic compounds, or both, said reaction being effected at a temperature of not greater than 500° C.

4,824,441

METHOD AND COMPOSITION FOR DECREASING EMISSIONS OF SULFUR OXIDES AND NITROGEN OXIDES

James K. Kindig, Boulder, Colo., assignor to Genesis Research Corporation, Carefree, Ariz.

Filed Nov. 30, 1987, Ser. No. 126,409

Int. Cl.⁴ C10L *10/00;* **F23B** *7/00*

U.S. Cl. 44—604 **21 Claims**

18. A self-scrubbing carbonaceous fuel composition, said composition producing reduced emissions of sulfur oxides and nitrogen oxides on combustion, said composition comprising:

(a) at least about sixty percent by weight refined particulate coal having a pyritic sulfur content, wherein said pyritic sulfur content is less than about one percent by weight of said coal;

(b) a sulfur sorbent comprising a calcium and a magnesium component, wherein said calcium component includes material selected from the group consisting of lime, limestone, hydrated lime, dolomite, burnt dolomite, pressure hydrated burnt dolomite, and mixtures thereof, and wherein said sulfur sorbent is present in an amount suffi-

VOL 1101 ISS 4 APR 25 1989 UMI

cient to provide a calcium to total sulfur content molar ratio of at least about 1;

(c) a sulfation promoter present in amounts equal to at least about one percent by weight of said sulfur sorbent, wherein said sulfation promoter comprises material selected from the group consisting of Cr_2O_3, Na_2CO_3, $NaHCO_3$, K_2CO_3, Li_2CO_3, Na_2SO_4, MoO_3, V_2O_5, TiO_2, Pt, P_2O_5, NaCl, $KHCO_3$, K_2SO_4 and mixtures thereof; and

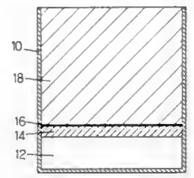
(d) a catalyst for converting sulfur dioxide to sulfur trioxide in an amount effective to increase sulfur oxides reduction by said magnesium component of said sorbent, wherein said catalyst comprises material selected from the group consisting of platinum, nickel sulfate, cobalt sulfate, vanadium oxides, tungsten oxides, chromium oxides, molybdenum oxides, iron oxides, and mixtures thereof.

4,824,442

METHOD OF MANUFACTURING COMPOSITE THERMOSTABLE ABRASIVE PRODUCTS

Jean-Michel Cerceau, Seyssinet, France, assignor to Societe Industrielle de Combustible Nucleaire, Annecy, France

Filed Jun. 14, 1988, Ser. No. 206,378
Claims priority, application France, Jun. 16, 1987, 8708368
Int. Cl.[4] B24D *3/00*
U.S. Cl. 51—293 **9 Claims**



1. Method for producing a composite abrasive body having;

an active compact containing grains of ultra-hard product representing more than 80% per volume of the compact, said grains mutually bonded directly so that the compact has a polycrystalline structure; and a hard refractory support bonded to the compact, formed essentially of a refractory metal carbide, comprising the steps of:

placing, within a cell, a layer of grains of particulate ultra-hard product in contact with material of such nature as to generate a ultra-hard ceramic binder phase;

placing a thin layer of tungsten coated with carbon supplying material over said layer of grains;

placing a tungsten carbide support over said thin layer to constitute a stack; and

bringing the cell containing the stack to a temperature and a pressure and for a time sufficient to cause mutual plastic phase sintering of the ultra-hard product grains and to bond the compact generated by the layers to the support.

4,824,443

GAS SEPARATION BY COMPOSITE SOLVENT-SWOLLEN MEMBRANES

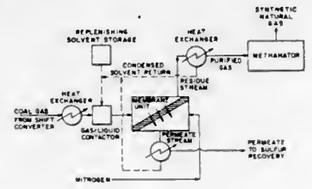
Stephen L. Matson, Harvard; Eric K. L. Lee, Acton, both of Mass.; Dwayne T. Friesen, and Donald J. Kelly, both of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Continuation-in-part of Ser. No. 947,996, Dec. 30, 1986, Pat. No. 4,737,166. This application Apr. 7, 1988, Ser. No. 178,452
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **43 Claims**

1. A composite immobilized liquid membrane characterized in that it comprises:

(a) a microporous support; and

(b) a solvent-swollen polymer compatible with and swellable by at least one solvent selected from a class of solvents comprising those solvents with a highly polar group in the molecular structure of the solvent, said highly polar group



containing at least one atom selected from nitrogen, oxygen, phosphorous and sulfur, said solvents having a boiling point of at least 100° C. and a solubility parameter of from about 7.5 to about 13.5 $(cal/cm^3\text{-}atm)^{\frac{1}{2}}$.

4,824,444

GAS PERMSELECTIVE COMPOSITE MEMBRANE PREPARED BY PLASMA POLYMERIZATION COATING TECHNIQUES

Hiroshi Nomura, Minnetonka, Minn., assignor to Applied Membrane Technology, Inc., Minnetonka, Minn.

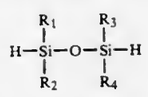
Continuation of Ser. No. 850,954, Apr. 11, 1986, abandoned.
This application Oct. 26, 1987, Ser. No. 112,994
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **39 Claims**



1. A method for separating gases comprising:

positioning a gas permselective hollow fiber membrane having an O_2/N_2 gas permselectivity of at least about 2.3 in a suitable gas separatory apparatus,

wherein said membrane comprises a microporous hollow fiber substrate, and a gas permselective plasma polymerizate coating on the surface of the substrate, wherein the plasma polymerizate coating is formed from a lower alkyl substituted disiloxane monomer of molecular weight of not more than 165 according to the formula:



wherein R_1, R_2, R_3 and R_4 are individually selected from methyl and ethyl, and

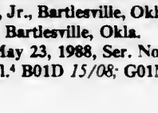
contacting a gaseous mixture with said membrane in order to effect the required separation.

3. A gas permselective hollow fiber membrane having an O_2/N_2 gas permselectivity of greater than 2.3 comprising:

a microporous hollow fiber substrate; and

a gas permselective plasma polymerizate coating on the surface of the substrate,

wherein the plasma polymerizate coating is formed from a lower alkyl substituted disiloxane monomer of molecular weight of not more than 165 according to the formula:



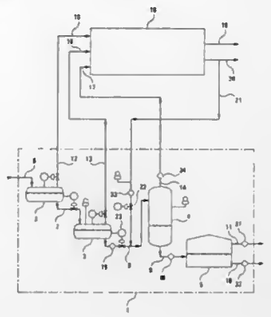
wherein R_1, R_2, R_3, and R_4 are individually selected from methyl and ethyl.

4,824,445

METHOD FOR RECYCLING IN A CRUDE OIL STABILIZATION INSTALLATION, WHICH IMPROVES THE PRODUCTION OF LIQUEFIED PETROLEUM GAS COMING FROM THE ASSOCIATED GASES

Ari Minkkinen, St. Nom La Breteche, France, assignor to Total Compagnie Francaise des Petroles, Paris, France and Abu Dhabi Gas Industries Limited, United Arab Emirates

Filed Jan. 28, 1988, Ser. No. 149,319
Claims priority, application France, Jan. 28, 1987, 87 00981
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—40 **2 Claims**



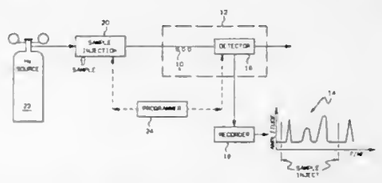
1. A method for recycling gas in an installation for crude oil stabilization containing several gas/liquid separation stage each connected to the following stage, traversed in series by a flow of crude oil from the first to the last stage and each provided with a gas removal pipe connected to the intake of a gas treatment installation which provides a current of rich gas and a current of poor residual gas, characterized in that an adjustable part of said current of poor residual gas is injected into the flow of crude oil upstream of at least one of the gas/liquid separation stages of the installation for crude oil stabilization.

4,824,446

GAS CHROMATOGRAPHY SIMULATION

Richard A. Mowery, Jr., Bartlesville, Okla., assignor to Applied Automation, Inc., Bartlesville, Okla.

Filed May 23, 1988, Ser. No. 196,720
Int. Cl.[4] B01D *15/08*; G01N *30/02*
U.S. Cl. 55—67 **11 Claims**



1. A method of assigning a linear equation to a chemical compound, wherein said compound, in a gaseous state, is separable from other compounds by gas chromatographic techniques, said method comprising the steps of:

(a) determining the elution time, t_o, for a nonretained material eluting from a chromatograph column at a temperature T_1;

(b) determining the elution time, t_n, for said compound eluting from said chromatograph column at the temperature T_1;

(c) calculating the distribution coefficient, K_n, for said compound in response to the elution time, t_o, and the elution time, t_n, determined in steps (a) and (b) respectively;

(d) defining a chromatographic parameter, M, responsive to the distribution constant K_n, determined in step (c);

(e) calculating the log (M) at a temperature T_1 to provide a data point for log (M) versus temperature;

(f) repeating steps (a) through (e) for a desired number of different temperatures;

(g) determining a least squares fit of a straight line equation for log (M) as a function of temperature, wherein said straight line corresponds to the data obtained in step (f); and

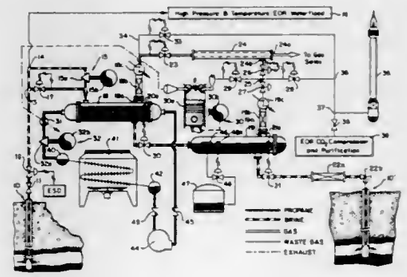
(h) determining a slope and an intercept of said straight line and assigning the numerical values of said slope and said intercept as a coefficient and a constant term respectively for said linear equation assigned to said chemical compound.

4,824,447

ENHANCED OIL RECOVERY SYSTEM

Fred L. Goldsberry, Spring, Tex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 30, 1986, Ser. No. 947,791
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—158 **6 Claims**



1. Apparatus for the production of electric power utilizing all energy resources available from a geopressured geothermal reservoir comprising

two gas separator vessels connected in tandem to a brine resource for separating gas from said brine by exsolution, the first at high pressure and the second at low pressure,

means for limiting brine level for broad surface level exposure into said high pressure gas separator vessel and said low pressure gas separator vessel,

means for detection, removal and collection of hydrocarbon liquid of low specific gravity in said second low pressure separator,

a pipeline for disposing of residual liquid out of said low pressure separator vessel,

a membrane separator connected to receive gas from said high pressure separator for separating quality gas from gas separated out of said brine in said high pressure separator vessel, and emitting low pressure waste gas having high CO_2 content, and

means for combining said gas having high CO_2 content from

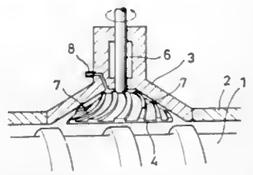
said membrane separator with gas separated from liquid in said low pressure separator.

4,824,448

GAS EXPELLING EQUIPMENT FOR USE IN A VISCOUS-MATERIAL KNEADER

Masao Moriyama, No. 508-13, Tendocho 17, Nishinomiya, Hyogo 663, Japan

Filed Jul. 14, 1988, Ser. No. 219,050
Claims priority, application Japan, Jul. 15, 1987, 62-178061
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—190 **3 Claims**



1. Gas expelling device for use in a viscous-material treating apparatus such as a kneader, an extruder said gas expelling device comprising:

a cone-shaped rotor having a plurality of first volute protrusions on its coned surface; and

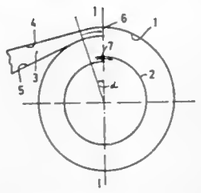
a cone-shaped cover member to cover said cone-shaped rotor, said cone-shaped cover member having a gas exhaust orifice through which the gas liberated within said viscous-material treating appratus is removed.

4,824,449

DEVICE FOR TRANSFORMING A FLUID FLOW

Istvàn Majoros, Widenstrasse 25, CH-6317 Oberwil, Switzerland

PCT No. PCT/EP86/00333, § 371 Date Mar. 20, 1987, § 102(e) Date Mar. 20, 1987, PCT Pub. No. WO86/07417, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 4, 1986, Ser. No. 44,501
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3520032
Int. Cl.[4] B01D *45/16;* **B04C** *5/04*
U.S. Cl. 55—459.1 **21 Claims**



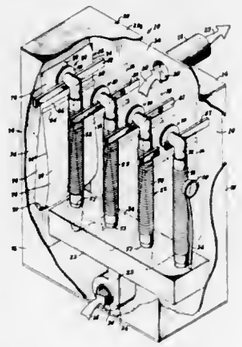
1. A device for transforming a fluid flow of a first type into a fluid flow of a second type, said device comprising a chamber having two lateral end walls and a circumferential wall extending between the lateral end walls, a flow duct forming a passage area disposed substantially tangentially to the circumferential wall and in communication with the chamber, a passage opening formed in one of said lateral end walls, the circumferential wall extending along a somewhat arcuate path, an oblong core disposed in the chamber, said core having a circular cross-section with a central longitudinal axis which coincides with the axis of the circular arc of said circumferential wall and which extends through the passage opening formed in said lateral end wall, an annular gap formed between said core and said passage opening, said gap having two optional points (P_1, P_2) where fluid flows between the passage area and the external surface of the axial core and having the condition $w_1 r_1^n = w_2 r_2^n$ substantially fulfilled, with r_1 being the radial distance of the point P_1 measured from the center of the circular arc, w_i being the flow rate of the fluid at the point P_i and n being a constant with $0 < n < \infty$, and an actuator means slidably mounted between said end walls within said chamber for supporting said oblong core for movement within said passage opening.

4,824,450

AIR FILTER APPARATUS

Arthur G. Howard, 8761 LeMode Ct.-C, Indianapolis, Ind. 46268

Filed Nov. 19, 1987, Ser. No. 122,831
Int. Cl.[4] B01D *29/14, 29/24*
U.S. Cl. 55—274 **22 Claims**



1. An air filter device for association with an associated air treatment installation such as a furnace or air conditioner, comprising, in combination:

a housing,

filter bag means supported in the housing,

the housing having an inlet means for admission of air to be filtered,

ductwork communicating the inlet means with the filter bag means,

the housing having an outlet means,

the housing being hermetically sealed except as to its inlet and outlet,

releasable connection means connecting the filter bag means to the ductwork, and

blower means causing flow of air inwardly through the inlet means,

the arrangement providing that air flowing inwardly through the ductwork is caused to pass through the filter bag means, into the interior of the housing, and out the outlet, for entrance of the associated air treatment installation;

and the filter bag means comprises a plurality of individual filter bag means, and the ductwork includes a manifold which communicates, in parallel, each of the individual filter bag means with the inlet means, and each of individual filter bag means is individually connected to the ductwork for separate releasability.

4,824,451

MELT-BLOWN FILTER MEDIUM

Clifford M. Vogt, Roswell, and Peter W. Shipp, Jr., Woodstock, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 815,478, Dec. 31, 1985, abandoned. This application Sep. 21, 1987, Ser. No. 99,283
Int. Cl.[4] B01D *39/16*
U.S. Cl. 55—528 **1 Claim**



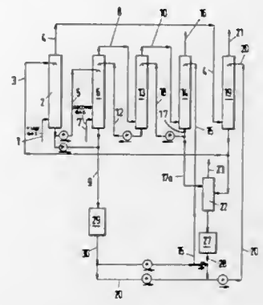
1. A filter medium having an efficiency in the range of from about 97.0 to about 99.57 percent with a pressure drop in the range of from about 0.32 to 0.65 inch of water comprising a cold calendered web of meltblown polypropylene fibers, wherein the fibers have an average diameter of about 5 microns, and wherein the fibers are randomly oriented and spaced to define surface pores which are less than about 20 microns in size.

4,824,452

PROCESS FOR DESULFURIZING CO_2-CONTAINING GASES

Gerhard Grünewald, Mainz-Gonsenheim, and Emil Alunic, Kronberg, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Linde Aktiengesellschaft, Hollriegelskreuth, both of, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 156,279
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704882
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—20 **6 Claims**



1. A process for desulfurizing gases containing CO_2, H_2S and COS which comprises the steps of:

a) scrubbing a first gas containing CO_2, H_2S and COS in a first scrubbing zone with a solvent capable of substantially completely solubilizing sulfur compounds contained in said first gas and which partially solubilizes CO_2 from said first gas to produce a laden solvent and a gas substantially free from sulfur compounds;

(b) scrubbing a second gas different from said first gas and which contains CO_2, H_2S and COS but has a lower CO_2 content than said first gas with at least part of said laden solvent from said first scrubbing zone, in a second scrubbing zone, to produce a partly desulfurized gas and a solvent containing sulfur compounds with a lesser CO_2 content than said laden solvent;

(c) regenerating the solvent containing sulfur compounds produced in said second scrubbing zone; and

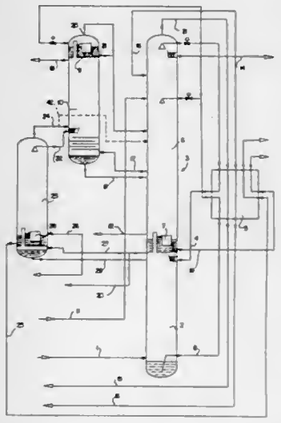
(d) scrubbing said partly desulfurized gas in a third scrubbing zone with a portion of said solvent which is substantially free from sulfur compounds.

4,824,453

PROCESS AND APPARATUS FOR AIR SEPARATION BY RECTIFICATION

Dietrich Rottmann, Munich, and Horst Corduan, Puchheim, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 11, 1988, Ser. No. 217,516
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722746
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 **35 Claims**



1. In a process for air separation by rectification wherein air is preliminarily separated in a first rectification stage of a rectification column into a nitrogen-enriched fraction and an oxygen-enriched fraction, the nitrogen-enriched fraction and oxygen-enriched fraction are fed to a second rectification stage of said rectification column and separated into a further enriched oxygen fraction and a further enriched nitrogen fraction, a stream containing essentially oxygen and argon is removed from the second rectification stage at an intermediate point and is separated by rectification in an argon column into an argon-enriched fraction and a liquid oxygen fraction depleted in argon and the latter liquid fraction is withdrawn from the argon column and fed back into the second rectification stage, the improvement comprising:

(a) removing an additional fraction containing oxygen and argon from said argon column, separating said additional fraction of oxygen and argon in a high-purity oxygen column into a high-purity oxygen fraction and a lighter residual fraction and

(b) removing an additional nitrogen-enriched fraction from the head of said first rectification stage and separating said additional nitrogen-enriched fraction in a high-purity nitrogen column into a bottom liquid fraction and a residual gas fraction.

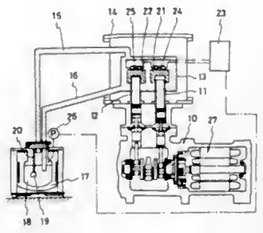
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4,824,454

DEVICE FOR LIQUEFYING A GAS

Hitoshi Kondo, Nagoya, and Koichi Hata, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 4, 1988, Ser. No. 164,408
Claims priority, application Japan, Mar. 5, 1987, 62-051151
Int. Cl.[4] F25J 3/00
U.S. Cl. 62—37 5 Claims



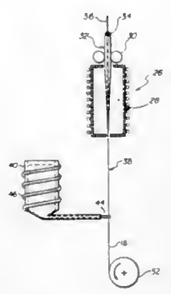
1. A device for liquefying a gas, comprising:
(a) a vessel containing therein an amount of liquid cryogen and having a space above the surface of said liquid cryogen;
(b) a chamber;
(c) a first conduit for connecting an upper side of an interior portion in said chamber and said space in said vessel;
(d) a second conduit for connecting a lower side of said interior portion in said chamber and said liquid cryogen in said vessel;
(e) a sensor for detecting the pressure in said vessel;
(f) cooling means provided in said chamber for liquefying a gas;
(g) heater means provided around said cooling means in said chamber for producing heat as a function of a quantity of electrical power provided thereto; and
(h) a control device for controlling the quantity of the electric power to said heater means according to a signal from said sensor.

4,824,455

POLARIZATION PRESERVING OPTICAL FIBER AND METHOD OF MANUFACTURING

Stephen C. Rand, Agoura, and Joseph A. Wysocki, Oxnard, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 28, 1987, Ser. No. 43,565
Int. Cl.[4] C03B 37/027
U.S. Cl. 65—3.11 7 Claims



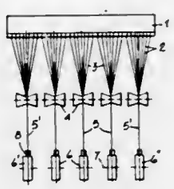
1. A process of manufacturing a polarization preserving birefringent optical fiber comprising the steps of:
heating a composite of a core member and cladding member of soft glasses;
drawing the core and cladding members to unite and reduce the dimensions of the core and cladding members, to thereby form a fiber;
transporting the drawn core and cladding through a molten metallic bath, having a predetermined temperature gradient transverse to the transportation path, at sufficient speed and at sufficient said temperature gradient to coat the drawn fiber with a sufficient variation in coating thickness about the cladding to provide an anisotropic compressional strain, when the molten metal solidifies about the cladding, to create an anisotropy of the refractive index of the core member sufficient for polarization preservation, and
cooling the coated molten metal to provide the desired variation in coating thickness to thereby form a metal-coated polarization preserving optical fiber.

4,824,456

PROCESS AND MECHANISM FOR THE PRODUCTION OF GLASS FIBER PRODUCTS FOR EXAMPLE FLEECE, MATS, YARNS AND ROVINGS

Fredo E. L. Schlachter, Sattelhecke 21, Fed. Rep. of Germany, assignor to Glaswerk Schuller GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 06/866,028, May 21, 1986, Pat. No. 4,737,180. This application Jan. 13, 1988, Ser. No. 143,917
Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518769
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[4] C03B 37/035
U.S. Cl. 65—4.4 10 Claims



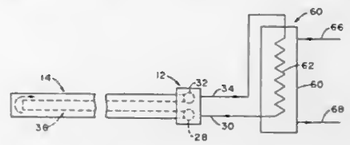
1. In a process for the production of glass fiber which includes drawing a number of filaments from streams of liquid glass from a nozzle bushing using a rotary surface to draw the filaments to a desired diameter, and before completion of a single rotation, removing the filaments from the rotating surface by stripping means located contiguous to the rotary surface, an improvement comprising collecting the filaments being drawn from streams of liquid glass into a plurality of loosely bound strands of filaments not having been treated with binders and then drawing off the strands individually on separated but parallel rotating surfaces comprising spaced cylindrical disks mounted for rotation about a common axis.

4,824,457

METHOD AND APPARATUS FOR CONTROLLING THERMAL ENVIRONMENT IN A GLASS FIBER FORMING PROCESS

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 58,719, Jun. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 914,429, Oct. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 783,883, Oct. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 696,966, Jan. 31, 1985, abandoned. This application Mar. 18, 1988, Ser. No. 170,203
Int. Cl.[4] C03B 37/012
U.S. Cl. 65—12 28 Claims



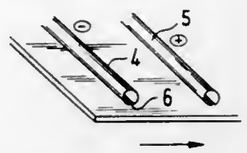
1. In a method of cooling glass fibers formed from molten glass, wherein heat is extracted from the glass fibers as they are formed through a fin cooler assembly by indirect heat exchange through the fin surfaces, the improvement comprising: circulating in a closed loop through each fin a heat transfer fluid having a specific heat of at least 0.5 cal/°C./gm and a vapor pressure not over 1 atmosphere at operating temperature, at a rate sufficient to maintain the fin surfaces above about 150° F. and below a temperature which would cause fin distortion while extracting heat from the glass fiber forming environment into said heat transfer fluid and removing heat from the heat transfer fluid in a heat exchanger remote from the fins but located in the closed loop through which the heat transfer fluid flows as it circulates.

4,824,458

DEIONIZATION OF GLASS BY CORONA DISCHARGE

Solange Ettori, Paris; Jean-Claude Peraud, Combs La Ville, and James Barton, Paris, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Mar. 11, 1987, Ser. No. 24,601
Claims priority, application France, Mar. 11, 1986, 86 03416
Int. Cl.[4] C03C 23/00, 29/00
U.S. Cl. 65—30.13 11 Claims



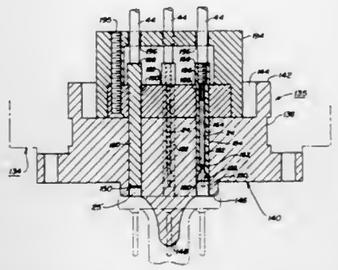
1. A method for deionizing a surface of a glass sheet using a corona discharge means, comprising the steps of:
(i) heating said glass sheet to a temperature below the softening temperature of said glass sheet;
(ii) treating one or two sides of said heat glass sheet with a continuous current regulated corona discharge,
(iii) continuously mutually moving said glass sheet and said corona discharge means relative to one another; and
(iv) regulating the intensity of said corona discharge to obtain a uniform treatment of said continuously moving glass sheet relative to the distance between said glass sheet and said discharge means and to said temperature.

4,824,459

MARKER PIN FOR A UNIVERSAL STEM MOLD

John R. Hale, Lancaster, Pa., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed May 20, 1988, Ser. No. 196,593
Int. Cl.[4] C03B 23/217
U.S. Cl. 65—59.26 11 Claims



1. In an apparatus for manufacturing a glass stem for an electron tube having a plurality of lead-in conductors and a greater plurality of fillets, said lead-in conductors extending through said fillets, there being at least one dummy fillet without a lead-in conductor extending therethrough, said apparatus comprising a first mold assembly and a second mold assembly for forming said stem therebetween, said first mold assembly including fillet forming means therein, the improvement wherein said first stem mold assembly comprises
a universal stem mold having a plurality of fillet-forming openings formed through a mold block; and at least one marker pin replaceably disposed and retained within said fillet-forming openings, said marker pin having a first end and an oppositely disposed second end spaced therefrom, said first end having a distinctive geometric shape for contacting said dummy fillet and for conveying intelligible information thereto.

11. A method for manufacturing a molded glass stem for an electron tube, said stem having a plurality of lead-in conductors extending therethrough, said method comprising the steps of:
(a) providing a stem mold having a first mold assembly and a second mold assembly, at least one of the stem mold assemblies being moveable relative to the other stem mold assembly, said first mold assembly including a mold block, a lead-weight translator, a pin holder, a plurality of inserts and at least one marker pin having a geometric shape at one end thereof, said inserts and said marker pin being disposed within said mold block;
(b) positioning said first mold assembly and said second mold assembly in spaced-apart relation;
(c) disposing said plurality of lead-in conductors within said second mold assembly so that one end of each of said lead-in conductors is in contact with a support platform assembly;
(d) locating a mass of glass on said second mold assembly around said lead-in conductors;
(e) heating said mass of glass, said lead-in conductors and said second mold assembly to a temperature sufficient to melt said glass;
(f) repositioning said first mold assembly and said second mold assembly so that the other end of each of said lead-in conductors extends through said inserts in said mold block, there being at least one opening in said mold block without a lead-in conductor, said opening having a marker pin therein;
(g) contacting each of said inserts and said marker pin with a different one of a plurality of lead-weights extending through a plurality of lead-weight apertures in said trans-

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lator of said first mold assembly to maintain said one end of said lead-in conductors in contact with said support platform of second mold assembly and to retain said marker pin within said mold block; and

(h) pressing said mass of melted glass between the first and second mold assemblies to fuse said glass into a glass stem comprising a disk having fillets around said lead-in conductors of said stem and at least one dummy fillet that is contacted by the geometric shape at the end of said marker pin for conveying intelligible information to said dummy fillet.

4,824,460

MANUFACTURE OF PARISONS OF MOLTEN GLASS

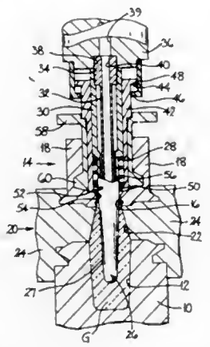
Frank A. Fenton, Granby, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 25, 1988, Ser. No. 236,574

Claims priority, application United Kingdom, Sep. 4, 1987, 8720848

Int. Cl.⁴ C03B *11/06*

U.S. Cl. 65—68 **5 Claims**



1. A method of manufacturing a parison of molten glass for subsequent moulding into a glass container comprising:

assembling a mould having a mould cavity which defines the desired shape of the parison, the mould comprising a one-piece lower mould portion defining a lower portion of the mould cavity, a dividable neck ring defining a neck portion of the mould cavity and engaging a gob guide arranged to guide gobs into the mould cavity, and a dividable central mould portion engaging the neck ring and the lower mould portion and defining a central portion of the mould cavity;

introducing a gob of molten glass into the gob guide so that the gob passes into the mould cavity through the neck ring;

introducing into the gob guide a plunger guide which serves to guide a plunger through the neck ring and which defines a sealing surface of the neck portion of the mould cavity;

pressing the plunger guide downwardly on to the neck ring, introducing a plunger into the plunger guide so that the plunger enters the mould cavity through the neck ring so that the plunger presses the molten glass into conformity with the cavity;

withdrawing the plunger from the mould and the plunger guide from the gob guide; and

disassembling the mould to allow removal of the parison.

3. Parison moulding apparatus for use in manufacturing a parison of molten glass for subsequent moulding into a glass container comprising a mould comprising a one-piece lower mould portion defining a lower portion of a mould cavity, a dividable neck ring defining a neck portion of the mould cavity, a dividable central mould portion defining a central portion of the mould cavity, the apparatus also comprising mould assembling means for assembling the lower portion, the neck ring and the central portion to form the mould in which a parison can be moulded and for disassembling the mould to allow removal of the parison, a gob guide engageable by the neck ring arranged to guide gobs of molten glass into the mould cavity, a plunger, and means for moving, the plunger into the mould cavity through the neck ring to press molten glass in the mould cavity into conformity with the mould cavity, the apparatus also comprising a plunger guide arranged to be introduced into the gob guide, to guide the plunger in its motion through the neck ring and to define a sealing surface of the neck portion of the mould cavity, and pressing means operable to press the plunger guide downwardly on to the neck ring while the plunger is in the mould.

4,824,461

METHOD AND APPARATUS FOR MOLD COOLING

Guillermo Cavazos, M. De Cervantes No. 810, Col. Colinas De San Jeronimo, Mty., N.L., Mexico

Filed Feb. 4, 1988, Ser. No. 152,323

Int. Cl.⁴ C03B *9/38*

U.S. Cl. 65—83 **4 Claims**

1. A mold cooling arrangement comprising:

a metallic mold having a plurality of closed vertical bores positioned between the molding surface and the exterior of the mold;

a manifold positioned vertically above said mold and means communicating the interior of said manifold with the upper end of each of said bores;

a vapor condenser communicating with said manifold through a single closed conduit; and positioned vertically thereabove; and

means including an adjustable relief valve connected between said condenser and the ambient atmosphere.

2. The method of cooling a mold in order to remove heat from the material being molded and in which the mold includes a plurality of vertical closed bores positioned between the molding surface and the mold exterior comprising:

filling said bores with a vaporizable liquid;

permitting said liquid to partially vaporize in response to heat transfer from the molding material;

conducting said vapors through a single closed conduit to a condenser located vertically above said mold; and

permitting the condensed vapor to return to the mold by gravity through said conduit.

4,824,462

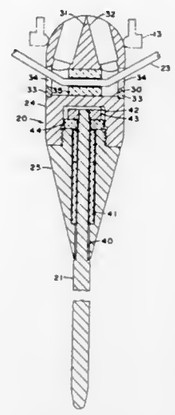
FLOW CONTROL MEANS FOR MOLTEN GLASS OR THE LIKE

Ronald L. Schwenninger, Ridgeley, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 14, 1987, Ser. No. 132,236

Int. Cl.⁴ C03B *17/04*

U.S. Cl. 65—325 **16 Claims**



1. Apparatus for controlling flow of molten glass or the like comprising:

a vessel adapted to contain a melt of glass or the like;

an orifice for passing a stream of the melt vertically from the vessel;

flow control means mounted in alignment with and below the exterior end of the orifice at variable proximity thereto so as to vary the opening from the orifice, including a bulbous member facing the orifice, a support arm extending transversely from the bulbous member, and a passageway extending through the bulbous member from the top of the bulbous member to a side portion under the support such that some of the melt flows through the passageway to fill a void in the flow stream under the support, thereby avoiding entrainment of gases in the stream.

4,824,463

PROCESS FOR CERAMISING GLASS-CERAMIC SHEETS

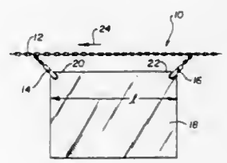
Eckard Neuhoff, Taunusstein-Bleidenstadt, and Friedrich-Georg Schröder-Gerlach, Ingelheim, both of Fed. Rep. of Germany, assignors to Schott Glaswerke, Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 93,190

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1986, 3632085

Int. Cl.⁴ C03B *29/00*

U.S. Cl. 65—33 **3 Claims**



1. A process for ceramising planar, transparent, substantially-rectangular sheets of glass-ceramic; comprising the steps of vertically suspending the sheets at their upper corners to provide a substantially horizontal tensile stress therein, and heating the vertically suspended sheets to a predetermined temperature to effect ceramising, whereby the substantially horizontal tensile stress inhibits sagging of the upper edges of the heated sheets.

4,824,464

PROCESS AND APPARATUS FOR HEATING GLASS SHEETS

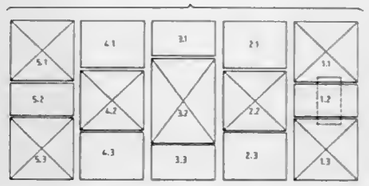
Francis Perin, Sauvigny les Bois, and Herve Prouveur, Liev-Saint Amand, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Apr. 9, 1987, Ser. No. 36,327

Claims priority, application France, Apr. 9, 1986, 86 05057

Int. Cl.⁴ C03B *29/04*

U.S. Cl. 65—106 **22 Claims**



1. A process for heating glass sheets to subsequently bend and/or temper them, comprising:

advancing said glass sheets along a path between two layers of resistors, the layers being distributed on both sides of the path followed by the glass sheet and on a portion of the length of this path, each layer of resistors being divided into independently controlled longitudinal zones, and each longitudinal zone comprising crosswise subzones with the subzones in adjacent zones being of various widths;

arranging said crosswise subzones so that the borders between subzones are longitudinally out of line with the corresponding borders in adjacent zones so as to eliminate a non-temperature-controlled belt, not contributing to the heating of the glass sheets parallel to the direction of advance of the glass sheets; and

regulating the temperature of each crosswise subzone independently of the temperature of the other crosswise subzones thereby controlling differentiated heating.

7. Device for heating glass sheets comprising:

a furnace which comprises an upper layer and a lower layer of resistors placed respectively above and below a conveyor for glass sheets going through the furnace, said resistors of each layer being distributed in longitudinal zones equipped with means for regulating their temperature;

each longitudinal zone comprising crosswise subzones with the subzones in adjacent zones being of varying widths as a fucntion of the position in the furnace;

each longitudinal zone equipped with means for independently regulating the temperature of the subzones; and

the pattern of said crosswise subzones being arranged so that the border between subzones are longitudinally out of line with the corresponding borders in adjacent zones so as to eliminate a non-temperature-controlled belt, not contributing to the heating of the glass sheets parallel to the direction of advance of the glass sheets.

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4,824,465

BENZOTHIAZOLONES, AND THEIR PRODUCTION AND USE

Toru Haga, Takarazuka; Eiki Nagano, Tokyo; Ryo Sato, and Kouichi Morita, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

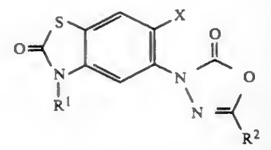
Filed Aug. 25, 1987, Ser. No. 89,172

Claims priority, application Japan, Aug. 25, 1986, 61-198769

Int. Cl.[4] C07D *417/04;* A01N *43/82*

U.S. Cl. 71—90 **12 Claims**

1. A compound of the formula:



wherein R^1 is a C_1–C_5 alkyl group, a C_3–C_4 alkenyl group, a C_3–C_4 alkynyl group or a C_1–C_2 alkoxy(C_1–C_2)alkyl group, R^2 is a t-butyl group or a 1-methylcyclopropyl group and X is a fluorine atom or a chlorine atom.

4,824,466

HETEROCYCLYLALKYL ESTERS OF 2-IMIDAZOLINONENICOTINIC ACIDS

Dieter Dürr, Bottmingen, and Henry Szczepanski, Wallbach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

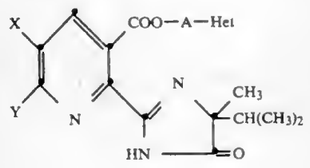
Division of Ser. No. 902,805, Sep. 2, 1986, Pat. No. 4,741,763. This application Mar. 10, 1988, Ser. No. 166,276

Claims priority, application Switzerland, Sep. 9, 1985, 3881/85; Feb. 27, 1986, 780/86

Int. Cl.[4] A01N *43/40;* C07D *401/14*

U.S. Cl. 71—92 **9 Claims**

1. A heterocyclylalkyl ester of a 2-imidazolinonenicotinic acid of formula I



(I)

wherein

A is a straight chain or branched C_1–C_4alkylene bridge,

X and Y are each independently of the other hydrogen, C_1–C_3alkyl, C_1–C_3haloalkyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy or halogen, or X and Y together form the butadiene bridge CH=CH—CH=CH, which may be substituted by halogen, cyano or C_1–C_4alkyl, and

Het is a 5-membered heterocycle which contains one oxygen or sulfur atom and which may further contain one or two carbonyl groups, which heterocycle may also be substituted by halogen, formyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy, nitro, amino, C_1–C_3 alkylamino or di(C_1–C_3)alkylamino, with the proviso that Het may not be the unsubstituted furyl radical.

4,824,467

COMPOSITION FOR DEFOLIATION OF PLANTS

Reinhart Rusch, D-1000 Berlin 28, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 135,065

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643654; Dec. 18, 1986, 3643655

Int. Cl.[4] A01N *43/78*

U.S. Cl. 71—73 **11 Claims**

1. Composition for defoliation of plants which is characterised by comprising a mixture of the components

(A) one part of 1-phenyl-3-(1,2,3-thiadiazol-5-yl)urea and

(B) 1–100 parts of 1-dodecylazacycloheptan-2-one.

4,824,468

HERBICIDAL OXAZOLIDINES AND METHODS OF USE

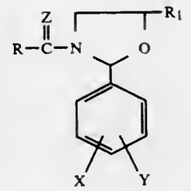
Eugene G. Teach, El Cerrito, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed Oct. 13, 1987, Ser. No. 107,196

Int. Cl.[4] A01N *43/76;* C07D *263/06*

U.S. Cl. 71—88 **30 Claims**

21. A method for controlling undesirable weed pests which comprises applying to the locus where control is desired a herbicidally effective amount of an oxazolidine compound having the formula



wherein

R is selected from the group consisting of alkyl having from 1 to about 8 carbon atoms, substituted alkyl wherein the alkyl group has from 1 to about 8 carbon atoms and the substituent is selected from the group consisting of halogen or trifluoromethyl, alkenyl having from 2 to about 5 carbon atoms, cycloalkyl in which the cyclo ring has from 3 to about 6 carbon atoms and the alkyl group has from 1 to about 3 carbon atoms, benzyl, alkoxyalkyl wherein the alkoxy group has from 1 to about 2 carbon atoms and the alkyl group has from 1 to about 2 carbon atoms, carboalkoxyalkyl wherein the alkoxy group has from 1 to about 2 carbon atoms and the alkyl group has from 1 to about 5 carbon atoms, alkylthioalkyl wherein the alkylthio group has from 1 to about 3 carbon atoms and the alkyl group has from 1 to about 3 carbon atoms, phenyl, substituted phenyl wherein the substituent is selected from the group consisting of halogen or trifluoromethyl, furanyl, phenoxyalkyl wherein the alkyl group has from about 1 to about 2 carbon atoms, carboalkoxy wherein the alkoxy group has from 1 to about 3 carbon atoms, substituted phenoxyalkyl wherein the alkyl group has from 1 to about 2 carbon atoms and the substituent is selected from the group consisting of halogen and trifluoromethyl, alkylamino wherein the alkyl group has from 1 to about 6 carbon atoms, alkoxy having from from 1 to about 5 carbon atoms, chloroethylamino, alkylthio wherein the alkyl group has from 1 to about 5 carbon atoms, cycloalkylalkyl wherein the cyclo ring has from 3 to about 6 carbon atoms and each alkyl group has from 1 to about 3 carbon atoms, cycloalkenylalkyl wherein the cyclo ring has from 5 to about 6 carbon atoms and each alkyl group has from 1 to about 3 carbon atoms, phenylamino, substituted phenylamino wherein the substituent is selected from the group consisting of halogen, trifluoromethyl or cyano, alkenylamino wherein the alkyl group has from 2 to about 5 carbon atoms, and benzylamino;

Z is oxygen;

R_1 is selected from the group consisting of alkyl or halo-substituted alkyl wherein the alkyl group has from 1 to 4 carbon atoms;

X is selected from the group consisting of trifluoromethyl and cyano,; and

Y is hydrogen or chlorine.

4,824,469

FUNGICIDAL AZOLE COMPOUNDS

David E. Green, and Albert Percival, both of Cambridge, England, assignors to Schering Agrochemicals Ltd., Great Britain

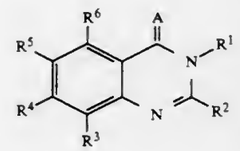
Division of Ser. No. 28,974, Mar. 23, 1987, Pat. No. 4,731,106, which is a continuation-in-part of Ser. No. 801,480, Nov. 11, 1985, abandoned. This application Mar. 11, 1988, Ser. No. 140,746

Claims priority, application United Kingdom, Nov. 24, 1984, 84/29739

Int. Cl.[4] A01N *43/54;* A61K *31/505;* C07D *403/04*

U.S. Cl. 71—76 **10 Claims**

5. A method of inhibiting the growth of plants which comprises applying to said plants a growth inhibiting amount of at least one compound of the formula



where:

A is oxygen or sulphur;

R^1 is phenyl or substituted phenyl in which the substituent is at least one member selected from the group consisting of halogen, C_{1-6}-alkyl, C_{1-6}-haloalkyl, C_{1-6}-alkoxy, C_{1-6}-haloalkoxy and nitro;

R^2 is 1-imidazolyl or 1,2,4-triazol-1-yl; and

R^3, R^4, R^5 and R^6, which may be the same or different, are each hydrogen, halo, C_{1-6}-alkyl or C_{1-6}-alkoxy.

4,824,470

2-(1-(5-HALOTHIENYLMETHOXYIMINO)ETHYL-3-HYDROXY-5-(TETRAHYDRO-2H-THIOPYRANYL)-CYCLOHEX-2-EN-1-ONE HERBICIDES

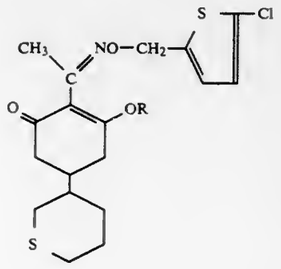
William Loh, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1987, Ser. No. 101,321

Int. Cl.[4] C07D *409/02;* A01N *43/02*

U.S. Cl. 71—90 **19 Claims**

1. A compound having the formula:



(I)

4,824,471

HETEROCYCLYLALKYL ESTERS OF 2-IMIDAZOLINONENICOTINIC ACIDS

Dieter Dürr, Bottmingen, and Henry Szczepanski, Wallbach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

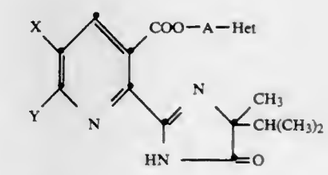
Division of Ser. No. 902,805, Sep. 2, 1986, Pat. No. 4,741,763. This application Mar. 10, 1988, Ser. No. 166,275

Claims priority, application Switzerland, Sep. 9, 1985, 3881/85; Feb. 27, 1986, 780/86

Int. Cl.[4] A01N *43/40;* C07D *401/14*

U.S. Cl. 71—92 **10 Claims**

1. A heterocyclylalkyl ester of a 2-imidazolinonenicotinic acid of formula I



(I)

wherein

A is a straight chain or branched C_1–C_4alkylene bridge,

X and Y are each independently of the other hydrogen, C_1–C_3alkyl, C_1–C_3haloalkyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy or halogen, or X and Y together form the butadiene bridge CH=CH—CH=CH, which may be substituted by halogen, cyano or C_1–C_4alkyl, and

Het is a 5-membered heterocycle which contains two nitrogen atoms and which may further contain one or two carbonyl groups, which heterocycle may also be substituted by halogen, C_1–C_3alkyl, C_1–C_3haloalkyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy, phenyl, nitro, amino, C_1–C_3alkylamino or di(C_1–C_3)alkylamino.

4,824,472

HERBICIDAL POLYCYCLYL SUBSTITUTED 1H-IMIDAZOLE-5-CARBOXYLIC ACIDS

Guy R. E. Van Lommen, Berlaar; Victor Sipido, Merksem; Wim G. Verschueren, Antwerpen, all of Belgium, and William R. Lutz, Riehen, Switzerland, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed Dec. 23, 1987, Ser. No. 137,384

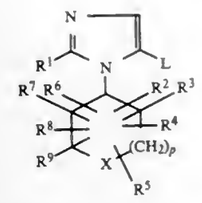
Claims priority, application United Kingdom, Dec. 31, 1986, 8631091

Int. Cl.[4] A01N *43/50;* C07D *233/90*

U.S. Cl. 71—92 **23 Claims**

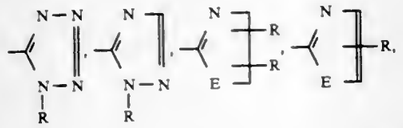
1. A chemical compound having the formula

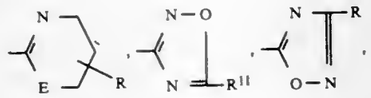
VOL 1101 ISS 4 APR 25 1989 UMI

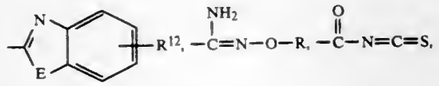


(I)

or a stereoisomeric form thereof, or a salt thereof, wherein
R^1 is hydrogen or mercapto;
L is cyano, $COOR^{10}$,

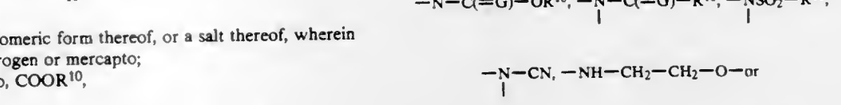


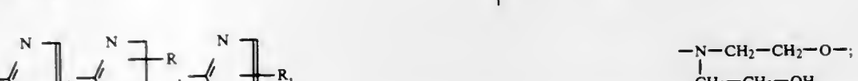


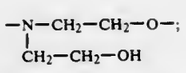


or a group of $-C(=G)-D-R^{13}$;
p is zero or the integer one to seven;
X is CH_2, O, S(O) or NR^{14}, wherein n is 0, 1 or 2;
R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 are each independently hydrogen, C_1–C_6alkyl, mono- and di(aryl)C_1–C_5alkyl, hydroxyC_1–C_5alkyl, C_1–C_5alkyloxyC_1–C_5alkyl, C_1–C_6alkyloxy, halo, C_3–C_7alkenyl, trifluoromethyl, difluoromethoxy, or aryl; and two or four of the substituents R^2, R^3, R^4, R^5, R^6, R^7, R^8 or R^9 taken together form one or two bivalent C_1–C_5alkanediyl, or C_3–C_5alkenedi7yl or C_5–C_7cycloalkanediyl radicals, said C_1–C_5alkanediyl, C_3–C_5alkenediyl or C_5–7 cycloalkanediyl which is unsubstituted or substituted where possible with up to four radicals selected from the group consisting of C_1–Calkyl, mono- and di(aryl)C_1–C_5alkyl, hydroxyC_1–C_5alkyl, C_1–C_5alkyloxyC_1–C_5alkyl, C_1–C_6alkyloxy, halo, C_3–C_7alkenyl, trifluromethyl, difluoromethoxy and aryl; or two or four of the substituents R^2, R^3, R^4, R^5, R^6, R^7, R^8 or R^9 being vicinally substituted may form one or two further bonds; and wherein one of the substituents on the said bivalent C_1–C_5alkanediyl, C_3–C_5alkenediyl or C_5–C_7cycloalkandiyl taken together with one of the substituents R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 may also form a bivalent C_1–C_5alkanediyl or C_3–C_5alkenediyl bridge which in turn may be substituted where possible with up to four radicals selected from the group consisting of C_1–C_6alkyl, mono- and di(aryl)C_1–C_5alkyl, hydroxyC_1–C_5alkyl, C_1–C_5alkyloxyC_1–C_5alkyl, C_1–C_6alkyloxy, halo, C_3–C_7alkenyl, trifluoromethyl, difluoromethoxy and aryl;
R^{10} is hydrogen, C_1–C_7alkyl which is unsubstituted or substituted with one, two or three halo atoms, C_3–C_7alkenyl, C_3–C_7alkynyl, C_3–C_7cycloalkyl, C_1–C_7alkyloxyC_1–C_7alkyl, arylC_1–C_5alkyl or a radical of formula $-N{=}C(R^{15})_2$;
E ix oxygen, sulfur or —NR—;
R is hydrogen or C_1–C_5alkyl;
R^{11} is hydrogen, C_1–C_5alkyl or trifluoromethyl;
R^{12} is hydrogen, C_1–C_6alkyl, C_1–C_6alkyloxy, halo, trifluoromethyl, difluoromethoxy, cyano, nitro, amino, mono- and diC_1–C_5alkylamino or C_1–C_5-alkylcarbonylamino;
R^{15} is hydrogen, C_1–C_5alkyl or two R^{15} radicals may form a C_4–C_6alkanediyl radical;
G is $=N-R^{16}$, oxygen or sulfur;
D is sulfur,

$-N(R^{17})-$, $-N(R^{18})-NH-$, $-N(R^{18})-O-$,







R^{13}, R^{17} and R^{18} are independently selected from hydrogen, C_1–C_5alkyl, C_3–C_5alkenyl, C;hd 3–C_5alkynyl, C_3–C_7cycloalkyl or C_1–C_5alkyl substituted with aryl, C_3–C_7cycloalkyl, C_3–C_7cycloalkyloxy, C_1–C_5alkyloxy, hydroxy, carboxyl or C_1–C_5alkyloxycarbonyl, whereas R^{18} may also be aryl; or
R^{13} and R^{17} together with the nitrogen atom to which they are attached may form a piperidinyl, pyrrolidinyl, 2-oxopiperidinyl, 2-oxopyrrolidinyl, morpholinyl, thiomorpholinyl, piperazinyl or 4-(C_1–C_5alkyl)piperazinyl ring, each unsubstituted or substituted with one to three C_1–C_5alkyl groups;
R^{14} is hydrogen, C_1–C_5alkyl, C_1–C_5alkanoyl, or 4-methylphenylsulfonyl; and
R^{16} is hydrogen or C_1–C_5alkyl;
aryl is phenyl which is unsubstituted or substituted with one to three substitutents each independently selected from C_1–C_5alkyl, C_1–C_5alkyloxy and halo.

13. A method for controlling weeds comprising the application to said weeds or to the locus thereof of a herbicidally effective amount of a compound of formula (I) as claimed in claim 1.

4,824,473

TREATMENT OF PLANTS WITH A COMBINATION FERTILIZER COMPOSITION

George R. McVey; Kenneth W. Tornberg; Larry R. Widell, and George E. Wood, all of Marysville, Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio

Continuation-in-part of Ser. No. 596,006, Apr. 2, 1984, Pat. No. 4,704,160. This application May 14, 1986, Ser. No. 863,174
The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.
Int. Cl.[4] A01N *43/64, 43/60*
U.S. Cl. 71—92 **30 Claims**

1. A process for treating vegetation comprising herbaceous and woody ornamental plants and vegetable crops comprising
applying to the vegetation a nitrogen containing fertilizer and from 0.006 to 6.0 pounds per acre of a plant growth regulator, said plant growth regulator selected from the group consisting of paclobutrazol and flurprimidol being a compound which regulates the growth of said vegetation by retardation of gibberellin synthesis,
the ratio by weight of nitrogen in said fertilizer to said plant growth regulator being at least forty to one,
said fertilizer and plant growth regulator being applied in proportions which are effective to improve the quality of the vegetation, the improvement in quality being both greater and extending for a longer period than that resulting from the application of the fertilizer or plant growth regulator alone.

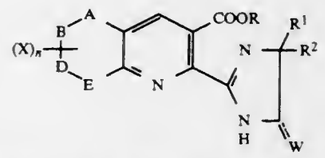
4,824,474

QUINOLINE DERIVATIVES AND HERBICIDAL COMPOSITIONS AND METHOD OF USE THEREOF

Tatsuo Numata; Masataka Hatanaka, both of Funabashi; Junichi Watanabe, Narashino; Takasi Ikai, Tokyo; Tsutomu Nawamaki, Yono, and Kenji Hattori, Urawa, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 882,408, Jul. 7, 1986, Pat. No. 4,696,694. This application Jul. 1, 1987, Ser. No. 69,022
Claims priority, application Japan, Jul. 25, 1985, 60-164407; Jan. 16, 1986, 61-6979; May 26, 1986, 61-120455
Int. Cl.[4] A01N *43/50;* **C07D** *401/04*
U.S. Cl. 71—92 **7 Claims**

1. A compound of the formula:



(I)

wherein one of A, B, D, and E is



or =CH—with the rest being all carbon atoms, provided that when one of A, B, D and E is =CH—, one double bond is present in the ring constituted by A, B, D and E, and when one of A, B, D and E is



one double bond may or may not be present in the ring; X is a halogen atom, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group, a C_1–C_4 chloroalkyl group, a C_1–C_4 chloroalkoxy group, a C_1–C_4 alkoxycarbonyl group, a C_1–C_4 alkylthioalkyl group, a tetrahydrothiopyranyl group, a hydroxyl group, a CF_3 group, phenyl or C_1–C_4 alkylphenyl; n zero, one or two; W is an oxygen atom or a sulfur atom; R is a hydrogen atom, a di-lower alkylimino group, a C_1–C_5 alkyl group which may be substituted by C_1–C_3 alkoxy or phenyl which may be substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or nitro, a C_2–C_5 alkenyl group which may be substituted by C_1–C_3 alkoxy, or phenyl, a C_2–C_5 alkynyl group, a C_4 or C_5 oxacycloalkyl group, a mono-, di- or tri- chloro -C_2–C_5 alkenyl group, a chloro -C_2–C_5 alkynyl group, a glycidyl group, a furfuryl group, an alkylthioalkyl group, a C_3–C_6 cycloalkyl group which may be substituted by C_1–C_3 alkyl, or a cation selected from the group consisting of an alkali metal ion, an alkaline earth metal ion, an ammonium ion or a monoalkyl ammonium ion; R^1 is a C_1–C_4 alkyl group, R^2 is a C_1–C_4 alkyl group or a C_3–C_6 cycloalkyl group, or R^1 and R^2 together with the adjacent carbon atom form a C_3–C_6 cycloalkyl group which may be substituted by C_1–C_3 alkyl.

7. A method for controlling weeds which comprises applying to the weeds or to the locus of the weeds an effective amount of the compound of claim 1.

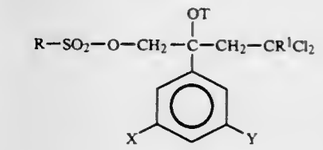
4,824,475

ENHANCED HERBICIDAL TRIAZINE COMPOSITIONS AND METHOD OF USE

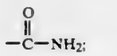
Lowell D. Markley, Midland, Mich., and Paul S. Zorner, Clayton, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 16, 1985, Ser. No. 776,732
Int. Cl.[4] A01N *43/70*
U.S. Cl. 71—93 **47 Claims**

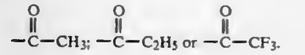
1. A herbicidal composition for use in postemergent agricultural field operations which comprises, in admixture, an agriculturally acceptable carrier and an effective amount in the range of, by weight, from about 1 to about 20 parts of a herbicidal triazine or mixture of herbicidal triazines and as a second herbicidal component, 1 to 2 parts of a glycol sulfonate or sulfamate compound or mixture of such compounds each having the following formula:



wherein:
R is C_1 to C_{18} alkyl; C_1 to C_4 haloalkyl; C_3 to C_6 cycloalkyl; phenyl; naphthyl; benzyl; any of phenyl, naphthyl, or benzyl in which up to three hydrogens on the ring have been replaced by substituent groups which may be the same or different and are selected from the group consisting of methyl, methoxy, methylthio, chloro, bromo, CF_3 or nitro; or NR^2R^3;
R^1 is CH_3, Cl, Br, F or



X and Y are the same or different and are Cl, Br, F, CF_3 or H, provided X and Y may not both be H; and
R^2 is H or C_1 to C_4 alkyl;
R^3 is H; C_1 to C_4 alkyl; phenyl; naphthyl; benzyl; and any of phenyl, naphthyl, or benzyl in which up to two hydrogens on the ring have been replaced by substituent groups which may be the same or different and are selected from the group consisting of methyl, methoxy, methylthio, chloro, bromo, CF_3 or nitro, provided that when R^2 is C_1 to C_4 alkyl, R^3 must be H or C_1 to C_4 alkyl; and
T is H,



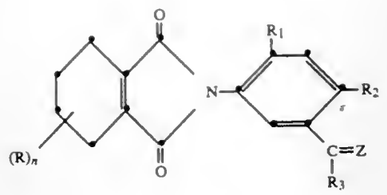
4,824,476

HERBICIDALLY ACTIVE DERIVATIVES OF N-PHENYL-3,4,5,6-TETRAHYDROPHTHALIMIDE

Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Beat Böhner, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,765
Claims priority, application Switzerland, Jun. 24, 1985, 2665/85; Jul. 25, 1985, 3237/85; Mar. 26, 1986, 1207/86
Int. Cl.[4] C07D *209/48;* **A01N** *43/38*
U.S. Cl. 71—095 **37 Claims**

1. A derivative of N-phenyl-3,4,5,6-tetrahydrophthalimide of the formula I

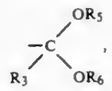


(I)

wherein
R is C_1–C_3-alkyl,
N is zero, one or two,
R_1 and R_2 independently of one another are each hydrogen, fluorine, chlorine or bromine,
R_3 is hydrogen, cyano, C_1–C_4-alkyl, C_1–C_4-chloroalkyl or a radical $—CH_2YR_4$,
Y is oxygen or sulfur,
R_4 is C_1–C_4-alkyl, C_3–C_4-alkenyl, C_3–C_4-alkynyl, C_3–C_7-cycloalkyl, benzyl or phenyl, and the phenyl ring is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-chloroalkyl or -fluoroalkyl, C_1–C_4-chloroalkoxy or -fluoroalkoxy, nitro or cyano,
Z is oxygen or an oxime radical =N—O—Q, and the radical



can also be a ketal radical



wherein
R_5 and R_6 independently of one another are each C_1–C_4-alkyl, C_1–C_4-chloroalkyl or C_2–C_8-alkoxyalkyl, or
R_5 and R_6 together are an ethylene bridge, a propylene bridge, or a cyclohexyl radical bound by way of adjacent carbon atoms, and the propylene bridge and the cyclohexyl radical can be substituted up to three times by C_1–C_4-alkyl groups, whilst the ethylene bridge can be mono- or disubstituted by C_1–C_4-alkyl, C_1–C_4-chloroalkyl, C_1–C_4-hydroxyalkyl, C_2–C_8-alkoxyalkyl, C_3–C_8-alkoxyalkyloxyalkyl, or by phenyl or benzyl unsubstituted or substituted by fluorine, chlorine or bromine or C_1–C_4-alkyl, or can be mono- or disubstituted by a radical $—CH_2YH$ or $—CH_2YR_4$, and
Q is hydrogen, a C_1–C_{10}-alkyl radical which can be interrupted by oxygen, sulfur, —CO—, —CONH— or —NH—, or which can be substituted by fluorine, chlorine or bromine, cyano, hydroxyl, C_1–C_6-alkoxycarbonyl, C_3–C_6-alkenyloxycarbonyl, C_3–C_6-alkynyloxycarbonyl, C_1–C_6-alkylthiocarbonyl, C_3–C_6-alkenylthiocarbonyl, C_3–C_6-alkynylthiocarbonyl, carbamoyl or di-C_1–C_4-alkylcarbamoyl, or is a C_3–C_8-alkenyl or -chloroalkenyl radical, a C_3–C_8-alkynyl radical, a C_3–C_7-cycloalkyl or cycloalkenyl radical unsubstituted or substituted by chlorine, or is a phenyl-C_1–C_4-alkyl radical, the phenyl nucleus of which can be substituted by fluorine, chlorine or bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-chloroalkyl or -fluoroalkyl, C_1–C_4-chloroalkoxy or -fluoroalkoxy, nitro or cyano, or is a C_1–C_{10}-alkylcarbonyl, C_3–C_{10}-alkenylcarbonyl or C_3–C_{10}-alkynylcarbonyl radical, each of which can be interrupted by oxygen or substituted by chlorine or cyano, or is a C_1–C_{10}-alkoxycarbonyl, C_3–C_{10}-alkenyloxycarbonyl or C_3–C_{10}-alkynyloxycarbonyl radical, each of which can be interrupted by oxygen or substituted by chlorine or cyano, or is a C_1–C_{10}-alkoxythiocarbonyl, C_3–C_{10}-alkenylthiocarbonyl or C_3–C_{10}-alkynyloxythiocarbonyl radical, each of which can be interrupted by oxygen or substituted by chlorine or cyano, or is a benzyl, C_3–C_6-cycloalkyl, phenyl or furyl, thienyl or dioxolanyl carbonyl or sulfonyl radical, each of which is unsubstituted in the ring or substituted by chlorine, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-chloroalkoxy, nitro or cyano, or is a C_1–C_4-alkylsulfonyl radical, a sulfonamido or carbamoyl radical, each of which is unsubstituted or substituted by C_1–C_4-alkyl, or is a sodium or potassium ion, or a benzyl-, chlorobenzyl-, C_3–C_6cycloalkylphenyl-, chlorophenyl-, furyl- or thienyl-carbonic acid group;
and the stereoisomers of this derivative.

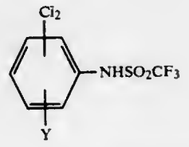
4,824,477

TRIFLUOROMETHANESULFONANILIDE COMPOUNDS AND HERBICIDAL COMPOSITIONS CONTAINING THEM

Tetsuo Takematsu; Makoto Konnai, both of Utsunomiya; Kuniaki Shimizu, Shimizu; Ikumi Urushibata, and Ikuo Kajiwara, both of Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 871,870, Jun. 9, 1986, Pat. No. 4,659,371. This application Feb. 26, 1987, Ser. No. 19,331
Claims priority, application Japan, Jun. 11, 1985, 60-125228
The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.
Int. Cl.[4] A01N *41/06*; C07C *143/74*
U.S. Cl. 71—103 **6 Claims**

1. A trifluoromethanesulfonanilide compound having the formula:



(I')

wherein Y is a (1-cyano-2-propyl)cyclopropyl group or a (1-cyano)cyclopentyl group.

6. A method for killing weeds, which comprises applying a herbicidally effective amount of a compound of the formula I' as defined in claim 1 to a locus to be protected.

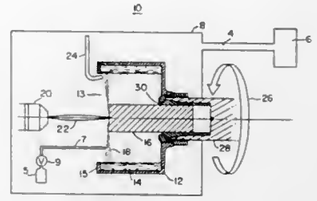
4,824,478

METHOD AND APPARATUS FOR PRODUCING FINE METAL POWDER

Peter R. Roberts; James J. Airey, both of Groton; James E. Blout, Concord, and Joseph J. Airey, Groton, all of Mass., assignors to Nuclear Metals, Inc., Concord, Mass.

Filed Feb. 29, 1988, Ser. No. 161,979
Int. Cl.[4] B22F *9/08, 9/10*
U.S. Cl. 75—0.5 C **39 Claims**

21. A method of producing fine metal powder by quenching molten metal drops into a liquified gas quench medium comprising the steps of:
rotating a drum with at least one partially open end at speeds up to 3000 rpm;
supplying a liquified gas to the inside of the drum to form an annulus of quench medium within said drum;
placing a metallic consumable electrode within the drum and along its longitudinal axis;
rotating the electrode;
melting the electrode with a plasma torch that supplies an arc to the electrode and forms metal drops that are flung into the quench medium to solidify; and



boiling away the quench medium to leave behind clean, unentrained metal powder.

4,824,480

CRUCIBLE FOR THE THERMAL ANALYSIS OF ALUMINUM ALLOYS USING SPECIAL CRUCIBLE

Jean Morice, and Jean-Jacques Perrier, both of Paris, France, assignors to Aluminum Pechiney, Paris, France

Division of Ser. No. 29,989, Mar. 25, 1987, Pat. No. 4,746,362.
This application Feb. 9, 1988, Ser. No. 153,911
Claims priority, application France, Mar. 27, 1986, 86-04655
Int. Cl.[4] C22B *21/00*
U.S. Cl. 75—68 R **4 Claims**

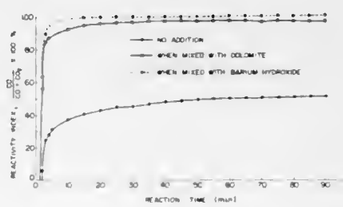
1. A process for measuring the silicon content of a hypereutectic aluminum alloy comprising:
(i) adding the said hypereutectic aluminum alloy to a crucible having the internal surface of at least one side wall at least partially covered with a film of a refining agent; and
(ii) measuring the incipient solidification temperature of the said alloy in the said crucible and comparing it to a temperature provided on a theoretical curve giving incipient solidification temperature as a function of silicon content for an alloy of the same type.

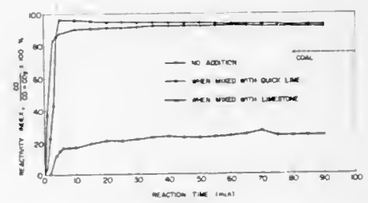
4,824,479

METHOD FOR PRODUCING A CARBONACEOUS SOLID REDUCTANT FOR DIRECT REDUCTION OF IRON ORE

Toshio Matsuoka, Nihama; Seiji Sugimori, Saijo; Yukio Koyabu, and Shinichi Kurozu, both of Nihama, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 735,292, May 17, 1985, abandoned, which is a continuation of Ser. No. 538,882, Oct. 4, 1983, abandoned. This application Apr. 29, 1988, Ser. No. 188,628
Claims priority, application Japan, Oct. 12, 1982, 57-178735
Int. Cl.[4] C21B *13/00*
U.S. Cl. 75—0.5 R **5 Claims**





1. In a method for producing a reactivity promoted carbonaceous solid reductant for use in the direct reduction of iron ore, wherein the carbonaceous solid is incorporated with an additional alkaline earth metal compound, the improvement comprising, grinding and mixing the carbonaceous solid reductant with the alkaline earth metal compound and agglomerating the resulting mixture to produce the reactivity promoted carbonaceous solid reductant of a definite grain size, and having a Boudouard reactivity of above 80%.

4,824,481

SPUTTERING TARGETS FOR MAGNETO-OPTIC FILMS AND A METHOD FOR MAKING

Dilip K. Chatterjee, Rochester, N.Y., and Srinivas T. Rao, Los Gatos, Calif., assignors to Eaastman Kodak Company, Rochester, N.Y.

Filed Jan. 11, 1988, Ser. No. 142,363
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—246 **19 Claims**

1. A method for producing a sputtering target which comprises heating at least one rare earth metal and at least one transition metal to produce an amorphous alloy melt, forming a powder of the alloy in an oxygen-free atmosphere, introducing the powdered alloy into a reducing mold, adding a layer of powdered oxygen-getter on top of the powdered alloy, and hot pressing the alloy.

4,824,482

PYROPHORIC IRON PRODUCT AND PROCESS OF MAKING

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 685,910, Dec. 27, 1984, Ser. No. 632,016, Jul. 18, 1984, abandoned, Ser. No. 584,538, Feb. 28, 1984, Ser. No. 571,510, Jan. 17, 1984, Pat. No. 4,537,927, Ser. No. 554,441, Nov. 22, 1983, abandoned, Ser. No. 488,103, Apr. 25, 1983, Pat. No. 4,615,920, and Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913, said Ser. No. 584,538, Ser. No. 554,441, and Ser. No. 488,103, each is a continuation-in-part of Ser. No. 417,214, Sep. 13, 1982, abandoned, and Ser. No. 172,671, Jul. 28, 1980, Pat. No. 4,435,481, said Ser. No. 281,405, is a continuation-in-part of Ser. No. 172,671,. This application Mar. 4, 1985, Ser. No. 707,656
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—254 **9 Claims**

1. In the process of leaching aluminized iron substrates to develop a high degree of pyrophoricity, the improvement according to which the leaching is effected at from about 190° F. to about 215° F. in an aqueous solution of from about 8% to about 15% sodium or potassium hydroxide by weight and from about ¼ to about 1½ grams of dissolved tin per liter, and the leaching is terminated after about five minutes.

4,824,483

U.V. DETECTABLE FLAME RETARDANT TREATMENT

Patrick D. Bumpus, 44 Chedell Pl., Auburn, N.Y. 13021

Continuation-in-part of Ser. No. 874,275, Jun. 12, 1986, Pat. No. 4,737,406. This application Mar. 15, 1988, Ser. No. 168,474
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[4] C09D *18/16*
U.S. Cl. 106—18.12 16 Claims

1. A flame-retardant or fire-retardant preparation that consists essentially of an aqueous solution of ammonium sulfate, a metasilicate salt serving as a binder, ammonium phosphate, and an effective amount of a wetting agent which promotes penetration of the aqueous solution into fibrous material.

4,824,484

AGENT FOR PRESERVING WOOD OR WOOD-BASED MATERIALS AND METHOD FOR PREPARATION AND USE THEREOF

Wolfgang Metzner, and Detlef Seepe, both of Krefeld, Fed. Rep. of Germany, assignors to Desowag Materialschutz GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,209
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714051
Int. Cl.[4] C09D *5/14;* B05D *1/00*
U.S. Cl. 106—18.31 29 Claims

1. An agent for preserving wood or wood-based based materials comprising ammonium monofluorophosphate selected from the group consisting of

(1) at least one of components (a) and (b), and

(2) a mixture of components (a), (b) or mixtures thereof and component (c), wherein component

(a) comprises an organic ammonium monofluorophosphate an organic diammonium monofluorophosphate or mixtures thereof of the formula

$$(R_1R_2R_3R_4N)R_5PO_3F \qquad \text{(Formula I)}$$

wherein

R_1, R_2, R_3 and R_4 are identical or different and each denotes a straight-chain, branched or cyclic, saturated or unsaturated alkyl, aralkyl, alkylaryl or aryl radical, either unsubstituted or substituted by an alkyl, alkoxy or a hydroxyl group, and up to three of the four R_1-R_4 can be hydrogen or can together form an alkylene bridge;

R_5 is a hydrogen atom or a $R_6R_7R_8R_9N$ group in which R6, R7, R8 and R9, respectively, have the same meanings as R_1, R_2, R_3 and R_4, respectively;

(b) comprises a mixture of a salt of monofluorophosphoric acid in a solvent with at least one ammonium salt of the formula

$$R_1R_2R_3R_4NX \qquad \text{(Formula II)}$$

wherein

R_1, R_2, R_3 and R_4, respectively, have the same meanings as in Formula I, and

X denotes an acid radical; and

(c) comprises an alkali metal monofluorophosphate or ammonium monofluorophosphate of the formula

$$M_2PO_3F,$$

$$MHPO_3F \text{ or mixtures thereof}$$

wherein M is at least one of sodium, potassium and ammonium.

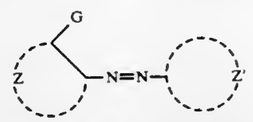
4,824,485

RECORDING LIQUID

Mitsugu Tanaka, and Takeo Sakai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 23, 1987, Ser. No. 41,493
Claims priority, application Japan, Apr. 24, 1986, 61-95321
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 11 Claims

1. A non-aqueous organic solvent containing recording liquid containing at least one organic solvent soluble compound represented by formula (I)



(I)

wherein Z represents an atomic group forming at least one substituted or unsubstituted 5-membered to 7-membered aromatic or heterocyclic ring; Z' represents at least one substituted or unsubstituted 5-membered to 7-membered aromatic or heterocyclic ring which contains in its ring (i) a nitrogen atom acting as a coordinating atom or (ii) a carbon atom to which a nitrogen atom acting as a coordinating atom is directly bonded at a position adjacent to the position to which the azo group is bonded; and G represents a metal-chelating group.

4,824,486

SIMULATED WATERMARK PRINTING SYSTEM

Robert E. Lafler, Charlton City, Mass., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 794,391, Nov. 4, 1985, abandoned. This application Aug. 31, 1987, Ser. No. 93,104
Int. Cl.[4] C09D *11/08*
U.S. Cl. 106—30 7 Claims

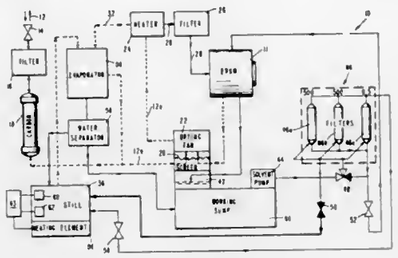
1. A printing solution for reducing the opacity index of paper to approximately that of cellulose comprising a solution of about 50% solids having a refractive index of between 1.50 and 1.54 and approximately 50% solvent having a boiling point in excess of 290° F., said solids portion of said solution comprising about 70% to 90% soluble, oxidation resistant resin that is the hydrogenated ester of rosin having a refractive index of about 1.50 and about 10% to 30% plasticizer.

4,824,487

CLEANING OF POLYURETHANE FOAM RESERVOIR

Mary B. Heffernan, Encinitas, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 10, 1987, Ser. No. 72,079
Int. Cl.[4] B08B *9/00*
U.S. Cl. 134—10 20 Claims



1. A process of cleaning foam parts used as ink reservoirs and ink delivery systems in ink-jet printers comprising:

(a) providing a solvent in a container;

(b) exposing said foam parts to said solvent in said container;

(c) agitating said foam parts in said container for a period of time;

(d) draining said solvent from said foam parts;

(e) repeating steps (b) through (d) at least twice;

(f) removing said foam parts; and

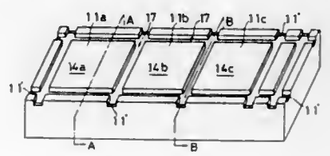
(g) drying said foam parts in a clean environment.

4,824,488

PHOTOVOLTAIC DEVICE

Souichi Sakai; Shoichi Nakano, both of Hirakata, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Division of Ser. No. 778,377, Dec. 19, 1985, Pat. No. 4,721,629, which is a continuation of Ser. No. 613,520, May 23, 1984, abandoned. This application Sep. 17, 1987, Ser. No. 98,014
Claims priority, application Japan, Jun. 21, 1983, 58-112093
Int. Cl.[4] H01L *27/14*
U.S. Cl. 136—244 5 Claims



1. A photovoltaic apparatus, comprising

a substrate having an insulating surface with a plurality of spaced apart photoelectric converting regions,

a plurality of spaced apart first electrode film parts formed on said insulating surface, said film parts including a segmented transparent conductive film corresponding to said photoelectric converting regions, said plurality of first electrode film parts having been formed in a manner that a first electrode film is formed on substantially all of said insulating surface of said substrate, and portions of said first electrode film surrounding the entire periphery of each of said first electrode film parts having been removed at a distance inward of the periphery of said substrate so as to form grooves by irradiating an energy beam on said portions of said first electrode film substantially equivalent to the entire periphery of each of said photoelectric converting regions, said grooves separating said first electrode parts from portions of the first electrode film existing about the periphery of said substrate.

a semiconductor film formed on said first electrode film parts,

a plurality of second electrode film parts formed on said semiconductor film to correspond to each of said photoelectric converting regions, and

electrically connecting means for connecting said first electrode film parts and said second electrode film parts of adjacent photoelectric converting regions to each other.

4,824,489

ULTRA-THIN SOLAR CELL AND METHOD

George W. Cogan; Lee A. Christel, both of Menlo Park; J. Thomas Merchant, Los Gatos, and James F. Gibbons, Palo Alto, all of Calif., assignors to Sera Solar Corporation, Santa Clara, Calif.

Filed Feb. 2, 1988, Ser. No. 151,392
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—256 12 Claims

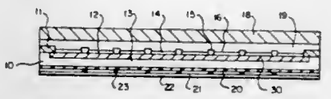
10. A method of fabricating a solar cell from a wafer formed of a semiconductor material and having a front surface and a back surface, the semiconductor material forming a bulk layer having a selected first conductivity type, the method comprising the steps of:

forming a front surface junction layer having a second conductivity type opposite that of the bulk layer and in contact therewith;

adhering a transparent support member to the front surface of the wafer to provide structural support for the wafer and to admit electromagnetic radiation into the cell, the interface between the support member and the wafer forming a bondline;

thinning the bulk layer;

forming a doped ohmic contact layer in the bottom surface of the wafer by depositing a layer of amorphous material



containing a first conductivity type dopant on said bottom surface, and melting the amorphous material using a pulsed laser energy source having an intensity high enough to melt the amorphous material and a thin layer of the semiconductor material adjacent the bottom surface, and low enough to insure that the bondline will not be damaged;

applying a dielectric layer to the back surface of the ohmic layer, and

forming contacts to the ohmic layer through openings formed in the dielectric layer.

11. A solar cell formed by the method of claim 10 wherein said thinning step includes thinning the wafer to a thickness of less than 50 microns.

4,824,490

PROCESS OF PRODUCING PHOSPHATE COATINGS ON METALS

Han Yong Oei, Frankfurt am Main; Günter Siemund, Heusenstamm, and Rudolf Vey, Bad Vilbel, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 20, 1987, Ser. No. 110,949
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1986, 3636390
Int. Cl.[4] C23C *22/17, 22/86*
U.S. Cl. 148—259 12 Claims

12. A process of preparing a metal for cold working comprising: contacting said metal surface with an aqueous phosphatizing solution which is at a temperature in the range from 30° to 50° C. containing about 5 to about 25 g/l zinc, about 1 to about 10 g/l manganese, about 0.1 to about 13 g/l iron(II), about 5 to about 40 g/l phosphate (calculated as P_2O_5), about 5 to about 50 g/l nitrate, about 0.5 to about 5 g/l fluoroborate (calculated as BF_4), about 0.05 to about 3 g/l tartaric acid and/or citric acid, the phosphatizing solution having weight ratios of $Zn:P_2O_5=(0.5 \text{ to } 3):1$ and of $Mn:Zn=(0.04 \text{ to } 0.5):1$ and a ratio of free acid to total acid of (0.04 to 0.2):1.

4,824,491

PROCESS FOR THE PRODUCTION OF A STRIP OF A CHROMIUM STAINLESS STEEL OF A DUPLEX STRUCTURE HAVING HIGH STRENGTH AND ELONGATION AS WELL AS REDUCED PLANE ANISOTROPY

Teruo Tanaka; Katsuhisa Miyakusu, and Hiroshi Fujimoto, all of Yamaguchi, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

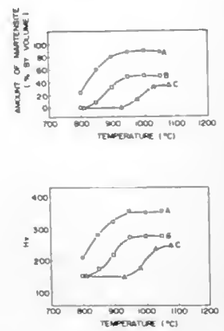
Filed Dec. 18, 1987, Ser. No. 134,873

Claims priority, application Japan, Dec. 30, 1986, 61-311961; Dec. 30, 1986, 61-311962; Jan. 3, 1987, 62-101

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] C21D *8/02*

U.S. Cl. 148—12 EA 13 Claims



1. A process for the production of a strip of a chromium stainless steel of a duplex structure, consisting essentially of ferrite and martensite, having high strength and elongation as well as reduced plane anisotropy and having a hardness of at least HV 200, which process comprises:

a step of hot rolling a slab of a steel to provide a hot rolled strip, said steel comprising, by weight from 10.0% to 20.0% of Cr, up to 0.10% of C, up to 0.12% of N, the (C+N) being not less than 0.01% but not more than 0.20%, up to 2.0% of Si, up to 4.0% of Mn, up to 4.0% of Ni and up to 4.0% of Cu, the {Ni+(Mn+Cu)/3} being not less than 0.5% but not more than 5.0%, the balance being Fe and unavoidable impurities;

a step of cold rolling the hot rolled strip to provide a cold rolled strip of a desired thickness; and

a step of continuous final heat treatment in which the cold rolled strip is continuously passed through a heating zone where it is heated to a temperature ranging from the Ac1 point of the steel to 1100° C. to form a two-phase of ferrite and austenite and maintained at that temperature for not longer than 10 minutes, and the heated strip is cooled at a cooling rate sufficient to transform the austenite to martensite.

4,824,492

METHOD FOR PRODUCING A PRECIPITATION HARDENABLE MARTENSITIC LOW ALLOY STEEL FORGING

Peter Wright, Duncanville, Tex., assignor to Chaparral Steel Company, Midlothian, Tex.

Filed Dec. 23, 1987, Ser. No. 137,105

Int. Cl.[4] C21D *1/02*

U.S. Cl. 148—12.4 2 Claims

1. A method for producing a forging of a precipitation-hardenable, martensitic, low alloy steel, said method comprising, forging a steel consisting essentially of, in weight percent, less than 0.20 carbon, 1.0 to 2.5 manganese, 0.10 to 1.5 silicon, 0.01 to less than 1.0 of at least one carbide, nitride or carbonitride forming element selected from the group consisting of niobium, titanium, vanadium, aluminum, zirconium and tantalum, less than 0.05 nitrogen, 0.01 to less than 2.0 of at least one element selected from the group consisting of molybdenum, nickel and chromium and the balance iron and incidental impurities, completing said forging at a temperature of 1800° to 2300° F., directly quenching said forging at a rate sufficient to achieve a tempered martensitic structure, said forging having a yield strength of 90,000 to 165,000 psi, a tensile strength of 120,000 to 210,000 psi, impact energy greater than 15 ft-lbs at −22° F. and a ductile-to-brittle transition temperature between −40° F. and +25° F.

4,824,493

PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING IMPROVED MAGNETIC PROPERTIES

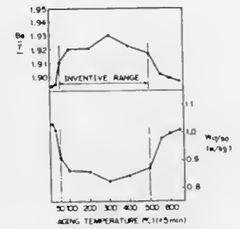
Yasunari Yoshitomi, and Kenzo Iwayama, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 12, 1987, Ser. No. 13,887

Claims priority, application Japan, Feb. 14, 1986, 61-028933

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—111 5 Claims



1. In a process for producing a grain-oriented electrical steel sheet having improved magnetic properties, wherein a silicon-steel hot-rolled sheet containing from 2.5 to 4.0% of Si, from 0.03 to 0.10% of C, from 0.010 to 0.065% of acid-soluble Al, from 0.0010 to 0.0150% of N, from 0.02 to 0.30% of Mn, from 0.005 to 0.040% of S and 0.4% or less of at least one element selected from the group consisting of Sn, Sb, Cu, and Cr, the balance being iron and unavoidable impurities, said hot-rolled sheet being successively subjected to annealing, then an at least twice cold-rolling operation including a first cold-rolling step comprising a plurality of passes and a final cold-rolling step to effect a heavy reduction from at least 80% to 95%, an intermediate annealing between the first and final cold-rolling steps, a decarburization annealing after the final cold-rolling step, then a final finishing annealing, the improvement comprising the steps of cooling the hot rolled silicon steel sheet at a rate of at least 5° C./sec. in a temperature range from 600° C. to 200° C. during the annealing of the hot-rolled silicon steel sheet and holding the steel sheet in at least one inter-pass of the plurality of passes of the first cold-rolling step at a temperature in a range from 50° to 500° C. for at least one minute.

4,824,494

ALUMINUM-BASED ALLOY FOIL FOR NEGATIVE ELECTRODES OF ELECTROLYTIC CAPACITORS

Shozo Umetsu, and Takeshi Nishizaki, both of Kawachinagano-shi, Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Filed Feb. 10, 1988, Ser. No. 154,580

Claims priority, application Japan, Feb. 19, 1987, 62-37575

Int. Cl.[4] C22C *21/00*

U.S. Cl. 148—438 4 Claims

1. An aluminum-based alloy foil for use as negative electrodes of electrolytic capacitors, the foil consisting essentially of 0.2 to 0.5% of Cu, 0.01 to 0.3% of Ni, and 0.005 to 0.02% of Ti, wherein the balance is substantially aluminum.

4,824,495

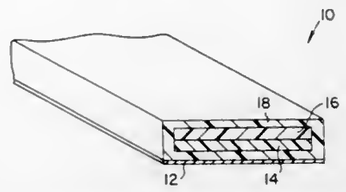
COMBUSTIBLE COATINGS AS PROTECTIVE DELAY BARRIERS

Vencatesh R. P. Verneker, Jessup, Md., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 10, 1987, Ser. No. 36,660

Int. Cl.[4] C06B *45/34*

U.S. Cl. 149—7 23 Claims



1. A combustible coating for providing a delay barrier to intrusion into an object, the coating comprising a combustible layer containing a substantially homogeneous mixture of fuel and oxidizer, the coating being ignitable at a temperature in excess of about 300° C., resistant to the effects of common fire extinguishing materials during combustion, and capable of sustaining combustion for at least five minutes with a burn rate of from about 1 to about 4 inches per minute, and a burn temperature of less than about 550° C.

4,824,496

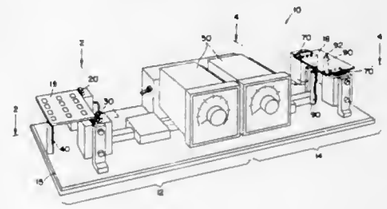
METHOD AND APPARATUS FOR REMOVING RETICLE GUIDES

Willis Seifert, Cupertino, and Michael Loeffler, Sunnyvale, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 24, 1987, Ser. No. 137,884

Int. Cl.[4] B31B *1/00*

U.S. Cl. 156—64 7 Claims



1. An apparatus for removing a stepper guide that is bonded to a reticle with an adhesive comprising:

a base;

support means coupled to said base for supporting the reticle in a generally horizontal position;

heater means for conductively heating the stepper guide having a generally planar upper surface and disposed on said base so that the stepper guide is in intimate contact with said planar upper surface when the reticle is supported by said support means; and

controller means for maintaining the temperature of said heater means at a predetermined value;

whereby the stepper guide is heated to a temperature at which the adhesive flows and the stepper guide may be removed from the reticle.

4,824,497

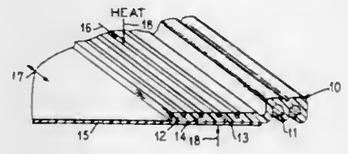
ATTACHMENT OF A THERMOPLASTIC EXTRUDED PASTENER TO A NON-EXTENSIBLE WEB

Paul A. Tilman, New City, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed May 6, 1987, Ser. No. 46,510

Int. Cl.[4] A44B *18/00*

U.S. Cl. 156—66 18 Claims



11. The process of making a film with an attached strip having a continuous profile thereon shaped to interlockingly engage with another profile, comprising the steps:

providing a profile strip having a web with substantial longitudinal strength and resistance to elongation with the application of a longitudinal force;

applying the strip to a film while applying a longitudinal force to the strip to obtain intimate contact between the film and the strip;

simultaneously applying a longitudinal force to the film at the location where the strip is to be sealed to the film for obtaining said intimate contact between the web and strip;

and bonding the strip to the film whereby the profiles or the webs of the strip are not distorted and warped due to stretching of the strip.

4,824,498

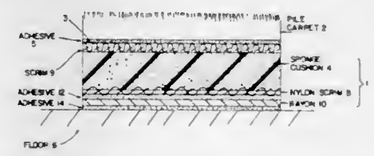
STRIPFALBLE SPONGE CUSHION UNDERLAY FOR A SURFACE COVERING, SUCH AS CARPETING

Roy D. Goodwin; Henry S. Ostrowski, both of Greenville, S.C., and Gary J. Davis, Chesterfield, Mo., assignors to James River Corporation, Richmond, Va.

Filed Jul. 9, 1987, Ser. No. 71,426

Int. Cl.[4] E04B *2/00*; E04F *13/00*; B32B *3/26, 7/06*

U.S. Cl. 156—71 35 Claims



13. A cushion underlay for a carpet, wherein the cushion underlay comprises:

(A) a solid, flexible, resilient, cellular layer having a top surface for bonding to an underside of a carpet and an opposing bottom surface;

(B) a self-supporting, flexible, nonwoven, scrim textile layer having an open mesh and opposing first and second surfaces, wherein the first surface of the scrim layer is adhered to the bottom of the cellular layer;

(C) a self-supporting, flexible, nonwoven, textile web having a denser mesh than the open mesh of the scrim layer, wherein said web is adhesively bonded to the second surface of the scrim layer;

wherein, when the scrim layer is secured to solid support and the cushion underlay is pulled away from the solid support, the scrim layer is strippable from the textile web without tearing the cellular layer, but the cellular layer is not strippable from the scrim layer.

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30. Method of installing a strippable surface covering and cushion underlay on a solid support, wherein the method comprises:

(A) providing a cushion underlay for the surface covering, wherein the cushion underlay comprises the cushion underlay as claimed in claim 13;

(B) adhesively securing the cushion underlay to a solid support; and

(C) adhesively securing the surface covering to the top surface of the cellular layer;

wherein the second layer adheres to the support, and the surface covering, cellular layer and first layer are strippable from the second layer when the surface covering is pulled away from the support.

4,824,499

METHOD FOR PRODUCTION OF GAS-PERVIOUS COMPOSITE FILM

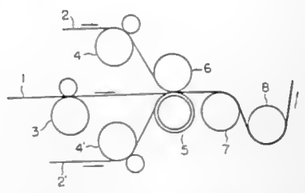
Seiji Kagawa, Kanagawa, Japan, assignor to Tonen Sekiyukagaku K.K., Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,008

Claims priority, application Japan, Jul. 8, 1987, 62-170497

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—85 **8 Claims**



1. A method for the production of a gas-pervious composite film comprising the steps of unaxially or biaxially drawing a film composed of a crystalline polyolefin resin with a content in the range of 30–60% be weight, a rubbery polymer with a content in the range of 40–70% by weight, and a filler with a content in the range of 5–15% by weight thereby forming a drawn film, joining said drawn film to a meshed sheet by hot pressing at a temperature exceeding the temperature at which said drawn film begins to undergo thermal shirnkage thereby adhering said drawn film to said meshed sheet and, simultaneously, causing thermal shrinkage of said drawn film and consequently imparting a microporous texture to said composite film.

4,824,500

METHOD FOR REPAIRING DAMAGED COMPOSITE ARTICLES

Warren D. White; Paul M. Puckett; Larry T. Blankenship, and Mary N. White, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 3, 1987, Ser. No. 116,620

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—94 **12 Claims**

1. In a method for patching damaged composite articles which comprises (a) removing grossly damaged composite from the damaged part, if necessary, and roughening the area to be repaired including an area immediately surrounding the area to be repaired by any suitable means: (b) removing dust and loose particles from the previously roughened area by any suitable means: (c) optionally cleansing the roughened area with a suitable solvent: and (d) either (i) placing one or more plies of a substrate material saturated with a curable resinous composition and retaining said saturated substrate material in place by any suitable means until the composition has gelled sufficiently that any retaining means can be removed: or (ii) bonding to the damaged area of the composite article in the area which has been previously roughened and cleaned one or more plies of metal or reinforced plastic material employing a curable resinous composition as an adhesive for bonding the metal or reinforced plastic material to the damaged area: and (e) subjecting the thus treated damaged area to sufficient heat and pressure to cure the adhesive or saturated substrate material; the improvement which comprises employing as the curable resinous composition, a composition which comprises (A) one or more vinyl ester resins modified with one or more rubbers or elastomers: optionally (B) at least one polymerizable ethylenically unsaturated monomer: (C) one or more curing agents or curing catalysts for the vinyl ester resin(s): and optionally, (D) one or more accelerators for the curing agent(s) or curing catalyst(s).

4,824,501

METHOD OF MANUFACTURING RADIAL TIRE

Hisao Ushikubo; Toru Tsuda, both of Tokyo, and Ichiro Takahashi, Saitama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 5, 1987, Ser. No. 58,441

Claims priority, application Japan, Jun. 11, 1986, 61-133771

Int. Cl.[4] B29D *30/10, 30/20*

U.S. Cl. 156—130 **10 Claims**

1. A method of manufacturing a radial tire comprising; a toroidal carcass, a belt arranged on a crown of the carcass, an auxiliary layer arranged on the belt, and having a width at least as wide as the width of said belt, and a tread rubber arranged on the auxiliary layer, which comprised the steps of:

(a) forming the belt uncured by wrapping at least two rubber-coated layers made of inextensible cords around a drum having an axially convex outer surface, a radius of curvature of said axially convex outer surface being substantially the same as that of a cured tire tread in such a way that cords of each layer are inclined at an angle with respect to a drum circumferential direction and cords of two different belt layers are laid one upon another so as to intersect each other so that said belt is formed axially in parallel with said axially convex outer surface;

(b) forming the uncured auxiliary layer on the belt by winding a ribbon composed of a plurality of heat-shrinkable rubber-coated cords around an outermost belt layer in spiral fashion along a tire circumferential direction;

(c) bonding the tread rubber layer onto the formed auxiliary layer to form a belt structure body;

(d) forming the carcass structure body independently from the belt structure body and expanding the formed carcass structure body into the toroidal shape;

(e) fitting the formed belt structure body to an outer periphery of the formed toroidal carcass structure body to form a green tire; and

(f) vulcanizing the formed green tire within a vulcanization mold to obtain a finished tire.

4,824,502

METHOD AND APPARATUS FOR MANUFACTURING A PLASTIC PIPE

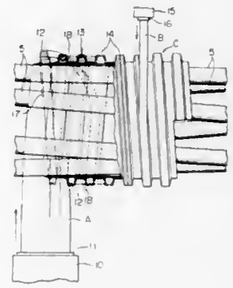
Akio Nagayoshi, and Kiyoharu Nagayoshi, both of Sakai, Japan, assignors to UC Industry Co., Ltd., Osaka and Tonen Sekiyukagaku Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 3, 1988, Ser. No. 163,681

Claims priority, application Japan, Mar. 6, 1987, 62-52289; Mar. 6, 1987, 62-52290; Apr. 21, 1987, 62-98372; Jun. 9, 1987, 62-144459

Int. Cl.[4] B65H *81/00*

U.S. Cl. 156—195 **9 Claims**



1. A method of manufacturing a plastic pipe having a spiral ridge on an outer surface and a flat inner surface, comprising the steps of:

(a) supplying a plastic ribbon in a softened state onto a plurality of rotating forming rolls arranged circularly, so that said plastic ribbon is spirally wound around said forming rolls while partially overlapping to be fused with each other;

(b) spirally winding an endless forming core belt around said forming rolls in such a manner that said endless forming core belt is sandwiched between the plastic ribbon already wound around said forming rolls and the plastic ribbon newly supplied, thereby providing the resulting plastic pipe with a spiral ridge:

(c) cutting said spiral ridge after the plastic ribbon is fused with each other and sufficiently cooled, thereby providing said spiral ridge with a slit extending along it to remove said endless forming core belt from it; and

(d) winding a second plastic ribbon in a softened state around said spiral ridge to fuse said second plastic ribbon thereto, thereby sealing said slit.

4,824,503

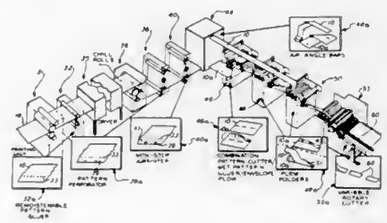
MAGAZINE ASSEMBLY SYSTEM AND METHOD

Richard Wilen, 8 Roxbury Ct., Oakdale, N.Y. 11769

Filed Jul. 30, 1987, Ser. No. 79,596

Int. Cl.[4] B31F *1/08;* **B65H** *45/20*

U.S. Cl. 156—204 **16 Claims**



1. A method for making a magazine into which is integrated billing elements and a remittance envelope comprising the steps of:

(a) feeding a length of printable material from a supply into a printing unit for printing pages of a magazine in units on at least a first part of said material as said material passes through said printing unit;

(b) passing said printable material through a pattern gluer for laying down a pattern of glue associated with each unit of printed magazine pages on at least a second part of said material;

(c) passing said printable material through a pattern perforator for perforating a pattern of perforations on at least a third part of said material, associated with each said unit of printed magazine pages;

(d) passing said printable material through a pattern slitter for slitting a pattern of slits in said material on at least said third part of said material, associated with each said unit of printed magazine pages;

(e) folding said printable material over itself so that said second part overlays said third part for forming a lamination of said printable material by at least some of the glue pattern layed down on said printable material for forming billing elements and a remittance envelope and,

(f) further folding said printable material over itself so that the portions of said printable material on which the printed pages are printed form the pages of a magazine inside said lamination.

4,824,504

METHOD OF MANUFACTURING TRIMMINGS AND GOODS

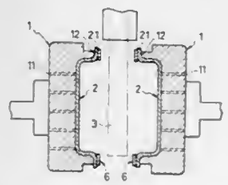
Sadatoshi Kagata, Ayase, Japan, assignor to Ikeda Bussan Co, Ltd., Ayase, Japan

Filed Dec. 23, 1987, Ser. No. 137,364

Claims priority, application Japan, Dec. 24, 1986, 61-306397

Int. Cl.[4] B29C *49/04, 49/48*

U.S. Cl. 156—216 **6 Claims**



1. A method of manufacturing interior trimmings comprising the steps of:

separating a pair of blow molding die halves from each other, each of said blow molding die halves comprising a concave central cavity portion surrounded by a circumferential rim portion extending outwardly therefrom;

setting a skin material on an inner face of each of said cavity portions in a manner such that an integral portion of the skin material extends over the circumferential rim of each cavity portion;

covering an outer face of each extended portion of the skin material with a holder member;

extruding a parison between the separated die halves;

combining the die halves with each other;

blowing pressurized air into the parison to mold a resin body against said skin material to thereby form a molded product;

separating the die halves from each other after the die halves have cooled;

removing the holder member from against each extended portion of the skin material thereby defining a space between each extended portion of the skin material and the resin body;

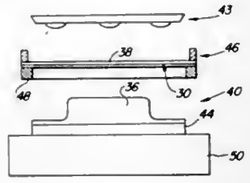
removing the molded body from the die halves;
dividing the molded product by cutting said molded product along the space formed between said resin body and each extended portion of said skin material; and
folding each extended portion of the skin material around a cut end of the resin body and fixing each extended portion of said skin material thereto.

4,824,505
METHOD OF FABRICATING FLEXIBLE CURTAINS OF ANY SIZE
Bernard Kraeutler, 1 rue du Château, 43220 Dunieres, France
Filed Jul. 27, 1987, Ser. No. 78,144
Claims priority, applicatioo France, Jul. 29, 1986, 86 10743
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—227 **16 Claims**



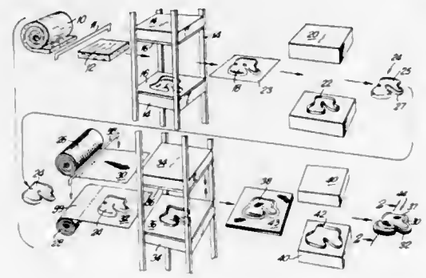
1. A method of fabricating a flexible curtain of width W which is stiffened at regular intervals by a plurality of horizontal reinforcing bars (9) individually disposed in a plurality of sheaths and which is of the type suitable for providing a goods-handling door, the method comprising the steps of:
(a) cutting strips of appropriate flexible material, said strips being of a length which is not less than substantially the desired width W for the curtain;
disposing said strips in parallel on a reference plane (11) such that their side edges are parallel, with each pair of adjacent strips overlapping by a width approximately equal to the width (μ) of a reinforcing bar sheath plus a width of two overlap margins (β) respectively flanking each sheath width for fastening said strips together;
holding the strips disposed in this manner relative to one another and relative to the reference plane; and
successively fastening the strips in pairs over at least two fastening lines running parallel to their longitudinal edges and provided respectively in each of said two overlap margins which are separated by approximately the width of the sheaths.

4,824,506
PROCESS FOR PROTECTING THERMOFORMED FILMS
Rebecca S. Hoerner, Grosse Point Woods, and William T. Short, Southfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 21, 1988, Ser. No. 184,216
Int. Cl.[4] B29C *43/56*; B32B *31/20*
U.S. Cl. 156—245 **18 Claims**



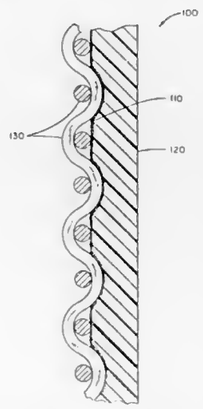
1. In a process for molding a thermally sensitive carrier film to a relatively rigid substrate by use of thermoforming apparatus including a direct heat source the improvement comprising:
selecting a carrier film having a decorative feature therein which is thermally stable below a predetermined temperature limit and thermoformable at temperatures below the predetermined temperature limit;
covering the carrier film with a protective material having heat absorption characteristics which will preferentially heat the carrier film to be thermally formable without reaching the predetermined temperature limit;
exposing the protective covering to the heat source and attenuating heat flow from the heat source in the protective coating to control the temperature in the carrier film within a range less than the predetermined temperature limit and above the thermoforming temperature;
thermoforming the carrier film into bonded engagement with the relatively rigid substrate to form a laminated part including the carrier film and the relatively rigid substrate;
cooling the laminated part and removing the protective covering to expose the decorative aspect of the carrier film.

4,824,507
PROCESS TO PRODUCE ENVELOPED FIBERGLASS PRODUCT
John A. D'Amico, Easton, Pa., assignor to Molded Accoustical Products, Easton, Pa.
Filed May 28, 1987, Ser. No. 52,454
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—245 **5 Claims**



1. A process for producing a laminated and enveloped fiberglass sandwiched product of irregular topography, said product having every internal and external edge terminating in a lipped and enveloped boundary to thereby totally enclose said fiberglass, said process comprising the steps of:
(a) providing a first press including a heated mold;
(b) feeding a fibrous fiberglass blank mat into said first press;
(c) simultaneously pressing and heat molding said fiberglass-mat into a predetermined shape of irregular topography;
(d) trimming excess fiberglass to produce a semi-final, molded workpiece with an irregular shape;
(e) providing two sheets of polyester facing fabric including a thermoset binder, one fabric surface including thermoset adhesive;
(f) placing said trimmed fiberglass workpiece between said two sheets of facing fabric, one said sheet on the top of said workpiece, said other fabric sheet on the bottom of said trimmed workpiece, both said sheets' thermoset adhesive surfaces facing said work piece and each other;
(g) providing a second press, said second press including a second heated mold having a similar configuration as said first mold and including generally an oversized circumferential mold area to allow for edge binding compression of said fabric edges;
(h) feeding said trimmed workpiece and said fabric sheets together into said second press;
(i) heat pressure molding said fabric and workpiece to produce a laminated fiberglass to fabric workpiece including a fabric to fabric edged lip whereby said workpiece, including each and every fiberglass edge is enveloped by said fabric; and,
(j) trimming excess fabric to produce thereby a product with fabric surrounding all fiberglass surfaces with no fiberglass edges or surfaces exposed.

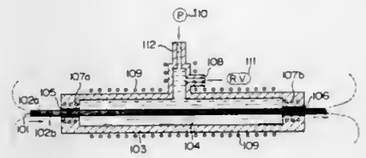
4,824,508
METHOD FOR MAKING AN IMPROVED SOLID POLYMER ELECTROLYTE ELECTRODE USING A LIQUID OR SOLVENT
John M. McIntyre; Bruce R. Smith, and Jeffrey D. Birdwell, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 9, 1985, Ser. No. 806,714
Int. Cl.[4] B32B *31/12*; C25B *11/20*
U.S. Cl. 156—276 **19 Claims**



1. A method for forming a solid polymer electrolyte structure consisting essentially of:
a. forming a suspension of catalytically active, electrically conductive particles and a liquid;
b. applying the suspension to at least one side of a fluorcarbon membrane sheet, while said sheet is in its thermoplastic form;
c. removing substantially all of the liquid, leaving the particles on the membrane sheet;
d. pressing at least a portion of the particles into the membrane sheet;
e. contacting the side of the so-treated membrane having the particles on the surface with an electrically conductive, hydraulically permeable matrix;
f. subjecting the membrane/matrix combination to a pressure sufficient to bond at least a portion of the matrix to the membrane.

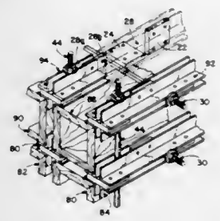
4,824,509
METHOD FOR PRESSURE LAMINATION UTILIZING FLUID MEDIUM WITH PARTIAL SOLIDIFICATION THEREOF FOR SEALING PRESSURE CHAMBER
Kenji Tonoki; Kazuyoshi Tsunoda; Haruki Yokono; Hisao Kono, all of Yuki; Ryoji Yokoyama, Musashino, and Fumiaki Nakamura, Shimodate, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan
Filed Jan. 13, 1986, Ser. No. 818,188
Claims priority, application Japan, Jan. 11, 1985, 60-3662
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—285 **13 Claims**

1. A method for applying pressure and heat to a laminated sheet material from opposite surfaces thereof, wherein:
(a) said sheet material is conveyed in through an entrance zone of a pressure vessel, along through an interior zone thereof, and out through an exit zone thereof;
(b) said zones of said pressure vessel being substantially filled with a pressure medium;
(c) said pressure medium in said interior zone of said pressure vessel being maintained at a temperature and pressure at which said pressure medium is substantially in the liquid phase;
(d) said pressure medium in said entrance and exit zones of said pressure vessel being at least partially maintained at such a temperature at which said pressure medium is in the solid phase as to provide a sealing effect against leakage of



said pressure medium out of said pressure vessel through said entrance and exit zones and to retain said pressure in said interior zone of said pressure vessel, and to provide a small rate of leakage of said pressure medium from said exit zone in discontinuously broken forms; and
(e) protective sheets being provided over opposite surfaces of said laminated sheet material and wherein; an additional sealing effect is provided in at least one of said entrance and said exit zones of said pressure vessel against face portions of said protective sheets on opposite surfaces of said sheet material by providing an additional sealing member to slide there against, and to retain said pressure medium in said interior zone of said pressure vessel.

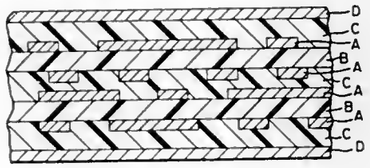
4,824,510
METHOD AND APPARATUS FOR ASSEMBLING BOX UNITS
Arthur L. Troutner, Boise, and Thomas M. Atwood, Kuna, both of Id., assignors to Trus Joist Corporation, Boise, Id.
Filed Nov. 27, 1987, Ser. No. 125,701
Int. Cl.[4] B25B *1/20*
U.S. Cl. 156—288 **24 Claims**



1. An apparatus for assembling elongate box units wherein the box units consist of multiple elongate side pieces joined on their long edges, comprising:
plural, elongate clamping elements, formed from a plurality of formation angles with said formation angles each being equal to the angle of a corner of a box unit to be formed, constructed and arranged to define a corner configuration for adjacent side pieces of at least two of the box units; and
plural, elongate tensioning rods extending between said clamping elements in an array, with said rods extending perpendicular to the elongate length of the box units.

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4,824,511
MULTILAYER CIRCUIT BOARD WITH FLUOROPOLYMER INTERLAYERS
Frederick N. Hartman, Wilmington, Del., and Alan C. Knight, Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 19, 1987, Ser. No. 109,586
Int. Cl.⁴ C09J *5/10*
U.S. Cl. 156—306.6 **1 Claim**



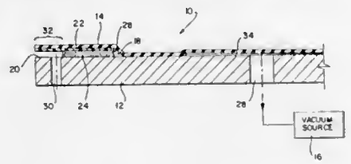
1. A process of assembling circuit-bearing sheets containing surface portions of conductive circuitry and surface portions of polytetrafluoroethylene to form multilayer laminates in which unsintered tetrafluoroethylene polymer made by dispersion polymerization is inserted between the sheets, pressure is applied at 50–1000 psi at a temperature below the fusion temperature of the polymer to encapsulate the circuits, and, in a separate step at a lower pressure of 0–50 psi the assembly is heated above the fusion temperature of the polymer to fuse the polymer particles into a continuous mass.

4,824,512
LOW VISCOSITY, PREGELABLE RUBBER-BASED ADHESIVES
Hans-Peter Kohlstadt, Velbert, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Jul. 24, 1987, Ser. No. 77,258
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1986, 3625030
Int. Cl.⁴ C09J *3/12;* **C08C** *19/08;* **B62D** *27/00*
U.S. Cl. 156—334 **25 Claims**

1. A rubber-based adhesive composition comprising:
(a) from about 20 to about 60% by weight of liquid stereospecific polybutadiene rubber;
(b) from about 1.5 to about 5% by weight of one or more chemically irreversibly depolymerized solid rubbers of natural or synthetic origin;
(c) from about 0.5 to about 15% by weight of one or more hardeners;
(d) from about 25 to about 70% by weight of one or more fillers;
(e) from 0 to about 8% by weight of one or more primers; and
(f) from 0 to about 12% by weight of sulfur.

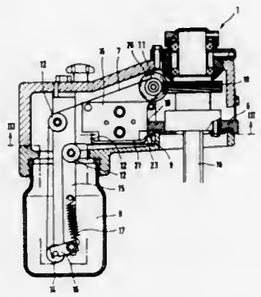
4,824,513
SILICONE RUBBER VACUUM BAG TOOL
John J. Dodds, Clifton Heights, Pa., assignor to The Boeing Company, Seattle, Wash.
Continuation of Ser. No. 655,656, Sep. 28, 1984, Pat. No. 4,698,115. This application Aug. 20, 1987, Ser. No. 87,327
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.
Int. Cl.⁴ B25B *11/00;* **B32B** *33/00*
U.S. Cl. 156—382 **2 Claims**

1. A tool for use in applying pressure to a layup of composite material, comprising:
a base plate;
a silicone rubber bag in the form of a sheet having at least one edge, said at least one edge having on the surface of said sheet facing the base plate a strip of silicone elastomer material adhered thereto and a further strip of adhesive tape adhered to the strip of silicone elastomer material,



said strip of adhesive tape adhering the at least one edge of the sheet to the base plate; and
means for establishing a vacuum within the bag when adhered to the base plate.

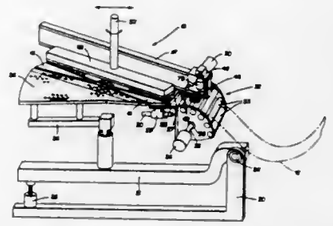
4,824,514
DEVICE FOR PRINTING LABELS ON LABELING MACHINES
Egon Schneider, Neutraubling, and Georg Ketterl, Straubing, both of Fed. Rep. of Germany, assignors to Krones AG Hermann Kronseder, Neutraubling, Fed. Rep. of Germany
Filed Oct. 20, 1987, Ser. No. 110,971
Claims priority, application Fed. Rep. of Germany, May 13, 1987, 8706876[U]; Oct. 22, 1987, 3635923
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—387 **18 Claims**



1. Apparatus for printing labels on a labeling machine said apparatus including a printing head, a rotating inking roller, an ink container, and an inking ribbon which translates longitudinally in a takes ink from ink in said container, said linking ribbon contacting the outer circumference of the inking roller, said inking ribbon being arranged to translate generally transversely to the direction of rotation of the inking roller in the area of contact between the inking ribbon and the inking roller.

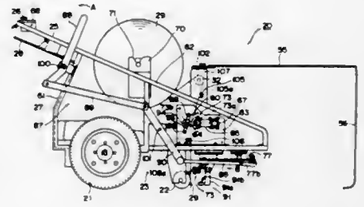
4,824,515
PLY APPLICATOR
Donald O. Still, Akron; Hubert T. Hovance, Ravenna, and George J. Burley, Clinton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed May 9, 1983, Ser. No. 493,108
Int. Cl.⁴ B29D *30/30*
U.S. Cl. 156—406.4 **7 Claims**

1. An apparatus for applying a length from a continuous roll of elastomeric material having substantially parallel cords disposed therein at a bias angle to a cylindrical drum comprising:
(a) means for cutting the elastomeric material substantially between and parallel to said bias angle cords to form a length of material having leading and trailing edges;
(b) means associated with said cutting means for sensing the position of the cutting means during cutting for determining the angle of cut; and



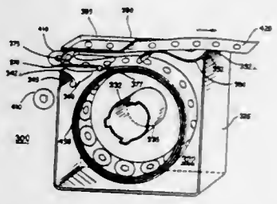
(c) applicator means adapted to apply said leading and trailing edges to said cylindrical drum to form a splice and having means for rotating the trailing edge prior to application to said drum responsive to an angle difference between the leading and trailing edges to form a splice wherein the angle of the trailing edge is substantially the same as the angle of the leading edge.

4,824,516
PAVEMENT-MARKING TAPE APPLICATOR
Yuji Ishihara, and Akio Yamasaki, both of Tochigi, Japan, assignors to Seibu Polymer Kasei Kabushiki Kaishas, Tokyo, Japan
Filed Dec. 5, 1986, Ser. No. 938,724
Claims priority, application Japan, Dec. 16, 1985, 60-193262[U]; Mar. 11, 1986, 61-35753[U]; Mar. 11, 1986, 61-35754
Int. Cl.⁴ E01C *23/16*
U.S. Cl. 156—523 **9 Claims**



4. A pavement-marking tape applicator comprising:
a carrier having at least one wheel and an application roller for engaging a pavement-marking tape and applying the same on a paved surface while rolling on the paved surface;
means for supporting a roll of the pavement-marking tape unwindably on said carrier;
a pair of free end position adjusting rollers mounted on said carrier for holding the tape unwound from the roll between them for hanging the tape in front of said application roller in the advancing direction of said carrier and adjusting a free end position of the tape;
drive means mounted on said carrier and operated by an operator for rotating one of said free end position adjusting rollers independently from rotation of said application roller and selectively in forward and reverse direction during adjusting of the free end position of the tape; and
cutting means mounted on said carrier for cutting the tape; said cutting means comprising:
a rail extending transversely of the moving direction of said carrier;
a rotary blade support member having rail engaging means for engaging with said rail for sliding movement along said rail;
a disc-like rotary blade supported by said rotary blade support member in such a manner that said rotary blade can be rotated horizontally; and
actuating means for actuating said rotary blade support member for the sliding movement along said rail.

4,824,517
MULTIPURPOSE DISPENSER
David J. Leahy, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Continuation-in-part of Ser. No. 87,364, Aug. 20, 1987, Pat. No. 4,772,355. This application Sep. 21, 1987, Ser. No. 99,437
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.
Int. Cl.⁴ B32B *35/00;* **B65C** *11/00*
U.S. Cl. 156—584 **3 Claims**



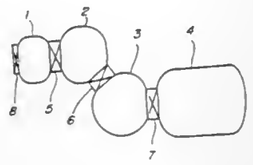
1. A dispenser for housing and dispensing a rolled substrate comprising:
a case formed of molded plastic comprising a backface panel, two oppositely facing sidewalls connected to said backface panel,
a cylindrical spindle connected to the backface panel and protruding into the interior of the dispenser, said spindle adapted to removably hold a rolled substrate,
a first cutting member and a second cutting member, each connected to one of the oppositely facing sidewalls, and
a first threading member and a second threading member each connected to the backface panel and each disposed between said first and second cutting members,
said first threading member located in closer proximity to said first cutting member than to said second cutting member, and the second threading member located in closer proximity to the second cutting member than to the first cutting member, said threading members being spaced apart from each other and from each of said cutting members,
wherein said dispenser at least functions to house and dispense one at a time of two types of correction tapes, the first type being a rolled permanent correction tape having a releasable backing sheet attached to an adhesive coated substrate sheet, said backing sheet being stripped from the adhesive coated substrate as the correction tape is manually pulled through the dispenser and the second type of correction tape being a rolled readhering and repositionable correction tape not having a release backing sheet,
said threading members each comprises a horizontal guide panel, the horizontal guide panel oriented substantially perpendicular to the backface and at least one of the threading members had a cylindrical member protruding downwardly for said horizontal panel in a direction toward the interior of the dispenser.

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4,824,518
METHOD FOR THE PRODUCTION OF SEMICONDUCTOR DEVICES

Toshiro Hayakawa; Takahiro Suyama; Kohsei Takahashi, and Saburo Yamamoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1986, Ser. No. 843,146
Claims priority, application Japan, Mar. 29, 1985, 60-67447; Apr. 8, 1985, 60-74976
Int. Cl.⁴ H01L *21/20*
U.S. Cl. 156—613 **3 Claims**

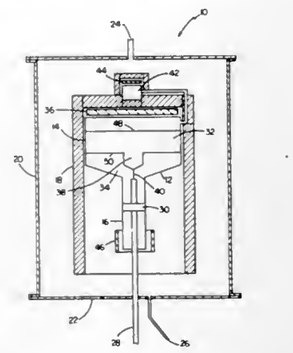


1. A method for the production of semi-conductor devices comprising:
subjecting a GaAs substrate with an oxidized film thereon to a degasification treatment in a heating chamber;
heating the substrate during a radiation treatment by a molecular beam of As within a pre-treatment chamber to remove the oxidized film from the substrate;
subjecting the substrate to irradiation with a molecular beam of In within said pre-treatment chamber after the removal of the oxidized film; and
growing a phosphorous compound semiconductor layers on the substrate by molecular beam epitaxy within a growth chamber connected to the pre-treatment chamber.

4,824,519
METHOD AND APPARATUS FOR SINGLE CRYSTAL PULLING DOWNWARDLY FROM THE LOWER SURFACE OF A FLOATING MELT

Aleksandar G. Ostrogorsky, New York, N.Y., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 22, 1987, Ser. No. 112,499
Int. Cl.⁴ C30B *15/08, 35/00*
U.S. Cl. 156—617.1 **33 Claims**

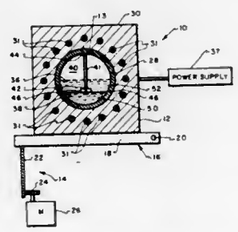


1. Apparatus for growing a single crystal from a melt comprising:
a container for holding a melt
a liquid encapsulant denser than the melt disposed within the container below the melt; and
a pulling shaft including a seed crystal extending upwardly through the encapsulant to contact the melt, the shaft adapted to be withdrawn downwardly with or without rotation to grow the crystal inside the liquid encapsulant within the container.
25. Method for growing a single crystal from a melt comprising:
floating the melt on a liquid encapsulent whose density is greater than the density of the melt; and
pulling the crystal downwardly through the encapsulent without or with rotation.

4,824,520
LIQUID ENCAPSULATED CRYSTAL GROWTH

Andrew D. Morrison, Altadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 19, 1987, Ser. No. 27,981
Int. Cl.⁴ C03B *15/02*
U.S. Cl. 156—620.1 **11 Claims**

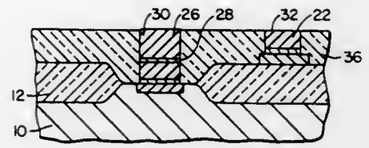


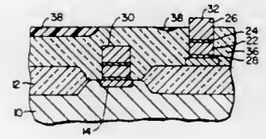
1. A method of growing a sheet of single crystal of a material having a band gap exceeding 1.0 e.V. and which contains a volatile component from a molten pool of said material comprising the steps of:
forming a pool consisting of molten precursor of said material;
floating a layer of liquid encapsulant directly on top of the pool of molten precursor to form an interface between the top surface of the pool and the bottom surface of the layer, said encapsulant being inert to and having a lower density than the molten precursor and said layer having a thickness of at least 2 cm and a thickness exceeding that of the sheet of grown crystal;
crystallizing the molten precursor at said interface to form a sheet of grown crystal having a thickness and a top surface and a bottom surface;
moving the sheet of grown crystal completely into said layer of liquid encapsulant so that said top and bottom surface are in contact with said encapsulant and lowering the temperature of the sheet of grown crystal to a first temperature while the sheet is in the layer of encapsulant;
moving the sheet of crystal out of the layer of liquid encapsulant into an inert gas phase; and
lowering the temperature of the sheet of crystal while in said gas phase to a second temperature lower than the first temperature.

4,824,521
PLANARIZATION OF METAL PILLARS ON UNEVEN SUBSTRATES

Vivek D. Kulkarni, Sunnyvale, and Egil D. Castel, Cupertino, both of Calif., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Apr. 1, 1987, Ser. No. 33,961
Int. Cl.⁴ B44C *1/22;* C23F *1/00*
U.S. Cl. 156—643 **21 Claims**





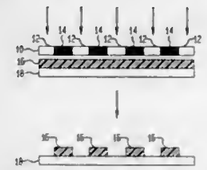
1. A method for forming vertical metal interconnect over a substrsate having an uneven surface, said method comprising:
forming a first metallization layer generally conforming to the surface of the substrate;
forming an etch stop barrier layer over at least selected regions of the first metallization layer, wherein said selected regions are at differing elevations as a result of the uneven substrate surface;
forming a second metallization layer generally conforming to the etch stop barrier layer and the first metallization layer;
patterning the combined first and second metallization layers and etch stop barrier layer to define vertical metal interconnects over regions having different elevations and forming said vertical metal interconnects; and
selectively etching those vertical metal interconnects having higher elevations and having a thickness approximately equal to the variation in elevation on the uneven substrate surface, back to the etch stop barrier layer overlying the first metallization layer.

4,824,522
FABRICATION OF POLYDIACETYLENE WAVEGUIDES

Gregory L. Baker, Bridgewater Township, Somerset County, N.J., and Cynthia F. Klausner, Amherst, Mass., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 1, 1988, Ser. No. 176,647
Int. Cl.⁴ B44C *1/22;* B29C *37/00;* C03C *15/00, 25/06*
U.S. Cl. 156—643 **31 Claims**

1. A process for the manufacture of optical waveguides comprising
applying a first layer of an optical material made from a soluble polydiacetylene to a substrate,
applying a second layer atop said first layer,
producing a pattern in said second layer, and transferring said pattern to said first layer by exposing said second layer to a reactive ion etching environment,



said second layer being made from a material which is resistant to said reactive ion etching environment.

4,824,523
METHOD OF MAKING PAPER WITH HIGH FILLER CONTENT

Lars E. R. Wagberg, Kungsängen, and Tom S. C. Lindström, Sollentuna, both of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

Continuation of Ser. No. 763,439, filed as PCT SE84/00406 as Nov. 28, 1984, published as WO85/02635 on Jun. 20, 1985, abandoned. This application Jun. 1, 1987, Ser. No. 57,720
Claims priority, application Sweden, Dec. 6, 1983, 8306739
Int. Cl.⁴ D21H *3/28, 3/36*
U.S. Cl. 162—164.1 **9 Claims**

1. A method for manufacturing paper comprising the step of adding a dry-strength retention agent system to paper stock prior to forming the paper, said system comprising:
(i) from about 1% to about 7% by weight of a cationic starch having a degree of substitution between about 0.01 to about 0.035;
(ii) from about 0.003 to about 0.5% by weight of an anionic polymer having a mean molecular weight greater than 10^6; comprising a copolymer of acrylamide with acrylic acid or 2-acrylamide 2-alkylpropane sulfonic acid; and
(iii) from about 0.005 to about 0.5% by weight of a non-starch cationic synthetic polymer;
selected from the group consisting of:
(i) a cationic acrylic polymer;
(ii) a cationic polyacrylamide;
(iii) a polydiallyldialkyl-ammonium polymer;
(iv) a cationic condensation amido-amine polymer;
(v) a condensation product formed between dicyandiamide, formaldehyde, and an ammonium salt;
(vi) a reaction product formed between epichlorohydrin or polyepichlorohydrin and ammonia, a primary amine or a secondary amine;
(vii) a polymer formed by reacting a di-tertiary amine or secondary amine and dihalo-alkanes;
(viii) a polyethylamine formed by polymerization of ethylimine; and
(ix) a polymer formed by polymerization of a N-(dialkylaminoalkyl)-acrylamide monomer;
wherein said paper stock comprises at least 15% by weight of a mineral filler.

4,824,524
MULTI-PLY HEADBOX FOR A PAPERMAKING MACHINE

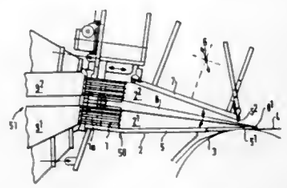
Otto Hildebrand, Ravensburg-Taldorf, Fed. Rep. of Germany, assignor to Sulzer Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jan. 28, 1988, Ser. No. 149,658
Claims priority, application Switzerland, Feb. 2, 1987, 00 358/87
Int. Cl.⁴ D21F *1/02, 1/06*
U.S. Cl. 162—343 **8 Claims**

1. A headbox for a papermaking machine, comprising:
means defining an internal compartment within the headbox;

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guide block means arranged in said headbox and flow communicating with said internal compartment;
said guide block means containing guide channels through which there can flow at least one fiber stock suspension in a predeterminate direction of flow;
said means defining said internal compartment comprising two lip members;
at least one adjustable rigid partition wall arranged in said internal compartment for dividing said internal compartment into at least two nozzle chambers;
said at least one rigid partition wall coacting with said two lip members to define at least two outlet slices for the fiber stock suspension;
means for pivotably mounting the at least one rigid partition wall at the guide block so as to have a pivot axis extending transverse with respect to the predeterminate direction of flow of the fiber stock suspension;



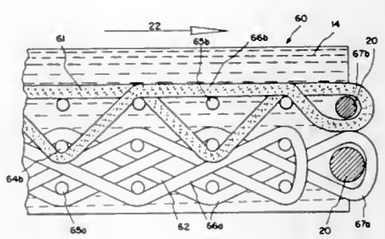
said pivotable mounting means comprising substantially cylindrical shell bearing structure for mounting said at least one rigid partition wall for pivotable movement about said pivot axis extending transverse to the direction of flow of the fiber stock suspension;
said at least one rigid partition wall being provided with a projection extending from said pivot axis;
said projection extending rearwardly from said pivot axis as viewed in said predeterminate direction of flow of the fiber stock suspension and connected for conjoint movement with the pivotably mounted at least one rigid partition wall;
adjustment means for selectively adjusting the position of said at least one rigid partition wall; and
said adjustment means operatively engaging said projection of said at least one rigid partition wall for accomplishing a selective pivoting of the at least one rigid partition wall about the pivot axis extending transverse to the predeterminate direction of flow of the fiber stock suspension.

4,824,525

PAPERMAKING APPARATUS HAVING A SEAMED WET PRESS FELT

Patrick H. Penven, Clinton, S.C., assignor to Asten Group, Inc., Charleston, S.C.

Filed Oct. 14, 1987, Ser. No. 108,491
Int. Cl.[4] D21F *3/00*
U.S. Cl. 162—358 **4 Claims**



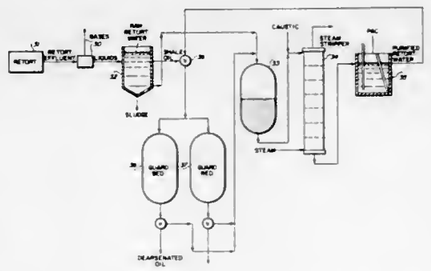
1. In combination, an apparatus for dewatering a paper web in the wet press section of a papermaking machine which includes a plurality of rollers through which the web is dewatered, and an improved web supporting pintle seamed press felt in said wet press section, said wet press felt rendered endless by intermeshing seaming loops, extending from the respective ends of a base fabric of said felt, and inserting a pintle in the resulting channel formed by the loops and further comprised of said base fabric being a multi-ply fabric which was flat woven in a selected repeat pattern with crimped warp yarns woven at least 60 to 100 yarns per inch, said crimped warp yarns oriented lengthwise in the loom and further oriented in the felt running direction of said wet press section, each of said seaming loops, at the respective ends of said felt, being a portion of a selected one of said crimped warp yarns of said base fabric which extends beyond the respective end of said woven base fabric and is retained in said base fabric by said selected repeat pattern, said seaming loops extending in the lengthwise or felt running direction when said loops are intermeshed at the seam, and at least one layer of batt material affixed to said base fabric.

4,824,526

SYSTEM FOR CONTINUOUSLY AND CATALYTICALLY REMOVING ARSENIC FROM SHALE OIL AND REGENERATING THE CATALYST

Shri K. Goyal, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 822,144, Jan. 24, 1986, abandoned, which is a division of Ser. No. 761,198, Jul. 31, 1985, Pat. No. 4,719,006. This application Feb. 3, 1988, Ser. No. 151,868
Int. Cl.[4] B01J *8/02, 23/90*
U.S. Cl. 202—82 **1 Claim**



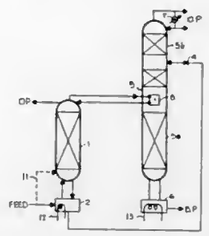
1. A system for producing and upgrading shale oil, comprising:
(a) an oil shale retort for liberating a gaseous effluent stream containing hydrocarbons, residual amounts of arsenic and retort water vapor;
(b) means connected to the retort for receiving the effluent stream, and recovering a liquid containing shale oil, arsenic and retort water;
(c) separator means connected to the liquid recovery means for receiving the liquid and separating the shale oil arsenic from the retort water;
(d) retort water purification means connected to the separator means for receiving and substantially purifying the retort water;
(e) a first guard bed containing an arsenic-removing absorber;
(f) a second guard bed containing an arsenic-removing absorber;
(g) a first means interconnecting the separator means with each of the guard beds and having a first valve means for alternately directing a flow of the shale oil and arsenic through each of the guard beds;
(h) a second means interconnecting the retort water purification means with each of the guard beds and having a second value means for alternately directing a flow of the purified retort water through each of the guard beds in opposite phase relationship to the flow of shade oil and arsenic though each of the guard beds.

4,824,527

NESTED ENRICHMENT CASCADE DISTILLATION OF UNEQUAL MIXTURES

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Jun. 10, 1986, Ser. No. 872,558
Int. Cl.[4] B01D *3/14*
U.S. Cl. 203—25 **8 Claims**



5. A process for fractionally distilling a fluid mixture consisting essentially of a major amount of heavy product and a minor amount of light product comprising:
(a) feeding at least part of the fluid mixture to a pre-fractionator comprised of at least a stripping section;
(b) fractionating said pre-fractionator feed to a first heavy product stream as the bottom product and overhead fluid enriched in the minor product;
(c) increasing the pressure of the overhead fluid product and feeding said pressurized fluid to a distillation column comprised of stripping and rectifying sections; and
(d) reboiling the pre-fractionator by exchanging latent heat between an intermediate height vapor of said distillation column and a bottom liquid of said pre-fractionator.

6. Process according to claim 5 wherein said fluid mixture is liquid phase and further comprising condensing said enriched overhead fluid before increasing the pressure.

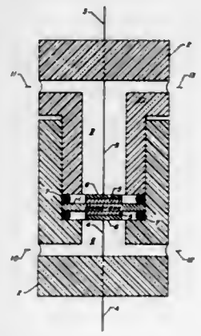
4,824,528

GAS DETECTION APPARATUS AND METHOD WITH NOVEL ELECTROLYTE MEMBRANE

Anthony J. Polak, Lake Zurich, and Sandra Petty-Weeks, Naperville, both of Ill., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation of Ser. No. 756,614, Jul. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 687,348, Dec. 28, 1984, abandoned. This application Jul. 6, 1987, Ser. No. 70,650
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—1 T **20 Claims**

1. Apparatus for detection, in a gas sample, of a gaseous component which is capable, in the presence of a catalytic agent, of dissociating to yield hydrogen ions or of combining with hydrogen ions comprising:
(a) a thin film polymer blend macroscopically homogeneous membrane possessing a high protonic conductivity and which is formed by evaporating the solvent from a solution of a phosphoric acid and an organic polymer, wherein said phosphoric acid is present in the blend in an amount in the range of about 10% to about 70% by weight of the blend and is selected from a group consisting of hypophosphoric acid, metaphosphoric acid, orthophosphoric acid, pyrophosphoric acid, and polyphosphoric acid, and wherein said organic polymer is present in the blend in an amount in the range of about 90% to about 30% by weight of the blend and is selected from a group consisting of poly(vinyl alcohol), poly(vinyl fluoride), polyethylenimine, poly(ethylene glycol), cellulose acetate, poly(ethoxyoxazoline), poly(vinyl sulfonic acid), poly(vinyl pyridine), poly(vinyl pyrrolidone), polyimide, poly(acrylamide), poly(acrylic acid), poly(N-isopropyl acrylamide), poly(N,N-dimethyl acrylamide), and copolymers having as repeat units the monomer units used in the polymers of said group;
(b) a membrane housing comprising a sample gas chamber and a reference substance chamber separated by a partition comprising said membrane, said membrane having a first surface in common with the sample gas chamber and a second surface in common with the reference substance chamber;
(c) two separate portions of catalytic agent effective to promote dissociation and combination, a first portion in contact with said first surface and a second portion in contact with said second surface of said membrane;
(d) means for forming electrical connection in operative contact with said catalytic agent at said first surface and with said catalytic agent as said second surface; and
(e) means for measuring EMF between said means for forming electrical connection, the existence of said EMF being indicative of the presence of said gaseous component in said gas sample and the magnitude of said EMF being proportional to the concentration of said gaseous component in said gas sample.



13. A method for detection, in a gas sample, of a gaseous component which is capable, in the presence of a catalytic agent, of dissociating to yield hydrogen ions or of combining with hydrogen ions, such method comprising:
(a) contacting said gas sample with a first surface of a thin film polymer blend macroscopically homogeneous membrane possessing high protonic conductivity, which membrane isolates said gas sample from a reference substance, and which is formed by evaporating the solvent from a solution of a phosphoric acid and an organic polymer, wherein said phosphoric acid is present in the blend in an amount in the range of about 10% to about 70% by weight of the blend and is selected from a group consisting of hypophosphoric acid, metaphosphoric acid, orthophosphoric acid, pyrophosphoric acid, and polyphosphoric acid, and wherein said organic polymer is present in the blend in an amount in the range of about 90% to about 30% by weight of the blend and is selected from a group consisting of poly(vinyl alcohol), poly(vinyl fluoride), polyethylenimine, poly(ethylene glycol), cellulose acetate, poly(ethyloxazoline), poly(vinyl sulfonic acid), poly(vinyl pyridine), poly(vinyl pyrrolidone), polyimide, poly(acrylamide), poly(acrylic acid), poly(N-isopropyl acrylamide), poly(N,N-dimethyl acrylamide), and copolymers having as repeat units the monomer units used in the polymers of said group;

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(b) exposing a second surface of said membrane to a reference substance; and

(c) detecting EMF between means for forming electrical connection with two separate portions of a catalytic agent effective to promote dissociation and combination, where a first portion of catalytic agent is in contact with said first surface and a second portion of catalytic agent is in contact with said second surface of said membrane, the existence of said EMF being indicative of the presence of said gaseous component in said gas sample and the magnitude of said EMF being proportional to the concentration of said gaseous component in said gas sample.

4,824,529

LIPID MEMBRANE-BASED DEVICE

Michael Thompson; Ulrich J. Krull, both of Mississauga, and Krishna M. Kallury, Scarborough, all of Canada, assignors to Allied-Signal Inc.

Filed Nov. 27, 1987, Ser. No. 125,849

Int. Cl.[4] G01N *27/30, 27/40*

U.S. Cl. 204—1 T **26 Claims**

1. A protected, lipid membrane-based device useful as a chemoreceptive transducer for determining the concentration of a specified chemical species, said device comprising:

a porous, ion-permeable, hydratable, membrane-protective layer, the pores of which permit passage therethrough of said specified chemical species but block passage of a larger material from which an underlying lipid membrane is desirably shielded, and

attached to said membrane-protective layer, an underlying, lipid membrane which controls ion permeability, said lipid membrane being modified by the incorporation of a complexing agent for selectively interacting with said specified chemical species to increase membrane ion permeability.

11. A process for determining the concentration of a selected chemical species in an aqueous electrolytic solution, said process comprising:

(a) forming an electrochemical cell from said aqueous electrolytic solution and the device of claim **1**;

(b) applying an electrical potential difference across the modified lipid membrane of said device whereby said chemical species interacts with the membrane-incorporated complexing agent to produce an analytical signal based upon an increase in membrane ion permeability;

(c) measuring said analytical signal; and

(d) determining said chemical species concentration from the measured analytical signal.

14. A lipid membrane-based, gas sensor comprising a gas-permeable, hydrated, upper layer permeable to an inorganic ion-forming gas, and attached to an underlying lipid membrane, said lipid membrane including a complexing agent for selectively interacting with a specified inorganic ion formed by dissolution of said inorganic ion-forming gas in the hydrated, upper layer, to increase permeability of said lipid membrane to said specified inorganic ion.

24. A process for determining the concentration of a specified inorganic ion formed by dissolution of an inorganic ion-forming gas in an aqueous electrolytic solution, said process comprising

(a) applying an electrical potential difference across the lipid membrane of the gas sensor of claim **14**, whereby said inorganic ion interacts with the lipid membrane-incorporated, complexing agent to increase the permeability of said lipid membrane to said inorganic ion, thereby producing an analytical signal based upon the increased membrane ion permeability;

(b) measuring said analytical signal; and

(c) determining said inorganic ion concentration from the measured analytical signal.

4,824,530

METHOD OF PRODUCING HEAT-TRANSFER MATERIAL

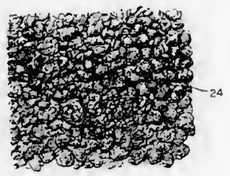
Yasuo Masuda, Urawa; Tsutomu Takahashi, Ohmiya; Yoshio Takizawa, Hasuda, and Naokazu Yoshiki, Kitamoto, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 934,652, Nov. 25, 1986, Pat. No. 4,780,373. This application Jul. 21, 1988, Ser. No. 222,142

Claims priority, application Japan, Nov. 27, 1985, 60-266812; Mar. 5, 1986, 61-47763; Mar. 6, 1986, 61-48794

Int. Cl.[4] C25D *5/34, 7/04*

U.S. Cl. 204—26 **6 Claims**



1. A method of producing a heat-transfer material comprising the steps of:

(a) preparing a body made of metal serving as a cathode and forming a hydrophobic film on a surface of said body;

(b) subsequently keeping said surface of said body and an anode in contact with a plating solution, said anode being soluble to said plating solution on electroplating; and

(c) subsequently applying a direct electrical potential between said anode and said cathode to cause a plating current to flow through said plating solution to produce slime from said anode and to lay deposits of plating metal on said surface of said body and moving said slime to said surface of said body to lay deposits of said slime on said surface of said body, so that said deposits of plating metal and said deposits of said slime jointly form on said surface of said body a porous layer which has minuscule projections of electrodeposits densely formed on one surface of said layer directed away from said body.

4,824,531

ELECTROLYSIS METHOD AND PACKED CATHODE BED FOR ELECTROWINNING METALS FROM FUSED SALTS

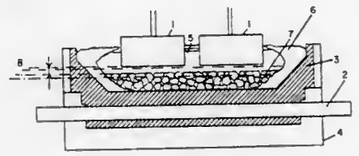
Jean-Jacques R. Duruz, and Jean-Pierre Derivaz, both of Geneva, Switzerland, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 316,331, Sep. 3, 1981, abandoned. This application Apr. 16, 1984, Ser. No. 601,810

Claims priority, application United Kingdom, Jan. 28, 1980, 80102728

Int. Cl.[4] C25C *3/06*

U.S. Cl. 204—67 **25 Claims**



1. In an electrolytic cell for electrowinning molten aluminum from a fused cryolite-alumina bath, the cell including at least one anode arranged in said bath above a cathode associated with a base of the cell, the improvement comprising: a packed cathode bed composed of conductive refractory packing elements of higher density than molten aluminum and resistant to attack by molten aluminum, which are loosely stacked upon one another from the base of the cell, whereby during operation of the cell, molten aluminum is produced on said packing elements and fills the empty space within the packed cathode bed, so as to substantially restrict movement of the molten aluminum.

4,824,532

PROCESS FOR THE ELECTROCHEMICAL SYNTHESIS OF CARBOXYLIC ACIDS

Marie-Odile Moingeon, Villabe; Jacques Chaussard, Paris; Michel Troupel, Maincy, and Christophe Saboureau, Brie Comte Robert, all of France, assignors to Societe Nationale Industrielle et Aerospatiale des Poudres et, Paris, France

Filed Jan. 7, 1988, Ser. No. 141,492

Claims priority, application France, Jan. 9, 1987, 87 00134

Int. Cl.[4] C25B *3/00*

U.S. Cl. 204—72 **17 Claims**

1. Process for the electrosynthesis of carboxylic acids of the general formul R—COOH, in which R is an organic radical, comprising: electrochemically reducing, in the presence of carbon dioxide, an organic compound of the general formula R—Y, in which R is said organic radical and Y is a hetero atom-containing radical, said hetero atom being directly linked to a carbon atom of said radical R by a single covalent linkage and being selected from the group consisting of oxygen, nitrogen, sulphur, and phosphorus, wherein said process is performed in an organic medium in an electrolysis cell that includes an anode made of a metal chosen from the group consisting of reducing metals and alloys thereof, and wherein if said hetero atom is nitrogen, said radical Y is an ammonium radical, and if said hetero atom is phosphorus, said radical Y is a phosphonium radical.

4,824,533

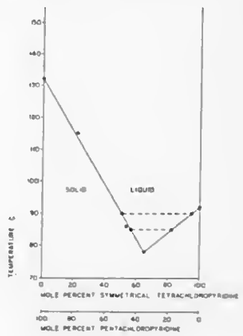
PROCESS FOR PREPARING TETRAHALOPYRIDINE

George E. Ham; Robert D. Spradling, and John M. McIntyre, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 22, 1986, Ser. No. 899,267

Int. Cl.[4] C07D *213/61*

U.S. Cl. 204—73 R **25 Claims**



1. A process for making a symmetrical tetrahalopyridine from a pentahalopyridine in an electrolytic cell having an anode and a cathode, in the presence of an electrolyte, comprising the steps of:

forming an organic solvent free emulsion of the pentahalopyridine and the tetrahalopyridine; and

applying an electric current across the electrolytic cell to electrolyze the emulsion.

4,824,534

PROCESS FOR ELECTRICALLY SEPARATING THE ELECTROLYTE-BEARING MAINS FROM THE ELECTROLYTE SPACES OF AN ELECTROCHEMICAL CELL PILE

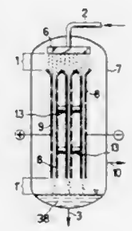
Karl-Heinz Tetzlaff, Kelkheim; Dieter Schmid, Schwalbach, and Jürgen Russow, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 776,898, Sep. 17, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 11,936

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434328

Int. Cl.[4] C25B *1/00*

U.S. Cl. 204—128 **5 Claims**



1. A process for electrically separating individual electrolyte spaces of a bipolar electrochemical cell pile from common electrolyte spaces and individual electrolyte spaces from each other, the process comprising the steps of directly delivering an electrolyte in the shape of droplets from a common delivery main to each individual electrolyte space without individual mains, subsequently draining off the electrolyte from the individual electrolyte spaces by forming electrolyte droplets, and delivering the droplets directly into a common exhaust main without individual mains.

4,824,535

PROCESS FOR THE ELECTROCHEMICAL GRAINING OF ALUMINUM FOR USE IN PRINTING PLATE SUPPORTS

Engelbert Pliefke, Wiesbaden, and Dieter Mohr, Schlangenbad, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 13, 1987, Ser. No. 106,588

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 3635304

Int. Cl.[4] C25F *3/02*

U.S. Cl. 204—129.75 **18 Claims**

1. A process for the production of aluminum or aluminum alloy substrates for use in the manufacture of printing plates, comprising the steps of:

mechanically graining the substrate and then,

electrochemically graining in a nitrate containing electrolyte having a concentration of nitrate compound ranging from about 1.0 g/l the saturation limit by means of a direct current of from about 1 to 300 A/dm^2 at a quantity of charge of from about 1 to 400 C/dm^2.

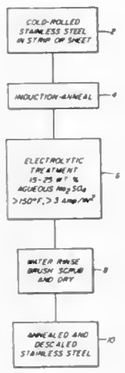
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4,824,536

METHOD FOR PROCESSING COLD-ROLLED STAINLESS-STEEL SHEET AND STRIP

Yeong-U Kim, Export, and Donald R. Zaremski, Cheswick, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Jun. 15, 1988, Ser. No. 207,083
Int. Cl.[4] C25F *1/06*
U.S. Cl. 294—145 R **11 Claims**



1. A method of processing cold-rolled stainless steel in a form of a strip or a sheet, said method comprising:

subjecting said steel to transverse-flux electrical-induction heating substantially uniformly across its width to an annealing temperature in the range of up to 2300 degrees Fahrenheit, thereby producing on said steel an oxide-scale thickness of 2000 Angstroms or less,

electrolytically descaling said steel by subjecting it to the action of a bath consisting of essentially water plus 15 to 25 weight percent sodium sulfate maintained at a temperature in excess of 150 degrees Fahrenheit and with the use of current density over 3.0 amperes per square inch for a time sufficient to descale the steel substantially entirely, and

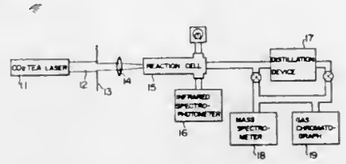
then further processing said steel by brush-scrubbing, water-rinsing, and drying without the use of an acid-pickling treatment to produce an annealed and descaled stainless-steel product.

4,824,537

WORKING SUBSTANCES USED IN LASER ISOTOPE SEPARATION AND METHOD OF LASER ISOTOPE SEPARATION

Shigeyoshi Arai, Tokyo; Masatsugu Kamioka, Urawa; Yo-ichi Ishikawa, Wako; Shobei Isomura; Kyoko Sugita, both of Tokyo; Takao Oshima, Niigata, and Tatsuhiko Hongun, Yokohama, all of Japan, assignors to Rikagaku Kenkyusho, Wako and Shin-Etsu Chemical Co., Ltd., Tokyo, both of, Japan

Filed Jan. 30, 1986, Ser. No. 824,222
Claims priority, application Japan, Feb. 6, 1985, 60-21577; Aug. 21, 1985, 60-183680
Int. Cl.[4] B01D *59/34*
U.S. Cl. 204—157.22 **2 Claims**



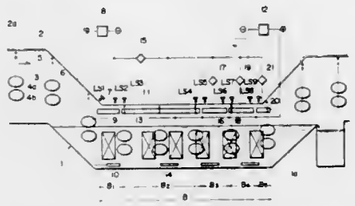
1. A method for separating silicon isotopes, which comprises a step of irradiating Si_2F_6 with infrared laser rays.

4,824,538

METHOD FOR ELECTRODEPOSITION COATING

Ikukazu Hibino, and Yoshinobu Takahashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 8, 1987, Ser. No. 130,278
Claims priority, application Japan, Dec. 10, 1986, 61-292502
Int. Cl.[4] C25D *13/06, 17/16*
U.S. Cl. 204—180.2 **6 Claims**



1. A method of coating each of a plurality of different types of workpieces spaced from each other in the direction of conveyance, with a different coating thickness while being continuously conveyed through an electrodepositon bath having a submersion area of sufficient dimension to completely submerge at least two of said spaced plurality of workpieces at one time, each of said spaced plurality of workpieces having a conveyor carried electrode, and a plurality of successive current stages including selectable current stages disposed in the direction of conveyance and operative to be electrically coupled to the current carrying electrodes of the submerged workpieces, said method comprising the steps of:

detecting the type of spaced workpieces being conveyed for selecting a required thickness of electrodeposition coating on each of said plurality of workpieces;

selecting different ones of said plurality of selectable current stages for each different detected type of spaced workpieces;

conveying the spaced workpieces through the electrodeposition bath at a substantially uniform rate;

providing a fixed voltage for the selectable current stages; and

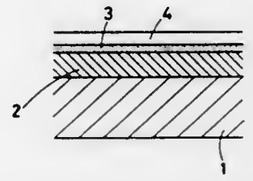
electrically coupling said fixed voltage to said selected ones of said plurality of selectable current stages for controlling the length of time said fixed voltage is applied to each respective workpiece in the electrodeposition bath.

4,824,539

PERPENDICULAR MAGNETIC RECORDING MEDIUM

Tomohisa Komoda; Mamoru Ishizuka; Shuhei Tsuchimoto, all of Nara, and Mitsuhiko Yoshikawa, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 685,838, Dec. 24, 1984, Pat. No. 4,725,482. This application Dec. 30, 1987, Ser. No. 139,823
Claims priority, application Japan, Dec. 27, 1983, 58-249983
Int. Cl.[4] G11B *5/64*
U.S. Cl. 204—192.2 **7 Claims**



1. A method for the formation of a perpendicular magnetic recording medium having improved recording and reproducing characteristics and durability comprising:

forming a Co-Cr perpendicular magnetization film on a substrate;

forming a chromium oxide film on said Co-Cr perpendicular magnetization film by heat-treating the surface of the Co-Cr perpendicular magnetization film;

forming a protective layer film selected from SiO_2, SiO or Si_3N_4 having a minimal thickness formed on said chromium oxide film to protect said Co-Cr perpendicular magnetization film from being damaged and to ensure stable operation and impart an increase in physical strength to the perpendicular magnetic recording medium;

wherein the minimal thickness of the protective layer film is greater than 50 Å, but the total thickness of the chromium oxide film and the protective layer film is between 70 Å and 300 Å.

4,824,540

METHOD AND APPARATUS FOR MAGNETRON SPUTTERING

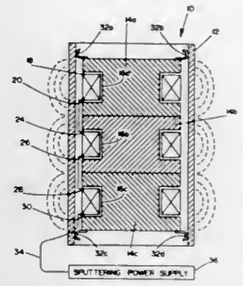
Robley V. Stuart, 536 63rd Ave. NE., Minneapolis, Minn. 55432

Filed Apr. 21, 1988, Ser. No. 184,579
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.12 **9 Claims**

2. Method of magnetron sputtering comprising the steps of:

a. generating a plasma in a magnetron type structure about a sputtering target;

b. coupling ion current from the plasma to the sputtering target; and,



c. powering electromagnets of the magnetron with the ion currents.

4,824,541

FLUID BED ELECTROLYSIS CELL

Richard E. Malpas; Gerardus J. C. M. Janssen; Anthonie Houders, and Johannes B. J. Spijkerman, all of At Arnhem, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Sep. 4, 1987, Ser. No. 94,248
Claims priority, application United Kingdom, Sep. 25, 1986, 8623069; Mar. 9, 1987, 8705471
Int. Cl.[4] C25D *17/00; C25C 7/00, 7/02*
U.S. Cl. 204—222 **12 Claims**

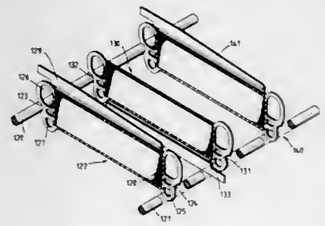
1. A fluidized bed electrolysis cell, comprising: one or more particulate electrodes provided with one or more current feeders carrying on their surface artificially created protective film of valve metal oxide formed by anodizing process; and one or more diaphragms for separating the anode compartments from the cathode compartments in the cell.

4,824,542

FILTER PRESS STRUCTURE OR CELL AND METHOD OF ASSEMBLING SAME

Paul E. A. Burgess, Crowton, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Oct. 27, 1987, Ser. No. 112,891
Claims priority, application United Kingdom, Oct. 30, 1986, 8626010
Int. Cl.[4] C25B *9/00; B01D 25/00*
U.S. Cl. 204—253 **26 Claims**



2. A method of assembling the component parts of a filter press type of electrolytic cell onto a support structure which comprises a pair of support rods, at least some of the component parts having a pair of jaws adapted to be positioned onto the support rods, and in the method the cell being assembled by positioning the jaws of the component parts onto the support

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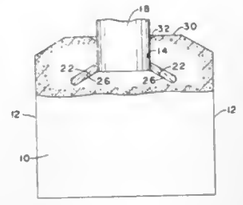
rods, in which one of the jaws of a pair thereof associated with a component part is so shaped that it may be positioned onto a support rod only when the component part is at an angle to the plane between the support rods, the method comprising positioning the said jaw of the said component part onto one of the support rods and thereafter rotating the component part about the said support rod and positioning the other jaw of the said component part onto the other support rod, and in the method the component parts of the filter press structure being positioned onto the support structure in an alternating sequence by positioning a jaw of a first component part onto a first support rod and then positioning the other jaw of the first component part into the second support rod, and thereafter positioning a jaw of an adjacent component part onto a second support rod and then positioning the other jaw of the second component part onto the first support rod.

4,824,543

ELECTRODE DESIGN FOR INCREASED CURRENT DISTRIBUTION

Richard W. Peterson; Donald C. Fisher, both of Lower Burrell, and John W. Luffy, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 2, 1987, Ser. No. 127,706
Int. Cl.⁴ C25C *3/16, 7/00, 3/12*
U.S. Cl. 204—280 **18 Claims**



1. An improved electrode for an electrolytic reduction cell comprising a nonmetallic electrode having a top surface, a central bore in the top surface to receive a central metal current source, and a plurality of side bores extending from the sidewall of said central bore substantially adjacent the bottom of said central bore toward the sides of the electrode at an angle, with respect to the horizontal, of from 0° to not greater than 45° to receive metallic portions therein to provide lateral current distribution from said central current source.

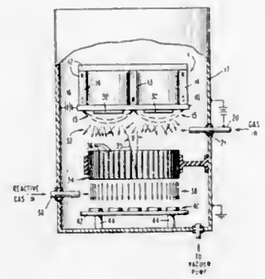
4,824,544

LARGE AREA CATHODE LIFT-OFF SPUTTER DEPOSITION DEVICE

Donald J. Mikalesen, Carmel, and Stephen M. Rossnagel, White Plains, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1987, Ser. No. 114,896
Int. Cl.⁴ C23C *14/34*
U.S. Cl. 204—298 **6 Claims**

1. In an etching/deposition system operable at low pressures for producing lift-off quality coatings comprising a hollow cathode electron source in combination with a magnetron sputter deposition plasma device within a containment chamber, said hollow cathode being disposed to inject electrons into the magnetic field of the magnetron plasma device adjacent to the magnetron cathode surface to which a deposition source is affixed, said system further including means for initiating and maintaining a discharge plasma within the hollow cathode and for initiating and maintaining the magnetron plasma, the improvement which compirses a workpiece to be coated located in said chamber, spaced from said magnetron cathode surface, a particle collimation filter assembly interposed between the magnetron cathode surface and said workpiece, but outside of said plasma region, which prevents any deposition particles from reaching said workpiece which are not travelling in a direction substantially normal thereto, and wherein said particle collimation filter assembly is composed of a plurality of closely packed elongated tubes, the axis of all of said tubes



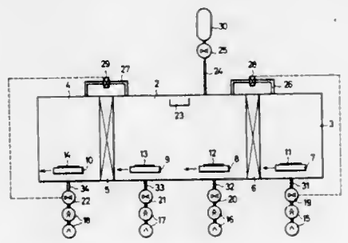
being disposed normal to both the magnetron cathode surface and the workpiece to be coated, each individual tube having a length-to-diameter ratio such that any particle attempting to travel through said tube is unable to do so if it is travelling in a direction more than ten degrees from the axis of said tube without striking said filter assembly.

4,824,545

APPARATUS FOR COATING SUBSTRATES

Manfred Arnold, Aschaffenburg, and Peter Wirz, Waldernbach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,362
Claims priority, applicatioo Fed. Rep. of Germany, Sep. 18, 1987, 3731444
Int. Cl.⁴ C23C *14/56*
U.S. Cl. 204—298 **3 Claims**



1. Apparatus for coating substrates in a vacuum chamber having a cathode system or an evaporating system which is preceded and followed by evacuable isolating chambers, the individual chambers being separable from one another by locks, with a conduit leading into the coating chamber for feeding one or more process gases, and with transport frames for holding the substrates to be coated, which frames are movable through the individual chambers while held and guided on rails and/or wheels, characterized by one or more bypass conduits (**26, 27**) which connect the coating chamber (**2**) to the chamber (**3** or **4**) that precedes or follows it, a shutoff means or valve being inserted into each bypass conduit, by which a pressure equalization between the chambers (**2, 3** or **2, 4**, respectively) can be controlled, whereby the constancy of the ratio of admixture of inert gas and reactive gas, which is essential to the stability of a reactive process going on in the process chamber (**2**), is automatically assured even when the locks (**5** or

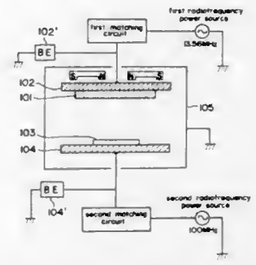
6) are opened for the advancement of the transport frames (**7** to **10**) laden with the substrates (**11–14**) to be coated, so that the coating properties are held constant during dynamic coating operation.

4,824,546

SEMICONDUCTOR MANUFACTURING APPARATUS

Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Sendai-shi, Miyagi-ken 980, Japan

Filed Aug. 14, 1987, Ser. No. 85,157
Claims priority, application Japan, Aug. 20, 1986, 61-194151
Int. Cl.⁴ C23C *14/34*
U.S. Cl. 204—298 **12 Claims**



1. A semiconductor manufacturing apparatus for depositing an insulating thin film on the surface of a semiconductor substrate in a vacuum vessel at an atmosphere of reduced pressure, comprising:
- a target composed of a material for said insulating thin film or of at least one of constituent elements of said material for the insulating thin film;
- wherein the semiconductor substrate is adapted to be disposed spaced apart from the target in a confronting relation therewith for permitting the insulating film of the target to be deposited thereon;
- a first radiofrequency power source for generating first radiofrequency power of a first frequency for application to the target;
- a succeptor electrode adapted to support the semiconductor substrate thereon;
- a second radiofrequency power source for generating second radiofrequency power of a second frequency for application to the succeptor electrode; and
- said first frequency being selected to be lower than said second frequency.

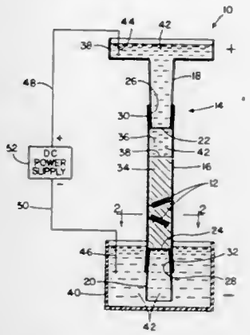
4,824,547

ELECTROPHORETIC EXTRACTION OF PROTEINS FROM TWO-DIMENSIONAL ELECTROPHORESIS GEL SPOTS

Jian-Shi Zhang, Shanghai, China; Carol S. Giometti, Glenview, and Sandra L. Tollaksen, Montgomery, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 4, 1987, Ser. No. 92,924
Int. Cl.⁴ G01N *27/28*
U.S. Cl. 204—299 R **19 Claims**

1. Apparatus for extracting proteins and related materials from gel spot cores, the apparatus comprising
- an extraction tube having a chamber therein for receiving the gel spot cores in a portion of the chamber,
- the extraction tube and the chamber having first and second opposite ends,
- means including a first porous membrane for closing the first end of the chamber in the extraction tube,
- means including a second porous membrane for closing the second end of the chamber in the extraction tube,
- an immobilizing gel for surrounding and immobilizing the gel spot cores in said portion of the chamber,
- the immobilizing gel extending in the tube from the second membrane to a location spaced from the first membrane,
- the chamber having a space therein between the immobilizing gel and the first membrane,
- means affording a first buffer solution contacting the outside of the first membrane,
- means affording a second buffer solution contacting the outside of the second membrane,



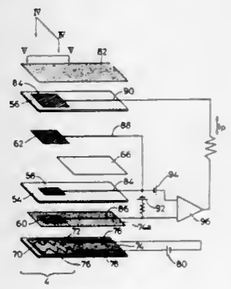
- a third buffer solution filling the space between the first membrane and the immobilizing gel,
- and means including first and second electrodes contacting the first and second buffer solutions for causing the flow of an electrical current along the chamber in the extraction tube and between the first and second buffer solutions,
- whereby proteins or related materials present in the gel spot cores are extracted therefrom and are caused to collect in the third buffer solution between the first membrane and the immobilizing gel.

4,824,548

ELECTROCHEMICAL GAS SENSOR

Atsushi Iino, Nagoya, and Nobuhide Kato, Aichi, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Mar. 16, 1987, Ser. No. 26,433
Claims priority, application Japan, Mar. 17, 1986, 61-58875
Int. Cl.⁴ G01N *27/58*
U.S. Cl. 204—406 **26 Claims**



1. An electrochemical device for detecting a measurement fluid, comprising:
- a planar solid electrolyte body;

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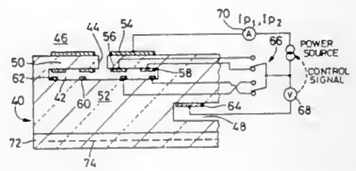
a first electrode formed on said planar solid electrolyte body, and substantially exposed to said measurement fluid;
a second electrode formed on said planar solid electrolyte body, and substantially isolated from said measurement fluid;
a porous layer disposed in direct contact with said second electrode;
a heat-generating element embedded within said porous layer; and
reference-gas supply means for supplying said porous layer with a reference gas, comprising an electrochemical reference-gas supply cell including an inner electrode disposed in direct contact with said porous layer, and an outer electrode, said reference-gas supply means further comprising means for applying an electric current between said inner and outer electrodes to pump said reference gas into said porous layer,
said planar solid electrolyte body, said first and second electrodes, said heat-generating element and said electrochemical cell being superimposed on each other in parallel relation with each other, such that said heat-generating element and said inner electrode are spaced apart from each other in a direction parallel to a plane of said planar solid electrolyte body, said outer electrode of said electrochemical cell having a larger surface area than said inner electrode, and partially overlapping said heat-generating element as viewed in a plane parallel to said direction.

4,824,549

EXHAUST GAS SENSOR FOR DETERMINING A/F RATIO

Yasuhiko Hamada, and Tsunenori Yoshimura, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Dec. 23, 1987, Ser. No. 137,349
Claims priority, application Japan, Dec. 27, 1986, 61-311196; Mar. 2, 1987, 62-46998
Int. Cl.⁴ G01N *27/58*
U.S. Cl. 204—410 **21 Claims**



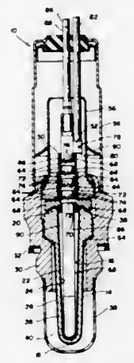
1. An oxygen sensor for detecting a measurement gas existing in an external space, which has a sensing element comprising:
means for defining a gas-diffusion space which communicates with said external space, said gas-diffusion space having a predetermined resistance to diffusion of the measurement gas therethrough, said gas-diffusion space including a first portion to which the measurement gas diffuses along a first diffusion path, and a second portion to which the measurement gas diffuses through said first portion along a second diffusion path which has a larger length than said first diffusion path;
first oxygen sensing means for producing a first output representative of an oxygen concentration of an atmosphere in said first portion of said gas-diffusion space;
first oxygen pumping means responsive to said first output from said first oxygen sensing means, for effecting an oxygen pumping action for controlling the oxygen concentration of said atmosphere in said first portion of said gas-diffusion space;
second oxygen sensing means for producing a second output representative of an oxygen concentration of an atmosphere in said second portion of said gas-diffusion space; and
second oxygen pumping means responsive to said second output from said second oxygen sensing means, for effecting an oxygen pumping action for controlling the oxygen concentration of said atmosphere in said second portion of said gas-diffusion space.

4,824,550

HEATED SOLID ELECTROLYTE OXYGEN SENSOR AND SECURING ELEMENT THEREFOR

Eric L. Ker, Grand Blanc, and Joseph R. Griffin, Fenton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 19, 1987, Ser. No. 110,353
Int. Cl.⁴ G01N *27/58*
U.S. Cl. 204—427 **9 Claims**



1. An oxygen sensing device, comprising:
a substantially tubular solid electrolyte body having an elongated bore axially located, with a first end closed by said solid electrolyte and a second end open, said solid electrolyte body having a reference electrode provided on an inner surface thereof and a measuring electrode provided on an outer surface thereof;
a housing, said housing supports said solid electrolyte body so that said measuring electrode of said solid electrolyte body contacts the external gas to be measured and so that said reference electrode of said solid electrolyte body is gas tight to the external gas to be measured;
an elongated heater element comprising a heating resistor having a positive coefficient of resistance, said elongated heater element being inserted within said elongated bore of said solid electrolyte body;
a gripping body having a spine, at least one outwardly biased semicylindrical ring positioned on said spine from a first end to a second end of said spine, and a terminal post having a stop surface, said semicylindrical ring having a plurality of outwardly flared tangs, further said semicylindrical ring yieldably encircles said heater element to provide a friction fit therebetween, said terminal post located at said first end of said spine and extending outward from said semicylindrical ring; and
a stop body having a seat for said terminal post of said gripping body, so that said stop surface of said terminal post abuts against said first end of said stop body and so that said plurality of outwardly flared tangs contact an inner diameter of said stop body when said gripper body encircling said heater element is inserted within said stop body, said stop body provided within said housing body.

9. A device for rigidly securing and centering a heater element within a heated oxygen sensor which is self aligning, comprising:

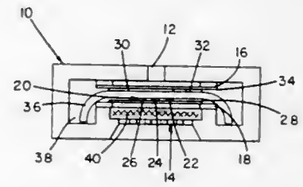
a spine;
at least one outwardly biased semicylindrical ring positioned on said spine from a first end to a second end of said spine for yieldably encircling a heater element and securing with a friction fit therebetween, said semicylindrical ring having a plurality of outwardly flared tangs; and
a terminal post having a stop surface, said terminal post located at said first end of said spine and extending outward from said semicylindrical rings.

4,824,551

CELL FOR MEASURING GAS LEVELS

Martin W. Rupich, Framingham, Mass., assignor to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 743,402, Jun. 11, 1985, abandoned. This application Jul. 16, 1987, Ser. No. 75,243
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—431 **4 Claims**



1. An electrochemical cell for measuring the amount of a predetermined gas in a gaseous mixture, said cell comprising a working electrode, a counter electrode, an electrolyte, means for applying across said electrodes a potential that varies over a range that includes values at which oxygen is subject to reduction, means that measure, while said potential is varying over said range, current flow between said electrodes as a measure of said predetermined gas in said gaseous mixture and means for inhibiting the reduction of oxygen at said working electrode, said means for inhibiting comprising a dissociable compound dissolved in said electrolyte that provides an anion adsorbable on said working electrode sufficiently strongly to prevent its own displacement by oxygen but not so strongly as to prevent its own displacement by said predetermined gas, wherein said anion is of the general formula $B_zX_z^{2-}$ where B is boron, X is a halogen, and z is equal to 10 or 12.

4,824,552

HIGH-OCTANE-RATING GASOLINES

Takao Nagasawa, Kawasaki; Kingo Ikeda, Yokohama, and Hirotsugu Nomura, Chigasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed May 19, 1988, Ser. No. 196,005
Claims priority, application Japan, May 20, 1987, 62-123129; Jun. 19, 1987, 62-153026
Int. Cl.⁴ C10L *1/04*
U.S. Cl. 208—17 **5 Claims**

1. A gasoline free from lead and of high octane number which comprises base gasolines so blended as to meet the distillation and composition characteristics of equations (I) to (VI)

$$60 \leqq T_{70} - T_{30} \leqq 85\ (^{\circ}C.) \quad (I)$$

$$0.15 \leqq \frac{T_{90} - T_{70}}{T_{70} - T_{30}} < 0.50 \quad (II)$$

$$VO(\text{WHOLE}) \leqq 25\ (\text{vol. \%}) \quad (III)$$

$$VA(\text{WHOLE}) \leqq 50\ (\text{vol. \%}) \quad (IV)$$

-continued

$$VO(\leqq T_{30}) \geqq 40\ (\text{vol. \%}) \quad (V)$$

$$VA(\geqq T_{70}) \geqq 85\ (\text{vol. \%}) \quad (VI)$$

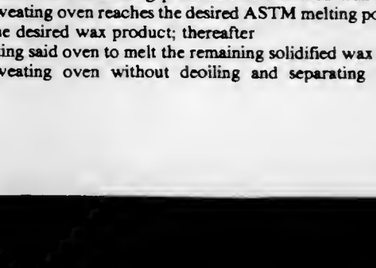
where T_{30} is a 30% distillation temperature, T_{70} is a 70% distillation temperature, T_{90} is a 90% distillation temperature, VO(WHOLE) is an olefins content in the total gasoline, VA(WHOLE) is an aromatics content in the total gasoline, $VO(\leqq T_{30})$ is an olefins content in the total volume of a fraction boiling at or below T_{30}, and $VA(>T_{70})$ is an aromatics content in the total volume of a fraction boiling at or above T_{70}.

4,824,553

WAX SWEATING PROCESS

Roger M. Rueff, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Jan. 4, 1988, Ser. No. 140,472
Int. Cl.⁴ C10G *43/04*
U.S. Cl. 208—32 **8 Claims**



1. A wax sweating process, comprising the steps of:
solidifying molten slack wax containing oil to crystallize said wax;
sweating and substantially deoiling said wax to produce sweated wax by gradually and progressively heating said wax in a sweating oven to at least its melting point; while simultaneously
withdrawing liquid drippings comprising some of said wax and oil from said sweating oven;
graphing the wax sweating efficiency of said sweating oven on a nomograph with an abscissa comprising the congealing point of said liquid drippings and an ordinate comprising the ASTM melting point of said wax in said sweating oven;
monitoring the congealing point of said liquid drippings as said solidified wax in said sweating oven is being heated by placing some of said liquid drippings on a thermometer, rotating said thermometer until said liquid drippings begin to congeal, and observing the congealing temperature of said liquid drippings on said thermometer;
determining the ASTM melting point of the remaining solidified wax in said sweating oven by intersecting the monitored congealing temperature of said liquid drippings observed on said thermometer on said nomograph of said wax sweating efficiency of said sweating oven, drawing a horizontal line from said intersection to said ordinate of said nomograph, and observing said ASTM melting point on said ordinate;
ceasing sweating and deoiling of the solidified wax in the sweating oven and withdrawal of said liquid drippings by closing the valves in said sweating oven when said determined ASTM melting point of said solidified wax in the sweating oven reaches the desired ASTM melting point of the desired wax product; thereafter
heating said oven to melt the remaining solidified wax in the sweating oven without deoiling and separating liquid

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drippings from said wax to liquify and produce said desired wax product;
discharging and draining said melted wax product from said sweating oven by opening said valves of said sweating oven; and
collecting said melted wax product in a container selected from the group consisting of a pan, vessel, tank, bin, receptacle, pipe, drum, and kettle.

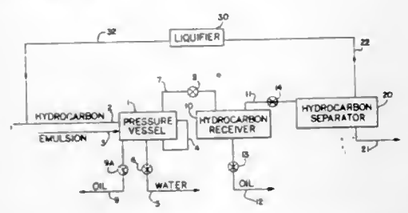
4,824,554
PROCESSES FOR THE USE OF COBALT-ALUMINUM-PHOSPHORUS-SILICON-OXIDE MOLECULAR SIEVE COMPOSITIONS
Brent M. Lok, New City; Bonita K. Marcus, Rye, and Edith M. Flanigen, White Plains, all of N.Y., assignors to UOP, Des Plains, Ill.
Division of Ser. No. 600,174, Apr. 13, 1984, Pat. No. 4,744,970.
This application Jan. 28, 1988, Ser. No. 149,590
Int. Cl.[4] C10G *47/02*; C07C *2/68, 4/12*
U.S. Cl. 208—46 **15 Claims**

1. Process for converting a hydrocarbon which comprises contacting said hydrocarbon under hydrocarbon converting conditions with a molecular sieve, said molecular sieve being a crystalline molecular sieve having three-dimensional microporous framework structures of CoO_2, AlO_2, PO_2 and SiO_2 tetrahedral units having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR:(Co_wAl_xP_ySi_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(Co_xAl_xP_ySi_z)O_2$ and has a value between zero (0) and about 0.3; and "w", "x", "y" and "z" represent the mole fractions of cobalt, aluminum, phosphorus and silicon, respectively, present at tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D, and E of FIG. 1 and each has a value of at least 0.01.

4,824,555
EXTRACTION OF OIL FROM STABLE OIL-WATER EMULSIONS
Stephen C. Paspek, North Royalton, and Christopher P. Eppig, Cleveland Hts., both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Filed Jul. 9, 1987, Ser. No. 71,433
Int. Cl.[4] C10G *33/00*
U.S. Cl. 208—187 **19 Claims**



1. A process of extracting oil from oil-water emulsions containing suspended solid particulates comprising the steps of:
(A) introducing said emulsion into a vessel,
(B) pressurizing the vessel by adding a volatile hydrocarbon whereby said volatile hydrocarbon in the vessel is in the liquefied state and forms a two-phase system with said emulsion,
(C) maintaining said pressure for a period of time sufficient to effect the displacement of at least some of the oil in the emulsion phase with said volatile hydrocarbon, the displaced oil being dissolved in the volatile hydrocarbon phase,
(D) withdrawing at least a portion of said oil-containing volatile hydrocarbon phase while maintaining the pressure on the two-phase system,
(E) reducing the pressure on the two-phase system whereby volatile hydrocarbon dissolved in the emulsion is vaporized, and the emulsion separates into a water phase and an oil phase, and
(F) recovering the oil phase from the water phase.

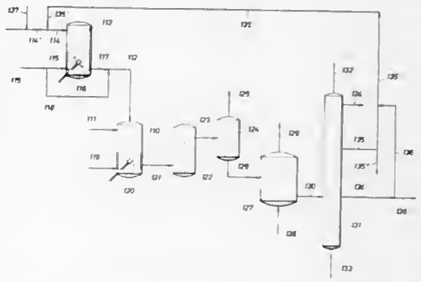
4,824,556
HYDROGENATION PROCESS OF UNSATURATED HYDROCARBONS EMPLOYING IMPREGNATED ALUMINA CONTAINING MATERIAL
Karlheinz K. Brandes, Bartlesville, Okla.; Simon G. Kukes, Naperville, Ill., and Thomas Davis, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 52,097, May 20, 1987, Pat. No. 4,778,588.
This application Jun. 29, 1988, Ser. No. 212,838
Int. Cl.[4] C10G *45/00*
U.S. Cl. 208—143 **16 Claims**

1. A hydrogenation process comprising the step of contacting a feed stream which comprises at least one unsaturated hydrocarbon compound with a free hydrogen containing gas and a catalyst composition, under such hydrogenating conditions as to obtain a product stream comprising at least one hydrocarbon product compound containing more hydrogen than said at least one unsaturated hydrocarbon compound from which said hydrocarbon product compound is formed;
wherein said catalyst composition has been prepared by a process comprising the steps of
(A) impregnating a support material comprising alumina with a solution comprising water and at least one dissolved thiosulfate compound;
(B) heating the material obtained in step (A) under such conditions as to at least partially dry said material obtained in step (A);
(C) impregnating the at least partially dried material obtained in step (B) with a solution comprising a liquid solvent and at least one dissolved compound of at least one metal selected from the group consisting of transition metals belonging to Group VB, Group VIB, Group VIIB, Group VIII and Group IB of the Periodic Table of Elements;
(D) heating the material obtained in step (C) at a first temperature so as to at least partially dry said material obtained in step (C); and
(E) heating the at least partially dried material obtained in step (D) at a second temperature, which is higher than said first temperature, so as to activate said at least partially dried material obtained in step (D).

4,824,557
PROCESS FOR MIXING CRACKING CATALYST WITH A FLUID HYDROCARBON
Robert R. Cartmell, Crown Point, Ind., and Carl J. Horecky, Elmhurst, Ill., assignors to Amoco Corporation, Chicago, Ill.
Division of Ser. No. 934,746, Nov. 25, 1986, Pat. No. 4,711,766, which is a division of Ser. No. 629,070, Jul. 9, 1984, Pat. No. 4,624,836. This application Aug. 28, 1987, Ser. No. 90,533
Int. Cl.[4] C10G *35/10*
U.S. Cl. 208—146 **4 Claims**

1. A process for immediately and intimately mixing a fluidizable cracking catalyst with a fluid hydrocarbon in a riser reactor situated within a chamber containing said cracking catalyst comprising the steps of:
(a) passing a fluid hydrocarbon feedstock through a stationary fluid feedstock feed means in fixed relationship with a means defining an access opening at the upstream end of said riser reactor;
(b) retracting a plug valve having: (1) a generally upright tubular valve stem positioned concentrically and externally around a portion of said stationary fluid feedstock feed means from said access opening and moving said plug valve in reciprocating fashion to permit and control the flow of cracking catalyst from said chamber to said access opening to said riser reactor, said catalyst being aspirated into said riser by the flow of said hydrocarbon feedstock to said riser;
(c) atomizing said fluid hydrocarbon feedstock through a nozzle means secured to the downstream end of said feed means prior to passing said feedstock to said riser reactor and mixing with said cracking catalyst.

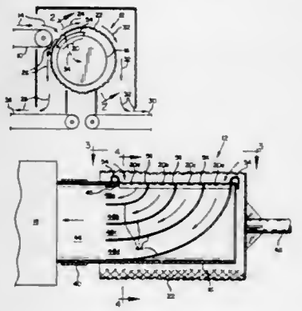
4,824,558
COAL LIQUEFACTION PROCESS WITH METAL/IODINE COCATALYST
Peter S. Maa, Baton Rouge, La.; Lonnie W. Vernon, Baytown, Tex.; William E. Winter, and Gopal H. Singhal, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Sep. 4, 1987, Ser. No. 93,376
Int. Cl.[4] C10G *45/00, 45/04*
U.S. Cl. 208—420 **34 Claims**



1. An improved process for hydroconverting carbonaceous materials comprising:
(a) contacting a carbonaceous material with hydrogen at an elevated temperature and pressure in the presence of a catalyst comprising tin and in the presence of iodine, which iodine may be present as hydrogen iodide;
(b) continuing the contacting of step (a) for a sufficient period of time to convert at least a portion of said carbonaceous material to a liquid product; and
(c) recovering a liquid product from the effluent of step (a).

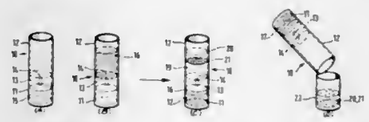
4,824,559
ROTARY AIR SEPARATOR
Larry J. Gilmore, 17555 S.E., Braden, Oreg. 97027, and John W. Makin, 12405 S.E. 27th St., Milwaukie, Oreg. 97222
Filed May 27, 1987, Ser. No. 54,442
Int. Cl.[4] B07B *13/00*
U.S. Cl. 209—23 **5 Claims**

1. A rotary air separator for separating a mixture of materials comprising; a configured manifold having an end opening and side opening, a vacuum air source connected to the end opening with the air flow through said end opening being substantially consistent throughout the included cross sectional area of said end opening, said vacuum air source drawing air from the side opening and through the manifold to the end opening, a cylindrical screen surrounding the manifold and being rotatably mounted for rotating the screen around a horizontal axis and across the side opening whereby air flow is directed radially through the screen, passes through an area of transition in the manifold to be directed through the end opening axially of the screen, and means for depositing the mixture of materials onto the screen as it crosses the side opening, and the improvement that comprises;
a plurality of vanes arranged in the manifold and cooperating with the manifold configuration to define a plurality of separated air directing throats throughout the area of transition, said plurality of vanes extended from the side opening where the ends of the vanes are aligned axially and thereby crossway to the air flow, to the end opening where the ends of the vanes are aligned radially and



thereby crossway to the air flow, said vanes dividing the side opening into a plurality of area portions, and said throats and area portions cooperatively formed to generate similar air flow within the individual area portions and thereby a substantially consistent air flow across the side opening.

4,824,560
SEPARATION OF MATERIALS FROM A LIQUID DISPERSION BY SEDIMENTATION
Benjamin Alspector, Jerusalem, Israel, assignor to Assaf Pharmaceutical Industries Ltd., Israel
Filed Apr. 4, 1986, Ser. No. 848,133
Claims priority, application Israel, Apr. 18, 1985, 74967
Int. Cl.[4] B01D *43/00*
U.S. Cl. 209—208 **21 Claims**



1. A method of classification by centrifugation of particulate material in liquid dispersion with at least two fractions, characterized by:
(i) providing a tubular vessel comprising at least two aligned coaxial compartments with each two neighbouring compartments communicating via at least one opening, said tubular vessel having a first extreme compartment with a sealed bottom and a second extreme compartment with an open end;
(ii) charging a working liquid into said tubular vessel via said second extreme compartment thereof so as to fill completely said first extreme compartment, said working liquid having a density intermediate the densities of said at least two particulate material fractions to be classified;
(iii) charging said particulate material in liquid dispersion into said vessel via said second extreme compartment;
(iv) subjecting the so-charged vessel to centrifugation, thereby to cause a heaviest fraction of said particulate material to migrate axially into said first extreme compartment; and
(v) decanting a liquid fraction with particulate material dispersed therein from said second extreme compartment.

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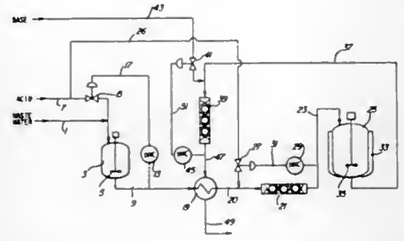
WASTEWATER TREATMENT

Mao-Yao Huang, Riverview, and Joseph F. Louvar, Lincoln Park, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 942,999, Dec. 18, 1986, Pat. No. 4,746,443. This application Jan. 26, 1988, Ser. No. 129,452

Int. Cl.[4] C02F *1/66*

U.S. Cl. 210—96.1 **1 Claim**



1. An apparatus for treating alkaline wastewater containing 3-isopropyl-2,1,3-benzothiadiazin-4-one-2,2,-dioxide (bentazon) consisting essentially of:

a container for mixing the bentazon containing wastewater with acid;

a first conduit for conducting a mixture from said container to an in-line mixer;

means for adding an acid to said container and to said first conduit;

a first pH controlling means for controlling acid flow to said container to attin a pH value in said first conduit of about 0.2 to less than 7;

a second conduit for conducting said mixture from said in-line mixer to a reactor;

a second pH controlling means for controlling acid flow to said first conduit to maintain a pH value in said second conduit of about 0.2 to less than 7;

a reactor including heating means to decompose said bentazon and reduce the bentazon content of said wastewater;

a third conduit for discharging effluent from said reactor;

means for adding a base to said effluent in said third conduit;

a second in-line mixer for receiving said effluent from said third conduit;

a fourth conduit for discharging effluent form said second in-line mixer;

a third pH controlling means for controlling the amount of base added to said effluent in said third conduit to attain a substantially neutral pH value in said forth conduit;

and heat exchange means provided in said first conduit, arranged to exchange heat from the effluent in said fourth conduit to the bentazon containing wastewater and acid mixture in said first conduit.

4,824,562

IN WELL SEPARATOR FOR HEAVIER LIQUID

Glenn S. Carson, Mechanicsburg, Pa., assignor to R. E. Wright Associates, Inc., Middletown, Pa.

Filed Mar. 12, 1987, Ser. No. 25,068

Int. Cl.[4] E21B *43/38*

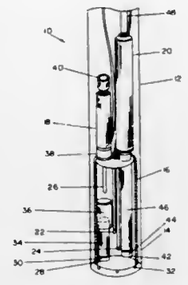
U.S. Cl. 210—104 **3 Claims**

1. An apparatus for removing a heavier liquid from a well containing water and a heavier liquid, comprising:

a sealed container located within a well at a location where a heavier liquid than water has accumulated, the sealed container including an inlet which feeds into the container through a unidirectional flow means, with the inlet located so that it is in contact with the heavier liquid in the well;

a heavier liquid pump interconnected with the sealed container, with its inlet interconnected with the lower region in the sealed container and its outlet interconnected with ground surface above the well;

a water pump interconnected with the sealed container with its inlet located above the inlet of the heavier liquid pump in the sealed container and with an outlet located within the well so as to discharge the pumped water into the well; and



liquid sensing probe means located within the sealed container, interconnected with and controlling the pumps so that the heavier liquid pump stops operating when an interface between the heavier liquid and water approaches its inlet and the water pump stops operating when an interface between the heavier liquid and water approaches its inlet.

4,824,563

EQUIPMENT FOR TREATING WASTE WATER

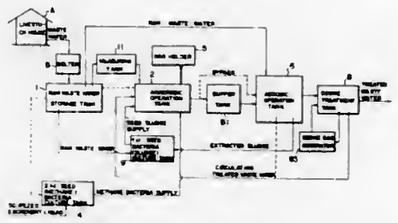
Keisuke Iwahori, and Masao Fujiu, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 28, 1986, Ser. No. 889,754

Claims priority, application Japan, Dec. 4, 1985, 60-272987; Dec. 4, 1985, 60-272988; Dec. 4, 1985, 60-272989; Dec. 4, 1985, 60-272990; Dec. 4, 1985, 60-272991

Int. Cl.[4] C02F *3/30*

U.S. Cl. 210—195.1 **14 Claims**



1. An equipment for treating waste water comprising:

(a) a source of waste water including organic substances;

(b) an anaerobic tank having a flow path having an inlet connected to the waste water source for having a supply of the waste water from the waste water source, the flow path having an outlet;

(c) means for supplying anaerobic bacteria into the flow path at a first position for anaerobically treating the waste water;

(d) at least one biological contact zone provided in the flow path at a second position downstream of the first position;

(e) a bacteria culture tank for culturing methane bacteria;

(f) means for supplying the cultured methane bacteria from the bacteria culture tank to the at least one biological contact zone to further anaerobically treat the waste water passing the at least one biological contact zone;

(g) an aerobic tank connected to the outlet of the flow path of the anaerobic tank for having a supply of the waste water from the anaerobic tank, the aerobic tank containing activated sludge including aerobic bacteria for aerobically treating the waste water discharged from the anaerobic tank; and

(h) means for discharging the treated waste water from the aerobic tank.

4,824,564

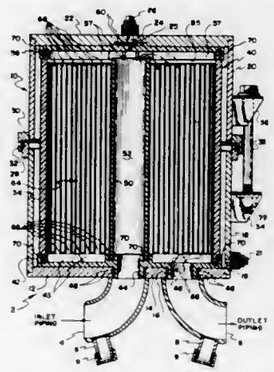
DRY SUMP LIQUID FILTER

Evan A. Edwards, Pittsford; James T. Greene, and Richard Mayo, both of Baldwinsville, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 926,612, Nov. 4, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 238,963

Int. Cl.[4] B01D *27/04, 27/08, 35/30*

U.S. Cl. 210—232 **2 Claims**



1. A liquid filter apparatus for connection to inlet and outlet piping, including a housing connected to said piping and an integral filter unit removably inserted into said housing, such housing permitting replacement of said integral filter unit without spillage of liquid;

said housing including:

a. a base plate having fixed inlet and outlet apertures communicating, respectively, with said inlet and outlet piping;

b. a side wall extending from the peripheral region of said base plate;

c. a cover plate mounted atop said side wall, said cover plate having a vent aperture therein and removably mounted relative to said base plate;

said integral filter unit including:

d. a bottom end cap having inlet and outlet apertures and adapted for sealing engagement with the respective inlet and outlet apertures of said base plate;

e. a cylindrical core tube surrounding the inlet aperture of said bottom end cap and in sealing engagement with said bottom end cap and extending upwardly therefrom, said core tube effecting a continuation of said inlet piping;

f. a concentric cylindrical outer tube extending upwardly from the periphery of said bottom end cap and in sealing engagement with, respectively, said inlet and outlet apertures in said plate;

g. a top end cap mounted atop said outer tube, and in sealing engagement with said outer tube, said top end cap having a vent aperture in registry with the vent aperture in said cover plate;

h. a filter element disposed between said core tube and said outer tube;

i. said bottom and top end caps each including axially extending ribs to create, respectively, bottom and top radial flow channels below and above said filter element; and

j. said filter element including a porous filter material defining a plurality of axial flow channels: some of said axial flow channels being open at their tops and open at their bottoms to discharge liquid into said bottom radial flow channel, whereby filter action is by way of radial flow from those axial flow channels with open tops to those axial flow channels with open bottoms; whereby said integral filter unit defines the complete liquid flow path through said apparatus from said inlet to said outlet apertures.

4,824,565

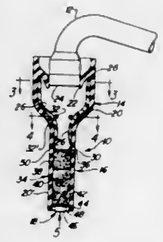
PERSONAL, PORTABLE, DISPOSABLE TAP WATER FILTER

Glen H. Middleton, 2641 Meldrum Rd., Windsor, Ontario, Canada

Filed Feb. 1, 1988, Ser. No. 150,978

Int. Cl.[4] B01D *27/02*

U.S. Cl. 210—266 **14 Claims**



1. A portable water filter for a water faucet comprising:

an upper portion made of a resilient material, said upper portion having a first end and a second end;

annular lip means sealingly connected with said upper portion near said first end thereof, said annular lip means being structured to removably and sealingly engage said water faucet;

a plurality of ribs attached to said upper portion, each rib of said plurality of ribs having a first end and a second end, each said rib of said plurality of ribs being mutally spaced apart, said first end of each of said ribs being located substantially adjacent said annular lip means, said second end of each said ribs being substantially located adjacent said second end of said upper portion;

fulcrum means adjacent said plurality of ribs, said fulcrum means being positioned at a location spaced from said first end and said second end of each of said ribs;

a lower portion having a first end and a second end, said lower portion being sealingly connected at said first end thereof with said second end of said upper portion; and

filtration means located within said lower portion.

4,824,566

ASSEMBLY COMPRISING A FORAMINOUS CORE, RESINOUS TUBESHEET AND SELF-LOCKING, HELICALLY WOUND, HOLLOW FIBER BUNDLE

Patricia A. Thibos, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 24, 1985, Ser. No. 747,629

Int. Cl.[4] B01D *13/01*

U.S. Cl. 210—321.87 **7 Claims**

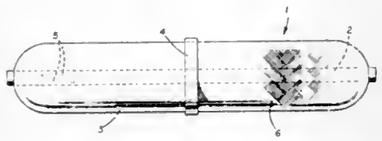
1. An assembly adapted to function in a permeator and comprising a core, a fiber bundle and one or more wall members,

said core being a rigid generally cylindrical, elongated con-

duct having two end sections and an intervening foraminous section;

said bundle comprising permeable, hollow fiber lengths disposed, as separate lengths or as bands thereof, around said core in the general form of a cylinder closed at each end by a dome through which one of said end sections of said core protrudes;

each of said wall members (a) being a generally toroidal, resin body through which said core and said fiber lengths pass in sealing engagement therewith and (b) being located inwardly along the central axis of said core from the



ends of the cylindrical portion of said bundle, the parts of that bundle extending beyond the outermost of said wall members being unpotted;

said fiber lengths being wound around said core as a series of criss-crossed helices of successively greater diameter and in such manner that said unpotted parts of said bundle are stable and self-anchored to the core;

at least one of said one or more wall members being adapted to function as a tubesheet in said permeator; and

each end of each said fiber lengths or bands being disposed within one of said wall members which is so adapted.

4,824,567

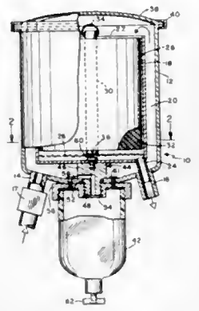
FUEL OIL FILTER ASSEMBLY

William C. Turman, San Juan Capistrano, Calif., assignor to Filter Systems, Inc., Laguna Hills, Calif.

Filed Feb. 8, 1988, Ser. No. 152,972

Int. Cl.[4] B01D *27/04*

U.S. Cl. 210—416.4 **8 Claims**



1. An oil filter assembly, comprising:

an outer housing having upper and lower ends, an inlet for connection to a supply line from a fuel tank and an outlet for connection to the supply line to an engine;

an inner, filter housing mounted in the outer housing having an open upper end, an outlet at its lower end connected to the outer housing outlet, and an imperforate cylindrical wall extending between the upper and lower ends for directing oil to flow upwardly between the inner and outer housings and downwardly through the open upper end of the inner housing towards the outlet;

a removable filter cartridge removably mounted in the inner housing for filtering particles from the oil; and

a water collecting device connected to the lower end of the outer housing.

4,824,568

COMPOSITE ULTRAFILTRATION MEMBRANES

Anthony E. Allegrezza, Jr., Milford, and Edmund T. Burke, Winchester, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed May 16, 1986, Ser. No. 864,074

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—490 **17 Claims**



13. A composite integral membrane comprising a preformed microporous membrane having an average pore diameter of below about 0.65 micrometers and having an assymetric skinned membrane formed therein and an intermediate membrane zone having a pore structure finer than that of said microporous membrane, said integral membrane having a bubble point significantly higher than that of said preformed microporous membrane.

4,824,569

HOLLOW FIBER FOR DIALYSIS AND METHOD FOR MANUFACTURE THEREOF

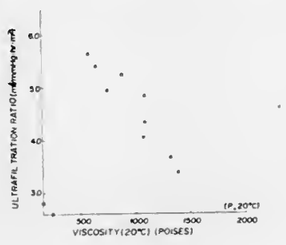
Kazuhiko Suzuki, Fujinomiya, and Kazuaki Takahara, Tokyo, both of Japan, assignors to Terumo Kabushiki Kaisha Trading as Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 769,886, Aug. 27, 1985, abandoned. This application May 26, 1987, Ser. No. 53,536

Claims priority, application Japan, Aug. 27, 1984, 59-178030

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—500.23 **11 Claims**



1. A method for the manufacture of unstretched hollow fibers of cuprammonium cellulose for dialysis possessing a film structure having a porosity of 15 to 25%, a pore diameter of 25 to 40 Å, and an ultrafiltration ratio of 3.0 to 5.5 ml/mmHg.hr.m^2., which method is characterized by the steps of directly discharging a cuprammonium cellulose spinning dope possessing a cellulose concentration of 6.0 to 8.7% and a viscosity of 600 to 1200 poises (at 20° C.) through annular spinning orifices into a non-coagulating solution in a bath filled with a coagulating solution in the upper layer and said non-coagulating solution in the lower layer and, at the same time, allowing said non-coagulating solution to enter and fill up the interiors of the discharged tubes of the spinning dope, then passing said tubes of the spinning dope through said coagulating solution thereby allowing said tubes to coagulate, allowing the resultant wet hollow fibers to be shaken down onto a conveyor device without being stretched, subjecting said hollow fibers to coagulation, regeneration, and washing with water while in motion as carried on said conveyor device, then subjecting the regenerated hollow fibers to plasticization, and further shrinking and drying the resultant hollow fibers.

10. Unstretched hollow fibers suitable for dialysis prepared by the process of claim 1.

4,824,570

APPARATUS FOR THE EXTRACTION OF CONSTITUENTS BY A SUPERCRITICAL FLUID OR PRESSURIZED LIQUID

Louis Bethuel; Maurice Carles, and Roger Neige, all of Pierrelatte, France, assignors to Commissariat a l'Energie Atomique, Paris, France

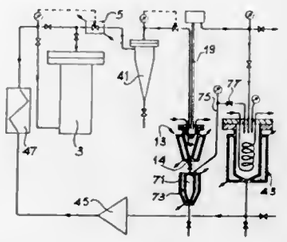
PCT No. PCT/FR86/00295, § 371 Date Apr. 2, 1987, § 102(e) Date Apr. 2, 1987, PCT Pub. No. WO87/01299, PCT Pub. Date Mar. 12, 1987

PCT Filed Sep. 2, 1986, Ser. No. 46,915

Claims priority, application France, Sep. 6, 1985, 85 13246

Int. Cl.[4] B01D *11/04*

U.S. Cl. 210—511 **7 Claims**



1. Apparatus for the extraction of at least one of the constituents present in a substance by means of an extraction fluid constituted by a supercritical fluid or a pressurized liquid, comprising an extractor (3) within which can be placed said substance, means (9) for circulating the extraction fluid in said extractor under pressure p and temperature T conditions adequate for dissolving the constituent or constituents of the substance in said fluid and a discharge pipe (7) for the extraction fluid leaving the extractor equipped with a relief valve (5) wherein said pipe (7) is connected to the lower part of a gas separator-liquefier (13) provided with cooling means (15, 17) linked by its upper part with a vertical column (19) surmounted by a condenser (21), said gas separator-liquefier (13) being provided in its lower part with means (14) for withdrawing a liquefied phase present in said separator-liquefier and in that a gas-liquid separator (41) is interposed on the gas circuit between the relief valve (5) and the gas separator-liquefier (13).

4,824,571

METHOD OF AND EQUIPMENT FOR ANAEROBIC DEGRADATION OF ORGANIC PRODUCTS

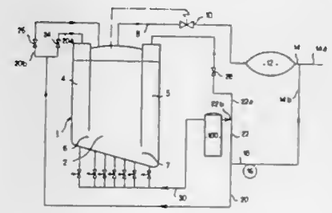
Gilbert Ducellier, deceased, late of Montpellier, France (by Lucienne Ducellier, legal representative, Michele Fabres nee Ducellier, Monique Goudet nee Ducellier, Colette Segonzac nee Ducellier, Renee Ducellier nee Richert, Veronique Ducellier, heirs), and Andre Pavia, 408 Rue Valery Larbaud, 34100 Montpellier, France, assignors to Union Industrielle et D'Entreprise; Valorga; Andre Pavia; Lucienne Ducellier; Michele Fabres nee Ducellier; Monique Goudet nee Ducellier; Colette Segonzac nee Ducellier; Renee Ducellier nee Richert and Veronique Ducellier, all of, France

PCT No. PCT/FR85/00042, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/05200, PCT Pub. Date Sep. 12, 1986

PCT Filed Mar. 5, 1985, Ser. No. 929,195

Int. Cl.[4] C02F *3/28*; C12P *5/02*

U.S. Cl. 210—603 **26 Claims**



1. Method for carrying out a methanogenesis of organic products, by-products and waste of human, animal and vegetable origin, resulting in the production of degraded products and biogas and comprising feeding a mass of products to be degraded into a closed fermentation vessel comprising an inlet and an outlet, imposing upon said products a direction of circulation within said vessel from said inlet to said outlet, recovering produced biogas evolved above said mass of products and discharging the degraded products with a reintroduction of the biogas into the mass of products present within the vessel from the bottom of the vessel in order to produce a fluidization effect of said products, comprising the steps of

subdividing said vessel into a plurality of different product density sectors juxtaposed in the direction of circulation, and

injecting the biogas intermittently into each one of said sectors under a predetermined injection pressure and for a predetermined period of time,

said pressure and period of time being selectively adjustable in each sector in accordance with the density of the products therein.

4,824,572

METHOD AND APPARATUS FOR TREATING HOUSEHOLD WASTE WATER

Richard E. Scott, P.O. Box 18, Rockaway Beach, Mo. 65740

Filed Apr. 1, 1988, Ser. No. 176,690

Int. Cl.[4] C02F *3/32, 9/00*

U.S. Cl. 210—602 **20 Claims**

1. A gravity flow treatment facility for household waste water, comprising:

a treatment bed having a water impervious floor sloping downwardly from a high end to a low end and water impervious walls extending around the floor;

a layer of small gravel particles on the floor;

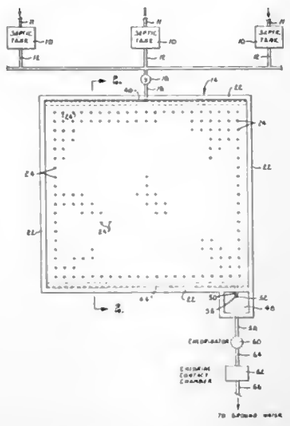
a layer of large gravel particles on said layer of small gravel particles, said large gravel particles being larger than said small gravel particles;

a strip of limestone in said layer of large gravel particles

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extending transversely across substantially the entirety of the treatment bed;
a layer of straw or hay on said layer of large gravel particles;
a layer of topsoil on said layer of straw or hay;
a plurality of reed plants planted in said topsoil and having roots capable of penetrating the layer of straw or hay and the layers of large and small gravel particles;
a perforated header pipe for receiving incoming waste water, said header pipe extending transversely across the bed at the high end thereof to distribute the waste water across the width of the bed; and
a perforated collection pipe extending transversely across said bed at the low end thereof for receiving waste water that has passed through the bed, said collection pipe having an outlet for discharging the treated waste water.

19. A method of treating sewage emanating at a plurality of residential dwellings, said method comprising the steps of:



treating the sewage in individual septic tanks, one of which is located at each dwelling;
directing the effluent from the septic tanks into a single treatment bed which serves all of the septic tanks and which is sloped to effect gravity flow of liquid through the bed from a high end to a low end;
planting reeds in the treatment bed having roots effective to remove pollutants from the liquid;
providing in the treatment bed a strip of limestone effective to neutralize acids in the liquids passing therethrough;
collecting treated liquid in a sump located adjacent the low end of the treatment bed;
directing the liquid through a chlorinator effective to chlorinate same;
passing the liquid through a chlorine contact chamber located downstream from the chlorinator; and
discharging the water from the chlorine contact chamber to the ground water.

4,824,573

CROSSLINKED COMPOSITE MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Zenjiro Honda; Hajime Komada, and Hiroki Karakane, all of Himeji, Japan, assignors to General Director of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 23, 1987, Ser. No. 6,151
Claims priority, application Japan, Jan. 23, 1986, 61-11088; Jan. 23, 1986, 61-11089
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—640 **20 Claims**

1. A method for separating water from an aqueous solution of an organic substance which comprises subjecting the solution to pervaporation with a crosslinked composite membrane comprising a skin layer which comprises a crosslinked reaction product of a water-soluble polysaccharide having a sulfonate group and/or a sulfonic acid group and a polyfunctional melamine compound.

4,824,574

NOVEL WATER SOFTENING PROCESS USING MEMBRANES

John E. Cadotte, Minnetonka, Minn., and David R. Walker, Kilmarnock, Scotland, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 856,519, Apr. 28, 1986, Pat. No. 4,765,897. This application Jun. 13, 1988, Ser. No. 205,523
Int. Cl.⁴ C02F *1/44*
U.S. Cl. 210—654 **9 Claims**

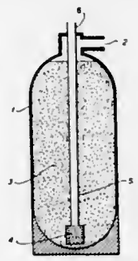
1. A process for reducing the hardness of water comprising:
(a) contacting water containing hardness ions with a first surface of a water softening membrane at a transmembrane pressure in the range from about 50 to about 100 psi, wherein said membrane is prepared by a process comprising:
(i) contacting a crosslinked, aromatic polyamide discriminating layer of a reverse osmosis membrane with an aqueous solution of a compatible strong mineral acid;
(ii) maintaining the membrane in contact with the acid at an elevated temperature for a period sufficient to produce a membrane having a water flux of at least about 8 gfd and a $MgSO_4$ rejection of at least about 65 percent when tested under reverse osmosis conditions at 50 psi and 25° C. using an aqueous solution of 0.2 weight percent $MgSO_4$; and
(iii) contacting the membrane from step (ii) with a rejection enhancing agent so as to produce a membrane having a $MgSO_4$ rejection of at least about 85 percent; and
(b) separating a permeate from a second surface of the water softening membrane, wherein the permeate contains a reduced concentration of hardness ions.

4,824,575

METAL-CONTAINING WASTE WATER TREATMENT AND METAL RECOVERY PROCESS

Richard H. Schlossel, 15 Woodside Ave., Metuchen, N.J. 08840

Filed Jun. 22, 1987, Ser. No. 64,520
Int. Cl.⁴ B01J *49/00;* **C02F** *1/42*
U.S. Cl. 210—662 **7 Claims**



1. A process for treating waste water, containing heavy metal salt contaminants to remove and recover the metal values therefrom comprising the steps of:
(a) introducing the waste water to a first portable water-conducting canister containing a bed of ion exchange resin capable of removing the heavy metal ions from said waste water and retaining same in said resin bed, and permitting said waste water to exit from said canister after contact with said bed;

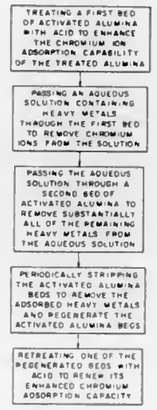
(b) removing said first portable canister to a regeneration zone;
(c) replacing the portable canister with a second portable canister containing a fresh or regenerated resin bed;
(d) connecting said first canister to a backwash receiver;
(e) treating said resin bed in said first canister by the steps of:
(i) backwashing the resin bed with water and permitting a portion of the resin bed to expand into the backwashing receiver;
(ii) forward-washing the resin bed with water and permitting the portion of the resin bed in the backwashing receiver to be returned to the portable canister;
(iii) forwarding-washing the resin bed with a regenerant solution effective to displace said heavy metal ions from said resin bed;
(iv) collecting the regenerant solution; and
(v) forward-washing the resin bed with water to remove regenerant agent solution.

4,824,576

PROCESS FOR REMOVAL, SEPARATION AND RECOVERY OF HEAVY METAL IONS FROM SOLUTIONS USING ACTIVATED ALUMINA INCLUDING ACID TREATED ACTIVATED ALUMINA

Ajay Sood, Pittsburgh; Hubert L. Fleming, Lower Burrell, and John W. Novak, Jr., New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 14, 1986, Ser. No. 885,202
Int. Cl.⁴ C02F *1/28*
U.S. Cl. 210—662 **27 Claims**



1. An improved process for the purification of an impure aqueous solution containing chromium ions and other heavy metal ions which comprises passing the solution through an activated alumina adsorbent bed, at least a portion of which has been treated with acid to enhance chromium adsorption of said activated alumina, to cause heavy metal ions, and substantially all of said chromium ions present, to be removed from the impure aqueous solution by adsorption onto the activated alumina adsorbent.

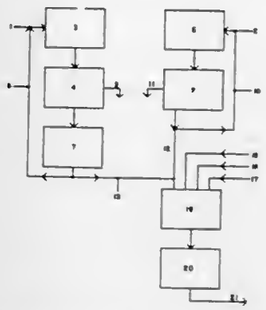
4,824,577

PHENOL, MELAMINE, FORMALDEHYDE REMOVAL PROCESS

Klaus Schwitzgebel, 7507 Chimney Corners, Austin, Tex. 78701

Filed Aug. 17, 1987, Ser. No. 86,073
Int. Cl.⁴ C02F *9/00*
U.S. Cl. 210—665 **10 Claims**

1. A clean up process for removing melamine, formaldehyde, and phenol from a first wash stream containing phenol and formaldehyde and a second wash stream containing melamine and formaldehyde comprising:
A. adjusting the pH of said first wash stream in a first reactor to a pH below 9 and holding in said first reactor with stirring until a precipitate forms, thereafter,
B. feeding said first reactor effluent through first separation equipment,
C. feeding said first separation equipment aqueous effluent through a first set of carbon beds to remove phenol,
D. adjusting the pH of said second wash stream containing melamine and formaldehyde in a second reactor to a pH of about 4.5 and holding at a temperature above 50 degrees centigrade for a minimum of two hours,



E. feeding effluent from said second reactor through a second separation equipment,
F. feeding said second separation equipment aqueous effluent to a stirred urotropination reactor along with an effluent from said first set of carbon beds,
G. adding ammonia above stoichiometric amounts to said second separation equipment aqueous effluent and combined with said first set of carbon bed effluent being fed to said stirred urotropination reactor, maintaining said stirred urotropination reactor contents at a pH above 9 by adding a base and holding up for about 10 hours, and
H. feeding said stirred urotropination reactor effluent through carbon beds to remove melamine, and urotropine formed in said stirred urotropination reactor.

4,824,578

METHOD OF PURIFYING BIOACTIVE SUBSTANCES BY BIOSPECIFIC ADSORPTION

Michel Schneider, Troinex, Switzerland; Christian Guillot, Saint-Julien en Genevois, France, and Bernard Lamy, Carouge, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

PCT No. PCT/CH86/00081, § 371 Date Feb. 5, 1987, § 102(e) Date Feb. 5, 1987, PCT Pub. No. WO86/07281, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 4, 1986, Ser. No. 23,861
Claims priority, application Switzerland, Jun. 10, 1985, 2436/85
Int. Cl.⁴ B01D *15/00*
U.S. Cl. 210—674 **3 Claims**

1. A method of separating a bioactive substance by adsorption on a mineral carrier in the aqueous phase, the substance being capable of being specifically and reversibly fixed to a given ligand, the adsorbent substrate used being a mineral-ligand system comprising a particulate material wherein such material is SiO_2, Al_2O_3, TiO_2 or ZrO_2 to which the ligands are fixed through siloxane agents, the method comprising the steps of:
(a) mixing the carrier with the aqueous phase so that the substance in the aqueous phase becomes bonded to the ligand thereby forming a charged carrier;

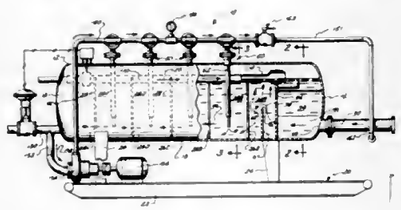
(b) centrifuging or filtering the aqueous phase of step a in order to separate the charged carrier from the aqueous phase;
(c) dispersing the charged carrier separated in step b in a second aqueous phase, thereby desorbing the substance from the carrier, and
(d) centrifuging or filtering the second aqueous phase in which the charged carrier was dispersed, thereby separating the carrier from the second aqueous phase containing the desorbed substance, and
(e) isolating the desorbed substance from the second aqueous phase, wherein the mineral particles used as the adsorbent substrate are submicronic and non-porous.

4,824,579

WATER CLARIFICATION METHOD AND APPARATUS

Albert L. George, P.O. Box 3604, Lafayette, La. 70502

Filed Apr. 20, 1987, Ser. No. 39,974
Int. Cl.[4] C02F *1/24, 1/40*
U.S. Cl. 210—703 **20 Claims**



1. A process for clarifying a contaminated fluid stream, comprising the following steps:
a. providing a primary vessel;
b. separating the primary vessel into a plurality of fluid clarification chambers;
c. introducing a primary stream of contaminated fluid into a first end of the vessel;
d. providing a flow of fluid containing entrained gas through the contaminated stream within at least a portion of the clarification chambers;
e. allowing the gas entrained within the fluid to flow to the surface of the contaminated stream and carry contaminants therewith;
f. collecting the contaminants at a central collection zone at the top portion of the vessel;
g. flowing the collected contaminants out of the collection zone in a collection trough; and
h. separating water collected in the collection trough from contaminants collected in the collection trough.

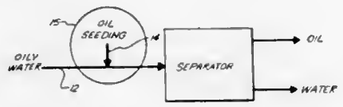
4,824,580

METHOD FOR REMOVING WASTE OIL PARTICLES FROM A WASTE WATER FLUID STREAM

Robert Standridge, League City, Tex.; George R. Ratliff, Denham Springs; Corley P. Senyard, Sr., Baton Rouge, both of La.; Corley P. Senyard, Jr., Friendswood, Tex.; Steve L. Garrett, League City, Tex.; William H. Senyard, Houston, Tex., and Thomas J. Senyard, Baton Rouge, La., assignors to Quad-S Consultants, Inc., Baton Rouge, La.

Filed Jun. 13, 1988, Ser. No. 208,577
Int. Cl.[4] B01D *17/04*
U.S. Cl. 210—708 **12 Claims**

1. A method of removing relatively small waste oil particles having a particle size in the range of less than one hundred microns from a waste water stream comprising the steps of:
(a) transmitting seed oil particles from an external source into the waste water stream;
(b) allowing the seed oil particles and waste water oil particles to mix in the wastewater stream for a time interval sufficiently long so that waste oil particles combine with the seed oil particles; and



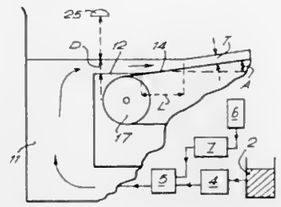
(c) removing oil that includes the seed oil and the combined waste oil particles from the waste water stream after the time interval.

4,824,581

FILTRATION APPARATUS CONTROL

James Cooper, Watton-at-Stone, England, assignor to Wickham Land Limited, Hertfordshire, England

Filed Sep. 12, 1986, Ser. No. 907,213
Claims priority, application United Kingdom, Sep. 13, 1985, 8522712
Int. Cl.[4] B01D *37/04*
U.S. Cl. 210—709 **5 Claims**



1. In a method of operating a filtration apparatus comprising the steps of establishing a first flow of a material to be filtered and a second flow of a flocculant adapted to assist filtration of said material when admixed therewith, mixing said first and second flows in a controllable proportion to form a mixture, forming a pool of said mixture from which said mixture flows to between two filter belts for extraction of moisture, measuring the depth of said pool as a measure of the degree of flocculation of said mixture, and controlling the proportions of said material and said flocculant in said mixture in response to said measured depth to obtain a predetermined optimum degree of flocculation, the improvement comprising forming said pool on a generally horizontal stationary plate by flowing said mixture upwardly from below over an edge of said plate, and from an opposed edge of said plate onto an upwardly inclined portion of the lower one of said two filter belts.

4. A method of operating a filtration apparatus comprising a rotatable filter drum and drive means for rotating said drum, said method comprising the steps of establishing a first flow of a material to be filtered and a second flow of flocculant adapted to assist filtration of said material when admixed therewith, mixing said flows in a controllable proportion, to form a mixture, feeding said mixture into said rotatable filter drum during rotation thereof by said drive means to separate said mixture into a sludge and a filtrate, measuring the resistance to rotation of said filter drum as a measure of the degree of flocculation of said mixture, and controlling the proportions of said material and said flocculant in said mixture in response to said measured resistance to obtain a predetermined optimum degree of flocculation.

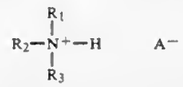
4,824,582

ARTICLES AND METHODS FOR TREATING FABRICS

Bala C. Nayar, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 14, 1986, Ser. No. 930,836
Int. Cl.[4] C11D *7/54;* **D06M** *13/34*
U.S. Cl. 252—8.75 **24 Claims**

1. An article of manufacture comprising:
(a) a fabric conditioning composition comprising one or more of an amine-anionic surfactant ion-pair complex of the formula:



wherein R_1 is C_1 to C_{24} alkyl or alkenyl, R_2 is C_1 to C_{24} alkyl or alkenyl, and R_3 is H or C_1–C_{24} alkyl or alkenyl, and A is an anionic surfactant selected from the group consisting of alkyl sulfonates, aryl sulfonates, alkylaryl sulfonates and olefin sulfonates; and
(b) a dispensing means which provides for release of an effective amount of said composition to fabrics in the dryer at automatic dryer operating temperatures.

4,824,583

LUBRICATING COMPOSITIONS FOR PVC OR THE LIKE

Jeffrey R. Hyde, West Chester, Ohio, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Apr. 25, 1988, Ser. No. 185,607
Int. Cl.[4] C10M *107/18*
U.S. Cl. 252—39 **16 Claims**

1. A process of preparing a lubricant useful for preparing a rigid poly(vinyl chloride) composition or the like, the method comprising mixing (1) a triglyceride material, (2) calcium hydroxide equivalent to between about 50% and 100% of the fatty acid content of said triglyceride material, (3) water at a level of at least about 10 wt. % relative to the total weight of said triglyceride material plus calcium hydroxide and (4) oxidized polyethylene having an acid number of between about 2 and about 50 at a level that achieves a weight ratio of (A) triglyceride material plus calcium hydroxide to (B) oxidized polyethylene of between about 95:5 and about 50:50; and heating said mixture to substantially react all of said calcium hydroxide with said triglyceride material, thereby producing a homogeneous lubricant composition.

4,824,584

ONE-STEP PROCESS FOR PREPARATION OF THIXOTROPIC OVERBASED CALCIUM SULFONATE COMPLEX THICKENED COMPOSITIONS

Ron Muir, West Hall, Canada, and Kevin L. Mulrooney, Glen Rock, N.J., assignors to Witco Corporation, New York, N.Y.

Filed Oct. 15, 1987, Ser. No. 108,629
Int. Cl.[4] C10M *105/12*
U.S. Cl. 252—39 **23 Claims**

1. A 1-step process for preparing thixotropic overbased calcium sulfonate complex thickened compositions, the steps which comprise introducing into a reactor, which is adapted to be sealed and to withstand certain predetermined superatmospheric pressures, (1) a generally liquid mixture containing an inert liquid carrier material in the form of at least one member selected from the group consisting of volatile liquids and nonvolatile liquids; (2) a sulfonic acid having an aliphatic chain containing predominately at least 12 carbon atoms; (3) at least one member selected from the group consisting of calcium hydroxide and calcium oxide; and (4) a small proportion of at least one promoter selected from the group consisting of water, C_1–C_4 water-soluble alcohol, readily water-miscible alcohol, readily water-dispersible aliphatic alcohols, water-soluble alkoxyalkanols, readily water-miscible alkoxyalkanols, and readily water-dispersible alkoxyalkanols; sealing said reactor; stirring the aforesaid contents of said reactor while maintaining said contents at a temperature a range of from about 60° F. to about 350° F., and introducing carbon dioxide into said contents in amounts to build up the pressure in said reactor to a range of about 25 to about 80 psi for a period of time to convert said reaction mixture to the desired thixotropic overbased calcium sulfonate complex thickened compositions in which the calcium carbonate content thereof is essentially in the form of colloidally dispersed particles of calcite crystals.

4,824,585

CALCIUM SOAPS POSSESSING A HIGH BASICITY RESERVE

Yves Marotel, Coye la Foret; Francis Hurier, Pont Sainte Maxence; Jean-Louis Mansot, Villefranche/Saone, and Jean-Michel Martin, Lozanne, all of France, assignors to Norsolor, Paris la Defense, France

Filed Dec. 30, 1986, Ser. No. 947,716
Claims priority, application France, Dec. 30, 1985, 85 19393
Int. Cl.[4] C10M *129/38*
U.S. Cl. 252—39 **23 Claims**

1. A calcium soap having a total basic number of at least on the order of 400, consisting essentially of calcium dissolved in 5–80% by weight of at least one oil, said calcium being in the form of carbonate and of at least one salt of at least one acid, said at least one acid being a saturated hydrocarbyl carboxylic acid containing from 7 to 13 carbon atoms, having the following characteristics:
a linear acid content of 0 to 46% by weight,
a content of acids branched on carbon 2 of 0 to 20% by weight,
and a content of acids which are mono- or polysubstituted by alkyl on carbon 3 and/or on carbons of higher rank, of at least 50% by weight, said soap being dissolvable in oil to yield a clear and stable solution.

4,824,586

METAL WORKING LUBRICANT

Mark D. Johnson, and Nelson W. Smith, both of Cortland, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 1, 1987, Ser. No. 92,024
Int. Cl.[4] C10M *173/00*
U.S. Cl. 252—49.5 **8 Claims**

1. In an acidic metal working lubricant composition for treatment of metal surfaces, which composition has a pH of less than 7.0 and includes an unstable, oil-based water emulsion containing an emulsifying effective amount of an acidic active surface active agent to provide deposition of the oil onto the metal surfaces being treated; the improvement which comprises incorporated in the composition an oil emulsifying and cleansing effective amount of a polyethoxyalkylamine as an alakline activeated surface active agent to promote cleansing of the deposited oil from the metal surfaces during alkaline cleaning of the metal surfaces after metal working without affecting lubricant performance during metal working.

4,824,587

COMPOSITES OF COERCIVE PARTICLES AND SUPERPARAMAGNETIC PARTICLES

O'Dae Kwon, and Jitka Solc, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1985, Ser. No. 712,821
Int. Cl.[4] H01F *1/26, 1/28*
U.S. Cl. 252—62.55 **10 Claims**

1. A stable, fluid aqueous dispersion comprising a mixture of (1) coercive particles and (2) a magnetic latex of from about 5 to about 70 weight percent of superparamagnetic particles in a hydrophobic polymer matrix wherein the hydrophobic polymer matrix maintains the superparamagnetic particles in an essentially discrete, spaced apart relationship.

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4,824,588

DEICING AGENT

Stephen Y. Lin, Wausau, Wis., assignor to Reed Lignin Inc., Rothschild, Wis.

Filed Dec. 18, 1987, Ser. No. 134,791
Int. Cl.[4] C09K *3/18*
U.S. Cl. 252—70 **15 Claims**

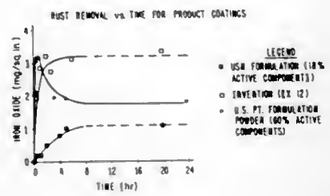
1. A deicing composition comprising a mixture of saccharinic acid, lignosulfonate and an alkali metal or alkaline earth metal chloride salt selected from the group consisting of sodium chloride, magnesium chloride, calcium chloride, and mixtures thereof, the ratio of said saccharinic acid, lignosulfonate and chloride being from about 0.05:0.95:15 to about 0.75:2.25:1.

4,824,589

RUST CONVERTING AND REMOVING COMPOSITIONS

Arpad M. Magyar, Conroe, Tex.; Darrell W. Patton, Wichita, Kans., and Paul J. DesLauriers, Conroe, Tex., assignors to Penzoil Products Company, Houston, Tex.

Filed Aug. 4, 1986, Ser. No. 892,443
Int. Cl.[4] C02F *5/10*; B08B *7/00*
U.S. Cl. 252—82 **16 Claims**



1. An aqueous rust transforming composition, comprising 15 to 60 weight percent active ingredients and a balance of water, said active ingredients comprising 1 to 80 weight percent ascorbic acid, 10 to 90 weight percent lignin sulfonate and 5 to 75 weight percent of a water soluble polymer.

4,824,590

THICKENED AQUEOUS COMPOSITIONS WITH SUSPENDED SOLIDS

Brian J. Roselle, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 905,366, Sep. 8, 1986, abandoned. This application Feb. 26, 1988, Ser. No. 163,172
Int. Cl.[4] C11D *7/16, 7/54, 11/00*
U.S. Cl. 252—90 **12 Claims**

1. An aqueous liquid, shear-thinning automatic dishwashing detergent composition comprising:
(1) from 0% to about 3% of bleach-stable, low foaming detergent surfactant;
(2) from about 10% to about 40% of detergency builder;
(3) hypochlorite bleach to yield available chlorine in an amount of from about 0.3% to about 2.5%;
(4) from about 0.1% to about 10% of thickening agent; and
(5) the balance a continuous phase of aqueous liquid, said composition having:
(a) a yield value of from about 20 to about 500 dynes/cm^2;
(b) from about 10% to about 40% of said detergency builder in the form of solid suspended particles which do not dissolve in said continuous aqueous liquid phase, which have a density greater than that of the continuous liquid phase, and which have a particle size range of from about 2 microns to about 500 microns; and
(c) entrained gas selected from the group consisting of air, nitrogen, carbon dioxide, oxygen, helium, and mixtures thereof, in the form of bubbles having a maximum diameter of less than about $\frac{1}{8}$ inch, in an amount to adjust the overall specific gravity of the composition to within from about 3% more than to about 10% less than the specific gravity of the aqueous liquid by itself.

4,824,591

SULFONE PEROXYCARBOXYLIC ACIDS

David R. Dyroff; Daniel P. Getman, and Joan K. Glascock, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 97,274, Sep. 17, 1987, Pat. No. 4,758,369, which is a continuation-in-part of Ser. No. 962,592, Nov. 3, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 168,033
Int. Cl.[4] C11D *3/39, 7/38*
U.S. Cl. 252—94 **62 Claims**

1. A compound represented by the formula



wherein A and B are peroxycarboxylic acid compatible organic moieties bonded to the sulfur atom by a carbon atom, each of A and B containing from 1 to 4



groups bonded to carbon atoms.

4,824,592

SUSPENDING SYSTEM FOR INSOLUBLE PEROXY ACID BLEACH

Mark E. Rerek, Fanwood, N.J., and Michael P. Aronson, West Nyack, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 25, 1988, Ser. No. 173,327
Int. Cl.[4] C11D *3/395, 7/54*
U.S. Cl. 252—95 **12 Claims**

1. An aqueous liquid bleaching composition having a pH of from 1 to 6.5 comprising:
(i) from 1 to 40% by weight of a solid, particulate, substantially water-insoluble organic peroxy acid;
(ii) from 1 to 30% by weight of a C_8–C_{22} secondary alkane sulfonate; and
(iii) a fatty acid present in an amount sufficient to stabilize said peroxy acid against phase separation from the aqueous liquid.

4,824,593

ANTIFOAM INGREDIENT

Peter W. Appel, Rotterdam, Netherlands; Fabrizio Bortolotti, Wirral, Italy; Francois Delwel, Dordrecht, Netherlands; Fredrik Hornung, Gouderak, Netherlands; Alan D. Tomlinson, Vlaardingen, Netherlands, and Simon Willemse, Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 10, 1987, Ser. No. 84,004
Claims priority, application United Kingdom, Aug. 13, 1986, 8619683
Int. Cl.[4] C11D *9/60, 9/24, 9/36*
U.S. Cl. 252—127 **16 Claims**

16. A particulate solid antifoam ingredient suitable for incorporation into a detergent powder, the antifoam ingredient being in the form of a matrix comprising a mixture of a C_{8-22} fatty acid and an alkali metal soap of a C_{8-22} fatty acid wherein the weight ratio of fatty acid to soap in the mixture is within the range of from 0.25:1 to 2:1, said mixture having a liquid phase content at 40° C. of not more than 50% by weight, enclosing an antifoam material consisting essentially of
(i) an antifoam active substance selected from the group consisting of hydrocarbons, polysiloxanes and mixtures thereof; and
(ii) antifoam promoter selected from the group consisting of alkyl phosphoric acids and salts thereof, hyrophobic silica, and mixtures thereof.

4,824,594

FREE-FLOWING PEARLESCENT CONCENTRATE

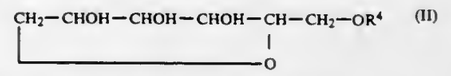
Horst Hoeffkes, and Anke Kaczich, both of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,506
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640755
Int. Cl.[4] C11D *1/74, 1/835*
U.S. Cl. 252—174.21 **8 Claims**

1. A pearlescent hair rinse and conditioner concentrate in the form of a free-flowing dispersion at room temperature consisting essentially of from about 5 to about 15% by weight of one or more pearlescing ester corresponding to the formula

$$R^1—(OC_nH_{2n})_x—OR^2 \quad (I)$$

in which R^1 is a linear C_{16}–C_{22} fatty acyl group, R^2 is hydrogen or an R^1 group, n is 2 or 3, and x is a number from 1 to 4; and 1 to 6% by weight of one or more monoethanolamide of a C_{12}–C_{22} fatty acid; wherein the concentrate contains as an emulsifier from 2 to 8% by weight of one or more compound corresponding to general formula II below,



(II)

being a sorbitan monofatty acid ester, in which R^4 is a C_{12}–C_{18} fatty acyl group; an effective amount of quaternary ammonium compound conditioning agent; and from about 70 to about 90% by weight of water, all weights being based on the weight of said concentrate.

4,824,595

POLYISOCYANATE COMPOSITIONS CONTAINING REVERSIBLY BLOCKED CATALYSTS AND ADDITION PRODUCTS OF SULFONYL ISOCYANATES WITH CATALYSTS HAVING A TIN(II)- OR TIN(IV)-CARBOXYLATE STRUCTURE

Ruland Richter, Cologne; Hanns P. Muller, Odenthal; Rudolf Hombach, Leverkusen; Manfred Dollhausen, Odenthal; Geza Avar, Leverkusen, and Hans-Albrecht Freitag, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,732
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1983, 3326566
The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—182.17 **10 Claims**

1. A polyisocyanate composition containing a reversibly blocked catalyst for the isocyanate addition reaction which comprises
(a) at least one organic polyisocyanate and
(b) at least one addition product dissolved or dispersed in the polyisocyanate composition, of a sulfonyl isocyanate with a catalyst having a tin(II)- or tin(IV)-carboxylate structure as the reversibly blocked catalyst.

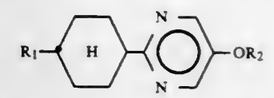
4,824,596

2-(TRANS-4-ALKYLCYCLOHEXYL)-5-ALKOXYPYRIMIDINES

Kisei Kitano, and Yasuyuki Goto, both of Yokohama, Japan, assignors to Chisso Corporation, Japan

Filed Jul. 9, 1987, Ser. No. 71,380
Claims priority, application Japan, Jul. 14, 1986, 61-165443
Int. Cl.[4] C09K *19/34*; C07D *239/02*; G02F *1/13*
U.S. Cl. 252—299.61 **10 Claims**

1. A 2-(trans-4-alkylcyclohexyl)-5-alkoxypyrimidine expressed by the formula (I)



(I)

wherein R_1 and R_2 each independently represent an alkyl group of 1 to 12 carbon atoms.

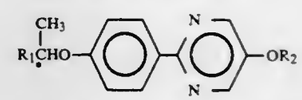
4,824,597

LIQUID CRYSTAL COMPOSITION

Mitsuru Kano, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

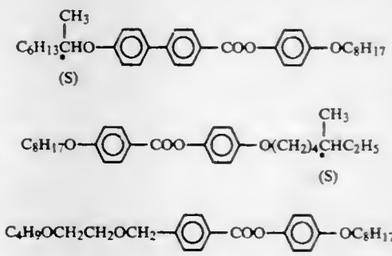
Filed Mar. 17, 1988, Ser. No. 170,916
Claims priority, application Japan, Jun. 23, 1987, 62-155804
Int. Cl.[4] G02F *1/13*; C09K *19/34*
U.S. Cl. 252—299.61 **1 Claim**

1. A liquid crystal composition comprising:
less than 15 mol % of a pyrimidine compound expressed by the following general formula (I)



(I)

where R_1 is an alkyl group expressed by C_nH_{2n+1} and R_2 is an alkyl group expressed by C_mH_{2m+1}, wherein $4 \leqq n \leqq 8$, and $6 \leqq n \leqq 14$; and
the balance of the following compounds (II), (III) and (IV)



(II)

(III)

(IV)

where (S) indicates that the absolute configuration of an optically active group forming its side chain is of S type, and where * indicates an asymmetric carbon atom.

4,824,598

SYNTHETIC LASER MEDIUM

Stanley E. Stokowski, Danville, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 20, 1987, Ser. No. 110,387
Int. Cl.[4] C09K *11/80*; H01S *3/16*
U.S. Cl. 252—301.4 R **8 Claims**

1. A synthetic laser medium comprising:

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a body having a primary composition and a secondary composition, the body's absorption coefficient at about one micron wavelength being less than about 0.01 cm^{-1}, the primary composition being

$$J_{3-x-y}L_{2+x}Q_{3+y}O_{12-z}$$

wherein J is gadolinium or yttrium, L is scandium, gallium or aluminum, Q is gallium or aluminum, x is from about −0.20 to about 0, y is from about −0.20 to about 0.5, and z is from about 0 to about 1;

the secondary composition having ionic species dispersed in the primary composition, the ionic species including a chromium dopant in an amount of at least 0.1×10^{20} ions/cc of the body to absorb broad energy bands and a neodymium codopant in an amount effective to actively lase, divalent cations in an amount at least about 25 ppm with respect to the body and being Mg^{2+}, Sr^{2+}, Ba^{2+}, Mn^{2+}, Ca^{2+}, Ni^{2+}, or $Co2+$, and convertible cations in an amount effective to reduce the absorption coefficient of the body at about one micron wavelength, the convertible cations being Ti, Ce or Tb in the trivalent state, tetravalent state or mixtures thereof.

4,824,599

ENZYMATIC DETERGENT COMPOSITION

Hendrik E. de Jong, Rozenburg; Ton Swarthoff, Hellevoetsluis, and Johan Haverkamp, Bergschenhoek, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 3, 1987, Ser. No. 128,302

Claims priority, application United Kingdom, Dec. 10, 1986, 8629536

Int. Cl.⁴ C11D *3/386, 7/42*

U.S. Cl. 252—174.12 **4 Claims**

1. A detergent composition comprising from 1-50% by weight of one or more detergent surfactants, from 0.1-50 GU/mg of a protease and from 0.05-100 LU/mg of a lipase, wherein the protease has an isoelectric point of less than 10.0 and the lipase is a lipase which shows a positive immunological cross-reaction with the antibody of the lipase produced by *Chromobacter viscosum* var. lipolyticum NRRL B-3673.

4,824,600

PREPARATION OF A SUSPENSION IN PREPARATION OF POWDER MAKING

Wulf Kock, Markdorf, and Wolfgang Wagner, Deggenhauser Tal, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,469

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 3621398

Int. Cl.⁴ B22F *9/30;* **C22C** *1/04*

U.S. Cl. 252—313.1 **18 Claims**

1. Method for making a highly concentrated watery suspension containing silver and tin salts from which a silver (metallic) and tin oxide powder can be made under utilization of the reaction spray method comprising the steps of:

providing an injection suspension of a tin II salt solution by adding, in small steps a tin II salt solution into a small volume concentrated nitric acid while maintaining a temperature below 35 degrees C;

mixing the injection suspension with about a three fold quantity (volume) of concentrated 65% nitric acid;

adding the latter mixture in small steps to a watery citrate solution combined with tin granules, until all tin granules are dissolved and changed into a tin IV oxide hydrate suspension; and

combining the completed tin IV oxide hydrate suspension as per the preceding step with a water silver nitrate solution.

4,824,601

LIQUID ANTIOXIDANT PRODUCED BY ALKYLATING DIPHENYLAMINE WITH A MOLAR EXCESS OF DIISOBUTYLENE

Janet Franklin, Rochdale, England, assignor to Ciba-Geigy-Corporation, Ardsley, N.Y.

Continuation of Ser. No. 62,372, Jun. 12, 1987, which is a continuation of Ser. No. 779,891, Sep. 25, 1985, which is a continuation-in-part of Ser. No. 676,903, Nov. 30, 1984. This application Jan. 11, 1988, Ser. No. 144,596

Claims priority, application United Kingdom, Dec. 8, 1983, 8332797

Int. Cl.⁴ C09K *15/18*

U.S. Cl. 252—401 **14 Claims**

1. Process for the production of a liquid antioxidant composition by reaction of diphenylamine with diisobutylene comprising

reacting diphenylamine with diisobutylene in a molar ratio from 1:1.1 to 1:2.5 in the presence of an acid-activated earth catalyst, at a reaction temprature of at least 160° C., the reaction being effected for such a period that the content of 4,4'-di-t-octyldiphenyl-amine in the final reaction mass, excluding catalyst, is below 25% by weight and that of diphenylamine is below 10% by weight; and

removing catalyst and unreacted diisobutylene thereby producing the desired liquid antioxidant composition.

4,824,602

PROCESSES FOR PURIFICATION OF QUATERNARY CATIONIC SURFACTANT MATERIALS AND COSMETIC COMPOSITIONS CONTAINING SAME

Prem S. Juneja, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 923,372, Oct. 27, 1986, abandoned. This application Dec. 22, 1987, Ser. No. 136,591

Int. Cl.⁴ A61K *7/075;* **C07C** *85/26;* **C11D** *1/65, 3/37*

U.S. Cl. 252—547 **7 Claims**

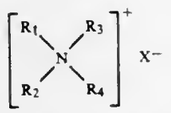
1. A process for purifying an impure quaternary cationic surfactant material intended for cosmetic use and rendering said quaternary cationic surfactant materials free flowing and substantially free of UV absorbing impurities having a maximum absorption in the range of from about 260 nm to about 280 nm comprising the following steps:

(a) washing said impure quaternary cationic surfactant materials with an organic solvent selected from the group consisting of acetonitrile, acetone, diethyl ether, and mixtures thereof;

(b) applying suction to remove the filtrate; and

(c) drying the solid;

wherein said impure quaternary cationic surfactant materials have the following general formula:



wherein R_1 and R_2 are aliphatic groups containing from about 12 to about 22 carbon atoms, R_3 and R_4 are hydrogen or short chain alkyl groups containing from about 1 to about 4 carbon atoms and X is an ion selected from halogen, acetate, phosphate, nitrate and alkyl sulfate radicals.

5. A process for purifying an impure quaternary cationic surfactant material intended for cosmetic use and rendering the material free flowing and substantially free of UV absorbing impurities with a maximum absorption at from about 270 nm to about 275 nm comprising the following steps:

(a) washing the impure quaternary cationic surfactant material with at least 0.5 ml/gm acetonitrile for from about 60 to about 120 minutes;

(b) applying suction for from about 30 to about 60 minutes to remove the filtrate; and

(c) drying the solid,

wherein said impure quaternary cationic surfactant materials have the following general formula:



wherein R_1 and R_2 are aliphatic groups containing from about 12 to about 22 carbon atoms, R_3 and R_4 are hydrogen or short chain alkyl groups containing from about 1 to about 4 carbon atoms and X is an ion selected from halogen, acetate, phosphate, nitrate and alkyl sulfate radicals.

4,824,603

AMPHOTERIC AND ZWITTER-IONIC PHOSPHATE SURFACTANTS

Hinrich Möller, Monheim, and Ulrich Zeidler, Duesseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

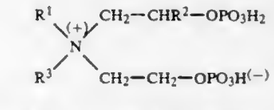
Filed Oct. 28, 1987, Ser. No. 115,003

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636750

Int. Cl.⁴ C11D *1/88, 1/62, 1/94*

U.S. Cl. 252—545 **10 Claims**

1. Amphoteric and zwitter-ionic phosphate surfactants of the formula:



(I)

(a) in which R^1 is a group $R^4(OC_nH_{2n})_x$—, where n=2 to 4, x=1 to 6, and R^4 is a C_6–C_{22} alkyl group, or a group R^5—$CONH(CH_2)_m$, where R^5 is a C_5–C_{21} alkyl group and m=2 to 4; R^2 is hydrogen, and R^3 is a C_1–C_4 alkyl group, or a group $—(C_nH_{2n}O)_x—H$ or $—(C_nH_{2n}O)_x—PO_3H_2$, where n=2 to 4 and x=1 to 6, or

(b) in which R^1 is a C_1–C_4 alkyl group or a C_2–C_4 2-hydroxyalkyl group; R^2 is a C_6–C_{22} alkyl group; and R^3 is as defined above;

mixtures thereof with correspondingly substituted surfactants of formula (I) in which the $—PO_3H_2$ group or groups are replaced by hydrogen; and neutral and basic salts of the foregoing phosphate surfactants.

4,824,604

DETERGENT COMPOSITION

Kazuyuki Yahagi, Tokyo; Kaoru Tsujii, Wakayama; Hajime Hirota, Tokyo, and Yoshihisa Matsumura, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

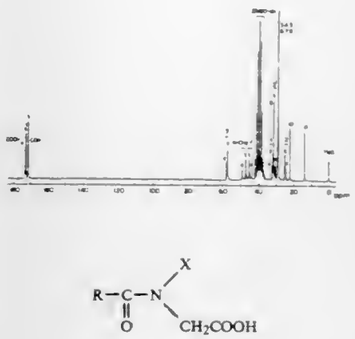
Filed May 19, 1987, Ser. No. 51,329

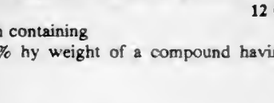
Claims priority, application Japan, May 26, 1986, 61-120399; Sep. 17, 1986, 61-217286; Sep. 17, 1986, 61-217287

Int. Cl.⁴ C11D *1/37, 1/94*

U.S. Cl. 252—546 **6 Claims**

1. A liquid detergent composition, comprising (1) a detergent base, (2) 5 to 50 wt.% of an anionic or amphoteric surface active agent, and (3) 5 to 50 wt.% of one or more N-acyl-N-hydroxyalkylglycines of the general formula (I) or salts thereof:





wherein:

RCO is a saturated fatty acid residue having from 8 to 18 carbon atoms; and

X is a 2-hydroxypropyl group or a 3-hydroxypropyl group.

4,824,605

NON-IONIC SURFACTANT BASED DETERGENT FORMULATIONS WITH SHORT CHAIN AMPHOTERIC ADDITIVES

E. D. Hildreth, Dill Rd. RD #3, Belleville, Ohio 44813

Continuation-in-part of Ser. No. 892,772, Jul. 31, 1986, Pat. No. 4,759,877. This application Jun. 16, 1988, Ser. No. 207,711

Int. Cl.⁴ C11D *1/62*

U.S. Cl. 252—547 **4 Claims**

1. A detergent formulation which contains, by weight:

17.4% of the reaction product at 40° C. of 1 mole of 1-hydroxyethyl-2-octylimidazoline, in the presence of sodium methylate as catalyst with 1 mole of methylacrylate and following saponification with an amount of water to give a 50% concentrated solution of the resulting amphoteric surfactant,

50.1% water,

13.0% of a nonionic surfactant obtained from 2,6,8-trimethylnonanol ethoxylated with 6 moles of ethylene oxide,

13.0% of tridecyloxypolyethylene ethanol, and

6.5% of coconut diethanolamide.

4,824,606

ALKOXYLATED POLYESTERS

Anthony J. O'Lenick, Jr., Lilburn, and Randy L. Rayborn, Winder, both of Ga., assignors to GAF Corporation, Wayne, N.J.

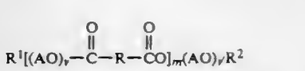
Continuation-in-part of Ser. No. 50,089, May 14, 1987. This application Apr. 20, 1988, Ser. No. 178,423

Int. Cl.⁴ C09K *2/10;* **C07C** *69/74, 69/76*

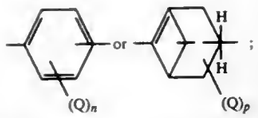
U.S. Cl. 252—607 **12 Claims**

1. A composition containing

(a) 80% to 100% hy weight of a compound having the formula:

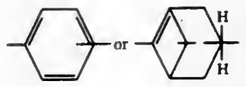


and mixtures thereof wherein AO is C_2 to C_3 alkylene oxide which, when present as a mixture of ethylene oxide and propylene oxide units can occur in random or block distribution; R^1 is hydroxy or C_1 to C_{10} alkoxy; R^2 is hydrogen or C_1 to C_{10} alkyl; R is a halogenated cyclic radical optionally substituted with lower alkyl and having the structure



wherein Q is chlorine or bromine; n is an integer having a value of from 3 to 4; p is an integer having a value of from 2 to 6; m is an integer having a value of from 3 to 22 and v and v' are each integers having a value of from 5 to 150;

(b) from 0% to 20% by weight of a compound having the same formula except that R is



and

(c) an inert carrier therefor.

4,824,607

PROCESS FOR DENITRATING AQUEOUS, NITRIC ACID AND SALT CONTAINING WASTE SOLUTIONS

Klaus Gompper, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,797

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243840

Int. Cl.⁴ G21F *9/08*; C02F *1/70*

U.S. Cl. 252—631 **11 Claims**

1. A process for denitrating dilute aqueous nitric acid and nitrate salt containing waste solutions, comprising mixing the waste solution with ethyl alcohol at room temperature, and heating the mixture to at least 75° C. and up to 100° C. at normal pressure.

4,824,608

PREPARATION OF C.I. VAT BLUE 16

Reinhard Helwig, Gruenstadt, and Helmut Hoch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 1, 1987, Ser. No. 91,846

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631072

Int. Cl.⁴ C09B *3/22*

U.S. Cl. 260—355 **11 Claims**

1. A process for the preparation of C.I. Vat Blue 16, C.I. No. 71200, comprising alkylating 16,17-dihydroxyviolanthrene-5,10-dione in a polar solvent at elevated temperatures, wherein the alkylation is carried out in a tertiary aliphatic or cycloaliphatic amine or an N-alkylpiperidine as the solvent at from 100° to 230° C.

4,824,609

PROCESS FOR PURIFYING A WORKING COMPOUND

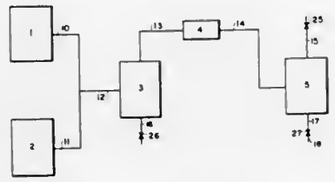
Dalbir S. Sethi, Cranbury, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 7, 1988, Ser. No. 141,387

Int. Cl.⁴ C07C *50/18*

U.S. Cl. 260—369 **18 Claims**

1. A process for separating contaminants from an impure, contaminated working compound used to manufacture hydrogen peroxide by the cyclic reduction and oxidation of an alkylated anthraquinone, the process comprising forming a mixture by contacting the impure working compound, a nonaqueous solvent for the working compound, and a carbon dioxide fluid at a pressure of about 7 MPa to about 24 MPa and at a temperature of from about −5° C. to about 100° C., separating the mixture into a first portion containing working compound,



solvent and carbon dioxide fluid and a residue portion containing contaminants, and separating carbon dioxide from the first portion.

4,824,610

COLORANTS FOR BALL-POINT PEN AND RIBBON INKS

Reinhard J. Sappok, Montclair, N.J.; Louis R. de Alvare, Holland, Mich., and Floyd G. Spence, Holland, Mich., assignors to BASF Corporation, Parsippany, N.J.

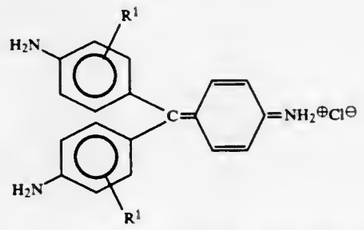
Filed Dec. 21, 1987, Ser. No. 135,699

Int. Cl.⁴ C09B *11/10*

U.S. Cl. 260—391 **10 Claims**

1. A process for the preparation of triarylmethane dyestuff salts, comprising:

(a) adding alkali nitrate to a triarylmethane hydrochloride having the formula:



wherein R^1 is hydrogen, C_1–C_8 alkyl or alkenyl, halo, cyano, or alkoxy; and R is hydrogen, lower alkyl, lower alkenyl, phenyl, substituted phenyl, naphthyl; or substituted naphthyl, and where n is an integer from 1 to about 3;

(b) separating from the mixture prepared in step 1, the nitrate salt corresponding to the triarylmethane dyestuff;

(c) dissolving said nitrate salt of (b) in aniline;

(d) adding sufficient aqueous alkali to raise the pH of the mixture (c) to from about 11.5 to about 12.5;

(e) separating from the reaction mixture (d) a presscake containing the carbinol base form of said triarylmethane dyestuff; and

(f) reacting said carbinol base form of said triarylmethane dyestuff with sufficent acid to form said triarylmethane dyestuff salt.

4,824,611

PREPARATION OF HYDROCARBON-SOLUBLE TRANSITION METAL SALTS OF ORGANIC CARBOXYLIC ACIDS

Paul L. Cells, Cleveland, Ohio, assignor to Mooney Chemicals, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 682,925, Dec. 18, 1984, abandoned. This application Nov. 21, 1985, Ser. No. 800,458 The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.⁴ C11C *1/00*; C07F *9/00, 11/00, 13/00*

U.S. Cl. 260—414 **17 Claims**

1. A process for preparing hydrocarbon-soluble transition metal salt composition of organic carboxylic acids having improved properties wherein the transition metal is one capable of having a multiplicity of oxidation states comprising the steps of

(a) providing at least one transition metal compound wherein the transition metal is at one of its higher positive oxidation states,

(b) reducing said transition metal compound with at least one hydrazine source forming an intermediate containing the transition metal in a lower positive oxidation state, and

(c) reacting said intermediate with at least one organic carboxylic acid containing at least 5 carbon atoms to form the transition metal salt of said carboxylic acid.

4,824,612

PROCESS FOR OXIDIZING SECONDARY AROMATIC ALCOHOLS

Werner Rutsch, Fribourg, and Mario Slongo, Tafers, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1987, Ser. No. 129,578

Claims priority, application Switzerland, Dec. 15, 1986, 4987/86

Int. Cl.⁴ C07C *145, 00*

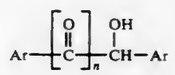
U.S. Cl. 260—513.7 **10 Claims**

1. A process for the preparation of an aromatic ketone of formula I



(I)

wherein Ar is an aromatic carbocyclic radical of 6 to 14 carbon atoms or an aromatic heterocyclic radical of 4 to 14 carbon atoms selected from the group consisting of thienyl, furyl, pyrrolyl, pyridyl, quinolyl, indolyl, carbazolyl and thioxanthyl, which radical is unsubstituted or substituted by one or more members of the group consisting of halogen, C_1–C_{14}alkyl, C_1–C_8alkoxy, phenyl or nitro, and n is 0 or 1, with simultaneous formation of a sulfinic acid of formula R—S(O)—OH, or the alkali metal salt or alkaline earth metal salt thereof, wherein R is C_1–C_8alkyl, 10-camphoryl, phenyl, naphthyl, or phenyl or naphthyl each substituted by halogen, C_1–C_{14}alkyl, C_1–C_{12}alkoxy, phenoxy or phenyl, which process comprises reacting a secondary alcohol of formula II



(II)

with a sulfonyl chloride of formula R—SO_2Cl, in the presence of a base selected from the group consisting of hydroxides, oxides and alcoholates of alkali metals or alkaline earth metals, and in the presence of an organic solvent, in the temperature range from 20° to 150° C., such that not less than 1 mole of RSO_2Cl and not less than 2 equivalents of base are used per mole of the alcohol of formula II.

4,824,613

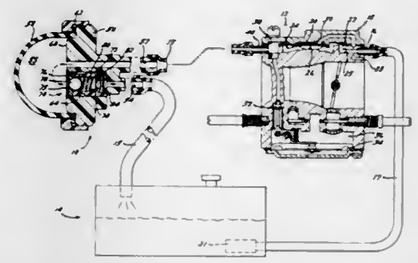
VAPOR RETURN PRIMER FOR CARBURETORS OF INTERNAL COMBUSTION ENGINES

William A. Scott, and Mark A. Hutchinson, both of Mt. Zion, Ill., assignors to Tillotson, Ltd., Tralee, Northern Ireland

Filed Jan. 25, 1988, Ser. No. 147,747

Int. Cl.⁴ F02M *1/16*

U.S. Cl. 261—35 **6 Claims**



1. In combination, a vapor return primer and a diaphragm carburetor, the carburetor having a fuel chamber with a high pressure side and the carburetor associated with an internal combustion engine, the vapor return primer comprising:

a housing having an inlet and outlet;

conduit means coupling said inlet with said fuel chamber high pressure side;

second conduit means coupling said outlet with a fuel tank;

a resilient flexibe membrane coupled with said housing, said resilient membrane for priming said carburetor such that said membrane is fixed from a first original position to a second compressed position wherein fluid is expelled from said housing into said fuel tank and upon said membrane reflexing back to the first original position fluid is drawn from said carburetor into said housing; and

pressure relief means for enabling fluid to pass into said fuel tank while said membrane is being compressed and preventing said fluid from entering said fuel tank when said memberane reflexes to said first original position, and for regulating pressure of said carburetor enabling fluid to flow from said carburetor to said fuel tank while pressure in said carburetor is at a desired pressure while said engine is running, said pressure relief means coupled with said outlet and said housing.

4,824,614

DEVICE FOR UNIFORMLY DISTRIBUTING A TWO-PHASE FLUID

Jeffrey A. Jones, Keene, Calif., assignor to Santa Fe Energy Company, Santa Fe Springs, Calif.

Filed Apr. 9, 1987, Ser. No. 36,331

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—76 **3 Claims**

1. An apparatus for uniformly distributing a two-phase fluid comprised of a gas phase and a liquid phase into a pair of branch streams of two-phase fluid, said apparatus comprising:

a conduit means for the fluid, said conduit means comprising an upstream branch having a downstream end that opens into first and second downstream flow-splitting branches of said conduit means;

a mixing means mounted within said upstream branch for dividing the two-phase fluid into a plurality of individual streams and then turbulently re-combining the individual streams;

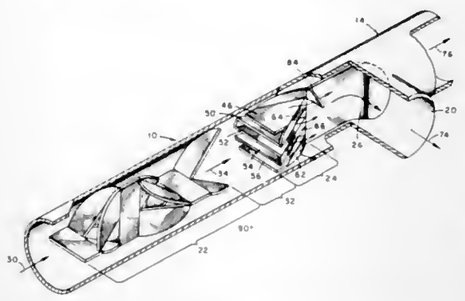
a stratifier means mounted within said conduit means between said mixing means and said first and second branches of said conduit means for dividing the fluid exhausted by said mixing means into two sets of a plurality of alternate parallel strata of the fluid,

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said stratifier means comprising a multi-duct structure comprising a plurality of spaced-apart super-posed parallel flat plates of substantially triangular configuration each of which plates has an upstream edge of a length to subtend said conduit means such that each stratum of fluid is bounded on a pair of opposite sides at said upstream edge by opposite side walls of said conduit means,

said plates having downstream vertices disposed along a mid-line of said conduit means,

each of the ducts of said multi-duct structure being bounded along one straight side of said duct by a straight side of said conduit means,



each of said ducts on the side opposite to said on e side being bounded by a convergent wall means having a downstream end terminating at said mid-line along which said vertices of said plates are disposed such that said two sets of strata exhaust past said downstream end of said stratifier means on opposite sides thereof; and

a divider wall means mounted within said conduit means between said downstream end of said stratifer means and said first and second downstream branches for defining an isolated pair of fluid flow passages for said two sets of strta from said downstream end of said stratifier means into said first and second branches.

4,824,615

PROCESS FOR MAKING FOAMED MATERIALS AND STRUCTURES THEREFROM

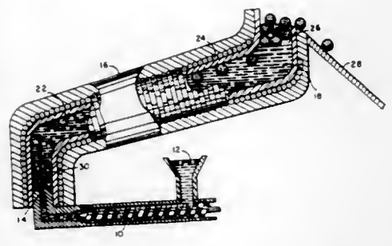
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Filed Sep. 17, 1987, Ser. No. 97,709

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.[4] B29B *9/10;* **C01B** *31/00;* **B29C** *67/20*

U.S. Cl. 264—6 **15 Claims**



1. A method of forming a structure comprising the steps of:

introducing bead forming material into a column of molten medium of heavier density than the density of said bead-forming material;

forming globules of discrete amounts of said bead-forming material;

raising said globules in said column over a predetermined residence of time;

expanding said globules within said column as they rise therein;

foaming said globules within said column as they rise therein;

curing said globules to form beads within said column as they rise therein;

coating said beads with said medium;

removing the thus formed coated foamed beads from said column;

entering said coated beads into a means for molding;

draining excess medium from around said beads;

forming a plurality of interstices in the areas around said beads from where said medium has drained;

molding said beads coated with said medium into a shape;

solidifying said medium; and

holding said beads together in said shape by said solidified medium.

4,824,616

METHOD FOR THE PRODUCTION OF SPHERICAL SILICONE GEL PARTICLES

Koji Shimizu, Ichihara, and Mitsuo Hamada, Kisarazu, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 200,828

Claims priority, application Japan, Jun. 5, 1987, 62-141051

Int. Cl.[4] B29B *9/00*

U.S. Cl. 264—7 **8 Claims**

1. A method for the production of spherical silicone gel particles having a diameter of from 0.01 millimeters to 20 millimeters and having an elastomeric silicone layer on a silicone gel surface comprising

(a) forming cured spherical silicone gel particles by dispersing spherical particles of a liquid silicone gel composition in water and curing, where the liquid silicone gel composition comprises

(A) organopolysiloxane having at least two lower alkenyl groups in each molecule,

(B) organohydrogenpolysiloxane having at least two silicon-bonded hydrogen atoms in each molecule, in a quantity such that the molar ratio between the total quantity of silicon-bonded hydrogen atoms in component (B) and the total quantity of all lower alkenyl groups in component (A) is from 0.1:1 to 1:1, and

(C) a platinum catalyst at 0.1 to 1,000 parts by weight of platinum metal for each one million parts by weight of the total quantity of components (A) plus (B), and

(b) forming the elastomeric layer on the surface of the spherical silicone gel particle by contacting the particles with organohydrogenpolysiloxane and curing to form the elastomer.

4,824,617

METHOD FOR MANUFACTURING PLASTIC FOAM

Shin Takeuchi; Isamu Eto, and Taketoshi Yamada, all of Anjyo, Japan, assignors to Inoue MTP Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 17, 1987, Ser. No. 62,972

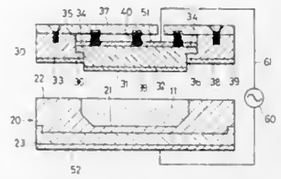
Claims priority, application Japan, Jul. 30, 1986, 61-179383

Int. Cl.[4] C08J *9/06;* **B29C** *65/04, 39/10, 67/22*

U.S. Cl. 26.4—26 **5 Claims**

1. A method for manufacturing thermoplastic resin foam having a predetermined shape, in which a polar thermoplastic resinous compound having a chemical foaming agent which produces a gas by a heat decomposition thereof is charged into a molding cavity which is defined by opposing cavity surfaces and said resinous compound is subjected to a dielectric heating, so that said resinous compound is molten and plasticized and the chemical foaming agent is decomposed, characterized in that the cavity surfaces define the shape of an automobile

molding and that one of said cavity surfaces is movable to withdraw from and to move closer to the other cavity surface so as to vary the volume of the molding cavity, said resinous compound being charged into the molding cavity, so that said resinous compound is brought into surface contact with the cavity surfaces without an air gap between said resinous compound and the cavity surfaces, said movable cavity surface



being moved, in response to the expansion of said resinous compound caused by the decomposition of the chemical foaming agent during heating, in order to maintain contact with and to accommodate the cubically expanding resinous compound, wherein the obtained thermoplastic resin foam contains a core portion having a comparatively low density and a shell portion having a comparatively high density, and the obtained foam is in the form of an automobile molding.

4,824,618

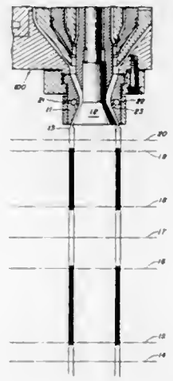
COEXTRUSION BLOWMOLDING PROCESS

William L. Strum, Kennett Square, Pa., and Alvin S. Topolski, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1987, Ser. No. 135,450

Int. Cl.[4] B29C *49/04, 49/22, 47/06*

U.S. Cl. 264—37 **11 Claims**



1. In a process for coextrusion blow molding of a multi-layer article, wherein molten polymer from at least two sources is fed to a multi-layer extrusion head having at least two polymer inlet ports individually communicating with at least first and second corresponding channels arranged in such a manner that molten polymer flowing along the first channel at some point downstream of the first channel encounters molten polymer flowing along the second channel, thereby forming a flow of two distinct coaxial layers downstream of the second channel, and where more than two coaxial layers ar desired, one or more subsequent channels are arranged downstream of the second channel and molten polymer flows from each subsequent channel into the flow of coaxial layers emanating from a previously encountered channel thereby forming a flow of more than two coaxial layers; a final layered polymer mass being extruded through an opening in a die attached to an exit portion of the extrusion head into a parison; placing an open mold in which the parison is to be blow molded in the path of the parison and beyond the die opening, and continuing the extrusion of the coaxial layers until the parison extends beyond an end of the mold furthest from the extrusion head; closing the mold; sealing both ends of the parison; blowing air into the parison to form the multi-layer article in the mold; cooling the multi-layer article, and removing portions of the parison which extend beyond the mold cavity; and recycling the so removed portions;

the improvement of periodically rapidly injecting into the die attached to the multi-layered coextrusion bead additional molten polymer material at timed intervals and at a higher pressure than the pressure at which the coaxial layers of polymer material flow by using a high flow device so as to create a back pressure sufficient to temporarily stop the flow of the coaxial layers of polymer material and to allow this additional polymer material to flow alone out of the die, such that this additional polymer material forms those portions of the parison which will later be removed from the multi-layer article and recycled.

4,824,619

PROCESS OF PRODUCING POLYETHYLENE DRAWN FILAMENTS AND DRAWN FILMS

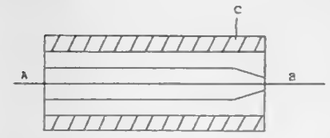
Fujio Okada, and Toshihiko Ohta, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Dec. 21, 1987, Ser. No. 135,235

Claims priority, application Japan, Dec. 19, 1986, 61-303448

Int. Cl.[4] B29C *47/92, 55/00*

U.S. Cl. 264—40.1 **17 Claims**



1. A process for producing polyethylene drawn filaments and drawn films which comprises molding under pressure a mixture of 51–90 parts by weight of polyethylene powder having a weight average molecular weight of at least 4×10^5 and having no history of being molten or dissolved after polymerization, and 49 to 10 parts by weight of a solvent at a temperature lower than the endothermic peak temperature of the mixture, and then hot-stretching the molded product.

4,824,620

METHOD FOR CONTROLLING THE CROSS-LINKING OF ELASTOMERS IN A MOULD

Fausto Casa, Bresso; Raniero Mendichi, Milan, and Angelo C. Bassi, Milan, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Division of Ser. No. 17,898, Feb. 24, 1987, Pat. No. 4,781,561.

This application Jul. 30, 1987, Ser. No. 79,825

Int. Cl.[4] B29C *35/02*

U.S. Cl. 264—40.1 **2 Claims**

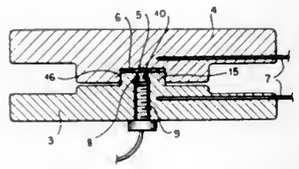
I. A method of checking progress of cross-linking in an elastomeric material, comprising the steps of:

(a) enclosing the elastomeric material in a fixed-volume mold with a predetermined mold-closing holding force and causing cross-linking of the material at a controlled constant temperature;

(b) while maintaining said force, measuring the pressure of the elastomeric material within the mold through an initial reduction in pressure representing the cross-linking and followed by a stage at which the reduction in pressure

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falls below a predetermined value, representing termination of cross-linking with a pressure probe in direct contact with said material;



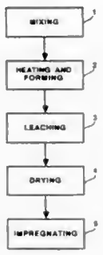
(c) detecting a stage in the measurement in step (b) at which said pressure falls below said predetermined value; and (d) automatically opening said mold in response to the detecting of said pressure falling below said predetermined value.

4,824,621

METHOD FOR MAKING AN INK-IMPREGNATED MATERIAL

Arthur L. Piepmeier, Jr., Cookeville, and Charles M. Nunally, Baxter, both of Tenn., assignors to Porelon, Inc., Cookeville, Tenn.

Division of Ser. No. 7,160, Jan. 26, 1987, Pat. No. 4,768,437.
This application Mar. 11, 1988, Ser. No. 166,680
Int. Cl.[4] C08J *9/26, 9/28*
U.S. Cl. 264—41 **14 Claims**



1. A method for making an ink-impregnated material, comprising:

mixing from about 8 to about 50% by weight of a thermoplastic resin powder with about 10 to about 90% by weight of a water-soluble salt and about 10 to about 50% by weight of a water-soluble, C_2-C_5 alkanediol to form a mixture;

heating said mixture in a mold to a temperature sufficient to melt said plastic and form a cohesive structure conforming to said mold;

leaching said salt and said polar organic liquid from said structure;

drying said structure; and

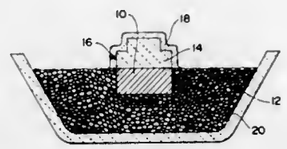
impregnating said structure with from about 40 to about 90% by weight of an ink.

4,824,622

METHOD OF MAKING SHAPED CERAMIC COMPOSITES

Christopher R. Kennedy, and Marc S. Newkirk, both of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 945,404, Dec. 22, 1986, abandoned.
This application Jun. 13, 1988, Ser. No. 207,924
Int. Cl.[4] C04B *33/32, 35/60*
U.S. Cl. 264—59 **29 Claims**



1. A method for producing a self-supporting ceramic composite body comprising a mass of filler material infiltrated by a ceramic matrix, said ceramic matrix being obtained by the oxidation of a parent metal to form a polycrystalline matrix comprising an oxidation reaction product of the parent metal, said method comprising:

(A) heating a parent metal to a temperature above its melting point but below the melting point of its oxidation reaction product to form a body of molten metal;

(B) contacting said body of molten metal with a permeable mass of filler material having at least one surface bearing a stratum, thereby forming an interface between the molten metal and the filler material, said stratum (a) substantially conforming to the geometry of said at least one surface, (b) being permeable to a vapor-phase oxidant, and (c) being permeable to infiltration by growth of the oxidation reaction product, and said stratum being at least partially spaced from said interface such that formation of said oxidation reaction product will occur into said mass of filler material and in a direction toward and at least partially into said stratum; and at said temperature:

(i) reacting said molten metal with an oxidant to form an oxidation reaction product,

(ii) maintaining at least a portion of said oxidation reaction product in contact with and between said molten metal and said oxidant, to progressively transport molten metal through the oxidation reaction product toward the oxidant so that oxidation reaction product continues to form at an interface between said oxidant and previously formed oxidation reaction product that has infiltrated said mass of filler material to produce a ceramic composite body, and

(iii) continuing said reacting to infiltrate at least a portion of said stratum with said oxidation reaction product to produce a ceramic stratum overlaying said ceramic composite body; and

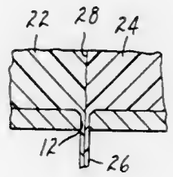
(C) removing said ceramic stratum from at least part of said at least one surface to produce a self-supporting ceramic composite body having said at least one surface established by said stratum.

4,824,623

A METHOD OF MAKING BICOMPONENT GREEN AND CERAMIC FIBERS

George M. Rambosek, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 809,065, Dec. 13, 1985, Pat. No. 4,707,399.
This application Jul. 20, 1987, Ser. No. 75,820
Int. Cl.[4] D01F *8/18, 9/08*
U.S. Cl. 264—60 **9 Claims**



1. A method for providing a bicomponent fiber comprising the steps of:

(a) separately preparing two viscous concentrates of aqueous-based precursor ceramic liquids of different compositions,

(b) placing said two viscous concentrates side-by-side in the feed cavity of a spinnerette assembly, said concentrates having essentially the same viscosities so that they meet at a line of interface with at most interface mixing,

(c) shaping said viscous concentrates into a fiber form by spinning or extruding and drawing, and

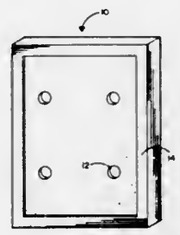
(d) gelling or hydrolyzing the resultant formed fiber to provide a non-refractory green fiber.

4,824,624

METHOD OF MANUFACTURING BORON CARBIDE ARMOR TILES

Richard J. Palicka, San Clemente, and John A. Negrych, Westminster, both of Calif., assignors to Ceradyne, Inc., Costa Mesa, Calif.

Filed Dec. 17, 1984, Ser. No. 684,930
Int. Cl.[4] B28B *11/00*
U.S. Cl. 264—67 **15 Claims**



1. A method of manufacturing ceramic armor tiles having holes for receiving bolts; the method comprising the steps of:

(a) providing a billet of precompacted ceramic powder material;

(b) drilling the desired holes in the billet;

(c) preparing plugs comprising material that is chemically compatible with and has compaction characteristics similar to the ceramic powder material;

(d) pressing the plugs into respective billet holes;

(e) hot pressing the billet and plugs; and

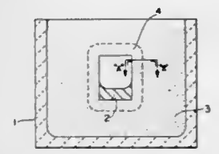
(f) removing the plugs.

4,824,625

PRODUCTION OF CERAMIC AND CERAMIC-METAL COMPOSITE ARTICLES INCORPORATING FILLER MATERIALS

T. Dennis Claar, Newark, Del.; Steven D. Poste, Ontario, Canada; Adam J. Gesing, Ontario, Canada; Marek Sobczyk, Ontario, Canada; Narashima S. Raghavan, Ontario, Canada; Dave K. Creber, Ontario, Canada, and Alan S. Nagelberg, Wilmington, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Sep. 16, 1986, Ser. No. 907,927
Int. Cl.[4] E27J *5/00;* **D04H** *1/54*
U.S. Cl. 264—126 **33 Claims**



1. A method of producing a composite comprising a self-supporting polycrystalline material obtained by the oxidation reaction of a molten parent metal with a vapor-phase oxidant comprising: providing control of infiltration of a molten parent metal into a permeable mass of filler material and in-situ oxidation of the molten parent metal with a vapor phase oxidant in the permeable mass of filler material, said control being sufficient to provide a predetermined relative proportion of oxidized to non-oxidized parent metal within the composite, by,

(a) selecting a parent metal and a permeable mass of filler material exhibiting inter-particle pore volume;

(b) heating said parent metal in the presence of a vapor-phase oxidant at a temperature above its melting point to form a body of molten parent metal, and contacting the resulting molten metal body with said permeable mass of filler material;

(c) maintaining said temperature for a time sufficient to permit (i) infiltration of said filler material by said molten metal and (ii) oxidation reaction of said molten metal with said vapor-phase oxidant, under conditions which control the rate of infiltration of said metal and the rate of said oxidation reaction such that the oxidation reaction which occurs between said molten parent metal and said vapor-phase oxidant is effected inside of the infiltrated mass of filler material within at least a portion of the inter-particle pore volume such that the oxidation reaction product formed inside of said mass, together with any unoxidized portion of the parent metal provides a matrix embedding the material; and

(d) recovering said composite.

4,824,626

PROCESS FOR THE REPRODUCTION OF WORKS OF ART OF LITHOID MATERIAL

Guglielmo Galli, Florence, and Adolfo Pasetti, Milan, both of Italy, assignors to Assimout S.p.A., Milan, Italy

Filed Mar. 13, 1987, Ser. No. 25,673
Claims priority, application Italy, Mar. 14, 1986, 19761 A/86
Int. Cl.[4] B29C *33/40;* **C10M** *141/00, 145/18*
U.S. Cl. 264—130 **7 Claims**

1. In a process for the reproduction of works of art of lithoid material comprising using a silicone rubber negative mold of the work of art, the mold being obtained by coating the work of art with the silicon rubber, the improvement consisting essentially in applying a thin layer of a fluorinated grease, based on polytetrafluoroethylene and on a liquid perfluoropolyether having neutral terminals, on the work of art before coating the work of art with the silicon rubber, remov-

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ing the mold from the work of art, and removing the layer of grease from the work of art without leaving appreciable residual traces of the grease thereon.

4,824,627

METHOD OF MAKING A MOLDED PLASTIC PRODUCT

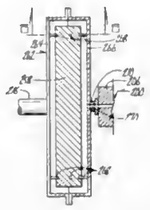
Floyd V. Hammer, R.R. 1, Union, Iowa 50258, and Brian Harper, Havant, United Kingdom, assignors to Floyd V. Hammer, Iowa Falls, Iowa

Continuation-in-part of Ser. No. 889,636, Jul. 28, 1986, Pat. No. 4,738,808, which is a division of Ser. No. 798,886, Nov. 18, 1985, Pat. No. 4,626,189. This application Apr. 12, 1988, Ser. No. 180,381

Claims priority, application Canada, Sep. 5, 1986, 517644; United Kingdom, Oct. 16, 1986, 8624853

Int. Cl.[4] B29C *33/34, 45/14, 47/02, 47/60*

U.S. Cl. 264—211.21 **5 Claims**



1. A method for molding plastic objects comprising:

taking a combination of waste plastic materials which have been ground into a comminuted mixture, said combination of plastic materials comprising at least two materials selected from a group of materials consisting essentially of polyester, polyethylene, polypropylene, and metal;

feeding said mixture into a hopper of a screw extruder capable of applying heat and pressure to said mixture;

using said screw extruder to heat said mixture to a temperature of approximately 350 degrees–600 degrees Fahrenheit whereby said mixture will melt and to force said molten mixture outwardly through a die opening under a pressure of from approximately 100 lbs. per sq. inch to 600 lbs. per sq. inch;

holding the inlet opening of a mold in tightly sealed relationship over said die opening so as to receive said molten mixture issuing from said die opening, said mold having an enclosed cavity in communication with said inlet opening for receiving said molten mixture;

continuing to use said screw extruder to force said molten mixture through said die opening and said inlet opening into said enclosed cavity of said mold until said mold is completely filled with said molten mixture at a pressure of from 100 to 600 p.s.i.;

removing said mold from said screw extruder after said cavity is filled;

permitting said mixture within said mold to cool and harden;

removing said hardened mixture from said mold.

4,824,628

METHOD OF MAKING AN EPOXY MOLD

William A. Curfman, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 20, 1988, Ser. No. 145,944

Int. Cl.[4] B29C *33/38, 39/10*

U.S. Cl. 264—225 **1 Claim**

1. A method of fabricating a wax pattern casting mold for disposition between pressure application surfaces comprising the steps of:

forming a first pouring chamber having a planar bottom surface,

forming a pattern plug in said first pouring chamber extending from said bottom surface into said first pouring chamber,

forming a plurality of first force transfer members each having a planar inner end face and an outer end face and an axial bore extending between said inner and said outer end faces,

forming right hand screw threads over at least a portion of the length of said axial bore in each of said first force transfer members,

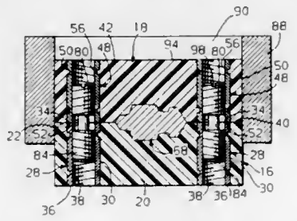
locating each of said first force transfer members in said first pouring chamber remote from said pattern plug with said inner end face thereof abutting said bottom surface,

pouring curable plastic material into said first pouring chamber around said pattern plug and around each of said first force transfer members and allowing said curable plastic material to cure,

removing said cured plastic material from said pouring chamber,

said removed cured plastic material forming a first mold section having a planar parting surface corresponding to said bottom surface of said first pouring chamber in which are disposed said inner end faces of each of said force transfer members, forming a plurality of connecting studs each having a right hand screw thread at one end and an a left hand screw thread at the other end,

threading said right hand screw thread of each of said connecting studs into the right hand screw threads of respective ones of said first force transfer members so that said connecting studs extend perpendicular to said first mold section parting surface,



forming a plurality of second force transfer members each having a planar inner end face and an outer end face and an axial bore extending between said inner and said outer end faces,

forming left hand screw threads over at least a portion of the length of said axial bore in each of said second force transfer members,

threading said left hand screw threads of each of said second force transfer members onto said left hand screw threads on respective ones of said connecting studs until said inner end face of each of said second force transfer members abuts said inner end face of the corresponding one of said first force transfer members,

forming a second pouring chamber around said second force transfer members with said first mold section parting surface defining a bottom surface of said second pouring chamber,

pouring curable plastic material into said second pouring chamber around each of said second force transfer members and allowing said curable plastic material to cure,

removing said second pouring chamber from around said cured plastic material,

said cured plastic material forming a second mold section attached to said first mold section by said connecting studs and having a planar parting surface abutting said first mold section parting surface, and

removing each of said connecting studs from said first and said second mold sections by unthreading said connecting studs in turnbuckle fashion to separate said first and said second mold sections.

4,824,629

PROCESS FOR PREPARING AN ORIENTED CRYSTALLINE SYNDIOTACTIC VINYLAROMATIC POLYMER

Jerry T. Seitz; Charles A. Berglund, and Andrew J. Pasztor, Jr., all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 4, 1988, Ser. No. 152,126

Int. Cl.[4] B29C *55/02*

U.S. Cl. 264—291 **9 Claims**

1. A process for preparing an oriented, crystalline, syndiotactic vinylaromatic polymer comprising:

(1) heating a syndiotactic vinylaromatic polymer to a temperature above the crystalline melting point;

(2) cooling the syndiotactic vinylaromatic polymer to a temperature less than an orientable temperature at a rate of cooling sufficient to result in a cooled polymer that is substantially amorphous;

(3) heating the syndiotactic vinylaromatic polymer to an orientable temperature;

(4) imparting sufficient strain into the vinylaromatic polymer in one or more directions to produce molecular orientation and crystal formation; and

(5) recovering the oriented, syndiotactic, vinylaromatic polymer.

4,824,630

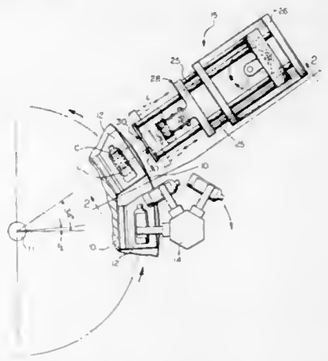
METHOD AND APPARATUS FOR APPLYING LABELS IN THE MOLDS OF A PLASTIC BLOW MOLDING MACHINE

Gerald L. Mohney, Maumee, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Feb. 25, 1988, Ser. No. 160,561

Int. Cl.[4] B29C *49/24, 49/20*

U.S. Cl. 264—509 **7 Claims**



1. In a method of operating a blow molding apparatus having a plurality of sets of molds on a wheel rotatable about a horizontal axis wherein the mold sections are moved toward and away from one another to enclose a parison and the parison is then blown to the confines of the cavity between the mold sections a the wheel rotates, the improvement for delivering labels to the cavities of the open mold sections which comprises

moving a web of label material past a die punch station,

punching labels successively from said web by a punch and delivering them directly to vacuum devices by said punch, and

moving the vacuum devices into the open mold sections and transversely relative to the mold sections to deliver the labels to the open mold sections.

4,824,631

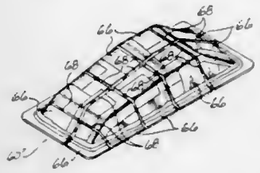
METHOD OF MANUFACTURING A CONTOURED ELASTOMERIC PAD

James F. Yeager, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 28, 1987, Ser. No. 55,243

Int. Cl.[4] B29C *43/12, 65/70*

U.S. Cl. 264—552 **10 Claims**



1. A method of manufacturing a contoured pressure pad of a type used for applying pressure to a contoured composite part during curing of said part, comprising:

providing a previously manufactured composite part of the desired size and contour, to serve as a form for the pressure pad;

applying uncured, heat curable elastomer to said part, to form on said part an uncured elastomeric member of desired thickness;

heat curing said elastomeric member while it is on said part; and

resizing the elastomeric member to correct for shrinkage caused by the heat curing, comprising:

cutting the cured elastomeric member into sections;

positioning the sections on the part, each on a region of the part to which it substantially conforms in size and shape;

applying additional uncured elastomeric material to fill gaps between the sections and splicing the sections together; and

heat curing the additional uncured elastomeric material while the elastomeric member is on the part, to unify the elastomeric member and substantially conform its inner surface to the contour of the part, enabling the member to be used as a pressure pad in the manufacture of additional parts of the same size and shape.

4,824,632

FUEL ASSEMBLY ALIGNMENT PIN STRAIGHTENING DEVICE

Robert E. Meuschke, Penn Hills, and Edward P. Shields, N. Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1987, Ser. No. 140,175

Int. Cl.[4] G21C *19/00, 19/26*

U.S. Cl. 376—261 **22 Claims**

17. A device for straightening bent fuel assembly alignment pins which project from a bottom surface of a nuclear reactor upper core plate, said device comprising:

an elongated mast including a plurality of segments, said mast having an upper and lower portion;

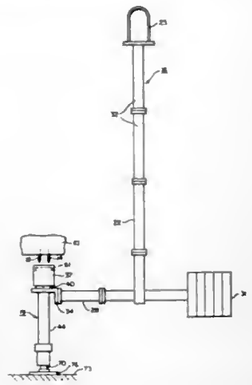
a support bail secured to the upper portion;

a cross member comprising at least one segment secured to the lower portion and generally perpendicularly disposed to the elongated mast;

a pin straightening assembly secured to one end of said cross member, said assembly further comprising:

(a) a housing having a top and bottom surface, said housing further having two vertical generally parallel holes disposed therein, a first hole adapted to receive an insert, and

a second hole which has an internal diameter substantially greater than that of a fuel assembly alignment pin;
(b) a die insert made of hardened material, having a bore disposed therein, said insert adapted to be secured within the first hole;
(c) a wedge-shaped shim adapted to be received on the top surface of the housing, said shim also having two holes therethrough such that the two holes are concentric with the two vertical holes of the housing;
(d) a baseplate adapted to secure the pin straightening assembly to the cross member;



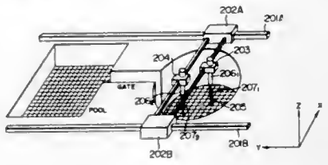
(e) a plurality of axially compressible and laterally deformable compression springs connected between the housing and the baseplate, whereby the housing is provided with both angular and translational compliance; and
(f) a hydraulic ram connected to the baseplate opposite the housing, said ram adapted to lift the shim on the top surface of the housing into full planar contact with the bottom surface of the upper core plate whereby a bent pin is received in the bore of the hardened die insert and straightened and a generally straight pin is received within the second hole.

4,824,633

METHOD AND APPARATUS FOR CONTROLLING REFUELLING MACHINE OF REACTOR

Yoshiaki Ichikawa, Hitachiota; Makoto Senoh, Ibaraki; Kenji Tsuchita, Hitachiota; Akira Koizumi, Hitachi, and Kunihiko Iwama, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,132
Claims priority, application Japan, Sep. 26, 1986, 61-227215
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—268 **8 Claims**



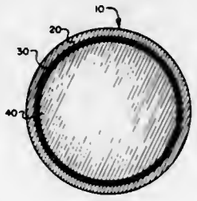
1. A method for controlling a refuelling machine of reactor including a plurality of grippers comprised of a plurality of telescopic bars which are telescopically actuatable independently of each other and at least one gripping member mounted to each telescopic bar, said controlling method comprising the steps of:
(a) storing a procedure representative of operations to be carried out by respective grippers in sequence of steps to be executed (gripper manipulation procedure) in gripper manipulation procedure memory means;
(b) determining allowable directions of the movement (directions of allowed motion) of the individual grippers on the basis of a position of each gripper, whether each gripper suspends a load and whether a suspended fuel element is shaking;
(c) executing operations of individual grippers to be carried out thereby in accordance with the directions of allowed motion during an execution step described in said gripper manipulation procedure read out of said gripper manipulation procedure memory means; and
(d) deciding whether the operations of the individual grippers are terminated during said execution step, whereby a subsequent execution step is read out of said gripper manipulation procedure memory means when said operations are terminated and when not terminated, said operations of the individual grippers are permitted to continue proceeding.

4,824,634

ELEMENT WITH BURNABLE POISON COATING

Nathan Fuhrman, Plainville, and William J. Bryan, Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 5, 1987, Ser. No. 81,969
Int. Cl.[4] G21C *3/00*
U.S. Cl. 376—419 **7 Claims**



1. In a fuel element for use in a nuclear reactor which includes a fission material contained within a zirconium-alloy cladding tube, the improvement which comprises:
a coating on the inside of the zirconium-alloy cladding tube, said coating including boron-containing compound burnable poison particles deposited from a liquid suspension which includes an acrylic polymer binder material.

4,824,635

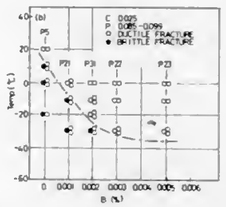
P-ADDED FERRITIC STAINLESS STEEL HAVING EXCELLENT FORMABILITY AND SECONDARY WORKABILITY

Kazuo Hoshino; Katsuhisa Miyakusu, and Isami Shimizu, all of Yamaguchi, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 737,405, May 24, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 40,102
Int. Cl.[4] C22C *38/32*
U.S. Cl. 420—42 **1 Claim**

1. P-Added ferritic stainless steel having excellent formability and secondary workability consisting essentially of, in % by weight,
C; 0.0050 to 0.0500%,
Cr; 10.00 to 18.00%,
Si; up to 0.50%,
Mn; up to 0.50%,
P; more than 0.040% but not more than 0.200%,
S; up to 0.030%,

Ni; up to 0.60%,
Sol.Al; 0.005 to 0.200%, and
B; 0.0020 to 0.0050%,



the balance being Fe and unavoidable impurities, and having a longitudinal cracking transition temperature of not higher than −10° C. as determined by the cup expansion test hereinbefore described.

4,824,636

AUSTENITIC STEEL WITH IMPROVED HIGH-TEMPERATURE STRENGTH AND CORROSION RESISTANCE

Sergio Vacchiano, Rome; Giovanni Lanfranco, St. Vincent, and Roberto Gubliotti, Terni, all of Italy, assignors to Centro Sviluppo Materiali S.p.A., Rome, Italy

Filed Mar. 5, 1987, Ser. No. 22,204
Claims priority, application Italy, Mar. 17, 1986, 47782 A86
Int. Cl.[4] C22C *38/44, 38/46, 38/48*
U.S. Cl. 420—59 **1 Claim**

1. Austenitic steel with improved and long-term constant high-temperature strength and resistance to aggressive agents, comprising the following elements in % by weight:
0.40–0.65 carbon
0.35–0.60 nitrogen
2.0–3.0 manganese
22.0–24.0 chromium
7.5–8.5 nickel
0.7–1.3 molybdenum
0.6–1.2 vanadium
0.7–1.5 niobium
up to 0.3 silicon
up to 0.03 sulphur
up to 0.025 phosphorus
balance essentially iron, carbon, nitrogen, vanadium, molybdenum and niobium being intercorrelated by specific ratios, said specific ratios being expressed in atomic fractions through the following mathematical relations:
(A) Nb+V/C+N=0.25–0.45
(B) N/C=0.60–1.10
(C) V/Nb=0.50–2.0
(D) Mo/C=0.15–0.25.

4,824,637

ALLOY PHASE STABILITY INDEX DIAGRAM

Natsuo Yukawa, and Masahiko Morinaga, both of 2-1, Higashiura, Kitayama-cho,, Toyohashi City, Aichi Pref., Japan

Continuation of Ser. No. 843,061, Mar. 24, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 147,047
Claims priority, application Japan, Aug. 29, 1985, 60-190220
Int. Cl.[4] C22C *33/00*
U.S. Cl. 420—129 **25 Claims**

1. A process for producing an alloy having a mother metal and at least one alloying element (1), . . . (i) and having a phase stability being free from the precipitation of second phases which deteriorate alloy properties which comprises:
calculating an average value Bo of an alloy according to the following formula:

$$Bo = \sum_{k=1}^{i} Xk\,(Bo)k \qquad (2)$$

wherein Xk is an atomic fraction of an alloying element (k), (Bo)k is a bond order between a mother metal and said alloying element (Bo)k, and k is 1, 2, . . . , i;
preparing an alloy phase stability index diagram of said alloy with known compositions of said mother metal and said alloying elements (1), . . . (i), said diagram having two axes corresponding to an ordinate and an abscissa in which said Bo thus defined is taken along a first axis and a property of said alloy is taken along a second axis; and
preparing said alloy having such amounts of said alloying elements as determined from said alloy phase stability index diagram.

4,824,638

CORROSION RESISTANT ALLOY

John H. Culling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 067,220, Jun. 29, 1987, abandoned. This application Apr. 1, 1988, Ser. No. 176,409
Int. Cl.[4] C22C *30/02*
U.S. Cl. 420—582 **12 Claims**

1. An air-meltable, castable, workable, non-magnetic alloy resistant to chlorides and other corrosive chemicals, consisting essentially of between about 20.5% and about 32% nickel, between about 23.5% and about 27.5% by weight chromium, between about 4.0% and about 6.7% by weight molybdenum, between about 0.7% and about 3.6% by weight copper, up to about 0.09% by weight carbon, up to about 1.5% by weight silicon, up to about 5% by weight cobalt, up to about 0.45% by weight nitrogen, up to about 1% by weight titanium, up to about 0.8% by weight niobium, up to about 0.3% of a rare earth component selected from the group consisting of cerium, lanthanum, and misch metal, up to about 2% by weight manganese, up to about 1.6% by weight tantalum, and the balance essentially iron, the sum of the nickel content and the cobalt content being between about 25.5% and 32% by weight and exceeding the chromium content by between about 2% and about 6.2% by weight, basis the entire alloy.

4,824,639

TEST DEVICE AND A METHOD FOR THE DETECTION OF A COMPONENT OF A LIQUID SAMPLE

Karlheinz Hildenbrand, Krefeld; Hans-Hagen von Döhren, Bochum-Langendreer; Hermann Perrey, Krefeld, all of Fed. Rep. of Germany; Georg Frank, Elkhart, Ind., and Rolf Dhein, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 35,821, Apr. 8, 1987, abandoned, which is a continuation of Ser. No. 704,825, Feb. 25, 1985, abandoned. This application Feb. 3, 1988, Ser. No. 151,779
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407359
Int. Cl.[4] G01N *31/22, 33/483*
U.S. Cl. 422—56 **17 Claims**

1. A test device for the detection of a component in a liquid sample, the device comprising a support layer, a microporous polymer layer, one side of which facing the support, the other side of which being a side on which a sample can be applied and a reagent system for the detection of the component to be determined, the reagent system being incorporated in the polymer layer, the microporous polymer layer being a membrane which has an asymmetric pore structure with the pores narrowing toward the side to which the sample is applied, the microporous polymer layer being synthesized from a polymer selected from the group consisting of polyamides, polyether carbonates, polyacryloaitriles and polyurethanes and being produced by coagulation of a solution of the polymer, and the

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support layer being macroscopically smooth and impermeable to the sample.

15. A method for detecting a component in a liquid sample comprising bringing said sample into contact with a test device according to claim 1, said sample being applied in such a manner so that the sample enters the membrane at a surface thereof having narrower pore diameters and detecting the presence of the sample.

4,824,640

TRANSPARENT TEST STRIP SYSTEM

Karlheinz Hildenbrand, Krefeld; Hans-Hagen Von Döhren, Bochum-Langendreer; Hermann Perrey, Krefeld, and Klaus Wehling, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 923,536

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540526

Int. Cl.⁴ G01N *31/22*

U.S. Cl. 422—56 **11 Claims**

1. A transparent reagent carrier layer for an analytical agent for dry chemical detection of constituents of aqueous sample solutions, comprising within one layer a water-soluble or water-swellable component selected from the group consisting of a polyacrylamide, a polyacrylic acid, cellulose ether, polyethyleneimine, polyvinyl alcohol, a copolymer of vinyl alcohol and vinyl acetate, gelatine, agarose, alginate and polyvinyl pyrrolidone, and an essentially water-insoluble film-forming component selected from the group consisting of a polystyrenesulfonic acid, a cellulose ester, a polyvinyl acetate, a polyamide, a polycarbonate, a polyether-carbonate, a ionic polyurethane, a non-ionic polyurethane, mixtures thereof and copolymers thereof.

4,824,641

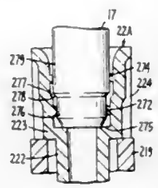
CAROUSEL AND TIP

Fred G. Williams, San Anselmo, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Filed Jun. 20, 1986, Ser. No. 877,026

Int. Cl.⁴ G01N *35/06*

U.S. Cl. 422—100 **5 Claims**



1. In a pipette system having a generally cylindrical pipette nozzle having an attachment end defining a passageway, having an end surface and having an outer generally cylindrical surface which can engage a pipette tip, means for achieving axial movement of said pipette nozzle and a pipette tip having a generally cylindrical inner surface detachably affixed to said pipette nozzle by engagement of said inner surface of the pipette tip with the outer surface of the nozzle in fluid communication with said passageway; the improvement comprising employing as said pipette nozzle a pipette nozzle having an outer surface defining a plurality of generally cylindrical pipette nozzle sections each having a nozzle section height and a nozzle section diameter, said nozzle section diameter for each of said pipette nozzle sections being different from that of the others with the generally cylindrical pipette nozzle section of smallest nozzle section diameter being adjacent to the end surface of said nozzle and the other generally cylindrical pipette nozzle sections positioned in order of increasing nozzle section diameter away from the end surface and employing as said tip a disposable pipette tip comprising an elongated truncated conical double open-ended tube section having a small end defining a passageway for vacuum uptake and pressure discharge of liquid and a large end joined to and in fluid communication with a first end of a pipettereceiving collar portion extending radially away from the conical tube section, said collar portion having a bell mouthed opening at its second end and an inner surface defining a plurality of generally cylindrical tip sections each having a tip section height and a tip section diameter different from that of the others with the generally cylindrical tip section having of largest diameter being adjacent to the bell mouthed opening and the other generally cylindrical tip sections positioned in order of decreasing tip section diameter toward the first end of the collar the tip section height and tip section diameter of each of the tip sections being related to the nozzle section height and nozzle section diameter of a nozzle section so as to permit nestling insertion of said nozzle into the collar of said tip, at least two of said plurality of generally cylindrical tip sections each carrying an inward-extending circumferential sealing rib, the at least two ribs being axially displaced from one another, being integral with the collar portion and capable of deforming in contact with a generally cylindrical collar section to give a vacuum uptake and pressure discharge seal upon direct nontwisting axial insertion of the nozzle of said pipette into the collar portion via its bell mouthed open end.

4,824,642

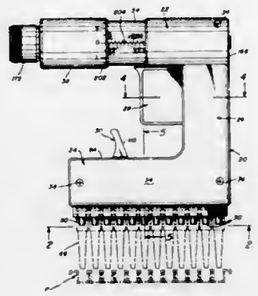
MULTI-CHANNEL PIPETTER

George Lyman, Rocky Point, and Gregory Mathus, Concord, both of Mass., assignors to Costar Corporation, Cambridge, Mass.

Filed Oct. 21, 1986, Ser. No. 921,319

Int. Cl.⁴ G01N *1/14*

U.S. Cl. 422—100 **20 Claims**



1. A multi-channel pipetter comprising

a U-shaped housing having generally parallel upper and lower arms and an interconnecting hand grip portion,

a plurality of parallel cylinders in a circular array disposed in the upper arm of the housing and a plurality of pistons movable in and out of respective ones of said plurality of cylinders,

a plurality of nozzles mounted on the lower arm of the housing and tubing connecting each of said plurality of nozzles to respective ones of said plurality of cylinders, said tubing extending from the lower arm to the upper arm through the grip portion,

a means including a trigger mechanism connected to each of said plurality of pistons and mounted on the grip portion for actuating said plurality of pistons through a stroke length to draw a quantity of fluid into and expel fluid from said plurality of cylinders via respective ones of said plurality of nozzles.

4,824,643

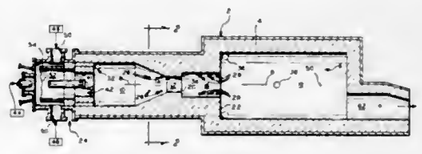
APPARATUS FOR PRODUCING CARBON BLACK

Mark L. Gravley, and E. Webb Henderson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 759,376, Jul. 26, 1985. This application May 18, 1987, Ser. No. 50,363

Int. Cl.⁴ C09C *1/48*

U.S. Cl. 422—151 **5 Claims**



1. A carbon black reactor comprising

(a) a refractory sidewall defining a reaction flow passage having a longitudinal axis, said passage having the following zones:

(i) a combustion zone;

(ii) a reactor throat zone;

(iii) a converging zone converging from said combustion zone to said reactor throat zone;

(iv) a quench zone having cross sectional dimension of at least three times the cross sectional dimension of said reactor throat zone;

(v) a reaction zone connecting said reactor throat zone with said quench zone, said reaction zone having a cross sectional dimension less than that of said quench zone and in the range of 1.1 to 3 reactor throat diameters and a length in the range of 2 to 6 reactor throat diameters; and

(vi) a tail pipe zone connecting said quench zone with an exit port;

said sidewall further forming a first generally radially perpendicular wall where said reactor throat zone connects with said reaction zone;

said sidewall further forming a second generally radially perpendicular wall where said reaction zone connects with said quench zone;

(b) a burner positioned for axial flow of combustion gases from said combustion zone through said quench zone and out said tail pipe zone;

(c) port means radially extending through said sidewall in said converging zone for positioning at least one oil injector means and oil injector means associated therewith for introducing a carbonaceous feedstock radially inwardly toward said longitudinal axis;

(d) port means radially extending through said sidewall in said reaction zone for positioning at least one oil injector means and oil injector means associated therewith for introducing a carbonaceous feedstock generally radially inwardly toward said longitudinal axis; and

(e) port means for introducing a quench fluid into said quench zone.

4,824,644

RECIRCULATING HIGH VELOCITY HOT AIR STERILIZING DEVICE HAVING IMPROVED INTERNAL INSULATION STRUCTURE

M. Keith Cox, Dallas, Tex., and Virgil L. Archer, Boyce City, Okla., assignors to Archeraire Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 44,909, Apr. 30, 1987. This application Oct. 8, 1987, Ser. No. 106,182

Int. Cl.⁴ A61L *2/00*

U.S. Cl. 422—300 **12 Claims**

1. A recirculating hot air sterilizer comprising:

wall means for defining a sterilization chamber separated from a supply air plenum by a plate member having a series of jet-forming openings formed therethrough, said sterilization chamber being partially bounded by a deflection wall spaced apart from and extending generally parallel to said plate member;

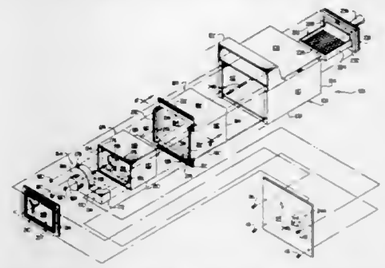
support means for supporting objects to be sterilized within said sterilization chamber in a mutually spaced relationship with each other and in a spaced relationship with said plate member and said deflection wall, said jet-forming openings being positioned and arranged so as to both impinge high velocity air flowed therethrough, upon first surface portions of said objects supported on said support means and to bypass high velocity air around the supported objects; and

hot air recirculating means for creating a recirculating hot air flow within said wall means which sequentially:

enters said supply air plenum;

is forced through said jet-forming openings to form a series of relatively high velocity impingement air jets directed toward said deflection wall so that a first number of said jets impinge upon first surface portions of objects supported by said support means within said sterilization chamber, and a second number of said jets bypass the supported objects, strike said deflection wall and are deflected thereby onto opposite surface portions of the objects in the form of redirected, relatively high velocity jets which form with said first number of said jets a turbulent, heated air layer around the objects,

is drawn outwardly through said sterilization chamber in a direction generally transverse to said jets and said redirected jets to move said air layer across the objects in a direction generally transverse to said jets and said redirected jets, and



is then returned to said supply air plenum,

said wall means comprising an inner housing having a wall section extending along said sterilization chamber and said air supply plenum, said wall section having a return opening extending therethrough into said sterilization chamber, and a supply opening extending therethrough into said supply air plenum,

said sterilizer further comprising an outer housing enveloping said inner housing and having an access wall section being movable to permit insertion of said inner housing into said outer housing and to permit access to said wall section of said inner housing, said inner and outer housings having aligned openings therein through which a portion of said support means may be inserted into said sterilization chamber,

said hot air recirculating means including a fan, duct and heating element assembly removably secured to said wall section of said inner housing and including:

a recirculating fan having an outlet, and an inlet communicating with said sterilization chamber through said return opening,

a supply duct connected to said outlet and having an open discharge end communicating with said supply air plenum through said supply opening, and

a heating element operatively disposed within said supply duct; and

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an insulating jacket structure extending around and removably receiving said inner housing and said fan, duct and heating element assembly, said insulating jacket structure having a hollow shell portion captively retaining insulation therein, and having an access wall section being movable to permit insertion of said inner housing into the interior of said jacket structure.

4,824,645

PROCESS FOR SELECTIVELY REMOVING HYDROGEN SULFIDE FROM A GAS STREAM AT HIGH PRESSURE

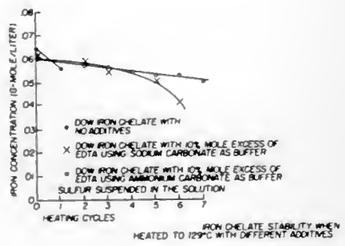
Timothy A. Jones, Carrollton, and Earl S. Snavely, Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 361,947, Mar. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 336,796, Jan. 4, 1982, abandoned. This application May 25, 1984, Ser. No. 614,010

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.⁴ B01D *53/16;* **C01B** *17/05*

U.S. Cl. 423—226 **3 Claims**



1. A method for selectively removing hydrogen sulfide from a gas stream from a natural gas production well containing hydrogen sulfide and carbon dioxide, comprising contacting the gas stream with a stoichiometric excess of a polyvalent metal chelate solution over said hydrogen sulfide said solution having a pH of about 8.0 to 9.2 for a time period less than 80 milliseconds to absorb hydrogen sulfide and not carbon dioxide, by flowing said gas stream and said solution past from two to six mixing elements in a static mixer, said gas stream being at a wellhead pressure of about 760–880 psig during said contacting period.

4,824,646

REMOVING NOX FROM CRYOGENIC SYSTEMS

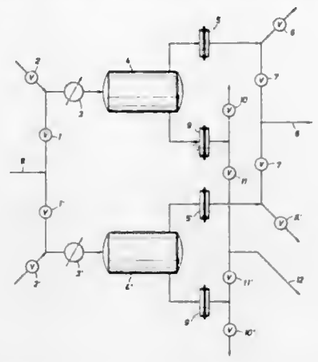
Weston W. Haskell, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1987, Ser. No. 129,118

Int. Cl.⁴ B01D *53/36*

U.S. Cl. 423—235 **12 Claims**

1. A process for the removal of NO_x impurities from a gas stream which comprises treating the gas stream containing NO_x impurities under cryogenic conditions with oxygen and



an unsaturated hydrocarbon, removing solid N_2O_3 from the gas stream and recovering a gas stream reduced in NOx.

4,824,647

METHOD OF REMOVING ACID GAS POLLUTANTS FROM FLUE GASES

Donald S. Scott, 382 Arden Place, Waterloo, Ontario, Canada (N2L 2N7)

Filed May 27, 1987, Ser. No. 54,509

Claims priority, application Canada, Jun. 3, 1986, 510745

Int. Cl.⁴ C01B *17/00, 21/00;* **B01J** *8/00*

U.S. Cl. 423—235 **10 Claims**

1. A method of wet scrubbing a gas stream containing acid gas pollutants, said pollutants being at least one of a sulfur oxide or a nitrogen oxide, said method comprising introducing said gas and a slurry of a suitable low rank coal in water into any appropriate type of slurry-gas contactor, said coal having exchangeable cations associated with it, contacting said gas with said slurry while controlling pH in a range of 2.5 to 6, many of said cations being replaced during said contact by hydrogen ions formed in siad slurry, said exchangeable cations combining with said pollutants to form soluble salts in said slurry, said method removing substantially all of said pollutants from the gas stream and removing pollutants from and reducing the ash content of the coal, removing the gas stream and removing the slurry from the contactor, separating the liquid part of the slurry from the coal, the soluble salts being taken away from the coal in the liquid slurry.

4,824,648

PREPARATION OF LINEAR POLYCHLOROPHOSPHAZENES

Guy Pagniez, Poey De Lescar; Nadine Passimourt, Pau, and Philippe Potin, Billere, all of France, assignors to Atochem, Puteaux, France

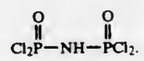
Filed Mar. 10, 1988, Ser. No. 166,368

Claims priority, application France, Mar. 10, 1987, 87 03250

Int. Cl.⁴ C01B *25/10*

U.S. Cl. 423—300 **4 Claims**

1. A process for the preparation of a linear polychlorophosphazene, comprising polycondensing N-(dichlorophosphoryl)-trichlorophosphazene [P_2NOCl_5], at least a part of the polycondensation reaction being carried out in the presence of a catalytically effective amount of the bis(dichlorophosphoryl)imide of the formula:



4,824,649

HIGH VISCOSITY POTASSIUM METAPHOSPHATE

Lieh-Jiun Shyu, Brewster, N.Y., assignor to Stauffer Chemical Company, Shelton, Conn.

Filed Aug. 31, 1987, Ser. No. 91,139

Int. Cl.⁴ C01B *25/30*

U.S. Cl. 423—314 **7 Claims**

1. A process for preparing potassium metaphosphate of high solution viscosity which comprises reacting potassium ion derived from potassium carbonate, potassium bicarbonate or potassium orthophosphate with phosphate ion in an amount sufficient to provide a K/P ratio on a molar basis ranging from about 0.85 to about 0.95 substantially in the absence of metal cation other than potassium under heat for a period of time and at a temperature sufficient to convert the potassium and phosphate ions to potassium metaphosphate but insufficient to overconvert.

4,824,650

METHOD FOR EXTRACTING ARSENIC AND HEAVY METALS FROM PHOSPHORIC ACID

Lloyd E. Segrist, 5110 N. Lawn, Kansas City, Mo. 64119

Filed Aug. 23, 1988, Ser. No. 235,208

Int. Cl.⁴ C01B *25/16*

U.S. Cl. 423—321 R **23 Claims**

1. A method of removing heavy metals from phosphoric acid, comprising the steps of contacting said phosphoric acid with a sulfiding agent and a liquid extractant, said sulfiding agent serving to react with said heavy metals and form sulfides thereof, and said extractant comprising carbon disulfide and serving to sequester said heavy metal sulfides, and thereafter recovering phosphoric acid.

4,824,651

PROCESS FOR PREPARING SILICON CARBIDE FIBERS

Volker Frey; Bernd Pachaly, and Norbert Zeller, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 22, 1988, Ser. No. 158,801

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707225

Int. Cl.⁴ C01B *31/36*

U.S. Cl. 423—345 **4 Claims**

1. A process for preparing silicon carbide fibers, which comprises spinning a copolymer obtained by reacting at least one disilane of the formula

$$R_2R^1Si_2(OCH_3)_3$$

in which R is selected from the group consisting of alkyl, alkenyl, aryl radicals and mixtures thereof and R^1 is an alkyl radical, with at least one compound of the formula

$$R_2R^2SiH$$

in which R is the same as above and R^2 is selected from the group consisting of a methoxy radical and R, in the presence of at least one compound of the formula

MOR

in which R is the same as above and M is an alkali metal, which compound functions as a catalyst, and a compound of the formula

$$HO—(R^1R^3SiO)_x(R_2{}^1SiO)_y—_nH$$

in which R^1 is the same as above, R^3 is an alkenyl radical, x is in the range of from 0.5 to 1.5, y is in the range of from 3 to 5 and n is in the range of from 500 to 2,000, into fibers and thereafter reacting the fibers under an inert atmosphere or in vacuo at temperatures in the range of from 800° to 1300° C.

4,824,652

METHOD FOR TREATING ACTIVATED SILICON POWDER

Hidehiko Hosokawa, Chiba, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 844,928, Mar. 27, 1986, abandoned. This application Mar. 18, 1987, Ser. No. 27,576

Claims priority, application Japan, Apr. 9, 1985, 60-75140

Int. Cl.⁴ C01B *33/02, 33/08, 33/00*

U.S. Cl. 423—348 **2 Claims**

1. A method for treating reaction residue from the preparation of organochlorosilanes or chlorosilanes from the reaction of metallic silicon with chlorinated hydrocarbon or hydrogen chloride, said reaction residue being chemically reactive and readily undergoing spontaneous combustion upon contact with the atmosphere, said method comprising

(A) combining the reaction residue with water, wherein the amount of water combined with the reaction residue is in a range from about 5–50 weight percent, based upon the weight of the reaction residue; and

(B) granulating the mixture of water and reaction residue from (A), utilizing heat of reaction from reaction of the reaction residue with water to dry resulting granules and to physically strengthen the granules.

4,824,653

METHOD OF BLEACHING LIMESTONE

Nelson Severinghaus, Jr., Nashville, Tenn., and Gregory R. Sharp, Anchorage, Ak., assignors to Franklin Industries, Inc., Nashville, Tenn.

Filed Sep. 29, 1988, Ser. No. 250,551

Int. Cl.⁴ C01F *5/24, 11/18, 11/06;* **C09C** *1/02*

U.S. Cl. 423—430 **19 Claims**

1. A method for improving the brightness of limestone containing at least a small amount of iron, comprising the steps of:

(a) grinding said limestone,

(b) forming a slurry of said ground limestone with water,

(c) adding a chelating agent capable of complexing divalent iron ions to said slurry in at least an amount sufficient to complex ions in said slurry,

(d) adding a bleaching agent selected from the group consisting of hydrosulfites, zinc sulfite, sulfur dioxide, or zinc dust to said slurry, in at least an amount sufficient to react with iron present in said slurry, and

(e) separating said limestone from the liquid in the slurry containing said iron.

4,824,654

PROCESS OF PRODUCING NEEDLE-SHAPED CALCIUM CARBONATE PARTICLES

Yoshio Ota; Norifumi Goto; Iwao Motoyama; Tetsushi Iwashita, and Kunio Nomura, all of Ogaki, Japan, assignors to Yabashi Industries Co., Ltd., Gifu, Japan

Filed Mar. 17, 1988, Ser. No. 169,397

Int. Cl.⁴ C09C *1/02;* **C01B** *5/24, 1/18*

U.S. Cl. 423—432 **8 Claims**

1. A process of producing needle-shaped calcium carbonate particles consisting of the steps of adding, aqueous calcium hydroxide solution of a concentration of 0.04–0.17 % by weight to an aqueous medium bath with a temperature of not less than 60° C. and to which carbon dioxide gas or a carbon dioxide-containing gas is being blown to generate needle-shaped calcium carbonate particles, the temperature of the aqueous medium bath being kept not less than 60° C. during the

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addition of the aqueous calcium hydroxide solution; and recovering the generated needle-shaped calcium carbonate particles,



said particles having an average length of 5 to 100 micrometers and an average diameter of 0.2–5.

4,824,655

PROCESS FOR THE PREPARATION OF SULPHUR DIOXIDE

Günter Lailach, and Rudolf Gerken, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 15, 1987, Ser. No. 97,241

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633710

Int. Cl.[4] C01B *17/50, 17/52, 17/90*

U.S. Cl. 423—541 R **5 Claims**

1. In a process for the preparation of sulphur dioxide comprising thermally decomposing a metal sulphate and/or a metal hydrogen sulphate in a fluidized bed reactor having a fluidized layer and being supplied with fluidizing air, with a sulphurcontaining reducing agent selected from the group consisting of sulphur, iron pyrites and a mixture thereof, the improvement which comprises

(a) controlling the amount of reducing agent to sulphate in a manner such that there is an sufficient amount of reducing agent to convert the sulphate to sulphur dioxide, "said amount being insufficient to provide all the necessary heat for the process",

(b) supplying 75 to 99% of the balance of the necessary energy to convert the sulphate to sulfur dioxide by a first energy supplier, said first energy supplier being a fuel selected from the group consisting of coal, coke, heavy fuel oils and mixtures thereof, said first energy supplier being fed into the fluidized bed reactor along with the metal sulphate and the sulphur containing reducing agent,

(c) supplying the remainder of the balance of the necessary energy to convert the sulphate to sulphur dioxide by a second energy supplier selected from the group consisting of fuel oil, natural gas and finely divided coal, the second energy supplier being introduced separately into the fluidized layer of the fluidized bed reactor and the second energy supplier being introduced into the reactor by mixing the fluidization air and

(d) controlling the amount of the second energy supplier so that a reaction temperature of 800° C. to 1100° C. is maintained in the reactor.

4,824,656

METHOD OF RECOVERING SULFUR FROM SOLID CATALYSTS

David A. Rice, Northport, and Alexander May, Tuscaloosa, both of Ala., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 29, 1987, Ser. No. 68,083

Int. Cl.[4] C01B *17/027;* **B01J** *38/66*

U.S. Cl. 423—578 A **9 Claims**

1. A method of recovering sulfur from a solid sulfur-containing catalyst comprising the steps of contacting the catalyst with anhydrous liquid ammonia at a temperature ranging from about −11.5° C. to about 40° C. and at pressures ranging from about 40 psi to about 250 psi so as to leach the sulfur from the catalyst and form an ammonia-sulfur solution, separating the catalyst from the ammonia-sulfur solution, and separating the ammonia from the ammonia-sulfur solution to obtain the sulfur product.

4,824,657

PROCESS FOR REDUCING SILICON, GERMANIUM AND TIN HALIDES

Prabhakar K. Jadhav, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 27, 1985, Ser. No. 802,230

Int. Cl.[4] C01B *6/06, 33/04*

U.S. Cl. 423—645 **12 Claims**

1. A process for making hydrides of silicon, germanium or tin which consisting essentially of reacting lithium hydride in tetrahydrofuran with halogen-containing compounds of silicon, germanium or tin, said process comprising the following steps:

(1) Adding at least one mole of lithium hydride to at least 0.5 mole tetrahydrofuran per mole of the halogen-containing compound and heating; then

(2) Adding the halogen-containing compound.

4,824,658

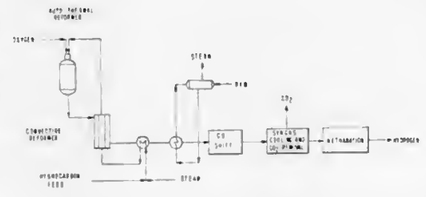
PRODUCTION OF SYNTHESIS GAS USING CONVECTIVE REFORMING

Maxim Karafian, Cold Spring Harbour, and Irving C. Tsang, Flushing, both of N.Y., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Division of Ser. No. 749,869, Jun. 27, 1985. This application Dec. 19, 1986, Ser. No. 944,327

Int. Cl.[4] C01B *3/38*

U.S. Cl. 423—652 **5 Claims**



1. A process for the convective reformation of a mixture of hydrocarbons and steam into a hydrogen-rich gas, comprising the steps of

(a) delivering substantially all of a feed mixture of hydrocarbons and steam to a first reformation zone which comprises convective reformation means;

(b) partially reforming the feed mixture in the first reformation zone at a temperature sufficient to reform from about 15% to about 25% of the hydrocarbon in the feed mixture;

(c) delivering the partially reformed effluent from the first reformaton zone to one or more additional reformation zones;

(d) completely reforming the partially reformed effluent into a hydrogen-rich gas in the additional reformation zones;

(e) directing at least a portion of the hydrogen-rich gas from step (d) back to the first reformation zone of step (a);

(f) effecting heat-exchange between the hydrogen-rich gas from step (e) and the feed mixture of hydrocarbons and steam in the first reformation zone, the hydrogen-rich gas being initially at a higher temperature than the feed mixture, such that the heat of reaction for the partial reformation is thus supplied from this exchange; and

(g) passing at least a portion of the heat-exchanged hydrogen-rich gas from step (f) to one or more additional heat-exchange zones located upstream of the first reformation zone of (a) for use as a heating fluid therein.

4,824,659

ANTIBODY CONJUGATES

Marion F. Hawthorne, Encino, Calif., assignor to Immunomedics, Inc., Warren, N.J.

Filed Jun. 7, 1985, Ser. No. 742,436

Int. Cl.[4] A61N *5/12;* **A61K** *49/02, 31/74, 42/02*

U.S. Cl. 424—1.1 **17 Claims**

1. A modified antibody or antibody fragment, consisting essentially of:

(1) at least one hypervariable region which specifically binds a ligand such that the formation of the resultant immunological complex is of diagnostic or therapeutic utility; and

(2) at least one defined, substantially homogeneous synthetic sequenced polymer whose constituent residues are linked by amide or urea or thiourea linkages or a combination thereof, and which incorporates residues containing a plurality of Boron-10 atoms;

wherein said synthetic sequenced polymer is chemically bound to said antibody or antibody fragment at one or more sites which do not substantially interfere with the immunological specificity of said hypervariable region.

4,824,660

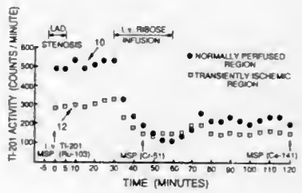
METHOD OF DETERMINING THE VIABILITY OF TISSUE IN AN ORGANISM

Debra A. Angelio, Charlottesville, Va., and Richard A. Wilson, Lake Oswego, Oreg., assignors to Paul S. Angello, Lake Oswego, Oreg., a part interest

Filed Jun. 6, 1985, Ser. No. 741,805

Int. Cl.[4] A61K *49/02, 49/00*

U.S. Cl. 424—1.1 **25 Claims**



1. A method of determining the viability of a region of heart tissue, comprising:

introducing a high energy phosphate precursor agent into the region of heart tissue;

introducing a blood flow marking medium into the circulatory system that supplies blood to the region of heart tissue; and

performing noninvasive myocardial imaging to monitor the amount of blood flow marking medium appearing in the region of heart tissue in response to the presence of the precursor agent, thereby to provide an indication of the viability of the region of heart tissue.

19. The method of determining the viability of a region of heart tissue, comprising:

introducing a quantity of ribose into the region of heart tissue;

introducing a blood flow marking medium into the circulatory system that supplies blood to the region of heart tissue; and

monitoring the amount of blood flow marking medium appearing in the region of heart tissue in response to the presence of the ribose, thereby to provide an indication of the viability of the region of heart tissue.

4,824,661

COMPOSITION FOR ORAL HYGIENE

Helmar R. Wagner, Darmstadt-Arheilgen, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 903,761

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532860

Int. Cl.[4] A61K *7/16, 7/18, 33/34*

U.S. Cl. 424—52 **6 Claims**

1. A composition for oral hygiene comprising a copper salt in an amount corresponding to from about 0.001 to 5% by weight of copper and from about 0.02 to 1.5% by weight of 2,4,4'-trichloro-2'-hydroxydiphenyl ether, wherein the weight percentages are based on the total weight of the composition.

4,824,662

NAIL POLISH REMOVER

William H. Hofmann, St. Louis, Mo., assignor to Vi-Jon Laboratories, Inc., St. Louis, Mo.

Filed Jun. 15, 1987, Ser. No. 62,200

Int. Cl.[4] A61K *7/47;* **C11D** *1/94*

U.S. Cl. 424—61 **3 Claims**

1. A nail polish remover composition having an active ingredient selected from the group consisting of ethyl acetate and acetone and containing as essential ingredients the combination about 0.1 to about 0.3% by weight of a surfactant and about 0.05 to about 0.25% by weight of a cosmetically acceptable amidoamine salt of hydrolyzed soy protein having a molecular weight of 1000–4000 and containing all of the essential amino acids for healthy looking keratin substrates, said soy protein being effective to substantially reduce the skin and nail water removal properties of the active ingredient in the nail polish remover.

4,824,663

BIOCIDAL MACROEMULSIONS CONTAINING POLYVINYL ALCOHOL

Wolfgang Wirth, Hennef; Heinz J. Niessen, Bergisch-Gladbach; John W. S. Goossens, and Hans Schulze, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengeselischaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 7, 1986, Ser. No. 837,465

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1985, 3508642; Apr. 11, 1985, 3512916

Int. Cl.[4] A01N *25/04, 57/00, 57/14*

U.S. Cl. 424—78 **9 Claims**

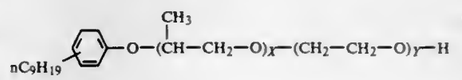
1. A macroemulsion consisting essentially of

0.001 to 60 percent by eight of at least one active compound from the group consisting of the insecticidal, acaricidal and/or nematicidal phosphates and carbamates,

0 to 50 percent by weight of an aromatic diluent,

0.001 to 20 percent by weight of polyvinyl alcohol having a mean molecular weight of between 5,000 and 150,000 and a content of acetate groups of between 2 and 30 mol % and/or

0.001 to 20 percent by weight of a nonylphenol/propylene oxide/ethylene oxide adduct of the formula



(I)

in which

X represents integers from 10 to 50 and

Y represents integers from 15 to 65,

and/or

0.001 to 20 percent by weight of an ethylene oxide/propylene oxide/ethylene oxide block copolymer having a mean moleculr weight of between 2,000 and 8,000 and HLB values of between 8 and 30,

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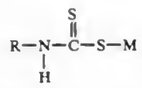
and water
and wherein
the oil phase of said macroemulsion is dispersed in the aqueous phase of said macroemulsion in the form of droplets having a mean particle diameter of 0.1 to 3.0 μm.
9. A method of combating pests comprising applying to said pests or habitat thereof the macroemulsion of claim 1.

4,824,664
EFFERVESCENT COUPLES, HISTAMINE H_2-ANTAGONIST EFFERVESCENT COMPOSITIONS CONTAINING THEM AND THEIR PREPARATION
René Tarral, Paris, and Jacky Mention, Leognan, both of France, assignors to Laboratoires Smith Kline & French, Paris, France
Filed Jan. 20, 1987, Ser. No. 4,725
Claims priority, application France, Jan. 22, 1986, 8600839
Int. Cl.[4] A01N 25/02; A61L 9/04
U.S. Cl. 424—43 16 Claims

1. A process for preparing an antacid effervescent couple wherein citric acid is mixed to an at least stoichiometric amount of alkali metal carbonate or bicarbonate and the homogenized mixture is granulated, characterized in that the mixture is allowed to react until a couple is obtained wherein citric acid is transformed in mono- and di-alkali metal citrate in a weight ratio comprised between about 8/1 and about 1/10, said reaction being stopped by drying under vigorous suction when from about 24% to about 54% of the potential amount of carbon dioxide is released.

4,824,665
BARK BEETLE TREATMENT
Lary Roton, Rt. #2, Box 411, Poliock, La. 71467
Filed Mar. 31, 1987, Ser. No. 32,864
Int. Cl.[4] A01N 25/00
U.S. Cl. 424—84 16 Claims

1. A method for controlling bark beetle infestations of pine trees comprising introducing into the cambium layer and outer sapwood of pine trees a solution of a tree penetrant in combination with a reactant of the formula:



wherein R is a methyl or ethyl radical, and M is an alkali metal, an alkaline earth metal or an ammonium radical, in an amount sufficient to stimulate phloem and outer xylem in the tree to attract bark beetles and substantially reduce their progeny.

4,824,666
METHOD OF LARGE SCALE GROWTH OF TOXOPLASMIC MICROORGANISMS
D. Craig Wright, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 13, 1987, Ser. No. 120,041
Int. Cl.[4] A61K 39/002; G01N 33/54
U.S. Cl. 424—88 7 Claims

1. A method of the large-scale production of Toxoplasma tachyzoites for use in vaccines and antibody detection procedures, comprising the steps of inoculating with Toxoplasma tachyzoites a clone of cell line U 937 (ATCC CRL 1593) and maintaining the clone in a tissue culture medium capable of supporting the growth of the inoculated Toxoplasma microorganisms in addition to maintaining the clone, wherein the tissue culture medium consists essentially of RPMI 1640 and fetal calf serum.

4,824,667
THYMIDINE KINASE DELETION MUTANTS OF BOVINE HERPESVIRUS-1, VACCINES AGAINST INFECTIOUS BOVINE RHINOTRACHEITIS CONTAINING SAME AND METHODS FOR THE PRODUCTION AND USE OF SAME
Malon Kit, and Sani Kit, both of Houston, Tex., assignors to NovaGene, Inc. and Baylor College of Medicine, both of Houston, Tex.
Division of Ser. No. 796,840, Nov. 12, 1985, Pat. No. 4,703,011. This application Jul. 28, 1987, Ser. No. 78,601
Int. Cl.[4] A61K 39/12
U.S. Cl. 424—89 53 Claims

1. A modified live-virus vaccine for infectious bovine rhinotracheitis comprising:
(1) a pharmaceutically effective amount of an infectious bovine rhinotracheitis virus which fails to produce any functional TK as a result of a deletion in the tk gene; and
(2) a pharmaceutically acceptable carrier or diluent.
12. A modified live-virus vaccine for infectious bovine rhinotracheitis comprising:
(1) a pharmaceutically effective amount of an infectious bovine rhinotracheitis virus which fails to produce any TK as a result of a deletion in the tk gene, produced by a process comprising:
(a) constructing a hybrid plasmid comprising a cloning vector and a DNA fragment of 1BRV containing substantially all of the 1BRV tk gene;
(b) co-transfecting, in tk^+ host cells, the hybrid plasmid of step (a) with infectious DNA from a tk^- 1BRV mutagen-induced mutant;
(c) selecting, in tk^- host cells, for tk^+ 1BRV from the virus produced in step (b);
(d) deleting DNA sequences from the hybrid plasmid of step (a) such that less than substantially all of the 1BRV tk gene is present;
(e) co-transfecting, in tk^+ host cells, 1BRV tk^+ DNA derived from the tk^+ 1BRV obtained in step (c) with the resulting tk^- hybrid plasmid of step (d); and
(f) selecting, in tk^- host cells, for tk^- 1BRV from the virus produced in step (e) so as to produce tk^- 1BRV mutants which fail to produce any functional TK as a result of a deletion in the tk gene, and
(2) a pharmaceutically acceptable carrier or diluent.

4,824,668
ATTENUATED INFECTIOUS BURSAL DISEASE VIRUS STRAIN AND VACCINE THEREFROM
Fred W. Melchior, Jr., Frankford, and Lillian Melson, Millsboro, both of Del., assignors to Sterwin Laboratories Inc., Millsboro, Del.
Filed Mar. 9, 1987, Ser. No. 23,612
Int. Cl.[4] A61K 35/76, 39/12
U.S. Cl. 424—89 24 Claims

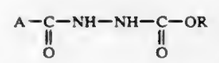
1. An attenuated Infectious Bursal Disease virus strain, VR2161.

4,824,669
FORMULATIONS OF COENZYME Q_{10} FOR INTRAVENOUS USE
Karl Folkers, Austin, Tex., and Kazumasa Muratsu, Fukuoka, Japan, assignors to Board of Regents, The University of Texas System, Austin, Tex.
Continuation-in-part of Ser. No. 722,861, May 11, 1985, abandoned. This application Mar. 27, 1987, Ser. No. 31,487
Int. Cl.[4] A61K 31/12, 31/685, 37/48
U.S. Cl. 424—94.1 19 Claims

1. A stable and non-toxic coenzyme Q_{10} formulation suitable for intravenous administration to an animal to produce clinically effective blood levels of coenzyme Q_{10}, the formulation consisting essentially of a clinically accepted fatty emulsion having an oil phase and coenzyme Q_{10} dissolved in the oil phase, the formulation containing coenzyme Q_{10} at a level between about 7.5 μg/ml and about 30 μg/ml.

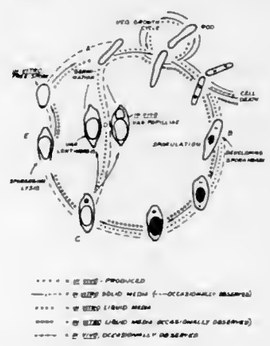
4,824,670
CARBAZATES
Ildikó Rátz née Simonek; Pal Benkó; Edit Bernényi née Poldermann, and Károly Magyar, all of Budapest, Hungary, assignors to Egis Gyogyszergyar, Budapest, Hungary
Filed Dec. 11, 1985, Ser. No. 808,352
Claims priority, application Hungary, Dec. 12, 1984, 4616/84
Int. Cl.[4] A23L 1/30
U.S. Cl. 424—141 6 Claims

1. A fodder premix which comprises:
(a) 0.001 to 85% by weight of a compound of the Formula (I)



wherein
A is C_3 to C_{10} alkyl, C_3 to C_{10} alkenyl, C_2 to C_{10} haloalkyl, trifluoromethyl, phenyl-C_1 to C_3 alkyl, naphthyl-C_1 to C_3 alkyl, phenyl-C_2 *to* C_3 alkenyl, phenyl which can be substituted by one or more identical or different substituents selected from the group consisting of C_1 to C_4 alkyl, halogen, C_1 to C_4 alkoxy, and hydroxy; C_3 to C_7 cycloalkyl-C_1 to C_3 alkyl; furyl which can be substituted by nitro; diphenyl-hydroxymethyl; or imidazolyl which can be substituted by one or more C_1 to C_4 alkoxy groups; and
R is C_1 to C_4 alkyl; and
A is other than tertiary butyl where R is ethyl: or an agriculturally acceptable acid addition salt thereof; and
(b) A usual animal fodder material selected from the group consisting of wheat, rice, maize, soybeans, alfalfa, barley, oats, rye, fish meal, meat meal, bone meal and mixtures thereof.

4,824,671
IN VITRO METHOD FOR PRODUCING INFECTIVE BACTERIAL SPORES AND SPORE-CONTAINING INSECTICIDAL COMPOSITIONS
Beth-Jayne Ellis; Frederick Obenchain, both of Manassas, Va., and Raj Mehta, King of Prussia, Pa., assignors to Renter Laboratories, Inc., Va.
Filed Mar. 24, 1986, Ser. No. 843,163
Int. Cl.[4] A01N 63/00; C12N 3/00, 11/02; C12R 3/00
U.S. Cl. 424—195.1 19 Claims



1. An insecticidal composition for use in controlling Scarabaeide by application to fields, orchards, pastures, lawns, gardens or containers comprising as an active ingredient an insecticidally effective amount of sporangium-free spore produced in culture in sporangium-free form and selected from the group consisting of spores of a pathogen of a species of the genus Bacillus causing milky disease in said Scarabaeide and mixtures of spores from at least two types, strains, isolates or species of said Bacillus; and a carrier or diluent.

4,824,672
METHOD AND COMPOSITION FOR REDUCING SERUM CHOLESTEROL
Charles E. Day, Fulton, Mich., and Eric H. Kuhrts, Santa Barbara, Calif., assignors to Hauser-Kuhrts, Inc., Santa Barbara, Calif.
Filed Jun. 6, 1986, Ser. No. 871,715
Int. Cl.[4] A61K 35/78, 9/22
U.S. Cl. 424—195.1 12 Claims

1. An orally administrable pharmaceutical composition for use in reducing serum cholesterol levels consisting essentially of:
(a) an effective amount of a gel-forming fiber which exhibits cholesterol reducing activity, and
(b) an orally ingestible non-toxic mineral salt capable of dissolution in the gastric fluid with release of carbon dioxide.

4,824,673
NEW DRUGS BASED ON EXTRACTS OF ALGAE, AND CORRESPONDING FORMULATIONS
René Herve, Pludono, and Serge Percehais, Saint-Malo, both of France, assignors to Goemar S.A., France
Continuation of Ser. No. 419,170, Sep. 17, 1982, abandoned. This application Dec. 9, 1983, Ser. No. 559,849
Claims priority, application France, Sep. 23, 1981, 81 17943
Int. Cl.[4] A61K 35/78
U.S. Cl. 421—195.1 10 Claims

1. A method for treating humans and domesticated animals to increase the level of cations in the blood, the method comprising the step of:
administering orally a composition consisting essentially of protoexoplasma of brown or red algae containing a cation that is selected from a member of the group consisting of Cu, Mg, Mn and Zn, the composition being administered in such proportions that a 5ml portion of the composition contains from about 30 to 100mg of the cation.

4,824,674
STABLE ALPHA-INTERFERON DOSAGE FORMS
Robert Becker, Biberach; Bernd Kruss, Hochdorf, and Leonhard Schilk, Biberach, all of Fed. Rep. of Germany, assignors to Karl Thomae, Biberach an der Riss, Fed. Rep. of Germany
Filed Aug. 21, 1987, Ser. No. 88,187
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628468
Int. Cl.[4] A61K 9/00, 45/02
U.S. Cl. 424—427 15 Claims

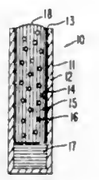
8. A method of preparing stable, dry α-interferons which comprises dissolving an α-interferon in an, strongly polar solvent with an added acid at a pH of between 1 and 5, applying the solution to an inert carrier, and removing the solvent at temperatures between 0° and 80° C.

4,824,675
DISPENSER WITH MOVABLE MATRIX COMPRISING A PLURALITY OF TINY PILLS
Patrick S. L. Wong, Hayward; Felix Theeuwes, Los Altos; Richard Cortese, Los Gatos, and James B. Eckenhoff, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Filed Jul. 13, 1987, Ser. No. 72,506
Int. Cl.[4] A61K 9/22, 9/26
U.S. Cl. 424—438 10 Claims

1. A dispenser for administering a beneficial agent formulation to an animal environment of use, the dispenser comprising:

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(a) a wall that surrounds and defines an internal lumen, the wall comprising at least in part a semipermeable composition that is permeable to the passage of fluid and is substantially impermeable to the passage of a beneficial agent;
(b) a plurality of tiny pills, the pills comprising:
(1) a core of a beneficial agent; and
(2) a wall that surrounds the beneficial agent;
(c) means in the lumen comprising the plurality of tiny pills, which means substantially maintains its physical and



chemical integrity and is substantially nonmeltable in the lumen of the dispenser, said means a carrier for delivering the timy pills from the lumen over time;
(d) means for occupying an increasing amount of space in the lumen for pushing the means comprising the tiny pills from the dispenser; and,
(e) a mouth in the dispenser comprising a cross-sectional dimension substantially equal to the cross-sectional dimension of the lumen for delivering the tiny pills to the environment of use.

4,824,676

PHYSIOLOGICAL MEANS OF ENHANCING TRANSDERMAL DELIVERY OF DRUGS

Nicholas Bodor, Gainesville, Fla., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 659,919, Oct. 11, 1984, abandoned. This application Feb. 13, 1987, Ser. No. 14,317
Int. Cl.[4] A61F *13/00*; A61K *7/32*
U.S. Cl. 424—449 **6 Claims**

1. An improved transdermal delivery system comprising:
a pharmaceutically active, non-anticholinergic, transdermally deliverable drug;
an anhidrotic agent; and
a transdermal delivery system means for applying said active drug and said anhidrotic agent to an area of the skin;
wherein said anhidrotic agent is a quaternary ammonium salt, and is present in an amount sufficient to have a local anhidrotic effect but insufficient to cause a systemic anhidrotic effect, whereby the transdermal delivery of said active drug is enhanced.

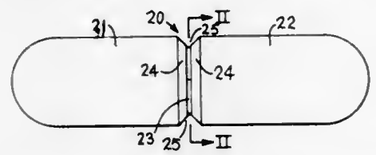
4,824,677

GROOVED TABLET FOR FRACTIONAL DOSING OF SUSTAINED RELEASE MEDICATION

Ashok C. Shah, Portage; Nancy J. Britten, Kalamazoo, and Joseph N. Badalamenti, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 18, 1986, Ser. No. 943,979
Int. Cl.[4] A61K *9/44*
U.S. Cl. 424—467 **28 Claims**

1. A divisible matrix tablet, divisible into tablet segments, with or without coating, having controlled and delayed release of an active substance, comprising breakable connecting means in the form of laterally extending grooves on the top and bottom tablet surfaces directly opposite each other at each line of division; and at least one laterally opening groove on one side of the tablet at least at one end of said laterally extending grooves thereby making the length of said laterally extending grooves less than a width dimension of a tablet segment when measured along a line parallel to said laterally extending grooves, and means in at least one of said laterally extending grooves for effecting a reduction in a newly formed surface area created when said first and second body parts are severed



along said laterally extending grooves, so that said newly formed surface area is less than 15% of the total surface area of said separated first or second body parts.

4,824,678

CONTROLLED-RELEASE MEDICAL PREPARATIONS

Åke R. Lindahl, Skurup, and Bo M. Ekman, Malmö both of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

Continuation-in-part of Ser. No. 647,928, Sep. 5, 1984, Pat. No. 4,557,925, which is a continuation of Ser. No. 396,391, Jul. 8, 1982, abandoned. This application Sep. 5, 1985, Ser. No. 772,779
Claims priority, application Sweden, Sep. 6, 1984, 8404467
Int. Cl.[4] A61K *9/44, 9/32, 9/22*
U.S. Cl. 424—473 **22 Claims**

1. A controlled-release pharmaceutical preparation having a biphasic release profile, comprising; a drug tablet core and a coating applied thereon, said coating comprising a film-forming polymer which is insoluble in water and gastro-intestinal fluids and a water-soluble pore-creating material containing a therapeutically effective amount of a drug active substance, said pore-creating material being randomly distributed in said polymer.

4,824,679

ENCAPSULATION

Christopher P. Freeman, Bedford, England, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Division of Ser. No. 717,146, Mar. 28, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 60,025
Claims priority, application United Kingdom, Mar. 28, 1984, 8407947
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 **4 Claims**

1. A method of rearing animals which comprises feeding to said animals an encapsulated lipid material consisting essentially of a dried gel made up of lipid material containing more than 20% by weight free fatty acids encapsulated within a heat-denatured proteinaceous matrix, the amount of fatty acid being such that the mixture of lipid material and proteinaceous matrix sets into a gel at 50° C. or less.

4,824,680

NON-STALING GUM COMPOSITION WITH IMPROVED WRAPPABILITY

Kevin J. Bernatz, Hickory Hills, and Ron W. Pillsbury, Downers Grove, both of Ill., assignors to Wm. Wrigley, Jr. Company, Chicago, Ill.

Filed May 19, 1988, Ser. No. 196,129
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—3 **18 Claims**

1. In a method of producing a chewing gum composition comprising the steps of mixing about 15 to about 35 parts by weight of a gum base with about 50 to about 80 parts by weight sugar, about 5 to about 30 parts by weight corn syrup, effective amounts of flavor and optional color and other ingredients, the improvement comprising the step of mixing about 0.25 to about 2.0 parts by weight of powdered sorbitol with the gum base prior to mixing more than one half of the sugar into the gum composition.

4,824,681

ENCAPSULATED SWEETENER COMPOSITION FOR USE WITH CHEWING GUM AND EDIBLE PRODUCTS

Alexander M. Schobel, Whitehouse Station, and Robert K. Yang, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 19, 1986, Ser. No. 944,391
Int. Cl.[4] A23L *1/236*; A23G *3/30*
U.S. Cl. 426—5 **72 Claims**

1. An extended release sweetener composition comprising:
solid particles of a sweetening agent encapsulated by a coating material of a hydrophobic polymer, said hydrophobic polymer being characterized by:
(a) being water insoluble,
(b) having film forming capability,
(c) being compatible with the sweetening, agent, and
(d) being edible; and
a hydrophobic plasticizer, wherein the amount of said coating material to said sweetening component is from about 3:1 to about 10:1.

4,824,682

IN-PACKAGE RIPENING OF BLUE CHEESE CURDS

Crystal A. Morrison, 19903 Warrington Dr., Detroit, Mich. 48221

Filed Feb. 9, 1987, Ser. No. 12,275
Int. Cl.[4] A23C *19/068*
U.S. Cl. 426—8 **7 Claims**

1. A method for preparing an in-package ripened blue cheese product from raw cheese curd, said method comprising
forming raw cheese curds each having a surface and an average volume of about 0.125 cc to about 7 cc and inoculating said raw cheese curds with mold spores in an amount effective to initiate mold growth, said mold spores selected from the group consisting of *Penicillium roqueforti* and *Penicillium glaucum*,
sealing said inoculated raw cheese curds in a container comprising a semi-permeable polymeric film or film laminate, said container having an initial headspace gas composition comprising about 20 to about 30% oxygen, and
maintaining said sealed, inoculated cheese curd-containing packages at a temperature of about 50 to about 65° F. until mold has grown to cover at least 50% of the surface of said inoculated cheese curds.

4,824,683

LOW CALORIE HIGH FIBER BREAD

William W. Hodgson, West Chester, Pa., and Tom R. Watkins, New York, N.Y., assignors to Nutri-Life Foods, Inc., West Chester, Pa.

Continuation of Ser. No. 860,999, May 8, 1986. This application Aug. 7, 1987, Ser. No. 83,863
Int. Cl.[4] A21D *2/00*
U.S. Cl. 426—62 **10 Claims**

1. A composition for use in making a low calorie and high fiber content bread product which is free of a bitter after-taste comprising 100 parts flour, about 10 to 40 parts of pre-gelatinized pea bran based on flour, and 10 to 40 parts of pre-gelatinized oat bran based on flour.

4,824,684

HIGH SOLIDS FILLING MATERIAL AND COMESTIBLE PRODUCT

David L. Barry, Lewisville; Mark L. Dreher, Highland Village; Alan A. Johnson, Irving, and Otto E. Schroeder, Dallas, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Sep. 25, 1986, Ser. No. 911,358
Int. Cl.[4] A21D *13/08*; A23G *3/00*
U.S. Cl. 426—94 **15 Claims**

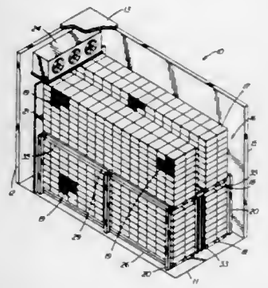
1. A pumpable, edible filling composition comprising vegetable shortening and solid particles:
(a) said vegetable shortening making up from about 40% to about 60% by weight of said composition, said vegetable shortening having a Wiley melt point from about 90° F. to about 120° F. and a solid fat index from about 1% to about 6% at 92° F. and at 100° F.;
(b) said solid particles making up at least about 40% by weight of said composition, the solid particles comprising solids extender selected from the group consisting of maltodextrin, pregelatinized starch, modified starch, cellulose powder, milled flour and whey solids,–. and solid flavoring material, the solids extender making up from about 10% to about 40% by weight of said composition; and said solid flavoring material making up from about 1% to about 50% by weight of said composition, wherein substantially all of the solid particles of said composition have a particle size from about 20 microns to about 100 microns and are uniformly dispersed throughout the vegetable shortening.

4,824,685

METHOD AND APPARATUS FOR CONTROLLING THE RIPENING OF FRESH PRODUCE

Michael Bianco, Miami, Fla., assignor to Del Monte Fresh Fruit Company, Miami, Fla.

Filed Aug. 17, 1987, Ser. No. 86,275
Int. Cl.[4] A23B *7/144*; A23L *1/00*
U.S. Cl. 426—418 **22 Claims**



20. A method for controllably ripening fresh produce comprising the steps of:
(a) inserting a load of palletized produce into a chamber having a ceiling and front, rear and side walls;
(b) arranging and supporting said palletized produce into two rows each of two vertically spaced tiers;
(c) further arranging said two rows to be spaced from one another to define an intersitial volume therebetween and to be spaced from said ceiling and side walls to define a fluid circulation space around said load of palletized produce;
(d) sealing said intersitial volume from said fluid circulation space about the spacing between said two rows of palletized produce;
(e) sealing the vertical space between said two tiers of palletized produce to prevent fluid circulation therethrough; and

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(f) thereafter simultaneously introducing controlled fluid into said fluid circulation space and exhausting fluid from said intersitial space to thereby create a pressure differential between said intersitial space and said fluid circulation space such that said introduced, controlled fluid is forced to flow uniformly through said load of palletized produce.

4,824,686

ANTIMICROBIAL ADDITIVES FOR COMPOUND ANIMAL FOODSTUFFS

Michael Dunn, Sutton, and David A. Parker, Hull, both of England, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 914,263, Oct. 2, 1986, abandoned. This application Mar. 29, 1988, Ser. No. 175,622

Claims priority, application United Kingdom, Oct. 10, 1985, 8525061

Int. Cl.[4] **A23L** *3/34, 3/36;* **A21D** *4/00;* **C09K** *15/04*

U.S. Cl. 426—532 **10 Claims**

7. A preserved animal feed composition comprising an animal feedstuff containing a salmonella infection inhibitor,

said inhibitor comprising a binary blend of formic acid and propionic acid characterised in that the amount of propionic acid in the blend is from 10 to 23% w/w of the total blend, and

wherein said inhibitor is applied to the feedstuff in an amount corresponding to 0.2-5% by weight of the blend based on the total feedstuff preserved.

4,824,687

PROCESS FOR MANUFACTRING FABRICATED CRAB LEG MEAT

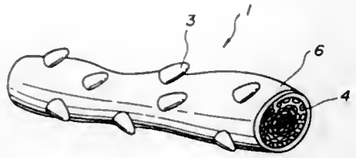
Shigeo Yasuno, 9-27, Toneri-chome, Adachi-ku, Tokyo, Japan

Division of Ser. No. 918,007, Oct. 10, 1986. This application May 17, 1988, Ser. No. 194,887

Claims priority, application Japan, Oct. 15, 1985, 60-229566; Mar. 26, 1986, 61-067937

Int. Cl.[4] **A23L** *1/325*

U.S. Cl. 426—643 **11 Claims**



1. A process for manufacturing fabricated crab leg meat, which process comprises:

ground meat consisting essentially of fish meat in a sheet onto a die member having a cornua forming recesses on an outer surface thereof so as to form a sheet-like material having cornua on an outer surface thereof;

spreading ground meat consisting essentially of fish meat in a sheet, and forming slits extending in a longitudinal direction of said sheet onto said sheet so as to form fibrous material; and then

gathering said fibrous material into a bar shape, and wrapping said bar shaped fibrous material with said sheet-like material having cornua.

4,824,688

HYDROGEL LENS WITH A SIMULATED IRIS PORTION

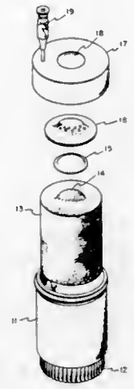
William S. Covington, River Rd., West Cornwall, Conn. 06796

Continuation-in-part of Ser. No. 865,105, May 20, 1986. This application Aug. 1, 1986, Ser. No. 891,600

Int. Cl.[4] **B05D** *5/06;* **A61F** *9/00*

U.S. Cl. 427—2 **8 Claims**

1. A method for providing a soft contact lens with a stable, dimensionally compatible, opaque color pattern which comprises imprinting said lens with an ink comprising an alkyl



acrylic ester, an organic solvent which is a swelling agent for said lens and compatible with said ester, a photosensitive source of free radicals, and a finely divided pigment.

4,824,689

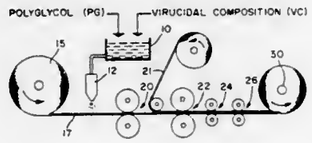
METHOD FOR PRODUCING VIRUCIDAL TISSUE PRODUCTS CONTAINING WATER-SOLUBLE HUMECTANTS

Cary K. Kuenn, Appleton, and Daniel S. Westbrook, Green Bay, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 835,017, Feb. 28, 1986, Pat. No. 4,764,418. This application Nov. 2, 1987, Ser. No. 115,666

Int. Cl.[4] **A61K** *9/70, 31/19;* **B05D** *3/00*

U.S. Cl. 427—2 **3 Claims**



1. A method for making a tissue produce base sheet comprising:

(a) blending a water-soluble humectant with a carboxylic acid-containing virucidal composition at a temperature of from about 100° C. to about 150° C. to solubilize the blend without degrading the carboxylic acid;

(b) applying the solubilized blend to the surface of a cellulosic web; and

(c) cooling the web to reduce the tackiness of the solubilized blend.

4,824,690

PULSED PLASMA PROCESS FOR TREATING A SUBSTRATE

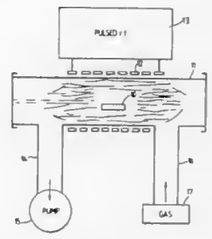
Rudolf A. H. Heinecke; Suresh M. Ojha, and Ian P. Llewellyn, all of Harlow, England, assignors to Standard Telephones and Cables Public Limited Company, London, England

Continuation of Ser. No. 913,590, Oct. 1, 1986, abandoned, Continuation of Ser. No. 706,792, Feb. 28, 1985, abandoned. This application Nov. 3, 1987, Ser. No. 117,923

Claims priority, application United Kingdom, Mar. 3, 1984, 8405647

Int. Cl.[4] **B05D** *3/06*

U.S. Cl. 427—38 **12 Claims**



1. In a process for surface treatment of a substrate material wherein the substrate is exposed under reduced pressure to a high intensity pulsed radio frequency plasma, and wherein the plasma pulse repetition frequency corresponds to the rate at which gas is exchanged adjacent the substrate, the improvement comprising:

controlling the partial pressure of the active constituents of the plasma from about 10 to about 100 m torr;

providing a plasma pulse width of 50 to 500 microseconds; and exposing the plasma to a power density of 100 to 1000 watts/cc such that a high degree of dissociation of the plasma occurs.

4,824,691

IMAGED MICROCAPSULE-COATED PAPER

Leslie Townsend, Chesham, England, assignor to The Wiggins Teape Group Limited, Basingstoke, England

Filed Mar. 25, 1987, Ser. No. 29,962

Claims priority, application United Kingdom, Mar. 27, 1986, 8607689

Int. Cl.[4] **B05D** *3/06;* **B41M** *3/12*

U.S. Cl. 427—53.1 **10 Claims**

1. A method of producing an imaged paper, comprising the steps of (1) applying laser energy to a surface of paper having a moisture content above about 4 wt. % and dry to conventional paper manufacturing levels, thereby forming an image with disrupted surface fiber structure, said laser energy having an intensity such that at least one of the light-transmitting and light-reflecting characteristics of the paper are affected, and (2) applying a microcapsule coating over said paper surface after application of said laser energy, said coating covering, but not obscuring, said image.

4,824,692

PROCESS FOR THE SURFACE TREATMENT OF UNSATURATED RUBBER BY PHOTOCHEMICAL MODIFICATION WITH ALKYL HALIDES

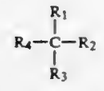
James G. Gillick, Akron, and Walter H. Waddell, Fairlawn, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 27, 1987, Ser. No. 78,326

Int. Cl.[4] **B05D** *3/06;* **C08C** *19/12;* **C08F** *8/18*

U.S. Cl. 427—53.1 **9 Claims**

1. A process for the surface treatment of a rubber containing ethylenic unsaturation comprising: (1) coating said rubber with an alkyl halide of the following structural formula:



wherein at least two of R_1, R_2, R_3, R_4 radicals are halogen atoms and at least one is a hydrogen radical and the remaining radical is either a halogen or a hydrogen atom; and (2) irradiating the thus coated rubber with ultraviolet-visible light under conditions and for a time sufficient to provide for the surface modification of the rubber, wherein said rubber is selected from at least one of natural rubber, polyisoprene, polybutadiene, butadiene isoprene copolymers, styrene butadiene copolymers, acrylonitrile butadiene isoprene terpolymers, polychloroprene, and isobutylene isoprene copolymers and blends thereof.

4,824,693

METHOD FOR DEPOSITING A SOLDERABLE METAL LAYER BY AN ELECTROLESS METHOD

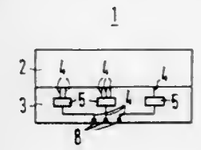
Michael Schlipf, Schorndorf, and Rolf Zoedler, Straubing-Ittling, both of Fed. Rep. of Germany, assignors to Nokia Graetz GmbH, Pforzheim, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,933

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705251

Int. Cl.[4] **B05D** *5/12*

U.S. Cl. 427—98 **6 Claims**



1. Method of depositing a solderable metal layer by an electroless method on transparent conductive paths of indium tin oxide disposed over that portion of a substrate which is invisible in finished display devices, characterized in that the surface of the conductive paths (4) is activated by immersing the substrate in a bath of palladium chloride and tin chloride, that the areas not covered by the conductive paths (4) are then deactivated by immersing the substrate in a bath containing fluoride ions, and that the metal layer is finally formed by electroless deposition.

4,824,694

CERMET RESISTIVE ELEMENT FOR VARIABLE RESISTOR

Wayne P. Bouze, Riverside; Ronald L. Froebe, Rubidoux; Gordon McClure, Pasadena; Ronald E. Thomas, Jr., and Philip F. Weingartner, both of Alta Loma, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Continuation of Ser. No. 912,875, Sep. 26, 1986, Pat. No. 4,732,802. This application Feb. 26, 1988, Ser. No. 160,956

Int. Cl.[4] **B09D** *5/12*

U.S. Cl. 427—102 **19 Claims**

1. A method of making a resistive element for a variable resistor or the like, comprising the steps of:

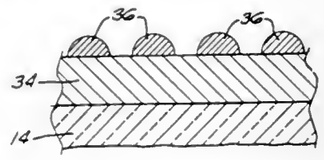
(a) forming a cermet layer having a first conductivity on an insulative substrate;

(b) firing said substrate with said cermet layer;

(c) applying an array of discrete islands of predominantly conductive thick film material onto the surface of said

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fired cermet layer in a repetitive pattern, said islands having a second conductivity that is substantially greater than said first conductivity; and



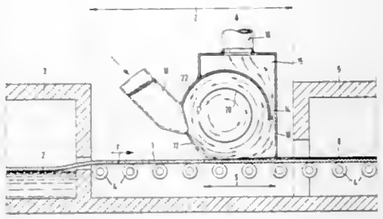
(d) firing said substrate with said islands on said cermet layer.

4,824,695

PROCESS AND APPARATUS FOR COATING A SUBSTRATE

Jean C. Coulon, Mercurey, France; Carl Kramer; Wolfgang Schaefer, both of Aix La Chapelle, and Hans Sustmann, Colonge, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jan. 6, 1986, Ser. No. 816,220
Claims priority, application France, Jan. 7, 1985, 85 00134
Int. Cl.⁴ B05D *1/12*
U.S. Cl. 427—168 **37 Claims**



1. A process for coating a glass ribbon with a metal oxide coating obtained by pyrolysis of a pulverulent powder product of an organic compound in which, by a distribution nozzle ending in a slot, a gas current charged with said pulverulent product is directed over the glass ribbon at such an angle that it sweeps the surface of the glass before being suctioned by a slotted device, placed at a distance from the nozzle and parallel to it, characterized in that at least one eddy current of gas charged with said pulverulent product is created and maintained in the space between the nozzle and the suctioning device by a ceiling member located therebetween.

4,824,696

PRODUCTION PROCESS AND ADHESIVES FOR CORRUGATED BOARD

Masateru Tokumo, Nishinomiya; Kinichi Shirakawa, Takatsuki; Takatoshi Koyakumaru, Kyoto; Takuji Okaya, Nagaokakyo; Hiroyuki Onishi, Kurashiki, and Hiroji Kohno, Kawanishi, all of Japan, assignors to Kuraray Co., Ldt. and Rengo Co., Ltd., both of, Japan

Filed Oct. 30, 1985, Ser. No. 793,107
Claims priority, application Japan, Oct. 31, 1984, 59-230793
Int. Cl.⁴ B05D *5/10*
U.S. Cl. 427—208.6 **10 Claims**

1. A process for production of corrugated board using an adhesive which comprises water, polyvinyl alcohol, clay and a water-soluble boron compound, the ratio of clay to polyvinyl alcohol being in a range of 200 to 600 parts by weight based on 100 parts by weight of polyvinyl alcohol, the ratio of the water-soluble boron compound being not more than 15 parts by weight based on 100 parts by weight of polyvinyl alcohol, the solid content of the adhesive being 25 to 60% by weight, characterized in that

(a) a polyvinyl alcohol concentration in the solution excluding solid other than polyvinyl alcohol from the adhesive being in the region bounded by the following formulas:

$$Y \geqq -0.0014\,X + 9.4 \quad \text{(i)}$$

$$Y \leqq -0.0061\,X + 26.4 \quad \text{(ii)}$$

$$200 \leqq X \leqq 3500 \quad \text{(iii)}$$

wherein Y is defined by the following formula:

$$Y = \frac{P}{P + W} \times 100\ (\%\ \text{by weight})$$

P = Polyvinyl alcohol content in the adhesive (by weight)
W = Water content in the adhesive (by weight) and X is degree of polymerization of the polyvinyl alcohol,

(b) the viscosity of the adhesive measured by a Brookfield viscometer being from 200 to 6000 centipoises at 85° C., and the rate of increase of the viscosity of the adhesive being in the range of 1.5 to 8 times when the temperature of adhesive is dropped from 85° to 30° C.,

(c) the clay being one or more members selected from the group consisting of kaolinite, halloysite, pyrophyllite and cericite, and the pH of the adhesive being not more than 6,

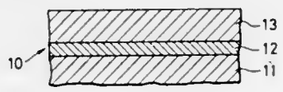
(d) the process comprising applying the adhesive, at a temperature of 60° to 95° C., onto the flute tips of corrugated medium, and utilizing the corrugated medium coated with the adhesive to produce a corrugated board.

4,824,697

METHOD FOR FORMING A MULTI-LAYER DEPOSITED FILM

Shunichi Ishihara, Ebina; Masaaki Hirooka, Toride; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1987, Ser. No. 2,217
Claims priority, application Japan, Jan. 14, 1986, 61-4364
Int. Cl.⁴ C23C *16/22*
U.S. Cl. 427—255.2 **6 Claims**



1. A method for forming a multi-layer deposited film on a substrate in a film forming space, comprising:

separately introducing into the film forming space (i) an active species (A) at a first flow rate (a) said active species (A) formed by decomposition of a starting material gas (A) which is a major flow rate component, said starting material gas (A) being a compound containing silicon and halogen, (ii) an active species (B) at a second flow rate (b), said active species (B) formed by decomposition of a starting material gas (B) which is a minor flow rate component, said starting material gas (B) being a compound containing germanium or carbon and halogen, and (iii) an active species (C) at a third flow rate (c), said active species (C) being reactive with said active species (A) and said active species (B) and formed from a compound (C), compound (C) being a hydrogenated silicon compound;

forming a first deposited film layer on the substrate by permitting said active species (A) and active species (B) to form a mixture, and allowing said mixture to chemically react with said active species (C) to thereby produce the first deposited film layer on the substrate having a first composition; and

forming at least a second deposited film layer on top of said first deposited film layer by varying said second flow rate (b) relative to said first flow rate (a) to thereby produce said at least second deposited film layer having a second composition different from said first composition;

wherein the said first flow rate (a), said second flow rate (b) and said third flow rate (c) are maintained such that ((a)+(b)/(c)) is within a range of between 10/1 and 1/10 and

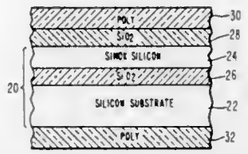
wherein said first deposited film layer and said at least second deposited film layer each have a thickness of between 10 Å and 200 Å.

4,824,698

HIGH TEMPERATURE ANNEALING TO IMPROVE SIMOX CHARACTERISTICS

Lubomir L. Jastrzebski, Plainsboro; Gary W. Looney, Bordentown, and David L. Patterson, Belmar, all of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1987, Ser. No. 137,314
Int. Cl.⁴ C23C *16/24, 16/40*
U.S. Cl. 427—255 **8 Claims**



1. A method of treating an article of separation by oxygen implantation (SIMOX) material to reduce the density of cyrstallographic defects by removing oxygen precipitates and contaminants therefrom, said article including a substrate, an implanted layer of silicon dioxide and a layer of a SIMOX silicon, the method comprising the steps of:

(a) forming a protective silicon dioxide layer on said layer of SIMOX silicon to preclude oxidation of said SIMOX silicon during subsequent heating as set forth below in step (b);

(b) heating said SIMOX article and said protective layer so that a significant portion of said precipitates and contaminants migrate toward and diffuse into said protective layer so that said cyrstallographic defects and contaminants are significantly reduced.

4,824,699

PROCESS FOR IMPROVED ADHESION TO SEMICRYSTALLINE POLYMER FILM

Edward J. Woo, Woodbury, and Elaine M. Yorkgitis, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 21, 1987, Ser. No. 88,069
Int. Cl.⁴ B05D *3/10;* **B32B** *31/12*
U.S. Cl. 427—307 **26 Claims**

1. A process for coating semicrystalline polymer surfaces which comprises first providing a semicrystalline polymer surface with areas of at least 5 nm in thickness of the same semicrystalline polymer in a quasi-amorphous state and then either:

(a) applying a solvent capable of swelling or dissolving the amorphous form of said semicrystalline polymer to said surface, heating said surface to a temperature sufficient to enable at least some of said quasi-amorphous areas to recrystallize while a coating or laminable surface is being applied to or is in contact with said polymer surface, and/or

(b) applying said coating or laminable surface to said surface and subsequently heating said surface to a temperature sufficient to enable at least some of said quasi-amorphous areas to crystallize.

4,824,700

PAINTABLE ADHESION PROMOTER SYSTEM FOR POLYVINYL CHLORIDE PLASTISOLS

Don S. Wozniak, Powell, Ohio, assignor to Sherex Chemical Company, Inc., Ohio

Division of Ser. No. 902,936, Sep. 2, 1986. This application Feb. 22, 1988, Ser. No. 158,568
Int. Cl.⁴ B05D *3/02*
U.S. Cl. 427—379 **6 Claims**

1. A method for coating a metal substrate which comprises:

(a) applying a plastisol composition comprising a finely-divided vinyl chloride polymer, filler, a primary plasticizer, and a polyaminoamide-polyimidazoline adhesion promoter, said plastisol including a plasticizer/promoter phase comprising said primary plasticizer, said adhesion promoter, and an effective amount of a secondary plasticizer nonionic solvent effective in solvating said adhesion promoter in said plasticizer/promoter phase, said plasticizer/promoter phase being preformed and added to the remaining ingredients of said plastisol composition;

(b) applying an acid-catalyzed topcoat over said plastisol composition; and

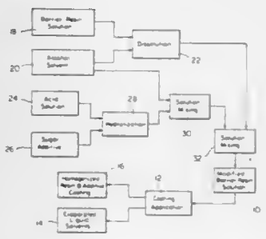
(c) heating said coated metal substrate to cure said plastisol composition and said topcoat.

4,824,701

METHOD AND COMPOSITION FOR ENHANCING PROPERTIES OF BARRIER COATINGS

Gregory Grosbard, 16353 N.W. 57th Ave., Miami, Fla. 33014

Continuation-in-part of Ser. No. 903,039, Sep. 2, 1986, Pat. No. 4,752,429. This application Feb. 12, 1988, Ser. No. 155,379
Int. Cl.⁴ B05D *3/02;* **C08J** *3/20*
U.S. Cl. 427—385.5 **15 Claims**



1. A process for improving gas impermeability properties of a barrier formed by a particulate resin applied to a substrate, comprising:

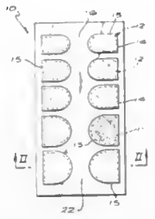
(a) introducing a sugar additive to said resin at a ratio of the resin to the additive of about 38.5 to 48;

(b) forming a solution of the resin and the additive in a solvent; and

(c) applying said solution to the substrate for coating thereof with the resin and the additive uniformly dispersed therein upon evaporation of the solvent.

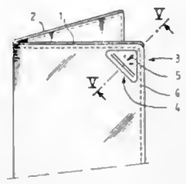
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4,824,702
TRANSFER ADHESIVE SHEET MATERIAL
Dale K. Straub, 2925 Terrace Ave., Alhambra, Calif. 91803
Filed Jun. 11, 1986, Ser. No. 872,884
Int. Cl.[4] A45D *31/00*
U.S. Cl. 428—15 13 Claims



1. A transfer adhesive sheet materail comprising:
adhesive means for adhering an article to an object;
first and second liner means for protecting said adhesive means, said liner means being less adhesive than said article or object to said adhesive means;
said adhesive means positioned over a plurality of separated adhesive areas between said first and second liner means; and,
each of said first and second liner means having an area extending beyond essentially the entire perimeter of each said adhesive area, said first liner means being a die cut liner including a plurality of die cut liner tabs, each tab covering at least one corresponding adhesive area and being sized to be larger than said adhesive area to extend beyond essentially the entire perimeter thereof, but not to extend to be in contact with adhesive in a non-corresponding adhesive area.

4,824,703
LEATHER OF FABRIC ARTICLE INCORPORATING AN ATTACHED TRIMMING
Lehmann Bernard, Saint Cloud, France, assignor to Chanel, Hauts-de-Seine, France
Filed Jun. 28, 1985, Ser. No. 749,706
Claims priority, application France, Jun. 29, 1984, 84 10307
Int. Cl.[4] F16B *2/00*
U.S. Cl. 428—33 7 Claims



1. In combination a sheet-formed article and a trim member attached thereto, wherein said sheet formed article has two facing sheet walls secured together at the edge thereof, one of said walls being a bearing wall having a slit therein, and wherein said trim member has a tongue extending generally parallel thereto to form a clip and is attached to said bearing wall, such that said tongue extends through said slit and to be positioned between said walls and to grip said bearing wall between said tongue and said trim member.

4,824,704
3-METHYLBUTENE-1 POLYMER COMPOSITION, PROCESS FOR ITS PREPARATION AND CONTAINER MADE THEREOF
Yoshinori Suga, Tokyo; Eiji Tanaka, Kawasaki; Nobuo Enokido, Sagamihara; Hidehito Kato, and Katsuji Shibata, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Filed Mar. 25, 1988, Ser. No. 173,583
Claims priority, application Japan, Mar. 26, 1987, 62-72083; Sep. 14, 1987, 62-230754
Int. Cl.[4] C08L *23/10, 23/20;* B65D *1/22, 1/26*
U.S. Cl. 428—36.92 20 Claims

1. A 3-methylbutene-1 polymer composition comprising:
(a) from 10 to 85% by weight of a 3-methylbutene-1 homopolymer or a copolymer of 3-methylbutene-1 with other α-olefin having from 2 to 18 carbon atoms, which has a heat of fusion of at least 7 cal/g as measured by a differential scanning calorimeter;
(b) from 10 to 85% by weight of a copolymer of 3-methylbutene-1 with other α-olefin having from 2 to 18 carbon atoms, which has a heat of fusion of more than 1 cal/g and less than 7 cal/g as measured by a differential scanning calorimeter; and
(c) from 3 to 40% by weight of an elastomeric copolymer of 3-methylbutene-1 with other α-olefin having from 2 to 18 carbon atoms or an elastomeric copolymer of at least two other olefins having from 2 to 18 carbon atoms, which shows no peak in fusion as measured by a differential scanning calorimeter.

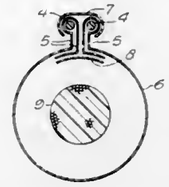
4,824,705
INSULATED PIPE
Sture Persson, Skelleftea, and Lars Hoel, Ersmark, both of Sweden, assignors to Skega AB, Ersmark, Sweden
Filed Aug. 22, 1986, Ser. No. 899,014
Claims priority, application Sweden, Sep. 4, 1985, 8504115
Int. Cl.[4] F16L *9/14*
U.S. Cl. 428—35.9 9 Claims



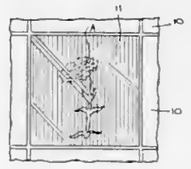
1. Insulated pipe especially intended for subsea use in pipelines for transport of oil, gas and similar products comprising a steel pipe, a first protective layer surrounding the pipe as corrosion protection, a second layer of thermally insulating material surrounding the first layer and a third external protective layer surrounding the second layer, characterized in that the first and third layers consist of rubber and the second layer consists of rubber and 30–70 percent, by volume, cork.

4,824,706
WRAP-AROUND RECOVERABLE ARTICLE
Noel M. M. Overbergh, Bertem, and Bert Decneut, Linden, both of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.
Filed Sep. 3, 1987, Ser. No. 92,831
Claims priority, application United Kingdom, Oct. 20, 1986, 8625125
Int. Cl.[4] B32B *31/00*
U.S. Cl. 428—34.5 15 Claims

1. A recoverable wrap-around article which comprises:
(a) a recoverable fabric cover portion
(b) at least one closure element provided on an edge region of the cover portion, the fabric having at least a component of recoverability perpendicular to the edge region, the closure element comprising a bundle of heat stable filaments enclosed by a loop or folded over portion of the recoverable fabric.



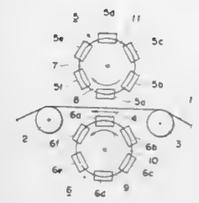
4,824,707
DECORATIVE AIR FRESHENER UNIT
Donald Spector, 380 Mountain Rd., Union City, N.J. 07087
Filed Jun. 27, 1988, Ser. No. 211,702
Int. Cl.[4] B32B *3/14;* B44C *1/28*
U.S. Cl. 428—46 11 Claims



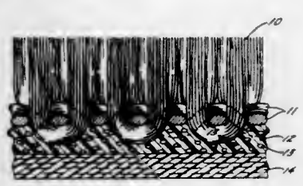
1. An air freshener unit adherable to a flat substrate to exude a fragrance into the atmosphere from a limited supply and to signal when the supply of fragrance approaches exhaustion, said unit comprising:
(A) an impermeable backing sheet whose rear surface is adherable to the substrate;
(B) a facing sheet laminated to the backing sheet and formed of normally opaque microporous material having an affinity for liquid lipids and which becomes translucent when wet by liquid lipids, the rear surface of the facing sheet or the front surface of the backing sheet having artwork printed thereon which is normally blocked from view by the opacity of the facing sheet; and
(C) a rupturable supply of volatile oil-based liquid fragrance interposed between the sheets, the unit being activated by rupturing the supply to release the liquid fragrance and cause it to impregnate the pores of the facing sheet and to be exuded therefrom, the facing sheet being rendered translucent by the oil in the liquid fragrance impregnated therein to render the artwork visible until such time as the liquid fragrance approaches exhaustion and the facing sheet dries to again block the artwork from view.

4,824,708
PROCESS FOR PRODUCING MAGNETIC RECORDING MEDIUM
Takashi Suzuki, Yokohama; Akinori Hasu, Sagamihara; Hiroshi Yoshida, Kawasaki, and Shigeru Hashimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 10, 1986, Ser. No. 928,420
Claims priority, application Japan, Nov. 11, 1985, 60-250853; Nov. 20, 1985, 60-258677
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—64 8 Claims

1. In a process for producing a magnetic recording medium, comprising coating a nonmagnetic substrate with a magnetic paint and applying a rotating magnetic field for orientation to the magnetic paint in a yet unsolidified state on the substrate; the improvement which comprises forming a magnetic recording disk (a) by providing in a plane substantially parallel to the substrate surface said magnetic field for orientation, said field being stronger in a direction perpendicular to the direction of movement of the substrate as compared to the directions of movement of the substrate to thereby form a circular magnetic orientation pattern and thereafter (b) removing from said coated substrate at least one magnetic recording disk in conformity with the circular magnetic orientation pattern.



4,824,709
TEXTILE PRODUCT WITH BACKCOATING COMPRISING SMOKE SUPPRESSANT AND/OR FLAME RETARDANT INTUMESCENT PARTICLES
Richard P. Tschirch, Westwood, Mass., assignor to Collins & Aikman Corporation, New York, N.Y.
Filed May 24, 1988, Ser. No. 198,151
Int. Cl.[4] B32B *3/02, 5/16*
U.S. Cl. 428—95 23 Claims



1. A textile product having reduced smoke generation and/or reduced flame spread characteristics comprising a textile material and a coating applied to a surface of said textile material and forming a layer thereon, said coating comprising a polymer matrix containing inorganic smoke suppressant-flame retardant intumescent particles comprising a mixture of alkali metal silicates, at least one oxy boron compound selected from the group consisting of boric acid and borate salts of group I and II elements and water.

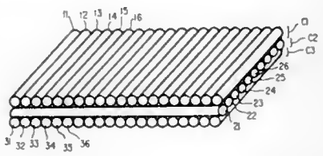
4,824,710
HEAT-INSULATION WALL AND ITS APPLICATION TO THE BUILDING OF A HEAT-INSULATION DEVICE
Jean H. L. Dieul, Voisin Le Bretonneux, France, assignor to Bronzavia Air Equipment, Courbevoie, France
Filed Mar. 18, 1987, Ser. No. 27,248
Claims priority, application France, Mar. 21, 1986, 86 04105
Int. Cl.[4] B32B *5/12*
U.S. Cl. 428—113 7 Claims

1. A heat insulation wall comprising:
(a) a first layer of reflecting material;
(b) a second layer of heat conductive fibers each of which is at least approximately circular in cross-section, adjacent pairs of the fibers in said second layer being at least approximately parallel to one another and being in tangential

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linear contact with one another, said second layer having a first side in surface abutting contact with said first layer and a second side; and

(c) a third layer of heat conductive fibers each of which is at least approximately circular in cross-section, adjacent pairs of the fibers in said third layer being at least approximately parallel to one another and being in tangential linear contact with one another, said third layer having a first side in surface abutting contact with the second layer and a second side;



(d) said second and third layers being in surface abutting contact but being set at an angle to each other such that the fibers in the surface of said second layer facing said third layer make point contact with the fibers in the surface of said third layer facing said second layer, there being no resin or other bonding material between said second and third layers,

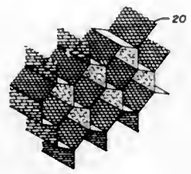
(e) whereby said heat insulation wall conducts heat in directions parallel to said second and third layers and retards heat in directions perpendicular to said second and third layers.

4,824,711

CERAMIC HONEYCOMB STRUCTURES AND METHOD THEREOF

Domenick E. Cagliostro, Berkeley, and Salvatore R. Riccitiello, San Jose, both of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 29, 1987, Ser. No. 8,242
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 **24 Claims**



9. A method for the production of a three-dimensional lightweight ceramic composite honeycomb structure, which method comprises:

(a) pyrolyzing a loosely woven fabric/binder having a three-dimensional honeycomb shape and having a high char yield and three-dimensional geometric integrity during and after pyrolysis at between about 700° and 1,100° C.;

(b) substantially evenly depositing at least one layer of ceramic material on and within the three-dimensional pyrolyzed fabric/binder of step (a) by chemical vapor deposition and chemical vapor infiltration in a reaction system; and

(c) removing the pyrolyzed fabric/binder of the structure of step (b) by slow pyrolysis at between about 700° and 1000° C. in between about a 2 to 5% by volume oxygen atmosphere for between about 0.5 and 5 hr;

(d) substantially evenly depositing on and within the rigid hollow honeycomb structure of step (c) at least one additional layer of the same or a different ceramic material by chemical vapor deposition and chemical vapor infiltration; and

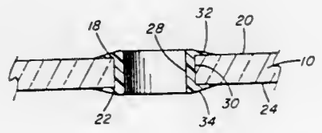
(e) removing the ceramic article from the chemical vapor deposition-chemical vapor infiltration reaction system.

4,824,712

TREATMENT OF GLASS TO REDUCE VENTING DURING THERMAL TREATMENT AND A GLASS ARTICLE MADE THEREBY

Charlene A. Falleroni, New Kensington, and Chia-Cheng Lin, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 631,050, Jul. 16, 1984, abandoned. This application Oct. 8, 1985, Ser. No. 785,431
Int. Cl.[4] C03B *23/02, 23/26*
U.S. Cl. 428—137 **18 Claims**



1. A method of heat treating a glass sheet having a scored region comprising the steps of:

a. coating said scored region with a sol composition prepared from an alkoxide and comprising silicon;

b. hydrolyzing said alkoxide and polymerizing to form a gel;

c. heating said glass sheet to a temperature above its strain point and below its melting point and sufficient to cause said gel to densify;

d. maintaining said temperature for a sufficient time to cause said gel to form a glassy coating; and

e. cooling said glass sheet.

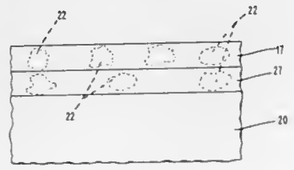
10. A tempered glass article comprising a glass sheet having at least one hole extending entirely through its thickness, and a sol-gel coating fused to the wall of said hole, wherein said coating comprises SiO_2 and B_2O_3.

4,824,713

LIGHTNING PROTECTED STRUCTURAL SURFACE

Rowan O. Brick, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 810,355, Dec. 18, 1985, abandoned. This application Mar. 10, 1988, Ser. No. 169,146
Int. Cl.[4] B32B *5/16, 15/08;* **H02H** *3/22;* **B64C** *1/00*
U.S. Cl. 428—144 **9 Claims**



1. A lightning protected structural surface, comprising:

a structural substrate;

a protective coating of electrically insulating material adhered to said substrate; and

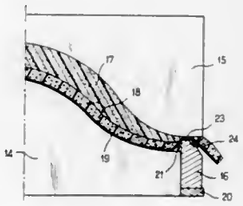
a plurality of conductive particles supported in said coating, said particles being spaced in a direction parallel to said surface a distance greater than the thickness of said coating and wherein the dielectric strength between adjacent ones of said plurality of conductive pareticles in said directinn parallel to said structural surface is greater than the dielectric strength from the outer surface of said coating to said structural surface.

4,824,714

MOLDED COMPOSITE PANELS

Rene Gest, Rantigny, France, assignor to Isover Saint-Gobain c/o Saint-Gobain Recherche, Courbevoie, France

Filed Dec. 24, 1987, Ser. No. 137,815
Claims priority, application France, Dec. 24, 1986, 86 18183
Int. Cl.[4] B32B *1/04, 3/02, 5/14, 31/00*
U.S. Cl. 428—156 **17 Claims**



1. A composite panel comprising:

(1) a molded layer of mineral fibers bonded by a thermosetting resin, and

(2) a surface layer of a non-compressible material which disintegrates at the optimum polymerization temperatures appropriate to said thermosetting resin;

wherein said molded layer of mineral fibers comprises selected zones having a density which is at least three times the nominal density of the layer of mineral fibers outside these selected zones, wherein said selected zones have a thickness which is at least equal to one-third the nominal thickness of the layer of mineral fibers, and wherein said surface layer is at least partially destroyed by disintegration under heat over said selected zones.

4,824,715

ENGRAVING PROCESS AND PRODUCT THEREOF

Gregory D. Jackson, Sturgis, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Division of Ser. No. 883,125, Jul. 8, 1986, Pat. No. 4,745,020. This application Feb. 17, 1988, Ser. No. 156,706
Int. Cl.[4] B32B *3/10;* **B05D** *3/02, 3/12*
U.S. Cl. 428—172 **12 Claims**

1. A process for preparing an article bearing engraved indicia thereon consisting essentially of:

coating the surface of a polyether sulfone resin article with an epoxy resin paint material;

curing the coated article at an elevated temperature to form a bond between the paint material and the article;

engraving indicia on said surface of the cured article.

4,824,716

IMPERMEABLE ENCAPSULATION SYSTEM FOR INTEGRATED CIRCUITS

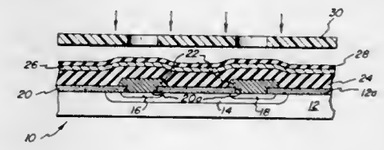
Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,001
Int. Cl.[4] B32B *3/00, 9/00;* **B23P** *15/00*
U.S. Cl. 428—209 **17 Claims**

1. An impermeable encapuslation system for an integrated circuit chip comprising:

A. A layer of polyimide-siloxane block copolymer applied as an undercoat to a surface of the chip; and

B. an impervious outer coat applied over said undercoat,



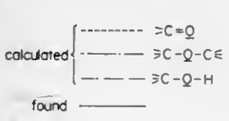
said outer coat selected from the group of materials consisting of tantalum, titanium, aluminum and silicon-boronn and having a thickness in the range of 5000 Angstroms to 2 microns.

4,824,717

MESH SCREEN OF POLYESTER FILAMENTS FOR SCREEN PRINTING

Toru Nakanishi; Shigehiro Hoshida, and Susumu Ueno, all of Ibaraki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1967, Ser. No. 137,321
Claims priority, application Japan, Jan. 7, 1987, 62-1448; Jan. 7, 1987, 62-1449
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—255 **2 Claims**



1. A mesh screen of polyester filaments for screen printing which is a plain-woven mesh screen made of polyester filaments, the surface of each of the filaments having a crosslinked layer in a thickness of 0.001 to 0.1 μm and having tiny protrusions and concavities with a diameter in the range from 0.01 to 0.1 μm in a density in the range from 1000 to 6000 per μm^2 of the surface area.

4,824,718

POROUS FILM

Kirk K. Hwang, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 4, 1987, Ser. No. 128,793
Int. Cl.[4] B32B *3/10, 7/02, 7/04, 33/00*
U.S. Cl. 428—284 **11 Claims**

1. A disposable article comprising a top sheet, an intermediate liquid absorbent core and an outer backsheet, said backsheet being a rattle-free, liquid impermeable, vapor permeable, microporous film with a rattle-reducing additive material partially filling said micropores uniformly distributed through said film, said film having a moisture vapor transmission rate of at least 2000 grams per square meter per 24 hours at 23° C. and 50% relative humidity.

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4,824,719

FIRE-RESISTANT INTERMEDIATE LAYER FOR COVERING ARTICLES OF SEATING FURNITURE, AND ARTICLES OF SEATING FURNITURE WHICH ARE PROVIDED WITH A COVERING CONTAINING SUCH AN INTERMEDIATE LAYER

Hubert S. G. Creyf, Brugge, and Eddie R. Du Prez, Brakel, both of Belgium, assignors to Recticel, Brussels, Belgium

Filed Jan. 27, 1987, Ser. No. 7,016

Claims priority, application Netherlands, Jan. 31, 1986, 8600242

Int. Cl.[4] B32B 3/26

U.S. Cl. 428—285 13 Claims

1. Fire-resistant intermediate layer for covering articles of seating furniture which consist at least of a soft supporting material and a fire-resistant covering characterized in that the fire-resistant intermediate layer comprises a combination of a layer (a) of polyurethane foam plastic rendered fire-resistant, which rests on the soft supporting material, and (b) a glass fabric which is situated on the layer of polyurethane foam plastic rendered fire resistant.

4,824,720

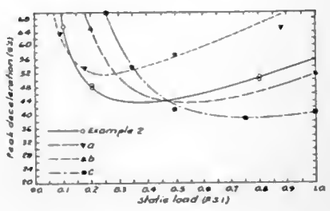
COALESCED POLYOLEFIN FOAM HAVING EXCEPTIONAL CUSHIONING PROPERTIES

Bruce A. Malone, Granville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 11, 1988, Ser. No. 155,338

Int. Cl.[4] B32B 7/02

U.S. Cl. 428—294 15 Claims



1. A closed cell foam structure comprising a plurality of coalesced extruded strands or profiles of a foamed thermoplastic composition comprising a copolymer of ethylene and an ethylenically unsaturated comonomer or a blend of two or more nonaromatic olefin polymers characterized in that the heat seal strength of a film of the thermoplastic composition is at least 3.0 Newtons/ inch width and provided further that the foam structure has a gross density from about 0.1 o about 5.0 lbs/ft^3 and the strands or profiles are disposed in substantially parallel arrangement to the longitudinal axis of the foam.

4,824,721

DONOR SHEET FOR HEAT TRANSFER RECORDING

Yutaka Fujita, and Sumitaka Tatsuta, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 29, 1987, Ser. No. 78,957

Claims priority, application Japan, Jul. 29, 1986, 61-178446

Int. Cl.[4] B41M 5/26

U.S. Cl. 428—321.5 12 Claims

1. A heat transfer recording medium comprising a support having thereon a transfer layer comprising (a) microcapsules containing an oil-soluble dye dissolved in an organic solvent and (b) a sensitizer being solid at ordinary temperature and capable of melting on heating to swell the microcapsule wall and release said dye, wherein said heat transfer recording medium further comprises a subbing layer between said support and said transfer layer, said subbing layer being 0.1 to 0.5 μm thick.

4,824,722

SAFETY GLASS LAMINATES

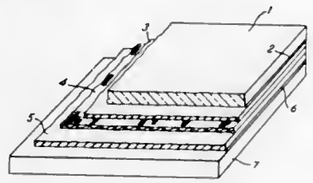
Kenneth B. Jarrett, Woodbridge, United Kingdom, assignor to Deltaglass SA, Fribourg, Switzerland

Filed Mar. 17, 1987, Ser. No. 26,507

Claims priority, application United Kingdom, Mar. 17, 1986, 8606576; Mar. 17, 1986, 8606578

Int. Cl.[4] C03C 27/12; B02B 17/10; C09J 7/02

U.S. Cl. 428—430 9 Claims



1. A laminate comprising a first sheet of organic or inorganic glass and a second rigid sheet with a flexible plastics interlayer therebetween and wherein the interlayer is bonded to each of the sheets by means of a layer of an adhesive composition which has been cured by irradiation and the second sheet is not opaque to the radiation employed for curing the adhesive to bond said second sheet to said interlayer, end wherein the interlayer comprises two outer layers each of plastics film with an inner layer of fabric interposed therebetween.

4,824,723

FLAME RESISTANT ELECTRICAL INSULATING MATERIAL

Richard W. Campbell, and Kirk L. Kimbel, both of Evansville, Ind., assignors to General Electric Company, Selkirk, N.Y.

Filed Jun. 2, 1986, Ser. No. 833,707

Int. Cl.[4] B32B 27/00, 27/06, 27/36

U.S. Cl. 428—332 30 Claims

1. A coextruded flame resistant electrically insulating multilayer material comprising a flame resistant core, said core comprised of a thermoplastic polymer selected from the group comprising polyolefins, poly(aryl ethers), polyetherimides, polyamides, poly(aryl sulfones), thermoplastic polyurethanes, alkenyl aromatic polymers, acrylic-based polymers, polycarbonates, nitrile barrier resins, thermoplastic polyester, and blends of said polymers blended with a flame retardant and an electrically insulating first thermoplastic outer layer wherein said thermoplastic core is the only flame resistant polymer in said multilayer material and wherein said flame retardant is the only flame retardant in said multilayer material.

4,824,724

MAGNETIC RECORDING MEDIUM

Kunihiro Ueda; Yasufumi Takasugi, and Masatoshi Nakayama, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 30, 1986, Ser. No. 868,511

Claims priority, application Japan, Jun. 5, 1985, 60-121666; Jun. 6, 1985, 60-123368; Jun. 7, 1985, 60-123737

Int. Cl.[4] G11B 5/64

U.S. Cl. 428—336 1 Claim

1. In a magnetic recording medium having improved corrosion resistance and minimum head clogging comprising a nonmagnetic substrate, a magnetic metal layer of continuous thin film type deposited on the substrate, and a topcoat film on the magnetic layer,

the improvement wherein the topcoat film has a thickness of about 5 Å to about 100 Å and has a contact angle with water between 70° and 120° and consists essentially of flourine and carbon in an atomic ratio of flourine to carbon in the range of 0.5:1 to 3:1 formed by sputtering or ion plating a flourocarbon resin, and flourine atoms of the topcoat film are chemically combined with metal atoms of the magnetic layer in proximity to the interface between the topcoat film and the magnetic layer.

4,824,725

DRAFTING MATERIAL

Klaus Thoese, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,485

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642847

Int. Cl.[4] B32B 27/08

U.S. Cl. 428—336 11 Claims

1. A drafting material, comprising:

a transparent base material having on at least one surface a hydrophilic coating containing from about 30 to 70 percent by weight of polyvinyl alcohol and from about 70 to 30 percent by weight of a sulfonate-group-containing copolyester; and

an adhesion-promoting layer between the transparent base material and the hydrophilic coating.

4,824,726

LAYERED PATCHING COMPOSITION

Addison W. Closson, Jr., 50 Central St., Manchester, Mass. 01944

Filed Nov. 14, 1986, Ser. No. 930,693

Int. Cl.[4] B32B 27/00

U.S. Cl. 428—349 19 Claims

1. A laminate article useful in the covering of a hole in a workpiece comprising:

(a) an abrasion-resistant layer comprising a thermoplastic resin having a melt index in the range of 0.2 to about 10;

(b) a crosslinking cold-shock resistant layer underlying said abrasion-resistant layer, said cold-shock resistant layer comprising a polymeric material selected from the group consisting of ethylene copolymers, terpolymers, and mixtures thereof; and

(c) a hot-melt adhesive layer underlying said cold-shock resistant layer, said hot-melt adhesive layer comprising a compound selected from the group consisting of (i) ethylene copolymers; (ii) phenolic hydrocarbon resins; (iii) phenolic rosin esters; (iv) phenolic hydrocarbon terpene resins; (v) a rosin ester tackifying resin; and mixtures thereof.

4,824,727

CHAR-FORMING PROTECTIVE COATING FOR FLEXIBLE BASE MATERIALS

Charles Balian; Jon H. Simpson, both of Guilford, and Arun Agarwal, Ansonia, all of Conn., assignors to CHR Industries, Inc., New Haven, Conn.

Filed May 24, 1984, Ser. No. 613,718

Int. Cl.[4] C09J 7/02

U.S. Cl. 428—352 13 Claims

1. A char-forming flexible base material consisting essentially of (1) a flexible backing of film, fiber and/or non-woven mat, said backing being comprised of a polymer that melts and drips in flame forming free radical fragments, and (2) a very thin catalytic coating applied to at least one side of said backing, said coating comprising a compound or compounds containing at least one polyfunctional moiety selected from the group consisting of atoms, molecules, and radicals having a valence functionality of at least 3, said polyfunctional moieties being capable of reacting with and/or catalyzing the cyclization and crosslinking of said free radical fragments and promoting the formation of a strong char from the combustion products of the base material, said char being strong enough to prevent the melting and dripping of the base material when exposed to a flaming environment said coating being present in a thickness insufficient to form a char by itself.

4,824,728

MULTILAYER DURABLE FLUOROCARBON COATINGS

Gerry A. Parsons, St. George, and Pat P. Li, Agincourt, both of Canada, assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 9, 1987, Ser. No. 106,527

Int. Cl.[4] B32B 27/28, 15/08

U.S. Cl. 428—421 10 Claims

1. A durably coated substrate coated with a heavily pigmented opaque basecoat composition consisting essentially of from about 45% to about 85% of a fluorocarbon resin and from 15% to about 55% of an acrylic resin, and having a pigment volume concentration sufficient to visually obliterate anything beneath it, said heavily pigmented coating composition being overcoated with a fluorocarbon topcoat containing from about 45% to about 85% of a fluorocarbon resin, and from about 15% to about 55% of an acrylic resin, on a resin solids basis, and having a pigment volume concentration of at least about 1%, on a film solids basis, the pigment content of said topcoat being insufficient to prevent the color of the basecoat from being easily seen, said pigment volume concentration being up to about 3% when titanium dioxide is the pigment in the topcoat, and the pigment volume concentration being up to about 4.5% when said topcoat contains a pigment other than titanium dioxide, and said topcoat being pigmented with the same pigment composition as in said basecoat.

4,824,729

DECORATIVE MIRROR AND METHOD OF MAKING IT

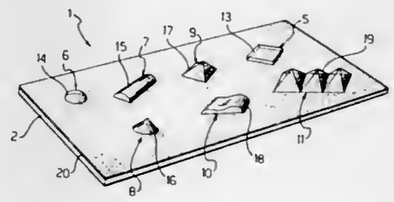
Vittorio Livi, Pesaro, Italy, assignor to FIAM S.r.L., Tavullia, Italy

Filed Feb. 10, 1987, Ser. No. 13,055

Claims priority, application Italy, Jul. 2, 1986, 21011 A/86

Int. Cl.[4] B32B 17/00; G02B 5/08

U.S. Cl. 428—428 8 Claims



5. A decorative mirror which comprises

a glass sheet having a substantially flat front face and a substantially flat back face

at least one glass plate having a flat front face and a back face with any desired configuration, said glass plate being glued by its flat front face to the back face of the front sheet, and

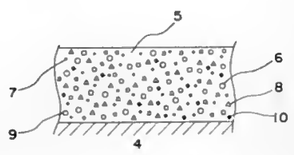
a backing layer coating the back face of the glass sheet and the back face of the glass plate, said backing layer constituting the reflective surface of the mirror.

4,824,730

IR RADIATION HEATING ELEMENT

Akio Fukuda, Nara; Yasunori Kaneko, Shiki; Masao Maki, Nabari, and Mamoru Isogai, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 098,993, Sep. 21, 1988, abandoned. This application Jun. 21, 1988, Ser. No. 209,638
Claims priority, application Japan, Sep. 19, 1986, 61-223007; Oct. 16, 1986, 245723
Int. Cl.[4] B32B 9/04
U.S. Cl. 428—447 **12 Claims**



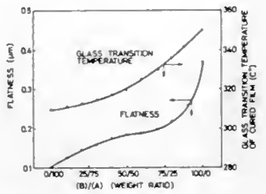
1. An IR radiation heating element comprising a substrate and a coating film formed on the substrate from a coating composition for IR radiation heating which comprises an oxide of a transition metal, ZrO_2 and polyborosiloxane.

4,824,731

THIN FILM MAGNETIC HEAD

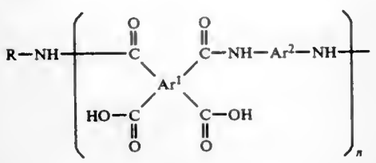
Haruhiko Matsuyama, Hiratsuka; Fusaji Shoji, Yokohama; Shunichiro Kawatsuka, and Kenji Sugimoto, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,560
Claims priority, application Japan, Feb. 2, 1987, 62-20447
Int. Cl.[4] G11B 5/40
U.S. Cl. 428—473.5 **17 Claims**



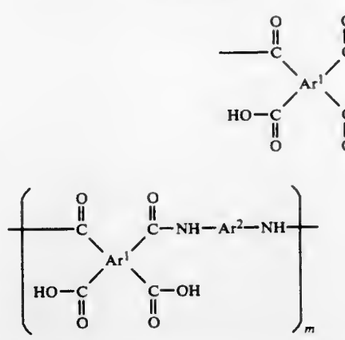
1. A thin film magnetic head comprising a first magnetic layer, an insulating gap layer provided over said first magnetic layer, a first insulation layer provided over said insulating gap layer, a conductor layer provided over said first insulation layer, an insulation portion comprising at least one insulation layer provided over said conductor layer and a second magnetic layer provided over said insulation portion, wherein at least an uppermost insulation layer of said insulation portion has a glass transition temperature of not less than 280° C. and is made of a product obtained by heat-curing a polyimide precursor represented by the following general formula (I) or a mixture of said polyimide precursor represented by the general formula (I) with a polyimide precursor represented by the following general formula (II):

(I)

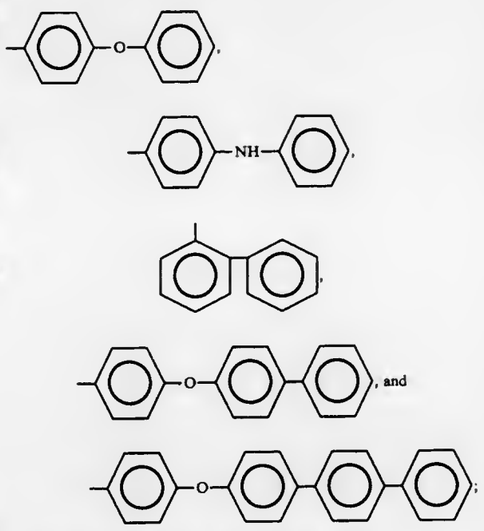


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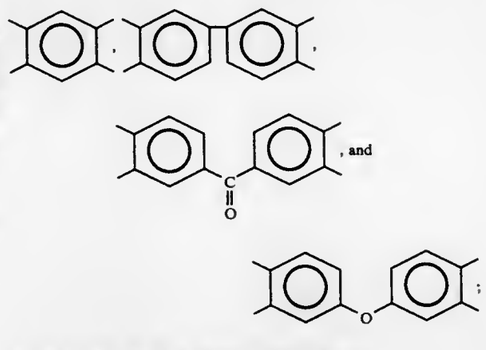
(II)



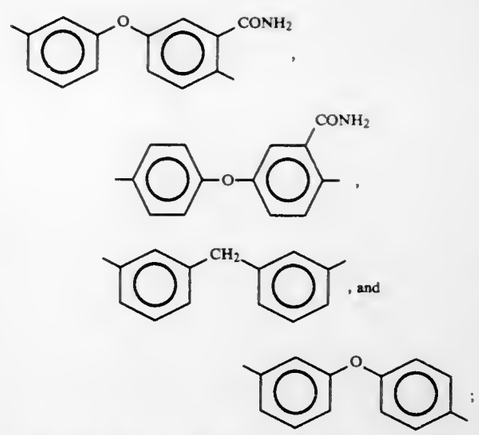
wherein R is at least one radical selected from among



Ar^1 is at least one radical selected from among



Ar^2 is at least one radical selected from among



n is an integer of 1 to 100; and m is an integer of 10 to 500. wherein said mixture has a mixing ratio in terms of weight ratio of solid content of the polyimide precursors represented by the following formula:

(III)

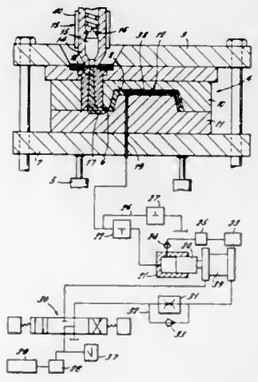
$$\left(\begin{array}{c}\text{polyimide precursor}\\ \text{represented by the}\\ \text{general formula (I)}\end{array}\right) / \left(\begin{array}{c}\text{polyimide precursor}\\ \text{represented by the}\\ \text{general formula (II)}\end{array}\right) = 5/95 \text{ to } 95/5.$$

4,824,732

PROCESS AND APPARATUS FOR INJECTION MOULDING AND MOULDINGS PRODUCED THEREBY

James W. Hendry, Spring Hill, Fla., and Geoffery D. Cahan, Little Kingshill, England, assignors to Cinpres Limited, Staffordshire, England

Continuation-in-part of Ser. No. 607,560, May 7, 1984, abandoned. This application Apr. 29, 1986, Ser. No. 857,015
Claims priority, application United Kingdom, May 11, 1983, 8312933
Int. Cl.[4] B32B 3/26; B29C 67/20, 49/00; C08J 9/34
U.S. Cl. 428—542.8 **28 Claims**



1. A process of producing an injection moulded plastic article, comprising the steps of:
determining a quantity of non-plastic fluid sufficient to achieve an intended weight reduction in the article being produced as well as required internal pressure in the article being produced;
increasing the volume of a variable volume chamber to hold the determined quantity of non-plastic fluid;
measuring said quantity of the non-plastic fluid by filling said variable volume chamber with the non-plastic fluid at a pressure determined in relation to the increased chamber volume;
introducing plastic material in the form of a stream into a mould space;
pressurizing the non-plastic fluid to a pressure sufficient to initiate the creation of at least one cavity of non-plastic fluid in the stream of plastic material when the non-plastic fluid is introduced into contact with the plastic material;
reducing the volume of said variable volume chamber at a controlled rate to introduce the non-plastic fluid into the stream of plastic material so as to initiate the formation of the cavity of non-plastic fluid within the stream of plastic material;
continuing to control the rate of reduction of the variable volume chamber to pressurize the non-plastic fluid after the cavity is initiated, maintaining a non-interrupted flow of the non-plastic fluid at a pressure higher than that of the stream of plastic material yet not so high as to cause a rupture in the plastic material defining the cavity formed therein,
terminating the introduction of plastic material;
continuing to apply pressure to the plastic material through the pressurized non-plastic fluid until the plastic material has spread completely throughout said mould space and the plastic material is positively held against the surface of said mould space; and continuing to apply a pressure to the plastic material through the pressurized non-plastic fluid within the cavity while the plastic material solidifies and cools until the article can itself sustain the form dictated by the interior surface of the mould.

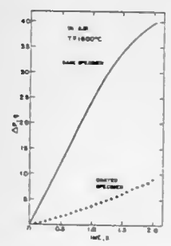
20. An injection molded article produced by the process of claim 1.

4,824,733

ANTI-OXIDANT BARRIER FOR CARBON BASED MATERIAL

Serge Dallaire, Longueuil, Canada, assignor to Canadian Patents and Developmeat Limited/Société , Ottawa, Canada

Filed Apr. 23, 1987, Ser. No. 41,447
Claims priority, application Canada, Apr. 25, 1986, 507650
Int. Cl.[4] H05B 7/06
U.S. Cl. 428—551 **7 Claims**



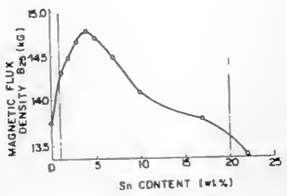
1. A coating providing an antioxidant barrier for carbon-based material, said coating comprising:
a first layer that acts as carbon retention material and consists of metallic titanium or titanium alloy essentially applied directly on said carbon-based material;
a second different layer that acts as a diffusion barrier for oxygen, comprising a mixture of silicon carbide and aluminum or aluminum alloy, said second layer being essentially applied on said first layer.

4,824,734

TIN-CONTAINING IRON BASE POWDER AND PROCESS FOR MAKING

Shigeaki Takajo, Chiba, Japan, assignor to Kawasaki Steel Corp., Japan

PCT No. PCT/JP84/00278, § 371 Date Feb. 1, 1985, § 102(e) Date Feb. 1, 1985, PCT Pub. No. WO84/04712, PCT Pub. Date Dec. 6, 1984
Continuation of Ser. No. 908,957, Sep. 18, 1986, abandoned, which is a continuation of Ser. No. 700,483, Feb. 1, 1985, abandoned. This PCT application Jun. 1, 1984, Ser. No. 70,144
Claims priority, application Japan, Jun. 2, 1983, 58-98577; Apr. 28, 1984, 59-86998
Int. Cl.[4] B22F *1/02*
U.S. Cl. 428—570 1 Claim



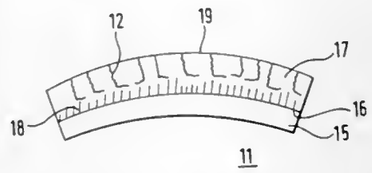
1. A tin-containing iron base powder comprising iron base particles each having tin-rich portions consisting essentially of finely dispersed spots of iron-tin compounds at the surface thereof, wherein the total tin content is in the range of 1 to 20% by weight of the powder.

4,824,735

CASTING TRANSITION METAL ALLOY CONTAINING RARE EARTH METAL

Ian R. McGill, Thatcham, and David Kennedy, Runcorn, both of United Kingdom, assignors to Johnson Matthey Public Limited Company, London, United Kingdom

Division of Ser. No. 024,075, Mar. 10, 1987, Pat. No. 4,739,818. This application Feb. 2, 1988, Ser. No. 151,530
Claims priority, application United Kingdom, Mar. 10, 1986, 8605878
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—610 8 Claims



1. A unitary structure (21) comprising a layer (27) of a transition metal alloy containing 15 to 35 atomic % of rare earth metal wherein the transition metal consists of at least one member of the 4*b*, 5*b*, 6*b*, 7*b* and 8 Groups of the Periodic Table, the layer (27) of transition metal alloy being bonded to a surface (26) of a backing member (25) through at least one zone (28) comprising said alloy mixed with material of the said surface (26).

4,824,736

GASOLINE TANK OF TIN-FREE (ELECTROPLATE CHROME-CHROME OXIDE COATED) STEEL COATED WITH A MALEIC ANHYDRIDE MODIFIED POLYPROPYLENE

Raymond J. Ehrig, Upper St. Clair Township, Allegheny County, and Richard C. Weil, Monroeville, both of Pa., assignors tn Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 23, 1987, Ser. No. 99,966
Int. Cl.[4] B65D *25/36*
U.S. Cl. 428—623 14 Claims

13. Tin-free steel coated directly with polypropylene having an ethylene content of up to about 25% by weight and a maleic anhydride grafted content of 0.3 to 1.5 weight percent, blended with polypropylene having an ethylene content of up to about 25% by weight, in a ratio of about 20 to 80 weight percent.

4,824,737

TIN-LEAD ALLOY COATED MATERIAL

Heinz G. Hiesbock, Modling, and Karl Bartl, Vienna, both of Austria, assignors tn Karl Neumayer, Erzeugung und Vertrieb von Kabeln, Drahten, Isolierten Leitungen und Elektromaterial Gesellschaft m.b.H., Gunselsdorf, Austria

Filed Mar. 30, 1987, Ser. No. 31,277
Claims priority, application Austria, Apr. 16, 1986, 1008/86
Int. Cl.[4] B32B *15/02*
U.S. Cl. 428—643 8 Claims

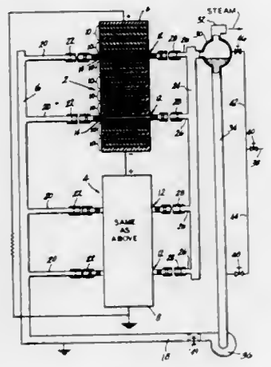
1. A band or wire shaped material consisting essentially of a bronze metal alloy with a phosphorus content of from about 0.03 to about 0.35 percent by weight and a tin content of from about 5 to about 8 percent by weight and having an outer coating made of a tin-lead alloy, the phosphorus content of the bronze metal alloy ranging from about 0.03 to about 0.13 percent by weight of the bronze metal alloy when the tin content of the bronze metal alloy is greater than or equal to about 7 percent by weight of the bronze metal alloy, and when the tin content is less than about 7 percent by weight of the bronze metal alloy, the phosphorus content is greater than about 0.13 percent by weight of the bronze metal alloy.

4,824,738

CONTROLLING OXYGEN CONCENTRATIONS IN FUEL CELL COOLING WATER LOOPS

Robert J. Misage, Manchester; Daniel L. D'Aquila, South Windsor, and Albert P. Grasso, Vernon, all of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Feb. 12, 1988, Ser. No. 157,541
Int. Cl.[4] H01M *8/04, 2/32*
U.S. Cl. 429—12 10 Claims



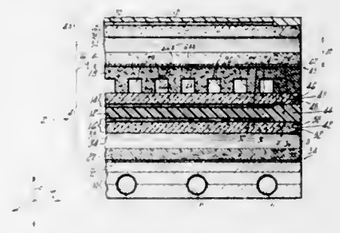
8. A method for controlling the amount of oxygen in coolant water ducted into a cooling system in a fuel cell power plant, said method comprising the steps of:
(a) providing a flowing supply of oxygen-depleted water from a steam separator in the power plant;
(b) adding a supply of oxygen-rich makeup water to the supply of oxygen-depleted water to form a water mixture, said makeup water being added at a steady flow rate;
(c) sensing the amount of oxygen in the water mixture; and
(d) changing the flow rate of the oxygen-depleted water when the amount of oxygen in the water mixture is outside of the range of about 50 to about 150 ppb until the amount of oxygen in the water mixture is within the range of about 50 to about 150 ppb.

4,824,739

METHOD OF OPERATING AN ELECTROCHEMICAL CELL STACK

Richard D. Breault, Coventry; Michael J. Rajpolt, Marlborough, and John C. Trocciola, Glastonbury, all of Conn., assignors to International Fuel Cells, South Windsor, Conn.

Division of Ser. No. 947,168, Dec. 24, 1986, Pat. No. 4,756,981. This application Nov. 2, 1987, Ser. No. 115,298
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—13 7 Claims



1. In a method of operating an electrochemical cell stack having a plurality of cells disposed adjacent to each other, each cell having a pair of electrodes and an electrolyte matrix extending therebetween, each electrode having an associated gas in close proximity to the electrode, each electrode including a gas porous substrate in contact with said electrolyte filled matrix, and including a gas porous plate adjacent to a gas porous plate of the adjacent cell, the electrochemical cell stack including a sealing structure to prevent the mixing of reactant gases from adjacent porous plates, wherein the improvement comprises:
employing a sealing structure which includes a gas permeable, hydrophobic liquid barrier which extends to block the movement of a liquid in a direction substantially normal to said boundary;
a seal region which is a portion of one of said porous plates adjacent to said hydrophobic liquid barrier that is filled with electrolyte to form a seal along the surface of the porous plate to block the leakage of a reactant gas across the electrolyte filled seal.

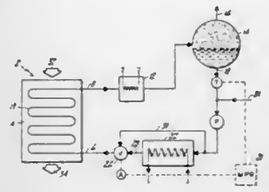
4,824,740

FUEL CELL STACK COOLING SYSTEM

Martin L. Abrams, Glastonbury; Daniel L. D'Aquila, South Windsor, and Glenn W. Scheffler, Tolland, all of Conn., assignors to International Fuel Cell Corporation, South Windsor, Conn.

Continuation of Ser. No. 62,040, Jun. 15, 1987, abandoned. This application May 9, 1988, Ser. No. 198,604
Int. Cl.[4] H01M *8/04, 2/00*
U.S. Cl. 429—24 6 Claims

1. A fuel cell stack cooling using a water coolant comprising:
(a) coolant passages in the stack, said coolant passages having an inlet end and an outlet end for receiving water and discharging a water/steam mixture respectively, said coolant passages in counterflow relationship to oxidation gas flowing through the stack;
(b) a steam separator;
(c) a first conduit at said coolant passage outlet end for conveying the water/steam mixture from said stack to said steam separator, wherein the water and steam are separated from each other;
(d) a second conduit conveying steam from said steam separator to a catalytic fuel reformer;
(e) a heat exchanger for removing heat from water passing therethrough;
(f) a third conduit at said steam separator for conveying



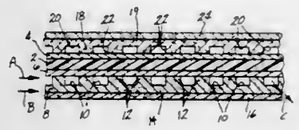
water from said steam separator to said heat exchanger operable to lower the temperature of the water;
(g) a fourth conduit at said heat exchanger for conveying water from said heat exchanger to said inlet end of said coolant passages thereby forming a coolant loop;
(h) a pump for circulating coolant through said loop;
(i) modulating means for modulating the heat removed by said heat exchanger;
(j) sensor means for sensing a measure of the temperature of the water in the steam separator; and
(k) control means responsive to said sensor means for varying said modulation means to maintain said measure of temperature at a preselected value.

4,824,741

SOLID POLYMER ELECTROLYTE FUEL CELL SYSTEM WITH POROUS PLATE EVAPORATIVE COOLING

Harold R. Kunz, Vernon, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Feb. 12, 1988, Ser. No. 155,184
Int. Cl.[4] H01M *8/10*
U.S. Cl. 429—26 3 Claims

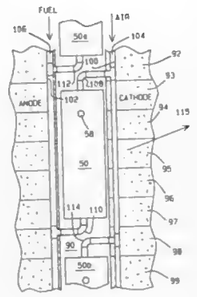


1. A solid polymer electrolyte fuel cell system comprising:
(a) a solid polymer electrolyte membrane having anode and cathode catalyst layers on opposite sides thereof;
(b) a porous anode flow field plate adjacent to the anode catalyst layer, said anode flow field plate including a continuous basal part and a contoured face fronting said anode catalyst layer, said contoured face including a plurality of lands abutting said anode catalyst layer with intervening grooves defining a flow field for gaseous anode reactant; and
(c) means for pumping water into said basal part of said anode flow field plate at a pressure near anode reactant gas pressure whereby water will migrate from said flow field plate basal part to said lands in continuous fashion to be absorbed into said electrolyte membrane, and whereby

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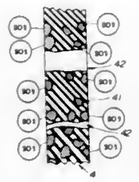
said anode flow field plate will provide a moist surface from which water will evaporate to cool the fuel cell.

4,824,742
MANIFOLD, BUS SUPPORT AND COUPLING ARRANGEMENT FOR SOLID OXIDE FUEL CELLS
Gareth W. Parry, East Windsor, Conn., assignor to The United States Department of Energy, Washington, D.C.
Filed Apr. 21, 1988, Ser. No. 184,475
Int. Cl.[4] H01M *8/10*
U.S. Cl. 429—30 **14 Claims**



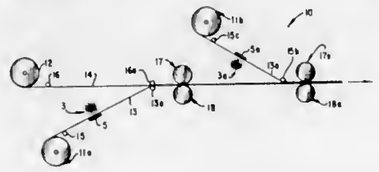
1. A modular solid oxide fuel cell arrangement comprising:
a solid oxide fuel cell having an anode, a cathode and a solid electrolyte therebetween and responsive to an oxidant and a fuel gas provided thereto for converting chemical energy of said fuel gas to DC electrical energy;
structural means disposed about said solid oxide fuel cell and including a fuel gas delivery tube, an oxidant gas delivery tube and an exhaust gas manifold; and
coupling/support means for coupling said solid oxide fuel cell to said fuel and oxidant gas delivery tubes in providing fuel and oxidant gases respectively to said cathode and said anode and support for said solid oxide fuel cell, and wherein said exhaust generated within and discharged from said solid oxide fuel cell exits through said exhaust gas manifold.

4,824,743
SECONDARY BATTERY WITH ION-EXCHANGE POROUS MEMBRANE
Toshinobu Fujii, Hino; Yasuo Ando, Mitaka, and Kazuo Fushimi, Kawaguchi, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan
Filed Oct. 24, 1986, Ser. No. 922,709
Claims priority, application Japan, Oct. 30, 1985, 60-241606; Oct. 31, 1985, 60-166711[U]
Int. Cl.[4] H01M *2/14*
U.S. Cl. 429—101 **6 Claims**



1. A secondary battery having a stack of secondary cells each comprising:
a positive electrode chamber;
a negative electrode chamber; and
a separation membrane separating said positive and negative electrode chambers from each other, said separation membrane being produced by mixing a high molecular compound matrix material, an ion exchange material, and a pore forming material, kneading the materials, forming the kneaded materials in the form of a membrane, and extracting the pore forming material from the membrane, said separation membrane being an ion-exchange porous membrane having a single layer structure including ion-exchange particles dispersed in the high molecular compound matrix material and a number of fine pores extending through the high molecular compound matrix material.

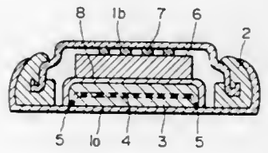
4,824,744
METHOD OF MAKING CELL ANODE
Han C. Kuo, Burlington; John J. Andreola, Reading, and Brian J. Bardsley, Burlington, all of Mass., assignors to Duracell Inc., Bethel, Conn.
Continuation of Ser. No. 650,488, Sep. 14, 1984, abandoned. This application Jul. 24, 1986, Ser. No. 890,873
Int. Cl.[4] H01M *4/02, 4/74, 6/00*; B23K *31/02*
U.S. Cl. 429—209 **16 Claims**



1. A method of making an anode, for an electrochemical cell, comprised of an anode active ductile metal foil and an electrically conductive metal foil substrate having a smooth surface, said method comprising the steps of indenting the smooth surface of said metal foil substrate thereby forming indentations therein, compressingly adhering said anode active ductile metal foil to said indented metal foil substrate by pressing portions of said anode active ductile metal foil into said indentations and cutting the adhered anode active metal foil and metal foil substrate to size for use as an anode in said electrochemical cell.

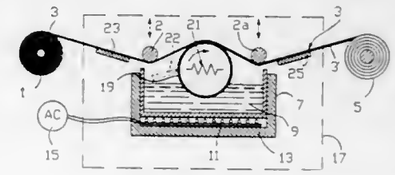
4,824,745
ELECTRIC CELL COMPRISING A POLYMERIC MATERIAL FILM ELECTRODE HAVING A COLLECTION INTEGRATED THEREWITH
Masao Ogawa, Kawagoe; Toyoo Harada, Sendai; Shinichi Toyosawa, Tokorozawa; Isamu Shinoda, Sendai; Takahiro Kawagoe, Tokorozawa; Hideharu Daifuku, Kodaira, and Yoshitomo Masuda, Tachikawa, all of Japan, assignors to Bridgestone Corporation, Tokyo and Seiko Electronic Components Ltd., Sendai, both of, Japan
Filed Feb. 22, 1988, Ser. No. 158,590
Claims priority, application Japan, Feb. 25, 1987, 62-43492; Feb. 26, 1987, 62-44987; Apr. 13, 1987, 62-91522
Int. Cl.[4] H01M *4/60*
U.S. Cl. 429—213 **11 Claims**

1. An electric cell comprising
a positive electrode comprising a positive electrode active material,
a negative electrode comprising a negative electrode active material, at least one of the active materials being comprised of an electroconductive polymeric material film,



a current collector in the form of a conductor embedded in said film at a level between 3/10 and 7/10 of the thickness of said film, and
an electrolyte disposed between the electrodes.

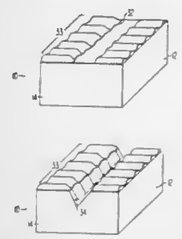
4,824,746
THIN ELECTRODE SUPPORTED ON ELECTRONICALLY CONDUCTIVE SHEET AND PROCESS OF MANUFACTURE
André Belanger, Sainte-Julie; Michel Gauthier, Laprairie, and Michel Robitaille, Sainte-Julie, all of Canada, assignors to Hydro-Quebec, Quebec, Canada
Filed Mar. 11, 1988, Ser. No. 166,980
Claims priority, application Canada, Mar. 11, 1987, 531715
Int. Cl.[4] H01M *4/04*
U.S. Cl. 429—218 **33 Claims**



1. Process for manufacturing thin electrodes supported on an electronically conductive sheet, said electrodes being made from an element selected from the group consisting of lithium, lithium alloy and doped lithium, whose melting point does not differ from the melting point of lithium by ±50° C., the thickness of said element being constant, from a roll of said sheet and a source of said element, which comprises providing a bath of said element in molten state and keeping said bath under an inert atmosphere, continuously unwinding said sheet, continuously applying on at least one of the two faces of said sheet, a constant quantity of said element in molten state, so as to produce a film on said sheet whose thickness is constant and between about 0.1 and about of 40μ and whose surface is homogeneous and uniform, preventing the element in molten state from immediately solidifying while in contact with said sheet, and causing a controlled solidification of said element on said sheet after said film has been formed thereon.

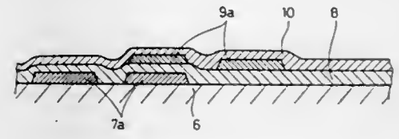
4,824,747
METHOD OF FORMING A VARIABLE WIDTH CHANNEL
James T. Andrews, Hopewell Township, Mercer County, N.J., assignor to General Electric Company, Scbenectady, N.Y.
Filed Oct. 21, 1985, Ser. No. 789,749
Int. Cl.[4] G03H *1/18*
U.S. Cl. 430—1 **6 Claims**

1. A method of forming a variable width channel in a body having a pair of opposed end faces and a major surface extending therebetween, which comprises the steps of:
forming a plurality of masking elements having an opening therethrough on said major surface, said opening intersecting a plurality of said elements;
flowing said elements such that a plurality of said elements partially extend into said opening to form a masking pattern having a variable width opening;



removing a portion of said body exposed in said variable width opening to form a channel having a plurality of sidewalls with at least one sidewall having a surface contour corresponding to an edge of said masking pattern.
6. The method of claim 1, wherein said masking elements are composed of photoresist and are formed by holographic techniques.

4,824,748
METHOD OF MAKING A COLOR SEPARATION FILTER INCLUDING MONOMOLECULAR FILM LAYERS OF COUPLED DYESTUFF
Hideo Saeki, and Shigeyuki Uematsu, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 830,131, Feb. 18, 1986, Pat. No. 4,745,327. This application Feb. 22, 1988, Ser. No. 158,848
Claims priority, application Japan, May 21, 1985, 60-109806
Int. Cl.[4] G03F *9/00*
U.S. Cl. 430—7 **2 Claims**



1. A method of manufacturing a color separation filter comprising a step of forming monomolecular films through use of dyestuffs provided with monomolecular film forming properties in which molecules can be adsorbed by air-water interfaces and patterning properties capable of forming patterns through exposure by ionizing radiations, a step of piling a plurality of said monomolecular films radiating said ionizing radiations on said cumulative films for patterning the same.

4,824,749
LIGHT RECEIVING MEMBER FOR USE IN ELECTROPHOTOGRAPHY AND PROCESS FOR THE PRODUCTION THEREOF
Shigeru Shirai; Keishi Saito; Takayoshi Arai; Minoru Kato, and Yasushi Fujioka, all of Shiga, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 23, 1987, Ser. No. 28,777
Claims priority, application Japan, Mar. 25, 1986, 61-67581
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—66 **43 Claims**

1. A light receiving member for use in electrophotography

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comprising a substrate for electrophotography and a light receiving layer comprising: (i) a charge injection inhibition layer of 0.01 to 10 μm in thickness, (ii) a photoconductive layer of 1 to 100 μm in thickness and (iii) a surface layer of 0.003 to 30 μm in thickness being disposed in this sequence from the side of said substrate; said charge injection inhibition layer comprising one kind of material selected from the group consisting of (a) amorphous material containing silicon atoms as the main constituent and 30 to 5×10^4 atomic ppm of a conductivity controlling element and (b) polycrystalline material containing silicon atoms as the main constituent and 30 to 5×10^4 atomic ppm of a conductivity controlling element; said photoconductive layer comprising an amorphous material containing silicon atoms as the main constituent and at least one kind of atom selected from the group consisting of hydrogen atoms and halogen atoms in a total amount of 1 to 40 atomic %; said surface layer having a free surface and comprising a polycrystalline material containing silicon atoms, 0.001 to 90 atomic % of carbon atoms and 41 to 70 atomic % of hydrogen atoms; at least said surface layer being formed by chemically reacting a precursor (C) generated from (c) a silicon-and halogen-containing compound by subjecting said compound (c) to the action of an excitation energy, another precursor (D) generated from (d) a carbon- and halogen-containing compound by subjecting said compound (d) to the action of an excitation energy and an active species (e) generated from a substance (E) selected from the group consisting of H_2, HF, HCl, HBr, and HI by subjecting said substance (E) to the action of an excitation energy while adjusting the volume ratio of each said precursor to said active species to be in the range of 20:1 to 1:20 based on flow ratio in the absence of a plasma.

4,824,750

TONER COMPOSITIONS WITH A CROSSLINKED RESIN COMPONENT

Thomas L. Mahalek, Rochester, and David R. Santo, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1987, Ser. No. 114,998
Int. Cl.⁴ G03G *13/16*
U.S. Cl. 430—99 **25 Claims**

1. A developer composition consisting essentially of crosslinked styrene copolymers with an insoluble gel content of from about 20 to about 60 percent, pigment particles, low molecular weight wax components, first external additive particles of colloidal silica, second external additive particles of fatty acid metal salts, and carrier particles.

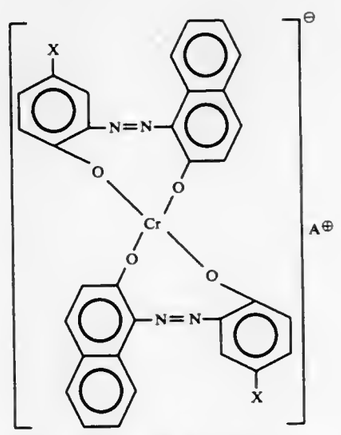
4,824,751

TONERS FOR ELECTROPHOTOGRAPHIC PROCESS CONTAINING CHROMIUM COMPLEX SALTS

Toshihiko Matsuura, Okegawa; Kenzi Sawaki, Chiba; Seizin Shindo, Yono, and Michiko Torigoe, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,717
Claims priority, application Japan, Aug. 4, 1986, 61-181863
Int. Cl.⁴ G03G *9/08*
U.S. Cl. 430—106 **7 Claims**

1. An electrophotographic toner capable of being electrified negatively comprising (a) a suitable binder; (b) an agent for coloring said toner; and (c) a complex salt compound represented by the following formula (I):



(I)

wherein X represents Cl, Br, SO_2NH_2, SO_2CH_3 or $SO_2C_2H_5$ and A+ represents an alkenyl or alkylammonium ion of 17–28 carbon atoms.

4,824,752

ELECTROPHOTOGRAPHIC MAGNETIC DRY DEVELOPER CONTAINING CERIUM OXIDE AND HYDROPHOBIC SILICA

Satoshi Yasuda, Matsudo; Mitsuru Uchida, Chofu; Seiichi Takagi, Yokohama, and Yusuke Karami, Kamakura, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 857,023, Apr. 29, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 108,521
Claims priority, application Japan, Nov. 19, 1985, 60-260597; Dec. 23, 1985, 60-291165
Int. Cl.⁴ G03G *9/14*
U.S. Cl. 430—106.6 **18 Claims**

1. A magnetic dry one-component developer, comprising:
negatively chargeable insulating magnetic toner particles containing, at least a binder resin, a magnetic substance and an organo-chromium or -zinc complex having a negative chargeability controlling property;
cerium oxide particles containing CeO_2 as a predominant component and having a volume average particle size of 1.0 to 4.0 microns, a heating loss of 0.5 wt. % or less on heating up to 100° C. and a BET specific surface area of 15 m^2/g or less as measured by the nitrogen absorption method; and
hydrophobicity-imparted negatively chargeable silicon oxide particulates having a methanolic hydrophobicity of 40% or more.

4,824,753

CARRIER COATED WITH PLASMA-POLYMERIZED FILM AND APPARATUS FOR PREPARING SAME

Hideo Hotomi, Suita, and Shigeyuki Hakumoto, Toyonaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 23, 1987, Ser. No. 41,745
Claims priority, application Japan, Apr. 30, 1986, 61-100757; May 28, 1986, 61-124342
Int. Cl.⁴ G03G *9/10*
U.S. Cl. 430—108 **6 Claims**

1. A developer for use in developing an electrostatic latent image which comprises a carrier and a toner, wherein said carrier comprises a core and a coating layer of a hydrocarbon film prepared by plasma polymerization, and said film contains fluorine in an amount of 5 to 60% by weight and metal atoms

in an amount of 0.1 to 9% by weight, and has a thickness of 80 to 15000 Å.

4,824,754

ELECTROPHOTOGRAPHIC TONER COMPOSITIONS OF PARTICLES COATED WITH METALLIC OXIDES AND TREATED WITH A TITANATE

Takeshi Mikami, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 8, 1987, Ser. No. 35,740
Claims priority, application Japan, Apr. 8, 1986, 61-80637
Int. Cl.⁴ G03G *9/08*
U.S. Cl. 430—110 **12 Claims**

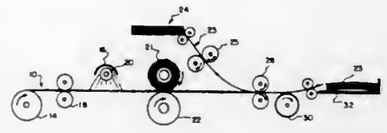
1. A toner composition having particles of at least one metallic oxide selected from the group consisting of oxides of Al, Ga, In, Tl, Ge, Sn, Pb, Sb, Bi and Po, fixed on the surface of the toner such that a portion of the particles is exposed, and wherein the surfaces of the particles have been treated with a titanate.

4,824,755

PRESSURE ROLLER DEVELOPED IMAGES VIA PRE-ABRASION

Lyudmila Feldman, Centerville, and Edward J. Saccocio, Bellbrook, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 5, 1987, Ser. No. 10,922
Int. Cl.⁴ G03C *1/72*; G03D *13/00, 13/04*; B32B *5/16*
U.S. Cl. 430—138 **14 Claims**



1. A method for developing a latent image in an imaging sheet having a layer of microcapsules containing a photosensitive composition on the surface thereof comprising the steps of:
abrading said microcapsules on said surface of said sheet;
after abrading said microcapsules, assembling said imaging sheet with a receiver sheet; and
after assembling, transferring the contents of said microcapsules to said receiver sheet by passing said assembly through a nip between a pair of pressure rollers to subject the microcapsules to pressure such that an image is formed on said receiver sheet.

4,824,756

IMAGE-FORMING METHOD EMPLOYING LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND A MIXTURE OF POLYMERIZABLE COMPOUNDS

Taku Nakamura, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1987, Ser. No. 24,482
Claims priority, application Japan, Mar. 11, 1986, 61-55504
Int. Cl.⁴ G03C *5/54, 1/72*
U.S. Cl. 430—138 **15 Claims**

1. An image-forming method which comprises:
imagewise exposing a light-sensitive material comprising a support and a light-sensitive layer containing silver halide, a reducing agent and a mixture of polymerizable compounds having at least one ethylenic unsaturated group to form a latent image of the silver halide;
simultaneously or thereafter developing the light-sensitive material to polymerize the mixture of the polymerizable compounds within the area where the latent image of the silver halide has been formed; and
pressing the light-sensitive material on an image-receiving material to transfer the unpolymerized mixture of the polymerizable compounds to the image-receiving material,
wherein 40–90 weight % of the mixture comprises a polymerizable compound having 2–4 ethylenic unsaturated groups, and the remaining 10 to 60 weight % of the mixture comprises a polymerizable compound having five or more ethylenic unsaturated groups.

15. The image-forming method as claimed in claim 1, wherein the mixture of the polymerizable compound is contained in microcapsules which are dispersed in the light-sensitive layer of the light-sensitive material, and the silver halide is contained in the microcapsules, the shell of said microcapsules being made of urea-formaldehyde or melamine-formaldehyde resin.

4,824,757

PROCESS FOR PREPARING POSITIVE-ACTING PHOTOSENSITIVE LITHOGRAPHIC ALUMINUM PRINTING PLATE PRECURSOR USING NITRIC ACID ELECTROKYTE FOR GRAINING

Koichiro Aono, and Hirokazu Sakaki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 819,330, Jan. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 191,097, Sep. 26, 1980, abandoned. This application Feb. 8, 1988, Ser. No. 154,474
Claims priority, application Japan, Sep. 27, 1979, 54-124513
The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.
Int. Cl.⁴ G03C *1/94, 1/54*
U.S. Cl. 430—169 **8 Claims**

1. A process for preparing a positive-acting photosensitive lithographic printing plate precursor consisting essentially of the steps (a) electrolytically graining an aluminum plate in an aqueous electrolyte consisting essentially of nitric acid, (b) etching the grained plate with an alkali to dissolve the grained surface of the aluminum plate in an amount of from 0.5 to 3.0 g of aluminum per square meter of the surface, (c) anodizing the etched plate with an aqueous solution of sulfuric acid using D.C. current, and (d) forming a photosensitive layer containing an o-quinonediazide on the anodized plate.

4,824,758

PHOTORESIST COMPOSITIONS BASED ON ACETOXYSTYRENE COPOLYMERS

Balaram Gupta, North Plainfield, and Palaiyur Kalyanaraman, Fanwood, both of N.J., assignors to Hoechst Celanese Corp, Somerville, N.J.

Filed Jan. 25, 1988, Ser. No. 148,265
Int. Cl.⁴ G03C *1/68, 5/16*
U.S. Cl. 430—197 **25 Claims**

1. A negative photoresist composition comprising (A) a copolymer of 4-acetoxystyrene and a monomer selected from the group consisting of dialkyl muconate, alkyl sorbate, alkadiene monomers and allyl esters of ethylenically unsaturated acids wherein the alkyl groups contain 1 to 4 carbon atoms and (B) a aromatic azide compound.

4,824,759

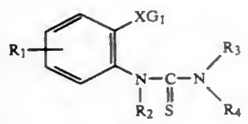
METHOD FOR FORMING AN IMAGE

Kozo Sato; Hiroshi Kitaguchi; Masashi Takeuchi; Masaaki Tsukase, and Masatoshi Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

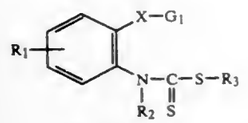
Filed Feb. 7, 1986, Ser. No. 827,139
Claims priority, application Japan, Feb. 7, 1985, 60-22602
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[4] G03C *1/06, 134*
U.S. Cl. 430—203 **16 Claims**

1. A method for forming an image, which comprises exposing a silver halide containing light-sensitive material imagewise to light and heating said light-sensitive material in the presence of a compound capable of forming a 2-mercaptobenzazole ring by a ring closing reaction when heated,

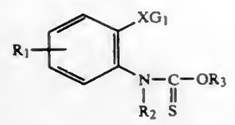
wherein the compound capable of forming a 2-mercaptobenzazole ring is represented by formula (I), (II), or (III)



(I)



(II)



(III)

wherein X represents an oxygen atom, a sulfur atom or a group represented by



G_1 represents a hydrogen atom or a protective group capable of being removed upon action of a nucleophilic reagent; R_1 represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group having from 1 to 12 carbon atoms, a substituted or unsubstituted cycloalkyl group having from 5 to 10 carbon atoms, a substituted or unsubstituted alkenyl group having from 2 to 12 carbon atoms, a substituted or unsubstituted aryl group having from 6 to 14 carbon atoms, a substituted or unsubstituted aralkyl group having from 7 to 14 carbon atoms, a substituted or unsubstituted alkoxy group having from 1 to 12 carbon atoms, a substituted or unsubstituted aryloxy group, a cyano group, a nitro group, a sulfo group, a carboxy group, an alkylsulfonyl group, an arylsulfonyl group, a substituted or unsubstituted sulfamoyl group, a substituted or unsubstituted carbamoyl group, a substituted or unsubstituted amino group, an alkylacylamino group, an arylacylamino group, an alkylsulfonylamino group, or an arylsulfonylamino group, or two or more of R_1 groups are present and in such a case the R_1 groups are the same or different or the R_1 groups are connected to form a condensed carbocyclic or heterocyclic ring; R_2, R_3 and R_4 each represents a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 8 carbon atoms, a substituted or unsubstituted aralkyl group having from 7 to 14 carbon atoms, or a substituted or unsubstituted aryl group having from 6 to 14 carbon atoms; and M represents a metallic atom or a primary, secondary, tertiary or quaternary ammonium group.

6. A method for forming an image as in claim 1, wherein said light-sensitive material contains one or more dye providing compounds which form or release imagewise diffusible dyes from a light-sensitive layer and the compound capable of forming a mercaptobenzazole ring is present in a dye fixing material.

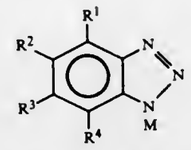
4,824,760

LITHOGRAPHIC PRINTING PLATE WITH BENZOTRIAZOLES IMPROVED IN PRINTING ENDURANCE

Kazuyoshi Yamamoto; Masahiko Saikawa, and Eiji Kanada, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Apr. 7, 1987, Ser. No. 35,368
Claims priority, application Japan, Apr. 11, 1986, 61-83875
Int. Cl.[4] G03C *5/54;* **G03F** *7/06*
U.S. Cl. 430—204 **7 Claims**

1. A lithographic printing plate material having improved printing andurance which utilizes the silver complex diffusion transfer process for making the plate and which comprises a support and at least an undercoat layer, a silver halide emulsion layer and a catalytic layer containing physical development nuclei provided in this order on said support, at least one of these layer containing at least one of nonpolymerized benzotriazoles and its substitution derivatives represented by the following general formula [I]:



wherein M represents hydrogen, an alkali metal or ammonium ion and R^1–R^4 each represents hydrogen atom, alkyl group, alkenyl group, aralkyl group, aryl group, halogen atom, alkoxy group, hydroxyl group, amino group, carboxyl group, sulfone group, alkoxycarbonyl group, acylamide group or sulfonamide group and two of R^1–R^4 may link to form a ring.

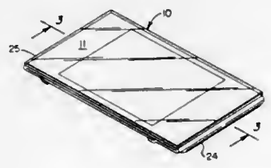
6. A process for making a lithographic printing plate which comprises subjecting the lithographic printing plate material of claim 1 to imagewise exposure and then diffusion transfer development.

4,824,761

INTEGRAL FILM ASSEMBLAGE OF THE INSTANT OR SELF-DEVELOPING TYPE

John I. Sturgis, Stoneham, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 24, 1987, Ser. No. 137,864
Int. Cl.[4] G03L *3/00;* **G03D** *9/02*
U.S. Cl. 430—209 **2 Claims**



1. A self-developing integral film unit having leading and trailing ends and adapted to be advanced leading end first between pressure-applying means to distribute a processing liquid within said unit from said leading end to said trailing end comprising:

first and second superposed image-receiving and image-recording sheets;

an intermediate opaque masking sheet of uniform thickness throughout disposed between said first and second sheets and having an aperture therein for defining an image-receiving area in said first sheet, said intermediate masking sheet also being provided with a cutout extending outwardly from said aperture through which an extended area of said image-recording sheet may be exposed to indicia representative of the date of exposure or an exposure parameter;

a pod containing processing liquid located adjacent said leading end of said film unit, said pod being rupturable when said unit is passed between the pressure-applying means;

means forming a trap at said trailing end of said film unit for receiving excess processing liquid;

said masking sheet being of a desirable uniform thickness to properly space said first and second sheets to form a chamber therebetween extending between said pod and said trap through which said processing liquid is spread in a layer of thickness substantially equal to the thickness of said masking sheet to act on photosensitive constituents in said second sheet to form a visible image in said first sheet; and,

said masking sheet further includes first and second opposite ends, said first end being folded back upon itself and being transversely sealed throughout its entire width to an external surface of said second sheet so as to define a compartment for housing said pod, and said second end being folded back upon itself and being transversely sealed throughout its entire width to an external surface of said second sheet so as to define a compartment for housing said trap.

4,824,762

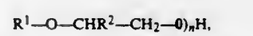
METHOD FOR RINSE TREATMENT OF A SUBSTRATE

Masakazu Kobayashi, Kawasaki; Shingo Asaumi, Fujisawa, and Hatsuyuki Tanaka, Samukawa, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kawasaki, Japan

Filed Jun. 26, 1987, Ser. No. 67,313
Claims priority, application Japan, Jul. 18, 1986, 61-167898
Int. Cl.[4] G03C *11/12, 5/00*
U.S. Cl. 430—258 **6 Claims**

1. In a rinse treatment of a substrate from which a patterned photoresist layer has been removed with a remover solution, the improvement which comprises:

rinsing the substrate with a nonaqueous rinse solvent which is essentially composed of an ether compound represented by the general formula



wherein R^1 is an alkyl group having 1 to 4 carbon atoms, R^2 is a hydrogen atom or a methyl group and n is 2 or 3.

4,824,763

TRIAMINE POSITIVE PHOTORESIST STRIPPING COMPOSITION AND PREBAKING PROCESS

Wai M. Lee, Milpitas, Calif., assignor to EKC Technology, Inc., Hayward, Calif.

Filed Jul. 30, 1987, Ser. No. 79,714
Int. Cl.[4] G03F *7/00;* **G03C** *5/00*
U.S. Cl. 430—258 **10 Claims**

1. A composition for the removal of a positive organic photoresist from a substrate, which comprises a triamine having the general formula:



wherein R_1 and R_2 are, independently in each case, a difunctional straight or branched chain hydrocarbyl or substituted hydrocarbyl group having from about 2 to about 20 carbon atoms in sufficient amounts to remove the photoresist from the substrate and a nonpolar aliphatic or aromatic hydrocarbon or chlorinated hydrocarbon or polar pyrrolidone, dimethyl formamide or butyrolactone organic solvent.

6. A process for stripping positive organic photoresist from a substrate, which comprises contacting the positive organic photoresist with a triamine having the general formula:



wherein R_1 and R_2 are, independently in each case, a difunctional straight or branched chain hydrocarbyl or substituted hydrocarbyl group having from about 2 to about 20 carbon atoms at a temperature of at least about 80° C. for a time sufficient to remove the positive organic photoresist from the substrate.

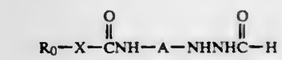
4,824,764

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yoshio Inagaki, and Nobuaki Inoue, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1987, Ser. No. 51,800
Claims priority, application Japan, May 20, 1986, 61-115036
Int. Cl.[4] G03C *1/10, 1/34*
U.S. Cl. 430—264 **6 Claims**

1. A silver halide photographic material comprising a support having at least one light-sensitive silver halide emulsion layer on the support, wherein at least one of the emulsion layer and other constituent layers contains at least one compound represented by formula (I) and at least one compound represented by formula (II):



(I)

wherein R_0 is an organic group having 7 to 30 carbon atoms, A is a substituted or unsubstituted phenylene group, or a substituted or unsubstituted naphthylene group, and X is NH or 0,



(II)

wherein R_1 is an aliphatic, aromatic or heterocyclic group; R_2 is a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aryloxy group, or a substituted or unsubstituted amino group; G is a carbonyl group, a sulfoxy group, a phosphoryl group, or an N-substituted or unsubstituted iminomethylene group (NH=C<); R_{10} and R_{100} are both hydrogen, atoms, or one of R_{10} and R_{100} is a hydrogen atom and the other is a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, or an acyl group; and G, R_2, R_{100} and the nitrogen atom to which G, R_2 and R_{100} are linked may form a partial structure of hydrazone (—N=C<), provided that the compound represented by formula (II) is not the same with the compound represented by formula (I), and the total number of carbon atoms of R_1 and R_2 is 14 to 60 wherein said compound repre-

sented by formula (I) and said compound represented by formula (II) are present in an amount sufficient to increase contrast and to prevent decreased sensitivity and gradiation following storage, and reduction in sensitivity and gamma value resulting from processing in a low activity developer of said halide photographic material.

4,824,765

WATER-SOLUBLE PHOTOINITIATORS

John A. Sperry, 41 Norman Avenue, Abingdon, Oxon, OX14 2HJ, and Ross A. Balfour, 36 Mallard Way, Grove, Wantage, Oxon, both of England

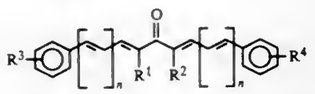
Filed Oct. 10, 1986, Ser. No. 917,465

Claims priority, application United Kingdom, Oct. 10, 1985, 8525027

Int. Cl.[4] G03C 5/00, 1/68

U.S. Cl. 430—281 6 Claims

1. An aqueous photopolymerisable composition, comprising (i) a polymerisable compound having at least one ethylenically-unsaturated bond and (ii) a photopolyerisation initiator represented by the general formula:



wherein R^1 and R^2 are the same or different and each is a hydrogen atom or an alkyl group or, taken together, R^1 and R^2 are an aliphatic ring, n=0 or an integer, R^3 is a water-solubilising group:

(a) $—X(CH_2)_mN^+R^5{}_3$,

(b) $—X(CH_2)_mCOO^-M$ or

(c) $—X(CH_2)_mSO^-{}_3M$,

and R^4 is any one of the water-solubilising groups of R^3 or $—NR^5{}_2$, wherein X represents —CH_2—, —O— or —S—, R^5 is an alkyl group, M is H^+ or a metal cation and m=0 or an integer from 1 to 6, and wherein R^1 and R^2 do not together form an aliphatic ring —$(CH_2)_4$) when R^3 and R^4 are both group (b) in the ortho positions and have the formula —OCH_2 COOM.

4,824,766

PATTERN FORMING METHOD

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

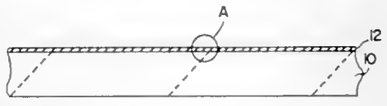
Continuation of Ser. No. 751,256, Jul. 2, 1985, Pat. No. 4,751,171. This application Mar. 27, 1987, Ser. No. 30,612

Claims priority, application Japan, Jul. 3, 1984, 59-138155; Oct. 16, 1984, 59-216641; Dec. 10, 1984, 59-259327

The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.

Int. Cl.[4] G03F 7/16, 7/26

U.S. Cl. 430—299 10 Claims



10. A pattern forming method comprising:

a step of forming an organic film on a substrate;

a step of forming on said organic film an energy responsive monomolecular film of a straight chain hydrocarbon having a terminal chlorosilane or silanol group at one end of the chain for bonding to the substrate, and a terminal vinyl, acetylene or cyano group at another end of the chain as responsive groups which undergo chemical reaction under irradiation of energy beams;

a step of deactivating said responsive groups in a pattern by irradiating energy beams onto the responsive film in a pattern;

a step of bonding a chemical reagent to parts of said responsive film where the responsive groups remain, said chemical reagent being resistant to etching by oxygen plasma and containing silicon; and

a step of transferring said pattern to the organic film by subjecting said substrate to oxygen plasma treatment.

4,824,767

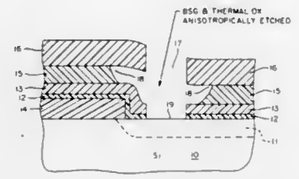
DUAL GLASS CONTACT PROCESS

Stephen T. Chambers, Hillsboro, Oreg., and Stephen T. Luce, Underhill, Vt., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 817,523, Jan. 9, 1986, abandoned. This application Jun. 2, 1987, Ser. No. 57,240

Int. Cl.[4] G03C 5/00

U.S. Cl. 430—313 16 Claims



1. An improved method of providing insulated contact openings having sloped two step profiles on a semiconductor body comprising the steps of:

forming a first dielectric layer on said body, said first dielectric layer having a first reflow temperature, said first dielectric layer being permeable to hydrogen;

forming a second dielectric layer on said first dielectric layer, said second dielectric layer having a second reflow temperature lower than said first reflow temperature;

heating said body to said second reflow temperature;

forming a photoresist layer on said second dielectric layer and forming openings in said photoresist layer to expose portions of said second dielectric layer utilizing a photolithographic means;

removing said exposed portions of said second dielectric layer to expose portions of said first dielectric layer by an isotropic etching process;

removing said exposed portions of said first dielectric layer to expose portions of said body by an anisotropic etching process;

removing said photoresist layer;

heating said body to said second reflow temperature;

whereby an improved insulated contact opening having a sloped, two step profile is realized.

4,824,768

METHOD FOR FORMING PATTERNED ALUMINA FILM ELEMENT

Ruth C. O. Laugal, Union Lake, and Adolph L. Micheli, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1987, Ser. No. 127,985

Int. Cl.[4] G03C 5/00

U.S. Cl. 430—323 3 Claims

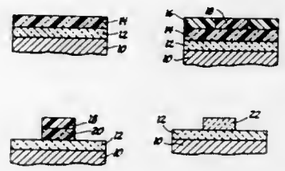
1. A method for forming an alumina film on a selected region of a surface without forming the film on an adjacent region and such that the film is formed in a desired pattern, said method comprising

applying uniformly onto both the selected region and the adjacent region an ink film comprising a thermally decomposable aluminum carboxylate compound,

heating the ink film for a time and at a temperature sufficient to partially decompose the aluminum carboxylate compound to form a film having reduced solubility in aqueous alkaline solution,

coating said partially decomposed film with a photoresist layer and selectively irradiating such that the selected region carries a photoresist mask insoluble in aqueous alkaline solution,

removing the photoresist material from the adjacent region, thereby exposing the underlying partially decomposed aluminum compound, said partially decomposed compound being protected in the selected region by said mask,



dissolving the exposed partially decomposed aluminum compound using aqueous alkaline solution, whereupon the photoresist mask protects the partially decomposed aluminum compound in the selected region from dissolution,

removing the photoresist material from the selected region to expose the partially decomposed aluminum compound, and

heating the partially decomposed aluminum compound for a time and at a temperature sufficient to further decompose the compound to produce an alumina film, whereupon the film is formed on the selected region but not on the adjacent region.

4,824,770

CONTINUOUS TONE COLOR IMAGING USING LASER OR LIGHT EMITTING DIODE SOURCES

Jonathan P. Kitchin, Hertford; Stephen R. Powers, Harlow; Keith A. Penfound, Saffron Walden, and Peter J. Finn, Harlow, all of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 9, 1987, Ser. No. 36,078

Claims priority, application United Kingdom, Apr. 15, 1986, 8609133

Int. Cl.[4] G03C 5/16, 7/26, 7/28

U.S. Cl. 430—363 17 Claims

1. A process for producing a continuous tone colour image comprising providing a light sensitive photographic element comprising a substrate bearing three imaging media coated thereon, said imaging media comprising:

(1) an imaging medium capable of forming a yellow image upon imagewise exposure and processing,

(2) an imaging medium capable of forming a magenta image upon imagewise exposure and processing,

(3) an imaging medium capable of forming a cyan image upon imagewise exposure and processing, each imaging medium having a maximum spectral sensitivity at a wavelength different from that of the maximum spectral sensitivity of the other imaging media within the range 550 to 900 nm, the sensitivities at the wavelength of maximum spectral sensitivity of the media decreasing in order from the medium of shortest wavelength maximum spectral sensitivity to the medium of longest wavelength maximum spectral sensitivity, the difference in said sensitivities between the media of shortest and longest wavelength maximum spectral sensitivity being greater than 0.8 log exposure units,

exposing said element to three independently modulated sources each emitting radiation of a wavelength in the region of the wavelength of maximum sensitivity of a respective imaging medium, the maximum emission intensities of the sources at the wavelength of their maximum output increasing from the source of shortest wavelength to longest wavelength by an amount corresponding to the sensitivity difference of the imaging media, said exposures being conducted in scanning fashion and over at least light discrete exposure levels.

4,824,769

HIGH CONTRAST PHOTORESIST DEVELOPER

James M. Lewis, Williamsville, and Robert A. Owens, East Amherst, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 660,600, Oct. 15, 1984, Pat. No. 4,670,372. This application Apr. 28, 1987, Ser. No. 43,380

Int. Cl.[4] B03C 5/24

U.S. Cl. 430—331 5 Claims

1. A developer for radiation sensitive film consisting essentially of:

(a) an aqueous alkali metal base;

(b) water; and

(c) 0.0001 to 1.0 percent based on the total weight of a carboxylated surfactant of the formula:

$$R—O—(C_2H_4O)_n—CH_2COOX$$

wherein R is selected from the group consisting of linear or branched hydrocarbons of 6-18 carbon atoms, n is an integer of 1 to 24 and X is a cation selected from K^+, Na^+ and H^+.

4,824,771

PHOTOGRAPHIC ACETANILIDE COUPLERS WITH NOVEL BALLAST GROUP AND PHOTOGRAPHIC ELEMENTS CONTAINING THEM

Paul R. Buckland, St. Albans, and John D. Goddard, Middlesex, both of United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

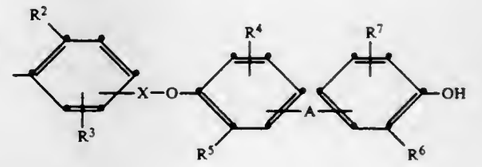
Filed Oct. 30, 1987, Ser. No. 114,966

Claims priority, application United Kingdom, Dec. 18, 1986, 8630304

Int. Cl.[4] G03C 7/36

U.S. Cl. 430—388 12 Claims

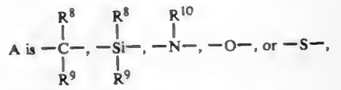
1. A color photographic element comprising a support bearing at least one photographic silver halide emulsion layer and a non-diffusible yellow dye-forming acetanilide coupler having a ballast group comprising a stabilizer moiety represented by the formula:



wherein

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R^2 is halogen or alkoxy having 1 to 4 carbon atoms;
R^3 is hydrogen, halogen, alkyl or alkoxy;
R^4, R^5, R^6 and R^7 are individually alkyl;



R^8 and R^9 are individually hydrogen or alkyl;
R^{10} is hydrogen, alkyl or aryl; and,
X is a linking group.

4,824,772

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING PYRAZOLOAZOLE COUPLER AND DIR COMPOUND

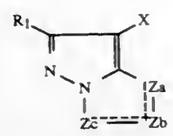
Seiji Ichijima, and Keiji Mihayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 29, 1986, Ser. No. 947,341
Claims priority, application Japan, Dec. 26, 1985, 60-294548
Int. Cl.[4] G03C *7/32*
U.S. Cl. 430—544 **35 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, wherein said material contains at least one compound represented by general formula (I) described below and at least one compound represented by general formula (II) described below:

A—PDI (I)

wherein A represents a group capable of releasing PDI upon reaction with an oxidation product of a developing agent; and PDI represents a group which forms a development inhibitor upon reaction with an oxidation product of a developing agent after being released from A;



(II)

wherein R_1 represents a hydrogen atom or a substituent; X represents a hydrogen atom or a group capable of being released upon coupling; Za, Zb and Zc each represents a methine group, a substituted methine group, =N— or —NH—, wherein one of the Za—Zb bond and the Zb—Zc bond is a double bond and the other is a single bond; wherein R_1 or a substituted methine group represented by Za, Zb or Zc may be a divalent group which forms a polymer, including a dimer; and wherein X does not represent a group of a development inhibitor or a precursor thereof.

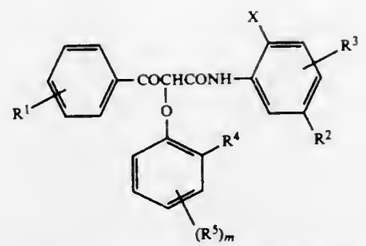
4,824,773

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shingo Sato; Yoshisada Nakamura, and Koji Tamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 23, 1987, Ser. No. 41,560
Claims priority, application Japan, Apr. 23, 1986, 61-94042
Int. Cl.[4] G03C *7/36*
U.S. Cl. 430—557 **12 Claims**

1. A silver halide color photographic material comprising a support having thereon at least a silver halide emulsion layer containing a compound represented by formula (I)



(I)

wherein R^1 represents a hydrogen atom, an alkyl group, an alkoxy group, a halogen atom, an alkoxycarbonyl group, a carbamoyl group, a carbonamido group, a sulfonamido group, or a sulfamoyl group; R^2 represents a carbonamido group, a sulfonamido group, an alkoxycarbonyl group, a carbamoyl group, or a sulfamoyl group; R^3 represents a hydrogen atom, a chlorine atom, a methyl group, a methoxy group or an ethoxy group; X represents a chlorine atom, a methoxy group or an ethoxy group; R^4 represents a methylsulfonyl group, an ethylsulfonyl group, or a phenylsulfonyl group; R^5 represents a hydrogen atom, a halogen atom, a halogen-substituted alkyl group, a nitro group, a cyano group, a carbamoyl group, a sulfamoyl group, an alkylsulfonyl group, an acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkoxy group, an aryloxy group, a carbonamido group, or a sulfonamido group; provided that at least one of said R^1, R^2, and R^5 is a non-diffusible group; and m represents an integer of from 0 to 4.

4,824,774

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING AN ULTRAHIGH CONTRAST NEGATIVE IMAGE THEREWITH

Nobuaki Inoue, and Senzo Sasaoka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 845,298, Mar. 28, 1986, abandoned. This application Sep. 14, 1987, Ser. No. 95,738
Claims priority, application Japan, Mar. 29, 1985, 60-66179
Int. Cl.[4] G03C *5/04, 5/24, 1/02*
U.S. Cl. 430—566 **20 Claims**

1. A silver halide negative photographic material comprising a support, at least one silver halide emulsion layer, and one or more light-insensitive hydrophilic colloid layers, wherein said silver halide emulsion layer or said light-insensitive hydrophilic colloid layer contains a hydrazine derivative, and the photographic material has a film surface pH not higher than 5.8 on the side of said emulsion layer inclusive of said light-insensitive hydrophilic colloid layer, wherein film surface pH is maintained at not higher than 5.8 using an organic acid or an ester of citric acid.

4,824,775

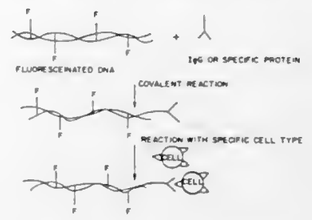
CELLS LABELED WITH MULTIPLE FLUOROPHORES BOUND TO A NUCLEIC ACID CARRIER

Nanibhushan Dattagupta, New Haven, and Michael E. Kamarck, Guilford, both of Conn., assignors to Molecular Diagnostics, Inc., West Haven, Conn.

Filed Jan. 3, 1985, Ser. No. 688,493
Int. Cl.[4] C12Q *1/00;* **G01N** *33/554*
U.S. Cl. 435—4 **5 Claims**

1. A labeled cell consisting essentially of a cell, an antibody specific to and bound to such cell, a nucleic acid fragment

covalently coupled to said antibody, and a plurality of fluorophores on said nucleic acid fragment, wherein said fluorophores are coupled to said nucleic acid fragment via a nucleic acid specific intercalator carrying a primary amine residue.



4,824,776

METHOD FOR INCREASING THE SENSITIVITY OF NUCLEIC ACID HYBRIDIZATION ASSAYS

Michael J. Heller, Poway, Calif., assignor to Molecular Biosystems, Inc., San Diego, Calif.

Filed Jul. 25, 1985, Ser. No. 759,047
Int. Cl.[4] C12Q *1/68;* **G01N** *33/566*
U.S. Cl. 435—6 **14 Claims**

1. The hybridization assay method for detecting a specific polynucleotide target sequence wherein a nucleic acid containing target sample in single stranded form is affixed to a support, contacted thereon under hybridizing conditions with a non-radioactive reporter group labeled single-stranded polynucleotide probe having a sequence complementary to the target sequence, said probe being bound to said affixed sample when the target is present, said probe hybridizing with said target sequence, then removing the unbound portion of said probe from said support, and detecting the presence of said probe by means of its reporter group, wherein the sensitivity of the assay is increased by employing the additional steps comprising:

(a) after removal of the unbound portion of the probe, dehybridizing the bound portion;

(b) concentrating the dehybridized separated probe onto a solid support; and

(c) detecting the presence of said probe on said solid support by means of said non-radioactive reporter group.

4,824,777

METHOD FOR DETERMINING THYROXINE UPTAKE

Steve C. S. Chang, Franklin; Thomas E. Miller, Norwood, and Elizabeth K. Krodel, Arlington, all of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Jul. 8, 1987, Ser. No. 71,661
Int. Cl.[4] G01N *33/53, 33/546, 33/543, 33/533*
U.S. Cl. 435—7 **12 Claims**

1. A method for determining the thyroxine uptake of a sample serum comprising the steps of:

(a) incubating the sample serum with (i) a composite comprising thyroxine immobilized on an insoluble carrier material and (ii) an excess of a labeled antibody to thyroxine binding globulin over endogenous thyroxine binding globulin, to form a complexed composite;

(b) separating the complexed composite from any unbound labeled antibody;

(c) measuring the amount of label associated with the complexed composite: and

(d) determining a thyroxine uptake ratio of the sample serum by relating the measurement of step c) to a measurement of a reference serum.

4,824,778

IMMUNOASSAY FOR MEASURING THE CONCENTRATION OF ANTIGEN IN A SAMPLE

Keiichi Nagai, Tokyo; Daizo Tokinaga, Hachioji; Kazumichi Imai, Kodaira; Kenji Yasuda, Tokyo; Satoshi Takahashi, Kokubunji, and Teruaki Kobayashi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1986, Ser. No. 867,554
Claims priority, application Japan, May 29, 1985, 60-114084
Int. Cl.[4] G01N *33/53*
U.S. Cl. 435—7 **3 Claims**

1. An immunoassay comprising:

immobilizing antibody in substantially the whole portion of a matrix for electrophoresis;

immobilizing antigen in a measurement sample by subjecting the same to antigen antibody reaction with the above-mentioned immobilized antibody by a procedure of moving the antigen by electrophoresis;

either moving labeled antibody to the above-mentioned immobilized antigen by electrophoresis to react the same with the immobilized antigen, or moving labeled antigen to the unreacted portion of the above-mentioned antibody by electrophoresis to react the same with the unreacted portion;

measuring the concentration of antigen in the sample, characterized by using as a label for the labeled antibody or the labeled antigen an enzyme capable of converting a substrate into a fluorescent substance,

moving the substrate convertible into a fluorescent substance by said enzyme by electrophoresis,

reacting the substrate with the label enzyme to convert the same into a fluorescent substance,

moving said fluorescent substance from the matrix for electrophoresis to electrolytic solution, and then

measuring the concentration of the formed fluorescent substance in the electrolyte solution.

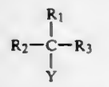
4,824,779

METHOD FOR THE DETERMINATION OF THE REDUCED FORM OF NICOTINAMIDE ADENINE DINUCLEOTIDE

Norihito Aoyama; Akira Miike; Yoshiaki Shimizu, all of Shizuoka, and Toshio Tatano, Numazu, all of Japan, assignors to Kyowa Medex Co., Ltd., Tokyo, Japan

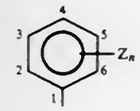
Filed Feb. 28, 1985, Ser. No. 706,404
Claims priority, application Japan, Feb. 29, 1984, 59-37623
Int. Cl.[4] C12Q *1/26*
U.S. Cl. 435—25 **15 Claims**

1. A method for the determination of NAD(P)H comprising the steps of: reacting a chromogen represented by formula (I):



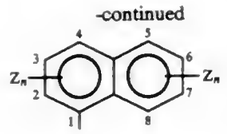
(I)

wherein Y is hydrogen or hydroxyl; R_1, R_2 and R_3 are independently selected from the group consisting of (II), (III) and (IV):

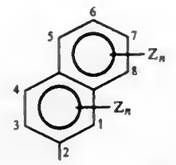


(II)

-continued



(III)



(IV)

wherein Z is independently selected from the group consisting of hydrogen, hydroxyl, optionally substituted amino, optionally substituted alkyl, alkenyl, optionally substituted aryl, acyl, halogen, nitro, suflo, carboxyl and alkoxy, wheren n is 1, 2 or 3 and the optional substituent is selected from the group consisting of alkyl, alkenyl, aryl, alkoxy, hydroxyl, carboxyl, sulfo, sulfonyl, halogen, amino, alkoxycarbonylamino, alkoxycarbonyl, aminoalkyl, acyl and nitro; provided that at least one Z in R_1, R_2 and R_3 is hydroxyl or optionally substituted amino; with NAD(P)H in the presence of (1) peroxidase or thiol oxide reductase and (2) diaphorase or an electron carrier; determining the pigment thus formed, said pigment being determined in the absence of Mn^{2+} or Co^{2+} ion; and determining NAD(P)H from a calibration curve.

4,824,780

METHOD FOR PRODUCING HYDROQUINONE

Akira Yoshikawa, and Hiroko Sato, both of Niigata, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,307

Claims priority, application Japan, Apr. 3, 1984, 59-65154; Apr. 3, 1984, 59-65155

Int. Cl.[4] C12P *7/66;* C12R *1/32*

U.S. Cl. 435—133 3 Claims

1. A process for producing hydroquinone which comprises the following steps:

(a) contacting bacterial cells or enzyme obtained by crushing the cells thereof in an aqueous medium with benzene or phenol under reaction conditions of a temperature from 25 to 35 degrees Celsius and a pH about 7, wherein said cells are obtained by culturing microorganism selected from the group consisting of *Mycobacterium album* and *Mycobacterium vaccae* in a culture medium and wherein said cells are capable of oxidizing benzene or phenol;

(b) providing to said aqueous medium a molecular oxygen-containing gas; and

(c) recovering hydroquinone from a reaction product solution.

4,824,781

MICROBIOLOGICALLY PRODUCED D(-)-MANDELATE-DEHYDROGENASE PROCESS FOR OBTAINING IT AND ITS USE

Werner Hummel, Titz; Horst Schütte, Salzgitter; Maria-Regina Kula, Niederzier/Hambach, and Wolfgang Leuchtenberger, Bruchköbel, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,440

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536662

Int. Cl.[4] C12P *7/42;* C12N *9/04;* C12R *1/225*

U.S. Cl. 435—146 10 Claims

1. A purified form of a microbiologically produced D(−)-mandelate-dehydrogenase having the following physical-chemical properties:

(i) reactivity:

said dehydrogenase reacts in the presence of NADH (nicotinamide-adenine-dinucleotide) with benzoyl formate to form D(−)-mandelate and in the presence of NAD^+ with D(−)-mandelate to form benzoyl formate;

(ii) substrate specificity:

said dehydrogenase reduces aliphatic and araliphatic 2-ketocarboxylic acids and oxidizes aliphatic and araliphatic D-2-hydroxycarboxylic acids;

(iii) optimum temperature and pH:

at a temperature of 55° C. the optimum pH for said reduction reaction of (ii) above is 6.0±0.5 and the optimum pH for said oxidation reaction of (ii) above is 8.5;

(iv) pH stability:

after storage for one week at 4° C. at a pH between 5 and 7.5, said dehydrogenase has a residual activity of at least 85%;

(v) temperature stability:

said dehydrogenase treated for 15 minutes at a pH of 6.0 at 50° C. has a residual activity of 90%;

(vi) activity:

said dehydrogenase has a specific activity of about 2100 U/mg protein;

(vii) influence of inhibitors:

said dehydrogenase is strongly inhibited by $HgCl_2$, $CuSO_4$ and mercuri-p-chlorobenzoate;

(viii) molecular weight:

said dehydrogenase has a molecular weight of 60,000±5,000 (determined by gel filtration);

(ix) molecular weight of a subunit of said dehydrogenase:

the molecular weight of said subunit is 30,000+/−3,000 (determined by SDS-electrophoresis);

(x) K_M value:

the K_M value for said reduction reaction of (ii) above when said substrate is benzoyl formate, at pH 7.0, is 0.22 mM, the K_M value for said oxidation reaction of (ii) above when said substrate is D(−)-mandelate, at pH 8.0, is 0.5 mM.

4,824,782

DNA BASE SEQUENCE, METHOD FOR PREPARING A RECOMBINANT PLASMID INCLUDING THE DNA BASE SEQUENCE, AND BREEDING METHOD FOR ENHANCING THE PROTEIN-SECRETING ABILITY OF A MICROORGANISM BY INTRODUCING THEREINTO THE RECOMBINANT PLASMID

Yoshio Furutani, Miuragun; Noboru Tomioka, Mobara; Masaru Houjo, Mobara; Kazuaki Manabe, Mobara, and Hiroaki Shimada, Mobara, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of, Japan

Continuation of Ser. No. 649,278, Sep. 11, 1984, abandoned. This application Apr. 8, 1988, Ser. No. 180,691

Claims priority, application Japan, Sep. 12, 1983, 58-166665

Int. Cl.[4] C12N *15/00, 1/20, 7/00;* C12P *21/00*

U.S. Cl. 435—172.3 7 Claims

1. A recombinant DNA plasmid, comprising: a sequence of bases capable of increasing protease secretion in *Bacillus subtilis,* wherein the sequence is:

ATCGA	TACGC	TTCTC	CAGAG
AGAGC	TTGAG	GACAT	AGTCA
AAGAA	CTGCC	TTTAA	TTGAT
GAAGT	CGGAC	AGGCG	CTGCT
CGGTT	ATGAA	AACGA	TAATT
ACATG	ATGCT	CGGGC	TCGTC
AAAGC	CATTG	AATGC	AACAA
CTGGG	ACTGT	GACGA	GTGGG
GAAAA	GAACT	GGACA	AAGAA
GAAGC	ATATG	AATGT	TACTT
ACAGG	CGATC	GAATG	GTGCC
GGCAG	CTTAT	CGTGA	ATTGA
GGCGC	TTTAA	GCCGA	CCACC

-continued

TGAGG	GCGAT	GATGA	ACCGG
CTTTG	CTCTC	TGAAC	AGACT
GACAC	GGATG	CCGTC	GGGAT
TAAAT	GTCAC	ATCAA	AATCA
TTTTT	GATGC	CGGTC	TGCTT
AATGA	GCCGC	TTGAC	CGCCG
CGGCG	TCAGA	TGATT	GCGCT
GCGGT	GAGGA	TGCGG	CGCGC
AAGCT	CTTTT	GACGC	CGACA
GCCGC	GCAAG	GAGCA	GACGG
GCGTC	CTCCA	GCATG	CCCGC
AGCCT	CTTTT	GCGGA	CGCTG
TCAAA	ATATC	TGCGT	GAATC
GTGGG	AGCAG	GCGCA	GGATT
CGCTA	TGGCG	CGGCG	AAAAC
AGGAC	AGCAT	GGATA	CACAT
AAAGC	ATGCG	GCGGC	CTCCT
TCTGA	GATAA	CATTC	GTTAT
ACATG	AGTAT	AGGCG	GCGTG
ATAAC	GAGTT	ATGAC	ATGCA
AAAAG	ACCAC	AATGC	GGGTG
TTGCG	GTCTT	TTCGG	TGTTT
GTCGG	TGGTT	ATGCG	ACGCT
GTTCT	CCCAT	TCTCT	TTTGA
AATTG	CGACG	TCAGG	GACTA
TAGTC	CTTAG	CGGTT	TGTCG
GAAAA	CCGTT	AAAAA	ACCAG
CAGAA	CCACC	AGATT	GATCT
GCTTC	ATCCC	AAACG	TCTGC
CTTTA	TGGTA	GTTAT	ATAGT
CCTGT	TCGCC	AAATG	CTCTG
TTCGG	GACTA	TGGGA	TTACC
GTGGT	TTGCG	GTGTC	ACGCA
GATAC	TTTTA	CACAT	ACTTT
TCGGT	GAAAA	ATCCC	GCAAA
AACGT	TTACA	CTATT	AGTAA
CAGAT	CAAAT	ACCTA	GGACT
CGTTC	ACCAT	ACACA	ATTCA
TTGAT	CTTTC	AAAAA	AAGGA
GTGTG	GAAAC	GGTGG	AAAAG
AAATT	AGAAG	AAGTA	AAGCA
ATTAT	TATTC	CGACT	TGAAA
ATGAT	ATCAG	AGAAA	CAACC
GACTC	ATTAC	GAAAC	ATTAA
CAAAA	GCATT	GATCA	GCTCG
ATAAA	TTCTC	ATATG	CAATG
AAAAT	TTCTT	AAAAA	GACTT
GGAAA	CAAGT	CTTTT	TTTTG
TGCAT	TTTTC	ACCCA	TTTCA
TGGAT	AAAGT	ATTAT	ACGAT
TGTTA	AAAAA	CGAAA	AACCT
GCTGT	CTTTC	ATCAC	CTGCA
TTTAG	TAAAA	TAGAA	TGGGA
GGGTG	AAGAC	AATTA	TTGAG
CAAAT	GTGTT	TAGAT	GCCGA
AACGA	TTAAA	GGGAA	GATGA
AGGAA	ATTGT	TGGGG	ATAAA
GTCGA	TAATC	TACAT	TTAGA
AGAGA	CTCTT	TTGAC	CTTCA
TTAAT	GAAAA	GAAGC	ACTTT
TCATT	CGGTG	TCCTT	GCTTT
CCAGC	ATTAT	GTTGC	TTTTA
AGGGT	ACACA	TTCCT	CGGAA
ATCAC	ACTAC	TGGCC	GCTGG
AATTG	AACTT	TTAAT	TTTAG
CTTTT	GATAT	TTTTG	ACGAT
ATTGA	AGATG	AAGAT	AACTT
TAATA	AGGCA	TGGAT	GCAAA
CTGAC	CATGC	TATAT	CCCTG
AATGC	GGCTA	CTTCT	CTGTA
TTCAA	TAAGC	CTGCA	AGCCA
TTTGT	GAGCT	TGAAT	CAAAC
AATCG	AT		

where A, T, C and G represent adenine, thymine, cytosine and guanine, respectively.

4,824,783

OXIDIZED SULFUR DERIVATIVES OF DIAMINOPHOSPHINYL COMPOUNDS AS UREASE INHIBITORS

Michael D. Swerdloff, Parsippany; Milorad M. Rogic, Whippany, both of N.J., and Larry L. Hendrickson, Camillus, N.Y., assignors to Enichem S.p.A., Italy

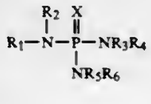
Division of Ser. No. 563,347, Dec. 30, 1983, Pat. No. 4,629,491. This application Sep. 18, 1986, Ser. No. 908,542

Int. Cl.[4] C12N *9/99;* C07F *9/22*

U.S. Cl. 435—184 8 Claims

1. A method of inhibiting the ureas catalyzed hydrolysis of urea at a situs which comprises applying to said situs a urease inhibiting effective amount of one or more compounds selected from the group consisting of N-(diaminophosphinyl)p-toluenesulfonamide and N-(diaminophosphinyl)benzenesulfonamide.

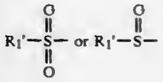
8. A compound of the formula:



wherein:

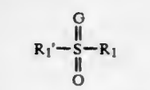
X is oxygen or sulfur;

R_1 is



wherein

R_1' is amino or substituted or unsubstituted alkyl, aryl or amine wherein permissible substituents are selected from the group consisting of one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkylcarboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl,m O-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl groups, with the proviso that when R_2 is hydrogen and R_1 is



is other than aryl;

R_2 is hydrogen, or substituted or unsubstituted alkyl or aryl wherein permissible substituents are selected from the group consisting of one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkylcarboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, O-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl groups; and

R_3, R_4, R_5, and R_6 are the same or different and are hydrogen or alkyl having from about 1 to about 4 carbon atoms.

4,824,784

CHROMOGENIC SOLUTION FOR IMMUNOASSAY

Walter D. Cantarow, Norwood, Mass., assignor to Hygeia Sciences, Incorporated, Newton, Mass.

Continuation of Ser. No. 721,102, Apr. 8, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 120,182

Int. Cl.[4] G01N *33/53, 33/72;* C12Q *1/28;* C12N *9/96*

U.S. Cl. 435—7 15 Claims

1. In an enzyme immunoassay for the colorimetric detection

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of an antigen comprising the steps of adsorbing a quantity of a first antibody to a solid support; forming a conjugate between an immunologic reagent and an oxidoreductase enzyme; mixing said conjugate with a sample to be tested for an antigen so that said antigen binds to said first antibody and to said conjugate to form an immunologic complex in solid phase; determining the presence of said enzyme in the adsorbed material by subjecting the adsorbed material to a chromogenic substrate comprising a chromogen which is a hydrogen donor; and monitoring the visible color characteristics of said substrate; the improvement comprising that said chromogenic substrate is provided in a chromogenic solution comprising a chromogen, a solvent and a stabilizing agent comprising an alkylhydroxylamine which is soluble in the chromogenic solution and which functions to retard discoloration of the chromogen during storage of the chromogenic substrate prior to use in said assay, said stabilizing agent being present in an amount sufficient to stabilize said chromogen and having the additional properties that it does not adversely affect either the reactivity of the enzyme or the binding specificity and avidity of the first antibody and said conjugate for said antigen.

4,824,785

CANINE CORONA VIRUS VACCINE

William M. Acree; Bobby Edwards, both of Temple, Tex., and John W. Black, Milton, Tenn., assignors to American Home Products Corp. (Del), New York, N.Y.

Division of Ser. No. 504,434, Jun. 15, 1983, Pat. No. 4,567,043. This application Jan. 22, 1986, Ser. No. 821,194

Int. Cl.⁴ A61K *39/12;* **C12N** *7/08*

U.S. Cl. 435—237 **21 Claims**

1. Modified live Canine Corona virus which is prepared by passing virulent Canine Corona virus in feline cells at a low virus to cell ratio of about 1:1000 to about 1:10000 as measured by the $TCID_{50}$ method between 8 and 25 times.

3. A method for propagating Canine Corona virus, comprising the steps of: inoculating a primary or established cell line of feline or canine origin with modified live Canine Corona virus at a virus to cell ratio of 1:500 to 1:1 as measured by the $FAID_{50}$ method; cultivating the inoculated cells and collecting virus produced by the cells.

7. A method for evaluating the effectiveness of a Canine Corona virus vaccine which comprises: vaccinating a test dog with an modified live Canine Corona virus vaccine; challenging the vaccinated test dog and a non-vaccinated control dog with an infectious amount of a virulent Canine Corona virus; and examining intestinal tract samples of the test dog and the control dog to determine the degree of replication of the challenge virus.

4,824,786

METHYLOTROPH CLONING VEHICLE

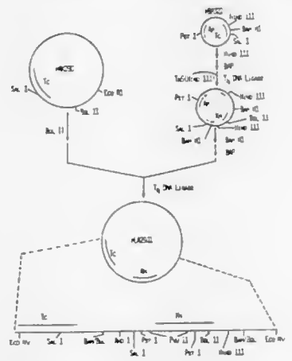
Richard S. Hanson, Deephaven, and Larry N. Allen, Excelsior, both of Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 650,825, Sep. 14, 1984, abandoned. This application Nov. 13, 1987, Ser. No. 107,244

Int. Cl.⁴ C12N *1/20, 15/00*

U.S. Cl. 435—252.3 **3 Claims**

1. A cloning vehicle selected from the group consisting of the following plasmids: pLA 2917 as deposited in *E. coli* strain HB101 as ATCC 39840; pLA 2920 as deposited in *E. coli* strain



HB101 as ATCC 39841; pLA 2901; pLA 2905; pLA 2910; and derivatives engineered therefrom.

4,824,787

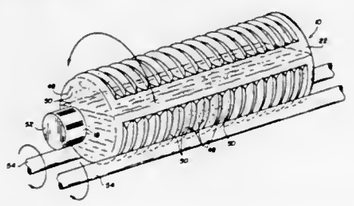
ROLLER BOTTLE FOR TISSUE CULTURE GROWTH

Jonathan M. Serkes, Oak View, and William L. Foschaar, Camarillo, both of Calif., assignors to In Vitro Scientific Products, Inc., Ventura, Calif.

Filed Feb. 16, 1988, Ser. No. 130,740

Int. Cl.⁴ C12M *3/00, 3/04*

U.S. Cl. 435—285 **13 Claims**



1. A roller bottle for tissue culture growth comprising in combination:

a substantially cyclindrical wall section having a central axis and containing a pleated segment having an upper edge and a lower edge;

the pleated segment including at least one unpleated panel for forming a drain channel for emptying the contents of the bottle and a plurality of pleats disposed crosswise to the axis of the bottle, each of the pleats containing an outer rim disposed in a common cylindrical plane and forming a trough on the inside surface of the segment;

each of the panels being connected to said troughs, being disposed no nearer to said central axis than said common cylindrical plane and extending substantially from the upper edge to the lower edge of the cylindrical segment;

said roller bottle having an inner surface area at least 110% larger than the surface area of a roller bottle having an unpleated cylindrical segment having the same external diameter;

a top section of the bottle having a neck connected to the cylindrical wall section; and

a bottom section of the bottle connected to the cylindrical wall section.

4,824,788

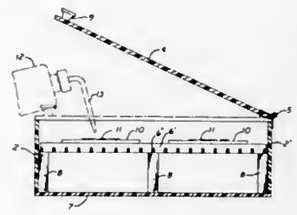
HUMIDITY CHAMBER FOR IMMUNOPEROXIDASE STAINING

Penelope J. Ferre, 1416 2nd St. North, St. Petersburg, Fla. 33704

Filed Nov. 9, 1987, Ser. No. 117,844

Int. Cl.⁴ C12M *1/22*

U.S. Cl. 435—298 **6 Claims**



1. A humidity chamber in combination with a number of glass slides on which specimen samples have been deposited thereon and a staining solution dropped thereon for immunoperoxidase reaction, comprising:

(a) a rectangular housing having four walls and a bottom wall tightly sealed together forming said humidity chamber, said chamber having an upper opening to provide access to said chamber;

(b) a grid for supporting the glass slides within the chamber, said grid having a substantial open portion therein capable of being fitted within the four side walls, said grid comprising a series of longitudinal slats parallel to each other and spaced from adjacent longitudinal slats and a series of lateral slats parallel to each other and spaced from adjacent slats with the lateral slats positioned perpendicular to the longitudinal slats dovetailed to fit each other;

(c) a supporting means for supporting said grid and spaced from said bottom wall forming upper and lower regions of the chamber so that a constant humidity can be maintained between upper and lower regions of the chamber and allowing any excess solution from the glass slides to drain through the grid to the bottom region of the chamber; and

(d) a top providing a cover and tight seal for said upper opening of said chamber.

4,824,789

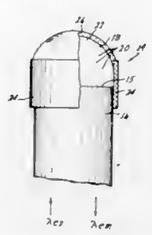
GAS SENSOR

Masao Yafuso, El Toro, and John K. Suzuki, San Juan Capistrano, both of Calif., assignors to Cardiovascular Devices, Inc., Irvine, Calif.

Filed Oct. 10, 1986, Ser. No. 917,912

Int. Cl.⁴ G01N *33/49;* **G02B** *6/02*

U.S. Cl. 436—68 **26 Claims**



1. A gas sensing composition which comprises:

suspended dispersed microcompartments of an aqueous first phase in a cross-linked polymeric second phase wherein said aqueous first phase is present in micro-compartments smaller that 5 microns, said first phase comprising an aqueous buffer solvent and a solute, said solute including a dye soluble in said solvent, and said second cross-linked polymeric phase comprising a gas permeable, light permeable, ion impermeable and substantially aqueous impermeable polymeric material.

22. A gas sensor comprising:

a gas sensing composition which comprises suspended dispersed micro-compartments of an aqueous first phase in a cross-linked polymeric second phase wherein said aqueous first phase is present in micro-compartments smaller than 5 microns, said first phase comprising an aqueous buffer solvent and a solute, said solute including a dye soluble in said solvent, and said second cross-linked polymeric phase comprising a gas permeable, light permeable, ion impermeable and substantially aqueous impermeable polymeric material; and

optical fiber means on which said gas sensing composition is located for transmitting signals from said gas sensing composition.

4,824,790

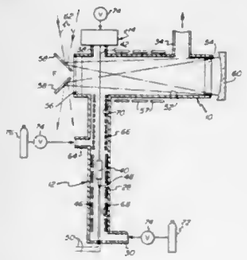
SYSTEM AND METHOD FOR THERMOGRAVIMETRIC ANALYSIS

Robert M. Carangelo, Coventry, and Peter R. Solomon, West Hartford, both of Conn., assignors to Advanced Fuel Research, Inc., East Hartford, Conn.

Filed Oct. 17, 1986, Ser. No. 920,846

Int. Cl.⁴ G01N *21/35, 21/75, 25/00*

U.S. Cl. 436—157 **25 Claims**



1. Analytical apparatus comprised of:

(a) a furnace having an internal chamber with an inlet, and an outlet spaced from said inlet, defining a path for fluid flow therebetween through said chamber;

(b) an optical analysis cell having an enclosed cavity with an inlet and an outlet for fluid flow therethrough, said cell cavity being in substantially direct flow communication with said furnace chamber through said inlet of said cell cavity and said outlet of said furnace chamber;

(c) an infrared spectrometer operatively connected to said optical cell for obtaining compositional data from substances passing through said cavity thereof;

(d) heating means including a heater having heating elements defining a portion of said path within said furnace chamber and adapted to heat gas flowing therealong, and including temperature control means for controlling the temperature of said heating means; and

(e) weighing means, including a balance and a sample holder operatively connected thereto, said sample holder being adapted to afford efficient heating of material held thereby, and being disposed within said furnace chamber at a location along said path portion defined by said heater elements and spaced from said chamber inlet a distance sufficient to preheat fluid flowing along said path portion to substantially the temperature of said heater elements prior to contact with said sample holder, said apparatus

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being substantially free from constriction along said furnace path, from the vicinity of said holder location and through said chamber outlet and said cell cavity inlet.

13. An analytical method comprising the steps of:

(a) supporting a sample of a material to be analyzed within the chamber of a furnace, said sample being subject to pyrolysis to evolve volatiles;

(b) heating said sample within said furnace chamber to effect pyrolysis thereof and thereby to evolve volatiles;

(c) sweeping said pyrolyzing sample with a carrier gas;

(d) monitoring the weight change of said pyrolyzing sample as a function of time;

(e) introducing the resultant mixture of said carrier gas and said evolved volatiles directly into the cavity of an optical analysis cell, and determining by infrared spectrometry the composition of said volatiles as a function of time; the flow rate, temperature thermal conductivity and heat capacity of said carrier gas being such as to cause any components of said mixture that are condensible at the temperature prevailing in said optical cell to condense to form an aerosol; and

(f) correlating the dynamic weight change data and the dynamic compositional data for analysis of sample.

4,824,791

THERMOSTATED CUVETTE SET

Pertti Ekholm; Olli Salmi; Jukka Tuunanen, all of Helsinki, and Erkki Vesanen, Kerava, all of Finland, assignors to Labsystems Oy, Helsinki, Finland

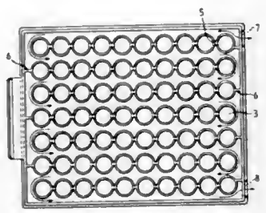
PCT No. PCT/FI86/00081, § 371 Date Mar. 5, 1987, § 102(e) Date Mar. 5, 1987, PCT Pub. No. WO87/00281, PCT Pub. Date Jan. 15, 1987

PCT Filed Jul. 9, 1986, Ser. No. 34,558

Claims priority, application Finland, Jul. 10, 1985, 852736

Int. Cl.⁴ G01N *21/03*

U.S. Cl. 436—165 **13 Claims**



1. A method for thermostating liquid samples in a cuvette set in which cuvettes of substantially uniform wall thickness are disposed in spaced-apart relationship within a basin-shaped structure having a bottom wall and a side wall, comprising the steps of feeding a thermostated medium through means defining an inlet opening in said side wall into space between said cuvettes and passing said medium past all of said cuvettes and out through means defining an outlet opening in said side wall.

4. A cuvette assembly for thermostated photometric analysis comprising in combination cuvettes of substantially uniform wall thickness disposed with spaces therebetween, within a basin-shaped structure having a bottom wall and a side wall, each of said cuvettes having a bottom acting as an optical measurement window and forming part of said basin bottom wall, means defining at least one inlet opening through said side wall communicating with one of said spaces, means defining at least one outlet opening through said side wall communicating with another of said spaces, and partition walls interconnecting said cuvettes to one another and to said side wall to form an array defining a path for fluid flow that extends from said at least one inlet opening to said at least one outlet opening through said spaces for passing fluid by each of said cuvettes.

4,824,792

APPARATUS AND A METHOD FOR REMOVING A SOLUTE FROM A SOLVENT

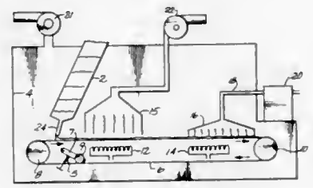
Michael Thorpe, Bristol; William J. Hoskin, Harpenden, and Leslie Brown, Wern Tarw, all of United Kingdom, assignors to Analink Developments Limited, Cardiff, United Kingdom

Filed Dec. 2, 1986, Ser. No. 937,026

Claims priority, application United Kingdom, Dec. 11, 1985, 8530511

Int. Cl.⁴ G01N *1/18, 1/22, 25/22*

U.S. Cl. 436—177 **12 Claims**



10. Apparatus for processing a solvent containing a solute comprising:

a conveyor belt having a carrier surface so profiled as to enable the solvent containing a solute to be generally uniformly disposed and keyed into the surface, and so resist displacement relative to the belt by forces acting on the solvent in the downstream direction of the belt,

means for depositing the solvent containing the solute on the belt at an upstream location, and

means for processing the solvent containing the solute, at a downstream station to remove the solvent and to convert the solute into a gaseous form.

4,824,793

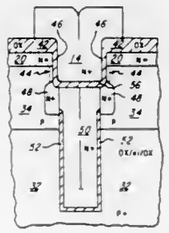
METHOD OF MAKING DRAM CELL WITH TRENCH CAPACITOR

William F. Richardson, Richardson, and Satwinder S. Malhi, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 873,822, Jun. 6, 1986, abandoned, which is a division of Ser. No. 655,849, Sep. 27, 1984, abandoned. This application Nov. 12, 1987, Ser. No. 122,559

Int. Cl.⁴ H01L *21/265, 27/10, 21/302*

U.S. Cl. 437—47 **46 Claims**



9. A method of forming a contact on a wall extending into a substrate substantially perpendicular to the surface of said substrate comprising the steps of:

(a) forming an insulating layer on said wall;

(b) forming a conductor including part of a device along at least a portion of said wall;

(c) removing said conductor from along a part of said wall;

(d) removing a portion of said insulating layer; and

(e) forming a contact to said wall within at least a part of said portion of said insulating layer utilizing a conductive material in contact with said conductor.

4,824,794

METHOD FOR FABRICATING A BIPOLAR TRANSISTOR HAVING SELF ALIGNED BASE AND EMITTER

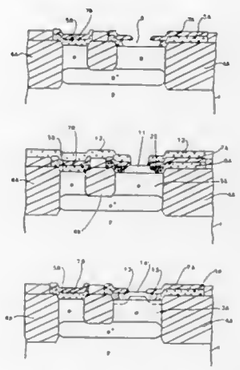
Akira Tabata, Zama; Motoshu Miyajima, Kawasaki, and Kazushi Kawaguchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 902,835, Sep. 2, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 170,618

Claims priority, application Japan, Sep. 2, 1985, 60-191959

Int. Cl.⁴ H01L *21/265*

U.S. Cl. 437—33 **22 Claims**



1. A method for fabricating a bipolar transistor in a substrate having a single crystal semiconductor region on the surface thereof, comprising steps of:

(i) selectively forming an isolation region on the substrate so as to surround said single crystal semiconductor region, said single crystal semiconductor region having a first conductivity type;

(ii) forming a polycrystalline semiconductor layer on said single crystal semiconductor region, said polycrystalline semiconductor layer extending to a portion of said isolation region adjacent to said single crystal semiconductor region;

(iii) selectively ion-implanting second conductivity type impurities into said polycrystalline semiconductor layer at a portion in which an extrinsic base region is formed;

(iv) selectively forming a dielectric layer on said polycrystalline semiconductor layer, so that said dielectric layer is provided with an opening to expose therefrom said portion of said polycrystalline semiconductor layer formed on said single crystal semiconductor region;

(v) removing the exposed portion of said polycrystalline semiconductor layer until the corresponding portion of said single crystal semiconductor region is exposed by using an etchant having a higher etching capacity for said polycrystalline semiconductor layer then for said single crystal semiconductor region, wherein a predetermined amount of undercut is provided in said polycrystalline semiconductor layer under said dielectric layer around said opening;

(vi) epitaxially growing a semiconductor layer on said exposed portion of said single crystal semiconductor region so that said removed portion of said polycrystalline semiconductor layer is filled with said epitaxially grown semiconductor layer;

(vii) annealing the substrate so that said second conductivity type impurities ion-implanted in said polycrystalline semiconductor layer diffuses into at least the periphery of said epitaxially grown semiconductor layer, such that an extrinset base region is formed in the periphery of said epitaxially grown layer;

(viii) selectively ion-implanting second conductivity type impurities and first conductivity type impurities into said epitaxially grown semiconductor layer, so that the region between the base and emitter regions for said bipolar transistors are formed in a single crystal region of said epitaxially grown semiconductor layer; and

(ix) selectively forming a conductor layer on said epitaxially grown semiconductor layer doped with said first conductivity type impurities, such that an emitter electrode for said bipolar transistor is provided.

4,824,795

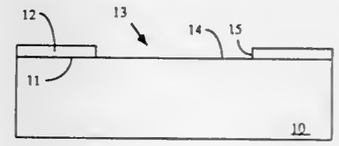
METHOD FOR OBTAINING REGIONS OF DIELECTRICALLY ISOLATED SINGLE CRYSTAL SILICON

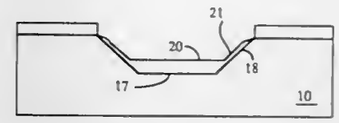
Richard A. Blanchard, Los Altos, Calif., assignor to Siliconix incorporated, Santa Clara, Calif.

Continuation-in-part of Ser. No. 811,600, Dec. 19, 1985, abandoned. This application Feb. 5, 1987, Ser. No. 10,924

Int. Cl.⁴ H01L *21/76, 21/26*

U.S. Cl. 437—62 **14 Claims**





1. The process for forming a dielectrically-isolated single-crystal island in a monocrystalline wafer substrate comprising the steps of:

providing a monocrystalline semiconductor wafer having a top surface in a low crystal index plane;

masking the top surface mask material, leaving the surface exposed in a window area with rectangular sides parallel to the lattice of said crystal plane in the top surface;

etching the exposed wafer surface preferentially normal to the top surface plane, to remove an inverted pyramid section having a flat bottom surface and with sidewall surfaces converging towards the bottom surface;

providing a dielectric layer on the bottom surface only of the pyramid section;

refilling the pyramid section with semiconductor refill above the dielectric;

providing that the semiconductor refill is epitaxial with the monocrystalline semiconductor material of the sidewalls, to constitute a single crystal refill; and

laterally isolating the single crystal between its surface and the dielectric layer,

wherein the step of providing a dielectic layer includes:

providing that at least the bottom surface of the pyramid section is heavily doped with phosphorus;

forming a layer of dielectric on the pyramid section surface, substantially thicker on the bottom surface than on the sidewall surfaces; and

nonpreferentially etching the layer of dielectric so that there

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is dielectric on the bottom surface but no dielectric on the sidewalls.

4,824,796

PROCESS FOR MANUFACTURING SEMICONDUCTOR BICMOS DEVICE

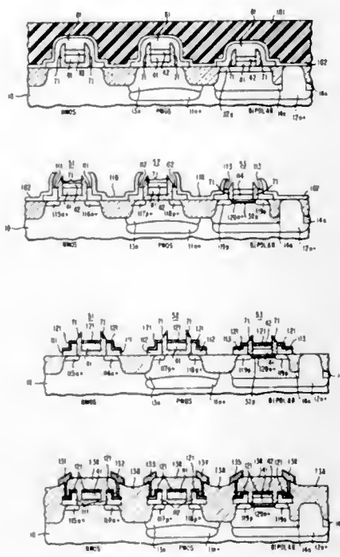
Tzu-Yin Chiu; Gen M. Chin, both of Marlboro; Ronald C. Hanson, Middletown; Maureen Y. Lau, Keyport; Kwing F. Lee, Aberdeen; Mark D. Morris; Alexander M. Voshchenkov, both of Freehold; Avinoam Kornblit, Highland Park; Joseph Lebowitz, Watchung, and William T. Lynch, Summit, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 854,885, Apr. 23, 1986, abandoned. This application Jul. 10, 1987, Ser. No. 77,953

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

Int. Cl.⁴ H01L *21/70, 27/00*

U.S. Cl. 437—57 **8 Claims**



1. In a process for creating transistor devices in selected areas of a semiconductor wafer wherein stacks of appropriate materials have been created over predetermined portions of the selected areas corresponding to elements of the transistors, a method of creating an insulating boundary between elements of said devices created in the wafer under said stacks and elements of said devices in the wafer adjacent to said stacks comprising the steps of depositing an insulating layer over the entire wafer including the stacks, directionally selective etching said insulating layer such that the insulating layer remains only as walls around the stacks, depositing a semiconductor material over the wafer including the walls and stacks, said semiconductor material having the property that it can be doped to become conductive where appropriate, and etching the semiconductor material back to the point where the walls form protruding insulating boundaries between the semiconductor material within the walls and outside of the walls.

4,824,797

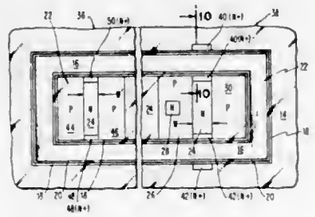
SELF-ALIGNED CHANNEL STOP

George R. Goth, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,504

Int. Cl.⁴ H01L *21/265*

U.S. Cl. 437—67 **13 Claims**



1. A method for forming a semiconductor structure having a self-aligned channel stop, comprising:

providing a first conductivity type semiconductor body having on the surface thereof an insulator layer;

forming in said insulator layer an opening to expose said body corresponding to where a trench of a predetermined length is desired;

forming a blockout layer having an opening therein to limit the exposure of said body exposed by said opening in said insulator layer to a selected portion of said length;

introducing dopant of the first conductivity type into said body exposed by the resultant of the openings in said insulator and blockout layer;

annealing to diffuse said dopant into said body; and

reactively ion etching said body exposed by the opening in said insulator layer to form said trench whereby is formed a highly doped first conductivity type channel stop in a surface region of the semiconductor body abutting a portion of said trench.

4,824,798

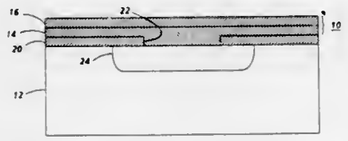
METHOD OF INTRODUCING IMPURITY SPECIES INTO A SEMICONDUCTOR STRUCTURE FROM A DEPOSITED SOURCE

Robert D. Burnham, Wheaton, Ill., and Robert L. Thornton, East Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 5, 1987, Ser. No. 117,593

Int. Cl.⁴ H01L *21/265, 21/203*

U.S. Cl. 437—81 **3 Claims**



1. A method of introducing impurity species into a semiconductor structure comprising the steps of

depositing a Si or Ge diffusion source layer on the surface of said structure in the presence of a source of As, P or Sb heavily doping said layer in the range of 5 to 20 by atomic percent,

depositing a thin cap layer on said Si or Ge diffusion source layer to prevent the outdiffusion of elemental constituents comprising said structure,

thermally annealing said structure at a high temperature in the range of 700° C. to 900° C. to cause the diffusion of Si or Ge form said source layer into said structure,

carrying out the deposition of said layers at a temperature in excess of 500° C. in order to minimize the occurrence of irregularities in the morphology of said layers and said structure due to thermal strain and compressive stress during said high temperature annealing.

said diffusion source layer comprising unhydrogenated amorphous Si or Ge to prevent the formation of irregularities in the morphology of said diffusion source layer due to hydrogen outdiffusion during said high temperature annealing and thereby permitting uniform diffusion of said Si or Ge into said semiconductor structure.

4,824,799

METHOD OF MAKING A BIPOLAR SEMICONDUCTOR DEVICE

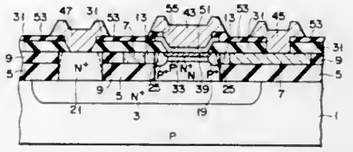
Shigeru Komatsu, Kitakyushu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 817,102, Jan. 8, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 178,875

Claims priority, application Japan, Jan. 17, 1985, 60-6216

Int. Cl.⁴ H01L *31/36, 21/38*

U.S. Cl. 437—162 **6 Claims**



6. A method of manufacturing a semiconductor device, comprising the steps of:

forming a first insulation film on a semiconductor body;

forming a metallic layer on said first insulation film;

forming an opening in said metallic layer;

forming an annular polysilicon layer, including an impurity of the first conductivity type, in said opening, said annular polysilicon layer contacting a side wall of said metallic layer;

forming a hole in said first insulation film using said annular polysilicon layer and said metallic layer as a mask, said hole penetrating said first insulation film to reach said buried layer;

growing a monocrystalline silicon layer in said hole, said monocrystalline silicon layer contacting said annular polysilicon layer, and diffusing said impurity included in said polysilicon layer into said monocrystalline silicon layer to form an external base region;

forming a base region of the first conductivity type within said monocrystalline silicon layer to contact said external base region, with a remaining region of the monocrystalline silicon layer of the second conductivity type forming a collector; and

forming an emitter region of the second conductivity type within said base region.

4,824,800

METHOD OF FABRICATING SEMICONDUCTOR DEVICES

Hirozo Takano, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,480

Claims priority, application Japan, May 8, 1987, 62-112911

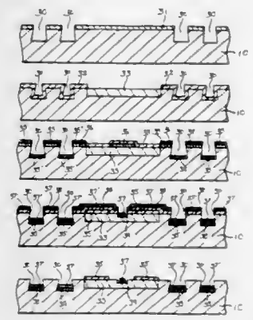
Int. Cl.⁴ H01L *21/00, 21/02, 21/20, 21/203*

U.S. Cl. 437—180 **8 Claims**

1. A method of fabricating a semiconductor device on a substrate which includes formation of electrodes by selective plating using a liftoff procedure, the method comprising the steps of:

forming a pattern of access grooves in the substrate associated with the semiconductor device in such a way as to assist in the lift-off of photoresist,

producing a photoresist pattern on a partly fabricated semiconductor device having open areas for defining electrode positions and photoresist covered areas protecting the remaining surface of the semiconductor device,



plating electrode material over the semiconductor device, and

applying solvent to the plated semiconductor device to invade the photoresist at the exposed edges and lift off the photoresist and the overlying plating, the access grooves being of a depth sufficient to provide exposed edges to allow access by the solvent to the photoresist underlying the plating to assure lift-off.

4,824,801

METHOD OF MANUFACTURING ALUMINUM BONDING PAD WITH PSG COATING

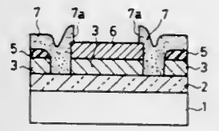
Hiroshi Kawashimo; Kouichi Nakagawa, and Kou Shimomura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,645

Claims priority, application Japan, Sep. 9, 1986, 61-213119; Sep. 9, 1986, 61-213121

Int. Cl.⁴ H01L *21/441*

U.S. Cl. 437—187 **1 Claim**



1. A method of manufacturing a semiconductor device having a bonding pad, comprising the steps of:

preparing a semiconductor substrate,

forming underlying films on said semiconductor substrate,

forming an insulating film including phosphorus on said underlying films,

etching away a portion of the region in which said bonding pad is to be formed on said insulating film and providing an opening in said insulating film,

forming an aluminum film on said insulating film having said opening formed and said underlying films,

applying a resist film to a region inside of said opening region on said aluminum film, etching away unnecessary portions of the aluminum film and underlying films utiliz-

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ing said resist film and said insulating film as masks to separate the aluminum. film from the insulating film, and forming a diffusion preventing film for preventing diffusion of phosphorus in a region between said separated aluminum film and insulating film including phosphorus.

4,824,802

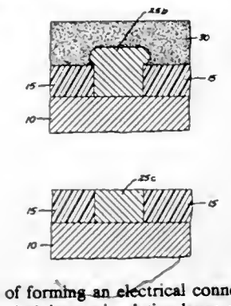
METHOD OF FILLING INTERLEVEL DIELECTRIC VIA OR CONTACT HOLES IN MULTILEVEL VLSI METALLIZATION STRUCTURES

Dale M. Brown, Schenectady; Bernard Gorowitz, Clifton Park, and Richard J. Saia, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 835,025, Feb. 28, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 104,002

Int. Cl.[4] H01L *21/283, 21/312*

U.S. Cl. 437—192 **8 Claims**



1. A method of forming an electrical connection to a conductive layer underlying an insulative layer on an integrated circuit substrate, said method comprising the steps of:

forming an opening in said insulative layer so as to expose an underlying portion of said conductive layer through said opening;

selectively depositing an intermediary metal in said opening so that said intermediary metal substantially fills said opening and extends over said insulative layer only in the vicinity of said opening;

applying and flowing a planarization resist over said substrate; and

planarizingly etching said resist and said intermediary metal down to said insulative layer by reactive ion etching or plasma etching, whereby said opening is provided with a metal plug in electrical contact with said underlying conductive layer.

4,824,803

MULTILAYER METALLIZATION METHOD FOR INTEGRATED CIRCUITS

Natasha Us, Jackson Heights; Bonggi Kim, Smithtown, and John E. Berg, New York, all of N.Y., assignors to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Jan. 22, 1987, Ser. No. 64,501

Int. Cl.[4] H01L *23/48*

U.S. Cl. 437—192 **4 Claims**

1. A method of making a metal connection to the face of a semiconductor body, the connection extending over a step in an insulating layer on the face, said method comprising:

(a) providing a substrate;

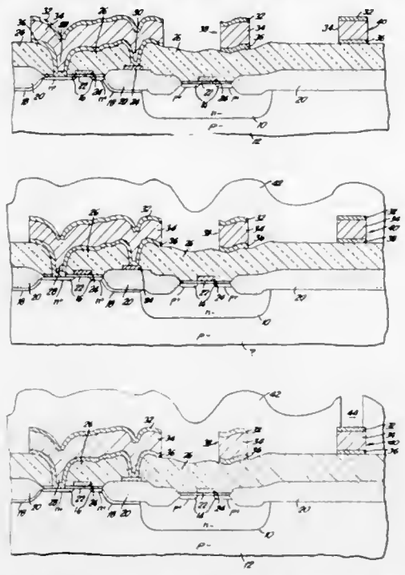
(b) forming a three-layer sandwich structure of metal by depositing a layer of a refractory metal, a layer of aluminum or aluminum alloy, and a layer of refractory metal over said substrate;

(c) selectively removing said three-layer sandwich structure;

(d) depositing a protective oxide and/or nitride overlay layer over the remaining portions of said three-layer metal sandwich structure;

(e) etching an opening to the bonding pad in said protective overlay layer; and

(f) employing the remaining overlay layer as an etchant mask, and without using an additional lithography step, selectively removing by dry etching the refractory metal



layer at the bonding pad to expose the underlying aluminum or aluminum alloy.

4,824,804

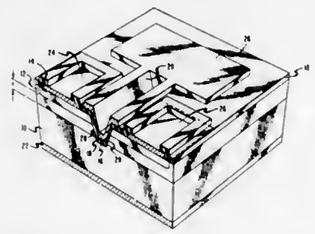
METHOD OF MAKING VERTICAL ENHANCEMENT-MODE GROUP III-V COMPOUND MISFETS

Chu-Liang Cheng, Piscataway, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 896,772, Aug. 15, 1986, Pat. No. 4,755,867. This application Apr. 28, 1988, Ser. No. 187,606

Int. Cl.[4] H01L *21/265, 21/88*

U.S. Cl. 437—203 **4 Claims**



1. A method of fabricating a vertical field effect transistor comprising the steps of:

providing a Group III-V compound conductive body having one conductivity type,

epitaxially growing a semi-insulating Group III-V compound blocking layer on one major surface of said body,

ion-implanting a conductive layer into a surface portion of said blocking layer on the side thereof remote from said body,

forming a groove which extends through said blocking and conductive layers to said body,

forming a dielectric layer on at least one wall of said groove, and

forming electrodes to said transistor, including a gate electrode on said dielectric layer, a source electrode on the other major surface of said body, and a drain electrode on said one major surface adjacent said gate electrode.

4,824,805

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

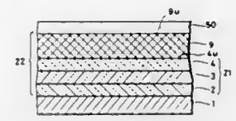
Yasutomo Kajikawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,496

Claims priority, application Japan, Feb. 17, 1987, 62-34854

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—228 **8 Claims**



1. A method of manufacturing a semiconductor device having a semiconductor mesa on which a first electrode is formed, said method comprising the sequential steps of;

(a) preparing a semiconductor substrate;

(b) forming a semiconductor layer on an upper surface of said semiconductor substrate;

(c) shaping a recess in said semiconductor layer;

(d) forming a first metallic layer serving as said first electrode on a bottom surface of said recess;

(e) forming a resist mask matching a shape of said recess by filling said recess with resist material;

(f) selectively removing an upper portion of said semiconductor layer by etching process using said resist mask to shape said semiconductor mesa beneath said resist mask; and

(g) removing said resist mask.

4,824,806

GLASS FIBERS HAVING LOW DIELECTRIC CONSTANT

Koji Yokoi; Mitsugi Yoshiyagawa, and Selichiro Manabe, all of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 029,568, Mar. 24, 1987, abandoned. This application Dec. 28, 1987, Ser. No. 138,489

Claims priority, application Japan, Mar. 27, 1986, 69196986

Int. Cl.[4] C03C *13/00, 3/091, 3/093*

U.S. Cl. 501—35 **4 Claims**

1. Glass fibers having a low dielectric constant composed of a glass having a dielectric constant of not more than 5 and consisting essentially of

SiO_2 45–65% by weight,

Al_2O_3 9–20% by weight,

B_2O_3 20.5–30% by weight,

$CaO+MgO+ZnO$ 4–10% by weight,

$Li_2O+Na_2O+K_2O$ 0–5% by weight,

based on the total weight of the glass, the total proportion of SiO_2, Al_2O_3, B_2O_3, CaO, MgO, ZnO, Li_2O, Na_2O, and K_2O being at least 95% by weight.

4,824,807

FLEXIBLE ALKALI METAL SILICATE GLASS PRODUCTS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Filed Jun. 1, 1987, Ser. No. 57,810

Int. Cl.[4] C03C *3/04*

U.S. Cl. 501—53 **8 Claims**

1. A flexible sodium silicate glass produced by the following steps:

(a) mixing 10 to 80 parts by weight of sodium silicate glass having a SiO_2:alkali metal oxide ratio of 3.9:1 to 2.0:1 with 50 to 100 parts by weight of water until an aqueous alkali metal glass suspension is produced;

(b) pouring or applying the aqueous alkali metal silicate glass suspension into the desired form;

(c) drying out water from the sodium silicate glass suspension.

4,824,808

SUBSTRATE GLASS FOR LIQUID CRYSTAL DISPLAYS

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 9, 1987, Ser. No. 118,266

Int. Cl.[4] C03C *3/091, 3/093*

U.S. Cl. 501—66 **3 Claims**

1. A glass composition consisting essentially, in cation percent, of about 52–58% SiO_2, 12.5–18% Al_2O_3, 20–23% B_2O_3, 0–4% MgO, 0–6% CaO, 0–6% SrO, 1–9% BaO, 8–12% $MgO+CaO+SrO+BaO$, 0–3% ZnO, and 0–1% of fining agents, said composition providing a glass having a strain point in excess of 625° C., an average linear coefficient of thermal expansion in the range of about $20–60\times10^{-7}$/°C. over the temperature range 25°–300° C., an internal liquidus temperature not exceeding about 1050° C., and chemical durability sufficient to exhibit a weight loss in 5% HCl at 95 ° C. not exceeding about 10 mg/cm^2 in a 24 hour period.

4,824,809

OPTICAL CDO AND THO_2-FREE GLASS WITH REFRACTIVE INDICES OF 1.73–1.78 ABBE NUMBERS OF 30–34, AND HIGH DEVITRIFICATION STABILITY

Danuta Grabowski, Taunusstein, and Ludwig Roos, Klein Winterheim, both of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 818,858, Jan. 15, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 139,069

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501100

Int. Cl.[4] C03C *3/072, 3/074, 4/00*

U.S. Cl. 501—75 **15 Claims**

1. An optical, substantially CdO-and ThO_2-free glass having a refractive index of 1.73–1.78, an Abbe number of 30–34, good devitrification stability, good transmission in the visible range and low raw material cost, consisting essentially of in weight percent:

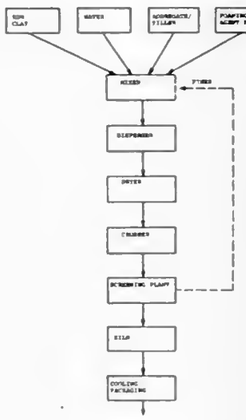
SiO_2	12–20
B_2O_3	10–18
PbO	52–60
Al_2O_3	2–7
ZnO	0–3
ZrO_2	0.5–3
La_2O_3	2–9.5
Cs_2O	0–5
M_2O(M_2O=Na_2O, K_2O, Li_2O)	0–1
TiO_2	0–5,
SnO_2	0–1.5
F^-(replacing $O^=$)	0–2
Y_2O_3	0–2
Bi_2O_3	0–2
Nb_2O_5	0–1.

4,824,810

HIGHLY POROUS CERAMIC MATERIAL FOR ABSORPTION AND ADSORPTION PURPOSES, PARTICULARLY FOR ANIMAL LITTER/BEDDING, PROCESS FOR THE PRODUCTION THEREOF AND THE USE THEREOF

Rudiger Lang, Minden, and Bernd Meyer, Bremen, both of Fed. Rep. of Germany, assignors to Effem GmbH, Verden, Fed. Rep. of Germany

PCT No. PCT/DE85/00035, § 371 Date Dec. 17, 1985, § 102(e) Date Dec. 17, 1985, PCT Pub. No. WO85/04862, PCT Pub. Date Nov. 7, 1985
Continuation of Ser. No. 810,014, Dec. 17, 1985, abandoned.
This PCT application Feb. 9, 1985, Ser. No. 71,539
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414965
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.[4] C04B *38/00*
U.S. Cl. 501—84 11 Claims



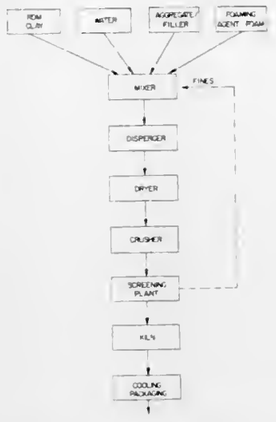
1. A process for producing a porous ceramic material for use as an adsorbent or absorbent, having a porosity of 50 to 300%; a water absorption capacity of 50 to 200%; a pH-value in the range 5 to 9; a bulk density of 400 to 700 g/l; and an internal surface (BET-N_2) between 20 and 200 m^2/g, which comprises forming a starting mixture containing 45 to 80 parts by weight of clay, 0 to 50 parts by weight of an aggregate with a high specific surface, 15 to 30 parts by weight of water, 0.01 to 0.03 parts by weight of deflocculant and 0.001 to 0.01 parts by weight of a surfactant; foaming the starting mixture under pressure at a pressure of 1 to 10 bar by compressed air at a temperature between ambient temperature and 95° C. to form a foam; shaping and drying the foam to give a shaped clay member; crushing the dried shaped clay member; screening the crushed shaped clay member and returning fines to the starting mixture; and firing the crushed shaped clay member with a chosen particle size range at a product temperature in the shaped clay member between 600° and 1000° C.

4,824,811

LIGHTWEIGHT CERAMIC MATERIAL FOR BUILDING PURPOSES, PROCESS FOR THE PRODUCTION THEREOF AND THE USE THEREOF

Rudiger Lang, Minden, and Bernd Meyer, Bremen, both of Fed. Rep. of Germany, assignors to Effem GmbH, Verden, Fed. Rep. of Germany

Continuation of Ser. No. 810,040, Dec. 12, 1985, abandoned.
This application Jul. 17, 1987, Ser. No. 75,203
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414967
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.[4] C04B *38/00*
U.S. Cl. 501—84 11 Claims



1. A process for producing a lightweight ceramic material for use in building purposes, as a thermal and/or noise insulating material or as an aggregate for high temperature building materials, furnace building materials and/or refractory building materials, having a bulk density of 300 to 700 g/liter, which comprises forming a starting mixture containing 45 to 80 parts by weight of clay, 0 to 50 parts by weight of an aggregate, 15 to 30 parts by weight of water, 0.01 to 0.03 parts by weight of a deflocculant and 0.001 to 0.01 parts by weight of a surfactant; foaming the starting mixture at a pressure of 1 to 10 bar by compressed air at a temperature between ambient temperature and 95° C. to form a foam; molding and drying the foam to give a dried clay blank; and firing the dried clay blank at a product temperature between 600° and 1400° C.

4,824,812

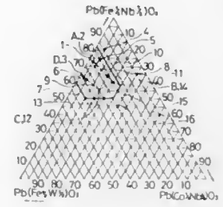
HIGH FREQUENCY WAVE ABSORBING CERAMICS

Toshiki Saburi, Anjo; Nobuyuki Ohya, Nagoya; Toru Yamazaki, Kariya, and Taisei Katoh, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 27,073, Mar. 17, 1987, abandoned, which is a continuation of Ser. No. 813,779, Dec. 27, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 125,713
Claims priority, application Japan, Dec. 28, 1984, 59-280711
Int. Cl.[4] C04B *35/00*
U.S. Cl. 501—134 7 Claims

1. A high frequency wave absorbing ceramics of a ternary composition comprising lead iron niobate $Pb(Fe_{\frac{1}{2}}Nb_{\frac{1}{2}})O_3$, lead iron tungstate $Pb(Fe_{\frac{1}{2}}W_{\frac{1}{2}})O_3$ and lead cobalt niobate $Pb(Co_{\frac{1}{2}}Nb_{\frac{1}{2}})O_3$

the composition ratio in the ternary composition lying in the inside (including the boundary) of a quadrangle A–B–C–D in the ternary phase diagram shown in FIG. 1, and



the high frequency wave absorbing ceramics having a dielectric constant of 13,000 or more at a frequency of 1 MHz

4,824,813

DIELECTRIC CERAMIC COMPOSITION

Shinsuke Yano; Susumu Nishigaki; Hiroshi Katu, and Toshio Nonomura, all of Nagoyo, Japan, assignors to Narumi China Corporation, Nagoya, Japan

Filed Dec. 17, 1987, Ser. No. 134,008
Claims priority, application Japan, Dec. 27, 1986, 61-315249
The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—139 14 Claims

1. A dielectric ceramic composition consisting essentially of a $BaO-TiO_2-WO_3$ ternary system wherein the molar percentages of BaO, TiO_2 and WO_3 are within the area defined by straight lines joining the points A(21.5, 78.5, 0), B(40.0, 30.0, 30.0), C(37.0, 30.0, 33.0), D(20.0, 75.0, 5.0), E(21.5, 75.0, 3.5) and A, in that order, in the composition diagram, in mole %, shown in the attached drawing, with the proviso that said molar percentages of BaO, TiO_2 and WO_3 laying on the straight lines joining said points A, E and D, in that order, are excluded, and wherein the amount of WO_3 contained in the composition is at least 0.1 mole %.

4,824,814

CATALYST TREATMENT AND PROCESS FOR USING TREATED CATALYST

Frank J. Elvin, Kenner, La., and Jin S. Yoo, Flossmoor, Ill., assignors to Chemcat Corporation, Kenner, La.

Filed Sep. 21, 1987, Ser. No. 98,911
Int. Cl.[4] B01J *29/38, 38/64, 38/60*; C10G *11/05*
U.S. Cl. 502—22 9 Claims

1. A process for treating a catalyst used to promote the cracking of a hydrocarbon feedstock containing at least one first metal which is a contaminating metal, at least a portion of said first metal from said hydrocarbon feedstock is deposited on said catalyst forming a first metal-containing catalyst, which process comprises:

demetallizing said first metal-containing catalyst to provide a demetallized first metal-containing catalyst having a reduced first metal content; and

contacting said demetallized first metal-containing catalyst with at least one antimony component to increase the antimony content of said demetallized, first metal-containing catalyst and form a treated catalyst having at least one improved hydrocarbon cracking catalytic property relative to said first metal-containing catalyst, provided that the atomic ratio of said antimony to said first metal in said treated catalyst is in the range of about 0.1 to about 1.0.

4,824,815

CRACKING CATALYSTS CONTAINING STRONTIUM CARBONATE

Edwin L. Kugler, Glen Gardner, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 743,593, Jun. 11, 1985, abandoned. This application Feb. 13, 1987, Ser. No. 14,469
Int. Cl.[4] B01J *29/08*
U.S. Cl. 502—64 8 Claims

1. A catalytic cracking catalyst comprising:

a zeolitic material;

a matrix material; and

strontium carbonate dispersed in the matrix as discrete particles, said carbonate being present in an amount sufficient to form a product having a melting point greater than about 670° C. when the carbonate is reacted with vanadium or nickel containing compounds or mixtures thereof at fluid catlaytic cracking regenerator temperatures.

4,824,816

METHOD FOR PRODUCING STABILIZED ZEOLITE CATALYSTS

Theodore D. Trowbridge, Madison; Shun C. Fung, Bridgewater, both of N.J., and Thomas H. Vanderspurt, Atascocita, Tex., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Sep. 21, 1987, Ser. No. 99,432
Int. Cl.[4] B01J *29/06, 37/00*
U.S. Cl. 502—66 13 Claims

8. A method for producing a stabilized bound zeolite catalyst comprising the steps of:

contacting a substrate comprising a large pore zeolite bound with alumina with an aqueous solution containing at least a platinum salt and an alkali or alkaline earth metal compound at a pH between 10.5 and 12.0,

reducing the platinum salt to the metal form, and

dispersing the Group VIII metal by oxychlorination.

4,824,817

CATALYST FOR THE CARBONYLATION OF CONJUGATED DIENES

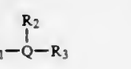
Eit Drent, CM Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 23, 1987, Ser. No. 124,128
Claims priority, application Netherlands, Dec. 5, 1986, 8603101
Int. Cl.[4] B01J *31/04, 31/02, 31/12*
U.S. Cl. 502—154 11 Claims

1. A catalyst system for the selective carbonylation of conjugated dienes in the presence of a hydroxyl group containing compound in the liquid phase comprises a combination of:

(a) palladium or a compound thereof;

(b) an organic phosphorus, antimony or arsenic derivative according to the formula:



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wherein R_1 represents an aryl group substituted with at least one electron-attracting group and R_2 and R_3 each represent individually an aryl group or an aryl group substituted with at least one electron-attracting group and wherein Q represents phosphine, antimony or arsenic; and

(c) an acid with a pka from about 2.5 to about 4.0, said acid is a condensed aromatic carboxylic acid or a benzoic acid substituted by at least one electron-attracting group selected from the group consisting of (1) halogen, (2) hydroxy, and (3) methoxy.

4,824,818

CATALYTIC COMPOSITE AND PROCESS FOR MERCAPTAN SWEETENING

Jeffery C. Bricker, Buffalo Grove, and Robert R. Frame, Glenview, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 5, 1988, Ser. No. 152,508

Int. Cl.[4] B01J *31/00;* **C10G** *27/00*

U.S. Cl. 502—163 **15 Claims**

1. A catalytic composite effective in oxidizing mercaptans contained in a sour petroleum distillate to disulfides comprising a metal chelate and an onium compound selected from the group consisting of phosphonium, arsonium, stibonium, oxonium and sulfonium compounds dispersed on an adsorbent support, the onium compound having the formula $[R'(R)_yM]^+X^-$ wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R' is a straight chain alkyl radical containing from about 5 to about 20 carbon atoms, M is phosphorous, arsenic, antimony, oxygen, or sulfur, X is hydroxide or a halide selected from the group consisting of chlorine, bromine and iodine, y is 2 when M is oxygen or sulfur and y is 3 when M is phosphorous, arsenic or antimony.

4,824,819

VANADIUM COATED PHOSPHORUS-VANDIUM OXIDE AND PHOSPHORUS-VANADIUM OXIDE CO-METAL CATALYST AND PROCESS FOR THE MANUFACTURE OF MALEIC ANHYDRIDE

Robert C. Edwards, and William S. Eryman, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 10, 1988, Ser. No. 154,788

Int. Cl.[4] B01J *27/198, 27/18;* **C07D** *307/34*

U.S. Cl. 502—209 **21 Claims**

1. A catalyst effective for the oxidation of butane to maleic anhydride, which catalyst comprises a solid substrate comprising phosporus and vanadium, in an atomic ratio of about 0.8:1 to about 2:1, said substrate having vanadium post-deposited upon its surface, said catalyst being prepared by treating said substrate, after said substrate is formed, with a vanadium compound to deposit upon said substrate at least 0.001 atom of post-deposited vanadium per atom of vanadium in the substrate.

8. A catalyst effective for the oxidation of butane to maleic anhydride, which catalyst comprises a solid substrate comprising phosporus, vanadium, in an atomic ration of about 0.8:1 to about 2:1 and a co-metal selected from the group consisting of zinc, bismuth, copper, molybdenum, tungsten uranium, titanium, tin, cobalt, chromium, manganese, iron, nickel, antimony, and mixtures thereof, said substrate having vanadium post-deposited upon its surface, said catalyst being prepared by treating said substrate, after said substrate is formed, with a vanadium compound to deposit upon said substrate at least 0.001 atom of post-deposited vanadium per atom of vanadium in the substrate.

4,824,820

HYDROTREATING CATALYSTS COMPRISING A MIXTURE OF A SULFIDE OF A PROMOTER METAL, AMORPHOUS SULFIDE OF TRIVALENT CHROMIUM AND MICROCRYSTALLINE MOLYBDENUM OR TUNGSTEN SULFIDE

Allan J. Jacobson, Princeton; Teh C. Ho, Bridgewater; Russell R. Chianelli, Somerville; John J. Steger, Pittstown, and Angelo A. Montagna, Summit, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 871,152, May 30, 1986, Pat. No. 4,721,558, which is a continuation of Ser. No. 656,088, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 567,882, Jan. 3, 1984, abandoned, which is a continuation of Ser. No. 454,384, Dec. 29, 1982, abandoned. This application Sep. 24, 1987, Ser. No. 100,479

Int. Cl.[4] B01J *27/047*

U.S. Cl. 502—219 **12 Claims**

1. A process for preparing a catalyst comprising a mixture of (i) an amorphous sulfide of trivalent chromium, (ii) micorcrystallites of a metal sulifide of a metal selected from the group consisting of Mo, W, and mixtures thereof, and (iii) a sulfide of at least one promoter metal selected from the group consisting of Ni, Co, Mn, Zn, Cu, mixtures thereof and mixtures thereof with Fe, said process comprising heating a precursor at a temperature of at least aobut 200° C., in the presence of sulfur and under oxygen free conditions for a time sufficient to form said catalyst, wherein said precursor comprises a mixture of (i) a hydrated oxide of trivalent chromium and (ii) a thiometallate salt of the general formula $(ML)(Mo_yW_{1-y}S_4)$ wherein M is one or more of the divalent promoter metals selected from the group consisting of Ni, Co, Mn, Zn, Cu, mixtures thereof and mixtures thereof with Fe, wherein Y is any value ranging from 0 to 1, L is one or more neutral, nitrogen-containing ligands, at least one of which is a chelating polydentate ligand.

4,824,821

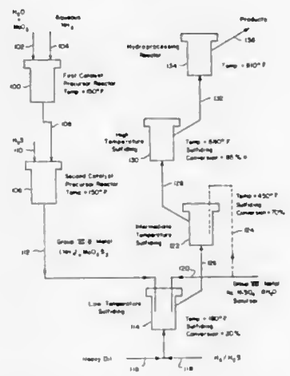
DISPERSED GROUP VIB METAL SULFIDE CATALYST PROMOTED WITH GROUP VIII METAL

Jaime Lopez, Benicia, Calif., and Eugene A. Pasek, Export, Pa., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 527,414, Aug. 29, 1983, Pat. No. 4,557,821. This application Aug. 21, 1985, Ser. No. 767,760 The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] B01J *27/047, 27/051*

U.S. Cl. 502—220 **32 Claims**



14. A process for preparing a dispersed Group VIB metal sulfide catalyst promoted with a Group VIII metal for hydrocarbon oil hydroprocessing comprising sulfiding an aqueous dispersion of a thiosubstituted ammonium salt of Group VIB metal in the presence of a Group VIII metal compound, wherein said sulfiding occurs in a plurality of distinct sulfiding steps at progressively increasing temperatures including relatively low and relatively high temperature steps, wherein said relatively low temperature is below about 350° F. and said relatively high temperature is above about 500° F.

4,824,822

THERMOSENSITIVE RECORDING MATERIAL

Yoichi Yamamoto, Nara; Hironori Fujii, Osaka, and Toshio Oichi, Itami, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Sugai Chemical Industry Co., Ltd., Wakayama, both of, Japan

Continuation of Ser. No. 756,269, Jul. 18, 1985, abandoned. This application Mar. 28, 1988, Ser. No. 191,821

Claims priority, application Japan, Jul. 24, 1984, 59-154879

Int. Cl.[4] B41M *5/035, 5/22;* **G03C** *5/00*

U.S. Cl. 503—201 **7 Claims**

1. A thermosensitive recording method, comprising;

providing a first recording sheet pre-treated with a compound A, and a second recording sheet pre-treated with a compound B, and placing said first recording sheet upon said second recording sheet to form a set of recording sheets,

heat-treating said set of recording sheets resulting in sublimation or evaporation of compound B to bring these two compounds into contact with each other on said first recording sheet, resulting in a latent image on said first recording sheet, and

exposing said first recording sheet to light to produce a color image on said first recording sheet corresponding to said latent image.

4,824,823

MICROCAPSULES CONTAINING OILS AND SOLUBLE COLOR REACTION COMPONENTS, THEIR MANUFACTURE AND USE IN COLOR REACTION RECORDING SYSTEMS

Gunter Pietsch, Isernhagen, and Karl-Heinz Schrader, Hanover, both of Fed. Rep. of Germany, assignors to Papierfabrik August Koehler AG, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,591

Int. Cl.[4] B01J *13/02;* **B41M** *5/16, 5/22*

U.S. Cl. 503—201 **14 Claims**

1. A process for microencapsulating hydrophobic oils within a microcapsule envelope in an aminoplast system, comprising the steps of:

preparing a first acidic aqueous solution of a cationic melamine/formaldehyde precondensate and a second aqueous solution of a water-soluble polymer,

stirring said first aqueous solution under highly turbulent conditions,

instantaneously precipitating said cationic melamine/formaldehyde precondensate as a very fine solid suspension, by combining said first and second aqueous solutions during said highly turbulent stirring,

adding a hydrophobic oil containing a color reactant in solution, with highly turbulent stirring, to rapidly form a stable oil-in-water dispersion of said oil,

acidifying the oil-in-water dispersion thus obtained and adding a third aqueous solution of a water-soluble nonionic melamine/formaldehyde precondensate, with laminar stirring, and

condensing said non-ionic melamine/formaldehyde precondensate to form the microcapsule envelope, thereby encapsulating said dispersed oil.

10. Microcapsules, obtainable by a process as claimed in any one of claims 1, 2, or 7.

13. A color reaction recording system comprising paper having at least one surface treated with microcapsules as claimed in claim 10.

4,824,824

HEAT-SENSITIVE THERMAL TRANSFER RECORDING SHEET AND SYSTEM USING THE SAME

Toshihiko Matsushita; Shigetoshi Hiraishi, both of Tokyo, and Sadao Morishita, Ushiku, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jul. 15, 1987, Ser. No. 73,742

Claims priority, application Japan, Jul. 17, 1986, 61-169192; Jul. 17, 1986, 61-169193; Jul. 17, 1986, 61-169194

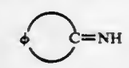
Int. Cl.[4] B41M *5/18, 5/22*

U.S. Cl. 503—204 **13 Claims**

1. In a heat-sensitive thermal transfer recording sheet comprising a substrate, a heat-sensitive color-forming layer formed on a front side of said substrate and a thermal transfer layer formed on a back side of the substrate, the improvement wherein the thermal transfer layer comprises:

(a) an aromatic isocyanate compound,

(b) an imino compound of the formula:



(I)

wherein is an aromatic compound residue which can form a conjugated system with an adjacent C=N and which can form a color by a reaction with said isocyanate compound, and

(c) a substance having a low melting point, whereby the desired images are thermally transferred to an image receiving sheet.

4,824,825

COLOR DEVELOPER SHEET FOR PRESSURE-SENSITIVE RECORDING

Toshizo Iida, Himeji, Japan, assignor to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 121,886

Claims priority, application Japan, Nov. 18, 1986, 61-276195; Jul. 7, 1987, 62-170792; Oct. 26, 1987, 62-271187

Int. Cl.[4] B41M *5/16, 5/22*

U.S. Cl. 503—214 **7 Claims**

1. A color developer sheet for pressure-sensitive recording comprising a support and formed thereon a color developer layer comprising as a color developer a novolak phenol resin and as a binder a copolymer of acrylamide and acrylic acid in a monomer weight ratio of 90:10 to 99.5:0.5 in terms of the ratio of acrylamide to acrylic acid.

4,824,826

MILLIMETER SIZE SINGLE CRYSTALS OF SUPERCONDUCTING $YBa_2Cu_3O_x$

Michael A. Damento, and Karl A. Gschneidner, Jr., both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Sep. 10, 1987, Ser. No. 95,317

Int. Cl.[4] C30B *9/06;* **C01F** *17/00;* **C01G** *3/02;* **H01L** *39/12*

U.S. Cl. 505—1 **15 Claims**

1. A method of growing superconductive crystals of $YBa_2Cu_3O_x$ wherein x equals from 6.5 to 7.2, comprising

(a) subdividing of mixture of oxides of copper and yttrium, and carbonate of barium, said mixture containing an excess of copper oxide over the stoichiometric amount needed for formation of $YBa_2Cu_3O_x$;

(b) heating the subdivided mixture until it forms a melt flux wherein the oxides and carbonates are melted;

(c) cooling the melt flux at a rapid rate sufficient to prevent the melt flux from separating into phases, to room temperature;

(d) reheating the mixture for a time and temperature sufficient to again form a melt flux;

(e) holding the melt flux at temperatures above the melting point of said melt flux but below the melting point of

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crystals of $YBa_2Cu_3O_x$ to allow formation of millimeter size or larger crystals; and thereafter

(f) slowly cooling the mixture to room temperature in an oxygen containing atmosphere at a rate to allow oxygen to enter said crystals sufficient to form said superconductive crystals of $YBa_2Cu_3O_x$.

4,824,827

TIME-COLOR INDICATORS

Petrina M. Kelly, Egham, and Colin Berrido, Bagshot, both of England, assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 5, 1988, Ser. No. 152,733

Claims priority, application United Kingdom, Sep. 23, 1987, 8722379

Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—1 **27 Claims**

1. A time-color indicator composition to visually indicate when a product associated with said composition has become ineffective for its intended use, said composition comprising:

(a) a room temperature volatilizable, nonaqueous liquid solvent;

(b) an effective amount of an indicator dye which is substantially nonvolatile at room temperature and is soluble in said solvent, said dye assuming a first color when dissolved in said solvent; and

(c) an effective amount of at least one proton donating compound wherein said dye assumes a second color visually distinct from said first color when the dye is in contact with only said compound,

wherein the ratio of the solvent to the dye and the proton donating compound is such that upon evaporation of said solvent, said dye visually changes from said first color to said second color, assumption of said second color indicating that the product has become ineffective and wherein all components of said composition are selected to result in a composition which is essentially neutral in pH.

4,824,828

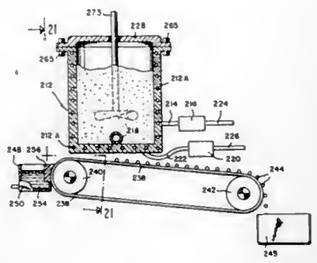
SCHIFF BASE REACTION PRODUCTS OF ALDEHYDES AND ALKYL ANTHRANILATES AND ORGANOLEPTIC USES THEREOF

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Point Pleasant, both of N.J.; Nicholas Calderone, Laurel Hollow, N.Y.; Keith P. Sands, Marlboro, and Myrna L. Hagedorn, Edison, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

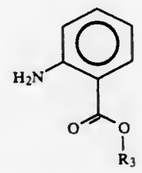
Division of Ser. No. 114,247, Oct. 29, 1987, Pat. No. 4,775,720. This application Jun. 3, 1988, Ser. No. 202,047

Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—21 **2 Claims**

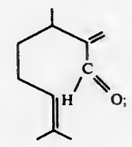


1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of intimately admixing with said consumable material, an aroma augmenting or enhancing quantity of at least one schiff base reaction product produced according to the process of reacting an alkyl anthranilate having the structure:

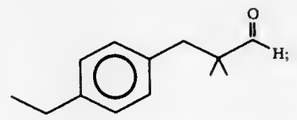


wherein R_3 is methyl or ethyl with an aldehyde selected from the group consisting of:

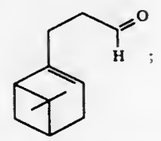
(a) Bergamal having the structure:



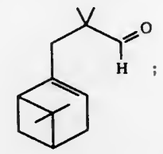
(b) Floralozone having the structure:



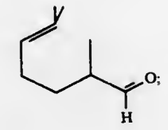
(c) Pino acetaldehyde having the structure:



(d) Pino isobutyraldehyde having the structure:

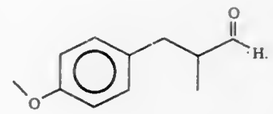


(e) Melonal having the structure:



and

(f) Canthoxal having the structure:



4,824,829

NON-DUSTING ANTIBIOTIC, ANTICOCCIDIAL PREMIX COMPOSITIONS AND A PROCESS FOR THEIR MANUFACTURE

Irving Klothen, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 641,094, Aug. 15, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 750,144

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—27 **9 Claims**

1. An antibiotic anticoccidial non-dusting dry feed premix composition comprising the following ingredients, all stated in terms of percentage of total weight of feed premix composition:

(a) 30.0% to 99.0% of a sorptive, edible organic carrier or a sorptive silica or a silicate on which has been sprayed and allowed to dry;

(b) a premix solution of 0.25% to 35% of an ionophore polyether antibiotic, or a pharmaceutically or pharmacologically acceptable salt thereof, 0.75% to 35% of a physiologically acceptable alcohol, provided that the ratio of said antibiotic or salt thereof to said alcohol is between about 1:10 and about 3:10, and 0.0% to 10.0% of a vegetable oil or additional physiologically acceptable alcohol.

4,824,830

6- OR 7-METHYLENANDROSTA-1,4-DIENE-3,17-DIONE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Franco Buzzetti, Monza; Natale Barbugian, Milan; Paolo Lombardi, Milan, and Enrico di Salle, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

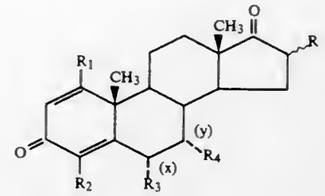
Filed Jul. 7, 1987, Ser. No. 70,685

Claims priority, application United Kingdom, Jul. 14, 1986, 8617107

Int. Cl.[4] A61K *31/56*; **C07J** *1/00*

U.S. Cl. 514—177 **8 Claims**

1. A compound of formula (1)



(1)

wherein

R is hydrogen or fluorine;

R_1 is hydrogen or C_1–C_6 alkyl;

R_2 is hydrogen or halogen;

one of R_3 and R_4 is $=CH_2$ and the other is hydrogen or C_1–C_4 alkyl, and when R_3 is $=CH_2$, at least one of R and R_4 is other than hydrogen; and the symbol

(x)

represents a double bond and the symbol

(y)

represents a single bond when R_3 is $=CH_2$ or the symbol

(x)

represents a single bond and the symbol

(y)

represents a double bond when R_4 is $=CH_2$.

4,824,831

4,5-DIHYDRG-1H-BENZAZEPINE-3-CARBOXYLIC ACID ESTERS WHICH ARE USEFUL AS ANTI-HYPERTENSIVE AGENTS

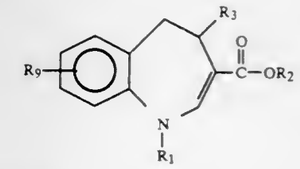
Karnail Atwal, Cranbury, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 21, 1987, Ser. No. 135,960

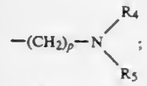
Int. Cl.[4] A61K *31/55*

U.S. Cl. 514—213 **11 Claims**

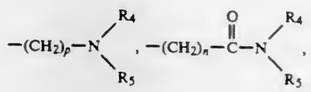
1. A compound of the formula

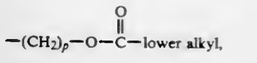


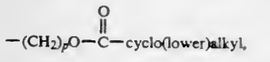
R_1 is hydrogen or

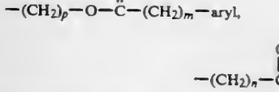


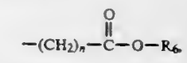
R_2 is hydrogen, lower alkyl, $-(CH_2)_m$—aryl, $-(CH_2)_m$—cyclo(lower)alkyl, $-(CH_2)_p$—OH, $-(CH_2)_p-(CH_2)_p$—O—lower alkyl, $-(CH_2)_p$—O—$(CH_2)_m$—aryl, $-(CH_2)_p$—SH, $-(CH_2)_p$—S—lower alkyl, $-(CH_2)_p$—S—$(CH_2)_m$—aryl,









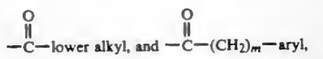


halo substituted lower alkyl, or a pharmaceutically acceptable salt forming ion;

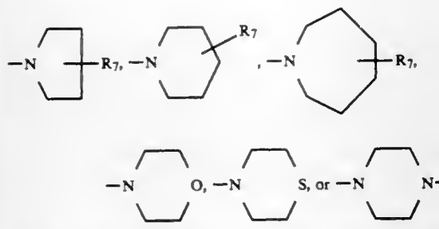
VOL 1101 ISS 4 APR 25 1989 UMI

R_3 is aryl;

R_4 and R_5 are independently selected from the group consisting of hydrogen, lower alkyl, $-(CH_2)_m-$aryl,



or R_4 and R_5 taken together with the N atom to which they are attached complete a heterocyclic ring of the formula



R_6 is hydrogen, lower alkyl, $-(CH_2)_m-$aryl, or a pharmaceutically acceptable salt forming ion;

R_7 is hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, alkylthio of 1 to 4 carbons, halo, CF_3 or hydroxy;

R_8 is hydrogen, alkyl of 1 to 4 carbons or $(CH_2)_m-$aryl;

R_9 is hydrogen, alkoxy of 1 to 4 carbons, halo or CF_3;

m is zero or an integer from 1 to 6;

n is an integer from 1 to 6;

p is an integer from 2 to 6;

wherein the term lower alkyl refers to straight or branched chain hydrocarbon radicals having up to eight carbons, and the terms lower alkoxy and lower alkylthio refer to such lower alkyl groups attached to an oxygen or sulfur;

the term lower alkenyl refers to straight or branched chain hydrocarbon radicals having from two to eight carbons and one double bond;

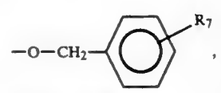
the term lower alkynyl refers to straight or branched chain hydrocarbon radicals having from two to eight carbons and one triple bond;

the term cycloalkyl refers to saturated rings of 4 to 7 carbon atoms;

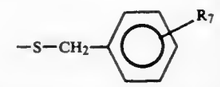
the term halo refers to chloro, bromo and fluoro;

the term halo substituted lower alkyl refers to said lower alkyl groups in which one or more hydrogens have been replaced by chloro, bromo or fluoro groups;

the term aryl refers to phenyl or mono substituted phenyl, wherein said substituent is alkyl of 1 to 4 carbons, alkylthio of 1 to 4 carbons, alkoxy of 1 to 4 carbons, halo, cyano, hydroxy, amino, —NH—alkyl wherein alkyl is of 1 to 4 carbons, —N(alkyl)$_2$ wherein alkyl is of 1 to 4 carbons, CF_3, $OCHF_2$,

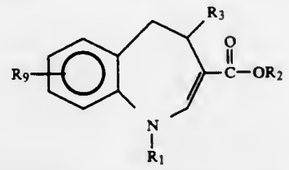


—OCH_2—cyclo(lower)alkyl,



or —S—CH_2—cyclo(lower)alkyl, di- or tri-substituted phenyl wherein said substituents are selected from methyl, methoxy, methylthio, halo, CF_3, hydroxy, amino, and $OCHF_2$.

10. A composition useful in reducing blood pressure in a mammal comprising a pharmaceutically acceptable carrier and an anti-hypertensively effective amount of a compound or pharmaceutically acceptable salt thereof of the formula



wherein R_1, R_2, R_3 and R_9 are as defined in claim 1.

4,824,832

SULFHYDRYL CONTAINING TRICYCLIC LACTAMS AND THEIR PHARMACOLOGICAL METHODS OF USE

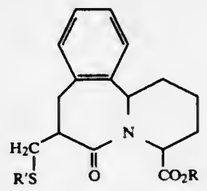
Gary A. Flynn, and Douglas W. Beight, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Dec. 30, 1987, Ser. No. 139,485

Int. Cl.[4] A61K *31/33;* **C07D** *223/10*

U.S. Cl. 514—214 **10 Claims**

1. A compound of the formula

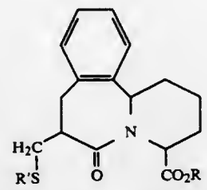


wherein

R is hydrogen, C_1–C_6 lower alkyl, or (C_6–C_{12})aryl(C_1–C_6)-lower alkyl; and

R' is hydrogen or —COR, wherein R is as defined above, or a pharmaceutically-acceptable salt thereof.

8. A method of treating hypertension which comprises administering to a patient in need thereof a compound of the formula



wherein R is hydrogen, C_1–C_6 lower alkyl, or (C_6–C_{12})aryl(C_1–C_6)lower alkyl; and

R' is hydrogen or —COR, wherein R is as defined above, or the pharmaceutically-acceptable salts thereof, in an amount necessary to effect an antihypertensive result.

4,824,833

BENZOXAZINE DERIVATIVES

Ikuo Iijima, Urawa; Masakatsu Ozeki, Wako; Kunihito Okumura, Urawa, and Masanori Inamasu, Misato, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

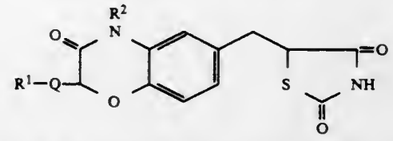
Filed Mar. 14, 1988, Ser. No. 167,344

Claims priority, application Japan, Mar. 18, 1987, 62-65360

Int. Cl.[4] A61K *31/535;* **C07D** *413/10*

U.S. Cl. 514—230.5 **7 Claims**

1. A benzoxazine derivative of the formula:



wherein R^1 is a phenyl group or a phenyl-thiazolyl group; R^2 is an hydrogen atom or a lower alkyl group; Q is a single bond or a lower alkylene group, or a pharmaceutically acceptable salt thereof.

4,824,834

PYRAZOLOTRIAZINE COMPOUNDS

Setsuro Fujii, Kyoto; Hiroyuki Kawamura, Otsu; Hiroshi Kiyokawa, Nara, and Satoshi Yamada, Otsu, all of Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo, Japan

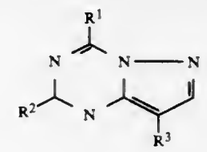
Filed Oct. 8, 1987, Ser. No. 105,581

Claims priority, application Japan, Oct. 31, 1986, 61-261008; Mar. 26, 1987, 62-073911; May 18, 1987, 62-120688; Jun. 25, 1987, 62-159437

Int. Cl.[4] C07D *487/04;* **A61K** *31/53*

U.S. Cl. 514—246 **24 Claims**

1. A pyrazolotriazine compound of the formula:



(I)

wherein

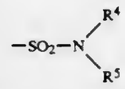
R^1 is a hydroxy or a C_{1-6} alkanoyloxy,

R^2 is hydrogen atom, hydroxy, or mercapto,

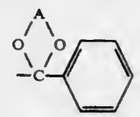
R^3 is (1) an unsaturated heterocyclic group selected from the group consisting of pyrrolyl, pyridyl, thienyl, thiopyranyl, indolyl, benzothienyl, 2,3-dihydrobenzothienyl, thiochromanyl, and dibenzothienyl which may optionally have one or two substituents selected from a halogen atom, nitro, and phenylthio, (2) naphthyl, and (3) a phenyl which may optionally have one to three substituents selected from the group consisting of (i) a C_{1-6} alkyl, (ii) phenyl, (iii) a C_{1-6} alkoxycarbonyl, (iv) cyano, (v) nitro, (vi) a C_{1-6} alkoxy, (vii) a phenyl-C_{1-6} alkoxy, (viii) a phenylthio-C_{1-6} alkyl, (ix) phenoxy, (x) a group of the formula:



wherein R is a C_{1-6} alkyl, a halogen-substituted C_{1-6} alkyl, a phenyl which may optionally have one to three substituents selected from a halogen atom, a C_{1-6} alkyl and a C_{1-6} alkoxy, or pyridyl, and l is an integer of 0, 1 or 2, (xi) a halogen atom, (xii) a phenyl-C_{1-6} alkyl, (xiii) carboxy, (xiv) a C_{1-6} alkanoyl, (xv) a benzoyl which may optionally have one to three substituents selected from a halogen atom, a phenyl C_{1-6} alkoxy and hydroxy on the phenyl ring, (xvi) amino, (xvii) hydroxy, (xviii) a C_{1-6} alkanoyloxy, (xix) a group of the formula:



wherein R^4 and R^5 are the same or different and are each hydrogen atom, a cycloalkyl, a C_{1-6} alkyl which may optionally have a substituent selected from hydroxy, furyl, thienyl, tetrahydrofuranyl and phenyl, a phenyl which may optionally have one to three substituents selected from a C_{1-6} alkyl, a hydroxy-substituted C_{1-6} alkyl, a C_{1-6} alkanonyl, cyano, carboxy, a C_{1-6} alkoxycarbonyl, hydroxy, a C_{1-6} alkoxy, and a halogen atom, or a heterocyclic group selected from pyridyl, pyrimidinyl, thiazolyl, isoxazolyl, and purazolyl, said heterocyclic group being optionally substituted by a C_{1-6} alkyl, amino, or a C_{1-6} alkyl, amino, or a C_{1-6} alkanoyl-amino, or R^4 and R^5 may join together with the adjacent nitrogen atom to form a saturated 5- or 6-membered heterocyclic group, which may optionally be intervened with oxygen atom, selected from the group consisting of pyrrolidinyl, piperidinyl, tetrahydro-1,2-oxazinyl, tetrahydro-1,3-oxazinyl, and morpholine, or (xx) a group of the formula:



wherein A is a C_{1-6} alkylene.

23. A pharmaceutical composition for the prophylaxis and treatment of gout, which comprises an active ingredient a prophylactically and therapeutically effective amount of a pyrazolotriazine compound of the formula (I) as set forth in claim 1 in admixture with a pharmaceutically acceptable carrier or diluent.

4,824,835

ISOQUINOLINEDIONE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

Alfred Mertens, Schriesheim, and Bernd Müller-Beckmann, Grünstadt, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

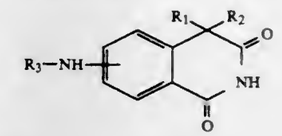
Filed Apr. 24, 1987, Ser. No. 42,300

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1986, 3614000

Int. Cl.[4] A61K *31/47;* **C07D** *217/24, 401/12*

U.S. Cl. 514—278 **23 Claims**

1. An isoquinoline-1,3-dione compound of the formula



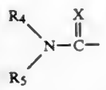
(I)

wherein

R_1 is hydrogen, a C_1–C_6 alkyl, a C_2–C_6 alkenyl or C_3–C_7 cycloalkyl wherein said cycloalkyl is optionally interrupted by a heteroatom or by a heteroatom substituted

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with a C_1–C_6 alkyl radical wherein said heteroatomic heterocycloalkyl is piperidyl or N-alkyl piperidyl;
R_2 is hydrogen a C_1–C_6 alkyl or a C_2–C_6 alkenyl radical or, R_2 together with R_1, is a C_3–C_8 cycloalkyl ring, C_3–C_8 heterocycloalkylene, up to 6 carbon alkylidene or C_3–C_8 cycloalkylidene wherein said radical is optionally interrupted by a heteroatom or by a heteroatom substituted by a C_1–C_6 alkyl radical wherein said heteroatomic cycloalkyl is piperidyl or N-alkyl piperidyl; and
R_3 is



which can be in the 5-, 6-, 7- or 8-position of the isoquinoline-1,3-dione and in which R_4 and R_5, which can be the same or different, are hydrogen, C_1–C_8 alkyl, C_1–C_8 alkyl, C_1–C_3 trihaloalkyl, C_3–C_7 cycloalkyl, C_3–C_7 cycloalkyl, C_3–C_7 cycloalkenyl, pyridyl, pyrrolyl, phenyl, naphthyl or dialkylaminoalkyl, alkoxycarbonylalkyl, alkylcarbonyl wherein the alkyl or alkoxy moieties of said dialkylaminoalkyl, alkoxycarbonylalkyl and alkylcarbonyl groups have 1–5 carbons, and X is an oxygen or sulphur atom or a radical of the formula =N—R_6, in which R_6 is a hydrogen atom, a cyano group or C_1–C_6 alkyl; and the physiologically acceptable salts thereof.

20. A method for the treatment or prophylaxis of heart and circulatory disease comprising administering a pharmaceutically effective amount of at least one of the compound designated
N-methyl-N'-(4,4-dimethyl-1,2,3,4-tetrahydro-1,3-dioxo-7-isoquinolinyl)-urea,
N-ethyl-N'-(4,4-dimethyl-1,2,3,4-tetrahydro-1,3-dioxo-7-isoquinolinyl)-urea,
N-cyano-N'-(4,4-dimethyl-1,2,3,4-tetrahydro-1,3-dioxo-7-isoquinolinyl)-urea, and
N-cyano-N'-methyl-N"-(4,4-dimethyl-1,2,3,4-tetrahydro-1,3-dioxo-7-isoquinolinyl)-guanidine.

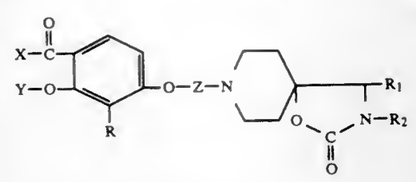
4,824,836

SPIRO (4,5) DECONE COMPOUNDS

Gilbert Regnier, Chatenay Malabry; Claude Guillonneau, Clamart; Jacques Duhault, Croissy S/Seine, and Michel Lonchampt, Rungis, all of France, assignors to Adir et Compagnie, Neuilly-sur-Seine, France

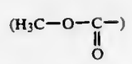
Filed May 20, 1988, Ser. No. 196,303
Claims priority, application France, May 22, 1987, 87 07186
Int. Cl.[4] A61K *31/445;* **C07D** *498/10*
U.S. Cl. 514—278 **9 Claims**

1. A compound selected from the group consisting of: spiro(4,5)decane compounds of the formula I:

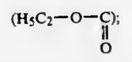


(I)

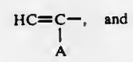
in which:
X represents a methyl radical; and
Y is selected from the group consisting of: hydrogen and a radical of the formula: R'—CO, in which R' is selected from the group consisting of (C_1 to C_4)alkyl, (C_1 to C_4)alkoxy, methyloxycarbonyl



and ethyloxycarbonyl

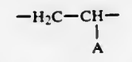


or X and Y together represent a chain selected from the group consisting of:
an ethenylene chain of the formula:



and

an ethylene chain of the formula:



in each of which A is selected from the group consisting of: hydrogen, methyl, carboxy, methoxycarbonyl and ethoxycarbonyl;
R is selected from the group consisting of (C_1 to C_7) straight and branched chain alkyl and alkenyl radicals;
Z is selected from the group consisting of (C_1 to C_7) saturated and unsaturated straight and branched chain hydrocarbon radicals, and such hydroxy substituted radicals;
R_1 is selected from the group consisting of hydrogen and methyl; and
R_2 is selected from the group consisting of: hydrogen, acyl of the formula: R'—CO— in which R' has the meaning defined above, and benzyloxycarbonyl; and
physiologically tolerable acid addition salts thereof.

9. A method for treating a living animal body afflicted with asthma, allergic phenomena, a chronic obstructive bronchopathy, pulmonary arterial hypertension, or an inflammatory affection of the upper respiratory passages, comprising the step of administering to the said living animal an amount of a compound of claim 1 which is effective for the alleviation of the said condition.

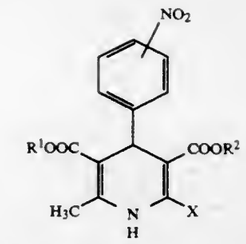
4,824,837

NOVEL 1,4-DIHYDROPYRIDINE DERIVATIVES, PROCESS FOR PREPARING THE SAME, AND AGENTS FOR TREATING DISORDERS OF CIRCULATORY SYSTEM

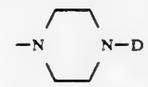
Hidetsura Cho, and Masaru Ueda, both of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

Filed Jul. 3, 1986, Ser. No. 881,779
Claims priority, application Japan, Jul. 3, 1985, 60-146290
Int. Cl.[4] A61K *31/455;* **C07D** *211/86*
U.S. Cl. 514—356 **6 Claims**

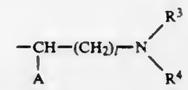
1. A novel 1,4-dihydropyridine derivative of the formula (1):



wherein X is a halogen; R^1 is
a straight or branched alkyl group having 1 to 10 carbon atoms,
the group —$(CH_2)_n$—Y, where n is an integer of 0 to 8, provided that when n is zero or 1, —(CH_2)n— is not bonded to the hetero atom of Y; Y is a cyclic alkyl group having 3–6 carbon atoms, an aryl group having 6–10 carbon atoms, a thienyl group, a pyridyl group, a morpholinyl group or a pyrrolizidinyl group, the group



(where D is an aryl or aralkyl group having 6–15 carbon atoms), or a 3-piperidinyl group substituted by a phenylalkyl group of 7–10 carbon atoms which may be substituted by one or two halogens,
the group —$(CH_2)_m$—O—Z where m is an integer of 1 to 8 and Z is C_1–C_5 alkyl or C_6–C_{10} aryl group,
or the group



(where l is an integer of 1–7; A is a hydrogen atom or C_6–C_{10} aryl group; and R^3 and R^4 which may be the same or different represent an C_1–C_5 alkyl, C_6–C_{10} aryl or aralkyl group); and R^2 is C_1–C_3 alkyl group, or a pharmaceutically acceptable acid addition salt thereof.

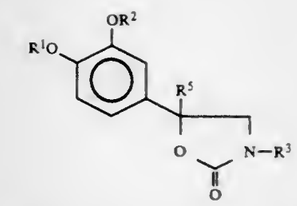
4,824,838

USE OF 5-(SUBSTITUTED PHENYL)-OXAZOLIDINONE DERIVATIVES FOR TREATMENT OF DEPRESSION

Helmut Wachtel, and Herbert H. Schneider, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,255
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639225
Int. Cl.[4] A61U *31/42*
U.S. Cl. 514—380 **15 Claims**

1. A method of treating depression comprising administering to a patient in need of such treatment an antidepressantly effective amount of a compound of the formula



wherein
R^1 and R^2 each independently is a C_{1-8} hydrocarbon group or C_{3-7}-cycloalkyl wherein a CH_2 group is replaced by oxa,
R^3 is hydrogen, C_{1-8}-alkyl, C_{6-8}-aryl or C_{6-8}-aralkyl or an acyl group of a C_{1-8}-hydrocarbon carboxylic acid,
R^5 is hydrogen or C_{1-8}-alkyl.

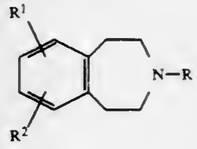
4,824,839

SULFINYL AND SULFONYL SUBSTITUTED 2,3,4,5 TETRAHYDRO-1H-3-BENZAZEPINES AND THEIR USE IN TREATING GASTROINTESTINAL MOTILITY DISORDERS

William E. Bondinell, and Herbert S. Ormsbee, III, both of Wayne, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

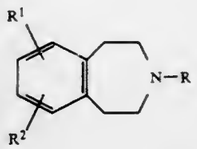
Continuation-in-part of Ser. No. 13,103, Feb. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 811,789, Dec. 20, 1985, Pat. No. 4,659,706, and Ser. No. 36,403, Apr. 9, 1987, which is a continuation-in-part of Ser. No. 13,103,. This application Mar. 14, 1988, Ser. No. 167,663
Int. Cl.[4] C07D *223/16;* **A61K** *31/55*
U.S. Cl. 514—213 **19 Claims**

1. A compound of the formula:



in which:
R is hydrogen, or C_1–C_6alkyl or C_3–C_5alkenyl;
R^1 is SOR^3, SO_2R^3 or $SO_2NR^4R^5$;
R^2 is hydrogen, halogen, CF_3, C_1–C_6alkyl or R^6O—;
R^3 is C_1–C_6alkyl or CF_3;
R^4 and R_5 are hydrogen or C_1–C_6alkyl; and
R_6 is C_2–C_6alkyl, provided that when R^1 is SO_2R^2 is R^6O—, halogen, CF_3, or C_1–C_6alkyl, or a pharmaceutically acceptable acid addition salt thereof.

18. A method of treating or preventing emesis which comprises administering internally to a subject in need of said treatment an effective but nontoxic amount of a compound of the formula:



in which:
R is hydrogen, C_1–C_6alkyl or C_3–C_5alkenyl;
R^1 is SOR^3, SO_2R^3 or $SO_2NR^4R^5$;

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R^2 is hydrogen, halogen, CF_3, C_1–C_6alkyl or R^6O—;
R^3 is C_1–C_6alkyl or trifluoromethyl;
R^4 and R_5 are hydrogen or C_1–C_6alkyl; and
R^6 is hydrogen, C_1–C_6alkyl or C_1–C_6alkanoyl, provided that when R^1 is SO_2NH_2, R^2 is R^6O—, halogen, CF_3 or C_1–C_6alkyl,
or a pharmaceutically acceptable acid addition salt thereof.

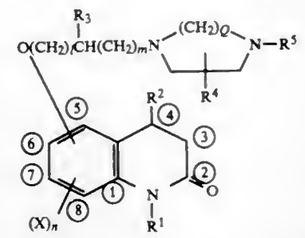
4,824,840

CARBOSTYRIL DERIVATIVES AND PHARMACEUTICAL PREPARATIONS CONTAINING SAME

Kazuo Banno; Takafumi Fujioka; Yasuo Oshiro, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

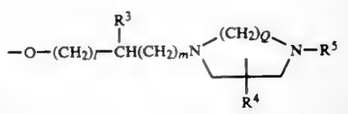
Division of Ser. No. 24,602, Mar. 28, 1979, Pat. No. 4,734,416. This application Mar. 12, 1987, Ser. No. 25,193
Claims priority, application Japan, Mar. 30, 1978, 53-37783
Int. Cl.⁴ A61K *31/495;* **C07D** *403/02*
U.S. Cl. 514—218 **15 Claims**

1. A carbostyril derivative represented by the formula,



(1)

wherein R^1 is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an alkynyl group having 2 to 4 carbon atoms or a phenyl alkyl group having an alkylene group having 1 to 4 carbon atoms; R^2 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or a phenyl group; R^3 is a hydrogen atom, a hydroxy group, an alkyl group having 1 to 4 carbon atoms, an alkanoyloxy group having 1 to 4 carbon atoms or a 3,4,5-trimethoxybenzoyloxy group; R^4 is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; R^5 is a cycloalkyl group having 3 to 8 carbon atoms, a phenyl group which may be substituted by 1 to 3 identical or different groups selected from the group consisting of a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a substituted alkyl group having 1 to 4 carbon atoms, having one hydroxy group, phenyl group or alkanoyloxy group having 1 to 4 carbon atoms as the substituent, an alkanoyl group having 1 to 4 carbon atoms and a benzoyl group; X is a halogen atom; n is 0 or an integer of 1 or 2; Q is an integer of 3; l and m are respectively 0 or an integer of 1 to 6, but the sum of l and m should not exceed 6; the carbon-carbon bond at the 3- and 4-positions in the carbostyril skeleton is a single or double bond; the substituted position of the side chain of



is any one of the 4-, 5-, 6-, 7- or 8-positions, or a pharmaceutically acceptable acid addition salt thereof, with the proviso that when said side chain is substituted at the 4-position and said carbon-carbon bond at the 3- or 4-positions is a double bond, then R^2 does not exist.

15. A pharmaceutical composition useful as a central nervous controlling agent, comprising an amount of carbostyril derivative or a pharmaceutically acceptable acid salt thereof according to claim 1 sufficient to affect the central nervous system and a pharmaceutically acceptable carrier.

4,824,841

AQUEOUS PHARMACEUTICAL FORMULATIONS OF PIROXICAM MONOHYDRATE

Paolo Chiesi, and Luciana Pavesi, both of Parma, Italy, assignors to Chiesi Farmaceutici S.P.A., Parma, Italy

Continuation of Ser. No. 788,783, Oct. 18, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,819
Claims priority, application Italy, Oct. 22, 1984, 23263 A/84
Int. Cl.⁴ A61K *31/54*
U.S. Cl. 514—226.5 **6 Claims**

1. A pharmaceutical composition for the treatment of inflammatory diseases, comprising as the active agent 0.2–5% by weight of N-(2-pyridyl)-2-methyl-4-hydroxy-2H-1, 2-benzothiazine-3-carboxamide 1, 1-dioxide monohydrate, in the form of a yellow crystalline powder dispersed in an oil/water emulsion or suspended in water, said composition being stabilized with respect to crystal growth, crystal conversion and agglomerate formation in aqueous medium by maintaining a pH from about 4.5 to about 6, said composition further comprising conventional excipients.

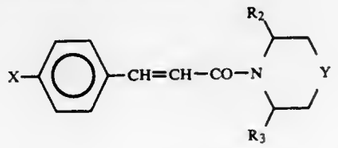
4,824,842

CINNAMOYL PIPERIDINES AND THIOMORPHOLINE AND CEREBRAL PROTECTION COMPOSITIONS

Joji Nakamura; Kazuhiro Kubo; Shunji Ichikawa; Hajime Takahashi; Keisuke Isozumi, and Toyofumi Yamada, all of Shizuoka, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

Filed Feb. 13, 1986, Ser. No. 829,382
Claims priority, application Japan, Feb. 14, 1985, 60-27450
Int. Cl.⁴ A61K *31/54, 31/445;* **C07D** *211/22, 265/30*
U.S. Cl. 514—227.5 **7 Claims**

1. Compounds of the formula



(I)

wherein
X is selected from the group of chloro and triflurometh yl;
R_2 is selected from the group of hydrogen and methyl;
R_3 is selected from the group of hydrogen and methyl; and
Y is selected from the group of methylene, sulfinyl, sulfonyl and sulphur; provided that:
(a) when Y is methylene at least one of R_2 and R_3 is methyl;
(b) when Y is sulfinyl, sulfonyl or sulphur X is not chloro.

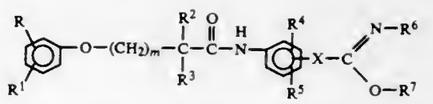
4,824,843

SUBSTITUTED AMIDE INHIBITORS OF CHOLESTEROL ABSORPTION

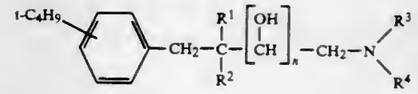
Milton L. Hoefle, and Robert F. Meyer, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 25, 1987, Ser. No. 66,688
Int. Cl.⁴ A61K *31/42, 31/535;* **C07D** *263/14, 265/08*
U.S. Cl. 514—228.8 **25 Claims**

1. A compound having the formula



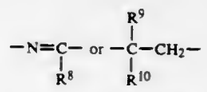
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or a pharmaceutically acceptable acid addition salt thereof where
R and R^1 are each independently hydrogen, straight or branched alkyl of from one to nine carbon atoms, cycloalkyl of from three to seven carbon atoms or alkoxy of from one to six carbons;
m is an integer from one to six;
R^2 and R^3 are each independently hydrogen, straight or branched alkyl of from one to nine carbon atoms, or when taken together with the carbon atom to which they are attached, form a cycloalkyl ring of from three to seven carbon atoms;
R^4 and R^5 are each independently hydrogen, straight or branched alkyl of from one to nine carbon atoms, cycloalkyl of from three to seven carbon atoms or alkoxy of from one to six carbons;
X is $—(CH_2)_n—$, $—O—CH_2—$ or



wherein n is zero to four and R^8 is hydrogen, straight or branched alkyl of from one to nine carbon atoms, or cycloalkyl of from three to seven carbon atoms;
R^6 and R^7 taken together are $—(CH_2)_p—$, $—CH=CH—$,



wherein p is two or three, R^9 and R^{10} are each independently hydrogen, straight or branched alkyl of from one to nine carbon atoms, cycloalkyl of from three to seven carbon atoms, or $—CH_2OH$ and R^8 is as described above.

25. A method of inhibiting intestinal absorption of cholesterol in mammals comprising administering to said mammal an acyl-coenzyme A: cholesterol acyltransferase-inhibitory effective amount of a compound as defined by claim 1 in combination with a pharmaceutically acceptable carrier.

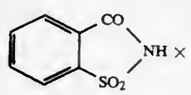
4,824,844

SACCHARINE SALTS OF SUBSTITUTED AMINES, FUNGICIDAL COMPOSITIONS AND USE

Joachim Weissmüller, Monheim; Paul Reinecke, and Gerd Hänssler, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 118,109
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1986, 3639900
Int. Cl.⁴ A01N *43/80, 43/84;* **C07D** *417/02*
U.S. Cl. 514—239.5 **11 Claims**

1. A saccharine salt of a substituted amine of the formula



in which
R^1 represents hydrogen or alkyl,
R^2 represents alkyl,
R^3 and R^4 together with the nitrogen atom to which they are bonded, represent piperidine or morpholine unsubstituted or substituted by 1 or 2 lower alkyl radicals and
n represents the number 0 or 1.

9. A fungicidal composition comprising a fungicidally effective amount of a saccharine salt according to claim 1 and a diluent.

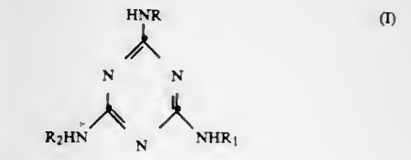
4,824,845

PESTICIDAL COMPOSITIONS

Jean-Claude Gehret, Aesch, and Odd Kristiansen, Möhlin, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 810,482, Dec. 18, 1985, abandoned, Continuation of Ser. No. 676,904, Nov. 30, 1984, abandoned. This application Aug. 17, 1988, Ser. No. 233,870
Claims priority, application Switzerland, Dec. 2, 1983, 6466/83; Nov. 2, 1984, 5267/84
Int. Cl.⁴ A01N *43/68;* **C07D** *251/70*
U.S. Cl. 514—245 **10 Claims**

1. A compound of the formula I



(I)

wherein
R is cyclopropyl,
R_1 is hydrogen, and
R_2 is C_2–C_{12}-acyl.

7. A method for controlling ectoparasites of productive animals, which process comprises applying to the exterior of said animals an ectoparasiticidally effective amount of a compound of formula I of claim 1.

4,824,846

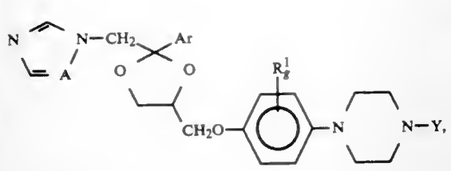
2-AZOLYLMETHYL-2-ARYL-1,3-DIOXOLANES AND THE SALTS THEREOF, AGENTS CONTAINING SAME, AND THE USE THEREOF

Klaus D. Kampe, Bad Soden am Taunus; Wolfgang Raether, Dreieich; Walter Dittmar, Hofheim am Taunus, and Heinz Hänel, Bad Homburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 19, 1987, Ser. No. 28,087
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609596
Int. Cl.⁴ A61K *31/505;* **C07D** *405/14*
U.S. Cl. 514—252 **6 Claims**

1. A compound of the formula I

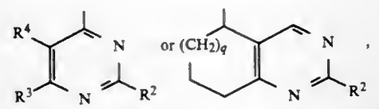
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I

in which
A denotes CH or N,
Ar denotes napthyl, thienyl, halothienyl or a phenyl group which is unsubstituted or carries one to 3 substituents, where the substituents may be identical or different and denote halogen, trifluoromethyl, C_1–C_2-alkyl, C_1–C_2-alkoxy or phenoxy,
R^1 denotes C_1–C_3-alkyl, F or Cl,
g denotes 0, 1 or 2, and
Y denotes the following heterocyclic radicals

(a)



in which R^2 denotes C_1–C_4-alkyl, a phenyl group which is unsubstituted or carries 1 or 2 substituents, where the substituents may be identical or different and denote halogen, trifluoromethyl, methoxy, ethoxy, nitro or C_1–C_4-alkyl, or a phenyl-C_1–C_2-alkyl group which is unsubstituted or carries 1 or 2 substituents in the phenyl radical, where the substituents may be identical or different and denote F, Cl, methoxy, ethoxy or C_1–C_3-alkyl,
R^3 denotes H, C_1–C_8-alkyl, C_3–C_6-cycloalkyl-C_1–C_3-alkyl, a phenyl group which is unsubstituted or carries 1 or 2 substituents, where the substituents may be identical or different and denote halogen, methoxy, ethoxy or C_1–C_3-alkyl, a phenyl-C_1–C_2-alkyl group which is unsubstituted or substituted in the phenyl radical by methoxy, 1,2-methylenedioxy, F, Cl or C_1–C_3-alkyl, or trifluoromethyl,
R^4 denotes H, C_1–C_4-alkyl or benzyl, or R^3 and R^4 together denote $-(CH_2)_r-$, where r is 3 or 4, or —CH=CH—CH=CH—, and
q denotes 0 or 1,
and the physiologically acceptable acid-addition salts thereof.

4,824,847

COCCIDIOCIDAL COMPOSITIONS

Wolfgang Raether, Dreieich, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 117,960
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703789
Int. Cl.[4] A61K *31/35, 31/44, 31/47, 31/505*
U.S. Cl. 514—256 **14 Claims**

1. A coccidiocidal composition which contains the polyether antibiotic lasalocid A or its physiologically acceptable salts or esters in combination with one of the following other ingredients or their salts, in the ratio of lasalocid A to other ingredients as indicated:
a. with meticlorpindol in a ratio between 1 to 2:1,
b. with methyl benzoquate in a ratio between 12.5 to 25:1,
c. with halofuginone in a ratio between 41.5 to 83:1,
d. with a mixture of 10 parts of meticlorpindol to one part of methyl benzoquate in a ratio between 6.5 to 9.3:1,
e. with amprolium in a ratio between 1 to 2:1,
f. with a mixture of 20 parts of amprolium to 1 part of ethopabate in a ratio between 1 to 2:1.

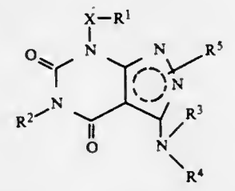
4,824,848

PYRAZOLO[3,4-D]PYRIMIDINE DERIVATIVES, THEIR PRODUCTION AND USE

Takehiko Naka; Yoshiyasu Furukawa, and Akinobu Nagaoka, all of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Mar. 13, 1987, Ser. No. 25,622
Claims priority, application Japan, Mar. 14, 1986, 61-57920; Jan. 23, 1987, 62-14627
Int. Cl.[4] A61K *31/415;* **C07D** *487/04*
U.S. Cl. 514—258 **18 Claims**

1. A compound of the formula (I)



wherein
R^1 is phenyl, naphthyl, furyl, pyridyl, pyridinio, or thienyl which may be substituted by a member selected from the class consisting of halogen, C_{1-4}alkyl, C_{1-4}alkoxy, nitro, amino, N-C_{1-4} alkylamino, N,N-diC_{1-4}alkylamino, hydroxy, trifluoromethyl, carbamoyl, N-C_{1-4} alkylcarbamoyl and N,N-diC_{1-4}alkylcarbamoyl;
R^2 is C_{1-4}alkyl;
R^3 and R^4 are independently hydrogen or C_{1-4}alkyl;
R^5 is hydrogen, C_{1-2}alkyl, C_{1-5}alkanoyl or C_{1-4}alkoxycarbonyl, the group R^5 being attached at the 1- or 2-position of the pyrazole ring;
X is C_{1-7}alkylene or a group of the formula:
$-(CH_2)_m-Y-(CH_2)_n-$ wherein m is 2 or 3,
n is an integer of 0 to 3,
and Y is oxygen, sulfur, imino or N-C_{1-4}alkylimino; and
the dotted line designates the presence of two double bonds in the pyrazole ring
or a pharmaceutically acceptable salt thereof.

17. A pharmaceutical composition which comprises
(a) as the active ingredient, an amount effective to treat or prevent neurosis or dementia caused by cerebral apoplexy, head trauma or encephalatrophic diseases of a compound as claimed in claim 1 or a pharmaceutically acceptable salt thereof and
(b) a pharmaceutically acceptable carrier, vehicle or diluent therefor.

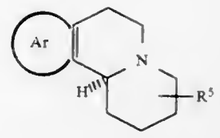
4,824,849

α_2-ADRENOCEPTOR ANTAGONISTIC ARYLQUINOLIZINES

John J. Baldwin, Gwynedd Valley; Joel R. Huff, Lederach; Joseph P. Vacca, Telford; Steven D. Young, Lansdale; Jane deSolms, Norristown, and James P. Guare, Jr., Quakertown, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

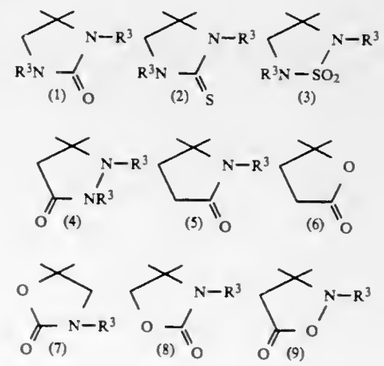
Division of Ser. No. 848,262, Apr. 4, 1986, Pat. No. 4,710,504, which is a continuation-in-part of Ser. No. 740,609, Jun. 3, 1985, abandoned. This application Aug. 28, 1987, Ser. No. 90,641
Int. Cl.[4] A61K *31/415, 31/305;* **C07D** *455/00, 471/20*
U.S. Cl. 514—267 **6 Claims**

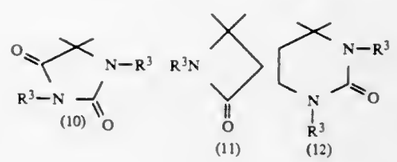
1. A method of treating at least one condition diabetes, hypertension, ocular hypertension, abnormal platelet aggregation, obesity, and abnormal gastrointestinal motility, when said condition is responsive to an α_2 adrenoceptor antagonist, which comprises administering to a patient, in need of such treatment, an α_2 adrenoceptor antagonist amount of a compound, or a pharmaceutically acceptable salt thereof, of the structural formula:

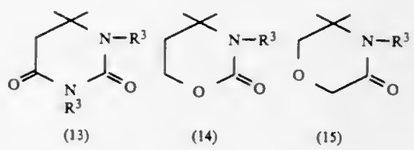


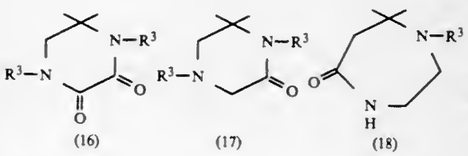
B

wherein
Ar represents an aromatic heterocycle selected from R^2,R^2-benzo[b]furo-,R^1,R^2-benzo[b]thieno-, thieno-, furo-; R^1,R^2-benzo, R^1,R^2-pyridino, thiazolo, imidazo, and pyrazolo; R^1 and R^2 are independently:
(1) hydrogen,
(2) halo,
(3) hydroxy,
(4) C_{1-3}alkoxy, or
(5) C_{1-6}alkyl;
B represents a spiroheterocycle of 4–7 members selected from









R^3 is
(1) hydrogen,
(2)

wherein R is hydrogen or C_{1-3}alkyl,
(3) Cl_{1-6}alkyl, either unsubstituted or substituted with one or more of;
(a) hydroxy,
(b) carboxy,
(c) C_{1-3}alkoxycarbonyl,
(d) halo,
(e) C_{1-3}alkoxy,
(f) $-CONR^6R^7$, wherein R^6 and R^7 are the same or different and are hydrogen or C_{1-5}alkyl, or joined together directly to form a 5–7 membered ring selected from pyrrolidino, and piperidino or through a heteroatom selected from O, N and S, to form a 6-membered heterocycle selected from morpholino, piperazino, and N—C_{1-3}alkylpiperazino with the nitrogen to which they are attached,
(g) $-NR^6R^7$,



(h)

(i) $-SO_2NR^6R^7$ or
(j) $-SO_2(C_{1-3alkyl})$; and
R^5 is
(1) hydrogen,
(2) C_{1-6}alkyl, either unsubstituted or substituted with one or more of
(a) $-OR^8$, wherein R^8 is
(i) H, or
(ii) C_{1-6}alkyl
(b) $-NR^8COR^8$, or
(c) $-CO_2R_8$,
(3) $-CO_2R^8$, or
(4) $CONR^6R^7$.

4,824,850

BRAIN-SPECIFIC DRUG DELIVERY

Nicholas S. Bodor, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 379,316, May 18, 1982, Pat. No. 4,479,932, and a continuation-in-part of Ser. No. 461,543, Jan. 27, 1983, abandoned, and a continuation-in-part of Ser. No. 475,493, Mar. 15, 1983, Pat. No. 4,622,218, and a continuation-in-part of Ser. No. 516,382, Jul. 22, 1983, Pat. No. 4,540,564. This application Oct. 29, 1984, Ser. No. 665,940
Claims priority, application Canada, May 16, 1983, 428192
Int. Cl.[4] A61K *31/515, 31/47, 31/44, 31/40*
U.S. Cl. 514—270 **24 Claims**

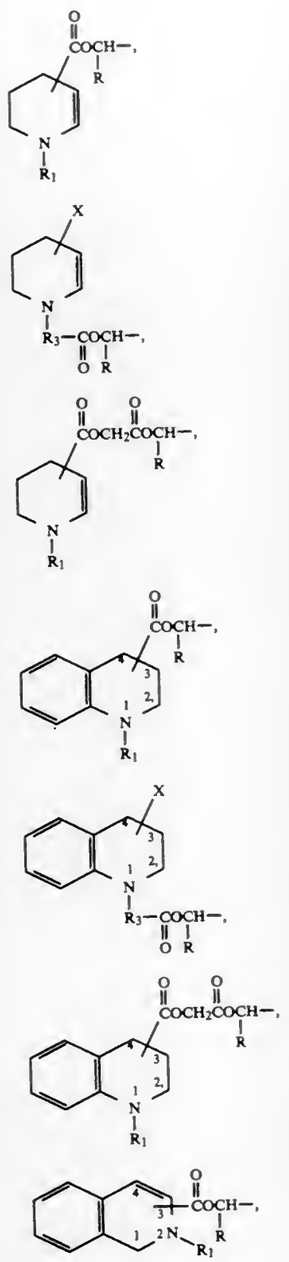
1. A compound of the formula

D—DHC]$_n$ (Ia)

or a nontoxic pharmaceutically acceptable salt thereof, wherein D is the residue of a centrally acting drug having anticonvulsant, sedative and/or hypnotic properties, said drug being a hydantoin or barbiturate or an analog of a hydantoin or barbiturate, said drug containing at least one reactive amide or imide functional group, said residue being characterized by the absence of a hydrogen atom from at least one of said amide or imide functional groups in said drug; n is a positive integer equal to the number of said functional groups from which a hydrogen atom is absent; and [DHC] is the reduced, biooxidizable, blood-brain barrier penetrating, lipoidal form of a dihydropyridine⇄pyridinium salt redox carrier, [DHC] being at-

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tached directly to an amide or imide nitrogen in the drug residue, [DHC] being a radical of the formula



(k') (l') (m') (n') (o') (p') (q') (r') (s')

-continued

wherein R is hydrogen, C_1–C_7 alkyl, C_3–C_8 cycloalkyl, C_1–C_7 haloalkyl, furyl, phenyl, or phenyl substituted by one or more halo, lower alkyl, lower alkoxy, carbamoyl, lower alkoxycarbonyl, lower alkanoyloxy, lower haloalkyl, mono(lower alkyl)carbamoyl, di(lower alkyl)carbamoyl, lower alkylthio, lower alkylsulfinyl or lower alkylsulfonyl; the dotted line in formulas (k'), (l') and (m') indicates the presence of a double bond in either the 4 or 5 position of the dihydropyridine ring; the dotted line in formulas (n'), (o') and (p') indicates the presence of a double bond in either the 2 or 3 position of the dihyroquinoline ring; R_1 is C_1–C_7 alkyl, C_1–C_7 haloalkyl or C_7–C_{10} aralkyl; R_3 is C_1 to C_3 alkylene; X is —CONR'R", wherein R' and R", which can be the same or different, are each H or C_1–C_7 alkyl, or X is —CH=NOR"' wherein R"' is H or C_1–C_7 alkyl; the carbonyl-containing groupings in formulas (k') and (m') and the X substituent in formula (l') can each be attached at the 2, 3 or 4 position of the dihydropyridine ring; the carbonyl-containing groupings in formulas (n') and (p') and the X substituent in formula (o') can each be attached at the 2, 3 or 4 position of the dihydroquinoline ring; and the carbonyl-containing groupings in formulas (q') and (s') and the X substituent in formula (r') can each be attached at the 1, 3 or 4 position of the dihydroisoquinoline ring.

4,824,851

PYRIMIDONES AS CARDIOTONIC, ANTI HYPERTENSIVE, CEREBROVASCULAR VASODILATOR AND ANTI-PLATELET AGENTS

Takao Takaya, Kawanishi; Masayoshi Murata, Toyono, and Kiyotaka Ito, Ibaragi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

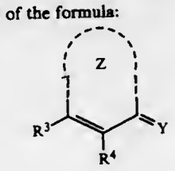
Division of Ser. No. 870,826, Jun. 5, 1986, Pat. No. 4,746,664, which is a division of Ser. No. 588,902, Mar. 12, 1984, Pat. No. 4,612,376. This application Mar. 25, 1988, Ser. No. 173,584

Claims priority, application United Kingdom, Mar. 25, 1983, 8308290; Jun. 7, 1983, 8315542; Oct. 18, 1983, 8327859

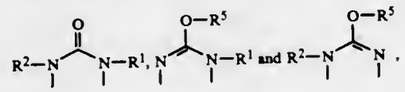
Int. Cl.[4] A61K *31/495;* **C07D** *239/24*

U.S. Cl. 514—274 **7 Claims**

1. A compound of the formula:



wherein Z is a group selected from



in which

R^1 and R^2 are each hydrogen, C_2–C_6 alkenyl, phenyl-(C_1–C_6)alkyl, C_1–C_6 alkyl, or C_1–C_6 alkyl substituted with one epoxy, or with one hydroxy and one amino, or with one hydroxy and one C_1–C_6 alkylamino, and R^5 is C_1–C_6 alkyl,

R^3 is hydrogen, phenyl, phenyl substituted with mono-, di- or tri-C_1–C_6 alkyl, or with mono-, di- or tri-C_1–C_6 alkoxy, or with mono- or di-halogen, or with one C_1–C_6 alkoxy and one C_1–C_6 alkyl, 2-, 3- or 4-pyridyl, or 2-, 3- or 4-pyridyl substituted with one C_1–C_6 alkyl at the N-position,

R^4 is hydrogen, phenyl or phenyl substituted with mono- or di-C_1–C_6 alkoxy, and

Y is =O or =S,

provided that R^3 is not hydrogen when R^4 is hydrogen, and that Y is =S when R^1 and R^2 are each hydrogen or C_1–C_6 alkyl and R^3 is phenyl, and pharmaceutically acceptable salts thereof.

7. A cardiotonic, antihypertensive, cerebrovascular vasodilative and anti-platelet agregration pharmaceutical composition comprising an effective amount of a compound of claim 1 in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

4,824,852

SUBSTITUTED INDOLE COMPOUNDS WHICH HAVE USEFUL EFFECTS ON THE CENTRAL NERVOUS SYSTEM

Henning Böttcher, Darmstadt; Hans-Heinrich Hansberg, Ober-Ramstadt; Christoph Seyfried, Seeheim-Jugenheim, and Klaus-Otto Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

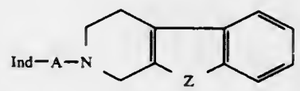
Division of Ser. No. 878,559, Jun. 26, 1986, Pat. No. 4,740,602. This application Feb. 8, 1988, Ser. No. 153,692

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3522959

Int. Cl.[4] A61K *31/44;* **C07D** *231/02*

U.S. Cl. 514—290 **22 Claims**

1. An indole derivative of the formula



wherein

Ind is 3-indolyl or 3-indolyl substituted by (a) a hydroxymethyl, methylenedioxy, S-alkyl, SO-alkyl, SO_2-alkyl, CN or COW group, or (b) substituted once or twice by alkyl, O-alkyl, OH, F, Cl or Br, or (c) a combination of (a) and (b),

W is H, OH, O-alkyl, NH_2, NH-alkyl or N(alkyl)$_2$,

A is $-(CH_2)_n-$, $-CH_2-S-CH_2CH_2-$, $-CH_2-SO-CH_2CH_2-$ or $-CH_2-SO_2-CH_2CH_2-$,

Z is $-(CH_2)_m-$, —CH=CH—, —CHOH—, —CO—, S, SO, SO_2 or O,

n is 2, 3, 4 or 5 and

m is 1, 2 or 3,

each alkyl group independently is of 1–4C atoms, or a physiologically acceptable salt thereof.

22. A method of treating psychosis comprising administering to a patient in need of such treatment an antipsychotic effective amount of a compound of claim 1.

4,824,853

α,α-DIARYL-4-ARYL-4-HYDROXY-1-PIPERIDINEBUTANAMIDE, N-OXIDES AND METHOD OF TREATING DIARRHEA

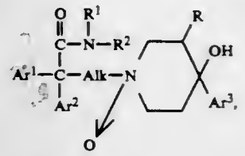
Lourens Wals, Turnhout, and Ludwig P. Cooymans, Beerse, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 786,566, Oct. 11, 1985, abandoned. This application Jul. 23, 1986, Ser. No. 888,606

Int. Cl.[4] A61K *31/445;* **C07D** *211/94*

U.S. Cl. 514—327 **15 Claims**

1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt and a stereochemically isomeric form thereof, wherein

R is hydrogen or methyl;

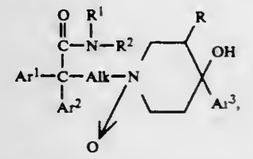
Ar^1 and Ar^2 are, each independently, phenyl or halophenyl;

Alk is $-CH_2-CH_2-$ or $-CH_2-CH(CH_3)-$;

R^1 and R^2 are, each independently, hydrogen, C_{1-6}alkyl, phenylmethyl, or 2-propenyl or R^1 and R^2 combined with the nitrogen atom bearing said R^1 and R^2 may form a pyrrolidinyl, piperidinyl, C_{1-6}alkylpiperidinyl, 4-morpholinyl or 2,6-di(C_{1-6}alkyl)-4-morpholinyl radical;

Ar^3 is phenyl being optionally substituted with up to 3 substituents selected from the group consisting of C_{1-6}alkyl, C_{1-6}alkyloxy, halo and trifluoromethyl.

11. A method of treating warm-blooded animals suffering from diarrhea, which method comprises the systemic administration to warm-blooded animals of an effective antidiarrheal amount of a compound having the formula



(I)

a pharmaceutically acceptable acid addition salt and a stereochemically isomeric form thereof, wherein

R is hydrogen or methyl;

Ar^1 and Ar^2 are, each independently, phenyl or halophenyl;

Alk is $-CH_2-CH_2-$ or $-CH_2-CH(CH_3)-$;

R^1 and R^2 are, each independently, hydrogen, C_{1-6}alkyl, phenylmethyl, or 2-propenyl or R^1 and R^2 combined with the nitrogen atom bearing said R^1 and R^2 may form a pyrrolidinyl, piperidinyl, C_{1-6}alkylpiperidinyl, 4-morpholinyl or 2,6-di(C_{1-6}alkyl)-4-morpholinyl radical;

Ar^3 is phenyl being optionally substituted with up to 3 substituents selected from the group consisting of C_{1-6}alkyl, C_{1-6}alkyloxy, halo and trifluoromethyl.

4,824,854

FUNGICIDAL PYRIDYL IMINOCARBONATES

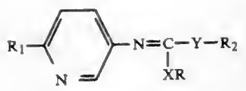
Don R. Baker, Orinda, and Keith H. Brownell, San Jose, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Filed Oct. 29, 1987, Ser. No. 114,808

Int. Cl.[4] C07D *213/64, 213/74;* **A01N** *43/40*

U.S. Cl. 514—346 **5 Claims**

1. A compound having the structural formula



wherein

R is selected from the group consisting of C_1–C_{16} alkyl, C_3–C_8 cycloalkyl, C_2–C_8 alkenyl, C_2–C_8 substituted alkenyl wherein the substituents are selected from the group consisting of —Cl, —Br, —F and —NO_2;

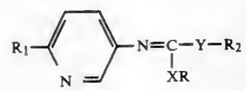
R_1 is selected from the group consisting of halogen, C_1–C_3 alkoxy, C_3–C_4 alkenyloxy and C_1–C_3 haloalkoxy;

R_2 is C_1–C_4 alkyl;

X is sulfur or oxygen;

Y is sulfur or oxygen; or a fungicidally acceptable organic or inorganic salt thereof.

4. The method of controlling fungi comprising applying to the area where control is desired, a fungicidally effective amount of a compound having the formula



wherein

R is selected from the group consisting of C_1–C_{16} alkyl, C_3–C_8 cycloalkyl, C_2–C_8 alkenyl, C_2–C_8 substituted alkenyl wherein the substituents are selected from the group consisting of —Cl, —Br, —F and —NO_2;

R_1 is selected from the group consisting of halogen, C_1–C_3 alkoxy, C_3–C_4 alkenyloxy and C_1–C_3 haloalkoxy;

R_2 is C_1–C_4 alkyl;

Y is sulfur or oxygen;

Y is sulfur or oxygen;

or a fungicidally acceptable organic or inorganic salt thereof.

4,824,855

1,4-DIHYDROPYRIDINE DERIVATIVES

Masayasu Kurono, Mie; Tsunemasa Suzuki, Matsubase; Yasuaki Kondo; Kenji Hamase, both of Kasugai; Toshinao Usui, Gifu; Tomoo Suzuki, Kasugai; Masato Fukushima, Komaki, and Kiichi Sawai, Funabashi, all of Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

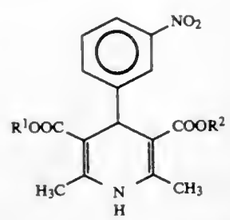
Continuation-in-part of Ser. No. 921,080, Oct. 21, 1986, abandoned. This application Nov. 5, 1987, Ser. No. 119,227

Claims priority, application Japan, Oct. 22, 1985, 60-234449; Jun. 24, 1986, 61-146030

Int. Cl.[4] A61K *31/455;* **C07D** *211/86*

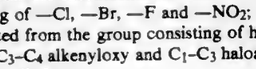
U.S. Cl. 514—356 **10 Claims**

1. A 1,4-dihydropyridine derivative represented by the formula



(I)

wherein one of R^1 and R^2 is C_{3-6} cycloalkylmethyl group and the other is a group of



in which R^3 is hydrogen atom or lower alkyl group and R^4 is hydrogen atom, hydroxyl radical, carboxyl radical, alkoxycarbonyl group, carbamoyl radical or phenyl radical, unsubstituted or substituted by one or two halogens, lower alkoxy or nitro or trilower alkylsilyl group, and n and m are an integer of 1 to 6, respectively and a salt thereof.

4,824,856

METHOD OF PROTECTING GASTROINTESTINAL TRACT

Susumu Okabe, Kyoto; Masaru Satoh, Koshigaya; Tomio Yamakawa, Kashiwa; Yutaka Nomura, Noda, and Masatoshi Hayashi, Ichigaya-dai, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1986, Ser. No. 896,154

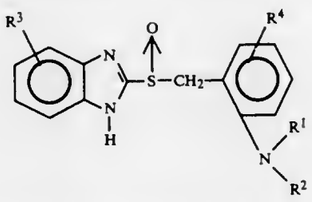
Claims priority, application Japan, Aug. 14, 1985, 60-178951; Apr. 11, 1986, 61-82268

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—395 **7 Claims**

1. A method of protecting gastrointenstinal tract in a mammal from the untoward, non-gastric-acid-induced effects of exposure to gastrointestinally injuruous agents,

which comprises administering orally to said mammal a non-antisecretory amount of benzimidazole derivative having the formula (I):



(I)

wherein R^1 is an alkyl group having 1 to 8 carbon atoms, R^2 is an hydrogen atom or a lower alkyl group, and each of R^3 and R^4 independently is an hydrogen atom, a halogen atom, a trifluoromethyl group, a lower alkyl group, a lower alkoxy group, a lower alkoxycarbonyl group or an amino group.

4,824,857

USE OF PROSTAGLANDIN D_2-ACTIVE SUBSTANCES

Yasumasa Goh, 91-5, Kawashimarokunotsubo-cho, Nishiko-ku, Kyoto-shi, Kyoto-fu, and Osamu Hayashi, Kyoto, both of Japan, assignors to Yasumasa Goh, Kyoto and Research Development Corporation of Japan, Tokyo, both of, Japan

Filed May 4, 1987, Ser. No. 45,965

Claims priority, application Japan, May 16, 1986, 61-113140

Int. Cl.[4] A61K *31/415, 31/215, 31/19, 31/557*

U.S. Cl. 514—398 **7 Claims**

1. A method of treatment of ocular hypertension and glaucoma which comprises administering from about 2 to about 50 μg, per eye, of prostaglandin D_2-active substance selected from the group consisting of prostaglandin D_2, prostaglandin D_2 methyl ester, 1-(3-cyclohexyl-3α-hydroxypropyl)-2,4-dioxoimidazolidine-5α-heptanoic acid, and pharmaceutically acceptable salts thereof, to a subject in need of such treatment.

4,824,858

1,3-DIOXOLANE-5-YL-HEXENOIC ACID DERIVATIVES

George R. Brown, Wilmslow, and Michael J. Smithers, Macclesfield, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

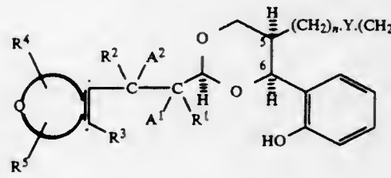
Filed May 9, 1986, Ser. No. 861,335

Claims priority, application United Kingdom, May 10, 1985, 8511896; Dec. 30, 1985, 8531893

Int. Cl.[4] A61K *31/335;* **C07D** *319/06*

U.S. Cl. 514—336 **8 Claims**

1. A (2,4,5-cis)-dioxane of the formula I



I

wherein A^1 and A^2 are hydrogen or together form a direct link; R^1 and R^2 are hydrogen; R^3 is hydrogen; R^4 and R^5 are independently selected from hydrogen; halogeno, (1–4C)alkyl, (1–4C)alkoxy, nitro, cyano, trifluoromethyl, hydroxy, (1–4C)alkanoylamino and (2–4C)alkanoyloxy, or R^4 and R^5 together form (1–4C)alkylenedioxy attached to adjacent carbon atoms in Q when the latter completes a benzene ring; Y is cis-vinylene; n is 1; m is 2; Q, in conjunction with its adjoining carbon atoms, completes a benzene or pyridine ring; and Z is carboxy, 1(H)-tetrazol-5-yl or a group of the formula —CO.NH.SO_2R^6 wherein R^6 is (1–6C)alkyl, benzyl or phenyl, the latter two of which are unsubstituted or bear a halogeno, (1–4C)alkyl, (1–4C)alkoxy, nitro, cyano or trifluoromethyl substituent; or a pharmaceutically acceptable salt thereof.

4,824,859

PYRAZOLINE COMPOUNDS COMPOSITIONS AND USE

Sidney C. Burford, and David N. Hardern, both of Loughborough, United Kingdom, assignors to Fisons plc., Ipswich, England

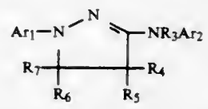
Filed May 3, 1984, Ser. No. 606,867

Claims priority, application United Kingdom, May 21, 1983, 8314111; Dec. 22, 1983, 8334283

Int. Cl.[4] A61K *31/415;* **C07D** *231/06*

U.S. Cl. 514—403 **7 Claims**

1. A compound of formula I,



I

in which Ar_1 and Ar_2, which may be the same or different, each independently represent phenyl or pyridinyl, the phenyl or the pyridinyl each optionally being substituted by one or more of halogen; hydroxy; $COOR_{12}$; trihalomethyl; alkoxy C1 to 6; alkyl C1 to 6; —NR_1R_2; alkoxy C1 to 6 substituted by NR_1R_2 or by phenyl; or alkyl C1 to 6 substituted by NR_1R_2 or by —$COOR_{12}$;

R_1 and R_2, which may be the same or different, each independently represent hydrogen or alkyl C1 to 6,

R_3 represents —$COOR_8$, or —$CONHR_{11}$,

R_4, R_5, R_6 and R_7, which may be the same or different each independently represent hydrogen, alkyl C1 to 6 or phenyl,

R_8 represents alkyl C1 to 6 or phenyl,

R_{11} represents alkyl C1 to 6 or phenyl,

R_{12} represents hydrogen or alkyl C1 to 6, or a pharmaceutically acceptable acid addition salt, ester, amide, or prodrug thereof.

7. A method of treatment of an inflammatory condition, which comprises administration of an effective amount of a compound according to claim 1 to a patient suffering from such a condition.

4,824,860

TREATMENT OF PARKINSONS DISEASE

David A. A. Owen, Welwyn Garden City, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

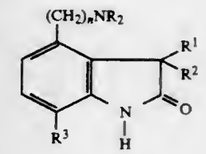
Filed May 19, 1988, Ser. No. 196,653

Claims priority, application United Kingdom, May 21, 1987, 8712073

Int. Cl.[4] A61K *31/40*

U.S. Cl. 514—418 **3 Claims**

1. A method of treatment of Parkinsons Disease which comprises administering an effective non-toxic amount for the treatment of Parkinsons Disease of a compound of the following structure:



in which

each group R is hydrogen or C_{1-4}alkyl;

R^1 and R^2 are each hydrogen or C_{1-4}alkyl;

R^3 is hydrogen or hydroxy; and

n is 1 to 3;

or a pharmaceutically acceptable salt thereof to a subject in need thereof.

4,824,861

PYRROLIDONE DERIVATIVES AND MEMORY ENHANCEMENT USE THEREOF

Mario Piazza, Milano; Carlo Farina, Como; Silvano Banfi, and Ugo Pfeiffer, both of Milano, all of Italy, assignors to ISF Societa Per Azioni, Milan, Italy

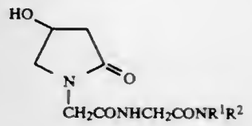
Filed Dec. 11, 1987, Ser. No. 131,862

Claims priority, application Italy, Jun. 21, 1985, 21234 A/85

Int. Cl.[4] A61K *31/40;* **C07D** *207/26*

U.S. Cl. 514—425 **4 Claims**

1. A compound of Structure (1)



in which

R^1 is hydrogen or straight or branched C_{1-4} alkyl, and

R_2 is hydrogen or straight and branched C_{1-4} alkyl.

4. A method of restoring learning and treating memory difficulties which comprises administering to a mammal in need thereof a non-toxic effective amount of a compound of claim 1.

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4,824,862

3-PHENYL-2-STYRYLPYRROLIDINES, PREPARATION AND USE THEREOF

Walter Himmele, Walldorf; Gerd Steiner, Kirchheim; Hans-Juergen Teschendorf, Dudenhofen, and Harald Weifenbach, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

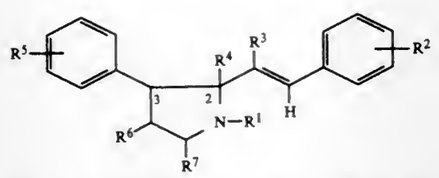
Filed May 23, 1988, Ser. No. 197,275

Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717394

Int. Cl.[4] C07D *207/06, 207/08;* **A61K** *31/40*

U.S. Cl. 514—429 **12 Claims**

1. A 3-phenyl-2-styrylpyrrolidine of the formula I



I

where R^1 is hydrogen or C_1–C_6-alkyl; R^2 and R^5 are each independently one substituent on each phenyl ring selected from the group consisting of halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, C_1–C_3-alkylthio or trifluoromethyl, or one or both of R^2 and R^5 may be hydrogen, the remaining positions on the phenyl rings being hydrogen atoms; and R^3, R^4, R^6 and R^7 are each hydrogen or C_1–C_3-alkyl, or a salt thereof with a physiologically tolerated acid.

11. The method of treating depressions in a patient suffering therefrom which comprises administering an antidepressant effective amount of a compound of claim 1.

4,824,863

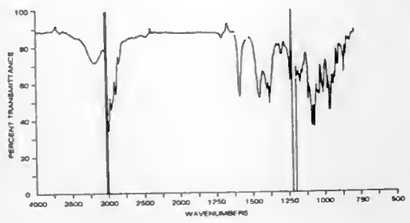
ANTIBIOTIC A80438

Robert L. Hamill, Greenwood; Walter M. Nakatsukasa, Indianapolis, and Raymond C. Yao, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

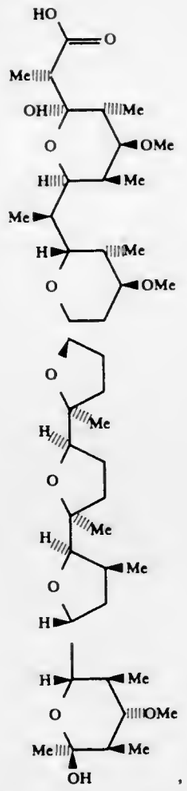
Filed May 28, 1985, Ser. No. 738,320

Int. Cl.[4] A61K *31/00;* **C07D** *309/22*

U.S. Cl. 514—460 **31 Claims**



1. Antibiotic A80438 which has the formula



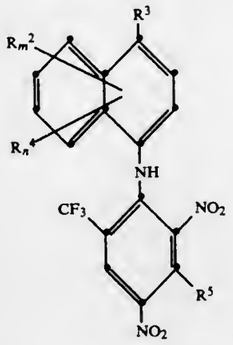
the C_1–C_7-alkanoyl and C_1–C_7-alkyl ester and C_1–C_7 alkyl ether derivatives of A80438, and the pharmaceutically acceptable salts of A80438 and of the specified ester and ether derivatives.

25. A method for treating coccidiosis in poultry which comprises administering to the poultry a feedstuff comprising a first component which is a compound of claim 1 and a second component which is selected from the group consisting of

(a) nicarbazin,

(b) 4,4'-dinitrocarbanilide,

(c) a naphthalenamine of the formula



wherein:

R^2 is C_1–C_4 alkyl;

R^3 is halogen, C_1–C_4 fluoroalkyl, C_1–C_4 fluoroalkoxy or C_1–C_4 fluoroalkylthio;

R^4 is halogen;

R^5 is hydrogen or halogen;

m is 0, 1 or 2; and

n is 0 or 1;

with the proviso that, when an R^4 substituent exists, it is at other than the 2-position;

(d) a benzenamine selected from 2,4-dinitro-N-[4-(trifluoromethoxy)phenyl]-6-(trifluoromethyl)benzenamine, 2,4-dinitro-N-[4-(1,1,2,2-tetrafluoroethoxy)phenyl]-6-(trifluoromethyl)benzenamine or 2,4-dinitro-N-[4-(pentafluoroethoxy)phenyl]-6-(trifluoromethyl)benzenamine;

(e) metichlorpindol; or

(f) a pharmaceutically acceptable salt of an (a)–(e) compound;

the components being present in the feedstuff in amounts which, in combination, are synergistic as to at least one coccidiosis-causing strain of Eimeria.

4,824,864

STABILIZATION OF ZINEB

Roman Fischer; Knut Koob, both of Mutterstadt, and Friedrich Loecher, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 754,012

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1984, 3426078

Int. Cl.[4] A01N *47/10, 55/02*

U.S. Cl. 514—494 **3 Claims**

1. A method of stabilizing fungicidal compositions consisting essentially essential of zineb to reduce substantially the decomposition of zineb during storage, which method consists of mixing into said composition from 1 to 15% by weight of calcium oxide based on the weight of zineb in the composition to produce a homogeneous mixture.

4,824,865

TREATMENT OF SKIN DISORDERS

Paul A. Bowser, and Richard J. White, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 12, 1987, Ser. No. 2,046

Claims priority, application United Kingdom, Jan. 15, 1986, 8600822

Int. Cl.[4] A61K *31/20*

U.S. Cl. 514—558 **9 Claims**

1. A method for the treatment of the skin disorder of *tinea pedis* in man and other mammals, which method of treatment comprises applying to involved areas of the body an effective amount of a composition comprising from 0.01 to 20% by weight of an active agent selected from the group consisting of 2-hydroxyoctanoic acid, 2-ketooctanoic acid, their C_2 to C_6 alkyl esters, their diglyceride and triglyceride esters and mixtures thereof; together with a pharmaceutically acceptable vehicle.

4,824,866

ANTI-GLAUCOMA USE OF TRIFLUOROMETHANESULFONAMIDE

Donald C. Kvam, North Oaks, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Feb. 2, 1987, Ser. No. 9,719

Int. Cl.[4] A61K *31/18*

U.S. Cl. 514—601 **7 Claims**

1. A method for lowering intraocular pressure in an eye of a mammal suffering from glaucoma, comprising administering topically to said eye a compound of the formula

CF_3SO_2NHR

wherein R is hydrogen or a pharmaceutically acceptable cation selected from the group consisting of an alkali or alkaline-earth metal ion and a protonated or quaternized amine, in an amount sufficient to reduce intraocular pressure.

4,824,867

QUATERNARY AMMONIUM COMPOUNDS

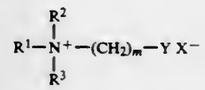
Kim R. Smith, 1950 Stafford Dr., Baton Rouge, La. 70810; James E. Borland, 12253 E. Millburn, Baton Rouge, La. 70815, and Joe D. Sauer, 15553 Waywood Ave., Baton Rouge, La. 70816

Continuation of Ser. No. 894,938, Aug. 8, 1986, which is a continuation of Ser. No. 782,353, Oct. 1, 1985. This application Sep. 22, 1986, Ser. No. 910,417

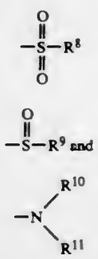
Int. Cl.[4] A01N *33/12, 37/02, 37/34, 41/02*

U.S. Cl. 514—642 **5 Claims**

1. A method of inhibiting the growth of bacteria, said method comprising contacting said bacteria with a bactericidal amount of a quaternary ammonium compound having the formula



wherein R^1 is an alkyl containing 8–20 carbon atoms, R^2 is an alkyl containing 8–20 carbon atoms, methyl or ethyl, R^3 is methyl or ethyl, m is an integer from 1 to 6, X is an anion and Y is selected from the group consisting of



wherein, R^8, R^9, R^{10} and R^{11} are alkyls containing 1–12 carbon atoms.

4,824,868

PROPYLAMINE DERIVATIVES USEFUL FOR THE TREATMENT OF DEMENTIA

Jeffrey W. H. Watthey, Chappaqua, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y. and Ciba-Geigy Corporation, Ardsley, N.Y.

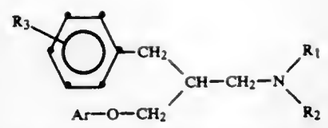
Continuation of Ser. No. 848,661, Apr. 4, 1986, Pat. No. 4,692,469, which is a continuation of Ser. No. 568,000, Jul. 4, 1984, Pat. No. 4,588,746, which is a continuation-in-part of Ser. No. 415,000, Sep. 7, 1982, abandoned. This application Jul. 17, 1987, Ser. No. 74,581

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—651 **3 Claims**

1. A method for the treatment of dementia in mammals in need thereof which consists of administering to said mammal a therapeutically effective amount of a selective serotonin uptake inhibiting compound of the formula

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wherein R_1 represents hydrogen or methyl; R_2 represents methyl; R_3 represents hydrogen; and Ar represents 4-trifluoromethylphenyl; or a pharmaceutically acceptable salt thereof; in combination with one or more pharmaceutically acceptable carriers.

4,824,869

BASE-MODIFIED METAL OXIDE CATALYSTS FOR THE CONVERSION OF SYNTHESIS GAS TO ALCOHOLS

Guillermo Prada-Silva, Wappingers Falls, and Ajit K. Bhattacharya, Hopewell Junction, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,474

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.⁴ B07C *27/01*

U.S. Cl. 518—714 **6 Claims**

1. In a method for preparing lower aliphatic alcohols where carbon monoxide and hydrogen are reacted in the presence of an oxide-containing heavy metal catalyst under carbon monoxide-hydrogenation conditions and where said catalyst comprises:

(1) a support consisting of a member selected from the group consisting of alumina, silica, titania, zirconia, lanthana and mixed metal oxides thereof;

(2) at least one metal oxide selected from the group consisting of molybdenum oxide, tungsten oxide, and rhenium oxide;

(3) a heavy metal oxide selected from the group of elements consisting of cobalt oxide, iron oxide and nickel oxide; and

(4) a promoter comprising an alkali or alkaline earth element in free or combined form;

wherein the improvement comprises improving the selectivity to said alcohols by treating said metal oxide or oxides with a nitrogen-containing compound selected from the group consisting of urea, dimethyl-olurea, cyanuric acid, melamine, melam, melen and melon, or a thermally stable derivative thereof.

4,824,870

POLYALDEHYDE ACTIVATED MEMBRANES

Kariyawasam P. W. Pemawansa, Ann Arbor; Mark Heisler, Saline, and Menahem Kraus, Ann Arbor, all of Mich., assignors to Gelman Sciences, Inc., Ann Arbor, Mich.

Filed Sep. 14, 1987, Ser. No. 96,730

Int. Cl.⁴ C08J *9/36*

U.S. Cl. 521—53 **7 Claims**

1. A process for making an activated microporous membrane comprising:

casting a microporous membrane that comprises a membrane polymer; and

activating the membrane polymer by physically combining a polyaldehyde containing mixture with the membrane polymer in an amount sufficient to cover substantially all available surface area of the microporous membrane.

4,824,871

ELECTRICALLY CONDUCTIVE POLYMER COMPOSITE AND METHOD OF MAKING SAME

Toshihiko Shinomura, Tokyo, Japan, assignor to Inoue MTP Kabushiki Kaisya, Nagoya, Japan

Filed Feb. 29, 1988, Ser. No. 162,126

Claims priority, application Japan, Mar. 2, 1987, 62-45163

Int. Cl.⁴ C08J *9/36*

U.S. Cl. 521—53 **1 Claim**

1. A method of making an electrically conductive polymer composite which comprises the steps of (a) providing a porous body of polymer A containing interconnected cavities ranging in diameter from 0.05 μm to 10 mm and having a porosity of 5 to 95% by volume, (b) filing the cavities of said porous body with a liquid monomer, monomer mixture or prepolymer suitable for the formation of polymer B and containing 10 to 95% by weight of an electrically conductive filler, and (c) polymerizing or cross-linking said liquid monomer, monomer mixture or prepolymer to yield polymer B in solid form.

4,824,872

NEOCARBYL-SUBSTITUTED PHOSPHORATES

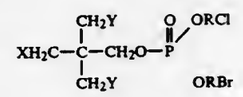
Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 843,452, Mar. 24, 1986, Pat. No. 4,739,091. This application Nov. 27, 1987, Ser. No. 125,911

Int. Cl.⁴ C08J *9/00*; C08K *9/00*

U.S. Cl. 521—107 **10 Claims**

1. A method for improving a production characteristic selected from the group consisting of processability, scorch, odor, flame-retardant efficiency, and combinations thereof flame-retardant polyurethanes comprising incorporation of an amount of a flame-retardant compound of the general formula:



wherein

X is selected from the group consisting of H, Cl, Br, and C_{1-5} alkyl;

Y is independently at each occurrence selected from the group consisting of H, Cl and Br, and at least one X or Y is Cl or Br; and

R is independently at each occurence C_{3-8} haloalkyl or C_{6-8} haloalkoxyhaloalkyl, wherein the halo moieties are Cl or Br, or a saturated hydrocarbyl of the formula C_nH_{2n} wherein n is an integer from 2 to about 8,

into a polyurethane foam under conditions sufficient to improve said characteristics.

4,824,873

LEATHER-WRAPPED STEERING WHEEL

Yoshio Uchida, Inazawa, and Sinji Jinushi, Gifu, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Oct. 15, 1987, Ser. No. 108,591

Int. Cl.⁴ C08G *18/14*

U.S. Cl. 521—137 **4 Claims**

1. A leather-wrapped steering wheel, comprising a core, a core-covering part, and a leather wrap part covering said core-covering part, which leather-wrapped steering wheel is characterized by the fact that said core-covering part is made of semirigid urethane foam, said semirigid urethane foam is produced by the reaction injection molding of a urethane foam material for water expansion using a polyether type compound and/or a polymer polyol type compound as the polyol moiety therof and a MDI type compound as the polyisocyanate moiety thereof, and said semirigid urethane foam possesses hardness in the range of 40 to 65 (Asker C), repulsion elasticity in the range of 15 to 60%, and density in the range of 0.3 to 0.5 g/cm³.

4,824,874

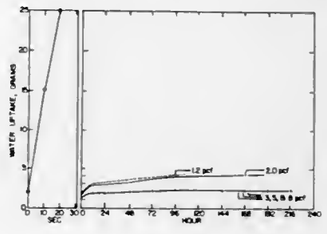
POLYIMIDE FOAM PRECURSOR AND ITS USE IN REINFORCING OPEN-CELL MATERIALS

Kyu W. Lee, Danville, Calif., assignor to Hexcel Corporation, San Francisco, Calif.

Filed Sep. 9, 1986, Ser. No. 905,718

Int. Cl.⁴ C08J *9/00*

U.S. Cl. 521—127 **20 Claims**



1. A method for preparing a solid phase polyimide foam precursor comprising combining the components:

(i) a member selected from the group consisting of furfuryl alcohol and condensation products thereof;

(ii) an organic polycarboxylic compound containing two carboxylic anhydride groups; and

(iii) an organic polyisocyanate in excess

amount with respect to component (i); under conditions which promote the reaction of component (i) with component (iii) but which permit substantially no reaction to occur between component (ii) and component (iii), to form a friable solid said conditions comprising the use of a urethane formation promoting catalyst at a controlled temperature.

4,824,875

UV CURABLE CONFORMAL COATING WITH MOISTURE SHADOW CURE

Beth I. Gotek, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 6, 1987, Ser. No. 118,086

Int. Cl.⁴ C08F *2/50*

U.S. Cl. 522—9 **16 Claims**

1. A composition comprising

(A) at least 20 weight percent based on the total weight of the composition of an acrylamide polydimethylsiloxane having acrylamide end groups bonded to silicon atoms through Si-C bonds and on the average at least 20 to less than 300 dimethylsiloxane units per molecule.

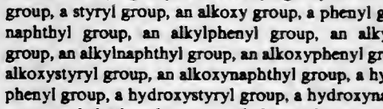
(B) at least 20 weight percent based on the total weight of the composition of a polydiorganosiloxane having endgroups containing both alkoxy groups and methacrylate groups where there are two alkoxy groups per endgroup bonded to silicon through an Si-O bond and one methacrylate group bonded to silicon through an Si-C bond and having on the average less than 350 diorganosiloxane units per molecule, said diorganosiloxane units being selected from dimethylsiloxane units, diphenylsiloxane units, and methylphenylsiloxane units wherein at least 50 percent of the organic groups of the diorganosiloxane units are methyl,

(C) at least 20 weight percent based on the total weight of the composition of a reactive diluent selected from the group consisting of isobornyl acrylate, cyclohexyl acrylate, and 2-ethylhexyl acrylate,

(D) from 0.5 to 10 weight percent based on the total weight of the composition of a photoinitiator combination in which there is at least 0.25 weight percent of based on the total weight of the composition



and at least 0.25 weight percent of based on the total weight of the composition



(E) from 0.1 to 2 weight percent based on the total weight of the composition of an amine selected from the group consisting of dimethylethanolamine and diisopropylethylamine, and

(F) from 0.05 to 1 weight percent based on the total weight of the composition of an organic titanate, where the composition has a viscosity at 25° C. in the range of 0.07 to 0.2 Pa.s.

4,824,876

LIGHT CURABLE DENTAL LIQUID OR PASTE

Takeo Matsumoto; Eiichi Yamada, both of Ibaraki; Osamu Nakachi, Yokohama; Godo Irukayama, and Yoshihiro Minoshima, both of Ibaraki, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

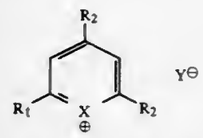
Continuation-in-part of Ser. No. 768,546, Aug. 23, 1985, Pat. No. 4,746,685. This application Mar. 23, 1987, Ser. No. 29,287

Claims priority, application Japan, Aug. 31, 1984, 59-180268; Dec. 29, 1984, 59-275895; Feb. 26, 1985, 60-35342

Int. Cl.⁴ C08F *2/50, 4/36, 265/06*

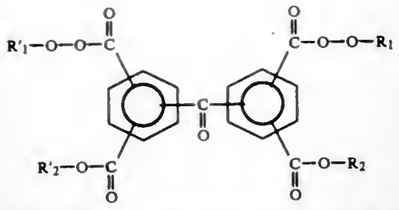
U.S. Cl. 522—24 **14 Claims**

1. A light curable dental liquid or paste comprising an ethylenic unsaturated monomer, a light polymerization initiator and an organic filler, said light polymerization initiator comprising a combination of an organic peroxide and a pyrylium salt compound represented by the following general formula (I) of:

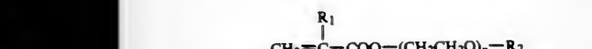


wherein R_1, R_2 and R_3 each represents the same or different atom or group and stands for a hydrogen atom, a halogen atom, an alkyl group, a haloalkyl group, an ethylenyl group, a styryl group, an alkoxy group, a phenyl group, a naphthyl group, an alkylphenyl group, an alkylstyryl group, an alkylnaphthyl group, an alkoxyphenyl group, an alkoxystyryl group, an alkoxynaphthyl group, a hydroxyphenyl group, a hydroxystyryl group, a hydroxynaphthyl group, a halophenyl group, a halostyryl group, a halonaphthyl group, a nitrophenyl group, a nitrostyryl group, a nitronaphthyl group, a aminophenyl group, an aminostyryl group, an aminonaphthyl group, an alkylaminophenyl group, an alkylaminostyryl group, an alkylaminonaphthyl group, a nitro group, an amino group or a hydroxyl group, X stands for an oxygen atom or a sulfur atom and Y for an anionic functional group, said organic peroxide being a tetraperoxy ester containing a benzophenone group and represented by the following general formula (II) of:

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wherein R_1 and R'_1 each represent a tertiary alkyl group having 4 to 8 carbon atoms and R_2 and R'_2 each represents a tertiary alkoxy group having 4 to 8 carbon atoms, said organic filler being a polymer obtained by polymerizing a feed monomer containing at least an ester of carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid and mixtures thereof, said feed monomer further containing an unsaturated comonomer copolymerizable with and different from said ester of carboxylic acid, said unsaturated comonomer being represented by the following general formula (III) of:



wherein R_1 is a hydrogen atom or a methyl group, R_2 is an alkyl group having 1 to 4 carbon atoms or a phenyl group, and n is an integer of 1 to 15.

4,824,877

HIGH POLYMER CONTENT SILICONE EMULSIONS

Shedric O. Glover, and Daniel Graiver, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 2, 1988, Ser. No. 151,686
Int. Cl.[4] C08L 53/04
U.S. Cl. 523—221 **4 Claims**

1. A method of producing a polydiorganosiloxane emulsion having a high polymer content of greater than 40 percent by weight and a relatively low viscosity of less than 25 Pa.s at 25° C. comprising, mixing 100 parts by weight of a high polymer content polydiorganosiloxane macroemulsion having a polymer content of greater than 60 percent by weight and particle diameters greater than 0.14 micrometers with from 1 to 70 parts by weight of a high polymer content polydiorganosiloxane microemulsion having a polymer content of from 20 to 30 percent by weight and particle diameters less than 0.14 micrometers. with the ratio of the average particle size of the macroemulsion to the average particle size of the microemulsion being from 5 to 15 and the particle size distribution of each of the parent emulsions being broad.

4,824,878

COMPOSITES OF THERMOPLASTIC POLYMERS AND SILICA REINFORCING FIBERS

Hans-Josef Sterzel, Dannstadt-Schauernheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 61,655
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621206
Int. Cl.[4] C08K 3/36
U.S. Cl. 523—307 **10 Claims**

1. A composite of a thermoplastic polymer having a softening point above 150° C. and containing from 1 to 80% by volume of silica reinforcing fibers, wherien the fibers have diameter of from 1 to less than 1000 nm and a length/diameter ratio of greater than 10 and are produced in a homogeneous organic phase in the presence of the thermoplastic polymer under the influence of a high shear gradient of from 50 to 5000 S^{-1}

(a) by condensation of silicic acid and/or polysilicic acid or
(b) by hydrolysis and subsequent condensation of polysilicates.

4,824,879

LOW SHRINKAGE TAPE JOINT COMPOSITION CONTAINING ATTAPULGITE

Richard L. Montgomery, Woodbury, and Donald L. Robertson, Eagan, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 876,753, Jun. 20, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 127,520
Int. Cl.[4] C08L 1/26
U.S. Cl. 524—43 **7 Claims**

1. In a ready-mix tape joint or wall repair compound of the type that hardens by drying comprising particular filler, binder, and water,

the improvement wherein said composition has a diluted yield value no greater than about 15 Pa.s,

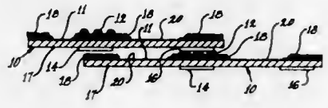
whereby said composition is readily spreadable and resists sagging but shrinks no more than about 25% upon drying.

4,824,880

ASPHALT ADHESIVES

Donald J. Algrim, Reynoldsburg; William E. Uffner, Newark; Glenn D. Lamb, Granville, and Stephen J. Jones, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 835,581, Mar. 3, 1986, abandoned. This application May 14, 1987, Ser. No. 49,372
Int. Cl.[4] C08L 51/02, 95/00
U.S. Cl. 524—62 **5 Claims**



1. An adhesive composition, for retaining adjacent portions of asphalt roofing sheets against windlift at temperatures of about 50° F. and greater, comprising a blend of asphalt, an elastomer containing about 80% triblock styrene-butadiene-styrene copolymer and about 20% diblock styrene-butadiene copolymer, a tackifying resin and a petroleum oil,

wherein the blend contains about 25–80% asphalt, a 3–18% elastomer, 5–25% tackifying resin and 10–50% petroleum oil;

wherein the asphalt is characterized by a kinematic viscosity in the range of from about 500 poise±100 to about 250±50 poise at 140° F. (60° C.), a minimum viscosity of from about 110 cs (centistokes) to about 80 centistokes at 275° F. (135° C.), a penetration (ASTM D5 73) of from about 120 to about 300 dmm (decimillimeters) at 77° F. (25° C.), and a ring and ball softening point from about 90° F. to about 130° F.; and

wherein the petroleum oil is a resinous by-product of a lubricating oil tower used in the crude oil refining process.

4,824,881

METHOD FOR MAKING POLYAMIDE ANION SOLUTIONS

Young H. Kim, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 14, 1988, Ser. No. 143,833
Int. Cl.[4] C08K 5/41; C08L 77/10
U.S. Cl. 524—82 **20 Claims**

1. A method for deprotonating an aromatic polyamide dissolved in a liquid sulfoxide, the method consisting essentially of reacting the polyamide with a base selected from at least one member of the group: (i) an alkoxide of the formula $C_xH_{2x+1}O^-M^+$ wherein x=1 to 7 and M is Li, Na, K, Rb or Cs, and (ii) an alkali amide of the formula $R_1R_2N^-M^+$, wherein M is as defined in (i) and R_1 and R_2 are selected from C_1 to C_7 alkyl and trialkylsilyl, said base having a pKa in dimethyl sulfoxide of about 19 or higher, thereby forming a polyamide anion solution, the polyamide having the repeating unit:

—NHRCO—

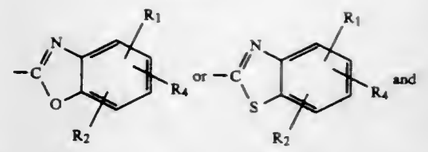
wherein:

R is selected from R^3 and R^1NHCOR^2,

R^1 and R^3, individually, are selected from m-phenylene, p-phenylene, 3,3'-biphenylene, 3,4'-biphenylene and 4,4'-biphenylene,

R^2 is selected from R^1 and CH_{2-x}, and x is 1 to 10.

-continued



when n is an integer of 2 or 3, R_3 represents —COOH, —$COOR_4$, —$CONH_2$, —$CONHR_4$, —$OOCR_4$, —$NHCOR_4$, —N=N—R_4, in which R_4 is a phenyl, biphenyl or naphthalene radical that may be substituted by R_1, R_2, —COOH and/or —$COOCH_3$, and ring A is a phenyl, biphenyl or naphthalene radical that may be substituted by R_1, R_2, —COOH and/or —$COOCH_3$ or an anthraquinone radical that may be substituted by X_2, X_3, X_4, X_5, and/or X_6, has a solubility in water, organic solvents and liquid crystals of not greater than 0.05% by weight of about 25° C., and the dichroic ratio of the colorant is not less than 7 when it is measured with the film obtained by blending the colorant intimately with polyethylene terephthalate, melting the resulting blend and forming it into a film.

4,824,882

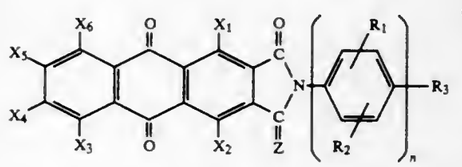
POLARIZING FILM

Katsuji Nakamura, Yokohama; Junichi Fujio; Shin Hosonuma, both of Nagoya; Masakatsu Nakatsuka, and Tsutomu Nishizawa, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP85/00328, § 371 Date May 20, 1986, § 102(e) Date May 20, 1986, PCT Pub. No. WO86/02170, PCT Pub. Date Apr. 10, 1986
PCT Filed Jun. 12, 1985, Ser. No. 866,492
Claims priority, application Japan, Oct. 5, 1984, 59-210067
Int. Cl.[4] C08L 31/06; F21V 9/14; G02F 1/13
U.S. Cl. 524—89 **4 Claims**

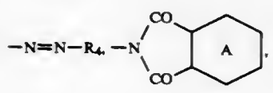
1. A polarizing film comprising a hydrophobic polymer containing a dichroic organic colorant in an oriented state which is characterized in that the dichroic organic colorant has a solubility in water, organic solvents and liquid crystals of not greater than 0.05% by weight at about 25° C. and the dichroic ratio of the colorant is not less than 7 when it is measured with the film obtained by blending the colorant intimately with polyethylene terephthalate, melting the resulting blend and forming it into a film.

3. A polarizing film comprising a hydrophobic polymer containing a dichroic organic colorant in an oriented state which is characterized in that the dichroic organic colorant, which is compound represented by the formula



(I)

where X_1, X_2, X_3, X_4, X_5, and X_6 represent hydrogen atoms, halogen atoms, hydroxyl groups or amino groups that may be substituted by an alkyl group of 1 to 3 carbon atoms, and at least one of X_1, X_2, X_3 and X_6 is a hydroxyl group or an imino group that may be substituted by an alkyl group of 1 to 3 atoms; Z represents an oxygen atom, a sulfur atom or an amino group; R_1 and R_2 independently represent hydrogen atoms, halogen atoms, methyl groups or methoxy groups; and n represents an integer of 1, 2 or 3; when n is an integer of 1, R_3 represents



4,824,883

POLYOLEFIN COMPOUNDS HAVING IMPROVED HEAT CURING STABILITY, METHOD OF IMPROVING HEAT AGING STABILITY THEREIN, AN ELECTRICAL CONDUCTOR INSULATED THEREWITH AND METHOD OF FORMING

Robert B. Walters, Oxford, and Edward V. Wilkus, Trumbull, both of Conn., assignors to Vulkor, Incorporated, Lowell, Mass.

Continuation of Ser. No. 576,163, Jan. 30, 1984, abandoned, which is a continuation of Ser. No. 474,240, Mar. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 965,716, Dec. 1, 1978, abandoned. This application Jan. 19, 1988, Ser. No. 147,028
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—93 **14 Claims**

1. A polyolefin polymer composition which may be cured by cross-linking with an organic peroxide curing agent comprising a polyolefin polymer and from about 1 to 6 parts by weight per 100 parts by weight of said polyolefin polymer of a sterically hindered di-tertiary butyl phenol and from about 1 to about 12 parts by weight of said polyolefin polymer of at least one zinc salt of mercaptoimidazole selected from the group consisting of a zinc salt of 2-mercaptobenzimidazole, a zinc salt of 2-mercaptotolylimidazole and mixtures thereof.

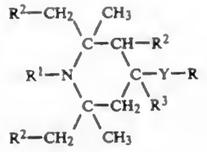
4,824,884

CYCLIC ANHYDRIDE DERIVATIVES OF HYDRAZIDE FUNCTIONALIZED HINDERED AMINE LIGHT STABILIZERS

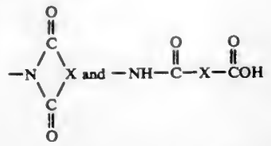
Ronald E. MacLeay, and Robert T. Kazmierczak, both of Williamsville, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 12, 1987, Ser. No. 84,533
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—99 **23 Claims**

1. A composition of the following structure:



where R is selected from



and X is selected from 1,2-aryl diradical of 6–12 carbons, 1,8-naphthyl diradical of 10–14 carbons, aryl-alkyl diradical of 7–13 carbons, saturated or unsaturated alkylene, cycloalkylene or bicycloalkylene diradical of 2–20 carbons which may be optionally substituted with carboxy, alkyl of 1–40 carbons, alkylthio of 1–18 carbons, alkoxy of 1–18 carbons, alkenyl of 2–40 carbons, arylthio of 6–20 carbons, aryl of 6–16 carbons, aralkyl of 7–17 carbons, aryloxy of 6–16 carbons, aralkylthio of 7–20 carbons or alkoxycarbonylalkylthio of 3–30 carbons.

R^1 is hydrogen, oxyl, hydroxyl, alkyl of 1–20 carbons, alkenyl or alkynyl of 3–8 carbons, aralkyl of 7–12 carbons, aliphatic acyl of 1–10 carbons, aromatic acyl of 7–13 carbons, alkoxycarbonyl of 2–9 carbons, aryloxycarbonyl of 7–15 carbons, alkyl, aryl, cycloalkyl or aralkyl substituted carbamoyl of 2–13 carbons, hydroxyalkyl of 1–5 carbons, 2-cyanoethyl, epoxyalkyl of 3–10 carbons or a polyalkylene oxide group of 4 to 30 carbons,

R^2 is hydrogen or alkyl of 1–4 carbons,

R^3 is hydrogen, hydroxyl or alkoxy of 1–4 carbons,

when R^3 is hydrogen, Y is a divalent radical selected from $-Z-R^4-C(=O)-N(R^5)-$, $-Z-C(=O)-N(R^5)-$, $-Z-C(=O)-R^6-C(=O)-N(R^5)-$, $-R^4-C(=O)-N(R^5)-$, $-C(=O)-N(R^5)-$;

Z is $-O-$, $-N(R^7)-$ or $-N(R^9)-R^8-N(R^9)-$,

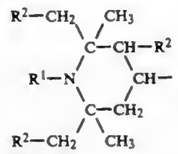
when R^3 is hydroxyl or alkoxy, Y is a divalent radical selected from $-R^4-C(=O)-N(R^5)-$, $-C(=O)-N(R^5)-$,

R^4 is an alkylene diradical of 1–4 carbons,

R^5 is hydrogen, primary or secondary alkyl of 1–8 carbons, aralkyl of 7–12 carbons or cycloalkyl of 5–20 carbons,

R^6 is a direct bond, alkylene of 1–14 carbons, oxydialkylene of 4–10 carbons, thiodialkylene of 4–10 carbons, alkenylene of 2–20 carbons, o-, m- or p-phenylene and R^6 may be optionally substituted with lower alkyl or alkoxy of 1–8 carbons, hydroxy, bromine, chlorine, mercapto or lower alkylmercapto of 1–8 carbons,

R^7 is hydrogen, alkyl of 1 to 10 carbons, aryl of 6 to 12 carbons, aralkyl of 7–12 carbons, cycloalkyl of 5–12 carbons, 2-cyanoethyl or a radical of the formula



and

R^8 is alkylene of 2–12 carbons and

R^9 is hydrogen, alkyl of 1–10 carbons, aryl of 6–12 carbons, aralkyl of 7–12 carbons or cycloalkyl of 5–12 carbons.

18. A stabilized synthetic polymer composition comprising a synthetic polymer and the composition of claim **1** in an amount effective to stabilize the synthetic polymer against degradative effects of heat or light.

4,824,885

PROCESS OF (CO) POLYMERIZATION OF ALPHA-OLEFINS IN THE PRESENCE OF ANTIOXIDANTS

Ambrogio Magni, Robbiate, and Erik Bersanetti, Milan, both of Italy, assignors to Enichem Sintesi S.p.A., Palermo, Italy

Filed Jul. 6, 1987, Ser. No. 70,179

Claims priority, application Italy, Jul. 23, 1986, 2122A/86

Int. Cl.[4] C08K *5/52, 5/53*

U.S. Cl. 524—120 **11 Claims**

1. A process for preparing polymers or copolymers of thermostabilized α-olefins, comprising polymerizing an α-olefin monomer or copolymerizing α-olefin monomers in the presence of a catalyst of the Ziegler-Natta type or metal oxides and in the presence of at least an antioxidant selected from organic phosphites, diphosphites, phosphonites and diphosphonites in excess of the amount of catalyst to produce a polyolefin containing from 0.005 to 1% by weight of antioxidant.

4,824,886

2-PHOSPHONO-BUTANE-1,2,4,-TRICARBOXYLIC ACID EMULSIFIER DERIVATIVES

Adolf Schmidt, Cologne, and Udo Hendricks, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

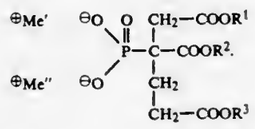
Continuation of Ser. No. 13,366, Feb. 11, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 229,806

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1986, 3605800

Int. Cl.[4] C08K *F/53;* **C08F** *2/28*

U.S. Cl. 524—131 **3 Claims**

1. A method for stabilizing polymers against thermal degradation which comprises adding an efficient amount of a compound of formula I:



(I)

where

⊕Me′ and ⊕Me″, independently of one another, denote hydrogen, sodium potassium, lithium or ammonium, and the radicals R^1, R^2 and R^3, independently of one another, denote an alkyl containing 6 to 20 carbon atoms, a cycloalkyl radical containing 6 to 20 carbon atoms, or ⊕Me′, with the proviso that a maximum of two of the radicals R^1, R^2 and R^3 may simultaneously be ⊕Me′.

4,824,887

HIGH IMPACT RUBBER MODIFIED POLYSTYRENE AND POLYPHENYLENE ETHER RESINS CONTAINING THE SAME

David F. Aycock, Glenmont, N.Y., and Peter H. Shu, Pittsburgh, Pa., assignors to General Electric Company, Selkirk, N.Y.

Filed Dec. 19, 1986, Ser. No. 944,696

Int. Cl.[4] C08K *5/51;* **C08L** *69/00, 71/04*

U.S. Cl. 524—151 **21 Claims**

1. A thermoplastic composition comprising:

(a) a polyphenylene ether resin; and

(b) a rubber modified polystyrene containing dispersed rubbery particles having a maximum mean diameter of about 2.0 microns and a ratio of the volume average particle size/number average particle size of 2.00 to about 3.20.

4,824,888

DIURETHANES AS STABILIZING ADDITIVES IN SEALING COMPOUNDS

Winfried Emmerling, Erkrath; Tore Podola, Monheim, and Juergen Wichelhaus, Wuppertal, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 3, 1988, Ser. No. 189,852

Claims priority, application Fed. Rep. of Germany, May 4, 1987, 3714768

Int. Cl.[4] C08K *5/16*

U.S. Cl. 524—199 **14 Claims**

1. In a sealing composition based on an isocyanate-terminated polyurethane prepolymer, the improvement wherein a viscosity stabilizing quantity of at least one diurethane of one or both of the following formulae is present therein:

$$R^1—NH—CO—O—R^2—O—CO—NH—R^1 \quad (I)$$

$$R^3—O—CO—NH—R^4—NH—CO—OR^3 \quad (II)$$

in which

R^1 is a C_3–C_{22} alkyl, C_7–C_{22} aralkyl, or phenyl radical,

R^2 is the residue of a difunctional polypropylene glycol having a number average molecular weight of from about 1000 to about 4000,

R^3 is the residue of a monofunctional polypropylene glycol monoalkyl ether having a number average molecular weight of from about 500 to about 2000, and

R^4 is a C_4–C_{36} alkylene group, a diaryl methane group, or a tolylidene group.

4,824,889

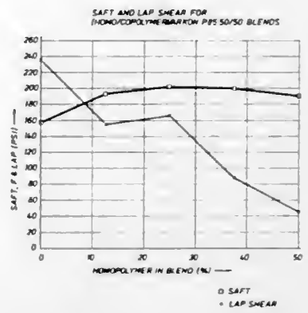
POLY-1-BUTENE BLEND ADHESIVES

Simon Mostert, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 30, 1987, Ser. No. 115,682

Int. Cl.[4] C08L *23/20, 45/00*

U.S. Cl. 524—232 **7 Claims**



1. A hot melt adhesive comprising a blend of:

(A) a butene-1-polymer blend of from 10% by weight to 90% by weight of an at least partially crystalline copolymer of butene-1 and ethylene, wherein the ethylene content is from about 1 mole percent to about 20 mole percent of said copolymer, and from 10% by weight to 90% by weight of a butene-1 homopolymer;

(B) from about 20% by weight to about 60% by weight of a substantially non-polar tackifying resin selected from the group; consisting of polyterpenes and aliphatic resins from C_5-C_9 hydrocarbon streams or hydrogenated resins thereof with softening points in a range of 70° C. to 130° C. and

(C) from about 0.1 phr to about 0.5 phr of an antioxidizing agent.

4,824,890

FILM FORMING SILICONE MICROEMULSIONS

Shedric O. Glover, and Daniel Graiver, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 2, 1988, Ser. No. 151,666

Int. Cl.[4] C08K *3/20*

U.S. Cl. 524—253 **4 Claims**

1. A method of producing a curable, reinforced polydiorganosiloxane microemulsion capable of giving a clear, coherent, elastomeric film of less than 0.4 micrometer thickness comprising,

(A) preparing a microemulsion of polydiorganosiloxane by sequentially adding a precursor emulsion comprised of cyclopolydiorganosiloxane, surfactant, and water to a polymerization medium comprised of water and an effective amount of a polymerization catalyst while mixing, wherein the rate of addition of the precursor emulsion is effective to form a clear, stable microemulsion which has polydiorganosiloxane droplets of less than 0.15 micrometer size, and which contains a surfactant to polydiorganosiloxane weight ratio of 0.15 to 0.65,

(B) admixing from 5 to 30 parts by weight of colloidal silica per 100 parts by weight of polydiorganosiloxane in the microemulsion and from 1 to 5 parts by weight of dialkyltindicarboxylate catalyst per 100 parts by weight of the microemulsion, to yield a stable, clear, microemulsion, capable of giving a coherent, elastomeric film of less than 0.4 micrometer thickness upon removal of the water at room temperature.

4,824,891

ELASTOFORMING DIE/FORM BLOCK COMPRISING LOW-HARDNESS SILICONE ELASTOMER

Claude Laurent, Annecy; Paul Rostaing, Vienne, and Rene Lyobard, Saint-Priest, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Feb. 11, 1987, Ser. No. 13,362

Claims priority, application France, Feb. 11, 1986, 86 01993

Int. Cl.[4] C08K *5/24*

U.S. Cl. 524—264 **14 Claims**

1. A resilient, crosslinked silicone elastomer shaped as an elastoforming die or form block for the stamping of sheet material workpieces, said silicone elastomer comprising a crosslinked fluid organopolysiloxane including at least one organic or inorganic plasticizer within the crosslinked network thereof, said at least one plasticizer being stable and nonmigrating under elastoforming stamping conditions, and said at least one plasticizer being present in such amount that said plasticized silicone elastomer has a Shore 00 hardness of less than about 40.

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4,824,892

UV LIGHT STABILIZER BASED ON BENZOPHENONE

Kurt Eigimeier, Neustadt, and Joachim Schulz, Pohle, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Fed. Rep. of Germany

Continuation of Ser. No. 943,835, Dec. 18, 1986, abandoned, which is a continuation of Ser. No. 787,986, Oct. 16, 1985, abandoned. This application Dec. 15, 1987, Ser. No. 132,374
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438190
Int. Cl.[4] C08K 5/13; C07C 69/734; C08F 120/30
U.S. Cl. 524—291 7 Claims

1. An ester formed from 1,3-bis-(4-benzoyl-3-hydroxyphenoxy)-2-propanol and an unsaturated carboxylic acid.

5. A method of stabilizing a plastic against the effects of UV light, which comprises incorporating an ester as claimed in claim 1 into said plastic.

6. A method of preparing homopolymers and copolymers, which comprises polymerizing an ester as claimed in claim 1 under conditions known per se.

4,824,893

CITRATE ESTERS AND METHODS

Ezekiel H. Hull, Greensboro, N.C., assignor to Morflex Chemical Company, Inc., Greensboro, N.C.

Continuation of Ser. No. 117,080, Nov. 4, 1987, which is a continuation of Ser. No. 865,874, May 21, 1986, Pat. No. 4,711,922, which is a continuation of Ser. No. 735,149, May 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,583, Jun. 11, 1984, abandoned. This application Jul. 11, 1988, Ser. No. 217,218
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[4] C08K 5/11
U.S. Cl. 524—310 22 Claims

6. A polymeric composition comprising a polymer and a plasticizing amount of a substantially pure citrate consisting of n-butyryltri-n-hexyl citrate wherein said citrate has an aconitate level of less than 0.20% when the esterification mixture from which said citrate is produced tests about 0.6% maximum acidity calculated as citric acid.

4,824,894

BIODEGRADABLE ORGANOSOL FLOCCULANTS

Reiner Schnee, Darmstadt; Angelo Scordialo, and Jurgen Masanek, both of Pfungstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jun. 30, 1986, Ser. No. 880,208
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1985, 3524950
Int. Cl.[4] C08K 5/11
U.S. Cl. 524—314 12 Claims

1. A biodegradable water-organosol flocculant emulsion, comprising:

(i) a continuous organic phase, said organic phase comprising at least one member selected from the group consisting of aliphatic hydrocarbons, animal and vegetable oils, fats, fatty acid monoesters and aliphatic dicarboxylic acid esters, wherein said organic phase comprises at least 10 wt. % of said aliphatic dicarboxylic acid ester;

(ii) a finely distributed aqueous polymer phase, said aqueous polymer phase comprising one or more homopolymers or copolymers selected from the group consisting of polymers of acrylates, metahcrylates, acrylamides and methacrylamides and salts thereof, dispersed in water, said aqueous polymer phase distributed within said organic phase; and

(iii) one or more emulisifying agents.

4,824,895

STABILIZED AROMATIC POLYESTER COMPOSITIONS

Jerold C. Rosenfeld, Tonawanda, N.Y., assignor to Celanese Corporation, New York, N.Y.

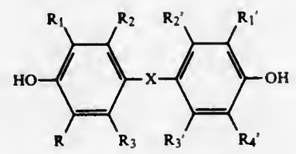
Division of Ser. No. 833,643, Feb. 25, 1986, abandoned. This application Oct. 30, 1987, Ser. No. 114,850
Int. Cl.[4] C08K 5/06; C08G 65/48
U.S. Cl. 524—370 9 Claims

1. A resin composition comprising:

(A) an aromatic polyester produced by polymerizing a substantially equimolar mixture of the monomeric components

(a) terephthalic acid units selected from the group consisting of the acid halide, dialkyl ester and diaryl ester thereof and/or isophthalic acid units selected from the group consisting of the acid halide, dialkyl ester and diaryl ester thereof, and

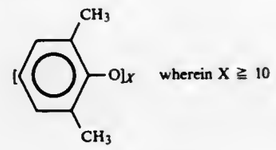
(b) at least one bisphenol of the general formula (I)



(I)

wherein —X— is selected from the gorup consisting of —O—, —S—, $—SO_213$, —SO—, —CO—, an alkylene group containing 1 to 4 carbon atoms and an alkylidene group containing 1 to 4 carbon atoms, and $_1$, R_2, R_3, R_4, R_1', R_2', R_3', and R_4', which may be the same or different, each is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom, and an alkyl group containing 1 to 4 carbon atoms, or a metal salt or diester of said bisphenol of the general formula (I), and

(B) about 0.01 to less than about 2% by weight, based on the aromatic polyester (A) of a polyphenylene oxide stabilizer of the general formula:



wherein X ≧ 10

4,824,896

PHENOL FORMALDEHYDE ADHESIVE FOR BONDING WOOD PIECES OF HIGH MOISTURE CONTENT AND COMPOSITE BOARD AND VENEERS BONDED WITH SUCH ADHESIVE

Michael R. Clarke, 324 Stevens Drive, West Vancouver, B.C., Canada (V7S 1C6); Paul R. Steiner, 1330 Frederick Road, North Vancouver, B.C., Canada (V7K 1J4), and Axel W. Anderson, 5774 Elcom Avenue, Burnaby, B.C., Canada (V5H 2Z9)

Filed Mar. 9, 1988, Ser. No. 165,929
Int. Cl.[4] C08L 61/00; C08K 3/38
U.S. Cl. 524—405 14 Claims

1. An adhesive composition intended particularly for use in bonding veneers or wafers of wood having a moisture content greater than 8% said adhesive composition comprising:

A. A highly advanced high molecular weight resin prepared by condensing phenol with an excess of formaldehyde in the presence of an alkaline hydroxide catalyst under reflux conditions;

B. A resin powder or aqueous dispersion which is a phenol formaldehyde (PF) condensation product partially cross-linked so that the particles swell when added to component A without dissolving;

C. A component selected from the group consisting of alkylene carbonates and phenol resorcinol formaldehyde (PRF) resins in an amount between about 1 and 10 weight percent based on the amount of solid resin in components A and B; and

D. Optionally borax in the amount of 0 to 3 weight percent based on the amount of solid resin of components A and B.

4,824,897

RUBBER COMPOSITIONS FOR STEEL TIRES

Hiroyuki Kaido, Hadano, and Yasuhiro Ishikawa, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 67,123, Jun. 29, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 220,964
Claims priority, application Japan, Jul. 11, 1986, 61-161995
Int. Cl.[4] C08K 3/04, 5/05, 5/09
U.S. Cl. 524—385 6 Claims

1. A rubber composition for coating the steel cords of automobile tires comprising:

(a) 100 parts of a vulcanizable starting rubber containing more than 50 parts by weight of a first rubber selected from the group consisting of natural rubber and polyisoprene rubber and combinations thereof; and

(b) from 0.25 to 1.0 parts by weight of a saturated aliphatic monovalent alcohol having from 14 to 20 carbon atoms;

(c) from 50 to 70 parts by weight of carbon black;

(d) from to 2.5 to 8 parts by weight of sulfur; and

(e) from 1 to 3 parts by weight of cobalt salt of an organic carboxylic acid.

4,824,898

SHAPED ARTICLE OF A TETRAFLUOROETHYLENE POLYMER

Masayuki Sukigara; Yasushi Kaneko, both of Yokohama, and Hiroshi Kataoka, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1988, Ser. No. 172,680
Claims priority, application Japan, Mar. 27, 1987, 62-71370; Nov. 27, 1987, 62-297340
Int. Cl.[4] B29C 17/00, 3/00; C08K 3/10
U.S. Cl. 524—401 10 Claims

1. A shaped article comprising a tetrafluoroethylene polymer having a number average molecular weight of at least about 10^6, which article has a specific gravity of at least 1.8 and an orientation release stress at 200° C. of less than 5 Kg/cm^2, and which article has a shrinking starting temperature of at least 80° C. as measured by thermomechanical analysis and has heat shrinking properties such that upon heating to a temperature higher than the shrinking starting temperature, shrinking occurs in a plurality of planes contiguously aligned in substantially parallel relationship within the shaped article and simultaneously expansion occurs in a direction perpendicular to said planes, wherein said shaped article exhibits an average maximum expansion ratio of from 2 to 10 as measured in terms of a ratio of a maximum expansion in the direction perpendicular to said planes and a least maximum shrinkage ratio of 0.71 or less as measured in terms of a ratio of a maximum shrinkage in a direction in which the maximum shrinkage is least.

4,824,899

RUBBER COMPOSITIONS FOR BEAD FILLER

Takuo Yasuda, Tokorozawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,712
Claims priority, application Japan, Nov. 18, 1986, 61-273017; Jul. 15, 1987, 62-174775
Int. Cl.[4] C08K 3/04; C08L 7/00, 9/00, 9/06
U.S. Cl. 524—495 5 Claims

1. A rubber composition for a tire bead filler comprising:

(A) 50 ~ 100 parts by weight of reinforcing carbon black,

(B) 1 ~ 10 parts by weight of sulfur, and

(C) 1 ~ 15 parts by weight of a metal salt of acrylic acid selected from the group consisting of aluminum acrylate, zinc acrylate, nickel acrylate, cobalt acrylate, lead acrylate, iron acrylate, manganese acrylate, barium acrylate, calcium acrylate and magnesium acrylate, based on 100 parts by weight of natural rubber or a blend of natural rubber and not more than 50% of synthetic diene rubber.

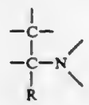
4,824,900

RUBBER COMPOSITIONS FOR PNEUMATIC RADIAL TIRES

Mitsuo Sakurai, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,358
Claims priority, application Japan, Dec. 22, 1986, 61-303965
Int. Cl.[4] C08K 3/04; C08L 7/00, 9/00, 15/02
U.S. Cl. 524—495 2 Claims

1. A rubber composition for automobile tires which comprises a rubber component of from 70 to 30 parts by weight of polybutadiene rubber and from 30 to 70 parts by weight of at least one rubber selected from the group consisting of natural rubber and polyisoprene rubber and from 25 to 55 parts by weight of carbonblack per 100 weight parts of the rubber component, said polybutadiene rubber containing less than 20 weight percent of 1,2-vinyl bonds, and more than 30 weight parts of said polybutadiene rubber having in the molecular chain at least one atomic group of the formula



wherein R is OH or SH and said carbonblack having an iodine adsorption of from 30 to 50 mg/g.

4,824,901

SURFACE TREATED ABSORBENT POLYMERS

William Alexander, Naperville; Mark Anderson, Wheaton, and Barbara R. Regan, Glenview, all of Ill., assignors to American Colloid Company, Arlington Heights, Ill.

Division of Ser. No. 872,654, Jun. 10, 1986. This application Apr. 25, 1988, Ser. No. 185,853
Int. Cl.[4] C08F 8/32
U.S. Cl. 524—555 32 Claims

1. A method of absorbing water comprising mixing a monomer solution of (A) acrylic acid, neutralized 70 to 100 mole percent, (B) styrene and/or methyl methacrylate in an amount of 0% to 25% based on the weight of acrylic acid and (C) acrylamide in a mole ratio of acrylic acid: acrylamide in the range of 70:30 to 100:0; (D) a water soluble or water miscible polyvinyl monomer cross-linking agent in an amount of 0.001 to 0.3 percent by weight of (A) plus (B) plus (C); and water to form a mixed monomer solution, wherein the monomers of the mixed monomer solution consist essentially of (A), (B), (C) and (D) and the monomer concentration is below 70 percent by weight of the monomer solution prior to polymerization; and initiating polymerization of monomers (A) and (B) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, cross-linking and to drive off sufficient water to form a water-absorbent cross-linked polyacrylate resin having a water content of 15 percent by weight or less, followed by contacting said resin with a polyquaternary amine in an amount of from about 0.1% to about 5.0% based on the weight of said resin, and thereafter contacting said polyquaternary amine treated resin with water to absorb water into said treated resin.

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4,824,902
LATEX COMPOSITION COMPRISING POLYCARBONATE HAVING TERTIARY AMINE ACID ADDITION MOIETY
Tsang J. Chen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 31, 1987, Ser. No. 91,249
Int. Cl.[4] C08G 63/62
U.S. Cl. 524—611 7 Claims

1. A latex composition comprising an aqueous continuous phase having dispersed therein polycarbonate particles characterized in that
(a) the polycarbonate comprises from about 0.1 to 30 mole percent of recurring units having a carboxyl or a tertiary amine acid addition salt component, and
(b) the polycarbonate particles are less than about 0.3 μm in diameter.

4,824,903
HEAT-RESISTANT POLYORGANOSILOXANE COMPOSITION
Koichi Aizawa, Kamakura; Shingo Sewa, Odawara; Kiyoshi Mizushima, Yokosuka, and Minoru Emoto, Ashigarakami, all of Japan, assignors to Dow Corning Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 2, 1986, Ser. No. 936,875
Claims priority, application Japan, Dec. 25, 1985, 60-290386
Int. Cl.[4] C08K 5/09
U.S. Cl. 524—772 6 Claims

1. A heat-resistant polyorganosiloxane composition comprising
(A) a polyorganosiloxane having a viscosity at 25° C. of at least 0.1 Pa.s and having an average unit formula

$$R_aR'SiO_{(4-a-b)/2}$$

wherein R is vinyl group or allyl group; R' is a group selected from the group consisting of lower alkyl group, phenyl, and 3,3,3-trifluoropropyl; a is a number such that at least two R are present in each molecule; and a+b has an average value of from 1.8 to 2.3,
(B) a hydrogenpolyorganosiloxane with a viscosity at 25° C. of from 0.001 to 100 Pa.s and having an average unit formula

$$R''_cH_dSiO_{(4-c-d)/2}$$

wherein R'' is a lower alkyl group of phenyl; d is a number such that at least two hydrogen atoms are present in each molecule; and c+d has an average value of from 1.8 to 3, the proportions of polyorganosiloxane (A) and hydrogenpolyorganosiloxane (B) are such that the number of —SiH in (B) is from 1.2 to 7.0 times the number of R in (A).
(C) 0 to 20 weight percent of a siloxane copolymer formed from dimethylvinylsiloxy units, trimethylsiloxy units, and SiO_2 units, based on the total weight of (A) and (B),
(D) a platinum-containing catalyst in an amount to give from 1.0 to 1,000 ppm as platinum metal based on the total weight of (A), (B), and (C),
(E) 1 to 30 weight percent of carbon black based on the total weight of (A), (B), and (C), and
(F) 0.01 to 1.0 weight percent of acetylacetone salt of a metal based on the total weight of (A), (B), and (C).

4,824,904
RESIN COMPOSITIONS, LAMINATES AND BLOCK COPOLYMERS
Akimasa Aoyama; Takeshi Moritani; Kiyoshi Yonezu, all of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Filed Mar. 19, 1987, Ser. No. 27,862
Claims priority, application Japan, Mar. 31, 1986, 61-74934; Mar. 31, 1986, 61-74935; Mar. 31, 1986, 61-74936; Mar. 31, 1986, 61-74937
Int. Cl.[4] C08F 16/06, 16/12, 29/04
U.S. Cl. 525—60 5 Claims

1. A resin composition comprising 95 to 50 parts by weight of a saponified ethylene-vinyl acetate copolymer and 5 to 50 parts by weight of a saponified ethylene-vinyl acetate copolymer containing a polyether component.

4,824,905
THERMOPLASTIC RESIN COMPOSITION COMPRISING POLYAMIDE, AROMATIC VINYL/UNSATURATED NITRILE/RUBBERY POLYMER GRAFT COPOLYMER AND AROMATIC VINYL/UNSATURATED NITRILE/α-UNSATURATED CARBOXYLIC ACID COPOLYMER
Tadashi Saeki; Kiyoshi Ikawa; Seiji Kurita, and Katsuji Ueno, all of Niihama, Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan
Filed Feb. 10, 1988, Ser. No. 154,276
Claims priority, application Japan, Feb. 13, 1987, 82-31241; Oct. 5, 1987, 82-251913
Int. Cl.[4] C08L 77/00
U.S. Cl. 525—66 4 Claims

1. A thermoplastic resin composition comprising:
(A) polyamide having a relative viscosity in sulfuric acid of not less than 2.0 and less than 3.0,
(B) a graft copolymer which is obtainable by copolymerizing 50 to 90% by weight of an aromatic vinyl monomer, 10 to 50% by weight of an unsaturated nitrile monomer and 0 to 40% by weight of at least one monomer selected from the group consisting of alkyl esters of unsaturated carboxylic acids and maleimide compounds in the presence of a rubber polymer and
(C) a carboxylic acid-modified copolymer consisting essentially of monomeric units derived from 50 to 89.5% by weight of an aromatic vinyl monomer, 10 to 49.5% by weight of an unsaturated nitrile monomer and 0.5 to 20% by weight of an α,β-unsaturated monocarboxylic acid,
wherein the weight ratio of polyamide (A) to the total amount of the graft copolymer (B) and the carboxylic acid-modified copolymer (C) is from 90:10 to 10:90, the content of α,β-unsaturated monocarboxylic acid is 0.1 to 1.5% by weight based on the total amount of the graft copolymer (B) and the carboxylic acid-modified copolymer (C), and the content of the rubbery polymer is 5 to 30% by weight based on the whole weight of the composition.

4,824,906
BLENDS OF GRAFTED POLYETHYLENE WITH CHLORINATED POLYETHYLENE
Wolfgang Honsberg, Wilmington, Del., and Royce E. Eanis, Beaumont, Tex., assignors to E. I. DuPont De Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 75,823, Jul. 20, 1987, abandoned. This application Mar. 10, 1988, Ser. No. 166,487
Int. Cl.[4] C08L 51/06, 23/26, 23/28, 23/06
U.S. Cl. 525—74 6 Claims

1. A blend of 80–99 weight percent of chlorinated polyethylene containing 15–60 percent by weight chlorine and from 1–20 weight percent of polyethylene containing 0–50 weight percent chlorine to which is grafted 0.1–5 weight percent

unsaturated dicarboxylic acid or anhydride containing 4 to 6 carbon atoms.

4,824,907
PREPARATION OF THERMOFORMED PLASTICS ARTICLES
Harmen Z. K. Coster, Amsterdam, Netherlands, assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.
Continuation of Ser. No. 842,231, Mar. 21, 1986. This application Mar. 9, 1988, Ser. No. 166,127
Claims priority, application United Kingdom, Apr. 2, 1985, 8508602
Int. Cl.[4] C08L 47/00, 51/04
U.S. Cl. 525—86 10 Claims

1. A polymer blend comprising:
(a) 100 pbw of an impact-modified base resin comprising a first copolymer of a styrenic monomer and an ethylenically unsaturated nitrile, and an impact modifier therefor, said first copolymer having a number average molecular weight of from 3×10^4 to 1×10^5; and
(b) from 0.1 to 20 parts by weight of a second copolymer consisting of said styrenic monomer and said ethylenically unsaturated nitrile, said second copolymer having a number average molecular weight of from 3×10^5 to 3×10^6.

4,824,908
BUTADIENE-BASED RUBBER COMPOSITION
Fumio Tsutsumi; Mitsuhiko Sakakibara; Noboru Shimada; Yoshihisa Fujinaga, all of Yokkaichi; Noboru Oshima, Suzuka; Tatsuro Hamada, and Tatsuo Fujimaki, both of Higashimurayama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan
Filed Mar. 24, 1987, Ser. No. 29,558
Claims priority, application Japan, Mar. 24, 1986, 61-64184
Int. Cl.[4] C08L 7/00, 9/00, 9/06, 53/02
U.S. Cl. 525—99 20 Claims

1. A butadiene-based rubber composition containing not less than 20% by weight of a butadiene-based homopolymer or copolymer having a glass transition temperature (Tg) of not less than −105° C. but less than −70° C. and a Mooney viscosity (ML_{1+4}, 100° C.) of 10 to 150, wherein said butadiene-based homopolymer or copolymer is obtained by:
(A) (i) polymerizing butadiene or (ii) random copolymerizing butadiene with at least one kind of a monomer selected from the group consisting of another conjugated diene and an aromatic vinyl compound, using an organic lithium initiator, and
(B) then reacting the polymerization-active terminals thereof with, as a coupling agent, an isocyanate compound or an isothiocyanate compound.

4,824,909
POWDER COATING COMPOSITION
Masahiko Togo, and Kazutoshi Abe, both of Yokohama, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan
Continuation of Ser. No. 851,115, Apr. 10, 1986, abandoned, which is a continuation of Ser. No. 673,262, Nov. 20, 1984, abandoned. This application Apr. 13, 1987, Ser. No. 37,064
Int. Cl.[4] C08L 67/02
U.S. Cl. 525—124 3 Claims

1. A powder coating composition consisting essentially of a melt-blended resin of:
(i) 65% to 95% by weight of a polyester resin comprising terephthalic acid as a main acid component and a dihydric alcohol as a main alcohol component and having a hydroxyl number of 20 to 100 and an acid value of 1 to 20;
(ii) 4% to 30% by weight of a blocked isocyanate; and
(iii) 0.2% to 30% by weight of a non-rubbery acrylic resin having a glass transition temperature of 40° C. to 85° C. and having at least one hydroxyl group and at least one glycidyl group.

4,824,910
POLYMER BLEND OF CARBON MONOXIDE/OLEFIN COPOLYMER AND A POLY(VINYLPYRIDINE) POLYMER
Robert G. Lutz, Santa Rosa, Calif., assignor to Shell Oil Company, Houston, Tex.
Filed Jun. 13, 1988, Ser. No. 205,973
Int. Cl.[4] C08F 1/64
U.S. Cl. 525—185 7 Claims

1. A composition comprising a non-miscible blend of, as a major component, a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and, as a minor component, poly(vinylpyridine) polymer.

4,824,911
BLENDS AND MOLDED ARTICLES COMPRISING METHACRYLATE POLYMERS AND VINYLIDENE FLUORIDE - HEXAFLUOROPROPYLENE COPOLYMER
Shaw-Chang Chu, Cranbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Aug. 21, 1987, Ser. No. 88,433
Int. Cl.[4] C08L 27/16, 27/20, 33/10, 27/12
U.S. Cl. 525—199 7 Claims

1. A blend comprising (a) 60 to 95 weight percent of a solid methacrylate polymer in which the predominant component is methyl methacrylate, ethyl methacrylate or a mixture thereof; and (b) 5 to 40 weight percent of a solid fluorocarbon copolymer of 60 to 90 weight percent vinylidene fluoride and 10 to 40 weight percent hexafluoropropylene, wherein said blend of solid polymers is free of glass microspheres and is suitable for preparing molded articles.

4,824,912
TERBLENDS AND FILMS OF LLDPE, LMW-HDPE AND HMW-HDPE
Tien-Kuei Su, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Aug. 31, 1987, Ser. No. 91,580
Int. Cl.[4] C08L 23/06, 23/08, 23/18
U.S. Cl. 525—240 20 Claims

1. A composition comprising a blend of a major proportion of LLDPE (linear low density polyethylene) and a minor proportion of each of two HDPE (high density polyethylene) resins one of which is LMW-HDPE having a MI (melt index) of greater than 10 and the other being HMW-HDPE having a melt index of less than 1.

4,824,913
PROCESS FOR PREPARING WATER-SOLUBLE POLYMER
Yoshikazu Murao, Machida; Shigeru Sawayama, Yokohama, and Kohichi Satoh, Zama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Filed May 6, 1987, Ser. No. 46,382
Claims priority, application Japan, May 13, 1986, 61-108795
Int. Cl.[4] C08F 8/10
U.S. Cl. 525—344 12 Claims

1. A process for preparing a powdery water-soluble polymer, which comprises granulating a hydrous gel-like polymer obtained by polymerizing N-vinylformamide in the form of an aqueous solution of which a monomer concentration is 20 to 60% by weight, dispersing the formed polymer particles in methanol and contacting them with an acid in the presence of ammonium salt of a monovalent acid in an amount of 1 to 200% by mole based on the formamide groups in said polymer, thereby partially modifying the formamide groups in said polymer to acid salt of amine groups.

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4,824,914

VULCANIZATION ACCELERATING DIAMINES

Paul H. Sandstrom, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 14, 1987, Ser. No. 95,785
Int. Cl.[4] C08F 8/34
U.S. Cl. 525—346 **11 Claims**

1. A process for the sulfur vulcanization of a sulfur vulcanizable unsaturated rubber which comprises heating the sulfur vulcanizable unsaturated rubber composition to a temperature within the range of about 100° C. to about 300° C. for a sufficient period of time to cure said rubber wherein the sulfur vulcanizable unsaturated rubber composition which is comprised of (a) at least one unsaturated rubber, (b) from about 0.2 to about 8 ph of sulfur, (c) from about 0.1 to about 2.5 phr at least one primary accelerator, and (d) from about 0.02 to about 0.8 phr of 4,7-diaza-decane-1,10-diamine as a secondary accelerator.

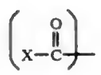
4,824,915

FUNCTIONALIZED POLYPHENYLENE ETHERS AND BLENDS WITH POLYAMIDES

David F. Aycock, Glenmont, and Sai-Pei Ting, Delmar, both of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,151
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] C08L 71/04
U.S. Cl. 525—397 **6 Claims**

1. A functionalized-polyphenylene ether composition comprising the reaction product of (a) a polyphenylene ether polymer; and (b) a compound having the general formula (i)—Z—(ii) which is a compound that contains in its molecule both group (i) which is at least one group having the formula



where X is F, Cl, Br, I, OH, OR, or



where R is H or an alkyl or aryl radical and group (ii) which is at least one carboxylic acid, acid anhydride, acid amide, imido, carboxylic acid ester, amino or hydroxyl group; wherein groups (i) and (ii) are covalently bonded through linkage Z which is a divalent hydrocarbon radical, provided that groups (i) and (ii) are not both simultaneously carboxylic acid groups.

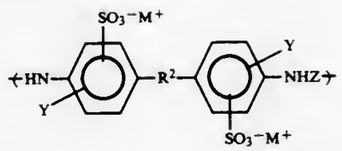
4,824,916

WATER-INSOLUBLE, CROSSLINKED, SULFONATED AROMATIC POLYAMIDE

Larry D. Kershner; Charles E. Reineke, both of Midland, Mich.; Nitis Sarkar, Lake Jackson, Tex., and Larry R. Wilson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

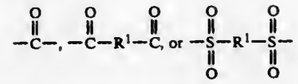
Continuation-in-part of Ser. No. 708,608, Mar. 15, 1985, abandoned. This application Jul. 14, 1986, Ser. No. 885,357
Int. Cl.[4] C08G 69/48
U.S. Cl. 525—420 **11 Claims**

1. A polymer comprising recurring units corresponding to Formula I:



(I)

wherein y, at each occurrence, is independently a compatible substituent, M^+, at each occurrence, is a compatible cation, R^2 at each occurrence is a covalent bond, or R^2 is hydrocarbylene or inertly substituted hydrocarylene; and Z at each occurrence is independently



and R^1 at each occurrence is independently hydrocarbylene or an inertly substituted hydrocarbylene, wherein the ploymer comprises an effective number of crosslinking groups so as to render the polymer normally insoluble in water and wherein the polymer would be water-soluble or water dispersible to the extent of at least about 1 weight percent polymer at 20° C., if the polymer were not crosslinked.

4,824,917

COATING COMPOSITION OF A HYDROXY GROUP-CONTAINING URETHANE POLYESTER WITH POLYMERIZED LACTONE MONOMERS

Panagiotis I. Kordomenos, Mt. Clemens, and Andrew H. Dervan, Grosse Pointe Farms, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 877,931, Jun. 23, 1986, Pat. No. 4,737,551. This application Nov. 4, 1987, Ser. No. 116,659
Int. Cl.[4] C08G 63/08, 63/18, 63/20
U.S. Cl. 525—440 **5 Claims**

1. A solvent based, thermosetting coating composition comprising:

(I) hydroxy functional urethane modified polyester resin having a number average molecular weight of between about 2,000 and about 20,000, said resin being the polymerization product of about 10 and about 80 weight percent of a hydroxy-containing urethane modified polyester precursor and between about 90 and about 20 weight percent of lactone monomers, said hydroxy-containing urethane modified polyester precursor having reactive hydroxy groups, wherein the lactone monomers are polymerized and reacted with the hydroxy groups of the precursor to form polymeric chains attached to the precursor, said precursor (i) having a number average molecular weight between about 2,000 and about 4,000, (ii) having a hydroxyl number between about 50 and about 250, and (iii) containing between about 1 and 7 urethane groups per molecule, and being the reaction product of

(A) hydroxy functional polyester resin being the reaction product of: (a) polyhydroxy materials comprising (i) diols selected from glycols, caprolactone diols, hydroxy alkylated bisphenols and polyester diols and (ii) triols in a hydroxy equivalent ratio of from about 4:1 to 1:4 and (b) acid component selected from C_6–C_{40} dicarboxylic acids and anhydrides thereof, wherein said (a) and (b) are reacted in amounts so as to provide hydroxy groups and carboxyl groups in a ratio of from about 6:2 to about 6:5, respectively; and

(B) diisocyanate selected from aliphatic, cycloalipatic and aromatic diisocyanates, wherein said (A) and (B) are reacted in amounts so as to provide hydroxyl groups and isocyanate group in the ratio of from about 4:1 to about 10:1, respectively; and

(II) amine-aldehyde crosslinking agent.

4,824,918

METHOD OF PRODUCING SILICON CARBIDE PRECERAMIC VINYL-CONTAINING POLYMERS

Duane R. Bujalski, Bay City; Gary E. LeGrow; Jonathan Lipowitz, both of Midland, all of Mich., and Thomas F. Lim, Cuyahoga, Ohio, assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 4, 1987, Ser. No. 93,434
Int. Cl.[4] C08F 283/00
U.S. Cl. 525—479 **26 Claims**

1. A method of preparing a vinyl-containing first polysilane having the general formula

[RSi][R_2Si]

where there are present 0 to 60 mole percent [R_2Si] units and 40 to 100 mole percent [RSi] units, where R is an alkyl radical containing 1 to 8 carbon atoms, and where the remaining bonds on silicon are attached to other silicon atoms, —R′ groups, and vinyl groups, where R′ is an alkyl group containing 1 to 8 carbon atoms or a phenyl group, said method consisting of reacting under anhydrous conditions in the presence of a solvent a second polysilane with chlorine or bromine endblocking groups of general formula

[RSi][R_2Si]

where there are present 0 to 60 mole percent [R_2Si] units and 40 to 100 mole percent [RSi] units, where R is an alkyl radical containing 1 to 8 carbon atoms, and where the remaining bonds on silicon are attached to other silicon atoms and chlorine or bromine atoms with (1) a Grignard reagent of general formula R′MgX′ or an organolithium compound of general formula R′Li at a temperature of 0 to 120° C., followed by reaction with (2) a vinyl-containing Grignard reagent of general formula (CH_2=CH)MgX′ or vinyllithium at a temperature of 0 to 120° C., followed by reaction with (3) a Grignard reagent of general formula R′MgX′ or an organolithium reagent of general formula R′Li at a temperature of 0° to 120° C. where R′ is an alkyl radical with 1 to 8 carbon atoms or a phenyl radical and X′ is chlorine, bromine, or iodine and thereafter removing the solvent at a temperature of less than about 150° C. to obtain the vinyl-containing first polysilane.

4,824,919

TOUGHENING OF CURED VINYL ESTER RESINS BY INCLUSION IN THE UNCURED RESINS OF OLIGOMERIC VINYL-REACTIVE URETHANES WHICH PHASE OUT UPON CURING

Alvin W. Baker, Antioch, and Patrick H. Martin, Danville, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 682,633, Dec. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 502,886, Jun. 9, 1983, abandoned. This application Jan. 17, 1986, Ser. No. 819,669
Int. Cl.[4] C08L 61/14, 63/10
U.S. Cl. 525—502 **28 Claims**

1. A curable shaped article which is not in the form of a coating, and is formed from a material consisting essentially of a homogeneous mixture of a vinyl ester with a toughness imparting urethane oligomer and a non-resinous vinyl monomer, the urethane to ester ratio by weight in said mixture being from about 3/97 to about 40/60, the weight percent of said monomer therein being from about 10 to about 60, the weight percent of said urethane therein being from about 3 to about 20 and said urethane being one which:

a. is the reaction product of one molecular proportion of a polyalkylene glycol, having a molecular weight of from about 1,200 to about 4,000 with either

(1) about 0.5 molecular proportion of a diisocyanate and about 1 molecular proportion of a vinyl-reactive monoisocyanate or monoisothiocyanate or

(2) from about 1.5 to 2 molecular proportions of a diisocyanate and from about 1 to about 2 molecular proportions of a hydroxyalkyl acrylate or methacrylate, an alkylene oxide extended hydroxyalkyl acrylate, an N-methylol acrylamide or an alkyl- or vinyldialkanolmine

b. will form a dispersed second phase when said article is cured; and

c. has weight average molecular weight of from about 4,000 to about 8,000.

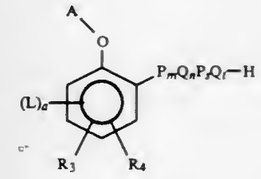
4,824,920

VINYL-BENZYL ETHERS OF PHENOL-DICYCLOPENTADIENE ADDUCTS AS NEW THERMOSETTING RESINS FOR COMPOSITES

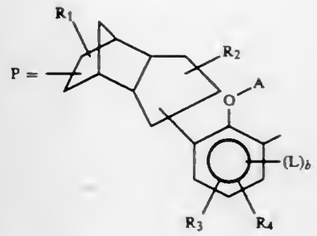
Joseph J. Zupancic, Bensenville; Jeffrey P. Coarad, Chicago; James A. Wrezel, Buffalo Grove; Andrew M. Zweig, Schaumburg, all of Ill., and Jean M. J. Frechet, Ithica, N.Y., assignors to Allied-Signal Inc., Morristown, N.J.

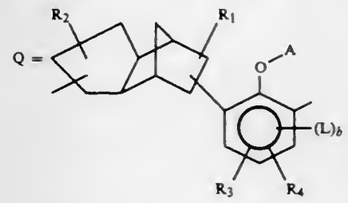
Continuation-in-part of Ser. No. 941,882, Dec. 15, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 126,312
Int. Cl.[4] C08G 61/12
U.S. Cl. 525—534 **28 Claims**

1. A thermosetting resin comprising a vinylbenzyl ether of the reaction product of a dicyclopentadiene with a phenol, said reaction product having essentially the formula



where





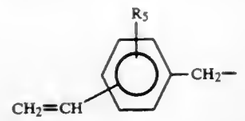
where

R_1 and R_2 are independently selected from the group consisting of hydrogen or an alkyl moiety containing from 1 to about 10 carbon atoms;

R_3 is selected from the group consisting of alkyl moieties containing from 1 to about 20 carbon atoms and is located at a position meta or para to the position of the oxygen on the aromatic ring;

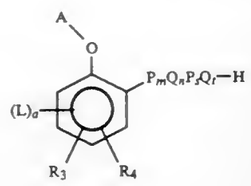
R_4 is hydrogen or a tertiary butyl moiety;

m, n, s, and t each are O or an integer and whose sum is z, where z is 1–10;
a is 0, 1, or 2;
b is 0 or 1;
L is Cl or Br; and
A is selected from the group consisting of hydrogen, the vinylbenzyl moiety,

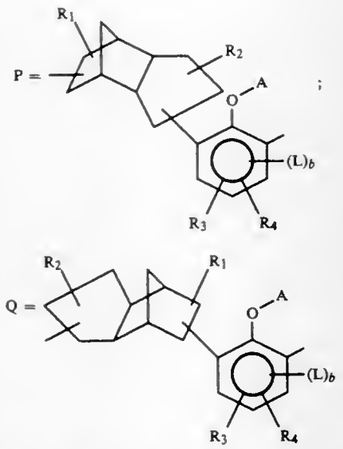


alkyl moieties containing 1 to 10 carbon atoms, cycloalkyl moieties having 5 to 10 carbon atoms, or benzyl, subject to the constraints (a) at least 50% of all A's are the vinylbenzyl moiety, (b) not more than 20% of the A moieties are hydrogen, (c) the vinyl group is para or meta to the benzylic group, and (d) R_5 is a chemically inert substituent selected from the group consisting of hydrogen, alkyl moieties containing from 1 to about 10 carbon atoms, the halogens, alkoxy moieties containing from 1 to about 10 carbon atoms, and monovalent radicals whose parent is an aromatic hydrocarbon.

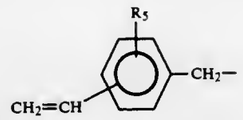
15. A mixture of thermosetting resins comprising vinylbenzyl ethers of the reaction product of a dicyclopentadiene with a phenol, said reaction product having essentially the formula



where



where each of R_1 and R_2 is hydrogen or an alkyl group containing from 1 to about 10 carbon atoms;
R_3 is selected from the group consisting of alkyl moieties containing from 1 to about 20 carbon atoms and is located at a position meta or para to the position of the oxygen on the aromatic ring;
R_4 is hydrogen or a tert-butyl moiety and at least 5 percent and as many as 100% are the tert-butyl moieties;
m, n, s, and t each are integers whose sum is z and where z is an integer from 1 to 10;
a is 0, 1, or 2;
b is 0 or 1;
L is Cl or Br; and
A is selected from the group consisting of the vinylbenzyl moiety,



hydrogen, alkyl moieties containing 1 to 10 carbon atoms, cycloalkyl moieties having 5 to 10 carbon atoms, or benzyl subject to the constraints (a) at least 50% of all A's are the vinylbenzyl moiety, (b) not more than 20% of the A moieties are hydrogen, (c) the vinyl group is para or meta to the benzylic group, and (d) R_5 is a chemically inert substituent selected from the group consisting of hydrogen, an alkyl or alkoxy moiety containing 1 to about 10 carbon atoms, a halogen, and monovalent radicals whose parent is an aromatic hydrocarbon, in which from about 15 to about 40% of said thermosetting resins have z=1, from about 10 to about 30% have z=2, from about 5 to about 20% have z=3, from about 5 to about 20% have z=4, and from about 5 to about 20% have z=5–10.

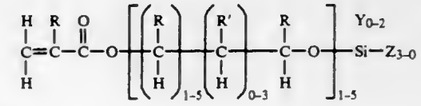
4,824,921
PETROLEUM RESINS AND THEIR PRODUCTION
Quoc Luvinh, Brussels, Belgium, assignor to Exxon Research & Engineering Company, Florham Park, N.J.
Continuation of Ser. No. 623,108, Jun. 22, 1984, abandoned. This application Jan. 7, 1987, Ser. No. 4,298
Claims priority, application United Kingdom, Jun. 28, 1983, 8317510
Int. Cl.⁴ C08F *210/14, 212/06*
U.S. Cl. 526—237 **16 Claims**

1. A process for the production of petroleum resins compatible with base polymers in hot melt formulations and having a softening point of from about 60° C. to about 120° C. and Gardner color of about 4 or less, comprising copolymerizing using a Friedel-Crafts catalyst, a mixture consisting essentially of:
(i) 5 to 55 wt. % of a feed comprising C_5 olefines or diolefines, or C_6 olefines or diolefines or a mixture of C_5 and C_6 olefines or diolefines, said feed comprising at least 10 wt. % olefines;
(ii) 5 to 55 wt. % of a terpene; and
(iii) 3 to 55 wt. % of an olefinically unsaturated aromatic compound
wherein said mixture is substantially free form cyclopentadiene and dicyclopentadiene.

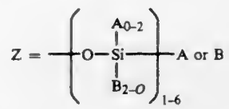
12. A resin consisting essentially of a copolymer containing from 5 to 80 wt. % of units derived from an olefinically unsaturated aromatic compound form 5 to 80 wt. % of units derived from C_5 olefines or diolefines or C_6 olefines diolefines or a mixture of C_5 and C_6 olefines or diolefines and from 7 to 45 wt. % of units derived from a terpene.

4,824,922
ACRYLIC SILICATE COMPOSITIONS AND METHODS AND HIGHLY OXYGEN-PERMEABLE POLYACRYLATES MADE THEREFROM
Dwain R. Chapman, deceased, late of Adrian, Mich. (by Twila V. Chapman, legal representative), assignor to Fused Kontacts of Chicago, Chicago, Ill.
Division of Ser. No. 754,590, Jul. 15, 1985, Pat. No. 4,709,066. This application Oct. 30, 1987, Ser. No. 115,179
Int. Cl.⁴ C08F *30/08*
U.S. Cl. 526—279 **4 Claims**

1. An oxygen permeable plastic material comprising the reaction product of from about 10% to about 90% by weight of a polymerizable acrylic or methacrylic ester, and substituted or unsubstituted acrylic silicate from about 10% to about 90% by weight of a polymerizable silicate having the structure:



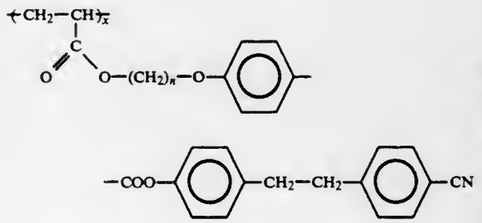
wherein
R=alkyl, aryl or H,
R'=R or OR
Y=alkyl, vinyl, aryl, or fluoroalkyl



A=Y or H and
B=oxyalkyl, oxyaryl, oxyfluoroalkyl, oxyalkylacrylate, alkyl esters, aryl esters, fluoroalkyl esters, or acrylic esters.

4,824,923
SIDE-CHAIN MESOMORPHIC POLYMERS DERIVED FROM 1-(PHENYL)-2-(4-CYANOPHENYL)-ETHANE
Jean-Claude Dubois, St Remy les Chevreuse; Pierre Le Barny, Orsay; Nicolas Spassky, Sevres; Sophie Esselin, Antony; Claudine Noel, Houilles; Nicole Lacoudre, and Alain Leborgne, both of Paris, all of France, assignors to Thomson CSF, Paris, France
Filed Sep. 29, 1987, Ser. No. 102,440
Claims priority, application France, Sep. 30, 1986, 86 13573
Int. Cl.⁴ C08F *20/42*
U.S. Cl. 536—298 **1 Claim**

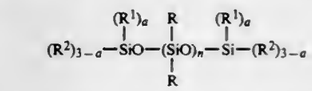
1. A side-chain mesomorphic polymer corresponding to the following general chemical formula:



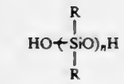
where x indicates the degree of polymerization and $2 \leqq n \leqq 15$.

4,824,924
PREPARATION OF TERMINALLY ALKOXYLATED DIORGANOPOLYSILOXANES
Michel Letoffe, Sainte Foy Les Lyon, and Pierre-Michel Peccoux, Lyons, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France
Filed Apr. 28, 1987, Ser. No. 43,362
Claims priority, application France, Apr. 28, 1986, 86 06365
Int. Cl.⁴ C08G *77/06*
U.S. Cl. 528—21 **7 Claims**

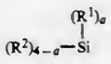
1. A process for the preparation of a diorganopolysiloxane having polyalkoxy end groups of the formula:


(1)

comprising reacting at least one diorganopolysiloxane of the formula:


(2)

with at least one polyalkoxysilane of the formula:


(3)

in the presence of a catalytically effective amount of at least one organic oxime devoid of silicon, in which formulae the radicals R, which may be identical or different, are each monovalent hydrocarbon radicals containing from 1 to 10 carbon atoms, substituted such radicals bearing at least one halogen atom or cyano group substituent, R^1 is a monovalent C_1–C_{10} hydrocarbon radical, R^2 is an alkoxy or polyalkoxy radical of the formulae TO or TOZO, in which T is a C_1–C_4 alkyl radical, Z is a straight or branched chain C_2–C_4 alkylene radical, a is 0 or 1, and n is an integer such that the polymers (1) and (2) have a viscosity of 700 to 1,000,000 mPa.s at 25° C.

4,824,925
NOVEL BLOCKED ISOCYANATES AND CURABLE COMPOSITIONS CONTAINING THE SAME
Peter Kamarchik, Jr., Saxonburg; Gregory J. McCollum, Gibsonia, and George W. Mauer, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 11, 1987, Ser. No. 131,889
Int. Cl.⁴ C08G *18/30*
U.S. Cl. 528—45 **10 Claims**

1. A novel blocked isocyanates curing agent which is prepared by reacting:
(a) meta-xylylene diisocyanate or a prepolymer thereof, and
(b) a ketoxime having from about three to five carbon atoms.

4,824,926
BILAYER WINDSHIELD WITH AN ABRASION AND SOLVENT RESISTANT POLYURETHANE PROTECTIVE COATING
James B. O'Dwyer, Valencia; Wen-Hsuan Chang; Roger L. Scrivea, both of Gibsonia, and Joseph Chereako, Valencia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 16, 1987, Ser. No. 133,830
Int. Cl.⁴ C08G *18/00*
U.S. Cl. 528—65 **10 Claims**

1. An abrasion-resistant polyurethane coating composition comprising:

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a. a branched prepolymer having an isocyanate functionality greater that 2; and

b. a hydroxy-terminated linear polymeric polyol selected from the group consisting of polyethers and polyesters having a molecular weight between 300 and 5,000.

4,824,927

PRODUCTS OF DIEPOXIDE POLYADDITION WITH MONOFUNCTIONAL INITIATORS, WHICH CONTAIN PENDANT EPOXY GROUPS IN THE BACKBONE OF THE POLYMER

Arnold Dobbelstein; Michael Geist; Günther Ott, all of Münster, and Georg Schön, Everswinkel, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AKT, Munster, Fed. Rep. of Germany

PCT No. PCT/EP86/00302, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/07082, PCT Pub. Date Dec. 4, 1986

PCT Filed May 17, 1986, Ser. No. 9,336

Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518732

Int. Cl.⁴ C08G *59/42, 59/62*

U.S. Cl. 528—88 **23 Claims**

1. A water-dilutable binder for cationic electrocoating finishes, comprising:

a reaction product of an epoxy resin and an amine, sulfide or phosphine compound; wherein

the epoxy resin comprises a polyepoxide-polyether, synthesized from a diepoxide compound and a monofunctionally reacting initiator carrying an alcoholic OH group, a phenolic OH group or an SH group, the diepoxide compound or compounds and the initiator being incorporated in a molar ratio of greater than about 2:1 to about 10:1, and the synthesis being conducted under reaction conditions sufficient to produce a polymer having a polyether backbone with pendant unreacted epoxy groups; and,

the amine, sulfide or phosphine compound comprises a primary amine, a secondary amine, a mixture thereof or a salt thereof, a salt of a tertiary amine, a sulfide/acid mixture, a phosphine/acid mixture or a mixture of any of said amines, sulfide/acids or phosphine/acids.

4,824,928

COPOLYESTER WHICH IS PARTICULARLY SUITABLE FOR USE IN MAKING TIRE CORD

Edward R. Terrill, and Douglas D. Callander, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 28, 1988, Ser. No. 173,903

Int. Cl.⁴ C08G *63/18*

U.S. Cl. 528—190 **11 Claims**

1. A copolyester which is comprised of repeat units which are derived from (a) a diol component which is comprised of from about 80 to about 99 mole percent phenyl hydroquinone and from about 1 to about 20 mole percent of at least one member selected from the group consisting of 1,4-bis(4-hydroxycumyl) benzene, 1,3-bis(4-hydroxycumyl) benzene, alkyl substituted 1,4-bis(4-hydroxycumyl) benzene, and alkyl substituted 1,3-bis(4-hydroxycumyl) benzenes; and (b) a diacid component which is comprised of from about 90 to about 100 mole percent terephthalic acid and from 0 to about 10 mole percent isophthalic acid.

2. A copolyester which is comprised of repeat units which are derived from (a) at least one aromatic hydroxy acid selected from the group consisting of hydroxy benzoic acid and hydroxy naphthoic acid; (b) at least one diol selected from the group consisting of 1,4-bis(4-hydroxycumyl) benzene, 1,3-bis(4-hydroxycumyl) benzene, alkyl substituted 1,4-bis(4-hydroxycumyl) benzenes, and alkyl substituted 1,3-bis(4-hydroxycumyl) benzenes; and (c) a diacid component which is comprised of from about 90 to 100 mole percent terephthalic acid and from 0 to about 10 mole percent isophthalic acid; wherein the mole ratio of aromatic hydroxy acid to diol is within the range of about 80:20 to about 99:1.

4,824,929

POLYMERIC ANTIOXIDANT AND PROCESS FOR PRODUCTION THEREOF

Yoshikazu Arimatsu, Otsu; Katsuya Tani, Shiga; Hideyuki Mitamura, Otsu; Minoru Saito, Otsu; Atsushi Kaji, Otsu, and Kenichi Katsuo, Tsuruga, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

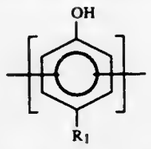
Continuation-in-part of Ser. No. 842,966, Mar. 24, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 93,605

Claims priority, application Japan, Mar. 26, 1985, 60-62899; Jun. 24, 1985, 60-138495

Int. Cl.⁴ C08G *61/02*

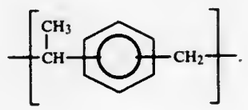
U.S. Cl. 528—205 **11 Claims**

1. A polymeric antioxidant which comprises a repeating monomeric unit having the formula (I):



(I)

wherein R_1 is methyl or ethyl; and a repeating monomeric unit having the formula (II):



(II)

4,824,930

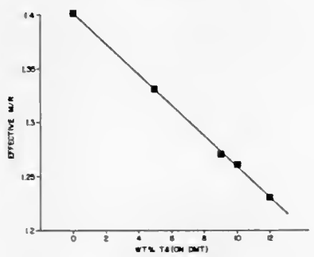
POLYMERIZATION PROCESS FOR THE PREPARATION OF POLY(BUTYLENE TEREPHTHALATE)

Marvin L. Doerr, Pineville, N.C., assignor to Celanese Fibers, Inc., New York, N.Y.

Filed Dec. 18, 1987, Ser. No. 135,174

Int. Cl.⁴ C08G *63/40*

U.S. Cl. 528—272 **10 Claims**



1. In a process for the preparation of poly(butylene terephthalate) by feeding dimethyl terephthalate and glycol components with catalysts to an ester interchange reactor and reacting components to form monomer, adding terephthalic acid on completion of the ester interchange reaction following by polymerization of the terephthalic acid containing monomer, the improvement comprising maintaining the ratio of glycol to dimethyl terephthalate in the ratio of not more than 1.3 to 1 and adding terephthalic acid neat in amounts of from 7% to 12% by weight based on the weight of dimethyl terephthalate.

4,824,931

POLYESTERS FROM TRANS-4,4'-STILBENEDICARBOXYLIC ACID AND 1,6-HEXANEDIOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 16, 1988, Ser. No. 155,788

Int. Cl.⁴ C08G *63/18*

U.S. Cl. 528—298 **7 Claims**

1. Composition of matter comprising a polyester containing repeating units from at least 80 mol % trans-4,4'-stilbenedicarboxylic acid and at least 80 mol % 1,6-hexanediol, based on 100 mol % of an acid component and 100 mol % of a glycol component, the I.V. of said polyester being at least 1.20.

4,824,932

METHOD OF MANUFACTURING THERMOPLASTICALLY PROCESSIBLE AROMATIC POLYAMIDES AND POLYAMIDIMIDES FROM BISAMIDE

Juergen Finke, Marl, and Martin Bartmann, Recklinghausen, Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 30, 1986, Ser. No. 947,897

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612935

Int. Cl.⁴ C08G *69/28*

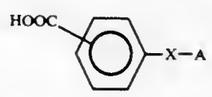
U.S. Cl. 528—363 **10 Claims**

1. A method for manufacturing a thermoplastically processible aromatic polyamide or polyamidimide, comprising subjecting to a transamidation reaction a component (A) and a component (B);

wherein said component (A) is at least one aromatic polycarboxylic acid selected from the group consisting of

(i) isophthalic acid, a combination of up to 60 mol % of terephthalic acid and at least 40 mol % of isophthalic acid;

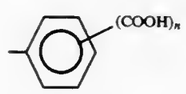
(ii) an acid having the formula



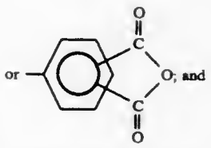
wherein:

X is $—CH_2—$, —CO—, —O—, —S—, $—SO_2—$, or —O—Ph—SO_2—Ph—O—; and

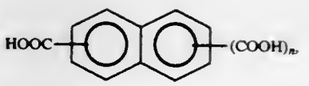
A is



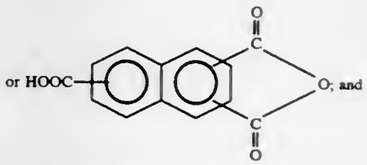
with n is 1 or 2,



(iii) a naphthalenecarboxylic acid of formula



with n is 1 or 2,



component (B) is at least one aromatic bisamide of the formula (I)

R—CO—NH—Ph—X—Ph—Y—Ph—X—Ph—N-
H—CO—R,

or a mixture of at least 50 mol % by a bisamide of formula (I) and up to 50 mol % of a bisamide of the formula

R—CO—NH—Ph—$(Z—Ar)_m$—Ph—N-
H—CO—R,

wherein:

Ph is a difunctional phenylene radical;

R is an alkyl group having 1 to 4 carbon atoms;

Ar is an aromatic radical;

Y is SO_2 or O;

Z is —O—, —S—, $—SO_2—$, —CO—, or $—CH_2—$; and

m is O or 1.

4,824,933

PROCESS FOR THE PREPARATION OF COPOLYARYLENE SULPHIDES WITH REDUCED CRYSTALLIZATION TEMPERATURE

Edgar Ostlinning, Duesseldorf, and Ernst-Ulrich Dorf, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 113,656

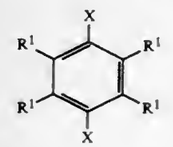
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637813

Int. Cl.⁴ C08G *75/14*

U.S. Cl. 528—388 **3 Claims**

1. Process for the preparation of highly crystalline branched or unbranched polyarylene sulphides with reduced crystallization temperature, which comprises reacting:

(a) from 75-99.5 mol-% of at least one dihalogenated aromatic compound corresponding to the formula



(I)

wherein

X represents halogen in the para-position to one another and the

R^1s which are identical or different represent hydrogen, C_1–C_4-alkyl, C_5–C_{10}-cycloalkyl, C_6–C_{10}-aryl, C_7–C_{14}-alkylaryl or C_7–C_{14}-arylalkyl or any two groups represented by R^1 which are in the orthoposition to one another, together with the carbon atoms in the ring to which they are attached, are linked together to form an

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aromatic or heterocyclic ring having 5 or 6 ring atoms, with up to 3 ring carbon atoms replaced by O, S or N,

(b) from 0 to 5 mol-%, based on the dihalogenated aromatic compound of formula (I), of a tri- or tetrahalogenated aromatic compound of the formula

$$ArX_n \quad (II)$$

wherein

Ar represents an aromatic group having 6 to 14 carbon atoms or a heterocyclic group having 6 to 14 carbon atoms with up to 4 ring carbon atoms replaced by N, O or S,

X represents halogen and

n represents the number 3 or 4,

(c) conventional chain terminating agents,

(d) alkali metal sulphides together with alkali metal hydrogen sulphides in the form of their hydrates or aqueous mixtures, with or without catalysts or other auxiliary agents, in a solvent, and

(e) from 0.5 to 24 mol-% of a comonomer or of a mixture of various comonomers, at a pressure of from 1 to 50 bar, wherein the comonomers are 3,4-dichlorodiphenylsulphone, 3,4-dichlorobenzophenone, N-(3,4-dichlorophenyl)-phthalimide, 4,4-dichloro-triphenylamine, N-phenyl-4,5-dichlorophthalimide, N-(3,4-dichlorophenyl)-hexahydrophthalimide, 2,4-dichloro-6-phenyl-triazine-(1,3,5), 2,3-dichloroquinoxaline, 2,3-dichloro-6-methyl-quinoxaline, N-(3,4-dichlorophenyl)-3,4-diphenyldicarboxylimide or 2,6-dichlorobenzothiazole.

4,824,934

PROCESS FOR POLYMERIZING CARBON MONOXIDE WITH A QUINONE

Johannes A. M. van Broekhoven, and Eit Drent, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

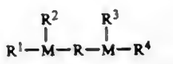
Filed Mar. 5, 1987, Ser. No. 21,948

Claims priority, application Netherlands, Mar. 5, 1986, 8600564

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **47 Claims**

1. A process for preparing a linear alternating polymer which process comprises contacting carbon monoxide and at least one olefinically unsaturated organic compound in the presence of a catalyst wherein the catalyst is obtained by reacting (1) a compound of a Group VIII metal selected from the group consisting of palladium, cobalt and nickel, (2) at least one salt of a metal selected from the group of metals consisting of Group 1B-7B, iron, cobalt, nickel, actinides, and lanthanides, having an anion of a non-hydrohalogenic acid with a pKa less than 6 (3) a bidentate ligand of the general formula



wherein M is selected from the group consisting of phosphorus, arsenic or antimony, R is a bivalent organic bridging group containing at least two carbon atoms in the bridge and R^1, R^2, R^3 and R^4 are substituted or unsubstituted hydrocarbon groups, and (4) a quinone, and under conditions suitable for preparing a linear alternating polymer.

4,824,935

PROCESS FOR POLYMERIZING CARBON MONOXIDE AND OLEFINS WITH ETHER

Johannes A. M. Van Broekhoven, and Eit Drent, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

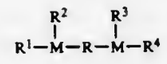
Filed Mar. 5, 1987, Ser. No. 21,947

Claims priority, application Netherlands, Mar. 5, 1986, 8600562

Int. Cl.[4] G08G *67/02*

U.S. Cl. 528—392 **51 Claims**

1. A process for preparting a linear alternating polymer which process comprises contacting carbon monoxide and at least one olefinically unsaturated organic compound in the presence of a catalyst wherein the catalyst is obtained by reacting (1) a compound of a Group VIII metal selected from the group consisting of palladium, cobalt and nickel, (2) at least one compound selected from the group consisting of Group 1A-5A metal salts having an anion of a non-hydrohalogenic acid with a pKa less than 6, (3) a bidentate ligand of the general formula



wherein M is selected from the group consisting of phosphorus, arsenic or antimony, R is a bivalent organic bridging group containing at least two carbon atoms in the bridge and R^1, R^2, R^3 and R^4 are substituted or unsubstituted hydrocarbon groups, and (4) an ether, and under conditions suitable for preparaing a linear alternating polymer.

4,824,936

(19-ALANINE) CALCITONIN

Ronald C. Orlowski, Frankfort, Ill.; Glenn L. Stahl, Manchester, Mo., and Robert L. Colescott, Bourbonnais, Ill., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed May 6, 1987, Ser. No. 47,798

Int. Cl.[4] C07K *7/36*

U.S. Cl. 530—307 **5 Claims**

1. A calcitonin peptide having the structure:

Cys—Ser—Asn—Leu—Ser—Thr—Cys—Val—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Ala—
—Gln—Thr—Tyr—Pro—Arg—Thr—Asn—Thr—Gly—
—Ser—Gly—Thr—Pro—NH_2 (Salmon),

Cys—Ser—Asn—Leu—Ser—Thr—Cys—Val—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Ala—
—Gln—Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—
—Ala—Gly—Thr—Pro—NH_2 (Eel),

Cys—Ala—Ser—Leu—Ser—Thr—Cys—Val—Leu—Gly—
—Lys—Leu—Ser—Gln—Glu—Leu—His—Lys—Ala—
—Gln—Thr—Tyr—Pro—Arg—Thr—Asp—Val—Gly—
—Ala—Gly—Thr—Pro—NH_2 (Chicken), or

-continued

Cys—Gly—Asn—Leu—Ser—Thr—Cys—Met—Leu—Gly—
—Thr—Tyr—Thr—Gln—Asp—Phe—Asn—Lys—Ala—
—His—Thr—Phe—Pro—Gln—Thr—Ala—Ile—Gly—
—Val—Gly—Ala—Pro—NH_2 (Human).

4,824,937

SYNTHETIC NATRIURETIC PEPTIDES

Romano Deghenghi, Denens, and Hans U. Immer, Balsthal, both of Switzerland, assignors to 501 Advanced Peptide Development, Ltd., Chingford, England

Filed May 14, 1987, Ser. No. 50,208

Claims priority, application Canada, May 20, 1986, 509564

Int. Cl.[4] C07K *7/10*

U.S. Cl. 530—326 **7 Claims**

1. A peptide of the formula:

R^1—Cys—Phe—Gly—Gly—Arg—R^2—Asp—Arg—Ile—Gly—
Ala—Gln—Ser—Gly—Leu—Gly—Cys—Asn—Ser—Phe—
Arg—Tyr—R^3

in which

R^1 is a D-amino acid selected from the group consisting of Ala, Asn, Asp, Cys, Gln, Glu, His, Ile, Trp, Tyr, PheGly & t-BuGly

R^2 is selected from Ile and Met and R^3 is selected from OH and NH_2 and the pharmacologically acceptable acid addition salt thereof.

4,824,938

WATER-SOLUBLE DRY SOLID CONTAINING PROTEINACEOUS BIOACTIVE SUBSTANCE

Shunsaku Koyama, and Toshio Miyake, both of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Continuation of Ser. No. 729,191, May 1, 1985, abandoned. This application Aug. 31, 1987, Ser. No. 93,089

Claims priority, application Japan, Jun. 6, 1984, 59-116158

Int. Cl.[4] C07K *15/00*; A61K *37/02, 37/24, 37/48*

U.S. Cl. 530—351 **11 Claims**

1. A water-soluble dry solid composition, comprising:

one part by weight of a proteinaceous bioactive substance in admixture with at least 0.5 parts by weight of a polysaccharide mainly composed of repeating maltotriose units.

4,824,939

PROCESS FOR LEACHING PARTICULATE SOLID MATERIALS

Brian L. Simpson, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 9, 1986, Ser. No. 917,342

Int. Cl.[4] A23J *1/10*; B01D *11/02*; C07G *7/00*

U.S. Cl. 530—356 **24 Claims**

1. A leaching process for separating extractable material from a particulate solid material, said process comprising the steps of:

(1) introducing said particulate solid material and a liquid solvent to an extraction zone,

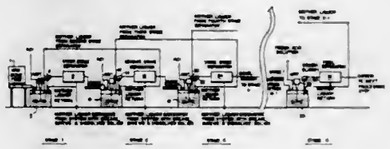
(2) subjecting said liquid solvent within said extraction zone to controlled agitation to suspend said particulate solid material therein and effect segregation of particles thereof in relation to their propensity to settle,

(3) maintaining said liquid solvent in contact with said suspended particulate solid material within said extraction zone for a time sufficient to leach extractable material therefrom,

and (4) selectively withdrawing, on the basis of said segregation, particles of said particulate solid material from said extraction zone.

10. A process for the demineralization of bone in which particles of bone are leached with an acid solution to extract mineral material and yield particles of ossein similar in size and shape to said bone particles, said mineral material being of greater density than said ossein whereby said extraction is accompanied by an increase in the buoyancy of said bone particles, said process comprising the steps of:

(1) introducing said bone particles and said acid solution to at least one stage of a series of stages in each of which said bone particles are contacted with said acid solution to extract said mineral material,



(2) subjecting said acid solution in each of said stages to controlled agitation to suspend said bone particles therein and effect segregation thereof in relation to their propensity to settle,

(3) maintaining said acid solution in contact with said suspended bone particles within each of said stages for a time sufficient to leach mineral material therefrom,

(4) selectively withdrawing, on the basis of said segregation, more buoyant bone particles from each stage of said series except the final stage while leaving less buoyant bone particles within such stage and introducing said more buoyant bone particles to the next successive stage of said series,

and (5) withdrawing from the final stage of said series particles which are substantially free of said mineral material and composed essentially of ossein.

4,824,940

PARTIALLY DEAMIDATED OILSEED PROTEINS AND PROCESS FOR THE PREPARATION THEREOF

Frederick S. Shih, Kenner, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 27, 1987, Ser. No. 54,562

Int. Cl.[4] A23J *1/12, 1/14*

U.S. Cl. 530—377 **10 Claims**

1. A partially deamidated oilseed protein having improved functional properties with respect to solubility, water-binding, foam capacity, emulsion capacity and emulsion viscosity, wherein the partially deamidated oilseed protein has greater than 30% deamidation and no more than 2% peptide bond hydrolysis.

4,824,941

SPECIFIC ANTIBODY TO THE NATIVE FORM OF 2'5'-OLIGONUCLEOTIDES, THE METHOD OF PREPARATION AND THE USE AS REAGENTS IN IMMUNOASSAYS OR FOR BINDING 2'5'-OLIGONUCLEOTIDES IN BIOLOGICAL SYSTEMS

Julian Gordon, 307 E. Sheridan Rd., Lake Bluff, Ill. 60044, and Michael A. Minks, Biochemistry Dept., University of the Witwatersrand, 1 Jan Smuts Ave, Johannesburg 2001, South Africa

Continuation of Ser. No. 672,266, Nov. 9, 1984, Pat. No. 4,743,539. This application Jan. 25, 1988, Ser. No. 149,138

Int. Cl.[4] C07K *15/00*

U.S. Cl. 530—403 **8 Claims**

1. A process of producing antibody specific for 5'-terminal mono-, di- or tri-phosphorylated (2'-5') adenyl-adenosine oligonucleotides which comprises parenterally administering to a vertebrate living animal an immunogen consisting of an immunogenic substance coupled with a fully or partially 3'-ribose and 2'-terminal ribose acylated 5'-terminal mono- di- or tri-phosphorylated (2'-5') adenyl-adenosine oligonucleotide at time intervals suitable to induce immunization of said animal, gathering blood which contains the resulting specific antibody, and obtaining serum from said blood by clotting and optionally centrifugation or plasma from said blood by addition of anticoagulant and centrifugation.

4,824,942

FIBER-REACTIVE MONOAZO COMPOUND AND AQUEOUS COMPOSITIONS THEREOF IMPARTING AND COLOR

Kazufumi Yokogawa, Minoo; Noriaki Yamauchi, Hirakata, and Takashi Omura, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

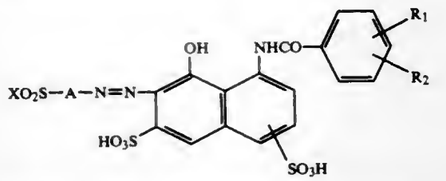
Continuation of Ser. No. 19,254, Feb. 26, 1987, abandoned. This application Jan. 21, 1988, Ser. No. 147,119

Claims priority, application Japan, Mar. 3, 1986, 61-45663; Jul. 18, 1986, 61-170484

Int. Cl.[4] C09B *62/51*; D06P *1/38, 3/24, 3/66*

U.S. Cl. 534—642 **9 Claims**

1. A monoazo compound represented by the following formula in a free acid form,



wherein A in phenylene unsubstituted or substituted with methyl, methoxy, chloro, carboxy or sulfo, or naphthylene unsubstituted or substituted with sulfo, R_1 and R_2 are independently hydrogen, chloro, methyl, nitro, carboxy or sulfo, provided that R_1 and R_2 cannot both be hydrogen and R_1 is sulfo located at o-position to —NHCO— and R_2 is hydrogen when A is phenylene, and X is $—CH=CH_2$ or $—CH_2CH_2Y$ in which Y is a group splittable by the action of an alkali.

4,824,943

INOSOSE DERIVATIVES AND PRODUCTION THEREOF

Satoshi Horii, and Hiroshi Fukase, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Japan

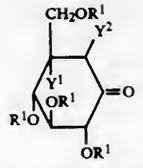
Filed Mar. 4, 1987, Ser. No. 21,745

Claims priority, application Japan, Mar. 5, 1986, 61-47941; May 21, 1986, 61-116672

Int. Cl.[4] C07H *1/00, 3/00*; C08B *37/00*; C07G *3/00*

U.S. Cl. 536—1.1 **7 Claims**

1. An inosose compound of the formula



wherein Y^1 stands for hydroxyl group and Y^2 stands for hydrogen atom, or CY^1CY^2 is C=C, and R^1 is a protective group for hydroxyl group.

7. Compound of claim 2, wherein R^1 is benzyl.

4,824,944

ANTINEOPLASTIC ENAMINE DERIVATIVES OF DAUNORUBICIN AND ADRIAMYCIN

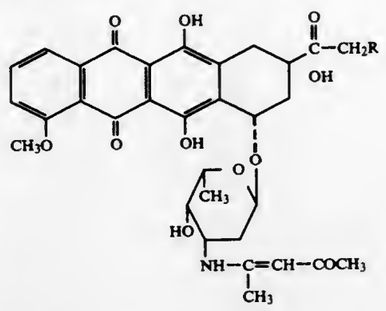
Barbara J. Stefanska; Leonard S. Falkowski, and Edward Borowski, all of Gdansk, Poland, assignors to Politechnika Gdanska, Gdansk, Poland

Continuation-in-part of Ser. No. 627,443, Jul. 3, 1984, abandoned. This application Jan. 12, 1987, Ser. No. 2,050

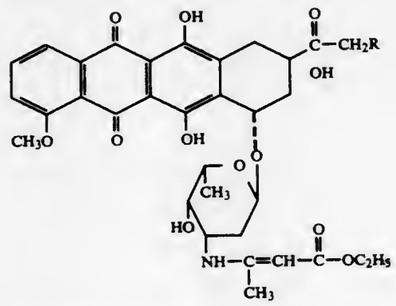
Int. Cl.[4] C07H *15/24*

U.S. Cl. 536—6.4 **1 Claim**

1. A compound consisting of the enamine derivative of daunorubicin and adriamycin of the formula 1:



and formula 2:



wherein R denotes a hydrogen atom or a hydroxyl group.

4,824,945

HYPOCHOLESTEROLEMICALLY ACTIVE RNA FRACTIONS

Yasuo Kawai, Atsugi, and Yoshiaki Oshida, Sagamihara, both of Japan, assignors to Kabushiki Kaisya Advance Kaithatsu Kenkyujo, Nihonba, Japan

Filed Dec. 23, 1985, Ser. No. 812,340

Claims priority, application Japan, Dec. 24, 1984, 59-270982

Int. Cl.[4] C07H *15/12*; C12P *19/34*; C12R *1/46*; A61K *31/715*

U.S. Cl. 536—27 **1 Claim**

1. Hypocholesterolemically active RNA fractions derived from a microorganism selected from the group consisting of *Streptococcus faecium* FERM BP-296, *Streptococcus faecalis* FERM BP-297, *Streptococcus avium* FERM BP-298, *Streptococcus salivarius* FERM BP-299, *Streptococcus durans* FERM BP-300, *Streptococcus mitis* FERM BP-301, and *Streptococcus equinus* FERM BP-302, and having the following characteristics:

(a) Molecular weight by gel filtration: 11,000±9,000;

(b) Base composition ratio of nucleic acid:uracil:guanine:-cytosine:adenine=1:1:2:1;

(c) Infrared absorption spectrum: shown in FIG. 2; and

(d) Physiological characteristics: having a hypocholesterolemic activity in mammals.

4,824,946

CELL CULTURE MICROCARRIER, METHOD FOR PREPARING SAME AND USE THEREOF FOR CULTIVATING ANCHORAGE-DEPENDENT CELLS

Dieter Schwengers, Dormagen, and Ingrid Keller, Mönchengladbach, both of Fed. Rep. of Germany, assignors to Pfeiffer & Langen, Fed. Rep. of Germany

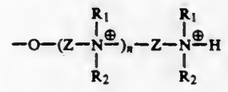
Filed Jan. 14, 1985, Ser. No. 691,006

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402927

Int. Cl.[4] C08B *37/02*; C12B *3/00*; C12N *5/02*

U.S. Cl. 536—55.1 **4 Claims**

1. A cell culture microcarrier having a pK of 5–8 and comprising positively charged cross-linked polysaccharides and positively charged basic groups linked therewith, said positively charged basic groups having the formula (I)



(I)

wherein

Z is a hydrocarbon chain having 2 to about 5 carbon atoms,

R_1 and R_2 are the same or different and represent C_{1-4} alkyl groups, and

n is 1 to about 4.

4,824,947

SUBSTITUTED PHTHALOCYANINE

William M. Stark, Glasgow, Scotland, assignor to Imperial Chemical Industries PLC, London, England

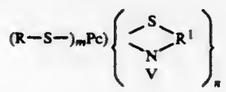
Filed Mar. 1, 1988, Ser. No. 162,514

Claims priority, application United Kingdom, Mar. 10, 1987, 8705576

Int. Cl.[4] C07D *487/22*; C09B *47, 04, 47/30*

U.S. Cl. 540—125 **6 Claims**

1. A phthalocyanine compound of the formula:



I

wherein

Pc is a phthalocyanine nucleus;

each R independently is selected from phenyl, naphthyl and phenyl substituted by from 1 to 3 substituents selected from C_{1-10}-alkyl, C_{1-10}-alkoxy, S-C_{1-10}-alkyl, halogen, phenyl, COOH, COT^1, $CONT^1T^2$, SO_2T^1 and $SO_2NT^1T^2$ in which T^1 and T^2 are selected from H, alkyl, aryl and aralkyl;

m is 4 to 12;

V is H or C_{1-4}-alkyl;

each R^1 independently is selected from phenylene, naphthylene, substituted phenylene and substituted naphthylene in which the substituents are selected from C_{1-10}-alkyl, C_{1-10}-alkoxy, S-C_{1-10}-alkyl, halogen, phenyl, COOH, COT^1, $CONT^1T^2$, SO_2T^1 and $SO_2NT^1T^2$ in which T^1 and T^2 are selected from H, alkyl, aryl and aralkyl; and the S atom and the group N-V are attached to adjacent nuclear carbon atoms;

and n is 2 to 6.

4,824,948

SUBSTITUTED PHTHALOCYANINE

William Stark, Glasgow, Scotland; Nigel Hughes, Oldham, and Donald M. Guss, Stockport, both of England, assignors to Imperial Chemical Industries plc, London, England

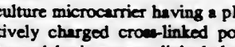
Filed Mar. 1, 1988, Ser. No. 162,513

Claims priority, application United Kingdom, Mar. 10, 1987, 8705575

Int. Cl.[4] C07D *487/22*; C09B *47/04, 47/30*

U.S. Cl. 540—125 **6 Claims**

1. A phthalocyanine compound of the formula:



I

wherein

Pc is a phthalocyanine nucleus (Pc);

each R independently is a monovalent aromatic radical linked to a peripheral carbon atom of the Pc nucleus through X selected from phenyl, naphthyl, thienyl, furyl, pyrryl, thiazolyl, isothiazolyl, quinolyl, indolyl, pyridyl, benzoimidazolyl and benzothiazolyl each of which is unsubstituted or substituted by up to 3 substituents selected from C_{1-20}-alkyl, C_{1-20}-alkoxy, S-C_{1-20}-alkyl, halogen, aryl, S-aryl, nitro, cyano, di-N-alkylamino, N-alkyl-N-arylamino, di-N-arylamino, COOH, COT^1, $CONT^1T^2$, SO_2T^1 and $SO_2NT^1T^2$ in which T^1 and T^2 are selected from H, alkyl, aryl and aralkyl;

X selected from S, Se and Te;

m is 4 to 16;

each R^1 independently is a divalent aromatic radical linked to two adjacent peripheral carbon atoms of the Pc nucleus through Y and Z selected from phenylene, naphthylene, substituted phenylene and substituted naphthylene in which the substituents are selected from C_{1-20}-alkyl, C_{1-20}-alkoxy, S-C_{1-20}-alkyl, halogen, aryl, S-aryl, nitro, cyano, di-N-alkylamino, N-alkyl-N-arylamino, di-N-arylamino, COOH, COT^1, $CONT^1T^2$, SO_2T^1 and $SO_2NT^1T^2$ in which T^1 and T^2 are selected from H, alkyl, aryl and aralkyl;

Y is selected from S, NT, Se and Te;

Z is selected from S, Se, Te, NT and O;

T is selected from H, alkyl and aryl;

n is 0 to 7;

M is selected from H; a metal; ammonium; substituted ammonium of the formula NQ_4 in which at least one Q is a C_{6-20}-fatty aliphatic group or two Qs together with the nitrogen atom, form a heteroalicyclic or heteroaromatic group selected from pyridino, piperidino and morpholino and the other two or three Qs are each independently selected from H, C_{1-4}-alkyl, phenyl and benzyl; and diarylguanidinium of the formula:

$T^3—NH—C(NHT^4)—NH—T^3$ in which each T^3 is phenyl or C_{1-4}-alkylphenyl and T^4 is H or C_{1-4}-alkyl;

and p is from 1 to 16.

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4,824,949

PROCESS FOR THE PREPARATION OF PYRIMIDINES

Stephen Lachhein, Hofheim am Taunus, and Lothar Willms, Hillscheid, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

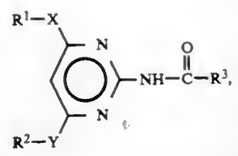
Filed Dec. 14, 1987, Ser. No. 132,483

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642830

Int. Cl.[4] C07D *239/47*

U.S. Cl. 544—320 **16 Claims**

1. A process for the preparation of a compound of the formula I



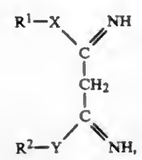
I

in which

X and Y, independently of one another, are oxygen or sulfur,

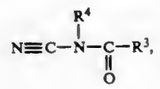
R^1 and R^2, independently of one another, are (C_1–C_4)-alkyl, (C_1–C_4)alkoxy-(C_1–C_2)alkyl or halo(C_1–C_4)alkyl, and

R^3 is (C_1–C_4)alkyl, phenyl or phenoxy which may both be substituted by one, two or three radicals from the series comprising halogen, (C_1–C_4)alkoxy or (C_1–C_4)alkyl radicals, halo(C_1–C_4)alkyl or (C_1–C_4)alkoxy, wherein a propanediimidate of the formula II



II

in which R^1 and R^2 are as defined in the formula I, or one of its salts, is reacted with an N-cyanoamide of the formula III



III

in which

R^4 is H or a cation, in an inert solvent.

4,824,950

CHIRAL STATIONARY PHASES AND COLUMNS FOR CHROMATOGRAPHIC RESOLUTION

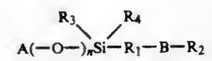
Sandor Barcza, Mountain Lakes, N.J., assignor to Sandoz Pharm. Corp., E. Hanover, N.J.

Continuation-in-part of Ser. No. 776,251, Sep. 16, 1985, abandoned. This application Sep. 3, 1987, Ser. No. 92,834

Int. Cl.[4] C07F *7/02, 7/10, 7/08, 5/06*

U.S. Cl. 546—14 **13 Claims**

1. A composition of the formula,



(I)

wherein

A may be silica, alumina, glass beads, diatomaceous earth, or other siliceous solids;

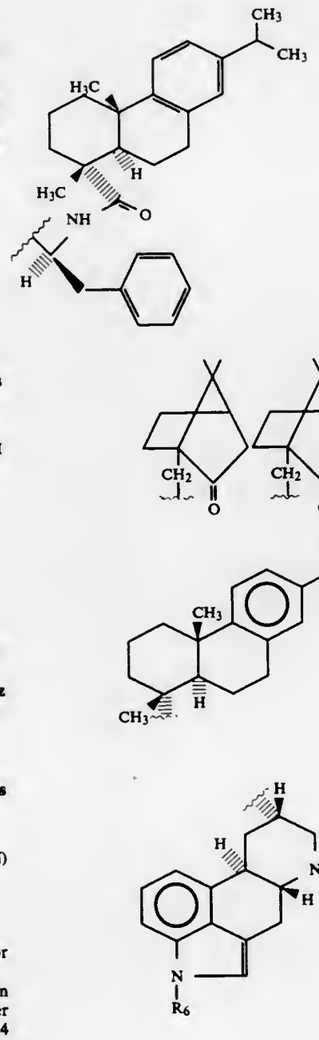
n represents an integer of from 1 to 3, R_3 and R_4 which can be the same or different each represents hydroxy, lower alkyl or alkoxy straight chain or branched having 1 to 4 carbon atoms, preferably unbranched, provided that when n=2 only R_3 occurs, when n=3 neither R_3 nor R_4 occurs;

R_1 may be an aliphatic chain having 1 to 18 carbon atoms, phenylene, arylene or ether when R_1 may contain one —O—, with additionally at least two carbon alkylene group between the —O— and the heteroatom which is part of the B unit;

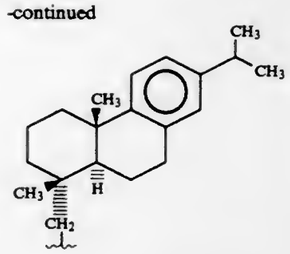
B may be $—NR_5SO_2NR_5—$, $—NR_5CONR_5—$, $—NR_5CO—$, or $—CONR_5—$ or $—SO_2NR_5—$, $—NR_5SO_2—$, —COO—, —OOC—, —OCOO, NCOO—, OOCN—;

where each R_5 may be independently H, or lower alkyl having 1 to 4 carbon atoms; and

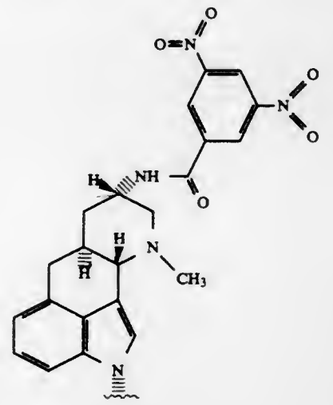
R_2 may be



-continued



where R_6 may be lower alkyl having 1 to 4 carbon atoms, or benzyl; B-R_2 may be



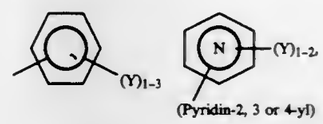
wherein,

A represents a heterocyclic ring having two of its carbon atoms held mutually with the imidazo moiety, selected from the group consisting of pyridine in any of its four positions wherein nitrogen is unshared by the imidazo moiety and substituted by one or two Z radicals on a carbon not shared by the imidazo moiety selected from the group consisting of hydrogen, halogen, loweralkyl, hydroxy, loweralkoxy, diloweralkylamino or nitro;

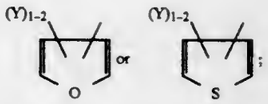
n is 1 to 3;

R_6 is hydrogen or loweralkyl,

Ar is selected from:



(Pyridin-2, 3 or 4-yl)



B is carbonyl;

W is $—OR^1$ wherein R^1 is hydrogen or loweralkyl;

Y is hydrogen, halo, loweralkoxy, loweralkyl, trifluoromethyl, cyano, nitro or diloweralkylamino;

the optical isomers, the oxides represented by ⟶O and the pharmaceutically acceptable acid addition salts thereof.

4,824,952

ISOQUINOLINE DERIVATIVE

Tsuneji Suzuki, Kanagawa; Kunio Sasnobe, Kanagawa; Toshihiko Ito, Kanagawa; Masahiko Maruyama, Chiba; Joji Kamiya, Chiba; Makoto Hirayama, Chiba; Takafumi Kitano, Chiba, and Akira Awaya, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

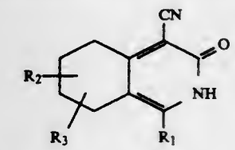
Filed Jul. 12, 1985, Ser. No. 754,286

Claims priority, application Japan, Jul. 26, 1984, 59-154108

Int. Cl.[4] A61K *217/26*

U.S. Cl. 546—141 **4 Claims**

1. An isoquinoline derivative of the formula:



(I)

wherein R_1 is a methyl or a methoxymethyl group and R_2 and R_3 are each a hydrogen atom or a methyl, ethyl, methoxy, a cyclohexyl, a phenyl, 3,4-dimethoxy phenyl, a pyridyl or an oxo (=O) group;

and therapeutically acceptable salts thereof.

4,824,953

MULTI-STEP PROCESS FOR PRODUCING 5-HYDROXY-N-(6-OXO-PIPERIDYL-METHYL)-2-(2,2,2-TRIFLUORO-ETHOXY)-BENZAMIDE AND DERIVATIVES

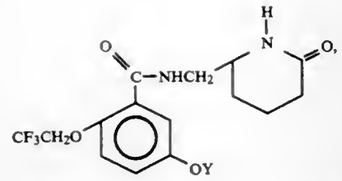
William R. Bruns, Maplewood, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 773,283, Sep. 6, 1985, Pat. No. 4,656,285, Division of Ser. No. 551,967, Nov. 15, 1983, Pat. No. 4,555,573. This application Feb. 3, 1987, Ser. No. 10,559

Int. Cl.[4] C07D *211/76, 213/75, 213/56*

U.S. Cl. 546—221 **2 Claims**

1. A process for preparing a compound of the formula



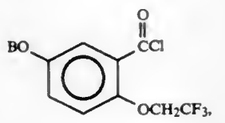
wherein Y is hydrogen or —CH_2CF_3, comprising the steps of:

(a) reductively acetylating 2-cyano-6-methoxypyridine to provide 2-acetamidomethyl-6-methoxypyridine;

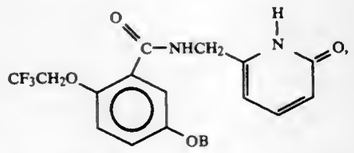
(b) deacetylating the product of step (a) to provide 2-aminoethyl-6-methoxypyridine;

(c) converting the product of step (b) to 6-aminomethyl-2(1H)-pyridone;

(d) reacting the product of step (c) with a reactant of the formula



wherein B is benzyl or —CH_2CF_3, to provide an intermediate of the formula



wherein B is as defined above; and

(e) reducing the product of step (d) to provide said compound;

with the proviso that when B is —CH_2CF_3, said reduction of step (e) provides said compound wherein Y is —CH_2CF_3, and when B is benzyl, said reduction of step (e) provides said compound wherein Y is hydrogen.

4,824,954

PROCESS FOR PREPARATION OF SUBSTITUTED PYRIDINES

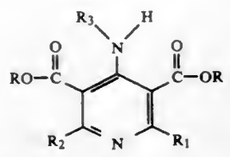
Maria L. Miller, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 668,850, Nov. 6, 1984, abandoned. This application Aug. 27, 1985, Ser. No. 768,658

Int. Cl.[4] C07D *211/02*

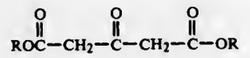
U.S. Cl. 546—250 **8 Claims**

1. A process for the preparation of a compound of the formula



wherein R_1 and R_2 are independently selected from fluorinated and chlorofluorinated lower alkyl radicals; R is lower alkyl; R_3 is independently selected from lower alkyl, cycloalkyl, and aralkyl which comprises:

(a) reacting an acetonediester of the formula



with a primary amine of the formula

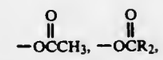


to form an enamine;

(b) reacting the enamine with a carboxylic acid anhydride or halide of the formula



wherein X is



or a halogen and R_2 is the corresponding fluorinated or chlorofluorinated lower alkyl radical of the product compound to form a 2-alkylcarbonyl-3-amino-2-pentenedicarboxylate; and

(c) reacting the pentenedicarboxylate with a halogenated alkylnitrile of the formula

R_1CN

wherein R_1 is the corresponding fluorinated or chlorofluorinated radical of the product compound in the presence of a base to form the 4-amino-3,5pyridinedicarboxylate product.

4,824,955

SELENIUM OXY CHLORIDE-PYRIDINE OR BIPYRIDINE COMPLEXES

Hisao Ekimoto, Tokyo; Masanobu Suzuki; Takao Izawa, both of Yono; Katsutoshi Takahashi, Tokyo; Tokuji Nakatani, Saitama, and Akio Fujii, Kamakura, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 928,551

Claims priority, application Japan, Nov. 15, 1985, 60-254694; May 13, 1986, 61-107589; May 16, 1986, 61-110697

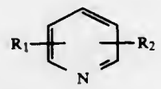
Int. Cl.[4] C07D *401/04, 213/64, 213/65*

U.S. Cl. 546—266 **3 Claims**

1. A selenium compound represented by the general formula (I):

$$SeOCl_2(A)_n(Y)_m \qquad (I)$$

wherein n is 1 or 2, and m is 0 or 1, A is 2,2'-dipyridyl or a group represented by the formula:



(wherein R_1 is hydrogen atom and R_2 is a hydroxyl group), and Y is H_20.

4,824,956

REDUCTIVE DEHALOGENATION OF HALOGEN COMPOUNDS

Toni Dockner, Meckenheim; Herbert Krug, Ludwigshafen, and Heinz Nohe, Meckenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,099

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1985, 3510033

Int. Cl.[4] C07D *213/48*

U.S. Cl. 546—314 **6 Claims**

1. A process for preparing an aldehyde by reductively dehalogenating a compound selected from the group consisting of mono- and bicyclic aromatic acyl halides and monocyclic heteroaromatic acyl halide in which the heteroatom is selected from the group consisting of oxygen, nitrogen or sulfur, the aromatic and the heterocyclic rings being unsubstituted or carrying substituents which are inert under the reaction conditions, which process comprises: reacting the acyl halide with a hydrocarbon in the liquid phase in the presence of carbon and at from 100° to 450° C. with the formation of an aldehyde and a hydrogen halide.

4,824,957

STABILIZATION OF NON-AQUEOUS SOLUTIONS OF 3-ISOTHIAZOLONES

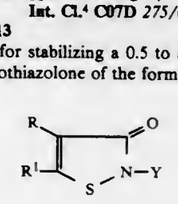
David R. Amick, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 709,755, Mar. 8, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 80,933

Int. Cl.[4] C07D *275/02*

U.S. Cl. 548—213 **6 Claims**

1. A method for stabilizing a 0.5 to about 10% by weight solution of an isothiazolone of the formula:



I

wherein

Y is an unsubstituted alkyl of 1 to 8 carbon atoms, an unsubstituted or halo substituted alkenyl or alkynyl of 2 to 8 carbon atoms, an unsubstituted cycloalkyl of 5 to 8 carbon atoms, benzyl, aralkyl selected from 3,4-dichlorobenzyl, 4-methoxybenzyl or 4-chlorobenzyl or substituted aryl selected from 3,4-dichlorophenyl or 4-methoxyphenyl; R is halo; R^1 is hydrogen, halogen or (C_1–C_4)alkyl which consists of formulating a solution of the isothiazolone by dissolving the isothiazolone in from about 90 to about 99% by weight of dipropylene glycol, polypropylene glycol, 1,5-pentadiol or benzyl alcohol.

4,824,958

PROCESS FOR THE PREPARATION OF N-1H-TETRAZOL-5-YL-2-PYRROLE CARBOXAMIDES

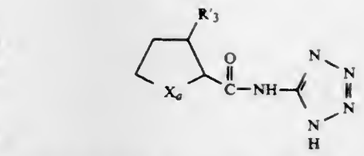
Wlaczeslaw A. Cetenko; David T. Connor, both of Ann Arbor; Michael D. Mullican, Ypsilanti, and Roderick J. Sorenson, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 27,453, Mar. 18, 1987, Pat. No. 4,748,183, which is a continuation-in-part of Ser. No. 874,309, Jun. 13, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 155,784

Int. Cl.[4] C07D *257/06, 207/12*

U.S. Cl. 548—251 **2 Claims**

1. A process for preparing a compound of the formula (I')



wherein R'_3 is OH and X_a is NH or NR_4 by

(a) contacting a compound of the formula $HX_aCH_2CO_2R'_5$ wherein X_a is as defined above and R'_5 is lower alkyl with methyl α-haloacrylate wherein halo is chloro or bromo and hydrolyzing the resulting product; and

(b) treating the product of (a) with 5-aminotetrazol in the presence of a coupling agent.

4,824,959

INTERMEDIATES FOR ANTIHYPERCHOLESTEROLEMIC TETRAZOLE COMPOUNDS

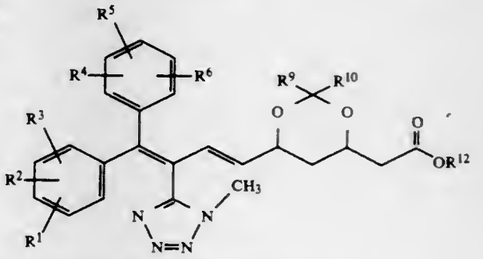
William T. Han, Cheshire, and John J. Wright, Middletown, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 18, 1988, Ser. No. 156,865

Int. Cl.[4] C07D *405/06*

U.S. Cl. 548—253 **12 Claims**

1. A compound of the formula



in substantially the cis form wherein

R^1 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy or trifluoromethyl;

R^2, R^3, R^5 and R^6 each are independently hydrogen, halogen, C_{1-4} alkyl or C_{1-4} alkoxy;

R^9 and R^{10} each are C_{1-4} alkyl or R^9 and R^{10}, taken together with the carbon atom to which they are attached, is cyclopentyl, cyclohexyl or cycloheptyl; and

R^{12} is hydrogen, C_{1-4} alkyl or a metal cation.

4,824,960

PREPARATION OF 1-ARYL-5-AMINO-PYRAZOLES

Bernd Gallenkamp, and Hermann Arold, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

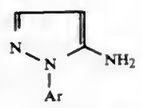
Filed Apr. 3, 1987, Ser. No. 34,300

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612939

Int. Cl.[4] C07D *231/38*

U.S. Cl. 548—362 **10 Claims**

1. A process for the preparation of a 1-aryl-5-amino-pyrazole of the formula



in which Ar is in each case optionally substituted phenyl or pyridyl, comprising reacting an arylhydrazine of the formula

Ar—NH—NH_2

with acrylonitrile of the formula

CH_2=CH—CN

in a first stage in the presence of a diluent at a temperature between about 20° C. and 100° C. to form the arylhydrazine derivative of the formula

Ar—NH—NH—CH_2—CH_2—CN, and

in a second stage contacting such derivative with an oxidizing agent selected from the group consisting of sodium hypochlorite and atmospheric oxygen in the presence of a base at a temperature between about 0° C. and 60° C., thereby to effect oxidation and cyclization.

4,824,961

PRODUCTION OF SUBSTITUTED 1,3,4,9-TETRAHYDROPYRANO(3,4/b)INDOLE-1-ACETIC ACIDS

Chia-Cheng Shaw, and Karel Pelz, both of Quebec, Canada, assignors to American Home Products Corporation, New York, N.Y.

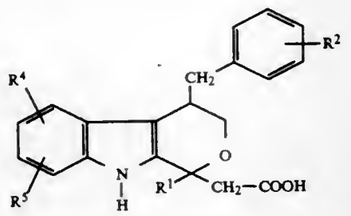
Filed Aug. 27, 1987, Ser. No. 89,881

Int. Cl.[4] C07D *493/04*

U.S. Cl. 548—432 **7 Claims**

1. A process for producing compounds of formula (I)

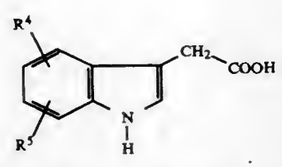
(I)



wherein R^1 is lower alkyl containing 1 to 4 carbon atoms; R^4 and R^5 are hydrogen, lower alkyl containing 1 to 6 carbon atoms, or halogen; and R^2 is hydrogen, 4-halogen, 2- and 4-dihalogen, 3-trifluoromethyl, or 4-methoxy which comprises the steps

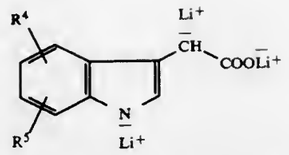
(a) lithiating substituted indole-3-acetic acids of formula (II)

(II)



wherein R^4 and R^5 are as defined above to produce the synthon substituted lithium 1, α-dilithioindole-3-acetate of formula (III)

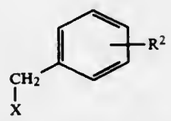
(III)



wherein R^4 and R^5 are as defined above

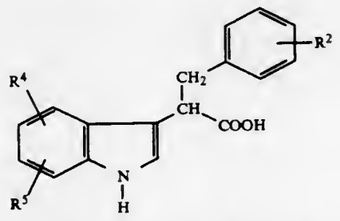
(b) alkylating said synthon (III) with the halide of formula (IV)

(IV)



wherein R^2 is as defined above and X is halogen selected from the group consisting of chlorine, bromine, and iodine to produce substituted indole-3-acetic acids of formula (V)

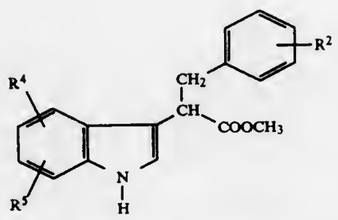
(V)



wherein R^2, R^4, and R^5 are as defined above

(c) esterifying said substituted indole-3-acetic acids of formula (V) to produce the corresponding ester of formula (VI)

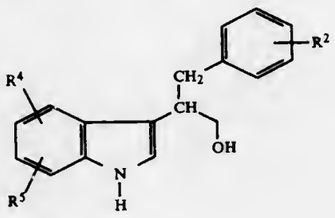
(VI)



wherein R^2, R^4, and R^5 are as defined above

(d) reducing said ester of formula (VI) to produce the substituted β-benzyltryptophol of formula (VII)

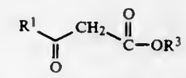
(VII)



wherein R^2, R^4, and R^5 are as defined above

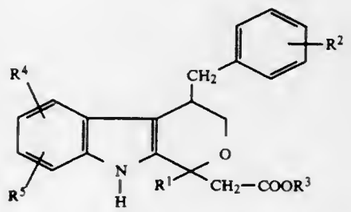
(e) reacting said tryptophol of formula (VII) with 3-oxo-2-alkanoic acid, alkyl ester of formula (VIII)

(VIII)



wherein R^1 is as defined above and R^3 is lower alkyl containing 1 to 8 carbon atoms to produce isomers A and B of the alkyl ester of formula (IX)

(IX)



wherein R^1, R^2, R^3, R^4, and R^5 are as defined above

(f) separating said isomer A from isomer B by crystallizing isomer A from an alcohol solvent and hydrolyzing isomer A to obtain the desired compound of formula (I).

4,824,962

PROCESS FOR THE PREPARATION OF NAPHTHOSTYRIL

Otto Arndt, Hofheim am Taunus, and Theodor Papenfuhs, Frankfurt, am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 914,485, Oct. 2, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 170,065

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535482

Int. Cl.[4] C07D *209/92*

U.S. Cl. 548—437 **5 Claims**

5. A process for the preparation of naphthostyril which comprises:

dissolving 1,8-naphthalimide in an aqueous solution of a combination of alkali metal hydroxides comprising (a) potassium hydroxide and (b) lithium or sodium hydroxide, the quantity of the combination of alkali metal hydroxides thereby applied being about 5 to about 6 mole per mole of 1,8-naphthalimide, the dissolving being carried out while heating to 40° to 80° C.;

cooling the resulting alkali metal 1,8-naphthalimide solution to 14° C. and seeding it at said temperature with a seeding amount, not exceeding 1 mol-% per mole of 1,8-naphthalimide used, of sodium 1,8-naphthalimide seed crystals, while substantially maintaining the alkali metal 1,8-naphthalimide in solution, except for said seed crystals;

adding chlorine bleaching liquor to the thus-seeded solution at 10 to 20° C. and commencing crystallization after the addition of the chlorine bleaching liquor has begun;

maintaining said reaction mixture at a temperature of 16° to 20° C. after the addition of the chlorine bleaching liquor has been completed, said reaction mixture now containing an alkaline aqueous solution of alkali metal salt of 1-aminonaphthalene-8-carboxylic acid, and

removing excess active chlorine and adjusting the pH of said alkaline aqueous solution to below about 2.5 to form precipitated naphthostyril, and isolating the naphthostyril.

4,824,963

PROCESS FOR THE PREPARATION OF OPTICALLY-ACTIVE CARBAZOLE DERIVATIVES

Herbert Leinert, Heppenheim, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 612,255, May 21, 1984, Pat. No. 4,697,022. This application May 13, 1987, Ser. No. 49,673

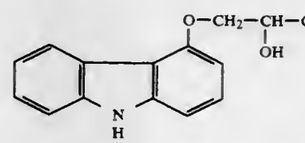
Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319027

Int. Cl.[4] C07D *401/12, 209/82*

U.S. Cl. 548—444 **2 Claims**

1. Process for the preparation of an essentially optically pure S-carbazole derivative of the formula:

(I)



or its pharmacologically acceptable salts wherein R is an amino group, an amino group substituted by a C1-C6 alkyl radical, or the radical:

in which R_2 is a hydrogen atom, C1-C6 alkyl, benzyl, phenylethyl or phenylpropyl; R_3 is a hydrogen atom or C1-C6 alkyl, R_4 is a hydrogen atom or C1-C6 alkyl, X is a valency bond, a —CH_2— group, or an oxygen or sulphur atom; Ar is a phenyl, naphthyl, indanyl, tetrahydronaphthyl or pyridyl; and R_5 and R_6, which can be the same or different, are hydrogen or halogen atoms, C1-C6 alkyl, aminocarbonyl, hydroxyl, lower alkoxy, benzyloxy, lower alkylthio, lower alkylsulphinyl or lower alkylsulphonyl or together represent methylenedioxy,

reacting R-(−)-epichlorhydrin and 4-hydroxycarbazole in an alkaline medium to form an S-4-(2,3-epoxypropoxy)-carbazole, and

reacting the S-4-(2,3-epoxypropoxy)-carbazole obtained, with RH, in which R has the same meaning as above; and

thereafter recovering an essentially optically pure S-carbazole derivative or converting the essentially optically pure S-carbazole derivative into a pharmacologically acceptable salt and recovering said salt.

4,824,964

METHOD FOR PREPARING OPTICALLY ACTIVE N-ACETYLINDOLINE-2-CARBOXYLIC ACID

Satoru Miyata, Kariya; Hiromi Fukuda, and Shinzo Imamura, both of Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 752,900, Jul. 8, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 6,312

Claims priority, application Japan, Jul. 13, 1984, 59-144185

Int. Cl.[4] C07D *209/12*

U.S. Cl. 548—490 **2 Claims**

1. In a method for preparing optically active N-acetylindoline-2-carboxylic acid wherein N-acetylindoline-2-carboxylic acid and an optically active resolving agent provided in the form of an optically active α-amino-ε-caprolactam are dissolved in an inert solvent, and wherein a diastereomeric N-acetylindoline-2-carboxylic acid-resolving agent salt is precipitated from the solution formed therefrom by fractional crystallization and wherein said salts are separated and liberated to optically active free acids by treatment with stronger acids,

the improvement wherein said inert solvent is water.

4,824,965

4-OXO-4,5,6,7-TETRAHYDROINDOLE DERIVATIVES

Helmut Michel, Mannheim, and Roland Ofenloch, Lorsch, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

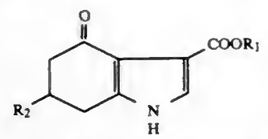
Division of Ser. No. 438,663, Nov. 2, 1982, Pat. No. 4,736,043. This application Dec. 22, 1987, Ser. No. 136,834

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147276

Int. Cl.[4] C07D *209/42*

U.S. Cl. 548—492 3 Claims

1. A 4-oxo-4,5,6,7-tetrahydroindole derivative of the general formula:



(IV)

wherein R_1 is a hydrogen atom or an alkyl radical containing up to 6 carbon atoms and R_2 is a hydrogen atom or an alkyl radical containing up to 6 carbon atoms.

4,824,966

PROCESS FOR THE PRODUCTION OF 4-HYDROXY-2-OXO-PYRROLIDIN-1-YL ACETAMIDE

Thomas Meul, and John McGarrity, both of Visp, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

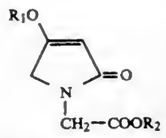
Continuation of Ser. No. 905,128, Sep. 9, 1986, abandoned. This application May 4, 1988, Ser. No. 188,702

Claims priority, application Switzerland, Sep. 24, 1985, 4126/85; May 20, 1986, 2023/86

Int. Cl.[4] C07D *207/27*

U.S. Cl. 548—544 5 Claims

1. Process for the production of 4-hydroxy-2-oxo-pyrrolidin-1-yl acetamide comprising (a) reacting 4-(C_1–C_2)-alkoxy-3-pyrrolin-2-on-1-yl-acetic acid (C_1–C_4)-alkyl ester of the formula:



wherein R_1 is alkyl having 1 or 2 C atoms and R_2 is alkyl having 1 to 4 C atoms, with trichloromethyl-silane in the presence of an alkali iodide to a 2,4-dioxo-pyrrolidin-1-yl-acetic acid (C_1–C_4)-alkyl ester, (b) hydrogenating the 2,4-dioxopyrrolidin-1-yl-acetic acid (C_1–C_4)-alkyl ester with sodium borohydride to a 4-hydroxy-2-oxo-pyrrolidin-1-yl-acetic acid (C_1–C_4)-alkyl ester, and (c) converting the 4-hydroxy-2-oxo-pyrrolidin-1-yl-acetic acid (C_1–C_4)-alkyl ester by amidation with ammonia to said acetamide.

4,824,967

PROCESS FOR THE PREPARATION OF 2-PYRROLIDONE

Kou-Chang Liu, Wayne, and Paul D. Taylor, West Milford, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Jun. 27, 1988, Ser. No. 211,941

Int. Cl.[4] C07D *201/08*

U.S. Cl. 548—554 15 Claims

1. The process which comprises reacting butyrolactone with ammonia in the vapor phase at an elevated temperature and pressure in the presence of a magnesium silicate particulate catalyst which catalyst optionally contains between about 0.01% and about 5% by weight of elemental Ca, Cu, Ni, K, Na or mixtures thereof and between aboul 0.01% and about 5% by weight of Cl, Br, F or So_4 groups and reacting said components for a period sufficient to produce 2-pyrrolidone in high yield and selectivity.

4,824,968

SUBSTITUTED AROMATIC SULFONAMIDES AS ANTIGLAUCOMA AGENTS

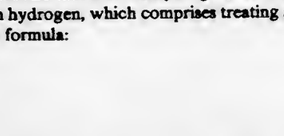
Gerald S. Ponticello, Lansdale, and J. Mark Wiggins, Perkasie, both of Pa., assignors to Merck & Co., Inc., Rayway, N.J.

Continuation-in-part of Ser. No. 863,225, May 14, 1986, Pat. No. 4,677,115, which is a continuation-in-part of Ser. No. 777,654, Sep. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 680,684, Dec. 12, 1984, abandoned. This application Jun. 26, 1987, Ser. No. 67,332

Int. Cl.[4] C07D *495/04*

U.S. Cl. 549—23 2 Claims

1. A process for the preparation of a compound of structural formula:



wherein

R^{14} is

(a) hydrogen,

(b) —CN,

(c) phenyl—$C_{1\text{-}3}$alkyl, wherein the phenyl is either unsubstituted or substituted with one or more of

(1) hydroxy,

(2) $C_{1\text{-}3}$alkoxy,

(3) $R^{17}R^{18}N$—$C_{1\text{-}5}$alkyl, wherein R^{17} and R^{18} are independently selected from:

(i) hydrogen or

(ii) $C_{1\text{-}3}$alkyl, or taken together with the nitrogen to which they are attached from a heterocycle selected from morpholine, piperidine pyrrolidine and piperazine;

R^{15} is

(a) hydrogen,

(b) $C_{1\text{-}5}$alkyl,

(c) phenyl—$C_{1\text{-}3}$alkyl, wherein the phenyl is either unsubstituted or substituted with one or more of:

(1) hydroxy,

(2) $C_{1\text{-}3}$alkoxy,

(3) $R^{17}R^{18}N$—$C_{1\text{-}3}$alkyl;

(d) phenyl either unsubstituted or substituted with one or more of

(1) hydroxy,

(2) $C_{1\text{-}3}$alkoxy,

(3) $R^{17}R^{18}N$—$C_{1\text{-}3}$alkyl, or

(4) halo, such as chloro or fluoro

(e) aromatic heterocycle of 5 or 6 members selected from furyl, pyridyl, and thienyl either unsubstituted or substituted with $R^{17}R^{18}N$—$C_{1\text{-}3}$alkyl

(f) —$NR^{17}R^{18}$, and

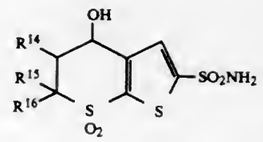
(g) $C_{2\text{-}5}$alkyl substituted with —$NR^{17}R^{18}$;

R^{16} is

(a) hydrogen, or

(b) $C_{1\text{-}3}$alkyl;

with the proviso that if R^{14} is hydrogen, one of R^{15} and R^{16} is other than hydrogen, which comprises treating a compound of structural formula:



with dimethyldichlorosilane and sodium iodide in an acetonitrile at about 75° to 100° C. for about one to 4 hours.

4,824,969

PROCESS FOR PREPARING CYCLIC CARBONATE ESTERS FROM OLEFINS IN A SINGLE REACTION MIXTURE

Richard G. Austin, Ridgewood; Robert C. Michaelson, Kinnelon, and Richard S. Myers, Fairlawn, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 24, 1984, Ser. No. 685,713

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.[4] C07D *317/26, 319/06*

U.S. Cl. 549—230 17 Claims

1. A process for preparing at least one cyclic alkylene carbonate ester which comprises reacting in a liquid phase admixture at least one olefin containing at least one ethylenic unsaturation, water, molecular oxygen, and carbon monoxide in the presence of an osmium containing catalyst composition, thereby forming said cyclic alkylene carbonate ester product, with the proviso that the total amount of water present in said liquid phase during reaction being a molar ratio of water to ethylenic unsaturation to be reacted of from about 0.1:1 to about 20:1; said catalyst composition comprising:

(A) at least one catalytically active osmium containing compound;

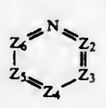
(B) an amount of at least one copper containing compound co-catalyst I effective to increase at least one of the rate and selectivity in the formation of said cyclic carbonate ester product relative to its absence;

(C) at least one co-catalyst II in an amount effective to increase the rate of said cyclic carbonate ester product formation relative to its absence, said co-catalyst II being selected from at least one member of the group consisting of:

(i) 1,4-diazabicyclo (2.2.2) octane;

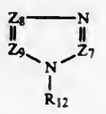
(ii) hexamethylenetetraamine; and

(iii) at least one compound represented by at least one of the structural formulae:



(XIIa)

or



(XIIb)

wherein:

(1) in structural formula (XIIa):

(a) Z_2 to Z_6 independently represent a member selected from the group consisting of a methylidyne group, a substituted methylidyne group represented, by the formula =CR_{11}, and a tertiary nitrogen group; said R_{11} substituent being selected from the group consisting of hydroxy, alkyl, aryl, aralkyl and alkaryl; and

(b) any two of said R_{11} substituents located on adjacent carbons of said Z_2 to Z_5 groups of structural formula (XIIa) together can constitute part of a monocyclic or fused bicyclic ring system, which partial ring systems are (i) aromatic, or heteroaromatic in nature, said heteroatom being nitrogen, and (ii) completed by, and fused with parent structure (XIIa) through said adjacent carbons of Z_2 to Z_5 groups; and

(2) in structural formula (XIIb):

(a) Z_7 to Z_9 independently represent a member selected from the group consisting of a methylidyne group, and a substituted methylidyne group represented by the formula =CR'_{11} wherein R'_{11} is independently selected from the group consisting of alkyl, aryl, aralkyl, and alkaryl; and

(b) R_{12} is selected from the group consisting of alkyl, aryl, aralkyl, and alkaryl.

4,824,970

INTERMEDIATES FOR THE SYNTHESIS OF CARBOXYLIC ACIDS

Graziano Castaldi, Briosa, and Claudio Giordano, Vicenza, both of Italy, assignors to ZAMBON Spa, Vicenza, Italy

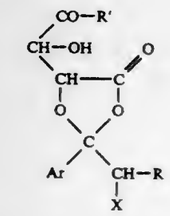
Filed Jul. 31, 1986, Ser. No. 891,348

Claims priority, application Italy, Jul. 31, 1985, 21803 A/85

Int. Cl.[4] C07D *317/00*

U.S. Cl. 549—296 2 Claims

1. A compound of formula



(I)

wherein

Ar represents 4-isobutyl-phenyl, 3-phenoxy-phenyl, 2-fluoro-4-diphenylyl, 4-(2-thienylcarbonyl)-phenyl, 6-methoxy-2-naphthyl, 5-bromo-6-methoxy-2-naphthyl, 6-hydroxy-2-naphthyl, 4-chloro-phenyl or 4-difluoromethoxy-phenyl;

R represents a C_1–C_4 alkyl;

R′ represents a hydroxyl or an alkoxy C_1–C_4;

X represents a chlorine, bromine or iodine atom.

4,824,971

2-ALLYLCHROMANS

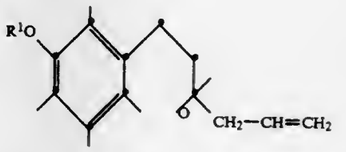
Neal Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 932,970, Nov. 2, 1986, Pat. No. 4,752,646, Continuation-in-part of Ser. No. 821,590, Jan. 23, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 146,550

Int. Cl.[4] C07D *311/72*

U.S. Cl. 549—408 3 Claims

1. A compound of the formula:



wherein R^1 is methyl or a hydroxy protecting group removable by basic hydrolysis or hydrogenolysis.

4,824,972

HYDROQUINONE DERIVATIVES

Richard Barner, Witterswil, and Josef Hübscher, Seon, both of Switzerland, assignors to Hoffmann-LaRoche Inc., Nutley, N.J.

Division of Ser. No. 22,303, Mar. 5, 1987, Pat. No. 4,743,696, which is a division of Ser. No. 768,789, Aug. 23, 1985, Pat. No. 4,675,421. This application Jan. 19, 1988, Ser. No. 145,166

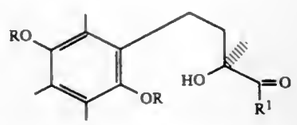
Claims priority, application Switzerland, Aug. 28, 1984, 4117/84; Jul. 11, 1985, 3000/85

The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.

Int. Cl.[4] C07D *309/02*; C07C *69/612*

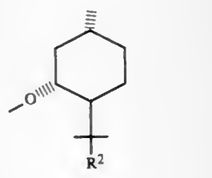
U.S. Cl. 549—420 2 Claims

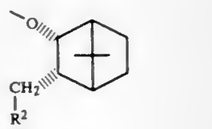
1. Compounds of the general formula

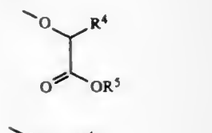


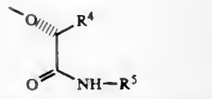
III

wherein R represents an ether protecting group; and R^1 represents a residue of the formula









in which R^2 signifies phenyl; R^4 signifies methyl or phenyl; and R^5 signifies lower alkyl, aryl or aryl-lower alkyl, wherein aryl signifies phenyl or naphthyl.

4,824,973

PREPARATION OF 4-FORMYLTETRAHYDROPYRANS

Wolfgang Spiegler, Worms; Wolfgang Hoelderich, Frankenthal; Norbert Goetz, Worms; Leopold Hupfer, Friedelsheim, and Jochen Wild, Deidesheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

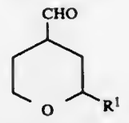
Filed Aug. 26, 1987, Ser. No. 89,752

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630614

Int. Cl.[4] C07D *309/06, 333/22*

U.S. Cl. 549—425 5 Claims

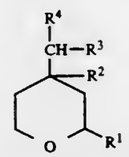
1. A process for the preparation of a 4-formyltetrahydropyran of the formula



(I)

where R^1 is hydrogen, C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, C_1–C_6-alkoxy-substituted C_1–C_{12}-alkyl, C_4–C_{12}-cycloalkyl, unsubstituted or substituted aryl, aralkyl, or a tetrahydropyranyl ring, which process comprises:

treating a pyran derivative of the formula



(II)

where R^1 is as defined above, R^2 and R^3 are each OH or together are an oxygen atom and thus form an oxirane ring, and R^4 is hydrogen when R^2 and R^3 are each OH, and is hydrogen or tert-butoxycarbonyl when R^2 and R^3 together are an oxygen atom, at elevated temperatures with a catalyst selected from

(a) the group consisting of zeolites, silica and mixtures thereof.

4,824,974

SYNTHESIS FOR THE PREPARATION OF 4-AMINO-4,5-DIHYDRO-2-FURANCARBOXYLIC ACID

Joseph P. Burkhart, West Chester, and Gene W. Holbert, Loveland, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

(b) Division of Ser. No. 836,788, Mar. 6, 1986, which is a division of Ser. No. 712,318, Mar. 13, 1985, Pat. No. 4,588,825, which is a continuation of Ser. No. 540,745, Oct. 11, 1983, abandoned. This application Oct. 15, 1987, Ser. No. 108,521

Int. Cl.[4] C07D *307/30*

U.S. Cl. 549—480 8 Claims

1. A method for the stereospecific synthesis of 4-amino-4,5-dihydro-2-furancarboxylic acid or a lower alkyl ester thereof

(c) which comprises the steps of:

(a) reducing the anhydride of a γ-lower alkyl ester of N-[(1,1-dimethylethoxy)carbonyl]glutamic acid having anhydride] to a lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl]-amino]-5-hydroxypentanoate;

(d) (b) silylating the lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl]amino]-5-hydroxypenanoate, reacting the resulting-4-[[(1,1-dimethylethoxy)carbonyl]amino]-5-[[(1,1-dimethylethyl)dimethylsilyl]oxy]pentanoate with lithium diisopropylamine, and silylating the resulting enol ether to yield a 1,1-dimethylethyl [1-[[(1,1-dimethylethyl)dimethylsilyloxy]methyl]-4-(lower alkoxy)-4-(trimethylsilyloxy)-3-butenyl]-carbamate;

(c) reacting the 1,1-dimethylethyl [1-[[(1,1-dimethylethyl)-dimethylsilyloxy]methyl]-4-(lower alkoxy)-4-(trimethylsilyloxy)-3-butenyl]carbamate with a strong oxidizing agent to yield a lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl]amino]-5-[[(1,1-dimethylethyl)dimethylsilyl]oxy]-2-hydroxypentanoate;

(d) oxidizing the lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl]amino]-5-[[(1,1-dimethylethyl)dimethylsilyl]oxy]-2-hydroxypentanoate to form a lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl]amino]-5-[[(1,1-dimethylethyl)dimethylsilyl]oxy]-2-oxopentanoate;

(e) hydrolyzing the lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl]amino[-5-[[(1,1-dimethylethyl)dimethylsilyl]oxy]-2-oxopentanoate to form a lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl]amino] -2-hydroxytetrahydrofuran-2-carboxylate;

(g) dehydrating the lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl]amino]-2-hydroxytetrahydrofuran-2-carboxylate to yield a lower alkyl 4-[[(1,1-dimethylethoxy)carbonyl-]amino]-4,-dihydro-2-furancarboxylate; and

(f) deprotecting the amine to yield the desired isomer of a lower alkyl ester of 4-amino-4,5-dihydro-2-furancarboxylic acid, and hydrolyzing the ester when the free acid is desire.

4,824,975

PROCESS FOR THE PREPARATION OF OXETANE-3-CARBOXYLIC ACIDS

Helmut Fiege, Leverkusen; Manfred Jautelat, Burscheid, and Dieter Arlt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

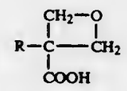
Filed May 13, 1987, Ser. No. 49,749

Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618135

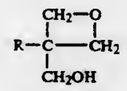
Int. Cl.[4] C00F *305/04, 305/08*

U.S. Cl. 549—511 8 Claims

1. A process for the preparation of an oxetane-3-carboxylic acid of the formula



in which R represents hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, or phenyl which is optionally substituted by at least one of halogen and alkyl having 1 to 4 carbon atoms, comprising reacting a 3-hydroxymethyl-oxetane of the formula



with oxygen in an aqueous solution of an alkali metal compound or an alkaline earth metal compound at a temperature between about 40° C. and 100° C. in the presence of a palladium and/or platinum catalyst and in the presence of an activator selected from lead, bismuth, a lead compound, a bismuth compound or a mixture thereof.

4,824,976

PROCESS FOR THE EPOXIDATION OF OLEFINIC COMPOUNDS AND CATALYSTS USED THEREIN

Mario G. Clerici, and Ugo Romano, both of Milan, Italy, assignors to Enitricerche, S.p.A. and Enichem Sintesi, S.p.A., both of Milan, Italy

Filed Jan. 20, 1987, Ser. No. 4,680

Claims priority, application Italy, Jan. 28, 1986, 19207 A/86; Jan. 28, 1986, 19209 A/86

Int. Cl.[4] C07D *301/12*

U.S. Cl. 549—531 16 Claims

1. A process for the highly selective epoxidation of olefinic compounds comprising reacting in an aqueous solvent at least one olefinic compound with hydrogen peroxide or substances which produce hydrogen peroxide under the reaction conditions, in presence of a synthetic zeolite catalyst containing titanium atoms corresponding to the general formula x TiO_2. (1-x) SiO_2 wherein x is in the range of from 0.0001 to 0.04 and the titanium atoms replace at least a portion of the silicon atoms, and neutralizing the acidity of the catalyst with at least one neutralizing agent.

4,824,977

CHELATING LIGANDS AND CATALYSTS AND PROCESSES EMPLOYING THE SAME

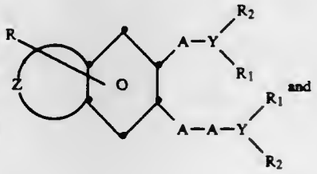
Thomas J. Devon; Gerald W. Phillips; Thomas A. Puckette; Jerome L. Stavinoha, Jr., and Jeffrey J. Vanderbilt, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 41,968, Apr. 24, 1987, Pat. No. 4,774,362. This application Mar. 11, 1988, Ser. No. 166,936

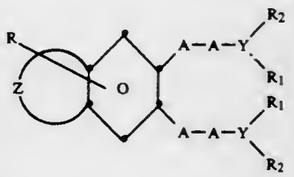
Int. Cl.[4] C07F *15/00, 9/50*

U.S. Cl. 556—21 6 Claims

1. A ligand compound of the formula



and



wherein

Z, when present, represents the atoms necessary to form with adjacent carbons on the benzene nucleus a fused divalent ring structure having up to about 20 ring carbons;

each ring is unsubstituted or substituted with up to three R substituents selected independently from alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen, alkanoyl, alkanoyloxy, alkoxycarbonyl, carboxyl or cyano;

each R_1 and R_2 is selected independently from alkyl, aryl, aralkyl, alkaryl or cycloaliphatic;

each A is a carbon atom which is either unsubstituted or substituted with one or two substituents selected independently from alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen, alkanoyl, alkanoyloxy, alkoxycarbonyl, carboxyl or cyano;

each of the above hydrocarbon groups or moieties of R, R_1 or R_2 may be substituted with 1-3 substituents selected

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independently from alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen, alkanoyl, alkanoyloxy, alkoxycarbonyl, carboxyl or cyano;

each of the above alkyl groups or moieties is straight or branched chain of 1–20 carbons, each aryl group contains 6–10 ring carbons, and each cycloaliphatic group contains from 4–6 ring carbons; and each Y is independently selected from the elements N, P, As, Sb and Bi.

4,824,978

COMPLEXES OF GLYCERYLPHOSPHORYLCHOLINE

Carlo Scolastico, Milan, and Giovanni Troconi, Vimodrone, both of Italy, assignors to Neopharmed Spa, Milan, Italy

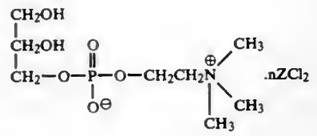
Division of Ser. No. 803,474, Dec. 2, 1985, Pat. No. 4,699,901. This application Jul. 7, 1987, Ser. No. 70,542

Claims priority, application Italy, Dec. 5, 1984, 23896 A/84

Int. Cl.[4] C07K 9/10; C07D 3/06

U.S. Cl. 556—26 **3 Claims**

1. A complex of glycerylphosphorylcholine with calcium or zinc chloride of the formula:



wherein Z represents Ca or Zn, and n is 0.5, 0.75, 1.25 or 1.5.

4,824,979

METHOD FOR THE PREPARATION OF PARTIAL ESTERS AND ORTHO ESTERS OF TITANIUM, ZIRCONIUM OR HAFNIUM

Hans-Joachim Kötzsch, Rheinfelden; Hans-Günther Srebny, Stolzenau, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Cologne, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,514

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447297

Int. Cl.[4] C07F 7/28, 7/00

U.S. Cl. 556—54 **12 Claims**

1. A method for the preparation of metallic acid esters of the formula $(RO)_nMeX_{4-n}$, in which Me is a metal selected from the group consisting of titanium, zirconium and hafnium, R represents an identical or different saturated or unsaturated aliphatic or aromatic hydrocarbon moiety, X is halogen, and n has a value from 1 to 4 comprising: selectively esterifying a corresponding metal halide with an amount of an organosilane ester of the formula $R'_nSi(OR)_{4-n}$ where R has the definition given above, R' represents identical or different alkyl groups of 1 to 4 carbon atoms, and n=1, 2 or 3 to provide a desired degree of partial esterification with the proviso that when a metallic acid ester is desired wherein n has values of 3 to 4, reacting a metallic acid partial ester wherein n=1 to 3 with an organic hydroxy compound in the presence of an amine.

4,824,980

PROCESS TO PRODUCE O-SILYL O,N-KETENE ACETALS

William J. Schulz, Jr., and John L. Speier, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

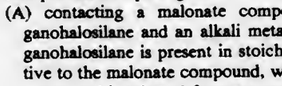
Filed Sep. 2, 1988, Ser. No. 239,917

Int. Cl.[4] C07F 7/10

U.S. Cl. 556—413 **13 Claims**

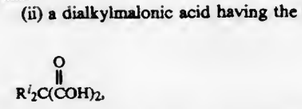
1. A process for preparing O-silyl O,N-ketene acetals having the formula,

$$R_2C{=}C(OSiR_nX_{3-n})(NR^a_2), \text{ or}$$



wherein each R and each R^a is independently selected from a group consisting of alkyl, alkenyl, aryl, or aralkyl; X is a fluorine, chlorine, or bromine atom; and wherein n has a value of 1, 2, or 3, and q has a value of from 2 to 22, inclusive, said process comprising

(A) contacting an alpha-haloamide with an alkali metal in the presence of an excess of an organohalosilane, wherein the alpha-haloamide has the formula,



the organohalosilane has the formula,

$$R_nSiX_{4-n};$$

wherein R, R^a, X, n, and q are defined above; and wherein X^i is a halogen atom; and

(B) facilitating reaction among the alpha-haloamide, the alkali metal, and the organohalosilane to form the O-silyl O,N-ketene acetal and alkali metal halides.

4,824,981

PROCESS TO PRODUCE SILYL KETENE ACETALS

William J. Schulz, Jr., and William H. Campbell, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 6, 1987, Ser. No. 69,750

Int. Cl.[4] C07F 7/08, 7/18

U.S. Cl. 556—443 **22 Claims**

1. A process for preparing silyl ketene acetals having the general formula,

$$R^i_2C{=}C(OSiR^{ii}_3)_2,$$

wherein each R^i and each R^{ii} is independently selected from a group consisting of alkyl groups containing 1 to 4 carbon atoms,

said process comprising

(A) contacting a malonate compound with a triorganohalosilane and an alkali metal, wherein the triorganohalosilane is present in stoichiometric excess relative to the malonate compound, wherein said malonate compound is selected from a group consisting of

(i) a bis(trialkylsilyl) dialkylmalonate having the formula,

$$R^i_2C(COSiR^{ii}_3)_2,$$

and

(ii) a dialkylmalonic acid having the formula,

$$R^i_2C(COH)_2,$$

said triorganohalosilane having the general formula

$$R^{ii}_3SiX,$$

wherein X is fluorine, chlorine, bromine, or iodine;

(B) separating and isolating the silyl ketene acetal.

4,824,982

METHOD FOR THE CLEAVAGE OF ORGANIC SILOXANES, AND PRODUCTS AND APPLICATIONS THEREOF

Hans-Joachim Vahlensieck, Wehr, and Hans-Joachim Koetzsch, Rheinfelden, both of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Troisdorf Bez. Cologne, Fed. Rep. of Germany

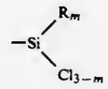
Filed Feb. 3, 1984, Ser. No. 576,621

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303707

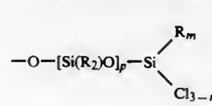
Int. Cl.[4] C07F 7/08

U.S. Cl. 556—451 **11 Claims**

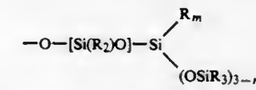
1. A method for the cleavage of organodisiloxanes of the general formula $(R_3Si)_2O$ in which R represents like or different saturated or unsaturated alkyl moieties, substituted if desired by ester, halogen or aryl moieties, and having 1 to 18 carbon atoms, or it represents aryl moieties substituted, if desired, with halogen or alkyl, with chlorosilanes of the general formula $R'_{4-n}SiCl_n$(n=2, 3 or 4) wherein R' represents H and/or R, these moieties being also able to be substituted by the group



(m=0 or 1 or 2), or it represents the moiety of the formula



in which R has the same meaning as above and p can be equal to 0 to 4, with the simultaneous production of organochlorosilanes of the general formula R_3SiCl and of organosiloxanes of the general formula $R''_{4-n}Si(OSiR_3)_n$, in which R'' is the same as R' and/or represents the grouping



wherein the reaction is performed in the presence of ferric trichloride and catalytic amounts of hydrogen chloride.

4,824,983

NEW FLUORINE-CONTAINING SILOXANES, THEIR SYNTHESIS AND USE AS DEFOAMING AGENT

Hans-Ferdi Fink; Götz Koerner, both of Essen; Roland Berger, Bochum, and Christian Weltemeyer, Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

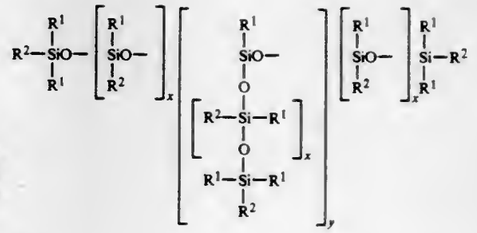
Filed Oct. 6, 1987, Ser. No. 106,561

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635093

Int. Cl.[4] C07F 7/08, 7/18

U.S. Cl. 556—454 **17 Claims**

1. A compound of the formula



wherein

R^1 is the same or different and represents alkyl or phenyl,

R^2 is the same as R^1 or represents the $C_nF_{2n+1}(CH_2)_2O$— group, in which n is a whole number from 4 to 16,

with the proviso that no more than 90% of R^2 has the meaning of R^1,

and

x=5 to 100 and

y=0 to 10.

4,824,984

PREPARATION OF A CATALYST FOR COMPOSITION FOR THE PRODUCTION OF ORGANOHALOSILANES

Erhard Klar, Beachwood, and Azza Elattar, Lakewood, both of Ohio, assignors to SCM Metal Products, Inc., Cleveland, Ohio

Filed Aug. 20, 1987, Ser. No. 87,607

Int. Cl.[4] C07F 7/16

U.S. Cl. 556—472 **30 Claims**

1. A method of making organohalosilanes comprising effecting reaction between an organohalide and powdered silicon at a temperature above about 200° C. in the presence of a catalytically effective amount of catalyst containing copper and zinc, the source of zinc in said catalyst being selected from the group consisting of zinc carbonate, zinc formate, zinc acetate, zinc vinyl acetate, zinc propionate, zinc butyrate, zinc beta-chlorobutyrate and zinc gamma-chlorobutyrate.

4,824,985

NOVEL ROUTE TO $CA_8SI_4O_{12}CL_8$, ALKOXYCYCLOTETRASILOXANES, ARYLOXYCYCLOTETRASILOXANES, ALKYLCYCLOTETRASILOXANES AND ARYLCYCLOTETRASILOXANES FROM WOLLASTONITE (CA SIO_3)

George B. Goodwin, Mars, Pa., and Malcolm E. Kenney, Cleveland Heights, Ohio, assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 11, 1987, Ser. No. 60,703

Int. Cl.[4] C07F 7/08, 7/18

U.S. Cl. 556—460 **21 Claims**

1. A process comprising:

(A) mixing wollastonite with an alkaline metal halide or alkaline metal halide hydrate, or mixture thereof;

(B) calcining the mixture; and

(C) isolating the alkaline metal cyclic silicate halide salt.

4,824,986

METAL CHELATE PROTEIN CONJUGATE

Otto Gansow, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Apr. 26, 1985, Ser. No. 727,919

Int. Cl.[4] C07C 161/04, 79/40; C07D 207/40

U.S. Cl. 558—17 **2 Claims**

1. A substituted diethylenetriaminepentacetic acid (DTPA)

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having a side chain selected from the group consisting of alkyl group having straight or branched chain of 1 to 15 carbon atoms, straight or branched chain alkene group having 2 to 15 carbon atoms and alkyl aryl group having in the alkyl portion 1 to 15 carbon atoms in one or more branched or straight chains, attached to the carbon backbone of the DTPA and containing a functional group which is stable in a dilute aqueous solution at a pH for metal chelation in the range of from about 1 to about 7 and which reacts directly with amino acid residues of a protein to form a stable covalent linkage at conjugating pH's in the range of from about 6 to about 11, said functional group being either isothiocyanate or an N-hydroxysuccinimide ester.

4,824,987

METHOD OF PREPARING M-TRIFLUOROMETHYLPHENYL ACETONITRILE

Axel Kleemann, Mühlheim; Herbert Kleuk, Hanau; Klaus Huthmacher, Gelnhausen, and Dieter Most, Bruchköbel, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

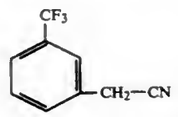
Filed May 23, 1988, Ser. No. 197,343

Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717434

Int. Cl.[4] **C07C** *120/00*

U.S. Cl. 558—348 **4 Claims**

1. A method of preparing m-trifluoromethylphenyl acetonitrile of the formula:



which comprises reacting m-trifluoromethyl toluene with cyanogen chloride in the gas phase at a temperature between 600° and 750° C.

4,824,988

PROCESS FOR RECOVERING CUPROUS IODIDE CATALYST USED IN SYNTHESIS OF (TRIFLUOROMETHYL)NAPTHALENES

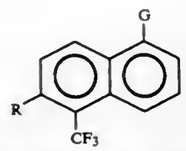
Roany W. Lin, and Venkataraman Ramachandran, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 26, 1987, Ser. No. 112,398

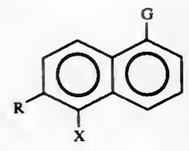
Int. Cl.[4] **C07C** *121/62, 69/76*

U.S. Cl. 558—423 **13 Claims**

1. In a process for preparing a (trifluoromethyl)naphthalene corresponding to the formula:



by reacting a halonaphthalene corresponding to the formula:



with a sodium, potassium, or trialkylammonium trifluoroacetate salt in the presence of cuprous iodide and a dipolar aprotic solvent to form the (trifluoromethyl)naphthalene and separating out the inorganic ingredients of the final reaction mixture in the recovery of the product, R in the formulas representing an alkoxy group containing 1–6 carbons, X representing bromo or iodo, and G representing —CN or —COOR" in which R" is a saturated hydrocarbyl group containing 1–10 carbons, the improvement which comprises washing the separated inorganic ingredients with an alkanol containing 1–10 carbons and an alkanoic acid containing 1–6 carbons and then with water to purify the cuprous iodide.

4,824,989

RECOVERY PROCESS

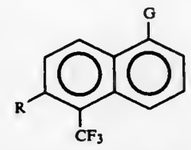
Gary D. Heidebrecht, Orangeburg, S.C., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 3, 1987, Ser. No. 21,162

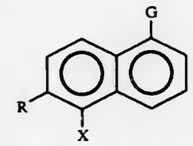
Int. Cl.[4] **C07C** *121/62, 69/76*

U.S. Cl. 558—423 **11 Claims**

1. In a process for preparing a (trifluoromethyl)napthalene corresponding to the formula:



by reacting a halonaphthalene corresponding to the formula:



with a sodium, potassium, or tetraalkylammonium trifluoroacetate salt in the presence of cuprous iodide and a dipolar aprotic solvent and recovering the product, R in the formulas representing an alkoxy group containing 1–6 carbons, X representing bromo or iodo, and G representing —CN or —COOR" in which R" is a saturated hydrocarbyl group containing 1–10 carbons, the improvement which comprises recovering the (trifluoromethyl)naphthalene by (1) replacing the dipolar aprotic solvent in the final reaction mixture with an alkane containing 6–12 carbons, (2) heating the resultant slurry to a temperature sufficient to dissolve the organic ingredients, (3) allowing the inorganic ingredients of the slurry to settle, (4) decanting the organic layer, and (5) cooling to precipitate the (trifluoromethyl)naphthalene.

4,824,990

COPOLYESTER PLASTICIZERS FOR POLYVINYL CHLORIDE

William J. Mertz, Cincinnati, and Robert J. Braun, Batavia, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 863,634, May 15, 1986, abandoned. This application Apr. 23, 1987, Ser. No. 41,503

Int. Cl.[4] **C07C** *69, 80*

U.S. Cl. 560—90 **20 Claims**

1. An improved copolyester plasticizer having an average molecular weight of 500° to 2000° and 100° F. kinematic viscosity of 600 to 2000 centistokes obtained by the reaction of (a) a mixture of a benzene dicarboxylic acid, anhydride or methyl ester thereof and an aliphatic saturated dicarboxylic acid having from 5 to 12 atoms or methyl ester thereof, said benzene dicarboxylic acid, anhydride or methyl ester being present in an amount from 40 to 60 equivalents percent, based on the total acid equivalents, and the aliphatic saturated dicarboxylic or methyl ester being present in an amount from 40 to 60 equivalent percent, based on the total acid equivalents, (b) a mixture of neopentyl glycol and ethylene glycol, said neopental glycol being present in an amount from 30 to 60 equivalent percent, based on the total alcohol equivalents, and said ethylene glycol being present in an amount from about 30 to 60 equivalent percent, based on the total alcohol equivalents, and (c) an aliphatic saturated monofunctional alcohol having from 6 to 13 carbon atoms or an aliphatic saturated monocarboxylic acid having from 6 to 13 carbon atoms or methyl ester thereof, said aliphatic saturated monofunctional alcohol or aliphatic saturated monocarboxylic acid being present in an amount from 8 to 30 equivalent percent, based on the total equivalents of alcohol or acid.

4,824,991

PROCESS FOR SEPARATING METHYL ISOCYANATE

George E. Heinsohn, Elkton, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 9, 1984, Ser. No. 639,083

Int. Cl.[4] **C07K** *69/00*

U.S. Cl. 560—352 **7 Claims**

1. A process for separating methyl isocyanate from a gas-phase mixture containing methyl isocyanate and water vapor comprising, in order

(a) removing a portion of the water vapor by cooling the mixture to a temperature above the dew point of the methyl isocyanate in the mixture to condense the water vapor; diluting the gas-phase mixture with nitrogen; and

(b) removing essentially all the remaining water vapor from the gas-phase mixture by absorbing the water vapor from the mixture; and

(c) liquefying the methyl isocyanate.

4,824,992

PROCESS FOR PRODUCING PYROMELLITIC ACID

Toru Tanaka; Tomiyoshi Furuta, and Kazue Suwa, all of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 104,892

Claims priority, application Japan, Nov. 20, 1986, 61-275329

Int. Cl.[4] **C07C** *51/265*

U.S. Cl. 562—416 **3 Claims**

1. A process for producing pyromellitic acid which comprises oxidizing 2,4,5-trimethylbenzaldehyde with a gas containing molecular oxygen at a reaction temperature in the range of 180° C. in the presence of a water solvent containing 0.5 to 12% by weight of bromine ion, 0.01 to 2.0% by weight of manganese ion and 0.1 to 10,000 weight of iron ion.

4,824,993

CYCLOPENTYL ETHERS AND THEIR PREPARATION AND PHARMACEUTICAL FORMULATION

Eric W. Collington, Knebworth; Harry Finch, Hitchin, and Duncan B. Judd, Ware, all of England, assignors to Glaxo Group Limited, London, England

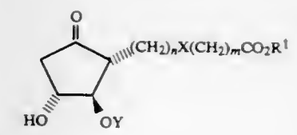
Continuation of Ser. No. 854,892, Apr. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 848,450, Apr. 4, 1986, abandoned, which is a continuation of Ser. No. 726,332, Apr. 23, 1985, abandoned. This application Sep. 11, 1987, Ser. No. 97,334

Claims priority, application United Kingdom, Apr. 23, 1984, 8410396; Apr. 23, 1985, 8510277

Int. Cl.[4] **C07C** *177/00*

U.S. Cl. 560—053 **20 Claims**

1. Compounds of the general formula (I)



(I)

wherein

n is 1 or 2;

m is 2–5 and X is cis or trans —CH=CH— or —CH-$_2$—CH_2—; or m is 1–4 and X is —CH=C=CH—;

R^1 is

(a) a hydrogen atom; C_{1-6} alkyl; C_{7-10} phenalkyl; or

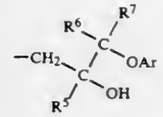
(b) phenyl [optionally substituted by C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkanoyl, methylthio, methylsulphinyl, methylsulphonyl, halogen, $—CO_2R^2$ [where R^2 is a hydrogen atom or C_{1-4} alkyl or phenyl], —NHCOR^2 [where R^2 is as defined above or is a phenyl group optionally substituted by hydroxyl, $CH_3CONH—$ or benzoylamino], $—CONR^3R^4$ [where R^3 and R^4 may be the same or different and are each a hydrogen atom or C_{1-4} alkyl group], $—NHCONH_2$, $—CH_2CH(CONH_2)NHCOCH_3$, or



or

(c) 2-naphthyl;

Y is



where R^5, R^6 and R^7 are each a hydrogen atom or a methyl group and at least one is a hydrogen atom, and

Ar is a phenyl group (optionally substituted by one or two C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulphinyl, C_{1-4} alkylsulphonyl, halogen or trifluoromethyl groups) and the salts of compounds in which R^2 is a hydrogen atom.

4,824,994

METHOD FOR PRODUCTION OF N-PROTECTED-ALPHA-L-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Satoji Takahashi, Ynkkaichi, and Katsumi Sugiyama, Yokosuka, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,498

Claims priority, application Japan, Sep. 30, 1983, 58-182529

Int. Cl.[4] **C07C** *101/02*

U.S. Cl. 560—38 **10 Claims**

1. A method for the production of N-carbobenzoxy-α-L-aspartyl-L-phenylalanine methyl ester, which comprises:

obtaining crystals of N-carbobenzoxy-L-aspartic anhydride wherein at least about 90% of said crystals have a particle diameter of not more than 130 μm;

reacting said crystals with L-phenylalanine methyl ester; and

isolating N-carbobenzoxy-α-L-aspartyl-L-phenylalanine methyl ester.

VOL 1101 ISS 4 AP 25 1989 UMI

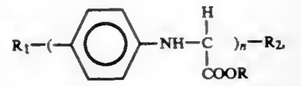
4,824,995

POLY-P-PHENYLAMINO CARBOXYLATE

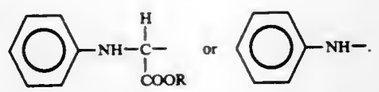
Neville E. Drysdale, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 66,126, Jun. 24, 1987. This application May 9, 1988, Ser. No. 193,195
Int. Cl.[4] C07C *101/44*
U.S. Cl. 560—44 3 Claims

1. A poly-p-phenylamino carboxylate having the following structure:



wherein n is greater than 1; R is a C_1 to C_6 alkyl group; and R_1 and R_2 are the same or different and are selected from the group:



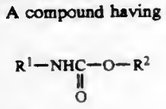
4,824,996

PHOSPHOLIPASE A2 INHIBITORS

William H. McGregor, Malvern, and Joseph Y. Chang, Berwyn, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 895,762, Aug. 12, 1986, abandoned. This application Nov. 6, 1986, Ser. No. 927,907
Int. Cl.[4] C07C *127/15*
U.S. Cl. 560—165 4 Claims

1. A compound having the formula



wherein
R^1 is alkyl of 8–22 carbon atoms;
R^2 is $-(CH_2)_nNR^4R^5$;
R^4 is hydrogen or lower alkyl;
R^5 is hydrogen or lower alkyl; and
n is 6–7.

4,824,997

METHOD FOR PREPARATION OF ALKYL GLYCOLATES

Alistair MacFarlane, Woodlands, Tex.; David R. Dyroff, and Robert V. Brill, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 25, 1988, Ser. No. 148,248
Int. Cl.[4] C07C *69/66*
U.S. Cl. 560—179 28 Claims

1. A method comprising:
bringing together in a reaction zone an aqueous formaldehyde concentrate comprising between about 60% by weight and about 85% by weight formaldehyde, carbon monoxide and a catalytic amount of sulfuric acid, in the absence of an effective amount of added Group IB cocatalyst, under a carbon monoxide partial pressure in said reaction zone of not greater than about 1.72×10^7 N/M^2 thereby effecting a carbonylation reaction in which a carboxylation product is produced comprising a mixture of compounds of the formula:

$HO(CH_2COO)_nH$

wherein n is an integer of at least 1 and in the range of from about 2% to about 10% by weight sulfuric acid.

12. A method for preparation of an alkyl glycolate by carbonylation of formaldehyde, the method comprising:
bringing together in a reaction zone an aqueous formaldehyde concentrate comprising between about 60% by weight and about 85% by weight formaldehyde, carbon monoxide and a catalytic amount of sulfuric acid, in the absence of an effective amount of added Group IB cocatalyst, the carbon monoxide partial pressure in said reaction zone being not greater than about 1.73×10^7 N/M^2, thereby effecting a reaction producing a carbonylation reaction mixture comprising in the range of from about 2% to about 10% by weight sulfuric acid and a mixture of polyglycolides having the formula:

$HO(CH_2COO)_nH$

wherein n is an integer of at least 1,
esterifying the polyglycolides contained in said carbonylation reaction, mixture without prior removal of the sulfuric acid, with an alcohol of the formula ROH to form an esterification product comprising an alkyl glycolate of the formula

wherein R is lower alkyl.

4,824,998

PROCESS FOR PRODUCING TAU-BUTYL METHACRYLATE

Kazutaka Inoue; Toshihiro Sato, and Masao Kobayashi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,453
Claims priority, application Japan, Nov. 27, 1986, 61-282990
Int. Cl.[4] C07C *69/52*
U.S. Cl. 560—205 5 Claims

1. A process for producing t-butyl methacrylate by a continuous process which comprises reacting methacrylic acid and isobutylene in the presence of a sulfonic acid group-containing ion exchange resin while controlling the reaction at a reaction temperature of −20° C. to +20° C. so as to satisfy the following condition:

$y<100-50x$

wherein x is the ratio of the total molar number of isobutylene and its reaction products to the total molar number of methacrylic acid and its reaction products and y is conversion (%) of isobutylene, followed by degassing the unreacted isobutylene, removing the low boiling substances by distillation under reduced pressure, and then sending the remainder to a t-butyl methacrylate purifying tower where a product of high purity is withdrawn from the distillate side and unreacted methacrylic acid is withdrawn from the tower bottom side and circulated to the reaction step.

4,824,999

PSYCHOTROPIC POLYCYCLIC IMIDES

Gary P. Stack, Merion, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 34,820, Apr. 3, 1987, Pat. No. 4,797,488. This application Sep. 23, 1988, Ser. No. 248,769
Int. Cl.[4] C07D *61/125*
U.S. Cl. 562—498 1 Claim

1. The compound which is 2,3,3a,3b,4,5,6,6a,7,7a-decahydro-4,6,7-metheno-1H-cyclopenta[a]pentalene-1,3-dicarboxylic acid.

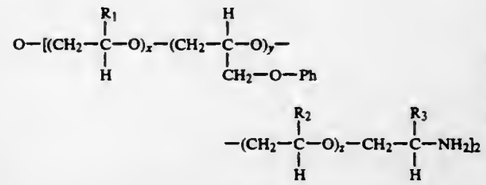
4,825,000

PHENYL GLYCIDYL ETHER MODIFIED POLYOXYALKYLENE DIAMINES AND EPOXY RESIN COMPOSITIONS THEREFROM

John M. Larkin; Robert L. Zimmerman; Michael Cascarida, and Harold G. Waddill, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 31, 1986, Ser. No. 891,086
Int. Cl.[4] C07C *93/06*
U.S. Cl. 564—347 6 Claims

1. A diamine having the formula:



wherein R_1 is hydrogen or an alkyl of 1 to 4 carbon atoms, R_2 is hydrogen or an alkyl of 1 to 4 carbon atoms, R_3 is an alkyl of 1 to 4 carbon atoms, Ph is phenyl, x ranges from 2 to 40, y ranges from 1 to 20 and z ranges from 1 to 40.

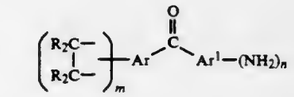
4,825,001

CYCLOBUTARENE KETOANILINE MONOMERIC AND POLYMERIC COMPOSITIONS

Kenneth J. Bruza, and Robert A. Kirchhoff, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 109,136, Oct. 16, 1987, Pat. No. 4,795,827. This application Aug. 26, 1988, Ser. No. 236,821
Int. Cl.[4] C07C *97/10*; C09B *11/02*
U.S. Cl. 564—328 6 Claims

1. A monomer of the formula:



wherein
Ar is an aromatic moiety having one valence on each of two adjacent carbon atoms of an aromatic ring;
Ar^1 is substituted or unsubstituted arylene;
each R is independently hydrogen, a monovalent electron donating moiety or a monovalent electron withdrawing moiety; and
each m and n is independently an integer of 1 or 2.

4,825,002

DECONTAMINATION OF (HYDROCARBYLTHIO) AROMATIC AMINES

Robert L. Davis, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 878,813, Jun. 26, 1986, abandoned. This application Nov. 2, 1987, Ser. No. 115,859
Int. Cl.[4] C07C *149/02, 149/04, 149.42*
U.S. Cl. 564—438 11 Claims

1. A process which comprises separating a Lewis acid from a (hydrocarbylthio)aromatic amine by intimately mixing at least about two molar proportions of a solid alkali metal hydroxide with a solution of one molar proportion of a Lewis acid in a (hydrocarbylthio)aromatic amine in the absence of a solubilizing agent for the alkali metal hydroxide and filtering the solids from the mixture.

4,825,003

PRODUCTION PROCESS OF 2-CHLOROPROPIONALDEHYDE

Hiroshi Ono, Fujisawa; Takaharu Kasuga, Kamakura; Shinji Kiyono, Yokohama, and Yoshihiro Fujita, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,218
Claims priority, application Japan, Sep. 17, 1986, 61-217301; Jul. 3, 1987, 62-165439; Jul. 8, 1987, 62-168566
Int. Cl.[4] C07C *45/50*
U.S. Cl. 568—490 12 Claims

1. In a process for producing 2-chloropropionaldehyde by reacting vinyl chloride, carbon monoxide and hydrogen in the presence of a rhodium compound and a trivalent organic phosphorus compound or the oxide of a trivalent organic phosphorus compound, the improvement which comprises carrying out the reaction at a temperature of 10° to 150° C. in the presence of:
(a) at least one acid selected from the group consisting of a halogen-substituted aliphatic carboxylic acid, a monovalent aromatic carboxylic acid, polyvalent aromatic carboxylic acid, a phosphonic acid, a phosphonous acid, a phosphinic acid and a phosphinous acid, or
(b) at least one compound selected from the group consisting of an oxide of an alkali metal, an oxide of an alkaline earth metal, a hydroxide of an alkali metal, a hydroxide of an alkaline earth metal, a weak acid salt of an alkali metal and a metal acid salt of an alkaline earth metal, or
(c) a buffer solution.

4,825,004

PROCESS FOR THE PRODUCTION OF ALKANE POLYOLS

Horst Rutzen, Langenfeld, and Gerhard Stoll, Waldkirch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,967
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719790
Int. Cl.[4] C07C *29/136, 31/22*
U.S. Cl. 568—864 18 Claims

1. A process for the production of alkane polyols which comprises reacting epoxidized fatty acids, epoxidized fatty acid esters or mixtures thereof with short-chain alkane carboxylic acid or alkali metal salts thereof under epoxide ring opening conditions to produce an ester alcohol of said epoxidized fatty acid or fatty acid ester, and passing the ester alcohol through a catalytic hydrogenation zone maintained under hydrogenation conditions to convert said ester alcohol to an alkane polyol, and thereafter recovering an alkanepolyol product.

4,825,005

PROCESS FOR THE PREPARATION OF AROMATIC ETHER AND THIOETHER COMPOUNDS

Christian Frey, Muttenz, Switzerland, and Bernd Dill, Rheinfelden, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,740
Claims priority, application Switzerland, Aug. 29, 1986, 3480/86
Int. Cl.[4] C07C *43/02*
U.S. Cl. 568—657 7 Claims

1. A process for the preparation of an aromatic ether or thioether compound of formula I

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by reacting a compound of formula



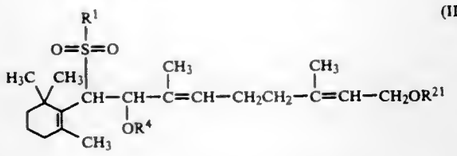
with a compound of formula

$$R_1—Y \quad \text{(III)}$$

wherein
R is a non-interfering substituent,
n is 0, 1 or 2,
X is oxygen, sulfur or $—SO_2$,
R_1 is alkyl having 1 to 6 carbon atoms which is unsubstituted or substituted by pyrrolidine, alkenyl having 1 to 6 carbon atoms, phenyl, naphthyl or anthraquinoyl and
Y is a halogen atom,
in the presence of an acid acceptor and in an aliphatic ketone as solvent, which process is carried out at a pressure of 0.5 to 10 bar in the temperature range from 115° to 200° C.

4,825,006
PROCESS FOR PRODUCING VITAMIN A OR ITS CARBOXYLIC ACID ESTERS, AND INTERMEDIATE COMPOUNDS USEFUL FOR THE PROCESS
Junzo Otera, Okayama, Japan; Tadakatsu Mandai, Ithaca, N.Y., and Mikio Kawada, Okayama, Japan, assignors to Kuraray Co., Ltd., Okayama, Japan
Filed Dec. 3, 1985, Ser. No. 804,252
Claims priority, application Japan, Jan. 10, 1985, 60-2964; Mar. 1, 1985, 60-41667; Oct. 11, 1985, 60-227549; Oct. 11, 1985, 60-227550; Oct. 16, 1985, 60-232073; Oct. 16, 1985, 60-232074
Int. Cl.⁴ C07C *147/00*
U.S. Cl. 568—32 **11 Claims**

1. A compound represented by the formula



(IIa)

wherein R^1 represents an aryl group which may be substituted, R^{21} represents a lower alkanoyl group and R^4 represents a hydrogen atom; or R^{21} represents a hydrogen atom or a lower alkanoyl group and R^4 represents an acetal-type protective group for a hydroxyl group.

4,825,007
OXIDATION PROCESS OF AROMATIC COMPOUNDS
Yutaka Konai; Kazuo Yoshida, and Masatoshi Hino, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Japan
Filed Nov. 4, 1987, Ser. No. 116,734
Claims priority, application Japan, Nov. 7, 1986, 61-263840
Int. Cl.⁴ C07C *27/16*
U.S. Cl. 568—815 **13 Claims**

1. A process for the oxidation of an aromatic compound selected from benzene and biphenyl compounds containing at least one isopropyl group, said process including oxidizing the aromatic compound to convert at least one of said at least one isopropyl group into a 2-hydroxy-2-propyl group, which process comprises oxidizing the aromatic compound with molecular oxygen in the presence of an aqueous alkali solution in an oxidative reaction vessel, said vessel being made of nickel at parst thereof which come into contact with a reaction mixture.

4,825,008
ACETYLKETENE DIALKYL ACETALS AND A PROCESS FOR THEIR PREPARATION
Klaus Günther, Eppstein, and Günter Mau, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 28, 1987, Ser. No. 138,309
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1986, 3644661
Int. Cl.⁴ C07C *45/64*
U.S. Cl. 568—391 **7 Claims**

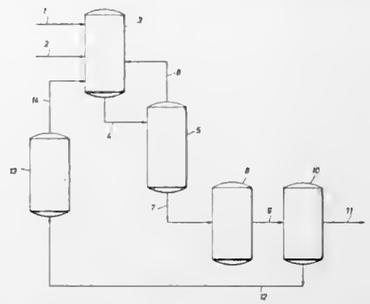
1. A process for the preparation of acetylketene dialkyl acetals of the formula $CH_3CO—CH=C(OR^2)_2$, in which R^2 can be an alkyl radical with 1 to 12 carbon atoms, which process comprises reacting an alkyl acetoacetate of the formula $CH_3CO—CH_2COOR^1$ in the presence of an acid catalyst with a saturated primary or secondary alcohol of the formula R^2OH, in which R^2 has the above mentioned meaning and R^2OH is either identical with R^1OH or is higher boiling than R^1OH.

4,825,009
PREPARATION OF NONIONIC SURFACTANTS
Charles L. Edwards, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Continuation of Ser. No. 812,604, Dec. 23, 1985, Pat. No. 4,721,816. This application Sep. 29, 1987, Ser. No. 102,196
The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.
Int. Cl.⁴ C07C *41/03*
U.S. Cl. 568—618 **18 Claims**

1. A process for the preparation of an alkanol alkoxylate product characterized by a narrow-range alkylene oxide adduct distribution and by a low content of residual alkanol, which comprises contacting and reacting an alkylene oxide reactant comprising one or more C_2 to C_4 vicinal alkylene oxides with an alkanol reactant comprising one or more C_6 to C_{30} alkanols in the presence of a catalytically effective amount of a catalyst prepared by contacting (i) one or more sulfur-containing acids and (ii) one or more aluminum compounds selected from the group consisting of aluminum alcoholates and aluminum phenolates, the molar ratio of (i) to (ii) being in the range from about 0.1:1 to 2:1.

4,825,010
ISOMERIZATION OF BY-PRODUCTS OF BI-PHENOL SYNTHESIS
Simon M. Li, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 19, 1987, Ser. No. 109,894
Int. Cl.⁴ C07C *37/68, 39/16*
U.S. Cl. 568—724 **24 Claims**

1. A process for isomerizing the by-products from the preparation of a desired bis-phenol having a 4,4'-dihydroxy form which comprises treating the by-products from the preparation of the desired bis-phenol from the condensation of a ketone with a phenol, at about 50° C. to about 110° C. and at about ambient pressure with a catalytic amount of a sulfonated cationic exchange resin having a plurality of sulfonic acid site



ionically bonded to an alkylmercaptoamine and a minor amount of water up to about 1.5 percent weight based on the isomerization reaction solution to isomerize the undesired by-products and recovering a product having a higher concentration of the desired bis-phenol.

4,825,011
METHOD OF PREPARING SUBSTITUTED DIHYDROXY-BENZENES
Karl-Heinz Drauz, Freigericht; Axel Kleeman, Mühlheim; Günter Prescher, and Gebhard Ritter, both of Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Fed. Rep. of Germany
Filed Dec. 4, 1987, Ser. No. 128,605
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643206
Int. Cl.⁴ C07C *37/60, 41/00*
U.S. Cl. 568—771 **9 Claims**

1. In a method of preparing a substituted dihydroxybenzene or a substituted dihydroxybenzene monoalkyl ether by nuclear hydroxylation of a substituted phenol selected from the group consisting of phenols and phenyl alkyl ethers with hydrogen peroxide;
the improvement which comprises forming a mixture which consists essentially of said substituted phenol, aqueous hydrogen peroxide and a catalyst selected from the group consisting of sulfur dioxide and selenium dioxide, and reacting the hydrogen peroxide with said substituted phenol.

4,825,012
INVERSION OF ALLYLIC ALCOHOLS
Andrea Leone-Bay, Ridgefield, Conn., assignor to Akzo America Inc., New York, N.Y.
Filed Dec. 7, 1987, Ser. No. 129,494
Int. Cl.⁴ C07C *29/58, 33/03*
U.S. Cl. 568—902 **2 Claims**

1. A process for the inversion of an allylic 1-hydroxy alcohol to an allylic 3-hydroxy alcohol which comprises:
(a) epoxidizing the allyl group of the allylic 1-hydroxy alcohol of the formula $R_2C=CR—CR_2—OH$, where R is hydrogen, to form a 2,3-epoxy-1-hydroxy alcohol species;
(b) halogenating the product from step (a) to form a 1,2-dihalo-3-hydroxy alcohol; and
(c) dehalogenating the product from step (b) to form the desired allylic 3-hydroxy alcohol of the formula $R_2C(OH)CR=CR_2$.

4,825,013
PREPARATION OF ETHANOL AND HIGHER ALCOHOLS FROM LOWER CARBON NUMBER ALCOHOLS
George J. Quarderer; Rex R. Stevens; Gene A. Cochran, and Craig B. Murchison, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 668,598, Nov. 5, 1984, abandoned. This application Feb. 16, 1988, Ser. No. 154,536
Int. Cl.⁴ C07C *29/00, 27/00, 31/08, 31/10*
U.S. Cl. 568—902.2 **10 Claims**

1. A process comprising contacting a mixture of hydrogen, carbon monoxide and one or more lower alcohols with a heterogeneous catalyst consisting of:
(1) a molybdenum metal, sulfide, oxide, carbide or a mixture thereof;
(2) an alkali or alkaline earth element or a mixture thereof in free or combined form;
(3) optionally a cobalt, nickel or iron, metal, sulfide, oxide or carbide or a mixture thereof;
(4) optionally an alumina, silica or carbon support;
under conditions sufficient to convert at least some of the one or more lower alcohols to higher alcohols.

4,825,014
PROCESS FOR PREPARING CHLOROTRIFLUOROMETHYLBENZENE
Yohnosuke Ohsaka, and Heikitsu Sonoyama, both of Osaka, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan
Continuation of Ser. No. 414,045, Sep. 2, 1982, abandoned. This application Jan. 15, 1988, Ser. No. 206,664
Claims priority, application Japan, Sep. 3, 1981, 56-139442; Oct. 15, 1981, 56-165460; Nov. 10, 1981, 56-181471
Int. Cl.⁴ C07C *17/14, 21/24*
U.S. Cl. 570—144 **12 Claims**

1. A process for preparing chlorotrifluoromethylbenzene which comprises reacting chlorotoluene, hydrogen fluoride and chlorine in a gaseous phase in the presence of a catalyst selected from the group consisting of α-aluminum fluoride carrying one or more salts of iron, bismuth, tin and lead, and chromium(III) oxide or partially fluorinated chromium(III) oxide carrying alkali metal fluoride.

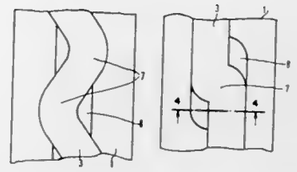
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4,825,015

ELECTROMAGNETIC SHIELDING ARRANGEMENT

Albert Prott, Bremen; Peter W. Prendel, Weyhe; Wilfried H. K. Kandler, Achim, and Jürgen Sandkuhl, Weyhe-Leeste, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,770
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703788
Int. Cl.[4] H05K *9/00*; G12B *17/02*; F16J *15/12*; B65D *53/00*
U.S. Cl. 174—35 GC
6 Claims



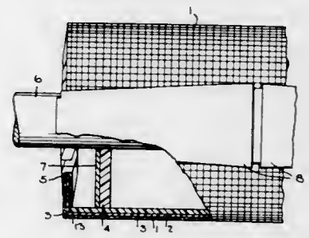
1. An electromagnetic shielding arrangement with a stranded soft elastic shielding body having a substantially constant cross-section which is arranged between two housing parts having an electrically conducting surface in a groove of one of the housing parts, which groove receives the major part of the cross-section of the shielding body with lateral clearance, characterized in that the groove changes its direction essentially at several substantially uniformly distributed points by a radius of the order of the width of the groove.

4,825,016

FLAME-RESISTANT CABLE SLEEVE

Hans-Jurgen Meltsch, Hagen; Jan Rost, Traubing; Albin Behmer, and Ernst Mahler, both of Lichtenfels, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 4, 1986, Ser. No. 826,090
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1985, 3503732
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—93
6 Claims



1. A flame-resistant cable sleeve, comprising: a tubular thermoplastic body open at both ends having an exterior surface covered with a metal foil layer and a wire fabric superposed on said metal foil layer;

a longitudinal opening in the tubular body for receiving a cable and means for sealing the opening;

a pair of washer-like bodies for securing the tubular body to a cable and sealing its open end; and

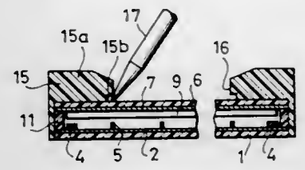
said washer-like bodies having exterior surfaces covered with metal foil.

4,825,017

COORDINATES INPUT DEVICE

Hidetoshi Hobara, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 24, 1987, Ser. No. 101,010
Claims priority, application Japan, Dec. 1, 1986, 61-183682
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18
2 Claims



1. In a coordinates input device including first collecting electrodes disposed at both edges of a first resistive film and parallel to each other, second collecting electrodes disposed at both edges of a second resistive film and parallel to each other, said first and second resistive films being disposed opposite to each other with said first and second collecting electrodes meeting at right angles to each other, and plural auxiliary electrodes disposed on said first and second resistive films and parallel to said respective first and second collecting electrodes, said coordinates input device comprising:

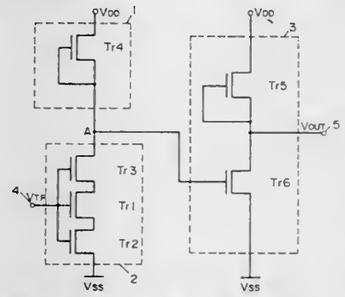
an unusable region disposed between said first or second collecting electrode and the respective auxiliary electrode disposed adjacent thereto.

4,825,018

VOLTAGE DETECTION CIRCUIT

Yasuyuki Okada, Takatsuki; Makoto Kojima, Suita, and Hirozumi Misaki, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 20, 1988, Ser. No. 197,450
Claims priority, application Japan, May 20, 1987, 61-122932
Int. Cl.[4] G05F *1/565*
U.S. Cl. 323—351
7 Claims



1. A voltage detection circuit comprising:

a serially connected voltage detecting transistor and a load between a constant voltage power supply terminal and a reference potential, in which at least a portion of gate insulation film of a gate of said voltage detecting transistor is formed thick; and

a logic gate whose input terminal is connected to a connecting point of said voltage detection transistor and said load;

whereby, when potential applied to said gate of said voltage detection transistor reaches a predetermined voltage, an output from said logic gate is inverted by a potential of said connecting point.

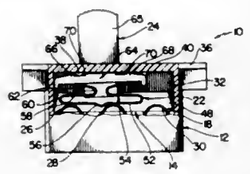
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4,825,019
CURSOR CONTROL ACCESSORY FOR A COMPUTER KEYBOARD
David H. Fisher, 1950 Foxborrough Ct., Hayden Lake, Id. 83835
Filed Apr. 14, 1988, Ser. No. 181,483
Int. Cl.[4] H01H *13/70, 25/00*
U.S. Cl. 200—6 A 27 Claims



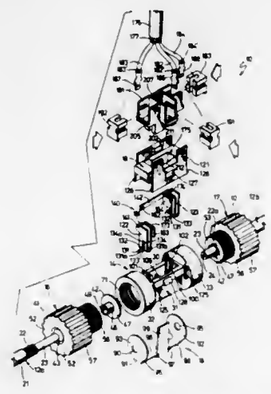
1. A cursor control accessory for a computer keyboard having a plurality of cursor control keys arranged about a keyboard housing in an array of projecting movable keys arranged about a central key, the attachment comprising:
a base adapted to overlay the array of keys;
an inwardly extending recess presented at one side of the base member adapted to freely receive a central key in the array;
and a plurality of key engaging surfaces at the one side of the base member, the key engaging surfaces being adapted to respectively overlie selected individual cursor control keys in the array for engaging and depressing selected cursor control keys in response to rocking movement of the base relative to the keyboard housing.

4,825,020
SLIDE SWITCH
Chepur P. Rao, North Kingstown, and Juan J. Barrena, Providence, both of R.I., assignors to Tower Manufacturing Corportion, Providence, R.I.
Filed Apr. 14, 1988, Ser. No. 181,663
Int. Cl.[4] H01H *15/00*
U.S. Cl. 200—16 D 12 Claims



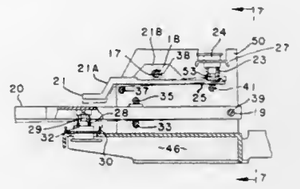
1. A slide switch comprising a housing, spaced, substantially aligned first, second and third first contacts in said housing, a movable contact member in said housing, and slide means for slidably moving said movable contact member between a first position wherein it is in engagement with said first and second fixed contacts but in spaced disengagement from said third fixed contact and a second position wherein it is in engagement with said second and third fixed contacts but in spaced disengagement from said first fixed contact, said movable contact member being integrally formed of a resilient conductive sheet metal and including an elongated contacting portion having opposite first and second ends, said contacting position being alternatively simultaneously engageable with either said first and second fixed contacts or said second and third fixed contacts, and first and second biasing portions extending from said first and second ends, respectively, said first and second biasing portions including first and second inwardly extending portions which are spaced from said contacting portion and extend inwardly in converging relation from said first and second ends, respectively, to spaced first and second bends, respectively, and outwardly extending portions which extend outwardly in diverging relation from said first and second bends and are spaced from said inwardly extending portions, said inwardly extending portions and said outwardly extending portions cooperating to alternatively resiliently bias said contacting portion toward said first and second fixed contacts or said second and third fixed contacts.

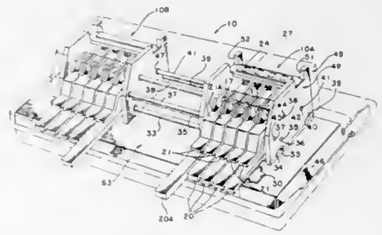
4,825,021
ELECTRICAL TAP CONNECTOR ASSEMBLY
William V. Pauza, Palmyra, Pa., assignor to Amp Incorporated, Harrisburg, Pa.
Division of Ser. No. 13,748, Feb. 12, 1987, Pat. No. 4,744,775.
This application Feb. 12, 1988, Ser. No. 155,663
Int. Cl.[4] H01R *33/96*
U.S. Cl. 200—504 5 Claims



1. A tap connector assembly for coaxial cable networks, comprising:
a receptacle tap connector adapted to be incorporated within said cable network, said receptacle tap connector comprising:
a connector housing; first and second signal-carrying contacts in said housing adapted to be connected to signal-carrying conductors in first and second electrical cables, respectively, in the cable network; and
normally closed switch means electrically connecting said first and second signal carrying contacts for providing a first signal path between said first and second signal-carrying contacts; and
a plug connector mateable with said receptacle tap connector to tap into said cable network, said plug connector including:
first and second electrical terminals for engaging said first and second signal-carrying contacts when said plug connector is mated with said receptacle tap connector for providing a second signal path between said first and second signal-carrying contacts through said plug connector;
means for opening said normally closed switch means when said plug connector is mated with said receptacle tap connector for interrupting said first signal path,
a third grounding contact in said connector housing adapted to be connected to corresponding conductive outer sheaths of said first and second cables, respectively, and
said plug connector includes a third contact terminal for engaging said third grounding contact when said plug connector is mated with said receptacle tap connector.

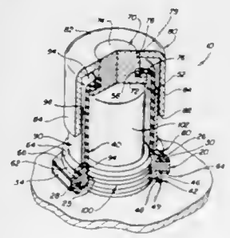
4,825,022
MAIL SORTING COMPUTER KEYBOARD
Gary C. Butts, Orange County, Calif., assignor to Labworks Inc., Huntington Beach, Calif.
Filed Oct. 27, 1986, Ser. No. 923,187
Int. Cl.[4] H01H *3/20*
U.S. Cl. 200—343 2 Claims





1. A keyboard comprising:
a plurality of keys, said plurality of keys being disposed in substantial transverse alignment with one another, each key of said plurality of keys having an aperture extending transversely therethrough; said plurality of keys further comprising a first group of keys having a front portion, and a rearward portion disposed in a first plane and a second group of keys disposed in a second plane, said second group of keys having a front portion and being disposed under said first group of keys and in substantial cross-sectional alignment therewith;
a means for pivotally supporting said keys, said means for pivotally supporting being disposed through each of said apertures thereby providing a pivot means for each of said keys; said means for pivotally supporting comprising a first rod disposed transversely through said first group of keys and a second rod disposed transversely through said second group of keys such that said first rod, said second rod and said apertures collectively provide first and second pivot means for, respectively, said first group of keys and said second group of keys;
a first means for limiting the extent of pivotal movement, in a first direction, of said keys, said first means for limiting being transversely and fixedly disposed adjacent said keys;
said first means for limiting comprising:
a third rod transversely extending across said keyboard and under said front portion of said first group of keys thereby limiting the extent of underline pivotal movement of said front portion of each key, of said first group of keys;
a fourth rod disposed underneath and transversely extending across a front portion of said second group of keys, thereby limiting the extent of downward movement, of said front portion of said second group of keys;
said second means for limiting comprising:
a fifth rod disposed below and transversely extending across said rearward portion of said first group of keys thereby limiting the extent of upward pivotal movement of said front portion of said first group of keys;
a sixth rod disposed above and transversely extending across said front portion of said second group of keys such that said sixth rod limits the extent of upward pivotal movement of said front portion of each of said second group of keys;
wherein said first means for limiting and said second means for limiting collectively and fixedly define the range of pivotal movement of each of said plurality of keys thereby substantially eliminating the need for readjustment and realignment of said keyboard.

4,825,023
ARMORED AXIALLY DISPLACEABLE SEALING APPARATUS
Milton Morse, Fort Lee, N.J., assignor to Nena Morse, Fort Lee, N.J.
Filed Sep. 22, 1986, Ser. No. 910,009
Int. Cl.[4] H01H *13/06*; F16J *15/32*
U.S. Cl. 200—302.2 9 Claims



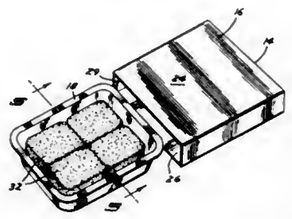
1. An axially displaceable armored seal to seal push button type switches to an opening in a panel surface comprising:
a nut;
a lower nut sealing means on the underside of the nut;
an upper nut sealing means on the upper side of the nut;
a flexible upper sealing member connected to the upper nut sealing means adapted to receive a plunger of a push button type switch;
an armored cap;
means connecting the armored cap to the upper flexible sealing member to form a cavity about a plunger of a push button switch;
said armored cap displaceable to contact a plunger in the cavity formed with the flexible sealing means and displace the plunger along its displaceable axis; and
armored cap displacement guide means extending from said upper nut sealing means to guide said armored cap.

4,825,024
SOLID STATE CERAMIC MICROWAVE HEATING SUSCEPTOR UTILIZING COMPOSITIONS WITH METAL SALT MODERATORS
Jonathan Seaborne, Corcoran, Minn., assignor to General Mills, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 56,201, Jun. 1, 1987. This application Oct. 19, 1987, Ser. No. 110,247
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E 19 Claims

1. A package article for food to be heated by microwave energy in a microwave oven comprising:
a tray for holding a food item having a top and bottom surface,
a substantially planar microwave heating susceptor disposed within said tray, said microwave heating susceptor fabricated from a ceramic composition, comprising:
(a) a ceramic binder;
(b) a ceramic susceptor material which absorbs energy and having a neutral lattice charge; and

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(c) a metal salt temperature profile moderator, wherein the composition is unvitrified, and wherein the susceptor is in

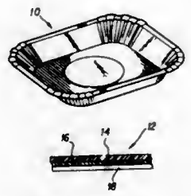


intimate physical contact with the food item and ranges in thickness from about 0.3 to 8 mm.

(c) support means for providing structural support for said interactive layer and said plastic film, said support means being formed of paper stock material having sufficient structural stability at the high temperature necessary for heating the surface of the quantity of food to maintain its physical shape; wherein said laminate is formed by the process including the successive steps of vacuum depositing said microwave interactive layer onto a smooth surface of said plastic film followed by the step of bonding directly said plastic film upon which said microwave interactive layer has been vacuum deposited to one side of said paper stock material in a manner to cause said plastic film and said microwave interactive layer to be held in bonded relationship with said support means to cause the surface of a quantity of food, when in heat transfer relationship therewith, to be heated when the laminate is subjected to microwave energy.

4,825,026
Patent Not Issued For This Number

4,825,025
FOOD RECEPTACLE FOR MICROWAVE COOKING
Oscar E. Seiferth, Madison, Wis., assignor to James River Corporation, Richmond, Va.
Continuation of Ser. No. 9,264, Jan. 30, 1987, abandoned, which is a division of Ser. No. 820,593, Jan. 2, 1986, Pat. No. 4,641,005, which is a continuation of Ser. No. 21,258, Mar. 16, 1979, abandoned. This application Feb. 4, 1988, Ser. No. 153,505
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E **40 Claims**



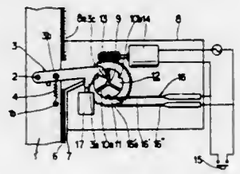
1. A laminate for use in a disposable container adapted to heat the surface of a quantity of food when exposed to microwave energy, said laminate comprising

(a) a continuous microwave interactive layer of electrically conductive metal having a thickness which is sufficiently small to cause said microwave interactive layer, when subjected to microwave energy, to heat up to a temperature which is sufficient to heat the surface of food in heat transfer relationship therewith,

(b) protective means for said microwave interactive layer, said protective means including a smooth surfaced plastic film having sufficient stability at high temperature that it will not degrade when the laminate is subjected to sufficient microwave energy to heat the surface of the quantity of food, and

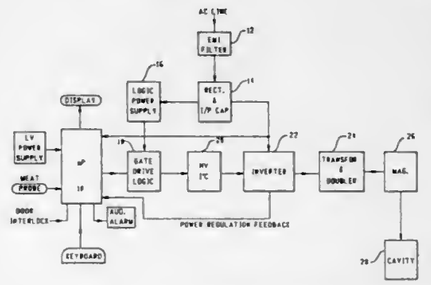
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4,825,027
MICROWAVE OVEN DOOR LATCH ASSEMBLY
Cha H. Yoon, Changwon, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Sep. 28, 1987, Ser. No. 101,447
Int. Cl.[4] H05B *6/76*
U.S. Cl. 219—10.55 C **9 Claims**



1. In a microwave oven having a housing, a door and a door latch assembly, said door latch assembly including a pawl-engaging means secured to said housing and a pawl secured to said door that co-acts with said pawl-engaging means to lock or release said door, the improvement in said door latch assembly comprising a worm coupled to a drive motor mounted to said housing, a primary electrical switch in circuit with said drive motor for activating same, a secondary electrical switch wired in parallel with said primary electrical switch and having one terminal which is movable for maintaining said circuit temporarily closed, a switching wheel having at least one first element thereon for releasably engaging said pawl, said switching wheel being rotatably mounted in said housing, a worm gear fixed to and rotatable with said switching wheel and engaging said worm, said switching wheel having at least one second element thereon for releasably engaging said terminal of said secondary electrical switch for activating same, said primary electrical switch when actuated starting said drive motor and worm to rotate said worm gear and switching wheel, rotation of said switching wheel driving said terminal of said secondary electrical switch to actuate same and maintain said circuit in closed condition even after said primary electrical switch is deactivated with further rotation of said switching wheel causing said at least one first element thereon to engage and drive said pawl from its engagement with said pawl-engaging means and thereby release said door to open.

4,825,028
MAGNETRON WITH MICROPROCESSOR POWER CONTROL
Peter H. Smith, deceased, late of Anchorage, Ky. (by Pamela Sheila Smith, executor), assignor to General Electric Company, Louisville, Ky.
Filed Dec. 28, 1987, Ser. No. 138,137
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 B **27 Claims**



27. The microwave energy generating system comprising:

a magnetron operable to generate microwave energy for cooking;

a power transformer having a primary and a magnetron powering secondary;

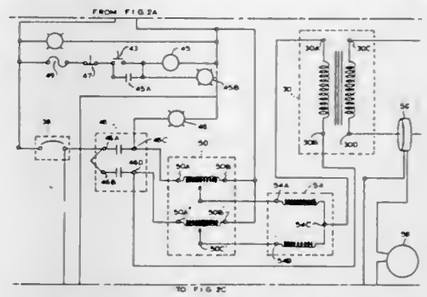
an inverter connected to supply power to said primary by selectively switching controlled switches;

a control circuit for controlling the operation of said inverter, said control circuit having an oscillator and operable to generate gating pulses to switch said controlled switches;

a magnetron sensor for generating a signal depending on the magnetron power; and

a microprocessor connected to receive the signal from said magnetron sensor and operable to adjust the operation of the inverter for changing the magnetron power until the signal from said magnetron sensor is brought to a set point corresponding to a desired magnetron power, and wherein the microprocessor is operable to adjust the operation of the inverter for changing the magnetron power without changing the duty cycle of the gating pulses.

4,825,029
SPARK EROSION SYSTEM FOR REDUCING THE HEIGHT OF A HONEYCOMB SEAL
Kenneth J. Otto, Jupiter, Fla., assignor to Wickes Companies, Inc., Santa Monica, Calif.
Filed Jan. 2, 1987, Ser. No. 57,876
Int. Cl.[4] B23H *7/14, 7/12;* H02H *3/08*
U.S. Cl. 219—69.19 **5 Claims**



1. An apparatus for machining metal substrates comprising:

a spindle unit including a spindle shaft and a spindle motor for rotating said shaft;

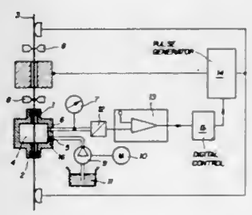
means for supplying power to said spindle motor;

means for supplying power to said spindle shaft including a dual circuit variable voltage autotransformer, said autotransformer including a pair of output terminals, a choke transformer including a pair of input terminals and an output terminal, said input terminals of said choke transformer being connected, respectively, to said pair of output terminals of said autotransformer, and a step-down power transformer, said output terminal of said power transformer being connected to said spindle shaft;

means for detecting the output current of said power transformer, and

means for cutting off power to said spindle shaft when said output current from said power transformer exceeds a certain amperage.

4,825,030
DEVICE AND PROCESS FOR PREVENTING THE BREAKING OF A METAL WIRE
René Demellayer, Geneve, Switzerland, assignor to Charmilles Technologies S.A., Meyrin, Switzerland
Filed Jan. 4, 1988, Ser. No. 140,389
Claims priority, application Switzerland, Jan. 13, 1987, 95/87
Int. Cl.[4] B23H *7/02;* G01B *13/08*
U.S. Cl. 219—69.12 **17 Claims**



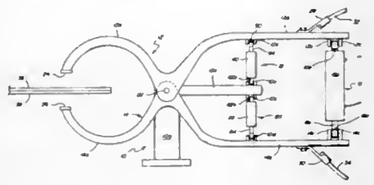
1. A device for preventing the breaking of a metal wire passing between two guide heads, said device comprising:

means for evaluating the wear on said wire by monitoring the variation with time of a cross-section of the wire at an outlet of the machining zone, said means for evaluating further comprising;

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means for holding fluid under pressure arranged at said outlet of said machining zone; said means for holding having at least one opening for accepting said wire;
means for injecting fluid under pressure through said means for holding fluid;
means for measuring an outflow of fluid through said opening of said means for holding; and
at least one comparator for comparing a measurement of said outflow of fluid to a predetermined reference value,
at least one apparatus for sending a signal for controlling at least one machining parameter, said apparatus automatically sending said signal in response to a predetermined relationship between said outflow measurement and said predetermined value established in said at least one comparator.

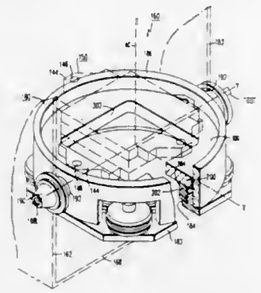
4,825,031
WELD GUN CONTROL
Robert J. Heideman, Westland, Mich., assignor to Enertrols, Inc., Westland, Mich.
Filed Jan. 21, 1987, Ser. No. 5,682
Int. Cl.[4] B23K *11/10*
U.S. Cl. 219—89 **18 Claims**



1. A weld gun assembly comprising:
(A) a support structure:
(B) a pair of arm members each having first and second ends and each pivotally mounted intermediate its ends on said support structure;
(C) a weld tip at said first end of each arm member;
(D) a power member interconnected between said second ends of said arm members and operative when actuated to move said weld tips together in a closing direction; and
(E) control means comprising an adjustable hydraulic cushioning assembly operative to adjustably control the closing movement of each of said tips, so as to allow said adjustable hydraulic cushioning assembly to be adjusted to assure that each of said weld tips engages members to be welded at substantially the same time.

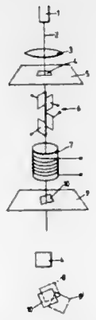
4,825,032
WORKPIECE HANDLING ASSEMBLY
Robert Duncan, Fork, S.C., assignor to Westinghous Electric Corp., Pittsburgh, Pa.
Filed Aug. 31, 1987, Ser. No. 91,472
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.63 **14 Claims**

1. A workpiece handling assembly for movably positioning each side of a multi-sided workpiece in the path of a welding laser beam, comprising:
a frame movable in a plane perpendicular to the direction of the welding laser beam, said frame having a central opening therein through which the welding laser beam may be projected;
a carrier rotatably mounted on the frame for securing the workpiece within the frame in a plane in parallel overlying relationship with the frame;
the frame being rotatably supported about a transverse axis parallel to the opening, and the carrier being rotatably supported on the frame about a central axis orthogonal to the transverse axis; and
the workpiece being movable through an angle of 360° about



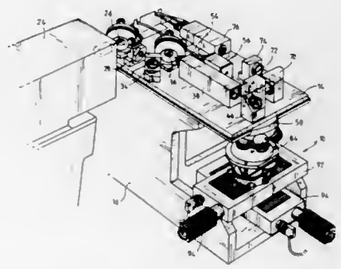
the transverse axis and through an angle of 360° about the central axis, so that all sides of the workpiece are movable into the path of the welding laser beam without removing the workpice from the assembly.

4,825,033
VARIABLE SHAPED SPOT ELECTRON BEAM PATTERN GENERATOR
James P. Beasley, Lower Kingswood, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 12, 1987, Ser. No. 119,591
Claims priority, application United Kingdom, Nov. 24, 1986, 8628058
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121.25 **5 Claims**



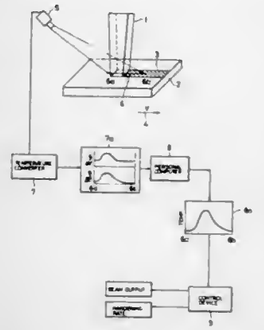
1. An electron beam pattern generator comprising an electron gun for emitting an electron beam, a first rectangular aperture for shaping the cross-section of the electron beam into a rectangular shape, an electron-optic lens focusing an image of the first rectangular aperture on the plane of a second rectangular aperture, a beam shaper deflection system for deflecting the image over the plane of the second rectangular aperture, means for projecting the electron beam emerging from the second aperture onto a target plane to form a shaped beam spot by overlap of the image of the first aperture on the second aperture, and means for scanning the shaped beam spot on the target plane to generate a pattern, characterised in that the electron-optic lens is a magnetic lens having reversible magnetic flux, in that the magnetic flux of the lens produces a rotation of the focused image of 22.5+45 n degrees where n=0, 1, 2, etc., in that one flux direction places the sides of the focused image of the first rectangular aperture parallel to the sides of the second rectangular aperture, the beam shaper deflection system being energisable so that the overlap of the images defines a rectangle, and in that the other flux direction places the sides of the focused image of the first rectangular aperture at 45 degrees to the sides of the second rectangular aperture, the beam shaper deflection system being energisable so that the overlap of the images defines a 45 degree right angled triangle.

4,825,034
MICROBEAM LASER MACHINE FOR ACTING ON OBJECTS HAVING THIN LAYERS OF MATERIAL
Geoffroy Auvert, Grenoble; Jean-Claude Georgel, Lambesc, and Yves Guern, Saint Maximin, all of France, assignors to Etat Francais (Centre National d'Etudes des Telecommunication), Issy-les-Moulineaux, France
Filed Dec. 22, 1987, Ser. No. 136,349
Claims priority, application France, Dec. 23, 1986, 86 18079
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.72 **19 Claims**



1. A microbeam laser machine for acting on objects having thin layers of materials, such as integrated circuits, for example for cutting said layers, the machine comprising a continuous laser, a microscope for focusing the laser beam on a particular point of the object and for observing the point of impact of the laser beam on the object, and a rigid platen, indeformable, and insensitive to vibrations, said platen being located between the outlet from the laser and the object and having removably fixed thereon the microscope and optical components for defining three optical paths including independent adjustment means and comprising:
a laser beam transmission path extending from the outlet of the laser towards the object through the microscope;
an illumination path for transmitting an illumination beam towards the object through the microscope; and
a video observation path extending from the object towards electronic means and a video display screen through the microscope,
said three optical paths being independent from one another on said platen upstream of the microscope and being permanently gathered by means of a dichroic plate at the inlet of the microscope, to permit to continuously observe the action of the laser bean on the object.

4,825,035
CONTROL APPARATUS FOR ENERGY BEAM HARDENING
Masaharu Moriyasu; Takeshi Morita; Seigo Hiramoto; Osamu Hamada, and Megumi Ohmine, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 4, 1987, Ser. No. 93,270
Claims priority, application Japan, Sep. 20, 1986, 61-223365; Sep. 20, 1986, 61-223366; Jun. 3, 1987, 62-139179
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.61 **12 Claims**

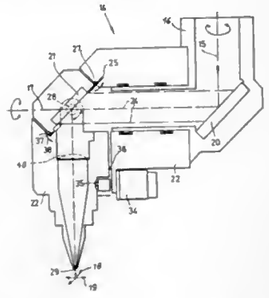


1. A control apparatus for energy beam surface hardening, comprising:
(a) an electromagnetic wave detector (5) for detecting an electromagnetic wave irradiated from a surface portion (6) of a workpiece (2) onto which a high intensity energy beam (1) is incident,
(b) a temperature converter (7) for converting a detection signal from the electromagnetic wave detector into two dimensional temperature distribution data (7*a*),
(c) means (8) for processing temperature distribution data from the temperature converter to derive assumed surface hardening characteristics therefrom,
(d) means (8) for comparing said assumed surface hardening characteristics with predetermined, desired surface hardening characteristics, and
(e) energy beam control means (9) for controlling at least one of the output and moving velocity of the energy beam according to the output of the comparing means to thereby suppress irregularities in the surface hardening characteristics, wherein
(f) said energy beam is controlled to heat said surface portion of the workpiece above the martensite and austenite transformation temperatures thereof but below the melting temperature such that surface hardening is effected by a martensite transformation.

4,825,036
DEVICE FOR DIRECTING OPTICAL RAYS
Martin Bickel, Munich, and Albrecht Baum, Dachau, both of Fed. Rep. of Germany, assignors to MAN Technologie GmbH, Munich, Fed. Rep. of Germany
Filed Apr. 1, 1988, Ser. No. 176,441
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711088; Mar. 8, 1988, 3807471
Int. Cl.[4] B23K *26/08*
U.S. Cl. 219—121.78 **8 Claims**

1. A device for directing an optical ray comprising at least one deflecting mirror, a ray exit member adjoining said mirror, means for supporting said member for pivoting motion about first and second axes perpendicular to each other, the first of said axes being parallel to or coinciding with a ray incident on said deflecting mirror and said second axis being perpendicular

thereto, said second pivot axis being in the reflecting surface of the mirror in a central setting of the ray exit member, and



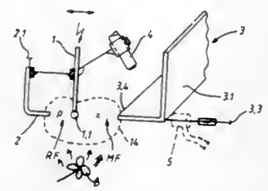
means for pivoting said mirror about a third axis with an angle of pivot equal to half the angle of pivot of the ray exit member, such third axis being parallel to the second pivot axis.

4,825,037

APPARATUS FOR CONTACTLESS DETERMINATION OF A DEVIATION FROM THE DESIRED INTERVAL BY A PULSED SPARK DISCHARGE

Heinz W. Spaude, Aichtal, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 170,290
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708770
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.34 **6 Claims**



1. Apparatus for the contactless determination of a deviation from the desired interval between a body and the contour of an object movable relative to the body by a pulsed spark discharge tripped by a high voltage generator either along a measurement spark path formed between a high voltage electrode and grounded electrode representing the object, or along a reference spark formed between a high voltage electrode and a reference electrode connected to ground; a sensor in the circuit of a spark path for detecting a spark discharge occurring along this spark path, and generating an impulse in response thereto; and an evaluator unit for evaluating said impulse to form a signal as a function of the interval, wherein:

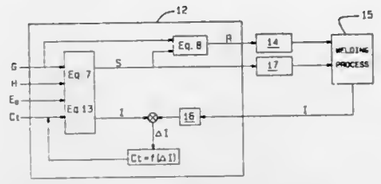
the reference spark path is arranged physically closely adjacent to and in the gas space of the measurement spark path and the evaluator unit includes a first means for forming the ratio of the frequency Z of the spark discharges occurring in the spark path provided with the sensor within each measurement cycle to the total number Z_o of the spark discharges tripped by the high voltage generator during each measurement cycle and second means for forming the signal which is a function of the deviation from the desired interval from the ratio Z/Z_o.

4,825,038

METHOD FOR CONTROLLING GAS METAL ARC WELDING

Herschel B. Smartt; Carolyn J. Einerson, and Arthur D. Watkins, all of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 10, 1987, Ser. No. 83,381
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—137 PS **10 Claims**



1. A method of independently controlling the heat input and weld reinforcement area in a gas metal arc welding process using gas metal arc welding apparatus which includes a power supply having a predetermined relationship (a volt/amp slope n) between the output voltage E (volts) and output current I (amperes) of the power supply, and an electrode filler wire having an average wire density δ (gm/mm^3), a cross-sectional area A_w (mm^2) and a melting temperature T_m (° C.), means for feeding the filler wire towards a workpiece at a wire feed speed S (mm/s), and means for moving the work piece relative to the filler wire at a welding speed R (mm/s) to create a longitudinal weld in the work piece, comprising the steps of:

selecting a desired heat input H (J/mm) and a desired weld reinforcement area G (mm^2);

calculating a filler wire feed rate S, the welding speed R and an expected welding current I for said desired heat input H and weld reinforcement area G by first preselected algorithmic function means;

said first preselected algorithmic function means comprising the equations:

$$S = \frac{GI}{A_w H}\, n^* (E_o + nI)$$

$$R = \frac{SA_w}{G}$$

$$I = \frac{E_o + \sqrt{E_o^2 + 4[n - (1 - n')\, R_a]\, SA_w\, \delta\, H_m}}{2[(1 - n')\, R_o - n]}$$

where

n^* = the overall heat transfer efficiency;

E_o = the open circuit voltage (volts) of the power supply,;

n' = the efficiency of the heat transfer from the arc to the filler wire;

R_a = the arc resistance (ohms); and

H_m = the heat required to melt the filler wire (J/gm);

operating the gas metal arc welding apparatus at said calculated wire feed speed S and weld speed R;

measuring the welding current and comparing said welding current with said expected welding current I to generate comparison data;

calculating, by means of second preselected algorithmic function means, a correction to said wire feed speed and weld speed by applying said comparison data; and

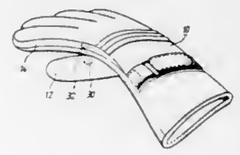
applying said correction to the operation of said welding apparatus whereby said desired heat input and said desired weld reinforcement area are achieved in said process.

4,825,039

GLOVE ASSEMBLY FOR USE AT LOW TEMPERATURE

Jhin P. Yoo, 847-19, Sihung-bon-dong, Kuro-ku, Seoul, Rep. of Korea

Filed Sep. 15, 1987, Ser. No. 96,477
Claims priority, application Rep. of Korea, Sep. 2, 1987, 15005
Int. Cl.[4] H05B *3/56*
U.S. Cl. 219—212 **4 Claims**



1. A glove assembly for vehicle drivers or others working at low temperature which comprises:

a glove having separate sheaths for receiving a tumb and fingers including:

a liner and an outer covering,

an electric heating wire arranged between said liner and said outer covering, said electric wire being provided with a plurality of loops arranged in a tip of each of said separate sheaths, and

a pair of electrically raised contacting members each of said contacting member extending from one end of said electric heating wire, said contacting members being positioned on palm-side base portions of said sheaths of the thumb and index finger, respectively, and

a cylindrical handle grip disposed on a vehicle and operatively associated with said glove, said cylindrical handle grip including:

an insulating base layer,

an insulating middle layer,

an upper layer having a pair of openings which receive a pair of conductive metal meshes disposed between said upper layer and said middle layer, and

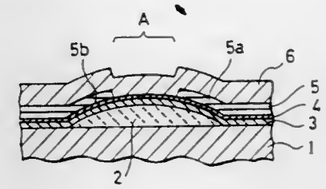
connecting means for electrically connecting a power source of said vehicle to said pair of conductive metal meshes, whereby, when a vehicle driver grasps said cylindrical handle grip with said glove, said pair of raised contacting members contact with said pair of conductive metal meshes so that the hands of the vehicle driver are warmed by heat generated from the heating wire.

4,825,040

THERMAL HEAD

Masakazu Kato, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 26, 1988, Ser. No. 160,537
Claims priority, application Japan, Jan. 5, 1987, 62-140886
Int. Cl.[4] G01D *15/10*; B41J *3/20, 3/10*
U.S. Cl. 219—216 **2 Claims**



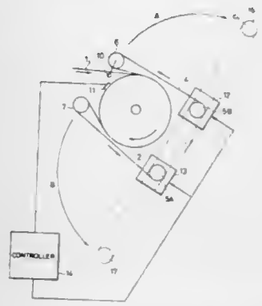
1. A thermal head characterized in that an overcoat layer comprised of SIALON having tungsten of 0.1 to 20 atomic percent is formed on a resistor layer composed of a thin film of Ta-Cr-N.

4,825,041

THERMAL DEVELOPING APPARATUS

Akihiko Nagano, and Minoru Ishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 18, 1986, Ser. No. 943,235
Claims priority, application Japan, Dec. 19, 1985, 60-284391; Jan. 24, 1986, 61-12099
Int. Cl.[4] H05B *1/00*
U.S. Cl. 219—244 **6 Claims**



1. An apparatus for thermally developing a light and pressure sensitive thermally developing material composed of a support and an active material applied thereon sealed from contact with air, said active material comprising microcapsules containing photosensitive compounds and being able to be thermally developed to obtain a picture which can be fixed by pressure bursting of at least some of said microcapsules, said apparatus comprising:

heater means for heating said photo-pressure sensitive thermally developing material and means for applying pressure to said material;

temperature detection means for detecting a temperature of heating said photo-pressure sensitive thermally developing material;

a rotating heating roller;

said heater means comprising means for heating said heating roller, a gas impermeable endless belt for bringing said

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photo-pressure sensitive thermally developing material into contact with said heating roller; and

means for moving said endless belt in the same direction as the rotational direction of said heating roller while contacting a part of an outer peripheral surface of said heating roller, whereby said photo-pressure sensitive thermally developing material is thermally developed under the condition that said material is being conveyed while being sandwiched between the heating roller and said endless belt with the belt and roller sealing the thermally developing material from contact with the air; and

heat stopping means comprising means responsive to said temperature detection means for separating said endless belt from said heating roller to thereby separate said photo-pressure sensitive thermally developing material from said heating roller indicative of said photo-pressure sensitive thermally developing material reaching a predetermined high temperature;

4,825,042

CONTINUOUS FLOW HEATER ASSEMBLY FOR A BEVERAGE MAKER

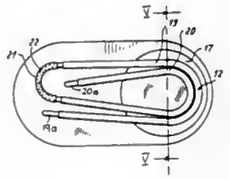
Reinhard Hänslein, Minden, Fed. Rep. of Germany, assignor to Melitta-Werke Bentz & Sohn, Minden, Fed. Rep. of Germany

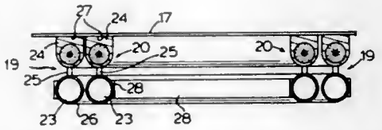
Continuation-in-part of Ser. No. 737,408, May 24, 1985, abandoned. This application Aug. 6, 1987, Ser. No. 82,159

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419365

Int. Cl.[4] H05B *3/00*; **F24H** *1/10*; **A47J** *31/00*

U.S. Cl. 219—283 **20 Claims**





1. In a beverage maker including a continuous flow electric heater assembly of tubular construction adapted to be connected to a source of fresh water and arranged for guiding fresh water therethrough for heating the fresh water to brewing temperatures, electric means for energizing said heater assembly, a filtering vessel and pipe means arranged to introduce heated fresh water from the heater assembly to said filtering vessel, the improvement wherein said heater assembly comprises at least two tubular continuous flow electric heaters each being bent into a U-shaped configuration; said heaters being arranged in a mutually nested relationship and each having metal heater tube containing an electrically energizable heating means, a metal water pipe extending adjacent said metal heater tube parallel therewith and spaced therefrom and a heat conducting web connecting said heater tube with said water pipe for transferring heat from the heater tube to said water pipe; further comprising tubular connecting means coupling ends of the water pipes of the heaters to one another.

4,825,043

ELECTRIC CONTINUOUS FLOW HEATER FOR LIQUID CONTAINERS

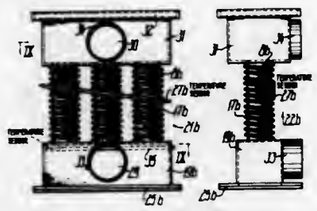
Hermann Knauss, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Jul. 18, 1986, Ser. No. 887,257

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526186

Int. Cl.[4] F24H *1/12, 1/18*; **H05B** *1/02, 3/00*

U.S. Cl. 219—298 **31 Claims**



1. An electrical heating means for liquid contained in a liquid container, comprising:

at least one heating resistor (**17***b*) and a continuous flow heater (**21***b*) heated by the heating resistor (**17***b*), said continuous flow heater (**21***b*) having an inlet side (**29**) and an outlet side (**30**) ducted for connection to the container and defining a liquid flow path, said flow path of said continuous flow heater (**21***b*) including heating duct means (**7***b*) bounded by at least one tubular wall portion (**8***b*) having lower and upper ends, a length extension and an interior, said lower end being connected to a separate inflow chamber (**19***b*) below said duct means and having an entire width substantially at least as wide as a maximum width across the heating duct means (**7**), said inflow chamber (**19***b*) having a chamber opening closed by a removable closure means (**25***b*); and,

wherein said inflow chamber (**19***b*) is a collector for solids to be separated from the liquid, said inflow chamber (**19***b*) being defined by a pot-shaped body having a large-area removal opening closed by the closure means (**25***b*), said removal opening, when open, providing access to the interior of said inflow chamber (**19***b*) substantially over the entire width thereof and providing substantially full access to the interior of the heating duct means.

4,825,044

Patent Not Issued For This Number

4,825,045

SYSTEM AND METHOD FOR CHECKOUT COUNTER PRODUCT PROMOTION

David R. Humble, Deerfield Beach, Fla., assignor to Advance Promotion Technologies, Inc., Deerfield Beach, Fla.

Filed Jul. 24, 1986, Ser. No. 889,801

Int. Cl.[4] G06K *15/00*

U.S. Cl. 235—383 **6 Claims**

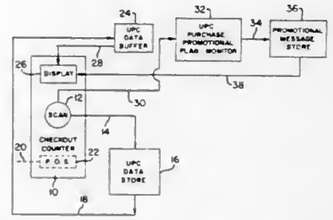
1. A system for the checkout of products bearing sensible codes indicative thereof and for the promotion of products responsively to customer decisions, said system comprising:

(a) sensing means for generating output signals indicative of such codes;

(b) first circuit means for receiving said sensing means output signals and for generating output signals selectively upon correspondence of the code indication in such received signals and the code indications of preselected of such products;

(c) second circuit means for receiving said first circuit means output signals, for storage of promotional messages relating to said products, and for generation of output signals indicative of said promotional messages selectively in response to said first circuit means output signals; and

(d) display means for receipt of said second circuit means output and for presentation of the promotional messages therein, said display means having adaptiveness to customer input to permit system receipt of customer input responsively related to such presented promotional message.



4,825,046

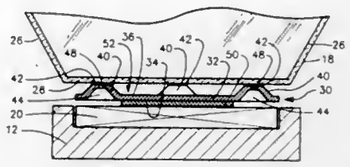
THERMAL INTERFACE DEVICE FOR HEATING ELEMENTS

David W. Box, 7045 Pebble Way, Colorado Springs, Colo. 80919

Filed Feb. 5, 1988, Ser. No. 152,863

Int. Cl.[4] H05B *3/72*

U.S. Cl. 219—433 **18 Claims**



1. A thermal interface device adapted to be inserted between a cyclical heating element cycling between an on state having a maximum temperature in excess of 250° and an off state having a minimum temperature and a vessel to be heated thereby to minimize degradation of a product within the vessel, comprising:

a flat plate of heat conductive material sized to overlay a heating element and be supported thereby, said flat plate having a thermal mass and a bottom surface facing said heating element and an upper surface opposite said bottom surface;

raised surface support means located on said upper surface for supporting a vessel in spaced relation to said upper surface whereby said vessel is heated primarily by convection currents and infrared radiation, said plate being operative to store heat when the heating element is in the one state and discharge heat during both on and off states thereby dampening an amplitude of maximum temperatures.

4,825,047

TEMPERATURE-RESPONSIVE CONTROLLER FOR WATERBED MATTRESS HEATERS

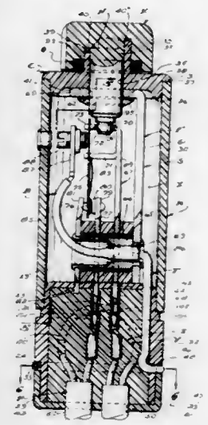
Floyd D. Miles, Molalla, Oreg., assignor to Thermafoil Products Inc., El Monte, Calif.

Filed May 7, 1987, Ser. No. 46,870

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—496 **14 Claims**

1. In combination: a waterbed structure including a horizontal platform, a retaining frame about the perimeter of and projecting up from the platform, a soft, flexible sheet plastic bladder mattress containing a volume of water supported atop the platform and within the frame; an electric resistance heater engaged with and between the platform and the mattress to heat and maintain the mattress and the water therein, an elongate power cord with a pair of conductors connected with and extending between the heater and an electric power service outlet remote from the waterbed structure, the cord has an inner portion extending from the heater between the mattress and the platform and between the mattress and the frame, and has an outer portion extending freely from said bed structure to said service outlet; a manually- adjustable thermally-responsive temperature controller responsive to the temperature of the mattress and operating to start and stop the flow of current through the cord, said controller includes an elongate cylindrical housing with opposite ends, an adjustable on and off switch with relatively movable contact parts within the housing, a manually-engageable adjusting knob accessible at one end of the housing with a shaft entering and sealingly-engaged in the housing, said shaft has a switch-adjusting part engaged with one movable contact part of the switch, a fluid-filled Bourdon tube mounted within the housing and engaging and moving another movable contact part of the switch relative to said one movable contact part between opened and closed positions when the Bourdon tube is deflected by changes in fluid pressure therein, an elongate fluid-filled capillary tube with an inner end connected with the Bourdon tube and an outer end portion extends from within and is supported by the exterior of the housing, openings in the housing into and out of which the capillary tube and related ends of the inner and outer portions of the power cord extend, conductors of the portions of the power cord are connected with related terminal parts of said switch, the controller housing is positioned in supported engagement between an inside surface of said frame and an adjacent portion of said mattress with a portion of the capillary in heat-conducting contact with the mattress.



4,825,048

SEAT HEATER FOR INTEGRATED ASSEMBLY INTO CAR SEATS

Horst-Dieter Altmann, Gründau-Lieblos, and Eberhard Haupt, Gründau-Rothenbergen, both of Fed. Rep. of Germany, assignors to I.G. Bauerhin GmbH elektro-technische Fabrik, Gruendau-Rothenbergen, Fed. Rep. of Germany

Filed Mar. 2, 1988, Ser. No. 163,312

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1987, 3725841

Int. Cl.[4] H05B *3/36*

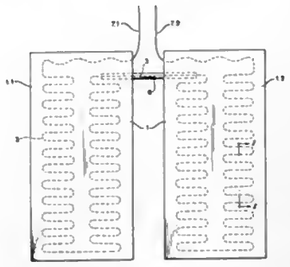
U.S. Cl. 219—528 **4 Claims**

1. In a seat heater for integrated assembly into car seats,

VOL 1101 ISS 4 AP 25 1989 UMI

comprising at least two segments, the improvement comprising:

said heater including a resilient heating element in each of said segments, said heating elements being interconnected



in series and defining a plurality of coherent heaters, a connection between each said heating element in each of said segments comprising a low strength electrical conductor, said electrical conductor being guided within an insulating resilient sheathing of silicone rubber.

4,825,049

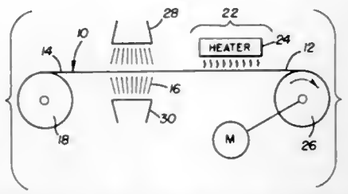
CARBON FILM COATED REFRACTORY FIBER CLOTH

Steven F. Rickborn, Campbell, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Division of Ser. No. 811,018, Dec. 18, 1985, Continuation-in-part of Ser. No. 714,090, Mar. 20, 1985, Continuation-in-part of Ser. No. 672,396, Nov. 16, 1984. This application Mar. 19, 1987, Ser. No. 28,121

Int. Cl.[4] H05B *3/34*

U.S. Cl. 219—545 **8 Claims**



1. A flexible electrically conducting cloth, comprising:

a plurality of intermingled or interwoven fibers of a refractory ceramic or of a refractory vitreous material, the sheet resistance of which exceeds 1,000 ohms per square; and

a conducting coating encapsulating a majority of the fibers, said coating including at least about 70 atomic percent carbon, said coating being applied in sufficient quantity to render the cloth electrically conducting with a sheet resistance which lies between about 0.1 ohm per square and about 1,000 ohms per square, said coating having been formed by chemical vapor deposition at a temperature in a range from about 800° C. to about 1200° C.

4,825,050

SECURITY TRANSACTION SYSTEM FOR FINANCIAL DATA

John B. Griffith, Plantation, and Donald F. Linton, Pompano Beach, both of Fla., assignors to Transaction Security Corporation, Delray Beach, Fla.

Filed Sep. 13, 1983, Ser. No. 531,673

Int. Cl.[4] G06F *15/30*

U.S. Cl. 235—379 **4 Claims**

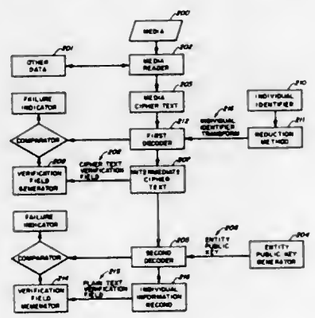
1. Apparatus for encoding a signal on an individual machine readable media when issued by an entity to a user for uniquely securing said media for use in performing transactions with said entity comprising:

entity public key cryptosystem key generating means (**109**) to produce a private key signal (**110**) and public key signal (**206**) pair;

user individual information input means (**101**) and checksum generating means (**102**) for providing specific user identity data and checksum verification data (**105**);

encoder means for encoding including a first encoding means (**111**) and a second encoding means (**104**), said first encoding means (**111**) is a public key cryptosystem and said second encoding means (**104**) is a private key cryptosystem;

said first encoding means (**111**) connected to said user individual input means (**101**) and checksum verification gener-



ating means (**102**) and said entity private key signal (**110**) for producing a first encoding signal (**107**);

said second encoding means (**104**) connected to said first encoding means (**111**) and checksum verification generating means (**108**) and user identification input means (**100** and reduction means **103**), for producing a media encoding signal (**117**);

said first encoding means (**111**) and said second encoding means (**104**) connected together to produce a signal at least twice encoded for use as said media encoding signal (**117**);

transducer means (**114**) connected to said second encoding means **104**, said transducer means operable with the machine readable media (**115**) for recording a detectable signal thereon representative of at least said media encoding signal (**117**).

4,825,051

METHOD OF PROCESSING THE DATA IN BANKING TERMINAL

Rie Kawai, Nagoya; Kanzen Goto, Owariasahi, and Kunio Morimoto, Seto, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 918,917

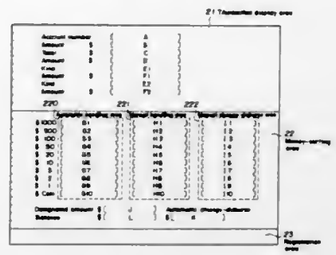
Claims priority, application Japan, Oct. 15, 1985, 60-227702

Int. Cl.[4] G06F *15/30*

U.S. Cl. 235—379 **18 Claims**

1. A method of processing data in a banking terminal which comprises a display unit having a display surface including a transaction display area for indicating contents of a transaction at a bank, a money sorting area including a manual handling area for indicating sorts of money received from a customer, a manual change-disburse area for indicating sorts of money of change to be disbursed, a balance area and a designated amount area used in calculating the balance, and said display surface further including a registration area for indicating the data to be subsequently displayed on the transaction area and the money sorting area; a data input unit; a cash handler for automatically calculating the received bills and coins and for automatically disbursing change due; and a controller for the display unit, the data input unit and the cash handler, wherein said method comprising the steps of:

determining the priority between data input corresponding to the total money-amount of a transaction to be displayed on said transaction display area and data input corresponding to the sorts of received money to be displayed on said money sorting area;



summing the data corresponding to the sorts of received money which is displayed on said money-sorting area when it is determined that the data input corresponding to the sorts of money to be displayed on said money-sorting area has priority over the data input corresponding to the transaction total money-amount; and

displaying the summation on said transaction display area and/or said designated amount area.

4,825,052

METHOD AND APPARATUS FOR CERTIFYING SERVICES OBTAINED USING A PORTABLE CARRIER SUCH AS A MEMORY CARD

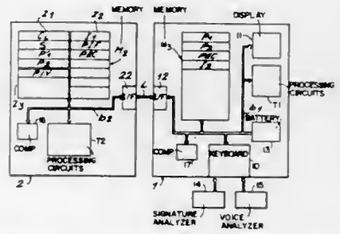
Francois Chemin, Plaisir, and Michel Ugon, Maurepas, both of France, assignors to Bull CP8, Trappes, France

Filed Dec. 30, 1986, Ser. No. 947,882

Claims priority, application France, Dec. 31, 1985, 85 19502

Int. Cl.[4] G06F *15/30*

U.S. Cl. 235—380 **20 Claims**



1. A method of certifying a service furnished with the aid of a portable card which is coupled to an apparatus, the card having a memory (M2) and processing circuits (T2), the method comprising calculating in the processing circuits of the card a first result (R) based upon an internal parameter (PI) prerecorded in the memory of the card and/or upon an external parameter (PE) and upon a secret key (S); preparing a certificate (C) comprising at least first and second data, the first datum being the first result (R) calculated by the processing circuits (T2) and the second datum being the internal and/or external parameters (PI, PE) used for calculating the result (R); recording the certificate (C) on a carrier (3) as proof that the service was furnished; recalculating in second processing circuit (T2) a second result (R) based upon the second datum recorded on the certificate and upon another secret key (S) corresponding to the first-mentioned secret key, comparing the second result with the first result recorded on the certificate, and certifying, upon the first and second results matching, that the service was properly obtained with the portable card.

4,825,053

SYSTEM FOR WEIGHING AN ARTICLE AND FOR EDITING A LABEL SERVING AS A TRANSPORT COUPON

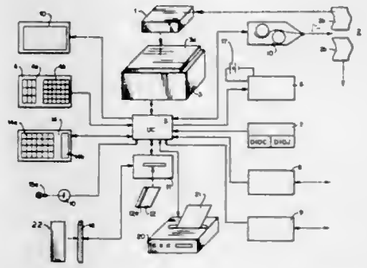
Roger Caille, Ecully, France, assignor to Jet Services, France

Filed Feb. 1, 1988, Ser. No. 151,320

Claims priority, application France, Jan. 30, 1987, 87 01303

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—380 **10 Claims**



1. System for weighing an article (1) and for editing a label (2*a*) serving as a transport coupon for said article, comprising the following peripherals:

a scale (3) supplying a numeric item of information whose value is the weight of the article

a user keyboard (4) for the acquisition by the user firstly of a coded item of information, representing the destination of the article, and secondly of various commands

a message or data display unit (10), intended for the user

a payment card reader (11), said cards comprising a medium (12*a*) for an item of information which can be machine-read and machine-modified, having the value of a credit

a printer (13), for editing and outputting the label (2*a*) serving as a transport coupon and comprising a central processing unit possessing:

a data processing unit (5), for example a microprocessor,

a read-only memory (7) for the storage of a data processing software, permitting a dialog with the user, and ensuring the automatic functioning of the system, as a function of the data exchanged both with the user and with the various peripherals,

wherein the system further possesses a terminal (14) intended for an operator, possessing a message or data display unit (14*b*) intended for the operator and an operator keyboard (14*a*) for the acquisition by the operator of various commands or data, particularly instead of those of the user, capable of ensuring complete functioning of the system whatever may be the errors made by the user.

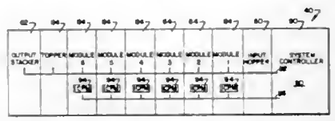
VOL 1101 ISS 4 AP 25 1989 UMI

4,825,054

METHOD AND APPARATUS FOR PARALLEL INTEGRATED CIRCUIT CARD INITIALIZATION AND EMBOSSING

Jeffrey J. Rust, Brooklyn Park; Rodney J. LeVasseur, Lakeville; Alan Meilach, Prior Lake; Brian Beech, Bloomington; Richard M. Wetzel, Plymouth, and Eric J. Freudenheim, Burnsville, all of Minn., assignors to DataCard Corporation, Minnetonka, Minn.

Filed Feb. 16, 1988, Ser. No. 156,351
Int. Cl.[4] G06K *1/00, 19/06*
U.S. Cl. 235—380 7 Claims



7. A method of processing integrated circuit (IC) cards having an integrated circuit including memory, the method comprising the steps of:

(a) sequentially feeding IC cards from an input hopper;

(b) transferring the IC cards along a predetermined card transfer path past a plurality of stations which transfer data onto the IC card by methods other than programming of the integrated circuit of the IC card; and

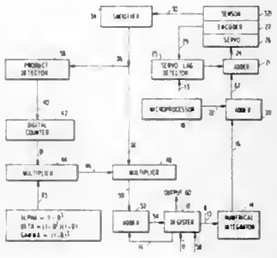
(c) interrupting the card transfer process to initialize in parallel IC cards at a plurality of the stations with personalization data by programming the integrated circuit of the IC cards.

4,825,055

ERROR-FREE INTEGRATION POINTING AND TRACKING

Eugene J. Pollock, 502 Dory Dr., Fort Walton Beach, Fla. 32548

Filed Sep. 30, 1987, Ser. No. 102,608
Int. Cl.[4] G01S *7/46, 13/58, 13/06*
U.S. Cl. 235—411 13 Claims



1. A method of tracking a remote object using a sensor positioned by a servomechanism, said method comprising the steps of:

(a) predetermining, for said servomechanism, servo lag in accordance with one or more of object acceleration, velocity or position,

(b) tracking said object with said sensor, and in the course of said tracking generating an estimate of acceleration, velocity and position of said object,

(c) based on said predetermining step, generating a quantity representing servo lag from one or more of the estimates of acceleration, velocity and position from step (b), and

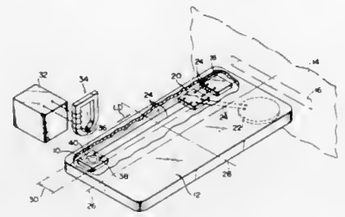
(d) modifying said estimated position by said quantity generated in said step (c).

4,825,056

THIN-FILM ELECTROMAGNETIC TRANSDUCER

Toshihiko Ohta, Yokohama, and Fumio Izawa, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 20, 1986, Ser. No. 932,521
Claims priority, application Japan, Nov. 21, 1985, 60-259713; Feb. 19, 1986, 61-32698
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—449 20 Claims



1. A thin-film type electromagnetic transducer formed on a nonmagnetic substrate by a thin-film forming process, comprising:

a magnetic core formed on the nonmagnetic substrate by the thin-film forming process, said core including a pair of members defining a magnetic gap therebetween; and

a conductor coil formed on the nonmagnetic substrate by the thin-film forming process, so as to be wound around the core;

said core being shaped so that a leakage flux generated along the plane of the nonmagnetic substrate is greater than a leakage flux generated in a direction intersecting with the plane of the substrate and said members being arranged so that a leakage flux generated in the magnetic gap along the plane of the nonmagnetic substrate is greater than in any other region along the plane of the nonmagnetic substrate, said leakage flux generated along the plane of the nonmagnetic substrate and in a direction intersecting with the plane of the substrate being generated from the core when a current is supplied to the coil.

4,825,057

PORTABLE LASER DIODE SCANNING HEAD

Jerome Swartz, Setauket; Howard M. Shepard, Great River, both of N.Y.; Eric F. Barkan, San Francisco, Calif.; Mark J. Krichever; Boris Metlitsky, both of Hauppauge, N.Y.; Edward Barkan, South Setauket, N.Y., and Alexander M. Adelson, Peekskill, N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Division of Ser. No. 706,502, Feb. 28, 1985, abandoned. This application Jan. 26, 1988, Ser. No. 148,669
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 2 Claims

1. In an improved laser scanning system for reading symbols of the type including

(A) a laser scanning head having a pair of housing parts together bounding an interior;

(B) means including an actuatable laser light source mounted in the interior of the head and operative, when actuated, for generating an incident laser beam;

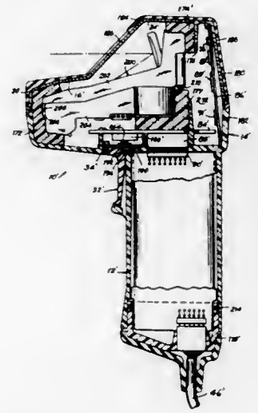
(C) optic means mounted in the interior of the head for optically forming and directing said incident laser beam along the first optical path toward a reference plane located exteriorly of the head, and to a symbol located in a working distance range in the vicinity of the reference plane, thereby reflecting off the symbol reflected laser light, at least a returning portion of which travels along a second optical path away from the symbol back toward the head;

(D) scanning means mounted in the interior of the head for scanning the symbol in a scan across the symbol, said returning portion of said reflected laser light having a variable intensity over the scan;

(E) sensor means mounted in the interior of the head for detecting the variable intensity of said returning portion of said reflected laser light over a field of view, and for generating an electrical analog signal indicative of the detected variable light intensity;

(F) said scanning means being operative for scanning at least one of said incident laser beam and said field of view;

(G) signal processing means mounted in the interior of the head for processing the analog electrical signal, and for generating a processed signal indicative of the symbol; and



(H) manually-actuatable trigger means on the head and operatively connected to, and operative for actuating, the actuatable source, the scanning means, the sensor means and the signal processing means to initiate a reading of the symbol upon manual actuation of the trigger means by the user, said trigger means being actuatable for each symbol to be read, each symbol in its respective turn;

the improvement comprising:

(a) one of the housing parts being constituted of a light-transmissive material of one-piece construction, said one housing part having an integral window region through which at least one of said optical paths extends; and

(b) a light-blocking cover covering said one housing part, but leaving the window region uncovered to permit at least one of said incident laser beam and said reflected laser light to pass therethrough.

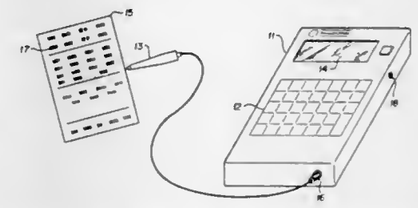
4,825,058

BAR CODE READER CONFIGURATION AND CONTROL USING A BAR CODE MENU TO DIRECTLY ACCESS MEMORY

McKee D. Poland, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 14, 1986, Ser. No. 918,944
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 7 Claims

1. A method of configuring a microprocessor controlled device or controlling the operation of the device by direct manipulations of the memory locations in the microprocessor hardware, by executing memory manipulation instructions capable of accessing operating system memory locations to load data directly into a flag location or into a variable location that controls the configuration or operation of the operating system, said memory manipulations performed in response to scanning bar code tags selected form a menu, said bar code tags



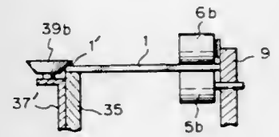
containing encoded memory manipulation instructions and the encoded data to be loaded.

4,825,059

APPARATUS FOR RECORDING AND REPRODUCING INFORMATION

Hitoshi Kurihara, Yorii; Kenichi Suzuki, and Kazuo Minoura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,488
Claims priority, application Japan, Oct. 25, 1985, 60-239199; Oct. 29, 1985, 60-240469
Int. Cl.[4] G06K *13/06*
U.S. Cl. 235—483 6 Claims



1. An apparatus for recording and/or reproducing information comprising:

a head for carrying out recording and/or reproduction of the information;

means for reciprocating an information recording medium relative to said head;

guide means for guiding the recording medium in a direction of the reciprocation of the recording medium; and

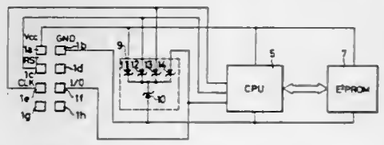
urging means for obliquely urging at least a ridge of one of opposite ends of the recording medium so as to urge the recording medium against said guide means.

4,825,060

PORTABLE MEMORY MEDIUM

Hidekiyo Kashima, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 10, 1987, Ser. No. 60,387
Claims priority, application Japan, Jun. 11, 1986, 61-133767
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 6 Claims



1. A portable memory medium comprising:

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a common connection terminal and a plurality of independent connection terminals to be electrically connected to an external apparatus; and

a constant voltage semiconductor chip connected to said common connection terminal and said independent connection terminals, said constant voltage semiconductor chip including

a common constant voltage element having a first terminal connected to said common connection terminal, and a second terminal which is different from said first terminal; and

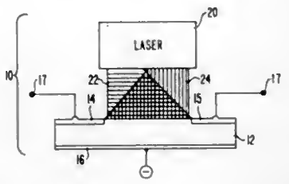
a plurality of independent constant voltage elements each having a first terminal connected to each of said independent connection terminals, and a second terminal commonly connected to said second terminal of said common constant voltage element.

4,825,061

OPTICALLY CONTROLLED BULK SEMICONDUCTOR SWITCH NOT REQUIRING RADIATION TO SUSTAIN CONDUCTION

Karl H. Schoenbach; Rudolf K. F. Germer, both of Norfolk; Vishnukumar K. Lakdawala, and Sacharia Albin, both of Virginia Beach, all of Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Aug. 7, 1987, Ser. No. 82,546
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 R **16 Claims**



1. A switch operatively connectable between first and second electrical conductors, comprising:

a block of semiconductor material having ohmic contacts operatively connectable to the first and second electrical conductors and having a deep acceptor level between conduction and valence bands; and

electromagnetic radiation means for directing a first beam onto said block between the ohmic contacts to cause photo-excitation of electrons from the deep acceptor level into the conduction band to provide initial electrons for conduction between the first and second electrical conductors and for directing a second beam onto said block between the ohmic contacts to cause electrons from the conduction band and holes from the deep acceptor level to combine, thereby interrupting conduction between the first and second electrical conductors.

4,825,062

EXTENDABLE LARGE APERTURE PHASED ARRAY MIRROR SYSTEM

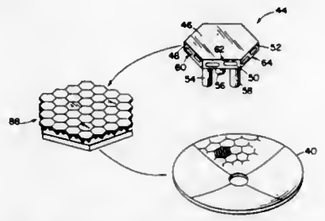
John D. G. Rather, Washington, D.C.; Gregory H. Ames, Colorado Springs, Colo.; Edward K. Conklin, Hermosa Beach, Calif.; Albert J. Lazzarini, Colorado Springs, Colo.; Joseph Mangano, Vienna, Va., and Bobby L. Ulich, Tucson, Ariz., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.

Filed Oct. 29, 1987, Ser. No. 114,540
Int. Cl.[4] G01V *1/20*
U.S. Cl. 250—201 **43 Claims**

1. An active optical element receiving an electormagnetic beam, comprising:

a plurality of optical segments each having opposed front and rear primary surfaces bounded by a plurality of edges formed by intersection with respective secondary side surfaces, said segments being arranged to collectively receive an electromagnetic beam at said first primary surfaces;

a plurality of displacement actuators each responsive to control signals affixed to said rear surfaces of said segments to effect linear movement of each segment along a segment axis substantially perpendicular to said front



primary surface of its segment and tilting movement relative to said segment axis;

a sensor means for providing signals indicative of the relative positions of said front surfaces of said segments; and

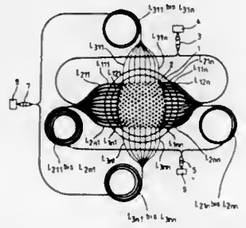
control means for providing said actuator control signals in dependence on said sensor signals and command signals that are capable of positioning said segments in real time so that said front surfaces thereof collectively form a surface having an arbitrary geometry.

4,825,063

RADIATION POSITION DETECTION USING TIME-INDICATIVE VARIABLE-LENGTH FIBER ARRAY

Thorsteinn Halldorsson, Munich; Ernst-August Seiffarth, Taufkirchen, and Sigmund Manhart, Haar, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bökow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,639
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 87104470
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—203 R **12 Claims**



1. A detector device for detecting the presence and originating location of laser radiation comprising

a plurality of discrete optics, each discrete optic being capable of detecting laser radiation over a certain solid angle, the solid angle of each discrete optics overlapping the solid angle of its neighbors, and the discrete optics being arranged in azimuth planes;

first and second wave guide coupled to each discrete optics, with all first wave guides being of identical length and the lengths of the second wave guides being of increasing length in the direction of increasing azimuth angle in order to form different transit times;

first and second detector stages having optoelectrical transducers and coupled respectively to the first and second wave guides; and

transit time measuring circuit coupled to the first and second detector stage which determines the total time between detection by the first detector stage and the second detector stage and consequently the azimuth angle of the incident laser radiation;

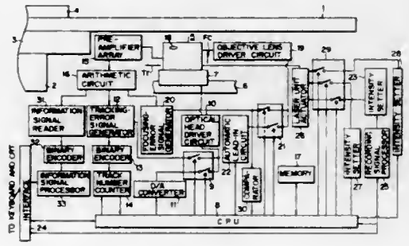
wherein the opto-electrical transducers of the first and second detector stage are coupled to respective damped resonant circuits, the resonant circuits requiring greater or equal amounts of time to reach maximum amplitude than the respective time to reach maximum amplitude of one laser pulse on at least one of the discrete optics and the damped resonant circuits being coupled to passage-through-the-zero-axis detectors, the detectors providing start and stop signals to the transit time measuring circuit.

4,825,064

APPARATUS FOR ENERGIZING A SEMICONDUCTOR LASER ARRAY HAVING A PLURALITY OF LIGHT BEAM EMITTING POINTS

Hideo Ando, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 25, 1987, Ser. No. 18,493
Claims priority, application Japan, Feb. 26, 1986, 61-40710
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **7 Claims**



1. An apparatus comprising:

light source means for generating first and second light beams, said light source means having first and second surfaces, a first portion of each of the first and second light beams being transmitted from said first surface and a second portion of each of the first and second light beams being transmitted from said second surface;

detecting means optically coupled to said light source means for detecting the first portion of the first and second light beams, said detecting means having a first detecting region for converting the first portion of the first light beam to a first electric signal and a second detecting region for converting the first portion of the second light beam to a second electric signal;

means responsive to said detecting means for generating first and second energizing signals in accordance with the first and second electric signals, respectively; and

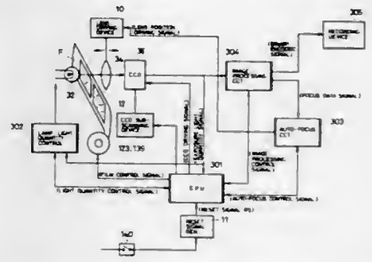
means for controlling the intensities of the first and second light beams in accordance with the first and second energizing signals.

4,825,065

APPARATUS FOR READING IMAGE RECORDED ON FILM

Ryoichi Imai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 924,433, Oct. 29, 1986, abandoned. This application Jul. 27, 1988, Ser. No. 225,643
Claims priority, application Japan, Oct. 31, 1985, 60-245479; Oct. 31, 1985, 60-245480
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **42 Claims**



1. An image reading method for reading an image on a film by focusing light from a light source through said film into an image sensor by means of an optical member, comprising the steps of:

regulating the quantity of light emitted by said light source before said film is set to a reading position;

focusing said optical member in accordance with the light transmitted through said film illuminated with light regulated in said regulating step, after said film is set to said reading position; and

determining a threshold value for quantizing the output of said image sensor in accordance with the light transmitted through said film illuminated with the regulated light after the completion of focusing of said optical member in said focusing step.

4,825,066

PHOTOMULTIPLIER WITH SECONDARY ELECTRON SHIELDING MEANS

Kimitsugu Nakamura, and Masao Ito, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Feb. 12, 1988, Ser. No. 155,842
Claims priority, application Japan, Feb. 13, 1987, 62-29659
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—207 **11 Claims**

1. A photomultiplier comprising;

photoelectric conversion means for emitting primary electrons in response to an incident light;

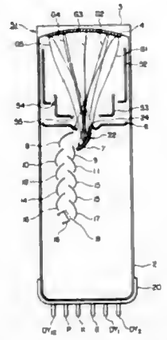
electron-multiplication means for emitting secondary electrons in response to incidence of said primary electrons thereto and multiplying first secondary electrons passing therein to output an electrical signal corresponding to said multiplied secondary signals;

focusing means for converging said primary electrons into said electron-multiplication means;

separating means for electrically separating said photoelectric conversion means from said electro-multiplication means; and

shield means for preventing second secondary electrons emitted from said electron-multiplication means toward said photoelectric conversion means and reflected there-

from from returning to said electron-multiplication means, said shield means being located between said photoelectric conversion means and said electron-multiplication means.



4,825,067

COUPLING MEANS FOR ALIGNING FIBER OPTIC BUNDLES BETWEEN X-RAY IMAGE INTENSIFIER AND IMAGE PICKUP TUBE

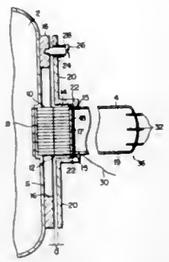
Shigeharu Kawamura; Yoshiharu Obata, both of Ootawara; Yuichi Fujimoto, Tochigi, and Kinya Kabashima, Ootawara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1987, Ser. No. 136,960

Claims priority, application Japan, Dec. 25, 1986, 61-307968

Int. Cl.[4] H01J *31/50, 40/15*

U.S. Cl. 250—213 VT **14 Claims**



1. An X-ray television apparatus comprising:

an X-ray image intensifier for converting an incident X-ray image into a visible image;

an imaging unit for converting the visible image into an electrical signal of an image;

two optical fiber bundles, respectively connected to said X-ray image intensifier and said imaging unit, for transmitting the visible image converted by said X-ray image intensifier to said imaging unit; and

coupling means for aligning said two optical fiber bundles and coupling said X-ray image intensifier with said imaging unit by means of elastic pressure,

said coupling means having a holding member for holding said imaging unit and an elastic fixing member for applying the elastic pressure to said holding member, so as to hold said imaging unit against said X-ray image intensifier.

4,825,068

METHOD AND APPARATUS FOR INSPECTING FORM, SIZE, AND SURFACE CONDITION OF CONVEYED ARTICLES BY REFLECTING IMAGES OF FOUR DIFFERENT SIDE SURFACES

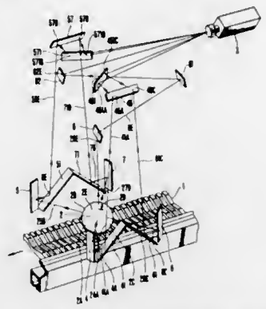
Motofumi Suzaki, and Hiromu Maeda, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Maki Seisakusho, Shizuoka, Japan

Filed Aug. 19, 1987, Ser. No. 86,953

Claims priority, application Japan, Aug. 30, 1986, 61-204588

Int. Cl.[4] G01N *9/04;* **G06M** *7/00;* **H01J** *40/14*

U.S. Cl. 250—223 R **19 Claims**



1. A method of inspecting the appearance of opaque articles, comprising: transporting the opaque articles in a stable manner on a conveyor moving along a conveying path, reflecting images of four different side surfaces of an article being transported on the conveyor by using a plurality of reflecting means arranged above and at both sides of said conveyor at an inspecting position to transmit the four images onto a sensor surface of a sensor camera, reflecting a fifth image of a top surface of said article onto the sensor surface of said sensor camera in array with said four images, scanning and photographing the five images of said five different surfaces of said article formed on said sensor surface of said sensor camera at every preset amount of movement of said article and synchronized with movement of said conveyor, and processing the photographed images so as to measure and inspect form, size and surface conditions of said article by using only one sensor camera.

4,825,069

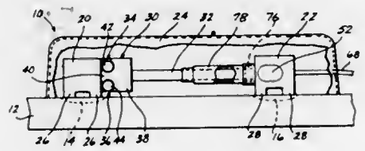
RELATIVE MOVEMENT SENSOR

James T. Hutchinson, Bellevue, and Marcell N. Benoit, Mountlake Terrace, both of Wash., assignors to Lodec, Inc., Lynnwood, Wash.

Filed May 15, 1987, Ser. No. 50,543

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—229 **10 Claims**



1. A sensor for measuring relative movement of a first portion of a structure with respect to a second portion of the structure, a line between the first and second portions defining a first axis, the sensor comprising:

a housing connected to the structure at the first portion;

an optical source and a pair of optical detectors, the source and detectors being secured to the housing such that the source and detectors do not move relative to one another, the detectors being positioned adjacent to one another, a line between the source and a point midway between the detectors defining a second axis;

a beam modulator;

mounting means for mounting the beam modulator such that the beam modulator is interposed between the source and detectors, the mounting means being connected to the structure at the second portion such that relative movement of the second portion with respect to the first portion results in movement of the beam modulator with respect to the housing;

circuit means connected to the detectors for providing an output signal corresponding to the relative illumination falling on the detectors;

the beam modulator being shaped such that the output signal varies as the beam modulator undergoes movement along a third axis perpendicular to the first and second axes; and

an output device for displaying the output signal, to thereby indicate the degree of relative movement between the first and second portions of the structure.

4,825,070

DISPLACEMENT DETECTOR FOR DETECTING AN AMOUNT OF DISPLACEMENT OF AN OBJECT TO BE MEASURED

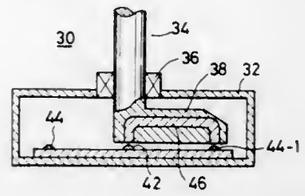
Yoshiaki Arimura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 10, 1986, Ser. No. 883,955

Claims priority, application Japan, Sep. 3, 1985, 60-193114; Sep. 3, 1985, 60-193113; Oct. 25, 1985, 60-237493; Nov. 8, 1985, 60-248894

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **28 Claims**



1. A displacement detector for detecting the amount of displacement of an object to be measured, comprising:

sensing means that are disposed with predetermined spacing, whose states change in response to changes in input electromagnetic energy;

electromagnetic energy varying means which is arranged movably, linked to motion of the object to be measured, along a row of said sensing means in order to vary an amount of electromagnetic energy in said sensing means in response to a displaced amount of the object to be measured; and

a signal processing circuit for converting a detector signal that is obtained from said sensing means situated at a position where the electromagnetic energy is changed by said electromagnetic energy varying means, to a coded signal which is characterized to the position of the sensing means at the position where there was a change in the electromagnetic energy, and for outputting the coded signal as a displacement detection signal;

wherein said sensing means comprises a plurality of light receiving elements,

said signal processing circuit comprises diode groups for generating signals that are characteristic of each of the plurality of light-receiving elements, based on the output obtained from a specified light-receiving element, a power source that is connected in series to the diode groups via load resistors, and NOT circuits that invert digital output signals from the respective load resistors that are short-circuited via the diode groups to output them as said coded signal representative of a displacement signal, based on the output from the specified light-receiving element.

4,825,071

GAMMA RAY BOREHOLE LOGGING METHOD AND APPARATUS HAVING COMPENSATION FOR BOREHOLE ATTENUATION EFFECTS

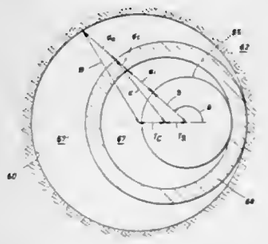
Larry L. Gadeken, and Dan M. Arnold, both of Houston, Tex., assignors to Halliburton Logging Services Inc., Houston, Tex.

Continuation of Ser. No. 720,450, Apr. 5, 1985. This application May 27, 1987, Ser. No. 56,033

Claims priority, application Australia, Mar. 20, 1986, 86/54952; Canada, Mar. 20, 1986, 5059351; European Pat. Off., Mar. 25, 1986, 86302203

Int. Cl.[4] G01V *5/00*

U.S. Cl. 250—256 **9 Claims**



1. A borehole logging method for measuring with a well logging tool in a well borehole radiations coming from adjacent earth formations and for compensating for borehole attenuation effects upon such radiations, comprising:

(a) detecting, in the borehole, gamma radiations emanating from the earth formations adjacent thereto over the energy range from 0 to 3 Mev,

(b) generating count signals representative of the detected gamma radiations,

(c) determining the attenuation effect upon the count signals caused by both the borehole materials and position of the well logging tool in the borehole by using parameters representative of said attenuation effect which are experimentally determined before the logging run and stored in a memory device to provide a set of predetermined attenuation parameters, and

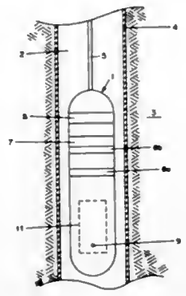
(d) combining said count signals and said stored attenuation parameters and compensating for the borehole attenuation effects on said count signals by utilizing said predetermined attenuation effect parameters according to a predetermined relationship comprising a predetermined polynominal approximation of a geometrical function related to the position of the logging tool in the well borehole to provide corrected count signals representative of the gamma radiations coming from the adjacent earth formations compensated for attenuation effects due to borehole materials and the geometry of the well logging tool in the borehole.

4,825,072

METHOD AND APPARATUS FOR DETERMINING WELL FLUID FLOW VELOCITY USING A NONRADIOACTIVE TRACER

Vernie C. McWhirter, Pearland; Donald W. Oliver, and David P. Hollingsworth, both of Houston, all of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Sep. 26, 1986, Ser. No. 911,859
Int. Cl.[4] G01V 5/10
U.S. Cl. 250—259 10 Claims



1. A method of determining the flow velocity of a flowing fluid comprising the steps of:

generating within said fluid a population of neutrons;

measuring within said fluid said population of neutrons;

injecting into said fluid, at a point upstream of said neutron population, a neutron capturing substance, said substance having a large thermal neutron capture cross section;

detecting at a fixed distance along the longitudinal axis of fluid flow the change in the measurement of said population of neutrons to indicate the occurrence of the capture of neutrons from said population by said neutron capturing substance; and

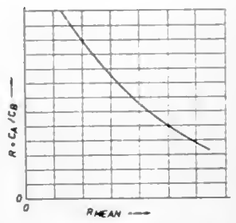
determining the travel time of said substance from injection to the maximum change in said measurement of said population of neutrons.

4,825,073

METHOD FOR DETERMINING DEPTH OF PENETRATION OF RADIOACTIVE TRACERS IN FORMATION FRACTURES

Harry D. Smith, Jr., and Larry L. Gadeken, both of Houston, Tex., assignors to Halliburton Logging Services Inc., Houston, Tex.

Filed Dec. 14, 1987, Ser. No. 132,437
Int. Cl.[4] G01V 5/04, 5/06
U.S. Cl. 250—260 13 Claims



1. A method for indicating the mean depth of penetration of one or more radioactive tracers injected from a well bore into fractures in a hydraulically fractured earth formation, said method comprising the steps of:

(1) detecting the intensity of gamma radiation from said one or more radioactive tracers and earth formations by a gamma ray detector positioned in a logging tool in the well bore adjacent to the fractured interval of earth formation and obtaining data representative of said radiation intensity;

(2) separating the gamma ray intensity data into an observed energy spectrum of detected gamma rays;

(3) obtaining from said observed energy spectrum, count rates of gamma radiation in tow or more different energy ranges, at least one of which is sensitive primarily to unscattered and minimally Compton scattered gamma rays, and at least one other of which includes significant lower energy gamma rays having undergone Compton scattering prior to detection; and

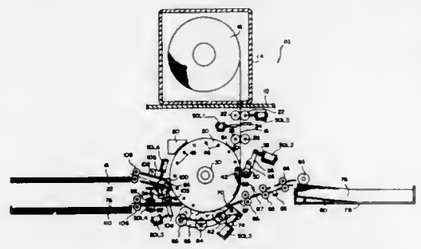
(4) combining said two or more count rates according to a predetermined relationship to produce a tracer penetration index which is indicative of the mean radial distance between the tracer and the detector in the logging tool.

4,825,074

IMAGE RECORDING APPARATUS

Sunio Yoshikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1987, Ser. No. 39,852
Claims priority, application Japan, Apr. 18, 1986, 61-90371
Int. Cl.[4] G03C 5/16
U.S. Cl. 250—317.1 20 Claims



1. An image recording apparatus of the type in which a latent image formed on a heat-developable photosensitive material through exposure is developed and the developed image is then transferred to an image-receiving material so as to be recorded on said image-receiving material, comprising:

an exposure drum for holding said heat-developable photosensitive material wound on the outer peripheral surface thereof;

an exposure head disposed to face the outer peripheral surface of said exposure drum for exposing said heat-developable photosensitive material on said exposure drum to an original image;

image-receiving material supplying means for supplying said image-receiving material onto said heat-developable photosensitive material on said exposure drum so as to wind said image-receiving material on said heat-developable photosensitive material; and

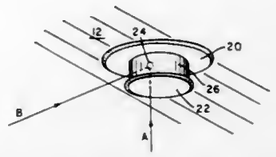
developing transfer means for applying heat to said heat-developable photosensitive material and said image-receiving material on said exposure drum so as to develop the latent image on said heat-developable photosensitive material while said heat-developable photosensitive material and image-receiving material are in contact with one another and to transfer the developed image to said image-receiving material.

4,825,075

NON-ELECTRONIC GAIN CONTROL

Elliot Jacoby, Glenside; Stephen J. Yuhasz, Zionsville, and Noel Mayo, Philadelphia, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Jul. 30, 1987, Ser. No. 79,848
Int. Cl.[4] G02F 1/01
U.S. Cl. 250—342 10 Claims



1. A device for receiving a radiated electromagnetic signal arriving at a substantially horizontal first surface; said device comprising:

(a) signal detector means, adapted for mounting in a fixed relationship to said first surface,

(b) a low transmission element, adapted for mounting in spaced-apart relationship to said first surface, having a second surface, and comprising a material that transmits no more than 50% of signal arriving at normal incidence to said second surface, and

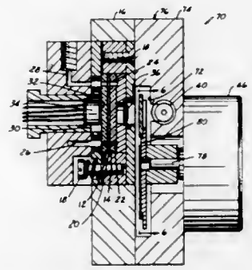
(c) a high-transmission element, surrounding said signal detector means in a horizontal plane and extending substantially vertically between said first surface and said low-transmission element.

4,825,076

INFRA-RED SPECTROPHOTOMETRIC APPARATUS

John Shields, 23 North Lane, Wheldrake Nr. York, England

Continuation-in-part of Ser. No. 796,910, Nov. 12, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 60,996
Claims priority, application United Kingdom, Nov. 13, 1984, 8428660; Apr. 17, 1985, 8509875
Int. Cl.[4] G01N 21/35
U.S. Cl. 250—343 8 Claims



1. An infrared spectrometer for measuring optical characteristics of aqueous emulsions containing light-scattering particles comprising a sample cell for receiving and containing an aqueous emulsion for test, means including a source for generating infrared energy at preselected wavelengths, an infrared detector, means for focusing energy from said source through the cell onto said detector, and means responsive to energy incident on said detector for indicating a preselected characteristic of an aqueous emulsion in said cell,

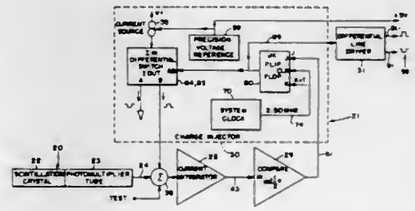
characterized in that said cell, said focusing means and said detector comprise a unitary assembly in which said cell includes means forming a pair of opposed spaced-apart parallel transparent windows carried by a frame and defining a sample cavity therebetween, in which said detector is externally mounted within said frame adjacent to one of said windows and contains a detector element spaced from and external to said cavity, and in which said focusing means comprises a focusing lens positioned within said frame externally adjacent to the other of said widows externally of said cavity and constructed to focus said energy convergently through said windows and cavity onto said detector element, said lens having a focal point at said element externally of said cavity.

4,825,077

PROCESS CONTROL SYSTEM AND METHOD

Riad A. Tawil, Kirtland, and David H. Sicking, Cleveland Hts., both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Continuation of Ser. No. 818,814, Jan. 14, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 121,099
Int. Cl.[4] G01N 23/06
U.S. Cl. 250—369 10 Claims



1. In a system for process monitoring by sensing a parameter of a medium, the system comprising:

a radiation source for emitting radiation that will be attenuated as a function of such parameter upon passage through the medium;

a radiation detector operatively positioned to detect such radiation that will be attenuated as aforesaid, said radiation detector including:

scintillator probe means for producing an electrical current output proportionally representative of detected radiation;

current integrator means for continuously integrating such electrical current output of said scintillator probe means, said integrator means having input means for receiving such electrical current output and output means for producing an electrical output representative of the integral of current received at said input means;

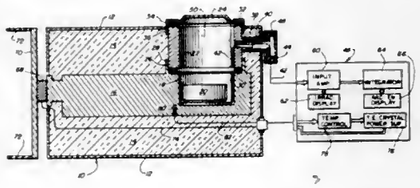
current supply means for supplying to said input means current pulses of predetermined total charge and of opposite polarity relative to such electrical current output of said probe means in response to said integrator means electrical output having a predetermined characteristic; and

output means for generating count signals at a frequency proportionally representative of the frequency at which such current pulses are supplied to said input means by said supply means; and

pulse count signal processor means for receiving the count signals generated by said output means of said detector for providing an output representative of the sensed parameter for performance of a process monitoring function.

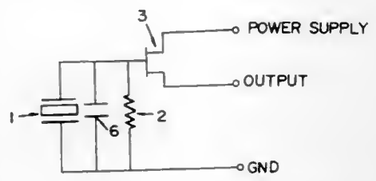
VOL 1101 ISS 4 APR 25 1989 UMI

4,825,078
RADIATION SENSOR
James V. Huber, Oak Park, and Jacob Tikhtman, Lincolnwood, both of Ill., assignors to Atlas Electric Devices Co., Chicago, Ill.
Filed Oct. 22, 1987, Ser. No. 112,666
Int. Cl.[4] G01J 5/04
U.S. Cl. 250—372 13 Claims



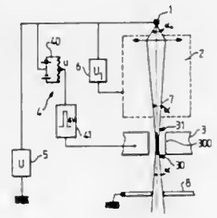
1. In an ultraviolet radiation sensor which comprises a housing, a radiation filter, a photocell positioned to sense radiation passing through said filter, and means for receiving signals from said photocell indicative of ultraviolet radiation sensed by the photocell, the improvement comprising, in combination: means for hermetically sealing said filter and photocell from the exterior, and means for cooling said filter and photocell to hold their respective temperatures below predetermined maximum levels, for improvement of sensing accuracy and operating life, said cooling means comprising a conductive metal block defining a recess, said filter and photocell being positioned in heat exchange relation with said block within said recess, and thermoelectric crystal means having a heat generating side and a heat absorbing side, said heat absorbing side being in heat exchange relation with a surface of said conductive metal block, said heat generating side being exposed to the exterior for heat exchange with the atmosphere, said radiation filter permitting transmission of substantially only ultraviolet radiation.

4,825,079
PYROELECTRIC INFRARED DETECTOR
Keiji Takamatsu, and Hideki Takahashi, both of Ichikawa, Japan, assignors to Sumitomo Metal Company Limited, Tokyo, Japan
Filed May 28, 1987, Ser. No. 55,122
Claims priority, application Japan, May 30, 1986, 61-125332
Int. Cl.[4] G01J 5/00
U.S. Cl. 250—338.3 8 Claims



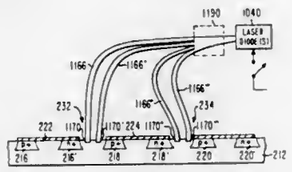
1. A pyroelectric infrared detector, comprising a pyroelectric element and a FET for picking up the output of said pyroelectric element, a capacitor connected in parallel to said pyroelectric element, and a package in which at least said pyroelectric element and said capacitor are accommodated integrally.

4,825,080
ELECTRICAL PARTICLE GUN
Michel Troyon, Gueux, France, assignor to Universite de Reims Champagne-Ardenne, France
Filed Sep. 23, 1987, Ser. No. 100,094
Int. Cl.[4] H01J 37/00
U.S. Cl. 250—396 R 14 Claims



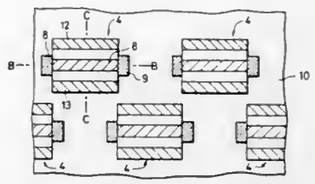
1. An electrical particle gun, comprising:
(a) an emission chamber;
(b) a source disposed in the said emission chamber for emitting particles;
(c) a device for accelerating said particles
(d) a device for focusing said particles;
(e) a decelerator electrode adjacent said focusing device;
(f) an exciter circuit; and
(g) an electrical connection between said decelerator electrode and said exciter circuit, enabling pulsed emission of said particles at said source with an energy level lying within a predetermined band and filtering of said particles according to their energy level.

4,825,081
LIGHT-ACTIVATED SERIES-CONNECTED PIN DIODE SWITCH
Douglas A. Wille, Palmyra, N.J.; John P. Kurmer, Columbus, Ohio, and Arye Rosen, Cherry Hill, N.J., assignors to General Electric Company, Moorestown, N.J.
Filed Dec. 1, 1987, Ser. No. 127,332
Int. Cl.[4] H01L 27/14
U.S. Cl. 250—551 20 Claims



1. A light-activated switch arrangement comprising:
at least first and second lateral PIN diodes formed on a single semiconductor substrate, each of said first and second PIN diodes including an active region associated with a P electrode doped withh an excess of electron acceptor impurities spaced by a substantially intrinsic region from an N electrode doped with an excess of electron donor impurities, said first and second PIN diodes being electrically connected in series to form a series combination with said P electrode of one of said PIN diodes being connected to said N electrode of the next adjacent PIN diode, thereby making one P electrode and one N electrode available for connections external to said series combination, said series combination being adapted to be connected in circuit with a load and with a source having a direct voltage component, said connection of said series combination in circuit with said load and with said source being such as to cause said PIN diodes to be reverse-biased by said direct voltage component, for controlling the flow of current from said source to said load in a manner dependent upon the conductive state of said series combination; and
control means coupled to said PIN diodes of said series combination for control of the conductive state thereof, said control means comprising selectively switchable light source means coupled principally to said intrinsic regions of said PIN diodes of said series combination, for rendering said PIN diodes of said series combination nonconductive in the absence of light coupled to said active regions of said PIN diodes, and for rendering said PIN diodes of said series combination conductive in the presence of light coupled to said active regions of said PIN diodes, whereby said series combination is selectively rendered nonconductive in the absence of light from said switchable light source means for not conducting current emanating from said source, and said series combination is selectively rendered conductive in the presence of light from said switchable light source means for conducting current emanating from said source for thereby controlling current flow from said source to said load.

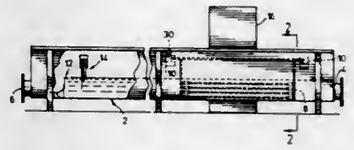
4,825,082
ELECTRON EMITTING APPARATUS
Masahiko Okunuki, Tokyo; Takeo Tsukamoto, Atsugi; Akira Shimizu, Sagamihara; Akira Suzuki, Yokohama; Masao Segata, Yokohama, and Isamu Shimoda, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 11, 1987, Ser. No. 60,238
Claims priority, application Japan, Jan. 19, 1986, 61-141389
Int. Cl.[4] H01J 27/00
U.S. Cl. 250—423 F 3 Claims



1. An electron emitting apparatus comprising a plurality of electron emitting devices each having an electron emitting portion having an elongated configuration in a first direction, wherein said electron emitting portions are arranged so that said portions adjacent to each other are diviated in a second direction, such that in a scanning direction substantially no gap exists between said adjacent electron emitting portions.

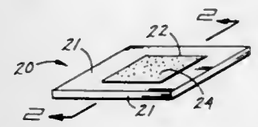
4,825,083
ULTRAVIOLET WATER TREATMENT APPARATUS
Ernest Latel, Etobicoke, and John A. Johnson, Toronto, both of Canada, assignors to Ariat Inc., Toronto, Canada
Continuation of Ser. No. 872,476, Jun. 10, 1986, Pat. No. 4,757,205. This application May 12, 1988, Ser. No. 192,908
Int. Cl.[4] G01N 21/01
U.S. Cl. 250—436 3 Claims

1. In an ultraviolet water treatment plant comprising a treatment channel for the passage of water to be treated, at least one vertically stacked array of elongated ultraviolet electric lamp units, means for supporting said at least one array within the channel, and means for connecting the lamps of said array individually to a power supply, the improvement wherein means are provided to restrict the flow of water through the channel such that the depth of water in the channel, and hence the number of lamps in each said array which are immersed, is progressively increased in accordance with the rate of flow through the channel, means to sense the depth of water in the channel, and switching means associated with said power



supply and controlled by said sensing means to turn on only such lamps as are required to irradiate the water.

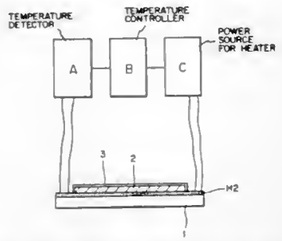
4,825,084
LASER READABLE THERMOLUMINESCENT RADIATION DOSIMETERS AND METHODS FOR PRODUCING THEREOF
Peter F. Braunlich, S.W. 730 City View, Pullman, Wash. 99163, and Wolfgang Tetzlaff, Pullman, Wash., assignors to Peter F. Braunlich, Pullman, Wash.
Filed Aug. 19, 1986, Ser. No. 897,992
Int. Cl.[4] G01T 1/11
U.S. Cl. 250—484.1 64 Claims



1. A laser readable dosimeter for thermoluminescent radiation dosimetry which is capable of withstanding high temperature gradients and relatively high temperatures generated during laser heating with low laser power requirements and resistance to physical degradation, comprising:
a substrate made from a nonporous ceramic having a relatively insignificant thermoluminescent output; said substrate having a thickness in the range of 50–100 microns;
at least one phosphor-binder layer bonded to the substrate; said phosphor-binder layer being less than 200 microns in thickness; said phosphor-binder layer including a suitable thermoluminescent phosphor composition and an inorganic glass binder; said glass binder being bonded to the substrate and to particles of the thermoluminescent phosphor according to a process which raises the binder to a temperature in excess of a softening temperature of the glass binder and then cools the binder below said softening temperature thus serving to hold particles of the thermoluminescent phosphor composition in position on the substrate.

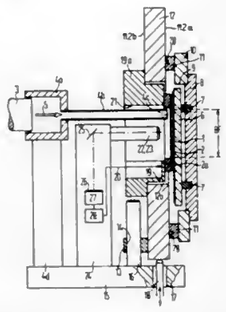
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4,825,085
RADIATION IMAGE STORAGE PANEL HAVING ASSEMBLED HEAT GENERATING BODY
Hisanori Tsuchino; Akiko Kano; Kuniaki Nakano, and Fumio Shimada, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Nov. 23, 1987, Ser. No. 123,762
Claims priority, application Japan, Dec. 3, 1986, 61-289691
Int. Cl.[4] G21K *4/00*
U.S. Cl. 250—484.1 10 Claims



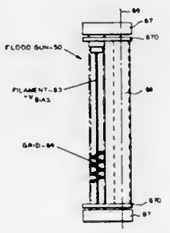
1. A radiation image storage panel, comprising a heat generating body for drying assembled in a radiation image storage panel using a light stimulable phosphor.

4,825,086
APPARATUS FOR THE EXACT MUTUAL ALIGNMENT OF A MASK AND SEMICONDUCTOR WAFER IN A LITHOGRAPHIC APPARATUS
Karl-Heinz Mueller, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 15, 1987, Ser. No. 73,760
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1986, 3623891
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—491.1 10 Claims



1. In an arrangement for exact, mutual alignment of a mask and a semiconductor wafer in a lithographic apparatus which utilizes parallel particle beams impinging on a structured mask and then into the semiconductor wafer to be structured, said apparatus including means for positioning the mask in the beam path including a first retaining plate having first means for securing, a first group of setting pins extending perpendicular from the plate and parallel to the beam path and being secured to a table, a second group of three setting pins being mounted for displacement in a first controllable drive mechanism secured on a mounting part which is secured on said table, said second group being arranged to extend parallel to the plane of the mask and being actuated to move the first retaining plate parallel to a first coordinate axis, parallel to a second coordinate axis and to also rotate the plate in the plane, the improvements comprising the first group of setting pins being mounted for displacement in a second controllable drive mechanism secured on said mounting part.

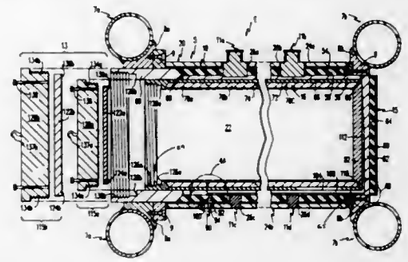
4,825,087
SYSTEM AND METHODS FOR WAFER CHARGE REDUCTION FOR ION IMPLANTATION
Anthony Renau, Horsham; Stephen Moffatt, Byfleet, and Frederick Plumb, Horsham, all of England, assignors to Applied Materials, Inc., Santa Clara, Calif.
Filed May 13, 1987, Ser. No. 50,586
Int. Cl.[4] G21K *5/00*
U.S. Cl. 250—492.2 14 Claims



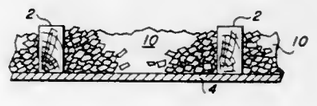
1. In combination with a system for irradiating a wafer-like target with an ion beam in a system end station comprising post-analysis electrode means for accelerating the ion beam to a given velocity incident upon a target located at a selected position downstream from the post-analysis electrode means, a flood gun inserted between the post-analysis electrode means and the target position for neutralizing positive charge build-up induced in the target by the ion beam, the flood gun comprising: a spiral wire grid anode having coil turns spaced a distance selected for admitting gas therethrough; a filament cathode extending lengthwise within the grid anode for receiving a bias voltage to stimulate the emission of electrons into the ion beam; means for introducing an inert gas through the grid anode for magnifying the flux of emitted electrons and lowering the peak electron energy to a value commensurate with the positive voltage level induced by the ion beam in the target; and means for supplying an adjustable bias voltage to the filament for amplifying the current of emitted electrons and for controlling the electron peak energy.

4,825,088
LIGHTWEIGHT TITANIUM CASK ASSEMBLY FOR TRANSPORTING RADIOACTIVE MATERIAL
Balakrishnan R. Nair, North Huntingdon; Raymond V. Richardson, and Raymond M. Mello, both of Greensburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 30, 1987, Ser. No. 114,599
Int. Cl.[4] G21F *5/00*
U.S. Cl. 250—506.1 30 Claims

1. An improved cask assembly for containing radioactive materials, comprising a container having a shielding wall substantially formed from a radiation shielding material, and structural walls formed at least in part by titanium for supporting said shielding wall.

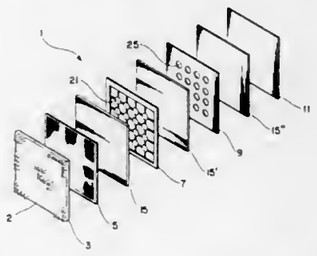


4,825,089
RADIANT BARRIER APPARATUS
Brad H. Lindsay, 601 E. Bell Rd. Suite 350, Phoenix, Ariz. 85022
Filed Jul. 13, 1987, Ser. No. 72,287
Int. Cl.[4] G21F *3/02*
U.S. Cl. 250—515.1 21 Claims



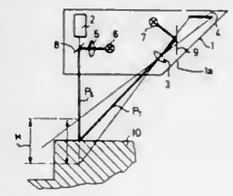
1. Radiant barrier apparatus for reflecting long wave radiation, comprising, in combination:
base means, including a flexible chip having a first substantially clear film substrate having a first side and a second side; and
metallized layer means including first and second layer secured to one of each of the first and second sides of the substrate for reflecting long wave infra red radiation.

4,825,090
SHIELDING MEMBRANE
Dietrich W. Grabis, 58 Oakdale Ave., San Rafael, Calif. 94901
Filed Feb. 9, 1988, Ser. No. 154,977
Int. Cl.[4] G21C *11/00*
U.S. Cl. 250—515.1 26 Claims



4. A shielding membrane for absorbing radiation from an electromagnetic radiation source, the shielding membrane having an incident side facing substantially towards the radiation source and a base side facing substantially away from the radiation source, the shielding membrane comprising:
means for minimizing reflection of electromagnetic radiation incident on the incident surface of the shielding membrane;
a conductive deflection layer formed of a multiplicity of spaced apart metallic deflection pads for deflecting incident radiation thereabout, said deflection layer being positioned in spaced apart confronting relationship with the base side of said reflection minimizing means;
a conductive absorption funneling layer disposed in spaced apart confronting relationship with the base side of the deflection layer and having a multiplicity of apertures for passing radiation; and
a grounded reflecting plate spaced apart from the base side of said absorption funneling layer.

4,825,091
OPTOELECTRONIC DISTANCE SENSOR WITH VISIBLE PILOT BEAM
Karl-Hermann Breyer, Heidenheim, and Klaus P. Koch, Aalen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany
Filed Feb. 1, 1988, Ser. No. 151,207
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 3703422
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—560 8 Claims



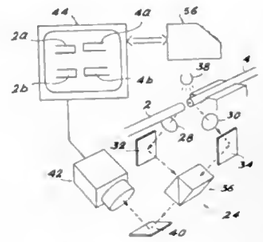
1. An optoelectronic distance sensor for operating on a workpiece in accordance with the triangulation principle, the distance sensor comprising:
light source means for generating a measuring beam and directing the same onto a workpiece to define a measuring region;
a position-sensitive photoelectric receiver;
optical imaging means for imaging said measuring region on said receiver and for defining an imaging beam path inclined to said measuring beam and extending from said measuring region to said receiver; and,
pilot beam means for superposing a pilot beam in the visible spectral range onto said imaging beam path.

4,825,092
PROCESS AND SYSTEM FOR THE RELATIVE POSITIONING OF TWO OPTICAL FIBERS WITH A VIEW TO FORMING AN OPTICAL LINK BETWEEN THEM
Kada Mehadji, Rue Ropartz Brelevenez, 22300 Lannion, France
Filed Mar. 4, 1987, Ser. No. 21,411
Claims priority, application France, Mar. 7, 1986, 86 03237
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—561 11 Claims

1. A process for the relative positioning of first and second optical fibers to establish an optical link between them respective ends of said fibers then being positioned facing one another said process comprising the following steps of:
forming on a screen, for each fiber, at least one image of said fiber observed along at least one plane parallel thereto and representing on said image on said screen the contour of

the core of the fiber, said contour being in its effective position,

moving on the screen, the contours of the second fiber and



of the core thereof until the contour of the core of said second fiber is aligned with the contour of the core of the first fiber, and displacing the second fiber until its image coincides with the corresponding contour.

4,825,093

METHODS FOR IDENTIFYING SEMICONDUCTOR WAFER WITH BAR CODE PATTERN THEREON AND METHODS FOR MANUFACTURING SEMICONDUCTOR DEVICE

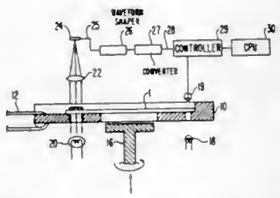
Tadashi Kiriseko, Kanagawa, and Nobuo Iijima, Tama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 19, 1987, Ser. No. 51,398

Claims priority, application Japan, May 20, 1986, 61-116422; Jun. 18, 1986, 61-142533

Int. Cl.[4] G06K *7/10*

U.S. Cl. 250—566 **15 Claims**



1. A method for identifying a semiconductor wafer utilizing a bar code pattern formed thereon, said method comprising the steps of:

(a) depositing a metal layer on the semiconductor wafer, having a low transmission factor with respect to infrared rays;

(b) forming the bar code pattern with the metal layer;

(c) irradiating light, including infrared rays onto a first side of the semiconductor wafer;

(d) receiving the infrared rays transmitted through the semiconductor wafer and the bar code pattern of the metal layer on a second side of the semiconductor wafer; and

(e) identifying the semiconductor wafer by decoding the received signal.

4,825,094

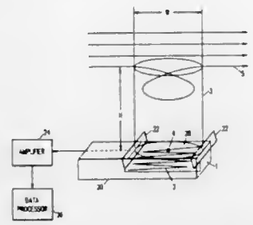
REAL TIME PARTICLE FALLOUT MONITOR WITH TUBULAR STRUCTURE

Peter Borden, Palo Alto, and Jon Munson, Sunnyvale, both of Calif., assignors to High Yield Technology, Mountain View, Calif.

Filed Feb. 4, 1988, Ser. No. 152,198

Int. Cl.[4] G01N *15/06*

U.S. Cl. 250—573 **9 Claims**



1. An assembly for monitoring particle fallout comprising:

particle flux monitoring means including a housing with an aperture on a major surface, said housing having a closed surface opposite to said major surface to provide an effective closure; and

a tubular structure seated on said major surface having its top end open and its bottom end disposed over said aperture and facing said effective closure for providing a substantially static air condition adjacent to said aperture so that particles descend through said tubular structure to land and settle on said opposite surface.

4,825,095

STARTER MOTOR

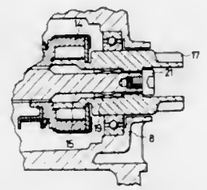
Akira Morishita, and Shuzo Isozumi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1988, Ser. No. 203,364

Claims priority, application Japan, May 27, 1987, 62-134291; Jun. 17, 1987, 62-151666

Int. Cl.[4] F02N *15/06*

U.S. Cl. 249—48 **4 Claims**



1. An engine starter motor including a motor, an output shaft, an over-running clutch adapted to be moved forwardly upon application of a voltage to a magnet switch and a pinion supported by said over-running cltutch slidably on and along said output shaft, comprising a stopper member having an outer diameter larger than an outer diameter of said output shaft and adapted to be detachably threaded to a front end portion of said output shaft, a front end of said stopper member being behind a front end of said pinion when fully retracted, a land portion formed on an inner surface of said pinion, said land portion being engaged with a rear end of said stopper member when said pinion is moved forwardly by a predetermined distance, and a bearing fixedly supported by said inner surface of said pinion and supporting said output shaft slidably, said bearing being positioned to receive a reactive force exerted on said output shaft.

4,825,096

REMOTE CONTROL APPARATUS FOR TRIPPING OFF SWITCHES

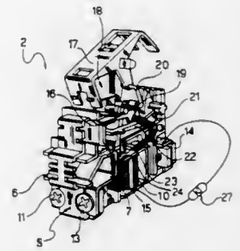
Fabrizio Fabrizi, Bergamo, and Ennio Calderara, Cuasso Al Piano, both of Italy, assignors to Bassani Ticino S.p.A., Milan, Italy

Filed Jan. 26, 1988, Ser. No. 148,769

Claims priority, application Italy, Feb. 9, 1987, 19298 A/87

Int. Cl.[4] H01H *47/22, 75/00*

U.S. Cl. 307—112 **8 Claims**



1. A remote control system for tripping off switches, of a type which comprises at least one double-pole switch, connected to and acting on an electrical appliance, having a central core supporting trip-off linkages, at least one input terminal electrically connected to a fixed contact and one output terminal electrically connected to a moving contact, a key for manually operating said trip-off linkages, a voltmeter coil housed within the central core for mechanically operating said trip-off linkages, having one end connected electrically to said moving contact and the other end serially connected by a diode to said output terminal, a power supply circuit for said coil equipped with a pushbutton control for energizing said coil and operating said trip-off linkages being connected with said moving contact in said power supply circuit.

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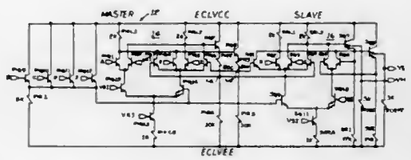
MASTER-SLAVE D-TYPE FLIP-FLOPS WITH IMPROVED VOLTAGE OFFSET MEANS

John C. Bazil, and Donald G. Goddard, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 21, 1988, Ser. No. 146,453

Int. Cl.[4] H03K *3/289*

U.S. Cl. 307—272.2 **8 Claims**



1. A master-slave D-type flip-flop comprising:

a master section (14) having a master clock differential transistor pair formed of a first input transistor (MQ14) and a first reference transistor (MQ13) whose emitters are connected together;

the base of said input transistor (MQ14) being coupled to receive a clock input signal swinging between a high logic level and a low logic level;

the base of said reference transistor (MQ13) being connected to receive a threshold voltage level (VBI) set midway between the logic swing of said clock input signal;

means for effectively lowering of said threshold voltage level (VBI) at the base of said first input transistor to be closer to said low logic level of said clock signal, said means for effectively lowering of said threshold voltage level being formed of said first input transistor (MQ14) having dual-emitters;

a slave section (16) having a slave clock differential transistor pair formed of a second input transistor (SQ9) and a second reference transistor (SQ10) whose emitters are connected together;

the base of said second input transistor (SQ9) being also coupled to receive said clock input signal;

the base of said second reference transistor (SQ10) being connected also to receive said threshold voltage level (VBI) set midway between the logic swing of said clock input signal;

means for effectively raising of said threshold voltage level (VBI) at the base of said second input transistor (SQ9) to be closer to said high logic level of said clock signal, said means for effectively raising of said threshold voltage level being formed of said second reference transistor (SQ10) having dual-emitters;

said slave section (16) including a pair of differentially connected transistor pair formed of a first latch transistor (SQ5) and a second latch transistor (SQ6) whose emitters are connected together and to the collector of said second reference transistor (SQ10);

a first slave emitter follower transistor (SQ7) having its base connected to the collector of said first latch transistor (SQ5) and dual-emitters, one of the dual-emitters being connected to a first output terminal for generating a complementary data output signal compatible with ECL circuits, the other one of the dual-emitters being connected to the base of said second latch transistor (SQ6); and

a second slave emitter follower transistor (SQ8) having its base connected to the collector of said second latch transistor (SQ6) and dual-emitters, one of the dual-emitters being connected to a second output terminal for generating a true data output signal compatible with ECL circuits, the other one of the dual-emitters being connected to the base of said first latch transistor (SQ5),

whereby the threshold voltage levels in said master clock differential transistor pair in said master section and in said slave clock differential transistor pair in said slave section are offset so as to prevent transferring of false data directly from the master section to the slave section during low-to-high and high-to-low transistions of said clock signal.

4,825,098

BIDIRECTIONAL SEMICONDUCTOR DEVICE HAVING ONLY ONE ONE-DIRECTIONAL DEVICE

Keizo Aoyama, Yamato, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 8, 1987, Ser. No. 130,630

Claims priority, application Japan, Dec. 17, 1986, 61-298887; Dec. 17, 1986, 61-298895; Dec. 18, 1986, 61-300112

Int. Cl.[4] H03K *3/01, 3/356, 17/693, 19/092*

U.S. Cl. 307—243 **8 Claims**

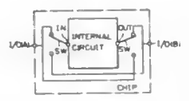
1. A bidirectional semiconductor device comprising:

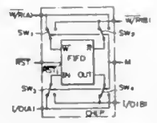
only one one-directional internal circuit having an internal input port and an internal output

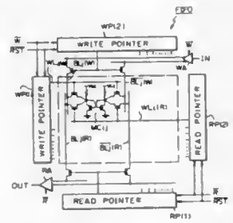
first and second external input/output ports; and

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switching means for connecting said internal input port to one of said first and second external input/output ports

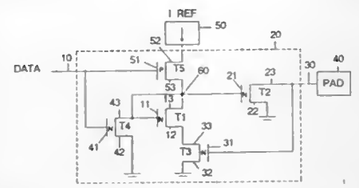






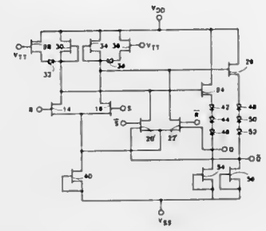
and connecting said internal output port to said other port in accordance with a mode signal.

4,825,099
FEEDBACK-CONTROLLED CURRENT OUTPUT DRIVER HAVING REDUCED CURRENT SURGE
Steven K. Barton, Peyton, Colo., assignor to Ford MicroElectronics, Colorado Springs, Colo.
Filed Dec. 4, 1987, Ser. No. 128,617
Int. Cl.[4] H03K *19/003, 19/094, 17/284, 17/08*
U.S. Cl. 307—270 **19 Claims**



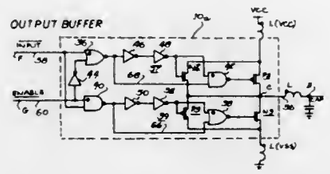
1. A controlled current driver circuit comprising:
an input terminal to which an input signal is applied;
an output terminal from which an output signal is derived;
a reference current terminal to which a source of reference current is applied;
a current mirror circuit coupled between said reference current terminal and said output terminal;
first means, coupled between said input terminal and said current mirror circuit, for causing said current mirror circuit to apply a controlled current to said output terminal in response to the application of an input signal to said input terminal; and
second means, coupled between said output terminal and said current mirror circuit, for causing said current mirror circuit to terminate the supply of controlled current to said output terminal in response to the voltage level at said output terminal reaching a prescribed threshold.

4,825,100
HIGH SPEED R-S LATCH
George J. Caspell, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.
Filed Apr. 4, 1988, Ser. No. 177,556
Int. Cl.[4] H03K *3/356*
U.S. Cl. 307—279 **8 Claims**



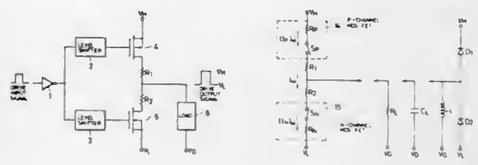
1. A high speed R-S latch comprising:
a. an input stage having reset and set inputs, and a differential output;
b. an output stage having a differential input, a differential output, the differential input being coupled to the differential output of said input stage; and
c. a double gate FET latch stage having inverted reset and set inputs, a differential input, and a differential output, the differential input of said double gate FET latch stage being coupled to the differential output of said output stage, the differential output of said double gate FET latch stage being coupled to the differential output of said input stage, the differential output of said double gate FET latch stage being coupled to the differential output of said output stage.

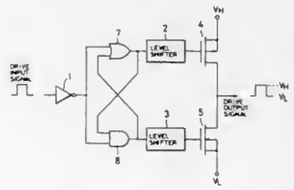
4,825,101
FULL-LEVEL, FAST CMOS OUTPUT BUFFER
Donald M. Walters, Jr., Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Feb. 11, 1988, Ser. No. 154,723
Int. Cl.[4] H03K *19/094, 17/284, 19/20*
U.S. Cl. 307—270 **18 Claims**



1. An output buffer for driving widely varying capacitive and inductive loads which has a significant reduction in inductive ringing at an output node, comprising:
pull-up circuit means responsive to a first control signal for generating a transition from a low logic level to a high logic level at the output node;
said pull-up circuit means including a first inverter (46), a second inverter (48), a first pull-up N-channel transistor (N2), a NAND logic gate (42), and a second pull-up P-channel transistor (P2);
said first inverter (46) having its input connected to receive the first control signal and its output connected to the input of said second inverter (48), the output of said second inverter (48) being connected to the gate of said first pull-up transistor (N2) and to a first input of said NAND gate (42), said first pull-up transistor (N2) having its drain connected to a supply potential and its source connected to the output node;
said NAND gate (42) having a second input connected to receive the first control signal and its output connected to the gate of said second pull-up transistor (P2), said second pull-up transistor (P2) having its source connected to the supply potential and its drain connected to the output node;
pull-down circuit means responsive to a second control signal for generating a transition from the high logic level to the low logic level at the output node;
said pull-down circuit means including a third inverter (50), a fourth inverter (52), a first pull-down P-channel transistor (P3), a NOR logic gate (38), and a second pull-down N-channel transistor (N3);
said third inverter (50) having its input connected to receive the second control signal and its output connected to the input of said fourth inverter (52) being connected to the gate of said first pull-down transistor (P3) and to a first input of said NOR gate (38), said first pull-down transistor (P3) having its source connected to the output node and its drain connected to a ground potential;
said NOR gate (38) having a second input connected to receive the second control signal and its output connected to the gate of said second pull-down transistor (N3), said second pull-down transistor (N3) having its drain connected to the output node and its source connected to the ground potential,
whereby output impedance is increased towards the end of an output transition and energy stored in parasitic inductance is decreased by said pull-up and pull-down transistors so as to reduce the inductive ringing while accelerating the completion of the output transition.

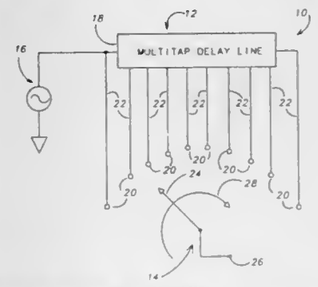
4,825,102
MOS FET DRIVE CIRCUIT PROVIDING PROTECTION AGAINST TRANSIENT VOLTAGE BREAKDOWN
Toshiyuki Iwasawa, Tokyo, and Masayoshi Miura, Kawasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Sep. 11, 1987, Ser. No. 95,457
Claims priority, application Japan, Sep. 11, 1986, 61-214381; Nov. 12, 1986, 61-269054; Nov. 12, 1986, 61-269057
Int. Cl.[4] H03K *17/08, 17/16, 17/284, 3/013*
U.S. Cl. 307—296.5 **22 Claims**





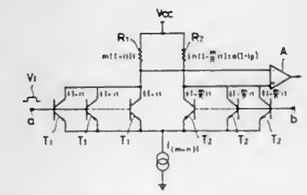
1. A drive circuit comprising a P-channel field effect transistor and an N-channel field effect transistor connected in a push-pull configuration, a first resistor having first and second terminals, said first terminal being connected to a drain electrode of said P-channel field effect transistor, said first resistor having a resistance value which is higher than an ON-state internal resistance value of said P-channel field effect transistor, a second resistor having first and second terminals, said first terminal of said second resistor being connected to a drain electrode of said N-channel field effect transistor, said second resistor having a resistance value which is higher than an ON-state internal resistance value of said N-channel field effect transistor, with the respective second terminals of said first and second resistors being mutually connected to form a junction which constitutes an output terminal of said drive circuit.

4,825,103
SAMPLE-AND-HOLD CIRCUIT
Thomas Hornak, Portola Valley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 14, 1987, Ser. No. 38,105
Int. Cl.[4] H03K *5/06;* **G11C** *27/02*
U.S. Cl. 307—353 **28 Claims**



1. A sample-and-hold circuit comprising:
delay means adapted for the spatial transmission at a predetermined propagation rate of a signal applied to an input thereof; and
signal following means for sequentially sensing the level of a first segment of said signal at progressive sections of said delay means in synchronization with said propagation rate so as to provide a substantially constant output corresponding to said level.

4,825,104
COMPARATOR
Akira Yamakoshi; Toyohiko Fujita; Kunihiko Tsukakoshi, and Kazuhisa Mito, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed Sep. 29, 1987, Ser. No. 102,418
Claims priority, application Japan, Oct. 2, 1986, 61-234998; Nov. 10, 1986, 61-267072
Int. Cl.[4] H03K *5/24*
U.S. Cl. 307—355 **16 Claims**



1. A comparator comprising:
a first circuit including m(m=1, 2 . . .) transistors connected

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in parallel for receiving a first input signal at each respective base of the transistors;

a second circuit including n(n=1, 2 . . . where n≠m) transistors connected in parallel for receiving a second input signal at each respective base of the transistors;

a first load resistor connected in series with the first circuit, and a second load resistor having the same resistance as the first load resistor and connected in series with the second circuit;

said first circuit and said first load resistor constituting a first series-connected circuit, and said second circuit and said second load resistor consituting a second series-connected circuit, said first series-connected circuit and said second series-connected circuit each being connected in parallel with a common power source; and

a differential amplifier having input terminals respectively connected to a junction of the first load resistor and the first circuit and a junction of the second load resistor and the second circuit.

4,825,105

CIRCUIT FOR GENERATION OF LOGIC VARIABLES, USING MULTIPLEXES AND INVERTERS

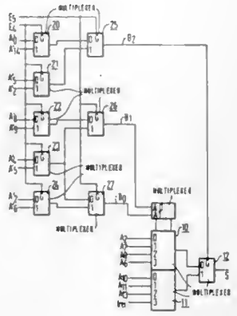
Josef Hölzle, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 781,826, Sep. 30, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 142,343

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 3435774

Int. Cl.⁴ H03K *19/02*

U.S. Cl. 307—440 **8 Claims**



1. Circuit for the generation of combinatorial logic variables, formed of multiplexers having multiple data and address inputs and multiple binary input and output states and inverters , said circuit having for each input state defined by a combination of input variables of lowest binary weight, a uniquely defined output state defining at least one output variable, said circuit comprising first means for receiving a plurality of first input variables of lowest binary weight; second means connected to said first means for generating intermediate variables of equal binary weight

being a logic function of the input variables of

lowest binary weight, and third means connected to said second means including logic combinations having further input variables of higher binary weights to generate said at least one output variable.

4,825,106

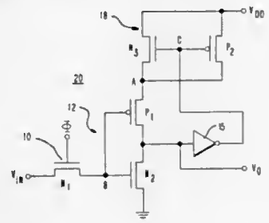
MOS NO-LEAK CIRCUIT

Donald G. Tipon, San Diego, and Chinh V. Tran, Escondido, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 8, 1987, Ser. No. 35,842

Int. Cl.⁴ H03K *19/017, 3/037, 19/094*

U.S. Cl. 307—451 **6 Claims**



1. A no-leak circuit comprising:

a first MOS inverter circuit having an input for receiving a bi-level input signal and an output for providing an inverted input signal and a pair of power terminals for receiving power, one of said power terminals connected to a reference potential;

a second inverter circuit having an input connected to the output of said first MOS inverter circuit and an output terminal; and

circuit means for coupling the other power terminal of said first MOS inverter circuit to a source of power, said circuit means connected to the output of said second inverter circuit and responsive to the signal from said second inverter circuit for cutting off the current flow to said first MOS inverter circuit when the bi-level input signal is of a first level and for permitting the flow of current when said input signal is of a second level;

wherein said circuit means comprises a P channel and an N channel transistor each having a control electrode and first and second current electrodes, said control electrodes connected to the output of said second inverter circuit and said first current electrodes connected to the other power terminal of said first MOS inverter and said second current electrodes connected to a source of power.

4,825,107

MASTER SLICE TYPE INTEGRATED CIRCUIT

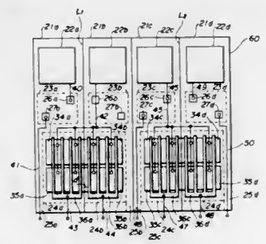
Masayuki Naganuma, and Yoshiyuki Snehiro, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 12, 1988, Ser. No. 155,574

Claims priority, application Japan, Feb. 13, 1987, 62-31782

Int. Cl.⁴ H03K *3/01, 19/01, 17/04;* **H01L** *27/00*

U.S. Cl. 307—465 **13 Claims**



1. A master slice type integrated circuit for providing various circuits by altering the routing of interconnections comprising:

a plurality of input/output cells arranged in a peripheral region on a semiconductor chip, the input/output cells each comprising pads for connection with an external circuit, input wiring regions each for accommodating input interconnecting lines carrying input signals, and output circuit regions each for forming output buffers; and

a plurality of basic cells being arranged in a region on the chip surrounded by the arrangement of the input/output cells,

wherein two adjacent input/output cells are paired with each other, the output circuit regions of the pair of the input/output cells are arranged in the vicinity of a boundary of the pair, and the input wiring regions of the pair are arranged in the vicinity of boundaries with respect to other pairs.

4,825,108

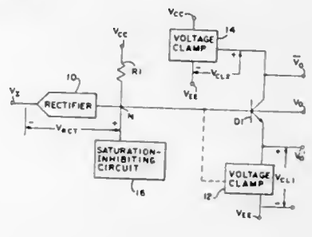
VOLTAGE TRANSLATOR WITH RESTRICTED OUTPUT VOLTAGE SWING

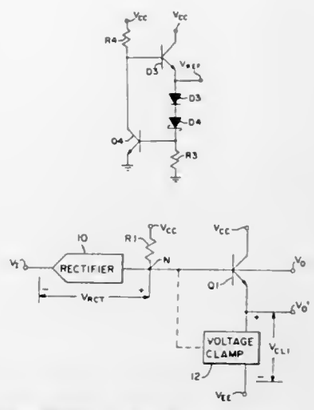
Edward A. Burton, Provo; Charles E. Dike, Pleasant Grove, and Thomas D. Fletcher, Orem, all of Utah, assignors to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Filed Jun. 15, 1987, Ser. No. 63,569

Int. Cl.⁴ H03K *19/092, 17/04, 17/60, 19/088*

U.S. Cl. 307—475 **25 Claims**





1. A voltage translator comprising:

an input terminal for receiving an input voltage;

a bipolar transistor having a base coupled to a node, an emitter coupled to a source of a first supply voltage, and a collector directly connected to a source of a second supply voltage that differs in magnitude from the first supply voltage by a selected voltage V_{PS};

a rectifier coupled between the input terminal and the node in the current-flow direction opposite to that of the base-emitter junction of the transistor;

a resistor coupled between the node and the source of the second supply voltage;

a clamp that, when the transistor is turned on, prevents the magnitude of the difference between the first supply voltage and the voltage at the emitter from exceeding a value V_{CL1} less than V_{PS} but greater than zero;

an output terminal coupled to the base for providing an output voltage logically the same as the input voltage; and

an output terminal coupled to the emitter for providing an output voltage logically the same as the input voltage but at a different voltage level from the other output voltage.

4,825,109

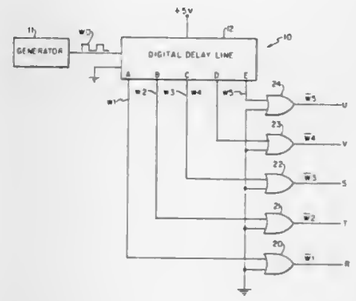
DIGITAL DELAY CIRCUIT

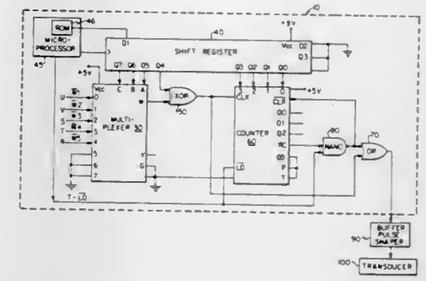
Charles A. Reynolds, West Haven, Conn., assignor to American Home Products Corporation, N.Y.

Continuation of Ser. No. 873,932, Jun. 13, 1986. This application Nov. 20, 1987, Ser. No. 124,417

Int. Cl.⁴ H03K *5/06, 5/04*

U.S. Cl. 307—601 **6 Claims**





1. A timing circuit for producing a signal after a predetermined period of time has elapsed comprising:

generating means for generating a periodic waveform, said waveform having leading and trailing edges;

means responsive to said periodic waveform for producing a plurality of waveforms shifted in time relative to said periodic waveform, said shifted waveforms having leading and trailing edges;

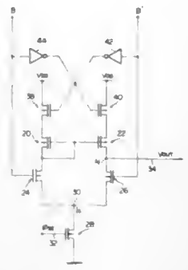
means responsive to said time shifted waveforms for inverting said time shifted waveforms;

selecting means for selecting a waveform from a set including said time shifted waveforms and said inverted time shifted waveforms depending on the length of said predetermined period of time;

counting means responsive to one of said edges of said selected waveform; and

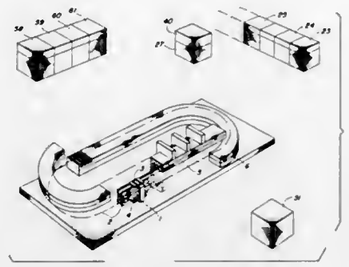
means responsive to said counting means for producing said signal when said counting means reaches a predetermined count value, said predetermined count value being dependent on said length of said predetermined period of time.

4,825,110
DIFFERENTIAL AMPLIFIER CIRCUIT
Takashi Yamaguchi, and Yasuo Kobayashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Oct. 9, 1986, Ser. No. 917,137
Claims priority, application Japan, Oct. 9, 1985, 60-226121; Dec. 20, 1985, 60-288717
Int. Cl.[4] G01R 19/01; H03K 17/16, 19/017
U.S. Cl. 307—530 4 Claims



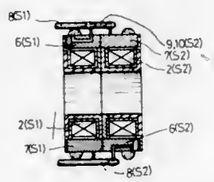
1. A differential amplifier circuit comprising
(a) a pair of mutually complementary bit lines connected to a row of memory cells arranged in rows and columns,
(b) first and second load transistors each of the load transistors being implemented by a p-channel MOS field-effect transistor,
(c) first and second amplifier transistors each of the amplifier transistors being implemented by an n-channel MOS field-effect transistor,
(d) said load transistors having their respective gates commonly connected to the respective drains of the first load transistor and the first amplifier transistor, said first and second amplifier transistors having their respective gates connected to said complementary bit lines, respectively,
(e) an activating transistor through which said first and second amplifier transistors have their respective sources commonly connected to a first supply voltage line, said activating transistor being implemented by an n-channel MOS field-effect transistor and having its drain connected to the respective sources of said first and second amplifier transistors through a common node, its source connected to said first supply voltage line, and its gate connected to a clock supply line through which an active-high clock signal is to be supplied,
(f) said second load transistor and said second amplifier transistor having their respective drains commonly connected through a node to an output line, and
(g) first and second current cutoff transistors each of which is implemented by a p-channel MOS field-effect transistor, the first and second current cutoff transistors having their respective sources connected to a second voltage supply, their respective drains connected to the sources of the first and second load transistors, respectively, and their respective gates connect to said complementary bit lines through first and second inverters, respectively.

4,825,111
LINEAR MOTOR PROPULSION SYSTEM
William J. Hommes, Hockessin, and John J. Keegan, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 2, 1987, Ser. No. 115,791
Int. Cl.[4] B60L 15/38, 13/00; B65G 43/10; H02K 41/02
U.S. Cl. 310—12 57 Claims



40. A method of controlling the propulsion of a plurality of spaced apart carriages into a stack of moving abutted carriages including the steps of:
propelling the abutted stack of carriages at a first speed;
propelling a spaced apart carriage into a controlled impacting abutment with the stack of abutted carriages by propelling the spaced apart carriages at second speed greater than the first speed before the carriage reaches the stack, using a linear motor.

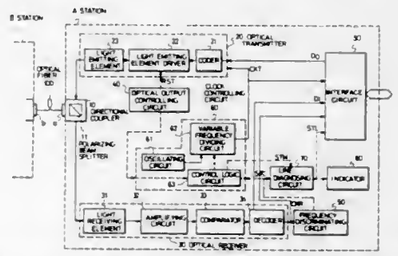
4,825,112
STATOR IN STEP MOTOR
Katsumi Mineyama, Obu, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan
Continuation of Ser. No. 932,589, Nov. 20, 1986, abandoned.
This application Mar. 15, 1988, Ser. No. 168,478
Claims priority, application Japan, Dec. 3, 1985, 60-186478
Int. Cl.[4] H02K 3/00
U.S. Cl. 310—71 2 Claims



1. A stator assembly in a step motor connected to driving power supply harnesses for supplying electric current to the stator, said assembly comprising:

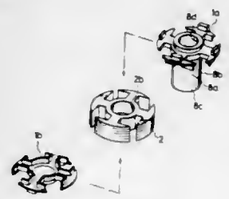
(a) first and second cylindrical housings attached to each other at opposite ends thereof;
(b) first and second stator coils installed in said first and second housings;
(c) first and second pairs of connecting members for connecting terminal ends of said first and second stator coils to said driving power supply harnesses, said first pair of said connecting members being mounted on a peripheral surface of said first cylindrical housing, said second pair of said connecting members being mounted on a peripheral surface of said second cylindrical housing at positions corresponding to positions of said first pair of said connecting members; and,
(d) said driving power supply harnesses comprising two groups with each group having three terminals, one power supply harness of each of said groups having a positive polarity and the others having a negative polarity, said positive terminal of said three terminals of said one group being connected to one terminal end of said first pair of connecting members, while the other two negative terminals being connected to said terminal ends of said second pair of connecting members positioned in corresponding relationship to said one connecting member of said first pair of connecting members; said positive terminal of said three terminals of the other group being connected to the other connecting member of said second pair of connecting members, while the other two negative terminals being connected to said terminal end said first pair of connecting members positioned in corresponding relationship to said other connecting member of said second pair of connecting members, and a triangle connection is formed over the two corresponding peripheral surfaces with said positive terminal on one surface and said two negative terminals on the other corresponding surface.

4,825,113
SINGLE TRANSMISSION LINE BIDIRECTIONAL OPTICAL COMMUNICATION SYSTEM
Hirochika Sato; Haruo Nakayama; Takeshi Uchiyama; Yoshihisa Hagami, and Yoshiro Sato, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan
Filed Feb. 9, 1987, Ser. No. 12,354
Claims priority, application Japan, Mar. 3, 1986, 61-45881
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—2 16 Claims



10. A single transmission line bidirectional optical communication system comprising:
a directional coupler including a polarizing beam splitter and an optical system for separating an optical output signal to be outputted to a single transmission line and an optical input signal coded with data and a remote clock signal to be inputted from said single transmission line;
an optical transmitting circuit coupled to said directional coupler for coding original data by using a local clock signal of predetermined frequency and for subsequently converting the coded data into said optical output signal by means of a light emitting element;
an optical receiving circuit coupled to said directional coupler for converting said optical input signal into an electric signal, for recognizing the electrical signal through a comparator including an automatic threshold controlling circuit for automatically setting a threshold level at a substantially average value of the electric signal intensities, and for subsequently decoding the electric signal to reproduce and output the remote clock signal and data;
an optical output controlling circuit coupled to said optical transmitting circuit for controlling whether or not said optical output signal is to be outputted from said optical transmitting circuit to said directional coupler;
a frequency discriminating circuit coupled to said optical receiving circuit for discriminating the frequency of said reproduced remote clock signal to output a first status signal indicating said frequency; and
a clock controlling circuit coupled to said frequency discriminating circuit for determining the frequency of the local clock signal by the first status signal coming from said frequency discriminating circuit when said optical output signal is not being transmitted from said optical transmitting circuit by the control of said optical output controlling circuit and to output the local clock signal (CKT) and a second status signal (STC) indicating the frequency of the local clock signal; and
a line diagnosing circuit coupled to said clock controlling circuit for diagnosing if a communication line is put in a normal state from said first status signal coming from said frequency discriminating circuit when said optical output signal is transmitted from said optical transmitting circuit by the control of said optical output controlling circuit, and said second status signal coming from said clock controlling circuit.

4,825,114
ASSEMBLY OF AXIAL FAN MOTOR
Shigeru Ohtsuka, Yonago, and Seiichi Tsukutani, Sakaiminato, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Feb. 16, 1988, Ser. No. 156,437
Claims priority, application Japan, Feb. 17, 1987, 62-21605[U]
Int. Cl.[4] H02K 5/16
U.S. Cl. 310—90 7 Claims



1. An axial fan motor comprising:
a housing;
cylindrical bearing boss means having at an inner portion thereof a bearing mechanism for supporting a rotational shaft of said fan motor, said bearing boss means integrally having, at its one end portion, an insulator means;
a stator core coupled to said bearing boss means so as to be insulated by said insulator means, winding means disposed around said stator core; and
a stator-holding section in said housing, said stator-holding section having a cylindrical bearing boss receiving portion whose axis is substantially coincident with the axis of said rotational shaft of said axial fan motor, said bearing boss

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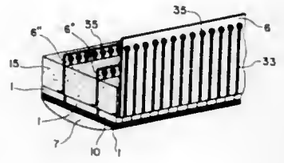
receiving portion having upper and lower engaging portions engaging with said bearing boss means with said rotational shaft of said axial fan motor being supported by said bearing mechanism provided in the inner portion of said bearing boss means to axially support said bearing boss means.

4,825,115

ULTRASONIC TRANSDUCER AND METHOD FOR FABRICATING THEREOF

Kenji Kawabe, Yokohama; Kazuhiro Watanabe, Tokyo; Fumihiro Namiki, Machida; Atsuo Iida, Yokohama, and Takaki Shimura, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 10, 1988, Ser. No. 204,909
Claims priority, application Japan, Jun. 12, 1987, 62-147292
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—327 **13 Claims**



1. An ultrasonic transducer having a plurality of piezoelectric elements arranged in a piezoelectric matrix, said piezoelectric matrix including a plurality of piezoelectric arrays aligned in parallel to each other, each of said piezoelectric arrays including a portion of said plurality of piezoelectric elements aligned in an azimuthal direction, and each of said piezoelectric elements having a front electrode and a back electrode for applying electrical potential between them to energize the piezoelectric element and radiate ultrasonic wave or for receiving the electrical potential from a received wave, said ultrasonic transducer further comprising:

a front matching layer attached to each of said front electrodes of said piezoelectric elements for matching an acoustic impedance between said piezoelectric elements and species to which the ultrasonic wave is transmitted or from which the wave is received;

a backing plate having a back surface provided on the backside of said piezoelectric elements for absorbing an ultrasonic wave radiated backward from said piezoelectric elements to prevent reflection from backward portions of said piezoelectric elements; and

L shaped printed wiring boards respectively aligned to said piezoelectric arrays, each of said L shaped printed wiring boards having:

a plurality of bonding areas positioned on one branch of said L shaped printed wiring board, each of said bonding areas being bonded to a respective said back electrode of a said piezoelectric element aligned in said piezoelectric array;

a plurality of terminal pads provided on another branch of said L shaped printed wiring board; and

a plurality of wiring lines for electrically connecting said bonding areas to respective terminal pads,

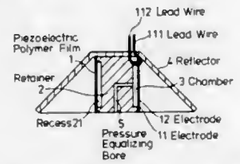
said another branch of the L shaped printed wiring board being extended vertically to said back electrode through said backing plate, and said terminal pads protruding from the back surface of said backing plate.

4,825,116

TRANSMITTER-RECEIVER OF ULTRASONIC DISTANCE MEASURING DEVICE

Ichizo Itoh; Hiroshi Owada, and Toru Fujii, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 171,963
Claims priority, application Japan, May 7, 1987, 62-111492; Aug. 11, 1987, 62-200424; Aug. 31, 1987, 62-216999; Sep. 8, 1987, 137078[U]
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—335 **7 Claims**



1. A transmitter-receiver of an ultrasonic distance measuring device comprising

a columnar supporter;

an annular recess provided in the peripheral surface of said supporter with both end portions thereof remaining;

a cylindrical piezoelectric polymer film secured to said end portions of said peripheral surface of said supporter to cooperate with said recess to define a chamber;

electrodes provided on the outer and inner peripheral surfaces, respectively, of said piezoelectric polymer film;

a conical reflector connected at its top to one end of said supporter to impart directivity to ultrasonic waves transmitted and received so that the transmitted ultrasonic wave travels in the axial direction of said supporter; and

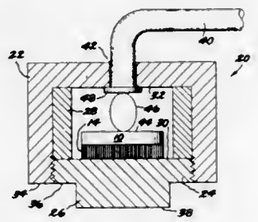
a pressure equalizing bore provided in said supporter to provide communication between said chamber and the outside.

4,825,117

TEMPERATURE COMPENSATED PIEZOELECTRIC TRANSDUCER ASSEMBLY

Lewis J. Thomas, III, Schenectady; Robert S. Gilmore, Burat Hills, and Homer H. Glascock, II, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 27, 1987, Ser. No. 126,138
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—346 **3 Claims**



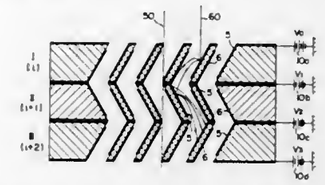
1. A temperature compensated ultrasonic transducer assembly comprising a piezoelectric transducer element, a metal substrate, and an intermediate compliant metal layer disposed between the transducer element and the metal substrate, the transducer element being bonded to one surface of the metal layer and an opposite surface of the metal layer being bonded to the metal substrate, and the metal layer being compliant in directions parallel to said surfaces, and further comprising a hollow cap positioned on the metal substrate to form a housing for enclosing the transducer element and the compliant metal layer, wherein the metal substrate comprises a stepped-diameter disk having a large diameter portion and a small diameter portion, the transducer element and the compliant metal layer being mounted on a surface of the large diameter portion of the disk, and wherein the cap has an annular shape and is threaded onto the large diameter portion of the disk such that the small diameter portion of the disk projects beyond the cap.

4,825,118

ELECTRON MULTIPLIER DEVICE

Hiroyuki Kyushima, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 3, 1986, Ser. No. 903,306
Claims priority, application Japan, Sep. 6, 1985, 60-197371; Feb. 21, 1986, 61-37670
Int. Cl.[4] H01J *43/00*
U.S. Cl. 313—104 **11 Claims**



1. An electron multiplier device comprising:

an insulating substrate having opposite first and second substrate surfaces which are parallel with each other,

a plurality of through-holes in said substrate having first through-hole surfaces at an obtuse angle with respect to said first substrate surfaces and second through-hole surfaces opposing said first through-hole surfaces,

a secondary electron emission layer formed on said first through-hole surfaces,

a conductive layer of non-electron emissive materials formed on the second through-hole surface of each respective through-hole separated from the secondary electron emission layer of the respective through-hole,

first connection means to connect said secondary electron emission layer of each through-hole to a respective first DC voltage supply through said first substrate surface, and

second connection means to connect said conductive layer of each through-hole to a respective second DC voltage supply through said second substrate surface,

whereby electrons incident on said through-holes passing through said first substrate surface and impinging on said secondary electron emission layer are multiplied and accelerated toward the second substrate surface when the DC voltage of the first and second DC voltage supplies are respectively connected by said first and second connection means to said secondary emission layer and said conductive layer of each through-hole and the DC voltage of the second DC voltage supply is greater than the DC voltage of the first DC voltage supply.

2. An electron multiplier device as claimed in Claim (1), wherein each through-hole is one of circular, rectangular, and hexagonal in said first substrate surface and the through-holes are closely and regularly arranged.

4,825,119

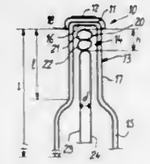
LOW CONSUMPTION ELECTRON GUN FOR CATHODE RAY TUBES

Maryvonne Penelon, Lyons, France, assignor to Videocolor, Montrouge, France

Filed Dec. 15, 1986, Ser. No. 941,748
Claims priority, application France, Dec. 17, 1985, 85 18696
Int. Cl.[4] H01J *1/16, 19/10*
U.S. Cl. 313—344 **8 Claims**

1. An electron gun for a cathode ray tube wherein said electron gun is more particularly used for a color television tube of the type with perforated mask with three in line guns, having a cathode with an emissive surface at the end of a cylindrical sleeve in which is located a heating element including a resistance wire and connecting lugs for connection to an electric energy supply, wherein the heating element includes a filament which is formed of spirally wound resistance wire having elementary turns wherein said filament includes an active part being formed of at most two turns; and

said connecting lugs having a core made from a low electric resistance metal which short circuits said elementary turns



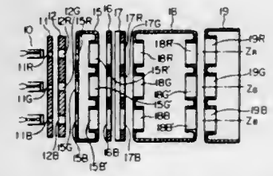
of said resistance wire and wherein the extent of said active part of said filament in a direction perpendicular to said emissive surface is approximately the same as the extent of said active part of said filament in a direction parallel to said emissive surface.

4,825,120

ELECTRON GUN APPARATUS WITH AUXILIARY ELECTRODES FOR A COLOR CATHODE-RAY TUBE

Yoshiaki Takahashi, Chiba, Japan, assignor to Hitachi, Ltd. and Hitachi Device Eng. Co. Ltd., both of Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,286
Claims priority, application Japan, Oct. 22, 1986, 61-249716
Int. Cl.[4] H01J *29/46, 29/56*
U.S. Cl. 313—414 **7 Claims**



1. An electron gun apparatus for a color cathode-ray tube including an electron beam source having three electron guns arranged in line for emitting respective electron beams, and focusing electrodes for focusing electron beams emitted from said electron beam source onto a fluorescent screen of the color cathode-ray tube, comprising:

a pair of auxiliary electrodes so disposed between bisected parts of said focusing electrodes forming main electron lenses as to be opposed to each other, a concave groove for producing an axial-nonsymmetrical electron lens formed relative to each of the electron beams on at least one of opposed faces of said auxiliary electrodes; and

means for applying mutually different dynamic voltage values to said auxiliary electrodes in accordance with the change in the deflection angle of the electron beam emitted from said electron beam source.

4,825,121

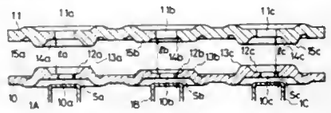
IN-LINE TYPE ELECTRON GUN FOR COLOR PICTURE TUBE

Masahiro Miyazaki, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1988, Ser. No. 146,393
Claims priority, application Japan, Jan. 26, 1987, 62-14017
Int. Cl.[4] H01J *29/58*
U.S. Cl. 313—414 **4 Claims**

1. In an electron gun for a color picture tube having three

cathodes which are arrayed orthogonally to an axial direction of the tube and at equal intervals on a straight line, and a first grid and a second grid which are successively arrayed and each of which has apertures aligned with electron beam paths corresponding to the three cathodes; said electron gun for a color picture tube characterized in that a surface of said first grid opposing to said second grid comprises aperture-vicinity flats corresponding to the respective apertures aligned with the



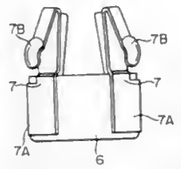
electron beam paths, and annular margins protruded to a side of said second grid around said aperture-vicinity flats, and that said annular margin corresponding to said aperture aligned with the central electron beam path is retracted from a plane which contains the two annular margins corresponding to said apertures aligned with the outer electron beam paths, while said aperture-vicinity flats for said apertures of said first grid aligned with the three electron beam paths are all formed on an identical plane.

4,825,122

COLOR PICTURE TUBE OF IN-LINE GUN TYPE OPERABLE AT HIGH HORIZONTAL SCANNING FREQUENCY

Takateru Kakesu, Chiba, and Hideo Oomori, Koganei, both of Japan, assignors to Hitachi Ltd. and Hitachi Device Engineering Co., Ltd., both of Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,302
Claims priority, application Japan, Apr. 10, 1987, 62-86888
Int. Cl.[4] H01J *29/02*
U.S. Cl. 313—417 **4 Claims**



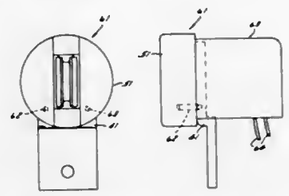
1. A color picture tube operable at a high horizontal scanning frequency, comprising:
an electron gun of the in-line type disposed in an electron tube for emitting three electron beams;
a shielding electrode disposed at the top of the electron gun and having the form of a cup for shielding the electron beams electrostatically from the outside, apertures for transmitting the electron beams being formed in the bottom of the cup so as to be in alignment; and
supporting means made of a conductive material and kept in contact with the cup, the supporting means having a leg portion and a skirt portion, the leg portion and the skirt portion being united in one body, the tip of the leg portion being kept in contact with the inner surface of the electron tube, a portion of the side wall of the cup being covered by the skirt portion so that the central and outer ones of the electron beams are equally affected by a magnetic field induced by an eddy current in the shielding electrode.

4,825,123

TWO-PIECE CATHODE CUP

Patricia E. Franzel, Brookfield; Charles S. Goldsworthy; Peter A. Dillenburg, both of West Allis, and James H. Hall, Jr., Mukwonago, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 31, 1986, Ser. No. 948,202
Int. Cl.[4] H01J *9/04*
U.S. Cl. 313—452 **19 Claims**



1. A method of manufacturing a cathode cup for an X-ray tube comprising the steps of:
setting a filament in a lower channel in a lower channel means, said lower channel means being made of a non-refractory metal; and
securing, in a fixed relationship to said filament and lower channel means, an upper channel means having an upper channel which is wider than said lower channel, wherein said upper channel means and said lower channel means are electrically connected, said upper channel means being made of a refractory metal.

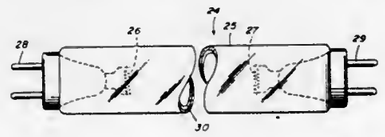
17. A cathode cup comprising:
(a) a lower channel means for retaining a filament in a fixed relationship with a lower beam-forming channel; and
(b) an upper channel means which is secured in a fixed relationship to said lower channel means and said filament, said upper channel means having an upper channel which is wider than said lower channel and wherein said upper channel means and said lower channel means are electrically connected, and said upper channel has walls which extend below and enclose at least the upper portion of the lower channel means.

4,825,124

PHOSPHOR PARTICLE, FLUORESCENT LAMP, AND MANUFACTURING METHOD

A. Gary Sigai, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 718,095, Apr. 3, 1985, Pat. No. 4,710,674, which is a continuation-in-part of Ser. No. 607,865, May 7, 1984, abandoned, and a continuation-in-part of Ser. No. 607,846, May 7, 1984, abandoned. This application Apr. 29, 1987, Ser. No. 43,792
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[4] H01J *1/70, 61/46*
U.S. Cl. 313—486 **10 Claims**



1. A particle of a finely-divided fluorescent lamp phosphor having a nonparticulate, conformal coating of aluminum oxide surrounding the particle.

4,825,125

DISCHARGE LAMP HAVING MULTIPLE CONSTRICTIONS

Radomir Lagushenko; Jakob Maya, both of Brookline, and Robert Y. Pai, Hamilton, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 678,928, Dec. 6, 1984, Pat. No. 4,736,134. This application Nov. 2, 1987, Ser. No. 99,026
Int. Cl.[4] H01J *61/33*
U.S. Cl. 313—493 **15 Claims**



1. A fluorescent lamp comprising:
an envelope having a substantially circular configuration in cross-section, said envelope having two axially opposed end portions;
first and second electrodes, each of said electrodes located within a respective one of said axially opposed end portions;
at least one phosphor layer positioned on the interior surface of said envelope;
an ionizable medium enclosed within said envelope including an inert starting gas and a quantity of mercury for producing a plasma discharge when a predetermined voltage is applied across said electrodes, said plasma discharge being characterized by three processes, including:
(a) the gain of energy by the electrons in said plasma discharge from the axial electric field established by said voltage and the redistribution of said energy among said electrons to establish an electron energy distribution,
(b) the energy losses to said mercury and said starting gas by said electrons and
(c) the escape of energy of excited atoms in the form of radiation; and
means provided within said envelope in the form of a plurality of constricting portions, each of said constricting portions having a defined end segment with a specific axial length, said means being sufficient to separate at least one of said discharge processes spatially from the remainder of said discharge processes and for causing said separated process to take place in a different portion within said envelope to permit the conditions for energy input and energy dissipation to be independently optimized.

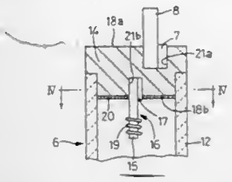
4,825,126

CERAMIC ENVELOPE DEVICE FOR HIGH-PRESSURE DISCHARGE LAMP

Hirotsugu Izumiya, and Mikio Kariya, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 28, 1987, Ser. No. 101,407
Claims priority, application Japan, Oct. 3, 1986, 61-152872[U]
Int. Cl.[4] H01J *17/18, 61/36*
U.S. Cl. 313—623 **10 Claims**

1. A ceramic envelope device for a high-pressure metal-vapor discharge lamp, comprising:
a translucent ceramic arc tube;
a pair of electrically conducting cermet end caps closing opposite open ends of said ceramic arc tube, and having opposite inner surfaces facing each other, said pair of end caps having a pair of inner holes formed in said opposite inner surfaces, respectively;
a pair of discharge electrodes each provided in the form of a rod, having first ends supported in said pair of inner holes in said pair of end caps, respectively, and second ends which protrude from said opposite inner surfaces toward each other in a longitudinally inward direction in said ceramic arc tube; and
at least one substantially straight strand provided in each of said pair of inner holes in said end caps substantially parallel to each discharge electrode, so as to fix each discharge electrode in each corresponding inner hole, such that at



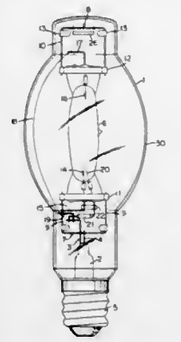
least one radial space exists between outer surfaces of each discharge electrode and said at least one strand, and an inner surface of said corresponding inner hole, said at least one radial space extending in an axial direction generally parallel to the length of said electrode and said strand, each of said at least one strand having a diameter which is smaller than that of said rod.

4,825,127

METAL HALIDE DISCHARGE LAMP FOR PLANT GROWING

Zeya K. Krasko, Beverly, and William M Keeffe, Rockport, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

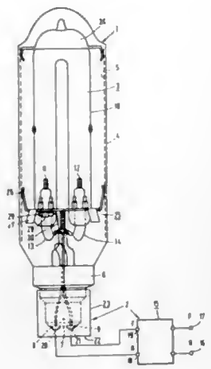
Filed Jun. 24, 1987, Ser. No. 65,797
Int. Cl.[4] H01J *17/20, 61/18, 63/04*
U.S. Cl. 313—638 **9 Claims**



1. A high pressure metal halide discharge lamp comprising:
an outer envelope having an inner surface, said inner surface including thereon a phosphor layer, said phosphor converting ultraviolet wavelength radiation into radiation having a wavelength from about 710 to about 780 nanometers; and
an arc tube including therein a pair of spaced electrodes and a chemical fill, said chemical fill comprising mercury, an inert gas, indium halide, lithium halide, sodium halide, and cesium halide, wherein said indium halide, lithium halide, sodium halide, and cesium halide are present in a molar ratio of 0.2–1.2 mol indium (I) halide to 5–10 mol lithium halide to 1–1.6 mol sodium halide to 0.3–0.5 mol cesium halide, said indium halide being present in an amount so as to be completely vaporized in the arc tube at lamp operating temperature.

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4,825,128
COMPACT DISCHARGE LAMP WITH CONDUCTIVE COATING CAPACITVELY COUPLED TO HIGH FREQUENCY SUPPLY
Leo M. Sprengers, Turnhout, Belgium, assignor to U.S. Phillips Corporation, New York, N.Y.
Filed Oct. 16, 1987, Ser. No. 109,807
Claims priority, application Netherlands, Oct. 22, 1986, 8602643
Int. Cl.[4] H05B *41/24*
U.S. Cl. 315—58 **6 Claims**



4. In a low-pressure sodium discharge lamp of the type having an evacuated outer envelope, a discharge vessel within said outer envelope and containing a quantity of a sodium-containing filling, a translucent electrically conductive coating disposed on an inner surface of said outer envelope, a lamp cap attached to said outer envelope and having insulated contacts for receiving an operating voltage for operating said lamp, and conductors each extending from a respective one of said contacts to said discharge vessel for applying to said discharge vessel the operating voltage applied to said lamp cap, the improvement comprising:

one of said insulated contacts and the respective one of said conductors being intended for connection to the neutral conductor of a high frequency voltage supply for operating the low-pressure sodium discharge lamp; and

a capacitor within said outer envelope connected between said conductive coating and said respective one of said conductors and having a value effective to establish a conductive path between said conductive coating and the neutral conductor of a high frequency supply during lamp operation in order to reduce radio frequency interference.

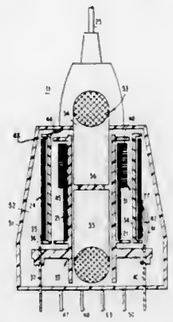
4,825,129
CRT FOCUS TRACKING ARRANGEMENT
Leroy W. Nero, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.
Continuation of Ser. No. 730,131, May 3, 1985, abandoned. This application Oct. 29, 1987, Ser. No. 115,547
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—278 **9 Claims**

1. In a video display apparatus incorporating a cathode ray tube having an electron gun assembly, a high voltage transformer comprising:

a high voltage winding having first and second terminals located at opposite ends of said winding for defining a high voltage winding region and providing a high voltage potential at said second terminal, and an intermediate terminal located between said first and second terminals, said intermediate terminal defining a focus winding region between said intermediate terminal and said first terminal and providing a focus potential for said electron gun assembly;

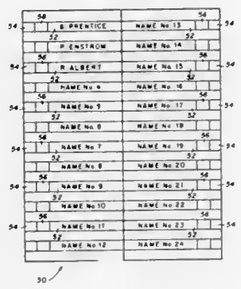
a primary winding for energizing said transformer; and

a supply winding, forming a secondary winding of said transformer, for energizing said electron gun assembly and being located adjacent said high voltage winding for magnetically coupling thereto, the region occupied by said supply winding and said focus winding region having substantial non-overlapping portions such that the degree of magnetic coupling between said supply winding and said focus winding region of said high voltage winding is less than the degree of magnetic coupling between said



supply winding and the region of said high voltage winding defined by said intermediate terminal and said second terminal, the output impedance associated with the region of said high voltage winding being defined by said intermediate terminal and said second terminal, said output impedance being lowered as a result of increasing beam current from said electron gun to cause a greater decrease in said focus potential relative to the decrease in the high voltage potential, such that loading of said high voltage winding due to an increasing beam current causes a focus ratio of said focus potential to said high voltage potential that decreases as said beam current increases.

4,825,130
DISPATCH BOARD SYSTEM
Paul M. Enstrom, Fremont, Calif., assignor to Centigram Corporation, San Jose, Calif.
Filed Apr. 14, 1987, Ser. No. 38,153
Int. Cl.[4] G09F *9/33*
U.S. Cl. 315—317 **3 Claims**



1. A dispatch board system comprising:

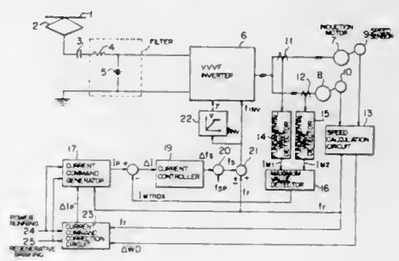
a decoder for receiving an address signal;

an address signal verifier connected to the decoder for determining if a valid address signal has been received, the address signal verifier being comprised of a first NAND gate connected to the decoder, a first latch connected to said first NAND gate, a first NOT gate connected to the decoder, a second NAND gate connected to said first NOT gate, said first latch, and the decoder, a second NOT gate connected to said second NAND gate, a second latch connected to the decoder, a third NAND gate connected to said second NOT gate, said second latch and said first latch, and a storage register connected to the decoder and said first latch;

a lamp driver connected to the decoder and said storage register of the address signal verifier, for driving a plurality of lamps responsive to said address signal; and

a plurality of lamps connected to the lamp driver.

4,825,131
CONTROL SYSTEM FOR INDUCTION MOTOR DRIVEN ELECTRIC CAR
Yoshio Nozaki; Shigetoshi Okamatsu, both of Katsuta, and Tadashi Takaoka, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 30, 1987, Ser. No. 115,038
Claims priority, application Japan, Nov. 5, 1986, 61-261869
Int. Cl.[4] B61C *15/08*
U.S. Cl. 318—52 **18 Claims**



1. A control system for induction motor driven electric car comprising:

a variable voltage and variable frequency inverter,

a plurality of induction motors fed from said inverter and connected to different wheels;

means for detecting currents of said motors;

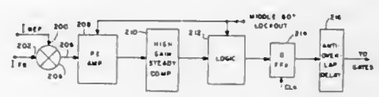
means for detecting a maximum value of the motor currents;

means for generating a motor current command;

a current control system for causing the maximum motor current value to follow the current command; and

means for increasing the motor current command as a function of a signal representative of an operating frequency of said inverter or an electric car speed.

4,825,132
CURRENT MODE MOTOR CONTROL
David J. Gritter, Racine, Wis., assignor to Eaton Corporation, Cleveland, Ohio
Filed May 21, 1987, Ser. No. 52,340
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—811 **11 Claims**



1. A controller that receives input commands for controllig a three phase induction motor powered by a dc power source comprising:

a static inverter having controllable conduction means actuable into conduction by gating signals, for selectively connecting the positive and negative terminals of said dc source to the input terminals of said motor;

reference means receiving said input commands, for providing current reference signals;

current feedback means for sensing input currents to said motor and providing feedback signals accordingly;

error signal means receiving said current reference signals and said current feedback signals for producing error signals in response thereto;

threshold comparator means receiving said error signals for each phase and converting each of them to a digital signal by outputting a first digital level when the error signal for the phase is above a first predetermined threshold and a second digital level when it is below a second predetermined threshold;

gating means responsive to occurrence of said first digital signal level for gating the controllable conduction means of said static inverter to a first state, in which current could be forced from said positive dc terminal to the motor; and responsive to occurrence of said second digital signal level for gating the controllable conduction means to a second state, in which current could be forced between said negative terminal and said motor;

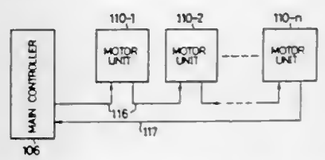
means for tracking the position of the motor's flux and producing position signals in accordance with the position;

control means responsive to said input commands and to said position signals, for providing timing control signals;

locking means receiving said timing control signals, for overriding, in one phase at a time, the effects of said proportional plus integral signal by constraining said conduction means to said first state throughout the approximate middle 60° interval of the positive lobe of that phase and by constraining said conduction means to said second state throughout the approximate middle 60° interval of the negative lobe of that phase.

wherein said gating means comprises timing perturbation means for altering the starting times of said first and second states asynchronously with respect to the instantaneous phase of said reference signals, whereby acoustic noise of the motor is made less conspicuous by broader dispersion of the switching times.

4,825,133
ELECTROMECHANICAL ACTUATOR CONTROL SYSTEM
Jiro Tanuma; Naoji Akutsu, and Tadashi Kasai, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan
Filed Jul. 30, 1987, Ser. No. 79,453
Claims priority, application Japan, Aug. 5, 1986, 61-182728; Aug. 8, 1986, 61-185237; Aug. 8, 1986, 61-185238; Oct. 15, 1986, 61-243089
Int. Cl.[4] H02P *7/68*
U.S. Cl. 318—113 **10 Claims**



1. A system for accessing a plurality of electromechanical actuators by command signals sent by a main controller, each

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of the plurality of electromechanical actuators including a control section integrated with an electric motor, comprising:

each of the plurality of electromechanical actuators are connected in series with each other by a serial data line originating from the main controller, the main controller providing serial data which includes an address value and a command signal to said serial data line, the control section in each electromechanical actuator including:

an address register;

means for setting and storing a fixed value in said address register as an address when the control section is initialized;

a processor circuit for receiving said serial data and for determining whether said address value in the received serial data is equal to said address stored in said address register, said processor circuit producing a command according to said command signal when said address value is equal to said address;

bypass means having an activated and an inactivated condition, said bypass means when in said activated condition bypassing said processor circuit such that said serial data applied to an input of said processor circuit is directed to the next electromechanical actuator along said serial data line;

said processor circuit causing said bypass means to be in said activated condition when said address value in the received serial data does not equal said address stored in said address register; and

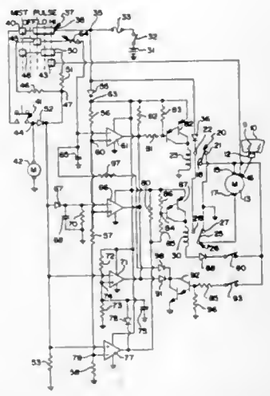
a motor controller responsive to said processor circuit for sending drive signals to the electric motor.

4,825,134

INTERMITTENT WIPER CONTROL CIRCUIT WITH INSTANT WIPE

Steven L. Tracht, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1988, Ser. No. 211,604
Int. Cl.[4] B60S *1/08*
U.S. Cl. 318—443 **5 Claims**



1. A wiper control circuit for a vehicle having a windshield, a wiper, an electric power source and an electric motor linked to the wiper to drive the wiper through repeating cycles across the windshield between inner and outer wipe positions, the wiper control circuit comprising, in combination:

an inner wipe switch closed througout the cycle of the wiper except for a small range defining an inner wipe position in which wiper pause is desired;

a wiper activating switch;

a first voltage divider comprising first and second resistors connected in series across the electric power source to define an output at their junction normally effective to provide a first predetermined voltage thereon;

an instant wipe capacitor connected across the output of the voltage divider in parallel with the second resistor;

a first comparator having one input connected to the output of the first voltage divider, another input and an output;

first motor drive means connected to the output of the first comparator and activated thereby to connect the electric motor across the electric power source for activation thereof when the voltage at the other input thereof exceeds the voltage at the one input, the first motor drive means being similarly activated by closure of the inner wiper switch to latch itself in an activated state through each wipe cycle, once started, until the inner wipe switch opens;

first circuit means connected across the electric power source effective to provide from an output thereof to the other input of the first comparator a second predetermined voltage less than the first predetermined voltage when the wiper activating switch is closed and a third predetermined voltage less than the second predetermined voltage when the wiper activating awitch is open; and

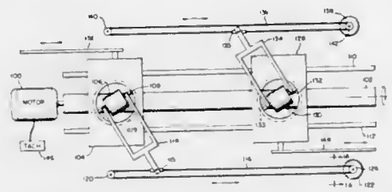
second circuit means connected across the electric power source and responsive to the wiper activating awitch to modify the voltage on the output of the voltage divider by diverting electric current from the second resistor, when the wiper activating switch is open, in aufficient quantity to lower the output voltage of the voltage divider to a fourth predetermined voltage less than the second predetermined voltage but, when the wiper activating switch closes, to stop taking electric current from the second resistor, whereby closure of the wiper activating switch initially provides the second and fourth predetermined voltages to the other and one inputs, respectively, of the first comparator for activation of the first comparator in an instant wipe cycle and initiates charging of the instant wipe capacitor through the first resistor, the instant wipe capacitor thereafter reaching the first predetermined voltage before another wipe cycle can be initiated.

4,825,135

METHOD AND APPARATUS FOR PROVIDING MECHANICAL AMPLIFICATION

Keith J. Perez, Seattle, Wash., assignor to Hypermotion, Inc., Seattle, Wash.

Filed Nov. 17, 1987, Ser. No. 121,532
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568.17 **20 Claims**



1. Apparatus for providing mechanical motion in response to an input, comprising:

motion control means including a control arm responsive to the input for linearly displacing said control arm;

power drive means for providing rotational movement, said power drive means including an elongate cylinder and means for rotating said cylinder; and

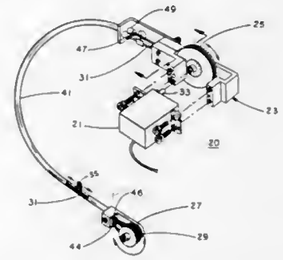
linear drive means including a trolley assembly for providing the mechanical output, said linear drive means being coupled to said power drive means and responsive to the rotation of said cylinder and the linear displacement of said control arm for traversing said cylinder and displacing said trolley assembly such that said linear drive means provides output motion which is a function of the power supplied by said power drive means and the linear displacement of said control arm.

4,825,136

MIMETIC FUNCTION SIMULATOR

Jon A. Farhat, Laguna Beach, Calif., assignor to Exhibitronix, La Palma, Calif.

Filed Nov. 28, 1986, Ser. No. 935,751
Int. Cl.[4] A63H *3/40*
U.S. Cl. 318—568.1 **10 Claims**



1. A system for regulating movement of a model to simulate mimetic functions comprising:

a plurality of electromechanical rotational servo mechanism, each operable to rotate in first and second directions and disposed within an interior surface of the model said servo mechanisms incorporating first and second pulley assemblies having a flexible connecting cord non-linearly looped thereabout, said connecting cord being attached to an inner surface of the model at a point intermediate said first and second pulley assemblies such that the surface of the model will move in response to movement of the connecting cord thereby simulating a desired mimetic movement, said mechanism cord cooperating with said servo mechanism to apply a bi-directional force to the attached point on the model inner surface, the direction of said force being responsive to the direction of rotation of said servo mechanism; and

at least one control mechanism connected to said servo mechanisms and operative to generate control signals responsive to the desired mimetic movement to be implemented.

4,825,137

TIME BASE CONTROL SYSTEM FOR A SPINDLE SERVO

Masahiro Nakajima, and Tutomu Banno, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 16, 1987, Ser. No. 121,248
Claims priority, application Japan, Nov. 14, 1986, 61-271293
Int. Cl.[4] G05B *11/18*
U.S. Cl. 318—594 **6 Claims**

1. A time base control system for a rotating recording medium, comprising:

means for rotating a recording medium;

accessing means for accessing recording tracks on said rotating recording medium and having a detection point on said recording medium, said accessing means providing a detection signal corresponding to a relative speed between said detection point and a circumferential position of said rotating recording medium;

a source of a reference signal;

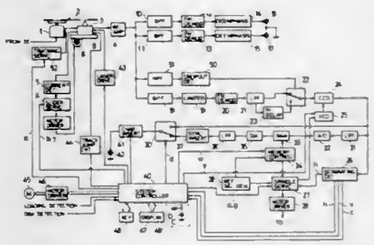
means for generating an error signal in accordance with a comparison between said reference signal and said detection signal, said error signal having first components with a first characteristic and second components with a second characteristic, different from said first characteristic;

means for jumping said detection point radially across tracks of said rotating recording medium;

tracking means for causing said accessing means to follow a selected one of said tracks of said rotating recording medium;

time base correction means for correcting, in accordance with said error signal and said reference signal, a time base according to which said rotating means rotates said recording medium;

coarse tuning means responsive to said error signal for correcting said time base, said coarse tuning means including a first servo loop passing through said rotating means;



fine tuning means responsive to said error signal for correcting said time base, said fine tuning means including a second servo loop not passing through said rotating means, said fine tuning means being capable of controlling said time base over a variable range thereof; and

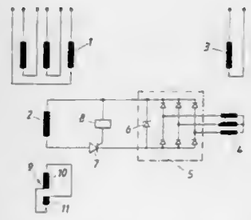
control means operative during said jumping mode for alternately operating said tracking means and said jumping means, said control means widening said variable range of said fine tuning means and gradually increasing a supply of said second components of said error signal under a predetermined level to said coarse tuning means, whereby rough tuning of said time base is performed according to both said first and said second components of said error signal.

4,825,138

BRUSHLESS SYNCHRONOUS MOTOR WITH SHORT-CIRCUITED PROTECTIVE WINDING FOR THE FIELD WINDING OF THE ROTOR

Hubert Platzer, and Helmut Roland, both of Linz, Austria, assignors to Dipl. Ing. Hitzinger Gesellschaft mbH, Linz, Austria

Filed Jun. 22, 1987, Ser. No. 65,324
Claims priority, application Austria, Jul. 10, 1986, 1867/86
Int. Cl.[4] H02P *1/46*
U.S. Cl. 318—716 **4 Claims**

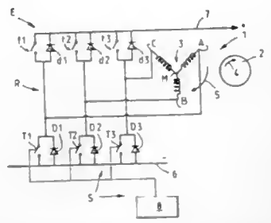


1. A brushless synchronous electric motor comprising a rotor,

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a field winding carried by said rotor, and
a short-circuited protective winding magnetically coupled to said field winding and adapted to have a voltage induced therein by a current flowing in said field winding, said protective winding comprising
two winding sections having different numbers of turns, the winding sections being connected in series and being mutually oppositely poled as regards the voltages which are inducible therein by the current flowing in said field winding.

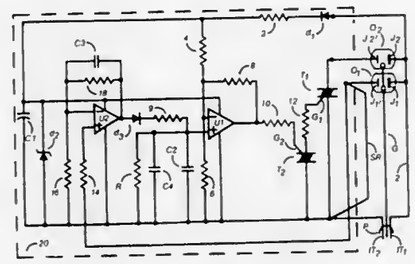
4,825,139
ELECTRIC POWER SUPPLY UNIT, IN PARTICULAR FOR A MOTOR VEHICLE, AND AN ELECTRIC ROTARY MACHINE FOR SUCH A UNIT
Gilbert Hamelin, Marly La Ville, and Lucien Palma, Paris, both of France, assignors to Valeo, Paris, France
Filed Jul. 6, 1987, Ser. No. 70,050
Claims priority, application France, Jul. 4, 1986, 86 09730
Int. Cl.[4] H02J 7/24; H02P 9/48
U.S. Cl. 322—90 **13 Claims**



1. In an electric power supply unit comprising:
(a) a rotary electric machine intended to be driven by a prime mover so as to supply electrical energy to at least one of a battery and various user units; and
(b) rectifier means combined with the rotary machine to establish direct current;
(c) the rotary electric machine is designed such that when it is driven at idling speed, the phase voltage at the terminals of the rotary electric machine is insufficient to charge the battery; and wherein:
(d) said rotary machine comprises means to establish periodically a voltage surge at the terminals of the rotary electric machine and to generate a current for charging the battery;
wherein said rectifier means comprises a rectifier bridge having first and second sides, wherein the rotary electric machine is an alternator, and wherein the means for establishing a voltage surge at the terminals of the alternator and for causing a current to be delivered to the battery comprise:
(i) controlled switches disposed on the first side of the rectifier bridge, and
(ii) control means for controlling said switches to cut the current at the idling speed so as to generate the voltage surge at the terminals of successive windings of the alternator.

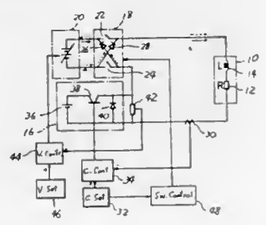
4,825,140
POWER TOOL/VACUMM CLEANER POWER CONTROL
Raymond F. St. Louis, 32 Rensselaer Rd., Essex Fells, N.J. 07021
Filed May 3, 1988, Ser. No. 189,730
Int. Cl.[4] G05F 1/455
U.S. Cl. 323—237 **3 Claims**

1. A power control circuit comprising:
first and second A.C. power input terminals,
a first power outlet having two contacts,
a second power outlet having two contacts,
a connection from said first input terminal to one contact in each power outlet,
a sensing impedance connected between said second input terminal and the other contact of said first power outlet,
a triac having a gate and two terminals,
a connection between one of said terminals of said triac and the other contact of said second power outlet,



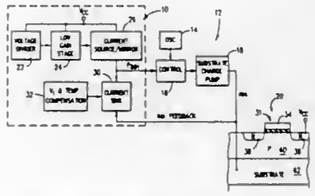
a connection between the other of said terminals of said triac and said second input terminal,
control means for applying a voltage to said gate so as to prevent current from flowing between the terminals of said triac until a given time after a predetermined minimum value of current starts flowing in said sensing impedance and continues flowing for a given period.

4,825,141
DC POWER SUPPLY DEVICE
Yukio Watanabe, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 31, 1987, Ser. No. 91,027
Claims priority, application Japan, Sep. 12, 1986, 61-215231
Int. Cl.[4] G03F 1/46
U.S. Cl. 323—271 **5 Claims**



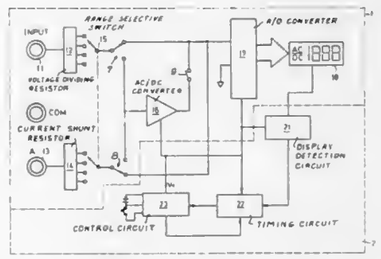
1. A device for supplying DC power to a load, the device comprising:
a DC current source;
a DC voltage source connected in series to the current source, wherein the current source has a narrower range of output voltage than the voltage source;
means for detecting current in the load;
means for controlling the current source so that the detected current becomes close to a stipulated current;
means for detecting an output voltage of the current source; and
means for controlling the voltage source so that the detected output voltage of the current source becomes close to a predetermined value.

4,825,142
CMOS SUBSTRATE CHARGE PUMP VOLTAGE REGULATOR
I-Fay F. Wang, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jun. 1, 1987, Ser. No. 57,063
Int. Cl.[4] G05F 3/16; H03K 3/01
U.S. Cl. 323—314 **27 Claims**



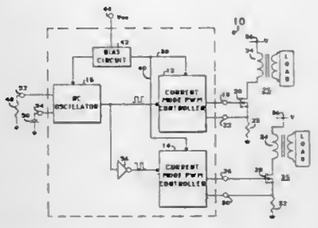
1. A regulator for use with a substrate charge pump for providing a regulated bias voltage to a semiconductor chip, comprising:
a current source and a current sink interconnected to provide an output of said regulator for controlling said charge pump;
a reference voltage generator for developing a reference voltage from a supply voltage of said chip;
a low gain stage having a gain of unity or less connected to said reference voltage for defining a drive substantially independent of variations in said supply voltage for driving said current source to provide a current independent of said supply voltage; and
means for connecting said bias voltage to said current sink so that when said bias voltage increases beyond a specified magnitude, said current sink becomes operative to provide an output for disabling the operation of said charge pump, and so that when said bias voltage decreases below a specified magnitude, said current source becomes operative to provide an output for enabling the operation of said charge pump.

4,825,143
DIGITAL METER AUTOMATIC OFF POWER SUPPLY CIRCUIT
Leo Cheng, 12F-7, No. 391, Sec. 4 Shin-Yi Rd., Taipei, Taiwan
Filed Aug. 12, 1987, Ser. No. 84,158
Int. Cl.[4] G05F 1/33
U.S. Cl. 323—351 **2 Claims**



1. A digital instrument automatic off power supply circuit for automatically stopping power supply to a digital instrument having a segmented digital display, comprising:
display detection means for continuously monitoring the display status of respective segments of said digital display of said digital instrument when power is being supplied to said digital instrument so as to determine if the digital instrument is being used;
timing means for counting to a predetermined count corresponding to an automatic off interval; and
control means for controlling power supply to said digital instrument, wherein power supply is maintained to said digital instrument and the count of said timing means is reset when said display detection means detects that said digital instrument is being used, and power supply to said digital instrument is automatically stopped when said predetermined count has been reached, thereby indicating that said digital instrument has not been used for said automatic off interval.

4,825,144
DUAL CHANNEL CURRENT MODE SWITCHING REGULATOR
Jade H. Alberkrack, and W. David Pace, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 10, 1987, Ser. No. 118,927
Int. Cl.[4] G05F 1/577
U.S. Cl. 323—272 **2 Claims**



1. A dual channel current mode switching regulator for providing two independent output control currents at respective outputs at which first and second load utilization means are connected, each of the first and second load utilization means including a control transistor, comprising:
a first controller circuit for providing the first one of the output control currents at a first one of the outputs of the regulator, said first controller circuit having first and second inputs and an output, said output being coupled to the first output of the regulator, said first input being coupled to a first input of the regulator for receiving a first feedback signal the magnitude of which is proportional to the current flowing through the control transistor of the first load utilization means, said first controller circuit including a comparator for comparing the magnitude of a first error voltage generated from the first load utilization means to said magnitude of said first feedback signal such that the first output control current is terminated whenever said magnitude of said first feedback signal exceeds said magnitude of said first error voltage;
a second controller circuit for providing the second of the output control currents at a second one of the outputs of the regulator, said second controller circuit having first and second inputs and an output, said output being coupled to the second output of the regulator, said first input being coupled to a second input of the regulator for receiving a second feedback signal the magnitude of which is proportional to the current flowing through the control transistor of the second load utilization means, said second controller circuit including a comparator for comparing the magnitude of an error voltage generated from the second load utilization means to said magnitude of said second feedback signal such that the second output control current is terminated whenever said magnitude of said second feedback signal exceeds said magnitude of said second error voltage;
an oscillator for providing a single predetermined duty cycle

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oscillation signal at an output thereof, said output being coupled to said second input of said first controller circuit; and

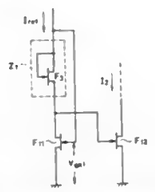
an inverter coupled between said output of said oscillator and said second input of said second controller circuit for inverting the oscillation signal supplied thereto such that said first and second controller circuits are rendered operative on alternating cycle of said oscillation signal.

4,825,145

CONSTANT CURRENT CIRCUIT

Hirotoshi Tanaka, Yamanashi; Satoshi Tanaka, Kokubunji; Taizo Kinoshita, Kokubunji; Nobuo Kotera, Kokubunji, and Minoru Nagata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 16, 1987, Ser. No. 133,914
Claims priority, application Japan, Jan. 14, 1987, 62-4830
Int. Cl.⁴ G05F *3/24*
U.S. Cl. 323—315 **5 Claims**



1. A constant current circuit comprising:

(1) a first field effect transistor which provides an input current flow through the drain-source channel thereof;

(2) an impedance element having a first end which is supplied with said input current and which is connected to the gate of said first field effect transistor and having a second end coupled to the drain of said first field effect transistor; and

(3) a second field effect transistor having a gate which is connected to a common node of said second end of said impedance element and said drain of said first field effect transistor, so that an output current flows through the drain-source channel of said second field effect transistor, wherein, when said input current is denoted by I_{ref}, said impedance element has non-linear voltage-current characteristics generating a voltage drop containing at least a component of $\alpha I_{ref}{}^{n}(n \neq 1)$, and

wherein, when the conductance of said first field effect transistor is denoted by K, values of said parameters α, I_{ref}, n and K are so set as to substantially satisfy the following equation:

$$I_{ref}^{n-1} = \frac{1}{2n\alpha\sqrt{K}}.$$

4,825,146

UNTHRESHED HEAD GRAIN LOSS MONITOR

Wayne M. Kotyk; Thomas G. Kirk; Robert J. Wilson, and James N. Wilson, all of Saskatchewan, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

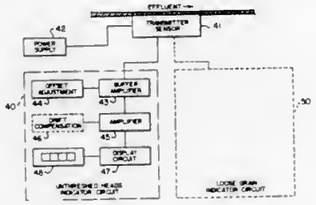
Filed May 4, 1988, Ser. No. 190,240
Claims priority, application Canada, May 15, 1987, 537329
Int. Cl.⁴ G01R *27/00*
U.S. Cl. 324—58.5 B **5 Claims**

1. An apparatus for measuring grain loss in unthreshed heads in a combine harvester comprising:

means for receiving a sample of the harvester effluent and conveying to a detection region;

said detection region including a detector surface over which the sample passes;

microwave transmitter-sensor means operative to generate a microwave field pattern with respect to the detection region such that the traversing of effluent across the detection region produces a disturbance in said microwave field pattern, and wherein said transmitter-sensor means produces a first output signal in response to the disturbance and related in magnitude to the mass of effluent traversing the detector region at a distance spaced from the detection surface, and indicator means responsive to an output signal greater than a predetermined threshold value representative of a threshed head to provide a measure of the grain loss in unthreshed heads.

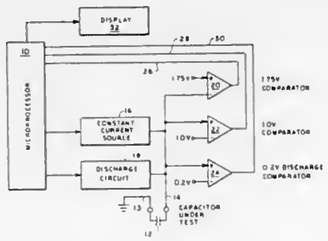


4,825,147

CAPACITANCE MEASURING METHOD AND APPARATUS

Terry D. Cook, and Ross Ortman, both of Sioux Falls, S. Dak., assignors to Sencore, Inc., Sioux Falls, S. Dak.

Filed Sep. 14, 1988, Ser. No. 244,041
Int. Cl.⁴ G01R *27/26*
U.S. Cl. 324—60 C **7 Claims**



1. A method of measuring the capacitance of a capacitor comprising the steps of

applying to said capacitor a train of constant current charging pulses to increase the voltage across said capacitor,

sampling the voltage across said capacitor only during the periods between said pulses,

counting the number of current pulses applied to said capacitor to raise the voltage across said capacitor a predetermined amount, and

using said number to calculate the capacitance of said capacitor.

4,825,148

RESISTANCE MEASUREMENT CIRCUIT AND METHOD

Roger A. McCardy, Troy, and Dana A. Stonerook, Plymouth, both of Mich., assignors to TRW Inc., Lyndhurst, Ohio

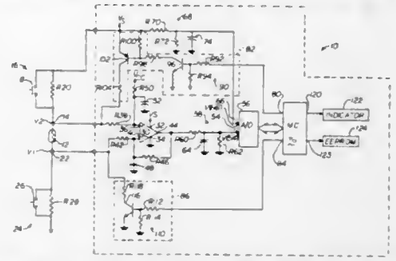
Filed Dec. 18, 1987, Ser. No. 134,953
Int. Cl.⁴ G01R *27/14*
U.S. Cl. 324—64 **21 Claims**

1. A circuit for monitoring the resistance of an electrical device biased between potentials of a source of electrical energy by series resistors connected to respective terminals of the device, said circuit comprising:

a differential amplifier having its input terminals connected to respective terminals of the device, said differential amplifier providing an output signal having a value indicative of the voltage developed across the device;

a switchable current source connected to the device, said switchable current source having first switching means and an associated first resistor connected in series to one terminal of the device and to one potential of the source of electrical energy, and second switching means and an associated second resistor connected in series to the other terminal of the device and to the other potential of the source of electrical energy, said switchable current source, when actuated, providing a second amount of current through the device, the ratio of the first and second resistors of the switchable current source being substantially equal to the ratio of the respective resistors connected to the respective terminals of the device; and

control means for measuring the value of the output signal from said differential amplifier and for controlling said switchable current source, said control means subtracting the value of the output signal of the differential amplifier when said switchable current source is not actuated from the value of the output signal of the differential amplifier when said switchable current source is actuated, said difference being a value functionally related to the resistance value of said device.

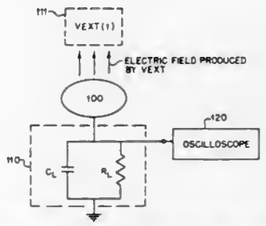


4,825,149

CONFORMAL GROUND REFERENCED SELF-INTEGRATING ELECTRIC FIELD SENSOR

Donald E. Voss, Cedar Crest; Lynn M. Miner, Kirtland AFB, and Kenneth O. Busby, Albuquerque, all of N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1987, Ser. No. 137,487
Int. Cl.⁴ G01T *1/16, 1/15*
U.S. Cl. 324—72 **4 Claims**



1. An electric Field sensor which directly detects a pulsed electric field arising from a nuclear detonation and an electric field arising from any source of electrical potential, said pulsed electric field having a rise time and wherein said electric field sensor comprises:

a disk electrode which is charged by said pulsed electric field and produces an electrical detection current therefrom;

a probe response adjustment circuit which receives said electrical detection current from said disk electrode and outputs therefrom a measurement signal with a useful measurement time that is several orders of magnitude above the rise time of the pulsed electric field of the nuclear detonation, said probe response adjustment circuit thereby allowing direct measurement of the pulsed electric field of the electromagnetic pulse;

an oscilloscope which receives and displays said measurement signal from said probe response adjustment circuit;

an output electrode which is electrically connected to said disk electrode and said oscilloscope;

a load resistor which is electrically connect between said disk electrode and a common electrical ground said load resistor having an impedance of R_L ohms; and

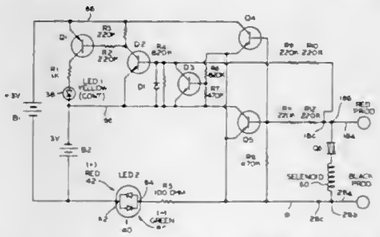
a load capacitor which is electrically connected between said disk electrode and said common electrical ground in parallel with said load resistor, said load capacitor having a capacitance of value C_L farads such that $C_L R_L$ is a product which equals said useful measurement time in seconds which is several orders of magnitude larger than said rise time of said pulsed electric field.—

4,825,150

VOLTAGE AND CONTINUITY TESTER

Anantsak Sirasud, Edwardsville, Ill., assignor to FL Industries, Inc., Livingston, N.J.

Filed Dec. 24, 1987, Ser. No. 138,500
Int. Cl.⁴ G01R *31/02, 19/00*
U.S. Cl. 324—133 **12 Claims**



1. An electrical testing circuit for measuring a test voltage which is the difference between first and second voltages respectively associated with first and second test points or detecting the relative continuity between the first and second test points, comprising:

(a) first and second inputs to which the first and second test points can be respectively electrically connected;

(b) a continuity circuit, a polarity circuit, and a voltage amplitude circuit continuously and simultaneously connected electrically to the first and second signal inputs;

(c) battery means electrically connected to the continuity and polarity circuits for powering them;

(d) the polarity circuit comprising first and second polarity indicators, and sensing means having a portion for activating the first polarity indicator whenever the test voltage is positive and a second portion for activating the second polarity indicator whenever the test voltage is negative, the portion of the sensing means which activates the first polarity indicator being connected to the first and second inputs in substantially the same way as the portion of the sensing means which activates the second polarity indicator;

(e) the continuity circuit comprising a continuity indicator separate from the polarity indicators, driving means for activating the continuity indicator whenever a zero or a low passive impedance is electrically connected between the first and second inputs, and disabling means for disabling the driving means if the test voltage between the first and second inputs equals or exceeds a predetermined continuity limit voltage; and

(f) the voltage amplitude circuit comprising meter means for measuring the absolute amplitude of the test voltage.

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4,825,151

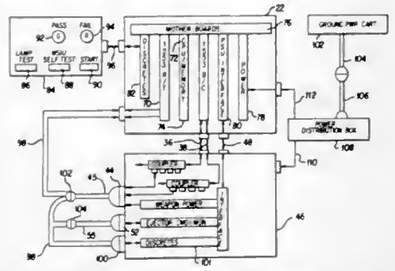
WEAPON INTERFACE SYSTEM EVALUATOR

David J. Aspelin, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 825,612, Feb. 3, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 205,552

Int. Cl.[4] G01R *31/02, 29/02;* **F42C** *11/00*

U.S. Cl. 324—73 R **11 Claims**



1. An apparatus for evaluating an operational status of a weapon interface system for coupling an aircraft controller to a plurality of weapon systems and a corresponding plurality of weapon ejectors, the weapon interface system having a weapon system interface unit, a power switching unit, and a power distribution box, the weapon system interface unit being coupled to the power switching unit and the distribution box and having a first port for communicating with the aircraft controller and a second port for communicating with one of the plurality of weapon systems, the power switching unit being coupled to the weapon system interface unit and to the power distribution box and having a port for communicating with and providing power to the one of the plurality of weapon systems and a corresponding one of the plurality of ejectors, and the power distribution box being coupled to an external power supply, said apparatus comprising:

input/output means removably coupled to the first port of the weapon sysem interface unit for generating a first test signal and providing said first test signal to the first port of the weapon system interface;

coupling means for removably coupling the port of the power switching unit to the second port of the weapon system interface unit; and

processing means mounted in the weapon interface system and operatively coupled to the first port of the weapon system interface unit and to a selected portion of the weapon interface system to be tested for generating a second test signal in response to said first test signal and communicating said second test signal to said selected portion to cause said selected portion to communicate a response signal to said processing means corresponding to the state of said selected portion via said coupling means, and for generating an output signal in response to and corresponding to said response signal and communicating said output signal to said input/output means;

said input/output means including means responsive to said output signal for indicating the state of said selected portion.

4,825,152

TRANSIENT FIELD INDICATOR

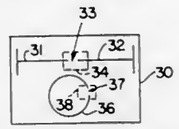
Peter R. Bossard, Langhorne, Pa., assignor to Voyager Technologies, Inc., Langhorne, Pa.

Filed Apr. 22, 1986, Ser. No. 855,074

Int. Cl.[4] G01R *13/14*

U.S. Cl. 324—95 **8 Claims**

1. In combination, a film and an antenna in energy coupling relationship with said film, said antenna having a geometry to define a gap and being responsive to the presence of a field to concentrate the energy of said field at said gap, said film being responsive to said concentrated energy at said gap to provide an indication thereof; said film being an undeveloped photographic film and said antenna comprising first and second metallic depositions extending along said film and being closely spaced apart from one another in a manner to form a single gap therebetween; wherein said field is electric and each



of said first and second metallic depositions has a T-shape and the bases of the T-shapes are closely spaced apart to form said gap.

4,825,153

SHUNT ELEMENT FOR MEASURING CURRENT COMPRISING COMPENSATION MEANS

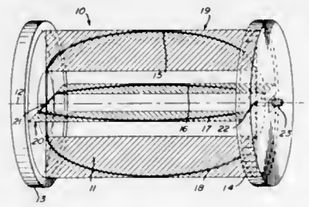
Ryszard Malewski, St. Lambert, and Marc Leclerc, Boucherville, both of Canada, assignors to Hydro-Quebec, Quebec, Canada

Filed Mar. 4, 1987, Ser. No. 21,751

Claims priority, application Canada, Nov. 5, 1986, 522214

Int. Cl.[4] G01R *1/20;* **H01C** *5/00*

U.S. Cl. 324—126 **7 Claims**



1. A shunt for measuring current comprising a massive shunt resistive element for carrying heavy current and having an input and an output terminal, compensation means to reduce the effect of asymmetric return currents on the shunt response and including at least two measuring circuits for measuring the voltage drop and disposed in a longitudinal plane of the shunt element, each of said measuring circuits being comprised of an insulated conductor having an optimized path established in the calibrated configuration of the said shunt, each said optimized paths being symmetrical to one another, both said insulated conductors further having an input end connected together and to said input terminal and an output end connected to an insulated output connection.

4,825,154

CURRENT PROBE

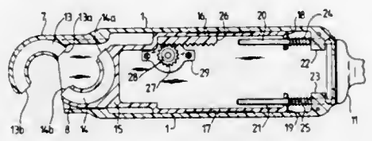
Geoffrey Cross, Merseyside, and Brian Hargreaves, Warrington, both of England, assignors to Pilkington Brothers PLC, England

Filed Feb. 5, 1987, Ser. No. 11,019

Claims priority, application United Kingdom, Feb. 15, 1986, 8603781

Int. Cl.[4] G01R *1/073, 19/00*

U.S. Cl. 324—127 **2 Claims**



1. A current probe comprising:

(a) handle means having a proximal end and a distal end and defining a longitudinal direction therebetween;

(b) a first ring portion of magnetisable material fixed to the handle means with at least a major part projecting from the distal end of the handle means, said first ring portion having two end faces, said end faces being spaced apart in a direction oblique to said longitudinal direction;

(c) a second ring portion of magnetisable material, said second ring portion having two end faces spaced apart in said oblique direction and being linearly slidable in said longitudinal direction between a retracted position in which said ring portions can be located around a current-carrying electrical conductor and an extended position in which the end faces of the first ring portion mate with respective end faces of the second ring portion along a line of split oblique to said longitudinal direction to form a composite magnetisable ring surrounding said conductor for sensing the current in said conductor, said ring having a center lying outside said handle means and defining an aperture located substantially wholly outside said handle means; and,

(d) damping means for damping the movement of said second ring portion to said extended position, said damping means comprising a toothed rack coupled to move with said first ring portion, and a gear engaging the rack.

4,825,155

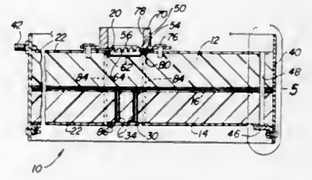
X-BAND LOGIC TEST JIG

Henry K. Takamine, Gardena, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 684,767, Dec. 20, 1984, Pat. No. 4,712,062, and a continuation-in-part of Ser. No. 684,421, Dec. 20, 1984, Pat. No. 4,672,312. This application Jul. 20, 1987, Ser. No. 75,714

Int. Cl.[4] G01R *1/04, 1/073*

U.S. Cl. 324—158 F **16 Claims**



1. A test jig for testing an integrated circuit device having a body and a plurality of leads extending radially therefrom, said test jig comprising:

a first dielectric layer having a substantially centrally located cut-out portion in a surface thereof;

a plurality of conductive signal carrying traces having inner ends terminating adjacent to said cut-out portion and outer ends located on peripheral portions of said dielectric layer;

guide means in the cut-out portion for receiving the leads and orienting the integrated circuit device such that the leads thereof become aligned with and rest on the signal traces when the device is placed into the guide; and

clamping means for clamping the leads of the integrated circuit device to the signal traces.

4,825,156

SIGNAL DETECTOR FOR CYCLE COMPUTER WITH RELEASABLE STRAP FRAME MOUNTING

Robert Read, Bartlett, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Mar. 30, 1988, Ser. No. 175,116

Int. Cl.[4] G01P *1/02*

U.S. Cl. 324—166 **3 Claims**

1. A signal detector for a cycle computer adapted to be releasably mounted on the frame of a bicycle to detect wheel or sprocket turns, comprising:

a head, sensor means supported by the head, and a flexible strap connected at one end of the head;

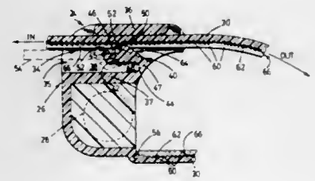
said head comprising a housing having an abutment surface adapted to bear against a support member carried by the frame;

said head having a strap-receiving passageway extending through the housing tangent to said abutment surface with a strap entrance portion adjacent the abutment surface and a strap exit portion remote from the abutment surface;

said strap-receiving passageway extending between upper and lower walls, the upper wall having a strap-guiding surface;

said strap having transverse teeth along the inside surface thereof facing inwardly into the passageway when the strap is inserted therein along the strap-guiding surface;

said head having a pawl in said passageway extending cantileverly rearwardly from a fixed end portion connected



to said head through an elastic hinge portion, tooth means extending transversely from the pawl for engagement with the teeth on the strap when the strap is inserted in the passageway, said pawl having a free rear end portion with a shoulder extending rearwardly from the tooth means, said shoulder being parallel to and offset inwardly from the strap sufficiently to provide an upper space between the shoulder and the strap into which a screwdriver-like tool may be inserted through said exit portion to disengage the tooth means on the pawl from the teeth on the strap to facilitate withdrawal of the strap from the passageway, a lower space between the lower wall and the pawl rear end portion providing room to receive the pawl rear end portion when displaced therein by such screwdriver-like tool, and said pawl rear end portion being wholly contained within said passageway beneath said upper wall and accessible only through said exit portion of the passageway.

4,825,157

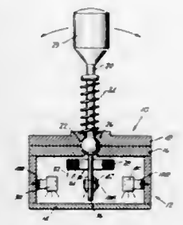
HALL-EFFECT CONTROLLER

Peter J. Mikan, 31 Greenfield Rd., Milford, Conn. 06460

Filed May 16, 1988, Ser. No. 194,141

Int. Cl.[4] G01B *7/14;* **G05G** *9/00*

U.S. Cl. 324—208 **11 Claims**



1. A joystick control, comprising in combination:

(a) a base,

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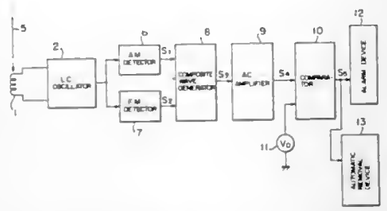
(b) a movable actuator member,
(c) means pivotally mounting the actuator member for tilting movement on the base,
(d) means providing a fluctuating electric field on the base,
(e) said actuator member carrying a magnetic core movable with respect to said fluctuating electric field providing means, thereby to alter the said fluctuating electric field as the actuator member is moved,
(f) a Hall-effect sensor rigid with respect to the base and disposed so as to be under the influence of said fluctuating electric field,
(g) said Hall-effect sensor providing a fluctuating electrical output signal in response to fluctuations of said fluctuating electric field, and
(h) electronic circuit means connected to said Hall-effect sensor, for converting the fluctuating output signal thereof to essentially a d.c. voltage which varies with changes in the position of the magnetic core carried by said actuator member.

4,825,158

METHOD OF DETECTING CONDUCTIVE MATERIAL CONTAINED IN GLASS FIBER BY DETECTING CHANGES IN AMPLITUDE AND FREQUENCY OF AN OSCILLATOR AND DETECTING APPARATUS THEREFOR

Kenzo Watabe; Mitsuo Ysbuki; Kazuyuki Iwama, and Toshihiko Yokoi, all of Koriyama, Japan, assignors to Nitto Glass Fiber Mfg. Co., Ltd., Fukushima, Japan

Filed Jun. 17, 1987, Ser. No. 63,266
Claims priority, application Japan, Jun. 20, 1986, 61-142729
Int. Cl.⁴ G01N *27/82*; G08B *21/00*
U.S. Cl. 324—237 **11 Claims**



1. A method of detecting conductive material in a glass fiber, which is minute and contained in a very small quantity therein, under the condition that the glass fiber is moved at relatively high speed, the method comprising the steps of

providing an oscillator including a reactance element set in an oscillating state which has a predetermined oscillating amplitude value and a predetermined oscillating frequency value existing in a range of a relatively high frequency,

moving the glass fiber, which may contain the conductive material to be detected, in the vicinity of the reactance element,

detecting instantaneous changes respectively in the oscillating amplitude and oscillating frequency in response to such glass movement, in which the corresponding value is changed from the respective predetermined value to a different value of increasing or decreasing direction relative to the predetermined value, and

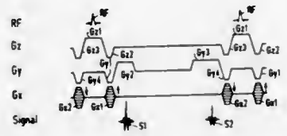
determining instantaneously the presence of such conductive material upon simultaneously determining that a detected change of the oscillating state is caused by the conductive material contained in the glass fiber, by detecting when the direction of the detected change in the oscillating amplitude and the direction of the simultaneously detected change in oscillating frequency are identical to each other.

4,825,159

METHOD FOR OPERATING A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

Arnulf Oppelt, Spardorf; Hubertus Fischer, and Helmut Barfuss, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 19, 1988, Ser. No. 183,231
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714368
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **3 Claims**



1. A method for operating a nuclear magnetic resonance tomography apparatus to obtain an image of an examination subject comprising the steps of:

generating a static magnetic field in which said examination subject is disposed;

exposing said examination subject to a sequence consisting of a plurality of RF pulses;

after each RF pulse, generating a first gradient magnetic field pulse in a first direction as a dephasing gradient and simultaneously generating a first gradient pulse in at least one second direction perpendicular to said first direction as a first phase-coding gradient;

generating a second gradient pulse in said first direction inverted relative to said first gradient pulse in said first direction and simultaneously reading out a first nuclear magnetic resonance signal from said examination subject;

preceding each RF pulse, generating a third gradient pulse in said first direction and simultaneously reading out a second nuclear magnetic resonance signal from said examination subject;

following said third gradient pulse, generating a fourth gradient pulse in said first direction inverted relative to said third gradient pulse and simultaneously generating a second gradient pulse in said second direction as a second phase-coding gradient, said second gradient pulse in said second direction being inverted relative to said first gradient pulse in said first direction; and

using said first and second nuclear magnetic resonance signals to generate respectively different images of said examination subject.

4,825,160

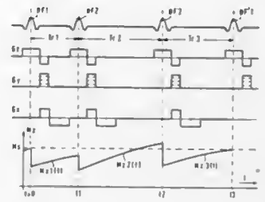
METHOD AND DEVICE FOR MR TOMOGRAPHY

Michael H. Kuhn, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1988, Ser. No. 141,803
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701849
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **4 Claims**

1. A method in MR tomography of determining magnetization relaxation time in connection with an object disposed in an examination zone where the examination zone is subjected, in the presence of a uniform steady magnetic field, to a plurality of sequences of magnetic energization, each sequence including generating an r.f. pulse for rotating nuclear magnetization in the object through an angle which is smaller than 90°, activating magnetic gradient fields with gradients that are variable from one sequence to another, and detecting spin resonance signals in timed relation with the application of the magnetic gradient fields, wherein each sequence comprises at least two

successive sub-sequences, each sub-sequence containing an r.f. pulse for producing echo signals and each sub-sequence having a different repetition time, calculating a respective tomogram from echo signals associated with sub-sequences having the



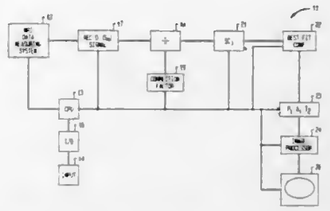
same repetition time, determining a longitudinal relaxation time from the different values of the nuclear magnetization for the same pixel in the tomograms and from the value of the associated repetition time.

4,825,161

NOISE REDUCTION IN MAGNETIC RESONANCE IMAGES

Daniel Barnea, Tel Aviv; Saul Stokar, Ra'Anana; Yuval Zur, Herzlia, all of Israel; Noam Kaplan, Vancouver, Canada, and Amir Ban, Tel Aviv, Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Nov. 12, 1987, Ser. No. 119,483
Claims priority, application Israel, Nov. 21, 1986, 80727
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **20 Claims**



1. A method of improving signal-to-noise-ratio in magnetic resonance (MR) systems, said method comprising the steps of:

measuring intensity values of at least three sequential echoes,

correcting the measured intensity values by operating on each of the measured intensity values with a correcting factor to obtain corrected measured intensity values,

said correcting factors correcting for differences between an actual slice profile and an ideal slice profile,

using said corrected measured intensity values to obtain a set of corrected intensity values having improved SNR characteristics, and

using the set of corrected intensity values to obtain images.

4,825,162

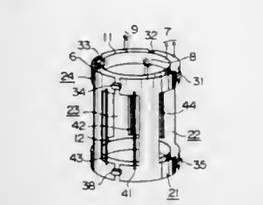
NUCLEAR MAGNETIC RESONANCE (NMR) IMAGING WITH MULTIPLE SURFACE COILS

Bernard Roemer, and William A. Edelstein, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 7, 1987, Ser. No. 130,046
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—318 **18 Claims**

9. Apparatus for simultaneously receiving NMR response signals from nuclei within a predetermine portion of a sample, comprising:

a plurality of substantially-identical single-turn surface coil antennae, each positioned to overlap at least a portion of at least one other surface coil and to simultaneously have



substantially no interaction with at least all adjacent surface coils; and

means for maintaining the positions of the surface coils in an array extending in at least one dimensional along a surface enclosing the sample.

4,825,163

QUADRATURE PROBE FOR NUCLEAR MAGNETIC RESONANCE

Masao Yabusaki, Tokyo; Etsuji Yamamoto, Akishima; Yoshiki Murakami, and Hideki Kohno, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,781
Claims priority, application Japan, Jul. 31, 1987, 62-190015; Apr. 13, 1988, 63-89045
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—318 **6 Claims**

1. A quadrature probe for nuclear magnetic resonance, comprising:

(a) first to fourth outer conductors provided along a predetermined cylindrical surface, each of said first to fourth outer conductors including one arm portion parallel to a center axis of said cylindrical surface and four wing portions extending rightwards and leftwards from opposite ends of said arm portion, said first and third outer conductors being disposed at positions symmetrical with respect to said center axis, said second and fourth outer conductors being disposed at positions symmetrical with respect to said center axis;

(b) first and second ring-shaped inner conductors provided inside the wing portions of said first to fourth outer conductors, each of said first and second inner conductors being capacitively coupled to the wing portions of said outer conductors through an insulator or an air gap so that said first and third outer conductors form a first coil and that said second and fourth outer conductors form a second coil;

(c) capacitors inserted between ends of the wing portions of the adjacent ones of said first to fourth outer conductors; and

(d) a conductor member provided to at least one of a set of said first and third outer conductors and a set of said

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second and fourth outer conductors for adjustment of the direction of the center axis of a coil, opposite ends of said conductor member being slidably attached to the upper and lower wing portions of the outer conductor.

4,825,164

SURFACE RESONATOR FOR NUCLEAR MAGNETIC RESONANCE EQUIPMENT

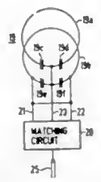
Hermann Requardt, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 156,587

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3706087

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—322 **9 Claims**



1. A surface resonator arrangement for use in nuclear magnetic resonance examination apparatus having means for supplying signals to and receiving signals from said surface resonator arrangement, said surface resonator arrangement including a surface resonator comprising:

first and second windings each having free ends;

a first pair of series-connected capacitors connected across the free ends of said first winding, said first pair of capacitors having a junction therebetween disposed at an electrical symmetry point for said first winding;

a second pair of series-connected capacitors connected across the free ends of said second winding, said second pair of capacitors having a junction therebetween disposed at an electrical symmetry point of said second winding;

each of said first and second windings connected to ground at said junctions; and

means directly electrically connecting one of said windings to said means for supplying and receiving signals.

4,825,165

METHOD AND APPARATUS FOR DETECTING A TRANSIENT PHENOMENON BY MONITORING VARIATIONS OF AN ALTERNATING COMPONENT OF A VERTICAL CURRENT EMANATING FROM THE EARTH'S SURFACE

Ronald L. Helms, 10165 Palmer Dr., Oakton, Va. 22124, and Claude V. Swanson, 1800 Old Meadow Rd., Reston, Va. 22102

Continuation of Ser. No. 678,568, Dec. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 404,459, Aug. 2, 1982, Pat. No. 4,507,611, which is a continuation of Ser. No. 876,163, Feb. 8, 1978, abandoned. This application Apr. 13, 1987, Ser. No. 37,052

Int. Cl.[4] G01V *3/08;* G01W *1/16;* G01R *19/00, 23/00*

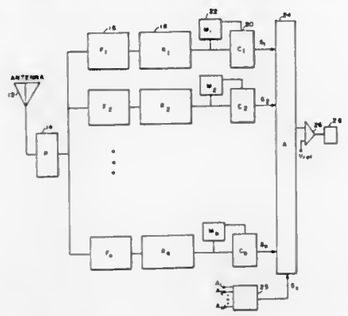
U.S. Cl. 324—323 **32 Claims**

1. A method of monitoring a transient phenomenon occurring on or beneath the surface of the earth and in the vicinity of a location of interest, comprising the steps of:

positioning a detector at said location;

measuring with said detector, an alternating component of a generally vertical current having a frequency characteristic which emanates from the earth in the vicinity of said location;

monitoring said alternating component of the generally vertical current emanating from the earth for variations indicative of the occurrence of said phenomenon;



correlating said variation with data indicative of said phenomenon to determine the occurrence of said phenomenon.

4,825,166

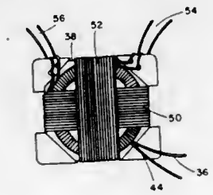
BOBBIN FOR A MAGNETIC SENSOR

Douglas C. MacGugan, Issaquah, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 27, 1987, Ser. No. 7,314

Int. Cl.[4] G01V *3/26;* G01R *33/04;* H01F *3/04, 17/06*

U.S. Cl. 324—346 **19 Claims**



1. A magnetometer sensor for use in a borehole survey tool, comprising:

(a) a bobbin made from a non-magnetic copper alloy having a magnetic permeability not greater than 1.001 , said alloy comprised of at least 60 percent and at least 9 percent nickel;

(b) a strip of magnetic metal alloy wrapped around said bobbin to form a magnetic core, said strip having two ends with one end joined to said bobbin;

(c) at least one excitation winding wrapped around said core; and

(d) at least one sense winding wrapped around said core and said excitation winding.

4,825,167

SPARK PLUG TESTING UNDER DYNAMIC LOAD

Richard Bayba, Sun Lakes, Ariz., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 2, 1987, Ser. No. 115,111

Int. Cl.[4] F02P *17/00*

U.S. Cl. 324—399 **11 Claims**

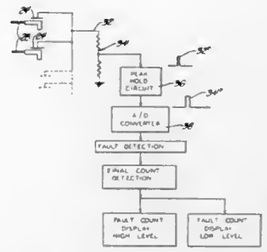
1. A method of testing spark plugs under load while installed in an engine comprising the steps of;

opening the throttle of the engine to wide open position,

applying ignition voltage to the spark plugs,

driving the engine by an external power source without applying fuel to the engine,

sensing the voltage characteristics developed in the spark plugs, and



evaluating the voltage characteristics of each spark plug and comparing it to acceptable standards.

4,825,168

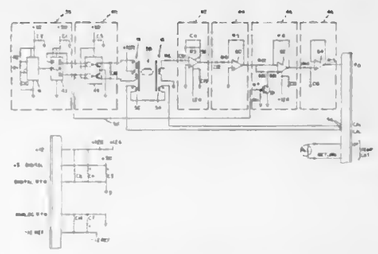
REMOTE CONDUCTIVITY SENSOR USING SQUARE WAVE EXCITATION

Francis T. Ogawa, Lakewood; George J. Ellers, Evergreen; Michael R. Manes, Littleton; Donn D. Lobdell, Englewood, and Terry D. Boucher, Littleton, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed May 30, 1986, Ser. No. 869,087

Int. Cl.[4] G01N *27/06, 27/08, 27/72*

U.S. Cl. 324—439 **10 Claims**



1. Apparatus for remotely sensing conductivity of a fluid passing through it, said apparatus comprising

a cell including means for defining a fluid flow path having a fluid loop and excitation and sensing transformers each having a core encompassing a portion of said fluid loop, and

a digital timer and a flip-flop connected to provide a square wave excitation signal to said excitation transformer.

4,825,169

ULTRASONIC STREAMING CURRENT DETECTOR

John F. Carver, Jupiter, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Jul. 9, 1987, Ser. No. 71,297

Int. Cl.[4] G01N *27/60*

U.S. Cl. 324—453 **7 Claims**

1. A streaming current detector for determining the charge condition in a fluid comprising:

a pair of electrodes disposed in a bore;

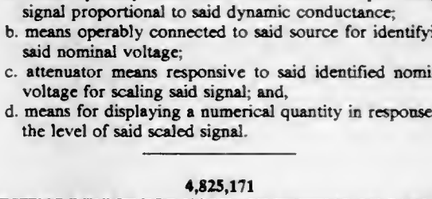
a reciprocating piston disposed in said bore;

means for reciprocating said piston;

a light shutter operated by said last named means;

a light source and a light detector on opposite sides of said shutter, said shutter passing light from said source to said detector while said piston is reciprocating in one direction, and blocking light from said source to said detector while said piston is reciprocating in the other direction, said light detector producing an output indicating the direction of travel of said piston;

an electronic synchronous detector controlled by said output of said light detector; and



an amplifier for amplifying electrical signals generated across said electrodes, the output of said amplifier being connected to said synchronous detector to produce full wave detection of the output of said amplifier in synchronism with the direction of reciprocation of said piston.

4,825,170

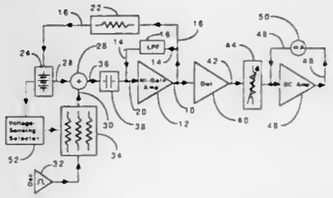
ELECTRONIC BATTERY TESTING DEVICE WITH AUTOMATIC VOLTAGE SCALING

Keith S. Champlin, 5437 Elliot Ave. S., Minneapolis, Minn. 55417

Filed May 25, 1988, Ser. No. 198,484

Int. Cl.[4] G01N *27/46*

U.S. Cl. 324—436 **19 Claims**



1. An electronic device for testing a direct current energy source having a dynamic conductance and a nominal voltage comprising:

a. means operably connected to said source for providing a signal proportional to said dynamic conductance;

b. means operably connected to said source for identifying said nominal voltage;

c. attenuator means responsive to said identified nominal voltage for scaling said signal; and,

d. means for displaying a numerical quantity in response to the level of said scaled signal.

4,825,171

TESTING DEVICE FOR VOLTAGE TESTING OF CABLES AND CABLE SETS

Ekkehard Lefeldt, Börnhoved, Fed. Rep. of Germany, assignor to HDW-Elektronik GmbH, Kiel, Fed. Rep. of Germany

Filed Dec. 19, 1986, Ser. No. 944,558

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1986, 3600391; Aug. 28, 1986, 3629352

Int. Cl.[4] G01R *31/14*

U.S. Cl. 324—544 **5 Claims**

1. A testing device for voltage testing of cables and cable sets for withstanding high and medium electric voltage variations, especially of cables with PE- or XLPE-isolation, comprising:

a rectified electric voltage testing means for generating a positive voltage and negative voltage;

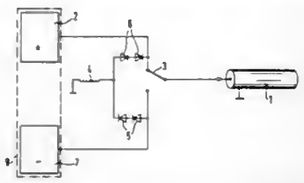
a first switch associated with said testing means and con-

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nected to the cable for alternate application of a positive voltage and a negative voltage to the cable to charge the cable to a desired voltage, losses occurring in said testing device due said voltage application, means to compensate due to said alternate voltage applications, including

first dissipating means including a first rectifier connected between the switch and the positive voltage of the testing means for dissipating any negative charges on the cable; and second dissipating means including a second rectifier connected between the switch and the negative voltage of the testing means for dissipating any positive charges on the cable;

whereby the cable is alternately positively and negatively charged by periodically switching the first switch in one switching position and then the other switching position, the change-over process is allowed to take place without the formation of any measurable wave, and losses from



said positive voltage application are compensated by said negative voltage application, while losses from said negative voltage application are compensated by said positive voltage application;

said first switch comprising:

a controllable switching rotor with first, second and third contacts with which are associated corresponding stationary contacts connected to said cable, said coil and said generators, said rotor having a rectifier between said first and second contacts as well as a contact bridge between said second and third contacts, whereby the switching rotor can be adjusted with its contacts so that in a half period a switching position results in which the cable is charged by the testing apparatus and, after the switching rotor has been turned to another switching position for the other half period through rectifier and said choke coil, the cable changes into an opposite polarity and is isolated from the apparatus.

4,825,172

EQUAL POWER AMPLIFIER SYSTEM FOR ACTIVE PHASE ARRAY ANTENNA AND METHOD OF ARRANGING SAME

James D. Thompson, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 30, 1987, Ser. No. 32,126

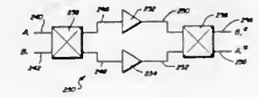
Int. Cl.[4] H03F *3/68*

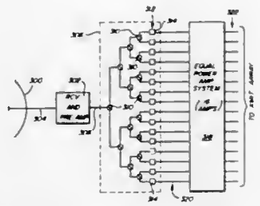
U.S. Cl. 330—124 R **33 Claims**

28. For use in a microwave antenna system of the type including an array of radiating elements for producing at least one microwave beam having a preselected beam pattern, and means for producing a plurality of transmit signals respectively having various predefined amplitudes related to said beam pattern, a method of amplifying said transmit signals, comprising the steps of:

(A) associating said transmit signals with each other in a manner to form a plurality of distinct pairs of said transmit signals, wherein the sums of the amplitudes of the pairs of transmit signals are essentially equal;

(B) separately amplifying each of said pairs of transmit signals using a plurality of separate amplification means, respectively associated with said plurality of pairs of transmit signals, wherein the amplification factors of all of said amplification means are essentially equal;





(C) delivering the pairs of transmit signals amplified in step (B) to said array.

4,825,173

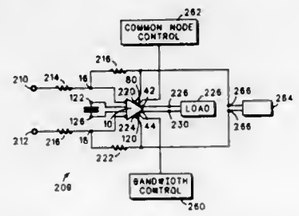
HIGH GAIN, PROGRAMMABLE DIFFERENTIAL AMPLIFIER CIRCUITRY

Frank N. Cornett, Queen Creek, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 18, 1988, Ser. No. 145,933

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—252 **11 Claims**



1. In a signal processing circuit having a first pair of output terminals, each of the first pair of output terminals providing an output potential, each output potential having a magnitude, the output potentials further having an average magnitude, and wherein it is desired that the average magnitude of the output potentials on the first pair of output terminals be controlled to remain at a substantially constant level, a regulator for controlling the average magnitude including in combination:

output potential control means having a control terminal and a second pair of output terminals, said second pair of output terminals of said output potential control means being coupled to the first pair of output terminals of the signal processing circuit, said output potential control means being adapted to control the average magnitude in response to a control signal;

first transistor means having input, output and control electrodes, second transistor means having input, output and control electrodes, said input electrodes being coupled together at a first node so that said first and second transistor means provide a first differential pair;

first current sink means coupled to said first node;

first circuit means coupling the first pair of output terminals of the signal processing circuit to said control electrode of said first transistor means said first differential pair and said first current sink means responding to undesirable changes in the magnitudes of the potential on the first pair of output terminals of the signal processing circuit to provide a control signal at said output electrode of said second transistor means; and

second circuit means coupling said output electrode of said second transistor means to said control terminal of said output potential control means for applying said control signal thereto, said output potential control means responding to said control signal to adjust the average magnitude of the output potentials (back) to the substantially constant level.

4,825,174

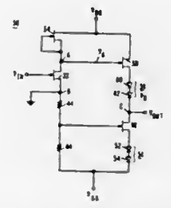
SYMMETRIC INTEGRATED AMPLIFIER WITH CONTROLLED DC OFFSET VOLTAGE

George P. Vella-Coleiro, Summit, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 20, 1988, Ser. No. 209,462

Int. Cl.[4] H03F *3/16*

U.S. Cl. 330—277 **16 Claims**



1. A symmetric integrated FET amplifier comprising

an input FET including a gate, source and drain, responsive to an applied input voltage signal;

input load means coupled between the drain of said input FET and a first power supply source;

first impedance matching means connected to the source of said input FET, said first impedance matching means comprising an impedance value essentially the impedance of said input load means;

second impedance matching means connected between said first impedance matching means and a second power supply source, said second impedance matching means comprising an impedance value essentially the impedance of said input FET;

a first buffer FET including a gate, source and drain, the gate being coupled to the drain of said input FET, the drain being coupled to said first power supply source;

first voltage level shifting means coupled between the source of said first buffer FET and the amplifier output, said first voltage level shifting means for supplying a predetermined DC voltage drop to the signal appearing at the gate of said first buffer FET;

a second buffer FET including a gate, source and drain, the gate being coupled to the connection between said first and second impedance matching means and the source being coupled to the first voltage level shifting means at the amplifier output, said second buffer FET being essentially identical in size to said first buffer FET; and

second voltage level shifting means coupled between the drain of said second buffer FET and said second power supply source, said second voltage level shifting means for supplying said predetermined DC voltage to the signal appearing at the gate of said second buffer FET.

4,825,175

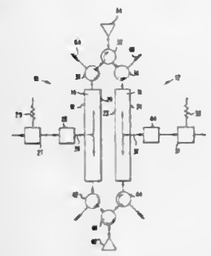
BROADBAND, HIGH ISOLATION RADIAL LINE POWER DIVIDER/COMBINER

George L. Tsuda, and James S. Ajioka, both of Fullerton, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 783,592, Oct. 3, 1985, abandoned. This application Aug. 31, 1987, Ser. No. 91,312

Int. Cl.[4] H03F *3/60*; H03H *7/48*

U.S. Cl. 330—286 **15 Claims**



13. A radial line power divider/combiner for processing applied energy and operating in a selected circumferential mode m, where |m| is a value of at least one, comprising:

a first radial transmission line;

a second radial transmission line;

a plurality of processor means for processing said applied energy; and

a plurality of coupling means for unidirectionally coupling divided energy out of said first radial transmission line at its circumference and into one of said processor means, and for unidirectionally coupling processed energy from said processor means into said second radial transmission line at its circumference, said coupling means comprising first, second and third H-plane waveguide, three port circulators, the first circulator being coupled to the first radial transmission line at its circumference for coupling energy received thereat to the processing means, the second circulator being coupled to the second radial transmission line at its circumference for coupling the processed energy from the processing means to the second radial transmission line at its circumference, and the third circulator having an inlet port coupled to an outlet port of the first circulator, an outlet port coupled to an inlet port of the second circulator and a third port coupled to said processing means, the third circulator being arranged such that energy received from the first circulator is unidirectionally coupled to the processing means, and processed energy received back from the processing means is unidirectionally coupled to the second circulator with each of said coupling means being joined to separate processor means in said plurality of processor means; and

the circulators are oriented in relation to the radial transmission lines such that the H-plane of the circulators is substantially orthogonal to the H-plane of the radial transmission lines.

4,825,176

CONTROL AMPLIFIER

Henri J. Velo, Hilversum, Netherlands, assignor to AT&T and Philips Telecommunications B.V., Hilversum, Netherlands

Filed Sep. 23, 1987, Ser. No. 99,944

Claims priority, application Netherlands, Sep. 24, 1986, 8602409

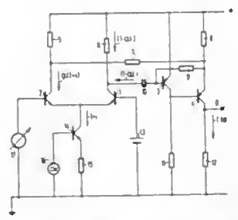
Int. Cl.[4] H03G *3/00*; H03F *3/45*

U.S. Cl. 330—254 **1 Claim**

1. A control amplifier having an output terminal, including a first and a second transistor whose emitters are connected to a point of constant potential via a common signal source, a

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control voltage source being provided between the base electrodes of the two transistors, and the collectors of the two transistors being connected to a point of constant potential via at least one resistor, characterized in that the output of said control voltage source is independent of any output appearing



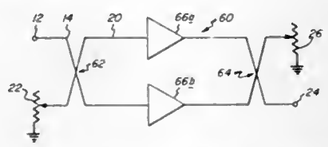
at said output terminal, and in that the collector of the first transistor is connected to the input of a multi-stage feedback amplifier which exhibits a low input impedance and that the collector of the second transistor is connected to an internal node point of low impedance of said feedback amplifier via at least one resistor.

4,825,177

MICROWAVE AMPLIFIER AND OTHER MICROWAVE COMPONENTS

Randy Teague, Syosset, and Michael E. Weinstein, Huntington Station, both of N.Y., assignors to General Instrument Corporation, New York, N.Y.

Filed Oct. 16, 1987, Ser. No. 109,101
Int. Cl.[4] H03F *3/68*
U.S. Cl. 330—295 **24 Claims**



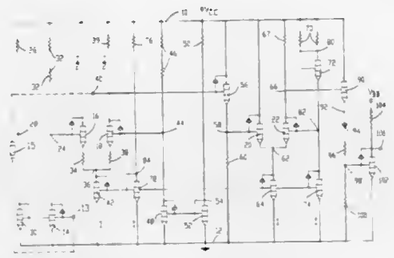
1. A broad band microwave amplifier comprising:
an input Lange coupler receiving an input signal, the graph of coupling as a function of frequency of said input Lange coupler exhibiting lower and upper frequency cross-over points;
a first single-ended amplifier connected to receive a portion of said input signal traveling through said input Lange coupler;
a second single-ended amplifier connected to receive a portion of said input signal coupled through said input Lange coupler; and
an output Lange coupler connected to receive the input signal portions after amplifications by said single-ended amplifiers, the graph of coupling as a function of frequency of said output Lange coupler exhibiting lower and upper frequency cross-over points, and wherein
at least one of said cross-over points of said input Lange coupler is substantially offset in frequency from both of the cross-over points of said output Lange coupler.

4,825,178

OSCILLATOR WITH NOISE REJECTION AND SQUARE WAVE OUTPUT

Edward F. Culican, Hyde Park; John D. Davis, Beacon; Martin E. Powell, Poughkeepsie, and Philip E. Pritzlaff, Jr., Highland, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1987, Ser. No. 89,711
Int. Cl.[4] H03B *5/36;* **H03K** *5/08*
U.S. Cl. 331—116 R **13 Claims**



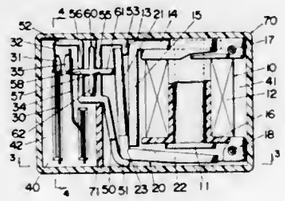
10. An oscillator with noise rejection comprising:
a first amplifier with an input and an inverting output;
first current switch means with a first control line thereof connected to the inverting output of said first amplifier, with a second control line connected to a reference, and an output line for providing an output in response to signals on said first control line, and including a first constant current source;
means for connecting an external crystal across the input of said first amplifier and the output line of said first current switch means so that a sine wave is generated and amplified; and
means connected to said inverting output for generating a square wave from said amplified sine wave signal by switching when said amplified sine wave crosses a voltage threshold, said square wave generating means including means for generating said switching voltage threshold so that said voltage threshold is approximately equal to the center of the voltage swing for the amplified sine wave.

4,825,179

ELECTROMAGNETIC RELAY WITH PIVOTABLE ARMATURE

Mitsuki Nagamoto, and Masayuki Shiomi, both of Tsu, Japan, assignors to Matsushita Electric Works, Ltd., Kodoma, Japan

Filed Mar. 11, 1988, Ser. No. 167,281
Claims priority, application Japan, Mar. 20, 1987, 62-041887[U]
Int. Cl.[4] H01H *51/22*
U.S. Cl. 335—80 **4 Claims**



1. In an electromagnetic relay comprising:
a base mounting an electromagnet and a contact assembly;

said contact assembly comprising a fixed contact on said base and an elongated movable spring carrying at its one end a movable contact engageable with said fixed contact and supported at the other end to said base;
said electromagnet including a core having first and second ends, a coil wound about said core, a yoke connected at its one end to the first end of the core and extending parallel to said core, and a generally L-shaped armature having a first leg extending along the yoke and a second leg extending over the second end of said core to define therebetween an air gap;
said armature rockable with its inside angle pivotally supported against an edge at the other end of said yoke for pivotal movement in response to the energization and deenergization of said coil between an attracted position in which the second armature leg is attracted to said second end of the core and a reset position in which the second armature leg is spaced away from the first end of said core;
said first armature leg being operatively connected to said movable spring through an electrically insulative actuator so as to drive the movable spring in a direction of engaging the movable contact with said fixed contact against a return bias applied to the armature as said armature moves to its attracted position in response to the energization of said coil, said return bias causing the armature to move back into said inoperative position for disengaging the movable contact from said fixed contact upon deenergization of the coil;
said relay characterized in that a stationary retainer means is provided on the base adjacent the angled portion of the armature to loosely engage that angled portion between the edge of the yoke and the retainer means for preventing said inside angle of the armature from departing beyond a predetermined allowable distance from the edge of the yoke;
that said movable spring is self-biased away from said fixed contact to thereby produce said return bias which is transmitted to said armature through said insulating actuator and said first armature leg while bolding said insulative actuator between said movable spring and said first armature leg, and
that a fulcrum projection is provided on the base to receive the free end of the first armature leg when the armature is moved to its reset position, said actuator abutting against the first armature leg at a point inwardly of said fulcrum projection along the length of the first armature leg for transmitting to the armature said return bias as a torque which causes said armature within said allowable distance from the edge of the yoke to pivot about the fulcrum projection in a direction of urging said inside angle of the armature toward the edge of said yoke close enough so that upon the energization of the coil the inside angle of the armature can be firstly attracted to the edge of the yoke before the second armature leg is attracted to the core to substantially drive the movable spring by the first armature leg into contact with the fixed contact, whereby the armature can have its inside angle in exact coincidence with the edge of the yoke prior to being pivoted to the attracted position.

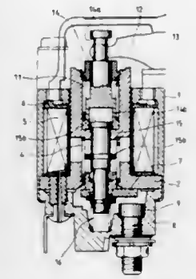
4,825,180

SOLENOID SWITCH FOR USE IN ENGINE STARTER MOTOR

Wakaki Miyaji, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1988, Ser. No. 206,779
Claims priority, application Japan, Jun. 15, 1987, 62-92219
Int. Cl.[4] H01H *51/08*
U.S. Cl. 335—131 **1 Claim**

1. A solenoid switch for an engine starter motor comprising a stationary core fixedly mounted on a casing, a plunger provided movably and opposingly to said stationary core, a solenoid surrounding said stationary core and said plunger, a stationary contact fixedly mounted on said casing, a plunger spring provided between said stationary core and said plunger for biasing said plunger from said stationary core, a movable member inserted into said plunger axially movably, said movable member having an engaging portion engaging with a lever for mechanically engaging an engine shaft with a rotary shaft of the engine starter motor, a lever spring provided between



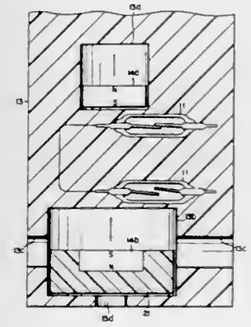
said movable member and said plunger for biasing said movable member into said plunger, a rod inserted axially movably into said plunger by a limited distance and having a protrusion adapted to be in contact with said plunger in a midway of a stroke of said plunger, a movable contact fixedly mounted on said rod opposingly to said stationary contact and a return spring provided between said rod and said casing for biasing said rod from said stationary contact.

4,825,181

SWITCHING DEVICE

Suketoshi Nagano, Yokohama; Munehiro Ichikawa, and Takashi Yoneyama, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1988, Ser. No. 163,560
Claims priority, application Japan, Mar. 10, 1987, 62-54651; Mar. 20, 1987, 62-67211
Int. Cl.[4] H01H *9/00*
U.S. Cl. 335—205 **10 Claims**



1. A switching device comprising at least one switch turned on and off by a magnetic field, a fixed bias magnet located in an area where said switch operates stably, and a starting magnet located opposite to the fixed bias magnet with the switch interposed between the fixed magnet and the starting magnet and capable of applying a magnetic field, reverse to that of the fixed bias magnet, to the switch, wherein when said starting magnet is close to the switch, its magnetic field overcomes that of the fixed bias magnet to control the switching-on and -off of

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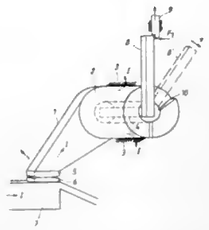
the switch, and when the starting magnet is remote from the switch, the fixed bias magnet controls the switching-on and -off of the switch, wherein said at least one switch comprises plural reed switches arranged with one end of each of the reed switches closer to one another than the other end of each of the reed switches are to one another, and wherein the fixed bias and starting magnets are common to said reed switches and are located adjacent said one end of said reed switches which are arranged closer to each other.

4,825,182

ELECTRICAL SWITCHING DEVICE

Stefan Valdemarsson, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Nov. 13, 1987, Ser. No. 120,423
Claims priority, application Sweden, Nov. 18, 1986, 8604924
Int. Cl.⁴ H01H *9/00*
U.S. Cl. 335—167 **10 Claims**



1. An electric switching device comprising a contact arm (1) which is fixed on a shaft (2) rotatably mounted in a fixed contact block (3) and being turnable between a closed position and an open position under the influence of a torsion rod spring (4), one end of which being fixedly connected to the contact arm (1) or the shaft (2) and the other end of which being fixedly connected to a percussion hammer (8), which cooperates with a latching device (9) which is adapted, in the closed position, to arrest the torsion rod spring (4) in tensioned condition, while the contact arm (1) is pressed against a fixed counter contact (7) for closing a current path through the contact arm (1), the percussion hammer being adapted, upon opening of the switching device after releasing of the latching device (9), to strike against a projection (10) fixedly arranged on the contact arm (1) or the shaft (2) to bring about a rapid contact opening.

4,825,183

SWITCH LATCH

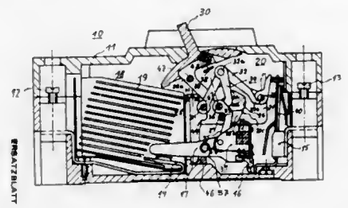
Herbert Hauschildt, deceased, late of Neumünster, Fed. Rep. of Germany (by Hildegard Hauschildt, heiress), assignor to Licentia Patent-Verwaltungs GmbH, Frankfurt, Fed. Rep. of Germany

PCT No. PCT/EP85/00343, § 371 Date Mar. 13, 1986, § 102(e) Date Mar. 13, 1986, PCT Pub. No. WO86/00751, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 12, 1985, Ser. No. 849,453
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1984, 3425996; Oct. 26, 1984, 3439243
Int. Cl.⁴ H01H *9/20*
U.S. Cl. 335—167 **24 Claims**

1. A switch latch for a power switch of the type having including a supporting part which includes two planar, parallel connected bearing plates holding a lock mechanism which includes a plurality of levers which are sheet-like members, a plurality of bearing pins, a plurality of connecting pins, and a plurality of tension springs which serve as spring elements, the improvement comprising:

an assembling bracket;

each bearing plate having an assembling tab which projects at approximately a right angle to a main body portion of the respective bearing plate, each said assembling tab having a tab end and projecting end opposite said tab end, said assembling bracket connecting said bearing plates together at the side opposite said tab ends, said assembling bracket being a generally sheet-like member, said bearing



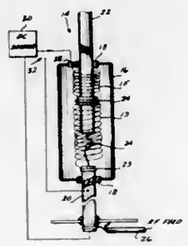
plates being releasably connected with said assembling bracket, said assembling bracket having a plurality of openings for receiving said projecting ends of said bearing plates, said asembling bracket having at least one bore for receiving a fastening member for fastening said lock mechanism to a switching instrument housing.

4,825,184

CURRENT CONTROLLED INDUCTOR

Joseph T. Bloch, Seattle, and Todd N. Johnstone, Federal Way, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 6, 1987, Ser. No. 69,814
Int. Cl.⁴ H01F *21/04*
U.S. Cl. 336—20 **13 Claims**



1. A current controlled inductor that provides a variable inductance in an electric circuit, comprising:

(a) a coil of electrically conductive wire formed of a shape memory allow that returns said coil to an original length from an altered length when heated to a predetermined temperature by an electric current flowing through said coil such that, as the length of the coil is altered, a change in the inductance of the coil alters the electric circuit;

(b) means for altering the original length of said coil; and,

(c) means electrically connecting the coil to the electric circuit.

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ELECTRIC NOISE ABSORBER

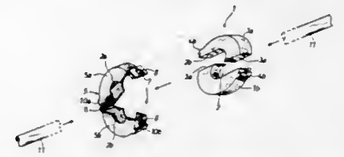
Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan

Filed Feb. 5, 1988, Ser. No. 152,859
Claims priority, application Japan, Feb. 19, 1987, 62-36828
Int. Cl.⁴ H01F *17/06, 27/02, 27/26*
U.S. Cl. 336—92 **11 Claims**

1. An electric noise absorber comprising:

a tubular magnetic body having therein a longitudinal through hole for securely receiving a wire of an electronic device and divided longitudinally by at least a cutting plane into two parts, each of said two parts including a half through hole and two abutment surfaces, each of said abutment surfaces being sufficiently larger in area than a basic cross section of said magnetic body;

a holding device for holding said magnetic body under the condition that said two parts of said magnetic body closely abut to each other through said abutment surfaces, said holding device including two hinged and detachably



connected case members for respectively housing therein two parts of said magnetic body; and

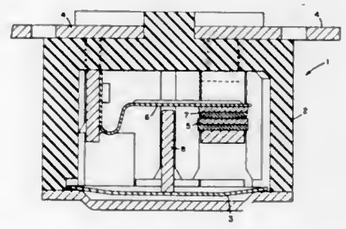
a locking device attached to said magnetic body and said holding device for preventing a movement of said magnetic body in said holding device, said locking device including one of a projection and recess located on the magnetic body and the other of said projection and recess located on the holding device, said projection cooperating with the recess to maintain each part of said magnetic body in a corresponding case member when said case members are detached from one another.

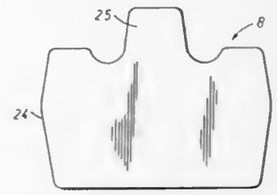
4,825,186

PROCESS FOR THE ADJUSTMENT OF A THERMAL SWITCH

Helmut Bayer, Vienna, Austria, assignor to Electrovac, Fabrikation elektrotechnischer Spezialartikel Gesellschaft m.b.H., Vienna, Austria

Filed Dec. 18, 1987, Ser. No. 134,660
Claims priority, application Austria, Dec. 18, 1986, 3379/86
Int. Cl.⁴ H01H *37/12, 37/52*
U.S. Cl. 337—360 **14 Claims**





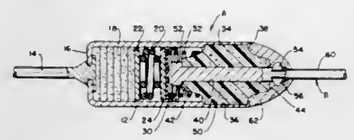
1. A process for the adjustment of a thermal switch including a housing, a temperature sensor defined by a snap acting thermostatic bimetal element, which sensor is in connection with a contact via a transfer element, said process comprising: a) providing a switch with a dished, snap acting thermostatic bimetal element and a contact, b) measuring the distance between the bimetal element and the contact, c) arithmetically determining the necessary nominal length of the transfer element, d) at least partially heating the transfer element to its plastic deformation temperature, and e) plastically deforming the transfer element to the arithmetically determined nominal length.

4,825,187

THERMAL CUTOFF

Mark A. Cesky, Lexington, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Nov. 6, 1987, Ser. No. 118,021
Int. Cl.⁴ H01H *37/76*
U.S. Cl. 337—407 **7 Claims**



1. In a thermal cutoff including a housing having an open end, a dielectric bushing received in said housing open end, said bushing having opposite ends and a hole therethrough, an electrical lead closely received through said hole and having an enlarged contact thereon within said housing adjacent one of said bushing opposite ends, a deformation on said lead adjacent the other of said bushing opposite ends, both said contact and deformation being substantially larger than said hole for stepping relative axial movement between said bushing and lead, said lead comprising a length of wire having a nominal diameter the same as the portion of said lead extending through said bushing hole, and said wire being substantially reduced in diameter beyond said deformation to define a flexible lead tail portion.

4,825,188

METHOD OF MANUFACTURING A LIGHTNING ARRESTER, AND A LIGHTNING ARRESTER OBTAINED BY THE METHOD

René Parraud, Chateldon, and Denis Thuillier, Vichy, both of France, assignors to Ceraver, Courbevoie, France

Filed Mar. 3, 1988, Ser. No. 163,676
Claims priority, application France, Mar. 6, 1987, 87 03049
Int. Cl.⁴ H01C *7/10*
U.S. Cl. 338—21 **9 Claims**

1. A method of manufacturing a lightning arrester comprising:

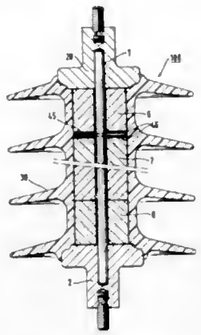
stacking substantially cylindrical pellets of a varistor-type material having holes passing through the center thereof on a central rod made of stratified material to form a stack assembly, placing said stack assembly into compression between two facing faces of two end fittings coupled to said central rod of stratified material;

filling the space between the rod and said pellets with an insulating material to render said assembly perfectly rigid; and

molding a coating of an elastomer of the EPDM type over

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said assembly to adhere said elastomer perfectly to all of the surfaces of a central core of the assembly defined by a



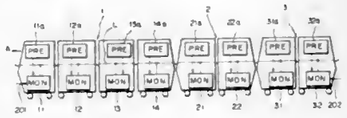
stack of pellets and the end fittings covered by said elastomer.

4,825,189

TRAIN MONITORING EQUIPMENT

Hidetoshi Honma, and Kenji Morihara, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1986, Ser. No. 936,846
Claims priority, application Japan, Dec. 24, 1985, 60-289189
Int. Cl.⁴ B61L *15/00*
U.S. Cl. 246—166.1 **11 Claims**



1. Train monitoring equipment for a train including a first set of cars and a second set of cars, said first and second set of cars comprising respectively a plurality of cars coupled together, wherein the cars of said first set have a first formation number and the cars of said second set have a second formation number different from said first formation number, said train monitoring equipment comprising:
- monitoring stations which are respectively mounted in each of said cars and each of which registers the number representing the location of the corresponding car;
- transmission lines for connecting said monitoring stations serially; and
- formation number presetting means for presetting said first formation number in said first set of cars and said second formation number in said second set of cars for discriminating between said first and second sets of cars.

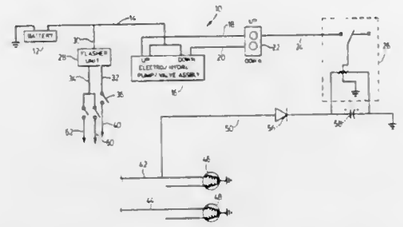
4,825,190

SAFETY SYSTEM FOR PREVENTING THE UNAUTHORIZED USE OF POWERED LIFTGATES

Paul H. Martin, Toronto, Canada, assignor to Diesel Equipment Limited, Toronto, Canada

Continuation of Ser. No. 165,446, Feb. 1, 1988, abandoned, which is a continuation of Ser. No. 911,740, Sep. 26, 1986, abandoned. This application Oct. 3, 1988, Ser. No. 253,337
Int. Cl.⁴ B60Q *1/26*
U.S. Cl. 340—471 **5 Claims**

1. A safety system for indicating the operative condition of the liftgate of a motor vehicle which is also provided with a hazard warning system incorporating one or more lights which are controlled by a flasher and wherein the liftgate and hazard warning system are powered by an electrical power source comprising, a first electrical circuit connecting the hazard warning system to the electrical power source so that the lights are activated by the flasher, first switch means for activating said first electrical circuit so as to operate the lights through the flasher, a second electrical circuit connecting said liftgate to said electrical power source and said first electrical circuit, said second electrical circuit including relay means for connecting said second electrical circuit to said first electrical circuit, said relay means being connected intermediate said first



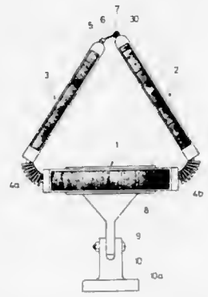
switch means and one of the lights of the hazard warning system of said first electrical circuit, said second electrical circuit further including a second switch means for controlling the operation of the liftgate, said second electrical circuit being activated to supply power through said second switch means when said relay means is activated to close said second electrical circuit through said first electrical circuit in response to the activation of said first circuit through said first switch means whereby the operation of the liftgate by said second switch means is only possible when said first switch means is operable to activate the hazard warning system.

4,825,191

AUTOMOBILE MULTI-PURPOSE AUXILIARY INDICATOR

Lan Ching-Hwei, 65, Hsiang-Shih Road, Sec. 2, Pan-Chiao, Taipei Hsien, Taiwan

Continuation-in-part of Ser. No. 891,105, Jul. 29, 1986, abandoned. This application Aug. 26, 1987, Ser. No. 89,673
Int. Cl.⁴ B60Q *1/52*
U.S. Cl. 340—472 **16 Claims**



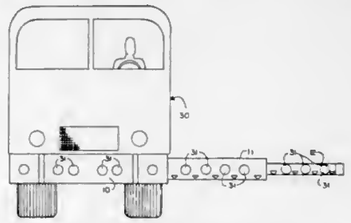
1. An auxiliary signaling device for vehicles, comprising:
- a braking indicator for indicating that a vehicle is braking;
- a left turn indicator;
- a right turn indicator; and
- a first flexible connection for flexibly connecting the left turn indicator to a first location on the braking indicator and a second flexible connection for flexibly connecting the right turn indicator to a second location on the braking indicator, the braking indicator and the left and right turn indicators having a normal position for signaling braking and turning of a vehicle in which normal position all indicators are in first fixed positions relative to each other substantially along a straight line and having an emergency indicating position for indicating an emergency in which emergency indicating position the signaling device is configured into a generally triangular shape, the first and second flexible connections being bendable to enable the left and right turn indicators to be moved to cause the signaling device including the braking indicator, the left turn indicator and the right turn indicator to together assume the triangular shape.

4,825,192

RETRACTABLE GUARD FOR VEHICLES

Kenneth A. Wells, P.O. Box 26042, Beattles, Ak. 99726-26107

Filed Nov. 24, 1987, Ser. No. 124,576
Int. Cl.⁴ E01F *9/00*
U.S. Cl. 340—433 **20 Claims**



1. In a vehicle movable in a forward direction:
- elongated enclosure means extending horizontally across said vehicle for a substantial distance, said elongated enclosure means having a longitudinal axis transverse to said forward direction,
- a horizontal elongated member having a longitudinal axis coinciding with the first-named longitudinal axis, said member being located in said enclosure, and
- control means for moving said member along said axis until it projects away from said vehicle for an extended distance,
- said horizontal elongated member, comprising two members the first of which telescopes within the second, and including means which in response to said control means extends said members in series horizontally away from the vehicle.

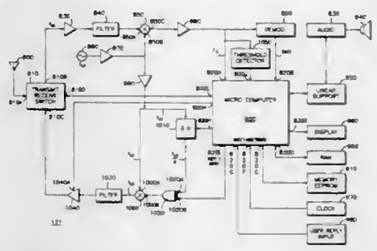
4,825,193

ACKNOWLEDGE BACK PAGER WITH ADAPTIVE VARIABLE TRANSMITTER OUTPUT POWER

Kazimierz Siwiak, Coral Springs; Leon Jasinski, Fort Lauderdale, and Francis R. Steel, Parkland, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,370
Int. Cl.⁴ H04Q *1/30;* **G08B** *5/22*
U.S. Cl. 340—311.1 **15 Claims**

1. An acknowledge back pager having a unique address associated therewith, said pager comprising;
- receiving means for receiving paging signals from a central station thus producing received paging signals;
- threshold detecting means, coupled to said receiving means, for determining if the signal level of said received paging signals exceeds a predetermined threshold level, and
- sub-band transmitting means for transmitting an acknowledge back signal on a selected one of a plurality of M predetermined frequency sub-bands, said transmitting means transmitting being coupled to said threshold detecting means and transmitting acknowledge back signals at a first output power level when said threshold detecting means determines that the signal level of said received paging signals is less than said predetermined threshold



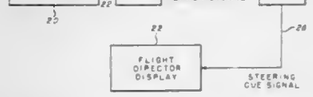
level, said transmitting means otherwise transmitting acknowledge back signals at a power level substantially less than said first output power level.

4,825,194

SINGLE CUE FLIGHT DIRECTOR INDICATOR

John E. Rasinski, Albuquerque, N. Mex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 27, 1987, Ser. No. 54,640
Int. Cl.⁴ G01C *23/00*
U.S. Cl. 340—975 **10 Claims**



1. Display apparatus for an aircraft having a roll axis and a pitch axis and having a display face for indicating to the pilot the pitch and roll attitudes and horizontal translation of the aircraft with respect to said axes, comprising:
- a stationary reference index indicative of a zero error command signal, said index being horizontally and centrally disposed with respect to said display face,
- an elongated steering cue generally resembling the shape of an aircraft viewed in a tail-on perspective, said steering cue being moveable in roll, pitch and translation with respect to said stationary reference index, and being normally disposed in coincidence with said stationary reference index,
- means for providing roll attitude and pitch attitude error signals representative of deviations from a predetermined flight path, and
- means for combining said roll attitude and pitch attitude signals and for applying said combined signals to said steering cue, so that said steering cue is commanded to a predetermined vertical deviation relative to said stationary index in response to said pitch attitude error signal and to a predetermined bank angle and horizontal deviation relative to said stationary index in response to a commanded bank angle, and for restoring said steering cue to substantial coincidence with said stationary reference index when said command signals are satisfied by redirecting the flight path of the aircraft so that said roll attitude error signal and said pitch attitude error signal have a null value.

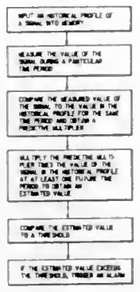
VOL 1101 ISS 4 APR 25 1989 UMI

4,825,195

METHOD OF MONITORING TO ANTICIPATE THE TRIGGERING OF AN ALARM

Yves Berruyer, 94 Boulevard Gabriel Péri, 92240 Malakoff, France

Filed May 1, 1987, Ser. No. 44,739
Claims priority, application France, May 7, 1986, 86 06622
Int. Cl.⁴ G08B *29/00*
U.S. Cl. 340—501 **5 Claims**



1. A method of monitoring a signal representing the amplitude of a predetermined physical value to trigger an alarm if the amplitude of the signal cross a predetermined threshold, wherein:

(a) an historical profile is available which represents historical values of the signal over a predetermined period;

(b) the historical profile is used to estimate the future development of the signal as a function of its values during past time periods, thereby obtaining an estimated value of the signal during at least one future time period;

(c) the estimated value of the signal is compared for the at least one future time period to the threshold; and

(d) an alarm is triggered if the estimated value is higher than the threshold.

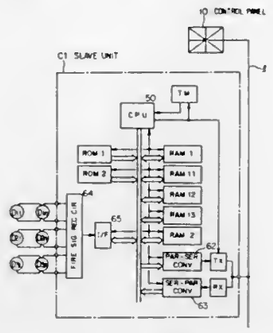
4,825,196

SIGNAL TRANSMISSION CIRCUIT OF FIRE/SECURITY PROTECTION SYSTEM

Toshikazu Morita, Tokyo, Japan, assignor to Nohmi Bosai Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00655, § 371 Date Dec. 4, 1987, § 102(e) Date Dec. 4, 1987, PCT Pub. No. WO88/02160, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 2, 1987, Ser. No. 141,662
Claims priority, application Japan, Sep. 9, 1986, 61/13554
Int. Cl.⁴ G08B *1/00;* **H04Q** *1/30*
U.S. Cl. 340—531 **4 Claims**

1. A signal transmission circuit which is provided in a control panel or a terminal device of a fire/security protection system and transmits a signal from a signal processing portion to a signal line, and which is equipped with a signal transmission means which is set to a state ready for signal transmission under control of the signal processing portion when transmission is desired, a signal detection means which detects the signal transmitted from the signal transmission means to the signal line, a timer means which is triggered at the time of signal transmission and reset by output of the signal detection means, and a signal transmission control means which sets the



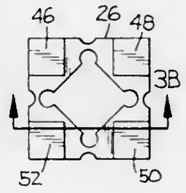
signal transmission means to the OFF state when a given time of the timer means is reached.

4,825,197

DUAL STATUS MAGNETIC MARKER HAVING MAGNETICALLY BIASABLE FLUX COLLECTORS FOR US IN ELECTRONIC ARTICLE SURVEILLANCE SYSTEMS

Russell W. Church, Oakdale, and Eugene C. Heltemes, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 1, 1988, Ser. No. 151,063
Int. Cl.⁴ G01B *13/18*
U.S. Cl. 340—572 **13 Claims**



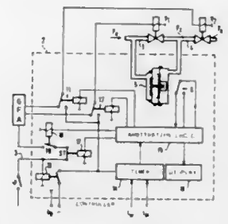
1. A dual status marker for use in an electronic surveillance system in which there is produced in an interrogation zone an alternating magnetic field, said marker comprising at least one piece of low coercive force, high permeability responder material configured to have at least one center section and flux collectors proximate to each end of each said center section and pieces of remanently magnetizable keeper material positioned proximate to at least certain of said flux collectors, whereby when said pieces of keeper material are magnetized, localized fields result which bias the magnetization in said certain flux collectors and results in an altered response of the marker to said applied field compared to that resulting when said pieces of keeper material are unmagnetized.

4,825,198

METHOD OF AND APPARATUS FOR TESTING THE TIGHTNESSES OF TWO VALVES ARRANGED IN A FLUID LINE

Jürgen Rolker, Westerkappeln; Peter Doerfler, Melle; Volker Kleine, and Johannes Meyknecht, both of Osnabrück, all of Fed. Rep. of Germany, assignors to G. Kromschröder Aktiengesellschaft, Osnabrück, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,262
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708471
Int. Cl.⁴ G08B *21/00*
U.S. Cl. 340—605 **19 Claims**



1. A method of determining the tightnesses of a first and a second valve arranged in a fluid line and spaced relative to each other, said method comprising the steps of:

building up a pressure gradient in said fluid line so that the fluid tends to flow in one direction, a first one of said two valves thereby becoming an upstream valve and a second one of said two valves thereby becoming a downstream valve;

closing said two valves;

presetting a limit pressure in the range between the pressure upstream of said upstream valve and the pressure downstream of said downstream valve;

determining the pressure in the line portion between said upstream valve and said downstream valve and comparing said line portion pressure with said limit pressure;

taking said upstream valve to be substantially tight if after a holding time the pressure so determined is below said limit pressure and taking said downstream valve to be substantially tight if after said holding time the pressure so determined is above said limit pressure;

opening a passageway across said valve so taken to be substantially tight to allow the pressure in said line portion to change and to enable testing of the other valve not so taken to be substantially tight;

determining the pressure in said line portion and comparing the pressure so determined with said limit pressure; and

judging said other valve to be substantially tight if, during a measuring time interval commencing upon the opening of said passageway, the pressure in said line portion does not reach said limit pressure less than one or more than once.

4,825,199

CIRCUIT UNDERLOADING MONITORING SYSTEM

John E. Antilozi, 1153 Chickasaw Cir., Warrington, Pa. 18976

Filed Oct. 22, 1986, Ser. No. 921,413
Int. Cl.⁴ G08B *17/10*
U.S. Cl. 340—640 **10 Claims**

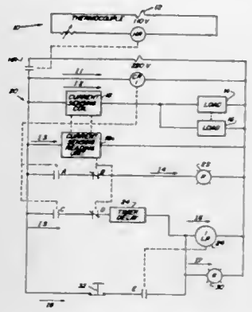
1. A method for monitoring current in an apparatus containing an electrical zoned heater load which may be activated to provide a pre-set temperature value, said apparatus including first and second alarm means to warn when the current received by said load is undervalued comprising:

(a) locating said first alarm means in proximity to said apparatus and said second alarm means at a remote location;

(b) causing said load to become activated when there is a call to supply heat therefrom;

(c) simultaneously causing said apparatus to generate first and second signals when the current in said heater load becomes undervalued;

(d) energizing said first and second alarms by means of said respective first and second signals when the current to said load becomes undervalued and there is a call to supply heat to said load; and



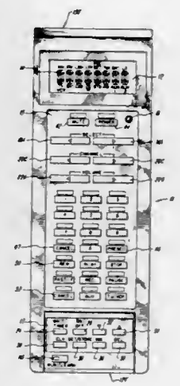
(e) de-energizing said first alarm when the call for heat is removed, whereby, the energizing and de-energizing of said first alarm provides an alert of a heater malfunction in the vicinity of said apparatus, whereas, said second alarm remains energized when the call for heat is removed and remains as such until manually terminated.

4,825,200

RECONFIGURABLE REMOTE CONTROL TRANSMITTER

Benjamin F. Evans, Weatherford; Peter H. Haagen, Arlington, and Paul J. Pempsell, Bedford, all of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Filed Jun. 25, 1987, Ser. No. 66,853
Int. Cl.⁴ H04B *9/00;* **H04N** *5/44*
U.S. Cl. 341—23 **27 Claims**



1. In a reconfigurable remote control transmitter for use with a plurality of remotely controlled products, each of which is normally controlled with one or more signals from an associated remote control transmitter, said reconfigurable transmitter having a plurality of input keys, having a learn mode in which it may store indications of signals generated by the remote control transmitter for one or more of said products and having a run mode in which it selectively transmits stored

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signals in response to one or more keyed inputs; the improvement comprising:

first means operative during said learn mode for storing a selected sequence of operations to be performed by one or more of said products in response to a first selected input key sequence; and

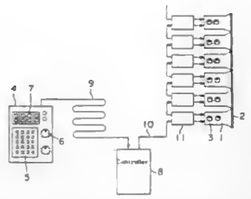
second means operative during said run mode for transmitting stored signals in a predetermined order in response to the performance of a second selected input key sequence to cause the selected sequence of operations to be performed.

4,825,201

DISPLAY DEVICE WITH PANELS COMPARED TO FORM CORRECTION SIGNALS

Kazuhiro Watanabe; Makoto Ota, and Toshiharu Imamura, all of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1986, Ser. No. 911,114
Claims priority, application Japan, Oct. 1, 1985, 60-150353
Int. Cl.[4] G09G 3/00
U.S. Cl. 340—717 **5 Claims**



1. A display device comprising a number of display panels arranged in a plane to constitute a large picture image screen, which comprises a correction signal generating means, including means for determining at least one of said display panels to be corrected, for generating a correction signal in response to a comparison of the optical condition of the panel to be corrected in said display panels with the optical condition of at least some other display panels so that the optical condition of the corrected display panel is the same as the other ones, correction circuits for said display panels, and a recorrection signal generating means which receives said correction signal from said correction signal generating means and transmits a recorrection signal to the correction circuit for one or more number of said display panels to be corrected.

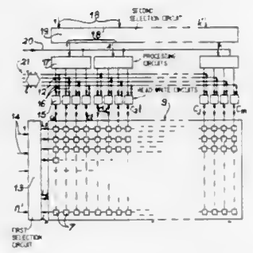
4,825,202

CONTROL MEANS FOR AN INTEGRATED MEMORY MATRIX DISPLAY AND ITS CONTROL PROCESS

Jean Dijon, Grenoble, and Thierry LeRoux, Fontaine, both of France, assignors to Commissariat a l'Energie Atomique, Grenoble, France

PCT No. PCT/FR86/00309, § 371 Date Apr. 30, 1987, § 102(e) Date Apr. 30, 1987, PCT Pub. No. WO87/01849, PCT Pub. Date Mar. 26, 1987
PCT Filed Dec. 15, 1986, Ser. No. 50,905
Claims priority, application France, Sep. 16, 1985, 85 13699
Int. Cl.[4] G09G 3/20
U.S. Cl. 340—752 **20 Claims**

1. Control means for a matrix display (9) having nxm image points arranged in matrix manner, a first group of n row conductors (L_i) and a second group of m column conductors (C_j) carrying appropriate signals for exciting an electrooptical display material, each image point (I_{ij}) of the display, formed from a capacitor whose dielectric is constituted by the display material, being associated with a row conductor (L_i), a column conductor (C_j) and a switch (5), each image point forming a memory point of the display in which it is possible to write, read and refresh an information, characterized in that the control means comprises m read-write circuits (15), each connected to a column conductor (C_j) for reading, writing and refreshing an information at the image points associated with said column conductor (C_j), said read-write circuits (15) being combined into k packages, each of which has at the most l read-write circuits, with m, l and k integers such that $1<l<m$



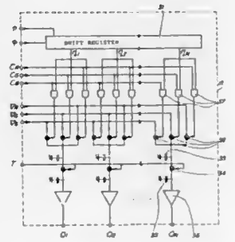
and $1<k<m$, the packages of read-write circuits being connected to a bidirectional data bus (21) of l rows, the pth read-write circuits (15) of each package being connected to the pth row of said bus, with a p being an integer such that $1 \leqq p \leqq l$, the reading, writing and refreshing operations performed by the read-write circuits being selected on the basis of control signals (20).

4,825,203

DRIVE CIRCUIT FOR COLOR LIQUID CRYSTAL DISPLAY DEVICE

Makoto Takeda, Tenri; Kunihiko Yamamoto, Kitakatsuragi; Nobuaki Matsuhashi, Tenri, and Hiroshi Take, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 5, 1985, Ser. No. 751,884
Claims priority, application Japan, Jul. 6, 1984, 59-140977; Jul. 11, 1984, 59-145121
Int. Cl.[4] G09G 3/36
U.S. Cl. 340—784 **5 Claims**



1. A color liquid crystal device comprising:

a first circuit board with multiple row electrodes and multiple column electrodes that intersect to form a matrix of picture element electrodes to which switching elements are connected;

a second circuit board with counter electrodes;

a liquid crystal layer that is inserted in between said first and second circuit boards;

color filters arranged in a selected pattern between the first and second circuit boards, each color filter being one of at least three colors, said selected pattern being an arrangement of said color filters wherein side-by-side color filters are different colors; and

column electrode drive circuit means for applying voltage to said column electrode corresponding to the color filter color arrangement and contrast brightness of the color liquid crystal display device;

said column electrode drive circuit means including,

at least three analog switches connected to and associated with each column electrode, each analog switch outputting a voltage specific to one of said at least three colors, said voltages outputted by said analog switches being different and each analog switch being associated with one color capable of being displayed in said column such that all said colors displayed by said color liquid crystal display device will be displayed with high color definition and substantially no color mixing, and

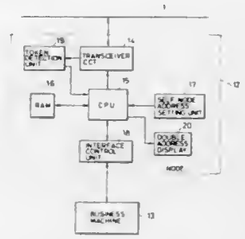
a sampling circuit that samples momentary, voltage corresponding to display picture elements, from input display signals.

4,825,204

ADDRESS SETTING AND DATA TRANSMISSION SYSTEM

Yasuo Nakamura, Fuchu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1986, Ser. No. 883,749
Claims priority, application Japan, Jul. 15, 1985, 60-154219
Int. Cl.[4] H04Q 9/00
U.S. Cl. 340—825.520 **15 Claims**



1. A data transmission system provided with plural transmission units connected to a communication medium, in which a transmission unit to which a right of communication has been assigned by a token passing procedure is permitted to perform data transmission, wherein each said transmission unit comprises:

setting means for setting an address unique to said transmission unit;

a recognition means for recognizing address information in a token transmitted between other transmission units on said communication medium; and

detection means for detecting the presence of another transmission unit having the same address as that set by said setting means, by means of comparing an address recognized by said recognition means and an address set by said setting means during a predetermined period of time after start-up of the transmission unit.

4,825,205

CHANGEABLE DISPLAY UNIT FOR USE IN A SIGN DEVICE

Gyu S. Lee, 239-5, Joongkok-Dong, Sungdong-Ku, Seoul, Rep. of Korea

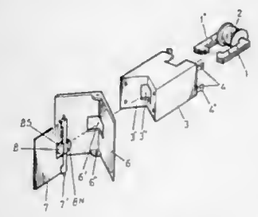
Filed Jun. 19, 1987, Ser. No. 64,010
Int. Cl.[4] G09G 3/34
U.S. Cl. 340—815.05 **2 Claims**

1. An interchangeable display unit for use in a sign device which comprises:

a case containing an electromagnet disposed therein and extending along opposite sides thereof, said case including a case aperture disposed at a front side thereof and a plurality of biased members disposed at a rear side of said case for mounting to a baseboard,

a fixed plate containing a plate aperture disposed at the center thereof, said fixed plate being bent with a bending angle of less than 90° at is center to form wing portions which extend therefrom, said fixed plate being attached to said case so that their respective apertures coincide, and

a movable plate rotably attached to said fixed plate at the center thereof, said movable plate having various colors on its surfaces which are different from or the same as the



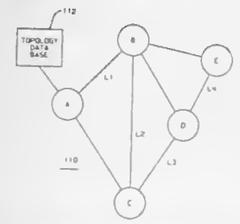
color on the surfaces of said wing portions, respectively, and a circular permanent magnet which faces said electromagnet through said apertures whereby after each display unit is inserted into the baseboard by the plurality of biased members, when the electromagnet is activated, the movable plate is selectively moved between the wing portions of the fixed plate in a short response time whereby the colors on the opposite side surfaces on the movable plate and the fixed plate are selectively combined with each other on the baseboard to create a desired sign.

4,825,206

AUTOMATIC FEEDBACK OF NETWORK TOPOLOGY DATA

Frank W. Brice, Jr., Kingston, and Robert A. Weingarten, Highland Mills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 795,053, Nov. 4, 1985, abandoned. This application May 3, 1988, Ser. No. 191,757
Int. Cl.[4] H04J 1/16; H04Q 5/20
U.S. Cl. 340—825.02 **10 Claims**



1. A digital data message transmission network, comprising:

(a) a plurality of network elements comprising message transmitting/receiving nodes and communication links interconnecting said nodes;

(b) means associated with each node for storing data corresponding to the availability of said network elements to communicate;

(c) means associated with each node for using said stored data to select a communication path made up of selected elements interconnecting that node with another node in said network;

(d) means for establishing said communication path between an origin node and a destination node;

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(e) means, associated with said means for establishing said communication path, for storing data identifying all of said communication path if said communication path is completed, or if completion of the said communication path is prevented because of an unavailable element, the segment of said communication path between said origin node and the node adjacent the unavailable element; and

(f) means, responsive to the detection of the unavailability of an element in said communication path, for using data from said means for storing data identifying said path or path segment, as the case may be, to generate and selectively send data as to the unavailability of said unavailable element along the segment of said path between the node adjacent said unavailable element and said origin node.

4,825,207

MONITORING OF FLUIDS

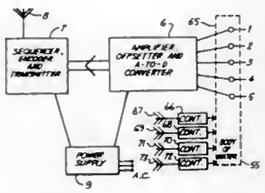
Julien D. Snell, Limpsfield, England, assignor to E.D.A. Research & Development Limited, London, England

Continuation of Ser. No. 744,461, Sep. 10, 1985, abandoned. This application Dec. 3, 1987, Ser. No. 129,334

Claims priority, application United Kingdom, Sep. 15, 1984, 8423369

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.17 **11 Claims**



1. Apparatus for monitoring a first set of parameters of that water contained in a body of recreational water subject to having a second set of parameters directly controlled by water controlling mechanisms comprising a first station incorporating a plurality of sensors each of which is adapted to provide signals indicating values of at least one of said first set of parameters, receipt circuit means adapted to receive signals from the sensors, a first radio transmitter circuit fed from the receipt circuit means; a second station separable from the first station and the water controlling mechanisms, and incorporating a radio receiving circuit for receiving signals from the first radio transmitter circuit and separating signals form the first radio transmitter circuit due to each of the sensors, an output means providing visual and/or audio outputs based on the separated signals as received therein, control circuits selectively providing control signals based on the separated signals as received in the output means indicating the manner in which the water controlling mechanisms are to be operated, and a second radio transmitter circuit adapted to receive the control signals from one or more of the control circuits and transmit command signals based thereon; and at least one controller radio receiving circuit adapted for electrical connection to at least one of the water controlling mechanisms and for receiving the command signals, and further adapted to correspondingly operate that one of the water controlling mechanisms in controlling a corresponding one of said second set of parameters.

4,825,208

METHOD FOR FLOW CONTROL OF DATA WITHIN A MESHED DATA NETWORK

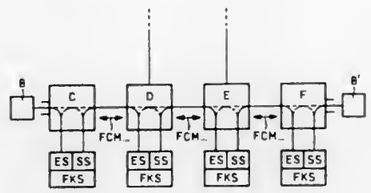
Wilhelm Mueller, Berlin, and Werner Schneider, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 17, 1987, Ser. No. 39,432

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3614062

Int. Cl.[4] H04Q *9/00, 11/04*

U.S. Cl. 340—825.020 **2 Claims**



1. A method for the flow control of data which users can exchange via nodes connecting an origin and a destination to one another, over arbitrarily meshed lines, and every node is equipped with a transmission memory device and a reception memory device, comprising the steps of;

cyclically sending, via the intermediate nodes (C . . . , F) a first flow control signal (FCM1) which provides an authorization for the acceptance of further data when forwarded in unmodified form to the transmission memory device (SS) of each of the respective nodes (C . . . , F) from each of the reception memory devices (ES), coincident with an average quantity of data transmitted between two users via the longest connecting path within the data network, in a prescribed periodic sequence longer than the time cycle required for such average transmission,

transmitting a second flow control signal (FCM2), via said intermediate nodes, coincident with a larger than average quantity of data to be transmitted, which second flow control signal provides authorization for the acceptance of further data quantities in response to unmodified forwarding to the transmission memory device (SS) of the respective nodes (C . . . , F) from the reception memory devices (ES) of the respective preceding and/or following nodes (C . . . , F),

providing an auxiliary identification for said first flow control signal (FCM1) or said second flow control signal (FCM2), in the case of a data jam indicated by nonreceipt, within a predetermined period of either of said first and second flow control signals in the reception memory device (ES) of the adjacent node (C . . . , F) and returning said modified flow control signal in the reverse direction by means of the transmission memory device (SS) of the adjacent node,

inhibiting the respective transmission memory device (SS), at the nodes (C . . . F) between the origin and destination, in response to the failure of the unmodified first and second flow control signals (FCM1, FCM2) to arrive, or the reception of the first and second flow control signals (FCM1, FCM2) provided with said auxiliary identification, within a period of time corresponding to time cycles of said cyclical sending, and

switching the respective transmission memory deice (SS) from a status corresponding to the "undisturbed" status into a status corresponding to a "jam has occurred" status in response to said inhibition.

4,825,209

REMOTE CONTROL APPARATUS

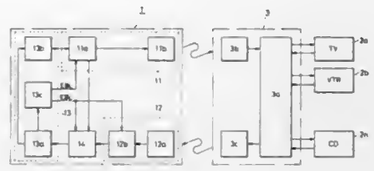
Hiroaki Sasaki; Junichi Ouchi, and Kazuo Hasegawa, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd, Japan

Continuation of Ser. No. 836,959, Mar. 6, 1986, abandoned. This application May 11, 1988, Ser. No. 193,214

Claims priority, application Japan, Mar. 6, 1985, 60-44138

Int. Cl.[4] H04B *11/16*; G08K *19/00*

U.S. Cl. 340—825.72 **3 Claims**



1. A remote control apparatus for operating a controller for a controlled device, comprising:

a transmitting portion for transmitting an operating command signal to the controller for the controlled device;

a receiving portion for receiving a status signal provided by the controller indicating an operation status of the controlled device;

an image display element, and an image display control portion; and

an operating portion connected to said transmitting portion, receiving portion, and image display control portion for inputting an operating command, having said transmitting portion transmit the operating command to the controller for the controlled device, having said receiving portion receive a status signal from the controller confirming the operation status of the controlled device, and operating said image display control portion for displaying the operation status of the controlled device on said image display element,

wherein said operating portion includes operation command inputting means formed by: a translucent panel disposed in front of a display surface of said image display element; an optical coordinate sensor arranged in front of said translucent panel for detecting a coordinate value of a point selected on the translucent panel in front of said image display element; and means, including a switch actuated by pressing said translucent panel, for enabling operation for a predetermined period of time of said image display control portion to provide a display of selectable operation commands on said image display element, said optical coordinate sensor being used to detect selection of a coordinate point corresponding to a selected operation command displayed on said image display element, and of said transmitting portion, receiving portion, and image display control portion to transmit the selected operation command, receive the status signal, and display the operation status of the controlled device, whereby a power supply to said remote control apparatus is required only while the above-mentioned portions are in the enabled state for said predetermined period of time, thereby allowing a saving of power consumption to be obtained.

4,825,210

ELECTRONIC LOCKING SYSTEM HAVING A LOCK AND A METHOD FOR RE-SYNCHRONIZATION

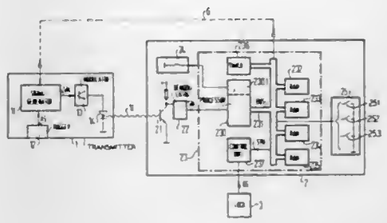
Anton Bachhuber, Nuestadt/Donau, and Arnost Proske, Fuerstenfeldbruck, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 85,075

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1986, 3627291

Int. Cl.[4] G06K *7/04*

U.S. Cl. 340—825.31 **10 Claims**



1. An electronic locking system including a lock comprising:

a transmitter having:

means for emitting a transmission signal modulated with a transmission mark at every transmission event,

a mark generator connected preceding said emitting means and operable to provide said transmission mark form a sequence of transmission marks for modulating every transmission signal emitted by said emitting means;

a receiver having:

means for receiving said transmission signal, said receiving means having a reference generator for supplying a reference mark from a sequence of reference marks that is identical to said sequence of transmission marks of said mark generator, said reference generator being driven to a new reference mark of said sequence of reference marks by said every transmission signal received by said receiver,

a synchronizing unit connected to said receiving means and said reference generator to compare said transmission mark of said transmission signal received by said receiver to said reference mark supplied by said reference generator, said synchronizing unit restoring synchronization between said receiver and said transmitter when said transmission mark and said reference mark lie within a re-synchronization region which extends over an excerpt from said sequence of reference marks, said synchronization unit having:

a mark memory in which a transmission sequence is stored, said transmission sequence being said transmission marks for a predetermined number of successive transmission signals,

said synchronization unit being operable to synchronize said reference generator to a reference mark which is identical to an nth transmission mark of said transmission sequence when a reference sequence of n reference marks which is identical to said transmission sequence is present in said re-synchronization region; and

a control unit connected to open the lock upon said reference mark supplied by said reference generator being identical to said transmission mark of said transmission signal received by said receiver.

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4,825,211

WARNING DEVICE FOR VEHICLES AGAINST AN APPROACHING OBJECTS

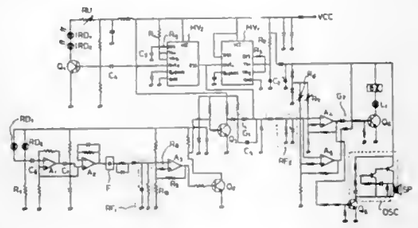
Byung-Young Park, Seoul, Rep. of Korea, assignor to Poong-Kyu Lee, Seoul, Rep. of Korea, a part interest

Filed Oct. 14, 1987, Ser. No. 108,590

Claims priority, application Rep. of Korea, Mar. 28, 1987, 1987-4066[U]; Jul. 16, 1987, 1987-11703[U]

Int. Cl.[4] G08G *1/00*

U.S. Cl. 340—901 **9 Claims**



7. A warning device for use on a vehicle for sensing an approaching object when the vehicle is moving backward, the device producing a first signal when the object is in remote proximity to the vehicle and at least a second signal when the object is in close proximity to the vehicle, comprising:

means for emitting intermittent infrared light when the vehicle in moving backward;

means for receiving said infrared light, said infrared light being reflected from the object, said means for receiving having an output for outputting a receive signal indicative of said infrared light being reflected;

said output of said means for receiving connected to noninverting inputs of both first and second differential amplifiers, inverting inputs of said first and second differential amplifiers being connected via first and second variable resistors, respectively, to an applied voltage;

first and second outputs of said first and second differential amplifiers, respectively, connected to first and second inputs of a second AND gate;

an output of said second AND gate connected to a means for producing the second signal and said output of said first differential amplifier connected to a means for producing the first signal.

4,825,212

ARRANGEMENT FOR USE WITH A TOUCH CONTROL SYSTEM HAVING A SPHERICALLY CURVED TOUCH SURFACE

Robert Adler, Northfield, and Peter C. J. Desmares, Chicago, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 14, 1986, Ser. No. 931,296

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—706 **10 Claims**

1. In a touch control system for a cathode ray tube, display panel or other touch-controlled device which is capable of recognizing touch positions along a predetermined coordinate axis on a spherically curved touch surface, which system includes;

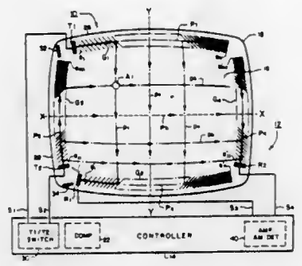
a substrate comprising a segment of a spherically curved surface having a touch surface capable of propagating surface acoustic waves,

an input surface wave transducer acoustically coupled to said touch surface of said substrate and useful when excited for launching on said touch surface a beam of surface acoustic wave energy which, if undisturbed, would travel along a path that corresponds to a great circle on said spherically curved surface, and

an output surface wave transducer, also acoustically coupled to said touch surface, for developing an electrical output signal upon receipt of surface acoustic wave energy derived from said beam;

an arrangement for use in said touch control system for establishing travel of said beam of surface wave energy along a desired path having a contour intermediate a great circle and a parallel comprising:

an elongated arcuate array of surface wave reflective elements disposed on said touch surface of said substrate and having a curvature corresponding to said desired path for directing wave components derived from said beam



across said touch surface of said substrate in a progression of transverse paths intersecting said coordinate axis,

said array having means for reducing the velocity of surface acoustic wave energy configured and of sufficient density to produce a wave guiding action within said array upon said beam of acoustic wave energy along said desired path effective to confine said beam of energy to said desired path, thus permitting derivation, along the entire length of said desired path, of said wave components in said transverse paths capable of eventually exciting said output transducer to develop said output signal.

4,825,213

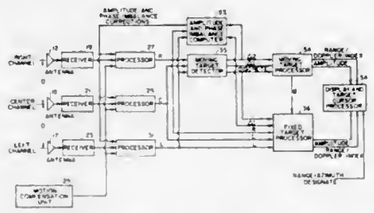
SIMULTANEOUS TRIPLE APERTURE RADAR

Walter J. Smrek, Lake Ronkonkoma, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 263,924, May 15, 1981, abandoned, which is a continuation of Ser. No. 90,570, Nov. 2, 1979, abandoned. This application Jan. 12, 1987, Ser. No. 12,765

Int. Cl.[4] G07S *13/52*

U.S. Cl. 342—25 **7 Claims**



1. An airborne simultaneous triple synthetic aperture radar system comprising:

first, second and third antenna means linearly spaced on an aircraft, each of said antenna means being electrically connected to a dedicated receive channel processor,

first, second and third frequency filter means in electrical communication with said first, second and third antenna means, respectively,

means for phase shifting the output of said first filter means to effect clutter coincidence with the output of said second filter means,

means for phase shifting the output of said second filter means to effect clutter coincidence with the output of said third filter means,

signal reduction means for combining clutter coincided filter outputs to derive a residual signal from each pair of clutter coincided signals,

signal addition means for combining the two residual signals so obtained,

signal comparison means for comparing the combined residual signals to a threshold and generating a moving target detection indicator signal,

signal comparison means adapted to determine phase relationships between residual signals to define the electrical phase angle between them, and

data processing means for deriving the doppler position and angle off boresight of the moving target.

4,825,214

FREQUENCY-MODULATED CONTINUOUS WAVE RADAR FOR RANGE MEASURING

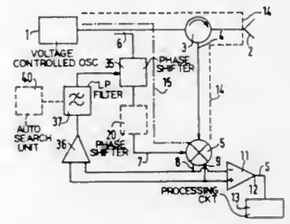
Daniel Dejaegher, Massy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 11, 1987, Ser. No. 84,656

Claims priority, application France, Aug. 27, 1986, 86 12132

Int. Cl.[4] G01S *13/32*

U.S. Cl. 342—128 **9 Claims**



1. A radar system of the frequency modulated continuous wave type (FM/CW), intended for range measuring, including a linearly frequency-modulated microwave signal generator, a transmitter-receiver antenna and deriving means for deriving a fractional signal of the transmitted wave to effect production of a local oscillation signal and for deriving a fractional signal of the received echo wave and transmission lines for transmitting the derived signals to the inputs of a mixer, the lengths of the transmission lines being adjusted so that at least the internal interference coupling signal due to the antenna reflection has, up to the mixer, the same propagation time as the local oscillation signal, characterized in that a phase control loop including an amplifier and a low pass filter is connected between the output of the mixer and a control input of a phase-shifting circuit placed in the local oscillation channel, the closed loop cut-off frequency of the control loop being lower than the frequency of the useful subtractive beat signal between the transmitted and received waves provided at the output of the mixer.

4,825,215

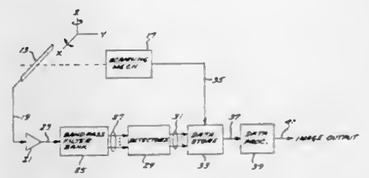
RADIOMETRIC IMAGER HAVING A FREQUENCY-DISPERSIVE LINEAR ARRAY ANTENNA

Carl A. Wiley, deceased, late of Westchester, Calif. (by Jean B. Wiley, administratrix), assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 3, 1986, Ser. No. 881,751

Int. Cl.[4] G01S *3/02*

U.S. Cl. 342—351 **18 Claims**



1. A radiometric imager for determining the frequency spectrum of a two-dimensional scene, comprising:

a frequency-dispersive, linear antenna having a longitudinal axis and providing an output signal in accordance with radiation received along a series of conical fanbeams, wherein the fanbeams represent unique frequencies extending over a predetermined frequency range and intersect a two-dimensional scene in a series of spaced-apart conic sections;

rocking means for controllably rocking the linear antenna about a rocking axis substantially perpendicular to the antenna axis and parallel to the scene, to cause the spaced-apart conic sections to scan the scene in a predetermined fashion, such that the output signal contains data representing the receipt of all radiation in the predetermined frequency range, from all segments of the scene;

data storage means for extracting and storing data contained in the output signal provided by the linear antenna;

supplementary movement means for controllably moving the linear antenna in a further fashion, to resolve ambiguities in the data stored by the data storage means; and

data processing for processing the data stored by the data storage means, to determine the frequency spectrum of substantially all segments of the scene.

4,825,216

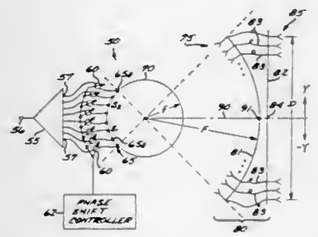
HIGH EFFICIENCY OPTICAL LIMITED SCAN ANTENNA

Edward C. DuFort, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 4, 1985, Ser. No. 805,068

Int. Cl.[4] H01Q *3/00*

U.S. Cl. 342—376 **21 Claims**



1. A high efficiency, limited scan optical antenna system, comprising:

an aperture lens having a circular inner surface with a finite

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radius and a linear aperture, said aperture lens comprising a plurality of radiating elements disposed along said linear array and a corresponding plurality of pickup elements disposed along said inner surface, corresponding ones of said radiation and pickup elements being coupled together by equal lengths of transmission lines;

an rf feed system comprising a plurality of feed elements, said system comprising means for providing a source distribution of rf radiation; and

a symmetric optical corrective lens centered at the center of said inner surface, said corrective lens comprising means for imaging the radiation at each feed element to a corresponding image point on said inner surface of said aperture lens so as to map the source distribution of said feed elements onto said inner surface to form an aperture distribution which is a scaled version of said source distribution.

4,825,217

CAR PHONE ANTENNA ASSEMBLY

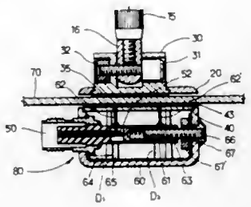
Young J. Choi, Seoul, Rep. of Korea, assignor to Tae Lim Electronics Co., Ltd., Rep. of Korea

Filed Feb. 9, 1988, Ser. No. 154,023

Claims priority, application Rep. of Korea, Oct. 19, 1987, 1987-11595

Int. Cl.[4] H01Q *1/32*

U.S. Cl. 343—715 **4 Claims**



1. A car phone antenna assembly comprising:

a whip for use in the car phone band frequency range;

a base, connected to an end of said whip, affixed to and mounted on a window of a car, and acting as a capacitor plate which serves as one of the two plates comprising a coupling capacitor; and

a coupling unit comprising:

a coupling plate being mounted on the inside of said window just opposite to said base, being fixed to a coupling box, and said coupling plate and said base, together with said window acting as said coupling capacitor;

a first inductor comprising an at least partially hollow copper tube located a distance from said coupling plate, joined to said coupling plate by two links, said copper tube connected across said distance to said coupling plate by said two links for the transmission of high-frequency energy, wherein a first end of said first inductor is connected to a coaxial connector;

a second inductor being connected between said first inductor and a grounding copper plate affixed to said coupling box; and

a variable capacitor comprising said first inductor and an adjustment screw connected to said grounding copper plate with a dielectric tube physically interposed between said first inductor and said adjustment screw, said variable capacitor for fine tuning the resonant frequency of the antenna assembly based on the position of said adjustment screw with respect to said first inductor.

4,825,218

REFLECTOR ANTENNA FOR TELECOMMUNICATIONS

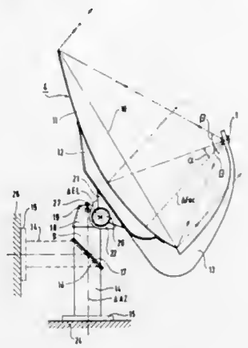
Eric Begout, Nogent sur Marne; Alain Bourgeois, Eaubonne; Raymond Gueuret, Nanterre, and Pascal Lapeyre, Ermont, all of France, assignors to Alcatel Thomason Faisceaux Hertizen, Perret Cedex, France

Filed Apr. 8, 1987, Ser. No. 35,823

Claims priority, application France, Dec. 18, 1986, 86 17758

Int. Cl.[4] H01Q *3/08*

U.S. Cl. 343—765 **6 Claims**



1. A reflector-type telecommunications antenna comprising a reflector having a semi-offset geometry, a feed mounted on a feed support rigidly fixed to the reflector, an antenna pedestal for supporting the reflector and the feed, wherein the feed is positioned in such a manner as to ensure that, in respect of a reflector illumination half-angle β as seen from the feed such that $45° < \beta < 55°$, the offset angle β between the focal axis Δ_{Foc} and the median ray of the total beam which is emitted by the feed and which illuminates the reflector is $25° < \alpha < 35°$, and wherein said antenna mount is an azimuth-elevation type mount.

4,825,219

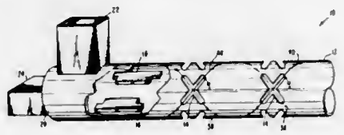
SLOT ANTENNA IN CIRCULAR WAVEGUIDE

James S. Ajioka, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 23, 1987, Ser. No. 6,533

Int. Cl.[4] H01Q *13/10*

U.S. Cl. 343—771 **5 Claims**



1. A slotted waveguide antenna for providing a beam of energy, the pattern of which may be varied, comprising:

a circular waveguide through which energy of a circumferential mode equal to or greater than |1| may be propagated, said energy having current flow lines which are helical in relation to said waveguide, said propagated energy including energy of a first circulating mode and energy of a second circulating mode;

a first slot formed in said waveguide and being oriented such that the long dimension of said slot is at an angle of greater than zero degrees with respect to the helical currents of said energy of a first circulating mode and the long dimension of said slot is parallel to the helical currents of said energy of a second circulating mode;

a second slot formed in said waveguide and being oriented such that the long dimension of said slot is at an angle of greater than zero degrees with respect to the helical currents of said energy of a second circulating mode and the long dimension of said slot is parallel to the helical currents of said energy of a first circulating mode;

at least a second pair of slots which are substantially the same as said first and second slots respectively and are formed in the waveguide such that the at least second pair cooperates with the first and second slots to result in the beam being omni-directional;

mode transducer means for feeding the circular waveguide with orthogonally polarized modes of the energy to be propagated;

circular polarizer means for circularly polarizing the energy propagated through the circular waveguide; and

control means for controlling the relative amplitudes and phases of the energy applied to the orthomode transducer so that the pattern of the beam may be varied.

4,825,220

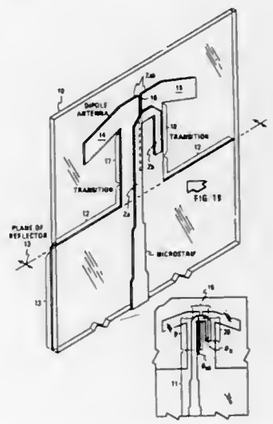
MICROSTRIP FED PRINTED DIPOLE WITH AN INTEGRAL BALUN

Brian J. Edward, Jamesville, and Daniel F. Rees, Camillus, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 26, 1986, Ser. No. 935,030

Int. Cl.[4] H01Q *9/28*

U.S. Cl. 343—795 **6 Claims**



1. A microstrip fed printed dipole with an integral balun comprising:

a planar dielectric substrate having a first metallization layer disposed on the under surface and a second metallization layer disposed on the upper surface,

(1) an unbalanced microstrip transmission line with a ground plane formed from said first metallization and a strip conductor formed from said second metallization,

(2) a dipole radiating element having two spaced arms formed from said first metallization and exhibiting a first impedance at resonance, and

(3) a transition in which a continuation of the ground plane of said unbalanced transmission line is bifurcated by a central slot extending to the arms of said dipole to form a first and a second ground plane, the bifurcated ground planes forming a balanced transmission line coextensive with the slot and exhibiting a characteristic impedance approximately matching said first impedance, and

a continuation of the strip conductor of said unbalanced transmission line forming a three part strip conductor disposed over said bifurcated ground planes to continue said unbalanced transmission line, the continuation of said unbalanced transmission line exhibiting a characteristic impedance approximately matching said first impedance, said three part strip conductor having a "J" shaped configuration,

a first part continuing over said first bifurcated ground plane toward said dipole radiating element,

a second part extending across said slot over said dipole from said first bifurcated ground plane to said second bifurcated ground plane, and

a third part extending back toward said unbalanced transmission line and ending in an open circuit,

said dipole radiating element being formed as a diverging extension of said first and second bifurcated ground planes, the inner portions of the arms of said dipole underlying and strongly coupled to said second part, and the outer portions of said arms extending beyond said second part for efficient radiation, and wherein:

the electrical length (theta b) of said unbalanced transmission line, measured from said slot to said open circuited end is approximately one-quarter wavelength so as to provide a low shunt RF impedance to unbalanced mode currents at the dipole load (Zl), and

the electrical length (theta ab) of said balanced transmission line measured from the base of the slot to the half width of the dipole arm is approximately one-quarter wavelength so as to provide a high shunt RF impedance to balanced mode currents at the dipole load, thereby facilitating the conversion of RF current flowing in an unbalanced mode in said microstrip transmission line to a balanced mode in the dipole arms in transmission, the reverse occurring in reception.

4,825,221

DIRECTLY EMITTING DIELECTRIC TRANSMISSION LINE

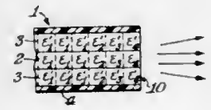
Hirosuke Suzuki, Tokorozawa; Hiromi Yasumoto, Hitaka, and Haruo Imaizumi, Nishi-Asuma, all of Japan, assignors to Junkosha Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 818,730, Jan. 14, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 129,241

Claims priority, application Japan, Jan. 16, 1985, 60-3981

Int. Cl.[4] H01Q *13/08*

U.S. Cl. 343—785 **5 Claims**



1. A dielectric transmission line for transmitting electromagnetic waves into free space comprising:

a core of expanded, porous polytetrafluoroethylene,

said core having a non-metallic cladding thereover,

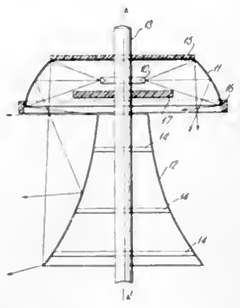
one end portion of said transmission line configured to emit electromagnetic waves directly into free space,

said core having a decreasing dielectric constant proceeding axially toward said one end portion, and

said cladding having a decreasing dielectric constant proceeding axially toward said one end portion.

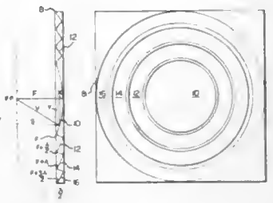
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4,825,222
OMNIDIRECTIONAL ANTENNA WITH HOLLOW POINT SOURCE FEED
Miles E. Butcher, Woodbridge, England, assignor to British Telecommunications PLC, London, England
Filed Jan. 27, 1987, Ser. No. 7,398
Claims priority, application United Kingdom, Jan. 30, 1986, 8602246
Int. Cl.[4] H01Q *19/17*
U.S. Cl. 343—836 **15 Claims**



1. An antenna comprising:
an omnidirectional primary feed means for radiating signals in directions substantially transversely of an axis, said feed means including a ring-shaped ground plane disposed about said axis;
a ring-shaped secondary reflector disposed about said axis, and
a ring-shaped main reflector means positioned about the said axis, said secondary reflector so positioned relative to said main reflector means as to reflect radio signals onto the surface of said main reflector means, said main reflector means for redirecting said reflected signals in directions substantially transversely of the said axis,
wherein the feed means and the secondary reflector have ring foci substantially coincident with one another, and the feed means is hollow and comprises a plurality of substantially point source radiator elements disposed about said ring-shaped ground plane.

4,825,223
MICROWAVE REFLECTOR ASSEMBLY
Brian H. Moore, Edmonton, Canada, assignor to Tsiger Systems Corporation, Edmonton, Canada
Filed Nov. 25, 1986, Ser. No. 934,818
Int. Cl.[4] H01Q *19/12*
U.S. Cl. 343—840 **15 Claims**



1. A reflective assembly for use in an antenna for receiving an incident microwave signal having a wavelength λ, comprising a sequence of microwave reflective surfaces facing in a common direction, each said reflective surface being at least a portion of a concave surface of one of a corresponding sequence of paraboloids that have a common axis and a common focal point, and means for mounting said reflective surfaces in an array such that when said incident microwave signal is received parallel to said axis, each reflective surface reflects said incident microwave signal as a reflected microwave signal onto said common focal point, wherein each reflected microwave signal arrives at said common focal point in-phase with each other of said reflected microwave signals; wherein the focal length of each paraboloid differs by mλ/2 from the focal length of a paraboloid directly adjacent in the sequence of paraboloids, where m is a non-zero integer; and wherein said means for mounting said sequence of microwave reflective surfaces forms a region which is bounded by first and second major surfaces which are spaced an equidistance apart and edge surfaces and wherein said first and second major surfaces cut the concave surface of each paraboloid in said sequence of paraboloids such that each reflective surface of said sequence of reflective surfaces totally lies within said region.

4,825,224
BROAD BAND IMPEDANCE MATCHING SYSTEM AND METHOD FOR LOW-PROFILE ANTENNAS
Brian L. Grose, and Orval N. Skousen, both of Provo, Utah, assignors to Eyring Research Institute, Inc., Provo, Utah
Filed Sep. 2, 1986, Ser. No. 902,875
Int. Cl.[4] H01Q *1/50*
U.S. Cl. 343—860 **39 Claims**

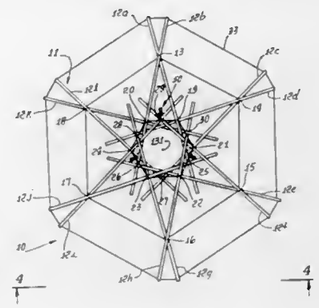


1. A method for matching the impedance of each radiating element of a low-profile antenna system to the impedance of a transmission line, the method comprising the steps of:
obtaining one or more radiating elements which each have an effective electrical length that is at least one half wavelength for a given medium at the lowest frequency in a desired operating range of electromagnetic signal frequencies;
capacitively coupling each said radiating element to the earth's surface so that the impedance variations of each said radiating element are substantially damped over said selected range of operating signal frequencies; and
coupling each radiating element to the transmission line through an impedance matching means, and essentially matching means being selected such that the average magnitude of the impedance of the antenna to the impedance of the transmission line by means of said impedance matching means.

4,825,225
HYPERBOLOIDAL DEPLOYABLE SPACE ANTENNA
Terrance J. Waters, and Michael T. Waters, both of 33560 Mulholland Hwy., Malibu, Calif. 90265
Filed Jan. 27, 1987, Ser. No. 6,741
Int. Cl.[4] H01Q *1/08, 15/20*
U.S. Cl. 343—881 **14 Claims**

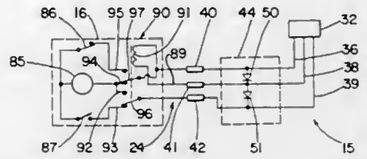
1. In a hyperboloidal deployable antenna, related to an hyperboloid of revolution having ruled lines, the combination comprising:
(a) a first upright framework including multiple elongated frame members extending along the ruled lines of said hyperboloid of revolution, said members having opposite free ends and being unitary and straight between said opposite free ends,
(b) the members having pivotal interconnections at member side-by-side locations between said opposite ends,

(c) whereby the framework is deployable between collapsed and expanded conditions,
(d) and a second upright framework including multiple elongated second frame members having opposite ends and having pivotal attachment to one another at second member side-by-side locations between said opposite ends, and also having side-by-side pivotal interconnections to members of the first framework, whereby the second framework is also deployable between multiple positions as the first framework is deployed between said collapsed and expanded conditions, there being like pairs of the frame members of the second framework and characterized in that the members of each pair are pivotally interconnected at their lower end portions, below the level of



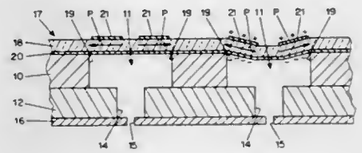
interconnections of the members of the first and second framework,
(e) each member of the first framework having pivotal connection with at least two other members of the first framework, at connection locations spaced along the length of each member of the first framework,
(f) and wherein said connection locations include first locations and second locations, said first locations defining a first plane normal to an axis defined by said hyperboloid of revolution, and said second locations defining a second plane normal to said axis, said first and second planes having relatively greater axial spacing therebetween in said collapsed condition of the framework, and relatively lesser spacing therebetween in said expanded condition of the framework.

4,825,226
POWER ANTENNA ADAPTER FOR REPLACEMENT ANTENNA
Frank J. Viola, Sandy Hook, Conn., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Dec. 29, 1987, Ser. No. 139,393
Int. Cl.[4] H01Q *1/10*
U.S. Cl. 343—901 **12 Claims**



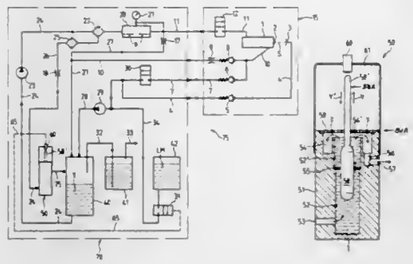
1. Replacement antenna apparatus for a motor vehicle radio receiver system and the like, comprising
an extendable antenna rod,
motor means for moving said antenna rod between extended and retracted positions,
contact means associated with said antenna rod for sensing the extended and retracted positions,
an antenna relay having pairs of power contacts and pairs of ground contacts and an energizing coil for switching said contacts between first and second positions,
a three wire cable interconnecting said antenna relay with a remote power source, first and second pairs of wires of said wire cable being alternately energizable, and
first and second diodes connected between said first and second pairs of wires for directing current flow among the wires of said three wire cable.

4,825,227
SHEAR MODE TRANSDUCER FOR INK JET SYSTEMS
Kenneth H. Fischbeck, Hanover, N.H., and Paul A. Hoisington, Norwich, Vt., assignors to Spectra, Inc., Hanover, N.H.
Filed Feb. 29, 1988, Ser. No. 161,855
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **18 Claims**



1. A piezoelectric transducer for an ink jet system having a pressure chamber with a central region and opposite walls comprising a piezoelectric plate polarized parallel to the plane of the plate with the direction of polarization extending between a region corresponding to the central region of the pressure chamber and regions corresponding to the opposite walls of the pressure chamber.

4,825,228
METHOD OF, AND APPARATUS FOR, REGULATING INK VISCOSITY IN AN INK JET PRINTING SYSTEM
Gerhard Glöeckler, Ringstrasse 1, 7769 Orsingen, and Klaus Schrodin, Allmannsdorferstrasse 61, 7750 Konstanz, both of Fed. Rep. of Germany
Filed Mar. 9, 1987, Ser. No. 23,270
Claims priority, application Switzerland, Mar. 17, 1986, 1070/86
Int. Cl.[4] G01D *15/18*; G05D *11/00*
U.S. Cl. 346—1.1 **17 Claims**



1. A method of regulating the ink viscosity in an ink jet printing system containing an ink jet printing head, a main ink reservoir, a solvent reservoir, a conduit interconnecting said main ink reservoir and said solvent reservoir, and a control valve governing said conduit, said method comprising the steps of:

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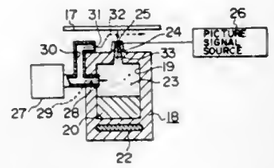
feeding ink of a predetermined ink viscosity to the ink jet printing head for generating ink droplets to be electrically charged and deflected during an ink jet printing operation;
during said step of feeding said ink to said ink jet printing head, branch-off a partial ink flow;
returning to the main ink reservoir said branch-off partial ink flow through regulating means through which flows the branch-off partial ink flow in a predetermined flow direction;
positionally adjusting, in said regulating means during said branched-off partial ink flow, a floating spindle body in and opposite to said predetermined flow direction in response to variations in the ink viscosity in said branched-off partial ink flow;
sensing a predetermined position of said floating spindle body in said regulating means which indicative of an ink viscosity which exceeds said predetermined ink viscosity; and
regulating said ink viscosity by operating said control valve in said predetermined position of said floating spindle body and passing the solvent from said solvent reservoir through said control valve into the main ink reservoir as long as the ink viscosity in said branched-off ink flow exceeds said predetermined ink viscosity.

4,825,229

METHOD AND APPARATUS FOR INK JET PRINTING

Yasuo Matsumoto, Shizuoka, Japan; Eric J. Shrader, Palo Alto, and Patricia O. Cohn, Redwood City, both of Calif., assignors to Tokyo Electric Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 841,856, Mar. 20, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 96,236
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **6 Claims**



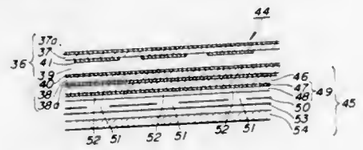
1. In an image recording method comprising the steps of producing a first gas stream and a second gas stream, heating sublimable dye in a positively pressurized dye chamber to produce dye vapor, jetting the dye vapor from a nozzle, utilizing a spray amount control device, toward a recording member, and attaching the dye vapor to the recording member to form an image thereon, the improvement comprising the steps of positively pressurizing said dye chamber utilizing the first gas stream thereby to jet said dye vapor from said dye chamber at a given vapor velocity, generating the second gas stream having certain air velocity relative to said vapor velocity, and passing said second gas stream along the surface of said recording member across the stream of said dye vapor at a velocity of flow such as not to disturb the dye vapor stream thereby to clean said recording member of unattached particles of dye vapor.

4,825,230

OPTICAL WRITER WITH VACUUM TUBE AND ELECTRO-OPTIC SHUTTER

Yukihiko Shimizu, Mobara, Japan, assignor to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jun. 5, 1987, Ser. No. 58,873
Claims priority, application Japan, Jun. 6, 1986, 61-130073
Int. Cl.[4] G01D *9/42*; **G09G** *3/10*; **H01J** *31/00*
U.S. Cl. 346—108 **4 Claims**



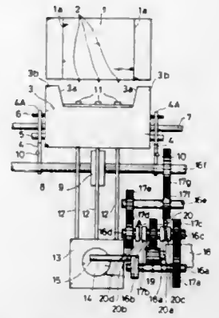
1. An optical write device comprising:
a light source which comprises a vacuum fluorescent tube of a diode-type structure including a substrate, anodes comprising a plurality of linear anode conductors arranged on said substrate and phosphor layers respectively continuously deposited on said anode conductors and functioning as a plurality of rows of luminous sections arranged in parallel to one another, filamentary cathodes and a front cover arranged opposite to said substrate and adapted to transmit therethrough lights emitted from said anodes;
a light shielding positioning slit means formed with a plurality of slits extending obliquely across said anodes and provided on said front cover of said vacuum fluorescent device, thereby to define luminous dots in cooperation with said anodes on each of said luminous sections, said luminous dots arranged obliquely across a longitudinal direction of said luminous sections and being driven to emit lights which are uninterruptedly linearly radiated together in a direction perpendicular to a direction of movement of a record medium on a surface of said record medium; and
an electro-optical shutter arranged in front of said obliquely arranged luminous dots so as to face a front surface of said positioning slit plate, said electro-optical shutter being varied in optical characteristics in synchronism with an emission driving signal supplied to said luminous sections to selectively shield or transmit light emitted from each of said luminous dots through a respective slit of said positioning slit plate.
2. An optical write device comprising:
a light source which comprises a vacuum fluorescent tube of a triode-type structure including a light-permeable substrate, anodes comprising a plurality of linear light-permeable anode conductors arranged on an inner surface of said substrate and phosphor layers respectively continuously deposited on said anode conductors and functioning as a plurality of rows of luminous sections arranged in parallel to one another, a shielding control electrode arranged opposite to said anodes and formed with plural slits extending in a direction obliquely across said anode conductors to partition said anodes at predetermined dimensions and intervals to define luminous dots on each of said luminous sections, said luminous dots arranged obliquely across a longitudinal direction of said luminous sections and being driven to emit lights which are uninterruptedly linearly irradiated together in a direction perpendicular to a direction of movement of a record medium on a surface of said record medium, said light source further comprising filamentary cathodes stretched so as to be spaced from said control electrode, so that light emitted from each of said luminous dots may be transmitted through said substrate and anode conductors; and
an electro-optical shutter arranged on an outer surface of said substrate in front of said obliquely arranged luminous dots, said electro-optical shutter being varied in optical characteristics in synchronism with an emission driving signal supplied to said luminous sections to selectively shield or transmit light emitted from each of said luminous dots.

4,825,231

CAP MECHANISM FOR USE WITH AN INK JET HEAD

Masahiro Nozaki, Iwate, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 6, 1987, Ser. No. 82,832
Claims priority, application Japan, Sep. 25, 1986, 61-224897
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **4 Claims**



1. A cap mechanism for use with an ink jet head comprising:
a cap member for covering the ink jet head provided with nozzles on a front end face thereof;
caps formed on the cap member to fit onto the nozzles and a suction pump communicated with the caps to suck ink in the nozzles;
means for moving the cap member to and from the ink jet head;
means for driving the suction pump to suck the ink in the nozzles through the caps;
driving source means for providing a driving source; and
clutch means for selectively rendering the cap member moving means and the driving means operative through the driving source means;
wherein said clutch means has a pair of clutches to which the driving force of the driving source means is selectively transmitted responsive to on- and off- states of a solenoid.

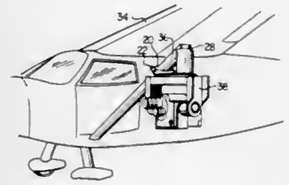
4,825,232

APPARATUS FOR MOUNTING AERIAL SURVEY CAMERA UNDER AIRCRAFT WINGS

William J. Howdle, Roanoke, Tex., assignor to Enserch Corporation, Dallas, Tex.

Filed Mar. 25, 1988, Ser. No. 173,371
Int. Cl.[4] G03B *29/00*, *17/00*
U.S. Cl. 354—74 **4 Claims**

1. A mount for securing a camera-carrying gimbal below an aircraft wing supported by a diagonal wing strut comprising:
(a) a base;
(b) strut clamping means carried by the base for removably surrounding and engaging the diagonal wing strut;
(c) anchor means on the base spaced from the strut clamping means, and adapted to securement to the airplane wing; and



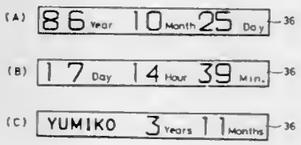
(d) gimbal attachment means carried by the base for removably holding the gimbal below the base.

4,825,233

DATA RECORDING CAMERA

Masaharu Kanai; Yasuo Yamazaki; Nobuyuki Kameyama; Yoshihiro Ide, all of Tokyo; Muneyoshi Sato, and Mitsuo Yokota, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1987, Ser. No. 119,076
Claims priority, application Japan, Nov. 12, 1986, 61-173435[U]; May 14, 1987, 62-57311[U]
Int. Cl.[4] G03B *17/24*
U.S. Cl. 354—106 **8 Claims**



1. A data recording camera capable of photographically recording a date, comprising:
first memory means for storing data as to the most recent shooting date;
second memory means for storing data as to the birth date of an individual;
operation means for calculating the age of said individual based on said data stored in said first and second memories;
a liquid crystal display device for digitally displaying said calculated age thereon; and
a light source for illuminating said liquid crystal display device to photographically record said age on a film in said data recording camera.

4,825,234

CYLINDRICAL ALL AROUND STEREOPHOTOGRAPH (PHOTO-STATUE) AND A CYLINDRICAL CONTINUOUS PHOTOGRAPHY WITH LENTICULE AND ITS EQUIPMENT

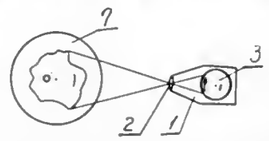
Hong-Zhang Cai, No. 2 Branch Lane 43 Lane 1088 Yu Yuan Rd., Shanghai, China

Filed Apr. 30, 1986, Ser. No. 857,272
Claims priority, application China, Jun. 20, 1985, 85104886
Int. Cl.[4] G03B *35/00*
U.S. Cl. 354—112 **9 Claims**

4. A lenticular all around camera for stereophotography comprising a camera body and lens and characterized by a

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lenticular cylindrical negative stand, a lenticular screen surrounding said cylindrical negative stand, means locating said



negative stand along the axis of said lens, and means supporting said negative stand in the camera body for rotation.

4,825,235

CAMERA HAVING SOFT FOCUS FILTER

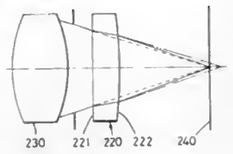
Hiroshi Wakabayashi, Yokohama; Kazuyuki Kazami, Tokyo; Toshio Sosa, Narashino, and Hidenori Miyamoto, Ichikawa, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 46,700, May 7, 1987, abandoned. This application Dec. 11, 1987, Ser. No. 132,565

Claims priority, application Japan, May 9, 1986, 61-106222; May 12, 1986, 61-108343; Jul. 4, 1986, 61-158581; Jul. 15, 1986, 61-165988; Aug. 22, 1986, 61-196838; Nov. 27, 1986, 61-283922; Feb. 24, 1987, 62-40536

Int. Cl.[4] G03B *3/00, 11/00;* **G02B** *13/20*

U.S. Cl. 354—195.12 **10 Claims**



1. A camera comprising:

a photographing optical system for forming an image of an object to be photographed onto a focusing plane;

an optical filter member;

means for holding said optical filter member so that the optical filter may be switched between an insertion position in which the optical filter member is inserted within an optical path of said photographing optical system and a removal position in which the optical filter member is removed from said optical path; and

said optical filter member having positive power, and satisfying the following formulae: $B+Ht=D$, and $1/(-D)+1/B=1/F$;

where Ht represents thickness of said optical filter member between a front principal point H1 and rear principal point H2, B and D represent, respectively, distances to said focusing plane from said rear principal point H2 and from said front principal point H1 when said optical filter member is inserted within the optical path of said photographing optical system, and F represents a focal length of said optical filter member.

4,825,236

SHUTTER FOR CAMERA

Teiji Hashimoto, Kanagawa; Fumio Shimada, Saitama, and Fumio Mochida, Saigama, all of Japan, assignors to Canon Denshi Kabushiki Kaisha, Saitama, Japan

Filed Feb. 3, 1987, Ser. No. 10,399

Claims priority, application Japan, Feb. 4, 1986, 61-14071[U]

Int. Cl.[4] G03B *9/40*

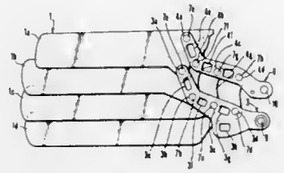
U.S. Cl. 354—246 **8 Claims**

1. A shutter apparatus comprising:

(a) a plurality of successively overlapping light shielding blades adapted to be disposed across a light path of an optical device;

(b) an axis; and

(c) an arm plate for driving said blades between a closing position in which said blades are extended to close said light path and an opening position in which said blades are retracted to open said light path, said arm plate being



supported rotatably about said axis, and having a plurality of engaging portions engageable with a respective one of said blades and at least one hold provided between said engaging portions.

4,825,237

AUTOMATIC FOCUSING DEVICE FOR USE IN A CAMERA

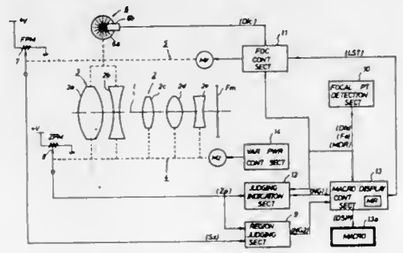
Takayuki Hatase, Yokohama, and Yoshimi Ohno, Kawasaki, both of Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,470

Claims priority, application Japan, Mar. 18, 1987, 62-61341; Mar. 18, 1987, 62-61342; May 1, 1987, 62-106210; May 28, 1987, 62-129810; May 30, 1987, 62-133403

Int. Cl.[4] G03B *3/10, 5/00, 13/18, 15/22*

U.S. Cl. 354—402 **5 Claims**



1. An automatic focusing device for use in a camera using photographic lenses having a variable power region in which an entire focal length of a variable power optical system comprising a variable power lens group, a focusing lens group and a macro lens group disposed on an identical optical axis can optionally be set by the variable power lens group between a shortest focal length and a longest focal length and a macro region capable of macro photographing by the macro lens group, as well as having, as a focusing region of the focusing lens group, a variable power focusing region from an infinite position to a nearest position on the optical axis corresponding to an object distance from an infinite distance to a nearest distance and a macro focusing region capable of macro photographing in a predetermined region disposed from the nearest position on a side opposite to the infinite position, the device comprising:

a focal point detection means for receiving light from an object transmitting through the photographic lenses and detecting a defocusing direction and a defocusing amount

for a focused position of an object relative to an intended focal point position,

a region judging means for judging as to whether the variable power optical system is in the variable power region or in the macro region,

a focal length detection means for outputting a focal length information corresponding to an entire system focal length when the variable power lens group is in the variable power region,

a focusing drive control means for driving the focusing lens group, detecting that the focusing lens group has been driven to end of the variable power focusing region and then stopping a driving for the focusing lens group,

a macro information providing means for providing a camera operator with an operation promotion information so that the variable power optical system is shifted to a macro photographing possible state when the focusing lens group is driven to end in the variable power focusing region, the defocusing directions just before the driving is stopped or just after the driving is stopped by the focusing drive control means respectively are identical with each other and the defocusing direction is directed to the nearest position and

a judging indication means for calculating a macro photographing possible range to the entire system focal length set by a focal length information and the defocusing amount, judging as to whether the operation promotion information should be provided or not and then indicating this to the macro information providing means.

4,825,238

FOCUS DETECTING DEVICE

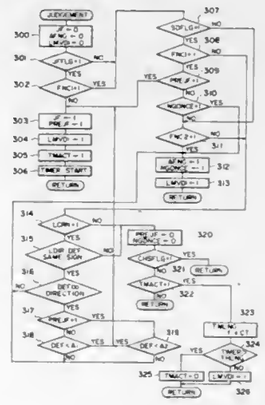
Akira Akashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,354

Claims priority, application Japan, Jan. 12, 1987, 62-004587

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **6 Claims**



1. A focus detecting device including:

(a) a focus detecting circuit for detecting a focus state of a photo-taking lens and outputting a focus signal;

(b) an in-focus determining circuit for determining an in-focus state of said lens on the basis of the focus signal from said focus detecting circuit; and

(c) an in-focus range adjusting circuit for setting an in-focus determination range of said in-focus determining circuit, within which range the photo-taking lens is regarded as being in-focus relative to the focus signal, to a greater value when the photo-taking lens is in a movable limit position than when the photo-taking lens is not in the movable limit position, and for adjusting the in-focus determination range when the photo-taking lens is in the movable limit position in conformity with the result of an earlier focus detection.

4,825,239

DISTANCE DETECTION METHOD AND APPARATUS

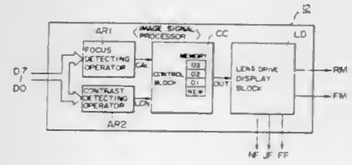
Yasuo Suda; Akira Akashi; Akira Ishizaki, all of Yokohama; Hiroshi Ohmura, Wako, and Keiji Ohtaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 771,301, Aug. 30, 1985, abandoned. This application Aug. 1, 1988, Ser. No. 226,557

Claims priority, application Japan, Sep. 11, 1984, 59-191158

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **14 Claims**



1. A focus state detection method comprising steps of:

detecting information on a focus state a plurality of times;

storing the detected information;

comparing the latest detected information with a predetermined information;

adjusting the focus state in accordance with the latest detected information when focus state is worse than a predetermined state; and

adjusting the focus state in accordance with a plurality of stored information detected before the immediately previous detection when the focus state is better than the predetermined state.

4,825,240

CAMERA

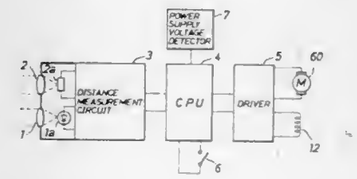
Masataka Sawamura, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 113,545

Claims priority, application Japan, Oct. 29, 1987, 62-259228

Int. Cl.[4] G03B *7/26*

U.S. Cl. 354—484 **10 Claims**



1. A camera having a driven member vulnerable to be damaged by mechanical shock if the driven member travels at excessive speed and is then stopped at a desired position, comprising:

a battery;

a voltage sensor coupled to the battery;

a DC motor;

an electrically driven member coupled to the DC motor;

driver means coupled the battery to the DC motor; and

control means for setting the driver means to apply a first signal, comprising a DC signal, to the DC motor when said driven member is moved from a first position to a

second position, and for applying a second signal to the DC motor different from the first signal as said driven member is moved from the second position toward said first position;

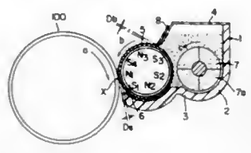
said control means being coupled to the voltage sensor for setting the driver means to apply said second signal to the DC motor in response to an output of the voltage sensor to maintain motion of the driven member below said excessive speed.

4,825,241

ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS

Hiromitsu Saijo, Toyokawa; Hiroshi Ikeda; Masamichi Hayashi, both of Aichi, and Shinya Matsuda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 14, 1987, Ser. No. 73,710
Claims priority, application Japan, Jul. 16, 1986, 61-168959
Int. Cl.⁴ G03G *15/09*
U.S. Cl. 355—3 DD **3 Claims**



1. An electrostatic latent image developing apparatus comprising;

a rotatable developing sleeve provided opposite to a latent image bearing member;

a brush-height regulating member made of non-magnetic material for regulating the volume of a developer carried to the developing portion opposite to the latent image bearing member; and

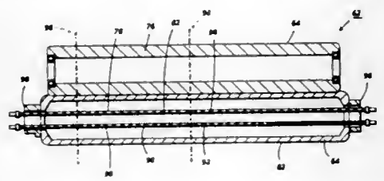
magnet means for maintaining the developer on the surface of said developing sleeve in a magnetic brush state and having multiple poles along the surface of said developing sleeve, one of said poles being provided opposite to said brush-height regulating member and being magnetized so that the region corresponding to 80% and more of the peak value in the magnetic force distribution curve of said pole has a spread with a central angle of 20° or greater on the exterior surface of the developing sleeve.

4,825,242

FUSING APPARATUS CONTROL SYSTEM

Michael R. Elter, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1988, Ser. No. 173,891
Int. Cl.⁴ G03G *15/20*
U.S. Cl. 355—14 FU **30 Claims**



1. An apparatus for fusing an image to a sheet during a copy run, including:

means for counting the number of sheets having images fused thereto during the copy run;

means for applying heat to at least the images on successive sheets of the copy run; and

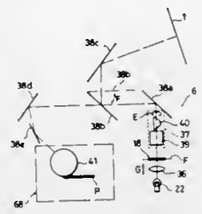
means, responsive to the number of sheets counted by said counting means, for controlling said heat applying means.

4,825,243

FILM IMAGE PROJECTING APPARATUS FOR HANDLING A ROLL FILM CONTAINING A PLURALITY OF ROWS OF FRAMES

Masaaki Ito, Kawasaki; Nobuo Ueda, Sagamihara, and Masafumi Fujita, Kawasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 11, 1987, Ser. No. 48,664
Claims priority, application Japan, May 12, 1986, 61-107877; Feb. 19, 1987, 62-37133; Feb. 19, 1987, 62-37134; Feb. 19, 1987, 62-37135; Feb. 19, 1987, 62-37136; Feb. 19, 1987, 62-37137
Int. Cl.⁴ G06K *7/10*; G03B *23/12*
U.S. Cl. 355—41 **33 Claims**



1. A film image projecting apparatus for handling a roll film, said apparatus comprising:

detecting means for automatically detecting whether said roll film contains a plurality of rows of frames;

a projecting optical system for projecting images contained in said roll film;

a first frame advance means for transporting said roll film frame by frame longitudinally thereof;

a second frame advance means operable when said roll film contains a plurality of rows of frames, for moving said roll film transversely thereof to place each of said rows of frames in an exposure section of said projecting optical system; and

control means for causing said first frame advance means alone to transport said roll film when said roll film contains a single row of frames, and causing said first frame advance means and said second frame advance means to transport said roll film when said roll film contains a plurality of rows of frames.

4,825,244

DEVELOPMENT STATION WITH IMPROVED MIXING AND FEEDING APPARATUS

Edwin A. Hediger, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1987, Ser. No. 124,219
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—3 DD **5 Claims**

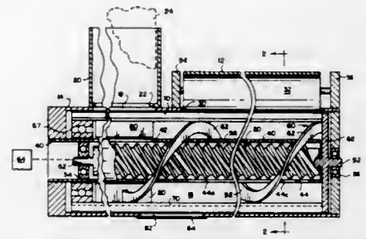
1. A development station for a reproduction apparatus, the station comprising:

a housing defining a sump for a supply of developer material comprising carrier particles and toner particles, the sump being elongate and generally cylindrical in shape and having first and second end portions, the housing having a first housing opening in the first end portion thereof and a second housing opening in the second end portion thereof,

a cartridge mounting member secured to the housing at the first end portion thereof with the member located directly above and communicating with the first housing opening so that toner particles from a cartridge supported by the member can fall through the member and mix with carrier particles in the first end portion of the sump,

a developer applicator located above the housing, axially spaced from a received cartridge and generally aligned with the second housing opening for receiving developer material from the housing,

a generally cylindrical tube coaxially positioned within the sump and extending substantially the entire length thereof, the tube having a first tube opening therein positioned below the first housing opening so that carrier particles with fresh toner particles delivered into the housing through the cartridge mounting member can enter the tube, and the tube having a second tube opening therein along the bottom of the tube generally beneath the applicator,



a feed screw positioned within the tube for positively driving developer material along the tube from the first tube opening to the second tube opening,

a ribbon blender rotatably mounted within the housing coaxial with the tube and between the tube and the housing,

drive means for rotating the screw in a direction for moving developer material including both carrier particles and toner particles from the first end portion of the housing toward the second end portion thereof and for rotating the ribbon blender in a direction for moving developer material from the second end portion of the housing to the first end portion thereof where said developer receives fresh toner particles directly through the first housing opening thereby providing a continuous mixing cycle including the portion of housing and tube under the cartridge, and

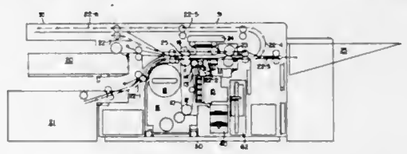
means for feeding developer material delivered into the sump from the tube to the applicator.

4,825,245

DUPLEX PRINTING MODULE FOR AN ELECTROGRAPHIC PRINTER

Kensuke Fukae, Monsey, N.Y., and Shozo Kaieda, Nagano, Japan, assignors to Kentek Information Systems, Inc., Allendale, N.J.

Continuation-in-part of Ser. No. 39,464, Apr. 16, 1987, Pat. No. 4,758,862. This application Nov. 2, 1987, Ser. No. 116,362
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 SH **25 Claims**



1. A duplexing unit for attachment to an electrographic printing apparatus which produces hard copies of information to be recorded on a sheet of paper or the like, comprising

a first region, a second region, and an area of reversion,

said first region forming a portion of a first paper path along which said sheet of paper is imprinted on a first side,

said second region and area of reversion forming a portion of a second paper path, said second paper path being operative to receive said sheet of paper from said first paper path, to turn said paper over, and to return said paper to said first paper path to imprint said paper on a second side, and

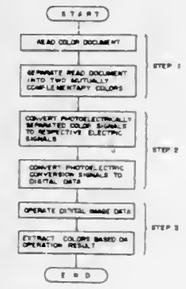
means for attaching said unit on top of an electographic printing apparatus.

4,825,246

IMAGE PROCESSING METHOD AND IMAGE FORMING APPARATUS

Masakazu Fukuchi; Kiyoshi Akazawa, both of Hachioji; Masahiko Matsunawa, Fussa; Hiroshi Niki, Hachioji; Shunji Matsuo, Hino; Hiroyuki Yamamoto, Yokohama, and Yoshinori Abe, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 133,160, Dec. 11, 1987, abandoned, which is a continuation of Ser. No. 890,071, Jul. 24, 1986, abandoned. This application Jan. 10, 1988, Ser. No. 205,548
Claims priority, application Japan, Jul. 27, 1985, 60-166549; Oct. 22, 1985, 60-236766
Int. Cl.⁴ G03G *15/01*
U.S. Cl. 355—4 **22 Claims**



1. An image processing apparatus comprising:

optical means for obtaining optical signals of two colors that are complementary to each other from document information;

photo-electric conversion means for converting said optical signals from said optical means into electric signals, respectively;

color extraction information generation means for processing two image signal outputs of said photo-electric conversion means and extracting colors on the basis of the result of processing; and

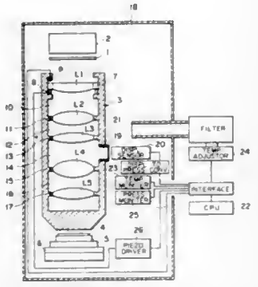
color information storage means for storing color information designated by the color extraction information of said color extraction information generation means.

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4,825,247
PROJECTION EXPOSURE APPARATUS

Ryuichi Kemi; Kazuo Takahashi, both of Kawasaki, and Itaru Fujita, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,277
Claims priority, application Japan, Feb. 16, 1987, 62-031621; Mar. 2, 1987, 62-045296
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—55 13 Claims

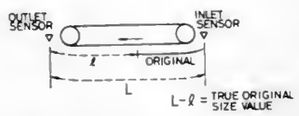


1. A projection exposure apparatus, comprising:
a stage for carrying thereon a workpiece;
an illumination system for illuminating an original with a light;
a projection optical system having a plurality of optical elements, for projecting upon the workpiece a pattern of the original being illuminated with the light;
monitoring means operable to monitor a change in temperature of a gaseous fluid contained in a closed space formed between at least two of said optical elements of said projection optical system; and
correcting means operable to correct the magnification of said projection optical system on the basis of an output signal from said monitoring means.

4,825,248
SHEET HANDLING APPARATUS

Takeshi Honjo, Kawasaki, and Naomi Takahata, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 924,736, Oct. 30, 1986, abandoned.
This application Apr. 29, 1988, Ser. No. 188,676
Claims priority, application Japan, Nov. 6, 1985, 60-249621; Nov. 6, 1985, 60-249622
Int. Cl.[4] G03G *15/00*; G03B *27/62*; B65H *7/02*
U.S. Cl. 355—14 SH 11 Claims



1. An original document handling apparatus comprising:
feed means for feeding an original document to an exposure position, said feed means being adapted, in the feeding to said exposure position, to transport the original document beyond said exposure position and then returning the original document to said exposure position;
first detection means for detecting the original document at the upstream side of said exposure position;
second detection means for detecting the original document at the downstream side of said exposure position; and
identification means for identifying the size of the original document based on the time from the detection of the original document by said first detection means to the detection of the original document by said second detection means.

4,825,249
CLEANING BLADE FOR USE WITH PHOTOELECTRONIC COPYING MACHINE

Yoshio Oki, Yokkaichi; Takeo Akatsuka, Nagoya, and Fuminori Satoji, Kuwana, all of Japan, assignors to NTN-Rulon Industries Co., Ltd., Tokyo, Japan

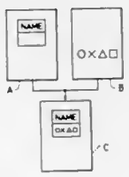
Filed Jan. 4, 1988, Ser. No. 140,502
Claims priority, application Japan, Mar. 14, 1987, 62-59858
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 3 Claims

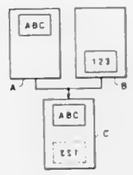
1. A cleaning blade for use with a photoelectronic copying machine, comprising a substrate of urethane rubber coated with perfluoropolyether having a main structural unit represented by formula
—C_XF_{2X}—O—(x is 1, 2, 3 or 4) and having a group selected from the group consisting of isocyanate, hydroxyl, carboxyl and amino groups at least at one end thereof.

4,825,250
IMAGE FORMING APPARATUS INCLUDING EXPOSURE SCANNING MEANS

Masanori Miyata, Yokohama; Yataka Komiya; Shinichi Nakamura, both of Tokyo; Masayuki Hirose, Yokohama; Toshihiko Mori, and Tomobumi Nakayama, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 770,190, Aug. 28, 1985, abandoned.
This application Aug. 17, 1987, Ser. No. 87,962
Claims priority, application Japan, Aug. 30, 1984, 59-182283; Sep. 4, 1984, 59-184861; Sep. 4, 1984, 59-184862; Sep. 4, 1984, 59-184863; Sep. 4, 1984, 59-184864; Oct. 2, 1984, 59-206626; Oct. 2, 1984, 59-206627
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 45 Claims





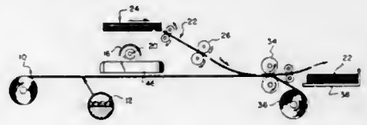
1. An image forming apparatus comprising:
a platen for placing an original thereon;
means for exposure-scanning an image of the original placed on said platen, wherein said exposure-scanning means scans a first area on said platen through a first scanning operation, and then scans a second area on said platen through a second scanning operation;

image forming means for forming on a sheet an image of an original exposed by said exposure scanning means upon the first scanning operation, and then for automatically forming on the same sheet an image of an original exposed by said exposure scanning means upon the second scanning operation, wherein said image forming means operates in a multi-mode for disposing both of the images formed upon the first scanning operation and upon the second scanning operation on the same surface of the same sheet and operates in a two-sided mode for disposing each of the images formed upon the first and second scanning operations, on different surfaces of the same sheet; and
selecting means for prohibiting said image forming means from operating in the two-sided mode when the multi-mode has been selected and for prohibiting said image forming means from operating in the mutli-mode when the two-sided mode has been selected.

4,825,251
IMAGING PROCESS INVOLVING HARDENING OF IMAGING WEB BORDER AREA PHOTOSENSITIVE MICROCAPSULES AND AN APPARATUS USEFUL THEREIN

Erik K. Nelson; Michael E. Demarchi, both of Centerville, and David A. Boyer, Miamisburg, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 52,317, May 19, 1987, Pat. No. 4,770,972.
This application Jul. 14, 1988, Ser. No. 218,773
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 12 Claims



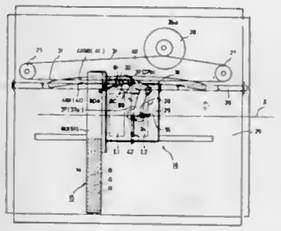
1. An apparatus for exposing and developing an imaging web having an image area and a border area, said imaging web including a support having a layer on the surface thereof of photosensitive microcapsules including an internal phase of a photohardenable photosensitive composition and a color former, comprising:
a source of actinic radiation for uniform exposure of said border area of said imaging web to harden said photosensitive microcapsules;
means for preventing said source of actinic radiation from exposing said image area of said imaging web; and
pressure application developer means.

4,825,252
COLOR ZOOM COPYING APPARATUS

Minoru Suzuki, and Nobutaka Minefuji, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,618
Claims priority, application Japan, Jun. 12, 1987, 62-146659
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—32 16 Claims

1. A color zoom copying apparatus having a light source for illuminating an object, a zoom lens system which has a plurality of groups of lenses for projecting an image of the illuminated object, a photoconductive body which receives the image of the object from the zoom lens system, and a color separating device for separating the image of the object into several colors to transfer the thus separated image onto the photoconductive body, said apparatus further comprising a slide base which holds one of the lens groups and which is adapted to move in the optical axis direction of the zoom lens system, means for driving the slide base in the optical axis direction in accordance with the magnification of the zoom lens system, a movable lens frame which supports another lens group and which is supported on the slide base so as to move in the optical axis direction, first adjusting means for moving the movable lens frame relative to the slide base to correct deviations in focus of the zoom lens system occurring as a result of variation in magnification, in accordance with the displacement of the slide base, a plurality of color filters which are adapted to be independently inserted into, and retracted



from, the optical path of the zoom lens system, and a second adjusting means for moving the movable lens frame, independently of movement of said lens frame by the first adjusting means, to correct any deviation in focus which is produced when a specified color filter is inserted into the optical path of the zoom lens system and which is determined by the color of the specified color filter, in association with the insertion of the specified color filter.

4,825,253
FLASH ILLUMINATION APPARATUS

Hajime Ichimura, Purimu Vira 201, 3-28-19, Minamisenzoku, Ota-ku, Tokyo 145, Japan

PCT No. PCT/JP87/00011, § 371 Date Nov. 9, 1987, § 102(e) Date Nov. 9, 1987, PCT Pub. No. WO87/04267, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 8, 1987, Ser. No. 97,517
Claims priority, application Japan, Jan. 14, 1986, 61-4226
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—71 2 Claims



1. A flash illuminating apparatus for illuminating a given area with improved uniformity, comprising:
a strobe flash tube;
a reflector extending around said flash tube and terminating in an open face for reflecting illumination directed either laterally or rearwardly with respect to said open face from said flash tube through said open face of said reflector and for dispersing the reflected illumination over said given area; and
a dispersing element mounted within said reflector in intercepting relation to a majority of the illumination directed forwardly from said flash tube and not in intercepting relationship to a majority of said reflected illumination so as to independently disperse the forwardly directed illumination over said given area whereby both said forwardly directed illumination and said reflected illumination are

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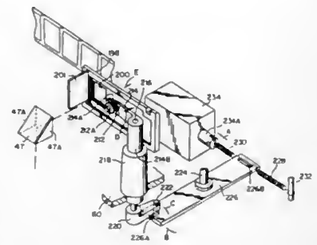
independently dispersed over said given area to thereby increase the uniformity of the illumination of said given area.

4,825,254

FILM PRESSING DEVICE

Makoto Moritake, and Shuichi Ohtsuka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 11, 1987, Ser. No. 95,503
Claims priority, application Japan, Sep. 11, 1986, 61-214916
Int. Cl.⁴ G03B *27/72*
U.S. Cl. 355—71 **11 Claims**



1. A film pressing device for use in an apparatus in which an exposure for forming an image on a photosensitive film and a projection of the image formed on said photosensitive film are effected at an identical position, comprising:

pressing means for pressing said photosensitive film at said identical position;

a through-hole formed in said pressing means and adapted for allowing a projecting light to pass therethrough for the purpose of projecting said image formed on said photosensitive film; and

light-shielding means for preventing the portion of said projecting light failing to pass through said through-hole from impinging upon said photosensitive film.

4,825,255

DOCUMENT HANDLER VACUUM BELT PLATEN TRANSPORT SYSTEM

Thomas C. Iaia, Jr., Rochester; William J. McLaughlin, Fairport, and Robert P. Siegel, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

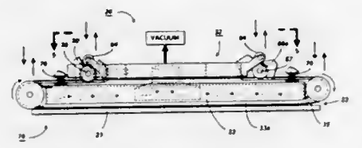
Filed Feb. 12, 1988, Ser. No. 155,350
Int. Cl.⁴ G03B *27/64*
U.S. Cl. 355—76 **7 Claims**

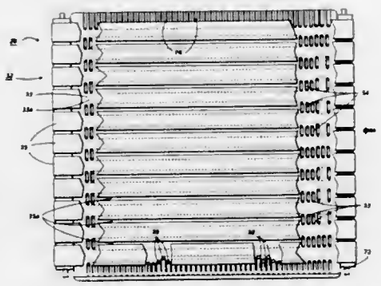
1. In a document handler for presenting documents to the platen of a copier for copying, comprising a vacuum belt platen transport system for feeding the documents over the platen and into an imaging position over the platen, wherein said vacuum belt platen transport system comprises plural unapertured document transporting belts, with substantial exposed spaces between the edges of said belts, movable under a substantially planar vacuum plenum backing and imaging background surface overlying said platen, and vacuum means for applying a partial vacuum to a document sheet being transported by said movable document transporting belts over the platen, the improvement wherein:

said vacuum plenum backing and imaging background surface has multiple vacuum apertures located under and overlaid by said edges of said belts, said belts extending in rows under said belt edges across said vacuum plenum backing and imaging background surface, but not extending into said exposed spaces between said belts,

said belts are light reflective and optically conceal said overlaid multiple vacuum apertures, and

said vacuum plenum backing and imaging background surface has multiple vacuum grooves in said surface extending transversely across said surface, said vacuum grooves extending across said exposed spaces between said edges of adjacent said belts but not passing under said belts, said vacuum grooves being in vacuum communication with said vacuum apertures for applying said partial vacuum from said vacuum means to a document on said belts in said exposed spaces between said belts but not applying





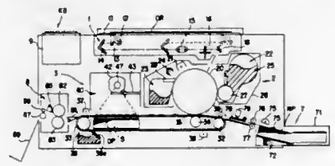
said partial vacuum under said belts except at said outer edges thereof, so that said belts are substantially riding on ungrooved and unapertured areas of said vacuum plenum backing and imaging background surface to which no partial vacuum is applied except at said edges of said belts, to substantially reduce frictional drag between said belts and said vacuum plenum backing and imaging background surface.

4,825,256

IMAGE RECORDING DEVICE

Hitoshi Nakai; Takemi Yamamoto; Jun Sakai, all of Nagoya, and Eiji Fujii, Gifu, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Feb. 23, 1988, Ser. No. 159,296
Claims priority, application Japan, Feb. 24, 1987, 62-41182
Int. Cl.⁴ G03B *27/32, 27/52*
U.S. Cl. 355—27 **10 Claims**



1. An image recording device comprising:

select means for selecting either a photo-sensitive paper or a plain paper as a recording medium;

light-shield image forming means for forming a provisional image with light-shield materials;

monochrom image forming means for forming a monochrom image on said plain paper by transferring said light-shield image onto said plain paper if said plain paper is seleced as the recording medium by said select means; and

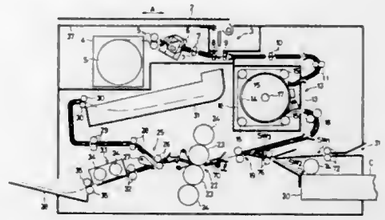
color image forming means for forming a color image on said photo-sensitive paper by exposing said light-shield image onto said photo-sensitive paper if said photo-sensitive paper is selected as the recording medium.

4,825,257

PICTURE RECORDING METHOD

Shigeru Yoshino, and Atsushi Takagi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 3, 1988, Ser. No. 151,721
Claims priority, application Japan, Feb. 3, 1987, 62-021815; Aug. 17, 1987, 62-203192
Int. Cl.⁴ G03B *27/02*
U.S. Cl. 355—132 **14 Claims**



1. A picture recording method of the type comprising the steps of exposing a surface of a photosensitive material to light representing a picture to form a picture image thereon, superposing said exposed surface of said photosensitive material onto an image receiving surface of an image receiving material and thereafter transferring said the picture image from said exposed surface onto said image receiving surface, said method further comprising the steps of:

optically detecting whether a facing surface of said image receiving material to be superposed on said exposed surface is said image receiving surface; and

preventing superposition of said exposed surface of said photosensitive material on said image receiving material when said optical detection step indicates that said facing surface of said image receiving material is not said image receiving surface.

4,825,258

DEVICE FOR BORE ALIGNMENT OF GUN SIGHTS

John M. Whitson, 306 Spruce, Woodward, Okla. 73801

Filed Jan. 4, 1988, Ser. No. 140,552
Int. Cl.⁴ G01B *11/26*
U.S. Cl. 356—153 **11 Claims**



1. A device for alignment of gunsights with the respective gun barrel bore, comprising:

a mounting assembly consisting of an elongated body of revolution having an axial bore and being formed as an outer head portion extending into a conical mandrel portion to be firmly received into the gun bore, and further extending a cylinder portion with expansion tube toward the distal end of the gun bore, a portion of said head portion axial bore having threads formed therein;

a control rod with mandrel nut rotatably disposed through the axial bore of the mounting assembly with the mandrel nut distally adjacent said expansion tube, a portion of said control rod having threads formed thereon for mating engagement with the threads in said axial bore;

manually rotatable means accessible in said mounting assembly head portion for rotating said control rod and changing the relative thread positioning to move said mandrel nut and expand the expansion tube into firm engagement with the distal gun bore wall thereby to axially align the mounting assembly;

a light source secured in axial alignment to said mounting assembly outer head portion, said light source directly projecting a radiation beam in axial alignment with the axial bore of said mounting assembly; and

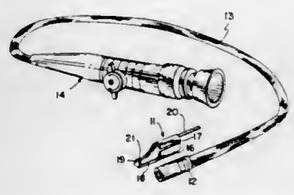
target means disposed at a selected distance to intercept said radiation beam and provide indication for sighting and aligning the gunsight.

4,825,259

ADAPTER TIP FOR REMOTE MEASURING DEVICE

Robert F. Berry, Jr., Rte. 3, Box 259, Hayes, Va. 23072

Filed Feb. 3, 1988, Ser. No. 151,863
Int. Cl.⁴ G02B *23/26*; G01B *11/02*
U.S. Cl. 356—241 **10 Claims**



1. An adapter tip for the forward end of an optical borescope including focus adjustment means and used for the internal inspection of an object having an external opening therein through which said forward end may be inserted comprising:

a body portion adapted to be secured to said forward end of said borescope:

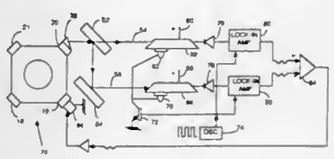
said body portion including means for supporting measuring indicia thereon thereby permitting external, substantially direct measurements when said measuring indicia coincide with an internal surface or defect and both brought into simultaneous focus with said focus adjustment means.

4,825,260

APPARATUS AND METHOD USING AMPLIFICATION CELLS FOR RING LASER GYROSCOPE CAVITY LENGTH CONTROL

Sami T. Hendow; Graham J. Martin, both of Canoga Park, and Sheridan W. Hammons, Thousand Oaks, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 20, 1987, Ser. No. 17,429
Int. Cl.⁴ G01C *19/64*
U.S. Cl. 356—350 **48 Claims**



1. A cavity length control system for a ring laser that includes a frame having a cavity therein for guiding a pair of counter propagating light beams and a cavity length control mirror mounted to the frame, comprising:

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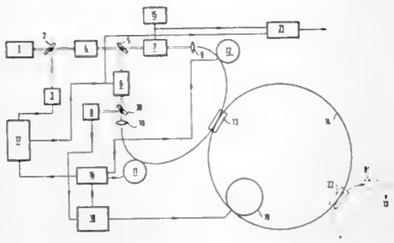
means for extracting a portion of each of the counter propagating light beams from the cavity;
means for splitting the light beams extracted from the cavity into a first source beam and a second source beam;
first gain means for amplifying the first source beam, the first gain means including a first isotope of a gas having a first gain profile that includes a natural resonance frequency of the first isotope;
second gain means for amplifying the second source beam, the second gain means including a second isotope of the gas having a second gain profile that includes a natural resonance frequency of the second isotope; and
means for applying to the cavity length control mirror a control signal indicative of the detuning of the frequency of the first and second source beams from a central frequency determined from superimposing the first and second gain profiles to move the cavity length control mirror to produce a cavity length that permits light of a selected frequency to resonate in the cavity and also to stabilize the cavity length.

4,825,261

METHOD FOR READING OUT ROTATION RATE WITH A PASSIVE OPTICAL RESONATOR

Werner Schroeder, Umkirch, Fed. Rep. of Germany, assignor to LITEF GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,570
Claims priority, application European Pat. Off., Jul. 29, 1986, 86 110 428
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—350 **14 Claims**



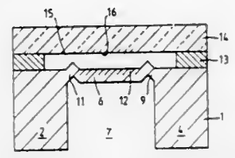
1. In a method for reading out rotation rate with a passive optical resonator in which light from a tuned coherent light source passes through a mode filter, is split into two partial light beams that are radiated in opposite directions into said ring resonator and said component beams are coupled out and detected to obtain a rotation rate signal, the improvement comprising the step of:
(a) shifting both partial light beams in frequency by equal and opposite amounts both before entry into and after exit from said ring resonator operated in reflection; then
(b) modulating said frequency shift; then
(c) bringing said exiting partial light beams to interference by passing said beams through said mode filter in the opposite direction; then
(d) detecting said interference signal by means of an opto-electronic converter; then
(e) demodulating said interference signal with respect to the modulation frequency of its harmonics; and then
(f) obtaining said rotation rate signal from said demodulated interference signal.

4,825,262

FABRY-PEROT INTERFEROMETER

Stephen R. Mallinson, Ipswich, England, assignor to British Telecommunications public limited company, England

PCT No. PCT/GB86/00631, § 371 Date Jun. 11, 1987, § 102(e) Date Jun. 11, 1987, PCT Pub. No. WO87/02470, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 16, 1986, Ser. No. 80,468
Claims priority, application United Kingdom, Oct. 16, 1985, 8525458; Oct. 16, 1985, 8525459; Oct. 16, 1985, 8525460; Oct. 16, 1985, 8525461; Oct. 16, 1985, 8525462; Oct. 23, 1985, 8526189
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—352 **15 Claims**



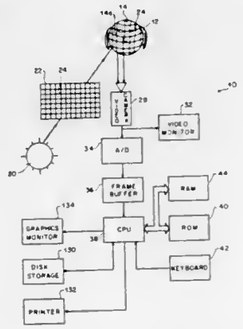
11. A Fabry-Perot interferometer comprising:
a first partially reflective member;
a second partially reflective member disposed parallel to the first member and adjustably disposed with respect thereto so as to permit variable dimensioning of an optical Fabry-Perot interferometer cavity formed therebetween; and
an at least partially transparent electrode means disposed on each of said members for electrostatically controlling said variable dimensioning as a function of an electrical signal impressed across said electrode means.

4,825,263

OPTICAL METHOD AND APPARATUS FOR DETERMINING THREE-DIMENSIONAL CHANGES IN FACIAL CONTOURS

Paul J. Desjardins, Maplewood; Stanley M. Dunn, Belle Mead, and Maano Milles, Berkeley Heights, all of N.J., assignors to University of Medicine & Dentistry of New Jersey, Newark and Rutgers University, Piscataway, both of, N.J.

Filed Jun. 2, 1987, Ser. No. 57,577
Int. Cl.⁴ G01B *11/24*
U.S. Cl. 356—376 **6 Claims**



2. A method of optically mapping a three-dimensional surface, comprising the steps of:
a) illuminating the surface through a grid structure to produce a grid representation on the surface, said grid representation having intersection points;

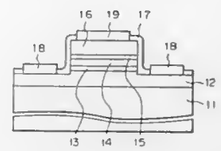
b) viewing the illuminated surface with a video camera;
c) producing a video signal in response to said step of viewing;
d) converting said video signal to digital form;
e) storing a frame of said digitized video signal in a frame memory;
f) defining the grid representation on the surface, from said stored video signal, said step of defining including the steps of:
(i) constructing an imaginary box of m x n pixels around substantially each pixel of said stored video signal;
(ii) determining the value of light intensity of each pixel in each said imaginary box;
(iii) averaging the values of light intensity in each said imaginary box to produce a local median intensity value for each box; and
(iv) subtracting the local median intensity value in each body from the pixel about which the body was constructed, to thereby define the grid representation on the surface, from the stored video signal;
(g) locating coordinates of said intersection points of said grid representation;
(h) determining curvatures of said grid representation at said located intersection points; and
(i) three-dimensionally reconstructing the surface from said coordinates and curvatures of said intersection points.

4,825,264

RESONANT TUNNELING SEMICONDUCTOR DEVICE

Tsuguo Inata; Shunichi Muto, both of Isehara, and Toshio Fujii, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 4, 1987, Ser. No. 81,340
Claims priority, application Japan, Aug. 4, 1986, 61-183101; May 12, 1987, 62-113590
Int. Cl.⁴ H01L *27/12, 45/00, 29/161, 29/72*
U.S. Cl. 357—4 **28 Claims**



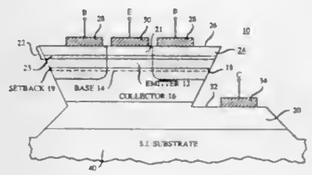
1. (Once Amended) A resonant tunneling semiconductor device comprising:
an InP substrate;
a first contact compound semiconductor layer formed on said InP substrate and lattice-matched to InP;
a first barrier layer of $(In_{0.52}Al_{0.48}As)_z(In_{0.53}Ga_{0.47}As)_{1-z}$ $(0<z\leqq 1)$, formed on said first contact compound semiconductor layer and lattice-matched to InP;
a well layer of $In_{1-y}Ga_yAs$ formed on said first barrier layer and substantially latticed-matched to InP;
a second barrier layer of $(In_{0.52}Al_{0.48}As)_z(In_{0.53}Ga_{0.47}As)_{1-z}$ $(0<z\leqq 1)$ formed on said well layer and lattice-matched in InP; and
a second contact compound semiconductor layer formed on said second barrier layer and lattice-matched to InP, said first barrier layer, said second barrier layer and said well-layer forming a quantum-well structure, and a bottom of a conduction band E_c of said first and second contact compound semiconductor layers is lower than a first resonant level E_o of the quantum-well structure under a nonbiased condition, said InP substrate, said first contact compound semiconductor layer, said first barrier layer, said well layer, said second barrier layer and said second contact compound semiconductor layer providing a negative differential resistance characteristic at resonance having a maximum/minimum current ratio greater than 5.5.

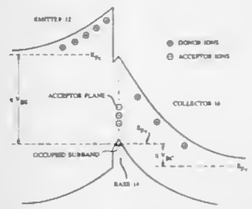
4,825,265

TRANSISTOR

Leda M. Lunardi, New Providence, and Roger J. Malik, Summit, both of N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 4, 1987, Ser. No. 94,633
Int. Cl.⁴ H01L *29/72, 29/205*
U.S. Cl. 357—16 **8 Claims**

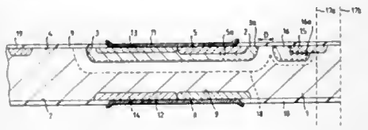




1. A bipolar transistor comprising a semiconductor body comprising an emitter region, a collector region, and a base region between the emitter and collector regions, with
(a) the emitter and collector regions comprising semiconductor material of one conductivity type;
(b) the base region comprising a submonolayer of dopant atoms providing to the base region charge carriers imparting a conductivity type opposite to the conductivity type of the emitter and collector regions; and
(c) associated with the emitter and collector region semiconductor materials being an emitter bandgap and a collector bandgap, respectively, characterized in that
(d) the emitter region has a relatively wide bandgap;
(e) the collector region has a bandgap that is narrower than the bandgap of the emitter region, whereby a quantum well is formed between the emitter region and the collector region; and
the semiconductor body further comprises an undoped or unintentionally doped semiconductor setback layer having associated therewith a bandgap and a diffusion length for the base dopant atoms, the setback layer;
(f) being disposed between the submonolayer and the emitter region,
(g) having a bandgap narrower than the bandgap of the emitter region, and
(h) having a thickness such that the charge carriers in the base region occupy one or more essentially two-dimensional energy sub-bands in the quantum well, the thickness furthermore being at least one diffusion length for the base-dopant atoms.

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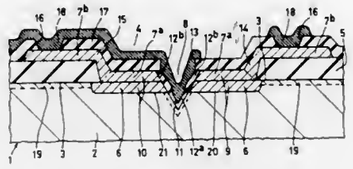
4,825,266
SEMICONDUCTOR DIODE
Kenneth R. Whight, Cowfold, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 2, 1987, Ser. No. 72,196
Claims priority, application United Kingdom, Aug. 8, 1986, 8619425
Int. Cl.[4] H01L *29/90, 29/78, 29/34, 29/74*
U.S. Cl. 357—13 13 Claims



1. A semiconductor diode comprising a semiconductor body having a first region of one conductivity type, a second region of the opposite conductivity type meeting only a given surface of the body and surrounded by the first region so as to form with the first region a first pn junction which when reverse-biassed in operation of the diode by a voltage applied across the diode gives the diode a blocking characteristic and a third region of the one conductivity type more highly doped than the first region provided within the first region for triggering conduction of the diode when a predetermined voltage less than the voltage at which the first pn junction would have broken down in the absence of the third region is applied across the diode to reverse bias the first pn junction, characterized in that the third region meets only the given surface, a fourth region of the opposite conductivity type disposed between the second and third regions meets only the given surface and forms a pn junction with the third region and a passivating layer on the given surface covers the third and fourth regions, the third and fourth regions forming a breakdown device and the relative locations of the breakdown device and the second region being selected such that, when the first pn junction is reverse-biassed by a voltage applied across the diode, a depletion region of the first pn junction meets a depletion region of the breakdown device at an applied voltage less than the predetermined voltage and, when the predetermined voltage is applied across the diode, a reverse-biassing voltage induced across the pn junction between the third and fourth regions causes the breakdown device to breakdown to trigger conduction of the diode.

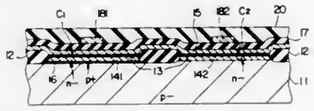
4,825,267
FIELD EFFECT TRANSISTOR HAVING SELF-REGISTERING SOURCE AND DRAIN REGIONS TO MINIMIZE CAPACITANCES
Henricus G. R. Maas, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 306,121, Sep. 28, 1981, abandoned. This application Apr. 8, 1985, Ser. No. 721,123
Claims priority, application Netherlands, Oct. 15, 1980, 8005673
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.4 10 Claims

1. A semiconductor device including at least one field effect transistor, said device comprising
a semiconductor substrate of a first conductivity type,
a first insulating layer on said substrate, said first insulating layer having at least one opening to said substrate,
a polycrystalline epitaxial layer of a second conductivity type on said first insulating layer and a monocrystalline epitaxial layer of said second conductivity type on said substrate within said opening,
at least one recess extending through said monocrystalline layer and into said substrate, said recess being covered with a second insulating layer,
wherein said field effect transistor is defined by a source region of said monocrystalline layer and a first surface zone of said second conductivity type in said substrate at a first side of said recess, by a drain region of said monocrystalline layer and a second surface zone of said second conductivity type in said substrate at a second side of said



recess opposite to said first side, and by a gate electrode over said second insulating layer in said recess, and
wherein a channel region is defined in said substrate below said recess between said source region and said drain region, said channel region extending between said surface zones.

4,825,268
SEMICONDUCTOR MEMORY DEVICE
Yukihito Oowaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 845,555, Mar. 28, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 213,435
Claims priority, application Japan, Mar. 29, 1985, 60-63463
Int. Cl.[4] H01L *29/78, 27/02, 27/10, 27/02*
U.S. Cl. 357—23.6 11 Claims

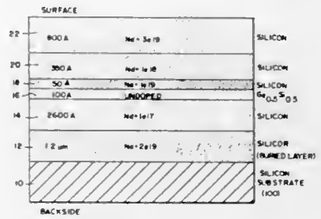


1. A semiconductor memory device comprising: a semiconductor substrate;
a plurality of word lines arranged in columns;
a plurality of bit lines arranged in rows; and
a plurality of one-bit memory cells of two different types arranged two-dimensionally along the columns of word lines and the rows of bit lines, in which a first t type of memory cell includes an MOS transistor and a first type of MOS capacitor not present in a second type of memory cell, and in which the second type of memory cell includes the MOS transistor and a second type of MOS capacitor not present in the first type of memory cell and different from the first type of MOS capacitor;
wherein the plurality of memory cells is arranged with the two different types of cell capacitors arranged alternately along the columns of word lines to reduce the probability of generation of multiple soft errors along each word line in adjacent memory cells.

4,825,269
DOUBLE HETEROJUNCTION INVERSION BASE TRANSISTOR
James D. Plummer, Portola Valley, and Robert C. Taft, Stanford, both of Calif., assignors to Stanford University, Stanford, Calif.
Filed Mar. 4, 1988, Ser. No. 164,260
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—34 11 Claims

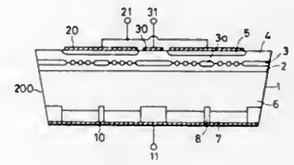
1. A transistor structure comprising:

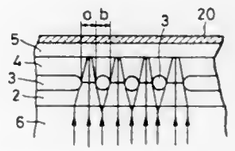
a first region of a first semiconductor material having a first conductivity type, said first region having a major surface,
a second region of a second semiconductor material positioned on said major surface of said first region and forming a first heterojunction with said first region,
a third region of said first semiconductor material positioned



on said second region, said third region having an opposite conductivity type relative to said first conductivity type, said third region forming a second heterojunction with said second region, and
a fourth region of said first semiconductor material having said first conductivity type, said fourth region positioned on said third region.

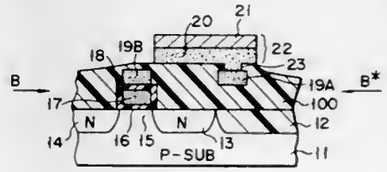
4,825,270
GATE TURN-OFF THYRISTOR
Yukimasa Satou; Tsutomu Yatsuo; Saburo Oikawa, all of Hitachi, and Isamu Sanpei, Kitaibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 2, 1987, Ser. No. 9,479
Claims priority, application Japan, Jan. 31, 1986, 61-17965
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 3 Claims





1. A gate turn-off thyristor comprising:
a. a semiconductor substrate having
(i) four alternate layers of two different conductivity types disposed between a pair of opposing principal surfaces, the first layer being exposed at one principal surface, and the fourth layer, together with the third layer, being exposed at the other principal surface,
(ii) the third layer having a low-resistance layer provided therein, said low-resistance layer being separate from the second and fourth layers and having the same conductivity type as that of the third layer,
(iii) said low-resistance layer having a multiplicity of small bores, the third layer extending through said small bores, said low-resistance layer having a thickness which is smaller than the carrier diffusion length in the second layer, and
(iv) the distance between each pair of adjacent small bores being set so as to be smaller than the carrier diffusion length in the second layer;
b. an anode electrode which is in low-resistance contact with the first layer;
c. a gate electrode which is in low-resistance contact with the third layer; and
d. a cathode electrode which is in low-resistance contact with the fourth layer.

4,825,271
NONVOLATILE SEMICONDUCTOR MEMORY
Sumio Tanaka, Tokyo; Masaki Sato, Kawasaki; Shinji Saito, Yokohama; Shigeru Atsumi, Tokyo, and Nobuaki Otsuka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 15, 1987, Ser. No. 50,316
Claims priority, application Japan, May 20, 1986, 61-115582; Jul. 17, 1986, 62-168537
Int. Cl.[4] H01L *29/78, 29/34, 27/20*
U.S. Cl. 357—23.5 16 Claims



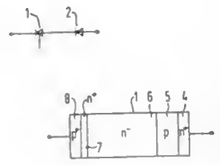
1. A nonvolatile semiconductor memory, said memory including a plurality of memory cell transistors each having a source, a drain, and a floating gate which is located over a channel region formed between said source and said drain, wherein said memory also comprises:
a source diffusion region extending in one direction, said source diffusion region being common to said sources of said memory cell transistors and serving as wiring of said sources;
a pair of first word lines arranged in parallel with said source diffusion region, said source diffusion region being located under an area between said pair of first word lines and said pair of first word lines being located over said respective floating gates of said memory cell transistors;
bit lines electrically connected to said respective drains of said memory cell transistors, said bit lines being arranged to cross said pair of first word lines; and
a second word line located over the area between said pair of first word lines and electrically connected in parallel to said pair of first word lines.

4,825,272
SEMICONDUCTOR POWER SWITCH WITH THYRISTOR
Erhard Lehmann, Aschheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 753,200, Jul. 9, 1985, abandoned. This application Sep. 17, 1987, Ser. No. 98,778
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 3425719
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 14 Claims

1. A semiconductor power switch device comprising:
an asymmetrically blocking thyristor having four zones with

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alternating conductivity type, such that a relatively heavily n-doped layer is interposed between a p-doped outer zone and a relatively lightly n-doped zone; and



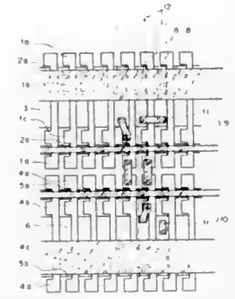
a first diode coupled in series with said asymmetrically blocking thyristor, said diode having a predetermined structure such that the reverse recovery charge stored therein is the same as or greater than the reverse recovery charge stored in said thyristor.

4,825,273

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Takahiko Arakawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1987, Ser. No. 24,010
Claims priority, application Japan, May 23, 1986, 61-119758
Int. Cl.⁴ H01L 27/02
U.S. Cl. 357—42 **12 Claims**



1. A basic cell formed on a substrate for constituting semiconductor integrated circuit devices, and comprising at least one first MOS transistor of a first type of electric conduction and at least one second MOS transistor of a second type of electric conduction, each of said MOS transistors having a region for constituting a source or drain and a gate electrode, said basic cell characterized by incorporating, in combination:

diffusion contact regions of said second type of electric conduction formed on said substrate and disposed on both sides of said region of said first MOS transistor;

diffusion contact regions of said first type of electric conduction formed on said substrate and disposed on both sides of said region of said second MOS transistor;

said first MOS transistor gate electrode having gate electrode contact regions disposed on both sides of each of said diffusion contact regions of said second type of electric conduction;

said first MOS transistor gate electrode contact regions for providing electrical contact with the gate electrode and of a width greater than the width of the gate electrode that bridges each diffusion contact region of second type of electric conduction;

said second MOS transistor gate electrode having gate electrode contact regions disposed on both sides of each of said diffusion contact regions of said first type of electric conduction;

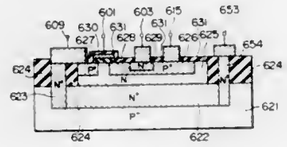
said second MOS transistor gate electrode contact regions for providing electrical contact with the gate electrode and of a width greater than the width of the gate electrode that bridges each diffusion contact region of first type of electric conduction.

4,825,274

BI-CMOS SEMICONDUCTOR DEVICE IMMUNE TO LATCH-UP

Hisayuki Higuchi, Kokubunji, and Makoto Suzuki, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 13, 1986, Ser. No. 929,910
Claims priority, application Japan, Nov. 15, 1985, 60-254748
Int. Cl.⁴ H01L 27/02
U.S. Cl. 357—43 **6 Claims**



1. A semiconductor device including a combination circuit of a bipolar transistor and a MOSFET; wherein said MOSFET includes a gate which responds to an input signal, a source region, a drain region, and a source-drain path; said bipolar transistor includes a collector region connected at one end to a first terminal and at a second end to the source-drain path, a base region connected to the source-drain path, and an emitter region connected to a second terminal, wherein the emitter region, base region and collector region of said bipolar transistor and the source region and drain region of said MOSFET are formed within a semiconductor material.

4,825,275

INTEGRATED BIPOLAR-CMOS CIRCUIT ISOLATION FOR PROVIDING DIFFERENT BACKGATE AND SUBSTRATE BIAS

Stephen R. Tomassetti, Lewisville, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 28, 1987, Ser. No. 55,480
Int. Cl.⁴ H01L 27/02
U.S. Cl. 357—43 **8 Claims**



1. A bipolar-CMOS circuit, comprising:

a P type semiconductor substrate having a P type epitaxial layer disposed thereon;

a vertical NPN bipolar transistor having a collector region formed by a first N well disposed in said p type epitaxial layer;

an NMOS transistor formed in a selected portion of said P type epitaxial layer and having a backgate, said selected portion of said P type epitaxial layer being electrically isolated from said P type substrate and form an adjacent portion of said P type epitaxial layer;

a PMOS transistor formed in a second N well disposed in said selected portion of said P type epitaxial layer;

conductors for interconnecting said NMOS transistor with said PMOS transistor to form a CMOS circuit;

a first connection for applying a voltage to said P type substrate; and

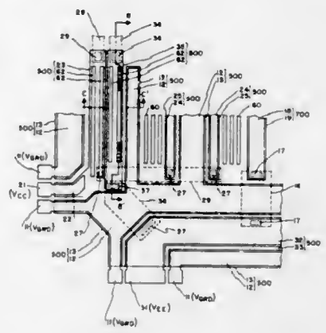
a second connection for applying a different voltage to said selected portion of said P type epitaxial layer whereby said backgate of said NMOS transistor in said selected portion of said P type epitaxial layer can be biased by a different voltage than said P type substrate and said adjacent portion of said P type epitaxial layer.

4,825,276

INTEGRATED CIRCUIT SEMICONDUCTOR DEVICE HAVING IMPROVED WIRING STRUCTURE

Masaharu Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 18, 1987, Ser. No. 64,996
Claims priority, application Japan, Jun. 19, 1986, 61-144365
Int. Cl.⁴ H01L 27/10, 27/02, 29/34
U.S. Cl. 357—45 **7 Claims**



1. An integrated circuit semiconductor device comprising a semiconductor substrate, a field insulating layer formed on said substrate, first and second parallel power supply lines formed on said field insulating layer and extending in one direction with an interval between them, said first and second power supply lines being located so that no circuit element is at a part of said substrate which is under said interval between said first and second power supply lines and so that said field insulating layer is continuously formed under said first and second power supply lines and under said interval between said first and second power supply lines,

said first power supply line including a first conductive layer at a first level at least first and second stripe type conductive layers at a second level located at portions which are above or below said first conductive layer so that said first and second stripe type conductive layers of said second level are positioned completely within said first conductive layer at said first level in the plan view, each of said first and second stripe type conductive layers at said second level being electrically connected to only said first conductive layer via a plurality of contact holes provided in an intermediate insulating film between said first conductive layer at said first level and said first and second stripe type conductive layers at said second level,

said second power supply line including a second conductive layer at said first level and at least a third stripe type conductive layer at said second level located above or below said second conductive layer so that said third stripe type conductive layer at said second level is positioned completely within said second conductive layer of said first level in the plan view, said third stripe type conductive layer at said second level being electrically connected to only said second conductive layer via a plurality of contract holes provided in an intermediate insulating film which is between said second conductive layer at said first level and said third stripe type conductive layer at said second level,

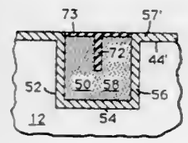
said first, second and third stripe type conductive layers belonging to said first and second power supply lines, respectively, each of said stripe type conductive layers having substantially the same width and extending in said one direction and in parallel with each other by keeping substantially the same interval between said first and second stripe type conductive layers as the interval between said second and third stripe type conductive layers.

4,825,277

TRENCH ISOLATION PROCESS AND STRUCTURE

Robert Mattox, Tempe, Ariz., and Steven Fong, Santa Clara, Calif., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 17, 1987, Ser. No. 122,086
Int. Cl.⁴ H01L 27/12, 29/34, 29/06
U.S. Cl. 357—49 **11 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having a major surface;

a trench extending into said substrate from said major surface wherein said trench has a sidewall and a bottom;

a silicon oxide-silicon nitride mixture substantially filling said trench to a first surface below said major surface; and

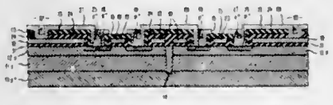
a silicon nitride layer completely covering said mixture.

4,825,278

RADIATION HARDENED SEMICONDUCTOR DEVICES

Steven J. Hillenius; William T. Lynch, both of Summit, and Lalita Manchanda, North Plainfield, all of N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 788,415, Oct. 17, 1985. This application Mar. 2, 1987, Ser. No. 20,771
Int. Cl.⁴ H01L 29/40
U.S. Cl. 357—53 **15 Claims**



1. A semiconductor device comprising:

a semiconductor substrate including active and inactive portions with a thick insulator overlying the inactive portion;

a conductive layer placed between the inactive portion of the semiconductor substrate and the thick insulator over essentially the entire area of the inactive portion, said conductive layer being electrically coupled to the underlying semiconductor substrate;

a first thin insulating layer covering the edges of the conductive layer in order to electrically isolate the conductive layer from other conductors extending over the active and

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inactive portions, said insulating layer having a thickness which is substantially less than the thick insulator; and

a second thin insulating layer between the conductive layer and the semiconductor substrate, said layer having a thickness in the range 50–1,000 angstroms;

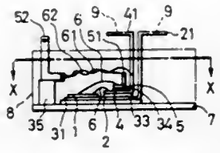
the conductive layer being aligned with the active portion of the substrate as a result of the elements of the active portion being formed after said conductive layer.

4,825,279

SEMICONDUCTOR DEVICE

Shoichi Furuhata, Kawasaki, Japan, assignor to Fuji Electric Col, Ltd., Japan

Filed Oct. 5, 1987, Ser. No. 104,083
Claims priority, application Japan, Oct. 8, 1986, 61-239742
Int. Cl.⁴ H01L *23/48, 29/44, 23/16, 29/46*
U.S. Cl. 357—68 **6 Claims**



1. A semiconductor device, comprising:

a common substrate;

a plurality of insulating boards;

a plurality of semiconductor pellets arranged in a line, which are provided with a plurality of electrodes to which common terminal boards are connected;

a plurality of terminal boards superimposed one on another with said insulating boards interposed therebetween and shifted from one another and fixedly secured to said common substrate, the surfaces of said plurality of terminal boards being in parallel with those of said semiconductor pellets;

lead wires interconnecting said electrodes of said plurality of semiconductor pellets and the exposed surfaces of said plurality of terminal boards, said lead wires extending in a direction perpendicular to the direction of said line along which said semiconductor pellets are arranged; and

a plurality of extended terminal conductors extending upwardly from one edge of respective ones of said plurality of terminal boards, said extended terminal conductors being arranged in parallel and spaced a small distance apart from one another.

4,825,280

ELECTROSTATIC DISCHARGE PROTECTION FOR SEMICONDUCTOR DEVICES

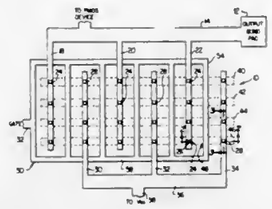
Kueing L. Chen, and Roland H. Pang, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1986, Ser. No. 914,208
Int. Cl.⁴ H01L *23/48, 29/46*
U.S. Cl. 357—71 **39 Claims**

1. An electrostatic discharge protected semiconductor device, comprising:

a bond pad used for connecting the semiconductor device to circuits external thereto; and

a plurality of resistive conductor strips connected in parallel between said bond pad and the semiconductor device, each said conductor strip being constructed of a material which exhibits a positive temperature coefficient with



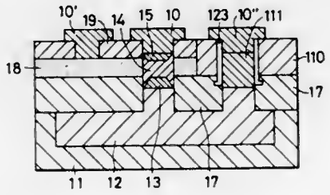
respect to resistance, and having a resistance substantially identical to the other conductor strips.

4,825,281

BIPOLAR TRANSISTOR WITH SIDEWALL BARE CONTACT STRUCTURE

Kazuo Nakazato, Kokubunji; Tohru Nakamura, Houya; Masatoshi Matsuda, Fuchu; Takao Miyazaki, Hachioji; Tokuo Kure, Kokubunji; Takahiro Okabe, Nishitama, and Minoru Nagata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1982, Ser. No. 435,552
Claims priority, application Japan, Oct. 28, 1981, 56-171443
Int. Cl.⁴ H01L *29/72, 29/34, 29/04, 23/48*
U.S. Cl. 357—59 **5 Claims**



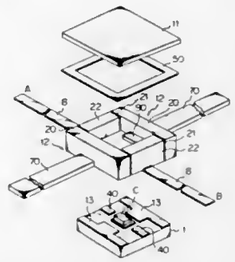
1. A semiconductor device comprising a first insulating film which is formed on a surface region of a semiconductor substrate and which has a plurality of openings; an active transistor region having an emitter, a base and a collector, said active transistor region being formed in a semiconductor region protruding from said semiconductor substrate into one of said openings of said first insulating film; a polycrystalline silicon film which is formed on a desired area of said first insulating film in contact with a side part of said base; a first electrode which is connected to said semiconductor substrate in another of said openings of said first insulating film; a second insulating film which is deposited on said polycrystalline silicon film and on the first insulating film near to said polycrystalline silicon film and which has a plurality of openings; a second electrode which is connected to said polycrystalline silicon film in a desired one of said openings of said second insulating film; and a third electrode which is connected to an upper exposed area of said active transistor region in another of said openings of said second insulating film; a semiconductor layer of low resistance being interposed between said first electrode and said semiconductor substrate; a third insulating film being formed on an exposed surface of said first insulating film, wherein an SiO_2 film and an Si_3N_4 film are stacked and deposited on a side part of said semiconductor layer of low resistance.

4,825,282

SEMICONDUCTOR PACKAGE HAVING SIDE WALLS, EARTH-BONDING TERMINAL, AND EARTH LEAD FORMED IN A UNITARY STRUCTURE

Jun Fukaya, Shinjuku, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 42,626, Apr. 23, 1987, abandoned, which is a continuation of Ser. No. 822,514, Jan. 27, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 147,633
Claims priority, application Japan, Jan. 30, 1985, 60-015904; Sep. 19, 1985, 60-207503; Sep. 19, 1985, 60-142994[U]
Int. Cl.⁴ H01L *23/48, 23/02, 39/02*
U.S. Cl. 347—74 **5 Claims**



1. A semiconductor device comprising:

a ceramic base plate for supporting a semiconductor chip mounted thereon;

side walls disposed on said ceramic base plate to surround said semiconductor chip;

an input lead piece and an output lead piece, both being connected to said semiconductor chip and extending outward from said side walls;

at least one earth lead piece extending outward from said side wall between the positions from where said input and output lead pieces are taken out,

wherein said side walls at said positions from where said input and output lead pieces are taken out are made of electrical insulation material and wherein said side wall at the position from where said earth lead piece is taken out is made of metal as one body integral with a bonding terminal extending inward of said side wall and said earth lead piece extending outward of said side wall;

a sealing metal portion disposed on said metal side walls and on said electrically insulating side walls; and

a cap disposed on said sealing metal portion to sealingly cover the semiconductor chip surrounded by said side walls.

4,825,283

IC CARD

Katsuhide Shino, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

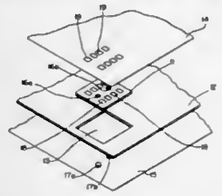
Filed Jun. 22, 1987, Ser. No. 65,288
Claims priority, application Japan, Jul. 3, 1986, 61-102762[U]
Int. Cl.⁴ H01L *23/02, 23/12;* **H02G** *13/08*
U.S. Cl. 357—74 **9 Claims**

1. An IC card comprising

an upper sheet,

a lower sheet which is substantially parallel to said upper sheet,

a module disposed between said upper and lower sheets, and at least one supporting piece secured to at least either one of said upper and lower sheets, said at least one supporting



piece penetrating said module and improving strength of said card against bending.

4,825,284

SEMICONDUCTOR RESIN PACKAGE STRUCTURE

Tasao Soga; Marahiro Goda; Fumio Nakano, Hitachi; Tadao Kushima, Ibaraki; Nobuyuki Ushifusa, Hitachi; Fumiyuki Kobayashi, Sagamihara, and Mamoru Sawahata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,485
Claims priority, application Japan, Dec. 11, 1985, 60-276807
Int. Cl.⁴ H01L *39/02*
U.S. Cl. 357—80 **20 Claims**

1. A semiconductor resin package structure formed according to flip-chip connection method and permitting the rear surface of a semiconductor chip to be cooled, comprising:

a semiconductor chip; and

a carrier substrate which is solder on one surface thereof to electrodes of a front face of said semiconductor chip according to the flip-chip connection method wherein solder connections extend from the carrier substrate to electrodes on said semiconductor chip to form a gap between the carrier substrate and the semiconductor chip, the gap between said semiconductor chip and said carrier substrate being filled with resin having a thermal expansion coefficient which is equal to that of the solder forming the solder connections, the electrodes of said semiconductor chip being electrically connected with terminals on the other surface of said carrier substrate through the solders connections and at least one through-hole conductor disposed within said carrier substrate, the thermal expansion coefficient of said carrier substrate being approximately equal to that of a multi-layer substrate, with which said carrier substrate is connected by soldering with said terminals; solder for connecting said carrier substrate with said multi-layer substrate having a melting point that is lower than the melting point of the solder for connecting said semiconductor chip with said carrier substrate.

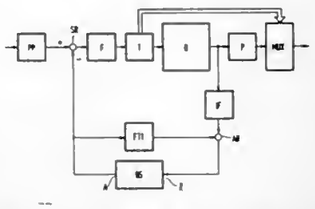
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4,825,285

HYBRID ENCODER

Joachim Speidel, Nuremberg, and Peter Vogel, Diepersdorf, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1987, Ser. No. 38,809
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—133 **10 Claims**



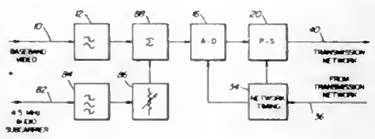
1. A hybrid encoder for encoding video signals which represent picture elements of a video picture and which are arranged in equally large data blocks, each data block being compared with the corresponding data block of the previous video picture by means of a subtractor and the corresponding data block of the previous video picture being derived from a picture store; a difference block being obtained by the subtractor and supplied to a first processing circuit (F) which subjects said difference block to a matrix transformation, such transformation being inversed in a feedback path by a second processing circuit (IF) with the inverse matrix to regain said difference block; the regained difference block being applied to a first input of an adder and data blocks from the picture store being applied to a second input of the adder, the output of the adder being connected to the data input of the picture store; characterized in that the first processing circuit (F) is succeeded by a third processing circuit (T) which performs a matrix transformation having a low-pass character on the transformed blocks from the first processing circuit (F) and in that a fourth processing circuit (FTI) is arranged between the output (A) of the picture store (BS) and the second input of the adder (AR); said fourth processing circuit performing a matrix transformation which has the same effect as the successively performed matrix operations of the first (F), third (T) and second (IF) processing circuits.

4,825,286

DIGITIZATION OF VIDEO SIGNALS

Alan F. Graves, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 19, 1988, Ser. No. 246,066
Claims priority, application Canada, Aug. 4, 1988, 573872
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—143 **36 Claims**



1. A method of converting an analog video signal within a predetermined bandwidth into a digital signal, comprising the steps of:

combining with the analog video signal a second signal having a frequency greater than the predetermined bandwidth to produce a combined signal; and

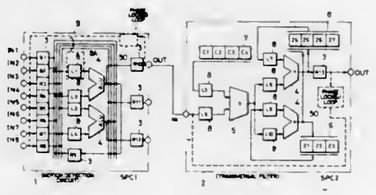
converting into a digital signal samples of the combined signal at a sampling frequency which i at least twice the frequency of the second signal.

4,825,287

DIGITAL VIDEO SIGNAL PROCESSOR

Toru Baji, Kodaira; Tatsuji Matsuura, Kokubunji; Toshiro Tsukada, Hachioji, and Shinya Ohba, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 63,476
Claims priority, application Japan, Jun. 20, 1986, 61-142998; Jul. 11, 1986, 61-161843; Aug. 15, 1986, 61-190519
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—160 **4 Claims**



1. A digital video signal processor comprising:

(1) a first signal processing core for processing a plurality of digital video signals, said first signal processing core having an M_{A1} number of arithmetic logic units and an M_{M1} number of multipliers; and

(2) a second signal processing core having its input responding to an output of said first signal processing core for filtering said output of said first signal processing core, said second signal processing core having an M_{A2} number of arithmetic logic units and an M_{M2} number of multipliers,

wherein, a sampling time shared between said first and second signal processing cores is designated as T;

processing times of said arithmetic logic units of said first and second signal processing cores are designated as τ_{A1} and τ_{A2}, respectively;

processing times of said multipliers of said first and second signal processing cores are designated as τ_{M1} and τ_{M2}, respectively;

a number of program steps of said first and second signal processing cores are designated as P_1 and P_2, respectively;

a number of additions and subtractions of said first and second signal processing cores are designated as N_{A1} and N_{A2}, respectively; and

a number of multiplications of said first and second signal processing cores are designated as N_{M1} and N_{M2}, respectively, and wherein said digital video signal processor is time-multiplexed by using numbers M_{A1} and M_{M2} of said arithmetic logic units and said multipliers respectively, wherein the following relations are satisfied

$$N_{Ai} \leqq P_i M_{Ai};$$

and

$$N_{Mi} \leqq P_i M_{Mi} (i = 1, 2); \text{ and}$$

at program step P_i the following relations are satisfied

$$\tau_i = \max(\tau_{Ai}, \tau_{Mi});$$

and

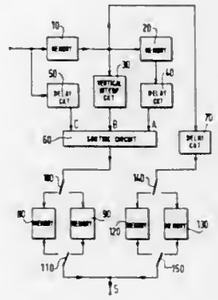
$$T/\tau_i \geqq P_i (i = 1, 2).$$

4,825,288

METHOD AND APPARATUS FOR PROCESSING VIDEO SIGNALS

Olivier Chanteiou, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 16, 1987, Ser. No. 40,452
Claims priority, application France, Apr. 25, 1986, 8606031
Int. Cl.[4] H04N *5/14, 5/44*
U.S. Cl. 358—166 **3 Claims**



2. A video signal converter comprising:

(a) a vertical filtering circuit for calculating, at each element point of a first given line of the video signal, a value resulting from weighting values representing said video signal and assigned to the element points in corresponding horizontal positions but belonging at least to two lines adjacent to the first line in a first field of lines comprising said first given line;

(b) a video signal selection circuit coupled to said vertical filtering circuit for sorting and choosing an intermediate value among values thus sorted, a sorting operation being effected on a plurality of values, one of which is a value obtained at the end of the vertical filtering operation and the other values of which are those assigned to element points of the same position as said element point of the first line but belonging at least to the field preceding and the field subsequent to said first field; and

(c) a non-interlaced final picture reconstitution circuit coupled to said video signal selection circuit for generating a non-interlaced video signal, the first line of said picture being constituted alternately by a corresponding line of an initial picture when said corresponding line is present, and by a line comprising values provided by said filtering and selection operations when said corresponding line is not present.

4,825,289

NOISE REDUCTION APPARATUS FOR VIDEO SIGNAL

Haruo Ohta, Yawata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 10, 1987, Ser. No. 119,065
Claims priority, application Japan, Nov. 11, 1986, 61-268007
Int. Cl.[4] H04N *5/21*
U.S. Cl. 358—167 **16 Claims**

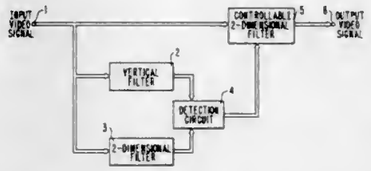
1. A noise reduction apparatus comprising:

a vertical filter means for extracting a component in a high vertical frequency region from an input video signal;

a two-dimensional filter means for extracting a component in a low vertical frequency region and a high horizontal frequency region from the input video signal;

a detecting means which receives an output signal of said vertical filter means and an output signal of said two-dimensional filter means and outputs a detection signal according to amplitudes of said output signals; and

a controllable two-dimensional filter means controlled by said detection signal output from said detecting means for



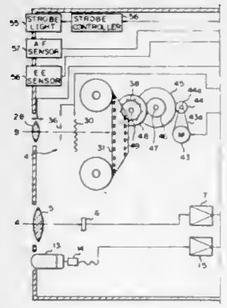
suppressing a noise component in said high vertical frequency region to obtain a video signal with reduced noise.

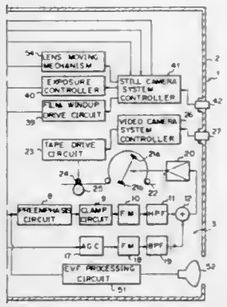
4,825,290

CAMERA FOR SHOOTING MOVIE AND STILL IMAGES

Toshiharu Iida, and Akio Serizawa, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Sony Corporation, Tokyo, both of, Japan

Filed Dec. 15, 1987, Ser. No. 133,299
Claims priority, application Japan, Dec. 16, 1986, 61-297459
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—209 **8 Claims**





1. A camera for shooting movie and still images comprising:

a video camera unit including an imaging optical system for imaging an object, said imaging optical system outputting signals representative of a movie image of the object which are recorded on a magnetic tape; and

a still camera unit for recording a still image of said object on a photographic film, said still camera unit including,

windup means for winding up the film,

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motor drive means for supplying a driving force causing said windup means to wind up the film and

driving force imparting means for imparting the driving force from said motor drive means to said windup means,

said driving force imparting means including at least two rotational force imparting members each having smooth surfaces contacting each other so as to impart a rotational force to said winding means through a contact between said smooth surfaces.

4,825,291

SOLID-STATE TELEVISON CAMERA WITH STORAGE TIME CONTROLLER

Itaru Mimura, Hachioji; Kazuhiro Sato, Setagaya; Toshiyuki Akiyama, Tokorozawa; Naoki Ozawa, Kokubunji; Koji Kudo, Hachioji; Kenji Takahashi, Tsukui, and Yoshizumi Eto, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

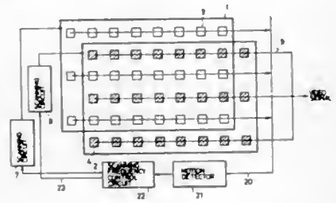
PCT No. PCT/JP87/00034, § 371 Date Sep. 24, 1987, § 102(e) Date Sep. 24, 1987, PCT Pub. No. WO87/04581, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 21, 1987, Ser. No. 108,827

Claims priority, application Japan, Jan. 24, 1986, 61-12126; Mar. 10, 1986, 61-50370; Aug. 13, 1986, 61-188441; Aug. 13, 1986, 61-188437

Int. Cl.[4] H04N *5/30*; G03B *7/08*

U.S. Cl. 358—213.19 13 Claims



1. A solid-state television camera comprising:

a first group of photoelements for storing signal charges in accordance with the illuminance of an object;

a second group of photoelements for storing the signal charges in accordance with the illuminance of said object;

first scanning means for reading out the signal charges of said first group at a predetermined frequency;

second scanning means for reading out the signal charges of said second group at a predetermined frequency;

motion detection means for detecting motion of said object on the basis of the signal charges read out from said first group; and

frequency control means for controlling the frequency of said second scanning means on the basis of a signal from said motion detection means.

4,825,292

PICTURE PICK-UP DEVICE INCLUDING A SOLID-STATE SENSOR AND OPERATING WITH A SIGNAL INTERFERENCE REDUCTION

Engel J. Kalbbe, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

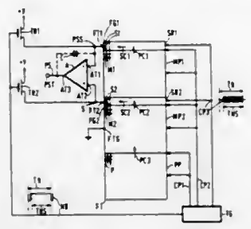
Filed Jan. 20, 1988, Ser. No. 145,859

Claims priority, application Netherlands, Jan. 27, 1987, 8700188

Int. Cl.[4] H04N *3/15*

U.S. Cl. 358—213.24 2 Claims

1. A picture pick-up device including a solid-state sensor and operating with a signal interference reduction, said sensor comprising a picture pick-up member and first and second shift register members, said picture pick-up member being formed with picture pick-up elements which are sensitive to picture information from a scene to be recorded, each of said first and second shift register members being controllable by clock pulse signals and being formed with at least one parallel-in, series-out shift register having a controllable parallel input coupled with said picture pick-up elements, the first shift register member having a series output coupling with a first output of the sensor and the second shift register member having a series output coupling with a second output of the sensor, said first and second outputs of the sensor supplying a signal with picture information and interference and a signal with interference only, respectively, by means of clock pulse control of the first and second shift register members, said picture pick-up device, for obtaining the interference reduction, further including a differential amplifier having a non-inverting and an inverting input coupled to the first and the second outputs,



respectively, of the sensor and an output for supplying a signal with picture information and reduced interference, characterized in that during the period when the differential amplifier is effectively operative for the interference reduction, the first or second output of the sensor has a DC connection with an electrically floating potential to the non-inverting input of the signal amplifier and the second or first output of the sensor has a DC connection to the inverting input of the differential amplifier, respectively, the first and second sensor outputs having a capacitive output impedance, wherein the differential amplifier is of a type having a current output, in which capacitances between said DC connections and ground are smaller by a factor of the order of at least ten as compared with capacitances between the respective sensor outputs and an associated semiconductor region in a substrate of the sensor.

4,825,293

SENSITIVITY COMPENSATING METHOD FOR SOLID-STATE IMAGE PICKUP ELEMENT USED IN ELECTRONIC STILL CAMERA

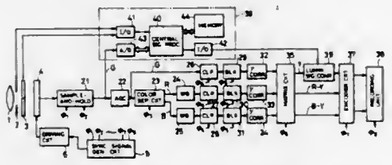
Kiyotaka Kobayashi; Masatoshi Tabei; Madoka Arashi, and Yuzo Mizobuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1987, Ser. No. 109,014

Claims priority, application Japan, Oct. 16, 1986, 61-244033; Oct. 16, 1986, 61-244036; Jan. 26, 1987, 62-14247

Int. Cl.[4] H04N *5/235*

U.S. Cl. 358—228 9 Claims



1. A photographing method for a camera having an iris for setting an aperture setting value, a shutter, a solid-state image pickup for sensing an input image received by said pickup and for providing an output having an output level, and means for

producing a video output signal in response to said output of said pickup, comprising the steps of:

determining when a shutter speed of said shutter exceeds a predetermined value; and

compensating a drop in said output level of said pickup which occurs when said shutter speed exceeds said predetermined value so as to maintain a predetermined relationship between said image and said video output signal.

4,825,294

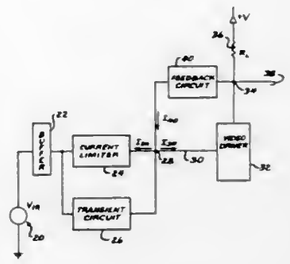
ANTI-FLARING VIDEO OUTPUT AMPLIFIER CIRCUIT AND TECHNIQUE

Fred D. Johnson, Evanston, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 7, 1987, Ser. No. 106,078

Int. Cl.[4] H04N *5/68*

U.S. Cl. 358—243 10 Claims



1. Video display apparatus comprising:

video driver means having an input for receiving video signals and an output at which a video drive signal is presented and feedback provided between said input and output;

current limiting means, comprising at least one junction diode reversed biased with respect to said video driver means, coupled between said input and said video signal source and responsive to said feedback means and said received video signals to limit the signal level at the input of said driver means; and

transient response means coupled in parallel with said current limiting means to provide response to transients in said input signal from said video signal source.

4,825,295

IMAGE READING APPARATUS

Tadashi Ishikawa, Urawa; Yoshitaka Watanabe, Tokyo; Toyokazu Mizogui, Kawasaki; Takao Kinoshita, Tokyo; Akihiko Tojo, Yokohama; Yasutomo Suzuki, Yokohama, and Yoshiyuki Mizoguchi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1986, Ser. No. 894,195

Claims priority, application Japan, Aug. 9, 1985, 60-176083; Feb. 24, 1986, 61-27488; Mar. 26, 1986, 61-66032; Mar. 28, 1986, 61-68507; May 14, 1986, 61-108489

Int. Cl.[4] H04N *5/64*

U.S. Cl. 358—254 30 Claims

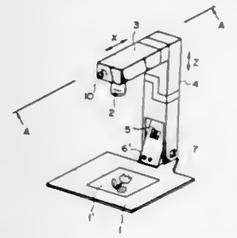
1. An image reading apparatus comprising:

(a) a mounting plate for mounting an image to be read;

(b) supporting means connected to said mounting plate;

(c) means, supported by said supporting means, for converting the image to an electric signal; and

(d) monitor display means, supported by said supporting means, for displaying an image on a basis of the electric signal;



wherein a length of said supporting means is variable, and wherein both said means for converting and said monitor display means are mounted on said supporting means.

4,825,296

METHOD OF AND APPARATUS FOR COPYING ORIGINALS IN WHICH AN IMAGE TO BE PRINTED IS EVALUATED BY OBSERVING A CORRESPONDING LOW-RESOLUTION VIDEO IMAGE

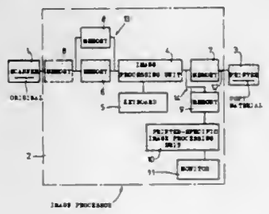
Eduard Wagensonner, Aschheim; Hermann Fuchsberger, Ismaning, and Wolfgang Ruf, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,941

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629462

Int. Cl.[4] H04N *1/40, 1/46*

U.S. Cl. 358—280 25 Claims



1. A method of copying originals, comprising the steps of scanning at least one original; generating raw imaging signals based on the scanning step; transmitting said raw signals along a predetermined path; storing said raw signals in a first part of said path; correcting said raw signals in a second part of said path downstream of said first part; converting a portion of the corrected signals into a video image; storing the corrected signals in a third part of said path downstream of said second part; converting said corrected signals into a printable image in a fourth part of said path downstream of said third part; printing said printable image in said fourth part to produce a printed image, said fourth part including a printer; and subjecting said portion of the corrected signals to printer-specific processing so as to cause said video image to correspond to said printed image, the subjecting step being performed prior to the step of converting said portion of the corrected signals into said video image.

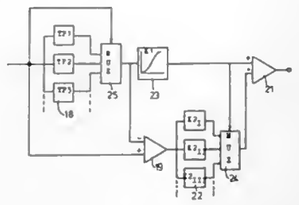
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4,825,297

METHOD OF AND APPARATUS FOR ELECTRONIC CONTRAST ENHANCEMENT OF REPRODUCTIONS OF TWO-DIMENSIONAL TRANSPARENT ORIGINAL IMAGES

Hermann Fuchsberger, Ismaning, and Eduard Wagensonner, Aschheim, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,865
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629409
Int. Cl.[4] H04N *1/40, 1/46, 5/14, 9/64*
U.S. Cl. 358—284 9 Claims



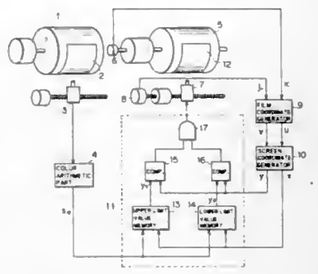
1. In a method of electronic contrast enhancement of reproductions of two-dimensional transparent original images in which the original images are scanned along rows and columns, and original image signals corresponding to image elements of the original images are subjected to frequency filtering in a low-pass filter and in which the resulting low-pass signals are added to high-pass signals obtained by subtracting said low-pass signals from said original image signals, the improvement comprising: providing a non-linear transfer characteristic curve K2; amplifying said high-pass signals in accordance with said characteristic curve K2 in such a manner that smaller signals corresponding to lower image contrasts are amplified more (slope S1) than larger signals corresponding to higher image contrasts (slope S2); and modifying said lowpass signals according to a non-linear gradation characteristic curve K1 before the addition of said high-pass and low-pass signals.

4,825,298

HALFTONE DOT-GENERATOR AND GENERATING METHOD

Kunio Ikuta, and Masayuki Murai, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 18, 1988, Ser. No. 196,332
Claims priority, application Japan, May 26, 1987, 62-128760
Int. Cl.[4] H04N *1/23*
U.S. Cl. 358—298 8 Claims



1. A halftone dot generator for use in a recording system for recording a halftone dot image on a photosensitive material by an exposure beam, comprising:

means for detecting a position of said exposure beam on said photosensitive material;

means for converting said position of said exposure beam as detected into virtual screen coordinates (x, y) in a prescribed screen angle and a prescribed screen ruling;

means for providing an image signal corresponding to said position of said exposure beam as detected; and

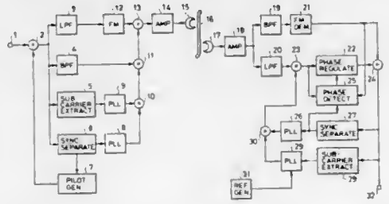
means for receiving said coordinates (x, y) and said image signal to provide a control signal indicating lighting of said exposure beam when one of said coordinates (x, y) as received is in between an upper limit value and a lower limit value which are previously determined for each combination of the other one of said coordinates (x, y) and a density value of said image signal.

4,825,299

MAGNETIC RECORDING/REPRODUCING APPARATUS UTILIZING PHASE COMPARATOR

Yoshinori Okada; Shigemitsu Higuchi; Hiroaki Takahashi; Yasufumi Yunde, and Takashi Furuhata, all of Kanagawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 31, 1987, Ser. No. 91,452
Claims priority, application Japan, Aug. 29, 1986, 61-201423
Int. Cl.[4] H04N *9/89*
U.S. Cl. 358—323 8 Claims



1. A video signal recording/reproducing device comprising:

means for dividing a video signal into at least a high frequency band and a low frequency band;

means for frequency-modulating a signal component of said low frequency band;

first frequency conversion means for frequency-converting a signal component of said high frequency band to a low frequency;

means for recording an output of said frequency modulating means and an output of said first frequency conversion means on a recording medium;

means for reproducing said recorded outputs of said frequency modulating means and said first frequency conversion means;

second frequency conversion means for frequency-converting a low frequency converted component of said reproduced signal;

means for demodulating said frequency modulated signal component;

means for adding an output of said second frequency conversion means to an output of said frequency demodulating means;

means for recording an additional signal on said recording medium;

means for reproducing said additional signal recorded on said recording medium;

means responsive to said reproduced additional signal for detecting a phase difference between a recording system including said first frequency conversion means and said video signal recording means and a reproducing system including said second frequency conversion means and said video signal reproducing means;

means for regulating said detected phase difference; and

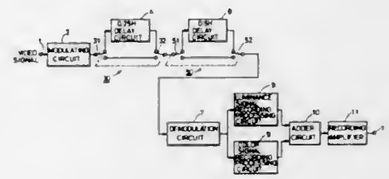
control means responsive to an output of said detecting means for controlling said regulating means to correct said detected phase difference.

4,825,300

MAGNETIC VIDEO RECORDING SYSTEM AND METHOD WITH HORIZONTAL SYNCHRONIZATION INTERVAL ALIGNMENT

Nobuyasu Omori, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1984, Ser. No. 679,921
Claims priority, application Japan, Feb. 2, 1984, 59-18561
Int. Cl.[4] H04N *9/80*
U.S. Cl. 358—328 17 Claims



1. A magnetic video recorder having a recording means for recording a video signal on a recording medium and switchable between a standard time recording mode and a long recording mode, said recording means including:

switching signal generation means for generating first and second switching signals;

first delay means receiving video signals in its input end for delaying said video signals;

first switching means receiving said input video signals in said input end of said first delay means and video signals delayed by said first delay means for performing a first switching operation in response to said first switching signal generated from said switching signal generation means for outputting said input video signals or said signals delayed by said first delay means;

second delay means receiving output signals from said first switching means in its input end for delaying said signals outputted from said first switching means;

second switching means receiving said output signals from said first switching means and output signals from said second delay means for performing a second switching operation in response to said second switching signal generated from said switching signal generation means and outputting said output signals from said first switching means or said signals delayed by said second delay means;

luminance signal processing means receiving said output signals from said second switching means in its input end for processing liminance signal components of said video signals outputted from said second switching means;

color signal processing means receiving said output signals from said second switching means in its input end for processing color signal components of said video signals outputted from said second switching means;

adder means for adding up said luminance signal components processed by said luminance signal processing means and said color signal components processed by said color signal processing means, and

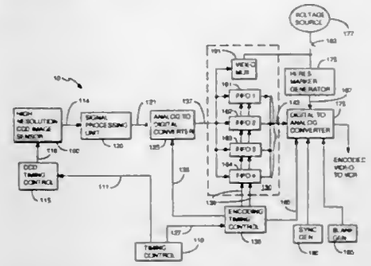
means responsive to said adder means for recording said video signal on a recording medium.

4,825,301

APPARATUS FOR ENCODING AND DECODING HIGH RESOLUTION STILL IMAGES AND VIDEO IMAGES FOR RECORDING ON A STANDARD STORAGE MEDIA

David D. Pape, and Allan C. Green, both of Framingham, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 16, 1987, Ser. No. 74,773
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 17 Claims



1. Apparatus for encoding electronic still image information signals of the type which can be provided from an image sensor having a plurality of image sensing areas or pixels arranged in rows and columns for recording on a conventional recording media comprising:

timing control means for selecting a substantially like number of different electronic still image information signals for each of a plurality of different groups of electronic still image information signals wherein the electronic still image information signals of each group correspond, respectively, to a select order of different pixels of the image sensor, said pixels of each group being spaced apart along a row of the image sensor by at least one pixel from each of the other groups of electronic still image information signals for that row; and

means for storing said plurality of different groups of electronic still image information signals, said timing control means being thereafter operative for retrieving said groups of electronic still image information signals one group at a time in a selected sequence from said storing means to provide an output signal for recording one group at a time on a conventional recording media.

4,825,302

VIDEO RECORDING CAMERA

Nobuo Tezuka; Nobuaki Date; Syuichiro Saito, all of Kanagawa, and Suzumu Kozuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 691,756, Jan. 15, 1985, abandoned. This application Nov. 19, 1987, Ser. No. 122,518
Claims priority, application Japan, Jan. 20, 1984, 59-8772; Jan. 20, 1984, 59-8773; Jan. 20, 1984, 59-8774; Jan. 20, 1984, 59-8775; Jan. 20, 1984, 59-8776
Int. Cl.[4] H04N *5/781*
U.S. Cl. 358—335 27 Claims

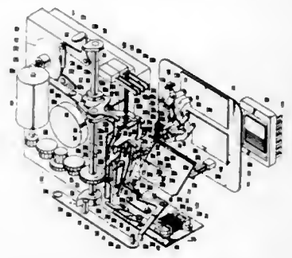
19. An image recording apparatus for recording an image pick-up signal on a medium comprising:

(a) image pick-up means for producing an image pick-up signal corresponding to an image;

(b) means for recording said pick-up signal on a medium, said recording means including a recording head and a mechanism for moving said head on the medium; and

(c) a common drive device for driving said moving mecha-

nism, said common device driving said moving mechanism and an element of a mechanism for setting said appa-



ratus in a ready state capable of photographing, at different drive intervals.

4,825,303

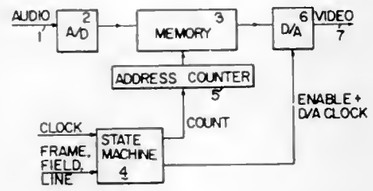
COMPRESSED AUDIO SILENCING

Robert E. Yablonski, Irvine, and John A. Roe, Orange, both of Calif., assignors to EECO Incorporated, Irvine, Calif.

Continuation of Ser. No. 621,387, Jun. 18, 1984, abandoned. This application May 18, 1987, Ser. No. 52,169

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—335 **7 Claims**



1. The method of operating a television-compressed-audio sound system in which electrical amplitude variation samples that originally represented sound are raised infrequency and are altered to a video signal format, which includes the method step of:

(a) adding a guard sample prior to the samples that are utilized on each video line of compressed audio to allow the amplitude of the signal to reach a steady state value by the time said samples are received and so avoid television-line-transient-produced spurious audio sounds, wherein said guard sample is equal in amplitude to a gray level half-way between black and white.

4,825,304

RECORDING DISC WITH SYNC INFORMATION DISPOSED IN RADIAL ALIGNMENT

Yoshikazu Kobayashi, Kawasaki, Japan, assignor to Nippon Columbia Kabushikikaisha, Tokyo, Japan

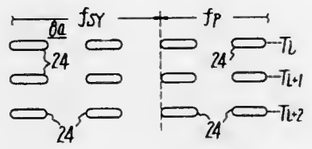
Continuation of Ser. No. 908,914, Sep. 18, 1986, abandoned, which is a continuation of Ser. No. 727,595, Apr. 26, 1985, abandoned, which is a division of Ser. No. 395,979, Jul. 7, 1982, Pat. No. 4,543,617. This application Sep. 28, 1988, Ser. No. 251,925

Claims priority, application Japan, Jul. 15, 1981, 56-110361

Int. Cl.[4] H04N *5/76*; **G11B** *7/00*

U.S. Cl. 358—342 **4 Claims**

1. A recording disc on which is recorded a frequency modulated (FM) signal provided by frequency-modulating a carrier signal by a recording signal including repeating synchronizing signals equal in width and level and generated by predetermined intervals, said FM signal having a higher frequency than said recording signal and being recorded on concentric or spiral tracks on the recording surface of said disc in the form of spaced dots, the distance between adjacent waveforms of said FM signal, each of said repeating synchronizing signals comprising a series of dots, series of dots in each synchronizing signals being arranged in each of said tracks at predetermined



intervals from the series of dots in the next adjacent synchronizing signal, and the individual dots in each synchronizing signal being arranged in radial alignment with corresponding dots in the corresponding synchronizing signal in the next radially adjacent track whereby the individual corresponding dots in all of said synchronizing signals recorded on said disc lie in predetermined radii relative to the center of said dots.

4,825,305

APPARATUS FOR RECORDING AND REPRODUCING DIGITAL USING DYNAMIC RANGE COMPRESSION

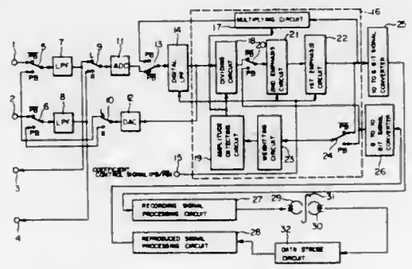
Shigeyuki Itoh, Yokohama; Yoshizumi Watatani, Fujisawa, and Akitoshi Tsunoka, Kamakura, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video Engineering Incorp., Kanagawa, both of, Japan

Filed Jul. 24, 1987, Ser. No. 77,175

Claims priority, application Japan, Jul. 28, 1986, 61-175616

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—8 **9 Claims**



1. A magnetic recording/reproducing apparatus for recording/reproducing digital signals via a plurality of rotary heads, comprising:

means for converting an input analog signal into a digital signal;

means for compressing the dynamic range of said digital signal so as to reduce the number of bits of said digital signal; and

means for recording the output signal of said dynamic range compressing means on a recording medium and reproducing the recorded signal.

4,825,306

VIDEO TRANSLATION SYSTEM FOR TRANSLATING A BINARY CODED DATA SIGNAL INTO A VIDEO SIGNAL AND VICE-VERSA

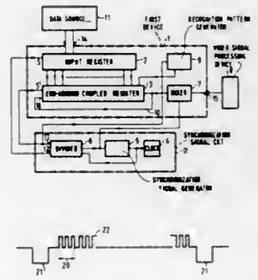
Klaas H. J. Robers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 634,902, Jul. 26, 1984, abandoned. This application Mar. 10, 1987, Ser. No. 24,902

Claims priority, application Netherlands, Aug. 8, 1983, 8302787

Int. Cl.[4] H04N *5/78*

U.S. Cl. 360—9.1 **7 Claims**



1. A video translation system comprising in combination

(a) a synchronization signal circuit generating television synchronization signals,

(b) a first device having a first connection terminal for receiving binary coded data signals from a data source and being provided for translating a received binary coded data signal into a video signal, said first device comprising

(i) a system of registers connected to said first connection terminal for receiving said binary coded data signals in the form of successive original data blocks and for storing temporarily each of said original data blocks, said system of registers having an input for receiving said television synchronization signals and comprising generating means for generating under control of associated television synchronization signals n copies of each of said original data blocks,

(ii) a mixer comprising a first input connected to said system of registers for receiving each original data block and its n copies, said mixer having a second input for receiving said associated television synchronization signals and forming for each original data block a data set having a predetermined number (n+1) of data blocks and associated television synchronization signals,

(iii) a video signal processing device connected to said mixer for receiving each of said data sets,

(c) a second device connected to said video signal processing device for translating each data set into a binary coded data signal, said second device comprising:

(i) a synchronization signal separating device for separating said associated television synchronization signals from each of said data sets received from said video signal processing device,

(ii) a shift pulse generator connected to said synchronization signal separating device for receiving said separated television synchronization signals of each video data set, said shift pulse generator generating in response to said separated television synchronization signals of each video data set a series of first shift pulses and for generating a second shift pulse each time n+1 series of first shift pulses are generated,

(iii) a recovery circuit including a majority circuit,

(iv) shifting means connected to said shift pulse generator and to an input of said recovery circuit, said shifting means having an input for receiving each said video set originating from said video signal processing device, said shifting means being provided for shifting into said recovery circuit under control of said first shift pulses the n+1 data blocks comprising each received video data set, and

(v) said recovery circuit receovering on the basis of a majority decision a corresponding binary coded data signal from each n+1 video data blocks in each received video data set and for outputting said corresponding binary coded data signal under control of a received second shift pulse.

4,825,307

INFORMATION SIGNAL RECORDING APPARATUS

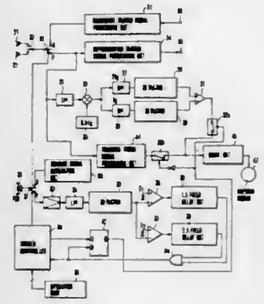
Mitsuhiro Otokawa; Hiroyuki Takimoto, both of Kanagawa; Keiji Satoh, Tokyo; Koji Takahashi, Kanagawa, and Hiroo Edakubo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1986, Ser. No. 912,586

Claims priority, application Japan, Sep. 30, 1985, 60-214831; Oct. 4, 1985, 60-220273

Int. Cl.[4] G11B *5/024*

U.S. Cl. 360—27 **18 Claims**



1. An information signal recording apparatus comprising:

(a) a first rotary head which is arranged to record an information signal on a recording medium;

(b) a second rotary head which is arranged to erase the information signal recorded on said recording medium; and

(c) determining means for determing timing for the start of recording the information signal by said first rotary head on the basis of a signal reproduced by the second rotary head, said determining means including a detecting circuit which detects the level of a signal reproduced by said second rotary head and a comparison circuit which compares the level detected by said detecting circuit with a predetermined level.

4,825,308

DATA PROCESSING SYSTEM

Masahito Fukushima, Hitachi; Eiji Matsuda, Takahagi; Shigeru Matsuoka, and Hitoshi Yonenaga, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,176

Claims priority, application Japan, Feb. 7, 1986, 61-23831

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—46 **7 Claims**

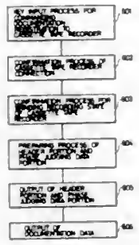
1. In a data processing system for use with a magnetic recording device serving as a data filing device for storing document data, the improvement comprising:

(a) first means for generating a first signal representing document data to be recorded by said magnetic recording device;

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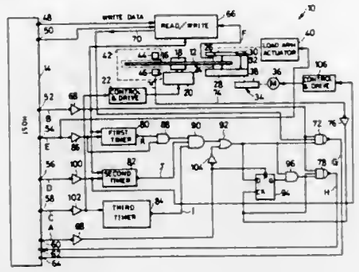
(b) second means connected to said first means for generating a second signal representing a header and a third signal of predetermined format representing phase judging data to be used to determine whether the phase of recording given document data by said magnetic recording device is the same as the phase of reproducing the same given document data by said magnetic recording device, and including means for appending said second and third signals in front of said first signal to produce a composite signal;
(c) third means coupled to said second means for sending said composite signal to said magnetic recording device for storage;
(d) fourth means for receiving a reproduced composite signal from said magnetic recording device;



(e) fifth means coupled to said fourth means for reading said reproduced composite signal with a timing having a first phase relationship to said signal or with a timing having a second phase relationship to said signal;
(f) sixth means coupled to said fifth means for detecting the portion of said reproduced composite signal formed by said third signal and for determining whether said third signal portion has said predetermined format; and
(g) seventh means coupled to said fifth means and said sixth means for controlling said fifth means to switch the phase relationship of the timing of reading of said reproduced composite signal by said fifth means when said sixth means detects that said third signal portion of said reproduced composite signal does not have said predetermined format.

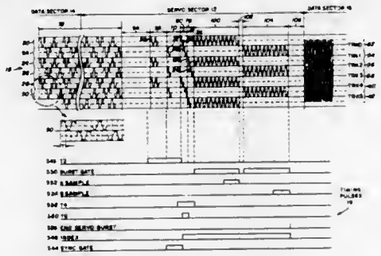
4,825,309
CIRCUIT ARRANGEMENT FOR THE SELECTIVE SUPPRESSION AND NONSUPPRESSION OF READ OUTPUT IN MAGNETIC DISK APPARATUS
Makoto Shoji, Akigawa, and Katsuya Enami, Houya, both of Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Nov. 10, 1987, Ser. No. 119,158
Claims priority, application Japan, Nov. 12, 1986, 61-269148
Int. Cl.[4] G11B *5/02, 21/08*
U.S. Cl. 360—60 **8 Claims**

1. A data transfer apparatus for use with a disklike record medium such as a flexible magnetic disk having data storage tracks thereon, comprising:
(a) disk drive means for imparting rotation to the record medium;
(b) a transducer for reading and writing data from and on the record medium;
(c) a read/write circuit connected to the transducer for producing read data in response to an output therefrom during reading and for causing the transducer to write desired data on the record medium;
(d) first signal supply means for supplying a stepping signal;
(e) transducer positioning means connected to the first signal supply means for stepping the transducer from track to track on the record medium in response to the stepping signal;
(f) a time setting circuit also connected to the first signal supply means for determining an access time to be elapsed from the moment the transducer starts traveling from one track on the record medium to a desired new track thereon in response to the stepping signal to the moment the transducer becomes stably positioned on the new track;
(g) second signal supply means for suppling a read-only mode signal having a first state dictating the operation of the apparatus in a write-only or read-and-write mode, and a second state dictating the operation of the apparatus in a read-only mode; and



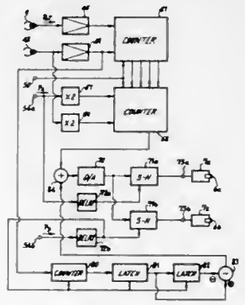
(h) a read data suppressor circuit connected to the read/write circuit and the time setting circuit and the second signal supply means and operating for suppressing, when the read-only mode signal is in the first state, the read data from the read/write circuit at least during the access time, the read data suppressor circuit constantly permitting the read data to pass unsuppressed therethrough when the read-only mode signal is in the second state.

4,825,310
METHOD AND APPARATUS FOR RECORDING SERVO SYNCHRONIZATION INFORMATION
Hubert Song, Sunnyvale, Calif., assignor to Konishiroku Photo Industries Co., Ltd., Tokyo, Japan
Filed Oct. 14, 1986, Ser. No. 918,502
Int. Cl.[4] G11B *5/82, 21/10*
U.S. Cl. 360—77.08 **4 Claims**



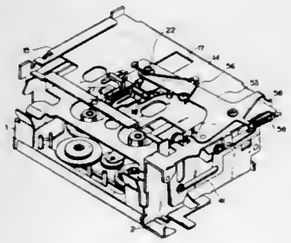
1. A magnetic disk comprising:
data sectors and servo sectors alternating on the surface of the disk, said data sectors and servo sectors each having a plurality of data tracks and servo tracks respectively, said servo tracks offset radially midway between said data tracks, each servo track being comprised of a gap section, a synchronization section following said gap section, and a burst section following said synchronization section, said servo tracks alternating between having a first synchronization mark and a second synchronization mark, said first synchronization mark is located in a first portion of said synchronization section and said second synchronization mark is located in a second portion of said synchronization section, said first synchronization marks are not radially aligned with said second synchronization marks, said servo tracks alternating between having a first servo burst and a second servo burst, said first servo burst is located in a first portion of said burst section and said second servo burst is located in a second portion of said burst section, said first servo bursts are not radially aligned with said second servo bursts, said second synchronization mark being distinguishable from said first synchronization mark such that a transducer head of a disk drive following the path of a data track will be able to read both said first synchronization mark and said second synchronization mark and the disk drive will be able to generate timing signals independently from either one of said first synchronization marks or one of said second synchronization marks for reading said first servo bursts and said second servo bursts in said burst section.

4,825,311
MAGNETIC REPRODUCING APPARATUS WITH HEAD POSITIONING CIRCUIT
Isao Saito, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 7, 1982, Ser. No. 385,934
Claims priority, application Japan, Jun. 9, 1981, 56-88367
Int. Cl.[4] G11B *5/592, 21/10*
U.S. Cl. 360—77.16 **8 Claims**



1. A control circuit for controlling the position of the heads in a magnetic reproducing apparatus of the kind having a plurality of rotary magnetic heads mounted on respective electromechanical transducer elements, said magnetic heads being displaceable in the transverse direction relative to the recorded tracks on a magnetic tape in response to control voltages applied to said respective transducer elements to effect correct scanning of said tracks by said heads and a pulse generator for generating a first pulse signal of a frequency dependent on a transport speed of said tape, said control circuit comprising:
a first counter for counting the pulses of said first pulse signal to produce a first count output each time one of said heads completes scanning of a track;
a second counter for adding to said first count output the number of pulses of a second pulse signal having a frequency which is an integral multiple of said frequency of said first pulse signal to produce a second count output;
a third counter responsive to the speed of said rotary heads and connected to count the pulses of said first pulse signal to produce a third count output upon each scan of a track by a head;
difference means connected to said third count output for producing a difference output representing the difference in count between successive ones of said third count outputs;
means for combining said difference output and said second count output for producing a summed signal; and
means responsive to the speed of said rotary heads for deriving control signals from said summed signal and said second count output fed to said transducer elements to preset the positions of said heads relative to said tracks before each head is to start scanning a respective track.

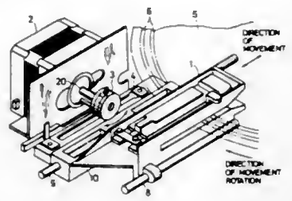
4,825,312
CASSETTE LOADING MECHANISM
Kikuo Yoshikawa; Takao Kanai; Katsumi Yamaguchi, and Syouichiro Yokoi, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan
Filed Mar. 24, 1987, Ser. No. 30,202
Claims priority, application Japan, Mar. 31, 1986, 61-74558
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.5 **6 Claims**



1. A cassette loading mechanism in a cassette tape player comprising:
a reversible motor;
a rotary member driven by said motor and having a driving pin at an eccentric position on a surface thereof;
a loading plate supported for reciprocal movement, having first and second cam portions and having means cooperable with said driving pin for reciprocally moving said loading plate between first and second positions substantially parallel to a straight line in response to rotational movement of said rotary member;
a guide arm pivotably supported on a stationary member and cooperable with said first cam portion, said guide arm being pivoted by said first cam portion between first and second positions in response to movement of said loading plate between its first and second positions, respectively;
a cassette holder supported on a free end of said guide arm;
a cassette guide having a contact portion engageable with a front end portion of a cassette and movable relative to said cassette holder between a cassette inserted position and a cassette ejecting position; and
a loading link pivotably supported on a stationary member, operatively coupled to said cassette guide, and cooperable with said second cam portion, reciprocal movement of said loading plate between its first and second positions causing said second cam portion to reciprocally pivot said loading link so as to reciprocally move said cassette guide between its cassette ejecting and cassette inserted positions, respectively.

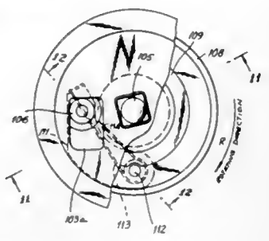
VOL 1101 ISS 4 AP 25 1989 UMI

4,825,313
METHOD FOR ADJUSTABLY POSITIONING A TRANSDUCER FOR A DISC DRIVE
Yoshihiro Moribe, Chigasaki; Mikio Takahashi, and Osamu Beppu, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 29, 1987, Ser. No. 8,251
Claims priority, application Japan, Jan. 29, 1986, 61-15652
Int. Cl.⁴ G11B *5/596*
U.S. Cl. 360—77.02 **18 Claims**



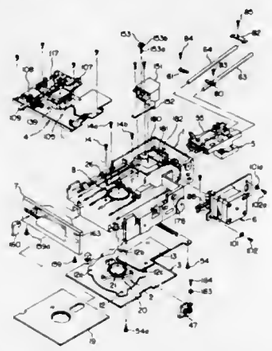
9. A method of adjusting the position of an object to be moved in a positioning mechanism making said object move forward and backward along a prescribed track and positioning the object at a plurality of target positions on said track, comprising:
a first step of calculating the displacement amounts of deviation of the object along the prescribed track, which results from the mechanical errors in dimensions of said positioning mechanism;
a second step of sampling and measuring amounts of deviation at three points at least in the course of the prescribed track, while the aforesaid object is being moved aliong the prescribed track;
a third step of comparing the amounts of deviation sampled by the aforesaid second step with those sampled by the first step and calculating the upper and lower limit values of deviation on the aforesaid prescribed track; and
a fourth step of adjusting the position of the object so that the upper and lower limit values of deviation obtained by said third step are averaged on the track.

4,825,314
DISC DRIVE
Nobuyoshi Maekawa; Hideya Yokouchi; Tomoe Aruga, and Tadashi Sugiyama, all of Suwa, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 746,095, Jun. 18, 1985, abandoned. This application Feb. 22, 1988, Ser. No. 161,362
Claims priority, application Japan, Jun. 22, 1984, 59-128955
Int. Cl.⁴ G11B *17/028*
U.S. Cl. 360—99.08 **39 Claims**



1. A disc drive for a disc having a first aperture and a second aperture, said disc drive having a disc rotating apparatus comprising:
a rotating shaft for being received within said first aperture of said disc;
a spindle hub means affixed to said shaft, said spindle hub means having a surface; and
a disc driving means operatively associated with said disc rotating apparatus, said disc driving means having a pin member for being received in the second aperture of said disc and a lever member having a first portion pivotally coupled to said disc rotating apparatus at a point removed form said rotating shaft and a second portion on which said pin member is supported, said pin member cooperating with said second aperture to cause said disc to rotate and to urge sides of said first aperture against said rotating shaft to center the disc thereof, the angle formed by a line connecting the axis of said pin member and said point and a second line connecting the axis of said shaft and said point defining an acute angle at all times.

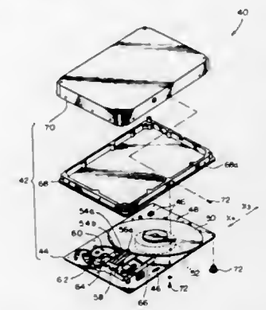
4,825,315
MAGNETIC DISC DRIVING DEVICE
Etsurou Hirose; Toshio Tsubaki; Takeshi Tokunaga, and Osamu Isoo, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 769,322, Aug. 26, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 105,806
Claims priority, application Japan, Sep. 7, 1984, 59-188293
Int. Cl.⁴ G11B *5/012*
U.S. Cl. 360—97.01 **10 Claims**



1. A magnetic disc driving device having a body, a control substrate member detachably disposed on a lower side of said body, said control substrate member incorporating a read-write circuit, a drive motor control circuit and a stepping motor control circuit, a head mechanism member detachably disposed on an upper side of said body, said head mechanism member comprising a carriage and a magnetic head, a stepping motor for moving said head mechanism member detachably disposed on a side of said body, said stepping motor having an output pulley, a means for transferring a torque of said stepping motor to said head mechanism member fixed on said output pulley of said stepping motor, a drive motor for rotating said magnetic disc mounted on said control substrate member, a mounting plate member detachably disposed on the upper side of said body, and a front panel having an insertion port for said magnetic disc detachably disposed on a front side of said body, wherein said stepping motor with said torque transfer means is fitted over a notch of said body from an upper side of said body, said torque transfer means penetrates through said notch, so that said stepping motor is disposed at an outside of said body, and wherein a collet mechanism member, a veil plate member of a head load mechanism member, and an on/-

off switch for said drive motor are installed on said mounting plate member.

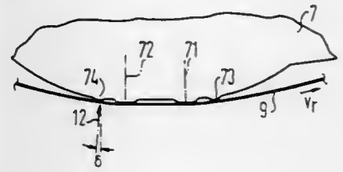
4,825,316
THERMAL DEFORMATION CONTROLLED ENCLOSURE FOR A DISK DRIVE SYSTEM
Toru Kishi, Zama, and Takashi Saito, Ayase, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan
Filed Jul. 10, 1987, Ser. No. 72,071
Claims priority, application Japan, Jul. 17, 1986, 61-168756
Int. Cl.⁴ G11B *17/02*
U.S. Cl. 360—97.02 **5 Claims**



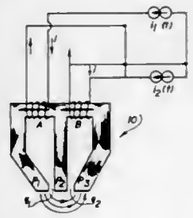
1. An enclosure for a disk drive having a disk driving section for causing a magnetic head to scan a magnetic disk which is driven in a rotational motion, the disk driving section including head transport means for causing the magnetic head to scan the recording medium and a spindle motor for supporting the magnetic disk and the head transport means, said enclosure comprising:
a first board constituting a base board of the enclosure and having a core formed from a sheet metal, said first board supporting said spindle motor thereon, said first board including a two-sided printed circuit board provided with a circuit pattern on each of an upper and a lower surface thereof on which circuit parts and elements are mounted;
a second board constituting a top board of the enclosure for hermetically confining the disk driving section in cooperation with the first board and formed from a sheet metal; and
a frame disposed between the first and second boards and formed from a molded plastic material;
the first board, second board and frame having substantially a same coefficient of linear thermal expansion.

4,825,317
MECHANISM FOR DAMPING TAPE VIBRATIONS IN A MAGNETIC TAPE RECORDER
Robert Rausch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 7, 1987, Ser. No. 70,795
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625249
Int. Cl.⁴ G11B *15/64*
U.S. Cl. 360—102 **18 Claims**

1. Mechanism for damping tape vibrations in a magnetic tape recorder having a tape drive, take-up and take-off reels with buffer chambers allocated thereto, a tape capstan located between the buffer chambers and adjacent a magnetic write-read head, the tape capstan being reversible in terms of a transport direction of the magnetic tape, said mechanism substantially eliminating deformations of the magnetic tape in the region of a transducing surface of the magnetic head, comprising:
a damping element mounted in juxtaposition to the transducing surface of the magnetic head and having a plurality of nozzles being under pressurization and forming a pneumatic air jet comb having an air jet output, axes of the nozzles being arranged in parallel in a plane lying transversely relative to the longitudinal direction of the magnetic tape and intersecting the magnetic tape in a region of a leading ledge of the transducing surface with a slight angle of deviation from the direction vertical to a surface of the magnetic tape so as to provide a slight force component of the air jet output in the direction of transportation of the magnetic tape relative to the magnetic head.



4,825,318
COMPOUND READ/WRITE ELEMENT FOR RIGID MAGNETIC DISK FILES
Stanley S. K. Hoo, San Jose, Calif., and Mark E. Re, Wheaton, Ill., assignors to Carnegie-Mellon University, Pittsburgh, Pa.
Filed Jun. 5, 1987, Ser. No. 58,827
Int. Cl.⁴ G11B *5/27, 5/18*
U.S. Cl. 360—121 **22 Claims**



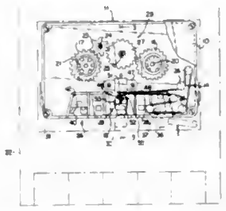
1. An inductive read/write head element comprising three spaced apart poles P_1, P_2 and P_3, pole P_2 comprising the center pole, each of said poles having a flux path extending from said head element; first and second electrical coils positioned about said flux paths for inducing a flux in said flux paths; and electrical insulation disposed between the flux paths and the coils, said poles P_1, P_2 and P_3, flux paths, first and second electrical coils and insulation produced by thin film techniques.

4,825,319
CARTRIDGE-SHAPED CLEANING DEVICE
Sam Andreas, Astoria, N.Y., assignor to Recotos Corporation, Long Island City, N.Y.
Filed Jun. 26, 1987, Ser. No. 67,488
Int. Cl.⁴ G11B *5/41*
U.S. Cl. 360—128 **11 Claims**

1. A cartridge-shaped cleaning device adapted to clean a head and tape drive assembly of a cassette player and/or recorder unit of the type having a head provided with a face having a portion that lies in a plane, a recess capable of receiving a tape cassette, and tape transport means including a pair of spaced spindles to drive the tape of said cassette, and a pinch roller and capstan, said device comprising a cassette housing configured to fit within the recess; a drive system having first

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and second hub gears rotatably mounted in said housing and adapted to engage respective spindles of the player/recorder unit when the device is within said recess; transmission means operatively engaging said first and second hub gears for transferring a driving force from one hub gear to the other; a head cleaning assembly mounted in said housing having a cleaning element positionable against the head of the player/recorder unit the device is within said recess; and rotary drive means driven by said pinch roller and capstan and coupled to the head cleaning assembly and adapted to rotate the cleaning element about an axis substantially perpendicular to the plane of the face of the head of the player/recorder unit such that said cleaning element remains in contact with the face of the head



substantially throughout the rotational cleaning motion of said cleaning element, said rotary drive means comprising an endless belt for coupling the rotation of the pinch roller and capstan to the element assembly, an idler puller having an axis of rotation substantially parallel to the axis of rotation of said capstan and a driven pulley having an axis of rotation substantially perpendicular to the axis of rotation of said capstan, said driven pulley being mounted to said cleaning assembly for rotation therewith, said endless belt being routed between said capstan and said pinch roller and around both said idler pulley and said driven pulley so that rotation of said capstan and pinch roller causes a corresponding movement of said endless belt which belt, in turn, causes a corresponding rotation of said driven pulley.

4,825,320

CLUB MAGNETIC TAPE CASSETTE HAVING A PROTECTIVE LAYER

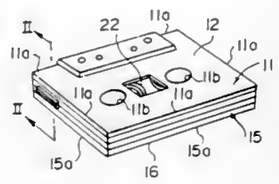
Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 23, 1987, Ser. No. 76,636

Claims priority, application Japan, Jul. 23, 1986, 61-112889[U]; Jul. 28, 1986, 61-115519[U]; Jul. 28, 1986, 61-115520[U]; Jul. 28, 1986, 61-115521[U]; Jul. 28, 1986, 61-177179

Int. Cl.⁴ G11B *23/04*

U.S. Cl. 360—132 **10 Claims**



1. A magnetic tape cassette, comprising: a cassette body; a pair of hubs housed for rotation in said cassette body; a magnetic tape wound around said hubs,

said cassette body being formed by injection molding of plastic material or the like; and a protective film layer on at least a part of the outer surface thereof, said protective film layer being bonded to the surface of said cassette body simultaneously with the molding of said cassette body by injecting molten material into a cavity of an injection mold with a protective film material being inserted into the cavity before injection.

4,825,321

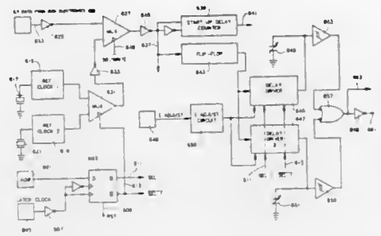
MODULAR UNITARY DISK FILE SUBSYSTEM HAVING INCREASED DATA STORAGE CAPACITY

Michael J. Hassel, Milpitas; Ian C. Felix, Campbell, and Claude E. Camp, Milpitas, all of Calif., assignors to Plus Development Corporation, Milpitas, Calif.

Filed May 20, 1987, Ser. No. 52,709

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—51 **3 Claims**



1. A data separator for a disk drive including a rotating disk having a data storage surface including a plurality of zones of concentric data tracks formed on a data storage surface of the disk rotated at substantially constant angular velocity when in operation, there being at least one outer zone of tracks for containing data recorded therein at a first data rate, and an inner zone of tracks for containing data recorded therein at a second data rate, the data separator comprising phase lock oscillator means for aiding decoding of data read from sectors of said disk surface, said phase lock oscillator means for automatically switching its frequency response characteristic in accordance with the selection of a said track as within a said zone so as to be responsive to data recorded at said first data rate and data recorded at said second data rate, said phase lock oscillator means including plural voltage controlled oscillator means, there being one voltage controlled oscillator means adapted for the data rate for each of said zones, and a single charge pump means for generating a control voltage in response to incoming data rate read back from the data surface, said control voltage being applied commonly to control the resonant frequencies of said plural voltage controlled oscillator means, and oscillator disable means supervised by user data controller means of said subsystem so that all of said voltage controlled oscillator means other than the one correlated to a zone in which the head transducer is located are automatically functionally disabled.

4,825,322

MAGNETIC-TAPE-CASSETTE APPARATUS WITH TWO-BUTTON CONTROL OF THREE FUNCTIONS

Norbert Kunze, Ehringshausen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 862,843, May 13, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 211,069

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518534

Int. Cl.⁴ G11B *5/008, 15/00, 17/00*

U.S. Cl. 360—96.3 **21 Claims**

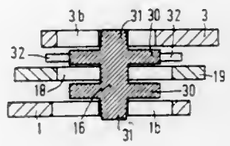
1. An apparatus comprising:

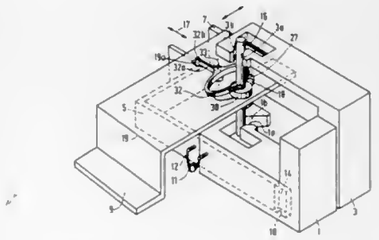
two button rods arranged for movement in the apparatus in a first direction to cause an apparatus part to perform a respective function, and for movement in a second direction,

two buttons, each connected to a respective rod for manual movement from an initial position for moving the rod in said first direction over a length of given travel,

a third rod, and

means responsive to simultaneous movement of said two buttons in said first direction for actuating said third rod to cause the apparatus to perform a further function, said means including a plurality of guide surfaces, a support, and a control member; said control member being connected via said support to said third rod, and being movable by one of said guide surfaces from a central position in a lateral direction transverse said first and second directions to enable a movement of one of said first and second





rods in said first direction without actuation of said third rod; and responsive to simultaneous movement of said two buttons, said guide surfaces blocking control member movement in said lateral direction, for actuating said third rod,

characterized by comprising positioning means including two further guide surfaces for urging said support and said control member to their central positions during movement of at least one of said two buttons in said second direction to the respective initial position, each of said further guide surfaces being fixed in position relative to a respective one of said plurality of guide surfaces, and

also characterized in that said third rod is directly moved in directions of movement parallel to said first and second directions.

4,825,323

OUT-OF-STEP BLOCKING UNIT

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, King of Prussia, Pa.

Filed Nov. 12, 1987, Ser. No. 120,149

Int. Cl.⁴ H02H *3/00*

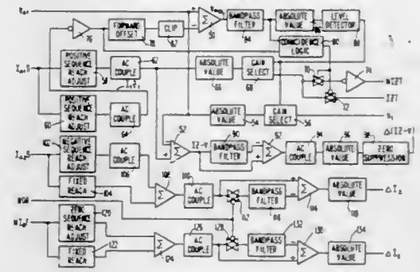
U.S. Cl. 361—65 **9 Claims**

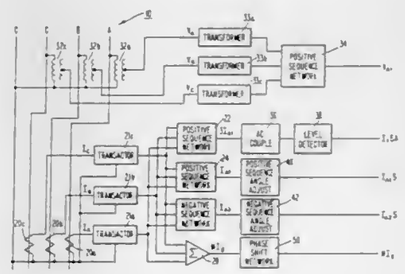
1. An out-of-step blocking unit of a protective relay for detecting power swings in a three phase alternating current electrical power distribution system, said unit comprising:

(a) means for receiving signals from a three phase power transmission line, which signals relate to the three phase voltages and currents;

(b) means for utilizing said signals related to the three phase voltages and currents to generate at least one operate signal having a first polarity;

(c) means for utilizing said signals related to the three phase voltages and currents to generate at least one restraint signal having a second polarity opposite said first polarity, said at least one restraint signal comprising a first restraint signal $\Delta(IZ-V)$, which signal is related to the difference between fault and prefault values of the $(IZ-V)$ quantity, where the signal IZ is related to the current I flowing in the power distribution system multiplied by a replica impedance Z of the protected zone and the signal V is





related to a phase voltage of the electrical power distribution system; and

(d) at least one summing circuit means, connected to receive said at least one operate signal and said at least one restraint signal, for producing a net operate signal having a polarity and a magnitude which is related to the vector sum of the magnitudes of said at least one operate signal and said at least one restraint signal.

4,825,324

STILL VIDEO CAMERA WITH CONTINUOUS PICTURE-TAKING MODE

Izumi Miyake; Kiyotaka Kaneko, both of Kawasaki; Kimihide Takahashi, and Kazuya Oda, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 28, 1987, Ser. No. 90,338

Claims priority, application Japan, Aug. 29, 1986, 61-201682; Sep. 2, 1986, 61-206207

Int. Cl.⁴ H04N *5/78;* **G11B** *21/08*

U.S. Cl. 360—35.1 **6 Claims**

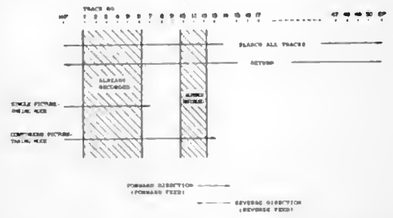
1. A still video camera with a continuous picture-taking mode, comprising:

a magnetic head transfer unit for transferring a magnetic head along the radius of a magnetic disc having a plurality of tracks and positioning the magnetic head on a predetermined track of the magnetic disc;

continuous picture-taking mode setting means;

track searching means for transporting the magnetic head across all tracks of the magnetic disc during initial pro-

cessing, distinguishing between recorded tracks and blank tracks on the basis of output signals from the magnetic head, and storing the results of the distinguishing operation; and



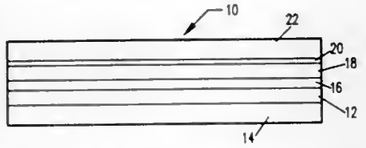
mean for controlling said magnetic head transfer unit on the basis of said results such that the magnetic head is transferred in a forward direction and positioned on a track which is next to a final recorded track when the continuous picture-taking mode has been set.

4,825,325

MAGNETORESISTIVE READ TRANSDUCER ASSEMBLY

James K. Howard, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 115,142
Int. Cl.[4] G11B *5/30*
U.S. Cl. 360—113 **17 Claims**



1. A magnetoresistive read transducer assembly comprising:
a thin film of magnetoresistive conductive layer; and
an ultrathin film of antiferromagnetic material in direct contact with said magnetoresistive layer, said ultrathin film of antiferromagnetic material having a thickness within the range of about 25 to 99 angstroms thereby producing an exchange bias field between said films which is relatively high and remains stable during subsequent thermal cycling.

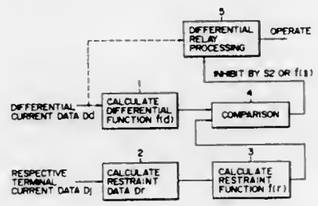
4,825,326

DIGITAL CALCULATION TYPE DIFFERENTIAL RELAY

Fumio Andow, Hachioji, and Noriyoshi Suga, Tama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 10, 1987, Ser. No. 60,351
Claims priority, application Japan, Jun. 11, 1986, 61-135840
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—63 **19 Claims**

1. A differential relay comprising:
means for sampling respective terminal currents in a predetermined time interval, and converting sampled currents into digital data to acquire respective terminal current data;
restraint data preparing means for preparing one or a plurality of restraint data from said digital data sampled at the same sampling time in the respective terminal current data;
differential current data preparing means for converting a sum of the respective terminal current data, or differential current corresponding to the sum of the respective terminal current data and sampled in the predetermined time interval, into digital data to prepare differential current data;
restraint function calculating means for calculating values of a restraint function using a plurality of predetermined number of the restraint data sampled at different sampling times;
differential function calculating means for calculating values of a differential function using a difference between a



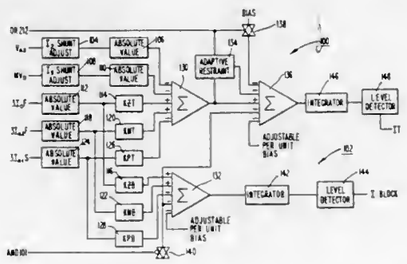
plurality of a predetermined number of the differential current data sampled at different sampling times;
comparing means for comparing the values of the differential function and the restraint function, and for generating an output when the value of the differential function is smaller than a value, modified by a predetermined relationship, of the restraint function; and
differential relay means for inhibiting an operation of the differential relay in accordance with the output from said comparing means.

4,825,327

NEGATIVE AND ZERO SEQUENCE DIRECTIONAL OVERCURRENT UNIT FOR AC POWER TRANSMISSION LINE PROTECTION

George E. Alexander, Wallingford, and Stanley B. Wilkinson, Havertown, both of Pa., assignors to General Electric Company, King of Prussia, Pa.

Filed Nov. 12, 1987, Ser. No. 120,078
Int. Cl.[4] H02H *3/28*
U.S. Cl. 361—82 **10 Claims**



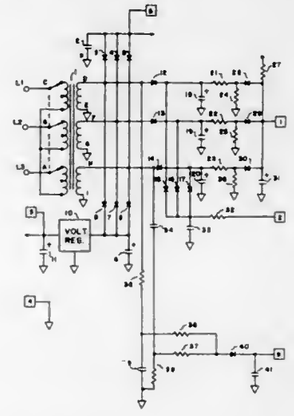
1. A directional overcurrent relay for detecting faults on a transmission line in a three phase alternating current electrical power distribution system, said relay comprising:
(a) means for generating a first operate signal which is related to a zero sequence component of current flowing in said power distribution system;
(b) means for generating a second operate signal which is related to a negative sequence component of current flowing in said power distribution system;
(c) means for generating a restraint signal which is related to a positive sequence component of current flowing in said power distribution system;
(d) means for summing said operate signals; and
(e) means for comparing the magnitude of the summed operate signals with the magnitude of said restraint signal and generating a net operate signal when the magnitude of the summed operate signals exceeds the magnitude of the restraint signal.

4,825,328

THREE PHASE ELECTRICAL LOAD PROTECTION DEVICE

Lowell F. Izaguirre, Sr., Miami, Fla., assignor to Watsco Components, Inc., Hialeah, Fla.

Filed Jun. 12, 1987, Ser. No. 62,134
Int. Cl.[4] H02H *3/20, 3/24*
U.S. Cl. 361—90 **14 Claims**



1. An input transducer for a multiphase electrical power system to provide a first signal and a second signal representative of the highest and lowest voltages, respectively, of any of the phases of the power system, said input transducer comprising in combination:
means for rectifying the voltage of each phase and charging a first storage means to a voltage value representative of the highest voltage present on said phase;
first means for coupling the voltage value of each said first storage means representative of the highest voltage present for each phase to charge a second storage means to a voltage value representative of the highest voltage present on any phase of the power system; and
second means for coupling the voltage value of each said first storage means representative of the highest voltage present to discharge a third storage means to a voltage value representative of the lowest voltage present on any phase of the power system.

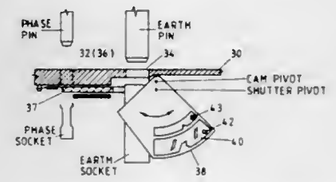
4,825,329

EARTH LEAKAGE CIRCUIT BREAKER WITH PLUG ACTUATED RESETTING BREAKER

Colin Turner, The Old Vicarage, United Kingdom, assignor to Flymo Limited, Darlington, United Kingdom

Filed Aug. 31, 1987, Ser. No. 90,891
Claims priority, application United Kingdom, Aug. 29, 1986, 8620902; Mar. 27, 1987, 8707439
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—93 **4 Claims**

1. An earth leakage circuit breaker comprising an output socket having terminals which receives electric power and being adapted to receive a plug for an appliance, whereby the plug has first, second, third and fourth successive positions in said socket upon being inserted in the socket and the socket comprises means for applying electric power to said plug only in said fourth position, said circuit breaker comprising a normally-open relay having contacts arranged to interrupt the supply of power to said terminals, a hold circuit for the relay, means for tripping the relay on occurrence of an unbalance current, test contacts connected to produce an unbalance current in said circuit breaker when said test contacts are closed, means responsive to said unbalance current for tripping



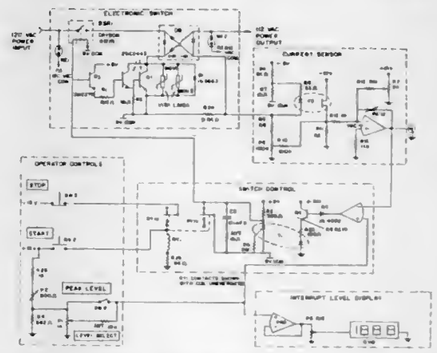
the relay, first means responsive to the insertion of a plug into the socket to said first position for energizing the relay, second means responsive to the insertion of the plug into the socket to said second position for closing the test contacts to produce an unbalance current for tripping the relay, third means responsive to the insertion of said plug to said third position for opening said test contacts, whereby said relay remains tripped at said third position if an unbalance current is present when said test contacts are open, and fourth means for inhibiting movement of said plug from said third position to said fourth position if an unbalance current is present in said breaker.

4,825,330

ULTRA-FAST SOLID STATE POWER INTERRUPTER

Ray W. Walchle, Mt. Airy, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 6, 1987, Ser. No. 105,335
Int. Cl.[4] H02H *3/087*
U.S. Cl. 361—95 **24 Claims**



1. A power interrupter, comprising
an electronic switch means for (1) receiving ac power as an input and outputting corresponding ac power to a load, (2) receiving as a further input an interrupt control signal, (3) interrupting said outputting of said corresponding ac power to said load depending on said interrupt control signal, and (4) outputting, separately from said ac power to said load, an output corresponding to the absolute value

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of the instantaneous current of said ac power output to said load,

a current sensor means for (1) receiving as an input said output from said electronic switch means corresponding to said instantaneous load current, and (2) outputting an output corresponding to said absolute value of the instantaneous load current;

a switch control means for (1) receiving as an input said output from said current sensor means corresponding to said absolute value, (2) comparing said input thereto with a value corresponding to a set limit for said absolute value, and (3) providing as an output said interrupt control signal of said input to said electronic switch means in accordance with the result of said comparison;

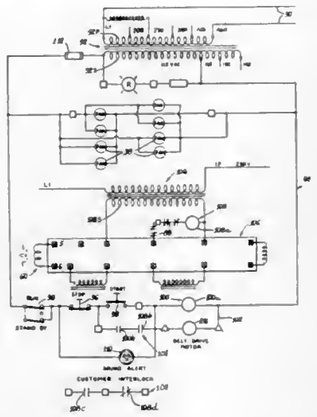
wherein (1) said output of said ac power to said load is interrupted when the absolute value of said instantaneous load current exceeds said set limit (2) said electronic switch means includes a solid state relay and a first transistor connected operatively in series with each other between respective parts of said electronic switch means for said receiving of said ac power and for said outputting of said ac power to said load, said load current flowing unidirectionally in said first transistor, and the current of said ac power input to said electronic switching means flowing as ac current through said solid state relay, and (3) said interrupt control signal opens said solid state relay and first transistor for said interrupting of said ac power output by said electronic switch means to said load.

4,825,331

TAPE DEGAUSSER

Joseph A. Armond, River Forest, Ill., assignor to Electro-Matic Products Co., Chicago, Ill.

Filed Aug. 29, 1983, Ser. No. 527,025
Int. Cl.⁴ H01F *13/00*
U.S. Cl. 361—151 **5 Claims**



1. Tape degaussing apparatus comprising,

a conveyor belt and means for moving it along a predetermined path, for carrying reels of tape thereon along the path,

degaussing coils operable for performing a degaussing effect on the tapes in the path, positioned relative to the path, the degaussing coils being respectively

(a) below and above the path and spaced therefrom to enable the reels to pass therebetween,

(b) anterior and posterior, relative to each other, in the direction of movement of the conveyor belt,

(c) producing magnetic fields on lines at 90° to each other and both at 45° to the direction of the path,

said degaussing coils being connected in series,

booster coils connected in series and together connected parallel with the degaussing coils, and operable for providing voltage of lesser or greater levels, respectively, and

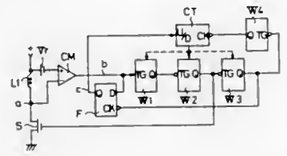
means for connecting the booster coils to the degaussing coils at different points on the booster coils for producing said lesser and greater levels, respectively, in the degaussing coils.

4,825,332

ELECTROMAGNETIC DRIVING CIRCUIT

Hiroshi Aoki, 1-1, Taihei 4-chome, Sumida-ku, Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,260
Claims priority, application Japan, Feb. 20, 1987, 62-37132; Feb. 25, 1987, 62-41817; Mar. 6, 1987, 62-51261
Int. Cl.⁴ H01H *47/00, 47/12;* **G04B** *17/16;* **G04F** *5/00*
U.S. Cl. 361—152 **5 Claims**



1. An electromagnetic driving circuit comprising:

a coil for detecting and driving a permanent magnet;

a comparison circuit for comparing an induction voltage induced in said coil with a reference voltage;

an output generating circuit for generating a driving pulse having a predetermined width in response to outputs of said comparison circuit; and

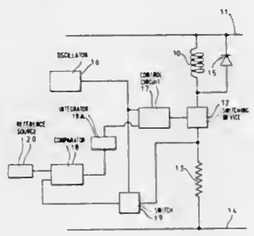
a driving circuit functioning in accordance with said driving pulse of said output generating circuit for causing a driving current to flow through said coil.

4,825,333

DRIVE CIRCUIT

Robert J. Clive, Cirencester, and Keith R. Emerson, Hankerton, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Jun. 23, 1987, Ser. No. 65,866
Claims priority, application United Kingdom, Jul. 11, 1986, 8616965
Int. Cl.⁴ H01H *47/00*
U.S. Cl. 361—154 **1 Claim**



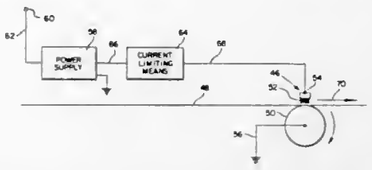
1. A drive circuit for an inductive load, the drive circuit being of the so-called constant frequency type and comprising a switching device connected in series with the load and a source of electric supply, an oscillator for supplying a constant frequency signal, a control circuit having first and second inputs, said constaot frequency signal being supplied to said first input, the control circuit having an output connected to said switching device, the output of the control circuit being a square wave signal having a mark/space ratio which is determined by the magnitude of a signal supplied to said second input of the control circuit, a comparator having first and second inputs and an output, a reference voltage source connected to the first input of the comparator, the output of the comparator being connected to the second input of the control circuit by way of an integrator, a resistor connected in series with said switching device and through which current flows to the load when the switching device is turned on by said square wave signal, the current flowing in said resistor producing a voltage signal across said resistor proportional to said current, and a switch through which said voltage signal is applied to the second input of the comparator, said switch being controlled by the constant frequency signal supplied by said oscillator and being arranged to be momentarily turned on to apply the voltage signal to the second input of the comparator at or a predetermined time after the switching device has been turned on but before it has been turned off.

4,825,334

HIGH POTENTIAL BRUSH POLARIZER

Semyon Kisler, W. Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 222,332, Jan. 5, 1981, abandoned. This application Sep. 24, 1985, Ser. No. 779,432
Int. Cl.⁴ H05F *3/00*
U.S. Cl. 361—212 **8 Claims**



1. Apparatus for producing corona free, electrostatic charging at typical corona voltages of charge-retaining material under conditions wherein corona would have an adverse effect, said apparatus comprising:

an electrically conductive reference member;

an electrostatic brush having a plurality of conductive bristles mounted in spaced relation to said reference member for passage of charge-retaining material between said bristles and said member, said brush and reference member arrangement having a corona voltage threshold below which only an electrostatic field occurs with an attendant field current in the low microamp range and above which corona occurs with attendant current in the milliamp range; and

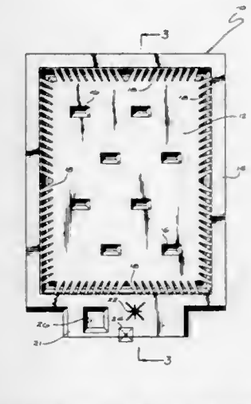
a high voltage source producing a D.C. voltage between an output thereof and said member which exceeds said corona threshold voltage, means associated with said brush and said source for limiting the current to said brush to the microamp range so as to be less than the value of current which would normally occur at said corona voltage threshold thereby precluding corona while electrostatically charging said material at corona voltage.

4,825,335

DIFFERENTIAL CAPACITIVE TRANSDUCER AND METHOD OF MAKING

Leslie B. Wilner, Palo Alto, Calif., assignor to Endevco Corporation, San Juan Capistrano, Calif.

Filed Mar. 14, 1988, Ser. No. 167,936
Int. Cl.⁴ H01G *7/00;* **G01L** *1/22*
U.S. Cl. 361—283 **25 Claims**



10. A differential variable capacitance transducer including a laminate of three layers, an inner plate layer, a first outer plate layer and a second outer layer of substantially the same size;

said layers comprising plates formed essentially of monocrystalline silicon;

said inner plate layer including a rim and a central seismic mass forming the moving capacitive plate of said transducer having a first and a second face, said mass being spaced from said rim;

a large number of leaf springs which are atomically continuous with said mass extending from both top and bottom edges of said mass to top and bottom edges of said rim, said seismic mass being supported on said leaf springs for movement in a plane normal to the plane of said plate;

a plurality of holes formed in said seismic mass forming fluid communication between said first and second faces of said mass;

a plurality of grooves formed in said layers extending from near at least some of said holes to points spaced from said holes;

said outer layers and said rim forming a cavity for said seismic mass and a gas in said cavity, said outer layers each having a rim of borosilicate glass insulating said outer layers from the rim of said inner plate layer; and

cooperating electrical contact means on said plate and said outer layers for transmitting the output of said transducer.

4,825,336

POWER DISTRIBUTION BOARD WITH IMPROVED MOUNTING ARRANGEMENT FOR CIRCUIT INTERRUPTERS

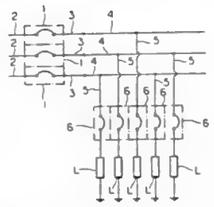
Tukasa Iio, and Sumio Egusa, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 804,141, Dec. 3, 1985, abandoned. This application May 18, 1988, Ser. No. 196,775
Claims priority, application Japan, Dec. 4, 1984, 59-184453[U]; Feb. 7, 1985, 60-16821[U]; Feb. 7, 1985, 60-16822[U]; Feb. 13, 1985, 60-20071[U]
Int. Cl.⁴ H02B *1/04*
U.S. Cl. 361—355 **6 Claims**

1. A power distribution board including an insulating mounting base supporting a plurality of shunt circuit interrupters in a side-by-side relationship, each of said shunt circuit interrupters having recessed portions on outer side surfaces and extending upwardly from the bottom of each circuit interrupter, recessed portions on the outer side surfaces of adjacent shunt circuit interrupters providing a space extending outwardly from the bottoms thereof, being free of any projections and said insulating mounting base having integral upstanding insulating partition walls including a given thickness and projecting above said mounting base and fitting into the space between adjacent shunt

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circuit interrupters supported on said mounting base, the recessed portions on the outer side surfaces of adjacent shunt circuit interrupters having a depth equal to one-half the thickness of a partition wall such that the partition wall snugly slides into the space between adjacent circuit interrupters and is sandwiched therebetween to isolate ionized gas from an exhaust



port of one of the shunt circuit interrupters from flowing to another in the event of arcing upon operation thereof and intervenes between the bottoms of adjacent shunt circuit interrupters so as to reduce the risk of insulation breakdown at the bottoms of the shunt circuit interrupters;

4,825,337

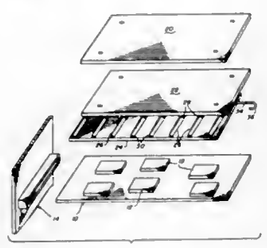
CIRCUIT BOARD THERMAL CONTACT DEVICE

Maurice S. Karpman, Westwood, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed May 17, 1988, Ser. No. 194,830

Int. Cl.[4] H05G *7/20*

U.S. Cl. 361—386 **32 Claims**



1. In combination, a circuit board means including a circuit board and electronic modules or packages mounted thereon, a cold plate for thermally coupling with said circuit board means, and a variable thickness intermediate coupling member disposed between said circuit board and said cold plate for thermally intercoupling therebetween, said intermediate cooling member comprised of a foldable heat conductive member having a manually operable handle for moving said member between a maximum thickness circuit board means engaging position to provide thermal contact, and a minimum thickness circuit board means disengaging position to enable access to said circuit board means.

4,825,338

BOLT-IN CIRCUIT BREAKER WITH IMPROVED TERMINAL FASTENER RETAINER

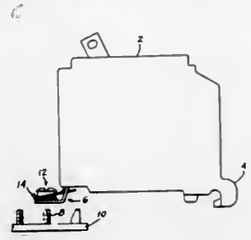
Dean A. Hubbard, Sussex; Michael R. Larsen, Milwaukee, and Donald A. Link, Hubertus, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 12, 1988, Ser. No. 192,997

Int. Cl.[4] H02B *1/04*

U.S. Cl. 361—376 **5 Claims**

1. In an overload responsive circuit breaker having a terminal adapted for bolted connection to an electric conductor, said terminal having first and second legs joined at substantially a right angle and an aperture in said second leg, a planar flexible retainer attached at one end thereof to said first leg and having a continuous loop on a free end thereof received in an annular groove of a threaded fastener, said retainer positioning said fastener on said second leg in registry with said aperture for cooperable engagement with mutually threaded means of said conductor, the improvement comprising providing an opening in said first leg and means on said one end of said



retainer affording press-in attachment to said first leg, said means comprising a central tongue and lateral fingers extending unidirectionally from said loop, and lateral projections on said tongue which are compressed upon insertion of said tongue through said opening and which expand after said insertion to resist withdrawal of said tongue from said opening, said fingers being deflected along said first leg away from said second leg, thereby biasing said loop toward said second leg.

4,825,339

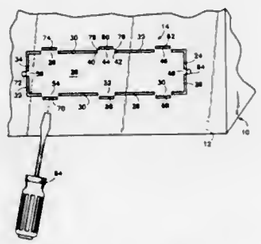
SHEET METAL KNOCK-OUT

Douglas M. Boudon, Hubbard, and Jim Gottsch, Tigard, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 11, 1988, Ser. No. 143,425

Int. Cl.[4] H02B *13/02*

U.S. Cl. 361—390 **19 Claims**



1. A knock-out detail in a sheet metal wall, the knock-out detail defining a knock-out which is selectively removed along a boundary to provide a knock-out opening through the wall, comprising:

first and second slits in the wall positioned along the boundary of the knock-out;

the knock-out having a land which separates the first and second slits; and

the wall including a break out opening adjacent to the land outside the boundary of the knock-out, the land including break portions which separate the break out opening from the first and second slits, the break portions being severed to connect the first and second slits together through the break out opening during removal of the knock-out such that no portion of the severed break portion extends into the knock-out opening after removal of the knock-out.

4,825,340

ELECTRICAL CONDUCTOR ARRANGEMENT

Colin B. Lewis, and Harold L. Spindley, both of Lincoln, England, assignors to Marconi Electronic Devices Limited, England

Filed Feb. 17, 1988, Ser. No. 157,281

Claims priority, application United Kingdom, Feb. 19, 1987, 8703903

Int. Cl.[4] H05K *1/18, 7/02, 7/06, 7/08*

U.S. Cl. 361—397 **6 Claims**



1. An electrical conductor arrangement, comprising:

(a) a thin lamina of ceramic having opposite major surfaces;

(b) a first metallic foil bonded directly at an elevated temperature to one of said major surfaces of the ceramic lamina, and having a predetermined thickness;

(c) a second metallic foil bonded directly at an elevated temperature to the other of said major surfaces of the ceramic lamina, and having a thickness which is less than said predetermined thickness of the first foil;

(d) said foils and the ceramic lamina therebeteween forming a sandwich structure having a curved shape upon cooling of the foils from said elevated temperatures; and

(e) said second foil having an outer convex surface, and said first foil having an outer concave surface.

4,825,341

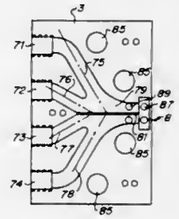
COOLED LIGHTING APPARATUS AND METHOD

George K. Awai, Haleiwa, Hi., assignor to Fiberstars, Inc., Fremont, Calif.

Filed Nov. 17, 1987, Ser. No. 121,906

Int. Cl.[4] F21V *7/04*

U.S. Cl. 362—32 **11 Claims**



1. A block for mounting and positioning optical fibers for the purpose of illumination comprising:

a plurality of input ports adapted to admit optical fibers and communicating with a plurality of ducts;

said ducts adapted to receive optical fibers and terminating in an optical illumination window capable of transmitting visible light to the end of an optical fiber located at the interior of said block and wherein at least two of said ducts join together to form a central chamber adjacent to said optical illumination window.

4,825,342

VEHICLE HEADLAMP ASSEMBLY LOCATOR

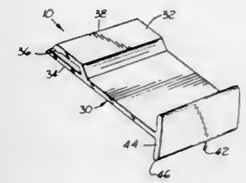
William J. Goraki, Warren, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 27, 1988, Ser. No. 199,835

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 362—61 **4 Claims**

1. A vehicle headlamp assembly locator for positioning a vehicle headlamp assembly both vertically and horizontally longitudinally with respect to the forward portion of the vehicle hood prior to securing the vehicle headlamp assembly in place on the vehicle, the locator comprising an elongated spacer element equal in length to the desired horizontal longitudinally distance between a designated portion of the vehicle headlamp assembly and a forward portion of the vehicle hood, fastening means on the elongated spacer element for removably securing the elongated spacer element to the designated portion of the vehicle headlamp assembly, an upright spacer element carried on the forward end of the elongated spacer



element, the upright spacer element having a downwardly extending portion for contacting the vehicle headlamp assembly when the elongated spacer element is fastened thereto to position the elongated spacer element at a desired vertical location with respect to the headlamp assembly, the upright spacer element having an upwardly extending portion for contacting, along with the elongated spacer element, the forward portion of the vehicle hood to thereby position the vehicle headlamp assembly both vertically and horizontally longitudinally with respect to the forward portion of the vehicle hood.

4,825,343

PROJECTOR TYPE HEADLAMP FOR VEHICLES

Yutaka Nakata, Isehara, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

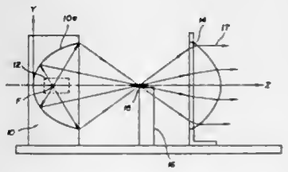
PCT No. PCT/JP86/00653, § 371 Date Jun. 23, 1987, § 102(e) Date Jun. 23, 1987, PCT Pub. No. WO87/04229, PCT Pub. Date Jul. 16, 1987

PCT Filed Dec. 23, 1986, Ser. No. 72,972

Claims priority, application Japan, Dec. 27, 1985, 60-292950; Feb. 10, 1986, 61-25971; Feb. 10, 1986, 61-25972; Feb. 10, 1986, 61-25973; Feb. 18, 1986, 61-31935

Int. Cl.[4] F21V *7/00*

U.S. Cl. 362—61 **15 Claims**



1. A projector type headlamp for vehicles comprising a reflecting mirror formed in a dish-like shape and having an inner surface as a reflecting surface, a light source an optical axis of which is coincident with the axis of said reflecting mirror, a shade having an edge optically effective for blocking a light-dark boundary by blocking a portion of the light emitted from said light source and reflected by said reflecting surface, and a convex lens disposed within the passage of light beams formed by said shade, the edge of said shade being disposed at the vicinity of the meridional image plane of said convex lens, said reflecting surface being formed of a great many minute face elements smoothly connected with each

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other, and each of said face elements having an orientation with respect to said optical axis being decided in such a manner that the light incident from said light source is reflected to the vicinity of said meridional image plane and further a desired luminosity distribution can be obtained at the position of said shade.

4,825,344

HEADLAMP FOR VEHICLES

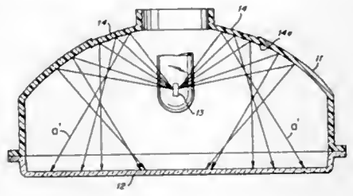
Takeo Ichihara, Hatano; Takashi Futami, Tokyo; Nobutaka Oda, Yokohama, and Shuichi Watanabe, Yamato, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 14,396, Feb. 13, 1987, abandoned. This application Jul. 28, 1987, Ser. No. 78,876

Claims priority, application Japan, Feb. 20, 1986, 61-23584[U]; Feb. 21, 1987, 62-24658[U]

Int. Cl.⁴ F21V *7/09*

U.S. Cl. 362—80 **13 Claims**



1. A headlamp for vehicles having a parabolic reflector arranged to reflect light from a light source to form a region of highly concentrated light on a lens, at which region a high temperature consequently exists, comprising:

a source of light;

a lens made of a synthetic resin;

a main parabolic reflector arranged to reflect light from said light source through said lens;

a composite reflector coupled to said main parabolic reflector and including means for reflecting and concentrating light from said light source toward said region of the lens to spread the concentrated light so as to expand the area of the region of highly concentrated light to a predetermined wider region and thereby reduce its temperature.

4,825,345

PORTABLE AUTOMOBILE LIGHT

William M. Stevens, 9717 Oak Hollow Dr., Austin, Tex. 78758

Filed Dec. 21, 1987, Ser. No. 135,683

Int. Cl.⁴ F21L *11/00*

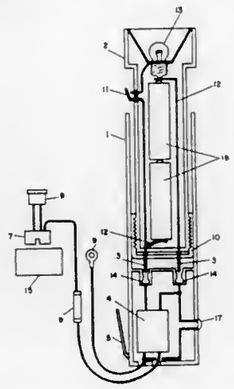
U.S. Cl. 362—183 **7 Claims**

1. An always charged portable automobile light comprising:

(a) a housing to removably hold a battery operated light and a charging means,

(b) a battery means in said battery operated light replaceable electrically connected to said charging means,

(c) a fused means to connect said charging means into an automobile fuse box in a position where one fuse has been removed and said one fuse is electrically connected back into said position,



(d) a means to removably anchor said housing means in an automobile.

4,825,346

LIGHT COVER, ESPECIALLY A PLATE-SHAPED OR BOWL-SHAPED LAMP COVER

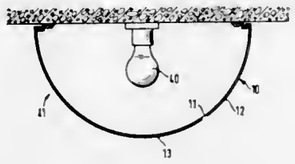
Horst Schindler, Dornstetten, and Adriaan A. Reekers, Freudenstadt, both of Fed. Rep. of Germany, assignors to Norddeutsche Seekabelwerke Aktiengesellschaft, Nordenham, Fed. Rep. of Germany

Filed Dec. 8, 1986, Ser. No. 938,918

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1985, 3543292

Int. Cl.⁴ F21V *3/00*

U.S. Cl. 362—311 **13 Claims**



1. Light cover (10), especially a plate-shaped or bowl-shaped lamp cover made of transparent material, comprising:

at least one rigid light-transmitting, supertransparent carrier layer (12);

at least one foamed, light-transmitting light distribution layer (11);

said light-distribution layer (11) and said carrier layer (12) being firmly joined to one another; and

said light distribution layer (11) containing a plurality of bubbles (14), and

characterized in that the carrier layer (12) is roughened or profiled on its surface (13) facing away from the light source.

4,825,347

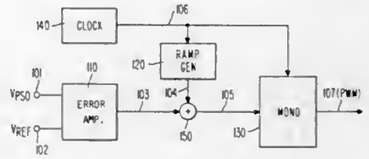
PULSE WIDTH MODULATION CONTROL CIRCUIT

Nunzio Guerrera, St. Leonard, and Lorenzo Clvidino, Pierrefonds, both of Canada, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 3, 1987, Ser. No. 92,555

Int. Cl.⁴ H02M *1/14*

U.S. Cl. 363—41 **10 Claims**



1. Apparatus for providing output signal pulses having variable time durations comprising:

clock means for generating a series of pulses with each pulse defining the initiation of an output signal pulse;

means for generating a control signal having a signal level which is related to a desired time duration for a given output signal pulse;

waveform means, coupled to the clock means, for generating a periodic signal having a period defined by the pulse repetition rate of the series of pulses generated by the clock means;

summing means, having first and second inputs respectively coupled to the means for generating a control signal and the waveform means, operative to superimpose the periodic signal upon the control signal at a summing means output; and

a monostable multivibrator circuit having a triggering input coupled to the clock means and an input conventionally coupled to a passive resistance/capacitive time period defining network instead coupled to the summing means output, the monostable multivibrator operative as connected to produce the output signal pulses, each pulse having a time duration extending from receipt at the triggering input of a clock pulse to attainment by the summing means output of a signal level determined by internal characteristics of the monostable multivibrator.

4,825,348

RESONANT POWER CONVERTER WITH CURRENT SHARING AMONG MULTIPLE TRANSFORMERS

Robert L. Steigerwald, Burnt Hills, and Andrew J. Macdonald, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1988, Ser. No. 140,377

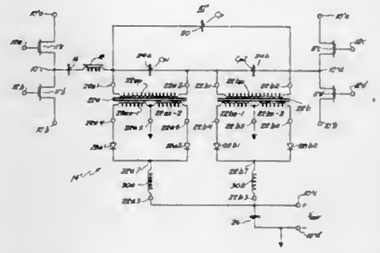
Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—17 **12 Claims**

1. A DC—DC power converter with a predetermined total power rating, comprising:

means for converting an input DC voltage to a single periodic AC voltage signal; and

a plurality N of transformer networks, each with a power rating substantially only of 1/N-th of said total power rating, each having a primary winding connected in series with all other primary windings and with each primary winding receiving substantially 1/N-th of the single AC signal voltage, and each having a secondary means for commutating another AC signal voltage, each proportional to the AC signal voltage received by the primary winding of that transformer network, to obtain an output DC voltage from that transformer network; each secondary means being connected in parallel with, and having essentially the same output DC voltage as, all other transformer network secondary means and additively providing substantially 1/N-th of a total required output current; each transformer network including impedance means, coupled to the primary winding, for causing commutation



in the associated secondary means to be substantially independent of commutation in the secondary means of all other transformer networks.

4,825,349

EMERGENCY D.C. POWER SUPPLY WITH THE EMERGENCY STATE BEING INDICATED BY POLARITY REVERSAL

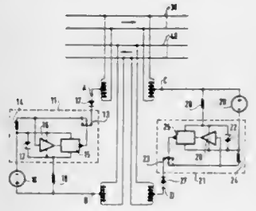
Francois Marcel, Orsay, France, assignor to Alcatel Cit, Paris, France

Filed Apr. 25, 1988, Ser. No. 185,651

Claims priority, application France, Apr. 29, 1987, 87 06078

Int. Cl.⁴ H02J *9/06*; **H02H** *7/00*

U.S. Cl. 363—50 **9 Claims**



1. An emergency D.C. electrical power supply with emergency status being indicated by polarity reversal, wherein the power supply comprises a main D.C. electrical power source provided with a protection device causing its output to go to a high impedance state in the absence of a voltage across its terminals, and an auxiliary D.C. electricity power source connected in parallel and in opposition with the main source and provided with a current limiting device which is normally tripped by the additional current which the main source attempts to impose thereon.

4,825,350

METHOD AND APPARATUS FOR DETECTING A REDUCTION IN THE INPUT VOLTAGE TO A POWER SUPPLY

William D. Brackman, Jr., Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Jul. 21, 1988, Ser. No. 222,660

Int. Cl.⁴ H02H *7/122*

U.S. Cl. 363—56 **14 Claims**

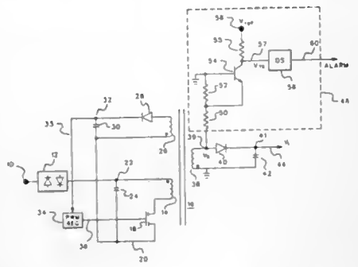
1. A method of detecting reduced input voltage to a a pulse width modulated regulated switching power supply comprising the steps:

(a) charging a capacitor from said input voltage to a value representative of such voltage;

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(b) periodically discharging said capacitor through a transformer primary winding by periodically rendering a switching means conductive and selectively rendering said switching means non-conductive;

(c) developing a power supply output voltage utilizing a transformer secondary winding in circuit with means permitting current through said secondary winding only when said switching means is non-conductive;



(d) sensing a voltage across said secondary winding in the absence of current therethrough and generating a timing signal during periods when said voltage exceeds, in magnitude, a predetermined value; and

(e) generating an alarm signal indicative of reduced input voltage in the absence of said timing signal for a predetermined period of time.

4,825,351

AC-DC CONVERTING APPARATUS HAVING POWER FACTOR IMPROVING CIRCUIT UTILIZING A PHOTOCOUPLER

Michika Uesugi, Tadehara Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 24, 1987, Ser. No. 124,869

Claims priority, application Japan, Nov. 26, 1986, 61-181606[U]

Int. Cl.⁴ H02M *7/04*

U.S. Cl. 363—79 **2 Claims**

1. An AC-DC converting apparatus wherein AC voltage from a power supply is converted to a DC voltage, comprising:

means for rectifying an alternating current from the power supply;

energy storing means connected to the rectifying means for alternately storing and releasing electrical energy;

switching means for alternately causing the energy storing means to store and to release the electrical energy;

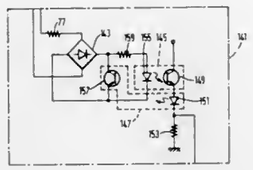
current detecting means for generating a current detection signal representative of the current flowing into the apparatus;

voltage waveform detecting means including a four-diode bridge providing a rectified waveform of the power supply and a photocoupler, said photocoupler having a first light-emitting diode and a first photo-transistor, for generating an input voltage waveform detection signal indicative of the rectified waveform of the power supply and including a second photocoupler having a second light-emitting diode connected in series with the first photo-transistor, and a second photo-transistor connected in parallel with the first light-emitting diode;

reference waveform generating means for generating first and second reference waveforms in response to the input voltage waveform detection signal, the first reference waveform being greater than the second reference waveform; and

switching control means for closing the switching means when the current detection signal falls to the second reference waveform, and for opening the switching means





when the current detection signal rises to the first reference waveform.

4,825,352

PROCESS CONTROL SYSTEM AND METHOD THEREOF

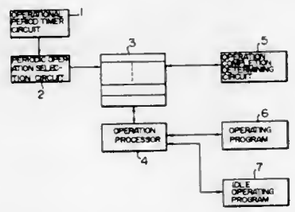
Tadahiko Iijima, Hitachi; Takumi Kawai, Katsuta; Yasuhiro Tennichi, and Sadao Yanada, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1987, Ser. No. 29,094

Claims priority, application Japan, Mar. 24, 1986, 61-64087

Int. Cl.⁴ G04F *5/00*; G04G *3/00*

U.S. Cl. 364—140 **4 Claims**



1. A process control system for controlling a process in a series of control blocks, said process control system comprising:

timer circuit means for issuing an instruction for starting each of a plurality of time periods permitting the computation of control blocks to occur in time periods of fixed duration;

periodic operation selection circuit means for selecting control blocks to be computed within each time period in response to a starting instruction from said timer circuit;

operation instruction circuit means for stacking control blocks selected by said periodic operation selection circuit means and an instruction for completion of the computation of control blocks and for effecting an idle operation for each time period and for issuing an instruction for consecutively executing the operation of the control blocks and an instruction for performing an idle operation after completion of the operation of the control blocks for each time period; and

operation completion determining circuit means, responsive to an instruction from said timer circuit means to start an ensuing time period at a time when computation of control blocks has not been completed within a predetermined time period, for cancelling the instruction for completion of the predetermined time period and for issuing an instruction to start the computation of ensuing time period, beginning with the computation of the remaining control blocks in the predetermined time period, and an instruction for causing said periodic operation selection circuit means to stack the control blocks of the ensuing time period in said operation instruction circuit means.

4,825,353

CONTROL OF REACTANTS IN CHEMICAL ENGINEERING SYSTEMS

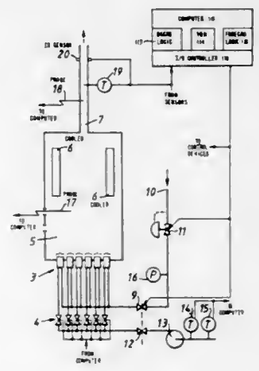
David P. Jenkins, Gryant, Wales, assignor to British Steel Corporation, England

Filed Aug. 12, 1986, Ser. No. 895,879

Claims priority, application United Kingdom, Aug. 30, 1985, 8521663

Int. Cl.⁴ G05B *13/00*

U.S. Cl. 364—152 **17 Claims**



1. A method for controlling reactants in a reaction in a chemical engineering system comprising:

(a) feeding analysis signals of an operation of the reactants to a background electronic logic circuit for interpretation;

(b) interpreting the analysis signals and outputting interpreted data signals;

(c) feeding the interpreted data signals from the background logic circuit to a data file;

(d) feeding data signals from the data file to a foreground electronic logic circuit together with signals relating to the activity level of the reaction and the physical conditions of an incoming supply of at least one of the reactants to the reaction; and

(e) controlling, using the foreground logic circuit, the flow of at least one of the reactions to the reaction based on the signals received by the foreground logic circuit.

4,825,354

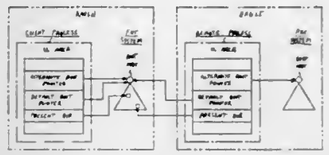
METHOD OF FILE ACCESS IN A DISTRIBUTED PROCESSING COMPUTER NETWORK

Rakesh Agrawal, Chatham, and Ahmed K. Ezzat, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 12, 1985, Ser. No. 796,863

Int. Cl.⁴ G06F *15/16*

U.S. Cl. 364—200 **14 Claims**



1. A method of performing remote process execution in a computer network having a plurality of computers each with separate file and separate file addressing systems, comprising the steps of

transmitting remote process execution request, including an identification of a process to be executed, from a requesting one of the computers to a serving one of the computers, and

establishing a temporary file addressing system extension at both the requesting and the serving computers for the duration of existence of the remote process in response to said request transmission for linking the file system of the requesting computer into the file system of the serving computer,

addressing, via the extension in response to a remote process file access, a file located at the requesting computer as an integral part of the file system of the serving computer and not a file at the serving computer.

4,825,355

INSTRUCTION FORMAT FOR PROGRAM CONTROL TYPE DATA PROCESSING SYSTEMS

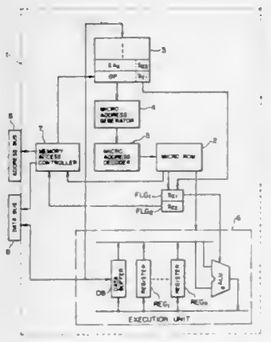
Keiichi Kurakazu, Tachikawa, and Shiro Baba, Tokorozawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1986, Ser. No. 899,389

Claims priority, application Japan, Oct. 25, 1985, 60-237359

Int. Cl.⁴ G06F *9/22, 9/30*

U.S. Cl. 364—200 **8 Claims**



1. A data processing system comprising:

an instruction register in which a macro instruction is stored;

a micro ROM for outputting a microinstruction according to

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a macro instruction outputted from said instruction register;

an execution unit for effecting an operation according to the microinstruction, wherein said macro instruction includes:

(a) a field for designating an operation code indicating an operation to be performed by said execution unit on at least two operands;

(b) a first address designation field for specifying an address of a first operand;

(c) a second address designation field for specifying an address of a second operand;

(d) a first bit length designation field for specifying a first bit length of data to be operated on by said execution unit; and

(e) a second bit length designation field for specifying a second bit length of said first operand, said first bit length being different from said second bit length;

a memory access control circuit including means responsive to a code in said second bit length designation field for reading an operand of specified bit length from a memory;

first store means in which predetermined information is stored by a microinstruction read according to a code in said first bit length designation field for controlling said execution unit; and

second store means in which a code in said second bit length designation field is stored for controlling said memory access control circuit.

8. A method of controlling processing in a microprocessor having an arithmetic logic means for effecting an operation on operands supplied thereto and memory access means for reading data from or writing data in a memory means in response to an instruction indicating an operation to be performed by said arithmetic logic means on at least two operands and having first and second operand address information and first and second size information, comprising the steps of:

(a) reading a first operand from said memory means by means of said memory access means in response to the first operand address information and the first size information of said instruction;

(b) changing the bit length of said first operand in response to the second size information of said instruction;

(c) reading a second operand from said memory means by means of said memory access means in response to the second operand address information and the second size information of said instruction;

(d) effecting an operation of said arithmetic logic means on said first operand and said second operand for a bit length of data specified by said second size information of said instruction; and

(e) writing output data of said arithmetic logic means into said memory means in response to said second operand address information of said instruction.

4,825,356

MICROCODED MICROPROCESSOR WITH SHARED RAM

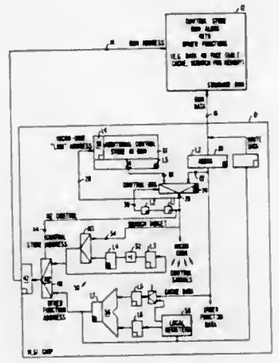
Daniel E. Lenoski, Mountain View, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Mar. 27, 1987, Ser. No. 31,477
Int. Cl.⁴ G06F 9/30
U.S. Cl. 364—200 **2 Claims**

1. In a digital system of the type that includes a processor for executing a program of macrocode instructions (macroinstructions), and a clock system for defining sequential clock cycles, where a given macroinstruction may require several clock cycles to execute and where the given macroinstruction is interpreted by an ordered sequence of microcode instructions (microinstructions) forming a microprogram, with the system also including a shared RAM array utilized to store the given macroinstruction, to store a given sequence of microinstructions for interpreting the given macroinstruction, and to perform other RAM functions such as accessing or updating a data cache, page table cache, or other types of tables of caches, a subsystem for accessing and executing the given sequence of microinstructions to interpret the given macroinstruction comprising:

a read-only-memory (ROM), having an ADDRESS port, a DATA port, and a plurality of ROM storage locations and included in said processor, for storing selected ones of the microinstructions from the given sequence of microinstructions in a plurality of said ROM storage locations;

means of accessing microinstructions in the given sequence of microinstructions from the shared RAM array to interpret the given macroinstruction during successive clock cycles when the shared RAM is not busy providing a macroinstruction or performing some other RAM function;



means, responsive to a microinstruction accessed from said shared RAM array during a first given clock cycle, for generating an indication of whether said shared RAM array will be busy performing some other RAM function during a second given clock cycle subsequent to said first given clock cycle; and

means, responsive to said indication, for accessing a given selected microinstruction from said ROM, during said second given clock cycle, if, during said second given clock cycle, the shared RAM is busy providing a macroinstruction or performing some other RAM function, with the given selected microinstruction being the microinstruction in the given sequence of microinstructions that otherwise would have been accessed from the shared RAM array during the second given clock cycle.

4,825,357

I/O CONTROLLER FOR MULTIPLE DISPARATE SERIAL MEMORIES WITH A CACHE

Hernando Ovies; Neil A. Katz, both of Boca Raton; Robert H. Farrell, Coral Springs, and Ernest D. Baker, Boca Raton, all of Fla., assignors to International Business Machine Corporation, Armonk, N.Y.

Continuation of Ser. No. 620,981, Jun. 15, 1984, abandoned.
This application Oct. 14, 1987, Ser. No. 110,080
Int. Cl.⁴ G06F 13/00
U.S. Cl. 364—200 **6 Claims**

1. An I/O controller for a computer system having a processor and a plurality of serial memory devices connected thereto, at least some of said memory devices differing in the rate at which data is transferred to and from said devices, comprising:

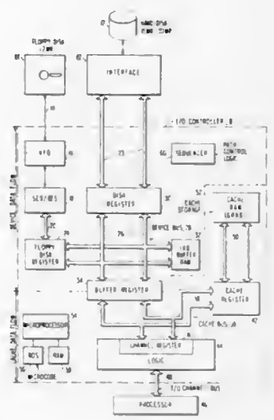
a device bus;

a plurality of interface means for transferring data from respective ones of said memory devices to said device bus, each of said interface means having a first input/output port connected to an input/output port of its respective one of said memory devices and a parallel second input/output port connected to said device bus, said first input/output port of at least one of said interface means being a single-bit serial port and said first input/output port of another one of said interface means being a multi-bit parallel port, all of said second input/output ports of said interface means being multi-bit parallel ports of the same width;

a first-in, first-out buffer memory having an input/output port connected to said device bus for storing records of data to be stored by or read from any of said memory devices, said buffer memory having a capacity sufficient for storing a complete record of data corresponding to a single complete read or write operation to or from any of said memory devices;

a buffer register having a first input/output port connected to said device bus for transferring data between said buffer register and said device bus;

first control means for controlling flow of data on said device bus between said interface means and said buffer memory and between said buffer memory and said buffer register;



a cache bus connected to a second input/output port of said buffer register;

a cache memory for storing data received via said buffer register and said cache bus from each of said memory devices, said cache memory having an input/output port connected to said cache bus;

a channel register having an input/output port connected to said cache bus and being in data communication with said processor; and

second control means for controlling flow of data between said buffer register and said cache memory and between said cache memory and said channel register independently of said flow of data on said device bus between said interface means and between said buffer memory and said buffer register, whereby said buffer register serves as an interface between said device bus and said cache bus, which is separate and independently controlled relative to said device bus, and said channel register operates as an interface between said cache bus and said processor.

4,825,358

METHOD AND OPERATING SYSTEM FOR EXECUTING PROGRAMS IN A MULTI-MODE MICROPROCESSOR

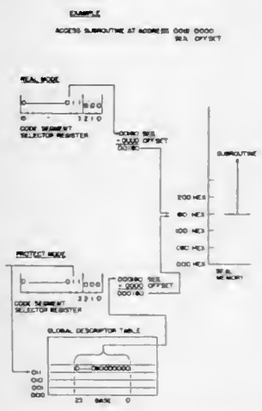
James Letwin, King County, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 722,052, Apr. 10, 1985, Pat. No. 4,779,187.
This application Jun. 18, 1987, Ser. No. 64,117
Int. Cl.⁴ G06F 9/46
U.S. Cl. 364—200 **21 Claims**

1. A method for operating a digital computer with an operating system program, said operating system program comprising a plurality of subroutines, said computer including memory, input-output devices, a system clock, initialization means to boot-up said computer, and a microprocessor, said microprocessor including a plurality of modes, a mode switch means capable of switching said microprocessor from a first mode to alternate modes but incapable of switching back to said first mode, and means for resetting said microprocessor, said resetting means causing said microprocessor to boot-up in said first mode, said method providing means for efficiently running on said computer applications programs adapted to said first mode concurrently with computer applications programs adapted to said alternate modes by switching between modes when necessary, said method comprising the steps of:

(a) booting up said computer;

(b) loading into said memory and said microprocessor operating system programs;



(c) running a plurality of said applications programs on said microprocessor as required;

(d) determining as each program is run whether a mode switch is required;

(e) if a switch from said first mode to one of said alternate modes is required, activating said mode switch means;

(f) if a switch from an alternate mode to said first mode is required, causing said microprocessor to reset by activating said resetting means by control means;

(g) determining whether said resetting was triggered by said control means rather than by power-up, hardware faults, or a malfunction in the operation of the computer; and

(h) if said resetting is determined to have been caused by said control means, causing said computer to bypass normal initialization routines during boot-up.

4,825,359

DATA PROCESSING SYSTEM FOR ARRAY COMPUTATION

Takehide Ohkami; Nobuyuki Iijima; Teijiro Sakamoto, and Toshiyuki Hirai, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1983, Ser. No. 524,326
Claims priority, application Japan, Jan. 18, 1983, 58-6082
Int. Cl.⁴ G06F 15/00
U.S. Cl. 364—200 **3 Claims**

1. A data processing system for array computation comprising:

a global data bus, and a global control bus;

a global memory unit connected to the global data bus and the global control bus for receiving and storing vast array data, scalar data, and program data from the global data bus and for passing the vast array data, scalar data and

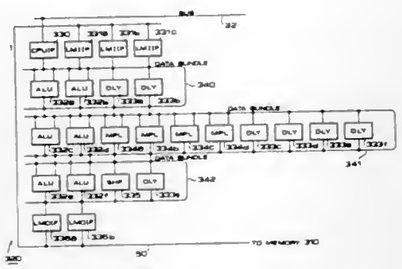
VOL 1101 ISS 4 APR 25 1989 UMI

program data onto the global data bus in response in corresponding instructions on the global control bus;

an array processor unit connected to the global data and global control buses, said array processor unit including a local data memory for receiving, storing and passing array data used in array computation from and to the global data bus in response to corresponding instructions on the global control bus, and including array operation execution means for receiving and performing array processing on array data from the local data memory and for passing the processed array data back to the local data memory in response to corresponding instructions on the global control bus;

an external interface unit connected to the global data and control buses for transferring data between the global data bus and external devices in response to corresponding instructions on the global control bus;

a control processor unit connected to the global data and control buses, said control processor unit including a local program memory for receiving, storing and passing scalar data and program data from and to the global data bus, and including program execution means for reading and executing a program in the local program memory to produce the control instructions on the global control bus controlling the transfer of data between the global memory and the local data memory of the array processor, the external interface unit, and the local program memory of the control processor unit, and controlling the array operation execution means of the array processor unit;



said array operation execution means of the array processor unit including two or more pluralities of local data buses, a plurality of operators wherein each operator is connected to at least one plurality of the pluralities of data buses and shares the connected buses with other operators connected thereto, and a plurality of control modules connected to the respective operators and the global control bus for controlling the operators in response to control instructions on the global control bus;

said plurality of operators including memory input interface circuits and memory output interface circuits connected between the local data memory and respective pluralities of the local data buses, arithmetic logic operators having inputs and outputs connected to respective pluralities of the local data buses, delay circuits having inputs and outputs connected to respective pluralities of the local data buses for holding selected data while other operators process other data, and multipliers having inputs and outputs connected to respective pluralities of the local data buses;

said input interface circuits each including output selector means for selecting respective buses of the pluralities of local data buses for transfer of array data from the local data memory;

said arithmetic logic operators, said delay circuits, and said multipliers each including input selector means and output selector means for connecting their respective inputs and outputs to corresponding local data buses of the pluralities of local data buses in various selected matrix, parallel and series arrangements to perform various array computations;

said output interface circuits each including input selector means for selecting respective buses of the pluralities of local data buses for transfer of array data to the local data memory;

said control modules of the array processor unit each including a control register connected to respective operators of the array processor unit for operating the input and output selector means of the operators, and including control data memory means containing a plurality of control data words and connected to the control register and the global control bus for passing a respective control data word from the control data memory means to the control register in accordance with a corresponding data memory address instruction on the global control bus; and

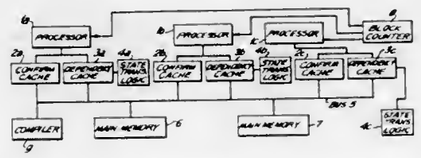
said plurality of control data memory means all responding to the same plurality of data memory address instructions on the global control bus and said control data words in the plurality of control data memory means being selected so that a corresponding arrangement of the operators to perform a selected array computation is produced for each of the plurality of instructions on the global control bus.

4,825,360

SYSTEM AND METHOD FOR PARALLEL PROCESSING WITH MOSTLY FUNCTIONAL LANGUAGES

Thomas P. Knight, Jr., Belmont, Mass., assignor to Symbolics, Inc., Concord, Mass.

Filed Jul. 30, 1986, Ser. No. 893,072
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—200 **13 Claims**



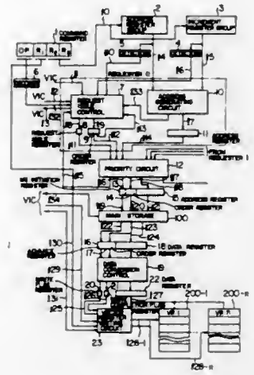
1. In a parallel processing system receptive of a program and having at least two processors connected in parallel to a shared main memory, wherein each processor executes instructions of a program which includes side effecting instructions which modify the contents of a location in main memory and functional instructions which reference locations in main memory or operate only on internal processor registers, the improvement comprising: means for compiling a program into a series of independent instruction blocks including predominantly functional instructions and terminating in a side effecting instruction; means for applying compiled blocks to the at least two processors for executing the blocks in parallel; and means for validating data to be stored in a location of main memory from each parallel processed block relative to locations referenced during execution by the other of the at least two processors, wherein the validating means comprises, for each processor, means for maintaining a dependency list of all locations in main memory which have been referenced during the execution of a block therein.

4,825,361

VECTOR PROCESSOR FOR REORDERING VECTOR DATA DURING TRANSFER FROM MAIN MEMORY TO VECTOR REGISTERS

Koichiro Omoda, Sagamihara; Shunichi Torii, Musashino; Shigeo Nagashima, Hachioji; Yasuhiro Inagami, and Takayuki Nakagawa, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 544,135, Oct. 21, 1983, abandoned. This application Mar. 2, 1987, Ser. No. 21,590
Claims priority, application Japan, Oct. 22, 1982, 57-184553
Int. Cl.[4] G06F *15/347*
U.S. Cl. 364—200 **10 Claims**



1. A vector processor comprising:

main storage having storage locations for storing vector elements of length m with a predetermined relative positional arrangement in said storage locations, and including means responsive to a read request for reading out data of length l_1 beginning from one of a plurality of specified address bounds which are separated by a length l_1;

vector data storage means comprising a plurality of vector registers each having a plurality of data storage areas, each data storage area having a width l_2, for storing vector data;

means for providing read requests to said main storage means for sequentially reading out a plurality of data of length l_1 from said main storage means, each data of length l_1 including at least two vector elements of length m (where l_1/m is an integer which is larger than 1 and l_2 is larger than or equal to m); and means for writing the vector elements, included in said read-out plurality of data of length l_1, into said plurality of data storage areas in each of said vector registers of the vector data storage means, so that respective vector elements of length m are positioned in the data storage areas of a vector register at predetermined positions which are independent of said predetermined relative positional arrangement of said vector elements as stored in said main storage means, whereby said vector elements are stored in vector register in an order required for subsequent operations; and

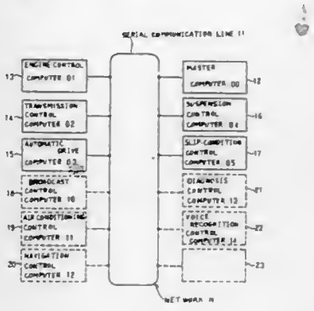
at least one arithmetic means coupled to receive vector elements from said vector data storage means for performing vector computation on the vector elements received from said vector data storage means, including means for providing computational results to be written into said vector data storage means.

4,825,362

NETWORK SYSTEM FOR DATA COMMUNICATION IN A VEHICLE

Kazuaki Minami, Anjo; Yuji Hirabayashi, Chita; Katsuhiro Ina, Okazaki; Katsunori Ito, Ama; Susumu Akiyama, Kariya, and Hidemichi Tanabe, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 29, 1986, Ser. No. 947,431
Claims priority, application Japan, Dec. 25, 1985, 60-295072
Int. Cl.[4] G06F *15/16, 13/00*
U.S. Cl. 364—200 **4 Claims**



1. A data network system for a vehicle having a plurality of separate and distinct control computers carrying out a predetermined control function of said vehicle, comprising:

data communication means for communicating data among said control computers;

a master computer, which is one of said control computers, for setting a polling time interval and polling each of said other control computers at said polling time interval to discriminate whether each of said polled computers responds or not;

determination means, provided in said master computer, for determining the number of polled computers which are linked with said data communication means in response to the result of said discrimination by said master computer; and

setting means, provided in all said control computers, in response to a command signal from said master computer indicative of the volume of data that must be transferred as a result of said determined number of said polled computers for setting a data transfer speed between each control computer and said data communication means wherein said master computer further sets said polling time interval in response to said determined number of said polled computers.

4,825,363

APPARATUS FOR MODIFYING MICROINSTRUCTIONS OF A MICROPROGRAMMED PROCESSOR

Burke B. Baumann, Glendale, and Troy K. Wilson, Phoenix, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 5, 1984, Ser. No. 678,536
Int. Cl.[4] G06F *9/22*
U.S. Cl. 364—200 **7 Claims**

1. A micprogrammable microprocessor for executing macroinstructions, each macroinstruction including an operation code field of binary signals and an operand field of binary signals, said microprocessor including:

arithmetic and logic unit (ALU) means for executing arithmetic and logic operations;

first register means for storing a macroinstruction in execution by the microprocessor:

first control storage means for storing microinstructions at addressable locations, said first control storage means

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responsive to address signals being applied thereto for producing as an output a microinstruction stored at the addressed location, each microinstruction including a set of "n" binary signals, each microinstruction further including a subset of "b" binary signals, where "n" and "b" are integers greater than 0, and "n" is greater than "b", each microinstruction also including signals representing the address of the next microinstruction to be executed by the microprocessor:

circuit means for applying addresses signals to the first control storage means;

programmable logic array means for producing as a first output "b" binary signals which are a function of the binary signals applied thereto:

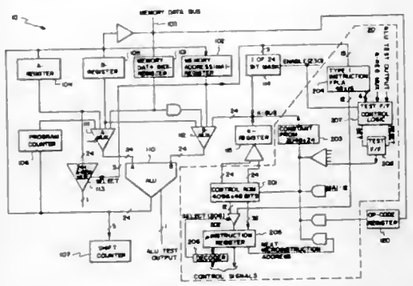
circuit means for applying to the programmable logic array means binary signals of the operand field of the macroinstruction stored in the first register means;

multiplexer means responsive to a select signal for producing as its output, one of two sets of "b" input signals applied thereto:

circuit means for applying the first output of the programmable logic array means as one set of "b" input signal and the subset of "b" binary signals of a microinstruction produced by the control storage means as a second set of input signals to the multiplexer means:

microinstruction register means for storing a microinstruction;

circuit means for applying the subset of "b" signals produced



by the multiplexer means and the binary signals of the microinstruction produced by the control storage means less said subset of "b" binary signals of the microinstruction for storage in the microinstruction register means, the signals stored in the microinstruction register means being the microinstruction in execution at any given time;

decoder means to which selected signals of the microinstruction stored in the microinstruction register means are applied for producing a binary select signal;

circuit means for applying the select signal produced by the decoder means to the multiplexer means, said select signal determining whether the subset of "b" binary signals of the microinstruction produced by the control store is stored in the microinstruction register, or the "b" bits binary signals produced by the programmable logic array means is stored in the microinstruction register means;

test flip flop means for storing the results of the execution of a test microinstruction and for producing an output signal representing such result;

test flip flop control logic means for controlling the state of the test flip flop means responsive to a second output of "c" binary signals produced by the programmable array logic means where "c" is an integer greater than zero, a binary signal stored in a designated position of a second register means, and an ALU test output binary signal produced by the ALU means;

circuit means for applying the second output of the programmable array logic means, the binary signal from the second register means and the ALU test output signal to the test flip flop logic means; and

circuit means for applying the output signal of the test flip flop as an address signal applied to the first control storage means.

4,825,364

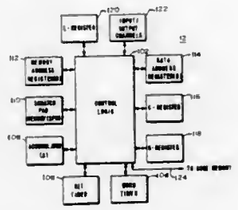
MONOLITHIC DATA PROCESSOR WITH MEMORY REFRESH

Gilbert P. Hyatt, 7841 Jennifer Cir., La Palma, Calif. 90703

Continuation of Ser. No. 101,881, Dec. 28, 1970. This application Oct. 1, 1973, Ser. No. 402,520

Int. Cl.[4] G06F *1/00, 13/00*

U.S. Cl. 364—200 **33 Claims**



1. A data processor architecture comprising:

an integrated circuit refreshable memory for storing computer operands in response to a memory refresh signal;

an integrated circuit read only memory for storing computer instructions; and

execution means for executing the computer instructions stored in said read only memory, said execution means including processing means for processing the computer operands stored in said refreshable memory in response to the execution of at least one of the computer instructions stored in said read only memory and refresh means for generating the memory refresh signal in response to the execution of at least one of the computer instructions stored in said read only memory.

4,825,365

MULTI-IMAGING APPARATUS

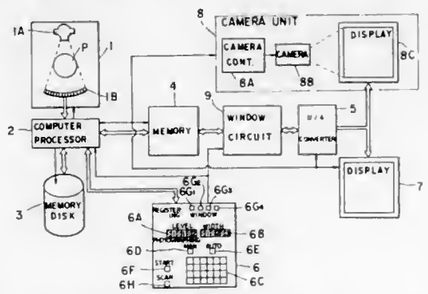
Akira Inoue, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 27, 1987, Ser. No. 7,403

Claims priority, application Japan, Feb. 14, 1986, 61-30180

Int. Cl.[4] G06F *15/42;* **G01N** *23/04;* **G03B** *42/02*

U.S. Cl. 364—413.19 **2 Claims**



1. A multi-imaging apparatus comprising:

an image displaying memory for storing image data of an object acquired by a medical diagnostic appliance;

a monitor means for displaying the image data of said image displaying memory;

a window circuit having a plurality of window conditions, for windowing the image displayed by said monitor means;

a memory disk for storing the image data of said image displaying memory;

a camera unit for photographing the image displayed by said monitor in a portion of a multi-image film having a plurality of photographing areas;

an input means for selectively inputting said window conditions and image identifying data; and

a computer processor for selectively controlling a register-mode in which the window condition data selected by said input means is registered in association with the image identifying data while said acquired data is stored into said memory disk, an window-condition displaying mode in which the window conditions based on said registered window condition data are automatically selected and said monitor means displays a correspondingly windowed image for photographing by said camera unit, a photographing mode in which the operation of said camera unit is controlled.

4,825,366

LOCKUP CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

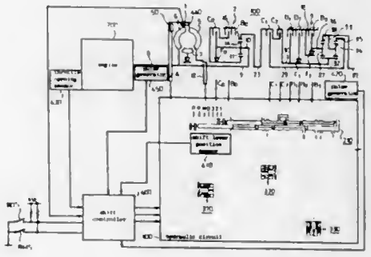
Keiichi Yamamoto, Okazaki, and Kazuo Ishikawa, Hoi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Mar. 6, 1987, Ser. No. 23,038

Claims priority, application Japan, Mar. 7, 1986, 61-49584

Int. Cl.[4] G06F *15/20;* **B60K** *41/22*

U.S. Cl. 364—424.1 **8 Claims**



1. A lockup control system for an automatic transmission including a torque converter having its input shaft coupled to an output shaft of an onboard engine, a directly coupled clutch which provides a direct connection between the input and the output shaft of the torque converter, a change gearing having its input shaft coupled to the output shaft of the torque converter and lockup activate means for turning the directly coupled clutch on or off;

the lockup control system comprising

first speed detecting means for detecting the rotational speed of at least one of the input and the output shaft of the change gearing;

second speed detecting means for detecting the rotational speed of the output shaft of the onboard engine;

means for detecting a ratio of the rotational speed of the output shaft over the rotational speed of the input shaft of the torque converter on the basis of the rotational speeds of the change gearing and the engine;

means for generating an engine status signal representing an operating status of the engine;

means for storing information which is to be referenced when determining the activation of the lockup and which corresponds to an engine operating status;

means for reading the reference information which corresponds to a particular engine operating status;

lockup command means for comparing a ratio of the rotational speed of the output shaft over the rotational speed of the input shaft of the torque converter against the reference information which is read out and for providing a lockup command to the lockup activate means whenever the ratio is equal to or greater than the reference information;

memory means for storing the rotational speed of the change gearing which is detected by the first speed detecting means at the time of the lockup command;

and lockup terminate command means operative to compare the rotational speed detected by the first speed detecting means against a rotational speed which is stored in the memory means and from which a preset value is subtracted and to provide a lockup terminate command to rotational speed is less than the latter valne.

4,825,367

CONTROL APPARATUS FOR CONTROLLING DEVICE LOADED ON VEHICLE

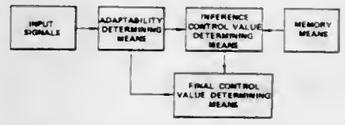
Mitsuru Nagaoka, and Toshihiro Matsuoka, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 23, 1987, Ser. No. 136,997

Claims priority, application Japan, Dec. 23, 1986, 61-305333; Dec. 23, 1986, 61-305334; Dec. 23, 1986, 61-305335

Int. Cl.[4] G06F *15/14*

U.S. Cl. 364—424.05 **17 Claims**



1. In a control apparatus for controlling a device loaded on a vehicle in which a control value therefor is on the basis of plural input signals, said control apparatus comprising:

basic control value memorizing means for memorizing a basic control value obtained for every combination of plural control zones present for every signal value of said input signals;

adaptability determining means for determining a second adaptability for every combination from a first adaptability obtained for every control zone with respect to every combination of said control zones;

inference control value determining means for determining an inference control value for every combination from said basic control value and said second adaptability; and

final control value determining means for determining a final control value from said second adaptabilities and said inference control values.

4,825,368

DEVICE FOR CONTROLLING VEHICLE FOUR WHEEL DRIVE FRONT/REAR COUPLING DEVICE BY LEARNING EFFECTIVE FRONT/REAR VEHICLE WHEELS RADIUS DISCREPANCY, AND METHOD OF OPERATION THEREOF

Hiroshi Itoh, and Tokuyuki Takahashi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 14, 1987, Ser. No. 95,918

Claims priority, application Japan, Sep. 29, 1986, 61-230544

Int. Cl.[4] B60K *17/34, 23/08;* **G05D** *17/02*

U.S. Cl. 364—424.1 **5 Claims**

1. For a four wheel drive vehicle with two front wheels, two rear wheels, a four wheel drive device, and an engine, rota-

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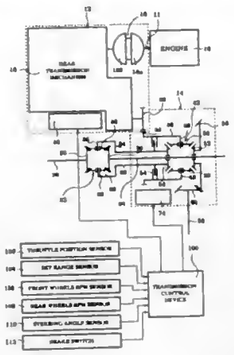
tional power from said engine being provided via said four wheel drive device to a combination of the front wheels of said vehicle and also to a combination of the rear wheels of said vehicle, and further comprising a front/rear coupling device fitted to said four wheel drive device for selectively coupling together the rotation of said combination of said front wheels and the rotation of said combination of said rear wheels,

a system for controlling said front/rear coupling device, comprising:

(a) a means for detecting the rotational speed of said combination of the front wheels of said vehicle;

(b) a means for detecting the rotational speed of said combination of the rear wheels of said vehicle;

(c) a calculating means for calculating a ratio between an effective rolling radius of the front wheels and an effective



rolling radius of the rear wheels from the rotational speed of said combination of the front wheels and the rotational speed of said combination of the rear wheels as they are detected by said rotational speed detecting means when the vehicle is running along a substantially straight course at a speed within a predetermined speed range under an engine output power less than a predetermined rate with no braking while said front/rear coupling device is released; and

(d) a control means for controlling said front/rear coupling device according to a discrepancy between the detected rotational speed of said combination of the front wheels and the detected rotational speed of said combination of the rear wheels, as corrected by said calculated ratio between the effective rolling radius of the front wheels and the effective rolling radius of the rear wheels.

4,825,369

APPARATUS FOR CONTROLLING FUEL INJECTION TIMING OF A FUEL INJECTION PUMP

Hidekazu Oshizawa, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1986, Ser. No. 870,782

Claims priority, application Japan, Jun. 13, 1985, 60-127112

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 364—431.05 **10 Claims**

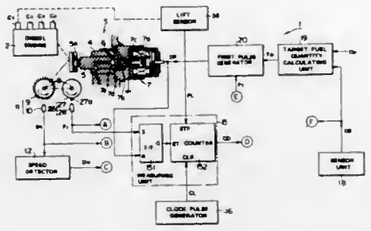
1. A fuel injection timing control apparatus for controlling the injection advance angle of fuel injected from a fuel injection pump to an associated internal combustion engine, said fuel injection pump including a solenoid valve which is located between a high pressure chamber and a lower pressure portion of said fuel injection pump and is opened/closed in response to a driving pulse signal so that an injection advance and an injection quantity of fuel from said fuel injection pump can be controlled, said apparatus comprising:

a first means for outputting a first data relating to an angular position of a driving shaft of said fuel injection pump which represents a target advance angle of fuel injection determined according to the operating condition of said internal combustion engine;

a detecting means for detecting the actual values of a timing which influences the beginning of the combustion of fuel in said internal combustion engine;

a second means responsive to the output from said detecting means and the driving pulse signal for producing a second data representing a delay time from a time of an application of the driving pulse signal to said actual value of the timing obtained in correspondence thereto; a rotation generator for generating rotation pulses every predetermined angle of rotation of the driving shaft;

a speed detector responsive to the rotation pulse signal for producing speed data relating to the speed of said internal combustion engine;



a third means responsive to the second data and the speed data for producing a third data representing the angle of the driving shaft corresponding to the delay time shown by the second data; and

a correcting means for correcting the angle represented by the first data by the angle represented by the third data;

an outputting means responsive to the rotation pulses for producing an angular position data relating to an angular position of the driving shaft at each instant;

a determining means responsive to said output means and said correcting means for determining an angular position of said driving shaft at where said solenoid valve is to be closed; and

means responsive to said determining means for generating the driving pulse signal so that the target advance angle of fuel injection determined by said first means can be attained.

4,825,370

ACTIVE SUSPENSION SYSTEM PROVIDING INHIBITION OF VEHICLE BODY VERTICAL OSCILLATION, AND METHOD OF OPERATION THEREOF

Ryuichi Kurosawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 27, 1987, Ser. No. 77,871

Claims priority, application Japan, Jul. 31, 1986, 61-180942

Int. Cl.⁴ G06F *15/00*; B60G *17/00*

U.S. Cl. 364—424.05 **7 Claims**

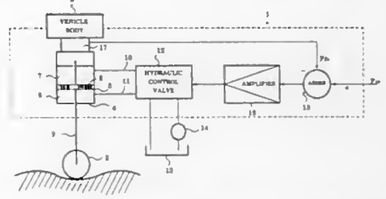
1. For a vehicle which is equipped with a body and a plurality of vehicle wheels for running on a road surface, an active suspension system comprising:

(a) a plurality of suspension actuators each being provided for one of said plurality of vehicle wheels and continually producing a supporting force for supporting said vehicle body on the corresponding vehicle wheel;

(b) a means for detecting an amount of relative movement between each said vehicle wheel and the vehicle body; and

(c) a calculation and control means for calculating a target value of said supporting force produced by each said suspension actuator according to the amount of relative

movement between the corresponding vehicle wheel and the vehicle body detected by said relative movement detecting means and controlling each said suspension



actuator so that the supporting force produced by each said suspension actuator conforms to the target value of said supporting force for each said suspension actuator.

4,825,371

ANTI-SKID CONTROL SYSTEM FOR MOTOR VEHICLE

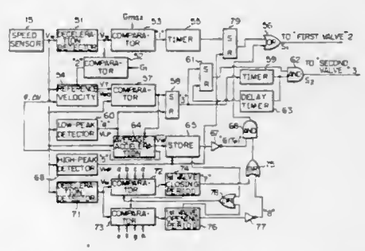
Akira Hosshi, Kawasaki; Hideo Akima, Yokohama; Katsuya Miyake, Ageo, and Isao Yamaki, Iwatsuki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 20, 1987, Ser. No. 28,544

Claims priority, application Japan, Mar. 20, 1986, 61-062433

Int. Cl.⁴ B60T *8/34*

U.S. Cl. 364—426.02 **8 Claims**



1. An anti-skid control system for a motor vehicle, including a brake fluid pressure buildup-control mode and a brake fluid pressure reduction mode, which occur in anti-skid cycles, said anti-skid control system comprising:

first valve means for alternately building up and holding brake fluid pressure during said brake fluid pressure build-up-control mode;

wheel speed measuring means for measuring a speed of each wheel of the motor vehicle and for providing a wheel velocity signal V_W responsive to said speed;

peak detecting means for receiving said velocity signal V_W and for detecting a high peak value V_{HP} and a low peak value V_{LP} of said velocity signal V_W when said anti-skid control system is operated;

controller means for repetitively opening and closing said first valve means during said brake fluid pressure buildup-control mode, from a first time when said velocity signal V_W has said high peak value V_{HP} to a second time when said velocity signal V_W has a value R, said value R corresponding to said velocity signal V_W being equal to a reference velocity V_{WO} at the second time, said reference velocity V_{WO} having an initial value at the first time being less than said high peak value V_{HP} by a predetermined velocity value ΔV, having values which vary between the first time and the second time dependent upon a gradient θ, and having a final value equal to said velocity signal V_W at the second time corresponding to said value R;

acceleration measuring means for measuring wheel acceleration during a time after detection of said low peak value V_{LP} by said peak detecting means on the basis of said velocity signal V_W between a first value Va and a second value Vb of said velocity signal V_W, said first value Va being dependent upon a predetermined rate of wheel velocity and said low peak value V_{LP}, said second value Vb being dependent upon another predetermined rate of wheel velocity and said first value Va; and

determining means for determining at least one of said predetermined velocity value ΔV, said gradient θ and an initial pressure buildup time T_P for said brake fluid pressure buildup-control mode and in accordance with said measured wheel acceleration.

4,825,372

SYSTEM FOR INTEGRALLY CONTROLLING AUTOMATIC TRANSMISSION AND ENGINE

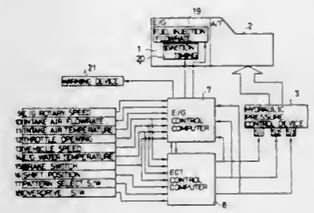
Hideki Yasue, and Kagenori Fukumura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 9, 1987, Ser. No. 12,165

Claims priority, application Japan, Feb. 14, 1986, 61-30292

Int. Cl.⁴ G05D *17/02*; G06F *15/50*

U.S. Cl. 364—431.01 **12 Claims**



1. A system for integrally controlling an automatic transmission and an engine, wherein gear stages are automatically switched in accordance with a preset shift map, and engine torque is changed by a predetermined value by a lag angle control, to maintain satisfactory shift characteristics, comprising:

processor means for controlling engine torque change, said processor means including

means for detecting a high frequency of shiftings;

regulating means for regulating said change of engine torque when said high frequency of shiftings is detected;

means for detecting a warmed-up state of said engine; and

modulating means for moderating regulation of the change of engine torque performed by said regulating means when the engine is not warmed-up.

4,825,373

FUEL INJECTION TIMING CONTROL APPARATUS FOR A DIESEL ENGINE, INCLUDING A DETERMINATION OF WHEN ACTUAL IGNITION CAN BE DETECTED

Tetsuya Nakamura, Kariya; Nobuhito Hobo, Inuyama; Akira Masuda, Aichi, and Kazuo Shinoda, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 16, 1986, Ser. No. 819,301

Claims priority, application Japan, Jan. 16, 1985, 60-6334

Int. Cl.⁴ F02D *41/26, 41/40*; G05D *17/02*; F02M *51/00*

U.S. Cl. 364—431.05 **5 Claims**

1. A fuel injection timing control apparatus for a diesel engine equipped with a fuel injection pump, comprising:

input means for receiving information indicative of a current operating status of said engine, and producing output data indicative thereof;

reference detecting means for detecting a reference time point at which a crankshaft of said engine attains a refer-

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ence angular position and producing a corresponding time reference signal indicative thereof;

means for detecting an actual fuel injection time point as a specific positional relationship between predetermined components of said fuel injection pump;

firing time sensing means for detecting an actual firing of fuel within a cylinder of said engine, and producing a signal indicative thereof;

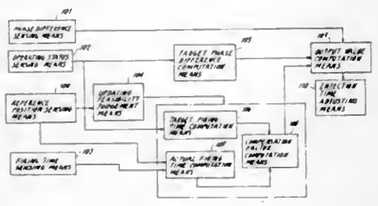
processing means for:

(a) computing a target firing time at which said firing should occur with respect to said reference time point based on output data from said operating status sensing means, and for producing data indicative of said target firing time point;

(b) computing, based on said output data from said input means, a target fuel injection time difference between said reference time point and a target fuel injection time point, and for producing data indicative of said target fuel injection time point, and for producing data indicative of said target fuel injection time difference;

(c) detecting an actual fuel injection time difference between said reference time point and said actual fuel injection time point and producing data indicative of said actual fuel injection time difference;

(d) computing an actual firing time point from a reference of said reference time point, based on said signals from said reference position sensing means and said firing time sensing means, and for producing data indicative of said actual firing time point;



(e) performing computations, based on output data from said input means, to determine whether or not a current operating status of said diesel engine enables a stable detecting operation by said firing time sensing means and producing an indication indicative of said determining;

(f) periodically computing, responsive to said indication from said step (e) that said engine operating status enables stable firing time detection, computing a value of a correction factor based on a difference between said target firing time point and said actual firing time point, storing said computed correction factor, and producing an output correction factor from said computed value while said indication is present, and for terminating said computation and updating operations and producing said stored value of correction factor as said output correction factor when said indication indicates that stable firing time detection cannot be obtained; and

(g) computing an output data value, based on said actual fuel injection time difference and said target fuel injection time difference, and for applying said output data value as a control value to control said injection time adjustment means such as to bring said actual fuel injection time difference into coincidence with said target fuel injection time difference, and for modifying said output data value in accordance with said output correction factor, such as to modify said actual fuel injection time difference to bring said actual firing time into coincidence with said target firing time; and

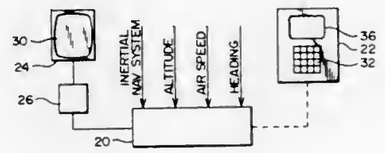
injection time adjustment means, responsive to a control value, for controlling said fuel injection pump to vary said actual fuel injection time difference.

4,825,374

AIRCRAFT DESCENT GUIDE SYSTEM AND METHOD FOR CREATING DESCENT GUIDANCE INFORMATION

Ethmer W. King; Robert C. Kircher, Jr., and David S. Yotsuuye, all of King County, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1985, Ser. No. 811,283
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—433 **23 Claims**



1. A method for guiding a descent of an aircraft, the method comprising the steps of:

a. determining a position of the aircraft and providing a first output corresponding to the position;

b. inputting information representing a lower descent position P_0 as well as first and second aircraft descent parameters for conducting said descent;

c. generating a descent guideslope which is formed by at least upper and lower descent legs, in which the lower descent leg includes the lower descent position P_0 and an upper descent position P_1, and the upper descent leg includes the upper descent position P_1 and a further upper descent position P_2, in a manner that a location of the upper descent position P_1 relative to the lower descent position P_0 is calculated as a function of the first descent parameters, and a location of the further upper descent position P_2 relative to the upper descent position P_1 is calculated as a function of the second descent parameters; and

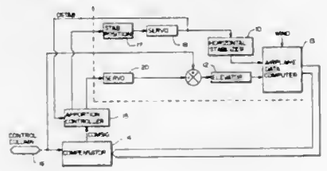
d. guiding the aircraft in response to the first output and the descent guideslope.

4,825,375

APPARATUS AND METHODS FOR APPORTIONING COMMANDS BETWEEN AIRCRAFT FLIGHT CONTROL SURFACES

Arun A. Nadkarni, and Thomas M. Richardson, both of King County, Wash., assignors to Boeing Company, Seattle, Wash.

Filed Dec. 23, 1985, Ser. No. 812,938
Int. Cl.[4] G06F *15/50*; B64C *13/00*
U.S. Cl. 364—435 **16 Claims**



1. An aircraft having first and second movable flight control members and a controller for so operating said flight control members as to cause said aircraft to follow a selected flight path, said controller comprising:

(a) means for receiving at least a first input signal derived from a flight operating parameter or an environmental operating condition which is capable of affecting the flight path of the aircraft;

(b) first means for processing said first input signal and thereby generating a first output for moving said second flight control member a first amount to a first position relative to a first reference position, coincidentally generating a first aerodynamic force;

(c) means for generating a second output indicative of a second amount of movement of said first flight control member to a second position relative to a second reference position in which said first flight control member is capable of coincidentally generating a second aerodynamic force substantially equivalent to said first aerodynamic force;

(d) second means for processing said second output and said first input signal into a third output for moving said first flight control member a third amount, relative to said second reference position, which is less than said second amount of movement by an amount which is equivalent to said second output, in order to move said first flight control to a third position;

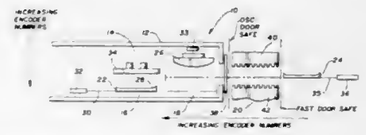
(e) said first output and said third output thereby so causing the second and first flight control members to be positioned at said first and third positions as to cause the aircraft to fly said selected path.

4,825,376

CONTROLLER FOR GLASS SHEET PROCESSING SYSTEM

Gary D. Brinker, Perrysburg; Jeffrey N. Klopping, Toledo, and Eric D. Fintel, Genoa, all of Ohio, assignors to Glasstech International L.P., Dover, Del.

Filed Apr. 17, 1986, Ser. No. 856,060
Int. Cl.[4] G06F *15/46*; C03B *35/00*
U.S. Cl. 364—473 **10 Claims**



1. In a glass sheet processing system, including one or more movable components each driven by a variable speed drive, a controller for monitoring one or more of the movable components and for operation with a central control system including a master computer, the controller comprising:

a position encoder associated with each of the movable components monitored by the system; and

a slave computer including

two-way communications means for receiving data signals corresponding to preselected position parameters for each of the movable components monitored by the system, said data signals being downloaded from the master computer, and for sending messages to the master computer,

a position input associated with each position encoder for receiving current position data of the movable components, and

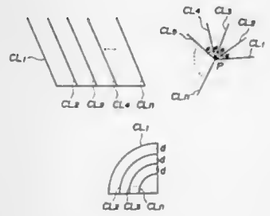
logic for continuously monitoring the current position data, comparing the current position data to the preselected position parameters for the movable components, and if certain preselected conditions are determined to exist, sending a preselected error condition message to the master computer.

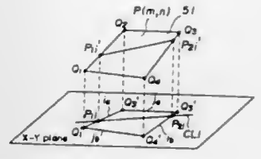
4,825,377

COMPLEX CURVED SURFACE CREATION METHOD

Masaki Seki, and Norihisa Amano, both of Tokyo, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00100, § 371 Date Oct. 23, 1986, § 102(e) Date Oct. 23, 1986, PCT Pub. No. WO86/05289, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 28, 1986, Ser. No. 928,288
Claims priority, application Japan, Feb. 28, 1985, 60-39445
Int. Cl.[4] G05B *19/403*
U.S. Cl. 364—474.29 **6 Claims**





1. A complex curved surface creation method for creating a complex curved surface composed of at least two three-dimensional curved surfaces, comprising the following steps:

(a) inputting data for specifying each of said three-dimensional curved surfaces, and inputting data specifying a single specified line of intersection on a reference plane and inputting a rule for determining additional lines of intersection of section planes with said reference plane on the basis of said single specified line of intersection;

(b) finding a plurality of section curves of the complex curved surface, each of said section curves lying in an i-th section plane having an i-th line of intersection, among said additional lines of intersection, with said reference plane, including the steps of:

(bi) dividing each of said three-dimensional curved surfaces into a plurality of patches each comprising a quadrilateral by using the inputted data;

(bii) obtaining coordinates of points of intersection between an i-th line of intersection and the sides of the patches projected onto said reference plane;

(biii) obtaining coordinates of points, each point lying on one of the three-dimensional curved surfaces and corresponding to one of the points of intersection; and

(biv) obtaining section curves by assembling said points on the three-dimensional curved surfaces; and

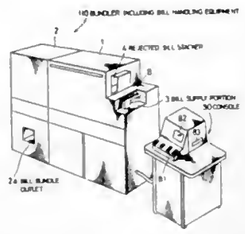
(c) machining a complex curved surface using an assemblage of the section curves lying in said section planes forming respective ones of the single specified and additional lines of intersection with said reference plane.

4,825,378

BUNDLER INCLUDING BILL HANDLING SYSTEM WHICH KEEPS TRACK OF UNBUNDLED BILLS

Akio Yuge, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 16, 1987, Ser. No. 62,600
Claims priority, application Japan, Jun. 17, 1986, 61-140943
Int. Cl.⁴ G06F *15/20*; B07C *5/34*
U.S. Cl. 364—478 **6 Claims**



6. A method of continually bundling bills of a predetermined number having the same predetermined denomination by a bundler including a bill handling system, comprising the steps of:

(a) designating a denomination of bills to be bundled;

(b) counting the number of bills of the designated denomination;

(c) bundling the designated denomination of bills into bundles having the predetermined number of bills;

(d) generating an end signal indicative of the end of the bill bundling step (c);

(e) temporarily storing a number of bills of the designated denomination remaining unbundled after said bill bundling step (c); and

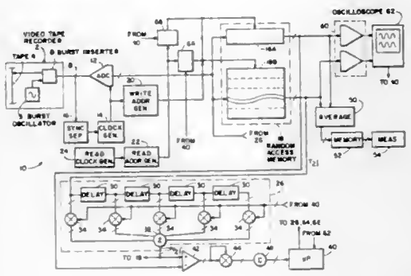
(f) indicating the number of bills bundled at bill bundling step (c) and the number of bills remaining unbundled after bill bundling step (c).

4,825,379

METHOD AND APPARATUS FOR PROCESSING WAVEFORM RECORDS FOR JITTER ELIMINATION PRIOR TO AVERAGING IN DETERMINING SIGNAL TO NOISE RATIO

Ajay K. Luthra, Beaverton, and Yih-Chyun Jenq, Lake Oswego, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 29, 1986, Ser. No. 901,668
Int. Cl.⁴ G01R *25/00*
U.S. Cl. 364—487 **21 Claims**



16. A method of processing a repetitive signal, comprising

(a) writing first and second waveform records representative of the waveforms of respective repetitions of the repetitive signal into memory,

(b) reading the first waveform record from memory to form a reference signal,

(c) reading the second waveform record from memory to form a second signal,

(d) shifting the second signal in time by a selected amount to form a time-shifted second signal,

(e) forming a difference signal representative of the difference in instantaneous magnitude between the time-shifted second signal and the reference signal,

(f) determining the power of the difference signal,

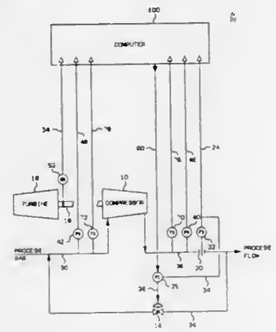
(g) repeating steps (e) and (f) a plurality of times, using a different selected amount on each occasion, and determining which selected amount provides the smallest value for the power determined in step (f).

4,825,380

MOLECULAR WEIGHT DETERMINATION FOR CONSTRAINT CONTROL OF A COMPRESSOR

James W. Hobbs, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 19, 1987, Ser. No. 52,668
Int. Cl.⁴ F04D *27/02*
U.S. Cl. 364—499 **12 Claims**



1. Apparatus comprising:

(a) a compressor having a suction inlet and a discharge outlet;

(b) means for supplying a gas to the suction inlet of said compressor;

(c) means for flowing the compressed gas from the discharge outlet of said compressor and for recycling at least a portion of said compressed gas in a recycle stream from the discharge outlet to the suction inlet of said compressor;

(d) means for establishing a first signal representative of the actual flow rate of said gas in said compressor;

(e) means for determining the molecular weight of said gas flowing in said compressor, wherein the molecular weight is determined on-line and further wherein the molecular weight is periodically determined so as to provide an essentially continuous determination;

(f) means for establishing a second signal representative of the desired minimum flow rate of said gas in said compressor responsive to the molecular weight of said gas, wherein the minimum flow rate represented by said second signal is a flow rate which will prevent surging of said compressor;

(g) means for comparing said first signal and said second signal and for establishing a third signal representative of the difference between said first signal and said second signal; and

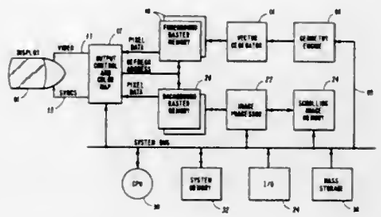
(h) means for manipulating the flow rate of said recycle stream in response to said third signal to thereby maintain the minimum flow of said gas in said compressor substantially equal to the desired minimum flow represented by said second signal.

4,825,381

MOVING MAP DISPLAY

Scott A. Bottorf; Jeffrey D. Russell, and Conway A. Southard, all of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 31, 1987, Ser. No. 33,298
Int. Cl.⁴ G06F *15/72*
U.S. Cl. 364—443 **6 Claims**



3. A high speed moving map display system, of the type having rapidly selectable cultural features displayed over the moving map; the display system comprising:

a. CPU having a system bus connected thereto;

b. a system memory device connected with said system bus for entering data to said system memory;

c. an input device connected with said system bus for entering data to said system memory;

d. mass storage means connected with said system bus for storing geographical map data and cultural feature data;

e. a first image data processing channel in connection with said system bus for generating an image from said geographic map data;

f. a second image data processing channel in connection with said system bus for processing said rapidly selectable cultural feature data;

g. a plurality of display memory banks in connection with said first image data processing channel and said second image data processing channel, for storing said geographic map data and said cultural featured data; and

h. a display device connected with said plurality of display memory banks for receiving and displaying said images;

whereby a high speed moving map display system with the capability of providing rapidly selectable cultural features displayed over the map is achieved by dividing the data within the mass storage means, on a functional basis, and separately processing the different functional data in separate and distinct image data processing channels.

4,825,382

NUMERICAL CONTROL PROGRAM EDITING AND STORAGE IN RAM AND ROM

Morio Kiyokawa, and Akihiko Fujimoto, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,624
Claims priority, application Japan, Apr. 12, 1983, 58-64016
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—474.01 **2 Claims**

1. A numerical control system comprising:

an input unit,

a control unit,

a memory unit,

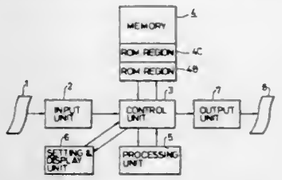
a processing unit,

a setting and display unit,

an output unit, and

an external storage unit receiving the output of said output unit and said input receiving the output of said external storage unit,

said memory unit including a RAM, a first ROM for storing an edited program produced by editing a machining program entered through said input unit into said RAM in



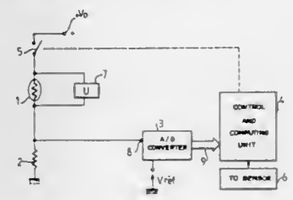
said memory unit, said edited program being stored through said output unit to said external storage unit, and a second ROM for storing a program for writing said edited program into said first ROM from said external storage unit through said input unit under a writing command entered through said setting and display unit, said first ROM being physically replaceable with said RAM in said memory unit.

4,825,383

PROCESS AND DEVICE FOR MEASURING THE LEVEL OF THE FREE SURFACE OF A LIQUID

Philippe Ory, Ittenheim, France, assignor to Bendix Electronics S.A., Toulouse, France

Filed May 20, 1987, Ser. No. 52,661
Claims priority, application France, Jun. 4, 1986, 86 08056
Int. Cl.⁴ G01F *23/24*
U.S. Cl. 364—509 **15 Claims**



1. Process for measuring the level of the free surface of a liquid contained in a storage vessel and having a heat conductivity which is different from that of the medium situated above this free surface, by means of a hot wire sensor whose electrical resistance varies greatly with the temperature, this sensor being arranged so as to be cooled by the liquid to a greater or lesser degree as a function of the level of its free surface, comprising the steps of

(a) heating the sensor to a predetermined temperature (To) by a Joule effect by being supplied with a constant voltage supply,

(b) measuring the current (Io) flowing in the sensor at the instant when the temperature (To) is reached,

(c) switching off the supply to the sensor at this instant,

(d) switching on the supply to the sensor at the end of a predetermined cooling time interval measured from the instant of the switching off of the supply,

(e) measuring the current (I) flowing in the sensor at the end of this time interval, and then

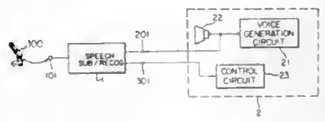
(f) computing the level of the liquid from the values of (I) and (Io).

4,825,384

SPEECH RECOGNIZER

Atsushi Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 408,594, Aug. 16, 1982, abandoned. This application May 11, 1987, Ser. No. 48,503
Claims priority, application Japan, Aug. 27, 1981, 56-134766
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 364—513.5 **8 Claims**



1. A system comprising a voice recognizer and an apparatus controlled by said voice recognizer comprising:

signal generation means for generating a voice signal;

conversion means for converting an output of said signal generating means to an output sound;

the voice recognizer comprising:

(a) acoustic input means for receiving output sound from said conversion means and a voice containing voice information;

(b) second input means connected to said signal generation means, for receiving said voice signal;

(c) means connected to said acoustic input means and to said second input means for filtering said output sound from the voice and output sound received by said acoustic input means, said filtering means performing said filtering in accordance with said voice signal received by said second input means, said filtering means thereby producing a filtered signal containing the voice information target via said acoustic input means;

(d) means connected to said filtering means for recognizing the voice information received through said filtering means, to produce a result of voice recognition; and

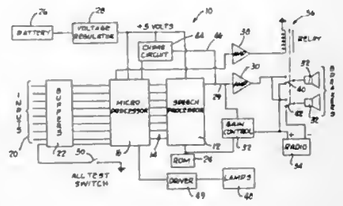
(e) control means provided in said apparatus responsive to said result of voice recognition.

4,825,385

SPEECH PROCESSOR METHOD AND APPARATUS

Darrel A. Dolph, Hersey; Leonard W. Demski, Reed City; Robert E. Taylor, Cadillac, and Arthur R. McKendry, Reed City, all of Mich., assignors to Nartron Corporation, Reed City, Mich.

Continuation of Ser. No. 96,021, Sep. 11, 1987, abandoned, which is a continuation of Ser. No. 525,315, Aug. 22, 1983, abandoned. This application Sep. 6, 1988, Ser. No. 241,829
Int. Cl.⁴ G10L *5/00*
U.S. Cl. 364—513.5 **12 Claims**



1. Apparatus for generating an audible chime to apprise a motor vehicle operator of the status of a motor vehicle comprising:

a microprocessor which executes an operating system that includes a program for monitoring one or more input pins and thereby monitors one or more status conditions of a motor vehicle;

said microprocessor operating system further executing a program for generating repetitive output signals from a single microprocessor output pin at an audible chime frequency in response to the monitoring of the one or more status conditions; and

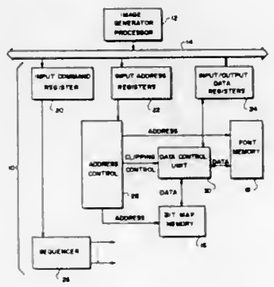
amplifier means coupled to said single microprocessor output pin for amplifying said repetitive output signals and coupling amplified output signals to a speaker for converting said amplified output signals into an audible tone having said audible chime frequency.

4,825,386

HORIZONTAL LINE PROCESSOR OF DATA TO BE PRINTED DOT SEQUENTIALLY

Anthony Bogacki, Chester, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 25, 1986, Ser. No. 900,028
Int. Cl.⁴ G06F *15/40*
U.S. Cl. 364—518 **5 Claims**



1. A horizontal line processor for loading print instruction commands into a full page bit map memory having addressable locations arranged in an X-Y pattern, each of the print instruction commands comprising a retrievable display means instruction for a page location corresponding to the full page bit map memory location the command is located in, the horizontal line processor comprising:

A. a font memory for storing bit representations of print instruction commands, for individual images, each set of bit representations for an image stored together in byte form, said bytes containing said bit representations for an individual image stored together and locatable by the first byte in said font memory containing said bit representations for the image;

B. means for receiving commands to load print instruction commands into said full page bit map memory, and in response thereto, re-transmitting same, each of said commands comprising:

1. a command specifying a type of operation to be performed on the print instructions stored in the full page bit map memory;

2. an address of a selected Y-location in said full page bit map memory in which said operation is to be performed;

3. a starting address on said selected Y-location line in said full page bit map memory at which said operation is to be performed;

4. a starting address in said font memory of said first bite containing bit representations of an image to be retrieved therefrom; and

5. a number representative of the length of said selected Y-location line in said full page bit map memory on which said instruction is to be loaded;

C. a sequencer means for generating a set of sequencer command instructions in response to receiving said operation command instructions and a LINE-DONE signal;

D. an address control unit receiving said sequencer command instructions, said selected Y-location address, said Y-location starting address, said font memory first byte starting address, and said number representative of line length, and, in response thereto, generating and sequentially incrementing selected addresses, along one Y-location line at a time, in the full page bit map memory where print instructions are to be loaded, generating and sequentially updating addresses in said font memory where said bit representations of printing instructions are located, and each time said address to the full page bit memory is incremented, decreasing by one said member representative of the length on said Y-line, until said number reaches zero and then generating said LINE-DONE signal; and

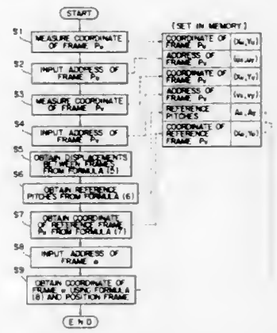
E. a data control unit receiving said sequencer command instructions, the print instructions in said full page map memory address locations generated by said address control unit, said bit representations of printing instructions in said font memory address locations generated by said address control, and at least a portion of said Y-location line starting address, and, in response thereto, selectively combining the contents of said retrieved printing instructions and said bit representations in response to said Y-location line starting address so as to generate an updated set of printing instructions and writing said updated printing instructions into the selected location in said full page bit map memory.

4,825,387

FRAME POSITIONING METHOD

Masaru Ono, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Feb. 9, 1987, Ser. No. 12,653
Claims priority, application Japan, Mar. 7, 1986, 61-48554
Int. Cl.⁴ G06F *15/40*; G03B *23/08*
U.S. Cl. 364—518 **3 Claims**



2. A frame positioning method which can precisely position a frame recorded on a microfiche mounted in a retrieval device comprising the steps of:

designating two arbitrary frames of different addresses which are recorded on a microfiche mounted in a retrieval device;

obtaining the addresses of the two arbitrary frames when they are displaced with respect to a predetermined position;

obtaining coordinates of the two arbitrary frames;

calculating a reference frame pitch between the two arbitrary frames;

calculating reference coordinates using the addresses and coordinates of the two arbitrary frames;

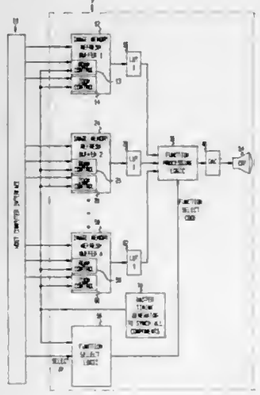
wherein one of the two arbitrary frames is a frame closest to a reference frame with an image recorded thereon and the other of the two arbitrary frames is a frame closest to a span frame with an image recorded thereon.

4,825,388

APPARATUS AND METHOD FOR PROCESSING DIGITAL IMAGES

David C. Dailey, West Trenton, and Richard B. Mott, Ringoes, both of N.J., assignors to Princeton Gamma Tech., Inc., Princeton, N.J.

Filed Apr. 1, 1986, Ser. No. 846,915
Int. Cl.⁴ G06F *15/00*; G09G *1/19*
U.S. Cl. 364—518 **21 Claims**



1. An improved computer graphics digital image comparison apparatus for processing and comparing at least two digitally stored images provided from a host computer and displaying on a raster-scan display means, a visible image of the result of said comparison, the apparatus comprising:

(a) at least two image memory refresh buffer means for digitally storing said images in respective pixel matrices, each said matrix having at least two bits per pixel;

(b) zoom and roam logic means for each of said image memory refresh buffer means for independently providing on said raster-scan display means, apparent magnification of a region of each digitally stored image, said apparent magnification including the selection of a pixel in each of said image memory refresh buffer means, which corresponds to a specific pixel correlated with said images being displayed on said raster-scan display means, said region having a selected size and position within the image memory refresh buffer means;

(c) lookup table means for each of said image memory refresh buffer means, each said lookup table means independently transforming into a programmed pixel value, each said pixel stored in said image memory refresh buffer means, and selected by the zoom and roam logic means;

(d) function processing logic means for processing said programmed pixel values from all of said lookup table means and generating new programmed pixel values;

(e) digital-to-analog conversion means for converting said new programmed pixel values generated by said function processing logic means, into an analog signal; and,

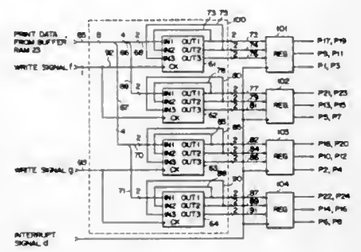
(f) raster-scan display means for using said analog signal to produce a visible image.

4,825,389

PRINT DATA EDITING CIRCUIT IN SERIAL PRINTER

Hideo Masaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 4, 1986, Ser. No. 870,372
Claims priority, application Japan, Jun. 12, 1985, 60-126189
Int. Cl.[4] B41J *3/12*; G06F *3/12*
U.S. Cl. 364—519 **3 Claims**



1. A print data editing circuit in a serial printer having printing pins arranged in two staggered columns, and driver means for driving the respective pins, comprising:

print data memory means for storing the print data;

write signal generating means for generating first and second write signals;

first register means for storing, in response to a first occurrence of the first write signal, odd bit print data comprising 2^{N-1}-bits (N being a positive integer of one or more) among 2^N-bits of print data stored in said print data memory means at address "m" (m being a positive integer), and for storing, in response to second and third occurrences of the first write signals, odd bit print data comprising 2^{N-1}-bits among 2^N-bits of data stored in said print data memory means at addresses "m+1" and "m+2", respectively;

second register means, connected to said first register means, for storing, in response to the second occurrence of the first write signal, odd bit print data comprising said 2^{N-1}-bits among 2^N-bits of data at address "m", and for storing, in response to the third occurrence of the first write signal, odd bit print data comprising said 2^{N-1}-bits among 2^N-bits of data at address "m+1"; and

third register means, connected to said second register means, for storing, in response to the third occurrence of the first write signal, odd bit print data comprising 2^{N-1}-bits among said 2^N-bits of print data at address "m", thereby setting the odd bit print data comprising 2^N-bits to be supplied to said driving means, in said first through third register means;

fourth register means for storing, in response to a first occurrence of the second write signal, even bit print data comprising 2^{N-1}-bits among 2^N-bits of print data stored in said print data memory means at address "m+a" (each of m and a being a positive integer), and for storing, in response to second and third occurrences of the second write signals, even bit print data comprising 2^{N-1}-bits among 2^N-bits of print data stored in said print data memory means at addresses "m+a+1" and "m+a+2", respectively;

fifth register means, connected to said fourth register means, for storing, in response to the second occurrence of the second write signal, odd bit print data comprising said 2^{N-1}-bits among 2^N-bits of print data at address "m+a", and for storing, in response to the third occurrence of the second write signal, even bit print data comprising said 2^{N-1}-bits among 2^N-bits of print data at address "m+a+1"; and

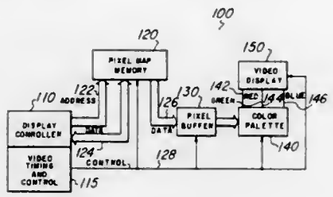
sixth register means, connected to said fifth register means, for storing, in response to the third occurrence of the second write signal, even bit print data comprising said 2^{N-1}-bits among 2^N-bit print data at address "m+a", thereby setting the even bit print data comprising 2^N-bits to be supplied to said driving means, in said fourth to sixth register means.

4,825,390

COLOR PALETTE HAVING REPEAT COLOR DATA

Jerry Van Aken, Sugarland, and Karl Guttag, Houston, both of Tex., assignors to Texas Instruments, Inc., Dallas, Tex.

Filed Apr. 28, 1986, Ser. No. 856,919
Int. Cl.[4] G09G *1/00*; G06G *3/153*
U.S. Cl. 364—526 **15 Claims**



1. A color palette system comprising:

a pixel map memory having a plurality of pixel color codes for defining a visual image, each pixel color code stored at a memory location corresponding to a video screen location;

a memory controller connected to said pixel map memory for sequentially applying memory addresses to said pixel memory map for recalling pixel color codes from said pixel map memory in a predetermined order corresponding to the raster scan of a video screen;

a color look up table connected to said pixel map memory and receiving said recalled pixel color codes, said color look up table including a plurality of color registers having stored therein color data words, each pixel color code received from said pixel map memory enabling recall of said color data words stored in a corresponding one of said color registers, at least one of said color registers storing therein a repeat color data word; and

a video signal generator connected to said color look up table for generating at least one video output signal having color characteristics corresponding to color data recalled from said color registers, except that said video signal generator generates said at least one video output signal having color characteristics corresponding to a previous recalled color data word when a said repeat color data word is recalled from said look up table.

4,825,391

DEPTH BUFFER PRIORITY PROCESSING FOR REAL TIME COMPUTER IMAGE GENERATING SYSTEMS

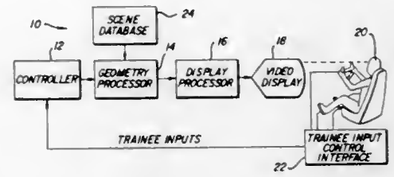
Donald M. Merz, Ormond Beach, Fla., assignor to General Electric Company, Philadelphia, Pa.

Filed Jul. 20, 1987, Ser. No. 75,126
Int. Cl.[4] G01J *1/10*
U.S. Cl. 364—526 **15 Claims**

1. A method for determining color image information in a computer image generation system for a sequence of display frames for each pixel of an image to be displayed, each frame being defined by a plurality of spans, each span including a respective plurality of pixels, each pixel including a respective plurality of subpixels, and each image being defined by a plurality of faces, each face having a predetermined color intensity value said method comprising the steps of:

(a) identifying range data for each face appearing in each span, the range data including a minimum range distance and a maximum range distance from a viewpoint to each face;

(b) ordering the faces into range separable groups for each span in response to the range data identified; and



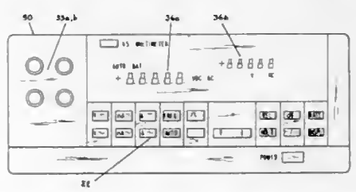
(c) processing the groups in group order sequence for each span until a color intensity control value for pixels in the span being processed is determined, the color intensity control value for pixels responsive to the color intensity control values from faces in the groups assigned to corresponding subpixels of pixels in the span.

4,825,392

DUAL FUNCTION DMM DISPLAY

Mark S. Freeman, 612 19th St., Snohomish, Wash. 98290

Filed Aug. 20, 1986, Ser. No. 898,250
Int. Cl.[4] G01D *7/04*; G01R *27/00*
U.S. Cl. 364—550 **16 Claims**



1. A measuring apparatus for controllably measuring a plurality of characteristics of parameters under test comprising:

single measuring means for measuring at one time only one of said plurality of characteristics of said parameters under test;

input means for providing said parameters under test to said measuring means;

control means for selecting a plurality of characteristics of said parameters provided by said input means to be sequentially measured by said single measuring means;

said measuring means providing plural data representations of said plurality of characteristics sequentially measured by said single measuring means; and

plural display means for concurrently displaying said plural data representations of said plurality of characteristics sequentially measured by said single measuring means.

4,825,393

POSITION MEASURING METHOD

Takushi Nishiya, Machida, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

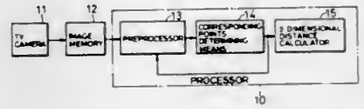
Filed Apr. 22, 1987, Ser. No. 41,228
Claims priority, application Japan, Apr. 23, 1986, 61-92088; Apr. 23, 1986, 61-92091
Int. Cl.[4] G01B *11/00*; G06F *15/46*
U.S. Cl. 364—560 **8 Claims**

1. A position measuring method comprising the steps of:

inputting a pair of image data representing an image of a picture of an external world;

processing the input image data to calculate a distribution of attractive forces generated between features of points of one image and features of points of an other image;

determining pairs of corresponding points on the images based upon said distribution; and



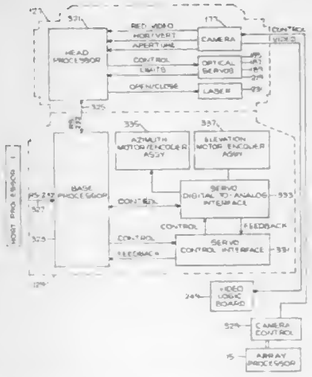
calculating positions of points of the external world corresponding to said corresponding points based upon relationships between positions of the pairs of the corresponding points.

4,825,394

VISION METROLOGY SYSTEM

Jerald K. Beamish, Fort Worth, and H. Dell Foster, San Antonio, both of Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed May 7, 1985, Ser. No. 731,916
Int. Cl.[4] G06K *9/46*; G03B *3/00*
U.S. Cl. 364—571.01 **35 Claims**



1. A vision head for a vision metrology system, comprising:

a primary prism,

a primary objective lens,

zoom optics means comprising a plurality of lenses

a sensor,

said primary prism, primary objective lens, and said zoom optics means comprising an optical path through which an image of an object may pass onto said sensor,

said primary prism comprising structure positioned to allow light to pass therethrough by way of a first path which coincides with said optical path and by way of a second path having an initial portion which is different from said first path and which intercepts said first path and then merges with said first path,

a reseau pattern means having a plurality of reseaus formed in a given pattern,

light means for projecting an image of said reseaus through said primary prism onto said sensor by way of said second path for use for correcting in real-time, optical distortion of the image of the object passing through said plurality of lenses of said zoom optics means.

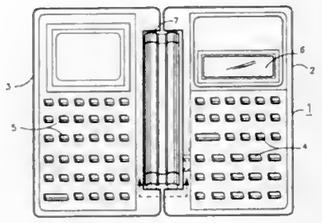
VOL 1101 ISS 4 APR 25 1989 UMI

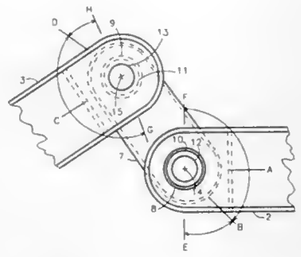
4,825,395

APPARATUS WITH TORSIONALLY STRESSED CONDUCTORS ROUTED THROUGH A HOLLOW ARTICULATED HINGE

Ralph W. Kinser, Jr.; David L. Shriver, and Judith A. Layman, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto,, Calif.

Filed May 29, 1986, Ser. No. 868,401
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—708 **3 Claims**





1. A handheld calculator or the like comprising:
a first case portion;
a display mounted in the first case portion;
a first keyboard mounted in the first case portion;
a second case portion; a second keyboard mounted in the second case portion;
a hollow articulated hinge, having separate and parallel first and second axes of rotation, coupled about the first axis of rotation to the first case portion and about the second axis of rotation to the second case portion, and allowing relative motion of one case portion about the other by one full revolution; and
flexible conductor means for electrically interconnecting the first and second keyboards by passing through the hollow articulated hinge.

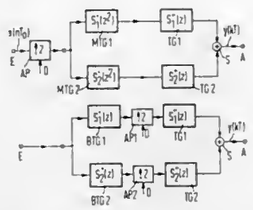
4,825,396

DIGITAL CIRCUIT FOR SAMPLING RATE VARIATION AND SIGNAL FILTERING AND METHOD FOR CONSTRUCTING THE CIRCUIT

Lajos Gazsi, Düsseldorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 12, 1987, Ser. No. 14,258
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604602
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.15 **12 Claims**

1. A digital circuit for sampling rate variation and signal filtering, said circuit comprising an input, an output, a lattice wave digital filter having a plurality of filter branches connected to said input, said filter branches each having at least two series-connected filter subgroups with basic filter elements each formed of one two port adaptor made up of adders and multipliers and one time-lag device, means disposed between



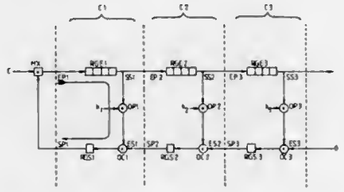
said at least two filter subgroups for varying the sampling rate and for generating a phase change in a digital system, and an adder connected between said filter branches and said output.

4,825,397

LINEAR FEEDBACK SHIFT REGISTER CIRCUIT, OF SYSTOLIC ARCHITECTURE

Marc Muller, Clamart, France, assignor to Schlumberger Industries S.A., Montrouge, France

Filed Jun. 22, 1987, Ser. No. 64,482
Claims priority, application France, Jun. 23, 1986, 86 08998
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.17 **1 Claim**



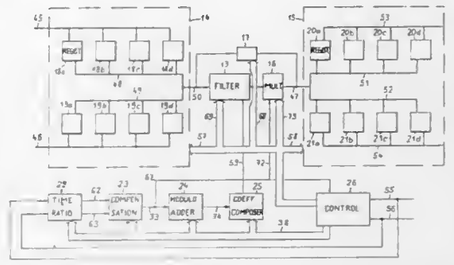
1. A linear feedback shift register circuit suitable for providing respective digital samples (Sj) at successive time instants, each of which samples represents a linear combination of prior digital samples (Sj−1 to Sj−N) and comprises M significant bits together with an optional addition of X sign extension bits, where X may optionally be zero, said circuit comprising N similar cells (C1 to CN) each of which forms a bit flow path comprising in series between a main input and a main output (EP1 to EPN, and SP1 to SPN) of said cell: a P-bit upstream register (RGE1 to RGEN); a weighting operator (OP1 to OPN); a two-input combining operator (OC1 to OCN); and a Q-bit downstream register (RGS1 to RGSN); with the output from the upstream register (RGE1 to RGEN) and one of the two inputs to the combining operator (OC1 to OCN) respectively constituting a secondary output and a secondary input (SS1 to SSN, and ES1 to ESN) of the cell suitable for being respectively connected to a main input and to a main output of a following cell in the circuit, and with the main output (SP1) of the first cell being fed back to the main input (EP1) of said cell in order to allow the digital samples produced to be recirculated, the LFSR circuit being characterized in that said upstream registers (RGE1 to RGEN), and said downstream registers (RGS1 to RGSN) of each cell are serial shift registers, and in that the sum P+Q of their lengths is equal to the total length M+X of each of the digital samples.

4,825,398

METHOD AND APPARATUS FOR CONVERTING AN INPUT SCANNING SEQUENCE INTO AN OUTPUT SCANNING SEQUENCE

Andreas Koch, San Francisco, Calif.; Roger Lagadec, Rumlang, and Daniele Pelloni, Zurich, both of Switzerland, assignors to Willi Studer, AG., Regensdorf, Switzerland

Filed Oct. 9, 1984, Ser. No. 658,776
Claims priority, application Switzerland, Oct. 6, 1983, 5 427/83
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.1 **6 Claims**



3. An apparatus for converting the scan values of an input scanning sequence occurring with an input scanning frequency into scan values of an output scanning sequence occurring with an output scanning frequency, comprising:
a digital filter;
a circuit for measuring the time difference between input and output scanning times;
a circuit for generating filter coefficients connected to said digital filter and said circuit for measuring the time difference, comprising a store for a set of fixed filter coefficients and an interpolating circuit for producing another set of coefficients used for filter.

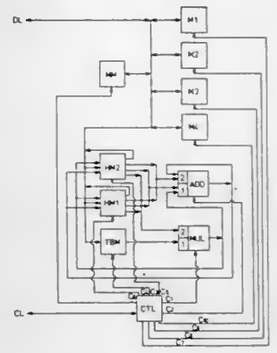
4,825,399

APPARATUS FOR FOURIER TRANSFORM

Hideo Nagai, Tachikawa, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP86/00093, § 371 Date Oct. 15, 1986, § 102(e) Date Oct. 15, 1986, PCT Pub. No. WO86/05295, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 26, 1986, Ser. No. 933,635
Claims priority, application Japan, Feb. 27, 1985, 60-38248
Int. Cl.[4] G06F *7/34, 15/35*
U.S. Cl. 364—726 **4 Claims**

1. An apparatus for Fourier transform comprising
a first memory (MM) for storing data which is obtained by sampling and is to be subjected to Fourier transform; and
means for multiplying spatial frequencies by fast Fourier transform without increasing operational time by eliminating the insertion of zeros otherwise needed for increased spatial frequencies, said means for multiplying comprising
a plurality of second memories (M1, M2, M3, M4), each comprising a series of addresses, and arranged to permit data to be written into any one of the plurality of second memories independently of each other,
Fourier transform means (ADD, MUL, HM1, HM2, TBM) for computing discrete Fourier transform from the data stored in said first memory by fast Fourier transform, and
control means (CTL) for causing data delivered from said Fourier transform means to be written simultaneously



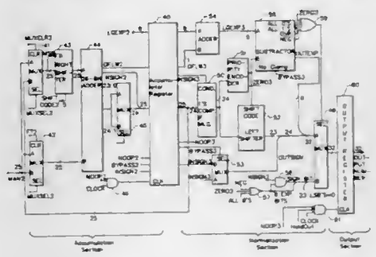
into said plurality of second memories at identical relative addresses therein.

4,825,400

FLOATING POINT ACCUMULATOR CIRCUIT

Paul A. Simoncic, Daytona Beach, and Walter R. Steiner, Ormond Beach, both of Fla., assignors to General Electric Company, Durham, N.C.

Filed Jan. 13, 1986, Ser. No. 818,284
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—748 **10 Claims**



1. A pipelined architecture, floating point number accumulator circuit for totalling a multiplicity of floating point numbers, such numbers comprising a sign, an exponent, and a mantissa, the circuit including:
a. an input circuit for receiving and temporarily storing an input floating point number;
b. an intermediate register for temporarily storing data;
c. an exponent comparison circuit, coupled to the output of the input circuit and of the intermediate register, for determining a shift code as a function of the difference between the values of the exponent of the input number and the exponent of a numeric result previously stored in the intermediate register, and for temporarily storing the larger exponent and the shift code in the intermediate register;
d. an accumulator register for temporarily accumulating non-normalized numeric results;
e. an accumulation circuit, coupled to the output of the exponent comparison circuit and of the accumulator register, for shifting the mantissa of the smaller of the input number and a non-normalized numeric result, previously accumulated in the accumulator register, by the amount of the shift code to align the binary points of both numbers, and for summing the two aligned numbers as a non-nor-

malized numeric result and accumulating the non-normalized numeric result in the accumulator register;

f. a normalization circuit, coupled to the accumulator register, for converting the non-normalized numeric result of the accumulation circuit into normalized floating point number form; and

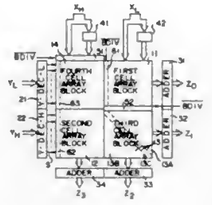
g. an output circuit, coupled to the output of the normalization circuit, for temporarily storing the normalized result in an output register and for outputting the normalized result from the circuit.

4,825,401

FUNCTIONAL DIVIDABLE MULTIPLIER ARRAY CIRCUIT FOR MULTIPLICATION OF FULL WORDS OR SIMULTANEOUS MULTIPLICATION OF TWO HALF WORDS

Nobuyuki Ikumi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 12, 1987, Ser. No. 25,201
Claims priority, application Japan, Mar. 31, 1986, 61-72947
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—760 **14 Claims**



1. A functionally dividable multiplier array circuit comprising:

decoding means for receiving a multiplier and for decoding on the basis of Booth's algorithm and outputting selection signals;

cell array means including a plurality of cells arranged in a matrix form of 2m rows and 2n+1 columns, where m and n are positive integers, said cells including sign cells arranged in a first column of said matrix, complex cells arranged in rows 1 to m of column (n+1) of said matrix and basic cells arranged in other cell positions of said matrix, for receiving said selection signals and a multiplicand having a plurality of binary digits, and for generating and adding partial products based on Booth's algorithm in response to said selection signals and the multiplicand, said complex cells having both the function of sign cells and the function of basic cells; and

adding means for obtaining final products on the basis of outputs from said cell array means.

4,825,402

MULTICONFIGURABLE INTERFACE DRIVER/RECEIVER CIRCUIT FOR A COMPUTER PRINTER PERIPHERAL ADAPTOR

Bahman Jalali, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

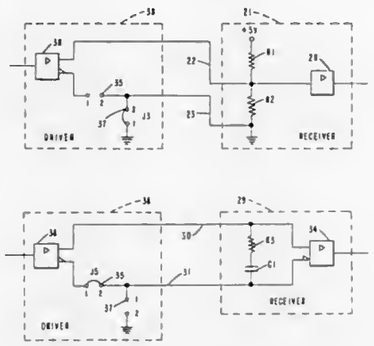
Filed Apr. 4, 1986, Ser. No. 848,666
Int. Cl.⁴ G06F *3/00*
U.S. Cl. 364—900 **7 Claims**

1. A multiconfigurable interface circuit for use with a computer input/output cable to a computer peripheral device comprising:

a plurality of drivers, each driver having an input for receiving a data bit, and output means for driving conductor means with said data bit in the input/output cable;

first electrical network means for making each of said plurality of drivers compatible with a first predetermined length of input/output cable;

second electrical network means for making each of said plurality of drivers compatible with a second predetermined length of input/output cable; and



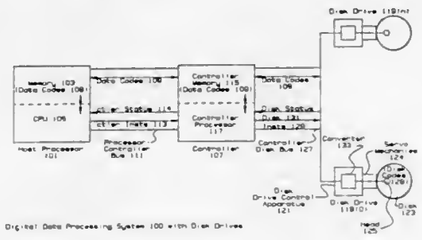
connection means for selectively connecting either said first electrical network means or said second electrical network means to said plurality of drivers such that said plurality of drivers are selectively made compatible with said first or second predetermined length of input/output cable.

4,825,403

APPARATUS GUARANTEEING THAT A CONTROLLER IN A DISK DRIVE SYSTEM RECEIVES AT LEAST SOME DATA FROM AN INVALID TRACK SECTOR

Edward Gershenson, Worcester; Louis A. Lemone, Stow, and Mark C. Lippitt, Ashland, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 495,214, May 16, 1983, abandoned.
This application Apr. 29, 1986, Ser. No. 858,540
Int. Cl.⁴ G06F *11/10, 13/12, 3/06*
U.S. Cl. 364—900 **6 Claims**



1. In a disk drive including

(1) a disk for storing information, said information being stored on said disk in track sectors, each of said track sectors including data, header information and a synchronization mark preceding said header information,

(2) means for reading said header information, synchronization marks and data from said disk, and

(3) a read-write processor for receiving said header information, synchronization marks and data from said disk,

apparatus for ensuring that said read-write processor processes some said data from track sectors which do not contain a valid synchronization signal, said apparatus comprising:

(1) synchronization mark detected signal providing means for receiving said synchronization marks, providing a synchronization mark detected signal in response to said synchronization mark, and providing said synchronization mark detected signal after said synchronization mark should have been received; and

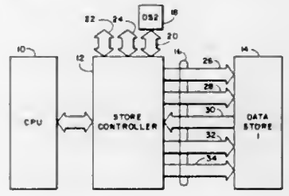
(2) control means in said read-write processor means responsive to said synchronization mark detected signal for causing said read-write processor means to commence processing said data currently being read from said track sector in response to said synchronization mark detected signal and ignoring any further synchronization mark detected signal until said read-write processor means has finished processing said data currently being read.

4,825,404

INTERFACE SYSTEM WHICH GENERATES CONFIGURATION CONTROL SIGNAL AND DUPLEX CONTROL SIGNAL FOR AUTOMATICALLY DETERMINING THE CONFIGURATION OF REMOVABLE MODULES

John G. Theus, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 27, 1985, Ser. No. 802,567
Int. Cl.⁴ G06F *3/00, 13/00, 15/16*
U.S. Cl. 364—900 **16 Claims**



1. In a modular electronic system having a control unit and a modular unit connected to the control unit, the modular unit receiving control signals form the control unit module interface circuit, comprising:

an interface lead transmitting control signals between the control unit and the modular unit;

means in the modular unit connected to the interface lead for generating a configuration control signal representing a system configuration of the modular unit;

means in the control unit connected to the interface lead for receiving the configuration control signal during a first time period;

means in the control unit having an output connected to the interface lead for generating a module control signal during a second time period, the module control signal being enabled on the interface lead during the second time period responsive to an enabled state of the configuration control signal amd disabled when the configuration control signal is a disabling signal;

means for generating a duplex control signal, the duplex control signal having a first state during the first time period and a second state during the second time period, the module contorl signal generating means including means responsive to the duplex control signal for decoupling the output of the module control signal generating means from the interface lead during the first time period, and

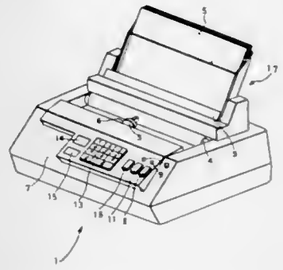
means in the modular unit connected to the interface lead for receiving the module control signal when the configuration control signal is in an enabled state.

4,825,405

PRINTER CAPABLE OF PRINTING THE SAME DATA REPEATEDLY ON A PLURALITY OF COPIES

Kuniyasu Makino, and Yuji Okamoto, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 8,096, Jan. 23, 1983, abandoned, which is a continuation of Ser. No. 541,916, Oct. 14, 1983, abandoned.
This application Apr. 8, 1988, Ser. No. 178,856
Claims priority, application Japan, Oct. 16, 1982, 57-181527; Feb. 3, 1983, 58-17913
Int. Cl.⁴ G06F *3/12*
U.S. Cl. 364—900 **3 Claims**



1. A stand alone printer comprising a buffer memory a print head to print individual pieces of data onto a sheet and having an on-line mode in which said printer is connected to an external device and an off-line mode in which said printer is disconnected from said external device, and having data fed into and stored in said buffer memory of said printer by said external device in said on-line mode, and having contents of said buffer memory printed by a printing mechanism, and comprising a manually operated mode switch for selecting one of said one-line mode and said off-line mode between said printer and said external device; a first lamp display means having an ON state, an OFF state, and a flicker state, said flicker state for displaying a standby state upon detection of a final part of data to be printed; a second lamp display means for indicating said on-line and off-line modes; and control means comprising

means actuated by manual operation of said mode switch switching from said on-line mode to said off-line mode, for clearing contents of said buffer memory during a non-printing state to produce a memory clear state;

means actuated by manual operation of said mode switch switching from said off-line mode to said on-line mode for storing in said buffer memory data fed by said external device and for causing said printing mechanism to print once contents of said buffer memory without erasing said contents of said buffer memory;

instruction means comprising a plurality of manually operable numeral buttons for instructing a required number of copies to be originally printed with the same data which was previously stored in said buffer memory;

a manually operated copy switch operable during said off-line mode as indicated by said second lamp display means and during said flicker state of said first lamp display means, for switching said printer from said standby state into a reprinting state whereby said first display means goes to an ON state to indicate said reprinting state; and

reprinting means for feeding a reprint command signal to said printer to originally print contents of said buffer memory on a desired number of copies as instructed by manual operation of said numeral buttons of said instruction means during said off-line mode and in said reprinting state.

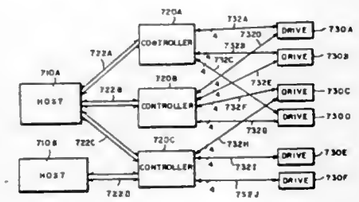
VOL 1101 ISS 4 APR 25 1989 UMI

4,825,406

SECONDARY STORAGE FACILITY EMPLOYING SERIAL COMMUNICATIONS BETWEEN DRIVE AND CONTROLLER

Robert G. Bean; Michael E. Beckman; Barry L. Rubinson; Edward A. Gardner; O. Winston Sergeant, and Peter T. McLean, all of Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 823,121, Jan. 24, 1986, abandoned, which is a continuation of Ser. No. 570,412, Jan. 12, 1984, abandoned, which is a continuation of Ser. No. 308,593, Oct. 5, 1981, abandoned. This application Mar. 20, 1987, Ser. No. 946,891
Int. Cl.[4] G06F *13/12*
U.S. Cl. 364—900 4 Claims



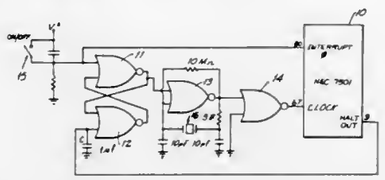
1. A data processing system comprising:
a host computer; and
a mass storage subsystem including
a mass storage device having a first and second port;
a first device controller coupled to said host computer and coupled to said first port of said mass storage device, said first port being on-line to said first device controller; and
a second device controller coupled to said host computer and coupled to said second port of said mass storage device;
said first device controller including means for sending a predetermined TOPOLOGY command to said mass storage device via said first port;
said mass storage device including;
means responsive to said predetermined TOPOLOGY command received through said first port to disable said first port and enable said second port while leaving the assignment of said mass storage device relative to said first port in the on-line status;
means for sending a predetermined AVAILABLE signal out through said second port after said first port has been disabled;
means responsive to further commands received through said second port to provide outputs through said second port indicative of the characteristics and status of said mass storage device to provide an indication of the path between said mass storage device and said second device controller whereby said indication can provide information which can be used in determining system topology; and
means for responding to a DISCONNECT command by enabling said first port and disabling said second port;
said second device controller including,
means responsive to said predetermined AVAILABLE signal for generating said further commands and transmitting said further commands to said mass storage device to interrogate said mass storage device to determine its characteristics and status thereby obtaining said indication of the path between said mass storage device and said second device controller; and
means for sending said DISCONNECT command to said device upon completion of said interrogation; and
said host computer including means for storing said information regarding paths to said mass storage device obtained from said mass storage device by said first and second device controllers.

4,825,407

METHOD AND CIRCUIT FOR CONTROLLING SINGLE CHIP MICROCOMPUTER

Mark C. Loessel; Robert W. Myers, both of Mishawaka, and Robert C. Neitzke, Elkhart, all of Ind., assignors to Miles Inc., Elkhart, Ind.

Continuation of Ser. No. 916,727, Oct. 8, 1986, abandoned, which is a continuation of Ser. No. 634,573, Jul. 26, 1984, abandoned. This application Mar. 2, 1988, Ser. No. 166,787
Int. Cl.[4] G06F *1/04, 3/02, 11/28*
U.S. Cl. 364—900 4 Claims



1. A clock circuit for a single chip microcomputer having a single clock input, a halt mode state output and an interrupt input and wherein the microcomputer has a predetermined period for writing data into a memory, the circuit comprising:
clock pulse generating means having an output;
manually actuatable switching means for applying a pulsed output to the interrupt input of the microcomputer to indicate a start of operation;
latching means initially in a first state and receptive of the output of the switching means to change the latching means from the first state to a second state;
gating means receptive of the output of the clock pulse generating means and the latching means for applying clock pulses to the microcomputer when the latching means is in the second state and preventing the application of clock pulses to the microcomputer when the latching means is in the first state; and
means for applying the halt mode state output to the latching means, after a predetermined time interval after being produced by the microcomputer to reset the latching means from the second state to the first state and thereby prevent the application of clock pulses to the microcomputer by the gating means until the latching means is changed to the second state by the manually actuated switching means at a start of operation, wherein the predetermined time interval is greater than the predetermined period for writing data into memory, said microcomputer writing into memory prior to termination of clock pulses.

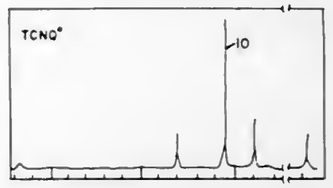
4,825,408

MULTISTATE OPTICAL SWITCHING AND MEMORY APPARATUS USING AN AMPHOTERIC ORGANIC CHARGE TRANSFER MATERIAL

Richard S. Potember, Catonsville, and Theodore O. Poehler, Baltimore, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 603,717, Apr. 25, 1984, Pat. No. 4,663,270. This application Apr. 7, 1987, Ser. No. 35,327
Int. Cl.[4] G11C *13/00;* G11B *3/70;* G03C *1/00, 3/00*
U.S. Cl. 365—113 75 Claims

1. An optically sensitive apparatus comprising:
a multistate optically sensitive organic charge transfer medium wherein the first state is a first oxidation state and is composed of at least two different organic compounds, each of said organic compounds containing an electron donor moiety complexed with an organic electron acceptor moiety, wherein each of said organic compounds has a different redox potential so as to switch from the first oxidation state to a second oxidation state in response to the application of electromagnetic energy at an optical frequency and at a field strength unique to said each of said organic compounds, thus providing a different second state for each organic compound, and wherein the oxida-



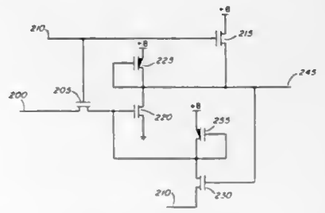
tion states of the first state and each second state have identifiably different optical spectra; and
a source of said electromagnetic energy.

4,825,409

NMOS DATA STORAGE CELL FOR CLOCKED SHIFT REGISTER APPLICATIONS

Jeffrey M. Bessolo, Groton, and Michael A. Wolf, Northboro, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed May 13, 1985, Ser. No. 733,159
Int. Cl.[4] G11C *7/00, 11/34, 11/40*
U.S. Cl. 365—154 10 Claims



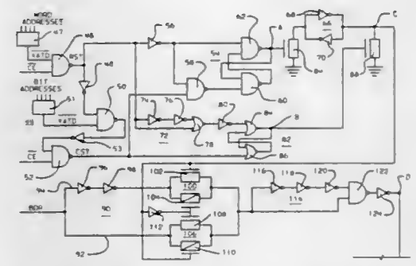
2. A NMOS data storage cell comprising:
clocking means input for inputting a single timing signal;
data input means for inputting data to said data storage cell;
a first pass transistor connected to said clocking means input, to allow the input of data from said data input means when said clocking means input signal is at a logic high level and to prevent the input of data when said clocking means input signal is at a logic low level;
a first inverter connected to said first pass transistor and to the output of said data storage cell, for inverting input data received at the input of said inverter from said first pass transistor; and
a second inverter connected at its input to the output of said data storage cell and at its output to the input of said first inverter, for inverting data received at its input from the output of said data storage cell, said second inverter including a transistor pair having the source of one of the pair connected to said clocking means input signal, so that said second inverter is enabled to pass data when said clocking means input signal is at a logic low level, and is disabled to prevent the passage of data when said clock input signal is at a logic high level.

4,825,410

SENSE AMPLIFIER CONTROL CIRCUIT

Hsing-San Lee, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,348
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 28 Claims



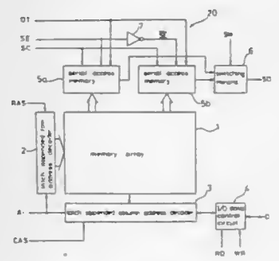
20. In a memory system having word and bit addresses, a sense amplifier control circuit comprising
a sense amplifier having a set device,
first means for producing a pulse for actuating said set device, said means including a first path arranged to pass said pulse to said set device during a given period of time and a second path arranged to pass said pulse to said set device during a shorter period of time than said given period of time,
second means responsive to pulses derived from word and bit address transitions for selecting one of said first and second paths, said first path including a first switch and a delay element serially interconnected and said second path including a second switch arranged in parallel with said first path, each of said first and second switches including an N-channel field effect transistor and a P-channel field effect transistor connected in parallel with said N-channel transistor, and
an inverter circuit disposed between the output of said second means and the control electrode of the P-channel transistor of said first switch the control electrode of the N-channel transistor of said second switch.

4,825,411

DUAL-PORT MEMORY WITH ASYNCHRONOUS CONTROL OF SERIAL DATA MEMORY TRANSFER

Hisanori Hamano, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1987, Ser. No. 66,003
Claims priority, application Japan, Jun. 24, 1986, 61-148874
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 4 Claims



1. A dual-port memory comprising:

a memory array including a plurality of memory elements each of which is accessed at random by a row and column address input to enable writing in or reading out of data thereat;

a first serial access memory which receives and latches a first portion of the data of the memory elements of a selected row or column of said memory array in parallel when a data transfer signal is at a first level and a selection signal is at a first level, and which outputs the latched parallel data serially in synchronism with a clock signal when said selection signal is at a second level; and

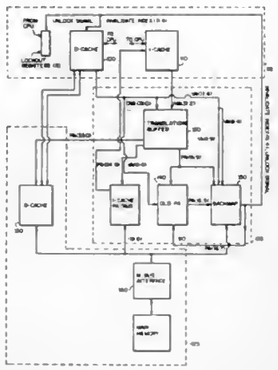
a second serial memory which receives and latches a second portion of the data of the memory elements of a selected row or column of said memory array in parallel when said data transfer signal is at said first level and said selection signal is at said second level, and which outputs the latched parallel data serially in synchronism with said clock signal when said selection signal is at said first level.

4,825,412

LOCKOUT REGISTERS

David J. Sager, Acton; Raj K. Ramanujan, Leominster, and Jeffrey L. Bell, Maynard, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 1, 1988, Ser. No. 176,448
Int. Cl.[4] G11C *15/00*
U.S. Cl. 365—49 **4 Claims**



1. A cache memory system in a data processor including a main memory and a processing unit, said cache memory system comprising:

a virtually addressed storage cache connected to said main memory for storing in storage cache locations preselected portions of data from main memory, each said cache location including a valid indicator to indicate the data in said cache location is current;

a translation buffer coupled to said storage cache, for translating a virtual address to a physical address;

a backmap coupled to said storage cache and said translation buffer, for invalidating data in said storage cache by generating an invalidate index to the cache location at which a valid indicator is to be cleared only when data in the storage cache is to be invalidated; and

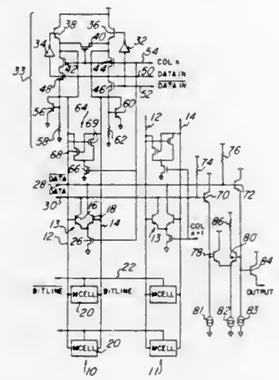
further comprising at least one lockout register for storing addresses for data which may exist in more than one storage cache location, wherein said backmap invalidates all copies of the data in said storage cache after every reference to data in said storage cache using an address in a lockout register.

4,825,413

BIPOLAR-CMOS STATIC RAM MEMORY DEVICE

Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 24, 1987, Ser. No. 18,874
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **9 Claims**



1. A bipolar-CMOS static RAM device having a plurality of static RAM cells arranged in columns and rows, comprising:

a plurality of complementary bit line pairs, each bit line pair coupled to an associated column of said cells;

a plurality of word lines, each word line coupled to a row of said cells; and

a plurality of write circuits for writing data into associated columns of cells, each write circuit respectively coupled to a single bit line pair and comprising:

first and second bipolar write transistors each having their emitters connected to a reference voltage, and each having their collectors coupled to one of the bit lines in the associated bit line pair;

first and second resistors connected between the base of said first and second bipolar write transistors and said reference voltage; and

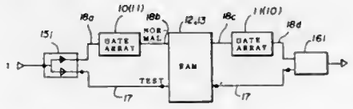
first and second pass transistors having their source-to-drain paths connected in series between the base and collector of said first and second transistors, respectively, and having their gates connected to complementary data input lines.

4,825,414

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING GATE ARRAY AND MEMORY AND INPUT-OUTPUT BUFFER

Mitsuya Kawata, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 24, 1988, Ser. No. 210,966
Claims priority, application Japan, Jun. 30, 1987, 62-163542
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—189 **6 Claims**



1. A semiconductor integrated circuit device having a normal mode and a test mode for testing a memory thereof, said semiconductor integrated circuit device comprising:

input/output buffer parts having input/output terminals;

at least one gate array;

at least one memory;

a first interconnection for coupling said input/output buffer parts, said gate array and said memory, said first interconnection being routed depending on a logic operation to be carried out by said semiconductor integrated circuit; and

a second interconnection for coupling said input/output buffer parts, said gate array and said memory, said second interconnection being fixed regardless of the logic operation to be carried out by said semiconductor integrated circuit,

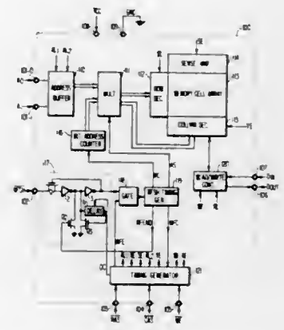
said input/output bufer parts comprising a first input/output part having a first terminal which is used in common as an input terminal of said first interconnection for receiving a normal input signal in the normal mode and an input terminal of said second interconnection for receiving a test signal in the test mode, and a second input/output part having a second terminal which is used in common as an output terminal of said first interconnection and an output terminal of said second interconnection.

4,825,415

SIGNAL INPUT CIRCUIT HAVING SIGNAL LATCH FUNCTION

Kazuo Nakaizumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 938,915
Claims priority, application Japan, Dec. 6, 1985, 60-275421
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—189 **8 Claims**



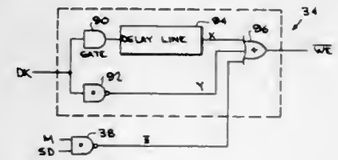
1. A signal input circuit comprising an input terminal supplied with a control signal, first and second modes, a switch coupled between said input terminal and said first node, an output node, a first inverter coupled between and first and second nodes, a second inverter coupled between said second and output nodes, means for coupling said output node to said switch such that said switch is conductive in response to a first voltage level of said output node and said switch is nonconductive in response to a second voltage level of said output node, means coupled to one of said first, second and output nodes for generating a detection signal when said output node is continuously at said second voltage level for a predetermined time period, and second means responsive to said detection signal for changing said output node from said second voltage level to said first voltage level.

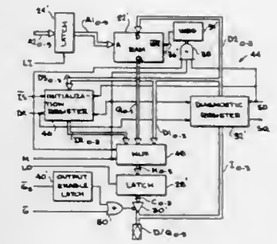
4,825,416

INTEGRATED ELECTRONIC MEMORY CIRCUIT WITH INTERNAL TIMING AND OPERABLE IN BOTH LATCH-BASED AND REGISTER-BASED SYSTEMS

Aloysius T. Tam, Sunnyvale, and N. Bruce Threewitt, Fremont, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 7, 1986, Ser. No. 860,727
Int. Cl.[4] G11C *7/00, 8/00*
U.S. Cl. 365—194 **10 Claims**





1. An integrated electronic memory circuit operating in response to an external memory access signal, comprising:

memory means for storing binary data in an array of memory locations, said memory means having a characteristic write time period during which data storage into said array is enabled;

first data signal providing means for providing input data signals to said memory means, for storage by said memory means as binary data at respective memory locations; and

write signal generator means internal to the integrated electronic memory circuit for generating, in response to said external memory access signal, an internal write signal during a prescribed time period causing said memory means to accept input data signals from said first data signal providing means for storage in said array, including means for adjusting the prescribed time period to substantially equal in time duration to said characteristic write time period, and in duration no longer than a time period during which said first data signal providing means provides input data signals to said memory means.

4,825,417

SENSE AMPLIFIER OPTIMIZED LAY-OUT FROM DYNAMIC RANDOM ACCESS MEMORIES ON COMPLEMENTARY METAL OXIDE SEMICONDUTOR

Seung M. Seo, Seoul, Rep. of Korea, assignor to Samsung Semiconductor & Telecommunications, Kyungsangbuk, Rep. of Korea

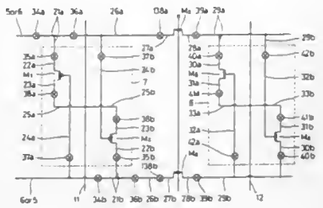
Filed Nov. 25, 1987, Ser. No. 125,389
Claims priority, application Rep. of Korea, Nov. 28, 1986, 86-10127[U]
Int. Cl.[4] G11C *7/00, 11/24*
U.S. Cl. 365—205 **2 Claims**

1. A sense amplifier of C-MOS semiconductor memory device provided with a memory cell array which is connected

to a plurality of memory cells having a capacitor **90** and a MOS transistor **80** on the respective bit line and word line **70** and having a plurality of bit lines on the semiconductor substrate of FIG. **1**, and with a plurality of sense amplifiers connected to the one end every said bit lines **5** and **6**, comprising

first semiconductor region **100** which is formed first latch circuit comprising two MOS transistors M_1 and M_2 having a well region **110** of opposite conduct type of the semiconductor substrate on the said semiconductor substrate, having same conduct type of guard ring region **53** with said substrate on the neighbor of boundary for said well region **110**, and having same conduct type of channel with the conduct type of said substrate on the central part of said well region **110** and the guard ring region **53**, and which is connected with drain regions **55***b* and **55***a* of said transistors M_1 and M_2 on said central part of the upper part interposed an insulated film layer of the upper part of said gate electrode, being formed with respective gate of same dimension of said transistors M_1 and M_2 expanded in the opposite direction with the expanding direction of said bit lines, being connected with the bit lines **5** and **6** and the second polysilicon conductor layer **24***b* and **24***a* which are gate electrodes of said transistors M_1 and M_2 on the central part;

second semiconductor region **120** which is contiguous to



said first semiconductor region, being vertically positioned said bit lines **5** and **6** in the expanding direction, being connected with dr sin regions **27***a* and **27***b* or opposite conduct type of source with the said substrate in which third polysilicon conductor layer lines **26***a* and **26***b* are formed on the surface region of the substrate and being formed transmission transistors M_3 and M_4 which drain regions, gate regions and source regions are formed on the same vertical line in the expanding direction of said bit lines **5** and **6**; and third semiconductor region **130** which is contiguous to said second semiconductor region **120**, being each connected with second polysilicon conductor layers **32***b* and **32***a* which are gate electrodes of said transistors M_6 and M_5 on the central part of the forming region of second latch circuit which the expanding lines of third polysilicon conductor layer **29***a* and **29***b*, connected to the source of said transmission transistors M_3 and M_4 of drain regions **28***a* and **28***b*, are formed with MOS transistors M_5 and M_6 having the substrate and opposite conduct type of channel, being each expanded in the opposite direction with expanding direction of third polysilicon conductor layers **29***a* and **29***b* in respect to said conductor layers **32***b* and **32***a*, being forming metal conductor layer **52***b*, **33***a*, **33***b*, **12** on the upper part of said gate electrode layer of the said central part, being each connected to source regions **57***b* and **57***a* of said transistors M_6 and M_5.

4,825,418

SEMICONDUCTOR MEMORY

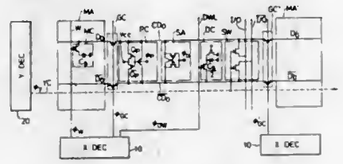
Kiyoo Itoh, Higashikurume, and Ryoichi Hori, Nishitama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 38,370, Apr. 14, 1987, Pat. No. 4,748,591, which is a division of Ser. No. 717,490, Mar. 29, 1985, Pat. No. 4,675,845, which is a continuation of Ser. No. 380,409, May 20, 1982, abandoned. This application Mar. 22, 1988, Ser. No. 171,772

Claims priority, application Japan, May 29, 1981, 56-81042

Int. Cl.[4] **G11C** *11/40, 13/00*

U.S. Cl. 365—207 **15 Claims**



1. A semiconductor memory comprising:

a plurality of arrays, each having a plurality of data lines, a plurality of word lines disposed in such a manner as to cross said data lines, and memory cells including capacitors disposed at predetermined points of intersection between said word lines and said data lines for storing predetermined signals and transistors electrically connecting said capacitors to said data lines, wherein two of said data lines are disposed in a pair adjacent to and in parallel with each other in such a manner that they have mutually different signals and are connected to corresponding differential amplifiers;

common signal lines disposed in common to at least four of said data lines;

first switching means for connecting said data lines to said common signal lines corresponding thereto;

control lines for transmitting signals for controlling said first switching means;

first decoder means for selecting at least one of said word lines; and

second decoder means for controlling the connection between selected data lines and said common signal lines through said control lines,

wherein a voltage impressed on said selected word lines is higher than at least one of a predetermined high voltage appearing on said selected data lines and a predetermined power supply voltage.

4,825,419

OPTICAL INFORMATION STORAGE APPARATUS

Junichi Ohtomo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 28, 1987, Ser. No. 137,944

Claims priority, application Japan, Dec. 27, 1986, 61-311887

Int. Cl.[4] **G11C** *13/00*

U.S. Cl. 365—218 **8 Claims**

6. A method of deleting information recorded on an optical information storing medium having a retrieval index storing area and an information storing area through an optical storage apparatus including an optical head, a keyboard having a delete key, a direct delete key and alpha/numeric keys, which comprises the following steps of:

(a) checking whether the delete key is depressed;

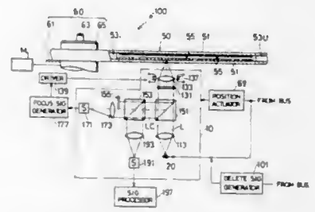
(b) if depressed, checking whether a retrieval index to be deleted is designated through the alpha/numeric keys;

(c) if designated, moving the optical head to the designated retrieval index position recorded on the retrieval index storing area on the basis of the designated retrieval index;

(d) record a delete mark on the designated retrieval index position;

(e) checking whether the direct delete key is depressed;

(f) if depressed, moving the optical head to the designated information position recorded on the information storing area on the basis of the designated retrieval index; and



(g) superimposing a delete signal upon the recorded information to directly delete the recorded information.

4,825,420

C-MOS ADDRESS BUFFER FOR SEMICONDUCTOR MEMORY

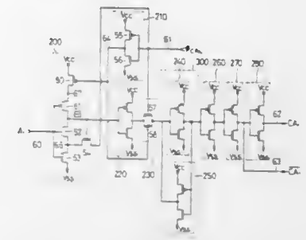
Dong S. Min, Seoul, Rep. of Korea, assignor to Samsung Semiconductor & Telecommunication Co., Ltd., Kyoungsangbuk, Rep. of Korea

Filed Jan. 7, 1988, Ser. No. 141,515

Claims priority, application Rep. of Korea, Jan. 17, 1987, P.87-345

Int. Cl.[4] **G11C** *8/00*

U.S. Cl. 365—230 **9 Claims**



1. A C-Mos address buffer for a semiconductor memory comprising:

a first signal inverter coupled to a clock signal and providing an inverted clock signal output corresponding to a column address strobe signal;

a schmitt trigger circuit coupled across a power supply source and including a first set of first type series connected transistors and a second set of second type series connected transistors coupled together at a circuit node, wherein one transistor of said first set of transistors is coupled to said inverter and controlled by said inverted clock signal to cut off said power supply source from said schmitt trigger circuit, and wherein said schmitt trigger circuit additionally includes a feedback transistor coupled between said second set of transistors and said clock signal whereby said feedback transistor and said one transistor operate in synchronism to generate an level shifted intermediate output address signal at said circuit node of an address signal applied to said schmitt trigger circuit;

a second signal inverter coupled to said circuit node,

a transmission gate coupled to said second signal inverter and being operable in response to said clock signal and said inverted clock signal to transfer said level shifted intermediate output address signal to a latch circuit;

said latch circuit coupled to said transmission gate for latching the logic state of said level shifted output address for a predetermined logic state of said clock signal; and

an output buffer circuit coupled to said latch circuit for providing a level shifted output address signal and an inverted level shifted output address signal.

4,825,421

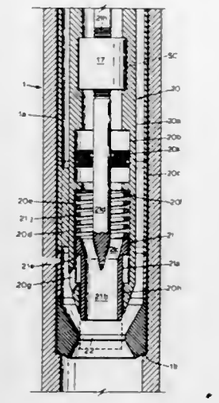
SIGNAL PRESSURE PULSE GENERATOR

John D. Jeter, 1403 Teche Dr., St. Martinville, La. 70582

Filed May 19, 1986, Ser. No. 865,083

Int. Cl.[4] **G01V** *1/40*

U.S. Cl. 367—83 **23 Claims**



1. A fluid flow resistance change signal generator for transmitting signals along a moving fluid column in a drill string bore from a downhole location in a well, the signal generator comprising:

(a) a body adapted to function as a length of drill string, having means at each end to attach with fluid tight engagement to a continuing drill string, and a drilling fluid channel extending therethrough;

(b) a resonant signal valve in said body, adapted to change resistance to the flow of drilling fluid in said drilling fluid channel, said signal valve adapted to oscillate between a first position corresponding to less flow resistance and a second position corresponding to more flow resistance in response to fluid flow rate oscillations of fluid flowing in said drilling fluid channel, the movement of said signal valve responsive to bias force arranged to urge said signal valve toward said second position and responsive to piston force arranged to urge said signal valve toward said first position, said piston force produced by a piston operatively connected to move said valve and arranged to respond to fluid pressure differential across said signal valve; and

(c) restraint means arranged to restrain said signal valve in said first position and to release said valve from said first position in response to signals from a downhole instrument.

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4,825,422

METHOD AND APPARATUS FOR DETERMINING THE LOCAL VELOCITIES IN A MOVING FLUID BY MEANS OF DOPPLER ULTRASONIC ECHOGRAPHY

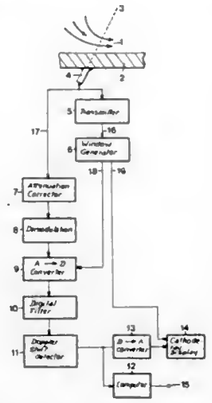
Yasushi Takeda, Brugg, Switzerland, assignor to Novatec S.A., Renens, Switzerland

Continuation of Ser. No. 855,301, Apr. 24, 1986. This application Apr. 28, 1988, Ser. No. 188,077

Claims priority, application Switzerland, May 9, 1985, 2009/85

Int. Cl.[4] G01F *1/66*

U.S. Cl. 367—90 2 Claims



1. In a method for determining by ultrasonic Doppler echography the local velocities inside a freely chosen portion of a moving fluid carrying solid particles, which method comprises the steps of periodically emitting trains of ultrasound from a transducer through the fluid and along an acoustical axis in successive cycles each of which commences with the emission of one of said trains of ultrasound, and receiving at said transducer echoes propagating along said axis resulting from the reflection of said ultrasound on said particles, the improvement which comprises providing during each such cycle a measure window of adjustable length (τ-N) along said axis, where τ is the time resolution and N is the number of measurement channels, adjusting the length of said measure window by adjusting the frequency of a variable frequency oscillator to obtain a desired time resolution τ and by adjusting an adjustable pulse counter to select the number of measurement channels N according to the chosen resolution, to cover with the desired time resolution the entire length of the window to be analyzed, which corresponds to the time duration of a portion of interest of a velocity curve for any area chosen at will along the said axis, and measuring the average fluid velocity for each of said measurement channels.

4,825,423

METHOD OF MEASURING MICROCRACK DEPTH

Kazushi Yamanaka, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,085

Claims priority, application Japan, Dec. 10, 1985, 60-277349

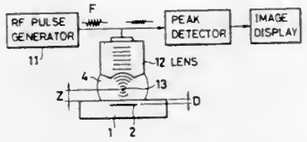
Int. Cl.[4] G01S *9/68*

U.S. Cl. 367—99 1 Claim

1. A method of measuring a depth of a microcrack substantially parallel to a surface of a sample comprising the steps of:

generating a tone burst of converging acoustic beam by using an acoustic lens with a half aperture angle of more than 20 degrees having its center line perpendicular to said surface, irradiating the sample placed in the neighborhood of a focal point of said acoustic beam;

exciting a leaky Lamb wave with phase velocity greater than 10,000 m/s by a portion of nearly perpendicular



incidence, leading to a destructive interference with peripheral portions of the beam;

detecting any peaks of the reflected beam from the sample and checking whether the reflected beam intensity assumes a minimum value.

4,825,424

SENSING SYSTEMS

Chris Lamb, Sherborne, and Chris Wade, Southampton, both of Great Britain, assignors to Plessey Overseas Limited, Ilford, England

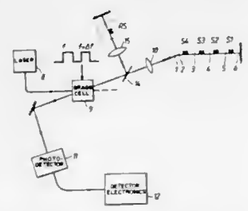
PCT No. PCT/GB86/00646, § 371 Date Aug. 20, 1987, § 102(e) Date Aug. 20, 1987, PCT Pub. No. WO87/02453, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 21, 1986, Ser. No. 94,880

Claims priority, application United Kingdom, Oct. 21, 1985, 8525924; Apr. 3, 1986, 8608167

Int. Cl.[4] H04R *23/00*

U.S. Cl. 367—141 11 Claims



1. A sensing system for sensing acoustic waves, the sensing system comprising:

an optical fiber for positioning underwater so as to be exposed to acoustic waves tending to deform the optical fiber, the optical fiber having spaced discontinuities along its length, each pair of adjacent discontinuities with the length of optical fiber therebetween constituting a sensor element;

optical fiber reference means containing light reflecting means;

light generating means for producing coherent light pulses and for transmitting the pulses along the optical fiber and along said optical fiber reference means, the light pulses being reflected from said spaced discontinuities and from said light reflecting means;

detector means for detecting reflected light pulses, the detector means including a demultiplexing means for separating reflected pulses from said optical fiber reference means into a reference channel, and reflected pulses from said sensor elements into further channel means;

the reference channel including signal processing means to derive a noise phase shift signal representative of phase shift arising from noise within the system, the further channel means including signal processing means to derive sensor element phase shift signals representative of phase shift caused by deformation of the individual sensor elements;

and compensation means responsive to said noise phase shift signal for applying a compensation to the sensing system in order to reduce the effect of noise in said sensor element phase shift signals.

4,825,425

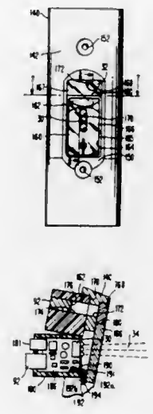
PARKING METER RESET DEVICE

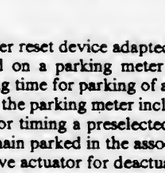
Paul Turner, New Ross, Ind., assignor to Midas Gate International, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 935,487, Nov. 26, 1986, abandoned. This application Feb. 18, 1988, Ser. No. 156,868

Int. Cl.[4] G04F *8/00*

U.S. Cl. 368—7 15 Claims





1. A parking meter reset device adapted for use with a parking meter mounted on a parking meter pole to control the allocation of parking time for parking of a vehicle in an associated parking space, the parking meter including an unpaid time indicator, a timer for timing a preselected period of paid time for a vehicle to remain parked in the associated parking space, and a coin responsive actuator for deactuating the unpaid time indicator and actuating the timer for a period of paid time selected in accordance with the coins utilized to initiate operation of the actuator, following which the unpaid time indicator is actuated, said parking meter reset device comprising:

a housing adapted for mounting on a parking meter pole;

an infra-red radiation transmitter mounted within said housing for transmitting infra-red radiation toward an associated parking space in a direction generally below horizontal;

an infra-red radiation detector mounted within said housing for detecting infra-red radiation from said transmitter after reflection thereof from a vehicle parked in the associated parking space; and

a controller connected to said detector and responsive to passage of a predetermined time interval without said detector detecting infra-red radiation of at least a predetermined level for providing an output signal for application to a parking meter to actuate an unpaid time indicator within the parking meter a

said housing including a first window member positioned adjacent said transmitter for passage therethrough of radiation transmitted from said transmitter toward the associated parking space and a second window member positioned adjacent said detector for passage therethrough of radiation reflected from the vehicle, said second window member having an edge abutting an edge of said first window member for passage thereinto of radiation from said transmitter entering said first window member and refracted to said first window member edge, at least a portion of the last-named radiation being refracted within said second window member toward said radiation detector.

4,825,426

HOROMETRIC ARRANGEMENT FOR INDICATING THE POSITION OF THE PLANETS

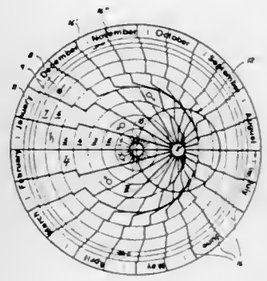
Ladwig Oechslin, Lucerne, Switzerland, assignor to Ulysse Nardin S.A., Switzerland

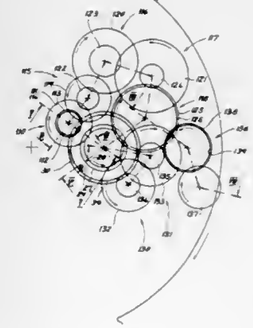
Filed Sep. 3, 1987, Ser. No. 92,665

Claims priority, application Switzerland, Sep. 5, 1986, 03573/86

Int. Cl.[4] G04B *19/26*

U.S. Cl. 368—15 11 Claims





1. An arrangement for indicating the position of planets in the solar system comprising:

a support;

a plurality of movable elements pivotally mounted on said support and rotatble about a common axis;

a plurality of display means each respectively mounted on one of said movable elements and comprising a distinctive sign representing a respective planet of the solar system, the position of which is to be indicated by said arrangement;

motor means; and,

connecting means for cinematically connecting said motor means to said elements; said connecting means including gear means driven by said motor means, and a plurality of driving means each respectively fixed to one of said elements and gearing with said gear means to drive said

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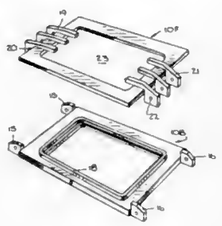
elements, at least two of said driving means being arranged substantially in the same plane.

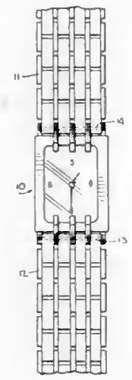
4,825,427

WRIST WATCH CASE AND BRACELET ASSEMBLY

Jack Wollman, Manhasset, N.Y., assignor to Bulova Watch Co., Inc., Woodside, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,851
Int. Cl.[4] G04B *5/02*
U.S. Cl. 368—282 **7 Claims**





1. A wrist watch and bracelet assembly comprising:

A a bipartite case composed of a base section adapted to accommodate a watch movement and provided at either end with a pair of pierced ears projecting forwardly from the corners of the base section, and a face section seated on the base section and provided at either end with an array of equi-spaced, forward projecting lugs having holes therein which register with the holes in the ears;

B a bracelet to encircle the wrist of a wearer formed of two components, each having a tail constituted by an array of equi-spaced links which intermesh with the lugs on the related end of the face section, the links having holes therein which register with those in the lugs and the ears;

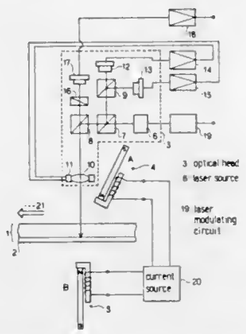
C a cross pin insertable into the holes of the ears at each end of the case to bridge the ears, the cross pin passing through the holes in the lugs and the links, thereby interlocking the base and face sections of the case and pivotally joining the bracelet components to the ends of the case.

4,825,428

OPTOMAGNETIC RECORDING, READING AND ERASING METHOD AND IMPLEMENTING APPARATUS WHICH PERMITS OVERWRITING OF PREVIOUSLY RECORDED INFORMATION

Kaoru Toki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 20, 1986, Ser. No. 831,198
Claims priority, application Japan, Feb. 20, 1985, 60-31958
Int. Cl.[4] G11B *11/14, 13/04*
U.S. Cl. 369—13 **17 Claims**



1. An optomagnetic recording and reading apparatus comprising:

an optical head for applying a laser beam onto a recording medium for heating the recording medium and for receiving the laser beam after passing through or reflecting from the recording medium in reading information;

a servo control unit responsive to the transmitted or reflected laser beam received by said optical head for reducing focussing and/or tracking errors; and

means for applying an external magnetic field to the recording medium, said applying means comprising a pair of permanent magnet assemblies disposed respectively at the opposite sides of the recording medium, each of said permanent magnet assemblies having a permanent magnet and a magnetic core equipped with a wire winding, and an electric current source supplying electric current to the wire windings of the permanent magnet assemblies.

4,825,429

RECORDING MEDIUM DRIVING DEVICE

Yukio Matsumoto, Furukawa, Japan, assignor to Alps Electric Co., Ltd, Japan

Filed Jan. 16, 1987, Ser. No. 5,574
Claims priority, application Japan, Mar. 12, 1986, 61-34660[U]
Int. Cl.[4] G11B *1/00, 25/04*
U.S. Cl. 369—75.2 **5 Claims**

1. A recording medium driving device having:

a chassis;

a tray for mounting an information recording medium;

means for driving said information recording medium, said driving means being located in said chassis;

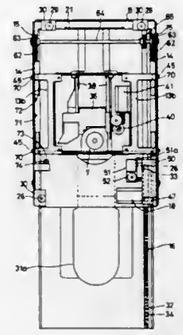
a rack interlocking with said tray; and

a tray moving means including gears that are in mesh with said rack, so as to lead the information recording medium mounted on said tray from outside said chassis onto said driving means at a loading position of said rack and said tray within said chassis;

the improvement comprising:

said tray moving means including a lock member for locking said rack to said tray into a locking state and so as to move said rack and said tray to the loading position; and

a first guide groove for guiding said lock member and said



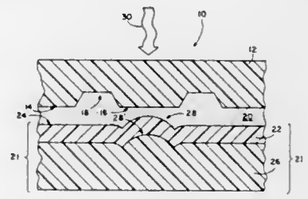
rack and said tray to said loading position and for guiding said lock member to a position at which said locking state between said rack and said tray is completely released after reaching said loading position.

4,825,430

ERASABLE OPTICAL DATA STORAGE MEDIUM HAVING AN EMBEDDED SERVO TRACK AND A SUBSURFACE RECORDING INTERFACE

Joseph M. Halter, Beaverton; John S. Hartman; Michael A. Lind, both of Durham; W. Eugene Skiens, Wilsonville; John W. Swanson, Milwaukie, and Jonathan R. Biles, Portland, all of Oreg., assignors to Optical Data, Inc., Beaverton, Oreg.

Filed Dec. 19, 1986, Ser. No. 944,423
Int. Cl.[4] G11B *7/24*
U.S. Cl. 369—275 **16 Claims**



1. An optical data storage medium comprising:

(a) a substrate;

(b) a recording structure;

(c) a compression layer intermediate said substrate and said recording structure;

(d) said substrate and said compression layer defining a first interface, said medium including a servo track formed at said first interface;

(e) said recording structure including a retention layer and an expansion layer integrally bonded to each other, said retention layer arranged adjacent to said compression layer defining a recording interface therewith; and

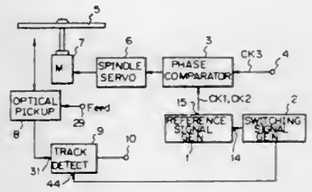
(g) said retention layer and said expansion layer defining a second interface, the thickness of said retention layer being such that the respective reflectance from said recording interface and said second interface constructively interfere with each other for light of predetermined wavelength.

4,825,431

DISC REPRODUCING APPARATUS

Shuichi Kimura, Tokyo, and Mitsuru Hanajima, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1986, Ser. No. 939,575
Claims priority, application Japan, Dec. 20, 1985, 60-287549
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—50 **7 Claims**



1. An apparatus for reproducing signals recorded on tracks on a disc-shaped record carrier comprising:

transducer means, including a transducer, for accessing selected tracks on the record carrier and reproducing the signals recorded thereon;

moving means for moving said transducer in the direction of the radius of the record carrier at a high speed;

drive means for rotating the record carrier at one speed during playback of the recorded signals and at a second, higher speed during accessing of the selected track by the transducer means at said high speed; and

wherein the moving means further includes track detecting means for detecting when the transducer has crossed over recording tracks on the record carrier during movement of the transducer, said track detecting means including

extracting means to which the reproduced signal from the transducer means is supplied and which extracts a signal indicative of the tracks crossed over by the transducer means and

selective time constant circuit means which has a variable time constant which changes from a first value to a second, lower value when said transducer reads information from said record carrier being rotated at said second speed.

4,825,432

FRICTIONLESS MOVING DEVICE FOR AN OPTICAL RECORDING SYSTEM IN A HIGH DENSITY SPIRAL TRACK-FORMING APPARATUS CAPABLE OF RESISTING DISTURBING FORCES

Yoshihiko Takahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 654,232, Sep. 25, 1984, Pat. No. 4,730,298.
This application Mar. 4, 1988, Ser. No. 164,471
Claims priority, application Japan, Sep. 27, 1983, 58-176885
Int. Cl.[4] G11B *21/16*
U.S. Cl. 369—255 **2 Claims**

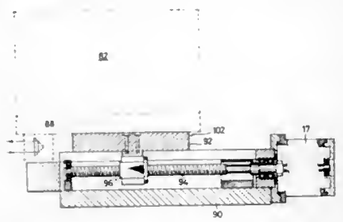
1. A spiral track-forming apparatus which forms a spiral-shaped recording track on a disk-shaped substrate disk by linearly moving an optical recording system, including focusing means for focusing a recording beam on the surface of the substrate disk which is rotated at a fixed angular velocity, in the radial direction of the substrate disk, comprising:

(a) a rail;

(b) a slider means mounted on the optical recording system and slidably engaged with the rail via an air bearing;

(c) a linear moving means for moving the optical recording system in the radial direction of the substrate disk along a line which passes through the center of the focusing means of the recording beam and through the center of mass of the body of the optical recording system, and which is perpendicular to the center line of rotation of the

substrate disk, wherein said linear moving means comprises a feed screw which is arranged on said line that passes through the center of the focusing means of the



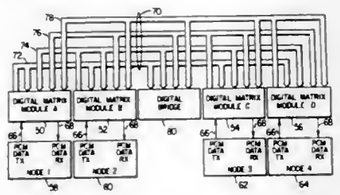
recording beam and through the center of mass of the body of the optical recording system and which is perpendicular to the center line of rotation of the substrate disk.

4,825,433

DIGITAL BRIDGE FOR A TIME SLOT INTERCHANGE DIGITAL SWITCHED MATRIX

Stephen A. Deschaine, Garland, Tex., assignor to DSC Communications Corporation, Plano, Tex.

Continuation-in-part of Ser. No. 939,036, Dec. 8, 1986, Pat. No. 4,771,420. This application Jan. 25, 1988, Ser. No. 148,383
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—62 **26 Claims**



1. A digital bridge circuit for enabling conference bridging of digital call signals between select ones of a plurality of ports in a switch matrix, comprising:

call signal storage means for receiving and storing in a collection time frame from the switch matrix digital call signals received by all of the ports in the switch matrix;

conference template storage means for storing a conference template defining a plurality of conferences and the ones of said digital call signals associated with conferees in each of said plurality of conferences;

accumulating and summing means coupled to said call signal storage means and said conference template storage means, said accumulating and summing means operable to accumulate and sum the digital call signals associated with said conferees in each of said conferences during an accumulation time frame to provide a digital conference signal for each of said conferences, said accumulation time frame occurring after said collection time frame;

conference storage means coupled to said accumulating and summing means for storing said digital conference signals; and

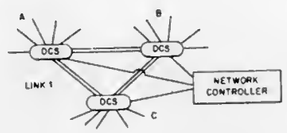
transmitting means coupled to said accumulating and summing means for transmitting to the switch matrix for each of said conferees in each of said conference said associated stored digital conference signal for routing to said conferees by the switch matrix during a transmission frame, said transmission frame occurring after said accumulation frame.

4,825,434

VARIABLE BANDWIDTH CONTROL SYSTEM

Jack Shaio, Cambridge, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 10, 1987, Ser. No. 94,973
Int. Cl.[4] H04J *3/17*
U.S. Cl. 370—80 **5 Claims**



1. A method of controlling access to a communication link by traffic types that require different fractions of transmission facilities simultaneously comprising the steps of

separating arriving traffic requests into bandwidth categories of narrowband and wideband;

allocating a first bandwidth portion of said link to narrowband request traffic types that require a smaller one of said fractions of transmission facilities, and allocating a second greater bandwidth portion of said link to wideband request traffic types that require a larger one of said fractions of transmission facilities;

ignoring requests for said first bandwidth portion when the number of said requests is less than a minimum threshold N, where N is a positive integer;

when at least N requests for said first bandwidth portion are present, deciding to serve narrowband or wideband requests by requiring that a fraction p of those decisions should favor the wideband, while the remaining 1−p should favor the narrowband; and

when narrowband requests are to be served, serving narrowband requests jointly N×R at a time, or the number present if less than N×R, R representing the number of batches of N requests which can be served in parallel, but always in multiples of N;

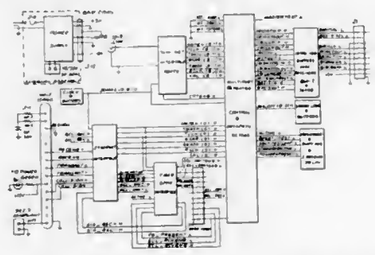
access to said communications link is permitted only when all requests in service have been completed.

4,825,435

MULTIPORT REPEATER

Keith B. Amundsen, Arlington; Richard P. Evans, Bolton; Richard C. Friess, Leominster; Robert J. Souza, Acton, and Barry C. Zink, Sudbury, all of Mass., assignors to Digital Equipment Corp., Maynard, Mass.

Filed Nov. 8, 1985, Ser. No. 796,470
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—97 **9 Claims**



1. A method for transmitting a packet of information including a preamble and data throughout a local area network comprising a multiport repeater having a plurality of ports for respectively connecting an end of each of a plurality of coaxial cables to said repeater, a port for connecting a transceiver cable to said repeater, FIFO buffer means, and repeating means, comprising the steps of:

(a) storing information received on one of said ports in said FIFO buffer means;

(b) regenerating a preamble in response to storage of said received information and transmitting said regenerated preamble on all of said ports except for said one port;

(c) detecting an end of said received preamble at the output of said buffer means and;

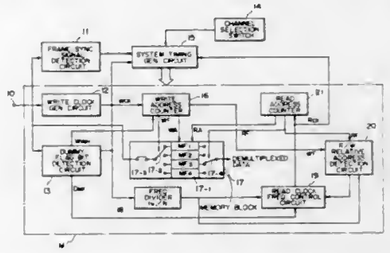
(d) always replicating the information stored in said buffer on all of said ports except for said one port in response to completion of said regenerated preamble.

4,825,436

TIME DIVISION MULTIPLEXING SYSTEM FOR N CHANNELS IN A FRAME UNIT BASE

Hirokazu Kobayashi, Gyoda; Yukihiko Miyamoto, Tokyo; Masaoki Takai, Tokyo; Syuichi Fujisawa, Tokyo, and Hiroshi Miyazawa, Tokyo, all of Japan, assignors to Trio Kabushiki Kaisha and Nippon Hoso Kyokai, both of Tokyo, Japan

Continuation of Ser. No. 201,347, May 26, 1988, abandoned, which is a continuation of Ser. No. 868,037, May 29, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 237,694
Claims priority, application Japan, May 29, 1985, 60-114355; May 29, 1985, 60-114356
Int. Cl.[4] H04J *3/07*
U.S. Cl. 370—102 **3 Claims**



1. A time division multiplexed signal demultiplexing system for regeneration of a plurality of original signals having information coded in a predetermined frame format from a time division multiplexed signal which is obtained by time-division multiplexing information signals of N channels with mutually different sampling or clock frequencies by means of a reference clock signal of a frequency equal to N times of the highest one of said sampling or clock frequencies or an even higher frequency, and inserting a dummy signal and a dummy flag bit in pairs in the portion where the corresponding information signal is inavailable due to the difference in frequencies among said plurality of original information signals, which comprises a frame buffer memory, a reading means for reading said frame buffer memory to produce said plurality of output signals, a writing clock signal having a writing clock frequency, a reading clock signal having a reading clock frequency, a means for performing a writing operation into said frame buffer memory, a means for detecting a dummy flag bit, said frame buffer memory capable of realizing a delay of $(\alpha+\beta x)$ frames {wherein α is a real number satisfying a condition $\alpha \geqq 0$, x is an integer satisfying a condition $x \geqq 1$, and β is a real number satisfying a condition $\beta > 0$} between a writing frame and a reading frame, and

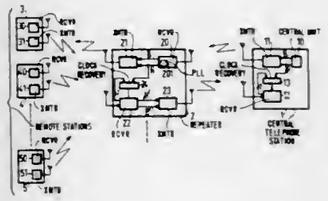
means for a controlling a reading clock control to interrupt the writing operation into said frame buffer memory for a period of β frame upon each detection of a dummy flag bit, said means for controlling then reducing said reading clock frequency of said reading clock signal, and said means for controlling returning said reading clock frequency of said reading clock signal to its original value when the delay between the writing frame and the reading frame returns to β frames or larger, said reading clock control controlling means thereby regenerating the continuous information signals prior to the time division multiplexing.

4,825,437

CLOCK RECOVERY ARRANGEMENT ESPECIALLY FOR AN INFORMATION TRANSMISSION SYSTEM USING THE TDMA PRINCIPLE IN ONE TRANSMISSION DIRECTION

Jean-Pierre Balech, Brive, France, assignor to Telecommunications Radioelectriques et telephoniques t.r.t., Paris, France

Filed Apr. 16, 1987, Ser. No. 40,382
Claims priority, application France, Apr. 22, 1986, 8605785
Int. Cl.[4] H04J *3/06*; H04L *7/02*
U.S. Cl. 370—104 **6 Claims**



1. A clock recovery arrangement suitable for an information transmission system using the time-division multiple-access (TDMA) principle in one transmission direction, the system including a central station and remote stations, each station having at least one transmitter circuit and one receiver circuit, information sent by the transmitter circuit of the central station to the receiver circuits of the remote stations being time-division multiplexed and synchronised by means of a phase-locked loop disposed within the central station, said phase-locked loop producing at least a multiplex clock signal, whilst information sent by the transmitter circuits of the remote stations is transmitted to the receiver circuit of the central station in accordance with said TDMA principle and is synchronised upon reception, at the central station, by the clock recovery arrangement which comprises:

a dual loop for fast phase reset, the dual loop comprising:

a. a first loop, distinct from said phase-locked loop, which includes an oscillator, which is locked onto said multiplex clock signal and which supplies a reference signal; and

b. a second loop, distinct from said phase-locked loop, which includes:

i. a phase comparator;

ii. a programmable frequency divider coupled to receive said reference signal; and

iii. a sequential digital filter coupled between said phase comparator and said programmable frequency divider to average input information to said programmable frequency divider.

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4,825,438

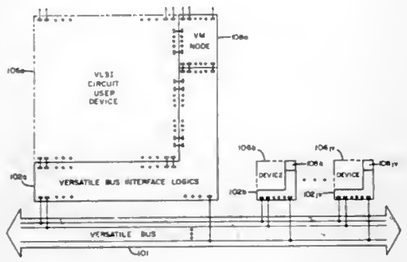
BUS ERROR DETECTION EMPLOYING PARITY VERIFICATION

Donald B. Bennett, Burnsville; Lee T. Thorsrud, Saint Paul, and Thomas W. Petschauer, Bloomington, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 898,810, Aug. 21, 1986, Pat. No. 4,734,909, which is a continuation of Ser. No. 356,051, Mar. 8, 1982, abandoned. This application Nov. 16, 1987, Ser. No. 98,634

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—8 **6 Claims**



1. A bus error detection system for detecting errors in binary bus signals comprising a bus having a plurality of lines each coupled to one of a plurality of digital means, said bus lines including an odd parity line and an even parity line, said system comprising clock means which provides at least two clock signal phases, wherein said digital means comprises activatable drive means for driving both of said odd and even parity lines to the same predefined logic level each time said first clock signal phase occurs, parity checking means coupled to said drive means for checking during a second clock signal phase the parity of the binary signals which appeared on said bus lines during a preceding first clock signal phase, and for activating said drive means for driving either said odd or said even parity lines to a predefined logic state according to the parity determined by said parity checking means during said second clock signal phase, and verification means constructed to normally verify that only one of said odd and even parity lines has been driven by said digital means to said predefined logic state during said second clock phase, and that both said odd and said even parity lines have been driven by said drive means during said first clock signal phase to the same predefined logic level.

4,825,439

SEMICONDUCTOR LOGIC INTEGRATED CIRCUIT DEVICE HAVING FIRST AND SECOND OPERATION MODES FOR TESTING

Kazuhiro Sakashita; Satoru Kishida, and Toshiaki Hanibuchi, all of Hyogo, Japan, assignors to Mitsubishi Denk Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1987, Ser. No. 86,447

Claims priority, application Japan, Aug. 22, 1986, 61-197587

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—15 **9 Claims**

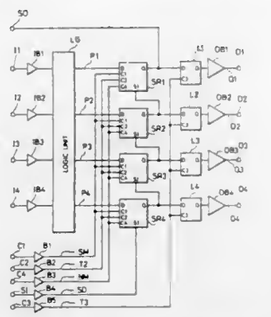
1. A semiconductor logic integrated circuit device having first and second operation modes with a parallel output terminal and a serial output terminal, said device including:

logic means having a plurality of output terminals for producing a first parallel output signal in response to an externally generated input signal;

signal selection means coupled to said logic means for receiving said first parallel output signal, said signal selection means being connected to receive a serial input signal, said signal selection means for producing a serial output signal and for further producing a second parallel output signal;

a storing means connected between said signal selection means and said parallel output terminal for temporarily storing said second parallel output signal; and

control means connected to control said signal selection means and said storing means for allowing said first parallel output signal to propagate through said signal selecting means and said storing means as an output signal from said



circuit device parallel output terminal in said first operation mode, and for alternately allowing said first parallel output signal to propagate from said serial signal output terminal while simultaneously maintaining the logic levels of the second parallel output signal in said temporary storing means at said circuit device parallel to output terminal when operating in said second operation mode.

4,825,440

SIGNAL ERROR CONCEALMENT CIRCUIT AND METHOD

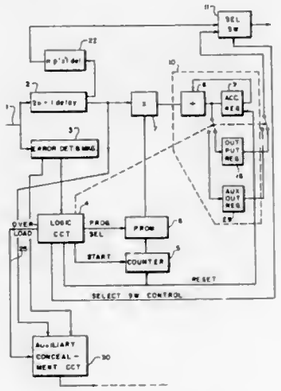
Jürgen Heitmann, Aisbach-Hähnlein, Fed. Rep. of Germany, and Peter Wagner, New York, N.Y., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 926,365, Oct. 31, 1986. This application Apr. 30, 1987, Ser. No. 45,692

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538735

Int. Cl.⁴ G06F *11/12*

U.S. Cl. 371—31 **8 Claims**



1. Method of compensating errors in digitally coded video signals comprising the steps of:

supplying digitally coded video signals simultaneously to a pixel value error detector and to a first delay circuit;

delaying said video signals in said first delay circuit by a first

time interval the duration of which depends upon a predetermined maximum number of pixels of a television line symmetrically bracketing an erroneous pixel which may be required for deriving a replacement pixel value for an erroneous pixel value;

detecting pixel value errors of said video signals in said pixel value error detector;

whenever an erroneous pixel is detected by said pixel value error detector, activating a counter for denominating each undisturbed pixel value appearing at the output of said first delay circuit with a numerical ordinate pixel designation with respect to said erroneous pixel value;

addressing a weighting factor memory with said numerical ordinate pixel designations to obtain respective matching weighting factors for each of said undisturbed pixel values;

multiplying said undisturbed pixel values by their corresponding matching weighting factors to obtain weighted product values;

summing said weighted product values to produce a substitute pixel value;

delaying the output of said first delay circuit by a second time interval equal to an integral number of pixel intervals (n) which is less than half said first time interval by no more than half a pixel interval, and

switching in said substitute pixel value in the plane of said erroneous pixel value when said erroneous pixel value appears in the output of said second delay circuit.

4,825,441

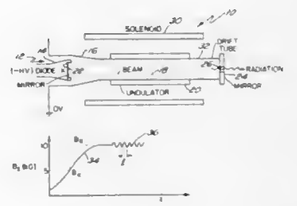
FREE ELECTRON LASER USING A RELATIVISTIC BEAM WITH SPIRALLING ELECTRON

Thomas C. Marshall; S. Perry Schlesinger, both of New York; Arthur A. Groesman, Bronx, and Shien-Chi Chen, New York, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1984, Ser. No. 575,425

Int. Cl.⁴ H01S *3/00*

U.S. Cl. 372—2 **7 Claims**



1. A method for generating continuously tunable coherent radiation having wavelength in the millimeter and submillimeter range in a longitudinal drift tube comprising the steps of:

generating a relativistic electron beam having a transverse velocity component and the corresponding longitudinal velocity component thereof along the axis of said drift tube so as to obtain a non-adiabatically compressed electron beam;

converting the longitudinal velocity of said relativistic electron beam into a transverse velocity component thereof and produce a spiralling electron beam;

subjecting said electron beam to a wiggler magnetic field having both longitudinal and transverse components thereof in said drift tube; and

extracting coherent radiation generated as a result of interaction between said electron beam and the wiggler magnetic field in said drift tube.

4,825,442

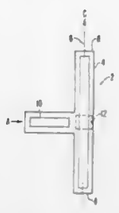
PLANAR OPTICAL LOGIC

John L. Fitz, Riverdale, Md., assignor to U.S. Government as represented by Director, National Security Agency, Fort George G. Meade, Md.

Filed Apr. 19, 1988, Ser. No. 183,218

Int. Cl.⁴ H01S *3/30*

U.S. Cl. 372—8 **9 Claims**



1. An optically controlled semiconductor laser for performing digital logic functions, comprising

(a) a material dependent index guided single mode laser diode device including a lasing cavity having a longitudinal axis and refractive index variations that support only a single mode of operation, said laser device generating laser media within said cavity in a direction parallel with said axis;

(b) means for optically coupling light into said lasing cavity at an angle greater than the numerical aperture of said laser device, said coupled light interacts with said laser media within a region of said laser cavity and introduces a pertubation in the form of a non-uniformity within said waveguide laser cavity thereby quenching the output to alter the output of said laser device, whereby input of the coupled light enables the laser device to perform logic functions.

4,825,443

CIRCUIT ARRANGEMENT FOR STARTING AND OPERATING A GAS DISCHARGE LASER

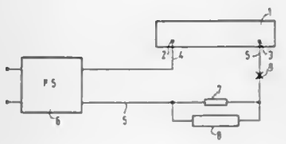
Pieter J. Bolhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 3, 1984, Ser. No. 606,745

Claims priority, application Netherlands, May 18, 1983, 8301761

Int. Cl.⁴ H01S *3/00*

U.S. Cl. 372—38 **17 Claims**



1. A circuit arrangement for starting and operating a gas discharge laser having a starting phase and an operating phase comprising, two supply lines for supplying a direct current to the gas discharge laser, a ballast resistor connected in at least one of the supply lines, and circuit means in shunt with the ballast resistor through which a starting current flows during the starting phase of the gas discharge laser.

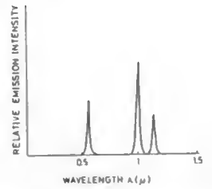
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4,825,444

LASER EMISSION MATERIAL

Nobuo Johna, Funabashi; Tsutomu Ishikawa; Takeshi Kawabe, both of Tokyo, and Masayoshi Nakamura, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,240
Claims priority, application Japan, Sep. 25, 1987, 62-241584; Jul. 11, 1988, 63-173176
Int. Cl.[4] H01S *3/16*
U.S. Cl. 372—41 2 Claims



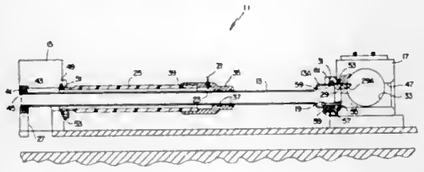
1. A laser emission material comprising a solid active lasing medium dispersed in a matrix, wherein a melt molded product of a zeolite is used as the matrix.

4,825,445

FLOWING GAS LASER DISCHARGE TUBE STRUCTURE

Dale E. Koop, Sunnyvale, and Robert E. Bazanese, San Jose, both of Calif., assignors to Rofin-Sinar, Inc., San Jose, Calif.

Filed May 19, 1988, Ser. No. 196,484
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—61 20 Claims



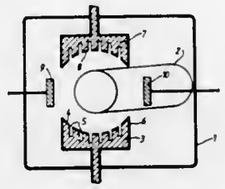
1. A co-axial laser tube structure of the kind used in a flowing gas laser, said laser tube structure comprising,
an inner axially extending tube for confining the flowing gas in the discharge region and having a cool end and a hot end,
cathode electrode means mounted adjacent the hot end of the inner tube,
anode electrode means mounted intermediate the cool end and the hot end of the inner tube,
said inner tube having a gas entrance orifice for permitting gas to flow from the exterior of the tube into the interior of the tube at the location of the anode electrode means,
an outer tube separate from and extending co-axially with, and spaced outwardly from the inner tube, said outer tube extending from the cool end of the inner tube to the anode electrode means for conducting flowing gas along the outside of the inner tube from the cool end to the gas entrance orifice, and
tube installation and mounting means effective to permit installation and/or replacement of the inner and outer tubes without adjustment or bore registration of the tubes.

4,825,446

LASER APPARATUS HAVING CATHODE BORE DIRECTING ELECTRON BEAM ONTO ANODE

Arthur Maitland, Fife, Scotland; Clifford R. Weatherup, and Ian A. Strudwick, both of Chelmsford, England, assignors to English Electric Valve Company Limited, Chelmsford, United Kingdom

Filed Jun. 15, 1987, Ser. No. 61,347
Claims priority, application United Kingdom, Jun. 14, 1986, 8614541; Aug. 30, 1986, 8621022; Sep. 1, 1986, 8621078; May 20, 1987, 8711891
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—87 23 Claims



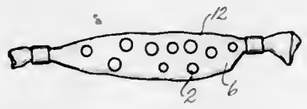
1. In a laser apparatus of the type including a gas-filled envelope having a resonant cavity, and anode and cathode electrodes positioned within said envelope, the gas being a laser active medium and including as a portion thereof a given material vapor, a given material member being positioned in said envelope which provides said given material vapor when sufficiently excited, the improvement comprising:
said cathode being a metallic member having at least one bore in a surface thereof;
means for producing a sufficiently high voltage between said anode and said cathode to produce an electron beam from said at least one bore extensive in a direction away from said at least one bore, said at least one bore being oriented relative to said material member such that said electron beam is incident upon said material member to vaporize said given material member and thereby excite said given material vapor.

4,825,447

LIPOSOMAL THERMOGRAPH AND METHODS FOR MAKING AND USING SAME

John S. Bramhall, 2805 Maple Ave., Manhattan Beach, Calif. 90266

Filed Sep. 21, 1987, Ser. No. 99,115
Int. Cl.[4] G01K *11/00*
U.S. Cl. 374—159 14 Claims



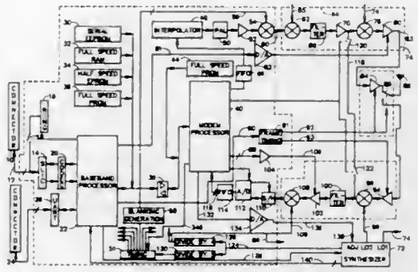
5. A liposomal thermograph comprising:
a sachet having a first enclosure and a second enclosure,
a first liposomal thermographic composition being bi-directional and having a first transition temperature, and
a second liposomal thermographic composition being bi-directional and having a second transition temperature,
the first transition temperature being different from the second transition temperature,
said first liposomal thermographic composition contained within the first enclosure of said sachet,
said second liposomal thermographic composition contained within the second enclosure of said sachet.

4,825,448

SUBSCRIBER UNIT FOR WIRELESS DIGITAL TELEPHONE SYSTEM

David N. Critchlow; Graham M. Avis; Sandra J. K. Earlam, all of San Diego; Karle J. Johnson, Carlsbad; Bruce A. Smetana, Escondido, and Gregory L. Westling, Poway, all of Calif., assignors to International Mobile Machines Corporation, Philadelphia, Pa.

Filed Aug. 7, 1986, Ser. No. 893,916
Int. Cl.[4] H04B *1/38*
U.S. Cl. 375—8 10 Claims



1. In a subscriber unit for a wireless digital telephone system a baseband processor for receiving an input signal from an input source, said input signal constituting a digitized bit stream wherein each given number of successive bits defines a symbol, transcoding said input signal in accordance with a predetermined code and acting as a function control means for said unit;
storage means coupled to said baseband processor for storing information associated with functions controlled by said baseband processor and information supplied thereto;
control means coupled to said baseband processor in a manner permitting said control means to access said baseband processor and to obtain information stored in said storage means and available to said baseband processor;
said control means being coupled to a programming means for programming said control means to perform its various control functions as well as to an interpolator means for increasing the sampling rate of the transcoded signal, and a frequency translator means for performing time multiplexed quadrature mixing of the output of said interpolator means with the output of a timing generator whereby the entire frequency spectrum of the output from said interpolator means is translated to a second frequency spectrum to provide a time multiplexed digital signal;
a digital to analog converter for receiving the time multiplexed digital signal from said frequency translator means and converting it into an analog signal;
deglitching means for removing glitch energy from said analog signal; and
means for converting said deglitched analog signal to an amplified IF signal.

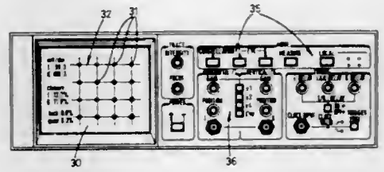
4,825,449

ANALYSIS OF DIGITAL RADIO TRANSMISSIONS

Murdo J. McKissock, South Queensferry, Scotland, assignor to Hewlett-Packard Limited, Pinewood, England

Filed Mar. 17, 1987, Ser. No. 26,816
Claims priority, application United Kingdom, Mar. 17, 1986, 8606573
Int. Cl.[4] H04B *17/00*
U.S. Cl. 375—10 3 Claims

1. An apparatus for analyzing digital radio transmissions comprising:
sampling means for sampling received digital radio signals to produce for each sampling instant a signal or signals as samples which are representative of the modulation state at that instant,
processing means for processing said signals representative of said samples to generate parameters indicative of the condition of said transmission and wherein said samples are represented by digitally encoded numbers and said processing means is arranged to allocate said numbers to one of a plurality of groups, the number of groups corresponding to the number of modulation states of the transmission and wherein the processing means is arranged to carry out a plurality of processing stages, a first processing stage comprising the evaluation of a set of statistics which comprise data representative of the position of each sample in a co-ordinate system, and a second stage of which comprises forming, using a least mean square error technique, a model cluster array which is a closest fit to the array represented by said statistics, said modelling stage producing a set of coefficients from which is calculated parameters representing a measurement of radio communication impairment,



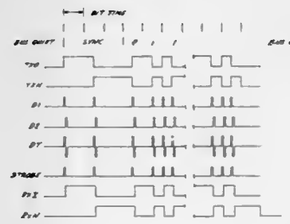
display means for displaying a given number of said samples as an array of clusters in which each cluster corresponds to one of the modulation states,
graticule generating means configured to store data indicative of a plurality of graticule configurations wherein said graticule generating means is configured and arranged to produce on said display a graticule configuration which is appropriate to a cluster array associated with the modulation scheme of the transmission under analysis, and
adjustment means configured to provide positional adjustment of said array relative to said graticule.

4,825,450

BINARY DATA COMMUNICATION SYSTEM

Hans K. Herzog, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 12, 1987, Ser. No. 25,131
Int. Cl.[4] H04L *25/34*
U.S. Cl. 375—17 29 Claims



23. A transmit coupler for a binary data communication system for coupling a source device to an electric wire data bus, said transmit coupler comprising:
a stub driver for receiving mark-space data signals from a source device and converting said mark-space data signals into doublets such that a doublet, coincident with each transition of said mark-space binary data signals, is pro-

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duced for each transition of said mark-space data signals, the number of doublets produced being equal in number to the number of transitions of said rectangular form data signal;

a line driver connected to said stub driver for amplifying said doublets produced by said stub driver; and

a transmit coupler transformer connected to said line driver for coupling said line driver in an electric wire data bus, said transmit coupler transformer including an input winding connected to said line driver so as to receive said amplified doublets produced by said line driver.

4,825,451

TECHNIQUE FOR TRANSMISSION OF VOICE COMMUNICATIONS AND APPARATUS USEFUL THEREIN

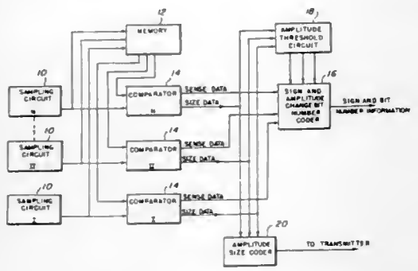
Nira Schwartz, Moshav Magshimim, Israel, assignor to Niravoice, Inc., Calif.

Continuation-in-part of Ser. No. 404,423, Aug. 2, 1982, abandoned, and Ser. No. 484,268, Apr. 12, 1983, abandoned. This application Apr. 19, 1984, Ser. No. 602,152

Claims priority, application Israel, Oct. 11, 1982, 66952; Jul. 17, 1983, 69251

Int. Cl.⁴ H04B *1/66, 14/06*

U.S. Cl. 375—27 **10 Claims**



1. A bit-saving method for transmission of digital communications comprising the steps of:

periodically sampling at least one signal to form digital samples which include information;

generating a derivative of said information which is functionally dependent upon a relationship among successive samples and transmitting a first message indicating a number of bits necessary to be used to define said derivative of said information of said at least one signal; and

transmitting a second message defining an amplitude relating to the sampled at least one signal, said second message having a variable number of bits as indicated by said first message.

4,825,452

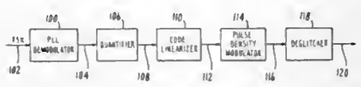
DIGITAL FSK DEMODULATOR

Hee Wong, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 4, 1987, Ser. No. 21,907

Int. Cl.⁴ H03K *7/08*; H04L *27/14*

U.S. Cl. 375—22 **10 Claims**



1. A digital frequency shift keying (FSK) demodulator which receives an FSK input signal and recovers a modulating baseband signal, the FSK demodulator comprising,

(a) means for receiving the FSK input signal and generating a corresponding pulse width modulated serial bit stream;

(b) means for transforming the pulse width modulated serial bit stream into an output signal comprising parallel bits representative of the frequency of the FSK input signal; and

(c) means for processing the output signal utilizing pulse density modulation to provide the recovered modulating baseband signal.

4,825,453

X-RAY EXPOSURE APPARATUS

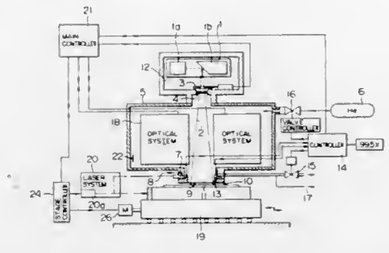
Yukio Kembo; Yoshihiro Komeyama; Minoru Ikeda, and Akira Inagaki, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,861

Claims priority, application Japan, Oct. 19, 1984, 59-218383

Int. Cl.⁴ G21K *5/00*

U.S. Cl. 378—34 **15 Claims**



7. An X-ray exposure apparatus having a less-attenuation chamber supplied with a low X-ray absorbing gas having an absorption coefficient for X-rays smaller than that of atmospheric air, said less-attenuation chamber being interposed between an X-ray source and a mask so that X-rays transmitted through said less-attenuation chamber are irradiated on said mask so as to transfer a pattern of the mask onto a resist on a wafer, said apparatus comprising detecting means for detecting the density of said gas or a component mixed in said gas in said less-attenuation chamber, and adjusting means for adjusting a quantity of X-rays effectively irradiating onto said mask in accordance with an output signal of said detecting means.

4,825,454

TOMOGRAPHIC IMAGING WITH CONCENTRIC CONICAL COLLIMATOR

Martin Annis, Cambridge; Michael Johnson, Southborough, and Richard Mastronardi, Medfield, all of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Dec. 28, 1987, Ser. No. 137,982

Int. Cl.⁴ G01N *23/201*

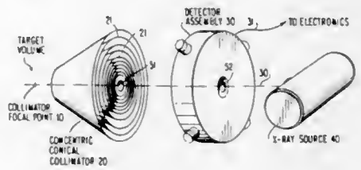
U.S. Cl. 378—87 **15 Claims**

11. An apparatus useful in backscatter tomographic imaging comprising:

a source of penetrating radiation means for supporting an object to be imaged so that the object includes a target volume,

a focused collimator for location between said target volume and said source of penetrating radiation, said collimator comprising a plurality of concentric frusto-conical wall sections, all of said frusto-conical wall sections having a common axis, adjacent pairs of said wall sections defining scattered radiation transmitting pathways, said pathways originating at a common region in said target volume, said collimator including an axial passageway, coincident with said common axis of all said frusto-conical wall sections, and

a scattered radiation detector assembly adjacent to said



focused collimator and located with said focussed collimator between said detector assembly and said target volume, said scattered radiation detector assembly having a central opening to accommodate said common axis.

4,825,455

COLLIMATOR FOR AN X-RAY MAMMOGRAPHY APPARATUS

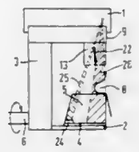
Manfred Bauer, Brunsbek, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,910

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437576[U]

Int. Cl.⁴ G21K *1/04*

U.S. Cl. 378—153 **7 Claims**



1. A device for generating collimated X-ray beams, said device comprising:

an X-ray source for emitting an input X-ray beam;

a cone arranged in the input X-ray beam to receive the entire input X-ray beam, said cone blocking a portion of the input X-ray beam such that a limited output X-ray beam emerges from the cone, said output X-ray beam being smaller than the input X-ray beam;

a diaphragm arranged in the cone for blocking a portion of the input X-ray beam such that the output X-ray beam is divided into first and second separate portions, said diaphragm being pivotable about a pivot axis such that the first portion of the output X-ray beam does not change when the diaphragm is pivoted, and the second portion of the output X-ray beam changes when the diaphragm is pivoted.

4,825,456

TELEPHONE SYSTEM/PAGING SYSTEM INTERFACE

Maury Rosenberg, 1121 E. 57th St., Brooklyn, N.Y. 11234

Filed Jan. 7, 1988, Ser. No. 142,530

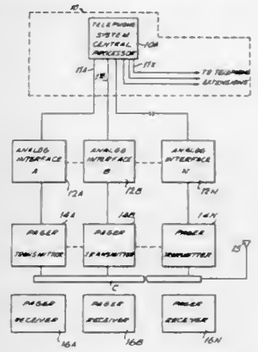
Int. Cl.⁴ H01Q *7/00*

U.S. Cl. 379—57 **13 Claims**

1. An apparatus for interfacing a telephone system having a central processor and a plurality of telephone extension lines operatively connected to said central processor to at least one pager transmitter, said apparatus comprising:

for each pager transmitter, an interface circuit connected to one of said telephone extension lines, and to one of said pager transmitters, said interface circuit having:

(a) detection means to detect activation of a telephone extension line connected to said interface circuit and for providing an output indicative of activation; and



(b) paging transmitter activation means responsive to the output of said detection means for activating one of the pager transmitters.

4,825,457

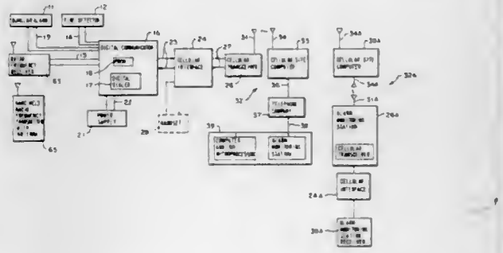
CELLULAR NETWORK DATA TRANSMISSION SYSTEM

Mayer M. Lebowitz, 9 Hinton St., Staten Island, 10312

Filed Apr. 25, 1988, Ser. No. 186,472

Int. Cl.⁴ H04M *11/04, 7/04*

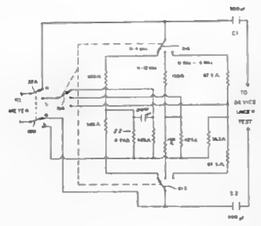
U.S. Cl. 379—40 **19 Claims**



1. A system for transmitting data from a specific location such as from a subscriber's premises to a central cellular network comprising, in combination, at least one alarm circuit for responding to a specific condition at said specific location for generating an electrical signal in response to said specific condition, a digital communicator including programmable means and an automatic digital dialer, means for connecting said alarm circuit to said digital communicator, a cellular interface, means for connecting said digital communicator to said cellular interface, a cellular transceiver having an antenna, a central cellular network having an antenna in telecommunication with said transceiver antenna and means for connecting said cellular interface with said cellular transceiver whereby data from said programmable means is transmitted over-the-air to said central cellular network in response to said specific condition, and said system further comprising a first alarm monitoring station and a telephone land line connecting said first alarm monitoring station to said central cellular network antenna and a second alarm monitoring station which includes means to connect the second alarm monitoring station to said first alarm monitoring station over-the-air via said cellular network.

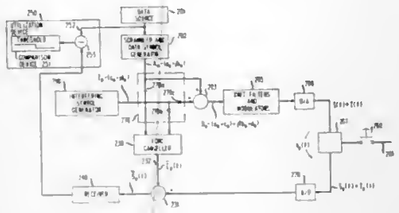
VOL 1101 ISS 4 AP 25 1989 UMI

4,825,458
SUBSCRIBER TELEPHONE EQUIPMENT TEST APPARATUS
Glen Dash, 201 Bingham Rd., Carlisle, Mass. 01741
Filed Aug. 7, 1987, Ser. No. 82,670
Int. Cl.[4] H04M *1/24;* H02M *7/00*
U.S. Cl. 379—1 14 Claims



1. An impedance termination network connected between a device under test and a frequency selective voltmeter, said network comprising, first resistive means, second resistive means, third resistive means, a first switch means having first, second and third positions corresponding to three successive frequency ranges, means coupling the first, second and third resistive means to the respective first, second and third positions whereby the position selection corresponds to resistive means selection, and a second switch means having two positions with each position for selection of either differential or common mode signals.

4,825,459
LOCAL LOOP TEST ARRANGEMENT IN AN ECHO CANCELLER BASED FULL DUPLEX MODEM
Cecil W. Farrow, Highlands; William E. Keasler, Jr., Tinton Falls; Joseph Marusesak, Howell, and David G. Shaw, Middletown, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.
Filed Dec. 30, 1985, Ser. No. 814,673
Int. Cl.[4] H04B *17/00, 3/23*
U.S. Cl. 379—3 11 Claims



1. Apparatus for testing the operation of a data set which comprises a transmitter, receiving means including a receiver and an echo canceller, said receiving means being responsive to the output of said echo canceller and an input signal received from a remote location via a transmission medium, said apparatus including

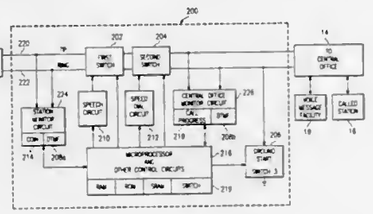
means operable during a test for disabling a connection between said data set and said transmission medium connecting said data set to said remote location, so that a portion of the output of said data set is applied at the input to said data set,

means operable during said test for applying a first symbol sequence to both said transmitter and to said echo canceller, and

means for applying a second symbol sequence to one of said transmitter and said echo canceller during said test, at which time said second symbol sequence is applied concurrently with said first symbol sequence, and

means responsive to said second symbol sequence and the output of said receiving means for testing operation of said receiver.

4,825,460
LINE INTERFACE UNIT FOR CALLER-CONTROLLED RECEIPT AND DELIVERY OF VOICE MESSAGES
Howard E. Carter, Denton; Joel A. Pugh, Dallas, and Byron C. Pierce, Garland, all of Tex., assignors to MessagePhone, Inc., Dallas, Tex.
Filed Jun. 22, 1988, Ser. No. 209,891
Int. Cl.[4] H04M *3/50, 15/16*
U.S. Cl. 379—67 22 Claims



22. A line interface unit for controlling receipt and delivery of voice messages over a telephone system having a voice message facility connectible to at least one calling station and a called station via a central office, the calling station having tip and ring lines connected to the central office, comprising:

a switch connected to the central office in the tip and ring lines, the switch having first and second positions and wherein signals on the tip and ring lines are connected directly between the calling station and the central office when the switch is in the first position;

means for signaling the voice message facility;

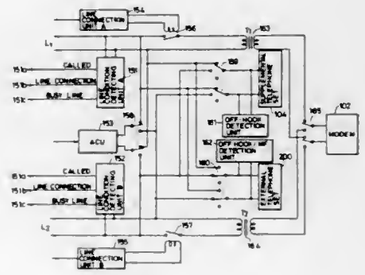
means for monitoring the tip and ring lines;

means connected to the monitoring means for detecting a predetermined condition at the called station upon call initiation to the called station, for detecting receipt of a first predetermined code from the calling station indicating that the caller desires to leave a voice message for the called station at the caller's expense, and for detecting receipt of a second predetermined code from the voice message facility;

control means connected to the detecting means and the switch, the control means responsive to receipt of the first predetermined code from the calling station for switching the switch from its first position to its second position to enable the signaling means to signal the voice message facility; and

wherein after signaling the voice message facility the control means is responsive to receipt of the second predetermined code from the voice message facility for switching the switch from its second position back to its first position to connect the calling station to the voice facility.

4,825,461
DATA COMMUNICATION APPARATUS FOR DATA AND/OR SPEECH COMMUNICATION ON A PLURALITY OF COMMUNICATION LINES
Kenji Kurita; Koichi Matsumoto, both of Tokyo, and Toshihiko Nakazawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 28, 1986, Ser. No. 823,286
Claims priority, application Japan, Jan. 31, 1985, 60-15438; Jan. 31, 1985, 60-15451; Feb. 5, 1985, 60-21363; Feb. 5, 1985, 60-21364
Int. Cl.[4] H04M *11/00, 1/27;* H04N *1/32*
U.S. Cl. 379—93 14 Claims



10. A communication apparatus comprising:

a plurality of communication lines;

data communication means for performing data communication;

speech communication for performing speech communication;

selection signal transmission means for transmitting to one of said communication lines a selection signal corresponding to an intended communication partner such that said communication line is line-connected to the intended communication partner;

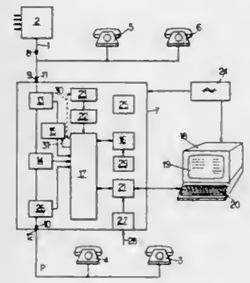
a memory for storing a plurality of selection signal data for speech communication;

indication means for indicating a speech request so as to perform speech communication with the intended communication partner during data communication by said data communication means; and

control means for discriminating whether or not the selection signal data for the speech communication with the intended communication partner indicated by said indication means is stored in said memory, and controlling the speech communication on the basis of a result of discrimination performed by said discrimination means,

wherein, only in the case that the selection signal data for the speech communication with the intended communication partner indicated by said indication means is stored in said memory, said control means sends said selection signal according to the selection signal data in said memory for the speech communication to one of said communication liens which is not being used for the data communication, so as to perform the data communication and the speech communication in parallel.

4,825,462
DEVICES FOR DELIVERING INFORMATION ON THEIR COMMUNICATIONS TO SUBSCRIBERS OF TELEPHONE LINES
Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint Cloud; Dominique Taudin, 4, rue Berthollet, 75005 Paris, and Eric Carreel, 62, rue Brancion, 75015 Paris, all of France
Filed Dec. 4, 1987, Ser. No. 128,904
Claims priority, application France, Dec. 9, 1986, 86 17226
Int. Cl.[4] H04M *1/56, 15/08*
U.S. Cl. 379—131 8 Claims



1. Device for providing the subscriber of a telephone line with information on the calls and other telephone communication service demanded on the subscriber's line from the corresponding station, said device comprising, connected to said line, beyond the general connection socket of the station to said line, means for detecting the number called and the cost of each call and means for displaying these two data on the spot, said device further comprising, also located on the subscriber's side of the station, means for recording the numbers called corresponding to the communication services demanded by the subscriber successively during the course of a predetermined time period, recording means for recording the successive cost of these communications and means for displaying on a video screen the sequence of the successively called numbers, with the corresponding cost of the respective communication services, in response to a request.

4,825,463
AUTOMATIC DIALER FOR ACCESSING PUBLIC NETWORK DIRECTLY OF VIA LOCAL NETWORK
Tatsuzo Miura, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Jan. 25, 1988, Ser. No. 147,648
Claims priority, application Japan, Jan. 30, 1987, 62-20928
Int. Cl.[4] H04M *1/26*
U.S. Cl. 379—355 6 Claims

1. An automatic dialer for use with a communications terminal selectively connectable to a public network and to a local network which is connected to said public network, said dialer comprising:

means for giving a first status indication when said communications terminal is connected to said local network and a second status indication when said communications terminal connected directly to said public network;

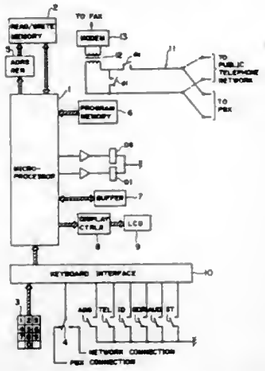
read/write memory means;

a numeric keypad;

registering means responsive to a unique keystroke input to said keypad for storing into said memory means a first set of data including a first call identifier signifying that a call is directed to said public network and a destination terminal number of said public network or a second set of data including a second call identifier signifying that a call is directed to said local network and a destination terminal number of said local network; and

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call establishing means for (a) recalling data from said memory means in response to a replica of said unique keystroke input to said keypad, (b) provided that said first status indication is given, dialing an access digit for accessing said public network and a recalled terminal number of a destination of said public network in succession with a pause therebetween if the recalled data contains said first



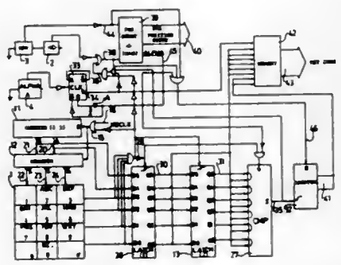
call identifier and dialing the recalled terminal number of a destination of said local network if the recalled data contains said second call identifier, and (c) provided that said second status indication is given, dialing the recalled terminal number of a destination of said public network if the recalled data contains said first identifier and discharging the recalled data if it contains said second call identifier.

4,825,464

SUCCESSIVE KEY OPERATING MECHANISM FOR TELEPHONE DIALING

Sayling Wen, Taipei, Taiwan, assignor to Inventa Electronic Co., Ltd., Taipei, Taiwan

Filed Dec. 16, 1987, Ser. No. 133,308
Int. Cl.[4] H04M 1/272
U.S. Cl. 379—354 **12 Claims**



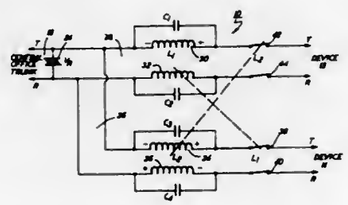
1. An input device for key telephone sets comprising:
an input means having ordinary numeral and alphanumeric push button keys as that provided in a key telephone set for inputting telephone call information therewith, and including a plurality of control means functionally disposed in conjunction with the numeral and alphanumeric push button keys for being operated to effect "circulatory" input operations in alphanumeric and numeral modes; a plurality of display means functionally disposed in said input means in conjunction with the push button keys and said control means for displaying input mode and keyed information thereon; circuit means electrically coupled with said input means and said display means in connection with each of the numeral and alphanumeric push button keys and said control means for processing keyed information by comparing and counting operations so as to effect input mode setting and changing functions on a "circulatory" basis; so that a telephone call can be conveniently made either through numerals or alphabetical letters or through the combination of both, said circuit means comprising a first counter matched with a decoder electrically connected to the push button keys for providing an output enable to each one of the push button keys;
a pair of latches coupled with the push button keys and said control means for temporarily latching keyed input data information therein and outputting the same therefrom;
a frequency generating means electrically connected to said first counter through an AND gate for providing keying scanning signals therefrom;
a memory means coupled with said ALPHA key through a flip-flop circuit arrangement for storing keyed input data information and providing a key code therefrom;
a comparator means electrically connected between said latches and said memory means for comparing input data information from said latches and outputting compared keying information therefrom;
a second counter electrically connected to said comparator means, said control means and said memory means for providing keyed input information in effecting input mode setting and changing operations in accordance with said compared keying information from said comparator means; and
a position counter means coupled with said second counter and said control means for providing said display means with display position count information in conjunction with said comparator means.

4,825,465

EXCLUSIONARY DEVICE FOR COUPLING PLURAL TELEPHONIC DEVICES TO A SINGLE CENTRAL OFFICE TRUNK

Donald J. Ryan, New Hartford, N.Y., assignor to Telecommunication Concepts, Inc., New Hartford, N.Y.

Filed Dec. 10, 1987, Ser. No. 131,368
Int. Cl.[4] H04M 1/72
U.S. Cl. 379—399 **9 Claims**



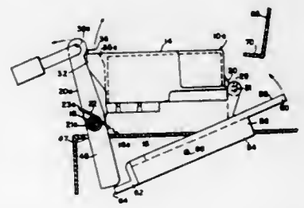
1. A line controller for automatically isolating first and second separate telephone line terminal devices that share a common telephone trunk line, comprising,
input means for coupling to tip and ring conductors of said telephone trunk line, and dividing the same into first and second branches which respectively connect to said first and second devices;
first line isolation means for cutting off the second device from the second branch when line current appears on the first branch to indicate that the first device has assumed an off-hook condition; and
second line isolation means for cutting off the first device from the first branch when line current appears on the second branch to indicate that the second device has assumed an off-hook condition;
wherein said first and second line isolation means each include a line relay device having a tip coil connected in series in the tip conductor of the associated branch and a ring coil connected in series in the ring conductor of said associated branch, and normally-closed tip and ring contacts actuated by the associated tip and ring coils and connected in series in the tip and ring conductors of the other of the first and second branches.

4,825,466

TELEPHONE INTERFACE SECURITY DEVICE

David H. Dowler, Raymond, and Richard K. St. John, Harrison, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 7, 1987, Ser. No. 82,624
Int. Cl.[4] H04M 1/15, 9/00; H01R 13/40, 13/46
U.S. Cl. 379—445 **15 Claims**



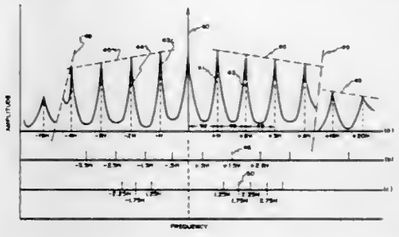
1. A telephone network interface security device comprising:
a storage container formed of a base portion having a bottom surface affixed to a mounting surface and a cover portion disposed on the upper surface of said base portion, said base portion and said cover portion together forming a compartment for the containment and storage of components;
elongated latch means pivotably connected to one end of said base portion and extending upwardly in a first position adjacent said cover portion;
hinge means connecting said cover portion to said base portion at the, opposite end of said base portion;
flange means disposed on said cover portion extending adjacent at least one side of said latch means;
securing means disposed on said latch means above said flange means with said latch means in a first position, said latch means further having a downwardly facing lip extending over said cover portion with said latch means in said first position;
a stop means spaced from said latch means a sufficient distance to allow said latch means to be pivotably moved away from said cover portion to a second position wherein said downwardly facing lip does not extend over said cover portion and said latch means contacts said stop means with said securing means disposed above said flange means, and said stop means being movable away from said latch means to provide a space between said stop means and said latch means
whereby said latch means is pivotably movable to a third position wherein said securing means is not disposed above said flange means.

4,825,467

RESTRICTED ACCESS TELEVISION TRANSMISSION SYSTEM

Bruno A. Rist, Van Nuys, Calif., and Adrian J. DeVries, Aurora, Ill., assignors to International Telesystems, Inc., Beverly Hills, Calif.

Filed Nov. 25, 1986, Ser. No. 934,810
Int. Cl.[4] H04N 7/467; H07H 7/00
U.S. Cl. 380—7 **63 Claims**



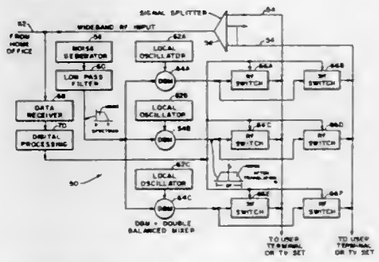
34. A television signal transmission security system comprising;
television signal generating means generating a television signal having a video carrier and an audio carrier;
encoder means for injecting multiple interfering signals into said television signal, each of said multiple interfering signals being injected into said television signal about midway between harmonics of the horizontal sweep frequency of said video carrier where spectral intensity of said harmonics is not substantial and in a frequency band including said video carrier and on either side of both sides of said video carrier;
transmission means for transmitting said television signal with said interfering signal to a plurality of television receivers; and
decoder means having notch filter means with multiple notches at each television receiver receiving and removing said multiple interfering signals, each of said multiple notches of said notch filter means having a bandwidth at 3db down of less than about the frequency bandwidth between adjacent harmonics of said horizontal sweep frequency wherein said notch filter means does not remove a significant amount of video sideband information, allowing said television signal to be viewed at said plurality of television receivers without substantial degradation.

4,825,468

VIDEO NOISE JAMMER

William H. Ellis, Jupiter, Fla., assignor to Broadband Engineering, Inc., Jupiter, Fla.

Filed Oct. 24, 1986, Ser. No. 923,131
Int. Cl.[4] H04L 9/00
U.S. Cl. 380—7 **4 Claims**



1. A multichannel signal distribution control system for

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providing a multichannel signal to channels of a subscriber, comprising:

means for distributing said multichannel signal to subscriber, comprising:

a random noise generator providing a band limited random noise signal having a limited bandwidth corresponding to a predetermined portion of the bandwidth of each channel to be selectively obscured;

oscillating means for providing a periodic signal for each channel to be selectively obscured;

means for translating said random noise signal and said periodic signal to produce a translated noise signal to said each channel corresponding to said periodic signal of the respective said multichannel signal distribution control system to be selectively obscured according to a control signal; and

means for combining said translated noise signal with said multichannel signal to provide an obscured multichannel signal to subscriber.

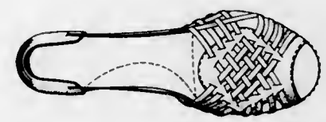
DESIGNS

APRIL 25, 1989

300,780
SHOE HEEL PROTECTOR FOR A HIGH HEEL
Mary A. Walls, 31764 Brown, Garden City, Mich. 48135
Filed Jul. 21, 1986, Ser. No. 887,641
Term of patent 14 years
U.S. Cl. D2—277



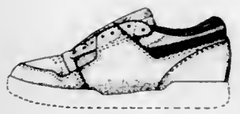
300,781
SANDAL
Norman H. Finn, Newton, Mass., assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Mar. 4, 1986, Ser. No. 841,358
Term of patent 14 years
U.S. Cl. D2—289





300,782
SHOE UPPER
Paul D. Brown, Hingham, and Juan A. Diaz, Weymouth, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Jul. 16, 1987, Ser. No. 74,164
Term of patent 14 years
U.S. Cl. D2—314





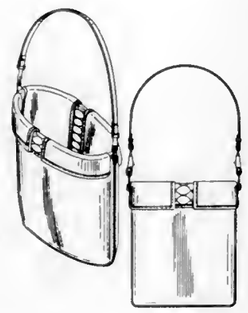
300,783
ELEMENT OF A SHOE UPPER
Paul D. Brown, Hingham, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Aug. 3, 1988, Ser. No. 227,714
Term of patent 14 years
U.S. Cl. D2—314

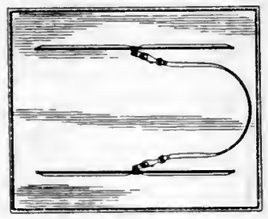




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300,784
CONVERTIBLE TOTE BAG AND BLANKET
Genevieve G. Powers, and Erin D. Powers, both of P.O. Box A.K., Agana, Guam 96910
Filed Aug. 6, 1984, Ser. No. 601,639
Term of patent 14 years
U.S. Cl. D3—42

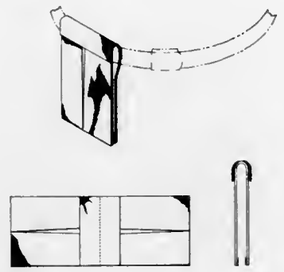




300,785
TOOL CADDY
David Sorge, 1820 Dan St., Tyler, Tex. 75701, and Michael A. Sorge, 402 Main St., Bridgeport, Ohio 43912
Filed Sep. 6, 1984, Ser. No. 647,836
Term of patent 14 years
U.S. Cl. D3—74

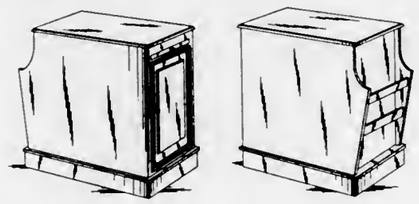


300,786
FOLDABLE MAP POUCH
Karl D. Josselyn, 1311 Lakeshore Dr., Quinton, Va. 23141
Filed Feb. 18, 1986, Ser. No. 775,165
Term of patent 14 years
U.S. Cl. D3—106

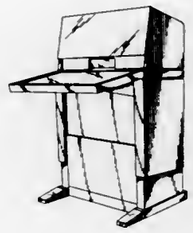


300,787
CRIB OR SIMILAR ARTICLE
Elaine K. Carter, 1125 La Jolla Rancho Rd., La Jolla, Calif. 92037
Filed Sep. 23, 1985, Ser. No. 778,787
Term of patent 14 years
U.S. Cl. D6—390

300,788
COMBINED CABINET AND READING MATERIAL RACK OR SIMILAR ARTICLE
Herman D. Crawley, Gretna, Va., assignor to The Lane Company, Altavista, Va.
Filed Feb. 26, 1987, Ser. No. 19,225
Term of patent 14 years
U.S. Cl. D6—397



300,789
LECTERN OR SIMILAR ARTICLE
Timothy P. Johnson, Dayton; Pierre L. Crease, Centerville, and Clifford J. Hoffman, Dayton, all of Ohio, assignors to Conference Communications, Inc., Dayton, Ohio
Filed Jul. 8, 1986, Ser. No. 883,511
Term of patent 14 years
U.S. Cl. D6—419



300,790
STAND FOR HOLDING BANANAS
Dennis Beckwith, HC2 Box 302B, Bovey, Minn. 55709
Filed Jul. 14, 1986, Ser. No. 885,255
Term of patent 14 years
U.S. Cl. D6—462



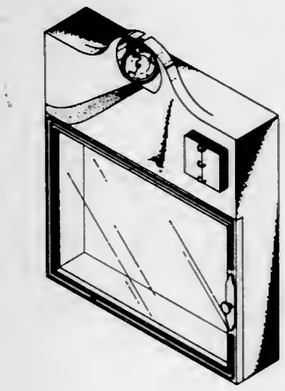
300,791
COUNTER TOP
Harry C. Osvold, 8405 Wesley Dr., Golden Valley, Minn. 55427
Filed May 15, 1986, Ser. No. 863,475
Term of patent 14 years
U.S. Cl. D6—511



300,792
PLANT HANGER
Gary E. Hutchins, 107 A Dora Dr., Waunakee, Wis. 53597
Filed Oct. 25, 1985, Ser. No. 791,374
Term of patent 14 years
U.S. Cl. D6—514

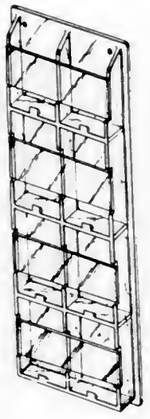


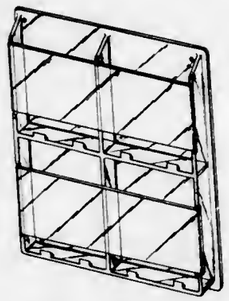
300,793
COIN DISPLAY CASE
Carl S. Sims, 4 Laurel Cir., Pease A. F. B., N.H. 03801
Filed Aug. 5, 1986, Ser. No. 883,058
Term of patent 14 years
U.S. Cl. D6—559

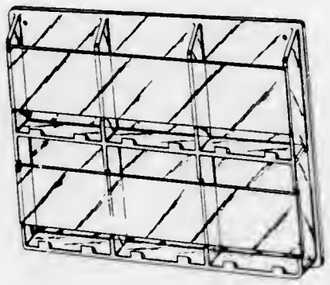


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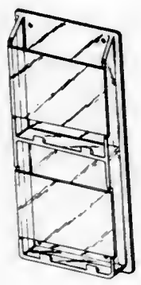
300,794
DISPLAY RACK
Arthur S. Kellogg, 11706 Ficus St., Palm Beach Gardens, Fla. 33410
Filed Jul. 15, 1986, Ser. No. 885,715
The portion of the term of this patent subsequent to Jul. 23, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—570



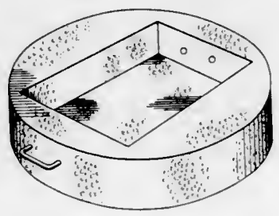




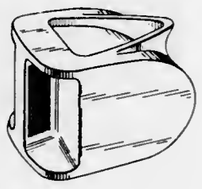
300,795
DISPLAY RACK
Arthur S. Kellogg, 11706 Ficus St., Palm Beach Gardens, Fla. 33410
Filed Jul. 15, 1986, Ser. No. 885,713
The portion of the term of this patent subsequent to Jul. 23, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—571



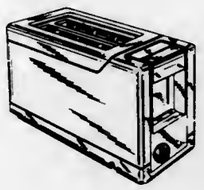
300,796
ICE CHEST FLOAT
Jerry H. Waggerman, 2307 Loes Ct., League City, Tex. 77573
Filed Dec. 31, 1986, Ser. No. 948,291
Term of patent 14 years
U.S. Cl. D7—77



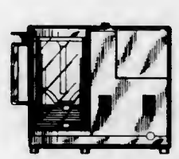
300,797
PITCHER
Max Klein, Hollywood, Fla., assignor to Salton Housewares, Inc., Niles, Ill.
Filed Apr. 4, 1986, Ser. No. 850,374
Term of patent 14 years
U.S. Cl. D7—316



300,798
ELECTRIC TOASTER
Gregory M. Tow, Randwick, Australia, assignor to Sunbeam Corporation Limited, New South Wales, Australia
Filed Aug. 15, 1986, Ser. No. 897,100
Claims priority, application Australia, Mar. 19, 1986, 452986
Term of patent 14 years
U.S. Cl. D7—330



300,799
COMBINED FOOD COOKER AND MIXER
Claude Viancin, Rumilly, France, assignor to S.N. Vivalp, Rumilly, France
Filed Jan. 29, 1986, Ser. No. 823,944
Claims priority, application France, Aug. 2, 1985, 854137
Term of patent 14 years
U.S. Cl. D7—376

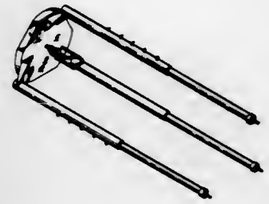




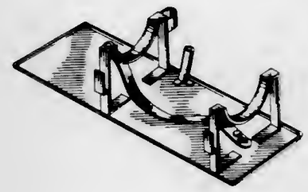
300,800
CORE PLUG EXTRACTOR
Harold A. Sutphen, Jr., Fairfield, Conn., assignor to Westvaco Corporation, New York, N.Y.
Filed Feb. 15, 1985, Ser. No. 702,128
Term of patent 14 years
U.S. Cl. D8—14



300,801
FENCE POST PULLER
James K. Pollard, 312 Parkwood Pl., Lewisville, Tex. 75067
Filed Apr. 22, 1985, Ser. No. 725,780
Term of patent 14 years
U.S. Cl. D8—51



300,802
HOLDER FOR TILE LAYER'S TOOLS
Clarence W. Raby, 27396 Los Amigos La. SE., Bonita Springs, Fla. 33923
Filed Jul. 3, 1985, Ser. No. 751,677
Term of patent 14 years
U.S. Cl. D8—71



300,803
HAND RAIL FITTING SET
Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Apr. 23, 1987, Ser. No. 41,361
Term of patent 14 years
U.S. Cl. D8—363





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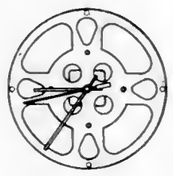
300,804
TRASH BAG HANGER
David H. Myers, 17 Woodland Dr., Pittsburgh, Pa. 15228
Filed Oct. 13, 1988, Ser. No. 257,347
Term of patent 14 years
U.S. Cl. D6—373



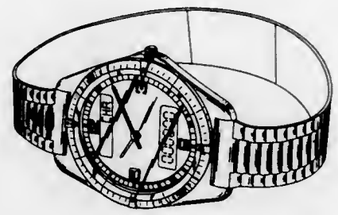
300,805
CONTAINER
William C. Rogier, St. Louis, Mo.; Michael S. Papa, Windsor Locks, and Edward J. Temple, Wethersfield, both of Conn., assignors to Monsanto Company, St. Louis, Mo.
Filed Jul. 30, 1985, Ser. No. 760,525
Term of patent 14 years
U.S. Cl. D9—390



300,806
CLOCK
Thomas E. Martin, 1842 Sylvania Ave., Toledo, Ohio 43613
Filed Apr. 27, 1988, Ser. No. 186,968
Term of patent 14 years
U.S. Cl. D10—6



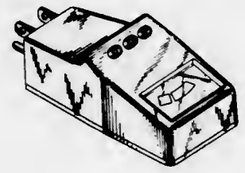
300,807
COMBINED WRIST WATCH AND BRACELET
Ernest Schneider, Evilard, Switzerland, assignor to Breitling Montres S.A., Grenchen, Switzerland
Filed Sep. 30, 1985, Ser. No. 781,474
Claims priority, application Switzerland, Mar. 29, 1985, 114 403
Term of patent 14 years
U.S. Cl. D10—32



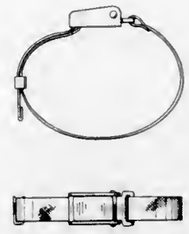
300,808
COMPASS
Nicole Richard, Paris, France, assignor to Compagnie Industrielle des Lasers Cilas Alcatel, Marcoussis, France
Filed May 9, 1986, Ser. No. 862,831
Claims priority, application France, Nov. 12, 1985, 85 5317
Term of patent 14 years
U.S. Cl. D10—68



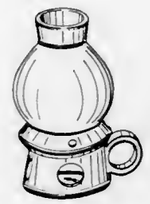
300,809
CIRCUIT ANALYZER
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed May 27, 1986, Ser. No. 867,708
Term of patent 14 years
U.S. Cl. D10—78



300,810
BRACELET
David G. Reaume, Tulsa, Okla., assignor to Care-Ware, Inc., Tulsa, Okla.
Filed Jul. 14, 1986, Ser. No. 885,188
Term of patent 14 years
U.S. Cl. D11—4



300,811
POTPOURRI BURNER
Frank J. Strafella, Powell, Ohio, assignor to The Love Mug, Inc., Worthington, Ohio
Filed Jun. 12, 1987, Ser. No. 61,179
Term of patent 14 years
U.S. Cl. D11—131.1



300,812
SEGMENT OF A VEHICLE TIRE
Delfin A. Rabinovich, Buenos Aires, Argentina, assignor to Fate Sociedad Anonima Comercial E Inmobiliaria, Buenos Aires, Argentina
Filed Jun. 30, 1986, Ser. No. 880,590
Term of patent 14 years
U.S. Cl. D12—147



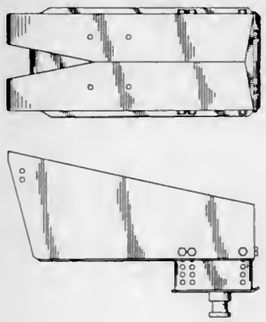
300,813
AUTOMOTIVE ROOF CARRIER
Masashi Kamaya, Tokyo, Japan, assignor to PIAA Corporation, Tokyo, Japan
Filed Jul. 30, 1986, Ser. No. 890,744
Term of patent 14 years
U.S. Cl. D12—157



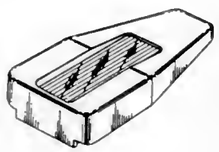
300,814
AUTOMOTIVE ROOF CARRIER
Masashi Kamaya, Tokyo, Japan, assignor to PIAA, Tokyo, Japan
Filed Jul. 30, 1986, Ser. No. 890,745
Term of patent 14 years
U.S. Cl. D12—157



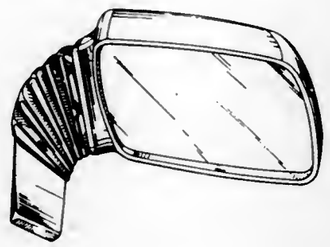
300,815
FIFTH WHEEL HITCH PIN BOX
James W. Chambers, Rockford, Ill., assignor to Atwood Industries, Inc., Rockford, Ill.
Filed Aug. 28, 1986, Ser. No. 901,463
Term of patent 14 years
U.S. Cl. D12—162



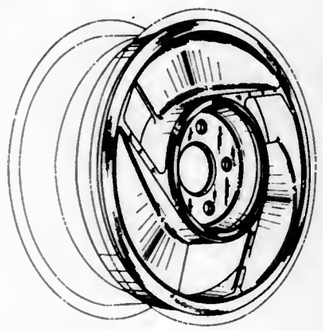
300,816
TRIM DOOR GUARD FOR AUTOMOBILES
Pierre Charet, and Duke Kraai, both of Miami, Fla., assignors to Rally Manufacturing, Inc., Miami, Fla.
Filed May 21, 1986, Ser. No. 865,603
Term of patent 14 years
U.S. Cl. D12—167



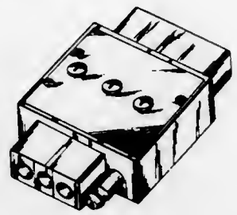
300,817
REAR VIEW MIRROR
Alberto Vitaloni, Torino, Italy, assignor to Vitaloni Group S.p.A., Italy
Filed Mar. 18, 1986, Ser. No. 845,058
Claims priority, application Italy, Dec. 4, 1985, 54135/85[U]
Term of patent 14 years
U.S. Cl. D12—187



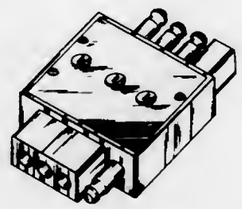
300,818
VEHICLE WHEEL CENTER
Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Jul. 17, 1986, Ser. No. 886,509
Term of patent 14 years
U.S. Cl. D12—211



300,819
ELECTRICAL CONNECTOR FOR A VEHICLE LIGHTING SYSTEM
Robert S. Orbanic, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Filed Oct. 30, 1986, Ser. No. 924,714
Term of patent 14 years
U.S. Cl. D13—24



300,820
ELECTRICAL CONNECTOR FOR A VEHICLE LIGHTING SYSTEM
Robert S. Orbanic, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Filed Oct. 30, 1986, Ser. No. 924,715
Term of patent 14 years
U.S. Cl. D13—24



300,821
COMBINED MICROPHONE AND SHIELDER
Hiroshi Kubota, Kobe, Japan, assignor to Toa Tokushu Denki Kabushiki Kaisha, Kobe, Japan
Continuation of Ser. No. 783,315, Sep. 13, 1985. This application Mar. 11, 1988, Ser. No. 145,199
Claims priority, application Japan, Mar. 13, 1985, 60-10094; Jul. 3, 1985, 60-28447
Term of patent 14 years
U.S. Cl. D14—228



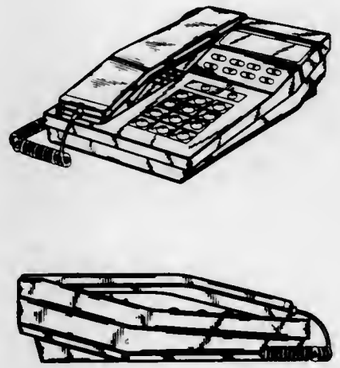
300,822
MICROPHONE SHIELDER
Hiroshi Kubota, Kobe, Japan, assignor to Toa Tokushu Denki Kabushiki Kaisha, Kobe, Japan
Division of Ser. No. 783,313, Sep. 13, 1985. This application Mar. 11, 1988, Ser. No. 145,201
Claims priority, application Japan, Mar. 13, 1985, 60-10091; Jul. 3, 1985, 60-28444; Jul. 3, 1985, 60-28451
Term of patent 14 years
U.S. Cl. D14—228



300,823
COMBINED MICROPHONE AND SHIELDER
Hiroshi Kubota, Kobe, Japan, assignor to Toa Tokushu Denki Kabushiki Kaisha, Kobe, Japan
Division of Ser. No. 783,314, Sep. 13, 1985. This application Mar. 11, 1988, Ser. No. 145,204
Claims priority, application Japan, Mar. 13, 1985, 60-10092; Jul. 3, 1985, 60-28445
Term of patent 14 years
U.S. Cl. D14—228

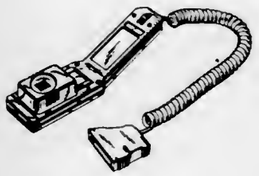


300,824
TELEPHONE SET
Mitsukazu Okuda, and Motokuni Yano, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Oct. 28, 1985, Ser. No. 792,331
Claims priority, application Japan, May 30, 1985, 60-23138
The portion of the term of this patent subsequent to Oct. 6, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—151



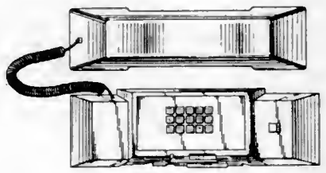
300,825
COMBINED CONTROL UNIT HANDSET, WITH CORD AND PLUG, FOR A MOBILE RADIOTELEPHONE SET
Jorma Pitkonen, Turku, Finland, assignor to Nokia-Mobira OY, Salo, Sweden
Filed Apr. 4, 1986, Ser. No. 850,346
Claims priority, application Finland, Oct. 11, 1985, 771/85
Term of patent 14 years
U.S. Cl. D14—138

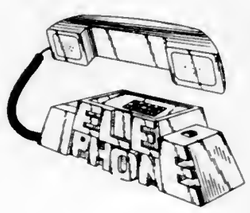




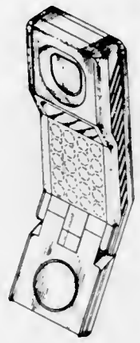
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300,826
TELEPHONE SET
Kam W. Ng, Flat A, 20th Floor, Willow Mansion, Taikoo Shing, Quarry Bay, Hong Kong
Filed Dec. 4, 1987, Ser. No. 129,138
Claims priority, application United Kingdom, Sep. 23, 1987, 1045096
Term of patent 14 years
U.S. Cl. D14—143



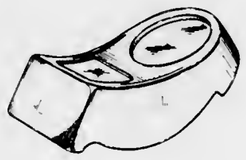


300,827
HOUSING FOR A PORTABLE HANDSET TELEPHONE OR SIMILAR ARTICLE
Leonid Soren, Lincolnwood, and Albert L. Nagele, Wilmette, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 11, 1987, Ser. No. 97,461
Term of patent 14 years
U.S. Cl. D14—138

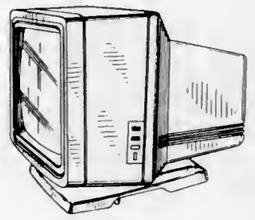




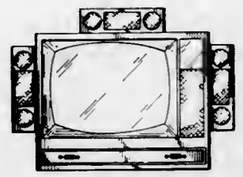
300,828
WRIST COMPUTER FOR DIVERS
Jurgen Hermann, Mauren, Liechtenstein, assignor to Divetronic AG, Liechtenstein, Liechtenstein
Filed Feb. 10, 1986, Ser. No. 827,555
Claims priority, application World Int. Prop. O., Aug. 21, 1985, 005,722
Term of patent 14 years
U.S. Cl. D14—100

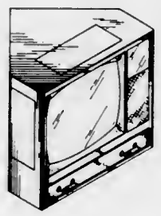


300,829
VIDEO TERMINAL
Stuart K. Morgan, Westford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Jan. 14, 1986, Ser. No. 818,738
Term of patent 14 years
U.S. Cl. D14—113

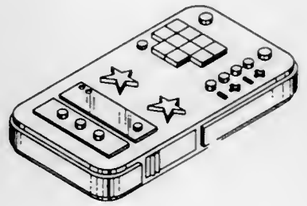


300,830
TELEVISION RECEIVER
Lamar G. Lowry, 5077 Towering Oaks Dr., Marrero, La. 70072
Filed Jan. 23, 1986, Ser. No. 821,820
Term of patent 14 years
U.S. Cl. D14—133

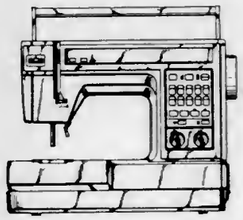




300,831
REMOTE CONTROL
Henry C. Jenkins; Marilyn Jenkins, both of 2807 Player Ave., and Myrtle Williams, 2902 Coronada Pkwy., all of Fayetteville, N.C. 28303
Filed Apr. 28, 1986, Ser. No. 857,813
Term of patent 14 years
U.S. Cl. D14—218



300,832
SEWING MACHINE
Nobufusa Kuroki, Machida, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Dec. 12, 1985, Ser. No. 808,435
Claims priority, application Japan, Oct. 4, 1985, 60-41488
Term of patent 14 years
U.S. Cl. D15—70



300,833
PEN CLIP
Richard S. McShirley, 150 W. Verdugo Ave., Burbank, Calif. 91502
Filed Oct. 25, 1985, Ser. No. 791,612
Term of patent 14 years
U.S. Cl. D19—46

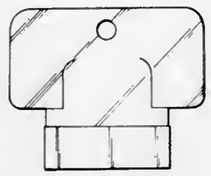


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300,834
POINT AND BARREL TIP ASSEMBLY AND POINT FOR WRITING INSTRUMENT
Fred L. Gerde, Pacific Palisades, Calif., assignor to The Gillette Company, Boston, Mass.
Continuation-in-part of Ser. No. 758,586, Jul. 1, 1985, abandoned, which is a continuation of Ser. No. 530,937, Sep. 12, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 857,562
Term of patent 14 years
U.S. Cl. D19—55



300,836
SHELF CLIP FOR HOLDING PROMOTIONAL ADVERTISING MATERIALS
Sol Goldstein, 300 Edward St., New York, N.Y. 11577
Filed Dec. 8, 1986, Ser. No. 939,466
Term of patent 14 years
U.S. Cl. D20—43



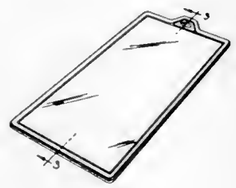
300,837
SIMULATIVE TOY BALLOON
Ronald E. Prater, 3432 N. Washington Rd., Fort Wayne, Ind. 46804
Filed Dec. 29, 1986, Ser. No. 947,500
Term of patent 14 years
U.S. Cl. D21—84



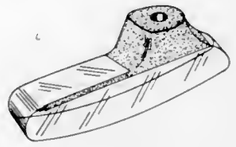
300,838
BATON
Jacob O. Smith, Sr., 601 Armenia Br., Pensacola, Fla. 32505
Filed Feb. 18, 1986, Ser. No. 833,751
Term of patent 14 years
U.S. Cl. D21—100



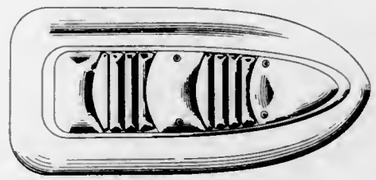
300,835
DISPLAY TAG
Charles P. Stevens, 5066 Spring Rock Ter., Roswell, Ga. 30075
Filed Nov. 28, 1986, Ser. No. 936,016
Term of patent 14 years
U.S. Cl. D20—27



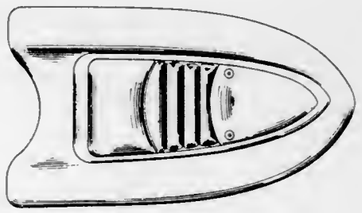
300,839
GOLF PUTTER HEAD
Robert W. Dupont, 473 W. Line St., Bishop, Calif. 93514
Filed Apr. 16, 1986, Ser. No. 852,913
Term of patent 14 years
U.S. Cl. D21—218

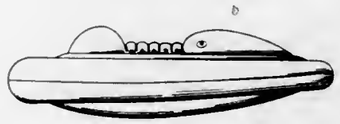


300,840
TWO-MAN WATER SLED
Donato Minurri, North Charleston, S.C., assignor to Sun Star Inflatable Corporation, N. Charleston, S.C.
Filed Mar. 13, 1987, Ser. No. 25,778
Term of patent 14 years
U.S. Cl. D21—228

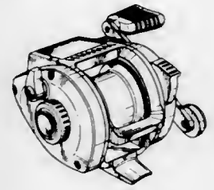


300,841
ONE-MAN WATER SLED
Donato Minurri, North Charleston, S.C., assignor to Sun Star Inflatable Corporation, N. Charleston, S.C.
Filed Mar. 13, 1987, Ser. No. 25,780
Term of patent 14 years
U.S. Cl. D21—228

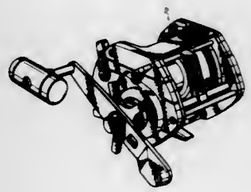




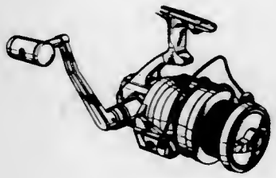
300,842
FISHING REEL
Tetsuyuki Doi, and Masaharu Nozma, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Feb. 27, 1987, Ser. No. 19,715
Claims priority, application Japan, Sep. 4, 1986, 61-30856
Term of patent 14 years
U.S. Cl. D22—140



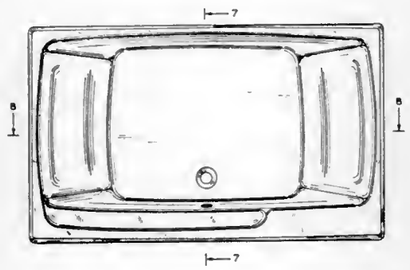
300,843
FISHING REEL
Tetsuyuki Doi, Hiroshima, and Etsuo Hiraishi, Tokyo, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Jan. 5, 1987, Ser. No. 59,671
Claims priority, application Japan, Dec. 19, 1986, 61-58397
Term of patent 14 years
U.S. Cl. D22—140



300,844
FISHING REEL
Etsuo Hiraishi, and Terubisa Numata, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Jan. 19, 1987, Ser. No. 64,270
Claims priority, application Japan, Dec. 19, 1986, 61-58394
Term of patent 14 years
U.S. Cl. D22—141

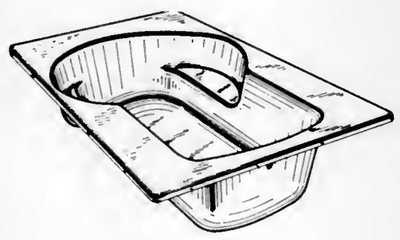


300,845
SOAKING BATHTUB
Henry M. Stairs, Jr., Neshanic, N.J., assignor to American-Standard Inc., New York, N.Y.
Filed Feb. 28, 1986, Ser. No. 834,724
Term of patent 14 years
U.S. Cl. D23—277

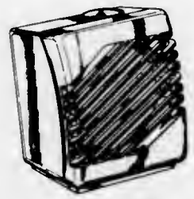




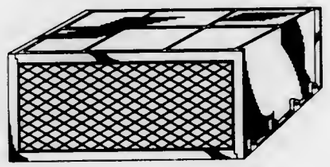
300,846
BATHTUB
Masayuki Kurokawa, Tokyo, Japan, assignor to American Standard Inc., New York, N.Y.
Filed Jul. 29, 1986, Ser. No. 890,438
Term of patent 14 years
U.S. Cl. D23—281



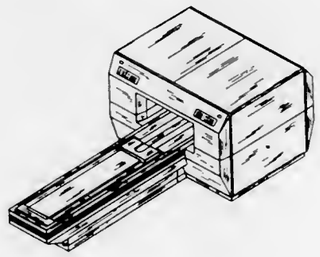
300,847
HOUSING FOR AN ELECTRIC FAN OR HEATER
Sharon W. Lin, La Canada, Calif., assignor to Tatung Company of America, Inc., Long Beach, Calif.
Filed Mar. 23, 1987, Ser. No. 29,474
Term of patent 14 years
U.S. Cl. D23—335



300,848
AIR FILTER CASE
Bradford L. Baker; Charles G. Hart, both of Carpinteria, Calif., and Paul J. Kudirka, Grand Rapids, Mich., assignors to Amway Corporation, Ada, Mich.
Filed Jun. 30, 1986, Ser. No. 880,507
Term of patent 14 years
U.S. Cl. D23—365



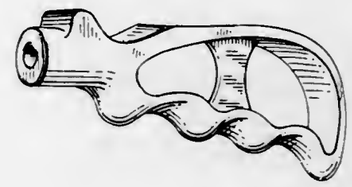
300,849
MAGNETIC RESONANCE IMAGER
Budd Steinhilber, Stinson Beach, and Kenneth C. Gilliam, San Francisco, both of Calif., assignors to Resonex, Inc., Sunnyvale, Calif.
Filed Jul. 25, 1986, Ser. No. 890,660
Term of patent 14 years
U.S. Cl. D24—2



300,850
DENTAL MIRROR
Charles A. Brewer, 5762 Parkhurst, Yorba Linda, Calif. 92686
Filed Sep. 29, 1986, Ser. No. 913,149
Term of patent 14 years
U.S. Cl. D24—13



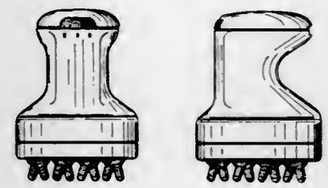
300,851
SURGICAL INSTRUMENT HANDLE
Herman R. Grieshaber, 2044 Balmoral La., Glenview, Ill. 60025
Filed May 19, 1986, Ser. No. 864,482
Term of patent 14 years
U.S. Cl. 24—30



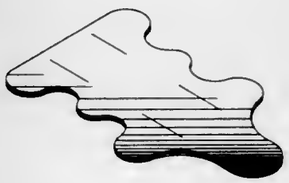
300,852
SOUND PROCESSOR FOR A HEARING AID
Richard Sunderland, Green Cove Springs, and Paul DiCarlo, Jacksonville, both of Fla., assignors to Xomed Inc., Jacksonville, Fla.
Filed Sep. 25, 1986, Ser. No. 912,011
Term of patent 14 years
U.S. Cl. D24—35



300,853
ELECTRICALLY-OPERATED MASSAGE APPLIANCE
Henri Smal, Blegny, Belgium, assignor to S.A. Faco, Herstal, Belgium
Filed Oct. 21, 1986, Ser. No. 921,680
Claims priority, application United Kingdom, Apr. 28, 1986, 1 033 728
Term of patent 14 years
U.S. Cl. D24—41



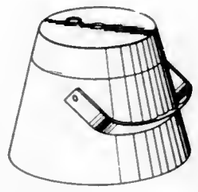
300,854
FLEXIBLE STERILE CLOSURE FOR A CONTAINER WITH A SIDE INJECTION PORT
Winfield S. Singletary, Jr., Garland, Tex., assignor to U.S. Clinical Products, Inc., Richardson, Tex.
Filed Feb. 6, 1985, Ser. No. 699,053
Term of patent 14 years
U.S. Cl. D24—51

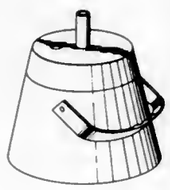




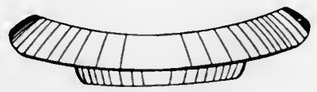
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300,855
URINARY DRAINAGE CANNISTER
Dennis M. Kay, 236 Mariner Dr., Tarpon Springs, Fla. 33589
Filed Feb. 12, 1985, Ser. No. 700,918
Term of patent 14 years
U.S. Cl. D24—54



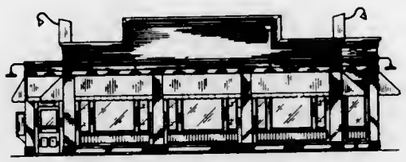


300,856
COMBINED LUMBAR AND BACK ALIGNMENT SUPPORT
Jan Bojsen-Moller, 318 Karen Way, Tiburon, Calif. 94920
Filed Apr. 21, 1986, Ser. No. 856,143
Term of patent 14 years
U.S. Cl. D24—64





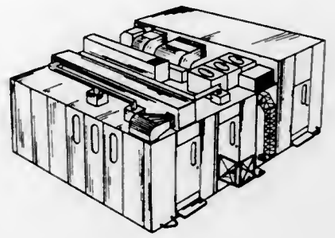
300,857
RESTAURANT BUILDING
Roy H. Adcock, Tulsa, Okla., assignor to Ken's Restaurant Systems, Inc., Tulsa, Okla.
Filed Jun. 11, 1986, Ser. No. 873,608
Term of patent 14 years
U.S. Cl. D25—1



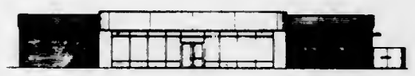
300,858
MODULAR HOUSE
Catherine M. P. Anjuere; Patrick M. J. Anjuere, both of 73, rue Saint-Honoré, Paris 1er; Bernard Grenot, 11, route du Chesnise Rogneux, Groscouvre (Yvelines), and Philippe H. Taffin de Givenchy, 471, Parc de Canaan, L'isle Adam (Val d'Oise), all of France
Filed Apr. 3, 1986, Ser. No. 847,871
Term of patent 14 years
U.S. Cl. D25—4



300,859
CLEAN ROOM MODULE OR SIMILAR ARTICLE
Johannes P. Klien, Vaduz, Liechtenstein, assignor to Lasarray Holding AG, Thun Dorf, Switzerland
Filed Apr. 21, 1986, Ser. No. 856,140
Term of patent 14 years
U.S. Cl. D25—33



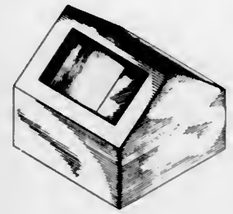
300,860
CONVENIENCE STORE BUILDING
Wyatt L. Phillips, Tulsa, Okla., assignor to QuikTrip Corporation
Filed Jul. 18, 1986, Ser. No. 886,744
Term of patent 14 years
U.S. Cl. D25—33



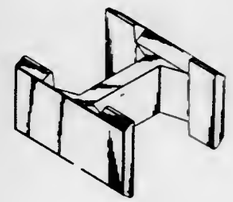
300,861
SAWHORSE
Gary A. Correll, 15351 NE. 202nd, Woodinville, Wash. 98072, and John T. Carter, 2914 Oakmont Ave., Orange, Calif. 92667
Filed May 21, 1986, Ser. No. 865,621
Term of patent 14 years
U.S. Cl. D25—67



300,862
BUILDING BLOCK
Fred Keller, Jr., 1410 Winston Cir., Bethlehem, Pa. 18017
Filed Apr. 24, 1986, Ser. No. 857,603
Term of patent 14 years
U.S. Cl. D24—113



300,863
CRIB BLOCK FOR RETAINING WALLS
Prentice J. McNeely, Cronst, Va., assignor to The Clear Flow Co., Inc., Waynesboro, Va.
Filed May 29, 1986, Ser. No. 868,339
Term of patent 14 years
U.S. Cl. D25—113



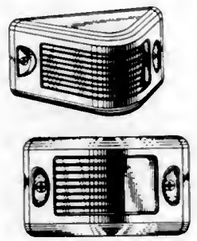
300,864
FLOODLIGHT
Brian V. Titmarsh, Barrington, R.I., assignor to GTE Products Corporation, Danvers, Mass.
Filed Feb. 5, 1986, Ser. No. 826,516
Term of patent 14 years
U.S. Cl. D26—24



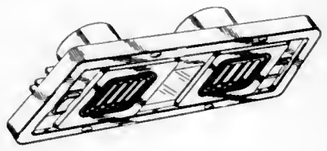


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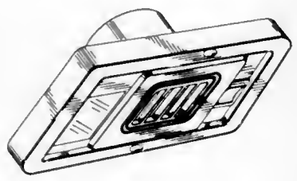
300,865
NAVIGATIONAL BOAT LIGHT
Steven P. Belletire, Oak Park, and Stanley T. Greaves, Chicago, both of Ill., assignors to Attwood Corporation, Lowell, Mich.
Filed May 16, 1986, Ser. No. 864,103
Term of patent 14 years
U.S. Cl. D26—28



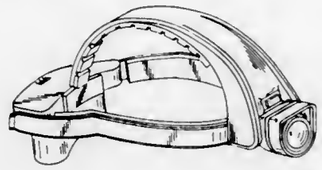
300,866
COMBINED COURTESY AND ADJUSTABLE LIGHT FOR THE INTERIOR OF AUTOMOTIVE VEHICLES
Anthony Macaluso, 6833 Rosecrans Ave., Unit D, Paramount, Calif. 90723
Filed Dec. 17, 1986, Ser. No. 942,861
The portion of the term of this patent subsequent to Apr. 25, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—28



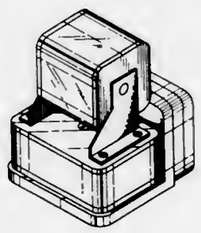
300,867
COMBINED COURTESY AND ADJUSTABLE LIGHT FOR THE INTERIOR OF AUTOMOTIVE VEHICLES
Anthony Macaluso, 6833 Rosecrans Ave., Unit D., Paramount, Calif. 90723
Filed Dec. 17, 1986, Ser. No. 942,862
The portion of the term of this patent subsequent to Apr. 25, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—28



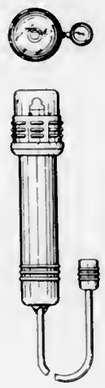
300,868
SURGICAL HEADLAMP
Leona Conforti, P.O. Box 2875, Aurora, Ill. 60507
Filed Jul. 16, 1985, Ser. No. 755,599
Term of patent 14 years
U.S. Cl. D26—39



300,869
BODY MOUNTED LAMP
Bennie L. Caffey, 14511 Desplaines St., Harvey, Ill. 60426
Filed Apr. 14, 1986, Ser. No. 852,496
Term of patent 14 years
U.S. Cl. D26—39



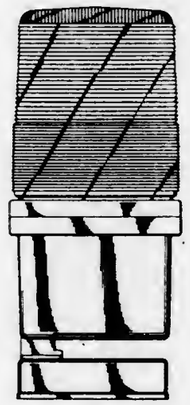
300,870
BATTERY-OPERATED TORCH
Kwong Y. Leung, Room 902, 9/F., 45-51 Chatham Road, Tsimshatsui, Kowloon, Hong Kong
Filed Apr. 3, 1986, Ser. No. 847,873
Term of patent 14 years
U.S. Cl. D26—40



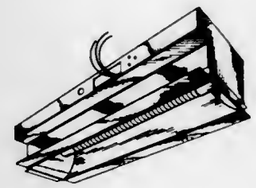
300,871
COMBINED TRANSISTORIZED FLUORESCENT LAMP AND EMERGENCY BLINKING LIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed May 7, 1986, Ser. No. 860,782
Claims priority, application United Kingdom, Nov. 7, 1985, 1030308
The portion of the term of this patent subsequent to Aug. 26, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—41



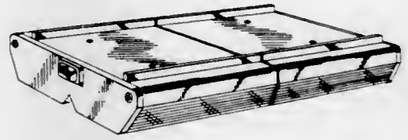
300,872
ADJUSTABLE LIGHT FIXTURE WITH LOUVERED REFLECTOR
Thomas Russello, Howell, and Richard Sangiamo, Linden, both of N.J., assignors to Keene Corporation, N.J.
Filed Dec. 3, 1986, Ser. No. 937,528
Term of patent 14 years
U.S. Cl. D26—63



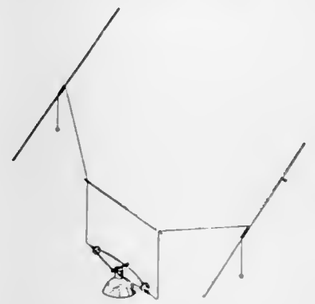
300,873
RECESSED FLUORESCENT LIGHTING FIXTURE
Neil J. Thompson, Granville, Ohio; John R. Brass, San Anselmo, Calif.; Herbert A. Fouke, Newark, and Mark San George, Westerville, both of Ohio, assignors to Manville Corporation, Denver, Colo.
Filed Feb. 2, 1987, Ser. No. 10,047
Term of patent 14 years
U.S. Cl. D26—74



300,874
FLUORESCENT LIGHT FIXTURE
Donald D. Szymanek, Westlake Village, Calif., assignor to REC Specialties, Camarillo, Calif.
Filed Apr. 28, 1986, Ser. No. 858,237
Term of patent 14 years
U.S. Cl. D26—76



300,875
HANGING LAMP
Ingo Maurer, Kaiserstrasse 47, D-8000 München 40, Fed. Rep. of Germany
Division of Ser. No. 713,239, Mar. 18, 1985, Pat. No. Des. 296,139. This application Mar. 22, 1988, Ser. No. 171,541
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 11 AR 3528/84
Term of patent 14 years
U.S. Cl. D26—85

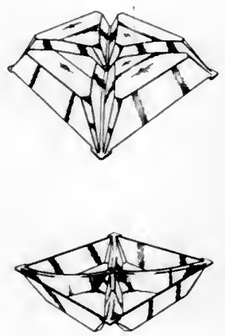


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300,876
TABLE LAMP
Toshiaki Sakai, Niigata, Japan, assignor to Twinbird Industrial Company Limited, Japan
Filed Sep. 1, 1987, Ser. No. 91,941
Term of patent 14 years
U.S. Cl. D26—107



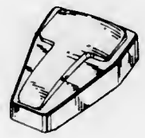
300,877
LAMP HOUSING FOR AN ILLUMINATED ADVERTISING OR GRAPHICS DISPLAY SYSTEM
Raymond Cyr, Wendover, Canada, assignor to Crecan International Ltd., Ontario, Canada
Filed Oct. 1, 1985, Ser. No. 782,693
Claims priority, application Canada, Jul. 24, 1985, 24-07-85-6
Term of patent 14 years
U.S. Cl. D26—134



300,878
PHARMACEUTICAL TABLET
Avinash M. Contractor, Warminster, Pa., assignor to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Apr. 2, 1987, Ser. No. 33,547
Term of patent 14 years
U.S. Cl. D28—2



300,879
PHARMACEUTICAL TABLET OR SIMILAR ARTICLE
William B. Mercer, Waukegan, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.
Filed May 1, 1987, Ser. No. 46,053
Term of patent 14 years
U.S. Cl. D28—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF APRIL, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Tomczuk, Bruce E.; and Sutherland, Deborah S., 4,824,951, Cl. 546-118.000.
A. O. Smith Corporation: *See*—
Hughes, Dennis R., 4,823,865, Cl. 165-109.100.
AAI Corporation: *See*—
Farinacci, Anthony L., 4,823,699, Cl. 102-443.000.
ABC Rail Corporation: *See*—
Farrell, Arthur W.; and Remington, James A., 4,824,015, Cl. 238-336.000.
Abe, Kazutoshi: *See*—
Togo, asahiko; and Abe, Kazutoshi, 4,824,909, Cl. 525-124.000.
Abe, Masaru: *See*—
Ogura, Masami; Seki, Kazuhiro; Abe, Masaru; Serizawa, Mitsuya; Kawamoto, Yoshimichi; Yasuda, Toru; and Kohata, Takashi, 4,823,898, Cl. 180-140.000.
Abe, Yoshinori: *See*—
Fukuchi, Masakazu; Akazawa, Kiyoshi; Matsunawa, Masahiko; Niki, Hiroshi; Matsuo, Shunji; Yamamoto, Hiroyuki; and Abe, Yoshinori, 4,825,246, Cl. 355-4.000.
Abex Corporation: *See*—
Novotny, Raymond J.; and McCune, Robert B., 4,824,260, Cl. 374-179.000.
Abrams, Martin L.; D'Aquila, Daniel L.; and Scheffler, Glenn W., to International Fuel Cell Corporation. Fuel cell stack cooling system. 4,824,740, Cl. 429-24.000.
Abshier, Steven L.: *See*—
Nielsen, Wade S.; and Abshier, Steven L., 4,824,157, Cl. 296-100.000.
Abthoff, Joerg; Schuster, Hans-Dieter; Schmidt, Karlwalter; Wollenhaupt, Gottfried; and Schmitz, Hans-Georg, to Daimler-Benz Aktiengesellschaft. Process and equipment for removing odorous substances from the fresh air for vehicle cabins. 4,824,363, Cl. 432-222.000.
Abu Dhabi Gas Industries Limited: *See*—
Minkkinen, Ari, 4,824,445, Cl. 55-40.000.
Ackland, David J.: *See*—
Dulebohn, David H.; and Ackland, David J., 4,823,792, Cl. 128-321.000.
Acme Group, The: *See*—
Redfield, John H., 4,824,146, Cl. 285-45.000.
Acree, William M.; Edwards, Bobby; and Black, John W., to American Home Products Corp. (Del). Canine corona virus vaccine. 4,824,785, Cl. 435-237.000.
Adachi, Akio: *See*—
Hishinuma, Itaru; Adachi, Akio; and Toyoshima, Ko, 4,823,585, Cl. 72-247.000.
Adahan, Carmeli. Portable ventilator apparatus. 4,823,787, Cl. 128-203.270.
Adams Rite Manufacturing Company: *See*—
Smith, Gregg L.; and Choi, Mansam, 4,824,150, Cl. 292-92.000.
Adelman, Herbert B., to Crowell Corporation, The. Protective cushioning. 4,823,945, Cl. 206-204.000.
Adelson, Alexander M.: *See*—
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 4,825,057, Cl. 235-472.000.
Adini, Ari. Device for and method of measuring tensile force in reinforcing member of reinforced concrete. 4,823,610, Cl. 73-828.000.
Adir et Compagnie: *See*—
Regnier, Gilbert; Guillonneau, Claude; Duhault, Jacques; and Lonchampt, Michel, 4,824,836, Cl. 514-278.000.
Adler, Robert; and Desmares, Peter C. J., to Zenith Electronics Corporation. Arrangement for use with a touch control system having a spherically curved touch surface. 4,825,212, Cl. 340-706.000.
Adolfsson, Rune, to SKF Nova AB. Mounting device with a clamping sleeve. 4,824,277, Cl. 403-370.000.
Advance Promotion Technologies, Inc.: *See*—
Humble, David R., 4,825,045, Cl. 235-383.000.
Advanced Circuit Technology: *See*—
Roberts, Joseph A.; and Stearns, Thomas H., 4,824,379, Cl. 439-77.000.
Advanced Fuel Research, Inc.: *See*—
Carangelo, Robert M.; and Solomon, Peter R., 4,824,790, Cl. 436-157.000.
Advanced Micro Devices, Inc.: *See*—
Bazil, John C.; and Goddard, Donald G., 4,825,097, Cl. 307-272.200.
Tam, Aloysius T.; and Threewitt, N. Bruce, 4,825,416, Cl. 365-194.000.
Walters, Donald M., Jr., 4,825,101, Cl. 307-270.000.
Aertker, Walter P.; Taylor, William L.; and Medica, Frank, to Dry, N. Elton; and Garvey, Charles C., Jr., part interest to each. Remotely controlled steering apparatus for outboard trolling motors. 4,824,408, Cl. 440-6.000.
AFROS S.p.A.: *See*—
Fiorentini, Carlo, 4,823,992, Cl. 222-333.000.
Agarwal, Arun: *See*—
Balian, Charles; Simpson, Jon H.; and Agarwal, Arun, 4,824,727, Cl. 428-352.000.
Agence Spatiale Europeenne: *See*—
Engelking, Uwe, 4,824,051, Cl. 244-158.00R.
Agency of Industrial Science and Technology: *See*—
Furutani, Yoshio; Tomioka, Noboru; Honjo, Masaru; Manabe, Kazuaki; and Shimada, Hiroaki, 4,824,782, Cl. 435-172.300.
Yamanaka, Kazushi, 4,825,423, Cl. 367-99.000.
Agfa-Gevaert AG: *See*—
Hamed, Saleman; and Soder, Jorg M., 4,823,595, Cl. 73-73.000.
Schmidt, Manfred; and Zanner, Johann, 4,823,535, Cl. 53-266.00R.
AGFA-Gevaert Aktiengesellschaft: *See*—
Fuchsberger, Hermann; and Wagensonner, Eduard, 4,825,297, Cl. 358-284.000.
Wagensonner, Eduard; Fuchsberger, Hermann; and Ruf, Wolfgang, 4,825,296, Cl. 358-280.000.
Agrawal, Rakesh; and Ezzat, Ahmed K., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method of file access in a distributed processing computer network. 4,825,354, Cl. 364-200.000.
Ainslie, Norman G.: *See*—
Master, Raj N.; Pittler, Marvin S.; Totta, Paul A.; Ainslie, Norman G.; and Palmateer, Paul H., 4,824,009, Cl. 228-124.000.
Air Products and Chemicals, Inc.: *See*—
Post, Robert C.; Bordelon, Kevin N.; and Moon, Burl M., 4,823,736, Cl. 118-730.000.
Air-Vend, Inc.: *See*—
Jurek, Richard D., 4,823,570, Cl. 70-129.000.
Airey, James J.: *See*—
Roberts, Peter R.; Airey, James J.; Blout, James E.; and Airey, Joseph J., 4,824,478, Cl. 75-0.50C.
Airey, Joseph J.: *See*—
Roberts, Peter R.; Airey, James J.; Blout, James E.; and Airey, Joseph J., 4,824,478, Cl. 75-0.50C.
Aisan Kogyo Kabushiki Kaisha: *See*—
Mineyama, Katsumi, 4,825,112, Cl. 310-71.000.
Aisin Seiki Kabushiki Kaisha: *See*—
Inagaki, Akio; and Shimomura, Masuo, 4,823,434, Cl. 16-115.000.
Kondo, Hitoshi; and Hata, Koichi, 4,824,454, Cl. 62-37.000.
Minamoto, Naoki; and Isobe, Takuya, 4,823,754, Cl. 123-470.000.
Tamura, Toru; Chujo, Masaki; and Jinnouchi, Kazuharu, 4,823,758, Cl. 123-564.000.
Yamamoto, Keiichi; and Ishikawa, Kazuo, 4,825,366, Cl. 364-424.100.
Aisin Warner Kabushiki Kaisha: *See*—
Hayakawa, Yoichi; and Ito, Yasunobu, 4,823,648, Cl. 74-869.000.
Aizawa, Koichi; Sewa, Shingo; Mizushima, Kiyoshi; and Emoto, Minoru, to Dow Corning Kabushiki Kaisha. Heat-resistant polyorganosiloxane composition. 4,824,903, Cl. 524-772.000.
Ajinomoto Co., Inc.: *See*—
Takahashi, Satoji; and Sugiyama, Katsumi, 4,824,994, Cl. 560-38.000.
Ajioka, James S., to Hughes Aircraft Company. Slot antenna in circular waveguide. 4,825,219, Cl. 343-771.000.
Ajioka, James S.: *See*—
Tsuda, George I.; and Ajioka, James S., 4,825,175, Cl. 330-286.000.
Aksi, Kazuaki. Purifying system of water area. 4,824,284, Cl. 405-21.000.
Akashi, Akira, to Canon Kabushiki Kaisha. Focus detecting device. 4,825,238, Cl. 354-402.000.
Akashi, Akira: *See*—
Suda, Yasuo; Akashi, Akira; Ishizaki, Akira; Ohmura, Hiroshi; and Ohtaka, Keiji, 4,825,239, Cl. 354-402.000.
Akashi, Shunji, to Yoshida Kogyo K.K. Pull tab attachment for slide fastener slider. 4,823,447, Cl. 24-429.600.
Akatsuka, Takeo: *See*—
Oki, Yoshio; Akatsuka, Takeo; and Satoji, Fuminori, 4,825,249, Cl. 355-15.000.
Akazawa, Kiyoshi: *See*—
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Finke, Juergen; and Bartmann, Martin, to Huls Aktiengesellschaft. Method of manufacturing thermoplastically processible aromatic polyamides and polyamidimides from bisamide. 4,824,932, Cl. 528-363.000.

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Seaborne, Jonathan, to General Mills, Inc. Solid state ceramic microwave heating susceptor utilizing compositions with metal salt moderators. 4,825,024, Cl. 219-10.55E.
Searle, Robin H. J.: *See—*
Furlong, Owen D.; and Searle, Robin H. J., 4,823,593, Cl. 73-23.000.
Seeberger, Fritz, to Pumpen- und Maschinenbau Fritz Seeberger KG. Apparatus for feeding material to an eccentric-worm pump. 4,823,935, Cl. 198-533.000.
Seepe, Detlef: *See—*
Metzner, Wolfgang; and Seepe, Detlef, 4,824,484, Cl. 106-18.310.
Seffens, David E., to H. W. Culp Lumber Co. Infeed table for lumber planer machine. 4,823,851, Cl. 144-245.00R.
Segonzac nee Ducellier, Colette: *See—*
Ducellier, Gilbert, deceased; and Pavia, Andre, 4,824,571, Cl. 210-603.000.
Segrist, Lloyd E. Method for extracting arsenic and heavy metals from phosphoric acid. 4,824,650, Cl. 423-321.00R.
Seibu Polymer Kasei Kabushiki Kaishas: *See—*
Ishihara, Yuji; and Yamasaki, Akio, 4,824,516, Cl. 156-523.000.
Seifert, Glenn A.: *See—*
Ratner, Harvey; Ratner, Ronald; Seifert, Glenn A.; Selwyn, Stephen; and Zaro, Marvin, 4,824,237, Cl. 351-203.000.
Seifert, Peter: *See—*
Denker, Dietrich; Seifert, Peter; Weber, Otto; and Schicht, Horst, 4,824,166, Cl. 296-204.000.
Seifert, Willis; and Loeffler, Michael, to Intel Corporation. Method and apparatus for removing reticle guides. 4,824,496, Cl. 156-64.000.
Seiferth, Oscar E., to James River Corporation. Food receptacle for microwave cooking. 4,825,025, Cl. 219-10.55E.
Seiffarth, Ernst-August: *See—*
Halldorsson, Thorsteinn; Seiffarth, Ernst-August; and Manhart, Sigmund, 4,825,063, Cl. 250-203.00R.
Seiko Electronic Components Ltd.: *See—*
Ogawa, Masao; Harada, Toyoo; Toyosawa, Shinichi; Shinoda, Isamu; Kawagoe, Takahiro; Daifuku, Hideharu; and Masuda, Yoshitomo, 4,824,745, Cl. 429-213.000.
Seiko Epson Kabushiki Kaisha: *See—*
Maekawa, Nobuyoshi; Yokouchi, Hideya; Aruga, Tomoe; and Sugiyama, Tadashi, 4,825,314, Cl. 360-99.080.
Seiko Instruments Inc.: *See—*
Sato, Hirochika; Nakayama, Haruo; Uchiyama, Takeshi; Hagami, Yoshihisa; and Sato, Yoshiro, 4,825,113, Cl. 370-2.000.
Yokote, Takasuke; and Kamimura, Nobuo, 4,823,562, Cl. 63-5.100.
Seiko Seiki Kabushiki Kaisha: *See—*
Kobayashi, Takeshi; and Asai, Junichi, 4,824,330, Cl. 417-295.000.
Seikosha Co., Ltd.: *See—*
Yamakoshi, Akira; Fujita, Toyohiko; Tsukakoshi, Kunihiko; and Mito, Kazuhisa, 4,825,104, Cl. 307-355.000.
Seitz, H. Michael, Jr. Apparatus used in a method for removing tissue and living organisms from human body cavities. 4,824,434, Cl. 604-27.000.
Seitz, Jerry T.; Berglund, Charles A.; and Pasztor, Andrew J., Jr., to Dow Chemical Company, The. Process for preparing an oriented crystalline syndiotactic vinylaromatic polymer. 4,824,629, Cl. 264-291.000.
Seki, Kazuhiro: *See—*
Ogura, Masami; Seki, Kazuhiro; Abe, Masaru; Serizawa, Mitsuya; Kawamoto, Yoshimichi; Yasuda, Toru; and Kohata, Takashi, 4,823,898, Cl. 180-140.000.
Seki, Kimiaki: *See—*
Iwaki, Yoshiyuki; Matsumoto, Akio; and Seki, Kimiaki, 4,824,336, Cl. 417-415.000.
Seki, Masaki; and Amano, Norihisa, to Fanuc Ltd. Complex curved surface creation method. 4,825,377, Cl. 364-474.290.

Sekine, Takashi, to Fuji Photo Film Co., Ltd. Reflection-type overhead projector. 4,824,239, Cl. 353-66.000.
Sela, Uri: *See—*
Cody, George D.; Joseph, Craig A.; Sela, Uri; and Baker, Charles L., 4,824,016, Cl. 239-8.000.
Selby, Charles R. Shift lever stowing device. 4,823,635, Cl. 74-524.000.
Selwyn, Stephen: *See—*
Ratner, Harvey; Ratner, Ronald; Seifert, Glenn A.; Selwyn, Stephen; and Zaro, Marvin, 4,824,237, Cl. 351-203.000.
Semaan, Naji. Self heating food receptacle. 4,823,769, Cl. 126-263.000.
Semenets, Valery I.: *See—*
Baldenko, Dmitry F.; Kondratenko, Leonid A.; and Semenets, Valery I., 4,823,889, Cl. 175-107.000.
Sencore, Inc.: *See—*
Cook, Terry D.; and Ortman, Ross, 4,825,147, Cl. 324-60.00C.
Senoh, Makoto: *See—*
Ichikawa, Yoshiaki; Senoh, Makoto; Tsuchita, Kenji; Koizumi, Akira; and Iwama, Kunihiko, 4,824,633, Cl. 376-268.000.
Sensormedics Corporation: *See—*
Frick, Gene; and McCarthy, Rex, 4,824,242, Cl. 356-41.000.
Sentimore, Marrilyn M.: *See—*
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Sentmore, Darryl J., Sr.; and Sentimore, Marrilyn M. Multipurpose funnel. 4,823,848, Cl. 141-334.000.
Senturia, Stephen D.: *See—*
Howe, Roger T.; Mehregany, Mehran; and Senturia, Stephen D., 4,823,607, Cl. 73-783.000.
Senyard, Corley P., Jr.: *See—*
Standridge, Robert; Ratliff, George R.; Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; Garrett, Steve L.; Senyard, William H.; and Senyard, Thomas J., 4,824,580, Cl. 210-708.000.
Senyard, Corley P., Sr.: *See—*
Standridge, Robert; Ratliff, George R.; Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; Garrett, Steve L.; Senyard, William H.; and Senyard, Thomas J., 4,824,580, Cl. 210-708.000.
Senyard, Thomas J.: *See—*
Standridge, Robert; Ratliff, George R.; Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; Garrett, Steve L.; Senyard, William H.; and Senyard, Thomas J., 4,824,580, Cl. 210-708.000.
Senyard, William H.: *See—*
Standridge, Robert; Ratliff, George R.; Senyard, Corley P., Sr.; Senyard, Corley P., Jr.; Garrett, Steve L.; Senyard, William H.; and Senyard, Thomas J., 4,824,580, Cl. 210-708.000.
Seo, Seung M., to Samsung Semiconductor & Telecommunications. Sense amplifier optimized lay-out from dynamic random access memories on complementary metal oxide semicondutor. 4,825,417, Cl. 365-205.000.
Sera Solar Corporation: *See—*
Cogan, George W.; Christel, Lee A.; Merchant, J. Thomas; and Gibbons, James F., 4,824,489, Cl. 136-256.000.
Sergeant, O. Winston: *See—*
Bean, Robert G.; Beckman, Michael E.; Rubinson, Barry L.; Gardner, Edward A.; Sergeant, O. Winston; and McLean, Peter T., 4,825,406, Cl. 364-900.000.
Serizawa, Akio: *See—*
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Serizawa, Mitsuya: *See—*
Ogura, Masami; Seki, Kazuhiro; Abe, Masaru; Serizawa, Mitsuya; Kawamoto, Yoshimichi; Yasuda, Toru; and Kohata, Takashi, 4,823,898, Cl. 180-140.000.
Serkes, Jonathan M.; and Foschaar, William L., to In Vitro Scientific Products, Inc. Roller bottle for tissue culture growth. 4,824,787, Cl. 435-285.000.
Sethi, Dalbir S., to FMC Corporation. Process for purifying a working compound. 4,824,609, Cl. 260-369.000.
Seux, Michel: *See—*
Terrasse, Joseph J.; Seux, Michel; and Leveque, Robert, 4,823,451, Cl. 29-129.500.
Severinghaus, Nelson, Jr.; and Sharp, Gregory R., to Franklin Industries, Inc. Method of bleaching limestone. 4,824,653, Cl. 423-430.000.
Sevigny, Conrad. Waste liquid disposal apparatus. 4,823,428, Cl. 15-302.000.
Sewa, Shingo: *See—*
Aizawa, Koichi; Sewa, Shingo; Mizushima, Kiyoshi; and Emoto, Minoru, 4,824,903, Cl. 524-772.000.
Seyfried, Christoph: *See—*
Bottcher, Henning; Hausberg, Hans-Heinrich; Seyfried, Christoph; and Minck, Klaus-Otto, 4,824,852, Cl. 514-290.000.
Shah, Ashok C.; Britten, Nancy J.; and Badalamenti, Joseph N., to Unjohn Company, The. Grooved tablet for fractional dosing of sustained release medication. 4,824,677, Cl. 424-467.000.
Shaio, Jack, to GTE Laboratories Incorporated. Variable bandwidth control system. 4,825,434, Cl. 370-80.000.
Sharp, Gregory R.: *See—*
Severinghaus, Nelson, Jr.; and Sharp, Gregory R., 4,824,653, Cl. 423-430.000.
Sharp Kabushiki Kaisha: *See—*
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; and Yamamoto, Saburo, 4,824,518, Cl. 156-613.000.
Komoda, Tomohisa; Ishizuka, Mamoru; Tsuchimoto, Shuhei; and Yoshikawa, Mitsuhiko, 4,824,539, Cl. 204-192.200.
Shino, Katsuhide, 4,825,283, Cl. 357-74.000.
Sumikama, Yoshimitsu; and Aramaki, Yoshihiro, 4,824,061, Cl. 248-225.200.
Takeda, Makoto; Yamamoto, Kunihiko; Matsuhashi, Nobuaki; and Take, Hiroshi, 4,825,203, Cl. 340-784.000.
Tanabe, Tunehiko; and Kawada, Fumiyoshi, 4,824,397, Cl. 439-496.000.
Taniguchi, Kouki, 4,824,212, Cl. 350-333.000.
Yamamoto, Yoichi; Fujii, Hironori; and Oichi, Toshio, 4,824,822, Cl. 503-201.000.
Sharp Kabushiki Kaishi: *See—*
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Sharpless, John, to Nordson Corporation. Powder delivery system. 4,824,295, Cl. 406-109.000.
Shaw, Chia-Cheng; and Pelz, Karel, to American Home Products Corporation. Production of substituted 1,3,4,9-tetrahydropyrano(3,4-b)indole-1-acetic acids. 4,824,961, Cl. 548-432.000.
Shaw, David G.: *See—*
Farrow, Cecil W.; Keasler, William E., Jr.; Maruscsak, Joseph; and Shaw, David G., 4,825,459, Cl. 379-3.000.
Shaw, Jimmie; and Brooker, Charles R., to Kartridg Pak Co., The. Meat separating means and method. 4,824,027, Cl. 241-24.000.
Shell Internationale Research Maatschappij B.V.: *See—*
Malpas, Richard E.; Jansen, Gerardus J. C. M.; Honders, Anthonie; and Spijkerman, Johannes B. J., 4,824,541, Cl. 204-222.000.
Shell Oil Company: *See—*
Davis, D. G.; and Dicks, L. W. R., 4,823,742, Cl. 122-7.00R.
Davis, Drucilla G.; Dicks, L. W. R.; and Horwege, J. A., 4,823,741, Cl. 122-7.00R.
Drent, Eit, 4,824,817, Cl. 502-154.000.
Edwards, Charles L., 4,825,009, Cl. 568-618.000.
Haskell, Weston W., 4,824,646, Cl. 423-235.000.
Li, Simon M., 4,825,010, Cl. 568-724.000.
Lutz, Robert G., 4,824,910, Cl. 525-185.000.
Mostert, Simon, 4,824,889, Cl. 324-232.000.
van Broekhoven, Johannes A. M.; and Drent, Eit, 4,824,934, Cl. 528-392.000.
Van Broekhoven, Johannes A. M.; and Drent, Eit, 4,824,935, Cl. 528-392.000.
Shepard, Howard M.: *See—*
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 4,825,057, Cl. 235-472.000.
Sherex Chemical Company, Inc.: *See—*
Wozniak, Don S., 4,824,700, Cl. 427-379.000.
Shibata, Fumio: *See—*
Kakehi, Yutaka; Nakazato, Norio; Fukushima, Yoshimasa; Shibata, Fumio; Tsubone, Tsunehiko; and Kanai, Norio, 4,824,309, Cl. 414-217.000.
Shibata, Katsuji: *See—*
Suga, Yoshinori; Tanaka, Eiji; Enokido, Nobuo; Kato, Hidehito; and Shibata, Katsuji, 4,824,704, Cl. 428-36.920.
Shibayama, Teruji; and Kaneko, Yoshio, to Nifco, Inc. Rotary welding member made of resin. 4,824,304, Cl. 411-171.000.
Shida, Yoshiaki: *See—*
Okada, Minoru; Shida, Yoshiaki; Nishikawa, Tomio; Kato, Isamu; Nakano, Kazuyuki; and Isomura, Ryozo, 4,824,373, Cl. 433-200.100.
Shields, Edward P.: *See—*
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Shields, John. Infra-red spectrophotometric apparatus. 4,825,076, Cl. 250-343.000.
Shigenobu, Michio: *See—*
Kishino, Kazuo; Tanaka, Takao; Shigenobu, Michio; Hirabayashi, Hiromitsu; Hibi, Takashi; and Kusaka, Kensaku, 4,823,689, Cl. 100-155.00R.
Shih, Frederick S., to United States of America, Agriculture. Partially deamidated oilseed proteins and process for the preparation thereof. 4,824,940, Cl. 530-377.000.
Shimada, Fumio: *See—*
Hashimoto, Teiji; Shimada, Fumio; and Mochida, Fumio, 4,825,236, Cl. 354-246.000.
Tsuchino, Hisanori; Kano, Akiko; Nakano, Kuniaki; and Shimada, Fumio, 4,825,085, Cl. 250-484.100.
Shimada, Hiroaki: *See—*
Furutani, Yoshio; Tomioka, Noboru; Honjo, Masaru; Manabe, Kazuaki; and Shimada, Hiroaki, 4,824,782, Cl. 435-172.300.
Shimada, Noboru: *See—*
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Shimai, Shunzo: *See—*
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Shimano Industrial Company Limited: *See—*
Kawabe, Yuzo, 4,824,045, Cl. 242-219.000.
Nagano, Masashi, 4,823,915, Cl. 188-2.00D.
Shimazaki, Tatsuo, to Casio Computer Co., Ltd. Liquid crystal projector. 4,824,210, Cl. 350-331.00R.
Shimizu, Akira: *See—*
Okunuki, Masahiko; Tsukamoto, Takeo; Shimizu, Akira; Suzuki, Akira; Sugata, Masao; and Shimoda, Isamu, 4,825,082, Cl. 250-423.00F.
Shimizu, Isami: *See—*
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Shimizu, Isamu: *See—*
Ishihara, Shunichi; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, 4,824,697, Cl. 427-255.200.

Shimizu, Koji; and Hamada, Mitsuo, to Toray Silicone Company, Ltd. Method for the production of spherical silicone gel particles. 4,824,616, Cl. 264-7.000.

Shimizu, Kuniaki: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Shimizu, Kuniaki; Urushibata, Ikumi; and Kajiwara, Ikuo, 4,824,477, Cl. 71-103.000.

Shimizu, Yasuhiko, to Kabushiki Kaisha Toshiba. Die bonding apparatus. 4,824,006, Cl. 228-10.000.

Shimizu, Yoshiaki: *See—*
Aoyama, Norihito; Miike, Akira; Shimizu, Yoshiaki; and Tatano, Toshio, 4,824,779, Cl. 435-25.000.

Shimizu, Yukihiko, to Futaba Denshi Kogyo K.K. Optical writer with vacuum tube and electro-optic shutter. 4,825,230, Cl. 346-108.000.

Shimoda, Isamu: *See—*
Kuno, Mitsutoshi; Enari, Masahiko; Shindo, Hitoshi; Shimoda, Isamu; Yoshioka, Seishiro; Kaneko, Shuzo; and Toyono, Tsutomu, 4,824,218, Cl. 350-350.00S.
Okunuki, Masahiko; Tsukamoto, Takeo; Shimizu, Akira; Suzuki, Akira; Sugata, Masao; and Shimoda, Isamu, 4,825,082, Cl. 250-423.00F.

Shimomura, Kou: *See—*
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Shimomura, Masuo: *See—*
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Shin-Etsu Chemical Co., Ltd.: *See—*
Arai, Shigeyoshi; Kamioka, Masatsugu; Ishikawa, Yo-ichi; Isomura, Shohei; Sugita, Kyoko; Oshima, Takao; and Honguu, Tatsuhiko, 4,824,537, Cl. 204-157.220.
Nakanishi, Toru; Hoshida, Shigehiro; and Ueno, Susumu, 4,824,717, Cl. 428-255.000.

Shindeldecker, Walter E. Oscillating lure. 4,823,500, Cl. 43-42.130.

Shindo, Hitoshi: *See—*
Kuno, Mitsutoshi; Enari, Masahiko; Shindo, Hitoshi; Shimoda, Isamu; Yoshioka, Seishiro; Kaneko, Shuzo; and Toyono, Tsutomu, 4,824,218, Cl. 350-350.00S.

Shindo, Seizin: *See—*
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Shinkoh Sellbic Co., Ltd.: *See—*
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Shino, Katsuhide, to Sharp Kabushiki Kaisha. IC card. 4,825,283, Cl. 357-74.000.

Shinoda, Isamu: *See—*
Ogawa, Masao; Harada, Toyoo; Toyosawa, Shinichi; Shinoda, Isamu; Kawagoe, Takahiro; Daifuku, Hideharu; and Masuda, Yoshitomo, 4,824,745, Cl. 429-213.000.

Shinoda, Kazuo: *See—*
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Shinomura, Toshihiko, to Inoue MTP Kabushiki Kaisya. Electrically conductive polymer composite and method of making same. 4,824,871, Cl. 521-53.000.

Shinraku, Mituaki: *See—*
Sasaki, Kunihiko; Yamaguchi, Kiichi; Oka, Tsumoru; Ohya, Takasi; Shinraku, Mituaki; Konno, Akihiro; and Ida, Yuichi, 4,824,396, Cl. 439-475.000.

Shiomi, Masayuki: *See—*
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Shipp, Peter W., Jr.: *See—*
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Shirai, Shigeru; Saito, Keishi; Arai, Takayoshi; Kato, Minoru; and Fujioka, Yasushi, to Canon Kabushiki Kaisha. Light receiving member for use in electrophotography and process for the production thereof. 4,824,749, Cl. 430-66.000.

Shiraishi, Masaru: *See—*
Takahashi, Fumitaka; Okazaki, Kunio; Shiraishi, Masaru; and Takahashi, Masayuki, 4,823,461, Cl. 29-612.000.

Shirakawa, Kinichi: *See—*
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Shoji, Fusaji: *See—*
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Shoji, Makoto; and Oshikawa, Yoshitoshi, to Ikeda Bussan Co., Ltd. Mold assembly for producing skin-covered foamed plastic article. 4,824,069, Cl. 249-91.000.

Shoji, Makoto; and Enami, Katsuya, to Teac Corporation. Circuit arrangement for the selective suppression and nonsuppression of read output in magnetic disk apparatus. 4,825,309, Cl. 360-60.000.

Shoji, Michihiro; and Asano, Osamu, to Nitto Kohki Co., Ltd. Chip breaking device for annular cutters. 4,824,299, Cl. 409-137.000.

Short, William T.: *See—*
Hoerner, Rebecca S.; and Short, William T., 4,824,506, Cl. 156-245.000.

Showa Aluminum Kabushiki Kaisha: *See—*
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Shoyo Sangyo Co., Ltd.: *See—*
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Shrader, Eric J.: *See—*
Matsumoto, Yasuo; Shrader, Eric J.; and Cohn, Patricia O., 4,825,229, Cl. 346-1.100.

Shreve, Donald R. Quick change spray paint receptacle apparatus. 4,824,018, Cl. 239-114.000.

Shriver, David L.: *See—*
Kinser, Ralph W., Jr.; Shriver, David L.; and Layman, Judith A., 4,825,395, Cl. 364-708.000.

Shu, Peter H.: *See—*
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Shyu, Lieh-Jiun, to Stauffer Chemical Company. High viscosity potassium metaphosphate. 4,824,649, Cl. 423-314.000.

Shyu, Yeong-Ji. Roller-type bicycle brake structure. 4,823,916, Cl. 188-24.120.

Sicking, David H.: *See—*
Tawil, Riad A.; and Sicking, David H., 4,825,077, Cl. 250-369.000.

Siebern, Michael R.: *See—*
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Siegel, Gunther R. Holder for positioning and holding a pallet that supports a workpiece. 4,824,088, Cl. 269-309.000.

Siegel, Robert P.: *See—*
Iaia, Thomas C., Jr.; McLaughlin, William J.; and Siegel, Robert P., 4,825,255, Cl. 355-76.000.

Siegel, Wolfgang; Eck, Reinhold; Heep, Dieter; and Vogel, Paul, to Waeschle Maschinenfabrik GmbH. Bucket wheel gate for dispensing granulated bulk material. 4,823,993, Cl. 222-345.000.

Siegenthaler, Fritz, to Autelca AG. Device for feeding several paper webs to a printer. 4,823,694, Cl. 101-227.000.

Siemag Transplan GmbH: *See—*
Kortenbusch, Michael; and Osenberg, Kurt A., 4,824,294, Cl. 406-93.000.

Siemens Aktiengesellschaft: *See—*
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Eisenmann, Manfred; and Schreiber, Hans, 4,823,749, Cl. 123-339.000.
Gazsi, Lajos, 4,825,396, Cl. 364-724.150.
Grasser, Franz, 4,823,774, Cl. 128-24.00A.
Heinze, Roland; and Stangl, Karl, 4,823,797, Cl. 128-419.0PG.
Holzle, Josef, 4,825,105, Cl. 307-440.000.
Kunze, Dieter; Odemar, Norbert; and Schramm, Josef, 4,824,203, Cl. 350-96.210.
Lehmann, Erhard, 4,825,272, Cl. 357-38.000.
Meltsch, Hans-Jurgen; Rost, Jan; Behmer, Albin; and Mahler, Ernst, 4,825,016, Cl. 174-93.000.
Mueller, Karl-Heinz, 4,825,086, Cl. 250-491.100.
Mueller, Wilhelm; and Schneider, Werner, 4,825,208, Cl. 340-825.020.
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Oppelt, Arnulf; Fischer, Hubertus; and Barfuss, Helmut, 4,825,159, Cl. 324-309.000.
Rausch, Robert, 4,825,317, Cl. 360-102.000.
Requardt, Hermann, 4,825,164, Cl. 324-322.000.
Stein, Karl-Ulrich, 4,823,605, Cl. 73-727.000.

Siemund, Gunter: *See—*
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Sig Schweizerische Industrie-Gesellschaft: *See—*
Low, Martin, 4,823,930, Cl. 198-437.000.

Sigai, A. Gary, to GTE Laboratories Incorporated. Phosphor particle, fluorescent lamp, and manufacturing method. 4,825,124, Cl. 313-486.000.

Signorelli, John A. Lockable terminal cover for hottom connected metering devices. 4,823,572, Cl. 70-163.000.

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Masuda, Yasuo; Takahashi, Tsutomu; Takizawa, Yoshio; and Yoshiki, Naokazu, 4,824,530, Cl. 204-26.000.

Talig Corporation: *See*—
Fergason, James L.; and Parker, Robert, 4,824,208, Cl. 350-276.0SL.

Tam, Aloysius T.; and Threewitt, N. Bruce, to Advanced Micro Devices, Inc. Integrated electronic memory circuit with internal timing and operable in both latch-based and register-based systems. 4,825,416, Cl. 365-194.000.

TAM International, Inc.: *See*—
Stokley, Charles O.; and Sanford, Lawrence, 4,823,882, Cl. 166-387.000.

Tambini, Angelo, to SPS Technologies, Inc. Torque and angular displacement sensing in yield threshold controlled wrenches. 4,823,616, Cl. 73-862.230.

Tamoto, Koji: *See*—
Sato, Shingo; Nakamura, Yoshisada; and Tamoto, Koji, 4,824,773, Cl. 430-557.000.

Tamura, Kenji; Hashimoto, Hirofumi; Baba, Youichiro; and Inose, Sadao, to Toyota Jidosha Kabushiki Kaisha and Ransburg-Gema K.K. Air atomizing electrostatic coating gun. 4,824,026, Cl. 239-707.000.

Tamura, Toru; Chujo, Masaki; and Jinnouchi, Kazuharu, to Aisin Seiki Kabushiki Kaisha. Mechanical supercharger. 4,823,758, Cl. 123-564.000.

Tanabe, Hidemichi: *See*—
Minami, Kazuaki; Hirabayashi, Yuji; Ina, Katsuhiro; Ito, Katsunori; Akiyama, Susumu; and Tanabe, Hidemichi, 4,825,362, Cl. 364-200.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Iijima, Ikuo; Ozeki, Masakatsu; Okumura, Kunihito; and Inamasu, Masanori, 4,824,833, Cl. 514-230.500.

Tanabe, Tunehiko; and Kawada, Fumiyoshi, to Sharp Kabushiki Kaisha. Electrical connecting device. 4,824,397, Cl. 439-496.000.

Tanahashi, Toshio: *See*—
Hirose, Katsuhiko; Noguchi, Hiroshi; Baika, Toyokazu; Horii, Kingo; Nagaosa, Hideo; Tanahashi, Toshio; and Itoh, Toshio, 4,823,755, Cl. 123-480.000.

Tanaka, Eiji: *See*—
Suga, Yoshinori; Tanaka, Eiji; Enokido, Nobuo; Kato, Hidehito; and Shibata, Katsuji, 4,824,704, Cl. 428-36.920.

Tanaka, Hatsuyuki: *See*—
Kobayashi, Masakazu; Asaumi, Shingo; and Tanaka, Hatsuyuki, 4,824,762, Cl. 430-258.000.

Tanaka, Hirotoshi; Tanaka, Satoshi; Kinoshita, Taizo; Kotera, Nobuo; and Nagata, Minoru, to Hitachi, Ltd. Constant current circuit. 4,825,145, Cl. 323-315.000.

Tanaka, Masami, to Minolta Camera Kabushiki Kaisha. Compact zoom lens system for video camera. 4,824,226, Cl. 350-427.000.

Tanaka, Menmei: *See*—
Fujii, Kenichi; and Tanaka, Menmei, 4,824,266, Cl. 400-120.000.

Tanaka, Mitsugu; and Sakai, Takeo, to Fuji Photo Film Co., Ltd. Recording liquid. 4,824,485, Cl. 106-22.000.

Tanaka, Satoshi: *See*—
Tanaka, Hirotoshi; Tanaka, Satoshi; Kinoshita, Taizo; Kotera, Nobuo; and Nagata, Minoru, 4,825,145, Cl. 323-315.000.

Tanaka Seiko Co., Ltd.: *See*—
Takeda, Shuji, 4,823,459, Cl. 29-563.000.

Tanaka, Sumio; Sato, Masaki; Saito, Shinji; Atsumi, Shigeru; and Ohtsuka, Nobuaki, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory. 4,825,271, Cl. 357-23.500.

Tanaka, Takao: *See*—
Kishino, Kazuo; Tanaka, Takao; Shigenobu, Michio; Hirabayashi, Hiromitsu; Hibi, Takashi; and Kusaka, Kensaku, 4,823,689, Cl. 100-155.00R.

Tanaka, Teruo; Miyakusu, Katsuhisa; and Fujimoto, Hiroshi, to Nisshin Steel Co., Ltd. Process for the production of a strip of a chromium stainless steel of a duplex structure having high strength and elongation as well as reduced plane anisotropy. 4,824,491, Cl. 148-12.0EA.

Tanaka, Toru; Furuta, Tomiyoshi; and Suwa, Kazue, to Mitsubishi Gas Chemical Company, Inc. Process for producing pyromellitic acid. 4,824,992, Cl. 562-416.000.

Tanaka, Toshihiro: *See*—
Kawashima, Yoshio; Ogata, Shuuji; Yokoyama, Masaaki; Tomiku, Masato; Yamada, Tsuneo; Kuno, Tsutomu; Murakami, Hisao; Morimoto, Hiroyuki; Myojo, Toyoshige; Watanabe, Kozo; and Tanaka, Toshihiro, 4,823,577, Cl. 72-24.000.

Tanaka, Tsuneo; Iwasa, Mikio; Kimura, Youichi; and Nakamura, Akira, to Matsushita Electric Industrial Co., Ltd. Directional loudspeaker system. 4,823,908, Cl. 181-175.000.

Tandem Computers Incorporated: *See*—
Lenoski, Daniel E., 4,825,356, Cl. 364-200.000.

Tandy Corporation: *See*—
Evans, Benjamin F.; Haagen, Peter H.; and Pempsell, Paul J., 4,825,200, Cl. 341-23.000.

Tani, Katsuya: *See*—
Arimatsu, Yoshikazu; Tani, Katsuya; Mitamura, Hideyuki; Saito, Minoru; Kaji, Atsushi; and Katsuo, Kenichi, 4,824,929, Cl. 528-205.000.

Taniguchi, Kouki, to Sharp Kabushiki Kaisha. Liquid crystal display device having separate driving circuits for display and non-display regions. 4,824,212, Cl. 350-333.000.

Tanikawa, Koichi: *See*—
Tsubata, Noritaka; Tanikawa, Koichi; and Watanabe, Kozo, 4,823,446, Cl. 24-389.000.

Tanuma, Jiro; Akutsu, Naoji; and Kasai, Tadashi, to OKI Electric Industry Co., Ltd. Electromechanical actuator control system. 4,825,133, Cl. 318-113.000.

Tarral, Rene ; and Mention, Jacky, to Laboratoires Smith Kline & French. Effervescent couples, histamine H_2-antagonist effervescent compositions containing them and their preparation. 4,824,664, Cl. 424-43.000.

Tasma, Gerald W. Color identification system. 4,824,144, Cl. 283-87.000.

Tatano, Toshio: *See*—
Aoyama, Norihito; Miike, Akira; Shimizu, Yoshiaki; and Tatano, Toshio, 4,824,779, Cl. 435-25.000.

Tatara, Stanley R. Spring loaded hinge. 4,823,437, Cl. 16-300.000.

Tate, Billy G., to United Enertech Corporation. Air flow damper control system. 4,824,012, Cl. 236-49.500.

Tatsuta, Sumitaka: *See*—
Fujita, Yutaka; and Tatsuta, Sumitaka, 4,824,721, Cl. 428-321.500.

Tauber, Karl: *See*—
Temmesfeld, Axel; and Tauber, Karl, 4,823,862, Cl. 165-104.320.

Taubert, Hubert. Articulated joint between two shafts. 4,824,418, Cl. 464-159.000.

Taudin, Dominique: *See—*
Lewiner, Jacques; Taudin, Dominique; and Carreel, Eric, 4,825,462, Cl. 379-131.000.

Tawil, Riad A.; and Sicking, David H., to Harshaw Chemical Company, The. Process control system and method. 4,825,077, Cl. 250-369.000.

Taylor, Andrew M., to Taylor Lock Company Ltd. Door lock. 4,824,151, Cl. 292-201.000.

Taylor Lock Company Ltd.: *See—*
Taylor, Andrew M., 4,824,151, Cl. 292-201.000.

Taylor, Paul D.: *See—*
Liu, Kou-Chang; and Taylor, Paul D., 4,824,967, Cl. 548-554.000.

Taylor, Robert E.: *See—*
Dolph, Darrel A.; Demski, Leonard W.; Taylor, Robert E.; and McKendry, Arthur R., 4,825,385, Cl. 364-513.500.

Taylor, Robert L., to AMP Incorporated. Solderable standoff boardlock. 4,824,398, Cl. 439-557.000.

Taylor, William L.: *See—*
Aertker, Walter P.; Taylor, William L.; and Medica, Frank, 4,824,408, Cl. 440-6.000.

TDK Corporation: *See—*
Ueda, Kunihiro; Takasugi, Yasufumi; and Nakayama, Masatoshi, 4,824,724, Cl. 428-336.000.

Teac Corporation: *See—*
Shoji, Makoto; and Enami, Katsuya, 4,825,309, Cl. 360-60.000.

Teach, Eugene G., to ICI Americas Inc. Herbicidal oxazolidines and methods of use. 4,824,468, Cl. 71-88.000.

Teague, Randy; and Weinstein, Michael E., to General Instrument Corporation. Microwave amplifier and other microwave components. 4,825,177, Cl. 330-295.000.

Tekmax Inc.: *See—*
Johnson, Peter E.; and Johnson, David A., 4,824,307, Cl. 44-798.200.

Tektronix, Inc.: *See—*
Boudon, Douglas M.; and Gottsch, Jim, 4,825,339, Cl. 361-390.000.
Caspell, George J., 4,825,100, Cl. 307-279.000.
Luthra, Ajay K.; and Jenq, Yih-Chyun, 4,825,379, Cl. 364-487.000.
Theus, John G., 4,825,404, Cl. 364-900.000.

Telecommunication Concepts, Inc.: *See—*
Ryan, Donald J., 4,825,465, Cl. 379-399.000.

Telecommunications Radioelectriques et telephoniques t.r.t.: *See—*
Balech, Jean-Pierre, 4,825,437, Cl. 370-104.000.

Teledyne Industries, Inc.: *See—*
Hickman, Clarence J., 4,824,368, Cl. 433-80.000.

Telford, Thomas M.: *See—*
Geisler, Richard J.; Scott, Gary M.; and Telford, Thomas M., 4,824,162, Cl. 296-100.000.

Temco Home Health Care Products, Inc.: *See—*
Spiegel, Alan M., 4,823,412, Cl. 4-483.000.

Temmesfeld, Axel; and Tauber, Karl, to Bayerische Motoren Werke Aktiengesellschaft. Plastic radiator for transverse-flow cooling systems of internal combustion engines. 4,823,862, Cl. 165-104.320.

Templeton, Kenly & Co.: *See—*
Decker, Arnold F., 4,823,550, Cl. 60-412.000.

Tengler, John N.: *See—*
Roath, Alan L.; and Tengler, John N., 4,824,394, Cl. 439-395.000.

Tennichi, Yasuhiro: *See—*
Iijima, Tadahiko; Kawai, Takumi; Tennichi, Yasuhiro; and Yanada, Sadao, 4,825,352, Cl. 364-140.000.

Terai, Kiyoshi: *See—*
Isono, Hideki; Asanuma, Kazushi; Yokota, Takashi; and Terai, Kiyoshi, 4,824,200, Cl. 350-96.160.

Terauchi, Kiyoshi: *See—*
Hiraga, Masaharu; Terauchi, Kiyoshi; Miyazawa, Kiyosh; and Sakamoto, Seiichi, 4,824,346, Cl. 418-55.000.

Termiflex Corporation: *See—*
Fletcher, William E.; Ault, Charles M.; and Sawyer, Dennis O., 4,823,952, Cl. 206-328.000.

Terrasse, Joseph J.; Seux, Michel; and Leveque, Robert, to Chavanne Ketin. Forged cold-rolling roll. 4,823,451, Cl. 29-129.500.

Terrill, Edward R.; and Callander, Douglas D., to Goodyear Tire & Rubber Company, The. Copolyester which is particularly suitable for use in making tire cord. 4,824,928, Cl. 528-190.000.

Terumo Kabushiki Kaisha Trading as Terumo Corporation: *See—*
Suzuki, Kazuhiko; and Takahara, Kazuaki, 4,824,569, Cl. 210-500.230.

Terzian, Rouben T.: *See—*
Herbstler, Horst-Dieter; and Terzian, Rouben T., 4,824,415, Cl. 446-276.000.

Tesch, Michael A. Fish hook positioner and release. 4,823,503, Cl. 43-42.040.

Teschendorf, Hans-Juergen: *See—*
Himmele, Walter; Steiner, Gerd; Teschendorf, Hans-Juergen; and Weifenbach, Harald, 4,824,862, Cl. 514-429.000.

Tesney, Bobby, to Winston Furniture Company Inc. Apparatus and method for attaching a table leg to a table top. 4,823,709, Cl. 108-157.000.

Tetzlaff, Karl-Heinz; Schmid, Dieter; and Russow, Jurgen, to Hoechst Aktiengesellschaft. Process for electrically separating the electrolyte-bearing mains from the electrolyte spaces of an electrochemical cell pile. 4,824,534, Cl. 204-128.000.

Tetzlaff, Wolfgang: *See—*
Braunlich, Peter F.; and Tetzlaff, Wolfgang, 4,825,084, Cl. 250-484.100.

Texaco Inc.: *See—*
Larkin, John M.; Zimmerman, Robert L.; Cuscurida, Michael; and Waddill, Harold G., 4,825,000, Cl. 564-347.000.
Prada-Silva, Guillermo; and Bhattacharya, Ajit K., 4,824,869, Cl. 518-714.000.

Texas Instruments Incorporated: *See—*
Chen, Kueing L.; and Pang, Roland H., 4,825,280, Cl. 357-71.000.
Komatsuzaki, Yasuo, 4,823,480, Cl. 34-218.000.
Richardson, William F.; and Malhi, Satwinder S., 4,824,793, Cl. 437-47.000.
Tomassetti, Stephen R., 4,825,275, Cl. 357-43.000.
Tran, Hiep V., 4,825,413, Cl. 365-189.000.
Van Aken, Jerry; and Guttag, Karl, 4,825,390, Cl. 364-526.000.
Wang, I-Fay F., 4,825,142, Cl. 323-314.000.

Textron Inc.: *See—*
Gorski, John W., 4,823,464, Cl. 30-276.000.

Tezuka, Nobuo; Date, Nobuaki; Saito, Syuichiro; and Kozuki, Suzumu, to Canon Kabushiki Kaisha. Video recording camera. 4,825,302, Cl. 358-335.000.

Th. Goldschmidt AG: *See—*
Fink, Hans-Ferdi; Koerner, Gotz; Berger, Roland; and Weitemeyer, Christian, 4,824,983, Cl. 556-454.000.

Thay, Ching H. Collapsible folding bicycle assembly. 4,824,131, Cl. 280-278.000.

Theeuwes, Felix: *See—*
Wong, Patrick S. L.; Theeuwes, Felix; Cortese, Richard; and Eckenhoff, James B., 4,824,675, Cl. 424-438.000.

Theiss, David H.: *See—*
McEver, James P.; and Theiss, David H., 4,823,871, Cl. 166-182.000.

Therm-O-Disc, Incorporated: *See—*
Cenky, Mark A., 4,825,187, Cl. 337-407.000.

Thermafoil Products Inc.: *See—*
Miles, Floyd D., 4,825,047, Cl. 219-496.000.

Theus, John G., to Tektronix, Inc. Interface system which generates configuration control signal and duplex control signal for automatically determining the configuration of removable modules. 4,825,404, Cl. 364-900.000.

Thibos, Patricia A., to Dow Chemical Company, The. Assembly comprising a foraminous core, resinous tubesheet and self-locking, helically wound, hollow fiber bundle. 4,824,566, Cl. 210-321.870.

Thoese, Klaus, to Hoechst Aktiengesellschaft. Drafting material. 4,824,725, Cl. 428-336.000.

Thomae, Karl: *See—*
Becker, Robert; Kruss, Bernd; and Schilk, Leonhard, 4,824,674, Cl. 424-427.000.

Thomas, Lewis J., III; Gilmore, Robert S.; and Glascock, Homer H., II, to General Electric Company. Temperature compensated piezoelectric transducer assembly. 4,825,117, Cl. 310-346.000.

Thomas, Ronald E., Jr.: *See—*
Bosze, Wayne P.; Froebe, Ronald L.; McClure, Gordon; Thomas, Ronald E., Jr.; and Weingartner, Philip F., 4,824,694, Cl. 427-102.000.

Thompson, James A., to Babcock Industries, Inc. Drive system with resilient yieldable biased actuator shaft for electric rear view mirror. 4,824,232, Cl. 350-633.000.

Thompson, James D., to Hughes Aircraft Company. Equal power amplifier system for active phase array antenna and method of arranging same. 4,825,172, Cl. 330-124.00R.

Thompson, Michael; Krull, Ulrich J.; and Kallury, Krishna M., to Allied-Signal Inc. Lipid membrane-based device. 4,824,529, Cl. 204-1.00T.

Thompson, Mortimer S., to Tri-Tech Systems International Inc. Closure for container and method for forming the closure. 4,823,967, Cl. 215-222.000.

Thompson, Taylor N., Sr., to FTS Systems, Inc. Freeze dryer for unattended operation. 4,823,478, Cl. 34-5.000.

Thomson Consumer Electronics, Inc.: *See—*
Hale, John R., 4,824,459, Cl. 65-59.260.

Thomson CSF: *See—*
Dubois, Jean-Claude; Le Barny, Pierre; Spassky, Nicolas; Esselin, Sophie; Noel, Claudine; Lacoudre, Nicole; and Leborgne, Alain, 4,824,923, Cl. 536-298.000.
Perbet, Jean N.; Hareng, Michel; and Mourey, Bruno, 4,824,216, Cl. 350-346.000.

Thornton, Robert L.: *See—*
Burnham, Robert D.; and Thornton, Robert L., 4,824,798, Cl. 437-81.000.

Thornton, William A., Jr. Colored object which exhibits improved constancy of color appearance upon change of illuminants and method. 4,824,246, Cl. 356-243.000.

Thorpe, Michael; Hoskin, William J.; and Brown, Leslie, to Analink Developments Limited. Apparatus and a method for removing a solute from a solvent. 4,824,792, Cl. 436-177.000.

Thorsrud, Lee T.: *See—*
Bennett, Donald B.; Thorsrud, Lee T.; and Petschauer, Thomas W., 4,825,438, Cl. 371-8.000.

Those Characters from Cleveland: *See—*
Perkitny, Jerzy, 4,824,413, Cl. 446-94.000.

Threewitt, N. Bruce: *See—*
Tam, Aloysius T.; and Threewitt, N. Bruce, 4,825,416, Cl. 365-194.000.

Thuillier, Denis: *See—*
Parraud, Rene ; and Thuillier, Denis, 4,825,188, Cl. 338-21.000.

Tikhtman, Jacob: *See—*
Huber, James V.; and Tikhtman, Jacob, 4,825,078, Cl. 250-372.000.

Tillotson, Ltd.: *See—*
Scott, William A.; and Hutchinson, Mark A., 4,824,613, Cl. 261-35.000.

Tilman, Paul A., to Minigrip, Inc. Attachment of a thermoplastic extruded fastener to a non-extensible web. 4,824,497, Cl. 156-66.000.

Ting, Sai-Pei: *See—*
Aycock, David F.; and Ting, Sai-Pei, 4,824,915, Cl. 525-397.000.

Tipon, Donald G.; and Tran, Chinh V., to NCR Corporation. MOS no-leak circuit. 4,825,106, Cl. 307-451.000.

Titan Corporation, The: *See—*
Donaldson, Coleman D., 4,823,703, Cl. 102-521.000.

Titterton, George F., III, to United Technologies Corporation. Gas turbine engine oil drain slot. 4,824,327, Cl. 416-174.000.

Tjulkov, Gennady: *See—*
Alperovich, Boris I.; Paramonova, Ljutsia; Tjulkov, Gennady; Soloviev, Valery I.; and Paramonov, Alexandr I., 4,823,790, Cl. 128-303.100.

Togo, asahiko; and Abe, Kazutoshi, to Nippon Paint Co., Ltd. Powder coating composition. 4,824,909, Cl. 525-124.000.

Toho Development Engineering Co., Ltd.: *See—*
Kobari, Osamu; and Kida, Takashi, 4,824,364, Cl. 432-30.000.

Tojo, Akihiko: *See—*
Ishikawa, Tadashi; Watanabe, Yoshitaka; Mizogui, Toyokazu; Kinoshita, Takao; Tojo, Akihiko; Suzuki, Yasutomo; and Mizoguchi, Yoshiyuki, 4,825,295, Cl. 358-254.000.

Toki, Kaoru, to NEC Corporation. Optomagnetic recording, reading and erasing method and implementing apparatus which permits overwriting of previously recorded information. 4,825,428, Cl. 369-13.000.

Tokinaga, Daizo: *See—*
Nagai, Keiichi; Tokinaga, Daizo; Imai, Kazumichi; Yasuda, Kenji; Takahashi, Satoshi; and Kobayashi, Teruaki, 4,824,778, Cl. 435-7.000.

Tokugawa, Osamu, to Nippon Seiko Kabushiki Kaisha. Anchorage for webbing of vehicle seat belt system. 4,824,175, Cl. 297-473.000.

Tokumo, Masateru; Shirakawa, Kinichi; Koyakumaru, Takatoshi; Okaya, Takuji; Onishi, Hiroyuki; and Kohno, Hiroji, to Kuraray Co., Ldt.; and Rengo Co., Ltd. Production process and adhesives for corrugated board. 4,824,696, Cl. 427-208.600.

Tokunaga, Takeshi: *See—*
Hirose, Etsurou; Tsubaki, Toshio; Tokunaga, Takeshi; and Isoo, Osamu, 4,825,315, Cl. 360-97.010.

Tokuono, Shinya: *See—*
Hase, Hiroyuki; Tokuono, Shinya; and Wakamiya, Masayuki, 4,823,617, Cl. 73-862.360.

Tokyo Electric Company, Ltd.: *See—*
Matsumoto, Yasuo; Shrader, Eric J.; and Cohn, Patricia O., 4,825,229, Cl. 346-1.100.

Tokyo Ohka Kogyo Co., Ltd.: *See—*
Kobayashi, Masakazu; Asaumi, Shingo; and Tanaka, Hatsuyuki, 4,824,762, Cl. 430-258.000.

Toliusis, Vytautas J., to Humphrey Products Company. Single-stem four-way valve. 4,823,842, Cl. 137-625.650.

Tollaksen, Sandra L.: *See—*
Zhang, Jian-Shi; Giometti, Carol S.; and Tollaksen, Sandra L., 4,824,547, Cl. 204-299.00R.

Tomala, Ambrose, to Allied-Signal Inc. Pressure activated isolation valve. 4,824,181, Cl. 303-84.200.

Tomassetti, Stephen R., to Texas Instruments Incorporated. Integrated bipolar-CMOS circuit isolation for providing different backgate and substrate bias. 4,825,275, Cl. 357-43.000.

Tomczuk, Bruce E.; and Sutherland, Deborah S., to A. H. Robins Company, Incorporated. Fused imidazopyridine compounds. 4,824,951, Cl. 546-118.000.

Tomiku, Masato: *See—*
Kawashima, Yoshio; Ogata, Shunji; Yokoyama, Masaaki; Tomiku, Masato; Yamada, Tsuneo; Kuno, Tsutomu; Murakami, Hisao; Morimoto, Hiroyuki; Myojo, Toyoshige; Watanabe, Kozo; and Tanaka, Toshihiro, 4,823,577, Cl. 72-24.000.

Tomioka, Noboru: *See—*
Furutani, Yoshio; Tomioka, Noboru; Honjo, Masaru; Manabe, Kazuaki; and Shimada, Hiroaki, 4,824,782, Cl. 435-172.300.

Tomita, Toshihiko, to Mazda Motor Corporation. Automobile rear seat. 4,824,173, Cl. 297-443.000.

Tomlinson, Alan D.: *See—*
Appel, Peter W.; Bortolotti, Fabrizio; Delwel, Francois; Hornung, Fredrik; Tomlinson, Alan D.; and Willemse, Simon, 4,824,593, Cl. 252-127.000.

Tommaney, Joseph W., to Allegheny Ludlum Corporation. Apparatus for introducing gas into molten metal baths. 4,824,080, Cl. 266-218.000.

Tonen Sekiyukagaku K.K.: *See—*
Kagawa, Seiji, 4,824,499, Cl. 156-85.000.

Tonen Sekiyukagaku Kabushiki Kaisha: *See—*
Nagayoshi, Akio; and Nagayoshi, Kiyoharu, 4,824,502, Cl. 156-195.000.

Tonoki, Kenji; Tsunoda, Kazuyoshi; Yokono, Haruki; Kono, Hisao; Yokoyama, Ryoji; and Nakamura, Fumiaki, to Hitachi Chemical Co., Ltd. Method for pressure lamination utilizing fluid medium with partial solidification thereof for sealing pressure chamber. 4,824,509, Cl. 156-285.000.

Tonokowa, Hiroshi; Ekker, Emil; and Smith, Hubert S., to Dow Chemical Company, The. Insulation of vessels having curved surfaces. 4,823,981, Cl. 220-414.000.

Topolski, Alvin S.: *See—*
Strum, William L.; and Topolski, Alvin S., 4,824,618, Cl. 264-37.000.

Topy Kogyo Kabushiki Kaisha: *See—*
Arai, Seizou; Fukumoto, Kikuo; Sunaga, Seizo; and Izumida, Kouji, 4,823,733, Cl. 118-630.000.

Toray Industries, Inc.: *See—*
Miyata, Satoru; Fukuda, Hiromi; and Imamura, Shinzo, 4,824,964, Cl. 548-490.000.

Toray Silicone Company, Ltd.: *See—*
Hosokawa, Hidehiko, 4,824,652, Cl. 423-348.000.
Shimizu, Koji; and Hamada, Mitsuo, 4,824,616, Cl. 264-7.000.

Torigai, Katsumi; and Takahashi, Masanori, to Sanshin Kogyo Kabushiki Kaisha. Trimming device for marine propulsion apparatus. 4,824,407, Cl. 440-1.000.

Torigoe, Michiko: *See—*
Matuura, Toshihiko; Sawaki, Kenzi; Shindo, Seizin; and Torigoe, Michiko, 4,824,751, Cl. 430-106.000.

Torii, Shunichi: *See—*
Omoda, Koichiro; Torii, Shunichi; Nagashima, Shigeo; Inagami, Yasuhiro; and Nakagawa, Takayuki, 4,825,361, Cl. 364-200.000.

Tornberg, Kenneth W.: *See—*
McVey, George R.; Tornberg, Kenneth W.; Widell, Larry R.; and Wood, George E., 4,824,473, Cl. 71-92.000.

Torocsik, Laszlo : *See—*
Simonyi, Sandor; Torocsik, Laszlo ; Valoczi, Gyorgy; and Toth, Istvan, 4,823,647, Cl. 74-867.000.

Toshiba Ceramics Co., Ltd.: *See—*
Naito, Sousuke; Takahashi, Hidekazu; Shimai, Shunzo; Watanabe, Toshio; and Otsuka, Yasuji, 4,824,035, Cl. 241-188.00A.

Toshikuni, Nobuyuki: *See—*
Takagi, Masao; Miyahara, Masayoshi; and Toshikuni, Nobuyuki, 4,824,128, Cl. 180-53.100.

TOTAL Compagnie Francaise des Petroles: *See—*
Hommani, Noureddine; and Kadjar, Daniel, 4,823,891, Cl. 175-323.000.
Minkkinen, Ari, 4,824,445, Cl. 55-40.000.

Toth, Istvan: *See—*
Simonyi, Sandor; Torocsik, Laszlo ; Valoczi, Gyorgy; and Toth, Istvan, 4,823,647, Cl. 74-867.000.

Totta, Paul A.: *See—*
Master, Raj N.; Pittler, Marvin S.; Totta, Paul A.; Ainslie, Norman G.; and Palmateer, Paul H., 4,824,009, Cl. 228-124.000.

Tovey, Peter: *See—*
Ezell, Larry O.; Schmid, John; and Tovey, Peter, 4,823,552, Cl. 60-443.000.

Tower Manufacturing Corportion: *See—*
Rao, Chepur P.; and Barrena, Juan J., 4,825,020, Cl. 200-16.00D.

Townsend, Leslie, to Wiggins Teape Group Limited, The. Imaged microcapsule-coated paper. 4,824,691, Cl. 427-53.100.

Toyne, Kenneth J.: *See—*
Chan, Lawrence K. M.; Coates, David; Gemmell, Peter A.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; Young, Daniel J. S.; Bone, Matthew F.; Jackson, Adam; and Scrowston, Richard M., 4,824,217, Cl. 350-350.500.

Toyo Boseki Kabushiki Kaisha: *See—*
Arimatsu, Yoshikazu; Tani, Katsuya; Mitamura, Hideyuki; Saito, Minoru; Kaji, Atsushi; and Katsuo, Kenichi, 4,824,929, Cl. 528-205.000.
Okada, Fujio; and Ohta, Toshihiko, 4,824,619, Cl. 264-40.100.

Toyoda Gosei Co., Ltd.: *See—*
Ushida, Yoshio; and Jinushi, Sinji, 4,824,873, Cl. 521-137.000.
Yoshioka, Shigeo, 4,823,576, Cl. 72-17.000.

Toyono, Tsutomu: *See—*
Kuno, Mitsutoshi; Enari, Masahiko; Shindo, Hitoshi; Shimoda, Isamu; Yoshioka, Seishiro; Kaneko, Shuzo; and Toyono, Tsutomu, 4,824,218, Cl. 350-350.00S.

Toyosawa, Shinichi: *See—*
Ogawa, Masao; Harada, Toyoo; Toyosawa, Shinichi; Shinoda, Isamu; Kawagoe, Takahiro; Daifuku, Hideharu; and Masuda, Yoshitomo, 4,824,745, Cl. 429-213.000.

Toyoshima, Ko: *See—*
Hishinuma, Itaru; Adachi, Akio; and Toyoshima, Ko, 4,823,585, Cl. 72-247.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Hibino, Ikukazu; and Takahashi, Yoshinobu, 4,824,538, Cl. 204-180.200.
Hirose, Katsuhiko; Noguchi, Hiroshi; Baika, Toyokazu; Horii, Kingo; Nagaosa, Hideo; Tanahashi, Toshio; and Itoh, Toshio, 4,823,755, Cl. 123-480.000.
Itoh, Hiroshi; and Takahashi, Tokuyuki, 4,825,368, Cl. 364-424.100.
Kurosawa, Ryuichi, 4,825,370, Cl. 364-424.050.
Nakamura, Tetsuya; Hobo, Nobuhito; Masuda, Akira; and Shinoda, Kazuo, 4,825,373, Cl. 364-431.050.
Omura, Seiji, 4,823,744, Cl. 123-41.120.
Uchida, Kiyoyuki; Akiyoshi, Michio; and Tsuchiya, Yoshiaki, 4,824,183, Cl. 303-92.000.
Umeda, Masahiro, 4,823,887, Cl. 173-31.000.
Yasue, Hideki; and Fukumura, Kagenori, 4,825,372, Cl. 364-431.010.

Toyota Jidosha Kabushiki Kaisha and Ransburg-Gema K.K.: *See—*
Tamura, Kenji; Hashimoto, Hirofumi; Baba, Youichiro; and Inose, Sadao, 4,824,026, Cl. 239-707.000.

Tracht, Steven L., to General Motors Corporation. Intermittent wiper control circuit with instant wipe. 4,825,134, Cl. 318-443.000.

Trachtenberg, Leonard; and Trachtenberg, Peter W. Vehicle thermoelectric cooling and heating food and drink appliance. 4,823,554, Cl. 62-3.000.
Trachtenberg, Peter W.: *See—*
Trachtenberg, Leonard; and Trachtenberg, Peter W., 4,823,554, Cl. 62-3.000.
Tracy, Lawrence M. Septic system. 4,824,287, Cl. 405-36.000.
Traeger, Joseph P.; Traeger, Randolph J.; and Traeger, Mark A. Pellet-fired barbecue. 4,823,684, Cl. 99-447.000.
Traeger, Mark A.: *See—*
Traeger, Joseph P.; Traeger, Randolph J.; and Traeger, Mark A., 4,823,684, Cl. 99-447.000.
Traeger, Randolph J.: *See—*
Traeger, Joseph P.; Traeger, Randolph J.; and Traeger, Mark A., 4,823,684, Cl. 99-447.000.
Tran, Chinh V.: *See—*
Tipon, Donald G.; and Tran, Chinh V., 4,825,106, Cl. 307-451.000.
Tran, Hiep V., to Texas Instruments Incorporated. Bipolar-CMOS static ram memory device. 4,825,413, Cl. 365-189.000.
Transaction Security Corporation: *See—*
Griffith, John B.; and Linton, Donald F., 4,825,050, Cl. 235-379.000.
Trenkle, Robert W.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., 4,824,828, Cl. 512-21.000.
Tri-Tech Systems International Inc.: *See—*
Thompson, Mortimer S., 4,823,967, Cl. 215-222.000.
Tri Tool Inc.: *See—*
VanderPol, Jerald, 4,823,655, Cl. 82-113.000.
Trick, Robert E.: *See—*
Daly, Mark D.; Maerzke, James T.; Gengler, Jeffrey R.; and Trick, Robert E., 4,823,779, Cl. 128-79.000.
Trierweiler, Joseph C. Apparatus and method for beach reclamation. 4,824,285, Cl. 405-17.000.
Trimble, Delmer: *See—*
Schultheis, Kevin A.; and Trimble, Delmer, 4,824,302, Cl. 410-151.000.
Trio Kabushiki Kaisha: *See—*
Kobayashi, Hirokazu; Miyamoto, Yukihiko; Takai, Masaoki; Fujisawa, Syuichi; and Miyazawa, Hiroshi, 4,825,436, Cl. 370-102.000.
Trocciola, John C.: *See—*
Breault, Richard D.; Rajpolt, Michael J.; and Trocciola, John C., 4,824,739, Cl. 429-13.000.
Troetscher, Gerhard: *See—*
Dornier, Peter; Langer, Rudolf; Troetscher, Gerhard; and Hecht, Anton, 4,823,479, Cl. 34-210.000.
Tronconi, Giovanni: *See—*
Scolastico, Carlo; and Tronconi, Giovanni, 4,824,978, Cl. 556-26.000.
Trotter, Johnny L. Mop head spreader attachment for enhanced drying. 4,823,481, Cl. 34-239.000.
Troupel, Michel: *See—*
Moingeon, Marie-Odile; Chaussard, Jacques; Troupel, Michel; and Saboureau, Christophe, 4,824,532, Cl. 204-72.000.
Troutner, Arthur L.; and Atwood, Thomas M., to Trus Joist Corporation. Method and apparatus for assembling box units. 4,824,510, Cl. 156-288.000.
Trowbridge, Theodore D.; Fung, Shun C.; and Vanderspurt, Thomas H., to Exxon Research & Engineering Company. Method for producing stabilized zeolite catalysts. 4,824,816, Cl. 502-66.000.
Troyon, Michel, to Universite de Reims Champagne-Ardenne. Electrical particle gun. 4,825,080, Cl. 250-396.00R.
True, Karen J.; Griffin, G. Barbara; Griffin, Daniel V.; and Nickels, William M., to Avtar Sciences, Inc. Method and apparatus for measuring sperm penetration. 4,824,247, Cl. 356-244.000.
Trus Joist Corporation: *See—*
Troutner, Arthur L.; and Atwood, Thomas M., 4,824,510, Cl. 156-288.000.
Truth Incorporated: *See—*
Allen, R. George, 4,823,508, Cl. 49-252.000.
TRW Cam Gears Limited: *See—*
Rayner, Alan, 4,823,839, Cl. 137-625.240.
TRW Inc.: *See—*
McCurdy, Roger A.; and Stonerook, Dana A., 4,825,148, Cl. 324-64.000.
Tsang, Irving C.: *See—*
Karafian, Maxim; and Tsang, Irving C., 4,824,658, Cl. 423-652.000.
Tschirch, Richard P., to Collins & Aikman Corporation. Textile product with backcoating comprising smoke suppressant and/or flame retardant intumescent particles. 4,824,709, Cl. 428-95.000.
Tsiger Systems Corporation: *See—*
Moore, Brian H., 4,825,223, Cl. 343-840.000.
Tsubaki, Toshio: *See—*
Hirose, Etsurou; Tsubaki, Toshio; Tokunaga, Takeshi; and Isoo, Osamu, 4,825,315, Cl. 360-97.010.
Tsubakimoto Chain Co.: *See—*
Katsube, Shinji, 4,824,281, Cl. 403-369.000.
Tsubata, Noritaka; Tanikawa, Koichi; and Watanabe, Kozo, to Yoshida Kogyo K. K. Fluid-tight slide fastener stringer. 4,823,446, Cl. 24-389.000.
Tsubone, Tsunehiko: *See—*
Kakehi, Yutaka; Nakazato, Norio; Fukushima, Yoshimasa; Shibata, Fumio; Tsubone, Tsunehiko; and Kanai, Norio, 4,824,309, Cl. 414-217.000.
Tsuchimoto, Shuhei: *See—*
Komoda, Tomohisa; Ishizuka, Mamoru; Tsuchimoto, Shuhei; and Yoshikawa, Mitsuhiko, 4,824,539, Cl. 204-192.200.
Tsuchino, Hisanori; Kano, Akiko; Nakano, Kuniaki; and Shimada, Fumio, to Konica Corporation. Radiation image storage panel having assembled heat generating body. 4,825,085, Cl. 250-484.100.
Tsuchita, Kenji: *See—*
Ichikawa, Yoshiaki; Senoh, Makoto; Tsuchita, Kenji; Koizumi, Akira; and Iwama, Kunihiko, 4,824,633, Cl. 376-268.000.
Tsuchiya, Yoshiaki: *See—*
Uchida, Kiyoyuki; Akiyoshi, Michio; and Tsuchiya, Yoshiaki, 4,824,183, Cl. 303-92.000.
Tsuda, George I.; and Ajioka, James S., to Hughes Aircraft Company. Broadband, high isolation radial line power divider/combiner. 4,825,175, Cl. 330-286.000.
Tsuda, Toru: *See—*
Ushikubo, Hisao; Tsuda, Toru; and Takahashi, Ichiro, 4,824,501, Cl. 156-130.000.
Tsujii, Kaoru: *See—*
Yahagi, Kazuyuki; Tsujii, Kaoru; Hirota, Hajime; and Matsumura, Yoshihisa, 4,824,604, Cl. 252-546.000.
Tsukada, Toshiro: *See—*
Baji, Toru; Matsuura, Tatsuji; Tsukada, Toshiro; and Ohba, Shinya, 4,825,287, Cl. 358-160.000.
Tsukakoshi, Kunihiko: *See—*
Yamakoshi, Akira; Fujita, Toyohiko; Tsukakoshi, Kunihiko; and Mito, Kazuhisa, 4,825,104, Cl. 307-355.000.
Tsukamoto, Takeo: *See—*
Okunuki, Masahiko; Tsukamoto, Takeo; Shimizu, Akira; Suzuki, Akira; Sugata, Masao; and Shimoda, Isamu, 4,825,082, Cl. 250-423.00F.
Tsukase, Masaaki: *See—*
Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; Tsukase, Masaaki; and Kato, Masatoshi, 4,824,759, Cl. 430-203.000.
Tsukutani, Seiichi: *See—*
Ohtsuka, Shigeru; and Tsukutani, Seiichi, 4,825,114, Cl. 310-90.000.
Tsunoda, Kazuyoshi: *See—*
Tonoki, Kenji; Tsunoda, Kazuyoshi; Yokono, Haruki; Kono, Hisao; Yokoyama, Ryoji; and Nakamura, Fumiaki, 4,824,509, Cl. 156-285.000.
Tsunoka, Akitoshi: *See—*
Itoh, Shigeyuki; Watatani, Yoshizumi; and Tsunoka, Akitoshi, 4,825,305, Cl. 360-8.000.
Tsutsui, Yoshimitsu: *See—*
Yonezawa, Keitaro; and Tsutsui, Yoshimitsu, 4,823,687, Cl. 100-53.000.
Tsutsumi, Fumio; Sakakibara, Mitsuhiko; Shimada, Noboru; Fujinaga, Yoshihisa; Oshima, Noboru; Hamada, Tatsuro; and Fujimaki, Tatsuo, to Japan Synthetic Rubber Co., Ltd. Butadiene-based rubber composition. 4,824,908, Cl. 525-99.000.
Tub-Master Corporation: *See—*
Roberts, Joseph W.; Roberts, John C.; and MacLeod, Gordon, 4,823,525, Cl. 52-200.000.
Tucker, Michael A. Fishing lure. 4,823,502, Cl. 43-42.370.
Tucker, Robert C.: *See—*
Rogers, Kermett A.; Tucker, Robert C.; and Iyer, Mani, 4,823,568, Cl. 70-58.000.
Tully, Michael: *See—*
Roggenburg, Stanley L.; Laauwe, Robert H.; Polite, John L.; and Tully, Michael, 4,823,990, Cl. 222-207.000.
Tuningley, Allen J.; Barlow, Keith M.; and Stanley, Thomas R., to Nortrak Limited. Railroad FROG. 4,824,055, Cl. 246-458.000.
Turman, William C., to Filter Systems, Inc. Fuel oil filter assembly. 4,824,567, Cl. 210-416.400.
Turner, Colin, to Flymo Limited. Earth leakage circuit breaker with plug actuated resetting breaker. 4,825,329, Cl. 361-93.000.
Turner, Paul, to Midas Gate International, Inc. Parking meter reset device. 4,825,425, Cl. 368-7.000.
Tuttle, John E. Power driven wire nut wrench. 4,823,650, Cl. 81-124.200.
Tuunanen, Jukka: *See—*
Ekholm, Pertti; Salmi, Oili; Tuunanen, Jukka; and Vesanen, Erkki, 4,824,791, Cl. 436-165.000.
Tzong-Lin, Sheen. Versatile vise. 4,824,084, Cl. 269-87.200.
UC Industry Co., Ltd.: *See—*
Nagayoshi, Akio; and Nagayoshi, Kiyoharu, 4,824,502, Cl. 156-195.000.
Uchida, Kiyoyuki; Akiyoshi, Michio; and Tsuchiya, Yoshiaki, to Toyota Jidosha Kabushiki Kaisha. Dual-circuit hydraulic anti-lock braking system. 4,824,183, Cl. 303-92.000.
Uchida, Mitsuru: *See—*
Yasuda, Satoshi; Uchida, Mitsuru; Takagi, Seiichi; and Karami, Yusuke, 4,824,752, Cl. 430-106.600.
Uchiyama, Takeshi: *See—*
Sato, Hirochika; Nakayama, Haruo; Uchiyama, Takeshi; Hagami, Yoshihisa; and Sato, Yoshiro, 4,825,113, Cl. 370-2.000.
UE Systems, Inc.: *See—*
Biegel, Michael; and Goodman, Mark, 4,823,600, Cl. 73-592.000.
Ueda, Hiroo; and Yagi, Hiromitsu, to Ricoh Co., Ltd.; and Nintendo Co., Ltd. T.V. game system having reduced memory needs. 4,824,106, Cl. 273-1.00E.
Ueda, Kunihiro; Takasugi, Yasufumi; and Nakayama, Masatoshi, to TDK Corporation. Magnetic recording medium. 4,824,724, Cl. 428-336.000.
Ueda, Masaru: *See—*
Cho, Hidetsura; and Ueda, Masaru, 4,824,837, Cl. 514-356.000.

Ueda, Nobuo: *See—*
Ito, Masaaki; Ueda, Nobuo; and Fujita, Masafumi, 4,825,243, Cl. 355-41.000.
Ueda, Toshihiko, to Minolta Camera Kabushiki Kaisha. Zoom lens system for use in microfilm projection apparatus. 4,824,236, Cl. 350-427.000.
Uematsu, Shigeyuki: *See—*
Saeki, Hideo; and Uematsu, Shigeyuki, 4,824,748, Cl. 430-7.000.
Uemura, Minoru: *See—*
Narita, Hiroshi; Uemura, Minoru; and Mori, Yoshitada, 4,824,229, Cl. 350-531.000.
Ueno, Katsuji: *See—*
Saeki, Tadashi; Ikawa, Kiyoshi; Kurita, Seiji; and Ueno, Katsuji, 4,824,905, Cl. 525-66.000.
Ueno, Kazuhiro: *See—*
Kashihara, Hidechiyo; Nemoto, Shin-ichi; and Ueno, Kazuhiro, 4,824,430, Cl. 494-22.000.
Ueno, Susumu: *See—*
Nakanishi, Toru; Hoshida, Shigehiro; and Ueno, Susumu, 4,824,717, Cl. 428-255.000.
Uesugi, Michika, to Kabushiki Kaisha Toshiba. AC-DC converting apparatus having power factor improving circuit utilizing a photocoupler. 4,825,351, Cl. 363-79.000.
Uffner, William E.: *See—*
Algrim, Donald J.; Uffner, William E.; Lamb, Glenn D.; and Jones, Stephen J., 4,824,880, Cl. 524-62.000.
Ugawa, Satoru: *See—*
Maekawa, Junichi; Ugawa, Satoru; and Obuchi, Satoshi, deceased, 4,823,512, Cl. 49-352.000.
Ugon, Michel: *See—*
Chemin, Francois; and Ugon, Michel, 4,825,052, Cl. 235-380.000.
Uken, William D., to Raychem Corp. Optical fiber tap utilizing reflector. 4,824,199, Cl. 350-96.150.
Ulich, Bobby L.: *See—*
Rather, John D. G.; Ames, Gregory H.; Conklin, Edward K.; Lazzarini, Albert J.; Mangano, Joseph; and Ulich, Bobby L., 4,825,062, Cl. 250-201.000.
Ultra-Centrifuge Nederland N.V.: *See—*
Keunen, Martinus H.; and de Bakker, Pieter J: A., 4,824,429, Cl. 494-16.000.
Ultrasonic Arrays, Inc.: *See—*
Kniest, James N.; and Campbell, Dean D., 4,823,590, Cl. 73-1.00J.
Ulysse Nardin S.A.: *See—*
Oechslin, Ludwig, 4,825,426, Cl. 368-15.000.
Umeda, Masahiro, to Toyota Jidosha Kabushiki Kaisha. Working/assembling device with self-clamping means. 4,823,887, Cl. 173-31.000.
Umetsu, Shozo; and Nishizaki, Takeshi, to Showa Aluminum Kabushiki Kaisha. Aluminum-based alloy foil for negative electrodes of electrolytic capacitors. 4,824,494, Cl. 148-438.000.
Unidynamics Corporation: *See—*
Ficken, Leonard A., 4,823,984, Cl. 221-96.000.
Unilever Patent Holdings B.V.: *See—*
Freeman, Christopher P., 4,824,679, Cl. 426-2.000.
Union Carbide Corporation: *See—*
Nowotarski, Mark S., 4,823,680, Cl. 98-36.000.
Union Industrielle et D'Entreprise: *See—*
Ducellier, Gilbert, deceased; and Pavia, Andre, 4,824,571, Cl. 210-603.000.
Unisys Corporation: *See—*
Bennett, Donald B.; Thorsrud, Lee T.; and Petschauer, Thomas W., 4,825,438, Cl. 371-8.000.
Guerrera, Nunzio; and Cividino, Lorenzo, 4,825,347, Cl. 363-41.000.
United Enertech Corporation: *See—*
Tate, Billy G., 4,824,012, Cl. 236-49.500.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Chan, Lawrence K. M.; Coates, David; Gemmell, Peter A.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; Young, Daniel J. S.; Bone, Matthew F.; Jackson, Adam; and Scrowston, Richard M., 4,824,217, Cl. 350-350.500.
United States Department of Energy, The: *See—*
Parry, Gareth W., 4,824,742, Cl. 429-30.000.
U.S. Government as represented by Director, National Security Agency: *See—*
Fitz, John L., 4,825,442, Cl. 372-8.000.
United States of America
Agriculture: *See—*
Shih, Frederick S., 4,824,940, Cl. 530-377.000.
Air Force: *See—*
Voss, Donald E.; Miner, Lynn M.; and Busby, Kenneth O., 4,825,149, Cl. 324-72.000.
Army: *See—*
Wright, D. Craig, 4,824,666, Cl. 424-88.000.
Energy: *See—*
Barna, Basil A., 4,823,601, Cl. 73-594.000.
Ginell, William S., 4,824,276, Cl. 403-213.000.
Goldsberry, Fred L., 4,824,447, Cl. 55-158.000.
Smartt, Herschel B.; Einerson, Carolyn J.; and Watkins, Arthur D., 4,825,038, Cl. 219-137.0PS.
Stokowski, Stanley E., 4,824,598, Cl. 252-301.40R.
Zhang, Jian-Shi; Giometti, Carol S.; and Tollaksen, Sandra L., 4,824,547, Cl. 204-299.00R.
Health and Human Services: *See—*
Gansow, Otto, 4,824,986, Cl. 558-17.000.
Walchle, Ray W., 4,825,330, Cl. 361-95.000.
Interior: *See—*
Rice, David A.; and May, Alexander, 4,824,656, Cl. 423-578.00A.
National Aeronautics and Space Administration: *See—*
Cagliostro, Domenick E.; and Riccitiello, Salvatore R., 4,824,711, Cl. 428-116.000.
Morrison, Andrew D., 4,824,520, Cl. 156-620.100.
White, Dorsey E., III; Updike, Benjamin T., deceased; and Allred, Johnny W., 4,823,976, Cl. 220-211.000.
Yost, William T., 4,823,609, Cl. 73-799.000.
National Aeronuautics & Space Administration: *See—*
Angulo, Earl D.; and Goodfriend, Roger, 4,823,793, Cl. 128-328.000.
National Security Agency: *See—*
Speidel, Joachim; and Vogel, Peter, 4,825,285, Cl. 358-133.000.
Navy: *See—*
Marshall, Thomas C.; Schlesinger, S. Perry; Grossman, Arthur A.; and Chen, Shien-Chi, 4,825,441, Cl. 372-2.000.
Winyard, David C., 4,824,348, Cl. 418-195.000.
U.S. Philips Corp.: *See—*
Bauer, Manfred, 4,825,455, Cl. 378-153.000.
Beasley, James P., 4,825,033, Cl. 219-121.250.
Bolhuis, Pieter J., 4,825,443, Cl. 372-38.000.
Chantelou, Olivier, 4,825,288, Cl. 358-166.000.
Dejaegher, Daniel, 4,825,214, Cl. 342-128.000.
Groothoff, Adriaan J.; Sluyterman, Albertus A. S.; Overdijk, Dik R.; and Van Maastricht, Jacob, 4,823,460, Cl. 29-605.000.
Khoe, Giok D., 4,824,195, Cl. 350-96.180.
Knibbe, Engel J., 4,825,292, Cl. 358-213.240.
Kuhn, Michael H., 4,825,160, Cl. 324-309.000.
Kunze, Norbert, 4,825,322, Cl. 360-96.300.
Littlejohn, David; and Marshall, John, 4,824,241, Cl. 356-36.000.
Maas, Henricus G. R., 4,825,267, Cl. 357-23.400.
Prott, Albert; Prendel, Peter W.; Kandler, Wilfried H. K.; and Sandkuhl, Jurgen, 4,825,015, Cl. 174-35.0GC.
Robers, Klaas H. J., 4,825,306, Cl. 360-9.100.
Whight, Kenneth R., 4,825,266, Cl. 357-13.000.
Zwijnenburg, Jan, 4,824,320, Cl. 414-744.300.
U.S. Phillips Corporation: *See—*
Sprengers, Leo M., 4,825,128, Cl. 315-58.000.
United Technologies Corporation: *See—*
Titterton, George F., III, 4,824,327, Cl. 416-174.000.
Universite de Reims Champagne-Ardenne: *See—*
Troyon, Michel, 4,825,080, Cl. 250-396.00R.
Universite de Tours Francois Rabelais: *See—*
Ghislaine, Marquis; Martin, Andre ; Murat, Jean; and Prulhiere, Jean-Pierre, 4,823,804, Cl. 128-733.000.
University of Florida: *See—*
Bodor, Nicholas S., 4,824,850, Cl. 514-270.000.
University of Medicine & Dentistry of New Jersey: *See—*
Desjardins, Paul J.; Dunn, Stanley M.; and Milles, Maano, 4,825,263, Cl. 356-376.000.
University of Minnesota, The Regents of the: *See—*
Hanson, Richard S.; and Allen, Larry N., 4,824,786, Cl. 435-252.300.
Unjohn Company, The: *See—*
Shah, Ashok C.; Britten, Nancy J.; and Badalamenti, Joseph N., 4,824,677, Cl. 424-467.000.
Unosen, Olov. Wood processor. 4,823,849, Cl. 144-3.00D.
UOP: *See—*
Lok, Brent M.; Marcus, Bonita K.; and Flanigen, Edith M., 4,824,554, Cl. 208-46.000.
UOP Inc.: *See—*
Bricker, Jeffery C.; and Frame, Robert R., 4,824,818, Cl. 502-163.000.
Updike, Barbara G., legal representative: *See—*
White, Dorsey E., III; Updike, Benjamin T., deceased; and Allred, Johnny W., 4,823,976, Cl. 220-211.000.
Updike, Benjamin T., deceased: *See—*
White, Dorsey E., III; Updike, Benjamin T., deceased; and Allred, Johnny W., 4,823,976, Cl. 220-211.000.
Urquhart, Andrew W.: *See—*
Luszcz, Stanley J.; Urquhart, Andrew W.; and Newkirk, Marc S., 4,824,008, Cl. 228-121.000.
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Grosse, Heinz; Koch, Friedrich-Otto; Peeck, Adolf; and Wennemann, Werner, 4,823,847, Cl. 138-143.000.
Werner, Hans U., to S. Franzen Sohne GmbH & Co. Permutation lock. 4,823,574, Cl. 70-312.000.
Werner & Pfleiderer: *See*—
Haring, Erwin; Weihrich, Gerhard; and Worz, Wolfgang, 4,824,256, Cl. 366-85.000.
Wessel, Joyce A.: *See*—
Morell, Lori A.; and Wessel, Joyce A., 4,823,404, Cl. 2-69.000.
Westbrook, Daniel S.: *See*—
Kuenn, Cary K.; and Westbrook, Daniel S., 4,824,689, Cl. 427-2.000.
Westerburgen, Joseph P. M. Building element and coupling-pin for interconnecting such elements. 4,823,532, Cl. 52-594.000.
Western Atlas International, Inc.: *See*—
McWhirter, Vernie C.; Oliver, Donald W.; and Hollingsworth, David P., 4,825,072, Cl. 250-259.000.
Westfalia Separator AG: *See*—
Bucker, Heinrich, 4,823,830, Cl. 137-205.000.
Westinghous Electric Corp.: *See*—
Duncan, Robert, 4,825,032, Cl. 219-121.630.
Westinghouse Electric Corp.: *See*—
Everett, James W.; and Sadofsky, Frank, 4,823,846, Cl. 138-89.000.
Meuschke, Robert E.; and Shields, Edward P., 4,824,632, Cl. 376-261.000.
Nair, Balakrishnan R.; Richardson, Raymond V.; and Mello, Raymond M., 4,825,088, Cl. 250-506.100.
Pisz, Frank A.; Warnock, Arthur S.; and Heinig, Roger W., 4,824,328, Cl. 416-219.00R.
Westling, Gregory L.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; and Westling, Gregory L., 4,825,448, Cl. 375-8.000.
Westvaco Corporation: *See*—
Lafler, Robert E., 4,824,486, Cl. 106-30.000.
Wetzel, Richard M.: *See*—
Rust, Jeffrey J.; LeVasseur, Rodney J.; Meilach, Alan; Beech, Brian; Wetzel, Richard M.; and Freudenheim, Eric J., 4,825,054, Cl. 235-380.000.
Wheeler, Bryce A.; and Cook, Lacy G., to Hughes Aircraft Company. Compact continuous wave wavefront sensor. 4,824,243, Cl. 356-121.000.
Whight, Kenneth R., to U.S. Philips Corporation. Semiconductor diode. 4,825,266, Cl. 357-13.000.
Whirlpool Corporation: *See*—
Stottmann, Richard L.; and Ponikwia, Edward F., 4,824,029, Cl. 241-375.000.
Whitaker, Ross C.; and Edwards, Richard E. Universal package holder. 4,824,042, Cl. 242-130.000.
White Consolidated Industries, Inc.: *See*—
Collins, Imack, 4,823,465, Cl. 30-276.000.
White, Dorsey E., III; Updike, Benjamin T., deceased (by Updike, Barbara G., legal representative); and Allred, Johnny W., to United States of America, National Aeronautics and Space Administration. Quick actuating closure. 4,823,976, Cl. 220-211.000.
White, Homer S., to Myrick-White, Inc. Sliver measuring apparatus. 4,823,597, Cl. 73-160.000.
White, Mary N.: *See*—
White, Warren D.; Puckett, Paul M.; Blankenship, Larry T.; and White, Mary N., 4,824,500, Cl. 156-94.000.
White, Richard J.: *See*—
Bowser, Paul A.; and White, Richard J., 4,824,865, Cl. 514-558.000.
White, Warren D.; Puckett, Paul M.; Blankenship, Larry T.; and White, Mary N., to Dow Chemical Company, The. Method for repairing damaged composite articles. 4,824,500, Cl. 156-94.000.
White, William H., to Bechtel International Corporation. Energy absorbing and assembly for structural system. 4,823,522, Cl. 52-167.000.
Whiteside, George D.: *See*—
Sturgis, John I.; and Whiteside, George D., 4,824,761, Cl. 430-209.000.
Whitney Equipment Sales, Inc.: *See*—
Maxwell, Douglas C., Jr.; and Whitney, Walter D., deceased, 4,823,589, Cl. 72-457.000.
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Maxwell, Douglas C., Jr.; and Whitney, Walter D., deceased, 4,823,589, Cl. 72-457.000.
Whitson, John M. Device for bore alignment of gun sights. 4,825,258, Cl. 356-153.000.
Whittenberger, William A.: *See*—
Bullock, Wesley; and Whittenberger, William A., 4,823,583, Cl. 72-196.000.
Wichelhaus, Juergen: *See*—
Emmerling, Winfried; Podola, Tore; and Wichelhaus, Juergen, 4,824,888, Cl. 524-199.000.
Wiciel, Richard D.: *See*—
Doyle, John T.; and Wiciel, Richard D., 4,824,389, Cl. 439-269.000.
Wickes Companies, Inc.: *See*—
Otto, Kenneth J., 4,825,029, Cl. 219-69.190.
Wickes Manufacturing Company: *See*—
Kelly, Terence C., Sr., 4,824,049, Cl. 244-110.00C.
Wickham Land Limited: *See*—
Cooper, James, 4,824,581, Cl. 210-709.000.
Wickholm, David R.; and Strittmatter, Donald J., to Hughes Aircraft Company. Stereomicroscopic inspection system with low eyestrain features. 4,824,228, Cl. 350-516.000.
Widell, Larry R.: *See*—
McVey, George R.; Tornberg, Kenneth W.; Widell, Larry R.; and Wood, George E., 4,824,473, Cl. 71-92.000.
Wieres, Ludwig: *See*—
Maus, Wolfgang; Kottmann, Rolf; Cyron, Theodor; and Wieres, Ludwig, 4,824,011, Cl. 228-173.700.
Wiethoff, Roger H.; and Nelson, Gary J., to FMC Corporation. Autoloader for military vehicle. 4,823,676, Cl. 89-46.000.
Wiggins, J. Mark: *See*—
Ponticello, Gerald S.; and Wiggins, J. Mark, 4,824,968, Cl. 549-23.000.
Wiggins Teape Group Limited, The: *See*—
Townsend, Leslie, 4,824,691, Cl. 427-53.100.
Wilcox, John B.: *See*—
Kroneberger, Gerald F.; and Wilcox, John B., 4,823,711, Cl. 110-236.000.
Wild, Jochen: *See*—
Spiegler, Wolfgang; Hoelderich, Wolfgang; Goetz, Norbert; Hupfer, Leopold; and Wild, Jochen, 4,824,973, Cl. 549-425.000.
Wilen, Richard. Magazine assembly system and method. 4,824,503, Cl. 156-204.000.
Wiley, Allen C., to MicroFuel Corporation. Means of pneumatic comminution. 4,824,031, Cl. 241-39.000.
Wiley, Carl A., deceased (by Wiley, Jean B., administratrix), to Hughes Aircraft Company. Radiometric imager having a frequency-dispersive linear array antenna. 4,825,215, Cl. 342-351.000.
Wiley, Jean B., administratrix: *See*—
Wiley, Carl A., deceased, 4,825,215, Cl. 342-351.000.
Wilhelm, Earl E., to Boeing Company, The. Multi-point warhead initiation system. 4,823,701, Cl. 102-492.000.
Wilhelm Haselmeier GmbH & Co.: *See*—
Gabriel, Jochen, 4,823,906, Cl. 181-137.000.
Wilkinson, Stanley B., to General Electric Company. Out-of-step blocking unit. 4,825,323, Cl. 361-65.000.
Wilkinson, Stanley B.: *See*—
Alexander, George E.; and Wilkinson, Stanley B., 4,825,327, Cl. 361-82.000.
Wilkus, Edward V.: *See*—
Walter, Robert B.; and Wilkus, Edward V., 4,824,883, Cl. 524-93.000.
Wille, Douglas A.; Kurmer, John P.; and Rosen, Arye, to General Electric Company. Light-activated series-connected pin diode switch. 4,825,081, Cl. 250-551.000.
Willemse, Simon: *See*—
Appel, Peter W.; Bortolotti, Fabrizio; Delwel, Francois; Hornung, Fredrik; Tomlinson, Alan D.; and Willemse, Simon, 4,824,593, Cl. 252-127.000.
Willford, George A.: *See*—
Meyers, Richard S.; and Willford, George A., 4,823,596, Cl. 73-118.100.
Willhite, William, Jr.; Weber, Gerald M.; and Retier, Godfrey, to Procter & Gamble Company, The. Adhesive-free bonding of continuously moving webs to form laminate web and products cut therefrom. 4,823,783, Cl. 128-156.000.
Willi Studer, AG.: *See*—
Koch, Andreas; Lagadec, Roger; and Pelloni, Daniele, 4,825,398, Cl. 364-724.100.

Wm. Wrigley, Jr. Company: *See*—
Bernatz, Kevin; and Pillsbury, Ron W., 4,824,680, Cl. 426-3.000.
Williams, Fred G., to Cetus Corporation. Carousel and tip. 4,824,641, Cl. 422-100.000.
Willms, Lothar: *See*—
Lachhein, Stephen; and Willms, Lothar, 4,824,949, Cl. 544-320.000.
Wilner, Leslie B., to Endevco Corporation. Differential capacitive transducer and method of making. 4,825,335, Cl. 361-283.000.
Wilson, Gary W. Trailer caddy. 4,824,133, Cl. 280-414.100.
Wilson, James N.: *See*—
Kotyk, Wayne M.; Kirk, Thomas G.; Wilson, Robert J.; and Wilson, James N., 4,825,146, Cl. 324-58.50B.
Wilson, Larry R.: *See*—
Kershner, Larry D.; Reineke, Charles E.; Sarkar, Nitis; and Wilson, Larry R., 4,824,916, Cl. 525-420.000.
Wilson, Richard A.: *See*—
Angello, Debra A.; and Wilson, Richard A., 4,824,660, Cl. 424-1.100.
Wilson, Robert J.: *See*—
Kotyk, Wayne M.; Kirk, Thomas G.; Wilson, Robert J.; and Wilson, James N., 4,825,146, Cl. 324-58.50B.
Wilson, Troy K.: *See*—
Baumann, Burke B.; and Wilson, Troy K., 4,825,363, Cl. 364-200.000.
Windish, Willis E.: *See*—
Krause, Michael W.; and Windish, Willis E., 4,823,639, Cl. 74-360.000.
Winners Japan Company Limited: *See*—
Nakamura, Katunori, 4,823,803, Cl. 128-717.000.
Winston Furniture Company Inc.: *See*—
Tesney, Bobby, 4,823,709, Cl. 108-157.000.
Winter, William E.: *See*—
Maa, Peter S.; Vernon, Lonnie W.; Winter, William E.; and Singhal, Gopal H., 4,824,558, Cl. 208-420.000.
Winyard, David C., to United States of America, Navy. Multiple tooth engagement single screw mechanism. 4,824,348, Cl. 418-195.000.
Wirth, Wolfgang; Niessen, Heinz J.; Goossens, John W. S.; and Schulze, Hans, to Bayer Aktiengesellschaft. Biocidal macroemulsions containing polyvinyl alcohol. 4,824,663, Cl. 424-78.000.
Wirz, Peter: *See*—
Arnold, Manfred; and Wirz, Peter, 4,824,545, Cl. 204-298.000.
Witco Corporation: *See*—
Muir, Ron; and Mulrooney, Kevin L., 4,824,584, Cl. 252-39.000.
Wittler, Hilmar; Martin, Adolf; and Palloch, Herbert, to Frankl & Kirchner GmbH & Co. KG. Electric motor regulating and control drive having a clutch-brake unit. 4,823,926, Cl. 192-18.00B.
Wohlfarth, Peter, to Daimler-Benz Aktiengesellschaft. Drive arrangement for all-wheel drive vehicles. 4,823,897, Cl. 180-75.100.
Wohlrab, Walter, to Krauss-Maffei A.G. Drive apparatus for a screw injection molding unit and a process for its operation. 4,824,255, Cl. 366-78.000.
Wojcik, Dennis, to C. R. Bard, Inc. Catheter incorporating strain relief. 4,823,805, Cl. 128-736.000.
Wokan, Andreas: *See*—
Pfalzgraf, Manfred; Stoll, Bernward; Probst, Kurt; Ohm, Heinz-Friedrich; and Wokan, Andreas, 4,823,751, Cl. 123-359.000.
Wolf, Michael A.: *See*—
Bessolo, Jeffrey M.; and Wolf, Michael A., 4,825,409, Cl. 365-154.000.
Wolfgang, Michael; Mikusch, Gerald; and Brangs, Eckhard, to L. Schuler GmbH. Arrangement and method for coupling and decoupling gripper rail parts in a transfer press. 4,823,587, Cl. 72-405.000.
Wolinsky, Harvey. Method for the prevention of restenosis. 4,824,436, Cl. 604-53.000.
Wollenhaupt, Gottfried: *See*—
Abthoff, Joerg; Schuster, Hans-Dieter; Schmidt, Karlwalter; Wollenhaupt, Gottfried; and Schmitz, Hans-Georg, 4,824,363, Cl. 432-222.000.
Wollman, Jack, to Bulova Watch Co., Inc. Wrist watch case and bracelet assembly. 4,825,427, Cl. 368-282.000.
Wong, Hee, to National Semiconductor Corporation. Digital FSK demodulator. 4,825,452, Cl. 375-22.000.
Wong, Patrick S. L.; Theeuwes, Felix; Cortese, Richard; and Eckenhoff, James B., to ALZA Corporation. Dispenser with movable matrix comprising a plurality of tiny pills. 4,824,675, Cl. 424-438.000.
Woo, Edward J.; and Yorkgitis, Elaine M., to Minnesota Mining and Manufacturing Company. Process for improved adhesion to semicrystalline polymer film. 4,824,699, Cl. 427-307.000.
Woo Kyong Industrial Co., Ltd.: *See*—
Chang, Moon S., 4,824,278, Cl. 403-93.000.
Wood, Coleman: *See*—
Carpenter, Clarence W.; and Wood, Coleman, 4,823,598, Cl. 73-232.000.
Wood, George E.: *See*—
McVey, George R.; Tornberg, Kenneth W.; Widell, Larry R.; and Wood, George E., 4,824,473, Cl. 71-92.000.
Woods, Percy. Liquid metering and mixing device. 4,823,829, Cl. 137-114.000.
Woolsey, Robert. Shotgun projectile. 4,823,702, Cl. 102-502.000.
Wormer, Alex F., to Wormser Engineering, Inc. Multifuel bubbling bed fluidized bed combustor system. 4,823,712, Cl. 110-245.000.
Wormser Engineering, Inc.: *See*—
Wormer, Alex F., 4,823,712, Cl. 110-245.000.
Worz, Wolfgang: *See*—
Haring, Erwin; Weihrich, Gerhard; and Worz, Wolfgang, 4,824,256, Cl. 366-85.000.
Wozniak, Don S., to Sherex Chemical Company, Inc. Paintable adhesion promoter system for polyvinyl chloride plastisols. 4,824,700, Cl. 427-379.000.
Wrezel, James A.: *See*—
Zupancic, Joseph J.; Conrad, Jeffrey P.; Wrezel, James A.; Zweig, Andrew M.; and Frechet, Jean M. J., 4,824,920, Cl. 525-534.000.
Wright, D. Craig, to United States of America, Army. Method of large scale growth of toxoplasmic microorganisms. 4,824,666, Cl. 424-88.000.
Wright, John J.: *See*—
Han, William T.; and Wright, John J., 4,824,959, Cl. 548-253.000.
Wright, Peter, to Chaparral Steel Company. Method for producing a precipitation hardenable martensitic low alloy steel forging. 4,824,492, Cl. 148-12.400.
Wuebker, Robert A.; Helton, Ova A.; Roggeman, Albert R.; and Switzer, Thomas P., to General Signal Corporation. Suspension system hanger means formed by cold forming processes. 4,824,056, Cl. 248-60.000.
Wundschock, Karl H.: *See*—
Bishop, Paul W.; and Wundschock, Karl H., 4,824,024, Cl. 239-333.150.
Wunner, Roland, to Liba Maschinenfabrik GmbH. Warp knitting machine with pile instrument bar. 4,823,563, Cl. 66-84.00R.
Wunner, Roland, to LIBA Maschinenfabrik GmbH. Device for clamping weft threads in a warp knitting machine. 4,823,564, Cl. 66-84.00A.
Wust, E. Apparatus for steaming food. 4,823,767, Cl. 126-20.000.
Wymer, Gary E.; and Salsbury, H. Allen. Method for covering an open-topped vehicle. 4,823,708, Cl. 105-377.000.
Wymer, Gary E.: *See*—
Salsbury, H. Allen; and Wymer, Gary E., 4,823,707, Cl. 105-377.000.
Wysocki, Joseph A.: *See*—
Rand, Stephen C.; and Wysocki, Joseph A., 4,824,455, Cl. 65-3.110.
Xerox Corporation: *See*—
Booth, Ronald P., Sr.; and Calcagno, Joseph S., 4,824,090, Cl. 271-3.100.
Burnham, Robert D.; and Thornton, Robert L., 4,824,798, Cl. 437-81.000.
Elter, Michael R., 4,825,242, Cl. 355-14.0FU.
Hamlin, Thomas J., 4,823,663, Cl. 83-208.000.
Iaia, Thomas C., Jr.; McLaughlin, William J.; and Siegel, Robert P., 4,825,255, Cl. 355-76.000.
Knight, Margaret A., 4,824,091, Cl. 271-178.000.
Mahalek, Thomas L.; and Santo, David R., 4,824,750, Cl. 430-99.000.
Xtalite Technology Limited/La Technologie Xtalite Limitee: *See*—
Joseph, Ezekiel; Kramer, Gordon; and Oh, Chan S., 4,824,215, Cl. 350-339.00D.
Yabashi Industries Co., Ltd.: *See*—
Ota, Yoshio; Goto, Norifumi; Motoyama, Iwao; Iwashita, Tetsushi; and Nomura, Kunio, 4,824,654, Cl. 423-432.000.
Yablonski, Robert E.; and Roe, John A., to EECO Incorporated. Compressed audio silencing. 4,825,303, Cl. 358-335.000.
Yabuki, Mitsuo: *See*—
Watabe, Kenzo; Yabuki, Mitsuo; Iwama, Kazuyuki; and Yokoi, Toshihiko, 4,825,158, Cl. 324-237.000.
Yabusaki, Masao; Yamamoto, Etsuji; Murakami, Yoshiki; and Kohno, Hideki, to Hitachi, Ltd. Quadrature probe for nuclear magnetic resonance. 4,825,163, Cl. 324-318.000.
Yafuso, Masao; and Suzuki, John K., to Cardiovascular Devices, Inc. Gas sensor. 4,824,789, Cl. 436-68.000.
Yagi, Hiromitsu: *See*—
Ueda, Hiroo; and Yagi, Hiromitsu, 4,824,106, Cl. 273-1.00E.
Yahagi, Kazuyuki; Tsujii, Kaoru; Hirota, Hajime; and Matsumura, Yoshihisa, to Kao Corporation. Detergent composition. 4,824,604, Cl. 252-546.000.
Yamada, Eiichi: *See*—
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Yamada, Koichiro: *See*—
Niida, Chiaki; Ito, Tomoo; Nishimiya, Torazo; Iseyama, Takashi; and Yamada, Koichiro, 4,823,750, Cl. 123-339.000.
Yamada, Satoshi: *See*—
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Yamada, Taketoshi: *See*—
Takeuchi, Shin; Eto, Isamu; and Yamada, Taketoshi, 4,824,617, Cl. 26.4-26.000.
Yamada, Toyofumi: *See*—
Nakamura, Joji; Kubo, Kazuhiro; Ichikawa, Shunji; Takahashi, Hajime; Isozumi, Keisuke; and Yamada, Toyofumi, 4,824,842, Cl. 514-227.500.
Yamada, Tsuneo: *See*—
Kawashima, Yoshio; Ogata, Shunji; Yokoyama, Masaaki; Tomiku, Masato; Yamada, Tsuneo; Kuno, Tsutomu; Murakami, Hisao; Morimoto, Hiroyuki; Myojo, Toyoshige; Watanabe, Kozo; and Tanaka, Toshihiro, 4,823,577, Cl. 72-24.000.
Yamada, Yukiyoshi: *See*—
Kano, Osamu; Yamada, Yukiyoshi; Fujisawa, Shigemi; and Yasuguchi, Masayuki, 4,824,030, Cl. 241-39.000.
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Yoshikawa, Kikuo; Kanai, Takao; Yamaguchi, Katsumi; and Yokoi, Syouichiro, 4,825,312, Cl. 360-96.500.

Yamaguchi, Kiichi: *See—*
Sasaki, Kunihiko; Yamaguchi, Kiichi; Oka, Tsumoru; Ohya, Takasi; Shinraku, Mituaki; Konno, Akihiro; and Ida, Yuichi, 4,824,396, Cl. 439-475.000.

Yamaguchi, Takashi; and Kobayashi, Yasuo, to NEC Corporation. Differential amplifier circuit. 4,825,110, Cl. 307-530.000.

Yamaha Corporation: *See—*
Nagamoto, Itsushi; Nakanishi, Tatsuo; and Tajima, Ryohei, 4,824,116, Cl. 273-171.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
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Yamakawa, Masanori: *See—*
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Yamakawa, Tomio: *See—*
Okabe, Susumu; Satoh, Masaru; Yamakawa, Tomio; Nomura, Yutaka; and Hayashi, Masatoshi, 4,824,856, Cl. 514-395.000.

Yamaki, Isao: *See—*
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Yamakoshi, Akira; Fujita, Toyohiko; Tsukakoshi, Kunihiko; and Mito, Kazuhisa, to Seikosha Co., Ltd. Comparator. 4,825,104, Cl. 307-355.000.

Yamamoto, Etsuji: *See—*
Yabusaki, Masao; Yamamoto, Etsuji; Murakami, Yoshiki; and Kohno, Hideki, 4,825,163, Cl. 324-318.000.

Yamamoto, Hajime; Gotou, Tadashi; Yamakawa, Masanori; Nakao, Noboru; and Ikeda, Takashi, to Hitachi, Ltd. Method and apparatus for controlling liquid metal flow. 4,824,329, Cl. 417-50.000.

Yamamoto, Hiroyuki: *See—*
Fukuchi, Masakazu; Akazawa, Kiyoshi; Matsunawa, Masahiko; Niki, Hiroshi; Matsuo, Shunji; Yamamoto, Hiroyuki; and Abe, Yoshinori, 4,825,246, Cl. 355-4.000.

Yamamoto, Kazuyoshi; Saikawa, Masahiko; and Kanada, Eiji, to Mitsubishi Paper Mills, Ltd. Lithographic printing plate with benzotriazoles improved in printing endurance. 4,824,760, Cl. 430-204.000.

Yamamoto, Keiichi; and Ishikawa, Kazuo, to Aisin Seiki Kabushiki Kaisha. Lockup control system for automatic transmission. 4,825,366, Cl. 364-424.100.

Yamamoto, Kunihiko: *See—*
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Yamamoto, Minoru: *See—*
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Yamamoto, Saburo: *See—*
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; and Yamamoto, Saburo, 4,824,518, Cl. 156-613.000.

Yamamoto, Takemi; Makino, Kuniyasu; and Suzuki, Makoto, to Brother Kogyo Kabushiki Kaisha. Device for forming an image with a laser beam. 4,824,220, Cl. 350-354.000.

Yamamoto, Takemi: *See—*
Nakai, Hitoshi; Yamamoto, Takemi; Sakai, Jun; and Fujii, Eiji, 4,825,256, Cl. 355-27.000.

Yamamoto, Yoichi; Fujii, Hironori; and Oichi, Toshio, to Sharp Kabushiki Kaisha; and Sugai Chemical Industry Co., Ltd. Thermosensitive recording material. 4,824,822, Cl. 503-201.000.

Yamanaka, Kazushi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method of measuring microcrack depth. 4,825,423, Cl. 367-99.000.

Yamane, Manabu: *See—*
Hashimoto, Naoyuki; Yamashita, Kazuichi; and Yamane, Manabu, 4,823,933, Cl. 198-465.300.

Yamasaki, Akio: *See—*
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Yamashita, Kazuichi: *See—*
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Yamashita, Nobuo; Takahashi, Susumu; and Matsui, Hiroshi, to Olympus Optical Co., Ltd. Apparatus for improving image formed by imaging optical system. 4,824,205, Cl. 350-96.250.

Yamashita, Tsuyoshi: *See—*
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Yamauchi, Noriaki: *See—*
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Yamazaki, Atsushi: *See—*
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Yamazaki Corporation: *See—*
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Yamazaki, Toru: *See—*
Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru; and Katoh, Taisei, 4,824,812, Cl. 501-134.000.

Yamazaki, Yasuo: *See—*
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Yang, Ping. Conformable bladder engine. 4,823,745, Cl. 123-51.00R.

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Yano, Shinsuke; Nishigaki, Susumu; Kato, Hiroshi; and Nonomura, Toshio, to Narumi China Corporation. Dielectric ceramic composition. 4,824,813, Cl. 501-139.000.

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Yasuda, Satoshi; Uchida, Mitsuru; Takagi, Seiichi; and Karami, Yusuke, to Canon Kabushiki Kaisha. Electrophotographic magnetic dry developer containing cerium oxide and hydrophobic silica. 4,824,752, Cl. 430-106.600.

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Yerman, Alexander J., to General Electric Company. Impermeable encapsulation system for integrated circuits. 4,824,716, Cl. 428-209.000.

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Yonkers, Robert A.; and Rosendall, Henry J., to Amway Corporation. Vacuum cleaner with brush lift-off. 4,823,430, Cl. 15-361.000.

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Yoshigai, Kenichi, to Yoshigai Kikai Kinzoku Co., Ltd. Device for holding outer wire of brake. 4,823,918, Cl. 188-24.190.

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Yoshimura, Kouichi; and Ishii, Tsuyoshi, to Yamazaki Corporation. Floor sweeper. 4,823,422, Cl. 15-41.00R.

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Zwijnenburg, Jan, to U.S. Philips Corporation. Device for picking up, displacing and delivering products. 4,824,320, Cl. 414-744.300.

374928 Alberta Limited: *See—*
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501 Advanced Peptide Development, Ltd.: *See—*
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF APRIL, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Clark, Brian, to Schlumberger Technology Corp. Shields for antennas of borehole logging devices. Re. 32,913, Cl. 324-338.000.

Doyle, Walter M., to Laser Precision Corporation. Parabolic focusing apparatus for optical spectroscopy. Re. 32,912, Cl. 356-244.000.

Laser Precision Corporation: *See*—
Doyle, Walter M., Re. 32,912, Cl. 356-244.000.

Schlumberger Technology Corp.: *See*—
Clark, Brian, Re. 32,913, Cl. 324-338.000.

Stuckler, Gerd. Arrangement for mounting components on a carrier board and method of indicating mounting locations. Re. 32,910, Cl. 29-407.000.

Walters, John P., to Wisconsin Alumni Research Foundation. Adjustable waveform spark source. Re. 32,911, Cl. 356-313.000.

Wisconsin Alumni Research Foundation: *See*—
Walters, John P., Re. 32,911, Cl. 356-313.000.

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TO WHOM

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Harwood, Jon, B1 4,736,817, Cl. 181-282.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Shiraki, Toshinori; Hayano, Fusakazu; and Morita: Hideo, B1 4,628,072, Cl. 525-57.000.
Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, B1 4,657,971, Cl. 525-57.000.

Chalberg, Philip E. Jet nozzle assembly for therapy baths. B1 4,349,923, 4-25-89, Cl. 4-542.000.

Edmonds, James T., Jr., to Phillips Petroleum Company. Preparation of block copolymers. B1 3,970,719, 4-25-89, Cl. 525-247.000.

Feinwerkhau Helfer & Co. KG: *See*—
Hornung, Ewald, B1 4,287,923, Cl. 81-429.000.

Harwood, Jon, to AP Industries, Inc. Stamp formed muffler. B1 4,736,817, 4-25-89, Cl. 181-282.000.

Hayano, Fusakazu: *See*—
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Hornung, Ewald, to Feinwerkhau Helfer & Co. KG. Screwing heads. B1 4,287,923, 4-25-89, Cl. 81-429.000.

Morita: Hideo: *See*—
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Phillips Petroleum Company: *See*—
Edmonds, James T., Jr., B1 3,970,719, Cl. 525-247.000.

Shiraki, Toshinori; Hayano, Fusakazu; and Morita: Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Modified block copolymer composition. B1 4,628,072, 4-25-89, Cl. 525-57.000.

Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Modified block copolymer composition. B1 4,657,971, 4-25-89, Cl. 525-57.000.

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Bear Creek Gardens, Inc.: *See*—
Christensen, Jack E., 6,758, Cl. 11.000.

Buksa, John A., to Dan Tudor & Sons. Grapevine, "Tudor Premium Red" . 6,760, 4-25-89, Cl. 47.000.

California Plant Company: *See*—
Van Wingerden, Rene, 6,754, Cl. 74.000.

Christensen, Jack E., to Bear Creek Gardens, Inc. Hybrid Tea Rose plant cv. Arotigy. 6,758, 4-25-89, Cl. 11.000.

Dan Tudor & Sons: *See*—
Buksa, John A., 6,760, Cl. 47.000.

Doyle, James F. Peach tree, "Flavor Queen". 6,759, 4-25-89, Cl. 43.000.

Duemmen, Guenter. Geranium plant named Serenade. 6,761, 4-25-89, Cl. 68.000.

Ecke, Paul, Jr.: *See*—
Kientzler, Ludwig, 6,762, Cl. 68.000.

Gardner, Leith M.: *See*—
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Zaiger, Chris F.; Zaiger, Gary N.; Gardner, Leith M.; and Zaiger, Grant G., 6,755, Cl. 39.000.
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 6,763, Cl. 38.000.
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 6,764, Cl. 38.000.

Groot Associates II: *See*—
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Paparozzi, Ellen T., to University of Nebraska, The Board of Regents of the. Concetta TM (Papconc) c.v. (Rose plant). 6,749, 4-25-89, Cl. 20.000.

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van Duyn, Cornelis, to Groot Associates II. Alstroemeria named Cordu Joy. 6,757, 4-25-89, Cl. 68.000.

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Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G. Nectarine tree ("Mid Glo"). 6,753, 4-25-89, Cl. 41.000.

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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

69 4,823,404
80 4,823,405
201 4,823,406
202 4,823,407

CLASS 4

111.5 4,823,408
192 4,823,409
228 4,823,410
255 4,823,411
4,823,416
483 4,823,412
542 B1 4,349,923
544 4,823,413
623 4,823,414

CLASS 5

93 R 4,823,415
455 4,823,417
503 4,823,418

CLASS 7

113 4,823,419

CLASS 8

471 4,824,437

CLASS 12

142 N 4,823,420

CLASS 14

71.3 4,823,421

CLASS 15

41 R 4,823,422
104.92 4,823,424
162 4,823,425
210 R 4,823,426
247 4,823,427
302 4,823,428
333 4,823,429
361 4,823,430
394 4,823,431

CLASS 16

86 A 4,823,432
114 R 4,823,433
115 4,823,434
121 4,823,435
258 4,823,436
300 4,823,437
307 4,823,438

CLASS 17

33 4,823,439

CLASS 19

105 4,823,440

CLASS 23

313 R 4,823,441

CLASS 24

20 R 4,823,442
68 CD 4,823,443
231 4,823,444
326 4,823,445
389 4,823,446
429 4,823,447
569 4,823,636

CLASS 27

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CLASS 29

24.5 4,823,449
116.2 4,823,450
129.5 4,823,451
235 4,823,452
243.5 4,823,455
261 4,823,453
407 Re.32,910
437 4,823,454
458 4,823,456
509 4,823,457
527.2 4,823,458
563 4,823,459
605 4,823,460
612 4,823,461

CLASS 30

162 4,823,463
276 4,823,464
4,823,465
344 4,823,466
355 4,823,467
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CLASS 33

1 B 4,823,472
228 4,823,470
264 4,823,471
265 4,823,474
449 4,823,475
512 4,823,476
760 4,823,469
787 4,823,473

CLASS 34

1 4,823,477
5 4,823,478
210 4,823,479
218 4,823,480
239 4,823,481

CLASS 36

2.6 4,823,482
43 4,823,483
117 4,823,484
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CLASS 37

142 A 4,823,487
142 R 4,823,486

CLASS 38

14 4,823,488

CLASS 40

124.1 4,823,489
449 4,823,490

CLASS 42

85 4,823,491

CLASS 43

6 4,823,492
15 4,823,493
17 4,823,494
17.5 4,823,496
17.6 4,823,497
25 4,823,498
41 4,823,499
42.04 4,823,503
42.13 4,823,500
42.31 4,823,501
42.37 4,823,502
43.13 4,823,495
96 4,823,504
124 4,823,505
131 4,823,506

CLASS 44

16 F 4,824,438
51 4,824,439
604 4,824,441
798.2 4,824,307

CLASS 48

206 4,824,440

CLASS 49

227 4,823,507
252 4,823,508
303 4,823,509
352 4,823,512
383 4,823,510
404 4,823,511

CLASS 51

7 4,823,513
170 MT 4,823,514
293 4,824,442
363 4,823,515
367 4,823,516

CLASS 52

39 4,823,517
40 4,823,518
93 4,823,519
101 4,823,520
102 4,823,521
167 4,823,522
173 R 4,823,523
182 4,823,524
200 4,823,525
220 4,823,526
221 4,823,527
233 4,823,528
263 4,823,529
317 4,823,530
586 4,823,531
594 4,823,532
727 4,823,533
743 4,823,534

CLASS 53

266 R 4,823,535
466 4,823,536
488 4,823,537
512 4,823,538
579 4,823,539

CLASS 54

80 4,823,540

CLASS 55

16 4,824,443
4,824,444
40 4,824,445
67 4,824,446
158 4,824,447
190 4,824,448
274 4,824,450
459.1 4,824,449
528 4,824,451

CLASS 56

13.4 4,823,541
17.5 4,823,542

CLASS 57

80 4,823,543
265 4,823,544
328 4,823,545

CLASS 60

39.04 4,823,546
226.2 4,823,547
253 4,823,548
275 4,823,549
412 4,823,550
422 4,823,551
443 4,823,552
585 4,823,553

CLASS 62

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20 4,824,452
22 4,824,453
37 4,824,454
133 4,823,555
139 4,823,556
238.6 4,823,557
272 4,823,558
347 4,823,559
467 4,823,560
513 4,823,561

CLASS 63

5.1 4,823,562

CLASS 65

3.11 4,824,455
4 4 4,824,456
12 4,824,457
30.13 4,824,458
33 4,824,463
59.26 4,824,459
68 4,824,460
83 4,824,461
106 4,824,464
325 4,824,462

CLASS 66

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84 R 4,823 563

CLASS 68

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CLASS 70

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38 C 4,823,566
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59 4,823,569
129 4,823,570
139 4,823,571
163 4,823,572
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312 4,823,574
358 4,823,575

CLASS 71

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88 4,824,468
90 4,824,465
4,824,470
92 4,824,466
4,824,471
4,824,472
4,824,473
4,824,474
93 4,824,475
095 4,824,476
103 4,824,477

CLASS 72

17 4,823,576
24 4,823,577
47 4,823,578
49 4,823,579
105 4,823,580
4,823,581
164 4,823,582
196 4,823,583
225 4,823,584
247 4,823,585
257 4,823,586
405 4,823,587
453.06 4,823,588
457 4,823,589

CLASS 73

1 J 4,823,590
3 4,823,591
4,823,592
23 4,823,593
54 4,823,594
73 4,823,595
118.1 4,823,596
118.2 4,823,462
160 4,823,597
232 4,823,598
579 4,823,599
592 4,823,600
594 4,823,601
661 4,823,602
717 4,823,604
724 4,823,603
727 4,823,605
761 4,823,606
783 4,823,607
4,823,608
799 4,823,609
828 4,823,610
842 4,823,611
861.18 4,823,612
861.38 4,823,613
4,823,614
861.66 4,823,615
862.04 4,823,618
862.23 4,823,616
862.36 4,823,617
4,823,620
862.58 4,823,619
862.69 4,823,621
863.71 4,823,622
864.74 4,823,623
865.9 4,823,624
866.5 4,823,625

CLASS 74

5.34 4,823,626
117 4,823,627
330 4,823,628
335 4,823,629
337.5 4,823,630
339 4,823,631
342 4,823,632
360 4,823,639
411.5 4,823,633
471 XY 4,823,634
524 4,823,635
606 R 4,823,637
640 4,823,638
687 4,823,640
760 4,823,641
860 4,823,642
866 4,823,643
4,823,644
4,823,645
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867 4,823,647
869 4,823,648

CLASS 75

0.5 C 4,824,478
0.5 R 4,824,479
68 R 4,824,480
246 4,824,481
254 4,824,482

CLASS 76

41 4,823,649

CLASS 81

124.2 4,823,650
124.4 4,823,651
125 4,823,652
429 B1 4,287,923
468 4,823,653
488 4,823,654

CLASS 82

113 4,823,655
159 4,823,656
162 4,823,657

CLASS 83

74 4,823,658
100 4,823,659
123 4,823,660
146 4,823,661
150 4,823,662
208 4,823,663
367 4,823,664
529 4,823,665
788 4,823,666

CLASS 84

1.16 4,823,667
296 4,823,668
313 4,823,669
318 4,823,670

CLASS 89

1.13 4,823,672
1.4 4,823,671
37.04 4,823,673
41.22 4,823,674
46 4,823,675
4,823,676

CLASS 91

49 4,823,677

CLASS 92

125 4,823,678

CLASS 98

2.09 4,823,682
33.1 4,823,679
36 4,823,680
40.3 4,823,681

CLASS 99

287 4,823,685
323.5 4,823,683
447 4,823,684

CLASS 100

26 4,823,686
53 4,823,687
93 RP 4,823,688
155 R 4,823,689
163 A 4,823,690

CLASS 101

104 4,823,691
110 4,823,692
218 4,823,693
227 4,823,694
230 4,823,695
334 4,823,696
375 4,823,697
409 4,823,698

CLASS 102

443 4,823,699
476 4,823,700
492 4,823,701
502 4,823,702
521 4,823,703

CLASS 104

140 4,823,705
247 4,823,704

CLASS 105

165 4,823,706
377 4,823,707
4,823,708

CLASS 106

18.12 4,824,483
18.31 4,824,484
22 4,824,485
30 4,824,486

CLASS 108

157 4,823,709

CLASS 110

234 4,823,710
236 4,823,711
245 4,823,712

CLASS 112

217 4,823,713
262.3 4,823,714
315 4,823,715
453 4,823,716

CLASS 114

61 4,823,717
98 4,823,720
113 4,823,718
126 4,823,719
303 4,823,721
333 4,823,722
343 4,823,723
4,823,724
4,823,725
345 4,823,726

CLASS 116

272 4,823,727

CLASS 118

50 4,823,728
213 4,823,729
223 4,823,730
326 4,823,731
622 4,823,732
630 4,823,733
719 4,823,734
730 4,823,735
4,823,736

CLASS 119

22 4,823,737
51 R 4,823,738

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4 D 4,823,739
4,823,740
7 R 4,823,741
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CLASS 123

18 R 4,823,743
41.12 4,823,744
51 R 4,823,745
145 A 4,823,746
193 H 4,823,747
303.14 4,823,791
336 4,823,748
339 4,823,749
4,823,750
359 4,823,751
400 4,823,752
417 4,823,753
470 4,823,754
480 4,823,755
531 4,823,756
557 4,823,757
564 4,823,758
568 4,823,759
571 4,823,760
4,823,798

CLASS 124

35 A 4,823,761
52 4,823,762
78 4,823,763
88 4,823,764

CLASS 126

20 4,823,766
4,823,767
91 R 4,823,768

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1101
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263 4,823,769
362 4,823,770
448 4,823,771
4,823,772

CLASS 128

24 A 4,823,773
4,823,774
4,823,775
33 4,823,776
57 4,823,777
76 B 4,823,778
79 4,823,779
92 VD 4,823,780
92 Z 4,823,781
94 4,823,782
156 4,823,783
200.14 4,823,784
202.15 4,823,785
202.27 4,823,786
203.27 4,823,787
205.24 4,823,788
207.18 4,823,789
303.1 4,823,790
321 4,823,792
328 4,823,793
335 4,823,794
419 D 4,823,796
419 PG 4,823,797
420.5 4,823,795
581 4,823,799
661.06 4,823,801
661.08 4,823,800
688 4,823,802
717 4,823,803
733 4,823,804
736 4,823,805
744 4,823,806
773 4,823,807
4,823,808
776 4,823,809
783 4,823,810
804 4,823,811
4,823,812
4,823,813
834 4,823,814
897 4,823,815

CLASS 130

9 B 4,823,816

CLASS 131

375 4,823,817

CLASS 134

10 4,824,487
95 4,823,818
104.4 4,823,819
109 4,823,820

CLASS 135

24 4,823,821
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96 4,823,823
120 4,823,824

CLASS 136

244 4,824,488
256 4,824,489

CLASS 137

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4,823,826
2 4,823,827
102 4,823,828
114 4,823,829
205 4,823,830
223 4,823,831
454.5 4,823,832
557 4,823,835
567 4,823,833
596.14 4,823,834
601 4,823,836
624.11 4,823,837
624.12 4,823,838
625.24 4,823,839
625.27 4,823,840
625.41 4,823,841
625.65 4,823,842
637.1 4,823,843

CLASS 138

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89 4,823,846
143 4,823,847
149 4,823,845

CLASS 141

334 4,823,848

CLASS 144

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3 D 4,823,849
4,823,852
245 R 4,823,851

CLASS 148

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12.4 4,824,492
111 4,824,493
259 4,824,490
438 4,824,494

CLASS 149

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CLASS 151

83 4,823,423

CLASS 152

209 R 4,823,853
4,823,855
382 4,823,854
523 4,823,856
540 4,823,857

CLASS 156

64 4,824,001
4,824,496
66 4,824,497
71 4,824,498
85 4,824,499
94 4,824,500
130 4,824,501
195 4,824,502
204 4,824,503
216 4,824,504
227 4,824,505
245 4,824,506
4,824,507
276 4,824,508
285 4,824,509
288 4,824,510
306.6 4,824,511
334 4,824,512
382 4,824,513
387 4,824,514
406.4 4,824,515
523 4,824,516
584 4,824,517
613 4,824,518
617.1 4,824,519
620.1 4,824,520
643 4,824,521
4,824,522

CLASS 160

135 4,823,858
370.2 4,823,859

CLASS 162

164.1 4,824,523
343 4,824,524
358 4,824,525

CLASS 164

480 4,823,860

CLASS 165

5 4,823,861
80.4 4,823,863
104.12 4,823,864
104.32 4,823,862
109.1 4,823,865
162 4,823,866
166 4,823,867
178 4,823,868
185 4,823,869

CLASS 166

79 4,823,870
182 4,823,871
217 4,823,872
272 4,823,873
279 4,823,874
280 4,823,875
299 4,823,876
319 4,823,877
341 4,823,878
4,823,879
373 4,823,880
382 4,823,881
387 4,823,882

CLASS 168

12 4,823,883

CLASS 172

508 4,823,884

CLASS 173

12 4,823,885
14 4,823,886
31 4,823,887

CLASS 174

35 GC 4,825,015
93 4,825,016

CLASS 175

45 4,823,888
107 4,823,889
318 4,823,890
323 4,823,891
329 4,823,892
410 4,823,893

CLASS 177

25.14 4,823,894

CLASS 178

18 4,825,017

CLASS 180

6.48 4,823,895
6.5 4,823,900
24.01 4,823,896
53.1 4,824,128
75.1 4,823,897
140 4,823,898
4,823,899
167 4,823,901
170 4,823,902
193 4,823,903
197 4,823,904
274 4,823,905

CLASS 181

137 4,823,906
148 4,823,907
175 4,823,908
282 B1 4,736,817
290 4,823,909

CLASS 182

84 4,823,910
119 4,823,911
214 4,823,912
225 4,823,913

CLASS 187

133 4,823,914

CLASS 188

2 D 4,823,915
24.12 4,823,916
24.19 4,823,917
4,823,918
67 4,823,919
73.34 4,823,920
250 G 4,823,921
322.15 4,823,922
376 4,823,923

CLASS 190

119 4,823,924

CLASS 192

0.076 4,823,925
18 B 4,823,926

CLASS 193

35 SS 4,823,927

CLASS 194

217 4,823,928

CLASS 198

345 4,823,929
437 4,823,930
445 4,823,931
450 4,823,932
465.3 4,823,933
470.1 4,823,934
533 4,823,935
550.1 4,823,936
657 4,823,937
750 4,823,938
805 4,823,939
817 4,823,940
819 4,823,941
847 4,823,942

CLASS 200

6 A 4,825,019
16 D 4,825,020
302.2 4,825,023
343.8 4,825,022
504 4,825,021

CLASS 202

82 4,824,526

CLASS 203

25 4,824,527

CLASS 204

1 T 4,824,528
4,824,529
26 4,824,530
67 4,824,531
72 4,824,532
73 R 4,824,533
128 4,824,534
129.75 4,824,535
157.22 4,824,537
180.2 4,824,538
192.12 4,824,540
192.2 4,824,539
222 4,824,541
253 4,824,542
280 4,824,543
298 4,824,544
4,824,545
4,824,546
299 R 4,824,547
406 4,824,548
410 4,824,549
427 4,824,550
431 4,824,551

CLASS 206

5 4,823,943
5.1 4,823,944
204 4,823,945
221 4,823,946
223 4,823,947
227 4,823,948
306 4,823,949
311 4,823,950
328 4,823,951
4,823,952
408 4,823,953
424 4,823,954
506 4,823,955
523 4,823,956
557 4,823,957
561 4,823,958
562 4,823,959
587 4,823,960
632 4,823,961

CLASS 208

17 4,824,552
32 4,824,553
46 4,824,554
143 4,824,556
146 4,824,557
187 4,824,555
420 4,824,558

CLASS 209

23 4,824,559
208 4,824,560

CLASS 210

17.4 4,824,160
96.1 4,824,561
104 4,824,562
195.1 4,824,563
232 4,824,564
266 4,824,565
321.87 4,824,566
416.4 4,824,567
490 4,824,568
500.23 4,824,569
511 4,824,570
602 4,824,572
603 4,824,571
640 4,824,573
654 4,824,574
662 4,824,575
4,824,576
665 4,824,577
674 4,824,578
703 4,824,579
708 4,824,580
709 4,824,581

CLASS 211

34 4,823,962
50 4,823,963
57.1 4,823,964
60.1 4,823,965
128 4,823,966

CLASS 215

222 4,823,967
228 4,823,968
260 4,823,969
329 4,823,970

CLASS 219

10.55 B 4,825,028
10.55 C 4,825,027
10.55 E 4,825,024
4,825,025
4,825,026
69.12 4,825,030
69.19 4,825,029
89 4,825,031
121.25 4,825,033
121.61 4,825,035
121.63 4,825,032
121.72 4,825,034
121.78 4,825,036
124.34 4,825,037
137 PS 4,825,038
212 4,825,039
216 4,825,040
244 4,825,041
283 4,825,042
298 4,825,043
433 4,825,046
496 4,825,047
528 4,825,048
545 4,825,049

CLASS 220

4 F 4,823,972
4 R 4,823,971
67 4,823,973
85 H 4,823,974
4,823,975
211 4,823,976
243 4,823,977
307 4,823,978
407 4,823,979
408 4,823,980
414 4,823,981

CLASS 221

3 4,823,982
92 4,823,983
96 4,823,984

CLASS 222

1 4,823,985
54 4,823,986
63 4,823,987
148 4,823,988
189 4,823,989
207 4,823,990
255 4,823,991
333 4,823,992
345 4,823,993
521 4,823,994
545 4,823,995

CLASS 224

42.03 B 4,823,997
150 4,823,998
309 4,823,999
322 4,823,996

CLASS 225

103 4,824,000

CLASS 226

197 4,824,002

CLASS 227

10 4,824,003
152 4,824,004

CLASS 228

1.1 4,824,005
10 4,824,006
102 4,824,007
121 4,824,008
124 4,824,009
173.7 4,824,011
180.2 4,824,010

CLASS 235

379 4,825,050
4,825,051
380 4,825,052
4,825,053
4,825,054
383 4,825,045
411 4,825,055
449 4,825,056
472 4,825,057
4,825,058
483 4,825,059
492 4,825,060

CLASS 236

49.5 4,824,012
78 R 4,824,013

CLASS 237

8 R 4,824,014

CLASS 238

336 4,824,015

CLASS 239

8 4,824,016
9 4,824,017
114 4,824,018
201 4,824,019
264 4,824,020
284.1 4,824,021
333.15 4,824,024
407 4,824,022
509 4,824,023
542 4,824,025
707 4,824,026

CLASS 241

24 4,824,027
4,824,028
39 4,824,030
4,824,031
46 B 4,824,032
66 4,824,033
101.2 4,824,034
188 A 4,824,035
375 4,824,029

CLASS 242

7.19 4,824,036
35.6 E 4,824,037
55.2 4,824,038
65 4,824,039
84.2 G 4,824,040
118.41 4,824,041
130 4,824,042
149 4,824,043
198 4,824,044
219 4,824,045
220 4,824,046

CLASS 244

2 4,824,047
12.2 4,824,048
110 C 4,824,049
118.1 4,824,050
158 R 4,824,051
170 4,824,052
218 4,824,053

CLASS 246

166.1 4,825,189
406 4,824,054
458 4,824,055

CLASS 248

60 4,824,056
62 4,824,057
176 4,824,059
210 4,824,060
225.2 4,824,061
265 4,824,062
346 4,824,063
441.1 4,824,064
483 4,824,065
500 4,824,066
642 4,824,067
764 4,824,058

CLASS 249

2 4,824,068
48 4,825,095
91 4,824,069
93 4,824,070
117 4,824,071

CLASS 250

201 4,825,062
203 R 4,825,063
205 4,825,064
4,825,065
207 4,825,066
211 R 4,825,061
213 VT 4,825,067
223 R 4,825,068
229 4,825,069
231 SE 4,825,070
256 4,825,071
259 4,825,072
260 4,825,073
317.1 4,825,074
338.3 4,825,079
342 4,825,075
343 4,825,076
369 4,825,077
372 4,825,078
396 R 4,825,080
423 F 4,825,082
436 4,825,083
484.1 4,825,084
4,825,085
491.1 4,825,086
492.2 R 4,825,087
506.1 4,825,088
515.1 4,825,089
4,825,090
551 4,825,081
560 4,825,091
561 4,825,092
566 4,825,093
573 4,825,094

CLASS 251

11 4,824,073
005 4,824,072
172 4,824,074
349 4,824,075

CLASS 252

8.75 4,824,582
39 4,824,583
4,824,584
4,824,585
49.5 4,824,586
62.55 4,824,587
70 4,824,588
82 4,824,589
90 4,824,590
94 4,824,591
95 4,824,592
127 4,824,593
174.12 4,824,599
174.21 4,824,594
182.17 4,824,595
299.61 4,824,596
4,824,597
301.4 R 4,824,598
313.1 4,824,600
401 4,824,601
545 4,824,603
546 4,824,604
547 4,824,602
4,824,605

607 4,824,606
631 4,824,607

CLASS 254

384 4,824,076

CLASS 256

51 4,824,077

CLASS 260

355 4,824,608
369 4,824,609
391 4,824,610
414 4,824,611
513.7 4,824,612

CLASS 261

35 4,824,613
76 4,824,614

CLASS 264

6 4,824,615
7 4,824,616
37 4,824,618
40.1 4,824,619
4,824,620
41 4,824,621
59 4,824,622
60 4,824,623
67 4,824,624
126 4,824,625
130 4,824,626
211.21 4,824,627
225 4,824,628
291 4,824,629
509 4,824,630
552 4,824,631

CLASS 266

44 4,824,079
218 4,824,080
237 4,824,078

CLASS 267

64.12 4,824,081
120 4,824,082

CLASS 269

15 4,824,083
87.2 4,824,084
139 4,824,085
156 4,824,086
234 4,824,087
309 4,824,088
328 4,824,089

CLASS 271

3.1 4,824,090
178 4,824,091
183 4,824,092
216 4,824,093
231 4,824,094
245 4,824,095
277 4,824,096

CLASS 272

8 N 4,824,097
19 4,824,098
33 R 4,824,099
65 4,824,100
66 4,824,101
73 4,824,102
125 4,824,103
4,824,104
130 4,824,105

CLASS 273

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1 GC 4,824,107
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144 B 4,824,113
148 B 4,824,111
157 R 4,824,112
162 B 4,824,114
169 4,824,115
171 4,824,116
248 4,824,117
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308 4,824,119
347 4,824,120
376 4,824,121

CLASS 277

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84 4,824,123
188 R 4,824,124
215 4,824,125

CLASS 279

1 C 4,824,126

CLASS 280

47.331 4,824,127
79.11 4,824,129
239 4,824,130
278 4,824,131
304.1 4,824,132
414.1 4,824,133
438.1 4,824,134
442 4,824,135
475 4,824,136
652 4,824,137
682 4,824,138
816 4,824,139

CLASS 281

8 4,824,140
42 4,824,141

CLASS 282

11.5 A 4,824,142

CLASS 283

56 4,824,143
87 4,824,144

CLASS 285

38 4,824,145
45 4,824,146
53 4,824,147
110 4,824,148

CLASS 290

1 R 4,824,149

CLASS 292

92 4,824,150
201 4,824,151
216 4,824,152
262 4,824,153
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CLASS 294

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142 4,824,156
145 R 4,824,536

CLASS 296

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37.7 4,824,159
97.8 4,824,161
100 4,824,157
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146 4,824,164
180.3 4,824,165
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CLASS 297

129 4,824,167
229 4,824,168
230 4,824,169
349 4,824,170
351 4,824,171
361 4,824,172
443 4,824,173
453 4,824,174
473 4,824,175

CLASS 299

59 4,824,176

CLASS 301

58 4,824,177

CLASS 303

15 4,824,178
22.5 4,824,180
22.7 4,824,179
84.2 4,824,181
92 4,824,182
4,824,183
100 4,824,184
110 4,824,185
4,824,186
114 4,824,187
116 4,824,188
119 4,824,189

CLASS 307

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243 4,825,098
270 4,025,099
4,825,101
272.2 4,825,097
279 4,825,100
296.5 4,825,102
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355 4,825,104
440 4,825,105
451 4,825,106
465 4,825,107
475 4,825,108
530 4,825,110
601 4,825,109

CLASS 310

12 4,825,111
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90 4,825,114
327 4,825,115
335 4,825,116
346 4,825,117

CLASS 312

138 R 4,824,190

CLASS 313

104 4,825,118
344 4,825,119
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417 4,825,122
452 4,825,123
486 4,825,124
493 4,825,125
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638 4,825,127

CLASS 315

58 4,825,128
278 4,825,129
317 4,825,130

CLASS 318

52 4,825,131
113 4,825,133
443 4,825,134
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568.17 4,825,135
594 4,825,137
716 4,825,138
811 4,825,132

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CLASS 323

237 4,825,140
271 4,825,141
272 4,825,144
314 4,825,142
315 4,825,145
351 4,825,018
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73 R 4,825,151
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126 4,825,153
127 4,825,154
133 4,825,150
158 F 4,825,155
166 4,825,136
208 4,825,157
237 4,825,158
309 4,825,159
4,825,160
4,825,161
318 4,825,162
4,825,163
322 4,825,164
323 4,825,165
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346 4,825,166
399 4,825,167
436 4,825,170
439 4,825,168
453 4,825,169
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CLASS 330

124 R 4,825,172
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CLASS 331

116 R 4,825,178

CLASS 335

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131 4,825,180
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CLASS 336

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CLASS 337

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605 4,825,198
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752 4,825,202
784 4,825,203
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825.02 4,825,206
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825.17 4,825,207
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825.520 4,825,204
825.72 4,825,209
901 4,825,211
975 4,825,194

CLASS 341

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CLASS 342

25 4,825,213
128 4,825,214
351 4,825,215
376 4,825,216

CLASS 343

715 4,825,217
765 4,825,218
771 4,825,219
785 4,825,221
795 4,825,220
836 4,825,222
840 4,825,223
860 4,825,224
881 4,825,225
901 4,825,226

CLASS 346

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108 4,825,230
140 R 4,825,231

CLASS 347

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3.73 4,824,192
96.10 4,824,194
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96.18 4,824,195
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96.21 4,824,197
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4,824,203
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96.25 4,824,205
96.29 4,824,206
255 4,824,207
276 SL 4,824,208
319 4,824,209
331 R 4,824,210
332 4,824,211
333 4,824,212
336 4,824,213
337 4,824,214
339 D 4,824,215
346 4,824,216
350 S 4,824,218
350.5 4,824,217
354 4,824,219
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357 4,824,221
4,824,222
427 4,824,223
4,824,226
4,824,236
432 4,824,224
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452 4,824,227
516 4,824,228
531 4,824,229
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632 4,824,231
633 4,824,232

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CLASS 353

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CLASS 354

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106 4,825,233
112 4,825,234
195.12 4,825,235
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484 4,825,240

CLASS 355

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3 SH 4,825,245
4 4,825,246
14 FU 4,825,242
14 R 4,825,250
14 SH 4,825,248
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27 4,825,251
4,825,256
32 4,825,252
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55 4,825,247
71 4,825,253
4,825,254
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CLASS 356

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141 4,824,245
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313 Re.32,911
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349 4,824,251
350 4,824,252
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16 4,825,265
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23.6 4,825,268
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38 4,825,270
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43 4,825,274
4,825,275
45 4,825,276
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59 4,825,281
68 4,825,279
71 4,825,280
74 4,825,283
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298 4,825,298
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99.08 4,825,314
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154 4,825,333
212 4,825,334
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80 4,825,344
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CLASS 363

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CLASS 364

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99 4,825,423
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CLASS 369

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CLASS 370

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CLASS 371

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15 4,825,439
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CLASS 372

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8 4,825,442
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CLASS 374

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179 4,824,260

CLASS 375

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22 4,825,452
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CLASS 376

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CLASS 378

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CLASS 379

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171 4,824,304
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273 4,824,311
310 4,824,312
346 4,824,313
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458 4,824,316
607 4,824,317
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723 4,824,319
744.3 4,824,320
757 4,824,321
788.4 4,824,306
797 4,824,308

CLASS 415

53 T 4,824,322
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CLASS 420

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CLASS 421

195.1 4,824,673

CLASS 422

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100 4,824,641
4,824,642
151 4,824,643
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321 R 4,824,650
345 4,824,651
348 4,824,652
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89 4,824,667
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94.1 4,824,669
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63 4,824,350
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8 4,824,682
62 4,824,683
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532 4,824,686
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53.1 4,824,691
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98 4,824,693
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168 4,824,695
208.6 4,824,696
255 4,824,698
255.2 4,824,697
307 4,824,699
379 4,824,700
385.5 4,824,701

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34.5 4,824,706
35.9 4,824,705
36.92 4,824,704
46 4,824,707
64 4,824,708
95 4,824,709
113 4,824,710
116 4,824,711
137 4,824,712
144 4,824,713
156 4,824,714
172 4,824,715
209 4,824,716
255 4,824,717
284 4,824,718
285 4,824,719
294 4,824,720
321.5 4,824,721
332 4,824,723
336 4,824,724
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349 4,824,726
352 4,824,727
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447 4,824,730
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26 4,824,741
30 4,824,742
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218 4,824,746

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110 4,824,754
138 4,824,755
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169 4,824,757
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203 4,824,759
204 4,824,760
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264 4,824,764
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299 4,824,766
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323 4,824,768
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269 4,824,389
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329 4,824,391
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	4,823,591		4,824,053		4,824,496		4,825,416		4,824,008		4,823,586
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	4,823,678		4,823,483		4,825,031		4,824,950		4,823,597		4,823,846
	4,823,738		4,823,499		4,825,148		4,824,967		4,824,119		4,823,893
	4,823,820		4,823,712		4,825,342		4,824,969		4,824,392		4,823,995
	4,823,833		4,823,729		4,825,385		4,824,971		4,824,893		4,823,999
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	4,824,015		4,824,230		4,823,725		4,825,354		4,823,583		4,824,250
	4,824,079		4,824,319		4,823,792		4,825,388		4,823,596		4,824,297
	4,824,121		4,824,376		4,823,795		4,825,459		4,823,783		4,824,383
	4,824,154		4,824,389		4,823,900	35 :	4,825,149		4,823,856		4,824,387
	4,824,179		4,824,443		4,823,956		4,825,194		4,823,857		4,824,398
	4,824,357		4,824,478		4,823,958	36 :	4,823,406		4,823,861		4,824,399
	4,824,395		4,824,486		4,823,975		4,823,412		4,823,901		4,824,404
	4,824,412		4,824,517		4,824,004		4,823,414		4,823,913		4,824,434
	4,824,414		4,824,551		4,824,089		4,823,437		4,823,967		4,824,457
	4,824,415		4,824,568		4,824,340		4,823,478		4,824,001		4,824,459
	4,824,526		4,824,642		4,824,342		4,823,514		4,824,041		4,824,482
	4,824,528		4,824,709		4,824,444		4,823,569		4,824,056		4,824,507
	4,824,553		4,824,726		4,824,540		4,823,571		4,824,081		4,824,513
	4,824,613		4,824,744		4,824,574		4,823,572		4,824,107		4,824,536
	4,824,680		4,824,761		4,824,623		4,823,600		4,824,295		4,824,543
	4,824,798		4,824,777		4,824,699		4,823,604		4,824,337		4,824,562
	4,824,818		4,824,784		4,824,718		4,823,610		4,824,367		4,824,576
	4,824,819		4,825,026		4,824,786		4,823,619		4,824,394		4,824,618
	4,824,901		4,825,124		4,824,866		4,823,663		4,824,413		4,824,632
	4,824,920		4,825,125		4,824,879		4,823,666		4,824,473		4,824,683
	4,824,936		4,825,127		4,824,953		4,823,671		4,824,515		4,824,712
	4,824,941		4,825,301		4,825,024		4,823,680		4,824,555		4,824,736
	4,825,078		4,825,334		4,825,054		4,823,772		4,824,582		4,824,839
	4,825,150		4,825,337		4,825,170		4,823,784		4,824,583		4,824,849
	4,825,156		4,825,360		4,825,197		4,823,859		4,824,590		4,824,925
	4,825,212		4,825,403		4,825,438		4,823,869		4,824,602		4,824,926
	4,825,294		4,825,409	28 :	4,823,552		4,823,873		4,824,605		4,824,957
	4,825,331		4,825,412		4,823,877		4,823,940		4,824,611		4,824,968
18 :	4,823,452		4,825,434		4,824,231		4,823,948		4,824,630		4,824,985
	4,823,632		4,825,435	29 :	4,823,493		4,823,963		4,824,692		4,824,996
	4,824,017		4,825,454		4,823,707		4,823,978		4,824,700		4,824,999
	4,824,351		4,825,458		4,823,982		4,823,990		4,824,720		4,825,021
	4,824,450	26 :	4,823,430		4,823,984		4,824,009		4,824,755		4,825,075
	4,824,557		4,823,441		4,824,075		4,824,088		4,824,832		4,825,088
	4,824,628		4,823,442		4,824,136		4,824,090		4,824,880		4,825,152
	4,824,723		4,823,455		4,824,572		4,824,105		4,824,914		4,825,199
	4,824,863		4,823,507		4,824,591		4,824,117		4,824,928		4,825,323
	4,825,129		4,823,511		4,824,638		4,824,130		4,824,974		4,825,327
	4,825,407		4,823,518		4,824,650		4,824,170		4,824,984	43 :	4,823,962
	4,825,425		4,823,533		4,824,662		4,824,209		4,824,990	44 :	4,823,824
19 :	4,823,789		4,823,557		4,824,954		4,824,227		4,825,077		4,824,057
	4,824,027		4,823,606	30 :	4,823,850		4,824,263		4,825,134		4,825,020
	4,824,031		4,823,677	31 :	4,823,942		4,824,305		4,825,187	45 :	4,823,464
	4,824,103		4,823,762	32 :	4,823,829		4,824,325		4,825,251		4,823,652
	4,824,627		4,823,778		4,823,864		4,824,371		4,825,376		4,824,043
	4,824,826		4,823,838	33 :	4,823,697		4,824,403		4,736,817		4,824,165
	4,825,381		4,823,842		4,823,952		4,824,417	40 :	4,823,474		4,824,498
20 :	4,823,453		4,823,844		4,824,122		4,824,436		4,823,496		4,824,525
	4,823,708		4,823,854		4,824,261		4,824,481		4,823,594		4,824,989
	4,823,884		4,823,920		4,824,377		4,824,483		4,823,611		4,825,032
	4,824,054		4,823,931		4,824,379		4,824,497		4,823,866	46 :	4,824,312
	4,825,151		4,823,972		4,825,227		4,824,503		4,823,872		4,825,147
21 :	4,823,988		4,823,996		4,825,386		4,824,519		4,823,874	47 :	4,823,668
	4,824,029		4,824,067	34 :	4,823,416		4,824,544		4,823,881		4,823,723
	4,825,028		4,824,126		4,823,429		4,824,554		4,824,040		4,823,979
22 :	4,823,415		4,824,144		4,823,524		4,824,564		4,824,316		4,824,012
	4,823,465		4,824,146		4,823,554		4,824,586		4,824,361		4,824,042
	4,823,481		4,824,159		4,823,623		4,824,649		4,824,446		4,824,332
	4,823,568		4,824,160		4,823,624		4,824,658		4,824,556		4,824,621
	4,823,651		4,824,181		4,823,660		4,824,716		4,824,643		4,824,653
	4,823,848		4,824,184		4,823,683		4,824,750		4,825,258		4,824,931
	4,823,919		4,824,232		4,823,960		4,824,769		3,970,719	48 :	Re.32,913
	4,824,064		4,824,234		4,823,966		4,824,797	41 :	4,823,472		4,823,408
	4,824,133		4,824,248		4,823,994		4,824,802		4,823,489		4,823,431
	4,824,408		4,824,285		4,824,016		4,824,803		4,823,498		4,823,456
	4,824,558		4,824,331		4,824,139		4,824,808		4,823,521		4,823,487
	4,824,579		4,824,333		4,824,143		4,824,868		4,823,540		4,823,497
	4,824,665		4,824,359		4,824,201		4,824,869		4,823,684		4,823,529
	4,824,814		4,824,427		4,824,219		4,824,884		4,823,796		4,823,556
	4,824,867		4,824,475		4,824,246		4,824,887		4,823,868		4,823,559
	4,824,940		4,824,506		4,824,260		4,824,895		4,823,895		4,823,598
	4,824,988		4,824,550		4,824,268		4,824,902		4,823,938		4,823,602
	4,825,002		4,824,561		4,824,303		4,824,915		4,823,965		4,823,673
	4,825,421		4,824,587		4,824,354		4,824,939		4,823,998		4,823,718
23 :	4,823,517		4,824,629		4,824,522		4,825,057		4,824,013		4,823,728
	4,823,836		4,824,672		4,824,575		4,825,117		4,824,158		4,823,731
	4,824,347		4,824,677		4,824,592		4,825,162		4,824,162		4,823,736
	4,824,390		4,824,682		4,824,609		4,825,177		4,824,296		4,823,741
	4,825,466		4,824,715		4,824,610		4,825,178		4,824,307		4,823,742
24 :	4,823,523		4,824,768		4,824,681		4,825,206		4,824,352		4,823,807
	4,823,672		4,824,843		4,824,698		4,825,213		4,824,435		4,823,827
	4,823,682		4,824,870		4,824,707		4,825,220		4,824,559		4,823,871
	4,823,699		4,824,872		4,824,747		4,825,242		4,824,767		4,823,882
	4,823,793		4,824,875		4,824,758		4,825,244		4,825,047		4,823,910
	4,824,237		4,824,877		4,824,783		4,825,245		4,825,100		4,823,986
	4,824,348		4,824,890		4,824,796		4,825,255		4,825,339		4,823,989
	4,824,432		4,824,916		4,824,804		4,825,319		4,825,379		4,824,000
	4,824,495		4,824,917		4,824,815		4,825,348		4,825,395		4,824,074

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4,824,114	4,824,889	4,825,457	4,824,038	4,824,713	4,823,752
4,824,137	4,824,977	4,825,460	4,824,111	4,825,069	4,823,761
4,824,196	4,824,997	49 : 4,823,405	4,824,204	4,825,084	4,823,764
4,824,197	4,825,000	4,823,407	4,824,251	4,825,135	4,823,779
4,824,317	4,825,009	4,823,424	4,824,660	4,825,166	4,823,816
4,824,411	4,825,010	4,823,433	4,824,671	4,825,184	4,823,865
4,824,447	4,825,071	4,823,443	4,824,951	4,825,358	4,823,936
4,824,492	4,825,072	4,823,890	4,825,061	4,825,374	4,823,961
4,824,500	4,825,073	4,824,020	4,825,165	4,825,375	4,823,968
4,824,508	4,825,097	4,824,279	4,825,259	4,825,392	4,824,034
4,824,533	4,825,101	4,824,283	4,825,350	4,825,450	4,824,062
4,824,577	4,825,142	4,825,108	53 : 4,823,419	54 : 4,823,732	4,824,272
4,824,580	4,825,200	4,825,224	4,823,444	4,824,462	4,824,425
4,824,589	4,825,232	50 : 4,825,410	4,823,590	55 : Re.32,911	4,824,426
4,824,644	4,825,275	51 : 4,823,457	4,823,627	4,823,409	4,824,588
4,824,645	4,825,280	4,823,510	4,823,649	4,823,494	4,824,615
4,824,646	4,825,345	4,823,558	4,823,701	4,823,506	4,824,689
4,824,667	4,825,380	4,823,609	4,823,852	4,823,515	4,825,025
4,824,669	4,825,390	4,823,703	4,823,911	4,823,661	4,825,123
4,824,684	4,825,394	4,823,776	4,824,050	4,823,688	4,825,132
4,824,785	4,825,413	4,823,923	4,824,134	4,823,724	4,825,338
4,824,793	4,825,433	4,823,976	4,824,631		

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6,754	6,756	6,759	6,763	6,764	31 : 6,749

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